

Appendix I

Water Characterization Results

ANALYTICAL REPORT

Job Number: 160-29476-1

Job Description: Former Carnotite Site - Non-Rad Analysis

For:

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Approved for release.
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8/17/2018 5:45 PM

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08/17/2018

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Louisiana Lab Certification ID (Non-Potable, Solid/Haz. Material): 106151
Florida Lab Certification ID (Drinking Water): E87689.

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Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.
*	LCS or LCSD is outside acceptance limits.
F1	MS and/or MSD Recovery is outside acceptance limits.

Rad

Qualifier	Qualifier Description
X	Tracer is outside acceptance limits.
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

CASE NARRATIVE

Client: Tetra Tech, Inc.

Project: Former Carnotite Site - Non-Rad Analysis

Report Number: 160-29476-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 07/12/2018; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.6° C, 20.0° C and 20.0° C.

TOTAL METALS (ICP)

Sample CRC-MW-1 (160-29476-1) was analyzed for total metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 07/31/2018 and analyzed on 08/02/2018 and 08/06/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HEXAVALENT CHROMIUM

Sample CRC-MW-1 (160-29476-1) was analyzed for hexavalent chromium in accordance with EPA SW-846 Method 7196A. The samples were analyzed on 07/13/2018.

Analytical Batch: 160-375313

The following sample in Hexavalent Chromium batch 160-375313 was received with less than one shift remaining of holding time, and was processed into the laboratory after the 24 hour holding time had expired: CRC-MW-1 (160-29476-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY

Sample CRC-MW-1 (160-29476-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were

prepared on 07/16/2018 and analyzed on 07/17/2018.

Prep Batch: 160-375873

The following samples were re-extracted/re-digested for mercury because the calibration tied to these samples was consumed before analysis could be performed in the previous prep batch: CRC-MW-1 (160-29476-1). Due to this issue the MS/MSD was spiked after preservation.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

1664A

Sample CRC-MW-1 (160-29476-1) was analyzed for 1664A in accordance with ASTM Method D3987-85/EPA Method 1664A. The samples were prepared and analyzed on 08/02/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS

Sample CRC-MW-1 (160-29476-1) was analyzed for total suspended solids in accordance with SM 2540D. The samples were analyzed on 07/18/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS, ION CHROMATOGRAPHY

Sample CRC-MW-1 (160-29476-1) was analyzed for Anions, Ion Chromatography in accordance with EPA Method 300.0. The samples were analyzed on 08/04/2018.

Analytical Batch: 160-380227

The following sample in Anion batch 160-380227 were diluted to bring the concentrations of target analytes within the calibration range: CRC-MW-1 (160-29476-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL CYANIDE

Sample CRC-MW-1 (160-29476-1) was analyzed for total cyanide in accordance with EPA SW-846 Method 9012B. The samples were prepared and analyzed on 07/24/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PHENOLICS, TOTAL RECOVERABLE

Sample CRC-MW-1 (160-29476-1) was analyzed for phenolics, total recoverable in accordance with EPA SW-846 Method 9066. The samples were prepared and analyzed on 08/03/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

BIOCHEMICAL OXYGEN DEMAND

Sample CRC-MW-1 (160-29476-1) was analyzed for Biochemical Oxygen Demand in accordance with SM 5210B. The samples were analyzed on 07/14/2018.

Analytical Batch: 490-529442

The following sample was received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: CRC-MW-1 (160-29476-1).

The correction factor for the Seeded Control Blank (SCB) for batch 490-529442 was outside the method range of 0.6 to 1.0 mg/L. Thus, there is added uncertainty for the associated sample results.

The glucose-glutamic acid standard recovered outside the recovery limits specified in the method in batch 490-529442. LCS 490-529442/2

All the dilutions failed to deplete the method-required 2 mgO₂/L for the following samples: CRC-MW-1 (160-29476-1). Only a "less than" result could be calculated from the least dilute preparation.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM 226 (21 DAY INGROWTH)

Sample CRC-MW-1 (160-29476-1) was analyzed for Radium 226 (21 day ingrowth) in accordance with SW- 846 Method 9315. The samples were prepared on 07/13/2018 and analyzed on 08/08/2018.

Prep Batch: 160-375564

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: CRC-MW-1 (160-29476-1). A

laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-228 (GFPC)

Sample CRC-MW-1 (160-29476-1) was analyzed for Radium-228 (GFPC) in accordance with SW-846 Method 9320. The samples were prepared on 07/13/2018 and analyzed on 07/27/2018.

Prep Batch: 160-375578

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: CRC-MW-1 (160-29476-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ISOTOPIC THORIUM (ALPHA SPECTROMETRY)

Sample CRC-MW-1 (160-29476-1) was analyzed for Isotopic Thorium (Alpha Spectrometry) in accordance with DOE. The samples were prepared on 08/08/2018 and analyzed on 08/10/2018.

Prep Batch: 160-381166

Insufficient sample volume was available to perform a sample duplicate (DUP) for following samples: CRC-MW-1 (160-29476-1). A Laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ISOTOPIC URANIUM (ALPHA SPECTROMETRY)

Sample CRC-MW-1 (160-29476-1) was analyzed for Isotopic Uranium (Alpha Spectrometry) in accordance with DOE. The samples were prepared on 07/24/2018 and analyzed on 08/06/2018.

Prep Batch: 160-377736

The uranium-232 tracer recovery for the following samples are low outside of the lower QC limit of 30% (160-29476-G-1-C, 17.4% and 160-29476-G-1-D DU, 17.1%). The DOE/DOD Quality Systems Manual for Environmental Laboratories (QSM Rev. 5.0) allows for reporting results as quantitative when tracer recoveries are below 30% if a) the relative uncertainty associated with the tracer recovery is less than 10% (2 sigma), b) spectral resolution requirements are met and there are no indications of spectral interferences, and c) detection limit requirements are met. All three of these criteria are met for these samples: a) a minimum of 400 counts (which leads to 10% count uncertainty at 2 sigma) in the tracer peak, b) resolution of < 100 keV is met for all peaks, and c) the activity in the sample is well above the MDC and the MDC is below the RL. The data have been qualified and reported. CRC-MW-1 (160-29476-1) and (160-29476-G-1-D DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Client Sample ID: CRC-MW-1

Date Collected: 07/11/18 13:55

Date Received: 07/12/18 09:30

Lab Sample ID: 160-29476-1

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	4700		2000	520	ug/L	—		08/04/18 06:06	20

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	330		200	50	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Antimony	3.0	U	10	3.0	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Arsenic	4.0	U	10	4.0	ug/L	—	07/31/18 19:39	08/06/18 12:41	1
Barium	15	J	50	15	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Beryllium	1.5	U	5.0	1.5	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Cadmium	1.5	U	5.0	1.5	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Calcium	71000		1000	300	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Chromium	3.0	U	10	3.0	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Cobalt	15	U	50	15	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Copper	7.0	U	25	7.0	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Iron	540		100	30	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Lead	3.0	U	10	3.0	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Magnesium	23000		1000	300	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Manganese	100		15	4.0	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Nickel	10	U	40	10	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Potassium	4000	J	5000	1500	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Selenium	8.0	U	15	8.0	ug/L	—	07/31/18 19:39	08/06/18 12:41	1
Silver	3.0	U	10	3.0	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Sodium	28000		1000	300	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Thallium	5.0	U	20	5.0	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Vanadium	56		50	25	ug/L	—	07/31/18 19:39	08/02/18 17:32	1
Zinc	8.1	J	20	6.0	ug/L	—	07/31/18 19:39	08/02/18 17:32	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.060	U	0.20	0.060	ug/L	—	07/16/18 11:20	07/17/18 14:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease)	1.3	U	3.8	1.3	mg/L	—	08/02/18 13:17	08/02/18 13:17	1
Cr (VI)	2.6	U H	10	2.6	ug/L	—		07/13/18 07:59	1
Cyanide, Total	0.0070	U	0.010	0.0070	mg/L	—	07/24/18 12:33	07/24/18 16:50	1
Phenols, Total	0.020	U F1	0.050	0.020	mg/L	—	08/03/18 10:04	08/03/18 18:39	1
Total Suspended Solids	12		2.0	1.4	mg/L	—		07/18/18 17:00	1
Biochemical Oxygen Demand	2.0	U H *	2.0	2.0	mg/L	—		07/14/18 15:33	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.356		0.105	0.109	1.00	0.0859	pCi/L	07/13/18 13:31	08/08/18 05:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.5		40 - 110					07/13/18 13:31	08/08/18 05:29	1

TestAmerica St. Louis

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Client Sample ID: CRC-MW-1

Date Collected: 07/11/18 13:55

Date Received: 07/12/18 09:30

Lab Sample ID: 160-29476-1

Matrix: Water

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.533		0.273	0.277	1.00	0.404	pCi/L	07/13/18 14:09	07/27/18 09:20	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.5		40 - 110					07/13/18 14:09	07/27/18 09:20	1
Y Carrier	83.0		40 - 110					07/13/18 14:09	07/27/18 09:20	1

Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium-230	0.197	U	0.247	0.248	1.00	0.328	pCi/L	08/08/18 14:32	08/10/18 18:48	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Thorium-229	74.9		30 - 110					08/08/18 14:32	08/10/18 18:48	1

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium-234	183		4.60	16.1	1.00	0.353	pCi/L	07/24/18 18:01	08/06/18 22:38	1
Uranium-235	9.10		1.15	1.38	1.00	0.342	pCi/L	07/24/18 18:01	08/06/18 22:38	1
Uranium-238	185		4.62	16.2	1.00	0.274	pCi/L	07/24/18 18:01	08/06/18 22:38	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Uranium-232	17.4	X	30 - 110					07/24/18 18:01	08/06/18 22:38	1

Default Detection Limits

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 300.0 - Anions, Ion Chromatography

Analyte	RL	MDL	Units	Method
Fluoride	100	26	ug/L	300.0

Method: 6010C - Metals (ICP)

Prep: 3010A

Analyte	RL	MDL	Units	Method
Aluminum	200	50	ug/L	6010C
Antimony	10	3.0	ug/L	6010C
Arsenic	10	4.0	ug/L	6010C
Barium	50	15	ug/L	6010C
Beryllium	5.0	1.5	ug/L	6010C
Cadmium	5.0	1.5	ug/L	6010C
Calcium	1000	300	ug/L	6010C
Chromium	10	3.0	ug/L	6010C
Cobalt	50	15	ug/L	6010C
Copper	25	7.0	ug/L	6010C
Iron	100	30	ug/L	6010C
Lead	10	3.0	ug/L	6010C
Magnesium	1000	300	ug/L	6010C
Manganese	15	4.0	ug/L	6010C
Nickel	40	10	ug/L	6010C
Potassium	5000	1500	ug/L	6010C
Selenium	15	8.0	ug/L	6010C
Silver	10	3.0	ug/L	6010C
Sodium	1000	300	ug/L	6010C
Thallium	20	5.0	ug/L	6010C
Vanadium	50	25	ug/L	6010C
Zinc	20	6.0	ug/L	6010C

Method: 7470A - Mercury (CVAA)

Prep: 7470A

Analyte	RL	MDL	Units	Method
Mercury	0.20	0.060	ug/L	7470A

General Chemistry

Analyte	RL	MDL	Units	Method
Cr (VI)	10	2.6	ug/L	7196A
Total Suspended Solids	1.0	0.70	mg/L	SM 2540D
Biochemical Oxygen Demand	2.0	2.0	mg/L	SM5210B

General Chemistry

Prep: 1664B

Analyte	RL	MDL	Units	Method
HEM (Oil & Grease)	4.0	1.4	mg/L	1664B

General Chemistry

Prep: 9012B

Analyte	RL	MDL	Units	Method
Cyanide, Total	0.010	0.0070	mg/L	9012B

TestAmerica St. Louis

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-29476-1

Project/Site: Former Carnotite Site - Non-Rad Analysis

General Chemistry

Prep: Distill/Phenol

Analyte	RL	MDL	Units	Method
Phenols, Total	0.050	0.020	mg/L	9066

Tracer/Carrier Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)					
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)					
160-29476-1	CRC-MW-1	96.5					
LCS 160-375564/1-A	Lab Control Sample	92.0					
LCSD 160-375564/2-A	Lab Control Sample Dup	99.7					
MB 160-375564/15-A	Method Blank	101					

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)					
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)				
160-29476-1	CRC-MW-1	96.5	83.0				
LCS 160-375578/1-A	Lab Control Sample	92.0	84.9				
LCSD 160-375578/2-A	Lab Control Sample Dup	99.7	81.1				
MB 160-375578/15-A	Method Blank	101	83.4				

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)					
Lab Sample ID	Client Sample ID	thorium-22 (30-110)					
160-29476-1	CRC-MW-1	74.9					
LCS 160-381166/2-A	Lab Control Sample	98.9					
LCSD 160-381166/3-A	Lab Control Sample Dup	95.4					
MB 160-381166/1-A	Method Blank	87.9					

Tracer/Carrier Legend

Thorium-229 = Thorium-229

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)					
Lab Sample ID	Client Sample ID	uranium-23 (30-110)					
160-29476-1	CRC-MW-1	17.4 X					
160-29476-1 DU	CRC-MW-1	17.1 X					
LCS 160-377736/2-A	Lab Control Sample	69.2					
MB 160-377736/1-A	Method Blank	81.0					

Tracer/Carrier Legend

Uranium-232 = Uranium-232

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 160-380227/3

Matrix: Water

Analysis Batch: 380227

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	26	U	100	26	ug/L			08/03/18 18:49	1

Lab Sample ID: LCS 160-380227/4

Matrix: Water

Analysis Batch: 380227

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	1000	1000		ug/L		100	90 - 110

Method: 300.0 - Anions, Ion Chromatography - DL

Lab Sample ID: 160-29476-1 MS

Matrix: Water

Analysis Batch: 380227

Client Sample ID: CRC-MW-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride - DL	4700		40000	46200		ug/L		104	90 - 110

Lab Sample ID: 160-29476-1 DU

Matrix: Water

Analysis Batch: 380227

Client Sample ID: CRC-MW-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Fluoride - DL	4700		4800		ug/L		2	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 160-379537/1-A

Matrix: Water

Analysis Batch: 380117

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 379537

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	50	U	200	50	ug/L		07/31/18 19:39	08/02/18 17:23	1
Antimony	3.0	U	10	3.0	ug/L		07/31/18 19:39	08/02/18 17:23	1
Barium	15	U	50	15	ug/L		07/31/18 19:39	08/02/18 17:23	1
Beryllium	1.5	U	5.0	1.5	ug/L		07/31/18 19:39	08/02/18 17:23	1
Cadmium	1.5	U	5.0	1.5	ug/L		07/31/18 19:39	08/02/18 17:23	1
Calcium	300	U	1000	300	ug/L		07/31/18 19:39	08/02/18 17:23	1
Chromium	3.0	U	10	3.0	ug/L		07/31/18 19:39	08/02/18 17:23	1
Cobalt	15	U	50	15	ug/L		07/31/18 19:39	08/02/18 17:23	1
Copper	7.0	U	25	7.0	ug/L		07/31/18 19:39	08/02/18 17:23	1
Iron	30	U	100	30	ug/L		07/31/18 19:39	08/02/18 17:23	1
Lead	3.0	U	10	3.0	ug/L		07/31/18 19:39	08/02/18 17:23	1
Magnesium	300	U	1000	300	ug/L		07/31/18 19:39	08/02/18 17:23	1
Manganese	4.0	U	15	4.0	ug/L		07/31/18 19:39	08/02/18 17:23	1
Nickel	10	U	40	10	ug/L		07/31/18 19:39	08/02/18 17:23	1
Potassium	1500	U	5000	1500	ug/L		07/31/18 19:39	08/02/18 17:23	1
Silver	3.0	U	10	3.0	ug/L		07/31/18 19:39	08/02/18 17:23	1

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 160-379537/1-A
Matrix: Water
Analysis Batch: 380117

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 379537

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	300	U	1000	300	ug/L		07/31/18 19:39	08/02/18 17:23	1
Thallium	5.0	U	20	5.0	ug/L		07/31/18 19:39	08/02/18 17:23	1
Vanadium	25	U	50	25	ug/L		07/31/18 19:39	08/02/18 17:23	1
Zinc	6.0	U	20	6.0	ug/L		07/31/18 19:39	08/02/18 17:23	1

Lab Sample ID: MB 160-379537/1-A
Matrix: Water
Analysis Batch: 380741

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 379537

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.0	U	10	4.0	ug/L		07/31/18 19:39	08/06/18 12:32	1
Selenium	8.0	U	15	8.0	ug/L		07/31/18 19:39	08/06/18 12:32	1

Lab Sample ID: LCS 160-379537/2-A
Matrix: Water
Analysis Batch: 380117

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 379537

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	10000	9610		ug/L		96	80 - 120
Antimony	500	451		ug/L		90	80 - 120
Barium	1000	946		ug/L		95	80 - 120
Beryllium	100	97.4		ug/L		97	80 - 120
Cadmium	1000	963		ug/L		96	80 - 120
Calcium	10000	10300		ug/L		103	80 - 120
Chromium	1000	967		ug/L		97	80 - 120
Cobalt	1000	1010		ug/L		101	80 - 120
Copper	1000	969		ug/L		97	80 - 120
Iron	10000	9990		ug/L		100	80 - 120
Lead	1000	977		ug/L		98	80 - 120
Magnesium	10000	9670		ug/L		97	80 - 120
Manganese	1000	987		ug/L		99	80 - 120
Nickel	1000	1020		ug/L		102	80 - 120
Potassium	10000	9980		ug/L		100	80 - 120
Silver	200	206		ug/L		103	80 - 120
Sodium	10000	9950		ug/L		99	80 - 120
Thallium	200	203		ug/L		102	80 - 120
Vanadium	1000	946		ug/L		95	80 - 120
Zinc	1000	963		ug/L		96	80 - 120

Lab Sample ID: LCS 160-379537/2-A
Matrix: Water
Analysis Batch: 380741

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 379537

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1000	995		ug/L		100	80 - 120
Selenium	500	504		ug/L		101	80 - 120

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 160-29476-1 MS

Matrix: Water

Analysis Batch: 380117

Client Sample ID: CRC-MW-1

Prep Type: Total/NA

Prep Batch: 379537

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Aluminum	330		10000	9910		ug/L		96	75 - 125
Antimony	3.0	U	500	462		ug/L		92	75 - 125
Barium	15	J	1000	959		ug/L		94	75 - 125
Beryllium	1.5	U	100	97.5		ug/L		98	75 - 125
Cadmium	1.5	U	1000	975		ug/L		97	75 - 125
Calcium	71000		10000	81100	4	ug/L		97	75 - 125
Chromium	3.0	U	1000	953		ug/L		95	75 - 125
Cobalt	15	U	1000	993		ug/L		99	75 - 125
Copper	7.0	U	1000	958		ug/L		96	75 - 125
Iron	540		10000	10400		ug/L		99	75 - 125
Lead	3.0	U	1000	951		ug/L		95	75 - 125
Magnesium	23000		10000	32200		ug/L		95	75 - 125
Manganese	100		1000	1070		ug/L		97	75 - 125
Nickel	10	U	1000	1000		ug/L		100	75 - 125
Potassium	4000	J	10000	14100		ug/L		102	75 - 125
Silver	3.0	U	200	210		ug/L		105	75 - 125
Sodium	28000		10000	38200		ug/L		101	75 - 125
Thallium	5.0	U	200	194		ug/L		97	75 - 125
Vanadium	56		1000	999		ug/L		94	75 - 125
Zinc	8.1	J	1000	985		ug/L		98	75 - 125

Lab Sample ID: 160-29476-1 MS

Matrix: Water

Analysis Batch: 380741

Client Sample ID: CRC-MW-1

Prep Type: Total/NA

Prep Batch: 379537

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	4.0	U	1000	976		ug/L		98	75 - 125
Selenium	8.0	U	500	493		ug/L		99	75 - 125

Lab Sample ID: 160-29476-1 MSD

Matrix: Water

Analysis Batch: 380117

Client Sample ID: CRC-MW-1

Prep Type: Total/NA

Prep Batch: 379537

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Aluminum	330		10000	9970		ug/L		96	75 - 125	1	20
Antimony	3.0	U	500	447		ug/L		89	75 - 125	3	20
Barium	15	J	1000	955		ug/L		94	75 - 125	0	20
Beryllium	1.5	U	100	97.1		ug/L		97	75 - 125	0	20
Cadmium	1.5	U	1000	956		ug/L		96	75 - 125	2	20
Calcium	71000		10000	80600	4	ug/L		92	75 - 125	1	20
Chromium	3.0	U	1000	939		ug/L		94	75 - 125	1	20
Cobalt	15	U	1000	979		ug/L		98	75 - 125	1	20
Copper	7.0	U	1000	936		ug/L		94	75 - 125	2	20
Iron	540		10000	10500		ug/L		99	75 - 125	1	20
Lead	3.0	U	1000	935		ug/L		93	75 - 125	2	20
Magnesium	23000		10000	32600		ug/L		99	75 - 125	1	20
Manganese	100		1000	1070		ug/L		97	75 - 125	0	20
Nickel	10	U	1000	992		ug/L		99	75 - 125	1	20

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 160-29476-1 MSD

Matrix: Water

Analysis Batch: 380117

Client Sample ID: CRC-MW-1

Prep Type: Total/NA

Prep Batch: 379537

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Potassium	4000	J	10000	14200		ug/L		103	75 - 125	1	20
Silver	3.0	U	200	209		ug/L		105	75 - 125	0	20
Sodium	28000		10000	38500		ug/L		104	75 - 125	1	20
Thallium	5.0	U	200	189		ug/L		95	75 - 125	3	20
Vanadium	56		1000	987		ug/L		93	75 - 125	1	20
Zinc	8.1	J	1000	969		ug/L		96	75 - 125	2	20

Lab Sample ID: 160-29476-1 MSD

Matrix: Water

Analysis Batch: 380741

Client Sample ID: CRC-MW-1

Prep Type: Total/NA

Prep Batch: 379537

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	4.0	U	1000	1000		ug/L		100	75 - 125	3	20
Selenium	8.0	U	500	504		ug/L		101	75 - 125	2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 160-375873/1-A

Matrix: Water

Analysis Batch: 376379

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 375873

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.060	U	0.20	0.060	ug/L		07/16/18 11:20	07/17/18 13:55	1

Lab Sample ID: LCS 160-375873/2-A

Matrix: Water

Analysis Batch: 376379

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 375873

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.36		ug/L		107	80 - 120

Lab Sample ID: 160-29274-A-3-C MS

Matrix: Water

Analysis Batch: 376379

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 375873

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.060	U	5.00	5.48		ug/L		110	80 - 120

Lab Sample ID: 160-29274-A-3-D MSD

Matrix: Water

Analysis Batch: 376379

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 375873

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.060	U	5.00	5.39		ug/L		108	80 - 120	2	20

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 1664B - HEM and SGT-HEM

Lab Sample ID: MB 490-533397/1-A
Matrix: Water
Analysis Batch: 533454

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 533397

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease)	1.4	U	4.0	1.4	mg/L	-	08/02/18 13:17	08/02/18 13:17	1

Lab Sample ID: LCS 490-533397/2-A
Matrix: Water
Analysis Batch: 533454

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 533397

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HEM (Oil & Grease)	41.7	39.58		mg/L	-	95	78 - 114

Lab Sample ID: LCSD 490-533397/3-A
Matrix: Water
Analysis Batch: 533454

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 533397

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
HEM (Oil & Grease)	41.7	39.48		mg/L	-	95	78 - 114	0	18

Lab Sample ID: 180-80122-B-1-A MS
Matrix: Water
Analysis Batch: 533454

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 533397

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
HEM (Oil & Grease)	1.3	U	40.5	37.55		mg/L	-	93	78 - 114

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 160-375313/8
Matrix: Water
Analysis Batch: 375313

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	2.6	U	10	2.6	ug/L	-		07/13/18 07:59	1

Lab Sample ID: LCS 160-375313/9
Matrix: Water
Analysis Batch: 375313

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	50.1	50.0		ug/L	-	100	85 - 115

Lab Sample ID: 160-29476-1 MS
Matrix: Water
Analysis Batch: 375313

Client Sample ID: CRC-MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	2.6	U H	50.1	51.2		ug/L	-	102	85 - 115

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 7196A - Chromium, Hexavalent (Continued)

Lab Sample ID: 160-29476-1 DU
Matrix: Water
Analysis Batch: 375313

Client Sample ID: CRC-MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cr (VI)	2.6	U H	2.6	U	ug/L		NC	20

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 490-531103/1-A
Matrix: Water
Analysis Batch: 531193

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 531103

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.0070	U	0.010	0.0070	mg/L		07/24/18 12:33	07/24/18 16:47	1

Lab Sample ID: LCS 490-531103/2-A
Matrix: Water
Analysis Batch: 531193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 531103
%Rec.

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Cyanide, Total	0.100	0.0864		mg/L		86	85 - 115

Lab Sample ID: 160-29476-1 MS
Matrix: Water
Analysis Batch: 531193

Client Sample ID: CRC-MW-1
Prep Type: Total/NA
Prep Batch: 531103
%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Cyanide, Total	0.0070	U	0.100	0.105		mg/L		105	70 - 130

Lab Sample ID: 160-29476-1 MSD
Matrix: Water
Analysis Batch: 531193

Client Sample ID: CRC-MW-1
Prep Type: Total/NA
Prep Batch: 531103
%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Cyanide, Total	0.0070	U	0.100	0.0927		mg/L		93	70 - 130	12	46

Lab Sample ID: 160-29476-1 DU
Matrix: Water
Analysis Batch: 531193

Client Sample ID: CRC-MW-1
Prep Type: Total/NA
Prep Batch: 531103

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cyanide, Total	0.0070	U	0.0070	U	mg/L		NC	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-529799/1
Matrix: Water
Analysis Batch: 529799

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	0.70	U	1.0	0.70	mg/L			07/18/18 17:00	1

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 490-529799/2
Matrix: Water
Analysis Batch: 529799

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	99.6		mg/L		100	90 - 110

Lab Sample ID: 490-155579-A-1 DU
Matrix: Water
Analysis Batch: 529799

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	260		316		mg/L		18	20

Lab Sample ID: 490-155733-A-1 DU
Matrix: Water
Analysis Batch: 529799

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	79		82.0		mg/L		4	20

Method: SM5210B - BOD, 5 Day

Lab Sample ID: USB 490-529442/1
Matrix: Water
Analysis Batch: 529442

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	USB Result	USB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Biochemical Oxygen Demand	2.0	U	2.0	2.0	mg/L			07/14/18 18:22	1

Lab Sample ID: LCS 490-529442/2
Matrix: Water
Analysis Batch: 529442

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Biochemical Oxygen Demand	3.96	4.99	*	mg/L		126	85 - 115

Lab Sample ID: 490-155652-F-1 DU
Matrix: Water
Analysis Batch: 529442

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Biochemical Oxygen Demand	5.0	b *	5.13	*	mg/L		2	20

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-375564/15-A
Matrix: Water
Analysis Batch: 380986

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 375564

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.1295		0.0706	0.0716	1.00	0.0869	pCi/L	07/13/18 13:31	08/08/18 05:29	1

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: MB 160-375564/15-A
Matrix: Water
Analysis Batch: 380986

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 375564

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	07/13/18 13:31	08/08/18 05:29	1

Lab Sample ID: LCS 160-375564/1-A
Matrix: Water
Analysis Batch: 380986

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 375564

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	10.46		1.09	1.00	0.0719	pCi/L	92	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	92.0		40 - 110						

Lab Sample ID: LCSD 160-375564/2-A
Matrix: Water
Analysis Batch: 380986

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 375564

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.4	10.60		1.10	1.00	0.101	pCi/L	93	68 - 137	0.07	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	99.7		40 - 110								

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-375578/15-A
Matrix: Water
Analysis Batch: 378362

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 375578

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.3845	U	0.274	0.276	1.00	0.430	pCi/L	07/13/18 14:09	07/27/18 09:20	1
Carrier	MB %Yield	MB Qualifier	Limits							
Ba Carrier	101		40 - 110							
Y Carrier	83.4		40 - 110							

Lab Sample ID: LCS 160-375578/1-A
Matrix: Water
Analysis Batch: 378362

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 375578

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	11.2	11.46		1.31	1.00	0.513	pCi/L	102	56 - 140

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-375578/1-A
Matrix: Water
Analysis Batch: 378362

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 375578

	LCS	LCS	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	92.0		40 - 110
Y Carrier	84.9		40 - 110

Lab Sample ID: LCSD 160-375578/2-A
Matrix: Water
Analysis Batch: 378362

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 375578

Analyte		Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228		11.2	10.96		1.25	1.00	0.404	pCi/L	98	56 - 140	0.19	1
	LCS	LCS										
Carrier	%Yield	Qualifier	Limits									
Ba Carrier	99.7		40 - 110									
Y Carrier	81.1		40 - 110									

Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Lab Sample ID: MB 160-381166/1-A
Matrix: Water
Analysis Batch: 381888

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 381166

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium-230	-0.03130	U	0.178	0.178	1.00	0.295	pCi/L	08/08/18 14:32	08/10/18 18:48	1
Tracer	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Thorium-229	87.9		30 - 110					08/08/18 14:32	08/10/18 18:48	1

Lab Sample ID: LCS 160-381166/2-A
Matrix: Water
Analysis Batch: 381889

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 381166

Analyte		Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Thorium-230		8.03	9.236		1.21	1.00	0.283	pCi/L	115	81 - 125		
Tracer	LCS %Yield	LCS Qualifier	Limits									
Thorium-229	98.9		30 - 110									

Lab Sample ID: LCSD 160-381166/3-A
Matrix: Water
Analysis Batch: 381909

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 381166

Analyte		Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Thorium-230		8.03	7.713		1.08	1.00	0.285	pCi/L	96	81 - 125	0.67	1

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Method: A-01-R - Isotopic Thorium (Alpha Spectrometry) (Continued)

Lab Sample ID: LCSD 160-381166/3-A
Matrix: Water
Analysis Batch: 381909

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 381166

Tracer	LCSD LCSD		Limits
	%Yield	Qualifier	
Thorium-229	95.4		30 - 110

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Lab Sample ID: MB 160-377736/1-A
Matrix: Water
Analysis Batch: 380260

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 377736

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Uranium-234	0.02174	U	0.0739	0.0739	1.00	0.169	pCi/L	07/24/18 18:01	08/03/18 14:29	1
Uranium-235	-0.01739	U	0.0201	0.0201	1.00	0.176	pCi/L	07/24/18 18:01	08/03/18 14:29	1
Uranium-238	-0.01395	U	0.0161	0.0162	1.00	0.141	pCi/L	07/24/18 18:01	08/03/18 14:29	1
Tracer	MB MB		Limits							
	%Yield	Qualifier								
Uranium-232	81.0		30 - 110							
								Prepared	Analyzed	Dil Fac
								07/24/18 18:01	08/03/18 14:29	1

Lab Sample ID: LCS 160-377736/2-A
Matrix: Water
Analysis Batch: 380261

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 377736

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec.	
				Uncert. (2σ+/-)					Limits	
Uranium-234	12.7	12.62		1.59	1.00	0.203	pCi/L	99	84 - 120	
Uranium-238	13.0	13.18		1.63	1.00	0.125	pCi/L	101	83 - 121	
Tracer	LCS LCS		Limits							
	%Yield	Qualifier								
Uranium-232	69.2		30 - 110							

Lab Sample ID: 160-29476-1 DU
Matrix: Water
Analysis Batch: 380835

Client Sample ID: CRC-MW-1
Prep Type: Total/NA
Prep Batch: 377736

Analyte	Sample Sample		DU Result	DU Qual	Total	RL	MDC	Unit	RER	RER	
	Result	Qual			Uncert. (2σ+/-)					Limit	
Uranium-234	183		195.3		17.1	1.00	0.380	pCi/L	0.36	1	
Uranium-235	9.10		10.52		1.50	1.00	0.234	pCi/L	0.49	1	
Uranium-238	185		195.2		17.0	1.00	0.188	pCi/L	0.29	1	
Tracer	DU DU		Limits								
	%Yield	Qualifier									
Uranium-232	17.1	X	30 - 110								

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

HPLC/IC

Analysis Batch: 380227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1 - DL	CRC-MW-1	Total/NA	Water	300.0	
MB 160-380227/3	Method Blank	Total/NA	Water	300.0	
LCS 160-380227/4	Lab Control Sample	Total/NA	Water	300.0	
160-29476-1 MS - DL	CRC-MW-1	Total/NA	Water	300.0	
160-29476-1 DU - DL	CRC-MW-1	Total/NA	Water	300.0	

Metals

Prep Batch: 375873

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	7470A	
MB 160-375873/1-A	Method Blank	Total/NA	Water	7470A	
LCS 160-375873/2-A	Lab Control Sample	Total/NA	Water	7470A	
160-29274-A-3-C MS	Matrix Spike	Total/NA	Water	7470A	
160-29274-A-3-D MSD	Matrix Spike Duplicate	Total/NA	Water	7470A	

Analysis Batch: 376379

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	7470A	375873
MB 160-375873/1-A	Method Blank	Total/NA	Water	7470A	375873
LCS 160-375873/2-A	Lab Control Sample	Total/NA	Water	7470A	375873
160-29274-A-3-C MS	Matrix Spike	Total/NA	Water	7470A	375873
160-29274-A-3-D MSD	Matrix Spike Duplicate	Total/NA	Water	7470A	375873

Prep Batch: 379537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	3010A	
MB 160-379537/1-A	Method Blank	Total/NA	Water	3010A	
LCS 160-379537/2-A	Lab Control Sample	Total/NA	Water	3010A	
160-29476-1 MS	CRC-MW-1	Total/NA	Water	3010A	
160-29476-1 MSD	CRC-MW-1	Total/NA	Water	3010A	

Analysis Batch: 380117

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	6010C	379537
MB 160-379537/1-A	Method Blank	Total/NA	Water	6010C	379537
LCS 160-379537/2-A	Lab Control Sample	Total/NA	Water	6010C	379537
160-29476-1 MS	CRC-MW-1	Total/NA	Water	6010C	379537
160-29476-1 MSD	CRC-MW-1	Total/NA	Water	6010C	379537

Analysis Batch: 380741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	6010C	379537
MB 160-379537/1-A	Method Blank	Total/NA	Water	6010C	379537
LCS 160-379537/2-A	Lab Control Sample	Total/NA	Water	6010C	379537
160-29476-1 MS	CRC-MW-1	Total/NA	Water	6010C	379537
160-29476-1 MSD	CRC-MW-1	Total/NA	Water	6010C	379537

TestAmerica St. Louis

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

General Chemistry

Analysis Batch: 375313

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	7196A	
MB 160-375313/8	Method Blank	Total/NA	Water	7196A	
LCS 160-375313/9	Lab Control Sample	Total/NA	Water	7196A	
160-29476-1 MS	CRC-MW-1	Total/NA	Water	7196A	
160-29476-1 DU	CRC-MW-1	Total/NA	Water	7196A	

Analysis Batch: 529442

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	SM5210B	
USB 490-529442/1	Method Blank	Total/NA	Water	SM5210B	
LCS 490-529442/2	Lab Control Sample	Total/NA	Water	SM5210B	
490-155652-F-1 DU	Duplicate	Total/NA	Water	SM5210B	

Analysis Batch: 529799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	SM 2540D	
MB 490-529799/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 490-529799/2	Lab Control Sample	Total/NA	Water	SM 2540D	
490-155579-A-1 DU	Duplicate	Total/NA	Water	SM 2540D	
490-155733-A-1 DU	Duplicate	Total/NA	Water	SM 2540D	

Prep Batch: 531103

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	9012B	
MB 490-531103/1-A	Method Blank	Total/NA	Water	9012B	
LCS 490-531103/2-A	Lab Control Sample	Total/NA	Water	9012B	
160-29476-1 MS	CRC-MW-1	Total/NA	Water	9012B	
160-29476-1 MSD	CRC-MW-1	Total/NA	Water	9012B	
160-29476-1 DU	CRC-MW-1	Total/NA	Water	9012B	

Analysis Batch: 531193

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	9012B	531103
MB 490-531103/1-A	Method Blank	Total/NA	Water	9012B	531103
LCS 490-531103/2-A	Lab Control Sample	Total/NA	Water	9012B	531103
160-29476-1 MS	CRC-MW-1	Total/NA	Water	9012B	531103
160-29476-1 MSD	CRC-MW-1	Total/NA	Water	9012B	531103
160-29476-1 DU	CRC-MW-1	Total/NA	Water	9012B	531103

Prep Batch: 533397

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	1664B	
MB 490-533397/1-A	Method Blank	Total/NA	Water	1664B	
LCS 490-533397/2-A	Lab Control Sample	Total/NA	Water	1664B	
LCSD 490-533397/3-A	Lab Control Sample Dup	Total/NA	Water	1664B	
180-80122-B-1-A MS	Matrix Spike	Total/NA	Water	1664B	

Analysis Batch: 533454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	1664B	533397
MB 490-533397/1-A	Method Blank	Total/NA	Water	1664B	533397

TestAmerica St. Louis

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

General Chemistry (Continued)

Analysis Batch: 533454 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 490-533397/2-A	Lab Control Sample	Total/NA	Water	1664B	533397
LCSD 490-533397/3-A	Lab Control Sample Dup	Total/NA	Water	1664B	533397
180-80122-B-1-A MS	Matrix Spike	Total/NA	Water	1664B	533397

Prep Batch: 533652

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	Distill/Phenol	

Analysis Batch: 533852

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	9066	533652

Rad

Prep Batch: 375564

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	PrecSep-21	
MB 160-375564/15-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-375564/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-375564/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 375578

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	PrecSep_0	
MB 160-375578/15-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-375578/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-375578/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 377736

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	ExtChrom	
MB 160-377736/1-A	Method Blank	Total/NA	Water	ExtChrom	
LCS 160-377736/2-A	Lab Control Sample	Total/NA	Water	ExtChrom	
160-29476-1 DU	CRC-MW-1	Total/NA	Water	ExtChrom	

Prep Batch: 381166

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29476-1	CRC-MW-1	Total/NA	Water	ExtChrom	
MB 160-381166/1-A	Method Blank	Total/NA	Water	ExtChrom	
LCS 160-381166/2-A	Lab Control Sample	Total/NA	Water	ExtChrom	
LCSD 160-381166/3-A	Lab Control Sample Dup	Total/NA	Water	ExtChrom	

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Client Sample ID: CRC-MW-1

Date Collected: 07/11/18 13:55

Date Received: 07/12/18 09:30

Lab Sample ID: 160-29476-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0	DL	20	380227	08/04/18 06:06	JCB	TAL SL
Total/NA	Prep	3010A			379537	07/31/18 19:39	LAM	TAL SL
Total/NA	Analysis	6010C		1	380741	08/06/18 12:41	SFF	TAL SL
Total/NA	Prep	3010A			379537	07/31/18 19:39	LAM	TAL SL
Total/NA	Analysis	6010C		1	380117	08/02/18 17:32	SFF	TAL SL
Total/NA	Prep	7470A			375873	07/16/18 11:20	DAS	TAL SL
Total/NA	Analysis	7470A		1	376379	07/17/18 14:12	DAS	TAL SL
Total/NA	Prep	1664B			533397	08/02/18 13:17	BAD	TAL NSH
Total/NA	Analysis	1664B		1	533454	08/02/18 13:17	BAD	TAL NSH
Total/NA	Analysis	7196A		1	375313	07/13/18 07:59	NPV	TAL SL
Total/NA	Prep	9012B			531103	07/24/18 12:33	LDT	TAL NSH
Total/NA	Analysis	9012B		1	531193	07/24/18 16:50	SDL	TAL NSH
Total/NA	Prep	Distill/Phenol			533652	08/03/18 10:04	CAD	TAL NSH
Total/NA	Analysis	9066		1	533852	08/03/18 18:39	SDL	TAL NSH
Total/NA	Analysis	SM 2540D		1	529799	07/18/18 17:00	BMC	TAL NSH
Total/NA	Analysis	SM5210B		1	529442		MSP	TAL NSH
					(Start)	07/14/18 15:33		
					(End)	07/19/18 11:00		
Total/NA	Prep	PrecSep-21			375564	07/13/18 13:31	JLC	TAL SL
Total/NA	Analysis	9315		1	380986	08/08/18 05:29	RTM	TAL SL
Total/NA	Prep	PrecSep_0			375578	07/13/18 14:09	JLC	TAL SL
Total/NA	Analysis	9320		1	378362	07/27/18 09:20	RTM	TAL SL
Total/NA	Prep	ExtChrom			377736	07/24/18 18:01	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	380834	08/06/18 22:38	ALS	TAL SL
Total/NA	Prep	ExtChrom			381166	08/08/18 14:32	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381919	08/10/18 18:48	RTM	TAL SL

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - Non-Rad Analysis

TestAmerica Job ID: 160-29476-1

Laboratory: TestAmerica St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Louisiana	NELAP	6	04080	06-30-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
A-01-R	ExtChrom	Water	Uranium-235

Laboratory: TestAmerica Nashville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	ISO/IEC 17025		0453.07	12-31-19
Alaska (UST)	State Program	10	UST-087	06-30-18 *
Arizona	State Program	9	AZ0473	05-05-19
Arkansas DEQ	State Program	6	88-0737	04-25-19
California	State Program	9	2938	10-31-18
Connecticut	State Program	1	PH-0220	12-31-19
Florida	NELAP	4	E87358	06-30-19
Georgia	State Program	4	NA: NELAP & A2LA	12-31-19
Illinois	NELAP	5	200010	12-09-18
Iowa	State Program	7	131	04-01-20
Kansas	NELAP	7	E-10229	10-31-18
Kentucky (UST)	State Program	4	19	06-30-19
Kentucky (WW)	State Program	4	90038	12-31-18
Louisiana	NELAP	6	30613	06-30-19
Maine	State Program	1	TN00032	11-03-19
Maryland	State Program	3	316	03-31-19
Massachusetts	State Program	1	M-TN032	06-30-19
Minnesota	NELAP	5	047-999-345	12-31-18
Mississippi	State Program	4	N/A	06-30-19
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-19
New Hampshire	NELAP	1	2963	10-09-18
New Jersey	NELAP	2	TN965	06-30-19
New York	NELAP	2	11342	03-31-19
North Carolina (WW/SW)	State Program	4	387	12-31-18
North Dakota	State Program	8	R-146	06-30-19
Ohio VAP	State Program	5	CL0033	07-06-19
Oklahoma	State Program	6	9412	08-31-18
Oregon	NELAP	10	TN200001	04-26-19
Pennsylvania	NELAP	3	68-00585	07-31-19
Rhode Island	State Program	1	LAO00268	12-30-18
South Carolina	State Program	4	84009 (001)	02-28-19
Tennessee	State Program	4	2008	02-23-20
Texas	NELAP	6	T104704077	08-31-19
USDA	Federal		P330-13-00306	12-01-19
Utah	NELAP	8	TN00032	07-31-18 *
Virginia	NELAP	3	460152	06-14-19
Washington	State Program	10	C789	07-19-19
West Virginia DEP	State Program	3	219	02-28-19
Wisconsin	State Program	5	998020430	08-31-18
Wyoming (UST)	A2LA	8	453.07	12-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica St. Louis

Method Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-29476-1

Project/Site: Former Carnotite Site - Non-Rad Analysis

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL SL
6010C	Metals (ICP)	SW846	TAL SL
7470A	Mercury (CVAA)	SW846	TAL SL
1664B	HEM and SGT-HEM	1664B	TAL NSH
7196A	Chromium, Hexavalent	SW846	TAL SL
9012B	Cyanide, Total and/or Amenable	SW846	TAL NSH
9066	Phenolics, Total Recoverable	SW846	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH
SM5210B	BOD, 5 Day	SM	TAL NSH
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
A-01-R	Isotopic Thorium (Alpha Spectrometry)	DOE	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
1664B	HEM and SGT-HEM (SPE)	1664B	TAL NSH
3010A	Preparation, Total Metals	SW846	TAL SL
7470A	Preparation, Mercury	SW846	TAL SL
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	TAL NSH
Distill/Phenol	Distillation, Phenolics	None	TAL NSH
ExtChrom	Preparation, Extraction Chromatography Resin Actinide Separation	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

1664B = EPA-821-98-002

DOE = U.S. Department of Energy

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-29476-1

Project/Site: Former Carnotite Site - Non-Rad Analysis

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-29476-1	CRC-MW-1	Water	07/11/18 13:55	07/12/18 09:30

HPLC/IC MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Instrument ID: CIC2500 Analysis Batch Number: 379990Lab Sample ID: STD2 160-379990/2 IC Client Sample ID: _____Date Analyzed: 08/02/18 17:07 Lab File ID: 080218- 2.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.05	Baseline Smoothing	boydj	08/03/18 11:47

Lab Sample ID: STD3 160-379990/3 IC Client Sample ID: _____Date Analyzed: 08/02/18 17:24 Lab File ID: 080218- 3.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.04	Baseline Smoothing	boydj	08/03/18 11:48

Lab Sample ID: STD4 160-379990/4 IC Client Sample ID: _____Date Analyzed: 08/02/18 17:41 Lab File ID: 080218- 4.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.07	Baseline Smoothing	boydj	08/03/18 11:47

Lab Sample ID: STD5 160-379990/5 IC Client Sample ID: _____Date Analyzed: 08/02/18 17:58 Lab File ID: 080218- 5.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.05	Baseline Smoothing	boydj	08/03/18 11:48

Lab Sample ID: ICV 160-379990/7 Client Sample ID: _____Date Analyzed: 08/02/18 18:32 Lab File ID: 080218- 7.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.04	Baseline Smoothing	boydj	08/03/18 11:48

HPLC/IC MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Instrument ID: CIC2500 Analysis Batch Number: 379990Lab Sample ID: ICB 160-379990/8 Client Sample ID: _____Date Analyzed: 08/02/18 18:49 Lab File ID: 080218- 8.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride		Invalid Compound ID	boydj	08/03/18 11:49

HPLC/IC MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Instrument ID: CIC2500 Analysis Batch Number: 380227Lab Sample ID: CCB 160-380227/2 Client Sample ID: _____Date Analyzed: 08/03/18 18:32 Lab File ID: 080318- 2.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride		Invalid Compound ID	boydj	08/06/18 10:32

Lab Sample ID: LCS 160-380227/4 Client Sample ID: _____Date Analyzed: 08/03/18 19:06 Lab File ID: 080318- 4.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.05	Baseline Smoothing	boydj	08/06/18 10:33

Lab Sample ID: CCV 160-380227/13 Client Sample ID: _____Date Analyzed: 08/03/18 21:39 Lab File ID: 080318- 13.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.04	Baseline Smoothing	boydj	08/06/18 10:34

Lab Sample ID: CCB 160-380227/14 Client Sample ID: _____Date Analyzed: 08/03/18 21:56 Lab File ID: 080318- 14.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride		Invalid Compound ID	boydj	08/06/18 10:34

Lab Sample ID: CCV 160-380227/36 Client Sample ID: _____Date Analyzed: 08/04/18 04:08 Lab File ID: 080318- 36.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.03	Baseline Smoothing	boydj	08/06/18 10:38

HPLC/IC MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Instrument ID: CIC2500 Analysis Batch Number: 380227Lab Sample ID: CCB 160-380227/37 Client Sample ID: _____Date Analyzed: 08/04/18 04:25 Lab File ID: 080318- 37.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride		Invalid Compound ID	boydj	08/06/18 10:38

Lab Sample ID: 160-29476-1 DL Client Sample ID: CRC-MW-1 DLDate Analyzed: 08/04/18 06:06 Lab File ID: 080318- 43.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.03	Baseline Smoothing	boydj	08/06/18 10:39

Lab Sample ID: 160-29476-1 DU DL Client Sample ID: CRC-MW-1 DU DLDate Analyzed: 08/04/18 06:40 Lab File ID: 080318- 45.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.03	Baseline Smoothing	boydj	08/06/18 10:40

Lab Sample ID: CCV 160-380227/48 Client Sample ID: _____Date Analyzed: 08/04/18 07:31 Lab File ID: 080318- 48.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride	3.03	Baseline Smoothing	boydj	08/06/18 10:40

Lab Sample ID: CCB 160-380227/49 Client Sample ID: _____Date Analyzed: 08/04/18 07:48 Lab File ID: 080318- 49.d GC Column: IonPacAS14 ID: 4 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoride		Invalid Compound ID	boydj	08/06/18 10:40

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
82232-334_00001	06/03/60	Eckert & Ziegler, Lot 82232-334			(Purchased Reagent)		Am-241	7.281 Bq
							Pu-239	7.137 Bq
							Thorium-230	7.63 Bq
82233-334_00001	06/03/60	Eckert & Zigler, Lot 82233-334			(Purchased Reagent)		Am-241	5.114 Bq
							Pu-239	6.064 Bq
							Thorium-230	4.95 Bq
82236-334_00001	06/02/60	Eckert & Ziegler, Lot 82236-334			(Purchased Reagent)		Am-241	6.891 Bq
							Pu-239	6.664 Bq
							Thorium-230	7.107 Bq
82237-334_00003	06/01/60	Eckert & Ziegler, Lot 82237-334			(Purchased Reagent)		Am-241	5.608 Bq
							Pu-239	6.424 Bq
							Thorium-230	5.856 Bq
82241-334_00001	06/08/60	Eckert & Ziegler, Lot 82241-334			(Purchased Reagent)		Am-241	6.638 Bq
							Pu-239	6.797 Bq
							Thorium-230	6.629 Bq
82243-334_00001	06/09/60	Eckert & Ziegler, Lot 82243-334			(Purchased Reagent)		Am-241	6.39 Bq
							Pu-239	5.979 Bq
							Thorium-230	5.856 Bq
82244-334_00001	06/09/60	Eckert & Zigler, Lot 82244-334			(Purchased Reagent)		Am-241	6.897 Bq
							Pu-239	6.717 Bq
							Thorium-230	7.352 Bq
Ba Carrier 00038	07/09/19	CPI, Lot 1104033			(Purchased Reagent)		Ba Carrier	20000 ug/mL
Cr6 5ppm Cal 00224	07/17/18	07/10/18	DI Water, Lot 071018	100 mL	Cr6 100ppmCal_00062	5 mL	Cr (VI)	5.00839 mg/L
.Cr6 100ppmCal 00062	10/30/18	04/30/18	DI Water, Lot 043018	100 mL	Cr6 1000ppmCa 00013	10 mL	Cr (VI)	100.168 mg/L
..Cr6 1000ppmCa 00013	04/30/19	04/30/18	DI Water, Lot 043018	500 mL	K Dichromate 00004	1.4168 g	Cr (VI)	1001.68 mg/L
...K Dichromate 00004	05/03/22	Sigma-Aldrich, Lot MKBV0900V			(Purchased Reagent)		Cr (VI)	0.3535 g/g
Cr6 5ppm QC 00219	07/17/18	07/10/18	DI Water, Lot 071018	100 mL	Cr6 100ppmQC 00057	5 mL	Cr (VI)	5.00627 mg/L
.Cr6 100ppmQC 00057	10/30/18	04/30/18	DI Water, Lot 043018	100 mL	Cr6 1000ppmQC 00015	10 mL	Cr (VI)	100.125 mg/L
..Cr6 1000ppmQC 00015	04/30/19	04/30/18	DI Water, Lot 043018	500 mL	K-Dichromate 00002	1.4162 g	Cr (VI)	1001.25 mg/L
...K-Dichromate 00002	05/31/20	Fisher, Lot 153492			(Purchased Reagent)		Cr (VI)	0.3535 g/g
Hg Curve Int._01021	07/17/18	07/16/18	2% Nitric Acid, Lot 1491915	100 mL	HG CAL_00012	0.1 mL	Mercury	0.1 ug/mL
.HG CAL_00012	06/01/19	Spex, Lot 23-116HGY			(Purchased Reagent)		Mercury	100 ug/mL
Hg QC Int._00998	07/17/18	07/16/18	2% Nitric Acid, Lot 1491915	100 mL	HG QC_00009	0.1 mL	Mercury	0.1 ug/mL
.HG QC 00009	06/21/19	Inorganic Ventures, Lot N2-HG667900			(Purchased Reagent)		Mercury	100 ug/mL
IC 2nd Source_00012	03/31/19	High-Purity Standards, Lot 1806639			(Purchased Reagent)		Fluoride	2500 ug/L
IC Cal High_00059	06/28/19	Inorganic Ventures, Lot M2-MEB661096			(Purchased Reagent)		Bromide	5000 ug/L
							Chloride	5000 ug/L
							Fluoride	2500 ug/L
							Sulfate	20000 ug/L
IC Cal Low_00009	01/23/19	Inorganic Ventures, Lot N2-MEB664662			(Purchased Reagent)		Bromide	5000 ug/L
							Chloride	4000 ug/L

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Fluoride	2000 ug/L
							Sulfate	10000 ug/L
IC MS Soln_00010	01/31/19	Inorganic Ventures, Lot N2-MEB664708			(Purchased Reagent)		Fluoride	100 ug/mL
ICP CAL1/LLC_00162	01/26/19	07/26/18	5% HCl/5%HN03, Lot 1511757	1000 mL	ICP LLC A_00007	5 mL	Antimony	0.01 ug/mL
					ICP LLC B_00005	5 mL	Aluminum	0.2 ug/mL
							Ba Carrier	0.05 ug/mL
							Beryllium	0.005 ug/mL
							Cadmium	0.005 ug/mL
							Calcium	1 ug/mL
							Chromium	0.01 ug/mL
							Cobalt	0.05 ug/mL
							Copper	0.025 ug/mL
							Iron	0.1 ug/mL
							Lead	0.01 ug/mL
							Magnesium	1 ug/mL
							Manganese	0.015 ug/mL
							Nickel	0.04 ug/mL
							Potassium	5 ug/mL
							Silver	0.01 ug/mL
							Sodium	1 ug/mL
							Thallium	0.02 ug/mL
							Vanadium	0.05 ug/mL
							Zinc	0.02 ug/mL
.ICP LLC A_00007	03/23/19	INORGANIC VENTURES, Lot M2-MEB661165			(Purchased Reagent)		Antimony	2 mg/L
.ICP LLC B_00005	03/23/19	INORGANIC VENTURES, Lot M2-MEB661170			(Purchased Reagent)		Aluminum	40 mg/L
						Ba Carrier	10 mg/L	
						Beryllium	1 mg/L	
						Cadmium	1 mg/L	
						Calcium	200 mg/L	
						Chromium	2 mg/L	
						Cobalt	10 mg/L	
						Copper	5 mg/L	
						Iron	20 mg/L	
						Lead	2 mg/L	
						Magnesium	200 mg/L	
						Manganese	3 mg/L	
						Nickel	8 mg/L	
						Potassium	1000 mg/L	
						Silver	2 mg/L	
						Sodium	200 mg/L	
						Thallium	4 mg/L	
						Vanadium	10 mg/L	
						Zinc	4 mg/L	
ICP CAL1/LLC_00163	02/02/19	08/02/18	5% HCl/5%HN03, Lot 1511757	1000 mL	ICP LLC B_00005	5 mL	Arsenic	0.01 ug/mL
							Selenium	0.015 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.ICP LLC B_00005	03/23/19	INORGANIC VENTURES, Lot M2-MEB661170			(Purchased Reagent)		Arsenic	2 mg/L
							Selenium	3 mg/L
ICP CAL2/CCV_00154	01/23/19	07/23/18	5% HCl/5@HN03, Lot 1511757	1000 mL	ICP CAL A_00006	5 mL	Ba Carrier	5 ug/mL
							Beryllium	5 ug/mL
							Cadmium	5 ug/mL
							Chromium	5 ug/mL
							Cobalt	5 ug/mL
							Copper	5 ug/mL
							Iron	50 ug/mL
							Lead	5 ug/mL
							Manganese	5 ug/mL
							Nickel	5 ug/mL
							Silver	1 ug/mL
							Sodium	50 ug/mL
							Thallium	1 ug/mL
							Vanadium	5 ug/mL
							Zinc	5 ug/mL
					ICP CAL B_00004	5 mL	Aluminum	50 ug/mL
							Calcium	50 ug/mL
							Magnesium	50 ug/mL
							Potassium	50 ug/mL
					ICP CAL C 00004	5 mL	Antimony	1 ug/mL
.ICP CAL A_00006	06/11/19	INORGANIC VENTURES, Lot M2-MEB661171			(Purchased Reagent)		Ba Carrier	1000 mg/L
							Beryllium	1000 mg/L
							Cadmium	1000 mg/L
							Chromium	1000 mg/L
							Cobalt	1000 mg/L
							Copper	1000 mg/L
							Iron	10000 mg/L
							Lead	1000 mg/L
							Manganese	1000 mg/L
							Nickel	1000 mg/L
							Silver	200 mg/L
							Sodium	10000 mg/L
							Thallium	200 mg/L
							Vanadium	1000 mg/L
							Zinc	1000 mg/L
.ICP CAL B_00004	06/11/19	INORGANIC VENTURES, Lot M2-MEB661174			(Purchased Reagent)		Aluminum	10000 mg/L
							Calcium	10000 mg/L
							Magnesium	10000 mg/L
							Potassium	10000 mg/L
.ICP CAL C 00004	06/11/19	INORGANIC VENTURES, Lot M2-MEB661175			(Purchased Reagent)		Antimony	200 mg/L
ICP CAL2/CCV_00155	01/26/19	07/26/18	5% HCl/5@HN03, Lot 1511757	1000 mL	ICP CAL A_00006	5 mL	Arsenic	5 ug/mL
							Selenium	1 ug/mL
.ICP CAL A 00006	06/11/19	INORGANIC VENTURES, Lot M2-MEB661171			(Purchased Reagent)		Arsenic	1000 mg/L

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Selenium	200 mg/L
ICP ICSA_00021	12/04/18	06/04/18	5% HCl/5%HN03, Lot 1455607	1000 mL	ICP ICSA A_00003	5 mL	Aluminum	100 ug/mL
					ICP ICSA B_00003	5 mL	Iron	100 ug/mL
							Calcium	100 ug/mL
							Potassium	100 ug/mL
							Sodium	100 ug/mL
ICP ICSA C 00003	5 mL	Magnesium	100 ug/mL					
.ICP ICSA A_00003	03/26/19	INORGANIC VENTURES, Lot N2-MEB666538			(Purchased Reagent)		Aluminum	20000 mg/L
.ICP ICSA B_00003	03/26/19	INORGANIC VENTURES, Lot N2-MEB666539			(Purchased Reagent)		Iron	20000 mg/L
							Calcium	20000 mg/L
							Potassium	20000 mg/L
.ICP ICSA C 00003	03/26/19	INORGANIC VENTURES, Lot N2-MEB666542			(Purchased Reagent)		Sodium	20000 mg/L
							Magnesium	20000 mg/L
ICP ICSAB_00018	12/04/18	06/04/18	5% HCl/5%HN03, Lot 1455607	1000 mL	ICP ICSA A_00003	5 mL	Aluminum	100 ug/mL
					ICP ICSA B_00003	5 mL	Iron	100 ug/mL
							Calcium	100 ug/mL
							Potassium	100 ug/mL
							Sodium	100 ug/mL
					ICP ICSA C 00003	5 mL	Magnesium	100 ug/mL
					ICP ICSAB A_00003	5 mL	Arsenic	2.5 ug/mL
							Ba Carrier	2.5 ug/mL
							Beryllium	2.5 ug/mL
							Cadmium	2.5 ug/mL
							Chromium	2.5 ug/mL
							Cobalt	2.5 ug/mL
							Copper	2.5 ug/mL
							Lead	2.5 ug/mL
							Manganese	2.5 ug/mL
							Nickel	2.5 ug/mL
							Selenium	0.5 ug/mL
							Silver	0.5 ug/mL
							Thallium	0.5 ug/mL
							Vanadium	2.5 ug/mL
							Zinc	2.5 ug/mL
					ICP ICSAB B_00003	5 mL	Antimony	0.5 ug/mL
.ICP ICSA A_00003	03/26/19	INORGANIC VENTURES, Lot N2-MEB666538			(Purchased Reagent)		Aluminum	20000 mg/L
.ICP ICSA B_00003	03/26/19	INORGANIC VENTURES, Lot N2-MEB666539			(Purchased Reagent)		Iron	20000 mg/L
							Calcium	20000 mg/L
							Potassium	20000 mg/L
.ICP ICSA C 00003	03/26/19	INORGANIC VENTURES, Lot N2-MEB666542			(Purchased Reagent)		Sodium	20000 mg/L
							Magnesium	20000 mg/L
.ICP ICSAB A_00003	03/26/19	INORGANIC VENTURES, Lot N2-MEB666540			(Purchased Reagent)		Arsenic	500 mg/L
							Ba Carrier	500 mg/L
							Beryllium	500 mg/L
							Cadmium	500 mg/L

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chromium	500 mg/L
							Cobalt	500 mg/L
							Copper	500 mg/L
							Lead	500 mg/L
							Manganese	500 mg/L
							Nickel	500 mg/L
							Selenium	100 mg/L
							Silver	100 mg/L
							Thallium	100 mg/L
							Vanadium	500 mg/L
							Zinc	500 mg/L
.ICP ICSAB B_00003	03/26/19	INORGANIC VENTURES, Lot N2-MEB666541			(Purchased Reagent)		Antimony	100 mg/L
ICP ICV_00518	08/03/18	08/02/18	5% HCl/50HNO3, Lot 1524339	100 mL	ICP ICV 1_00005	0.5 mL	Aluminum	50 ug/mL
							Calcium	50 ug/mL
							Iron	50 ug/mL
							Magnesium	50 ug/mL
					ICP ICV 2_00006	0.5 mL	Antimony	1 ug/mL
							Beryllium	5 ug/mL
					ICP ICV 3_00005	0.5 mL	Ba Carrier	5 ug/mL
							Cadmium	5 ug/mL
							Chromium	5 ug/mL
							Cobalt	5 ug/mL
							Copper	5 ug/mL
							Lead	5 ug/mL
							Manganese	5 ug/mL
							Nickel	5 ug/mL
							Silver	1 ug/mL
							Thallium	1 ug/mL
							Vanadium	5 ug/mL
							Zinc	5 ug/mL
					ICP ICV 4_00004	0.5 mL	Potassium	50 ug/mL
							Sodium	50 ug/mL
.ICP ICV 1_00005	06/25/19	SPEX, Lot 2-200SG			(Purchased Reagent)		Aluminum	10000 ug/mL
						Calcium	10000 ug/mL	
						Iron	10000 ug/mL	
						Magnesium	10000 ug/mL	
.ICP ICV 2_00006	06/25/19	SPEX, Lot 2-198SG			(Purchased Reagent)		Antimony	200 ug/mL
						Beryllium	1000 ug/mL	
.ICP ICV 3_00005	06/25/19	SPEX, Lot 2-199SG			(Purchased Reagent)		Ba Carrier	1000 ug/mL
						Cadmium	1000 ug/mL	
						Chromium	1000 ug/mL	
						Cobalt	1000 ug/mL	
						Copper	1000 ug/mL	
						Lead	1000 ug/mL	
						Manganese	1000 ug/mL	
						Nickel	1000 ug/mL	
						Silver	200 ug/mL	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Thallium	200 ug/mL
							Vanadium	1000 ug/mL
							Zinc	1000 ug/mL
.ICP ICV 4_00004	06/25/19		SPEX, Lot 2-208SG		(Purchased Reagent)		Potassium	10000 ug/mL
							Sodium	10000 ug/mL
ICP ICV_00520	08/07/18	08/06/18	5% HCl/50HN03, Lot 1524339	100 mL	ICP ICV 2_00006	0.5 mL	Arsenic	5 ug/mL
							Selenium	1 ug/mL
.ICP ICV 2_00006	06/25/19		SPEX, Lot 2-198SG		(Purchased Reagent)		Arsenic	1000 ug/mL
							Selenium	200 ug/mL
MPREP1_00017	06/22/19		Inorganic Ventures, Lot M2-MEB663768		(Purchased Reagent)		Aluminum	2000 mg/L
							Arsenic	200 mg/L
							B	40.01 mg/L
							Ba Carrier	200 mg/L
							Beryllium	20 mg/L
							Bi	200 mg/L
							Cadmium	200.1 mg/L
							Calcium	2000 mg/L
							Chromium	200 mg/L
							Cobalt	200 mg/L
							Copper	200 mg/L
							Iron	2000 mg/L
							Lead	200 mg/L
							Li	20 mg/L
							Magnesium	2000 mg/L
							Manganese	200 mg/L
							Nickel	200 mg/L
							P	200 mg/L
							Potassium	2000 mg/L
							Selenium	100 mg/L
							Silver	40.01 mg/L
							Sm	200 mg/L
							Sodium	2000 mg/L
							Sr	200.1 mg/L
							Sulfur	2000 mg/L
							Th	200 mg/L
							Thallium	40.01 mg/L
							U	200 mg/L
							Vanadium	200 mg/L
							Zinc	200 mg/L
MPREP2_00015	06/22/19		Inorganic Ventures, Lot M2-MEB663767		(Purchased Reagent)		Antimony	100 mg/L
							Mo	100 mg/L
							Si	1000 mg/L
							Sn	200 mg/L
							Ti	200 mg/L
							W	200 mg/L
							Zr	200 mg/L

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
Ra-226_00022	08/03/18	08/24/16	1M HNO3, Lot n/a	100 mL			Ra	7534.61 dpm/mL
					Ra-226_00021	5.0595 g	Radium-226	7534.61 dpm/mL
							Rn-222	7534.61 dpm/mL
							Total Alpha Emitting Radium Isotopes	7534.61 dpm/mL
.Ra-226_00021	09/01/53	NIST, Lot 4967A			(Purchased Reagent)		Radium-226	2482 Bq/g
							Rn-222	2482 Bq/g
							Total Alpha Emitting Radium Isotopes	2482 Bq/g
Ra-226_00025	10/19/18	12/08/16	0.1M HCl, Lot N/A	100 mL	Ra-226_00024	4.9774 g	Ra	8409.79 dpm/mL
							Radium-226	8409.79 dpm/mL
							Rn-222	8409.79 dpm/mL
							Total Alpha Emitting Radium Isotopes	8409.79 dpm/mL
.Ra-226_00024	12/05/66	Eckert & Ziegler, Lot 104858			(Purchased Reagent)		Ra	2815.99 Bq/g
							Radium-226	2815.99 Bq/g
							Rn-222	2815.99 Bq/g
							Total Alpha Emitting Radium Isotopes	2815.99 Bq/g
Ra-226_00027	10/19/18	08/02/17	0.1M HCl, Lot N/A	500 mL	Ra-226_00025	1.5 mL	Ra	25.2294 dpm/mL
							Radium-226	25.2294 dpm/mL
							Total Alpha Emitting Radium Isotopes	25.2294 dpm/mL
.Ra-226_00025	10/19/18	12/08/16	0.1M HCl, Lot N/A	100 mL	Ra-226_00024	4.9774 g	Ra	8409.79 dpm/mL
							Radium-226	8409.79 dpm/mL
							Total Alpha Emitting Radium Isotopes	8409.79 dpm/mL
..Ra-226_00024	12/05/66	Eckert & Ziegler, Lot 104858			(Purchased Reagent)		Ra	2815.99 Bq/g
							Radium-226	2815.99 Bq/g
							Total Alpha Emitting Radium Isotopes	2815.99 Bq/g
Ra22804A120_00001	07/12/19	Analytics, Lot 68824-310			(Purchased Reagent)		Radium-228	448.466 dpm/mL
Sr-90_00004	09/17/59	06/21/11	0.1M HCL, Lot 0	100 mL	Sr-90_00001	5.0139 g	Gross Beta	45120.6 dpm/mL
							Sr	22560.3 dpm/mL
							Sr-90	22560.3 dpm/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.Sr-90_00001	09/17/59	Eckert & Ziegler, Lot 80573-334			(Purchased Reagent)		Gross Beta	14998.5 Bq/g
							Sr	7499.25 Bq/g
							Sr-90	7499.25 Bq/g
Sr-90_00018	03/12/19	11/28/12	0.1M HCL, Lot 0	100 mL	Sr-90_00017	4.9997 g	Gross Beta	44774.2 dpm/mL
							Sr-90	22387.1 dpm/mL
.Sr-90_00017	11/29/62	Analytics, Lot 92352			(Purchased Reagent)		Gross Beta	14925.6 Bq/g
							Sr-90	7462.82 Bq/g
Th-229_00023	12/20/18	12/15/17	0.1M HNO3, Lot n/a	500 mL	Th-229_00017	15 mL	At-217	67.2296 dpm/mL
							Thorium-229	67.2296 dpm/mL
.Th-229_00017	12/20/18	08/20/14	0.1M HNO3, Lot n/a	100 mL	Th-229_00016	5.0464 g	At-217	2240.99 dpm/mL
							Thorium-229	2240.99 dpm/mL
..Th-229_00016	08/06/64	Analytics, Lot 97790			(Purchased Reagent)		At-217	740.127 Bq/g
							Thorium-229	740.127 Bq/g
Th-230_00016	11/29/62	11/28/12	0.5M HNO3, Lot 0	100 mL	Th-230_00015	5.0489 g	Gross Alpha	2374.49 dpm/mL
							Thorium-230	2374.49 dpm/mL
.Th-230_00015	11/29/62	Analytics, Lot 92523			(Purchased Reagent)		Gross Alpha	783.829 Bq/g
							Thorium-230	783.829 Bq/g
Th-230_00019	08/28/18	08/13/13	1M HNO3, Lot n/a	100 mL	Th-230_00018	5.0731 mL	Gross Alpha	2228.23 dpm/mL
							Thorium-230	2228.23 dpm/mL
.Th-230_00018	08/08/63	Eckert & Ziegler Analytics, Lot 92776			(Purchased Reagent)		Gross Alpha	43922.5 dpm/g
							Thorium-230	43922.5 dpm/g
Th-230_00036	08/28/18	08/30/16	1M HNO3, Lot 0	200 mL	Th-230_00019	4 mL	Gross Alpha	44.5646 dpm/mL
							Thorium-230	44.5646 dpm/mL
.Th-230_00019	08/28/18	08/13/13	1M HNO3, Lot n/a	100 mL	Th-230_00018	5.0731 mL	Gross Alpha	2228.23 dpm/mL
							Thorium-230	2228.23 dpm/mL
..Th-230_00018	08/08/63	Eckert & Ziegler Analytics, Lot 92776			(Purchased Reagent)		Gross Alpha	43922.5 dpm/g
							Thorium-230	43922.5 dpm/g
U-232_00040	12/20/18	12/18/17	DI Water, Lot n/a	500 mL	U-232_00009	4 mL	Uranium-232	82.2457 dpm/mL
.U-232_00009	12/20/18	08/29/11	1M HNO3, Lot 0	100 mL	U-232_00003	5.1609 g	Uranium-232	10280.7 dpm/mL
..U-232_00003	08/25/61	Eckert & Ziegler, Lot 85539-334			(Purchased Reagent)		Uranium-232	3320.07 Bq/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
UNAT_00014	11/28/18	12/21/17	1M HNO3, Lot n/a	200 mL	UNAT Parent_00001	20 mL	Uranium-234	70.6912 dpm/mL
							Uranium-235	3.37064 dpm/mL
							Uranium-238	72.265 dpm/mL
.UNAT Parent_00001	11/28/18	05/03/13	1M HNO3, Lot n/a	200 mL	UNAT Ampoule_00001	19.2509 g	Uranium-234	706.912 dpm/mL
							Uranium-235	33.7064 dpm/mL
							Uranium-238	722.65 dpm/mL
..UNAT Ampoule_00001	03/30/58	New Brunswick Lab, Lot CRM 145			(Purchased Reagent)		Uranium-234	7344.2 dpm/g
							Uranium-235	350.18 dpm/g
							Uranium-238	7507.7 dpm/g
Y Carrier 00032	04/16/19	CPI, Lot 10064660-5			(Purchased Reagent)		Y Carrier	50000 mg/L

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
O&G Disks_00015	06/06/23	Horizon, Lot 510721			(Purchased Reagent)		Stock Chemical	0 Filter
O&G HCL_00004	04/02/19	J.T. Baker, Lot 0000189699			(Purchased Reagent)		Stock Chemical	100 %
O&G Hexane_00015	11/03/18	J.T.Baker, Lot 0000189044			(Purchased Reagent)		Hexane	0 mg/mL
O&G Methanol_00006	04/18/19	J.T. Baker, Lot 00001123898			(Purchased Reagent)		Methanol	0 %
OP_HEM_spike_00019	11/25/18	05/25/18	ACETONE, Lot 0000168702	1000 mL	O&G_Stearic_A_00001	5 g	HEM (Oil & Grease)	10000 ug/mL
							SGT-HEM	5000 ug/mL
							Stearic Acid	0 ug/mL
					OP_Acetone_cy_00028	1000 mL	Acetone	0 ug/mL
				OP_Hexadecane_00002	5 g	HEM (Oil & Grease)	10000 ug/mL	
						Hexadecane	0 ug/mL	
						SGT-HEM	5000 ug/mL	
.O&G_Stearic_A_00001	10/26/22	Sigma, Lot BCBS5461V			(Purchased Reagent)		HEM (Oil & Grease)	1000000 ug/mL
							SGT-HEM	500000 ug/mL
							Stearic Acid	0 ug/mL
.OP_Acetone_cy_00028	03/20/19	J.T. Baker, Lot 0000192047			(Purchased Reagent)		Acetone	0 ug/mL
.OP_Hexadecane_00002	01/31/19	EMD, Lot 51126121			(Purchased Reagent)		HEM (Oil & Grease)	1000000 ug/mL
							Hexadecane	0 ug/mL
							SGT-HEM	500000 ug/mL
pH_strips_00011	05/30/19	Merck, Lot HC740840			(Purchased Reagent)		Physical Description	0 Filter Strip
W_BODGlucose_00095	03/22/20	LabChem, Lot H068-19			(Purchased Reagent)		Biochemical Oxygen Demand	198 mg/L
W_CN_CCV_00084	03/08/20	05/09/18	NaOH, Lot na	100 mL	W_Cyanide_Std_00048	1 mL	Cyanide, Total	10 mg/L
.W_Cyanide_Std_00048	03/08/20	Inorganic Venture, Lot N2-CN665509			(Purchased Reagent)		Cyanide, Total	1000 mg/L
W_CN_CCV_00087	03/07/20	07/11/18	NaOH, Lot na	100 mL	W_Cyanide_Std_00051	1 mL	Cyanide, Amenable	10 mg/L
							Cyanide, Non-amenable	10 mg/L
							Cyanide, Total	10 mg/L
							Cyanide, Weak Acid Dissociable	10 mg/L
.W_Cyanide_Std_00051	03/07/20	Inorganic Venture, Lot N2-CN665509			(Purchased Reagent)		Cyanide, Amenable	1000 mg/L
							Cyanide, Non-amenable	1000 mg/L
							Cyanide, Total	1000 mg/L
							Cyanide, Weak Acid Dissociable	1000 mg/L
W_CNworkLCS_00052	02/10/19	02/22/17	NaOH, Lot na	50 mL	Complex_CN_00006	0.5 mL	Cyanide, Amenable	10 mg/L
							Cyanide, Non-amenable	0 mg/L
							Cyanide, Total	10 mg/L
							Cyanide, Weak Acid Dissociable	10 mg/L
.Complex_CN_00006	02/10/19	Absolute Standards, Lot 021017			(Purchased Reagent)		Cyanide, Amenable	1000 ug/mL
							Cyanide, Non-amenable	0 ug/mL
							Cyanide, Total	1000 ug/mL
							Cyanide, Weak Acid Dissociable	1000 ug/mL
W_H2SO4 (50%)_00102	02/23/20	LabChem, Lot H046-08			(Purchased Reagent)		Stock Chemical	18 N
W_Mag. Chlori_00074	01/24/19	07/24/18	DI Water, Lot na	1000 mL/L	WC_magneiumCl_00064	510 g	Stock Chemical	510 g
.WC_magneiumCl_00064	07/24/23	Fisher, Lot 175303			(Purchased Reagent)		Stock Chemical	1 g/g
W_Sulfamic_00085	11/23/18	05/23/18	DI Water, Lot na	1000 mL	W_SulfamicAci_00034	200 g	Stock Chemical	200000 mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.W_SulfamicAci_00034	09/23/24		Ricca Chemical, Lot 2710F94		(Purchased Reagent)		Stock Chemical	1 g/g
W TSS LCS 00520	07/28/18	06/28/18	DI Water, Lot na	1 L	W_Celite_00006	0.1 g	Total Suspended Solids	100 mg/L
.W_Celite_00006	01/31/22		Fisher, Lot 170908		(Purchased Reagent)		Total Suspended Solids	1 g/g

Reagent

82232-334_00001

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

82232-334

24.1 mm Diameter x 0.65 mm Thick Stainless Steel Disk

Customer: Test America/St. Louis
P.O. No.: 2355182, Item 1

This standard radionuclide source was prepared by electrodeposition onto a stainless steel disk. Total alpha activity was determined with a ZnS scintillation detector. Radionuclide activities and impurities were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectroscopy. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Reference Date: 3-Jun-2010 12:00 PM EST

Isotope	Activity (Bq)	Energy Range (keV)	Half-Life, years	Uncertainty* Type (%)		
				u_A	u_B	U
Th-230	7.630E+00	4420-4800	7.540E+04	0.7	1.1	2.6
Pu-239	7.137E+00	4950-5240	2.410E+04	0.7	1.1	2.6
Am-241	7.281E+00	5280-5600	4.326E+02	0.7	1.1	2.6
Total Activity	2.210E+01	3000-8000		0.4	1.1	2.3

***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



Comments:

Diameter of active area: 19 mm. Disk mounted on customer supplied disk 31.8 mm diameter x 0.45 mm thick stainless steel disk.

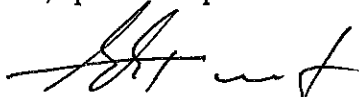
CAUTION: Active material deposited on the unmarked surface. Handle carefully to prevent scratching or damaging the active surface of this source (i.e., use Teflon coated forceps). Store in the container provided when not in use.

Source Calibrated by:



A. Chen, Spectroscopist

QA Approved:



E. A. Taskaev, QA Manager Alternate

Date: 06-24-2010



Reagent

82233-334_00001

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

82233-334

24.1 mm Diameter x 0.65 mm Thick Stainless Steel Disk

Customer: Test America/St. Louis
P.O. No.: 2355182, Item 1

This standard radionuclide source was prepared by electrodeposition onto a stainless steel disk. Total alpha activity was determined with a ZnS scintillation detector. Radionuclide activities and impurities were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectroscopy. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Reference Date: 3-Jun-2010 12:00 PM EST

Isotope	Activity (Bq)	Energy Range (keV)	Half-Life, years	Uncertainty* Type (%)		
				u_A	u_B	U
Th-230	4.950E+00	4420-4800	7.540E+04	0.8	1.1	2.7
Pu-239	6.064E+00	4950-5240	2.410E+04	0.7	1.1	2.6
Am-241	5.114E+00	5280-5600	4.326E+02	0.8	1.1	2.7
Total Activity	1.616E+01	3000-8000		0.1	1.1	2.2

***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



Comments:

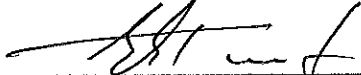
Diameter of active area: 19 mm. Disk mounted on customer supplied disk 31.8 mm diameter x 0.45 mm thick stainless steel disk.

CAUTION: Active material deposited on the unmarked surface. Handle carefully to prevent scratching or damaging the active surface of this source (i.e., use Teflon coated forceps). Store in the container provided when not in use.

Source Calibrated by:


A. Chen, Spectroscopist

QA Approved:


E. A. Taskaev, QA Manager Alternate

Date: 06-24-2010



Reagent

82236-334_00001

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

82236-334

24.1 mm Diameter x 0.65 mm Thick Stainless Steel Disk

Customer: Test America/St. Louis
P.O. No.: 2355182, Item 1

This standard radionuclide source was prepared by electrodeposition onto a stainless steel disk. Total alpha activity was determined with a ZnS scintillation detector. Radionuclide activities and impurities were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectroscopy. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Reference Date: 2-Jun-2010 12:00 PM EST

Isotope	Activity (Bq)	Energy Range (keV)	Half-Life, years	Uncertainty* Type (%)		
				u_A	u_B	U
Th-230	7.107E+00	4420-4800	7.540E+04	0.7	1.1	2.6
Pu-239	6.664E+00	4950-5240	2.410E+04	0.8	1.1	2.7
Am-241	6.891E+00	5280-5600	4.326E+02	0.7	1.1	2.6
Total Activity	2.071E+01	3000-8000		0.4	1.1	2.3

***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

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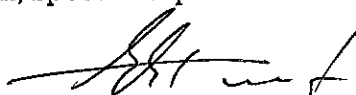


Comments:

Diameter of active area: 19 mm. Disk mounted on customer supplied disk 31.8 mm diameter x 0.45 mm thick stainless steel disk.

CAUTION: Active material deposited on the unmarked surface. Handle carefully to prevent scratching or damaging the active surface of this source (i.e., use Teflon coated forceps). Store in the container provided when not in use.

Source Calibrated by: 
A. Chen, Spectroscopist

QA Approved: 
E. A. Taskaev, QA Manager Alternate

Date: 06-24-2010



Reagent

82237-334_00003

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

82237-334

24.1 mm Diameter x 0.65 mm Thick Stainless Steel Disk

Customer: Test America/St. Louis
P.O. No.: 2355182, Item 1

This standard radionuclide source was prepared by electrodeposition onto a stainless steel disk. Total alpha activity was determined with a ZnS scintillation detector. Radionuclide activities and impurities were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectroscopy. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Reference Date: 1-Jun-2010 12:00 PM EST

Isotope	Activity (Bq)	Energy Range (keV)	Half-Life, years	Uncertainty* Type (%)		
				u _A	u _B	U
Th-230	5.856E+00	4420-4800	7.540E+04	1.0	1.1	3.0
Pu-239	6.424E+00	4950-5240	2.410E+04	0.9	1.1	2.8
Am-241	5.608E+00	5280-5600	4.326E+02	1.0	1.1	3.0
Total Activity	1.793E+01	3000-8000		0.6	1.1	2.5

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

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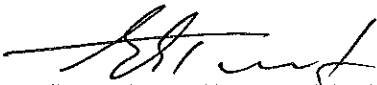


Comments:

Diameter of active area: 19 mm. Disk mounted on customer supplied disk 31.8 mm diameter x 0.45 mm thick stainless steel disk.

CAUTION: Active material deposited on the unmarked surface. Handle carefully to prevent scratching or damaging the active surface of this source (i.e., use Teflon coated forceps). Store in the container provided when not in use.

Source Calibrated by: 
A. Chen, Spectroscopist

QA Approved: 
E. A. Taskaev, QA Manager Alternate

Date: 06-24-2010



Reagent

82241-334_00001

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

82241-334

24.1 mm Diameter x 0.65 mm Thick Stainless Steel Disk

Customer: Test America/St. Louis
P.O. No.: 2355182, Item 1

This standard radionuclide source was prepared by electrodeposition onto a stainless steel disk. Total alpha activity was determined with a ZnS scintillation detector. Radionuclide activities and impurities were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectroscopy. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Reference Date: 8-Jun-2010 12:00 PM EST

Isotope	Activity (Bq)	Energy Range (keV)	Half-Life, years	Uncertainty* Type (%)		
				u_A	u_B	U
Th-230	6.629E+00	4420-4800	7.540E+04	0.8	1.1	2.7
Pu-239	6.797E+00	4950-5240	2.410E+04	0.8	1.1	2.7
Am-241	6.638E+00	5280-5600	4.326E+02	0.8	1.1	2.7
Total Activity	2.011E+01	3000-8000		0.4	1.1	2.3

*Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

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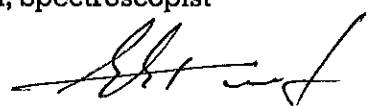


Comments:

Diameter of active area: 19 mm. Disk mounted on customer supplied disk 31.8 mm diameter x 0.45 mm thick stainless steel disk.

CAUTION: Active material deposited on the unmarked surface. Handle carefully to prevent scratching or damaging the active surface of this source (i.e., use Teflon coated forceps). Store in the container provided when not in use.

Source Calibrated by: 
A. Chen, Spectroscopist

QA Approved: 
E. A. Taskaev, QA Manager Alternate

Date: 06-24-2010



Reagent

82243-334_00001

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

82243-334

24.1 mm Diameter x 0.65 mm Thick Stainless Steel Disk

Customer: Test America/St. Louis
P.O. No.: 2355182, Item 1

This standard radionuclide source was prepared by electrodeposition onto a stainless steel disk. Total alpha activity was determined with a ZnS scintillation detector. Radionuclide activities and impurities were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectroscopy. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Reference Date: 9-Jun-2010 12:00 PM EST

Isotope	Activity (Bq)	Energy Range (keV)	Half-Life, years	Uncertainty* Type (%)		
				u_A	u_B	U
Th-230	5.856E+00	4420-4800	7.540E+04	0.8	1.1	2.7
Pu-239	5.979E+00	4950-5240	2.410E+04	0.8	1.1	2.7
Am-241	6.390E+00	5280-5600	4.326E+02	0.8	1.1	2.7
Total Activity	1.827E+01	3000-8000		0.3	1.1	2.3

***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

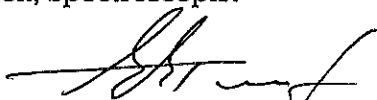


Comments:

Diameter of active area: 19 mm. Disk mounted on customer supplied disk 31.8 mm diameter x 0.45 mm thick stainless steel disk.

CAUTION: Active material deposited on the unmarked surface. Handle carefully to prevent scratching or damaging the active surface of this source (i.e., use Teflon coated forceps). Store in the container provided when not in use.

Source Calibrated by: 
A. Chen, Spectroscopist

QA Approved: 
E. A. Taskaev, QA Manager Alternate

Date: 06-24-2010



Reagent

82244-334_00001

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

82244-334

24.1 mm Diameter x 0.65 mm Thick Stainless Steel Disk

Customer: Test America/St. Louis
P.O. No.: 2355182, Item 1

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Reference Date: 9-Jun-2010 12:00 PM EST

Isotope	Activity (Bq)	Energy Range (keV)	Half-Life, years	Uncertainty* Type (%)		
				u_A	u_B	U
Th-230	7.352E+00	4420-4800	7.540E+04	0.8	1.1	2.7
Pu-239	6.717E+00	4950-5240	2.410E+04	0.9	1.1	2.8
Am-241	6.897E+00	5280-5600	4.326E+02	0.9	1.1	2.8
Total Activity	2.101E+01	3000-8000		0.6	1.1	2.5

*Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

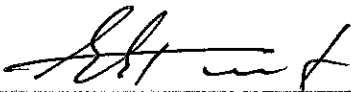


Comments:

Diameter of active area: 19 mm. Disk mounted on customer supplied disk 31.8 mm diameter x 0.45 mm thick stainless steel disk.

CAUTION: Active material deposited on the unmarked surface. Handle carefully to prevent scratching or damaging the active surface of this source (i.e., use Teflon coated forceps). Store in the container provided when not in use.

Source Calibrated by: 
A. Chen, Spectroscopist

QA Approved: 
E. A. Taskaev, QA Manager Alternate

Date: 06-24-2010



Reagent

Ba Carrier_00038



REPORT OF ANALYSIS

Single-Element Aqueous RM

Custom Barium Standard

Product #: 4400-132859

Matrix: 2% HNO₃

Lot #: 10079154-1

Element	Certified Concentration
Ba	20,000 µg/mL

Intended Use: This solution is intended for use as a reference material (RM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This RM was manufactured, processed, and/or certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO Guide 34**, and **ISO/IEC 17025**. This RM was prepared to a nominal concentration of 20,000 µg/mL by gravimetric methods using single-element concentrate dissolved in high purity nitric acid (HNO₃) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this RM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentration was determined based upon gravimetric procedures. Secondary verification of the certified concentration was performed using ICP-OES and is traceable to **NIST SRM 3104a**. The uncertainty associated with the certified concentration is ±0.5% relative, which is the sum of the estimated errors due to the purity of the raw materials, the gravimetric preparation of the solution, and transpiration through the container. This represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the RM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original RM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau, Certifying Officer

May 1, 2018

Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

Reagent

HG CAL_00012



SPEXertificate®

Certificate of Reference Material



Catalog Number: PLHG2-1Y

Lot No. 23-116HGY

Description: 100 µg/mL Mercury

Matrix: 5% HNO₃

1484756
ID: HG CAL_00012
Exp: 06/01/19 Pptd: DAS Ogn 06/21/18
Hg CAL 100PPM

This **ASSURANCE®** Certified Reference Material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICP-OES, DCP, AA, ICP-MS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 100 µg/mL ±0.5 µg/mL

Certified Value is Traceable to: 3133*

* - indicates NIST SRM

† - indicates SPEX CertiPrep CRM (when NIST SRM is not available)

The CRM is prepared gravimetrically using high purity Mercury Metal, Lot# 03141E. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 100 µg/mL

Method: This value was derived from dilution calculations of a Titrimetry analysis result of a Mercury concentrate. The concentrate was analyzed by EDTA titration using Ammonium Thiocyanate with Ferric Nitrate as indicator.

Instrumental Analysis by ICP Spectrometer: 100 µg/mL

Uncertified Properties

Density: 1.024 g/mL @ 20.0°C

Trace Metallic Impurities in the Actual Solution via ICP-MS Analysis:

Element	µg/mL	Element	µg/mL	Element	µg/mL	Element	µg/mL	Element	µg/mL	Element	µg/mL
Ag	<0.001	Cr	<0.001	Ho	<0.001	Nb	<0.001	Ru	<0.001	Th	<0.001
Al	<0.001	Cs	<0.001	In	<0.001	Nd	<0.001	Sb	<0.001	Ti	<0.001
As	<0.001	Cu	<0.001	Ir	<0.001	Ni	<0.001	Sc	<0.001	Tl	<0.001
Au	<0.01	Dy	<0.001	K	0.02	P	<0.1	Se	<0.02	Tm	<0.001
B	<0.002	Er	<0.001	La	<0.001	Pb	<0.001	Si	<0.2	U	<0.001
Ba	<0.001	Eu	<0.001	Li	<0.001	Pd	<0.01	Sm	<0.001	V	<0.001
Be	<0.001	Fe	0.002	Lu	<0.001	Pr	<0.001	Sn	<0.001	W	<0.001
Bi	<0.001	Ga	<0.001	Mg	<0.01	Pt	<0.001	Sr	<0.001	Y	<0.001
Ca	0.01	Gd	<0.001	Mn	<0.001	Rb	<0.001	Ta	<0.001	Yb	<0.001
Cd	<0.001	Ge	<0.001	Mo	<0.001	Re	<0.001	Tb	<0.001	Zn	0.003
Ce	<0.001	Hf	<0.001	Na	0.01	Rh	<0.001	Te	<0.001	Zr	<0.001
Co	<0.001										

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% of the certified value. This includes uncertainty components due to preparation, homogeneity by the most precise method, and short-term and long-term stability. This guarantee is valid for a period of one year from the date of certification only when the material is unopened and stored under ambient laboratory conditions.

Date of Certification: JUN - - 2018

Certifying Officer: Walter Cull

Report of Certification

This Certified Reference Material (CRM) has been prepared and certified under an ISO 9001:2008, ISO 17025:2005, and ISO Guide 34:2009 quality system consistent with the following guides:

- ISO 9001: Quality management systems – Requirements – certified by UL-DQS
- ISO 17025: General requirements for the competence of testing and calibration laboratories – accredited by A2LA
- ISO Guide 34: General requirements for the competence of reference material producers – accredited by A2LA
- ISO Guide 31: Reference Materials – Contents of certificates and labels
- ISO Guide 35: Reference Materials – General & Statistical Principles for Certification
- Guide To The Expression Of Uncertainty In Measurement 1997
- EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
- ASTM Guide D6362-98
- NIST Technical Note 1297
- ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
- ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9001:2008, ISO 17025:2005, and ISO Guide 34:2009 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further assistance, please contact the Sales Support Department at crmsales@spexcsp.com.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles (where appropriate), and Class A/calibrated volumetrics have been used in all preparations.

Homogeneity:

The homogeneity of the CRM has been confirmed by procedures consistent with ISO 17025:2005, ISO Guide 34:2009, and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed to prove homogeneity in accordance with our internal procedure 4600-HOMOGEN-1A. Since the product is highly homogeneous, any sample size taken for analysis would be within the uncertainty budget. This is consistent with the intended use of the CRM.

Statistical Estimator and Confidence Limits:

The certified value 'X' listed on the reverse of this document is at the 95% level of confidence and can be expressed as:

- $X = x \pm U$ where X = certified value, U = expanded uncertainty, x = property value
- $U = k u_c$ where $k = 2$ is the coverage factor at the 95% confidence level
- u_c is obtained by combining the individual element standard uncertainty components u_i , and $u_c = \sqrt{\sum u_i^2}$

Certification Traveler Report:

All certified values reported were derived from the Traveler Report (SPEX CertiPrep's traceability documentation) identified by the lot number of this CRM. During the stated period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution. For further assistance, please contact the Sales Support Department at crmsales@spexcsp.com.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, LLC of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this Reference Material shall be greater than the purchase price. In no event shall SPEX CertiPrep, LLC be liable for any loss of profits or any incidental, special, or consequential damages.

Reagent

HG QC_00009

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Mass Spec Solution

Catalog Number: MSHGN-100PPM

Lot Number: N2-HG667900

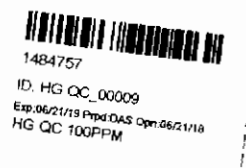
Matrix: 10% (v/v) HNO₃

Value / Analyte(s): 100 µg/mL ea:
Mercury

Starting Material: Hg Metal

Starting Material Lot#: 1780

Starting Material Purity: 99.9965%



3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 100.11 ± 0.53 µg/mL

Density: 1.050 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Hg	ICP Assay	3133	061204
Hg	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{char a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance

$$w_a = (1/u_{char a})^2 / ((1/u_{char a})^2 + (1/u_{char b})^2)$$

$$w_b = (1/u_{char b})^2 / ((1/u_{char a})^2 + (1/u_{char b})^2)$$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a}^2 + u_{char b}^2 + u_{ts}^2 + u_{ls}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a \& b} = [(w_a)^2 (u_{char a})^2 + (w_b)^2 (u_{char b})^2]^{1/2}$ where $u_{char a}$ and $u_{char b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ls} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = \text{mean of Assay Method A with standard uncertainty } u_{char a}$$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ls}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ls} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000604	M	Eu	<	0.000201	O	Na	0.000742	M	Se	<	0.005040	O	Zn	<	0.000591
O	Al	0.000387	O	Fe	0.000015	O	Nb	0.000727	O	Si	0.000755	M	Zr	0.000014				
M	As	<	0.001008	M	Ga	<	0.000201	M	Nd	<	0.000201	M	Sm	<	0.000201			
O	Au	<	0.003207	M	Gd	<	0.000201	O	Ni	<	0.001318	M	Sn	<	0.000403			
O	B	0.000688	M	Ge	<	0.001209	M	Os	<	0.000201	O	Sr	<	0.000558				
O	Ba	<	0.000853	M	Hf	<	0.000201	O	P	<	0.021340	M	Ta	<	0.000201			
M	Be	<	0.000604	s	Hg	<		M	Pb	<	0.000201	M	Tb	<	0.000201			
M	Bi	<	0.001613	M	Ho	<	0.000201	M	Pd	<	0.001209	M	Te	<	0.001613			
O	Ca	0.000111	M	In	<	0.000201	M	Pr	<	0.000201	M	Th	<	0.000201				
M	Cd	<	0.001209	M	Ir	<	0.000201	M	Pt	<	0.000201	M	Ti	<	0.001008			
M	Ce	<	0.000403	O	K	0.000088	M	Rb	<	0.000201	O	Tl	<	0.019206				
M	Co	<	0.000201	M	La	<	0.000201	M	Re	<	0.000604	M	Tm	<	0.000201			
O	Cr	<	0.001666	O	Li	<	0.000242	M	Rh	<	0.000201	M	U	<	0.002822			
M	Cs	<	0.000403	M	Lu	<	0.000201	M	Ru	<	0.000201	M	V	<	0.000604			
M	Cu	<	0.000604	O	Mg	0.000024	O	S	<	0.012481	M	W	<	0.000403				
M	Dy	<	0.000201	O	Mn	<	0.001280	M	Sb	<	0.002016	M	Y	<	0.000201			
M	Er	<	0.000201	O	Mo	<	0.001525	M	Sc	<	0.000403	M	Yb	<	0.000201			

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.
- For more information, visit www.inorganicventures.com/TCT

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 200.59 + 2 4 Hg(OH)(aq) 1+
Chemical Compatibility - Stable in HNO₃. Avoid basic media forming insoluble carbonate. The sulfide, basic carbonate, oxalate, phosphate, arsenite, arsenate and iodide are insoluble in water.

Stability - 2-100 ppb levels not stable in 1% HNO₃ / LDPE container, stable in 10% HNO₃ packaged in borosilicate glass. 1-100 ppm levels stable in 7% HNO₃ packaged in borosilicate glass. 1000-10,000 ppm solutions are chemically stable for years in 5-10% HNO₃ / LDPE container.

Hg Containing Samples (Preparation and Solution) - Metal (soluble in HNO₃); Oxide (Soluble in HNO₃); Ores and Organic based (The literature has more references to the preparation of Hg containing samples than any other element. Please consult the literature for your specific sample type, since such preparations are prone to error. Or e-mail our technical staff and we will contact you to discuss your particular sample preparation questions in further detail.).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 202 amu	9 ppt	n/a	186W16O
ICP-OES 184.950 nm	0.03 / 0.005 µg/mL	1	
ICP-OES 194.227 nm	0.03 / 0.005 µg/mL	1	V
ICP-OES 253.652 nm	0.1 / 0.03 µg/mL	1	Ta, Co, Th, Rh, Fe, U

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone 800.669.6799; 540.585.3030, Fax: 540.585.3012, [inorganicventures.com](mailto:info@inorganicventures.com); info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

May 25, 2018

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **May 25, 2022**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

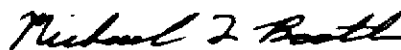
- Sealed TCT Bag Open Date: 6/21/18

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Reagent

IC 2nd Source_00012

Certificate of Analysis

Certified Reference Material

Product Description:

Part Number: **SM-606-138**
Lot Number: **1806639**
Matrix: **H₂O**
Purity: **98.5+%**



ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

Certified Values:

Component	Certified Value (mg/L)	NIST SRM ID	NIST SRM Lot #
Bromide	5.00 ± 0.05	3184	151130
Chloride	5.00 ± 0.05	3182	060925
Fluoride	2.50 ± 0.03	3183	140203
NO ₃ as N	1.00 ± 0.01	3185	050517
Phosphate	20.0 ± 0.2	*	
Sulfate	20.0 ± 0.2	3181	080603

Certified values are based on gravimetric and volumetric preparation, and verified against NIST SRM 3100 series when available via ion chromatography (IC) and/or inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2.

* Refer to Traceability Information, Section d

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Expiration Information:

The expiry date is guaranteed to be valid for twelve months from the shipping date provided and is guaranteed through the month of expiration. For this reason, standards from the same lot may have different expiration dates.

Shipped Date: **March 2018**

Certificate Issue Date: **March 8, 2018**

Moven Mututuvvari
Moven Mututuvvari PhD., Laboratory Manager

Preparation Information:

The Certified Reference Material (CRM) is generally prepared from single element standard solutions that are ISO Guide 34 certified reference materials and manufactured under appropriate laboratory conditions using the methods developed at NIST for SRM Spectrometric Standard Solutions. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product. If during the period of validity, a recall is instituted due to substantial changes in the stability of this product, the purchaser will be notified.

Homogeneity:

This product is determined to be homogeneous following in-house procedures developed in accordance with the requirements of ISO Guide 34 and ISO Guide 35.

Intended Use:

This product is intended for use as a calibration standard, quality control standard, and/or for the validation of analytical methods.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**

The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.

The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**

The calibration of volumetric vessels is checked annually using the ASTM method E542.

c. **Thermometer**

The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards**

The Calibration Standard is traceable to SRM 3100 Series Spectrometric Standard Solutions. If a SRM is not available, a second source standard or independent lot is used.

Refer to Safety Datasheet (SDS) for hazardous information.

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Reagent

IC Cal High_00059



300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6779 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

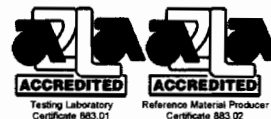


1492393

ID: IC Cal High_00059
Exp:06/28/19 Prod:ICB Opn:06/28/18
IC Cal High

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Ion Chromatography Solution
Catalog Number: STL-CAL-HIGH
Lot Number: M2-MEB661096
Matrix: H₂O
Value / Analyte(s): 20 000 µg/L ea:
o-Phosphate, Sulfate,
5 000 µg/L ea:
Bromide, Chloride,
2 500 µg/L ea:
Fluoride,
1 000 µg/L ea:
Nitrate as N,
400 µg/L ea:
Nitrite as N

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Bromide, Br	5 000 ± 26 µg/L	Chloride, Cl	5 000 ± 22 µg/L
Fluoride, F-	2 500 ± 11 µg/L	Nitrate as N, NNO3-	1 000 ± 5 µg/L
Nitrite as N, NNO2-	400.0 ± 3.4 µg/L	o-Phosphate, PO4	20 000.0 ± 90.0 µg/L
Sulfate, SO4	20 000.0 ± 90.0 µg/L		

Density: 0.998 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Br	IC Assay	3184	020701
Br	Volhard	999c	999c
Cl	IC Assay	3182	060925
Cl	Volhard	999c	999c
F-	IC Assay	3183	050721
F-	Calculated		See Sec. 4.2
NNO3-	IC Assay	3185	050517
NNO3-	Calculated		See Sec. 4.2
NNO2-	Calculated	8040	8040
NNO2-	IC Assay		traceable to 40h
PO4	IC Assay	3186	090723
SO4	IC Assay	3181	080603
SO4	Calculated		See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{char a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{char a}^2) / ((1/u_{char a}^2) + (1/u_{char b}^2))$$

$$w_b = (1/u_{char b}^2) / ((1/u_{char a}^2) + (1/u_{char b}^2))$$

$$CRM/RM \text{ Expanded Uncertainty } (z) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a \& b} = [(w_a)^2 (u_{char a}^2) + (w_b)^2 (u_{char b}^2)]^{1/2}$ where $u_{char a}$ and $u_{char b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = \text{mean of Assay Method A with standard uncertainty } u_{char a}$$

$$CRM/RM \text{ Expanded Uncertainty } (z) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.
- For more information, visit www.inorganicventures.com/TCT

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 24, 2017

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 24, 2020**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

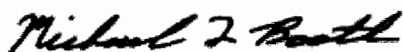
11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Reagent

IC Cal Low_00009



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CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030

fax: 540.585.3012

info@inorganicventures.com



1364880

ID: IC Cal Low_00009
Exp: 01/23/19 Ppd: JCB Oph: 01/23/18
IC Cal Low

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Ion Chromatography Solution

Catalog Number: STL-CAL-LOW

Lot Number: N2-MEB664662

Matrix: H₂O

Value / Analyte(s):
10 000 µg/L ea: Sulfate,
o-Phosphate,
5 000 µg/L ea:
Bromide,
4 000 µg/L ea:
Chloride,
2 000 µg/L ea:
Fluoride,
400 µg/L ea:
Nitrate as N, Nitrite as N

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Bromide, Br	5 001 ± 30 µg/L	Chloride, Cl	4 002 ± 17 µg/L
Fluoride, F-	2 000 ± 10 µg/L	Nitrate as N, NNO3-	400.0 ± 2.0 µg/L
Nitrite as N, NNO2-	399.9 ± 3.1 µg/L	o-Phosphate, PO ₄	10 000.0 ± 40.0 µg/L
Sulfate, SO ₄	9 990.0 ± 50.0 µg/L		
Density:	0.999 g/mL (measured at 20 ± 4 °C)		

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Br	IC Assay	3184	020701
Br	Volhard	999b	999b
Cl	IC Assay	3182	060925
Cl	Volhard	999c	999c
F-	IC Assay	3183	050721
NNO3-	Calculated		See Sec. 4.2
NNO2-	Calculated	traceable to 8040	SRM 8040
NNO2-	IC Assay		traceable to 40h new
PO4	IC Assay	3186	090723
SO4	IC Assay	3181	080603
SO4	Calculated		See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods

Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char } a}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char } b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char } a})^2 / ((1/u_{\text{char } a})^2 + (1/u_{\text{char } b})^2)$$

$$w_b = (1/u_{\text{char } b})^2 / ((1/u_{\text{char } a})^2 + (1/u_{\text{char } b})^2)$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char } a \& b}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char } a \& b} = [(w_a)^2 (u_{\text{char } a})^2 + (w_b)^2 (u_{\text{char } b})^2]^{1/2}$ where $u_{\text{char } a}$ and $u_{\text{char } b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char } a}$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char } a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030; Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 16, 2018

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- January 16, 2021

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Reagent

IC MS Soln_00010



300 Technology Drive
Chantilly, VA 24073 - USA
inorganic-ventures.com

CERTIFICATE OF ANALYSIS



1370921

ID: IC MS Soln_00010
Exp:01/31/19 Prip:JCB Opr:01/31/18
IC MS Solution

Lot: 8680.667.6197 - 54g (666.90 g)
Pack: 145.145 g (17.2
Batch: 8680.667.6197 - INORGANIC VENTURES

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Ion Chromatography Solution
Catalog Number: STLMO-MS-1
Lot Number: N2-MEB664708
Matrix: H2O
Value / Analyte(s): 200 µg/mL ea:
o-Phosphate, Sulfate,
100 µg/mL ea:
Bromide, Chloride, Fluoride,
20 µg/mL ea:
Nitrate as N,
5 µg/mL ea:
Nitrite as N

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Bromide, Br	100.0 ± 0.5 µg/mL	Chloride, Cl	100.0 ± 0.5 µg/mL
Fluoride, F-	100.0 ± 0.4 µg/mL	Nitrate as N, NNO3-	19.99 ± 0.09 µg/mL
Nitrite as N, NNO2-	5.000 ± 0.026 µg/mL	o-Phosphate, PO4	200.0 ± 0.9 µg/mL
Sulfate, SO4	200.0 ± 1.0 µg/mL		

Density: 0.999 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Br	IC Assay	3184	020701
Br	Volhard	999c	999c
Cl	IC Assay	3182	060925
Cl	Fajans	999c	999c
F-	IC Assay	3183	050721
NNO3-	IC Assay	3185	050517
NNO3-	Calculated		See Sec. 4.2
NNO2-	IC Assay		traceable to 40h
PO4	IC Assay	3186	090723
SO4	IC Assay	3181	080603
SO4	Calculated		See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char } a}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char } b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char } a})^2 / ((1/u_{\text{char } a})^2 + (1/u_{\text{char } b})^2)$$

$$w_b = (1/u_{\text{char } b})^2 / ((1/u_{\text{char } a})^2 + (1/u_{\text{char } b})^2)$$

$$\text{CRM/RM Expanded Uncertainty (t)} = U_{\text{CRM/RM}} = k (u_{\text{char } a \& b}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char } a \& b} = [(w_a)^2 (u_{\text{char } a})^2 + (w_b)^2 (u_{\text{char } b})^2]^{1/2}$ where $u_{\text{char } a}$ and $u_{\text{char } b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char } a}$$

$$\text{CRM/RM Expanded Uncertainty (t)} = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char } a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.
- For more information, visit www.inorganicventures.com/TCT

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 19, 2018

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 19, 2021**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Reagent

ICP CAL A_00006



CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: ICP CAL-A
Lot Number: M2-MEB661171
Matrix: 15% (v/v) HNO₃
Value / Analyte(s): 10 000 mg/L ea:
Iron, Sodium, Sulfur,
1 000 mg/L ea:
Nickel, Lead, Strontium,
Thorium, Uranium, Vanadium,
Zinc, Lithium, Manganese,
Arsenic, Barium, Beryllium,
Bismuth, Cadmium, Cobalt,
Chromium, Copper,
200 mg/L ea:
Boron, Thallium, Selenium,
Silver

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Arsenic, As	1 000 ± 9 mg/L	Barium, Ba	1 000 ± 4 mg/L
Beryllium, Be	1 000 ± 6 mg/L	Bismuth, Bi	1 000 ± 6 mg/L
Boron, B	200.0 ± 1.2 mg/L	Cadmium, Cd	1 000 ± 4 mg/L
Chromium, Cr	1 000 ± 8 mg/L	Cobalt, Co	1 000 ± 4 mg/L
Copper, Cu	1 000 ± 4 mg/L	Iron, Fe	10 000.0 ± 40.0 mg/L
Lead, Pb	1 000 ± 5 mg/L	Lithium, Li	996 ± 4 mg/L
Manganese, Mn	1 000 ± 4 mg/L	Nickel, Ni	1 000 ± 4 mg/L
Selenium, Se	200.0 ± 1.3 mg/L	Silver, Ag	200.0 ± 0.8 mg/L
Sodium, Na	10 000.0 ± 40.0 mg/L	Strontium, Sr	1 000 ± 4 mg/L
Sulfur, S	10 000.0 ± 50.0 mg/L	Thallium, Tl	200.0 ± 1.3 mg/L
Thorium, Th	1 000 ± 5 mg/L	Uranium, U	1 000 ± 7 mg/L
Vanadium, V	1 000 ± 4 mg/L	Zinc, Zn	1 000 ± 4 mg/L

Density: 1.174 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	992212
Ag	Volhard	999c	999c
As	ICP Assay	3103a	100818
B	ICP Assay	3107	110830
Ba	ICP Assay	3104a	070222
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Bi	ICP Assay	3106	991212
Bi	Calculated		See Sec. 4.2
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	ICP Assay	3113	000630 Co
Co	EDTA	928	928
Cr	ICP Assay	3112a	030730Cr3
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
Li	ICP Assay	3129a	100714
Li	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
S	Potentiometric	84L	84L
Se	ICP Assay	3149	100901
Sr	EDTA	928	928
Sr	ICP Assay	3153a	990906
Th	EDTA	928	928
Tl	ICP Assay	3158	993012
U	ICP Assay	3164	891509
U	Calculated		See Sec. 4.2
V	EDTA	928	928
V	ICP Assay	3165	992706
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char a}}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char b}}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance

$$w_a = (1/u_{\text{char a}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$w_b = (1/u_{\text{char b}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$\text{CRM/RM Expanded Uncertainty (z)} = U_{\text{CRM/RM}} = k (u_{\text{char a\&b}}^2 + u_{\text{bb}}^2 + u_{\text{ls}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a\&b}} = [(w_a)^2 (u_{\text{char a}})^2 + (w_b)^2 (u_{\text{char b}})^2]^{1/2}$ where $u_{\text{char a}}$ and $u_{\text{char b}}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ls} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Certified Abundance:

IV's Certified Abundance

Isotope	Atom %
Uranium 238U	99.6 ± 0.1
Uranium 235U	0.42 ± 0.05

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char a}}$$

$$\text{CRM/RM Expanded Uncertainty (z)} = U_{\text{CRM/RM}} = k (u_{\text{char a}}^2 + u_{\text{bb}}^2 + u_{\text{ls}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a}}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ls} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 29, 2017

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 29, 2020**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Reagent

ICP CAL B_00004



CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: ICP CAL-B
Lot Number: M2-MEB661174
Matrix: 5% (v/v) HNO₃
Value / Analyte(s): 10 000 mg/L ea:
Aluminum, Calcium, Potassium,
Magnesium, Phosphorus

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	10 000.0 ± 30.0 mg/L	Calcium, Ca	10 000.0 ± 40.0 mg/L
Magnesium, Mg	10 000.0 ± 40.0 mg/L	Phosphorus, P	10 000.0 ± 40.0 mg/L
Potassium, K	10 000.0 ± 40.0 mg/L		

Density: 1.185 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	050302
Mg	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric		traceable to 84L

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{CRM/RM} = [(w_a)(X_a)] + [(w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{char a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{char a})^2 / ((1/u_{char a})^2 + (1/u_{char b})^2)$$

$$w_b = (1/u_{char b})^2 / ((1/u_{char a})^2 + (1/u_{char b})^2)$$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a \& b}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a \& b} = [(w_a)^2 (u_{char a})^2 + (w_b)^2 (u_{char b})^2]^{1/2}$ where $u_{char a}$ and $u_{char b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = \text{mean of Assay Method A with standard uncertainty } u_{char a}$$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA, Telephone: 800.669.6799, 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 29, 2017

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 29, 2020**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

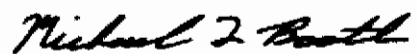
11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Handwritten signature of Michael Booth in black ink.

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Handwritten signature of Paul R. Gaines in black ink.

Reagent

ICP CAL C_00004



1474106

ID ICP CAL C_00004

Exp:06/11/18 Ppd:LKP Ogn:06/11/18

ICP CAL C



CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: ICP CAL-C
 Lot Number: M2-MEB661175
 Matrix: 5% (v/v) HNO₃
 2.5% (v/v) HF
 Value / Analyte(s): 1 000 mg/L ea:
 Silicon, Tin, Titanium,
 200 mg/L ea:
 Molybdenum, Antimony

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	200.0 ± 1.4 mg/L	Molybdenum, Mo	200.0 ± 0.9 mg/L
Silicon, Si	1 000 ± 7 mg/L	Tin, Sn	1 000 ± 4 mg/L
Titanium, Ti	1 000 ± 6 mg/L		

Density: 1.039 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Mo	Calculated		See Sec. 4.2
Sb	ICP Assay	3102A	061229
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	070330
Sn	Calculated		See Sec. 4.2
Ti	ICP Assay	3162a	130925

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{char a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{char a})^2 / ((1/u_{char a})^2 + (1/u_{char b})^2)$$

$$w_b = (1/u_{char b})^2 / ((1/u_{char a})^2 + (1/u_{char b})^2)$$

$$CRM/RM \text{ Expanded Uncertainty } (z) = U_{CRM/RM} = k (u_{char a \& b}^2 + u_{bb}^2 + u_{lts}^2 + u_{lts}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a \& b} = [(w_a)^2 (u_{char a})^2 + (w_b)^2 (u_{char b})^2]^{1/2}$ where $u_{char a}$ and $u_{char b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{lts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = \text{mean of Assay Method A with standard uncertainty } u_{char a}$$

$$CRM/RM \text{ Expanded Uncertainty } (z) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{lts}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{lts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA Telephone: 800.869.6799, 540.585.3030, Fax: 540.585.3012; inorganicventures.com, info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 29, 2017

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 29, 2020**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Handwritten signature of Michael Z. Booth in cursive script.

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Handwritten signature of Paul R. Gaines in cursive script.

Reagent

ICP ICSA A_00003



1410354

ID: ICP ICSEA A_00003

Exp 03/26/19 Prpt SFF Opn 03/26/18

ICP ICSEA A



CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: ICP ICSEA-A
Lot Number: N2-MEB666538
Matrix: 5% (v/v) HNO₃
Value / Analyte(s): 20 000 mg/L ea:
Aluminum, Iron

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	20 000.0 ± 70.0 mg/L	Iron, Fe	20 000.0 ± 80.0 mg/L

Density: 1.219 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char } a}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char } b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char } a})^2 / ((1/u_{\text{char } a})^2 + (1/u_{\text{char } b})^2)$$

$$w_b = (1/u_{\text{char } b})^2 / ((1/u_{\text{char } a})^2 + (1/u_{\text{char } b})^2)$$

$$\text{CRM/RM Expanded Uncertainty } (z) = U_{\text{CRM/RM}} = k (u_{\text{char } a \& b}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char } a \& b} = [(w_a)^2 (u_{\text{char } a})^2 + (w_b)^2 (u_{\text{char } b})^2]^{1/2}$, where $u_{\text{char } a}$ and $u_{\text{char } b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char } a}$$

$$\text{CRM/RM Expanded Uncertainty } (z) = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

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$u_{\text{char } a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 20, 2018

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 20, 2021**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

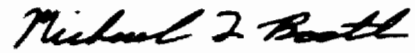
11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Handwritten signature of Michael Z Booth in black ink.

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Handwritten signature of Paul R Gaines in black ink.

Reagent

ICP ICSA B_00003



1410356

ID: ICP ICSA B_00003

Exp 03/26/19 Prpd SFF Opn 03/26/18

ICP ICSA B



CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: ICP ICSA-B
Lot Number: N2-MEB666539
Matrix: 5% (v/v) HNO₃
Value / Analyte(s): 20 000 mg/L ea:
Calcium, Potassium, Sodium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Calcium, Ca	20 000.0 ± 80.0 mg/L	Potassium, K	20 000.0 ± 70.0 mg/L
Sodium, Na	20 000.0 ± 70.0 mg/L		

Density: 1.164 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char a}}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char b}}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char a}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$w_b = (1/u_{\text{char b}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$\text{CRM/RM Expanded Uncertainty (t)} = U_{\text{CRM/RM}} = k (u_{\text{char a\&b}}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a\&b}} = [(w_a)^2 (u_{\text{char a}})^2 + (w_b)^2 (u_{\text{char b}})^2]^{1/2}$ where $u_{\text{char a}}$ and $u_{\text{char b}}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char a}}$$

$$\text{CRM/RM Expanded Uncertainty (t)} = U_{\text{CRM/RM}} = k (u_{\text{char a}}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a}}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 20, 2018

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 20, 2021**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

A handwritten signature in black ink, appearing to read "Michael Booth". The script is cursive and fluid.

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

A handwritten signature in black ink, appearing to read "Paul R. Gaines". The script is cursive and fluid.

Reagent

ICP ICSA C_00003



1410359

ID: ICP ICSCA C_00003

Exp 03/26/19 Prpd: SFF Opn 03/26/18

ICP ICSCA C



CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: ICP ICSCA-C
Lot Number: N2-MEB666542
Matrix: 5% (v/v) HNO₃
Value / Analyte(s): 20 000 mg/L ea:
Magnesium, Phosphorus

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Magnesium, Mg	20 000.0 ± 80.0 mg/L	Phosphorus, P	20 000.0 ± 100.0 mg/L

Density: 1.146 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mg	ICP Assay	3131a	050302
Mg	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char a}}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char b}}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char a}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$w_b = (1/u_{\text{char b}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char a\&b}}^2 + u_{\text{bb}}^2 + u_{\text{ts}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a\&b}} = [(w_a)^2 (u_{\text{char a}})^2 + (w_b)^2 (u_{\text{char b}})^2]^{1/2}$ where $u_{\text{char a}}$ and $u_{\text{char b}}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

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4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

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8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

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- Chemical Testing - Accredited / A2LA Certificate Number 883.01

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- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 20, 2018

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 20, 2021**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

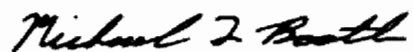
11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Handwritten signature of Michael Z Booth in black ink.

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Handwritten signature of Paul R Gaines in black ink.

Reagent

ICP ICSAB A_00003



CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution

Catalog Number: ICP ICSAB-A

Lot Number: N2-MEB666540

Matrix: 7% (v/v) HNO₃

Value / Analyte(s):

500 mg/L ea:	Barium,	Beryllium,	Bismuth,
	Cadmium,	Cobalt,	Chromium,
	Copper,	Lithium,	Manganese,
	Nickel,	Lead,	Arsenic,
	Strontium,	Thorium,	Uranium,
	Vanadium,	Zinc,	
100 mg/L ea:			
	Silver,	Thallium,	Boron,
	Selenium		

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Arsenic, As	500.0 ± 4.3 mg/L	Barium, Ba	500.0 ± 2.1 mg/L
Beryllium, Be	500.1 ± 2.8 mg/L	Bismuth, Bi	500.1 ± 3.1 mg/L
Boron, B	100.0 ± 0.6 mg/L	Cadmium, Cd	500.1 ± 2.1 mg/L
Chromium, Cr	500.0 ± 2.9 mg/L	Cobalt, Co	500.0 ± 2.4 mg/L
Copper, Cu	500.3 ± 2.1 mg/L	Lead, Pb	500.1 ± 2.2 mg/L
Lithium, Li	500.0 ± 2.1 mg/L	Manganese, Mn	500.1 ± 2.0 mg/L
Nickel, Ni	500.3 ± 2.2 mg/L	Selenium, Se	100.1 ± 0.6 mg/L
Silver, Ag	100.0 ± 0.4 mg/L	Strontium, Sr	500.0 ± 2.0 mg/L
Thallium, Tl	100.0 ± 0.5 mg/L	Thorium, Th	500.0 ± 2.5 mg/L
Uranium, U	500.1 ± 2.8 mg/L	Vanadium, V	500.0 ± 2.1 mg/L
Zinc, Zn	500.2 ± 2.1 mg/L		

Density: 1.070 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	992212
Ag	Volhard	999c	999c
As	ICP Assay	3103a	100818
B	ICP Assay	3107	110830
Ba	ICP Assay	3104a	070222
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Bi	ICP Assay	3106	991212
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	ICP Assay	3113	000630 Co
Co	EDTA	928	928
Cr	ICP Assay	3112a	030730Cr3
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Li	ICP Assay	3129a	100714
Li	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Se	Calculated		See Sec. 4.2
Sr	EDTA	928	928
Sr	ICP Assay	3153a	990906
Th	EDTA	928	928
Tl	ICP Assay	3158	993012
Tl	Calculated		See Sec. 4.2
U	ICP Assay	3164	080521
U	Calculated		See Sec. 4.2
V	EDTA	928	928
V	ICP Assay	3165	992706
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{char a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{char a}^2) / ((1/u_{char a}^2) + (1/u_{char b}^2))$$

$$w_b = (1/u_{char b}^2) / ((1/u_{char a}^2) + (1/u_{char b}^2))$$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/4}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a \& b} = [(w_a)^2 (u_{char a})^2 + (w_b)^2 (u_{char b})^2]^{1/2}$ where $u_{char a}$ and $u_{char b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Certified Abundance:

IV's Certified Abundance

Isotope	Atom %
Uranium 238U	99.7 ± 0.1
Uranium 235U	0.28 ± 0.05

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = \text{mean of Assay Method A with standard uncertainty } u_{char a}$$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/4}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 20, 2018

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 20, 2021**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

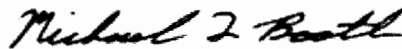
- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Reagent

ICP ICSAB B_00003



CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: ICP ICSAB-B
Lot Number: N2-MEB666541
Matrix: 5% (v/v) HNO₃
tr. HF
Value / Analyte(s): 500 mg/L ea: Silicon, Tin, Titanium,
100 mg/L ea: Molybdenum, Antimony

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.6 mg/L	Molybdenum, Mo	100.0 ± 0.5 mg/L
Silicon, Si	499.9 ± 3.2 mg/L	Tin, Sn	500.2 ± 1.9 mg/L
Titanium, Ti	500.0 ± 3.0 mg/L		

Density: 1.030 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Sb	ICP Assay	3102a	140911
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	070330
Sn	Calculated		See Sec. 4.2
Ti	ICP Assay	3162a	130925

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char a}}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char b}}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char a}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$w_b = (1/u_{\text{char b}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char a\&b}}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a\&b}} = [(w_a)^2 (u_{\text{char a}})^2 + (w_b)^2 (u_{\text{char b}})^2]^{1/2}$ where $u_{\text{char a}}$ and $u_{\text{char b}}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char a}}$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char a}}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a}}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

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u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

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- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.659.6799; 540.585.3030; Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 20, 2018

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 20, 2021**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

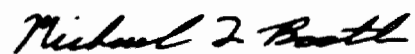
11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Handwritten signature of Michael Booth in cursive script.

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Handwritten signature of Paul R. Gaines in cursive script.

Reagent

ICP ICV 1_00005

SPEXertificate®

Certificate of Reference Material

Catalog Number: ZITMO-55-250
Description: Custom Claritas Standard
Matrix: 5% HNO₃

Lot No. 2-200SG



1487731

ID: ICP ICV 1_00005
Exp: 06/25/19 Prep: SFF Opn: 06/25/18
ICP ICV 1

This CLARITAS PPT® Certified Reference Material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICP-OES, DCP, AA, ICP-MS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations.

Instrumental Analysis by ICP Spectrometer:

Analyte	Labeled	Uncertainty	SRM	Analyte	Labeled	Uncertainty	SRM
Al	10000 µg/mL	±200 µg/mL	3101a*	Fe	10000 µg/mL	±200 µg/mL	3126a*
Ca	10000 µg/mL	±200 µg/mL	3109a*	Mg	10000 µg/mL	±200 µg/mL	3131a*

* - indicates NIST SRM

† - indicates SPEX CertiPrep CRM (when NIST SRM is not available)

SPEX CertiPrep Reference Multi: Lot# ALL8

Trace Metallic Impurities in the Actual Solution via ICP-MS Analysis:

Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L
Ag	<2	Cs	<0.4	In	<1	Ni	75	Sc	<2	Ti	130
As	5	Cu	40	Ir	<1	P	<1000	Se	<100	Tl	<4
Au	<4	Dy	<0.2	K	130	Pb	3	Si	200	Tm	0.05
B	<100	Er	<0.01	La	8	Pd	<3	Sm	<0.1	U	0.3
Ba	10	Eu	<0.08	Li	<80	Pr	1	Sn	<2	V	<0.6
Be	<5	Ga	3	Lu	<0.2	Pt	2	Sr	150	W	<4
Bi	0.8	Gd	1	Mn	500	Rb	<0.9	Ta	<4	Y	0.6
Cd	<3	Ge	<100	Mo	<8	Re	<0.3	Tb	0.2	Yb	<0.1
Ce	20	Hf	1	Na	80	Rh	<10	Te	<2	Zn	50
Co	22	Hg	10	Nb	<3	Ru	<3	Th	<4	Zr	<20
Cr	40	Ho	<0.04	Nd	2	Sb	30				

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to ±2% of the labeled value. This includes uncertainty components due to preparation, measurement, homogeneity, and short-term and long-term stability. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and stored under ambient laboratory conditions.

Date of Certification: JUN - - 2018

Certifying Officer: Katherine Cullinan
Katherine Cullinan, QC Manager

Reagent

ICP ICV 2_00006



Reference Materials Producer
Cert #2495.01

SPEXertificate®

Certificate of Reference Material



Chemical Testing
Cert #2495.02

Catalog Number:

ZITMO-53A-250

Lot No. 2-198SG

Description:

Custom Claritas Standard

Matrix:

10% HNO₃ / Tr. Tart. Acid / Tr. HF



1487732

ID: ICP ICV 2_00006

Exp. 06/25/19 Pripd SFF Opn 06/25/18
ICP ICV 2

This CLARITAS PPT® Certified Reference Material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICP-OES, DCP, AA, ICP-MS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations.

Instrumental Analysis by ICP Spectrometer:

Analyte	Labeled	Uncertainty	SRM	Analyte	Labeled	Uncertainty	SRM
As	1000 µg/mL	±20 µg/mL	3103a*	B	200 µg/mL	±4 µg/mL	3107*
Be	1000 µg/mL	±20 µg/mL	3105a*	Mo	200 µg/mL	±4 µg/mL	3134*
Si	1000 µg/mL	±20 µg/mL	3150*	Sb	200 µg/mL	±4 µg/mL	3102a*
Sn	1000 µg/mL	±20 µg/mL	3161a*	Se	200 µg/mL	±4 µg/mL	3149*
Ti	1000 µg/mL	±20 µg/mL	3162a*				

* - indicates NIST SRM

† - indicates SPEX CertiPrep CRM (when NIST SRM is not available)

SPEX CertiPrep Reference Multi: Lot# ALL8

Trace Metallic Impurities in the Actual Solution via ICP-MS Analysis:

Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L
Ag	30	Cs	2	Hg	<6	Na	100	Re	3	Tl	2
Al	70	Cu	10	Ho	<0.1	Nb	3	Rh	<8	Tm	<0.07
Au	<2	Dy	<0.4	In	<200	Nd	<0.3	Ru	<2	U	<0.5
Ba	50	Er	<0.01	Ir	<0.4	Ni	70	Sc	<20	V	<6
Bi	<0.3	Eu	<0.03	K	90	P	<1000	Sm	<0.3	W	20
Ca	40	Fe	5	La	5	Pb	3	Sr	<7	Y	0.3
Cd	40	Ga	0.6	Li	60	Pd	<4	Ta	20	Yb	<0.1
Ce	1	Gd	<0.5	Lu	0.1	Pr	0.3	Tb	0.2	Zn	40
Co	8	Ge	<5	Mg	200	Pt	<0.3	Te	<9	Zr	20
Cr	<10	Hf	0.5	Mn	<3	Rb	<0.6	Th	<0.6		

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to ±2% of the labeled value. This includes uncertainty components due to preparation, measurement, homogeneity, and short-term and long-term stability. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and stored under ambient laboratory conditions.

Date of Certification:

JUN - 2018

Certifying Officer:

Katherine Cullinan
Katherine Cullinan, QC Manager

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Reagent

ICP ICV 3_00005



Reference Materials Producer
Cert #2495.01

SPEXertificate®

Certificate of Reference Material



Chemical Testing
Cert #2495.02

Catalog Number:

ZITMO-54-250

Lot No. 2-199SG

Description:

Custom Claritas Standard

Matrix:

10% HNO₃



1487733

This CLARITAS PPT® Certified Reference Material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICP-OES, DCP, AA, ICP-MS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

ID: ICP ICV 3_00005

Exp:06/25/19 Pripd:SFF Opn:06/25/18
ICP ICV 3

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations.

Instrumental Analysis by ICP Spectrometer:

Analyte	Labeled	Uncertainty	SRM	Analyte	Labeled	Uncertainty	SRM
Ba	1000 µg/mL	±20 µg/mL	3104a*	Pb	1000 µg/mL	±20 µg/mL	3128*
Bi	1000 µg/mL	±20 µg/mL	3106*	Sr	1000 µg/mL	±20 µg/mL	3153a*
Cd	1000 µg/mL	±20 µg/mL	3108*	Th	1000 µg/mL	±20 µg/mL	3159*
Co	1000 µg/mL	±20 µg/mL	3113*	U	1000 µg/mL	±20 µg/mL	3164*
Cr	1000 µg/mL	±20 µg/mL	3112a*	V	1000 µg/mL	±20 µg/mL	3165*
Cu	1000 µg/mL	±20 µg/mL	3114*	Zn	1000 µg/mL	±20 µg/mL	3168a*
Li	1000 µg/mL	±20 µg/mL	3129a*	Ag	200 µg/mL	±4 µg/mL	3151*
Mn	1000 µg/mL	±20 µg/mL	3132*	Tl	200 µg/mL	±4 µg/mL	3158*
Ni	1000 µg/mL	±20 µg/mL	3136*				

* - indicates NIST SRM

† - indicates SPEX CertiPrep CRM (when NIST SRM is not available)

SPEX CertiPrep Reference Multi: Lot# ALL8

Trace Metallic Impurities in the Actual Solution via ICP-MS Analysis:

Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L
Al	40	Er	<0.01	In	1	Nd	<3	Ru	<30	Tb	0.08
As	<100	Eu	<1	Ir	<2	P	<1000	Sb	<2	Te	<30
Au	<3	Fe	100	K	130	Pd	<400	Sc	<3	Ti	<40
B	<100	Ga	20	La	10	Pr	0.7	Se	<100	Tm	<0.06
Be	<6	Gd	3	Lu	0.1	Pt	<0.3	Si	<400	W	<3
Ca	300	Ge	<4	Mg	140	Rb	2	Sm	30	Y	20
Ce	20	Hf	<0.3	Mo	<20	Re	<0.07	Sn	<1	Yb	<0.2
Cs	1	Hg	<4	Na	500	Rh	200	Ta	<0.9	Zr	4
Dy	<0.4	Ho	0.09	Nb	4						

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to ±2% of the labeled value. This includes uncertainty components due to preparation, measurement, homogeneity, and short-term and long-term stability. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and stored under ambient laboratory conditions.

Date of Certification:

JUN - - 2018

Certifying Officer:

Katherine Cullinan
Katherine Cullinan, QC Manager

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Reagent

ICP ICV 4_00004



Reference Materials Producer
Cert #2495.01

SPEXertificate®

Certificate of Reference Material



Chemical Testing
Cert #2495.02

Catalog Number:

ZITMO-56-250

Lot No. 2-208SG

Description:

Custom Claritas Standard

Matrix:

10% HNO₃



1487734

ID: ICP ICV 4_00004

Exp 06/25/19 Prpd SFF Opn 06/25/18
ICP ICV 4

This CLARITAS PPT® Certified Reference Material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICP-OES, DCP, AA, ICP-MS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations.

Instrumental Analysis by ICP Spectrometer:

Analyte	Labeled	Uncertainty	SRM	Analyte	Labeled	Uncertainty	SRM
K	10000 µg/mL	±200 µg/mL	3141a*	P	10000 µg/mL	±200 µg/mL	3139a*
Na	10000 µg/mL	±200 µg/mL	3152a*	S	10000 µg/mL	±200 µg/mL	3154*

* - indicates NIST SRM

† - indicates SPEX CertiPrep CRM (when NIST SRM is not available)

SPEX CertiPrep Reference Multi: Lot# ALL8

Trace Metallic Impurities in the Actual Solution via ICP-MS Analysis:

Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L	Element	µg/L
Ag	3	Co	0.6	Hf	0.6	Nb	<0.9	Sb	<0.7	Ti	<20
Al	40	Cr	10	Hg	<4	Nd	3	Sc	<2	Tl	<9
As	<7	Cs	0.3	Ho	<0.04	Ni	8	Se	3	Tm	<0.03
Au	<1	Cu	<8	In	2	Pb	<1	Si	1000	U	<0.3
B	100	Dy	0.7	Ir	<1	Pd	<3	Sm	<0.1	V	<3
Ba	3	Er	<0.1	La	0.05	Pr	0.3	Sn	<7	W	<3
Be	<3	Eu	<0.08	Li	<100	Pt	<0.5	Sr	<0.4	Y	<0.1
Bi	<0.4	Fe	5	Lu	<0.03	Rb	400	Ta	<3	Yb	<0.1
Ca	200	Ga	<0.5	Mg	30	Re	<0.3	Tb	<0.1	Zn	20
Cd	<0.5	Gd	<0.3	Mn	2	Rh	<20	Te	<8	Zr	<20
Ce	<0.1	Ge	<10	Mo	<6	Ru	<0.9	Th	<2		

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to ±2% of the labeled value. This includes uncertainty components due to preparation, measurement, homogeneity, and short-term and long-term stability. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and stored under ambient laboratory conditions.

Date of Certification: JUN - - 2018

Certifying Officer: Katherine Cullinan
Katherine Cullinan, QC Manager

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Reagent

ICP LLC A_00007

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
 Catalog Number: ICP LLC-A
 Lot Number: M2-MEB661165
 Matrix: 5% (v/v) HNO₃
 tr. HF
 Value / Analyte(s): 80 mg/L ea:
 Silicon,
 20 mg/L ea:
 Tin,
 8 mg/L ea:
 Molybdenum,
 4 mg/L ea:
 Titanium,
 2 mg/L ea:
 Antimony



1409519
 ID ICP LLC A_00007
 Exp 03/23/19 Prpd SFF Opi 03/23/18
 ICP LLC A

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	2.000 ± 0.014 mg/L	Molybdenum, Mo	8.00 ± 0.05 mg/L
Silicon, Si	80.0 ± 0.5 mg/L	Tin, Sn	20.00 ± 0.10 mg/L
Titanium, Ti	4.000 ± 0.024 mg/L		

Density: 1.024 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Mo	Calculated		See Sec. 4.2
Sb	ICP Assay	3102a	140911
Sb	Calculated		See Sec. 4.2
Si	ICP Assay	3150	130912
Si	Calculated		See Sec. 4.2
Sn	ICP Assay	3161a	070330
Ti	ICP Assay	3162a	130925
Ti	Calculated		See Sec. 4.2

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char a}}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char b}}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char a}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$w_b = (1/u_{\text{char b}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char a}}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a \& b}}$ = $[(w_a)^2 (u_{\text{char a}})^2 + (w_b)^2 (u_{\text{char b}})^2]^{1/2}$ where $u_{\text{char a}}$ and $u_{\text{char b}}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char a}}$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char a}}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a}}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 29, 2017

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 29, 2020**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

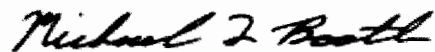
- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Handwritten signature of Michael Booth in black ink.

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Handwritten signature of Paul R. Gaines in black ink.

Reagent

ICP LLC B_00005

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution		
Catalog Number:	ICP LLC-B		
Lot Number:	M2-MEB661170		
Matrix:	5% (v/v) HNO3		
Value / Analyte(s):	1 000 mg/L ea:		
	Potassium,	Sulfur,	
	200 mg/L ea:		
	Sodium,	Magnesium,	Calcium,
	100 mg/L ea:		
	Uranium,		
	50 mg/L ea:		
	Phosphorus,		
	40 mg/L ea:		
	Thorium,	Bismuth,	Aluminum,
	20 mg/L ea:		
	Boron,	Iron,	
	10 mg/L ea:		
	Cobalt,	Lithium,	Barium,
	Vanadium,		
	8 mg/L ea:		
	Nickel,		
	5 mg/L ea:		
	Copper,		
	4 mg/L ea:		
	Thallium,	Zinc,	
	3 mg/L ea:		
	Selenium,	Manganese,	
	2 mg/L ea:		
	Chromium,	Arsenic,	Silver,
	Lead,		
	1 mg/L ea:		
	Strontium,	Cadmium,	Beryllium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	40.00 ± 0.14 mg/L	Arsenic, As	2.000 ± 0.018 mg/L
Barium, Ba	10.00 ± 0.06 mg/L	Beryllium, Be	1.000 ± 0.006 mg/L
Bismuth, Bi	40.00 ± 0.23 mg/L	Boron, B	20.00 ± 0.14 mg/L
Cadmium, Cd	1.000 ± 0.007 mg/L	Calcium, Ca	200.0 ± 0.9 mg/L
Chromium, Cr	2.000 ± 0.015 mg/L	Cobalt, Co	10.00 ± 0.05 mg/L
Copper, Cu	5.000 ± 0.030 mg/L	Iron, Fe	20.00 ± 0.10 mg/L
Lead, Pb	2.000 ± 0.009 mg/L	Lithium, Li	10.00 ± 0.04 mg/L
Magnesium, Mg	200.0 ± 0.8 mg/L	Manganese, Mn	3.000 ± 0.016 mg/L
Nickel, Ni	8.00 ± 0.05 mg/L	Phosphorus, P	50.00 ± 0.23 mg/L
Potassium, K	1 000 ± 4 mg/L	Selenium, Se	3.000 ± 0.016 mg/L
Silver, Ag	2.000 ± 0.014 mg/L	Sodium, Na	200.0 ± 0.7 mg/L
Strontium, Sr	1.000 ± 0.006 mg/L	Sulfur, S	1 000 ± 5 mg/L
Thallium, Tl	4.000 ± 0.024 mg/L	Thorium, Th	40.00 ± 0.20 mg/L
Uranium, U	100.0 ± 0.5 mg/L	Vanadium, V	10.00 ± 0.06 mg/L
Zinc, Zn	4.000 ± 0.024 mg/L		

Density: 1.033 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	992212
Ag	Volhard	999c	999c
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	110830
B	Calculated		See Sec. 4.2
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Bi	ICP Assay	3106	991212
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	060531
Cd	EDTA	928	928
Co	ICP Assay	3113	000630 Co
Co	EDTA	928	928
Cr	ICP Assay	3112a	030730Cr3
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
S	ICP Assay	3154	892205
S	Acidimetric		traceable to 84L
Se	ICP Assay	3149	100901
Se	Calculated		See Sec. 4.2
Sr	EDTA	928	928
Sr	ICP Assay	3153a	990906
Th	EDTA	928	928
Th	Calculated		See Sec. 4.2
Tl	ICP Assay	3158	993012
Tl	Calculated		See Sec. 4.2
U	ICP Assay	3164	080521

U	Calculated		See Sec. 4.2
V	EDTA	928	928
V	ICP Assay	3165	992706
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char a}}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char b}}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char a}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$w_b = (1/u_{\text{char b}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$\text{CRM/RM Expanded Uncertainty (t)} = U_{\text{CRM/RM}} = k(u_{\text{char a\&b}}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a\&b}} = [(w_a)^2(u_{\text{char a}})^2 + (w_b)^2(u_{\text{char b}})^2]^{1/2}$ where $u_{\text{char a}}$ and $u_{\text{char b}}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Certified Abundance:

IV's Certified Abundance

Isotope	Atom %
Uranium 238U	99.6 ± 0.1
Uranium 235U	0.37 ± 0.05

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char a}}$$

$$\text{CRM/RM Expanded Uncertainty (t)} = U_{\text{CRM/RM}} = k(u_{\text{char a}}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a}}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.
- For more information, visit www.inorganicventures.com/TCT

Low Silver Note: This solution contains "LOW" levels of Silver. Please store this entire bottle inside a sealed glass jar.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 29, 2017

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 29, 2020**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

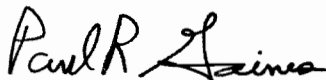
Certificate Approved By:

Michael Booth
Supervisor, Quality Control



Certifying Officer:

Paul Gaines
CEO, Senior Technical Director



Reagent

K Dichromate_00004

3050 Spruce Street, Saint Louis, MO 63103, USA

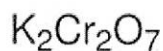
Website: www.sigmaaldrich.comEmail USA: techserv@sial.comOutside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:

Potassium dichromate - ACS reagent, ≥99.0%

Product Number: 207802
Batch Number: MKBV0900V
Brand: SIAL
CAS Number: 7778-50-9
MDL Number: MFCD00011367
Formula: Cr₂K₂O₇
Formula Weight: 294.18 g/mol
Quality Release Date: 07 APR 2015



900931

ID: K Dichromate_00004

Exp: 05/03/22 Prpd: NPV Ogn: 05/03/16
Potassium Dichromate Cal

Test	Specification	Result
Appearance (Color) Orange	Conforms to Requirements	Orange
Appearance (Form)	Crystals	Crystals
X-Ray Diffraction	Conforms to Structure	Conforms
Titration by Na ₂ S ₂ O ₃	≥ 99.0 %	99.0 %
Loss on Drying	≤ 0.05 %	< 0.03 %
Calcium (Ca)	≤ 0.003 %	< 0.001 %
Chloride Content	≤ 0.001 %	< 0.001 %
Iron (Fe)	≤ 0.001 %	< 0.001 %
Insoluble Matter	≤ 0.005 %	< 0.001 %
C = 10%, H ₂ O		
Sodium (Na)	≤ 0.02 %	< 0.01 %
Sulfate (SO ₄)	≤ 0.005 %	< 0.005 %
Meets ACS Requirements Tenth Edition	Current ACS Specification	Conforms

Ali Ataei, Manager
Quality Control
Milwaukee, WI US

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Reagent

K-Dichromate_00002



1 Reagent Lane
Fair Lawn, NJ 07410
201.796.7100 tel
201.796.1329 fax

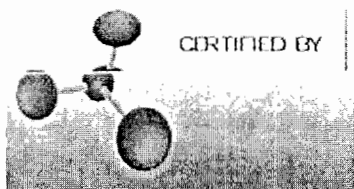
Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by SAI Global Certificate Number CERT - 0064970

This is to certify that units of the lot number below were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	P188	Quality Test / Release Date	5/14/2015
Lot Number	153492		
Description	POTASSIUM DICHROMATE, A.C.S.		
Country of Origin	United States	* Suggested Retest Date	May-2020
Chemical Origin	Inorganic-non animal		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	FINE ORANGE CRYSTALS
ASSAY	%	>= 99	99.9
CALCIUM	%	<= 0.003	0.0010
CHLORIDE	%	<= 0.001	<0.0010
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
INSOLUBLE MATTER	%	<= 0.005	0.001
IRON (Fe)	%	<= 0.001	<0.0010
LOSS ON DRYING @ 105 C	%	<= 0.05	0.02
SODIUM (Na)	%	<= 0.02	<0.020
SULFATE (SO4)	%	<= 0.005	0.004



Edgar E. Hane

Lab Manager Fair Lawn



1166282

ID: K-Dichromate_00002
Exp:05/31/20 Pripd NFW Opn:05/02/17
Potassium Dichromate

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.

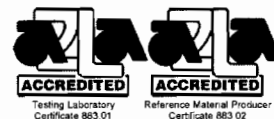
*Based on suggested storage condition.

Reagent

MPREP1_00017

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution

Catalog Number: TESTAMERICA-13

Lot Number: M2-MEB663768

Matrix: 7% (v/v) HNO₃

Value / Analyte(s): 2 000 mg/L ea:

Aluminum,

Potassium,

Sulfur,

200 mg/L ea:

Manganese,

Thorium,

Zinc,

Lead,

Cobalt,

Arsenic,

100 mg/L ea:

Selenium,

40 mg/L ea:

Thallium,

20 mg/L ea:

Lithium,

Calcium,

Sodium,

Samarium,

Uranium,

Nickel,

Bismuth,

Chromium,

Barium,

Boron,

Beryllium



1486976

ID: MPREP1_00017

Exp:06/22/19 Prpd:LAM Opn:06/23/18

Metals Prep 1 Spike

Iron,

Magnesium,

Strontium,

Vanadium,

Phosphorus,

Cadmium,

Copper,

Silver,

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	2 000 ± 7 mg/L	Arsenic, As	200.0 ± 1.7 mg/L
Barium, Ba	200.0 ± 0.8 mg/L	Beryllium, Be	20.00 ± 0.09 mg/L
Bismuth, Bi	200.0 ± 1.1 mg/L	Boron, B	40.01 ± 0.24 mg/L
Cadmium, Cd	200.1 ± 0.8 mg/L	Calcium, Ca	2 000 ± 8 mg/L
Chromium, Cr	200.0 ± 1.2 mg/L	Cobalt, Co	200.0 ± 0.9 mg/L
Copper, Cu	200.0 ± 0.8 mg/L	Iron, Fe	2 000 ± 8 mg/L
Lead, Pb	200.0 ± 0.9 mg/L	Lithium, Li	20.00 ± 0.07 mg/L
Magnesium, Mg	2 000 ± 8 mg/L	Manganese, Mn	200.0 ± 0.8 mg/L
Nickel, Ni	200.0 ± 0.8 mg/L	Phosphorus, P	200.0 ± 0.9 mg/L
Potassium, K	2 000 ± 8 mg/L	Samarium, Sm	200.0 ± 1.2 mg/L
Selenium, Se	100.0 ± 0.6 mg/L	Silver, Ag	40.01 ± 0.18 mg/L
Sodium, Na	2 000 ± 7 mg/L	Strontium, Sr	200.1 ± 0.8 mg/L
Sulfur, S	2 000 ± 10 mg/L	Thallium, Tl	40.01 ± 0.22 mg/L
Thorium, Th	200.0 ± 1.0 mg/L	Uranium, U	200.0 ± 1.1 mg/L
Vanadium, V	200.0 ± 0.9 mg/L	Zinc, Zn	200.0 ± 0.8 mg/L

Density: 1.091 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	992212
Ag	Volhard	999c	999c
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	110830
Ba	ICP Assay	3104a	070222
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Be	Calculated		See Sec. 4.2
Bi	ICP Assay	3106	991212
Bi	Calculated		See Sec. 4.2
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	ICP Assay	3113	000630 Co
Co	EDTA	928	928
Cr	ICP Assay	3112a	030730Cr3
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	050302
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric		traceable to 84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
S	ICP Assay	3154	892205
S	Acidimetric		traceable to 84L
Se	ICP Assay	3149	100901
Sm	ICP Assay	3147a	892911
Sm	EDTA	928	928
Sr	EDTA	928	928
Sr	ICP Assay	3153a	990906
Th	EDTA	928	928
Tl	ICP Assay	3158	993012
Tl	Calculated		See Sec. 4.2

U	ICP Assay	3164	080521
U	Calculated		See Sec. 4.2
V	EDTA	928	928
V	ICP Assay	3165	992706
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char a}}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char b}}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char a}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$w_b = (1/u_{\text{char b}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$\text{CRM/RM Expanded Uncertainty } (z) = U_{\text{CRM/RM}} = k (u_{\text{char a\&b}}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a\&b}} = [(w_a)^2 (u_{\text{char a}})^2 + (w_b)^2 (u_{\text{char b}})^2]^{1/2}$ where $u_{\text{char a}}$ and $u_{\text{char b}}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Certified Abundance:

IV's Certified Abundance

Isotope	Atom %
Uranium 238U	99.7 ± 0.1
Uranium 235U	0.28 ± 0.05

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char a}}$$

$$\text{CRM/RM Expanded Uncertainty } (z) = U_{\text{CRM/RM}} = k (u_{\text{char a}}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a}}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.
- For more information, visit www.inorganicventures.com/TCT

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	992212
Ag	Volhard	999c	999c
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	110830
Ba	ICP Assay	3104a	070222
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Be	Calculated		See Sec. 4.2
Bi	ICP Assay	3106	991212
Bi	Calculated		See Sec. 4.2
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Co	ICP Assay	3113	000630 Co
Co	EDTA	928	928
Cr	ICP Assay	3112a	030730Cr3
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	050302
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric		traceable to 84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
S	ICP Assay	3154	892205
S	Acidimetric		traceable to 84L
Se	ICP Assay	3149	100901
Sm	ICP Assay	3147a	892911
Sm	EDTA	928	928
Sr	EDTA	928	928
Sr	ICP Assay	3153a	990906
Th	EDTA	928	928
Tl	ICP Assay	3158	993012
Tl	Calculated		See Sec. 4.2

Reagent

MPREP2_00015

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution

Catalog Number: PREP-2

Lot Number: M2-MEB663767

Matrix: 7% (v/v) HNO₃
1.6% (v/v) HF

Value / Analyte(s): 1 000 mg/L ea:
Silicon,
200 mg/L ea:
Tin, Titanium, Tungsten,
Zirconium,
100 mg/L ea:
Molybdenum, Antimony



1486979

ID: MPREP2_00015

Exp:06/22/19 Prpd:LAM Opn:06/23/18

Metals Prep 2 Spike

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	100.0 ± 0.6 mg/L	Molybdenum, Mo	100.0 ± 0.5 mg/L
Silicon, Si	1 000 ± 6 mg/L	Tin, Sn	200.0 ± 0.8 mg/L
Titanium, Ti	200.0 ± 1.2 mg/L	Tungsten, W	200.0 ± 1.5 mg/L
Zirconium, Zr	200.0 ± 1.4 mg/L		

Density: 1.043 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Sb	ICP Assay	3102a	140911
Si	ICP Assay	3150	130912
Sn	ICP Assay	3161a	070330
Sn	Calculated		See Sec. 4.2
Ti	ICP Assay	3162a	130925
W	ICP Assay	3163	140606
Zr	ICP Assay	3169	130920

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM by two independent methods Characterization of CRM by one method

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char a}}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char b}}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char a}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$w_b = (1/u_{\text{char b}})^2 / ((1/u_{\text{char a}})^2 + (1/u_{\text{char b}})^2)$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char a\&b}}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a\&b}} = [(w_a)^2 (u_{\text{char a}})^2 + (w_b)^2 (u_{\text{char b}})^2]^{1/2}$ where $u_{\text{char a}}$ and $u_{\text{char b}}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = \text{mean of Assay Method A with standard uncertainty } u_{\text{char a}}$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k (u_{\text{char a}}^2 + u_{\text{bb}}^2 + u_{\text{Its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char a}}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{Its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 08, 2017

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 08, 2020**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____
- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Handwritten signature of Michael Booth in black ink.

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Handwritten signature of Paul Gaines in black ink.

Reagent

Ra-226_00021



National Institute of Standards & Technology

Certificate

Standard Reference Material[®] 4967A

Radium-226 Radioactivity Standard

This Standard Reference Material (SRM) consists of a solution of a standardized and certified quantity of radioactive radium-226 in a suitably stable and homogeneous matrix. It is intended primarily for the calibration of instruments that are used to measure radioactivity and for the monitoring of radiochemical procedures. A unit of SRM 4967A consists of approximately 5 mL of a hydrochloric acid and barium chloride solution, whose composition is specified in Table 1 and 2, contained in a flame-sealed borosilicate-glass ampoule [1].

The certified **radium-226** massic activity value, at a **Reference Time of 1200 EST, 01 September 2003**, is:

$$(2482 \pm 30) \text{ Bq}\cdot\text{g}^{-1}$$

A NIST certified value, as used within the context of this certificate, is a value for which NIST has the highest confidence in its uncertainty assessment. It is a "measurement result" [2] obtained directly or indirectly from a "primary reference measurement procedure" [3]. The certified value is traceable to the derived SI unit, becquerel (Bq).

Additional physical, chemical, and radiological properties for this SRM, as well as details on the standardization method, are given in Table 1 and 2. Uncertainties for the certified quantities are expanded ($k = 2$). The uncertainties are calculated according to the ISO and NIST Guides [4,5]. Table 3 contains a specification of the components that comprise the uncertainty analyses.

Expiration of Certification: The certification of **SRM 4967A** is valid indefinitely, within the measurement uncertainty specified, provided that the SRM is handled and stored properly and that no evaporation or change in composition has occurred. The solution matrix, in an unopened ampoule, is homogeneous and stable within its half-life-dependent useful lifetime provided the SRM is handled in accordance with instructions given in this certificate (see "Instructions for Handling and Storage"). Periodic recertification of this SRM is not required. The certification is nullified if the SRM is damaged, contaminated, or otherwise modified.

Maintenance of Certification: NIST will monitor this SRM over the period of its certification. If substantive technical changes occur that affect the certification, NIST will notify the purchaser. Registration (see attached sheet) will facilitate notification.

Radiological and chemical hazard: Consult the Safety Data Sheet (SDS), enclosed with the SRM shipment, for radiological and chemical hazard information.

This SRM was prepared in the NIST Physical Measurement Laboratory, Radiation Physics Division, under the direction of M.P. Unterwieser, Group Leader of the Radioactivity Group. The overall production, technical direction, and physical measurement leading to certification were provided by R. Collé and P. Volkovitsky of the NIST Radiation Physics Division, Radioactivity Group. Statistical consultation was provided by S.D. Leigh of the NIST Statistical Engineering Division.

Support aspects involved in the issuance of this SRM were coordinated through the NIST Office of Reference Materials.

Lisa R. Karam, Chief
Radiation Physics Division

Gaithersburg, Maryland 20899
Certificate Issue Date: 03 September 2013
See Certificate Revision History on Last Page

Robert L. Watters, Jr., Director
Office of Reference Materials

Table 3. Uncertainty Evaluation for the Massic Activity of SRM 4967A

Uncertainty component		Assessment Type ^(a)	Relative standard uncertainty contribution on massic activity of ²²⁶ Ra (%)
1	Calibration of the “1947 (1967 recalibrated) series” of radium-226 solution standards in terms of mass of radium-226 ^(b)	B	0.34
2	Ratio of the mass of radium-226 in SRM 4967A to the mass of radium-226 in the “1947 (1967 recalibrated) series” of radium-226 solution standards. Weighted mean of the ratios obtained using seven different comparisons.	B	0.15
3	Corrections for the decay of radium-226. Standard uncertainty of the radium-226 half-life.	A	0.007
4	Gravimetric measurements	B	0.10
5	Conversion of radium-226 mass to activity. Standard uncertainty of the radium-226 half-life. ^(c)	A	0.44
6	Photon emitting impurities. Limit of detection.	B	0.01
Relative combined standard uncertainty			0.6
Relative expanded uncertainty (<i>k</i> = 2)			1.2

^(a) Letter A denotes evaluation by statistical methods; B denotes evaluation by other methods.

^(b) For further details on NBS/NIST radium series calibrations refer to reference [8]. The 1967 recalibrations of the “1947 series” and of the “1957 series” were made using pressurized “4π”γ ionization chamber (PIC) “A”. The master solution for SRM 4967A was directly compared with the “1947 (1967 recalibrated) series” of radium-226 solution standards using PIC “A”, and was compared with the solutions of the “1992 series” of radium solution standards (SRM 4967) using PIC “A”, pulse-ionization-chamber radon analyses (see references [9] and [10]), and germanium photon spectrometry. The radium-226 in SRM 4967A was chemically purified approximately 55 years from the reference time. The lead-210 and its daughter radionuclides are still not in equilibrium as of the 2013 certificate issue date.

^(c) The U.S National Standards for radium-226 are certified in terms of mass of radium-226, as were all radium-226 SRMs prior to the “1992 series”. Beginning with “1992 series”, radium-226 solution SRMs are now certified in terms of the massic activity of radium-226. The relative standard uncertainty of the activity of radium-226 per unit mass of radium-226 is determined by the relative standard uncertainty of λ (i.e., of the half-life). The relative standard uncertainties of the atomic weight of radium-226 and of Avogadro’s number are negligible.

Table 1. Certified Massic Activity of SRM 4967A

Radionuclide	Radium-226
Reference time	1200 EST, 01 September 2003
Massic activity of the solution	2482 Bq·g⁻¹
Relative expanded uncertainty (<i>k</i> = 2)	1.20 %

Table 2. Uncertified Information of SRM 4967A

Source description	Liquid in a flame-sealed 5 mL borosilicate-glass ampoule [1]
Solution composition	1.0 mol·L ⁻¹ HCl with 80µg of BaCl ₂ per gram of solution
Solution density	(1.017 ± 0.002) g·mL ⁻¹ at 21 °C ^(a)
Solution mass	(5.086 ± 0.003) g ^(a)
Photon-Emitting Impurities	None detected ^(b)
Half-lives used	²²⁶ Ra: (1600 ± 7) a [6] ^(c) ²²² Ra: (3.8235 ± 0.0003) d [7] ^(c)
Calibration methods (and instruments)	Gravimetric dilution of SRM 4963, confirmed by comparison with solution standards, and derivatives thereof, from the NBS/NIST “1947 (1967 recalibrated) series” of radium-226 solution standards. The mass of radium-226 in these solution standards had previously been determined by comparison with the U.S. National Standards for radium-226. Conversion from mass of radium-226 to activity of radium-226 was done using the half-life of radium-226 shown above. ^(d)

^(a) The stated uncertainty is two times the standard uncertainty. See reference 5.

^(b) The estimated lower limits of detection for photon-emitting impurities, as of September 2003, expressed as massic photon mission rate, are:

- 6 × 10⁰ s⁻¹·g⁻¹ for energies between 22 keV and 182 keV,
- 3 × 10⁰ s⁻¹·g⁻¹ for energies between 190 keV and 347 keV,
- 8 × 10⁻¹ s⁻¹·g⁻¹ for energies between 356 keV and 1455 keV, and
- 3 × 10⁻¹ s⁻¹·g⁻¹ for energies between 1465 keV and 2750 keV,

provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of ²²⁶Ra and progeny.

^(c) The stated uncertainty is the standard uncertainty. See reference 5.

^(d) For further details on NBS/NIST radium series calibrations refer to reference [8]. The 1967 recalibrations of the “1947 series” and of the “1957 series” were made using pressurized “4π”γ ionization chamber (PIC) “A”. The master solution for SRM 4967A was directly compared with the “1947 (1967 recalibrated) series” of radium-226 solution standards using PIC “A”, and was compared with the solutions of the “1992 series” of radium solution standards (SRM 4967) using PIC “A”, pulse-ionization-chamber radon analyses (see references [9] and [10]), and germanium photon spectrometry. The radium-226 in SRM 4967A was chemically purified approximately 55 years from the reference time. The lead-210 and its daughter radionuclides are still not in equilibrium as of the 2013 certificate issue date.

INSTRUCTIONS FOR HANDLING AND STORAGE

Handling: If the ampoule is transported, it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) because of both the radioactivity and the strong acid. Only persons qualified to handle both radioactive material and alkaline and/or acidic solutions should open the ampoule. To minimize personnel exposure, appropriate shielding and/or distance should be used. Refer to the SDS for further information.

Storage: SRM 4967A should be stored and used at a temperature between 5 °C and 65 °C. The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material.

REFERENCES

- [1] NIST Physical Measurement Laboratory; *Storage and Handling of Radioactive Standard Reference Materials, Ampoule Specifications and Opening Procedure*, available at <http://www.nist.gov/pml/div682/grp04/srm.cfm> (accessed Sep 2013). Note: This SRM is contained in a generic borosilicate-glass ampoule and not in the standard NIST ampoule.
- [2] JCGM 200:2012; *International Vocabulary of Metrology - Basic and General Concepts and Associated Terms (VIM)* (2008 version with Minor Corrections), 3rd edition; Joint Committee for Guides in Metrology: BIPM, Sevres Cedex, France; p. 19 (2012); available at http://www.bipm.org/utls/common/documents/jcgm/JCGM_200_2012.pdf (accessed Sep 2013).
- [3] JCGM 200:2012; *International Vocabulary of Metrology - Basic and General Concepts and Associated Terms (VIM)* (2008 version with Minor Corrections), 3rd edition; Joint Committee for Guides in Metrology: BIPM, Sevres Cedex, France; p. 18 (2012); available at http://www.bipm.org/utls/common/documents/jcgm/JCGM_200_2012.pdf (accessed Sep 2013).
- [4] JCGM 100:2008; *Guide to the Expression of Uncertainty in Measurement*; (GUM 1995 with Minor Corrections), Joint Committee for Guides in Metrology: BIPM, Sevres Cedex, France (2008); available at http://www.bipm.org/utls/common/documents/jcgm/JCGM_100_2008_E.pdf (accessed Sep 2013).
- [5] Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297, U.S. Government Printing Office: Washington, DC (1994); available at <http://www.nist.gov/pml/pubs/index.cfm> (accessed Sep 2013).
- [6] Chisté, V; Bé, M.M.; *January 2007, ²²⁶Ra*; LNE-LNHB/CEA Table of Radionuclides, available at http://www.nucleide.org/DDEP_WG/Nuclides/Ra-226_tables.pdf (accessed Sep 2013).
- [7] Chisté, V; Bé, M.M.; *July 2010, ²²²Rn*; LNE-LNHB/CEA Table of Radionuclides, available at http://www.nucleide.org/DDEP_WG/Nuclides/Rn-222_tables.pdf (accessed Sep 2013).
- [8] Mann, W.B.; Stockman, L.L.; Youden, W.J.; Schwebel, A.; Mullen, P.A.; Garfinkel, S.B.; Preparation of New Solution Standards of Radium, *Journal of Research of the National Bureau of Standards* 62 (1959) 21-26.
- [9] Collé, R.; Hutchinson, J.M.R.; Unterweger, M.P.; The NIST Primary Radon-222 Measurement System, *Journal of Research of the National Institute of Standards and Technology* 95 (1990) 155-165.
- [10] Hutchinson J.M.R; Cessna, J.; Collé R.; Hodge P.; An International Radon-In-Air Measurement Intercomparison Using a New Transfer Standard, *Applied Radiation Isotopes* 43 (1992) 175-189.

Certificate Revision History: September 2013 (Text and expiration date revised); December 2004 (Original certification date).

Users of this SRM should ensure that the Certificate in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srminfo@nist.gov; or via the Internet at <http://www.nist.gov/srm>.

Reagent

Ra-226_00024



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

SRS Number: 104858

Source Description: 5 mL Liquid in Flame Sealed Vial

Product Code: 8226

Customer: TestAmerica St. Louis

P.O. Number: 2665998, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution calibrated by Eckert & Ziegler Analytics (EZA) using a germanium gamma-ray spectrometer system. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. EZA maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Reference Date: 05-December-2016

12:00 PM EST

Isotope	Half-Life, d	Activity, Bq	Uncertainty			Calibration Method**
			u_A , %	u_B , %	U , %*	
Ra-226	5.844E+05	1.408E+04	1.0	2.1	4.7	HPGe

Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." *Calibration Methods:** 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

SRS Number: 104858

Comments:

5.00002 g 0.1 M HCl solution with approximately 30 µg/g Ba carrier.

Impurities:

γ-impurities (other than decay products) < 0.1%

This source was wipe tested in its inactive areas with leak test results < 188 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by: _____


Z. Dimitrova, Radiochemist

QC Approved by: _____


J. Lahr, Spectroscopist

Date: 05-DEC-16

Reagent

Ra-226_00025

SRS Number: 104858

Comments:

5.00002 g 0.1 M HCl solution with approximately 30 µg/g Ba carrier.

Impurities:

γ-impurities (other than decay products) < 0.1%

This source was wipe tested in its inactive areas with leak test results < 185 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by: _____


Z. Dimitrova, Radiochemist

QC Approved by: _____


J. Lahr, Spectroscopist

Date: 05-DEC-16

CERTIFICATE OF CALIBRATION

Standard Reference Source

SRS Number: 104858

Source Description: 5 mL Liquid in Flame Sealed Vial

Product Code: 8226

Customer: TestAmerica St. Louis

P.O. Number: 2665998, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution calibrated by Eckert & Ziegler Analytics (EZA) using a germanium gamma-ray spectrometer system. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. EZA maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Reference Date: 05-December-2016

12:00 PM EST

Isotope	Half-Life, d	Activity, Bq	Uncertainty			Calibration Method**
			u_A , %	u_B , %	U , %*	
Ra-226	5.844E+05	1.408E+04	1.0	2.1	4.7	HPGe

Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." *Calibration Methods:** 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

Reagent

Ra-226_00027

Standard ID Number: Ra-226_00027
True Value = 11360 pCi/L or g
Date Analyzed: 10/19/2017

Radionuclide: Ra-226

	Replicates	
#1	<u>11590</u>	pCi/L or g
#2	<u>10870</u>	pCi/L or g
#3	<u>10690</u>	pCi/L or g
#4	<u>11320</u>	pCi/L or g
#5	<u>10440</u>	pCi/L or g
#6	<u>11270</u>	pCi/L or g

Mean = 11030

1 sigma = 434.649284

1.96 sigma = 851.9126

True Value minus 5% = 10792

(True Value - 5%)

True Value plus 5% = 11928

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable? Yes

Note: Criteria for reverification of radiological standards is taken from the DOE QSAS and LANL Statements of Work

1st Reviewed By/Date: Rm 10.20.17

2nd Reviewed By/Date: ALD 10/20/17

Analysis Report for Total Alpha-Emitting Radium

Batch: 332805

Operator:

SampleID	Analyte	WRKNO	Is	Aliquot	Tb	Cs	Ba Mass	Ba Yield	Trunc Yield	Ingrowth	Ba Precip Time	InstrID	UncTotal	MDA	Eff	Cal Type	Cut Date Time	Sigma
LCS 160-332805/2-A	LCS		100.00	1.0000mL	1000.00	501	0.0324	95.58%	False	1.0420	10/19/17 17:40	Orange9	7.363E+002	1.801E+002	0.1948	2	10/19/17 18:41	1.00
Total Alpha Emitting							19	5.01	0.02	1.159E+004pCi/L	5.198E+002		7.363E+002	1.801E+002		5.522E+001	736.3182	
LCS 160-332805/3-A	LCS		100.00	1.0000mL	1000.00	456	0.0308	90.85%	False	1.0421	10/19/17 17:40	Orange14	7.114E+002	2.835E+002	0.1968	2	10/19/17 18:42	1.00
Total Alpha Emitting							64	4.56	0.06	1.087E+004pCi/L	5.166E+002		7.114E+002	2.835E+002		1.055E+002	711.3722	
LCS 160-332805/4-A	LCS		100.00	1.0000mL	1000.00	447	0.0317	93.51%	False	1.0421	10/19/17 17:40	Orange15	7.033E+002	2.794E+002	0.1906	2	10/19/17 18:42	1.00
Total Alpha Emitting							61	4.47	0.06	1.069E+004pCi/L	5.130E+002		7.033E+002	2.794E+002		1.033E+002	703.3033	
LCS 160-332805/5-A	LCS		100.00	1.0000mL	1000.00	479	0.0318	93.81%	False	1.0421	10/19/17 17:40	Orange17	7.308E+002	2.741E+002	0.1926	2	10/19/17 18:42	1.00
Total Alpha Emitting							60	4.79	0.06	1.132E+004pCi/L	5.241E+002		7.308E+002	2.741E+002		1.011E+002	730.8393	
LCS 160-332805/6-A	LCS		100.00	1.0000mL	1000.00	440	0.0304	89.68%	False	1.0421	10/19/17 17:40	Orange19	6.939E+002	3.421E+002	0.1983	2	10/19/17 18:42	1.00
Total Alpha Emitting							103	4.40	0.10	1.044E+004pCi/L	5.105E+002		6.939E+002	3.421E+002		1.346E+002	693.8952	
LCS 160-332805/7-A	LCS		100.00	1.0000mL	1000.00	491	0.0324	95.58%	False	1.0422	10/19/17 17:40	Orange22	7.234E+002	2.792E+002	0.1944	2	10/19/17 18:42	1.00
Total Alpha Emitting							68	4.91	0.07	1.127E+004pCi/L	5.159E+002		7.234E+002	2.792E+002		1.047E+002	723.3587	

Laboratory Control Sample Information

SampleID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL	ZFactor
LCS 160-332805/2-A	LCS 160-332805/2-A	Total Alpha	1.159E+004 pCi/L	1.138E+004	102.01 %			0.2216
LCS 160-332805/3-A	LCS 160-332805/3-A	Total Alpha	1.087E+004 pCi/L	1.138E+004	95.67 %			-0.4779
LCS 160-332805/4-A	LCS 160-332805/4-A	Total Alpha	1.069E+004 pCi/L	1.138E+004	94.11 %			-0.8522
LCS 160-332805/5-A	LCS 160-332805/5-A	Total Alpha	1.132E+004 pCi/L	1.138E+004	99.64 %			-0.0395
LCS 160-332805/6-A	LCS 160-332805/6-A	Total Alpha	1.044E+004 pCi/L	1.138E+004	91.94 %			-0.8930
LCS 160-332805/7-A	LCS 160-332805/7-A	Total Alpha	1.127E+004 pCi/L	1.138E+004	99.17 %			-0.0912

Sample Duplicate Information

SampleID	SampleDupID	Analyte	Activity	DupActivity	RPD	RER	DER	ZFactor
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Matrix Spike Information

SampleID	SampleMSID	WRKNO	Analyte	Activity	MSActivity	StdAdded	Recovery	ZFactor
----------	------------	-------	---------	----------	------------	----------	----------	---------

Blanks Information

SampleID	WRKNO	Analyte	Activity	UncTotal
----------	-------	---------	----------	----------



Ref. 12/5/16

Reagent ID: Ra-226_00027

Description: Ra-226 Spike
No. of Bottles: 2
Storage Location: RAD Separations Reagents - Rm 131
Reagent Volume: 500.000 mL
Creation Date: 08/02/2017
Open Date:
Container(s): 1240776, 1240777
Comment:

Expiration Date: 02/16/2018
Laboratory: TestAmerica St. Louis
Prepared By: Bernsen, Sarah C
Solvent: 0.1M HCl
Solvent Lot: N/A

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
Ra	Ra-226_00025	02/16/2018	8409.78500	dpm/mL	25.22936	dpm/mL
Ra-226	Ra-226_00025	02/16/2018	8409.78500	dpm/mL	25.22936	dpm/mL
Total Alpha Emitting Radium Isotopes	Ra-226_00025	02/16/2018	8409.78500	dpm/mL	25.22936	dpm/mL

Source Reagents

Reagent	Description	Type	Expiration	Vendor	Vendor Lot #	Vendor Cat Lot #	Volume Used	Volume Units
Ra-226_00025	Ra-226 Parent		02/16/18				1.50000	mL

PrecSep_0 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 160-332805

Analyst: Mueller, Rachel T

Batch Open: 10/19/2017 2:20:00PM

Batch End: 10/19/2017 6:30:00PM

Preparation, Precipitate Separation

Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
160-25099-A-1 (903.0_TAR)	N/A (160-25099-1)	Water	1 mL		10/30/17	8_Days	2	dummy- do not count	
LCS~160-332805/2 N/A	N/A		1 mL		N/A	N/A	N/A	bottle a <i>orange</i>	
LCS~160-332805/3 N/A	N/A		1 mL		N/A	N/A	N/A	bottle a <i>14</i>	
LCS~160-332805/4 N/A	N/A		1 mL		N/A	N/A	N/A	bottle a <i>15</i>	
LCS~160-332805/5 N/A	N/A		1 mL		N/A	N/A	N/A	bottle b <i>17</i>	
LCS~160-332805/6 N/A	N/A		1 mL		N/A	N/A	N/A	bottle b <i>19</i>	
LCS~160-332805/7 N/A	N/A		1 mL		N/A	N/A	N/A	bottle b <i>22</i>	
N/A	N/A				N/A	N/A	N/A		
N/A	N/A				N/A	N/A	N/A		
N/A	N/A				N/A	N/A	N/A		

RA-ZZC - 00027 verification

PrecSep_0 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 160-332805

Analyst: Mueller, Rachel T

Batch Open: 10/19/2017 2:20:00PM

Batch End: 10/19/2017 6:30:00PM

Batch Notes

Manually Enter Results? (0=NO, No

1=YES)

EiChrom Used (Y/N)? no

Radium Batch (Y/N)? yes

Balance ID n/a

Analyst ID - Reagent Drop RTM

Analyst ID - Reagent Drop Witness SCB per RTM

Pipette ID CR-001

SOP Number ST-RC-0040

Carrier ID for Barium Ba

Strontium Carrier ID

Yttrium Carrier ID

Batch Comment Ra-226_00027 Verification- bottle a and bottle b

Comments

PrecSep_0 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 160-332805

Analyst: Mueller, Rachel T

Batch Open: 10/19/2017 2:20:00PM

Batch End: 10/19/2017 6:30:00PM

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
160-25099-A-1	Ba Carrier_00030	1 mL			
LCS 160-332805/2	Ba Carrier_00030	1 mL			
LCS 160-332805/2	Ra-226_00027	1 mL			
LCS 160-332805/3	Ba Carrier_00030	1 mL			
LCS 160-332805/3	Ra-226_00027	1 mL			
LCS 160-332805/4	Ba Carrier_00030	1 mL			
LCS 160-332805/4	Ra-226_00027	1 mL			
LCS 160-332805/5	Ba Carrier_00030	1 mL			
LCS 160-332805/5	Ra-226_00027	1 mL			
LCS 160-332805/6	Ba Carrier_00030	1 mL			
LCS 160-332805/6	Ra-226_00027	1 mL			
LCS 160-332805/7	Ba Carrier_00030	1 mL			
LCS 160-332805/7	Ra-226_00027	1 mL			

Rad Worksheet

Batch Number: 160-332805
 Method: PrecSep_0
 Analyst: Mueller, Rachel T

Date Open: Oct 19 2017 2:20PM
 Batch End: Oct 19 2017 6:30PM

Lab ID	Client ID	Method Chain	Basis	Initial weight/volume of sample	Tare Weight of Barium Planchette	Gross Weight of Barium Planchette	Barium Mass Added	Ingrowth/Decay Date1	Ingrowth/Decay Date2
160-25099-A-1	Ra-226 Verification	PrecSep_0, 903.0_TAR	T	1 mL			0.0339 g	10/19/2017 16:21	10/19/2017 17:40
LCS~160-332805/2				1 mL	8.6284 g	8.6608 g	0.0339 g	10/19/2017 16:21	10/19/2017 17:40
LCS~160-332805/3				1 mL	8.7340 g	8.7648 g	0.0339 g	10/19/2017 16:21	10/19/2017 17:40
LCS~160-332805/4				1 mL	8.6106 g	8.6423 g	0.0339 g	10/19/2017 16:21	10/19/2017 17:40
LCS~160-332805/5				1 mL	8.7237 g	8.7555 g	0.0339 g	10/19/2017 16:21	10/19/2017 17:40
LCS~160-332805/6				1 mL	8.8151 g	8.8455 g	0.0339 g	10/19/2017 16:21	10/19/2017 17:40
LCS~160-332805/7				1 mL	8.7377 g	8.7701 g	0.0339 g	10/19/2017 16:21	10/19/2017 17:40

Reagent

Ra22804A120_00001

Standard ID Number: **RA22804A120_00001**
True Value = **37455** pCi/L or g
Date Analyzed: **7/12/2018**

Radionuclide:
Ra-228

	Replicates	
#1	37800	pCi/L or g
#2	37400	pCi/L or g
#3	37200	pCi/L or g

Mean = 37466.6667

1 sigma = 305.505046

1.96 sigma = 598.7899

True Value minus 5% = 35582.25

(True Value - 5%)

True Value plus 5% = 39327.75

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable?

Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: ALS 7/13/18

2nd Reviewed By/Date: Rm 7/13/18



Ref. 7.19.04

Reagent ID: Ra22804A120_00001

Type:	ASTD	Expiration Date:	07/12/2019
Description:	Ra-228 spike from Richland	Laboratory:	TestAmerica St. Louis
No. of Bottles:	1	Prepared By:	Bernsen, Sarah C
Storage Location:	RAD Actinide STDs	Vendor:	Analytics
Reagent Volume:	125.000 mL	Vendor Lot #:	68824-310
Creation Date:	07/05/2016	Vendor Cat #:	n/a
Open Date:	07/12/2018		
Container(s):	1506348		
Comment:	use 0.3 mL		

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
Ra-228					448.46600	dpm/mL

Decay Calculations

Raw Sample/Standard Information

Initial Date/Time (t ₀):	7/19/2004 0:00		
Decayto Date/Time (t):	7/12/18 0:00		
Initial Activity (A ₀):	448.47 dpm		
Initial Aliquot:	1 mL		
Initial Conc:	448.466 dpm/mL		
*Soln. Density:	1 g/mL		
Nuclide:	Ra-228		
Half-Life (days):	2100.1875	decay days	fraction
**Decay Factor:	0.1854	5106.00	2.43121
Decay Corr Activity:	8.3150E+01 dpm		
Decay Corr Conc:	8.3150E+01 dpm/mL		

Conversion/Calculations

Final Activity Unit:	pCi
Activity Unit Factor:	0.45045
Final Volume Unit:	L
Volume Unit Factor:	0.001
Final Concentration:	3.7455E+04 pCi/L
Aliquot Volume:	1.0000E+00 L
Final Activity (A):	3.7455E+04 pCi

** Uses basic decay equation: $A = A_0 * \exp(-\ln(2)*(t-t_0)/(\text{half-life}))$

* Soln. Density to be used when converting from liquid expressed in mass (g) units to liquid units (mL), and is only applied in that case.

ASAP

Gamma Barcode Report

RA22804A120 Verification

Sample 		375155_Gamma_160-29468-A-1-A	
Instrument Operator:	Sample ID: 160-29468-A-1-A	160-29468-	Sample Title: 160-29468-A-1-A
Sample Type: water	Batch ID: 375155	Geometry: 100ml d=1 • (17)	

Sample 		375155_Gamma_160-29468-A-1-B	
Instrument Operator:	Sample ID: 160-29468-A-1-B	160-29468-	Sample Title: 160-29468-A-1-B
Sample Type: water	Batch ID: 375155	Geometry: • (8)	

Sample 		375155_Gamma_160-29468-A-1-C	
Instrument Operator:	Sample ID: 160-29468-A-1-C	160-29468-	Sample Title: 160-29468-A-1-C
Sample Type: water	Batch ID: 375155	Geometry: • (8)	

Fill_Geo_0 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 160-375155

Analyst: Mueller, Rachel T

Batch Open: 7/12/2018 3:15:00PM

Batch End: 7/12/2018 4:00:00PM

Fill Geometry, No In-Growth

Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
160-29468-A-1 (901.1_Cs)	N/A (160-29468-1)	Water	100 mL		8/7/18	18_Days	2	RA22804A120_00001	160-29468-A-1-A
160-29468-A-1 (901.1_Cs)	N/A (160-29468-1)	Water	100 mL		8/7/18	18_Days	2	RA22804A120_00001	160-29468-A-1-B
160-29468-A-1 (901.1_Cs)	N/A (160-29468-1)	Water	100 mL		8/7/18	18_Days	2	RA22804A120_00001	160-29468-A-1-C

1

2

3

Fill_Geo_0 Analysis Sheet (To Accompany Samples to Instruments)

Batch Number: 160-375155

Analyst: Mueller, Rachel T

Batch Open: 7/12/2018 3:15:00PM

Batch End: 7/12/2018 4:00:00PM

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
160-29468-A-1	Ra22804A120_00001	100 mL			
160-29468-A-1	Ra22804A120_00001	100 mL			
160-29468-A-1	Ra22804A120_00001	100 mL			

Other Reagents:	
Reagent	Amount/Units Lot#:

Reagent

Sr-90_00001



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

80573-334

5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis
P.O. No.: 2324797, Item 1

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			Type	u _A	u _B U	
Sr-90	10515.5	3.782E+04		0.1	0.9 1.8	09/17/2009

*Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

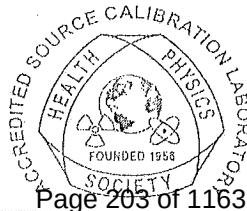
Comments:

Impurities: γ -impurities <0.1%. 5.04317 grams 0.1M HCl solution with approximately 30 microg/g each of Sr and Y carriers. NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared by: W. Mao
W. Mao, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 9-22-09



Reagent

Sr-90_00017

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

92352

Sr-90 5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2502682, Item 1 **Product Code:** 8090-5FSA-37kBq

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.16, Revision 2, July 2007, and compliance with ANSI N42.22-1998, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			Type	u_A	u_B	U
Sr-90	1.052E+04	3.749E+04		0.1	0.9	1.8
						11/29/2012

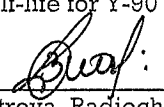
***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

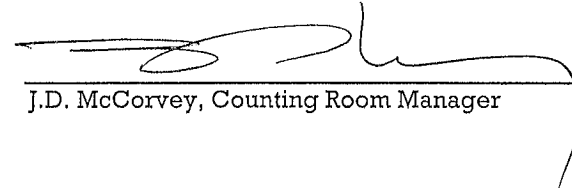
Comments:

Impurities: γ -impurities < 0.1%.

5.02357 g 0.1M HCl solution with approximately 30 $\mu\text{g/g}$ each Sr and Y carriers.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total activity for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared by: 
Z. Dimitrova, Radiochemist

QA Approved: 
J.D. McCorvey, Counting Room Manager

Date: 26 Nov 12



Reagent

Sr-90_00018



Reagent ID: Sr-90_00018

Description:	Sr-90 Calibration STD	Expiration Date:	11/29/2062
No. of Bottles:	1	Laboratory:	TestAmerica St. Louis
Storage Location:	RAD Separations Reagents - 1	Prepared By:	Hurst, Sarah
Reagent Volume:	100.000 mL	Solvent:	0.1M HCL
Creation Date:	11/28/2012	Solvent Lot:	0
Container(s):	51512		
Comment:	Rad12-0043		

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
Gross Beta	Sr-90_00017	11/29/2062	14925.64000	Bq/g	44774.23338	dpm/mL
Sr-90	Sr-90_00017	11/29/2062	7462.82000	Bq/g	22387.11669	dpm/mL

Source Reagents

Reagent	Description	Type	Expiration	Vendor	Vendor Lot #	Vendor Cat Lot #	Volume Used	Volume Units
Sr-90_00017	Sr-90 Ampoule	ASTD	11/29/62	Analytics	92352		4.99970	g

St. Louis Radiological Standard Reverification Form

Standard ID Number: Sr-90_00018 (51512)
True Value = 1976.75 pCi/sample or g
Date Analyzed: 2/10/2014

Radionuclide: Sr-90 (Low mass)

	Replicates	
#1	<u>1935</u>	pCi/sample or g
#2	<u>1941</u>	pCi/sample or g
#3	<u>1924</u>	pCi/sample or g

Mean = 1933.333

1 sigma = 8.621678

1.96 sigma = 16.89849

True Value minus 5% = 1877.913

(True Value - 5%)

True Value plus 5% = 2075.588

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable?

Yes

Note: Criteria for reverification of radiological standards is taken from the DOE QSAS and LANL Statements of Work

Reviewed By/Date: Jody Watson 2/10/14

SOP Reference: STL-QA-0002, Current Revision

St. Louis Radiological Standard Reverification Form

Standard ID Number: Sr-90_00018 (51512)
True Value = 1948.75 pCi/sample or g
Date Analyzed: 2/10/2014

Radionuclide: Sr-90 (Medium mass)

	Replicates	
#1	<u>1911</u>	pCi/sample or g
#2	<u>1945</u>	pCi/sample or g
#3	<u>1893</u>	pCi/sample or g

Mean = 1916.333

1 sigma = 26.40707

1.96 sigma = 51.75786

True Value minus 5% = 1851.313

(True Value - 5%)

True Value plus 5% = 2046.188

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable?

Yes

Note: Criteria for reverification of radiological standards is taken from the DOE QSAS and LANL Statements of Work

Reviewed By/Date: Jody Watson 2/10/14

SOP Reference: STL-QA-0002, Current Revision

St. Louis Radiological Standard Reverification Form

Standard ID Number: Sr-90_00018 (51512)
True Value = 1992 pCi/sample or g
Date Analyzed: 2/10/2014

Radionuclide: Sr-90 (High mass)

	Replicates	
#1	<u>1907</u>	pCi/sample or g
#2	<u>1930</u>	pCi/sample or g
#3	<u>1937</u>	pCi/sample or g

Mean = 1924.667

1 sigma = 15.69501

1.96 sigma = 30.76222

True Value minus 5% = 1892.4

(True Value - 5%)

True Value plus 5% = 2091.6

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable?

Yes

Note: Criteria for reverification of radiological standards is taken from the DOE QSAS and LANL Statements of Work

Reviewed By/Date: Jody Watson 2/10/14

SOP Reference: STL-QA-0002, Current Revision

Protean Beta ICV-ACV recoveries from March 2013			
Protean Detector	Low pCi/sample	Medium pCi/sample	High pCi/sample
0	1962	1945	1971
1	2003	1947	1995
2	1960	1965	1998
3	1988	1942	1995
4	1977	1940	1997
5	1969	1949	2013
6	1986	1938	1986
7	1969	1964	1981
Average pCi/sample	1976.75	1948.75	1992

Protean Beta ICV-ACV recoveries from February 2014			
Protean Detector	Low pCi/sample	Medium pCi/sample	High pCi/sample
4	1935	1911	1907
5	1941	1945	1930
6	1924	1893	1937
Average pCi/sample	1933.33	1916.33	1924.67

Standard ID

Strontium 90

Sr-90_00018 #51512

Cert# 92352 Ref. date 11/29/12

Analysis Report for Gross Alpha/Beta

Batch: M122640 Operator: 63903

Sample ID	WRKNO	Analte	Aliquot	Mass	XT	Instr ID	CountTime	Activity	Ts	Th	Dilution	Sigma	MDA	DLC
		Cs	Cb			CPMs	CPM/b	Eff		UncTot	UncCnt			
ICVABT-51512;B1	NA	1.000E+000sample		0.0513 g	Protein4	2/10/14 22:54		5.00		1000.00	1.00	2.00		
Gross Alpha		0	49	0.000E+000	4.900E-002	0.1157		-1.908E-001pCi/sample		5.869E-002	5.452E-002	3.382E+000		8.968E-001
Gross Beta		9072	417	0.00	1.814E+003	4.170E-001	0.4224	1.935E+003pCi/sample		1.977E+002	4.063E+001	1.594E+000		7.165E-001
ICVABT-51512;B2	NA	1.000E+000sample		0.1114 g	Protein4	2/10/14 23:19		5.00		1000.00	1.00	2.00		
Gross Alpha		1	49	0.00	2.000E-001	4.900E-002	0.0830	8.194E-001pCi/sample		2.174E+000	2.172E+000	4.713E+000		1.250E+000
Gross Beta		8432	417	0.00	1.686E-003	4.170E-001	0.3973	1.911E+003pCi/sample		1.956E+002	4.164E+001	1.694E+000		7.616E-001
ICVABT-51512;B3	NA	1.000E+000sample		0.1813 g	Protein4	2/10/14 23:04		5.00		1000.00	1.00	2.00		
Gross Alpha		1	49	0.00	2.000E-001	4.900E-002	0.0540	1.260E+000pCi/sample		3.343E+000	3.340E+000	7.248E+000		1.922E+000
Gross Beta		8054	417	0.00	1.611E+003	4.170E-001	0.3804	1.907E+003pCi/sample		1.954E+002	4.251E+001	1.770E+000		7.956E-001

Laboratory Control Sample Information

SampleID	WRKNO	Analte	Activity	StdAdded	Recovery	LCL	UCL	ZFactor
					%			

Sample Duplicate Information

Sample ID	Dup Sample ID	Analte	Sample Activity	Dup Activity	RPD	RER	DER	ZFactor
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Matrix Spike Information

SampleID	SampMSID	Analte	Sample Activity	MS Activity	StdAdded	MSRecovery	ZFactor
						%	

Blanks Information

SampleID	WRKNO	Analte	Activity	UncTotal	ZFactor
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Analysis Report for Gross Alpha/Beta

Batch: M122640 Operator: 63903

Sample ID	WRKNO	Aliquot	Mass	Instr ID	CountTime	Activity	Ts	Tb	Dilution	Sigma	MDA	DLC
	Analyte	Cs	XT	CPMs	CPMB	Eff		UncTot	UncCnt			
ICVABT-51512;B1	NA	1.000E+000sample	0.0513 g	Protein5	2/10/14 23:04	5.00	5.00	1000.00	1.00	2.00		
	Gross Alpha	0	0.000E+000	4.300E-002	0.1145	-1.692E-001pCi/sample	5.510E-002	5.161E-002	3.337E+000	8.490E-001		
	Gross Beta	9111	0.00	1.822E+003	3.980E-001	0.4228	1.941E+003pCi/sample	1.983E+002	4.068E+001	1.569E+000	6.992E-001	
ICVABT-51512;B2	NA	1.000E+000sample	0.1114 g	Protein5	2/10/14 22:54	5.00	5.00	1000.00	1.00	2.00		
	Gross Alpha	0	0.000E+000	4.300E-002	0.0823	-2.353E-001pCi/sample	7.661E-002	7.176E-002	4.639E+000	1.180E+000		
	Gross Beta	8552	0.00	1.710E+003	3.980E-001	0.3960	1.945E+003pCi/sample	1.990E+002	4.207E+001	1.675E+000	7.465E-001	
ICVABT-51512;B3	NA	1.000E+000sample	0.1813 g	Protein5	2/10/14 23:19	5.00	5.00	1000.00	1.00	2.00		
	Gross Alpha	2	0.00	4.000E-001	4.300E-002	0.0532	3.022E+000pCi/sample	4.802E+000	4.790E+000	7.178E+000	1.826E+000	
	Gross Beta	8046	0.00	1.609E+003	3.980E-001	0.3755	1.930E+003pCi/sample	1.977E+002	4.304E+001	1.766E+000	7.873E-001	

Laboratory Control Sample Information

SampleID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL	ZFactor
					%			

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Sample Activity	Dup Activity	RPD	RER	DER	ZFactor
-----------	---------------	---------	-----------------	--------------	-----	-----	-----	---------

Matrix Spike Information

SampleID	SampMSID	Analyte	Sample Activity	MS Activity	StdAdded	MSRecovery	ZFactor
						%	

Blanks Information

SampleID	WRKNO	Analyte	Activity	UncTotal	ZFactor
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Analysis Report for Gross Alpha/Beta

Batch: **M122640** Operator: **63903**

Sample ID	WRKNO	Aliquot	Mass	Instr ID	CountTime	Activity	Ts	Th	Dilution	Sigma	MDA	DLC
	Analyte	Cs	XT	CPMs	CPMB	Eff		UncTot	UncCnt			
ICVABT-51512;B1	NA	1.000E+000sample	0.0513 g	Protean6	2/10/14 23:19	5.00		1000.00	1.00	2.00		
	Gross Alpha	0	0.000E+000	8.700E-002	0.1165	-3.362E-001pCi/sample		8.166E-002	7.210E-002	3.776E+000	1.186E+000	
	Gross Beta	8992	0.00	1.798E+003	5.200E-001	0.4209		1.966E+002	4.059E+001	1.718E+000	8.029E-001	
ICVABT-51512;B2	NA	1.000E+000sample	0.1114 g	Protean6	2/10/14 23:04	5.00		1000.00	1.00	2.00		
	Gross Alpha	0	0.000E+000	8.700E-002	0.0842	-4.657E-001pCi/sample		1.131E-001	9.985E-002	5.230E+000	1.642E+000	
	Gross Beta	8356	0.00	1.671E+003	5.200E-001	0.3976		1.937E+002	4.142E+001	1.819E+000	8.499E-001	
ICVABT-51512;B3	NA	1.000E+000sample	0.1813 g	Protean6	2/10/14 22:54	5.00		1000.00	1.00	2.00		
	Gross Alpha	0	0.000E+000	8.700E-002	0.0559	-7.014E-001pCi/sample		1.703E-001	1.504E-001	7.877E+000	2.474E+000	
	Gross Beta	8127	0.00	1.625E+003	5.200E-001	0.3778		1.985E+002	4.300E+001	1.914E+000	8.945E-001	

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL	ZFactor
					%			

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Sample Activity	Dup Activity	RPD	RER	DER	ZFactor
-----------	---------------	---------	-----------------	--------------	-----	-----	-----	---------

Matrix Spike Information

Sample ID	SampMSID	Analyte	Sample Activity	MS Activity	StdAdded	MSRecovery	ZFactor
						%	

Blanks Information

Sample ID	WRKNO	Analyte	Activity	UncTotal	ZFactor
-----------	-------	---------	----------	----------	---------

TestAmerica St. Louis

Standards Preparation Logbook Record

Nov-28-2012

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD12-0042, Sr-90 Sr-90-00017 #51511

Analyst: hursts

Vendor: Analytics Lot No.: 92352
Solvent: None
Date Prep./Opened: 11-28-2012
Date Expires(1): 11-29-2062 (50 Years)
Date Expires(2): 11-29-2062 (50 Years)
Cert: 92352 Activity: 37490Bq Mass: 5.02357 Ref. Date: 11/29/12

Component	Initial Conc (dpm/g)	Final Conc (dpm/g)
Sr-90	447,769	447,769

RAD12-0043, Sr-90 Calibration STD Sr-90-00018 #51512

Analyst: hursts

Solvent: None
Date Prep./Opened: 11-28-2012
Date Expires(1): 11-29-2062 (50 Years)
Date Expires(2): 11-29-2062 (50 Years)

Volume (ml): 100.00

Parent Std No.: RAD12-0042, Sr-90 Aliquot Amount (g): 4.9997

Parent Date Expires(1): 11-29-2062 Parent Date Expires(2): 11-29-2062

Component	Initial Conc (dpm/g)	Final Conc (dpm/mL)
Sr-90	447,769	22,387

Reviewed By: STB

St. Louis Radiological Standard Reverification Form

Standard ID Number: Rad12-0043 Radionuclide: Sr90
True Value = 2016.7 pCi/L or g
Date Analyzed: 11/30/2012

	Replicates	
#1	<u>1964</u>	pCi/L or g
#2	<u>1958</u>	pCi/L or g
#3	<u>2015</u>	pCi/L or g

Mean = 1979

1 sigma = 31.32092

1.96 sigma = 61.389

True Value minus 5% =	<u>1915.865</u>	(True Value - 5%)
True Value plus 5% =	<u>2117.535</u>	(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable? Yes

Note: Criteria for reverification of radiological standards is taken from the DOE QSAS and LANL Statements of Work

Reviewed By/Date:  11/30/12

SOP Reference: STL-QA-0002, Current Revision

Analysis Report for Gross Alpha/Beta

Batch: M122629 Operator: 63903

Sample ID	WRKNO	Aliquot	Mass	Instr ID	CountTime	TS	Tb	Dilution	Sigma
	Analyte	Cs	XT	CPMs	CPMB	Eff	UncTot	UncCnt	MDA
verification-1b	NA	1.000E+000sample	0.0536 g	Purple16	11/30/12 10:42	8.00	1000.00	1.00	1.00
	Gross Alpha	123	0.00	1.538E+001	1.750E-001	0.4314	1.587E+001pCi/sample	1.707E+000	8.638E-001
	Gross Beta	14954	0.00	1.869E+003	4.850E-001	0.4285	1.964E+003pCi/sample	1.607E+001	1.211E+000
verification-2b	NA	1.000E+000sample	0.0529 g	Purple17	11/30/12 10:43	8.00	1000.00	1.00	1.00
	Gross Alpha	53	0.00	6.625E+000	8.700E-002	0.1306	2.254E+001pCi/sample	3.391E+000	2.356E+000
	Gross Beta	15152	0.00	1.894E+003	3.620E-001	0.4356	1.958E+003pCi/sample	9.919E+001	1.077E+000
verification-3b	NA	1.000E+000sample	0.0528 g	Purple18	11/30/12 10:43	8.00	1000.00	1.00	1.00
	Gross Alpha	85	0.00	1.063E+001	6.200E-002	0.1313	3.624E+001pCi/sample	4.462E+000	2.160E+000
	Gross Beta	15378	0.00	1.922E+003	3.950E-001	0.4296	2.015E+003pCi/sample	1.020E+002	1.125E+000

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL	ZFactor
					%			

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Sample Activity	Dup Activity	RPD	RER	DER	ZFactor
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Matrix Spike Information

Sample ID	SampMSID	Analyte	Sample Activity	MS Activity	StdAdded	MSRecovery	ZFactor
						%	

Blanks Information

Sample ID	WRKNO	Analyte	Activity	UncTotal	ZFactor
-----------	-------	---------	----------	----------	---------

Prep Report for Gross Alpha/Beta

Batch: M122629

Prep Analyst: 250

SampleID	WRKNO	Aliquot	Gross	Tare	Mass	Dilution
verification-1b	NA	1.000E+000 sample	8.7067 g	8.6531 g	0.0536 g	1.00
						
verification-2b	NA	1.000E+000 sample	8.6615 g	8.6086 g	0.0529 g	1.00
						
verification-3b	NA	1.000E+000 sample	8.6935 g	8.6407 g	0.0528 g	1.00
						

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
MS	Rad12-0043	SR-90	22.387 dpm/mL	0.1 mL	11-29-12	
Spiked By	LM	Spike Verified By		11-28-12	Spike Date	

Standard Operating Procedures

SOPNumber	Title	Revision
☐		

Reviewed By:  Review Date: 11/30/12

Analyst/Relinquished By: MS Release Date: 11/28/12
Received By:  Receipt Date: 11/28/12

Balance ID / Initials / Date

MS 11-30-12
1123433897/MS/11-28-12

Reagent

Th-229_00016

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

97790

Th-229 5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica - St. Louis
P.O. No.: 2573570, Item 1 **Product Code:** 8229



430569
ID: Th-229_00016
Exp:08/06/14 Pripd:SCB Opm:08/20/14
Th-229 Ampoule

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , %			Reference Date (12:00 PM EST)
			u_A	u_B	U	
Th-229	2.681E+06	3.761E+03	0.5	1.5	3.1	08/06/2014

***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: α -impurities: Th-228 2.83E-01 Bq, Th-230 2.33E+01 Bq, Th-232 1.51E0 Bq; γ -impurities (other than decay products) <0.1%.
5.08156 g 0.5M HNO₃ solution. Carrier free.

Source Prepared by: _____

Z. Dimitrova, Radiochemist

QC Approved: _____

A. Chen, Spectroscopist

Date: 06 AUG 14





U.S. DEPARTMENT OF COMMERCE

National Institute of Standards & Technology
Gaithersburg, MD 20899

Certificate of Participation

Eckert & Ziegler Analytics
Atlanta, Georgia

is a participant for the period January 1, 2014, through December 31, 2014, in a radioactivity measurements assurance program conducted by the National Institute of Standards and Technology, in cooperation with NRMAP Incorporated. Continued participation is evidenced by dated Reports of Traceability issued for particular radionuclides, which indicate the deviation of the participant's reported value from that measured by the National Institute of Standards and Technology. The significance of these Reports is addressed below.*

For the Director,

A handwritten signature in black ink, appearing to read "Michael P. Unterweger".

Michael P. Unterweger, Leader
Radioactivity Group
Physical Measurement Laboratory

*As guidance for the proper use of Reports of Traceability, it should be emphasized that the National Institute of Standards and Technology is concerned only with fostering good measurements capability and consistency with the national measurements system. The assurance of the proper application of that capability to the ultimate consumer products is the responsibility of each manufacturer of these products and of the Federal regulatory agencies.

A continuing traceability program in radioactivity demonstrates, to the degree established by the periodic assays of calibrated radioactivity samples, a continuing competence to maintain the methods and standards necessary for accurate measurement. Such a program cannot, however, endorse each and every measurement nor the final product, any more than a spot check can vouch for every unchecked item. Care should be taken, therefore, not to imply such endorsement. The proper use of this Report is governed by section 200.114 of Title 15 of the Code of Federal Regulations. These regulations may be met if Reports are quoted only in their entirety. Excerpts out of context may be misleading.

Recommended Procedure for Opening the Flame Sealed Vial

- 1) If the solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the standard.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood.
- 3) Shake the vial to wet the entire inside surface of the vial. Return the vial to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the vial. If necessary, gently tap the neck to speed the process.
- 5) The Wheaton vials we use are pre-scored.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the vial upright and wrap with soft tissue, such as Chem Wipes, around the tip of the vial and secure with tape (see picture). Snap off the top of the vial by pressing the pre-scored part of the neck away towards you while pulling the tip of the vial away from you.
- 8) Transfer the solution from the vial using a pycnometer or pipet with a dispenser handle. NEVER PIPETTE BY MOUTH.
- 9) Seal any unused solution in a flame sealed glass vial, if possible, to minimize the evaporation loss.

Reagent

Th-229_00023

Standard ID Number: Th-229_00023 (Coppt)
True Value = 67.21 dpm/mL
Date Analyzed: 12/20/2017

Radionuclide:
Th-229

	Replicates	
#1	<u>69.18</u>	dpm/mL
#2	<u>67.64</u>	dpm/mL
#3	<u>64.07</u>	dpm/mL

Mean = 66.9633333

1 sigma = 2.6213419

1.96 sigma = 5.13783

True Value minus 5% = 63.8495

(True Value - 5%)

True Value plus 5% = 70.5705

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable? Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: ALD 12/21/17

2nd Reviewed By/Date: Rm 12.21.17

Decay Calculations

Raw Sample/Standard Information

Initial Date/Time (t ₀):	8/6/2014 0:00		
Decayto Date/Time (t):	12/20/17 0:00		
Initial Activity (A ₀):	67.23 dpm		
Initial Aliquot:	1 mL		
Initial Conc:	67.22958 dpm/mL		
*Soln. Density:	1 g/mL		
Nuclide:	Th-229		
Half-Life (days):	2897163	decay days	fraction
**Decay Factor:	0.9997	1232.00	0.00043
Decay Corr Activity:	6.7210E+01 dpm		
Decay Corr Conc:	6.7210E+01 dpm/mL		

Conversion/Calculations

Final Activity Unit:	dpm
Activity Unit Factor:	1.00000
Final Volume Unit:	mL
Volume Unit Factor:	1.000
Final Concentration:	6.7210E+01 dpm/mL
Aliquot Volume:	1.0000E+00 mL
Final Activity (A):	6.7210E+01 dpm

** Uses basic decay equation: $A = A_0 * \exp(-\ln(2)*(t-t_0)/(\text{half-life}))$

* Soln. Density to be used when converting from liquid expressed in mass (g) units to liquid units (mL), and is only applied in that case.

Sample Name: Ver1
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

Type: Sample

Sample

Sample Volume : 0.10 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch Name: Th 229 tracer
AnalysisResultsID: 206417
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: Th-230_00036
Tracer Activity: 44.56 DPM / mL x (Vol.) 0.30 mL = 13.37 DPM
Tracer Ref. Date: 8/8/2013 11:41:20AM

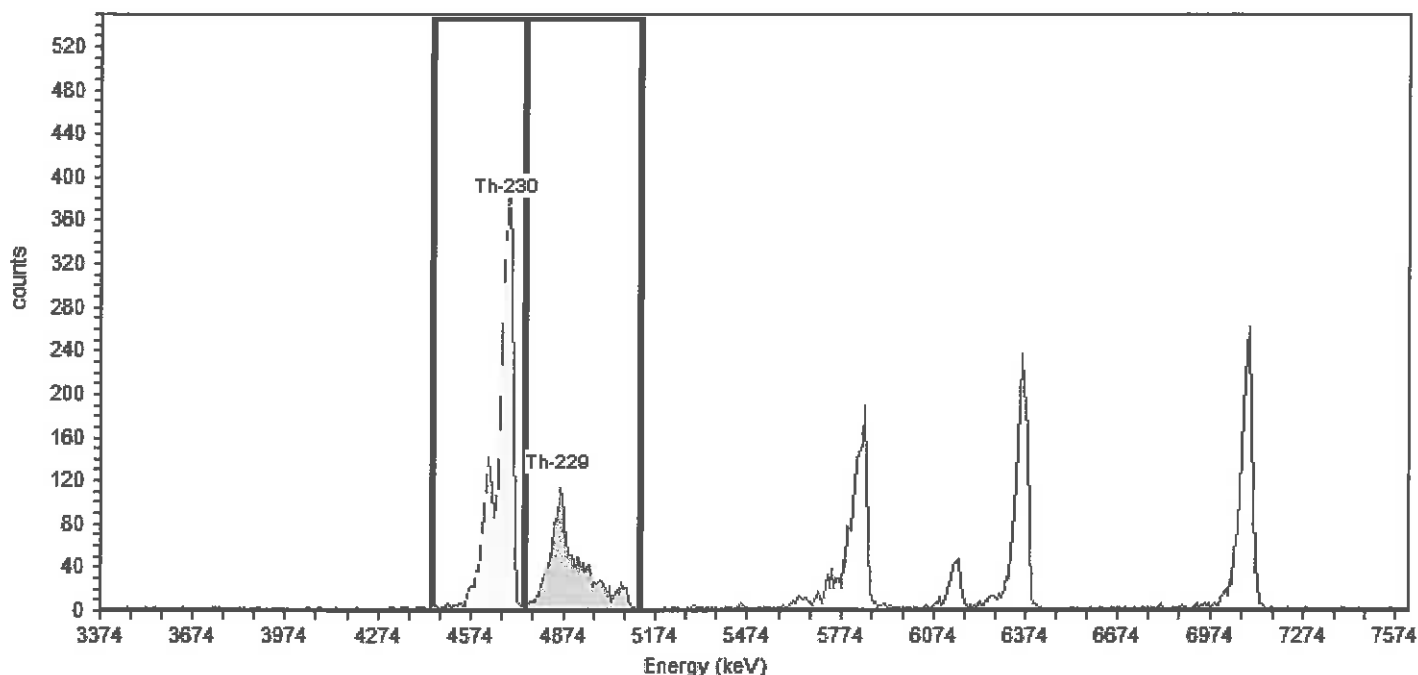
Tracer

Tracer Nuclide: Th-230
Tracer Recovery: 92.23%

Detector: AV210 SN: 50-119AA1
Acquisition Start Date: 12/20/2017 7:15:48PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Background Date: 11/17/2017 3:28:10PM
Bkgd Info: Sample: ICB;AV210; Det: AV210; Spectrum #1; 11/17/2017 3:28:10 PM

Acquisition

Energy Calibration: IC-9795;AV210-20171114
Efficiency Calibration:IC-9795;AV210-20171114
Calibration Date: 11/14/2017 12:00:23PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 25.40% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: Absolute Interactive ROI Analysis
Decay Correction:12/20/2017 7:14:50PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity Units
Th-230	4688.0	4,687.5	0.5	4448.3	4746.6	50.8	99.7	3004	6.0000	2998.00	1.233E+002 DPM/mL
Th-229	4848.0	4,845.3	2.7	4746.6	5119.5	69.5	99.8	1554	1.0000	1553.00	6.918E+001 DPM/mL

Sample Name: Ver2
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

Type: Sample

Sample

Sample Volume : 0.10 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch Name: Th 229 tracer
AnalysisResultsID: 206418
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: Th-230_00036
Tracer Activity: 44.56 DPM / mL x (Vol.) 0.30 mL = 13.37 DPM
Tracer Ref. Date: 8/8/2013 11:41:20AM

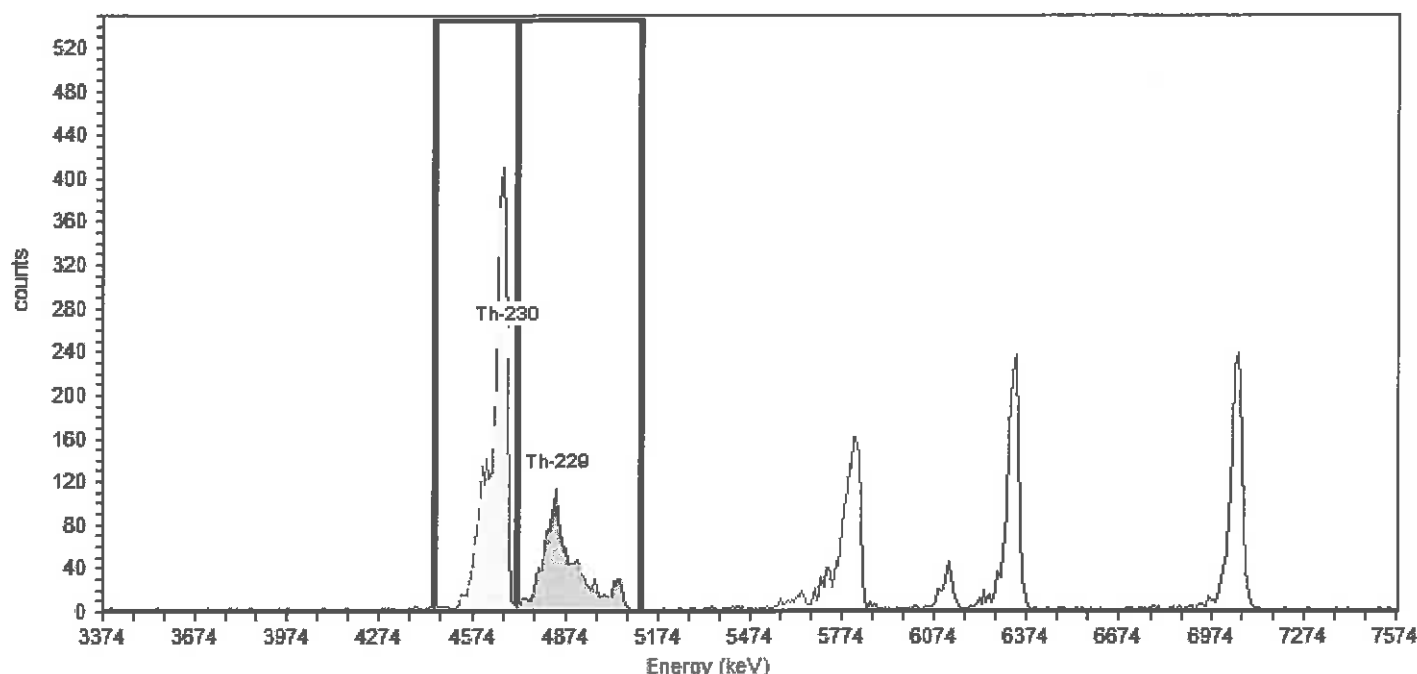
Tracer

Tracer Nuclide: Th-230
Tracer Recovery: 108.60%

Detector: AV211 SN: 50-117Z4
Acquisition Start Date: 12/20/2017 7:15:48PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Background Date: 11/17/2017 3:28:10PM
Bkgd Info: Sample: ICB;AV211; Det: AV211; Spectrum #1; 11/17/2017 3:28:10 PM

Acquisition

Energy Calibration: IC-9817;AV211-20171114a
Efficiency Calibration:IC-9817;AV211-20171114a
Calibration Date: 11/14/2017 12:01:51PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.81% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th229_ROI_2010
Decay Correction:12/20/2017 7:14:50PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity Units
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	22.9	99.7	3182	13.0310	3169.46	1.452E+002 DPM/mL
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	79.0	99.8	1615	10.0310	1605.15	6.764E+001 DPM/mL

Sample Name: Ver3
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

Type: Sample

Sample

Sample Volume : 0.10 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch Name: Th 229 tracer
AnalysisResultsID: 206420
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: Th-230_00036
Tracer Activity: 44.56 DPM / mL x (Vol.) 0.30 mL = 13.37 DPM
Tracer Ref. Date: 8/8/2013 11:41:20AM

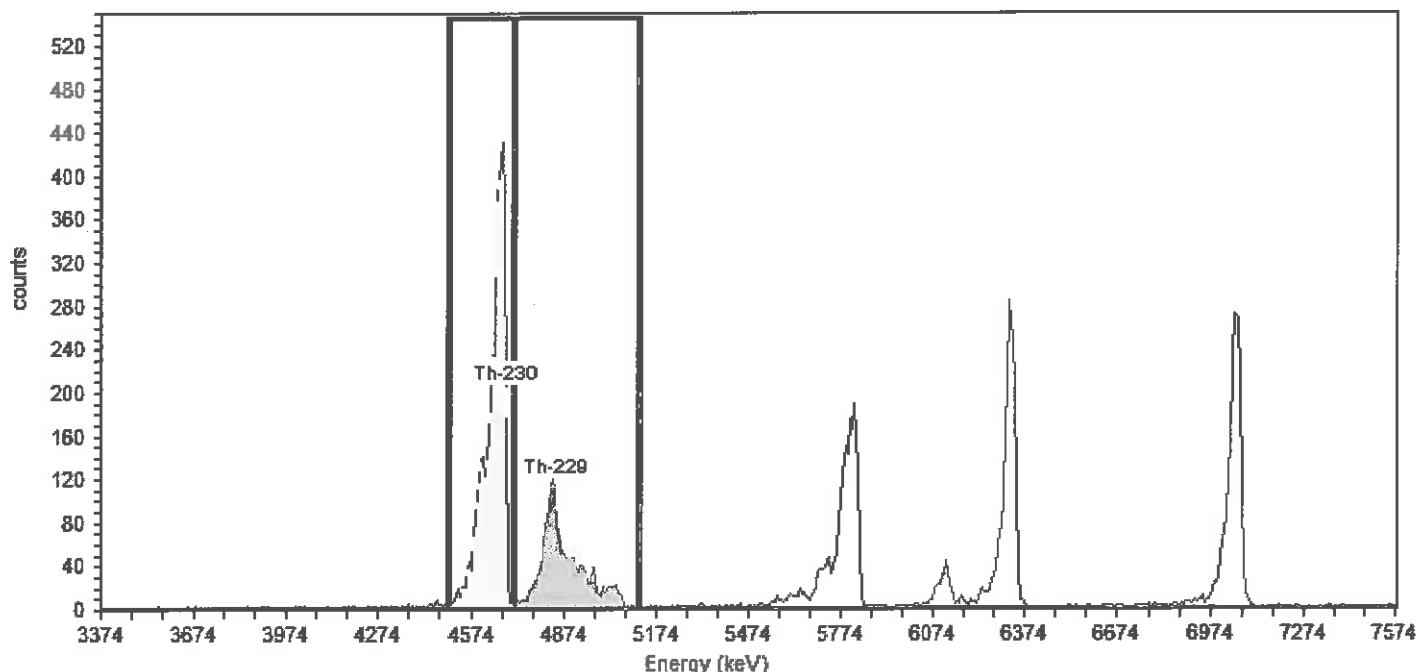
Tracer

Tracer Nuclide: Th-230
Tracer Recovery: 121.11%

Detector: AV212 SN: 49-155m5
Acquisition Start Date: 12/20/2017 7:15:48PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Background Date: 11/17/2017 3:28:10PM
Bkgd Info: Sample: ICB;AV212; Det: AV212; Spectrum #1; 11/17/2017 3:28:10 PM

Acquisition

Energy Calibration: IC-9884;AV212-20171114
Efficiency Calibration:IC-9884;AV212-20171114
Calibration Date: 11/14/2017 12:01:41PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.41% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: Absolute Interactive ROI Analysis
Decay Correction:12/20/2017 7:14:50PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity Units
Th-230	4688.0	4,687.5	0.5	4500.5	4709.3	42.7	99.7	3475	2.0000	3473.00	1.619E+002 DPM/mL
Th-229	4848.0	4,845.3	2.7	4709.3	5119.5	67.0	99.8	1667	1.0000	1666.00	6.407E+001 DPM/mL

Th-229 Trace Verification (coppt.)

Standard Verification

Batch No.:

Balance ID:

Note: If a section below is not used, marked the N/A box and initial & date next to the N/A.
i.e. Mark the N/A box if a tracer is not added to the sample(s) then initial and date next to the N/A

No	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	VER. 1	0.1	a10	
2	12	1	a11	
3	13	1	a12	
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Tracer	☐ N/A	Initials / Date
Isotope:	Th-230	
Std Sol'n No.:	Th-230-00030	
Vol (mL):	0.3	
Ref Activity (dpm/mL):	44.5044	
Act Ref Date:	08-08-13	

Samples Spiked and Traced By:
 Initials / Date
 SSB 12/19/17

Verification Signature & Date:
 Initials / Date
 QM 12/19/17

LCS Standard	☐ N/A	Initials / Date
Isotope:	Th-229	
Std Sol'n ID.:	Th-229-00023	
Vol (mL):	0.1	
Ref Activity (dpm/mL):	67.22958	
Act Ref Date:	08-06-14	

SOP's applied in preparing these samples. Mark box to left for all that apply:

☐ ST-RC-0003 Rev.	☐ ST-RC-0040 Rev.	☐ ST-RC-0110 Rev.
☐ ST-RC-0004 Rev.	☐ ST-RC-0041 Rev.	☐ ST-RC-0120 Rev.
☐ ST-RC-0014 Rev.	☐ ST-RC-0050 Rev.	☐ ST-RC-0232 Rev.
☐ ST-RC-0020 Rev.	☐ ST-RC-0090 Rev.	☐ ST-RC-0238 Rev.
☐ ST-RC-0021 Rev.	☐ ST-RC-0100 Rev.	☐ ST-RC-0240 Rev.
		☐ ST-RC-0241 Rev.
		☐ ST-RC-0242 Rev.
		☐ ST-RC-5016 Rev.
		☐
		☐

Count Time	Matrix
Long Count ☐	Soil ☐
Short Count ☐	H ₂ O ☐

Isotope(s)			
☐ αβ	☐ Iso Pu	☐ Tc-99	☐ Iso Cm
☐ Iso Am	☐ Ra	☐ Iso Th	☐ Pu-241
☐ KPA	☐ Sr	☐ Iso U	☐ Th-229
☐ Np	☐ TAR	☐ C-14	☐ Cl-36

Prepared By:

Date:

Reviewed by:

Date:

Page 1

Th-229 Tracer ONLY VER.

Standard Verification

Batch No. : _____

Balance ID : _____

Note: If a section below is not used, marked the N/A box and initial & date next to the N/A.
i.e. Mark the N/A box if a tracer is not added to the sample(s) then initial and date next to the N/A

Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1 VER. 1	100	205	1:147
2 1 2	15496	207	1:149
3 1 3	15874	209	1:152
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Tracer ☐ N/A ☒ Initials / Date

Isotope: Th-229

Std Sol'n No.: Th-229-00023

Vol (mL): 0.1

Ref Activity (dpm/mL): 67.22958

Act Ref Date: 08-06-14

Samples Spiked and Traced By: SUB Initials / Date 12/19/17

Verification Signature & Date: 20M Initials / Date 12/14/17

LCS Standard ☐ N/A ☒ Initials / Date

Isotope: 1

Std Sol'n ID.: _____

Vol (mL): _____

Ref Activity (dpm/mL): _____

Act Ref Date: _____

SOP's applied in preparing these samples. Mark box to left for all that apply:

☐ ST-RC-0003 Rev.	☐ ST-RC-0040 Rev.	☐ ST-RC-0110 Rev.
☐ ST-RC-0004 Rev.	☐ ST-RC-0041 Rev.	☐ ST-RC-0120 Rev.
☐ ST-RC-0014 Rev.	☐ ST-RC-0050 Rev.	☐ ST-RC-0232 Rev.
☐ ST-RC-0020 Rev.	☐ ST-RC-0090 Rev.	☐ ST-RC-0238 Rev.
☐ ST-RC-0021 Rev.	☐ ST-RC-0100 Rev.	☐ ST-RC-0240 Rev.
		☐ ST-RC-0241 Rev.
		☐ ST-RC-0242 Rev.
		☐ ST-RC-5016 Rev.
		☐
		☐

Isotope(s)

☐ αβ	☐ Iso Pu	☐ Tc-99	☐ Iso Cm
☐ Iso Am	☐ Ra	☐ Iso Th	☐ Pu-241
☐ KPA	☐ Sr	☐ Iso U	☐ Th-229
☐ Np	☐ TAR	☐ C-14	☐ Cl-36

Count Time	Matrix
Long Count ☐	Soil ☐
Short Count ☐	H ₂ O ☐

Prepared By : _____

Date : _____

Reviewed by: _____

Date: _____

Sample Name: Ver. 1
SampleType: Sample

Sample Collection Date:

Batch Name: Th-229 Tracer Only
AnalysisID: 719841

Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

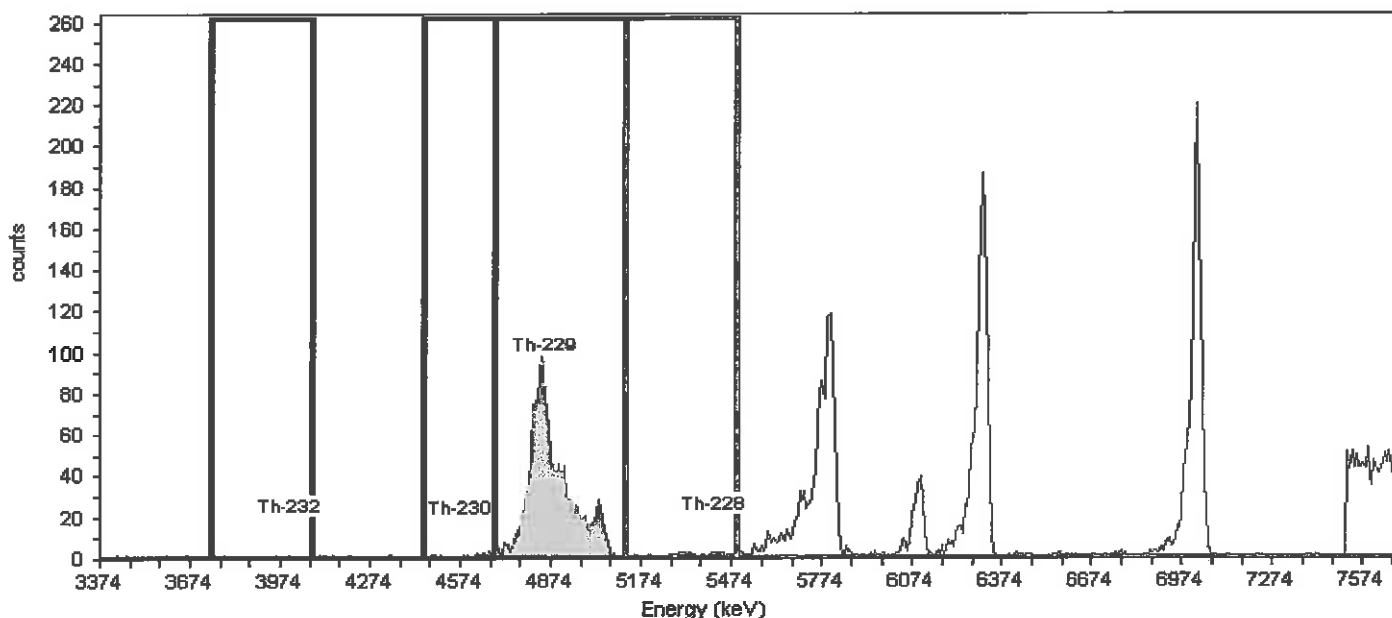
Tracer

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: AV97
Serial Number: 76-03393
Acquisition Start Date: 1/12/2018 5:11:28PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Background Date: 12/19/2017 12:16:50PM
Background Info: Sample: ICB;AV97; Det: AV97; Spectrum #1;
Dec-19-2017 12:16

Calibration Name: IC-9886;AV97-20170802
Calibration Date: 8/2/2017 11:02:54AM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.33% +/- 0.31% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 1/12/2018 5:08:17PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	11.9	100.2	3	1.0000	2.43	0.113	DPM/mL
Th-230	4567.6	4,687.5	-119.9	4448.3	4686.9	29.6	99.7	18	0.0000	18.00	0.842	DPM/mL
Th-229	4848.0	4,845.3	2.7	4686.9	5119.5	82.2	99.8	1538	1.0000	1537.00	71.851	DPM/mL
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	140.5	99.8	37	17.9134	19.17	0.897	DPM/mL

Sample Name: Ver 2
SampleType: Sample

Sample Collection Date:

Batch Name: Th-229 Tracer Only
AnalysisID: 719839

Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

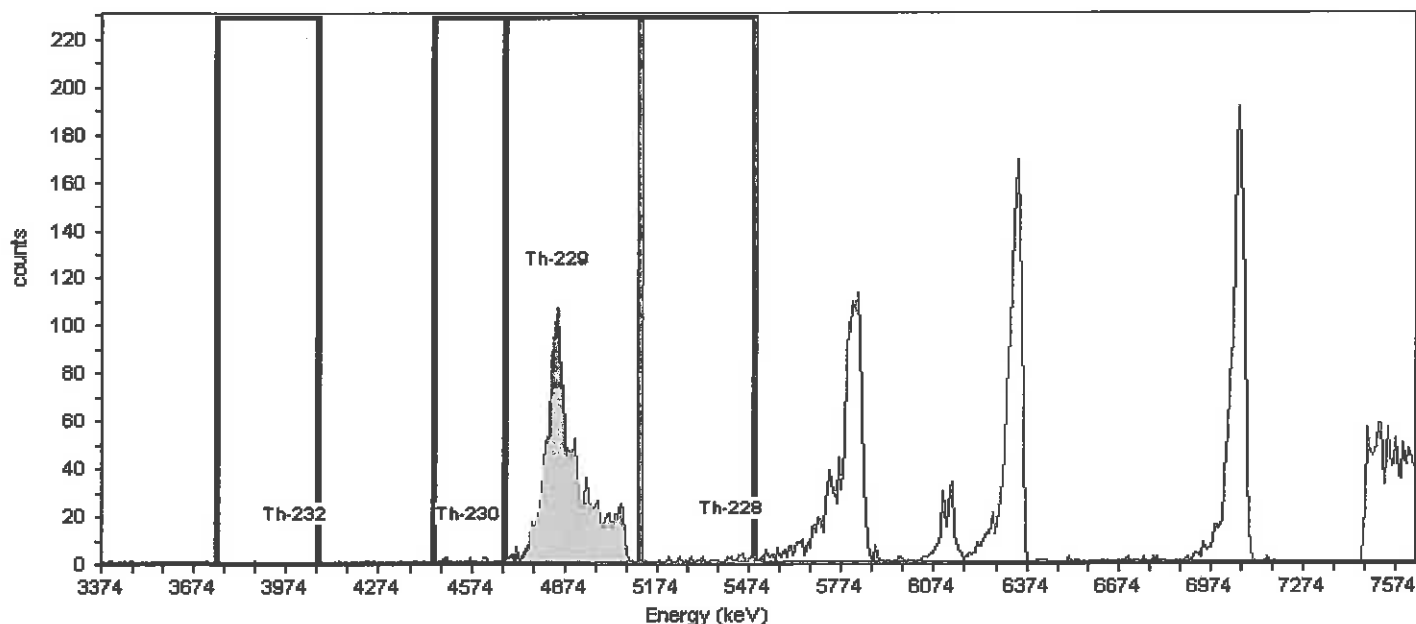
Tracer

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: AV96
Serial Number: 46-033P1
Acquisition Start Date: 1/12/2018 5:11:26PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Background Date: 12/19/2017 12:16:48PM
Background Info: Sample: ICB;AV96; Det: AV96; Spectrum #1;
Dec-19-2017 12:16

Calibration Name: IC-9885;AV96-20170802
Calibration Date: 8/2/2017 11:02:35AM
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Energy Cal: Quadratic = 0.0000 keV / Ch²
Efficiency: 24.24% +/- 0.36% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 1/12/2018 5:08:17PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	44.5	100.2	1	1.0000	0.00	0.000	DPM/mL
Th-230	4563.9	4,687.5	-123.6	4448.3	4679.5	196.1	99.7	23	0.0000	23.00	0.992	DPM/mL
Th-229	4848.0	4,845.3	2.7	4679.5	5119.5	76.5	99.8	1561	2.0000	1559.00	67.142	DPM/mL
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	15.1	99.8	39	14.0000	25.00	1.077	DPM/mL

Sample Name: Ver 3
SampleType: Sample

Sample Collection Date:

Batch Name: Th-229 Tracer Only
AnalysisID: 719837

Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

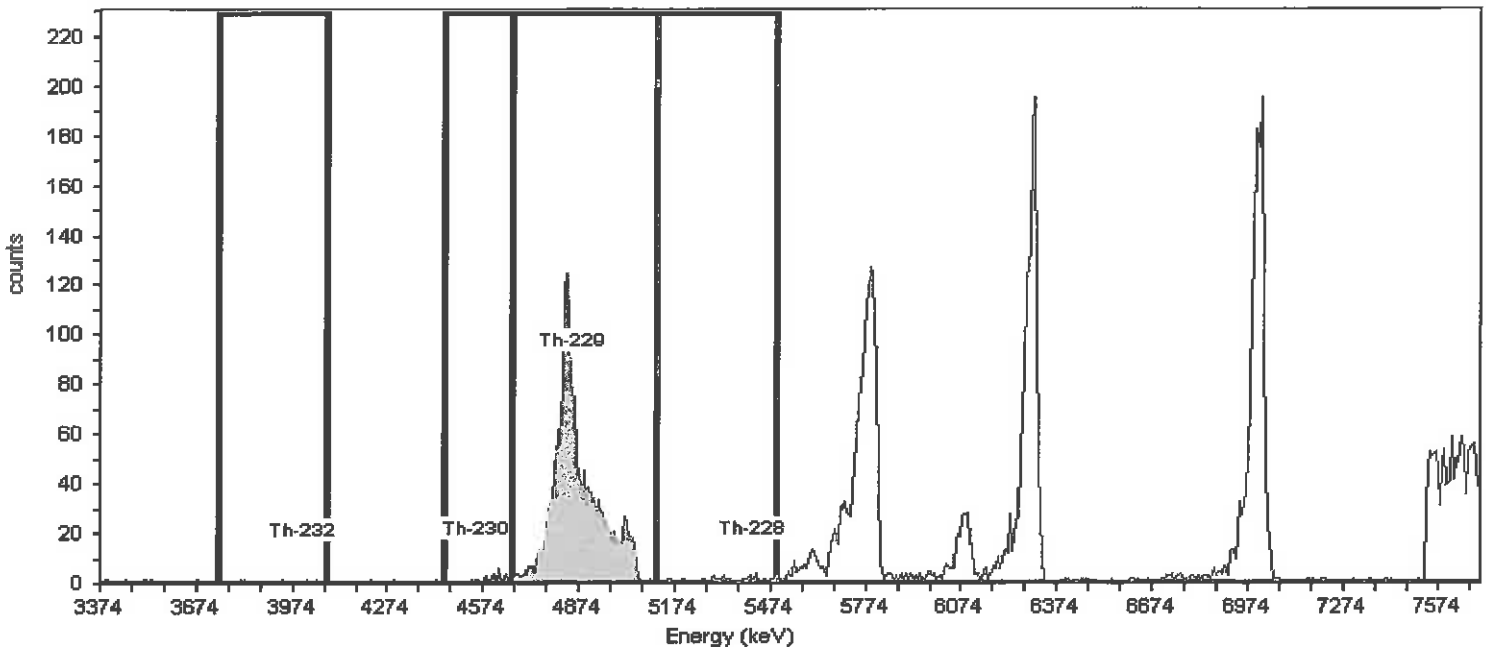
Tracer

Tracer Nuclide: External Recovery
Tracer Recovery: 100.00%

Acquisition

Detector: AV94
Serial Number: 49-203ff5
Acquisition Start Date: 1/12/2018 5:11:25PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Background Date: 12/20/2017 2:53:21PM
Background Info: Sample: ICB;AV94; Det: AV94; Spectrum #1;
Dec-20-2017 14:53

Calibration Name: IC-9817;AV94-20170802
Calibration Date: 8/2/2017 11:02:05AM
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Energy Cal: Quadratic = 0.0000 keV / Ch²
Efficiency: 23.29% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 1/12/2018 5:08:17PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	10.8	100.2	6	1.0000	4.57	0.204	DPM/mL
Th-230	4556.4	4,687.5	-131.1	4448.3	4664.6	52.6	99.7	22	0.0000	22.00	0.987	DPM/mL
Th-229	4848.0	4,845.3	2.7	4664.6	5119.5	68.6	99.8	1596	3.0000	1593.00	71.396	DPM/mL
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	181.0	99.8	27	14.0000	12.91	0.579	DPM/mL



Reagent ID: Th-229_00023

Description: Th-229 Tracer
 No. of Bottles: 1
 Storage Location: RAD Actinide STDs
 Reagent Volume: 500.000 mL
 Creation Date: 12/15/2017
 Open Date:
 Container(s): 1347365
 Comment:

Expiration Date: 12/20/2018
 Laboratory: TestAmerica St. Louis
 Prepared By: Bernsen, Sarah C
 Solvent: 0.1M HNO3
 Solvent Lot: n/a

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
At-217	Th-229_00017	03/26/2018	2240.98600	dpm/mL	67.22958	dpm/mL
Th-229	Th-229_00017	03/26/2018	2240.98600	dpm/mL	67.22958	dpm/mL

Source Reagents

Reagent	Description	Type	Expiration	Vendor	Vendor Lot #	Vendor Cat Lot #	Volume Used	Volume Units
Th-229_00017	Th-229 Parent		03/26/18				15.00000	mL

Reagent

Th-230_00015

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

92523

Th-230 5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2502650, Item 2 **Product Code:** 8230-5FSA-4kBq

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , %			Reference Date (12:00 PM EST)
			u_A	u_B	U	
Th-230	2.753E+07	3.979E+03	0.1	0.9	1.8	11/29/2012

***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: α -impurities 1.5915 Bq; γ -impurities (other than decay products) <0.1%.
5.07636 g 0.5M HNO₃ solution. Carrier free.

Source Prepared by: M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: J.D. McCorvey
J.D. McCorvey, Counting Room Manager

Date: 27 Nov 12



Reagent

Th-230_00016



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

92523

Th-230 5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2502650, Item 2 Product Code: 8230-5FSA-4kBq

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.18, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity .. (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)	
			Type	u _A	u _B		U
Th-230	2.753E+07	3.979E+03		0.1	0.9	1.8	11/29/2012

*Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: α -impurities 1.5915 Bq; γ -impurities (other than decay products) < 0.1%.
5.07636 g 0.5M HNO₃ solution. Carrier free.

Source Prepared by:

M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved:

J.D. McCorvey
J.D. McCorvey, Counting Room Manager

Date: 27 Nov 12

Single Isotope Certificate Rev 3, 23 August 2012



51464
ID Th-230_00015
Exp(1): 11/28/2062
Exp(2): 11/28/2062

RAD12-0040
Th-230 Ampoule
hursts
None
Prep/Opened: 11/28/2012
Exp(1): 11/28/2062
Exp(2): 11/28/2062

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

TestAmerica St. Louis

Standards Preparation Logbook Record

Nov-28-2012

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD12-0040, Th-230 Ampoule **Th-230-00015 # 51444**

Analyst: hursts

Vendor: Analytics

Lot No.: 92523

Solvent: None

Date Prep./Opened: 11-28-2012

Date Consumed: 11-28-2012

Date Expires(1): 11-28-2062 (50 Years)

Date Expires(2): 11-28-2062 (50 Years)

Cert: 92523 Activity: 3979Bq Reference Date: 11/29/12 Mass: 5.07636

<u>Component</u>	<u>Initial Conc (dpm/g)</u>	<u>Final Conc (dpm/g)</u>
Th-230	47,030	47,030

RAD12-0041, Th-230 Calibration Standard **Th-230-00016 # 51465** Analyst: hursts

Solvent: 0.5M HNO3

Volume (ml): 100.00

Date Prep./Opened: 11-28-2012

Date Expires(1): 11-29-2062 (50 Years)

Date Expires(2): 11-29-2062 (50 Years)

Parent Std No.: RAD12-0040, Th-230 Ampoule

Aliquot Amount (g): 5.0489

Parent Date Expires(1): 11-28-2062 Parent Date Expires(2): 11-28-2062

<u>Component</u>	<u>Initial Conc (dpm/g)</u>	<u>Final Conc (dpm/mL)</u>
Th-230	47,030	2,374.5

Reviewed By: _____



St. Louis Radiological Standard Reverification Form

Standard ID Number: Rad12-0041
True Value = 1069.59 pCi/mL
Date Analyzed: 11/30/2012

Radionuclide: Th-230 Gross Alpha

	Replicates	
#1	<u>1071</u>	pCi/mL
#2	<u>1027</u>	pCi/mL
#3	<u>1085</u>	pCi/mL

Mean = 1061

1 sigma = 30.26549

1.96 sigma = 59.32036

True Value minus 5% = 1016.111
True Value plus 5% = 1123.07

(True Value - 5%)
(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable?

Yes

Note: Criteria for reverification of radiological standards is taken from the DOE QSAS and LANL Statements of Work

Reviewed By/Date: *JA* 11/30/12

SOP Reference: STL-QA-0002, Current Revision

Analysis Report for Gross Alpha/Beta

Batch: M122628 Operator: 63903

Sample ID	WRKNO	Aliquot	Mass	Instr ID	CountTime	Is	Th	Dilution	Sigma
Analyte		Cs	XT	CPMs	CPMB	Eff	UncTot	UncCnt	MDA
verification 1a	NA	1.000E+000mL	0.0546 g	Purple16	11/30/12 13:03	8.00	1000.00	1.00	1.00
Gross Alpha		2528	0.00	3.160E+002	1.750E-001	0.1328	6.469E+004	2.132E+004	2.807E+003
Gross Beta		792	0.00	9.900E+001	4.850E-001	0.4280	6.370E+003	3.702E+003	1.212E+003
verification 2a	NA	1.000E+000mL	0.0536 g	Purple17	11/30/12 13:03	8.00	1000.00	1.00	1.00
Gross Alpha		2364	0.00	2.955E+002	8.700E-002	0.1295	6.225E+004	2.113E+004	2.376E+003
Gross Beta		764	0.00	9.550E+001	3.620E-001	0.4353	6.084E+003	3.576E+003	1.078E+003
verification 3a	NA	1.000E+000mL	0.0531 g	Purple18	11/30/12 13:04	8.00	1000.00	1.00	1.00
Gross Alpha		2521	0.00	3.151E+002	6.200E-002	0.1308	6.551E+004	2.161E+004	2.168E+003
Gross Beta		788	0.00	9.850E+001	3.950E-001	0.4295	6.325E+003	3.680E+003	1.125E+003

Laboratory Control Sample Information

SampleID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL	ZFactor
					%			

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Sample Activity	Dup Activity	RPD	RER	DER	ZFactor
-----------	---------------	---------	-----------------	--------------	-----	-----	-----	---------

Matrix Spike Information

SampleID	SampMSID	Analyte	Sample Activity	MS Activity	StdAdded	MSRecovery	ZFactor
						%	

Blanks Information

SampleID	WRKNO	Analyte	Activity	UncTotal	ZFactor
----------	-------	---------	----------	----------	---------

Prep Report for Gross Alpha/Beta

Batch: M122628

Prep Analyst: 250

SampID	WRKNO	Aliquot	Gross	Tare	Mass	Dilution
verification 1a	NA	6.500E-001 mL	8.6982 g	8.6436 g	0.0546 g	1.00
		Orange 5	Protean 14		16	
verification 2a	NA	6.500E-001 mL	8.6698 g	8.6162 g	0.0536 g	1.00
		7	15		17	
verification 3a	NA	6.500E-001 mL	8.6466 g	8.5935 g	0.0531 g	1.00
		8			18	

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
	Rad12-0041	M-236	2374.5 dpm/mL	1.00 mL	11-29-12	
MS		LM per MS		11-28-12		
Spiked By		Spike Verified By		Spike Date		

Standard Operating Procedures

SOPNumber	Title	Revision
☐		
	11/30/12	
Reviewed By	Review Date	
MS	11-28-12	
Analyst/Relinquished By	Release Date	
Um		
Received By		
	11/28/12	
	Receipt Date	

1123433897/MS/11-28-12

Balance ID / Initials / Date

Reagent

Th-230_00019

TestAmerica St. Louis

Standards Preparation Logbook Record

Aug-13-2013

Logbook: \\Qstlmo01\Stdslg\RAD_STD.std

RAD13-0028, Th-230 Ampoule

Analyst: marrss

Vendor: Analytics

Lot No.: 92776

Solvent: None

Date Prep./Opened: 08-13-2013

Date Expires(1): 08-08-2063 (50 Years)

Date Expires(2): 08-08-2063 (50 Years)

Activity: 3.728 E+03 Bq, Ref date: 08/08/2013, Solution mass: 5.09261g, Source ID: 92776

Component	Initial Conc (dpm/g)	Final Conc (dpm/g)
Th-230	43,922	43,922

TH-230-00019
#181198

RAD13-0029, Th-230 Parent

Analyst: marrss

Solvent: ~~None~~ 1M HNO3 SUB 8/13/13

Volume (ml): 100.00

Date Prep./Opened: 08-13-2013

Date Expires(1): 08-08-2063 (50 Years)

Date Expires(2): 08-08-2063 (50 Years)

Parent Std No.: RAD13-0028, Th-230 Ampoule

Aliquot Amount (g): 5.0731

Parent Date Expires(1): 08-08-2063 Parent Date Expires(2): 08-08-2063

Component	Initial Conc (dpm/g)	Final Conc (dpm/mL)
Th-230	43,922	2,228.2

Reviewed By: _____

SUB

Page 1 of 1

TH-230 Parent



Reagent ID: Th-230_00019

Description:	Th-230 Parent	Expiration Date:	08/08/2063
No. of Bottles:	1	Laboratory:	TestAmerica St. Louis
Storage Location:	RAD Actinide STDs	Prepared By:	Bernsen, Sarah C
Reagent Volume:	100.000 mL	Solvent:	1M HNO3
Creation Date:	08/13/2013	Solvent Lot:	n/a
Container(s):	181198		
Comment:			

Reagent Analyte Information

Analyte	Source ID	Source Expiration Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
Th-230	Th-230_00018	08/08/2063	43922.46	dpm/g	2228.23072	dpm/mL

Source Reagents

Reagent	Description	Type	Expiration	Vendor	Vendor Lot #	Vendor Cat Lot #	Volume Used	Volume Units
Th-230_00018	Th-230 Ampoule	ASTD	08/08/63	Eckert & Ziegler	92776		5.07310	mL



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

92776

Th-230 5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica
P.O. No.: 2532686, Item 1 **Product Code:** 8230-5FSA-4kBq

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			u_A	u_B	U	
Th-230	2.753E+07	3.728E+03	0.1	0.9	1.8	08/08/2013

***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: α -impurities 0.04%; γ -impurities (other than decay products) < 0.1%.
5.09261 g 0.5M HNO₃ solution. Carrier free.

Source Prepared by:

R. Ormsby, Radiochemist

QA Approved:

J.D. McCorvey, Counting Room Manager

Date: 6 AUG-13

RAD13-0029
Th-230 Parent
marrss
None
Prep/Opened: 8/13/2013
Exp(1): 8/8/2063
Exp(2): 8/8/2063



181198
ID: Th-230_00019
Exp: 08/08/63 Prip: SH Ctl. 08/13/13
Th-230 Parent



Reagent

Th-230_00036

Standard ID Number: Th-230_00034
True Value = 44.563 dpm/mL
Date Analyzed: 8/28/2017

Radionuclide: Th-230

	Replicates	
#1	44.57	dpm/mL
#2	44.43	dpm/mL
#3	43.79	dpm/mL

Mean = 44.2633333

1 sigma = 0.41585254

1.96 sigma = 0.815071

True Value minus 5% = 42.33485

(True Value - 5%)

True Value plus 5% = 46.79115

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable?

Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: ALD 8/29/17

2nd Reviewed By/Date: RM 8-29-17

Decay Calculations

Raw Sample/Standard Information

Initial Date/Time (t ₀):	8/8/2013 0:00		
Decayto Date/Time (t):	8/28/17 0:00		
Initial Activity (A ₀):	44.56 dpm		
Initial Aliquot:	1 mL		
Initial Conc:	44.5646 dpm/mL		
*Soln. Density:	1 g/mL		
Nuclide:	Th-230		
Half-Life (days):	27539850	decay days	fraction
**Decay Factor:	1.0000	1481.00	0.00005
Decay Corr Activity:	4.4563E+01 dpm		
Decay Corr Conc:	4.4563E+01 dpm/mL		

Conversion/Calculations

Final Activity Unit:	dpm
Activity Unit Factor:	1.00000
Final Volume Unit:	mL
Volume Unit Factor:	1.000
Final Concentration:	4.4563E+01 dpm/mL
Aliquot Volume:	1.0000E+00 mL
Final Activity (A):	4.4563E+01 dpm

** Uses basic decay equation: $A = A_0 * \exp(-\ln(2)*(t-t_0)/(\text{half-life}))$

* Soln. Density to be used when converting from liquid expressed in mass (g) units to liquid units (mL), and is only applied in that case.

Sample Name: Verification 1
Spectrum #1 Analysis #1

Type: Sample

Sample

Sample Volume : 0.30 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Sample Collection Date:
Comment:

Batch Name: Th-230_00034
AnalysisResultsID: 199659
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: Th-229_00022
Tracer Activity: 67.23 DPM / mL x (Vol.) 0.10 mL = 6.72 DPM
Tracer Ref. Date: 8/6/2014 9:07:15AM

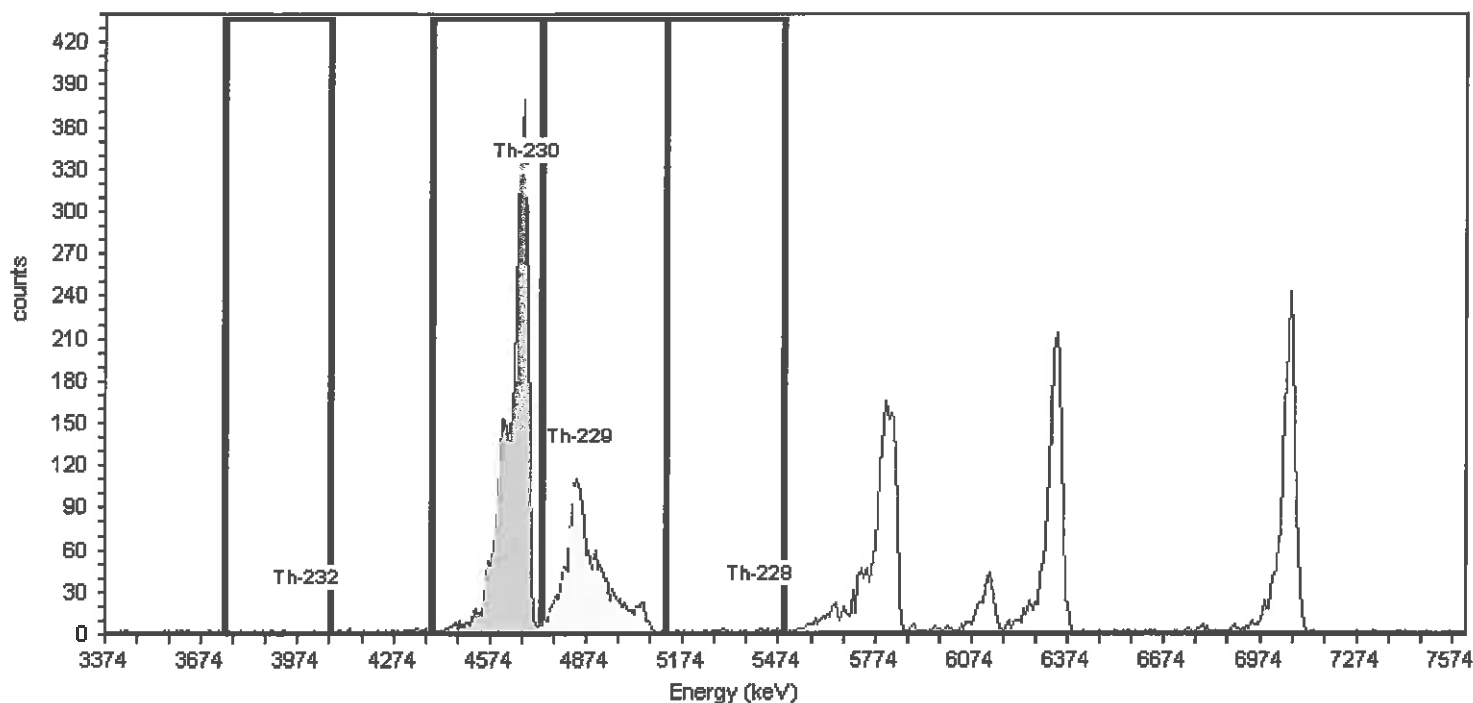
Tracer

Tracer Nuclide: Th-229
Tracer Recovery: 107.32%

Detector: AV175 SN: 50-117H1
Acquisition Start Date: 8/28/2017 3:27:30PM
Live Time: 960.00 min.
Real Time: 960.23 min.
Background Date: 8/21/2017 10:26:15PM
Bkgd Info: Sample: ICB:AV175; Det: AV175; Spectrum #1; 8/21/2017 10:26:15 PM

Acquisition

Energy Calibration: IC-9885;AV175-20161111
Efficiency Calibration:IC-9885;AV175-20161111
Calibration Date: 11/14/2016 8:18:26AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.93% +/- 0.37% TPU(2 sigma)



General Analysis

Analysis Method: Absolute Interactive ROI Analysis
Decay Correction:8/28/2017 3:25:48PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	317.3	100.2	8	1.0000	6.88	8.917E-002 DPM/mL
Th-230	4688.0	4,687.5	0.5	4388.6	4731.7	62.5	99.7	3429	5.0000	3424.00	4.457E+001 DPM/mL
Th-229	4848.0	4,845.3	2.7	4731.7	5119.5	87.7	99.6	1723	3.0000	1720.00	2.405E+001 DPM/mL
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	32.7	99.8	43	14.0866	28.80	3.748E-001 DPM/mL

Sample Name: Verification 2
Spectrum #1 Analysis #1

Type: Sample

Sample

Sample Volume : 0.30 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Sample Collection Date:
Comment:

Batch Name: Th-230_00034
AnalysisResultsID: 199658
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: Th-229_00022
Tracer Activity: 67.23 DPM / mL x (Vol.) 0.10 mL = 6.72 DPM
Tracer Ref. Date: 8/6/2014 9:07:15AM

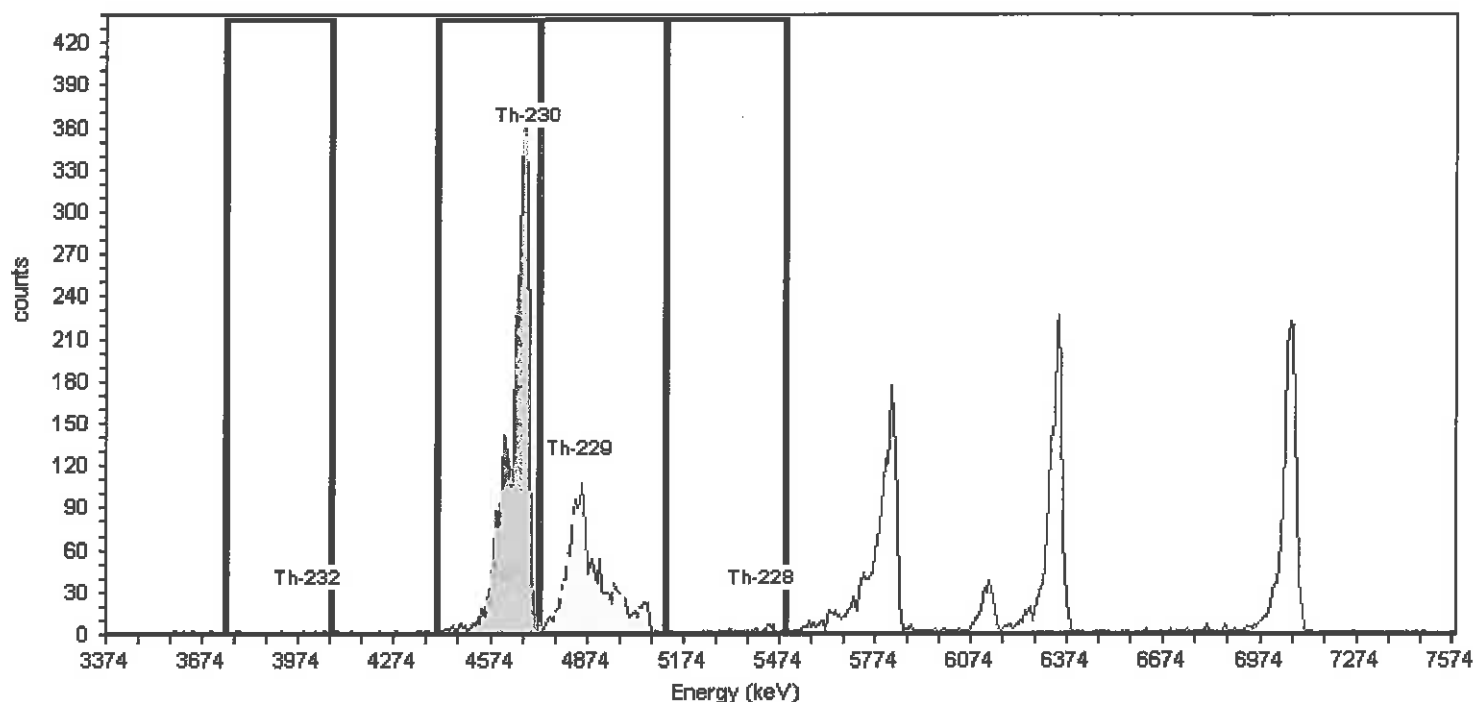
Tracer

Tracer Nuclide: Th-229
Tracer Recovery: 96.37%

Detector: AV177 SN: 50-117H3
Acquisition Start Date: 8/28/2017 3:27:30PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Background Date: 8/21/2017 10:26:16PM
Bkgd Info: Sample: ICB:AV177; Det: AV177; Spectrum #1; 8/21/2017 10:26:16 PM

Acquisition

Energy Calibration: IC-7107;AV177-20161206
Efficiency Calibration:IC-7107;AV177-20161206
Calibration Date: 12/16/2016 8:22:47AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 25.69% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute Interactive ROI Analysis
Decay Correction:8/28/2017 3:25:48PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	14.3	100.2	6	0.0000	6.46	9.039E-002 DPM/mL
Th-230	4688.0	4,687.5	0.5	4403.6	4724.2	33.5	99.7	3163	4.0000	3159.00	4.443E+001 DPM/mL
Th-229	4848.0	4,845.3	2.7	4724.2	5119.5	80.6	99.6	1598	6.0000	1592.00	2.160E+001 DPM/mL
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	16.8	99.8	49	14.9361	33.72	4.740E-001 DPM/mL

Sample Name: Verification 3
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

Batch Name: Th-230_00034
AnalysisResultsID: 199657
Description:

Tracer Name: Th-229_00022
Tracer Activity: 67.23 DPM / mL x (Vol.) 0.10 mL = 6.72 DPM
Tracer Ref. Date: 8/6/2014 9:07:15AM

Detector: AV178 SN: 50-117H4
Acquisition Start Date: 8/28/2017 3:27:30PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Background Date: 8/21/2017 10:26:16PM
Bkgd Info: Sample: ICB:AV178; Det: AV178; Spectrum #1; 8/21/2017 10:26:16 PM

Sample

Sample Volume : 0.30 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

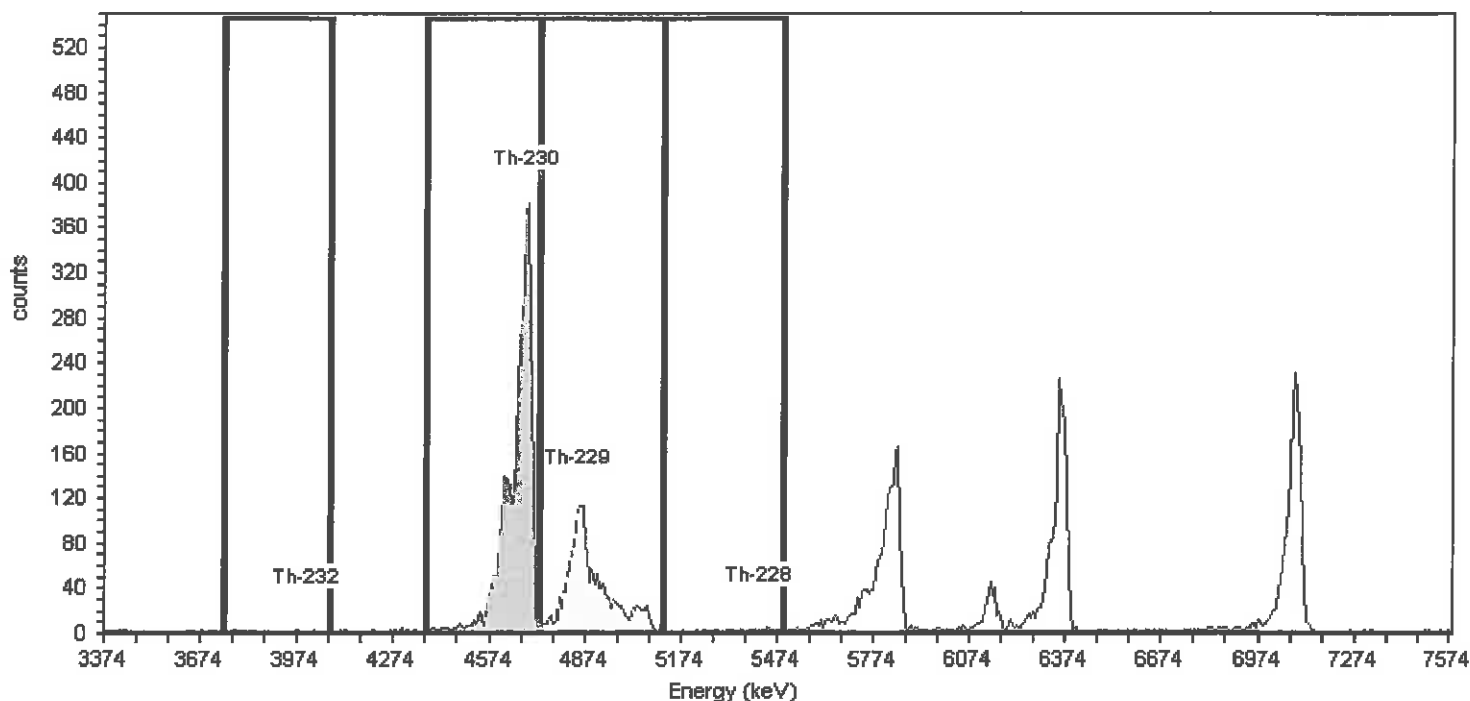
Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

Tracer Nuclide: Th-229
Tracer Recovery: 99.84%

Acquisition

Energy Calibration: IC-8874;AV178-20161206
Efficiency Calibration:IC-8874;AV178-20161206
Calibration Date: 12/16/2016 8:22:54AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.36% +/- 0.38% TPU(2 sigma)



General Analysis

Analysis Method: Absolute Interactive ROI Analysis
Decay Correction:8/28/2017 3:25:48PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	221.8	100.2	3	1.0000	2.00	2.634E-002 DPM/mL
Th-230	4688.0	4,687.5	0.5	4373.7	4731.7	20.0	99.7	3310	1.0000	3309.00	4.379E+001 DPM/mL
Th-229	4848.0	4,845.3	2.7	4731.7	5119.5	74.7	99.6	1693	1.0000	1692.00	2.237E+001 DPM/mL
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	15.9	99.8	33	16.9134	15.91	2.105E-001 DPM/mL

Th-230 spike
Aliquot Only
(copy) Ver

Batch No. _____

Balance ID: _____

Note: If a section below is not used, marked the N/A box and initial & date next to the N/A.
i.e. Mark the N/A box if a tracer is not added to the sample(s) then initial and date next to the N/A

No	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	Ver 1	0.3	175	
2	13	1	177	
3	13		178	
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Tracer ☐ N/A

Isotope: Th-229

Std Sol'n No.: Th-229.00022

Vol (mL): 0.1

Ref Activity (dpm/mL): 67.229

Act Ref Date: 08/06/14

Samples Spiked and Traced By: SVB 8/28/17

Verification Signature & Date: SVB 8-28-17

LCS Standard ☐ N/A

Isotope: Th-230

Std Sol'n ID.: Th-230.00034

Vol (mL): 0.3

Ref Activity (dpm/mL): 44.5644

Act Ref Date: 08/08/13

SOP's applied in preparing these samples. Mark box to left for all that apply:

☐ ST-RC-0003 Rev.	☐ ST-RC-0040 Rev.	☐ ST-RC-0110 Rev.
☐ ST-RC-0004 Rev.	☐ ST-RC-0041 Rev.	☐ ST-RC-0120 Rev.
☐ ST-RC-0014 Rev.	☐ ST-RC-0050 Rev.	☐ ST-RC-0232 Rev.
☐ ST-RC-0020 Rev.	☐ ST-RC-0090 Rev.	☐ ST-RC-0238 Rev.
☐ ST-RC-0021 Rev.	☐ ST-RC-0100 Rev.	☐ ST-RC-0240 Rev.
		☐ ST-RC-0241 Rev.
		☐ ST-RC-0242 Rev.
		☐ ST-RC-5016 Rev.
		☐
		☐

Isotope(s)

☐ αβ	☐ Iso Pu	☐ Tc-99	☐ Iso Cm
☐ Iso Am	☐ Ra	☐ Iso Th	☐ Pu-241
☐ KPA	☐ Sr	☐ Iso U	☐ Th-229
☐ Np	☐ TAR	☐ C-14	☐ Cl-36

Count Time ☒ **Matrix**

Long Count ☒ Soil ☐

Short Count ☐ H₂O ☐

Prepared By: SVB

Date: 8/28/13

Reviewed by: _____

Date: _____

Page 1

Reagent

U-232_00003



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

85539-334

5 mL Liquid in Flame Sealed Vial

Customer: Test America/Earth City, MO

P.O. No.: 2434448, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			u _A	u _B	U	
U-232	2.517E+04	1.725E+04	0.5	2.4	4.9	08/25/2011

*Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: U-232 daughters, γ -impurities (other than decay products) < 0.1 %.

Source Prepared by:

M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved:

J. D. McCorvey
J. D. McCorvey, QA Manager Alternate

Date:

8/25/11



Reagent

U-232_00040

Standard ID Number: U-232_00040 (Clean)
True Value = 77.177 dpm/mL
Date Analyzed: 12/20/2017

Radionuclide: U-232

	Replicates	
#1	<u>83.23</u>	dpm/mL
#2	<u>76.85</u>	dpm/mL
#3	<u>78.14</u>	dpm/mL

Mean = 79.4066667

1 sigma = 3.37334157

1.96 sigma = 6.611749

True Value minus 5% = 73.31815

(True Value - 5%)

True Value plus 5% = 81.03585

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value? Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value? Yes (Acceptance Criteria)

Standard Reverification Acceptable?

Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: ALD 12/21/17

2nd Reviewed By/Date: lm 12.21.17

Decay Calculations

Raw Sample/Standard Information

Initial Date/Time (t ₀):	8/25/2011 0:00		
Decayto Date/Time (t):	12/20/17 0:00		
Initial Activity (A ₀):	82.25 dpm		
Initial Aliquot:	1 mL		
Initial Conc:	82.245 dpm/mL		
*Soln. Density:	1 g/mL		
Nuclide:	U-232		
Half-Life (days):	25165.725	decay days	fraction
**Decay Factor:	0.9384	2309.00	0.09175
Decay Corr Activity:	7.7177E+01 dpm		
Decay Corr Conc:	7.7177E+01 dpm/mL		

Conversion/Calculations

Final Activity Unit:	dpm
Activity Unit Factor:	1.00000
Final Volume Unit:	mL
Volume Unit Factor:	1.000
Final Concentration:	7.7177E+01 dpm/mL
Aliquot Volume:	1.0000E+00 mL
Final Activity (A):	7.7177E+01 dpm

** Uses basic decay equation: $A = A_0 * \exp(-\ln(2)*(t-t_0)/(\text{half-life}))$

* Soln. Density to be used when converting from liquid expressed in mass (g) units to liquid units (mL), and is only applied in that case.

Sample Name: Ver1
Spectrum #1 Analysis #1

Type: Sample

Sample

Sample Volume : 0.10 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Sample Collection Date:
Comment:

Batch

Batch Name: U232 Clean
AnalysisResultsID: 206424
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

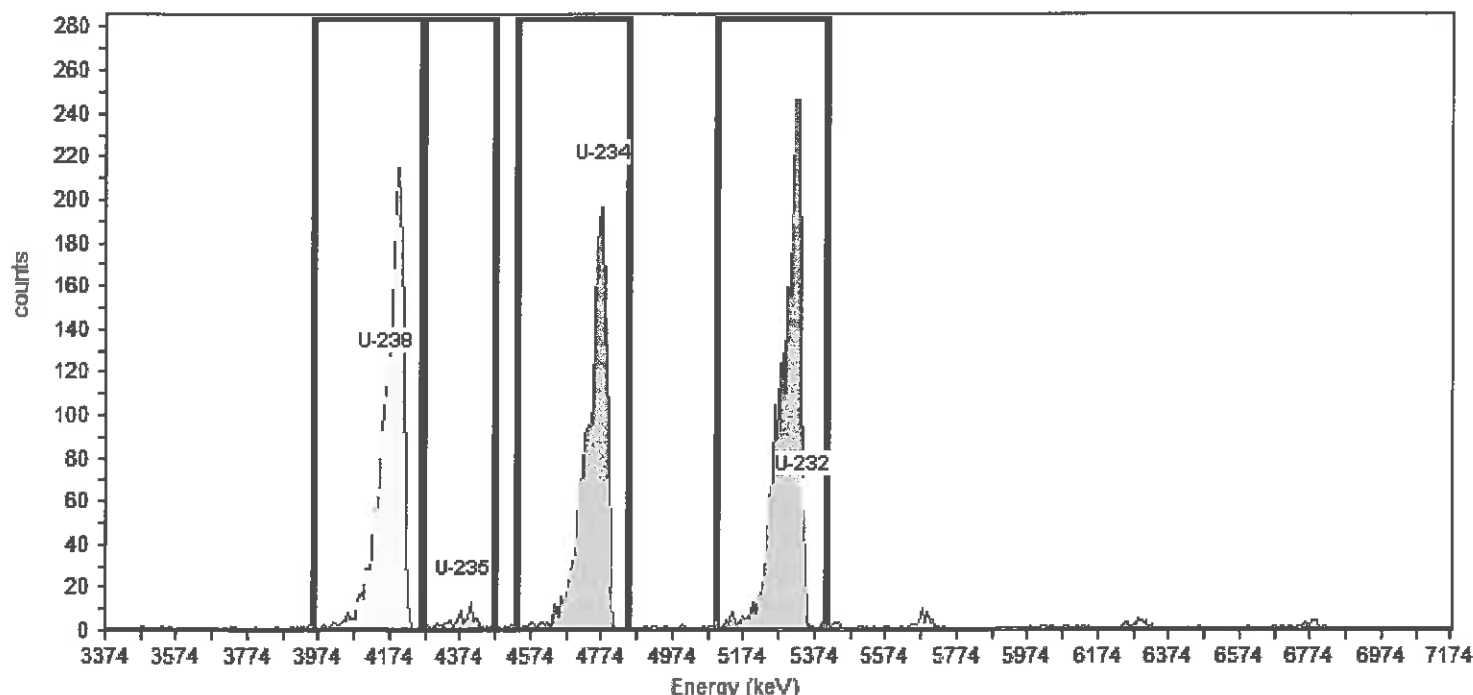
Tracer Name: UNAT_00013
Tracer Activity: 72.26 DPM / mL x (Vol.) 0.10 mL = 7.23 DPM
Tracer Ref. Date: 3/30/2008 11:48:31AM

Tracer Nuclide: U-238
Tracer Recovery: 114.55%

Acquisition

Detector: AV239 SN: 51-005EE1
Acquisition Start Date: 12/20/2017 7:23:04PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Background Date: 11/17/2017 3:28:16PM
Bkgd Info: Sample: ICB;AV239; Det: AV239; Spectrum #1; 11/17/2017 3:28:16 PM

Energy Calibration: IC-9794;AV239-20171114
Efficiency Calibration:IC-9794;AV239-20171114
Calibration Date: 11/15/2017 8:27:30AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.25% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI_U-232
Decay Correction:12/20/2017 7:22:15PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	62.0	100.0	1770	2.0000	1768.00	8.278E+001 DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	52.3	80.2	83	4.0000	79.00	4.026E+000 DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	62.5	99.8	1701	3.0000	1698.00	6.954E+001 DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	72.6	100.1	2043	5.0000	2038.00	8.323E+001 DPM/mL

Sample Name: Ver2
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

Type: Sample

Sample

Sample Volume : 0.10 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch Name: U232 Clean
AnalysisResultsID: 206425
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: UNAT_00013
Tracer Activity: 72.26 DPM / mL x (Vol.) 0.10 mL = 7.23 DPM
Tracer Ref. Date: 3/30/2008 11:48:31AM

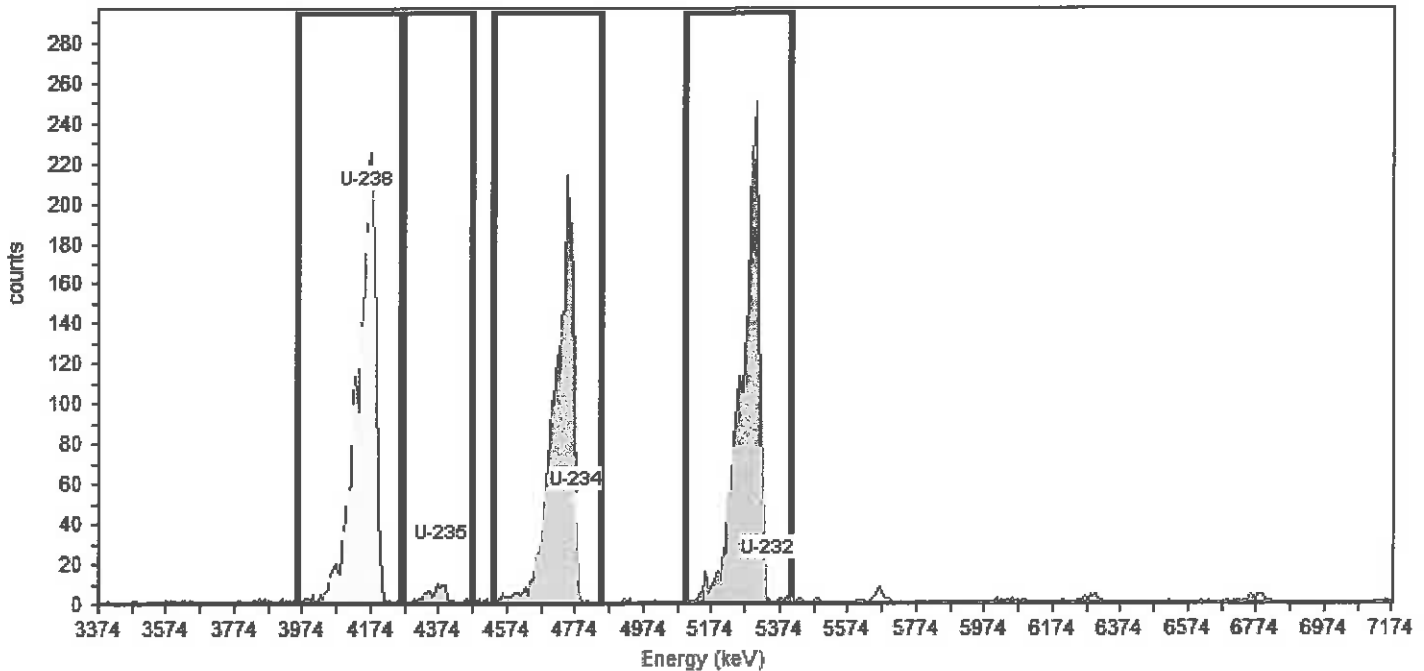
Tracer

Tracer Nuclide: U-238
Tracer Recovery: 103.73%

Detector: AV240 SN: 51-005Q1
Acquisition Start Date: 12/20/2017 7:23:05PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Background Date: 11/17/2017 3:28:16PM
Bkgd Info: Sample: ICB;AV240; Det: AV240; Spectrum #1; 11/17/2017 3:28:16 PM

Acquisition

Energy Calibration: IC-9795;AV240-20171114
Efficiency Calibration:IC-9795;AV240-20171114
Calibration Date: 11/15/2017 8:27:37AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.17% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI_U-232
Decay Correction:12/20/2017 7:22:15PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	63.1	100.0	1884	1.0000	1883.00	7.496E+001 DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	63.7	80.2	74	1.0000	73.00	3.493E+000 DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	71.3	99.8	1817	4.0000	1813.00	6.972E+001 DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	67.7	100.1	2005	1.0000	2004.00	7.685E+001 DPM/mL

Sample Name: Ver3
Spectrum #1 Analysis #1

Type: Sample

Sample

Sample Volume : 0.10 Sample Units: mL
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Sample Collection Date:
Comment:

Batch

Batch Name: U232 Clean
AnalysisResultsID: 206426
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

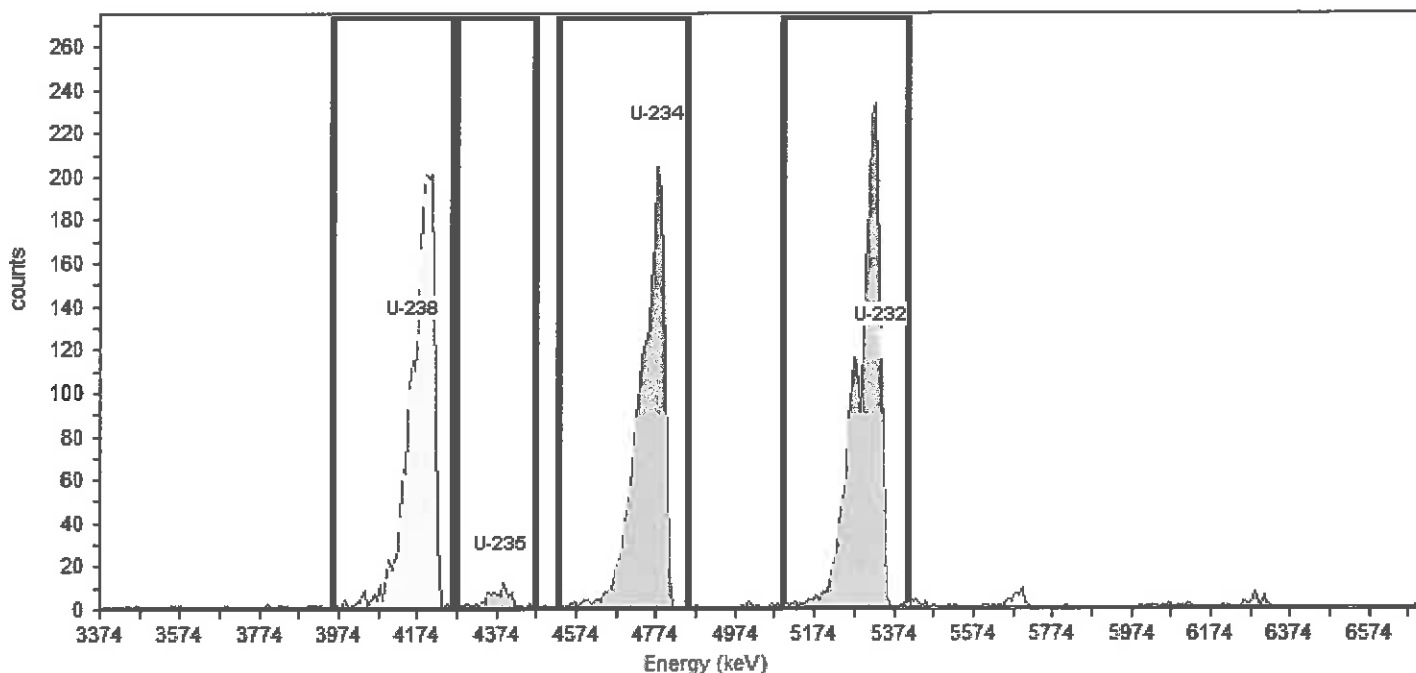
Tracer Name: UNAT_00013
Tracer Activity: 72.26 DPM / mL x (Vol.) 0.10 mL = 7.23 DPM
Tracer Ref. Date: 3/30/2008 11:48:31AM

Tracer Nuclide: U-238
Tracer Recovery: 122.50%

Acquisition

Detector: AV242 SN: 51-005P7
Acquisition Start Date: 12/20/2017 7:23:05PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Background Date: 11/17/2017 3:28:17PM
Bkgd Info: Sample: ICB;AV242; Det: AV242; Spectrum #1; 11/17/2017 3:28:17 PM

Energy Calibration: IC-9884;AV242-20171114a
Efficiency Calibration:IC-9884;AV242-20171114a
Calibration Date: 11/15/2017 8:27:49AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.04% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI_U-232
Decay Correction:12/20/2017 7:22:15PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	70.6	100.0	1873	0.0000	1873.00	8.853E+001 DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	60.4	80.2	81	1.0000	80.00	3.849E+000 DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	72.8	99.8	1864	4.0000	1860.00	7.191E+001 DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	64.8	100.1	2039	12.0000	2027.00	7.814E+001 DPM/mL

U-232 Clean Tracer Ver.

Standard Verification

Batch No.:

(copied)

Balance ID:

Note: If a section below is not used, marked the N/A box and initial & date next to the N/A.
I.e. Mark the N/A box if a tracer is not added to the sample(s) then initial and date next to the N/A

No.	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	VER-1	0.1	239	
2	12	1	240	
3	13		242	
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Tracer ☐ N/A ☒ Initials / Date

Isotope: U-232

Std Sol'n No.: U-232-00013

Vol (mL): 0.1

Ref Activity (dpm/mL):

Act Ref Date:

Samples Spiked and Traced By:
SAB 12/19/17
Initials / Date

Verification Signature & Date:
BMY 12/19/17
Initials / Date

LCS Standard ☐ N/A ☒ Initials / Date

Isotope: U-232 Clean

Std Sol'n ID.: U-232-00040

Vol (mL): 0.1

Ref Activity (dpm/mL): 87.245

Act Ref Date: 08-25-11

SOP's applied in preparing these samples. Mark box to left for all that apply:

☐ ST-RC-0003 Rev.	☐ ST-RC-0040 Rev.	☐ ST-RC-0110 Rev.
☐ ST-RC-0004 Rev.	☐ ST-RC-0041 Rev.	☐ ST-RC-0120 Rev.
☐ ST-RC-0014 Rev.	☐ ST-RC-0050 Rev.	☐ ST-RC-0232 Rev.
☐ ST-RC-0020 Rev.	☐ ST-RC-0090 Rev.	☐ ST-RC-0238 Rev.
☐ ST-RC-0021 Rev.	☐ ST-RC-0100 Rev.	☐ ST-RC-0240 Rev.
		☐ ST-RC-0241 Rev.
		☐ ST-RC-0242 Rev.
		☐ ST-RC-5016 Rev.
		☐
		☐

Isotope(s)

☐ αβ	☐ Iso Pu	☐ Tc-99	☐ Iso Cm
☐ Iso Am	☐ Ra	☐ Iso Th	☐ Pu-241
☐ KPA	☐ Sr	☐ Iso U	☐ Th-229
☐ Np	☐ TAR	☐ C-14	☐ Cl-36

Count Time	Matrix
Long Count ☐	Soil ☐
Short Count ☐	H ₂ O ☐

Prepared By: _____
Date: _____

Reviewed by: _____
Date: _____

U-232 Clean Tracer Ver.

Standard Verification

Batch No.:

(COPY) Balance ID:

Note: If a section below is not used, marked the N/A box and initial & date next to the N/A. I.e. Mark the N/A box if a tracer is not added to the sample(s) then initial and date next to the N/A

No	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	VER 1	0.1	235	10: 247
2	13	1	237	10: 248
3	13	1	238	10: 249
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Samples Spiked and Traced By: SUB / 12/19/17

Verification Signature & Date: gm / 12/19/17

Tracer ☐ N/A clean Initials / Date U-232

Isotope: U-232

Std Sol'n No.: U-232-00040

Vol (mL): 0.1

Ref Activity (dpm/mL): 82.245

Act Ref Date: 08-25-11

LCS Standard ☐ N/A

Isotope: _____

Std Sol'n ID: _____

Vol (mL): _____

Ref Activity (dpm/mL): _____

Act Ref Date: _____

SOP's applied in preparing these samples. Mark box to left for all that apply:

☐ ST-RC-0003 Rev.	☐ ST-RC-0040 Rev.	☐ ST-RC-0110 Rev.
☐ ST-RC-0004 Rev.	☐ ST-RC-0041 Rev.	☐ ST-RC-0120 Rev.
☐ ST-RC-0014 Rev.	☐ ST-RC-0050 Rev.	☐ ST-RC-0232 Rev.
☐ ST-RC-0020 Rev.	☐ ST-RC-0090 Rev.	☐ ST-RC-0238 Rev.
☐ ST-RC-0021 Rev.	☐ ST-RC-0100 Rev.	☐ ST-RC-0240 Rev.
		☐ ST-RC-0241 Rev.
		☐ ST-RC-0242 Rev.
		☐ ST-RC-5016 Rev.
		☐
		☐

Isotope(s)

☐ αβ	☐ Iso Pu	☐ Tc-99	☐ Iso Cm
☐ Iso Am	☐ Ra	☐ Iso Th	☐ Pu-241
☐ KPA	☐ Sr	☐ Iso U	☐ Th-229
☐ Np	☐ TAR	☐ C-14	☐ Cl-36

Count Time	Matrix
Long Count ☐	Soil ☐
Short Count ☐	H ₂ O ☐

Prepared By:

Reviewed by:

Date:

Date:

Page 1

Sample Name: Verification 1

SampleType: Sample

Sample Collection Date:

Batch Name: U-232 Clean Tracer Only

AnalysisID: 718500

Sample

Spectrum #1 Analysis #1

Sample Volume : 0.1000mL

Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

Tracer

Tracer Name: U-232_00040

Tracer Activity: 82.25 DPM/mL x (Vol.)0.10 mL = 8.22 DPM

Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232

Tracer Recovery: 104.22%

Acquisition

Detector: AV136

Serial Number: 49-16902

Acquisition Start Date: 12/27/2017 4:45:29PM

Live Time: 960.00 min.

Real Time: 960.01 min.

Background Date: 12/19/2017 12:17:35PM

Background Info: Sample: ICB;AV136; Det: AV136; Spectrum #1;
Dec-19-2017 12:17

Calibration Name: IC-9885;AV136-20170802

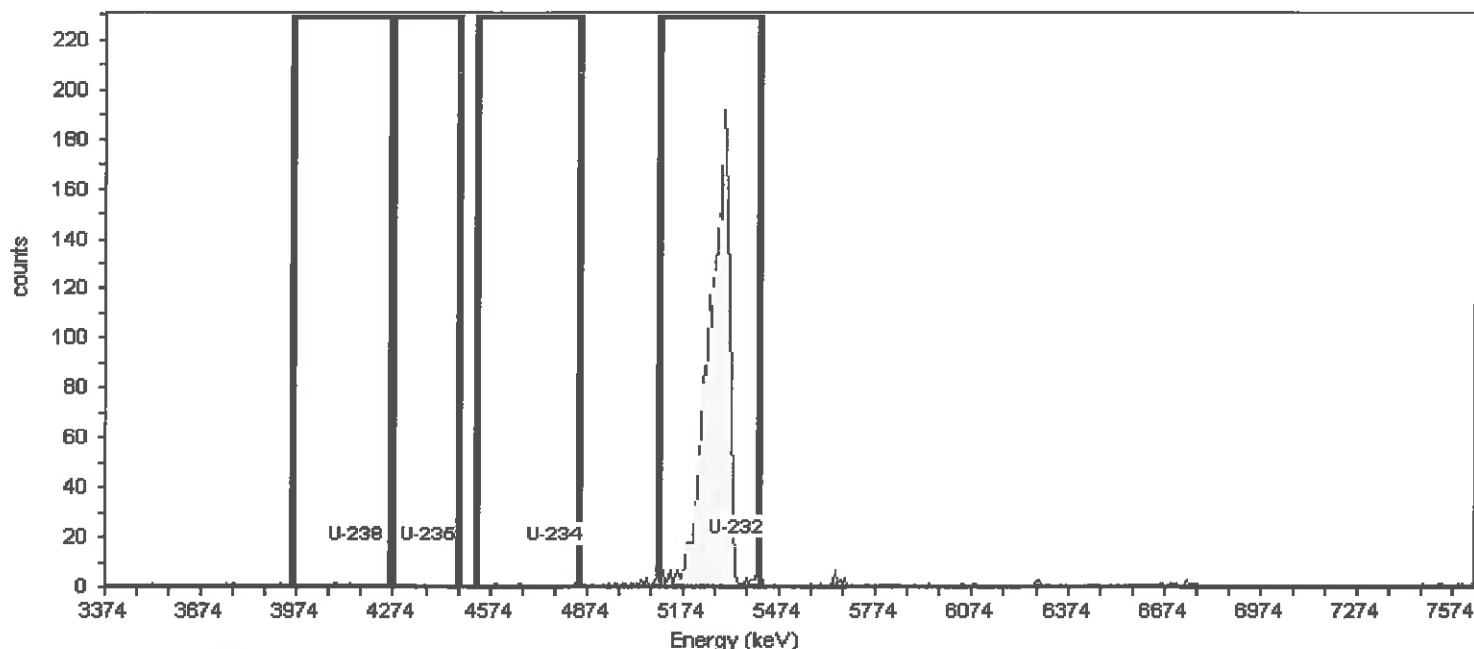
Calibration Date: 8/2/2017 4:16:31PM

Gain = 7.4575 keV / Ch

Energy Cal: Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 24.16% +/- 0.36% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI

Decay Correction: 12/27/2017 4:44:20PM

MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Uranium

MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	88.1	100.0	2	1.0000	1.00	0.041	DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	0.0000	0.00	0.000	DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	10.7	99.8	3	2.0000	1.00	0.041	DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	80.0	100.1	1873	1.0000	1872.00	85.715	DPM/mL

Sample

Sample Name: Verification 2

SampleType: Sample

:

Sample Collection Date:

Spectrum #1 Analysis #1

Sample Volume : 0.1000mL

Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: U-232 Clean Tracer Only

AnalysisID: 718499

Analyst: 60040

Tracer

Tracer Name: U-232_00040

Tracer Activity: 82.25 DPM/mL x (Vol.)0.10 mL = 8.22 DPM

Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232

Tracer Recovery: 121.04%

Acquisition

Detector: AV137

Serial Number: 49-16904

Acquisition Start Date: 12/27/2017 4:45:26PM

Live Time: 960.00 min.

Real Time: 960.01 min.

Background Date: 12/19/2017 12:17:34PM

Background Info: Sample: ICB;AV137; Det: AV137; Spectrum #1;

Dec-19-2017 12:17

Calibration Name: IC-9886;AV137-20170802

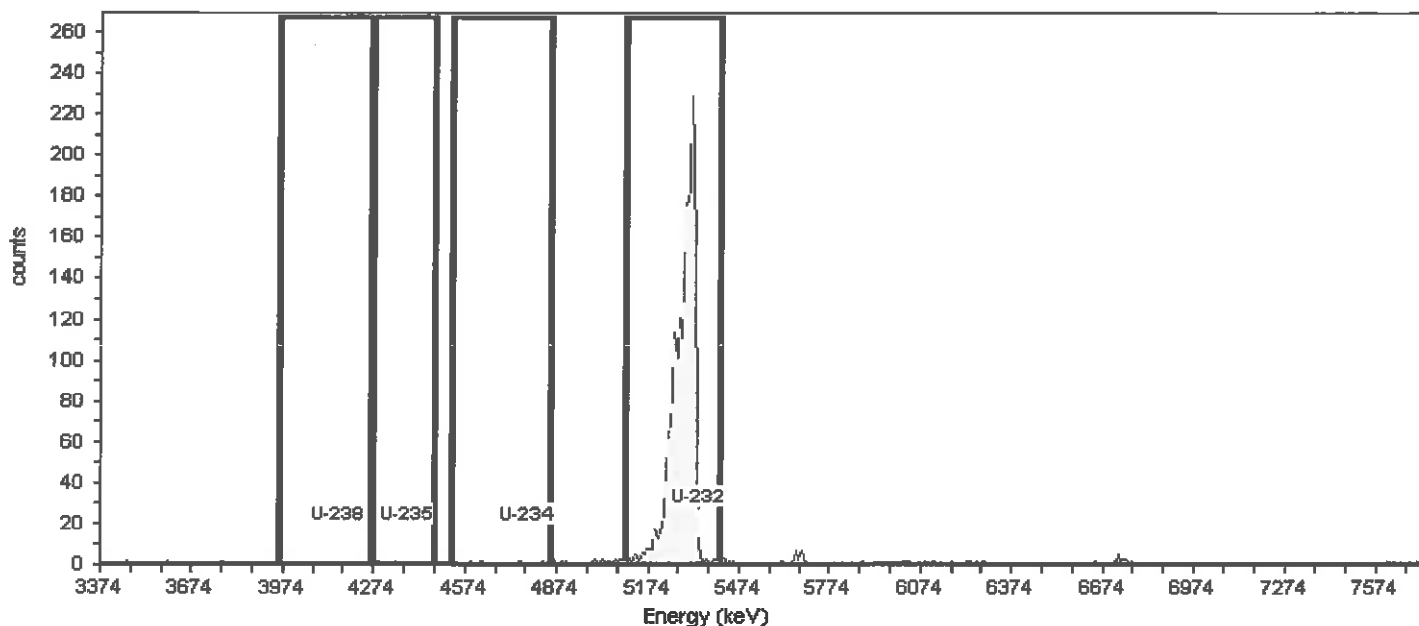
Calibration Date: 8/2/2017 4:17:12PM

Gain = 7.4575 keV / Ch

Energy Cal: Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 21.93% +/- 0.31% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI

Decay Correction: 12/27/2017 4:44:20PM

MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Uranium

MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	.0	100.0	0	0.0000	0.00	0.000	DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.3	80.2	3	0.0000	3.00	0.147	DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	10.2	99.8	4	0.0000	4.00	0.157	DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	71.3	100.1	1974	1.0000	1973.00	99.546	DPM/mL

Sample Name: Verification 3

SampleType: Sample

Sample Collection Date:

Batch Name: U-232 Clean Tracer Only

AnalysisID: 718501

Tracer Name: U-232_00040

Tracer Activity: 82.25 DPM/mL x (Vol.)0.10 mL = 8.22 DPM

Tracer Ref. Date: 8/25/2011 12:00:28PM

Sample

Spectrum #1 Analysis #1

Sample Volume : 0.1000mL

Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

Tracer

Tracer Nuclide: U-232

Tracer Recovery: 104.17%

Acquisition

Detector: AV138

Serial Number: 49-179B7

Acquisition Start Date: 12/27/2017 4:45:25PM

Live Time: 960.00 min.

Real Time: 960.01 min.

Background Date: 12/19/2017 12:17:36PM

Background Info: Sample: ICB;AV138; Det: AV138; Spectrum #1;

Dec-19-2017 12:17

Calibration Name: IC-7107;AV138-20170802

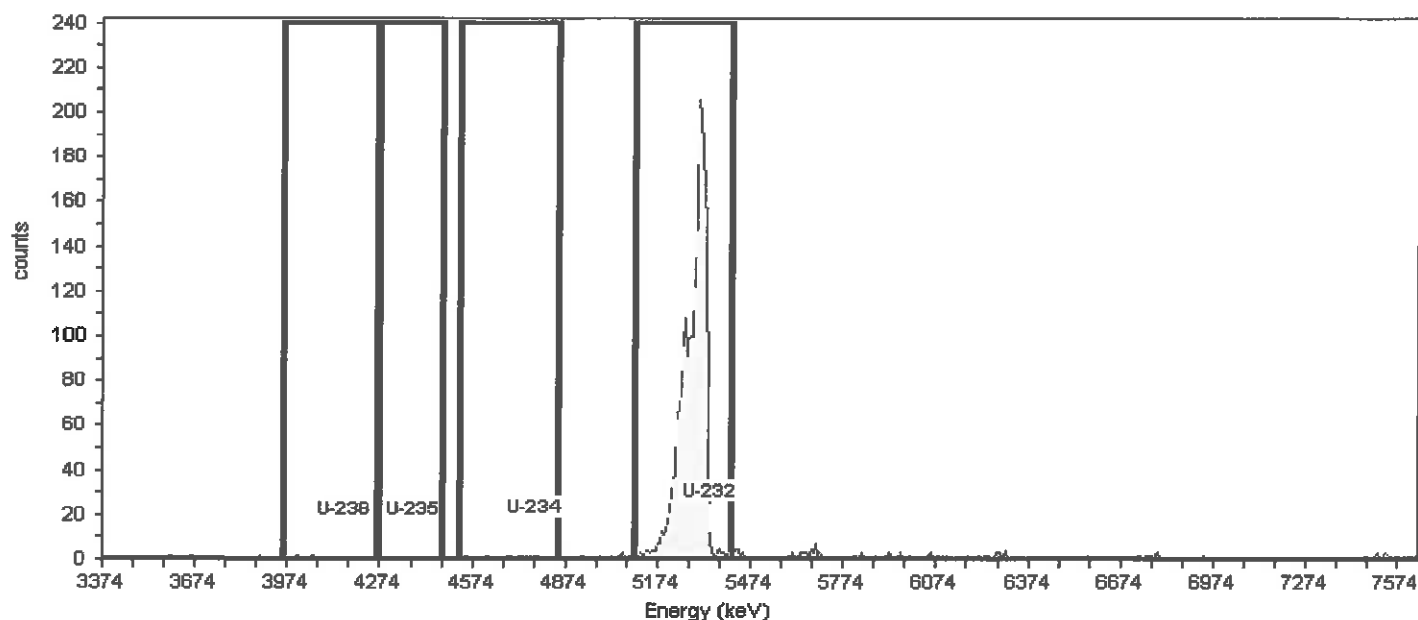
Calibration Date: 8/3/2017 8:14:16AM

Gain = 7.4575 keV / Ch

Energy Cal: Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 24.42% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI

Decay Correction: 12/27/2017 4:44:20PM

MDA Constants: K α = 1.65, K β = 1.65

Nuclide Library: Uranium

MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	91.2	100.0	2	0.0000	2.00	0.082	DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	1.0000	-1.00	-0.051	DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	247.6	99.8	10	3.0000	7.00	0.287	DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	75.8	100.1	1892	1.0000	1891.00	85.675	DPM/mL

Reagent

UNAT Ampoule_00001



New Brunswick Laboratory
U.S. Department of Energy

Certificate of Analysis

CRM 145

Uranyl (Normal) Nitrate Assay and Isotopic Solution

Uranium Mass Fraction: 0.0101356 g U/g solution $\pm$ 0.0000011 g U/g solution
[10.1356 mg U/g solution $\pm$ 0.0011 mg U/g solution]

	$^{234}\text{U}/^{238}\text{U}$	$^{235}\text{U}/^{238}\text{U}$	
Atom Ratio:	0.000052841	0.0072543	
Atom Ratio Uncertainty:	0.000000082	0.0000040	
	^{234}U	^{235}U	^{238}U
Atom Percent:	0.0052458	0.72017	99.27458
Atom Percent Uncertainty:	0.0000081	0.00039	0.00039
Weight Percent:	0.0051579	0.71114	99.28370
Weight Percent Uncertainty:	0.0000080	0.00038	0.00038
Relative Atomic Weight:	238.028918		
Relative Atomic Weight Uncertainty:	0.000012		

Note: ^{233}U and ^{236}U were not detected. The detection limit of uranium ratios for the technique used is 5×10^{-9} .

This Certified Reference Material (CRM) is a uranium concentration and isotopic solution standard intended for use in calibration of and/or quality control for uranium analysis methods. Each unit of CRM 145 consists of approximately 20-mL of uranyl nitrate solution in 1M nitric acid, contained in a sealed glass ampoule.

NOTE: The vial should be handled under proper radiologically-controlled conditions at all times.

The certified uranium content value is based on the mass of high-purity metal dissolved and diluted to a known solution mass. The stated uranium concentration was calculated as the prepared value and verified experimentally by the NBL-modified Davies and Gray titration. The certified uranium isotopic composition and atomic weight is based upon measurements performed on multiple samples by two different measurement techniques on a Thermal Ionization Mass Spectrometer (TIMS), calibrated using CRM U030-A as primary comparator and CRM 129-A as a quality control sample. The isotopic values are shared with CRM 112-A, uranium (normal) metal standard which was the source of uranium used to produce the solutions.

RAD13-0018
UNAT Spike
marrrs
None
Prep/Opened: 5/3/2013
Exp(1): 5/10/2014
Exp(2): 5/10/2014

All uncertainties for the certified values are expressed as expanded uncertainties (U) where $U = k \cdot u_c$, where u_c is the

September 30, 2010
Argonne, Illinois

www.nbl.doe.gov
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Jon Neuhoﬀ, Director
New Brunswick Laboratory

(Revision of Certificate dated March 30, 2008)



127971
ID: UNAT_00008
Exp: 05/10/14 Prpd: SB Crt: 05/03/13
UNAT spike

combined standard uncertainty and the coverage factor $k = 2$. Uncertainties were determined according to the JCGM 100:2008 *Guide to the Expression of Uncertainty in Measurement*. The coverage factor of 2 was chosen to provide an approximate 95% level of confidence. The input quantities associated with the uranium content included uncertainties due to weighing, CRM 112-A purity, and buoyancy factors. The input quantities associated with the uranium isotopic composition included uncertainties from the certified value for CRM U030-A, measurement precision, and background corrections associated with the analytical techniques.

The CRM was produced by dissolving uranium metal in a single batch and container, with extensive mixing of the resultant solution followed by dispensation into individual bottles. Subsequent measurements of a random sampling of the total lot produced did not indicate any inhomogeneity in uranium concentration or isotopic composition. The minimum sample sizes taken from packaged units and measured were 30 mg U by titration and 1 μ g U by TIMS. The NBL makes no recommendation as to the minimum sample size to be used to ensure concentration or isotopic homogeneity.

Users are cautioned that once the vial is opened, the uranium concentration and/or isotopic composition of the material may be affected by evaporative losses or environmental contamination. User's should take appropriate precautions to safeguard the material before, during and after use to ensure valid certificate values.

Recommended Procedure for Ampoule Handling and Dispensing of Solution

1. The ampoule contains a strongly acidic solution of uranium. Appropriate precautions should be taken.
2. Before opening the ampoule, ensure that any dried uranium or condensed liquid in the neck or body of the ampoule is re-dissolved into solution. This can be accomplished by inverting the ampoule repeatedly.
3. The glass ampoules are scored at the neck for ease of opening. However, glass burrs and fragments pose a cut hazard to anyone opening the ampoules. Appropriate precautions should be taken.
4. Lightly moisten the scored line on the neck with distilled water to help ensure a clean break at the score.
5. Because of the narrow neck of the ampoule it may be difficult or impossible to pour the solution out. Here is one possible method:
 - a. Obtain approximately 12-cm length of plastic capillary tubing (e.g. i.d. 0f 0.1", o.d. of 0.16").
 - b. Insert one end of the capillary tubing fully into the ampoule
 - c. Fold the remaining length of tubing along the outside of the ampoule, ensuring that the tube is not crimped and will allow the free flow of air through the tube and into the ampoule.
 - d. Holding the ampoule and tubing in one hand, and a beaker or dispensing bottle in another, invert the ampoule over the container allowing the solution to drain into it.
 - e. The capillary tubing allows air to flow into the ampoule, eliminating the "airlock" created by the narrow neck of the open ampoule.
6. The user should be wary of evaporative losses once the ampoule is opened, and prevent uranium contamination of the sample. It is recommended that the entire solution be accurately weighed and aliquanted as soon as possible after opening the sample. Precautions should be taken (clean glass/plastic ware, air filtration, etc) to prevent uranium contamination of the CRM with subsequent perturbation of the isotopic composition.

September 30, 2010
Argonne, Illinois

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Jon Neuhoff, Director
New Brunswick Laboratory

(Revision of Certificate dated March 30, 2008)

Reagent

UNAT_00014

Standard ID Number:

UNAT 00013

True Value =

70.689 dpm/mL

Date Analyzed:

11/28/2017

Radionuclide:

U-234

	Replicates	
#1	72.749	dpm/mL
#2	75.297	dpm/mL
#3	73.437	dpm/mL

Mean = 73.8276667

1 sigma = 1.31815831

1.96 sigma = 2.58359

True Value minus 5% = 67.15455

(True Value - 5%)

True Value plus 5% = 74.22345

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value?

Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value?

Yes (Acceptance Criteria)

Standard Reverification Acceptable?

Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date:

km 12-21-17

2nd Reviewed By/Date:

ALD 12/18/17

Decay Calculations

Raw Sample/Standard Information

Initial Date/Time (t ₀):	3/30/2008 0:00		
Decayto Date/Time (t):	11/28/17 0:00		
Initial Activity (A ₀):	70.69 dpm		
Initial Aliquot:	1 mL		
Initial Conc:	70.69123 dpm/mL		
*Soln. Density:	1 g/mL		
Nuclide:	U-234		
Half-Life (days):	89668875	decay days	fraction
**Decay Factor:	1.0000	3530.00	0.00004
Decay Corr Activity:	7.0689E+01 dpm		
Decay Corr Conc:	7.0689E+01 dpm/mL		

Conversion/Calculations

Final Activity Unit:	dpm
Activity Unit Factor:	1.00000
Final Volume Unit:	mL
Volume Unit Factor:	1.000
Final Concentration:	7.0689E+01 dpm/mL
Aliquot Volume:	1.0000E+00 mL
Final Activity (A):	7.0689E+01 dpm

** Uses basic decay equation: $A = A_0 * \exp(-\ln(2)*(t-t_0)/(\text{half-life}))$

* Soln. Density to be used when converting from liquid expressed in mass (g) units to liquid units (mL), and is only applied in that case.

Sample Name: Verification 1
SampleType: Sample

Sample Collection Date:

Batch Name: U-232_00039
AnalysisID: 717874

Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

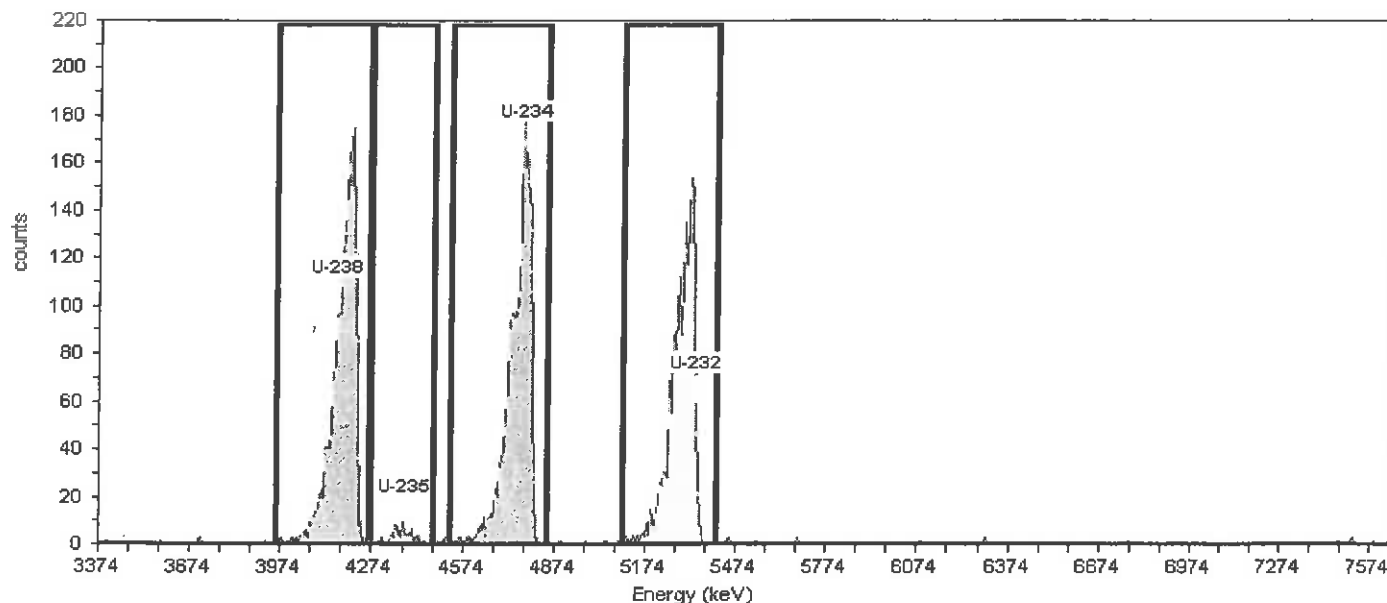
Tracer

Tracer Nuclide: U-232
Tracer Recovery: 90.40%

Acquisition

Detector: AV118
Serial Number: 49-037F4
Acquisition Start Date: 11/28/2017 6:15:19PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Background Date: 11/18/2017 3:51:24PM
Background Info: Sample: ICB;AV118; Det: AV118; Spectrum #1;
Nov-18-2017 15:51

Calibration Name: IC-9795;AV118-20170802
Calibration Date: 8/2/2017 1:38:49PM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.06% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 11/28/2017 12:43:59PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	78.5	100.0	1637	0.0000	1637.00	72.382	DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	64.9	80.2	56	0.0000	56.00	3.087	DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	75.3	99.8	1642	0.0000	1642.00	72.749	DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	80.2	100.1	1524	1.0000	1523.00	70.035	DPM/mL

Sample Name: Verification 2
SampleType: Sample

Sample Collection Date:

Batch Name: U-232_00039
AnalysisID: 717875

Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

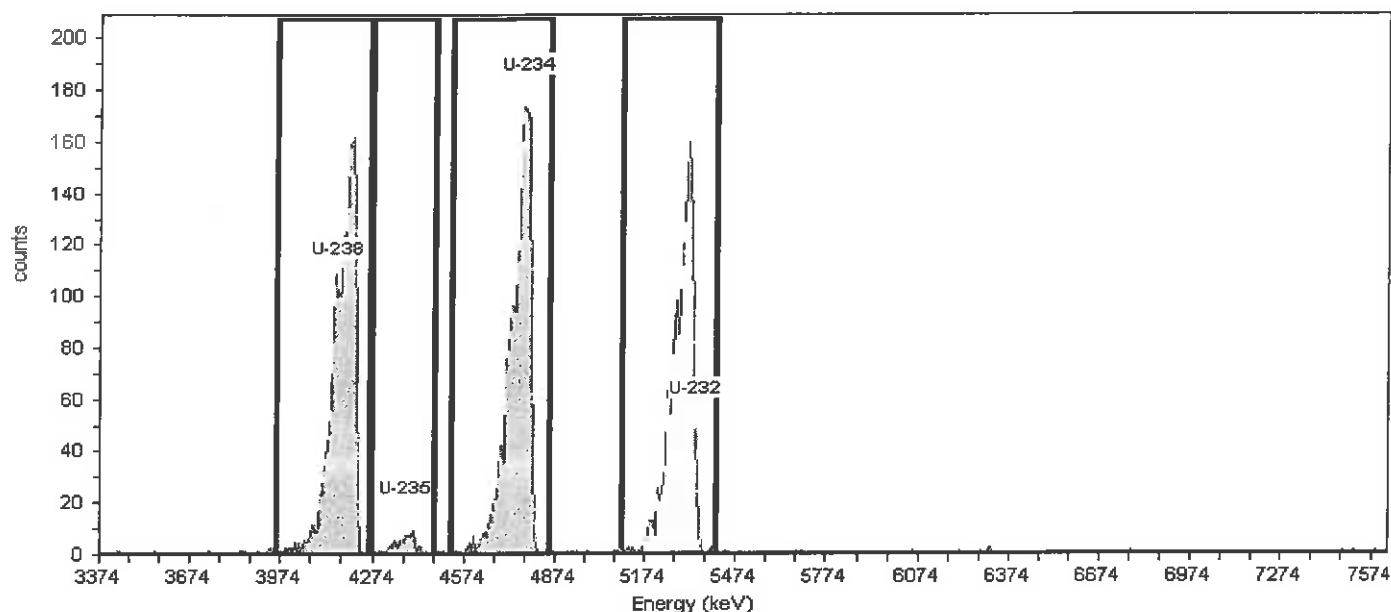
Tracer

Tracer Nuclide: U-232
Tracer Recovery: 99.72%

Acquisition

Detector: AV119
Serial Number: 49-037G6
Acquisition Start Date: 11/28/2017 6:15:20PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Background Date: 11/18/2017 3:51:26PM
Background Info: Sample: ICB;AV119; Det: AV119; Spectrum #1;
Nov-18-2017 15:51

Calibration Name: IC-9817;AV119-20170802
Calibration Date: 8/2/2017 1:39:16PM
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Energy Cal: Quadratic = 0.0000 keV / Ch²
Efficiency: 23.42% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 11/28/2017 12:43:59PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	84.0	100.0	1604	0.0000	1604.00	71.534	DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	61.4	80.2	69	0.0000	69.00	3.837	DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	71.1	99.8	1686	1.0000	1685.00	75.297	DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	78.4	100.1	1513	3.0000	1510.00	77.261	DPM/mL

Sample Name: Verification 3
SampleType: Sample

Sample Collection Date:

Batch Name: U-232_00039
AnalysisID: 717876

Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

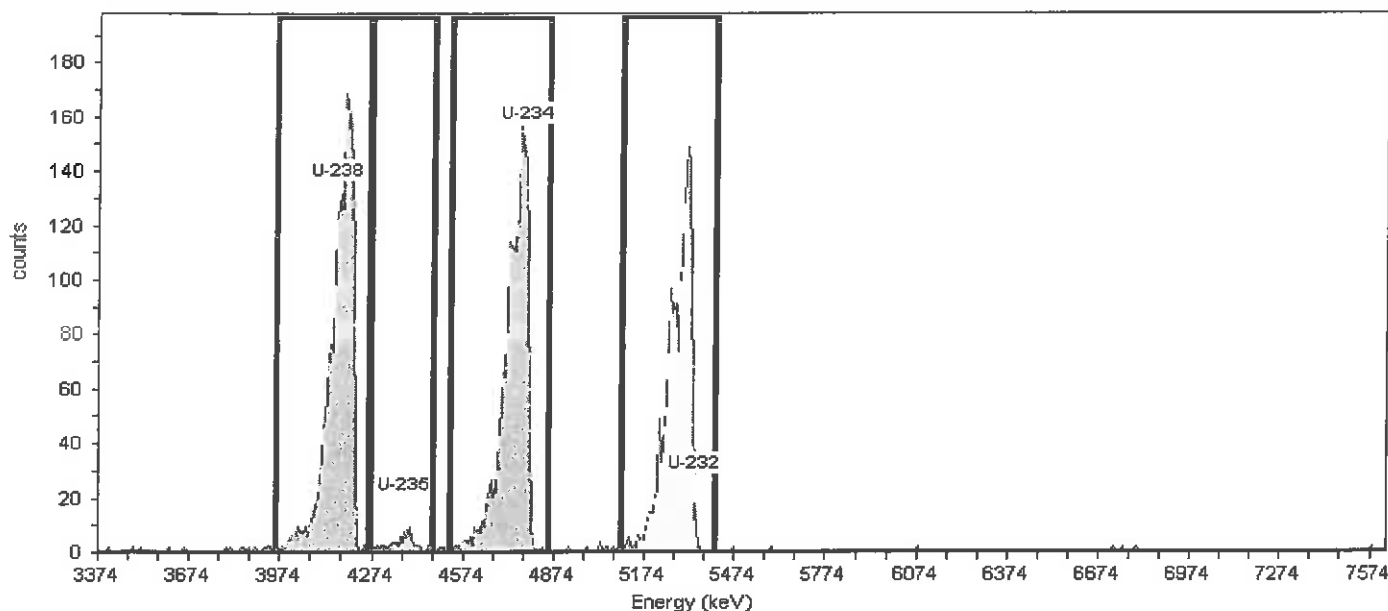
Tracer

Tracer Nuclide: U-232
Tracer Recovery: 104.37%

Acquisition

Detector: AV120
Serial Number: 49-037W3
Acquisition Start Date: 11/28/2017 6:15:21PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Background Date: 11/18/2017 3:51:28PM
Background Info: Sample: ICB;AV120; Det: AV120; Spectrum #1;
Nov-18-2017 15:51

Calibration Name: IC-9884;AV120-20170802
Calibration Date: 8/2/2017 1:39:29PM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.48% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 11/28/2017 12:43:59PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	72.0	100.0	1748	1.0000	1747.00	77.552	DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	39.5	80.2	67	0.0000	67.00	3.708	DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	80.4	99.8	1651	0.0000	1651.00	73.437	DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	89.6	100.1	1519	2.0000	1517.00	80.860	DPM/mL

Ref. 3.30.2008


Reagent ID: UNAT_00013

Description:	UNAT spike	Expiration Date:	12/22/2017
No. of Bottles:	1	Laboratory:	TestAmerica St. Louis
Storage Location:	RAD Actinide STDs	Prepared By:	Bernsen, Sarah C
Reagent Volume:	200.000 mL	Solvent:	1M HNO3
Creation Date:	11/16/2016	Solvent Lot:	n/a
Open Date:			
Container(s):	1047854		
Comment:	only U-234 and U-238 are controlled as spike analytes, and therefore we have not verified the U-235		

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
U-234	UNAT Parent_00001	12/22/2017	706.91200	dpm/mL	70.69123	dpm/mL
U-235	UNAT Parent_00001	12/22/2017	33.70600	dpm/mL	3.37064	dpm/mL
U-238	UNAT Parent_00001	12/22/2017	722.65000	dpm/mL	72.26499	dpm/mL

Source Reagents

Reagent	Description	Type	Expiration	Vendor	Vendor Lot #	Vendor Cat Lot #	Volume Used	Volume Units
UNAT Parent_00001	UNAT Parent		12/22/17				20.00000	mL

Batch No.:

THE LEADER IN ENVIRONMENTAL TESTING

No.	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	Ver 1	0.1	113	DL = 118
2	Ver 2	1	116	1 = 119
3	Ver 3	1	117	1 = 120
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Isotope(s)

☐ αβ	☐ Iso Pu	☐ Tc-99	☐ Iso Cm
☐ Iso Am	☐ Ra	☐ Iso Th	☐ Pu-241
☐ KPA	☐ Sr	☐ Iso U	☐ Th-229
☐ Np	☐ TAR	☐ C-14	☐ Cl-36

Prepared By: _____

Date: _____

Page 1

Reviewed by: _____

Date: _____

Note: If a section below is not used, marked the N/A box and Initials & date next to the N/A.
i.e. Mark the N/A box if a tracer is not added to the sample(s) then Initial and date next to the N/A

Balance ID: _____

Tracer	☐ N/A	Initials / Date
Isotope:	U-232	U-232
Std Sol'n No.:	U-232-00013	
Vol (mL):	0.1	
Ref Activity (dpm/mL):	77.2650 (U-232)	
Act Ref Date:	3-30-08	
N/A 3-30-08		

Samples Spiked and Traced By: SUB 11/22/17
Initials / Date

Verification Signature & Date: MM 11/22/2017
Initials / Date

LCS Standard	☐ N/A	Initials / Date
Isotope:	U-232	U-232
Std Sol'n ID.:	U-232-00039	
Vol (mL):	0.1	
Ref Activity (dpm/mL):	77.4716	
Act Ref Date:	04-07-03	

SOP's applied in preparing these samples. Mark box to left for all that apply:

☐ ST-RC-0003 Rev.	☐ ST-RC-0040 Rev.	☐ ST-RC-0110 Rev.
☐ ST-RC-0004 Rev.	☐ ST-RC-0041 Rev.	☐ ST-RC-0120 Rev.
☐ ST-RC-0014 Rev.	☐ ST-RC-0050 Rev.	☐ ST-RC-0232 Rev.
☐ ST-RC-0020 Rev.	☐ ST-RC-0090 Rev.	☐ ST-RC-0238 Rev.
☐ ST-RC-0021 Rev.	☐ ST-RC-0100 Rev.	☐ ST-RC-0240 Rev.
		☐ ST-RC-0241 Rev.
		☐ ST-RC-0242 Rev.
		☐ ST-RC-5016 Rev.
		☐
		☐

Count Time	Matrix
Long Count ☐	Soil ☐
Short Count ☐	H ₂ O ☐

Uranium only via UTEVA

ST-RC-0236

Batch: _____

*All rinses should flow at 1 mL/minute (only 1M HNO₃ may be done at 3 mL/minute)

UTEVA lot: <u>UTSR17E</u>	11.4.4	UTEVA cartridge	
	11.4.5	5mL 1M HNO ₃	COMPLETED ☒
	11.4.6	1000 sample	
	11.4.7	25mL 3M HNO ₃	COMPLETED ☒
	11.4.8	5mL 9M HCl	COMPLETED ☒
	11.4.9	20mL 5M HCl / 0.05M oxalic	COMPLETED ☒
11.4.10- 11.4.11		Elute into clean tube with 15mL 1M HCl	COMPLETED ☒

Standard ID Number: **UNAT 00013**
True Value = **72.265** dpm/mL
Date Analyzed: **11/28/2017**

Radionuclide:
U-238

	Replicates	
#1	72.382	dpm/mL
#2	71.534	dpm/mL
#3	77.552	dpm/mL

Mean = 73.8226667

1 sigma = 3.25741022

1.96 sigma = 6.384524

True Value minus 5% = 68.65175

(True Value - 5%)

True Value plus 5% = 75.87825

(True Value + 5%)

Accuracy:

Mean value within 5% of Certified (True) Value?

Yes (Acceptance Criteria)

Precision:

1.96 sigma Value Within 10% of Mean Value?

Yes (Acceptance Criteria)

Standard Reverification Acceptable?

Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: Rm 12-18-17

2nd Reviewed By/Date: ALD 12/18/17

Decay Calculations

Raw Sample/Standard Information

Initial Date/Time (t ₀):	3/30/2008 0:00		
Decayto Date/Time (t):	11/28/17 0:00		
Initial Activity (A ₀):	72.26 dpm		
Initial Aliquot:	1 mL		
Initial Conc:	72.26499 dpm/mL		
*Soln. Density:	1 g/mL		
Nuclide:	U-238		
Half-Life (days):	1.63194E+12	decay days	fraction
**Decay Factor:	1.0000	3530.00	0.00000
Decay Corr Activity:	7.2265E+01 dpm		
Decay Corr Conc:	7.2265E+01 dpm/mL		

Conversion/Calculations

Final Activity Unit:	dpm
Activity Unit Factor:	1.00000
Final Volume Unit:	mL
Volume Unit Factor:	1.000
Final Concentration:	7.2265E+01 dpm/mL
Aliquot Volume:	1.0000E+00 mL
Final Activity (A):	7.2265E+01 dpm

** Uses basic decay equation: $A = A_0 * \exp(-\ln(2)*(t-t_0)/(\text{half-life}))$

* Soln. Density to be used when converting from liquid expressed in mass (g) units to liquid units (mL), and is only applied in that case.

Sample Name: Verification 1

Sample Type: Sample

Sample Collection Date:

Batch Name: U-232_00039

Analysis ID: 717874

Tracer Name: U-232_00039

Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM

Tracer Ref. Date: 4/7/2003 11:00:47PM

Detector: AV118

Serial Number: 49-037F4

Acquisition Start Date: 11/28/2017 6:15:19PM

Live Time: 960.00 min.

Real Time: 960.02 min.

Background Date: 11/18/2017 3:51:24PM

Background Info: Sample: ICB; AV118; Det: AV118; Spectrum #1;
Nov-18-2017 15:51

Sample

Spectrum #1 Analysis #1

Sample Volume : 0.1000mL

Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

Tracer

Tracer Nuclide: U-232

Tracer Recovery: 90.40%

Acquisition

Calibration Name: IC-9795; AV118-20170802

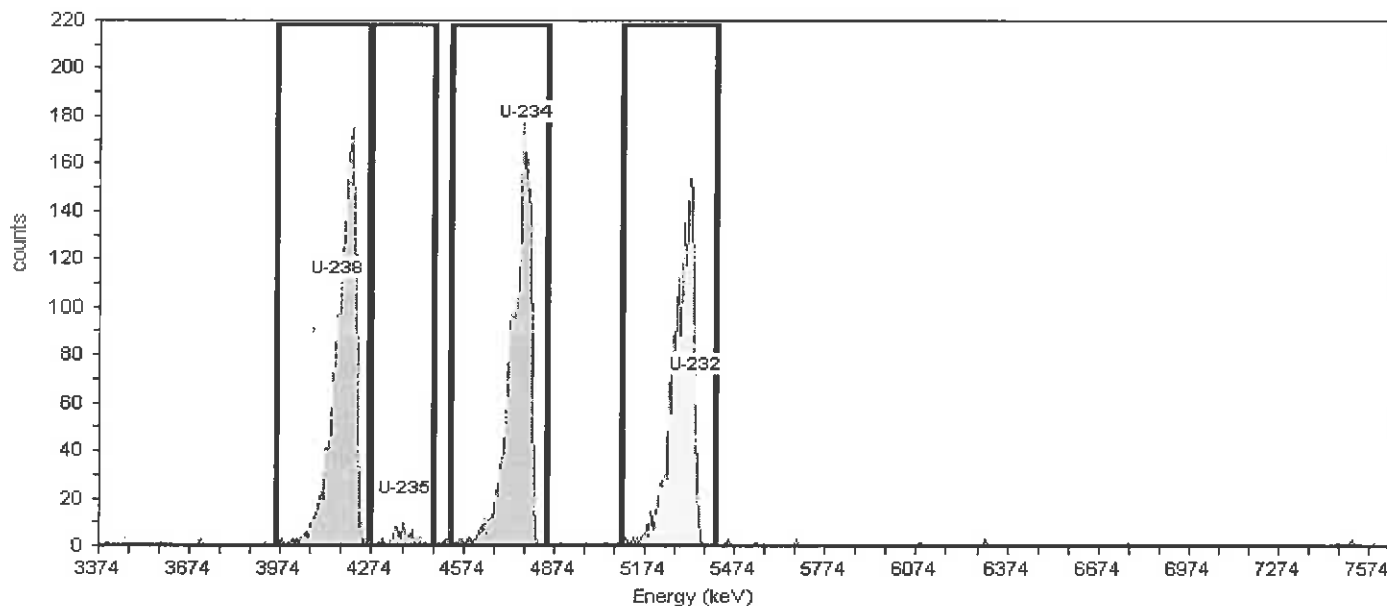
Calibration Date: 8/2/2017 1:38:49PM

Gain = 7.4575 keV / Ch

Energy Cal: Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 26.06% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI

Decay Correction: 11/28/2017 12:43:59PM

MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Uranium

MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	78.5	100.0	1637	0.0000	1637.00	72.382	DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	64.9	80.2	56	0.0000	56.00	3.087	DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	75.3	99.8	1642	0.0000	1642.00	72.749	DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	80.2	100.1	1524	1.0000	1523.00	70.035	DPM/mL

Sample Name: Verification 2
SampleType: Sample

Sample Collection Date:

Batch Name: U-232_00039
AnalysisID: 717875

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

Tracer

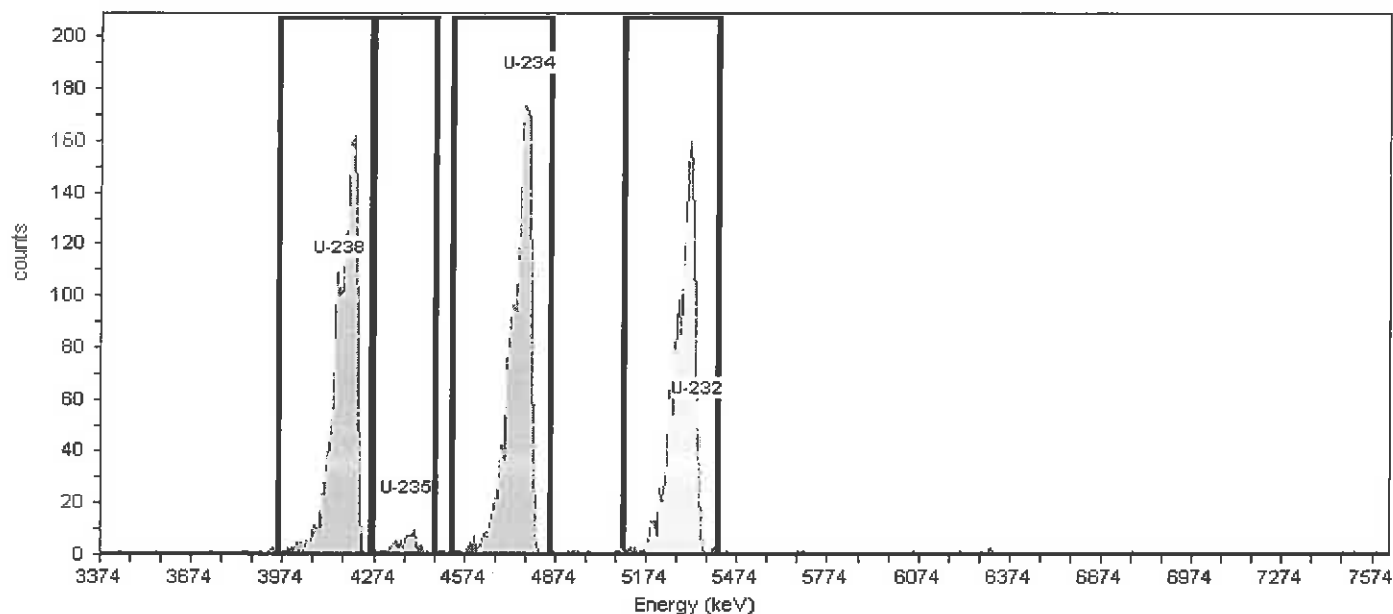
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

Tracer Nuclide: U-232
Tracer Recovery: 99.72%

Acquisition

Detector: AV119
Serial Number: 49-037G6
Acquisition Start Date: 11/28/2017 6:15:20PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Background Date: 11/18/2017 3:51:26PM
Background Info: Sample: ICB;AV119; Det: AV119; Spectrum #1;
Nov-18-2017 15:51

Calibration Name: IC-9817;AV119-20170802
Calibration Date: 8/2/2017 1:39:16PM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 23.42% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 11/28/2017 12:43:59PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	84.0	100.0	1604	0.0000	1604.00	71.534	DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	61.4	80.2	69	0.0000	69.00	3.837	DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	71.1	99.8	1686	1.0000	1685.00	75.297	DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	78.4	100.1	1513	3.0000	1510.00	77.261	DPM/mL

Sample Name: Verification 3

SampleType: Sample

Sample Collection Date:

Batch Name: U-232_00039

AnalysisID: 717876

Tracer Name: U-232_00039

Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM

Tracer Ref. Date: 4/7/2003 11:00:47PM

Sample

Spectrum #1 Analysis #1

Sample Volume : 0.1000mL

Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

Tracer

Tracer Nuclide: U-232

Tracer Recovery: 104.37%

Acquisition

Detector: AV120

Serial Number: 49-037W3

Acquisition Start Date: 11/28/2017 6:15:21PM

Live Time: 960.00 min.

Real Time: 960.02 min.

Background Date: 11/18/2017 3:51:28PM

Background Info: Sample: ICB;AV120; Det: AV120; Spectrum #1;
Nov-18-2017 15:51

Calibration Name: IC-9884;AV120-20170802

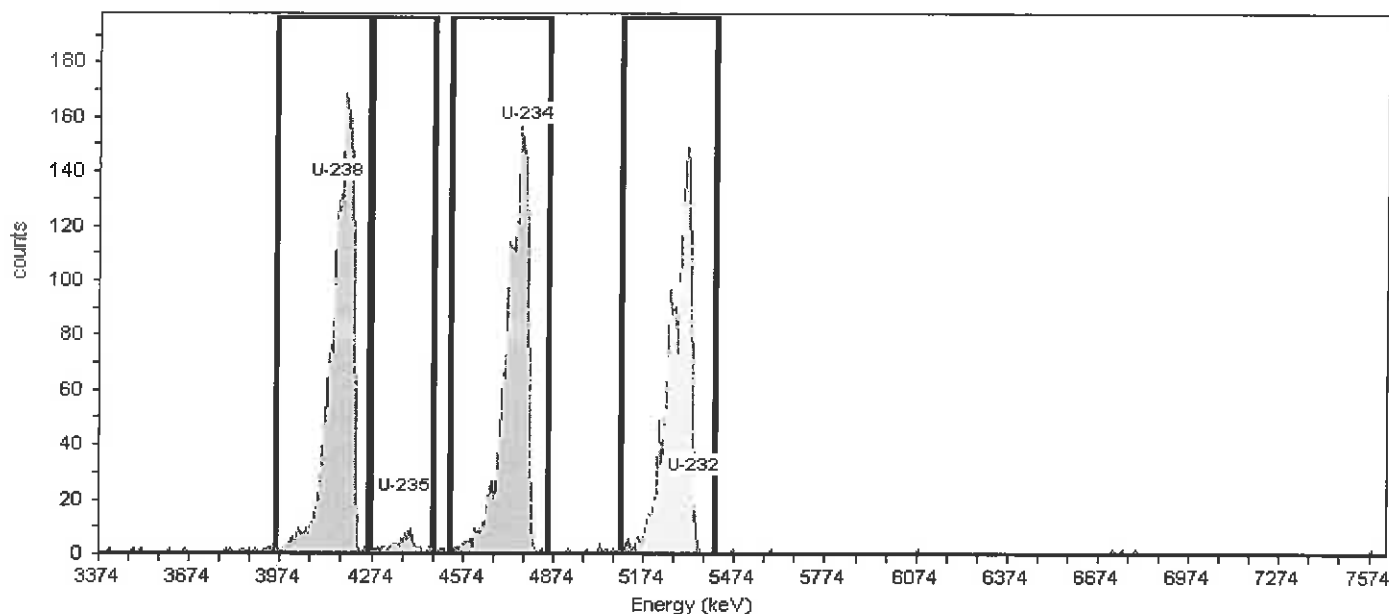
Calibration Date: 8/2/2017 1:39:29PM

Gain = 7.4575 keV / Ch

Energy Cal: Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 22.48% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI

Decay Correction: 11/28/2017 12:43:59PM

MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Uranium

MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	72.0	100.0	1748	1.0000	1747.00	77.552	DPM/mL
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	39.5	80.2	67	0.0000	67.00	3.708	DPM/mL
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	80.4	99.8	1651	0.0000	1651.00	73.437	DPM/mL
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	89.6	100.1	1519	2.0000	1517.00	80.860	DPM/mL

Ref. 3-30-2008


Reagent ID: UNAT_00013

Description:	UNAT spike	Expiration Date:	12/22/2017
No. of Bottles:	1	Laboratory:	TestAmerica St. Louis
Storage Location:	RAD Actinide STDs	Prepared By:	Bernsen, Sarah C
Reagent Volume:	200.000 mL	Solvent:	1M HNO3
Creation Date:	11/16/2016	Solvent Lot:	n/a
Open Date:			
Container(s):	1047854		
Comment:	only U-234 and U-238 are controlled as spike analytes, and therefore we have not verified the U-235		

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
U-234	UNAT Parent_00001	12/22/2017	706.91200	dpm/mL	70.69123	dpm/mL
U-235	UNAT Parent_00001	12/22/2017	33.70600	dpm/mL	3.37064	dpm/mL
U-238	UNAT Parent_00001	12/22/2017	722.65000	dpm/mL	72.26499	dpm/mL

Source Reagents

Reagent	Description	Type	Expiration	Vendor	Vendor Lot #	Vendor Cat Lot #	Volume Used	Volume Units
UNAT Parent_00001	UNAT Parent		12/22/17				20.00000	mL

U-232 Tracer Ver.
Aliquot Only

Batch No. :

Balance ID :

Note: If a section below is not used, mark the N/A box and initial & date next to the N/A.
I.e. Mark the N/A box if a tracer is not added to the sample(s) then initial and date next to the N/A

No	Sample Number	Aliquot (g/mL)	Crucible ID	Dilution
1	Ver 1	0.1	113	100 = 118
2	Ver 2	1	116	1 = 119
3	Ver 3	1	117	1 = 120
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Tracer ☐ N/A Initials / Date

Isotope: U-232

Std Sol'n No.: U-232-00039

Vol (mL): 0.1

Ref Activity (dpm/mL): 77.2650 (U-232)

Act Ref Date: 2-20-03

NEW FORM

Samples Spiked and Traced By: SAB Initials / Date 11/22/17

Verification Signature & Date: MM Initials / Date 11/22/2017

LCS Standard ☐ 42 Initials / Date

Isotope: U-232

Std Sol'n ID.: U-232-00039

Vol (mL): 0.1

Ref Activity (dpm/mL): 77.4711

Act Ref Date: 04-07-03

SOP's applied in preparing these samples. Mark box to left for all that apply:

☐ ST-RC-0003 Rev.	☐ ST-RC-0040 Rev.	☐ ST-RC-0110 Rev.
☐ ST-RC-0004 Rev.	☐ ST-RC-0041 Rev.	☐ ST-RC-0120 Rev.
☐ ST-RC-0014 Rev.	☐ ST-RC-0050 Rev.	☐ ST-RC-0232 Rev.
☐ ST-RC-0020 Rev.	☐ ST-RC-0090 Rev.	☐ ST-RC-0238 Rev.
☐ ST-RC-0021 Rev.	☐ ST-RC-0100 Rev.	☐ ST-RC-0240 Rev.
		☐ ST-RC-0241 Rev.
		☐ ST-RC-0242 Rev.
		☐ ST-RC-5016 Rev.
		☐
		☐

Isotope(s)

☐ αβ	☐ Iso Pu	☐ Tc-99	☐ Iso Cm
☐ Iso Am	☐ Ra	☐ Iso Th	☐ Pu-241
☐ KPA	☐ Sr	☐ Iso U	☐ Th-229
☐ Np	☐ TAR	☐ C-14	☐ Cl-36

Count Time

Long Count ☐ Short Count ☐

Matrix

Soil ☐ H₂O ☐

Prepared By :
Date :

Reviewed by :
Date :

Uranium only via UTEVA

ST-RC-0238

Batch: _____

*All reagents should flow at 1 mL/minute (only 3M HNO₃ may be done at 3 mL/minute)

Step	Action	Status
11.4.4	UTEVA cartridge	
11.4.5	5mL 3M HNO ₃	COMPLETED ☐
11.4.6	1000 sample	
11.4.7	25mL 3M HNO ₃	COMPLETED ☒
11.4.8	5mL 9M HCl	COMPLETED ☒
11.4.9	20mL 5M HCl / 0.05M oxalic	COMPLETED ☒
11.4.10-11.4.11	Elute into clean tube with 15mL 1M HCl	COMPLETED ☒

Reagent

Y Carrier_00032



REPORT OF ANALYSIS

Single-Element Aqueous RM

Yttrium Oxide

Product #: Z-067074-05-1L

Matrix: 10% HNO₃

Lot #: 10064660-5

Analyte	Certified Concentration
Y ₂ O ₃	50,000 µg/mL

Intended Use: This solution is intended for use as a reference material (RM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This RM was manufactured, processed, and/or certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO Guide 34**, and **ISO/IEC 17025**. This RM was prepared to a nominal concentration of 50,000 µg/mL by gravimetric methods using single-element concentrate dissolved in high purity nitric acid (HNO₃) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this RM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentration was determined based upon gravimetric procedures. Secondary verification of the certified concentration was performed using ICP-OES and is traceable to **NIST SRM 3167a**. The uncertainty associated with the certified concentration is ±0.5% relative, which is the sum of the estimated errors due to the purity of the raw materials, the gravimetric preparation of the solution, and transpiration through the container. This represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the RM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original RM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau, Certifying Officer

April 6, 2018
Certification Date

CPI International waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

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Santa Rosa, CA 95403 P: 800.878.7654
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Europe
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1013BG Amsterdam F: +31 20 420 28 36
The Netherlands



REPORT OF ANALYSIS

Single-Element Aqueous RM

Yttrium Oxide

Product #: Z-067074-05-1L

Matrix: 10% HNO₃

Lot #: 10064660-5

Analyte	Certified Concentration
Y ₂ O ₃	50,000 µg/mL

Intended Use: This solution is intended for use as a reference material (RM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This RM was manufactured, processed, and/or certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO Guide 34**, and **ISO/IEC 17025**. This RM was prepared to a nominal concentration of 50,000 µg/mL by gravimetric methods using single-element concentrate dissolved in high purity nitric acid (HNO₃) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this RM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentration was determined based upon gravimetric procedures. Secondary verification of the certified concentration was performed using ICP-OES and is traceable to **NIST SRM 3167a**. The uncertainty associated with the certified concentration is ±0.5% relative, which is the sum of the estimated errors due to the purity of the raw materials, the gravimetric preparation of the solution, and transpiration through the container. This represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the RM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original RM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: CPI International ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau, Certifying Officer

April 6, 2018

Certification Date

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Europe
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1013BG Amsterdam F: +31 20 420 28 36
The Netherlands

Reagent

Complex CN_00006



Certified Reference Material CRM

CERTIFIED WEIGHT REPORT:

Part Number:
Lot Number:
Description:

54150
021017
Complex Cyanide (CN⁻)

Lot #

Solvent: 021017 ASTM Type 1 Water

Expiration Date:
Recommended Storage:
Nominal Concentration (µg/mL):
NIST Test Number:

021019
Refrigerate (4 °C)
1000
822-275872-11

5E-05 Balance Uncertainty
0.058 Flask Uncertainty
Weights shown below were diluted to (mL): 999.86

Formulated By:	Lawrence Barry
Reviewed By:	Pedro L. Rentas

MSDS Information

Compound	RM#	Lot Number	Nominal Conc. (µg/mL)	Purity (%)	Uncertainty Assay (%)	Target Weight (g)	Actual Weight (g)	Actual Conc. (µg/mL)	Expanded Uncertainty +/- (µg/mL)	Solvent Safety Info. On Attached pg.)		
										CAS#	OSHA PEL (TWA)	LD50
1. Potassium Ferricyanide (III) (CN)	IN166	TS08427AR	1000.0	99.0	0.10	47.5	2.12846	2.12850	1000.0	2.0	13746-66-2	NA
2. Sodium hydroxide, ACS	IN072	MXBG2154V	NA	97.0	0.10	40.0	1.59977	1.59988	640.0	NA	1310-79-2	2 mg/m3
												40 mg/kg
												NA



3612388
ID: Complex CN_00005
Exp: 02/22/19 Pppl.LDT Ogn: 02/22/17
1000 ppm STD Potassium Fe



3710353
ID: Complex CN_00006
Exp: 02/10/19 Pppl.LDT Ogn: 02/22/17
1000 ppm STD Potassium Fe

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
- * All standard containers are meticulously cleaned prior to use.
- * Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- * Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- * All Standards should be stored with caps tight and under appropriate laboratory conditions.
- * Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).

Reagent

OP_Hexadecane_00002



EMD Chemicals Inc.
480 S. Democrat Road
Gibbstown, NJ 08027
Phone 856-423-6300
Fax 856-423-4389

Name: Hexadecane
Olefin Free, A.S.T.M. Grade Cetane

Formula: $\text{CH}_3(\text{CH}_2)_{14}\text{CH}_3$

Item Number: HX0200-1, HX0200-3, HX0200-901

Formula Wt: 226.45

Lot Number: 51126121

Data Order No: 000431481

CHARACTERISTIC	REQUIREMENT		RESULTS	UNITS
	Min.	Max.		
Assay (GC)	99.0		99.07	%
Color (APHA)		10	< 10	
Form			Clear liquid	
Infrared spectrum			Conforms	

Gene A. Desotelle,
Quality Control Manager

Release Date: 3/13/2013

EMD Chemicals Inc.
(Formerly EM Science, A Division of EM Industries, Inc.)
An Affiliate of Merck KGaA, Darmstadt, Germany



Specification

8.20633.0005 n-Hexadecane for synthesis

Specification		
Assay (GC, area%)	≥ 99.0	% (a/a)
Density (d 20 °C/ 4 °C)	0.773 - 0.774	
Identity (GC)	passes test	

Due to its specific melting range the product may be solid, liquid, a solidified melt or a supercooled melt.

Dr. Oliver Schramel
Responsible laboratory manager quality control

This document has been produced electronically and is valid without a signature.

Reagent

W_Celite_00006



1 Reagent Lane
Fair Lawn, NJ 07410
201.796.7100 tel
201.796.1329 fax

Certificate of Analysis

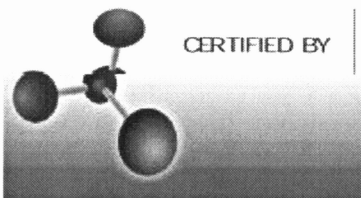
Fisher Scientific's Quality System has been found to conform to Quality Management System
Standard ISO9001:2008 standard by SAI Global Certificate Number CERT - 0090918

4058837
ID: W_Celite_00006
Exp 01/31/22 Prpd BMC Oprn 08/05/17
S_Celite

This is to certify that units of the lot number below were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	C212	Quality Test / Release Date 2/21/2017	
Lot Number	170908		
Description	CELITE 545		
Country of Origin	United States	* Suggested Retest Date	Feb-2022
Chemical Origin	Organic - Plant		
BSE/TSE Comment	This product is a synthetic silicate, processed from the skeletal remains of single-celled plants called diatoms. There is no known potential for BSE or TSE to be present in this material.		

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	White powder
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST



Jeresa Bailey-Wyche

Quality Assurance Specialist - Certificate of Analysis Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.
*Based on suggested storage condition.

Reagent

W_CNworkLCS_00052



CERTIFIED WEIGHT REPORT

Part Number: **54150**
Lot Number: **021017**
Description: **Complex Cyanide (CN)**

Solvent: **021017** Lot #
ASTM Type 1 Water

Expiration Date: **021019**
Recommended Storage: **Refrigerate (4 °C)**
Nominal Concentration (µg/mL): **1000**
NIST Test Number: **822-275872-11**

Weights shown below were diluted to (mL): **999.86** **0.058** Balance Uncertainty
0.058 Flask Uncertainty

Formulated By:	Lawrence Barry	021017
Reviewed By:	Pedro L. Rentas	021017

MSDS Information

Compound	Lot	Nominal	Purity	Uncertainty	Assay	Target	Actual	Actual	Uncertainty	(Solvent Safety Info. On Attached pg.)		NIST		
	RM#	Number	Conc. (µg/mL)	(%)	Purity (%)	(%)	Weight (g)	Weight (g)	Conc. (µg/mL)	+/- (µg/mL)	CAS#	OSHA PEL (TWA)	LD50	SRM
1. Potassium Ferricyanide (III) (CN)	IN166	TS08427AR	1000.0	99.0	0.10	47.5	2.12846	2.12850	1000.0	2.0	13746-66-2	NA	ol-mus 2970mg/kg	3141a
2. Sodium hydroxide, ACS	IN072	MKBG2154V	NA	97.0	0.10	40.0	1.59977	1.59988	640.0	NA	1310-73-2	2 mg/m3	40 mg/kg	NA

- * The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- * Purified acids, 18.2 megohm deionized water, calibrated Class A glassware and the highest purity raw materials are used in the preparation of all standards.
- * All standard containers are meticulously cleaned prior to use.
- * Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- * Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- * All Standards should be stored with caps tight and under appropriate laboratory conditions.
- * Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).

Reagent

W_Cyanide Std_00048

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories." Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



Testing Laboratory
Certificate 863.01



Reference Material Producer
Certificate 863.02

2.0 PRODUCT DESCRIPTION

Product Code: **Water QC Reference Material**
Catalog Number: CN-1000-25
Lot Number: N2-CN665509
Matrix: H₂O
Starting Material: NaCN
Starting Material Lot #: 00426KR



4387829

ID: W_Cyanide Std_00048

Exp: 03/08/20 Prep: SDI

S_Cyanide Free Standard

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: $990 \pm 20 \mu\text{g/mL}$
Density: 0.999 g/mL (measured at $20 \pm 4^\circ\text{C}$)
Assay Information:
Assay Method #1 $990 \pm 6 \mu\text{g/mL}$
Titrimetric Method, NIST SRM 3151, Lot Number 160729

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM/RM by Two Methods

Certified Value, $X_{\text{CRM/RM}}$, where two methods of characterization are used is the weighted mean of the two results:

$$X_{\text{CRM/RM}} = [(w_a)(X_a) + (w_b)(X_b)]$$

X_a = mean of Assay Method A with standard uncertainty $u_{\text{char } a}$

X_b = mean of Assay Method B with standard uncertainty $u_{\text{char } b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$$w_a = (1/u_{\text{char } a})^2 / ((1/u_{\text{char } a})^2 + (1/u_{\text{char } b})^2)$$

$$w_b = (1/u_{\text{char } b})^2 / ((1/u_{\text{char } a})^2 + (1/u_{\text{char } b})^2)$$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k(u_{\text{char } a \& b}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char } a \& b} = [(w_a)^2(u_{\text{char } a})^2 + (w_b)^2(u_{\text{char } b})^2]^{1/2}$ where $u_{\text{char } a}$ and $u_{\text{char } b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$X_{\text{CRM/RM}}$ = mean of Assay Method A with standard uncertainty $u_{\text{char } a}$

$$\text{CRM/RM Expanded Uncertainty } (\pm) = U_{\text{CRM/RM}} = k(u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{its}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{\text{char } a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{its} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

No correction has been applied for transpiration that will occur after the CRM/RM bottle has been removed from the sealed aluminized bag. See Section 7.0 (Instructions for the Correct Use of this Reference Material) for more information.

4.0 TRACEABILITY TO NIST

-This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution

errors. In rare cases where no NIST SRM/RM are available, the term "in-house std." is specified.

4.1 Thermometer Calibration

-All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

-All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

-An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL) - N/A

6.0 INTENDED USE

-For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

-For optimum conditions, this product should be frozen before opening. If this is not possible, then it should be stored at 4°C. Bring to room temperature and shake well before using to ensure the homogeneity of the solution. EPA method 335.4 recommends that the prepared sample (See Sec. 7.2) be analyzed within 14 days and stored at 4°C.

-While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur. It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

-After opening the sealed TCT bag keep cap tightly sealed when not in use. Do not pipette from the container. Do not return removed aliquots to container.

-For more information, visit www.inorganicventures.com/TCT.

7.2 Preparation Instructions

Carefully open the container and transfer solution to a clean, dry glass or plastic container for pipetting. If following EPA method 335.4, preserve any diluted solutions to pH of ≥ 12 with NaOH.

8.0 HAZARDOUS INFORMATION

-Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

-This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B – Nuclear Regulatory Commission

-Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 – Nuclear Regulatory Commission

-Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.4 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

-Chemical Testing – Accredited / A2LA Certificate Number 883.01

10.5 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

-Reference Material Producer – Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 7, 2018

-The certification is valid within the measurement uncertainty specified, provided the CRM/RM is stored and handled in accordance with instructions given in Section 7.1. This certification is nullified if instructions in Section 7.1 are not followed or if the CRM/RM is damaged, contaminated or otherwise modified.

11.2 Period of Validity

-Sealed TCT Bag Open Date: _____

-This CRM/RM should not be used longer than one year from the date of opening the sealed TCT bag or after the date given in Section-11.3, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instruction given in Section 7.1.

11.3 Lot Expiration Date

March 7, 2020

-The date after which this CRM/RM should not be used (See Section 11.2)

-The lot expiration date reflects the period of time the stability of a CRM/RM can be supported by long-term stability studies conducted on properly stored and handled CRM/RMs.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Joseph Burns
Product Documentation Supervisor



Certificate Approved By:

Brian Alexander
PhD., Technical Process Director



Certifying Officer:

Paul Gaines
PhD., Senior Technical Director



Method 300.0

Anions (IC) by Method 300.0

FORM III
HPLC/IC LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: 080318- 4.d
Lab ID: LCS 160-380227/4 Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Fluoride	1000	1000	100	90-110	

Column to be used to flag recovery and RPD values

FORM III
HPLC/IC MATRIX SPIKE RECOVERY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: 080318- 47.d
Lab ID: 160-29476-1 MS DL Client ID: CRC-MW-1 MS DL

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Fluoride	40000	4700	46200	104	90-110	

Column to be used to flag recovery and RPD values

FORM IV
HPLC/IC METHOD BLANK SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Lab File ID: 080318- 3.d Lab Sample ID: MB 160-380227/3
 Matrix: Water Date Extracted: _____
 Instrument ID: CIC2500 Date Analyzed: 08/03/2018 18:49
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	CCB 160-380227/2	080318- 2.d	08/03/2018 18:32
	LCS 160-380227/4	080318- 4.d	08/03/2018 19:06
	CCB 160-380227/14	080318- 14.d	08/03/2018 21:56
	CCB 160-380227/37	080318- 37.d	08/04/2018 04:25
CRC-MW-1 DL	160-29476-1 DL	080318- 43.d	08/04/2018 06:06
CRC-MW-1 DU DL	160-29476-1 DU DL	080318- 45.d	08/04/2018 06:40
CRC-MW-1 MS DL	160-29476-1 MS DL	080318- 47.d	08/04/2018 07:14
	CCB 160-380227/49	080318- 49.d	08/04/2018 07:48

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: CRC-MW-1 DL Lab Sample ID: 160-29476-1 DL
Matrix: Water Lab File ID: 080318- 43.d
Analysis Method: 300.0 Date Collected: 07/11/2018 13:55
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/04/2018 06:06
Con. Extract Vol.: _____ Dilution Factor: 20
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 380227 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	4700		2000	520

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 43.d
 Lims ID: 160-29476-Q-1
 Client ID: CRC-MW-1
 Sample Type: Client
 Inject. Date: 04-Aug-2018 06:06:00 ALS Bottle#: 0 Worklist Smp#: 43
 Injection Vol: 50.0 uL Dil. Factor: 20.0000
 Sample Info: 160-0013784-043
 Misc. Info.: 15298 160-29476-Q-1
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:49 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:39:58

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ug/l	Flags
1 Fluoride	3.025	3.067	-0.042	5065675	235.1	M
2 Chloride	4.167	4.200	-0.033	25953804	1597.3	
3 Nitrite as N		4.950			ND	
4 Bromide		6.100			ND	
5 Nitrate as N	6.958	7.050	-0.092	375276	9.93	
8 Chlorate		7.533			ND	
6 Orthophosphate		9.233			ND	
7 Sulfate	11.533	11.700	-0.167	18655069	1490.9	
10 Orthophosphate as P		0.000			ND	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 43.d

Injection Date: 04-Aug-2018 06:06:00

Instrument ID: CIC2500

Operator ID:

Lims ID: 160-29476-Q-1

Lab Sample ID: 160-29476-1

Worklist Smp#: 43

Client ID: CRC-MW-1

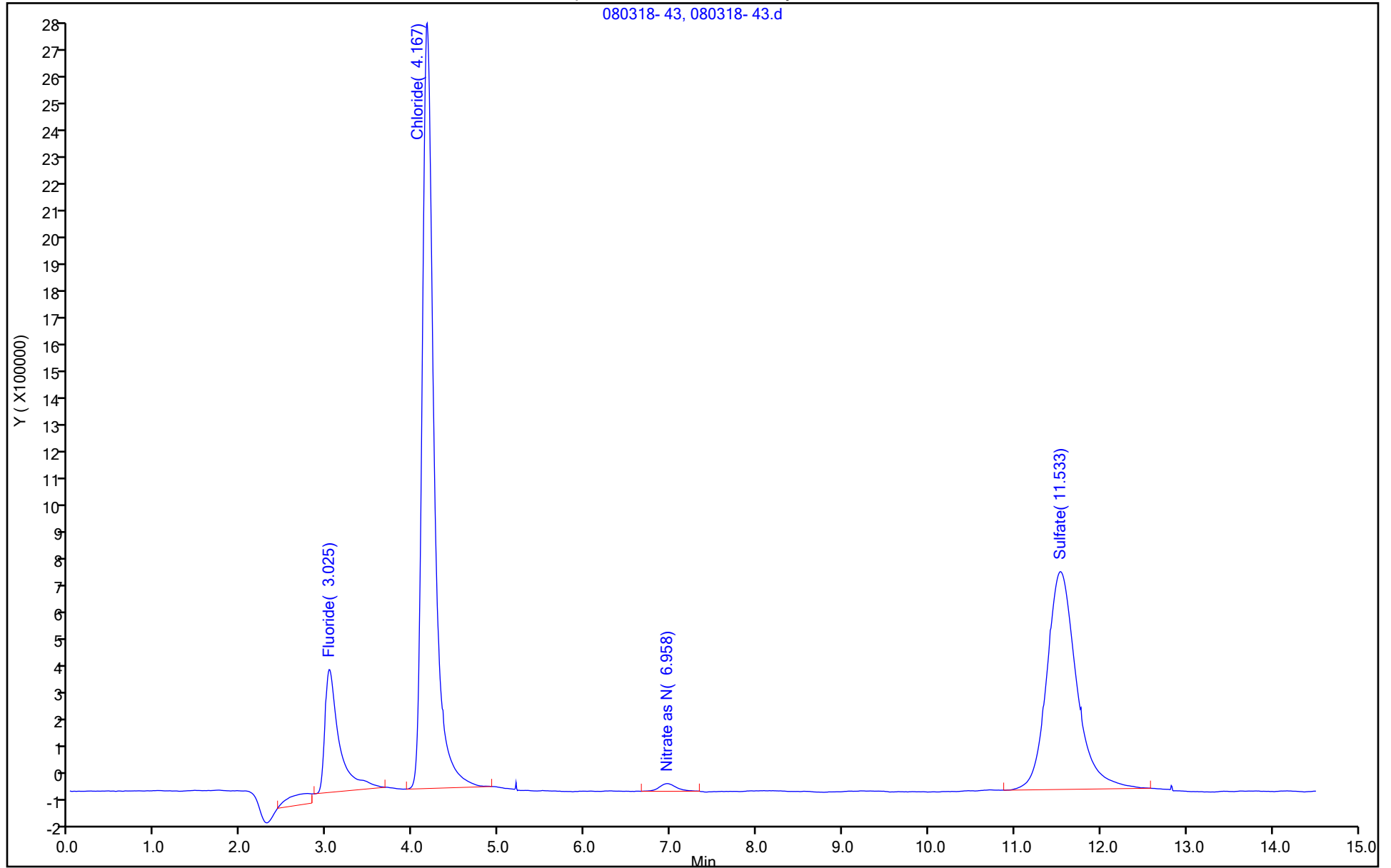
Injection Vol: 50.0 uL

Dil. Factor: 20.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

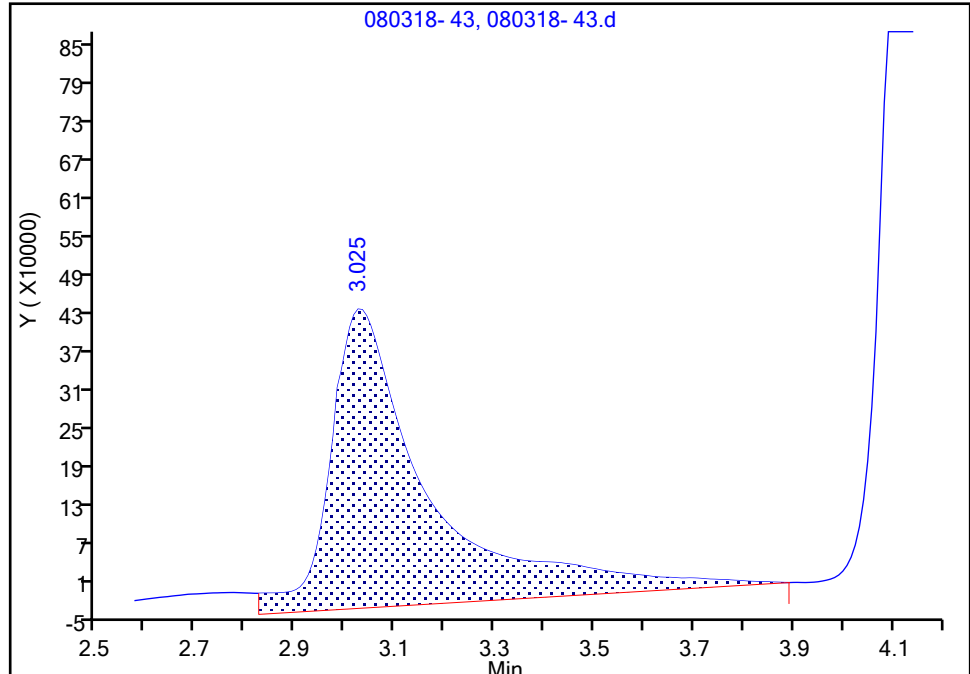
Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 43.d
Injection Date: 04-Aug-2018 06:06:00 Instrument ID: CIC2500
Lims ID: 160-29476-Q-1 Lab Sample ID: 160-29476-1
Client ID: CRC-MW-1
Operator ID: ALS Bottle#: 0 Worklist Smp#: 43
Injection Vol: 50.0 uL Dil. Factor: 20.0000
Method: Anions_CIC2500 Limit Group: WT - IC - 28Days
Column: Detector 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

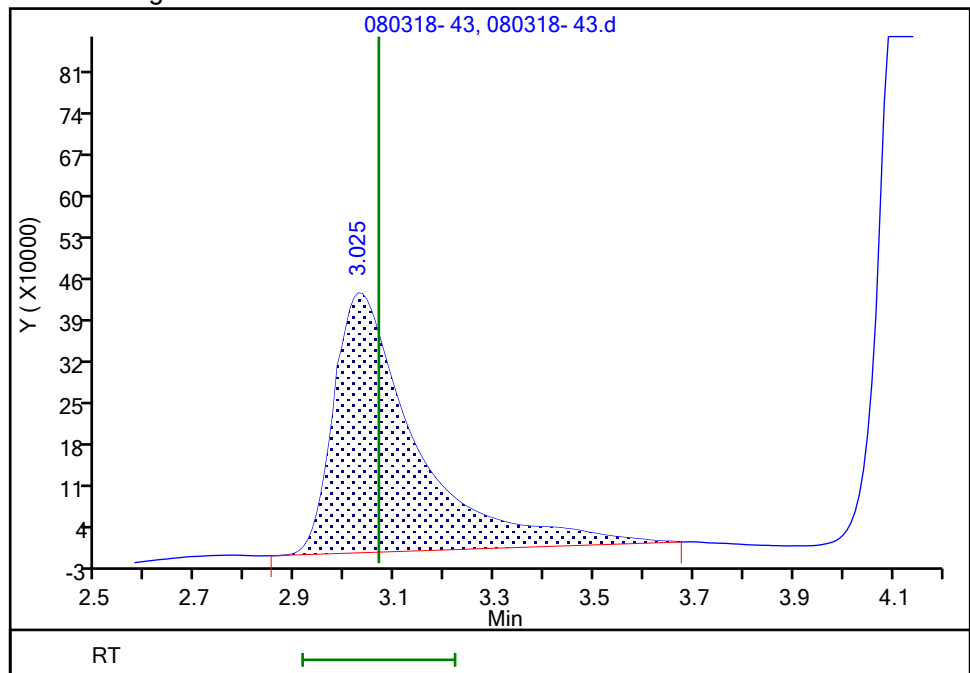
RT: 3.03
Area: 6421742
Amount: 297.9754
Amount Units: ug/l

Processing Integration Results



RT: 3.03
Area: 5065675
Amount: 235.0525
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 06-Aug-2018 10:39:51
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

FORM VI
HPLC/IC BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1 Analy Batch No.: 379990

SDG No.: _____

Instrument ID: CIC2500 GC Column: IonPacAS14 ID: 4 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 16:50 Calibration End Date: 08/02/2018 18:15 Calibration ID: 14920

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD0 160-379990/1	080218- 1.d
Level 2	STD2 160-379990/2	080218- 2.d
Level 3	STD3 160-379990/3	080218- 3.d
Level 4	STD4 160-379990/4	080218- 4.d
Level 5	STD5 160-379990/5	080218- 5.d
Level 6	STD6 160-379990/6	080218- 6.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6					RT WINDOW	AVG RT
Fluoride		3.050	3.042	3.067	3.050	3.050					2.913 - 3.220	3.052
Chloride	+++++	4.183	4.167	4.200	4.183	4.192					3.990 - 4.410	4.185
Bromide		6.092	6.083	6.100	6.083	6.083					5.795 - 6.405	6.088
Sulfate		11.683	11.683	11.700	11.692	11.675					11.115 - 12.285	11.687

FORM VI
HPLC/IC BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1 Analy Batch No.: 379990

SDG No.: _____

Instrument ID: CIC2500 GC Column: IonPacAS14 ID: 4 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 16:50 Calibration End Date: 08/02/2018 18:15 Calibration ID: 14920

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD0 160-379990/1	080218- 1.d
Level 2	STD2 160-379990/2	080218- 2.d
Level 3	STD3 160-379990/3	080218- 3.d
Level 4	STD4 160-379990/4	080218- 4.d
Level 5	STD5 160-379990/5	080218- 5.d
Level 6	STD6 160-379990/6	080218- 6.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3	LVL 4		B	M1	M2								
Fluoride	21348	19867 21635	21287	20863	LinF		21551.2523							1.0000		0.9950
Chloride	++++ 15750	14990 16433	14694	15208	LinF		16248.6881							0.9990		0.9950
Bromide	6762.2	6664.0 6816.4	6631.7	6671.5	LinF		6799.82156							1.0000		0.9950
Sulfate	12132	11277 12652	11478	11673	LinF		12512.3321							0.9990		0.9950

Note: The M1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
HPLC/IC BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1 Analy Batch No.: 379990

SDG No.: _____

Instrument ID: CIC2500 GC Column: IonPacAS14 ID: 4 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/02/2018 16:50 Calibration End Date: 08/02/2018 18:15 Calibration ID: 14920

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD0 160-379990/1	080218- 1.d
Level 2	STD2 160-379990/2	080218- 2.d
Level 3	STD3 160-379990/3	080218- 3.d
Level 4	STD4 160-379990/4	080218- 4.d
Level 5	STD5 160-379990/5	080218- 5.d
Level 6	STD6 160-379990/6	080218- 6.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
		LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Fluoride	LinF	54087549	1986702	5321770	10431300	26684642	2500	100	250	500	1250
Chloride	LinF	+++++ 82163074	2997912	7346961	15207641	39374495	+++++ 5000	200	500	1000	2500
Bromide	LinF	34081859	1666006	3315864	6671531	16905572	5000	250	500	1000	2500
Sulfate	LinF	253041868	5638546	22956147	46691919	121320415	20000	500	2000	4000	10000

Curve Type Legend:

LinF = Linear forced zero

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 1.d
 Lims ID: STD0
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 02-Aug-2018 16:50:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013779-001
 Misc. Info.: 1 STD0
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 03-Aug-2018 12:04:22 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0302

First Level Reviewer: boydj

Date: 03-Aug-2018 11:48:00

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride		3.067				ND	U
2 Chloride	4.092	4.200	-0.108	243239		15.0	
3 Nitrite as N		4.950				ND	
4 Bromide		6.100				ND	
5 Nitrate as N		7.050				ND	
6 Orthophosphate		9.233				ND	
7 Sulfate		11.700				ND	

QC Flag Legend

Review Flags

U - Marked Undetected

Reagents:

IC Cal Low_00009

Amount Added: 0.00

Units: uL

Report Date: 03-Aug-2018 12:04:23

Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 1.d

Injection Date: 02-Aug-2018 16:50:00

Instrument ID: CIC2500

Operator ID:

Lims ID: STD0

Worklist Smp#: 1

Client ID:

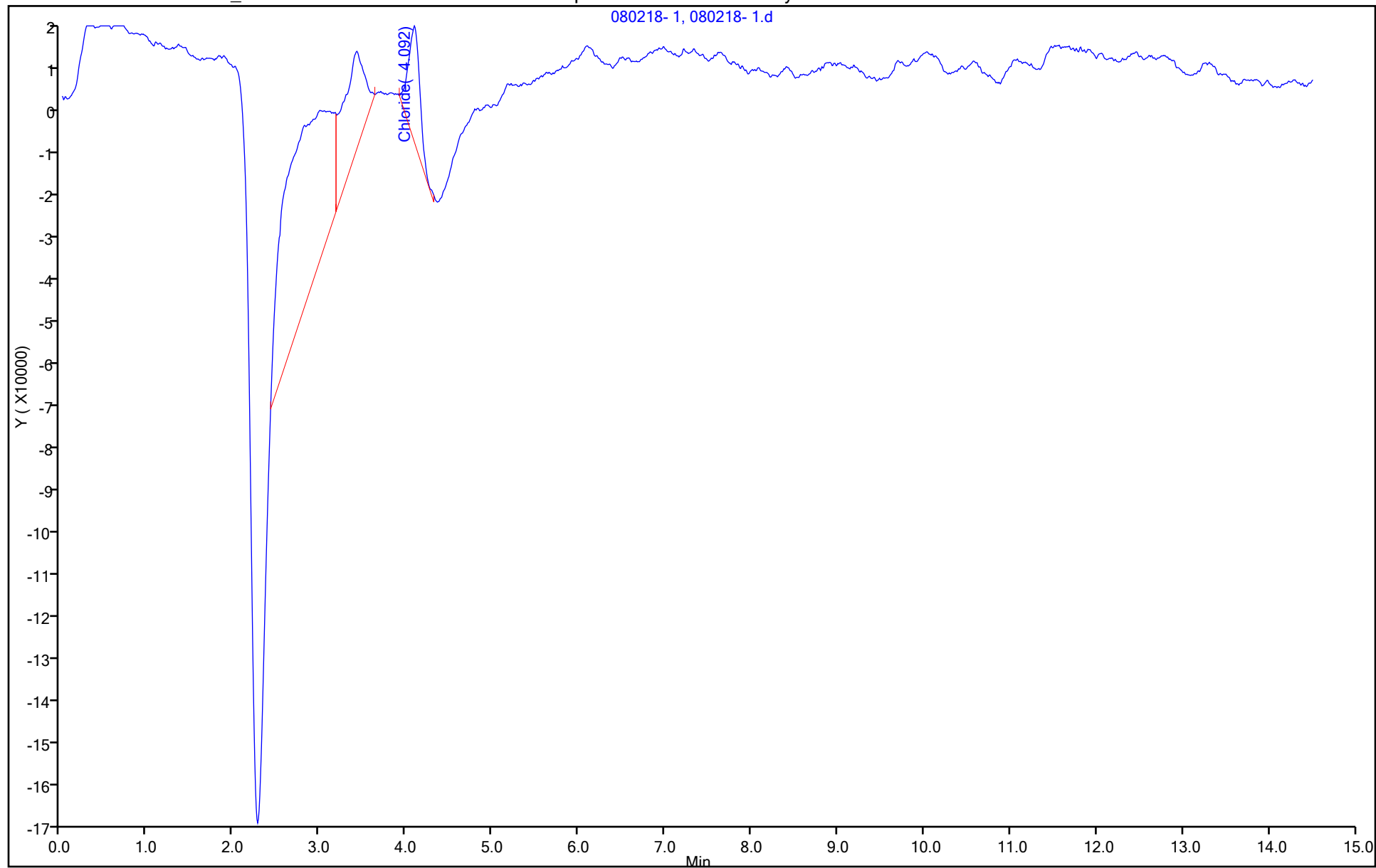
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 2.d
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 02-Aug-2018 17:07:00 ALS Bottle#: 0 Worklist Smp#: 2
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013779-002
 Misc. Info.: 2 STD2
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 03-Aug-2018 12:04:24 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0302

First Level Reviewer: boydj

Date: 03-Aug-2018 11:47:52

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.050	3.067	-0.017	1986702	100.0	92.2	M
2 Chloride	4.183	4.200	-0.017	2997912	200.0	184.5	
3 Nitrite as N	4.942	4.950	-0.008	681282	20.0	22.2	
4 Bromide	6.092	6.100	-0.008	1666006	250.0	245.0	
5 Nitrate as N	7.050	7.050	0.000	766353	20.0	20.3	
6 Orthophosphate	9.233	9.233	0.000	2082228	500.0	440.8	
7 Sulfate	11.683	11.700	-0.017	5638546	500.0	450.6	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

IC Cal Low_00009

Amount Added: 0.25

Units: mL

Report Date: 03-Aug-2018 12:04:25

Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 2.d

Injection Date: 02-Aug-2018 17:07:00

Instrument ID: CIC2500

Operator ID:

Lims ID: STD2

Worklist Smp#: 2

Client ID:

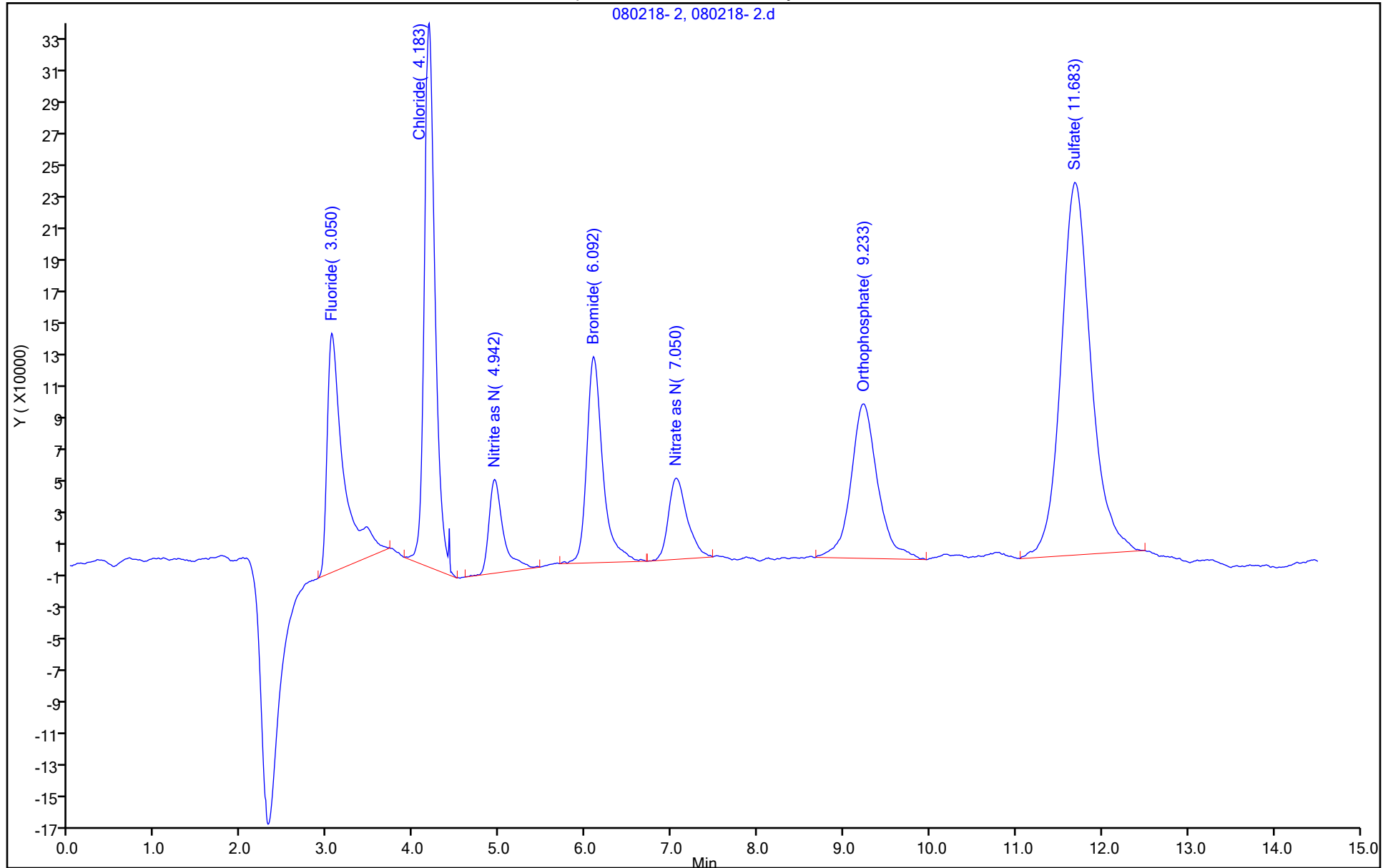
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 2.d
Injection Date: 02-Aug-2018 17:07:00 Instrument ID: CIC2500
Lims ID: STD2
Client ID:
Operator ID:
Injection Vol: 50.0 uL
Method: Anions_CIC2500
Column:

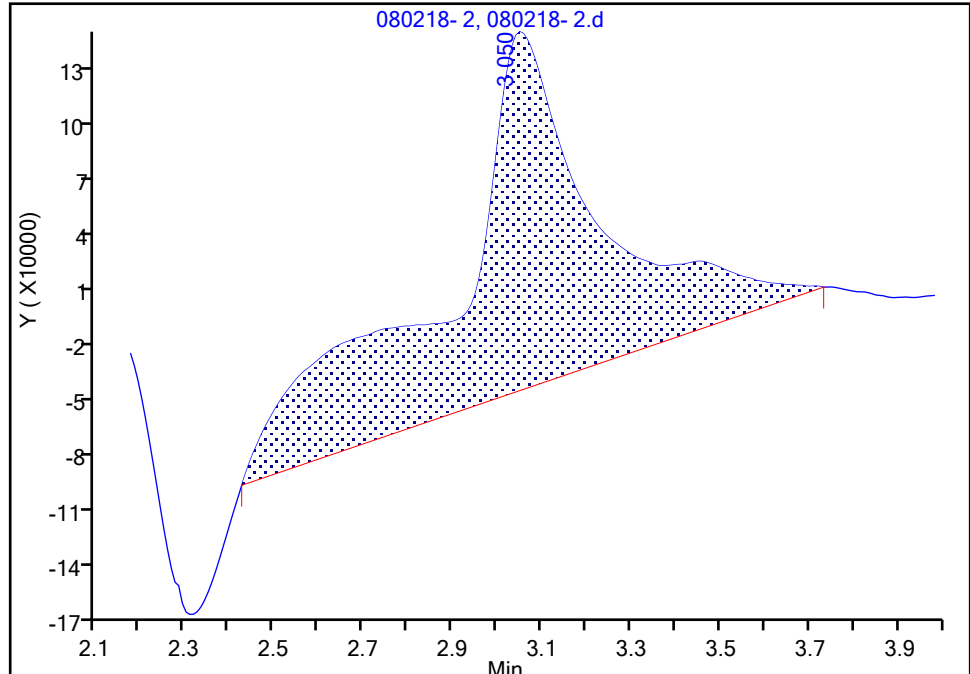
ALS Bottle#: 0 Worklist Smp#: 2
Dil. Factor: 1.0000
Limit Group: WT - IC - 28Days
Detector 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

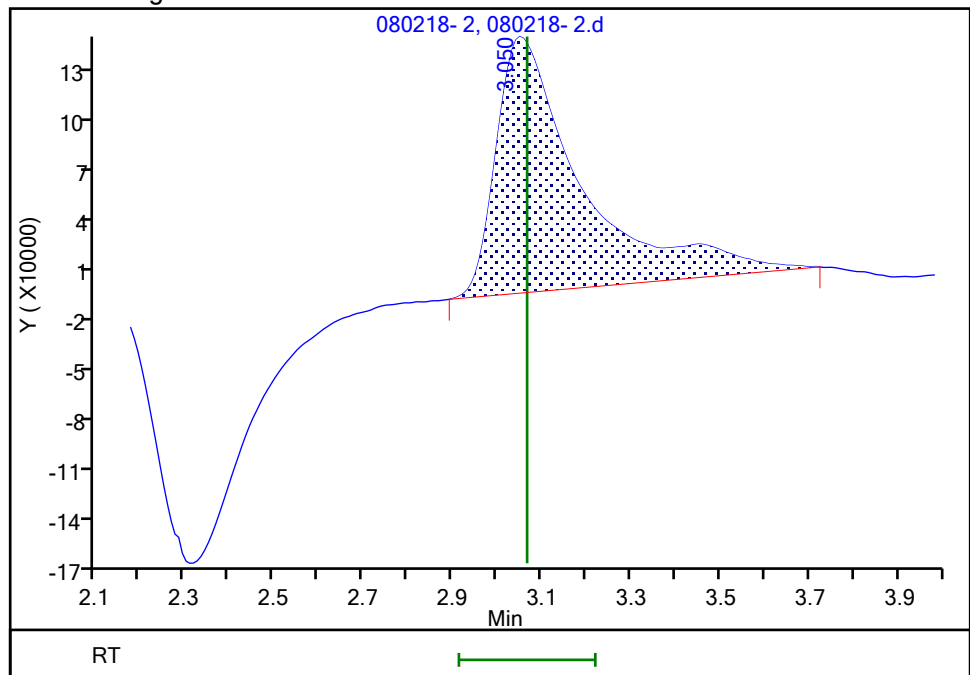
RT: 3.05
Area: 4526133
Amount: 207.9268
Amount Units: ug/l

Processing Integration Results



RT: 3.05
Area: 1986702
Amount: 92.184991
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 03-Aug-2018 11:47:43
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 3.d
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 02-Aug-2018 17:24:00 ALS Bottle#: 0 Worklist Smp#: 3
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013779-003
 Misc. Info.: 3 STD3
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 03-Aug-2018 12:04:26 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0302

First Level Reviewer: boydj

Date: 03-Aug-2018 11:47:35

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.042	3.067	-0.025	5321770	250.0	246.9	M
2 Chloride	4.167	4.200	-0.033	7346961	500.0	452.2	
3 Nitrite as N	4.933	4.950	-0.017	1201777	40.0	39.1	
4 Bromide	6.083	6.100	-0.017	3315864	500.0	487.6	
5 Nitrate as N	7.033	7.050	-0.017	3574160	100.0	94.6	
6 Orthophosphate	9.208	9.233	-0.025	8379807	2000.0	1774.0	
7 Sulfate	11.683	11.700	-0.017	22956147	2000.0	1834.7	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

IC Cal High_00059

Amount Added: 0.50

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 3.d

Injection Date: 02-Aug-2018 17:24:00

Instrument ID: CIC2500

Operator ID:

Lims ID: STD3

Worklist Smp#: 3

Client ID:

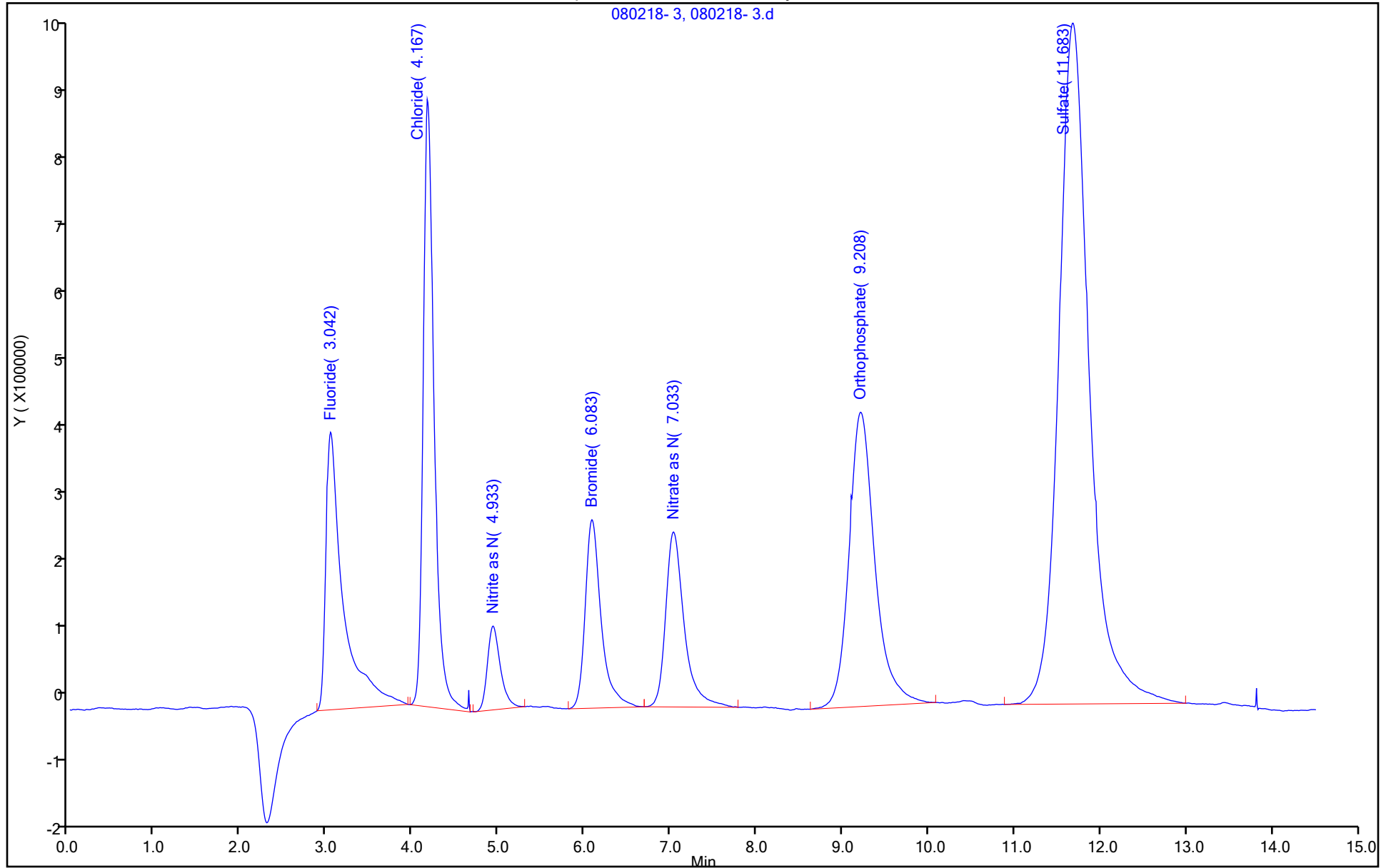
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 3.d
Injection Date: 02-Aug-2018 17:24:00 Instrument ID: CIC2500
Lims ID: STD3
Client ID:
Operator ID:
Injection Vol: 50.0 uL
Method: Anions_CIC2500
Column:

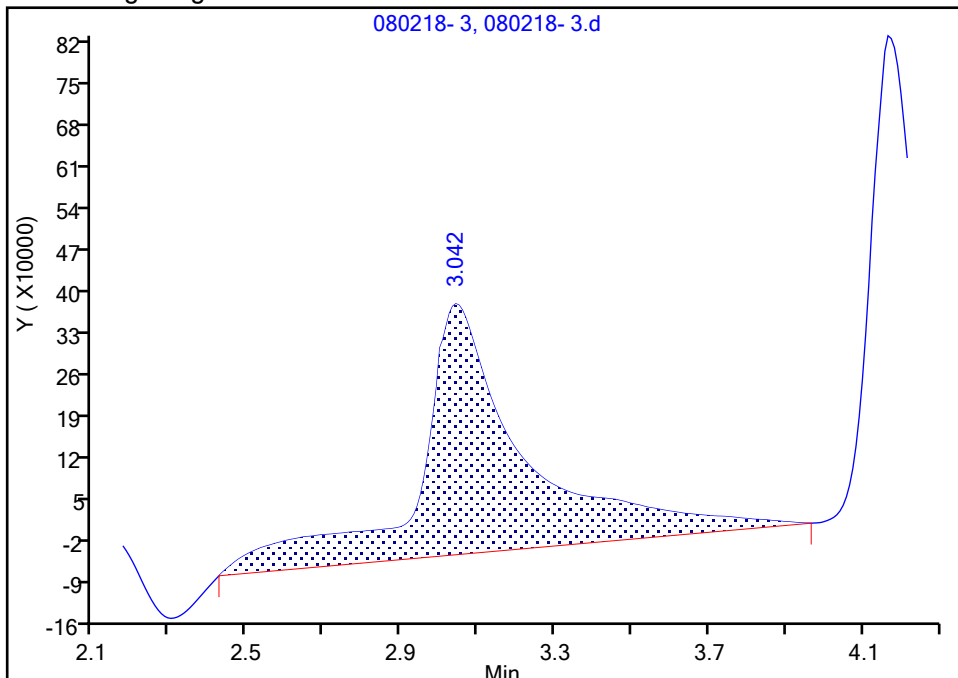
ALS Bottle#: 0 Worklist Smp#: 3
Dil. Factor: 1.0000
Limit Group: WT - IC - 28Days
Detector: 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

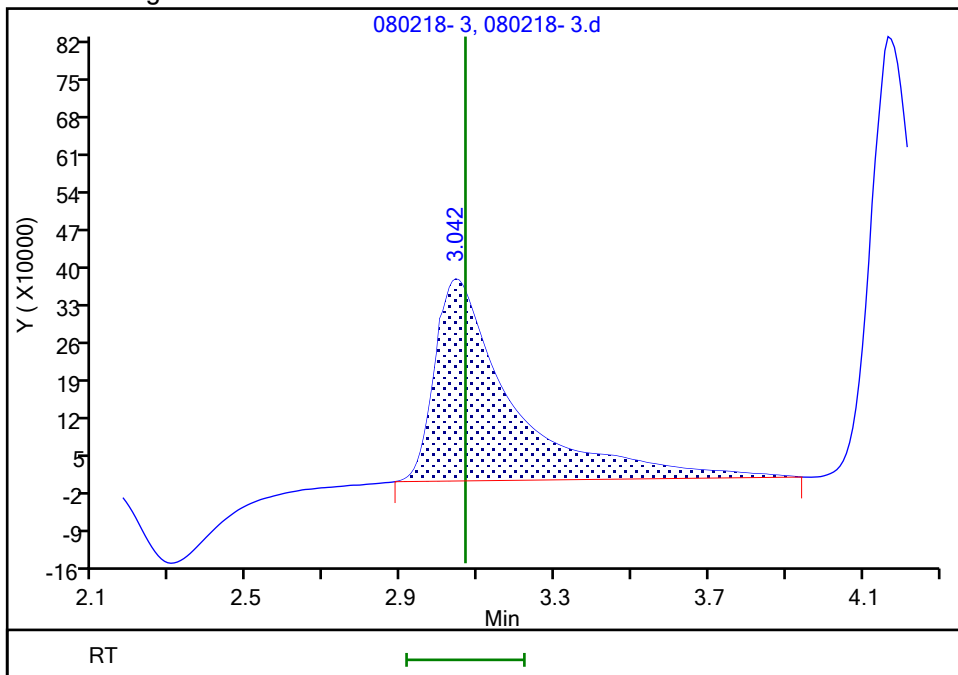
RT: 3.04
Area: 8327848
Amount: 380.8634
Amount Units: ug/l

Processing Integration Results



RT: 3.04
Area: 5321770
Amount: 246.9355
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 03-Aug-2018 11:48:14
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 4.d
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 02-Aug-2018 17:41:00 ALS Bottle#: 0 Worklist Smp#: 4
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013779-004
 Misc. Info.: 4 STD4
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 03-Aug-2018 12:04:27 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0302

First Level Reviewer: boydj

Date: 03-Aug-2018 11:47:23

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.067	3.067	0.000	10431300	500.0	484.0	M
2 Chloride	4.200	4.200	0.000	15207641	1000.0	935.9	
3 Nitrite as N	4.950	4.950	0.000	2421320	80.0	78.8	
4 Bromide	6.100	6.100	0.000	6671531	1000.0	981.1	
5 Nitrate as N	7.050	7.050	0.000	7494480	200.0	198.3	
6 Orthophosphate	9.233	9.233	0.000	17421077	4000.0	3688.0	
7 Sulfate	11.700	11.700	0.000	46691919	4000.0	3731.7	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

IC Cal High_00059

Amount Added: 1.00

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 4.d

Injection Date: 02-Aug-2018 17:41:00

Instrument ID: CIC2500

Operator ID:

Lims ID: STD4

Worklist Smp#: 4

Client ID:

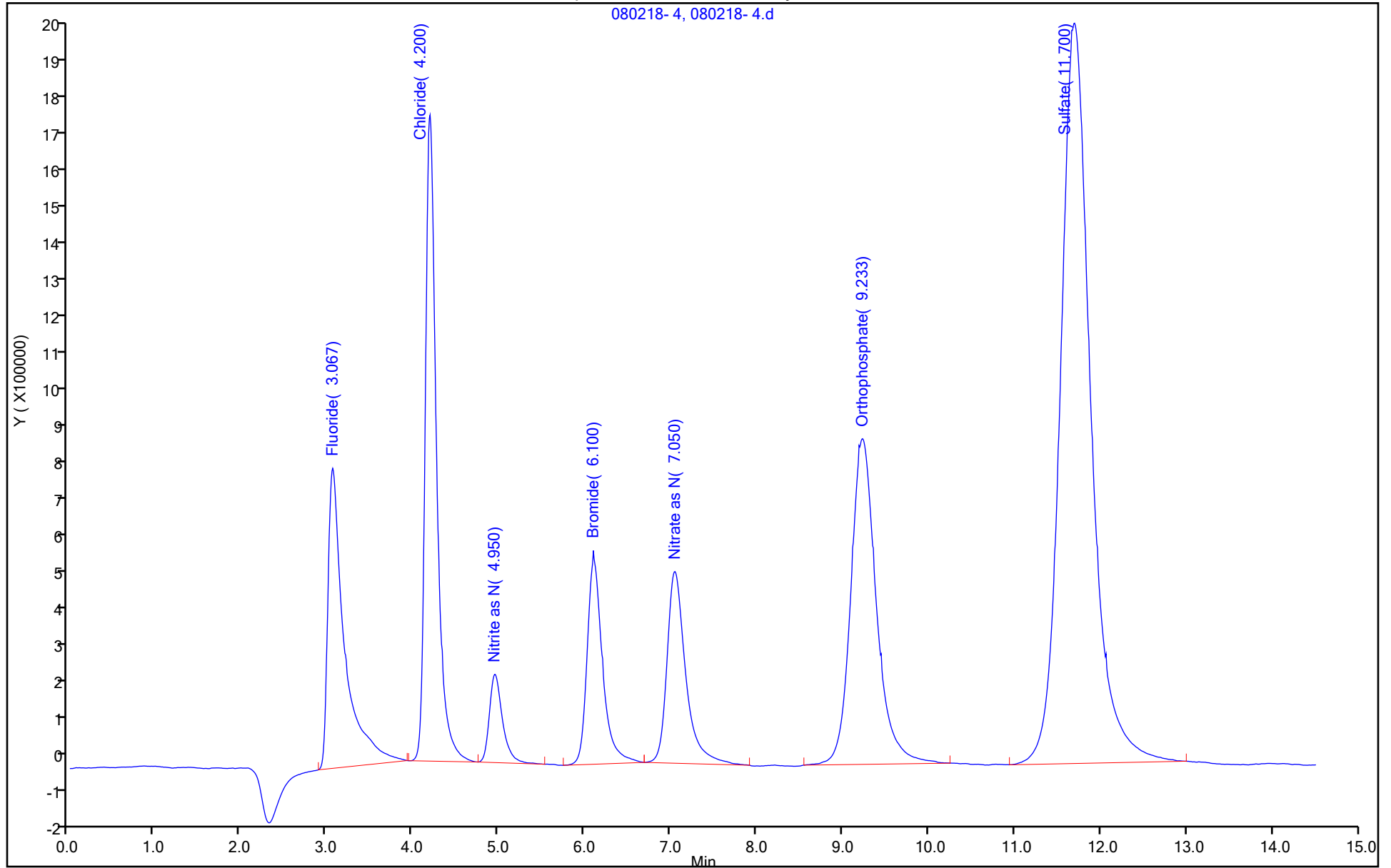
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 4.d
Injection Date: 02-Aug-2018 17:41:00 Instrument ID: CIC2500
Lims ID: STD4
Client ID:
Operator ID:
Injection Vol: 50.0 uL
Method: Anions_CIC2500
Column:

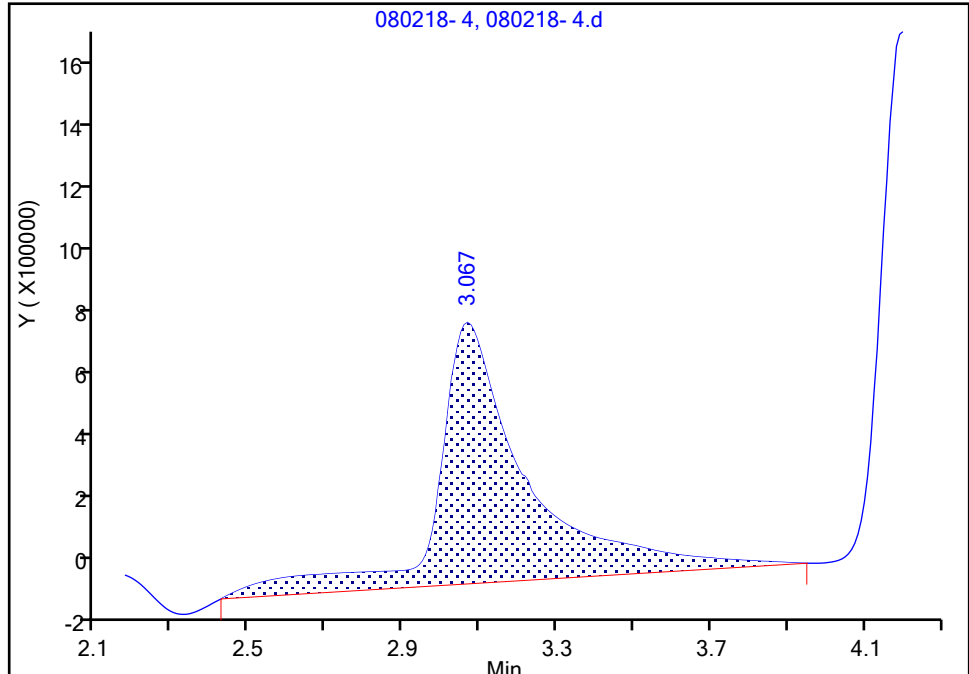
ALS Bottle#: 0 Worklist Smp#: 4
Dil. Factor: 1.0000
Limit Group: WT - IC - 28Days
Detector: 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

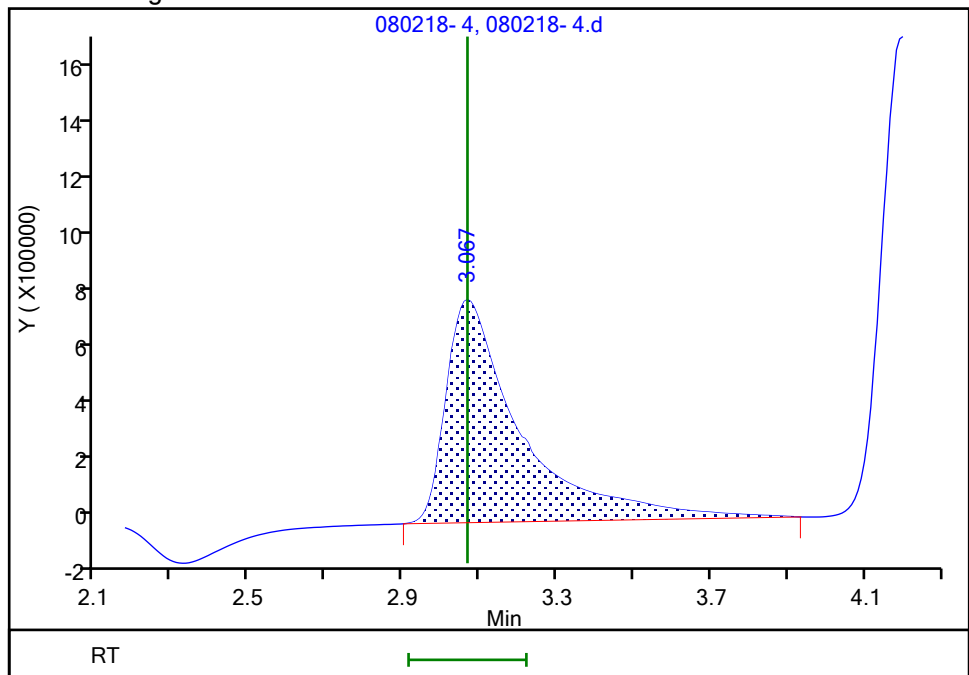
RT: 3.07
Area: 13519888
Amount: 612.9928
Amount Units: ug/l

Processing Integration Results



RT: 3.07
Area: 10431300
Amount: 484.0229
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 03-Aug-2018 11:47:20
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 5.d
 Lims ID: STD5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 02-Aug-2018 17:58:00 ALS Bottle#: 0 Worklist Smp#: 5
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013779-005
 Misc. Info.: 5 STD5
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 03-Aug-2018 12:04:30 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0302

First Level Reviewer: boydj

Date: 03-Aug-2018 11:48:37

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.050	3.067	-0.017	26684642	1250.0	1238.2	M
2 Chloride	4.183	4.200	-0.017	39374495	2500.0	2423.2	
3 Nitrite as N	4.933	4.950	-0.017	6156895	200.0	200.3	
4 Bromide	6.083	6.100	-0.017	16905572	2500.0	2486.2	
5 Nitrate as N	7.017	7.050	-0.033	18845943	500.0	498.7	
6 Orthophosphate	9.208	9.233	-0.025	46138467	10000	9767.4	
7 Sulfate	11.692	11.700	-0.008	121320415	10000	9696.1	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

IC Cal High_00059

Amount Added: 2.50

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 5.d

Injection Date: 02-Aug-2018 17:58:00

Instrument ID: CIC2500

Operator ID:

Lims ID: STD5

Worklist Smp#: 5

Client ID:

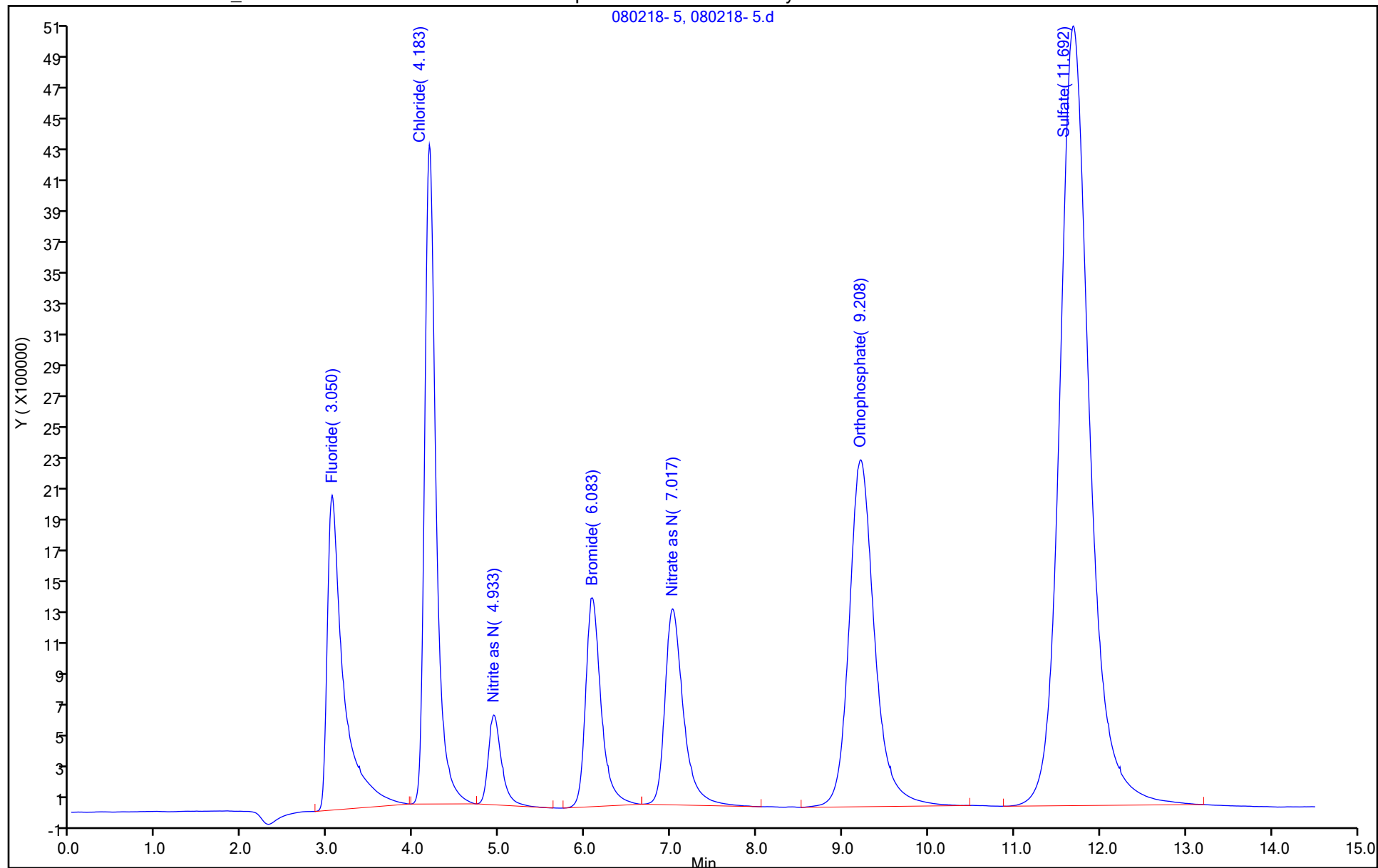
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 5.d
Injection Date: 02-Aug-2018 17:58:00 Instrument ID: CIC2500
Lims ID: STD5
Client ID:
Operator ID:
Injection Vol: 50.0 uL
Method: Anions_CIC2500
Column:

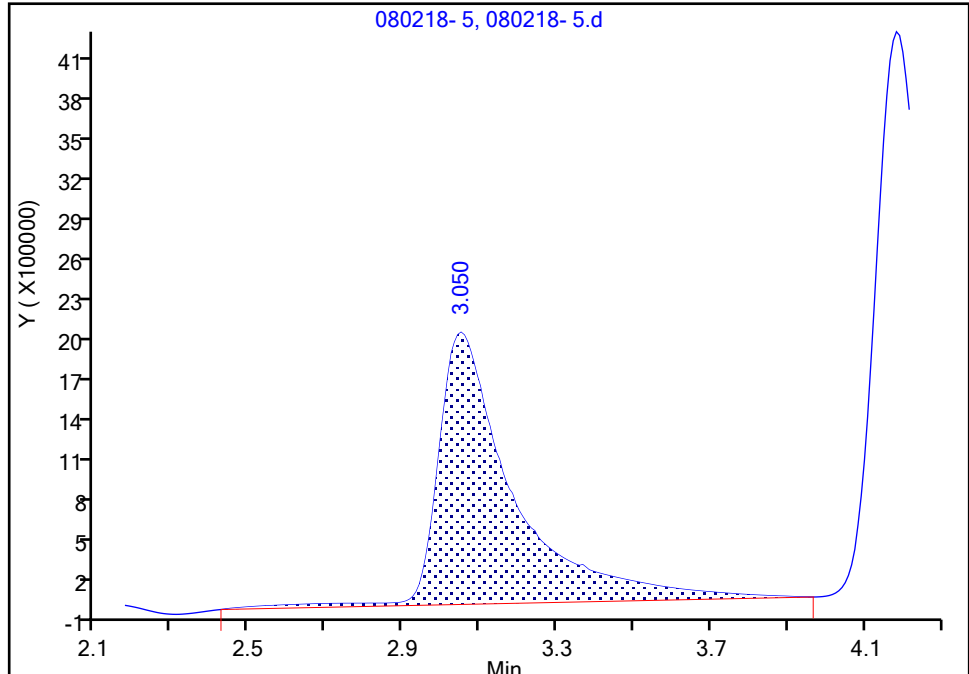
ALS Bottle#: 0 Worklist Smp#: 5
Dil. Factor: 1.0000
Limit Group: WT - IC - 28Days
Detector: 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

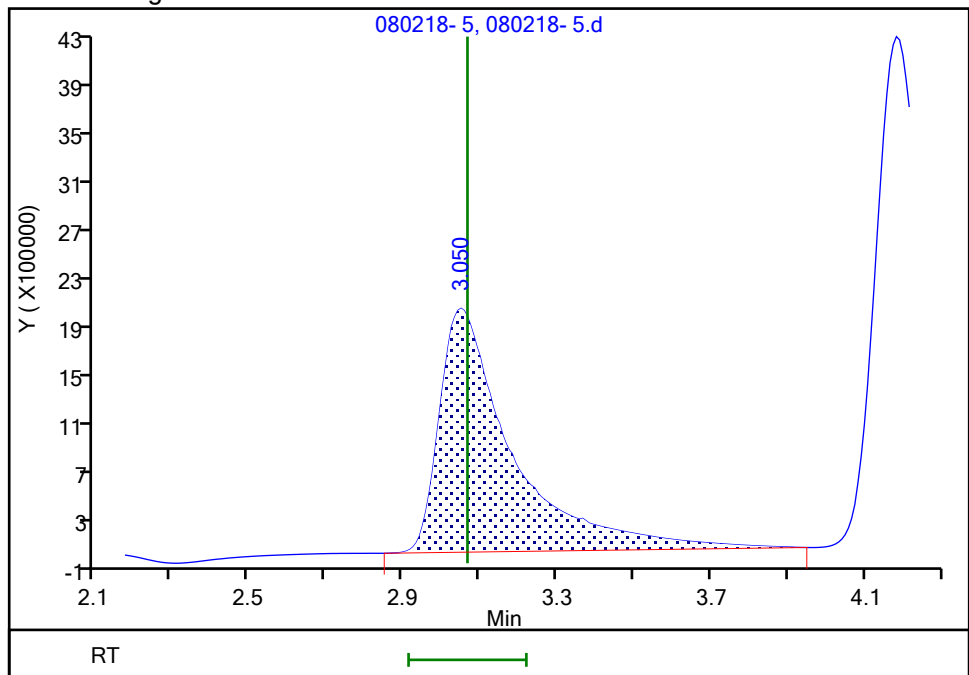
RT: 3.05
Area: 27926745
Amount: 1284.4542
Amount Units: ug/l

Processing Integration Results



RT: 3.05
Area: 26684642
Amount: 1238.1945
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 03-Aug-2018 11:48:33
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 02-Aug-2018 18:15:00 ALS Bottle#: 0 Worklist Smp#: 6
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013779-006
 Misc. Info.: 6 STD6
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 03-Aug-2018 12:04:31 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0302

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.050	3.067	-0.017	54087549	2500.0	2509.7	
2 Chloride	4.192	4.200	-0.008	82163074	5000.0	5056.6	
3 Nitrite as N	4.942	4.950	-0.008	12297204	400.0	400.1	
4 Bromide	6.083	6.100	-0.017	34081859	5000.0	5012.2	
5 Nitrate as N	7.008	7.050	-0.042	37843843	1000.0	1001.5	
6 Orthophosphate	9.208	9.233	-0.025	95431881	20000	20203	
7 Sulfate	11.675	11.700	-0.025	253041868	20000	20223	

Reagents:

IC Cal High_00059

Amount Added: 5.00

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d

Injection Date: 02-Aug-2018 18:15:00

Instrument ID: CIC2500

Operator ID:

Lims ID: STD6

Worklist Smp#: 6

Client ID:

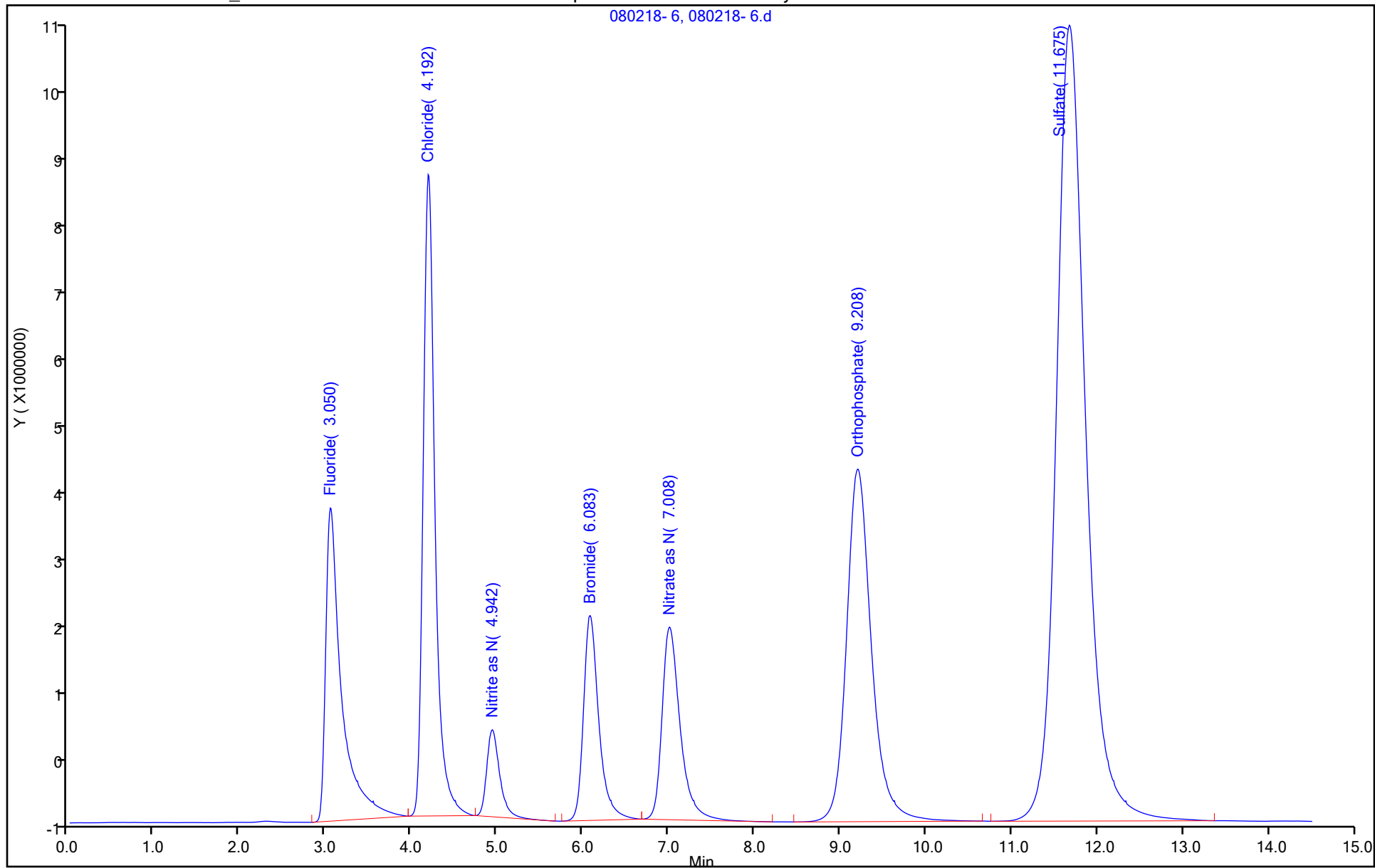
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



FORM VII
HPLC/IC CONTINUING CALIBRATION DATA

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Lab Sample ID: ICV 160-379990/7 Calibration Date: 08/02/2018 18:32
 Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
 GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
 Lab File ID: 080218- 7.d Conc. Units: mg/L

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Fluoride	LinF		21251		0.986	1.00	-1.4	10.0
Chloride	LinF		15553		1.91	2.00	-4.3	10.0
Nitrite as N	LinF		30720		0.160	0.160	-0.0	
Bromide	LinF		6677		1.96	2.00	-1.8	10.0
Nitrate as N	LinF		36914		0.391	0.400	-2.3	
Orthophosphate	LinF		4525		7.66	8.00	-4.2	
Sulfate	LinF		11969		7.65	8.00	-4.3	10.0

FORM VII
HPLC/IC CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Lab Sample ID: ICV 160-379990/7 Calibration Date: 08/02/2018 18:32
Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
Lab File ID: 080218- 7.d

Analyte	RT	RT WINDOW	
		FROM	TO
Fluoride	3.04	2.91	3.22
Chloride	4.18	3.99	4.41
Nitrite as N	4.93	4.70	5.20
Bromide	6.08	5.80	6.41
Nitrate as N	7.03	6.70	7.40
Orthophosphate	9.22	8.77	9.70
Sulfate	11.69	11.12	12.29

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 7.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 02-Aug-2018 18:32:00 ALS Bottle#: 0 Worklist Smp#: 7
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013779-007
 Misc. Info.: 7 ICV
 Operator ID: Instrument ID: CIC2500
 Sublist:
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 03-Aug-2018 12:05:08 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0302

First Level Reviewer: boydj

Date: 03-Aug-2018 11:49:00

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.042	3.067	-0.025	21250688	1000.0	986.1	M
2 Chloride	4.183	4.200	-0.017	31106769	2000.0	1914.4	
3 Nitrite as N	4.933	4.950	-0.017	4915126	160.0	159.9	
4 Bromide	6.083	6.100	-0.017	13354330	2000.0	1963.9	
5 Nitrate as N	7.025	7.050	-0.025	14765591	400.0	390.8	
6 Orthophosphate	9.217	9.233	-0.016	36199962	8000.0	7663.5	
7 Sulfate	11.692	11.700	-0.008	95752007	8000.0	7652.6	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

IC 2nd Source_00012

Amount Added: 2.00

Units: mL

IC NO2 2nd_00016

Amount Added: 16.00

Units: uL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 7.d

Injection Date: 02-Aug-2018 18:32:00

Instrument ID: CIC2500

Operator ID:

Lims ID: ICV

Worklist Smp#: 7

Client ID:

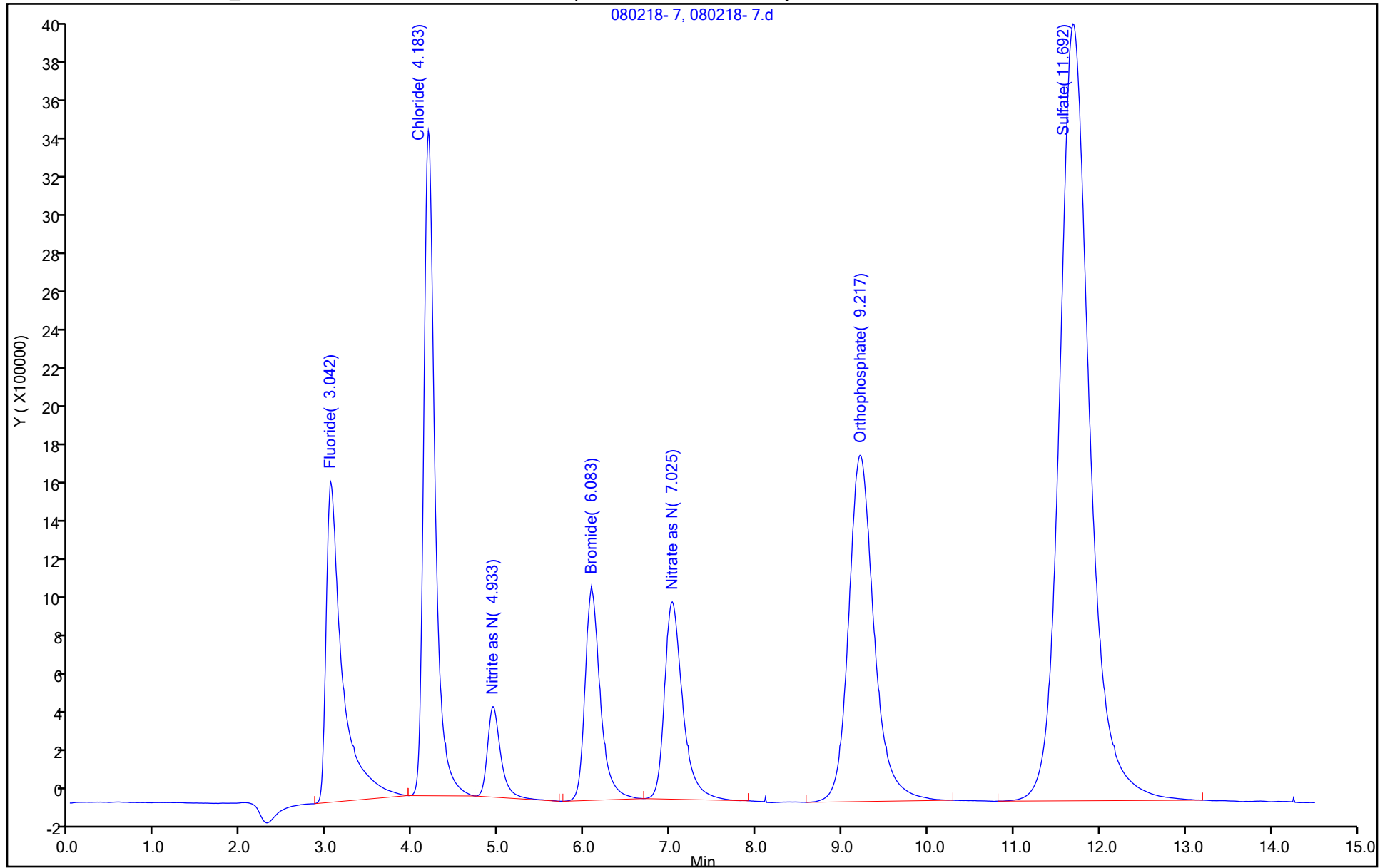
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 7.d

Injection Date: 02-Aug-2018 18:32:00

Instrument ID: CIC2500

Lims ID: ICV

Client ID:

Operator ID:

ALS Bottle#:

0

Worklist Smp#: 7

Injection Vol: 50.0 uL

Dil. Factor: 1.0000

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days

Column:

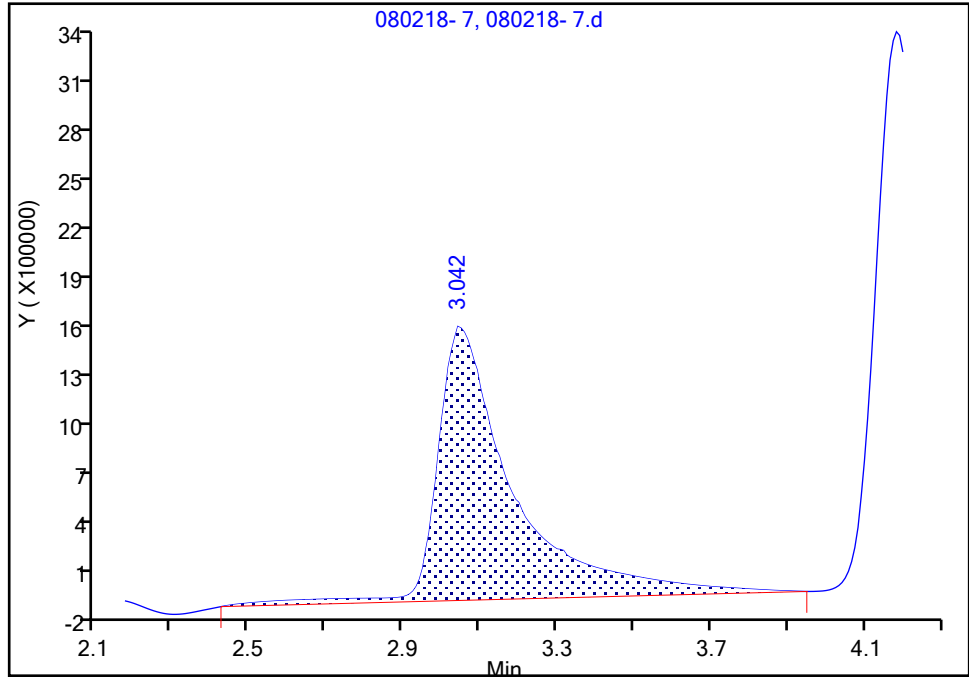
Detector 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

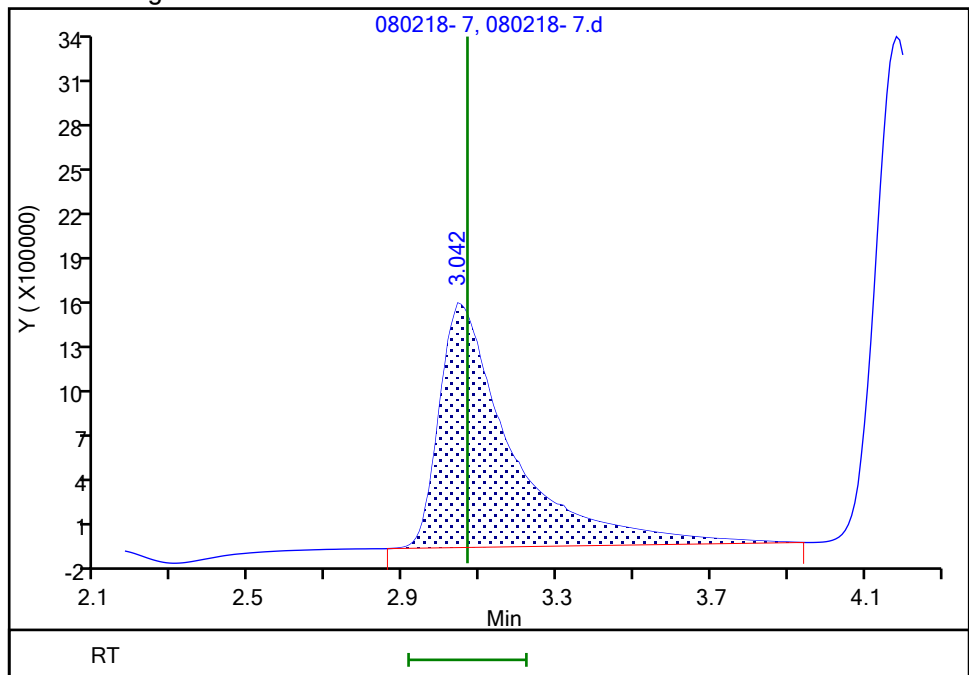
RT: 3.04
Area: 22690865
Amount: 1052.8792
Amount Units: ug/l

Processing Integration Results



RT: 3.04
Area: 21250688
Amount: 986.0535
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 03-Aug-2018 11:48:53

Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

FORM VII
HPLC/IC CONTINUING CALIBRATION DATA

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Lab Sample ID: CCV 160-380227/1 Calibration Date: 08/03/2018 18:16
 Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
 GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
 Lab File ID: 080318- 1.d Conc. Units: mg/L

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Fluoride	LinF		21744		1.01	1.00	0.9	10.0
Chloride	LinF		15436		1.90	2.00	-5.0	10.0
Nitrite as N	LinF		30547		0.159	0.160	-0.6	
Bromide	LinF		6699		1.97	2.00	-1.5	10.0
Nitrate as N	LinF		37264		0.394	0.400	-1.4	
Orthophosphate	LinF		4506		7.63	8.00	-4.6	
Sulfate	LinF		11911		7.62	8.00	-4.8	10.0

FORM VII
HPLC/IC CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Lab Sample ID: CCV 160-380227/1 Calibration Date: 08/03/2018 18:16
Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
Lab File ID: 080318- 1.d

Analyte	RT	RT WINDOW	
		FROM	TO
Fluoride	3.01	2.91	3.22
Chloride	4.13	3.99	4.41
Nitrite as N	4.87	4.70	5.20
Bromide	5.98	5.80	6.41
Nitrate as N	6.92	6.70	7.40
Orthophosphate	9.08	8.77	9.70
Sulfate	11.53	11.12	12.29

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 1.d
 Lims ID: CCV
 Client ID:
 Sample Type: CCV
 Inject. Date: 03-Aug-2018 18:16:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-001
 Misc. Info.: 19 CCV
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:26 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.008	3.067	-0.059	21743928	1000.0	1008.9	
2 Chloride	4.125	4.200	-0.075	30871503	2000.0	1899.9	
3 Nitrite as N	4.867	4.950	-0.083	4887584	160.0	159.0	
4 Bromide	5.983	6.100	-0.117	13397856	2000.0	1970.3	
5 Nitrate as N	6.917	7.050	-0.133	14905449	400.0	394.5	
6 Orthophosphate	9.075	9.233	-0.158	36046097	8000.0	7630.9	
7 Sulfate	11.533	11.700	-0.167	95286358	8000.0	7615.4	

Reagents:

IC Cal High_00059

Amount Added: 2.00

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 1.d

Injection Date: 03-Aug-2018 18:16:00

Instrument ID: CIC2500

Operator ID:

Lims ID: CCV

Worklist Smp#: 1

Client ID:

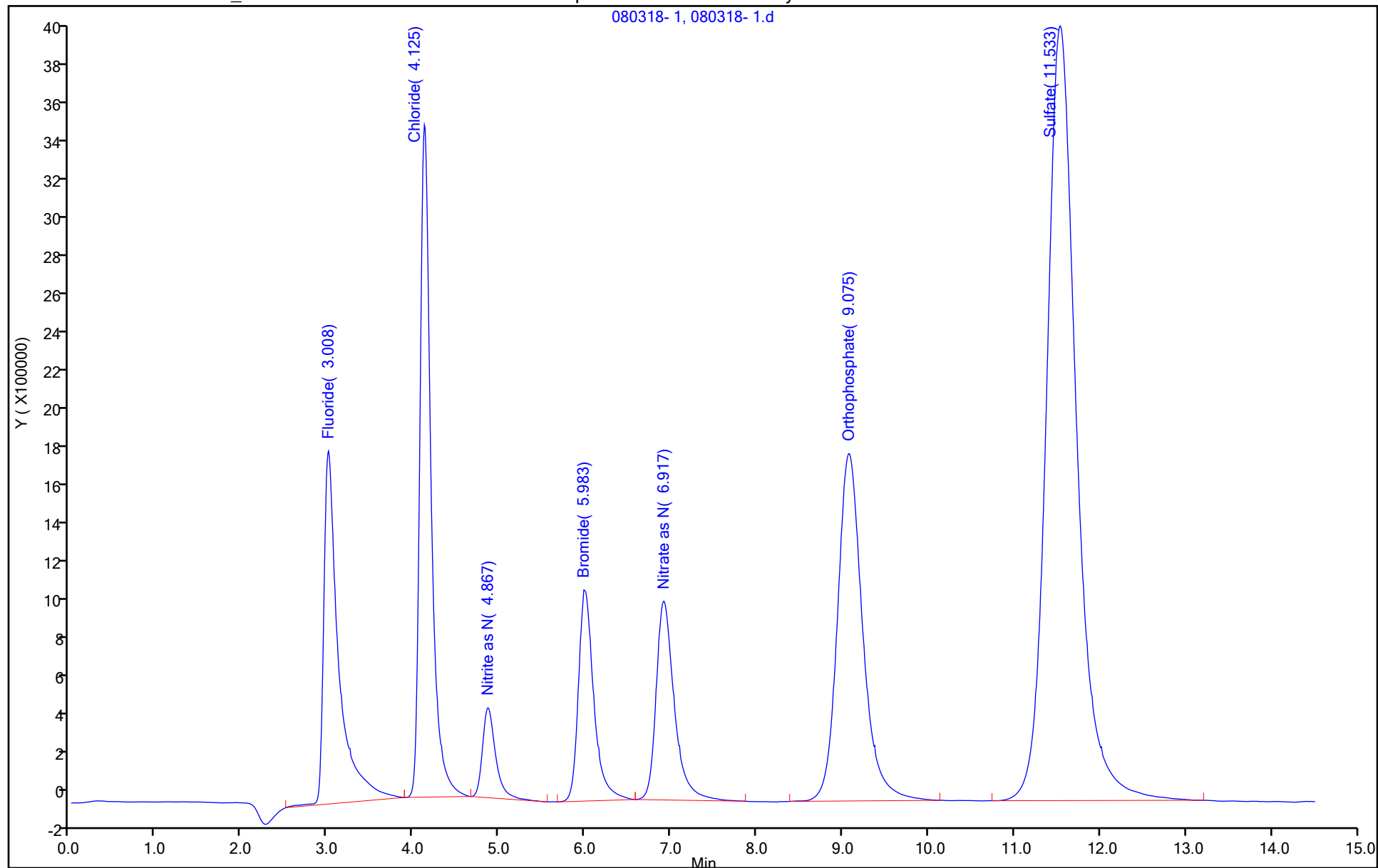
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



FORM VII
HPLC/IC CONTINUING CALIBRATION DATA

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Lab Sample ID: CCV 160-380227/13 Calibration Date: 08/03/2018 21:39
 Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
 GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
 Lab File ID: 080318- 13.d Conc. Units: mg/L

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Fluoride	LinF		22287		1.03	1.00	3.4	10.0
Chloride	LinF		16153		1.99	2.00	-0.6	10.0
Nitrite as N	LinF		30922		0.161	0.160	0.6	
Bromide	LinF		6884		2.02	2.00	1.2	10.0
Nitrate as N	LinF		38456		0.407	0.400	1.8	
Orthophosphate	LinF		4682		7.93	8.00	-0.9	
Sulfate	LinF		12325		7.88	8.00	-1.5	10.0

FORM VII
HPLC/IC CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Lab Sample ID: CCV 160-380227/13 Calibration Date: 08/03/2018 21:39
Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
Lab File ID: 080318- 13.d

Analyte	RT	RT WINDOW	
		FROM	TO
Fluoride	3.04	2.91	3.22
Chloride	4.17	3.99	4.41
Nitrite as N	4.91	4.70	5.20
Bromide	6.03	5.80	6.41
Nitrate as N	6.95	6.70	7.40
Orthophosphate	9.11	8.77	9.70
Sulfate	11.58	11.12	12.29

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 13.d
 Lims ID: CCV
 Client ID:
 Sample Type: CCV
 Inject. Date: 03-Aug-2018 21:39:00 ALS Bottle#: 0 Worklist Smp#: 13
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-013
 Misc. Info.: 31 CCV
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:39 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:34:27

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.042	3.067	-0.025	22287434	1000.0	1034.2	M
2 Chloride	4.167	4.200	-0.033	32306766	2000.0	1988.3	
3 Nitrite as N	4.908	4.950	-0.042	4947558	160.0	161.0	
4 Bromide	6.033	6.100	-0.067	13768935	2000.0	2024.9	
5 Nitrate as N	6.950	7.050	-0.100	15382317	400.0	407.1	
6 Orthophosphate	9.108	9.233	-0.125	37458728	8000.0	7929.9	
7 Sulfate	11.583	11.700	-0.117	98603615	8000.0	7880.5	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

IC Cal High_00059

Amount Added: 2.00

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 13.d

Injection Date: 03-Aug-2018 21:39:00

Instrument ID: CIC2500

Operator ID:

Lims ID: CCV

Worklist Smp#: 13

Client ID:

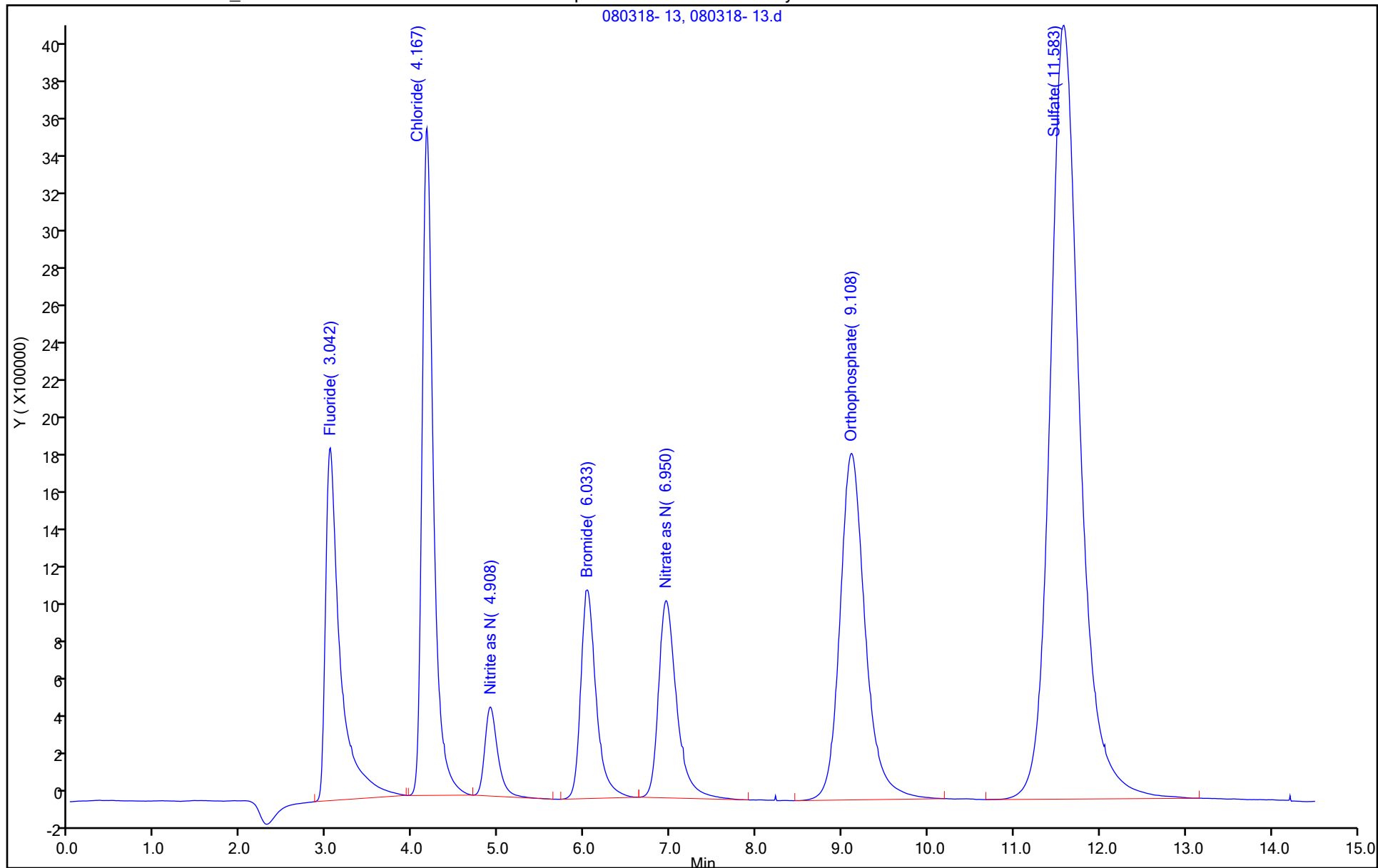
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 13.d
Injection Date: 03-Aug-2018 21:39:00 Instrument ID: CIC2500
Lims ID: CCV
Client ID:
Operator ID:
Injection Vol: 50.0 uL
Method: Anions_CIC2500
Column:

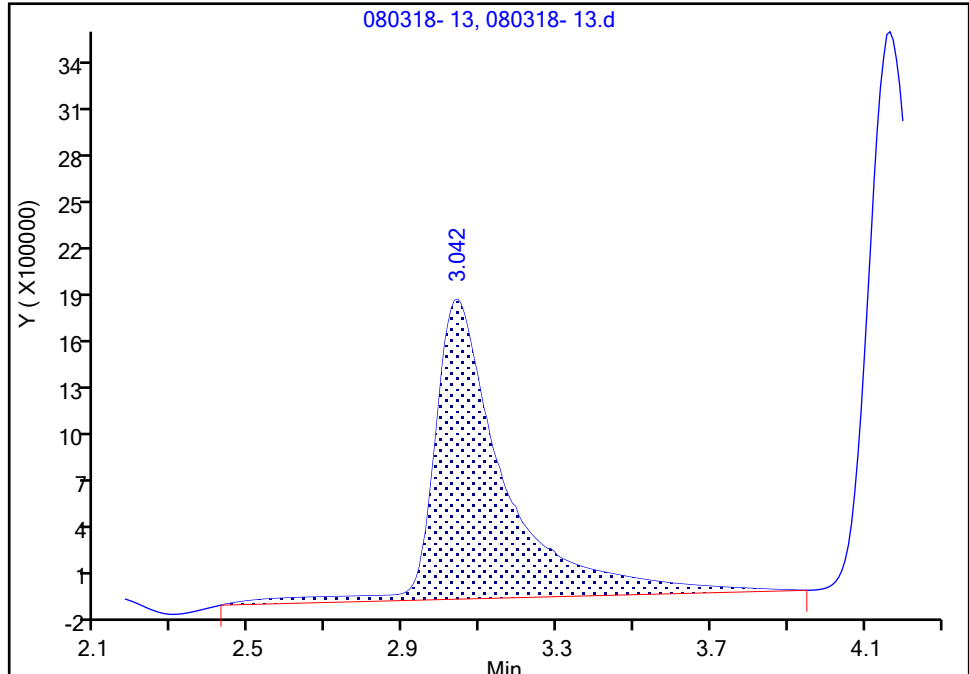
ALS Bottle#: 0 Worklist Smp#: 13
Dil. Factor: 1.0000
Limit Group: WT - IC - 28Days
Detector: 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

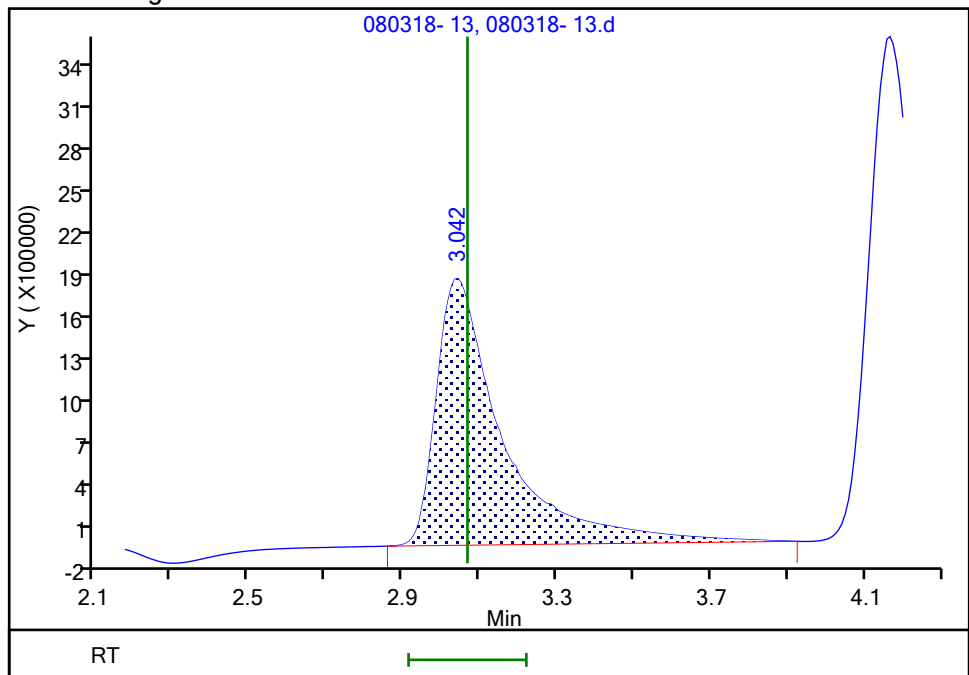
RT: 3.04
Area: 24267538
Amount: 1126.0384
Amount Units: ug/l

Processing Integration Results



RT: 3.04
Area: 22287434
Amount: 1034.1596
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 06-Aug-2018 10:34:21
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

FORM VII
HPLC/IC CONTINUING CALIBRATION DATA

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Lab Sample ID: CCV 160-380227/36 Calibration Date: 08/04/2018 04:08
 Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
 GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
 Lab File ID: 080318- 36.d Conc. Units: mg/L

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Fluoride	LinF		21515		0.998	1.00	-0.2	10.0
Chloride	LinF		15392		1.89	2.00	-5.3	10.0
Nitrite as N	LinF		29776		0.155	0.160	-3.1	
Bromide	LinF		6630		1.95	2.00	-2.5	10.0
Nitrate as N	LinF		36630		0.388	0.400	-3.1	
Orthophosphate	LinF		4516		7.65	8.00	-4.4	
Sulfate	LinF		11918		7.62	8.00	-4.7	10.0

FORM VII
HPLC/IC CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Lab Sample ID: CCV 160-380227/36 Calibration Date: 08/04/2018 04:08
Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
Lab File ID: 080318- 36.d

Analyte	RT	RT WINDOW	
		FROM	TO
Fluoride	3.03	2.91	3.22
Chloride	4.15	3.99	4.41
Nitrite as N	4.88	4.70	5.20
Bromide	6.00	5.80	6.41
Nitrate as N	6.93	6.70	7.40
Orthophosphate	9.07	8.77	9.70
Sulfate	11.53	11.12	12.29

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 36.d
 Lims ID: CCV
 Client ID:
 Sample Type: CCV
 Inject. Date: 04-Aug-2018 04:08:00 ALS Bottle#: 0 Worklist Smp#: 36
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-036
 Misc. Info.: 1921 CCV
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:49 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:38:45

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.025	3.067	-0.042	21514642	1000.0	998.3	M
2 Chloride	4.150	4.200	-0.050	30783566	2000.0	1894.5	
3 Nitrite as N	4.883	4.950	-0.067	4764138	160.0	155.0	
4 Bromide	6.000	6.100	-0.100	13259125	2000.0	1949.9	
5 Nitrate as N	6.925	7.050	-0.125	14652097	400.0	387.8	
6 Orthophosphate	9.067	9.233	-0.166	36130897	8000.0	7648.8	
7 Sulfate	11.525	11.700	-0.175	95346307	8000.0	7620.2	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

IC Cal High_00059

Amount Added: 2.00

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 36.d

Injection Date: 04-Aug-2018 04:08:00

Instrument ID: CIC2500

Operator ID:

Lims ID: CCV

Worklist Smp#: 36

Client ID:

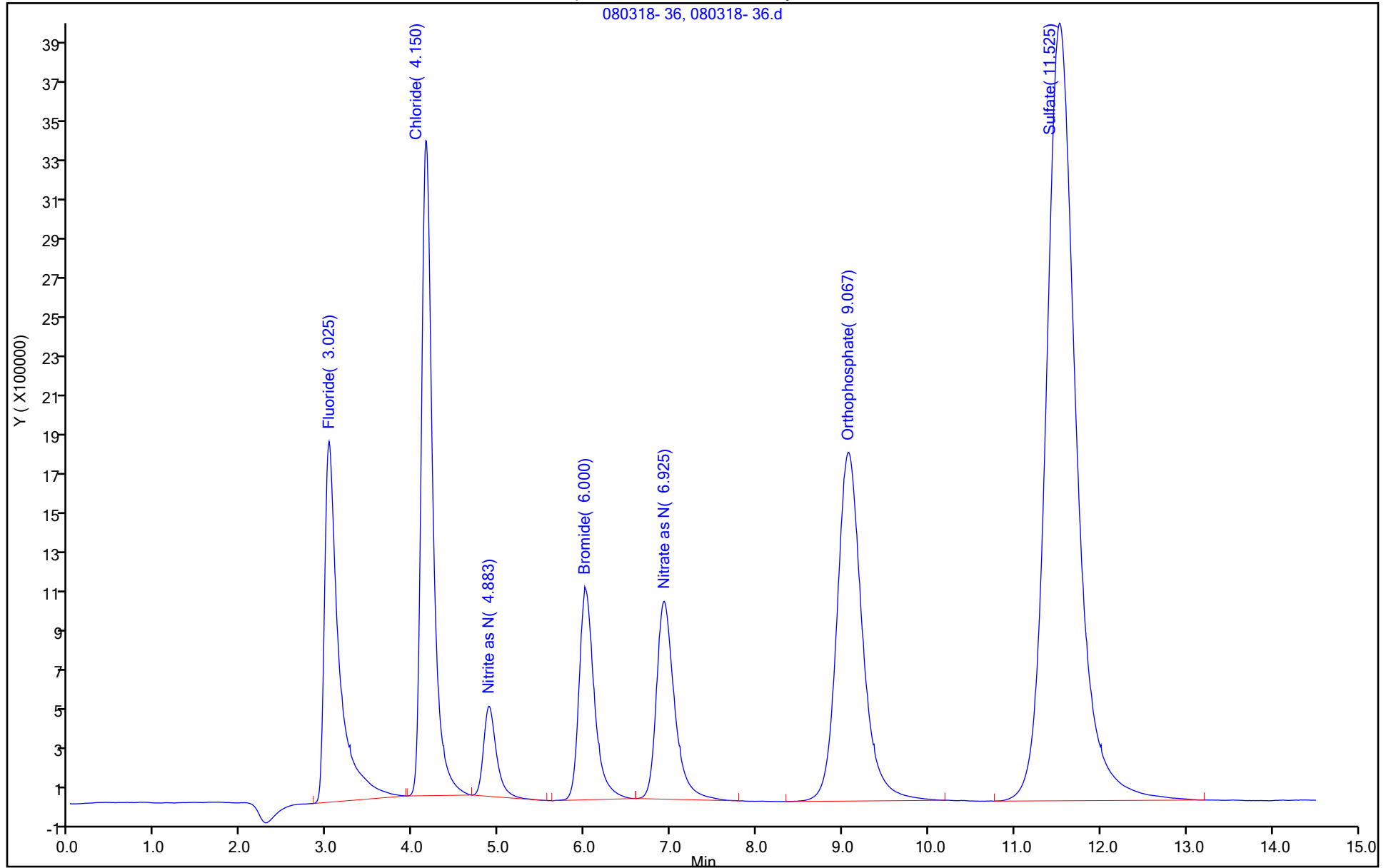
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 36.d
Injection Date: 04-Aug-2018 04:08:00 Instrument ID: CIC2500
Lims ID: CCV
Client ID:
Operator ID:
Injection Vol: 50.0 uL
Method: Anions_CIC2500
Column:

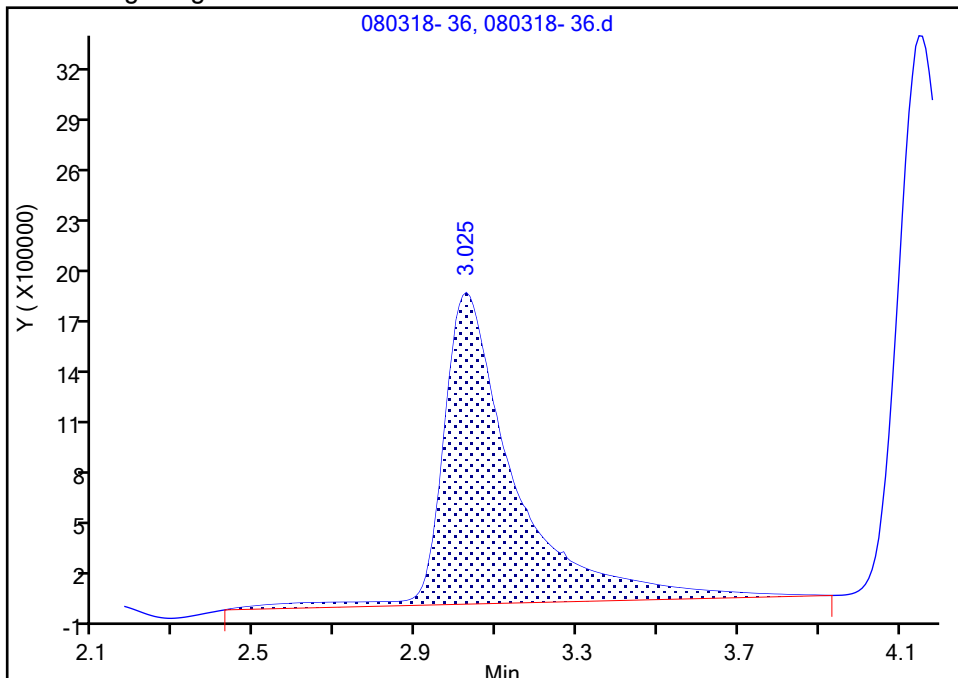
ALS Bottle#: 0 Worklist Smp#: 36
Dil. Factor: 1.0000
Limit Group: WT - IC - 28Days
Detector: 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

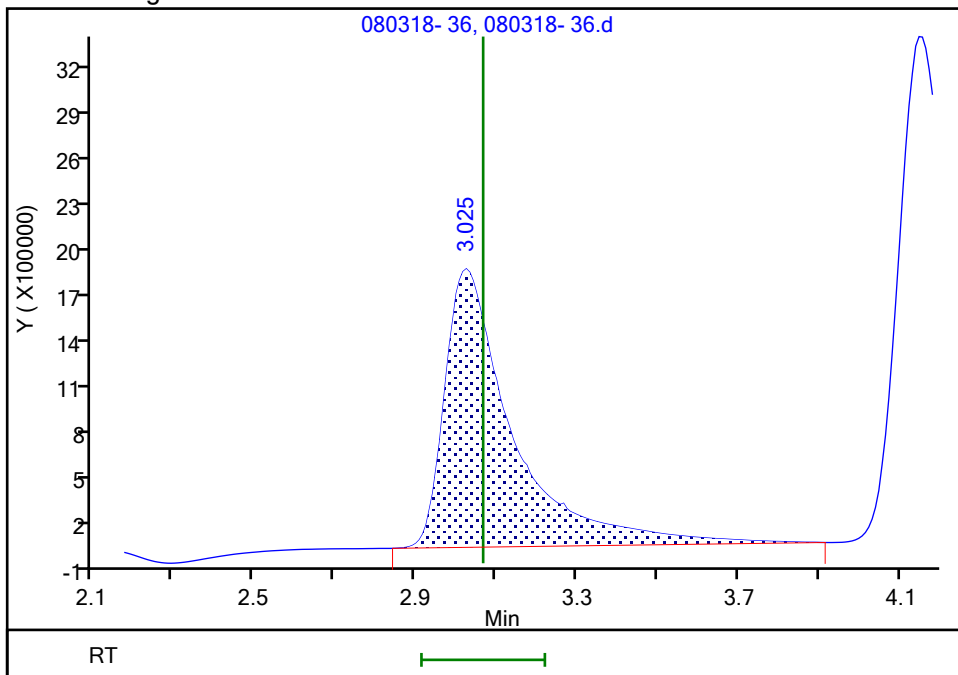
RT: 3.03
Area: 22911474
Amount: 1063.1157
Amount Units: ug/l

Processing Integration Results



RT: 3.03
Area: 21514642
Amount: 998.3012
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 06-Aug-2018 10:38:40
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

FORM VII
HPLC/IC CONTINUING CALIBRATION DATA

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Lab Sample ID: CCV 160-380227/48 Calibration Date: 08/04/2018 07:31
 Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
 GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
 Lab File ID: 080318- 48.d Conc. Units: mg/L

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Fluoride	LinF		22238		1.03	1.00	3.2	10.0
Chloride	LinF		15875		1.95	2.00	-2.3	10.0
Nitrite as N	LinF		30744		0.160	0.160	0.0	
Bromide	LinF		6774		1.99	2.00	-0.4	10.0
Nitrate as N	LinF		37615		0.398	0.400	-0.5	
Orthophosphate	LinF		4644		7.86	8.00	-1.7	
Sulfate	LinF		12136		7.76	8.00	-3.0	10.0

FORM VII
HPLC/IC CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Lab Sample ID: CCV 160-380227/48 Calibration Date: 08/04/2018 07:31
Instrument ID: CIC2500 Calib Start Date: 08/02/2018 16:50
GC Column: IonPacAS14 ID: 4.00 (mm) Calib End Date: 08/02/2018 18:15
Lab File ID: 080318- 48.d

Analyte	RT	RT WINDOW	
		FROM	TO
Fluoride	3.03	2.91	3.22
Chloride	4.17	3.99	4.41
Nitrite as N	4.89	4.70	5.20
Bromide	6.01	5.80	6.41
Nitrate as N	6.93	6.70	7.40
Orthophosphate	9.07	8.77	9.70
Sulfate	11.52	11.12	12.29

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 48.d
 Lims ID: CCV
 Client ID:
 Sample Type: CCV
 Inject. Date: 04-Aug-2018 07:31:00 ALS Bottle#: 0 Worklist Smp#: 48
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-048
 Misc. Info.: 28778 CCV
 Operator ID: Instrument ID: CIC2500
 Sublist: chrom-Anions_CIC2500*sub2
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:43:59 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:40:28

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.025	3.067	-0.042	22238426	1000.0	1031.9	M
2 Chloride	4.167	4.200	-0.033	31750144	2000.0	1954.0	
3 Nitrite as N	4.892	4.950	-0.058	4919086	160.0	160.0	
4 Bromide	6.008	6.100	-0.092	13547404	2000.0	1992.3	
5 Nitrate as N	6.925	7.050	-0.125	15045808	400.0	398.2	
6 Orthophosphate	9.067	9.233	-0.166	37149132	8000.0	7864.4	
7 Sulfate	11.517	11.700	-0.183	97087644	8000.0	7759.4	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

IC Cal High_00059

Amount Added: 2.00

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 48.d

Injection Date: 04-Aug-2018 07:31:00

Instrument ID: CIC2500

Operator ID:

Lims ID: CCV

Worklist Smp#: 48

Client ID:

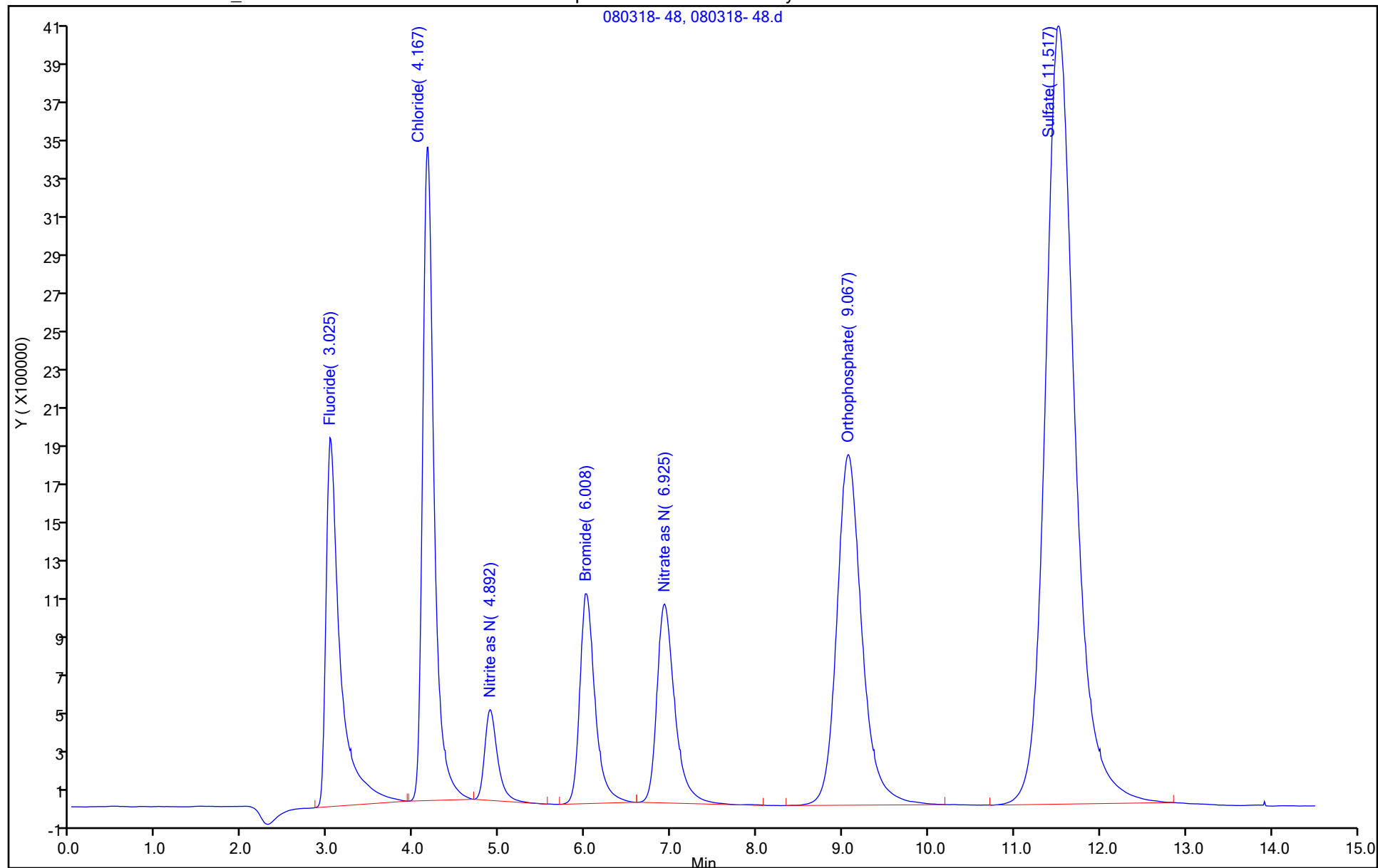
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 48.d
Injection Date: 04-Aug-2018 07:31:00 Instrument ID: CIC2500
Lims ID: CCV
Client ID:
Operator ID:
Injection Vol: 50.0 uL
Method: Anions_CIC2500
Column:

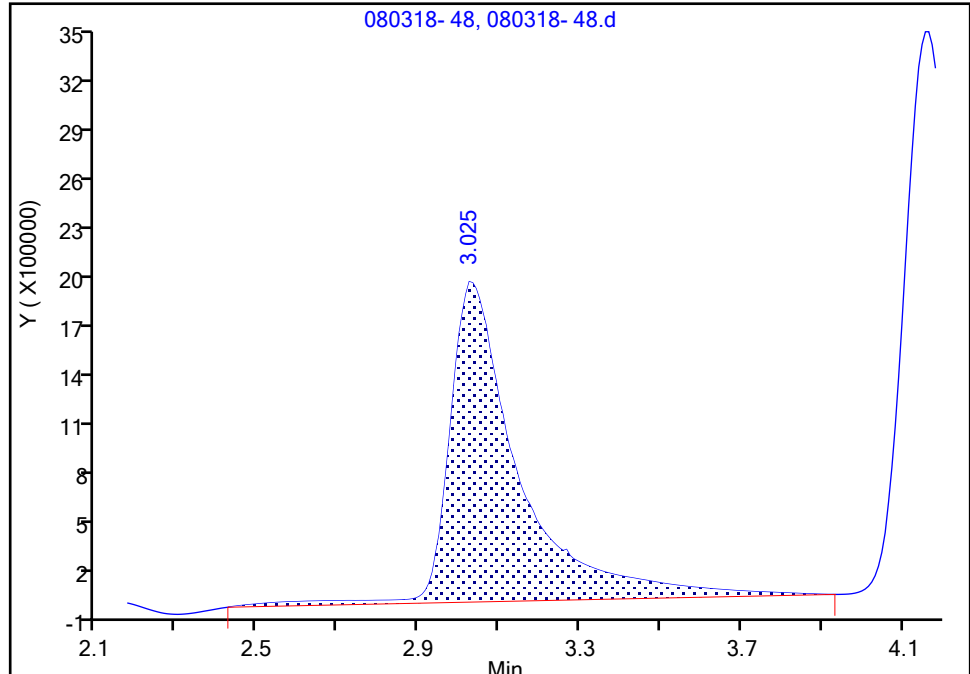
ALS Bottle#: 0 Worklist Smp#: 48
Dil. Factor: 1.0000
Limit Group: WT - IC - 28Days
Detector: 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

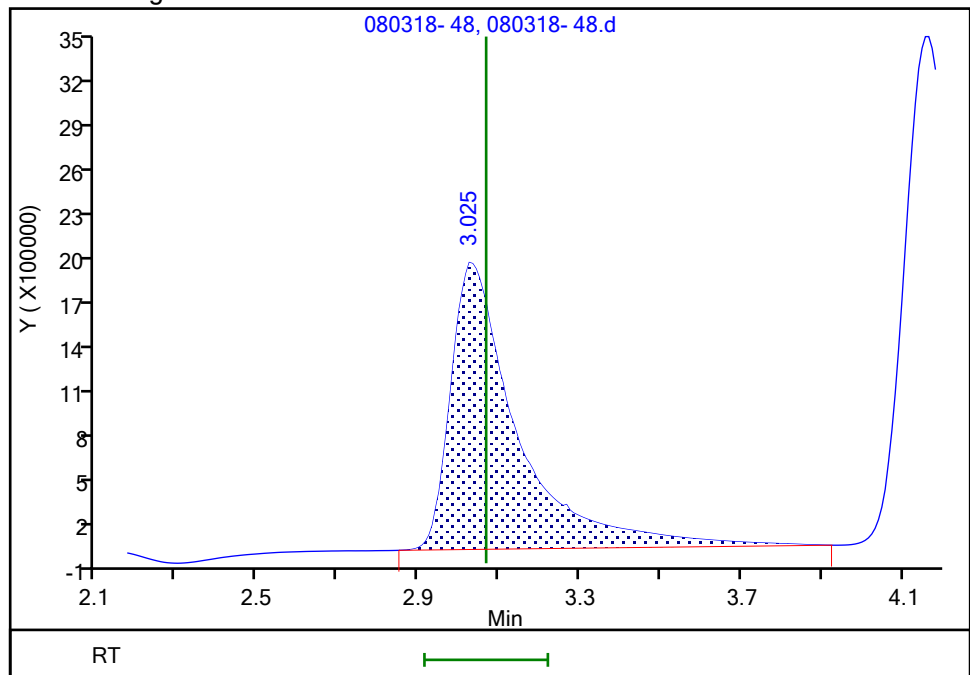
RT: 3.03
Area: 23468362
Amount: 1088.9558
Amount Units: ug/l

Processing Integration Results



RT: 3.03
Area: 22238426
Amount: 1031.8856
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 06-Aug-2018 10:40:24
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: MB 160-380227/3
Matrix: Water Lab File ID: 080318- 3.d
Analysis Method: 300.0 Date Collected: _____
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/03/2018 18:49
Con. Extract Vol.: _____ Dilution Factor: 1
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 380227 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	26	U	100	26

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 3.d
 Lims ID: MB
 Client ID:
 Sample Type: MB
 Inject. Date: 03-Aug-2018 18:49:00 ALS Bottle#: 0 Worklist Smp#: 3
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-003
 Misc. Info.: 21 MB
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:26 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:33:19

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride		3.067				ND	
2 Chloride	4.125	4.200	-0.075	107535		6.62	M
3 Nitrite as N		4.950				ND	U
4 Bromide		6.100				ND	
5 Nitrate as N		7.050				ND	
8 Chlorate		7.533				ND	
6 Orthophosphate		9.233				ND	
7 Sulfate		11.700				ND	
10 Orthophosphate as P		0.000				ND	

QC Flag Legend

Review Flags

M - Manually Integrated

U - Marked Undetected

Report Date: 06-Aug-2018 10:41:28

Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 3.d

Injection Date: 03-Aug-2018 18:49:00

Instrument ID: CIC2500

Operator ID:

Lims ID: MB

Worklist Smp#: 3

Client ID:

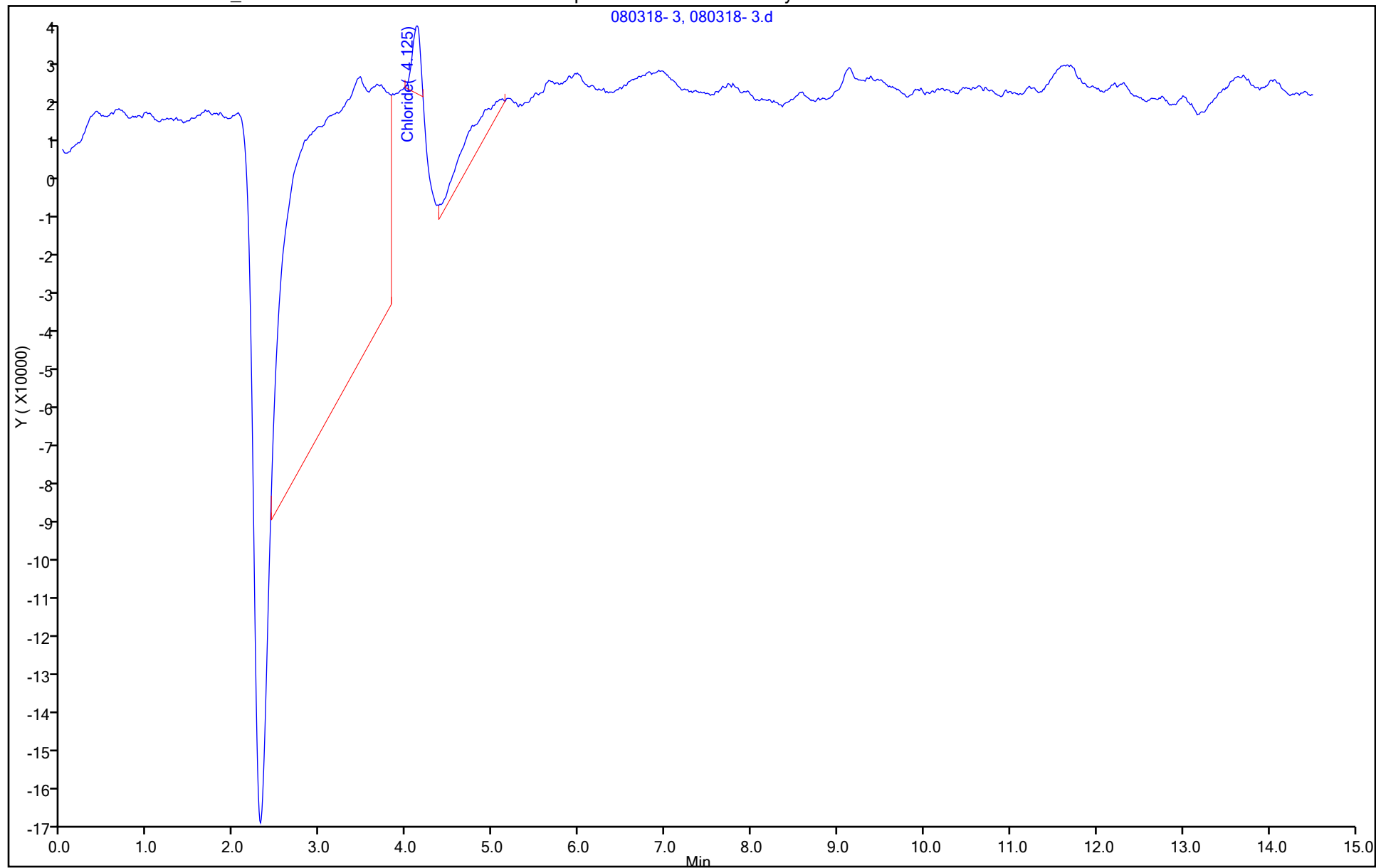
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: CCB 160-380227/2
Matrix: Water Lab File ID: 080318- 2.d
Analysis Method: 300.0 Date Collected: _____
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/03/2018 18:32
Con. Extract Vol.: _____ Dilution Factor: 1
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 380227 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	0.026	U	0.10	0.026

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 2.d
 Lims ID: CCB
 Client ID:
 Sample Type: CCB
 Inject. Date: 03-Aug-2018 18:32:00 ALS Bottle#: 0 Worklist Smp#: 2
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-002
 Misc. Info.: 20 CCB
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:26 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:32:53

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride		3.067				ND	U
2 Chloride	4.117	4.200	-0.083	390447		24.0	
3 Nitrite as N		4.950				ND	
4 Bromide		6.100				ND	
5 Nitrate as N		7.050				ND	
8 Chlorate		7.533				ND	
6 Orthophosphate		9.233				ND	
7 Sulfate		11.700				ND	
10 Orthophosphate as P		0.000				ND	

QC Flag Legend

Review Flags

U - Marked Undetected

Report Date: 06-Aug-2018 10:41:27

Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 2.d

Injection Date: 03-Aug-2018 18:32:00

Instrument ID: CIC2500

Operator ID:

Lims ID: CCB

Worklist Smp#: 2

Client ID:

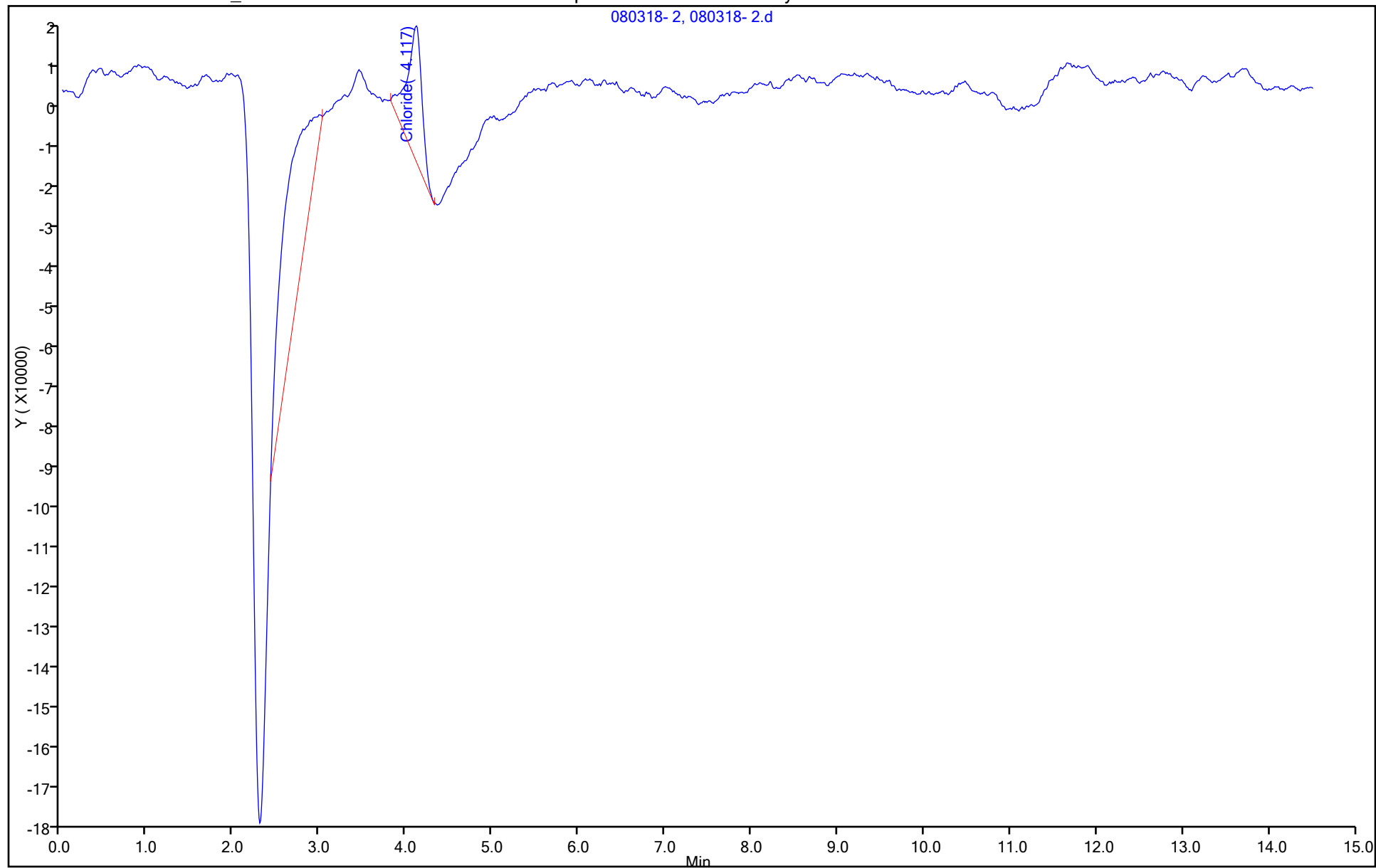
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 2.d

Injection Date: 03-Aug-2018 18:32:00

Instrument ID: CIC2500

Lims ID: CCB

Client ID:

Operator ID:

ALS Bottle#:

0

Worklist Smp#:

2

Injection Vol: 50.0 uL

Dil. Factor: 1.0000

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days

Column:

Detector

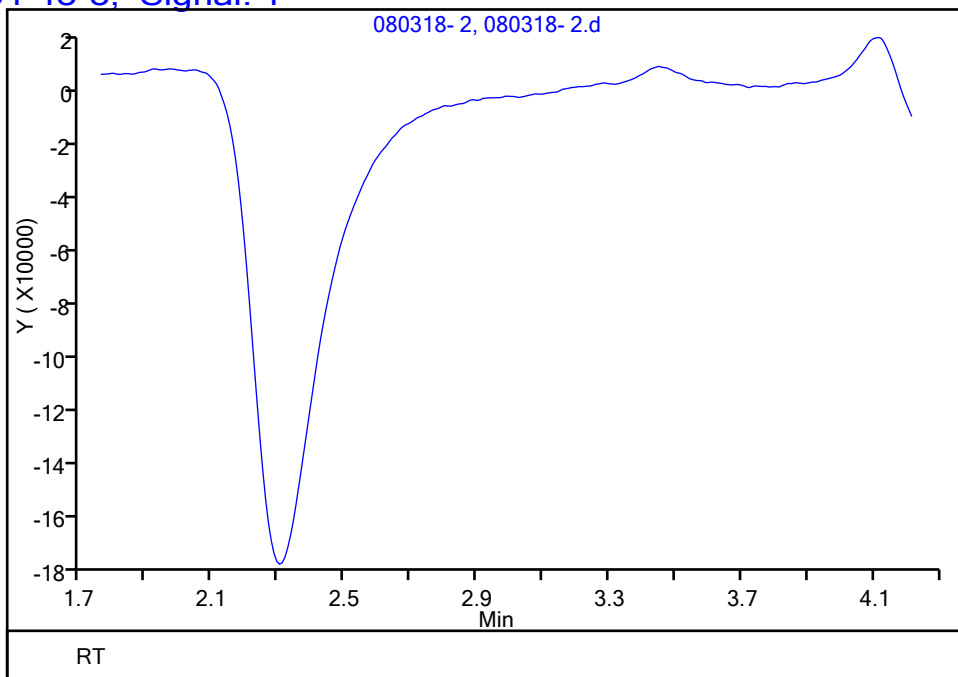
113

1 Fluoride, CAS: 16984-48-8, Signal: 1

RT: 2.99

Response: 964187

Amount: 44.739256



Reviewer: boydj, 06-Aug-2018 10:32:53

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: CCB 160-380227/14
Matrix: Water Lab File ID: 080318- 14.d
Analysis Method: 300.0 Date Collected: _____
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/03/2018 21:56
Con. Extract Vol.: _____ Dilution Factor: 1
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 380227 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	0.026	U	0.10	0.026

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 14.d
 Lims ID: CCB
 Client ID:
 Sample Type: CCB
 Inject. Date: 03-Aug-2018 21:56:00 ALS Bottle#: 0 Worklist Smp#: 14
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-014
 Misc. Info.: 32 CCB
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:39 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:34:48

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride		3.067				ND	U
2 Chloride	4.108	4.200	-0.092	78433		4.83	M
3 Nitrite as N		4.950				ND	U
4 Bromide		6.100				ND	
5 Nitrate as N		7.050				ND	
8 Chlorate		7.533				ND	
6 Orthophosphate		9.233				ND	
7 Sulfate		11.700				ND	
10 Orthophosphate as P		0.000				ND	

QC Flag Legend

Review Flags

M - Manually Integrated

U - Marked Undetected

Report Date: 06-Aug-2018 10:41:40

Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 14.d

Injection Date: 03-Aug-2018 21:56:00

Instrument ID: CIC2500

Operator ID:

Lims ID: CCB

Worklist Smp#: 14

Client ID:

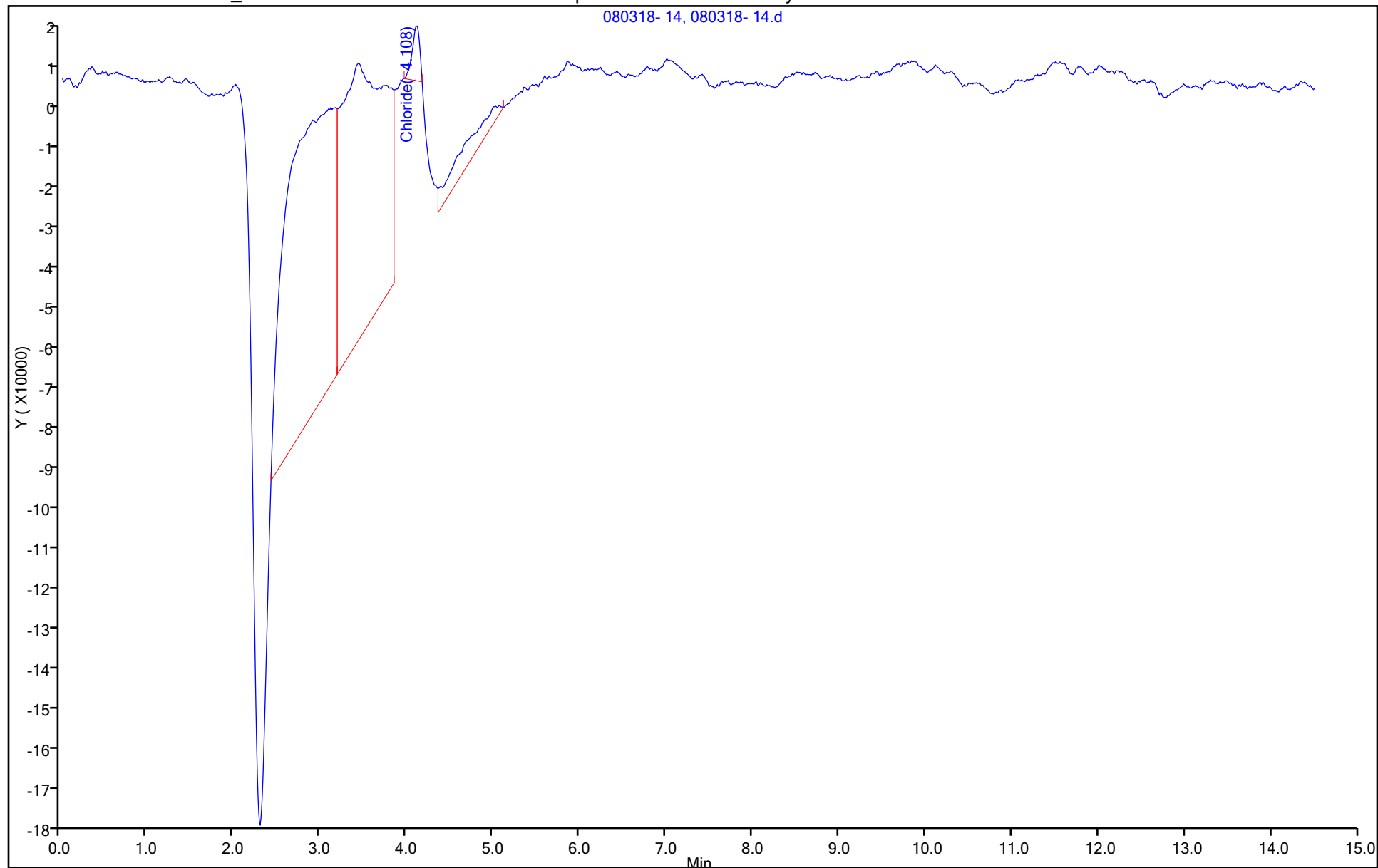
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 14.d

Injection Date: 03-Aug-2018 21:56:00

Instrument ID: CIC2500

Lims ID: CCB

Client ID:

Operator ID:

ALS Bottle#:

0

Worklist Smp#:

14

Injection Vol: 50.0 uL

Dil. Factor: 1.0000

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days

Column:

Detector

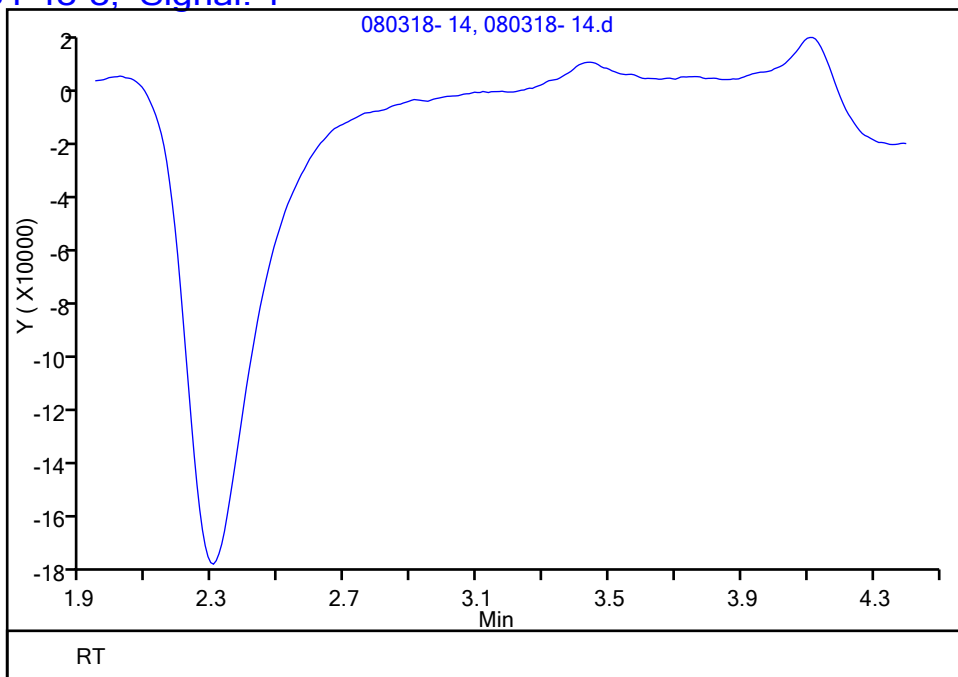
113

1 Fluoride, CAS: 16984-48-8, Signal: 1

RT: 3.18

Response: 2800341

Amount: 129.9387



Reviewer: boydj, 06-Aug-2018 10:34:48

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: CCB 160-380227/37
Matrix: Water Lab File ID: 080318- 37.d
Analysis Method: 300.0 Date Collected: _____
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/04/2018 04:25
Con. Extract Vol.: _____ Dilution Factor: 1
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 380227 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	0.026	U	0.10	0.026

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 37.d
 Lims ID: CCB
 Client ID:
 Sample Type: CCB
 Inject. Date: 04-Aug-2018 04:25:00 ALS Bottle#: 0 Worklist Smp#: 37
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-037
 Misc. Info.: 27090 CCB
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:49 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:39:01

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride		3.067				ND	U
2 Chloride	4.133	4.200	-0.067	71618		4.41	M
3 Nitrite as N		4.950				ND	
4 Bromide		6.100				ND	
5 Nitrate as N		7.050				ND	
8 Chlorate		7.533				ND	
6 Orthophosphate		9.233				ND	
7 Sulfate		11.700				ND	
10 Orthophosphate as P		0.000				ND	

QC Flag Legend

Review Flags

M - Manually Integrated

U - Marked Undetected

Report Date: 06-Aug-2018 10:41:49

Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 37.d

Injection Date: 04-Aug-2018 04:25:00

Instrument ID: CIC2500

Operator ID:

Lims ID: CCB

Worklist Smp#: 37

Client ID:

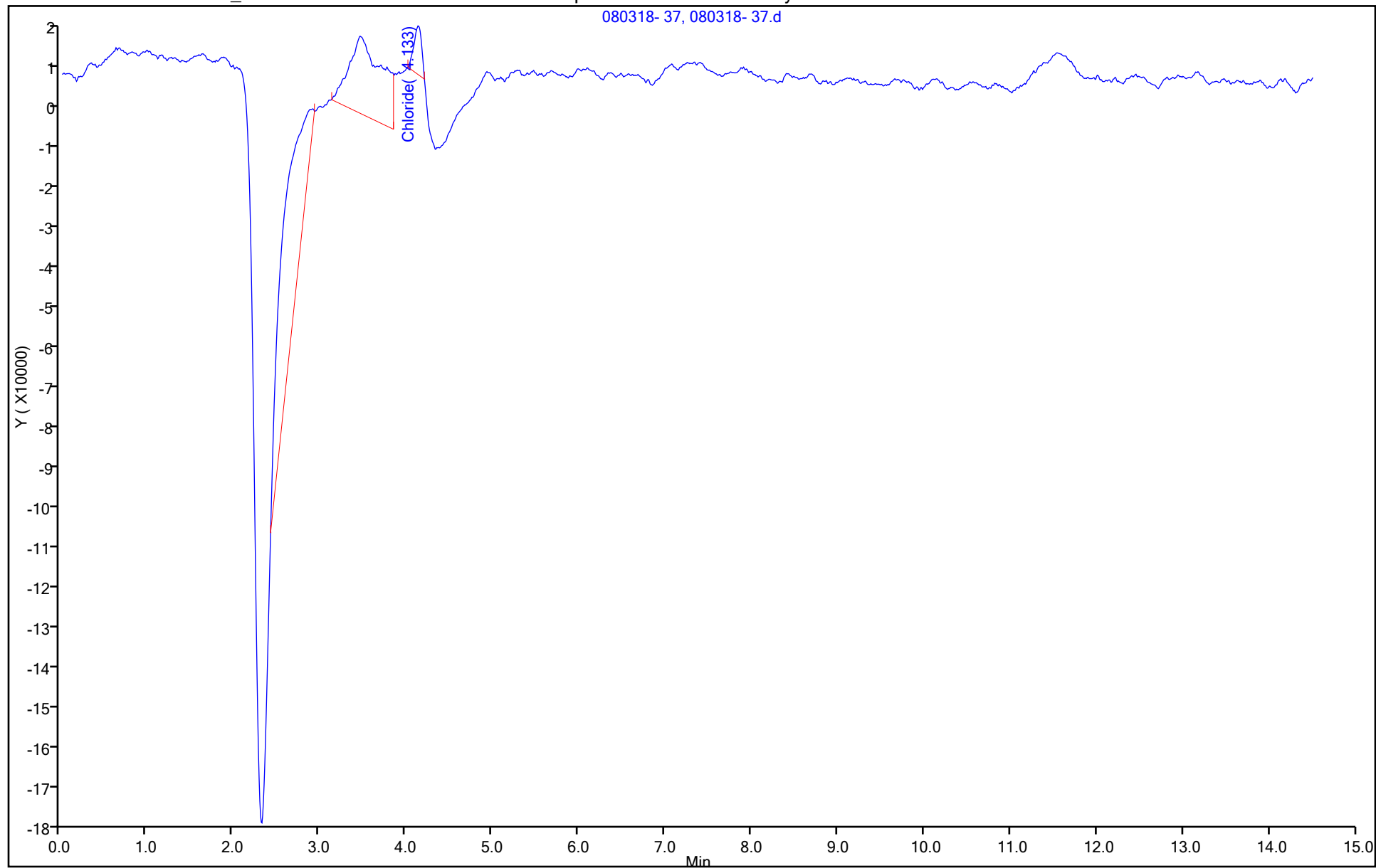
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 37.d

Injection Date: 04-Aug-2018 04:25:00

Instrument ID: CIC2500

Lims ID: CCB

Client ID:

Operator ID:

ALS Bottle#:

0

Worklist Smp#:

37

Injection Vol: 50.0 uL

Dil. Factor: 1.0000

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days

Column:

Detector

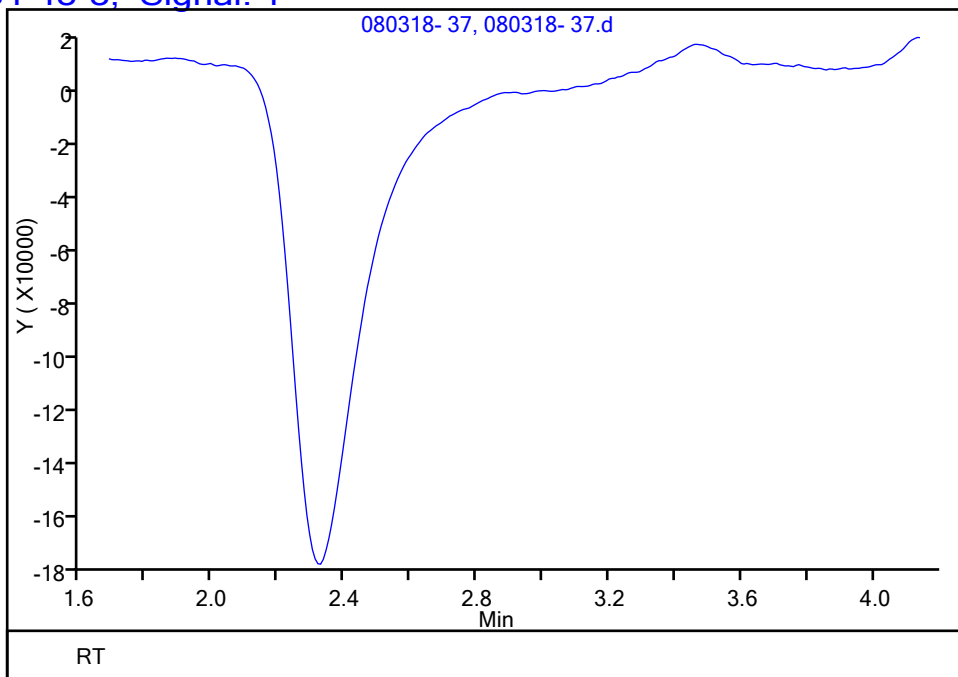
113

1 Fluoride, CAS: 16984-48-8, Signal: 1

RT: 2.92

Response: 859423

Amount: 39.878100



Reviewer: boydj, 06-Aug-2018 10:39:01

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: CCB 160-380227/49
Matrix: Water Lab File ID: 080318- 49.d
Analysis Method: 300.0 Date Collected: _____
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/04/2018 07:48
Con. Extract Vol.: _____ Dilution Factor: 1
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 380227 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	0.026	U	0.10	0.026

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 49.d
 Lims ID: CCB
 Client ID:
 Sample Type: CCB
 Inject. Date: 04-Aug-2018 07:48:00 ALS Bottle#: 0 Worklist Smp#: 49
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-049
 Misc. Info.: 11682 CCB
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:43:59 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:40:51

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride		3.067				ND	U
2 Chloride	4.117	4.200	-0.083	100205		6.17	M
3 Nitrite as N		4.950				ND	U
4 Bromide		6.100				ND	
5 Nitrate as N		7.050				ND	
8 Chlorate		7.533				ND	
6 Orthophosphate		9.233				ND	
7 Sulfate		11.700				ND	
10 Orthophosphate as P		0.000				ND	

QC Flag Legend

Review Flags

M - Manually Integrated

U - Marked Undetected

Report Date: 06-Aug-2018 10:44:00

Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 49.d

Injection Date: 04-Aug-2018 07:48:00

Instrument ID: CIC2500

Operator ID:

Lims ID: CCB

Worklist Smp#: 49

Client ID:

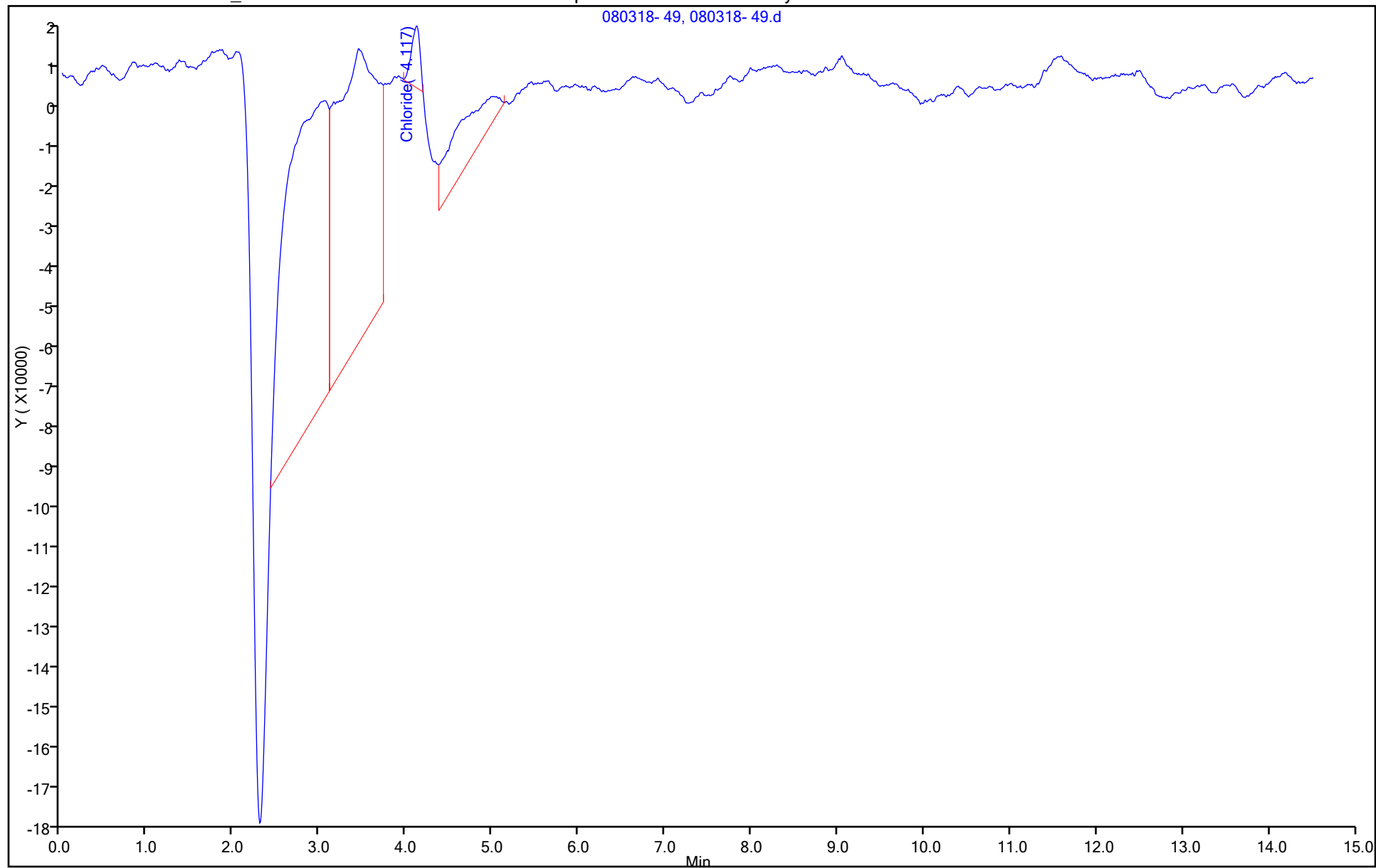
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 49.d

Injection Date: 04-Aug-2018 07:48:00

Instrument ID: CIC2500

Lims ID: CCB

Client ID:

Operator ID:

ALS Bottle#:

0

Worklist Smp#:

49

Injection Vol: 50.0 uL

Dil. Factor: 1.0000

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days

Column:

Detector

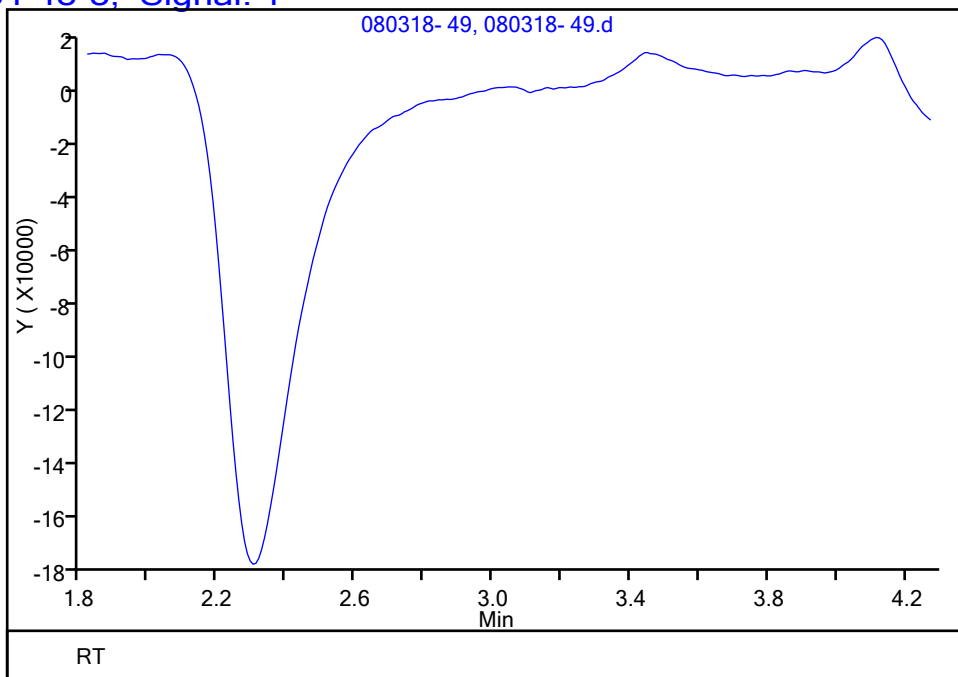
113

1 Fluoride, CAS: 16984-48-8, Signal: 1

RT: 3.05

Response: 2579645

Amount: 119.6981



Reviewer: boydj, 06-Aug-2018 10:40:51

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: ICB 160-379990/8
Matrix: Water Lab File ID: 080218- 8.d
Analysis Method: 300.0 Date Collected: _____
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/02/2018 18:49
Con. Extract Vol.: _____ Dilution Factor: 1
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 379990 Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	0.026	U	0.10	0.026

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 8.d
 Lims ID: ICB
 Client ID:
 Sample Type: ICB
 Inject. Date: 02-Aug-2018 18:49:00 ALS Bottle#: 0 Worklist Smp#: 8
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013779-008
 Misc. Info.: 8 ICB
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 03-Aug-2018 12:05:08 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0302

First Level Reviewer: boydj

Date: 03-Aug-2018 11:49:09

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride		3.067				ND	U
2 Chloride		4.200				ND	U
3 Nitrite as N		4.950				ND	
4 Bromide		6.100				ND	
5 Nitrate as N		7.050				ND	
8 Chlorate		7.533				ND	
6 Orthophosphate		9.233				ND	
7 Sulfate		11.700				ND	
10 Orthophosphate as P		0.000				ND	

QC Flag Legend

Review Flags

U - Marked Undetected

Report Date: 03-Aug-2018 12:05:10

Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 8.d

Injection Date: 02-Aug-2018 18:49:00

Instrument ID: CIC2500

Operator ID:

Lims ID: ICB

Worklist Smp#: 8

Client ID:

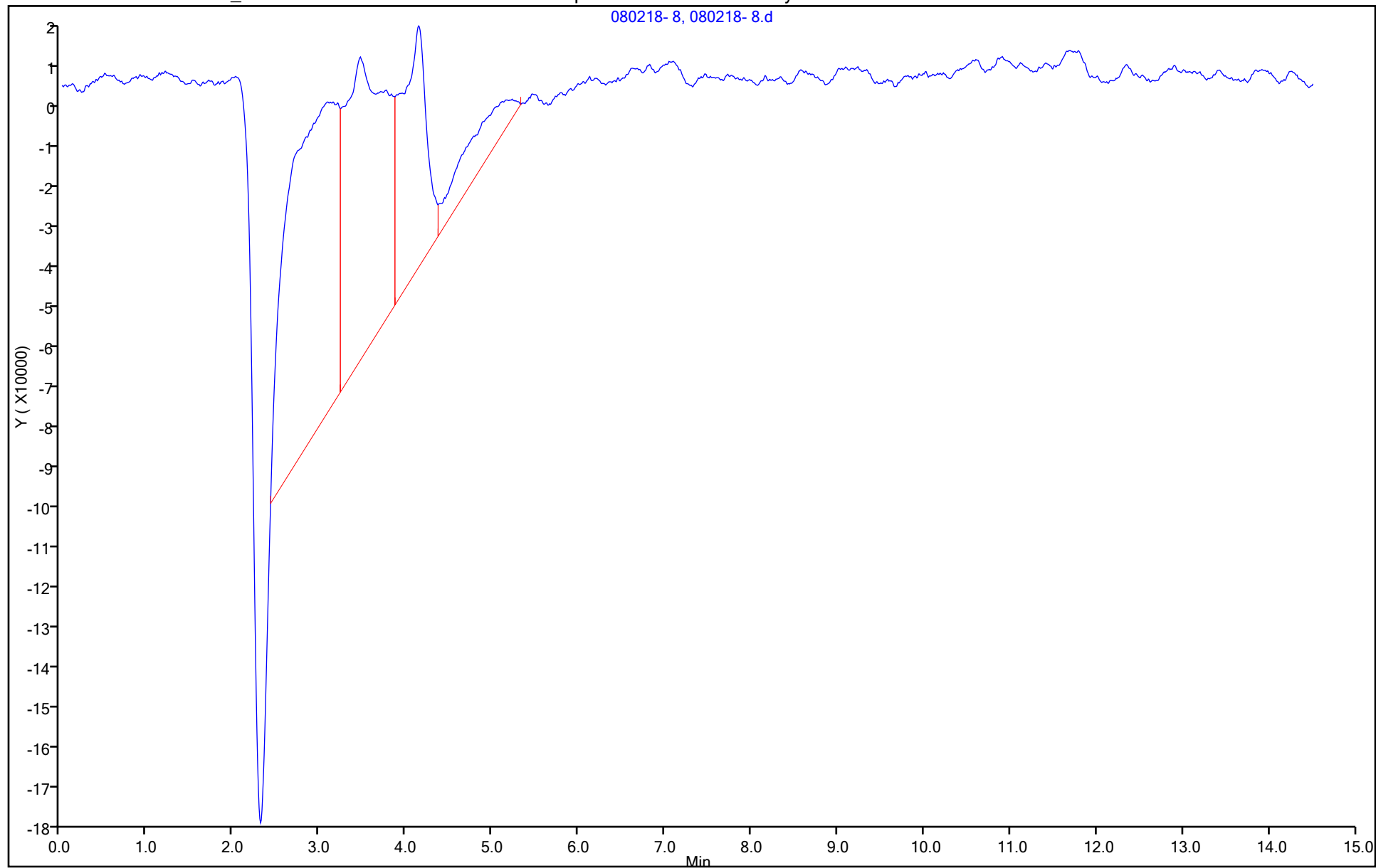
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 8.d

Injection Date: 02-Aug-2018 18:49:00

Instrument ID: CIC2500

Lims ID: ICB

Client ID:

Operator ID:

ALS Bottle#:

0

Worklist Smp#:

8

Injection Vol: 50.0 uL

Dil. Factor: 1.0000

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days

Column:

Detector

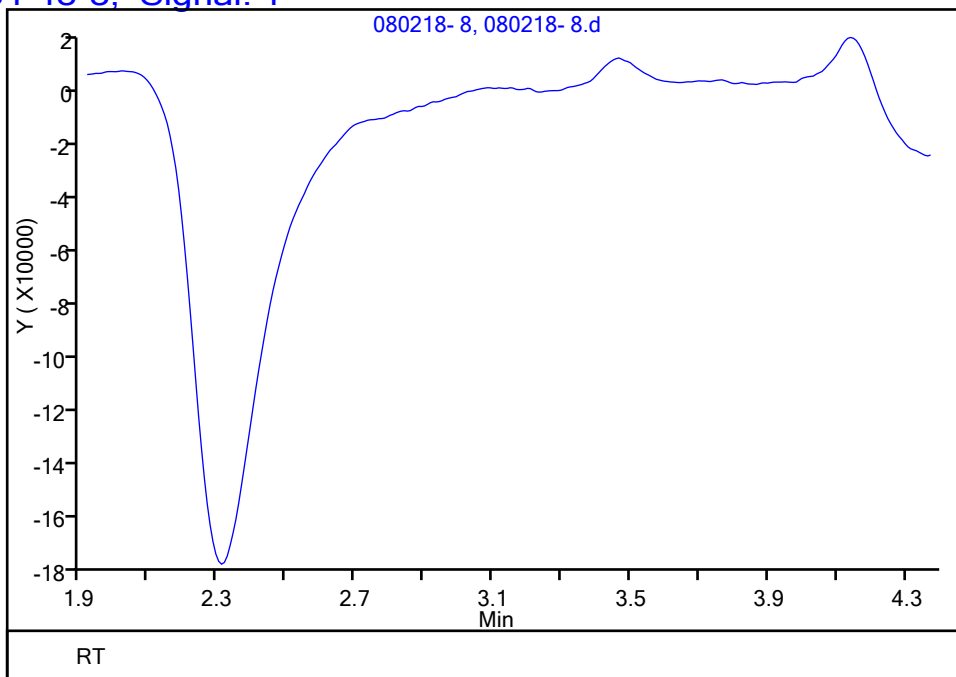
113

1 Fluoride, CAS: 16984-48-8, Signal: 1

RT: 3.15

Response: 3069468

Amount: 142.4264



Reviewer: boydj, 03-Aug-2018 11:49:09

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: LCS 160-380227/4
Matrix: Water Lab File ID: 080318- 4.d
Analysis Method: 300.0 Date Collected: _____
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/03/2018 19:06
Con. Extract Vol.: _____ Dilution Factor: 1
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 380227 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	1000		100	26

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 4.d
 Lims ID: LCS
 Client ID:
 Sample Type: LCS
 Inject. Date: 03-Aug-2018 19:06:00 ALS Bottle#: 0 Worklist Smp#: 4
 Injection Vol: 50.0 uL Dil. Factor: 1.0000
 Sample Info: 160-0013784-004
 Misc. Info.: 22 LCS
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:26 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:33:38

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.050	3.067	-0.017	21597944	1000.0	1002.2	M
2 Chloride	4.175	4.200	-0.025	31104244	2000.0	1914.3	
3 Nitrite as N	4.908	4.950	-0.042	4848326	160.0	157.7	
4 Bromide	6.033	6.100	-0.067	13349472	2000.0	1963.2	
5 Nitrate as N	6.958	7.050	-0.092	14917342	400.0	394.8	
6 Orthophosphate	9.125	9.233	-0.108	36609238	8000.0	7750.1	
7 Sulfate	11.608	11.700	-0.092	96113781	8000.0	7681.5	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

IC Cal High_00059

Amount Added: 2.00

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 4.d

Injection Date: 03-Aug-2018 19:06:00

Instrument ID: CIC2500

Operator ID:

Lims ID: LCS

Worklist Smp#: 4

Client ID:

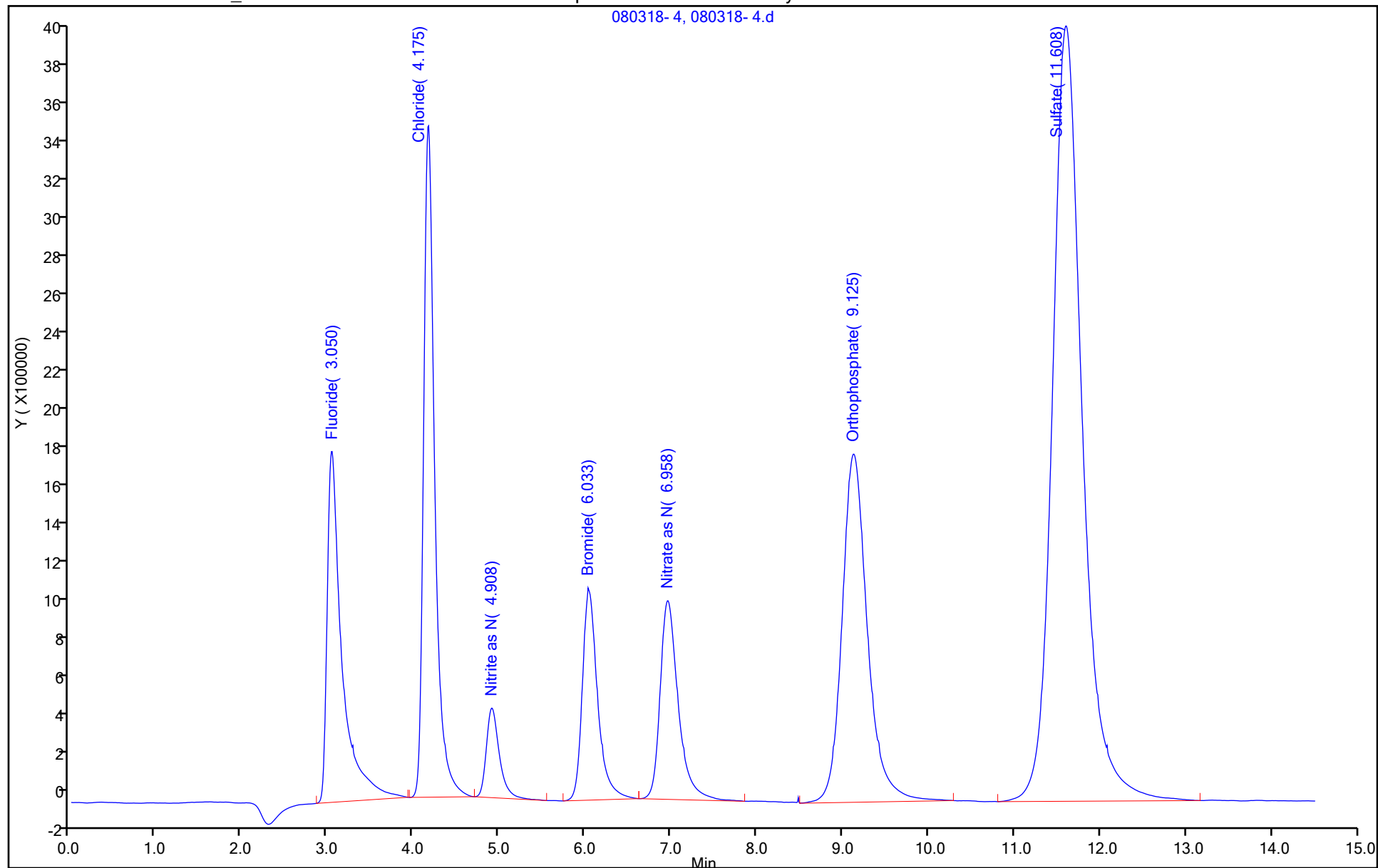
Injection Vol: 50.0 uL

Dil. Factor: 1.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 4.d
Injection Date: 03-Aug-2018 19:06:00 Instrument ID: CIC2500
Lims ID: LCS
Client ID:
Operator ID:
Injection Vol: 50.0 uL
Method: Anions_CIC2500
Column:

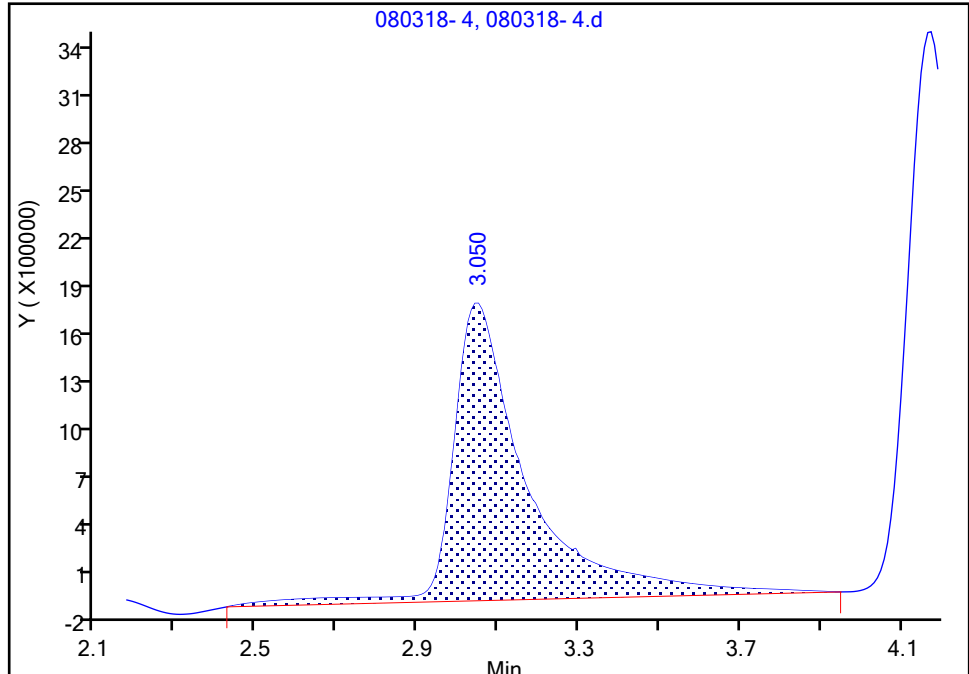
ALS Bottle#: 0 Worklist Smp#: 4
Dil. Factor: 1.0000
Limit Group: WT - IC - 28Days
Detector: 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

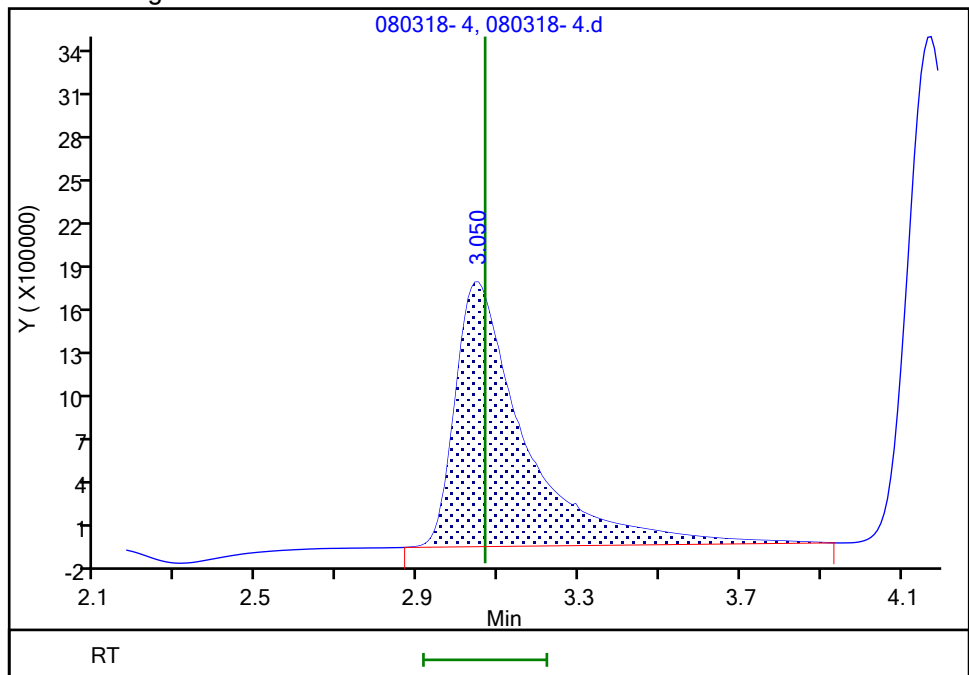
RT: 3.05
Area: 23585048
Amount: 1094.3702
Amount Units: ug/l

Processing Integration Results



RT: 3.05
Area: 21597944
Amount: 1002.1665
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 06-Aug-2018 10:33:31
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: CRC-MW-1 MS DL Lab Sample ID: 160-29476-1 MS DL
Matrix: Water Lab File ID: 080318- 47.d
Analysis Method: 300.0 Date Collected: 07/11/2018 13:55
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/04/2018 07:14
Con. Extract Vol.: _____ Dilution Factor: 20
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 380227 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	46200		2000	520

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 47.d
 Lims ID: 160-29476-Q-1 MS
 Client ID:
 Sample Type: MS
 Inject. Date: 04-Aug-2018 07:14:00 ALS Bottle#: 0 Worklist Smp#: 47
 Injection Vol: 50.0 uL Dil. Factor: 20.0000
 Sample Info: 160-0013784-047
 Misc. Info.: 15937 160-29476-Q-1 MS
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:49 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.033	3.067	-0.034	49739903	2000.0	2308.0	
2 Chloride	4.175	4.200	-0.025	56893679	2000.0	3501.4	
3 Nitrite as N	4.900	4.950	-0.050	2724961	100.0	88.7	
4 Bromide	6.017	6.100	-0.083	13066454	2000.0	1921.6	
5 Nitrate as N	6.925	7.050	-0.125	15140066	400.0	400.7	
8 Chlorate		7.533				ND	
6 Orthophosphate	9.075	9.233	-0.158	17383226	4000.0	3680.0	
7 Sulfate	11.525	11.700	-0.175	65162355	4000.0	5207.9	
10 Orthophosphate as P		0.000				ND	

Reagents:

IC MS Soln_00010

Amount Added: 0.10

Units: mL

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 47.d

Injection Date: 04-Aug-2018 07:14:00

Instrument ID: CIC2500

Operator ID:

Lims ID: 160-29476-Q-1 MS

Worklist Smp#: 47

Client ID:

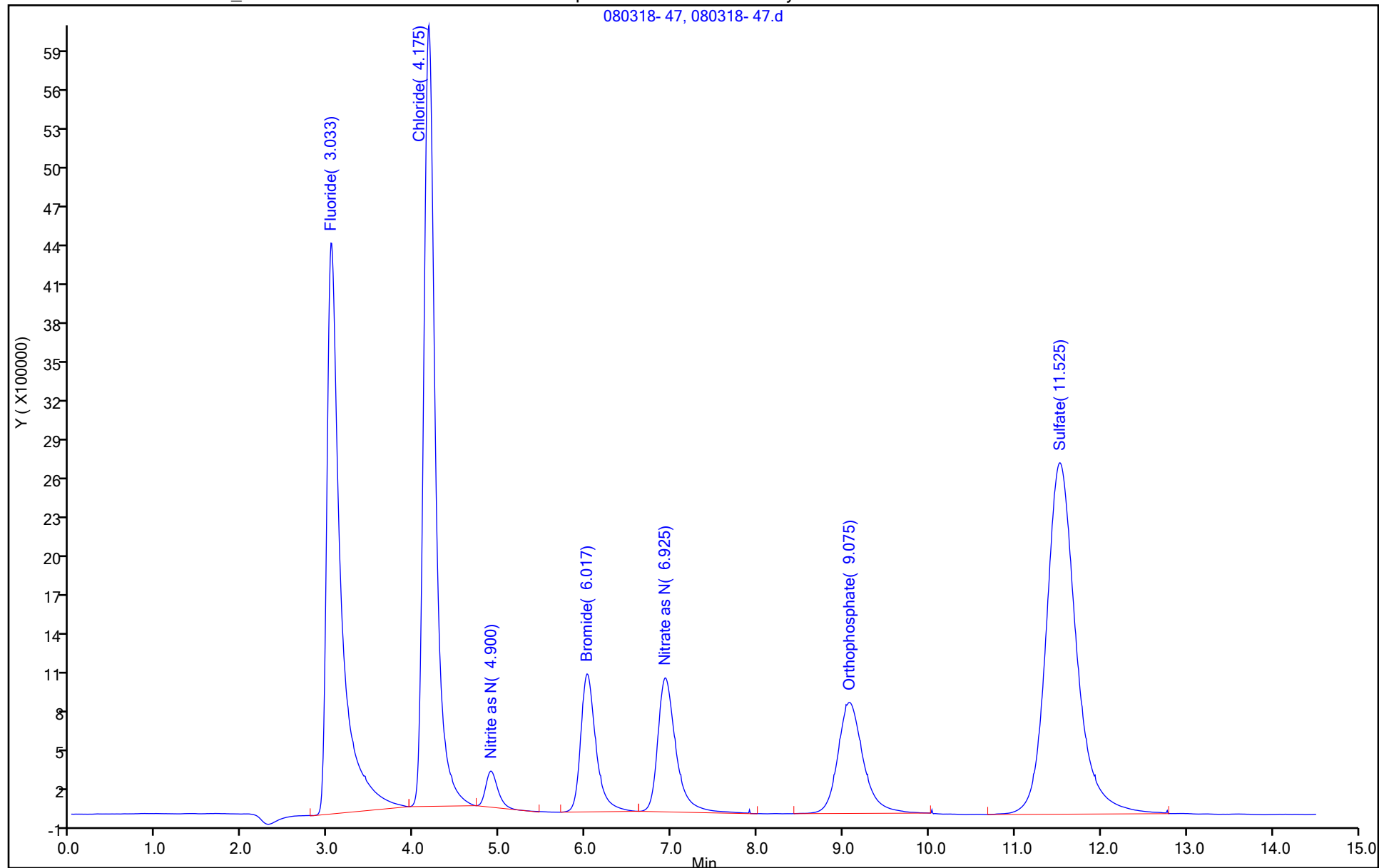
Injection Vol: 50.0 uL

Dil. Factor: 20.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Client Sample ID: CRC-MW-1 DU DL Lab Sample ID: 160-29476-1 DU DL
Matrix: Water Lab File ID: 080318- 45.d
Analysis Method: 300.0 Date Collected: 07/11/2018 13:55
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 5 (mL) Date Analyzed: 08/04/2018 06:40
Con. Extract Vol.: _____ Dilution Factor: 20
Injection Volume: 50 (uL) GC Column: IonPacAS14 ID: 4 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 380227 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
16984-48-8	Fluoride	4800		2000	520

TestAmerica St. Louis
Target Compound Quantitation Report

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 45.d
 Lims ID: 160-29476-Q-1 DU
 Client ID:
 Sample Type: DU
 Inject. Date: 04-Aug-2018 06:40:00 ALS Bottle#: 0 Worklist Smp#: 45
 Injection Vol: 50.0 uL Dil. Factor: 20.0000
 Sample Info: 160-0013784-045
 Misc. Info.: 9268 160-29476-Q-1 DU
 Operator ID: Instrument ID: CIC2500
 Method: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\Anions_CIC2500.m
 Limit Group: WT - IC - 28Days
 Last Update: 06-Aug-2018 10:41:49 Calib Date: 02-Aug-2018 18:15:00
 Integrator: Falcon
 Quant Method: External Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\StLouis\ChromData\CIC2500\20180802-13779.b\080218- 6.d
 Column 1 : Det: 113
 Process Host: CTX0308

First Level Reviewer: boydj

Date: 06-Aug-2018 10:40:09

Compound	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
1 Fluoride	3.025	3.067	-0.042	5168145		239.8	M
2 Chloride	4.158	4.200	-0.042	25724973		1583.2	
3 Nitrite as N		4.950				ND	
4 Bromide		6.100				ND	
5 Nitrate as N	6.942	7.050	-0.108	472699		12.5	
8 Chlorate		7.533				ND	
6 Orthophosphate		9.233				ND	
7 Sulfate	11.525	11.700	-0.175	18914272		1511.7	
10 Orthophosphate as P		0.000				ND	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica St. Louis

Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 45.d

Injection Date: 04-Aug-2018 06:40:00

Instrument ID: CIC2500

Operator ID:

Lims ID: 160-29476-Q-1 DU

Worklist Smp#: 45

Client ID:

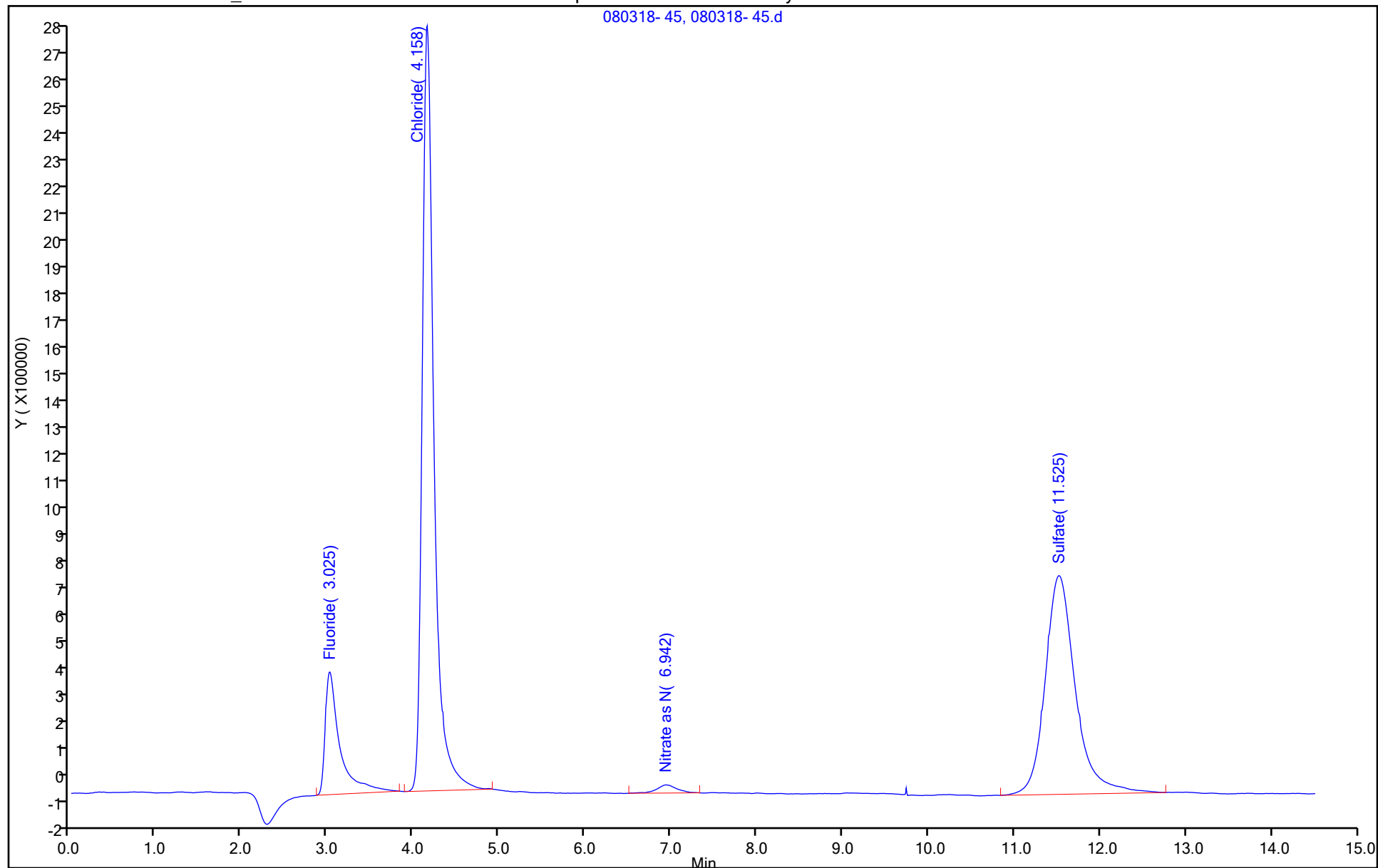
Injection Vol: 50.0 uL

Dil. Factor: 20.0000

ALS Bottle#: 0

Method: Anions_CIC2500

Limit Group: WT - IC - 28Days



TestAmerica St. Louis

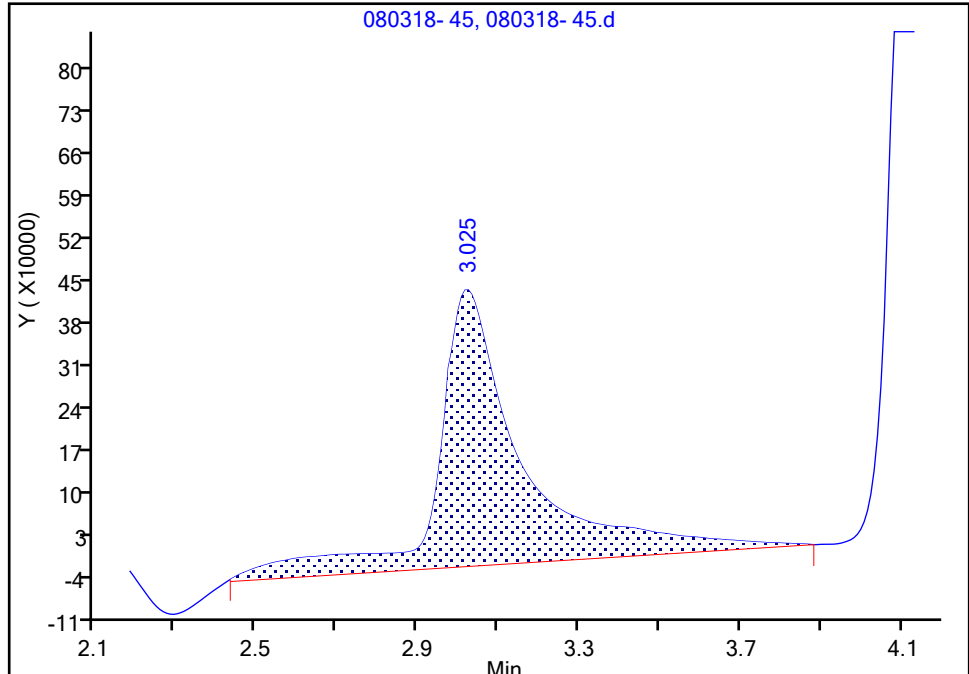
Data File: \\ChromNA\StLouis\ChromData\CIC2500\20180803-13784.b\080318- 45.d
Injection Date: 04-Aug-2018 06:40:00 Instrument ID: CIC2500
Lims ID: 160-29476-Q-1 DU
Client ID:
Operator ID: ALS Bottle#: 0 Worklist Smp#: 45
Injection Vol: 50.0 uL Dil. Factor: 20.0000
Method: Anions_CIC2500 Limit Group: WT - IC - 28Days
Column: Detector 113

1 Fluoride, CAS: 16984-48-8

Signal: 1

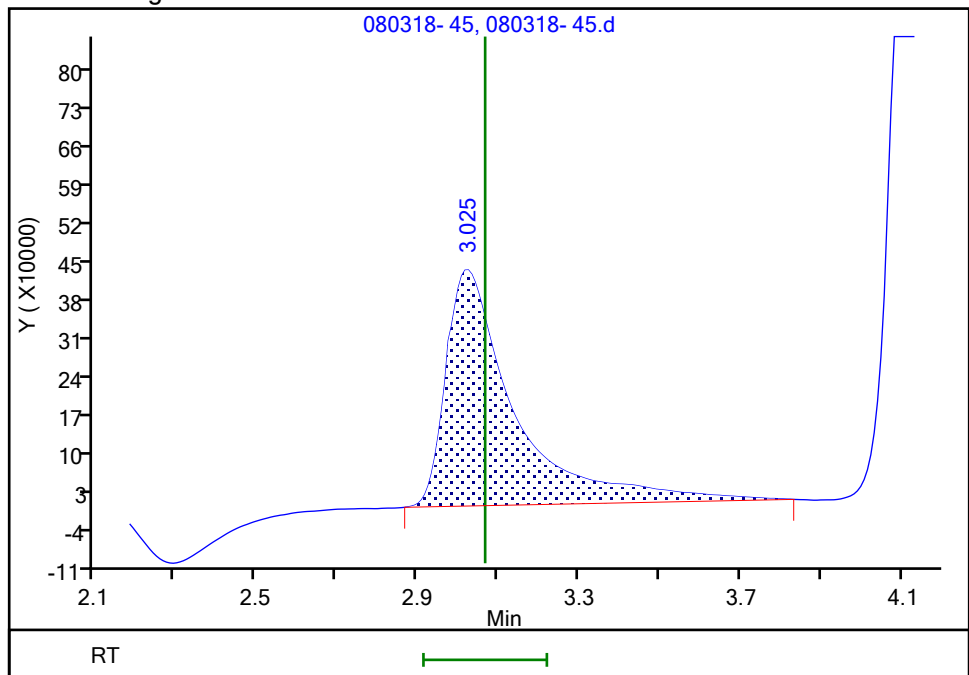
RT: 3.03
Area: 6862816
Amount: 318.4416
Amount Units: ug/l

Processing Integration Results



RT: 3.03
Area: 5168145
Amount: 239.8072
Amount Units: ug/l

Manual Integration Results



Reviewer: boydj, 06-Aug-2018 10:40:05
Audit Action: Manually Integrated

Audit Reason: Baseline Smoothing

HPLC/IC ANALYSIS RUN LOG

Lab Name: TestAmerica St. LouisJob No.: 160-29476-1

SDG No.: _____

Instrument ID: CIC2500Start Date: 08/02/2018 16:50Analysis Batch Number: 379990End Date: 08/03/2018 15:05

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD0 160-379990/1 IC		08/02/2018 16:50	1	080218- 1.d	IonPacAS14 4 (mm)
STD2 160-379990/2 IC		08/02/2018 17:07	1	080218- 2.d	IonPacAS14 4 (mm)
STD3 160-379990/3 IC		08/02/2018 17:24	1	080218- 3.d	IonPacAS14 4 (mm)
STD4 160-379990/4 IC		08/02/2018 17:41	1	080218- 4.d	IonPacAS14 4 (mm)
STD5 160-379990/5 IC		08/02/2018 17:58	1	080218- 5.d	IonPacAS14 4 (mm)
STD6 160-379990/6 IC		08/02/2018 18:15	1	080218- 6.d	IonPacAS14 4 (mm)
ICV 160-379990/7		08/02/2018 18:32	1	080218- 7.d	IonPacAS14 4 (mm)
ICB 160-379990/8		08/02/2018 18:49	1	080218- 8.d	IonPacAS14 4 (mm)
CCV 160-379990/19		08/02/2018 21:55	1		IonPacAS14 4 (mm)
CCB 160-379990/20		08/02/2018 22:12	1		IonPacAS14 4 (mm)
ZZZZZ		08/02/2018 22:29	1		IonPacAS14 4 (mm)
ZZZZZ		08/02/2018 22:46	1		IonPacAS14 4 (mm)
ZZZZZ		08/02/2018 23:03	1		IonPacAS14 4 (mm)
ZZZZZ		08/02/2018 23:20	1		IonPacAS14 4 (mm)
ZZZZZ		08/02/2018 23:36	1		IonPacAS14 4 (mm)
ZZZZZ		08/02/2018 23:53	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 00:10	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 00:27	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 00:44	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 01:01	1		IonPacAS14 4 (mm)
CCV 160-379990/31		08/03/2018 01:18	1		IonPacAS14 4 (mm)
CCB 160-379990/32		08/03/2018 01:35	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 01:52	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 02:09	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 02:26	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 02:43	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 03:00	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 03:16	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 03:33	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 03:50	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 04:07	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 04:24	1		IonPacAS14 4 (mm)
CCV 160-379990/43		08/03/2018 04:41	1		IonPacAS14 4 (mm)
CCB 160-379990/44		08/03/2018 04:58	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 05:15	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 05:32	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 05:49	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 06:06	1		IonPacAS14 4 (mm)
CCV 160-379990/49		08/03/2018 06:23	1		IonPacAS14 4 (mm)
CCB 160-379990/50		08/03/2018 06:39	1		IonPacAS14 4 (mm)
CCV 160-379990/51		08/03/2018 13:07	1		IonPacAS14 4 (mm)
CCB 160-379990/52		08/03/2018 13:24	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 13:41	2		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 13:58	2		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 14:15	2		IonPacAS14 4 (mm)

300.0

HPLC/IC ANALYSIS RUN LOG

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Instrument ID: CIC2500 Start Date: 08/02/2018 16:50Analysis Batch Number: 379990 End Date: 08/03/2018 15:05

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		08/03/2018 14:32	10		IonPacAS14 4 (mm)
CCV 160-379990/57		08/03/2018 14:49	1		IonPacAS14 4 (mm)
CCB 160-379990/58		08/03/2018 15:05	1		IonPacAS14 4 (mm)

HPLC/IC ANALYSIS RUN LOG

Lab Name: TestAmerica St. LouisJob No.: 160-29476-1

SDG No.: _____

Instrument ID: CIC2500Start Date: 08/03/2018 18:16Analysis Batch Number: 380227End Date: 08/04/2018 07:48

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 160-380227/1		08/03/2018 18:16	1	080318- 1.d	IonPacAS14 4 (mm)
CCB 160-380227/2		08/03/2018 18:32	1	080318- 2.d	IonPacAS14 4 (mm)
MB 160-380227/3		08/03/2018 18:49	1	080318- 3.d	IonPacAS14 4 (mm)
LCS 160-380227/4		08/03/2018 19:06	1	080318- 4.d	IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 19:23	20		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 19:40	20		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 19:57	20		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 20:14	20		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 20:31	1		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 20:48	20		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 21:05	2		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 21:22	2		IonPacAS14 4 (mm)
CCV 160-380227/13		08/03/2018 21:39	1	080318- 13.d	IonPacAS14 4 (mm)
CCB 160-380227/14		08/03/2018 21:56	1	080318- 14.d	IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 22:29	10		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 23:03	10		IonPacAS14 4 (mm)
ZZZZZ		08/03/2018 23:37	10		IonPacAS14 4 (mm)
ZZZZZ		08/04/2018 00:11	10		IonPacAS14 4 (mm)
ZZZZZ		08/04/2018 00:45	10		IonPacAS14 4 (mm)
CCV 160-380227/25		08/04/2018 01:02	1		IonPacAS14 4 (mm)
CCB 160-380227/26		08/04/2018 01:19	1		IonPacAS14 4 (mm)
ZZZZZ		08/04/2018 01:52	10		IonPacAS14 4 (mm)
ZZZZZ		08/04/2018 02:09	1		IonPacAS14 4 (mm)
ZZZZZ		08/04/2018 02:43	10		IonPacAS14 4 (mm)
ZZZZZ		08/04/2018 03:17	10		IonPacAS14 4 (mm)
ZZZZZ		08/04/2018 03:51	10		IonPacAS14 4 (mm)
CCV 160-380227/36		08/04/2018 04:08	1	080318- 36.d	IonPacAS14 4 (mm)
CCB 160-380227/37		08/04/2018 04:25	1	080318- 37.d	IonPacAS14 4 (mm)
ZZZZZ		08/04/2018 04:58	10		IonPacAS14 4 (mm)
ZZZZZ		08/04/2018 05:32	10		IonPacAS14 4 (mm)
160-29476-1 DL		08/04/2018 06:06	20	080318- 43.d	IonPacAS14 4 (mm)
160-29476-1 DU DL		08/04/2018 06:40	20	080318- 45.d	IonPacAS14 4 (mm)
160-29476-1 MS DL		08/04/2018 07:14	20	080318- 47.d	IonPacAS14 4 (mm)
CCV 160-380227/48		08/04/2018 07:31	1	080318- 48.d	IonPacAS14 4 (mm)
CCB 160-380227/49		08/04/2018 07:48	1	080318- 49.d	IonPacAS14 4 (mm)

METALS

COVER PAGE
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

Project: Former Carnotite Site - Non-Rad Analysis

Client Sample ID
CRC-MW-1

Lab Sample ID
160-29476-1

Comments:

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: CRC-MW-1

Lab Sample ID: 160-29476-1

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

SDG ID.:

Matrix: Water

Date Sampled: 07/11/2018 13:55

Reporting Basis: WET

Date Received: 07/12/2018 09:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	330	200	50	ug/L			1	6010C
7440-36-0	Antimony	3.0	10	3.0	ug/L	U		1	6010C
7440-38-2	Arsenic	4.0	10	4.0	ug/L	U		1	6010C
7440-39-3	Barium	15	50	15	ug/L	J		1	6010C
7440-41-7	Beryllium	1.5	5.0	1.5	ug/L	U		1	6010C
7440-43-9	Cadmium	1.5	5.0	1.5	ug/L	U		1	6010C
7440-70-2	Calcium	71000	1000	300	ug/L			1	6010C
7440-47-3	Chromium	3.0	10	3.0	ug/L	U		1	6010C
7440-48-4	Cobalt	15	50	15	ug/L	U		1	6010C
7440-50-8	Copper	7.0	25	7.0	ug/L	U		1	6010C
7439-89-6	Iron	540	100	30	ug/L			1	6010C
7439-92-1	Lead	3.0	10	3.0	ug/L	U		1	6010C
7439-95-4	Magnesium	23000	1000	300	ug/L			1	6010C
7439-96-5	Manganese	100	15	4.0	ug/L			1	6010C
7440-02-0	Nickel	10	40	10	ug/L	U		1	6010C
7440-09-7	Potassium	4000	5000	1500	ug/L	J		1	6010C
7782-49-2	Selenium	8.0	15	8.0	ug/L	U		1	6010C
7440-22-4	Silver	3.0	10	3.0	ug/L	U		1	6010C
7440-23-5	Sodium	28000	1000	300	ug/L			1	6010C
7440-28-0	Thallium	5.0	20	5.0	ug/L	U		1	6010C
7440-62-2	Vanadium	56	50	25	ug/L			1	6010C
7440-66-6	Zinc	8.1	20	6.0	ug/L	J		1	6010C
7439-97-6	Mercury	0.060	0.20	0.060	ug/L	U		1	7470A

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

ICV Source: ICP ICV_00520 Concentration Units: ug/L

CCV Source: ICP CAL1/LLC_00163

Analyte	ICV 160-380741/5 08/06/2018 11:21				CCVL 160-380741/10 08/06/2018 11:43				CCVL 160-380741/23 08/06/2018 13:18			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Arsenic	5010		5000	100	12.1		10.0	121	10.6		10.0	106
Selenium	988		1000	99	14.4	J	15.0	96	13.9	J	15.0	93

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

ICV Source: ICP ICV_00520 Concentration Units: ug/L

CCV Source: ICP CAL2/CCV_00155

Analyte	ICV 160-380741/5 08/06/2018 11:21				CCV 160-380741/11 08/06/2018 11:48				CCV 160-380741/24 08/06/2018 13:23			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Arsenic	5010		5000	100	5040		5000	101	5070		5000	101
Selenium	988		1000	99	1010		1000	101	1020		1000	102

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

ICV Source: ICP ICV_00518 Concentration Units: ug/L

CCV Source: ICP CAL1/LLC_00162

Analyte	ICV 160-380117/5 08/02/2018 15:24				CCVL 160-380117/14 08/02/2018 16:06				CCVL 160-380117/27 08/02/2018 17:37			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	49400		50000	99	205		200	102	207		200	103
Antimony	953		1000	95	10.5		10.0	105	11.1		10.0	111
Barium	4920		5000	98	47.4	J	50.0	95	46.7	J	50.0	93
Beryllium	4930		5000	99	5.00		5.00	100	4.80	J	5.00	96
Cadmium	4900		5000	98	4.30	J	5.00	86	4.70	J	5.00	94
Calcium	49100		50000	98	1020		1000	102	1010		1000	101
Chromium	4860		5000	97	10.2		10.0	102	9.40	J	10.0	94
Cobalt	4910		5000	98	50.5		50.0	101	51.0		50.0	102
Copper	4860		5000	97	25.1		25.0	100	26.3		25.0	105
Iron	51400		50000	103	105		100	105	102		100	102
Lead	4960		5000	99	10.2		10.0	102	10.6		10.0	106
Magnesium	49400		50000	99	1010		1000	101	972	J	1000	97
Manganese	4990		5000	100	15.0		15.0	100	14.8	J	15.0	99
Nickel	4930		5000	99	41.4		40.0	104	40.5		40.0	101
Potassium	49200		50000	98	5060		5000	101	5040		5000	101
Silver	987		1000	99	10.4		10.0	104	9.40	J	10.0	94
Sodium	49100		50000	98	941	J	1000	94	1100		1000	110
Thallium	1030		1000	103	23.3		20.0	117	21.1		20.0	106
Vanadium	4910		5000	98	52.4		50.0	105	48.7	J	50.0	97
Zinc	4870		5000	97	18.7	J	20.0	94	18.7	J	20.0	94

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

ICV Source: ICP ICV_00518 Concentration Units: ug/L

CCV Source: ICP CAL1/LLC_00162

Analyte	CCVL 160-380117/40 08/02/2018 18:36											
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	165	J	200	82								
Antimony	10.6		10.0	106								
Barium	46.1	J	50.0	92								
Beryllium	4.80	J	5.00	96								
Cadmium	4.50	J	5.00	90								
Calcium	1020		1000	102								
Chromium	9.50	J	10.0	95								
Cobalt	51.2		50.0	102								
Copper	25.9		25.0	104								
Iron	99.6	J	100	100								
Lead	10.1		10.0	101								
Magnesium	978	J	1000	98								
Manganese	15.2		15.0	101								
Nickel	40.5		40.0	101								
Potassium	4980	J	5000	100								
Silver	9.30	J	10.0	93								
Sodium	961	J	1000	96								
Thallium	19.3	J	20.0	97								
Vanadium	46.5	J	50.0	93								
Zinc	18.7	J	20.0	94								

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

SDG No.: _____

ICV Source: ICP ICV_00518

Concentration Units: ug/L

CCV Source: ICP CAL2/CCV_00154

Analyte	ICV 160-380117/5 08/02/2018 15:24				CCV 160-380117/15 08/02/2018 16:11				CCV 160-380117/28 08/02/2018 17:41			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	49400		50000	99	48200		50000	96	46300		50000	93
Antimony	953		1000	95	959		1000	96	924		1000	92
Barium	4920		5000	98	4820		5000	96	4670		5000	93
Beryllium	4930		5000	99	4870		5000	97	4780		5000	96
Cadmium	4900		5000	98	4870		5000	97	4830		5000	97
Calcium	49100		50000	98	49400		50000	99	49200		50000	98
Chromium	4860		5000	97	4830		5000	97	4700		5000	94
Cobalt	4910		5000	98	4910		5000	98	4920		5000	98
Copper	4860		5000	97	4840		5000	97	4650		5000	93
Iron	51400		50000	103	48900		50000	98	48200		50000	96
Lead	4960		5000	99	4890		5000	98	4730		5000	95
Magnesium	49400		50000	99	48600		50000	97	46400		50000	93
Manganese	4990		5000	100	4870		5000	97	4740		5000	95
Nickel	4930		5000	99	4920		5000	98	4940		5000	99
Potassium	49200		50000	98	48900		50000	98	48700		50000	97
Silver	987		1000	99	985		1000	98	983		1000	98
Sodium	49100		50000	98	48800		50000	98	48000		50000	96
Thallium	1030		1000	103	989		1000	99	951		1000	95
Vanadium	4910		5000	98	4810		5000	96	4620		5000	92
Zinc	4870		5000	97	4890		5000	98	4870		5000	97

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

ICV Source: ICP ICV_00518 Concentration Units: ug/L

CCV Source: ICP CAL2/CCV_00154

Analyte	CCV 160-380117/41 08/02/2018 18:40											
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	47000		50000	94								
Antimony	923		1000	92								
Barium	4720		5000	94								
Beryllium	4820		5000	96								
Cadmium	4830		5000	97								
Calcium	49300		50000	99								
Chromium	4720		5000	94								
Cobalt	4920		5000	98								
Copper	4680		5000	94								
Iron	48400		50000	97								
Lead	4750		5000	95								
Magnesium	47200		50000	94								
Manganese	4770		5000	95								
Nickel	4930		5000	99								
Potassium	49600		50000	99								
Silver	991		1000	99								
Sodium	48800		50000	98								
Thallium	956		1000	96								
Vanadium	4670		5000	93								
Zinc	4860		5000	97								

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

ICV Source: Hg QC Int._00998 Concentration Units: ug/L

CCV Source: Hg Curve Int._01021

Analyte	ICV 160-376379/7 07/17/2018 13:50				CCV 160-376379/19 07/17/2018 14:17							
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Mercury	5.21		5.00	104	5.81		5.00	116				

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Method: 6010C Instrument ID: ICP 6500 Duo
Lab Sample ID: CRI 160-380741/7 Concentration Units: ug/L
CRQL Check Standard Source: ICP CAL1/LLC_00163

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Arsenic	10.0	10.9		109	70-130
Selenium	15.0	14.9	J	99	70-130

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IIB-IN

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Method: 6010C Instrument ID: ICP6500
 Lab Sample ID: CRI 160-380117/7 Concentration Units: ug/L
 CRQL Check Standard Source: ICP CAL1/LLC_00162

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Aluminum	200	210		105	70-130
Antimony	10.0	11.2		112	70-130
Barium	50.0	47.1	J	94	70-130
Beryllium	5.00	4.90	J	98	70-130
Cadmium	5.00	4.50	J	90	70-130
Calcium	1000	1020		102	70-130
Chromium	10.0	9.80	J	98	70-130
Cobalt	50.0	50.8		102	70-130
Copper	25.0	26.1		104	70-130
Iron	100	105		105	70-130
Lead	10.0	11.6		116	70-130
Magnesium	1000	1010		101	70-130
Manganese	15.0	14.7	J	98	70-130
Nickel	40.0	40.7		102	70-130
Potassium	5000	4970	J	99	70-130
Silver	10.0	10.9		109	70-130
Sodium	1000	924	J	92	70-130
Thallium	20.0	19.2	J	96	70-130
Vanadium	50.0	52.7		105	70-130
Zinc	20.0	18.8	J	94	70-130

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Concentration Units: ug/L

Analyte	RL	ICB 160-380741/6 08/06/2018 11:25		CCB 160-380741/12 08/06/2018 11:52		CCB 160-380741/25 08/06/2018 13:27			
		Found	C	Found	C	Found	C	Found	C
Arsenic	10	4.0	U	4.0	U	4.0	U		
Selenium	15	8.0	U	8.0	U	8.0	U		

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

SDG No.: _____

Concentration Units: ug/L

Analyte	RL	ICB 160-380117/6 08/02/2018 15:28		CCB 160-380117/16 08/02/2018 16:15		CCB 160-380117/29 08/02/2018 17:46		CCB 160-380117/42 08/02/2018 18:44	
		Found	C	Found	C	Found	C	Found	C
Aluminum	200	50	U	50	U	50	U	50	U
Antimony	10	3.0	U	3.0	U	3.0	U	3.0	U
Barium	50	15	U	15	U	15	U	15	U
Beryllium	5.0	1.5	U	1.5	U	1.5	U	1.5	U
Cadmium	5.0	1.5	U	1.5	U	1.5	U	1.5	U
Calcium	1000	300	U	300	U	300	U	300	U
Chromium	10	3.0	U	3.0	U	3.0	U	3.0	U
Cobalt	50	15	U	15	U	15	U	15	U
Copper	25	7.0	U	7.0	U	7.0	U	7.0	U
Iron	100	30	U	30	U	30	U	30	U
Lead	10	3.0	U	3.0	U	3.0	U	3.0	U
Magnesium	1000	300	U	300	U	300	U	300	U
Manganese	15	4.0	U	4.0	U	4.0	U	4.0	U
Nickel	40	10	U	10	U	10	U	10	U
Potassium	5000	1500	U	1500	U	1500	U	1500	U
Silver	10	3.0	U	3.0	U	3.0	U	3.0	U
Sodium	1000	300	U	300	U	300	U	300	U
Thallium	20	5.0	U	5.0	U	5.0	U	5.0	U
Vanadium	50	15	U	15	U	15	U	15	U
Zinc	20	6.0	U	6.0	U	6.0	U	6.0	U

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Concentration Units: ug/L

Analyte	RL	ICB 160-376379/8 07/17/2018 13:53		CCB 160-376379/20 07/17/2018 14:18					
		Found	C	Found	C	Found	C	Found	C
Mercury	0.20	0.060	U	0.060	U				

Italicized analytes were not requested for this sequence.

3-IN
METHOD BLANK
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Concentration Units: ug/L Lab Sample ID: MB 160-379537/1-A
 Instrument Code: ICP6500 Batch No.: 380117

CAS No.	Analyte	Concentration	C	Q	Method
7429-90-5	Aluminum	50	U		6010C
7440-36-0	Antimony	3.0	U		6010C
7440-39-3	Barium	15	U		6010C
7440-41-7	Beryllium	1.5	U		6010C
7440-43-9	Cadmium	1.5	U		6010C
7440-70-2	Calcium	300	U		6010C
7440-47-3	Chromium	3.0	U		6010C
7440-48-4	Cobalt	15	U		6010C
7440-50-8	Copper	7.0	U		6010C
7439-89-6	Iron	30	U		6010C
7439-92-1	Lead	3.0	U		6010C
7439-95-4	Magnesium	300	U		6010C
7439-96-5	Manganese	4.0	U		6010C
7440-02-0	Nickel	10	U		6010C
7440-09-7	Potassium	1500	U		6010C
7440-22-4	Silver	3.0	U		6010C
7440-23-5	Sodium	300	U		6010C
7440-28-0	Thallium	5.0	U		6010C
7440-62-2	Vanadium	25	U		6010C
7440-66-6	Zinc	6.0	U		6010C

3-IN
METHOD BLANK
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Concentration Units: ug/L Lab Sample ID: MB 160-379537/1-A
Instrument Code: ICP 6500 Duo Batch No.: 380741

CAS No.	Analyte	Concentration	C	Q	Method
7440-38-2	Arsenic	4.0	U		6010C
7782-49-2	Selenium	8.0	U		6010C

3-IN
METHOD BLANK
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Concentration Units: ug/L Lab Sample ID: MB 160-375873/1-A

Instrument Code: HAA2 Batch No.: 376379

CAS No.	Analyte	Concentration	C	Q	Method
7439-97-6	Mercury	0.060	U		7470A

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Lab Sample ID: ICSA 160-380741/8 Instrument ID: ICP 6500 Duo
Lab File ID: 080618E2.asc ICS Source: ICP ICSA_00021
Concentration Units: ug/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Arsenic		6.10	
Selenium		0.100	
<i>Aluminum</i>	<i>100000</i>	<i>100300</i>	<i>100</i>

Calculations are performed before rounding to avoid round-off errors in calculated results.

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Lab Sample ID: ICSAB 160-380741/9 Instrument ID: ICP 6500 Duo
Lab File ID: 080618E2.asc ICS Source: ICP ICSAB_00018
Concentration Units: ug/L

Analyte	True	Found	Percent Recovery
	Solution AB	Solution AB	
Arsenic	2500	2507	100
Selenium	500	504	101

Calculations are performed before rounding to avoid round-off errors in calculated results.

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Lab Sample ID: ICSA 160-380117/8 Instrument ID: ICP6500
 Lab File ID: 080218C1.asc ICS Source: ICP ICSA_00021
 Concentration Units: ug/L

Analyte	True Solution A	Found	
		Solution A	Percent Recovery
Aluminum	100000	98260	98
Antimony		2.70	
Barium		-0.400	
Beryllium		0.0000	
Cadmium		-0.400	
Calcium	100000	97210	97
Chromium		-4.40	
Cobalt		7.30	
Copper		-13.1	
Iron	100000	99800	100
Lead		-6.50	
Magnesium	100000	98960	99
Manganese		1.60	
Nickel		3.90	
Potassium	100000	99960	100
Silver		-0.300	
Sodium	100000	99040	99
Thallium		0.900	
Vanadium		2.10	
Zinc		14.1	

Calculations are performed before rounding to avoid round-off errors in calculated results.

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
 SDG No.: _____
 Lab Sample ID: ICSAB 160-380117/9 Instrument ID: ICP6500
 Lab File ID: 080218C1.asc ICS Source: ICP ICSAB_00018
 Concentration Units: ug/L

Analyte	True	Found	Percent Recovery
	Solution AB	Solution AB	
Aluminum	100000	97970	98
Antimony	500	497	99
Barium	2500	2462	98
Beryllium	2500	2531	101
Cadmium	2500	2508	100
Calcium	100000	97110	97
Chromium	2500	2450	98
Cobalt	2500	2481	99
Copper	2500	2459	98
Iron	100000	99200	99
Lead	2500	2441	98
Magnesium	100000	99170	99
Manganese	2500	2507	100
Nickel	2500	2474	99
Potassium	100000	99140	99
Silver	500	514	103
Sodium	100000	98490	98
Thallium	500	490	98
Vanadium	2500	2474	99
Zinc	2500	2529	101

Calculations are performed before rounding to avoid round-off errors in calculated results.

5A-IN
MATRIX SPIKE SAMPLE RECOVERY
METALS

Client ID: CRC-MW-1 MS

Lab ID: 160-29476-1 MS

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

SDG No.: _____

Matrix: Water

Concentration Units: ug/L

% Solids: _____

Analyte	SSR C	Sample Result (SR) C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Aluminum	9910	330	10000	96	75-125		6010C
Antimony	462	3.0 U	500	92	75-125		6010C
Arsenic	976	4.0 U	1000	98	75-125		6010C
Barium	959	15 J	1000	94	75-125		6010C
Beryllium	97.5	1.5 U	100	98	75-125		6010C
Cadmium	975	1.5 U	1000	97	75-125		6010C
Calcium	81100	71000	10000	97	75-125	4	6010C
Chromium	953	3.0 U	1000	95	75-125		6010C
Cobalt	993	15 U	1000	99	75-125		6010C
Copper	958	7.0 U	1000	96	75-125		6010C
Iron	10400	540	10000	99	75-125		6010C
Lead	951	3.0 U	1000	95	75-125		6010C
Magnesium	32200	23000	10000	95	75-125		6010C
Manganese	1070	100	1000	97	75-125		6010C
Nickel	1000	10 U	1000	100	75-125		6010C
Potassium	14100	4000 J	10000	102	75-125		6010C
Selenium	493	8.0 U	500	99	75-125		6010C
Silver	210	3.0 U	200	105	75-125		6010C
Sodium	38200	28000	10000	101	75-125		6010C
Thallium	194	5.0 U	200	97	75-125		6010C
Vanadium	999	56	1000	94	75-125		6010C
Zinc	985	8.1 J	1000	98	75-125		6010C

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.

5A-IN
MATRIX SPIKE SAMPLE RECOVERY
METALS

Client ID: _____ Lab ID: 160-29274-A-3-C MS
Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Matrix: Water Concentration Units: ug/L
% Solids: _____

Analyte	SSR C	Sample Result (SR) C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Mercury	5.48	0.060 U	5.00	110	80-120		7470A

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS

Client ID: CRC-MW-1 MSD

Lab ID: 160-29476-1 MSD

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

SDG No.: _____

Matrix: Water

Concentration Units: ug/L

% Solids: _____

Analyte	(SDR) C	Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Aluminum	9970	10000	96	75-125	1	20		6010C
Antimony	447	500	89	75-125	3	20		6010C
Arsenic	1000	1000	100	75-125	3	20		6010C
Barium	955	1000	94	75-125	0	20		6010C
Beryllium	97.1	100	97	75-125	0	20		6010C
Cadmium	956	1000	96	75-125	2	20		6010C
Calcium	80600	10000	92	75-125	1	20	4	6010C
Chromium	939	1000	94	75-125	1	20		6010C
Cobalt	979	1000	98	75-125	1	20		6010C
Copper	936	1000	94	75-125	2	20		6010C
Iron	10500	10000	99	75-125	1	20		6010C
Lead	935	1000	93	75-125	2	20		6010C
Magnesium	32600	10000	99	75-125	1	20		6010C
Manganese	1070	1000	97	75-125	0	20		6010C
Nickel	992	1000	99	75-125	1	20		6010C
Potassium	14200	10000	103	75-125	1	20		6010C
Selenium	504	500	101	75-125	2	20		6010C
Silver	209	200	105	75-125	0	20		6010C
Sodium	38500	10000	104	75-125	1	20		6010C
Thallium	189	200	95	75-125	3	20		6010C
Vanadium	987	1000	93	75-125	1	20		6010C
Zinc	969	1000	96	75-125	2	20		6010C

SDR = Sample Duplicate Result

Calculations are performed before rounding to avoid round-off errors in calculated results.

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS

Client ID: _____ Lab ID: 160-29274-A-3-D MSD
Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Matrix: Water Concentration Units: ug/L
% Solids: _____

Analyte	(SDR) C	Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Mercury	5.39	5.00	108	80-120	2	20		7470A

SDR = Sample Duplicate Result

Calculations are performed before rounding to avoid round-off errors in calculated results.

7A-IN
LAB CONTROL SAMPLE
METALS

Lab ID: LCS 160-379537/2-A

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

Sample Matrix: Water

LCS Source: MPREP1_00017

Analyte	Water (ug/L)							
	True	Found	C	%R	Limits		Q	Method
Aluminum	10000	9610		96	80	120		6010C
Antimony	500	451		90	80	120		6010C
Barium	1000	946		95	80	120		6010C
Beryllium	100	97.4		97	80	120		6010C
Cadmium	1000	963		96	80	120		6010C
Calcium	10000	10300		103	80	120		6010C
Chromium	1000	967		97	80	120		6010C
Cobalt	1000	1010		101	80	120		6010C
Copper	1000	969		97	80	120		6010C
Iron	10000	9990		100	80	120		6010C
Lead	1000	977		98	80	120		6010C
Magnesium	10000	9670		97	80	120		6010C
Manganese	1000	987		99	80	120		6010C
Nickel	1000	1020		102	80	120		6010C
Potassium	10000	9980		100	80	120		6010C
Silver	200	206		103	80	120		6010C
Sodium	10000	9950		99	80	120		6010C
Thallium	200	203		102	80	120		6010C
Vanadium	1000	946		95	80	120		6010C
Zinc	1000	963		96	80	120		6010C

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA - IN

7A-IN
LAB CONTROL SAMPLE
METALS

Lab ID: LCS 160-379537/2-A

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

Sample Matrix: Water

LCS Source: MPREP1_00017

Analyte	Water (ug/L)							
	True	Found	C	%R	Limits		Q	Method
Arsenic	1000	995		100	80	120		6010C
Selenium	500	504		101	80	120		6010C

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA - IN

7A-IN
LAB CONTROL SAMPLE
METALS

Lab ID: LCS 160-375873/2-A

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

Sample Matrix: Water

LCS Source: Hg QC Int._00998

Analyte	Water (ug/L)							
	True	Found	C	%R	Limits		Q	Method
Mercury	5.00	5.36		107	80	120		7470A

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA - IN

8-IN
ICP-AES AND ICP-MS SERIAL DILUTIONS
METALS

Lab ID: 160-29476-1

SDG No:

Lab Name: TestAmerica St. Louis

Job No: 160-29476-1

Matrix: Water

Concentration Units: ug/L

Analyte	Initial Sample Result (I) C		Serial Dilution Result (S) C		% Difference	Q	Method
Aluminum	330		403	J	NC		6010C
Antimony	3.0	U	15	U	NC		6010C
Arsenic	4.0	U	20	U	NC		6010C
Barium	15	J	75	U	NC		6010C
Beryllium	1.5	U	7.5	U	NC		6010C
Cadmium	1.5	U	7.5	U	NC		6010C
Calcium	71000		74700		4.6		6010C
Chromium	3.0	U	15	U	NC		6010C
Cobalt	15	U	75	U	NC		6010C
Copper	7.0	U	35	U	NC		6010C
Iron	540		551		NC		6010C
Lead	3.0	U	15	U	NC		6010C
Magnesium	23000		23400		3.1		6010C
Manganese	100		104		NC		6010C
Nickel	10	U	50	U	NC		6010C
Potassium	4000	J	7500	U	NC		6010C
Selenium	8.0	U	40	U	NC		6010C
Silver	3.0	U	15	U	NC		6010C
Sodium	28000		28400		1.2		6010C
Thallium	5.0	U	25	U	NC		6010C
Vanadium	56		130	U	NC		6010C
Zinc	8.1	J	30	U	NC		6010C

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIII-IN

8-IN
ICP-AES AND ICP-MS SERIAL DILUTIONS
METALS

Lab ID: 160-29274-A-3-B SD

SDG No:

Lab Name: TestAmerica St. Louis

Job No: 160-29476-1

Matrix: Water

Concentration Units: ug/L

Analyte	Initial Sample		Serial		% Difference	Q	Method
	Result (I)	C	Dilution	Result (S)			
Mercury	0.060	U		0.30	U	NC	7470A

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIII-IN

9-IN
DETECTION LIMITS
METALS

Lab Name: TestAmerica St. Louis

Job Number: 160-29476-1

SDG Number: _____

Matrix: Water

Instrument ID: ICP 6500 Duo

Method: 6010C

MDL Date: 09/14/2016 11:58

Prep Method: 3010A

Analyte	Wavelength/ Mass	RL (ug/L)	MDL (ug/L)
Arsenic		10	4
Selenium		15	8

9-IN
CALIBRATION BLANK DETECTION LIMITS
METALS

Lab Name: TestAmerica St. Louis

Job Number: 160-29476-1

SDG Number: _____

Matrix: Water

Instrument ID: ICP 6500 Duo

Method: 6010C

XMDL Date: 09/14/2016 11:57

Analyte	Wavelength/ Mass	XRL (ug/L)	XMDL (ug/L)
Arsenic		10	4
Selenium		15	8

9-IN
DETECTION LIMITS
METALS

Lab Name: TestAmerica St. Louis

Job Number: 160-29476-1

SDG Number: _____

Matrix: Water

Instrument ID: ICP6500

Method: 6010C

MDL Date: 09/14/2016 11:58

Prep Method: 3010A

Analyte	Wavelength/ Mass	RL (ug/L)	MDL (ug/L)
Aluminum		200	50
Antimony		10	3
Barium		50	15
Beryllium		5	1.5
Cadmium		5	1.5
Calcium		1000	300
Chromium		10	3
Cobalt		50	15
Copper		25	7
Iron		100	30
Lead		10	3
Magnesium		1000	300
Manganese		15	4
Nickel		40	10
Potassium		5000	1500
Silver		10	3
Sodium		1000	300
Thallium		20	5
Vanadium		50	25
Zinc		20	6

9-IN
CALIBRATION BLANK DETECTION LIMITS
METALS

Lab Name: TestAmerica St. Louis

Job Number: 160-29476-1

SDG Number: _____

Matrix: Water

Instrument ID: ICP6500

Method: 6010C

XMDL Date: 09/14/2016 11:57

Analyte	Wavelength/ Mass	XRL (ug/L)	XMDL (ug/L)
Aluminum		200	50
Antimony		10	3
Barium		50	15
Beryllium		5	1.5
Cadmium		5	1.5
Calcium		1000	300
Chromium		10	3
Cobalt		50	15
Copper		25	7
Iron		100	30
Lead		10	3
Magnesium		1000	300
Manganese		15	4
Nickel		40	10
Potassium		5000	1500
Silver		10	3
Sodium		1000	300
Thallium		20	5
Vanadium		50	15
Zinc		20	6

9-IN
DETECTION LIMITS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1
SDG Number: _____
Matrix: Water Instrument ID: HAA2
Method: 7470A MDL Date: 06/28/2011 19:17
Prep Method: 7470A

Analyte	Wavelength/ Mass	RL (ug/L)	MDL (ug/L)
Mercury		0.2	0.06

9-IN
CALIBRATION BLANK DETECTION LIMITS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1
SDG Number: _____
Matrix: Water Instrument ID: HAA2
Method: 7470A XMDL Date: 06/28/2011 19:19

Analyte	Wavelength/ Mass	XRL (ug/L)	XMDL (ug/L)
Mercury		0.2	0.06

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP 6500 Duo Date: 07/10/2018

Analyte	Wave Length	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
Aluminum															
Antimony													0.005469		
Arsenic															-0.0002931
Barium															
Beryllium															
Bismuth															
Boron															
Cadmium				0.0050593	0										
Calcium															
Chromium								-0.0017766							
Cobalt															
Copper															
Gold															
Iron															
Lead														0.006478	
Lithium															
Magnesium															
Manganese															
Molybdenum															
Nickel															
Palladium															
Phosphorus															
Potassium															
Selenium															
Silicon															
Silver															
Sodium															
Strontium															
Sulfur															
Thallium															

X-IN

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP 6500 Duo Date: 07/10/2018

Analyte	Wave Length	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
Thorium															0.0023371
Tin															
Titanium												0.00343			
Uranium															
Vanadium															
Yttrium															
Zinc															

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP 6500 Duo Date: 07/10/2018

Analyte	Wave Length	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Se	Si	Sn
Aluminum															
Antimony															
Arsenic															
Barium															
Beryllium															
Bismuth															
Boron															
Cadmium															
Calcium															
Chromium															
Cobalt															
Copper															
Gold															
Iron															
Lead														0.0016372	
Lithium															
Magnesium															
Manganese															
Molybdenum															
Nickel															
Palladium															
Phosphorus															
Potassium															
Selenium															
Silicon															
Silver															
Sodium															
Strontium															
Sulfur															
Thallium															

X-IN

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP 6500 Duo Date: 07/10/2018

Analyte	Wave Length	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Se	Si	Sn
Thorium				0.0001125											
Tin															
Titanium															
Uranium															
Vanadium															
Yttrium															
Zinc								0.0056769							

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP 6500 Duo Date: 07/10/2018

Analyte	Wave Length	Sr	Th	Ti	Tl	U	V	Zn							
Aluminum															
Antimony															
Arsenic															
Barium															
Beryllium															
Bismuth															
Boron															
Cadmium															
Calcium															
Chromium															
Cobalt															
Copper															
Gold															
Iron															
Lead						0.0013161									
Lithium															
Magnesium															
Manganese															
Molybdenum															
Nickel								0.0056769							
Palladium															
Phosphorus															
Potassium															
Selenium						-0.0029707									
Silicon															
Silver						0.0012661									
Sodium															
Strontium															
Sulfur															
Thallium															

X-IN

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP 6500 Duo Date: 07/10/2018

Analyte	Wave Length	Sr	Th	Ti	Tl	U	V	Zn							
Thorium						-0.0052638									
Tin															
Titanium															
Uranium															
Vanadium															
Yttrium															
Zinc						-0.0019673									

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP6500 Date: 04/18/2018

Analyte	Wave Length	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	In
Aluminum	396.152														
Antimony	206.833											0.0074765			
Arsenic	189.042													-0.0002894	
Barium	455.403														
Beryllium	313.042														
Bismuth	223.061														
Boron	249.678														
Cadmium	228.802			0.0146407											
Calcium	184.006														
Chromium	205.56						-0.0009892								
Cobalt	228.616														
Copper	217.894														
Iron	259.940														
Lead	220.353														
Lithium	670.784														
Magnesium	279.806														
Manganese	257.610														
Molybdenum	202.030														
Nickel	221.647														
Phosphorus	177.495														
Potassium	766.490														
Selenium	196.090														
Silicon	251.611														
Silver	328.068														
Sodium	589.592														
Strontium	407.771														
Sulfur	182.034														
Thallium	190.856										0.0042244				
Thorium	283.231														
Tin	189.989														

X-IN

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP6500 Date: 04/18/2018

Analyte	Wave Length	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	In
Titanium	334.941														
Uranium	367.007														
Vanadium	290.882														
Yttrium	371.030														
Zinc	213.856														
Zirconium															

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP6500 Date: 04/18/2018

Analyte	Wave Length	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Se	Si	Sn
Aluminum	396.152														
Antimony	206.833					-0.0090711									
Arsenic	189.042														
Barium	455.403														
Beryllium	313.042														
Bismuth	223.061														
Boron	249.678														
Cadmium	228.802														
Calcium	184.006														
Chromium	205.56														
Cobalt	228.616														
Copper	217.894														
Iron	259.940														
Lead	220.353														
Lithium	670.784														
Magnesium	279.806														
Manganese	257.610														
Molybdenum	202.030														
Nickel	221.647														
Phosphorus	177.495														
Potassium	766.490														
Selenium	196.090														
Silicon	251.611														
Silver	328.068														
Sodium	589.592														
Strontium	407.771														
Sulfur	182.034														
Thallium	190.856														
Thorium	283.231														
Tin	189.989														

X-IN

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP6500 Date: 04/18/2018

Analyte	Wave Length	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Se	Si	Sn
Titanium	334.941														
Uranium	367.007														
Vanadium	290.882														
Yttrium	371.030														
Zinc	213.856							0.0074156							
Zirconium															

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP6500 Date: 04/18/2018

Analyte	Wave Length	Sr	Th	Ti	Tl	U	V	Y	Zn						
Aluminum	396.152														
Antimony	206.833														
Arsenic	189.042														
Barium	455.403														
Beryllium	313.042														
Bismuth	223.061														
Boron	249.678														
Cadmium	228.802														
Calcium	184.006														
Chromium	205.56														
Cobalt	228.616														
Copper	217.894														
Iron	259.940														
Lead	220.353														
Lithium	670.784														
Magnesium	279.806														
Manganese	257.610														
Molybdenum	202.030														
Nickel	221.647														
Phosphorus	177.495														
Potassium	766.490														
Selenium	196.090					-0.0019668									
Silicon	251.611														
Silver	328.068					0.0013483									
Sodium	589.592														
Strontium	407.771														
Sulfur	182.034														
Thallium	190.856														
Thorium	283.231			0.0993051											
Tin	189.989														

X-IN

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

ICP-AES Instrument ID: ICP6500 Date: 04/18/2018

Analyte	Wave Length	Sr	Th	Ti	Tl	U	V	Y	Zn						
Titanium	334.941														
Uranium	367.007														
Vanadium	290.882														
Yttrium	371.030														
Zinc	213.856														
Zirconium															

11-IN
LINEAR RANGES
METALS

Lab Name: TestAmerica St. Louis

Job No: 160-29476-1

SDG No.: _____

Instrument ID: ICP 6500 Duo

Date: 02/12/2018 14:09

Analyte	Integ. Time (Sec.)	Concentration (mg/L)	Method
Arsenic		10	6010C
Selenium		2	6010C

11-IN
LINEAR RANGES
METALS

Lab Name: TestAmerica St. Louis

Job No: 160-29476-1

SDG No.: _____

Instrument ID: ICP6500

Date: 02/07/2018 08:55

Analyte	Integ. Time (Sec.)	Concentration (mg/L)	Method
Aluminum		100	6010C
Antimony		2	6010C
Barium		10	6010C
Beryllium		10	6010C
Cadmium		10	6010C
Calcium		100	6010C
Chromium		10	6010C
Cobalt		10	6010C
Copper		10	6010C
Iron		100	6010C
Lead		10	6010C
Magnesium		100	6010C
Manganese		10	6010C
Nickel		10	6010C
Potassium		100	6010C
Silver		2	6010C
Sodium		100	6010C
Thallium		2	6010C
Vanadium		10	6010C
Zinc		10	6010C

11-IN
LINEAR RANGES
METALS

Lab Name: TestAmerica St. Louis

Job No: 160-29476-1

SDG No.: _____

Instrument ID: HAA2

Date: 02/07/2018 11:19

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	Method
Mercury		10	7470A

12-IN
PREPARATION LOG
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Prep Method: 3010A

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight	Initial Volume (mL)	Final Volume (mL)
MB 160-379537/1-A	07/31/2018 19:39	379537		50	50
LCS 160-379537/2-A	07/31/2018 19:39	379537		50	50
160-29476-1	07/31/2018 19:39	379537		50	50
160-29476-1 MS	07/31/2018 19:39	379537		50	50
160-29476-1 MSD	07/31/2018 19:39	379537		50	50

12-IN
PREPARATION LOG
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Prep Method: 7470A

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight	Initial Volume (mL)	Final Volume (mL)
MB 160-375873/1-A	07/16/2018 11:20	375873		30	30
LCS 160-375873/2-A	07/16/2018 11:20	375873		30	30
160-29274-A-3-C MS	07/16/2018 11:20	375873		30	30
160-29274-A-3-D MSD	07/16/2018 11:20	375873		30	30
160-29476-1	07/16/2018 11:20	375873		30	30

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

SDG No.: _____

Instrument ID: ICP 6500 Duo

Analysis Method: 6010C

Start Date: 08/06/2018 11:03

End Date: 08/06/2018 17:48

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				A s	S e																								
ICIS 160-380741/1	1		11:03	X	X																								
IC 160-380741/2			11:07	X	X																								
IC 160-380741/3			11:12	X	X																								
IC 160-380741/4			11:16	X	X																								
ICV 160-380741/5	1		11:21	X	X																								
ICB 160-380741/6	1		11:25	X	X																								
CRI 160-380741/7	1		11:30	X	X																								
ICSA 160-380741/8	1		11:34	X	X																								
ICSAB 160-380741/9	1		11:39	X	X																								
CCVL 160-380741/10	1		11:43	X	X																								
CCV 160-380741/11	1		11:48	X	X																								
CCB 160-380741/12	1		11:52	X	X																								
MB 160-379537/1-A	1	T	12:32	X	X																								
LCS 160-379537/2-A	1	T	12:37	X	X																								
160-29476-1	1	T	12:41	X	X																								
160-29476-1 SD	5	T	12:46	X	X																								
160-29476-1 MS	1	T	12:50	X	X																								
160-29476-1 MSD	1	T	12:55	X	X																								
ZZZZZZ			12:59																										
ZZZZZZ			13:04																										
ZZZZZZ			13:08																										
ZZZZZZ			13:13																										
CCVL 160-380741/23	1		13:18	X	X																								
CCV 160-380741/24	1		13:23	X	X																								
CCB 160-380741/25	1		13:27	X	X																								
ZZZZZZ			13:32																										
ZZZZZZ			13:36																										
ZZZZZZ			13:41																										
ZZZZZZ			13:46																										
ZZZZZZ			13:51																										
ZZZZZZ			13:55																										
ZZZZZZ			14:00																										
ZZZZZZ			14:05																										
ZZZZZZ			14:09																										
ZZZZZZ			14:14																										
CCVL 160-380741/36			14:18																										
CCV 160-380741/37			14:23																										
CCB 160-380741/38			14:27																										
ZZZZZZ			14:32																										
ZZZZZZ			14:37																										
ZZZZZZ			14:42																										
ZZZZZZ			14:46																										

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Instrument ID: ICP 6500 Duo Analysis Method: 6010C

Start Date: 08/06/2018 11:03 End Date: 08/06/2018 17:48

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				A s	S e																								
ZZZZZZ			14:51																										
ZZZZZZ			14:56																										
ZZZZZZ			15:00																										
ZZZZZZ			15:05																										
ZZZZZZ			15:09																										
ZZZZZZ			15:14																										
CCVL 160-380741/49			15:19																										
CCV 160-380741/50			15:23																										
CCB 160-380741/51			15:28																										
ZZZZZZ			15:32																										
ZZZZZZ			15:37																										
ZZZZZZ			15:42																										
ZZZZZZ			15:47																										
ZZZZZZ			15:52																										
ZZZZZZ			15:56																										
ZZZZZZ			16:01																										
ZZZZZZ			16:05																										
ZZZZZZ			16:10																										
ZZZZZZ			16:15																										
CCVL 160-380741/62			16:20																										
CCV 160-380741/63			16:24																										
CCB 160-380741/64			16:29																										
ZZZZZZ			16:34																										
LRC 160-380741/66			16:38																										
ZZZZZZ			16:43																										
ZZZZZZ			16:48																										
ZZZZZZ			16:52																										
ZZZZZZ			16:57																										
ZZZZZZ			17:02																										
ZZZZZZ			17:06																										
ZZZZZZ			17:11																										
ZZZZZZ			17:15																										
CCVL 160-380741/75			17:20																										
CCV 160-380741/76			17:25																										
CCB 160-380741/77			17:29																										
ZZZZZZ			17:34																										
CCVL 160-380741/79			17:39																										
CCV 160-380741/80			17:44																										
CCB 160-380741/81			17:48																										

Prep Types: _____
T = Total/NA

Lab Name: <u>TestAmerica St. Louis</u>	Job No.: <u>160-29476-1</u>
SDG No.: _____	
Instrument ID: <u>ICP6500</u>	Analysis Method: <u>6010C</u>
Start Date: <u>08/02/2018 15:06</u>	End Date: <u>08/02/2018 20:07</u>

[illegible]

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Instrument ID: ICP6500 Analysis Method: 6010C

Start Date: 08/02/2018 15:06 End Date: 08/02/2018 20:07

Lab Sample Id	D/F	Type	Time	Analytes																									
				A	A	B	B	C	C	C	C	C	F	K	M	M	N	N	P	S	T	V	Z						
ZZZZZZ			18:49																										
ZZZZZZ			18:54																										
ZZZZZZ			18:58																										
ZZZZZZ			19:03																										
ZZZZZZ			19:07																										
ZZZZZZ			19:12																										
ZZZZZZ			19:16																										
ZZZZZZ			19:21																										
ZZZZZZ			19:26																										
ZZZZZZ			19:30																										
CCVL 160-380117/53			19:35																										
CCV 160-380117/54			19:40																										
CCB 160-380117/55			19:44																										
ZZZZZZ			19:48																										
ZZZZZZ			19:53																										
CCVL 160-380117/58			19:58																										
CCV 160-380117/59			20:02																										
CCB 160-380117/60			20:07																										

Prep Types: _____
T = Total/NA

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

SDG No.: _____

Instrument ID: HAA2

Analysis Method: 7470A

Start Date: 07/17/2018 13:37

End Date: 07/18/2018 07:09

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				H g																									
IC 160-376379/1			13:37	X																									
IC 160-376379/2			13:39	X																									
IC 160-376379/3			13:41	X																									
IC 160-376379/4			13:43	X																									
IC 160-376379/5			13:45	X																									
IC 160-376379/6			13:47	X																									
ICV 160-376379/7	1		13:50	X																									
ICB 160-376379/8	1		13:53	X																									
MB 160-375873/1-A	1	T	13:55	X																									
LCS 160-375873/2-A	1	T	13:57	X																									
ZZZZZZ			13:59																										
ZZZZZZ			14:02																										
ZZZZZZ			14:04																										
160-29274-A-3-B SD	5	T	14:06	X																									
160-29274-A-3-C MS	1	T	14:07	X																									
160-29274-A-3-D MSD	1	T	14:09	X																									
160-29476-1	1	T	14:12	X																									
ZZZZZZ			14:15																										
CCV 160-376379/19	1		14:17	X																									
CCB 160-376379/20	1		14:18	X																									
ZZZZZZ			14:21																										
ZZZZZZ			14:23																										
ZZZZZZ			14:25																										
ZZZZZZ			14:27																										
ZZZZZZ			14:29																										
ZZZZZZ			14:32																										
ZZZZZZ			14:34																										
ZZZZZZ			14:36																										
ZZZZZZ			14:38																										
ZZZZZZ			14:40																										
CCV 160-376379/31			14:41																										
CCB 160-376379/32			14:43																										
ZZZZZZ			14:46																										
ZZZZZZ			14:48																										
ZZZZZZ			14:50																										
ZZZZZZ			14:52																										
ZZZZZZ			14:54																										
ZZZZZZ			14:56																										
ZZZZZZ			14:58																										
ZZZZZZ			15:00																										
ZZZZZZ			15:02																										
ZZZZZZ			15:03																										

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Instrument ID: HAA2 Analysis Method: 7470A

Start Date: 07/17/2018 13:37 End Date: 07/18/2018 07:09

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				H g																									
CCV 160-376379/43			15:05																										
CCB 160-376379/44			15:07																										
CCV 160-376379/45			15:10																										
CCB 160-376379/46			15:12																										
CCV 160-376379/47			06:56																										
CCB 160-376379/48			06:59																										
ZZZZZZ			07:05																										
CCV 160-376379/50			07:07																										
CCB 160-376379/51			07:09																										

Prep Types: _____
T = Total/NA

15-IN
ICP INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

ICP Instrument ID: ICP 6500 Duo Start Date: 08/06/2018 End Date: 08/06/2018

Lab Sample ID	Time	Internal Standards %RI For:									
		Element Y 224.306	Q	Element Y 360.073	Q	Element	Q	Element	Q	Element	Q
ICIS 160-380741/1	11:03										
ICV 160-380741/5	11:21	95		96							
ICB 160-380741/6	11:25	99		98							
CRI 160-380741/7	11:30	99		101							
ICSA 160-380741/8	11:34	94		92							
ICSAB 160-380741/9	11:39	95		93							
CCVL 160-380741/10	11:43	99		98							
CCV 160-380741/11	11:48	93		93							
CCB 160-380741/12	11:52	100		101							
MB 160-379537/1-A	12:32	95		98							
LCS 160-379537/2-A	12:37	96		96							
160-29476-1	12:41	96		96							
160-29476-1 SD	12:46	100		99							
160-29476-1 MS	12:50	97		96							
160-29476-1 MSD	12:55	96		95							
CCVL 160-380741/23	13:18	97		98							
CCV 160-380741/24	13:23	91		93							
CCB 160-380741/25	13:27	99		98							

15-IN
ICP INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
METALS

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

ICP Instrument ID: ICP6500 Start Date: 08/02/2018 End Date: 08/02/2018

Lab Sample ID	Time	Internal Standards %RI For:									
		Element Y 224.306	Q	Element Y 360.073	Q	Element	Q	Element	Q	Element	Q
ICIS 160-380117/1	15:06										
ICV 160-380117/5	15:24	95		95							
ICB 160-380117/6	15:28	99		99							
CRI 160-380117/7	15:32	98		100							
ICSA 160-380117/8	15:37	93		93							
ICSAB 160-380117/9	15:42	96		94							
CCVL 160-380117/14	16:06	98		96							
CCV 160-380117/15	16:11	94		94							
CCB 160-380117/16	16:15	98		101							
MB 160-379537/1-A	17:23	101		103							
LCS 160-379537/2-A	17:28	95		96							
160-29476-1	17:32	101		101							
CCVL 160-380117/27	17:37	100		97							
CCV 160-380117/28	17:41	94		98							
CCB 160-380117/29	17:46	101		100							
160-29476-1 SD	17:50	102		102							
160-29476-1 MS	17:55	99		99							
160-29476-1 MSD	17:59	99		96							
CCVL 160-380117/40	18:36	101		101							
CCV 160-380117/41	18:40	93		92							
CCB 160-380117/42	18:44	101		102							

METALS BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Batch Number: 379537 Batch Start Date: 07/31/18 19:39 Batch Analyst: Mazariegos, Leonel ABatch Method: 3010A Batch End Date: 08/01/18 08:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MPREP1 00017	MPREP2 00015	AnalysisComment	
MB 160-379537/1		3010A, 6010C		50 mL	50 mL				
LCS 160-379537/2		3010A, 6010C		50 mL	50 mL	0.25 mL	0.25 mL		
160-29476-L-1	CRC-MW-1	3010A, 6010C	T	50 mL	50 mL			Samples may be high in Activity	
160-29476-L-1 MS	CRC-MW-1	3010A, 6010C	T	50 mL	50 mL	0.25 mL	0.25 mL	Samples may be high in Activity	
160-29476-L-1 MSD	CRC-MW-1	3010A, 6010C	T	50 mL	50 mL	0.25 mL	0.25 mL	Samples may be high in Activity	

Batch Notes	
Balance ID	27150420
Batch Comment	Digestion started by LAM and completed by DAS
Temperature - Corrected - End	93.8 Degrees C
Temperature - Corrected - Start	93.8 Degrees C
Digestion End Time	08/01/2018 06:50
Digestion Start Time	07/31/2018 20:39
Digestion Unit ID	HOTBLOCK 3
Hydrochloric Acid ID	1510584
Nitric Acid ID	1510472
Pipette/Syringe/Dispenser ID	MET-11
Analyst ID - Spike Analyst	LAM
Sufficient Volume for Batch QC	YES
Thermometer ID	160612183, 160322360
Digestion Tube/Cup ID	306612-8166

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Batch Number: 375873 Batch Start Date: 07/16/18 11:20 Batch Analyst: Shinn, Daniel ABatch Method: 7470A Batch End Date: 07/16/18 14:15

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Hg QC Int. 00998			
MB 160-375873/1		7470A, 7470A		30 mL	30 mL				
LCS 160-375873/2		7470A, 7470A		30 mL	30 mL	1.5 mL			
160-29274-A-3 MS		7470A, 7470A	T	30 mL	30 mL	1.5 mL			
160-29274-A-3 MSD		7470A, 7470A	T	30 mL	30 mL	1.5 mL			
160-29476-L-1	CRC-MW-1	7470A, 7470A	T	30 mL	30 mL				

Batch Notes	
Temperature - Corrected - End	94.9 Deg. C
Temperature - Corrected - Start	96.2 Deg. C
Digestion End Time	07/16/2018 @ 14:15
Digestion Start Time	07/16/2018 @ 12:15
Digestion Unit ID	Hot Block HG1
Sulfuric Acid ID	1447931
Nitric Acid ID	1491915
Hydroxylamine ID	1504316
Potassium Persulfate ID	1501574
Potassium Permanganate ID	1504315
Pipette/Syringe/Dispenser ID	MT002 Met-16 Met-10
Analyst ID - Spike Analyst	DAS
Sufficient Volume for Batch QC	yes
Thermometer ID	160322347
Digestion Tube/Cup ID	296900-4191 86

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

7470A

Page 1 of 1

Sample Name: CALBLK1 Acquired: 8/6/2018 11:03:08 Type: Cal
Method: _2016(v705) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-0.0032	.0024	.0005	-0.0006	.0059	.0001	-0.0007	.0026	.0009
Stddev	.0001	.0009	.0001	.0008	.0031	.0007	.0006	.0003	.0002
%RSD	3.688	38.80	17.92	147.8	52.70	982.1	81.62	10.25	17.87

#1	-0.0030	.0013	.0004	-0.0002	.0057	.0007	-0.0007	.0023	.0007
#2	-0.0033	.0029	.0005	.0001	.0030	.0002	-0.0013	.0027	.0010
#3	-0.0032	.0029	.0006	-0.0015	.0092	-0.0007	-0.0001	.0028	.0010

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0019	.0001	-0.0007	-0.0000	.0155	.0186	-0.0009	-0.0003	-0.0003
Stddev	.0002	.0001	.0003	.0002	.0020	.0025	.0005	.0003	.0003
%RSD	9.182	95.13	44.60	1774.	12.92	13.63	51.74	110.3	106.1

#1	.0018	.0002	-0.0004	-0.0000	.0132	.0188	-0.0004	-0.0001	-0.0006
#2	.0021	.0001	-0.0010	-0.0002	.0165	.0159	-0.0014	-0.0001	.0001
#3	.0019	-0.0000	-0.0007	.0002	.0169	.0210	-0.0009	-0.0007	-0.0005

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0407	.0001	-0.0170	.0004	-0.0005	.0007	.0002	.0018	.0011
Stddev	.0019	.0002	.0002	.0001	.0001	.0002	.0003	.0002	.0002
%RSD	4.754	291.9	1.378	27.96	16.54	32.25	141.7	13.20	16.99

#1	.0394	-0.0002	-0.0172	.0003	-0.0005	.0009	.0003	.0017	.0010
#2	.0397	.0002	-0.0168	.0005	-0.0005	.0005	.0005	.0021	.0009
#3	.0429	.0002	-0.0168	.0003	-0.0006	.0006	-0.0001	.0016	.0013

Elem	Sr4077	Th2832	Ti3349	Tl1908	U_3670	V_2908	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-0.0170	.0006	.0004	-0.0008	.0059	.0009	-0.0001
Stddev	.0008	.0000	.0010	.0002	.0001	.0006	.0001
%RSD	4.414	6.235	281.0	19.73	1.716	64.62	127.2

#1	-0.0176	.0007	.0010	-0.0007	.0060	.0004	-0.0001
#2	-0.0174	.0006	.0008	-0.0010	.0059	.0015	-0.0001
#3	-0.0162	.0006	-0.0008	-0.0007	.0058	.0007	.0000

Sample Name: CALBLK1 Acquired: 8/6/2018 11:03:08 Type: Cal
Method: _2016(v705) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3321.3	52910.	3782.3
Stddev	11.8	28.	47.3
%RSD	.35642	.05336	1.2507
#1	3315.5	52937.	3816.9
#2	3313.5	52881.	3801.5
#3	3334.9	52911.	3728.4

Sample Name: CAL 1 Acquired: 8/6/2018 11:07:50 Type: Cal
Method: _2016(v705) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.0015	.0285	.0024	.0079	.3208	.0342	.0450	.4551	.0160
Stddev	.0000	.0015	.0002	.0005	.0019	.0007	.0002	.0008	.0001
%RSD	1.863	5.159	9.890	6.873	.5999	2.029	.4514	.1669	.8352

#1	-.0015	.0297	.0024	.0073	.3191	.0350	.0449	.4548	.0161
#2	-.0015	.0289	.0026	.0081	.3205	.0338	.0452	.4545	.0158
#3	-.0015	.0268	.0022	.0083	.3229	.0337	.0449	.4559	.0160

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0457	.0123	.0037	.0146	.2344	.0785	.0145	.0128	.0335
Stddev	.0002	.0000	.0001	.0005	.0011	.0003	.0003	.0003	.0003
%RSD	.5267	.3274	3.233	3.467	.4876	.4018	1.764	2.693	.9675

#1	.0459	.0122	.0036	.0141	.2332	.0782	.0147	.0124	.0338
#2	.0456	.0123	.0037	.0151	.2354	.0786	.0145	.0129	.0332
#3	.0454	.0123	.0038	.0147	.2347	.0788	.0142	.0130	.0336

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.1840	.0667	.0265	.0036	.4421	.0027	.0018	.0261	.0299
Stddev	.0021	.0002	.0001	.0002	.0010	.0002	.0004	.0003	.0000
%RSD	1.127	.2352	.4524	5.962	.2158	6.848	19.55	1.237	.0814

#1	.1827	.0668	.0264	.0034	.4419	.0029	.0021	.0259	.0299
#2	.1830	.0665	.0266	.0036	.4412	.0025	.0020	.0265	.0299
#3	.1864	.0668	.0266	.0038	.4431	.0027	.0014	.0260	.0299

Elem	Sr4077	Th2832	Ti3349	Tl1908	U_3670	V_2908	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0362	.0033	.0132	.0031	.0112	.0094	.0571
Stddev	.0012	.0000	.0007	.0002	.0000	.0001	.0003
%RSD	3.389	1.371	5.546	5.024	.2194	1.206	.4743

#1	.0371	.0033	.0134	.0031	.0112	.0093	.0571
#2	.0348	.0033	.0124	.0029	.0112	.0093	.0574
#3	.0367	.0034	.0138	.0032	.0112	.0095	.0568

Sample Name: CAL 1 Acquired: 8/6/2018 11:07:50 Type: Cal
 Method: _2016(v705) Mode: IR Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3391.1	53775.	3833.2
Stddev	10.2	153.	31.6
%RSD	.29979	.28437	.82569
#1	3400.0	53835.	3863.3
#2	3393.4	53601.	3800.2
#3	3380.0	53888.	3836.1

Sample Name: Cal 2 Acquired: 8/6/2018 11:12:34 Type: Cal
Method: _2016(v705) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.1602	6.214	.9131	.0842	31.75	34.76	1.119	22.38	15.37
Stddev	.0002	.024	.0023	.0006	.09	.09	.004	.07	.04
%RSD	.1068	.3905	.2545	.6623	.2853	.2646	.3256	.2998	.2782

#1	.1604	6.191	.9142	.0835	31.67	34.69	1.122	22.41	15.39
#2	.1600	6.210	.9148	.0844	31.74	34.72	1.118	22.43	15.39
#3	.1603	6.240	.9105	.0846	31.85	34.87	1.115	22.31	15.32

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	4.285	6.016	.9078	7.237	2.269	6.191	.7581	4.418	.8636
Stddev	.012	.015	.0030	.019	.010	.021	.0056	.012	.0023
%RSD	.2755	.2537	.3316	.2573	.4297	.3367	.7401	.2609	.2702

#1	4.289	6.026	.9096	7.219	2.259	6.175	.7524	4.407	.8650
#2	4.295	6.023	.9094	7.236	2.273	6.184	.7584	4.417	.8649
#3	4.272	5.998	.9043	7.256	2.277	6.215	.7636	4.430	.8609

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	7.359	8.074	8.559	1.410	4.661	.2205	.1284	.3342	1.444
Stddev	.024	.020	.022	.003	.011	.0012	.0007	.0011	.004
%RSD	.3201	.2430	.2602	.2190	.2373	.5456	.5526	.3265	.2592

#1	7.336	8.088	8.573	1.412	4.672	.2217	.1286	.3330	1.443
#2	7.358	8.084	8.572	1.412	4.662	.2206	.1290	.3350	1.448
#3	7.383	8.052	8.534	1.407	4.650	.2193	.1277	.3347	1.441

Elem	Sr4077	Th2832	Ti3349	Tl1908	U_3670	V_2908	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	53.43	.0705	3.222	.1869	.0644	.9008	14.09
Stddev	.12	.0002	.007	.0009	.0003	.0031	.03
%RSD	.2177	.3010	.2109	.4800	.4622	.3459	.2307

#1	53.36	.0707	3.215	.1863	.0647	.8976	14.11
#2	53.36	.0705	3.221	.1879	.0641	.9010	14.11
#3	53.56	.0703	3.229	.1865	.0645	.9039	14.05

Sample Name: Cal 2 Acquired: 8/6/2018 11:12:34 Type: Cal
Method: _2016(v705) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3161.7	50005.	3704.5
Stddev	6.2	212.	56.6
%RSD	.19757	.42344	1.5273
#1	3162.3	50245.	3768.1
#2	3155.2	49842.	3685.4
#3	3167.6	49929.	3659.9

Sample Name: Cal 3 Acquired: 8/6/2018 11:16:47 Type: Cal
Method: _2016(v705) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.3320	12.79	1.894	.1731	64.95	70.51	2.315	45.11	31.58
Stddev	.0008	.02	.006	.0005	.09	.04	.011	.19	.10
%RSD	.2447	.1847	.3061	.2673	.1352	.0633	.4728	.4125	.3118

#1	.3323	12.79	1.901	.1736	65.05	70.49	2.328	45.26	31.69
#2	.3327	12.77	1.890	.1730	64.90	70.47	2.309	44.90	31.50
#3	.3311	12.82	1.893	.1727	64.90	70.56	2.308	45.17	31.55

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	8.742	12.38	1.883	14.70	4.661	12.72	1.553	9.054	1.788
Stddev	.025	.04	.006	.02	.005	.03	.006	.004	.006
%RSD	.2823	.3234	.3470	.1538	.1090	.2359	.3584	.0481	.3544

#1	8.766	12.42	1.889	14.70	4.665	12.74	1.555	9.055	1.795
#2	8.717	12.34	1.882	14.72	4.656	12.68	1.557	9.050	1.784
#3	8.743	12.37	1.876	14.67	4.662	12.73	1.546	9.059	1.785

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	15.05	16.41	16.90	2.850	9.656	.4574	.2655	.6824	2.940
Stddev	.01	.04	.05	.006	.016	.0020	.0018	.0009	.006
%RSD	.0852	.2255	.2827	.2196	.1646	.4333	.6896	.1334	.1989

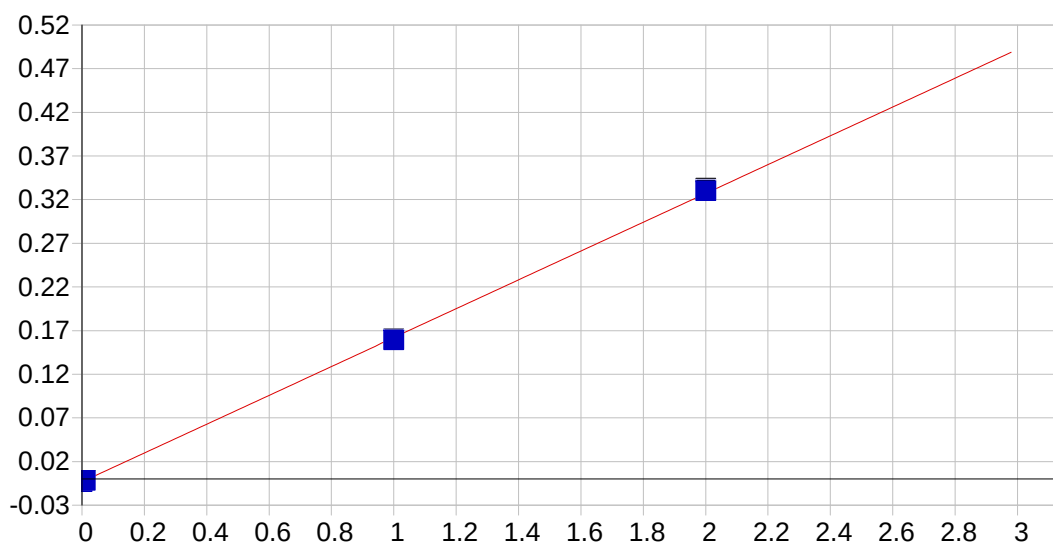
#1	15.06	16.44	16.93	2.855	9.674	.4595	.2672	.6814	2.946
#2	15.04	16.37	16.84	2.843	9.644	.4570	.2636	.6832	2.934
#3	15.05	16.41	16.91	2.853	9.649	.4556	.2657	.6825	2.940

Elem	Sr4077	Th2832	Ti3349	Tl1908	U_3670	V_2908	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	107.1	.1430	6.593	.3763	.1250	1.839	28.52
Stddev	.6	.0005	.010	.0004	.0004	.005	.08
%RSD	.5187	.3714	.1462	.1163	.3324	.2932	.2783

#1	106.7	.1428	6.592	.3768	.1248	1.835	28.60
#2	107.7	.1436	6.584	.3760	.1254	1.837	28.44
#3	106.9	.1425	6.603	.3762	.1247	1.845	28.51

Sample Name: Cal 3 Acquired: 8/6/2018 11:16:47 Type: Cal
Method: _2016(v705) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2943.8	48342.	3538.1
Stddev	14.5	185.	43.3
%RSD	.49182	.38344	1.2246
#1	2943.9	48429.	3537.8
#2	2958.2	48129.	3494.9
#3	2929.3	48468.	3581.6

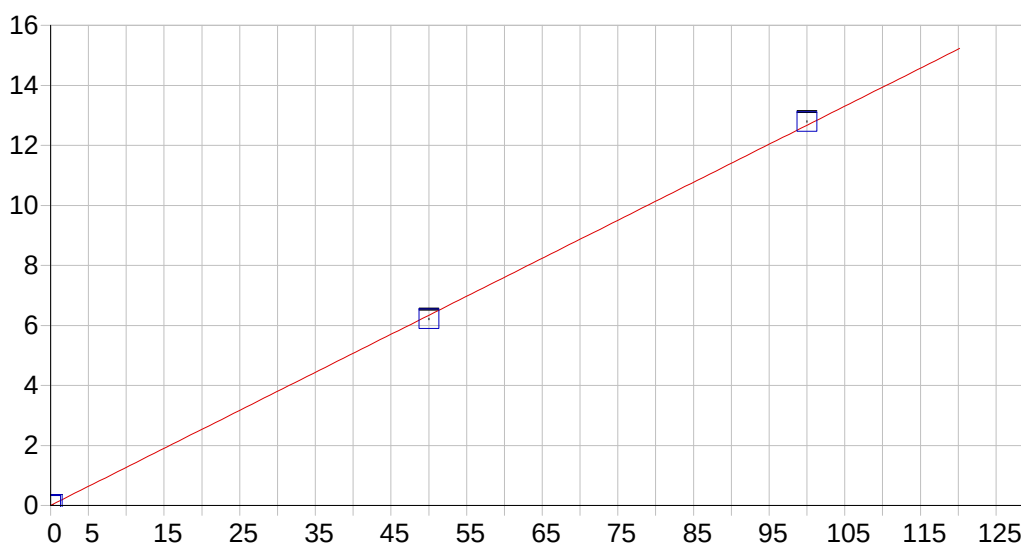


Ag 328.068 (103)

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.003165 Re-Slope: 1.000000
 A1 (Gain): 0.165121 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999923 Status: OK.
 Std Error of Est: 0.000016
 Predicted MDL: 0.000907
 Predicted MQL: 0.003025

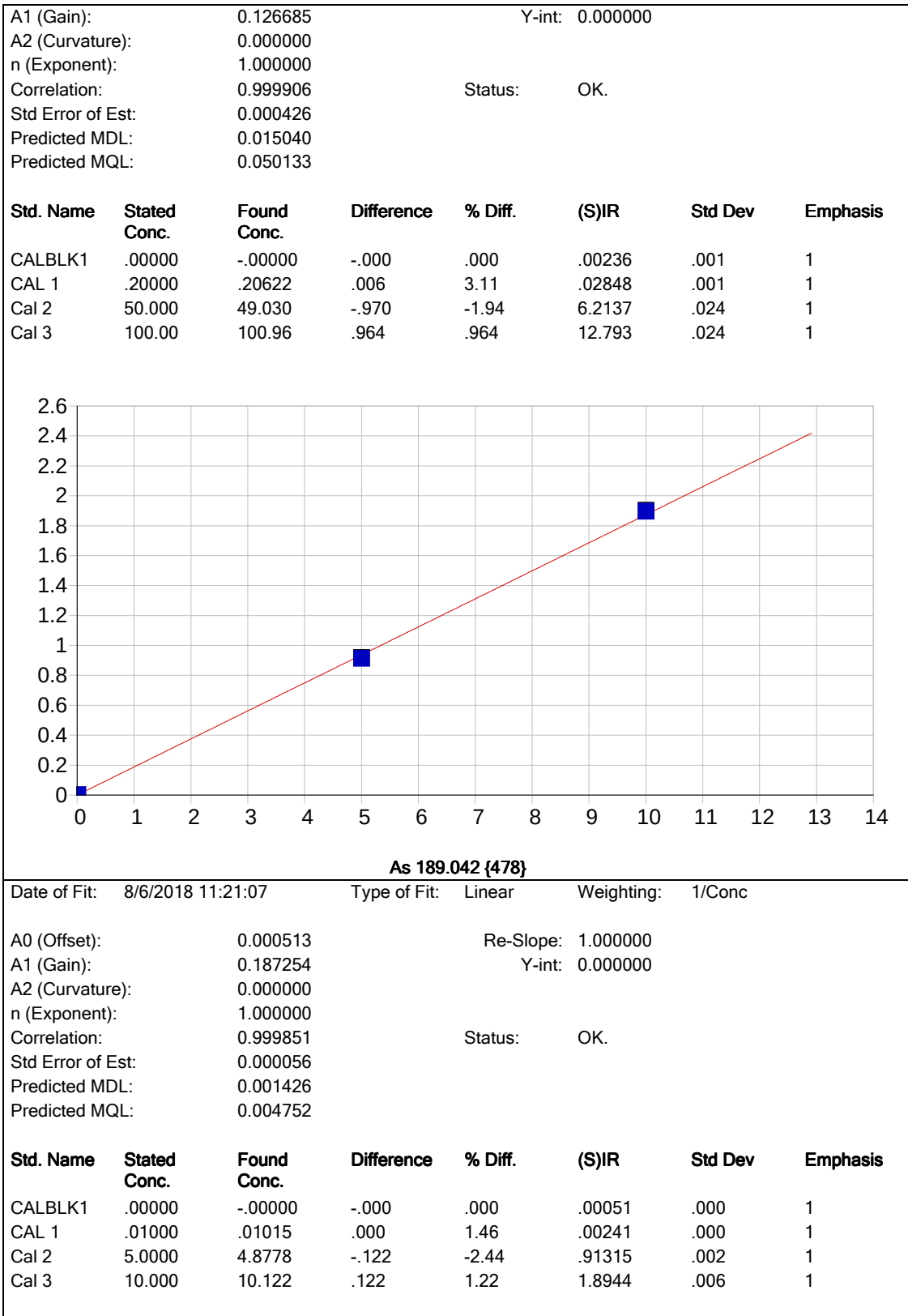
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.00317	.000	1
CAL 1	.01000	.00939	-.001	-6.15	-.00151	.000	1
Cal 2	1.0000	.98320	-.017	-1.68	.16023	.000	1
Cal 3	2.0000	2.0174	.017	.872	.33205	.001	1

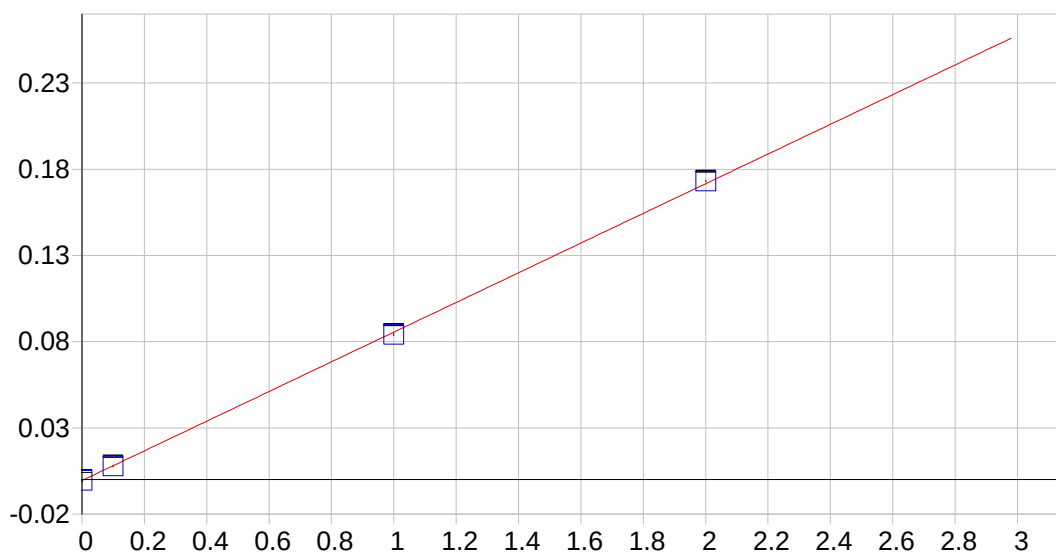


AI 396.152 (85)

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.002357 Re-Slope: 1.000000



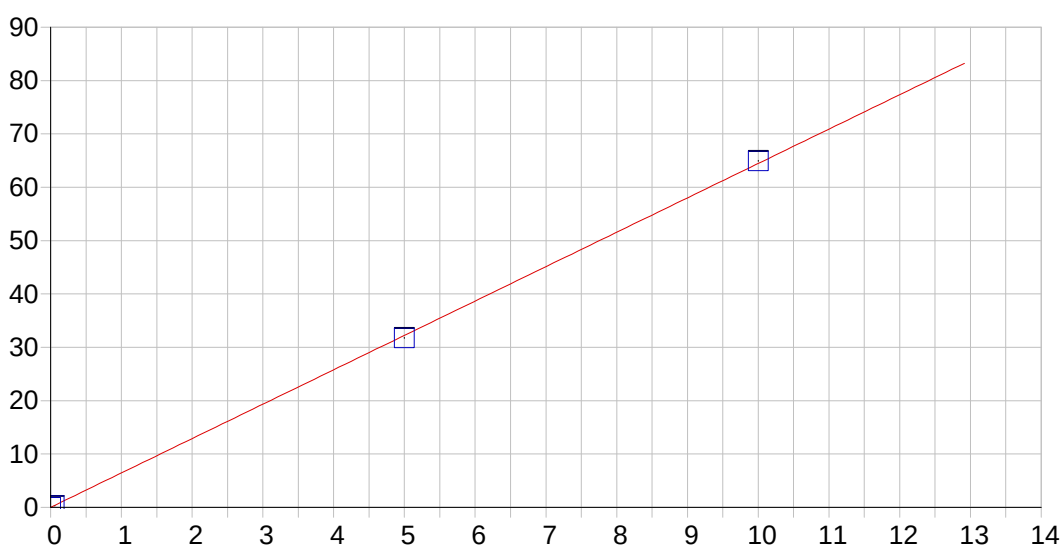


B 249.678 {135}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000555 Re-Slope: 1.000000
 A1 (Gain): 0.086095 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999931 Status: OK.
 Std Error of Est: 0.000025
 Predicted MDL: 0.006586
 Predicted MQL: 0.021953

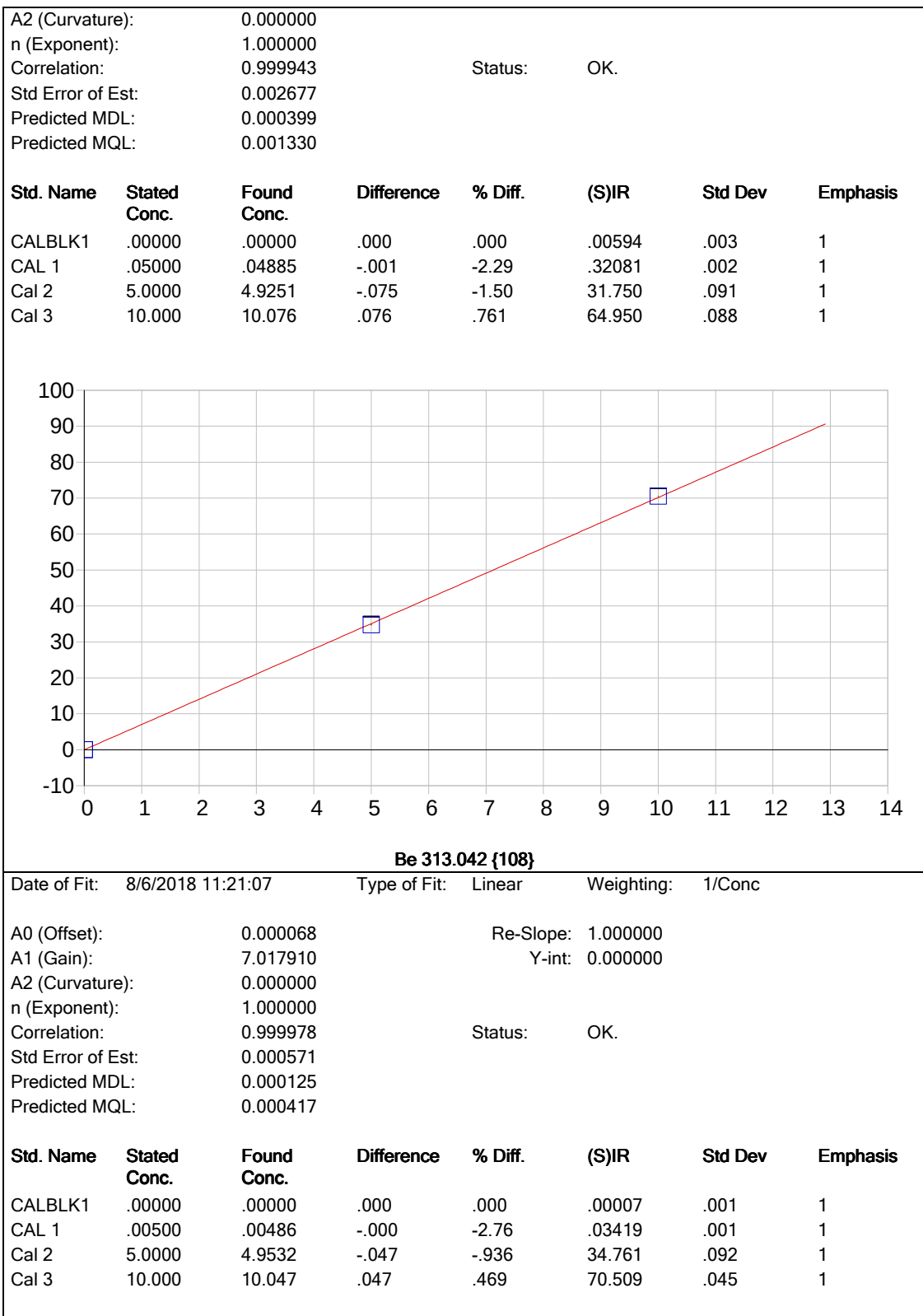
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.00055	.001	1
CAL 1	.10000	.09840	-.002	-1.60	.00792	.001	1
Cal 2	1.0000	.98419	-.016	-1.58	.08418	.001	1
Cal 3	2.0000	2.0174	.017	.871	.17313	.000	1

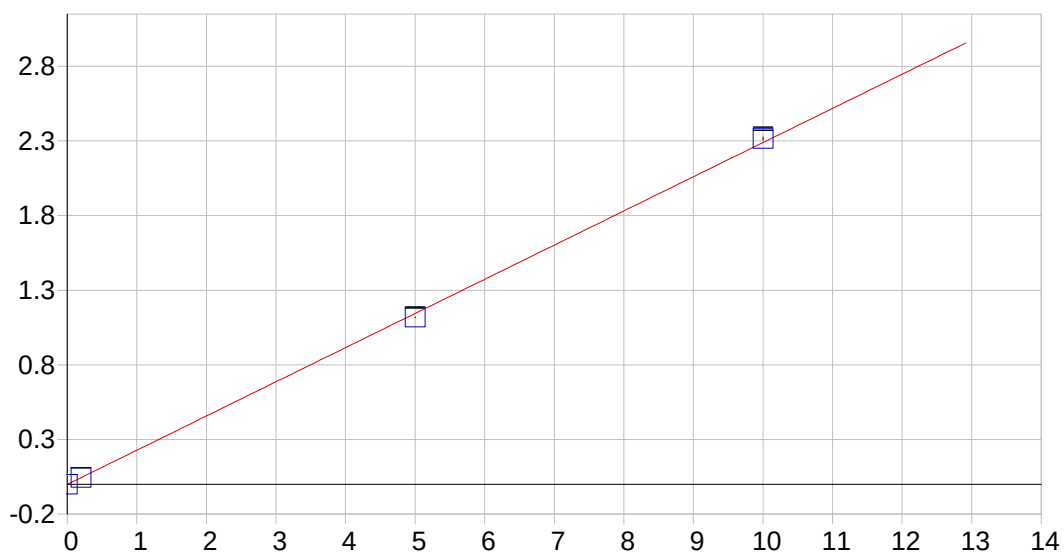


Ba 455.403 {74}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.005929 Re-Slope: 1.000000
 A1 (Gain): 6.445355 Y-int: 0.000000



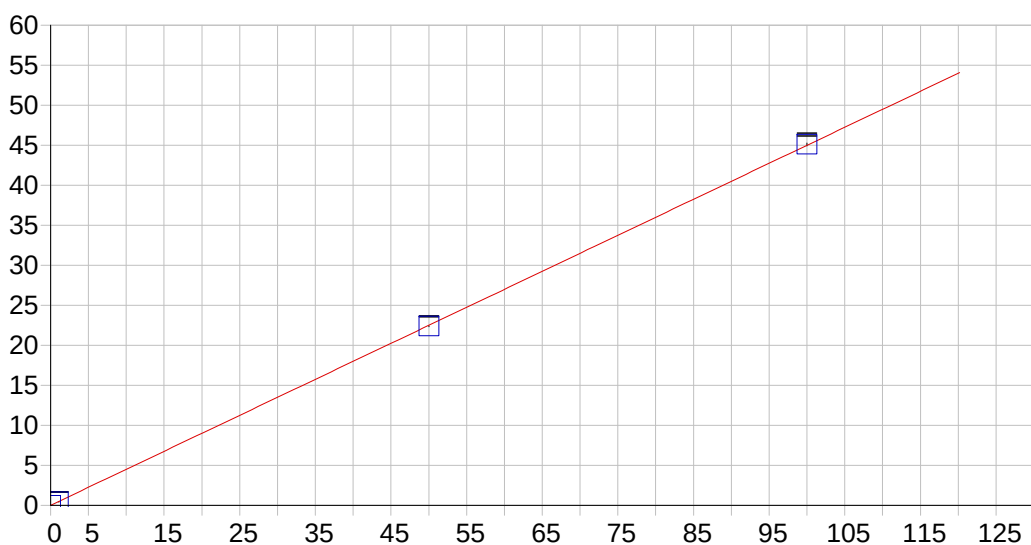


Bi 223.061 {451}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000696 Re-Slope: 1.000000
 A1 (Gain): 0.228992 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999875 Status: OK.
 Std Error of Est: 0.000282
 Predicted MDL: 0.001973
 Predicted MQL: 0.006577

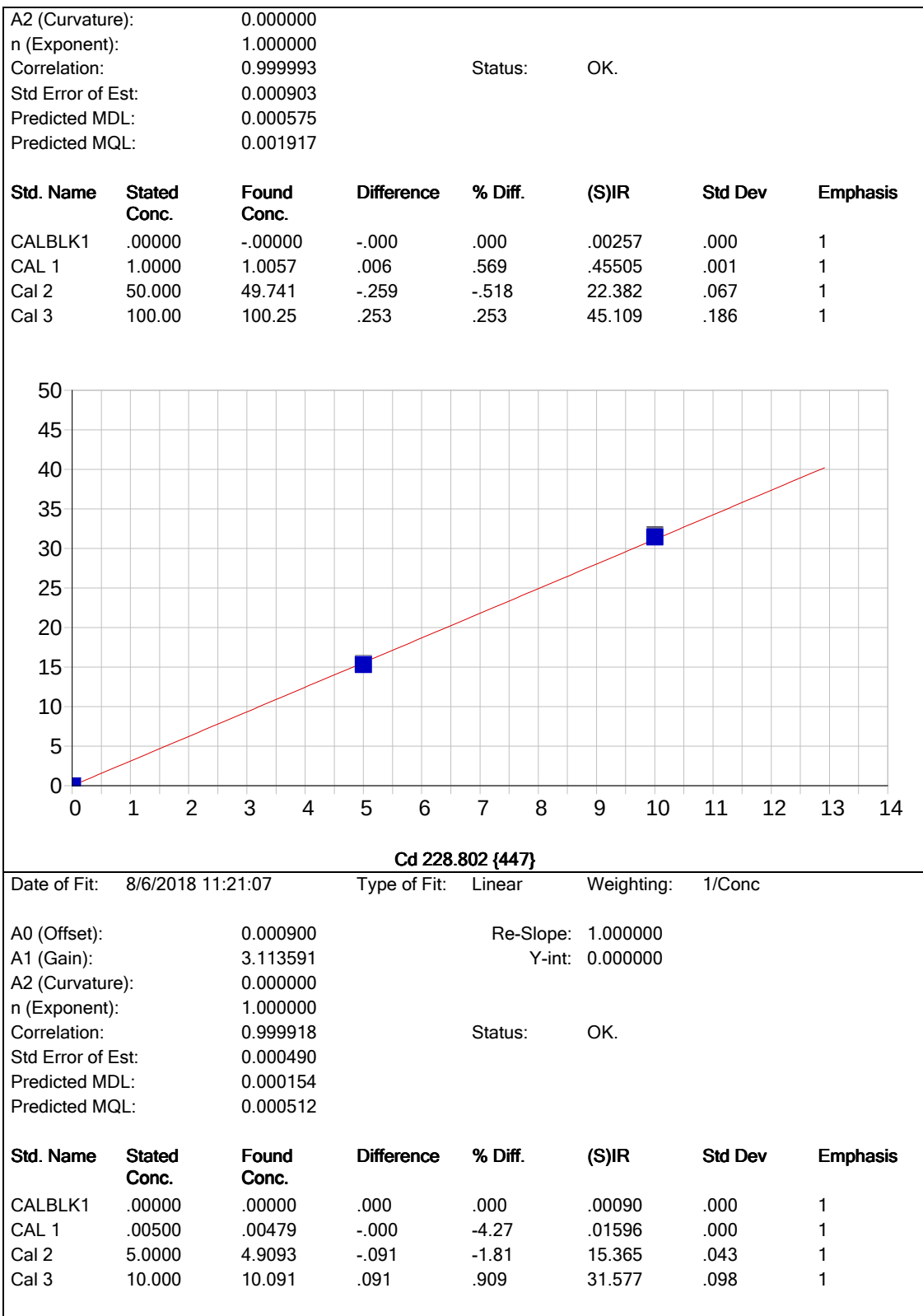
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.00070	.001	1
CAL 1	.20000	.19955	-.000	-.224	.04500	.000	1
Cal 2	5.0000	4.8875	-.112	-2.25	1.1185	.004	1
Cal 3	10.000	10.113	.113	1.13	2.3151	.011	1

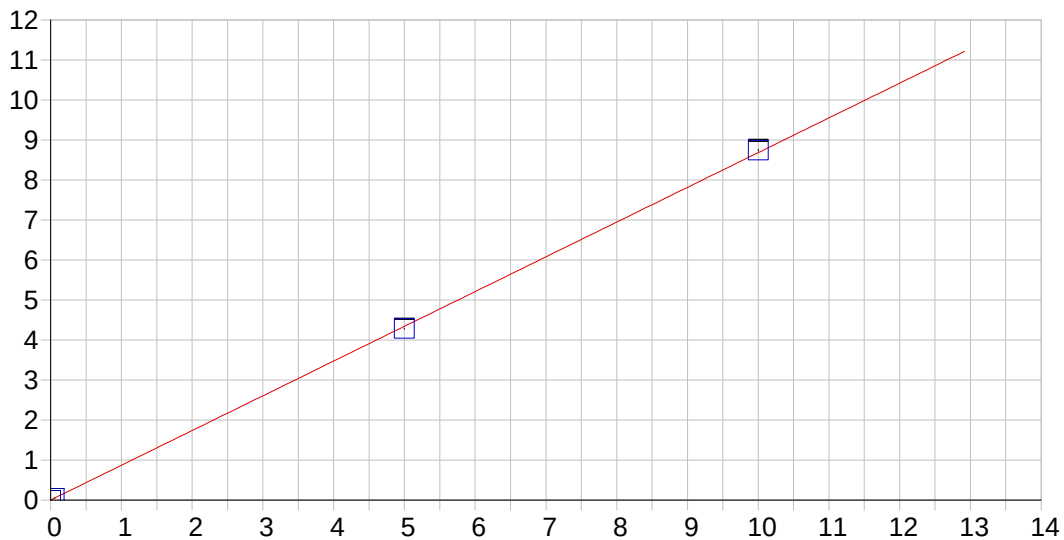


Ca 184.006 {483}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.002572 Re-Slope: 1.000000
 A1 (Gain): 0.449922 Y-int: 0.000000



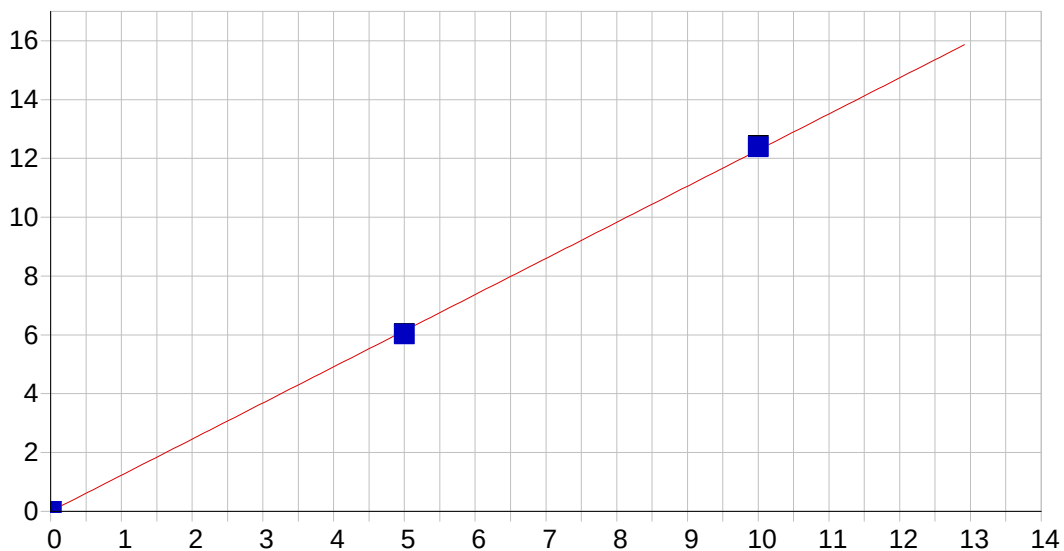


Co 228.616 {448}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.001912 Re-Slope: 1.000000
 A1 (Gain): 0.868239 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999956 Status: OK.
 Std Error of Est: 0.000316
 Predicted MDL: 0.000373
 Predicted MQL: 0.001242

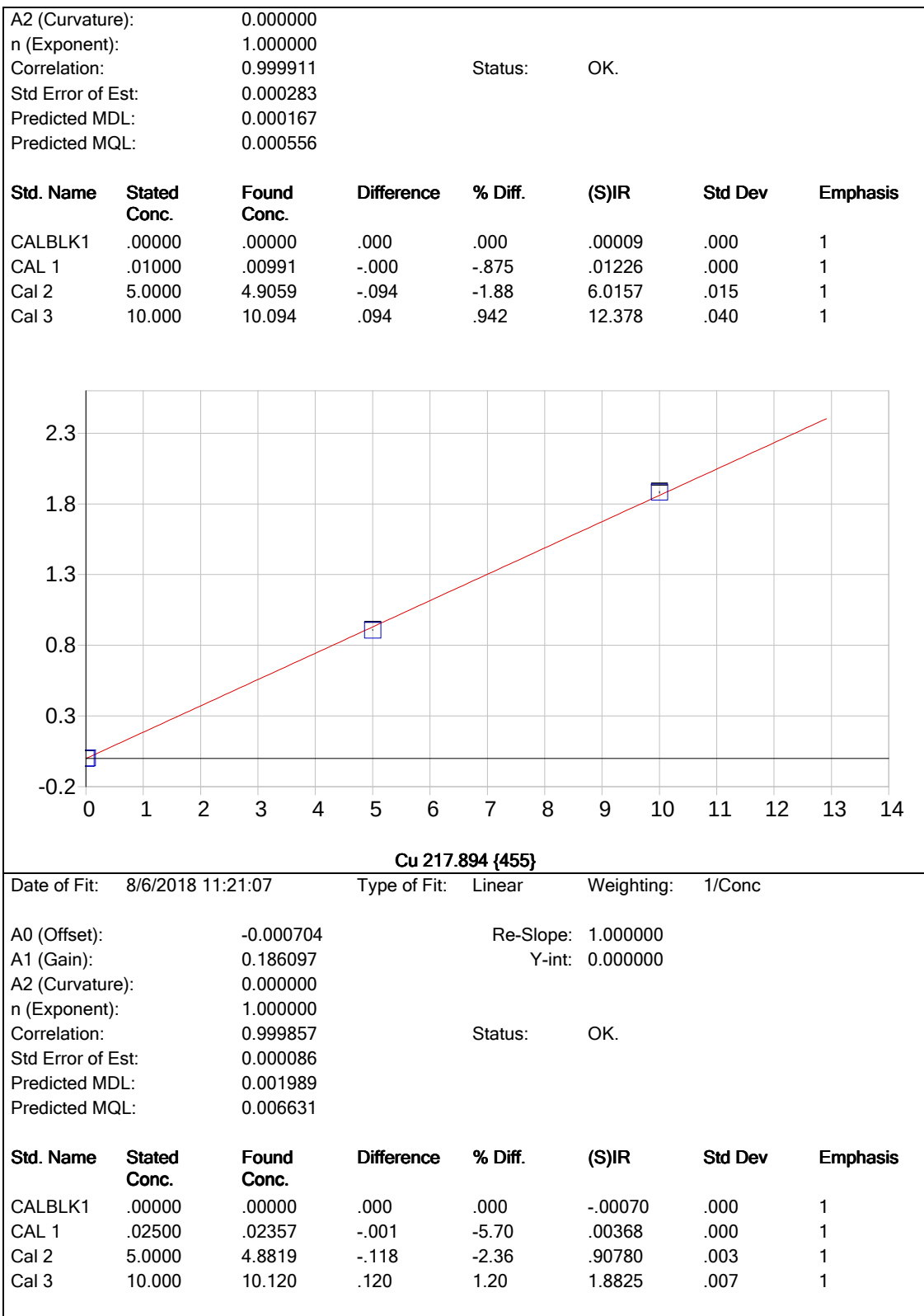
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	-.00000	-.000	.000	.00191	.000	1
CAL 1	.05000	.05039	.000	.783	.04566	.000	1
Cal 2	5.0000	4.9334	-.067	-1.33	4.2852	.012	1
Cal 3	10.000	10.066	.066	.662	8.7418	.025	1

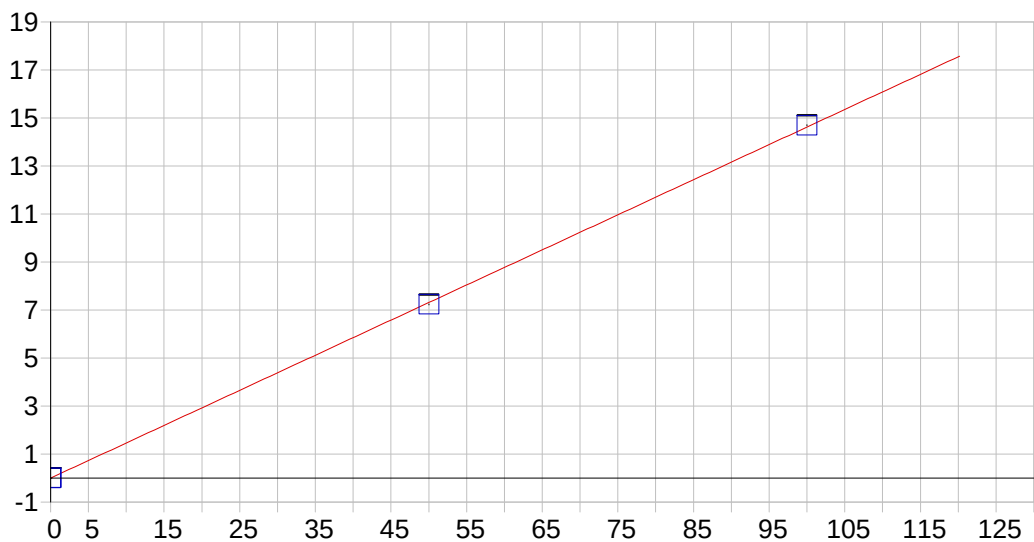


Cr 205.560 {464}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000094 Re-Slope: 1.000000
 A1 (Gain): 1.228422 Y-int: 0.000000



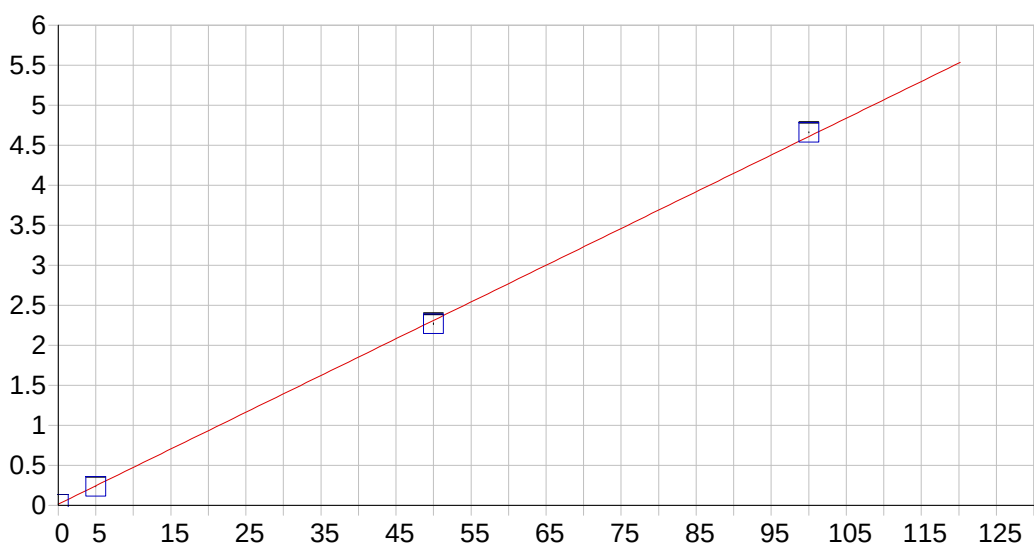


Fe 259.940 {130}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000012 Re-Slope: 1.000000
 A1 (Gain): 0.146233 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999974 Status: OK.
 Std Error of Est: 0.000183
 Predicted MDL: 0.003832
 Predicted MQL: 0.012775

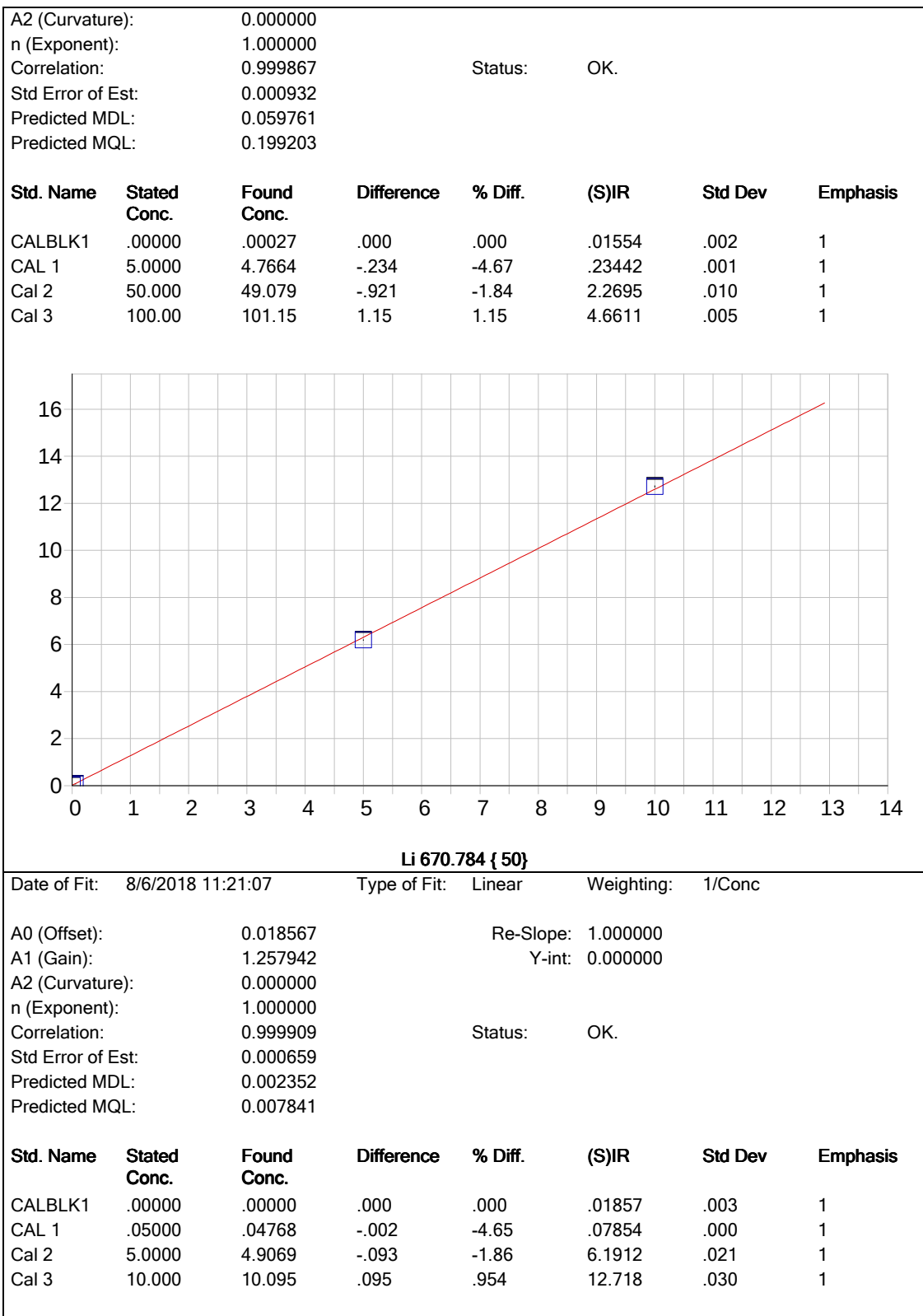
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.00001	.000	1
CAL 1	.10000	.10009	.000	.087	.01462	.001	1
Cal 2	50.000	49.490	-.510	-1.02	7.2370	.019	1
Cal 3	100.00	100.51	.510	.510	14.698	.023	1

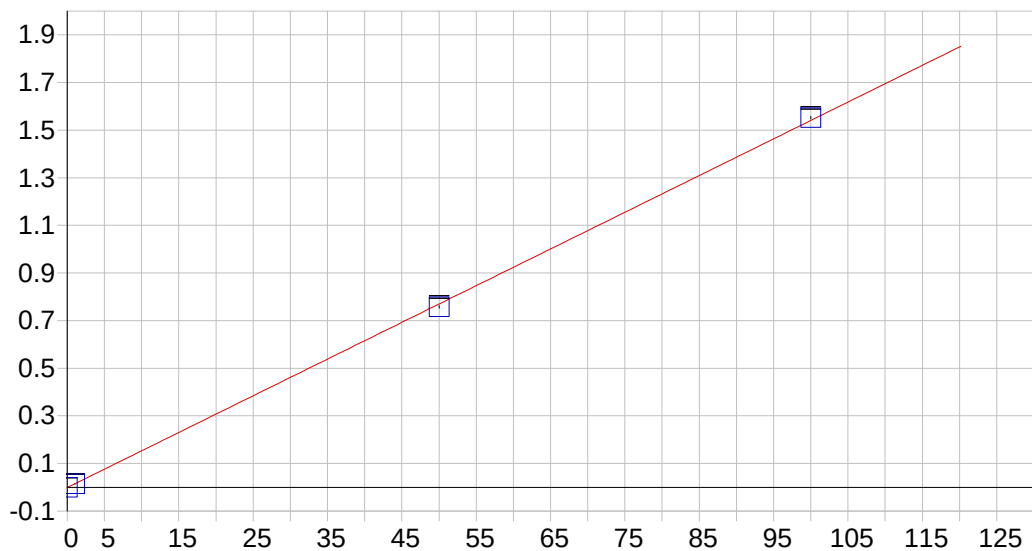


K 766.490 {44}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.015528 Re-Slope: 1.000000
 A1 (Gain): 0.045925 Y-int: 0.000000



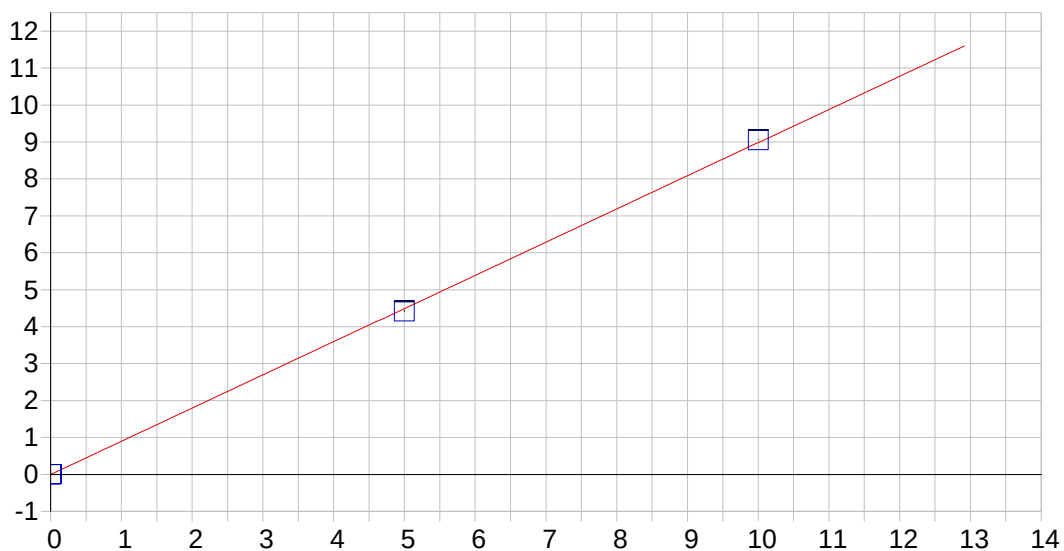


Mg 279.806 {121}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000896 Re-Slope: 1.000000
 A1 (Gain): 0.015417 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999941 Status: OK.
 Std Error of Est: 0.000092
 Predicted MDL: 0.034788
 Predicted MQL: 0.115962

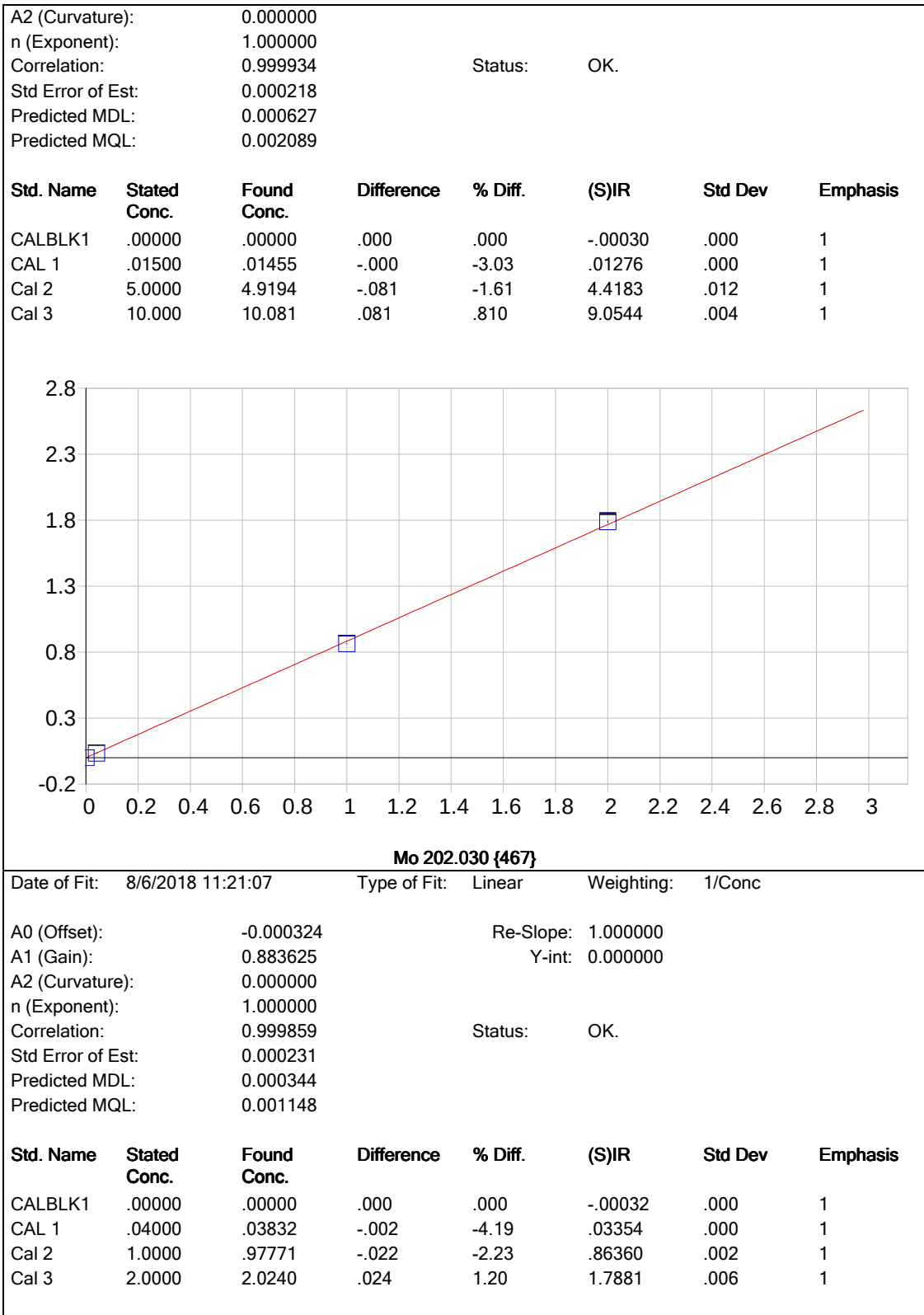
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00001	.000	.000	-.00090	.000	1
CAL 1	1.0000	.99708	-.003	-.292	.01448	.000	1
Cal 2	50.000	49.234	-.766	-1.53	.75814	.006	1
Cal 3	100.00	100.77	.769	.769	1.5527	.006	1

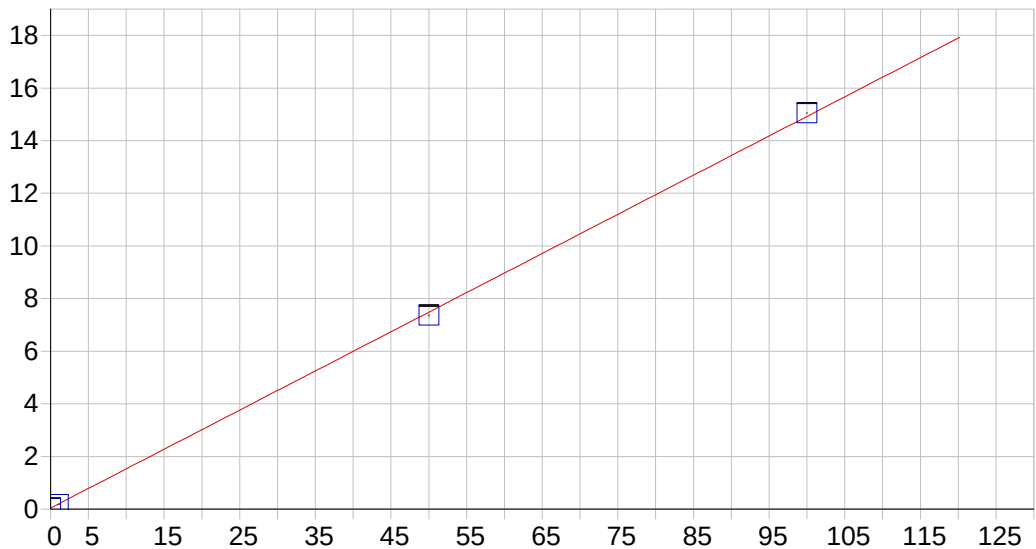


Mn 257.610 {131}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000303 Re-Slope: 1.000000
 A1 (Gain): 0.898196 Y-int: 0.000000



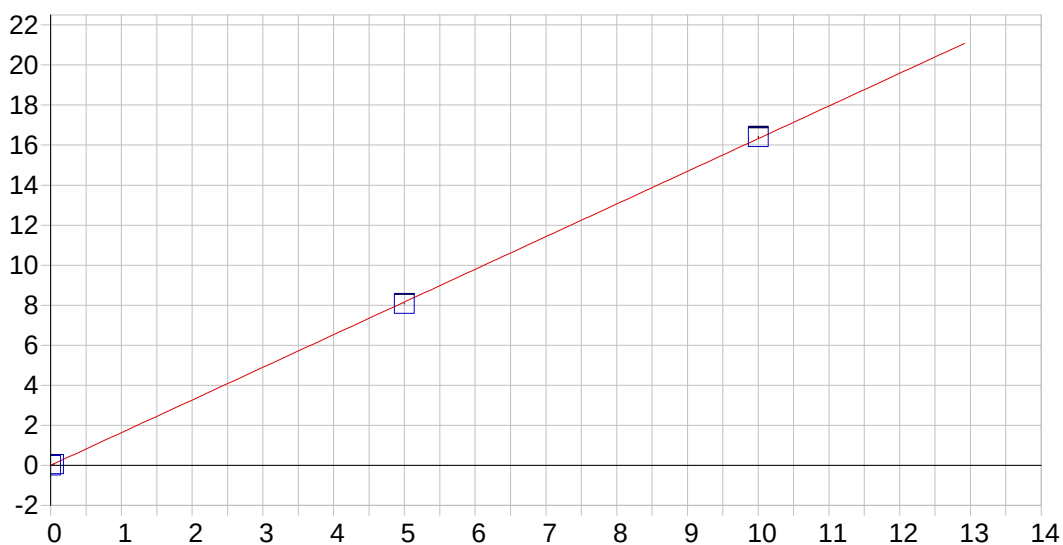


Na 589.592 { 57}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.040649 Re-Slope: 1.000000
 A1 (Gain): 0.148832 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999925 Status: OK.
 Std Error of Est: 0.000999
 Predicted MDL: 0.017779
 Predicted MQL: 0.059263

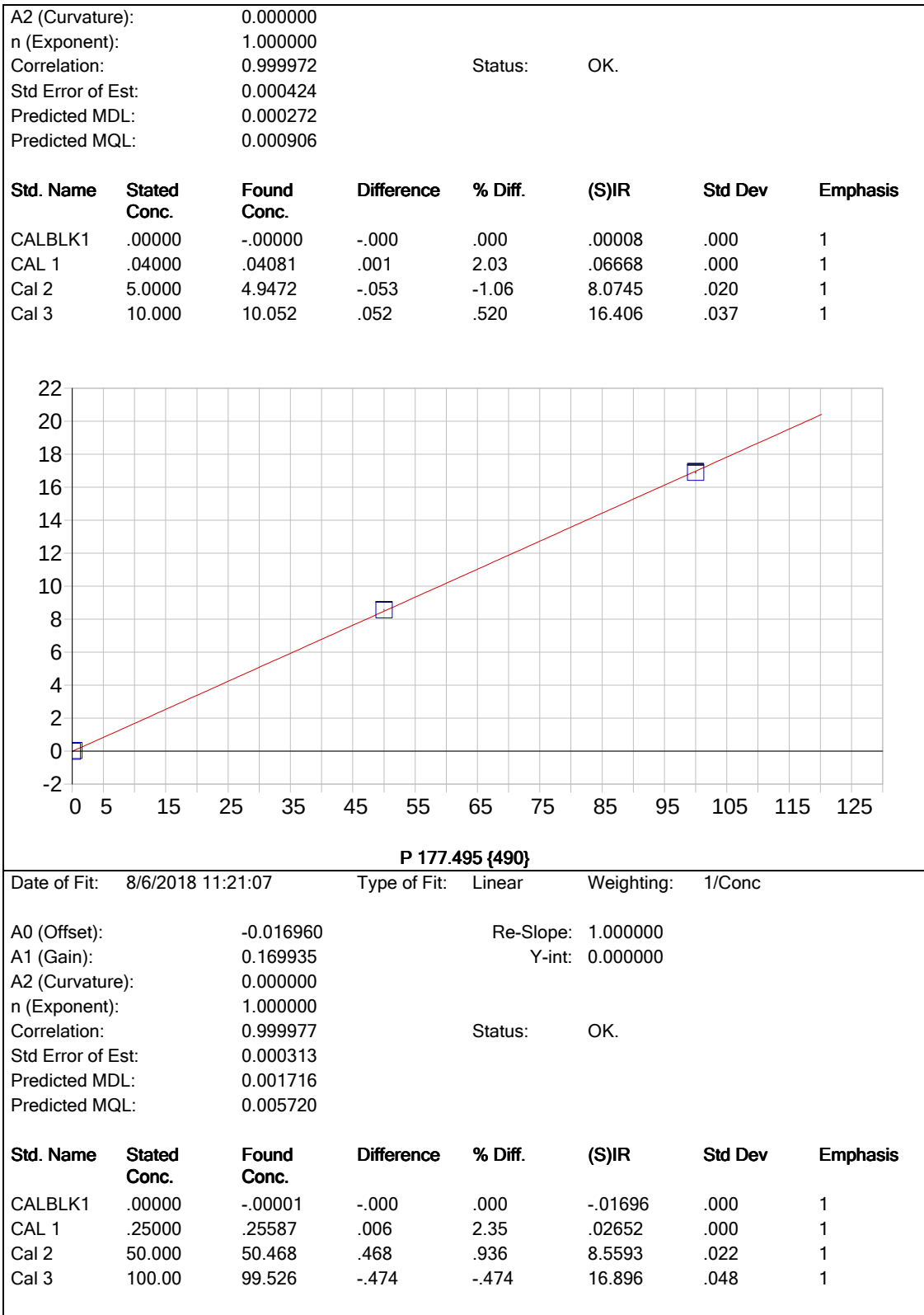
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00004	.000	.000	.04066	.002	1
CAL 1	1.0000	.96349	-.037	-3.65	.18405	.002	1
Cal 2	50.000	49.172	-.828	-1.66	7.3590	.024	1
Cal 3	100.00	100.86	.865	.865	15.053	.013	1

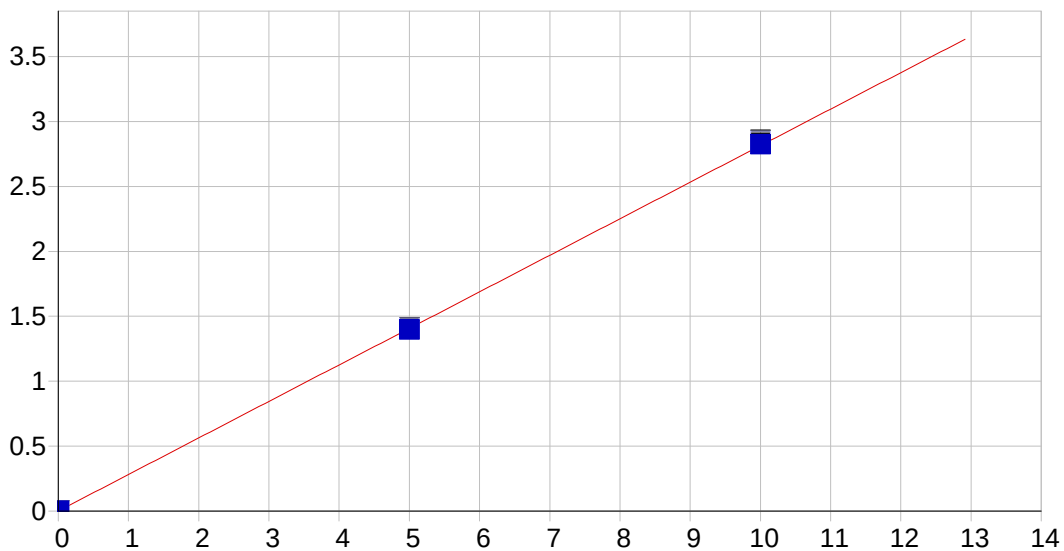


Ni 221.647 {452}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000076 Re-Slope: 1.000000
 A1 (Gain): 1.632114 Y-int: 0.000000



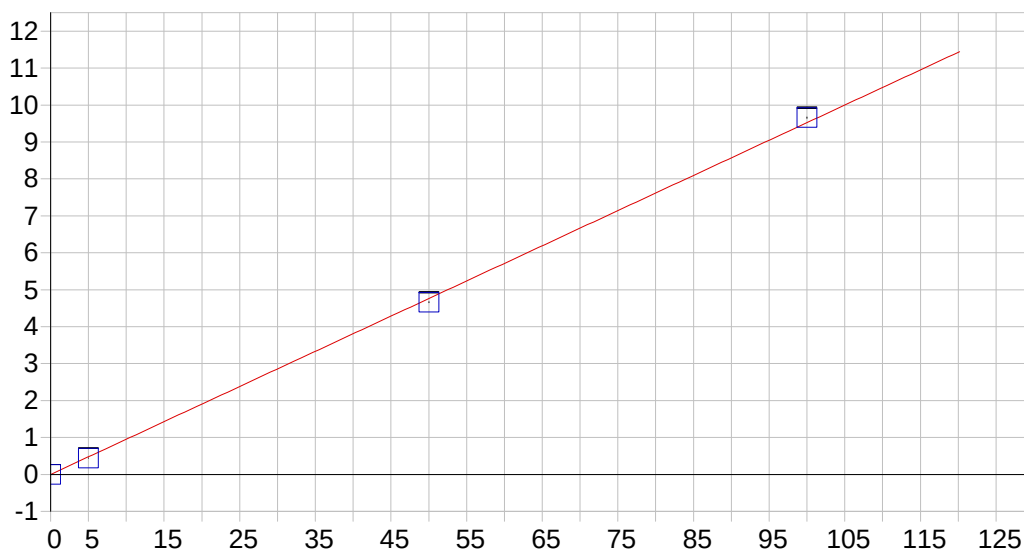


Pb 220.353 {453}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000394 Re-Slope: 1.000000
 A1 (Gain): 0.281332 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999987 Status: OK.
 Std Error of Est: 0.000025
 Predicted MDL: 0.001243
 Predicted MQL: 0.004143

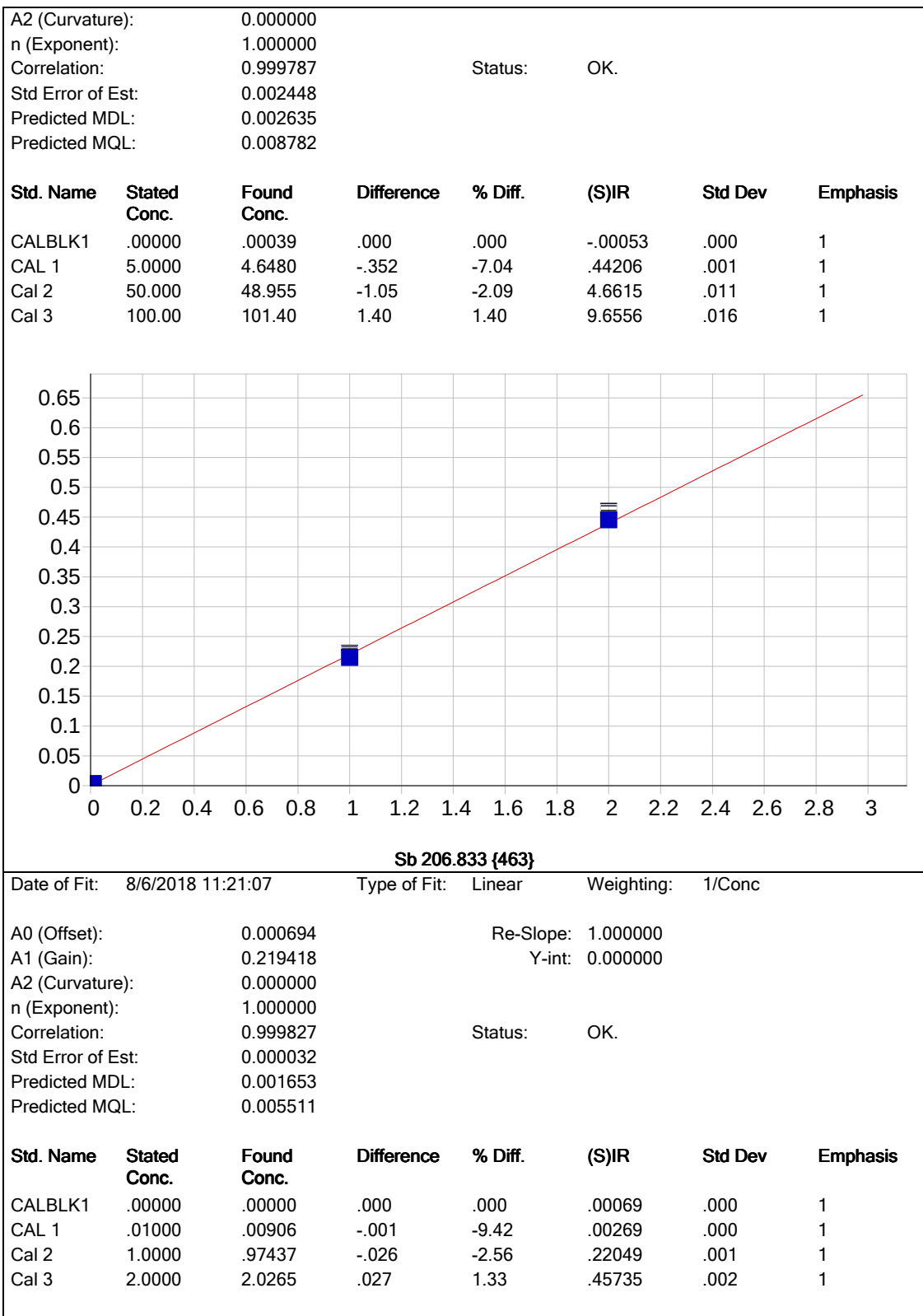
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	.00039	.000	1
CAL 1	.01000	.00995	-.000	-.450	.00361	.000	1
Cal 2	5.0000	4.9636	-.036	-.727	1.4101	.003	1
Cal 3	10.000	10.036	.036	.364	2.8505	.006	1

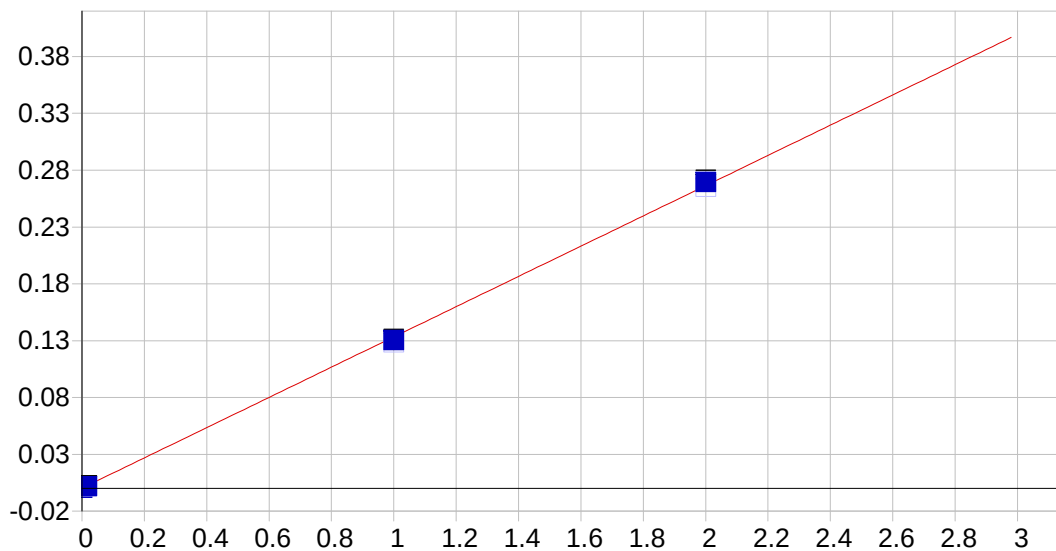


S 182.034 {485}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000571 Re-Slope: 1.000000
 A1 (Gain): 0.095231 Y-int: 0.000000



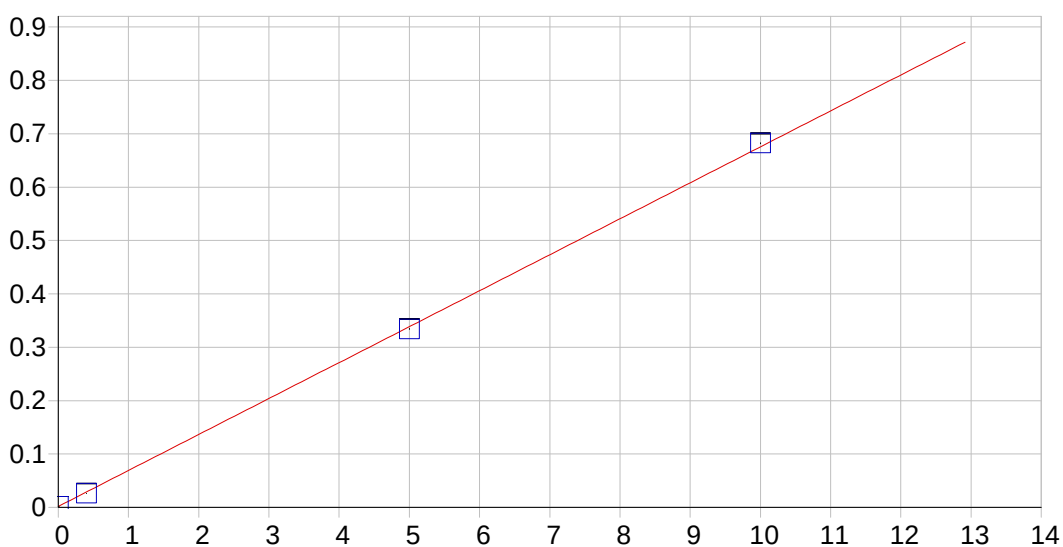


Se 196.090 {472}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000209 Re-Slope: 1.000000
 A1 (Gain): 0.133090 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999853 Status: OK.
 Std Error of Est: 0.000021
 Predicted MDL: 0.002292
 Predicted MQL: 0.007640

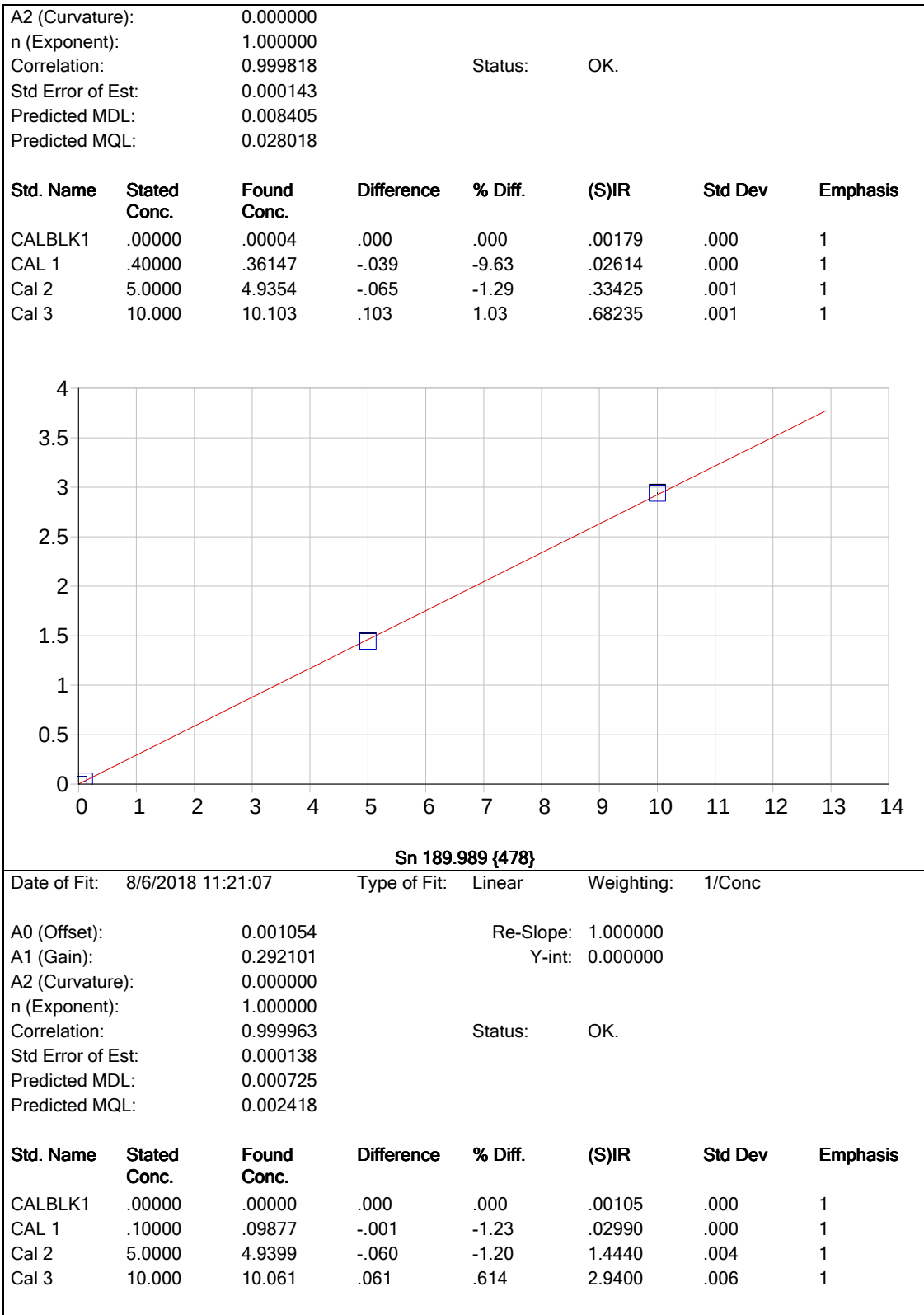
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	.00021	.000	1
CAL 1	.01500	.01361	-.001	-9.26	.00182	.000	1
Cal 2	1.0000	.97836	-.022	-2.16	.12844	.001	1
Cal 3	2.0000	2.0229	.023	1.15	.26548	.002	1

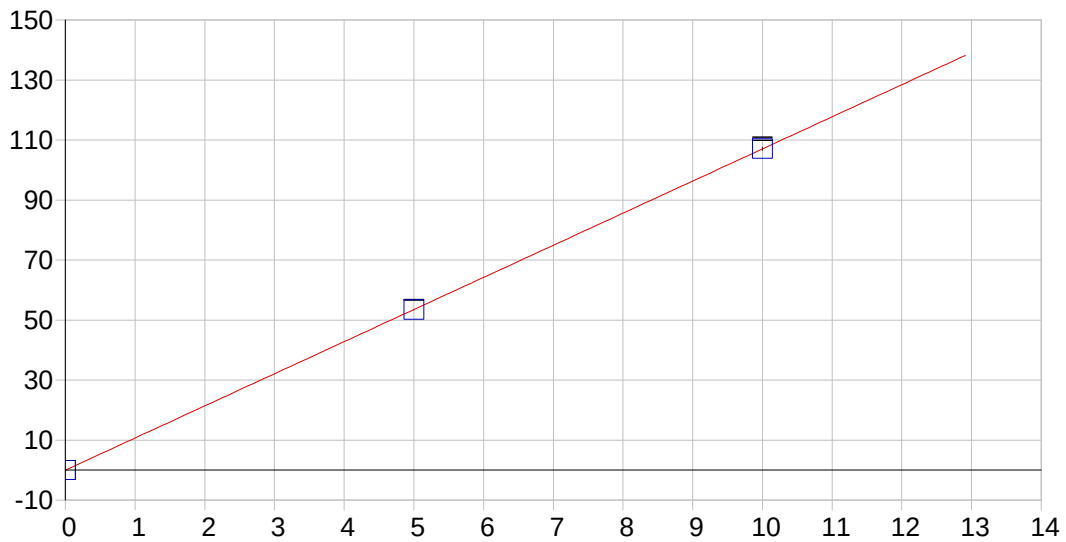


Si 251.611 {134}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.001792 Re-Slope: 1.000000
 A1 (Gain): 0.067361 Y-int: 0.000000



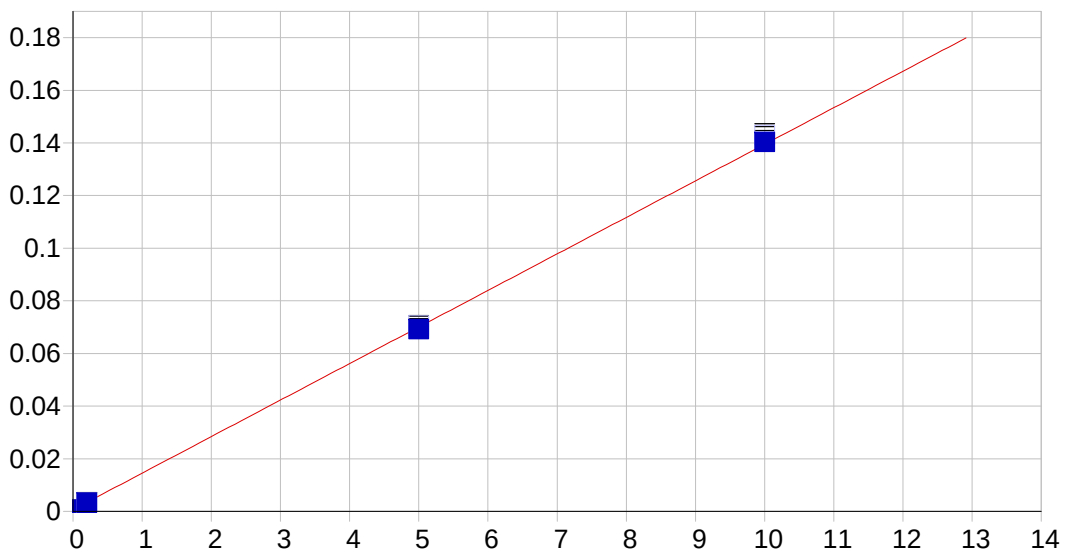


Sr 407.771 { 83}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.017026 Re-Slope: 1.000000
 A1 (Gain): 10.704038 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 1.000000 Status: OK.
 Std Error of Est: 0.000130
 Predicted MDL: 0.000154
 Predicted MQL: 0.000513

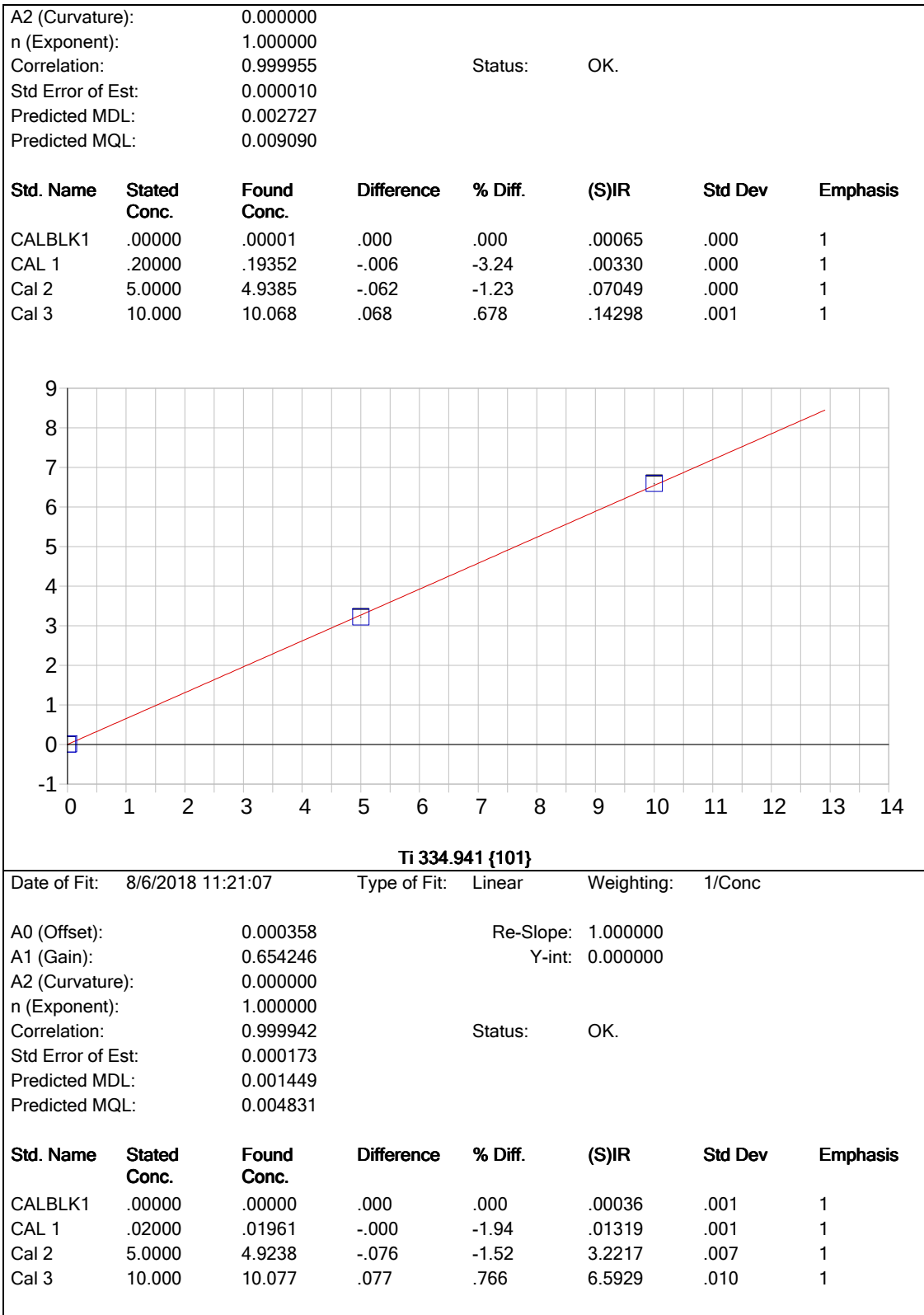
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.01703	.001	1
CAL 1	.00500	.00497	-.000	-.500	.03623	.001	1
Cal 2	5.0000	4.9930	-.007	-.140	53.428	.116	1
Cal 3	10.000	10.007	.007	.070	107.10	.555	1

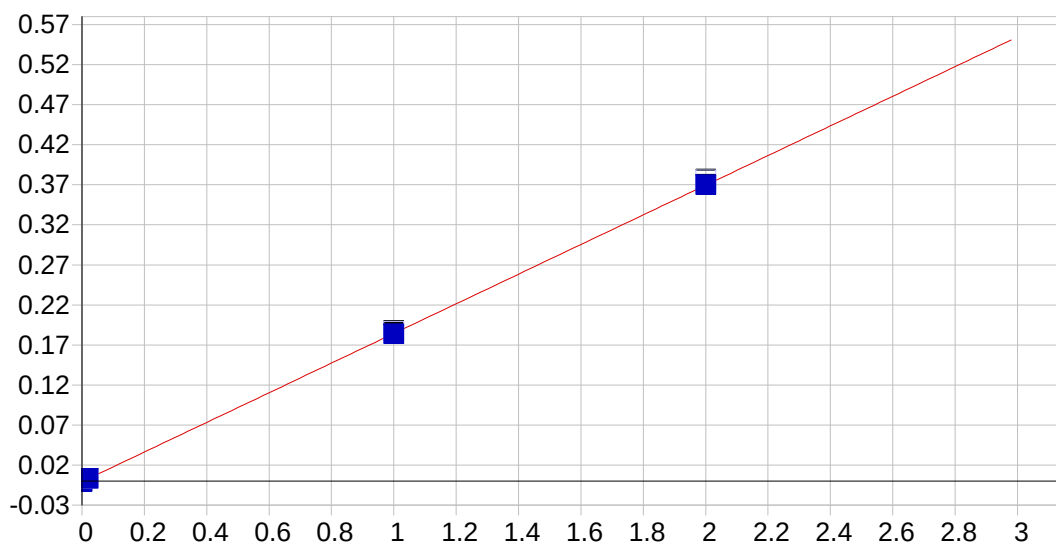


Th 283.231 {119}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.000648 Re-Slope: 1.000000
 A1 (Gain): 0.013883 Y-int: 0.000000



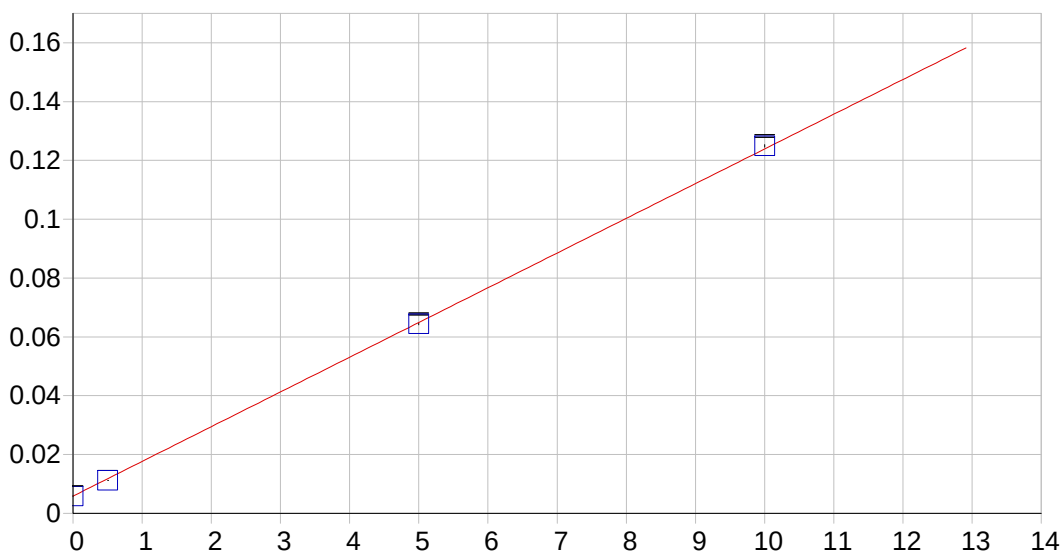


TI 190.856 {477}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.000781 Re-Slope: 1.000000
 A1 (Gain): 0.185128 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999994 Status: OK.
 Std Error of Est: 0.000007
 Predicted MDL: 0.001375
 Predicted MQL: 0.004584

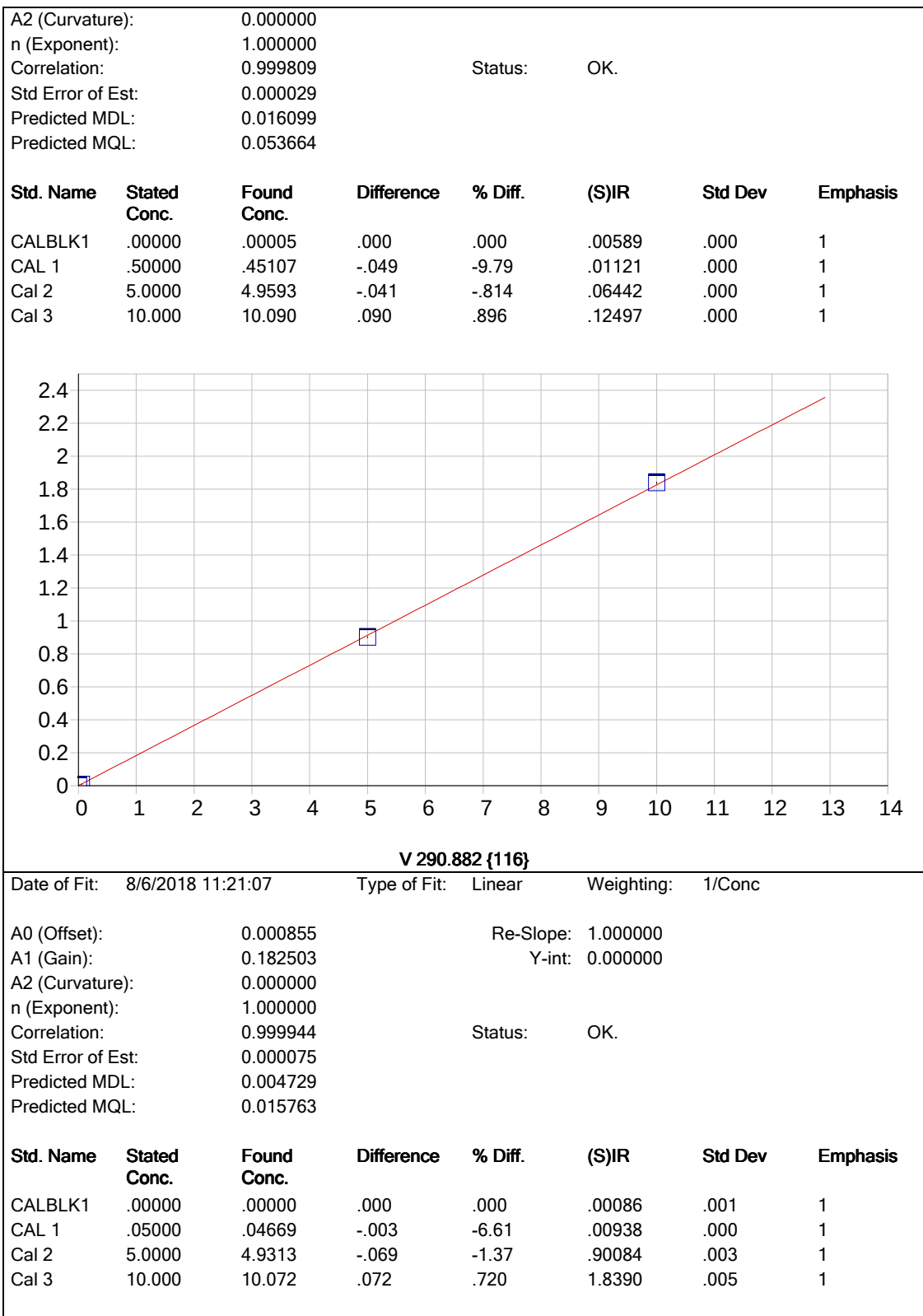
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	-.00000	-.000	.000	-.00078	.000	1
CAL 1	.02000	.02066	.001	3.31	.00308	.000	1
Cal 2	1.0000	.99660	-.003	-.340	.18689	.001	1
Cal 3	2.0000	2.0027	.003	.137	.37633	.000	1

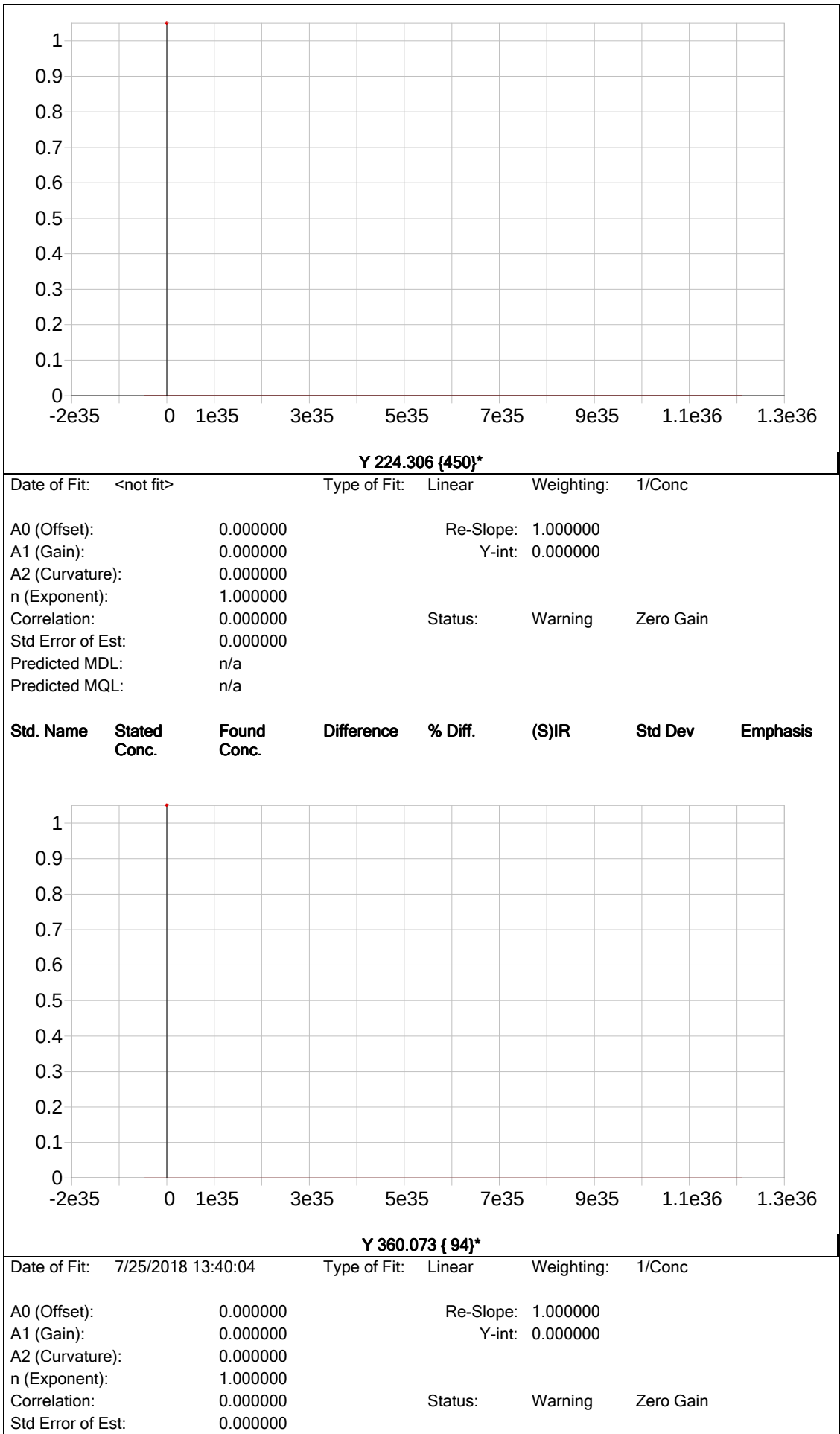


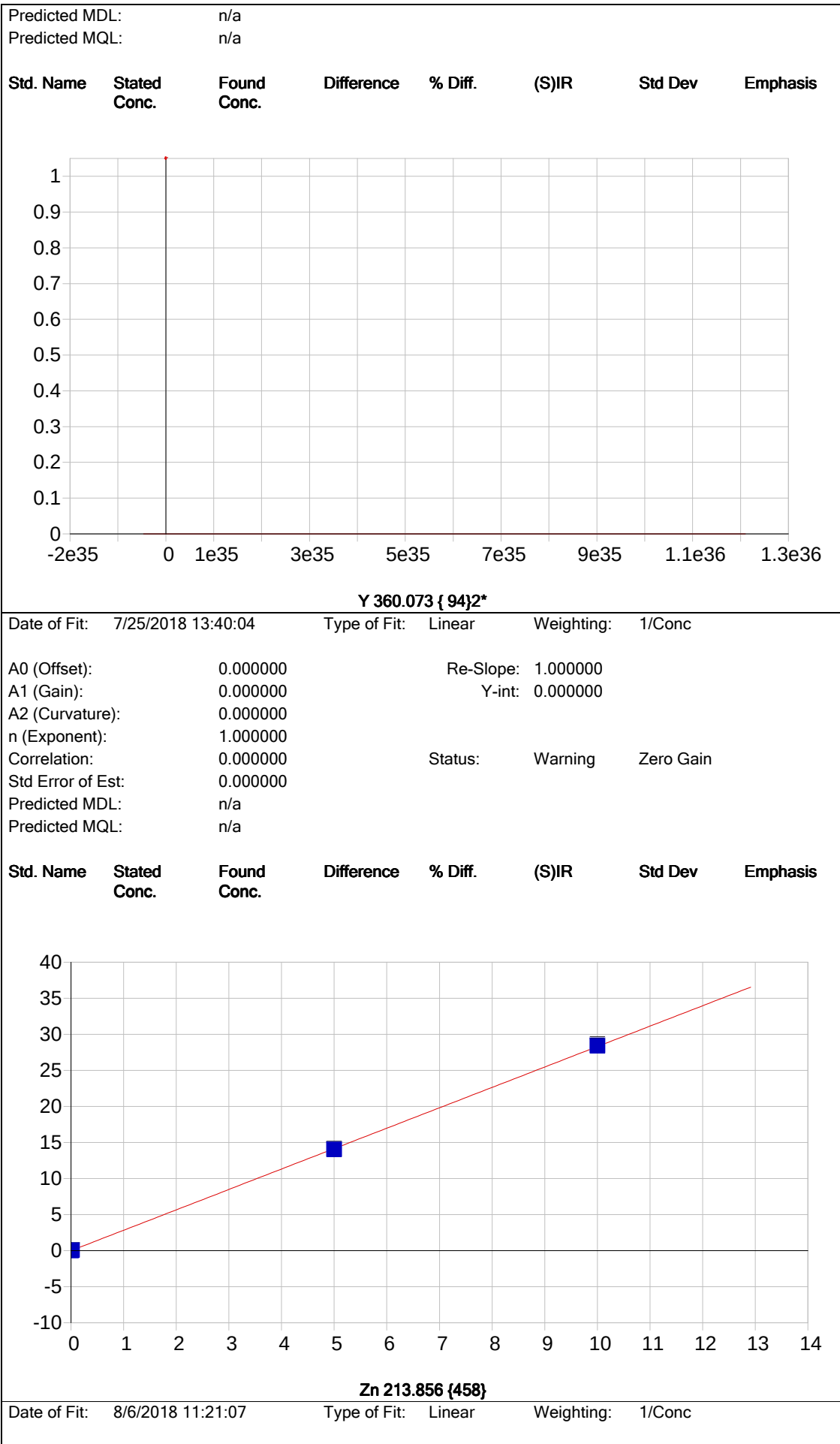
U 367.007 {92}

Date of Fit: 8/6/2018 11:21:07 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): 0.005887 Re-Slope: 1.000000
 A1 (Gain): 0.011802 Y-int: 0.000000







A0 (Offset):	-0.000056	Re-Slope:	1.000000
A1 (Gain):	2.830114	Y-int:	0.000000
A2 (Curvature):	0.000000		
n (Exponent):	1.000000		
Correlation:	0.999984	Status:	OK.
Std Error of Est:	0.000390		
Predicted MDL:	0.000119		
Predicted MQL:	0.000397		

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.00006	.000	1
CAL 1	.02000	.02001	.000	.043	.05710	.000	1
Cal 2	5.0000	4.9602	-.040	-.797	14.090	.033	1
Cal 3	10.000	10.040	.040	.398	28.519	.079	1

Sample Name: ICV Acquired: 8/6/2018 11:21:14 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9934	49.78	5.008	1.034	4.978	4.950	5.019	50.08	5.025
Stddev	.0022	.03	.012	.004	.006	.007	.017	.09	.013
%RSD	.2215	.0698	.2479	.4360	.1202	.1324	.3362	.1768	.2501
#1	.9932	49.77	5.010	1.030	4.980	4.943	5.032	50.00	5.021
#2	.9913	49.75	4.994	1.038	4.971	4.953	5.000	50.06	5.015
#3	.9957	49.82	5.019	1.033	4.983	4.955	5.025	50.17	5.040

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.014	4.992	4.961	51.96	49.71	4.990	49.76	5.020	.9751
Stddev	.009	.008	.013	.04	.09	.010	.07	.007	.0026
%RSD	.1890	.1557	.2697	.0861	.1862	.1997	.1354	.1450	.2642
#1	5.011	4.993	4.971	51.93	49.64	4.991	49.81	5.014	.9747
#2	5.006	4.984	4.946	52.01	49.68	4.979	49.78	5.028	.9727
#3	5.025	4.999	4.966	51.95	49.82	4.999	49.68	5.019	.9778

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	49.69	5.041	51.76	5.060	49.89	.9802	.9875	4.935	4.926
Stddev	.04	.014	.10	.006	.11	.0018	.0028	.015	.012
%RSD	.0889	.2688	.1939	.1273	.2203	.1802	.2797	.3040	.2477
#1	49.69	5.029	51.70	5.054	49.91	.9804	.9852	4.932	4.916
#2	49.64	5.037	51.69	5.059	49.77	.9784	.9906	4.922	4.924
#3	49.73	5.056	51.87	5.067	49.99	.9819	.9867	4.951	4.940

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: ICV Acquired: 8/6/2018 11:21:14 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.055	5.035	5.064	1.048	4.988	4.979	5.034
Stddev	.007	.008	.003	.002	.014	.004	.010
%RSD	.1395	.1671	.0651	.1883	.2739	.0902	.2037

#1	5.055	5.031	5.063	1.046	4.974	4.983	5.029
#2	5.048	5.045	5.061	1.048	4.990	4.980	5.027
#3	5.062	5.029	5.067	1.050	5.001	4.974	5.046

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3140.7	50743.	3681.0
Stddev	13.7	154.	33.8
%RSD	.43493	.30350	.91781

#1	3156.5	50836.	3705.5
#2	3133.5	50827.	3642.5
#3	3132.2	50565.	3695.2

Sample Name: ICB Acquired: 8/6/2018 11:25:30 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0052	.0017	.0093	-.0000	.0000	-.0004	.0019	-.0001
Stddev	.0007	.0060	.0001	.0072	.0003	.0000	.0016	.0002	.0000
%RSD	186.7	115.9	3.724	77.79	742.0	222.4	420.0	9.980	19.61
#1	-.0005	.0036	.0016	.0173	.0000	.0000	.0010	.0020	-.0001
#2	.0004	.0119	.0017	.0072	-.0004	.0001	-.0022	.0017	-.0001
#3	-.0010	.0001	.0017	.0033	.0003	-.0000	.0000	.0019	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0000	.0013	.0039	.0373	.0025	.0159	.0003	.0008
Stddev	.0000	.0000	.0015	.0008	.0338	.0009	.0189	.0006	.0001
%RSD	36.51	19.23	111.0	21.30	90.75	36.94	119.2	207.5	17.27
#1	-.0001	.0000	.0026	.0045	.0755	.0035	.0118	.0000	.0007
#2	-.0001	.0000	.0017	.0030	.0112	.0026	-.0007	-.0001	.0009
#3	-.0001	.0000	-.0003	.0044	.0252	.0016	.0365	.0009	.0007

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0132	.0001	.0031	.0002	.0053	.0000	-.0004	.0012	.0008
Stddev	.0083	.0003	.0011	.0009	.0009	.0024	.0009	.0071	.0008
%RSD	62.82	493.1	35.17	513.5	17.81	6801.	262.3	589.0	104.3
#1	.0037	-.0002	.0018	.0002	.0048	.0022	-.0011	-.0027	.0017
#2	.0171	-.0000	.0036	-.0007	.0048	.0004	.0007	.0093	.0001
#3	.0190	.0004	.0038	.0010	.0064	-.0025	-.0007	-.0030	.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: ICB Acquired: 8/6/2018 11:25:30 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	.0017	.0003	.0014	-.0056	-.0027	.0003
Stddev	.0001	.0033	.0016	.0003	.0154	.0026	.0001
%RSD	671.7	193.5	603.9	19.60	272.9	94.64	32.25

#1	.0001	.0049	.0017	.0011	.0104	-.0003	.0004
#2	-.0001	.0020	.0005	.0015	-.0071	-.0025	.0002
#3	.0000	-.0018	-.0015	.0017	-.0202	-.0054	.0002

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3304.1	51662.	3718.0
Stddev	15.0	220.	24.3
%RSD	.45308	.42489	.65408

#1	3287.7	51915.	3746.1
#2	3307.6	51542.	3704.7
#3	3317.0	51529.	3703.4

Sample Name: LLC Acquired: 8/6/2018 11:30:16 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0098	.1980	.0109	.1079	.0494	.0049	.2019	1.043	.0049
Stddev	.0010	.0064	.0006	.0069	.0002	.0001	.0016	.002	.0002
%RSD	9.699	3.249	5.244	6.402	.4044	1.720	.7914	.2120	4.951
#1	.0101	.2049	.0106	.1030	.0496	.0049	.2037	1.043	.0051
#2	.0088	.1922	.0116	.1049	.0493	.0049	.2006	1.045	.0049
#3	.0106	.1968	.0106	.1158	.0492	.0050	.2015	1.040	.0046

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0516	.0102	.0253	.1002	4.866	.0518	1.018	.0149	.0395
Stddev	.0004	.0002	.0018	.0045	.016	.0011	.013	.0004	.0001
%RSD	.7384	2.323	7.255	4.442	.3180	2.061	1.304	2.660	.1699
#1	.0520	.0105	.0271	.1049	4.859	.0509	1.003	.0153	.0394
#2	.0516	.0101	.0234	.0961	4.855	.0530	1.027	.0149	.0395
#3	.0512	.0101	.0253	.0997	4.884	.0515	1.024	.0145	.0394

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9879	.0421	.2635	.0104	4.746	.0091	.0149	.3781	.1016
Stddev	.0043	.0001	.0010	.0005	.009	.0006	.0009	.0069	.0004
%RSD	.4314	.2585	.3672	4.934	.1834	6.130	6.207	1.815	.4124
#1	.9888	.0423	.2645	.0109	4.755	.0095	.0158	.3706	.1012
#2	.9833	.0421	.2626	.0103	4.738	.0084	.0151	.3798	.1021
#3	.9917	.0421	.2634	.0099	4.746	.0093	.0139	.3840	.1015

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: LLC Acquired: 8/6/2018 11:30:16 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0051	.1952	.0200	.0210	.4539	.0500	.0215
Stddev	.0000	.0019	.0012	.0006	.0186	.0017	.0002
%RSD	.6487	.9532	5.965	2.650	4.106	3.404	1.067
#1	.0052	.1939	.0214	.0216	.4690	.0490	.0218
#2	.0051	.1973	.0192	.0211	.4597	.0490	.0214
#3	.0051	.1944	.0193	.0205	.4331	.0520	.0214

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3276.2	53204.	3850.9
Stddev	12.8	168.	36.8
%RSD	.39102	.31550	.95688
#1	3285.7	53014.	3884.2
#2	3261.6	53267.	3857.1
#3	3281.3	53331.	3811.3

Sample Name: ICSA Acquired: 8/6/2018 11:34:58 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	100.3	.0061	-.0293	-.0000	-.0000	.0134	98.28	-.0002
Stddev	.0007	.4	.0022	.0029	.0005	.0001	.0019	.16	.0003
%RSD	111.4	.3715	36.10	9.907	1509.	245.9	14.00	.1586	146.6
#1	.0001	99.93	.0036	-.0307	.0004	-.0000	.0127	98.40	-.0001
#2	-.0006	100.7	.0077	-.0260	-.0000	.0000	.0155	98.33	.0000
#3	-.0013	100.2	.0071	-.0313	-.0005	-.0001	.0120	98.11	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0058	-.0003	-.0089	100.00	100.5	.0287	100.4	.0006	-.0010
Stddev	.0002	.0003	.0032	.308	.4	.0018	.5	.0004	.0005
%RSD	4.293	77.41	35.59	.3083	.3899	6.222	.5325	65.90	45.72
#1	.0061	-.0002	-.0053	99.69	100.1	.0290	99.83	.0009	-.0014
#2	.0056	-.0006	-.0105	100.3	100.9	.0268	100.9	.0007	-.0012
#3	.0057	-.0002	-.0110	99.98	100.6	.0303	100.5	.0002	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	100.2	.0048	98.38	-.0062	99.44	.0046	.0001	-.0107	.0003
Stddev	.4	.0002	.15	.0003	.16	.0008	.0005	.0117	.0008
%RSD	.4039	4.554	.1479	4.133	.1588	18.01	851.4	108.8	245.0
#1	99.89	.0049	98.47	-.0065	99.59	.0056	-.0005	.0004	-.0005
#2	100.7	.0049	98.45	-.0060	99.46	.0043	.0004	-.0097	.0003
#3	100.2	.0045	98.21	-.0062	99.27	.0040	.0003	-.0229	.0012

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: ICSEA Acquired: 8/6/2018 11:34:58 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0009	.0355	.0031	.0015	.3571	.0031	.0137
Stddev	.0001	.0015	.0019	.0009	.0062	.0017	.0002
%RSD	6.500	4.105	62.21	60.31	1.725	55.32	1.211
#1	.0010	.0361	.0020	.0022	.3521	.0013	.0138
#2	.0009	.0365	.0019	.0005	.3640	.0032	.0139
#3	.0008	.0338	.0053	.0017	.3552	.0047	.0136

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3126.4	48853.	3647.6
Stddev	2.5	244.	48.6
%RSD	.08037	.49946	1.3321
#1	3128.0	49125.	3703.3
#2	3123.5	48780.	3625.5
#3	3127.7	48654.	3614.0

Sample Name: ICSAB Acquired: 8/6/2018 11:39:37 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5082	99.43	2.507	.4765	2.497	2.533	2.511	95.86	2.522
Stddev	.0021	.40	.001	.0062	.006	.007	.003	.05	.002
%RSD	.4180	.3993	.0334	1.306	.2370	.2930	.1233	.0534	.0658
#1	.5068	99.36	2.507	.4837	2.497	2.533	2.511	95.89	2.521
#2	.5106	99.07	2.508	.4732	2.491	2.525	2.514	95.89	2.524
#3	.5072	99.86	2.507	.4727	2.503	2.540	2.507	95.80	2.520

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.467	2.461	2.485	99.04	99.86	2.567	101.0	2.491	.4920
Stddev	.003	.002	.003	.25	.31	.006	.3	.005	.0011
%RSD	.1171	.0858	.1308	.2557	.3061	.2280	.3336	.2014	.2142
#1	2.465	2.462	2.487	98.95	99.88	2.568	101.0	2.486	.4925
#2	2.470	2.463	2.487	98.84	99.55	2.561	100.6	2.492	.4926
#3	2.465	2.459	2.481	99.32	100.2	2.572	101.3	2.496	.4907

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	99.37	2.456	98.14	2.446	100.4	.5022	.5040	2.421	2.481
Stddev	.28	.001	.05	.004	.1	.0028	.0019	.030	.003
%RSD	.2788	.0394	.0505	.1770	.0902	.5657	.3826	1.233	.1170
#1	99.37	2.455	98.10	2.443	100.3	.5023	.5051	2.399	2.481
#2	99.09	2.457	98.20	2.451	100.5	.5050	.5051	2.408	2.483
#3	99.64	2.456	98.12	2.445	100.3	.4993	.5018	2.455	2.477

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
Value
Range

Sample Name: ICSAB Acquired: 8/6/2018 11:39:37 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.547	2.567	2.522	.4949	2.789	2.509	2.565
Stddev	.009	.012	.007	.0023	.003	.009	.002
%RSD	.3519	.4846	.2725	.4675	.0950	.3415	.0747
#1	2.547	2.554	2.520	.4955	2.788	2.503	2.565
#2	2.538	2.579	2.517	.4969	2.791	2.505	2.567
#3	2.556	2.567	2.530	.4924	2.786	2.519	2.564

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3149.2	49383.	3675.5
Stddev	3.3	256.	22.3
%RSD	.10564	.51927	.60745
#1	3152.5	49241.	3700.7
#2	3149.3	49230.	3667.9
#3	3145.8	49680.	3658.0

Sample Name: CCVL Acquired: 8/6/2018 11:43:55 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0093	.2010	.0121	.1080	.0493	.0048	.2001	1.034	.0050
Stddev	.0004	.0047	.0002	.0032	.0004	.0000	.0009	.024	.0005
%RSD	4.119	2.323	1.955	2.928	.8013	1.019	.4666	2.276	10.37

#1	.0097	.2010	.0124	.1044	.0497	.0049	.1999	1.020	.0049
#2	.0092	.2057	.0120	.1093	.0489	.0048	.2011	1.061	.0056
#3	.0090	.1964	.0120	.1104	.0495	.0048	.1992	1.021	.0046

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0513	.0104	.0259	.1071	4.940	.0516	1.029	.0151	.0391
Stddev	.0005	.0005	.0014	.0029	.060	.0030	.034	.0008	.0001
%RSD	.9272	4.580	5.540	2.740	1.220	5.768	3.300	4.972	.2984

#1	.0509	.0102	.0274	.1085	4.871	.0504	.9925	.0147	.0393
#2	.0518	.0110	.0246	.1038	4.975	.0494	1.034	.0160	.0390
#3	.0512	.0101	.0257	.1091	4.976	.0550	1.060	.0147	.0391

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.032	.0416	.2811	.0105	4.704	.0091	.0144	.3665	.1007
Stddev	.020	.0003	.0251	.0006	.007	.0028	.0034	.0065	.0002
%RSD	1.961	.6094	8.928	6.087	.1484	31.28	23.39	1.780	.1765

#1	1.038	.0418	.2668	.0099	4.705	.0064	.0128	.3726	.1006
#2	1.049	.0417	.3101	.0112	4.711	.0087	.0121	.3673	.1009
#3	1.010	.0413	.2666	.0103	4.697	.0121	.0182	.3596	.1007

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCVL Acquired: 8/6/2018 11:43:55 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0052	.1943	.0197	.0204	.4271	.0533	.0207
Stddev	.0001	.0011	.0011	.0013	.0057	.0027	.0005
%RSD	2.259	.5763	5.585	6.277	1.328	4.978	2.437
#1	.0051	.1938	.0186	.0203	.4236	.0508	.0203
#2	.0051	.1956	.0208	.0218	.4337	.0531	.0212
#3	.0053	.1936	.0195	.0192	.4241	.0561	.0204

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3277.9	52015.	3635.3
Stddev	4.7	201.	18.1
%RSD	.14450	.38605	.49793
#1	3281.6	52097.	3645.1
#2	3272.6	52162.	3614.4
#3	3279.6	51786.	3646.3

Sample Name: CCV Acquired: 8/6/2018 11:48:40 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.001	50.61	5.042	1.015	5.028	5.102	5.063	51.05	5.064
Stddev	.002	.01	.015	.005	.009	.009	.030	.06	.020
%RSD	.1984	.0245	.2983	.5280	.1758	.1667	.6001	.1260	.3918
#1	1.002	50.60	5.026	1.016	5.037	5.102	5.032	50.97	5.043
#2	1.003	50.62	5.044	1.019	5.026	5.110	5.066	51.08	5.066
#3	.9991	50.62	5.056	1.009	5.020	5.093	5.092	51.09	5.083

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.075	5.068	5.043	50.86	50.46	5.040	50.64	5.076	1.012
Stddev	.017	.016	.031	.01	.03	.003	.22	.005	.004
%RSD	.3289	.3069	.6091	.0160	.0521	.0606	.4403	.0972	.4478
#1	5.061	5.051	5.012	50.87	50.43	5.042	50.41	5.073	1.007
#2	5.072	5.070	5.042	50.86	50.46	5.041	50.66	5.082	1.013
#3	5.093	5.082	5.074	50.85	50.48	5.036	50.85	5.075	1.016

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	50.63	5.082	52.44	5.072	50.54	1.011	1.012	5.119	5.079
Stddev	.04	.008	.17	.013	.21	.010	.009	.012	.018
%RSD	.0814	.1642	.3194	.2540	.4155	.9646	.8480	.2299	.3556
#1	50.66	5.074	52.25	5.064	50.31	1.001	1.005	5.107	5.061
#2	50.64	5.080	52.47	5.065	50.58	1.011	1.010	5.131	5.079
#3	50.58	5.091	52.59	5.087	50.72	1.021	1.022	5.118	5.097

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/6/2018 11:48:40 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.130	5.043	5.066	1.031	5.033	5.084	5.116
Stddev	.008	.007	.006	.004	.007	.010	.019
%RSD	.1492	.1384	.1281	.4290	.1456	.2007	.3690

#1	5.132	5.035	5.068	1.026	5.027	5.086	5.097
#2	5.137	5.046	5.070	1.033	5.042	5.073	5.116
#3	5.122	5.047	5.058	1.035	5.031	5.093	5.134

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3090.9	49144.	3537.1
Stddev	1.6	129.	27.8
%RSD	.05178	.26164	.78672

#1	3089.6	49288.	3567.7
#2	3092.7	49043.	3530.4
#3	3090.6	49100.	3513.3

Sample Name: CCB Acquired: 8/6/2018 11:52:54 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0323	.0018	.0083	.0003	.0001	-.0000	.0042	-.0000
Stddev	.0007	.0070	.0025	.0024	.0001	.0000	.0015	.0007	.0001
%RSD	175.0	21.63	136.0	28.86	23.36	61.38	75330.	17.90	219.7
#1	-.0012	.0252	.0007	.0102	.0004	.0000	-.0012	.0036	.0000
#2	-.0001	.0324	.0001	.0090	.0003	.0001	.0017	.0038	-.0001
#3	.0001	.0392	.0047	.0056	.0004	.0001	-.0004	.0050	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0000	-.0002	.0046	.0747	.0002	.0316	-.0003	.0005
Stddev	.0003	.0001	.0031	.0011	.0335	.0036	.0186	.0004	.0003
%RSD	68.58	751.9	1810.	23.64	44.84	2255.	58.85	145.8	49.38
#1	-.0001	.0001	.0032	.0039	.0456	.0037	.0350	-.0001	.0004
#2	-.0005	-.0001	-.0029	.0059	.1113	.0002	.0115	-.0000	.0004
#3	-.0005	.0000	-.0008	.0041	.0671	-.0035	.0482	-.0007	.0008

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0169	.0001	.0040	-.0003	.0073	-.0000	-.0020	-.0078	-.0003
Stddev	.0041	.0003	.0016	.0008	.0018	.0012	.0009	.0081	.0003
%RSD	24.34	209.5	40.13	322.8	24.83	3700.	47.61	102.9	102.9
#1	.0198	.0000	.0039	-.0007	.0064	-.0014	-.0020	-.0171	.0001
#2	.0122	.0005	.0056	.0007	.0093	.0004	-.0029	-.0041	-.0004
#3	.0186	-.0001	.0024	-.0008	.0061	.0009	-.0010	-.0024	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/6/2018 11:52:54 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0010	.0002	-.0003	.0089	-.0041	.0006
Stddev	.0000	.0011	.0006	.0006	.0121	.0019	.0002
%RSD	25.63	115.1	289.2	211.3	135.7	45.74	27.36

#1	.0002	.0003	-.0002	.0002	-.0048	-.0057	.0004
#2	.0001	-.0020	-.0000	-.0000	.0184	-.0020	.0005
#3	.0002	-.0013	.0009	-.0010	.0132	-.0044	.0007

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3307.1	53340.	3858.4
Stddev	29.9	286.	28.4
%RSD	.90316	.53678	.73537

#1	3327.5	53009.	3861.6
#2	3321.0	53509.	3828.5
#3	3272.8	53502.	3885.0

Sample Name: MB 160-379537/1-A Acquired: 8/6/2018 12:32:23 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment: 379537

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0007	.0063	.0007	-.0017	-.0001	.0000	-.0010	.0083	.0001
Stddev	.0003	.0150	.0013	.0014	.0002	.0000	.0006	.0002	.0001
%RSD	51.28	239.2	199.9	84.12	353.6	142.5	64.21	2.147	77.94
#1	.0009	.0212	.0010	-.0017	.0002	.0001	-.0005	.0084	.0002
#2	.0008	-.0088	-.0008	-.0030	-.0001	-.0000	-.0008	.0084	.0000
#3	.0003	.0065	.0017	-.0002	-.0002	.0000	-.0017	.0081	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	.0000	.0012	.0023	-.0146	-.0012	.0049	-.0004	.0007
Stddev	.0003	.0001	.0003	.0016	.0268	.0005	.0220	.0003	.0001
%RSD	1183.	463.1	26.42	70.55	183.1	39.66	452.0	67.36	21.67
#1	.0001	.0001	.0012	.0009	.0121	-.0007	.0271	-.0001	.0006
#2	-.0003	.0001	.0008	.0018	-.0415	-.0013	.0043	-.0005	.0007
#3	.0001	-.0001	.0014	.0040	-.0145	-.0016	-.0169	-.0006	.0009

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006	.0000	.0101	.0004	.0034	.0000	-.0016	.0033	.0003
Stddev	.0209	.0001	.0008	.0008	.0018	.0018	.0016	.0034	.0009
%RSD	3707.	3525.	8.273	212.2	52.93	53510.	98.93	104.2	288.9
#1	-.0109	.0001	.0093	.0013	.0045	.0020	-.0009	.0021	-.0005
#2	-.0121	-.0002	.0109	-.0001	.0044	-.0016	-.0005	.0006	.0014
#3	.0247	.0001	.0100	-.0000	.0013	-.0004	-.0034	.0071	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Sample Name: MB 160-379537/1-A Acquired: 8/6/2018 12:32:23 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment: 379537

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	-.0011	-.0005	-.0016	-.0212	.0028	.0004
Stddev	.0001	.0004	.0007	.0008	.0095	.0037	.0001
%RSD	361.8	33.19	139.0	46.69	44.84	132.9	35.89
#1	-.0001	-.0010	-.0008	-.0023	-.0243	-.0013	.0003
#2	-.0000	-.0009	.0003	-.0017	-.0105	.0058	.0005
#3	.0001	-.0016	-.0010	-.0008	-.0288	.0039	.0004

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3156.7	51674.	3787.7
Stddev	10.9	415.	42.9
%RSD	.34627	.80374	1.1330
#1	3148.8	52084.	3831.0
#2	3152.2	51254.	3787.1
#3	3169.2	51683.	3745.2

Sample Name: LCS 160-379537/2-A Acquired: 8/6/2018 12:37:04 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2069	10.30	.9953	.2035	.9927	.1005	1.026	10.69	1.010
Stddev	.0011	.01	.0023	.0028	.0013	.0002	.003	.05	.001
%RSD	.5123	.0735	.2294	1.386	.1285	.1772	.2487	.4251	.1075
#1	.2065	10.30	.9968	.2055	.9918	.1004	1.024	10.73	1.008
#2	.2081	10.29	.9927	.2048	.9921	.1004	1.025	10.71	1.010
#3	.2061	10.31	.9965	.2003	.9942	.1007	1.029	10.64	1.011

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.046	1.038	1.005	10.24	9.950	.1070	10.26	1.026	.5093
Stddev	.001	.001	.007	.01	.094	.0027	.03	.004	.0003
%RSD	.0534	.1212	.6927	.0675	.9470	2.541	.2570	.3714	.0545
#1	1.045	1.039	.9975	10.25	9.959	.1101	10.24	1.022	.5094
#2	1.046	1.039	1.005	10.24	10.04	.1060	10.29	1.026	.5095
#3	1.046	1.037	1.011	10.24	9.852	.1050	10.24	1.030	.5090

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.08	1.048	1.102	1.030	9.690	.4943	.5043	4.813	1.029
Stddev	.03	.003	.003	.003	.022	.0028	.0020	.021	.001
%RSD	.2634	.2405	.2337	.2649	.2248	.5760	.3943	.4281	.1344
#1	10.09	1.049	1.103	1.033	9.673	.4911	.5057	4.790	1.028
#2	10.05	1.050	1.104	1.030	9.683	.4954	.5020	4.820	1.030
#3	10.09	1.045	1.099	1.027	9.715	.4964	.5052	4.830	1.028

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: LCS 160-379537/2-A Acquired: 8/6/2018 12:37:04 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.037	1.015	1.008	.2161	.9850	1.017	1.025
Stddev	.001	.006	.004	.0011	.0032	.003	.001
%RSD	.1281	.5726	.3512	.5087	.3287	.3205	.0446
#1	1.038	1.021	1.012	.2153	.9840	1.020	1.025
#2	1.038	1.012	1.006	.2173	.9886	1.018	1.025
#3	1.036	1.010	1.007	.2156	.9823	1.014	1.026

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3173.9	50907.	3677.0
Stddev	16.3	75.	24.7
%RSD	.51355	.14749	.67042
#1	3163.6	50843.	3694.2
#2	3165.4	50989.	3688.1
#3	3192.7	50888.	3648.8

Sample Name: 160-29476-L-1-C Acquired: 8/6/2018 12:41:23 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0005	.3073	.0023	.0680	.0165	-.0000	-.0039	72.84	-.0001
Stddev	.0003	.0079	.0022	.0034	.0003	.0001	.0018	.13	.0001
%RSD	57.88	2.578	94.54	5.040	2.039	364.3	45.62	.1719	68.32
#1	.0002	.3019	.0048	.0659	.0165	.0000	-.0019	72.71	-.0002
#2	.0008	.3036	.0017	.0661	.0169	.0000	-.0053	72.96	-.0000
#3	.0005	.3164	.0005	.0720	.0162	-.0001	-.0045	72.86	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0007	.0006	.0025	.5465	4.156	.0249	24.04	.1031	.0191
Stddev	.0003	.0001	.0013	.0105	.019	.0003	.19	.0012	.0003
%RSD	40.33	20.96	51.19	1.929	.4612	1.082	.8048	1.158	1.711
#1	.0004	.0007	.0011	.5347	4.164	.0248	23.89	.1017	.0189
#2	.0008	.0008	.0029	.5550	4.134	.0246	24.26	.1039	.0188
#3	.0010	.0005	.0035	.5497	4.170	.0252	23.97	.1036	.0194

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	28.82	.0044	.0247	-.0077	10.51	.0005	.0014	7.192	-.0015
Stddev	.13	.0003	.0016	.0016	.01	.0011	.0030	.017	.0009
%RSD	.4666	7.213	6.620	20.47	.0507	230.3	215.0	.2343	57.25
#1	28.67	.0044	.0234	-.0077	10.50	.0004	.0040	7.173	-.0012
#2	28.94	.0047	.0241	-.0092	10.51	-.0006	.0021	7.198	-.0009
#3	28.85	.0041	.0265	-.0061	10.51	.0017	-.0019	7.204	-.0025

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29476-L-1-C Acquired: 8/6/2018 12:41:23 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1637	.0075	.0096	-.0001	.5259	.0567	.0093
Stddev	.0008	.0034	.0015	.0007	.0151	.0028	.0001
%RSD	.4740	45.30	15.19	825.7	2.880	5.012	1.523

#1	.1628	.0036	.0088	.0007	.5247	.0539	.0091
#2	.1643	.0095	.0087	-.0007	.5114	.0565	.0093
#3	.1639	.0095	.0112	-.0002	.5416	.0596	.0094

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3174.3	51046.	3674.0
Stddev	9.1	148.	30.3
%RSD	.28561	.28999	.82401

#1	3184.7	50875.	3656.8
#2	3168.3	51138.	3656.3
#3	3169.8	51124.	3709.0

Sample Name: 160-29476-L-1-CSD@5 Acquired: 8/6/2018 12:46:04 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	.0687	-.0000	.0112	.0034	-.0000	-.0015	14.82	-.0002
Stddev	.0008	.0047	.0010	.0020	.0005	.0001	.0007	.04	.0001
%RSD	259.2	6.804	12210.	18.06	13.30	472.0	48.28	.2982	45.65
#1	.0005	.0670	-.0002	.0132	.0032	.0000	-.0017	14.83	-.0003
#2	-.0009	.0651	-.0009	.0111	.0032	.0000	-.0021	14.85	-.0002
#3	-.0005	.0739	.0010	.0092	.0040	-.0001	-.0007	14.77	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0001	.0013	.1103	.8698	.0048	4.930	.0206	.0038
Stddev	.0001	.0002	.0012	.0041	.0510	.0025	.025	.0002	.0004
%RSD	29.17	197.1	98.01	3.701	5.865	52.50	.4998	1.085	10.90
#1	-.0002	.0003	.0018	.1086	.8323	.0022	4.901	.0209	.0042
#2	-.0002	.0002	-.0001	.1074	.9279	.0073	4.946	.0205	.0034
#3	-.0003	-.0002	.0022	.1150	.8493	.0048	4.942	.0206	.0038

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.786	.0009	.0060	-.0023	2.054	-.0000	-.0000	1.428	-.0001
Stddev	.011	.0003	.0013	.0007	.012	.0013	.0017	.010	.0005
%RSD	.1838	30.26	22.33	31.49	.5659	13560.	4563.	.7083	333.6
#1	5.779	.0009	.0045	-.0030	2.064	.0013	-.0004	1.437	.0004
#2	5.780	.0006	.0067	-.0015	2.057	-.0013	-.0015	1.417	-.0003
#3	5.798	.0011	.0069	-.0024	2.042	-.0000	.0018	1.431	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29476-L-1-CSD@5 Acquired: 8/6/2018 12:46:04 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0330	.0004	.0018	-.0008	.0918	.0125	.0021
Stddev	.0003	.0025	.0012	.0010	.0096	.0015	.0000
%RSD	.7575	682.0	66.59	124.5	10.42	11.84	.9923

#1	.0333	-.0021	.0030	-.0011	.1015	.0142	.0021
#2	.0329	.0003	.0008	-.0016	.0915	.0113	.0021
#3	.0328	.0029	.0015	.0003	.0824	.0122	.0021

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3327.2	52236.	3753.4
Stddev	11.2	64.	46.8
%RSD	.33765	.12160	1.2476

#1	3340.1	52233.	3805.8
#2	3322.4	52301.	3738.8
#3	3319.2	52174.	3715.6

Sample Name: 160-29476-L-1-D MS Acquired: 8/6/2018 12:50:47 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2073	10.35	.9759	.2712	1.012	.0991	.9819	80.31	.9831
Stddev	.0000	.02	.0047	.0068	.002	.0002	.0059	.32	.0025
%RSD	.0240	.2143	.4854	2.501	.1803	.1688	.6003	.3936	.2571
#1	.2072	10.33	.9704	.2673	1.012	.0989	.9751	80.09	.9804
#2	.2073	10.35	.9788	.2791	1.014	.0992	.9855	80.67	.9855
#3	.2073	10.38	.9784	.2674	1.011	.0991	.9851	80.17	.9834

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9847	.9845	.9788	10.60	14.09	.1308	33.54	1.093	.5057
Stddev	.0030	.0031	.0050	.01	.02	.0011	.24	.002	.0025
%RSD	.3093	.3176	.5106	.0967	.1657	.8331	.7171	.1601	.4951
#1	.9822	.9812	.9737	10.59	14.11	.1321	33.41	1.092	.5028
#2	.9881	.9874	.9837	10.60	14.10	.1300	33.39	1.092	.5074
#3	.9838	.9850	.9790	10.61	14.06	.1304	33.82	1.095	.5069

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	38.63	.9900	1.100	.9697	20.16	.4790	.4928	F 12.13	.9768
Stddev	.06	.0026	.005	.0003	.06	.0025	.0016	.04	.0026
%RSD	.1478	.2653	.4807	.0326	.2966	.5227	.3337	.3064	.2681
#1	38.57	.9879	1.095	.9694	20.10	.4761	.4915	12.09	.9745
#2	38.67	.9929	1.106	.9700	20.21	.4804	.4946	12.15	.9797
#3	38.66	.9890	1.098	.9697	20.18	.4804	.4922	12.16	.9763

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Fail Chk Pass
High Limit
Low Limit

10.00
-500.0

Sample Name: 160-29476-L-1-D MS Acquired: 8/6/2018 12:50:47 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.170	.9976	.9946	.2036	1.504	1.048	1.006
Stddev	.003	.0041	.0026	.0013	.014	.001	.003
%RSD	.2401	.4100	.2621	.6439	.9525	.1262	.3016
#1	1.168	.9968	.9955	.2038	1.498	1.047	1.004
#2	1.173	.9939	.9916	.2048	1.493	1.047	1.010
#3	1.168	1.002	.9965	.2022	1.520	1.050	1.006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3227.4	50645.	3763.4
Stddev	10.7	97.	67.7
%RSD	.33001	.19112	1.7986
#1	3232.3	50753.	3796.2
#2	3215.1	50567.	3808.5
#3	3234.7	50616.	3685.6

Sample Name: 160-29476-L-1-E MSD Acquired: 8/6/2018 12:55:06 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2093	10.63	1.003	.2720	1.021	.1005	1.007	83.06	1.007
Stddev	.0005	.03	.004	.0113	.002	.0001	.004	.43	.005
%RSD	.2567	.2888	.4417	4.150	.2264	.1393	.3641	.5155	.4681
#1	.2096	10.60	1.004	.2730	1.018	.1005	1.004	83.16	1.007
#2	.2096	10.66	1.007	.2828	1.023	.1004	1.011	83.43	1.012
#3	.2087	10.64	.9984	.2603	1.020	.1007	1.006	82.59	1.002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.006	1.011	1.001	10.80	14.52	.1334	34.77	1.116	.5213
Stddev	.004	.005	.008	.03	.10	.0023	.22	.004	.0029
%RSD	.3697	.4758	.7577	.2747	.6614	1.706	.6192	.3564	.5620
#1	1.007	1.012	1.005	10.77	14.46	.1351	34.53	1.112	.5228
#2	1.009	1.015	1.006	10.81	14.47	.1343	34.95	1.118	.5233
#3	1.002	1.006	.9928	10.83	14.63	.1309	34.84	1.119	.5180

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	39.74	1.013	1.128	.9867	20.69	.4960	.5036	F 12.55	1.002
Stddev	.14	.003	.004	.0023	.06	.0042	.0036	.05	.005
%RSD	.3609	.3313	.3251	.2298	.2894	.8405	.7133	.4130	.4980
#1	39.58	1.013	1.132	.9886	20.71	.4973	.5023	12.51	1.004
#2	39.86	1.016	1.129	.9872	20.73	.4994	.5077	12.52	1.005
#3	39.77	1.009	1.124	.9842	20.62	.4914	.5009	12.60	.9962

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Fail Chk Pass
High Limit
Low Limit

10.00
-500.0

Sample Name: 160-29476-L-1-E MSD Acquired: 8/6/2018 12:55:06 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.190	1.021	1.017	.2083	1.523	1.067	1.030
Stddev	.001	.009	.003	.0024	.013	.006	.004
%RSD	.1200	.9049	.2862	1.176	.8782	.5271	.4314
#1	1.190	1.029	1.014	.2099	1.530	1.061	1.031
#2	1.192	1.025	1.017	.2095	1.531	1.073	1.033
#3	1.189	1.011	1.020	.2055	1.507	1.067	1.025

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3177.7	50439.	3584.0
Stddev	13.8	338.	43.9
%RSD	.43434	.67085	1.2249
#1	3175.1	50081.	3634.6
#2	3165.4	50484.	3561.2
#3	3192.6	50753.	3556.2

Sample Name: LB 160-378221/1-C Acquired: 8/6/2018 12:59:23 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment: 380009

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0009	.0191	.0039	.0048	.0002	-0.0000	-0.0013	.0382	.0002
Stddev	.0005	.0012	.0012	.0025	.0001	.0000	.0004	.0200	.0001
%RSD	61.11	6.435	31.64	52.91	59.73	86.11	32.84	52.34	62.85
#1	-0.0014	.0203	.0054	.0026	.0001	-0.0000	-0.0009	.0613	.0003
#2	-0.0005	.0178	.0030	.0076	.0001	-0.0000	-0.0013	.0270	.0002
#3	-0.0007	.0193	.0034	.0042	.0003	-0.0000	-0.0017	.0263	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0005	-0.0012	.0020	.3725	.0091	.0379	-0.0000	.0005
Stddev	.0002	.0004	.0010	.0039	.0328	.0010	.0127	.0003	.0001
%RSD	346.5	76.90	83.60	196.8	8.804	11.58	33.41	1218.	29.88
#1	-0.0002	.0008	-0.0013	-0.0021	.3385	.0091	.0265	-0.0002	.0004
#2	.0002	.0006	-0.0022	.0024	.4039	.0101	.0357	-0.0003	.0006
#3	.0002	.0001	-0.0002	.0057	.3751	.0080	.0515	.0003	.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 511.3	.0003	.0151	.0010	.0157	-0.0008	.0006	.0249	.0017
Stddev	6.2	.0003	.0011	.0010	.0065	.0005	.0013	.0014	.0005
%RSD	1.208	85.98	7.463	104.5	41.24	63.17	205.2	5.789	31.20
#1	511.9	.0007	.0164	.0002	.0228	-0.0009	.0016	.0233	.0012
#2	504.8	.0001	.0145	.0021	.0143	-0.0003	-0.0008	.0255	.0015
#3	517.1	.0002	.0144	.0007	.0101	-0.0013	.0011	.0259	.0023

Check ? Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 100.0
Low Limit -500.0

Sample Name: LB 160-378221/1-C Acquired: 8/6/2018 12:59:23 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment: 380009

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003	.0017	.0001	-.0024	-.0226	-.0005	.0009
Stddev	.0000	.0010	.0015	.0013	.0294	.0007	.0003
%RSD	11.48	61.56	1278.	55.53	129.8	151.0	33.71
#1	.0004	.0028	.0015	-.0012	.0109	.0003	.0012
#2	.0003	.0007	-.0014	-.0038	-.0352	-.0005	.0008
#3	.0003	.0016	.0003	-.0022	-.0437	-.0012	.0007

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3063.3	50120.	3876.1
Stddev	28.2	280.	16.4
%RSD	.91927	.55835	.42386
#1	3094.7	50106.	3879.9
#2	3055.1	49848.	3890.3
#3	3040.2	50407.	3858.1

Sample Name: LCS 160-380009/2-A Acquired: 8/6/2018 13:04:17 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2074	9.867	1.002	.2016	.9805	.0993	.9649	9.886	.9882
Stddev	.0013	.018	.004	.0042	.0021	.0003	.0036	.053	.0040
%RSD	.6161	.1821	.4013	2.087	.2144	.2963	.3699	.5409	.4032

#1	.2081	9.887	1.005	.1988	.9828	.0996	.9683	9.868	.9883
#2	.2059	9.853	1.004	.1996	.9801	.0990	.9653	9.947	.9922
#3	.2081	9.861	.9976	.2065	.9786	.0992	.9612	9.845	.9842

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9835	.9848	.9786	10.05	10.54	.1172	9.648	.9911	.4889
Stddev	.0037	.0043	.0021	.03	.03	.0005	.034	.0013	.0027
%RSD	.3803	.4396	.2159	.3393	.2889	.4523	.3468	.1316	.5513

#1	.9824	.9863	.9803	10.09	10.56	.1178	9.686	.9908	.4893
#2	.9876	.9882	.9792	10.03	10.50	.1168	9.631	.9899	.4914
#3	.9804	.9799	.9762	10.03	10.55	.1169	9.626	.9925	.4860

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 523.9	.9915	1.117	.9578	9.857	.4807	.5188	4.804	.9728
Stddev	4.1	.0040	.007	.0019	.024	.0023	.0011	.006	.0039
%RSD	.7755	.4022	.6175	.1953	.2395	.4855	.2053	.1254	.4034

#1	528.3	.9907	1.119	.9558	9.879	.4806	.5186	4.807	.9738
#2	520.3	.9958	1.122	.9595	9.860	.4831	.5200	4.797	.9762
#3	523.2	.9879	1.109	.9580	9.832	.4784	.5179	4.808	.9685

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0								
Low Limit	-500.0								

Sample Name: LCS 160-380009/2-A Acquired: 8/6/2018 13:04:17 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.000	.9960	.9969	.1880	.9484	.9864	1.018
Stddev	.002	.0039	.0041	.0027	.0013	.0022	.004
%RSD	.1972	.3904	.4146	1.459	.1423	.2280	.3430
#1	1.003	.9950	.9956	.1868	.9471	.9854	1.018
#2	.9995	1.000	1.002	.1912	.9498	.9890	1.022
#3	.9989	.9928	.9936	.1861	.9483	.9848	1.015

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3086.2	48951.	3685.2
Stddev	21.1	118.	28.2
%RSD	.68459	.24167	.76417
#1	3104.3	48822.	3653.3
#2	3063.0	48976.	3696.1
#3	3091.3	49054.	3706.3

Sample Name: 160-29687-B-1-E Acquired: 8/6/2018 13:08:45 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0007	.0890	.0069	.2211	.0789	-0.0002	-0.0015	F 462.1	.0381
Stddev	.0002	.0137	.0012	.0053	.0006	.0001	.0012	1.1	.0002
%RSD	27.70	15.36	17.88	2.381	.7234	48.62	78.51	.2343	.4862
#1	-0.0005	.0912	.0058	.2270	.0791	-0.0001	-0.0021	462.4	.0379
#2	-0.0007	.0743	.0066	.2168	.0794	-0.0001	-0.0022	463.1	.0383
#3	-0.0009	.1014	.0082	.2194	.0783	-0.0003	-0.0001	461.0	.0380

[illegible]

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0752	.0042	.0200	.0177	5.046	.1709	41.33	.5281	.0012
Stddev	.0006	.0002	.0007	.0029	.053	.0019	.25	.0020	.0001
%RSD	.7660	3.834	3.652	16.30	1.043	1.101	.6115	.3844	11.33
#1	.0757	.0042	.0200	.0166	4.988	.1731	41.12	.5296	.0011
#2	.0753	.0044	.0207	.0156	5.061	.1700	41.61	.5288	.0013
#3	.0746	.0041	.0193	.0210	5.090	.1697	41.25	.5258	.0012

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 512.1	.0127	.0516	.4066	F 204.8	.0043	.0032	1.513	-.0007
Stddev	4.3	.0002	.0024	.0015	.2	.0026	.0012	.014	.0001
%RSD	.8442	1.471	4.610	.3616	.0945	60.81	37.56	.9273	16.14
#1	507.4	.0129	.0527	.4064	204.6	.0013	.0024	1.529	-.0006
#2	515.9	.0126	.0489	.4082	205.0	.0061	.0045	1.506	-.0008
#3	513.1	.0126	.0532	.4052	204.9	.0056	.0026	1.503	-.0006

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29687-B-1-E Acquired: 8/6/2018 13:08:45 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 11.86	.0075	.0044	-.0012	-.0184	-.0052	8.376
Stddev	.06	.0011	.0019	.0003	.0173	.0038	.020
%RSD	.4928	14.06	42.01	23.97	93.86	73.36	.2376

#1	11.91	.0079	.0049	-.0015	-.0297	-.0052	8.383
#2	11.80	.0083	.0024	-.0013	-.0272	-.0014	8.392
#3	11.88	.0063	.0061	-.0009	.0015	-.0090	8.354

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	10.00						
Low Limit	-500.0						

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2892.2	46810.	3616.0
Stddev	3.6	98.	19.3
%RSD	.12586	.20923	.53292

#1	2896.4	46867.	3634.0
#2	2889.9	46866.	3595.7
#3	2890.3	46697.	3618.4

Sample Name: 160-29687-B-1-ESD@5 Acquired: 8/6/2018 13:13:48 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0193	.0007	.0421	.0152	-.0001	-.0014	F 115.2	.0073
Stddev	.0007	.0007	.0012	.0036	.0003	.0001	.0012	.9	.0001
%RSD	323.8	3.412	179.8	8.441	2.209	120.5	85.21	.7987	1.980

#1	.0000	.0199	.0020	.0404	.0149	-.0001	-.0001	116.2	.0073
#2	-.0004	.0186	.0003	.0462	.0156	-.0001	-.0025	114.9	.0074
#3	.0010	.0194	-.0003	.0397	.0151	.0000	-.0018	114.4	.0071

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								100.0	
Low Limit								-500.0	

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0152	.0011	.0061	.0033	.9884	.0341	8.453	.1068	.0005
Stddev	.0004	.0000	.0018	.0045	.0460	.0013	.049	.0007	.0002
%RSD	2.757	3.973	29.83	135.0	4.652	3.951	.5757	.6457	48.00

#1	.0157	.0011	.0075	.0069	.9887	.0352	8.474	.1074	.0002
#2	.0149	.0011	.0067	-.0017	.9422	.0345	8.488	.1061	.0005
#3	.0150	.0011	.0040	.0048	1.034	.0326	8.398	.1071	.0007

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 102.6	.0026	.0086	.0844	39.09	.0009	-.0008	.2914	-.0014
Stddev	.6	.0002	.0007	.0015	.07	.0005	.0020	.0075	.0003
%RSD	.6232	6.497	8.105	1.832	.1752	60.39	254.6	2.565	18.98

#1	103.3	.0026	.0081	.0854	39.14	.0003	.0015	.2999	-.0015
#2	102.5	.0025	.0083	.0851	39.11	.0012	-.0016	.2859	-.0016
#3	102.0	.0028	.0094	.0826	39.01	.0011	-.0022	.2883	-.0011

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0								
Low Limit	-500.0								

Sample Name: 160-29687-B-1-ESD@5 Acquired: 8/6/2018 13:13:48 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.387	.0023	.0039	.0004	-.0215	.0001	1.665
Stddev	.012	.0012	.0016	.0008	.0074	.0055	.006
%RSD	.5101	50.56	42.13	199.0	34.46	9616.	.3567
#1	2.401	.0011	.0021	.0002	-.0167	.0043	1.670
#2	2.382	.0023	.0053	.0013	-.0178	.0021	1.666
#3	2.378	.0035	.0043	-.0003	-.0300	-.0062	1.658

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3164.0	51212.	3691.0
Stddev	22.5	400.	71.6
%RSD	.71135	.78164	1.9400
#1	3138.0	50964.	3612.0
#2	3177.3	50999.	3709.3
#3	3176.6	51674.	3751.7

Sample Name: CCVL Acquired: 8/6/2018 13:18:29 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0088	.2145	.0106	.0981	.0490	.0049	.2016	1.040	.0049
Stddev	.0004	.0191	.0009	.0016	.0002	.0000	.0011	.013	.0001
%RSD	3.990	8.900	8.261	1.652	.4095	.4117	.5397	1.237	1.613
#1	.0084	.2231	.0102	.0981	.0492	.0049	.2005	1.027	.0050
#2	.0091	.1926	.0100	.0998	.0489	.0049	.2027	1.043	.0049
#3	.0089	.2278	.0116	.0965	.0488	.0049	.2015	1.052	.0049

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0517	.0102	.0266	.0996	4.946	.0499	1.003	.0149	.0394
Stddev	.0009	.0002	.0005	.0008	.071	.0011	.026	.0005	.0005
%RSD	1.726	2.027	1.856	.8341	1.429	2.145	2.568	3.298	1.272
#1	.0506	.0099	.0262	.0988	5.025	.0510	1.032	.0150	.0390
#2	.0520	.0103	.0272	.1005	4.922	.0488	.9840	.0154	.0393
#3	.0523	.0103	.0265	.0995	4.890	.0499	.9921	.0144	.0400

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.240	.0420	.2645	.0113	4.803	.0102	.0139	.3669	.1021
Stddev	.154	.0003	.0027	.0008	.058	.0005	.0015	.0073	.0022
%RSD	12.38	.8150	1.016	6.937	1.199	5.025	10.90	1.982	2.166
#1	1.143	.0416	.2618	.0121	4.739	.0104	.0128	.3708	.0998
#2	1.160	.0422	.2645	.0105	4.819	.0096	.0133	.3585	.1022
#3	1.417	.0422	.2671	.0114	4.851	.0105	.0156	.3713	.1042

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCVL Acquired: 8/6/2018 13:18:29 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F .0070	.1931	.0188	.0212	.4189	.0488	.0210
Stddev	.0034	.0013	.0020	.0010	.0086	.0015	.0003
%RSD	48.51	.6947	10.68	4.530	2.061	3.117	1.387

#1	.0051	.1916	.0199	.0202	.4283	.0487	.0207
#2	.0051	.1937	.0201	.0221	.4170	.0504	.0212
#3	.0110	.1941	.0165	.0215	.4114	.0473	.0211

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value	.0050						
Range	30.00%						

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3235.3	51937.	3692.8
Stddev	34.0	120.	5.0
%RSD	1.0523	.23087	.13561

#1	3270.7	51876.	3689.3
#2	3232.4	51860.	3690.6
#3	3202.8	52076.	3698.6

Sample Name: CCV Acquired: 8/6/2018 13:23:13 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9977	50.46	5.074	1.008	5.009	5.050	5.076	51.23	5.085
Stddev	.0012	.27	.007	.006	.010	.018	.012	.10	.013
%RSD	.1156	.5380	.1361	.6326	.2007	.3530	.2403	.1986	.2467
#1	.9989	50.15	5.078	1.001	5.007	5.029	5.079	51.31	5.090
#2	.9966	50.67	5.066	1.014	5.000	5.059	5.062	51.12	5.071
#3	.9975	50.56	5.079	1.008	5.020	5.061	5.086	51.28	5.095

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.099	5.095	5.050	50.34	50.30	5.031	50.50	5.011	1.019
Stddev	.011	.009	.015	.17	.26	.014	.38	.019	.004
%RSD	.2122	.1863	.3038	.3383	.5107	.2826	.7505	.3869	.3575
#1	5.105	5.101	5.057	50.18	50.02	5.020	50.07	4.989	1.022
#2	5.087	5.084	5.032	50.34	50.36	5.027	50.65	5.025	1.015
#3	5.106	5.100	5.061	50.52	50.53	5.047	50.79	5.018	1.021

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	50.37	5.105	53.65	5.095	50.87	1.019	1.021	5.047	5.127
Stddev	.18	.007	.10	.011	.10	.005	.004	.039	.009
%RSD	.3517	.1394	.1870	.2224	.1949	.5424	.3771	.7732	.1670
#1	50.18	5.107	53.68	5.100	50.89	1.021	1.022	5.002	5.129
#2	50.40	5.097	53.53	5.082	50.76	1.013	1.017	5.075	5.118
#3	50.53	5.110	53.73	5.103	50.95	1.023	1.025	5.064	5.135

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/6/2018 13:23:13 Type: QC
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.099	5.033	5.015	1.039	5.038	5.047	5.141
Stddev	.017	.003	.026	.003	.007	.027	.009
%RSD	.3360	.0633	.5121	.3058	.1373	.5283	.1778

#1	5.079	5.036	4.986	1.040	5.032	5.021	5.147
#2	5.110	5.030	5.031	1.035	5.045	5.045	5.130
#3	5.107	5.033	5.029	1.041	5.035	5.075	5.145

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3032.8	49046.	3565.6
Stddev	4.1	509.	41.0
%RSD	.13406	1.0385	1.1498

#1	3028.1	48474.	3612.3
#2	3035.1	49451.	3535.3
#3	3035.2	49211.	3549.2

Sample Name: CCB Acquired: 8/6/2018 13:27:28 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0005	.0170	.0013	.0053	.0001	-.0000	.0011	.0038	-.0001
Stddev	.0003	.0104	.0015	.0055	.0006	.0001	.0002	.0006	.0001
%RSD	55.41	61.58	110.6	105.1	570.8	902.1	14.17	17.23	90.63
#1	.0003	.0200	.0001	.0051	-.0001	-.0000	.0010	.0042	-.0001
#2	.0004	.0053	.0009	-.0002	.0008	.0001	.0013	.0030	.0000
#3	.0008	.0255	.0029	.0109	-.0004	-.0001	.0011	.0041	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0000	.0008	.0047	.0961	.0029	.0416	.0001	.0003
Stddev	.0004	.0001	.0007	.0029	.0475	.0011	.0039	.0004	.0002
%RSD	236.8	211.0	90.71	61.41	49.43	39.57	9.301	371.1	64.62
#1	.0001	.0002	.0015	.0063	.0614	.0035	.0372	.0006	.0006
#2	-.0006	-.0000	.0009	.0014	.1503	.0036	.0440	-.0000	.0002
#3	.0000	.0000	.0000	.0065	.0768	.0016	.0438	-.0002	.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0952	-.0000	-.0013	.0009	.0090	.0005	-.0008	-.0027	.0001
Stddev	.0174	.0000	.0011	.0011	.0014	.0018	.0017	.0037	.0008
%RSD	18.23	112.0	84.06	131.9	15.92	356.8	198.2	139.2	662.7
#1	.1107	-.0000	-.0000	.0011	.0075	-.0001	.0011	-.0005	-.0008
#2	.0764	-.0000	-.0019	.0019	.0092	.0025	-.0021	-.0069	.0008
#3	.0986	-.0001	-.0020	-.0004	.0104	-.0009	-.0015	-.0005	.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/6/2018 13:27:28 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0001	-.0002	-.0001	-.0044	-.0022	.0003
Stddev	.0002	.0015	.0009	.0004	.0160	.0036	.0001
%RSD	104.0	1619.	552.2	437.6	366.2	165.1	44.04
#1	.0000	.0016	-.0010	-.0006	-.0194	.0009	.0001
#2	.0004	-.0014	.0008	.0002	-.0062	-.0013	.0004
#3	.0001	.0000	-.0003	.0001	.0125	-.0061	.0003

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3273.9	51652.	3680.9
Stddev	11.2	365.	62.6
%RSD	.34104	.70571	1.7007
#1	3274.1	51861.	3631.9
#2	3285.1	51231.	3659.4
#3	3262.7	51865.	3751.5

Sample Name: 160-29687-B-1-F MS Acquired: 8/6/2018 13:32:15 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2129	10.13	1.067	.4085	1.062	.0964	1.032	F 453.3	1.075
Stddev	.0005	.06	.016	.0103	.003	.0006	.015	3.6	.014
%RSD	.2282	.5934	1.472	2.524	.3095	.6271	1.485	.7989	1.291
#1	.2129	10.18	1.050	.4024	1.065	.0967	1.015	450.9	1.060
#2	.2135	10.14	1.080	.4204	1.062	.0969	1.039	457.4	1.086
#3	.2125	10.06	1.073	.4027	1.059	.0957	1.043	451.5	1.081

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								100.0	
Low Limit								-500.0	

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.053	.9991	1.042	9.713	15.24	.2716	49.29	1.473	.5044
Stddev	.012	.0123	.018	.050	.06	.0007	.24	.011	.0063
%RSD	1.101	1.235	1.675	.5132	.3993	.2731	.4914	.7748	1.241
#1	1.040	.9858	1.022	9.742	15.25	.2711	49.56	1.477	.4972
#2	1.063	1.010	1.051	9.741	15.30	.2714	49.10	1.481	.5089
#3	1.057	1.001	1.053	9.655	15.18	.2725	49.20	1.460	.5070

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 500.4	.9848	1.224	1.342	F 211.5	.5204	.5563	6.233	.9705
Stddev	3.9	.0122	.018	.013	3.0	.0081	.0116	.024	.0120
%RSD	.7780	1.234	1.450	.9687	1.438	1.561	2.084	.3766	1.237
#1	497.7	.9718	1.204	1.328	208.0	.5112	.5433	6.260	.9587
#2	498.7	.9958	1.234	1.353	213.4	.5266	.5600	6.223	.9827
#3	504.9	.9870	1.235	1.343	213.1	.5234	.5656	6.216	.9701

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29687-B-1-F MS Acquired: 8/6/2018 13:32:15 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 12.48	.9912	.9916	.1878	.9894	.9766	9.126
Stddev	.12	.0018	.0033	.0036	.0229	.0064	.108
%RSD	.9634	.1792	.3356	1.902	2.311	.6573	1.183

#1	12.61	.9923	.9929	.1837	1.012	.9840	9.007
#2	12.46	.9921	.9941	.1905	.9662	.9721	9.217
#3	12.37	.9891	.9878	.1891	.9901	.9739	9.156

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	10.00						
Low Limit	-500.0						

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2934.3	48596.	3767.5
Stddev	16.8	81.	6.5
%RSD	.57319	.16732	.17252

#1	2946.0	48680.	3772.5
#2	2915.0	48591.	3760.2
#3	2942.0	48518.	3770.0

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2151	10.17	1.067	.4111	1.067	.0967	1.035	F 451.4	1.072
Stddev	.0016	.05	.001	.0012	.003	.0003	.004	7.6	.004
%RSD	.7220	.5175	.1197	.3021	.3039	.2627	.3647	1.694	.3269
#1	.2135	10.12	1.068	.4110	1.065	.0967	1.037	459.1	1.076
#2	.2166	10.23	1.066	.4099	1.071	.0965	1.031	451.2	1.072
#3	.2152	10.17	1.066	.4124	1.066	.0970	1.037	443.8	1.069

[illegible]

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.049	.9956	1.045	9.711	15.46	.2746	50.01	1.483	.5033
Stddev	.004	.0038	.005	.031	.09	.0011	.19	.005	.0019
%RSD	.3787	.3867	.5074	.3178	.5993	.3929	.3885	.3348	.3690
#1	1.052	.9992	1.046	9.704	15.39	.2734	49.88	1.477	.5054
#2	1.049	.9961	1.050	9.745	15.56	.2755	50.24	1.486	.5027
#3	1.044	.9916	1.039	9.685	15.42	.2749	49.93	1.485	.5018

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 503.6	.9772	1.224	1.332	F 214.9	.5206	.5584	6.261	.9628
Stddev	1.8	.0062	.003	.008	.2	.0006	.0035	.014	.0046
%RSD	.3479	.6327	.2579	.5855	.0944	.1211	.6246	.2211	.4745
#1	502.0	.9833	1.228	1.340	215.1	.5208	.5563	6.247	.9658
#2	505.5	.9773	1.223	1.333	214.9	.5199	.5624	6.274	.9651
#3	503.2	.9709	1.222	1.324	214.7	.5211	.5565	6.261	.9575

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29687-B-1-G MSD Acquired: 8/6/2018 13:36:58 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 12.68	1.000	.9969	.1875	.9792	.9852	9.233
Stddev	.01	.003	.0027	.0004	.0101	.0059	.043
%RSD	.0668	.3437	.2747	.2329	1.032	.5971	.4666
#1	12.68	1.001	.9960	.1880	.9728	.9842	9.274
#2	12.69	1.003	.9999	.1871	.9739	.9915	9.236
#3	12.68	.9966	.9947	.1874	.9908	.9798	9.188

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	10.00						
Low Limit	-500.0						

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2948.4	48143.	3823.3
Stddev	24.7	159.	26.4
%RSD	.83851	.33022	.68997
#1	2923.3	47963.	3795.3
#2	2949.3	48265.	3826.8
#3	2972.7	48200.	3847.7

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0936	1.925	.1034	1.110	.5212	.0439	1.874	F 430.8	.0819
Stddev	.0007	.018	.0008	.007	.0020	.0004	.001	1.1	.0003
%RSD	.7767	.9534	.8204	.6090	.3870	.8270	.0528	.2533	.3336
#1	.0941	1.910	.1038	1.104	.5205	.0436	1.873	430.3	.0817
#2	.0940	1.946	.1040	1.108	.5197	.0437	1.873	432.1	.0822
#3	.0928	1.920	.1024	1.118	.5235	.0443	1.875	430.0	.0817

[illegible]

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5175	.0951	.2550	.9069	51.66	.6276	46.23	.6126	.3650
Stddev	.0001	.0005	.0014	.0046	.19	.0022	.34	.0028	.0002
%RSD	.0270	.4868	.5426	.5059	.3678	.3428	.7460	.4598	.0586
#1	.5176	.0953	.2537	.9100	51.62	.6261	46.00	.6114	.3648
#2	.5176	.0955	.2549	.9091	51.49	.6266	46.06	.6106	.3650
#3	.5174	.0946	.2565	.9017	51.87	.6300	46.62	.6158	.3652

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 470.4	.3688	2.711	.4558	F 235.0	.0950	.1523	4.819	.8839
Stddev	5.1	.0008	.005	.0028	.1	.0016	.0024	.018	.0018
%RSD	1.088	.2138	.2010	.6080	.0551	1.713	1.553	.3729	.2041
#1	466.0	.3694	2.716	.4590	235.1	.0963	.1549	4.807	.8840
#2	469.3	.3690	2.705	.4540	234.9	.0956	.1502	4.811	.8856
#3	476.0	.3679	2.712	.4544	235.0	.0932	.1517	4.840	.8820

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29687-B-1-EPDS Acquired: 8/6/2018 13:41:42 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 10.93	1.806	.1857	.1698	4.001	.4458	7.882
Stddev	.15	.002	.0019	.0025	.009	.0022	.006
%RSD	1.387	.1339	1.019	1.445	.2114	.5035	.0764

#1	10.78	1.808	.1859	.1672	3.991	.4446	7.885
#2	10.94	1.808	.1838	.1720	4.007	.4484	7.885
#3	11.08	1.804	.1875	.1702	4.003	.4445	7.875

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	10.00						
Low Limit	-500.0						

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2899.4	46955.	3710.2
Stddev	5.8	425.	41.9
%RSD	.19999	.90578	1.1298

#1	2893.0	46469.	3723.7
#2	2904.3	47140.	3743.8
#3	2900.8	47257.	3663.2

Sample Name: MB 160-380003/1-A Acquired: 8/6/2018 13:46:31 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment: 380003

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0166	-.0010	.0066	-.0003	-.0000	-.0018	.0710	.0001
Stddev	.0004	.0100	.0008	.0011	.0004	.0001	.0020	.0902	.0001
%RSD	380.5	60.11	87.29	16.36	139.5	203.4	111.8	127.0	87.77
#1	.0001	.0268	-.0001	.0058	-.0004	-.0000	-.0005	.1752	.0002
#2	.0005	.0068	-.0018	.0079	.0001	-.0001	-.0041	.0190	-.0000
#3	-.0003	.0162	-.0010	.0063	-.0006	.0000	-.0008	.0189	.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0001	.0006	-.0001	.0486	-.0012	.0237	-.0001	.0003
Stddev	.0002	.0001	.0009	.0025	.0141	.0022	.0354	.0002	.0001
%RSD	95.32	85.55	139.3	1814.	28.98	178.4	149.5	212.6	22.55
#1	-.0003	.0001	.0008	.0017	.0323	-.0026	-.0141	-.0001	.0004
#2	.0000	.0002	.0014	-.0030	.0571	-.0024	.0290	-.0003	.0003
#3	-.0003	.0001	-.0003	.0009	.0563	.0013	.0561	.0001	.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3268	-.0001	.0128	-.0000	.0518	-.0003	-.0032	.0247	.0003
Stddev	.0148	.0003	.0013	.0006	.0373	.0004	.0026	.0037	.0001
%RSD	4.526	504.6	10.43	1914.	72.05	124.6	81.39	14.90	22.21
#1	.3130	.0003	.0144	-.0008	.0949	-.0002	-.0033	.0289	.0003
#2	.3424	-.0002	.0121	.0003	.0313	.0001	-.0058	.0235	.0002
#3	.3252	-.0002	.0120	.0004	.0292	-.0006	-.0006	.0218	.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: MB 160-380003/1-A Acquired: 8/6/2018 13:46:31 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment: 380003

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0005	.0010	-.0000	.0004	.0216	-.0004	.0011
Stddev	.0003	.0018	.0004	.0003	.0187	.0054	.0013
%RSD	53.62	181.4	1046.	68.72	86.76	1215.	114.7
#1	.0002	-.0003	-.0003	.0003	.0383	-.0065	.0026
#2	.0006	.0002	-.0002	.0008	.0014	.0036	.0003
#3	.0008	.0031	.0004	.0002	.0250	.0016	.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3293.4	54268.	4015.3
Stddev	46.0	107.	27.3
%RSD	1.3973	.19765	.67961
#1	3286.2	54149.	4014.8
#2	3251.5	54298.	4042.9
#3	3342.6	54357.	3988.3

Sample Name: LCS 160-380003/2-A Acquired: 8/6/2018 13:51:18 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2010	10.05	.9749	.2039	.9955	.0979	1.014	10.05	.9815
Stddev	.0004	.01	.0060	.0069	.0042	.0006	.006	.11	.0066
%RSD	.2119	.1484	.6199	3.399	.4171	.5928	.6198	1.101	.6707
#1	.2013	10.05	.9742	.2082	.9995	.0984	1.013	9.982	.9785
#2	.2005	10.04	.9693	.2076	.9958	.0982	1.009	9.984	.9770
#3	.2013	10.07	.9813	.1959	.9912	.0973	1.021	10.17	.9891

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.018	1.013	.9915	10.03	9.837	.1043	9.891	.9996	.5075
Stddev	.006	.007	.0031	.04	.040	.0012	.019	.0027	.0038
%RSD	.6328	.6730	.3083	.3773	.4085	1.150	.1906	.2676	.7499
#1	1.014	1.011	.9926	10.04	9.879	.1052	9.876	1.002	.5061
#2	1.013	1.007	.9880	10.05	9.799	.1048	9.886	1.001	.5045
#3	1.025	1.020	.9939	9.984	9.834	.1029	9.912	.9966	.5118

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.03	1.014	1.090	.9942	9.576	.4932	.4957	4.710	1.011
Stddev	.03	.008	.006	.0085	.048	.0035	.0028	.008	.009
%RSD	.3240	.7724	.5848	.8584	.4971	.7037	.5716	.1714	.9018
#1	10.05	1.011	1.086	.9879	9.569	.4939	.4939	4.719	1.007
#2	10.06	1.008	1.087	.9906	9.532	.4894	.4943	4.708	1.004
#3	9.998	1.023	1.097	1.004	9.627	.4962	.4990	4.704	1.021

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: LCS 160-380003/2-A Acquired: 8/6/2018 13:51:18 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.023	.9862	1.001	.2112	1.004	.9876	.9977
Stddev	.003	.0032	.005	.0019	.009	.0069	.0069
%RSD	.2902	.3224	.5214	.9129	.9011	.6962	.6879
#1	1.026	.9838	1.006	.2105	1.011	.9903	.9951
#2	1.022	.9851	1.001	.2097	.9941	.9927	.9925
#3	1.021	.9898	.9954	.2134	1.008	.9798	1.005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3323.3	54606.	4018.1
Stddev	35.5	70.	9.9
%RSD	1.0688	.12780	.24721
#1	3346.2	54526.	4014.0
#2	3341.3	54634.	4010.8
#3	3282.4	54657.	4029.4

Sample Name: 680-155956-G-1-A@10 Acquired: 8/6/2018 13:55:37 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0244	.0012	.0654	.0147	-.0001	.0001	11.06	-.0000
Stddev	.0005	.0105	.0014	.0023	.0002	.0001	.0009	.05	.0001
%RSD	781.3	43.10	113.0	3.514	1.231	184.8	751.7	.4276	313.4
#1	.0000	.0125	.0014	.0629	.0148	-.0002	-.0002	11.10	-.0002
#2	.0006	.0285	-.0002	.0658	.0147	.0000	.0011	11.06	.0001
#3	-.0004	.0323	.0025	.0674	.0145	-.0001	-.0005	11.01	-.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2218	.0001	.0027	.0167	.5447	.0154	39.41	.0058	.0028
Stddev	.0011	.0001	.0020	.0040	.0765	.0007	.07	.0002	.0002
%RSD	.5088	128.8	72.63	23.79	14.04	4.658	.1665	3.615	7.716
#1	.2217	.0002	.0004	.0204	.5761	.0159	39.47	.0061	.0026
#2	.2230	.0001	.0037	.0125	.4575	.0158	39.34	.0056	.0030
#3	.2208	-.0000	.0040	.0171	.6006	.0146	39.40	.0058	.0027

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	59.42	.0097	.0029	-.0033	2.499	.0011	-.0004	2.145	-.0007
Stddev	.08	.0002	.0002	.0020	.008	.0009	.0011	.013	.0005
%RSD	.1394	2.506	8.301	59.22	.3103	82.38	285.1	.6051	61.59
#1	59.50	.0099	.0031	-.0044	2.507	.0020	-.0010	2.154	-.0010
#2	59.42	.0096	.0029	-.0010	2.499	.0011	-.0010	2.130	-.0010
#3	59.33	.0094	.0027	-.0045	2.491	.0002	.0009	2.150	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 680-155956-G-1-A@10 Acquired: 8/6/2018 13:55:37 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0787	.0043	.0001	.0000	.0216	-.0009	.0010
Stddev	.0003	.0026	.0008	.0010	.0053	.0021	.0000
%RSD	.4298	60.40	825.1	2158.	24.37	234.8	1.717

#1	.0790	.0044	-.0003	.0005	.0189	-.0022	.0010
#2	.0788	.0017	-.0004	-.0011	.0276	.0015	.0010
#3	.0784	.0069	.0010	.0007	.0181	-.0021	.0010

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3265.7	54433.	4157.3
Stddev	6.7	55.	7.6
%RSD	.20489	.10107	.18315

#1	3258.1	54480.	4158.7
#2	3268.3	54445.	4164.1
#3	3270.7	54372.	4149.1

Sample Name: 680-155956-G-1ASD@50 Acquired: 8/6/2018 14:00:17 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0124	-.0002	.0148	.0029	-.0000	-.0011	2.231	-.0000
Stddev	.0003	.0052	.0009	.0022	.0002	.0001	.0003	.018	.0001
%RSD	64.17	42.14	555.4	15.03	7.130	132.6	28.86	.8305	754.6
#1	-.0002	.0120	.0006	.0157	.0031	-.0001	-.0007	2.221	-.0000
#2	-.0007	.0074	.0000	.0123	.0027	.0000	-.0012	2.221	-.0001
#3	-.0003	.0178	-.0012	.0165	.0029	-.0001	-.0012	2.253	.0001

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0443	.0001	.0028	.0031	.0588	.0039	7.983	.0011	.0007
Stddev	.0002	.0001	.0010	.0041	.0250	.0003	.016	.0008	.0004
%RSD	.4292	71.73	35.79	129.8	42.45	8.375	.1968	66.92	56.00
#1	.0441	.0001	.0029	.0056	.0851	.0038	7.979	.0020	.0003
#2	.0445	.0001	.0017	-.0016	.0355	.0037	8.001	.0008	.0007
#3	.0442	.0002	.0037	.0054	.0557	.0043	7.970	.0006	.0011

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	12.03	.0022	-.0008	-.0005	.4917	.0004	-.0000	.4174	-.0005
Stddev	.06	.0003	.0012	.0004	.0054	.0003	.0019	.0074	.0004
%RSD	.5209	13.62	152.2	80.16	1.092	64.41	18780.	1.762	89.50
#1	12.04	.0025	-.0015	-.0001	.4899	.0001	-.0019	.4230	-.0006
#2	12.08	.0020	.0006	-.0005	.4875	.0005	.0020	.4201	-.0008
#3	11.96	.0020	-.0013	-.0010	.4978	.0007	-.0001	.4091	-.0000

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: 680-155956-G-1ASD@50 Acquired: 8/6/2018 14:00:17 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0156	.0001	-.0006	-.0002	.0359	.0000	.0006
Stddev	.0001	.0008	.0003	.0008	.0065	.0040	.0002
%RSD	.3941	748.2	54.48	401.4	18.21	10660.	36.79
#1	.0155	.0010	-.0007	-.0001	.0429	-.0026	.0005
#2	.0157	-.0005	-.0008	-.0010	.0300	.0046	.0005
#3	.0156	-.0002	-.0002	.0005	.0347	-.0019	.0009

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3354.1	55515.	4039.2
Stddev	11.2	220.	30.9
%RSD	.33245	.39686	.76549
#1	3359.2	55295.	4028.5
#2	3361.7	55513.	4015.0
#3	3341.3	55736.	4074.0

Sample Name: 680-155956-G-1BMS@10 Acquired: 8/6/2018 14:05:01 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0209	1.038	.1029	.0809	.1182	.0103	.1087	12.26	.1044
Stddev	.0003	.008	.0003	.0019	.0001	.0000	.0004	.09	.0006
%RSD	1.518	.8109	.3196	2.371	.0542	.4804	.3302	.7060	.5490
#1	.0206	1.047	.1026	.0827	.1181	.0103	.1091	12.32	.1047
#2	.0213	1.036	.1029	.0813	.1182	.0102	.1084	12.29	.1048
#3	.0209	1.030	.1033	.0789	.1182	.0103	.1087	12.16	.1037

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3308	.1049	.1102	1.044	1.572	.0278	41.83	.1074	.0546
Stddev	.0011	.0005	.0007	.003	.010	.0013	.33	.0008	.0007
%RSD	.3340	.4928	.6672	.2515	.6119	4.671	.7995	.7568	1.225
#1	.3317	.1053	.1108	1.045	1.562	.0287	42.19	.1081	.0554
#2	.3313	.1050	.1103	1.041	1.571	.0284	41.75	.1076	.0541
#3	.3296	.1043	.1094	1.045	1.582	.0263	41.53	.1065	.0543

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	62.78	.1134	.1175	.0978	3.571	.0540	.0544	2.680	.1033
Stddev	.28	.0006	.0011	.0012	.012	.0012	.0005	.019	.0002
%RSD	.4470	.5068	.9298	1.241	.3301	2.197	.8657	.6984	.2334
#1	63.11	.1137	.1163	.0992	3.583	.0535	.0544	2.702	.1034
#2	62.64	.1136	.1183	.0973	3.571	.0532	.0540	2.670	.1034
#3	62.61	.1127	.1180	.0970	3.559	.0554	.0549	2.669	.1030

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 680-155956-G-1BMS@10 Acquired: 8/6/2018 14:05:01 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1865	.1069	.1033	.0208	.1296	.1056	.1069
Stddev	.0007	.0005	.0012	.0008	.0096	.0041	.0006
%RSD	.3949	.4253	1.147	3.973	7.435	3.928	.5191
#1	.1873	.1064	.1043	.0217	.1230	.1047	.1072
#2	.1859	.1070	.1020	.0203	.1407	.1019	.1072
#3	.1862	.1073	.1037	.0203	.1252	.1101	.1062

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3287.5	54528.	4110.0
Stddev	15.9	353.	21.9
%RSD	.48401	.64818	.53380
#1	3277.3	54136.	4085.0
#2	3279.3	54626.	4119.0
#3	3305.8	54822.	4126.0

Sample Name: 680-155956-G1CMSD@10 Acquired: 8/6/2018 14:09:36 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0213	1.009	.1015	.0845	.1152	.0099	.1052	11.85	.1016
Stddev	.0006	.014	.0004	.0015	.0003	.0001	.0014	.05	.0002
%RSD	2.609	1.369	.4156	1.780	.2826	.9840	1.374	.4079	.1954
#1	.0216	1.009	.1018	.0845	.1156	.0100	.1068	11.82	.1016
#2	.0216	1.023	.1018	.0860	.1150	.0098	.1041	11.82	.1014
#3	.0206	.9953	.1011	.0830	.1151	.0099	.1047	11.90	.1018

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3190	.1022	.1058	1.015	1.526	.0246	40.20	.1045	.0529
Stddev	.0009	.0004	.0009	.005	.021	.0020	.20	.0008	.0002
%RSD	.2808	.3543	.8531	.4548	1.341	8.063	.4968	.7509	.3119
#1	.3196	.1026	.1063	1.020	1.513	.0225	40.24	.1042	.0530
#2	.3180	.1019	.1064	1.016	1.515	.0264	40.38	.1054	.0527
#3	.3195	.1021	.1048	1.011	1.550	.0248	39.99	.1039	.0530

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	60.51	.1104	.1127	.0959	3.432	.0509	.0529	2.570	.1002
Stddev	.16	.0003	.0009	.0016	.015	.0007	.0010	.009	.0006
%RSD	.2712	.2546	.7956	1.641	.4348	1.302	1.924	.3476	.5592
#1	60.61	.1105	.1121	.0942	3.441	.0504	.0529	2.577	.0998
#2	60.59	.1101	.1138	.0973	3.415	.0507	.0519	2.560	.1008
#3	60.32	.1107	.1123	.0962	3.441	.0516	.0539	2.574	.1001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 680-155956-G1CMSD@10 Acquired: 8/6/2018 14:09:36 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1814	.1018	.0996	.0202	.1383	.1002	.1040
Stddev	.0003	.0036	.0001	.0010	.0064	.0013	.0006
%RSD	.1446	3.542	.0748	4.905	4.645	1.282	.5574
#1	.1817	.1060	.0997	.0206	.1420	.1006	.1041
#2	.1813	.0995	.0996	.0208	.1420	.0987	.1033
#3	.1812	.0999	.0996	.0190	.1309	.1011	.1045

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3316.9	55029.	4252.8
Stddev	13.4	232.	33.7
%RSD	.40275	.42074	.79231
#1	3326.3	54817.	4229.0
#2	3322.9	54993.	4238.0
#3	3301.6	55276.	4291.3

Sample Name: MB Acquired: 8/6/2018 14:14:11 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment: 378338 Ni Carrier

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006	.0243	-.0005	-.0011	.0005	-.0001	-.0011	.0325	-.0001
Stddev	.0006	.0111	.0012	.0087	.0004	.0001	.0006	.0001	.0001
%RSD	111.9	45.62	244.6	769.9	77.40	57.79	52.91	.4335	203.1
#1	-.0001	.0131	-.0019	.0043	.0001	-.0000	-.0008	.0326	.0001
#2	.0011	.0352	-.0002	-.0112	.0007	-.0002	-.0018	.0323	-.0001
#3	.0007	.0245	.0005	.0035	.0007	-.0001	-.0007	.0325	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0001	.0008	.0101	.0031	-.0021	.0360	-.0005	-.0001
Stddev	.0000	.0001	.0012	.0010	.0414	.0017	.0237	.0005	.0002
%RSD	29.61	102.2	149.8	9.818	1338.	80.75	65.77	91.47	210.6
#1	-.0001	.0002	.0019	.0107	.0509	-.0041	.0404	-.0010	-.0000
#2	-.0001	-.0000	.0010	.0090	-.0196	-.0012	.0571	-.0006	.0001
#3	-.0000	.0001	-.0005	.0107	-.0220	-.0011	.0104	-.0000	-.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0947	.1605	-.0030	.0005	.0293	.0010	-.0004	-.0001	-.0007
Stddev	.0113	.0005	.0004	.0015	.0014	.0026	.0010	.0069	.0002
%RSD	11.94	.3034	11.78	306.6	4.869	261.4	215.4	10030.	23.63
#1	.1075	.1602	-.0031	-.0005	.0280	.0034	-.0013	-.0041	-.0009
#2	.0860	.1602	-.0027	.0022	.0290	-.0018	-.0006	.0079	-.0007
#3	.0906	.1610	-.0034	-.0002	.0308	.0014	.0006	-.0041	-.0006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: MB Acquired: 8/6/2018 14:14:11 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment: 378338 Ni Carrier

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0011	.0004	.0003	.0213	.0015	.0075
Stddev	.0001	.0022	.0005	.0015	.0065	.0022	.0001
%RSD	126.0	202.8	133.6	490.0	30.54	149.1	.7573
#1	.0002	.0002	.0006	-.0008	.0207	.0038	.0074
#2	-.0000	.0002	-.0002	.0020	.0282	.0012	.0075
#3	.0001	-.0036	.0008	-.0003	.0152	-.0006	.0075

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3359.4	55024.	3997.9
Stddev	6.3	219.	29.9
%RSD	.18685	.39812	.74684
#1	3363.6	55186.	4014.9
#2	3362.3	55112.	3963.4
#3	3352.2	54775.	4015.4

Sample Name: CCVL Acquired: 8/6/2018 14:18:57 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0100	.1991	.0107	.0993	.0499	.0048	.2075	1.024	.0049
Stddev	.0009	.0035	.0006	.0019	.0003	.0001	.0005	.006	.0001
%RSD	8.727	1.751	5.798	1.932	.5597	1.800	.2500	.6111	2.418
#1	.0093	.1960	.0101	.1015	.0501	.0047	.2081	1.032	.0048
#2	.0096	.2029	.0113	.0981	.0496	.0048	.2072	1.022	.0048
#3	.0110	.1984	.0106	.0983	.0499	.0049	.2073	1.020	.0050

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0524	.0104	.0268	.0997	4.874	.0479	1.003	.0152	.0405
Stddev	.0004	.0002	.0020	.0023	.035	.0018	.013	.0007	.0007
%RSD	.8022	2.012	7.278	2.347	.7212	3.721	1.337	4.750	1.683
#1	.0528	.0106	.0268	.1003	4.880	.0459	.9879	.0143	.0412
#2	.0521	.0102	.0248	.0971	4.836	.0489	1.011	.0155	.0399
#3	.0522	.0103	.0287	.1016	4.906	.0490	1.011	.0157	.0404

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.059	.0420	.2726	.0097	4.911	.0096	.0154	.3642	.1019
Stddev	.013	.0002	.0035	.0007	.039	.0007	.0004	.0042	.0015
%RSD	1.216	.4119	1.273	7.696	.7992	6.993	2.715	1.160	1.482
#1	1.058	.0422	.2765	.0089	4.956	.0089	.0157	.3661	.1036
#2	1.047	.0419	.2710	.0100	4.893	.0103	.0156	.3594	.1016
#3	1.073	.0419	.2702	.0103	4.883	.0095	.0149	.3672	.1006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCVL Acquired: 8/6/2018 14:18:57 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0052	.1973	.0188	.0211	.4636	.0511	.0213
Stddev	.0001	.0018	.0005	.0010	.0045	.0026	.0002
%RSD	1.473	.9350	2.557	4.850	.9740	5.161	.8303

#1	.0052	.1982	.0185	.0206	.4622	.0541	.0215
#2	.0051	.1952	.0185	.0203	.4599	.0502	.0211
#3	.0052	.1985	.0194	.0222	.4686	.0491	.0213

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3338.3	53924.	4037.6
Stddev	11.9	393.	50.4
%RSD	.35637	.72919	1.2486

#1	3325.3	53589.	4068.6
#2	3348.6	53826.	4064.7
#3	3340.9	54357.	3979.4

Sample Name: CCV Acquired: 8/6/2018 14:23:41 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9814	50.07	5.194	.9924	5.005	4.995	5.268	50.89	5.175
Stddev	.0035	.40	.052	.0115	.039	.038	.058	.51	.049
%RSD	.3576	.8055	.9949	1.156	.7807	.7661	1.102	1.008	.9406
#1	.9775	50.52	5.140	1.006	5.044	5.038	5.211	50.37	5.125
#2	.9844	49.92	5.199	.9873	5.004	4.983	5.266	50.92	5.179
#3	.9821	49.76	5.243	.9843	4.966	4.965	5.327	51.39	5.222

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.175	5.193	5.206	49.45	49.75	5.027	48.82	4.926	1.044
Stddev	.048	.051	.054	.36	.42	.042	.41	.042	.012
%RSD	.9344	.9748	1.039	.7288	.8414	.8318	.8419	.8600	1.099
#1	5.126	5.141	5.153	49.86	50.21	5.073	49.29	4.973	1.032
#2	5.176	5.196	5.205	49.34	49.64	5.014	48.61	4.915	1.045
#3	5.223	5.243	5.261	49.16	49.39	4.993	48.56	4.890	1.055

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	49.74	5.149	54.94	5.126	52.32	1.054	1.051	4.956	5.195
Stddev	.39	.045	.51	.039	.48	.012	.014	.022	.054
%RSD	.7833	.8750	.9295	.7571	.9159	1.109	1.311	.4482	1.039
#1	50.18	5.103	54.43	5.085	51.84	1.042	1.036	4.961	5.139
#2	49.61	5.149	54.93	5.130	52.30	1.054	1.055	4.975	5.199
#3	49.44	5.194	55.46	5.162	52.80	1.066	1.062	4.931	5.246

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/6/2018 14:23:41 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.116	4.990	4.991	1.063	5.077	4.999	5.221
Stddev	.039	.014	.039	.010	.034	.031	.049
%RSD	.7534	.2889	.7852	.9512	.6627	.6283	.9309
#1	5.158	4.974	5.034	1.052	5.039	5.034	5.172
#2	5.106	4.998	4.981	1.063	5.102	4.987	5.223
#3	5.083	4.999	4.957	1.072	5.090	4.975	5.269

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3091.4	52543.	3975.2
Stddev	21.9	130.	34.1
%RSD	.70732	.24726	.85713
#1	3114.1	52680.	3936.1
#2	3089.7	52421.	3991.0
#3	3070.5	52530.	3998.6

Sample Name: CCB Acquired: 8/6/2018 14:27:54 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0243	.0018	.0043	-.0001	.0001	-.0002	.0031	.0001
Stddev	.0006	.0093	.0005	.0043	.0004	.0002	.0024	.0005	.0001
%RSD	805.9	38.33	25.72	101.1	848.0	293.2	1245.	16.54	105.2
#1	.0004	.0328	.0020	.0090	.0004	.0003	-.0004	.0036	.0001
#2	-.0006	.0144	.0022	.0033	-.0005	-.0000	.0023	.0026	.0002
#3	.0005	.0256	.0013	.0005	-.0001	-.0001	-.0026	.0032	-.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0000	.0006	.0028	.0120	-.0027	.0153	.0001	.0006
Stddev	.0002	.0001	.0007	.0036	.0324	.0013	.0287	.0003	.0002
%RSD	178.3	268.0	111.5	127.7	270.5	46.74	187.2	446.7	31.59
#1	-.0000	.0001	-.0001	.0069	.0283	-.0027	.0316	.0003	.0004
#2	.0000	-.0000	.0013	.0014	-.0253	-.0014	-.0178	-.0002	.0008
#3	-.0003	.0001	.0007	.0001	.0330	-.0040	.0323	.0001	.0007

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0639	.0001	-.0009	-.0002	.0082	.0006	-.0014	-.0056	-.0000
Stddev	.0062	.0001	.0014	.0009	.0029	.0007	.0022	.0080	.0004
%RSD	9.759	75.86	160.4	495.5	35.15	119.0	155.6	144.0	1731.
#1	.0591	.0002	.0002	-.0004	.0102	.0001	-.0000	.0025	-.0002
#2	.0709	.0000	-.0003	-.0009	.0049	.0014	-.0003	-.0136	-.0003
#3	.0616	.0002	-.0024	.0008	.0095	.0003	-.0040	-.0057	.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/6/2018 14:27:54 Type: QC
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0019	.0007	.0008	.0067	-.0005	.0004
Stddev	.0003	.0030	.0004	.0007	.0116	.0019	.0002
%RSD	457.0	156.4	65.95	91.78	172.1	369.0	44.41
#1	.0004	.0011	.0002	.0000	.0074	-.0015	.0006
#2	-.0002	-.0049	.0009	.0009	-.0052	-.0017	.0003
#3	-.0000	-.0020	.0009	.0015	.0179	.0016	.0003

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3337.6	54370.	3984.0
Stddev	7.6	120.	44.3
%RSD	.22910	.21985	1.1116
#1	3344.5	54463.	3933.9
#2	3339.0	54412.	4018.0
#3	3329.4	54235.	4000.1

Sample Name: LCS Acquired: 8/6/2018 14:32:41 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0048	.0014	.0066	.0002	-.0001	.0001	.0266	-.0000
Stddev	.0008	.0081	.0005	.0016	.0002	.0002	.0015	.0020	.0002
%RSD	510.7	170.4	32.49	24.73	74.63	278.4	1982.	7.362	362.1
#1	-.0002	.0082	.0011	.0082	.0002	.0001	-.0016	.0250	-.0000
#2	.0011	.0105	.0013	.0049	.0001	-.0002	.0009	.0259	-.0002
#3	-.0004	-.0045	.0020	.0067	.0004	-.0001	.0009	.0288	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	.0003	.0017	.0029	-.0185	-.0006	.0188	-.0000	.0001
Stddev	.0004	.0001	.0006	.0022	.0102	.0017	.0205	.0005	.0003
%RSD	905.0	29.45	35.15	75.57	55.40	280.6	108.6	1504.	216.6
#1	.0003	.0002	.0016	.0049	-.0159	-.0026	.0096	.0005	.0004
#2	-.0005	.0002	.0024	.0032	-.0098	.0007	.0423	-.0004	.0000
#3	.0001	.0003	.0012	.0006	-.0297	.0001	.0046	-.0001	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0432	.1724	-.0009	.0008	.0159	-.0000	-.0008	-.0021	-.0001
Stddev	.0119	.0011	.0034	.0003	.0024	.0010	.0012	.0086	.0002
%RSD	27.52	.6497	370.1	41.44	15.27	3070.	161.3	410.8	173.0
#1	.0513	.1711	-.0034	.0005	.0132	-.0011	-.0009	-.0088	.0000
#2	.0296	.1729	-.0023	.0009	.0163	.0001	-.0019	.0076	-.0004
#3	.0488	.1732	.0030	.0011	.0180	.0009	.0005	-.0051	-.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: LCS Acquired: 8/6/2018 14:32:41 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0019	-.0009	-.0001	.0205	-.0043	.0051
Stddev	.0001	.0028	.0003	.0013	.0232	.0012	.0002
%RSD	169.2	147.1	31.51	1735.	112.8	28.52	3.613

#1	.0000	-.0007	-.0007	-.0006	-.0032	-.0048	.0049
#2	-.0000	.0001	-.0012	-.0010	.0217	-.0053	.0051
#3	.0002	-.0050	-.0008	.0014	.0431	-.0029	.0053

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3469.6	56363.	4102.3
Stddev	13.0	74.	11.3
%RSD	.37464	.13161	.27432

#1	3481.3	56424.	4115.0
#2	3471.9	56384.	4098.3
#3	3455.6	56281.	4093.6

Sample Name: LCSD Acquired: 8/6/2018 14:37:26 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003	.0057	-.0004	.0059	-.0001	-.0001	.0003	.0175	.0000
Stddev	.0003	.0028	.0013	.0019	.0002	.0000	.0008	.0001	.0001
%RSD	95.49	49.33	280.6	31.50	232.5	54.71	299.5	.6397	916.0
#1	.0006	.0088	-.0007	.0063	-.0002	-.0000	-.0007	.0174	-.0000
#2	.0000	.0045	.0009	.0039	.0001	-.0001	.0008	.0175	-.0001
#3	.0003	.0037	-.0015	.0076	-.0002	-.0001	.0006	.0176	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0001	.0001	.0014	-.0348	-.0010	.0204	.0005	.0002
Stddev	.0004	.0000	.0004	.0033	.0604	.0008	.0176	.0003	.0002
%RSD	93.72	18.05	478.7	240.8	173.6	76.40	86.56	48.48	133.4
#1	-.0007	.0002	-.0004	.0032	.0226	-.0004	.0067	.0006	.0001
#2	-.0005	.0001	.0001	-.0024	-.0292	-.0019	.0403	.0008	.0004
#3	.0000	.0001	.0005	.0033	-.0978	-.0007	.0142	.0003	.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0275	.1623	-.0019	.0003	.0105	-.0012	-.0033	-.0052	-.0001
Stddev	.0040	.0008	.0010	.0008	.0020	.0004	.0014	.0046	.0001
%RSD	14.44	.5102	52.77	258.1	19.37	37.73	43.51	89.20	110.6
#1	.0231	.1614	-.0007	-.0001	.0083	-.0014	-.0026	-.0007	.0000
#2	.0308	.1626	-.0023	.0013	.0122	-.0015	-.0049	-.0049	-.0001
#3	.0286	.1630	-.0026	-.0002	.0110	-.0007	-.0023	-.0099	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: LCSD Acquired: 8/6/2018 14:37:26 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	-.0039	-.0009	.0008	.0453	.0010	.0047
Stddev	.0001	.0011	.0011	.0003	.0036	.0037	.0001
%RSD	648.4	28.71	120.5	31.01	8.021	381.3	1.578
#1	.0000	-.0029	-.0017	.0007	.0416	.0025	.0046
#2	.0001	-.0051	-.0015	.0011	.0455	-.0032	.0047
#3	-.0001	-.0036	.0004	.0006	.0489	.0036	.0048

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3469.8	57360.	4254.8
Stddev	29.1	255.	10.7
%RSD	.83905	.44432	.25146
#1	3495.6	57447.	4258.0
#2	3475.6	57560.	4263.6
#3	3438.2	57073.	4242.9

Sample Name: 160-29595-B-1 Acquired: 8/6/2018 14:42:12 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0106	.0001	.0039	.0005	-.0001	-.0002	.0371	-.0001
Stddev	.0003	.0109	.0004	.0026	.0005	.0000	.0019	.0008	.0001
%RSD	504.7	102.7	369.2	67.67	94.77	88.38	855.6	2.158	70.94
#1	-.0002	.0225	.0005	.0034	.0011	-.0001	-.0000	.0368	-.0001
#2	.0003	.0083	-.0003	.0067	.0001	-.0000	.0015	.0366	-.0000
#3	-.0003	.0011	.0001	.0016	.0004	-.0001	-.0022	.0380	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0002	.0018	.0059	.0334	-.0011	.0401	.0002	.0001
Stddev	.0002	.0001	.0017	.0049	.0446	.0018	.0226	.0005	.0002
%RSD	43.00	72.44	94.12	81.86	133.4	170.9	56.19	277.1	217.3
#1	-.0005	.0001	.0007	.0009	.0412	-.0031	.0365	.0006	.0003
#2	-.0005	.0003	.0039	.0063	.0736	.0000	.0196	-.0003	-.0001
#3	-.0002	.0001	.0010	.0106	-.0145	-.0000	.0643	.0001	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0560	.1451	-.0035	.0002	.0179	.0000	-.0008	.0010	.0001
Stddev	.0142	.0002	.0010	.0008	.0022	.0004	.0001	.0024	.0005
%RSD	25.28	.1444	26.94	355.1	12.06	2000.	9.156	246.0	607.1
#1	.0402	.1452	-.0046	.0006	.0186	-.0002	-.0008	.0005	.0003
#2	.0605	.1448	-.0032	.0008	.0155	.0005	-.0009	.0035	.0004
#3	.0674	.1452	-.0028	-.0007	.0196	-.0003	-.0007	-.0011	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29595-B-1 Acquired: 8/6/2018 14:42:12 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	-.0013	-.0014	.0005	.0331	-.0015	.0095
Stddev	.0001	.0001	.0002	.0008	.0058	.0036	.0001
%RSD	286.8	11.34	13.47	163.4	17.42	241.4	1.212
#1	.0001	-.0014	-.0012	.0008	.0308	-.0042	.0095
#2	-.0000	-.0013	-.0015	.0010	.0397	-.0029	.0096
#3	-.0000	-.0011	-.0015	-.0004	.0288	.0026	.0094

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3456.9	55002.	3976.1
Stddev	12.9	214.	37.2
%RSD	.37179	.38938	.93437
#1	3455.2	55158.	3992.4
#2	3470.4	54758.	4002.3
#3	3444.9	55091.	3933.5

Sample Name: MB 160-380005/1-A Acquired: 8/6/2018 14:46:57 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment: 380005/380006 PT

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0071	.0002	.0014	.0000	-.0000	-.0013	.0167	.0001
Stddev	.0007	.0126	.0010	.0010	.0002	.0000	.0013	.0005	.0001
%RSD	340.8	176.4	501.7	76.07	911.1	29.67	102.7	2.830	122.8
#1	.0004	.0214	-.0008	.0025	-.0000	-.0000	-.0028	.0168	.0001
#2	-.0009	.0021	.0003	.0005	-.0002	-.0000	-.0008	.0162	.0000
#3	-.0000	-.0022	.0011	.0011	.0003	-.0001	-.0003	.0171	.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0000	.0013	.0015	-.0465	-.0021	.0252	-.0000	.0000
Stddev	.0002	.0000	.0021	.0019	.0541	.0024	.0025	.0002	.0002
%RSD	41.30	113.0	160.6	128.3	116.5	112.8	10.06	320.2	531.8
#1	-.0004	.0000	.0036	-.0007	-.1055	-.0027	.0275	-.0001	-.0002
#2	-.0003	.0001	-.0001	.0027	-.0349	.0005	.0256	.0001	.0003
#3	-.0007	.0000	.0003	.0023	.0009	-.0042	.0225	-.0002	.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0267	.0001	.0126	-.0001	.0053	-.0011	-.0008	.0151	-.0002
Stddev	.0152	.0003	.0011	.0011	.0020	.0017	.0004	.0067	.0003
%RSD	56.97	413.3	8.705	1739.	36.98	151.5	48.02	44.51	167.2
#1	.0140	-.0001	.0125	.0011	.0068	.0008	-.0007	.0205	-.0005
#2	.0436	-.0001	.0138	-.0008	.0060	-.0024	-.0006	.0172	-.0002
#3	.0225	.0004	.0116	-.0006	.0031	-.0017	-.0013	.0076	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: MB 160-380005/1-A Acquired: 8/6/2018 14:46:57 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment: 380005/380006 PT

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	-.0016	.0001	-.0002	.0346	-.0026	.0004
Stddev	.0001	.0012	.0005	.0003	.0092	.0020	.0000
%RSD	36.09	73.93	907.6	203.3	26.68	75.48	9.093
#1	.0001	-.0018	.0005	-.0004	.0403	-.0006	.0004
#2	.0002	-.0003	.0001	.0002	.0240	-.0045	.0004
#3	.0002	-.0027	-.0005	-.0003	.0396	-.0028	.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3416.7	56351.	4148.4
Stddev	10.9	204.	32.1
%RSD	.31800	.36170	.77471
#1	3404.1	56524.	4141.1
#2	3422.5	56403.	4120.6
#3	3423.4	56127.	4183.6

Sample Name: LCS 160-380005/2-A Acquired: 8/6/2018 14:51:43 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2022	9.955	.9868	.2012	.9908	.0973	1.025	10.22	.9919
Stddev	.0020	.073	.0097	.0049	.0068	.0006	.009	.08	.0081
%RSD	.9679	.7320	.9849	2.455	.6831	.5679	.8884	.7451	.8186
#1	.2008	10.04	.9916	.2041	.9986	.0979	1.028	10.26	.9950
#2	.2015	9.922	.9932	.1955	.9865	.0972	1.032	10.27	.9980
#3	.2045	9.904	.9756	.2040	.9873	.0969	1.014	10.13	.9827

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.029	1.025	1.003	9.942	9.710	.1036	9.805	.9913	.5055
Stddev	.011	.009	.011	.051	.079	.0014	.077	.0059	.0043
%RSD	1.100	.9139	1.135	.5156	.8157	1.383	.7856	.5938	.8515
#1	1.033	1.030	1.009	9.999	9.793	.1041	9.874	.9974	.5069
#2	1.038	1.031	1.011	9.930	9.702	.1047	9.820	.9908	.5088
#3	1.017	1.014	.9902	9.899	9.636	.1020	9.722	.9857	.5006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.893	1.028	1.108	1.011	9.704	.4919	.5003	4.616	1.013
Stddev	.067	.009	.013	.007	.097	.0043	.0054	.006	.009
%RSD	.6780	.8290	1.149	.6958	1.002	.8797	1.088	.1283	.8363
#1	9.971	1.033	1.112	1.014	9.750	.4940	.5058	4.622	1.018
#2	9.855	1.034	1.118	1.016	9.769	.4948	.5003	4.614	1.019
#3	9.854	1.019	1.093	1.003	9.592	.4870	.4949	4.611	1.004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: LCS 160-380005/2-A Acquired: 8/6/2018 14:51:43 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.018	.9985	.9826	.2141	1.030	.9825	1.009
Stddev	.007	.0063	.0062	.0022	.014	.0048	.009
%RSD	.7404	.6322	.6312	1.006	1.374	.4886	.8962
#1	1.026	.9930	.9881	.2138	1.039	.9878	1.013
#2	1.016	.9973	.9838	.2164	1.014	.9811	1.016
#3	1.011	1.005	.9759	.2122	1.038	.9785	.9989

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3281.8	54418.	4046.5
Stddev	15.6	387.	17.2
%RSD	.47544	.71133	.42530
#1	3273.2	54709.	4028.5
#2	3272.4	54568.	4048.0
#3	3299.8	53979.	4062.9

Sample Name: 160-29429-A-1-A@5 Acquired: 8/6/2018 14:56:02 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1401	.4417	.0703	.2992	.0608	.0457	-.0004	.0149	.0918
Stddev	.0008	.0036	.0013	.0053	.0006	.0002	.0005	.0004	.0002
%RSD	.5692	.8081	1.849	1.768	.9172	.3848	124.8	2.492	.1891
#1	.1397	.4418	.0716	.2933	.0602	.0455	-.0007	.0144	.0916
#2	.1396	.4452	.0703	.3011	.0613	.0456	.0002	.0151	.0918
#3	.1410	.4381	.0690	.3033	.0610	.0459	-.0006	.0150	.0920

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0806	.0930	.0919	.6182	.0006	.0013	.0067	.3226	.0120
Stddev	.0004	.0003	.0001	.0042	.0134	.0010	.0024	.0015	.0001
%RSD	.4415	.3502	.1264	.6812	2068.	77.85	35.80	.4708	.9633
#1	.0806	.0934	.0920	.6192	-.0099	.0002	.0040	.3211	.0120
#2	.0809	.0928	.0918	.6218	-.0039	.0022	.0074	.3241	.0122
#3	.0802	.0929	.0918	.6136	.0158	.0014	.0086	.3227	.0119

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0401	.3595	.0006	.1103	.0073	.0463	.0361	.0271	-.0007
Stddev	.0121	.0004	.0004	.0015	.0014	.0028	.0038	.0044	.0002
%RSD	30.09	.1061	69.33	1.327	19.45	5.995	10.42	16.29	27.68
#1	.0491	.3597	.0001	.1097	.0075	.0442	.0330	.0221	-.0005
#2	.0448	.3596	.0007	.1119	.0058	.0495	.0403	.0288	-.0009
#3	.0264	.3590	.0009	.1091	.0086	.0453	.0350	.0305	-.0008

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-1-A@5 Acquired: 8/6/2018 14:56:02 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0770	-.0019	.0005	.0712	.0187	.0528	.1103
Stddev	.0002	.0012	.0003	.0011	.0227	.0019	.0003
%RSD	.2359	65.14	61.12	1.560	121.3	3.515	.3090
#1	.0770	-.0027	.0002	.0707	.0343	.0532	.1099
#2	.0768	-.0005	.0004	.0725	.0291	.0507	.1105
#3	.0772	-.0025	.0008	.0705	-.0073	.0544	.1105

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3454.4	55793.	3980.3
Stddev	6.4	108.	17.8
%RSD	.18557	.19380	.44746
#1	3447.2	55731.	3989.7
#2	3459.4	55918.	3959.7
#3	3456.7	55729.	3991.4

Sample Name: 160-29429-A-1-ASD@25 Acquired: 8/6/2018 15:00:39 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0291	.0982	.0151	.0703	.0126	.0093	-.0006	.0112	.0190
Stddev	.0005	.0013	.0013	.0026	.0003	.0001	.0002	.0001	.0002
%RSD	1.546	1.283	8.530	3.680	2.129	1.518	33.97	.9163	.9629
#1	.0297	.0981	.0139	.0730	.0123	.0095	-.0006	.0112	.0192
#2	.0289	.0996	.0150	.0700	.0125	.0093	-.0004	.0111	.0189
#3	.0288	.0971	.0164	.0678	.0129	.0092	-.0008	.0113	.0188

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0166	.0192	.0225	.1240	-.0214	.0000	.0213	.0667	.0028
Stddev	.0005	.0000	.0004	.0031	.0369	.0032	.0297	.0007	.0001
%RSD	2.727	.2345	1.837	2.490	172.8	12400.	139.5	.9985	2.767
#1	.0171	.0193	.0225	.1230	.0094	.0027	.0389	.0668	.0028
#2	.0162	.0192	.0221	.1275	-.0623	-.0035	-.0130	.0660	.0027
#3	.0164	.0192	.0229	.1215	-.0112	.0009	.0379	.0673	.0028

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0526	.0738	-.0021	.0233	.0061	.0105	.0067	.0026	-.0002
Stddev	.0145	.0006	.0025	.0010	.0024	.0007	.0017	.0113	.0002
%RSD	27.53	.7570	121.5	4.503	39.14	6.410	25.42	431.7	141.3
#1	.0646	.0744	-.0050	.0244	.0036	.0113	.0085	-.0103	-.0001
#2	.0365	.0733	-.0003	.0224	.0084	.0100	.0052	.0102	-.0004
#3	.0567	.0737	-.0010	.0231	.0063	.0103	.0063	.0079	.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-1-ASD@25 Acquired: 8/6/2018 15:00:39 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0159	-.0000	-.0007	.0137	.0232	.0104	.0231
Stddev	.0002	.0005	.0010	.0014	.0084	.0022	.0001
%RSD	1.053	1112.	136.1	10.37	36.20	21.08	.2695

#1	.0160	-.0003	-.0006	.0152	.0264	.0129	.0231
#2	.0157	-.0004	-.0018	.0136	.0295	.0087	.0232
#3	.0160	.0005	.0002	.0123	.0137	.0097	.0231

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3332.1	53598.	3902.9
Stddev	11.1	102.	9.6
%RSD	.33408	.19084	.24700

#1	3320.4	53486.	3906.9
#2	3333.5	53687.	3891.9
#3	3342.5	53619.	3909.9

Sample Name: 160-29429-A-1-B MS@5 Acquired: 8/6/2018 15:05:23 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1785	2.422	.2643	.3433	.2613	.0649	.2042	2.068	.2869
Stddev	.0007	.018	.0017	.0072	.0009	.0001	.0011	.005	.0009
%RSD	.3736	.7605	.6599	2.094	.3575	.1004	.5462	.2514	.3060
#1	.1791	2.433	.2656	.3494	.2611	.0650	.2054	2.074	.2879
#2	.1778	2.400	.2623	.3354	.2623	.0649	.2040	2.067	.2863
#3	.1785	2.432	.2650	.3450	.2605	.0649	.2032	2.064	.2864

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2840	.2951	.2887	2.609	1.925	.0187	1.999	.5185	.1103
Stddev	.0006	.0012	.0009	.004	.082	.0015	.013	.0007	.0004
%RSD	.2223	.3995	.3075	.1474	4.239	8.169	.6582	.1420	.3909
#1	.2847	.2965	.2897	2.605	1.845	.0205	2.013	.5177	.1107
#2	.2834	.2942	.2882	2.613	1.922	.0178	1.997	.5191	.1103
#3	.2839	.2947	.2881	2.611	2.008	.0178	1.987	.5186	.1098

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.032	.5604	.2121	.3109	1.911	.1436	.1339	.9318	.2006
Stddev	.007	.0007	.0015	.0004	.008	.0019	.0015	.0015	.0013
%RSD	.3319	.1195	.6958	.1178	.4192	1.306	1.121	.1571	.6394
#1	2.032	.5610	.2127	.3105	1.918	.1445	.1343	.9327	.2004
#2	2.039	.5597	.2131	.3112	1.903	.1448	.1351	.9301	.2020
#3	2.025	.5605	.2104	.3111	1.913	.1414	.1322	.9326	.1994

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-1-B MS@5 Acquired: 8/6/2018 15:05:23 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2799	.1954	.1933	.1130	.2061	.2495	.3098
Stddev	.0005	.0012	.0012	.0011	.0090	.0060	.0009
%RSD	.1898	.6001	.6097	.9748	4.387	2.391	.2744
#1	.2803	.1966	.1943	.1133	.1957	.2536	.3106
#2	.2801	.1953	.1920	.1139	.2122	.2427	.3089
#3	.2793	.1942	.1936	.1117	.2104	.2523	.3098

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3350.7	54442.	3930.3
Stddev	1.3	134.	24.8
%RSD	.03924	.24564	.63209
#1	3350.4	54291.	3958.1
#2	3352.1	54545.	3910.1
#3	3349.6	54490.	3922.8

Sample Name: 160-29429-A-1-CMSD@5 Acquired: 8/6/2018 15:09:54 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1741	2.400	.2589	.3408	.2579	.0640	.1999	2.007	.2802
Stddev	.0002	.013	.0015	.0052	.0009	.0003	.0007	.002	.0002
%RSD	.1277	.5542	.5909	1.530	.3453	.4811	.3588	.1019	.0616
#1	.1742	2.412	.2592	.3364	.2590	.0643	.1998	2.009	.2804
#2	.1741	2.404	.2603	.3465	.2576	.0638	.2006	2.007	.2801
#3	.1738	2.386	.2573	.3393	.2573	.0638	.1992	2.005	.2801

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2780	.2884	.2807	2.568	1.943	.0202	1.984	.5106	.1088
Stddev	.0007	.0002	.0022	.004	.013	.0005	.026	.0010	.0002
%RSD	.2469	.0703	.7814	.1723	.6832	2.390	1.318	.1973	.1717
#1	.2783	.2883	.2800	2.565	1.940	.0199	2.014	.5117	.1086
#2	.2784	.2886	.2832	2.573	1.957	.0207	1.968	.5103	.1089
#3	.2772	.2883	.2790	2.565	1.931	.0198	1.970	.5098	.1089

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.011	.5469	.2094	.3032	1.873	.1392	.1301	.9388	.1972
Stddev	.010	.0009	.0002	.0012	.004	.0010	.0018	.0018	.0007
%RSD	.5037	.1634	.0753	.3812	.2323	.7213	1.346	.1875	.3381
#1	2.020	.5478	.2094	.3045	1.876	.1382	.1320	.9408	.1977
#2	2.000	.5469	.2092	.3029	1.876	.1402	.1285	.9378	.1975
#3	2.014	.5460	.2096	.3022	1.868	.1393	.1297	.9377	.1964

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-1-CMSD@5 Acquired: 8/6/2018 15:09:54 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2756	.1922	.1931	.1105	.2058	.2460	.3024
Stddev	.0008	.0030	.0006	.0019	.0063	.0033	.0005
%RSD	.2909	1.548	.3176	1.709	3.063	1.348	.1594
#1	.2762	.1943	.1938	.1126	.2131	.2494	.3026
#2	.2759	.1936	.1925	.1093	.2021	.2460	.3027
#3	.2746	.1888	.1931	.1095	.2022	.2428	.3018

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3414.7	55356.	3937.2
Stddev	2.4	217.	14.9
%RSD	.06912	.39162	.37940
#1	3414.7	55178.	3925.0
#2	3417.1	55292.	3932.9
#3	3412.4	55598.	3953.9

Sample Name: 160-29429-A-3-A@5 Acquired: 8/6/2018 15:14:24 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	.0169	-.0001	.0366	.0004	-.0002	-.0002	.0090	-.0000
Stddev	.0007	.0051	.0008	.0031	.0004	.0001	.0019	.0004	.0001
%RSD	131.7	29.94	798.0	8.599	102.2	33.47	864.8	3.920	327.1
#1	.0001	.0228	.0005	.0399	.0002	-.0002	-.0015	.0086	.0001
#2	-.0004	.0143	.0003	.0361	.0008	-.0001	-.0011	.0093	-.0000
#3	-.0012	.0137	-.0010	.0337	.0001	-.0002	.0020	.0091	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	-.0001	.0043	-.0000	-.0159	-.0015	.0203	-.0001	.0001
Stddev	.0002	.0001	.0005	.0008	.0200	.0013	.0279	.0006	.0002
%RSD	79.87	90.77	11.06	6523.	125.8	86.75	137.5	394.9	283.1
#1	-.0000	-.0001	.0038	.0009	-.0331	-.0001	-.0116	-.0008	-.0000
#2	-.0005	-.0003	.0045	-.0007	.0060	-.0017	.0402	.0001	.0003
#3	-.0004	-.0000	.0047	-.0002	-.0206	-.0027	.0323	.0003	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0748	.0001	-.0040	.0009	.0036	-.0009	-.0007	.2241	.2991
Stddev	.0155	.0002	.0015	.0005	.0027	.0001	.0018	.0051	.0019
%RSD	20.78	288.4	38.16	63.46	76.56	13.18	252.3	2.283	.6312
#1	.0662	-.0001	-.0023	.0004	.0067	-.0009	-.0017	.2294	.3009
#2	.0927	.0003	-.0043	.0008	.0023	-.0008	.0014	.2238	.2991
#3	.0654	.0001	-.0053	.0014	.0018	-.0011	-.0019	.2191	.2971

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-3-A@5 Acquired: 8/6/2018 15:14:24 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0000	.0430	-.0005	.0191	-.0033	.0004
Stddev	.0001	.0015	.0006	.0008	.0114	.0025	.0001
%RSD	91.68	7801.	1.397	165.2	59.39	74.08	26.81
#1	.0000	-.0008	.0423	-.0013	.0164	-.0007	.0004
#2	.0002	-.0011	.0433	-.0004	.0094	-.0038	.0003
#3	.0000	.0017	.0434	.0002	.0316	-.0055	.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3322.1	53564.	3839.6
Stddev	34.2	195.	32.2
%RSD	1.0295	.36448	.83851
#1	3304.6	53736.	3867.4
#2	3300.3	53606.	3804.3
#3	3361.6	53352.	3847.1

Sample Name: CCVL Acquired: 8/6/2018 15:19:11 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0099	.2034	.0097	.0990	.0495	.0047	.2076	1.039	.0049
Stddev	.0003	.0144	.0006	.0050	.0009	.0001	.0015	.010	.0001
%RSD	3.509	7.102	5.738	5.058	1.755	2.151	.7050	.9278	1.068
#1	.0095	.2045	.0094	.1033	.0505	.0048	.2062	1.029	.0049
#2	.0099	.2173	.0094	.0935	.0490	.0046	.2074	1.048	.0048
#3	.0102	.1885	.0104	.1002	.0489	.0048	.2091	1.041	.0049

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0521	.0105	.0267	.0987	4.868	.0477	1.011	.0151	.0404
Stddev	.0006	.0002	.0018	.0028	.075	.0023	.010	.0003	.0004
%RSD	1.156	2.376	6.815	2.787	1.549	4.882	.9577	2.107	.9160
#1	.0514	.0103	.0250	.1001	4.953	.0459	1.022	.0155	.0399
#2	.0524	.0108	.0286	.0956	4.842	.0503	1.009	.0151	.0404
#3	.0524	.0103	.0266	.1005	4.810	.0468	1.003	.0149	.0407

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.019	.0421	.2697	.0109	4.869	.0092	.0129	.3658	.1024
Stddev	.003	.0003	.0018	.0006	.045	.0011	.0007	.0050	.0004
%RSD	.2914	.8214	.6520	5.363	.9294	12.20	5.788	1.376	.3861
#1	1.022	.0418	.2686	.0112	4.819	.0104	.0131	.3714	.1019
#2	1.018	.0421	.2717	.0112	4.907	.0092	.0136	.3644	.1026
#3	1.016	.0424	.2687	.0102	4.882	.0081	.0121	.3616	.1026

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCVL Acquired: 8/6/2018 15:19:11 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0051	.1973	.0193	.0211	.4654	.0508	.0212
Stddev	.0001	.0035	.0007	.0003	.0157	.0060	.0002
%RSD	2.084	1.761	3.392	1.603	3.370	11.84	.8067

#1	.0050	.1936	.0194	.0212	.4742	.0534	.0212
#2	.0052	.1978	.0186	.0213	.4473	.0440	.0214
#3	.0050	.2005	.0199	.0207	.4747	.0551	.0211

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3280.1	53956.	3895.0
Stddev	22.5	215.	24.6
%RSD	.68574	.39771	.63124

#1	3305.3	54201.	3867.5
#2	3262.0	53799.	3902.7
#3	3273.0	53870.	3914.9

Sample Name: CCV Acquired: 8/6/2018 15:23:55 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9900	50.44	5.148	.9951	5.031	5.016	5.180	51.07	5.127
Stddev	.0013	.48	.013	.0068	.057	.055	.009	.05	.008
%RSD	.1285	.9497	.2611	.6866	1.130	1.086	.1770	.1043	.1554

#1	.9908	50.99	5.144	1.001	5.095	5.079	5.186	51.04	5.132
#2	.9885	50.23	5.163	.9965	5.007	4.987	5.185	51.13	5.131
#3	.9907	50.10	5.136	.9876	4.989	4.983	5.170	51.04	5.118

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.139	5.158	5.127	49.72	50.35	5.067	49.71	4.945	1.035
Stddev	.006	.009	.016	.61	.59	.054	.57	.047	.001
%RSD	.1118	.1674	.3105	1.223	1.175	1.059	1.142	.9455	.0795

#1	5.141	5.157	5.136	50.42	51.03	5.128	50.36	4.999	1.035
#2	5.143	5.167	5.137	49.40	50.07	5.044	49.43	4.917	1.035
#3	5.133	5.150	5.109	49.34	49.95	5.028	49.33	4.919	1.034

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	50.41	5.122	54.94	5.111	51.92	1.039	1.038	4.966	5.178
Stddev	.52	.007	.09	.006	.10	.002	.003	.038	.004
%RSD	1.032	.1344	.1697	.1128	.1917	.1685	.2495	.7728	.0837

#1	51.00	5.123	54.95	5.111	51.94	1.038	1.040	5.010	5.181
#2	50.21	5.129	55.02	5.118	52.01	1.038	1.037	4.947	5.180
#3	50.02	5.115	54.84	5.106	51.81	1.041	1.035	4.941	5.173

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/6/2018 15:23:55 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.131	5.037	4.998	1.051	5.055	4.994	5.181
Stddev	.052	.002	.053	.001	.014	.036	.008
%RSD	1.011	.0318	1.058	.1335	.2696	.7308	.1475
#1	5.191	5.039	5.059	1.051	5.046	5.036	5.183
#2	5.109	5.036	4.974	1.053	5.047	4.973	5.188
#3	5.095	5.037	4.961	1.050	5.070	4.973	5.173

Check ? Chk Pass Chk Pass Chk Pass Chk Pass None Chk Pass Chk Pass
Value
Range

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3076.3	51285.	3815.8
Stddev	5.0	216.	39.2
%RSD	.16140	.42102	1.0266
#1	3077.9	51372.	3775.1
#2	3080.2	51444.	3818.9
#3	3070.7	51039.	3853.3

Sample Name: CCB Acquired: 8/6/2018 15:28:11 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	.0189	.0014	.0065	.0002	.0002	-.0007	.0032	.0001
Stddev	.0008	.0097	.0012	.0083	.0001	.0002	.0004	.0002	.0000
%RSD	150.8	51.42	84.11	127.9	49.30	137.4	58.43	6.952	45.56
#1	-.0002	.0302	.0026	.0107	.0001	.0004	-.0009	.0034	.0001
#2	-.0014	.0130	.0002	-.0031	.0003	.0000	-.0009	.0029	.0000
#3	.0000	.0137	.0016	.0119	.0002	.0000	-.0002	.0032	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0001	.0014	.0028	.0419	.0013	.0108	-.0001	.0005
Stddev	.0002	.0001	.0001	.0016	.0261	.0008	.0227	.0013	.0000
%RSD	250.6	86.72	6.297	56.40	62.24	59.59	209.8	1373.	8.214
#1	.0002	.0000	.0014	.0012	.0157	.0020	.0343	.0013	.0004
#2	-.0003	.0002	.0015	.0029	.0421	.0015	-.0111	-.0013	.0005
#3	-.0001	.0001	.0014	.0044	.0679	.0005	.0093	-.0003	.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0435	.0002	-.0003	.0005	.0051	-.0005	-.0016	-.0019	-.0003
Stddev	.0138	.0004	.0023	.0012	.0013	.0016	.0017	.0012	.0002
%RSD	31.76	234.9	764.0	226.3	26.05	350.6	105.8	63.91	60.23
#1	.0582	.0005	-.0029	.0018	.0054	-.0013	-.0016	-.0032	-.0004
#2	.0308	-.0003	.0014	.0003	.0037	.0014	.0001	-.0008	-.0001
#3	.0416	.0003	.0006	-.0005	.0064	-.0015	-.0034	-.0016	-.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/6/2018 15:28:11 Type: QC
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0015	.0009	.0012	.0174	-.0036	.0004
Stddev	.0003	.0005	.0009	.0006	.0099	.0009	.0000
%RSD	215.6	30.78	94.45	50.04	56.53	25.46	8.052

#1	.0004	.0010	.0001	.0007	.0064	-.0035	.0004
#2	-.0002	.0018	.0008	.0018	.0253	-.0046	.0004
#3	.0002	.0018	.0019	.0010	.0207	-.0028	.0005

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3335.7	53081.	3836.7
Stddev	30.4	148.	16.5
%RSD	.91157	.27906	.43080

#1	3305.0	53242.	3838.1
#2	3365.8	53052.	3852.5
#3	3336.3	52950.	3819.6

Sample Name: 160-29429-A-7-A@5 Acquired: 8/6/2018 15:32:58 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	-.0014	.0013	.0067	.0002	-.0001	-.0010	2.861	-.0000
Stddev	.0002	.0032	.0008	.0062	.0002	.0001	.0010	.015	.0001
%RSD	29.42	238.0	59.98	93.12	125.6	120.7	101.1	.5331	345.0
#1	-.0004	-.0036	.0005	.0100	.0003	-.0001	-.0018	2.861	-.0001
#2	-.0007	-.0028	.0013	-.0005	.0002	.0000	-.0013	2.876	.0001
#3	-.0005	.0024	.0020	.0106	-.0001	-.0002	.0001	2.845	-.0002

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	.0001	.0029	-.0005	5.573	.0007	6.960	.0003	.0000
Stddev	.0003	.0001	.0003	.0020	.084	.0006	.071	.0000	.0002
%RSD	103.0	117.7	8.757	411.1	1.501	79.32	1.021	15.65	489.9
#1	-.0006	.0001	.0031	.0012	5.556	.0013	6.886	.0002	.0002
#2	-.0005	-.0000	.0031	.0000	5.664	.0002	7.028	.0003	.0000
#3	.0001	.0002	.0026	-.0028	5.500	.0006	6.965	.0002	-.0001

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	12.30	.0004	-.0013	.0002	.0054	.0005	-.0015	.0021	-.0003
Stddev	.01	.0001	.0007	.0001	.0012	.0018	.0010	.0031	.0002
%RSD	.1146	35.67	53.88	34.43	22.22	382.5	70.93	148.1	72.75
#1	12.32	.0005	-.0005	.0001	.0061	-.0005	-.0020	.0028	-.0005
#2	12.30	.0004	-.0014	.0002	.0040	.0026	-.0003	-.0013	-.0001
#3	12.29	.0002	-.0018	.0003	.0061	-.0006	-.0021	.0049	-.0003

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: 160-29429-A-7-A@5 Acquired: 8/6/2018 15:32:58 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0013	-.0013	-.0010	.0001	.0320	-.0006	.0003
Stddev	.0001	.0013	.0005	.0001	.0048	.0029	.0001
%RSD	6.874	99.09	54.68	239.9	15.13	469.4	32.39
#1	.0014	-.0025	-.0016	.0001	.0312	-.0024	.0002
#2	.0012	-.0015	-.0006	.0001	.0276	-.0022	.0004
#3	.0013	.0001	-.0007	-.0001	.0371	.0028	.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3397.4	54326.	3902.1
Stddev	13.7	41.	11.5
%RSD	.40242	.07541	.29565
#1	3405.6	54359.	3894.1
#2	3381.6	54280.	3915.3
#3	3405.0	54339.	3896.9

Sample Name: 160-29429-A-21-A@5 Acquired: 8/6/2018 15:37:44 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0006	.0057	.0004	.0040	.0001	-0.0001	-0.0016	.0105	-0.0000
Stddev	.0003	.0024	.0005	.0014	.0002	.0001	.0004	.0004	.0001
%RSD	51.19	43.07	114.6	35.15	141.9	96.93	22.29	3.576	520.6
#1	-0.0002	.0034	.0005	.0024	-0.0000	-0.0001	-0.0020	.0101	-0.0001
#2	-0.0008	.0054	-0.0001	.0051	.0001	-0.0003	-0.0015	.0108	-0.0001
#3	-0.0007	.0082	.0008	.0045	.0003	-0.0000	-0.0013	.0105	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0003	.0002	.0002	.0002	.0027	.0006	.0250	-0.0000	-0.0001
Stddev	.0002	.0001	.0005	.0018	.0303	.0015	.0058	.0002	.0004
%RSD	69.54	44.26	247.4	994.3	1123.	249.9	22.98	1235.	455.3
#1	-0.0001	.0002	.0002	-0.0018	-0.0311	.0023	.0184	.0001	-0.0004
#2	-0.0004	.0001	.0006	.0018	.0274	.0003	.0282	-0.0003	-0.0002
#3	-0.0003	.0003	-0.0003	.0006	.0117	-0.0007	.0285	.0001	.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	35.73	.0072	.0006	-0.0249	.0049	-0.0013	-0.0016	F 20.05	-0.0004
Stddev	.05	.0001	.0010	.0007	.0013	.0009	.0013	.10	.0005
%RSD	.1424	1.474	179.4	2.696	27.35	65.14	77.88	.4760	110.0
#1	35.69	.0073	.0012	-0.0244	.0063	-0.0003	-0.0030	20.01	-0.0008
#2	35.79	.0071	.0011	-0.0256	.0037	-0.0020	-0.0013	20.15	-0.0007
#3	35.72	.0071	-0.0006	-0.0247	.0046	-0.0017	-0.0006	19.97	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Fail Chk Pass
High Limit
Low Limit

10.00
-500.0

Sample Name: 160-29429-A-21-A@5 Acquired: 8/6/2018 15:37:44 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	-.0024	.0017	.0007	.0043	-.0013	.0003
Stddev	.0002	.0026	.0012	.0008	.0144	.0012	.0000
%RSD	1593.	106.4	70.89	118.6	335.9	90.66	8.886
#1	-.0001	-.0027	.0019	.0002	-.0112	-.0024	.0003
#2	-.0001	.0003	.0028	.0017	.0173	-.0015	.0003
#3	.0002	-.0048	.0004	.0003	.0068	-.0000	.0003

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3355.9	53424.	3841.3
Stddev	16.7	586.	26.2
%RSD	.49716	1.0966	.68077
#1	3375.1	52780.	3871.2
#2	3347.7	53925.	3822.4
#3	3345.0	53566.	3830.4

Sample Name: 160-29429-A-22-A@5 Acquired: 8/6/2018 15:42:30 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0025	.0003	.0076	.0002	-.0001	-.0016	.0084	-.0001
Stddev	.0003	.0121	.0002	.0006	.0001	.0001	.0020	.0002	.0001
%RSD	238.5	490.1	48.84	7.488	25.09	108.3	126.0	2.277	145.5
#1	-.0002	.0142	.0002	.0075	.0002	-.0002	-.0036	.0082	-.0002
#2	.0004	-.0100	.0005	.0070	.0001	-.0001	.0003	.0084	-.0001
#3	.0003	.0032	.0002	.0081	.0002	-.0000	-.0013	.0086	.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0001	.0019	.0003	-.0145	.0307	.0310	-.0004	.0003
Stddev	.0001	.0000	.0011	.0033	.0684	.0021	.0380	.0005	.0003
%RSD	47.61	31.57	58.85	1232.	470.5	6.767	122.9	131.0	112.0
#1	-.0002	.0001	.0012	-.0034	.0322	.0296	-.0079	.0001	-.0001
#2	-.0002	.0002	.0013	.0014	.0172	.0331	.0328	-.0003	.0006
#3	-.0004	.0002	.0032	.0028	-.0931	.0294	.0681	-.0010	.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0307	-.0001	-.0014	.0007	.0034	.0005	-.0016	.0149	-.0009
Stddev	.0121	.0001	.0006	.0004	.0006	.0022	.0016	.0041	.0006
%RSD	39.40	182.3	38.86	57.84	18.21	485.2	100.0	27.40	68.50
#1	.0364	-.0002	-.0021	.0005	.0027	.0027	-.0007	.0124	-.0011
#2	.0168	.0000	-.0011	.0012	.0039	.0004	-.0034	.0126	-.0002
#3	.0388	.0000	-.0011	.0005	.0036	-.0017	-.0006	.0196	-.0014

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-22-A@5 Acquired: 8/6/2018 15:42:30 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	-.0022	.0003	.0007	.0053	-.0028	.0004
Stddev	.0001	.0016	.0009	.0011	.0111	.0030	.0001
%RSD	84.58	74.35	315.1	153.2	210.0	106.7	31.85
#1	-.0000	-.0017	-.0008	-.0002	-.0067	-.0002	.0002
#2	-.0002	-.0040	.0007	.0004	.0151	-.0061	.0004
#3	-.0001	-.0009	.0009	.0019	.0075	-.0022	.0005

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3378.7	53779.	3903.7
Stddev	14.8	231.	61.6
%RSD	.43903	.42881	1.5771
#1	3368.1	54034.	3973.9
#2	3372.4	53586.	3878.4
#3	3395.6	53717.	3858.9

Sample Name: 160-29429-A-1-A@10 Acquired: 8/6/2018 15:47:18 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0716	.2359	.0342	.1557	.0312	.0233	.0014	.0087	.0461
Stddev	.0008	.0123	.0009	.0059	.0004	.0002	.0014	.0005	.0002
%RSD	1.076	5.211	2.608	3.790	1.243	.7757	100.0	5.505	.4828
#1	.0718	.2273	.0335	.1494	.0308	.0233	.0011	.0086	.0462
#2	.0722	.2304	.0340	.1612	.0312	.0231	.0002	.0092	.0463
#3	.0707	.2499	.0352	.1565	.0316	.0235	.0030	.0082	.0458

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0402	.0467	.0470	.3152	-.0047	-.0019	.0420	.1647	.0060
Stddev	.0005	.0003	.0020	.0026	.0360	.0023	.0302	.0008	.0003
%RSD	1.140	.5507	4.254	.8252	759.4	122.7	71.86	.5038	4.602
#1	.0405	.0469	.0493	.3163	-.0211	-.0040	.0589	.1656	.0061
#2	.0404	.0467	.0457	.3123	-.0296	-.0022	.0072	.1639	.0062
#3	.0397	.0464	.0460	.3171	.0365	.0006	.0599	.1647	.0057

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0431	.1804	.0007	.0547	.0044	.0227	.0158	.0124	-.0001
Stddev	.0139	.0005	.0010	.0005	.0007	.0016	.0009	.0059	.0005
%RSD	32.18	.2825	143.5	.8499	15.83	6.867	5.433	47.99	499.4
#1	.0287	.1810	-.0005	.0550	.0052	.0244	.0148	.0140	-.0006
#2	.0563	.1800	.0013	.0550	.0039	.0221	.0163	.0058	.0005
#3	.0444	.1803	.0013	.0542	.0042	.0215	.0162	.0173	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-1-A@10 Acquired: 8/6/2018 15:47:18 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0391	-.0007	-.0004	.0347	.0201	.0258	.0555
Stddev	.0003	.0023	.0007	.0011	.0134	.0022	.0002
%RSD	.6715	328.3	193.7	3.233	66.52	8.339	.3819
#1	.0393	-.0028	-.0010	.0360	.0158	.0244	.0558
#2	.0388	.0017	.0004	.0341	.0351	.0283	.0554
#3	.0391	-.0010	-.0004	.0340	.0094	.0248	.0555

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3433.8	54689.	3894.9
Stddev	5.5	417.	39.9
%RSD	.15874	.76207	1.0243
#1	3429.3	54247.	3860.2
#2	3439.9	54744.	3938.5
#3	3432.3	55076.	3886.0

Sample Name: 160-29429-A-1-ASD@50 Acquired: 8/6/2018 15:52:00 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0140	.0532	.0070	.0356	.0061	.0046	-.0002	.0109	.0090
Stddev	.0006	.0120	.0010	.0041	.0004	.0002	.0016	.0006	.0001
%RSD	4.222	22.56	14.96	11.56	6.495	4.205	775.1	5.394	1.117
#1	.0134	.0471	.0071	.0397	.0060	.0044	.0006	.0105	.0089
#2	.0146	.0670	.0079	.0315	.0058	.0046	-.0020	.0116	.0091
#3	.0140	.0454	.0059	.0357	.0066	.0048	.0007	.0107	.0090

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0078	.0092	.0116	.0712	.0218	.0012	.0173	.0325	.0011
Stddev	.0001	.0001	.0012	.0043	.0666	.0009	.0340	.0003	.0001
%RSD	1.672	.8294	10.04	6.083	305.1	69.00	196.8	1.059	10.91
#1	.0078	.0092	.0114	.0668	.0590	.0003	.0279	.0322	.0010
#2	.0076	.0093	.0105	.0715	.0616	.0015	.0447	.0325	.0012
#3	.0079	.0091	.0128	.0754	-.0551	.0019	-.0208	.0329	.0011

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0203	.0355	-.0014	.0117	.0042	.0055	.0026	.0026	-.0002
Stddev	.0027	.0002	.0002	.0010	.0014	.0002	.0004	.0033	.0006
%RSD	13.42	.6563	13.22	8.419	33.38	2.756	15.08	129.9	332.6
#1	.0232	.0354	-.0012	.0128	.0057	.0057	.0027	.0062	-.0006
#2	.0200	.0354	-.0014	.0109	.0041	.0054	.0030	.0019	-.0005
#3	.0178	.0358	-.0016	.0115	.0029	.0055	.0022	-.0004	.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-1-ASD@50 Acquired: 8/6/2018 15:52:00 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0077	-.0022	-.0010	.0082	.0211	.0044	.0113
Stddev	.0002	.0022	.0012	.0009	.0111	.0013	.0001
%RSD	2.203	101.3	119.5	10.64	52.36	29.24	1.231
#1	.0078	.0004	.0004	.0073	.0088	.0050	.0113
#2	.0078	-.0035	-.0015	.0084	.0243	.0029	.0114
#3	.0075	-.0034	-.0018	.0090	.0302	.0052	.0112

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3421.5	54250.	3871.4
Stddev	7.8	425.	19.0
%RSD	.22761	.78363	.48957
#1	3412.5	53952.	3863.3
#2	3425.2	54737.	3857.9
#3	3426.6	54060.	3893.1

Sample Name: 160-29429-A-1-BMS@10 Acquired: 8/6/2018 15:56:47 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0934	1.241	.1341	.1795	.1373	.0332	.1046	1.048	.1458
Stddev	.0006	.015	.0007	.0044	.0005	.0001	.0014	.005	.0002
%RSD	.6010	1.185	.4996	2.437	.3648	.2726	1.347	.4494	.1198

#1	.0937	1.224	.1347	.1771	.1379	.0333	.1030	1.047	.1457
#2	.0936	1.249	.1334	.1769	.1369	.0331	.1052	1.053	.1460
#3	.0927	1.251	.1343	.1846	.1373	.0333	.1057	1.044	.1457

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1442	.1496	.1501	1.344	.9934	.0098	1.000	.2668	.0556
Stddev	.0005	.0005	.0012	.005	.0397	.0010	.004	.0014	.0003
%RSD	.3485	.3456	.7775	.3881	3.992	10.54	.4349	.5154	.4943

#1	.1446	.1495	.1506	1.344	.9670	.0089	.9952	.2683	.0559
#2	.1443	.1501	.1488	1.349	.9741	.0109	1.003	.2657	.0554
#3	.1436	.1490	.1510	1.339	1.039	.0096	1.002	.2664	.0554

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.043	.2865	.1092	.1580	.9745	.0729	.0662	.4748	.1017
Stddev	.010	.0011	.0017	.0007	.0046	.0022	.0010	.0048	.0009
%RSD	.9640	.3935	1.533	.4690	.4724	2.955	1.582	1.007	.8936

#1	1.036	.2864	.1074	.1574	.9780	.0704	.0653	.4694	.1008
#2	1.054	.2876	.1096	.1588	.9763	.0737	.0674	.4784	.1026
#3	1.039	.2854	.1106	.1578	.9693	.0745	.0660	.4766	.1016

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-1-BMS@10 Acquired: 8/6/2018 15:56:47 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1438	.1014	.0992	.0572	.1350	.1250	.1575
Stddev	.0002	.0013	.0007	.0009	.0100	.0019	.0004
%RSD	.1402	1.233	.6707	1.549	7.435	1.544	.2821
#1	.1438	.1025	.0991	.0563	.1395	.1227	.1576
#2	.1437	.1000	.0986	.0573	.1419	.1259	.1579
#3	.1441	.1018	.0999	.0581	.1235	.1262	.1570

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3389.8	54106.	3932.4
Stddev	18.5	247.	26.2
%RSD	.54666	.45592	.66620
#1	3388.3	54003.	3903.4
#2	3372.0	53927.	3939.8
#3	3409.0	54388.	3954.2

Sample Name: 160-29429-A-1CMSD@10 Acquired: 8/6/2018 16:01:21 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0889	1.193	.1298	.1704	.1336	.0325	.1005	1.006	.1412
Stddev	.0009	.006	.0002	.0031	.0002	.0000	.0010	.001	.0002
%RSD	1.047	.5290	.1746	1.833	.1579	.0797	1.009	.0942	.1439
#1	.0900	1.185	.1300	.1722	.1333	.0324	.1016	1.007	.1412
#2	.0885	1.196	.1299	.1723	.1336	.0325	.0997	1.006	.1414
#3	.0883	1.196	.1296	.1668	.1337	.0325	.1002	1.006	.1410

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1403	.1443	.1452	1.321	.9851	.0098	1.016	.2602	.0545
Stddev	.0009	.0003	.0005	.004	.0113	.0021	.005	.0004	.0002
%RSD	.6106	.2055	.3665	.2937	1.152	21.41	.5328	.1380	.3466
#1	.1412	.1446	.1453	1.318	.9741	.0074	1.015	.2602	.0543
#2	.1403	.1443	.1456	1.325	.9843	.0112	1.012	.2606	.0545
#3	.1395	.1441	.1446	1.319	.9967	.0108	1.022	.2599	.0546

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.026	.2761	.1058	.1533	.9473	.0693	.0645	.4674	.1003
Stddev	.005	.0007	.0003	.0004	.0012	.0009	.0026	.0128	.0005
%RSD	.5060	.2497	.2801	.2405	.1274	1.252	4.096	2.733	.4827
#1	1.022	.2768	.1062	.1533	.9468	.0684	.0630	.4532	.1000
#2	1.024	.2761	.1058	.1536	.9487	.0701	.0675	.4779	.1001
#3	1.032	.2755	.1056	.1529	.9465	.0692	.0629	.4710	.1009

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-1CMSD@10 Acquired: 8/6/2018 16:01:21 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1397	.0970	.0970	.0550	.1271	.1229	.1525
Stddev	.0005	.0021	.0022	.0004	.0099	.0027	.0004
%RSD	.3863	2.176	2.292	.7528	7.815	2.203	.2399
#1	.1398	.0952	.0995	.0554	.1370	.1258	.1526
#2	.1402	.0994	.0957	.0546	.1171	.1224	.1528
#3	.1392	.0965	.0957	.0552	.1273	.1205	.1521

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3443.6	54370.	3919.5
Stddev	8.0	20.	5.6
%RSD	.23365	.03731	.14351
#1	3434.4	54346.	3913.7
#2	3448.0	54378.	3919.9
#3	3448.6	54384.	3925.0

Sample Name: 160-29429-A-3-A@10 Acquired: 8/6/2018 16:05:54 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0011	.0040	-.0001	.0181	-.0000	-.0001	-.0017	.0073	-.0001
Stddev	.0005	.0143	.0012	.0074	.0001	.0001	.0009	.0003	.0002
%RSD	41.69	360.3	1843.	41.06	447.6	117.1	51.61	4.037	197.0
#1	-.0009	.0154	-.0014	.0179	.0000	-.0002	-.0014	.0073	-.0001
#2	-.0007	.0086	.0011	.0256	.0000	-.0000	-.0011	.0070	.0001
#3	-.0016	-.0120	.0000	.0108	-.0001	-.0000	-.0028	.0076	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	-.0000	.0029	-.0008	.0471	.0001	.0296	-.0006	.0001
Stddev	.0003	.0002	.0009	.0029	.0424	.0005	.0361	.0002	.0002
%RSD	219.4	503.0	30.76	367.8	90.06	608.9	122.0	27.02	213.3
#1	-.0000	-.0000	.0026	-.0018	.0300	.0007	.0405	-.0004	-.0000
#2	.0001	-.0002	.0040	-.0030	.0159	-.0002	.0589	-.0006	-.0000
#3	-.0005	.0001	.0022	.0025	.0954	-.0002	-.0107	-.0007	.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0236	-.0000	-.0010	.0005	.0034	.0000	-.0017	.1029	.1474
Stddev	.0075	.0001	.0015	.0003	.0012	.0009	.0015	.0056	.0008
%RSD	31.96	332.4	155.2	50.98	33.91	2891.	87.28	5.454	.5698
#1	.0196	-.0001	-.0016	.0002	.0037	-.0010	-.0027	.1093	.1483
#2	.0188	-.0000	-.0020	.0007	.0022	.0008	-.0024	.0995	.1466
#3	.0322	.0000	.0008	.0007	.0045	.0003	.0000	.0997	.1472

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-3-A@10 Acquired: 8/6/2018 16:05:54 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	.0002	.0215	.0001	.0250	-.0012	.0003
Stddev	.0002	.0017	.0010	.0013	.0178	.0014	.0001
%RSD	524.9	945.7	4.704	1146.	71.32	114.8	20.38
#1	.0000	.0001	.0221	.0016	.0442	-.0027	.0004
#2	.0001	.0020	.0221	-.0010	.0218	-.0000	.0003
#3	-.0002	-.0015	.0204	-.0002	.0090	-.0009	.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3400.2	53789.	3873.3
Stddev	7.3	287.	10.7
%RSD	.21596	.53363	.27583
#1	3393.1	53797.	3862.5
#2	3407.8	53498.	3883.9
#3	3399.8	54072.	3873.5

Sample Name: 160-29429-A-7-A@10 Acquired: 8/6/2018 16:10:41 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	-.0092	.0003	.0001	.0001	-.0001	-.0011	1.467	-.0002
Stddev	.0001	.0085	.0015	.0064	.0002	.0000	.0023	.002	.0000
%RSD	38.60	92.42	430.1	4961.	138.1	79.92	214.0	.1342	24.52
#1	-.0004	-.0130	-.0010	.0045	.0004	-.0000	-.0033	1.465	-.0002
#2	-.0003	-.0152	.0019	.0032	.0001	-.0001	.0013	1.468	-.0001
#3	-.0002	.0005	.0001	-.0073	-.0000	-.0000	-.0012	1.469	-.0001

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	.0000	.0037	-.0004	2.840	-.0012	3.558	.0001	.0002
Stddev	.0001	.0001	.0007	.0028	.039	.0004	.022	.0003	.0001
%RSD	42.00	264.1	19.45	787.3	1.356	35.44	.6193	387.6	38.10
#1	-.0004	.0001	.0045	.0028	2.881	-.0007	3.567	.0004	.0001
#2	-.0002	.0001	.0035	-.0016	2.834	-.0014	3.533	.0001	.0002
#3	-.0004	-.0001	.0031	-.0023	2.805	-.0014	3.574	-.0003	.0003

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	6.246	.0001	-.0014	.0012	.0049	.0009	-.0016	-.0027	-.0002
Stddev	.001	.0003	.0012	.0004	.0011	.0019	.0000	.0013	.0007
%RSD	.0192	281.6	85.04	34.34	22.84	205.0	1.249	46.77	344.2
#1	6.247	-.0001	-.0003	.0015	.0051	-.0009	-.0016	-.0014	.0004
#2	6.245	.0004	-.0013	.0007	.0037	.0007	-.0016	-.0028	-.0010
#3	6.246	.0000	-.0027	.0013	.0060	.0029	-.0016	-.0039	.0000

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: 160-29429-A-7-A@10 Acquired: 8/6/2018 16:10:41 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006	-.0008	.0012	.0005	.0233	-.0010	.0003
Stddev	.0001	.0008	.0009	.0008	.0038	.0036	.0000
%RSD	8.942	103.2	79.55	157.9	16.09	362.9	2.013
#1	.0006	.0000	.0001	.0008	.0204	.0030	.0003
#2	.0007	-.0008	.0019	.0012	.0276	-.0020	.0003
#3	.0006	-.0016	.0014	-.0004	.0221	-.0039	.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3375.0	54318.	3891.9
Stddev	7.5	195.	16.4
%RSD	.22231	.35928	.42177
#1	3383.7	54388.	3887.2
#2	3370.3	54098.	3878.4
#3	3371.1	54469.	3910.2

Sample Name: 160-29429-A-21-A@10 Acquired: 8/6/2018 16:15:27 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0009	.0144	.0007	-.0000	-.0000	-.0001	-.0016	.0078	-.0000
Stddev	.0010	.0089	.0007	.0065	.0003	.0001	.0006	.0002	.0002
%RSD	110.8	61.43	100.9	20580.	735.5	151.4	35.82	3.102	2488.
#1	-.0004	.0244	.0001	-.0038	.0003	-.0001	-.0020	.0078	-.0002
#2	-.0003	.0076	.0015	-.0037	-.0002	.0000	-.0017	.0076	.0002
#3	-.0021	.0112	.0005	.0075	-.0002	-.0002	-.0009	.0081	.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0001	.0020	-.0017	.0144	.0003	.0348	-.0004	-.0002
Stddev	.0001	.0000	.0012	.0035	.0365	.0024	.0280	.0002	.0002
%RSD	32.70	32.75	59.89	213.2	254.0	945.5	80.44	54.43	120.8
#1	-.0002	.0002	.0025	-.0055	.0505	.0026	.0481	-.0002	-.0003
#2	-.0004	.0001	.0006	-.0008	.0151	.0004	.0537	-.0004	.0001
#3	-.0004	.0001	.0029	.0014	-.0225	-.0022	.0026	-.0007	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	17.94	.0035	-.0009	-.0131	.0030	-.0011	-.0000	9.999	-.0008
Stddev	.07	.0001	.0011	.0006	.0007	.0007	.0021	.009	.0004
%RSD	.3851	2.689	121.5	4.600	22.83	63.48	4308.	.0948	47.78
#1	18.02	.0034	.0003	-.0138	.0032	-.0004	.0005	10.01	-.0006
#2	17.89	.0034	-.0018	-.0127	.0023	-.0012	.0017	9.991	-.0012
#3	17.91	.0036	-.0012	-.0127	.0036	-.0018	-.0024	9.996	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-21-A@10 Acquired: 8/6/2018 16:15:27 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	-.0020	.0012	.0011	.0255	.0001	.0003
Stddev	.0001	.0013	.0004	.0003	.0167	.0030	.0001
%RSD	1538.	63.39	32.41	26.51	65.34	3891.	30.79
#1	-.0001	-.0006	.0012	.0008	.0063	.0024	.0002
#2	-.0000	-.0023	.0016	.0014	.0353	.0012	.0003
#3	.0001	-.0031	.0008	.0010	.0349	-.0034	.0003

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3421.8	54013.	3871.2
Stddev	6.9	99.	30.3
%RSD	.20113	.18316	.78331
#1	3418.6	54125.	3836.1
#2	3429.7	53973.	3888.2
#3	3417.1	53939.	3889.2

Sample Name: CCVL Acquired: 8/6/2018 16:20:14 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0099	.2056	.0113	.1033	.0497	.0049	.2003	1.004	.0048
Stddev	.0007	.0015	.0005	.0052	.0006	.0001	.0018	.003	.0001
%RSD	6.579	.7054	4.243	4.989	1.270	1.876	.8825	.2790	2.060

#1	.0102	.2048	.0117	.1028	.0504	.0048	.1998	1.007	.0049
#2	.0104	.2073	.0107	.1087	.0492	.0050	.1987	1.002	.0047
#3	.0092	.2047	.0113	.0984	.0495	.0049	.2022	1.004	.0048

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0509	.0101	.0256	.1014	4.907	.0488	1.019	.0148	.0392
Stddev	.0001	.0001	.0004	.0048	.077	.0024	.024	.0004	.0001
%RSD	.2270	.9188	1.662	4.711	1.566	4.936	2.336	2.876	.1537

#1	.0510	.0101	.0253	.1062	4.995	.0509	1.047	.0152	.0391
#2	.0508	.0100	.0261	.1013	4.867	.0492	1.010	.0148	.0392
#3	.0509	.0101	.0255	.0967	4.858	.0462	1.002	.0143	.0392

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.025	.0412	.2671	.0097	4.779	.0095	.0143	.3680	.1006
Stddev	.012	.0001	.0018	.0017	.011	.0003	.0017	.0121	.0002
%RSD	1.163	.3477	.6657	17.19	.2228	3.375	12.17	3.282	.1853

#1	1.018	.0410	.2651	.0092	4.770	.0098	.0126	.3813	.1004
#2	1.039	.0412	.2678	.0084	4.777	.0094	.0160	.3652	.1007
#3	1.018	.0413	.2685	.0116	4.790	.0092	.0143	.3577	.1008

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCVL Acquired: 8/6/2018 16:20:14 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0052	.1951	.0186	.0205	.4885	.0482	.0207
Stddev	.0002	.0022	.0007	.0007	.0157	.0046	.0000
%RSD	2.942	1.121	3.747	3.336	3.212	9.447	.0624

#1	.0053	.1971	.0189	.0212	.4761	.0534	.0207
#2	.0052	.1927	.0191	.0199	.4833	.0452	.0207
#3	.0050	.1954	.0178	.0204	.5062	.0459	.0207

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3366.3	53462.	3785.3
Stddev	5.5	108.	26.0
%RSD	.16368	.20173	.68796

#1	3359.9	53366.	3765.3
#2	3369.1	53578.	3775.7
#3	3369.8	53441.	3814.7

Sample Name: CCV Acquired: 8/6/2018 16:24:59 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.008	50.24	5.012	.9894	5.023	5.004	5.010	50.09	5.012
Stddev	.004	.28	.034	.0177	.021	.020	.036	.33	.033
%RSD	.4487	.5645	.6816	1.788	.4137	.3993	.7263	.6672	.6531
#1	1.003	50.10	5.023	.9766	5.012	4.992	5.019	50.27	5.024
#2	1.012	50.05	5.040	.9821	5.010	4.993	5.041	50.29	5.037
#3	1.008	50.56	4.974	1.010	5.047	5.027	4.970	49.70	4.975

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.036	5.033	5.001	50.18	50.75	5.038	50.71	4.969	1.008
Stddev	.029	.034	.031	.22	.25	.024	.38	.019	.006
%RSD	.5808	.6688	.6179	.4443	.4997	.4704	.7484	.3772	.6443
#1	5.050	5.046	5.012	50.05	50.67	5.029	50.59	4.964	1.011
#2	5.055	5.058	5.026	50.07	50.55	5.019	50.40	4.954	1.013
#3	5.002	4.994	4.967	50.44	51.03	5.064	51.13	4.990	1.001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	50.67	5.035	53.90	5.048	50.77	1.006	1.013	5.051	5.092
Stddev	.24	.028	.33	.030	.31	.007	.005	.032	.025
%RSD	.4643	.5576	.6061	.5945	.6012	.6898	.4774	.6418	.4917
#1	50.54	5.049	54.04	5.064	50.88	1.007	1.015	5.029	5.102
#2	50.53	5.053	54.14	5.066	51.01	1.013	1.017	5.037	5.111
#3	50.95	5.003	53.53	5.013	50.43	.9990	1.008	5.088	5.064

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/6/2018 16:24:59 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.072	5.103	4.978	1.024	5.112	4.993	5.071
Stddev	.021	.030	.022	.004	.044	.024	.028
%RSD	.4054	.5935	.4431	.4118	.8619	.4777	.5505
#1	5.067	5.074	4.961	1.025	5.065	4.977	5.084
#2	5.055	5.134	4.969	1.028	5.120	4.982	5.091
#3	5.095	5.102	5.003	1.019	5.152	5.021	5.039

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3099.6	48671.	3479.4
Stddev	13.7	266.	25.0
%RSD	.44152	.54720	.71850
#1	3090.1	48510.	3489.4
#2	3093.3	48524.	3497.8
#3	3115.3	48978.	3450.9

Sample Name: CCB Acquired: 8/6/2018 16:29:14 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0043	.0017	.0024	.0004	.0003	-.0009	.0030	.0001
Stddev	.0005	.0043	.0013	.0022	.0003	.0004	.0021	.0007	.0001
%RSD	303.8	98.92	74.24	91.17	71.43	161.0	225.9	24.99	150.0
#1	-.0001	.0092	.0023	.0048	.0006	.0008	.0002	.0033	.0001
#2	-.0008	.0019	.0026	.0019	.0005	.0000	-.0033	.0021	.0002
#3	.0003	.0018	.0003	.0005	.0001	.0000	.0003	.0035	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0001	.0013	.0068	-.0075	.0001	.0312	.0008	.0004
Stddev	.0003	.0001	.0011	.0034	.0571	.0015	.0439	.0005	.0001
%RSD	86.02	95.38	85.67	50.95	763.6	2662.	140.5	62.64	35.86
#1	-.0003	.0001	.0000	.0105	.0575	-.0016	.0819	.0013	.0003
#2	-.0007	.0002	.0020	.0060	-.0306	.0012	.0069	.0010	.0006
#3	-.0001	.0000	.0017	.0037	-.0493	.0006	.0049	.0003	.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0301	.0002	-.0019	.0006	.0077	-.0005	-.0019	.0015	-.0004
Stddev	.0075	.0003	.0007	.0017	.0014	.0008	.0008	.0066	.0006
%RSD	25.02	220.8	35.05	271.3	17.94	167.4	43.52	425.7	132.4
#1	.0234	-.0002	-.0026	-.0008	.0078	-.0002	-.0019	.0059	-.0010
#2	.0382	.0003	-.0015	.0001	.0090	.0001	-.0028	.0048	-.0003
#3	.0286	.0004	-.0015	.0025	.0062	-.0014	-.0011	-.0060	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/6/2018 16:29:14 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	-.0005	.0008	.0006	.0042	-.0012	.0003
Stddev	.0004	.0007	.0009	.0002	.0075	.0005	.0001
%RSD	272.4	128.8	112.1	41.59	179.0	43.97	26.74

#1	.0007	-.0001	.0019	.0003	-.0029	-.0010	.0002
#2	-.0000	-.0013	.0005	.0006	.0121	-.0019	.0004
#3	-.0002	-.0002	.0001	.0008	.0034	-.0009	.0004

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3340.9	52860.	3814.4
Stddev	15.1	141.	49.7
%RSD	.45281	.26741	1.3017

#1	3326.7	52903.	3871.5
#2	3339.1	52975.	3781.1
#3	3356.8	52702.	3790.6

Sample Name: 160-29429-A-22-A@10 Acquired: 8/6/2018 16:34:01 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	.0087	-.0003	.0033	.0002	-.0000	.0008	.0084	-.0000
Stddev	.0002	.0161	.0004	.0019	.0005	.0001	.0009	.0002	.0000
%RSD	38.88	186.2	130.6	58.34	236.8	707.6	109.2	2.200	27.42
#1	-.0008	.0183	-.0007	.0043	.0008	.0001	.0015	.0084	-.0000
#2	-.0006	-.0100	-.0003	.0046	-.0000	-.0001	.0010	.0083	-.0001
#3	-.0004	.0176	.0001	.0011	-.0001	-.0001	-.0002	.0086	-.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	-.0000	.0039	.0048	-.0497	.0155	.0426	-.0001	.0002
Stddev	.0002	.0001	.0005	.0043	.0325	.0002	.0188	.0004	.0003
%RSD	33.74	258.0	12.75	89.55	65.33	1.602	44.19	877.4	128.5
#1	-.0007	-.0001	.0044	.0095	-.0329	.0158	.0599	-.0004	.0003
#2	-.0006	-.0000	.0035	.0039	-.0871	.0155	.0226	.0004	-.0001
#3	-.0003	.0000	.0036	.0011	-.0290	.0153	.0452	-.0002	.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0293	-.0000	-.0006	.0005	.0040	.0002	-.0024	.0112	-.0003
Stddev	.0063	.0002	.0015	.0008	.0027	.0019	.0005	.0055	.0003
%RSD	21.39	11740.	275.6	167.9	67.92	1108.	22.48	49.18	109.1
#1	.0365	-.0002	-.0012	-.0002	.0068	-.0016	-.0018	.0131	-.0007
#2	.0257	-.0000	-.0016	.0014	.0041	.0000	-.0028	.0155	.0000
#3	.0256	.0002	.0012	.0003	.0013	.0021	-.0027	.0050	-.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29429-A-22-A@10 Acquired: 8/6/2018 16:34:01 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0019	.0003	-.0001	.0245	.0005	.0004
Stddev	.0003	.0011	.0003	.0009	.0175	.0035	.0001
%RSD	431.8	60.00	124.0	1794.	71.28	654.7	21.38
#1	.0004	-.0006	.0003	-.0007	.0361	-.0006	.0005
#2	-.0001	-.0029	.0006	-.0004	.0330	-.0022	.0003
#3	-.0000	-.0021	-.0001	.0010	.0044	.0044	.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3449.1	54882.	3912.3
Stddev	8.9	181.	20.3
%RSD	.25783	.32926	.51868
#1	3444.3	55041.	3894.1
#2	3443.7	54686.	3908.4
#3	3459.4	54920.	3934.2

Sample Name: LRC Acquired: 8/6/2018 16:38:48 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment: LRC

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.940	98.23	9.929	1.938	9.847	9.632	9.970	94.78	9.785
Stddev	.002	.08	.048	.002	.094	.020	.062	.41	.048
%RSD	.1210	.0864	.4785	.1206	.9493	.2066	.6250	.4340	.4918
#1	1.941	98.32	9.972	1.936	9.922	9.650	10.04	95.22	9.834
#2	1.942	98.16	9.937	1.939	9.742	9.610	9.962	94.71	9.783
#3	1.938	98.20	9.878	1.940	9.876	9.636	9.912	94.41	9.738

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.761	F 9.832	9.939	96.09	99.32	9.947	96.55	9.609	1.986
Stddev	.044	.049	.056	.21	.15	.026	.28	.011	.013
%RSD	.4470	.4945	.5609	.2184	.1517	.2634	.2875	.1117	.6614
#1	9.805	9.881	9.990	96.32	99.47	9.972	96.37	9.614	2.000
#2	9.759	9.831	9.947	95.91	99.17	9.919	96.87	9.597	1.984
#3	9.718	9.784	9.879	96.05	99.30	9.950	96.41	9.617	1.974

Check ? Chk Pass Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 2.000
Low Limit -500.0

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	98.66	9.685	F 100.8	9.662	F 100.8	F 2.007	1.997	9.610	9.784
Stddev	.21	.036	.4	.031	.4	.016	.011	.019	.046
%RSD	.2140	.3723	.4019	.3175	.4190	.8016	.5664	.1941	.4693
#1	98.89	9.719	101.2	9.690	101.3	2.024	2.007	9.631	9.831
#2	98.48	9.689	100.7	9.667	100.8	2.005	1.999	9.600	9.782
#3	98.62	9.647	100.4	9.629	100.4	1.992	1.985	9.598	9.739

Check ? Chk Pass Chk Pass Chk Fail Chk Pass Chk Fail Chk Fail Chk Pass Chk Pass Chk Pass
High Limit 100.0 100.0 2.000
Low Limit -500.0 -500.0 -500.0

Sample Name: LRC Acquired: 8/6/2018 16:38:48 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment: LRC

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.905	9.790	9.690	1.953	9.876	9.686	9.744
Stddev	.082	.010	.028	.007	.010	.022	.045
%RSD	.8271	.1050	.2897	.3727	.0979	.2268	.4630
#1	9.913	9.798	9.719	1.960	9.866	9.666	9.791
#2	9.820	9.793	9.663	1.954	9.886	9.710	9.741
#3	9.983	9.778	9.690	1.946	9.877	9.683	9.700

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3038.0	50420.	3738.2
Stddev	11.2	72.	14.7
%RSD	.36819	.14299	.39235
#1	3027.1	50423.	3747.9
#2	3037.4	50490.	3721.4
#3	3049.4	50346.	3745.4

Sample Name: LB 160-379782/1-B Acquired: 8/6/2018 16:43:13 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment: 380213

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006	.0756	.0041	.0691	.0013	.0002	-.0003	.6004	.0002
Stddev	.0015	.0048	.0011	.0014	.0001	.0001	.0002	.0039	.0001
%RSD	268.4	6.283	26.75	2.071	7.304	54.05	67.23	.6564	59.06
#1	.0001	.0805	.0044	.0688	.0013	.0003	-.0005	.6040	.0001
#2	-.0007	.0753	.0029	.0706	.0013	.0003	-.0003	.6009	.0003
#3	.0023	.0710	.0050	.0678	.0012	.0001	-.0001	.5962	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0006	.0012	.0102	.4650	.0108	.1708	.0004	.0009
Stddev	.0003	.0000	.0006	.0031	.0127	.0015	.0294	.0001	.0003
%RSD	87.93	1.294	50.87	30.80	2.723	13.42	17.19	30.32	35.18
#1	-.0000	.0006	.0013	.0138	.4654	.0092	.1772	.0003	.0006
#2	-.0007	.0006	.0017	.0078	.4774	.0115	.1388	.0005	.0009
#3	-.0005	.0006	.0005	.0090	.4521	.0118	.1965	.0005	.0012

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 470.8	.0013	.0158	.0009	.2066	-.0013	.0007	.3257	.0012
Stddev	8.0	.0001	.0024	.0012	.0015	.0014	.0017	.0010	.0001
%RSD	1.694	9.509	14.91	137.8	.7119	105.3	236.8	.3073	11.64
#1	464.8	.0012	.0143	.0009	.2061	-.0020	.0022	.3245	.0012
#2	479.8	.0015	.0146	-.0004	.2083	.0003	.0011	.3262	.0011
#3	467.7	.0014	.0185	.0020	.2055	-.0023	-.0011	.3263	.0014

Check ? Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 100.0
Low Limit -500.0

Sample Name: LB 160-379782/1-B Acquired: 8/6/2018 16:43:13 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment: 380213

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0026	.0077	-.0006	-.0025	.0119	-.0006	.0037
Stddev	.0000	.0069	.0008	.0006	.0145	.0062	.0000
%RSD	1.780	89.04	138.2	21.71	122.1	996.3	1.142
#1	.0026	.0018	-.0012	-.0032	.0128	.0045	.0037
#2	.0025	.0061	.0003	-.0023	-.0031	.0011	.0037
#3	.0026	.0152	-.0007	-.0022	.0258	-.0075	.0038

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3257.1	50669.	3811.8
Stddev	19.3	550.	38.7
%RSD	.59316	1.0853	1.0151
#1	3239.6	50318.	3853.7
#2	3254.0	50385.	3804.1
#3	3277.8	51302.	3777.5

Sample Name: LCS 160-380213/2-A Acquired: 8/6/2018 16:48:07 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1970	9.360	.9418	.2483	.9497	.0929	.9148	9.522	.9243
Stddev	.0007	.024	.0051	.0002	.0011	.0002	.0046	.065	.0046
%RSD	.3558	.2589	.5459	.0856	.1205	.2577	.5004	.6792	.4932

#1	.1969	9.381	.9469	.2484	.9485	.0931	.9197	9.596	.9288
#2	.1977	9.366	.9366	.2481	.9508	.0929	.9107	9.481	.9197
#3	.1963	9.334	.9419	.2484	.9498	.0926	.9139	9.488	.9244

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9186	.9186	.9313	9.399	10.11	.1115	9.189	.9196	.4587
Stddev	.0041	.0043	.0030	.020	.03	.0014	.020	.0033	.0024
%RSD	.4451	.4682	.3207	.2085	.3213	1.262	.2200	.3601	.5186

#1	.9232	.9234	.9329	9.421	10.15	.1109	9.166	.9229	.4610
#2	.9155	.9151	.9278	9.384	10.10	.1131	9.202	.9198	.4563
#3	.9170	.9173	.9331	9.393	10.08	.1105	9.199	.9163	.4589

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 467.7	.9232	1.072	.8966	9.590	.4497	.4942	4.724	.9093
Stddev	4.2	.0045	.001	.0033	.044	.0023	.0020	.016	.0044
%RSD	.9045	.4897	.0646	.3682	.4582	.5068	.4065	.3293	.4813

#1	471.2	.9284	1.073	.9003	9.625	.4516	.4959	4.725	.9141
#2	463.0	.9203	1.071	.8956	9.540	.4472	.4920	4.708	.9056
#3	468.9	.9209	1.072	.8939	9.603	.4504	.4948	4.739	.9081

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0								
Low Limit	-500.0								

Sample Name: LCS 160-380213/2-A Acquired: 8/6/2018 16:48:07 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9516	.9478	.9331	.1763	.9820	.9266	.9563
Stddev	.0013	.0016	.0031	.0018	.0046	.0030	.0043
%RSD	.1389	.1673	.3307	.9984	.4638	.3257	.4531
#1	.9531	.9460	.9361	.1783	.9828	.9300	.9605
#2	.9509	.9486	.9299	.1759	.9771	.9256	.9519
#3	.9508	.9489	.9334	.1748	.9861	.9242	.9566

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3313.6	52438.	4056.2
Stddev	19.5	20.	32.6
%RSD	.58806	.03901	.80376
#1	3291.2	52421.	4020.1
#2	3322.9	52432.	4065.0
#3	3326.7	52460.	4083.5

Sample Name: 160-29879-A-1-B Acquired: 8/6/2018 16:52:35 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	1.075	.0049	.1797	.1077	.0012	-.0008	1.799	.0000
Stddev	.0006	.014	.0007	.0073	.0006	.0000	.0013	.016	.0001
%RSD	742.0	1.307	14.23	4.083	.5320	2.284	169.9	.8764	348.1
#1	.0005	1.090	.0041	.1724	.1081	.0012	-.0015	1.816	.0000
#2	-.0007	1.074	.0052	.1797	.1080	.0012	-.0015	1.798	-.0000
#3	-.0001	1.062	.0055	.1871	.1071	.0011	.0007	1.784	.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0038	.0384	.0015	2.985	.6440	.0756	.2248	.7090	.0020
Stddev	.0004	.0004	.0005	.012	.0559	.0011	.0226	.0023	.0002
%RSD	11.34	.9483	31.79	.3884	8.676	1.400	10.07	.3192	11.13
#1	.0042	.0387	.0011	2.975	.5804	.0745	.1987	.7069	.0023
#2	.0039	.0384	.0020	2.997	.6850	.0766	.2373	.7114	.0020
#3	.0034	.0380	.0014	2.982	.6667	.0758	.2385	.7089	.0018

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 479.0	.1454	.0218	-.0001	.3249	-.0003	.0030	.7401	.0014
Stddev	7.0	.0012	.0011	.0009	.0054	.0011	.0010	.0038	.0001
%RSD	1.460	.8262	4.901	975.7	1.664	320.1	32.90	.5130	8.883
#1	485.8	.1466	.0230	-.0001	.3307	.0001	.0040	.7386	.0013
#2	479.3	.1454	.0210	-.0010	.3241	-.0016	.0020	.7445	.0016
#3	471.8	.1441	.0213	.0008	.3199	.0004	.0031	.7373	.0014

Check ? Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 100.0
Low Limit -500.0

Sample Name: 160-29879-A-1-B Acquired: 8/6/2018 16:52:35 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0833	.0085	.0225	-.0032	.0654	-.0003	.0164
Stddev	.0000	.0004	.0017	.0008	.0124	.0025	.0002
%RSD	.0500	5.019	7.530	25.58	18.97	745.3	1.484
#1	.0833	.0088	.0208	-.0023	.0523	-.0031	.0166
#2	.0833	.0080	.0242	-.0032	.0668	.0017	.0165
#3	.0832	.0086	.0227	-.0039	.0770	.0004	.0161

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3377.4	52050.	3976.0
Stddev	12.2	337.	33.0
%RSD	.36091	.64678	.82886
#1	3363.4	52433.	4008.0
#2	3385.2	51799.	3942.2
#3	3383.7	51919.	3977.7

Sample Name: 160-29879-A-1-BSD@5 Acquired: 8/6/2018 16:57:25 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	.2394	.0014	.0431	.0222	.0002	-.0005	.3901	.0000
Stddev	.0001	.0115	.0007	.0028	.0003	.0001	.0011	.0003	.0001
%RSD	19.57	4.821	52.18	6.573	1.355	90.88	207.3	.0745	928.4
#1	-.0006	.2497	.0014	.0463	.0219	.0003	-.0015	.3899	-.0000
#2	-.0005	.2269	.0007	.0411	.0221	.0002	-.0007	.3900	.0001
#3	-.0007	.2415	.0022	.0418	.0225	.0000	.0006	.3904	-.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0005	.0081	.0009	.6150	.1350	.0111	.0545	.1456	.0003
Stddev	.0002	.0001	.0015	.0044	.0253	.0011	.0159	.0016	.0004
%RSD	45.20	.8262	173.6	.7221	18.71	9.667	29.16	1.119	129.1
#1	.0003	.0081	-.0003	.6195	.1373	.0114	.0404	.1474	.0005
#2	.0008	.0080	.0026	.6106	.1087	.0119	.0717	.1451	-.0001
#3	.0005	.0080	.0003	.6148	.1591	.0099	.0513	.1443	.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 101.6	.0306	.0037	.0000	.0692	.0009	-.0023	.1420	.0003
Stddev	.5	.0001	.0014	.0004	.0023	.0003	.0015	.0040	.0005
%RSD	.4507	.2151	38.13	1767.	3.393	32.48	67.95	2.793	161.0
#1	102.1	.0305	.0052	-.0002	.0667	.0012	-.0014	.1436	.0003
#2	101.2	.0306	.0036	.0004	.0696	.0007	-.0040	.1449	.0009
#3	101.4	.0305	.0024	-.0001	.0713	.0007	-.0014	.1375	-.0002

Check ? Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 100.0
Low Limit -500.0

Sample Name: 160-29879-A-1-BSD@5 Acquired: 8/6/2018 16:57:25 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0171	.0002	.0042	-.0008	.0512	-.0012	.0037
Stddev	.0001	.0024	.0013	.0006	.0108	.0032	.0002
%RSD	.5347	1242.	30.15	77.68	21.04	259.9	4.020
#1	.0171	-.0025	.0044	-.0015	.0547	.0010	.0039
#2	.0171	.0012	.0029	-.0003	.0598	-.0049	.0036
#3	.0170	.0019	.0055	-.0006	.0391	.0002	.0038

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3403.6	54077.	3994.7
Stddev	5.5	112.	36.0
%RSD	.16263	.20633	.90108
#1	3409.9	54194.	3954.0
#2	3401.3	53972.	4007.8
#3	3399.5	54064.	4022.3

Sample Name: 160-29879-A-1-C MS Acquired: 8/6/2018 17:02:10 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2004	10.81	.9559	.3856	1.084	.0971	.9265	10.90	.9365
Stddev	.0001	.03	.0027	.0007	.002	.0005	.0020	.01	.0022
%RSD	.0711	.3080	.2861	.1752	.2244	.4685	.2177	.0943	.2373
#1	.2003	10.84	.9527	.3864	1.086	.0976	.9255	10.91	.9343
#2	.2005	10.81	.9573	.3852	1.084	.0968	.9252	10.89	.9364
#3	.2004	10.77	.9576	.3852	1.081	.0969	.9288	10.91	.9388

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9302	.9681	.9438	12.78	10.73	.1843	9.532	1.701	.4611
Stddev	.0022	.0019	.0034	.04	.07	.0015	.042	.010	.0028
%RSD	.2409	.1912	.3566	.2736	.6374	.8017	.4428	.6126	.6072
#1	.9276	.9668	.9406	12.82	10.81	.1858	9.483	1.713	.4580
#2	.9314	.9674	.9437	12.77	10.70	.1842	9.559	1.696	.4621
#3	.9315	.9702	.9473	12.76	10.69	.1829	9.553	1.694	.4633

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 517.4	1.078	1.079	.8989	9.821	.4552	.5000	5.346	.9077
Stddev	4.6	.001	.002	.0006	.032	.0016	.0024	.028	.0006
%RSD	.8954	.1298	.1802	.0691	.3267	.3563	.4867	.5183	.0690
#1	522.3	1.077	1.079	.8991	9.803	.4533	.4976	5.370	.9082
#2	516.8	1.078	1.077	.8994	9.802	.4562	.5025	5.316	.9080
#3	513.1	1.080	1.081	.8982	9.858	.4560	.4998	5.353	.9070

Check ? Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 100.0
Low Limit -500.0

Sample Name: 160-29879-A-1-C MS Acquired: 8/6/2018 17:02:10 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.067	.9645	.9873	.1782	.9751	.9547	.9811
Stddev	.006	.0037	.0063	.0023	.0054	.0048	.0021
%RSD	.5718	.3833	.6345	1.280	.5533	.5068	.2103
#1	1.073	.9687	.9941	.1756	.9813	.9603	.9790
#2	1.066	.9624	.9862	.1797	.9726	.9517	.9810
#3	1.061	.9622	.9817	.1793	.9715	.9521	.9831

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3278.2	51036.	3843.8
Stddev	4.4	217.	8.2
%RSD	.13304	.42554	.21402
#1	3273.3	50879.	3835.0
#2	3279.6	50945.	3845.2
#3	3281.7	51284.	3851.2

Sample Name: 160-29879-A-1-D MSD Acquired: 8/6/2018 17:06:38 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.3833	19.88	1.927	.5602	2.014	.1899	1.876	20.39	1.901
Stddev	.0012	.05	.007	.0028	.004	.0002	.007	.04	.004
%RSD	.3034	.2450	.3550	.4974	.2213	.0792	.3874	.1942	.2109
#1	.3820	19.85	1.931	.5576	2.011	.1900	1.882	20.35	1.903
#2	.3838	19.94	1.919	.5599	2.019	.1897	1.868	20.39	1.896
#3	.3841	19.86	1.930	.5631	2.012	.1900	1.879	20.43	1.903

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.886	1.926	1.915	22.03	20.43	.2860	18.55	2.608	.0011
Stddev	.002	.003	.008	.04	.08	.0005	.09	.005	.0002
%RSD	.1209	.1447	.3976	.1770	.4003	.1577	.4586	.1952	17.38
#1	1.887	1.927	1.923	21.99	20.34	.2865	18.45	2.604	.0013
#2	1.883	1.924	1.908	22.06	20.47	.2858	18.60	2.605	.0012
#3	1.887	1.929	1.914	22.05	20.49	.2857	18.60	2.613	.0009

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 521.5	2.042	2.162	1.860	19.47	.0007	.9889	.8038	.0015
Stddev	8.4	.003	.005	.001	.03	.0008	.0065	.0110	.0003
%RSD	1.612	.1365	.2421	.0492	.1428	116.0	.6619	1.368	20.41
#1	511.8	2.040	2.165	1.860	19.49	.0015	.9951	.7917	.0018
#2	526.6	2.042	2.156	1.859	19.44	.0003	.9821	.8063	.0012
#3	526.1	2.045	2.166	1.861	19.48	.0001	.9895	.8133	.0016

Check ? Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 100.0
Low Limit -500.0

Sample Name: 160-29879-A-1-D MSD Acquired: 8/6/2018 17:06:38 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.012	1.917	.0303	.3656	1.911	1.882	1.968
Stddev	.004	.001	.0012	.0012	.002	.001	.003
%RSD	.1919	.0691	3.807	.3397	.1025	.0501	.1336
#1	2.011	1.918	.0295	.3653	1.909	1.883	1.969
#2	2.016	1.918	.0298	.3645	1.913	1.882	1.965
#3	2.008	1.916	.0317	.3670	1.911	1.882	1.969

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3166.5	50745.	3841.1
Stddev	9.3	185.	50.9
%RSD	.29495	.36406	1.3252
#1	3176.9	50558.	3888.0
#2	3163.9	50749.	3848.3
#3	3158.7	50927.	3787.0

Sample Name: 160-29879-A-2-B Acquired: 8/6/2018 17:11:09 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0008	.3757	.0060	.1590	.1165	.0008	.0145	8.972	-.0004
Stddev	.0004	.0086	.0005	.0037	.0005	.0001	.0019	.013	.0000
%RSD	45.59	2.277	8.514	2.307	.4478	7.307	13.32	.1427	11.29
#1	-.0011	.3854	.0064	.1632	.1167	.0007	.0166	8.986	-.0004
#2	-.0007	.3694	.0054	.1578	.1159	.0008	.0143	8.962	-.0005
#3	-.0004	.3724	.0061	.1562	.1168	.0008	.0127	8.967	-.0004

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1353	.0859	-.0094	F 124.1	.9940	.0454	1.194	1.122	.0039
Stddev	.0004	.0002	.0017	.3	.0801	.0019	.033	.003	.0001
%RSD	.3034	.2299	17.55	.2387	8.058	4.110	2.776	.2298	1.623
#1	.1357	.0860	-.0098	124.2	.9886	.0435	1.205	1.122	.0040
#2	.1350	.0856	-.0109	123.8	1.077	.0456	1.157	1.119	.0039
#3	.1351	.0860	-.0076	124.3	.9167	.0472	1.220	1.124	.0038

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Fail** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 472.5	F 19.92	.3978	-.0039	.8764	.0047	.0041	3.355	.0042
Stddev	5.7	.02	.0019	.0007	.0035	.0009	.0020	.016	.0003
%RSD	1.199	.1215	.4693	18.41	.4030	19.39	48.87	.4732	6.304
#1	466.0	19.94	.3998	-.0043	.8783	.0058	.0019	3.357	.0043
#2	475.1	19.92	.3962	-.0044	.8723	.0040	.0058	3.338	.0038
#3	476.3	19.89	.3974	-.0031	.8785	.0045	.0047	3.369	.0043

Check ? **Chk Fail** **Chk Fail** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: 160-29879-A-2-B Acquired: 8/6/2018 17:11:09 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1381	.0227	.0055	-.0024	.4736	.0061	.3318
Stddev	.0003	.0039	.0006	.0010	.0048	.0014	.0002
%RSD	.2504	17.23	11.16	43.50	1.011	22.66	.0707
#1	.1381	.0190	.0062	-.0017	.4708	.0077	.3319
#2	.1378	.0223	.0052	-.0019	.4791	.0052	.3319
#3	.1385	.0267	.0050	-.0036	.4708	.0054	.3315

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3247.7	51425.	3908.4
Stddev	2.9	467.	9.4
%RSD	.08782	.90739	.23946
#1	3247.6	51903.	3918.7
#2	3250.6	51400.	3900.3
#3	3244.9	50971.	3906.2

Sample Name: 160-29879-A-3-B Acquired: 8/6/2018 17:15:54 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	.8416	.0054	.1803	.1560	.0012	.0035	7.037	-.0004
Stddev	.0004	.0051	.0012	.0023	.0004	.0000	.0004	.033	.0001
%RSD	67.22	.6072	22.91	1.269	.2855	3.867	12.79	.4681	35.19
#1	-.0007	.8472	.0060	.1825	.1564	.0013	.0038	7.074	-.0005
#2	-.0009	.8372	.0039	.1803	.1556	.0012	.0030	7.024	-.0002
#3	-.0001	.8403	.0061	.1779	.1559	.0012	.0037	7.012	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1703	.2319	-.0034	57.13	.8477	.0570	.8159	.8424	.0036
Stddev	.0007	.0009	.0024	.15	.0190	.0025	.0196	.0032	.0001
%RSD	.4174	.3780	71.10	.2623	2.243	4.424	2.401	.3790	2.459
#1	.1711	.2326	-.0017	57.27	.8305	.0548	.8354	.8453	.0036
#2	.1700	.2322	-.0061	57.14	.8443	.0564	.7962	.8429	.0036
#3	.1698	.2310	-.0023	56.98	.8681	.0597	.8160	.8390	.0037

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 478.2	F 21.12	.0984	-.0045	.6971	.0021	.0032	2.109	.0020
Stddev	3.4	.07	.0010	.0006	.0072	.0019	.0004	.011	.0009
%RSD	.7067	.3290	1.064	12.70	1.035	90.23	12.87	.4995	43.48
#1	477.9	21.18	.0979	-.0048	.7001	.0029	.0037	2.120	.0011
#2	481.7	21.12	.0996	-.0049	.7024	-.0000	.0030	2.109	.0029
#3	474.9	21.04	.0976	-.0038	.6889	.0036	.0030	2.099	.0021

Check ? Chk Fail Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 100.0 10.00
Low Limit -500.0 -500.0

Sample Name: 160-29879-A-3-B Acquired: 8/6/2018 17:15:54 Type: Unk
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1483	.0108	.0043	-.0025	.2007	.0062	.1509
Stddev	.0004	.0008	.0008	.0006	.0096	.0021	.0004
%RSD	.2631	7.739	19.72	22.92	4.796	33.22	.2886
#1	.1487	.0112	.0034	-.0019	.1977	.0054	.1513
#2	.1483	.0113	.0051	-.0029	.2115	.0085	.1510
#3	.1479	.0098	.0044	-.0029	.1930	.0047	.1504

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3280.4	50949.	3799.7
Stddev	8.4	205.	44.7
%RSD	.25573	.40242	1.1759
#1	3271.1	51178.	3772.1
#2	3282.9	50782.	3775.7
#3	3287.3	50888.	3851.2

Sample Name: CCVL Acquired: 8/6/2018 17:20:41 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0094	.2077	.0105	.0998	.0505	.0049	.1936	.9692	.0046
Stddev	.0004	.0191	.0008	.0056	.0001	.0000	.0015	.0009	.0002
%RSD	4.466	9.210	7.294	5.564	.2483	.9509	.7513	.0968	3.836
#1	.0096	.2088	.0104	.1024	.0506	.0049	.1921	.9681	.0044
#2	.0089	.1880	.0113	.0935	.0504	.0048	.1950	.9697	.0046
#3	.0097	.2262	.0098	.1037	.0506	.0049	.1938	.9699	.0048

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0493	.0098	.0259	.1052	5.047	.0515	1.038	.0144	.0376
Stddev	.0004	.0001	.0026	.0027	.047	.0016	.020	.0006	.0002
%RSD	.8208	1.374	10.15	2.570	.9252	3.088	1.941	4.437	.5649
#1	.0489	.0096	.0289	.1059	5.092	.0506	1.047	.0144	.0378
#2	.0497	.0099	.0249	.1022	4.999	.0507	1.015	.0138	.0375
#3	.0492	.0098	.0240	.1075	5.050	.0534	1.052	.0150	.0375

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 1.344	.0405	.2619	.0091	4.642	.0087	.0123	.3688	.0967
Stddev	.022	.0001	.0025	.0007	.010	.0009	.0010	.0070	.0007
%RSD	1.667	.1752	.9661	7.963	.2073	10.43	8.097	1.903	.7478
#1	1.370	.0405	.2597	.0092	4.631	.0079	.0113	.3703	.0973
#2	1.330	.0404	.2613	.0083	4.650	.0085	.0133	.3749	.0970
#3	1.332	.0406	.2646	.0098	4.645	.0097	.0122	.3611	.0959

Check ? Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range 1.000
30.00%

Sample Name: CCVL Acquired: 8/6/2018 17:20:41 Type: QC
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0051	.1976	.0193	.0207	.4690	.0470	.0202
Stddev	.0001	.0033	.0015	.0009	.0136	.0008	.0002
%RSD	2.704	1.678	7.910	4.578	2.903	1.675	.7870
#1	.0053	.2006	.0201	.0218	.4583	.0465	.0200
#2	.0051	.1940	.0201	.0200	.4843	.0466	.0202
#3	.0050	.1982	.0175	.0204	.4643	.0479	.0203

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3423.6	52321.	3602.3
Stddev	10.6	516.	34.8
%RSD	.30870	.98629	.96720
#1	3429.9	51778.	3562.2
#2	3429.6	52805.	3619.6
#3	3411.4	52381.	3625.1

Sample Name: CCV Acquired: 8/6/2018 17:25:24 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.004	49.59	4.852	.9797	5.121	5.012	4.864	47.69	4.872
Stddev	.005	.40	.020	.0092	.038	.035	.024	.15	.023
%RSD	.5511	.8113	.4094	.9349	.7421	.6922	.4822	.3080	.4744
#1	.9992	49.81	4.871	.9875	5.154	5.035	4.884	47.84	4.893
#2	1.010	49.82	4.853	.9820	5.130	5.030	4.871	47.68	4.875
#3	1.004	49.12	4.831	.9696	5.080	4.972	4.838	47.55	4.847

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.893	4.866	4.916	50.26	50.62	5.106	49.41	4.950	.9702
Stddev	.022	.020	.026	.33	.37	.036	.40	.033	.0049
%RSD	.4464	.4070	.5310	.6595	.7389	.7028	.8124	.6575	.5030
#1	4.914	4.884	4.944	50.55	50.85	5.128	49.70	4.972	.9744
#2	4.894	4.870	4.912	50.32	50.82	5.126	49.58	4.965	.9714
#3	4.870	4.845	4.892	49.90	50.19	5.065	48.95	4.912	.9649

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	50.70	4.906	52.31	4.935	49.65	.9678	.9773	4.964	4.895
Stddev	.38	.018	.21	.019	.20	.0067	.0005	.045	.017
%RSD	.7479	.3582	.4027	.3889	.4075	.6923	.0522	.9150	.3550
#1	50.93	4.924	52.51	4.955	49.85	.9729	.9778	4.982	4.912
#2	50.91	4.905	52.33	4.933	49.66	.9702	.9771	4.998	4.895
#3	50.26	4.888	52.09	4.917	49.45	.9602	.9768	4.912	4.878

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/6/2018 17:25:24 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.062	5.000	4.971	.9826	5.167	4.920	4.924
Stddev	.039	.027	.044	.0051	.052	.045	.023
%RSD	.7647	.5403	.8898	.5184	1.012	.9128	.4705
#1	5.085	4.972	5.000	.9881	5.107	4.957	4.947
#2	5.084	5.026	4.993	.9816	5.197	4.934	4.925
#3	5.017	5.001	4.920	.9780	5.198	4.870	4.900

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3230.8	50853.	3655.4
Stddev	6.4	264.	31.4
%RSD	.19833	.51930	.85996
#1	3223.8	50726.	3642.6
#2	3232.2	50677.	3632.4
#3	3236.4	51157.	3691.2

Sample Name: CCB Acquired: 8/6/2018 17:29:40 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0112	.0020	.0039	.0000	.0001	-.0012	.0027	.0000
Stddev	.0007	.0043	.0011	.0006	.0002	.0001	.0004	.0000	.0001
%RSD	440.4	38.70	55.51	15.31	1000.	226.3	32.20	.9499	3023.
#1	-.0003	.0139	.0011	.0032	.0001	-.0001	-.0008	.0027	.0001
#2	-.0007	.0062	.0033	.0041	-.0002	.0001	-.0014	.0027	-.0001
#3	.0006	.0134	.0017	.0043	.0002	.0002	-.0015	.0027	.0000

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0000	.0003	.0076	.0351	.0022	.0037	.0008	.0004
Stddev	.0002	.0001	.0005	.0037	.0596	.0028	.0191	.0002	.0002
%RSD	120.7	166.6	170.9	49.07	170.1	127.1	516.7	29.72	60.93
#1	-.0000	.0001	.0009	.0037	-.0321	-.0009	.0229	.0006	.0001
#2	-.0001	-.0000	.0001	.0079	.0818	.0043	.0034	.0010	.0004
#3	-.0004	.0000	-.0001	.0111	.0554	.0031	-.0153	.0007	.0006

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1557	-.0000	.0042	.0003	.0039	-.0006	-.0019	-.0020	-.0000
Stddev	.0036	.0000	.0008	.0008	.0030	.0004	.0021	.0081	.0003
%RSD	2.310	39.85	19.34	311.8	76.69	56.12	110.5	411.3	755.5
#1	.1526	-.0000	.0041	.0002	.0064	-.0003	-.0007	-.0030	.0001
#2	.1548	-.0000	.0035	.0011	.0045	-.0010	-.0007	.0066	.0002
#3	.1596	-.0001	.0051	-.0005	.0006	-.0006	-.0044	-.0094	-.0004

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: CCB Acquired: 8/6/2018 17:29:40 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0005	.0008	.0003	.0162	-.0040	.0002
Stddev	.0001	.0034	.0015	.0010	.0197	.0066	.0001
%RSD	32.42	717.7	191.9	293.5	121.5	166.1	23.89

#1	.0002	.0005	-.0003	.0013	.0331	.0007	.0002
#2	.0002	-.0029	.0001	.0002	.0209	-.0116	.0002
#3	.0003	.0039	.0024	-.0006	-.0054	-.0010	.0003

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3446.5	53395.	3764.2
Stddev	41.6	653.	47.4
%RSD	1.2072	1.2232	1.2583

#1	3408.2	54070.	3718.5
#2	3440.5	53351.	3761.0
#3	3490.7	52766.	3813.1

Sample Name: 160-29879-A-4-B Acquired: 8/6/2018 17:34:28 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-0.0007	.6212	.0050	.1367	.3706	.0012	.0023	6.224	-.0002
Stddev	.0004	.0156	.0004	.0061	.0008	.0001	.0011	.026	.0000
%RSD	52.81	2.509	8.549	4.441	.2189	6.566	47.37	.4116	7.996
#1	-0.0007	.6243	.0054	.1369	.3703	.0013	.0034	6.249	-.0002
#2	-.0003	.6350	.0048	.1306	.3716	.0011	.0012	6.198	-.0002
#3	-.0010	.6043	.0046	.1427	.3700	.0012	.0022	6.225	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	3.849	.1563	-.0156	53.65	.7451	.0468	.8228	.6974	.0297
Stddev	.003	.0001	.0008	.06	.0428	.0032	.0316	.0013	.0002
%RSD	.0886	.0473	5.310	.1053	5.748	6.785	3.845	.1892	.5365
#1	3.852	.1564	-.0159	53.61	.6959	.0434	.7997	.6978	.0296
#2	3.846	.1563	-.0162	53.64	.7655	.0474	.8098	.6959	.0296
#3	3.850	.1563	-.0146	53.72	.7740	.0497	.8589	.6985	.0299

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 468.3	F 18.03	.2240	-.0147	.5784	.0033	.0172	1.920	.0066
Stddev	8.0	.04	.0008	.0010	.0014	.0004	.0012	.004	.0002
%RSD	1.714	.2038	.3701	6.774	.2428	11.62	6.819	.1975	2.721
#1	465.4	18.06	.2247	-.0158	.5790	.0036	.0186	1.923	.0068
#2	462.2	17.99	.2231	-.0139	.5794	.0029	.0164	1.916	.0066
#3	477.4	18.02	.2241	-.0144	.5768	.0034	.0167	1.922	.0064

Check ? Chk Fail Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 100.0 10.00
Low Limit -500.0 -500.0

Sample Name: 160-29879-A-4-B Acquired: 8/6/2018 17:34:28 Type: Unk
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1280	.0131	.0360	-.0014	.2025	.0055	.1670
Stddev	.0006	.0012	.0009	.0003	.0089	.0057	.0001
%RSD	.4330	9.254	2.460	20.21	4.416	103.7	.0415
#1	.1281	.0145	.0366	-.0011	.2048	.0068	.1670
#2	.1284	.0128	.0365	-.0016	.1926	-.0007	.1670
#3	.1274	.0121	.0350	-.0016	.2100	.0105	.1669

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3355.4	52143.	3920.4
Stddev	18.2	315.	44.5
%RSD	.54330	.60502	1.1340
#1	3342.1	51779.	3942.3
#2	3376.2	52335.	3949.6
#3	3348.0	52316.	3869.2

Sample Name: CCVL Acquired: 8/6/2018 17:39:15 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0091	.2106	.0106	.0958	.0506	.0048	.1982	.9807	.0047
Stddev	.0001	.0065	.0005	.0028	.0006	.0000	.0019	.0038	.0001
%RSD	1.110	3.097	5.080	2.970	1.148	.9498	.9672	.3888	1.690

#1	.0090	.2137	.0109	.0969	.0511	.0048	.1983	.9811	.0046
#2	.0091	.2149	.0109	.0926	.0508	.0049	.2001	.9844	.0048
#3	.0091	.2031	.0100	.0980	.0500	.0048	.1963	.9768	.0047

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0500	.0100	.0259	.1049	5.035	.0519	1.053	.0149	.0381
Stddev	.0003	.0000	.0015	.0002	.031	.0004	.039	.0004	.0001
%RSD	.6614	.3251	5.763	.2218	.6235	.6955	3.718	2.914	.3832

#1	.0502	.0100	.0273	.1051	5.019	.0523	1.097	.0152	.0381
#2	.0496	.0100	.0259	.1049	5.016	.0518	1.040	.0144	.0383
#3	.0501	.0100	.0243	.1046	5.072	.0516	1.022	.0149	.0380

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.287	.0410	.2683	.0097	4.728	.0079	.0154	.3686	.0988
Stddev	.032	.0002	.0010	.0007	.023	.0001	.0017	.0008	.0005
%RSD	2.488	.3874	.3699	7.538	.4859	.8277	11.00	.2254	.5100

#1	1.320	.0412	.2695	.0096	4.736	.0078	.0173	.3686	.0993
#2	1.285	.0410	.2678	.0105	4.746	.0079	.0143	.3677	.0983
#3	1.256	.0409	.2677	.0090	4.702	.0079	.0145	.3694	.0989

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCVL Acquired: 8/6/2018 17:39:15 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0050	.1941	.0188	.0197	.4653	.0433	.0205
Stddev	.0002	.0015	.0003	.0008	.0070	.0010	.0001
%RSD	3.500	.7833	1.530	4.307	1.508	2.224	.2696

#1	.0049	.1945	.0185	.0195	.4734	.0424	.0205
#2	.0052	.1924	.0190	.0190	.4608	.0431	.0205
#3	.0050	.1954	.0190	.0207	.4616	.0443	.0204

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3414.4	53663.	3710.5
Stddev	2.2	173.	34.4
%RSD	.06434	.32327	.92612

#1	3417.0	53793.	3672.9
#2	3413.4	53730.	3718.4
#3	3413.0	53466.	3740.3

Sample Name: CCV Acquired: 8/6/2018 17:44:00 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.004	50.20	4.911	.9905	5.100	5.023	4.896	48.88	4.938
Stddev	.006	.26	.003	.0038	.020	.031	.009	.06	.006
%RSD	.5823	.5231	.0565	.3878	.3819	.6131	.1727	.1188	.1178
#1	.9989	50.31	4.909	.9862	5.103	5.039	4.888	48.85	4.933
#2	1.004	50.39	4.914	.9935	5.118	5.042	4.905	48.95	4.944
#3	1.011	49.90	4.910	.9919	5.079	4.987	4.895	48.84	4.937

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.957	4.941	4.939	50.49	51.34	5.123	50.50	4.966	.9854
Stddev	.008	.008	.008	.30	.31	.026	.33	.034	.0008
%RSD	.1621	.1701	.1632	.6001	.6132	.5133	.6541	.6771	.0779
#1	4.952	4.934	4.932	50.65	51.49	5.127	50.80	4.991	.9851
#2	4.966	4.950	4.948	50.68	51.55	5.148	50.54	4.980	.9863
#3	4.954	4.938	4.938	50.14	50.98	5.096	50.15	4.928	.9849

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	51.18	4.976	53.08	5.007	49.89	.9780	.9870	5.025	4.993
Stddev	.29	.009	.10	.010	.07	.0034	.0021	.048	.011
%RSD	.5593	.1723	.1865	.2071	.1464	.3470	.2169	.9538	.2182
#1	51.35	4.968	52.99	5.000	49.85	.9750	.9857	5.053	4.982
#2	51.35	4.985	53.19	5.018	49.97	.9773	.9858	5.053	5.004
#3	50.85	4.973	53.06	5.001	49.84	.9817	.9895	4.970	4.993

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/6/2018 17:44:00 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.073	5.018	4.986	1.000	5.088	4.971	4.995
Stddev	.026	.023	.029	.002	.013	.035	.008
%RSD	.5129	.4504	.5783	.2198	.2567	.7120	.1623

#1	5.080	4.996	4.996	1.001	5.082	4.988	4.987
#2	5.095	5.016	5.009	1.001	5.080	4.995	5.003
#3	5.044	5.041	4.954	.9975	5.103	4.930	4.994

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3130.9	49071.	3428.6
Stddev	6.6	284.	51.6
%RSD	.21097	.57807	1.5051

#1	3137.7	49360.	3370.5
#2	3124.5	49061.	3446.2
#3	3130.5	48793.	3469.1

Sample Name: CCB Acquired: 8/6/2018 17:48:15 Type: QC
Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	.0285	.0018	.0058	.0002	.0001	-.0011	.0027	-.0002
Stddev	.0007	.0186	.0013	.0013	.0003	.0000	.0014	.0002	.0000
%RSD	139.2	65.43	71.75	21.52	176.6	38.95	135.0	8.345	25.34
#1	-.0005	.0447	.0003	.0046	.0003	.0001	-.0010	.0024	-.0002
#2	.0002	.0081	.0024	.0057	-.0002	.0001	-.0025	.0027	-.0002
#3	-.0012	.0327	.0027	.0071	.0004	.0001	.0003	.0029	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0000	.0008	.0055	.0020	.0024	.0166	-.0000	.0003
Stddev	.0002	.0001	.0020	.0018	.0439	.0017	.0176	.0008	.0002
%RSD	204.0	339.3	245.4	33.31	2237.	72.35	105.9	1939.	61.83
#1	-.0001	-.0000	-.0015	.0061	.0123	.0043	.0325	-.0001	.0001
#2	.0001	-.0000	.0016	.0069	.0398	.0019	-.0023	.0008	.0005
#3	-.0004	.0001	.0024	.0034	-.0462	.0010	.0195	-.0009	.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1649	.0002	.0034	-.0006	.0034	-.0015	-.0001	-.0000	-.0005
Stddev	.0127	.0001	.0007	.0005	.0032	.0016	.0013	.0078	.0007
%RSD	7.695	66.89	21.45	76.61	95.43	104.5	1461.	17670.	141.2
#1	.1793	.0001	.0029	-.0010	.0071	-.0016	-.0001	.0088	-.0013
#2	.1600	.0001	.0042	-.0001	.0018	.0001	.0012	-.0062	.0000
#3	.1554	.0004	.0030	-.0007	.0013	-.0030	-.0014	-.0027	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/6/2018 17:48:15 Type: QC
 Method: _2016(v705) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: ICP6500#1: ICP6500#1
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0011	.0007	.0004	.0111	.0015	.0005
Stddev	.0001	.0025	.0009	.0014	.0051	.0023	.0001
%RSD	36.79	222.6	121.8	345.0	46.38	155.1	15.93

#1	.0001	.0038	.0016	.0015	.0053	.0024	.0004
#2	.0002	.0005	.0008	.0009	.0153	.0031	.0005
#3	.0001	-.0010	-.0002	-.0012	.0125	-.0011	.0006

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3368.7	52556.	3623.7
Stddev	8.2	389.	25.5
%RSD	.24429	.74018	.70439

#1	3376.0	52204.	3608.2
#2	3370.2	52490.	3609.7
#3	3359.8	52974.	3653.2

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)
Ag 328.068 {103}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.003165	0.165121	0.000000	1.000000
Al 396.152 { 85}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.002357	0.126685	0.000000	1.000000
As 189.042 {478}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000513	0.187254	0.000000	1.000000
B 249.678 {135}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000555	0.086095	0.000000	1.000000
Ba 455.403 { 74}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.005929	6.445355	0.000000	1.000000
Be 313.042 {108}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000068	7.017910	0.000000	1.000000
Bi 223.061 {451}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000696	0.228992	0.000000	1.000000
Ca 184.006 {483}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.002572	0.449922	0.000000	1.000000
Cd 228.802 {447}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000900	3.113591	0.000000	1.000000
Co 228.616 {448}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.001912	0.868239	0.000000	1.000000
Cr 205.560 {464}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000094	1.228422	0.000000	1.000000
Cu 217.894 {455}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000704	0.186097	0.000000	1.000000
Fe 259.940 {130}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000012	0.146233	0.000000	1.000000
K 766.490 { 44}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.015528	0.045925	0.000000	1.000000
Li 670.784 { 50}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.018567	1.257942	0.000000	1.000000
Mg 279.806 {121}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000896	0.015417	0.000000	1.000000
Mn 257.610 {131}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000303	0.898196	0.000000	1.000000
Mo 202.030 {467}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000324	0.883625	0.000000	1.000000
Na 589.592 { 57}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.040649	0.148832	0.000000	1.000000
Ni 221.647 {452}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000076	1.632114	0.000000	1.000000
P 177.495 {490}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.016960	0.169935	0.000000	1.000000
Pb 220.353 {453}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000394	0.281332	0.000000	1.000000
S 182.034 {485}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000571	0.095231	0.000000	1.000000
Sb 206.833 {463}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000694	0.219418	0.000000	1.000000
Se 196.090 {472}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000209	0.133090	0.000000	1.000000
Si 251.611 {134}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.001792	0.067361	0.000000	1.000000
Sn 189.989 {478}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.001054	0.292101	0.000000	1.000000
Sr 407.771 { 83}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.017026	10.704038	0.000000	1.000000
Th 283.231 {119}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000648	0.013883	0.000000	1.000000
Ti 334.941 {101}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000358	0.654246	0.000000	1.000000
Tl 190.856 {477}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000781	0.185128	0.000000	1.000000
U 367.007 { 92}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.005887	0.011802	0.000000	1.000000
V 290.882 {116}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	0.000855	0.182503	0.000000	1.000000
Y 224.306 {450}* Y 360.073 { 94}* Y 360.073 { 94}2*	<not fit> 7/25/2018 13:40:04 7/25/2018 13:40:04	<Never Calibrated> 6/22/2018 11:30:38 6/22/2018 11:30:38	Linear Linear Linear	1/Conc 1/Conc 1/Conc	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	1.000000 1.000000 1.000000
Zn 213.856 {458}	8/6/2018 11:21:07	8/6/2018 11:21:07	Linear	1/Conc	-0.000056	2.830114	0.000000	1.000000

Element, Wavelength and Order	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope		QC Norm	
						Slope	Y-int	Slope factor	Offset
Ag 328.068 {103}	0.999923	0.000016	0.000907	0.003025	OK.	1.000000	0.000000	1	0
Al 396.152 { 85}	0.999906	0.000426	0.015040	0.050133	OK.	1.000000	0.000000	1	0
As 189.042 {478}	0.999851	0.000056	0.001426	0.004752	OK.	1.000000	0.000000	1	0
B 249.678 {135}	0.999931	0.000025	0.006586	0.021953	OK.	1.000000	0.000000	1	0
Ba 455.403 { 74}	0.999943	0.002677	0.000399	0.001330	OK.	1.000000	0.000000	1	0
Be 313.042 {108}	0.999978	0.000571	0.000125	0.000417	OK.	1.000000	0.000000	1	0
Bi 223.061 {451}	0.999875	0.000282	0.001973	0.006577	OK.	1.000000	0.000000	1	0
Ca 184.006 {483}	0.999993	0.000903	0.000575	0.001917	OK.	1.000000	0.000000	1	0
Cd 228.802 {447}	0.999918	0.000490	0.000154	0.000512	OK.	1.000000	0.000000	1	0
Co 228.616 {448}	0.999956	0.000316	0.000373	0.001242	OK.	1.000000	0.000000	1	0
Cr 205.560 {464}	0.999911	0.000283	0.000167	0.000556	OK.	1.000000	0.000000	1	0
Cu 217.894 {455}	0.999857	0.000086	0.001989	0.006631	OK.	1.000000	0.000000	1	0
Fe 259.940 {130}	0.999974	0.000183	0.003832	0.012775	OK.	1.000000	0.000000	1	0
K 766.490 { 44}	0.999867	0.000932	0.059761	0.199203	OK.	1.000000	0.000000	1	0
Li 670.784 { 50}	0.999909	0.000659	0.002352	0.007841	OK.	1.000000	0.000000	1	0
Mg 279.806 {121}	0.999941	0.000092	0.034788	0.115962	OK.	1.000000	0.000000	1	0
Mn 257.610 {131}	0.999934	0.000218	0.000627	0.002089	OK.	1.000000	0.000000	1	0
Mo 202.030 {467}	0.999859	0.000231	0.000344	0.001148	OK.	1.000000	0.000000	1	0
Na 589.592 { 57}	0.999925	0.000999	0.017779	0.059263	OK.	1.000000	0.000000	1	0
Ni 221.647 {452}	0.999972	0.000424	0.000272	0.000906	OK.	1.000000	0.000000	1	0
P 177.495 {490}	0.999977	0.000313	0.001716	0.005720	OK.	1.000000	0.000000	1	0
Pb 220.353 {453}	0.999987	0.000025	0.001243	0.004143	OK.	1.000000	0.000000	1	0
S 182.034 {485}	0.999787	0.002448	0.002635	0.008782	OK.	1.000000	0.000000	1	0
Sb 206.833 {463}	0.999827	0.000032	0.001653	0.005511	OK.	1.000000	0.000000	1	0
Se 196.090 {472}	0.999853	0.000021	0.002292	0.007640	OK.	1.000000	0.000000	1	0
Si 251.611 {134}	0.999818	0.000143	0.008405	0.028018	OK.	1.000000	0.000000	1	0
Sn 189.989 {478}	0.999963	0.000138	0.000725	0.002418	OK.	1.000000	0.000000	1	0
Sr 407.771 { 83}	1.000000	0.000130	0.000154	0.000513	OK.	1.000000	0.000000	1	0
Th 283.231 {119}	0.999955	0.000010	0.002727	0.009090	OK.	1.000000	0.000000	1	0
Ti 334.941 {101}	0.999942	0.000173	0.001449	0.004831	OK.	1.000000	0.000000	1	0
Tl 190.856 {477}	0.999994	0.000007	0.001375	0.004584	OK.	1.000000	0.000000	1	0
U 367.007 { 92}	0.999809	0.000029	0.016099	0.053664	OK.	1.000000	0.000000	1	0
V 290.882 {116}	0.999944	0.000075	0.004729	0.015763	OK.	1.000000	0.000000	1	0
Y 224.306 {450}*	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Y 360.073 { 94}*	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Y 360.073 { 94}2*	0.000000	0.000000	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Zn 213.856 {458}	0.999984	0.000390	0.000119	0.000397	OK.	1.000000	0.000000	1	0

	Pos ID	Rack	Row	Col	Type	Sample Name	Comment	Custom ID1	Custom ID2
1	1001	3	1	1	Unk	MB 160-379537/1-A	379537		
2	1002	3	1	2	Unk	LCS 160-379537/2-A			
3	1003	3	1	3	Unk	160-29476-L-1-C			
4	1004	3	1	4	Unk	160-29476-L-1-CSD@5			
5	1005	3	1	5	Unk	160-29476-L-1-D MS			
6	1006	3	1	6	Unk	160-29476-L-1-E MSD			
7	1007	3	1	7	Unk	LB 160-378221/1-C	380009		
8	1008	3	1	8	Unk	LCS 160-380009/2-A			
9	1009	3	1	9	Unk	160-29687-B-1-E			
10	1010	3	1	10	Unk	160-29687-B-1-ESD@5			
11	1011	3	1	11	Unk	160-29687-B-1-F MS			
12	1012	3	1	12	Unk	160-29687-B-1-G MSD			
13	1013	3	2	1	Unk	160-29687-B-1-EPDS			
14	1014	3	2	2	Unk	MB 160-380003/1-A	380003		
15	1015	3	2	3	Unk	LCS 160-380003/2-A			
16	1016	3	2	4	Unk	680-155956-G-1-A@10			
17	1017	3	2	5	Unk	680-155956-G-1-ASD@50			
18	1018	3	2	6	Unk	680-155956-G-1-BMS@10			
19	1019	3	2	7	Unk	680-155956-G1CMSD@10			
20	1020	3	2	8	Unk	MB	378338 Ni Carrier		
21	1021	3	2	9	Unk	LCS			
22	1022	3	2	10	Unk	LCSD			
23	1023	3	2	11	Unk	160-29595-B-1			
24	1024	3	2	12	Unk	MB 160-380005/1-A	380005/380006 PT		
25	1025	3	3	1	Unk	LCS 160-380005/2-A			
26	1026	3	3	2	Unk	160-29429-A-1-A@5			
27	1027	3	3	3	Unk	160-29429-A-1-ASD@25			
28	1028	3	3	4	Unk	160-29429-A-1-B MS@5			
29	1029	3	3	5	Unk	160-29429-A-1-CMSD@5			
30	1030	3	3	6	Unk	160-29429-A-3-A@5			
31	1031	3	3	7	Unk	160-29429-A-7-A@5			
32	1032	3	3	8	Unk	160-29429-A-21-A@5 SFF 8/7/18			
33	1033	3	3	9	Unk	160-29429-A-22-A@5			
34	1034	3	3	10	Unk	160-29429-A-1-A@10			
35	1035	3	3	11	Unk	160-29429-A-1-ASD@50			
36	1036	3	3	12	Unk	160-29429-A-1-BMS@10			
37	1037	3	4	1	Unk	160-29429-A-1-CMSD@10			
38	1038	3	4	2	Unk	160-29429-A-3-A@10			
39	1039	3	4	3	Unk	160-29429-A-7-A@10			
40	1040	3	4	4	Unk	160-29429-A-21-A@10			
41	1041	3	4	5	Unk	160-29429-A-22-A@10			
42	1042	3	4	6	Unk	LRC	LRC		
43	1043	3	4	7	Unk	LB 160-378782/1-B	380273		
44	1044	3	4	8	Unk	LCS 160-380213/2-A			
45	1045	3	4	9	Unk	160-29879-A-1-B			
46	1046	3	4	10	Unk	160-29879-A-1-BSD@5			
47	1047	3	4	11	Unk	160-29879-A-1-C MS			
48	1048	3	4	12	Unk	160-29879-A-1-D MSD			
49	1049	3	5	1	Unk	160-29879-A-2-B			
50	1050	3	5	2	Unk	160-29879-A-3-B			
51	1051	3	5	3	Unk	160-29879-A-4-B SFF 8/7/18			

Sample Name: CALBLK1 Acquired: 8/2/2018 15:06:17 Type: Cal
Method: _2016(v681) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.0037	.0010	-.0000	-.0007	.0252	-.0023	-.0006	.0027	-.0004
Stddev	.0001	.0024	.0001	.0005	.0039	.0007	.0002	.0002	.0001
%RSD	3.818	242.1	333.3	64.48	15.49	32.62	37.40	5.628	26.03

#1	-.0038	.0037	-.0002	-.0008	.0232	-.0032	-.0004	.0028	-.0003
#2	-.0037	-.0006	-.0000	-.0012	.0226	-.0019	-.0007	.0025	-.0003
#3	-.0036	-.0001	.0001	-.0003	.0296	-.0019	-.0008	.0028	-.0005

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0007	.0003	-.0006	-.0003	.0401	.0072	-.0009	.0014	-.0006
Stddev	.0001	.0001	.0000	.0014	.0059	.0040	.0004	.0009	.0001
%RSD	20.00	21.59	5.391	429.4	14.77	54.85	49.79	64.81	21.24

#1	.0008	.0002	-.0006	-.0010	.0333	.0112	-.0004	.0021	-.0005
#2	.0008	.0002	-.0006	-.0012	.0427	.0072	-.0013	.0017	-.0005
#3	.0005	.0003	-.0005	.0012	.0443	.0033	-.0010	.0004	-.0007

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0982	.0007	-.0030	-.0004	.0006	-.0001	.0002	.0019	.0003
Stddev	.0032	.0004	.0001	.0003	.0001	.0004	.0001	.0007	.0002
%RSD	3.266	55.15	1.929	68.87	21.80	423.5	36.05	37.94	74.87

#1	.1019	.0008	-.0029	-.0001	.0005	-.0004	.0003	.0011	.0003
#2	.0960	.0010	-.0029	-.0005	.0008	.0003	.0003	.0023	.0001
#3	.0967	.0003	-.0030	-.0007	.0006	-.0001	.0001	.0024	.0006

Elem	Sr4077	Th2832	Ti3349	Tl1908	U_3670	V_2908	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.0203	.0018	-.0003	-.0003	.0023	-.0006	.0013
Stddev	.0023	.0000	.0006	.0001	.0001	.0007	.0001
%RSD	11.46	1.408	232.2	21.98	5.179	111.6	10.50

#1	-.0213	.0018	-.0005	-.0003	.0024	.0001	.0013
#2	-.0218	.0018	-.0007	-.0004	.0022	-.0012	.0013
#3	-.0176	.0017	.0004	-.0002	.0023	-.0008	.0011

Sample Name: CALBLK1 Acquired: 8/2/2018 15:06:17 Type: Cal
Method: _2016(v681) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3652.9	33607.	3579.1
Stddev	48.0	212.	19.2
%RSD	1.3148	.63033	.53518
#1	3611.3	33385.	3572.0
#2	3642.1	33807.	3564.5
#3	3705.5	33629.	3600.8

Sample Name: CAL 1 Acquired: 8/2/2018 15:10:57 Type: Cal
Method: _2016(v681) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.0021	.0237	.0003	.0094	.2810	.0442	.0181	.1105	.0052
Stddev	.0001	.0027	.0000	.0002	.0014	.0003	.0003	.0007	.0004
%RSD	4.778	11.60	12.57	2.040	.4907	.5664	1.417	.6291	8.272

#1	-.0021	.0205	.0002	.0091	.2799	.0439	.0181	.1100	.0054
#2	-.0020	.0247	.0003	.0095	.2806	.0442	.0184	.1113	.0056
#3	-.0022	.0257	.0003	.0095	.2826	.0444	.0179	.1103	.0048

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0213	.0059	.0019	.0184	.2019	.0484	.0208	.0230	.0148
Stddev	.0000	.0002	.0002	.0009	.0035	.0046	.0007	.0006	.0002
%RSD	.2248	3.290	11.22	4.728	1.756	9.476	3.495	2.704	1.320

#1	.0213	.0057	.0020	.0194	.2033	.0441	.0211	.0235	.0146
#2	.0213	.0061	.0016	.0178	.1979	.0532	.0200	.0223	.0149
#3	.0212	.0059	.0020	.0180	.2045	.0478	.0214	.0230	.0150

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.2000	.0271	.0037	.0015	.0944	.0009	.0008	.0326	.0119
Stddev	.0010	.0002	.0002	.0001	.0002	.0002	.0001	.0009	.0002
%RSD	.5039	.6085	4.836	9.462	.2589	19.60	17.87	2.719	1.273

#1	.2007	.0272	.0039	.0017	.0941	.0007	.0006	.0329	.0121
#2	.2004	.0269	.0038	.0015	.0946	.0009	.0009	.0316	.0119
#3	.1988	.0271	.0035	.0014	.0943	.0011	.0009	.0334	.0118

Elem	Sr4077	Th2832	Ti3349	Tl1908	U_3670	V_2908	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0336	.0034	.0119	.0012	.0070	.0096	.0240
Stddev	.0010	.0000	.0012	.0001	.0002	.0008	.0003
%RSD	2.861	.5802	9.902	10.27	2.943	8.408	1.164

#1	.0327	.0034	.0112	.0011	.0068	.0105	.0237
#2	.0346	.0034	.0113	.0014	.0070	.0092	.0243
#3	.0335	.0034	.0133	.0012	.0073	.0091	.0240

Sample Name: CAL 1 Acquired: 8/2/2018 15:10:57 Type: Cal
Method: _2016(v681) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3767.7	35110.	3965.1
Stddev	20.3	485.	24.9
%RSD	.53757	1.3825	.62883
#1	3786.7	35669.	3955.1
#2	3746.4	34795.	3993.5
#3	3769.8	34866.	3946.8

Sample Name: Cal 2 Acquired: 8/2/2018 15:15:35 Type: Cal
Method: _2016(v681) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.1400	5.417	.2681	.0981	26.99	47.70	.4536	5.355	5.909
Stddev	.0007	.016	.0012	.0005	.12	.20	.0025	.012	.024
%RSD	.4935	.2871	.4390	.5298	.4419	.4135	.5518	.2203	.4067

#1	.1394	5.424	.2690	.0976	27.12	47.84	.4561	5.361	5.933
#2	.1399	5.428	.2685	.0987	26.97	47.78	.4536	5.362	5.909
#3	.1408	5.399	.2667	.0980	26.88	47.47	.4511	5.341	5.885

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2.071	2.820	.5105	9.312	1.714	4.058	1.072	7.114	.3946
Stddev	.006	.006	.0011	.043	.008	.015	.002	.024	.0014
%RSD	.2836	.2098	.2194	.4595	.4879	.3613	.2029	.3370	.3509

#1	2.076	2.827	.5114	9.355	1.715	4.069	1.073	7.128	.3960
#2	2.072	2.820	.5109	9.313	1.722	4.064	1.073	7.128	.3946
#3	2.065	2.815	.5093	9.269	1.705	4.042	1.069	7.086	.3932

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	5.863	3.281	1.376	.8825	1.005	.0917	.0434	.4294	.5858
Stddev	.016	.011	.006	.0024	.006	.0003	.0002	.0008	.0004
%RSD	.2664	.3337	.4438	.2733	.6099	.2995	.3850	.1777	.0599

#1	5.864	3.289	1.382	.8844	1.012	.0919	.0436	.4286	.5858
#2	5.879	3.286	1.376	.8833	1.005	.0916	.0433	.4296	.5861
#3	5.847	3.268	1.370	.8798	.9998	.0914	.0434	.4301	.5854

Elem	Sr4077	Th2832	Ti3349	Tl1908	U_3670	V_2908	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	53.45	.0513	3.176	.0751	.0524	.9735	6.070
Stddev	.24	.0005	.018	.0003	.0004	.0030	.026
%RSD	.4427	1.035	.5803	.3523	.8061	.3057	.4247

#1	53.67	.0511	3.194	.0751	.0519	.9727	6.094
#2	53.49	.0508	3.178	.0754	.0526	.9768	6.073
#3	53.20	.0519	3.157	.0749	.0527	.9710	6.043

Sample Name: Cal 2 Acquired: 8/2/2018 15:15:35 Type: Cal
Method: _2016(v681) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3480.4	31689.	3676.7
Stddev	31.7	199.	95.4
%RSD	.90967	.62664	2.5938
#1	3510.9	31493.	3784.8
#2	3482.5	31684.	3640.8
#3	3447.7	31890.	3604.6

Sample Name: Cal 3 Acquired: 8/2/2018 15:19:47 Type: Cal
Method: _2016(v681) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.2947	11.06	.5609	.2039	55.22	96.45	.9429	11.01	12.38
Stddev	.0008	.08	.0012	.0015	.31	.52	.0017	.02	.00
%RSD	.2633	.7379	.2158	.7210	.5616	.5427	.1850	.2021	.0350

#1	.2941	11.14	.5611	.2043	55.50	96.93	.9448	11.02	12.38
#2	.2944	10.98	.5596	.2022	54.89	95.89	.9415	11.02	12.37
#3	.2956	11.05	.5621	.2051	55.28	96.54	.9423	10.98	12.38

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	4.303	5.865	1.056	19.00	3.468	8.283	2.173	14.38	.8234
Stddev	.003	.013	.001	.09	.023	.057	.015	.09	.0010
%RSD	.0736	.2139	.0613	.4535	.6602	.6912	.6932	.6457	.1237

#1	4.304	5.878	1.057	19.08	3.488	8.327	2.189	14.45	.8241
#2	4.306	5.865	1.056	18.91	3.443	8.218	2.159	14.28	.8237
#3	4.300	5.853	1.057	19.02	3.472	8.303	2.170	14.41	.8222

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	11.81	6.816	2.791	1.799	2.099	.1909	.0905	.8696	1.209
Stddev	.09	.004	.006	.004	.002	.0008	.0003	.0083	.003
%RSD	.7420	.0660	.2162	.2021	.0855	.4325	.3708	.9594	.2772

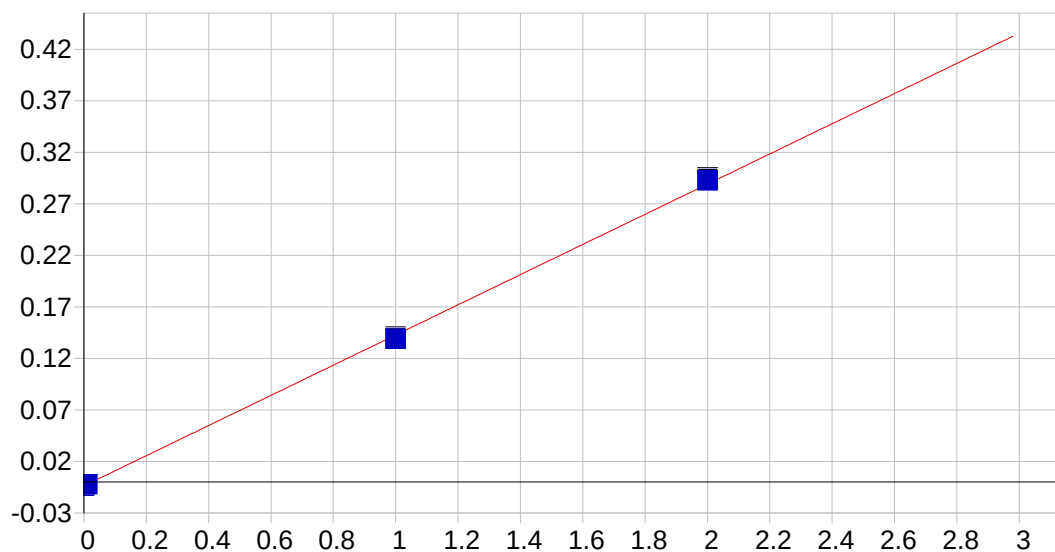
#1	11.90	6.821	2.797	1.802	2.100	.1913	.0904	.8747	1.211
#2	11.72	6.816	2.790	1.799	2.097	.1900	.0908	.8600	1.210
#3	11.82	6.812	2.785	1.795	2.100	.1915	.0901	.8741	1.205

Elem	Sr4077	Th2832	Ti3349	Tl1908	U_3670	V_2908	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	109.0	.1039	6.507	.1510	.1048	1.980	12.68
Stddev	1.0	.0002	.036	.0000	.0006	.017	.01
%RSD	.9088	.1997	.5531	.0286	.5732	.8743	.0664

#1	109.3	.1039	6.540	.1510	.1042	1.996	12.69
#2	107.9	.1037	6.468	.1510	.1054	1.962	12.68
#3	109.8	.1041	6.512	.1510	.1048	1.981	12.68

Sample Name: Cal 3 Acquired: 8/2/2018 15:19:47 Type: Cal
Method: _2016(v681) Mode: IR Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3223.7	29977.	3460.2
Stddev	27.0	849.	72.3
%RSD	.83734	2.8309	2.0898
#1	3211.0	28998.	3382.4
#2	3205.5	30503.	3525.3
#3	3254.8	30430.	3472.9

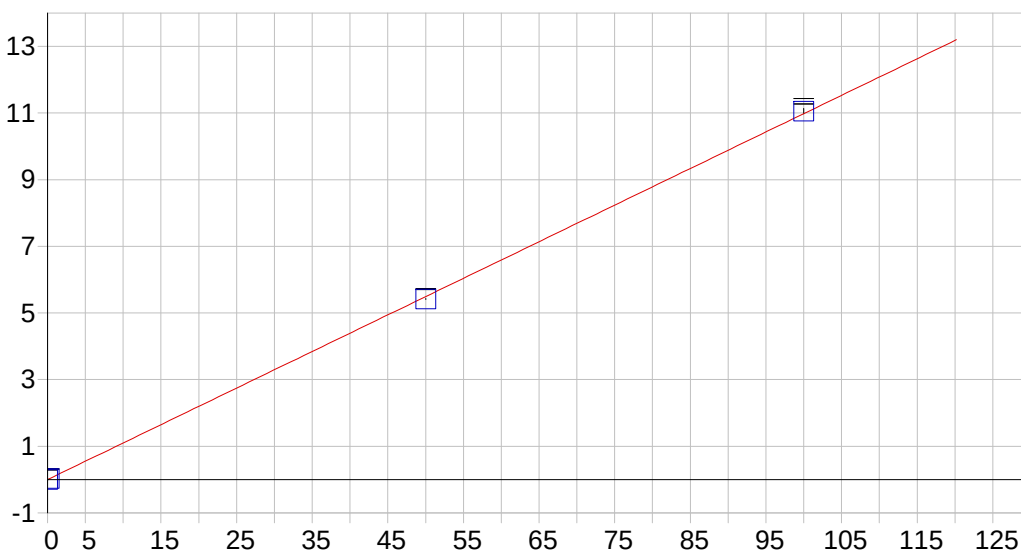


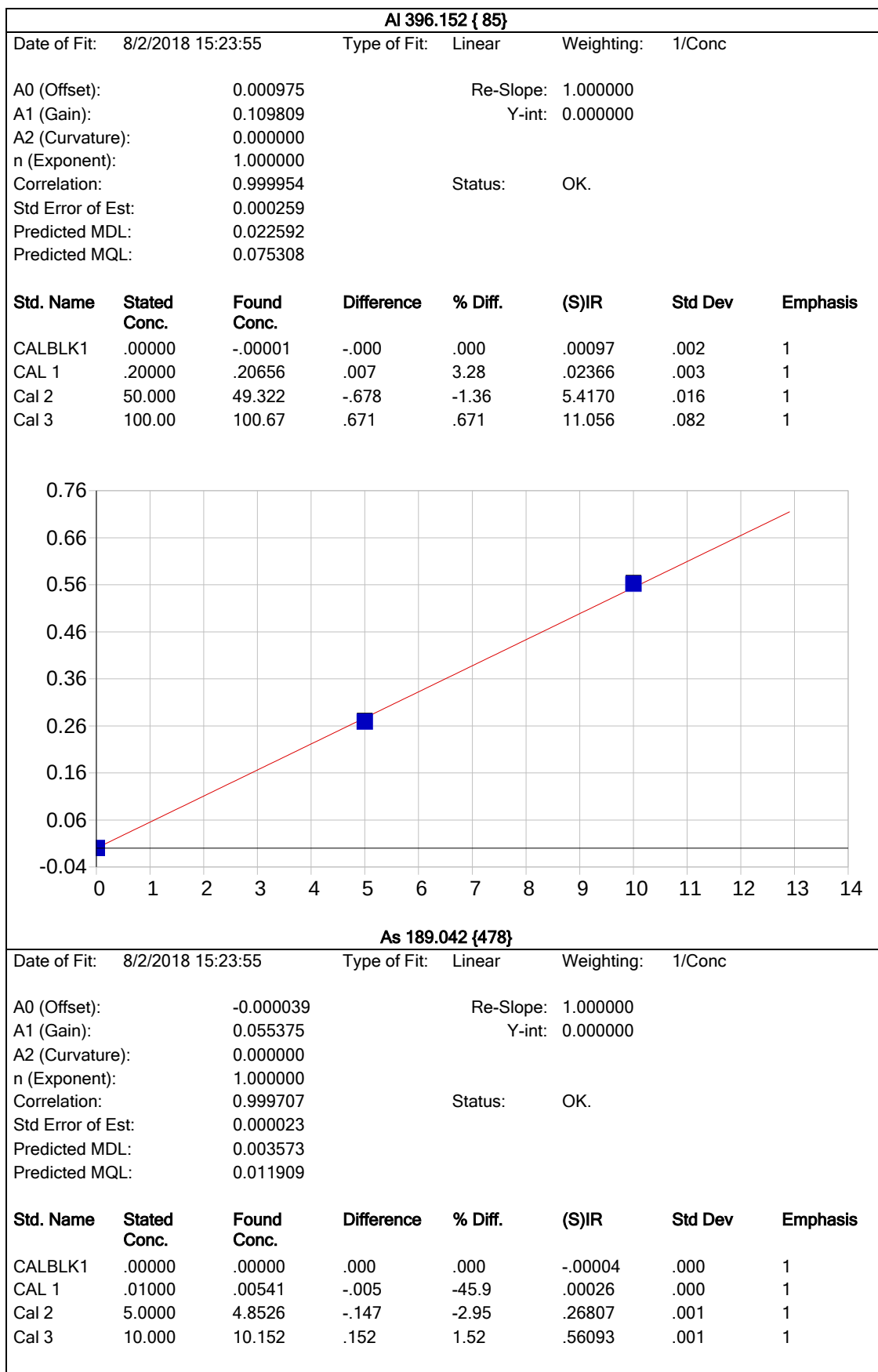
Ag 328.068 {103}

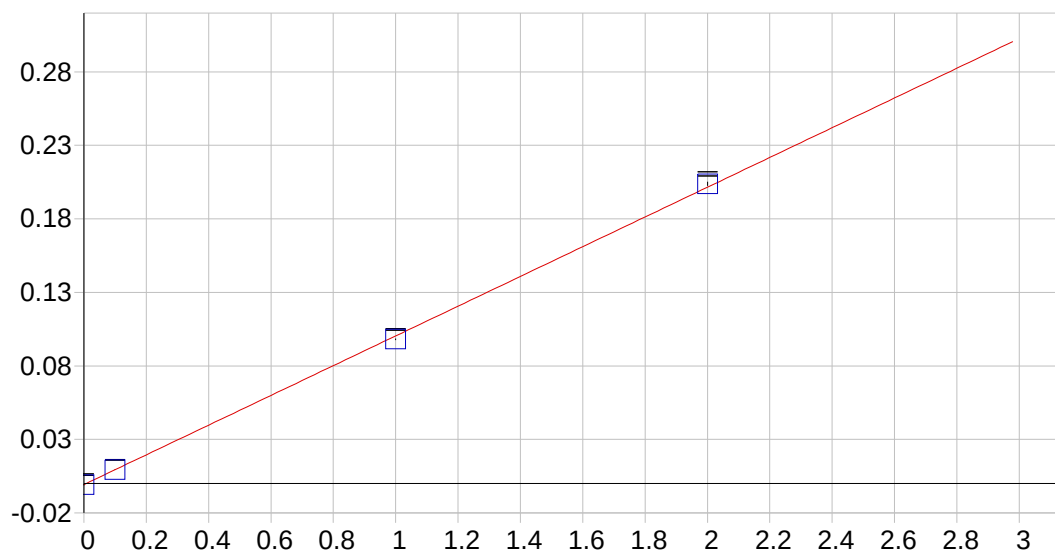
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

A0 (Offset): -0.003704 Re-Slope: 1.000000
 A1 (Gain): 0.146410 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999846 Status: OK.
 Std Error of Est: 0.000020
 Predicted MDL: 0.001587
 Predicted MQL: 0.005290

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	-.00000	-.000	.000	-.00370	.000	1
CAL 1	.01000	.01029	.000	2.93	-.00210	.000	1
Cal 2	1.0000	.97496	-.025	-2.50	.14003	.001	1
Cal 3	2.0000	2.0247	.025	1.24	.29471	.001	1





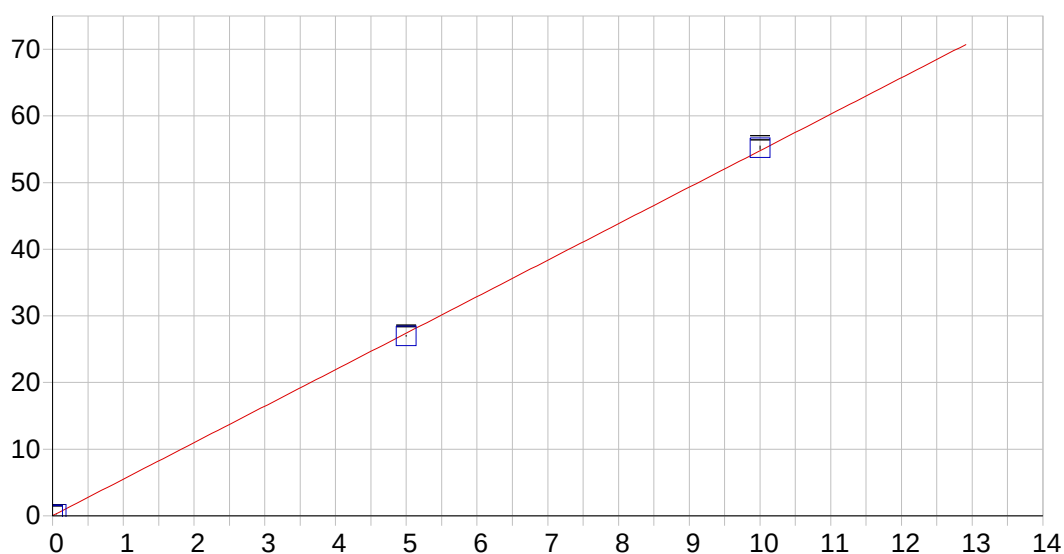


B 249.678 {135}

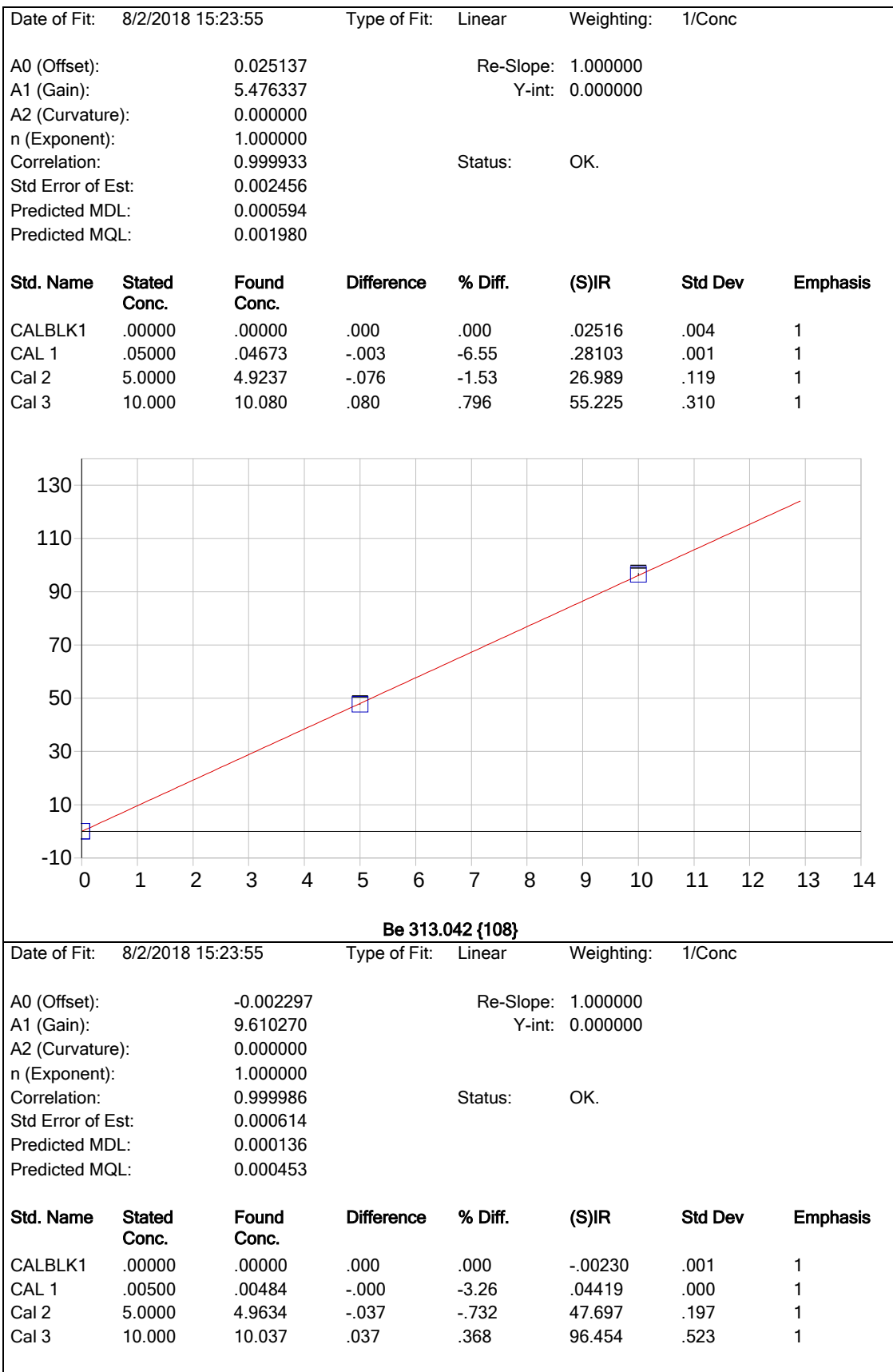
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

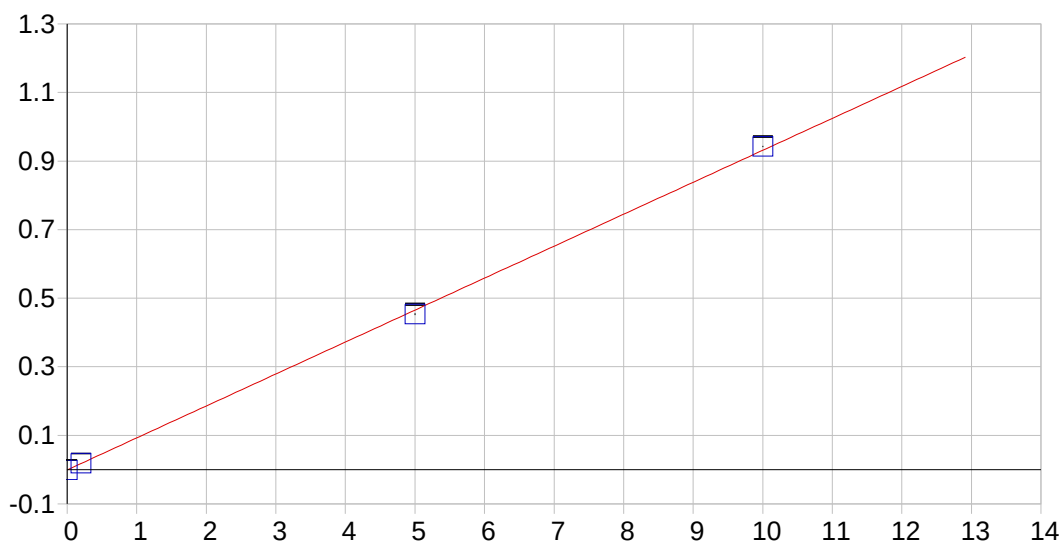
A0 (Offset): -0.000748 Re-Slope: 1.000000
 A1 (Gain): 0.101148 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999874 Status: OK.
 Std Error of Est: 0.000040
 Predicted MDL: 0.008559
 Predicted MQL: 0.028529

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.00075	.000	1
CAL 1	.10000	.09994	-.000	-.064	.00936	.000	1
Cal 2	1.0000	.97720	-.023	-2.28	.09809	.001	1
Cal 3	2.0000	2.0229	.023	1.14	.20386	.001	1



Ba 455.403 { 74}



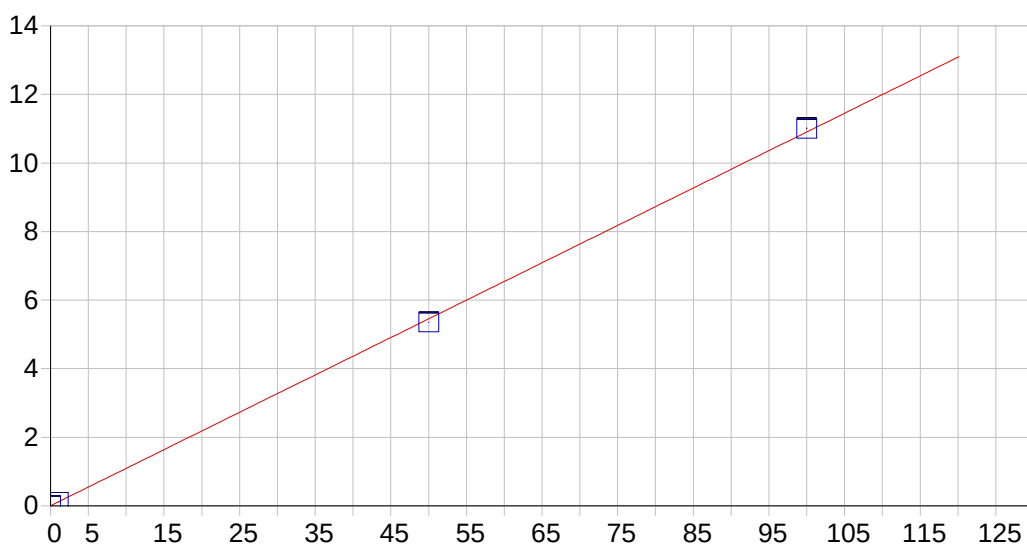


Bi 223.061 {451}

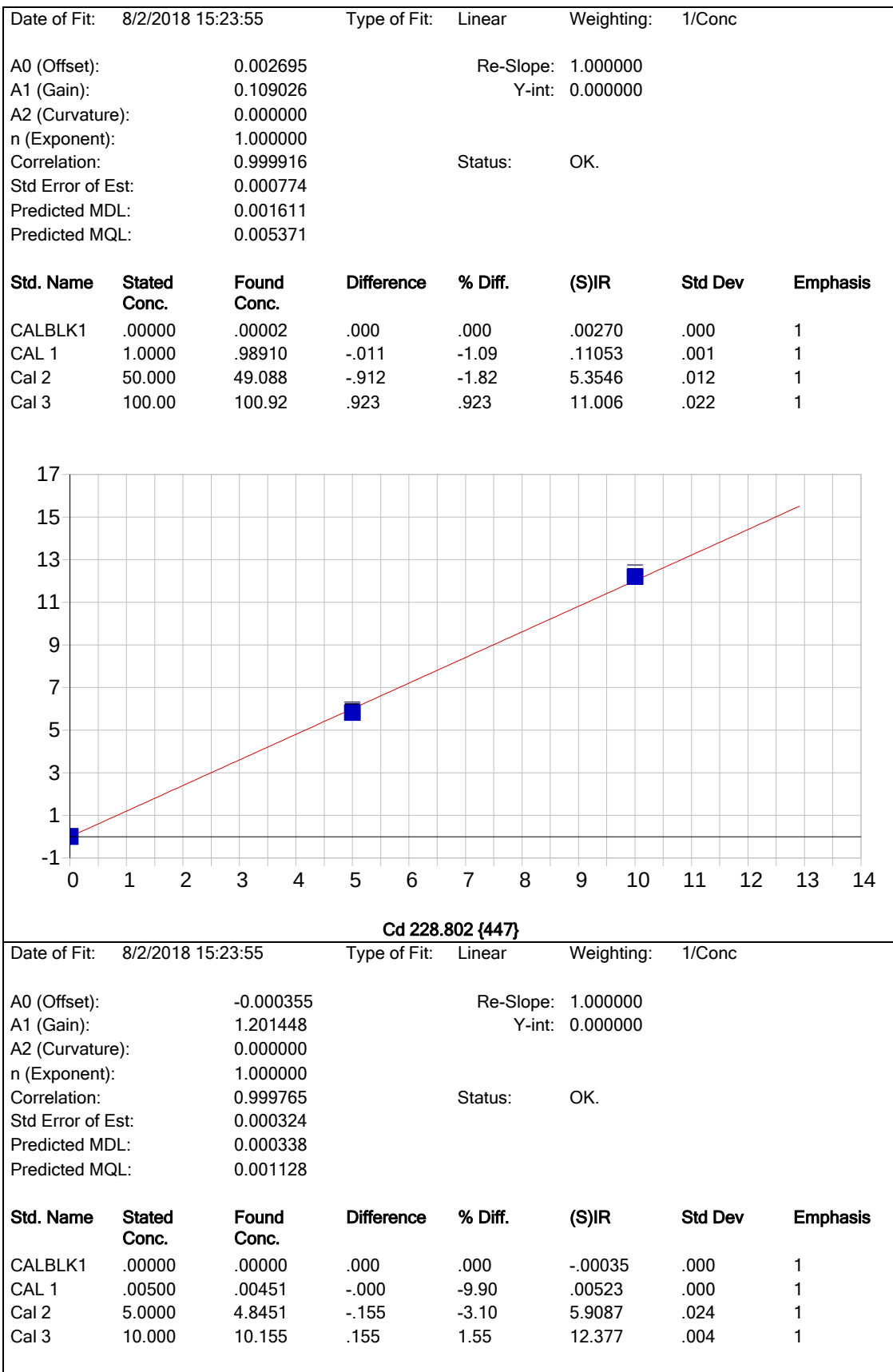
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

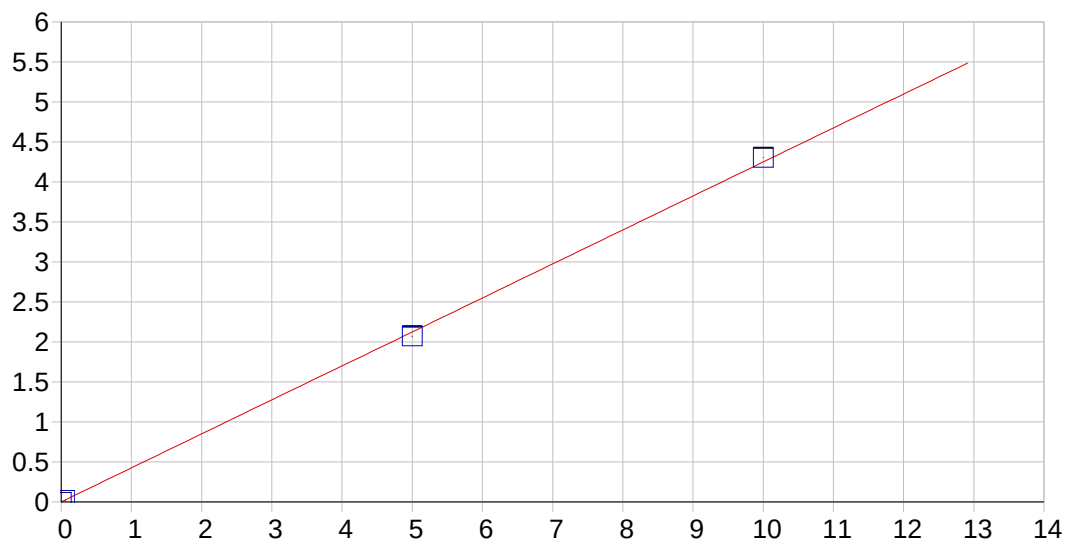
A0 (Offset): -0.000647 Re-Slope: 1.000000
 A1 (Gain): 0.093195 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999845 Status: OK.
 Std Error of Est: 0.000128
 Predicted MDL: 0.004172
 Predicted MQL: 0.013907

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.00065	.000	1
CAL 1	.20000	.20166	.002	.832	.01815	.000	1
Cal 2	5.0000	4.8742	-.126	-2.52	.45360	.003	1
Cal 3	10.000	10.124	.124	1.24	.94287	.002	1



Ca 184.006 {483}



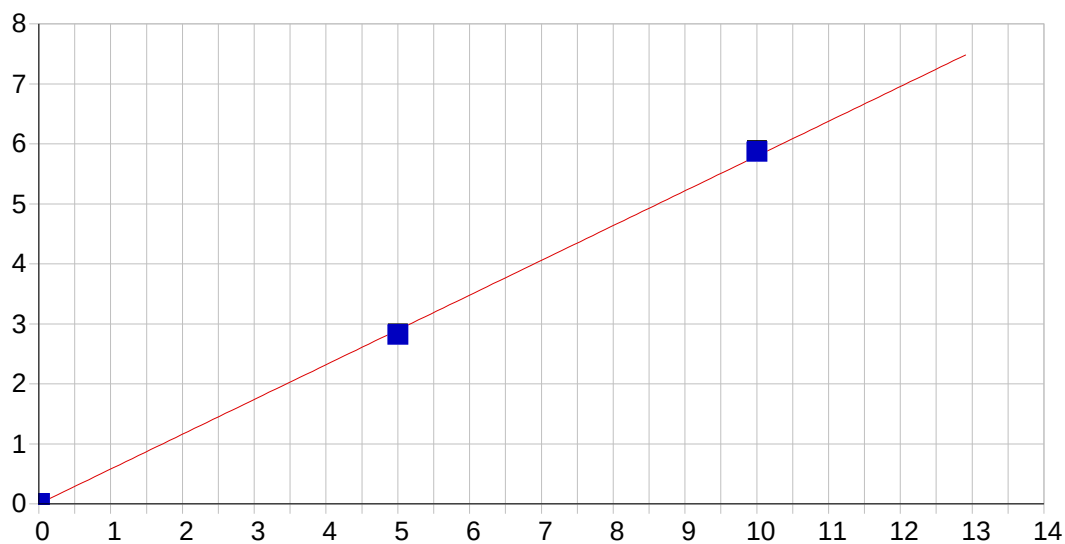


Co 228.616 {448}

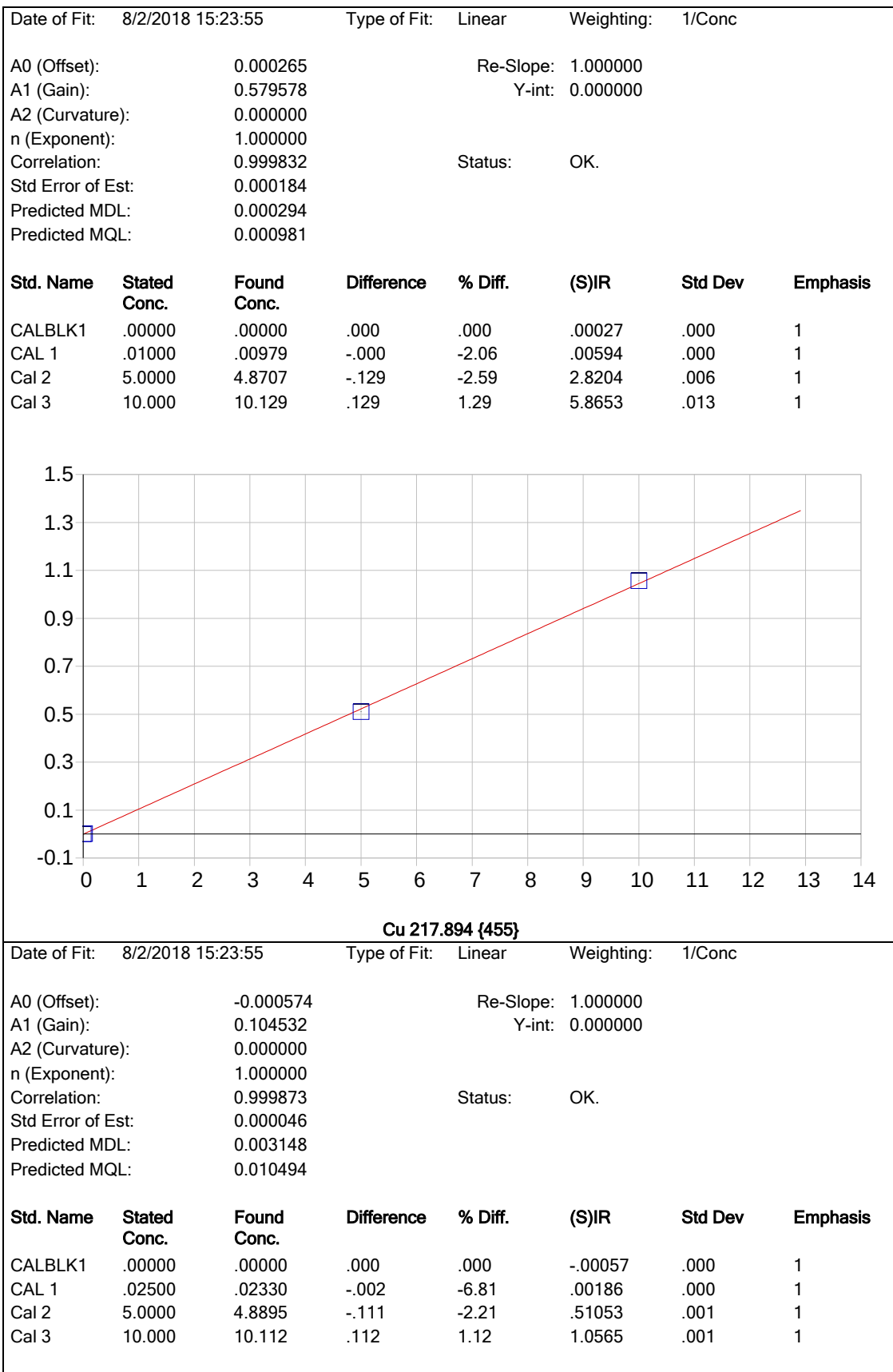
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

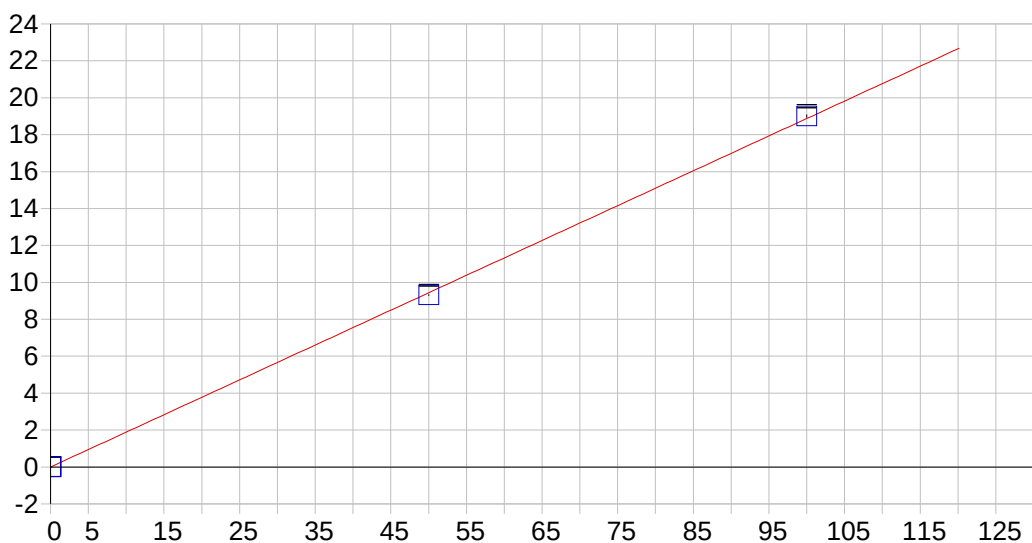
A0 (Offset): 0.000697 Re-Slope: 1.000000
 A1 (Gain): 0.424824 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999838 Status: OK.
 Std Error of Est: 0.000296
 Predicted MDL: 0.000705
 Predicted MQL: 0.002349

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	.00070	.000	1
CAL 1	.05000	.04844	-.002	-3.12	.02128	.000	1
Cal 2	5.0000	4.8737	-.126	-2.53	2.0712	.006	1
Cal 3	10.000	10.128	.128	1.28	4.3033	.003	1



Cr 205.560 {464}



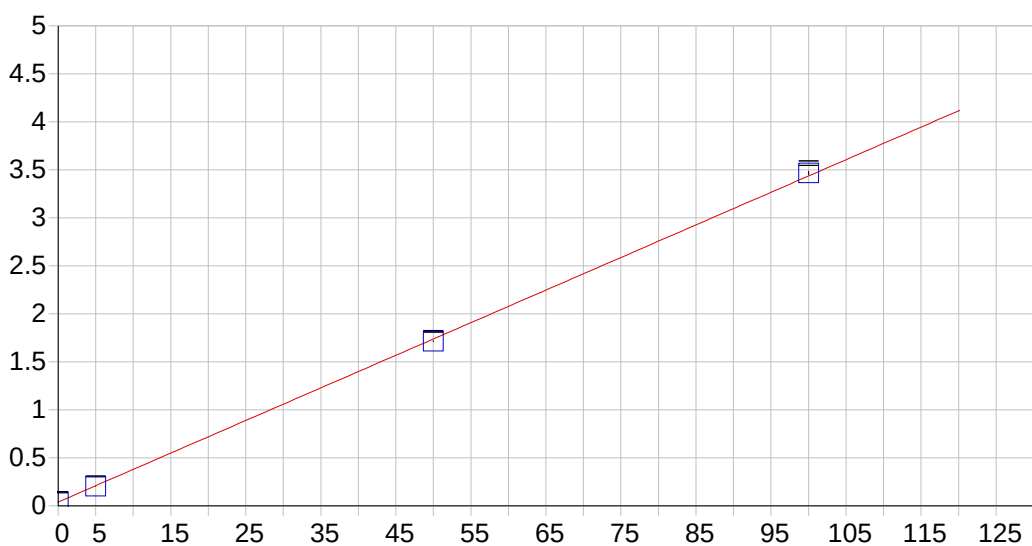


Fe 259.940 {130}

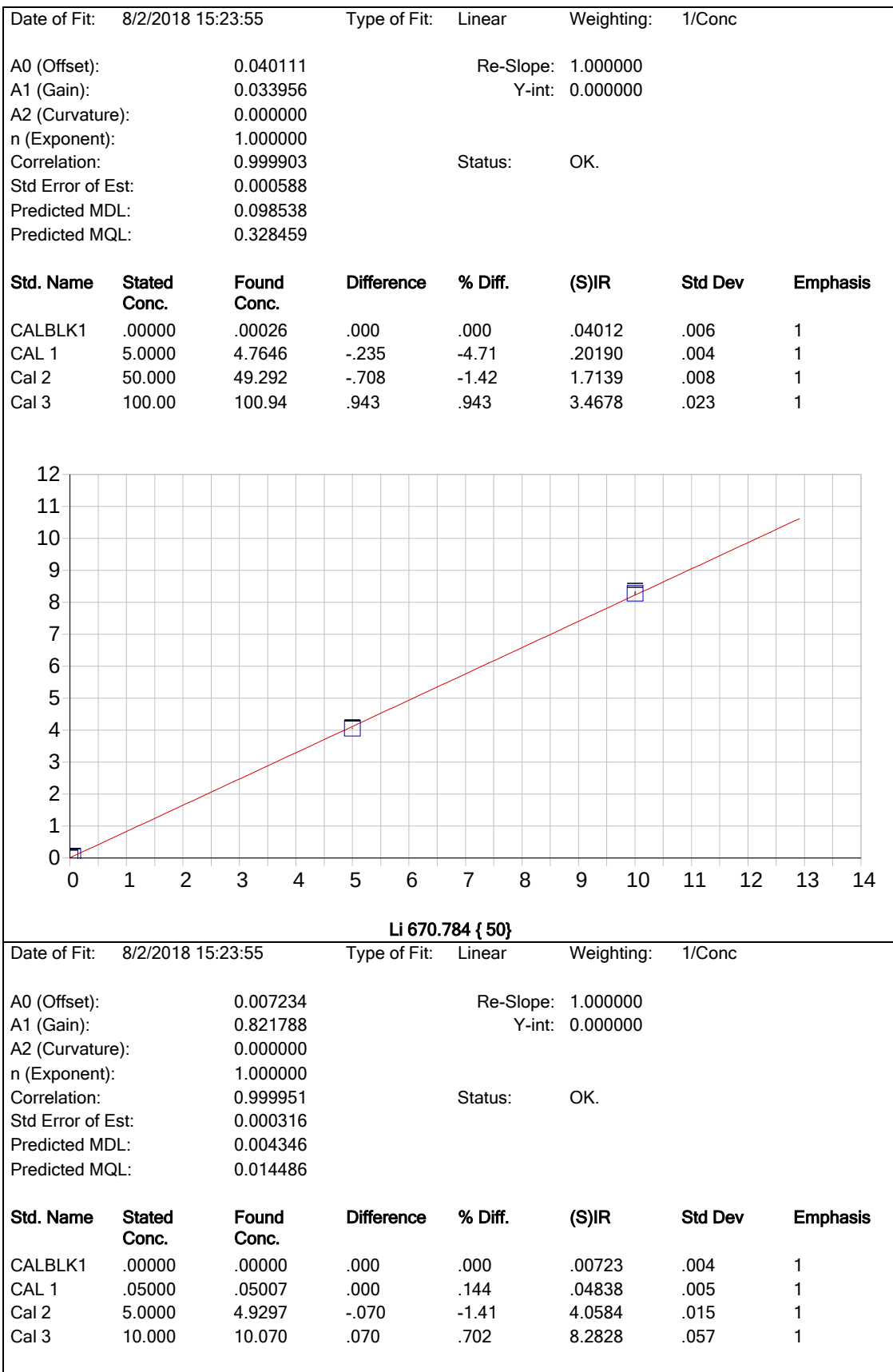
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

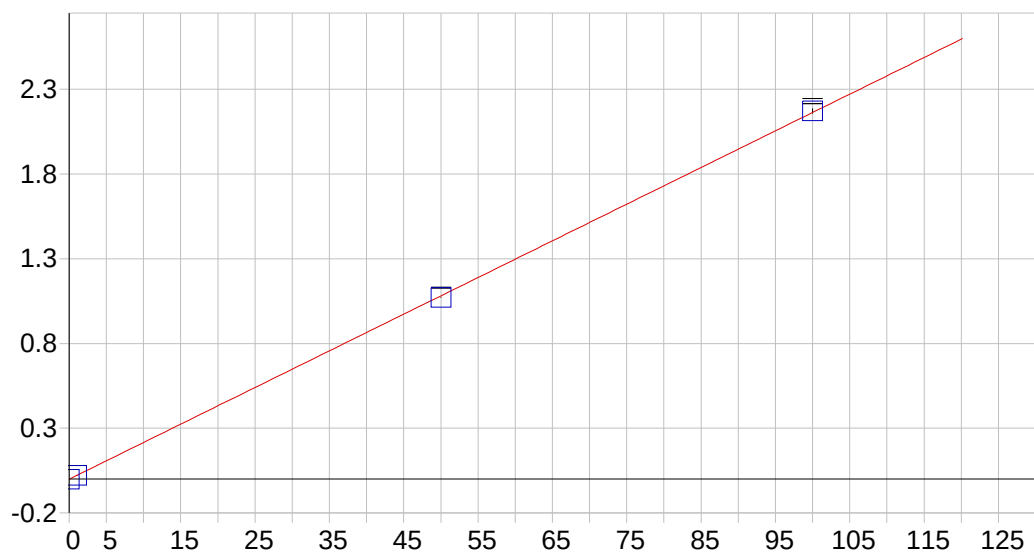
A0 (Offset): -0.000315 Re-Slope: 1.000000
 A1 (Gain): 0.188763 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999956 Status: OK.
 Std Error of Est: 0.000307
 Predicted MDL: 0.004197
 Predicted MQL: 0.013990

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.00032	.001	1
CAL 1	.10000	.09896	-.001	-1.04	.01837	.001	1
Cal 2	50.000	49.335	-.665	-1.33	9.3124	.043	1
Cal 3	100.00	100.67	.666	.666	19.002	.086	1



K 766.490 {44}



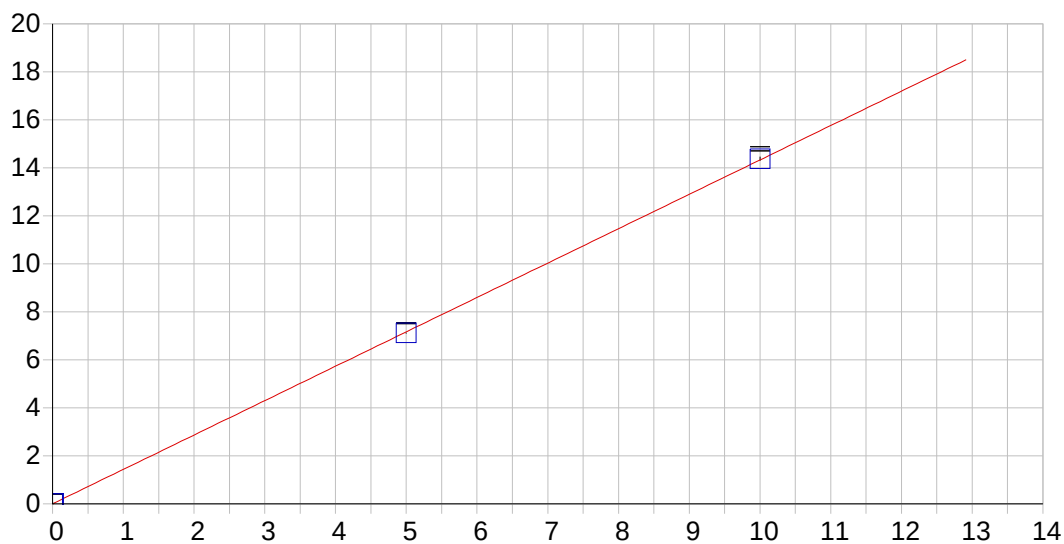


Mg 279.806 {121}

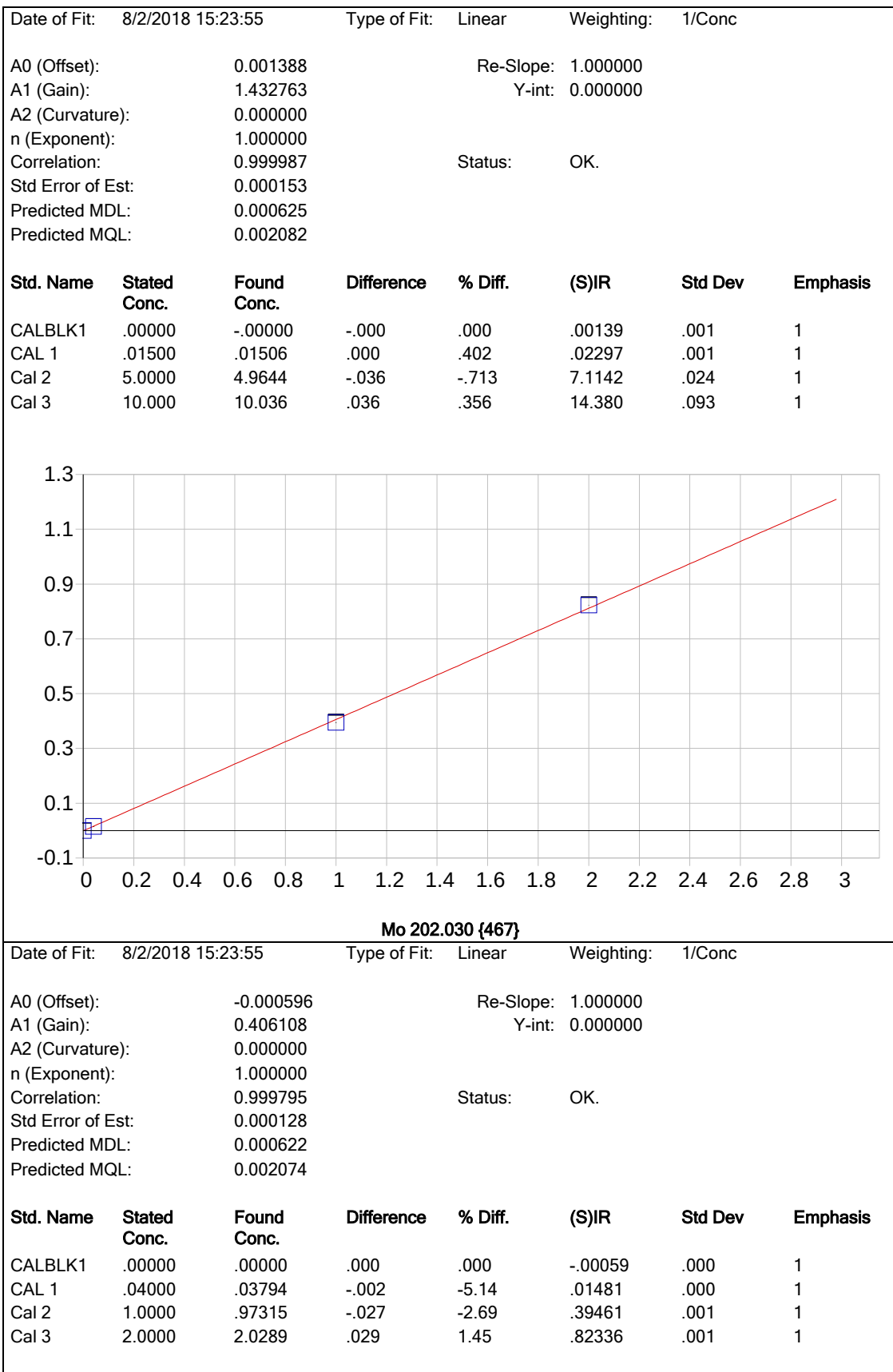
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

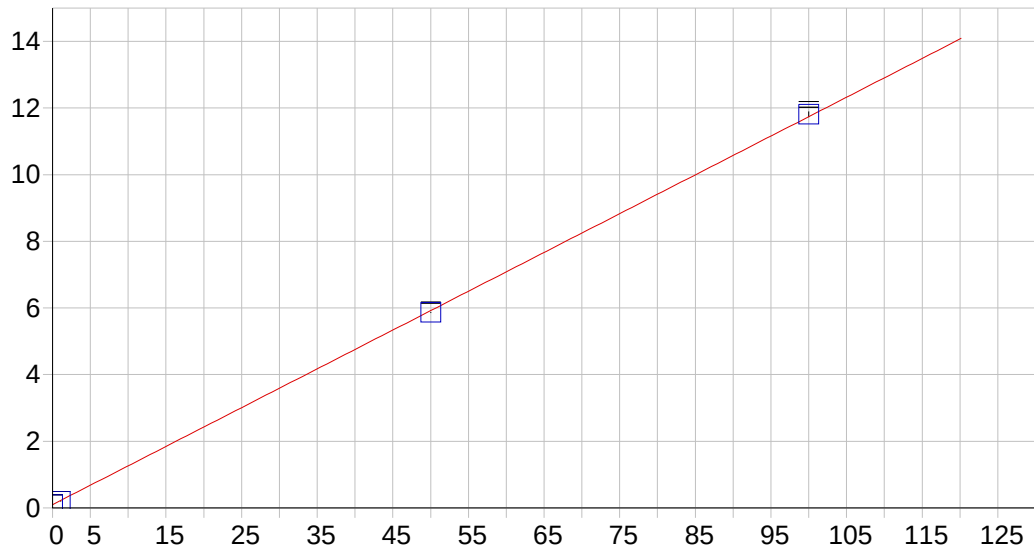
A0 (Offset): -0.000876 Re-Slope: 1.000000
 A1 (Gain): 0.021640 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999981 Status: OK.
 Std Error of Est: 0.000074
 Predicted MDL: 0.033301
 Predicted MQL: 0.111002

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.00088	.000	1
CAL 1	1.0000	1.0030	.003	.304	.02083	.001	1
Cal 2	50.000	49.560	-.440	-.880	1.0716	.002	1
Cal 3	100.00	100.44	.437	.437	2.1726	.015	1



Mn 257.610 {131}



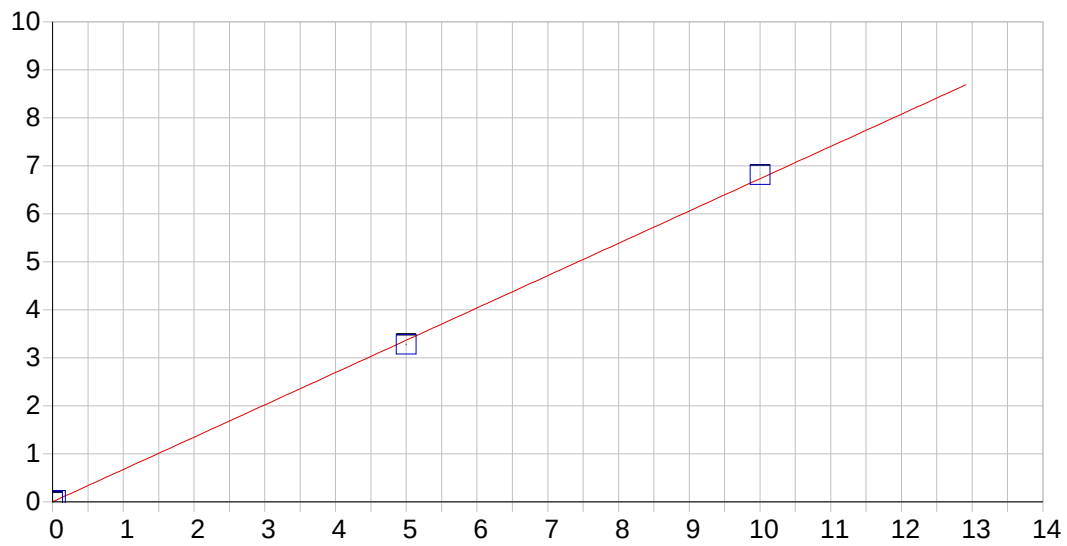


Na 589.592 { 57}

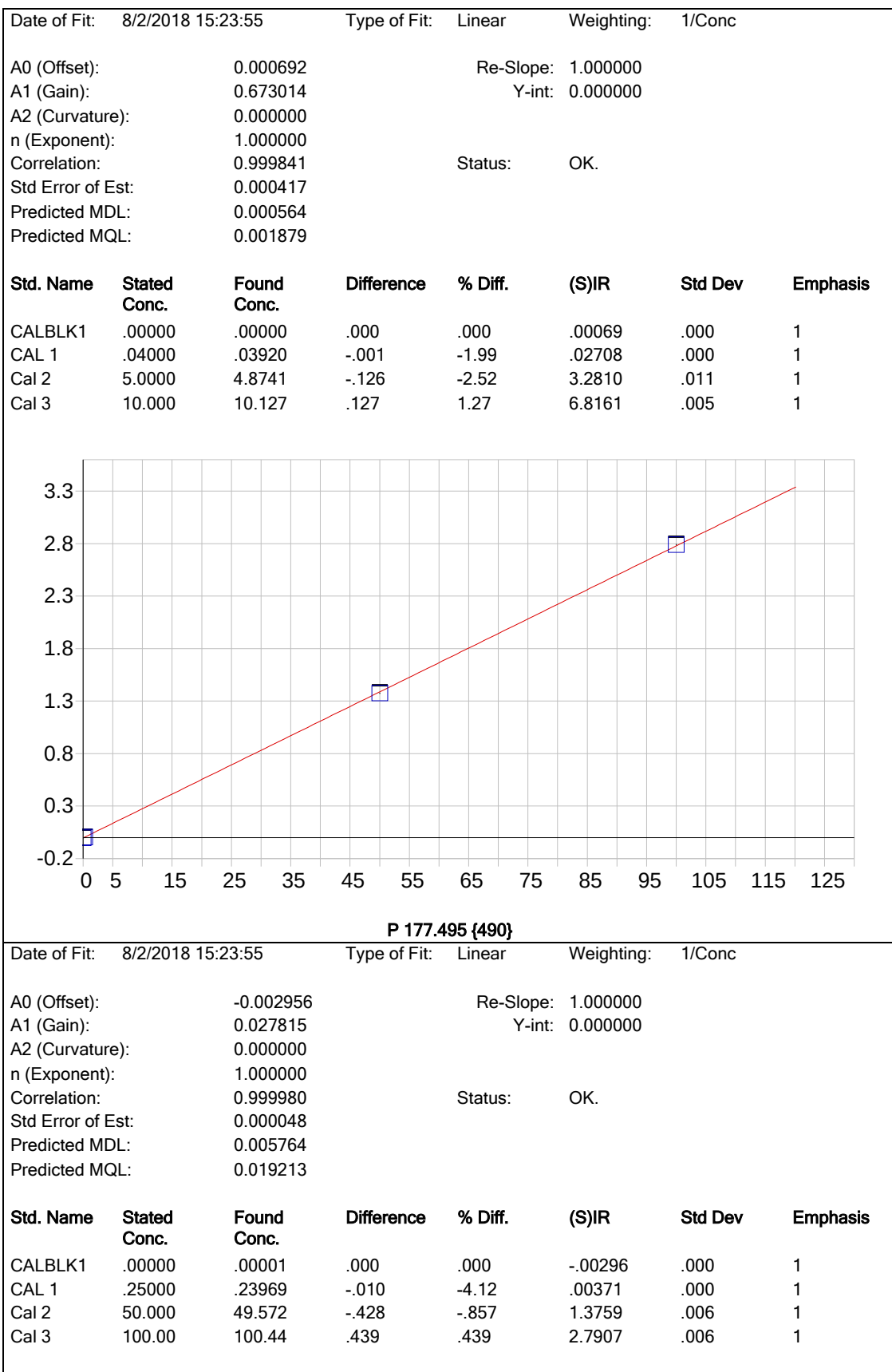
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

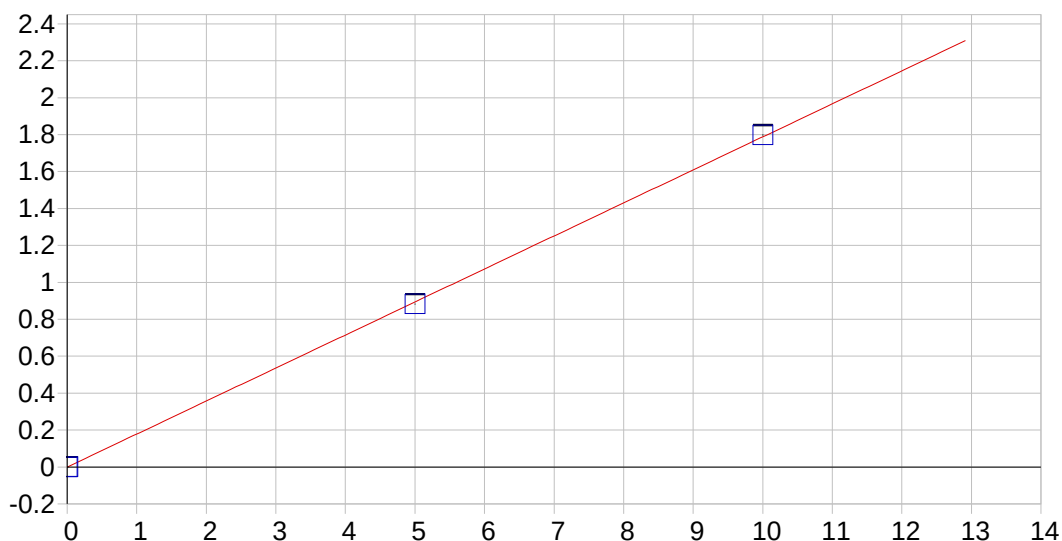
A0 (Offset): 0.098206 Re-Slope: 1.000000
 A1 (Gain): 0.116434 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999919 Status: OK.
 Std Error of Est: 0.000812
 Predicted MDL: 0.027769
 Predicted MQL: 0.092563

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00013	.000	.000	.09822	.003	1
CAL 1	1.0000	.87423	-.126	-12.6	.20000	.001	1
Cal 2	50.000	49.513	-.487	-.973	5.8632	.016	1
Cal 3	100.00	100.61	.612	.612	11.813	.088	1



Ni 221.647 {452}



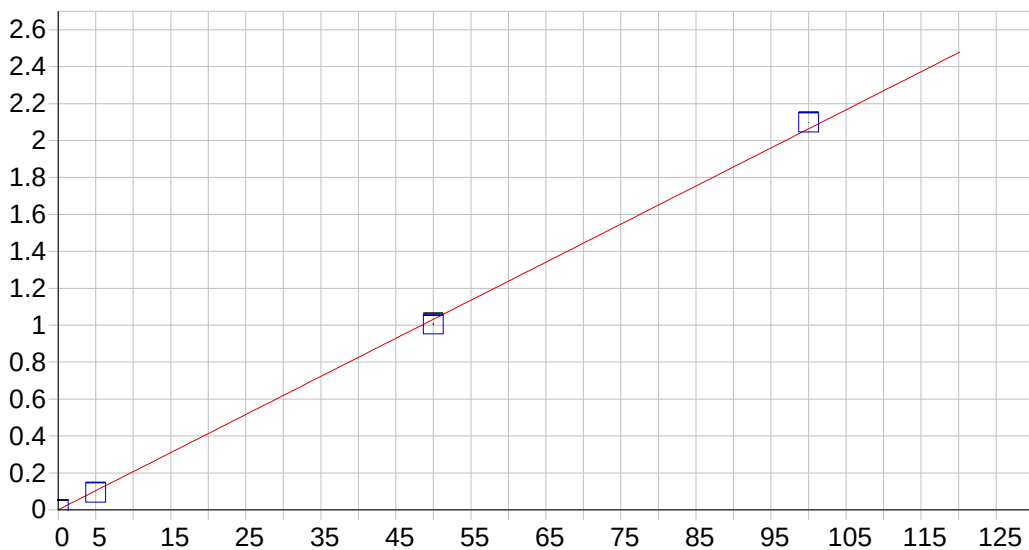


Pb 220.353 {453}

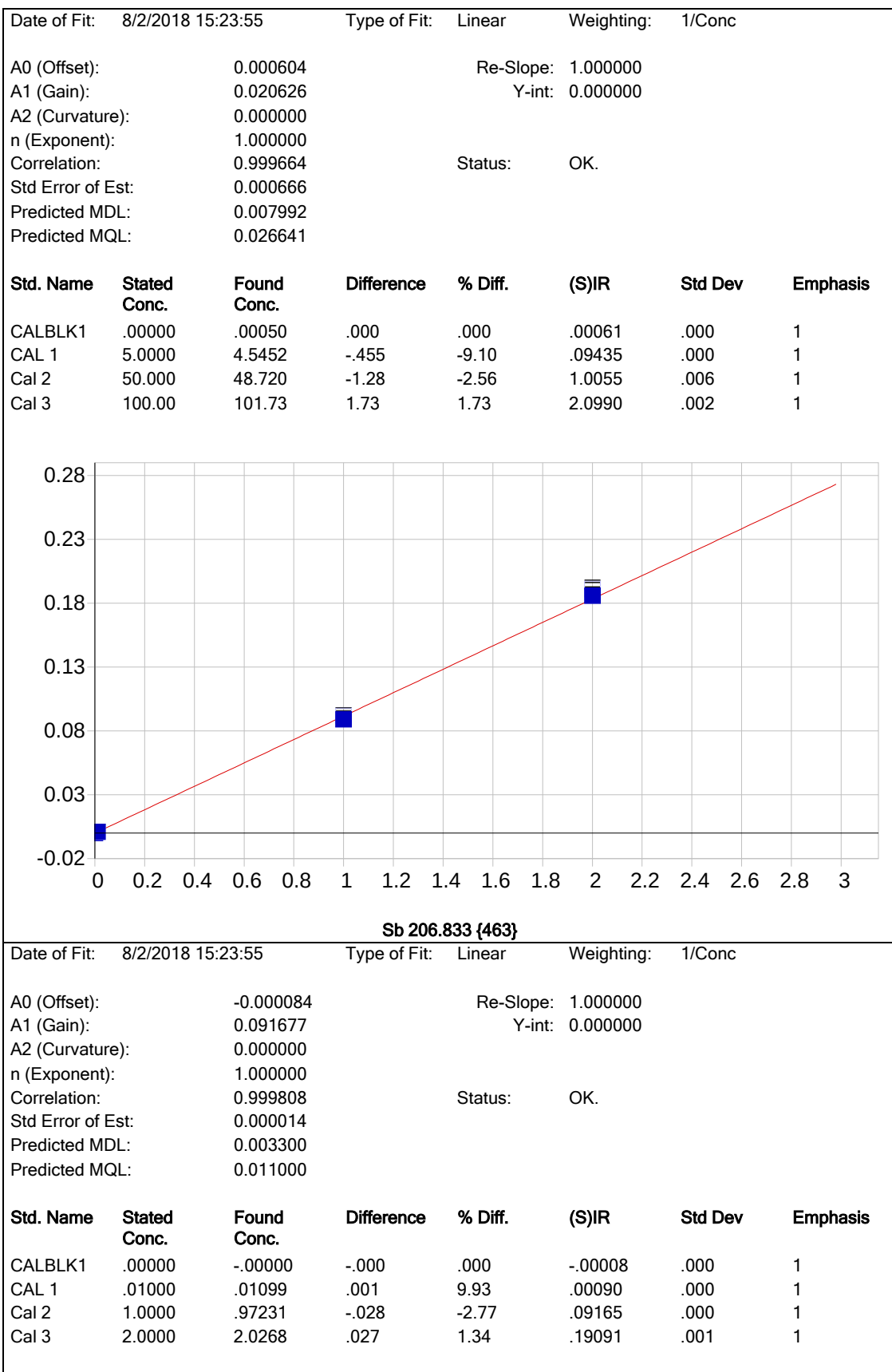
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

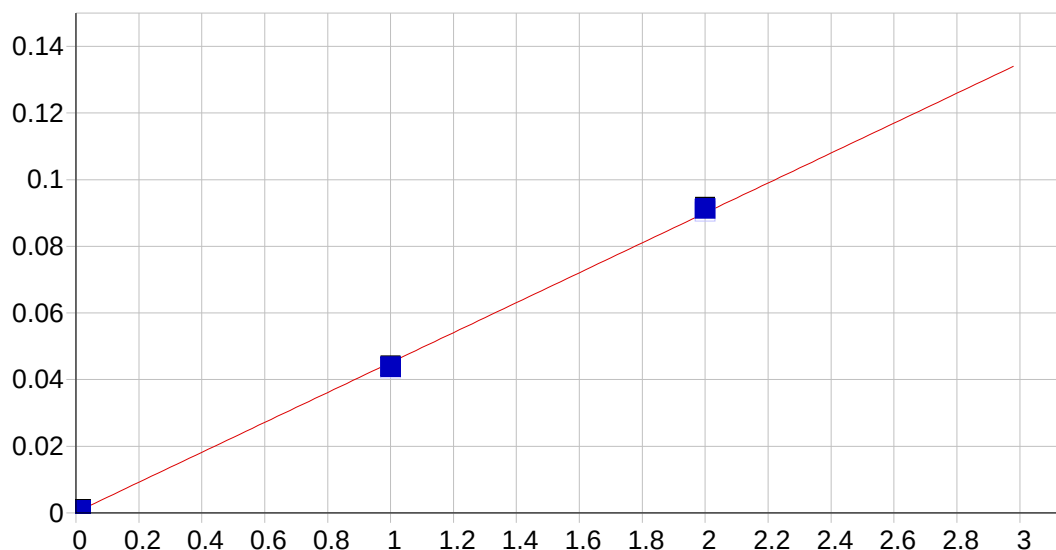
A0 (Offset): -0.000437 Re-Slope: 1.000000
 A1 (Gain): 0.178830 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999958 Status: OK.
 Std Error of Est: 0.000028
 Predicted MDL: 0.001707
 Predicted MQL: 0.005692

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	-.00000	-.000	.000	-.00044	.000	1
CAL 1	.01000	.01091	.001	9.10	.00151	.000	1
Cal 2	5.0000	4.9372	-.063	-1.26	.88247	.002	1
Cal 3	10.000	10.062	.062	.619	1.7989	.004	1



S 182.034 {485}



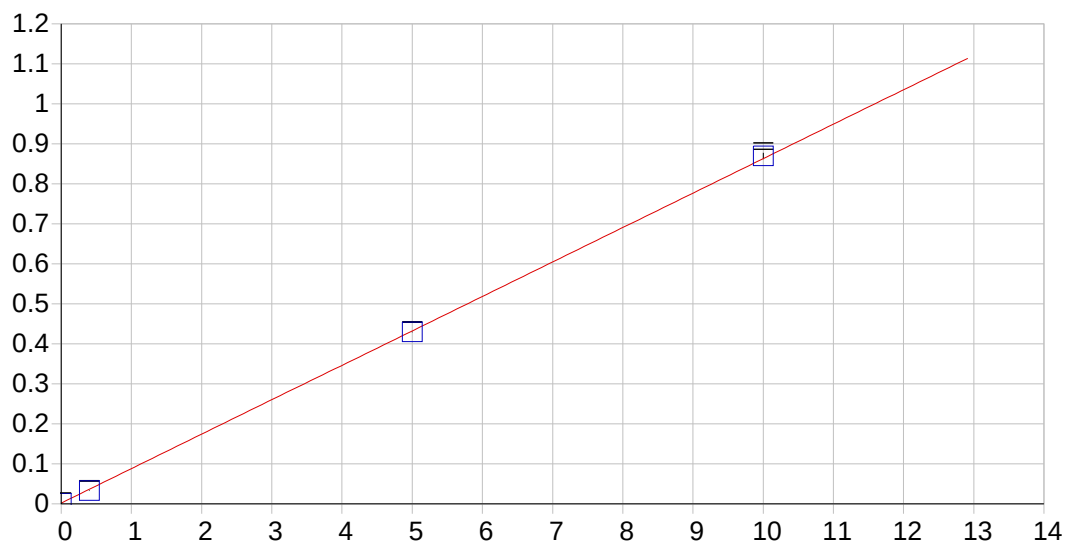


Se 196.090 {472}

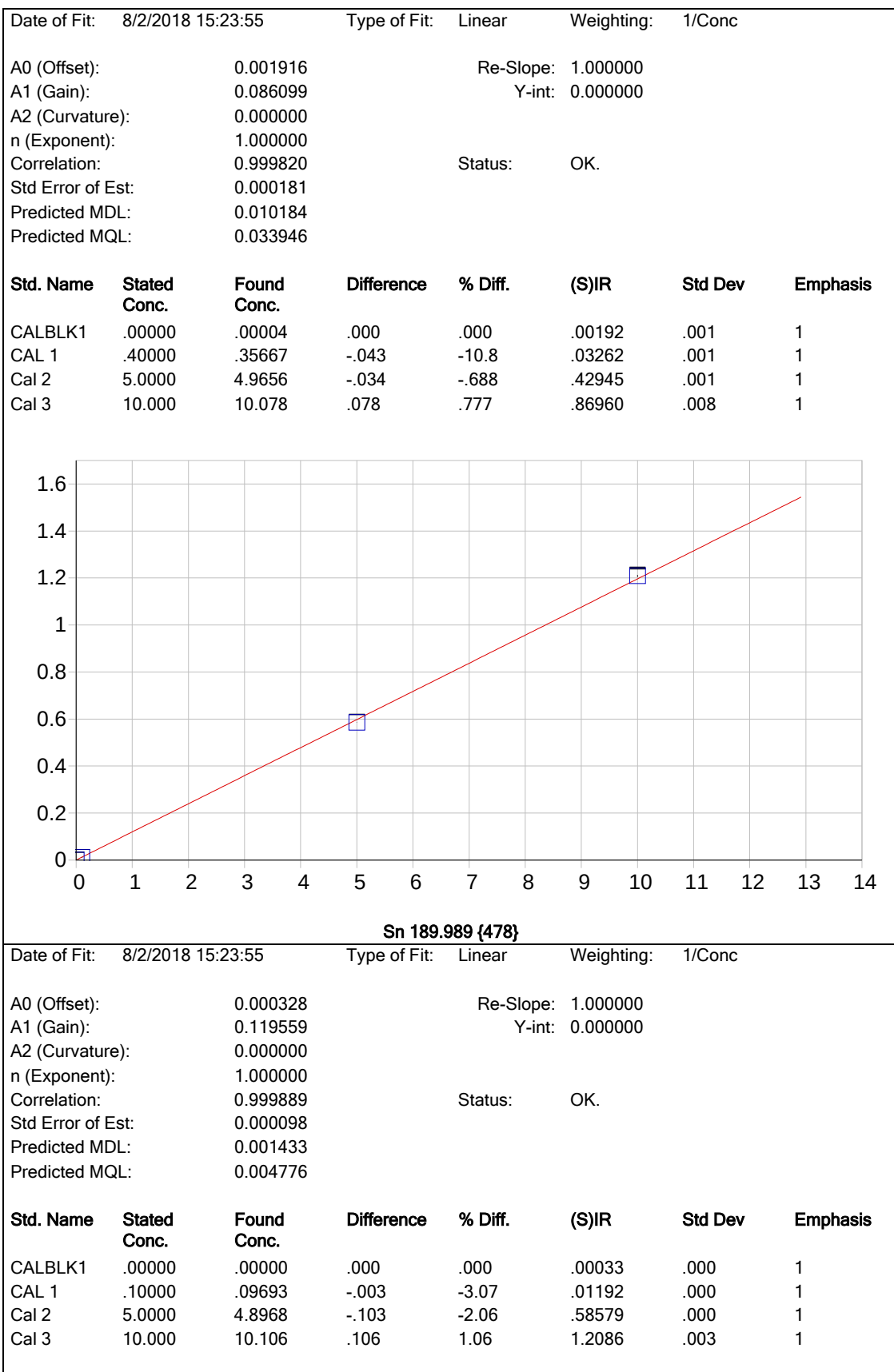
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

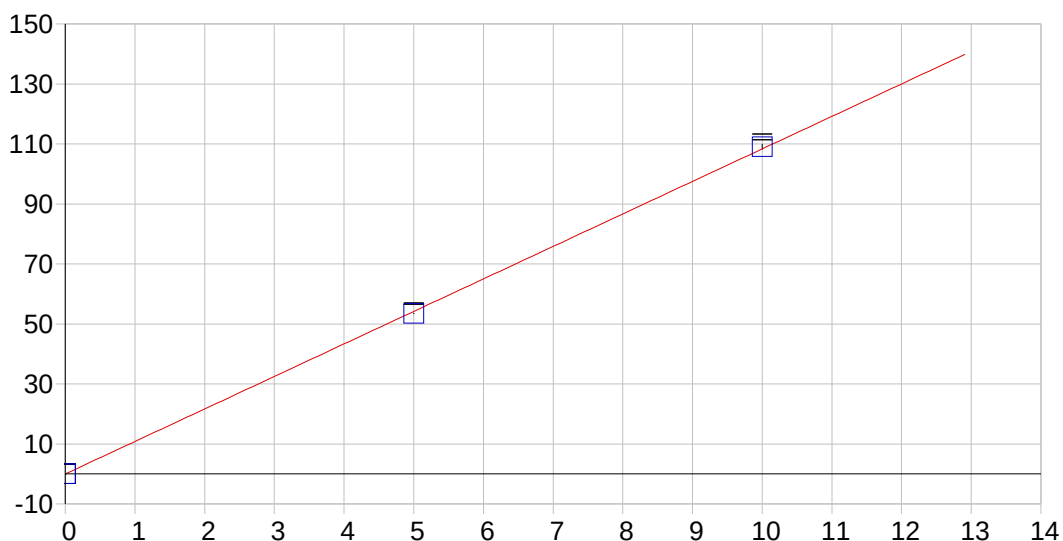
A0 (Offset): 0.000227 Re-Slope: 1.000000
 A1 (Gain): 0.044901 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999784 Status: OK.
 Std Error of Est: 0.000009
 Predicted MDL: 0.005268
 Predicted MQL: 0.017559

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	.00023	.000	1
CAL 1	.01500	.01403	-.001	-6.45	.00081	.000	1
Cal 2	1.0000	.97184	-.028	-2.82	.04342	.000	1
Cal 3	2.0000	2.0291	.029	1.45	.09045	.000	1



Si 251.611 {134}



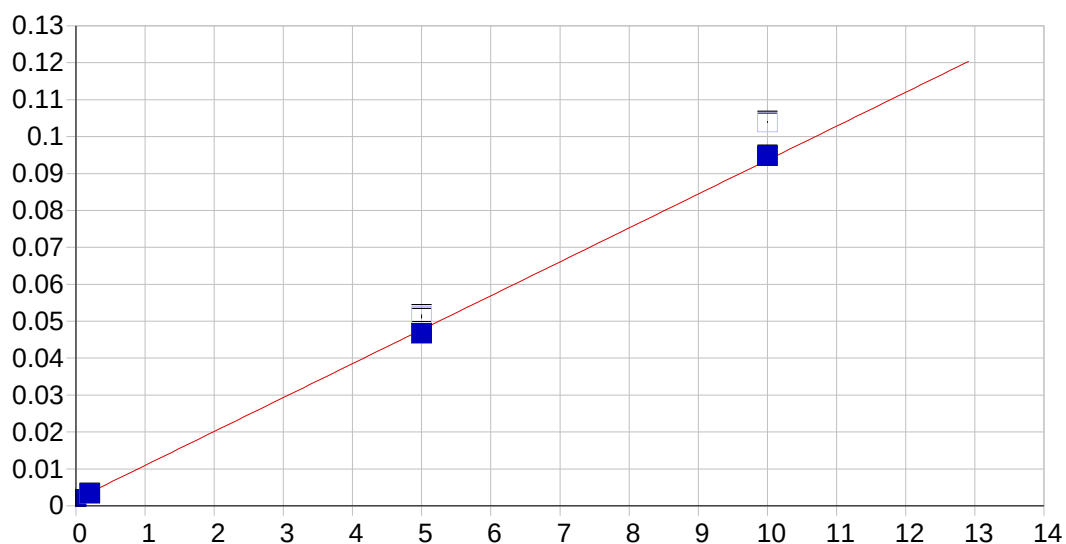


Sr 407.771 {83}

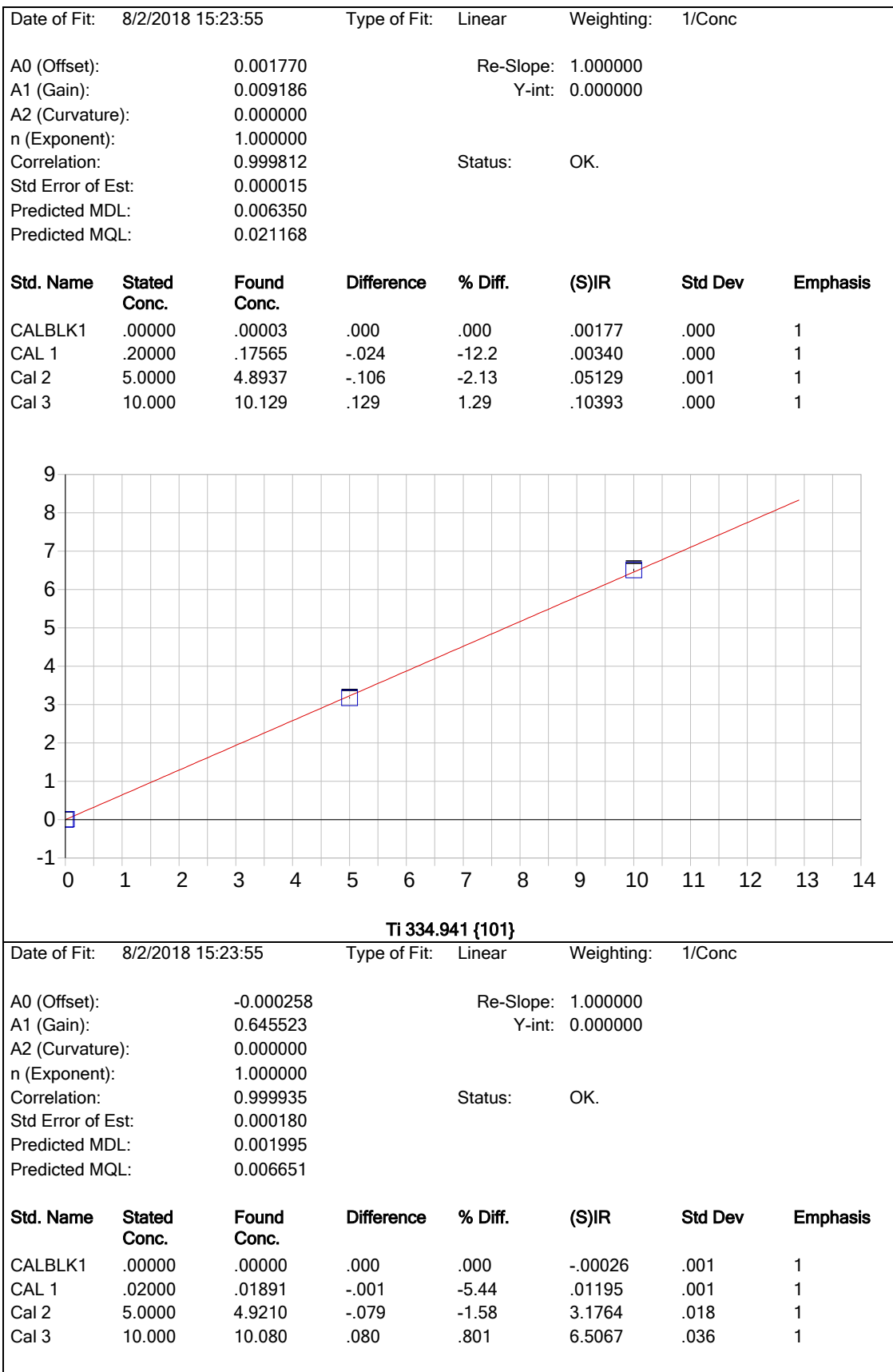
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

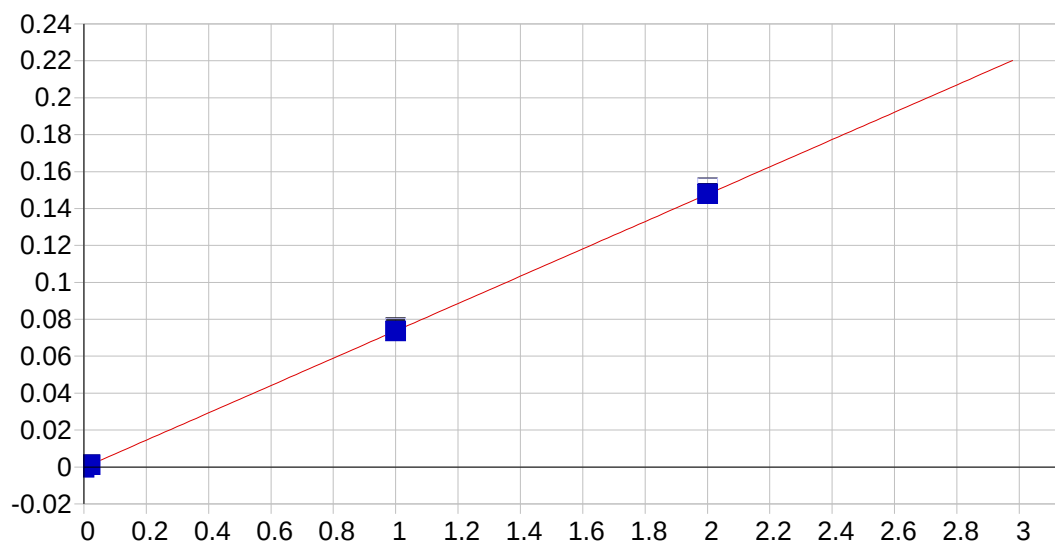
A0 (Offset): -0.020253 Re-Slope: 1.000000
 A1 (Gain): 10.835094 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999958 Status: OK.
 Std Error of Est: 0.001215
 Predicted MDL: 0.000204
 Predicted MQL: 0.000679

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	.00000	.000	.000	-.02025	.002	1
CAL 1	.00500	.00497	-.000	-.606	.03359	.001	1
Cal 2	5.0000	4.9352	-.065	-1.30	53.454	.237	1
Cal 3	10.000	10.065	.065	.648	109.03	.991	1



Th 283.231 {119}



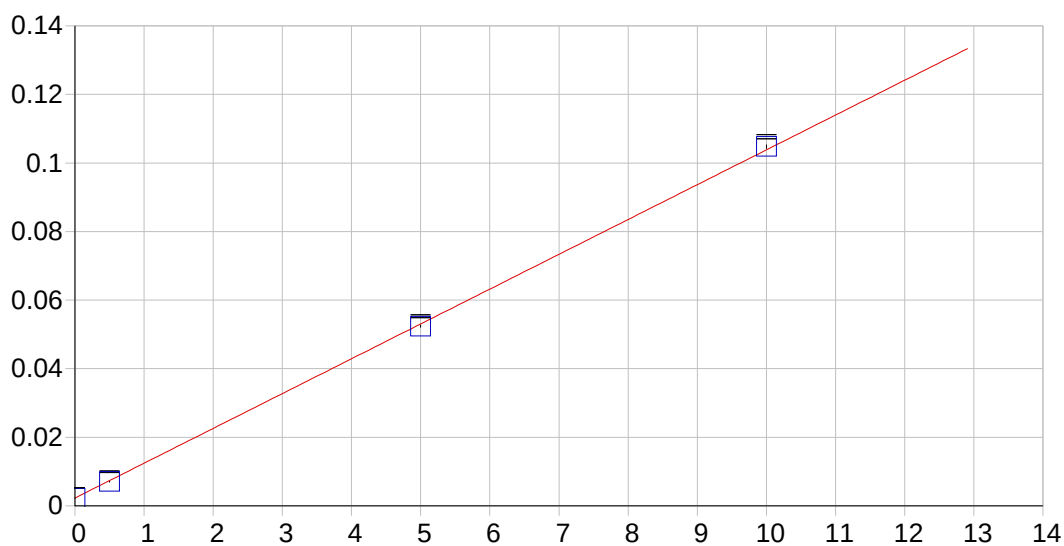


TI 190.856 {477}

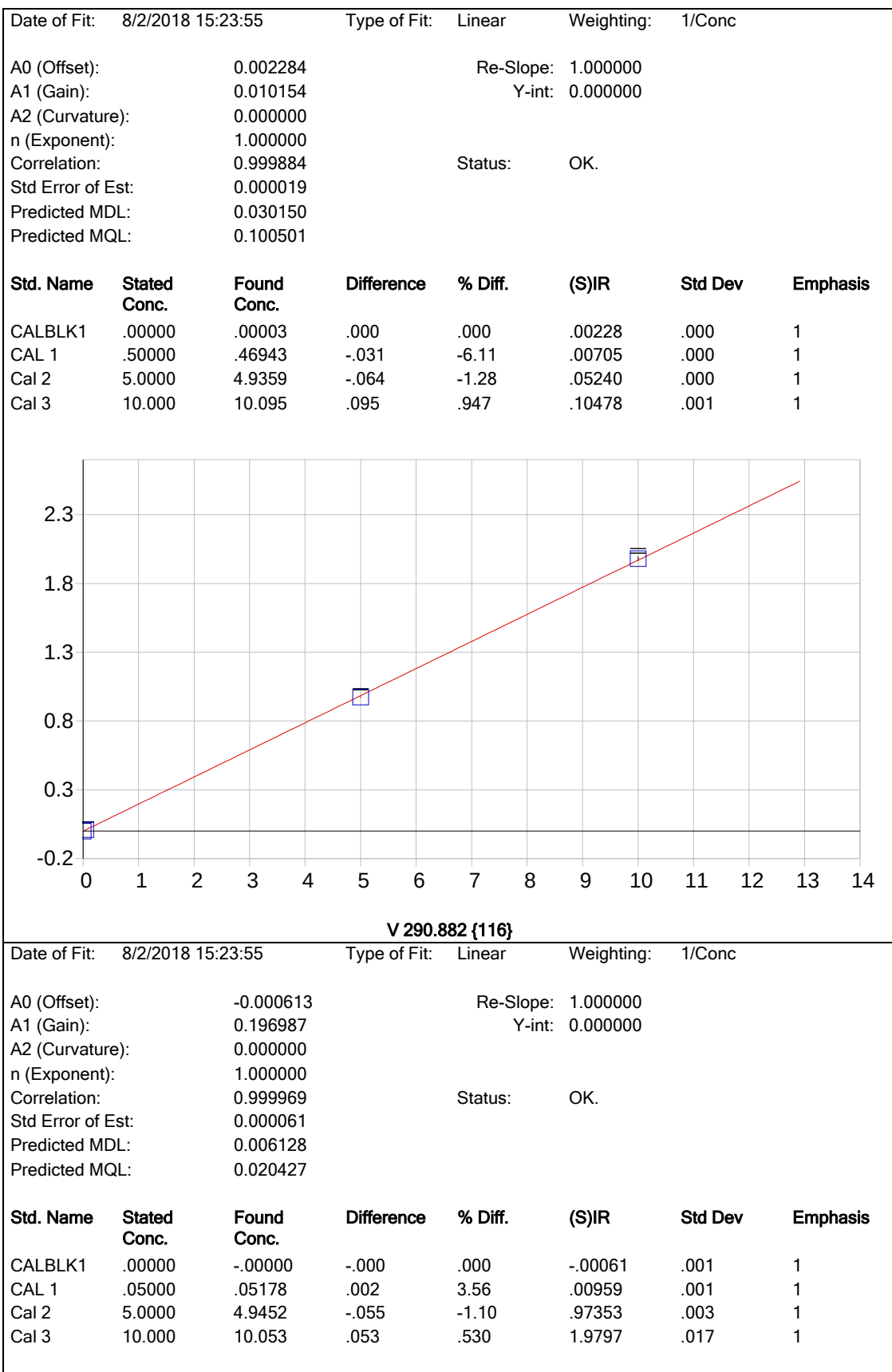
Date of Fit: 8/2/2018 15:23:55 Type of Fit: Linear Weighting: 1/Conc

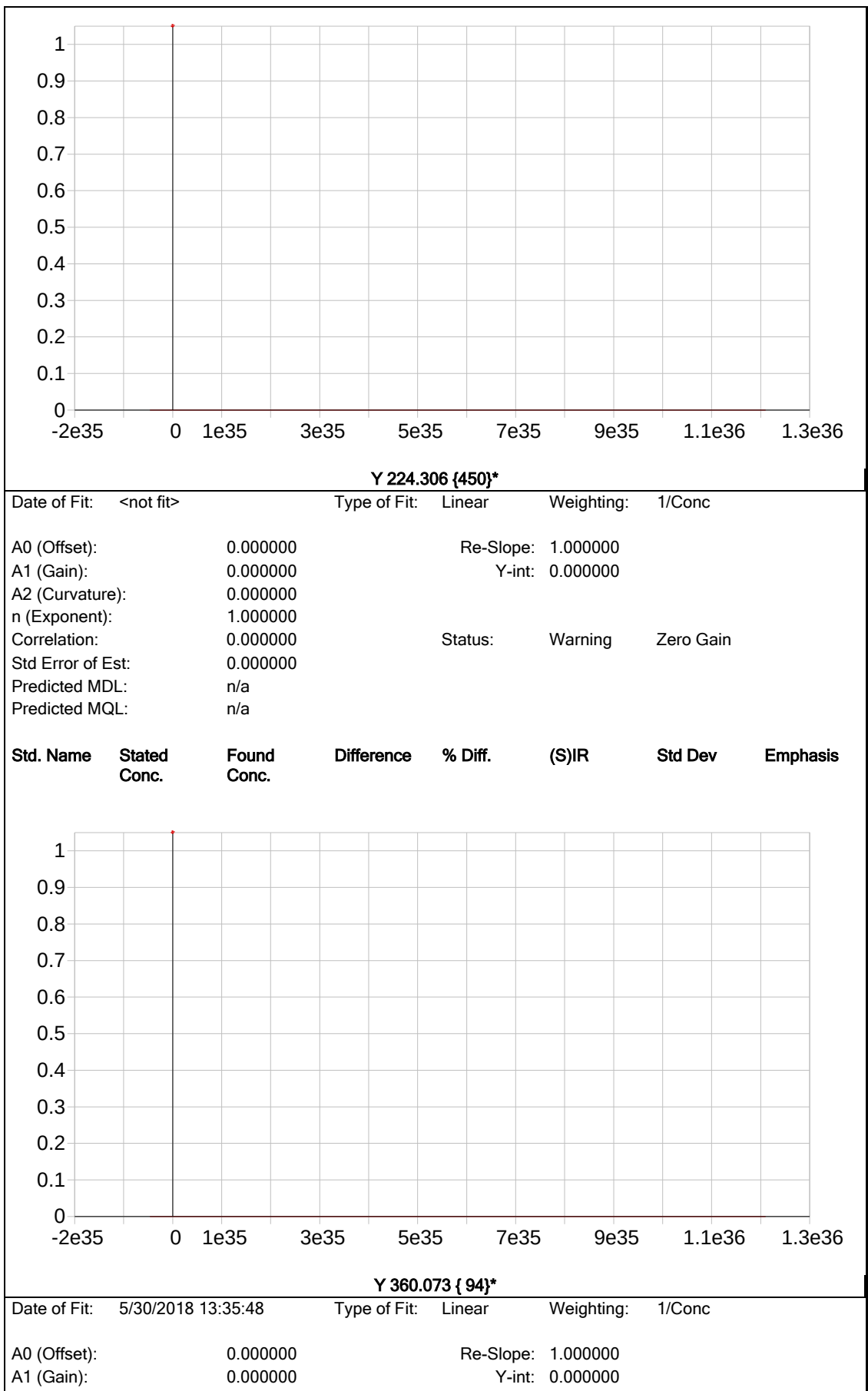
A0 (Offset): -0.000293 Re-Slope: 1.000000
 A1 (Gain): 0.074019 Y-int: 0.000000
 A2 (Curvature): 0.000000
 n (Exponent): 1.000000
 Correlation: 0.999999 Status: OK.
 Std Error of Est: 0.000001
 Predicted MDL: 0.002684
 Predicted MQL: 0.008947

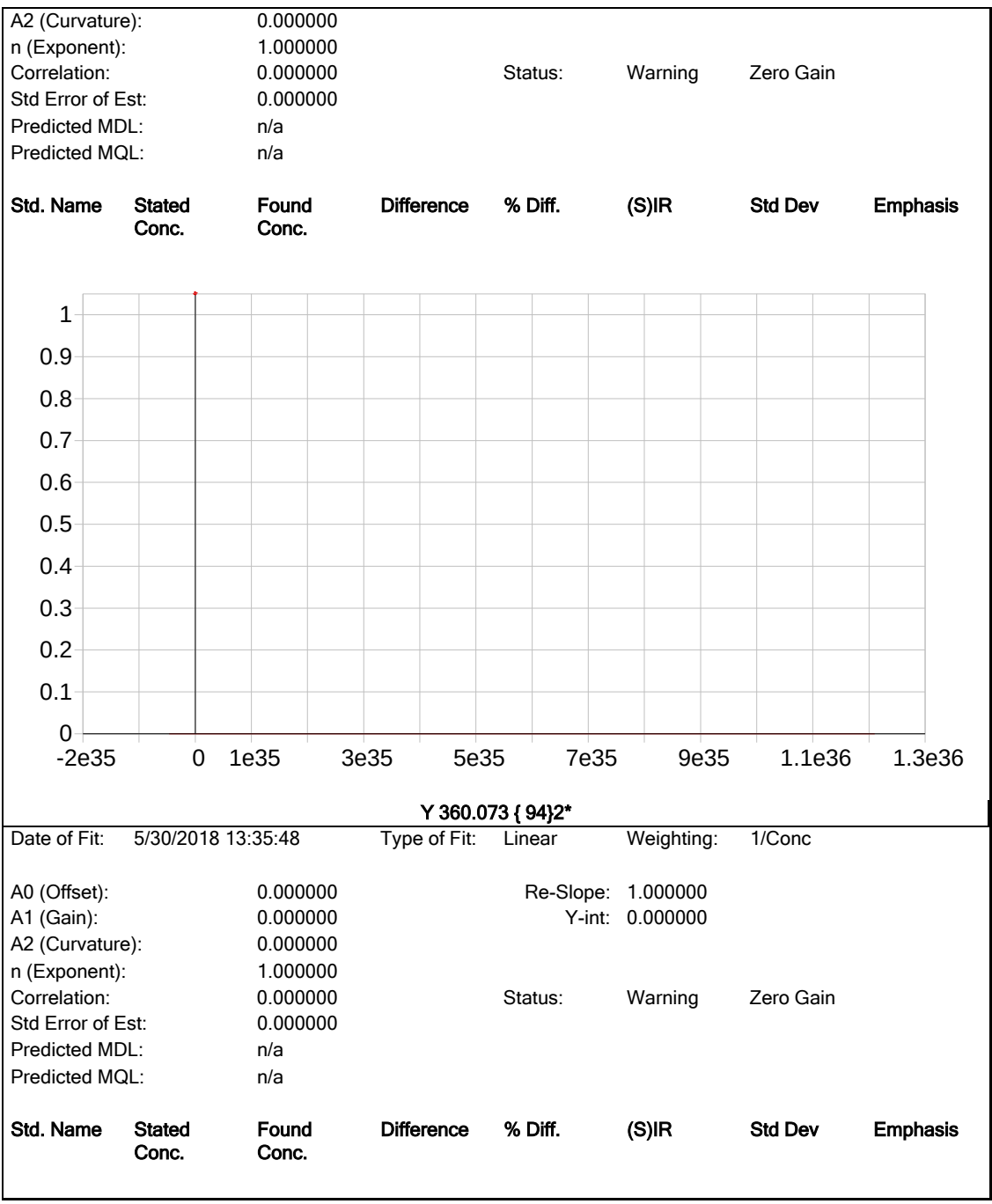
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
CALBLK1	.00000	-.00000	-.000	.000	-.00029	.000	1
CAL 1	.02000	.02019	.000	.969	.00122	.000	1
Cal 2	1.0000	.99785	-.002	-.215	.07513	.000	1
Cal 3	2.0000	2.0020	.002	.098	.15102	.000	1

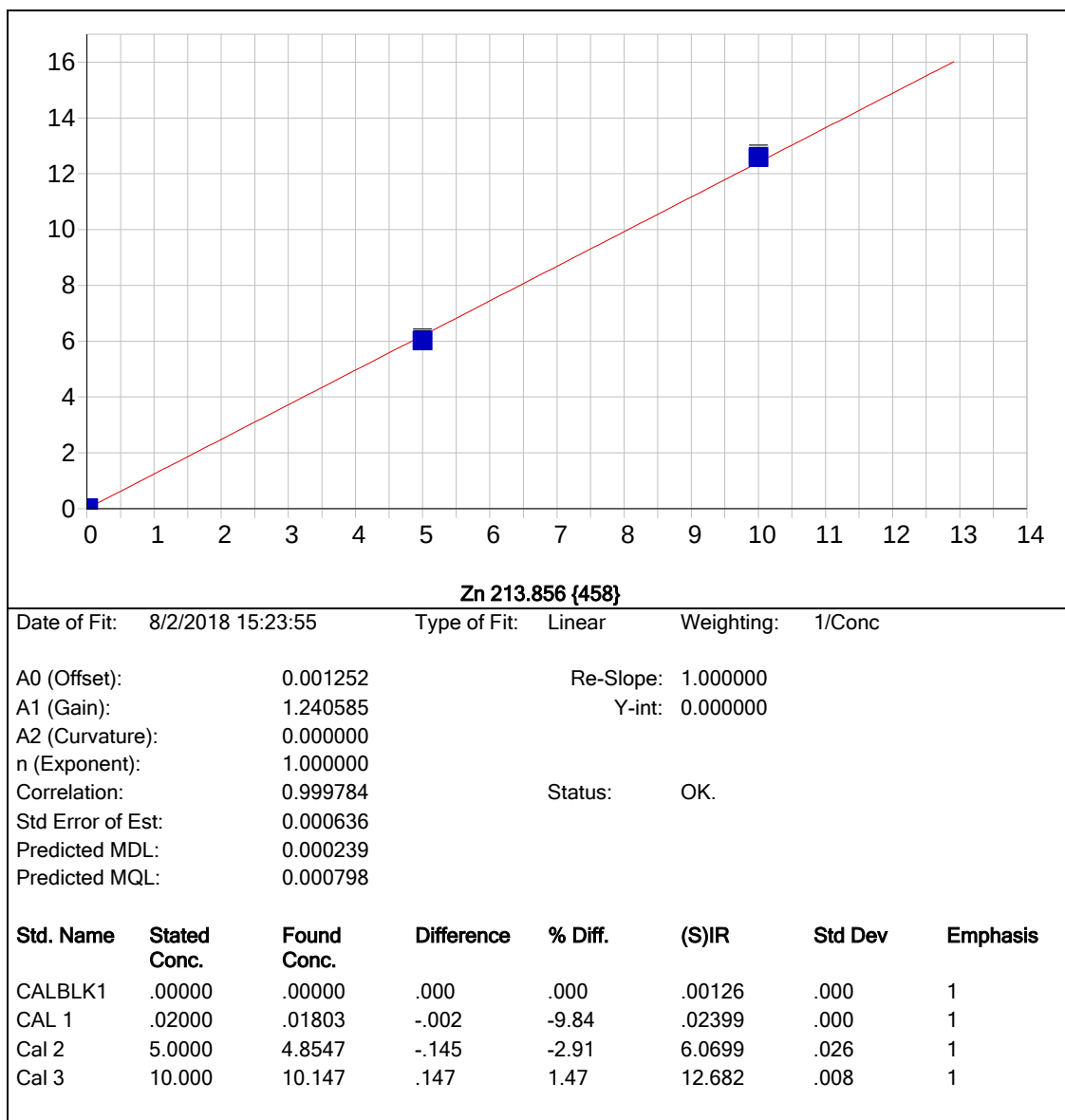


U 367.007 {92}









Sample Name: ICV Acquired: 8/2/2018 15:24:00 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9870	49.41	4.867	1.004	4.923	4.928	4.921	49.12	4.898
Stddev	.0028	.28	.011	.002	.020	.019	.012	.07	.004
%RSD	.2848	.5726	.2200	.1831	.4128	.3934	.2449	.1528	.0738

#1	.9840	49.09	4.875	1.006	4.905	4.909	4.935	49.04	4.902
#2	.9896	49.61	4.854	1.003	4.945	4.948	4.916	49.19	4.895
#3	.9874	49.54	4.870	1.003	4.920	4.926	4.913	49.13	4.897

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.912	4.861	4.860	51.43	49.18	4.980	49.38	4.994	.9514
Stddev	.005	.003	.008	.16	.24	.018	.32	.022	.0005
%RSD	.0960	.0649	.1683	.3125	.4832	.3594	.6424	.4479	.0545

#1	4.912	4.860	4.851	51.26	48.90	4.959	49.03	4.972	.9510
#2	4.917	4.864	4.861	51.58	49.32	4.993	49.65	5.017	.9513
#3	4.908	4.858	4.868	51.45	49.31	4.987	49.47	4.994	.9520

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	49.12	4.926	49.42	4.956	48.43	.9532	.9651	4.852	4.835
Stddev	.26	.004	.01	.006	.18	.0063	.0067	.041	.006
%RSD	.5263	.0798	.0231	.1178	.3640	.6613	.6942	.8404	.1274

#1	48.83	4.925	49.41	4.950	48.62	.9581	.9727	4.809	4.839
#2	49.32	4.930	49.43	4.962	48.28	.9461	.9622	4.857	4.837
#3	49.22	4.923	49.43	4.956	48.39	.9554	.9603	4.891	4.828

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: ICV Acquired: 8/2/2018 15:24:00 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.932	4.987	5.021	1.029	4.950	4.913	4.872
Stddev	.019	.017	.023	.005	.032	.040	.003
%RSD	.3886	.3491	.4512	.5031	.6478	.8200	.0654
#1	4.914	4.971	5.002	1.025	4.963	4.880	4.876
#2	4.952	4.985	5.046	1.027	4.974	4.958	4.872
#3	4.929	5.005	5.015	1.035	4.914	4.903	4.869

Check ? Chk Pass Chk Pass Chk Pass Chk Pass None Chk Pass Chk Pass
Value
Range

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3462.0	31911.	3679.2
Stddev	34.8	134.	84.1
%RSD	1.0041	.41914	2.2850
#1	3499.5	31886.	3774.7
#2	3430.9	31792.	3646.5
#3	3455.5	32056.	3616.3

Sample Name: ICB Acquired: 8/2/2018 15:28:13 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0235	.0004	.0081	-.0002	.0000	-.0030	-.0212	-.0005
Stddev	.0017	.0165	.0034	.0094	.0004	.0000	.0013	.0008	.0002
%RSD	1184.	70.39	778.2	116.1	183.2	458.1	43.46	3.723	41.90
#1	-.0013	.0099	.0030	.0073	.0001	.0001	-.0024	-.0220	-.0008
#2	.0020	.0187	.0017	.0179	-.0007	-.0000	-.0021	-.0205	-.0004
#3	-.0003	.0418	-.0034	-.0009	-.0000	.0000	-.0045	-.0210	-.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	-.0003	.0014	.0018	-.0742	-.0007	-.0107	-.0001	.0002
Stddev	.0005	.0002	.0030	.0038	.0660	.0033	.0309	.0007	.0005
%RSD	226.1	60.63	221.7	217.2	88.98	486.5	289.4	503.1	277.0
#1	-.0002	-.0001	-.0012	.0059	-.1460	-.0044	-.0334	-.0005	.0005
#2	-.0008	-.0003	.0047	.0008	-.0161	.0006	.0245	-.0006	-.0004
#3	.0003	-.0004	.0006	-.0015	-.0604	.0017	-.0231	.0007	.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0479	-.0003	-.0005	.0006	.0123	-.0008	-.0020	.0063	.0006
Stddev	.0240	.0000	.0050	.0022	.0053	.0025	.0008	.0138	.0003
%RSD	50.09	14.03	1041.	342.0	42.57	299.2	42.66	220.3	48.97
#1	-.0714	-.0004	-.0051	.0032	.0132	-.0034	-.0018	-.0038	.0008
#2	-.0235	-.0003	.0049	-.0007	.0171	-.0006	-.0029	.0220	.0006
#3	-.0487	-.0003	-.0012	-.0005	.0067	.0015	-.0012	.0006	.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: ICB Acquired: 8/2/2018 15:28:13 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	-.0061	.0018	-.0009	.0085	.0059	-.0010
Stddev	.0002	.0046	.0010	.0033	.0268	.0056	.0001
%RSD	105.5	75.37	55.16	373.7	316.4	95.53	13.09
#1	.0004	-.0015	.0015	-.0009	.0318	.0114	-.0008
#2	.0001	-.0060	.0029	.0025	.0143	.0061	-.0011
#3	.0001	-.0106	.0010	-.0042	-.0208	.0001	-.0010

Check ? Chk Pass Chk Pass Chk Pass Chk Pass None Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3602.7	33295.	3572.0
Stddev	26.8	93.	9.6
%RSD	.74509	.27994	.26899
#1	3572.1	33240.	3563.0
#2	3622.4	33402.	3570.9
#3	3613.6	33242.	3582.1

Sample Name: LLC Acquired: 8/2/2018 15:32:53 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0109	.2104	F .0064	.1017	.0471	.0049	.2073	1.018	.0045
Stddev	.0007	.0238	.0039	.0092	.0007	.0002	.0037	.004	.0003
%RSD	6.003	11.31	60.14	9.057	1.519	3.471	1.799	.3995	6.471

#1	.0108	.2093	.0090	.1063	.0478	.0051	.2037	1.021	.0042
#2	.0104	.2347	.0020	.0911	.0463	.0050	.2072	1.013	.0048
#3	.0117	.1872	.0082	.1077	.0472	.0048	.2111	1.019	.0046

Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.0100						
Range			-30.00%						

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0508	.0098	.0261	.1048	4.968	.0526	1.011	.0147	.0384
Stddev	.0006	.0001	.0021	.0015	.144	.0035	.026	.0008	.0004
%RSD	1.112	1.258	8.172	1.448	2.908	6.591	2.536	5.539	1.060

#1	.0502	.0100	.0243	.1031	5.108	.0557	1.041	.0139	.0388
#2	.0511	.0097	.0255	.1058	4.977	.0534	.9949	.0156	.0384
#3	.0513	.0098	.0284	.1056	4.820	.0489	.9984	.0147	.0380

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9244	.0407	.2489	.0116	4.622	.0112	.0140	.3639	.0993
Stddev	.0233	.0000	.0047	.0015	.014	.0029	.0016	.0102	.0021
%RSD	2.517	.1090	1.881	12.63	.3094	26.16	11.56	2.812	2.102

#1	.9333	.0406	.2531	.0099	4.621	.0140	.0156	.3697	.1004
#2	.9419	.0407	.2438	.0126	4.637	.0113	.0123	.3698	.0969
#3	.8980	.0407	.2498	.0124	4.609	.0082	.0140	.3520	.1006

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Sample Name: LLC Acquired: 8/2/2018 15:32:53 Type: QC
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0051	.1930	.0189	.0192	.4395	.0527	.0188
Stddev	.0001	.0018	.0009	.0017	.0042	.0079	.0001
%RSD	2.783	.9463	4.825	9.052	.9479	15.05	.4631
#1	.0052	.1949	.0179	.0173	.4388	.0614	.0187
#2	.0050	.1912	.0194	.0199	.4357	.0510	.0188
#3	.0051	.1927	.0195	.0205	.4440	.0458	.0188

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3565.1	33693.	3664.9
Stddev	28.7	49.	5.4
%RSD	.80568	.14462	.14724
#1	3568.1	33637.	3671.1
#2	3592.1	33726.	3662.5
#3	3534.9	33715.	3661.2

Sample Name: ICSA Acquired: 8/2/2018 15:37:31 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	98.26	-.0070	-.0403	-.0004	-.0000	.0165	97.21	-.0004
Stddev	.0005	.19	.0034	.0046	.0004	.0001	.0026	.14	.0003
%RSD	138.7	.1889	47.85	11.40	97.39	173.6	15.62	.1441	92.51
#1	-.0006	98.21	-.0033	-.0415	-.0002	-.0001	.0173	97.35	-.0006
#2	.0002	98.47	-.0081	-.0441	-.0009	.0000	.0185	97.07	.0000
#3	-.0007	98.11	-.0098	-.0352	-.0002	-.0001	.0136	97.20	-.0006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0073	-.0044	-.0131	99.80	99.96	.0097	98.96	.0016	-.0011
Stddev	.0003	.0004	.0026	.28	.17	.0058	.14	.0003	.0005
%RSD	4.656	9.249	20.04	.2825	.1737	59.27	.1416	19.15	42.65
#1	.0075	-.0039	-.0127	99.78	99.96	.0065	99.09	.0013	-.0008
#2	.0074	-.0047	-.0106	100.1	100.1	.0164	98.98	.0019	-.0008
#3	.0069	-.0046	-.0158	99.52	99.79	.0063	98.81	.0017	-.0016

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	99.04	.0039	96.96	-.0065	97.07	.0027	-.0003	-.0025	-.0032
Stddev	.18	.0008	.08	.0004	.06	.0022	.0036	.0103	.0018
%RSD	.1809	19.59	.0805	6.290	.0651	80.97	1072.	406.2	57.12
#1	98.93	.0034	97.04	-.0063	97.09	.0048	.0010	-.0081	-.0013
#2	99.25	.0036	96.89	-.0063	97.11	.0030	-.0044	-.0089	-.0049
#3	98.94	.0048	96.96	-.0070	96.99	.0004	.0024	.0094	-.0035

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: ICSA Acquired: 8/2/2018 15:37:31 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0011	.0597	-.0004	.0009	.4117	.0021	.0141
Stddev	.0001	.0059	.0004	.0046	.0345	.0080	.0003
%RSD	12.62	9.834	89.93	488.4	8.383	377.5	1.883
#1	.0012	.0544	-.0000	-.0007	.4015	-.0071	.0138
#2	.0009	.0660	-.0005	-.0026	.3835	.0072	.0144
#3	.0011	.0587	-.0007	.0061	.4502	.0064	.0142

Check ? Chk Pass Chk Pass Chk Pass Chk Pass None Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3410.2	31113.	3594.2
Stddev	14.4	222.	9.6
%RSD	.42319	.71328	.26693
#1	3398.8	30888.	3583.3
#2	3426.4	31119.	3601.2
#3	3405.3	31332.	3598.1

Sample Name: ICSAB Acquired: 8/2/2018 15:42:05 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5142	97.97	2.479	.4759	2.462	2.531	2.499	97.11	2.508
Stddev	.0017	.51	.013	.0068	.009	.012	.014	.24	.005
%RSD	.3397	.5239	.5353	1.423	.3460	.4691	.5652	.2471	.1852

#1	.5140	97.43	2.466	.4709	2.452	2.518	2.486	97.04	2.505
#2	.5126	98.05	2.478	.4732	2.468	2.537	2.498	96.92	2.505
#3	.5161	98.44	2.492	.4836	2.467	2.540	2.514	97.38	2.513

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.481	2.450	2.459	99.20	99.14	2.530	99.17	2.507	.4890
Stddev	.001	.010	.005	.42	.64	.010	.60	.013	.0021
%RSD	.0455	.4172	.2192	.4216	.6434	.3937	.6072	.5045	.4249

#1	2.481	2.444	2.459	98.73	98.43	2.519	98.49	2.493	.4876
#2	2.480	2.445	2.453	99.50	99.33	2.538	99.62	2.512	.4879
#3	2.482	2.462	2.464	99.39	99.66	2.532	99.41	2.516	.4914

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	98.49	2.474	98.50	2.441	100.2	.4974	.5023	2.425	2.474
Stddev	.56	.003	.52	.007	.3	.0043	.0017	.016	.009
%RSD	.5711	.1271	.5305	.3071	.2710	.8581	.3404	.6678	.3644

#1	97.85	2.475	98.17	2.439	100.1	.4967	.5039	2.406	2.468
#2	98.71	2.471	98.24	2.434	100.1	.5020	.5005	2.436	2.470
#3	98.91	2.477	99.11	2.449	100.5	.4936	.5027	2.432	2.485

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: ICSAB Acquired: 8/2/2018 15:42:05 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.485	2.555	2.508	.4897	2.819	2.474	2.529
Stddev	.011	.005	.007	.0006	.010	.008	.003
%RSD	.4474	.1879	.2946	.1174	.3405	.3055	.1206
#1	2.472	2.551	2.499	.4895	2.808	2.472	2.529
#2	2.491	2.560	2.513	.4892	2.826	2.483	2.526
#3	2.492	2.554	2.511	.4903	2.823	2.468	2.532

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3512.4	31723.	3721.8
Stddev	17.3	213.	53.7
%RSD	.49325	.67258	1.4435
#1	3522.5	31507.	3776.0
#2	3522.3	31729.	3721.0
#3	3492.4	31934.	3668.5

Sample Name: CCVL Acquired: 8/2/2018 15:46:19 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0109	.2148	.0092	.1000	.0466	.0049	.2030	1.012	.0046
Stddev	.0010	.0073	.0023	.0014	.0002	.0001	.0036	.001	.0004
%RSD	9.372	3.414	25.02	1.417	.3636	1.576	1.797	.1014	8.980

#1	.0119	.2069	.0067	.1006	.0466	.0049	.2054	1.013	.0042
#2	.0099	.2214	.0098	.1010	.0468	.0050	.1988	1.013	.0046
#3	.0109	.2163	.0112	.0984	.0465	.0049	.2049	1.011	.0051

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0499	.0097	.0278	.1031	5.057	.0544	1.011	.0151	.0386
Stddev	.0006	.0003	.0021	.0018	.072	.0017	.023	.0006	.0003
%RSD	1.229	2.629	7.388	1.786	1.423	3.114	2.239	3.774	.6549

#1	.0501	.0096	.0290	.1051	5.113	.0559	.9948	.0157	.0387
#2	.0492	.0094	.0255	.1015	5.082	.0526	1.002	.0152	.0383
#3	.0503	.0099	.0291	.1028	4.976	.0547	1.037	.0145	.0388

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9418	.0408	.2412	.0102	4.615	.0090	.0109	.3617	.0988
Stddev	.0400	.0002	.0107	.0011	.026	.0034	.0075	.0215	.0005
%RSD	4.244	.5119	4.433	11.15	.5682	38.20	68.55	5.948	.5067

#1	.9712	.0406	.2371	.0093	4.637	.0070	.0052	.3838	.0993
#2	.9579	.0409	.2533	.0098	4.622	.0129	.0194	.3604	.0985
#3	.8963	.0409	.2331	.0115	4.586	.0070	.0081	.3408	.0984

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCVL Acquired: 8/2/2018 15:46:19 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0048	.1811	.0201	.0191	.4768	.0491	.0189
Stddev	.0001	.0023	.0014	.0018	.0038	.0049	.0002
%RSD	2.693	1.259	6.944	9.259	.8010	10.03	.9423
#1	.0050	.1834	.0205	.0209	.4784	.0439	.0191
#2	.0048	.1812	.0185	.0173	.4796	.0496	.0187
#3	.0047	.1788	.0211	.0192	.4725	.0537	.0190

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** None **Chk Pass** **Chk Pass**
Value
Range

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3709.0	34054.	3593.6
Stddev	9.8	140.	124.7
%RSD	.26346	.40980	3.4689
#1	3719.6	33968.	3523.6
#2	3700.3	33978.	3519.7
#3	3707.0	34215.	3737.5

Sample Name: CCV Acquired: 8/2/2018 15:50:58 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9782	47.90	4.758	.9804	4.798	4.863	4.862	48.94	4.846
Stddev	.0021	.06	.008	.0068	.008	.005	.004	.11	.006
%RSD	.2106	.1223	.1682	.6956	.1735	.1002	.0930	.2293	.1181
#1	.9778	47.95	4.768	.9813	4.807	4.864	4.866	49.03	4.847
#2	.9805	47.91	4.755	.9867	4.790	4.858	4.864	48.98	4.851
#3	.9764	47.83	4.753	.9732	4.797	4.867	4.857	48.82	4.840

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.894	4.787	4.801	48.76	48.86	4.898	48.26	4.863	.9539
Stddev	.003	.007	.010	.03	.16	.006	.13	.003	.0026
%RSD	.0501	.1511	.2157	.0617	.3339	.1301	.2595	.0676	.2752
#1	4.893	4.794	4.807	48.80	48.99	4.904	48.35	4.861	.9548
#2	4.893	4.789	4.807	48.75	48.92	4.891	48.32	4.866	.9559
#3	4.897	4.779	4.789	48.74	48.68	4.899	48.12	4.861	.9509

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	48.58	4.899	48.66	4.834	48.37	.9532	.9635	4.841	4.837
Stddev	.05	.002	.09	.010	.09	.0049	.0062	.017	.005
%RSD	.0973	.0487	.1878	.2122	.1761	.5158	.6481	.3575	.1043
#1	48.63	4.899	48.75	4.842	48.35	.9556	.9599	4.860	4.841
#2	48.57	4.896	48.64	4.836	48.30	.9476	.9598	4.829	4.838
#3	48.53	4.901	48.57	4.822	48.47	.9566	.9707	4.832	4.831

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/2/2018 15:50:58 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.812	4.756	4.814	.9753	4.983	4.787	4.868
Stddev	.003	.030	.009	.0057	.018	.009	.001
%RSD	.0712	.6405	.1812	.5816	.3515	.1915	.0111
#1	4.815	4.722	4.823	.9752	4.980	4.794	4.867
#2	4.808	4.778	4.805	.9809	4.966	4.789	4.868
#3	4.811	4.770	4.814	.9696	5.001	4.776	4.868

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3535.7	32283.	3614.2
Stddev	31.7	208.	41.9
%RSD	.89527	.64548	1.1591
#1	3511.2	32283.	3594.4
#2	3524.5	32075.	3585.9
#3	3571.4	32492.	3662.3

Sample Name: CCB Acquired: 8/2/2018 15:55:10 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0011	-.0020	-.0025	-.0012	-.0010	.0001	-.0023	-.0244	-.0001
Stddev	.0007	.0043	.0023	.0024	.0004	.0002	.0023	.0006	.0002
%RSD	66.10	218.9	91.52	200.2	44.63	243.8	97.28	2.552	201.1
#1	.0004	-.0069	-.0007	.0005	-.0015	.0002	.0002	-.0248	.0001
#2	.0011	.0013	-.0017	-.0039	-.0008	-.0001	-.0042	-.0246	-.0003
#3	.0019	-.0003	-.0051	-.0001	-.0007	.0001	-.0030	-.0237	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	-.0005	.0006	.0024	.0999	.0013	-.0006	.0002	.0005
Stddev	.0005	.0001	.0007	.0008	.0307	.0030	.0124	.0005	.0001
%RSD	308.6	30.98	107.7	34.11	30.72	239.3	1972.	215.1	19.11
#1	.0004	-.0006	.0011	.0033	.1268	-.0022	-.0038	-.0002	.0004
#2	-.0005	-.0003	-.0002	.0021	.1063	.0026	-.0112	.0008	.0005
#3	-.0005	-.0004	.0010	.0018	.0665	.0034	.0131	.0001	.0006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0362	-.0008	-.0017	-.0006	-.0070	.0023	-.0022	-.0046	-.0004
Stddev	.0461	.0002	.0019	.0019	.0056	.0021	.0037	.0019	.0004
%RSD	127.3	23.07	112.2	335.5	79.66	94.02	166.1	41.56	79.69
#1	.0170	-.0009	-.0009	.0016	-.0028	.0014	-.0061	-.0068	-.0003
#2	-.0643	-.0006	-.0038	-.0016	-.0133	.0047	-.0017	-.0035	-.0002
#3	-.0613	-.0010	-.0003	-.0017	-.0049	.0007	.0012	-.0034	-.0008

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/2/2018 15:55:10 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0003	.0011	-.0007	.0043	-.0009	-.0014
Stddev	.0002	.0060	.0013	.0005	.0167	.0099	.0002
%RSD	102.8	2288.	121.5	72.23	393.3	1130.	11.24
#1	.0002	-.0003	.0009	-.0012	-.0072	-.0080	-.0015
#2	.0000	-.0054	-.0001	-.0001	-.0035	.0104	-.0013
#3	.0005	.0065	.0024	-.0009	.0234	-.0050	-.0012

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3657.8	33538.	3547.6
Stddev	9.7	246.	20.1
%RSD	.26531	.73481	.56680
#1	3663.9	33269.	3568.0
#2	3646.6	33752.	3547.2
#3	3662.8	33593.	3527.8

Sample Name: Rinse1 Acquired: 8/2/2018 16:01:44 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0010	.0134	-.0018	.0030	-.0011	.0000	-.0008	-.0259	-.0004
Stddev	.0005	.0217	.0014	.0018	.0001	.0000	.0033	.0013	.0002
%RSD	44.40	162.7	77.30	60.24	12.15	106.7	395.7	5.084	59.99
#1	.0014	.0245	-.0003	.0039	-.0013	.0000	-.0024	-.0274	-.0004
#2	.0012	.0273	-.0020	.0009	-.0010	-.0000	.0030	-.0250	-.0007
#3	.0005	-.0117	-.0030	.0040	-.0011	.0000	-.0030	-.0253	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	-.0002	.0006	.0006	-.0622	-.0007	-.0077	-.0004	.0004
Stddev	.0004	.0002	.0019	.0024	.0708	.0033	.0176	.0005	.0000
%RSD	104.6	92.96	295.6	395.7	113.9	505.6	229.3	137.3	11.76
#1	-.0009	.0000	.0022	.0005	-.0401	.0029	.0062	.0001	.0004
#2	-.0003	-.0003	.0012	-.0017	-.1414	-.0037	-.0275	-.0010	.0003
#3	-.0001	-.0002	-.0015	.0031	-.0050	-.0012	-.0017	-.0003	.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.1189	-.0008	-.0016	-.0006	-.0038	-.0007	-.0018	-.0055	-.0001
Stddev	.0083	.0003	.0042	.0009	.0062	.0050	.0019	.0011	.0011
%RSD	6.944	41.15	263.5	151.5	162.3	700.4	102.4	20.37	986.5
#1	-.1116	-.0005	-.0064	.0000	-.0109	-.0027	-.0028	-.0044	-.0003
#2	-.1173	-.0007	.0009	-.0016	-.0011	.0050	-.0031	-.0067	.0011
#3	-.1279	-.0012	.0008	-.0002	.0006	-.0044	.0003	-.0055	-.0011

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: Rinse1 Acquired: 8/2/2018 16:01:44 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	-.0002	.0000	-.0023	.0112	.0037	-.0013
Stddev	.0000	.0062	.0013	.0020	.0150	.0048	.0001
%RSD	149.3	3593.	415800.	87.32	133.3	128.8	10.22
#1	.0000	-.0070	-.0008	-.0037	.0279	.0018	-.0014
#2	-.0000	.0052	-.0007	.0000	.0070	.0002	-.0013
#3	.0000	.0014	.0014	-.0032	-.0012	.0091	-.0011

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3653.8	33883.	3822.9
Stddev	42.4	621.	25.3
%RSD	1.1618	1.8329	.66142
#1	3612.8	34575.	3829.3
#2	3650.9	33700.	3795.0
#3	3697.6	33374.	3844.3

Sample Name: CCVL Acquired: 8/2/2018 16:06:25 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0104	.2045	.0085	.1040	.0474	.0050	.2050	1.022	.0043
Stddev	.0007	.0268	.0022	.0054	.0004	.0001	.0012	.006	.0004
%RSD	6.486	13.13	25.51	5.147	.8893	2.252	.6066	.5726	9.857
#1	.0102	.2192	.0081	.1017	.0474	.0050	.2056	1.027	.0046
#2	.0099	.2207	.0108	.1102	.0470	.0049	.2036	1.022	.0038
#3	.0112	.1735	.0065	.1002	.0478	.0051	.2058	1.016	.0045

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0505	.0102	.0251	.1051	5.056	.0531	1.007	.0150	.0384
Stddev	.0008	.0004	.0030	.0019	.095	.0019	.017	.0004	.0004
%RSD	1.558	3.649	11.96	1.848	1.879	3.583	1.677	2.456	.9177
#1	.0502	.0100	.0234	.1042	4.991	.0547	.9964	.0154	.0388
#2	.0499	.0100	.0285	.1073	5.012	.0510	1.027	.0147	.0384
#3	.0514	.0106	.0233	.1037	5.165	.0536	.9984	.0148	.0380

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9413	.0414	.2390	.0102	4.601	.0105	.0138	.3626	.0993
Stddev	.0384	.0004	.0005	.0006	.011	.0016	.0041	.0179	.0010
%RSD	4.080	.9504	.2151	5.798	.2478	15.57	29.40	4.943	.9693
#1	.9226	.0418	.2387	.0106	4.588	.0118	.0156	.3479	.0982
#2	.9158	.0414	.2396	.0104	4.610	.0087	.0168	.3573	.0999
#3	.9854	.0410	.2386	.0095	4.604	.0111	.0092	.3826	.0998

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCVL Acquired: 8/2/2018 16:06:25 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0049	.1883	.0187	.0233	.4405	.0524	.0187
Stddev	.0002	.0077	.0008	.0018	.0163	.0056	.0001
%RSD	4.498	4.085	4.254	7.908	3.705	10.69	.4390
#1	.0051	.1887	.0178	.0216	.4554	.0477	.0188
#2	.0046	.1804	.0188	.0230	.4431	.0509	.0188
#3	.0049	.1957	.0194	.0252	.4231	.0586	.0186

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3577.8	32325.	3585.8
Stddev	54.8	135.	61.1
%RSD	1.5325	.41878	1.7039
#1	3551.6	32452.	3628.5
#2	3540.9	32182.	3613.2
#3	3640.8	32341.	3515.9

Sample Name: CCV Acquired: 8/2/2018 16:11:04 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9846	48.18	4.793	.9842	4.824	4.874	4.882	49.40	4.869
Stddev	.0041	.05	.023	.0057	.007	.004	.025	.13	.016
%RSD	.4157	.0967	.4776	.5828	.1382	.0917	.5140	.2715	.3240
#1	.9884	48.22	4.768	.9871	4.818	4.873	4.853	49.28	4.851
#2	.9803	48.13	4.797	.9776	4.823	4.880	4.895	49.54	4.878
#3	.9852	48.20	4.813	.9880	4.831	4.871	4.897	49.36	4.877

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.914	4.829	4.840	48.91	48.93	4.914	48.62	4.868	.9616
Stddev	.021	.021	.020	.13	.06	.008	.06	.006	.0027
%RSD	.4167	.4336	.4041	.2612	.1315	.1616	.1222	.1203	.2841
#1	4.892	4.805	4.818	48.77	48.90	4.905	48.67	4.862	.9592
#2	4.921	4.839	4.854	48.92	49.01	4.921	48.56	4.870	.9646
#3	4.931	4.842	4.848	49.03	48.89	4.916	48.65	4.873	.9611

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	48.83	4.921	49.19	4.890	48.50	.9588	.9652	4.845	4.884
Stddev	.05	.014	.26	.022	.30	.0039	.0102	.010	.023
%RSD	.0930	.2845	.5219	.4457	.6113	.4034	1.058	.2148	.4788
#1	48.81	4.906	48.89	4.867	48.22	.9555	.9561	4.856	4.857
#2	48.80	4.924	49.32	4.910	48.49	.9578	.9763	4.844	4.897
#3	48.88	4.933	49.35	4.894	48.81	.9630	.9633	4.836	4.897

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/2/2018 16:11:04 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.822	4.800	4.847	.9890	4.981	4.809	4.886
Stddev	.003	.004	.010	.0061	.020	.004	.017
%RSD	.0629	.0905	.2031	.6123	.4045	.0763	.3473
#1	4.821	4.805	4.846	.9873	4.958	4.813	4.868
#2	4.826	4.797	4.838	.9957	4.989	4.807	4.890
#3	4.821	4.798	4.858	.9840	4.995	4.807	4.901

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3437.7	31519.	3567.9
Stddev	54.3	221.	12.0
%RSD	1.5781	.70159	.33564
#1	3421.1	31498.	3569.7
#2	3393.7	31308.	3578.9
#3	3498.3	31749.	3555.2

Sample Name: CCB Acquired: 8/2/2018 16:15:17 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0061	-.0017	-.0018	.0002	.0001	.0001	-.0247	-.0003
Stddev	.0002	.0207	.0028	.0092	.0002	.0001	.0017	.0019	.0003
%RSD	125.9	342.2	163.5	506.2	97.39	69.15	1508.	7.583	95.26
#1	.0001	-.0178	.0002	-.0110	.0001	.0000	-.0000	-.0234	-.0007
#2	.0003	.0179	-.0004	.0074	.0001	.0001	-.0015	-.0268	-.0003
#3	-.0000	-.0183	-.0050	-.0018	.0004	.0001	.0019	-.0239	-.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	-.0003	.0016	.0083	-.0903	.0002	.0027	.0000	-.0001
Stddev	.0008	.0003	.0015	.0028	.0542	.0024	.0129	.0009	.0004
%RSD	1260.	107.5	93.68	34.36	59.95	1355.	476.3	2886.	338.9
#1	-.0002	-.0005	.0003	.0091	-.1411	-.0026	-.0029	.0009	.0000
#2	.0008	-.0004	.0012	.0106	-.0333	.0017	-.0064	.0001	-.0006
#3	-.0008	.0001	.0033	.0051	-.0965	.0014	.0175	-.0009	.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0389	-.0008	-.0009	-.0003	-.0022	.0014	-.0034	-.0003	.0001
Stddev	.0144	.0002	.0043	.0005	.0013	.0029	.0038	.0076	.0010
%RSD	37.13	28.41	493.6	179.2	58.07	213.6	111.3	2618.	1025.
#1	-.0457	-.0008	.0022	-.0003	-.0034	.0008	.0008	-.0089	.0000
#2	-.0223	-.0010	-.0058	.0002	-.0024	.0045	-.0065	.0025	-.0008
#3	-.0487	-.0006	.0010	-.0008	-.0008	-.0012	-.0046	.0056	.0011

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/2/2018 16:15:17 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	-.0082	.0005	.0005	.0015	.0031	-.0010
Stddev	.0003	.0027	.0007	.0025	.0186	.0001	.0001
%RSD	2417.	32.37	149.8	481.0	1267.	4.623	11.03
#1	-.0002	-.0102	.0000	-.0021	.0054	.0031	-.0010
#2	.0003	-.0093	.0014	.0008	-.0188	.0033	-.0010
#3	-.0001	-.0052	.0001	.0028	.0178	.0030	-.0012

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3563.6	33905.	3543.3
Stddev	33.2	207.	36.1
%RSD	.93226	.60961	1.0184
#1	3552.0	33917.	3556.3
#2	3537.7	34106.	3502.5
#3	3601.1	33693.	3571.1

Sample Name: LB 160-378221/1-B Acquired: 8/2/2018 16:51:17 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment: 379539

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0010	.0067	-.0035	.0018	.0038	-.0001	.0003	.0017	-.0001
Stddev	.0017	.0143	.0029	.0081	.0001	.0001	.0003	.0004	.0003
%RSD	160.7	214.1	83.20	452.9	3.647	137.6	100.5	23.68	227.1
#1	-.0006	.0189	-.0047	-.0033	.0040	-.0002	.0006	.0014	-.0004
#2	.0010	-.0090	-.0057	.0112	.0037	.0000	.0002	.0016	.0002
#3	.0027	.0102	-.0002	-.0025	.0037	-.0000	.0000	.0022	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	-.0000	.0027	.0080	.0109	-.0017	.0065	.0005	-.0000
Stddev	.0005	.0003	.0017	.0043	.0574	.0079	.0089	.0004	.0003
%RSD	1267.	1457.	62.17	53.48	527.8	460.8	136.3	77.80	956.6
#1	-.0006	-.0002	.0043	.0127	.0631	.0030	-.0014	.0001	-.0003
#2	.0002	.0003	.0027	.0046	.0202	.0027	.0161	.0006	-.0001
#3	.0002	-.0001	.0010	.0066	-.0507	-.0108	.0049	.0008	.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 500.6	-.0004	.0166	.0012	.0084	.0024	.0007	.0163	.0002
Stddev	4.6	.0001	.0053	.0018	.0050	.0038	.0018	.0031	.0012
%RSD	.9218	35.55	31.62	150.7	59.07	158.5	257.2	19.21	730.6
#1	505.9	-.0006	.0212	.0033	.0104	-.0020	.0025	.0128	-.0011
#2	498.2	-.0004	.0109	.0006	.0027	.0047	-.0012	.0173	.0003
#3	497.6	-.0003	.0178	-.0002	.0120	.0044	.0008	.0188	.0012

Check ? Chk Fail Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit 100.0
Low Limit -500.0

Sample Name: LB 160-378221/1-B Acquired: 8/2/2018 16:51:17 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment: 379539

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0020	.0241	.0016	-.0006	-.0306	.0051	-.0007
Stddev	.0001	.0046	.0017	.0010	.0068	.0043	.0000
%RSD	2.643	18.95	103.2	161.5	22.32	84.38	7.230
#1	.0020	.0259	.0020	-.0018	-.0245	.0101	-.0007
#2	.0020	.0189	.0030	-.0002	-.0379	.0025	-.0007
#3	.0021	.0275	-.0002	.0001	-.0293	.0028	-.0006

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3393.8	30455.	3495.3
Stddev	36.9	173.	72.4
%RSD	1.0873	.56958	2.0719
#1	3371.3	30257.	3423.0
#2	3373.7	30583.	3495.1
#3	3436.4	30524.	3567.8

Sample Name: LCS 160-379539/2-A Acquired: 8/2/2018 16:56:05 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2100	9.668	.9629	.2030	.9500	.0983	.9408	9.875	.9736
Stddev	.0019	.084	.0021	.0067	.0059	.0007	.0044	.018	.0001
%RSD	.8949	.8718	.2220	3.278	.6197	.6940	.4677	.1804	.0077

#1	.2083	9.586	.9615	.2079	.9441	.0975	.9444	9.879	.9735
#2	.2097	9.664	.9618	.1954	.9501	.0986	.9422	9.890	.9737
#3	.2121	9.754	.9653	.2057	.9558	.0988	.9359	9.855	.9736

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9832	.9644	.9560	9.963	9.948	.1049	9.622	.9805	.4744
Stddev	.0013	.0016	.0055	.042	.152	.0103	.072	.0077	.0012
%RSD	.1318	.1634	.5768	.4243	1.527	9.808	.7456	.7823	.2432

#1	.9823	.9639	.9498	9.915	9.807	.0983	9.540	.9725	.4738
#2	.9826	.9662	.9604	9.988	10.11	.1167	9.674	.9811	.4757
#3	.9847	.9632	.9577	9.988	9.928	.0997	9.653	.9878	.4736

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 514.7	.9961	1.022	.9359	9.672	.4639	.5040	4.657	.9521
Stddev	18.9	.0011	.004	.0021	.045	.0018	.0095	.018	.0028
%RSD	3.668	.1083	.3540	.2254	.4610	.3818	1.887	.3954	.2991

#1	536.0	.9966	1.019	.9362	9.632	.4626	.5096	4.638	.9524
#2	500.2	.9969	1.021	.9378	9.664	.4631	.4930	4.660	.9547
#3	507.9	.9949	1.026	.9336	9.720	.4659	.5094	4.674	.9491

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0								
Low Limit	-500.0								

Sample Name: LCS 160-379539/2-A Acquired: 8/2/2018 16:56:05 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9653	.9831	.9741	.1835	.9832	.9672	.9938
Stddev	.0058	.0125	.0088	.0014	.0233	.0054	.0007
%RSD	.5977	1.276	.9061	.7796	2.367	.5554	.0657

#1	.9593	.9707	.9649	.1841	.9893	.9625	.9935
#2	.9658	.9958	.9748	.1819	.9575	.9661	.9933
#3	.9708	.9829	.9825	.1846	1.003	.9730	.9945

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3364.7	30170.	3445.4
Stddev	38.7	227.	54.0
%RSD	1.1509	.75236	1.5668

#1	3344.3	30178.	3507.6
#2	3340.5	29939.	3410.4
#3	3409.4	30393.	3418.2

Sample Name: 160-29687-B-1-B Acquired: 8/2/2018 17:00:31 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	.0808	-.0030	.2172	.0748	-.0000	-.0024	F 499.2	.0367
Stddev	.0013	.0111	.0005	.0097	.0005	.0002	.0030	2.3	.0002
%RSD	3114.	13.80	16.11	4.476	.7192	495.1	127.5	.4643	.5382

#1	-.0013	.0928	-.0028	.2072	.0750	-.0001	.0011	501.4	.0369
#2	-.0001	.0788	-.0027	.2179	.0752	.0002	-.0036	496.8	.0366
#3	.0013	.0707	-.0036	.2266	.0742	-.0002	-.0046	499.5	.0365

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								100.0	
Low Limit								-500.0	

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0744	.0039	.0167	.0193	4.249	.0815	40.51	.5244	.0010
Stddev	.0008	.0002	.0009	.0031	.115	.0004	.07	.0018	.0008
%RSD	1.086	5.758	5.316	15.86	2.699	.5098	.1779	.3429	78.62

#1	.0753	.0040	.0176	.0158	4.143	.0816	40.57	.5258	.0009
#2	.0740	.0036	.0158	.0203	4.371	.0811	40.43	.5251	.0003
#3	.0738	.0041	.0167	.0217	4.232	.0819	40.53	.5224	.0019

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 496.5	.0113	.0484	.3943	F 197.2	.0080	-.0011	1.480	-.0030
Stddev	5.8	.0003	.0032	.0034	.5	.0020	.0030	.011	.0003
%RSD	1.167	2.238	6.565	.8553	.2678	25.21	282.9	.7274	9.784

#1	503.0	.0116	.0518	.3982	197.5	.0102	.0024	1.475	-.0032
#2	494.6	.0111	.0480	.3920	197.4	.0063	-.0033	1.472	-.0031
#3	491.9	.0114	.0454	.3927	196.5	.0075	-.0024	1.492	-.0027

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29687-B-1-B Acquired: 8/2/2018 17:00:31 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 11.36	.0204	.0013	-.0029	-.0227	.0034	8.337
Stddev	.06	.0084	.0004	.0017	.0196	.0015	.009
%RSD	.5409	41.05	29.67	59.47	86.14	44.04	.1134

#1	11.37	.0109	.0016	-.0009	-.0304	.0017	8.347
#2	11.41	.0265	.0008	-.0038	-.0373	.0045	8.334
#3	11.29	.0239	.0014	-.0041	-.0005	.0039	8.329

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	10.00						
Low Limit	-500.0						

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3220.4	29622.	3457.9
Stddev	32.7	362.	27.9
%RSD	1.0168	1.2222	.80585

#1	3195.0	29346.	3482.8
#2	3257.4	29489.	3463.1
#3	3208.9	30032.	3427.8

Sample Name: 160-29687-B-1-BSD@5 Acquired: 8/2/2018 17:05:21 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0012	.0451	-.0045	.0459	.0150	.0001	-.0046	F 118.7	.0073
Stddev	.0010	.0062	.0023	.0068	.0004	.0001	.0032	.2	.0004
%RSD	83.97	13.81	50.02	14.79	2.510	118.0	68.97	.1441	5.441
#1	-.0004	.0380	-.0051	.0524	.0154	-.0000	-.0057	118.7	.0078
#2	-.0009	.0473	-.0065	.0388	.0147	.0001	-.0010	118.5	.0071
#3	-.0023	.0498	-.0020	.0463	.0148	.0002	-.0071	118.9	.0071

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								100.0	
Low Limit								-500.0	

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0153	.0006	.0052	.0049	.8870	.0217	8.455	.1089	.0004
Stddev	.0003	.0001	.0012	.0031	.1714	.0096	.052	.0008	.0003
%RSD	1.778	21.95	23.29	64.14	19.32	44.36	.6170	.7290	71.83
#1	.0152	.0005	.0045	.0052	.6891	.0287	8.451	.1092	.0007
#2	.0155	.0006	.0066	.0079	.9896	.0107	8.509	.1095	.0002
#3	.0150	.0008	.0045	.0016	.9824	.0257	8.405	.1080	.0003

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 104.4	.0016	.0106	.0833	38.60	.0020	.0011	.2921	-.0031
Stddev	.1	.0003	.0051	.0007	.15	.0027	.0013	.0078	.0002
%RSD	.1265	17.48	48.49	.8516	.3847	131.7	111.8	2.675	6.864
#1	104.3	.0017	.0122	.0831	38.43	.0001	-.0002	.3001	-.0033
#2	104.6	.0018	.0049	.0840	38.66	.0051	.0013	.2845	-.0032
#3	104.4	.0013	.0148	.0827	38.70	.0009	.0024	.2917	-.0029

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0								
Low Limit	-500.0								

Sample Name: 160-29687-B-1-BSD@5 Acquired: 8/2/2018 17:05:21 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.325	.0186	.0015	-.0007	.0312	.0060	1.659
Stddev	.002	.0062	.0013	.0008	.0153	.0071	.003
%RSD	.0744	33.34	83.24	111.8	48.99	117.9	.1545

#1	2.326	.0233	.0020	-.0015	.0481	.0011	1.657
#2	2.325	.0115	.0001	-.0009	.0270	.0028	1.658
#3	2.323	.0209	.0026	.0002	.0184	.0141	1.662

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3451.5	31741.	3628.9
Stddev	26.1	94.	59.8
%RSD	.75594	.29475	1.6492

#1	3434.5	31758.	3696.1
#2	3481.5	31825.	3581.4
#3	3438.4	31640.	3609.1

Sample Name: 160-29687-B-1-C MS Acquired: 8/2/2018 17:09:56 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2187	9.791	.9904	.4152	1.035	.0984	.9656	F 514.0	1.045
Stddev	.0016	.048	.0025	.0047	.005	.0005	.0013	2.3	.003
%RSD	.7141	.4937	.2479	1.129	.4734	.4606	.1362	.4496	.2405

#1	.2204	9.757	.9882	.4103	1.031	.0979	.9661	512.0	1.044
#2	.2175	9.847	.9930	.4155	1.040	.0988	.9666	516.5	1.048
#3	.2182	9.771	.9899	.4197	1.032	.0985	.9641	513.5	1.044

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								100.0	
Low Limit								-500.0	

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.056	.9696	.9776	9.883	14.60	.1883	49.39	1.496	.4719
Stddev	.004	.0034	.0028	.011	.10	.0045	.07	.003	.0023
%RSD	.3649	.3556	.2831	.1135	.6924	2.380	.1347	.2149	.4796

#1	1.055	.9662	.9745	9.891	14.48	.1895	49.33	1.493	.4693
#2	1.061	.9731	.9800	9.888	14.66	.1921	49.38	1.494	.4735
#3	1.054	.9697	.9782	9.870	14.65	.1834	49.46	1.499	.4728

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 494.5	1.001	1.078	1.313	F 203.9	.4756	.5084	6.065	.9281
Stddev	24.1	.004	.007	.006	.6	.0027	.0094	.013	.0043
%RSD	4.880	.4319	.6270	.4394	.2837	.5597	1.853	.2155	.4628

#1	498.4	.9996	1.071	1.307	203.6	.4775	.4978	6.057	.9255
#2	468.7	1.006	1.081	1.319	204.6	.4769	.5157	6.058	.9331
#3	516.5	.9979	1.083	1.312	203.6	.4726	.5119	6.080	.9258

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29687-B-1-C MS Acquired: 8/2/2018 17:09:56 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 12.07	.9587	.9609	.1765	.9989	.9608	9.284
Stddev	.44	.0106	.0059	.0014	.0374	.0026	.031
%RSD	3.685	1.105	.6191	.8193	3.743	.2728	.3337

#1	12.27	.9701	.9577	.1748	1.041	.9580	9.261
#2	11.56	.9492	.9678	.1773	.9716	.9631	9.319
#3	12.38	.9568	.9573	.1774	.9835	.9612	9.272

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	10.00						
Low Limit	-500.0						

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3085.4	29024.	3685.9
Stddev	20.8	202.	126.1
%RSD	.67363	.69457	3.4202

#1	3107.8	29243.	3614.9
#2	3066.8	28984.	3831.4
#3	3081.4	28846.	3611.3

Sample Name: 160-29687-B-1-D MSD Acquired: 8/2/2018 17:14:32 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2204	9.971	1.017	.4213	1.043	.0989	.9955	F 508.6	1.066
Stddev	.0004	.022	.005	.0142	.006	.0009	.0056	2.8	.003
%RSD	.1982	.2171	.5209	3.372	.5929	.9361	.5618	.5531	.2837
#1	.2206	9.966	1.020	.4264	1.040	.0984	1.002	511.3	1.067
#2	.2200	9.952	1.019	.4322	1.039	.0984	.9942	508.9	1.067
#3	.2208	9.995	1.011	.4052	1.050	.1000	.9907	505.7	1.062

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								100.0	
Low Limit								-500.0	

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.065	.9783	.9948	10.01	14.73	.1918	49.79	1.507	.4735
Stddev	.004	.0042	.0058	.07	.11	.0058	.33	.006	.0014
%RSD	.3516	.4319	.5880	.6971	.7532	3.036	.6699	.4181	.3033
#1	1.066	.9819	.9890	9.970	14.60	.1968	49.97	1.504	.4742
#2	1.068	.9794	1.001	9.959	14.81	.1854	49.40	1.503	.4745
#3	1.060	.9737	.9947	10.09	14.77	.1933	50.00	1.514	.4719

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 500.5	1.012	1.110	1.327	F 208.7	.4820	.5253	6.137	.9347
Stddev	12.9	.003	.011	.006	.6	.0010	.0022	.051	.0041
%RSD	2.573	.2892	.9838	.4495	.2867	.2045	.4208	.8341	.4367
#1	504.1	1.013	1.101	1.333	208.4	.4826	.5278	6.128	.9363
#2	486.3	1.014	1.122	1.328	209.4	.4808	.5238	6.091	.9378
#3	511.3	1.009	1.108	1.321	208.4	.4825	.5243	6.192	.9301

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29687-B-1-D MSD Acquired: 8/2/2018 17:14:32 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 12.21	.9792	.9721	.1770	1.016	.9704	9.394
Stddev	.10	.0084	.0075	.0027	.020	.0062	.032
%RSD	.8016	.8528	.7710	1.508	1.972	.6382	.3416

#1	12.32	.9776	.9658	.1785	1.022	.9677	9.411
#2	12.20	.9717	.9701	.1785	1.033	.9660	9.414
#3	12.12	.9882	.9804	.1739	.9939	.9775	9.357

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	10.00						
Low Limit	-500.0						

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3213.8	29297.	3540.2
Stddev	35.2	76.	82.3
%RSD	1.0952	.25902	2.3259

#1	3174.1	29218.	3448.8
#2	3226.4	29302.	3563.3
#3	3241.0	29370.	3608.6

Sample Name: 160-29687-B-1-BPDS Acquired: 8/2/2018 17:19:07 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0933	1.851	.0853	1.112	.4914	.0438	1.734	F 470.7	.0777
Stddev	.0014	.030	.0036	.004	.0023	.0002	.004	2.2	.0002
%RSD	1.490	1.606	4.239	.3950	.4615	.3637	.2376	.4767	.3047
#1	.0940	1.842	.0890	1.112	.4910	.0439	1.734	468.1	.0774
#2	.0941	1.885	.0850	1.115	.4938	.0439	1.739	472.0	.0779
#3	.0917	1.827	.0818	1.107	.4893	.0437	1.731	471.9	.0777

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								100.0	
Low Limit								-500.0	

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5037	.0891	.2293	.8992	49.63	.5313	44.93	.6104	.3405
Stddev	.0021	.0004	.0027	.0071	.27	.0014	.20	.0036	.0012
%RSD	.4081	.4244	1.181	.7864	.5364	.2579	.4465	.5849	.3487
#1	.5014	.0888	.2324	.9072	49.67	.5328	44.96	.6099	.3401
#2	.5052	.0895	.2278	.8964	49.88	.5303	45.12	.6142	.3419
#3	.5045	.0890	.2276	.8939	49.35	.5306	44.72	.6072	.3396

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 464.3	.3632	2.365	.4468	F 221.9	.0924	.1328	4.728	.8404
Stddev	3.3	.0017	.014	.0016	.9	.0024	.0025	.026	.0014
%RSD	.7078	.4569	.5792	.3585	.3844	2.554	1.856	.5597	.1659
#1	467.4	.3614	2.359	.4467	221.8	.0924	.1354	4.746	.8389
#2	464.5	.3645	2.381	.4452	222.8	.0900	.1325	4.740	.8416
#3	460.9	.3637	2.357	.4484	221.1	.0947	.1305	4.698	.8408

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29687-B-1-BPDS Acquired: 8/2/2018 17:19:07 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 10.51	1.668	.1765	.1550	4.002	.4350	7.748
Stddev	.10	.008	.0014	.0019	.045	.0076	.023
%RSD	.9610	.4606	.8175	1.221	1.127	1.758	.2971

#1	10.62	1.673	.1764	.1572	3.998	.4321	7.727
#2	10.42	1.671	.1780	.1542	4.049	.4292	7.773
#3	10.49	1.659	.1751	.1537	3.959	.4437	7.744

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	10.00						
Low Limit	-500.0						

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3174.1	30497.	3485.8
Stddev	25.3	403.	20.6
%RSD	.79621	1.3229	.59071

#1	3201.2	30638.	3488.3
#2	3169.9	30812.	3464.2
#3	3151.2	30042.	3505.1

Sample Name: MB 160-379537/1-A Acquired: 8/2/2018 17:23:48 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment: 379537

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0013	-.0018	-.0017	.0061	-.0004	-.0000	-.0000	-.0181	-.0001
Stddev	.0007	.0074	.0010	.0023	.0005	.0001	.0023	.0008	.0003
%RSD	53.85	416.6	58.33	37.28	134.8	325.2	24490.	4.652	401.0
#1	-.0020	.0028	-.0026	.0051	.0002	-.0000	-.0026	-.0179	-.0003
#2	-.0008	.0022	-.0006	.0045	-.0006	.0001	.0007	-.0191	-.0003
#3	-.0010	-.0103	-.0019	.0087	-.0006	-.0001	.0018	-.0174	.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0007	-.0002	-.0005	.0054	.0610	.0053	.0050	-.0001	.0004
Stddev	.0005	.0002	.0021	.0046	.0553	.0031	.0180	.0006	.0007
%RSD	72.92	115.1	401.0	85.20	90.59	58.75	358.4	640.4	153.4
#1	-.0008	-.0004	.0009	.0107	.0544	.0060	-.0002	-.0005	-.0003
#2	-.0012	-.0001	-.0029	.0034	.1193	.0080	.0251	-.0004	.0010
#3	-.0001	-.0001	.0004	.0022	.0094	.0019	-.0098	.0006	.0006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0733	-.0011	.0127	.0004	.0044	.0010	-.0033	.0145	.0003
Stddev	.0574	.0002	.0052	.0006	.0054	.0050	.0059	.0107	.0012
%RSD	78.30	22.83	40.67	154.4	123.7	513.3	179.5	74.20	392.5
#1	.1395	-.0012	.0069	.0003	.0095	.0048	-.0016	.0138	-.0001
#2	.0396	-.0008	.0169	.0011	-.0013	.0029	.0016	.0255	.0016
#3	.0407	-.0012	.0142	-.0001	.0049	-.0047	-.0098	.0041	-.0006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: MB 160-379537/1-A Acquired: 8/2/2018 17:23:48 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment: 379537

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0050	.0016	-.0030	.0777	.0007	-.0008
Stddev	.0002	.0046	.0012	.0007	.0169	.0075	.0001
%RSD	235.3	91.44	73.44	22.44	21.77	1145.	14.36
#1	.0002	-.0098	.0014	-.0034	.0892	.0039	-.0007
#2	-.0001	-.0007	.0029	-.0034	.0855	-.0079	-.0010
#3	.0002	-.0046	.0005	-.0022	.0583	.0060	-.0008

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3689.0	34542.	3569.2
Stddev	13.0	342.	139.8
%RSD	.35285	.99147	3.9167
#1	3697.9	34189.	3415.6
#2	3674.1	34564.	3603.0
#3	3695.1	34872.	3689.0

Sample Name: LCS 160-379537/2-A Acquired: 8/2/2018 17:28:27 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2058	9.607	.9056	.2021	.9459	.0974	.9829	10.29	.9633
Stddev	.0035	.025	.0022	.0108	.0026	.0001	.0044	.02	.0022
%RSD	1.715	.2553	.2460	5.362	.2749	.1537	.4485	.1723	.2295

#1	.2093	9.634	.9065	.1903	.9482	.0976	.9877	10.30	.9647
#2	.2057	9.586	.9073	.2043	.9431	.0974	.9819	10.28	.9645
#3	.2023	9.601	.9031	.2116	.9464	.0973	.9791	10.27	.9608

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.014	.9670	.9689	9.992	9.981	.1106	9.672	.9871	.4682
Stddev	.002	.0019	.0017	.019	.167	.0050	.057	.0034	.0011
%RSD	.1777	.1949	.1804	.1883	1.669	4.525	.5928	.3425	.2264

#1	1.016	.9689	.9709	10.00	9.793	.1065	9.673	.9837	.4694
#2	1.013	.9652	.9675	10.00	10.11	.1092	9.729	.9869	.4677
#3	1.014	.9669	.9685	9.971	10.04	.1162	9.614	.9905	.4675

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.949	1.020	.9559	.9770	9.022	.4510	.4656	4.513	.9616
Stddev	.088	.002	.0049	.0011	.010	.0017	.0009	.009	.0021
%RSD	.8809	.1630	.5108	.1107	.1071	.3692	.1934	.1876	.2211

#1	9.854	1.022	.9543	.9772	9.031	.4513	.4656	4.505	.9591
#2	9.968	1.020	.9520	.9779	9.023	.4492	.4665	4.513	.9628
#3	10.03	1.018	.9613	.9758	9.012	.4525	.4647	4.522	.9628

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Sample Name: LCS 160-379537/2-A Acquired: 8/2/2018 17:28:27 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9645	.9218	.9566	.2032	1.067	.9458	.9629
Stddev	.0016	.0061	.0033	.0019	.026	.0068	.0004
%RSD	.1651	.6580	.3456	.9570	2.478	.7242	.0397
#1	.9646	.9232	.9593	.2017	1.037	.9502	.9633
#2	.9628	.9151	.9529	.2054	1.080	.9379	.9626
#3	.9660	.9270	.9576	.2027	1.085	.9492	.9628

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3481.8	32373.	3699.7
Stddev	9.2	493.	137.5
%RSD	.26426	1.5240	3.7166
#1	3471.2	32694.	3849.4
#2	3487.9	32620.	3670.8
#3	3486.2	31805.	3579.0

Sample Name: 160-29476-L-1-C Acquired: 8/2/2018 17:32:45 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0010	.3318	.0009	.0733	.0154	.0001	.0002	71.40	.0000
Stddev	.0016	.0270	.0014	.0026	.0001	.0001	.0039	.05	.0002
%RSD	152.9	8.123	148.6	3.562	.8488	90.50	1916.	.0714	508.7

#1	-.0015	.3162	.0021	.0712	.0155	.0001	.0046	71.45	.0003
#2	.0007	.3163	.0014	.0726	.0154	.0000	-.0010	71.39	.0000
#3	-.0024	.3629	-.0006	.0762	.0152	.0002	-.0029	71.35	-.0002

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004	.0005	.0021	.5399	3.968	.0163	22.67	.0998	.0180
Stddev	.0002	.0001	.0021	.0075	.145	.0018	.11	.0011	.0005
%RSD	57.86	21.33	99.65	1.394	3.665	11.27	.4756	1.142	2.966

#1	.0005	.0004	.0044	.5385	3.801	.0160	22.67	.1008	.0184
#2	.0006	.0004	.0008	.5332	4.068	.0182	22.56	.0986	.0182
#3	.0001	.0006	.0009	.5480	4.034	.0146	22.77	.1000	.0174

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	28.11	.0063	.0232	.0022	10.09	.0014	.0001	6.903	-.0020
Stddev	.09	.0003	.0009	.0012	.03	.0006	.0036	.020	.0004
%RSD	.3121	5.180	4.047	54.13	.3096	42.65	5881.	.2835	20.75

#1	28.10	.0066	.0239	.0035	10.07	.0020	-.0037	6.886	-.0016
#2	28.02	.0061	.0221	.0015	10.13	.0008	.0034	6.898	-.0024
#3	28.20	.0061	.0236	.0014	10.07	.0013	.0005	6.924	-.0020

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: 160-29476-L-1-C Acquired: 8/2/2018 17:32:45 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1544	.0087	.0096	-.0010	.5602	.0564	.0081
Stddev	.0010	.0044	.0016	.0015	.0218	.0045	.0001
%RSD	.6370	50.20	16.97	154.2	3.894	7.979	1.016
#1	.1543	.0038	.0100	-.0025	.5417	.0542	.0081
#2	.1534	.0100	.0078	-.0008	.5843	.0534	.0082
#3	.1554	.0122	.0110	.0005	.5548	.0616	.0081

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3689.4	33812.	3720.0
Stddev	35.2	167.	7.2
%RSD	.95405	.49382	.19380
#1	3652.2	33884.	3728.4
#2	3722.1	33931.	3715.7
#3	3693.9	33621.	3716.1

Sample Name: CCVL Acquired: 8/2/2018 17:37:20 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0094	.2068	F .0065	.0992	.0467	.0048	.2040	1.013	.0047
Stddev	.0005	.0141	.0019	.0078	.0010	.0002	.0074	.004	.0004
%RSD	5.487	6.799	29.61	7.907	2.101	3.485	3.621	.4089	8.184
#1	.0096	.1907	.0069	.1043	.0474	.0050	.2097	1.018	.0051
#2	.0098	.2167	.0082	.1032	.0456	.0047	.2067	1.011	.0046
#3	.0088	.2130	.0044	.0902	.0471	.0047	.1956	1.010	.0044

Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.0100						
Range			-30.00%						

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0510	.0094	.0263	.1017	5.042	.0544	.9717	.0148	.0372
Stddev	.0003	.0002	.0029	.0043	.022	.0068	.0183	.0013	.0003
%RSD	.5983	2.280	11.03	4.242	.4291	12.50	1.885	8.783	.9020
#1	.0508	.0095	.0258	.0970	5.032	.0622	.9901	.0163	.0374
#2	.0513	.0092	.0236	.1054	5.027	.0499	.9716	.0141	.0374
#3	.0508	.0095	.0293	.1027	5.067	.0511	.9534	.0139	.0369

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.099	.0405	.2318	.0106	4.504	.0111	.0123	.3629	.0986
Stddev	.030	.0003	.0081	.0016	.015	.0013	.0026	.0106	.0002
%RSD	2.744	.7539	3.502	15.01	.3411	11.47	21.02	2.922	.1631
#1	1.085	.0405	.2295	.0088	4.489	.0097	.0148	.3516	.0988
#2	1.134	.0402	.2251	.0119	4.519	.0115	.0096	.3727	.0985
#3	1.079	.0408	.2409	.0111	4.504	.0122	.0123	.3645	.0985

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Sample Name: CCVL Acquired: 8/2/2018 17:37:20 Type: QC
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0049	.1760	.0205	.0211	.4860	.0487	.0187
Stddev	.0001	.0016	.0007	.0021	.0192	.0039	.0002
%RSD	1.228	.9217	3.565	9.872	3.944	8.059	.9249
#1	.0049	.1776	.0210	.0188	.5078	.0530	.0186
#2	.0049	.1744	.0197	.0228	.4717	.0477	.0186
#3	.0048	.1759	.0209	.0216	.4786	.0453	.0189

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3651.9	32556.	3358.0
Stddev	28.5	183.	7.1
%RSD	.77929	.56185	.21224
#1	3623.9	32386.	3366.1
#2	3651.1	32532.	3352.6
#3	3680.8	32749.	3355.3

Sample Name: CCV Acquired: 8/2/2018 17:41:59 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9834	46.32	4.624	.9757	4.674	4.781	4.777	49.19	4.833
Stddev	.0018	.10	.011	.0073	.005	.004	.010	.12	.003
%RSD	.1826	.2076	.2470	.7456	.1116	.0826	.2120	.2473	.0695
#1	.9846	46.37	4.633	.9699	4.670	4.781	4.771	49.33	4.837
#2	.9813	46.21	4.629	.9839	4.672	4.777	4.771	49.12	4.831
#3	.9843	46.38	4.611	.9733	4.680	4.785	4.789	49.12	4.832

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.919	4.703	4.651	48.17	48.73	4.938	46.44	4.740	.9325
Stddev	.006	.008	.004	.10	.24	.012	.16	.008	.0031
%RSD	.1150	.1707	.0885	.2091	.4916	.2437	.3502	.1641	.3288
#1	4.921	4.711	4.647	48.11	48.91	4.928	46.51	4.743	.9360
#2	4.913	4.695	4.650	48.12	48.46	4.935	46.26	4.731	.9301
#3	4.924	4.705	4.655	48.29	48.81	4.951	46.56	4.746	.9314

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	48.00	4.935	47.29	4.728	47.04	.9240	.9405	4.680	4.777
Stddev	.14	.009	.13	.009	.12	.0016	.0005	.017	.013
%RSD	.2987	.1933	.2696	.1943	.2568	.1778	.0515	.3614	.2633
#1	48.08	4.946	47.35	4.737	46.95	.9222	.9410	4.676	4.790
#2	47.84	4.930	47.14	4.726	46.99	.9254	.9405	4.665	4.765
#3	48.09	4.929	47.37	4.719	47.18	.9245	.9400	4.698	4.776

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/2/2018 17:41:59 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.682	F 4.459	4.697	.9509	5.138	4.618	4.866
Stddev	.008	.028	.010	.0019	.020	.011	.007
%RSD	.1620	.6197	.2040	.1971	.3825	.2280	.1346

#1	4.682	4.490	4.692	.9521	5.145	4.618	4.872
#2	4.674	4.451	4.691	.9518	5.116	4.607	4.859
#3	4.689	4.437	4.708	.9487	5.153	4.628	4.867

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value		5.000					
Range		-10.00%					

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3444.1	32817.	3710.5
Stddev	26.4	703.	63.2
%RSD	.76604	2.1408	1.7042

#1	3420.9	33018.	3670.7
#2	3438.6	33398.	3783.4
#3	3472.8	32036.	3677.3

Sample Name: CCB Acquired: 8/2/2018 17:46:13 Type: QC
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	.0097	-.0031	.0065	-.0005	.0001	-.0006	-.0170	-.0004
Stddev	.0007	.0195	.0018	.0026	.0007	.0000	.0009	.0003	.0001
%RSD	13400.	200.9	58.25	40.50	148.0	16.68	155.9	1.596	34.93
#1	.0001	-.0091	-.0011	.0085	-.0011	.0001	-.0015	-.0169	-.0004
#2	.0006	.0085	-.0037	.0035	-.0005	.0001	.0002	-.0169	-.0003
#3	-.0008	.0297	-.0045	.0076	.0003	.0001	-.0004	-.0174	-.0006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	-.0002	.0015	.0010	.0554	.0038	.0009	-.0001	.0001
Stddev	.0006	.0001	.0015	.0037	.1348	.0036	.0401	.0009	.0004
%RSD	93.33	59.05	101.4	362.0	243.2	96.76	4434.	1658.	385.1
#1	-.0013	-.0002	.0031	-.0030	.2023	.0044	.0240	.0004	-.0002
#2	-.0006	-.0001	.0010	.0041	-.0626	.0070	-.0454	.0005	.0006
#3	-.0001	-.0003	.0003	.0020	.0266	-.0002	.0241	-.0010	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0080	-.0005	-.0033	.0002	-.0078	.0012	-.0011	.0056	-.0007
Stddev	.0390	.0005	.0034	.0015	.0032	.0036	.0045	.0077	.0002
%RSD	487.5	96.90	102.8	960.7	41.46	291.4	411.4	139.0	31.85
#1	-.0369	-.0009	-.0070	-.0015	-.0041	.0040	.0017	.0102	-.0008
#2	.0333	-.0007	-.0030	.0006	-.0100	.0025	.0013	-.0034	-.0008
#3	.0276	.0001	-.0001	.0013	-.0093	-.0028	-.0062	.0098	-.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Sample Name: CCB Acquired: 8/2/2018 17:46:13 Type: QC
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003	.0111	.0008	-.0023	.0582	.0038	-.0007
Stddev	.0002	.0033	.0013	.0024	.0152	.0015	.0002
%RSD	53.21	29.36	164.6	104.1	26.03	38.34	32.88
#1	.0002	.0074	.0014	-.0045	.0745	.0026	-.0010
#2	.0002	.0133	.0017	-.0028	.0444	.0055	-.0005
#3	.0005	.0127	-.0007	.0003	.0558	.0034	-.0006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass None Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3674.7	33551.	3493.3
Stddev	20.0	188.	6.7
%RSD	.54532	.56077	.19055
#1	3684.0	33371.	3500.2
#2	3688.4	33536.	3492.6
#3	3651.7	33746.	3486.9

Sample Name: 160-29476-L-1-CSD@5 Acquired: 8/2/2018 17:50:54 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0009	.0806	-.0011	.0167	.0026	.0001	.0018	14.94	-.0003
Stddev	.0005	.0181	.0007	.0077	.0006	.0000	.0002	.08	.0004
%RSD	55.82	22.48	62.71	45.87	24.11	30.58	10.77	.5086	130.5
#1	-.0005	.0932	-.0005	.0252	.0026	.0001	.0016	14.95	-.0001
#2	-.0015	.0889	-.0019	.0103	.0032	.0002	.0019	14.86	-.0001
#3	-.0008	.0598	-.0009	.0146	.0019	.0001	.0018	15.01	-.0008

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0007	-.0002	.0045	.1102	.6736	.0068	4.674	.0207	.0034
Stddev	.0003	.0001	.0024	.0016	.0840	.0035	.018	.0002	.0003
%RSD	36.91	38.85	53.59	1.452	12.47	50.74	.3877	1.140	8.815
#1	-.0007	-.0001	.0050	.1095	.7619	.0029	4.656	.0210	.0031
#2	-.0005	-.0001	.0019	.1091	.6642	.0093	4.676	.0208	.0037
#3	-.0010	-.0003	.0067	.1121	.5947	.0083	4.692	.0205	.0034

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.689	.0004	.0073	.0021	1.969	.0003	.0020	1.375	-.0016
Stddev	.003	.0005	.0037	.0010	.010	.0034	.0026	.015	.0016
%RSD	.0593	133.4	51.08	47.08	.4883	1108.	130.1	1.082	99.55
#1	5.689	.0007	.0115	.0012	1.964	-.0032	-.0008	1.370	-.0017
#2	5.692	-.0002	.0059	.0020	1.980	.0036	.0043	1.392	-.0032
#3	5.686	.0006	.0044	.0031	1.962	.0005	.0026	1.363	.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29476-L-1-CSD@5 Acquired: 8/2/2018 17:50:54 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0315	.0022	.0025	-.0010	.1458	.0161	.0009
Stddev	.0002	.0035	.0009	.0015	.0222	.0033	.0001
%RSD	.5279	160.3	33.74	147.0	15.25	20.24	6.029
#1	.0316	.0033	.0027	.0002	.1693	.0166	.0008
#2	.0317	.0049	.0033	-.0006	.1251	.0126	.0009
#3	.0313	-.0017	.0016	-.0026	.1429	.0191	.0008

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3739.2	34308.	3809.3
Stddev	87.0	569.	67.9
%RSD	2.3261	1.6578	1.7812
#1	3724.2	34439.	3864.5
#2	3832.7	33686.	3733.6
#3	3660.7	34800.	3829.9

Sample Name: 160-29476-L-1-D MS Acquired: 8/2/2018 17:55:32 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2098	9.908	.9331	.2710	.9586	.0975	.9774	81.05	.9749
Stddev	.0022	.039	.0010	.0016	.0047	.0005	.0033	.11	.0026
%RSD	1.032	.3933	.1101	.5909	.4902	.5374	.3367	.1384	.2657
#1	.2101	9.892	.9337	.2708	.9564	.0972	.9790	81.13	.9774
#2	.2076	9.879	.9338	.2727	.9554	.0973	.9795	81.10	.9751
#3	.2119	9.952	.9320	.2695	.9640	.0981	.9736	80.92	.9723

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9932	.9528	.9582	10.39	14.14	.1253	32.20	1.066	.4848
Stddev	.0019	.0016	.0012	.04	.12	.0039	.14	.007	.0004
%RSD	.1912	.1699	.1281	.3579	.8683	3.109	.4321	.6450	.0754
#1	.9947	.9538	.9569	10.36	14.10	.1272	32.16	1.062	.4852
#2	.9937	.9537	.9592	10.37	14.04	.1278	32.09	1.063	.4846
#3	.9910	.9509	.9586	10.43	14.28	.1208	32.36	1.074	.4846

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	38.17	1.003	.9960	.9506	19.63	.4619	.4823	F 11.65	.9501
Stddev	.23	.002	.0020	.0020	.04	.0036	.0049	.11	.0013
%RSD	.5988	.2209	.2018	.2144	.2027	.7835	1.007	.9270	.1332
#1	38.06	1.004	.9947	.9496	19.66	.4604	.4866	11.62	.9486
#2	38.02	1.004	.9950	.9529	19.65	.4592	.4770	11.56	.9508
#3	38.43	1.000	.9983	.9492	19.58	.4660	.4832	11.77	.9508

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Fail Chk Pass
 High Limit
 Low Limit

Sample Name: 160-29476-L-1-D MS Acquired: 8/2/2018 17:55:32 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.111	.9194	.9639	.1940	1.599	.9993	.9850
Stddev	.006	.0026	.0022	.0012	.010	.0134	.0026
%RSD	.5622	.2788	.2255	.5956	.6463	1.341	.2605
#1	1.108	.9224	.9644	.1938	1.610	.9958	.9877
#2	1.107	.9178	.9615	.1952	1.597	.9880	.9849
#3	1.118	.9181	.9657	.1929	1.589	1.014	.9825

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3601.6	33300.	3707.3
Stddev	21.7	215.	31.0
%RSD	.60215	.64599	.83653
#1	3603.4	33482.	3740.3
#2	3622.3	33355.	3702.8
#3	3579.0	33063.	3678.8

Sample Name: 160-29476-L-1-E MSD Acquired: 8/2/2018 17:59:49 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2093	9.969	.9131	.2725	.9552	.0971	.9497	80.59	.9555
Stddev	.0013	.052	.0114	.0054	.0005	.0005	.0113	1.36	.0142
%RSD	.6431	.5231	1.247	1.965	.0558	.5021	1.186	1.690	1.488
#1	.2085	9.988	.9239	.2783	.9555	.0969	.9623	82.12	.9716
#2	.2086	9.910	.9012	.2678	.9545	.0968	.9404	79.51	.9445
#3	.2109	10.01	.9140	.2713	.9554	.0977	.9465	80.14	.9505

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9788	.9388	.9355	10.45	14.24	.1262	32.60	1.069	.4764
Stddev	.0159	.0143	.0105	.02	.06	.0027	.13	.003	.0068
%RSD	1.623	1.524	1.121	.1603	.4529	2.152	.3850	.2780	1.432
#1	.9968	.9552	.9464	10.46	14.17	.1285	32.56	1.070	.4842
#2	.9665	.9294	.9254	10.43	14.24	.1232	32.50	1.066	.4730
#3	.9732	.9317	.9348	10.45	14.30	.1269	32.74	1.071	.4719

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	38.48	.9918	.9721	.9347	19.27	.4471	.4673	F 11.79	.9380
Stddev	.08	.0152	.0119	.0127	.20	.0068	.0045	.01	.0127
%RSD	.2184	1.529	1.221	1.357	1.057	1.523	.9643	.1268	1.352
#1	38.51	1.009	.9852	.9491	19.50	.4543	.4713	11.80	.9523
#2	38.39	.9793	.9620	.9254	19.18	.4407	.4624	11.77	.9282
#3	38.55	.9875	.9692	.9294	19.12	.4463	.4683	11.79	.9334

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Fail Chk Pass
High Limit
Low Limit

Sample Name: 160-29476-L-1-E MSD Acquired: 8/2/2018 17:59:49 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.109	.9102	.9688	.1891	1.559	.9869	.9690
Stddev	.003	.0025	.0007	.0023	.007	.0040	.0144
%RSD	.2361	.2700	.0764	1.220	.4292	.4067	1.489
#1	1.110	.9093	.9683	.1916	1.562	.9911	.9854
#2	1.106	.9084	.9684	.1888	1.552	.9831	.9582
#3	1.111	.9130	.9696	.1870	1.564	.9865	.9633

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3610.6	32128.	3591.4
Stddev	91.8	368.	15.5
%RSD	2.5419	1.1464	.43192
#1	3513.5	32507.	3575.6
#2	3695.8	32106.	3592.0
#3	3622.5	31772.	3606.6

Sample Name: MB 160-379477/1-A Acquired: 8/2/2018 18:04:06 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment: 379477

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0104	-.0005	.0136	-.0003	.0000	-.0037	.0356	-.0002
Stddev	.0018	.0233	.0003	.0079	.0004	.0001	.0015	.0016	.0002
%RSD	395.6	222.6	64.96	58.39	127.3	366.1	41.53	4.556	98.28
#1	-.0021	-.0164	-.0005	.0199	.0002	.0001	-.0041	.0338	-.0002
#2	.0014	.0229	-.0002	.0162	-.0006	-.0001	-.0020	.0369	.0000
#3	-.0006	.0249	-.0009	.0047	-.0005	.0001	-.0050	.0362	-.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	-.0002	.0023	.0032	.0582	.0051	-.0107	.0003	.0001
Stddev	.0004	.0002	.0005	.0014	.1025	.0016	.0200	.0004	.0008
%RSD	116.2	89.67	20.43	43.88	176.0	31.65	186.5	121.0	652.9
#1	-.0004	-.0004	.0018	.0036	.0911	.0037	.0040	.0005	.0007
#2	.0001	-.0001	.0028	.0017	-.0567	.0048	-.0027	.0006	-.0008
#3	-.0008	-.0001	.0024	.0044	.1403	.0069	-.0334	-.0001	.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0458	-.0009	.0084	-.0002	.0005	.0019	-.0035	.0225	.0001
Stddev	.0249	.0004	.0027	.0014	.0058	.0026	.0030	.0031	.0008
%RSD	54.32	41.18	32.26	690.2	1276.	139.0	84.50	13.83	890.0
#1	-.0223	-.0013	.0064	-.0000	.0029	.0048	-.0009	.0195	-.0007
#2	-.0432	-.0007	.0115	-.0017	-.0062	.0010	-.0068	.0223	.0001
#3	-.0719	-.0006	.0074	.0011	.0047	-.0002	-.0030	.0258	.0010

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: MB 160-379477/1-A Acquired: 8/2/2018 18:04:06 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment: 379477

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	-.0037	.0018	-.0011	.0488	.0008	-.0007
Stddev	.0001	.0051	.0017	.0033	.0164	.0017	.0002
%RSD	58.47	138.0	92.15	316.2	33.71	217.3	27.77
#1	.0001	.0006	.0019	.0014	.0563	.0001	-.0008
#2	.0003	-.0094	.0001	.0003	.0299	-.0005	-.0005
#3	.0001	-.0024	.0035	-.0048	.0601	.0028	-.0009

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3671.5	34264.	3613.1
Stddev	28.7	75.	22.9
%RSD	.78241	.21944	.63414
#1	3646.9	34272.	3596.9
#2	3664.5	34334.	3603.1
#3	3703.1	34184.	3639.3

Sample Name: LCS 160-379477/2-A Acquired: 8/2/2018 18:08:46 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2029	9.299	.8776	.1993	.9213	.0941	.9653	10.04	.9430
Stddev	.0006	.073	.0063	.0080	.0021	.0005	.0056	.05	.0044
%RSD	.3187	.7834	.7202	4.005	.2328	.5578	.5771	.4894	.4645

#1	.2036	9.261	.8767	.2061	.9191	.0938	.9621	10.06	.9441
#2	.2024	9.383	.8717	.2014	.9233	.0947	.9622	9.985	.9382
#3	.2027	9.253	.8843	.1905	.9214	.0937	.9718	10.08	.9468

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9953	.9404	.9406	9.761	9.792	.1040	9.493	.9566	.4558
Stddev	.0044	.0047	.0035	.025	.046	.0033	.086	.0056	.0027
%RSD	.4470	.4967	.3738	.2584	.4693	3.157	.9024	.5824	.5831

#1	.9950	.9420	.9399	9.739	9.835	.1002	9.409	.9553	.4561
#2	.9910	.9352	.9374	9.755	9.796	.1065	9.581	.9627	.4530
#3	.9999	.9441	.9444	9.788	9.744	.1051	9.489	.9517	.4582

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.675	.9983	.9306	.9471	8.866	.4373	.4616	4.394	.9395
Stddev	.064	.0040	.0048	.0022	.042	.0013	.0009	.024	.0047
%RSD	.6601	.4050	.5172	.2310	.4707	.3044	.2013	.5467	.4958

#1	9.619	1.001	.9299	.9487	8.885	.4372	.4619	4.395	.9402
#2	9.745	.9936	.9357	.9446	8.819	.4360	.4624	4.418	.9345
#3	9.663	1.000	.9262	.9479	8.895	.4387	.4606	4.370	.9437

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Sample Name: LCS 160-379477/2-A Acquired: 8/2/2018 18:08:46 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9342	.8826	.9350	.1973	1.074	.9114	.9451
Stddev	.0037	.0052	.0032	.0025	.015	.0066	.0039
%RSD	.3970	.5836	.3392	1.271	1.399	.7189	.4116
#1	.9326	.8882	.9347	.1950	1.081	.9118	.9484
#2	.9385	.8814	.9384	.1968	1.056	.9177	.9408
#3	.9316	.8781	.9320	.2000	1.083	.9046	.9460

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3603.6	33629.	3539.2
Stddev	10.1	284.	60.0
%RSD	.28066	.84307	1.6961
#1	3597.4	33327.	3606.2
#2	3615.2	33671.	3490.4
#3	3598.1	33889.	3520.8

Sample Name: LCSD 160-379477/3-A Acquired: 8/2/2018 18:13:03 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2046	9.412	.8921	.1950	.9260	.0948	.9783	10.14	.9530
Stddev	.0002	.060	.0061	.0040	.0036	.0005	.0042	.02	.0023
%RSD	.1049	.6404	.6884	2.060	.3897	.5056	.4331	.1948	.2459
#1	.2044	9.434	.8990	.1906	.9292	.0949	.9829	10.14	.9555
#2	.2048	9.458	.8901	.1958	.9268	.0952	.9746	10.12	.9508
#3	.2047	9.344	.8872	.1985	.9221	.0942	.9774	10.16	.9526

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.007	.9517	.9504	9.806	9.856	.1079	9.491	.9632	.4612
Stddev	.002	.0030	.0058	.067	.057	.0067	.044	.0056	.0016
%RSD	.1522	.3128	.6057	.6855	.5794	6.240	.4680	.5836	.3403
#1	1.007	.9544	.9519	9.818	9.921	.1078	9.529	.9631	.4630
#2	1.008	.9485	.9440	9.866	9.835	.1147	9.500	.9689	.4607
#3	1.005	.9522	.9552	9.733	9.813	.1012	9.442	.9577	.4600

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.755	1.010	.9442	.9573	8.992	.4473	.4630	4.447	.9521
Stddev	.096	.001	.0063	.0018	.046	.0063	.0067	.018	.0023
%RSD	.9850	.1290	.6674	.1887	.5118	1.413	1.438	.4129	.2413
#1	9.791	1.012	.9515	.9593	9.045	.4496	.4682	4.459	.9517
#2	9.827	1.010	.9410	.9559	8.972	.4401	.4555	4.455	.9501
#3	9.646	1.009	.9402	.9566	8.960	.4521	.4653	4.426	.9546

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass

High Limit

Low Limit

Sample Name: LCSD 160-379477/3-A Acquired: 8/2/2018 18:13:03 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9413	.8855	.9406	.2013	1.072	.9138	.9557
Stddev	.0041	.0067	.0058	.0032	.016	.0041	.0009
%RSD	.4343	.7567	.6125	1.597	1.480	.4497	.0953
#1	.9424	.8829	.9419	.2028	1.061	.9136	.9567
#2	.9447	.8805	.9457	.2035	1.090	.9097	.9550
#3	.9368	.8932	.9344	.1976	1.066	.9179	.9553

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3648.1	33693.	3492.9
Stddev	32.9	876.	56.4
%RSD	.90242	2.5986	1.6137
#1	3684.3	32692.	3495.9
#2	3640.0	34067.	3435.1
#3	3619.9	34319.	3547.8

Comment:

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29824-A-1-B@100 Acquired: 8/2/2018 18:17:21 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0008	.0208	.0004	.0004	.0324	.0025	-.0008
Stddev	.0001	.0060	.0008	.0035	.0094	.0046	.0001
%RSD	17.16	29.03	196.3	829.4	28.89	180.8	15.35
#1	.0009	.0208	-.0000	-.0021	.0410	.0062	-.0009
#2	.0007	.0147	-.0001	-.0011	.0338	.0040	-.0006
#3	.0009	.0268	.0014	.0045	.0224	-.0026	-.0008

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3666.1	32556.	3669.3
Stddev	64.2	581.	62.9
%RSD	1.7501	1.7849	1.7156
#1	3677.8	32080.	3733.1
#2	3723.7	33204.	3607.3
#3	3596.9	32385.	3667.4

Sample Name: 160-29824-A-1BSD@500 Acquired: 8/2/2018 18:22:08 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0010	-.0116	-.0046	-.0011	.0001	.0000	.0011	.0151	-.0001
Stddev	.0006	.0341	.0008	.0097	.0016	.0001	.0021	.0016	.0001
%RSD	55.60	293.2	17.55	854.8	1725.	325.5	184.9	10.79	129.6

#1	-.0012	-.0496	-.0038	-.0102	-.0011	-.0001	.0000	.0162	.0000
#2	-.0004	-.0020	-.0055	.0091	.0019	.0000	.0035	.0132	-.0001
#3	-.0016	.0167	-.0046	-.0023	-.0005	.0002	-.0002	.0158	-.0002

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0000	.0027	.0431	.1200	.0052	.4926	.0293	-.0003
Stddev	.0002	.0001	.0018	.0025	.0931	.0035	.0229	.0004	.0006
%RSD	59.84	450.0	63.92	5.704	77.54	68.70	4.650	1.201	225.5

#1	-.0007	.0001	.0014	.0448	.2258	.0048	.4704	.0295	.0002
#2	-.0003	.0001	.0047	.0442	.0836	.0018	.4913	.0295	-.0000
#3	-.0002	-.0001	.0020	.0403	.0507	.0089	.5162	.0289	-.0009

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	68.27	-.0005	.0009	.0011	45.86	-.0032	-.0011	-.0027	-.0007
Stddev	.18	.0006	.0033	.0004	.37	.0016	.0024	.0032	.0008
%RSD	.2614	103.0	372.5	35.67	.8126	51.39	224.5	119.0	108.1

#1	68.36	-.0008	-.0016	.0015	46.25	-.0013	-.0016	-.0017	-.0014
#2	68.38	.0001	.0046	.0010	45.50	-.0044	-.0032	-.0001	.0001
#3	68.06	-.0009	-.0003	.0007	45.84	-.0039	.0016	-.0062	-.0009

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: 160-29824-A-1BSD@500 Acquired: 8/2/2018 18:22:08 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0100	-.0002	.0009	.0630	.0014	-.0007
Stddev	.0001	.0074	.0023	.0003	.0259	.0043	.0001
%RSD	30.70	73.73	1297.	35.81	41.02	315.4	18.63
#1	.0003	.0033	.0023	.0009	.0824	.0001	-.0005
#2	.0002	.0088	-.0007	.0006	.0337	-.0021	-.0006
#3	.0001	.0180	-.0021	.0013	.0730	.0061	-.0008

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3600.8	34909.	3531.8
Stddev	136.6	54.	81.4
%RSD	3.7926	.15507	2.3052
#1	3758.3	34970.	3605.9
#2	3529.8	34887.	3444.6
#3	3514.4	34868.	3544.9

Sample Name: 160-29824-A-2-B@100 Acquired: 8/2/2018 18:26:46 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0008	-.0074	.0003	-.0005	-.0001	.0000	.0002	.0621	-.0004
Stddev	.0016	.0122	.0053	.0020	.0004	.0001	.0033	.0017	.0003
%RSD	200.1	166.5	1557.	380.0	331.1	2394.	1631.	2.663	70.54

#1	-.0007	-.0149	.0053	.0015	-.0006	.0001	.0039	.0639	-.0006
#2	-.0025	.0068	.0009	-.0006	-.0000	-.0001	-.0024	.0615	-.0005
#3	.0007	-.0139	-.0052	-.0025	.0003	-.0001	-.0009	.0608	-.0001

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	-.0001	.0031	.1033	.5263	.0037	1.385	.0798	.0004
Stddev	.0002	.0002	.0017	.0030	.0469	.0041	.022	.0002	.0005
%RSD	35.01	153.0	54.65	2.893	8.913	112.4	1.613	.2087	112.2

#1	-.0007	.0001	.0042	.1019	.5167	.0014	1.398	.0797	.0009
#2	-.0008	-.0002	.0012	.1068	.4849	.0084	1.399	.0799	.0002
#3	-.0004	-.0003	.0041	.1014	.5773	.0012	1.360	.0797	.0001

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F 175.1	-.0006	-.0014	-.0003	F 121.4	.0011	.0001	-.0072	-.0006
Stddev	.3	.0003	.0029	.0012	.8	.0024	.0030	.0026	.0014
%RSD	.1758	56.71	199.6	361.8	.6455	211.7	2193.	35.45	232.0

#1	175.5	-.0002	-.0007	-.0017	120.6	.0037	-.0030	-.0084	.0010
#2	174.9	-.0008	-.0046	.0001	121.5	-.0010	.0031	-.0043	-.0014
#3	175.1	-.0008	.0010	.0006	122.2	.0007	.0003	-.0089	-.0015

Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	100.0				100.0				
Low Limit	-500.0				-500.0				

Sample Name: 160-29824-A-2-B@100 Acquired: 8/2/2018 18:26:46 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004	.0194	.0004	.0002	.0582	-.0015	-.0008
Stddev	.0002	.0034	.0026	.0027	.0172	.0072	.0003
%RSD	53.04	17.67	695.7	1617.	29.53	470.8	33.14
#1	.0005	.0155	-.0019	.0031	.0445	-.0085	-.0006
#2	.0005	.0220	.0032	-.0022	.0527	.0058	-.0007
#3	.0001	.0205	-.0001	-.0005	.0775	-.0019	-.0011

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3650.3	32454.	3471.8
Stddev	56.1	90.	22.9
%RSD	1.5355	.27630	.65969
#1	3593.7	32366.	3487.4
#2	3651.6	32451.	3482.5
#3	3705.8	32546.	3445.5

Sample Name: 160-29824-A-3-B@20 Acquired: 8/2/2018 18:31:25 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0008	-.0069	.0002	-.0014	-.0002	.0000	-.0024	.0315	-.0002
Stddev	.0010	.0071	.0037	.0018	.0005	.0000	.0028	.0009	.0002
%RSD	130.8	102.2	1684.	131.5	271.7	183.8	117.6	2.851	93.24
#1	-.0019	-.0151	-.0025	.0005	.0002	.0001	-.0056	.0314	-.0001
#2	.0000	-.0031	-.0013	-.0016	-.0000	.0000	-.0014	.0307	-.0001
#3	-.0004	-.0026	.0044	-.0031	-.0007	-.0000	-.0002	.0325	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	-.0001	.0025	.0351	.0493	-.0023	1.359	.0911	.0005
Stddev	.0000	.0002	.0039	.0007	.1031	.0040	.025	.0005	.0001
%RSD	4.064	282.3	155.6	2.048	208.9	173.7	1.848	.5472	21.20
#1	-.0003	-.0003	-.0017	.0355	.0140	.0008	1.351	.0906	.0004
#2	-.0003	.0001	.0060	.0355	-.0314	-.0068	1.387	.0911	.0005
#3	-.0003	-.0000	.0033	.0343	.1654	-.0009	1.338	.0916	.0007

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	78.35	-.0006	-.0019	-.0005	54.47	-.0021	.0025	.0043	-.0007
Stddev	.28	.0008	.0004	.0007	.23	.0022	.0026	.0086	.0008
%RSD	.3547	147.6	22.45	156.0	.4284	107.0	102.6	199.5	108.4
#1	78.04	.0004	-.0020	-.0004	54.23	-.0025	.0026	.0030	.0002
#2	78.43	-.0012	-.0014	-.0012	54.49	-.0040	.0050	.0136	-.0011
#3	78.58	-.0009	-.0022	.0002	54.70	.0003	-.0001	-.0035	-.0013

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29824-A-3-B@20 Acquired: 8/2/2018 18:31:25 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0109	.0001	-.0004	.0400	.0003	-.0010
Stddev	.0001	.0022	.0012	.0015	.0054	.0022	.0002
%RSD	79.81	20.13	954.4	337.8	13.51	712.2	19.64
#1	.0003	.0098	.0011	.0013	.0457	-.0002	-.0010
#2	.0001	.0094	.0004	-.0011	.0350	.0028	-.0011
#3	.0001	.0134	-.0012	-.0015	.0393	-.0016	-.0007

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3697.6	32966.	3730.1
Stddev	36.3	63.	72.8
%RSD	.98049	.19164	1.9525
#1	3655.8	32986.	3807.6
#2	3717.6	32895.	3719.9
#3	3719.5	33016.	3663.0

Sample Name: CCVL Acquired: 8/2/2018 18:36:05 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0093	.1645	.0070	.0976	.0461	.0048	.2017	1.019	.0045
Stddev	.0006	.0347	.0014	.0008	.0005	.0000	.0023	.002	.0002
%RSD	6.285	21.06	20.16	.8338	1.056	.8615	1.139	.2103	3.710
#1	.0090	.2011	.0076	.0968	.0457	.0048	.2018	1.020	.0044
#2	.0089	.1602	.0081	.0975	.0467	.0048	.2039	1.020	.0044
#3	.0099	.1322	.0054	.0984	.0460	.0048	.1993	1.016	.0047

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0512	.0095	.0259	.0996	4.982	.0547	.9779	.0152	.0372
Stddev	.0002	.0003	.0016	.0005	.095	.0009	.0171	.0003	.0009
%RSD	.3629	3.656	6.169	.4699	1.900	1.628	1.747	1.790	2.548
#1	.0512	.0097	.0272	.1000	4.932	.0557	.9696	.0149	.0366
#2	.0510	.0091	.0263	.0998	5.091	.0539	.9666	.0154	.0383
#3	.0513	.0097	.0241	.0991	4.922	.0546	.9976	.0153	.0367

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9610	.0405	.2405	.0101	4.537	.0106	F .0093	.3484	.0968
Stddev	.0320	.0002	.0023	.0007	.014	.0020	.0064	.0128	.0012
%RSD	3.329	.4955	.9547	6.794	.3108	19.04	68.81	3.674	1.270
#1	.9976	.0407	.2379	.0100	4.545	.0088	.0139	.3464	.0966
#2	.9385	.0403	.2424	.0109	4.546	.0128	.0020	.3621	.0956
#3	.9469	.0406	.2411	.0095	4.521	.0102	.0119	.3367	.0981

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Fail Chk Pass Chk Pass
Value
Range
 .0150
 -30.00%

Sample Name: CCVL Acquired: 8/2/2018 18:36:05 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Tl1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0049	.1778	.0187	.0193	.4994	.0465	.0187
Stddev	.0004	.0044	.0019	.0015	.0168	.0058	.0001
%RSD	7.607	2.483	10.42	7.631	3.369	12.56	.2782
#1	.0053	.1760	.0166	.0180	.4926	.0411	.0187
#2	.0050	.1829	.0190	.0209	.4871	.0527	.0186
#3	.0045	.1746	.0204	.0191	.5186	.0459	.0187

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3677.7	33956.	3640.9
Stddev	6.0	268.	14.5
%RSD	.16342	.79005	.39956
#1	3684.7	34243.	3626.4
#2	3674.1	33711.	3640.7
#3	3674.4	33915.	3655.5

Sample Name: CCV Acquired: 8/2/2018 18:40:44 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9906	46.99	4.644	.9812	4.724	4.815	4.789	49.27	4.834
Stddev	.0007	.10	.026	.0083	.022	.009	.022	.11	.016
%RSD	.0734	.2121	.5545	.8428	.4654	.1981	.4670	.2171	.3296
#1	.9908	47.08	4.643	.9900	4.748	4.824	4.796	49.24	4.835
#2	.9898	46.89	4.671	.9799	4.705	4.805	4.808	49.39	4.849
#3	.9913	47.00	4.619	.9736	4.718	4.817	4.764	49.18	4.818

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.915	4.718	4.677	48.43	49.55	4.983	47.24	4.771	.9347
Stddev	.010	.016	.027	.14	.17	.012	.18	.006	.0038
%RSD	.2113	.3285	.5776	.2834	.3501	.2304	.3718	.1245	.4029
#1	4.920	4.718	4.680	48.59	49.62	4.991	47.44	4.777	.9347
#2	4.921	4.733	4.703	48.34	49.35	4.970	47.18	4.765	.9384
#3	4.903	4.702	4.649	48.37	49.67	4.987	47.10	4.772	.9309

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	48.82	4.929	47.79	4.753	47.32	.9225	.9398	4.719	4.789
Stddev	.12	.014	.23	.022	.18	.0036	.0057	.021	.018
%RSD	.2423	.2768	.4826	.4727	.3817	.3953	.6040	.4389	.3703
#1	48.89	4.932	47.78	4.752	47.39	.9252	.9459	4.726	4.789
#2	48.68	4.940	48.03	4.775	47.45	.9241	.9389	4.696	4.806
#3	48.88	4.914	47.57	4.731	47.11	.9184	.9346	4.736	4.771

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/2/2018 18:40:44 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.736	4.556	4.748	.9559	5.071	4.667	4.862
Stddev	.014	.033	.018	.0022	.031	.025	.014
%RSD	.2980	.7194	.3681	.2335	.6172	.5427	.2956
#1	4.750	4.549	4.767	.9573	5.081	4.688	4.863
#2	4.722	4.527	4.733	.9571	5.096	4.639	4.876
#3	4.734	4.592	4.743	.9533	5.036	4.674	4.848

Check ? Chk Pass Chk Pass Chk Pass Chk Pass None Chk Pass Chk Pass
Value
Range

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3401.8	30942.	3464.2
Stddev	20.8	97.	16.9
%RSD	.61275	.31421	.48836
#1	3425.1	30892.	3464.5
#2	3395.5	31054.	3447.1
#3	3384.9	30879.	3480.9

Sample Name: CCB Acquired: 8/2/2018 18:44:56 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	.0051	-.0008	-.0054	-.0005	.0001	-.0020	-.0170	-.0003
Stddev	.0010	.0040	.0016	.0068	.0003	.0001	.0023	.0011	.0002
%RSD	354.6	79.19	198.4	125.1	54.53	70.25	117.8	6.254	52.98
#1	.0000	.0026	-.0021	.0023	-.0002	.0001	.0003	-.0168	-.0004
#2	-.0014	.0097	-.0013	-.0105	-.0008	.0001	-.0043	-.0161	-.0001
#3	.0005	.0029	.0010	-.0081	-.0005	.0002	-.0020	-.0182	-.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0009	-.0002	.0006	.0048	-.0463	.0019	.0115	.0003	.0004
Stddev	.0006	.0002	.0034	.0037	.0199	.0039	.0076	.0002	.0001
%RSD	63.72	110.8	600.8	76.13	43.03	204.1	65.91	84.50	37.79
#1	-.0006	-.0004	-.0033	.0086	-.0534	.0027	.0184	.0001	.0004
#2	-.0006	-.0003	.0019	.0013	-.0617	.0054	.0125	.0002	.0005
#3	-.0016	.0000	.0031	.0046	-.0238	-.0023	.0034	.0005	.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0331	-.0004	-.0026	.0008	-.0143	.0005	-.0056	-.0022	-.0001
Stddev	.0370	.0005	.0063	.0007	.0059	.0043	.0048	.0080	.0008
%RSD	111.5	109.9	244.4	86.54	41.45	833.5	85.33	362.1	1414.
#1	-.0110	.0001	-.0093	.0009	-.0133	.0052	-.0045	.0037	.0008
#2	-.0126	-.0008	.0032	.0000	-.0089	-.0006	-.0108	.0010	-.0002
#3	-.0758	-.0006	-.0016	.0013	-.0207	-.0031	-.0015	-.0114	-.0008

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/2/2018 18:44:56 Type: QC
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0051	-.0003	.0001	.0533	.0017	-.0008
Stddev	.0001	.0045	.0012	.0036	.0233	.0047	.0001
%RSD	100.4	89.65	390.9	2789.	43.68	278.9	9.330
#1	.0000	.0101	-.0016	-.0024	.0323	.0020	-.0007
#2	.0001	.0039	.0005	-.0015	.0784	.0062	-.0008
#3	.0001	.0012	.0003	.0043	.0493	-.0032	-.0007

Check ? Chk Pass Chk Pass Chk Pass Chk Pass None Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3688.2	34406.	3636.1
Stddev	22.1	173.	57.9
%RSD	.59822	.50300	1.5919
#1	3711.9	34288.	3633.3
#2	3668.3	34326.	3579.7
#3	3684.3	34605.	3695.4

Sample Name: MB 160-379677/1-A Acquired: 8/2/2018 18:49:37 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment: 379677

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0004	.0008	-.0038	.0040	-.0004	-.0000	-.0050	.0195	-.0001
Stddev	.0015	.0108	.0044	.0111	.0009	.0001	.0034	.0005	.0002
%RSD	347.5	1296.	116.3	276.1	246.8	1487.	67.31	2.441	192.6
#1	-.0013	.0111	-.0076	.0002	-.0003	-.0001	-.0083	.0193	.0001
#2	.0016	-.0104	-.0048	.0165	.0005	-.0001	-.0051	.0192	-.0002
#3	.0010	.0018	.0010	-.0047	-.0013	.0001	-.0016	.0200	-.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	.0003	.0043	.0205	-.0525	.0042	-.0055	.0012	.0003
Stddev	.0006	.0001	.0010	.0024	.0844	.0057	.0287	.0002	.0004
%RSD	186.9	55.35	23.06	11.65	160.8	136.8	517.3	16.50	134.5
#1	-.0011	.0001	.0034	.0213	.0304	-.0017	.0242	.0013	.0004
#2	.0000	.0002	.0053	.0178	-.1384	.0046	-.0330	.0010	.0006
#3	.0000	.0004	.0043	.0223	-.0494	.0096	-.0079	.0014	-.0001

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0472	-.0004	.0113	.0000	-.0114	.0011	-.0006	-.0005	.0128
Stddev	.0164	.0003	.0017	.0012	.0008	.0036	.0023	.0017	.0012
%RSD	34.75	78.41	14.89	3449.	6.732	335.3	415.4	339.0	9.612
#1	-.0660	-.0000	.0132	.0007	-.0114	-.0026	.0021	-.0000	.0128
#2	-.0392	-.0004	.0102	.0007	-.0106	.0012	-.0021	.0009	.0116
#3	-.0363	-.0006	.0104	-.0014	-.0121	.0045	-.0017	-.0023	.0140

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: MB 160-379677/1-A Acquired: 8/2/2018 18:49:37 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment: 379677

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0011	.0017	-.0006	.0496	-.0012	-.0004
Stddev	.0001	.0020	.0028	.0015	.0265	.0029	.0001
%RSD	55.10	176.8	170.6	256.3	53.36	246.5	30.83
#1	.0001	.0023	-.0008	-.0015	.0767	.0013	-.0005
#2	.0002	.0022	.0010	.0011	.0237	-.0044	-.0005
#3	.0003	-.0012	.0047	-.0014	.0485	-.0005	-.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3725.9	35141.	3680.7
Stddev	146.3	229.	31.8
%RSD	3.9276	.65250	.86270
#1	3796.4	35061.	3680.2
#2	3823.6	34963.	3649.2
#3	3557.6	35400.	3712.7

Sample Name: LCSSRM 160-3796772@2 Acquired: 8/2/2018 18:54:17 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2085	33.79	.4731	.3820	1.024	.7186	.0037	29.25	.4070
Stddev	.0011	.12	.0004	.0054	.005	.0023	.0023	.02	.0008
%RSD	.5260	.3496	.0931	1.407	.5369	.3262	62.34	.0846	.2038
#1	.2087	33.89	.4728	.3760	1.030	.7213	.0011	29.27	.4062
#2	.2073	33.82	.4729	.3864	1.020	.7172	.0049	29.23	.4069
#3	.2094	33.66	.4736	.3837	1.021	.7173	.0053	29.27	.4078

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.6352	.5019	.7764	70.41	12.49	.0433	14.04	1.492	.2524
Stddev	.0012	.0010	.0021	.28	.05	.0046	.05	.006	.0013
%RSD	.1936	.2064	.2692	.4023	.3866	10.57	.3742	.3852	.5114
#1	.6360	.5011	.7740	70.73	12.53	.0386	14.07	1.498	.2525
#2	.6338	.5016	.7775	70.23	12.43	.0477	14.06	1.491	.2510
#3	.6358	.5031	.7778	70.25	12.50	.0437	13.98	1.487	.2535

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.117	.2541	3.011	.4311	.5535	.2898	.4340	1.014	.7517
Stddev	.013	.0002	.007	.0010	.0071	.0032	.0035	.013	.0021
%RSD	1.169	.0920	.2410	.2434	1.285	1.099	.8088	1.288	.2833
#1	1.104	.2544	3.002	.4323	.5453	.2896	.4300	1.002	.7505
#2	1.118	.2540	3.015	.4304	.5576	.2867	.4354	1.011	.7505
#3	1.130	.2540	3.015	.4305	.5576	.2931	.4365	1.028	.7542

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: LCSSRM 160-3796772@2 Acquired: 8/2/2018 18:54:17 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2846	.0750	1.576	.3031	.6019	.6455	.7375
Stddev	.0012	.0062	.005	.0015	.0215	.0089	.0005
%RSD	.4362	8.259	.2995	.4879	3.568	1.379	.0612
#1	.2860	.0683	1.581	.3043	.6180	.6490	.7375
#2	.2840	.0806	1.571	.3035	.6103	.6354	.7371
#3	.2838	.0760	1.576	.3014	.5775	.6522	.7380

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3782.9	34071.	3679.2
Stddev	18.1	104.	71.2
%RSD	.47976	.30540	1.9339
#1	3779.1	34188.	3760.3
#2	3802.7	33988.	3650.2
#3	3767.0	34038.	3627.1

Comment:

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				100.0					
Low Limit				-500.0					

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Sample Name: 160-29847-A-1-A@10 Acquired: 8/2/2018 18:58:42 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0164	.0770	.1113	.0033	1.353	.0168	1.780
Stddev	.0003	.0018	.0009	.0023	.017	.0070	.008
%RSD	1.555	2.326	.7788	69.41	1.280	41.79	.4653
#1	.0166	.0754	.1103	.0046	1.351	.0117	1.789
#2	.0166	.0765	.1120	.0007	1.372	.0138	1.773
#3	.0161	.0789	.1115	.0046	1.337	.0248	1.777

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3810.7	35591.	3877.0
Stddev	65.1	519.	103.0
%RSD	1.7092	1.4592	2.6569
#1	3885.8	34997.	3993.7
#2	3769.6	35818.	3838.5
#3	3776.6	35959.	3798.8

Sample Name: 160-29847-A-2-B@10 Acquired: 8/2/2018 19:03:15 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0007	63.56	-.0002	-.0006	5.883	.0000	.0023	1.606	.0025
Stddev	.0010	.04	.0031	.0034	.011	.0001	.0016	.005	.0002
%RSD	153.5	.0582	1781.	548.9	.1851	1309.	70.75	.3039	6.511
#1	.0004	63.55	-.0009	-.0026	5.879	.0001	.0041	1.600	.0025
#2	-.0009	63.60	-.0029	-.0026	5.875	-.0001	.0015	1.608	.0026
#3	-.0016	63.53	.0032	.0033	5.895	.0001	.0012	1.609	.0023

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0697	.0134	.0236	4.827	-.0050	.0104	2.433	.1010	-.0001
Stddev	.0002	.0000	.0003	.018	.0280	.0023	.022	.0004	.0008
%RSD	.2389	.1562	1.454	.3628	557.9	22.11	.9030	.3621	745.0
#1	.0695	.0134	.0239	4.830	.0243	.0131	2.429	.1012	.0003
#2	.0698	.0134	.0232	4.808	-.0079	.0093	2.456	.1005	-.0010
#3	.0698	.0134	.0237	4.843	-.0315	.0089	2.413	.1012	.0004

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0657	.0043	.4637	8.978	1.590	.0038	.0006	.1086	.0043
Stddev	.0429	.0006	.0061	.010	.003	.0020	.0031	.0102	.0004
%RSD	65.29	13.74	1.317	.1148	.2053	52.08	500.8	9.350	8.733
#1	.0737	.0048	.4658	8.987	1.591	.0020	.0016	.0999	.0044
#2	.1041	.0036	.4568	8.980	1.586	.0059	-.0028	.1063	.0046
#3	.0194	.0044	.4685	8.966	1.592	.0034	.0031	.1198	.0039

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29847-A-2-B@10 Acquired: 8/2/2018 19:03:15 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0859	.0095	.0757	-.0011	.0739	.0076	3.739
Stddev	.0004	.0047	.0002	.0015	.0067	.0014	.003
%RSD	.4474	49.41	.2195	141.6	9.046	18.41	.0686
#1	.0862	.0133	.0758	-.0002	.0677	.0063	3.736
#2	.0855	.0109	.0755	-.0028	.0729	.0074	3.741
#3	.0861	.0043	.0756	-.0002	.0810	.0091	3.740

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3811.9	33774.	3568.8
Stddev	8.2	810.	48.7
%RSD	.21465	2.3990	1.3646
#1	3817.8	33203.	3556.3
#2	3815.5	33418.	3527.6
#3	3802.6	34701.	3622.5

Sample Name: 160-29847-A-3-B@50 Acquired: 8/2/2018 19:07:49 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	7.103	-.0018	-.0000	1.349	.0000	.0003	.1775	.0031
Stddev	.0007	.021	.0011	.0048	.007	.0000	.0036	.0012	.0002
%RSD	272.6	.2997	61.17	15640.	.5596	144.8	1075.	.6714	6.717
#1	-.0010	7.081	-.0021	-.0056	1.346	.0001	-.0003	.1781	.0034
#2	-.0001	7.124	-.0006	.0032	1.357	-.0000	-.0029	.1761	.0030
#3	.0004	7.104	-.0026	.0023	1.343	.0000	.0042	.1782	.0031

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0142	.4484	.0057	6.839	.0537	.0014	.5972	.0431	.0002
Stddev	.0001	.0006	.0005	.024	.0400	.0015	.0333	.0006	.0004
%RSD	.8573	.1270	8.127	.3467	74.44	108.8	5.576	1.490	237.9
#1	.0143	.4480	.0058	6.854	.0341	.0023	.6167	.0437	.0004
#2	.0143	.4491	.0062	6.852	.0273	.0021	.6162	.0424	-.0003
#3	.0141	.4482	.0052	6.812	.0998	-.0003	.5588	.0432	.0004

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.1183	.0006	.0947	5.520	.3565	.0027	.0025	.0349	.0008
Stddev	.0279	.0005	.0039	.007	.0009	.0013	.0015	.0075	.0014
%RSD	23.56	84.17	4.112	.1353	.2561	47.17	60.17	21.43	165.9
#1	-.1012	.0012	.0978	5.514	.3565	.0014	.0040	.0435	.0015
#2	-.1505	.0004	.0961	5.518	.3556	.0040	.0027	.0311	.0017
#3	-.1033	.0003	.0904	5.529	.3574	.0029	.0009	.0301	-.0008

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: 160-29847-A-3-B@50 Acquired: 8/2/2018 19:07:49 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0184	-.0044	.0178	-.0025	.1000	-.0019	3.007
Stddev	.0000	.0042	.0014	.0018	.0117	.0039	.004
%RSD	.0895	96.17	7.797	73.72	11.71	205.6	.1379
#1	.0184	-.0039	.0169	-.0028	.0973	-.0049	3.002
#2	.0184	-.0004	.0194	-.0005	.0898	.0025	3.010
#3	.0184	-.0087	.0172	-.0041	.1128	-.0033	3.009

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3913.6	36096.	3959.0
Stddev	75.3	276.	73.7
%RSD	1.9248	.76452	1.8621
#1	3947.3	35855.	3964.8
#2	3966.1	36397.	4029.6
#3	3827.3	36036.	3882.5

Sample Name: 160-29847-A-3BSD@250 Acquired: 8/2/2018 19:12:24 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0009	1.416	-.0023	.0009	.2640	-.0000	-.0016	.0208	.0005
Stddev	.0006	.019	.0028	.0052	.0011	.0001	.0020	.0014	.0002
%RSD	69.38	1.364	121.6	606.3	.4119	384.2	126.9	6.873	37.37

#1	-.0005	1.406	.0001	.0058	.2642	.0001	-.0028	.0206	.0004
#2	-.0006	1.439	-.0054	-.0045	.2650	-.0002	.0008	.0195	.0003
#3	-.0017	1.405	-.0017	.0012	.2629	-.0000	-.0028	.0223	.0006

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0027	.0882	.0057	1.352	-.0493	.0060	.1311	.0089	.0002
Stddev	.0004	.0003	.0012	.011	.1312	.0071	.0275	.0004	.0002
%RSD	16.19	.3326	21.22	.8006	265.9	118.8	20.96	4.113	90.65

#1	.0028	.0885	.0046	1.354	-.0161	.0017	.1090	.0085	.0005
#2	.0031	.0880	.0055	1.362	-.1940	.0141	.1619	.0089	.0001
#3	.0022	.0880	.0070	1.341	.0620	.0020	.1224	.0093	.0002

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0787	-.0006	.0119	1.096	.0595	.0016	.0006	-.0052	-.0008
Stddev	.0142	.0005	.0036	.000	.0072	.0021	.0057	.0038	.0006
%RSD	18.07	83.00	29.99	.0408	12.08	135.9	929.5	72.25	73.38

#1	-.0778	-.0002	.0078	1.096	.0672	.0010	-.0054	-.0095	-.0014
#2	-.0934	-.0012	.0140	1.096	.0529	.0040	.0059	-.0034	-.0009
#3	-.0650	-.0005	.0139	1.095	.0583	-.0002	.0014	-.0027	-.0002

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Sample Name: 160-29847-A-3BSD@250 Acquired: 8/2/2018 19:12:24 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0039	-.0007	.0053	.0009	.0693	-.0002	.5961
Stddev	.0002	.0009	.0008	.0023	.0031	.0056	.0007
%RSD	4.496	130.7	15.16	253.7	4.468	2634.	.1151
#1	.0039	-.0003	.0048	.0013	.0658	.0057	.5953
#2	.0037	-.0016	.0062	.0030	.0713	-.0007	.5963
#3	.0040	-.0000	.0048	-.0016	.0710	-.0056	.5967

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3886.7	36101.	3767.1
Stddev	10.8	739.	29.6
%RSD	.27706	2.0463	.78620
#1	3898.8	36874.	3766.8
#2	3878.1	36026.	3737.7
#3	3883.4	35402.	3796.9

Sample Name: 160-29847-A-3-CMS@50 Acquired: 8/2/2018 19:16:59 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0040	8.109	.0105	.0064	1.390	.0019	.0202	.3598	.0195
Stddev	.0009	.044	.0009	.0030	.005	.0001	.0029	.0019	.0001
%RSD	23.79	.5448	8.855	47.35	.3880	3.646	14.20	.5414	.5162

#1	.0049	8.068	.0112	.0031	1.384	.0019	.0192	.3576	.0196
#2	.0039	8.156	.0095	.0072	1.394	.0019	.0179	.3611	.0194
#3	.0030	8.104	.0110	.0091	1.393	.0018	.0234	.3609	.0195

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0371	.5624	.0334	3.125	.2625	.0101	.7585	.0467	.0076
Stddev	.0004	.0007	.0014	.014	.0326	.0048	.0295	.0010	.0003
%RSD	.9430	.1200	4.103	.4591	12.40	47.21	3.895	2.178	3.886

#1	.0372	.5620	.0319	3.110	.2395	.0137	.7372	.0457	.0073
#2	.0374	.5620	.0344	3.139	.2997	.0119	.7922	.0478	.0079
#3	.0367	.5631	.0340	3.126	.2482	.0047	.7460	.0466	.0077

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1664	.0196	.0855	3.161	.5130	.0029	.0053	.0642	.0159
Stddev	.0337	.0005	.0018	.002	.0066	.0021	.0014	.0056	.0012
%RSD	20.23	2.526	2.097	.0734	1.278	74.81	25.71	8.682	7.437

#1	.1705	.0201	.0873	3.163	.5191	.0029	.0056	.0588	.0172
#2	.1978	.0192	.0854	3.162	.5137	.0050	.0066	.0699	.0149
#3	.1309	.0194	.0837	3.158	.5061	.0007	.0039	.0641	.0155

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29847-A-3-CMS@50 Acquired: 8/2/2018 19:16:59 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0374	.0153	.0408	.0021	.1071	.0205	2.111
Stddev	.0002	.0021	.0005	.0011	.0091	.0026	.001
%RSD	.5248	13.78	1.246	53.32	8.522	12.49	.0567
#1	.0372	.0175	.0413	.0013	.1165	.0219	2.112
#2	.0373	.0133	.0403	.0034	.0982	.0221	2.113
#3	.0376	.0150	.0408	.0016	.1065	.0176	2.110

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3827.5	35750.	3832.1
Stddev	22.9	329.	70.1
%RSD	.59768	.91978	1.8296
#1	3842.9	35745.	3799.1
#2	3801.2	35424.	3784.6
#3	3838.4	36081.	3912.6

Sample Name: 160-29847-A-3DMSD@50 Acquired: 8/2/2018 19:21:33 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0038	7.560	.0126	.0068	1.569	.0019	.0217	.3999	.0215
Stddev	.0010	.036	.0021	.0119	.005	.0001	.0019	.0016	.0002
%RSD	25.78	.4709	16.96	175.5	.2981	3.963	8.734	.3890	1.125
#1	.0027	7.520	.0111	-.0041	1.567	.0018	.0220	.3983	.0218
#2	.0046	7.571	.0117	.0049	1.574	.0019	.0234	.4002	.0213
#3	.0041	7.588	.0151	.0195	1.566	.0019	.0197	.4014	.0214

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0383	.9122	.0303	6.568	.4381	.0024	.8664	.0687	.0079
Stddev	.0007	.0019	.0051	.028	.0301	.0050	.0180	.0003	.0003
%RSD	1.758	.2121	16.85	.4220	6.868	205.4	2.073	.4713	3.948
#1	.0375	.9101	.0281	6.583	.4058	-.0033	.8460	.0689	.0075
#2	.0388	.9123	.0362	6.586	.4431	.0058	.8798	.0684	.0079
#3	.0386	.9140	.0267	6.536	.4654	.0048	.8735	.0690	.0081

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1366	.0208	.0983	4.482	.5696	.0023	.0065	.0775	.0176
Stddev	.0162	.0002	.0025	.009	.0069	.0011	.0039	.0041	.0003
%RSD	11.84	1.060	2.535	.1926	1.208	49.05	59.28	5.233	1.953
#1	.1480	.0210	.0957	4.472	.5617	.0016	.0079	.0806	.0173
#2	.1438	.0206	.0986	4.489	.5730	.0035	.0022	.0790	.0179
#3	.1181	.0209	.1007	4.484	.5742	.0017	.0095	.0729	.0176

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29847-A-3DMSD@50 Acquired: 8/2/2018 19:21:33 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0399	.0136	.0460	.0019	.1425	.0208	3.471
Stddev	.0002	.0027	.0012	.0022	.0124	.0070	.005
%RSD	.4738	19.95	2.561	119.8	8.736	33.61	.1596
#1	.0397	.0106	.0472	.0020	.1563	.0289	3.467
#2	.0401	.0144	.0448	-.0005	.1322	.0166	3.478
#3	.0400	.0159	.0459	.0040	.1389	.0169	3.470

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3908.3	36176.	3710.2
Stddev	11.0	280.	86.0
%RSD	.28194	.77526	2.3185
#1	3920.0	36469.	3639.6
#2	3906.8	35911.	3685.1
#3	3898.2	36146.	3806.0

Sample Name: 160-29847-A-4-A Acquired: 8/2/2018 19:26:07 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0581	55.74	.0093	F 15.80	F 121.3	.0006	.0139	21.77	.0208
Stddev	.0006	.18	.0018	.07	1.5	.0001	.0052	.06	.0003
%RSD	.9844	.3276	19.13	.4145	1.207	11.86	37.72	.2753	1.614
#1	.0587	55.72	.0089	15.80	120.1	.0007	.0156	21.70	.0211
#2	.0576	55.58	.0078	15.74	123.0	.0005	.0181	21.78	.0204
#3	.0581	55.94	.0113	15.87	121.0	.0006	.0080	21.82	.0208

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				2.000	10.00				
Low Limit				-500.0	-500.0				

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.190	F 24.41	.1080	42.95	11.12	.4391	91.70	1.001	1.465
Stddev	.009	.11	.0018	.13	.15	.0012	.46	.003	.009
%RSD	.4249	.4355	1.702	.3139	1.320	.2708	.5029	.2704	.6232
#1	2.180	24.30	.1060	42.88	10.95	.4380	91.19	1.002	1.455
#2	2.196	24.51	.1083	42.88	11.21	.4390	91.83	.9977	1.474
#3	2.195	24.44	.1096	43.11	11.20	.4404	92.09	1.003	1.467

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		2.000							
Low Limit		-500.0							

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.167	.0454	7.561	7.116	6.854	.0083	.0008	1.428	.3180
Stddev	.079	.0002	.039	.029	.064	.0019	.0098	.006	.0004
%RSD	3.626	.4741	.5158	.4038	.9316	22.83	1185.	.4248	.1329
#1	2.078	.0452	7.521	7.084	6.788	.0082	.0122	1.422	.3185
#2	2.201	.0453	7.599	7.141	6.916	.0102	-.0042	1.429	.3176
#3	2.224	.0456	7.563	7.122	6.856	.0064	-.0054	1.434	.3180

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Sample Name: 160-29847-A-4-A Acquired: 8/2/2018 19:26:07 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.106	.0754	6.096	-.0005	.2611	.0224	F 80.46
Stddev	.006	.0078	.015	.0029	.0122	.0058	.20
%RSD	.2892	10.33	.2434	582.2	4.664	26.09	.2482

#1	2.111	.0777	6.096	-.0031	.2527	.0217	80.68
#2	2.100	.0818	6.081	-.0011	.2750	.0170	80.42
#3	2.108	.0667	6.111	.0027	.2555	.0286	80.29

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit							10.00
Low Limit							-500.0

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3555.6	32686.	3579.3
Stddev	42.3	1010.	192.6
%RSD	1.1890	3.0909	5.3796

#1	3511.7	31535.	3781.7
#2	3596.1	33096.	3557.8
#3	3558.9	33427.	3398.4

Sample Name: 160-29824-A-1-B@500 Acquired: 8/2/2018 19:30:46 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment: 379477

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0009	.0045	-.0021	.0294	.0008	.0001	.0014	.0081	-.0004
Stddev	.0006	.0095	.0015	.0115	.0003	.0001	.0025	.0006	.0002
%RSD	69.96	210.3	73.35	39.16	35.69	240.7	181.9	6.921	48.63
#1	-.0014	-.0061	-.0039	.0425	.0010	.0002	.0007	.0075	-.0005
#2	-.0011	.0074	-.0013	.0249	.0010	-.0001	-.0007	.0081	-.0002
#3	-.0002	.0122	-.0012	.0208	.0005	.0001	.0041	.0086	-.0005

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0000	-.0000	.0023	.0420	.2915	.0037	.4907	.0288	.0001
Stddev	.0008	.0001	.0022	.0056	.0131	.0037	.0475	.0003	.0003
%RSD	2382.	255.1	93.18	13.40	4.495	100.1	9.679	1.071	235.9
#1	.0008	.0001	.0049	.0378	.2933	.0047	.4766	.0285	.0003
#2	-.0007	-.0000	.0009	.0484	.3036	-.0004	.5437	.0291	-.0002
#3	-.0002	-.0002	.0012	.0399	.2776	.0069	.4519	.0289	.0003

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	67.81	-.0003	-.0025	-.0008	45.49	.0003	.0006	-.0067	-.0012
Stddev	.45	.0002	.0004	.0008	.46	.0034	.0025	.0140	.0006
%RSD	.6679	75.42	16.45	102.8	1.003	1253.	397.8	207.1	47.20
#1	68.33	-.0001	-.0029	-.0017	45.29	-.0011	.0025	-.0083	-.0006
#2	67.54	-.0004	-.0024	-.0003	46.02	.0041	.0015	.0079	-.0013
#3	67.55	-.0005	-.0021	-.0003	45.18	-.0022	-.0022	-.0199	-.0017

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: 160-29824-A-1-B@500 Acquired: 8/2/2018 19:30:46 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment: 379477

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0029	.0007	.0004	.0191	.0019	-.0010
Stddev	.0002	.0050	.0014	.0038	.0416	.0071	.0001
%RSD	150.7	175.1	206.1	870.9	218.5	375.0	12.48
#1	.0001	.0010	.0022	.0048	-.0028	.0054	-.0009
#2	-.0001	-.0009	-.0006	-.0013	.0671	-.0063	-.0008
#3	.0004	.0086	.0004	-.0021	-.0071	.0066	-.0011

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3544.4	32094.	3370.3
Stddev	53.9	549.	27.3
%RSD	1.5213	1.7105	.81144
#1	3542.2	31943.	3340.3
#2	3599.4	32703.	3376.8
#3	3491.6	31637.	3393.9

Sample Name: CCVL Acquired: 8/2/2018 19:35:24 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0081	.1852	.0081	.1079	.0452	.0048	.2083	1.014	.0046
Stddev	.0009	.0055	.0026	.0094	.0004	.0001	.0025	.003	.0001
%RSD	11.14	2.995	32.25	8.703	.9909	2.104	1.178	.2437	2.551

#1	.0080	.1872	.0104	.1182	.0447	.0049	.2059	1.017	.0045
#2	.0073	.1895	.0087	.0998	.0455	.0048	.2081	1.014	.0047
#3	.0091	.1789	.0052	.1058	.0454	.0047	.2108	1.012	.0046

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0510	.0092	.0257	.1016	4.958	.0564	.9351	.0142	.0371
Stddev	.0008	.0004	.0017	.0018	.071	.0016	.0294	.0002	.0004
%RSD	1.544	4.899	6.550	1.763	1.426	2.869	3.149	1.579	1.151

#1	.0511	.0089	.0275	.1029	4.958	.0553	.9293	.0143	.0366
#2	.0501	.0089	.0242	.1024	5.029	.0557	.9670	.0139	.0374
#3	.0517	.0097	.0254	.0996	4.887	.0583	.9090	.0143	.0373

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9393	.0411	.2359	.0107	4.509	.0080	.0126	.3502	.0975
Stddev	.0225	.0004	.0021	.0006	.006	.0015	.0057	.0061	.0015
%RSD	2.394	1.072	.8766	5.615	.1340	18.85	44.79	1.751	1.571

#1	.9269	.0416	.2336	.0108	4.503	.0079	.0063	.3449	.0968
#2	.9652	.0408	.2377	.0112	4.514	.0065	.0143	.3487	.0993
#3	.9256	.0408	.2362	.0100	4.511	.0095	.0173	.3569	.0966

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCVL Acquired: 8/2/2018 19:35:24 Type: QC
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0049	.1754	.0199	.0199	.5290	.0478	.0189
Stddev	.0002	.0066	.0019	.0021	.0188	.0018	.0001
%RSD	4.692	3.781	9.625	10.32	3.563	3.790	.3497
#1	.0051	.1775	.0213	.0217	.5154	.0481	.0189
#2	.0049	.1679	.0177	.0205	.5212	.0459	.0189
#3	.0047	.1807	.0207	.0177	.5506	.0495	.0190

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3694.5	34133.	3654.6
Stddev	6.6	454.	16.8
%RSD	.17880	1.3290	.45832
#1	3692.4	33807.	3673.7
#2	3689.3	33941.	3647.7
#3	3702.0	34651.	3642.5

Sample Name: CCV Acquired: 8/2/2018 19:40:04 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9900	45.92	4.555	.9662	4.656	4.741	4.736	49.02	4.803
Stddev	.0083	.36	.008	.0098	.024	.021	.011	.08	.003
%RSD	.8379	.7796	.1819	1.014	.5240	.4508	.2408	.1545	.0699

#1	.9975	45.91	4.562	.9734	4.664	4.754	4.736	48.95	4.800
#2	.9811	45.56	4.556	.9702	4.628	4.716	4.747	49.10	4.804
#3	.9915	46.28	4.546	.9550	4.675	4.752	4.724	49.01	4.806

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.903	4.649	4.564	47.92	48.75	4.959	46.18	4.678	.9194
Stddev	.010	.007	.009	.17	.26	.030	.38	.021	.0021
%RSD	.2044	.1456	.1892	.3454	.5251	.6146	.8325	.4577	.2245

#1	4.895	4.641	4.558	47.83	48.68	4.958	45.99	4.674	.9186
#2	4.914	4.654	4.574	47.82	48.55	4.929	45.94	4.658	.9217
#3	4.899	4.651	4.560	48.11	49.04	4.990	46.63	4.700	.9178

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	48.09	4.924	46.71	4.654	46.63	.9060	.9311	4.595	4.726
Stddev	.30	.009	.04	.003	.02	.0021	.0037	.030	.008
%RSD	.6155	.1883	.0911	.0648	.0488	.2337	.3925	.6568	.1665

#1	48.06	4.913	46.72	4.651	46.64	.9059	.9291	4.591	4.723
#2	47.80	4.931	46.75	4.657	46.60	.9082	.9353	4.567	4.735
#3	48.39	4.926	46.67	4.655	46.64	.9040	.9288	4.627	4.721

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Sample Name: CCV Acquired: 8/2/2018 19:40:04 Type: QC
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.653	F 4.397	4.682	.9345	5.113	4.541	4.844
Stddev	.024	.049	.021	.0005	.028	.033	.003
%RSD	.5233	1.124	.4452	.0496	.5403	.7220	.0534
#1	4.661	4.449	4.678	.9350	5.135	4.558	4.841
#2	4.625	4.351	4.663	.9341	5.121	4.503	4.846
#3	4.671	4.391	4.704	.9343	5.082	4.562	4.845

Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value		5.000					
Range		-10.00%					

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3464.1	31653.	3571.3
Stddev	23.7	848.	131.1
%RSD	.68402	2.6782	3.6698
#1	3486.7	30674.	3711.6
#2	3439.5	32168.	3550.5
#3	3466.1	32116.	3451.9

Sample Name: CCB Acquired: 8/2/2018 19:44:17 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003	.0287	-.0022	.0068	-.0003	-.0000	-.0010	-.0183	-.0002
Stddev	.0001	.0313	.0024	.0137	.0003	.0001	.0022	.0004	.0002
%RSD	35.97	109.1	108.7	200.0	105.5	1691.	218.1	2.387	119.3
#1	.0002	.0097	-.0045	.0010	-.0004	.0001	.0015	-.0185	-.0002
#2	.0002	.0116	-.0025	-.0029	.0001	-.0001	-.0025	-.0178	-.0004
#3	.0004	.0649	.0003	.0225	-.0004	-.0001	-.0020	-.0186	.0000

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0007	-.0001	-.0007	.0054	.0303	.0047	-.0099	-.0002	-.0001
Stddev	.0001	.0001	.0011	.0017	.0316	.0011	.0154	.0006	.0002
%RSD	8.204	152.6	152.8	31.40	104.2	23.18	156.3	333.6	408.4
#1	-.0006	.0001	-.0001	.0074	.0199	.0039	-.0267	.0003	.0001
#2	-.0008	-.0002	-.0020	.0041	.0658	.0042	.0036	-.0009	.0001
#3	-.0007	-.0002	-.0001	.0049	.0052	.0059	-.0065	.0000	-.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0240	-.0004	.0004	.0007	-.0142	.0001	-.0005	-.0038	-.0006
Stddev	.0279	.0002	.0047	.0013	.0100	.0022	.0033	.0033	.0017
%RSD	116.4	42.20	1301.	179.1	70.25	2201.	642.9	87.44	306.4
#1	-.0560	-.0004	-.0045	.0021	-.0185	-.0024	.0010	.0000	-.0010
#2	-.0113	-.0006	.0007	-.0004	-.0028	.0012	.0017	-.0053	.0013
#3	-.0046	-.0003	.0049	.0004	-.0212	.0015	-.0043	-.0060	-.0020

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/2/2018 19:44:17 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0051	.0016	-.0007	.0554	-.0017	-.0005
Stddev	.0002	.0050	.0022	.0027	.0160	.0047	.0001
%RSD	136.1	98.82	143.3	420.9	28.90	279.8	19.50
#1	.0000	.0056	-.0010	.0025	.0531	.0037	-.0004
#2	.0005	.0098	.0029	-.0023	.0407	-.0038	-.0006
#3	.0000	-.0002	.0028	-.0022	.0725	-.0050	-.0006

Check ? Chk Pass Chk Pass Chk Pass Chk Pass None Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3684.7	33530.	3524.1
Stddev	14.2	321.	42.8
%RSD	.38436	.95715	1.2146
#1	3677.3	33230.	3567.7
#2	3675.7	33492.	3522.5
#3	3701.0	33868.	3482.1

Sample Name: 160-29824-A1BSD@2500 Acquired: 8/2/2018 19:48:57 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	.0067	-.0005	.0031	-.0005	.0001	-.0006	-.0147	-.0005
Stddev	.0008	.0197	.0028	.0066	.0002	.0001	.0009	.0014	.0004
%RSD	294.8	296.0	606.1	211.4	48.44	103.0	157.3	9.770	68.00
#1	.0005	-.0040	-.0034	.0107	-.0007	.0002	.0003	-.0141	-.0003
#2	-.0003	.0294	.0022	.0005	-.0004	.0000	-.0006	-.0137	-.0003
#3	-.0010	-.0054	-.0002	-.0017	-.0003	.0000	-.0015	-.0164	-.0010

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	-.0001	.0006	.0107	.0687	.0045	.1147	.0083	-.0001
Stddev	.0004	.0001	.0011	.0034	.1122	.0031	.0256	.0002	.0004
%RSD	82.84	82.81	172.7	31.20	163.2	69.09	22.36	2.177	410.5
#1	-.0010	-.0001	-.0006	.0083	.1981	.0073	.1301	.0084	-.0002
#2	-.0004	-.0001	.0013	.0146	-.0022	.0050	.1288	.0081	.0004
#3	-.0002	-.0000	.0012	.0094	.0103	.0012	.0851	.0083	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	13.84	-.0005	-.0006	.0006	8.844	-.0018	.0022	-.0058	-.0001
Stddev	.02	.0001	.0047	.0008	.014	.0003	.0033	.0105	.0012
%RSD	.1344	21.56	768.4	132.7	.1526	15.76	154.8	182.0	2138.
#1	13.83	-.0007	.0044	.0008	8.830	-.0016	-.0005	-.0169	-.0010
#2	13.83	-.0004	-.0015	-.0003	8.845	-.0016	.0011	.0039	.0013
#3	13.86	-.0005	-.0048	.0012	8.857	-.0021	.0059	-.0043	-.0005

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: 160-29824-A1BSD@2500 Acquired: 8/2/2018 19:48:57 Type: Unk
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0040	.0009	-.0017	.0469	.0053	-.0008
Stddev	.0002	.0022	.0016	.0010	.0353	.0016	.0002
%RSD	91.73	54.56	172.3	62.20	75.35	30.00	19.65
#1	.0000	.0058	.0017	-.0028	.0787	.0070	-.0007
#2	.0004	.0048	-.0009	-.0007	.0089	.0038	-.0008
#3	.0002	.0016	.0020	-.0016	.0529	.0051	-.0010

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3613.9	33386.	3511.7
Stddev	55.9	589.	64.0
%RSD	1.5474	1.7648	1.8228
#1	3677.1	33113.	3585.6
#2	3570.9	32984.	3472.4
#3	3593.8	34063.	3477.1

Sample Name: 160-29824-A-2-B@200 Acquired: 8/2/2018 19:53:36 Type: Unk

Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000

User: admin Custom ID1: Custom ID2: Custom ID3:

Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0012	.0077	-.0031	.0028	.0001	-.0001	-.0034	.0214	-.0002
Stddev	.0005	.0097	.0014	.0015	.0003	.0001	.0010	.0004	.0002
%RSD	44.04	126.1	45.32	54.78	347.4	109.7	31.16	1.826	94.46

#1	-.0007	-.0029	-.0020	.0031	.0002	-.0001	-.0041	.0219	-.0004
#2	-.0012	.0099	-.0047	.0042	.0004	-.0000	-.0038	.0213	-.0001
#3	-.0018	.0162	-.0026	.0011	-.0002	-.0003	-.0022	.0211	-.0001

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	-.0001	-.0013	.0480	.1929	.0001	.6873	.0385	.0001
Stddev	.0002	.0002	.0020	.0057	.0463	.0062	.0362	.0006	.0004
%RSD	75.51	187.9	152.8	11.89	23.99	4887.	5.274	1.433	361.5

#1	-.0005	-.0002	.0002	.0511	.1944	-.0040	.6455	.0390	.0002
#2	-.0001	.0001	-.0036	.0515	.2384	.0072	.7100	.0379	.0005
#3	-.0003	-.0002	-.0005	.0414	.1459	-.0029	.7064	.0387	-.0003

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	87.39	-.0005	.0010	.0001	58.81	.0007	.0009	-.0003	-.0021
Stddev	.26	.0003	.0051	.0003	.18	.0033	.0082	.0045	.0007
%RSD	.2994	59.43	527.0	227.8	.3010	445.9	890.7	1785.	31.67

#1	87.60	-.0008	-.0013	.0005	58.98	.0036	.0091	.0020	-.0028
#2	87.48	-.0006	-.0026	-.0000	58.82	-.0029	-.0073	.0027	-.0019
#3	87.10	-.0002	.0068	-.0000	58.63	.0015	.0010	-.0054	-.0016

Check ? **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass** **Chk Pass**
High Limit
Low Limit

Sample Name: 160-29824-A-2-B@200 Acquired: 8/2/2018 19:53:36 Type: Unk
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003	.0185	-.0008	.0005	.0585	.0030	-.0010
Stddev	.0002	.0076	.0011	.0007	.0318	.0020	.0002
%RSD	70.75	41.12	138.0	136.0	54.29	66.05	22.01
#1	.0001	.0105	-.0003	-.0001	.0828	.0051	-.0012
#2	.0004	.0194	-.0000	.0013	.0701	.0026	-.0007
#3	.0003	.0257	-.0020	.0003	.0226	.0012	-.0010

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
 High Limit
 Low Limit

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3641.0	32957.	3505.0
Stddev	23.0	246.	68.2
%RSD	.63183	.74757	1.9459
#1	3661.4	33193.	3427.0
#2	3645.4	32977.	3534.7
#3	3616.1	32701.	3553.4

Sample Name: CCVL Acquired: 8/2/2018 19:58:15 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0096	.1867	F .0063	.1073	.0458	.0047	.2041	1.012	.0047
Stddev	.0005	.0120	.0016	.0034	.0002	.0001	.0036	.002	.0001
%RSD	4.854	6.445	25.77	3.137	.3938	2.393	1.781	.1894	2.983
#1	.0096	.1739	.0082	.1108	.0456	.0046	.2001	1.013	.0045
#2	.0100	.1978	.0058	.1068	.0460	.0049	.2073	1.010	.0048
#3	.0091	.1883	.0051	.1042	.0458	.0047	.2050	1.012	.0047

Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.0100						
Range			-30.00%						

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0506	.0093	.0268	.1015	4.974	.0583	.9586	.0148	.0370
Stddev	.0008	.0001	.0019	.0024	.078	.0035	.0140	.0001	.0005
%RSD	1.504	.9967	6.955	2.350	1.574	6.060	1.465	.8904	1.225
#1	.0512	.0092	.0251	.1024	4.931	.0548	.9602	.0150	.0373
#2	.0497	.0093	.0288	.0988	5.064	.0583	.9718	.0148	.0365
#3	.0508	.0094	.0266	.1034	4.926	.0619	.9438	.0148	.0373

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.001	.0413	.2325	.0112	4.520	.0087	.0125	.3505	.0967
Stddev	.004	.0003	.0017	.0010	.026	.0021	.0032	.0075	.0006
%RSD	.4174	.6721	.7265	8.569	.5772	24.38	25.94	2.147	.6281
#1	.9976	.0415	.2323	.0101	4.491	.0066	.0115	.3424	.0960
#2	1.001	.0410	.2342	.0120	4.529	.0085	.0099	.3517	.0969
#3	1.006	.0415	.2308	.0115	4.541	.0109	.0161	.3573	.0972

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value									
Range									

Sample Name: CCVL Acquired: 8/2/2018 19:58:15 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0050	.1743	.0178	.0201	.5253	.0453	.0186
Stddev	.0001	.0070	.0015	.0016	.0105	.0015	.0001
%RSD	2.923	3.999	8.490	8.095	2.003	3.229	.7192
#1	.0048	.1762	.0179	.0214	.5325	.0436	.0187
#2	.0051	.1666	.0162	.0206	.5302	.0459	.0187
#3	.0050	.1801	.0192	.0182	.5132	.0463	.0184

Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3767.7	34995.	3443.5
Stddev	22.8	181.	22.9
%RSD	.60619	.51859	.66365
#1	3755.2	34785.	3445.0
#2	3794.1	35098.	3420.0
#3	3753.9	35101.	3465.6

Sample Name: CCV Acquired: 8/2/2018 20:02:54 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9888	46.52	4.649	.9663	4.700	4.743	4.767	49.36	4.819
Stddev	.0050	.16	.008	.0051	.020	.015	.009	.07	.002
%RSD	.5061	.3375	.1631	.5322	.4277	.3239	.1869	.1518	.0327
#1	.9833	46.67	4.643	.9722	4.718	4.760	4.771	49.39	4.818
#2	.9899	46.36	4.657	.9629	4.678	4.730	4.772	49.41	4.820
#3	.9931	46.54	4.645	.9638	4.702	4.740	4.756	49.27	4.820

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.923	4.711	4.630	48.08	49.34	4.952	47.16	4.723	.9341
Stddev	.004	.006	.004	.08	.11	.025	.12	.014	.0009
%RSD	.0891	.1267	.0909	.1613	.2283	.4949	.2635	.3052	.1010
#1	4.927	4.717	4.631	48.16	49.43	4.970	47.29	4.737	.9352
#2	4.923	4.709	4.633	48.01	49.22	4.924	47.04	4.708	.9336
#3	4.918	4.705	4.625	48.07	49.38	4.962	47.16	4.722	.9334

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	48.59	4.940	47.93	4.756	47.52	.9254	.9429	4.674	4.806
Stddev	.12	.001	.03	.004	.08	.0011	.0033	.007	.010
%RSD	.2525	.0263	.0649	.0858	.1671	.1200	.3483	.1598	.2171
#1	48.71	4.940	47.92	4.758	47.58	.9241	.9413	4.665	4.816
#2	48.47	4.941	47.97	4.758	47.43	.9263	.9407	4.676	4.808
#3	48.57	4.939	47.91	4.751	47.54	.9256	.9467	4.680	4.795

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
Value
Range

Sample Name: CCV Acquired: 8/2/2018 20:02:54 Type: QC
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.691	4.532	4.740	.9542	5.076	4.622	4.860
Stddev	.017	.015	.016	.0029	.016	.027	.004
%RSD	.3684	.3342	.3427	.3002	.3164	.5880	.0718
#1	4.708	4.515	4.751	.9511	5.057	4.653	4.863
#2	4.674	4.541	4.721	.9548	5.085	4.608	4.861
#3	4.692	4.541	4.747	.9567	5.085	4.604	4.856

Check ? Chk Pass Chk Pass Chk Pass Chk Pass None Chk Pass Chk Pass
 Value
 Range

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3447.2	31268.	3419.1
Stddev	15.8	390.	23.0
%RSD	.45962	1.2484	.67301
#1	3445.8	30903.	3445.3
#2	3432.0	31221.	3410.0
#3	3463.6	31679.	3402.1

Sample Name: CCB Acquired: 8/2/2018 20:07:07 Type: QC
Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
User: admin Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3961	As1890	B_2496	Ba4554	Be3130	Bi2230	Ca1840	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0013	.0014	-.0016	.0073	-.0006	.0000	.0001	-.0161	-.0002
Stddev	.0009	.0175	.0028	.0042	.0003	.0000	.0027	.0010	.0002
%RSD	64.85	1291.	178.4	58.05	46.37	197.6	2089.	6.025	105.0

#1	-.0011	-.0149	-.0045	.0036	-.0008	.0000	-.0021	-.0152	-.0002
#2	-.0006	-.0011	-.0012	.0064	-.0003	.0000	.0031	-.0171	.0000
#3	-.0023	.0200	.0010	.0119	-.0008	-.0000	-.0007	-.0159	-.0003

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Co2286	Cr2055	Cu2178	Fe2599	K_7664	Li6707	Mg2798	Mn2576	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	-.0003	.0006	.0055	-.0032	.0023	-.0097	-.0001	.0000
Stddev	.0008	.0000	.0016	.0013	.0485	.0036	.0149	.0007	.0003
%RSD	329.4	12.18	244.3	23.45	1512.	155.3	153.7	1139.	2438.

#1	-.0006	-.0003	.0012	.0070	-.0412	.0057	-.0268	.0005	.0002
#2	.0006	-.0003	-.0011	.0046	-.0199	.0027	-.0010	-.0009	-.0004
#3	-.0007	-.0003	.0019	.0049	.0514	-.0014	-.0012	.0002	.0002

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Elem	Na5895	Ni2216	P_1774	Pb2203	S_1820	Sb2068	Se1960	Si2516	Sn1899
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0584	-.0004	-.0063	-.0001	-.0175	.0017	.0017	-.0106	-.0006
Stddev	.0162	.0002	.0043	.0016	.0054	.0010	.0039	.0058	.0013
%RSD	27.69	60.33	69.40	1638.	30.89	58.75	231.2	54.19	228.0

#1	-.0760	-.0007	-.0022	-.0005	-.0185	.0029	-.0005	-.0168	-.0005
#2	-.0441	-.0003	-.0058	-.0014	-.0116	.0013	-.0007	-.0098	-.0020
#3	-.0552	-.0002	-.0108	.0017	-.0223	.0010	.0062	-.0054	.0007

Check ? Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass Chk Pass
High Limit
Low Limit

Sample Name: CCB Acquired: 8/2/2018 20:07:07 Type: QC
 Method: _2016(v681) Mode: CONC Corr. Factor: 1.000000
 User: admin Custom ID1: Custom ID2: Custom ID3:
 Comment:

Elem	Sr4077	Th2832	Ti3349	Ti1908	U_3670	V_2908	Zn2138
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	.0058	.0008	-.0008	.0448	.0036	-.0008
Stddev	.0002	.0031	.0019	.0047	.0163	.0053	.0001
%RSD	412.5	53.57	238.7	586.3	36.35	146.6	13.68
#1	.0001	.0032	.0029	.0003	.0261	.0034	-.0007
#2	-.0001	.0049	.0003	-.0060	.0556	-.0016	-.0008
#3	.0001	.0092	-.0008	.0033	.0527	.0091	-.0009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	3616.0	33977.	3657.9
Stddev	50.8	346.	22.1
%RSD	1.4047	1.0190	.60335
#1	3639.8	34227.	3664.7
#2	3650.5	34122.	3633.2
#3	3557.7	33582.	3675.8

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)
Ag 328.068 {103}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.003704	0.146410	0.000000	1.000000
Al 396.152 { 85}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.000975	0.109809	0.000000	1.000000
As 189.042 {478}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000039	0.055375	0.000000	1.000000
B 249.678 {135}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000748	0.101148	0.000000	1.000000
Ba 455.403 { 74}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.025137	5.476337	0.000000	1.000000
Be 313.042 {108}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.002297	9.610270	0.000000	1.000000
Bi 223.061 {451}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000647	0.093195	0.000000	1.000000
Ca 184.006 {483}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.002695	0.109026	0.000000	1.000000
Cd 228.802 {447}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000355	1.201448	0.000000	1.000000
Co 228.616 {448}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.000697	0.424824	0.000000	1.000000
Cr 205.560 {464}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.000265	0.579578	0.000000	1.000000
Cu 217.894 {455}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000574	0.104532	0.000000	1.000000
Fe 259.940 {130}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000315	0.188763	0.000000	1.000000
K 766.490 { 44}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.040111	0.033956	0.000000	1.000000
Li 670.784 { 50}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.007234	0.821788	0.000000	1.000000
Mg 279.806 {121}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000876	0.021640	0.000000	1.000000
Mn 257.610 {131}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.001388	1.432763	0.000000	1.000000
Mo 202.030 {467}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000596	0.406108	0.000000	1.000000
Na 589.592 { 57}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.098206	0.116434	0.000000	1.000000
Ni 221.647 {452}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.000692	0.673014	0.000000	1.000000
P 177.495 {490}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.002956	0.027815	0.000000	1.000000
Pb 220.353 {453}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000437	0.178830	0.000000	1.000000
S 182.034 {485}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.000604	0.020626	0.000000	1.000000
Sb 206.833 {463}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000084	0.091677	0.000000	1.000000
Se 196.090 {472}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.000227	0.044901	0.000000	1.000000
Si 251.611 {134}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.001916	0.086099	0.000000	1.000000
Sn 189.989 {478}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.000328	0.119559	0.000000	1.000000
Sr 407.771 { 83}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.020253	10.835094	0.000000	1.000000
Th 283.231 {119}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.001770	0.009186	0.000000	1.000000
Ti 334.941 {101}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000258	0.645523	0.000000	1.000000
Tl 190.856 {477}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000293	0.074019	0.000000	1.000000
U 367.007 { 92}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.002284	0.010154	0.000000	1.000000
V 290.882 {116}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	-0.000613	0.196987	0.000000	1.000000
Y 224.306 {450}* Y 360.073 { 94}* Y 360.073 { 94}2*	<not fit> 5/30/2018 13:35:48 5/30/2018 13:35:48	<Never Calibrated> 3/30/2018 12:28:46 3/30/2018 12:28:46	Linear Linear Linear	1/Conc 1/Conc 1/Conc	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	1.000000 1.000000 1.000000
Zn 213.856 {458}	8/2/2018 15:23:55	8/2/2018 15:23:55	Linear	1/Conc	0.001252	1.240585	0.000000	1.000000

Element, Wavelength and Order	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope		QC Norm	
						Slope	Y-int	Slope factor	Offset
Ag 328.068 {103}	0.999846	0.000020	0.001587	0.005290	OK.	1.000000	0.000000	1	0
Al 396.152 { 85}	0.999954	0.000259	0.022592	0.075308	OK.	1.000000	0.000000	1	0
As 189.042 {478}	0.999707	0.000023	0.003573	0.011909	OK.	1.000000	0.000000	1	0
B 249.678 {135}	0.999874	0.000040	0.008559	0.028529	OK.	1.000000	0.000000	1	0
Ba 455.403 { 74}	0.999933	0.002456	0.000594	0.001980	OK.	1.000000	0.000000	1	0
Be 313.042 {108}	0.999986	0.000614	0.000136	0.000453	OK.	1.000000	0.000000	1	0
Bi 223.061 {451}	0.999845	0.000128	0.004172	0.013907	OK.	1.000000	0.000000	1	0
Ca 184.006 {483}	0.999916	0.000774	0.001611	0.005371	OK.	1.000000	0.000000	1	0
Cd 228.802 {447}	0.999765	0.000324	0.000338	0.001128	OK.	1.000000	0.000000	1	0
Co 228.616 {448}	0.999838	0.000296	0.000705	0.002349	OK.	1.000000	0.000000	1	0
Cr 205.560 {464}	0.999832	0.000184	0.000294	0.000981	OK.	1.000000	0.000000	1	0
Cu 217.894 {455}	0.999873	0.000046	0.003148	0.010494	OK.	1.000000	0.000000	1	0
Fe 259.940 {130}	0.999956	0.000307	0.004197	0.013990	OK.	1.000000	0.000000	1	0
K 766.490 { 44}	0.999903	0.000588	0.098538	0.328459	OK.	1.000000	0.000000	1	0
Li 670.784 { 50}	0.999951	0.000316	0.004346	0.014486	OK.	1.000000	0.000000	1	0
Mg 279.806 {121}	0.999981	0.000074	0.033301	0.111002	OK.	1.000000	0.000000	1	0
Mn 257.610 {131}	0.999987	0.000153	0.000625	0.002082	OK.	1.000000	0.000000	1	0
Mo 202.030 {467}	0.999795	0.000128	0.000622	0.002074	OK.	1.000000	0.000000	1	0
Na 589.592 { 57}	0.999919	0.000812	0.027769	0.092563	OK.	1.000000	0.000000	1	0
Ni 221.647 {452}	0.999841	0.000417	0.000564	0.001879	OK.	1.000000	0.000000	1	0
P 177.495 {490}	0.999980	0.000048	0.005764	0.019213	OK.	1.000000	0.000000	1	0
Pb 220.353 {453}	0.999958	0.000028	0.001707	0.005692	OK.	1.000000	0.000000	1	0
S 182.034 {485}	0.999664	0.000666	0.007992	0.026641	OK.	1.000000	0.000000	1	0
Sb 206.833 {463}	0.999808	0.000014	0.003300	0.011000	OK.	1.000000	0.000000	1	0
Se 196.090 {472}	0.999784	0.000009	0.005268	0.017559	OK.	1.000000	0.000000	1	0
Si 251.611 {134}	0.999820	0.000181	0.010184	0.033946	OK.	1.000000	0.000000	1	0
Sn 189.989 {478}	0.999889	0.000098	0.001433	0.004776	OK.	1.000000	0.000000	1	0
Sr 407.771 { 83}	0.999958	0.001215	0.000204	0.000679	OK.	1.000000	0.000000	1	0
Th 283.231 {119}	0.999812	0.000015	0.006350	0.021168	OK.	1.000000	0.000000	1	0
Ti 334.941 {101}	0.999935	0.000180	0.001995	0.006651	OK.	1.000000	0.000000	1	0
Tl 190.856 {477}	0.999999	0.000001	0.002684	0.008947	OK.	1.000000	0.000000	1	0
U 367.007 { 92}	0.999884	0.000019	0.030150	0.100501	OK.	1.000000	0.000000	1	0
V 290.882 {116}	0.999969	0.000061	0.006128	0.020427	OK.	1.000000	0.000000	1	0
Y 224.306 {450}* Y 360.073 { 94}* Y 360.073 { 94}2*	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	-1.000000 -1.000000 -1.000000	-1.000000 -1.000000 -1.000000	Warnin Warnin Warnin	1.000000 1.000000 1.000000	0.000000 0.000000 0.000000	1 1 1	0 0 0
Zn 213.856 {458}	0.999784	0.000636	0.000239	0.000798	OK.	1.000000	0.000000	1	0

SFF 8/3/18 File: 080218C1 A. Batch: 380117 Inst: 6500

	Pos ID	Rack	Row	Col	Type	Sample name	Comment	Custom ID1	Custom ID2
1	1001	3	1	1	Unk	LB 160-379221/1-B	379839		
2	1002	3	1	2	Unk	LCS 160-379539/2-A			
3	1003	3	1	3	Unk	160-29687-B-1-B			
4	1004	3	1	4	Unk	160-29687-B-1-BSD@5			
5	1005	3	1	5	Unk	160-29687-B-1-C MS			
6	1006	3	1	6	Unk	160-29687-B-1-D MSD			
7	1007	3	1	7	Unk	160-29687-B-1-BPDS	SFF 8/3/18		
8	1008	3	1	8	Unk	MB 160-379537/1-A	379537		
9	1009	3	1	9	Unk	LCS 160-379537/2-A			
10	1010	3	1	10	Unk	160-29476-L-1-C			
11	1011	3	1	11	Unk	160-29476-L-1-CSD@5			
12	1012	3	1	12	Unk	160-29476-L-1-D MS			
13	1013	3	2	1	Unk	160-29476-L-1-E MSD			
14	1014	3	2	2	Unk	MB 160-379477/1-A	379477		
15	1015	3	2	3	Unk	LCS 160-379477/2-A			
16	1016	3	2	4	Unk	LCSD 160-379477/3-A			
17	1017	3	2	5	Unk	160-29824-A-1-B@100			
18	1018	3	2	6	Unk	160-29824-A-1-BSD@500			
19	1019	3	2	7	Unk	160-29824-A-2-B@100	SFF 8/3/18		
20	1020	3	2	8	Unk	160-29824-A-3-B@20			
21	1021	3	2	9	Unk	MB 160-379677/1-A	379677		
22	1022	3	2	10	Unk	LCSSRM 160-379677/2@2			
23	1023	3	2	11	Unk	160-29847-A-1-A@10			
24	1024	3	2	12	Unk	160-29847-A-2-B@10			
25	1025	3	3	1	Unk	160-29847-A-3-B@50			
26	1026	3	3	2	Unk	160-29847-A-3-BSD@250			
27	1027	3	3	3	Unk	160-29847-A-3-CMS@50			
28	1028	3	3	4	Unk	160-29847-A-3-DMSD@50			
29	1029	3	3	5	Unk	160-29847-A-4-A			
30	1030	3	3	6	Unk	160-29824-A-1-B@500	379477		
31	1031	3	3	7	Unk	160-29824-A-1-BSD@2500			
32	1032	3	3	8	Unk	160-29824-A-2-B@200			

- All but As & Se

- Mn & Na

- Na

- Pb

- Mn & Na

- Na

HAA071718A

Method: Initial Method

Operator: Admin

Date of Analysis: 17 Jul 2018 13:36:18

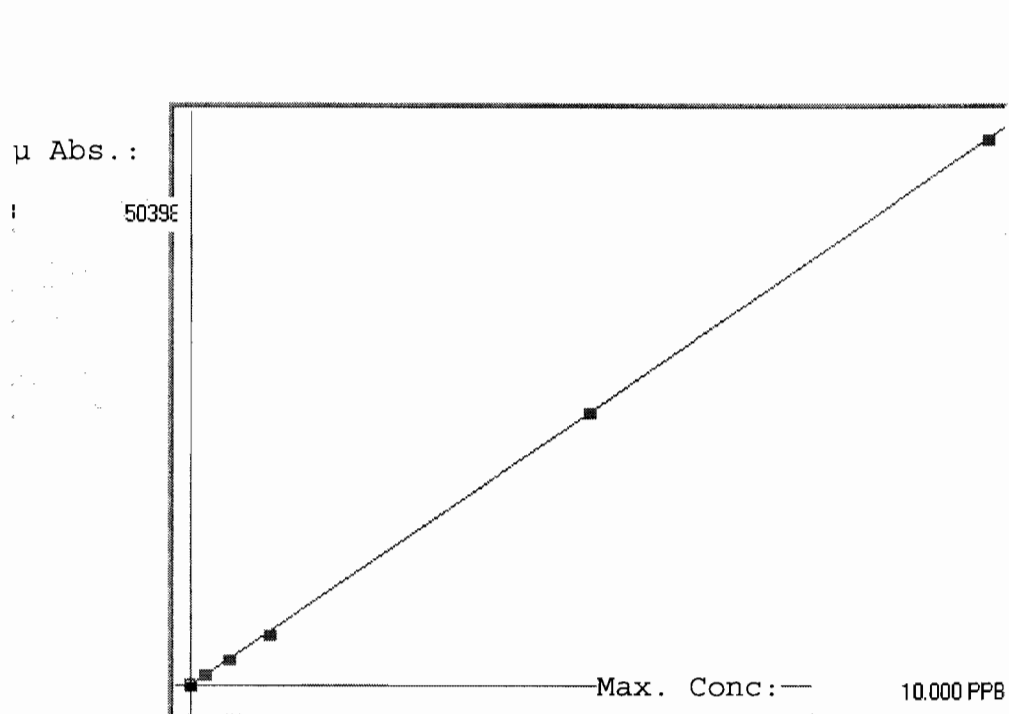
Sample ID	Extended ID	Mean	Stats Data	Std Cond	Units	Chapter
CALIBRATION BLANK		67	70, 66, 65,	0.0000	PPB	HAA071718A
CALIBRATION 1	Hg	1096	1071, 1099, 1117,	0.2000	PPB	HAA071718A
CALIBRATION 2		2456	2435, 2463, 2471,	0.5000	PPB	HAA071718A
CALIBRATION 3		4760	4763, 4747, 4771,	1.0000	PPB	HAA071718A
CALIBRATION 4		25296	24877, 25280, 25731,	5.0000	PPB	HAA071718A
CALIBRATION 5		50398	49720, 50449, 51026,	10.0000	PPB	HAA071718A
ICV		104.1% 5.2069	5.1366, 5.1943, 5.2898,		PPB	HAA071718A
ICB		-0.1030	-0.1026, -0.1036, -0.1030,		PPB	HAA071718A
MB 160-375873/1-A		0.0166	0.0167, 0.0165, 0.0165,		PPB	HAA071718A
LCS 160-375873/2-A		5.3593	5.3173, 5.3697, 5.3909,		PPB	HAA071718A
160-29274-A-1-D		-0.0818	-0.0816, -0.0824, -0.0814,		PPB	HAA071718A
160-29274-B-2-B		0.0236	0.0229, 0.0239, 0.0241,		PPB	HAA071718A
160-29274-A-3-B		0.0287	0.0276, 0.0292, 0.0292,		PPB	HAA071718A
160-29274-A-3-B SD	@5X	0.0015	0.0013, 0.0017, 0.0015,		PPB	HAA071718A
160-29274-A-3-C MS		5.4837	5.3542, 5.5124, 5.5845,		PPB	HAA071718A
160-29274-A-3-D MSD		5.3946	5.3189, 5.4034, 5.4614,		PPB	HAA071718A
160-29476-L-1-B		-0.0964	-0.0966, -0.0964, -0.0962,		PPB	HAA071718A
160-29226-A-1-F		0.0296	0.0294, 0.0292, 0.0302,		PPB	HAA071718A
CCV		116.2% 5.8084	5.7300, 5.8283, 5.8669,		PPB	HAA071718A
CCB		-0.0798	-0.0800, -0.0798, -0.0798,		PPB	HAA071718A
160-29226-A-2-D		0.0193	0.0189, 0.0197, 0.0193,		PPB	HAA071718A
MB 160-375819/1-A		0.0309	0.0300, 0.0308, 0.0318,		PPB	HAA071718A
LCS 160-375819/2-A		2.9760	2.9212, 2.9799, 3.0269,		PPB	HAA071718A
LCSD 160-375819/3-A		5.1328	5.0230, 5.1320, 5.2432,		PPB	HAA071718A
160-29453-A-1-A		-0.1073	-0.1069, -0.1073, -0.1075,		PPB	HAA071718A
160-29453-A-2-A		0.0313	0.0308, 0.0314, 0.0316,		PPB	HAA071718A
160-29453-A-3-A		0.0252	0.0249, 0.0255, 0.0253,		PPB	HAA071718A
160-29453-A-4-A		0.0378	0.0372, 0.0379, 0.0383,		PPB	HAA071718A
160-29453-A-5-A		0.0121	0.0116, 0.0120, 0.0128,		PPB	HAA071718A
160-29453-A-6-A	DAS 7/18/18	0.0376	0.0356, 0.0379, 0.0391,		PPB	HAA071718A
CCV		107.4% 5.3717	5.2844, 5.3816, 5.4491,		PPB	HAA071718A
CCB		-0.1175	-0.1174, -0.1176, -0.1174,		PPB	HAA071718A
160-29453-A-7-A		0.0176	0.0179, 0.0171, 0.0177,		PPB	HAA071718A
160-29453-A-8-A		0.0179	0.0177, 0.0177, 0.0181,		PPB	HAA071718A
160-29453-A-9-A		0.0245	0.0239, 0.0245, 0.0251,		PPB	HAA071718A
160-29453-A-10-A		0.0304	0.0308, 0.0296, 0.0306,		PPB	HAA071718A
160-29453-A-11-A		0.0261	0.0249, 0.0259, 0.0276,		PPB	HAA071718A
160-29453-A-12-A		0.0218	0.0215, 0.0217, 0.0221,		PPB	HAA071718A
160-29453-A-13-A		0.0671	0.0657, 0.0675, 0.0681,		PPB	HAA071718A
160-29453-A-14-A		0.0068	0.0070, 0.0070, 0.0062,		PPB	HAA071718A
160-29453-A-15-A		0.0189	0.0191, 0.0187, 0.0189,		PPB	HAA071718A
160-29453-A-17-A	DAS 7/18/18	0.0254	0.0251, 0.0257, 0.0255,		PPB	HAA071718A
CCV		106.4% 5.3189	5.2305, 5.3344, 5.3917,		PPB	HAA071718A
CCB		-0.1060	-0.1057, -0.1065, -0.1057,		PPB	HAA071718A
CCV		108.0% 5.4007	5.2634, 5.4347, 5.5040,		PPB	HAA071718A
CCB		-0.0894	-0.0895, -0.0893, -0.0893,		PPB	HAA071718A
CCV		107.2% 5.3597	5.3049, 5.3487, 5.4257,		PPB	HAA071718A
CCB		-0.0012	-0.0009, -0.0017, -0.0009,		PPB	HAA071718A
LCS 160-375819/2-A		2.9740	2.9274, 2.9791, 3.0156,		PPB	HAA071718A
CCV	DAS 7/18/18	105.9% 5.2947	5.1871, 5.2882, 5.4087,		PPB	HAA071718A
CCB		-0.0982	-0.0980, -0.0982,		PPB	HAA071718A

PREP METHOD:7470A

A. BATCH:376379

DAS 7/18/18

Initial Method



A= 0.0000e+000

B= 1.9819e-004

C= 6.2382e-003

Rho= 0.9999754

Accept=Accepted

Accepted Date=

07/17/18 13:50

Std ID	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
CALIBRATION BLANK	0.000	0.020	0.020	67	2.160	70	66	65		
CALIBRATION 1	0.200	0.223	0.023	1095	1.7 %	1071	1099	1117		
CALIBRATION 2	0.500	0.493	-0.007	2456	0.6 %	2435	2463	2471		
CALIBRATION 3	1.000	0.950	-0.050	4760	0.2 %	4763	4747	4771		
CALIBRATION 4	5.000	5.020	0.020	25296	1.4 %	24877	25280	25731		
CALIBRATION 5	10.000	9.995	-0.005	50398	1.1 %	49720	50449	51026		

HAA 071718A

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1

SDG No.: _____

Project: Former Carnotite Site - Non-Rad Analysis

Client Sample ID
CRC-MW-1

Lab Sample ID
160-29476-1

Comments:

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29476-1

SDG No.: _____

Project: Former Carnotite Site - Non-Rad Analysis

Client Sample ID
CRC-MW-1

Lab Sample ID
160-29476-1

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: CRC-MW-1

Lab Sample ID: 160-29476-1

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

SDG ID.:

Matrix: Water

Date Sampled: 07/11/2018 13:55

Reporting Basis: WET

Date Received: 07/12/2018 09:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Cr (VI)	2.6	10	2.6	ug/L	U	H	1	7196A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: CRC-MW-1

Lab Sample ID: 160-29476-1

Lab Name: TestAmerica Nashville

Job No.: 160-29476-1

SDG ID.:

Matrix: Water

Date Sampled: 07/11/2018 13:55

Reporting Basis: WET

Date Received: 07/12/2018 09:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
57-12-5	Cyanide, Total	0.0070	0.010	0.0070	mg/L	U		1	9012B
64743-03-9	Phenols, Total	0.020	0.050	0.020	mg/L	U	F1	1	9066
	HEM (Oil & Grease)	1.3	3.8	1.3	mg/L	U		1	1664B
	Total Suspended Solids	12	2.0	1.4	mg/L			1	SM 2540D
	Biochemical Oxygen Demand	2.0	2.0	2.0	mg/L	U	H *	1	SM5210B

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Analyst: NPV Batch Start Date: 07/13/2018
Reporting Units: ug/L Analytical Batch No.: 375313

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
6	ICV	07:59	Cr (VI)	51.2	50.1	102	90-110		Cr6 5ppm QC_00219
7	ICB	07:59	Cr (VI)	2.6				U	
13	CCV	07:59	Cr (VI)	51.2	50.1	102	90-110		Cr6 5ppm QC_00219
14	CCB	07:59	Cr (VI)	2.6				U	

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1
SDG No.: _____
Analyst: SDL Batch Start Date: 07/24/2018
Reporting Units: mg/L Analytical Batch No.: 531193

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
1	CCV	16:45	Cyanide, Total	0.200	0.200	100	90-110		W_CN CCV_00084
2	CCB	16:46	Cyanide, Total	0.0070				U	
5	CCV	16:49	Cyanide, Total	0.196	0.200	98	90-110		W_CN CCV_00087
11	CCV	16:56	Cyanide, Total	0.198	0.200	99	90-110		W_CN CCV_00084
12	CCB	16:57	Cyanide, Total	0.0070				U	

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis

Job No.: 160-29476-1

SDG No.: _____

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 375313 Date: 07/13/2018 07:59							
7196A	MB 160-375313/8	Cr (VI)	2.6	U	ug/L	10	1

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 533454 Date: 08/02/2018 13:17 Prep Batch: 533397 Date: 08/02/2018 13:17							
1664B	MB 490-533397/1-A	HEM (Oil & Grease)	1.4	U	mg/L	4.0	1
Batch ID: 531193 Date: 07/24/2018 16:47 Prep Batch: 531103 Date: 07/24/2018 12:33							
9012B	MB 490-531103/1-A	Cyanide, Total	0.0070	U	mg/L	0.010	1
Batch ID: 529799 Date: 07/18/2018 17:00							
SM 2540D	MB 490-529799/1	Total Suspended Solids	0.70	U	mg/L	1.0	1

3-IN
UNSEEDDED CONTROL BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 529442 Date: 07/14/2018 18:22							
SM5210B	USB 490-529442/1	Biochemical Oxygen Demand	2.0	U	mg/L	2.0	1

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 375313 Date: 07/13/2018 07:59											
7196A	160-29476-1	Cr (VI)	2.6	U	ug/L						H
7196A	160-29476-1	Cr (VI)	51.2		ug/L	50.1	102	85-115			
MS											

Calculations are performed before rounding to avoid round-off errors in calculated results.

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 533454 Date: 08/02/2018 13:17 Prep Batch: 533397 Date: 08/02/2018 13:17											
1664B	180-80122-B-1	HEM (Oil & Grease)	1.3	U	mg/L						
	-A										
1664B	180-80122-B-1	HEM (Oil & Grease)	37.55		mg/L	40.5	93	78-114			
	-A MS										
Batch ID: 531193 Date: 07/24/2018 16:53 Prep Batch: 531103 Date: 07/24/2018 12:33											
9012B	160-29476-1	Cyanide, Total	0.0070	U	mg/L						
9012B	160-29476-1	Cyanide, Total	0.105		mg/L	0.100	105	70-130			
	MS										

Calculations are performed before rounding to avoid round-off errors in calculated results.

5-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 531193 Date: 07/24/2018 16:54 Prep Batch: 531103 Date: 07/24/2018 12:33											
9012B	160-29476-1	Cyanide, Total	0.0927		mg/L	0.100	93	70-130	12	46	
MSD											

Calculations are performed before rounding to avoid round-off errors in calculated results.

6-IN
DUPLICATE
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Matrix: Water

Method	Client Sample ID	Lab Sample ID	Analyte	Result	Unit	RPD	RPD Limit	Qual
Batch ID: 375313 Date: 07/13/2018 07:59								
7196A	CRC-MW-1	160-29476-1	Cr (VI)	2.6	ug/L			U
7196A	CRC-MW-1	160-29476-1 DU	Cr (VI)	2.6	ug/L	NC	20	U

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VI-IN

6-IN
DUPLICATE
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Matrix: Water

Method	Client Sample ID	Lab Sample ID	Analyte	Result	Unit	RPD	RPD Limit	Qual
Batch ID: 531193 Date: 07/24/2018 16:52 Prep Batch: 531103 Date: 07/24/2018 12:33								
9012B	CRC-MW-1	160-29476-1	Cyanide, Total	0.0070	mg/L			U
9012B	CRC-MW-1	160-29476-1 DU	Cyanide, Total	0.0070	mg/L	NC	20	U
Batch ID: 529799 Date: 07/18/2018 17:00								
SM 2540D		490-155579-A-1	Total Suspended Solids	260	mg/L			
SM 2540D		490-155579-A-1 DU	Total Suspended Solids	316	mg/L	18	20	
Batch ID: 529799 Date: 07/18/2018 17:00								
SM 2540D		490-155733-A-1	Total Suspended Solids	79	mg/L			
SM 2540D		490-155733-A-1 DU	Total Suspended Solids	82.0	mg/L	4	20	
Batch ID: 529442 Date: 07/14/2018 14:12								
SM5210B		490-155652-F-1	Biochemical Oxygen Demand	5.0	mg/L			
SM5210B		490-155652-F-1 DU	Biochemical Oxygen Demand	5.13	mg/L	2	20	*

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VI-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1
SDG No.: _____
Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 375313 Date: 07/13/2018 07:59											
						LCS Source: Cr6 5ppm Cal_00224					
7196A	LCS 160-375313/9	Cr (VI)	50.0		ug/L	50.1	100	85-115			

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 533454 Date: 08/02/2018 13:17 Prep Batch: 533397 Date: 08/02/2018 13:17 LCS Source: OP_HEM_spike_00019											
1664B	LCS 490-533397/2-A	HEM (Oil & Grease)	39.58		mg/L	41.7	95	78-114	0	18	
Batch ID: 531193 Date: 07/24/2018 16:48 Prep Batch: 531103 Date: 07/24/2018 12:33 LCS Source: W_CNworkLCS_00052											
9012B	LCS 490-531103/2-A	Cyanide, Total	0.0864		mg/L	0.100	86	85-115			
Batch ID: 529799 Date: 07/18/2018 17:00 LCS Source: W_TSS LCS_00520											
SM 2540D	LCS 490-529799/2	Total Suspended Solids	99.6		mg/L	100	100	90-110			
Batch ID: 529442 Date: 07/14/2018 18:22 LCS Source: W_BODGlucose_00095											
SM5210B	LCS 490-529442/2	Biochemical Oxygen Demand	4.99		mg/L	3.96	126	85-115			*

Calculations are performed before rounding to avoid round-off errors in calculated results.

7A-IN
LAB CONTROL SAMPLE DUPLICATE
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 533454 Date: 08/02/2018 13:17 Prep Batch: 533397 Date: 08/02/2018 13:17											
LCSD Source: OP_HEM_spike_00019											
1664B	LCSD 490-533397/3-A	HEM (Oil & Grease)	39.48		mg/L	41.7	95	78-114	0	18	

Calculations are performed before rounding to avoid round-off errors in calculated results.

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis

Job Number: 160-29476-1

SDG Number: _____

Matrix: Water

Instrument ID: UV2

Method: 7196A

MDL Date: 01/16/2012 15:42

Analyte	Wavelength/ Mass	RL (ug/L)	MDL (ug/L)
Cr (VI)		10	2.59

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29476-1
SDG Number: _____
Matrix: Water Instrument ID: UV2
Method: 7196A XMDL Date: 01/16/2012 15:41

Analyte	Wavelength/ Mass	XRL (ug/L)	XMDL (ug/L)
Cr (VI)		10	2.59

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29476-1
SDG Number: _____
Matrix: Water Instrument ID: NOEQUIP
Method: 9012B MDL Date: 01/16/2012 13:42
Prep Method: 9012B

Analyte	Wavelength/ Mass	RL (mg/L)	MDL (mg/L)
Cyanide, Total		0.01	0.007

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville

Job Number: 160-29476-1

SDG Number: _____

Matrix: Water

Instrument ID: NOEQUIP

Method: 9012B

XMDL Date: 09/25/2014 14:05

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Cyanide, Total		0.01	0.007

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29476-1
SDG Number: _____
Matrix: Water Instrument ID: NOEQUIP
Method: 9066 MDL Date: 01/16/2012 19:08
Prep Method: Distill/Phenol

Analyte	Wavelength/ Mass	RL (mg/L)	MDL (mg/L)
Phenols, Total		0.05	0.02

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29476-1
SDG Number: _____
Matrix: Water Instrument ID: NOEQUIP
Method: 9066 XMDL Date: 01/16/2012 19:10

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Phenols, Total		0.05	0.02

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville

Job Number: 160-29476-1

SDG Number: _____

Matrix: Water

Instrument ID: NOEQUIP

Method: 1664B

MDL Date: 01/26/2012 12:56

Prep Method: 1664B

Analyte	Wavelength/ Mass	RL (mg/L)	MDL (mg/L)
HEM (Oil & Grease)		4	1.4

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville

Job Number: 160-29476-1

SDG Number: _____

Matrix: Water

Instrument ID: NOEQUIP

Method: 1664B

XMDL Date: 01/26/2012 13:00

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
HEM (Oil & Grease)		4	1.4

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville

Job Number: 160-29476-1

SDG Number: _____

Matrix: Water

Instrument ID: NOEQUIP

Method: SM 2540D

MDL Date: 07/03/2013 12:15

Analyte	Wavelength/ Mass	RL (mg/L)	MDL (mg/L)
Total Suspended Solids		1	0.7

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29476-1
SDG Number: _____
Matrix: Water Instrument ID: NOEQUIP
Method: SM 2540D XMDL Date: 07/03/2013 12:16

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Total Suspended Solids		1	0.7

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29476-1
SDG Number: _____
Matrix: Water Instrument ID: NOEQUIP
Method: SM5210B MDL Date: 01/16/2012 10:29

Analyte	Wavelength/ Mass	RL (mg/L)	MDL (mg/L)
Biochemical Oxygen Demand		2	1.4

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29476-1
SDG Number: _____
Matrix: Water Instrument ID: NOEQUIP
Method: SM5210B XMDL Date: 01/16/2012 10:29

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Biochemical Oxygen Demand		2	1.4

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville

Job No.: 160-29476-1

SDG No.: _____

Prep Method: 9012B

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight	Initial Volume (mL)	Final Volume (mL)
MB 490-531103/1-A	07/24/2018 12:33	531103		50	50
LCS 490-531103/2-A	07/24/2018 12:33	531103		50	50
160-29476-1	07/24/2018 12:33	531103		50	50
160-29476-1 DU	07/24/2018 12:33	531103		50	50
160-29476-1 MS	07/24/2018 12:33	531103		50	50
160-29476-1 MSD	07/24/2018 12:33	531103		50	50

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Prep Method: Distill/Phenol

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight	Initial Volume (mL)	Final Volume (mL)
160-29476-1	08/03/2018 10:04	533652		50	50

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville

Job No.: 160-29476-1

SDG No.: _____

Prep Method: 1664B

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight	Initial Volume (mL)	Final Volume (mL)
MB 490-533397/1-A	08/02/2018 13:17	533397		960	960
LCS 490-533397/2-A	08/02/2018 13:17	533397		960	960
LCSD 490-533397/3-A	08/02/2018 13:17	533397		960	960
160-29476-1	08/02/2018 13:17	533397		1024	960
180-80122-B-1-A MS	08/02/2018 13:17	533397		988	960

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Instrument ID: UV2 Analysis Method: 7196A

Start Date: 07/13/2018 07:59 End Date: 07/13/2018 07:59

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				C r 6																									
IC 160-375313/1	1		07:59	X																									
IC 160-375313/2	1		07:59	X																									
IC 160-375313/3	1		07:59	X																									
IC 160-375313/4	1		07:59	X																									
IC 160-375313/5	1		07:59	X																									
ICV 160-375313/6	1		07:59	X																									
ICB 160-375313/7	1		07:59	X																									
MB 160-375313/8	1	T	07:59	X																									
LCS 160-375313/9	1	T	07:59	X																									
160-29476-1	1	T	07:59	X																									
160-29476-1 DU	1	T	07:59	X																									
160-29476-1 MS	1	T	07:59	X																									
CCV 160-375313/13	1		07:59	X																									
CCB 160-375313/14	1		07:59	X																									

Prep Types: _____
T = Total/NA

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1
 SDG No.: _____
 Instrument ID: NOEQUIP Analysis Method: 9012B
 Start Date: 07/24/2018 16:45 End Date: 07/24/2018 16:57

Lab Sample Id	D/F	T Y p e	Time	Analytes																									
				C N																									
CCV 490-531193/1	1		16:45	X																									
CCB 490-531193/2	1		16:46	X																									
MB 490-531103/1-A	1	T	16:47	X																									
LCS 490-531103/2-A	1	T	16:48	X																									
CCV 490-531103/3-A	1		16:49	X																									
160-29476-1	1	T	16:50	X																									
160-29476-1 DU	1	T	16:52	X																									
160-29476-1 MS	1	T	16:53	X																									
160-29476-1 MSD	1	T	16:54	X																									
ZZZZZZ			16:55																										
CCV 490-531193/11	1		16:56	X																									
CCB 490-531193/12	1		16:57	X																									

Prep Types: _____
 T = Total/NA

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Instrument ID: NOEQUIP Analysis Method: 9066

Start Date: 08/03/2018 18:39 End Date: 08/03/2018 18:39

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				P h e n T																									
CCV 490-533852/1			18:39																										
CCB 490-533852/2			18:39																										
ZZZZZZ			18:39																										
ZZZZZZ			18:39																										
160-29476-1	1	T	18:39	X																									
ZZZZZZ			18:39																										
ZZZZZZ			18:39																										
CCV 490-533852/8			18:39																										
CCB 490-533852/9			18:39																										
ZZZZZZ			18:39																										
ZZZZZZ			18:39																										

Prep Types: _____
T = Total/NA

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Instrument ID: NOEQUIP Analysis Method: 1664B

Start Date: 08/02/2018 13:17 End Date: 08/02/2018 13:17

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				H E M																									
MB 490-533397/1-A	1	T	13:17	X																									
LCS 490-533397/2-A	1	T	13:17	X																									
LCSD 490-533397/3-A	1	T	13:17	X																									
160-29476-1	1	T	13:17	X																									
ZZZZZZ			13:17																										
ZZZZZZ			13:17																										
180-80122-B-1-A MS	1	T	13:17	X																									
ZZZZZZ			13:17																										
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Prep Types: _____
T = Total/NA

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1
 SDG No.: _____
 Instrument ID: NOEQUIP Analysis Method: SM 2540D
 Start Date: 07/18/2018 17:00 End Date: 07/18/2018 17:00

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				T S S																									
MB 490-529799/1	1	T	17:00	X																									
LCS 490-529799/2	1	T	17:00	X																									
ZZZZZZ			17:00																										
ZZZZZZ			17:00																										
160-29476-1	1	T	17:00	X																									
ZZZZZZ			17:00																										
490-155579-A-1 DU	1	T	17:00	X																									
ZZZZZZ			17:00																										
ZZZZZZ			17:00																										
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ZZZZZZ			17:00																										
490-155733-A-1 DU	1	T	17:00	X																									

Prep Types: _____
 T = Total/NA

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Instrument ID: NOEQUIP Analysis Method: SM5210B

Start Date: 07/14/2018 14:12 End Date: 07/14/2018 18:22

Lab Sample Id	D/F	T y p e	Time	Analytes																									
				B O D																									
ZZZZZZ			14:12																										
490-155652-F-1 DU	1	T	14:12	X																									
ZZZZZZ			14:20																										
ZZZZZZ			14:23																										
ZZZZZZ			14:27																										
ZZZZZZ			14:29																										
160-29476-1	1	T	15:33	X																									
USB 490-529442/1	1	T	18:22	X																									
LCS 490-529442/2	1	T	18:22	X																									
ZZZZZZ			18:22																										

Prep Types: _____

T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Batch Number: 375313 Batch Start Date: 07/13/18 07:59 Batch Analyst: Vassilev, Nikolay PBatch Method: 7196A Batch End Date: 07/13/18 10:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	ColorBlk	UnCorResp	Cr6 5ppm Cal 00224	Cr6 5ppm QC 00219
IC 160-375313/1		7196A		50 mL	50 mL		0.000 Absorbance		
IC 160-375313/2		7196A		50 mL	50 mL		0.008 Absorbance	0.1 mL	
IC 160-375313/3		7196A		50 mL	50 mL		0.016 Absorbance	0.2 mL	
IC 160-375313/4		7196A		50 mL	50 mL		0.039 Absorbance	0.5 mL	
IC 160-375313/5		7196A		50 mL	50 mL		0.078 Absorbance	1 mL	
ICV 160-375313/6		7196A		50 mL	50 mL		0.040 Absorbance		0.5 mL
ICB 160-375313/7		7196A		50 mL	50 mL		0.000 Absorbance		
MB 160-375313/8		7196A		50 mL	50 mL		0.000 Absorbance		
LCS 160-375313/9		7196A		50 mL	50 mL		0.039 Absorbance	0.5 mL	
160-29476-P-1	CRC-MW-1	7196A	T	50 mL	50 mL	0.004 Absorbance	0.006 Absorbance		
160-29476-P-1 DU	CRC-MW-1	7196A	T	50 mL	50 mL	0.004 Absorbance	0.006 Absorbance		
160-29476-P-1 MS	CRC-MW-1	7196A	T	50 mL	50 mL	0.004 Absorbance	0.044 Absorbance	0.5 mL	
CCV 160-375313/13		7196A		50 mL	50 mL		0.040 Absorbance		0.5 mL
CCB 160-375313/14		7196A		50 mL	50 mL		0.000 Absorbance		

Batch Notes	
Acid Used for pH Adjustment ID	1444348
Batch Comment	Balance ID: 1123051741
Spectrophotometer Cell Path Length	540 nm
Color Reagent ID	1506244
Pipette/Syringe/Dispenser ID	WC-J

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

7196A

Page 1 of 1

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 531103 Batch Start Date: 07/24/18 12:33 Batch Analyst: Tyus, Lashanda DBatch Method: 9012B Batch End Date: 07/24/18 14:03

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	SulfideCheck	W_CN CCV 00087	W_CNworkLCS 00052	W_H2SO4 (50%) 00102
MB 490-531103/1		9012B, 9012B		50 mL	50 mL	ND			5 mL
LCS 490-531103/2		9012B, 9012B		50 mL	50 mL	ND		0.5 mL	5 mL
CCV 490-531103/3		9012B, 9012B		50 mL	50 mL	ND	1 mL		5 mL
160-29476-K-1	CRC-MW-1	9012B, 9012B	T	50 mL	50 mL	ND			5 mL
160-29476-K-1 DU	CRC-MW-1	9012B, 9012B	T	50 mL	50 mL	ND			5 mL
160-29476-K-1 MS	CRC-MW-1	9012B, 9012B	T	50 mL	50 mL	ND		0.5 mL	5 mL
160-29476-K-1 MSD	CRC-MW-1	9012B, 9012B	T	50 mL	50 mL	ND		0.5 mL	5 mL

Lab Sample ID	Client Sample ID	Method Chain	Basis	W_Mag. Chlори 00074	W_Sulfamic 00085				
MB 490-531103/1		9012B, 9012B		2 mL	2 mL				
LCS 490-531103/2		9012B, 9012B		2 mL	2 mL				
CCV 490-531103/3		9012B, 9012B		2 mL	2 mL				
160-29476-K-1	CRC-MW-1	9012B, 9012B	T	2 mL	2 mL				
160-29476-K-1 DU	CRC-MW-1	9012B, 9012B	T	2 mL	2 mL				
160-29476-K-1 MS	CRC-MW-1	9012B, 9012B	T	2 mL	2 mL				
160-29476-K-1 MSD	CRC-MW-1	9012B, 9012B	T	2 mL	2 mL				

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

9012B

Page 1 of 2

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 531103 Batch Start Date: 07/24/18 12:33 Batch Analyst: Tyus, Lashanda DBatch Method: 9012B Batch End Date: 07/24/18 14:03

Batch Notes	
Centrifuge Tube ID	712202
Distillation Temperature	160 Degrees C
Lead Acetate Lot #	3954997
Magnesium Chloride Reagent ID Number	4514377
Sodium Hydroxide ID	4514395
Pipette/Syringe/Dispenser ID	24051042
Sulfamic Acid ID	4411176
Sulfuric Acid Reagent ID Number	4492783

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 531193 Batch Start Date: 07/24/18 16:45 Batch Analyst: Loggins, Shannon DBatch Method: 9012B Batch End Date: 07/24/18 16:59

Lab Sample ID	Client Sample ID	Method Chain	Basis	FinalAmount	W_CN CCV 00084				
CCV 490-531193/1		9012B		50 mL	1 mL				
CCB 490-531193/2		9012B		50 mL					
MB 490-531103/1-A		9012B		50 mL					
LCS 490-531103/2-A		9012B		50 mL					
CCV 490-531103/3-A		9012B		50 mL					
160-29476-K-1-A	CRC-MW-1	9012B	T	50 mL					
160-29476-K-1-B DU	CRC-MW-1	9012B	T	50 mL					
160-29476-K-1-C MS	CRC-MW-1	9012B	T	50 mL					
160-29476-K-1-D MSD	CRC-MW-1	9012B	T	50 mL					
CCV 490-531193/11		9012B		50 mL	1 mL				
CCB 490-531193/12		9012B		50 mL					

Batch Notes	
Buffer Reagent ID	4470604
Chloramine-T ID	4470558
Chlorination End Time	03/24/2018 17:32
Chlorination Start Time	03/24/2018 17:32
First End time	05/24/2018 17:32
Sodium Hydroxide ID	4470603
Pipette/Syringe/Dispenser ID	21031009
Pyridine-Barbituric Acid ID	4470532
First Start time	05/24/2018 17:32

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

9012B

Page 1 of 1

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 533652 Batch Start Date: 08/03/18 10:04 Batch Analyst: Donahue, Cecilia ABatch Method: Distill/Phenol Batch End Date: 08/03/18 11:04

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Final pH			
160-29476-D-1	CRC-MW-1	Distill/Phenol, 9066	T	50 mL	50 mL	3.95 SU			

Batch Notes	
Acid used for pH adjustment	4492783
Base Used to Adjust pH ID	4273883
Batch Comment	Cent tube lot# 712202
pH Meter ID	AB92331859
Pipette/Syringe/Dispenser ID	24051042
Probe ID	VVR1 11442

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 533852 Batch Start Date: 08/03/18 18:39 Batch Analyst: Loggins, Shannon DBatch Method: 9066 Batch End Date: 08/03/18 18:48

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount				
160-29476-D-1-A	CRC-MW-1	9066	T	50 mL	50 mL				

Batch Notes	
Buffer Reagent ID	4513063
Color Reagent 1 ID	4470762
Pipette/Syringe/Dispenser ID	21031027

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 533397 Batch Start Date: 08/02/18 13:17 Batch Analyst: Dunn, BradleyBatch Method: 1664B Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	Initial pH	Final pH	GrossWeight	TareWeight	InitialAmount	FinalAmount
MB 490-533397/1		1664B, 1664B		7 SU	<2 SU			960 mL	960 mL
LCS 490-533397/2		1664B, 1664B		7 SU	<2 SU			960 mL	960 mL
LCSD 490-533397/3		1664B, 1664B		7 SU	<2 SU			960 mL	960 mL
160-29476-A-1	CRC-MW-1	1664B, 1664B	T	<2 SU	<2 SU	1522.8 g	498.9 g	1024 mL	960 mL
180-80122-B-1 MS		1664B, 1664B	T	<2 SU	<2 SU	1488.4 g	500.2 g	988 mL	960 mL

Lab Sample ID	Client Sample ID	Method Chain	Basis	ReceiverTube	SGTRecTube	O&G_Disks 00015	O&G_HCL 00004	O&G_Hexane 00015	O&G_Methanol 00006
MB 490-533397/1		1664B, 1664B		2.3300 g	2.3300 g	1 Filter	1 mL	60 mL	10 mL
LCS 490-533397/2		1664B, 1664B		2.3830 g	2.3830 g	1 Filter	1 mL	60 mL	10 mL
LCSD 490-533397/3		1664B, 1664B		2.3366 g	2.3366 g	1 Filter	1 mL	60 mL	10 mL
160-29476-A-1	CRC-MW-1	1664B, 1664B	T	2.3714 g		1 Filter		60 mL	10 mL
180-80122-B-1 MS		1664B, 1664B	T	2.4165 g	2.4165 g	1 Filter		60 mL	10 mL

Lab Sample ID	Client Sample ID	Method Chain	Basis	OP_HEM_spike 00019	pH strips 00011				
MB 490-533397/1		1664B, 1664B			1 Filter Strip				
LCS 490-533397/2		1664B, 1664B		4 mL	1 Filter Strip				
LCSD 490-533397/3		1664B, 1664B		4 mL	1 Filter Strip				
160-29476-A-1	CRC-MW-1	1664B, 1664B	T		1 Filter Strip				
180-80122-B-1 MS		1664B, 1664B	T	4 mL	1 Filter Strip				

Batch Notes	
Balance ID	AL104-1231430929
Analyst ID - HEM Extraction	BAD
Nominal Amount Used	960 mL
Weight Set ID	2004

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 533397 Batch Start Date: 08/02/18 13:17 Batch Analyst: Dunn, BradleyBatch Method: 1664B Batch End Date: _____

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 533454 Batch Start Date: 08/02/18 15:15 Batch Analyst: Dunn, BradleyBatch Method: 1664B Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	FinalAmount	ReceiverTube	HEMWgt1	HEMWgt2	Residue	Residue2
MB 490-533397/1-A		1664B		960 mL	2.3300 g	2.3301 g	2.3301 g	0.0001 g	0.0001 g
LCS 490-533397/2-A		1664B		960 mL	2.3830 g	2.4210 g	2.4210 g	0.038 g	0.038 g
LCSD 490-533397/3-A		1664B		960 mL	2.3366 g	2.3745 g	2.3745 g	0.0379 g	0.0379 g
160-29476-A-1-A	CRC-MW-1	1664B	T	960 mL	2.3714 g	2.3715 g	2.3715 g	0.0001 g	0.0001 g
180-80122-B-1-A MS		1664B	T	960 mL	2.4165 g	2.4536 g	2.4536 g	0.0371 g	0.0371 g

Lab Sample ID	Client Sample ID	Method Chain	Basis	Weight2OK	SGTRecTube	SGTWgt1	SGTWgt2	SGTResidue1	SGTResidue2
MB 490-533397/1-A		1664B		Pass 0.0005g	2.3300 g	2.3300 g	2.3300 g	0 g	0 g
LCS 490-533397/2-A		1664B		Pass 0.0005g	2.3830 g	2.4013 g	2.4013 g	0.0183 g	0.0183 g
LCSD 490-533397/3-A		1664B		Pass 0.0005g	2.3366 g	2.3546 g	2.3546 g	0.018 g	0.018 g
160-29476-A-1-A	CRC-MW-1	1664B	T	Pass 0.0005g					
180-80122-B-1-A MS		1664B	T	Pass 0.0005g	2.4165 g	2.4341 g	2.4341 g	0.0176 g	0.0176 g

Lab Sample ID	Client Sample ID	Method Chain	Basis	SGTWeightOne%Diff	CalcMsg	O&G_NaSO4 00007	O&G_SilicaGel 00008	OP_FiltPaper 00020	
MB 490-533397/1-A		1664B		Pass 0.0005g %	OK	5 g	3 g	1 Filter	
LCS 490-533397/2-A		1664B		Pass 0.0005g %	OK	5 g	3 g	1 Filter	
LCSD 490-533397/3-A		1664B		Pass 0.0005g %	OK	5 g	3 g	1 Filter	
160-29476-A-1-A	CRC-MW-1	1664B	T		HEM OK. SGT-HEM not calculated.	5 g		1 Filter	
180-80122-B-1-A MS		1664B	T	Pass 0.0005g %	OK	5 g	3 g	1 Filter	

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 533454 Batch Start Date: 08/02/18 15:15 Batch Analyst: Dunn, BradleyBatch Method: 1664B Batch End Date: _____

Batch Notes	
Balance ID	AL104-1231430929
Cal check after 1st Weighing - 1g	1.0000 g
Cal check after 1st Weighing - 2 mg	0.0020 g
Cal check after 2nd Weighing - 1g	1.0000 g
Cal check after 2nd Weighing - 2 mg	0.0020 g
Cal check before 1st Weighing - 1g	1.0000 g
Cal check before 1st Weighing - 2 mg	0.0020 g
Cal check before 2nd Weighing - 1g	1.0000 g
Cal check before 2nd Weighing - 2 mg	0.0020 g
Batch Comment	Speed-vap temp set to 40c
Desiccator In Time - 1st Weight	15:16
Desiccator In Time - 2nd Weight	15:55
Desiccator Out Time - 1st Weight	15:48
Desiccator Out Time - 2nd Weight	16:30
Perform Calculation (0=No, 1=Yes)	1
Weight Set ID	2004

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 529799 Batch Start Date: 07/18/18 17:00 Batch Analyst: Cole, BridgetBatch Method: SM 2540D Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	CrucibleID	TareWeight	InitialAmount	Weight1	Weight2	Weight3
MB 490-529799/1		SM 2540D		aLEM1	0.1321 g	1000 mL	0.1319 g	0.1324 g	0.1324 g
LCS 490-529799/2		SM 2540D		aLEM2	0.1122 g	1000 mL	0.2113 g	0.2118 g	0.2118 g
160-29476-N-1	CRC-MW-1	SM 2540D	T	aLEM5	0.1323 g	500 mL	0.1380 g	0.1385 g	0.1385 g
490-155579-A-1 DU		SM 2540D	T	aLEJX	0.1116 g	25 mL	0.1191 g	0.1195 g	0 g
490-155733-A-1 DU		SM 2540D	T	aLEMQ	0.1196 g	100 mL	0.1277 g	0.1278 g	0 g

Lab Sample ID	Client Sample ID	Method Chain	Basis	WeightOne%Diff	WeightTwo%Diff	Residue	Residue2	Residue3	FinalAmount
MB 490-529799/1		SM 2540D		Fail >=0.5mg	PASS <0.5mg	-0.0002 g	0.0003 g	0.0003 g	1000 mL
LCS 490-529799/2		SM 2540D		Fail >=0.5mg	PASS <0.5mg	0.0991 g	0.0996 g	0.0996 g	1000 mL
160-29476-N-1	CRC-MW-1	SM 2540D	T	Fail >=0.5mg	PASS <0.5mg	0.0057 g	0.0062 g	0.0062 g	1000 mL
490-155579-A-1 DU		SM 2540D	T	PASS <0.5mg		0.0075 g	0.0079 g		1000 mL
490-155733-A-1 DU		SM 2540D	T	PASS <0.5mg		0.0081 g	0.0082 g		1000 mL

Lab Sample ID	Client Sample ID	Method Chain	Basis	ResDishWt	DishWeight	W_TSS LCS 00520			
MB 490-529799/1		SM 2540D		0.1324 g	0.1321 g				
LCS 490-529799/2		SM 2540D		0.2118 g	0.1122 g	1000 mL			
160-29476-N-1	CRC-MW-1	SM 2540D	T	0.1385 g	0.1323 g				
490-155579-A-1 DU		SM 2540D	T	0.1195 g	0.1116 g				
490-155733-A-1 DU		SM 2540D	T	0.1278 g	0.1196 g				

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 529799 Batch Start Date: 07/18/18 17:00 Batch Analyst: Cole, BridgetBatch Method: SM 2540D Batch End Date: _____

Batch Notes	
Balance ID	B207693115
Date/Time - In - CW (WT2)	07/19/2018 11:53
Date/Time - Out - CW (WT2)	07/19/2018 14:42
Temperature - Start - CW (WT2) - Correct	105 Celsius
Temperature - End - CW (WT2) - Correct	104 Celsius
Temperature - Start-CW(WT2) -Uncorrected	105 Celsius
Temperature - End-CW(WT2) -Uncorrected	104 Celsius
Temperature - Start - Corrected	105 Celsius
Temperature - End - Corrected	103 Celsius
Date/Time - In	07/18/2018 17:00
Date/Time - Out	07/19/2018 09:26
Filter ID	600012-5152-r2 100M2L
Nominal Amount Used	1000 mL
Oven ID	O4-B142322
Perform Calculation (0=No, 1=Yes)	1
Thermometer ID	O4-B142322
Temperature - Start - Uncorrected	105 Celsius
Temperature - End - Uncorrected	103 Celsius

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 529442 Batch Start Date: 07/17/18 12:19 Batch Analyst: Pasquerilla, Marisa SBatch Method: SM5210B Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	Initial pH	InitialTemp	Final pH	BotlAmt	BotlIDO	BotlFDO
USB 490-529442/1		SM5210B		7.04 SU	23 Celsius	7.04 SU	300 mL	7.85 mg/L	7.55 mg/L
LCS 490-529442/2		SM5210B		7.04 SU	23 Celsius	7.04 SU	300 mL	7.95 mg/L	2.04 mg/L
490-155652-F-1 DU		SM5210B	T	7.29 SU	22.8 Celsius	7.29 SU	10 mL	7.78 mg/L	6.19 mg/L
160-29476-K-1	CRC-MW-1	SM5210B	T	7.33 SU	20.3 Celsius	7.33 SU	10 mL	7.85 mg/L	6.42 mg/L

Lab Sample ID	Client Sample ID	Method Chain	Basis	BotlDep	BotlBOD	BotlUse	Bot2Amt	Bot2IDO	Bot2FDO
USB 490-529442/1		SM5210B		0.3 mg/L	0.3 mg/L	Yes. USB			
LCS 490-529442/2		SM5210B		5.91 mg/L	4.985 mg/L	YES. Pass			
490-155652-F-1 DU		SM5210B	T	1.59 mg/L	19.95 mg/L	No. DO Deplete Fail	30 mL	7.77 mg/L	5.96 mg/L
160-29476-K-1	CRC-MW-1	SM5210B	T	1.43 mg/L	15.15 mg/L	No. DO Deplete Fail	30 mL	7.82 mg/L	6.41 mg/L

Lab Sample ID	Client Sample ID	Method Chain	Basis	Bot2Dep	Bot2BOD	Bot2Use	Bot3Amt	Bot3IDO	Bot3FDO
USB 490-529442/1		SM5210B							
LCS 490-529442/2		SM5210B							
490-155652-F-1 DU		SM5210B	T	1.81 mg/L	8.85 mg/L	No. DO Deplete Fail	100 mL	7.98 mg/L	5.19 mg/L
160-29476-K-1	CRC-MW-1	SM5210B	T	1.41 mg/L	4.85 mg/L	No. DO Deplete Fail	100 mL	7.74 mg/L	6.33 mg/L

Lab Sample ID	Client Sample ID	Method Chain	Basis	Bot3Dep	Bot3BOD	Bot3Use	Bot4Amt	Bot4IDO	Bot4FDO
USB 490-529442/1		SM5210B							
LCS 490-529442/2		SM5210B							
490-155652-F-1 DU		SM5210B	T	2.79 mg/L	5.595 mg/L	YES. Pass	300 mL	8.49 mg/L	2.91 mg/L
160-29476-K-1	CRC-MW-1	SM5210B	T	1.41 mg/L	1.455 mg/L	NO. Deplete Fail	300 mL	7.44 mg/L	5.93 mg/L

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

SM5210B

Page 1 of 2

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29476-1

SDG No.: _____

Batch Number: 529442 Batch Start Date: 07/17/18 12:19 Batch Analyst: Pasquerilla, Marisa SBatch Method: SM5210B Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	Bot4Dep	Bot4BOD	Bot4Use	FinalAmount	W_BODGlucose 00095	
USB 490-529442/1		SM5210B					300 mL		
LCS 490-529442/2		SM5210B					300 mL	6 mL	
490-155652-F-1 DU		SM5210B	T	5.58 mg/L	4.655 mg/L	YES. Pass	300 mL		
160-29476-K-1	CRC-MW-1	SM5210B	T	1.51 mg/L	0.585 mg/L	NO. Deplete Fail	300 mL		

Batch Notes	
Barometric Pressure - Corrected	29.09 - 739
Calibration - Final Date/Time	07/17/2018 13:16
Calibration - Initial Date/Time	07/17/2018 13:16
Incubator ID	bod 8
Nominal Amount Used	300 mL
Pipette/Syringe/Dispenser ID	20101085;23091017
Probe ID	13L101225
Amount of Seed added to each Sample	2.5 mL
Seed Correction	0.925 mg/L
Seed ID	4243501
Thermometer ID	AB92337680
Barometric Pressure - Uncorrected	29.99

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

SM5210B

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Original Run Filename: OM_7-24-2018_04-45-41PM.OMN Created: 7/24/2018 4:45:41 PM

Original Run Author's Signature: [nvlwet]

Current Run Filename: OM_7-24-2018_04-45-41PM2.omn Last Modified: 7/24/2018 4:59:12 PM

Current Run Author's Signature: [macleodg]

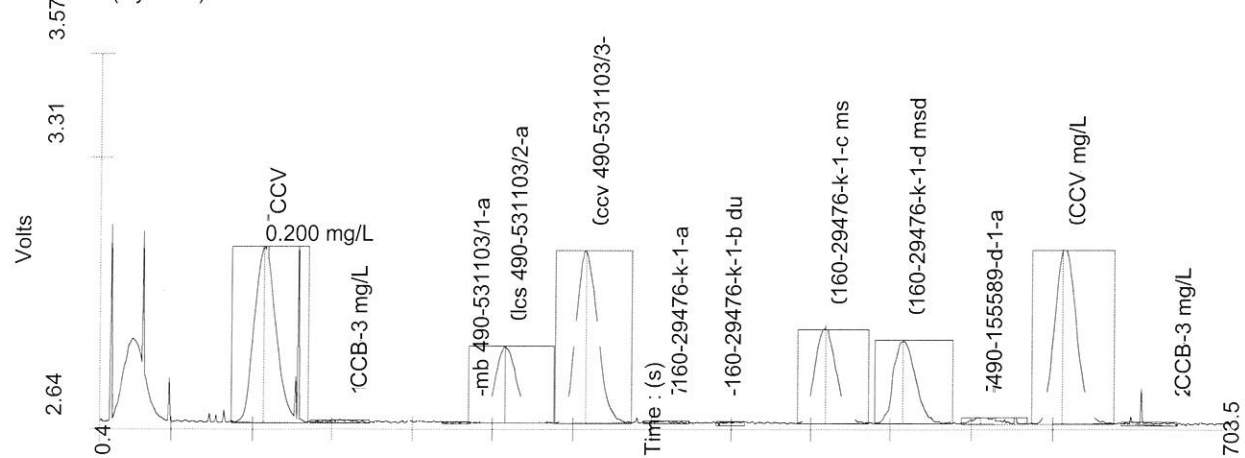
Description: Default New Run

Sample	Rep.	Cup No.	Channel 2			Detection Time
			Cyanide			
			Conc. (mg/L)	Area (V.s)	Height (V)	
CCV	1	1	0.200	6.82	0.432	7/24/2018@4:46:34 PM
CCB	1	2	1.52e-3	0.0982	6.48e-3	7/24/2018@4:47:26 PM
Calibration:			Table/Fig. : 1			
mb 490-531103/1-a	1	3	-1.60e-3	-7.55e-3	-4.25e-3	7/24/2018@4:48:18 PM
lcs 490-531103/2-a	1	4	0.0864	2.98	0.189	7/24/2018@4:49:10 PM
ccv 490-531103/3-a	1	5	0.196	6.68	0.423	7/24/2018@4:50:02 PM
160-29476-k-1-a	1	6	7.61e-4	0.0726	6.01e-3	7/24/2018@4:50:53 PM
160-29476-k-1-b du	1	7	-2.71e-3	-0.0452	-8.04e-3	7/24/2018@4:51:46 PM
160-29476-k-1-c ms	1	8	0.105	3.62	0.231	7/24/2018@4:52:37 PM
160-29476-k-1-d msd	1	9	0.0927	3.19	0.205	7/24/2018@4:53:29 PM
490-155589-d-1-a	1	10	7.18e-3	0.290	0.0162	7/24/2018@4:54:20 PM
CCV	1	1	0.198	6.76	0.426	7/24/2018@4:55:13 PM
CCB	1	2	2.53e-3	0.133	6.88e-3	7/24/2018@4:56:05 PM

Analyte Properties Table for : OM_7-24-2018_04-45-41PM2.omn

Property	Channel 2
	Cyanide
Concentration Units	mg/L
Calibration Fit Type	First Order
Clear Calibration	Yes
Force through Zero	No
Calibration Weighting	None
Auto Dilution Trigger	No
% of High Standard	110
Quik Chem Method	10-204-00-1-A
Chemistry	Direct/Bipolar
Calibration by Height	No
Inject to Peak Start	35
Peak Base Width	54

Channel 2 (Cyanide) - Current View

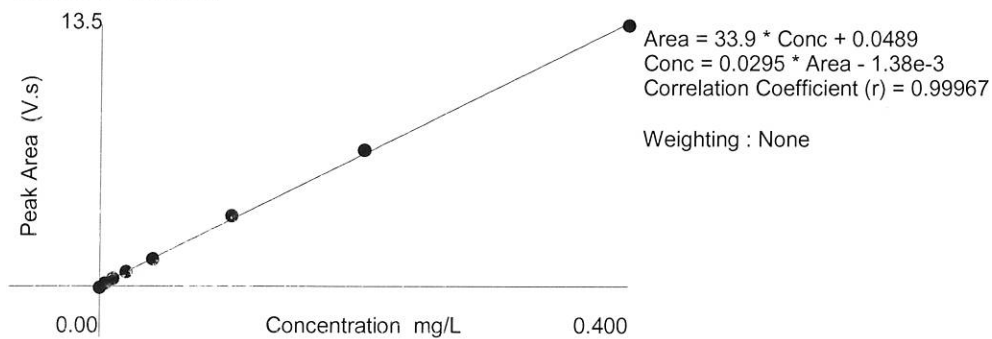


SL

Table : 1 (Cyanide)

	Known Conc. (mg/L)	Rep.	Peak Area (V.s)	Peak Height (V)	% RSD	% Residual	Det. Conc (mg/L)	Detection Date	Detection Time
1	0.400	1	13.5	0.823	0.0	1.0	0.396	6/15/2018	2:37:29 PM
2	0.200	1	7.02	0.434	0.0	-2.8	0.206	6/15/2018	2:38:20 PM
3	0.100	1	3.60	0.220	0.0	-4.8	0.105	6/15/2018	2:39:11 PM
4	0.0400	1	1.39	0.0867	0.0	1.2	0.0395	6/15/2018	2:40:03 PM
5	0.0200	1	0.720	0.0456	0.0	0.9	0.0199	6/15/2018	2:40:56 PM
6	0.0100	1	0.379	0.0234	0.0	2.2	9.81e-3	6/15/2018	2:41:48 PM
7	4.00e-3	1	0.132	0.0240	0.0	28.4	2.52e-3	6/15/2018	2:42:41 PM
8	0.00	1	-0.0897	-4.34e-3			-4.02e-3	6/15/2018	2:43:35 PM

Figure : 1 (Cyanide)



SL

Lachat 3

Cyanide 335.4, 9012, 4500_CN

Date : 6/15/2018

Original Run Filename: OM_6-15-2018_02-35-46PM.OMN Created: 6/15/2018 2:35:46 PM
 Original Run Author's Signature: [nvlwet]
 Current Run Filename: OM_6-15-2018_02-35-46PMCAL.omn Last Modified: 6/15/2018 2:46:22 PM
 Current Run Author's Signature: [NVLWET]
 Description: Default New Run

Sample	Rep.	Cup No.	Channel 2 Cyanide			Detection Time
			Conc. (mg/L)	Area (V.s)	Height (V)	
Cal Std 1	1	S1	0.400	13.5	0.823	6/15/2018@2:37:29 PM
Cal Std 2	1	S2	0.200	7.02	0.434	6/15/2018@2:38:20 PM
DQM Test: Maximum Percent Residual						
Result:			Abs(0.0) < 10.0			
Message			Pass			
Action						
DQM Test: Minimum Correlation Coefficient						
Result:			1.00000 > 0.99990			
Message			Pass			
Action						
Cal Std 3	1	S3	0.100	3.60	0.220	6/15/2018@2:39:11 PM
DQM Test: Maximum Percent Residual						
Result:			Abs(1.5) < 10.0			
Message			Pass			
Action						
DQM Test: Minimum Correlation Coefficient						
Result:			0.99990 > 0.99990			
Message			Pass			
Action						
Cal Std 4	1	S4	0.0400	1.39	0.0867	6/15/2018@2:40:03 PM
DQM Test: Maximum Percent Residual						
Result:			Abs(9.3) < 10.0			
Message			Pass			
Action						
DQM Test: Minimum Correlation Coefficient						
Result:			0.99968 < 0.99990			
Message			Fail			
Action						
Cal Std 5	1	S5	0.0200	0.720	0.0456	6/15/2018@2:40:56 PM
DQM Test: Maximum Percent Residual						
Result:			Abs(10.8) > 10.0			
Message			Fail			
Action						
DQM Test: Minimum Correlation Coefficient						
Result:			0.99970 < 0.99990			
Message			Fail			
Action						
Cal Std 6	1	S6	0.0100	0.379	0.0234	6/15/2018@2:41:48 PM
DQM Test: Maximum Percent Residual						
Result:			Abs(14.8) < 30.0			
Message			Pass			
Action						
DQM Test: Minimum Correlation Coefficient						
Result:			0.99972 < 0.99990			
Message			Fail			
Action						
Cal Std 7	1	S7	4.00e-3	0.132	0.0240	6/15/2018@2:42:41 PM
DQM Test: Maximum Percent Residual						
Result:			Abs(39.2) > 30.0			
Message			Fail			
Action						
DQM Test: Minimum Correlation Coefficient						
Result:			0.99972 < 0.99990			
Message			Fail			
Action						
Cal Std 8	1	S8	0.00	-0.0897	-4.34e-3	6/15/2018@2:43:35 PM
DQM Test: Maximum Percent Residual						
Result:			Abs(28.4) < 30.0			

Message	Pass			
Action				
DQM Test: Minimum Correlation Coefficient				
Result:	0.99967 < 0.99990			
Message	Fail			
Action				

Analyte Properties Table for : OM_6-15-2018_02-35-46PMCAL.omn

Property	Channel 2 Cyanide
Concentration Units	mg/L
Calibration Fit Type	First Order
Clear Calibration	Yes
Force through Zero	No
Calibration Weighting	None
Auto Dilution Trigger	No
% of High Standard	110
Quik Chem Method	10-204-00-1-A
Chemistry	Direct/Bipolar
Calibration by Height	No
Inject to Peak Start	42
Peak Base Width	46

Channel 2 (Cyanide) - Current View

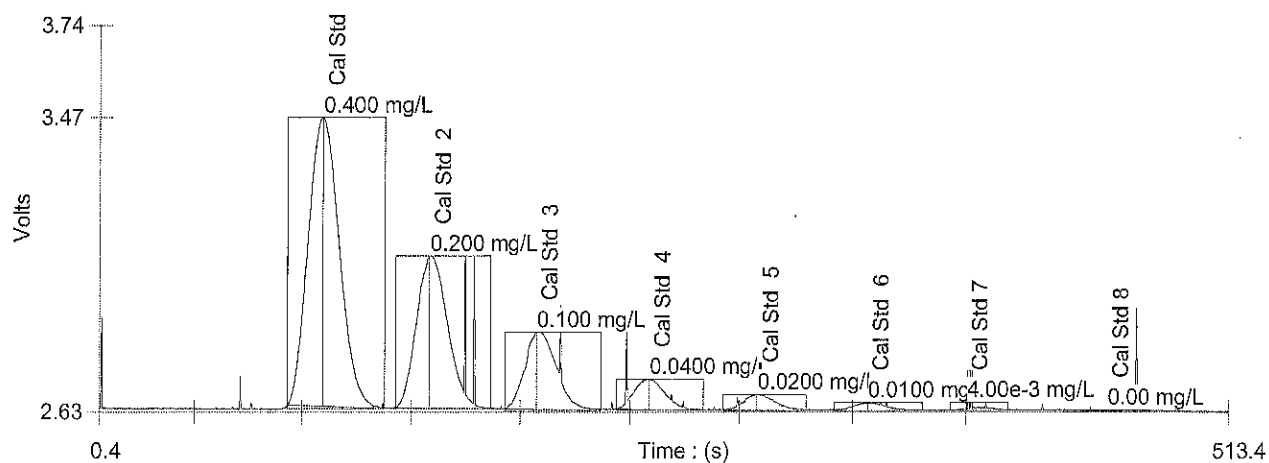
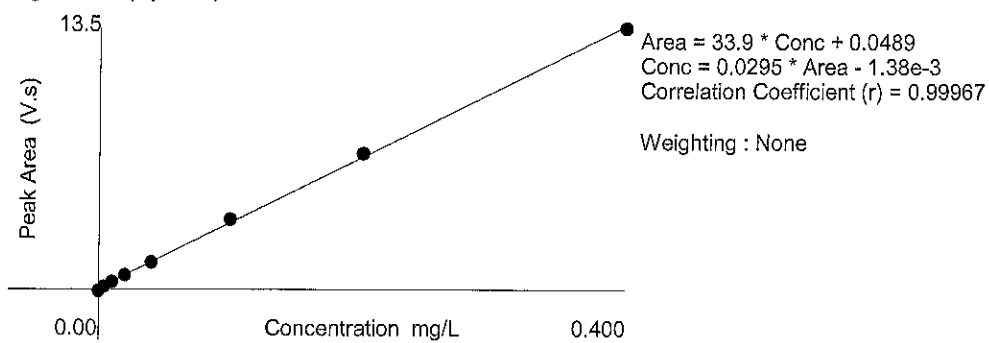


Table : 1 (Cyanide)

	Known Conc. (mg/L)	Rep.	Peak Area (V.s)	Peak Height (V)	% RSD	% Residual	Det. Conc (mg/L)	Detection Date	Detection Time
1	0.400	1	13.5	0.823	0.0	1.0	0.396	6/15/2018	2:37:29 PM
2	0.200	1	7.02	0.434	0.0	-2.8	0.206	6/15/2018	2:38:20 PM
3	0.100	1	3.60	0.220	0.0	-4.8	0.105	6/15/2018	2:39:11 PM
4	0.0400	1	1.39	0.0867	0.0	1.2	0.0395	6/15/2018	2:40:03 PM
5	0.0200	1	0.720	0.0456	0.0	0.9	0.0199	6/15/2018	2:40:56 PM
6	0.0100	1	0.379	0.0234	0.0	2.2	9.81e-3	6/15/2018	2:41:48 PM
7	4.00e-3	1	0.132	0.0240	0.0	28.4	2.52e-3	6/15/2018	2:42:41 PM
8	0.00	1	-0.0897	-4.34e-3			-4.02e-3	6/15/2018	2:43:35 PM

Figure : 1 (Cyanide)



SL

CN Calibration:

0.400 - 6 mL NaOH + 4 mL 1 ppm CN
0.200 - 8 mL NaOH + 2 mL 1 ppm CN
0.100 - 9 mL NaOH + 1 mL 1 ppm CN
0.040 - 9 mL NaOH + 1 mL 0.4 ppm CN
0.020 - 9 mL NaOH + 1 mL 0.2 ppm CN
0.010 - 9 mL NaOH + 1 mL 0.1 ppm CN
0.0 - 0.25 M NaOH

1 ppm CN: 9 mL NaOH + 1 mL 10 ppm CN
10 ppm CN: 9 mL NaOH + 1 mL 100 ppm CN
100 ppm CN: 9 mL NaOH + 1 mL 1000 ppm CN
1000 ppm CN = TALS ID # ~~3565020~~ → 4387835

ICV 2nd source TALS ID # ~~3612689~~ → 4246641

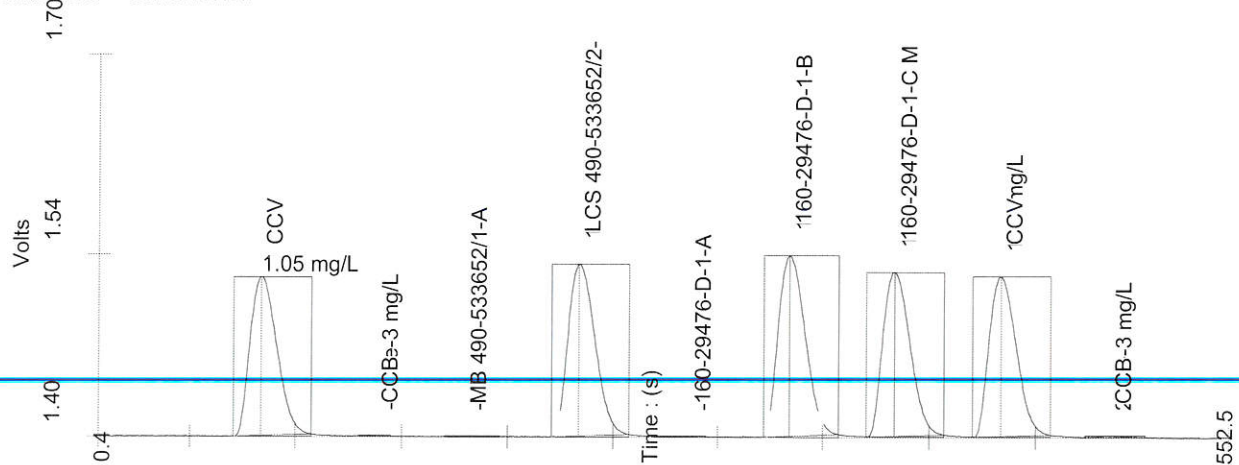
Original Run Filename: OM_8-3-2018_06-39-23PM.OMN Created: 8/3/2018 6:39:23 PM
 Original Run Author's Signature: [nvlwet]
 Current Run Filename: OM_8-3-2018_06-39-23PM.OMN Last Modified: 8/3/2018 6:48:44 PM
 Current Run Author's Signature: [NVLWET]
 Description: Default New Run

Sample	Rep.	Cup No.	Channel 3			Detection Time
			Phenol			
			Conc. (mg/L)	Area (V.s)	Height (V)	
CCV	1	3	1.05	1.91	0.126	8/3/2018@6:40:14 PM
Calibration:			Table/Fig. : 1			
CCB	1	4	-3.95e-3	5.09e-3	5.92e-4	8/3/2018@6:41:05 PM
MB 490-533652/1-A	1	5	-9.02e-3	-4.05e-3	-3.11e-4	8/3/2018@6:41:57 PM
LCS 490-533652/2-A	1	6	1.14	2.07	0.137	8/3/2018@6:42:49 PM
160-29476-D-1-A	1	7	-4.14e-3	4.74e-3	6.88e-4	8/3/2018@6:43:40 PM
160-29476-D-1-B MS	1	8	1.20	2.17	0.144	8/3/2018@6:44:31 PM
160-29476-D-1-C MSD	1	9	1.09	1.97	0.130	8/3/2018@6:45:22 PM
CCV	1	3	1.06	1.92	0.127	8/3/2018@6:46:14 PM
CCB	1	4	2.90e-3	0.0174	1.30e-3	8/3/2018@6:47:06 PM

Analyte Properties Table for : OM_8-3-2018_06-39-23PM.OMN

Property	Channel 3
	Phenol
Concentration Units	mg/L
Calibration Fit Type	First Order
Clear Calibration	Yes
Force through Zero	No
Calibration Weighting	None
Auto Dilution Trigger	No
% of High Standard	110
Quik Chem Method	10-210-00-1-B
Chemistry	Direct/Bipolar
Calibration by Height	No
Inject to Peak Start	18
Peak Base Width	42

Channel 3 - Current View

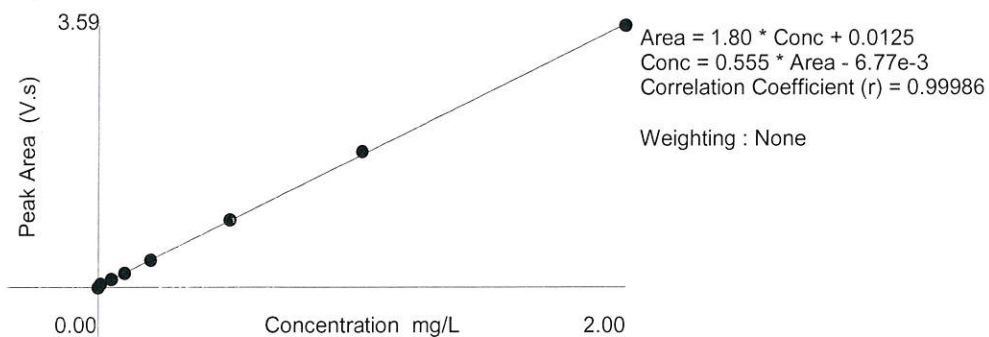


82

Table : 1 (Phenol)

	Known Conc. (mg/L)	Rep.	Peak Area (V.s)	Peak Height (V)	% RSD	% Residual	Det. Conc (mg/L)	Detection Date	Detection Time
1	2.00	1	3.59	0.244	0.0	0.6	1.99	8/2/2018	7:34:30 PM
2	1.00	1	1.86	0.125	0.0	-2.5	1.02	8/2/2018	7:35:22 PM
3	0.500	1	0.920	0.0623	0.0	-0.8	0.504	8/2/2018	7:36:13 PM
4	0.200	1	0.366	0.0251	0.0	1.8	0.196	8/2/2018	7:37:05 PM
5	0.100	1	0.188	0.0127	0.0	2.6	0.0973	8/2/2018	7:37:57 PM
6	0.0500	1	0.101	6.47e-3	0.0	1.0	0.0496	8/2/2018	7:38:50 PM
7	0.0100	1	0.0379	2.80e-3	0.0	-24.4	0.0143	8/2/2018	7:39:42 PM
8	0.00	1	-0.0107	-1.10e-3			-0.0127	8/2/2018	7:40:36 PM

Figure : 1 (Phenol)



General Chemistry Worksheet

Batch Number: 490-529799
 Method: SM 2540D
 Analyst: Cole, Bridget

Date Open: Jul 18 2018 3:39PM
 Batch End:

Due 7/24
 2540E VSS #

Due 7/20

Lab ID	Client ID	Method Chain	Basis	CrucibleID	Tare Weight	Initial weight/Volume of sample
MB-490-529799/1		2540D		aLEM1	0.1321 g	1000 mL
LCS-490-529799/2		2540D		aLEM2	0.1122 g	1000 mL
VSS-ics				aLEM3	0.1120 g	1000 mL
490-155423-D-1	82-626C	2540D	T	aLEM4	0.1329 g	10 mL
180-29476-N-1	CRC-MW-1	2540D	T	aLEM5	0.1323 g	500 mL
490-155579-A-1	F1807042-01B	2540D	T	aLEJW	0.1178 g	25 mL
490-155579-A-1-DU		2540D	T	aLEJX	0.1116 g	25 mL
490-155605-I-1	006-PA-115-071218-152540D		T	aLEM8	0.1189 g	1000 mL
490-155609-D-1	00-01-202					
490-155610-F-1	TW-01	2540D	T	aLEM9	0.1192 g	750 mL
490-155634-E-1	Metering Pit Composite 2540D		T	aLEMA	0.1204 g	250 mL
490-155636-A-1	ESSI MCS New	2540D	T	aLEMB	0.1193 g	1000 mL
490-155639-A-1	ESSI MCS Fickas	2540D	T	aLEMC	0.1182 g	600 mL
490-155640-A-1	MCS RP	2540D	T	aLEMD	0.1318 g	1000 mL
490-155651-I-1	MCS Eville	2540D	T	aLEME	0.1150 g	700 mL
490-155652-G-1	006-PA-115-071318-162540D		T	aLEMF	0.1204 g	1000 mL
490-155677-C-1	10-01-078					
490-155691-A-1	#1-11	2540D	T	aLEMG	0.1193 g	1000 mL
490-155732-A-1	Plant Effluent 071318	2540D	T	aLEJY	0.1210 g	10 mL
490-155732-B-1	7-1-18	2540D	T	aLEMI	0.1196 g	500 mL
490-155732-B-2	Influent	2540D	T	aLEMJ	0.1200 g	100 mL
490-155733-A-1	Effluent	2540D	T	aLEMK	0.1309 g	500 mL
490-155733-B-2	Influent	2540D	T	aLEML	0.1200 g	100 mL
490-155734-C-1	Effluent	2540D	T	aLEMM	0.1320 g	500 mL
490-155737-C-1	001	2540D	T	aLEMN	0.1199 g	1000 mL
490-155733-A-1-DU	01,02,03,04,05	2540D	T	aLEJZ	0.1194 g	250 mL
		2540D	T	aLEMQ	0.1196 g	100 mL

#4 Bnc 7/18/18 1700 105
 #4 Bnc 7/19/18 1153 105
 A14 Bnc 7/20/18 1250 550

Bnc 7/19/18 926 103
 Bnc 7/19/18 1442 104

Perform Calculation (0=No, 1=Yes):

Nominal Amount Used:

Filter ID:

1

1000 mL

600012-5152-12 100M2L

Wet Chemistry - TSS 7/14/2018 4:29:48 PM Assigned to: Conner, Ava E

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
490-155423-1	82-626C	Brw 11/8/13	2540D	2540D	07/17 23:59	07/23/18	JJH	KY	M196 & W740	Unconfirmed
M Ensafe requirement- TSS - must STIR and sample using a PIPETTE (rather than shake & pour) Brw 11/8/13 KE @ 10ml Brw 7/14/18 70.2g										
490-155451-1	008/012 Week 28		2540D	2540D	07/17 23:59	07/23/18	RLC	NE	W744 & HEMWed & M187	Unconfirmed
490-155453-1	001		2540D	2540D	07/16 23:59	07/23/18	SDB	TN	M192 & W741	Unconfirmed
490-155507-1	LCC-001-CP-071118		2540D	2540D	07/18 23:59	07/23/18	GAL	TN	M174 & TOC1 & W746	Unconfirmed
490-155507-2	LCC-GW INT-CP-071118		2540D	2540D	07/18 23:59	07/23/18	GAL	TN	W746 & TOC1 & M174	Unconfirmed
490-155507-3	LCC-EQB-071118		2540D	2540D	07/18 23:59	07/23/18	GAL	TN	TOC1 & W746 & M174	Unconfirmed
490-155512-1	Outfall 001		2540D	2540D	07/18 23:59	07/24/18	JAG	NC	W749 & VOA2A10 & TOC1 & HEMThurs	Unconfirmed
490-155516-1	Effluent - C 3" Parshall Flume		2540D	2540D	07/18 23:59	07/24/18	KAH	GA	M192 & W747	Unconfirmed
490-155537-1	Influent		2540D	2540D	07/18 23:59	07/24/18	QDR	TN	W751	Unconfirmed
490-155537-2	Effluent		2540D	2540D	07/18 23:59	07/24/18	QDR	TN	W751	Unconfirmed
490-155554-1	Outfall 001		2540D	2540D	07/17 23:59	07/24/18	MCG	PA	M199 & THURU & HEMThurs & W747	Unconfirmed
M Please record observations of sample/analysis										
490-155585-1	Outfall #1		2540D	2540D	07/14 23:59	07/24/18	RLC	TX	HEMThurs & W752 & TOC1	Unconfirmed
M BNSF										
490-155594-1	006-PA-015-071118 8-1005-1-636		2540D	2540D	07/18 23:59	07/24/18	MCG	PA	M198 & VOA2A10 & RSK14C & W750	Unconfirmed
490-155603-1	18071107801		2540D	2540D	07/18 23:59	07/25/18	MCG	PA	VOA2B4 & W752 & M197 & RSK14B	Unconfirmed

BIOCHEMICAL OXYGEN DEMAND QC WORKSHEET

Method SM5210 B

Start Incubation:

Date: 7/14/18

Time: 18:22

Analyst: msp

DO Probe Reading Day 1:

Initial DO:

Final DO:

Day 5:

Initial DO:

Final DO:

pH Slope:

End Incubation:

Date: 7/19/18

Time: 11:00

Analyst: msp

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Nashville, TN

SAMPLE NO.	VOL.(mL)	P	INITIAL DO. mg/L	FINAL DO. mg/L	DIFF. mg/L	CORR. mg/L	NET mg/L	BOD mg/L	Range Limits mg/L	Percent Recovery
UNSEED BLK	300	1	7.85	7.55	0.3	0.93	-0.625	-0.625	<0.2	

GGA STANDARD	6	0.02	7.95	1.85	6.1	0.93	5.175	258.750	167.5-228.5	
GGA STANDARD	6	0.02	7.95	2.01	5.94	0.93	5.015	250.750	167.5-228.5	
GGA STANDARD	6	0.02	7.95	2.25	5.7	0.93	4.775	238.750	167.5-228.5	
GGA Standard Average:			7.95	2.04	5.91	0.93	4.988	249.417		125.97

GGA STANDARD	6	0.02			0	0.93	0.000	0.000	167.5-228.5	
GGA STANDARD	6	0.02			0	0.93	0.000	0.000	167.5-228.5	
GGA STANDARD	6	0.02			0	0.93	0.000	0.000	167.5-228.5	
GGA Standard Average:			#DIV/0!	#DIV/0!	#DIV/0!	0.93	#DIV/0!	#DIV/0!		#DIV/0!

SEED BLANK	300	1			0	0.93	-0.93		<2.0 mg/L	
------------	-----	---	--	--	---	------	-------	--	-----------	--

SEED CNTRL	10	0.033	7.87	4.17	3.7	0.93			0.6-1.0	
	15	0.05	7.87	0.87	7	0.00			0.6-1.0	
	20	0.067	7.86	0.15	7.71	0.00			0.6-1.0	

Correction Factor Average =	0.93								0.6-1.0	
-----------------------------	------	--	--	--	--	--	--	--	---------	--

Seed added per bottle: 2.5 mL

Nutrient Water = 1 mL each nutrient per liter chlorine free reagent water

Seed prep:

g per 500 mL nutrient H₂O. Aerate and stir 1 hour. Stop aeration / continue stirring

Calculate Seed Correction Factor = ((initial DO - final DO)(mL seed in sample)) / mL seed used in seed control

P = sample vol/300

Corr = Correction Factor Average

NET = DIFF- CORR

BOD = NET/P x Dilution

Nutrient Water	
pH	7.04
DO	7.91
Barometric Pressure	
Uncorrected	29.99
Corrected	29.09
(mmHg)	739

Comments:

B# 529442

BIOCHEMICAL OXYGEN DEMAND QC WORKSHEET

Start Incubation

Date 7/14/18

Time 1822

Analyst WSP

DO Probe Reading Day 1

Initial DO

Final DO

7.77 / 7.85

Day 5 Initial DO 7.62

Final DO 7.55

pH Slope 98.7

Method 5M5210 B

Readout Thursday

End Incubation Date 7/14/18 Time 1100 Analyst WSP

TestAmerica

Nashville, TN

SAMPLE NO	VOL (ml)	P	INITIAL DO, mg/l	FINAL DO, mg/l	DIF-F	COHR	NET	BOD	Range Limits	Percent Recovery
UN-1 FOR DMRK	300	1	7.85	7.55	0	#DIV/0!	#DIV/0!	#DIV/0!	< 0.2	

GGA STANDARD	6	0.02	7.95	1.85	0	#DIV/0!	#DIV/0!	#DIV/0!	16.7 5.228 5	
GGA STANDARD	6	0.02	7.95	2.01	0	#DIV/0!	#DIV/0!	#DIV/0!	16.7 5.228 5	
GGA STANDARD	6	0.02	7.95	2.25	0	#DIV/0!	#DIV/0!	#DIV/0!	16.7 5.228 5	
GGA Standard Average:			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!

GGA STANDARD	6	0.02			0	#DIV/0!	0.000	0.000	16.7 5.228 5	
GGA STANDARD	6	0.02			0	#DIV/0!	0.000	0.000	16.7 5.228 5	
GGA STANDARD	6	0.02			0	#DIV/0!	0.000	0.000	16.7 5.228 5	
GGA Standard Average:			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!

SEED DILUTION	300	1			0	#DIV/0!	#DIV/0!	#DIV/0!	-2.0 mg/l	
---------------	-----	---	--	--	---	---------	---------	---------	-----------	--

SEED CONTROL	10	0.033	7.87	4.17	0	0.00			0.6-1.0	
	15	0.05	7.87	0.81	0	0.00			0.6-1.0	
	20	0.067	7.86	0.15	0	0.00			0.6-1.0	

Correction Factor Average =	#DIV/0!								0.6-1.0	
-----------------------------	---------	--	--	--	--	--	--	--	---------	--

Seed added per bottle 2.5 ml
 Nutrient Water = 1 ml each nutrient per liter chlorine free reagent water
 Seed prep A2394 9 per 500 ml nutrient H2O Aerate and stir 1 hour. Stop aeration / continue stirring
 Calculate Seed Correction Factor = ((initial DO - final DO)(ml seed in sample)) / ml seed used in seed control
 P = sample vol/300
 Corr = Correction Factor Average
 NET = DIF-F-COHR
 BOD = NET/P x Dilution

Nutrient Water	
pH	7.04
DO	7.91
Barometric Pressure	
Uncorrected	29.99
Corrected	29.09
(mmHg)	739

Comments
 Rack # T
 BOD # 8

CHEMICAL OXYGEN DEMAND WORKLIST (SM5210 B)

START INCUBATION:	
DATE:	
TIME:	
ANALYST:	

END INCUBATION:	
DATE:	
TIME:	
ANALYST:	

NOTE #1

OXIDATION
CHECK

NOTE #2

MIN = 2.0

MIN = 1.0

EXP#	SAMPLE	VOL. (mL)	P	INITIAL pH	# mL Acid/ Base	FINAL pH	#drops/ 50mL of Na ₂ SO ₃	Temp (°C)	INIT. DO (mg/L)	FIN. DO (mg/L)	DIFF. (mg/L)	CORR. (mg/L)	NET (mg/L)	D/L	SCD
3	490 155652 F1	300 10 30	1.000 0.033 0.100	7.29	"	"		22.8	7.78 7.77 7.98	6.30 6.08 5.35				1x	
	du	300	1.000						8.54	2.66					
4	490 155652 F1	300 10 30	1.000 0.033 0.100	7.29	"	"		22.8	7.78 7.77 7.98	6.19 5.96 5.19				1x	
	du	300	1.000						8.49	2.91					
5	160 29476 L1	300 10 30	1.000 0.033 0.100	7.33	"	"		20.3	7.85 7.82 7.74	6.42 6.41 6.33				1x	
	du	300	1.000						7.44	5.93					
6	490 155641 A1	300 10 30	1.000 0.033 0.100	7.26	"	"		28.1	7.83 7.82 7.77	6.57 6.52 6.35				Box	
	du	300	1.000						7.55	5.97				10/500	

CORR = seed control factor
NET = DIFF - CORR

Comments:

NOTE #1: Total vol. of acid/base used must be <0.5% or <2.5 mL/500 mL sample
BASE = 1N NaOH

NOTE #2: Initial DO of the sample must be between 7 and 9.

11-32
End of Form

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

BIOCHEMICAL OXYGEN DEMAND WORKLIST (SM5210 B)

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Nashville, TN

START INCUBATION:	
DATE:	
TIME:	
ANALYST:	

END INCUBATION:	
DATE:	
TIME:	
ANALYST:	

NOTE #1

OXIDATION CHECK

NOTE #2

MIN = 2.0

MIN = 1.0

R#	SAMPLE	VOL. (mL)	P	INITIAL pH	# mL Acid/Base	FINAL pH	# drops/ 50mL of Na ₂ SO ₃	Temp (°C)	INIT. DO (mg/L)	FIN. DO (mg/L)	DIFF. (mg/L)	CORR. (mg/L)	NET (mg/L)	DIL.	BOC (mg/L)
7	490	300	1.000	7.15		11		28.4	7.71	6.34				See	
	155641	30	0.033						7.63	5.55					
	A2	100	0.333						7.57	5.51				10/500	
8	490	300	1.000	8.70				28.2	7.91	6.35				See	
	155641	30	0.100						7.84	6.18					
	A3	100	0.333						7.80	5.49				10/500	
9	490	300	1.000	7.65		u		28.5	7.83	6.47				See	
	155641	30	0.100						7.82	6.61					
	A4	100	0.333						7.76	6.02				10/500	
		300	1.000						7.53	5.59					
		300	1.000												
		10	0.033												
		30	0.100												
		100	0.333												
		300	1.000												

NOTE: Total mL of acid/base used must be <0.5% or <2.5 mL/500 mL sample
 ACID = 1N H₂SO₄ BASE = 1N NaOH

Comments:

NOTE: Initial DO of the sample must be between 7 and 9.

End of Form

7/14/2018
1:36PM

Sample Request Form: 284831

680

Wet Chemistry - BOD 7/14/2018 1:36:43 PM Assigned to: Pasquerilla, Marisa S

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
490-155652-F-1 <i>314</i>	#1-11 <i>IX</i>	490-4499371	SM5210B_ BODCalc	SM5210B_BODCalc	07/15 12:30	07/26/18	RLC	MI	W755	Unconfirmed
<i>729</i><i>22.8</i><i>21412</i>										

7/13/2018
3:08PM

Sample Request Form: 284769

Wet Chemistry - BOD 7/13/2018 3:08:52 PM Assigned to: Pasquerilla, Marisa S

BOD

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
160-29476-K-1-5	CRC-MW-1 14	160-1507624	SM5210B_ BODCalc	SM5210B_BODCalc	07/13 13:55	08/06/18	CYLS	IL	W759	Unconfirmed
1.333 20.3 21533										

Received out of hold

7/14/2018
11:38AM

Sample Request Form: 284825

Page 1 of 1

Wet Chemistry - BOD 7/14/2018 11:38:41 AM Assigned to: Pasquerilla, Marisa S

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
490-155641-A-1 <i>le</i>	AQUANOX A8820	490-4498932	SM5210B_BODCalc	SM5210B_BODCalc	07/14 14:30	07/25/18	JAG	TN	W758	Unconfirmed
<i>7.20 28.1 e1420</i>										
M MX2183 & L5314 were both >60. These samples need greater dilutions.										
490-155641-A-2 <i>1</i>	LONOX L5614	490-4498933	SM5210B_BODCalc	SM5210B_BODCalc	07/14 14:30	07/25/18	JAG	TN	W758	Unconfirmed
<i>7.15 28.4 e1423</i>										
M MX2183 & L5314 were both >60. These samples need greater dilutions.										
490-155641-A-3 <i>8</i>	OPTISOLV OP7168	490-4498934	SM5210B_BODCalc	SM5210B_BODCalc	07/14 14:30	07/25/18	JAG	TN	W758	Unconfirmed
<i>8.70 7.00 28.2 e1429</i>										
M MX2183 & L5314 were both >60. These samples need greater dilutions.										
490-155641-A-4 <i>9</i>	KYZEN RINSE 20	490-4498935	SM5210B_BODCalc	SM5210B_BODCalc	07/14 14:30	07/25/18	JAG	TN	W758	Unconfirmed
<i>7.65 28.5 e1427</i>										
M MX2183 & L5314 were both >60. These samples need greater dilutions.										

DO PROBE CALIBRATION REPORT

Temperature °C	Expected D.O. @760BP	Actual BP	Calculated D.O.	ACTUAL D.O.	DIFFERENCE	RESULT	PROBE ID	DATE	Analyst
22.4	8.66	739	8.42	8.28	0.14	PASS	BOD5-08C101838	7/14/2018	mvp
23.5	8.50	739	8.27	8.26	0.01	PASS	BOD7-13L101225	7/14/2018	mvp
22.0	8.74	738	8.49	8.42	0.07	PASS	BOD8-00B0314	7/14/2018	ldc

Used until
8/29/18

TestAmerica

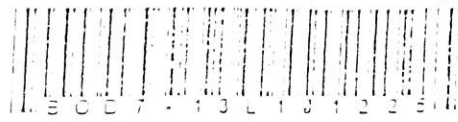
THE LEADER IN ENVIRONMENTAL TESTING

Nashville, TN

Reagents for

BOD & CBOD SM5210 B

Probe 7



Batch No.

Probe 5



8005-930191833

Probe 8



1.0 N Sulfuric Acid



4337329
ID: 1N Sulfuric_00023
Exp: 10/10/18 Prpd: REM Crt: 04/10/18
1N sulfuric acid for BO

10N

1.0 N Sodium Hydroxide



4337351
ID: W_1N NaOH_00023
Exp: 10/28/19 Prpd: REM Crt: 04/10/18
1N Sodium Hydroxide BOD p

10N

Sodium Sulfite Solution



4337344
ID: 10N H2SO4_00017
Exp: 11/17/19 Prpd: REM Crt: 04/10/18
10N Sulfuric Acid

Glucose Glutamic Acid



4332551
ID: OP_NaOH_00028
Exp: 11/28/19 Prpd: LDT Opn: 04/06/18
Sodium Hydroxide 10N

Calcium Chloride



4469317
ID: W_BODGlucose_00095
Exp: 03/22/20 Prpd: LDC
W_Glucose-Glutamic Acid



4423390
ID: Calcium CL_00050
Exp: 05/09/19 Prpd: LDC 5/31/18
BOD Calcium Chloride reagent

Magnesium Sulfate



4351131
ID: Mg sulfate_00018
Exp: 03/19/20 Prpd: LDC Opn: 04/18/18
BOD reagent Mg. Sulfate



4349516
ID: Ferric CL_00043
Exp: 03/09/20 Prpd: LDC Opn: 04/17/18
BOD Ferric Chloride Regen

Ferric Chloride



4423391
ID: Phos Buffer_00013
Exp: 03/23/20 Prpd: LDC Opn: 07/07/18
BOD reagent

Phosphate Buffer



4420850
ID: W_Polyseed_00050
Exp: 09/07/19 Prpd: LDC
S_Polyseed for BOD

Poly Seed



4351204
ID: Nitrification_00035
Exp: 05/31/21 Prpd: LDC Opn: 04/18/18
S_BOD Nitrification Inhib

Nitrification Inhibitor

Nutrient Mix



4430211
ID: W_Nutrient_00023
Exp: 08/29/18 Prpd: LDC Crt: 06/04/18
BOD Nutrient Mix



4430211
ID: W_Nutrient_00023
Exp: 08/29/18 Prpd: LDC Crt: 06/04/18
BOD Nutrient Mix

ALPHA SPECTROSCOPY

Method A-01-R Th

Isotopic Thorium (Alpha
Spectrometry) by Method A-01-R

Prep Batch: 381166

Preparation, Extraction
Chromatography Resin Actinide
Separation

Alpha Spectroscopy Analysis Detail Report

Prep Batch: 381166

Lab ID: MB 160-381166/1-A
 Client ID:
 Sigma: 2

Analyzed: 08/10/18 18:48
 Detector: AV3
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Ts: 180

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch	
Thorium-230	-0.03130	0.178	0.178	U	pCi/L	1.00	0.295	381888	
Tracer	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	10.64	0.936	1.29		pCi/L	0.157	12.1	87.9	30 - 110

Lab ID: LCS 160-381166/2-A
 Client ID:
 Sigma: 2

Analyzed: 08/10/18 18:48
 Detector: AV4
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Ts: 180

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch	
Thorium-230	9.236	0.925	1.21		pCi/L	1.00	0.283	381889	
Tracer	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	11.98	1.03	1.44		pCi/L	0.163	12.1	98.9	30 - 110

Lab ID: LCSD 160-381166/3-A
 Client ID:
 Sigma: 2

Analyzed: 08/10/18 18:48
 Detector: AV7
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Ts: 180

Analyte	LCSD Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch	
Thorium-230	7.713	0.860	1.08		pCi/L	1.00	0.285	381909	
Tracer	LCSD Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	11.56	1.01	1.40		pCi/L	0.114	12.1	95.4	30 - 110

Lab ID: 160-29476-1
 Client ID: CRC-MW-1
 Sigma: 2

Analyzed: 08/10/18 18:48
 Detector: AV8
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch	
Thorium-230	0.197	0.247	0.248	U	pCi/L	1.00	0.328	381919	
Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	9.06	0.838	1.13		pCi/L	0.131	12.1	74.9	30 - 110

Alpha Spectroscopy Analysis Detail Report

Prep Batch: 381166

Quality Control Summary

Method Blank ID:	Analyte	Parent Result	Spike Added	MB Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
MB 160-381166/1-A	Thorium-230			-0.03130	U	pCi/L							-.35242678
Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-381166/2-A	Thorium-230		8.03	9.236		pCi/L	115	81 - 125	18				1.5091936577
Lab Control Sample Duplicate	Analyte	Parent Result	Spike Added	LCSD Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCSD 160-381166/3-A	Thorium-230		8.03	7.713		pCi/L	96	81 - 125	18	0.67	1.88	1	-.4075591018

Glossary:

Ts = Count Duration, Sample

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Batch Number: 381166 Batch Start Date: 08/08/18 14:32 Batch Analyst: Fox, Kassie NBatch Method: ExtChrom Batch End Date: 08/09/18 18:23

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	Th-229 00023	Th-230 00036			
MB 160-381166/1		ExtChrom, A-01-R		500 mL	0.2 mL				
LCS 160-381166/2		ExtChrom, A-01-R		500 mL	0.2 mL	0.2 mL			
LCSD 160-381166/3		ExtChrom, A-01-R		500 mL	0.2 mL	0.2 mL			
160-29476-H-1	CRC-MW-1	ExtChrom, A-01-R	T	500.67 mL	0.2 mL				

Batch Notes	
Balance ID	1125353055
Analyst ID - Column	NMN per CMM
Column Date	08/09/2018
Analyst ID - CoPrecipitation	CMM
CoPrecipitation Date	08/09/2018
Pipette ID	RAD117
Analyst ID - Reagent Drop Witness	CMM per KNF
Analyst ID - Reagent Drop	KNF
SOP Number	ST-RC-0100, ST-RC-242

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Sample Name: MB 160-381166/1-A
SampleType: Blank
: MB 160-381166/1-A
Sample Collection Date: 8/9/2018 6:35:00PM

Batch Name: 381166
AnalysisID: 736756

Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.5000L
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

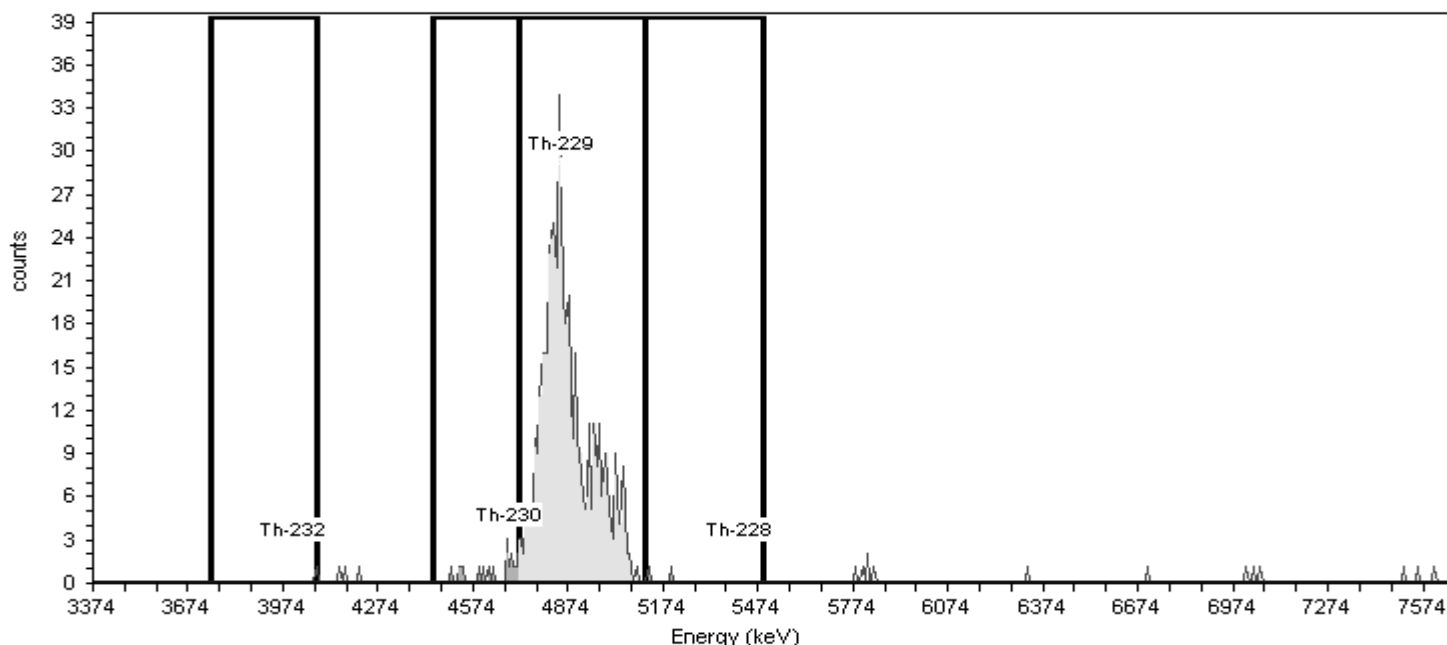
Tracer

Tracer Nuclide: Th-229
Tracer Recovery: 86.18%

Acquisition

Detector: AV3
Serial Number: 49-202 FF7
Acquisition Start Date: 8/10/2018 6:48:21PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/13/2018 12:11:20PM
Background Info: Sample: ICB;AV3; Det: AV3; Spectrum #2;
Jul-13-2018 12:11

Calibration Name: IC-8877;AV3-05142018
Calibration Date: 5/14/2018 6:25:15PM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.44% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:45:52PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	.0	100.2	1	1.4140	-0.87	-0.021	pCi/L
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	27.9	99.7	18	1.8634	16.14	0.385	pCi/L
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	99.1	99.6	509	1.3009	507.70	10.440	pCi/L
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	23.6	99.8	2	1.3125	0.69	0.016	pCi/L

Sample Name: MB 160-381166/1-A
SampleType: Blank
: MB 160-381166/1-A
Sample Collection Date: 8/9/2018 6:35:00PM

Batch Name: 381166
AnalysisID: 736937

Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Detector: AV3
Serial Number: 49-202 FF7
Acquisition Start Date: 8/10/2018 6:48:21PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/13/2018 12:11:20PM
Background Info: Sample: ICB;AV3; Det: AV3; Spectrum #2;
Jul-13-2018 12:11

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.5000L
Aliquot: N/A Aliquot Fraction: N/A

Batch

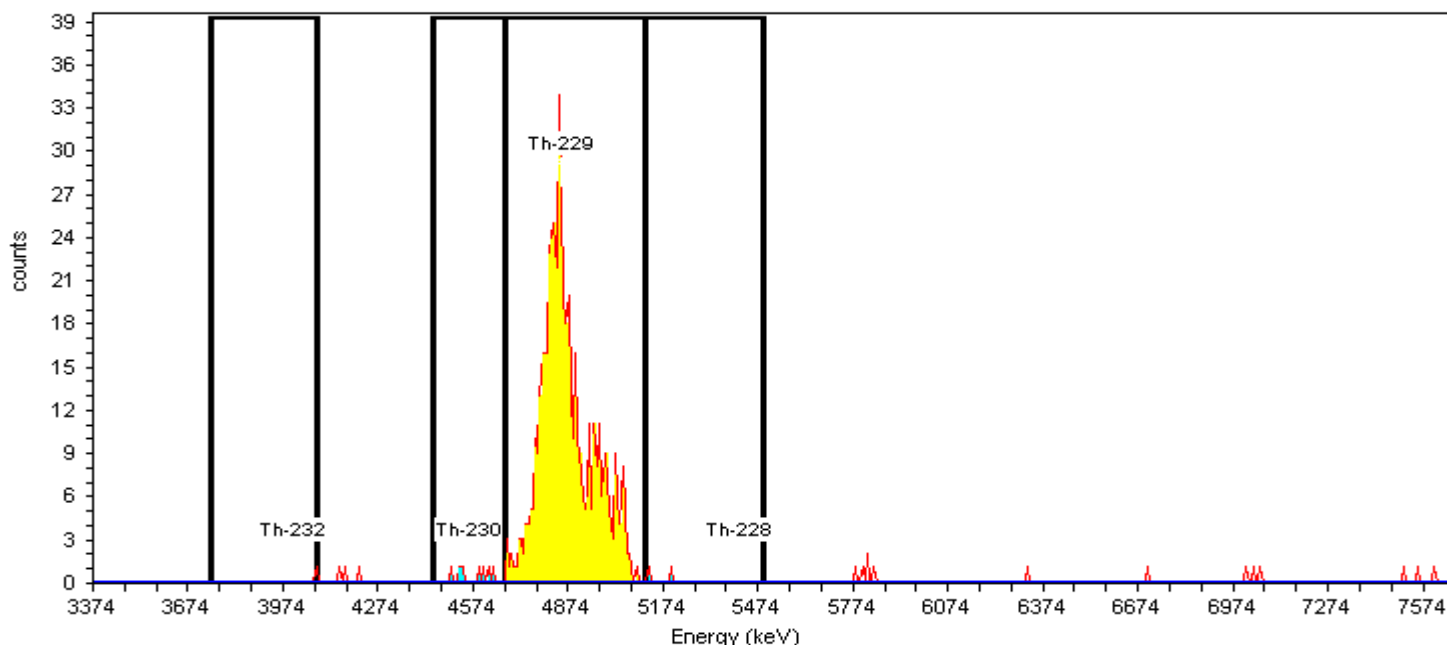
Analyst: 60040

Tracer

Tracer Nuclide: Th-229
Tracer Recovery: 87.85%

Acquisition

Calibration Name: IC-8877;AV3-05142018
Calibration Date: 5/14/2018 6:25:15PM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.44% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:45:52PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Thorium
MDA Source: Background

Manual Integration for tailing
RTM 8/13/18

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	.0	100.2	1	1.4140	-0.87	-0.020	pCi/L
Th-230	4560.2	4,687.5	-127.3	4448.3	4672.0	45.9	99.7	7	1.1250	5.88	0.137	pCi/L
Th-229	4848.0	4,845.3	2.7	4672.0	5119.5	99.1	99.8	520	1.6875	518.31	10.642	pCi/L
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	23.6	99.8	2	1.3125	0.69	0.016	pCi/L

Sample Name: LCS 160-381166/2-A
SampleType: Control
: LCS 160-381166/2-A
Sample Collection Date: 8/9/2018 6:35:00PM

Batch Name: 381166
AnalysisID: 736757

Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Detector: AV4
Serial Number: 46-033Q4
Acquisition Start Date: 8/10/2018 6:48:23PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:42:06PM
Background Info: Sample: ICB;AV4; Det: AV4; Spectrum #1;
Jul-12-2018 13:42

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.5000L
Aliquot: N/A Aliquot Fraction: N/A

Batch

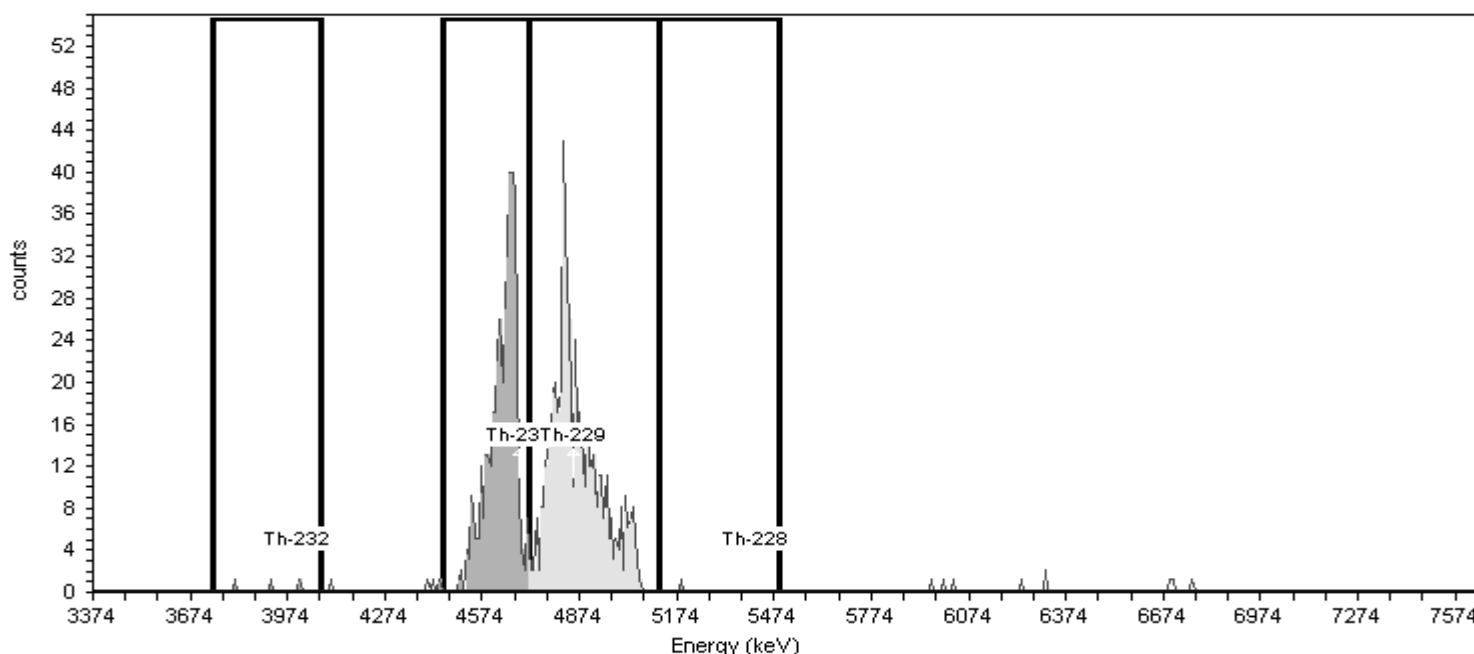
Analyst: 60040

Tracer

Tracer Nuclide: Th-229
Tracer Recovery: 98.92%

Acquisition

Calibration Name: IC-9520;AV4-05142018
Calibration Date: 5/14/2018 6:25:34PM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.79% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:45:51PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	44.5	100.2	3	1.3125	1.69	0.037	pCi/L
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	33.8	99.7	423	0.9375	422.31	9.405	pCi/L
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	87.6	99.6	545	1.5000	543.44	11.982	pCi/L
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	44.5	99.8	1	0.5625	0.44	0.010	pCi/L

Sample Name: LCSD 160-381166/3-A
SampleType: Control
: LCSD 160-381166/3-A
Sample Collection Date: 8/9/2018 6:35:00PM

Batch Name: 381166
AnalysisID: 736758

Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.5000L
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

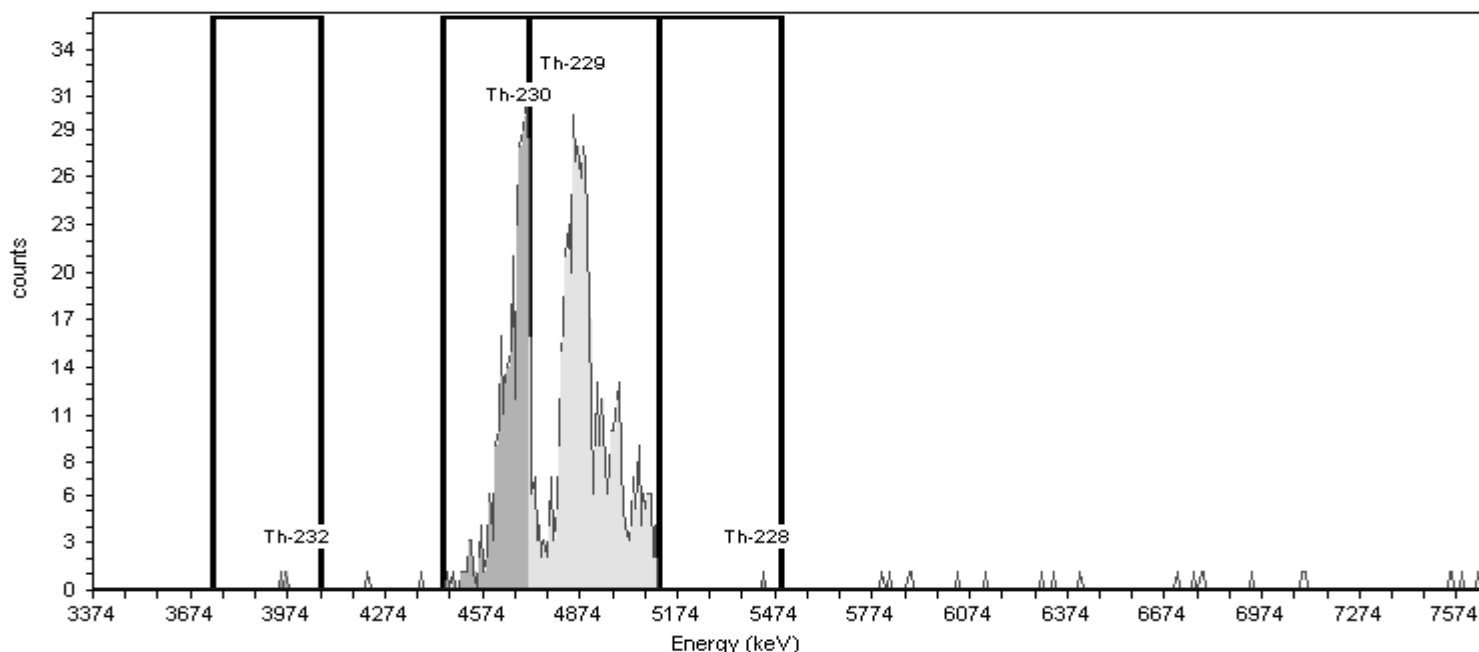
Tracer

Tracer Nuclide: Th-229
Tracer Recovery: 102.47%

Acquisition

Detector: AV7
Serial Number: 48-158EE5
Acquisition Start Date: 8/10/2018 6:48:25PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:27PM
Background Info: Sample: ICB;AV7; Det: AV7; Spectrum #1;
Jul-12-2018 13:39

Calibration Name: IC-9793;AV7-05142018
Calibration Date: 5/14/2018 6:26:13PM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.98% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:45:52PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	43.4	100.2	2	0.7500	1.25	0.027	pCi/L
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	344.4	99.7	322	0.3750	322.01	6.865	pCi/L
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	90.7	99.6	568	0.7500	567.63	12.413	pCi/L
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	39.8	99.8	1	1.6713	-0.67	-0.014	pCi/L

Sample Name: LCSD 160-381166/3-A
SampleType: Control
: LCSD 160-381166/3-A
Sample Collection Date: 8/9/2018 6:35:00PM

Batch Name: 381166
AnalysisID: 736936

Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Detector: AV7
Serial Number: 48-158EE5
Acquisition Start Date: 8/10/2018 6:48:25PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:27PM
Background Info: Sample: ICB;AV7; Det: AV7; Spectrum #1;
Jul-12-2018 13:39

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.5000L
Aliquot: N/A Aliquot Fraction: N/A

Batch

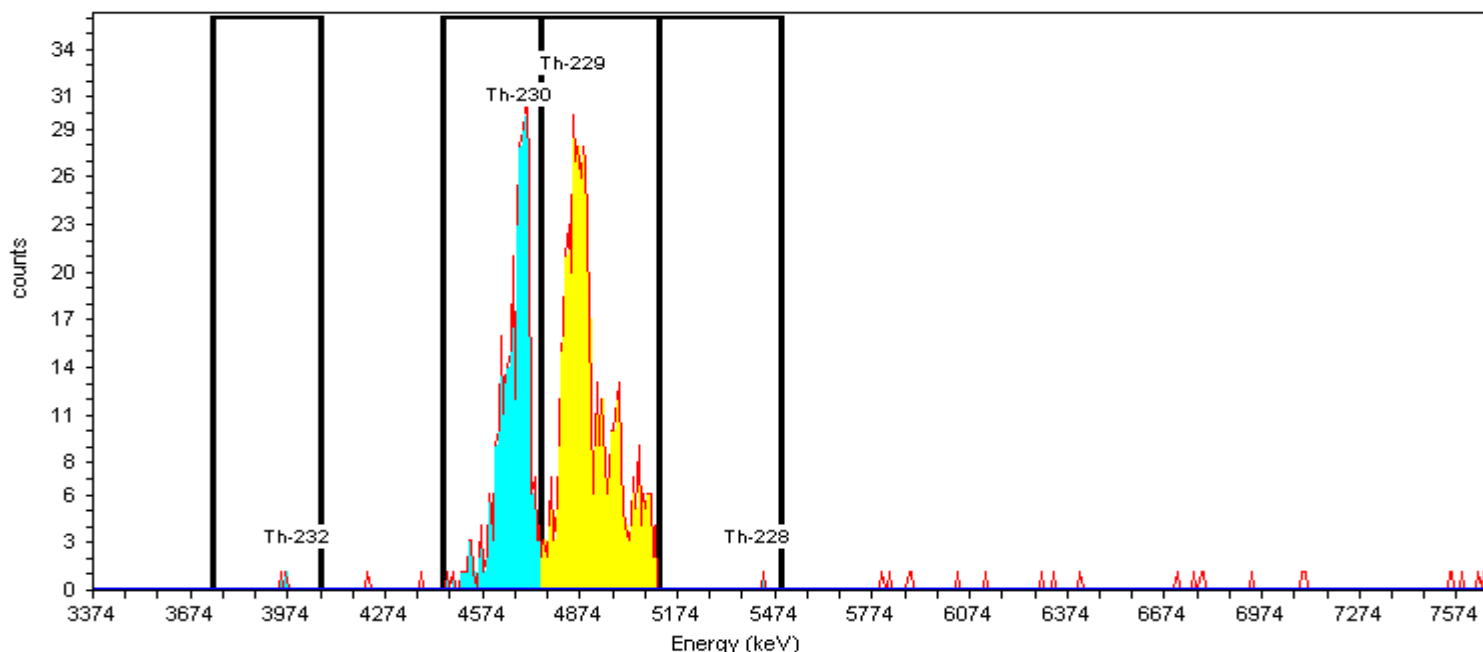
Analyst: 60040

Tracer

Tracer Nuclide: Th-229
Tracer Recovery: 95.43%

Acquisition

Calibration Name: IC-9793;AV7-05142018
Calibration Date: 5/14/2018 6:26:13PM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.98% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:45:52PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Thorium
MDA Source: Background

Manual Integration for tailing
RTM 8/13/18

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	43.4	100.2	2	0.7500	1.25	0.028	pCi/L
Th-230	4688.0	4,687.5	0.5	4448.3	4754.1	43.4	99.7	345	0.7500	344.25	7.881	pCi/L
Th-229	4848.0	4,845.3	2.7	4754.1	5119.5	90.7	99.6	529	0.3750	528.63	11.560	pCi/L
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	39.8	99.8	1	1.6713	-0.67	-0.015	pCi/L

Sample Name: 160-29476-H-1-A
SampleType: Sample
: 160-29476-H-1-A
Sample Collection Date: 7/11/2018 1:55:00PM

Batch Name: 381166
AnalysisID: 736759

Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Sample

Spectrum #1 Analysis #1
Sample Volume : 0.5007L
Aliquot: N/A Aliquot Fraction: N/A

Batch

Analyst: 60040

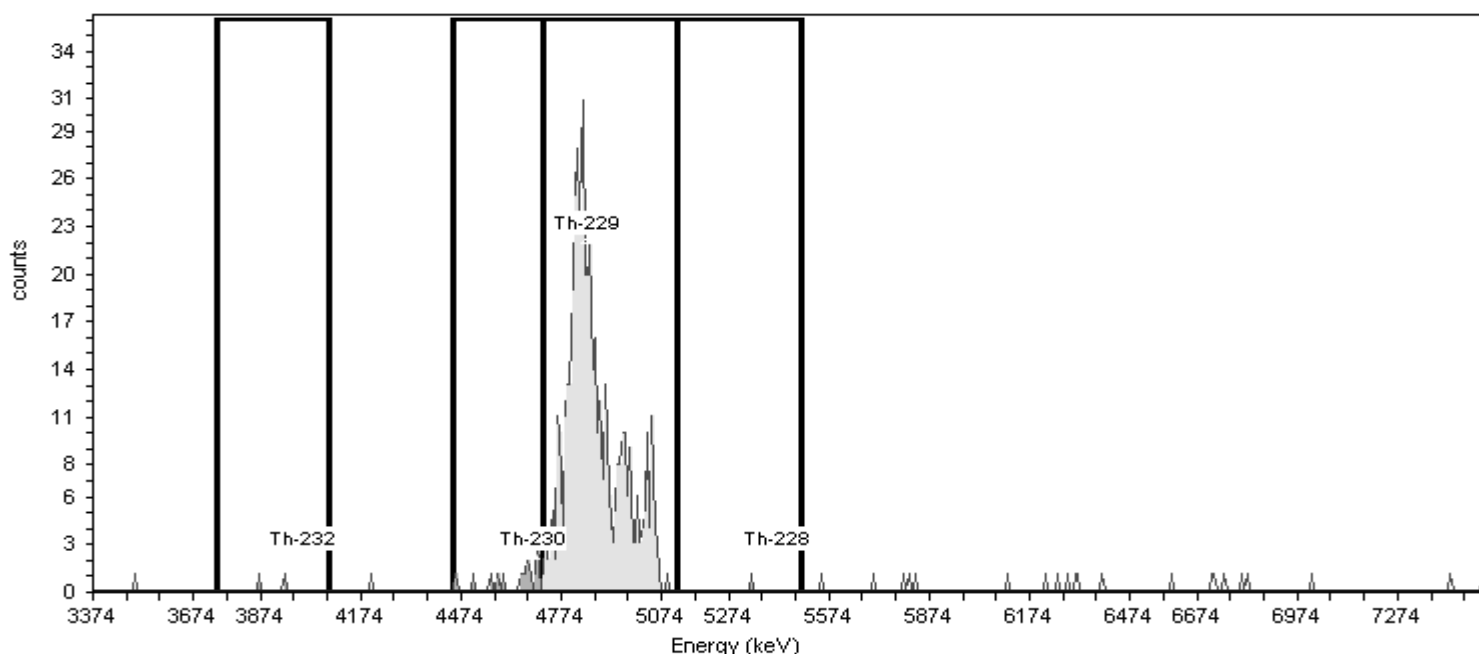
Tracer

Tracer Nuclide: Th-229
Tracer Recovery: 74.93%

Acquisition

Detector: AV8
Serial Number: 41-137Q6
Acquisition Start Date: 8/10/2018 6:48:27PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:28PM
Background Info: Sample: ICB;AV8; Det: AV8; Spectrum #1;
Jul-12-2018 13:39

Calibration Name: IC-9795;AV8-05142018
Calibration Date: 5/14/2018 6:26:27PM
Gain = 7.4575 keV / Ch
Energy Cal: Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 25.96% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:45:51PM
MDA Constants: $K\alpha = 1.65$, $K\beta = 1.65$

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	44.4	100.2	2	0.3750	1.63	0.042	pCi/L
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	38.2	99.7	16	1.8750	14.19	0.366	pCi/L
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	85.7	99.6	470	1.1250	468.94	9.064	pCi/L
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	44.5	99.8	1	0.7500	0.25	0.006	pCi/L

Method A-01-R U

Isotopic Uranium (Alpha
Spectrometry) by Method A-01-R

Prep Batch: 377736

Preparation, Extraction
Chromatography Resin Actinide
Separation

Alpha Spectroscopy Analysis Detail Report

Prep Batch: 377736

Lab ID: MB 160-377736/1-A
 Client ID:
 Sigma: 2

Analyzed: 08/03/18 14:29
 Detector: AV147
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Ts: 180

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch	
Uranium-234	0.02174	0.0739	0.0739	U	pCi/L	1.00	0.169	380260	
Uranium-235	-0.01739	0.0201	0.0201	U	pCi/L	1.00	0.176	380260	
Uranium-238	-0.01395	0.0161	0.0162	U	pCi/L	1.00	0.141	380260	
Tracer	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	11.23	0.952	1.34		pCi/L	0.177	13.8	81.0	30 - 110

Lab ID: LCS 160-377736/2-A
 Client ID:
 Sigma: 2

Analyzed: 08/03/18 14:29
 Detector: AV148
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Ts: 180

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch	
Uranium-234	12.62	1.18	1.59		pCi/L	1.00	0.203	380261	
Uranium-238	13.18	1.20	1.63		pCi/L	1.00	0.125	380261	
Tracer	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	9.595	0.855	1.18		pCi/L	0.155	13.8	69.2	30 - 110

Lab ID: 160-29476-1
 Client ID: CRC-MW-1
 Sigma: 2

Analyzed: 08/06/18 22:38
 Detector: AV147
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Ts: 720

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch	
Uranium-234	183	4.60	16.1		pCi/L	1.00	0.353	380834	
Uranium-235	9.10	1.15	1.38		pCi/L	1.00	0.342	380834	
Uranium-238	185	4.62	16.2		pCi/L	1.00	0.274	380834	
Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	2.41	0.224	0.302	X	pCi/L	0.0857	13.8	17.4	30 - 110

Lab ID: 160-29476-1 DU
 Client ID: CRC-MW-1
 Sigma: 2

Analyzed: 08/06/18 22:38
 Detector: AV148
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Ts: 720

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	195.3	4.66	17.1		pCi/L	1.00	0.380	380835
Uranium-235	10.52	1.21	1.50		pCi/L	1.00	0.234	380835
Uranium-238	195.2	4.65	17.0		pCi/L	1.00	0.188	380835

Alpha Spectroscopy Analysis Detail Report

Prep Batch: 377736

Tracer	DU Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	2.367	0.215	0.293	X	pCi/L	0.0734	13.8	17.1	30 - 110

Quality Control Summary

Method Blank ID:	Analyte	Parent Result	Spike Added	MB Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
MB 160-377736/1-A	Uranium-234			0.02174	U	pCi/L							.58828424
MB 160-377736/1-A	Uranium-235			-0.01739	U	pCi/L							-1.72748591
MB 160-377736/1-A	Uranium-238			-0.01395	U	pCi/L							-1.72748591
Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-377736/2-A	Uranium-234		12.7	12.62		pCi/L	99	84 - 120					-.0999662896
LCS 160-377736/2-A	Uranium-238		13.0	13.18		pCi/L	101	83 - 121					.1414605571
Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29476-1	Uranium-234	183		195.3		pCi/L			6	0.36	1.03	1	
160-29476-1	Uranium-235	9.10		10.52		pCi/L			14	0.49	1.39	1	
160-29476-1	Uranium-238	185		195.2		pCi/L			5	0.29	0.83	1	

Glossary:

Ts = Count Duration, Sample

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Batch Number: 377736 Batch Start Date: 07/24/18 18:01 Batch Analyst: Fox, Kassie NBatch Method: ExtChrom Batch End Date: 08/03/18 08:24

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	U-232 00040	UNAT 00014			
MB 160-377736/1		ExtChrom, A-01-R		500 mL	0.2 mL				
LCS 160-377736/2		ExtChrom, A-01-R		500 mL	0.2 mL	0.2 mL			
160-29476-G-1	CRC-MW-1	ExtChrom, A-01-R	T	500.84 mL	0.2 mL				
160-29476-G-1 DU	CRC-MW-1	ExtChrom, A-01-R	T	500.49 mL	0.2 mL				

Batch Notes	
Balance ID	1125353055
Analyst ID - Column	nmn
Column Date	8/2/18
Analyst ID - CoPrecipitation	nmn
CoPrecipitation Date	8/3/18
Pipette ID	RAD117
Analyst ID - Reagent Drop Witness	CMM per KNF
Analyst ID - Reagent Drop	KNF
SOP Number	ST-RC-0100, ST-RC-0242

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Sample Name: MB 160-377736/1-A Type: Blank
Spectrum #1 Analysis #1
: MB 160-377736/1-A
Sample Collection Date: 8/3/2018 8:27:00AM
Comment:

Sample

Sample Volume : 0.50 Sample Units: L
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch Name: 377736
AnalysisResultsID: 224488
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

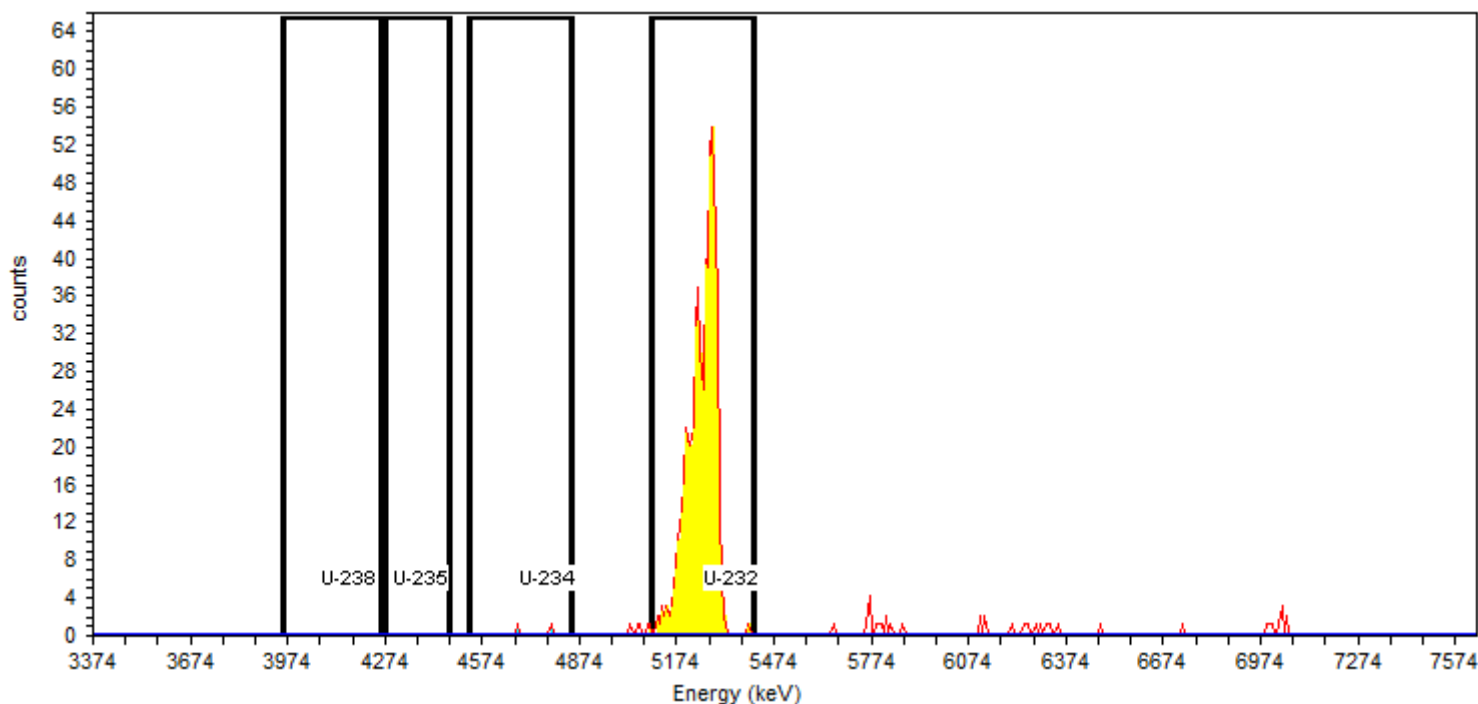
Tracer

Tracer Nuclide: U-232
Tracer Recovery: 80.98%

Detector: AV147 SN: 50-05/R1
Acquisition Start Date: 8/3/2018 2:29:10PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:12PM
Bkgd Info: Sample: ICB;AV147; Det: AV147; Spectrum #1; 7/21/2018
9:28:12 PM

Acquisition

Energy Calibration: IC-7107;AV147-20171113
Efficiency Calibration:IC-7107;AV147-20171113
Calibration Date: 11/13/2017 12:21:03PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.92% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/3/2018 2:27:55PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	.0	100.0	0	0.5625	-0.56	-1.395E-002	pCi/L
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	0.5625	-0.56	-1.739E-002	pCi/L
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	44.5	99.8	2	1.1250	0.88	2.174E-002	pCi/L
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	92.7	100.1	562	2.6250	559.38	1.200E+001	pCi/L

Sample Name: LCS 160-377736/2-A Type: Control
Spectrum #1 Analysis #1
: LCS 160-377736/2-A
Sample Collection Date: 8/3/2018 8:27:00AM
Comment:

Sample

Sample Volume : 0.50 Sample Units: L
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch Name: 377736
AnalysisResultsID: 224489
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

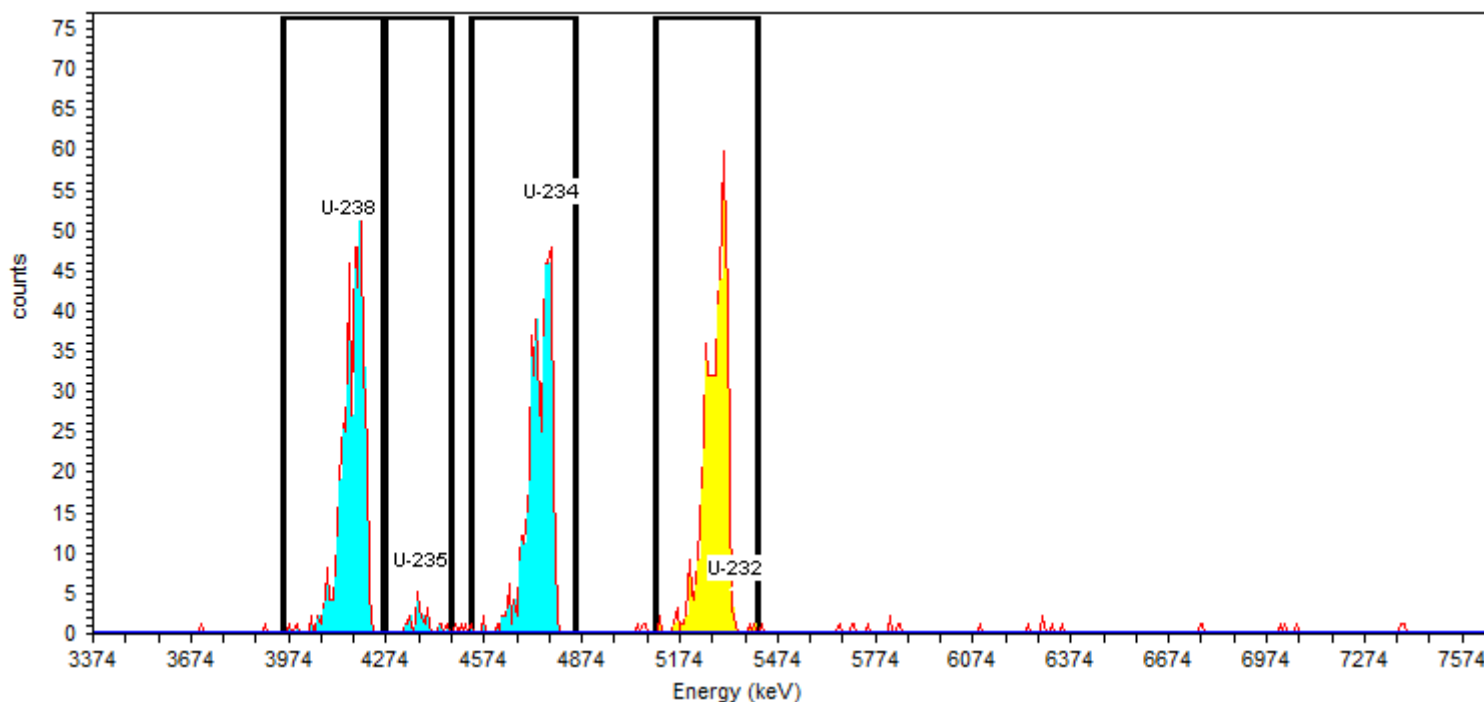
Tracer

Tracer Nuclide: U-232
Tracer Recovery: 69.22%

Detector: AV148 SN: 50-05/R2
Acquisition Start Date: 8/3/2018 2:29:10PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:13PM
Bkgd Info: Sample: ICB;AV148; Det: AV148; Spectrum #1; 7/21/2018 9:28:13 PM

Acquisition

Energy Calibration: IC-8874;AV148-20171113a
Efficiency Calibration:IC-8874;AV148-20171113a
Calibration Date: 11/13/2017 12:24:55PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.37% +/- 0.38% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/3/2018 2:27:54PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	72.0	100.0	481	0.1875	480.81	1.318E+001	pCi/L
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	19.9	80.2	23	0.1875	22.81	7.799E-001	pCi/L
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	85.3	99.8	461	1.5000	459.50	1.262E+001	pCi/L
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	81.5	100.1	508	2.0625	505.94	1.026E+001	pCi/L

Sample Name: 160-29476-G-1-C Type: Sample
Spectrum #1 Analysis #1
: 160-29476-G-1-C
Sample Collection Date: 7/11/2018 1:55:00PM
Comment:

Sample

Sample Volume : 0.50 Sample Units: L
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch Name: 377736
AnalysisResultsID: 224738
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

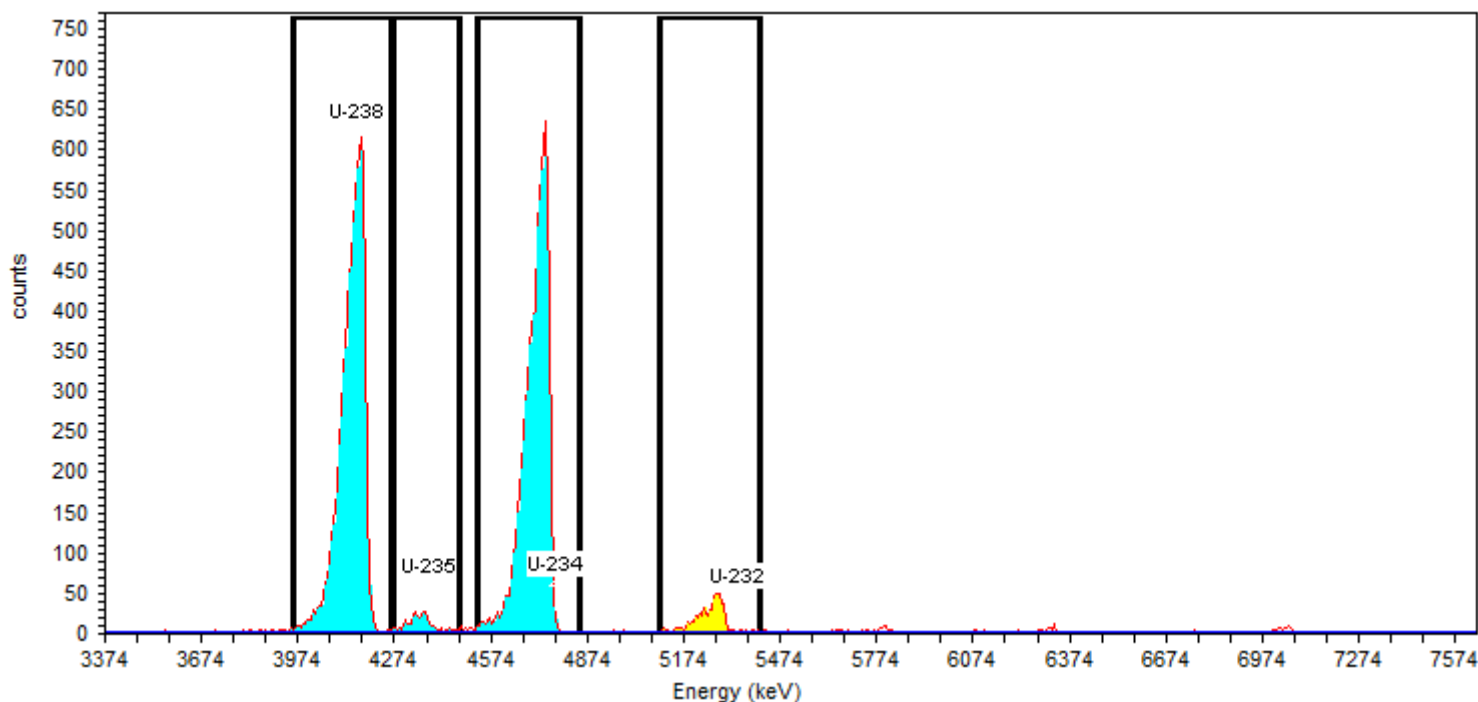
Tracer

Tracer Nuclide: U-232
Tracer Recovery: 17.43%

Detector: AV147 SN: 50-05/R1
Acquisition Start Date: 8/6/2018 10:38:22PM
Live Time: 720.00 min.
Real Time: 720.01 min.
Background Date: 7/21/2018 9:28:12PM
Bkgd Info: Sample: ICB;AV147; Det: AV147; Spectrum #1; 7/21/2018
9:28:12 PM

Acquisition

Energy Calibration: IC-7107;AV147-20171113
Efficiency Calibration:IC-7107;AV147-20171113
Calibration Date: 11/13/2017 12:21:03PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.92% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/6/2018 10:37:19PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	75.8	100.0	6451	2.2500	6448.75	1.855E+002 pCi/L	
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	59.2	80.2	256	2.2500	253.75	9.099E+000 pCi/L	
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	76.2	99.8	6362	4.5000	6357.50	1.832E+002 pCi/L	
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	76.8	100.1	492	10.5000	481.50	2.578E+000 pCi/L	

Sample Name: 160-29476-G-1-D DU Type: Sample
Spectrum #1 Analysis #1
: 160-29476-G-1-D DU
Sample Collection Date: 7/11/2018 1:55:00PM
Comment:

Sample

Sample Volume : 0.50 Sample Units: L
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch Name: 377736
AnalysisResultsID: 224739
Description:

Batch

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

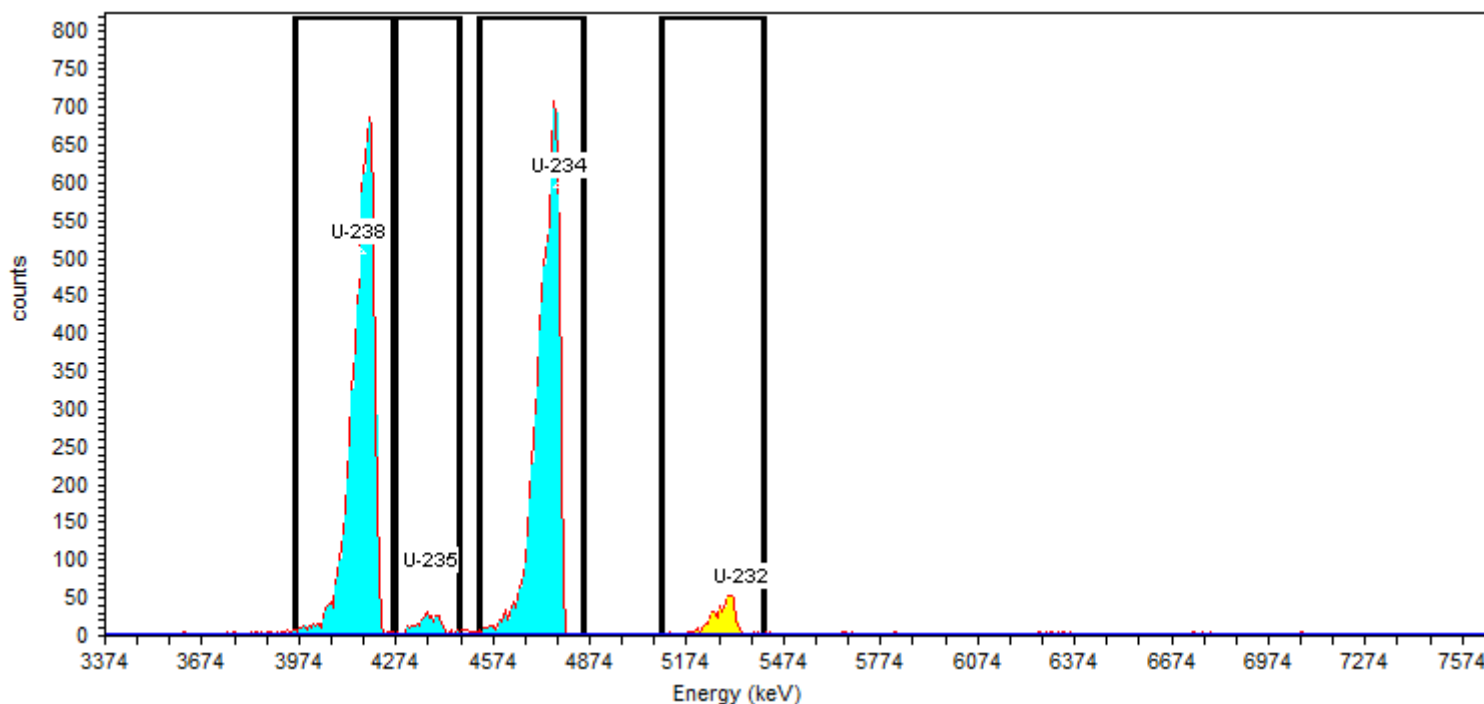
Tracer

Tracer Nuclide: U-232
Tracer Recovery: 17.10%

Detector: AV148 SN: 50-05/R2
Acquisition Start Date: 8/6/2018 10:38:22PM
Live Time: 720.00 min.
Real Time: 720.07 min.
Background Date: 7/21/2018 9:28:13PM
Bkgd Info: Sample: ICB;AV148; Det: AV148; Spectrum #1; 7/21/2018 9:28:13 PM

Acquisition

Energy Calibration: IC-8874;AV148-20171113a
Efficiency Calibration:IC-8874;AV148-20171113a
Calibration Date: 11/13/2017 12:24:55PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.37% +/- 0.38% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/6/2018 10:37:19PM
MDA Constants: $K\alpha = 1.64$, $K\beta = 1.64$

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diff keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	70.9	100.0	7042	0.7500	7041.25	1.952E+002 pCi/L	
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	85.6	80.2	305	0.7500	304.25	1.052E+001 pCi/L	
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	76.6	99.8	7034	6.0000	7028.00	1.953E+002 pCi/L	
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	76.2	100.1	508	8.2500	499.75	2.531E+000 pCi/L	

Daily Checks

Alpha Spectroscopy Daily Pulser Check

Analysis Date: 08/03/18

		Gross Counts			FWHM (keV)			Pulser Center			Energy (keV)		
Detector	Analysis Date	Result	Criteria	P/F	Result	Criteria	P/F	Result	Criteria	P/F	Result	Criteria	P/F
AV147	08/03/18 12:32	5999	5685.0-6283.4	Pass	19.6	10-20	Pass	215.9	211.9-221.9	Pass	4977	4944.8-5024.8	Pass
AV148	08/03/18 12:32	6013	5703.5-6303.9	Pass	14.4	10-20	Pass	222.0	216.9-226.9	Pass	5022	4981.7-5061.7	Pass

Analysis Date: 08/06/18

		Gross Counts			FWHM (keV)			Pulser Center			Energy (keV)		
Detector	Analysis Date	Result	Criteria	P/F	Result	Criteria	P/F	Result	Criteria	P/F	Result	Criteria	P/F
AV147	08/06/18 21:31	6002	5685.0-6283.4	Pass	19.8	10-20	Pass	216.0	211.9-221.9	Pass	4978	4944.8-5024.8	Pass
AV148	08/06/18 21:31	5979	5703.5-6303.9	Pass	16.2	10-20	Pass	222.0	216.9-226.9	Pass	5023	4981.7-5061.7	Pass

Analysis Date: 08/10/18

		Gross Counts			FWHM (keV)			Pulser Center			Energy (keV)		
Detector	Analysis Date	Result	Criteria	P/F	Result	Criteria	P/F	Result	Criteria	P/F	Result	Criteria	P/F
AV3	08/10/18 14:23	7228	6900.2-7626.5	Pass	13.2	10-20	Pass	225.0	220.0-230.0	Pass	5045	5004.9-5084.9	Pass
AV4	08/10/18 14:23	7393	7013.8-7752.1	Pass	13.6	10-20	Pass	225.0	220.0-230.0	Pass	5045	5005.1-5085.1	Pass
AV7	08/10/18 14:23	7342	6979.5-7714.2	Pass	16.5	10-20	Pass	233.2	226.3-236.3	Pass	5106	5052.3-5132.3	Pass
AV8	08/10/18 14:23	7378	7015.5-7753.9	Pass	14.9	10-20	Pass	224.0	219.0-229.0	Pass	5038	4997.4-5077.4	Pass

Sample Name: Pulser;AV3

Comment:

Sample

Spectrum #25 Analysis #1

Batch

Batch Name: July2018a

Description:

Analyst: 60040

Acquisition

Detector: AV3 , SN: 49-202 FF7

Acquisition Start Date: 8/10/2018 2:23:02PM

Live Time: 1.00 min.

Real Time: 1.01 min.

Calibration Name: IC-8877;AV3-05142018

Calibration Date: 5/14/2018 6:25:15PM

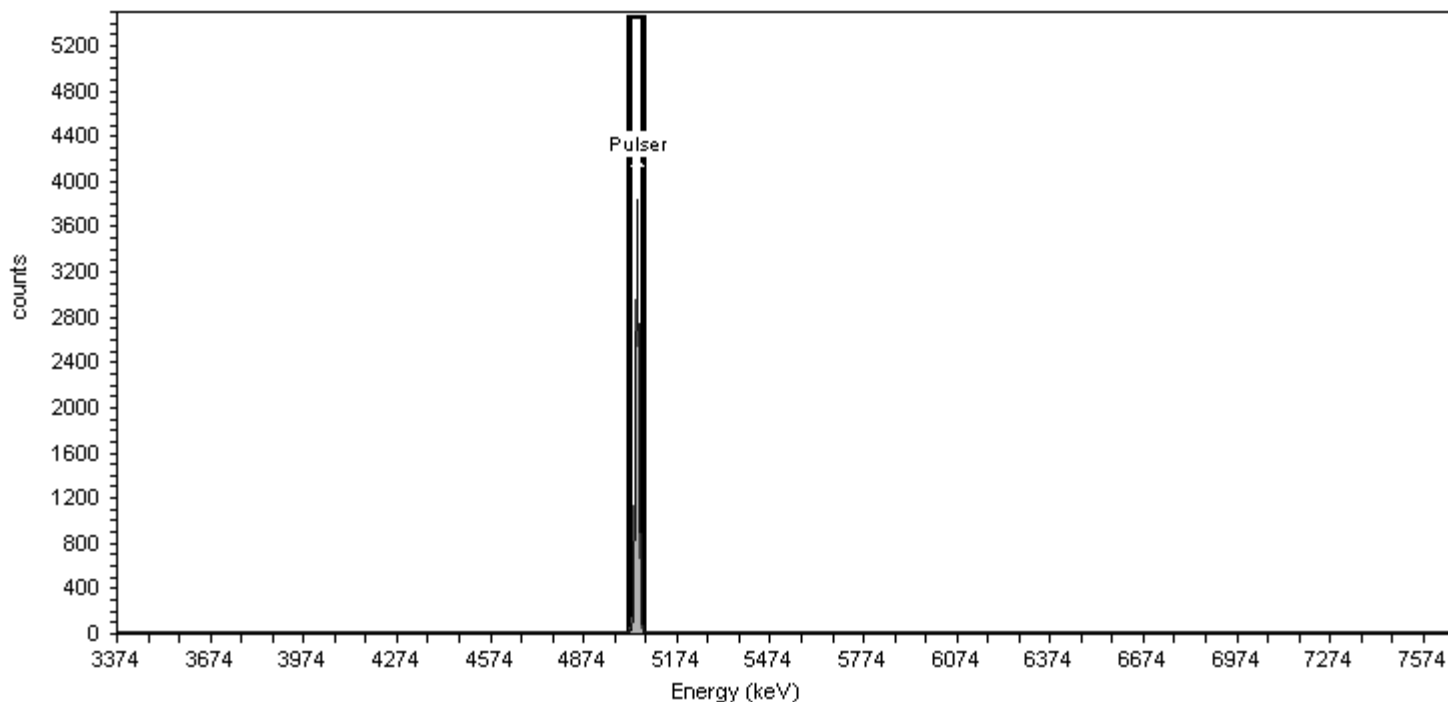
Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 24.44% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Peak Fit Analysis

Nuclide Summary (Peak Search)

Nuclide	Peak Energy keV	Start Energy keV	End Energy keV	FWHM keV	Fit Area	Gross Counts
Pulser	5045.093	5022.652	5067.534	13.18	7,254.99	7,227.85

Sample Name: Pulser;AV4

Comment:

Sample

Spectrum #25 Analysis #1

Batch

Batch Name: July2018a

Description:

Analyst: 60040

Acquisition

Detector: AV4 , SN: 46-033Q4

Acquisition Start Date: 8/10/2018 2:23:03PM

Live Time: 1.00 min.

Real Time: 1.01 min.

Calibration Name: IC-9520;AV4-05142018

Calibration Date: 5/14/2018 6:25:34PM

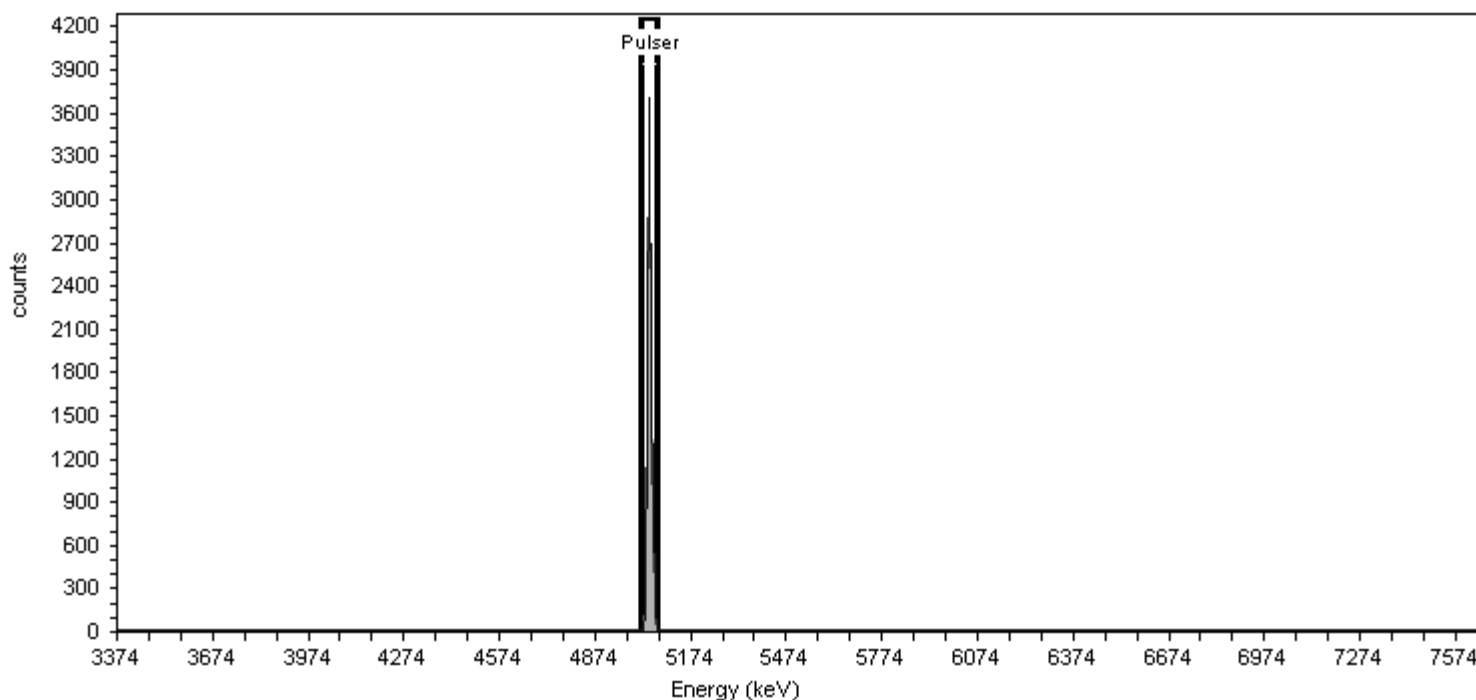
Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 22.79% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: Peak Fit Analysis

Nuclide Summary (Peak Search)

Nuclide	Peak Energy keV	Start Energy keV	End Energy keV	FWHM keV	Fit Area	Gross Counts
Pulser	5045.064	5021.841	5068.286	13.64	7,246.35	7,393.27

Sample Name: Pulser;AV7

Comment:

Sample

Spectrum #25 Analysis #1

Batch

Batch Name: July2018a

Description:

Analyst: 60040

Acquisition

Detector: AV7 , SN: 48-158EE5

Acquisition Start Date: 8/10/2018 2:23:04PM

Live Time: 1.00 min.

Real Time: 1.01 min.

Calibration Name: IC-9793;AV7-05142018

Calibration Date: 5/14/2018 6:26:13PM

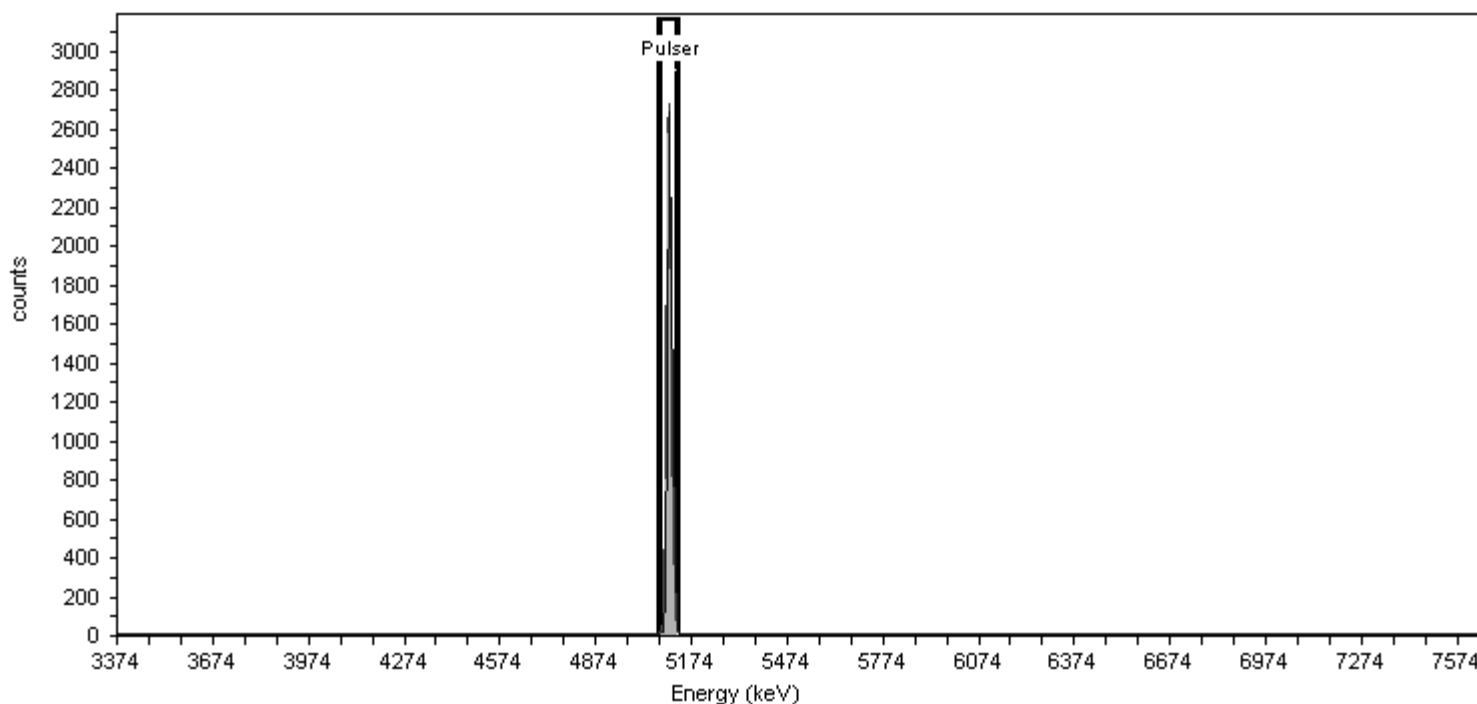
Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 22.98% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Peak Fit Analysis

Nuclide Summary (Peak Search)

Nuclide	Peak Energy keV	Start Energy keV	End Energy keV	FWHM keV	Fit Area	Gross Counts
Pulser	5105.754	5077.745	5133.763	16.46	6,426.71	7,341.53

Sample Name: Pulser;AV8

Comment:

Sample

Spectrum #25 Analysis #1

Batch

Batch Name: July2018a

Description:

Analyst: 60040

Acquisition

Detector: AV8 , SN: 41-137Q6

Acquisition Start Date: 8/10/2018 2:23:06PM

Live Time: 1.00 min.

Real Time: 1.01 min.

Calibration Name: IC-9795;AV8-05142018

Calibration Date: 5/14/2018 6:26:27PM

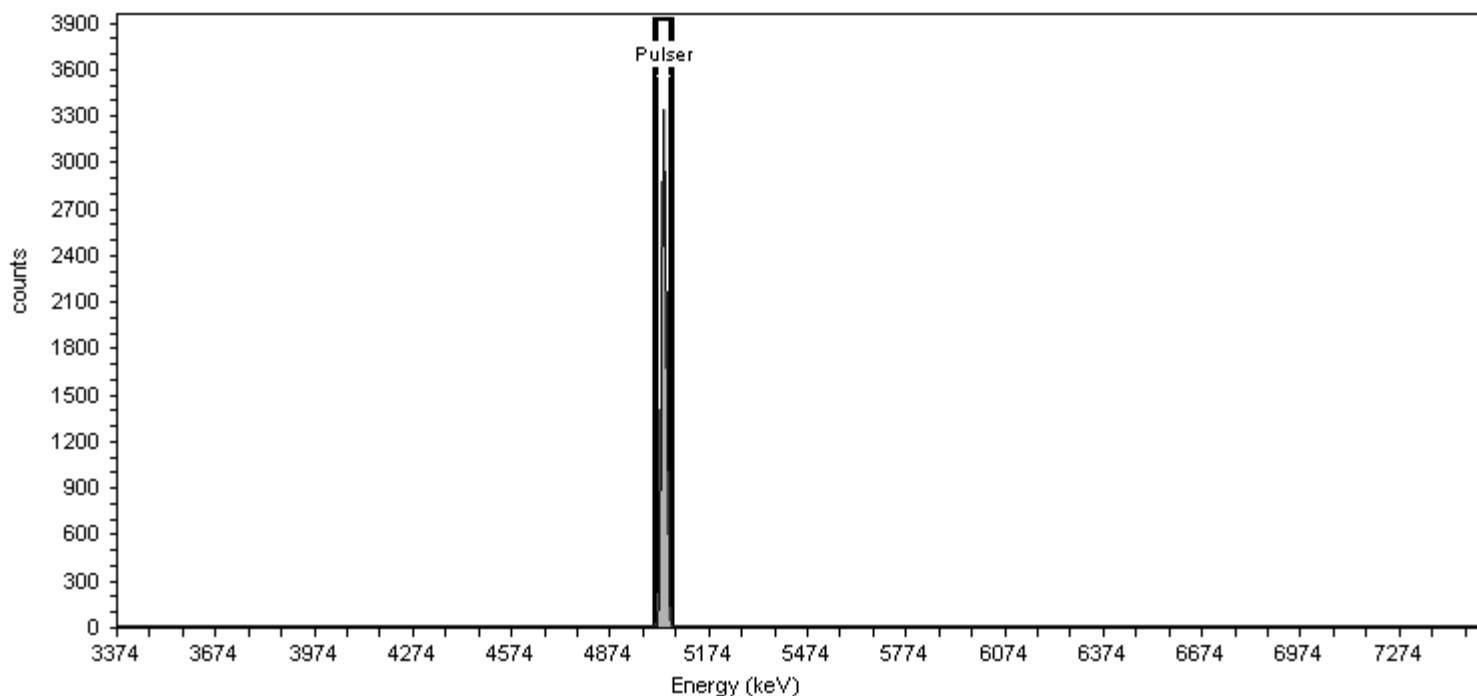
Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 25.96% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: Peak Fit Analysis

Nuclide Summary (Peak Search)

Nuclide	Peak Energy keV	Start Energy keV	End Energy keV	FWHM keV	Fit Area	Gross Counts
Pulser	5037.807	5012.483	5063.130	14.88	7,140.19	7,377.82

Sample Name: Pulser;AV147

Comment:

Sample

Spectrum #7 Analysis #1

Batch

Batch Name: July2018a

Description:

Acquisition

Detector: AV147 , SN: 50-05/R1

Acquisition Start Date: 8/3/2018 12:32:39PM

Live Time: 1.00 min.

Real Time: 1.00 min.

Calibration Name: IC-7107;AV147-20171113

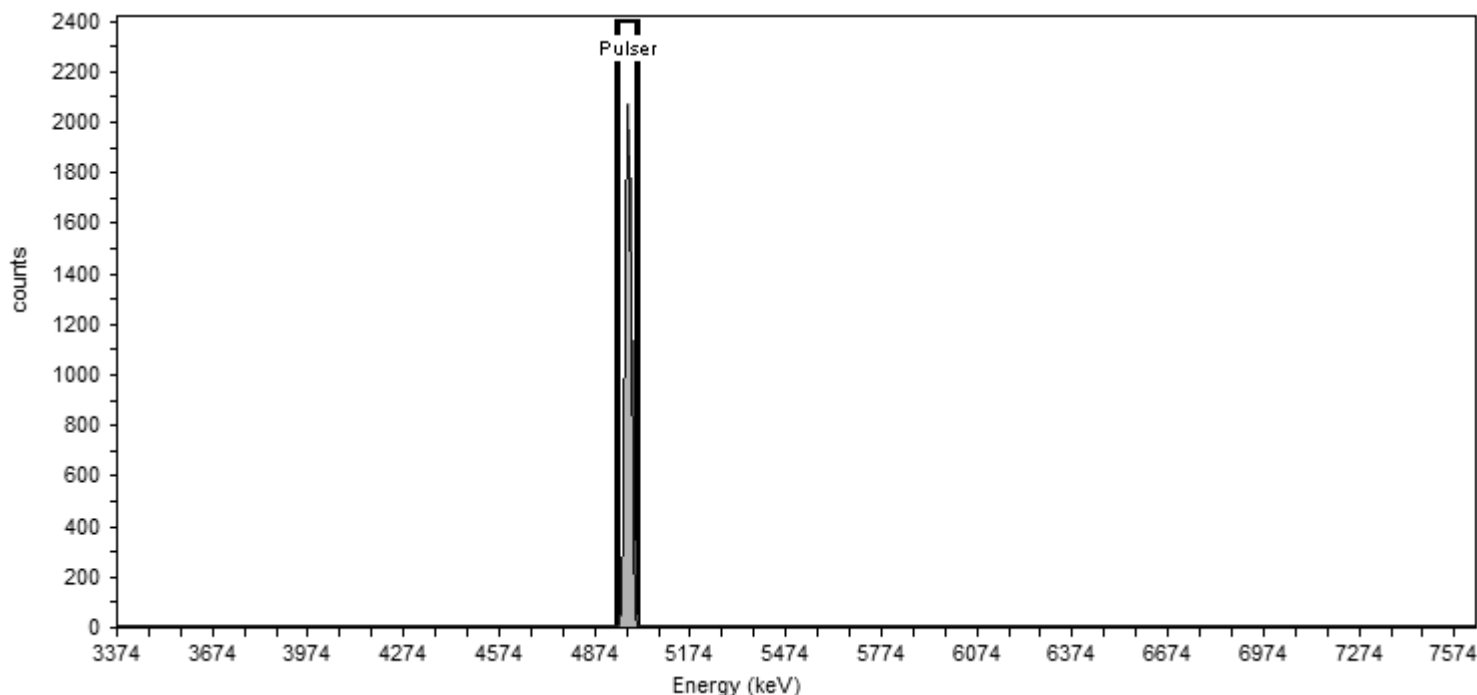
Calibration Date: 11/13/2017 12:21:03PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²



General Analysis

Analysis Method: Peak Fit Analysis

Nuclide Summary (Peak Search)

Nuclide	Peak Energy keV	Start Energy keV	End Energy keV	FWHM keV	Fit Area	Gross Counts
Pulser	4977.175	4943.800	5010.551	19.61	5,826.93	5,999.39

Sample Name: Pulser;AV147

Comment:

Sample

Spectrum #9 Analysis #1

Batch

Batch Name: July2018a

Description:

Acquisition

Detector: AV147 , SN: 50-05/R1

Acquisition Start Date: 8/6/2018 9:31:26PM

Live Time: 1.00 min.

Real Time: 1.00 min.

Calibration Name: IC-7107;AV147-20171113

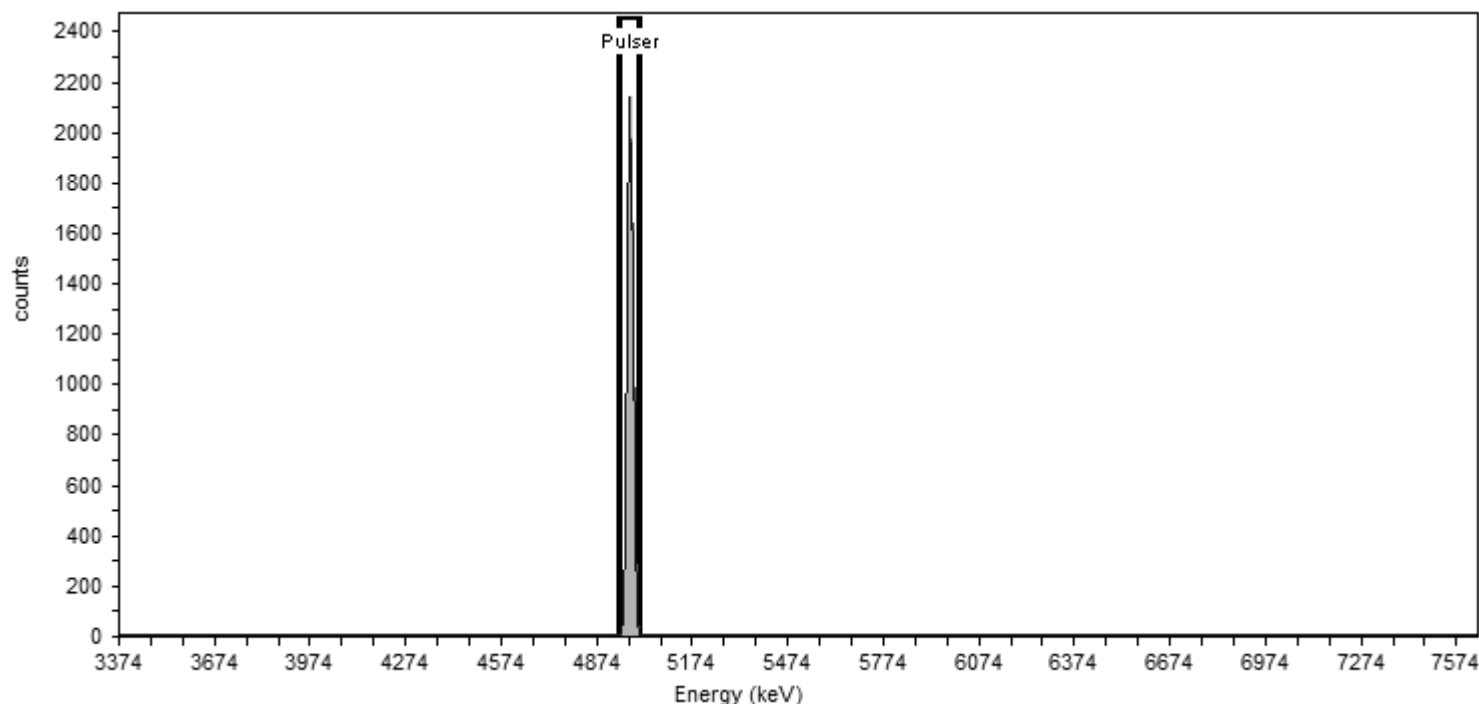
Calibration Date: 11/13/2017 12:21:03PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²



General Analysis

Analysis Method: Peak Fit Analysis

Nuclide Summary (Peak Search)

Nuclide	Peak Energy keV	Start Energy keV	End Energy keV	FWHM keV	Fit Area	Gross Counts
Pulser	4977.693	4943.959	5011.428	19.82	6,073.82	6,002.37

Sample Name: Pulser;AV148

Comment:

Sample

Spectrum #7 Analysis #1

Batch

Batch Name: July2018a

Description:

Acquisition

Detector: AV148 , SN: 50-05/R2

Acquisition Start Date: 8/3/2018 12:32:34PM

Live Time: 1.00 min.

Real Time: 1.00 min.

Calibration Name: IC-8874;AV148-20171113a

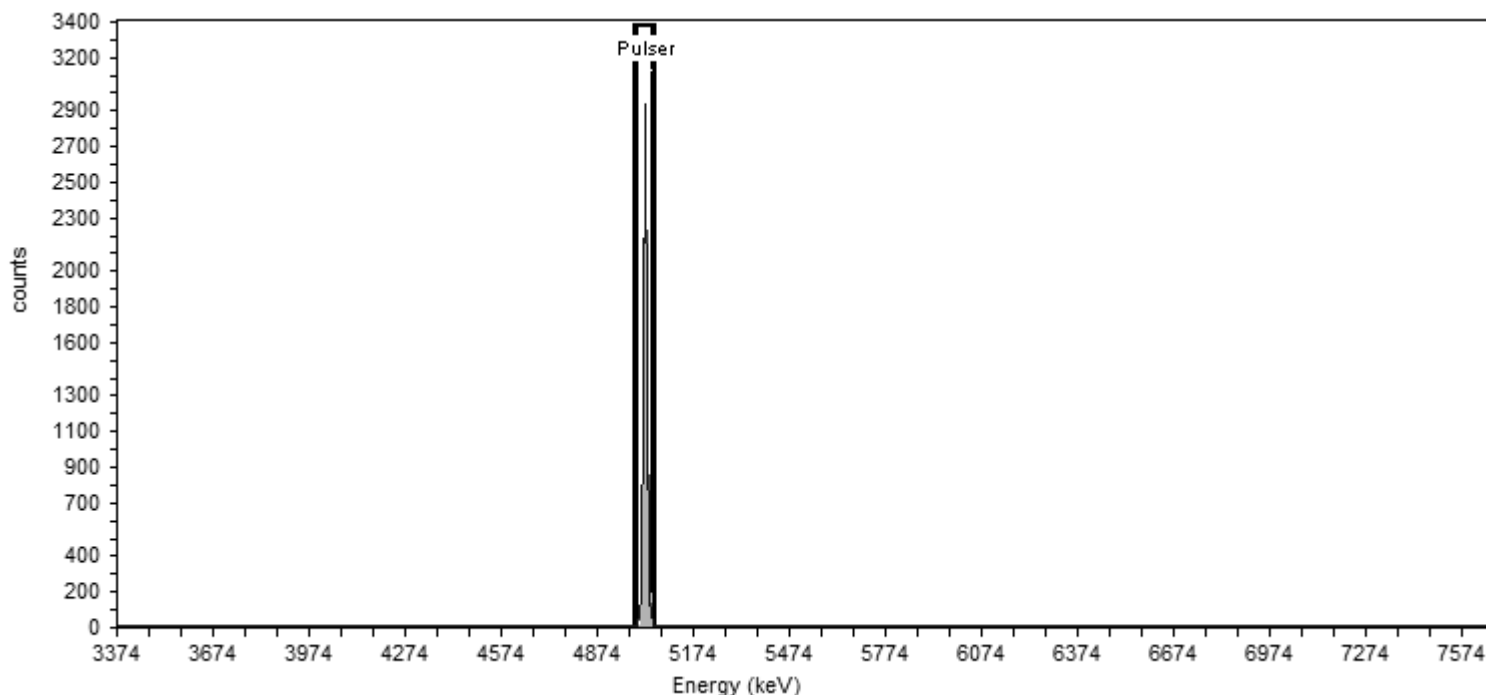
Calibration Date: 11/13/2017 12:24:55PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²



General Analysis

Analysis Method: Peak Fit Analysis

Nuclide Summary (Peak Search)

Nuclide	Peak Energy keV	Start Energy keV	End Energy keV	FWHM keV	Fit Area	Gross Counts
Pulser	5022.415	4997.835	5046.995	14.44	6,077.66	6,012.63

Sample Name: Pulser;AV148

Comment:

Sample

Spectrum #9 Analysis #1

Batch

Batch Name: July2018a

Description:

Acquisition

Detector: AV148 , SN: 50-05/R2

Acquisition Start Date: 8/6/2018 9:31:26PM

Live Time: 1.00 min.

Real Time: 1.00 min.

Calibration Name: IC-8874;AV148-20171113a

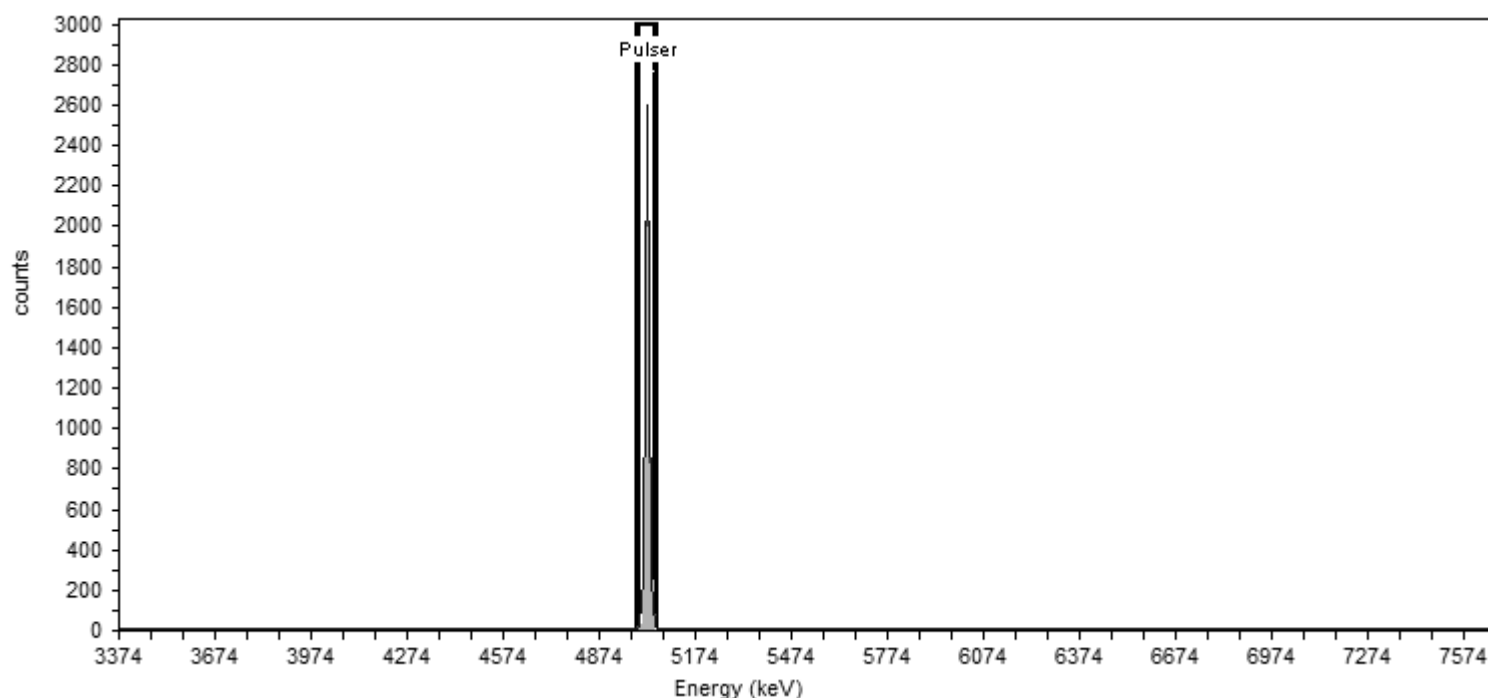
Calibration Date: 11/13/2017 12:24:55PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²



General Analysis

Analysis Method: Peak Fit Analysis

Nuclide Summary (Peak Search)

Nuclide	Peak Energy keV	Start Energy keV	End Energy keV	FWHM keV	Fit Area	Gross Counts
Pulser	5022.550	4995.060	5050.039	16.15	6,028.03	5,978.56

Initial Calibrations

Sample Name: IC-8877;AV3-05142018
Description:
Detector: AV3

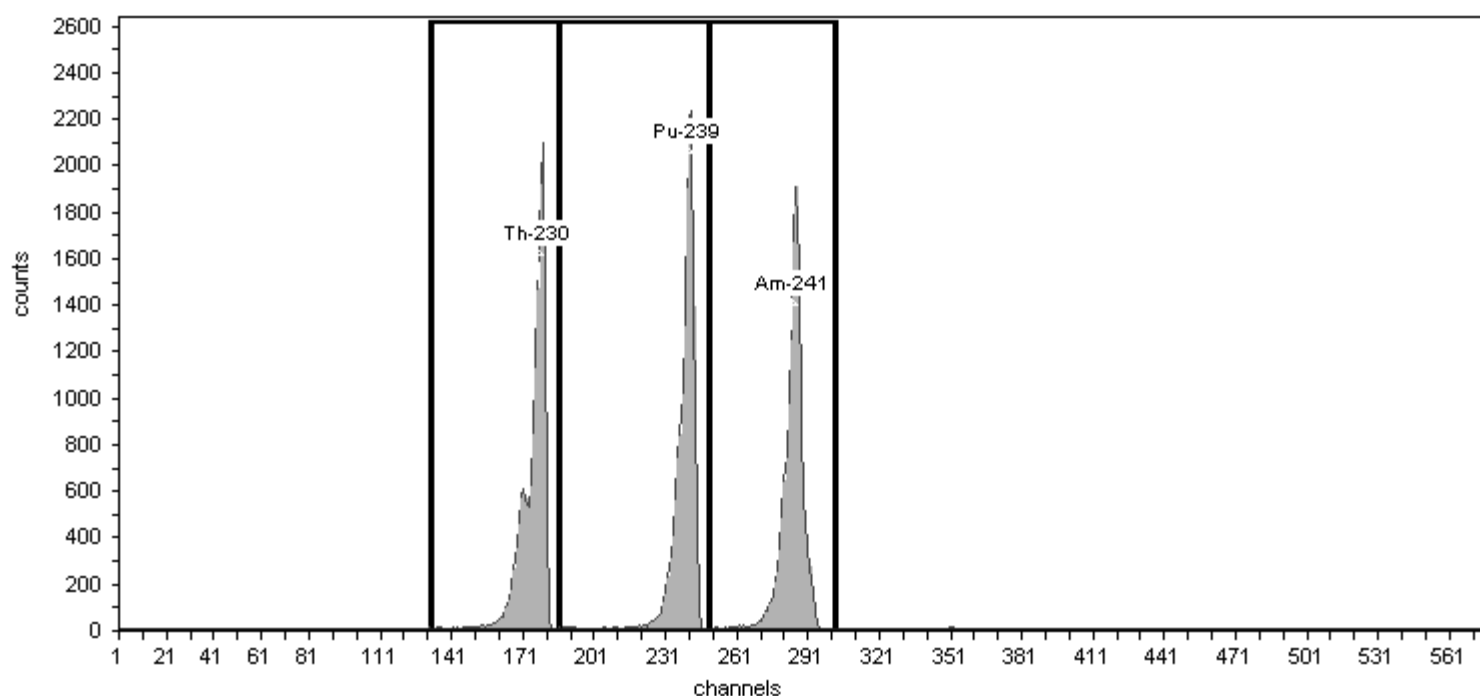
Calibration Date: 5/14/2018 6:25:15PM
Analyst: 60040

Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Detector: AV3, SN: 49-202 FF7
Acquisition Start Date: 5/14/2018 3:46:06PM
Live Time: 140.00 min.
Real Time: 140.09 min.
Efficiency: 24.44% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: Yes
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	14,252.00	101.80
Pu-239	240	5.16	186	249	0.00	14,532.00	103.80
Am-241	284	5.49	249	303	0.00	13,591.00	97.08

FWHM > 100keV
RTM 6/22/2018

Sample Name: IC-9520;AV4-05142018
Description:
Detector: AV4

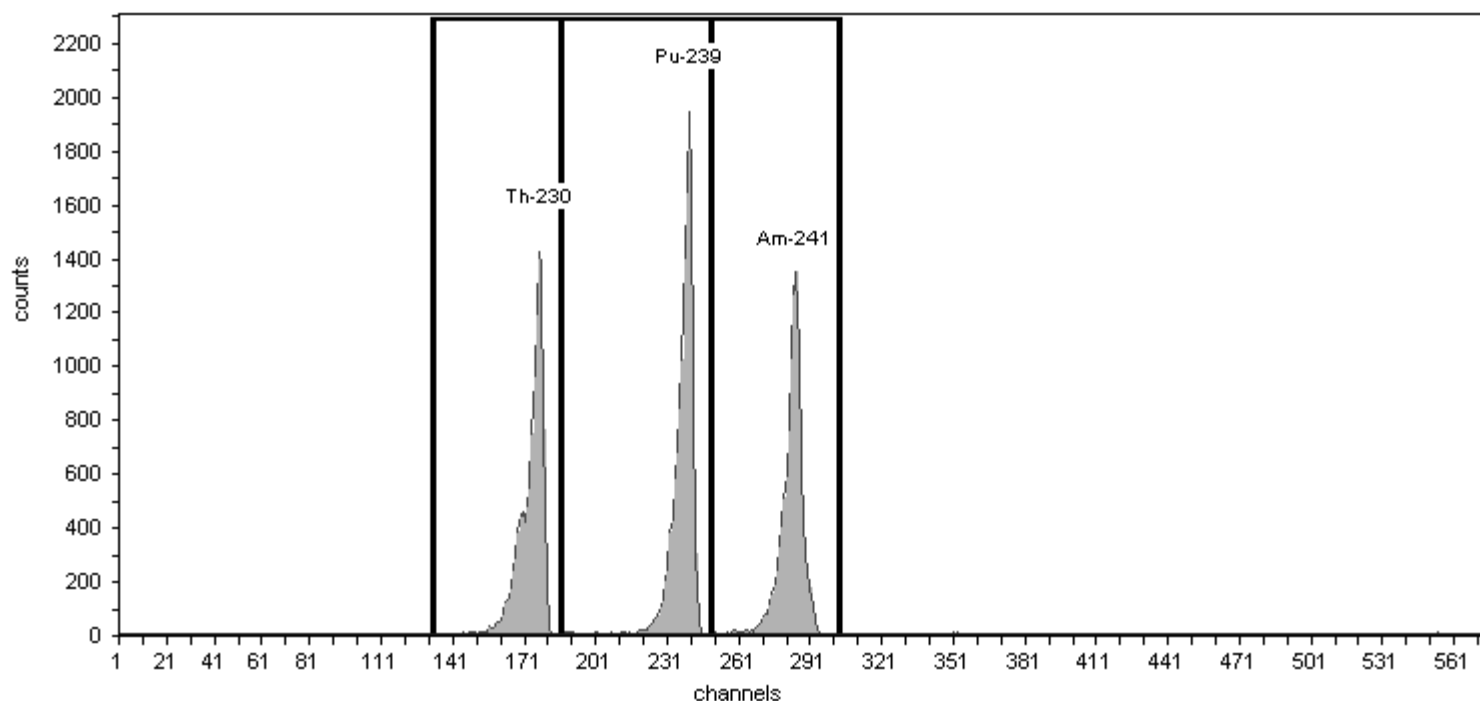
Calibration Date: 5/14/2018 6:25:34PM
Analyst: 60040

Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Detector: AV4 , SN: 46-033Q4
Acquisition Start Date: 5/14/2018 3:46:19PM
Live Time: 140.00 min.
Real Time: 140.09 min.
Efficiency: 22.79% +/- 0.33% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: Yes
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	10,751.00	76.79
Pu-239	240	5.16	186	249	0.00	13,005.00	92.89
Am-241	284	5.49	249	303	0.00	10,380.00	74.14

FWHM > 100keV
RTM 6/22/2018

Sample Name: IC-9793;AV7-05142018
Description:
Detector: AV7

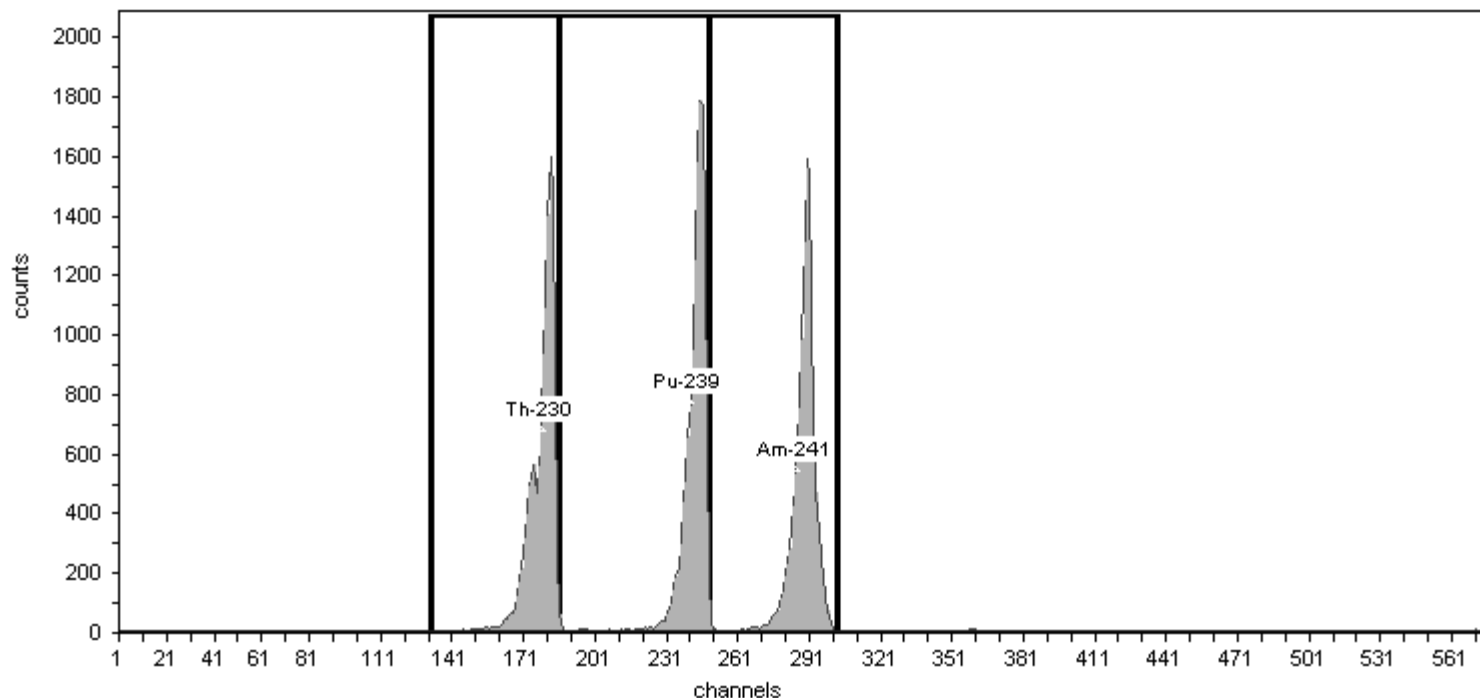
Calibration Date: 5/14/2018 6:26:13PM
Analyst: 60040

Certificate ID: 82241-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Detector: AV7, SN: 48-158EE5
Acquisition Start Date: 5/14/2018 3:47:01PM
Live Time: 140.00 min.
Real Time: 140.09 min.
Efficiency: 22.98% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: Yes
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	12,677.00	90.55
Pu-239	240	5.16	186	249	0.00	13,298.00	94.99
Am-241	284	5.49	249	303	0.00	12,604.00	90.03

FWHM > 100keV
RTM 6/22/2018

Sample Name: IC-9795;AV8-05142018
Description:
Detector: AV8

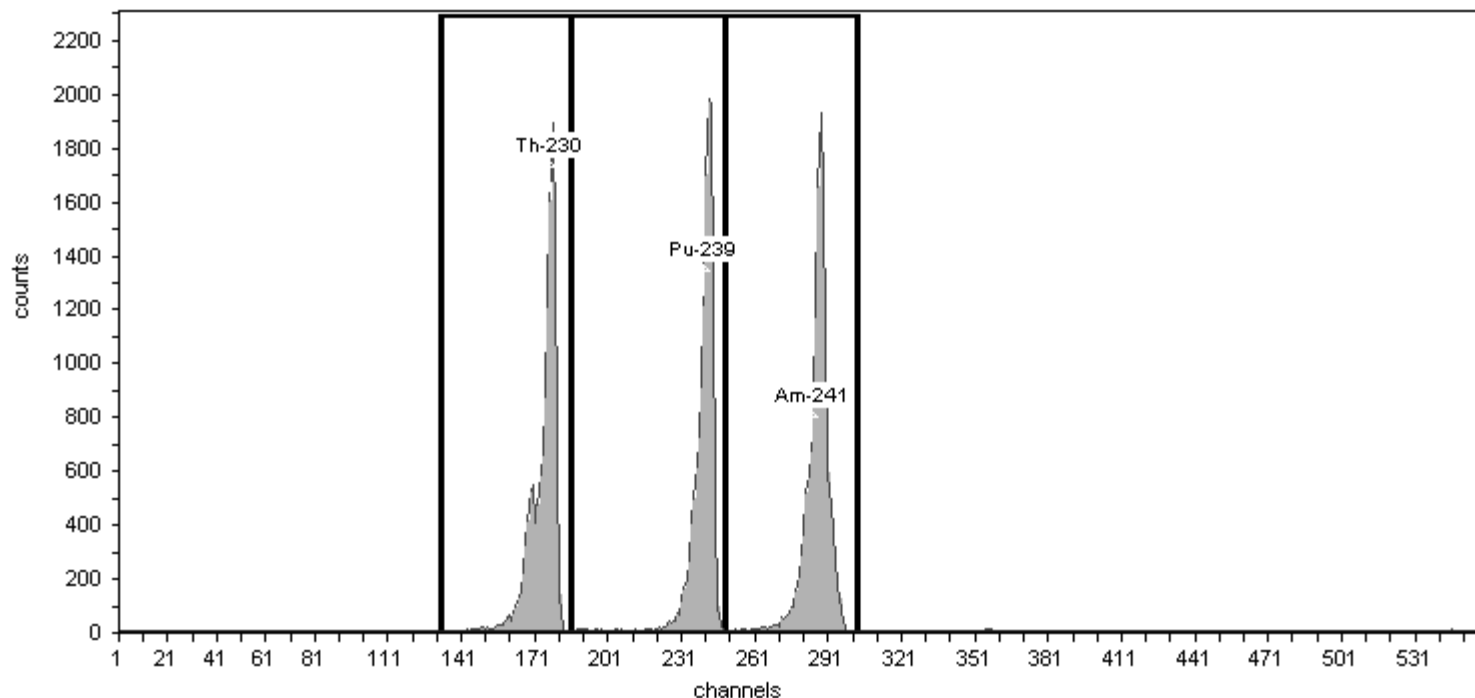
Calibration Date: 5/14/2018 6:26:27PM
Analyst: 60040

Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Detector: AV8, SN: 41-137Q6
Acquisition Start Date: 5/14/2018 3:47:39PM
Live Time: 140.00 min.
Real Time: 140.09 min.
Efficiency: 25.96% +/- 0.34% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: Yes
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	12,786.00	91.33
Pu-239	240	5.16	186	249	0.00	13,029.00	93.06
Am-241	284	5.49	249	303	0.00	13,761.00	98.29

FWHM > 100keV
RTM 6/22/2018

Sample Name: IC-7107;AV147-20171113
Description:
Detector: AV147

Calibration

Analyst: 60040
Analysis Date: 11/13/2017 12:21:03PM
Calibration Type: Energy And Efficiency

Certificate ID: 82232-334
Prepared by: Analytics
Description:

Source Info

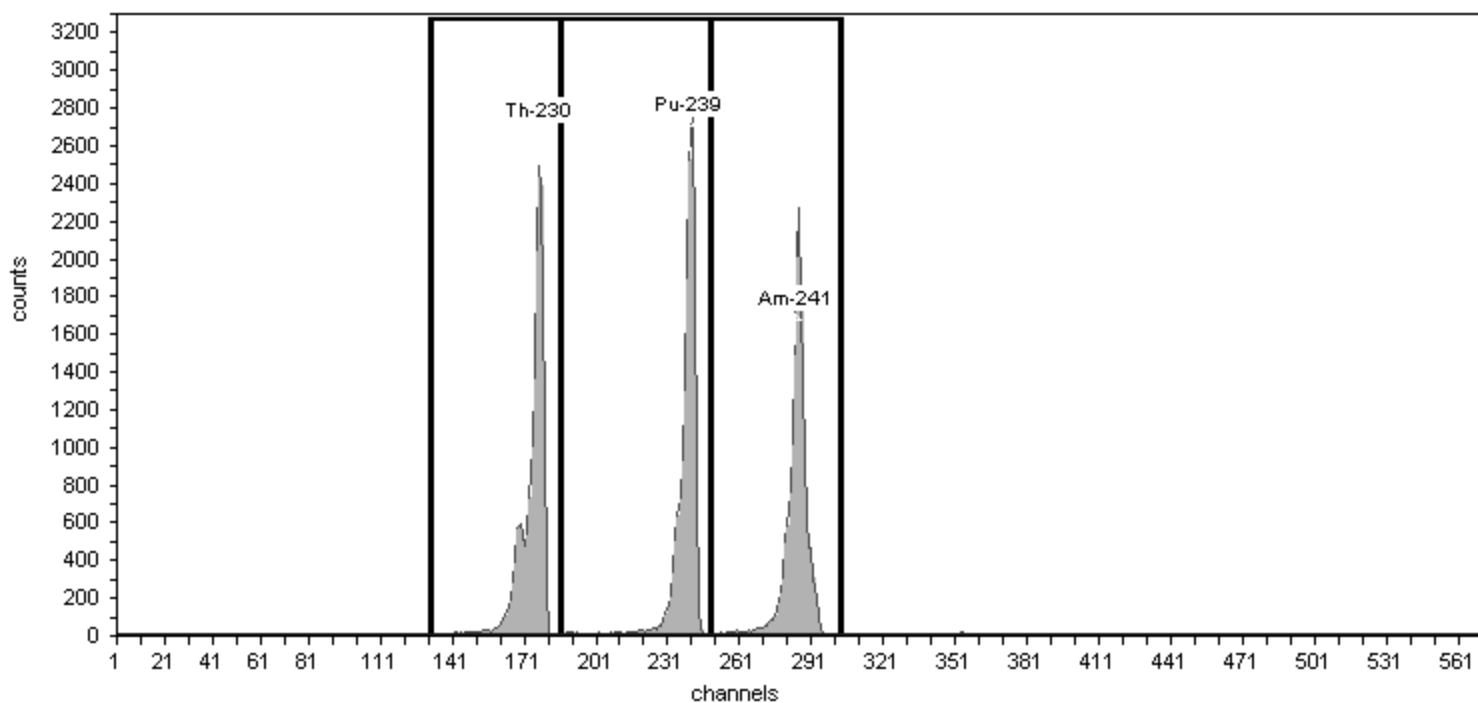
Certification Date: 6/3/2010 12:00:00PM

Acquisition

Detector: AV147 , SN: 50-05/R1
Acquisition Start Date: 11/13/2017 9:43:36AM
Live Time: 140.00 min.
Real Time: 140.01 min.

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.92% +/- 0.29% TPU(2 sigma)

Efficiency Calibration Name: IC-7107;AV147-20171113



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: Yes
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	31.67	15,649.00	111.78
Pu-239	240	5,155.40	186	249	32.26	15,551.00	111.08
Am-241	284	5,485.70	249	303	33.76	14,845.00	106.04

Sample Name: IC-8874;AV148-20171113a
Description:
Detector: AV148

Calibration

Analyst: 60040
Analysis Date: 11/13/2017 12:24:55PM
Calibration Type: Energy And Efficiency

Certificate ID: 82233-334
Prepared by: Analytics
Description:

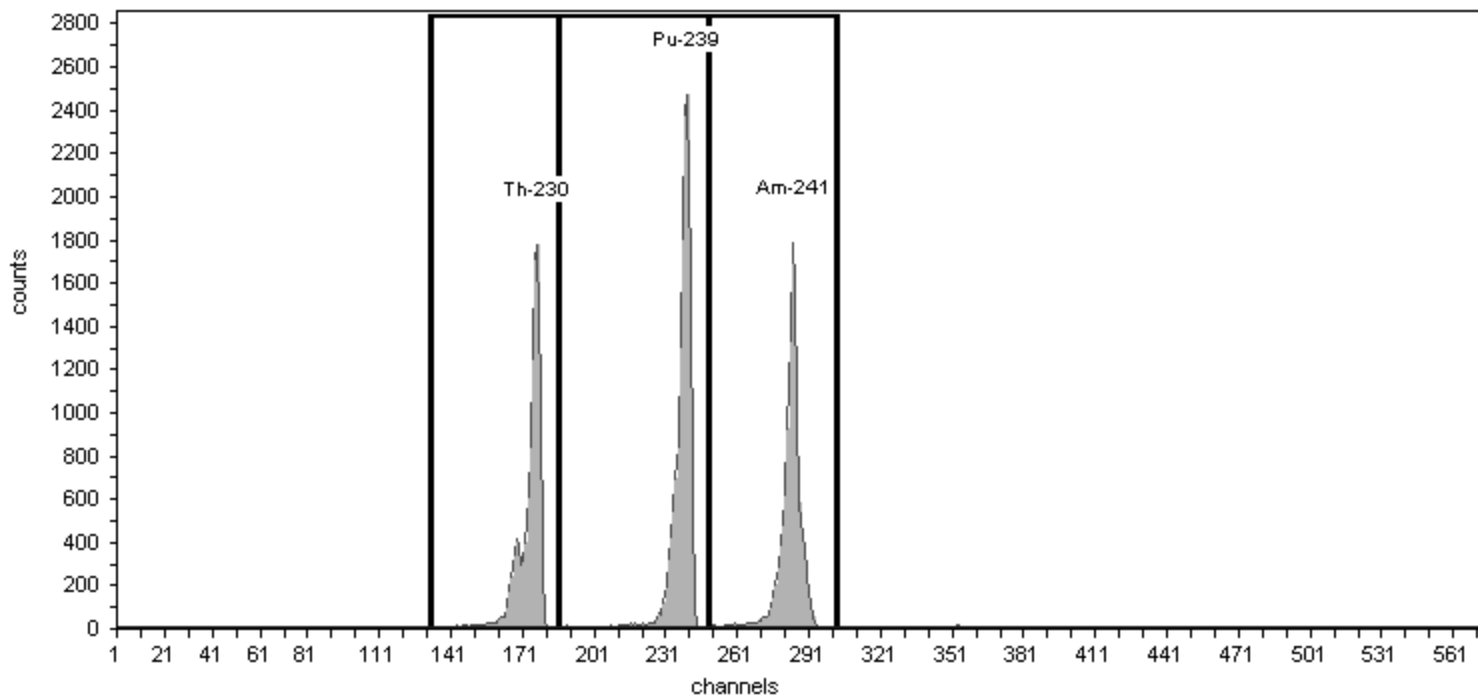
Source Info

Certification Date: 6/3/2010 12:00:00PM

Acquisition

Detector: AV148 , SN: 50-05/R2
Acquisition Start Date: 11/13/2017 10:03:59AM
Live Time: 140.00 min.
Real Time: 140.01 min.

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency Calibration Name: IC-8874;AV148-20171113a
Efficiency: 26.37% +/- 0.38% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: Yes
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	30.83	10,555.00	75.39
Pu-239	240	5,155.40	186	249	33.82	13,849.00	98.92
Am-241	284	5,485.70	249	303	32.64	11,187.00	79.91

Initial Calibration Verifications

Alpha Spectroscopy Calibration Summary

Detector: AV3

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371847/1	05/14/18 15:46	82236-334_00001	0.2444	0.20-0.32		
ICV 160-371942/1	05/18/18 19:25	82232-334_00001	0.2477	0.20-0.32	101.4	95-105
CCV 160-375343/1	07/10/18 16:55	82236-334_00001	0.2469	0.20-0.32	101.0	95-105

Detector: AV4

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371848/1	05/14/18 15:46	82237-334_00003	0.2279	0.20-0.32		
ICV 160-371943/1	05/18/18 19:26	82244-334_00001	0.2237	0.20-0.32	98.2	95-105
CCV 160-375344/1	07/10/18 16:57	82237-334_00003	0.2271	0.20-0.32	99.7	95-105

Detector: AV7

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371856/1	05/14/18 15:47	82241-334_00001	0.2298	0.20-0.32		
ICV 160-371945/1	05/18/18 19:26	82237-334_00003	0.2253	0.20-0.32	98.1	95-105
CCV 160-375346/1	07/10/18 16:56	82241-334_00001	0.2277	0.20-0.32	99.1	95-105

Detector: AV8

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371857/1	05/14/18 15:47	82243-334_00001	0.2596	0.20-0.32		
ICV 160-371946/1	05/18/18 19:27	82233-334_00001	0.2661	0.20-0.32	102.5	95-105
CCV 160-375347/1	07/10/18 16:56	82243-334_00001	0.2576	0.20-0.32	99.2	95-105

Detector: AV147

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337250/1	11/13/17 09:43	82232-334_00001	0.2492	0.20-0.32		
ICV 160-337582/1	11/15/17 11:44	82236-334_00001	0.2427	0.20-0.32	97.4	95-105
CCV 160-378429/1	07/24/18 10:31	82232-334_00001	0.2431	0.20-0.32	97.5	95-105

Detector: AV148

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337251/1	11/13/17 10:03	82233-334_00001	0.2637	0.20-0.32		
ICV 160-337583/1	11/15/17 11:50	82243-334_00001	0.2573	0.20-0.32	97.6	95-105
CCV 160-378430/1	07/24/18 10:32	82233-334_00001	0.2626	0.20-0.32	99.6	95-105

Sample Name: ICV-7107;AV3-05182018
Description:
Detector: AV3

Calibration

Calibration Date: 5/19/2018 3:58:34PM
Analyst: 60040

Certificate ID: 82232-334
Prepared by: Analytics

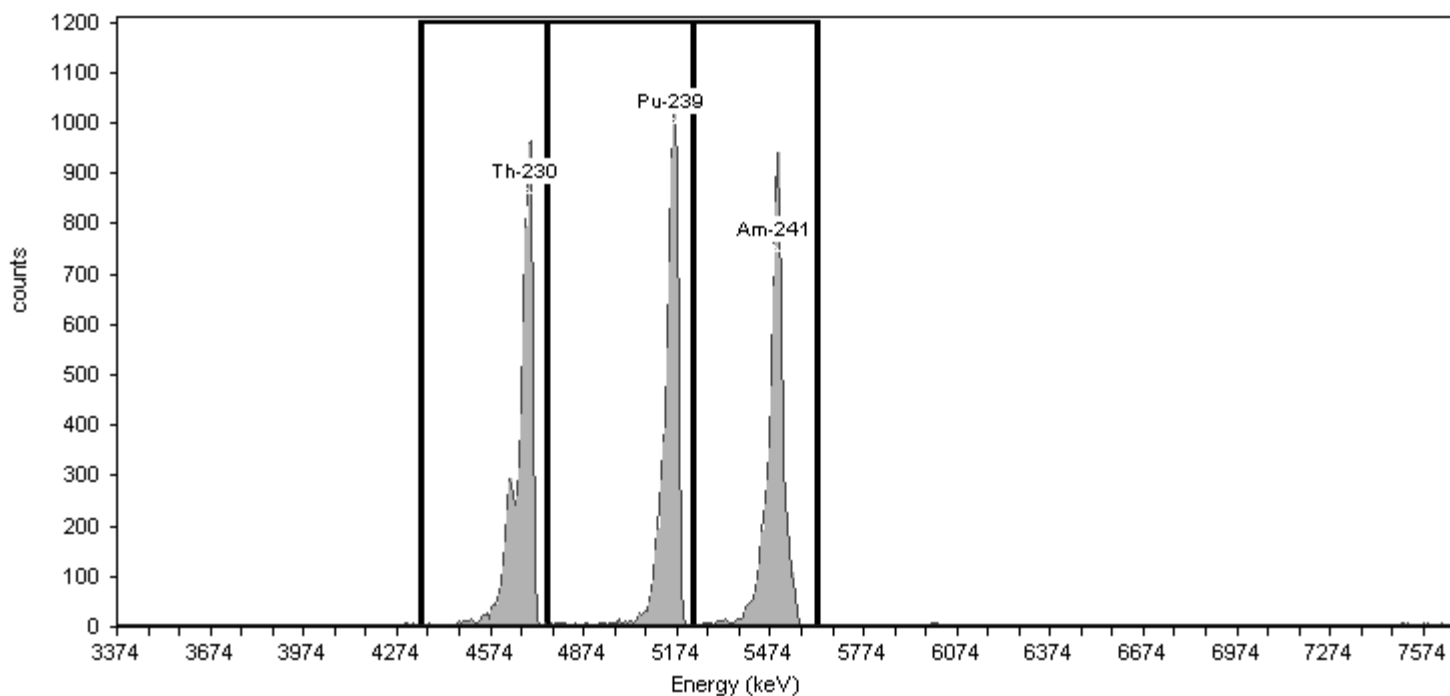
Source Info

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV3, SN: 49-202 FF7
Acquisition Start Date: 5/18/2018 7:25:51PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 24.77% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	6,662.00	111.03
Pu-239	240	5.16	186	249	0.00	6,545.00	109.08
Am-241	284	5.49	249	303	0.00	6,389.00	106.48

FWHM > 100keV
RTM 6/22/2018

Sample Name: ICV-9817;AV4-05182018
Description:
Detector: AV4

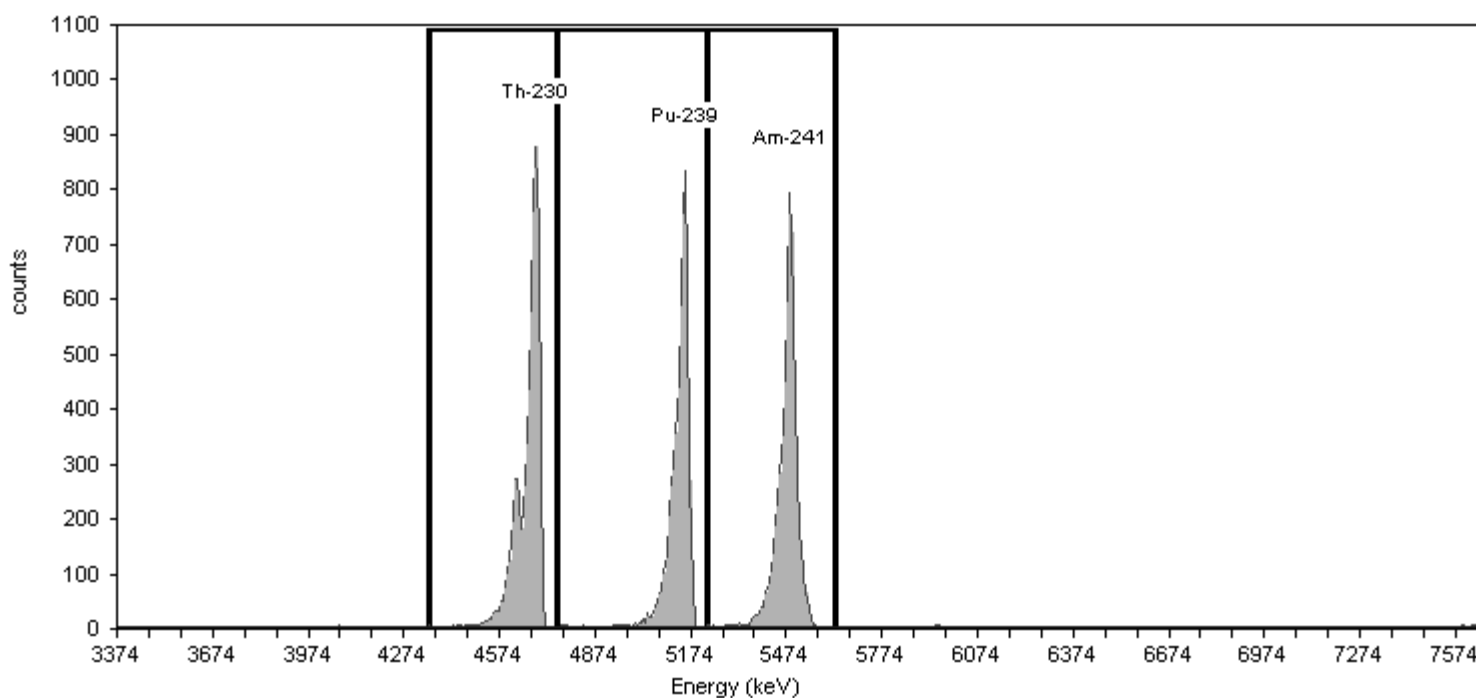
Calibration Date: 5/19/2018 3:58:45PM
Analyst: 60040

Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Detector: AV4, SN: 46-033Q4
Acquisition Start Date: 5/18/2018 7:26:15PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 22.37% +/- 0.38% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	6,064.00	101.07
Pu-239	240	5.16	186	249	0.00	5,321.00	88.68
Am-241	284	5.49	249	303	0.00	5,439.00	90.65

FWHM > 100keV
RTM 6/22/2018

Sample Name: ICV-9520;AV7-05182018
Description:
Detector: AV7

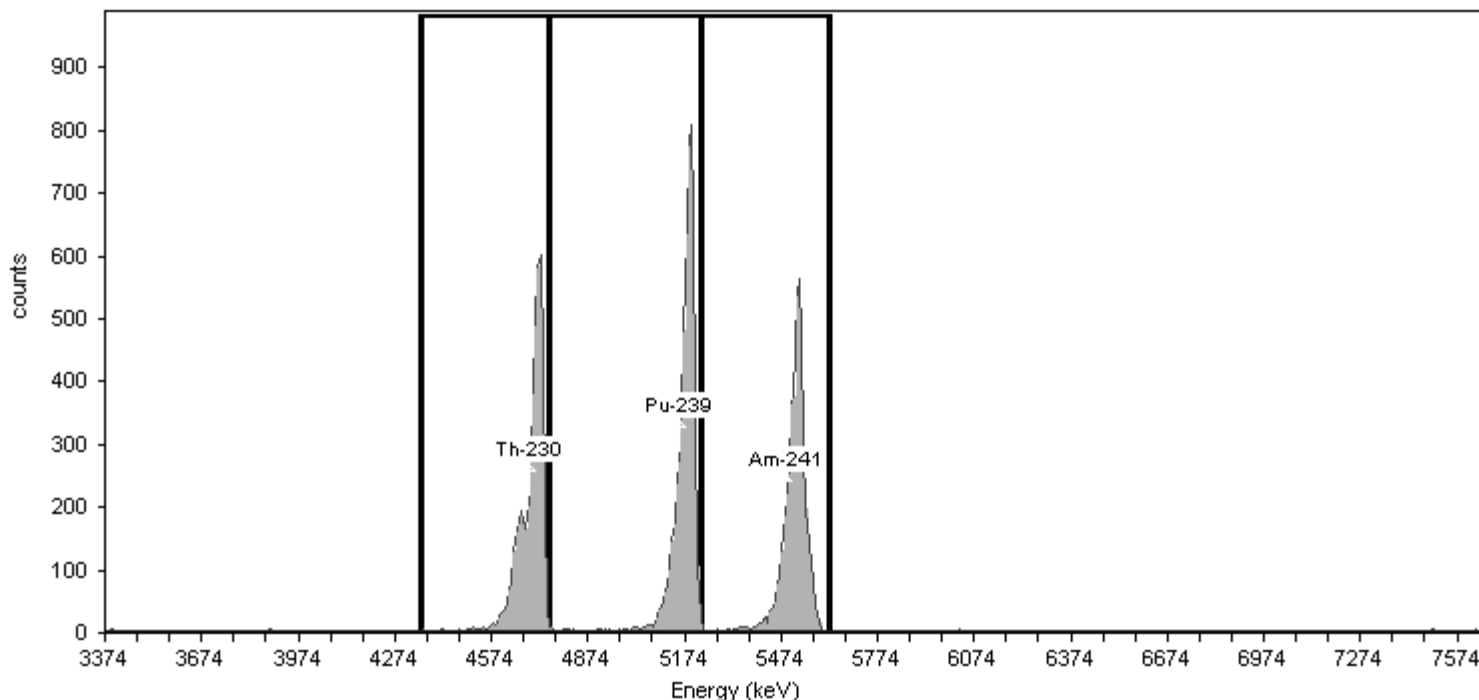
Calibration Date: 5/19/2018 3:59:09PM
Analyst: 60040

Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Detector: AV7, SN: 48-158EE5
Acquisition Start Date: 5/18/2018 7:26:58PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 22.53% +/- 0.43% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	4,559.00	75.98
Pu-239	240	5.16	186	249	0.00	5,466.00	91.10
Am-241	284	5.49	249	303	0.00	4,443.00	74.05

FWHM > 100keV
RTM 6/22/2018

Sample Name: ICV-8874;AV8-05182018
Description:
Detector: AV8

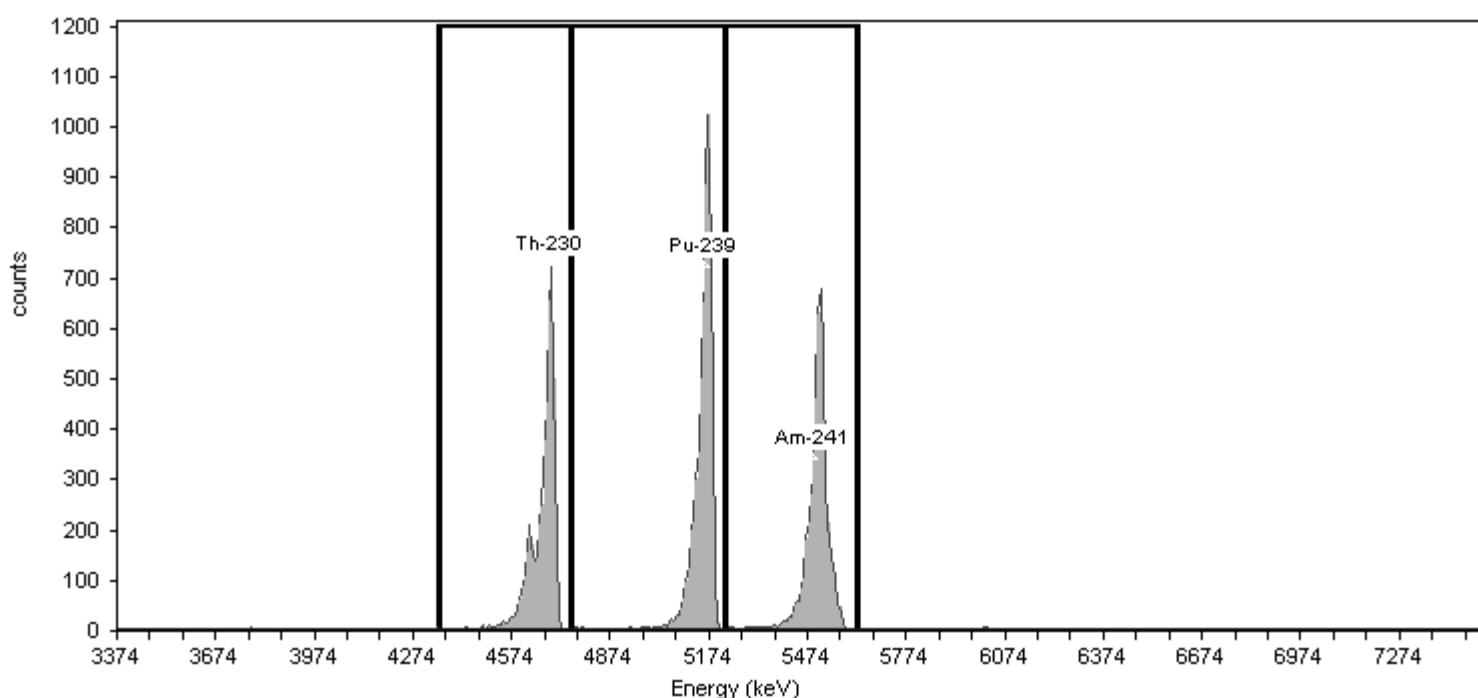
Calibration Date: 5/19/2018 3:59:26PM
Analyst: 60040

Certificate ID: 82233-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Detector: AV8 , SN: 41-137Q6
Acquisition Start Date: 5/18/2018 7:27:27PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 26.61% +/- 0.50% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	4,638.00	77.30
Pu-239	240	5.16	186	249	0.00	5,945.00	99.08
Am-241	284	5.49	249	303	0.00	4,809.00	80.15

FWHM > 100keV
RTM 6/22/2018

Sample Name: ICV-8877;AV147-20171115
Description:
Detector: AV147

Calibration

Analyst: 60040
Analysis Date: 11/15/2017 12:45:10PM
Calibration Type: Energy And Efficiency

Certificate ID: 82236-334
Prepared by: Analytics
Description:

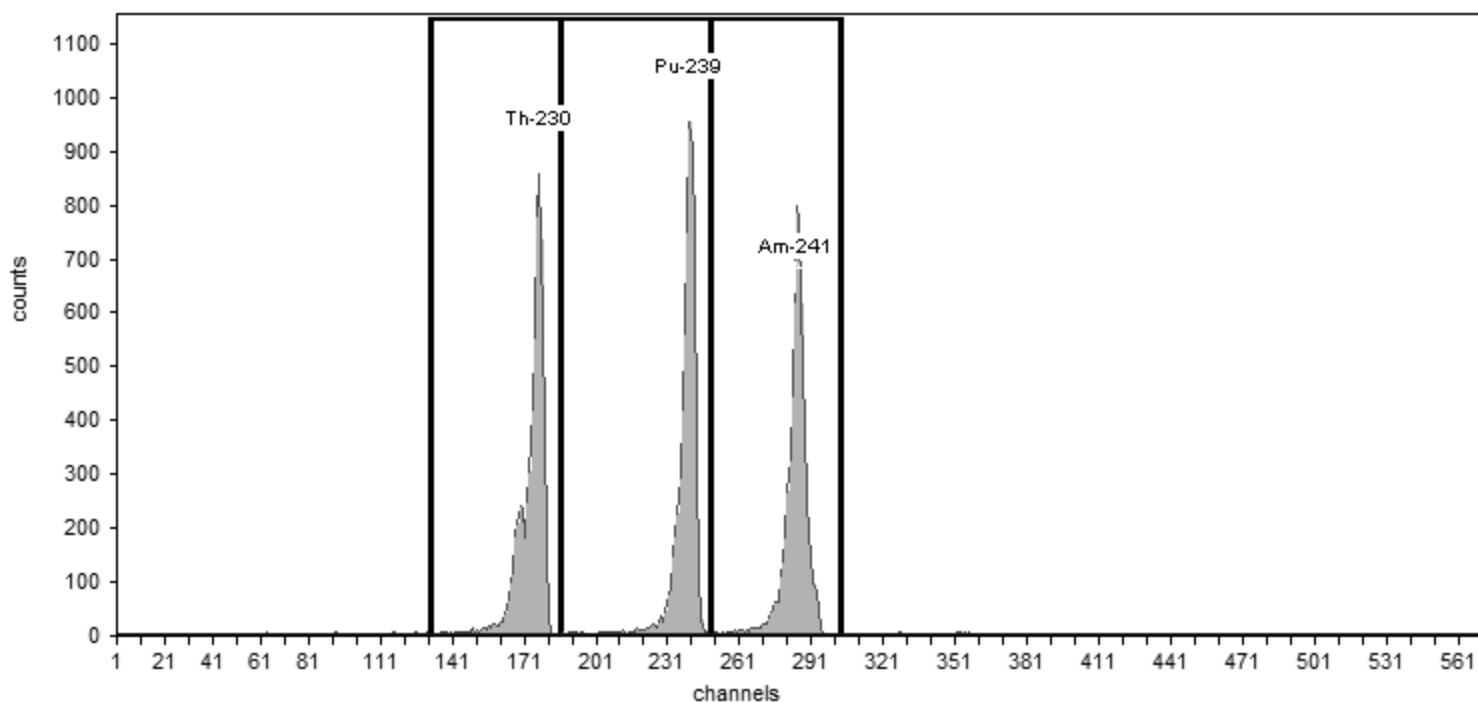
Source Info

Certification Date: 6/2/2010 12:00:00PM

Acquisition

Detector: AV147 , SN: 50-05/R1
Acquisition Start Date: 11/15/2017 11:44:15AM
Live Time: 60.00 min.
Real Time: 60.01 min.

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency Calibration Name: ICV-8877;AV147-20171115
Efficiency: 24.27% +/- 0.40% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	35.83	6,055.00	100.92
Pu-239	240	5,155.40	186	249	38.72	6,089.00	101.48
Am-241	284	5,485.70	249	303	39.45	5,870.00	97.83

Sample Name: ICV-9795;AV148-20171115
Description:
Detector: AV148

Calibration

Analyst: 60040
Analysis Date: 11/15/2017 12:50:32PM
Calibration Type: Energy And Efficiency

Certificate ID: 82243-334
Prepared by: Analytics
Description:

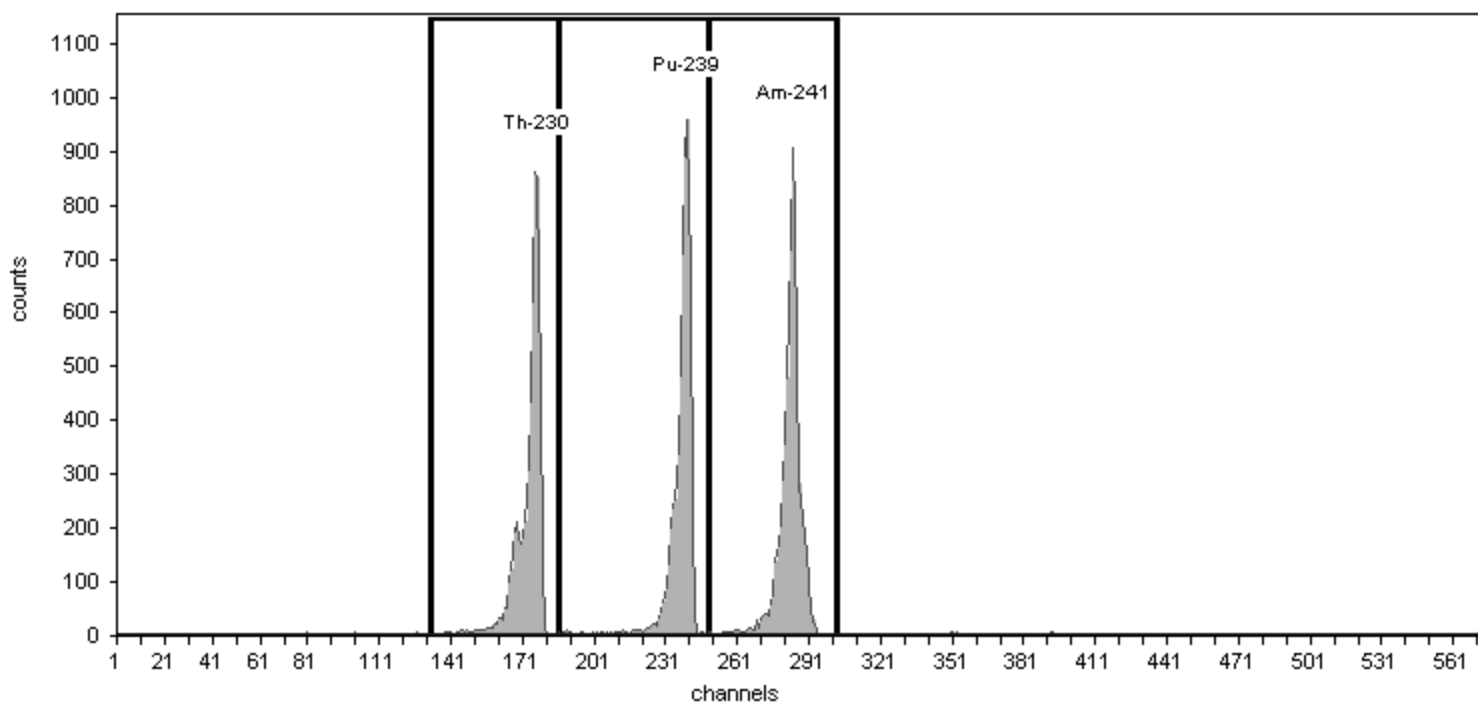
Source Info

Certification Date: 6/9/2010 12:00:00PM

Acquisition

Detector: AV148 , SN: 50-05/R2
Acquisition Start Date: 11/15/2017 11:50:26AM
Live Time: 60.00 min.
Real Time: 60.00 min.

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency Calibration Name: ICV-9795;AV148-20171115
Efficiency: 25.73% +/- 0.45% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	30.81	5,339.00	88.98
Pu-239	240	5,155.40	186	249	33.04	5,548.00	92.47
Am-241	284	5,485.70	249	303	33.16	5,932.00	98.87

Monthly Calibration Verifications

Sample Name: CCV-8877;AV3-07102018
Description:
Detector: AV3

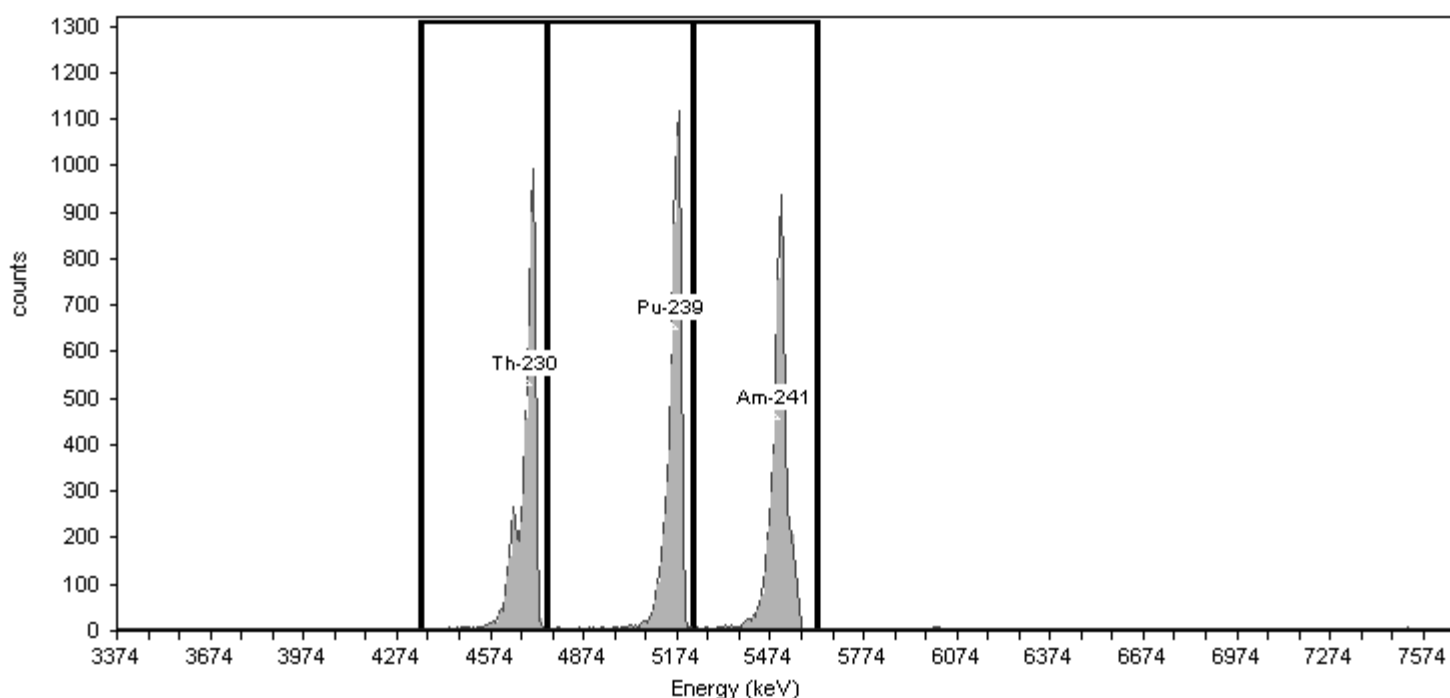
Calibration Date: 7/11/2018 10:52:42AM
Analyst: 60040

Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Detector: AV3 , SN: 49-202 FF7
Acquisition Start Date: 7/10/2018 4:55:46PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 24.69% +/- 0.41% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	6,049.00	100.82
Pu-239	240	5.16	186	249	0.00	6,325.00	105.42
Am-241	284	5.49	249	303	0.00	5,973.00	99.55

FWHM < 100 keV
RTM 7/13/18

Sample Name: CCV-9520;AV4-07102018a
Description:
Detector: AV4

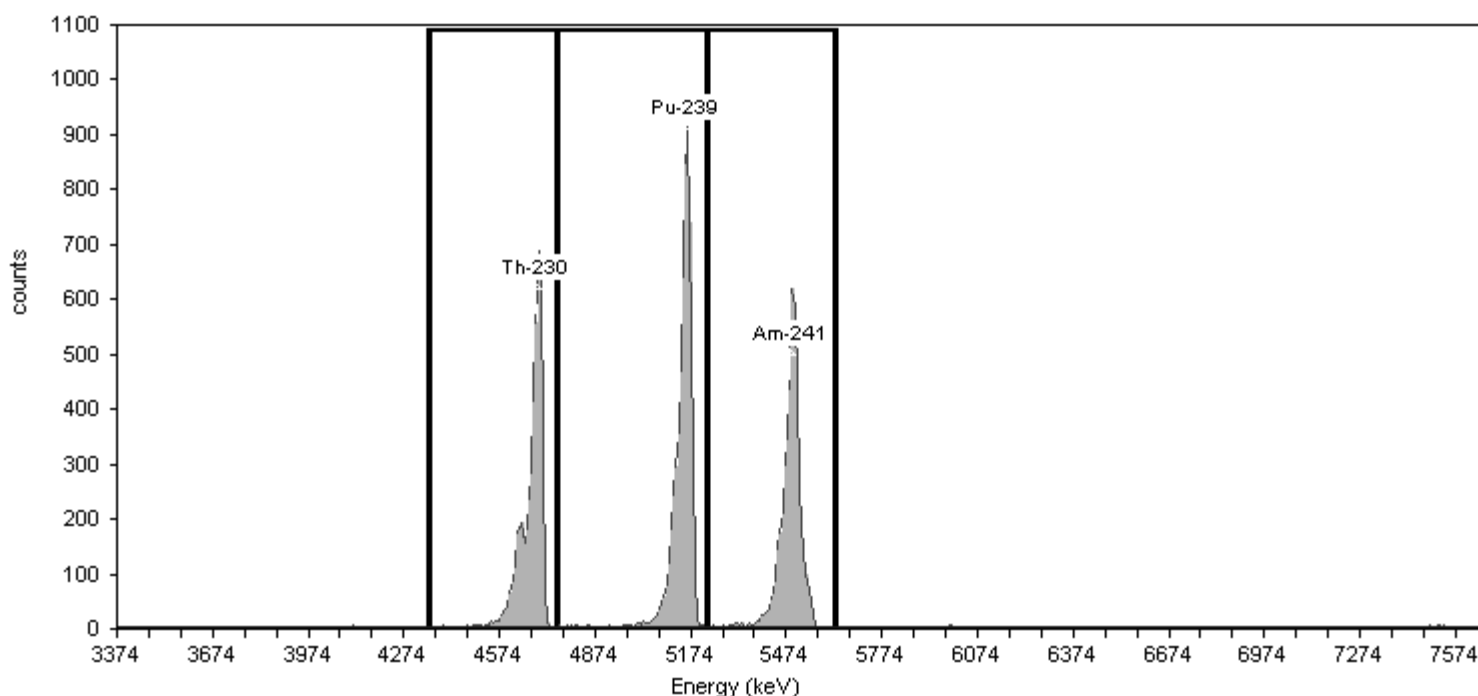
Calibration Date: 7/11/2018 10:53:46AM
Analyst: 60040

Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Detector: AV4 , SN: 46-033Q4
Acquisition Start Date: 7/10/2018 4:57:52PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 22.71% +/- 0.43% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	4,559.00	75.98
Pu-239	240	5.16	186	249	0.00	5,576.00	92.93
Am-241	284	5.49	249	303	0.00	4,457.00	74.28

FWHM < 100 keV
RTM 7/13/18

Sample Name: CCV-9793;AV7-07102018
Description:
Detector: AV7

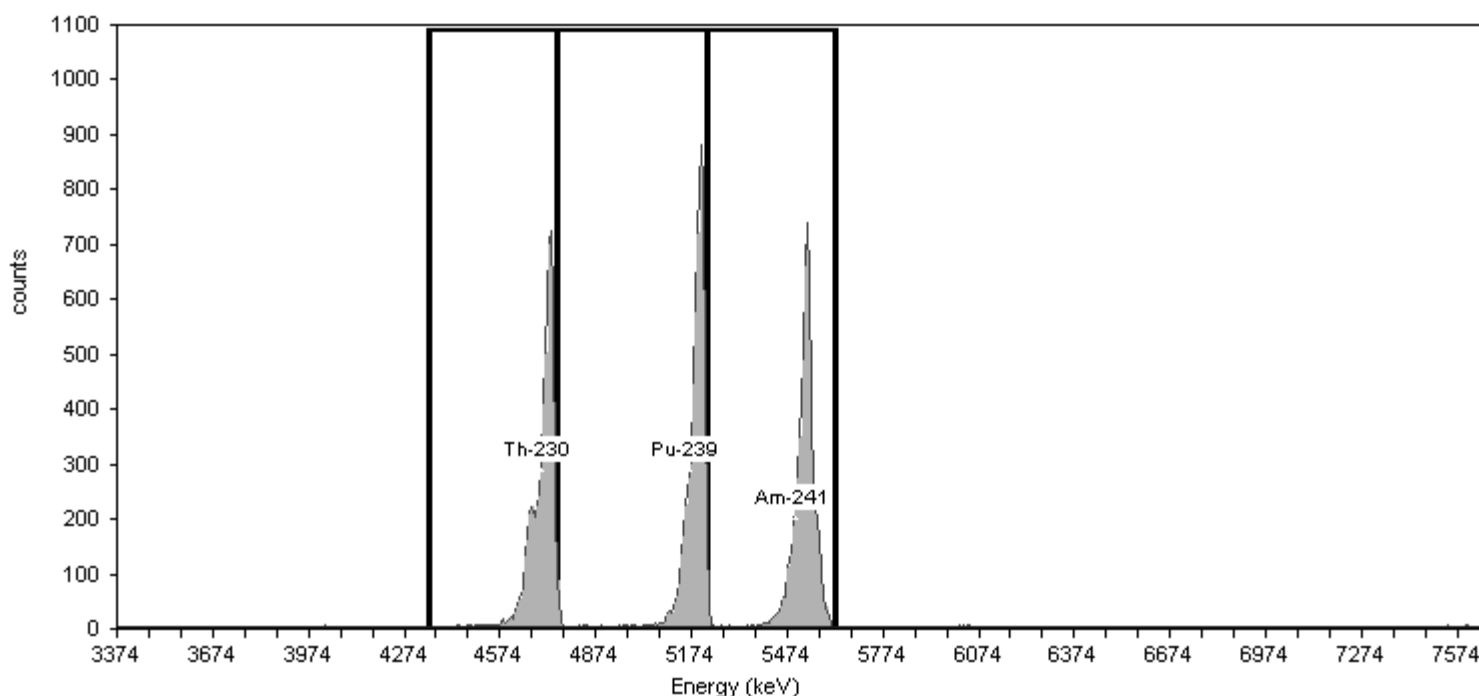
Calibration Date: 7/11/2018 10:52:53AM
Analyst: 60040

Certificate ID: 82241-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Detector: AV7, SN: 48-158EE5
Acquisition Start Date: 7/10/2018 4:56:23PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 22.77% +/- 0.40% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	5,254.00	87.57
Pu-239	240	5.16	186	249	0.00	5,589.00	93.15
Am-241	284	5.49	249	303	0.00	5,551.00	92.52

FWHM < 100 keV
RTM 7/13/18

Sample Name: CCV-9795;AV8-07102018
Description:
Detector: AV8

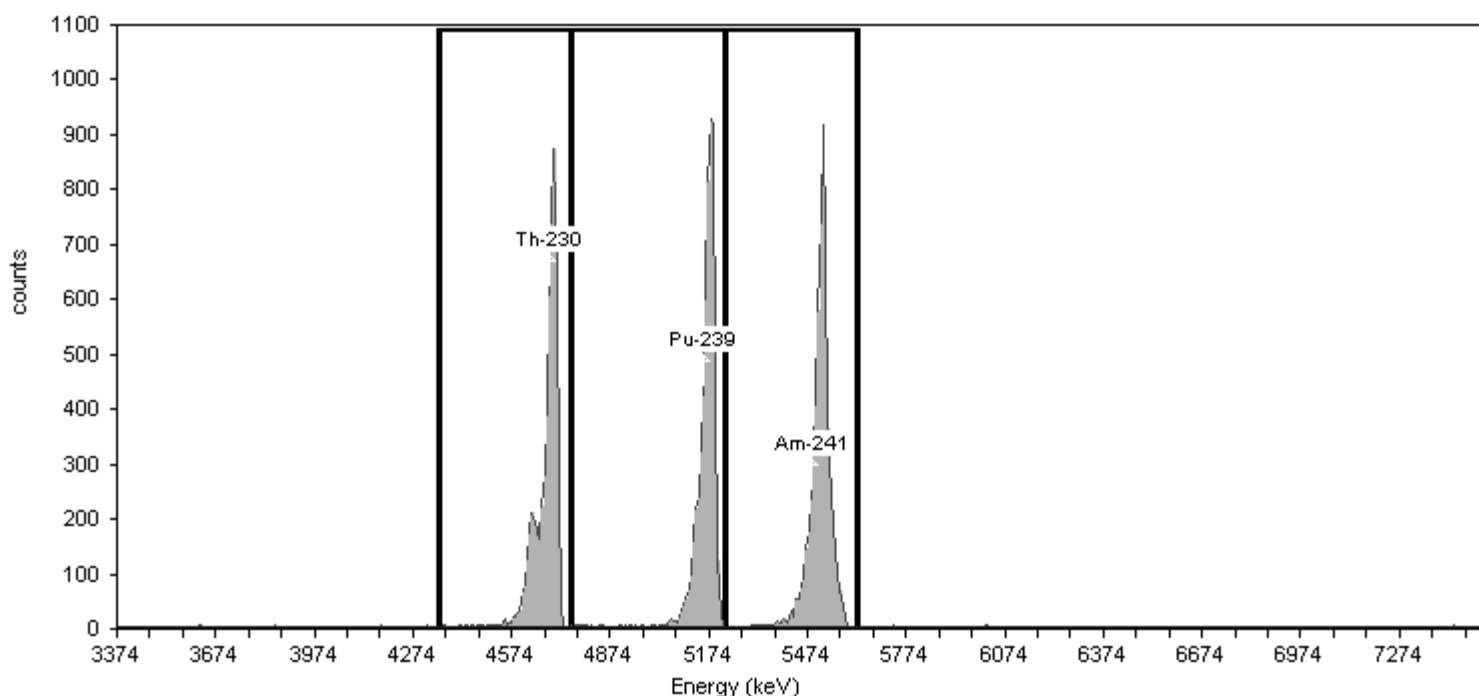
Calibration Date: 7/11/2018 10:53:03AM
Analyst: 60040

Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Detector: AV8 , SN: 41-137Q6
Acquisition Start Date: 7/10/2018 4:56:46PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 25.76% +/- 0.45% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	5,396.00	89.93
Pu-239	240	5.16	186	249	0.00	5,633.00	93.88
Am-241	284	5.49	249	303	0.00	5,804.00	96.73

FWHM < 100 keV
RTM 7/13/18

Sample Name: CCV-7107;AV147-20180724
Description:
Detector: AV147

Calibration

Analyst: 60040
Analysis Date: 7/24/2018 11:46:50AM
Calibration Type: Energy And Efficiency

Certificate ID: 82232-334
Prepared by: Analytics
Description:

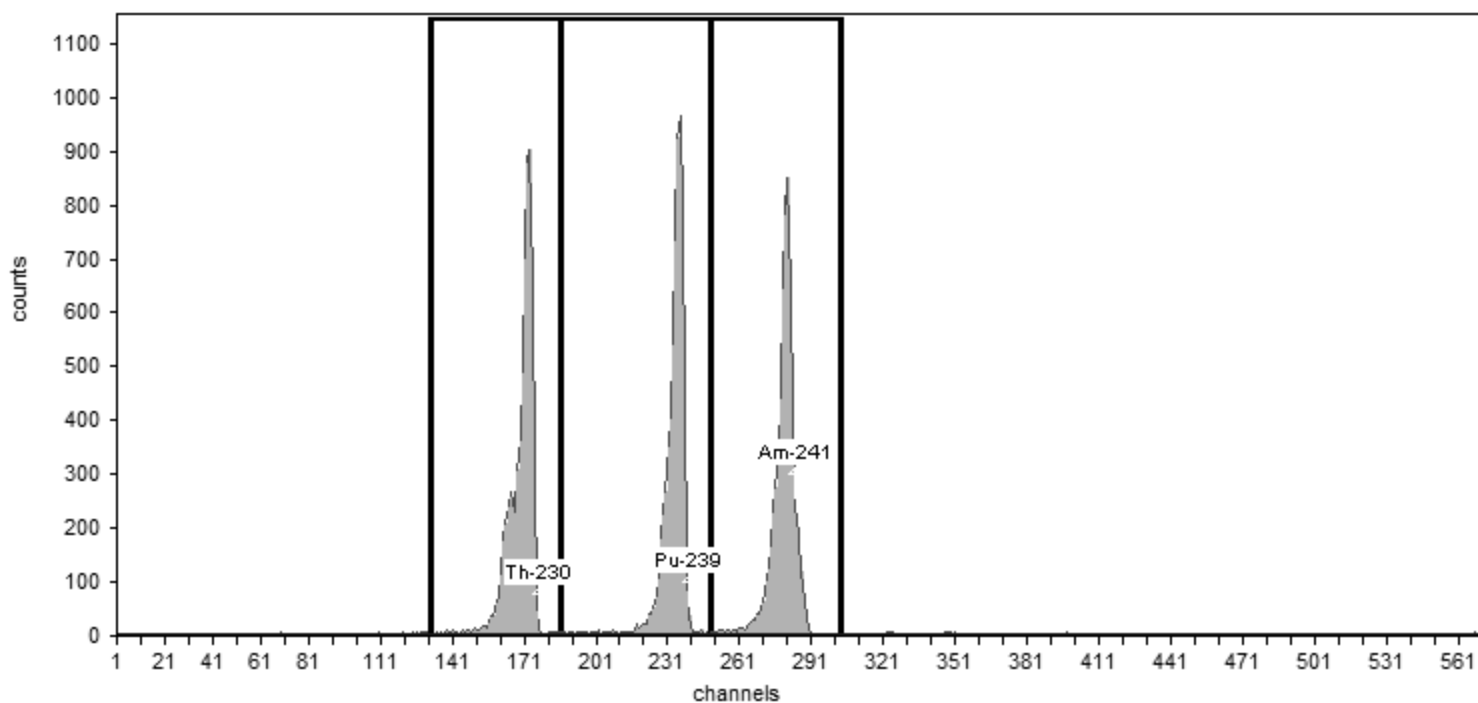
Source Info

Certification Date: 6/3/2010 12:00:00PM

Acquisition

Detector: AV147 , SN: 50-05/R1
Acquisition Start Date: 7/24/2018 10:31:22AM
Live Time: 60.00 min.
Real Time: 60.00 min.

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency Calibration Name: CCV-7107;AV147-20180724
Efficiency: 24.31% +/- 0.39% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	36.12	6,527.00	108.78
Pu-239	240	5,155.40	186	249	39.62	6,484.00	108.07
Am-241	284	5,485.70	249	303	37.60	6,223.00	103.72

Sample Name: CCV-8874;AV148-20180724
Description:
Detector: AV148

Calibration

Analyst: 60040
Analysis Date: 7/24/2018 11:47:01AM
Calibration Type: Energy And Efficiency

Certificate ID: 82233-334
Prepared by: Analytics
Description:

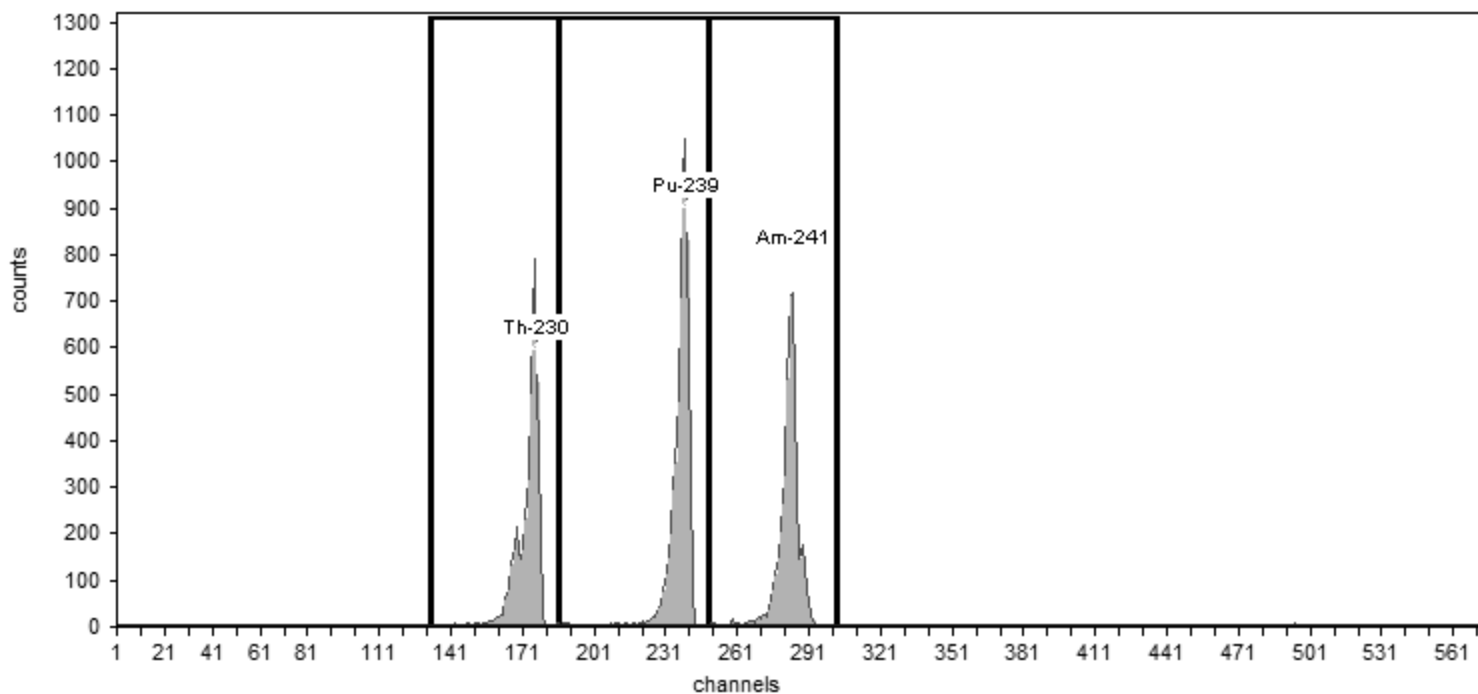
Source Info

Certification Date: 6/3/2010 12:00:00PM

Acquisition

Detector: AV148 , SN: 50-05/R2
Acquisition Start Date: 7/24/2018 10:32:15AM
Live Time: 60.00 min.
Real Time: 60.01 min.
Efficiency Calibration Name: CCV-8874;AV148-20180724

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.26% +/- 0.49% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	29.69	4,569.00	76.15
Pu-239	240	5,155.40	186	249	33.10	5,886.00	98.10
Am-241	284	5,485.70	249	303	33.63	4,729.00	78.82

Monthly Backgrounds

Sample Name: ICB;AV3

Comment:

Sample

Spectrum #2 Analysis #1

Batch Name: July2018

Description:

Batch

Analyst: 60040

Acquisition

Detector: AV3 , SN: 49-202 FF7

Acquisition Start Date: 7/13/2018 12:11:20PM

Live Time: 960.00 min.

Real Time: 960.01 min.

Calibration Name: IC-8877;AV3-05142018

Calibration Date: 5/14/2018 6:25:15PM

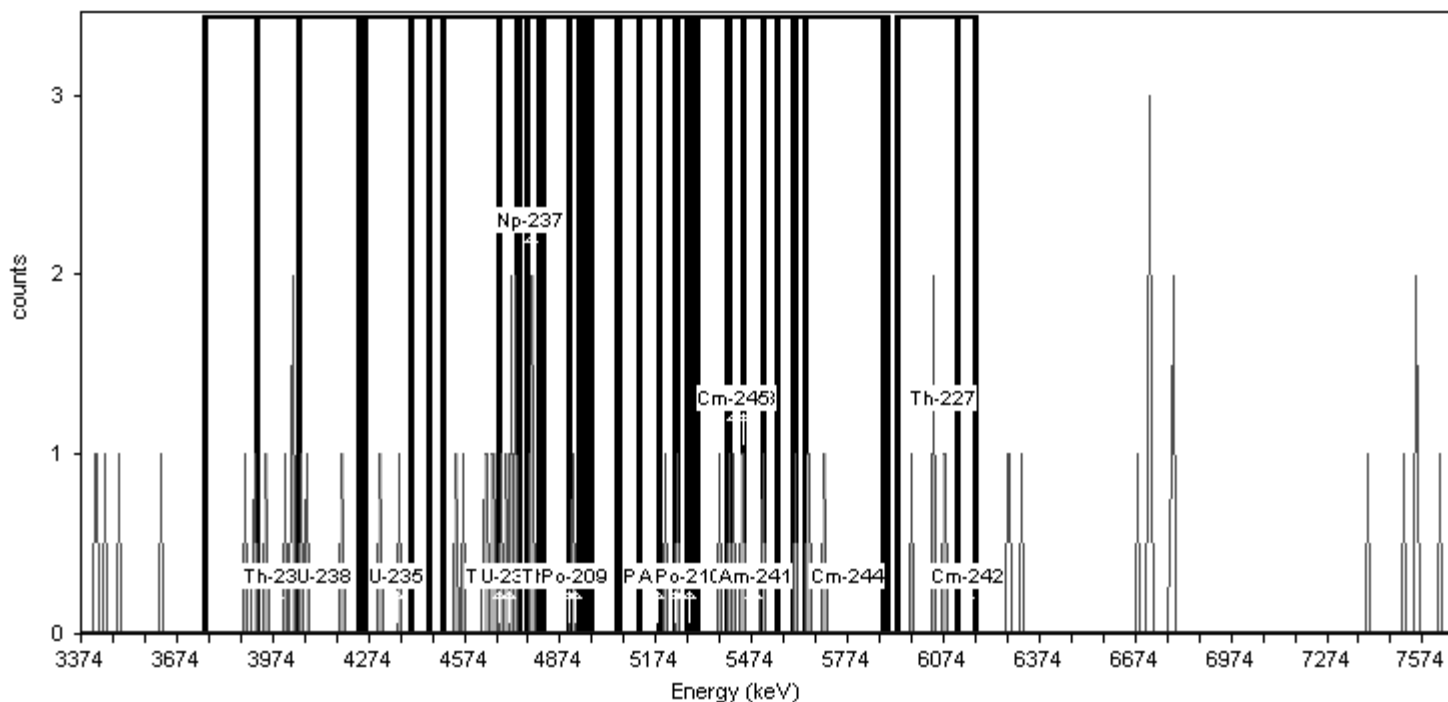
Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 24.44% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI, Nuclide Library: Background ROI Library

Total Background Counts: 67.00

Nuclide Summary (ROI)

<u>RegionName</u>	<u>Peak Energy</u>	<u>Start Energy</u>	<u>End Energy</u>	<u>GrossCounts</u>	<u>Count Rate</u>	<u>CR Uncertainty</u>
	(MeV)	(MeV)	(MeV)		(CPM)	(CPM)
Th-232	3.99	3.75	4.05	6.00	6.250E-003	2.756E-003
U-238	4.14	3.92	4.24	7.00	7.292E-003	2.946E-003
U-235	4.36	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.68	4.40	4.75	12.00	1.250E-002	3.756E-003
U-234	4.71	4.51	4.82	14.00	1.458E-002	4.034E-003
Pu-242	4.90	4.68	4.95	9.00	9.375E-003	3.294E-003
Th-229	4.86	4.74	5.12	3.00	3.125E-003	2.083E-003
Np-237	4.78	4.77	4.81	2.00	2.083E-003	1.804E-003
Po-209	4.92	4.90	4.93	1.00	1.042E-003	1.473E-003
Pu-239	5.18	4.97	5.24	2.00	2.083E-003	1.804E-003
Am-243	5.23	5.05	5.31	2.00	2.083E-003	1.804E-003
U-232	5.25	5.06	5.40	4.00	4.167E-003	2.329E-003
Th-228	5.45	5.19	5.51	8.00	8.333E-003	3.125E-003
Po-210	5.28	5.23	5.29	1.00	1.042E-003	1.473E-003
Pu-238	5.47	5.27	5.55	6.00	6.250E-003	2.756E-003
Am-241	5.48	5.30	5.60	6.00	6.250E-003	2.756E-003
Cm-245	5.42	5.40	5.45	4.00	4.167E-003	2.329E-003
Pu-236	5.76	5.61	5.89	4.00	4.167E-003	2.329E-003
Cm-244	5.78	5.64	5.90	3.00	3.125E-003	2.083E-003
Th-227	6.07	5.93	6.18	5.00	5.208E-003	2.552E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

Sample Name: ICB;AV4

Comment:

Sample

Spectrum #1 Analysis #1

Batch Name: July2018

Description:

Batch

Analyst: 60040

Acquisition

Detector: AV4 , SN: 46-033Q4

Acquisition Start Date: 7/12/2018 1:42:06PM

Live Time: 960.00 min.

Real Time: 960.02 min.

Calibration Name: IC-9520;AV4-05142018

Calibration Date: 5/14/2018 6:25:34PM

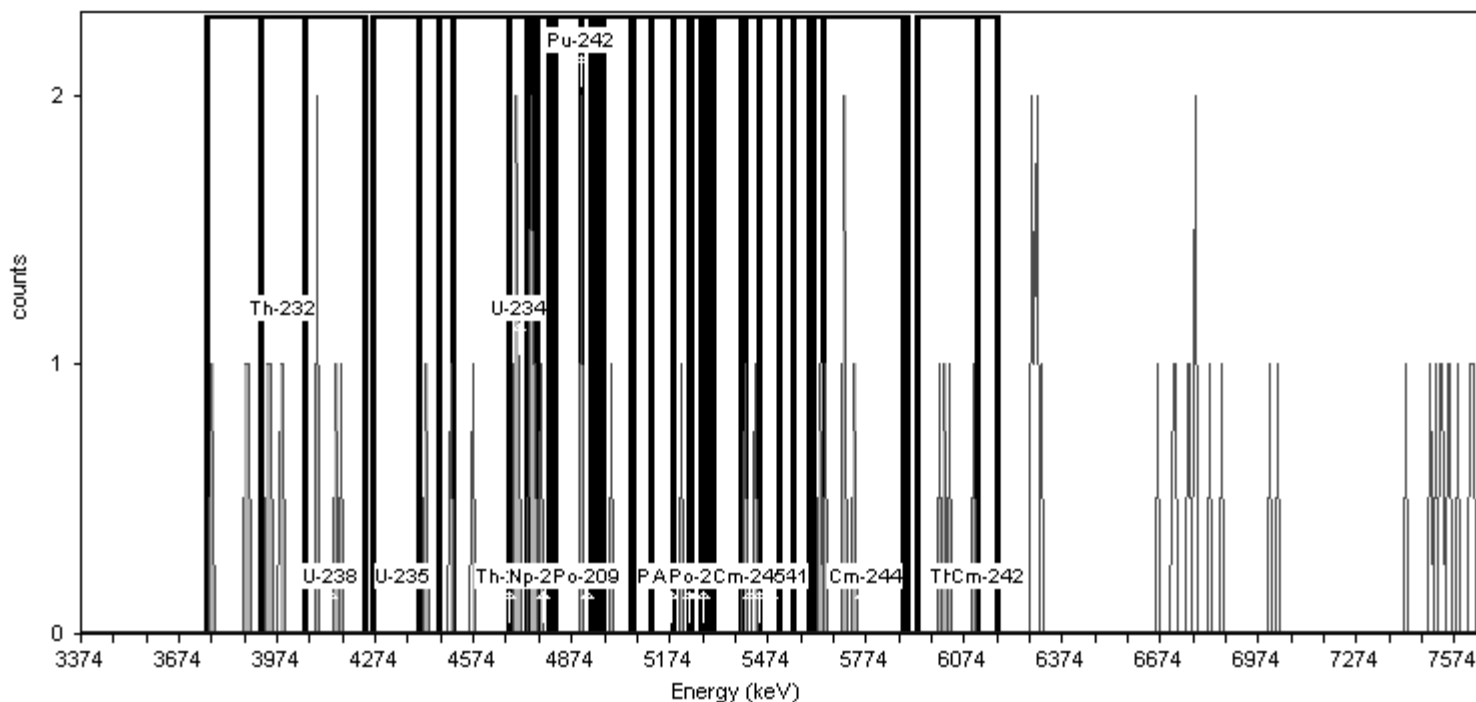
Energy Calibration Equation:

Gain = 7.4575 keV / Ch

Offset = 3,366.95 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 22.79% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI, Nuclide Library: Background ROI Library

Total Background Counts: 66.00

Nuclide Summary (ROI)

<u>RegionName</u>	<u>Peak Energy</u>	<u>Start Energy</u>	<u>End Energy</u>	<u>GrossCounts</u>	<u>Count Rate</u>	<u>CR Uncertainty</u>
	(MeV)	(MeV)	(MeV)		(CPM)	(CPM)
Th-232	3.99	3.75	4.05	7.00	7.292E-003	2.946E-003
U-238	4.14	3.92	4.24	8.00	8.333E-003	3.125E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.68	4.40	4.75	8.00	8.333E-003	3.125E-003
U-234	4.71	4.51	4.82	9.00	9.375E-003	3.294E-003
Pu-242	4.90	4.68	4.95	10.00	1.042E-002	3.455E-003
Th-229	4.86	4.74	5.12	8.00	8.333E-003	3.125E-003
Np-237	4.78	4.77	4.81	1.00	1.042E-003	1.473E-003
Po-209	4.92	4.90	4.93	2.00	2.083E-003	1.804E-003
Pu-239	5.18	4.97	5.24	2.00	2.083E-003	1.804E-003
Am-243	5.23	5.05	5.31	1.00	1.042E-003	1.473E-003
U-232	5.25	5.06	5.40	2.00	2.083E-003	1.804E-003
Th-228	5.45	5.19	5.51	3.00	3.125E-003	2.083E-003
Po-210	5.28	5.23	5.29	0.00	0.000E+000	1.473E-003
Pu-238	5.47	5.27	5.55	2.00	2.083E-003	1.804E-003
Am-241	5.48	5.30	5.60	2.00	2.083E-003	1.804E-003
Cm-245	5.42	5.40	5.45	2.00	2.083E-003	1.804E-003
Pu-236	5.76	5.61	5.89	5.00	5.208E-003	2.552E-003
Cm-244	5.78	5.64	5.90	4.00	4.167E-003	2.329E-003
Th-227	6.07	5.93	6.18	4.00	4.167E-003	2.329E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

Nuclide Summary (ROI)

<u>RegionName</u>	<u>Peak Energy</u>	<u>Start Energy</u>	<u>End Energy</u>	<u>GrossCounts</u>	<u>Count Rate</u>	<u>CR Uncertainty</u>
	(MeV)	(MeV)	(MeV)		(CPM)	(CPM)
Th-232	3.99	3.75	4.05	4.00	4.167E-003	2.329E-003
U-238	4.14	3.92	4.24	4.00	4.167E-003	2.329E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.68	4.40	4.75	4.00	4.167E-003	2.329E-003
U-234	4.71	4.51	4.82	5.00	5.208E-003	2.552E-003
Pu-242	4.90	4.68	4.95	3.00	3.125E-003	2.083E-003
Th-229	4.86	4.74	5.12	3.00	3.125E-003	2.083E-003
Np-237	4.78	4.77	4.81	1.00	1.042E-003	1.473E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	3.00	3.125E-003	2.083E-003
Am-243	5.23	5.05	5.31	3.00	3.125E-003	2.083E-003
U-232	5.25	5.06	5.40	4.00	4.167E-003	2.329E-003
Th-228	5.45	5.19	5.51	8.00	8.333E-003	3.125E-003
Po-210	5.28	5.23	5.29	1.00	1.042E-003	1.473E-003
Pu-238	5.47	5.27	5.55	9.00	9.375E-003	3.294E-003
Am-241	5.48	5.30	5.60	8.00	8.333E-003	3.125E-003
Cm-245	5.42	5.40	5.45	3.00	3.125E-003	2.083E-003
Pu-236	5.76	5.61	5.89	3.00	3.125E-003	2.083E-003
Cm-244	5.78	5.64	5.90	3.00	3.125E-003	2.083E-003
Th-227	6.07	5.93	6.18	7.00	7.292E-003	2.946E-003
Cm-242	6.15	6.12	6.18	2.00	2.083E-003	1.804E-003

Nuclide Summary (ROI)

<u>RegionName</u>	<u>Peak Energy</u> (MeV)	<u>Start Energy</u> (MeV)	<u>End Energy</u> (MeV)	<u>GrossCounts</u>	<u>Count Rate</u> (CPM)	<u>CR Uncertainty</u> (CPM)
Th-230	4.68	4.40	4.75	11.00	1.146E-002	3.608E-003
U-234	4.71	4.51	4.82	9.00	9.375E-003	3.294E-003
Pu-242	4.90	4.68	4.95	2.00	2.083E-003	1.804E-003
Th-229	4.86	4.74	5.12	6.00	6.250E-003	2.756E-003
Np-237	4.78	4.77	4.81	0.00	0.000E+000	1.473E-003
Po-209	4.92	4.90	4.93	1.00	1.042E-003	1.473E-003
Pu-239	5.18	4.97	5.24	7.00	7.292E-003	2.946E-003
Am-243	5.23	5.05	5.31	4.00	4.167E-003	2.329E-003
U-232	5.25	5.06	5.40	4.00	4.167E-003	2.329E-003
Th-228	5.45	5.19	5.51	2.00	2.083E-003	1.804E-003
Po-210	5.28	5.23	5.29	0.00	0.000E+000	1.473E-003
Pu-238	5.47	5.27	5.55	2.00	2.083E-003	1.804E-003
Am-241	5.48	5.30	5.60	2.00	2.083E-003	1.804E-003
Cm-245	5.42	5.40	5.45	0.00	0.000E+000	1.473E-003
Pu-236	5.76	5.61	5.89	6.00	6.250E-003	2.756E-003
Cm-244	5.78	5.64	5.90	6.00	6.250E-003	2.756E-003
Th-227	6.07	5.93	6.18	6.00	6.250E-003	2.756E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003
Th-232	3.99	3.75	4.05	2.00	2.083E-003	1.804E-003
U-238	4.14	3.92	4.24	7.00	7.292E-003	2.946E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003

Nuclide Summary (ROI)

<u>RegionName</u>	<u>Peak Energy</u>	<u>Start Energy</u>	<u>End Energy</u>	<u>GrossCounts</u>	<u>Count Rate</u>	<u>CR Uncertainty</u>
	(keV)	(keV)	(keV)		(CPM)	(CPM)
Th-232	3,985.93	3,754.75	4,053.05	0.00	0.000E+000	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	3.00	3.125E-003	2.083E-003
U-235	4,358.81	4,261.86	4,463.21	3.00	3.125E-003	2.083E-003
Th-230	4,679.48	4,403.55	4,746.60	4.00	4.167E-003	2.329E-003
U-234	4,709.31	4,507.96	4,821.17	6.00	6.250E-003	2.756E-003
Pu-242	4,903.21	4,679.48	4,947.95	5.00	5.208E-003	2.552E-003
Th-229	4,858.46	4,739.14	5,119.48	5.00	5.208E-003	2.552E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	2.00	2.083E-003	1.804E-003
Am-243	5,231.34	5,052.36	5,305.92	2.00	2.083E-003	1.804E-003
U-232	5,253.71	5,059.82	5,402.86	10.00	1.042E-002	3.455E-003
Th-228	5,447.61	5,186.59	5,507.27	18.00	1.875E-002	4.541E-003
Po-210	5,276.09	5,231.34	5,291.00	0.00	0.000E+000	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	20.00	2.083E-002	4.774E-003
Am-241	5,484.90	5,298.46	5,604.22	24.00	2.500E-002	5.208E-003
Cm-245	5,417.78	5,395.41	5,447.61	10.00	1.042E-002	3.455E-003
Pu-236	5,760.83	5,611.67	5,887.60	100.00	1.042E-001	1.047E-002
Cm-244	5,775.74	5,641.51	5,902.52	97.00	1.010E-001	1.031E-002
Th-227	6,074.04	5,932.35	6,178.45	22.00	2.292E-002	4.996E-003
Cm-242	6,148.62	6,118.79	6,178.45	8.00	8.333E-003	3.125E-003

Comment:

Sample

Analyst: 60040

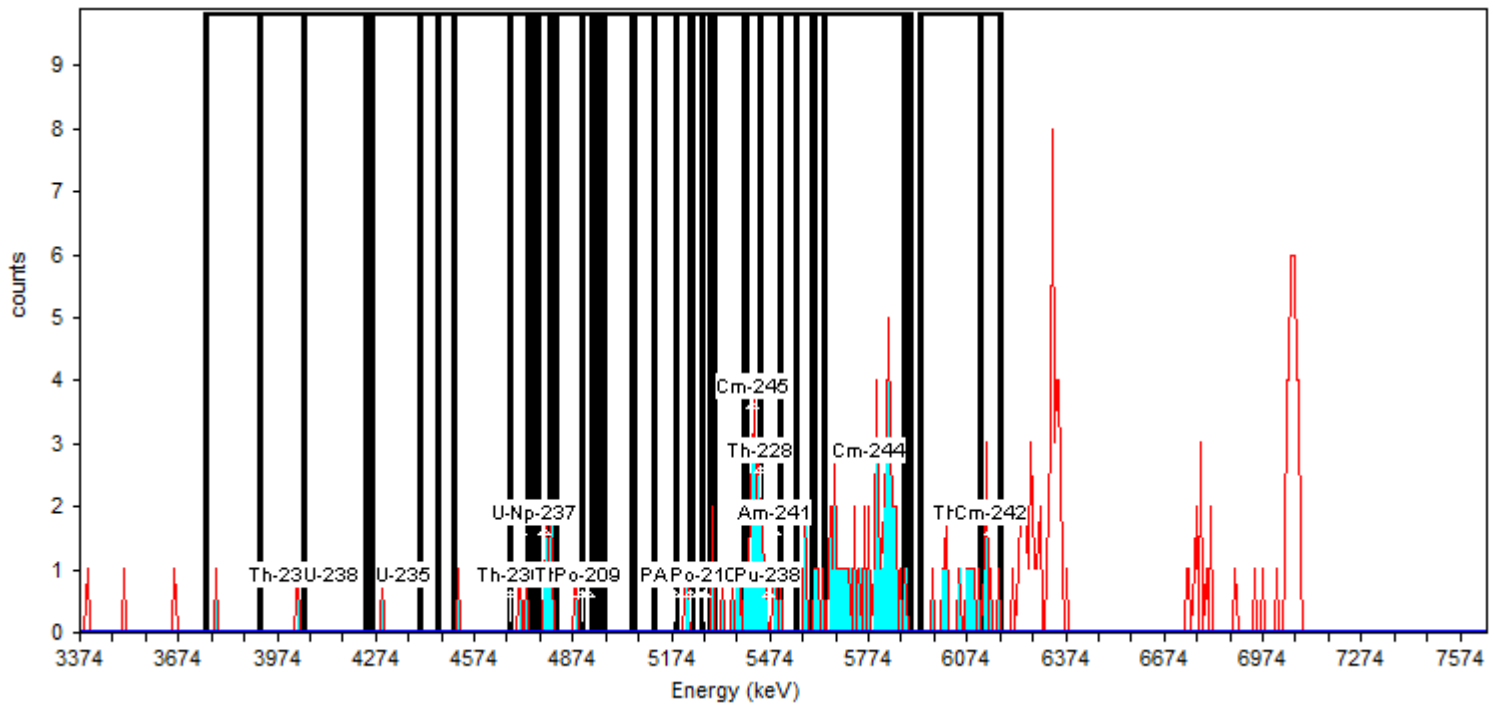
Description:

Batch

Acquisition

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI, Nuclide Library: Background ROI Library
Total Background Counts: 202.00

Nuclide Summary (ROI)

<u>RegionName</u>	<u>Peak Energy</u>	<u>Start Energy</u>	<u>End Energy</u>	<u>GrossCounts</u>	<u>Count Rate</u>	<u>CR Uncertainty</u>
	(keV)	(keV)	(keV)		(CPM)	(CPM)
Th-232	3,985.93	3,754.75	4,053.05	2.00	2.083E-003	1.804E-003
U-238	4,135.08	3,918.81	4,239.49	1.00	1.042E-003	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	1.00	1.042E-003	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	3.00	3.125E-003	2.083E-003
U-234	4,709.31	4,507.96	4,821.17	9.00	9.375E-003	3.294E-003
Pu-242	4,903.21	4,679.48	4,947.95	9.00	9.375E-003	3.294E-003
Th-229	4,858.46	4,739.14	5,119.48	7.00	7.292E-003	2.946E-003
Np-237	4,783.89	4,768.97	4,806.26	6.00	6.250E-003	2.756E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	2.00	2.083E-003	1.804E-003
Am-243	5,231.34	5,052.36	5,305.92	4.00	4.167E-003	2.329E-003
U-232	5,253.71	5,059.82	5,402.86	10.00	1.042E-002	3.455E-003
Th-228	5,447.61	5,186.59	5,507.27	30.00	3.125E-002	5.800E-003
Po-210	5,276.09	5,231.34	5,291.00	0.00	0.000E+000	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	28.00	2.917E-002	5.610E-003
Am-241	5,484.90	5,298.46	5,604.22	30.00	3.125E-002	5.800E-003
Cm-245	5,417.78	5,395.41	5,447.61	17.00	1.771E-002	4.419E-003
Pu-236	5,760.83	5,611.67	5,887.60	49.00	5.104E-002	7.366E-003
Cm-244	5,775.74	5,641.51	5,902.52	46.00	4.792E-002	7.141E-003
Th-227	6,074.04	5,932.35	6,178.45	17.00	1.771E-002	4.419E-003
Cm-242	6,148.62	6,118.79	6,178.45	6.00	6.250E-003	2.756E-003

Run Logs

Alpha Spectroscopy Run Log

Detector: AV3

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:46	140	IC 160-371847/1		371847			PS
05/18/18 19:25	60	ICV 160-371942/1		371942			PS
07/10/18 16:55	60	CCV 160-375343/1		375343			PS
07/13/18 12:11	960	ICB 160-375880/1		375880			PS
08/10/18 14:23	1	PULSER 160-381888/1		381888			RTM
08/10/18 18:48	180	MB 160-381166/1-A		381888	381166	A-01-R	RTM

Detector: AV4

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:46	140	IC 160-371848/1		371848			PS
05/18/18 19:26	60	ICV 160-371943/1		371943			PS
07/10/18 16:57	60	CCV 160-375344/1		375344			PS
07/12/18 13:42	960	ICB 160-375483/1		375483			PS
08/10/18 14:23	1	PULSER 160-381889/1		381889			RTM
08/10/18 18:48	180	LCS 160-381166/2-A		381889	381166	A-01-R	RTM

Detector: AV7

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:47	140	IC 160-371856/1		371856			PS
05/18/18 19:26	60	ICV 160-371945/1		371945			PS
07/10/18 16:56	60	CCV 160-375346/1		375346			PS
07/12/18 13:39	960	ICB 160-375509/1		375509			PS
08/10/18 14:23	1	PULSER 160-381909/1		381909			RTM
08/10/18 18:48	180	LCSD 160-381166/3-A		381909	381166	A-01-R	RTM

Detector: AV8

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:47	140	IC 160-371857/1		371857			PS
05/18/18 19:27	60	ICV 160-371946/1		371946			PS
07/10/18 16:56	60	CCV 160-375347/1		375347			PS
07/12/18 13:39	960	ICB 160-375520/1		375520			PS
08/10/18 14:23	1	PULSER 160-381919/1		381919			RTM
08/10/18 18:48	180	160-29476-1	CRC-MW-1	381919	381166	A-01-R	RTM

Detector: AV147

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 09:43	140	IC 160-337250/1		337250			PS
11/15/17 11:44	60	ICV 160-337582/1		337582			PS
07/21/18 21:28	960	ICB 160-378373/1		378373			PS
07/24/18 10:31	60	CCV 160-378429/1		378429			PS
08/03/18 12:32	1	PULSER 160-380260/1		380260			ALS
08/03/18 14:29	180	MB 160-377736/1-A		380260	377736	A-01-R	ALS
08/06/18 21:31	1	PULSER 160-380834/1		380834			ALS
08/06/18 22:38	720	160-29476-1	CRC-MW-1	380834	377736	A-01-R	ALS

Alpha Spectroscopy Run Log

Detector: AV148

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 10:03	140	IC 160-337251/1		337251			PS
11/15/17 11:50	60	ICV 160-337583/1		337583			PS
07/21/18 21:28	960	ICB 160-378374/1		378374			PS
07/24/18 10:32	60	CCV 160-378430/1		378430			PS
08/03/18 12:32	1	PULSER 160-380261/1		380261			ALS
08/03/18 14:29	180	LCS 160-377736/2-A		380261	377736	A-01-R	ALS
08/06/18 21:31	1	PULSER 160-380835/1		380835			ALS
08/06/18 22:38	720	160-29476-1 DU	CRC-MW-1 DU	380835	377736	A-01-R	ALS

GAS FLOW PROPORTIONAL COUNTER

Method 9315

Radium-226 (GFPC) by Method 9315

Prep Batch: 375564

Preparation, Precipitate Separation
(21-Day In-Growth)

Gas Flow Proportional Counter Analysis Detail Report

Prep Batch: 375564

Lab ID: LCS 160-375564/1-A	Analyzed: 08/08/18 05:27	Decay Corrected: No	Ts: 100
Client ID:	Detector: Orange4	Yield Truncated: No	Tb: 1000
Sigma: 2	Dil Fac: 1	Calibration Type: 2	

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Radium-226	10.46	0.552	1.09		pCi/L	1.00	0.0719	1444	40	14.440	0.040	0.18446	380986
Carrier	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits				
Ba Carrier	0.03120				g		0.0339	92.0	40 - 110				

Lab ID: LCSD 160-375564/2-A	Analyzed: 08/08/18 05:27	Decay Corrected: No	Ts: 100
Client ID:	Detector: Orange5	Yield Truncated: No	Tb: 1000
Sigma: 2	Dil Fac: 1	Calibration Type: 2	

Analyte	LCSD Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Radium-226	10.60	0.537	1.10		pCi/L	1.00	0.101	1584	119	15.840	0.119	0.18330	380986
Carrier	LCSD Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits				
Ba Carrier	0.03380				g		0.0339	99.7	40 - 110				

Lab ID: 160-29476-1	Analyzed: 08/08/18 05:29	Decay Corrected: No	Ts: 100
Client ID: CRC-MW-1	Detector: Orange19	Yield Truncated: No	Tb: 1000
Sigma: 2	Dil Fac: 1	Calibration Type: 2	

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Radium-226	0.356	0.105	0.109		pCi/L	1.00	0.0859	63	86	0.630	0.086	0.19526	380986
Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits				
Ba Carrier	0.0327				g		0.0339	96.5	40 - 110				

Lab ID: MB 160-375564/15-A	Analyzed: 08/08/18 05:29	Decay Corrected: No	Ts: 100
Client ID:	Detector: Orange22	Yield Truncated: No	Tb: 1000
Sigma: 2	Dil Fac: 1	Calibration Type: 2	

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Radium-226	0.1295	0.0706	0.0716		pCi/L	1.00	0.0869	30	96	0.300	0.096	0.19197	380986
Carrier	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits				
Ba Carrier	0.03430				g		0.0339	101	40 - 110				

Gas Flow Proportional Counter Analysis Detail Report

Prep Batch: 375564

Quality Control Summary

Method Blank ID:	Analyte	Parent Result	Spike Added	MB Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
MB 160-375564/15-A	Radium-226			0.1295		pCi/L							3.617412 27
Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-375564/1-A	Radium-226		11.4	10.46		pCi/L	92	68 - 137	1				-1.117189 905
Lab Control Sample Duplicate	Analyte	Parent Result	Spike Added	LCSD Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCSD 160-375564/2-A	Radium-226		11.4	10.60		pCi/L	93	68 - 137	1	0.07	0.19	1	-.9371899 937

Glossary:

Ts = Count Duration, Sample
 Tb = Count Duration, Background
 Cs = Total Counts, Sample
 Cb = Total Counts, Background
 CPMs = Counts Per Minute, Sample
 CPMb = Counts Per Minute, Background
 Eff = Efficiency

GAS FLOW PROPORTIONAL COUNTER BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Batch Number: 375564 Batch Start Date: 07/13/18 13:31 Batch Analyst: Chapman, Jessica LBatch Method: PrecSep-21 Batch End Date: 07/27/18 12:35

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	Ba_TareWt	Ba_GrossWt	Ba_Mass	IngDecDate1	IngDecDate2
LCS 160-375564/1		PrecSep-21, 9315		1000 mL	8.7765 g	8.8077 g	0.0339 g	07/18/2018 13:48	07/27/2018 08:20
LCSD 160-375564/2		PrecSep-21, 9315		1000 mL	8.8247 g	8.8585 g	0.0339 g	07/18/2018 13:48	07/27/2018 08:20
160-29476-F-1	CRC-MW-1	PrecSep-21, 9315	T	1000.16 mL	8.7417 g	8.7744 g	0.0339 g	07/18/2018 13:48	07/27/2018 08:20
MB 160-375564/15		PrecSep-21, 9315		1000 mL	8.8003 g	8.8346 g	0.0339 g	07/18/2018 13:48	07/27/2018 08:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	IngDecDate3	NativeMassBa	Ba Carrier 00038	Ra-226 00027		
LCS 160-375564/1		PrecSep-21, 9315		08/08/2018	0 g	1 mL	1 mL		
LCSD 160-375564/2		PrecSep-21, 9315		08/08/2018	0 g	1 mL	1 mL		
160-29476-F-1	CRC-MW-1	PrecSep-21, 9315	T	08/08/2018	0 g	1 mL			
MB 160-375564/15		PrecSep-21, 9315		08/08/2018	0 g	1 mL			

Batch Notes	
Balance ID	1122021820, 1125330898
Batch Comment	In CPR, Out JTR
Pipette ID	RAD112, CR001
Analyst ID - Reagent Drop Witness	CPR per JLC
Analyst ID - Reagent Drop	JLC
SOP Number	ST-RC-0041, ST-RC-0002

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID LCS 160-375564/1-A Repeat 1
Carrier No. 0

Batch ID 375564

Count Method Gross Alpha Beta Detector Volts 1515

Count Began 8/8/2018 5:27:22 AM
Count Ended 8/8/2018 7:07:35 AM
Sample Count Time 100.00 mins Background Count Time 1,000.00 mins

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.040	1,444	14.440	14.400
	sd 0.006	38.000	0.380	0.380
Beta	0.351	2,724	27.240	26.889
	sd 0.019	52.192	0.522	0.522

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID	LCSD 160-375564/2-A	Repeat	1
		Carrier No.	0
Batch ID	375564		
Count Method	Gross Alpha Beta	Detector Volts	1515

Count Began 8/8/2018 5:27:28 AM
Count Ended 8/8/2018 7:07:39 AM
Sample Count Time 100.00 mins Background Count Time 1,000.00 mins

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.119	1,584	15.840	15.721
	sd 0.011	39.799	0.398	0.398
Beta	0.362	2,808	28.080	27.718
	sd 0.019	52.991	0.530	0.530

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID 160-29476-F-1-A	Repeat	1
	Carrier No.	0
Batch ID 375564		
Count Method Gross Alpha Beta	Detector Volts	1515

Count Began 8/8/2018 5:29:05 AM
Count Ended 8/8/2018 7:09:17 AM
Sample Count Time 100.00 mins Background Count Time 1,000.00 mins

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.086	63	0.630	0.544
sd	0.009	7.937	0.079	0.080
Beta	0.465	80	0.800	0.335
sd	0.022	8.944	0.089	0.092

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID MB 160-375564/15-A	Repeat	1
	Carrier No.	0
Batch ID 375564		
Count Method Gross Alpha Beta	Detector Volts	1515

Count Began 8/8/2018 5:29:26 AM
Count Ended 8/8/2018 7:11:03 AM
Sample Count Time 100.00 mins Background Count Time 1,000.00 mins

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.096	30	0.300	0.204
sd	0.010	5.477	0.055	0.056
Beta	0.386	45	0.450	0.064
sd	0.020	6.708	0.067	0.070

Method 9320

Radium-228 (GFPC) by Method 9320

Prep Batch: 375578

Preparation, Precipitate Separation

Gas Flow Proportional Counter Analysis Detail Report

Prep Batch: 375578

Lab ID: LCS 160-375578/1-A
 Client ID:
 Sigma: 2

Analyzed: 07/27/18 09:18
 Detector: Protean0
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Calibration Type: 1

Ts: 200
 Tb: 1000

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Radium-228	11.46	0.782	1.31		pCi/L	1.00	0.513	1128	664	5.640	0.664	0.43619	378362
Carrier	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits				
Ba Carrier	0.03120				g		0.0339	92.0	40 - 110				
Y Carrier	0.02270				g		0.0268	84.9	40 - 110				

Lab ID: LCSD 160-375578/2-A
 Client ID:
 Sigma: 2

Analyzed: 07/27/18 09:18
 Detector: Protean1
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Calibration Type: 1

Ts: 200
 Tb: 1000

Analyte	LCSD Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Radium-228	10.96	0.732	1.25		pCi/L	1.00	0.404	1076	432	5.380	0.432	0.43795	378362
Carrier	LCSD Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits				
Ba Carrier	0.03380				g		0.0339	99.7	40 - 110				
Y Carrier	0.02170				g		0.0268	81.1	40 - 110				

Lab ID: 160-29476-1
 Client ID: CRC-MW-1
 Sigma: 2

Analyzed: 07/27/18 09:20
 Detector: Protean13
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Calibration Type: 1

Ts: 200
 Tb: 1000

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Radium-228	0.533	0.273	0.277		pCi/L	1.00	0.404	132	422	0.660	0.422	0.43897	378362
Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits				
Ba Carrier	0.0327				g		0.0339	96.5	40 - 110				
Y Carrier	0.0222				g		0.0268	83.0	40 - 110				

Lab ID: MB 160-375578/15-A
 Client ID:
 Sigma: 2

Analyzed: 07/27/18 09:20
 Detector: Protean15
 Dil Fac: 1

Decay Corrected: No
 Yield Truncated: No
 Calibration Type: 1

Ts: 200
 Tb: 1000

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Radium-228	0.3845	0.274	0.276	U	pCi/L	1.00	0.430	140	522	0.700	0.522	0.43189	378362
Carrier	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits				
Ba Carrier	0.03430				g		0.0339	101	40 - 110				
Y Carrier	0.02230				g		0.0268	83.4	40 - 110				

Gas Flow Proportional Counter Analysis Detail Report

Prep Batch: 375578

Quality Control Summary

Method Blank ID:	Analyte	Parent Result	Spike Added	MB Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
MB 160-375578/15-A	Radium-228			0.3845	U	pCi/L							2.78361485
Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-375578/1-A	Radium-228		11.2	11.46		pCi/L	102	56 - 140	4				.2980378917
Lab Control Sample Duplicate	Analyte	Parent Result	Spike Added	LCSD Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCSD 160-375578/2-A	Radium-228		11.2	10.96		pCi/L	98	56 - 140	4	0.19	0.55	1	-.252745236

Glossary:

Ts = Count Duration, Sample
 Tb = Count Duration, Background
 Cs = Total Counts, Sample
 Cb = Total Counts, Background
 CPMs = Counts Per Minute, Sample
 CPMb = Counts Per Minute, Background
 Eff = Efficiency

GAS FLOW PROPORTIONAL COUNTER BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Batch Number: 375578 Batch Start Date: 07/13/18 14:09 Batch Analyst: Chapman, Jessica LBatch Method: PrecSep_0 Batch End Date: 07/27/18 08:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	Ba_TareWt	Ba_GrossWt	Ba_Mass	Y_TareWt	Y_GrossWt
LCS 160-375578/1		PrecSep_0, 9320		1000 mL	8.7765 g	8.8077 g	0.0339 g	8.7137 g	8.7364 g
LCSD 160-375578/2		PrecSep_0, 9320		1000 mL	8.8247 g	8.8585 g	0.0339 g	8.8450 g	8.8667 g
160-29476-F-1	CRC-MW-1	PrecSep_0, 9320	T	1000.16 mL	8.7417 g	8.7744 g	0.0339 g	8.7350 g	8.7572 g
MB 160-375578/15		PrecSep_0, 9320		1000 mL	8.8003 g	8.8346 g	0.0339 g	8.8056 g	8.8279 g

Lab Sample ID	Client Sample ID	Method Chain	Basis	Y_Mass	IngDecDate1	IngDecDate2	NativeMassBa	NativeMassY	Ba Carrier 00038
LCS 160-375578/1		PrecSep_0, 9320		0.02675 g	07/18/2018 13:48	07/27/2018 06:00	0 g	0 g	1 mL
LCSD 160-375578/2		PrecSep_0, 9320		0.02675 g	07/18/2018 13:48	07/27/2018 06:00	0 g	0 g	1 mL
160-29476-F-1	CRC-MW-1	PrecSep_0, 9320	T	0.02675 g	07/18/2018 13:48	07/27/2018 06:00	0 g	0 g	1 mL
MB 160-375578/15		PrecSep_0, 9320		0.02675 g	07/18/2018 13:48	07/27/2018 06:00	0 g	0 g	1 mL

Lab Sample ID	Client Sample ID	Method Chain	Basis	Ra22804Al20 00001	Y Carrier 00032				
LCS 160-375578/1		PrecSep_0, 9320		0.3 mL	0.2 mL				
LCSD 160-375578/2		PrecSep_0, 9320		0.3 mL	0.2 mL				
160-29476-F-1	CRC-MW-1	PrecSep_0, 9320	T		0.2 mL				
MB 160-375578/15		PrecSep_0, 9320			0.2 mL				

Batch Notes	
Balance ID	1122021820, 1125330898
Batch Comment	In CPR, Out JTR
Pipette ID	RAD112, CR001, SEP005
Analyst ID - Reagent Drop Witness	CPR, JLC per CPR
Analyst ID - Reagent Drop	JLC per CPR, CPR
SOP Number	ST-RC-0041, ST-RC-0002

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GAS FLOW PROPORTIONAL COUNTER BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29476-1

SDG No.: _____

Batch Number: 375578 Batch Start Date: 07/13/18 14:09 Batch Analyst: Chapman, Jessica LBatch Method: PrecSep_0 Batch End Date: 07/27/18 08:40

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Addr: 0

Sample ID LCS 160-375578/1-A Repeat 1
Carrier No. 0

Batch ID 375578

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 Sample sd 0 Sample
Residual Wt 0 mg sd 0 mg

Count Began 7/27/2018 9:18:23 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 7/27/2018 12:38:36 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 200.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.066	49	0.245	0.179
sd	0.000			0.008	7.000	0.035	0.036
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.664	1,128	5.640	4.976
sd	0.000			0.026	33.586	0.168	0.170

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Currie Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Addr: 1

Sample ID LCSD 160-375578/2-A Repeat 1
Carrier No. 0

Batch ID 375578

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 Sample sd 0 Sample
Residual Wt 0 mg sd 0 mg

Count Began 7/27/2018 9:18:29 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 7/27/2018 12:38:41 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 200.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.074	36	0.180	0.106
sd	0.000			0.009	6.000	0.030	0.031
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.432	1,076	5.380	4.948
sd	0.000			0.021	32.802	0.164	0.165

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Currie Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Addr: 13

Sample ID 160-29476-F-1-B Repeat 1
Carrier No. 0

Batch ID 375578

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 Sample sd 0 Sample
Residual Wt 0 mg sd 0 mg

Count Began 7/27/2018 9:20:00 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 7/27/2018 12:40:14 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 200.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.137	46	0.230	0.093
sd	0.000			0.012	6.782	0.034	0.036
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	132	0.660	0.238
sd	0.000			0.021	11.489	0.057	0.061

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Currie Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Addr: 15

Sample ID MB 160-375578/15-A Repeat 1
Carrier No. 0

Batch ID 375578

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 Sample sd 0 Sample
Residual Wt 0 mg sd 0 mg

Count Began 7/27/2018 9:20:12 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 7/27/2018 12:40:26 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 200.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	54	0.270	0.121
sd	0.000			0.012	7.348	0.037	0.039
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.522	140	0.700	0.178
sd	0.000			0.023	11.832	0.059	0.063

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Currie Error = .00 x sd

Daily Checks

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

APPROVED

By Kody Saulters at 12:37 pm, Aug 08, 2018

Instrument: Orange

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
Detector 0											
12:08 AM	Efficiency						49200.94	49935.03	1498.05	-734.09	Pass
	Background										
12:15 AM	Crosstalk						46.535	655.525	273.412	-608.990	NA
	Efficiency	12508.33	12918.08	387.54	-409.74	FAIL					
1:16 AM	Background										
	Crosstalk	4288.000	4183.775	91.802	104.225	Pass					
4:38 AM	Efficiency	12441.29	12918.08	387.54	-476.79	FAIL					
	Background										
	Crosstalk	4215.000	4183.775	91.802	31.225	Pass					
	Efficiency										
	Background	0.185	0.097	0.037	0.088	Pass	0.575	0.500	0.099	0.076	Pass
	Crosstalk										
Detector 1											
12:07 AM	Efficiency						47484.96	48521.48	1455.64	-1036.52	Pass
	Background										
12:15 AM	Crosstalk						10.116	338.750	244.604	-328.634	NA
	Efficiency	13339.63	13693.68	410.81	-354.04	Pass					
4:27 AM	Background										
	Crosstalk	4640.000	4106.275	231.030	533.725	WARNING					
	Efficiency										
	Background	0.080	0.077	0.029	0.004	Pass	0.435	0.382	0.064	0.053	Pass
	Crosstalk										
Detector 2											
12:07 AM	Efficiency						48859.25	49918.95	1497.57	-1059.70	Pass
	Background										
	Crosstalk						8.093	611.900	348.104	-603.807	NA

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

Instrument: *Orange*

Orange											
Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
12:15 AM	Efficiency	13702.88	14260.08	427.80	-557.20	<u>FAIL</u>					
	Background										
	Crosstalk	4656.500	4228.575	214.101	427.925	Pass					
1:16 AM	Efficiency	13689.37	14260.08	427.80	-570.71	<u>FAIL</u>					
	Background										
	Crosstalk	4471.500	4228.575	214.101	242.925	Pass					
4:38 AM	Efficiency						0.595	0.408	0.053	0.187	<u>FAIL</u>
	Background	0.185	0.091	0.032	0.095	Pass					
	Crosstalk										
8:35 AM	Efficiency						0.475	0.408	0.053	0.067	Pass
	Background	0.115	0.091	0.032	0.025	Pass					
	Crosstalk										
Detector 3											
12:08 AM	Efficiency						58674.75	59069.20	1772.08	-394.45	Pass
	Background										
	Crosstalk										
12:15 AM	Efficiency	12779.74	13346.88	400.41	-567.14	<u>FAIL</u>	9.105	545.400	417.832	-536.295	NA
	Background										
	Crosstalk	4392.000	4042.275	43.117	349.725	DOEF					
1:16 AM	Efficiency	12857.30	13346.88	400.41	-489.58	<u>FAIL</u>					
	Background										
	Crosstalk	4403.000	4042.275	43.117	360.725	DOEF					
4:38 AM	Efficiency						0.675	0.601	0.097	0.074	Pass
	Background	0.245	0.104	0.021	0.141	<u>FAIL</u>					
	Crosstalk										
Detector 4											
12:08 AM	Efficiency						56232.15	55962.22	1678.87	269.93	Pass
	Background										
	Crosstalk										
							0.000	0.320	0.284	-0.320	NA

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

Instrument: *Orange*

Instrument: Orange							Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag					
12:15 AM	Efficiency	15772.13	16076.75	482.30	-304.62	Pass					
	Background										
4:27 AM	Crosstalk	6198.500	6120.950	71.073	77.550	Pass					
	Efficiency										
	Background	0.100	0.104	0.030	-0.003	Pass	0.400	0.462	0.068	-0.062	Pass
	Crosstalk										
Detector 5											
12:08 AM	Efficiency						54221.95	54077.08	1622.31	144.87	Pass
	Background										
	Crosstalk						3.541	0.250	0.344	3.291	NA
12:15 AM	Efficiency	16171.95	16418.00	492.54	-246.05	Pass					
	Background										
	Crosstalk	6441.000	6233.125	41.144	207.875	DOEF					
4:27 AM	Efficiency										
	Background	0.110	0.076	0.014	0.034	Pass	0.505	0.444	0.110	0.061	Pass
	Crosstalk										
Detector 6											
12:08 AM	Efficiency						45417.34	49761.08	1492.83	-4343.73	FAIL
	Background										
	Crosstalk						1.513	0.175	0.294	1.338	NA
12:15 AM	Efficiency	11501.74	14588.50	437.66	-3086.76	FAIL					
	Background										
	Crosstalk	9168.500	6496.200	551.681	2672.300	DOEF					
4:27 AM	Efficiency										
	Background	0.080	0.100	0.035	-0.020	Pass	0.410	0.463	0.080	-0.053	Pass
	Crosstalk										
Detector 7											

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

Instrument: *Orange*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
12:02 AM	Efficiency						45834.24	45414.23	1362.43	420.02	Pass
	Background										
	Crosstalk						3.541	1.325	0.893	2.216	NA
12:08 AM	Efficiency						45889.49	45414.23	1362.43	475.26	Pass
	Background										
	Crosstalk						3.035	1.325	0.893	1.710	NA
12:15 AM	Efficiency	15329.28	15629.53	468.89	-300.25	Pass					
	Background										
	Crosstalk	5801.000	5742.775	47.803	58.225	Pass					
1:17 AM	Efficiency	15142.63	15629.53	468.89	-486.90	<u>FAIL</u>					
	Background										
	Crosstalk	5792.000	5742.775	47.803	49.225	Pass					
4:38 AM	Efficiency										
	Background	0.185	0.119	0.035	0.066	Pass	0.660	0.560	0.073	0.100	Pass
	Crosstalk										
Detector 8											
12:11 AM	Efficiency						49778.49	49452.15	1483.56	326.34	Pass
	Background										
	Crosstalk						9.647	2.575	1.340	7.072	NA
12:18 AM	Efficiency	12294.84	12479.00	374.37	-184.16	Pass					
	Background										
	Crosstalk	4417.000	4244.750	69.836	172.250	WARNING					
4:27 AM	Efficiency										
	Background	0.145	0.068	0.016	0.078	<u>FAIL</u>	0.520	0.420	0.072	0.100	Pass
	Crosstalk										
8:35 AM	Efficiency										
	Background	0.080	0.068	0.016	0.013	Pass	0.520	0.420	0.072	0.100	Pass
	Crosstalk										

Detector 9

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

Instrument: *Orange*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
Detector 10	12:12 AM Efficiency						49023.82	48747.90	1462.44	275.92	Pass
	Background										
	Crosstalk						10.662	2.700	0.992	7.962	NA
	12:18 AM Efficiency	13429.19	13598.65	407.96	-169.46	Pass					
	Background										
	Crosstalk	4775.500	4590.975	94.057	184.525	Pass					
	4:27 AM Efficiency										
	Background	0.105	0.112	0.033	-0.007	Pass	0.595	0.487	0.082	0.108	Pass
	Crosstalk										
	12:12 AM Efficiency						50318.01	50054.68	1501.64	263.34	Pass
	Background										
	Crosstalk						3.046	0.125	0.222	2.921	NA
Detector 11	12:18 AM Efficiency	11378.61	11708.33	351.25	-329.72	Pass					
	Background										
	Crosstalk	7388.000	7201.325	145.497	186.675	Pass					
	4:27 AM Efficiency										
	Background	0.095	0.125	0.033	-0.030	Pass	0.390	0.506	0.095	-0.116	Pass
	Crosstalk										
	12:12 AM Efficiency						59412.28	59142.43	1774.27	269.86	Pass
	Background										
	Crosstalk						3.554	2.650	1.204	0.904	NA
	12:18 AM Efficiency	13273.63	13398.55	401.96	-124.92	Pass					
	Background										
	Crosstalk	4457.000	4216.575	69.064	240.425	DOEF					
4:27 AM	Efficiency										
	Background	0.125	0.116	0.031	0.009	Pass	0.715	0.719	0.097	-0.004	Pass
	Crosstalk										

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

Instrument: *Orange*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
Detector 12											
12:12 AM	Efficiency						57148.33	56886.15	1706.58	262.18	Pass
	Background										
12:18 AM	Crosstalk						3.046	2.475	1.082	0.571	NA
	Efficiency	16900.89	16917.10	507.51	-16.21	Pass					
4:27 AM	Background										
	Crosstalk	6014.000	5738.500	102.997	275.500	WARNING					
8:35 AM	Efficiency										
	Background	0.270	0.103	0.030	0.167	FAIL	0.730	0.618	0.100	0.112	Pass
	Crosstalk										
	Efficiency										
	Background	0.115	0.103	0.030	0.012	Pass	0.570	0.618	0.100	-0.048	Pass
	Crosstalk										
Detector 13											
12:12 AM	Efficiency						55704.96	55204.43	1656.13	500.53	Pass
	Background										
12:20 AM	Crosstalk						42.648	22.150	5.535	20.498	NA
	Efficiency	17161.60	17051.55	511.55	110.05	Pass					
4:27 AM	Background										
	Crosstalk	5472.500	5209.900	107.080	262.600	WARNING					
	Efficiency										
	Background	0.090	0.118	0.029	-0.028	Pass	0.635	0.615	0.084	0.020	Pass
	Crosstalk										
	Efficiency										
Detector 14											
12:12 AM	Efficiency						50931.05	51681.73	1550.45	-750.67	Pass
	Background										
	Crosstalk						64.535	51.775	17.970	12.760	NA
	Efficiency										

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

Instrument: *Orange*

Instrument: Orange		Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
12:18 AM	Efficiency	15437.24	15537.73	466.13	-100.49	Pass					
	Background										
4:27 AM	Crosstalk	4840.500	4533.500	133.093	307.000	WARNING					
	Efficiency										
	Background	0.125	0.095	0.034	0.031	Pass	0.545	0.518	0.090	0.027	Pass
	Crosstalk										
Detector 15											
12:12 AM	Efficiency						44623.96	44769.68	1343.09	-145.71	Pass
	Background										
	Crosstalk						13.201	5.175	1.711	8.026	NA
12:18 AM	Efficiency	15148.01	15520.28	465.61	-372.27	Pass					
	Background										
	Crosstalk	5291.000	4871.600	159.105	419.400	WARNING					
4:28 AM	Efficiency										
	Background	0.120	0.138	0.024	-0.018	Pass	0.425	0.544	0.070	-0.119	Pass
	Crosstalk										
Detector 16											
12:15 AM	Efficiency						49433.61	49427.80	1482.83	5.81	Pass
	Background										
	Crosstalk						27.928	13.575	3.477	14.353	NA
12:22 AM	Efficiency	12413.97	12627.03	378.81	-213.05	Pass					
	Background										
	Crosstalk	4491.000	4414.550	41.621	76.450	Pass					
4:29 AM	Efficiency										
	Background	0.155	0.106	0.034	0.050	Pass	0.555	0.515	0.101	0.041	Pass
	Crosstalk										
Detector 17											

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

Instrument: *Orange*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
12:15 AM	Efficiency						48252.32	48123.48	1443.70	128.84	Pass
	Background										
	Crosstalk						6.093	1.975	1.164	4.118	NA
12:22 AM	Efficiency	13207.59	13433.43	403.00	-225.83	Pass					
	Background										
	Crosstalk	4916.000	4784.025	106.709	131.975	Pass					
4:29 AM	Efficiency										
	Background	0.130	0.103	0.035	0.028	Pass	0.510	0.410	0.069	0.100	Pass
	Crosstalk										
Detector 18											
12:16 AM	Efficiency						50631.99	50092.13	1502.76	539.87	Pass
	Background										
	Crosstalk						16.757	12.050	3.734	4.707	NA
12:23 AM	Efficiency	13940.66	14158.50	424.76	-217.84	Pass					
	Background										
	Crosstalk	4969.500	4572.700	56.751	396.800	DOEF					
4:29 AM	Efficiency										
	Background	0.140	0.097	0.018	0.043	Pass	0.475	0.455	0.055	0.021	Pass
	Crosstalk										
Detector 19											
12:16 AM	Efficiency						60297.22	60133.55	1804.01	163.67	Pass
	Background										
	Crosstalk						20.309	17.325	4.190	2.984	NA
12:22 AM	Efficiency	13150.53	13501.28	405.04	-350.75	Pass					
	Background										
	Crosstalk	4606.500	4504.475	54.298	102.025	Pass					
4:29 AM	Efficiency										
	Background	0.155	0.110	0.034	0.045	Pass	0.405	2.596	9.515	-2.191	Pass
	Crosstalk										

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

Instrument: *Orange*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
Detector 20											
12:16 AM	Efficiency						56026.73	56390.63	1691.72	-363.90	Pass
	Background										
12:23 AM	Crosstalk						10.663	5.350	1.920	5.313	NA
	Efficiency	16638.67	16878.00	506.34	-239.33	Pass					
4:29 AM	Background										
	Crosstalk	5837.000	5700.475	42.878	136.525	DOEF					
	Efficiency										
	Background	0.145	0.098	0.026	0.048	Pass	0.385	0.409	0.085	-0.024	Pass
	Crosstalk										
Detector 21											
12:16 AM	Efficiency						55122.30	55234.63	1657.04	-112.32	Pass
	Background										
12:23 AM	Crosstalk						12.187	8.525	2.489	3.662	NA
	Efficiency	16760.33	17014.40	510.43	-254.07	Pass					
4:29 AM	Background										
	Crosstalk	5773.000	5708.100	49.208	64.900	Pass					
	Efficiency										
	Background	0.130	0.106	0.036	0.024	Pass	0.340	0.414	0.068	-0.074	Pass
	Crosstalk										
Detector 22											
12:16 AM	Efficiency						52221.76	52617.68	1578.53	-395.91	Pass
	Background										
12:23 AM	Crosstalk						8.631	3.950	2.070	4.681	NA
	Efficiency	15159.56	15510.45	465.31	-350.89	Pass					
	Background										
	Crosstalk	5624.500	5610.125	63.217	14.375	Pass					

Gas Proportional Counter Daily Quality Control Checks

Wednesday, August 08, 2018

Instrument: *Orange*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
4:29 AM	Efficiency										
	Background	0.125	0.104	0.030	0.021	Pass	0.410	0.407	0.060	0.004	Pass
	Crosstalk										
Detector 23											
12:16 AM	Efficiency						45496.95	45356.30	1360.69	140.65	Pass
	Background										
	Crosstalk						11.179	2.450	1.307	8.729	NA
12:23 AM	Efficiency	15076.99	15430.00	462.90	-353.01	Pass					
	Background										
	Crosstalk	5511.000	5503.275	61.421	7.725	Pass					
4:29 AM	Efficiency										
	Background	0.105	0.105	0.033	0.000	Pass	0.355	0.439	0.107	-0.084	Pass
	Crosstalk										

The Alpha and Beta +/- limit are based upon initial 20-point population.

The Alpha and Beta +/- limit for Efficiency is stated at 3%. Flags are "FAIL" > 3%.

The Alpha and Beta +/- limit for Background is stated at 1 StDev. Flags are "FAIL" > 3 StDev.

The Alpha +/- limit for Crosstalk is stated at 1 StDev. Flags are "Warning" > 2 StDev and "DOEF" > 3 StDev. Beta is negligible, for trend only ("NA").

Times shown reflect the end of the count duration.

Gas Proportional Counter Daily Quality Control Checks

APPROVED

By Rachel Mueller at 3:04 pm, Jul 28, 2018

Friday, July 27, 2018

Instrument: Protean

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
Detector 0											
12:36 AM	Efficiency	12191.88	12598.25	377.95	-406.37	FAIL					
	Background										
12:40 AM	Crosstalk	4102.000	4210.200	44.960	-108.200	WARNING	49679.12	48583.18	1457.50	1095.94	Pass
	Efficiency										
12:58 AM	Background						30.946	23.225	5.043	7.721	NA
	Crosstalk										
4:18 AM	Efficiency	12249.93	12598.25	377.95	-348.32	Pass					
	Background										
	Crosstalk	4191.500	4210.200	44.960	-18.700	Pass					
	Efficiency										
	Background	0.200	0.096	0.037	0.104	Pass	0.780	0.716	0.094	0.064	Pass
	Crosstalk										
Detector 1											
12:36 AM	Efficiency	13172.64	13515.73	405.47	-343.09	Pass					
	Background										
12:40 AM	Crosstalk	4642.000	4578.400	63.081	63.600	Pass	48788.30	47659.85	1429.80	1128.45	Pass
	Efficiency										
4:17 AM	Background						9.639	10.950	2.549	-1.311	NA
	Crosstalk										
	Efficiency						0.745	0.498	0.078	0.248	FAIL
	Background	0.245	0.111	0.029	0.134	FAIL					
9:04 AM	Crosstalk										
	Efficiency										
	Background	0.110	0.111	0.029	-0.001	Pass	0.375	0.498	0.078	-0.123	Pass
	Crosstalk										

Detector 2

Gas Proportional Counter Daily Quality Control Checks

Friday, July 27, 2018

Instrument: **Protean**

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
12:36 AM	Efficiency	13608.47	14068.05	422.04	-459.58	<u>FAIL</u>	49940.80	49887.83	1496.63	52.98	Pass
	Background										
	Crosstalk	4837.000	4802.250	75.574	34.750	Pass					
12:40 AM	Efficiency						8.117	5.375	1.806	2.742	NA
	Background										
	Crosstalk										
12:58 AM	Efficiency	13523.91	14068.05	422.04	-544.14	<u>FAIL</u>	3.520	0.541	0.087	2.979	<u>FAIL</u>
	Background										
	Crosstalk	4829.000	4802.250	75.574	26.750	Pass					
4:18 AM	Efficiency						0.670	0.541	0.087	0.129	Pass
	Background	1.200	0.088	0.031	1.112	<u>FAIL</u>					
	Crosstalk										
9:04 AM	Efficiency						0.730	0.682	0.093	0.048	Pass
	Background	0.230	0.088	0.031	0.142	<u>FAIL</u>					
	Crosstalk										
Detector 3											
12:36 AM	Efficiency	12984.99	13271.53	398.15	-286.53	Pass	59142.08	59018.83	1770.56	123.26	Pass
	Background										
	Crosstalk	4457.500	4349.025	65.645	108.475	Pass					
12:40 AM	Efficiency						10.654	10.375	2.724	0.279	NA
	Background										
	Crosstalk										
4:17 AM	Efficiency						0.975	0.682	0.093	0.293	<u>FAIL</u>
	Background	0.290	0.085	0.023	0.205	<u>FAIL</u>					
	Crosstalk										
9:04 AM	Efficiency						0.730	0.682	0.093	0.048	Pass
	Background	0.135	0.085	0.023	0.050	Pass					
	Crosstalk										

Detector 4

Gas Proportional Counter Daily Quality Control Checks

Friday, July 27, 2018

Instrument: Protean

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag	
Detector 4	12:37 AM	Efficiency	16188.96	16556.85	496.71	-367.89	Pass					
		Background										
	12:40 AM	Crosstalk	6387.000	6135.800	62.856	251.200	DOEF					
		Efficiency						56287.17	56572.13	1697.16	-284.95	Pass
		Background										
	4:17 AM	Crosstalk						3.044	0.850	0.651	2.194	NA
		Efficiency										
		Background	0.205	0.073	0.013	0.133	FAIL	0.615	0.435	0.045	0.180	FAIL
	9:04 AM	Crosstalk										
		Efficiency										
		Background	0.200	0.073	0.013	0.128	FAIL	0.435	0.435	0.045	0.000	Pass
		Crosstalk										
Detector 5												
Detector 5	12:37 AM	Efficiency	15761.13	15673.68	470.21	87.45	Pass					
		Background										
	12:40 AM	Crosstalk	6591.000	6104.975	888.403	486.025	Pass					
		Efficiency						53807.36	53786.35	1613.59	21.01	Pass
		Background										
	4:17 AM	Crosstalk						3.551	0.325	0.373	3.226	NA
		Efficiency										
		Background	0.245	0.074	0.018	0.172	FAIL	0.810	0.418	0.056	0.392	FAIL
	9:04 AM	Crosstalk										
		Efficiency										
		Background	0.165	0.074	0.018	0.092	FAIL	0.450	0.418	0.056	0.032	Pass
		Crosstalk										
Detector 6												
Detector 6	12:37 AM	Efficiency	14658.78	14736.55	442.10	-77.77	Pass					
		Background										
		Crosstalk	5899.000	5498.275	745.701	400.725	Pass					

Gas Proportional Counter Daily Quality Control Checks

Friday, July 27, 2018

Instrument: Protean

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
12:40 AM	Efficiency						51213.16	51221.45	1536.64	-8.29	Pass
	Background										
	Crosstalk						3.046	0.700	0.410	2.346	NA
4:17 AM	Efficiency										
	Background	0.410	0.114	0.035	0.296	<u>FAIL</u>	1.120	0.418	0.055	0.702	<u>FAIL</u>
	Crosstalk										
9:05 AM	Efficiency										
	Background	0.285	0.114	0.035	0.171	<u>FAIL</u>	0.485	0.418	0.055	0.067	Pass
	Crosstalk										
Detector 7											
12:37 AM	Efficiency	15074.10	15385.65	461.57	-311.55	Pass					
	Background										
	Crosstalk	5846.000	5760.050	798.954	85.950	Pass					
12:40 AM	Efficiency						44988.27	44749.03	1342.47	239.25	Pass
	Background										
	Crosstalk						4.566	1.425	0.922	3.141	NA
4:17 AM	Efficiency										
	Background	0.305	0.072	0.027	0.233	<u>FAIL</u>	0.815	0.523	0.066	0.292	<u>FAIL</u>
	Crosstalk										
9:05 AM	Efficiency										
	Background	0.175	0.072	0.027	0.103	<u>FAIL</u>	0.575	0.523	0.066	0.052	Pass
	Crosstalk										
Detector 8											
12:36 AM	Efficiency						46301.30	46135.45	1384.06	165.85	Pass
	Background										
	Crosstalk						4.566	0.725	0.638	3.841	NA
12:40 AM	Efficiency	11684.49	11620.55	348.62	63.94	Pass					
	Background										
	Crosstalk	4062.500	3784.000	489.685	278.500	Pass					

Gas Proportional Counter Daily Quality Control Checks

Friday, July 27, 2018

Instrument: Protean

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
4:17 AM	Efficiency										
	Background	0.335	0.097	0.034	0.239	<u>FAIL</u>	0.855	0.445	0.078	0.410	<u>FAIL</u>
	Crosstalk										
	Efficiency										
	Background	0.100	0.097	0.034	0.004	Pass	0.465	0.445	0.078	0.020	Pass
	Crosstalk										
Detector 9											
12:37 AM	Efficiency						47880.27	47841.35	1435.24	38.92	Pass
	Background										
	Crosstalk						7.102	10.350	2.705	-3.248	NA
12:40 AM	Efficiency	13335.76	13544.15	406.32	-208.39	Pass					
	Background										
	Crosstalk	4833.000	4627.500	61.771	205.500	DOEF					
4:17 AM	Efficiency										
	Background	0.305	0.115	0.033	0.190	<u>FAIL</u>	0.685	0.440	0.052	0.245	<u>FAIL</u>
	Crosstalk										
9:05 AM	Efficiency										
	Background	0.195	0.115	0.033	0.080	Pass	0.500	0.440	0.052	0.060	Pass
	Crosstalk										
Detector 10											
12:37 AM	Efficiency						49299.98	49376.35	1481.29	-76.37	Pass
	Background										
	Crosstalk						12.683	28.625	5.591	-15.942	NA
12:40 AM	Efficiency	13358.78	13960.33	418.81	-601.55	<u>FAIL</u>					
	Background										
	Crosstalk	4850.000	4854.775	66.791	-4.775	Pass					
1:00 AM	Efficiency	13532.41	13960.33	418.81	-427.92	<u>FAIL</u>					
	Background										
	Crosstalk	4919.500	4854.775	66.791	64.725	Pass					

Gas Proportional Counter Daily Quality Control Checks

Friday, July 27, 2018

Instrument: **Protean**

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
4:20 AM	Efficiency										
	Background	0.240	0.105	0.038	0.135	<u>FAIL</u>	0.500	0.420	0.089	0.080	Pass
	Crosstalk										
	Efficiency										
	Background	0.190	0.105	0.038	0.085	Pass	0.425	0.420	0.089	0.005	Pass
	Crosstalk										
Detector 11											
12:37 AM	Efficiency						59109.23	59256.13	1777.68	-146.89	Pass
	Background										
	Crosstalk						28.410	33.400	4.406	-4.990	NA
12:41 AM	Efficiency	13065.55	13382.03	401.46	-316.48	Pass					
	Background										
	Crosstalk	4701.000	4646.925	43.882	54.075	Pass					
4:17 AM	Efficiency										
	Background	0.525	0.096	0.029	0.429	<u>FAIL</u>	0.990	0.470	0.063	0.521	<u>FAIL</u>
	Crosstalk										
9:05 AM	Efficiency										
	Background	0.205	0.096	0.029	0.109	<u>FAIL</u>	0.455	0.470	0.063	-0.014	Pass
	Crosstalk										
Detector 12											
12:37 AM	Efficiency						0.00	57255.23	1717.66	-57255.23	<u>FAIL</u>
	Background										
	Crosstalk						0.000	22.750	5.663	-22.750	NA
12:41 AM	Efficiency	0.00	16555.28	496.66	-16555.28	<u>FAIL</u>					
	Background										
	Crosstalk	9.500	5593.325	888.555	-5583.825	DOEF					
4:17 AM	Efficiency										
	Background	0.000	0.073	0.021	-0.073	<u>FAIL</u>	0.000	0.483	0.059	-0.483	<u>FAIL</u>
	Crosstalk										

Gas Proportional Counter Daily Quality Control Checks

Friday, July 27, 2018

Instrument: *Protean*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
Detector 13											
12:37 AM	Efficiency						54807.68	55313.48	1659.40	-505.79	Pass
	Background										
12:41 AM	Crosstalk						5.580	8.025	2.603	-2.445	NA
	Efficiency	16564.74	16489.13	494.67	75.62	Pass					
4:17 AM	Background										
	Crosstalk	6060.000	5831.525	819.117	228.475	Pass					
9:05 AM	Efficiency										
	Background	0.475	0.141	0.019	0.334	<u>FAIL</u>	1.175	0.480	0.068	0.695	<u>FAIL</u>
	Crosstalk										
	Efficiency										
	Background	0.185	0.141	0.019	0.044	Pass	0.325	0.480	0.068	-0.155	Pass
	Crosstalk										
Detector 14											
12:37 AM	Efficiency						51390.25	51515.98	1545.48	-125.73	Pass
	Background										
12:41 AM	Crosstalk						5.073	0.950	0.742	4.123	NA
	Efficiency	14847.92	15209.15	456.27	-361.23	Pass					
4:17 AM	Background										
	Crosstalk	5680.000	5770.450	63.706	-90.450	Pass					
9:05 AM	Efficiency										
	Background	0.230	0.106	0.036	0.124	<u>FAIL</u>	0.560	0.434	0.070	0.126	Pass
	Crosstalk										
	Efficiency										
	Background	0.215	0.106	0.036	0.109	<u>FAIL</u>	0.505	0.434	0.070	0.071	Pass
	Crosstalk										

Detector 15

Gas Proportional Counter Daily Quality Control Checks

Friday, July 27, 2018

Instrument: *Protean*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag
12:37 AM	Efficiency						44795.01	45036.85	1351.11	-241.84	Pass
	Background										
	Crosstalk						6.595	2.575	1.417	4.020	NA
12:41 AM	Efficiency	15031.56	14890.68	446.72	140.89	Pass					
	Background										
	Crosstalk	5587.000	5361.500	749.037	225.500	Pass					
4:17 AM	Efficiency										
	Background	0.275	0.133	0.018	0.143	<u>FAIL</u>	0.650	0.553	0.100	0.097	Pass
	Crosstalk										
9:05 AM	Efficiency										
	Background	0.220	0.133	0.018	0.088	<u>FAIL</u>	0.500	0.553	0.100	-0.053	Pass
	Crosstalk										

The Alpha and Beta +/- limit are based upon initial 20-point population.

The Alpha and Beta +/- limit for Efficiency is stated at 3%. Flags are "FAIL" > 3%.

The Alpha and Beta +/- limit for Background is stated at 1 StDev. Flags are "FAIL" > 3 StDev.

The Alpha +/- limit for Crosstalk is stated at 1 StDev. Flags are "Warning" > 2 StDev and "DOEF" > 3 StDev. Beta is negligible, for trend only ("NA").

Times shown reflect the end of the count duration.

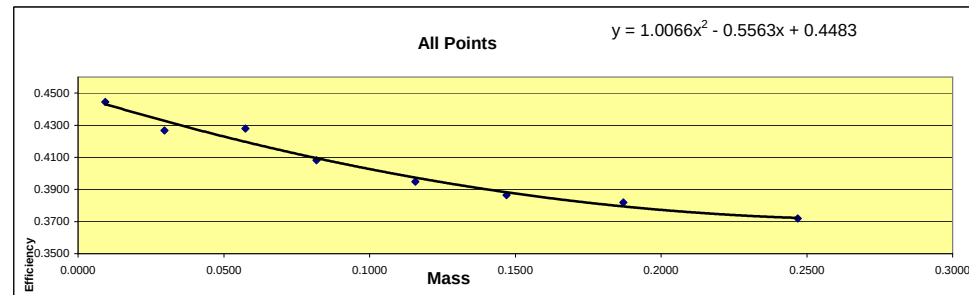
Alpha Beta Calibrations

**Curve is for Gross Beta
Strontium 90
and
Total Strontium**

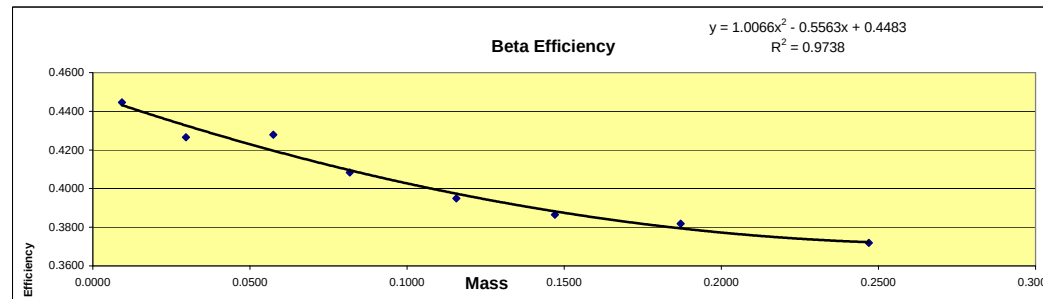
Protean 0

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41414.371 CPM	Sr-90 Eff	Standard Aliquot
0	B1	3/27/2013 12:24:34 AM	0.0093	1.01	18594	18409.901	0.4445	1mL
0	B2	3/27/2013 9:20:47 AM	0.0296	1.01	17845	17668.317	0.4266	1mL
0	B3	3/27/2013 8:55:13 AM	0.0574	1.01	17895	17717.822	0.4278	1mL
0	B4	3/27/2013 8:50:39 AM	0.0818	1.01	17078	16908.911	0.4083	1mL
0	B5	3/27/2013 2:15:46 AM	0.1157	1.01	16518	16354.455	0.3949	1mL
0	B6	3/27/2013 1:06:53 AM	0.1470	1.01	16166	16005.941	0.3865	1mL
0	B7	3/27/2013 12:52:20 AM	0.1871	1.01	15970	15811.881	0.3818	1mL
0	B8	3/27/2013 12:33:51 AM	0.2469	1.01	15554	15400.000	0.3719	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0093	0.4445	0.4432	0.30%
0.0296	0.4266	0.4327	-1.41%
0.0574	0.4278	0.4197	1.94%
0.0818	0.4083	0.4095	-0.30%
0.1157	0.3949	0.3974	-0.63%
0.1470	0.3865	0.3883	-0.46%
0.1871	0.3818	0.3795	0.62%
0.2469	0.3719	0.3723	-0.12%



Mass	Efficiency
0.0093	0.4445
0.0296	0.4266
0.0574	0.4278
0.0818	0.4083
0.1157	0.3949
0.1470	0.3865
0.1871	0.3818
0.2469	0.3719



Standard ID

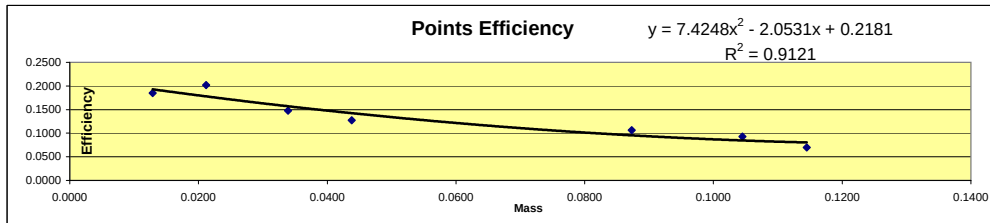
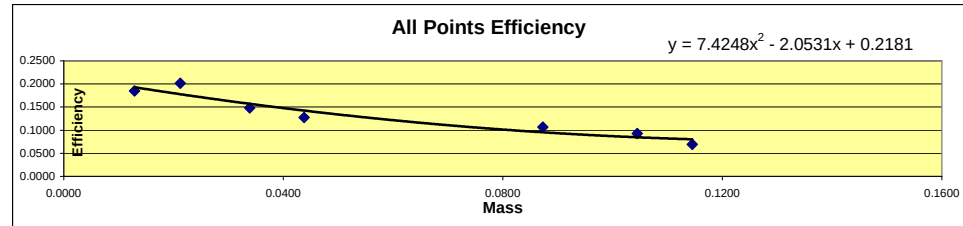
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity: 22560 dpm/mL
Reference Date: 9/17/2009
Count Date: 3/27/2013
Elapsed Time: 1287.000 days
Half Life: 10409.625 days
Exponential Term: 0.91787171
Corrected Activity: 20707.1857 dpm/mL
Decay Activity (Sr/Y-90) 41414.3714 dpm

Protean 0

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
0	ICABT-51465;A1	11/13/2015 1:18:49 PM	50	21949	438.980	2374.5	0.1849	1mL	0.0129
0	ICABT-51465;A2	11/15/2015 6:17:57 PM	20.89	10003	478.842	2374.5	0.2017	1mL	0.0212
0	ICABT-51465;A3	11/15/2015 2:39:37 PM	28.46	10002	351.441	2374.5	0.1480	1mL	0.0339
0	ICABT-51465;A4	11/15/2015 1:38:18 PM	33.02	10000	302.847	2374.5	0.1275	1mL	0.0438
0	ICABT-51465;A6	11/15/2015 11:16:21 PM	19.82	10007	504.894	4749.0	0.1063	2mL	0.0873
0	ICABT-51465;A7	11/15/2015 10:33:57 PM	22.71	10004	440.511	4749.0	0.0928	2mL	0.1045
0	ICABT-51465;A8	11/15/2015 9:23:24 PM	30.28	10000	330.251	4749.0	0.0695	2mL	0.1145

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0129	0.1849	0.1929	-4.14%
0.0212	0.2017	0.1779	13.35%
0.0339	0.1480	0.1570	-5.75%
0.0438	0.1275	0.1424	-10.45%
0.0873	0.1063	0.0955	11.38%
0.1045	0.0928	0.0846	9.60%
0.1145	0.0695	0.0804	-13.46%

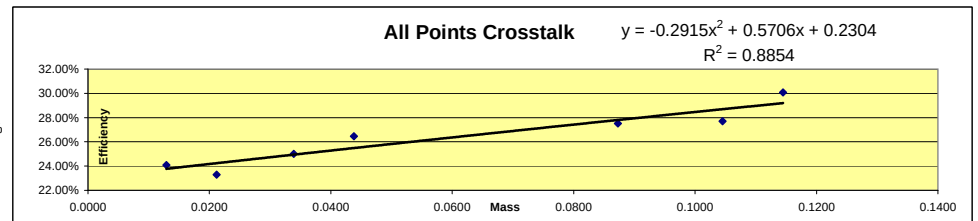


Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β
0	ICABT-51465;A1	0.0129	50	21949	6967	438.98	139.34	24.09%
0	ICABT-51465;A2	0.0212	20.89	10003	3037	478.84	145.3805649	23.29%
0	ICABT-51465;A3	0.0339	28.46	10002	3336	351.44	117.2171469	25.01%
0	ICABT-51465;A4	0.0438	33.02	10000	3599	302.85	108.9945488	26.47%
0	ICABT-51465;A6	0.0873	19.82	10007	3797	504.89	191.5741675	27.51%
0	ICABT-51465;A7	0.1045	22.71	10004	3832	440.51	168.7362395	27.70%
0	ICABT-51465;A8	0.1145	30.28	10000	4301	330.25	142.0409511	30.07%

Min
23.29%

Max
30.07%

Mean
26.31%

**Standard ID**

Thorium-230

Th-230_00016 #51465

Cert # 92523

Activity

Ref. date 11/29/2012

2374.5 dpm/mL

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-6322;B1**

Repeat **1**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 00:23

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	7	6.931	6.895
sd	0.000			0.006	2.646	2.620	2.620
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	18,594	18,409.901	18,409.342
sd	0.000			0.024	136.360	135.010	135.010

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-6322;B8**

Repeat **2**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 00:32

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	6	5.941	5.905
sd	0.000			0.006	2.449	2.425	2.425
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	15,554	15,400.000	15,399.441
sd	0.000			0.024	124.716	123.481	123.481

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-6322;B7**

Repeat **3**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 00:51

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	14	13.861	13.825
sd	0.000			0.006	3.742	3.705	3.705
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	15,970	15,811.881	15,811.322
sd	0.000			0.024	126.372	125.121	125.121

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-6322;B6**

Repeat **4**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 01:05

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	11	10.891	10.855
sd	0.000			0.006	3.317	3.284	3.284
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	16,166	16,005.941	16,005.382
sd	0.000			0.024	127.146	125.887	125.887

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-6322;B5**

Repeat **6**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 02:14

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	9	8.911	8.875
sd	0.000			0.006	3.000	2.970	2.970
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	16,518	16,354.455	16,353.896
sd	0.000			0.024	128.522	127.250	127.250

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-6322;B4**

Repeat **7**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 08:49

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	6	5.941	5.905
sd	0.000			0.006	2.449	2.425	2.425
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	17,078	16,908.911	16,908.352
sd	0.000			0.024	130.683	129.389	129.389

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-6322;B3**

Repeat **8**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 08:54

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	10	9.901	9.865
sd	0.000			0.006	3.162	3.131	3.131
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	17,895	17,717.822	17,717.263
sd	0.000			0.024	133.772	132.448	132.448

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-6322;B2**

Repeat **9**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:19

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	14	13.861	13.825
sd	0.000			0.006	3.742	3.705	3.705
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	17,845	17,668.317	17,667.758
sd	0.000			0.024	133.585	132.263	132.263

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-51465;A1**

Repeat **39**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/13/2011 12:28

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	21,949	438.980	438.909
sd	0.000			0.008	148.152	2.963	2.963
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	6,967	139.340	138.719
sd	0.000			0.025	83.469	1.669	1.670

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-51465;A4**

Repeat **40**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 13:05

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 33.02 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	10,000	302.847	302.776
sd	0.000			0.008	100.000	3.028	3.028
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	3,599	108.995	108.374
sd	0.000			0.025	59.992	1.817	1.817

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-51465;A3**

Repeat **41**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 14:11

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 28.46 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	10,002	351.441	351.370
sd	0.000			0.008	100.010	3.514	3.514
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	3,336	117.217	116.596
sd	0.000			0.025	57.758	2.029	2.030

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-51465;A2**

Repeat **42**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 17:57

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 20.89 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	10,003	478.842	478.771
sd	0.000			0.008	100.015	4.788	4.788
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	3,037	145.381	144.760
sd	0.000			0.025	55.109	2.638	2.638

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-51465;A8**

Repeat **40**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 20:53

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.28 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	10,000	330.251	330.180
sd	0.000			0.008	100.000	3.303	3.303
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	4,301	142.041	141.420
sd	0.000			0.025	65.582	2.166	2.166

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-51465;A7**

Repeat **41**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2018 22:11

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 22.71 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	10,004	440.511	440.440
sd	0.000			0.008	100.020	4.404	4.404
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	3,832	168.736	168.115
sd	0.000			0.025	61.903	2.726	2.726

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICABT-51465;A6**

Repeat **42**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 22:56

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 19.82 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	10,007	504.894	504.823
sd	0.000			0.008	100.035	5.047	5.047
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	3,797	191.574	190.953
sd	0.000			0.025	61.620	3.109	3.109

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

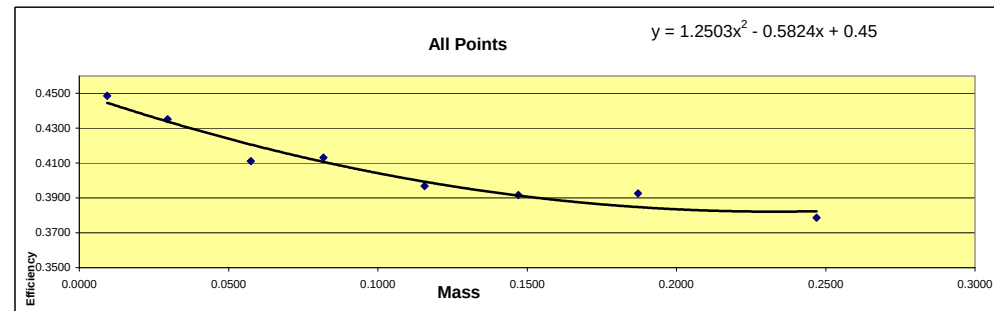
* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

**Curve is for Gross Beta
Strontium 90
and
Total Strontium**

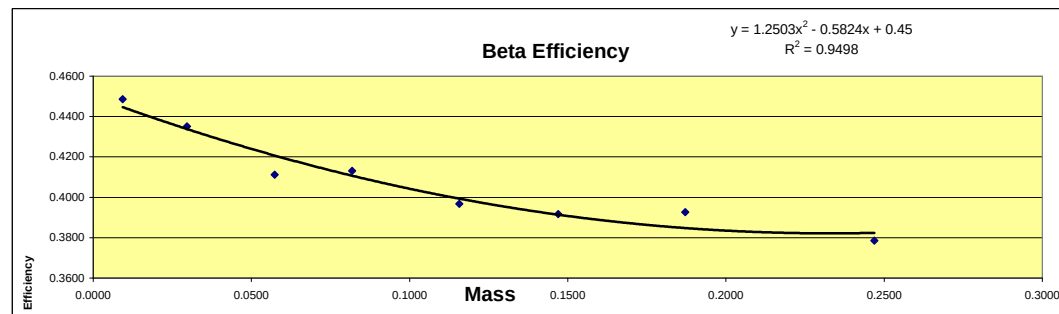
Protean 1

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41414.371 CPM	Sr-90 Eff	Standard Aliquot
1	B1	3/27/2013 12:33:56 AM	0.0093	1.01	18766	18580.198	0.4486	1mL
1	B2	3/27/2013 12:24:46 AM	0.0296	1.01	18203	18022.772	0.4352	1mL
1	B3	3/27/2013 9:20:52 AM	0.0574	1.01	17197	17026.733	0.4111	1mL
1	B4	3/27/2013 8:55:22 AM	0.0818	1.01	17282	17110.891	0.4132	1mL
1	B5	3/27/2013 8:50:46 AM	0.1157	1.01	16596	16431.683	0.3968	1mL
1	B6	3/27/2013 2:15:52 AM	0.1470	1.01	16384	16221.782	0.3917	1mL
1	B7	3/27/2013 1:10:03 AM	0.1871	1.01	16421	16258.416	0.3926	1mL
1	B8	3/27/2013 12:52:33 AM	0.2469	1.01	15836	15679.208	0.3786	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0093	0.4486	0.4447	0.89%
0.0296	0.4352	0.4339	0.31%
0.0574	0.4111	0.4207	-2.27%
0.0818	0.4132	0.4107	0.59%
0.1157	0.3968	0.3994	-0.65%
0.1470	0.3917	0.3914	0.07%
0.1871	0.3926	0.3848	2.02%
0.2469	0.3786	0.3824	-1.00%



Mass	Efficiency
0.0093	0.4486
0.0296	0.4352
0.0574	0.4111
0.0818	0.4132
0.1157	0.3968
0.1470	0.3917
0.1871	0.3926
0.2469	0.3786



Standard ID

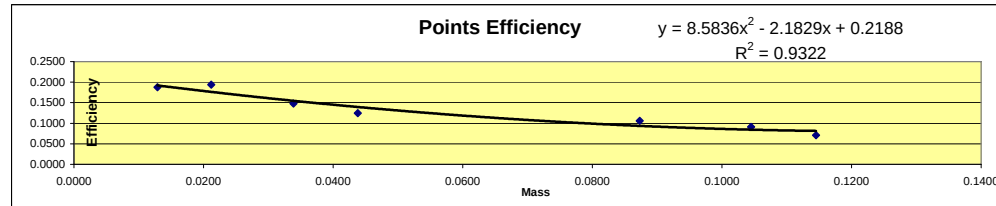
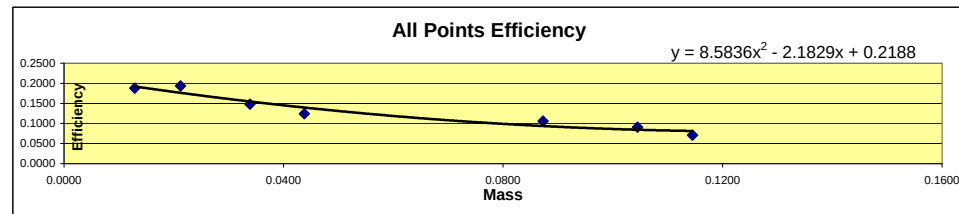
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/17/2009

Initial Activity: 22560 dpm/mL
Reference Date: 9/17/2009
Count Date: 3/27/2013
Elapsed Time: 1287.000 days
Half Life: 10409.625 days
Exponential Term: 0.917871706
Corrected Activity: 20707.18568 dpm/mL
Decay Activity (Sr/Y-90) 41414.37137 dpm

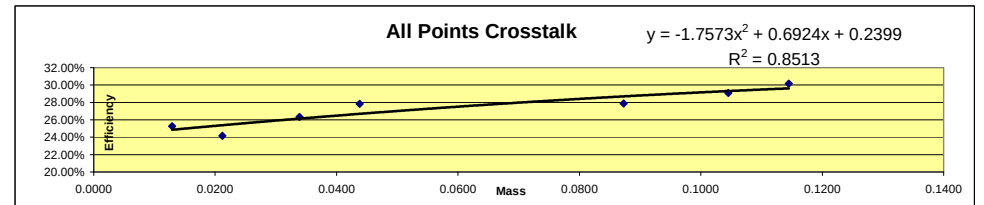
Protean 1

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
1	ICABT-51465;A1	11/15/2015 1:27:50 PM	22.43	10004	446.010	2374.5	0.1878	1mL	0.0129
1	ICABT-51465;A2	11/13/2015 1:18:58 PM	50	23017	460.340	2374.5	0.1939	1mL	0.0212
1	ICABT-51465;A3	11/15/2015 6:25:34 PM	28.44	10002	351.688	2374.5	0.1481	1mL	0.0339
1	ICABT-51465;A4	11/15/2015 2:45:06 PM	33.88	10002	295.218	2374.5	0.1243	1mL	0.0438
1	ICABT-51465;A6	11/14/2015 9:57:48 PM	50	25132	502.640	4749.0	0.1058	2mL	0.0873
1	ICABT-51465;A7	11/15/2015 11:19:41 PM	23.12	10004	432.699	4749.0	0.0911	2mL	0.1045
1	ICABT-51465;A8	11/15/2015 10:41:00 PM	29.7	10003	336.801	4749.0	0.0709	2mL	0.1145

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0129	0.1878	0.1921	-2.21%
0.0212	0.1939	0.1764	9.91%
0.0339	0.1481	0.1547	-4.24%
0.0438	0.1243	0.1397	-10.98%
0.0873	0.1058	0.0937	13.02%
0.1045	0.0911	0.0844	7.93%
0.1145	0.0709	0.0814	-12.86%



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β
1	ICABT-51465;A1	0.0129	22.43	10004	3383	446.01	150.8247882	25.27%
1	ICABT-51465;A2	0.0212	50	23017	7336	460.34	146.72	24.17%
1	ICABT-51465;A3	0.0339	28.44	10002	3575	351.69	125.7032349	26.33%
1	ICABT-51465;A4	0.0438	33.88	10002	3856	295.22	113.8134593	27.83%
1	ICABT-51465;A6	0.0873	50	25132	9717	502.64	194.34	27.88%
1	ICABT-51465;A7	0.1045	23.12	10004	4101	432.70	177.3788927	29.07%
1	ICABT-51465;A8	0.1145	29.7	10003	4316	336.80	145.3198653	30.14%
								Mean 27.24%



Standard ID
 Thorium-230
 Th-230_00016 #51465
 Cert # 92523
 Activity
 Ref. date 11/29/2012
 2374.5 dpm/mL

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-6322;B2**

Repeat **1**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 00:23

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	38	37.624	37.583
sd	0.000			0.006	6.164	6.103	6.103
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	18,203	18,022.772	18,022.305
sd	0.000			0.022	134.918	133.583	133.583

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-6322;B1**

Repeat **2**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 00:32

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	50	49.505	49.464
sd	0.000			0.006	7.071	7.001	7.001
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	18,766	18,580.198	18,579.731
sd	0.000			0.022	136.989	135.633	135.633

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-6322;B8**

Repeat **3**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 00:51

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	27	26.733	26.692
sd	0.000			0.006	5.196	5.145	5.145
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	15,836	15,679.208	15,678.741
sd	0.000			0.022	125.841	124.595	124.595

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-6322;B7**

Repeat **5**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 01:09

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	26	25.743	25.702
sd	0.000			0.006	5.099	5.049	5.049
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	16,421	16,258.416	16,257.949
sd	0.000			0.022	128.144	126.876	126.876

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-6322;B6**

Repeat **6**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 02:14

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	31	30.693	30.652
sd	0.000			0.006	5.568	5.513	5.513
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	16,384	16,221.782	16,221.315
sd	0.000			0.022	128.000	126.733	126.733

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID *ICABT-6322;B5*

Repeat 7

Batch ID *122627*

Count Routine *Gross Alpha Beta*

Detector Volts *1,515.0*

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 3/27/2013 08:49

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	18	17.822	17.781
sd	0.000			0.006	4.243	4.201	4.201
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	16,596	16,431.683	16,431.216
sd	0.000			0.022	128.825	127.550	127.550

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-6322;B4**

Repeat **8**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 08:54

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	36	35.644	35.603
sd	0.000			0.006	6.000	5.941	5.941
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	17,282	17,110.891	17,110.424
sd	0.000			0.022	131.461	130.159	130.159

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-6322;B3**

Repeat **9**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:19

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	27	26.733	26.692
sd	0.000			0.006	5.196	5.145	5.145
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	17,197	17,026.733	17,026.266
sd	0.000			0.022	131.137	129.839	129.839

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-51465;A2**

Repeat **39**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/13/2011 12:28

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	23,017	460.340	460.260
sd	0.000			0.009	151.714	3.034	3.034
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	7,336	146.720	146.226
sd	0.000			0.022	85.650	1.713	1.713

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-51465;A6**

Repeat **39**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/14/2011 21:07

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	25,132	502.640	502.560
sd	0.000			0.009	158.531	3.171	3.171
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	9,717	194.340	193.846
sd	0.000			0.022	98.575	1.971	1.972

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID *ICABT-51465;A1*

Repeat *40*

Batch ID *m153000*

Count Routine *Sample Count*

Detector Volts *1,515.0*

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 13:05

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 22.43 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	10,004	446.010	445.930
sd	0.000			0.009	100.020	4.459	4.459
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	3,383	150.825	150.331
sd	0.000			0.022	58.164	2.593	2.593

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-51465;A4**

Repeat **41**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 14:11

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 33.88 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	10,002	295.218	295.138
sd	0.000			0.009	100.010	2.952	2.952
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	3,856	113.813	113.319
sd	0.000			0.022	62.097	1.833	1.833

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-51465;A3**

Repeat **42**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 17:57

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 28.44 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	10,002	351.688	351.608
sd	0.000			0.009	100.010	3.517	3.517
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	3,575	125.703	125.209
sd	0.000			0.022	59.791	2.102	2.102

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-51465;A8**

Repeat **41**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 22:11

Collection Date 1

Collection Date 2

Half Life 0.00 *days*

Decay Factor 1.000

Sample Count Time 29.70 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	10,003	336.801	336.721
sd	0.000			0.009	100.015	3.368	3.368
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	4,316	145.320	144.826
sd	0.000			0.022	65.696	2.212	2.212

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICABT-51465;A7**

Repeat **42**

Batch ID **m153000**

Count Routine **Sample Count**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/15/2011 22:56

Collection Date 1

Collection Date 2

Half Life 0.00 *days*

Decay Factor 1.000

Sample Count Time 23.12 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	10,004	432.699	432.619
sd	0.000			0.009	100.020	4.326	4.326
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	4,101	177.379	176.885
sd	0.000			0.022	64.039	2.770	2.770

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

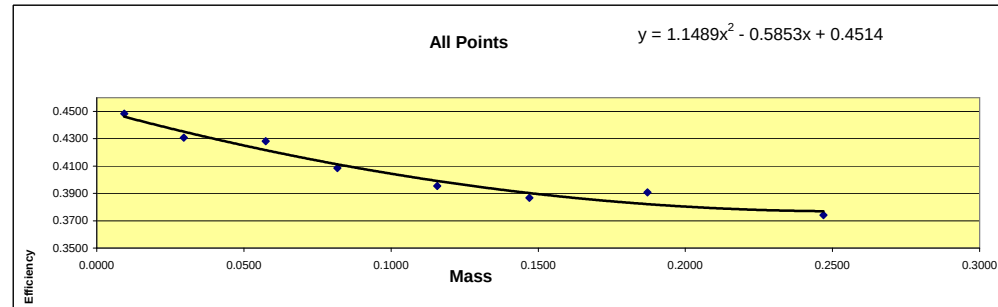
Tb = Ts < 10

Curve is for Gross Beta
Strontium 90
and
Total Strontium

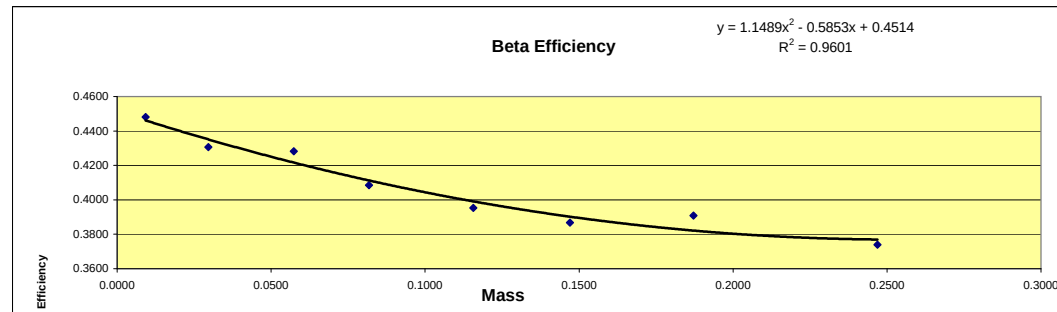
Protean 13

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41414.371 CPM	Sr-90 Eff	Standard Aliquot
13	B1	3/27/2013 10:14:19 AM	0.0093	1.01	18747	18561.386	0.4482	1mL
13	B2	3/27/2013 10:06:06 AM	0.0296	1.01	18015	17836.634	0.4307	1mL
13	B3	3/27/2013 9:57:08 AM	0.0574	1.01	17908	17730.693	0.4281	1mL
13	B4	3/27/2013 9:49:28 AM	0.0818	1.01	17087	16917.822	0.4085	1mL
13	B5	3/27/2013 9:36:05 AM	0.1157	1.01	16537	16373.267	0.3954	1mL
13	B6	3/27/2013 9:27:49 AM	0.1470	1.01	16181	16020.792	0.3868	1mL
13	B7	3/27/2013 10:28:32 AM	0.1871	1.01	16347	16185.149	0.3908	1mL
13	B8	3/27/2013 10:21:43 AM	0.2469	1.01	15645	15490.099	0.3740	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0093	0.4482	0.4461	0.48%
0.0296	0.4307	0.4351	-1.01%
0.0574	0.4281	0.4216	1.55%
0.0818	0.4085	0.4112	-0.66%
0.1157	0.3954	0.3991	-0.93%
0.1470	0.3868	0.3902	-0.86%
0.1871	0.3908	0.3821	2.28%
0.2469	0.3740	0.3769	-0.77%



Mass	Efficiency
0.0093	0.4482
0.0296	0.4307
0.0574	0.4281
0.0818	0.4085
0.1157	0.3954
0.1470	0.3868
0.1871	0.3908
0.2469	0.3740



Standard ID

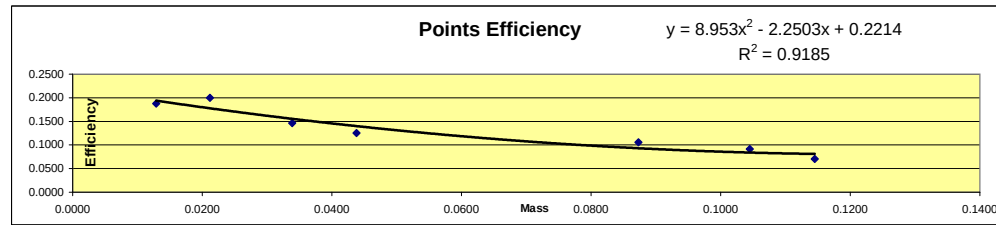
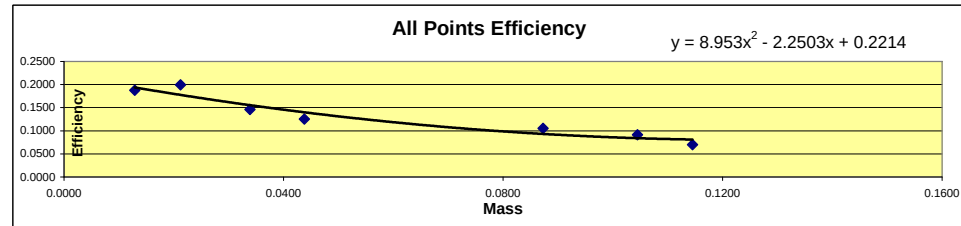
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity: 22560 dpm/mL
Reference Date: 9/17/2009
Count Date: 3/27/2013
Elapsed Time: 1287.000 days
Half Life: 10409.625 days
Exponential Term: 0.917871706
Corrected Activity: 20707.18568 dpm/mL
Decay Activity (Sr/Y-90): 41414.37137 dpm

Protean 13

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
13	ICABT-51465;A1	11/29/2015 4:23:27 PM	50	22264	445.280	2374.5	0.1875	1mL	0.0129
13	ICABT-51465;A2	11/27/2015 9:40:57 AM	50	23693	473.860	2374.5	0.1996	1mL	0.0212
13	ICABT-51465;A3	11/27/2015 8:38:31 AM	50	17349	346.980	2374.5	0.1461	1mL	0.0339
13	ICABT-51465;A4	11/26/2015 12:35:38 AM	50	14844	296.880	2374.5	0.1250	1mL	0.0438
13	ICABT-51465;A6	11/25/2015 7:09:06 PM	50	25031	500.620	4749.0	0.1054	2mL	0.0873
13	ICABT-51465;A7	11/27/2015 1:36:42 PM	50	21665	433.300	4749.0	0.0912	2mL	0.1045
13	ICABT-51465;A8	11/27/2015 12:40:03 PM	50	16687	333.740	4749.0	0.0703	2mL	0.1145

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0129	0.1875	0.1939	-3.27%
0.0212	0.1996	0.1777	12.29%
0.0339	0.1461	0.1554	-5.97%
0.0438	0.1250	0.1400	-10.70%
0.0873	0.1054	0.0932	13.13%
0.1045	0.0912	0.0840	8.60%
0.1145	0.0703	0.0811	-13.36%



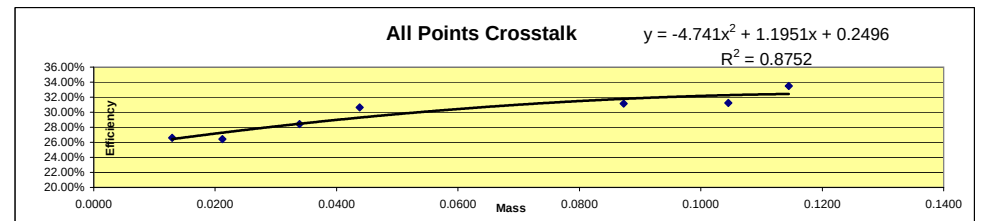
Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β
13	ICABT-51465;A1	0.0129	50	22264	8058	445.28	161.16	26.57%
13	ICABT-51465;A2	0.0212	50	23693	8503	473.86	170.06	26.41%
13	ICABT-51465;A3	0.0339	50	17349	6894	346.98	137.88	28.44%
13	ICABT-51465;A4	0.0438	50	14844	6559	296.88	131.18	30.65%
13	ICABT-51465;A6	0.0873	50	25031	11318	500.62	226.36	31.14%
13	ICABT-51465;A7	0.1045	50	21665	9845	433.30	196.90	31.24%
13	ICABT-51465;A8	0.1145	50	16687	8403	333.74	168.06	33.49%

Min

Max

Mean

29.71%

**Standard ID**

Thorium-230

Th-230_00016 #51465

Cert # 92523

Activity

Ref. date 11/29/2012

2374.5 dpm/mL

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-6322;B6**

Repeat **10**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:26

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	5	4.950	4.903
sd	0.000			0.007	2.236	2.214	2.214
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	16,181	16,020.792	16,020.363
sd	0.000			0.021	127.205	125.945	125.945

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-6322;B5**

Repeat **11**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:35

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	4	3.960	3.913
sd	0.000			0.007	2.000	1.980	1.980
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	16,537	16,373.267	16,372.838
sd	0.000			0.021	128.596	127.323	127.323

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-6322;B4**

Repeat **12**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:48

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	1	0.990	0.943
sd	0.000			0.007	1.000	0.990	0.990
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	17,087	16,917.822	16,917.393
sd	0.000			0.021	130.717	129.423	129.423

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-6322;B3**

Repeat **13**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:55

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	3	2.970	2.923
sd	0.000			0.007	1.732	1.715	1.715
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	17,908	17,730.693	17,730.264
sd	0.000			0.021	133.821	132.496	132.496

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-6322;B2**

Repeat **14**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 10:05

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	4	3.960	3.913
sd	0.000			0.007	2.000	1.980	1.980
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	18,015	17,836.634	17,836.205
sd	0.000			0.021	134.220	132.891	132.891

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-6322;B1**

Repeat **15**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 10:13

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	9	8.911	8.864
sd	0.000			0.007	3.000	2.970	2.970
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	18,747	18,561.386	18,560.957
sd	0.000			0.021	136.920	135.564	135.564

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-6322;B8**

Repeat **16**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 10:20

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	3	2.970	2.923
sd	0.000			0.007	1.732	1.715	1.715
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	15,645	15,490.099	15,489.670
sd	0.000			0.021	125.080	123.842	123.842

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-6322;B7**

Repeat **17**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 10:27

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	4	3.960	3.913
sd	0.000			0.007	2.000	1.980	1.980
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	16,347	16,185.149	16,184.720
sd	0.000			0.021	127.855	126.589	126.589

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-51465;A6**

Repeat **47**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/25/2011 18:18

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	25,031	500.620	500.471
sd	0.000			0.012	158.212	3.164	3.164
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	11,318	226.360	225.868
sd	0.000			0.022	106.386	2.128	2.128

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-51465;A4**

Repeat **49**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/25/2011 23:45

Collection Date 1
Collection Date 2

Half Life 0.00 *days*
Decay Factor 1.000

Sample Count Time 50.00 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	14,844	296.880	296.731
sd	0.000			0.012	121.836	2.437	2.437
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	6,559	131.180	130.688
sd	0.000			0.022	80.988	1.620	1.620

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-51465;A3**

Repeat **50**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/27/2011 07:48

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	17,349	346.980	346.831
sd	0.000			0.012	131.716	2.634	2.634
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	6,894	137.880	137.388
sd	0.000			0.022	83.030	1.661	1.661

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-51465;A2**

Repeat **51**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/27/2011 08:50

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	23,693	473.860	473.711
sd	0.000			0.012	153.925	3.079	3.079
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	8,503	170.060	169.568
sd	0.000			0.022	92.212	1.844	1.844

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-51465;A8**

Repeat **52**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/27/2011 11:48

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	16,687	333.740	333.591
sd	0.000			0.012	129.178	2.584	2.584
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	8,403	168.060	167.568
sd	0.000			0.022	91.668	1.833	1.833

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID *ICABT-51465;A7*

Repeat *53*

Batch ID *m153000*

Count Routine *Gross Alpha Beta*

Detector Volts *1,515.0*

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/27/2011 12:46

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 50.00 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	21,665	433.300	433.151
sd	0.000			0.012	147.190	2.944	2.944
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	9,845	196.900	196.408
sd	0.000			0.022	99.222	1.984	1.985

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICABT-51465;A1**

Repeat **54**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/29/2011 15:32

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	22,264	445.280	445.131
sd	0.000			0.012	149.211	2.984	2.984
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	8,058	161.160	160.668
sd	0.000			0.022	89.766	1.795	1.795

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

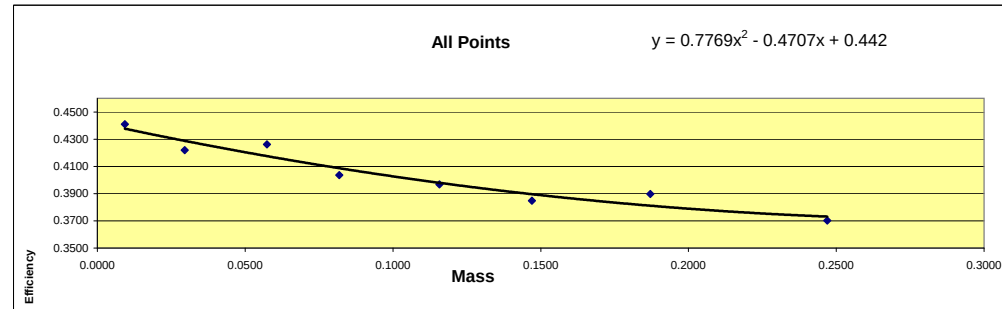
Tb = Ts < 10

**Curve is for Gross Beta
Strontium 90
and
Total Strontium**

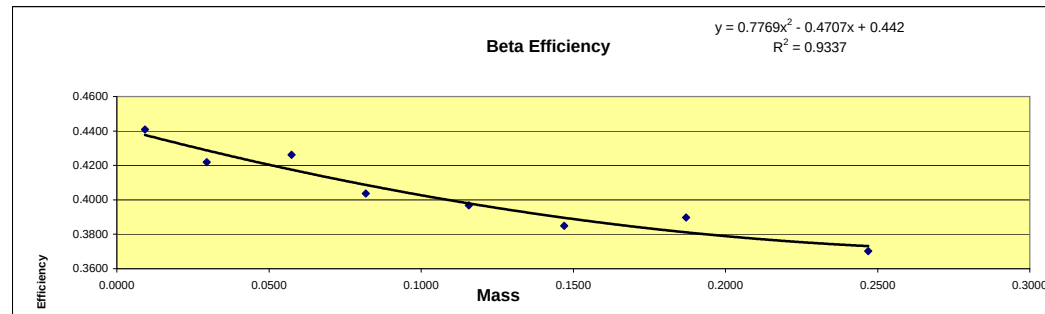
Protean 15

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41414.371 CPM	Sr-90 Eff	Standard Aliquot
15	B1	3/27/2013 10:28:44 AM	0.0093	1.01	18443	18260.396	0.4409	1mL
15	B2	3/27/2013 10:22:04 AM	0.0296	1.01	17651	17476.238	0.4220	1mL
15	B3	3/27/2013 10:14:38 AM	0.0574	1.01	17823	17646.535	0.4261	1mL
15	B4	3/27/2013 10:06:16 AM	0.0818	1.01	16883	16715.842	0.4036	1mL
15	B5	3/27/2013 9:57:09 AM	0.1157	1.01	16601	16436.634	0.3969	1mL
15	B6	3/27/2013 9:49:29 AM	0.1470	1.01	16099	15939.604	0.3849	1mL
15	B7	3/27/2013 9:36:15 AM	0.1871	1.01	16302	16140.594	0.3897	1mL
15	B8	3/27/2013 9:28:01 AM	0.2469	1.01	15488	15334.653	0.3703	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0093	0.4409	0.4377	0.74%
0.0296	0.4220	0.4287	-1.58%
0.0574	0.4261	0.4175	2.05%
0.0818	0.4036	0.4087	-1.24%
0.1157	0.3969	0.3979	-0.27%
0.1470	0.3849	0.3896	-1.21%
0.1871	0.3897	0.3811	2.26%
0.2469	0.3703	0.3731	-0.77%



Mass	Efficiency
0.0093	0.4409
0.0296	0.4220
0.0574	0.4261
0.0818	0.4036
0.1157	0.3969
0.1470	0.3849
0.1871	0.3897
0.2469	0.3703



Standard ID

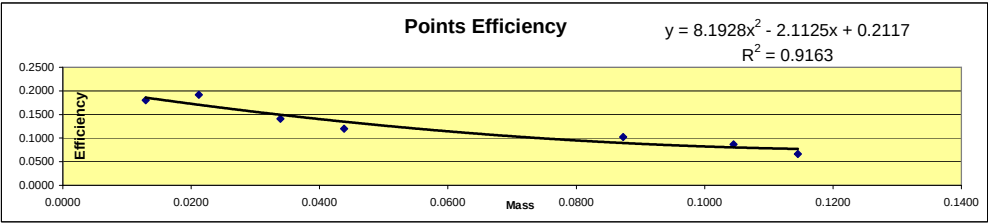
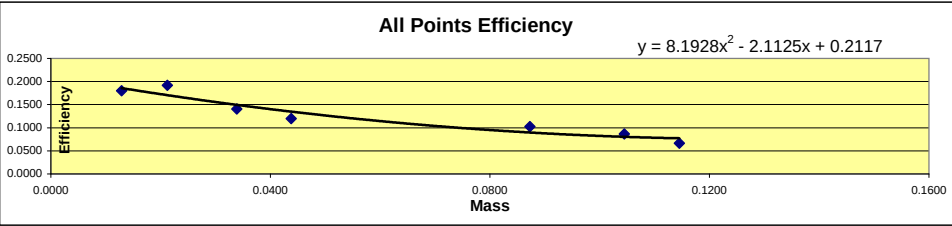
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/17/2009

Initial Activity: 22560 dpm/mL
Reference Date: 9/17/2009
Count Date: 3/27/2013
Elapsed Time: 1287.000 days
Half Life: 10409.625 days
Exponential Term: 0.917871706
Corrected Activity: 20707.18568 dpm/mL
Decay Activity (Sr/Y-90) 41414.37137 dpm

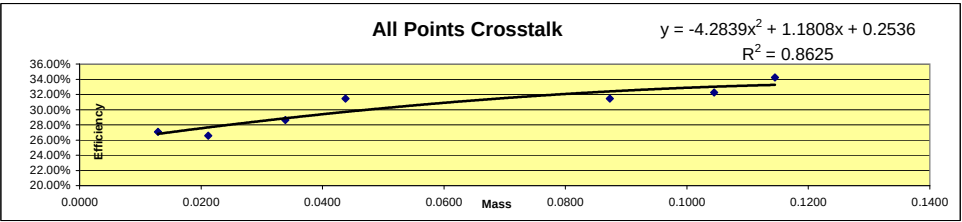
Protean 15

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
15	ICABT-51465;A1	11/27/2015 1:36:43 PM	50	21370	427.400	2374.5	0.1800	1mL	0.0129
15	ICABT-51465;A2	11/27/2015 12:40:08 PM	50	22735	454.700	2374.5	0.1915	1mL	0.0212
15	ICABT-51465;A3	11/29/2015 4:24:28 PM	50	16706	334.120	2374.5	0.1407	1mL	0.0339
15	ICABT-51465;A4	11/27/2015 9:41:09 AM	50	14210	284.200	2374.5	0.1197	1mL	0.0438
15	ICABT-51465;A6	11/26/2015 12:35:40 AM	50	24317	486.340	4749.0	0.1024	2mL	0.0873
15	ICABT-51465;A7	11/25/2015 11:38:49 PM	50	20630	412.600	4749.0	0.0869	2mL	0.1045
15	ICABT-51465;A8	11/25/2015 7:09:17 PM	50	15839	316.780	4749.0	0.0667	2mL	0.1145

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0129	0.1800	0.1858	-3.13%
0.0212	0.1915	0.1706	12.25%
0.0339	0.1407	0.1495	-5.88%
0.0438	0.1197	0.1349	-11.27%
0.0873	0.1024	0.0897	14.14%
0.1045	0.0869	0.0804	8.05%
0.1145	0.0667	0.0772	-13.63%



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β
15	ICABT-51465;A1	0.0129	50	21370	7940	427.40	158.80	27.09% Min
15	ICABT-51465;A2	0.0212	50	22735	8232	454.70	164.64	26.58% Max
15	ICABT-51465;A3	0.0339	50	16706	6709	334.12	134.18	28.65%
15	ICABT-51465;A4	0.0438	50	14210	6516	284.20	130.32	31.44%
15	ICABT-51465;A6	0.0873	50	24317	11164	486.34	223.28	31.46%
15	ICABT-51465;A7	0.1045	50	20630	9823	412.60	196.46	32.26%
15	ICABT-51465;A8	0.1145	50	15839	8245	316.78	164.90	34.23% Mean



Standard ID
Thorium-230
Th-230_00016 #51465
Cert # 92523
Activity
Ref. date 11/29/2012
2374.5 dpm/mL

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-6322;B8**

Repeat **10**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:26

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	2	1.980	1.933
sd	0.000			0.007	1.414	1.400	1.400
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	15,488	15,334.653	15,334.173
sd	0.000			0.022	124.451	123.219	123.219

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-6322;B7**

Repeat **11**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:35

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	0	0.000	-0.047
sd	0.000			0.007	0.000	0.000	0.305
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	16,302	16,140.594	16,140.114
sd	0.000			0.022	127.679	126.415	126.415

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-6322;B6**

Repeat **12**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:48

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	1	0.990	0.943
sd	0.000			0.007	1.000	0.990	0.990
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	16,099	15,939.604	15,939.124
sd	0.000			0.022	126.882	125.626	125.626

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-6322;B5**

Repeat **13**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 09:55

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	1	0.990	0.943
sd	0.000			0.007	1.000	0.990	0.990
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	16,601	16,436.634	16,436.154
sd	0.000			0.022	128.845	127.569	127.569

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-6322;B4**

Repeat **14**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 10:05

Collection Date 1
Collection Date 2

Half Life 0.00 days
Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	0	0.000	-0.047
sd	0.000			0.007	0.000	0.000	0.305
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	16,883	16,715.842	16,715.362
sd	0.000			0.022	129.935	128.648	128.648

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-6322;B3**

Repeat **15**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 10:13

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	1	0.990	0.943
sd	0.000			0.007	1.000	0.990	0.990
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	17,823	17,646.535	17,646.055
sd	0.000			0.022	133.503	132.181	132.181

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-6322;B2**

Repeat **16**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 10:20

Collection Date 1
Collection Date 2

Half Life 0.00 days
Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	2	1.980	1.933
sd	0.000			0.007	1.414	1.400	1.400
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	17,651	17,476.238	17,475.758
sd	0.000			0.022	132.857	131.542	131.542

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-6322;B1**

Repeat **17**

Batch ID **122627**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/27/2013 10:27

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 1.01 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	0	0.000	-0.047
sd	0.000			0.007	0.000	0.000	0.305
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	18,443	18,260.396	18,259.916
sd	0.000			0.022	135.805	134.460	134.460

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-51465;A8**

Repeat **47**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/25/2011 18:19

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	15,839	316.780	316.649
sd	0.000			0.011	125.853	2.517	2.517
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	8,245	164.900	164.417
sd	0.000			0.022	90.802	1.816	1.816

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-51465;A7**

Repeat **48**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/25/2011 22:48

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 50.00 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	20,630	412.600	412.469
sd	0.000			0.011	143.631	2.873	2.873
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	9,823	196.460	195.977
sd	0.000			0.022	99.111	1.982	1.982

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-51465;A6**

Repeat **49**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/25/2011 23:45

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 50.00 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	24,317	486.340	486.209
sd	0.000			0.011	155.939	3.119	3.119
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	11,164	223.280	222.797
sd	0.000			0.022	105.660	2.113	2.113

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-51465;A4**

Repeat **51**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/27/2011 08:50

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	14,210	284.200	284.069
sd	0.000			0.011	119.206	2.384	2.384
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	6,516	130.320	129.837
sd	0.000			0.022	80.722	1.614	1.615

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-51465;A2**

Repeat **52**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/27/2011 11:48

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	22,735	454.700	454.569
sd	0.000			0.011	150.781	3.016	3.016
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	8,232	164.640	164.157
sd	0.000			0.022	90.730	1.815	1.815

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-51465;A1**

Repeat **53**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/27/2011 12:46

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	21,370	427.400	427.269
sd	0.000			0.011	146.185	2.924	2.924
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	7,940	158.800	158.317
sd	0.000			0.022	89.107	1.782	1.782

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICABT-51465;A3**

Repeat **54**

Batch ID **m153000**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/29/2011 15:33

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 50.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	16,706	334.120	333.989
sd	0.000			0.011	129.252	2.585	2.585
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	6,709	134.180	133.697
sd	0.000			0.022	81.908	1.638	1.638

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

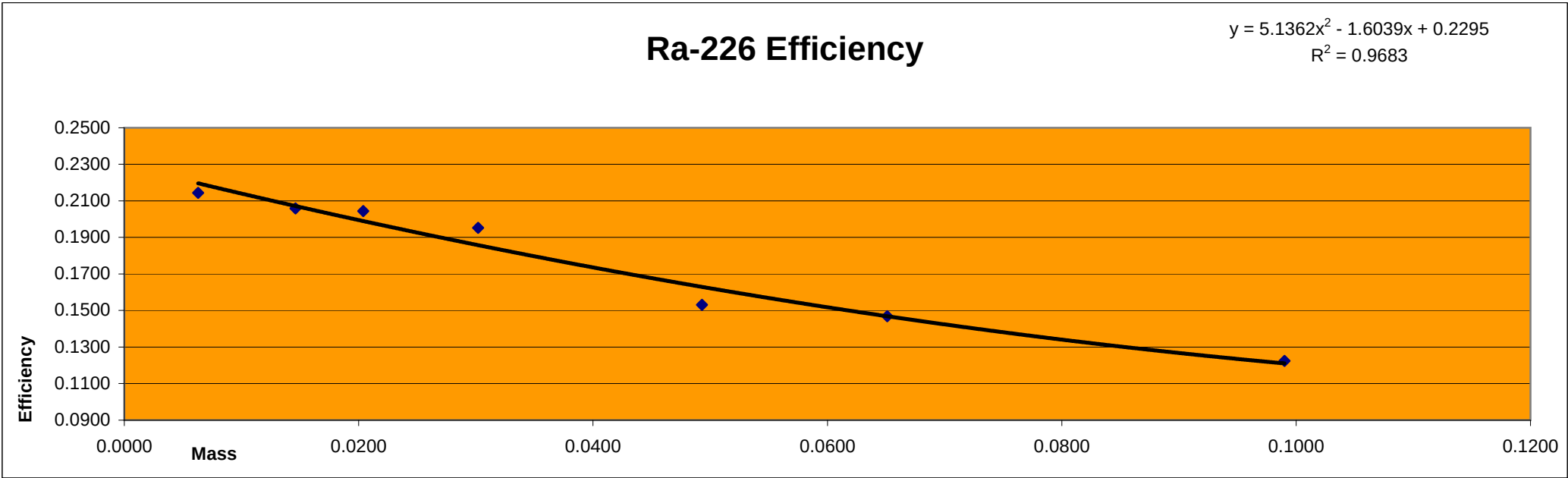
Ra-226

Calibrations

Ra-226 Calibration 2017

Orange 4

Std #	Mass	Count Time	Sample Time	Alpha Counts	CPM	Sep Time	Ingrowth	Recovery	Adj CPM	DPM	Efficiency
R2	0.0063	15.00	2/14/2017 21:44	17922	1194.8000	2/13/2017 13:30	1.6484	0.4487	1615.3043	7534.6	0.2144
R3	0.0146	15.00	2/14/2017 21:26	26502	1766.8000	2/13/2017 13:30	1.6431	0.6933	1551.0727	7534.6	0.2059
R4	0.0204	15.00	2/14/2017 21:09	27485	1832.3333	2/13/2017 13:30	1.6380	0.7265	1539.7503	7534.6	0.2044
R5	0.0302	15.00	2/14/2017 20:52	31007	2067.1333	2/13/2017 13:30	1.6328	0.8604	1471.4068	7534.6	0.1953
R6	0.0493	15.00	2/14/2017 20:32	26373	1758.2000	2/13/2017 13:30	1.6269	0.9364	1154.1603	7534.6	0.1532
R7	0.0651	15.00	2/14/2017 22:47	25671	1711.4000	2/13/2017 13:30	1.6669	0.9274	1107.1113	7534.6	0.1469
R8	0.0990	15.00	2/14/2017 22:27	21603	1440.2000	2/13/2017 13:30	1.6610	0.9402	922.2723	7534.6	0.1224



Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICRa6-986404;6-A Repeat 1
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 8:32:11 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 8:47:17 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	26,373	1,758.200	1,758.072
sd	0.000			0.011	162.398	10.827	10.827
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	22,745	1,516.333	1,515.966
sd	0.000			0.019	150.814	10.054	10.054

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICRa6-986404;-5-A Repeat 2
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 8:52:04 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 9:07:12 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	31,007	2,067.133	2,067.005
sd	0.000			0.011	176.088	11.739	11.739
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	21,653	1,443.533	1,443.166
sd	0.000			0.019	147.150	9.810	9.810

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICRa6-986404;-4-A Repeat 3
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 9:09:34 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 9:24:41 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	27,485	1,832.333	1,832.205
sd	0.000			0.011	165.786	11.052	11.052
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	18,897	1,259.800	1,259.433
sd	0.000			0.019	137.466	9.164	9.164

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICRa6-986404;-3-A Repeat 4
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 9:26:37 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 9:41:43 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	26,502	1,766.800	1,766.672
sd	0.000			0.011	162.794	10.853	10.853
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	17,805	1,187.000	1,186.633
sd	0.000			0.019	133.435	8.896	8.896

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICRa6-986404;-2-A Repeat 5
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 9:44:36 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 9:59:42 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	17,922	1,194.800	1,194.672
sd	0.000			0.011	133.873	8.925	8.925
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	11,660	777.333	776.966
sd	0.000			0.019	107.981	7.199	7.199

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICRa6-986404;8-A Repeat 7
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 10:27:05 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 10:42:14 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	21,603	1,440.200	1,440.072
sd	0.000			0.011	146.980	9.799	9.799
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	22,807	1,520.467	1,520.100
sd	0.000			0.019	151.020	10.068	10.068

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICRa6-986404;-7-A Repeat 8
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 10:47:24 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 11:02:30 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	25,671	1,711.400	1,711.272
sd	0.000			0.011	160.222	10.681	10.681
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	22,652	1,510.133	1,509.766
sd	0.000			0.019	150.506	10.034	10.034

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

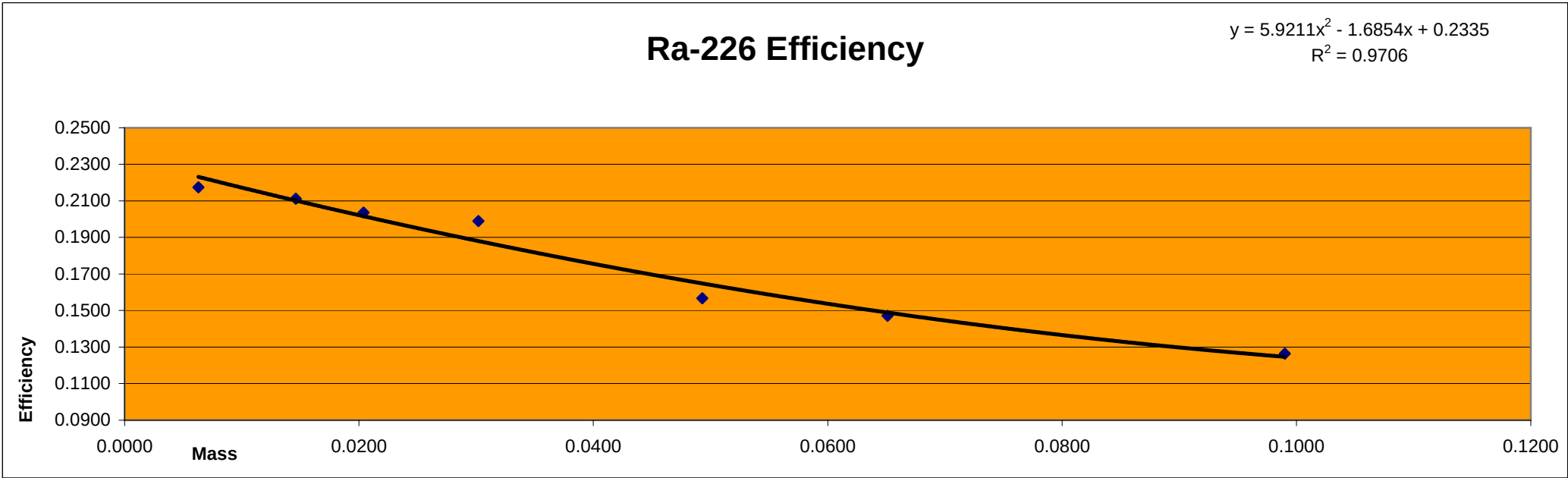
* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Ra-226 Calibration 2017

Orange 5

Std #	Mass	Count Time	Sample Time	Alpha Counts	CPM	Sep Time	Ingrowth	Recovery	Adj CPM	DPM	Efficiency
R2	0.0063	15.00	2/14/2017 22:09	18255	1217.0000	2/13/2017 13:30	1.6557	0.4487	1638.1216	7534.6	0.2174
R3	0.0146	15.00	2/14/2017 21:44	27282	1818.8000	2/13/2017 13:30	1.6484	0.6933	1591.5470	7534.6	0.2112
R4	0.0204	15.00	2/14/2017 21:26	27467	1831.1333	2/13/2017 13:30	1.6431	0.7265	1533.9904	7534.6	0.2036
R5	0.0302	15.00	2/14/2017 21:09	31689	2112.6000	2/13/2017 13:30	1.6380	0.8604	1498.9885	7534.6	0.1989
R6	0.0493	15.00	2/14/2017 20:52	27076	1805.0667	2/13/2017 13:30	1.6328	0.9364	1180.6100	7534.6	0.1567
R7	0.0651	15.00	2/14/2017 20:32	25092	1672.8000	2/13/2017 13:30	1.6269	0.9274	1108.7706	7534.6	0.1472
R8	0.0990	15.00	2/14/2017 22:47	22386	1492.4000	2/13/2017 13:30	1.6669	0.9402	952.2664	7534.6	0.1264

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Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICRa6-986404;-7-A Repeat 1
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 8:32:14 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 8:47:21 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	25,092	1,672.800	1,672.728
sd	0.000			0.008	158.405	10.560	10.560
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	21,123	1,408.200	1,407.838
sd	0.000			0.019	145.338	9.689	9.689

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICRa6-986404;-6-A Repeat 2
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 8:52:07 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 9:07:14 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	27,076	1,805.067	1,804.995
sd	0.000			0.008	164.548	10.970	10.970
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	22,431	1,495.400	1,495.038
sd	0.000			0.019	149.770	9.985	9.985

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICRa6-986404;5-A Repeat 3
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 9:09:34 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 9:24:41 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	31,689	2,112.600	2,112.528
sd	0.000			0.008	178.014	11.868	11.868
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	21,401	1,426.733	1,426.371
sd	0.000			0.019	146.291	9.753	9.753

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICRa6-986404;-4-A Repeat 4
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 9:26:39 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 9:41:45 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	27,467	1,831.133	1,831.061
sd	0.000			0.008	165.732	11.049	11.049
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	18,920	1,261.333	1,260.971
sd	0.000			0.019	137.550	9.170	9.170

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICRa6-986404;-3-A Repeat 5
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 9:44:39 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 9:59:44 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	27,282	1,818.800	1,818.728
sd	0.000			0.008	165.173	11.012	11.012
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	17,926	1,195.067	1,194.705
sd	0.000			0.019	133.888	8.926	8.926

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICRa6-986404;-2-A Repeat 6
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 10:09:06 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 10:24:11 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	18,255	1,217.000	1,216.928
sd	0.000			0.008	135.111	9.007	9.007
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	11,518	767.867	767.505
sd	0.000			0.019	107.322	7.155	7.155

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICRa6-986404;-8-A Repeat 8
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/14/2017 10:47:27 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/14/2017 11:02:33 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	22,386	1,492.400	1,492.328
sd	0.000			0.008	149.620	9.975	9.975
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	22,984	1,532.267	1,531.905
sd	0.000			0.019	151.605	10.107	10.107

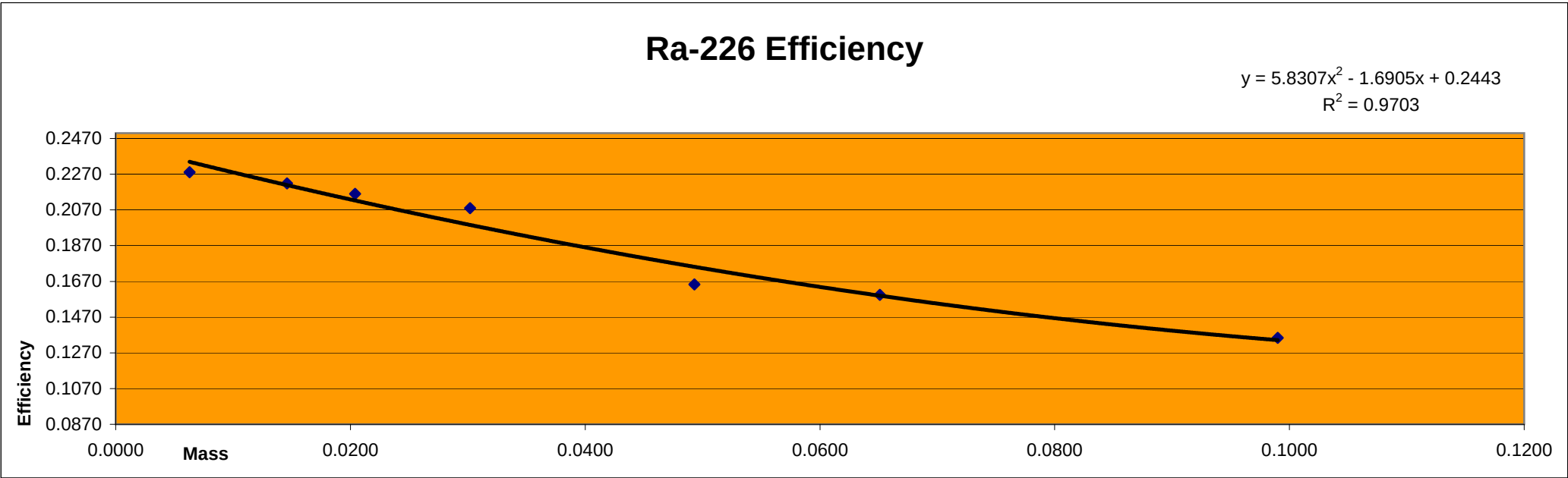
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Ra-226 Calibration 2017

Orange 19

Std #	Mass	Count Time	Sample Time	Alpha Counts	CPM	Sep Time	Ingrowth	Recovery	Adj CPM	DPM	Efficiency
R2	0.0063	15.00	2/15/2017 8:09	21124	1408.2667	2/13/2017 13:30	1.8264	0.4487	1718.3451	7534.6	0.2281
R3	0.0146	15.00	2/15/2017 7:50	31654	2110.2667	2/13/2017 13:30	1.8212	0.6933	1671.4126	7534.6	0.2218
R4	0.0204	15.00	2/15/2017 7:24	32173	2144.8667	2/13/2017 13:30	1.8140	0.7265	1627.5304	7534.6	0.2160
R5	0.0302	15.00	2/15/2017 7:04	36589	2439.2667	2/13/2017 13:30	1.8086	0.8604	1567.5618	7534.6	0.2080
R6	0.0493	15.00	2/15/2017 10:11	32525	2168.3333	2/13/2017 13:30	1.8593	0.9364	1245.4399	7534.6	0.1653
R7	0.0651	15.00	2/15/2017 9:18	30826	2055.0667	2/13/2017 13:30	1.8451	0.9274	1201.0376	7534.6	0.1594
R8	0.0990	15.00	2/15/2017 8:58	26462	1764.1333	2/13/2017 13:30	1.8397	0.9402	1019.9621	7534.6	0.1354



Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICRa6-986404;-5-A Repeat 17
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 7:04:57 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 7:20:05 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	36,589	2,439.267	2,439.154
sd	0.000			0.011	191.283	12.752	12.752
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	25,241	1,682.733	1,682.291
sd	0.000			0.021	158.874	10.592	10.592

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICRa6-986404;-4-A Repeat 18
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 7:24:39 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 7:39:47 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	32,173	2,144.867	2,144.754
sd	0.000			0.011	179.368	11.958	11.958
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	22,516	1,501.067	1,500.625
sd	0.000			0.021	150.053	10.004	10.004

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICRa6-986404;-3-A Repeat 19
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 7:50:53 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 8:06:00 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	31,654	2,110.267	2,110.154
sd	0.000			0.011	177.916	11.861	11.861
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	21,324	1,421.600	1,421.158
sd	0.000			0.021	146.027	9.735	9.735

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICRa6-986404;2-A				Repeat	20
				Carrier No.	0
Batch ID 291968					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 8:09:55 AM		Collection Date 1 1/1/1900		Half Life	0.00 days
Count Ended 2/15/2017 8:25:01 AM		Collection Date 2 1/1/1900		Decay Factor	1.000
Sample Count Time		15.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	21,124	1,408.267	1,408.154
sd	0.000			0.011	145.341	9.689	9.689
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	13,765	917.667	917.225
sd	0.000			0.021	117.324	7.822	7.822
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICRa6-986404;-8-A				Repeat	22
				Carrier No.	0
Batch ID 291968					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 8:58:32 AM		Collection Date 1 1/1/1900		Half Life	0.00 days
Count Ended 2/15/2017 9:13:38 AM		Collection Date 2 1/1/1900		Decay Factor	1.000
Sample Count Time		15.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	26,462	1,764.133	1,764.020
sd	0.000			0.011	162.671	10.845	10.845
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	27,220	1,814.667	1,814.225
sd	0.000			0.021	164.985	10.999	10.999
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICRa6-986404;-7-A Repeat 23
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 9:18:36 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 9:33:43 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	30,826	2,055.067	2,054.954
sd	0.000			0.011	175.573	11.705	11.705
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	27,096	1,806.400	1,805.958
sd	0.000			0.021	164.609	10.974	10.974

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICRa6-986404;-6-A				Repeat	24
				Carrier No.	0
Batch ID 291968					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 10:11:08 AM			Collection Date 1 1/1/1900		Half Life 0.00 days
Count Ended 2/15/2017 10:26:22 AM			Collection Date 2 1/1/1900		Decay Factor 1.000
Sample Count Time		15.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	32,525	2,168.333	2,168.220
sd	0.000			0.011	180.347	12.023	12.023
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	28,455	1,897.000	1,896.558
sd	0.000			0.021	168.686	11.246	11.246
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

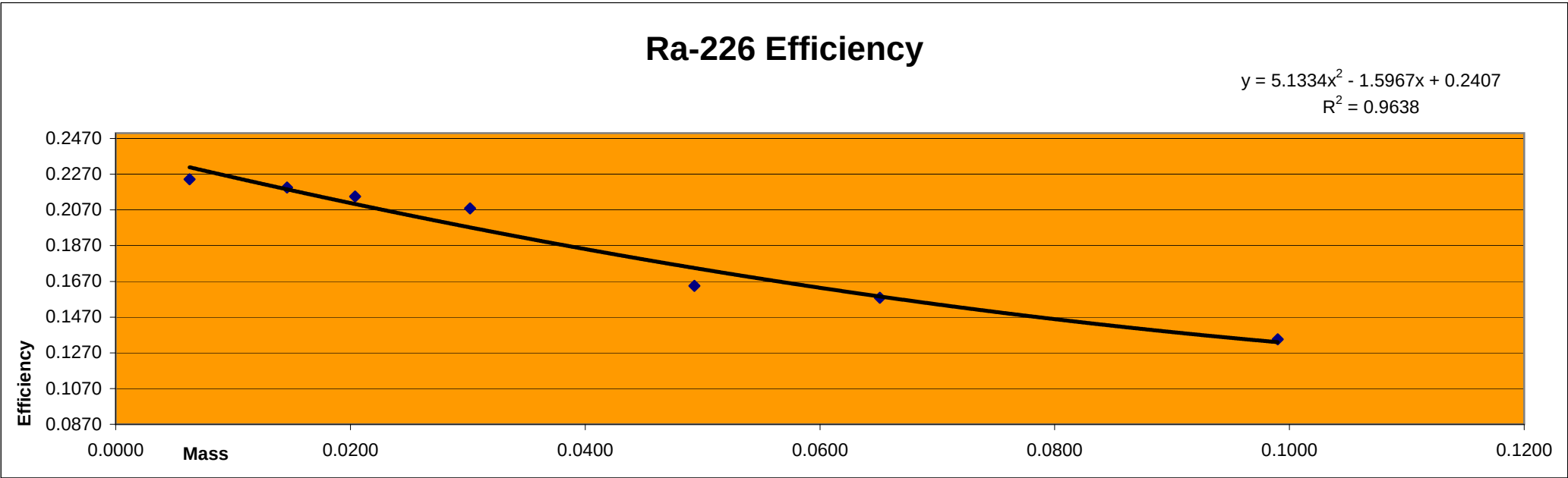
* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Ra-226 Calibration 2017

Orange 22

Std #	Mass	Count Time	Sample Time	Alpha Counts	CPM	Sep Time	Ingrowth	Recovery	Adj CPM	DPM	Efficiency
R2	0.0063	15.00	2/15/2017 9:18	20977	1398.4667	2/13/2017 13:30	1.8450	0.4487	1689.1949	7534.6	0.2242
R3	0.0146	15.00	2/15/2017 8:58	31638	2109.2000	2/13/2017 13:30	1.8396	0.6933	1653.8766	7534.6	0.2195
R4	0.0204	15.00	2/15/2017 8:29	32265	2151.0000	2/13/2017 13:30	1.8318	0.7265	1616.2805	7534.6	0.2145
R5	0.0302	15.00	2/15/2017 8:09	36903	2460.2000	2/13/2017 13:30	1.8262	0.8604	1565.7520	7534.6	0.2078
R6	0.0493	15.00	2/15/2017 7:51	31713	2114.2000	2/13/2017 13:30	1.8213	0.9364	1239.7075	7534.6	0.1645
R7	0.0651	15.00	2/15/2017 7:24	30008	2000.5333	2/13/2017 13:30	1.8141	0.9274	1189.1928	7534.6	0.1578
R8	0.0990	15.00	2/15/2017 7:05	25871	1724.7333	2/13/2017 13:30	1.8086	0.9402	1014.2936	7534.6	0.1346

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Ra226 ICV

Orange Ra226 ICV 2017				
	Low	Medium	High	Mean
	Mass	Mass	Mass	Recovery
Detector	Recovery	Recovery	Recovery	
22	87.77%	95.74%	89.38%	90.97%

Standard ID

Ra-226

Ra-226_00025 #1063071

Cert # 104858

Added: 1mL

Activity 3788.19152 pCi/mL

Prep Batch: 291970

Detector	Beta 1	Activity	Units
22	Low Mass	3.325E+03	pCi/mL

Beta 2	Activity	Units
Medium Mass	3.627E+03	pCi/mL

Beta 3	Activity	Units
High Mass	3.386E+03	pCi/mL

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICRa6-986404;-8-A				Repeat	17
				Carrier No.	0
Batch ID 291968					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 7:05:13 AM		Collection Date 1 1/1/1900		Half Life	0.00 days
Count Ended 2/15/2017 7:20:30 AM		Collection Date 2 1/1/1900		Decay Factor	1.000
Sample Count Time		15.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	25,871	1,724.733	1,724.623
sd	0.000			0.010	160.845	10.723	10.723
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	26,865	1,791.000	1,790.611
sd	0.000			0.020	163.905	10.927	10.927
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICRa6-986404;-7-A				Repeat	18
				Carrier No.	0
Batch ID 291968					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 7:24:52 AM		Collection Date 1 1/1/1900		Half Life	0.00 days
Count Ended 2/15/2017 7:39:59 AM		Collection Date 2 1/1/1900		Decay Factor	1.000
Sample Count Time		15.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	30,008	2,000.533	2,000.423
sd	0.000			0.010	173.228	11.549	11.549
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	26,786	1,785.733	1,785.344
sd	0.000			0.020	163.664	10.911	10.911
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICRa6-986404;-6-A				Repeat	19
				Carrier No.	0
Batch ID 291968					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 7:51:13 AM		Collection Date 1 1/1/1900		Half Life	0.00 days
Count Ended 2/15/2017 8:06:20 AM		Collection Date 2 1/1/1900		Decay Factor	1.000
Sample Count Time		15.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	31,713	2,114.200	2,114.090
sd	0.000			0.010	178.081	11.872	11.872
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	27,758	1,850.533	1,850.144
sd	0.000			0.020	166.607	11.107	11.107
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICRa6-986404;-5-A				Repeat	20
				Carrier No.	0
Batch ID 291968					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 8:09:07 AM		Collection Date 1 1/1/1900		Half Life	0.00 days
Count Ended 2/15/2017 8:24:16 AM		Collection Date 2 1/1/1900		Decay Factor	1.000
Sample Count Time		15.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	36,903	2,460.200	2,460.090
sd	0.000			0.010	192.102	12.807	12.807
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	26,960	1,797.333	1,796.944
sd	0.000			0.020	164.195	10.946	10.946
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICRa6-986404;-4-A				Repeat	21
				Carrier No.	0
Batch ID 291968					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 8:29:47 AM		Collection Date 1 1/1/1900		Half Life	0.00 days
Count Ended 2/15/2017 8:44:54 AM		Collection Date 2 1/1/1900		Decay Factor	1.000
Sample Count Time		15.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	32,265	2,151.000	2,150.890
sd	0.000			0.010	179.625	11.975	11.975
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	23,393	1,559.533	1,559.144
sd	0.000			0.020	152.948	10.197	10.197
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICRa6-986404;3-A Repeat 22
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 8:58:11 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 9:13:18 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	31,638	2,109.200	2,109.090
sd	0.000			0.010	177.871	11.858	11.858
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	22,292	1,486.133	1,485.744
sd	0.000			0.020	149.305	9.954	9.954

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICRa6-986404;2-A Repeat 23
Carrier No. 0

Batch ID 291968

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 9:18:09 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 9:33:14 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 15.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	20,977	1,398.467	1,398.357
sd	0.000			0.010	144.834	9.656	9.656
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	14,377	958.467	958.078
sd	0.000			0.020	119.904	7.994	7.994

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha Beta Calibration Verifications

ICV is for Gross Alpha

Protean Alpha ICV - 2015				
	Low	Medium	High	Mean
	Mass	Mass	Mass	Recovery
Detector	Recovery	Recovery	Recovery	
0	101.29%	85.46%	85.48%	90.74%

Standard ID

Thorium-230

Th-230_00019 #181198

Cert # 92776 Ref. date 08/08/2013

Activity 5.0185 pCi/mL

Prep Batch: M153001

	Low Mass	Medium Mass	High Mass
	0.142g	0.0512g	0.0747g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
0	5.083	4.289	4.29

**ICV is for Gross Beta
Strontium 90
and
Total Strontium**

Protean Beta ICV - 2013				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
0	98.05%	97.20%	98.50%	97.92%

Beta
Activity 2000.929 pCi

Standard ID

Strontium 90

Sr-90_00018 #51512

Cert# 92352 Ref. date 11/29/12

Initial Activity: 2238.7 dpm
Reference Date: 11/29/2012
Count Date: 3/28/2013 (or date at which you wish to determine activity)
Elapsed Time: 119.000 days
Half Life: 10409.625 days
Exponential Term: 0.992107441
Corrected Activity: 2221.030929 dpm
Decay Activity (Sr/Y-90) 4442.061857 dpm 2000.929 pCi

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICVABT-51512;Beta 1**

Repeat **5**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 10:21

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	6	1.200	1.164
sd	0.000			0.006	2.449	0.490	0.490
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	9,201	1,840.200	1,839.641
sd	0.000			0.024	95.922	19.184	19.184

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICVABT-51512;Beta 3**

Repeat **10**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 13:22

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	5	1.000	0.964
sd	0.000			0.006	2.236	0.447	0.447
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	8,327	1,665.400	1,664.841
sd	0.000			0.024	91.252	18.250	18.250

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICVABT-51512;Beta 2**

Repeat **11**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 13:39

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.036	7	1.400	1.364
sd	0.000			0.006	2.646	0.529	0.529
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.559	8,614	1,722.800	1,722.241
sd	0.000			0.024	92.812	18.562	18.562

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICVABT-181198;A1**

Repeat **1**

Batch ID **m153001**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/20/2011 13:53

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	12,896	429.867	429.796
sd	0.000			0.008	113.561	3.785	3.785
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	4,088	136.267	135.646
sd	0.000			0.025	63.937	2.131	2.131

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICVABT-181198;A3**

Repeat **3**

Batch ID **m153001**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/20/2011 18:43

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.00 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	6,068	202.267	202.196
sd	0.000			0.008	77.897	2.597	2.597
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	2,274	75.800	75.179
sd	0.000			0.025	47.686	1.590	1.590

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - A

Address: 0

Sample ID **ICVABT-181198;A2**

Repeat **4**

Batch ID **m153001**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/20/2011 19:40

Collection Date 1

Collection Date 2

Half Life 0.00 *days*

Decay Factor 1.000

Sample Count Time 30.00 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	7,568	252.267	252.196
sd	0.000			0.008	86.994	2.900	2.900
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.621	2,634	87.800	87.179
sd	0.000			0.025	51.323	1.711	1.711

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

ICV is for Gross Alpha

Protean Alpha ICV - 2015				
	Low	Medium	High	Mean
	Mass	Mass	Mass	Recovery
Detector	Recovery	Recovery	Recovery	
1	100.63%	88.77%	87.70%	92.36%

Standard ID

Thorium-230

Th-230_00019 #181198

Cert # 92776 Ref. date 08/08/2013

Activity 5.0185 pCi/mL

Prep Batch: M153001

	Low Mass	Medium Mass	High Mass
	0.142g	0.0512g	0.0747g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
1	5.05	4.455	4.401

**ICV is for Gross Beta
Strontium 90
and
Total Strontium**

Protean Beta ICV - 2013				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
1	100.10%	97.30%	99.70%	99.04%

Beta
Activity 2000.929 pCi

Standard ID

Strontium 90

Sr-90_00018 #51512

Cert# 92352 Ref. date 11/29/12

Initial Activity: 2238.7 dpm
Reference Date: 11/29/2012
Current Date: 3/28/2013 (or date at which you wish to determine activity)
Elapsed Time: 119.000 days
Half Life: 10409.625 days
Exponential Term: 0.992107441
Corrected Activity: 2221.030929 dpm
Decay Activity (Sr/Y-90) 4442.061857 dpm 2000.929 pCi

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICVABT-51512;Beta 2**

Repeat **5**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 10:21

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	13	2.600	2.559
sd	0.000			0.006	3.606	0.721	0.721
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	8,660	1,732.000	1,731.533
sd	0.000			0.022	93.059	18.612	18.612

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICVABT-51512;Beta 3**

Repeat **11**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 13:39

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	15	3.000	2.959
sd	0.000			0.006	3.873	0.775	0.775
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	8,539	1,707.800	1,707.333
sd	0.000			0.022	92.407	18.481	18.481

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICVABT-51512;Beta 1**

Repeat **20**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 4/2/2013 21:11

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	23	4.600	4.559
sd	0.000			0.006	4.796	0.959	0.959
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.467	9,415	1,883.000	1,882.533
sd	0.000			0.022	97.031	19.406	19.406

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICVABT-181198;A2**

Repeat **1**

Batch ID **m153001**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/20/2011 13:53

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 30.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	7,689	256.300	256.220
sd	0.000			0.009	87.687	2.923	2.923
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	2,743	91.433	90.939
sd	0.000			0.022	52.374	1.746	1.746

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICVABT-181198;A1**

Repeat **2**

Batch ID **m153001**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 11/20/2011 14:28

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	12,752	425.067	424.987
sd	0.000			0.009	112.925	3.764	3.764
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	4,155	138.500	138.006
sd	0.000			0.022	64.459	2.149	2.149

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Address: 1

Sample ID **ICVABT-181198;A3**

Repeat **4**

Batch ID **m153001**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.200 *l* sd 0.000 *l*

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 11/20/2011 19:40

Collection Date 1

Half Life 0.00 *days*

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.00 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.080	6,077	202.567	202.487
sd	0.000			0.009	77.955	2.599	2.599
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.494	2,442	81.400	80.906
sd	0.000			0.022	49.417	1.647	1.647

	Net Activity dpm	LLD dpm	Net Concentration * pCi/l	MDC pCi/l	Limits pCi/l	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

ICV is for Gross Alpha

Protean Alpha ICV - 2015				
	Low	Medium	High	Mean
	Mass	Mass	Mass	Recovery
Detector	Recovery	Recovery	Recovery	
13	101.68%	103.98%	103.02%	102.89%

Standard ID

Thorium-230

Th-230_00019 #181198

Cert # 92776 Ref. date 08/08/2013

Activity 5.0185 pCi/mL

Prep Batch: M153007

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
13	5.103	5.218	5.17

**ICV is for Gross Beta
Strontium 90
and
Total Strontium**

Protean Beta ICV - 2013				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
13	99.70%	99.45%	97.35%	98.84%

Beta
Activity 2000.929 pCi

Standard ID

Strontium 90

Sr-90_00018 #51512

Cert# 92352 Ref. date 11/29/12

Initial Activity: 2238.7 dpm
Reference Date: 11/29/2012
Current Date: 3/28/2013 (or date at which you wish to determine activity)
Elapsed Time: 119.000 days
Half Life: 10409.625 days
Exponential Term: 0.992107441
Corrected Activity: 2221.030929 dpm
Decay Activity (Sr/Y-90) 4442.061857 dpm 2000.929 pCi

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICVABT-51512;Beta 3**

Repeat **15**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 23:41

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	3	0.600	0.553
sd	0.000			0.007	1.732	0.346	0.346
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	8,285	1,657.000	1,656.571
sd	0.000			0.021	91.022	18.204	18.204

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICVABT-51512;Beta 2**

Repeat **16**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 23:47

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	5	1.000	0.953
sd	0.000			0.007	2.236	0.447	0.447
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	8,847	1,769.400	1,768.971
sd	0.000			0.021	94.058	18.812	18.812

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICVABT-51512;Beta 1**

Repeat **17**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 23:53

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	2	0.400	0.353
sd	0.000			0.007	1.414	0.283	0.283
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	9,399	1,879.800	1,879.371
sd	0.000			0.021	96.948	19.390	19.390

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICVABT-181198; A3**

Repeat **99**

Batch ID **m153007**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 12/3/2015 08:30

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 30.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	8,655	288.500	288.351
sd	0.000			0.012	93.032	3.101	3.101
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	3,265	108.833	108.341
sd	0.000			0.022	57.140	1.905	1.905

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICVABT-181198; A2**

Repeat **100**

Batch ID **m153007**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 12/3/2015 10:24

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	12,748	424.933	424.784
sd	0.000			0.012	112.907	3.764	3.764
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	4,325	144.167	143.675
sd	0.000			0.022	65.765	2.192	2.192

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - B

Address: 13

Sample ID **ICVABT-181198; A1**

Repeat **21**

Batch ID **m153007**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 12/3/2015 12:21

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.149	6,933	231.100	230.951
sd	0.000			0.012	83.265	2.775	2.776
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.492	2,877	95.900	95.408
sd	0.000			0.022	53.638	1.788	1.788

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

ICV is for Gross Alpha

Protean Alpha ICV - 2015				
	Low	Medium	High	Mean
	Mass	Mass	Mass	Recovery
Detector	Recovery	Recovery	Recovery	
15	104.97%	104.41%	104.39%	104.59%

Standard ID

Thorium-230

Th-230_00019 #181198

Cert # 92776 Ref. date 08/08/2013

Activity 5.0185 pCi/mL

Prep Batch: M153007

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
15	5.27E+00	5.24E+00	5.24E+00

**ICV is for Gross Beta
Strontium 90
and
Total Strontium**

Protean Beta ICV - 2013				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
15	97.91%	97.45%	99.00%	98.12%

Beta
Activity 2000.929 pCi

Beta
Activity 2000.796 pCi

Standard ID

Strontium 90

Sr-90_00018 #51512

Cert# 92352 Ref. date 11/29/12

Initial Activity: 2238.7 dpm
Reference Date: 11/29/2012
Current Date: 3/28/2013 (or date at which you wish to determine activity)
Elapsed Time: 119.000 days
Half Life: 10409.625 days
Exponential Term: 0.992107441
Corrected Activity: 2221.030929 dpm
Decay Activity (Sr/Y-90) 4442.061857 dpm 2000.929 pCi

Initial Activity: 2238.7 dpm
Reference Date: 11/29/2012
Current Date: 3/29/2013 (or date at which you wish to determine activity)
Elapsed Time: 120.000 days
Half Life: 10409.625 days
Exponential Term: 0.992041382
Corrected Activity: 2220.883041 dpm
Decay Activity (Sr/Y-90) 4441.766083 dpm 2000.796 pCi

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICVABT-51512;Beta 3**

Repeat **17**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 23:53

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	0	0.000	-0.047
sd	0.000			0.007	0.000	0.000	0.137
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	8,408	1,681.600	1,681.120
sd	0.000			0.022	91.695	18.339	18.339

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICVABT-51512;Beta 2**

Repeat **18**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/28/2013 23:59

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	5	1.000	0.953
sd	0.000			0.007	2.236	0.447	0.447
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	8,642	1,728.400	1,727.920
sd	0.000			0.022	92.962	18.592	18.592

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICVABT-51512;Beta 1**

Repeat **19**

Batch ID **122640**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 3/29/2013 00:05

Collection Date 1

Collection Date 2

Half Life 0.00 days

Decay Factor 1.000

Sample Count Time 5.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	2	0.400	0.353
sd	0.000			0.007	1.414	0.283	0.283
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.480	9,131	1,826.200	1,825.720
sd	0.000			0.022	95.556	19.111	19.111

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method -
Error = 0.00 x sd

Tb = Ts < 10

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICVABT-181198; A1**

Repeat **18**

Batch ID **m153007**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 12/3/2015 10:24

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	6,775	225.833	225.702
sd	0.000			0.011	82.310	2.744	2.744
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	2,817	93.900	93.417
sd	0.000			0.022	53.075	1.769	1.769

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICVABT-181198; A3**

Repeat **102**

Batch ID **m153007**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 12/3/2015 11:38

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	8,383	279.433	279.302
sd	0.000			0.011	91.559	3.052	3.052
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	3,245	108.167	107.684
sd	0.000			0.022	56.965	1.899	1.899

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results

Sample Activity Report

Protean 12-15 - D

Address: 15

Sample ID **ICVABT-181198; A2**

Repeat **103**

Batch ID **m153007**

Count Routine **Gross Alpha Beta**

Detector Volts **1,515.0**

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 mg sd 0.000 mg

Count Date 12/3/2015 12:22

Collection Date 1

Half Life 0.00 days

Collection Date 2

Decay Factor 1.000

Sample Count Time 30.00 mins

Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.131	12,621	420.700	420.569
sd	0.000			0.011	112.343	3.745	3.745
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.483	4,278	142.600	142.117
sd	0.000			0.022	65.406	2.180	2.180

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Ra-226 Calibration Verifications

Analysis Report for Total Alpha-Emitting Radium

Batch: 291970

Operator:

<u>SampID</u>	<u>WRKNO</u>		<u>Aliquot</u>		<u>Ba Mass</u>	<u>Ba Yield</u>	<u>Trunc Yield</u>	<u>Ingrowth</u>	<u>Ba Precip Time</u>	<u>InstrID</u>	<u>Eff</u>	<u>Cal Type</u>	<u>Cnt Date Time</u>	<u>Sigma</u>
<u>Analyte</u>	<u>Ts</u>		<u>Th</u>	<u>Cs</u>	<u>Ch</u>	<u>CPMs</u>	<u>CPMb</u>	<u>Activity</u>	<u>UncCount</u>	<u>UncTotal</u>	<u>MDA</u>		<u>DLC</u>	<u>MOQ</u>
160-21018-A-1-A	160-21018-A-1-A		1.0000mL		0.0133	63.15%	False	1.8468	2/13/17 13:30	Orange4	0.2091	2	2/15/17 9:21	1.00
Total Alpha Emitting	5.00		1000.00	9123	128	1824.60	0.13	3.371E+003pCi/mL	3.529E+001	1.557E+002	2.083E+000		4.875E-001	155.7301
160-21018-A-2-A	160-21018-A-2-A		1.0000mL		0.0276	78.63%	False	1.8442	2/13/17 13:30	Orange4	0.1891	2	2/15/17 9:12	1.00
Total Alpha Emitting	5.00		1000.00	11128	128	2225.60	0.13	3.655E+003pCi/mL	3.465E+001	1.681E+002	1.852E+000		4.334E-001	168.0884
160-21018-A-3-A	160-21018-A-3-A		1.0000mL		0.0487	92.50%	False	1.8396	2/13/17 13:30	Orange4	0.1636	2	2/15/17 8:55	1.00
Total Alpha Emitting	5.00		1000.00	10262	128	2052.40	0.13	3.322E+003pCi/mL	3.279E+001	1.530E+002	1.825E+000		4.271E-001	153.0306

Laboratory Control Sample Information

<u>SampID</u>	<u>WRKNO</u>	<u>Analyte</u>	<u>Activity</u>	<u>StdAdded</u>	<u>Recovery</u>	<u>LCL</u>	<u>UCL</u>	<u>ZFactor</u>
					%			

Sample Duplicate Information

<u>SampID</u>	<u>SampDupID</u>	<u>Analyte</u>	<u>Activity</u>	<u>DupActivity</u>	<u>RPD</u>	<u>RER</u>	<u>DER</u>	<u>ZFactor</u>
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Matrix Spike Information

<u>SampID</u>	<u>SampMSID</u>	<u>WRKNO</u>	<u>Analyte</u>	<u>Activity</u>	<u>MSActivity</u>	<u>StdAdded</u>	<u>Recovery</u>	<u>ZFactor</u>
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Blanks Information

<u>SampID</u>	<u>WRKNO</u>	<u>Analyte</u>	<u>Activity</u>	<u>UncTotal</u>
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Ra226 ICV

Orange Ra226 ICV 2017				
	Low	Medium	High	Mean
	Mass	Mass	Mass	Recovery
Detector	Recovery	Recovery	Recovery	
4	88.99%	96.48%	87.69%	91.05%

Standard ID

Ra-226

Ra-226_00025 #1063071

Cert # 104858

Added: 1mL

Activity 3788.19152 pCi/mL

Prep Batch: 291970

Detector	1	Activity	Units
4	Low Mass (0.0133g)	3.371E+03	pCi/mL

2	Activity	Units
Medium Mass (0.0276g)	3.655E+03	pCi/mL

3	Activity	Units
High Mass (0.0487g)	3.322E+03	pCi/mL

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICVRa6-1063071;3-A Repeat 3
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 8:55:34 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 9:00:38 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	10,262	2,052.400	2,052.272
sd	0.000			0.011	101.302	20.260	20.260
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	10,305	2,061.000	2,060.633
sd	0.000			0.019	101.514	20.303	20.303

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method $T_b = T_s < 10$ Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICVRa6-1063071;2-A Repeat 4
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 9:12:37 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 9:17:39 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	11,128	2,225.600	2,225.472
sd	0.000			0.011	105.489	21.098	21.098
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	9,097	1,819.400	1,819.033
sd	0.000			0.019	95.378	19.076	19.076

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - A

Addr: 4

Sample ID ICVRa6-1063071;-1-A Repeat 5
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 9:21:58 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 9:27:01 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.128	9,123	1,824.600	1,824.472
sd	0.000			0.011	95.514	19.103	19.103
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.367	7,481	1,496.200	1,495.833
sd	0.000			0.019	86.493	17.299	17.299

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Analysis Report for Total Alpha-Emitting Radium

Batch: 291970

Operator:

<u>SampID</u>	<u>WRKNO</u>		<u>Aliquot</u>		<u>Ba Mass</u>	<u>Ba Yield</u>	<u>Trunc Yield</u>	<u>Ingrowth</u>	<u>Ba Precip Time</u>	<u>InstrID</u>	<u>Eff</u>	<u>Cal Type</u>	<u>Cnt Date Time</u>	<u>Sigma</u>
<u>Analyte</u>		<u>Ts</u>	<u>Tb</u>	<u>Cs</u>	<u>Cb</u>	<u>CPMs</u>	<u>CPMb</u>	<u>Activity</u>	<u>UncCount</u>	<u>UncTotal</u>	<u>MDA</u>	<u>DLC</u>	<u>MOO</u>	
160-21018-A-1-A	160-21018-A-1-A		1.0000mL		0.0133	63.15%	False	1.8609	2 / 13 / 17 13:30	Orange5	0.2121	2	2 / 15 / 17 10:14	1.00
Total Alpha Emitting		5.00	1000.00	9151	72	1830.20	0.07	3.307E+003pCi/mL	3.457E+001	1.528E+002	1.799E+000	3.576E-001	152.7846	
160-21018-A-2-A	160-21018-A-2-A		1.0000mL		0.0276	78.63%	False	1.8468	2 / 13 / 17 13:30	Orange5	0.1915	2	2 / 15 / 17 9:22	1.00
Total Alpha Emitting		5.00	1000.00	11328	72	2265.60	0.07	3.670E+003pCi/mL	3.448E+001	1.687E+002	1.613E+000	3.206E-001	168.7176	
160-21018-A-3-A	160-21018-A-3-A		1.0000mL		0.0487	92.50%	False	1.8443	2 / 13 / 17 13:30	Orange5	0.1655	2	2 / 15 / 17 9:12	1.00
Total Alpha Emitting		5.00	1000.00	10704	72	2140.80	0.07	3.417E+003pCi/mL	3.302E+001	1.573E+002	1.589E+000	3.158E-001	157.2518	

Laboratory Control Sample Information

SampID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL	ZFactor
					%			

Sample Duplicate Information

SampID	SampDupID	Analyte	Activity	DupActivity	RPD	RER	DER	ZFactor
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Matrix Spike Information

SampID	SampMSID	WRKNO	Analyte	Activity	MSActivity	StdAdded	Recovery	ZFactor
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Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal
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Ra226 ICV

Orange Ra226 ICV 2017				
	Low	Medium	High	Mean
	Mass	Mass	Mass	Recovery
Detector	Recovery	Recovery	Recovery	
5	87.30%	96.88%	90.20%	91.46%

Standard ID

Ra-226

Ra-226_00025 #1063071

Cert # 104858

Added: 1mL

Activity 3788.19152 pCi/mL

Prep Batch: 291970

Detector	1	Activity	Units
5	Low Mass (0.0133g)	3.307E+03	pCi/mL

2	Activity	Units
Medium Mass (0.0276g)	3.670E+03	pCi/mL

3	Activity	Units
High Mass (0.0487g)	3.417E+03	pCi/mL

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICVRa6-1063071;3-A Repeat 4
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 9:12:45 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 9:18:00 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	10,704	2,140.800	2,140.728
sd	0.000			0.008	103.460	20.692	20.692
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	10,222	2,044.400	2,044.038
sd	0.000			0.019	101.104	20.221	20.221

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICVRa6-1063071;-2-A Repeat 5
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 9:22:03 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 9:27:07 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	11,328	2,265.600	2,265.528
sd	0.000			0.008	106.433	21.287	21.287
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	8,966	1,793.200	1,792.838
sd	0.000			0.019	94.689	18.938	18.938

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 4-7 - B

Addr: 5

Sample ID ICVRa6-1063071;1-A Repeat 6
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 10:14:09 AM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 10:19:12 AM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	9,151	1,830.200	1,830.128
sd	0.000			0.008	95.661	19.132	19.132
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.362	7,218	1,443.600	1,443.238
sd	0.000			0.019	84.959	16.992	16.992

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Analysis Report for Total Alpha-Emitting Radium

Batch: 291970

Operator:

<u>SampID</u>	<u>WRKNO</u>		<u>Aliquot</u>		<u>Ba Mass</u>	<u>Ba Yield</u>	<u>Trunc Yield</u>	<u>Ingrowth</u>	<u>Ba Precip Time</u>	<u>InstrID</u>	<u>Eff</u>	<u>Cal Type</u>	<u>Cnt Date Time</u>	<u>Sigma</u>
<u>Analyte</u>		<u>Ts</u>	<u>Tb</u>	<u>Cs</u>	<u>Ch</u>	<u>CPMs</u>	<u>CPMb</u>	<u>Activity</u>	<u>UncCount</u>	<u>UncTotal</u>	<u>MDA</u>	<u>DLC</u>	<u>MOQ</u>	
160-21018-A-1-A	160-21018-A-1-A		1.0000mL		0.0133	63.15%	False	1.8922	2/13/17 13:30	Orange19	0.2228	2	2/15/17 12:11	1.00
Total Alpha Emitting		5.00	1000.00	9857	113	1971.40	0.11	3.335E+003pCi/mL	3.359E+001	1.538E+002	1.854E+000	4.194E-001	153.7746	
160-21018-A-2-A	160-21018-A-2-A		1.0000mL		0.0276	78.63%	False	1.8904	2/13/17 13:30	Orange19	0.2021	2	2/15/17 12:04	1.00
Total Alpha Emitting		5.00	1000.00	12142	113	2428.40	0.11	3.642E+003pCi/mL	3.305E+001	1.672E+002	1.643E+000	3.718E-001	167.1709	
160-21018-A-3-A	160-21018-A-3-A		1.0000mL		0.0487	92.50%	False	1.8882	2/13/17 13:30	Orange19	0.1758	2	2/15/17 11:56	1.00
Total Alpha Emitting		5.00	1000.00	11514	113	2302.80	0.11	3.378E+003pCi/mL	3.149E+001	1.553E+002	1.608E+000	3.637E-001	155.2554	

Laboratory Control Sample Information

SampID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL	ZFactor
					%			

Sample Duplicate Information

SampID	SampDupID	Analyte	Activity	DupActivity	RPD	RER	DER	ZFactor
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Matrix Spike Information

SampID	SampMSID	WRKNO	Analyte	Activity	MSActivity	StdAdded	Recovery	ZFactor
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Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal
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Ra226 ICV

Orange Ra226 ICV 2017				
	Low	Medium	High	Mean
	Mass	Mass	Mass	Recovery
Detector	Recovery	Recovery	Recovery	
19	88.04%	96.14%	89.17%	91.12%

Standard ID

Ra-226

Ra-226_00025 #1063071

Cert # 104858

Added: 1mL

Activity 3788.19152 pCi/mL

Prep Batch: 291970

Detector	1	Activity	Units
19	Low Mass (0.0133g)	3.335E+03	pCi/mL

2	Activity	Units
Medium Mass (0.0276g)	3.642E+03	pCi/mL

3	Activity	Units
High Mass (0.0487g)	3.378E+03	pCi/mL

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICVRa6-1063071;3-A				Repeat	18
				Carrier No.	0
Batch ID 291970					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 11:56:24 AM		Collection Date 1 1/1/1900		Half Life	0.00 days
Count Ended 2/15/2017 12:01:44 PM		Collection Date 2 1/1/1900		Decay Factor	1.000
Sample Count Time		5.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	11,514	2,302.800	2,302.687
sd	0.000			0.011	107.303	21.461	21.461
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	10,224	2,044.800	2,044.358
sd	0.000			0.021	101.114	20.223	20.223
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

* Note: Decay Corrected

MDC Method Tb = Ts < 10

Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICVRa6-1063071;-2-A Repeat 19
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 12:04:43 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 12:09:51 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	12,142	2,428.400	2,428.287
sd	0.000			0.011	110.191	22.038	22.038
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	8,886	1,777.200	1,776.758
sd	0.000			0.021	94.266	18.853	18.853

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 16-19 - D

Addr: 19

Sample ID ICVRa6-1063071;-1-A Repeat 20
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 12:11:33 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 12:16:35 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	9,857	1,971.400	1,971.287
sd	0.000			0.011	99.282	19.856	19.856
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.442	7,434	1,486.800	1,486.358
sd	0.000			0.021	86.221	17.244	17.244

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Analysis Report for Total Alpha-Emitting Radium

Batch: 291970

Operator:

<u>SampID</u>	<u>WRKNO</u>		<u>Aliquot</u>		<u>Ba Mass</u>	<u>Ba Yield</u>	<u>Trunc Yield</u>	<u>Ingrowth</u>	<u>Ba Precip Time</u>	<u>InstrID</u>	<u>Eff</u>	<u>Cal Type</u>	<u>Cnt Date Time</u>	<u>Sigma</u>
<u>Analyte</u>		<u>Ts</u>	<u>Tb</u>	<u>Cs</u>	<u>Cb</u>	<u>CPMs</u>	<u>CPMb</u>	<u>Activity</u>	<u>UncCount</u>	<u>UncTotal</u>	<u>MDA</u>		<u>DLC</u>	<u>MOO</u>
160-21018-A-1-A	160-21018-A-1-A		1.0000mL		0.0133	63.15%	False	1.8975	2 / 13 / 17 13:30	Orange22	0.2204	2	2 / 15 / 17 12:31	1.00
Total Alpha Emitting		5.00	1000.00	9746	110	1949.20	0.11	3.325E+003pCi/mL	3.368E+001	1.534E+002	1.858E+000		4.173E-001	153.3688
160-21018-A-2-A	160-21018-A-2-A		1.0000mL		0.0276	78.63%	False	1.8957	2 / 13 / 17 13:30	Orange22	0.2005	2	2 / 15 / 17 12:24	1.00
Total Alpha Emitting		5.00	1000.00	12034	110	2406.80	0.11	3.627E+003pCi/mL	3.306E+001	1.665E+002	1.641E+000		3.686E-001	166.5230
160-21018-A-3-A	160-21018-A-3-A		1.0000mL		0.0487	92.50%	False	1.8941	2 / 13 / 17 13:30	Orange22	0.1751	2	2 / 15 / 17 12:18	1.00
Total Alpha Emitting		5.00	1000.00	11532	110	2306.40	0.11	3.386E+003pCi/mL	3.154E+001	1.556E+002	1.599E+000		3.592E-001	155.6165

Laboratory Control Sample Information

<u>SampID</u>	<u>WRKNO</u>	<u>Analyte</u>	<u>Activity</u>	<u>StdAdded</u>	<u>Recovery</u>	<u>LCL</u>	<u>UCL</u>	<u>ZFactor</u>
					%			

Sample Duplicate Information

<u>SampID</u>	<u>SampDupID</u>	<u>Analyte</u>	<u>Activity</u>	<u>DupActivity</u>	<u>RPD</u>	<u>RER</u>	<u>DER</u>	<u>ZFactor</u>
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Matrix Spike Information

<u>SampID</u>	<u>SampMSID</u>	<u>WRKNO</u>	<u>Analyte</u>	<u>Activity</u>	<u>MSActivity</u>	<u>StdAdded</u>	<u>Recovery</u>	<u>ZFactor</u>
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Blanks Information

<u>SampID</u>	<u>WRKNO</u>	<u>Analyte</u>	<u>Activity</u>	<u>UncTotal</u>
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Ra226 ICV

Orange Ra226 ICV 2017				
	Low	Medium	High	Mean
	Mass	Mass	Mass	Recovery
Detector	Recovery	Recovery	Recovery	
22	87.77%	95.74%	89.38%	90.97%

Standard ID

Ra-226

Ra-226_00025 #1063071

Cert # 104858

Added: 1mL

Activity 3788.19152 pCi/mL

Prep Batch: 291970

Detector	1	Activity	Units
22	Low Mass (0.0133g)	3.325E+03	pCi/mL

2	Activity	Units
Medium Mass (0.0276g)	3.627E+03	pCi/mL

3	Activity	Units
High Mass (0.0487g)	3.386E+03	pCi/mL

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICVRa6-1063071;-3-A Repeat 21
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 12:18:36 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 12:23:52 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	11,532	2,306.400	2,306.290
sd	0.000			0.010	107.387	21.477	21.477
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	10,410	2,082.000	2,081.611
sd	0.000			0.020	102.029	20.406	20.406

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method $T_b = T_s < 10$ Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICVRa6-1063071;-2-A				Repeat	22
				Carrier No.	0
Batch ID 291970					
Count Method Gross Alpha Beta				Detector Volts	1515
Sample Qty	0 l	sd	0 l		
Residual Wt	0 mg	sd	0 mg		
Count Began 2/15/2017 12:24:36 PM		Collection Date 1 1/1/1900		Half Life	0.00 days
Count Ended 2/15/2017 12:29:38 PM		Collection Date 2 1/1/1900		Decay Factor	1.000
Sample Count Time		5.00 mins	Background Count Time		1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	12,034	2,406.800	2,406.690
sd	0.000			0.010	109.700	21.940	21.940
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	9,242	1,848.400	1,848.011
sd	0.000			0.020	96.135	19.227	19.227
	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l		Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		
Beta	0.000	0.000	0.000	1.000	0.000 ±	0.000	0.000
sd	0.000				0.000		

* Note: Decay Corrected MDC Method Tb = Ts < 10 Error = .00 x sd

Alpha/Beta Count Results

Sample Activity Report

Orange 20-23 - C

Addr: 22

Sample ID ICVRa6-1063071;-1-A Repeat 23
Carrier No. 0

Batch ID 291970

Count Method Gross Alpha Beta Detector Volts 1515

Sample Qty 0 l sd 0 l
Residual Wt 0 mg sd 0 mg

Count Began 2/15/2017 12:31:18 PM Collection Date 1 1/1/1900 Half Life 0.00 days
Count Ended 2/15/2017 12:36:23 PM Collection Date 2 1/1/1900 Decay Factor 1.000

Sample Count Time 5.00 mins Background Count Time 1,000.00 mins

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.110	9,746	1,949.200	1,949.090
sd	0.000			0.010	98.722	19.744	19.744
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	7,533	1,506.600	1,506.211
sd	0.000			0.020	86.793	17.359	17.359

	Net Activity dpm	LLD dpm	MDC pCi/l	MPC pCi/l	Net Concentration * pCi/l	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	1.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

* Note: Decay Corrected MDC Method $T_b = T_s < 10$ Error = .00 x sd

Monthly Backgrounds

Alpha/Beta Count Results

Source Count Report

Orange 4-7 - A

Addr: 4

Sample ID ICB		Repeat	2014
ICB;Monthly Background Check		Carrier No.	0
Batch ID ICB;Monthly Background			
		Detector Volts	1515
Residual Wt	0 mg	Half Life	0.00 Year
Count Began	7/27/2018 2:16:02 PM	Calibration Date	8/4/2012 9:20:16 AM
Count Ended	7/28/2018 6:57:32 AM	Decay Factor	1.000
		Backgrounds From	
Sample Count Time	1,000.00 mins	Background Count Time	0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	40	0.040	0.000	0.040
sd	6.325	0.006	0.000	0.006
Beta	351	0.351	0.000	0.351
sd	18.735	0.019	0.000	0.019

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Orange 4-7 - B

Addr: 5

Sample ID ICB		Repeat	2024
ICB;Monthly Background Check		Carrier No.	0
Batch ID ICB;Monthly Background			
Detector Volts			1515
Residual Wt	0 mg	Half Life	0.00 Year
Count Began	7/27/2018 2:16:04 PM	Calibration Date	8/4/2012 9:20:16 AM
Count Ended	7/28/2018 6:57:40 AM	Decay Factor	1.000
Backgrounds From			
Sample Count Time	1,000.00 mins	Background Count Time	0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	119	0.119	0.000	0.119
sd	10.909	0.011	0.000	0.011
Beta	362	0.362	0.000	0.362
sd	19.026	0.019	0.000	0.019

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Orange 16-19 - D

Addr: 19

Sample ID ICB		Repeat	2029
ICB;Monthly Background Check		Carrier No.	0
Batch ID ICB;Monthly Background			
		Detector Volts	1515
Residual Wt	0 mg	Half Life	0.00 Year
Count Began	7/27/2018 2:16:55 PM	Calibration Date	8/4/2012 9:20:16 AM
Count Ended	7/28/2018 6:57:58 AM	Decay Factor	1.000
		Backgrounds From	
Sample Count Time	1,000.00 mins	Background Count Time	0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	86	0.086	0.000	0.086
sd	9.274	0.009	0.000	0.009
Beta	465	0.465	0.000	0.465
sd	21.564	0.022	0.000	0.022

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Orange 20-23 - C

Addr: 22

Sample ID ICB		Repeat	2032
ICB;Monthly Background Check		Carrier No.	0
Batch ID ICB;Monthly Background			
		Detector Volts	1515
Residual Wt	0 mg	Half Life	0.00 Year
Count Began	7/27/2018 2:17:04 PM	Calibration Date	8/4/2012 9:20:16 AM
Count Ended	7/28/2018 6:58:06 AM	Decay Factor	1.000
		Backgrounds From	
Sample Count Time	1,000.00 mins	Background Count Time	0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	96	0.096	0.000	0.096
	sd 9.798	0.010	0.000	0.010
Beta	386	0.386	0.000	0.386
	sd 19.647	0.020	0.000	0.020

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
	sd 0.000	0.000	0.000	0.000
Alpha to Beta				0.000
	sd			0.000
Beta	0.000	0.000	0.000	0.000
	sd 0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Protean 0-3 - A

Addr: 0

Sample ID ICB		Repeat	511
ICB; Monthly Backgrounds		Carrier No.	0
Batch ID ICB;Monthly Backgrounds			
		Detector Volts	1515
Residual Wt	0 mg	Half Life	0.00 Year
Count Began	6/29/2018 10:24:56 AM	Calibration Date	2/15/2016 5:20:09 PM
Count Ended	6/30/2018 3:05:48 AM	Decay Factor	1.000
		Backgrounds From	
Sample Count Time	1,000.00 mins	Background Count Time	0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	66	0.066	0.000	0.066
sd	8.124	0.008	0.000	0.008
Beta	664	0.664	0.000	0.664
sd	25.768	0.026	0.000	0.026

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Protean 0-3 - B

Addr: 1

Sample ID ICB		Repeat		512	
ICB; Monthly Backgrounds		Carrier No.		0	
Batch ID ICB;Monthly Backgrounds					
			Detector Volts	1515	
Residual Wt	0 mg	Half Life		0.00 Year	
Count Began	6/29/2018 10:33:50 AM	Calibration Date	2/15/2016 5:20:09 PM	Decay Factor	1.000
Count Ended	6/30/2018 3:14:42 AM	Backgrounds From			
Sample Count Time	1,000.00 mins	Background Count Time	0.00		

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	74	0.074	0.000	0.074
sd	8.602	0.009	0.000	0.009
Beta	432	0.432	0.000	0.432
sd	20.785	0.021	0.000	0.021

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Protean 12-15 - B

Addr: 13

Sample ID ICB		Repeat		515	
ICB; Monthly Backgrounds		Carrier No.		0	
Batch ID ICB;Monthly Backgrounds					
			Detector Volts	1515	
Residual Wt	0 mg	Half Life		0.00 Year	
Count Began	6/29/2018 11:05:32 AM	Calibration Date	2/15/2016 5:20:09 PM	Decay Factor	1.000
Count Ended	6/30/2018 3:46:29 AM	Backgrounds From			
Sample Count Time	1,000.00 mins	Background Count Time	0.00		

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	137	0.137	0.000	0.137
sd	11.705	0.012	0.000	0.012
Beta	422	0.422	0.000	0.422
sd	20.543	0.021	0.000	0.021

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Protean 12-15 - D

Addr: 15

Sample ID ICB		Repeat	516
ICB; Monthly Backgrounds		Carrier No.	0
Batch ID ICB;Monthly Backgrounds			
		Detector Volts	1515
Residual Wt	0 mg	Half Life	0.00 Year
Count Began	6/29/2018 11:13:12 AM	Calibration Date	2/15/2016 5:20:09 PM
Count Ended	6/30/2018 3:54:08 AM	Decay Factor	1.000
		Backgrounds From	
Sample Count Time	1,000.00 mins	Background Count Time	0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	149	0.149	0.000	0.149
	sd 12.207	0.012	0.000	0.012
Beta	522	0.522	0.000	0.522
	sd 22.847	0.023	0.000	0.023

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
	sd 0.000	0.000	0.000	0.000
Alpha to Beta				0.000
	sd			0.000
Beta	0.000	0.000	0.000	0.000
	sd 0.000	0.000	0.000	0.000

Run Logs

Gas Flow Proportional Counter Run Log

Detector: Orange4

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/14/17 20:32	15	ICRA6 160-292932/1		292932			PS
02/14/17 20:52	15	ICRA6 160-292932/2		292932			PS
02/14/17 21:09	15	ICRA6 160-292932/3		292932			PS
02/14/17 21:26	15	ICRA6 160-292932/4		292932			PS
02/14/17 21:44	15	ICRA6 160-292932/5		292932			PS
02/14/17 22:27	15	ICRA6 160-292932/6		292932			PS
02/14/17 22:47	15	ICRA6 160-292932/7		292932			PS
02/15/17 08:55	5	ICVRA6 160-292932/8		292932			PS
02/15/17 09:12	5	ICVRA6 160-292932/9		292932			PS
02/15/17 09:21	5	ICVRA6 160-292932/10		292932			PS
07/27/18 14:16	1000	ICB 160-378546/5		378546			PS
08/08/18 00:05	2	CCVB 160-380986/3		380986			RTM
08/08/18 00:11	2	CCVA 160-380986/27		380986			RTM
08/08/18 01:07	200	CCB 160-380986/48		380986			RTM
08/08/18 05:27	100	LCS 160-375564/1-A		380986	375564	9315	RTM
08/08/18 08:52	60	ZZZZZ		380986			
08/08/18 10:18	60	ZZZZZ		380986			
08/08/18 11:45	60	ZZZZZ		380986			
08/08/18 13:10	200	ZZZZZ		380986			
08/08/18 18:18	60	ZZZZZ		380986			

Detector: Orange5

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/14/17 20:32	15	ICRA6 160-292933/1		292933			PS
02/14/17 20:52	15	ICRA6 160-292933/2		292933			PS
02/14/17 21:09	15	ICRA6 160-292933/3		292933			PS
02/14/17 21:26	15	ICRA6 160-292933/4		292933			PS
02/14/17 21:44	15	ICRA6 160-292933/5		292933			PS
02/14/17 22:09	15	ICRA6 160-292933/6		292933			PS
02/14/17 22:47	15	ICRA6 160-292933/7		292933			PS
02/15/17 09:12	5	ICVRA6 160-292933/8		292933			PS
02/15/17 09:22	5	ICVRA6 160-292933/9		292933			PS
02/15/17 10:14	5	ICVRA6 160-292933/10		292933			PS
07/27/18 14:16	1000	ICB 160-378546/6		378546			PS
08/08/18 00:05	2	CCVB 160-380986/10		380986			RTM
08/08/18 00:11	2	CCVA 160-380986/28		380986			RTM
08/08/18 01:07	200	CCB 160-380986/49		380986			RTM
08/08/18 05:27	100	LCSD 160-375564/2-A		380986	375564	9315	RTM
08/08/18 13:11	200	ZZZZZ		380986			
08/08/18 18:20	200	ZZZZZ		380986			

Detector: Orange19

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/15/17 07:04	15	ICRA6 160-292948/1		292948			PS
02/15/17 07:24	15	ICRA6 160-292948/2		292948			PS
02/15/17 07:50	15	ICRA6 160-292948/3		292948			PS
02/15/17 08:09	15	ICRA6 160-292948/4		292948			PS
02/15/17 08:58	15	ICRA6 160-292948/5		292948			PS
02/15/17 09:18	15	ICRA6 160-292948/6		292948			PS
02/15/17 10:11	15	ICRA6 160-292948/7		292948			PS
02/15/17 11:56	5	ICVRA6 160-292948/8		292948			PS

Gas Flow Proportional Counter Run Log

Detector: Orange19 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/15/17 12:04	5	ICVRA6 160-292948/9		292948			PS
02/15/17 12:11	5	ICVRA6 160-292948/10		292948			PS
07/27/18 14:16	1000	ICB 160-378546/20		378546			PS
08/08/18 00:05	2	CCVB 160-380986/5		380986			RTM
08/08/18 00:19	2	CCVA 160-380986/42		380986			RTM
08/08/18 01:07	200	CCB 160-380986/62		380986			RTM
08/08/18 05:29	100	160-29476-1	CRC-MW-1	380986	375564	9315	RTM
08/08/18 08:53	60	ZZZZZ		380986			
08/08/18 10:19	60	ZZZZZ		380986			
08/08/18 11:45	60	ZZZZZ		380986			
08/08/18 13:12	200	ZZZZZ		380986			
08/08/18 18:21	200	ZZZZZ		380986			

Detector: Orange22

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/15/17 07:05	15	ICRA6 160-292951/1		292951			PS
02/15/17 07:24	15	ICRA6 160-292951/2		292951			PS
02/15/17 07:51	15	ICRA6 160-292951/3		292951			PS
02/15/17 08:09	15	ICRA6 160-292951/4		292951			PS
02/15/17 08:29	15	ICRA6 160-292951/5		292951			PS
02/15/17 08:58	15	ICRA6 160-292951/6		292951			PS
02/15/17 09:18	15	ICRA6 160-292951/7		292951			PS
02/15/17 12:18	5	ICVRA6 160-292951/8		292951			PS
02/15/17 12:24	5	ICVRA6 160-292951/9		292951			PS
02/15/17 12:31	5	ICVRA6 160-292951/10		292951			PS
07/27/18 14:17	1000	ICB 160-378546/23		378546			PS
08/08/18 00:05	2	CCVB 160-380986/14		380986			RTM
08/08/18 00:19	2	CCVA 160-380986/45		380986			RTM
08/08/18 01:07	200	CCB 160-380986/63		380986			RTM
08/08/18 05:29	100	MB 160-375564/15-A		380986	375564	9315	RTM
08/08/18 08:53	60	ZZZZZ		380986			
08/08/18 10:20	60	ZZZZZ		380986			
08/08/18 11:45	60	ZZZZZ		380986			
08/08/18 13:12	200	ZZZZZ		380986			
08/08/18 18:21	200	ZZZZZ		380986			

Detector: Protean0

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/13 00:23	1.01	ICABT 160-224068/1		224068			JLW
03/27/13 00:32	1.01	ICABT 160-224068/2		224068			JLW
03/27/13 00:51	1.01	ICABT 160-224068/3		224068			JLW
03/27/13 01:05	1.01	ICABT 160-224068/4		224068			JLW
03/27/13 01:08	1.01	ZZZZZ		224068			
03/27/13 02:14	1.01	ICABT 160-224068/6		224068			JLW
03/27/13 08:49	1.01	ICABT 160-224068/7		224068			JLW
03/27/13 08:54	1.01	ICABT 160-224068/8		224068			JLW
03/27/13 09:19	1.01	ICABT 160-224068/9		224068			JLW
03/28/13 10:21	5	ICVABT 160-224068/10		224068			JLW
03/28/13 13:22	5	ICVABT 160-224068/11		224068			JLW
03/28/13 13:39	5	ICVABT 160-224068/12		224068			JLW
11/13/15 12:28	50	ICABT 160-224068/22		224068			JLW

Gas Flow Proportional Counter Run Log

Detector: Protean0 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/15 21:07	50	ZZZZZ		224068			
11/15/15 13:05	33	ICABT 160-224068/13		224068			JLW
11/15/15 14:11	28	ICABT 160-224068/14		224068			JLW
11/15/15 17:57	21	ICABT 160-224068/15		224068			JLW
11/15/15 20:53	30	ICABT 160-224068/16		224068			JLW
11/15/15 22:11	23	ICABT 160-224068/17		224068			JLW
11/15/15 22:56	20	ICABT 160-224068/18		224068			JLW
11/20/15 13:53	30	ICVABT 160-224068/19		224068			JLW
11/20/15 18:43	30	ICVABT 160-224068/20		224068			JLW
11/20/15 19:40	30	ICVABT 160-224068/21		224068			JLW
06/29/18 10:24	1000	ICB 160-373454/11		373454			PS
07/27/18 00:05	2	CCVA 160-378362/9		378362			
07/27/18 00:38	2	CCVB 160-378362/17		378362			RTM
07/27/18 00:55	2	CCVA 160-378362/33		378362			RTM
07/27/18 00:58	200	CCB 160-378362/49		378362			RTM
07/27/18 09:18	200	LCS 160-375578/1-A		378362	375578	9320	RTM

Detector: Protean1

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/13 00:23	1.01	ICABT 160-224047/10		224047			JLW
03/27/13 00:32	1.01	ICABT 160-224047/11		224047			JLW
03/27/13 00:51	1.01	ICABT 160-224047/12		224047			JLW
03/27/13 01:05	1.01	ZZZZZ		224047			
03/27/13 01:09	1.01	ICABT 160-224047/14		224047			JLW
03/27/13 02:14	1.01	ICABT 160-224047/15		224047			JLW
03/27/13 08:49	1.01	ICABT 160-224047/16		224047			JLW
03/27/13 08:54	1.01	ICABT 160-224047/17		224047			JLW
03/27/13 09:19	1.01	ICABT 160-224047/18		224047			JLW
03/28/13 10:21	5	ICVABT 160-224047/19		224047			JLW
03/28/13 13:39	5	ICVABT 160-224047/20		224047			JLW
04/02/13 21:11	5	ICVABT 160-224047/21		224047			JLW
11/13/15 12:28	50	ICABT 160-224047/22		224047			JLW
11/14/15 21:07	50	ICABT 160-224047/23		224047			JLW
11/15/15 13:05	22	ICABT 160-224047/1		224047			JLW
11/15/15 14:11	34	ICABT 160-224047/2		224047			JLW
11/15/15 17:57	28	ICABT 160-224047/3		224047			JLW
11/15/15 20:52	24	ZZZZZ		224047			
11/15/15 22:11	30	ICABT 160-224047/5		224047			JLW
11/15/15 22:56	23	ICABT 160-224047/6		224047			JLW
11/20/15 13:53	30	ICVABT 160-224047/7		224047			JLW
11/20/15 14:28	30	ICVABT 160-224047/8		224047			JLW
11/20/15 19:40	30	ZZZZZ		224047			
11/20/15 19:40	30	ICVABT 160-224047/24		224047			JLW
06/29/18 10:33	1000	ICB 160-373454/12		373454			PS
07/27/18 00:05	2	CCVA 160-378362/6		378362			RTM
07/27/18 00:38	2	CCVB 160-378362/18		378362			RTM
07/27/18 00:57	200	CCB 160-378362/36		378362			
07/27/18 05:44	200	CCB 160-378362/51		378362			RTM
07/27/18 09:18	200	LCSD 160-375578/2-A		378362	375578	9320	RTM

Gas Flow Proportional Counter Run Log

Detector: Protean13

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/13 09:26	1.01	ICABT 160-224911/9		224911			JLW
03/27/13 09:35	1.01	ICABT 160-224911/10		224911			JLW
03/27/13 09:48	1.01	ICABT 160-224911/11		224911			JLW
03/27/13 09:55	1.01	ICABT 160-224911/12		224911			JLW
03/27/13 10:05	1.01	ICABT 160-224911/13		224911			JLW
03/27/13 10:13	1.01	ICABT 160-224911/14		224911			JLW
03/27/13 10:20	1.01	ICABT 160-224911/15		224911			JLW
03/27/13 10:27	1.01	ICABT 160-224911/16		224911			JLW
03/28/13 23:41	5	ICVABT 160-224911/17		224911			JLW
03/28/13 23:47	5	ICVABT 160-224911/18		224911			JLW
03/28/13 23:53	5	ICVABT 160-224911/19		224911			JLW
11/25/15 18:18	50	ICABT 160-224911/1		224911			JLW
11/25/15 22:48	50	ZZZZZ		224911			
11/25/15 23:45	50	ICABT 160-224911/3		224911			JLW
11/27/15 07:48	50	ICABT 160-224911/4		224911			JLW
11/27/15 08:50	50	ICABT 160-224911/5		224911			JLW
11/27/15 11:48	50	ICABT 160-224911/6		224911			JLW
11/27/15 12:46	50	ICABT 160-224911/7		224911			JLW
11/29/15 15:32	50	ICABT 160-224911/8		224911			JLW
12/03/15 08:30	30	ICVABT 160-224911/20		224911			JLW
12/03/15 10:24	30	ICVABT 160-224911/21		224911			JLW
12/03/15 12:21	30	ICVABT 160-224911/22		224911			JLW
06/29/18 11:05	1000	ICB 160-373454/15		373454			PS
07/27/18 00:05	2	CCVB 160-378362/1		378362			RTM
07/27/18 00:39	2	CCVA 160-378362/30		378362			RTM
07/27/18 00:57	200	CCB 160-378362/45		378362			
07/27/18 05:45	200	CCB 160-378362/62		378362			RTM
07/27/18 09:20	200	160-29476-1	CRC-MW-1	378362	375578	9320	RTM

Detector: Protean15

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/13 09:26	1.01	ICABT 160-224913/9		224913			JLW
03/27/13 09:35	1.01	ICABT 160-224913/10		224913			JLW
03/27/13 09:48	1.01	ICABT 160-224913/11		224913			JLW
03/27/13 09:55	1.01	ICABT 160-224913/12		224913			JLW
03/27/13 10:05	1.01	ICABT 160-224913/13		224913			JLW
03/27/13 10:13	1.01	ICABT 160-224913/14		224913			JLW
03/27/13 10:20	1.01	ICABT 160-224913/15		224913			JLW
03/27/13 10:27	1.01	ICABT 160-224913/16		224913			JLW
03/28/13 23:53	5	ICVABT 160-224913/17		224913			JLW
03/28/13 23:59	5	ICVABT 160-224913/18		224913			JLW
03/29/13 00:05	5	ICVABT 160-224913/19		224913			JLW
11/25/15 18:19	50	ICABT 160-224913/1		224913			JLW
11/25/15 22:48	50	ICABT 160-224913/2		224913			JLW
11/25/15 23:45	50	ICABT 160-224913/3		224913			JLW
11/27/15 07:48	50	ZZZZZ		224913			
11/27/15 08:50	50	ICABT 160-224913/5		224913			JLW
11/27/15 11:48	50	ICABT 160-224913/6		224913			JLW
11/27/15 12:46	50	ICABT 160-224913/7		224913			JLW
11/29/15 15:33	50	ICABT 160-224913/8		224913			JLW
12/03/15 10:24	30	ICVABT 160-224913/20		224913			JLW
12/03/15 11:38	30	ICVABT 160-224913/21		224913			JLW

Gas Flow Proportional Counter Run Log

Detector: Protean15 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
12/03/15 12:22	30	ICVABT 160-224913/22		224913			JLW
06/29/18 11:13	1000	ICB 160-373454/16		373454			PS
07/27/18 00:05	2	CCVB 160-378362/3		378362			RTM
07/27/18 00:39	2	CCVA 160-378362/32		378362			RTM
07/27/18 00:57	200	CCB 160-378362/47		378362			
07/27/18 05:45	200	CCB 160-378362/64		378362			RTM
07/27/18 09:20	200	MB 160-375578/15-A		378362	375578	9320	RTM

Shipping and Receiving Documents

Earth City, MO 63045
Phone: 314.298.8566 Fax: 314.298.8757

THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact		Project Manager: <u>Kris Schmaes</u>		Site Contact: <u>Kris Schmaes</u>		Date: <u>7/11/18</u>		COC No: _____ of _____ COCs	
Company Name: <u>Petra Tech</u>		Tel/Fax: <u>73759 8058</u>		Lab Contact:		Carrier: <u>Red Ex</u>		Sampler:	
Address: <u>1 E. Wacker drive</u>		☐ CALENDAR DAYS ☐ WORKING DAYS		Analysis Turnaround Time		For Lab Use Only:		Walk-in Client:	
City/State/Zip: <u>Chicago, IL 60606</u>		TAT if different from Below		2 weeks ☒ 1 week ☐ 2 days ☐ 1 day ☐		Lab Sampling:		Job / SDG No.:	
Phone: <u>73759-8058</u>		Sample Date		Sample Time		Sample Type (C=Comp, G=Grab)		Matrix	
Project Name: <u>Carbonate Reduction</u>		7/18/18 1355		6		W		# of Cont.	
Site: <u>Chicago, IL</u>		Sample Identification		CRC-MW-1		Filtered Sample (Y/N)		Perform MS / MSD (Y/N)	
P O #		Sample Specific Notes:		Ka-236, U-238		Isotopic, U-235		Plutonium	
						Cm-240		Cm-244	
						Pu-239		Pu-240	
						Pu-241		Pu-242	
						Pu-243		Pu-244	
						Pu-245		Pu-246	
						Pu-247		Pu-248	
						Pu-249		Pu-250	
						Pu-251		Pu-252	
						Pu-253		Pu-254	
						Pu-255		Pu-256	
						Pu-257		Pu-258	
						Pu-259		Pu-260	
						Pu-261		Pu-262	
						Pu-263		Pu-264	
						Pu-265		Pu-266	
						Pu-267		Pu-268	
						Pu-269		Pu-270	
						Pu-271		Pu-272	
						Pu-273		Pu-274	
						Pu-275		Pu-276	
						Pu-277		Pu-278	
						Pu-279		Pu-280	
						Pu-281		Pu-282	
						Pu-283		Pu-284	
						Pu-285		Pu-286	
						Pu-287		Pu-288	
						Pu-289		Pu-290	
						Pu-291		Pu-292	
						Pu-293		Pu-294	
						Pu-295		Pu-296	
						Pu-297		Pu-298	
						Pu-299		Pu-300	
						Pu-301		Pu-302	
						Pu-303		Pu-304	
						Pu-305		Pu-306	
						Pu-307		Pu-308	
						Pu-309		Pu-310	
						Pu-311		Pu-312	
						Pu-313		Pu-314	
						Pu-315		Pu-316	
						Pu-317		Pu-318	
						Pu-319		Pu-320	
						Pu-321		Pu-322	
						Pu-323		Pu-324	
						Pu-325		Pu-326	
						Pu-327		Pu-328	
						Pu-329		Pu-330	
						Pu-331		Pu-332	
						Pu-333		Pu-334	
						Pu-335		Pu-336	
						Pu-337		Pu-338	
						Pu-339		Pu-340	
						Pu-341		Pu-342	
						Pu-343		Pu-344	
						Pu-345		Pu-346	
						Pu-347		Pu-348	
						Pu-349		Pu-350	
						Pu-351		Pu-352	
						Pu-353		Pu-354	
						Pu-355		Pu-356	
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						Pu-363		Pu-364	
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						Pu-367		Pu-368	
						Pu-369		Pu-370	
						Pu-371		Pu-372	
						Pu-373		Pu-374	
						Pu-375		Pu-376	
						Pu-377		Pu-378	
						Pu-379		Pu-380	
						Pu-381		Pu-382	
						Pu-383		Pu-384	
						Pu-385		Pu-386	
						Pu-387		Pu-388	
						Pu-389		Pu-390	
						Pu-391		Pu-392	
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						Pu-395		Pu-396	
						Pu-397		Pu-398	
						Pu-399		Pu-400	
						Pu-401		Pu-402	
						Pu-403		Pu-404	
						Pu-405		Pu-406	
						Pu-407		Pu-408	
						Pu-409		Pu-410	
						Pu-411		Pu-412	
						Pu-413		Pu-414	
						Pu-415		Pu-416	
						Pu-417		Pu-418	
						Pu-419		Pu-420	
						Pu-421		Pu-422	
						Pu-423		Pu-424	
						Pu-425		Pu-426	
						Pu-427		Pu-428	
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						Pu-431		Pu-432	
						Pu-433		Pu-434	
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						Pu-439		Pu-440	
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						Pu-443		Pu-444	
						Pu-445		Pu-446	
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						Pu-449		Pu-450	
						Pu-451		Pu-452	
						Pu-453		Pu-454	
						Pu-455		Pu-456	
						Pu-457		Pu-458	
						Pu-459		Pu-460	
						Pu-461		Pu-462	
						Pu-463		Pu-464	
						Pu-465		Pu-466	
						Pu-467		Pu-468	
						Pu-469		Pu-470	
						Pu-471		Pu-472	
						Pu-473		Pu-474	
						Pu-475		Pu-476	
						Pu-477		Pu-478	
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						Pu-481		Pu-482	
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						Pu-661		Pu-662	
						Pu-663		Pu-664	
						Pu-665		Pu-666	
						Pu-667		Pu-668	
						Pu-669		Pu-670	
						Pu-671		Pu-672	
						Pu-673		Pu-674	
						Pu-675		Pu-676	
						Pu-677		Pu-678	
						Pu-679		Pu-680	
						Pu-6			

COOLER RECEIPT FORM



160-29476 Chain of Custody

Cooler Received/Opened On 7/13/2018 @ 10:10

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

1. Tracking # 3379 (last 4 digits, FedEx) Courier: FedEx
IR Gun ID 17960353 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 01 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA
If yes, how many and where: 1 Front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) KOF

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA



14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) [Signature]

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) [Signature]

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) [Signature]

I certify that I attached a label with the unique LIMS number to each container (initial) [Signature]

21. Were there Non-Conformance issues at login? YES...NO...NA Was a NCM generated? YES...NO...NA

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

Loc: 160
29476
Loc: 160
29476

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)

Client Contact:

Lab POC:
Lambert-Sykes, Chenise Y

Shipping/Receiving

Phone:

E-Mail:
chenise.lambert-sykes@testamericainc.com

Company:

TestAmerica Laboratories, Inc

Accreditations Required (See note):
NELAP - Louisiana

Address:
2980 Foster Creighton Drive,

Due Date Requested:
8/6/2018

City:
Nashville

TAT Requested (days):

State, Zip:

PO #:

TN, 37204

Phone:

WO #:

615-726-0177(Tel) 615-726-3404(Fax)

Project #:

Project Name:
Former Carnotite Site - Non-Rad Analysis

SSOW#:

Site:

Sample Identification - Client ID (Lab ID)

CRC-MW-1 (160-29476-1)

Sample Date

Sample Time

Sample Type
(C=C-Comp, G=grab)

Matrix
(W=Water, S=Soil, O=Organic, A=Air)

Preservation Code:

Field Filtered Sample (Yes or No)

Perform MS/MSD (Yes or No)

SM5210B BODCal Biochemical Oxygen Demand (BOD 5-Day)

9012B/9012B Prep Total Cyanide

9066/Distill Phenol Total Phenols

1664B/1664B SPE (MOD) Local Method

2540D/ Total Suspended Solids

Total Number of containers

Special Instructions/Note:

RAD SCREENS REQUIRED PRIOR TO SHIPPING

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/mark being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification

Unconfirmed

Deliverable Requested: I, II, III, IV, Other (specify)

Primary Deliverable Rank: 4

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client

Disposal By Lab

Archive For

Empty Kit Relinquished by:

Date:

Time:

Method of Shipment:

Relinquished by:

Date/Time:

Company

Received by:

Date/Time:

Company

Relinquished by:

Date/Time:

Company

Received by:

Date/Time:

Company

Relinquished by:

Date/Time:

Company

Received by:

Date/Time:

Company

Custody Seals Intact:

Custody Seal No.:

Δ Yes Δ No

Cooler Temperature(s) °C and Other Remarks:

COOLER RECEIPT FORM



160-29476 Chain of Custody

Cooler Received/Opened On 7/13/2018 @ 10:10

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

1. Tracking # 3379 (last 4 digits, FedEx) Courier: FedEx _____
IR Gun ID 17960353 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 0.1 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 Front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) KOF

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap AD Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA



14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) NA

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) NA

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) NA

I certify that I attached a label with the unique LIMS number to each container (initial) NA

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...# _____

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

Loc: 160
29476
Loc: 160
29476

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)		Sampler:		Lab Pmt:	
Client Contact:		Phone:		Lambert-Sykes, Cherise Y	
Shipping/Receiving:		chenise.lambert-sykes@testamerica.com		Illinois	
Company:		Accreditations Required (See note):		NELAP - Louisiana	
TestAmerica Laboratories, Inc		Due Date Requested:		8/6/2018	
Address:		2960 Foster Creighton Drive,		City:	
Nashville		TAT Requested (days):		7	
State, Zip:		TN, 37204		PO #:	
Phone:		615-726-0177 (Tel)		615-726-3404 (Fax)	
Email:		WFO #:		Project #:	
Former Carnotite Site - Non-Rad Analysis		16007488		SSOW#:	
Site:		Sample Identification - Client ID (Lab ID)		Sample Date	
CRC-MW-1 (160-29476-1)		7/11/18		13:55	
		Central		Water	
		Sample Time		Sample Type (C=comp, G=grab)	
		Preservation Code:		Matrix (Heater, Spool, Overfill, Aseal)	
		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)	
		SM5210B_BODCalc/ Biochemical Oxygen Demand (BOD 5-Day)		9012B/9012B_Prep Total Cyanide	
		9066/Distill_Phenol Total Phenols		1664B/1664B_SPE (MOD) Local Method	
		2540D/ Total Suspended Solids		Total Number of containers	
		9		RAD SCREENS REQUIRED PRIOR TO SHIPPING	
		Special Instructions/Note:		Preservation Codes:	
				A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsnO2 P - Na2CO3 Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 Z - other (specify)	
		Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	
Unconfirmed		Return To Client		Disposal By Lab	
Deliverable Requested: I, II, III, IV, Other (specify)		Primary Deliverable Rank: 4		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Date:		Time:	
Relinquished by:		Date/Time:		Received by:	
Relinquished by:		Date/Time:		Received by:	
Relinquished by:		Date/Time:		Received by:	
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	
Δ Yes Δ No					

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 160-29476-1

Login Number: 29476

List Source: TestAmerica St. Louis

List Number: 1

Creator: McKinney, Gerrod E

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	20.0, 20.0, 2.6
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Job Number: 160-32649-1

Job Description: Former Carnotite Site - MW-1 Sampling

For:

Tetra Tech, Inc.
1 South Wacker Dr.
Suite 3700
Chicago, IL 60606

Attention: Ms. Kristine Schnoes



Approved for release.
Chenise Y Lambert-Sykes
Project Manager I
2/7/2019 4:25 PM

Chenise Y Lambert-Sykes, Project Manager I
13715 Rider Trail North, Earth City, MO, 63045
(314)298-8566
chenise.lambert-sykes@testamericainc.com
02/07/2019

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. Pursuant to NELAP, this report shall not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of TestAmerica and its client. All questions regarding this report should be directed to the TestAmerica Project Manager.

Louisiana Lab Certification ID (Non-Potable, Solid/Haz. Material): 106151
Florida Lab Certification ID (Drinking Water): E87689.

TestAmerica Laboratories, Inc.

TestAmerica St. Louis 13715 Rider Trail North, Earth City, MO 63045
Tel (314) 298-8566 Fax (314) 298-8757 www.testamericainc.com



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Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	LCS or LCSD is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
T	Result is a tentatively identified compound (TIC) and an estimated value.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
*	LCS or LCSD is outside acceptance limits.
*	RPD of the LCS and LCSD exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Dioxin

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated

Definitions/Glossary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-32649-1

Project/Site: Former Carnotite Site - MW-1 Sampling

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

CASE NARRATIVE

Client: Tetra Tech, Inc.

Project: Former Carnotite Site - MW-1 Sampling

Report Number: 160-32649-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 01/16/2019; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.2° C and 3.6° C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample CRC-MW-1-011519 (160-32649-1) was analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 01/28/2019.

Analytical Batch: 280-445753

The laboratory control sample (LCS) for analytical batch 280-445753 recovered outside control limits for the following analytes: Chloroethane (140 %R, limit 46-136 %R) and Dichlorodifluoromethane (146 %R, limit 43-142 %R). This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported. The following samples are impacted CRC-MW-1-011519 (160-32649-1) and (LCS 280-445753/4).

Methylene Chloride failed the recovery criteria low for the MSD of sample 280-119359-1 in batch 280-445753. The presence of the "4 qualifier denotes that the analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. Refer to the QC report for details.

Batch QC was performed on a non-client sample, an LCS/LCSD was also performed..

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS (GC MS)

Sample CRC-MW-1-011519 (160-32649-1) was analyzed for semivolatile organic compounds (GC MS) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 01/21/2019 and analyzed on 01/22/2019.

Analytical Batch: 280-444835

The laboratory control sample (LCSD) for preparation batch 280-444835 and analytical batch 280-445019 recovered outside control limits for the following analytes: Pyridine, Aniline, and 4-Chloroaniline. The samples have exceeded holding time. The LCS was within limits for all compounds.

Pyridine= 0% limits of 10-69%

Aniline= 3% limits of 29-87%

4-Chloroaniline= 40% limits of 41-93%

The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch preparation batch 280-444835 and analytical batch 280-445019 recovered outside control limits for the following analytes: Phenol, Pyridine, Benzidine, Aniline, 4-Nitrophenol, Benzoic acid and 4-Chloroaniline.

Organic Prep

Methods 3510C:

The matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 280-444835 was not performed; however, an LCS duplicate was performed to provide evidence of batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS (GC)

Sample CRC-MW-1-011519 (160-32649-1) was analyzed for semivolatile organic compounds (GC) in accordance with EPA SW-846 Method 8081B. The samples were prepared on 01/18/2019 and analyzed on 01/23/2019.

Analytical Batch: 280-444894

The continuing calibration verification (CCV) for associated with analytical batch 280-444894 recovered below the lower control limit on the front column for Dieldrin & 4,4-DDD. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported from the back column which is in control.

CCVIS:

Dieldrin: front: -27%D, back: in control

4,4-DDD: front: -21%D, back: in control

CCV

Dieldrin: front: -20%D, back: in control

4,4-DDD: front: in control, back: in control

The continuing calibration verification (CCV) for associated with analytical batch 280-444894 recovered below the lower control limit on the back column for Endosulfan I. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported from the front column which is in control.

CCVIS

Endosulfan I: Front: in control, Back: -21%D

The Tetrachloro-m-xylene surrogate recovery for the following samples was outside acceptance limits (low biased) on the confirmation column: CRC-MW-1-011519 (160-32649-1), (CCV 280-444894/47) and (CCVIS 280-444894/13). The recovery is within acceptance limits on the other column, indicating that the extraction process was in control. DCB Decachlorobiphenyl is in control on both columns for the CCVIS and CCV.

CCVIS

Tetrachloro-m-xylene, Front: in control, Back: -22%D

CCV

Tetrachloro-m-xylene, Front: in control, Back: -20%D

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

POLYCHLORINATED BIPHENYLS (PCBS)

Sample CRC-MW-1-011519 (160-32649-1) was analyzed for polychlorinated biphenyls (PCBs) in accordance with EPA SW-846 Method 8082A. The samples were prepared on 01/21/2019 and analyzed on 02/05/2019.

Organic Prep

Methods 3510C:

The matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 280-444887 was not performed; however, an LCS duplicate was performed to provide evidence of batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIOXINS AND FURANS (HRGC/HRMS)

Sample CRC-MW-1-011519 (160-32649-1) was analyzed for Dioxins and Furans (HRGC/HRMS) in accordance with 1613B. The samples were prepared on 01/22/2019 and analyzed on 01/29/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Client Sample ID: CRC-MW-1-011519

Lab Sample ID: 160-32649-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Acetone	8.7	J	10	1.9	ug/L	1			8260B	Total/NA
Methylene Chloride	0.40	J	2.0	0.32	ug/L	1			8260B	Total/NA
Bis(2-ethylhexyl) phthalate	5.2	J	10	1.2	ug/L	1			8270D	Total/NA

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Client Sample ID: CRC-MW-1-011519

Lab Sample ID: 160-32649-1

Date Collected: 01/15/19 12:30

Matrix: Water

Date Received: 01/16/19 09:10

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.16	U	1.0	0.16	ug/L			01/28/19 23:21	1
1,1,2,2-Tetrachloroethane	0.21	U	1.0	0.21	ug/L			01/28/19 23:21	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/28/19 23:21	1
1,1,2-Trichlorotrifluoroethane	0.42	U	3.0	0.42	ug/L			01/28/19 23:21	1
1,1-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/28/19 23:21	1
1,1-Dichloroethene	0.23	U	1.0	0.23	ug/L			01/28/19 23:21	1
1,2,3-Trichlorobenzene	0.21	U	1.0	0.21	ug/L			01/28/19 23:21	1
1,2,4-Trichlorobenzene	0.21	U	1.0	0.21	ug/L			01/28/19 23:21	1
1,2-Dibromo-3-Chloropropane	0.47	U	5.0	0.47	ug/L			01/28/19 23:21	1
1,2-Dibromoethane	0.18	U	1.0	0.18	ug/L			01/28/19 23:21	1
1,2-Dichlorobenzene	0.15	U	1.0	0.15	ug/L			01/28/19 23:21	1
1,2-Dichloroethane	0.13	U	1.0	0.13	ug/L			01/28/19 23:21	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/28/19 23:21	1
1,3,5-Trimethylbenzene	0.16	U	1.0	0.16	ug/L			01/28/19 23:21	1
1,3-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/28/19 23:21	1
1,4-Dichlorobenzene	0.16	U	1.0	0.16	ug/L			01/28/19 23:21	1
1,4-Dioxane	57	U	200	57	ug/L			01/28/19 23:21	1
2-Butanone (MEK)	2.0	U	6.0	2.0	ug/L			01/28/19 23:21	1
2-Chloroethyl vinyl ether	0.69	U	3.0	0.69	ug/L			01/28/19 23:21	1
2-Hexanone	1.7	U	5.0	1.7	ug/L			01/28/19 23:21	1
4-Methyl-2-pentanone (MIBK)	0.98	U	5.0	0.98	ug/L			01/28/19 23:21	1
Acetone	8.7	J	10	1.9	ug/L			01/28/19 23:21	1
Acetonitrile	9.6	U	30	9.6	ug/L			01/28/19 23:21	1
Acrolein	2.8	U	20	2.8	ug/L			01/28/19 23:21	1
Acrylonitrile	1.4	U	20	1.4	ug/L			01/28/19 23:21	1
Benzene	0.16	U	1.0	0.16	ug/L			01/28/19 23:21	1
Bromoform	0.19	U	1.0	0.19	ug/L			01/28/19 23:21	1
Bromomethane	0.21	U	2.0	0.21	ug/L			01/28/19 23:21	1
Carbon disulfide	0.45	U	2.0	0.45	ug/L			01/28/19 23:21	1
Carbon tetrachloride	0.19	U	1.0	0.19	ug/L			01/28/19 23:21	1
Chlorobenzene	0.17	U	1.0	0.17	ug/L			01/28/19 23:21	1
Chlorobromomethane	0.10	U	1.0	0.10	ug/L			01/28/19 23:21	1
Chlorodibromomethane	0.17	U	1.0	0.17	ug/L			01/28/19 23:21	1
Chloroethane	0.41	U *	2.0	0.41	ug/L			01/28/19 23:21	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/28/19 23:21	1
Chloromethane	0.30	U	2.0	0.30	ug/L			01/28/19 23:21	1
cis-1,2-Dichloroethene	0.15	U	1.0	0.15	ug/L			01/28/19 23:21	1
cis-1,3-Dichloropropene	0.16	U	1.0	0.16	ug/L			01/28/19 23:21	1
Cyclohexane	0.28	U	2.0	0.28	ug/L			01/28/19 23:21	1
Dichlorobromomethane	0.17	U	1.0	0.17	ug/L			01/28/19 23:21	1
Dichlorodifluoromethane	0.31	U *	2.0	0.31	ug/L			01/28/19 23:21	1
Ethylbenzene	0.16	U	1.0	0.16	ug/L			01/28/19 23:21	1
Isopropylbenzene	0.19	U	1.0	0.19	ug/L			01/28/19 23:21	1
Methyl acetate	1.6	U	5.0	1.6	ug/L			01/28/19 23:21	1
Methyl tert-butyl ether	0.25	U	5.0	0.25	ug/L			01/28/19 23:21	1
Methylcyclohexane	0.36	U	1.0	0.36	ug/L			01/28/19 23:21	1
Methylene Chloride	0.40	J	2.0	0.32	ug/L			01/28/19 23:21	1
m-Xylene & p-Xylene	0.34	U	2.0	0.34	ug/L			01/28/19 23:21	1
o-Xylene	0.19	U	1.0	0.19	ug/L			01/28/19 23:21	1

TestAmerica St. Louis

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Client Sample ID: CRC-MW-1-011519

Lab Sample ID: 160-32649-1

Date Collected: 01/15/19 12:30

Matrix: Water

Date Received: 01/16/19 09:10

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	0.17	U	1.0	0.17	ug/L			01/28/19 23:21	1
Tetrachloroethene	0.20	U	1.0	0.20	ug/L			01/28/19 23:21	1
Toluene	0.17	U	1.0	0.17	ug/L			01/28/19 23:21	1
trans-1,2-Dichloroethene	0.15	U	1.0	0.15	ug/L			01/28/19 23:21	1
trans-1,3-Dichloropropene	0.19	U	3.0	0.19	ug/L			01/28/19 23:21	1
Trichloroethene	0.16	U	1.0	0.16	ug/L			01/28/19 23:21	1
Trichlorofluoromethane	0.29	U	2.0	0.29	ug/L			01/28/19 23:21	1
Vinyl chloride	0.10	U	1.0	0.10	ug/L			01/28/19 23:21	1

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	1.7	T J	ug/L		6.53			01/28/19 23:21	1
Unknown	1.5	T J	ug/L		10.54			01/28/19 23:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	110		70 - 127		01/28/19 23:21	1
4-Bromofluorobenzene (Surr)	100		78 - 120		01/28/19 23:21	1
Dibromofluoromethane (Surr)	107		77 - 120		01/28/19 23:21	1
Toluene-d8 (Surr)	106		80 - 125		01/28/19 23:21	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	0.42	U	10	0.42	ug/L		01/21/19 06:56	01/22/19 22:36	1
1,2,4,5-Tetrachlorobenzene	2.1	U	10	2.1	ug/L		01/21/19 06:56	01/22/19 22:36	1
1,2,4-Trichlorobenzene	2.1	U	5.2	2.1	ug/L		01/21/19 06:56	01/22/19 22:36	1
1,2-Dichlorobenzene	2.1	U	5.2	2.1	ug/L		01/21/19 06:56	01/22/19 22:36	1
1,2-Diphenylhydrazine(as Azobenzene)	0.56	U	10	0.56	ug/L		01/21/19 06:56	01/22/19 22:36	1
1,3-Dichlorobenzene	2.1	U	10	2.1	ug/L		01/21/19 06:56	01/22/19 22:36	1
1,3-Dinitrobenzene	1.0	U	10	1.0	ug/L		01/21/19 06:56	01/22/19 22:36	1
1,4-Dichlorobenzene	2.1	U	5.2	2.1	ug/L		01/21/19 06:56	01/22/19 22:36	1
1,4-Dioxane	0.73	U	21	0.73	ug/L		01/21/19 06:56	01/22/19 22:36	1
1-Methylnaphthalene	0.36	U	4.1	0.36	ug/L		01/21/19 06:56	01/22/19 22:36	1
2,3,4,6-Tetrachlorophenol	0.99	U	52	0.99	ug/L		01/21/19 06:56	01/22/19 22:36	1
2,4,5-Trichlorophenol	0.54	U	10	0.54	ug/L		01/21/19 06:56	01/22/19 22:36	1
2,4,6-Trichlorophenol	0.76	U	10	0.76	ug/L		01/21/19 06:56	01/22/19 22:36	1
2,4-Dichlorophenol	0.70	U	10	0.70	ug/L		01/21/19 06:56	01/22/19 22:36	1
2,4-Dimethylphenol	0.69	U	10	0.69	ug/L		01/21/19 06:56	01/22/19 22:36	1
2,4-Dinitrophenol	7.7	U	31	7.7	ug/L		01/21/19 06:56	01/22/19 22:36	1
2,4-Dinitrotoluene	0.96	U	10	0.96	ug/L		01/21/19 06:56	01/22/19 22:36	1
2,6-Dichlorophenol	0.77	U	10	0.77	ug/L		01/21/19 06:56	01/22/19 22:36	1
2,6-Dinitrotoluene	0.74	U	10	0.74	ug/L		01/21/19 06:56	01/22/19 22:36	1
2-Chloronaphthalene	0.48	U	4.1	0.48	ug/L		01/21/19 06:56	01/22/19 22:36	1
2-Chlorophenol	0.44	U	10	0.44	ug/L		01/21/19 06:56	01/22/19 22:36	1
2-Methylnaphthalene	0.42	U	4.1	0.42	ug/L		01/21/19 06:56	01/22/19 22:36	1
2-Methylphenol	0.58	U	10	0.58	ug/L		01/21/19 06:56	01/22/19 22:36	1
2-Nitroaniline	0.93	U	10	0.93	ug/L		01/21/19 06:56	01/22/19 22:36	1
2-Nitrophenol	0.64	U	10	0.64	ug/L		01/21/19 06:56	01/22/19 22:36	1
3 & 4 Methylphenol	0.41	U	10	0.41	ug/L		01/21/19 06:56	01/22/19 22:36	1
3,3'-Dichlorobenzidine	0.86	U	52	0.86	ug/L		01/21/19 06:56	01/22/19 22:36	1
3-Methylphenol	0.41	U	10	0.41	ug/L		01/21/19 06:56	01/22/19 22:36	1

TestAmerica St. Louis

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Client Sample ID: CRC-MW-1-011519

Lab Sample ID: 160-32649-1

Date Collected: 01/15/19 12:30

Matrix: Water

Date Received: 01/16/19 09:10

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Nitroaniline	0.81	U	10	0.81	ug/L		01/21/19 06:56	01/22/19 22:36	1
4,6-Dinitro-2-methylphenol	6.1	U	52	6.1	ug/L		01/21/19 06:56	01/22/19 22:36	1
4-Bromophenyl phenyl ether	0.42	U	10	0.42	ug/L		01/21/19 06:56	01/22/19 22:36	1
4-Chloro-3-methylphenol	0.46	U	10	0.46	ug/L		01/21/19 06:56	01/22/19 22:36	1
4-Chloroaniline	0.58	U *	10	0.58	ug/L		01/21/19 06:56	01/22/19 22:36	1
4-Chlorophenyl phenyl ether	0.65	U	10	0.65	ug/L		01/21/19 06:56	01/22/19 22:36	1
4-Methylphenol	0.41	U	10	0.41	ug/L		01/21/19 06:56	01/22/19 22:36	1
4-Nitroaniline	0.87	U	10	0.87	ug/L		01/21/19 06:56	01/22/19 22:36	1
4-Nitrophenol	1.0	U *	10	1.0	ug/L		01/21/19 06:56	01/22/19 22:36	1
Acenaphthene	0.46	U	4.1	0.46	ug/L		01/21/19 06:56	01/22/19 22:36	1
Acenaphthylene	0.52	U	4.1	0.52	ug/L		01/21/19 06:56	01/22/19 22:36	1
Acetophenone	0.54	U	10	0.54	ug/L		01/21/19 06:56	01/22/19 22:36	1
Aniline	0.91	U *	10	0.91	ug/L		01/21/19 06:56	01/22/19 22:36	1
Anthracene	0.46	U	4.1	0.46	ug/L		01/21/19 06:56	01/22/19 22:36	1
Azobenzene	0.56	U	4.1	0.56	ug/L		01/21/19 06:56	01/22/19 22:36	1
Benzaldehyde	0.55	U	10	0.55	ug/L		01/21/19 06:56	01/22/19 22:36	1
Benzidine	4.5	U *	100	4.5	ug/L		01/21/19 06:56	01/22/19 22:36	1
Benzo[a]anthracene	0.60	U	4.1	0.60	ug/L		01/21/19 06:56	01/22/19 22:36	1
Benzo[a]pyrene	0.66	U	4.1	0.66	ug/L		01/21/19 06:56	01/22/19 22:36	1
Benzo[b]fluoranthene	0.55	U	4.1	0.55	ug/L		01/21/19 06:56	01/22/19 22:36	1
Benzo[g,h,i]perylene	0.82	U	4.1	0.82	ug/L		01/21/19 06:56	01/22/19 22:36	1
Benzo[k]fluoranthene	0.58	U	4.1	0.58	ug/L		01/21/19 06:56	01/22/19 22:36	1
Benzoic acid	5.8	U *	26	5.8	ug/L		01/21/19 06:56	01/22/19 22:36	1
Benzyl alcohol	0.36	U	10	0.36	ug/L		01/21/19 06:56	01/22/19 22:36	1
bis (2-chloroisopropyl) ether	0.43	U	10	0.43	ug/L		01/21/19 06:56	01/22/19 22:36	1
Bis(2-chloroethoxy)methane	0.63	U	10	0.63	ug/L		01/21/19 06:56	01/22/19 22:36	1
Bis(2-chloroethyl)ether	0.51	U	10	0.51	ug/L		01/21/19 06:56	01/22/19 22:36	1
Bis(2-ethylhexyl) phthalate	5.2	J	10	1.2	ug/L		01/21/19 06:56	01/22/19 22:36	1
Butyl benzyl phthalate	2.1	U	5.2	2.1	ug/L		01/21/19 06:56	01/22/19 22:36	1
Caprolactam	1.2	U	10	1.2	ug/L		01/21/19 06:56	01/22/19 22:36	1
Carbazole	0.46	U	4.1	0.46	ug/L		01/21/19 06:56	01/22/19 22:36	1
Chrysene	0.54	U	4.1	0.54	ug/L		01/21/19 06:56	01/22/19 22:36	1
Dibenz(a,h)anthracene	0.67	U	4.1	0.67	ug/L		01/21/19 06:56	01/22/19 22:36	1
Dibenzofuran	0.37	U	4.1	0.37	ug/L		01/21/19 06:56	01/22/19 22:36	1
Diethyl phthalate	0.77	U	4.1	0.77	ug/L		01/21/19 06:56	01/22/19 22:36	1
Dimethyl phthalate	0.55	U	4.1	0.55	ug/L		01/21/19 06:56	01/22/19 22:36	1
Di-n-butyl phthalate	0.91	U	4.1	0.91	ug/L		01/21/19 06:56	01/22/19 22:36	1
Di-n-octyl phthalate	1.6	U	5.2	1.6	ug/L		01/21/19 06:56	01/22/19 22:36	1
Diphenylamine	0.51	U	10	0.51	ug/L		01/21/19 06:56	01/22/19 22:36	1
Famphur	2.1	U	100	2.1	ug/L		01/21/19 06:56	01/22/19 22:36	1
Fluoranthene	0.66	U	4.1	0.66	ug/L		01/21/19 06:56	01/22/19 22:36	1
Fluorene	0.51	U	4.1	0.51	ug/L		01/21/19 06:56	01/22/19 22:36	1
Hexachlorobenzene	0.99	U	10	0.99	ug/L		01/21/19 06:56	01/22/19 22:36	1
Hexachlorobutadiene	7.8	U	31	7.8	ug/L		01/21/19 06:56	01/22/19 22:36	1
Hexachlorocyclopentadiene	6.8	U	52	6.8	ug/L		01/21/19 06:56	01/22/19 22:36	1
Hexachloroethane	7.9	U	31	7.9	ug/L		01/21/19 06:56	01/22/19 22:36	1
Hexadecane	0.36	U	10	0.36	ug/L		01/21/19 06:56	01/22/19 22:36	1
Indeno[1,2,3-cd]pyrene	1.7	U	4.1	1.7	ug/L		01/21/19 06:56	01/22/19 22:36	1
Isophorone	0.69	U	10	0.69	ug/L		01/21/19 06:56	01/22/19 22:36	1

TestAmerica St. Louis

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Client Sample ID: CRC-MW-1-011519

Lab Sample ID: 160-32649-1

Date Collected: 01/15/19 12:30

Matrix: Water

Date Received: 01/16/19 09:10

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.41	U	4.1	0.41	ug/L		01/21/19 06:56	01/22/19 22:36	1
Nitrobenzene	0.44	U	10	0.44	ug/L		01/21/19 06:56	01/22/19 22:36	1
N-Nitrosodimethylamine	0.64	U	10	0.64	ug/L		01/21/19 06:56	01/22/19 22:36	1
N-Nitrosodi-n-propylamine	0.58	U	10	0.58	ug/L		01/21/19 06:56	01/22/19 22:36	1
N-Nitrosodiphenylamine	0.63	U	10	0.63	ug/L		01/21/19 06:56	01/22/19 22:36	1
Pentachlorophenol	5.7	U	52	5.7	ug/L		01/21/19 06:56	01/22/19 22:36	1
Phenanthrene	0.29	U	4.1	0.29	ug/L		01/21/19 06:56	01/22/19 22:36	1
Phenol	0.58	U *	10	0.58	ug/L		01/21/19 06:56	01/22/19 22:36	1
Pyrene	0.44	U	10	0.44	ug/L		01/21/19 06:56	01/22/19 22:36	1
Pyridine	1.8	U *	21	1.8	ug/L		01/21/19 06:56	01/22/19 22:36	1

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	4.6	T J	ug/L		3.01		01/21/19 06:56	01/22/19 22:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	77		52 - 123	01/21/19 06:56	01/22/19 22:36	1
2-Fluorobiphenyl	65		47 - 119	01/21/19 06:56	01/22/19 22:36	1
2-Fluorophenol (Surr)	49		17 - 71	01/21/19 06:56	01/22/19 22:36	1
Nitrobenzene-d5 (Surr)	67		45 - 113	01/21/19 06:56	01/22/19 22:36	1
Phenol-d5 (Surr)	34		10 - 52	01/21/19 06:56	01/22/19 22:36	1
Terphenyl-d14 (Surr)	74		50 - 123	01/21/19 06:56	01/22/19 22:36	1

Method: 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	0.0080	U	0.052	0.0080	ug/L		01/18/19 12:03	01/23/19 03:22	1
4,4'-DDE	0.0078	U	0.052	0.0078	ug/L		01/18/19 12:03	01/23/19 03:22	1
4,4'-DDT	0.015	U	0.052	0.015	ug/L		01/18/19 12:03	01/23/19 03:22	1
Aldrin	0.0061	U	0.052	0.0061	ug/L		01/18/19 12:03	01/23/19 03:22	1
alpha-BHC	0.0055	U	0.052	0.0055	ug/L		01/18/19 12:03	01/23/19 03:22	1
alpha-Chlordane	0.0055	U	0.052	0.0055	ug/L		01/18/19 12:03	01/23/19 03:22	1
beta-BHC	0.0090	U	0.052	0.0090	ug/L		01/18/19 12:03	01/23/19 03:22	1
delta-BHC	0.0060	U	0.052	0.0060	ug/L		01/18/19 12:03	01/23/19 03:22	1
Dieldrin	0.0065	U	0.052	0.0065	ug/L		01/18/19 12:03	01/23/19 03:22	1
Endosulfan I	0.0060	U	0.052	0.0060	ug/L		01/18/19 12:03	01/23/19 03:22	1
Endosulfan II	0.0072	U	0.052	0.0072	ug/L		01/18/19 12:03	01/23/19 03:22	1
Endosulfan sulfate	0.0059	U	0.052	0.0059	ug/L		01/18/19 12:03	01/23/19 03:22	1
Endrin	0.0082	U	0.052	0.0082	ug/L		01/18/19 12:03	01/23/19 03:22	1
Endrin aldehyde	0.0091	U	0.052	0.0091	ug/L		01/18/19 12:03	01/23/19 03:22	1
Endrin ketone	0.0072	U	0.052	0.0072	ug/L		01/18/19 12:03	01/23/19 03:22	1
gamma-BHC (Lindane)	0.0071	U	0.052	0.0071	ug/L		01/18/19 12:03	01/23/19 03:22	1
gamma-Chlordane	0.0094	U	0.052	0.0094	ug/L		01/18/19 12:03	01/23/19 03:22	1
Heptachlor	0.0080	U	0.052	0.0080	ug/L		01/18/19 12:03	01/23/19 03:22	1
Heptachlor epoxide	0.0078	U	0.052	0.0078	ug/L		01/18/19 12:03	01/23/19 03:22	1
Methoxychlor	0.013	U	0.10	0.013	ug/L		01/18/19 12:03	01/23/19 03:22	1
Toxaphene	0.38	U	2.1	0.38	ug/L		01/18/19 12:03	01/23/19 03:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	48		34 - 122	01/18/19 12:03	01/23/19 03:22	1
Tetrachloro-m-xylene	78		28 - 115	01/18/19 12:03	01/23/19 03:22	1

TestAmerica St. Louis

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Client Sample ID: CRC-MW-1-011519

Lab Sample ID: 160-32649-1

Date Collected: 01/15/19 12:30

Matrix: Water

Date Received: 01/16/19 09:10

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1221	0.22	U	1.0	0.22	ug/L		01/21/19 11:30	02/05/19 16:14	1
PCB-1016	0.13	U	1.0	0.13	ug/L		01/21/19 11:30	02/05/19 16:14	1
PCB-1232	0.17	U	1.0	0.17	ug/L		01/21/19 11:30	02/05/19 16:14	1
PCB-1242	0.11	U	1.0	0.11	ug/L		01/21/19 11:30	02/05/19 16:14	1
PCB-1248	0.093	U	1.0	0.093	ug/L		01/21/19 11:30	02/05/19 16:14	1
PCB-1254	0.12	U	1.0	0.12	ug/L		01/21/19 11:30	02/05/19 16:14	1
PCB-1260	0.16	U	1.0	0.16	ug/L		01/21/19 11:30	02/05/19 16:14	1
PCB-1262	0.086	U	1.0	0.086	ug/L		01/21/19 11:30	02/05/19 16:14	1
PCB-1268	0.37	U	1.0	0.37	ug/L		01/21/19 11:30	02/05/19 16:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	87		25 - 120				01/21/19 11:30	02/05/19 16:14	1
DCB Decachlorobiphenyl	41		30 - 136				01/21/19 11:30	02/05/19 16:14	1

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.35	U	10	0.35	pg/L		01/22/19 13:19	01/29/19 12:43	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
¹³ C-2,3,7,8-TCDD	63		25 - 164				01/22/19 13:19	01/29/19 12:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
³⁷ Cl ₄ -2,3,7,8-TCDD	95		35 - 197				01/22/19 13:19	01/29/19 12:43	1

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-32649-1

Project/Site: Former Carnotite Site - MW-1 Sampling

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	RL	MDL	Units	Method
1,1,1-Trichloroethane	1.0	0.16	ug/L	8260B
1,1,2,2-Tetrachloroethane	1.0	0.21	ug/L	8260B
1,1,2-Trichloroethane	1.0	0.27	ug/L	8260B
1,1,2-Trichlorotrifluoroethane	3.0	0.42	ug/L	8260B
1,1-Dichloroethane	1.0	0.22	ug/L	8260B
1,1-Dichloroethene	1.0	0.23	ug/L	8260B
1,2,3-Trichlorobenzene	1.0	0.21	ug/L	8260B
1,2,4-Trichlorobenzene	1.0	0.21	ug/L	8260B
1,2-Dibromo-3-Chloropropane	5.0	0.47	ug/L	8260B
1,2-Dibromoethane	1.0	0.18	ug/L	8260B
1,2-Dichlorobenzene	1.0	0.15	ug/L	8260B
1,2-Dichloroethane	1.0	0.13	ug/L	8260B
1,2-Dichloropropane	1.0	0.18	ug/L	8260B
1,3,5-Trimethylbenzene	1.0	0.16	ug/L	8260B
1,3-Dichlorobenzene	1.0	0.13	ug/L	8260B
1,4-Dichlorobenzene	1.0	0.16	ug/L	8260B
1,4-Dioxane	200	57	ug/L	8260B
2-Butanone (MEK)	6.0	2.0	ug/L	8260B
2-Chloroethyl vinyl ether	3.0	0.69	ug/L	8260B
2-Hexanone	5.0	1.7	ug/L	8260B
4-Methyl-2-pentanone (MIBK)	5.0	0.98	ug/L	8260B
Acetone	10	1.9	ug/L	8260B
Acetonitrile	30	9.6	ug/L	8260B
Acrolein	20	2.8	ug/L	8260B
Acrylonitrile	20	1.4	ug/L	8260B
Benzene	1.0	0.16	ug/L	8260B
Bromoform	1.0	0.19	ug/L	8260B
Bromomethane	2.0	0.21	ug/L	8260B
Carbon disulfide	2.0	0.45	ug/L	8260B
Carbon tetrachloride	1.0	0.19	ug/L	8260B
Chlorobenzene	1.0	0.17	ug/L	8260B
Chlorobromomethane	1.0	0.10	ug/L	8260B
Chlorodibromomethane	1.0	0.17	ug/L	8260B
Chloroethane	2.0	0.41	ug/L	8260B
Chloroform	1.0	0.16	ug/L	8260B
Chloromethane	2.0	0.30	ug/L	8260B
cis-1,2-Dichloroethene	1.0	0.15	ug/L	8260B
cis-1,3-Dichloropropene	1.0	0.16	ug/L	8260B
Cyclohexane	2.0	0.28	ug/L	8260B
Dichlorobromomethane	1.0	0.17	ug/L	8260B
Dichlorodifluoromethane	2.0	0.31	ug/L	8260B
Ethylbenzene	1.0	0.16	ug/L	8260B
Isopropylbenzene	1.0	0.19	ug/L	8260B
Methyl acetate	5.0	1.6	ug/L	8260B
Methyl tert-butyl ether	5.0	0.25	ug/L	8260B
Methylcyclohexane	1.0	0.36	ug/L	8260B
Methylene Chloride	2.0	0.32	ug/L	8260B
m-Xylene & p-Xylene	2.0	0.34	ug/L	8260B
o-Xylene	1.0	0.19	ug/L	8260B
Styrene	1.0	0.17	ug/L	8260B
Tetrachloroethene	1.0	0.20	ug/L	8260B
Toluene	1.0	0.17	ug/L	8260B

TestAmerica St. Louis

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-32649-1

Project/Site: Former Carnotite Site - MW-1 Sampling

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	RL	MDL	Units	Method
trans-1,2-Dichloroethene	1.0	0.15	ug/L	8260B
trans-1,3-Dichloropropene	3.0	0.19	ug/L	8260B
Trichloroethene	1.0	0.16	ug/L	8260B
Trichlorofluoromethane	2.0	0.29	ug/L	8260B
Vinyl chloride	1.0	0.10	ug/L	8260B

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Prep: 3510C

Analyte	RL	MDL	Units	Method
1,1'-Biphenyl	10	0.41	ug/L	8270D
1,2,4,5-Tetrachlorobenzene	10	2.0	ug/L	8270D
1,2,4-Trichlorobenzene	5.0	2.0	ug/L	8270D
1,2-Dichlorobenzene	5.0	2.0	ug/L	8270D
1,2-Diphenylhydrazine(as Azobenzene)	10	0.54	ug/L	8270D
1,3-Dichlorobenzene	10	2.0	ug/L	8270D
1,3-Dinitrobenzene	10	0.97	ug/L	8270D
1,4-Dichlorobenzene	5.0	2.0	ug/L	8270D
1,4-Dioxane	20	0.71	ug/L	8270D
1-Methylnaphthalene	4.0	0.35	ug/L	8270D
2,3,4,6-Tetrachlorophenol	50	0.96	ug/L	8270D
2,4,5-Trichlorophenol	10	0.52	ug/L	8270D
2,4,6-Trichlorophenol	10	0.74	ug/L	8270D
2,4-Dichlorophenol	10	0.68	ug/L	8270D
2,4-Dimethylphenol	10	0.67	ug/L	8270D
2,4-Dinitrophenol	30	7.5	ug/L	8270D
2,4-Dinitrotoluene	10	0.93	ug/L	8270D
2,6-Dichlorophenol	10	0.75	ug/L	8270D
2,6-Dinitrotoluene	10	0.72	ug/L	8270D
2-Chloronaphthalene	4.0	0.46	ug/L	8270D
2-Chlorophenol	10	0.43	ug/L	8270D
2-Methylnaphthalene	4.0	0.41	ug/L	8270D
2-Methylphenol	10	0.56	ug/L	8270D
2-Nitroaniline	10	0.90	ug/L	8270D
2-Nitrophenol	10	0.62	ug/L	8270D
3 & 4 Methylphenol	10	0.40	ug/L	8270D
3,3'-Dichlorobenzidine	50	0.83	ug/L	8270D
3-Methylphenol	10	0.40	ug/L	8270D
3-Nitroaniline	10	0.78	ug/L	8270D
4,6-Dinitro-2-methylphenol	50	5.9	ug/L	8270D
4-Bromophenyl phenyl ether	10	0.41	ug/L	8270D
4-Chloro-3-methylphenol	10	0.45	ug/L	8270D
4-Chloroaniline	10	0.56	ug/L	8270D
4-Chlorophenyl phenyl ether	10	0.63	ug/L	8270D
4-Methylphenol	10	0.40	ug/L	8270D
4-Nitroaniline	10	0.84	ug/L	8270D
4-Nitrophenol	10	1.0	ug/L	8270D
Acenaphthene	4.0	0.45	ug/L	8270D
Acenaphthylene	4.0	0.50	ug/L	8270D
Acetophenone	10	0.52	ug/L	8270D
Aniline	10	0.88	ug/L	8270D
Anthracene	4.0	0.45	ug/L	8270D

TestAmerica St. Louis

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-32649-1

Project/Site: Former Carnotite Site - MW-1 Sampling

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Prep: 3510C

Analyte	RL	MDL	Units	Method
Azobenzene	4.0	0.54	ug/L	8270D
Benzaldehyde	10	0.53	ug/L	8270D
Benzidine	100	4.4	ug/L	8270D
Benzo[a]anthracene	4.0	0.58	ug/L	8270D
Benzo[a]pyrene	4.0	0.64	ug/L	8270D
Benzo[b]fluoranthene	4.0	0.53	ug/L	8270D
Benzo[g,h,i]perylene	4.0	0.79	ug/L	8270D
Benzo[k]fluoranthene	4.0	0.56	ug/L	8270D
Benzoic acid	25	5.7	ug/L	8270D
Benzyl alcohol	10	0.35	ug/L	8270D
bis (2-chloroisopropyl) ether	10	0.42	ug/L	8270D
Bis(2-chloroethoxy)methane	10	0.61	ug/L	8270D
Bis(2-chloroethyl)ether	10	0.49	ug/L	8270D
Bis(2-ethylhexyl) phthalate	10	1.1	ug/L	8270D
Butyl benzyl phthalate	5.0	2.0	ug/L	8270D
Caprolactam	10	1.2	ug/L	8270D
Carbazole	4.0	0.45	ug/L	8270D
Chrysene	4.0	0.52	ug/L	8270D
Dibenz(a,h)anthracene	4.0	0.65	ug/L	8270D
Dibenzofuran	4.0	0.36	ug/L	8270D
Diethyl phthalate	4.0	0.75	ug/L	8270D
Dimethyl phthalate	4.0	0.53	ug/L	8270D
Di-n-butyl phthalate	4.0	0.88	ug/L	8270D
Di-n-octyl phthalate	5.0	1.6	ug/L	8270D
Diphenylamine	10	0.49	ug/L	8270D
Famphur	100	2.0	ug/L	8270D
Fluoranthene	4.0	0.64	ug/L	8270D
Fluorene	4.0	0.49	ug/L	8270D
Hexachlorobenzene	10	0.96	ug/L	8270D
Hexachlorobutadiene	30	7.5	ug/L	8270D
Hexachlorocyclopentadiene	50	6.6	ug/L	8270D
Hexachloroethane	30	7.6	ug/L	8270D
Hexadecane	10	0.35	ug/L	8270D
Indeno[1,2,3-cd]pyrene	4.0	1.6	ug/L	8270D
Isophorone	10	0.67	ug/L	8270D
Naphthalene	4.0	0.40	ug/L	8270D
Nitrobenzene	10	0.43	ug/L	8270D
N-Nitrosodimethylamine	10	0.62	ug/L	8270D
N-Nitrosodi-n-propylamine	10	0.56	ug/L	8270D
N-Nitrosodiphenylamine	10	0.61	ug/L	8270D
Pentachlorophenol	50	5.5	ug/L	8270D
Phenanthrene	4.0	0.28	ug/L	8270D
Phenol	10	0.56	ug/L	8270D
Pyrene	10	0.43	ug/L	8270D
Pyridine	20	1.8	ug/L	8270D

Method: 8081B - Organochlorine Pesticides (GC)

Prep: 3510C

Analyte	RL	MDL	Units	Method
4,4'-DDD	0.050	0.0077	ug/L	8081B

TestAmerica St. Louis

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-32649-1

Project/Site: Former Carnotite Site - MW-1 Sampling

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Prep: 3510C

Analyte	RL	MDL	Units	Method
4,4'-DDE	0.050	0.0075	ug/L	8081B
4,4'-DDT	0.050	0.015	ug/L	8081B
Aldrin	0.050	0.0059	ug/L	8081B
alpha-BHC	0.050	0.0053	ug/L	8081B
alpha-Chlordane	0.050	0.0053	ug/L	8081B
beta-BHC	0.050	0.0087	ug/L	8081B
delta-BHC	0.050	0.0058	ug/L	8081B
Dieldrin	0.050	0.0063	ug/L	8081B
Endosulfan I	0.050	0.0058	ug/L	8081B
Endosulfan II	0.050	0.0070	ug/L	8081B
Endosulfan sulfate	0.050	0.0057	ug/L	8081B
Endrin	0.050	0.0079	ug/L	8081B
Endrin aldehyde	0.050	0.0088	ug/L	8081B
Endrin ketone	0.050	0.0070	ug/L	8081B
gamma-BHC (Lindane)	0.050	0.0069	ug/L	8081B
gamma-Chlordane	0.050	0.0091	ug/L	8081B
Heptachlor	0.050	0.0077	ug/L	8081B
Heptachlor epoxide	0.050	0.0075	ug/L	8081B
Methoxychlor	0.10	0.013	ug/L	8081B
Toxaphene	2.0	0.37	ug/L	8081B

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Prep: 3510C

Analyte	RL	MDL	Units	Method
PCB-1016	1.0	0.12	ug/L	8082A
PCB-1221	1.0	0.21	ug/L	8082A
PCB-1232	1.0	0.17	ug/L	8082A
PCB-1242	1.0	0.10	ug/L	8082A
PCB-1248	1.0	0.092	ug/L	8082A
PCB-1254	1.0	0.11	ug/L	8082A
PCB-1260	1.0	0.16	ug/L	8082A
PCB-1262	1.0	0.085	ug/L	8082A
PCB-1268	1.0	0.36	ug/L	8082A

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Prep: HRMS-Sept

Analyte	RL	Units	Method
2,3,7,8-TCDD	10	pg/L	1613B

Surrogate Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (70-127)	BFB (78-120)	DBFM (77-120)	TOL (80-125)
160-32649-1	CRC-MW-1-011519	110	100	107	106
280-119359-A-1 MSD	Matrix Spike Duplicate	108	99	103	102
280-119359-A-1 MSD	Matrix Spike Duplicate	106	97	105	103
280-119359-C-1 MS	Matrix Spike	112	102	108	105
280-119359-C-1 MS	Matrix Spike	103	95	102	101
LCS 280-445753/4	Lab Control Sample	114	105	109	111
LCS 280-445753/6	Lab Control Sample	114	106	110	111
LCSD 280-445753/5	Lab Control Sample Dup	112	102	107	106
LCSD 280-445753/7	Lab Control Sample Dup	114	103	109	108
MB 280-445753/8	Method Blank	113	102	109	110

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		TBP (52-123)	FBP (47-119)	2FP (17-71)	NBZ (45-113)	PHL (10-52)	TPHL (50-123)
160-32649-1	CRC-MW-1-011519	77	65	49	67	34	74
LCS 280-444835/2-A	Lab Control Sample	86	80	42	82	26	82
LCSD 280-444835/3-A	Lab Control Sample Dup	84	74	54	75	38	82
MB 280-444835/1-A	Method Blank	73	56	44	59	30	81

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		DCBP1 (34-122)	TCX1 (28-115)
160-32649-1	CRC-MW-1-011519	48	78
LCS 280-444680/2-A	Lab Control Sample	86	74
LCSD 280-444680/3-A	Lab Control Sample Dup	95	85
MB 280-444680/1-A	Method Blank	70	54

Surrogate Legend

DCBP = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Surrogate Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	TCX2 (25-120)	DCBP2 (30-136)
160-32649-1	CRC-MW-1-011519	87	41
LCS 280-444887/2-A	Lab Control Sample	90	84
LCSD 280-444887/3-A	Lab Control Sample Dup	93	88
MB 280-444887/1-A	Method Blank	73	77

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	37TCDD (35-197)	
160-32649-1	CRC-MW-1-011519	95	
MB 140-27087/10-A	Method Blank	97	

Surrogate Legend

37TCDD = 37Cl₄-2,3,7,8-TCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	37TCDD (31-191)	
LCS 140-27087/11-A	Lab Control Sample	100	

Surrogate Legend

37TCDD = 37Cl₄-2,3,7,8-TCDD

Isotope Dilution Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (25-164)							
160-32649-1	CRC-MW-1-011519	63							
MB 140-27087/10-A	Method Blank	84							

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (20-175)							
LCS 140-27087/11-A	Lab Control Sample	83							

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-445753/8

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.16	U	1.0	0.16	ug/L			01/28/19 19:09	1
1,1,2,2-Tetrachloroethane	0.21	U	1.0	0.21	ug/L			01/28/19 19:09	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/28/19 19:09	1
1,1,2-Trichlorotrifluoroethane	0.42	U	3.0	0.42	ug/L			01/28/19 19:09	1
1,1-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/28/19 19:09	1
1,1-Dichloroethene	0.23	U	1.0	0.23	ug/L			01/28/19 19:09	1
1,2,3-Trichlorobenzene	0.21	U	1.0	0.21	ug/L			01/28/19 19:09	1
1,2,4-Trichlorobenzene	0.21	U	1.0	0.21	ug/L			01/28/19 19:09	1
1,2-Dibromo-3-Chloropropane	0.47	U	5.0	0.47	ug/L			01/28/19 19:09	1
1,2-Dibromoethane	0.18	U	1.0	0.18	ug/L			01/28/19 19:09	1
1,2-Dichlorobenzene	0.15	U	1.0	0.15	ug/L			01/28/19 19:09	1
1,2-Dichloroethane	0.13	U	1.0	0.13	ug/L			01/28/19 19:09	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/28/19 19:09	1
1,3,5-Trimethylbenzene	0.16	U	1.0	0.16	ug/L			01/28/19 19:09	1
1,3-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/28/19 19:09	1
1,4-Dichlorobenzene	0.16	U	1.0	0.16	ug/L			01/28/19 19:09	1
1,4-Dioxane	57	U	200	57	ug/L			01/28/19 19:09	1
2-Butanone (MEK)	2.0	U	6.0	2.0	ug/L			01/28/19 19:09	1
2-Chloroethyl vinyl ether	0.69	U	3.0	0.69	ug/L			01/28/19 19:09	1
2-Hexanone	1.7	U	5.0	1.7	ug/L			01/28/19 19:09	1
4-Methyl-2-pentanone (MIBK)	0.98	U	5.0	0.98	ug/L			01/28/19 19:09	1
Acetone	1.9	U	10	1.9	ug/L			01/28/19 19:09	1
Acetonitrile	9.6	U	30	9.6	ug/L			01/28/19 19:09	1
Acrolein	2.8	U	20	2.8	ug/L			01/28/19 19:09	1
Acrylonitrile	1.4	U	20	1.4	ug/L			01/28/19 19:09	1
Benzene	0.16	U	1.0	0.16	ug/L			01/28/19 19:09	1
Bromoform	0.19	U	1.0	0.19	ug/L			01/28/19 19:09	1
Bromomethane	0.21	U	2.0	0.21	ug/L			01/28/19 19:09	1
Carbon disulfide	0.45	U	2.0	0.45	ug/L			01/28/19 19:09	1
Carbon tetrachloride	0.19	U	1.0	0.19	ug/L			01/28/19 19:09	1
Chlorobenzene	0.17	U	1.0	0.17	ug/L			01/28/19 19:09	1
Chlorobromomethane	0.10	U	1.0	0.10	ug/L			01/28/19 19:09	1
Chlorodibromomethane	0.17	U	1.0	0.17	ug/L			01/28/19 19:09	1
Chloroethane	0.41	U	2.0	0.41	ug/L			01/28/19 19:09	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/28/19 19:09	1
Chloromethane	0.30	U	2.0	0.30	ug/L			01/28/19 19:09	1
cis-1,2-Dichloroethene	0.15	U	1.0	0.15	ug/L			01/28/19 19:09	1
cis-1,3-Dichloropropene	0.16	U	1.0	0.16	ug/L			01/28/19 19:09	1
Cyclohexane	0.28	U	2.0	0.28	ug/L			01/28/19 19:09	1
Dichlorobromomethane	0.17	U	1.0	0.17	ug/L			01/28/19 19:09	1
Dichlorodifluoromethane	0.31	U	2.0	0.31	ug/L			01/28/19 19:09	1
Ethylbenzene	0.16	U	1.0	0.16	ug/L			01/28/19 19:09	1
Isopropylbenzene	0.19	U	1.0	0.19	ug/L			01/28/19 19:09	1
Methyl acetate	1.6	U	5.0	1.6	ug/L			01/28/19 19:09	1
Methyl tert-butyl ether	0.25	U	5.0	0.25	ug/L			01/28/19 19:09	1
Methylcyclohexane	0.36	U	1.0	0.36	ug/L			01/28/19 19:09	1
Methylene Chloride	0.32	U	2.0	0.32	ug/L			01/28/19 19:09	1
m-Xylene & p-Xylene	0.34	U	2.0	0.34	ug/L			01/28/19 19:09	1

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 280-445753/8

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	0.19	U	1.0	0.19	ug/L			01/28/19 19:09	1
Styrene	0.17	U	1.0	0.17	ug/L			01/28/19 19:09	1
Tetrachloroethene	0.20	U	1.0	0.20	ug/L			01/28/19 19:09	1
Toluene	0.17	U	1.0	0.17	ug/L			01/28/19 19:09	1
trans-1,2-Dichloroethene	0.15	U	1.0	0.15	ug/L			01/28/19 19:09	1
trans-1,3-Dichloropropene	0.19	U	3.0	0.19	ug/L			01/28/19 19:09	1
Trichloroethene	0.16	U	1.0	0.16	ug/L			01/28/19 19:09	1
Trichlorofluoromethane	0.29	U	2.0	0.29	ug/L			01/28/19 19:09	1
Vinyl chloride	0.10	U	1.0	0.10	ug/L			01/28/19 19:09	1

Tentatively Identified Compound	MB Est. Result	MB Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Iodomethane	0.390	J	ug/L		5.52	74-88-4		01/28/19 19:09	1
Tentatively Identified Compound	None		ug/L					01/28/19 19:09	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		70 - 127		01/28/19 19:09	1
4-Bromofluorobenzene (Surr)	102		78 - 120		01/28/19 19:09	1
Dibromofluoromethane (Surr)	109		77 - 120		01/28/19 19:09	1
Toluene-d8 (Surr)	110		80 - 125		01/28/19 19:09	1

Lab Sample ID: LCS 280-445753/4

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	5.00	5.71		ug/L		114	65 - 135
1,1,1,2-Tetrachloroethane	5.00	5.12		ug/L		102	58 - 135
1,1,2-Trichloroethane	5.00	5.20		ug/L		104	64 - 135
1,1,2-Trichlorotrifluoroethane	5.00	5.61		ug/L		112	65 - 140
1,1-Dichloroethane	5.00	5.75		ug/L		115	65 - 135
1,1-Dichloroethene	5.00	5.39		ug/L		108	65 - 136
1,2,3-Trichlorobenzene	5.00	5.20		ug/L		104	60 - 135
1,2,4-Trichlorobenzene	5.00	5.09		ug/L		102	58 - 135
1,2-Dibromo-3-Chloropropane	5.00	4.16	J	ug/L		83	57 - 135
1,2-Dibromoethane	5.00	4.71		ug/L		94	65 - 135
1,2-Dichlorobenzene	5.00	5.04		ug/L		101	65 - 135
1,2-Dichloroethane	5.00	5.58		ug/L		112	65 - 135
1,2-Dichloropropane	5.00	5.58		ug/L		112	64 - 135
1,3,5-Trimethylbenzene	5.00	5.32		ug/L		106	65 - 135
1,3-Dichlorobenzene	5.00	5.10		ug/L		102	65 - 135
1,4-Dichlorobenzene	5.00	5.12		ug/L		102	65 - 135
1,4-Dioxane	100	106	J	ug/L		106	31 - 147
2-Butanone (MEK)	20.0	20.6		ug/L		103	44 - 177
2-Chloroethyl vinyl ether	10.0	11.3		ug/L		113	10 - 159
2-Hexanone	20.0	20.4		ug/L		102	57 - 139
4-Methyl-2-pentanone (MIBK)	20.0	21.9		ug/L		109	60 - 150
Acetone	20.0	22.6		ug/L		113	39 - 156

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-445753/4

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	5.00	5.57		ug/L		111	65 - 135
Bromoform	5.00	4.20		ug/L		84	62 - 135
Bromomethane	5.00	6.61		ug/L		132	45 - 135
Carbon disulfide	5.00	5.33		ug/L		107	55 - 143
Carbon tetrachloride	5.00	5.62		ug/L		112	65 - 135
Chlorobenzene	5.00	5.27		ug/L		105	65 - 135
Chlorobromomethane	5.00	5.01		ug/L		100	65 - 135
Chlorodibromomethane	5.00	4.62		ug/L		92	65 - 135
Chloroethane	5.00	7.01	*	ug/L		140	46 - 136
Chloroform	5.00	5.54		ug/L		111	65 - 135
Chloromethane	5.00	6.53		ug/L		131	34 - 145
cis-1,2-Dichloroethene	5.00	5.23		ug/L		105	65 - 135
cis-1,3-Dichloropropene	5.00	5.01		ug/L		100	65 - 135
Cyclohexane	5.00	5.93		ug/L		119	62 - 135
Dichlorobromomethane	5.00	5.17		ug/L		103	65 - 135
Dichlorodifluoromethane	5.00	7.28	*	ug/L		146	43 - 142
Ethylbenzene	5.00	5.23		ug/L		105	65 - 135
Isopropylbenzene	5.00	4.84		ug/L		97	65 - 135
Methyl acetate	10.0	10.2		ug/L		102	52 - 135
Methyl tert-butyl ether	5.00	4.89	J	ug/L		98	54 - 135
Methylcyclohexane	5.00	5.98		ug/L		120	63 - 135
Methylene Chloride	5.00	4.94		ug/L		99	54 - 141
m-Xylene & p-Xylene	5.00	5.21		ug/L		104	65 - 135
o-Xylene	5.00	5.26		ug/L		105	65 - 135
Styrene	5.00	4.79		ug/L		96	65 - 135
Tetrachloroethene	5.00	5.44		ug/L		109	65 - 135
Toluene	5.00	5.59		ug/L		112	65 - 135
trans-1,2-Dichloroethene	5.00	5.60		ug/L		112	65 - 135
trans-1,3-Dichloropropene	5.00	5.00		ug/L		100	65 - 135
Trichloroethene	5.00	5.33		ug/L		107	65 - 135
Trichlorofluoromethane	5.00	6.81		ug/L		136	53 - 137
Vinyl chloride	5.00	6.50		ug/L		130	40 - 137

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	114		70 - 127
4-Bromofluorobenzene (Surr)	105		78 - 120
Dibromofluoromethane (Surr)	109		77 - 120
Toluene-d8 (Surr)	111		80 - 125

Lab Sample ID: LCS 280-445753/6

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	114		70 - 127
4-Bromofluorobenzene (Surr)	106		78 - 120
Dibromofluoromethane (Surr)	110		77 - 120

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-445753/6

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	111		80 - 125

Lab Sample ID: LCSD 280-445753/5

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	5.00	5.42		ug/L		108	65 - 135	5	20
1,1,2,2-Tetrachloroethane	5.00	4.94		ug/L		99	58 - 135	3	20
1,1,2-Trichloroethane	5.00	5.10		ug/L		102	64 - 135	2	27
1,1,2-Trichlorotrifluoroethane	5.00	5.24		ug/L		105	65 - 140	7	20
1,1-Dichloroethane	5.00	5.53		ug/L		111	65 - 135	4	21
1,1-Dichloroethene	5.00	5.18		ug/L		104	65 - 136	4	20
1,2,3-Trichlorobenzene	5.00	5.15		ug/L		103	60 - 135	1	36
1,2,4-Trichlorobenzene	5.00	4.92		ug/L		98	58 - 135	4	25
1,2-Dibromo-3-Chloropropane	5.00	4.08	J	ug/L		82	57 - 135	2	22
1,2-Dibromoethane	5.00	4.60		ug/L		92	65 - 135	2	27
1,2-Dichlorobenzene	5.00	4.86		ug/L		97	65 - 135	4	20
1,2-Dichloroethane	5.00	5.42		ug/L		108	65 - 135	3	20
1,2-Dichloropropane	5.00	5.41		ug/L		108	64 - 135	3	20
1,3,5-Trimethylbenzene	5.00	5.07		ug/L		101	65 - 135	5	20
1,3-Dichlorobenzene	5.00	4.86		ug/L		97	65 - 135	5	20
1,4-Dichlorobenzene	5.00	4.85		ug/L		97	65 - 135	6	23
1,4-Dioxane	100	104	J	ug/L		104	31 - 147	2	30
2-Butanone (MEK)	20.0	20.7		ug/L		103	44 - 177	0	32
2-Chloroethyl vinyl ether	10.0	11.2		ug/L		112	10 - 159	1	23
2-Hexanone	20.0	20.1		ug/L		101	57 - 139	2	25
4-Methyl-2-pentanone (MIBK)	20.0	21.7		ug/L		108	60 - 150	1	22
Acetone	20.0	22.0		ug/L		110	39 - 156	3	23
Benzene	5.00	5.33		ug/L		107	65 - 135	4	20
Bromoform	5.00	4.07		ug/L		81	62 - 135	3	27
Bromomethane	5.00	6.28		ug/L		126	45 - 135	5	33
Carbon disulfide	5.00	5.00		ug/L		100	55 - 143	6	20
Carbon tetrachloride	5.00	5.31		ug/L		106	65 - 135	6	21
Chlorobenzene	5.00	5.01		ug/L		100	65 - 135	5	20
Chlorobromomethane	5.00	4.88		ug/L		98	65 - 135	3	29
Chlorodibromomethane	5.00	4.48		ug/L		90	65 - 135	3	20
Chloroethane	5.00	6.65		ug/L		133	46 - 136	5	25
Chloroform	5.00	5.35		ug/L		107	65 - 135	4	20
Chloromethane	5.00	6.11		ug/L		122	34 - 145	7	24
cis-1,2-Dichloroethene	5.00	5.06		ug/L		101	65 - 135	3	20
cis-1,3-Dichloropropene	5.00	4.79		ug/L		96	65 - 135	5	26
Cyclohexane	5.00	5.67		ug/L		113	62 - 135	4	20
Dichlorobromomethane	5.00	4.98		ug/L		100	65 - 135	4	20
Dichlorodifluoromethane	5.00	6.92		ug/L		138	43 - 142	5	30
Ethylbenzene	5.00	5.02		ug/L		100	65 - 135	4	20
Isopropylbenzene	5.00	4.60		ug/L		92	65 - 135	5	20
Methyl acetate	10.0	10.2		ug/L		102	52 - 135	0	27

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-445753/5

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl tert-butyl ether	5.00	4.82	J	ug/L		96	54 - 135	1	21
Methylcyclohexane	5.00	5.58		ug/L		112	63 - 135	7	20
Methylene Chloride	5.00	4.70		ug/L		94	54 - 141	5	26
m-Xylene & p-Xylene	5.00	5.00		ug/L		100	65 - 135	4	20
o-Xylene	5.00	5.03		ug/L		101	65 - 135	5	20
Styrene	5.00	4.61		ug/L		92	65 - 135	4	26
Tetrachloroethene	5.00	5.10		ug/L		102	65 - 135	6	20
Toluene	5.00	5.40		ug/L		108	65 - 135	3	20
trans-1,2-Dichloroethene	5.00	5.38		ug/L		108	65 - 135	4	24
trans-1,3-Dichloropropene	5.00	4.88		ug/L		98	65 - 135	2	26
Trichloroethene	5.00	5.17		ug/L		103	65 - 135	3	20
Trichlorofluoromethane	5.00	6.54		ug/L		131	53 - 137	4	27
Vinyl chloride	5.00	6.15		ug/L		123	40 - 137	6	24

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	112		70 - 127
4-Bromofluorobenzene (Surr)	102		78 - 120
Dibromofluoromethane (Surr)	107		77 - 120
Toluene-d8 (Surr)	106		80 - 125

Lab Sample ID: LCSD 280-445753/7

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	114		70 - 127
4-Bromofluorobenzene (Surr)	103		78 - 120
Dibromofluoromethane (Surr)	109		77 - 120
Toluene-d8 (Surr)	108		80 - 125

Lab Sample ID: 280-119359-A-1 MSD

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	640	U	20000	20600		ug/L		103	65 - 135	5	20
1,1,2,2-Tetrachloroethane	840	U	20000	19800		ug/L		99	58 - 135	6	20
1,1,2-Trichloroethane	1100	U	20000	20000		ug/L		100	64 - 135	8	27
1,1,2-Trichlorotrifluoroethane	1700	U	20000	19700		ug/L		99	65 - 140	4	20
1,1-Dichloroethane	880	U	20000	20900		ug/L		105	65 - 135	7	21
1,1-Dichloroethene	920	U	20000	19600		ug/L		98	65 - 136	4	20
1,2,3-Trichlorobenzene	840	U	20000	19700		ug/L		99	60 - 135	5	36
1,2,4-Trichlorobenzene	840	U	20000	19600		ug/L		98	58 - 135	3	25
1,2-Dibromo-3-Chloropropane	1900	U	20000	17600	J	ug/L		88	57 - 135	1	22
1,2-Dibromoethane	720	U	20000	18100		ug/L		91	65 - 135	6	27
1,2-Dichlorobenzene	5100		20000	24900		ug/L		99	65 - 135	2	20
1,2-Dichloroethane	520	U	20000	21000		ug/L		105	65 - 135	7	20
1,2-Dichloropropane	720	U	20000	21000		ug/L		105	64 - 135	6	20

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 280-119359-A-1 MSD

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,3,5-Trimethylbenzene	640	U	20000	19700		ug/L		98	65 - 135	4	20
1,3-Dichlorobenzene	520	U	20000	18900		ug/L		95	65 - 135	5	20
1,4-Dichlorobenzene	640	U	20000	19100		ug/L		96	65 - 135	5	23
1,4-Dioxane	230000	U	400000	376000	J	ug/L		94	31 - 147	11	30
2-Butanone (MEK)	8000	U	80000	77900		ug/L		97	44 - 177	8	32
2-Chloroethyl vinyl ether	2800	U	40000	40900		ug/L		102	10 - 159	14	23
2-Hexanone	6800	U	80000	78500		ug/L		98	57 - 139	8	25
4-Methyl-2-pentanone (MIBK)	3900	U	80000	83000		ug/L		104	60 - 150	8	22
Acetone	7600	U	80000	82000		ug/L		102	39 - 156	1	23
Benzene	640	U	20000	20600		ug/L		103	65 - 135	6	20
Bromoform	760	U	20000	17400		ug/L		87	62 - 135	4	27
Bromomethane	840	U	20000	21200		ug/L		106	45 - 135	15	33
Carbon disulfide	1800	U	20000	18700		ug/L		93	55 - 143	6	20
Carbon tetrachloride	760	U	20000	20700		ug/L		104	65 - 135	3	21
Chlorobenzene	680	U	20000	19200		ug/L		96	65 - 135	7	20
Chlorobromomethane	400	U	20000	19100		ug/L		96	65 - 135	7	29
Chlorodibromomethane	680	U	20000	18300		ug/L		92	65 - 135	7	20
Chloroethane	1600	U *	20000	23000		ug/L		115	46 - 136	13	25
Chloroform	16000		20000	37400		ug/L		109	65 - 135	0	20
Chloromethane	1200	U	20000	21400		ug/L		107	34 - 145	15	24
cis-1,2-Dichloroethene	600	U	20000	19800		ug/L		99	65 - 135	6	20
cis-1,3-Dichloropropene	640	U	20000	19100		ug/L		95	65 - 135	6	26
Cyclohexane	1100	U	20000	21300		ug/L		106	62 - 135	6	20
Dichlorobromomethane	680	U	20000	19500		ug/L		98	65 - 135	9	20
Dichlorodifluoromethane	1200	U *	20000	23800		ug/L		119	43 - 142	14	30
Ethylbenzene	640	U	20000	19100		ug/L		96	65 - 135	5	20
Isopropylbenzene	760	U	20000	17900		ug/L		90	65 - 135	2	20
Methyl acetate	6600	U	40000	38600		ug/L		96	52 - 135	9	27
Methyl tert-butyl ether	1000	U	20000	18800	J	ug/L		94	54 - 135	7	21
Methylcyclohexane	1400	U	20000	21100		ug/L		106	63 - 135	6	20
Methylene Chloride	1700000	E	20000	1700000	E 4	ug/L		-198	54 - 141	3	26
m-Xylene & p-Xylene	1400	U	20000	19200		ug/L		96	65 - 135	5	20
o-Xylene	760	U	20000	19500		ug/L		97	65 - 135	5	20
Styrene	680	U	20000	17600		ug/L		88	65 - 135	6	26
Tetrachloroethene	800	U	20000	19300		ug/L		96	65 - 135	6	20
Toluene	680	U	20000	20900		ug/L		104	65 - 135	6	20
trans-1,2-Dichloroethene	600	U	20000	20900		ug/L		104	65 - 135	5	24
trans-1,3-Dichloropropene	760	U	20000	19500		ug/L		98	65 - 135	9	26
Trichloroethene	640	U	20000	19700		ug/L		98	65 - 135	5	20
Trichlorofluoromethane	1200	U	20000	22100		ug/L		111	53 - 137	15	27
Vinyl chloride	400	U	20000	21900		ug/L		110	40 - 137	12	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	108		70 - 127
4-Bromofluorobenzene (Surr)	99		78 - 120
Dibromofluoromethane (Surr)	103		77 - 120
Toluene-d8 (Surr)	102		80 - 125

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 280-119359-A-1 MSD

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	106		70 - 127
4-Bromofluorobenzene (Surr)	97		78 - 120
Dibromofluoromethane (Surr)	105		77 - 120
Toluene-d8 (Surr)	103		80 - 125

Lab Sample ID: 280-119359-C-1 MS

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	640	U	20000	21700		ug/L		109	65 - 135
1,1,2,2-Tetrachloroethane	840	U	20000	21000		ug/L		105	58 - 135
1,1,2-Trichloroethane	1100	U	20000	21700		ug/L		109	64 - 135
1,1,2-Trichlorotrifluoroethane	1700	U	20000	20500		ug/L		102	65 - 140
1,1-Dichloroethane	880	U	20000	22500		ug/L		113	65 - 135
1,1-Dichloroethene	920	U	20000	20300		ug/L		102	65 - 136
1,2,3-Trichlorobenzene	840	U	20000	20700		ug/L		104	60 - 135
1,2,4-Trichlorobenzene	840	U	20000	20100		ug/L		101	58 - 135
1,2-Dibromo-3-Chloropropane	1900	U	20000	17500	J	ug/L		87	57 - 135
1,2-Dibromoethane	720	U	20000	19200		ug/L		96	65 - 135
1,2-Dichlorobenzene	5100		20000	25400		ug/L		101	65 - 135
1,2-Dichloroethane	520	U	20000	22500		ug/L		113	65 - 135
1,2-Dichloropropane	720	U	20000	22300		ug/L		111	64 - 135
1,3,5-Trimethylbenzene	640	U	20000	20400		ug/L		102	65 - 135
1,3-Dichlorobenzene	520	U	20000	19900		ug/L		99	65 - 135
1,4-Dichlorobenzene	640	U	20000	20100		ug/L		100	65 - 135
1,4-Dioxane	230000	U	400000	422000	J	ug/L		106	31 - 147
2-Butanone (MEK)	8000	U	80000	84000		ug/L		105	44 - 177
2-Chloroethyl vinyl ether	2800	U	40000	47000		ug/L		118	10 - 159
2-Hexanone	6800	U	80000	85000		ug/L		106	57 - 139
4-Methyl-2-pentanone (MIBK)	3900	U	80000	89700		ug/L		112	60 - 150
Acetone	7600	U	80000	82800		ug/L		103	39 - 156
Benzene	640	U	20000	21800		ug/L		109	65 - 135
Bromoform	760	U	20000	18100		ug/L		91	62 - 135
Bromomethane	840	U	20000	24600		ug/L		123	45 - 135
Carbon disulfide	1800	U	20000	19700		ug/L		99	55 - 143
Carbon tetrachloride	760	U	20000	21400		ug/L		107	65 - 135
Chlorobenzene	680	U	20000	20500		ug/L		103	65 - 135
Chlorobromomethane	400	U	20000	20500		ug/L		102	65 - 135
Chlorodibromomethane	680	U	20000	19700		ug/L		99	65 - 135
Chloroethane	1600	U *	20000	26200		ug/L		131	46 - 136
Chloroform	16000		20000	37600		ug/L		110	65 - 135
Chloromethane	1200	U	20000	24800		ug/L		124	34 - 145
cis-1,2-Dichloroethene	600	U	20000	21100		ug/L		105	65 - 135
cis-1,3-Dichloropropene	640	U	20000	20300		ug/L		101	65 - 135
Cyclohexane	1100	U	20000	22600		ug/L		113	62 - 135
Dichlorobromomethane	680	U	20000	21400		ug/L		107	65 - 135
Dichlorodifluoromethane	1200	U *	20000	27500		ug/L		137	43 - 142

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 280-119359-C-1 MS

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethylbenzene	640	U	20000	20100		ug/L		101	65 - 135
Isopropylbenzene	760	U	20000	18400		ug/L		92	65 - 135
Methyl acetate	6600	U	40000	42400		ug/L		106	52 - 135
Methyl tert-butyl ether	1000	U	20000	20100		ug/L		101	54 - 135
Methylcyclohexane	1400	U	20000	22400		ug/L		112	63 - 135
Methylene Chloride	1700000	E	20000	1750000	E 4	ug/L		60	54 - 141
m-Xylene & p-Xylene	1400	U	20000	20200		ug/L		101	65 - 135
o-Xylene	760	U	20000	20500		ug/L		103	65 - 135
Styrene	680	U	20000	18800		ug/L		94	65 - 135
Tetrachloroethene	800	U	20000	20400		ug/L		102	65 - 135
Toluene	680	U	20000	22300		ug/L		111	65 - 135
trans-1,2-Dichloroethene	600	U	20000	21900		ug/L		110	65 - 135
trans-1,3-Dichloropropene	760	U	20000	21300		ug/L		106	65 - 135
Trichloroethene	640	U	20000	20700		ug/L		103	65 - 135
Trichlorofluoromethane	1200	U	20000	25900		ug/L		129	53 - 137
Vinyl chloride	400	U	20000	24800		ug/L		124	40 - 137

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	112		70 - 127
4-Bromofluorobenzene (Surr)	102		78 - 120
Dibromofluoromethane (Surr)	108		77 - 120
Toluene-d8 (Surr)	105		80 - 125

Lab Sample ID: 280-119359-C-1 MS

Matrix: Water

Analysis Batch: 445753

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	103		70 - 127
4-Bromofluorobenzene (Surr)	95		78 - 120
Dibromofluoromethane (Surr)	102		77 - 120
Toluene-d8 (Surr)	101		80 - 125

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-444835/1-A

Matrix: Water

Analysis Batch: 445019

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 444835

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	0.41	U	10	0.41	ug/L		01/21/19 06:56	01/22/19 17:40	1
1,2,4,5-Tetrachlorobenzene	2.0	U	10	2.0	ug/L		01/21/19 06:56	01/22/19 17:40	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	ug/L		01/21/19 06:56	01/22/19 17:40	1
1,2-Dichlorobenzene	2.0	U	5.0	2.0	ug/L		01/21/19 06:56	01/22/19 17:40	1
1,2-Diphenylhydrazine(as Azobenzene)	0.54	U	10	0.54	ug/L		01/21/19 06:56	01/22/19 17:40	1
1,3-Dichlorobenzene	2.0	U	10	2.0	ug/L		01/21/19 06:56	01/22/19 17:40	1
1,3-Dinitrobenzene	0.97	U	10	0.97	ug/L		01/21/19 06:56	01/22/19 17:40	1

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 280-444835/1-A

Matrix: Water

Analysis Batch: 445019

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 444835

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	2.0	U	5.0	2.0	ug/L		01/21/19 06:56	01/22/19 17:40	1
1,4-Dioxane	0.71	U	20	0.71	ug/L		01/21/19 06:56	01/22/19 17:40	1
1-Methylnaphthalene	0.35	U	4.0	0.35	ug/L		01/21/19 06:56	01/22/19 17:40	1
2,3,4,6-Tetrachlorophenol	0.96	U	50	0.96	ug/L		01/21/19 06:56	01/22/19 17:40	1
2,4,5-Trichlorophenol	0.52	U	10	0.52	ug/L		01/21/19 06:56	01/22/19 17:40	1
2,4,6-Trichlorophenol	0.74	U	10	0.74	ug/L		01/21/19 06:56	01/22/19 17:40	1
2,4-Dichlorophenol	0.68	U	10	0.68	ug/L		01/21/19 06:56	01/22/19 17:40	1
2,4-Dimethylphenol	0.67	U	10	0.67	ug/L		01/21/19 06:56	01/22/19 17:40	1
2,4-Dinitrophenol	7.5	U	30	7.5	ug/L		01/21/19 06:56	01/22/19 17:40	1
2,4-Dinitrotoluene	0.93	U	10	0.93	ug/L		01/21/19 06:56	01/22/19 17:40	1
2,6-Dichlorophenol	0.75	U	10	0.75	ug/L		01/21/19 06:56	01/22/19 17:40	1
2,6-Dinitrotoluene	0.72	U	10	0.72	ug/L		01/21/19 06:56	01/22/19 17:40	1
2-Chloronaphthalene	0.46	U	4.0	0.46	ug/L		01/21/19 06:56	01/22/19 17:40	1
2-Chlorophenol	0.43	U	10	0.43	ug/L		01/21/19 06:56	01/22/19 17:40	1
2-Methylnaphthalene	0.41	U	4.0	0.41	ug/L		01/21/19 06:56	01/22/19 17:40	1
2-Methylphenol	0.56	U	10	0.56	ug/L		01/21/19 06:56	01/22/19 17:40	1
2-Nitroaniline	0.90	U	10	0.90	ug/L		01/21/19 06:56	01/22/19 17:40	1
2-Nitrophenol	0.62	U	10	0.62	ug/L		01/21/19 06:56	01/22/19 17:40	1
3 & 4 Methylphenol	0.40	U	10	0.40	ug/L		01/21/19 06:56	01/22/19 17:40	1
3,3'-Dichlorobenzidine	0.83	U	50	0.83	ug/L		01/21/19 06:56	01/22/19 17:40	1
3-Methylphenol	0.40	U	10	0.40	ug/L		01/21/19 06:56	01/22/19 17:40	1
3-Nitroaniline	0.78	U	10	0.78	ug/L		01/21/19 06:56	01/22/19 17:40	1
4,6-Dinitro-2-methylphenol	5.9	U	50	5.9	ug/L		01/21/19 06:56	01/22/19 17:40	1
4-Bromophenyl phenyl ether	0.41	U	10	0.41	ug/L		01/21/19 06:56	01/22/19 17:40	1
4-Chloro-3-methylphenol	0.45	U	10	0.45	ug/L		01/21/19 06:56	01/22/19 17:40	1
4-Chloroaniline	0.56	U	10	0.56	ug/L		01/21/19 06:56	01/22/19 17:40	1
4-Chlorophenyl phenyl ether	0.63	U	10	0.63	ug/L		01/21/19 06:56	01/22/19 17:40	1
4-Methylphenol	0.40	U	10	0.40	ug/L		01/21/19 06:56	01/22/19 17:40	1
4-Nitroaniline	0.84	U	10	0.84	ug/L		01/21/19 06:56	01/22/19 17:40	1
4-Nitrophenol	1.0	U	10	1.0	ug/L		01/21/19 06:56	01/22/19 17:40	1
Acenaphthene	0.45	U	4.0	0.45	ug/L		01/21/19 06:56	01/22/19 17:40	1
Acenaphthylene	0.50	U	4.0	0.50	ug/L		01/21/19 06:56	01/22/19 17:40	1
Acetophenone	0.52	U	10	0.52	ug/L		01/21/19 06:56	01/22/19 17:40	1
Aniline	0.88	U	10	0.88	ug/L		01/21/19 06:56	01/22/19 17:40	1
Anthracene	0.45	U	4.0	0.45	ug/L		01/21/19 06:56	01/22/19 17:40	1
Azobenzene	0.54	U	4.0	0.54	ug/L		01/21/19 06:56	01/22/19 17:40	1
Benzaldehyde	0.53	U	10	0.53	ug/L		01/21/19 06:56	01/22/19 17:40	1
Benzidine	4.4	U	100	4.4	ug/L		01/21/19 06:56	01/22/19 17:40	1
Benzo[a]anthracene	0.58	U	4.0	0.58	ug/L		01/21/19 06:56	01/22/19 17:40	1
Benzo[a]pyrene	0.64	U	4.0	0.64	ug/L		01/21/19 06:56	01/22/19 17:40	1
Benzo[b]fluoranthene	0.53	U	4.0	0.53	ug/L		01/21/19 06:56	01/22/19 17:40	1
Benzo[g,h,i]perylene	0.79	U	4.0	0.79	ug/L		01/21/19 06:56	01/22/19 17:40	1
Benzo[k]fluoranthene	0.56	U	4.0	0.56	ug/L		01/21/19 06:56	01/22/19 17:40	1
Benzoic acid	5.7	U	25	5.7	ug/L		01/21/19 06:56	01/22/19 17:40	1
Benzyl alcohol	0.35	U	10	0.35	ug/L		01/21/19 06:56	01/22/19 17:40	1
bis (2-chloroisopropyl) ether	0.42	U	10	0.42	ug/L		01/21/19 06:56	01/22/19 17:40	1
Bis(2-chloroethoxy)methane	0.61	U	10	0.61	ug/L		01/21/19 06:56	01/22/19 17:40	1
Bis(2-chloroethyl)ether	0.49	U	10	0.49	ug/L		01/21/19 06:56	01/22/19 17:40	1

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 280-444835/1-A

Matrix: Water

Analysis Batch: 445019

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 444835

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	1.1	U	10	1.1	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Butyl benzyl phthalate	2.0	U	5.0	2.0	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Caprolactam	1.2	U	10	1.2	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Carbazole	0.45	U	4.0	0.45	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Chrysene	0.52	U	4.0	0.52	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Dibenz(a,h)anthracene	0.65	U	4.0	0.65	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Dibenzofuran	0.36	U	4.0	0.36	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Diethyl phthalate	0.75	U	4.0	0.75	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Dimethyl phthalate	0.53	U	4.0	0.53	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Di-n-butyl phthalate	0.88	U	4.0	0.88	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Di-n-octyl phthalate	1.6	U	5.0	1.6	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Diphenylamine	0.49	U	10	0.49	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Famphur	2.0	U	100	2.0	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Fluoranthene	0.64	U	4.0	0.64	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Fluorene	0.49	U	4.0	0.49	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Hexachlorobenzene	0.96	U	10	0.96	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Hexachlorobutadiene	7.5	U	30	7.5	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Hexachlorocyclopentadiene	6.6	U	50	6.6	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Hexachloroethane	7.6	U	30	7.6	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Hexadecane	0.35	U	10	0.35	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Indeno[1,2,3-cd]pyrene	1.6	U	4.0	1.6	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Isophorone	0.67	U	10	0.67	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Naphthalene	0.40	U	4.0	0.40	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Nitrobenzene	0.43	U	10	0.43	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
N-Nitrosodimethylamine	0.62	U	10	0.62	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
N-Nitrosodi-n-propylamine	0.56	U	10	0.56	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
N-Nitrosodiphenylamine	0.61	U	10	0.61	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Pentachlorophenol	5.5	U	50	5.5	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Phenanthrene	0.28	U	4.0	0.28	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Phenol	0.56	U	10	0.56	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Pyrene	0.43	U	10	0.43	ug/L	—	01/21/19 06:56	01/22/19 17:40	1
Pyridine	1.8	U	20	1.8	ug/L	—	01/21/19 06:56	01/22/19 17:40	1

Tentatively Identified Compound	MB Est. Result	MB Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L	—			01/21/19 06:56	01/22/19 17:40	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	73		52 - 123	01/21/19 06:56	01/22/19 17:40	1
2-Fluorobiphenyl	56		47 - 119	01/21/19 06:56	01/22/19 17:40	1
2-Fluorophenol (Surr)	44		17 - 71	01/21/19 06:56	01/22/19 17:40	1
Nitrobenzene-d5 (Surr)	59		45 - 113	01/21/19 06:56	01/22/19 17:40	1
Phenol-d5 (Surr)	30		10 - 52	01/21/19 06:56	01/22/19 17:40	1
Terphenyl-d14 (Surr)	81		50 - 123	01/21/19 06:56	01/22/19 17:40	1

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-444835/2-A

Matrix: Water

Analysis Batch: 445019

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 444835

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	80.0	65.2		ug/L		81	53 - 116
1,2,4,5-Tetrachlorobenzene	80.0	67.4		ug/L		84	52 - 110
1,2,4-Trichlorobenzene	80.0	62.7		ug/L		78	47 - 103
1,2-Dichlorobenzene	80.0	56.8		ug/L		71	44 - 103
1,2-Diphenylhydrazine(as Azobenzene)	80.9	67.5		ug/L		83	59 - 116
1,3-Dichlorobenzene	80.0	56.1		ug/L		70	42 - 100
1,3-Dinitrobenzene	80.0	69.6		ug/L		87	66 - 124
1,4-Dichlorobenzene	80.0	56.9		ug/L		71	43 - 101
1,4-Dioxane	80.0	31.8		ug/L		40	20 - 63
1-Methylnaphthalene	80.0	70.4		ug/L		88	57 - 108
2,3,4,6-Tetrachlorophenol	80.0	69.3		ug/L		87	53 - 129
2,4,5-Trichlorophenol	80.0	67.2		ug/L		84	58 - 121
2,4,6-Trichlorophenol	80.0	70.1		ug/L		88	52 - 132
2,4-Dichlorophenol	80.0	68.8		ug/L		86	60 - 108
2,4-Dimethylphenol	80.0	66.7		ug/L		83	54 - 105
2,4-Dinitrophenol	160	126		ug/L		79	38 - 125
2,4-Dinitrotoluene	80.0	68.9		ug/L		86	63 - 124
2,6-Dichlorophenol	80.0	69.6		ug/L		87	56 - 114
2,6-Dinitrotoluene	80.0	68.8		ug/L		86	64 - 123
2-Chloronaphthalene	80.0	63.9		ug/L		80	52 - 116
2-Chlorophenol	80.0	58.5		ug/L		73	50 - 105
2-Methylnaphthalene	80.0	68.6		ug/L		86	55 - 107
2-Methylphenol	80.0	54.1		ug/L		68	43 - 94
2-Nitroaniline	80.0	65.3		ug/L		82	59 - 121
2-Nitrophenol	80.0	66.7		ug/L		83	58 - 110
3 & 4 Methylphenol	80.0	49.8		ug/L		62	34 - 88
3,3'-Dichlorobenzidine	160	148		ug/L		93	38 - 118
3-Nitroaniline	80.0	55.7		ug/L		70	40 - 108
4,6-Dinitro-2-methylphenol	160	167		ug/L		104	48 - 126
4-Bromophenyl phenyl ether	80.0	72.8		ug/L		91	60 - 115
4-Chloro-3-methylphenol	80.0	69.5		ug/L		87	63 - 107
4-Chloroaniline	80.0	60.6		ug/L		76	41 - 93
4-Chlorophenyl phenyl ether	80.0	66.5		ug/L		83	57 - 120
4-Methylphenol	80.0	49.8		ug/L		62	34 - 88
4-Nitroaniline	80.0	65.6		ug/L		82	55 - 123
4-Nitrophenol	160	52.3		ug/L		33	15 - 60
Acenaphthene	80.0	66.1		ug/L		83	52 - 122
Acenaphthylene	80.0	65.3		ug/L		82	58 - 112
Acetophenone	80.0	64.3		ug/L		80	58 - 108
Aniline	80.0	51.2		ug/L		64	29 - 87
Anthracene	80.0	75.1		ug/L		94	62 - 113
Azobenzene	80.0	66.7		ug/L		83	59 - 115
Benzaldehyde	80.0	38.2		ug/L		48	31 - 91
Benzidine	160	64.7	J	ug/L		40	5 - 82
Benzo[a]anthracene	80.0	68.1		ug/L		85	61 - 115
Benzo[a]pyrene	80.0	74.7		ug/L		93	61 - 114
Benzo[b]fluoranthene	80.0	75.4		ug/L		94	61 - 117

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-444835/2-A

Matrix: Water

Analysis Batch: 445019

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 444835

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzo[g,h,i]perylene	80.0	75.4		ug/L		94	67 - 111
Benzo[k]fluoranthene	80.0	75.7		ug/L		95	69 - 119
Benzoic acid	80.0	20.9	J	ug/L		26	10 - 54
Benzyl alcohol	80.0	52.5		ug/L		66	40 - 91
bis (2-chloroisopropyl) ether	80.0	60.7		ug/L		76	49 - 114
Bis(2-chloroethoxy)methane	80.0	67.8		ug/L		85	61 - 107
Bis(2-chloroethyl)ether	80.0	64.9		ug/L		81	56 - 112
Bis(2-ethylhexyl) phthalate	80.0	72.7		ug/L		91	60 - 116
Butyl benzyl phthalate	80.0	70.3		ug/L		88	66 - 111
Caprolactam	80.0	14.6		ug/L		18	10 - 50
Carbazole	80.0	74.4		ug/L		93	69 - 109
Chrysene	80.0	72.4		ug/L		90	63 - 118
Dibenz(a,h)anthracene	80.0	76.4		ug/L		96	65 - 111
Dibenzofuran	80.0	67.0		ug/L		84	58 - 116
Diethyl phthalate	80.0	68.1		ug/L		85	65 - 121
Dimethyl phthalate	80.0	67.4		ug/L		84	63 - 120
Di-n-butyl phthalate	80.0	74.6		ug/L		93	68 - 110
Di-n-octyl phthalate	80.0	73.0		ug/L		91	60 - 111
Diphenylamine	68.0	57.9		ug/L		85	62 - 118
Fluoranthene	80.0	74.3		ug/L		93	68 - 111
Fluorene	80.0	67.8		ug/L		85	48 - 130
Hexachlorobenzene	80.0	75.7		ug/L		95	64 - 112
Hexachlorobutadiene	80.0	62.6		ug/L		78	41 - 102
Hexachlorocyclopentadiene	160	114		ug/L		71	27 - 107
Hexachloroethane	80.0	53.2		ug/L		66	39 - 100
Hexadecane	80.0	64.8		ug/L		81	54 - 112
Indeno[1,2,3-cd]pyrene	80.0	72.2		ug/L		90	56 - 111
Isophorone	80.0	66.8		ug/L		84	59 - 100
Naphthalene	80.0	64.9		ug/L		81	53 - 105
Nitrobenzene	80.0	65.2		ug/L		82	56 - 106
N-Nitrosodimethylamine	80.0	33.3		ug/L		42	22 - 70
N-Nitrosodi-n-propylamine	80.0	65.6		ug/L		82	59 - 106
N-Nitrosodiphenylamine	80.0	75.9		ug/L		95	64 - 112
Pentachlorophenol	160	147		ug/L		92	41 - 121
Phenanthrene	80.0	74.8		ug/L		93	63 - 113
Phenol	80.0	22.9		ug/L		29	11 - 52
Pyrene	80.0	72.4		ug/L		91	62 - 114
Pyridine	160	59.1		ug/L		37	10 - 69

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol (Surr)	86		52 - 123
2-Fluorobiphenyl	80		47 - 119
2-Fluorophenol (Surr)	42		17 - 71
Nitrobenzene-d5 (Surr)	82		45 - 113
Phenol-d5 (Surr)	26		10 - 52
Terphenyl-d14 (Surr)	82		50 - 123

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-444835/3-A

Matrix: Water

Analysis Batch: 445019

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 444835

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1'-Biphenyl	80.0	60.9		ug/L		76	53 - 116	7	30
1,2,4,5-Tetrachlorobenzene	80.0	60.7		ug/L		76	52 - 110	11	30
1,2,4-Trichlorobenzene	80.0	56.6		ug/L		71	47 - 103	10	30
1,2-Dichlorobenzene	80.0	51.7		ug/L		65	44 - 103	9	30
1,2-Diphenylhydrazine(as Azobenzene)	80.9	66.1		ug/L		82	59 - 116	2	30
1,3-Dichlorobenzene	80.0	49.8		ug/L		62	42 - 100	12	30
1,3-Dinitrobenzene	80.0	66.9		ug/L		84	66 - 124	4	30
1,4-Dichlorobenzene	80.0	51.0		ug/L		64	43 - 101	11	30
1,4-Dioxane	80.0	25.1		ug/L		31	20 - 63	23	30
1-Methylnaphthalene	80.0	64.2		ug/L		80	57 - 108	9	30
2,3,4,6-Tetrachlorophenol	80.0	66.2		ug/L		83	53 - 129	5	30
2,4,5-Trichlorophenol	80.0	64.6		ug/L		81	58 - 121	4	30
2,4,6-Trichlorophenol	80.0	65.6		ug/L		82	52 - 132	7	30
2,4-Dichlorophenol	80.0	61.0		ug/L		76	60 - 108	12	30
2,4-Dimethylphenol	80.0	59.3		ug/L		74	54 - 105	12	30
2,4-Dinitrophenol	160	124		ug/L		77	38 - 125	2	30
2,4-Dinitrotoluene	80.0	66.5		ug/L		83	63 - 124	4	30
2,6-Dichlorophenol	80.0	62.9		ug/L		79	56 - 114	10	50
2,6-Dinitrotoluene	80.0	65.9		ug/L		82	64 - 123	4	30
2-Chloronaphthalene	80.0	59.4		ug/L		74	52 - 116	7	30
2-Chlorophenol	80.0	55.2		ug/L		69	50 - 105	6	30
2-Methylnaphthalene	80.0	63.0		ug/L		79	55 - 107	9	30
2-Methylphenol	80.0	55.2		ug/L		69	43 - 94	2	30
2-Nitroaniline	80.0	63.3		ug/L		79	59 - 121	3	30
2-Nitrophenol	80.0	61.5		ug/L		77	58 - 110	8	30
3 & 4 Methylphenol	80.0	55.5		ug/L		69	34 - 88	11	30
3,3'-Dichlorobenzidine	160	147		ug/L		92	38 - 118	1	30
3-Nitroaniline	80.0	57.9		ug/L		72	40 - 108	4	30
4,6-Dinitro-2-methylphenol	160	160		ug/L		100	48 - 126	4	30
4-Bromophenyl phenyl ether	80.0	70.8		ug/L		88	60 - 115	3	30
4-Chloro-3-methylphenol	80.0	65.9		ug/L		82	63 - 107	5	30
4-Chloroaniline	80.0	32.4 *		ug/L		40	41 - 93	61	30
4-Chlorophenyl phenyl ether	80.0	64.1		ug/L		80	57 - 120	4	30
4-Methylphenol	80.0	55.5		ug/L		69	34 - 88	11	30
4-Nitroaniline	80.0	63.8		ug/L		80	55 - 123	3	30
4-Nitrophenol	160	79.5 *		ug/L		50	15 - 60	41	30
Acenaphthene	80.0	61.9		ug/L		77	52 - 122	7	30
Acenaphthylene	80.0	61.7		ug/L		77	58 - 112	6	30
Acetophenone	80.0	59.3		ug/L		74	58 - 108	8	30
Aniline	80.0	2.37	J *	ug/L		3	29 - 87	182	30
Anthracene	80.0	73.4		ug/L		92	62 - 113	2	30
Azobenzene	80.0	65.4		ug/L		82	59 - 115	2	30
Benzaldehyde	80.0	48.5		ug/L		61	31 - 91	24	50
Benzidine	160	13.9	J *	ug/L		9	5 - 82	129	50
Benzo[a]anthracene	80.0	65.5		ug/L		82	61 - 115	4	30
Benzo[a]pyrene	80.0	72.3		ug/L		90	61 - 114	3	30
Benzo[b]fluoranthene	80.0	72.6		ug/L		91	61 - 117	4	30

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-444835/3-A

Matrix: Water

Analysis Batch: 445019

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 444835

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzo[g,h,i]perylene	80.0	74.2		ug/L		93	67 - 111	2	30
Benzo[k]fluoranthene	80.0	73.7		ug/L		92	69 - 119	3	30
Benzoic acid	80.0	30.3	*	ug/L		38	10 - 54	36	30
Benzyl alcohol	80.0	46.1		ug/L		58	40 - 91	13	30
bis (2-chloroisopropyl) ether	80.0	55.3		ug/L		69	49 - 114	9	30
Bis(2-chloroethoxy)methane	80.0	61.2		ug/L		77	61 - 107	10	30
Bis(2-chloroethyl)ether	80.0	58.5		ug/L		73	56 - 112	10	30
Bis(2-ethylhexyl) phthalate	80.0	72.0		ug/L		90	60 - 116	1	30
Butyl benzyl phthalate	80.0	68.9		ug/L		86	66 - 111	2	30
Caprolactam	80.0	13.1		ug/L		16	10 - 50	11	30
Carbazole	80.0	71.9		ug/L		90	69 - 109	3	30
Chrysene	80.0	70.2		ug/L		88	63 - 118	3	30
Dibenz(a,h)anthracene	80.0	74.5		ug/L		93	65 - 111	3	30
Dibenzofuran	80.0	63.5		ug/L		79	58 - 116	5	30
Diethyl phthalate	80.0	66.8		ug/L		84	65 - 121	2	30
Dimethyl phthalate	80.0	65.7		ug/L		82	63 - 120	3	30
Di-n-butyl phthalate	80.0	72.6		ug/L		91	68 - 110	3	30
Di-n-octyl phthalate	80.0	71.2		ug/L		89	60 - 111	3	30
Diphenylamine	68.0	55.6		ug/L		82	62 - 118	4	50
Fluoranthene	80.0	70.6		ug/L		88	68 - 111	5	30
Fluorene	80.0	65.0		ug/L		81	48 - 130	4	30
Hexachlorobenzene	80.0	72.6		ug/L		91	64 - 112	4	30
Hexachlorobutadiene	80.0	56.1		ug/L		70	41 - 102	11	30
Hexachlorocyclopentadiene	160	105		ug/L		66	27 - 107	8	50
Hexachloroethane	80.0	46.9		ug/L		59	39 - 100	12	30
Hexadecane	80.0	61.4		ug/L		77	54 - 112	5	30
Indeno[1,2,3-cd]pyrene	80.0	71.0		ug/L		89	56 - 111	2	30
Isophorone	80.0	60.8		ug/L		76	59 - 100	9	30
Naphthalene	80.0	60.0		ug/L		75	53 - 105	8	30
Nitrobenzene	80.0	59.8		ug/L		75	56 - 106	9	30
N-Nitrosodimethylamine	80.0	28.1		ug/L		35	22 - 70	17	34
N-Nitrosodi-n-propylamine	80.0	59.6		ug/L		74	59 - 106	10	30
N-Nitrosodiphenylamine	80.0	73.0		ug/L		91	64 - 112	4	30
Pentachlorophenol	160	147		ug/L		92	41 - 121	0	30
Phenanthrene	80.0	72.7		ug/L		91	63 - 113	3	30
Phenol	80.0	31.7	*	ug/L		40	11 - 52	32	30
Pyrene	80.0	70.4		ug/L		88	62 - 114	3	30
Pyridine	160	1.8	U *	ug/L		0	10 - 69	200	41

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2,4,6-Tribromophenol (Surr)	84		52 - 123
2-Fluorobiphenyl	74		47 - 119
2-Fluorophenol (Surr)	54		17 - 71
Nitrobenzene-d5 (Surr)	75		45 - 113
Phenol-d5 (Surr)	38		10 - 52
Terphenyl-d14 (Surr)	82		50 - 123

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 280-444680/1-A

Matrix: Water

Analysis Batch: 444894

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 444680

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	0.0077	U	0.050	0.0077	ug/L		01/18/19 12:03	01/23/19 01:19	1
4,4'-DDE	0.0075	U	0.050	0.0075	ug/L		01/18/19 12:03	01/23/19 01:19	1
4,4'-DDT	0.015	U	0.050	0.015	ug/L		01/18/19 12:03	01/23/19 01:19	1
Aldrin	0.0059	U	0.050	0.0059	ug/L		01/18/19 12:03	01/23/19 01:19	1
alpha-BHC	0.0053	U	0.050	0.0053	ug/L		01/18/19 12:03	01/23/19 01:19	1
alpha-Chlordane	0.0053	U	0.050	0.0053	ug/L		01/18/19 12:03	01/23/19 01:19	1
beta-BHC	0.0087	U	0.050	0.0087	ug/L		01/18/19 12:03	01/23/19 01:19	1
delta-BHC	0.0058	U	0.050	0.0058	ug/L		01/18/19 12:03	01/23/19 01:19	1
Dieldrin	0.0063	U	0.050	0.0063	ug/L		01/18/19 12:03	01/23/19 01:19	1
Endosulfan I	0.0058	U	0.050	0.0058	ug/L		01/18/19 12:03	01/23/19 01:19	1
Endosulfan II	0.0070	U	0.050	0.0070	ug/L		01/18/19 12:03	01/23/19 01:19	1
Endosulfan sulfate	0.0057	U	0.050	0.0057	ug/L		01/18/19 12:03	01/23/19 01:19	1
Endrin	0.0079	U	0.050	0.0079	ug/L		01/18/19 12:03	01/23/19 01:19	1
Endrin aldehyde	0.0088	U	0.050	0.0088	ug/L		01/18/19 12:03	01/23/19 01:19	1
Endrin ketone	0.0070	U	0.050	0.0070	ug/L		01/18/19 12:03	01/23/19 01:19	1
gamma-BHC (Lindane)	0.0069	U	0.050	0.0069	ug/L		01/18/19 12:03	01/23/19 01:19	1
gamma-Chlordane	0.0091	U	0.050	0.0091	ug/L		01/18/19 12:03	01/23/19 01:19	1
Heptachlor	0.0077	U	0.050	0.0077	ug/L		01/18/19 12:03	01/23/19 01:19	1
Heptachlor epoxide	0.0075	U	0.050	0.0075	ug/L		01/18/19 12:03	01/23/19 01:19	1
Methoxychlor	0.013	U	0.10	0.013	ug/L		01/18/19 12:03	01/23/19 01:19	1
Toxaphene	0.37	U	2.0	0.37	ug/L		01/18/19 12:03	01/23/19 01:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	70		34 - 122	01/18/19 12:03	01/23/19 01:19	1
Tetrachloro-m-xylene	54		28 - 115	01/18/19 12:03	01/23/19 01:19	1

Lab Sample ID: LCS 280-444680/2-A

Matrix: Water

Analysis Batch: 444894

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 444680

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	0.500	0.457		ug/L		91	73 - 115
4,4'-DDE	0.500	0.421		ug/L		84	71 - 112
4,4'-DDT	0.500	0.407		ug/L		81	71 - 121
Aldrin	0.500	0.408		ug/L		82	50 - 114
alpha-BHC	0.500	0.433		ug/L		87	68 - 113
alpha-Chlordane	0.500	0.417		ug/L		83	70 - 113
beta-BHC	0.500	0.442		ug/L		88	54 - 113
delta-BHC	0.500	0.452		ug/L		90	72 - 113
Dieldrin	0.500	0.434		ug/L		87	74 - 116
Endosulfan I	0.500	0.398		ug/L		80	69 - 111
Endosulfan II	0.500	0.388		ug/L		78	69 - 109
Endosulfan sulfate	0.500	0.417		ug/L		83	71 - 116
Endrin	0.500	0.430		ug/L		86	69 - 128
Endrin aldehyde	0.500	0.376		ug/L		75	47 - 119
Endrin ketone	0.500	0.423		ug/L		85	65 - 113
gamma-BHC (Lindane)	0.500	0.459		ug/L		92	70 - 112
gamma-Chlordane	0.500	0.430		ug/L		86	65 - 121

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 280-444680/2-A

Matrix: Water

Analysis Batch: 444894

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 444680

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Heptachlor	0.500	0.420		ug/L		84	61 - 115
Heptachlor epoxide	0.500	0.430		ug/L		86	72 - 114
Methoxychlor	0.500	0.432		ug/L		86	66 - 131

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl	86		34 - 122
Tetrachloro-m-xylene	74		28 - 115

Lab Sample ID: LCSD 280-444680/3-A

Matrix: Water

Analysis Batch: 444894

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 444680

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
4,4'-DDD	0.500	0.504		ug/L		101	73 - 115	10	50
4,4'-DDE	0.500	0.466		ug/L		93	71 - 112	10	50
4,4'-DDT	0.500	0.444		ug/L		89	71 - 121	9	25
Aldrin	0.500	0.453		ug/L		91	50 - 114	10	33
alpha-BHC	0.500	0.474		ug/L		95	68 - 113	9	50
alpha-Chlordane	0.500	0.459		ug/L		92	70 - 113	10	50
beta-BHC	0.500	0.485		ug/L		97	54 - 113	9	50
delta-BHC	0.500	0.496		ug/L		99	72 - 113	9	50
Dieldrin	0.500	0.476		ug/L		95	74 - 116	9	22
Endosulfan I	0.500	0.438		ug/L		88	69 - 111	10	50
Endosulfan II	0.500	0.424		ug/L		85	69 - 109	9	50
Endosulfan sulfate	0.500	0.455		ug/L		91	71 - 116	9	50
Endrin	0.500	0.466		ug/L		93	69 - 128	8	39
Endrin aldehyde	0.500	0.406		ug/L		81	47 - 119	8	50
Endrin ketone	0.500	0.466		ug/L		93	65 - 113	10	50
gamma-BHC (Lindane)	0.500	0.507		ug/L		101	70 - 112	10	26
gamma-Chlordane	0.500	0.479		ug/L		96	65 - 121	11	50
Heptachlor	0.500	0.462		ug/L		92	61 - 115	10	27
Heptachlor epoxide	0.500	0.472		ug/L		94	72 - 114	9	50
Methoxychlor	0.500	0.468		ug/L		94	66 - 131	8	50

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCB Decachlorobiphenyl	95		34 - 122
Tetrachloro-m-xylene	85		28 - 115

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 280-444887/1-A

Matrix: Water

Analysis Batch: 446463

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 444887

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1221	0.21	U	1.0	0.21	ug/L		01/21/19 11:30	02/05/19 14:49	1
PCB-1016	0.12	U	1.0	0.12	ug/L		01/21/19 11:30	02/05/19 14:49	1

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: MB 280-444887/1-A

Matrix: Water

Analysis Batch: 446463

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 444887

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1232	0.17	U	1.0	0.17	ug/L		01/21/19 11:30	02/05/19 14:49	1
PCB-1242	0.10	U	1.0	0.10	ug/L		01/21/19 11:30	02/05/19 14:49	1
PCB-1248	0.092	U	1.0	0.092	ug/L		01/21/19 11:30	02/05/19 14:49	1
PCB-1254	0.11	U	1.0	0.11	ug/L		01/21/19 11:30	02/05/19 14:49	1
PCB-1260	0.16	U	1.0	0.16	ug/L		01/21/19 11:30	02/05/19 14:49	1
PCB-1262	0.085	U	1.0	0.085	ug/L		01/21/19 11:30	02/05/19 14:49	1
PCB-1268	0.36	U	1.0	0.36	ug/L		01/21/19 11:30	02/05/19 14:49	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	73		25 - 120	01/21/19 11:30	02/05/19 14:49	1
DCB Decachlorobiphenyl	77		30 - 136	01/21/19 11:30	02/05/19 14:49	1

Lab Sample ID: LCS 280-444887/2-A

Matrix: Water

Analysis Batch: 446463

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 444887

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
PCB-1016	2.00	1.85		ug/L		92	71 - 128
PCB-1260	2.00	1.92		ug/L		96	75 - 126

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tetrachloro-m-xylene	90		25 - 120
DCB Decachlorobiphenyl	84		30 - 136

Lab Sample ID: LCSD 280-444887/3-A

Matrix: Water

Analysis Batch: 446463

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 444887

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
PCB-1016	2.00	1.85		ug/L		93	71 - 128	0	30
PCB-1260	2.00	1.95		ug/L		97	75 - 126	2	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tetrachloro-m-xylene	93		25 - 120
DCB Decachlorobiphenyl	88		30 - 136

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 140-27087/10-A

Matrix: Water

Analysis Batch: 27191

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 27087

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.44	U	10	0.44	pg/L		01/22/19 13:19	01/28/19 03:56	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	84		25 - 164	01/22/19 13:19	01/28/19 03:56	1

TestAmerica St. Louis

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: MB 140-27087/10-A
Matrix: Water
Analysis Batch: 27191

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 27087

	<i>MB</i>	<i>MB</i>			
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>
37Cl4-2,3,7,8-TCDD	97		35 - 197	01/22/19 13:19	01/28/19 03:56
					1

Lab Sample ID: LCS 140-27087/11-A
Matrix: Water
Analysis Batch: 27191

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 27087

<i>Analyte</i>		<i>Spike</i>	<i>LCS</i>	<i>LCS</i>						
		<i>Added</i>	<i>Result</i>	<i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec.</i>	<i>Limits</i>	
2,3,7,8-TCDD		200	183		pg/L		92		67 - 158	
	<i>LCS</i>	<i>LCS</i>								
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>							
13C-2,3,7,8-TCDD	83		20 - 175							
	<i>LCS</i>	<i>LCS</i>								
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>							
37Cl4-2,3,7,8-TCDD	100		31 - 191							

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

GC/MS VOA

Analysis Batch: 445753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-32649-1	CRC-MW-1-011519	Total/NA	Water	8260B	
MB 280-445753/8	Method Blank	Total/NA	Water	8260B	
LCS 280-445753/4	Lab Control Sample	Total/NA	Water	8260B	
LCS 280-445753/6	Lab Control Sample	Total/NA	Water	8260B	
LCSD 280-445753/5	Lab Control Sample Dup	Total/NA	Water	8260B	
LCSD 280-445753/7	Lab Control Sample Dup	Total/NA	Water	8260B	
280-119359-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
280-119359-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
280-119359-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
280-119359-C-1 MS	Matrix Spike	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 444835

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-32649-1	CRC-MW-1-011519	Total/NA	Water	3510C	
MB 280-444835/1-A	Method Blank	Total/NA	Water	3510C	
LCS 280-444835/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 280-444835/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 445019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-32649-1	CRC-MW-1-011519	Total/NA	Water	8270D	444835
MB 280-444835/1-A	Method Blank	Total/NA	Water	8270D	444835
LCS 280-444835/2-A	Lab Control Sample	Total/NA	Water	8270D	444835
LCSD 280-444835/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	444835

GC Semi VOA

Prep Batch: 444680

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-32649-1	CRC-MW-1-011519	Total/NA	Water	3510C	
MB 280-444680/1-A	Method Blank	Total/NA	Water	3510C	
LCS 280-444680/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 280-444680/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Prep Batch: 444887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-32649-1	CRC-MW-1-011519	Total/NA	Water	3510C	
MB 280-444887/1-A	Method Blank	Total/NA	Water	3510C	
LCS 280-444887/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 280-444887/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 444894

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-32649-1	CRC-MW-1-011519	Total/NA	Water	8081B	444680
MB 280-444680/1-A	Method Blank	Total/NA	Water	8081B	444680
LCS 280-444680/2-A	Lab Control Sample	Total/NA	Water	8081B	444680
LCSD 280-444680/3-A	Lab Control Sample Dup	Total/NA	Water	8081B	444680

TestAmerica St. Louis

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

GC Semi VOA (Continued)

Analysis Batch: 446463

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-32649-1	CRC-MW-1-011519	Total/NA	Water	8082A	444887
MB 280-444887/1-A	Method Blank	Total/NA	Water	8082A	444887
LCS 280-444887/2-A	Lab Control Sample	Total/NA	Water	8082A	444887
LCSD 280-444887/3-A	Lab Control Sample Dup	Total/NA	Water	8082A	444887

Specialty Organics

Prep Batch: 27087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-32649-1	CRC-MW-1-011519	Total/NA	Water	HRMS-Sepf	
MB 140-27087/10-A	Method Blank	Total/NA	Water	HRMS-Sepf	
LCS 140-27087/11-A	Lab Control Sample	Total/NA	Water	HRMS-Sepf	

Analysis Batch: 27191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 140-27087/10-A	Method Blank	Total/NA	Water	1613B	27087
LCS 140-27087/11-A	Lab Control Sample	Total/NA	Water	1613B	27087

Analysis Batch: 27242

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-32649-1	CRC-MW-1-011519	Total/NA	Water	1613B	27087

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: Former Carnotite Site - MW-1 Sampling

TestAmerica Job ID: 160-32649-1

Client Sample ID: CRC-MW-1-011519

Date Collected: 01/15/19 12:30

Date Received: 01/16/19 09:10

Lab Sample ID: 160-32649-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	445753	01/28/19 23:21	FCN	TAL DEN
Total/NA	Prep	3510C			444835	01/21/19 06:56	JT	TAL DEN
Total/NA	Analysis	8270D		1	445019	01/22/19 22:36	DCK	TAL DEN
Total/NA	Prep	3510C			444680	01/18/19 12:03	KJS	TAL DEN
Total/NA	Analysis	8081B		1	444894	01/23/19 03:22	TEB	TAL DEN
Total/NA	Prep	3510C			444887	01/21/19 11:30	AAG	TAL DEN
Total/NA	Analysis	8082A		1	446463	02/05/19 16:14	TEM	TAL DEN
Total/NA	Prep	HRMS-Sepf			27087	01/22/19 13:19	SMA	TAL KNX
Total/NA	Analysis	1613B		1	27242	01/29/19 12:43	MSD	TAL KNX

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Accreditation/Certification Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-32649-1

Project/Site: Former Carnotite Site - MW-1 Sampling

Laboratory: TestAmerica St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Louisiana	NELAP	6	04080	06-30-19

Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	02-28-19
Arizona	State Program	9	AZ0713	12-20-19
Arkansas DEQ	State Program	6	88-0687	06-01-19
California	State Program	9	2513	01-18-19 *
Connecticut	State Program	1	PH-0686	09-30-20
Florida	NELAP	4	E87667	06-30-19
Georgia	State Program	4	N/A	01-08-20
Illinois	NELAP	5	200017	04-30-19
Iowa	State Program	7	370	12-01-20
Kansas	NELAP	7	E-10166	04-30-19
Louisiana	NELAP	6	02096	06-30-19
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-19
Nevada	State Program	9	CO0026	07-31-19
New Hampshire	NELAP	1	205310	04-28-19
New Jersey	NELAP	2	CO004	06-30-19
New York	NELAP	2	11964	04-01-19
North Carolina (WW/SW)	State Program	4	358	12-31-19
North Dakota	State Program	8	R-034	01-08-20
Oklahoma	State Program	6	8614	08-31-19
Oregon	NELAP	10	4025	01-08-20
Pennsylvania	NELAP	3	68-00664	07-31-19
South Carolina	State Program	4	72002001	01-08-19 *
Texas	NELAP	6	T104704183-18-15	09-30-19
US Fish & Wildlife	Federal			07-31-19
USDA	Federal			03-26-21
Utah	NELAP	8	CO00026	07-31-19
Virginia	NELAP	3	460232	06-14-19
Washington	State Program	10	C583	08-03-19
West Virginia DEP	State Program	3	354	11-30-19
Wisconsin	State Program	5	999615430	08-31-19 *
Wyoming (UST)	A2LA	8	2907.01	10-31-19

Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		N/A	
ANAB	DoD ELAP		L2311	02-13-19
Arkansas DEQ	State Program	6	88-0688	06-16-19
California	State Program	9	2423	06-30-19
Colorado	State Program	8	TN00009	02-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica St. Louis

Accreditation/Certification Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-32649-1

Project/Site: Former Carnotite Site - MW-1 Sampling

Laboratory: TestAmerica Knoxville (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0223	09-30-19
Florida	NELAP	4	E87177	06-30-19
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-19
Kansas	NELAP	7	E-10349	10-31-19
Kentucky (DW)	State Program	4	90101	12-31-18 *
Louisiana	NELAP	6	83979	06-30-19
Louisiana (DW)	NELAP	6	LA160005	12-31-19
Maryland	State Program	3	277	03-31-19
Michigan	State Program	5	9933	04-13-20
Nevada	State Program	9	TN00009	07-31-19
New Hampshire	NELAP	1	2999	01-17-20
New Jersey	NELAP	2	TN001	06-30-19
New York	NELAP	2	10781	03-31-19
North Carolina (DW)	State Program	4	21705	07-31-19
North Carolina (WW/SW)	State Program	4	64	12-31-19
Ohio VAP	State Program	5	CL0059	08-28-20
Oklahoma	State Program	6	9415	08-31-19
Oregon	NELAP	10	TNI0189	06-30-19
Pennsylvania	NELAP	3	68-00576	12-31-19
Tennessee	State Program	4	2014	04-13-20
Texas	NELAP	6	T104704380-16-9	08-31-19
US Fish & Wildlife	Federal		LE-058448-0	07-31-19
USDA	Federal		P330-16-00262	08-20-19
Utah	NELAP	8	TN00009	07-31-19
Virginia	NELAP	3	460176	09-14-19
Washington	State Program	10	C593	01-19-20
West Virginia (DW)	State Program	3	9955C	12-31-19
West Virginia DEP	State Program	3	345	04-30-19
Wisconsin	State Program	5	998044300	08-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica St. Louis

Method Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-32649-1

Project/Site: Former Carnotite Site - MW-1 Sampling

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL DEN
8081B	Organochlorine Pesticides (GC)	SW846	TAL DEN
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	TAL DEN
1613B	Dioxins and Furans (HRGC/HRMS)	40CFR136A	TAL KNX
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL DEN
5030B	Purge and Trap	SW846	TAL DEN
HRMS-Sepf	Separatory Funnel (Liquid-Liquid) Extraction	EPA	TAL KNX

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 160-32649-1

Project/Site: Former Carnotite Site - MW-1 Sampling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-32649-1	CRC-MW-1-011519	Water	01/15/19 12:30	01/16/19 09:10

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: VMS_MS1 Analysis Batch Number: 443512Lab Sample ID: ICV 280-443512/26 Client Sample ID: _____Date Analyzed: 01/08/19 14:55 Lab File ID: MS1_1084.D GC Column: DB-624 (60.25 ID: 0.25 (mm))

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Tetrahydrothiophene		Invalid Compound ID	wickhamt	01/09/19 06:36

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: VMS_MS1 Analysis Batch Number: 444687Lab Sample ID: STD 280-444687/12 IC Client Sample ID: _____Date Analyzed: 01/18/19 11:48 Lab File ID: MS1_1421.D GC Column: DB-624 (60.25 ID: 0.25 (mm))

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Toluene-d8 (Surr)		Invalid Compound ID	ornelasg	01/22/19 17:07

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: VMS_MS1 Analysis Batch Number: 445753Lab Sample ID: MB 280-445753/8 Client Sample ID: _____Date Analyzed: 01/28/19 19:09 Lab File ID: MS1_1907.D GC Column: DB-624 (60.25 ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Acetonitrile		Invalid Compound ID	nwangumaf	01/28/19 19:29

Lab Sample ID: 160-32649-1 Client Sample ID: CRC-MW-1-011519Date Analyzed: 01/28/19 23:21 Lab File ID: MS1_1919.D GC Column: DB-624 (60.25 ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Acetonitrile		Invalid Compound ID	nwangumaf	01/28/19 23:41

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SMS_D Analysis Batch Number: 443607Lab Sample ID: ICIS 280-443607/3 Client Sample ID: _____Date Analyzed: 01/08/19 14:43 Lab File ID: D31076.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Phenol	4.25	Wrong peak	kiekeld	01/08/19 15:47
Aniline	4.28	Wrong peak	kiekeld	01/08/19 15:47
Bis(2-chloroethyl)ether	4.32	Wrong peak	kiekeld	01/08/19 15:47
3 & 4 Methylphenol	4.96	Wrong peak	kiekeld	01/08/19 15:48
Isophorone	5.36	Wrong peak	kiekeld	01/08/19 15:48
Bis(2-chloroethoxy)methane	5.56	Wrong peak	kiekeld	01/08/19 15:48
Benzoic acid	5.61	Wrong peak	kiekeld	01/08/19 15:48
Naphthalene	5.85	Wrong peak	kiekeld	01/08/19 15:48
1-Methylnaphthalene	6.63	Wrong peak	kiekeld	01/08/19 15:49
2,4-Dinitrophenol	7.62	Wrong peak	kiekeld	01/08/19 15:49
4-Nitrophenol	7.70	Wrong peak	kiekeld	01/08/19 15:49
Benzo[a]anthracene	13.10	Wrong peak	kiekeld	01/08/19 15:49
Chrysene	13.19	Wrong peak	kiekeld	01/08/19 15:49
Indeno[1,2,3-cd]pyrene	20.18	Wrong peak	kiekeld	01/08/19 15:50

Lab Sample ID: STD004 280-443607/4 IC Client Sample ID: _____Date Analyzed: 01/08/19 15:12 Lab File ID: D31077.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
3-Nitroaniline	7.51	Assign Peak	kiekeld	01/08/19 15:51

Lab Sample ID: STD010 280-443607/5 IC Client Sample ID: _____Date Analyzed: 01/08/19 15:42 Lab File ID: D31078.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Benzoic acid	5.54	Wrong peak	kiekeld	01/09/19 10:01

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SMS_D Analysis Batch Number: 443607Lab Sample ID: STD020 280-443607/6 IC Client Sample ID: _____Date Analyzed: 01/08/19 16:11 Lab File ID: D31079.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Benzoic acid	5.56	Wrong peak	kiekeld	01/09/19 10:02

Lab Sample ID: STD050 280-443607/7 IC Client Sample ID: _____Date Analyzed: 01/08/19 16:40 Lab File ID: D31080.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Benzoic acid	5.59	Wrong peak	kiekeld	01/09/19 10:03

Lab Sample ID: STD120 280-443607/8 IC Client Sample ID: _____Date Analyzed: 01/08/19 17:10 Lab File ID: D31081.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Caprolactam	6.25	Split Peak	kiekeld	01/09/19 10:04

Lab Sample ID: STD160 280-443607/9 IC Client Sample ID: _____Date Analyzed: 01/08/19 17:39 Lab File ID: D31082.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Caprolactam	6.26	Split Peak	kiekeld	01/09/19 10:05
Indeno[1,2,3-cd]pyrene	20.22	Shouldering	kiekeld	01/09/19 10:05

Lab Sample ID: STD200 280-443607/10 IC Client Sample ID: _____Date Analyzed: 01/08/19 18:08 Lab File ID: D31083.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Caprolactam	6.27	Split Peak	kiekeld	01/09/19 10:06
Indeno[1,2,3-cd]pyrene	20.22	Shouldering	kiekeld	01/09/19 10:06

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SMS_D Analysis Batch Number: 443607Lab Sample ID: ICV 280-443607/11 Client Sample ID: _____Date Analyzed: 01/08/19 18:38 Lab File ID: D31084.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
N-Nitrosodi-n-propylamine	4.97	Assign Peak	kiekeld	01/09/19 10:17

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SMS_D Analysis Batch Number: 445019Lab Sample ID: CCV 280-445019/3 Client Sample ID: _____Date Analyzed: 01/22/19 13:59 Lab File ID: D31281.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Caprolactam	6.15	Split Peak	kiekeld	01/22/19 14:27

Lab Sample ID: LCSD 280-444835/3-A Client Sample ID: _____Date Analyzed: 01/22/19 18:40 Lab File ID: D31291.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Caprolactam	6.12	Split Peak	kiekeld	01/23/19 09:18

Lab Sample ID: 160-32649-1 Client Sample ID: CRC-MW-1-011519Date Analyzed: 01/22/19 22:36 Lab File ID: D31299.D GC Column: Rxi-5Sil MS ID: 0.25 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Fluoranthene		Invalid Compound ID	kiekeld	01/23/19 09:17

PESTICIDES MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_C Analysis Batch Number: 444894Lab Sample ID: CCV 280-444894/45 Client Sample ID: _____Date Analyzed: 01/22/19 21:32 Lab File ID: 039F4501.D GC Column: Rxi-35Sil MS ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Toxaphene Peak 1	4.86	Baseline Smoothing	bacat	01/23/19 11:10
Toxaphene Peak 2	6.24	Baseline Smoothing	bacat	01/23/19 11:10
Toxaphene Peak 3	6.85	Baseline Smoothing	bacat	01/23/19 11:10
Toxaphene Peak 4	7.40	Baseline Smoothing	bacat	01/23/19 11:10
Toxaphene Peak 5	7.54	Baseline Smoothing	bacat	01/23/19 11:10

Lab Sample ID: CCV 280-444894/45 Client Sample ID: _____Date Analyzed: 01/22/19 21:32 Lab File ID: 039F4501.D GC Column: Rxi-XLB ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Toxaphene Peak 1	6.06	Baseline Smoothing	bacat	01/23/19 11:10
Toxaphene Peak 2	6.55	Baseline Smoothing	bacat	01/23/19 11:10
Toxaphene Peak 3	6.87	Baseline Smoothing	bacat	01/23/19 11:10
Toxaphene Peak 4	7.59	Baseline Smoothing	bacat	01/23/19 11:10
Toxaphene Peak 5	8.16	Baseline Smoothing	bacat	01/23/19 11:10

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 445745Lab Sample ID: STD4 280-445745/6 IC Client Sample ID: _____Date Analyzed: 01/29/19 15:57 Lab File ID: 01290006.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1248 Peak 1	4.53	Baseline Smoothing	mooret	01/30/19 11:44
PCB-1248 Peak 2	4.76	Baseline Smoothing	mooret	01/30/19 11:44

Lab Sample ID: STD5 280-445745/7 IC Client Sample ID: _____Date Analyzed: 01/29/19 16:18 Lab File ID: 01290007.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1248 Peak 1	4.53	Baseline Smoothing	mooret	01/30/19 11:45

Lab Sample ID: STD6 280-445745/8 IC Client Sample ID: _____Date Analyzed: 01/29/19 16:39 Lab File ID: 01290008.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1248 Peak 1	4.53	Baseline Smoothing	mooret	01/30/19 11:46

Lab Sample ID: STD7 280-445745/9 IC Client Sample ID: _____Date Analyzed: 01/29/19 17:00 Lab File ID: 01290009.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1248 Peak 1	4.53	Baseline Smoothing	mooret	01/30/19 12:40

Lab Sample ID: STD1 280-445745/11 IC Client Sample ID: _____Date Analyzed: 01/29/19 17:42 Lab File ID: 01290011.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1-Bromo-2-nitrobenzene	1.79	Incomplete Integration	mooret	01/30/19 12:58

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 445745Lab Sample ID: STD5 280-445745/23 ICIS Client Sample ID: _____Date Analyzed: 01/29/19 21:55 Lab File ID: 01290023.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1016 Peak 1	3.71	Baseline Smoothing	mooret	01/30/19 14:29
PCB-1016 Peak 2	4.18	Baseline Smoothing	mooret	01/30/19 14:30
PCB-1016 Peak 3	4.32	Baseline Smoothing	mooret	01/30/19 14:30
PCB-1016 Peak 4	4.56	Baseline Smoothing	mooret	01/30/19 14:30
PCB-1016 Peak 5	4.85	Baseline Smoothing	mooret	01/30/19 14:30

Lab Sample ID: STD3 280-445745/29 IC Client Sample ID: _____Date Analyzed: 01/30/19 00:02 Lab File ID: 01290029.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1232 Peak 2	3.71	Baseline Smoothing	mooret	01/30/19 14:46
PCB-1232 Peak 3	4.18	Baseline Smoothing	mooret	01/30/19 14:46
PCB-1232 Peak 4	4.32	Baseline Smoothing	mooret	01/30/19 14:46
PCB-1232 Peak 5	4.85	Baseline Smoothing	mooret	01/30/19 14:46

Lab Sample ID: STD4 280-445745/30 IC Client Sample ID: _____Date Analyzed: 01/30/19 00:23 Lab File ID: 01290030.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1232 Peak 2	3.65	Baseline Smoothing	mooret	01/30/19 14:38
PCB-1232 Peak 3	4.14	Baseline Smoothing	mooret	01/30/19 14:38
PCB-1232 Peak 4	4.29	Baseline Smoothing	mooret	01/30/19 14:38
PCB-1232 Peak 5	4.76	Baseline Smoothing	mooret	01/30/19 14:38
PCB-1262 Peak 1	6.66	Baseline Smoothing	mooret	01/30/19 14:38
PCB-1262 Peak 2	7.20	Baseline Smoothing	mooret	01/30/19 14:38
PCB-1262 Peak 3	7.53	Baseline Smoothing	mooret	01/30/19 14:38
PCB-1262 Peak 4	7.98	Baseline Smoothing	mooret	01/30/19 14:38
PCB-1262 Peak 5	8.37	Baseline Smoothing	mooret	01/30/19 14:38

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 445745Lab Sample ID: STD5 280-445745/31 IC Client Sample ID: _____Date Analyzed: 01/30/19 00:44 Lab File ID: 01290031.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1232 Peak 1	3.32	Baseline Smoothing	mooret	01/30/19 14:39
PCB-1232 Peak 2	3.71	Baseline Smoothing	mooret	01/30/19 14:39
PCB-1232 Peak 3	4.18	Baseline Smoothing	mooret	01/30/19 14:39
PCB-1232 Peak 4	4.32	Baseline Smoothing	mooret	01/30/19 14:39
PCB-1232 Peak 5	4.85	Baseline Smoothing	mooret	01/30/19 14:39

Lab Sample ID: STD7 280-445745/33 IC Client Sample ID: _____Date Analyzed: 01/30/19 01:26 Lab File ID: 01290033.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1232 Peak 1	3.32	Baseline Smoothing	mooret	01/30/19 14:39
PCB-1232 Peak 2	3.71	Baseline Smoothing	mooret	01/30/19 14:39
PCB-1232 Peak 3	4.17	Baseline Smoothing	mooret	01/30/19 14:39
PCB-1232 Peak 4	4.32	Baseline Smoothing	mooret	01/30/19 14:39
PCB-1232 Peak 5	4.85	Baseline Smoothing	mooret	01/30/19 14:39

Lab Sample ID: ICV 280-445745/34 Client Sample ID: _____Date Analyzed: 01/30/19 01:48 Lab File ID: 01290034.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1232 Peak 1	3.32	Baseline Smoothing	mooret	01/30/19 14:48
PCB-1232 Peak 2	3.71	Baseline Smoothing	mooret	01/30/19 14:48
PCB-1232 Peak 3	4.18	Baseline Smoothing	mooret	01/30/19 14:48
PCB-1232 Peak 4	4.32	Baseline Smoothing	mooret	01/30/19 14:48
PCB-1232 Peak 5	4.85	Baseline Smoothing	mooret	01/30/19 14:48

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 445745Lab Sample ID: STD1 280-445745/35 IC Client Sample ID: _____Date Analyzed: 01/30/19 02:09 Lab File ID: 01290035.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1242 Peak 2	4.14	Baseline Smoothing	mooret	01/30/19 14:49
PCB-1242 Peak 3	4.76	Baseline Smoothing	mooret	01/30/19 14:49
PCB-1242 Peak 4	5.27	Baseline Smoothing	mooret	01/30/19 14:49
PCB-1242 Peak 5	5.30	Baseline Smoothing	mooret	01/30/19 14:49

Lab Sample ID: STD3 280-445745/37 IC Client Sample ID: _____Date Analyzed: 01/30/19 02:51 Lab File ID: 01290037.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1242 Peak 2	4.14	Baseline Smoothing	mooret	01/30/19 14:50
PCB-1242 Peak 3	4.76	Baseline Smoothing	mooret	01/30/19 14:50
PCB-1242 Peak 4	5.27	Baseline Smoothing	mooret	01/30/19 14:50
PCB-1242 Peak 5	5.29	Baseline Smoothing	mooret	01/30/19 14:50

Lab Sample ID: STD4 280-445745/38 IC Client Sample ID: _____Date Analyzed: 01/30/19 03:12 Lab File ID: 01290038.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1242 Peak 1	3.71	Baseline Smoothing	mooret	01/30/19 14:54
PCB-1242 Peak 4	4.85	Baseline Smoothing	mooret	01/30/19 14:54
PCB-1242 Peak 5	4.99	Baseline Smoothing	mooret	01/30/19 14:54

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 445745Lab Sample ID: STD5 280-445745/39 IC Client Sample ID: _____Date Analyzed: 01/30/19 03:33 Lab File ID: 01290039.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1242 Peak 4	5.28	Split Peak	mooret	01/30/19 14:50
PCB-1242 Peak 5	5.30	Unspecified	mooret	01/30/19 14:51

Lab Sample ID: STD6 280-445745/40 IC Client Sample ID: _____Date Analyzed: 01/30/19 03:54 Lab File ID: 01290040.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1242 Peak 4	5.28	Split Peak	mooret	01/30/19 14:51
PCB-1242 Peak 5	5.30	Split Peak	mooret	01/30/19 14:52

Lab Sample ID: STD7 280-445745/41 IC Client Sample ID: _____Date Analyzed: 01/30/19 04:15 Lab File ID: 01290041.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1242 Peak 4	5.28	Split Peak	mooret	01/30/19 14:52
PCB-1242 Peak 5	5.30	Split Peak	mooret	01/30/19 14:52

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 446463Lab Sample ID: MB 280-444887/1-A Client Sample ID: _____Date Analyzed: 02/05/19 14:49 Lab File ID: 02040008.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1016		Unspecified		
PCB-1221		Unspecified		
PCB-1232		Unspecified		
PCB-1242		Unspecified		
PCB-1248		Unspecified		
PCB-1254		Unspecified		
PCB-1260		Unspecified		
PCB-1262		Unspecified		
PCB-1268		Unspecified		
PCB-1016 Peak 1		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1016 Peak 2		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1016 Peak 3		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1016 Peak 4		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1016 Peak 5		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1221 Peak 1		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1221 Peak 2		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1221 Peak 3		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1232 Peak 1		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1232 Peak 2		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1232 Peak 3		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1232 Peak 4		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1232 Peak 5		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1242 Peak 1		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1242 Peak 2		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1242 Peak 3		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1242 Peak 4		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1242 Peak 5		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1248 Peak 1		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1248 Peak 2		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1248 Peak 3		Invalid Compound ID	mooret	02/06/19 10:45

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 446463Lab Sample ID: MB 280-444887/1-A Client Sample ID: _____Date Analyzed: 02/05/19 14:49 Lab File ID: 02040008.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1248 Peak 4		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1248 Peak 5		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1254 Peak 1		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1254 Peak 2		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1254 Peak 3		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1254 Peak 4		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1254 Peak 5		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1260 Peak 1		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1260 Peak 2		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1260 Peak 3		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1260 Peak 4		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1260 Peak 5		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1262 Peak 1		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1262 Peak 2		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1262 Peak 3		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1262 Peak 4		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1262 Peak 5		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1268 Peak 1		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1268 Peak 2		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1268 Peak 3		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1268 Peak 4		Invalid Compound ID	mooret	02/06/19 10:45
PCB-1268 Peak 5		Invalid Compound ID	mooret	02/06/19 10:45

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 446463Lab Sample ID: MB 280-444887/1-A Client Sample ID: _____Date Analyzed: 02/05/19 14:49 Lab File ID: 02040008.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1016		Unspecified		
PCB-1221		Unspecified		
PCB-1232		Unspecified		
PCB-1242		Unspecified		
PCB-1248		Unspecified		
PCB-1254		Unspecified		
PCB-1260		Unspecified		
PCB-1262		Unspecified		
PCB-1268		Unspecified		
PCB-1016 Peak 1		Unspecified		
PCB-1016 Peak 2		Unspecified		
PCB-1016 Peak 3		Unspecified		
PCB-1016 Peak 4		Unspecified		
PCB-1016 Peak 5		Unspecified		
PCB-1221 Peak 1		Unspecified		
PCB-1221 Peak 2		Unspecified		
PCB-1221 Peak 3		Unspecified		
PCB-1232 Peak 1		Unspecified		
PCB-1232 Peak 2		Unspecified		
PCB-1232 Peak 3		Unspecified		
PCB-1232 Peak 4		Unspecified		
PCB-1232 Peak 5		Unspecified		
PCB-1242 Peak 1		Unspecified		
PCB-1242 Peak 2		Unspecified		
PCB-1242 Peak 3		Unspecified		
PCB-1242 Peak 4		Unspecified		
PCB-1242 Peak 5		Unspecified		
PCB-1248 Peak 1		Unspecified		
PCB-1248 Peak 2		Unspecified		
PCB-1248 Peak 3		Unspecified		

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 446463Lab Sample ID: MB 280-444887/1-A Client Sample ID: _____Date Analyzed: 02/05/19 14:49 Lab File ID: 02040008.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1248 Peak 4		Unspecified		
PCB-1248 Peak 5		Unspecified		
PCB-1254 Peak 1		Unspecified		
PCB-1254 Peak 2		Unspecified		
PCB-1254 Peak 3		Unspecified		
PCB-1254 Peak 4		Unspecified		
PCB-1254 Peak 5		Unspecified		
PCB-1260 Peak 1		Unspecified		
PCB-1260 Peak 2		Unspecified		
PCB-1260 Peak 3		Unspecified		
PCB-1260 Peak 4		Unspecified		
PCB-1260 Peak 5		Unspecified		
PCB-1262 Peak 1		Unspecified		
PCB-1262 Peak 2		Unspecified		
PCB-1262 Peak 3		Unspecified		
PCB-1262 Peak 4		Unspecified		
PCB-1262 Peak 5		Unspecified		
PCB-1268 Peak 1		Unspecified		
PCB-1268 Peak 2		Unspecified		
PCB-1268 Peak 3		Unspecified		
PCB-1268 Peak 4		Unspecified		
PCB-1268 Peak 5		Unspecified		

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 446463Lab Sample ID: 160-32649-1 Client Sample ID: CRC-MW-1-011519Date Analyzed: 02/05/19 16:14 Lab File ID: 02040012.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1016		Unspecified		
PCB-1221		Unspecified		
PCB-1232		Unspecified		
PCB-1242		Unspecified		
PCB-1248		Unspecified		
PCB-1254		Unspecified		
PCB-1260		Unspecified		
PCB-1262		Unspecified		
PCB-1268		Unspecified		
PCB-1016 Peak 1		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1016 Peak 2		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1016 Peak 3		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1016 Peak 4		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1016 Peak 5		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1221 Peak 1		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1221 Peak 2		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1221 Peak 3		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1232 Peak 1		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1232 Peak 2		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1232 Peak 3		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1232 Peak 4		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1232 Peak 5		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1242 Peak 1		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1242 Peak 2		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1242 Peak 3		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1242 Peak 4		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1242 Peak 5		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1248 Peak 1		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1248 Peak 2		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1248 Peak 3		Invalid Compound ID	mooret	02/06/19 10:46

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 446463Lab Sample ID: 160-32649-1 Client Sample ID: CRC-MW-1-011519Date Analyzed: 02/05/19 16:14 Lab File ID: 02040012.D GC Column: CLP1 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1248 Peak 4		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1248 Peak 5		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1254 Peak 1		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1254 Peak 2		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1254 Peak 3		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1254 Peak 4		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1254 Peak 5		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1260 Peak 1		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1260 Peak 2		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1260 Peak 3		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1260 Peak 4		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1260 Peak 5		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1262 Peak 1		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1262 Peak 2		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1262 Peak 3		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1262 Peak 4		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1262 Peak 5		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1268 Peak 1		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1268 Peak 2		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1268 Peak 3		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1268 Peak 4		Invalid Compound ID	mooret	02/06/19 10:46
PCB-1268 Peak 5		Invalid Compound ID	mooret	02/06/19 10:46

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 446463Lab Sample ID: 160-32649-1 Client Sample ID: CRC-MW-1-011519Date Analyzed: 02/05/19 16:14 Lab File ID: 02040012.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1016		Unspecified		
PCB-1221		Unspecified		
PCB-1232		Unspecified		
PCB-1242		Unspecified		
PCB-1248		Unspecified		
PCB-1254		Unspecified		
PCB-1260		Unspecified		
PCB-1262		Unspecified		
PCB-1268		Unspecified		
PCB-1016 Peak 1		Unspecified		
PCB-1016 Peak 2		Unspecified		
PCB-1016 Peak 3		Unspecified		
PCB-1016 Peak 4		Unspecified		
PCB-1016 Peak 5		Unspecified		
PCB-1221 Peak 1		Unspecified		
PCB-1221 Peak 2		Unspecified		
PCB-1221 Peak 3		Unspecified		
PCB-1232 Peak 1		Unspecified		
PCB-1232 Peak 2		Unspecified		
PCB-1232 Peak 3		Unspecified		
PCB-1232 Peak 4		Unspecified		
PCB-1232 Peak 5		Unspecified		
PCB-1242 Peak 1		Unspecified		
PCB-1242 Peak 2		Unspecified		
PCB-1242 Peak 3		Unspecified		
PCB-1242 Peak 4		Unspecified		
PCB-1242 Peak 5		Unspecified		
PCB-1248 Peak 1		Unspecified		
PCB-1248 Peak 2		Unspecified		
PCB-1248 Peak 3		Unspecified		

PCBS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Analysis Batch Number: 446463Lab Sample ID: 160-32649-1 Client Sample ID: CRC-MW-1-011519Date Analyzed: 02/05/19 16:14 Lab File ID: 02040012.D GC Column: CLP2 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-1248 Peak 4		Unspecified		
PCB-1248 Peak 5		Unspecified		
PCB-1254 Peak 1		Unspecified		
PCB-1254 Peak 2		Unspecified		
PCB-1254 Peak 3		Unspecified		
PCB-1254 Peak 4		Unspecified		
PCB-1254 Peak 5		Unspecified		
PCB-1260 Peak 1		Unspecified		
PCB-1260 Peak 2		Unspecified		
PCB-1260 Peak 3		Unspecified		
PCB-1260 Peak 4		Unspecified		
PCB-1260 Peak 5		Unspecified		
PCB-1262 Peak 1		Unspecified		
PCB-1262 Peak 2		Unspecified		
PCB-1262 Peak 3		Unspecified		
PCB-1262 Peak 4		Unspecified		
PCB-1262 Peak 5		Unspecified		
PCB-1268 Peak 1		Unspecified		
PCB-1268 Peak 2		Unspecified		
PCB-1268 Peak 3		Unspecified		
PCB-1268 Peak 4		Unspecified		
PCB-1268 Peak 5		Unspecified		

DIOXIN MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Instrument ID: D2A Analysis Batch Number: 7768Lab Sample ID: IC 140-7768/2 Client Sample ID: _____Date Analyzed: 05/16/14 14:26 Lab File ID: d3140516i1.d GC Column: RTX-5 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2,3,7,8-TCDF	29.76	Baseline	davidsonm	01/11/17 16:11
2,3,7,8-TCDD	31.87	Baseline	davidsonm	01/11/17 16:11
1,2,3,7,8-PeCDD	41.02	Shouldering	davidsonm	01/11/17 16:11
1,2,3,7,8,9-HxCDD	45.76	Shouldering	davidsonm	01/11/17 16:11
1,2,3,7,8,9-HxCDF	46.03	Shouldering	davidsonm	01/11/17 16:11
OCDD	54.30	Shouldering	davidsonm	01/11/17 16:11

DIOXIN MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Instrument ID: D2A Analysis Batch Number: 27191Lab Sample ID: WDMCCV 140-27191/1 Client Sample ID: _____Date Analyzed: 01/28/19 01:01 Lab File ID: d3190128s1.d GC Column: RTX-5 ID: 0.32 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1,2,3,7,8-PeCDD	40.66	Baseline	mcwhirter 1	01/28/19 02:04

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration	
					Reagent ID	Volume Added			
8081 LCS_00460	01/21/19	01/14/19	P&T Methanol, Lot MethanolP&T_00221	50 mL	8081HCBPrim_00002	0.5 mL	Hexachlorobenzene	0.5 ug/mL	
					8081LCSPrim_00044	0.5 mL	4,4'-DDD	0.5 ug/mL	
							4,4'-DDE	0.5 ug/mL	
							4,4'-DDT	0.5 ug/mL	
							Aldrin	0.5 ug/mL	
							alpha-BHC	0.5 ug/mL	
							alpha-Chlordane	0.5 ug/mL	
							beta-BHC	0.5 ug/mL	
							delta-BHC	0.5 ug/mL	
							Dieldrin	0.5 ug/mL	
							Endosulfan I	0.5 ug/mL	
							Endosulfan II	0.5 ug/mL	
							Endosulfan sulfate	0.5 ug/mL	
							Endrin	0.5 ug/mL	
							Endrin aldehyde	0.5 ug/mL	
							Endrin ketone	0.5 ug/mL	
							gamma-BHC (Lindane)	0.5 ug/mL	
							gamma-Chlordane	0.5 ug/mL	
							Heptachlor	0.5 ug/mL	
Heptachlor epoxide	0.5 ug/mL								
Methoxychlor	0.5 ug/mL								
.8081HCBPrim_00002	05/08/19	11/08/18	Hexane, Lot Hexane Cycl 00053	10 mL	8081HCBStkSS_00038	0.5 mL	Hexachlorobenzene	50 ug/mL	
..8081HCBStkSS_00038		11/08/19	Ultra Scientific, Lot CR-5129			(Purchased Reagent)	Hexachlorobenzene	1000 ug/mL	
.8081LCSPrim_00044	04/30/19	10/30/18	Hexane, Lot Hexane_Cycl_00053	10 mL	8081ABResPS_00030	0.25 mL	4,4'-DDD	50 ug/mL	
							4,4'-DDE	50 ug/mL	
							4,4'-DDT	50 ug/mL	
							Aldrin	50 ug/mL	
							alpha-BHC	50 ug/mL	
							alpha-Chlordane	50 ug/mL	
							beta-BHC	50 ug/mL	
							delta-BHC	50 ug/mL	
							Dieldrin	50 ug/mL	
							Endosulfan I	50 ug/mL	
							Endosulfan II	50 ug/mL	
							Endosulfan sulfate	50 ug/mL	
							Endrin	50 ug/mL	
							Endrin aldehyde	50 ug/mL	
							Endrin ketone	50 ug/mL	
							gamma-BHC (Lindane)	50 ug/mL	
							gamma-Chlordane	50 ug/mL	
							Heptachlor	50 ug/mL	
							Heptachlor epoxide	50 ug/mL	
Methoxychlor	50 ug/mL								
..8081ABResPS_00030		10/30/19	Restek, Lot A0133751			(Purchased Reagent)		4,4'-DDD	2000 ug/mL
						(Purchased Reagent)		4,4'-DDE	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4,4'-DDT	2000 ug/mL
							Aldrin	2000 ug/mL
							alpha-BHC	2000 ug/mL
							alpha-Chlordane	2000 ug/mL
							beta-BHC	2000 ug/mL
							delta-BHC	2000 ug/mL
							Dieldrin	2000 ug/mL
							Endosulfan I	2000 ug/mL
							Endosulfan II	2000 ug/mL
							Endosulfan sulfate	2000 ug/mL
							Endrin	2000 ug/mL
							Endrin aldehyde	2000 ug/mL
							Endrin ketone	2000 ug/mL
							gamma-BHC (Lindane)	2000 ug/mL
							gamma-Chlordane	2000 ug/mL
							Heptachlor	2000 ug/mL
							Heptachlor epoxide	2000 ug/mL
							Methoxychlor	2000 ug/mL
8081/82 Surr_00106	03/25/19	12/18/18	ACETONE, Lot Acetone_00232	1000 mL	AR_SURR_RES_00099	1 mL	DCB Decachlorobiphenyl	0.2 ug/mL
.AR_SURR_RES_00099	11/30/24		RESTEK, Lot A0141110		(Purchased Reagent)		Tetrachloro-m-xylene	0.2 ug/mL
							DCB Decachlorobiphenyl	200 ug/mL
							Tetrachloro-m-xylene	200 ug/mL
8081_EvalBPem_00013	02/27/19	08/27/18	Hexane, Lot 173156	100 mL	8081EvalBStk2_00020	20 uL	4,4'-DDT	0.04 ug/mL
.8081EvalBStk2_00020	02/27/19		AccuStandard, Inc, Lot 217101288		(Purchased Reagent)		Endrin	0.04 ug/mL
							4,4'-DDT	200 ug/mL
							Endrin	200 ug/mL
8081_IS_00010	06/02/19	12/03/18	Hexane, Lot 189035	500 mL	BNB stock_00016	1 mL	1-Bromo-2-nitrobenzene	2 ug/mL
.BNB stock_00016	08/31/20		Restek, Lot A0127264		(Purchased Reagent)		1-Bromo-2-nitrobenzene	1000 ug/mL
8081Icall4_00033	06/20/19	12/21/18	Hexane, Lot 194963	500 mL	8081ABCalStk_00035	25 mL	4,4'-DDD	50 ng/mL
							4,4'-DDE	50 ng/mL
							4,4'-DDT	50 ng/mL
							Aldrin	50 ng/mL
							alpha-BHC	50 ng/mL
							alpha-Chlordane	50 ng/mL
							beta-BHC	50 ng/mL
							delta-BHC	50 ng/mL
							Dieldrin	50 ng/mL
							Endosulfan I	50 ng/mL
							Endosulfan II	50 ng/mL
							Endosulfan sulfate	50 ng/mL
							Endrin	50 ng/mL
							Endrin aldehyde	50 ng/mL
							Endrin ketone	50 ng/mL
							gamma-BHC (Lindane)	50 ng/mL
							gamma-Chlordane	50 ng/mL
							Heptachlor	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.8081ABCalStk_00035	06/20/19	12/21/18	Hexane, Lot 194963	100 mL	8081ABResPS_00027	0.05 mL	Heptachlor epoxide	50 ng/mL
							Methoxychlor	50 ng/mL
							DCB Decachlorobiphenyl	50 ng/mL
							Tetrachloro-m-xylene	50 ng/mL
							4,4'-DDD	1000 ng/mL
							4,4'-DDE	1000 ng/mL
							4,4'-DDT	1000 ng/mL
							Aldrin	1000 ng/mL
							alpha-BHC	1000 ng/mL
							alpha-Chlordane	1000 ng/mL
							beta-BHC	1000 ng/mL
							delta-BHC	1000 ng/mL
							Dieldrin	1000 ng/mL
							Endosulfan I	1000 ng/mL
							Endosulfan II	1000 ng/mL
							Endosulfan sulfate	1000 ng/mL
							Endrin	1000 ng/mL
							Endrin aldehyde	1000 ng/mL
							Endrin ketone	1000 ng/mL
							gamma-BHC (Lindane)	1000 ng/mL
gamma-Chlordane	1000 ng/mL							
Heptachlor	1000 ng/mL							
Heptachlor epoxide	1000 ng/mL							
Methoxychlor	1000 ng/mL							
AR_SURR_RES_00101	0.5 mL	DCB Decachlorobiphenyl	1000 ng/mL					
Tetrachloro-m-xylene	1000 ng/mL							
..8081ABResPS_00027	07/31/21	Restek, Lot A0129369			(Purchased Reagent)		4,4'-DDD	2000 ug/mL
							4,4'-DDE	2000 ug/mL
							4,4'-DDT	2000 ug/mL
							Aldrin	2000 ug/mL
							alpha-BHC	2000 ug/mL
							alpha-Chlordane	2000 ug/mL
							beta-BHC	2000 ug/mL
							delta-BHC	2000 ug/mL
							Dieldrin	2000 ug/mL
							Endosulfan I	2000 ug/mL
							Endosulfan II	2000 ug/mL
							Endosulfan sulfate	2000 ug/mL
							Endrin	2000 ug/mL
							Endrin aldehyde	2000 ug/mL
							Endrin ketone	2000 ug/mL
							gamma-BHC (Lindane)	2000 ug/mL
							gamma-Chlordane	2000 ug/mL
							Heptachlor	2000 ug/mL
							Heptachlor epoxide	2000 ug/mL
							Methoxychlor	2000 ug/mL
..AR_SURR_RES_00101	11/30/24	RESTEK, Lot A0141110			(Purchased Reagent)		DCB Decachlorobiphenyl	200 ug/mL
							Tetrachloro-m-xylene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
8081TOXCCVL4_00015	05/12/19	11/12/18	Hexane, Lot 189045	250 mL	8081ToxPS_00039	0.1 mL	Toxaphene	2000 ng/mL
.8081ToxPS_00039	05/12/19		Restek, Lot A0128388		(Purchased Reagent)		Toxaphene	5000 ug/mL
8082 LCS_00050	03/25/19	09/25/18	ACETONE, Lot Acetone_00234	500 mL	8082LCSSSTOCK_00038	0.9 mL	PCB-1016	2 ug/mL
							PCB-1260	2 ug/mL
					8082LCSSSTOCK_00039	0.1 mL	PCB-1016	2 ug/mL
							PCB-1260	2 ug/mL
.8082LCSSSTOCK_00038	09/25/19		RESTEK, Lot A0119290		(Purchased Reagent)		PCB-1016	1000 ug/mL
							PCB-1260	1000 ug/mL
.8082LCSSSTOCK_00039	09/25/19		RESTEK, Lot A0119290		(Purchased Reagent)		PCB-1016	1000 ug/mL
							PCB-1260	1000 ug/mL
8270 LCS_Main_00060	05/31/19	12/06/18	P&T Methanol, Lot MethanolP&T_00214	500 mL	571995_00054	5 mL	1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							n-Octadecane	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					571995_00057	5 mL	Pyridine	160 ug/mL
							1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							n-Octadecane	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL
							Pyridine	160 ug/mL
					571995_00062	5 mL	1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							n-Octadecane	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL
							Pyridine	160 ug/mL
					571995_00063	5 mL	1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							n-Octadecane	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL
							Pyridine	160 ug/mL
					571995_00064	5 mL	1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							n-Octadecane	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					571995_00065	2.5 mL	Pyridine	160 ug/mL
							1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							n-Octadecane	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL
							Pyridine	160 ug/mL
					571995_00068	5 mL	1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							n-Octadecane	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL
							Pyridine	160 ug/mL
					571995_00069	5 mL	1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							n-Octadecane	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL
							Pyridine	160 ug/mL
					571995_00090	2.5 mL	1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							n-Octadecane	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					MS-569731_00101	5 mL	Pyridine	160 ug/mL
					MS-569731_00103	5 mL	Benzoic acid	80 ug/mL
							Indene	80 ug/mL
					MS-569731_00104	5 mL	Benzoic acid	80 ug/mL
							Indene	80 ug/mL
					MS-569731_00105	5 mL	Benzoic acid	80 ug/mL
							Indene	80 ug/mL
					OP-572556_00020	5 mL	Hexachlorocyclopentadiene	160 ug/mL
.571995_00054	01/31/20		Restek, Lot A0140111				OP-572556_00027	160 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							(Purchased Reagent)	
							1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							n-Octadecane	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.571995_00057	01/31/20		Restek, Lot A0140111		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							n-Octadecane	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.571995_00062	01/31/20		Restek, Lot A0140111		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							n-Octadecane	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
.571995_00063	01/31/20		Restek, Lot A0140111		(Purchased Reagent)		Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
							1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							n-Octadecane	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.571995_00064	01/31/20		Restek, Lot A0140111		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							n-Octadecane	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.571995_00065	01/31/20		Restek, Lot A0140111		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							n-Octadecane	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.571995_00068	01/31/20		Restek, Lot A0140111		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							n-Octadecane	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
.571995_00069	01/31/20		Restek, Lot A0140111		(Purchased Reagent)		Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
							1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							n-Octadecane	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.571995_00090	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							n-Octadecane	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.MS-569731_00101	10/31/19		Restek, Lot A0136865		(Purchased Reagent)		Benzoic acid	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.MS-569731_00103	10/31/19		Restek, Lot A0136865		(Purchased Reagent)		Indene	2000 ug/mL
							Benzoic acid	2000 ug/mL
.MS-569731_00104	10/31/19		Restek, Lot A0136865		(Purchased Reagent)		Indene	2000 ug/mL
							Benzoic acid	2000 ug/mL
.MS-569731_00105	10/31/19		Restek, Lot A0136865		(Purchased Reagent)		Indene	2000 ug/mL
							Benzoic acid	2000 ug/mL
.OP-572556_00020	11/30/22		Restek, Lot A0143533		(Purchased Reagent)		Hexachlorocyclopentadiene	4000 ug/mL
.OP-572556_00027	11/30/22		Restek, Lot A0143533		(Purchased Reagent)		Hexachlorocyclopentadiene	4000 ug/mL
8270_LCS_Supp_00324	01/23/19	01/16/19	P&T Methanol, Lot MethanolP&T_00220	50 mL	OP-569730_00006	1.5 mL	3,3'-Dichlorobenzidine	160 ug/mL
							Benidine	160 ug/mL
					OP-569730_00009	2.5 mL	3,3'-Dichlorobenzidine	160 ug/mL
							Benidine	160 ug/mL
					OP-569732_00009	2 mL	Atrazine	80 ug/mL
							Benzaldehyde	80 ug/mL
							Caprolactam	80 ug/mL
.OP-569730_00006	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
							Benidine	2000 ug/mL
.OP-569730_00009	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
							Benidine	2000 ug/mL
.OP-569732_00009	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Benzaldehyde	2000 ug/mL
							Caprolactam	2000 ug/mL
8270Surrogate_00130	12/12/19	12/17/18	ACETONE, Lot Acetone_00250	1000 mL	8270SurStkHL_00299	5 mL	2,4,6 - Tribromophenol	100 ug/mL
							2,4,6-Tribromophenol (Surr)	100 ug/mL
							2-Fluorobiphenyl	100 ug/mL
							2-Fluorophenol (Surr)	100 ug/mL
							Nitrobenzene-d5 (Surr)	100 ug/mL
							Phenol-d5 (Surr)	100 ug/mL
							Phenol-d6	100 ug/mL
							Terphenyl-dl4 (Surr)	100 ug/mL
					8270SurStkHL_00300	5 mL	2,4,6 - Tribromophenol	100 ug/mL
							2,4,6-Tribromophenol (Surr)	100 ug/mL
							2-Fluorobiphenyl	100 ug/mL
							2-Fluorophenol (Surr)	100 ug/mL
							Nitrobenzene-d5 (Surr)	100 ug/mL
							Phenol-d5 (Surr)	100 ug/mL
							Phenol-d6	100 ug/mL
							Terphenyl-dl4 (Surr)	100 ug/mL
					8270SurStkHL_00305	5 mL	2,4,6 - Tribromophenol	100 ug/mL
							2,4,6-Tribromophenol (Surr)	100 ug/mL
							2-Fluorobiphenyl	100 ug/mL
							2-Fluorophenol (Surr)	100 ug/mL
							Nitrobenzene-d5 (Surr)	100 ug/mL
							Phenol-d5 (Surr)	100 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					8270SurStkHL_00306	5 mL	Phenol-d6	100 ug/mL
							Terphenyl-d14 (Surr)	100 ug/mL
							2,4,6 - Tribromophenol	100 ug/mL
							2,4,6-Tribromophenol (Surr)	100 ug/mL
							2-Fluorobiphenyl	100 ug/mL
							2-Fluorophenol (Surr)	100 ug/mL
							Nitrobenzene-d5 (Surr)	100 ug/mL
							Phenol-d5 (Surr)	100 ug/mL
							Phenol-d6	100 ug/mL
							Terphenyl-d14 (Surr)	100 ug/mL
.8270SurStkHL_00299	09/30/23		Restek, Lot A01411581		(Purchased Reagent)		2,4,6 - Tribromophenol	5000 ug/mL
							2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Phenol-d6	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
.8270SurStkHL_00300	09/30/23		Restek, Lot A01411581		(Purchased Reagent)		2,4,6 - Tribromophenol	5000 ug/mL
							2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Phenol-d6	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
.8270SurStkHL_00305	09/30/23		Restek, Lot A01411581		(Purchased Reagent)		2,4,6 - Tribromophenol	5000 ug/mL
							2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Phenol-d6	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
.8270SurStkHL_00306	09/30/23		Restek, Lot A01411581		(Purchased Reagent)		2,4,6 - Tribromophenol	5000 ug/mL
							2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Phenol-d6	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
AR 1248 ICV 00014	06/06/19	12/06/18	Hexane, Lot 186983	100 mL	AR_1248_RESSs_00011	25 uL	PCB-1248	250 ng/mL
.AR 1248 RESss 00011	12/06/19		RESTEK, Lot A0124143		(Purchased Reagent)		PCB-1248	1000 ug/mL
AR_1248_L7_00018	07/08/19	01/08/19	Hexane, Lot 192742	100 mL	AR_1248_RES_00013	100 uL	PCB-1248 Peak 1	1 ug/mL
							PCB-1248 Peak 2	1 ug/mL
							PCB-1248 Peak 3	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							PCB-1248 Peak 4	1 ug/mL
							PCB-1248 Peak 5	1 ug/mL
.AR_1248_RES_00013	07/08/19		RESTEK, Lot A0130978		(Purchased Reagent)		PCB-1248 Peak 1	1000 ug/mL
							PCB-1248 Peak 2	1000 ug/mL
							PCB-1248 Peak 3	1000 ug/mL
							PCB-1248 Peak 4	1000 ug/mL
							PCB-1248 Peak 5	1000 ug/mL
AR_1660_ICV_00015	06/06/19	12/06/18	Hexane, Lot 186983	100 mL	AR_1660_RESss_00011	25 uL	PCB-1016	250 ng/mL
							PCB-1260	250 ng/mL
.AR_1660_RESss_00011	12/06/19		RESTEK, Lot A0133256		(Purchased Reagent)		PCB-1016	1000 ug/mL
							PCB-1260	1000 ug/mL
AR_1660_L7_00028	07/08/19	01/08/19	Hexane, Lot 192742	100 mL	AR_1660_RES_00002	100 uL	PCB-1016 Peak 1	1 ug/mL
							PCB-1016 Peak 2	1 ug/mL
							PCB-1016 Peak 3	1 ug/mL
							PCB-1016 Peak 4	1 ug/mL
							PCB-1016 Peak 5	1 ug/mL
							PCB-1260 Peak 1	1 ug/mL
							PCB-1260 Peak 2	1 ug/mL
							PCB-1260 Peak 3	1 ug/mL
							PCB-1260 Peak 4	1 ug/mL
							PCB-1260 Peak 5	1 ug/mL
					AR_SURR_RES_00102	25 uL	DCB Decachlorobiphenyl	0.05 ug/mL
							Tetrachloro-m-xylene	0.05 ug/mL
.AR_1660_RES_00002	07/08/19		RESTEK, Lot A0134815		(Purchased Reagent)		PCB-1016 Peak 1	1000 ug/mL
							PCB-1016 Peak 2	1000 ug/mL
							PCB-1016 Peak 3	1000 ug/mL
							PCB-1016 Peak 4	1000 ug/mL
							PCB-1016 Peak 5	1000 ug/mL
							PCB-1260 Peak 1	1000 ug/mL
							PCB-1260 Peak 2	1000 ug/mL
							PCB-1260 Peak 3	1000 ug/mL
							PCB-1260 Peak 4	1000 ug/mL
							PCB-1260 Peak 5	1000 ug/mL
.AR_SURR_RES_00102	07/08/20		RESTEK, Lot A0141110		(Purchased Reagent)		DCB Decachlorobiphenyl	200 ug/mL
							Tetrachloro-m-xylene	200 ug/mL
AR_1660_L7_00028	07/08/19	01/08/19	Hexane, Lot 192742	100 mL	AR_1660_RES_00002	100 uL	PCB-1016	1 ug/mL
							PCB-1260	1 ug/mL
.AR_1660_RES_00002	07/08/19		RESTEK, Lot A0134815		(Purchased Reagent)		PCB-1016	1000 ug/mL
							PCB-1260	1000 ug/mL
AR_2154_ICV_00015	06/06/19	12/06/18	Hexane, Lot 186983	100 mL	AR_2154_RESss_00002	25 uL	PCB-1221	250 ng/mL
							PCB-1254	250 ng/mL
.AR_2154_RESss_00002	12/06/19		RESTEK, Lot A0131779		(Purchased Reagent)		PCB-1221	1000 ug/mL
							PCB-1254	1000 ug/mL
AR_2154_L7_00022	07/08/19	01/08/19	Hexane, Lot 192742	100 mL	AR_2154_RES_00002	100 uL	PCB-1221 Peak 1	1 ug/mL
							PCB-1221 Peak 2	1 ug/mL
							PCB-1221 Peak 3	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							PCB-1254 Peak 1	1 ug/mL
							PCB-1254 Peak 2	1 ug/mL
							PCB-1254 Peak 3	1 ug/mL
							PCB-1254 Peak 4	1 ug/mL
							PCB-1254 Peak 5	1 ug/mL
.AR_2154_RES_00002	07/08/19		RESTEK, Lot A0131802		(Purchased Reagent)		PCB-1221 Peak 1	1000 ug/mL
							PCB-1221 Peak 2	1000 ug/mL
							PCB-1221 Peak 3	1000 ug/mL
							PCB-1254 Peak 1	1000 ug/mL
							PCB-1254 Peak 2	1000 ug/mL
							PCB-1254 Peak 3	1000 ug/mL
							PCB-1254 Peak 4	1000 ug/mL
							PCB-1254 Peak 5	1000 ug/mL
AR_3262_ICV_00014	06/06/19	12/06/18	Hexane, Lot 186983	100 mL	AR_3262_RESss_00001	25 uL	PCB-1232	250 ng/mL
							PCB-1262	250 ng/mL
.AR_3262_RESss_00001	12/06/19		RESTEK, Lot A0134307		(Purchased Reagent)		PCB-1232	1000 ug/mL
							PCB-1262	1000 ug/mL
AR_3262_I7_00018	07/08/19	01/08/19	Hexane, Lot 192742	100 mL	AR_3262_RES_00002	100 uL	PCB-1232 Peak 1	1 ug/mL
							PCB-1232 Peak 2	1 ug/mL
							PCB-1232 Peak 3	1 ug/mL
							PCB-1232 Peak 4	1 ug/mL
							PCB-1232 Peak 5	1 ug/mL
							PCB-1262 Peak 1	1 ug/mL
							PCB-1262 Peak 2	1 ug/mL
							PCB-1262 Peak 3	1 ug/mL
							PCB-1262 Peak 4	1 ug/mL
							PCB-1262 Peak 5	1 ug/mL
.AR_3262_RES_00002	07/08/19		RESTEK, Lot A0132023		(Purchased Reagent)		PCB-1232 Peak 1	1000 ug/mL
							PCB-1232 Peak 2	1000 ug/mL
							PCB-1232 Peak 3	1000 ug/mL
							PCB-1232 Peak 4	1000 ug/mL
							PCB-1232 Peak 5	1000 ug/mL
							PCB-1262 Peak 1	1000 ug/mL
							PCB-1262 Peak 2	1000 ug/mL
							PCB-1262 Peak 3	1000 ug/mL
							PCB-1262 Peak 4	1000 ug/mL
							PCB-1262 Peak 5	1000 ug/mL
AR_4268_ICV_00014	06/06/19	12/06/18	Hexane, Lot 186983	100 mL	AR_4268_RESss_00001	25 uL	PCB-1242	250 ng/mL
							PCB-1268	250 ng/mL
.AR_4268_RESss_00001	12/06/19		RESTEK, Lot A0133202		(Purchased Reagent)		PCB-1242	1000 ug/mL
							PCB-1268	1000 ug/mL
AR_4268_I7_00017	07/08/19	01/08/19	Hexane, Lot 192742	100 mL	AR_4268_RES_00002	100 uL	PCB-1242 Peak 1	1 ug/mL
							PCB-1242 Peak 2	1 ug/mL
							PCB-1242 Peak 3	1 ug/mL
							PCB-1242 Peak 4	1 ug/mL
							PCB-1242 Peak 5	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							PCB-1268 Peak 1	1 ug/mL
							PCB-1268 Peak 2	1 ug/mL
							PCB-1268 Peak 3	1 ug/mL
							PCB-1268 Peak 4	1 ug/mL
							PCB-1268 Peak 5	1 ug/mL
.AR_4268_RES_00002	07/08/19		RESTEK, Lot A0133093		(Purchased Reagent)		PCB-1242 Peak 1	1000 ug/mL
							PCB-1242 Peak 2	1000 ug/mL
							PCB-1242 Peak 3	1000 ug/mL
							PCB-1242 Peak 4	1000 ug/mL
							PCB-1242 Peak 5	1000 ug/mL
							PCB-1268 Peak 1	1000 ug/mL
							PCB-1268 Peak 2	1000 ug/mL
							PCB-1268 Peak 3	1000 ug/mL
							PCB-1268 Peak 4	1000 ug/mL
							PCB-1268 Peak 5	1000 ug/mL
BNB IS 00013	07/04/19	01/04/19	Hexane, Lot 192742	500 mL	BNB stock 00017	0.5 mL	1-Bromo-2-nitrobenzene	1000 ng/mL
.BNB stock_00017	07/04/19		Restek, Lot A0127264		(Purchased Reagent)		1-Bromo-2-nitrobenzene	1000 ug/mL
MS-AFCA010_00017	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-AFCA_STK_00014	25 uL	Benzidine	10 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-AFCA_STK_00014	10/31/19	11/19/18	Methylene Chloride, Lot 203837	10 mL	MS-569730 AFC_00007	1 mL	Benzidine	200 ug/mL
.MS-569730 AFC_00007	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		Benzidine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
.MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-AFCA020_00018	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-AFCA_STK_00014	50 uL	Benzidine	20 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
					Phenanthrene-d10	40 ug/mL		
.MS-AFCA_STK_00014	10/31/19	11/19/18	Methylene Chloride, Lot 203837	10 mL	MS-569730 AFC_00007	1 mL	Benzidine	200 ug/mL
..MS-569730 AFC_00007	10/31/19	Restek, Lot A0137351			(Purchased Reagent)		Benzidine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
					Perylene-d12	400 ug/mL		
					Phenanthrene-d10	400 ug/mL		
..MS-567684_00019	07/31/20	Restek, Lot A0112833			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-AFCA050_00017	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-AFCA_STK_00014	125 uL	Benzidine	50 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-AFCA_STK_00014	10/31/19	11/19/18	Methylene Chloride, Lot 203837	10 mL	MS-569730 AFC_00007	1 mL	Benzidine	200 ug/mL
..MS-569730 AFC 00007	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		Benzidine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-AFCA080_00022	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-AFCA_STK_00014	200 uL	Benzidine	80 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-AFCA_STK_00014	10/31/19	11/19/18	Methylene Chloride, Lot 203837	10 mL	MS-569730 AFC_00007	1 mL	Benzidine	200 ug/mL
..MS-569730 AFC 00007	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		Benzidine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-AFCA120_00017	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-AFCA_STK_00014	300 uL	Benzidine	120 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-AFCA_STK_00014	10/31/19	11/19/18	Methylene Chloride, Lot 203837	10 mL	MS-569730 AFC_00007	1 mL	Benzidine	200 ug/mL
..MS-569730 AFC_00007	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		Benzidine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-AFCA160_00018	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-AFCA_STK_00014	400 uL	Benzidine	160 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-AFCA_STK_00014	10/31/19	11/19/18	Methylene Chloride, Lot 203837	10 mL	MS-569730 AFC_00007	1 mL	Benzidine	200 ug/mL
..MS-569730 AFC_00007	10/31/19	Restek, Lot A0137351			(Purchased Reagent)		Benzidine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20	Restek, Lot A0112833			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-AFCA200_00017	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-AFCA_STK_00014	500 uL	Benzidine	200 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-AFCA_STK_00014	10/31/19	11/19/18	Methylene Chloride, Lot 203837	10 mL	MS-569730 AFC_00007	1 mL	Benzidine	200 ug/mL
..MS-569730 AFC 00007	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		Benzidine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-AFCACCV080_00080	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-AFCACCV080_00080	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-AFCA_STK_00014	200 uL	Benzidine	80 ug/mL
.MS-AFCA_STK_00014	10/31/19	11/19/18	Methylene Chloride, Lot 203837	10 mL	MS-569730 AFC_00007	1 mL	Benzidine	200 ug/mL
..MS-569730 AFC_00007	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		Benzidine	2000 ug/mL
MS-AFCBSSV100_00021	04/04/19	11/19/18	Methylene Chloride, Lot 203837	0.5 mL	MS-AFCB_STK_00007	250 uL	Benzidine	100 ug/mL
.MS-AFCB_STK_00007	04/30/19	06/22/18	Methylene Chloride, Lot 187286	10 mL	MS-569730SECa_00004	1 mL	Benzidine	200 ug/mL
..MS-569730SECa_00004	04/30/19		Restek, Lot A0131614		(Purchased Reagent)		Benzidine	2000 ug/mL
MS-BZHDA-CCV_00052	04/04/19	11/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-BZHDA-CCV_00052	04/04/19	11/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-BZHDA_STK_00016	200 uL	Benzaldehyde	80 ug/mL
.MS-BZHDA_STK_00016	10/31/19	11/23/18	Methylene Chloride, Lot 203837	10 mL	MS-569732 BZH_00008	1 mL	Benzaldehyde	200 ug/mL
..MS-569732 BZH_00008	10/31/19	Restek, Lot A0137125			(Purchased Reagent)		Benzaldehyde	2000 ug/mL
MS-BZHDA010_00019	04/04/19	11/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-BZHDA_STK_00016	25 uL	Benzaldehyde	10 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-BZHDA_STK_00016	10/31/19	11/23/18	Methylene Chloride, Lot 203837	10 mL	MS-569732 BZH_00008	1 mL	Benzaldehyde	200 ug/mL
..MS-569732 BZH_00008	10/31/19	Restek, Lot A0137125			(Purchased Reagent)		Benzaldehyde	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20	Restek, Lot A0112833			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
						Acenaphthene-d10	2000 ug/mL	
						Chrysene-d12	2000 ug/mL	
						Naphthalene-d8	2000 ug/mL	
						Perylene-d12	2000 ug/mL	
						Phenanthrene-d10	2000 ug/mL	
..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenanthrene-d10	2000 ug/mL
MS-BZHDA020_00019	04/04/19	11/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-BZHDA_STK_00016	50 uL	Benzaldehyde	20 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-BZHDA_STK_00016	10/31/19	11/23/18	Methylene Chloride, Lot 203837	10 mL	MS-569732 BZH_00008	1 mL	Benzaldehyde	200 ug/mL
..MS-569732 BZH_00008	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Benzaldehyde	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833				1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635				1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-BZHDA050_00018	04/04/19	11/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-BZHDA_STK_00016	125 uL	Benzaldehyde	50 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-BZHDA_STK_00016	10/31/19	11/23/18	Methylene Chloride, Lot 203837	10 mL	MS-569732 BZH_00008	1 mL	Benzaldehyde	200 ug/mL
..MS-569732 BZH_00008	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Benzaldehyde	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration							
					Reagent ID	Volume Added									
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL							
							Acenaphthene-d10	400 ug/mL							
							Chrysene-d12	400 ug/mL							
							Naphthalene-d8	400 ug/mL							
							Perylene-d12	400 ug/mL							
					MS-567684_00020	45 mL	Phenanthrene-d10	400 ug/mL							
							1,4-Dichlorobenzene-d4	400 ug/mL							
							Acenaphthene-d10	400 ug/mL							
							Chrysene-d12	400 ug/mL							
							Naphthalene-d8	400 ug/mL							
..MS-567684_00019	07/31/20	Restek, Lot A0112833			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL							
							Acenaphthene-d10	2000 ug/mL							
							Chrysene-d12	2000 ug/mL							
							Naphthalene-d8	2000 ug/mL							
							Perylene-d12	2000 ug/mL							
							Phenanthrene-d10	2000 ug/mL							
							..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
														Acenaphthene-d10	2000 ug/mL
														Chrysene-d12	2000 ug/mL
														Naphthalene-d8	2000 ug/mL
Perylene-d12	2000 ug/mL														
Phenanthrene-d10	2000 ug/mL														
MS-BZHDA080_00018	04/04/19	11/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-BZHDA_STK_00016	200 uL								Benzaldehyde	80 ug/mL
					MS-IS_00014	50 uL								1,4-Dichlorobenzene-d4	40 ug/mL
														Acenaphthene-d10	40 ug/mL
														Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL							
							Perylene-d12	40 ug/mL							
							Phenanthrene-d10	40 ug/mL							
.MS-BZHDA_STK_00016	10/31/19	11/23/18	Methylene Chloride, Lot 203837	10 mL	MS-569732 BZH_00008	1 mL	Benzaldehyde	200 ug/mL							
..MS-569732 BZH_00008	10/31/19	Restek, Lot A0137125			(Purchased Reagent)		Benzaldehyde	2000 ug/mL							
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL							
							Acenaphthene-d10	400 ug/mL							
							Chrysene-d12	400 ug/mL							
							Naphthalene-d8	400 ug/mL							
							Perylene-d12	400 ug/mL							
					MS-567684_00020	45 mL	Phenanthrene-d10	400 ug/mL							
							1,4-Dichlorobenzene-d4	400 ug/mL							
							Acenaphthene-d10	400 ug/mL							
							Chrysene-d12	400 ug/mL							
							Naphthalene-d8	400 ug/mL							
						Perylene-d12	400 ug/mL								

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-BZHDA120_00018	04/04/19	11/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-BZHDA_STK_00016	300 uL	Benzaldehyde	120 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
					.MS-BZHDA_STK_00016	10/31/19	11/23/18	Methylene Chloride, Lot 203837
..MS-569732 BZH_00008	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Benzaldehyde	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
Phenanthrene-d10	400 ug/mL							
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenanthrene-d10	2000 ug/mL
MS-BZHDA160_00018	04/04/19	11/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-BZHDA_STK_00016	400 uL	Benzaldehyde	160 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
Phenanthrene-d10	40 ug/mL							
.MS-BZHDA_STK_00016	10/31/19	11/23/18	Methylene Chloride, Lot 203837	10 mL	MS-569732 BZH_00008	1 mL	Benzaldehyde	200 ug/mL
..MS-569732 BZH_00008	10/31/19	Restek, Lot A0137125			(Purchased Reagent)		Benzaldehyde	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
				MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL	
						Acenaphthene-d10	400 ug/mL	
						Chrysene-d12	400 ug/mL	
						Naphthalene-d8	400 ug/mL	
						Perylene-d12	400 ug/mL	
						Phenanthrene-d10	400 ug/mL	
..MS-567684_00019	07/31/20	Restek, Lot A0112833			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-BZHDA200_00018	04/04/19	11/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-BZHDA_STK_00016	500 uL	Benzaldehyde	200 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
Phenanthrene-d10	40 ug/mL							
.MS-BZHDA_STK_00016	10/31/19	11/23/18	Methylene Chloride, Lot 203837	10 mL	MS-569732 BZH_00008	1 mL	Benzaldehyde	200 ug/mL
..MS-569732 BZH_00008	10/31/19	Restek, Lot A0137125			(Purchased Reagent)		Benzaldehyde	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration																													
					Reagent ID	Volume Added																															
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL																													
							Acenaphthene-d10	400 ug/mL																													
							Chrysene-d12	400 ug/mL																													
							Naphthalene-d8	400 ug/mL																													
							Perylene-d12	400 ug/mL																													
					MS-567684_00020	45 mL	Phenanthrene-d10	400 ug/mL																													
							1,4-Dichlorobenzene-d4	400 ug/mL																													
							Acenaphthene-d10	400 ug/mL																													
							Chrysene-d12	400 ug/mL																													
							Naphthalene-d8	400 ug/mL																													
..MS-567684_00019	07/31/20	Restek, Lot A0112833	(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL																																
				Acenaphthene-d10	2000 ug/mL																																
				Chrysene-d12	2000 ug/mL																																
				Naphthalene-d8	2000 ug/mL																																
				Perylene-d12	2000 ug/mL																																
				Phenanthrene-d10	2000 ug/mL																																
				..MS-567684_00020	08/31/22	Restek, Lot A0129635	(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL																												
								Acenaphthene-d10	2000 ug/mL																												
								Chrysene-d12	2000 ug/mL																												
								Naphthalene-d8	2000 ug/mL																												
Perylene-d12	2000 ug/mL																																				
Phenanthrene-d10	2000 ug/mL																																				
MS-BZHDB-SSV_00023	02/28/19	11/23/18	Methylene Chloride, Lot 203837					0.5 mL	MS-BZHDB_STK_00010	250 uL	Benzaldehyde	100 ug/mL																									
											.MS-BZHDB_STK_00010	02/28/19	07/12/18	Methylene Chloride, Lot 187286	10 mL	MS-569732SEC_00005	1 mL	Benzaldehyde	200 ug/mL																		
																		..MS-569732SEC_00005	02/28/19	Restek, Lot A0130332	(Purchased Reagent)	Benzaldehyde	2000 ug/mL														
																						MS-DFTPP_00047	01/25/19	09/04/18	Methylene Chloride, Lot 187286	20 mL	MS-47548-U_00015	1 mL	DFTPP	50 ug/mL							
				.MS-47548-U_00015	03/31/19	Supelco, Lot XA19099V	(Purchased Reagent)																						DFTPP	1000 ug/mL							
																													MS-FAM_CCV_00002	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
																																				Acenaphthene-d10	40 ug/mL
																																				Chrysene-d12	40 ug/mL
																																				Naphthalene-d8	40 ug/mL
																																				Perylene-d12	40 ug/mL
Phenanthrene-d10	40 ug/mL																																				
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545					250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL																									
											Acenaphthene-d10	400 ug/mL																									
											Chrysene-d12	400 ug/mL																									
				Naphthalene-d8	400 ug/mL																																
				Perylene-d12	400 ug/mL																																
				MS-567684_00020	45 mL	Phenanthrene-d10	400 ug/mL																														
						1,4-Dichlorobenzene-d4	400 ug/mL																														

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SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-FAM CCV_00002	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-FAM_STK_00001	200 uL	Famphur	80 ug/mL
.MS-FAM_STK_00001	11/21/19	11/21/18	Methylene Chloride, Lot 203837	10 mL	MS-568023_00044	1 mL	Famphur	200 ug/mL
..MS-568023_00044	07/31/20		Restek, Lot A0139949		(Purchased Reagent)		Famphur	2000 ug/mL
MS-FAM004_00001	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-FAM_STK_00001	10 uL	Famphur	4 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-FAM_STK_00001	11/21/19	11/21/18	Methylene Chloride, Lot 203837	10 mL	MS-568023_00044	1 mL	Famphur	200 ug/mL
..MS-568023_00044	07/31/20		Restek, Lot A0139949		(Purchased Reagent)		Famphur	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-FAM010_00001	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-FAM_STK_00001	25 uL	Famphur	10 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-FAM_STK_00001	11/21/19	11/21/18	Methylene Chloride, Lot 203837	10 mL	MS-568023_00044	1 mL	Famphur	200 ug/mL
..MS-568023_00044	07/31/20		Restek, Lot A0139949		(Purchased Reagent)		Famphur	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-FAM020_00001	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-FAM_STK_00001	50 uL	Famphur	20 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-FAM_STK_00001	11/21/19	11/21/18	Methylene Chloride, Lot 203837	10 mL	MS-568023_00044	1 mL	Famphur	200 ug/mL
..MS-568023_00044	07/31/20		Restek, Lot A0139949		(Purchased Reagent)		Famphur	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-FAM050_00001	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-FAM_STK_00001	125 uL	Famphur	50 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
.MS-FAM_STK_00001	11/21/19	11/21/18	Methylene Chloride, Lot 203837	10 mL	MS-568023_00044	1 mL	Famphur	200 ug/mL
..MS-568023_00044	07/31/20		Restek, Lot A0139949		(Purchased Reagent)		Famphur	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-FAM080_00001	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-FAM_STK_00001	200 uL	Famphur	80 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-FAM_STK_00001	11/21/19	11/21/18	Methylene Chloride, Lot 203837	10 mL	MS-568023_00044	1 mL	Famphur	200 ug/mL
..MS-568023_00044	07/31/20		Restek, Lot A0139949		(Purchased Reagent)		Famphur	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-FAM120_00001	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-FAM_STK_00001	300 uL	Famphur	120 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-FAM_STK_00001	11/21/19	11/21/18	Methylene Chloride, Lot 203837	10 mL	MS-568023_00044	1 mL	Famphur	200 ug/mL
..MS-568023_00044	07/31/20		Restek, Lot A0139949		(Purchased Reagent)		Famphur	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-FAM160_00001	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-FAM_STK_00001	400 uL	Famphur	160 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-FAM_STK_00001	11/21/19	11/21/18	Methylene Chloride, Lot 203837	10 mL	MS-568023_00044	1 mL	Famphur	200 ug/mL
..MS-568023_00044	07/31/20		Restek, Lot A0139949		(Purchased Reagent)		Famphur	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-FAM200_00001	04/04/19	11/21/18	Methylene Chloride, Lot 203837	0.5 mL	MS-FAM_STK_00001	500 uL	Famphur	200 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-FAM_STK_00001	11/21/19	11/21/18	Methylene Chloride, Lot 203837	10 mL	MS-568023_00044	1 mL	Famphur	200 ug/mL
..MS-568023_00044	07/31/20		Restek, Lot A0139949		(Purchased Reagent)		Famphur	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-FAMSSV_100_00020	04/04/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-48379_00015	250 uL	Famphur	100 ug/mL
.MS-48379_00015	08/31/21		Supelco, Lot LRAB9515		(Purchased Reagent)		Famphur	200 ug/mL
MS-HSLA004_00041	01/30/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLA_STK_00050	10 uL	2,4,6-Tribromophenol (Surr)	4 ug/mL
							2-Fluorobiphenyl	4 ug/mL
							2-Fluorophenol (Surr)	4 ug/mL
							Nitrobenzene-d5 (Surr)	4 ug/mL
							Phenol-d5 (Surr)	4 ug/mL
							Terphenyl-d14 (Surr)	4 ug/mL
							3,3'-Dichlorobenzidine	4 ug/mL
							Benzoic acid	8 ug/mL
							Atrazine	4 ug/mL
							Caprolactam	4 ug/mL
							1,1'-Biphenyl	4 ug/mL
							1,2,4,5-Tetrachlorobenzene	4 ug/mL
							1,2,4-Trichlorobenzene	4 ug/mL
							1,2-Dichlorobenzene	4 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	4.0439 ug/mL
							1,3-Dichlorobenzene	4 ug/mL
							1,3-Dinitrobenzene	4 ug/mL
							1,4-Dichlorobenzene	4 ug/mL
							1,4-Dioxane	4 ug/mL
							1-Methylnaphthalene	4 ug/mL
							2,3,4,6-Tetrachlorophenol	4 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,4,5-Trichlorophenol	4 ug/mL
							2,4,6-Trichlorophenol	4 ug/mL
							2,4-Dichlorophenol	4 ug/mL
							2,4-Dimethylphenol	4 ug/mL
							2,4-Dinitrophenol	8 ug/mL
							2,4-Dinitrotoluene	4 ug/mL
							2,6-Dichlorophenol	4 ug/mL
							2,6-Dinitrotoluene	4 ug/mL
							2-Chloronaphthalene	4 ug/mL
							2-Chlorophenol	4 ug/mL
							2-Methylnaphthalene	4 ug/mL
							2-Methylphenol	4 ug/mL
							2-Nitroaniline	4 ug/mL
							2-Nitrophenol	4 ug/mL
							3 & 4 Methylphenol	4 ug/mL
							3-Methylphenol	4 ug/mL
							3-Nitroaniline	4 ug/mL
							4,6-Dinitro-2-methylphenol	8 ug/mL
							4-Bromophenyl phenyl ether	4 ug/mL
							4-Chloro-3-methylphenol	4 ug/mL
							4-Chloroaniline	4 ug/mL
							4-Chlorophenyl phenyl ether	4 ug/mL
							4-Methylphenol	4 ug/mL
							4-Nitroaniline	4 ug/mL
							4-Nitrophenol	8 ug/mL
							Acenaphthene	4 ug/mL
							Acenaphthylene	4 ug/mL
							Acetophenone	4 ug/mL
							Aniline	4 ug/mL
							Anthracene	4 ug/mL
							Azobenzene	4 ug/mL
							Benzo[a]anthracene	4 ug/mL
							Benzo[a]pyrene	4 ug/mL
							Benzo[b]fluoranthene	4 ug/mL
							Benzo[g,h,i]perylene	4 ug/mL
							Benzo[k]fluoranthene	4 ug/mL
							Benzyl alcohol	4 ug/mL
							bis (2-chloroisopropyl) ether	4 ug/mL
							Bis (2-chloroethoxy) methane	4 ug/mL
							Bis (2-chloroethyl) ether	4 ug/mL
							Bis (2-ethylhexyl) phthalate	4 ug/mL
							Butyl benzyl phthalate	4 ug/mL
							Carbazole	4 ug/mL
							Chrysene	4 ug/mL
							Di-n-butyl phthalate	4 ug/mL
							Di-n-octyl phthalate	4 ug/mL
							Dibenz (a,h) anthracene	4 ug/mL
							Dibenzofuran	4 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Diethyl phthalate	4 ug/mL
							Dimethyl phthalate	4 ug/mL
							Diphenylamine	3.4 ug/mL
							Fluoranthene	4 ug/mL
							Fluorene	4 ug/mL
							Hexachlorobenzene	4 ug/mL
							Hexachlorobutadiene	4 ug/mL
							Hexachlorocyclopentadiene	4 ug/mL
							Hexachloroethane	4 ug/mL
							Hexadecane	4 ug/mL
							Indeno[1,2,3-cd]pyrene	4 ug/mL
							Isophorone	4 ug/mL
							n-Decane	4 ug/mL
							N-Nitrosodi-n-propylamine	4 ug/mL
							N-Nitrosodimethylamine	4 ug/mL
							N-Nitrosodiphenylamine	4 ug/mL
							Naphthalene	4 ug/mL
							Nitrobenzene	4 ug/mL
							Pentachlorophenol	8 ug/mL
							Phenanthrene	4 ug/mL
							Phenol	4 ug/mL
							Pyrene	4 ug/mL
							Pyridine	8 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
.MS-HSLA_STK_00050	01/30/19	10/01/18	Methylene Chloride, Lot 187286	10 mL	MS-567685_00004	0.4 mL	Phenanthrene-d10	40 ug/mL
							2,4,6-Tribromophenol (Surr)	200 ug/mL
							2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
					MS-569730 HSL_00008	1 mL	Phenol-d5 (Surr)	200 ug/mL
							Terphenyl-d14 (Surr)	200 ug/mL
							3,3'-Dichlorobenzidine	200 ug/mL
					MS-569731_00079	2 mL	Benzoic acid	400 ug/mL
					MS-569732 HSL_00006	1 mL	Atrazine	200 ug/mL
							Caprolactam	200 ug/mL
					MS-571995_00002	2 mL	1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							bis (2-chloroisopropyl) ether	200 ug/mL
							Bis (2-chloroethoxy) methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz(a,h)anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-567685_00004	01/30/19		Restek, Lot A0130500		(Purchased Reagent)		2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
..MS-569730 HSL_00008	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
..MS-569731_00079	03/31/19		Restek, Lot A0130477		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-569732 HSL_00006	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Caprolactam	2000 ug/mL
..MS-571995_00002	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenanthrene-d10	2000 ug/mL
MS-HSLA010_00040	01/30/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLA_STK_00050	25 uL	2,4,6-Tribromophenol (Surr)	10 ug/mL
							2-Fluorobiphenyl	10 ug/mL
							2-Fluorophenol (Surr)	10 ug/mL
							Nitrobenzene-d5 (Surr)	10 ug/mL
							Phenol-d5 (Surr)	10 ug/mL
							Terphenyl-d14 (Surr)	10 ug/mL
							3,3'-Dichlorobenzidine	10 ug/mL
							Benzoic acid	20 ug/mL
							Atrazine	10 ug/mL
							Caprolactam	10 ug/mL
							1,1'-Biphenyl	10 ug/mL
							1,2,4,5-Tetrachlorobenzene	10 ug/mL
							1,2,4-Trichlorobenzene	10 ug/mL
							1,2-Dichlorobenzene	10 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	10.1097 ug/mL
							1,3-Dichlorobenzene	10 ug/mL
							1,3-Dinitrobenzene	10 ug/mL
							1,4-Dichlorobenzene	10 ug/mL
							1,4-Dioxane	10 ug/mL
							1-Methylnaphthalene	10 ug/mL
							2,3,4,6-Tetrachlorophenol	10 ug/mL
							2,4,5-Trichlorophenol	10 ug/mL
							2,4,6-Trichlorophenol	10 ug/mL
							2,4-Dichlorophenol	10 ug/mL
							2,4-Dimethylphenol	10 ug/mL
							2,4-Dinitrophenol	20 ug/mL
							2,4-Dinitrotoluene	10 ug/mL
							2,6-Dichlorophenol	10 ug/mL
							2,6-Dinitrotoluene	10 ug/mL
							2-Chloronaphthalene	10 ug/mL
							2-Chlorophenol	10 ug/mL
							2-Methylnaphthalene	10 ug/mL
							2-Methylphenol	10 ug/mL
							2-Nitroaniline	10 ug/mL
							2-Nitrophenol	10 ug/mL
							3 & 4 Methylphenol	10 ug/mL
							3-Methylphenol	10 ug/mL
							3-Nitroaniline	10 ug/mL
							4,6-Dinitro-2-methylphenol	20 ug/mL
							4-Bromophenyl phenyl ether	10 ug/mL
							4-Chloro-3-methylphenol	10 ug/mL
							4-Chloroaniline	10 ug/mL
							4-Chlorophenyl phenyl ether	10 ug/mL
							4-Methylphenol	10 ug/mL
							4-Nitroaniline	10 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitrophenol	20 ug/mL
							Acenaphthene	10 ug/mL
							Acenaphthylene	10 ug/mL
							Acetophenone	10 ug/mL
							Aniline	10 ug/mL
							Anthracene	10 ug/mL
							Azobenzene	10 ug/mL
							Benzo[a]anthracene	10 ug/mL
							Benzo[a]pyrene	10 ug/mL
							Benzo[b]fluoranthene	10 ug/mL
							Benzo[g,h,i]perylene	10 ug/mL
							Benzo[k]fluoranthene	10 ug/mL
							Benzyl alcohol	10 ug/mL
							bis (2-chloroisopropyl) ether	10 ug/mL
							Bis (2-chloroethoxy) methane	10 ug/mL
							Bis (2-chloroethyl) ether	10 ug/mL
							Bis (2-ethylhexyl) phthalate	10 ug/mL
							Butyl benzyl phthalate	10 ug/mL
							Carbazole	10 ug/mL
							Chrysene	10 ug/mL
							Di-n-butyl phthalate	10 ug/mL
							Di-n-octyl phthalate	10 ug/mL
							Dibenz (a,h) anthracene	10 ug/mL
							Dibenzofuran	10 ug/mL
							Diethyl phthalate	10 ug/mL
							Dimethyl phthalate	10 ug/mL
							Diphenylamine	8.5 ug/mL
							Fluoranthene	10 ug/mL
							Fluorene	10 ug/mL
							Hexachlorobenzene	10 ug/mL
							Hexachlorobutadiene	10 ug/mL
							Hexachlorocyclopentadiene	10 ug/mL
							Hexachloroethane	10 ug/mL
							Hexadecane	10 ug/mL
							Indeno[1,2,3-cd]pyrene	10 ug/mL
							Isophorone	10 ug/mL
							n-Decane	10 ug/mL
							N-Nitrosodi-n-propylamine	10 ug/mL
							N-Nitrosodimethylamine	10 ug/mL
							N-Nitrosodiphenylamine	10 ug/mL
							Naphthalene	10 ug/mL
							Nitrobenzene	10 ug/mL
							Pentachlorophenol	20 ug/mL
							Phenanthrene	10 ug/mL
							Phenol	10 ug/mL
							Pyrene	10 ug/mL
							Pyridine	20 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.MS-HSLA_STK_00050	01/30/19	10/01/18	Methylene Chloride, Lot 187286	10 mL	MS-567685_00004	0.4 mL	Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
							2,4,6-Tribromophenol (Surr)	200 ug/mL
					MS-569730 HSL 00008	1 mL	2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
							Phenol-d5 (Surr)	200 ug/mL
					MS-569731 00079	2 mL	Terphenyl-d14 (Surr)	200 ug/mL
							3,3'-Dichlorobenzidine	200 ug/mL
					MS-569732 HSL_00006	1 mL	Benzoic acid	400 ug/mL
							Atrazine	200 ug/mL
					MS-571995_00002	2 mL	Caprolactam	200 ug/mL
							1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							bis (2-chloroisopropyl) ether	200 ug/mL
							Bis (2-chloroethoxy)methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz (a,h) anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-567685_00004	01/30/19		Restek, Lot A0130500		(Purchased Reagent)		2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Terphenyl-dl4 (Surr)	5000 ug/mL
..MS-569730 HSL_00008	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
..MS-569731_00079	03/31/19		Restek, Lot A0130477		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-569732 HSL_00006	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Caprolactam	2000 ug/mL
..MS-571995_00002	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration				
					Reagent ID	Volume Added						
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL				
							Acenaphthene-d10	400 ug/mL				
							Chrysene-d12	400 ug/mL				
							Naphthalene-d8	400 ug/mL				
							Perylene-d12	400 ug/mL				
					MS-567684_00020	45 mL	Phenanthrene-d10	400 ug/mL				
							1,4-Dichlorobenzene-d4	400 ug/mL				
							Acenaphthene-d10	400 ug/mL				
							Chrysene-d12	400 ug/mL				
							Naphthalene-d8	400 ug/mL				
..MS-567684_00019	07/31/20	Restek, Lot A0112833	(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL							
				Acenaphthene-d10	2000 ug/mL							
				Chrysene-d12	2000 ug/mL							
				Naphthalene-d8	2000 ug/mL							
				Perylene-d12	2000 ug/mL							
				Phenanthrene-d10	2000 ug/mL							
				..MS-567684_00020	08/31/22	Restek, Lot A0129635	(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL			
								Acenaphthene-d10	2000 ug/mL			
								Chrysene-d12	2000 ug/mL			
								Naphthalene-d8	2000 ug/mL			
Perylene-d12	2000 ug/mL											
Phenanthrene-d10	2000 ug/mL											
MS-HSLA020_00040	01/30/19	10/23/18	Methylene Chloride, Lot 203837					0.5 mL	MS-HSLA_STK_00050	50 uL	2,4,6-Tribromophenol (Surr)	20 ug/mL
											2-Fluorobiphenyl	20 ug/mL
											2-Fluorophenol (Surr)	20 ug/mL
											Nitrobenzene-d5 (Surr)	20 ug/mL
				Phenol-d5 (Surr)	20 ug/mL							
				Terphenyl-d14 (Surr)	20 ug/mL							
				3,3'-Dichlorobenzidine	20 ug/mL							
				Benzoic acid	40 ug/mL							
				Atrazine	20 ug/mL							
				Caprolactam	20 ug/mL							
				1,1'-Biphenyl	20 ug/mL							
				1,2,4,5-Tetrachlorobenzene	20 ug/mL							
				1,2,4-Trichlorobenzene	20 ug/mL							
				1,2-Dichlorobenzene	20 ug/mL							
				1,2-Diphenylhydrazine (as Azobenzene)	20.2195 ug/mL							
				1,3-Dichlorobenzene	20 ug/mL							
				1,3-Dinitrobenzene	20 ug/mL							
				1,4-Dichlorobenzene	20 ug/mL							
				1,4-Dioxane	20 ug/mL							
				1-Methylnaphthalene	20 ug/mL							
				2,3,4,6-Tetrachlorophenol	20 ug/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,4,5-Trichlorophenol	20 ug/mL
							2,4,6-Trichlorophenol	20 ug/mL
							2,4-Dichlorophenol	20 ug/mL
							2,4-Dimethylphenol	20 ug/mL
							2,4-Dinitrophenol	40 ug/mL
							2,4-Dinitrotoluene	20 ug/mL
							2,6-Dichlorophenol	20 ug/mL
							2,6-Dinitrotoluene	20 ug/mL
							2-Chloronaphthalene	20 ug/mL
							2-Chlorophenol	20 ug/mL
							2-Methylnaphthalene	20 ug/mL
							2-Methylphenol	20 ug/mL
							2-Nitroaniline	20 ug/mL
							2-Nitrophenol	20 ug/mL
							3 & 4 Methylphenol	20 ug/mL
							3-Methylphenol	20 ug/mL
							3-Nitroaniline	20 ug/mL
							4,6-Dinitro-2-methylphenol	40 ug/mL
							4-Bromophenyl phenyl ether	20 ug/mL
							4-Chloro-3-methylphenol	20 ug/mL
							4-Chloroaniline	20 ug/mL
							4-Chlorophenyl phenyl ether	20 ug/mL
							4-Methylphenol	20 ug/mL
							4-Nitroaniline	20 ug/mL
							4-Nitrophenol	40 ug/mL
							Acenaphthene	20 ug/mL
							Acenaphthylene	20 ug/mL
							Acetophenone	20 ug/mL
							Aniline	20 ug/mL
							Anthracene	20 ug/mL
							Azobenzene	20 ug/mL
							Benzo[a]anthracene	20 ug/mL
							Benzo[a]pyrene	20 ug/mL
							Benzo[b]fluoranthene	20 ug/mL
							Benzo[g,h,i]perylene	20 ug/mL
							Benzo[k]fluoranthene	20 ug/mL
							Benzyl alcohol	20 ug/mL
							bis (2-chloroisopropyl) ether	20 ug/mL
							Bis (2-chloroethoxy)methane	20 ug/mL
							Bis (2-chloroethyl) ether	20 ug/mL
							Bis (2-ethylhexyl) phthalate	20 ug/mL
							Butyl benzyl phthalate	20 ug/mL
							Carbazole	20 ug/mL
							Chrysene	20 ug/mL
							Di-n-butyl phthalate	20 ug/mL
							Di-n-octyl phthalate	20 ug/mL
							Dibenz (a,h) anthracene	20 ug/mL
							Dibenzofuran	20 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Diethyl phthalate	20 ug/mL
							Dimethyl phthalate	20 ug/mL
							Diphenylamine	17 ug/mL
							Fluoranthene	20 ug/mL
							Fluorene	20 ug/mL
							Hexachlorobenzene	20 ug/mL
							Hexachlorobutadiene	20 ug/mL
							Hexachlorocyclopentadiene	20 ug/mL
							Hexachloroethane	20 ug/mL
							Hexadecane	20 ug/mL
							Indeno[1,2,3-cd]pyrene	20 ug/mL
							Isophorone	20 ug/mL
							n-Decane	20 ug/mL
							N-Nitrosodi-n-propylamine	20 ug/mL
							N-Nitrosodimethylamine	20 ug/mL
							N-Nitrosodiphenylamine	20 ug/mL
							Naphthalene	20 ug/mL
							Nitrobenzene	20 ug/mL
							Pentachlorophenol	40 ug/mL
							Phenanthrene	20 ug/mL
							Phenol	20 ug/mL
							Pyrene	20 ug/mL
							Pyridine	40 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
.MS-HSLA_STK_00050	01/30/19	10/01/18	Methylene Chloride, Lot 187286	10 mL	MS-567685_00004	0.4 mL	Phenanthrene-d10	40 ug/mL
							2,4,6-Tribromophenol (Surr)	200 ug/mL
							2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
					MS-569730 HSL_00008	1 mL	Phenol-d5 (Surr)	200 ug/mL
							Terphenyl-d14 (Surr)	200 ug/mL
							3,3'-Dichlorobenzidine	200 ug/mL
					MS-569731_00079	2 mL	Benzoic acid	400 ug/mL
					MS-569732 HSL_00006	1 mL	Atrazine	200 ug/mL
							Caprolactam	200 ug/mL
					MS-571995_00002	2 mL	1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							bis (2-chloroisopropyl) ether	200 ug/mL
							Bis (2-chloroethoxy)methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz(a,h)anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-567685_00004	01/30/19		Restek, Lot A0130500		(Purchased Reagent)		2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
..MS-569730 HSL_00008	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
..MS-569731_00079	03/31/19		Restek, Lot A0130477		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-569732 HSL_00006	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Caprolactam	2000 ug/mL
..MS-571995_00002	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenanthrene-d10	2000 ug/mL
MS-HSLA050_00041	01/30/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLA_STK_00050	125 uL	2,4,6-Tribromophenol (Surr)	50 ug/mL
							2-Fluorobiphenyl	50 ug/mL
							2-Fluorophenol (Surr)	50 ug/mL
							Nitrobenzene-d5 (Surr)	50 ug/mL
							Phenol-d5 (Surr)	50 ug/mL
							Terphenyl-d14 (Surr)	50 ug/mL
							3,3'-Dichlorobenzidine	50 ug/mL
							Benzoic acid	100 ug/mL
							Atrazine	50 ug/mL
							Caprolactam	50 ug/mL
							1,1'-Biphenyl	50 ug/mL
							1,2,4,5-Tetrachlorobenzene	50 ug/mL
							1,2,4-Trichlorobenzene	50 ug/mL
							1,2-Dichlorobenzene	50 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	50.5487 ug/mL
							1,3-Dichlorobenzene	50 ug/mL
							1,3-Dinitrobenzene	50 ug/mL
							1,4-Dichlorobenzene	50 ug/mL
							1,4-Dioxane	50 ug/mL
							1-Methylnaphthalene	50 ug/mL
							2,3,4,6-Tetrachlorophenol	50 ug/mL
							2,4,5-Trichlorophenol	50 ug/mL
							2,4,6-Trichlorophenol	50 ug/mL
							2,4-Dichlorophenol	50 ug/mL
							2,4-Dimethylphenol	50 ug/mL
							2,4-Dinitrophenol	100 ug/mL
							2,4-Dinitrotoluene	50 ug/mL
							2,6-Dichlorophenol	50 ug/mL
							2,6-Dinitrotoluene	50 ug/mL
							2-Chloronaphthalene	50 ug/mL
							2-Chlorophenol	50 ug/mL
							2-Methylnaphthalene	50 ug/mL
							2-Methylphenol	50 ug/mL
							2-Nitroaniline	50 ug/mL
							2-Nitrophenol	50 ug/mL
							3 & 4 Methylphenol	50 ug/mL
							3-Methylphenol	50 ug/mL
							3-Nitroaniline	50 ug/mL
							4,6-Dinitro-2-methylphenol	100 ug/mL
							4-Bromophenyl phenyl ether	50 ug/mL
							4-Chloro-3-methylphenol	50 ug/mL
							4-Chloroaniline	50 ug/mL
							4-Chlorophenyl phenyl ether	50 ug/mL
							4-Methylphenol	50 ug/mL
							4-Nitroaniline	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitrophenol	100 ug/mL
							Acenaphthene	50 ug/mL
							Acenaphthylene	50 ug/mL
							Acetophenone	50 ug/mL
							Aniline	50 ug/mL
							Anthracene	50 ug/mL
							Azobenzene	50 ug/mL
							Benzo[a]anthracene	50 ug/mL
							Benzo[a]pyrene	50 ug/mL
							Benzo[b]fluoranthene	50 ug/mL
							Benzo[g,h,i]perylene	50 ug/mL
							Benzo[k]fluoranthene	50 ug/mL
							Benzyl alcohol	50 ug/mL
							bis (2-chloroisopropyl) ether	50 ug/mL
							Bis (2-chloroethoxy)methane	50 ug/mL
							Bis (2-chloroethyl) ether	50 ug/mL
							Bis (2-ethylhexyl) phthalate	50 ug/mL
							Butyl benzyl phthalate	50 ug/mL
							Carbazole	50 ug/mL
							Chrysene	50 ug/mL
							Di-n-butyl phthalate	50 ug/mL
							Di-n-octyl phthalate	50 ug/mL
							Dibenz (a,h) anthracene	50 ug/mL
							Dibenzofuran	50 ug/mL
							Diethyl phthalate	50 ug/mL
							Dimethyl phthalate	50 ug/mL
							Diphenylamine	42.5 ug/mL
							Fluoranthene	50 ug/mL
							Fluorene	50 ug/mL
							Hexachlorobenzene	50 ug/mL
							Hexachlorobutadiene	50 ug/mL
							Hexachlorocyclopentadiene	50 ug/mL
							Hexachloroethane	50 ug/mL
							Hexadecane	50 ug/mL
							Indeno[1,2,3-cd]pyrene	50 ug/mL
							Isophorone	50 ug/mL
							n-Decane	50 ug/mL
							N-Nitrosodi-n-propylamine	50 ug/mL
							N-Nitrosodimethylamine	50 ug/mL
							N-Nitrosodiphenylamine	50 ug/mL
							Naphthalene	50 ug/mL
							Nitrobenzene	50 ug/mL
							Pentachlorophenol	100 ug/mL
							Phenanthrene	50 ug/mL
							Phenol	50 ug/mL
							Pyrene	50 ug/mL
							Pyridine	100 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.MS-HSLA_STK_00050	01/30/19	10/01/18	Methylene Chloride, Lot 187286	10 mL	MS-567685_00004	0.4 mL	Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
					MS-569730 HSL 00008	1 mL	2,4,6-Tribromophenol (Surr)	200 ug/mL
							2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
							Phenol-d5 (Surr)	200 ug/mL
					MS-569731 00079	2 mL	Terphenyl-d14 (Surr)	200 ug/mL
							3,3'-Dichlorobenzidine	200 ug/mL
					MS-569732 HSL_00006	1 mL	Benzoic acid	400 ug/mL
							Atrazine	200 ug/mL
					MS-571995_00002	2 mL	Caprolactam	200 ug/mL
							1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							bis (2-chloroisopropyl) ether	200 ug/mL
							Bis (2-chloroethoxy)methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz (a,h) anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-567685_00004	01/30/19		Restek, Lot A0130500		(Purchased Reagent)		2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
..MS-569730 HSL_00008	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
..MS-569731_00079	03/31/19		Restek, Lot A0130477		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-569732 HSL_00006	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Caprolactam	2000 ug/mL
..MS-571995_00002	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration						
					Reagent ID	Volume Added								
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL						
							Acenaphthene-d10	400 ug/mL						
							Chrysene-d12	400 ug/mL						
							Naphthalene-d8	400 ug/mL						
							Perylene-d12	400 ug/mL						
					MS-567684_00020	45 mL	Phenanthrene-d10	400 ug/mL						
							1,4-Dichlorobenzene-d4	400 ug/mL						
							Acenaphthene-d10	400 ug/mL						
							Chrysene-d12	400 ug/mL						
							Naphthalene-d8	400 ug/mL						
..MS-567684_00019	07/31/20	Restek, Lot A0112833			(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL							
						Acenaphthene-d10	2000 ug/mL							
						Chrysene-d12	2000 ug/mL							
						Naphthalene-d8	2000 ug/mL							
						Perylene-d12	2000 ug/mL							
						Phenanthrene-d10	2000 ug/mL							
						..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL	
												Acenaphthene-d10	2000 ug/mL	
												Chrysene-d12	2000 ug/mL	
												Naphthalene-d8	2000 ug/mL	
Perylene-d12	2000 ug/mL													
Phenanthrene-d10	2000 ug/mL													
MS-HSLA080_00040	01/30/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLA_STK_00050							200 uL	2,4,6-Tribromophenol (Surr)	80 ug/mL
													2-Fluorobiphenyl	80 ug/mL
													2-Fluorophenol (Surr)	80 ug/mL
													Nitrobenzene-d5 (Surr)	80 ug/mL
						Phenol-d5 (Surr)	80 ug/mL							
						Terphenyl-d14 (Surr)	80 ug/mL							
						3,3'-Dichlorobenzidine	80 ug/mL							
						Benzoic acid	160 ug/mL							
						Atrazine	80 ug/mL							
						Caprolactam	80 ug/mL							
						1,1'-Biphenyl	80 ug/mL							
						1,2,4,5-Tetrachlorobenzene	80 ug/mL							
						1,2,4-Trichlorobenzene	80 ug/mL							
						1,2-Dichlorobenzene	80 ug/mL							
						1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL							
						1,3-Dichlorobenzene	80 ug/mL							
						1,3-Dinitrobenzene	80 ug/mL							
						1,4-Dichlorobenzene	80 ug/mL							
						1,4-Dioxane	80 ug/mL							
						1-Methylnaphthalene	80 ug/mL							
						2,3,4,6-Tetrachlorophenol	80 ug/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							bis (2-chloroisopropyl) ether	80 ug/mL
							Bis (2-chloroethoxy)methane	80 ug/mL
							Bis (2-chloroethyl) ether	80 ug/mL
							Bis (2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz (a,h) anthracene	80 ug/mL
							Dibenzofuran	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	80 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL
							Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL
							Pyridine	160 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
.MS-HSLA_STK_00050	01/30/19	10/01/18	Methylene Chloride, Lot 187286	10 mL	MS-567685_00004	0.4 mL	Phenanthrene-d10	40 ug/mL
							2,4,6-Tribromophenol (Surr)	200 ug/mL
							2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
					MS-569730 HSL_00008	1 mL	Phenol-d5 (Surr)	200 ug/mL
							Terphenyl-d14 (Surr)	200 ug/mL
							3,3'-Dichlorobenzidine	200 ug/mL
					MS-569731_00079	2 mL	Benzoic acid	400 ug/mL
					MS-569732 HSL_00006	1 mL	Atrazine	200 ug/mL
							Caprolactam	200 ug/mL
					MS-571995_00002	2 mL	1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							bis (2-chloroisopropyl) ether	200 ug/mL
							Bis (2-chloroethoxy)methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz(a,h)anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-567685_00004	01/30/19		Restek, Lot A0130500		(Purchased Reagent)		2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
..MS-569730 HSL_00008	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
..MS-569731_00079	03/31/19		Restek, Lot A0130477		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-569732 HSL_00006	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Caprolactam	2000 ug/mL
..MS-571995_00002	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenanthrene-d10	2000 ug/mL
MS-HSLA120_00040	01/30/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLA_STK_00050	300 uL	2,4,6-Tribromophenol (Surr)	120 ug/mL
							2-Fluorobiphenyl	120 ug/mL
							2-Fluorophenol (Surr)	120 ug/mL
							Nitrobenzene-d5 (Surr)	120 ug/mL
							Phenol-d5 (Surr)	120 ug/mL
							Terphenyl-d14 (Surr)	120 ug/mL
							3,3'-Dichlorobenzidine	120 ug/mL
							Benzoic acid	240 ug/mL
							Atrazine	120 ug/mL
							Caprolactam	120 ug/mL
							1,1'-Biphenyl	120 ug/mL
							1,2,4,5-Tetrachlorobenzene	120 ug/mL
							1,2,4-Trichlorobenzene	120 ug/mL
							1,2-Dichlorobenzene	120 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	121.317 ug/mL
							1,3-Dichlorobenzene	120 ug/mL
							1,3-Dinitrobenzene	120 ug/mL
							1,4-Dichlorobenzene	120 ug/mL
							1,4-Dioxane	120 ug/mL
							1-Methylnaphthalene	120 ug/mL
							2,3,4,6-Tetrachlorophenol	120 ug/mL
							2,4,5-Trichlorophenol	120 ug/mL
							2,4,6-Trichlorophenol	120 ug/mL
							2,4-Dichlorophenol	120 ug/mL
							2,4-Dimethylphenol	120 ug/mL
							2,4-Dinitrophenol	240 ug/mL
							2,4-Dinitrotoluene	120 ug/mL
							2,6-Dichlorophenol	120 ug/mL
							2,6-Dinitrotoluene	120 ug/mL
							2-Chloronaphthalene	120 ug/mL
							2-Chlorophenol	120 ug/mL
							2-Methylnaphthalene	120 ug/mL
							2-Methylphenol	120 ug/mL
							2-Nitroaniline	120 ug/mL
							2-Nitrophenol	120 ug/mL
							3 & 4 Methylphenol	120 ug/mL
							3-Methylphenol	120 ug/mL
							3-Nitroaniline	120 ug/mL
							4,6-Dinitro-2-methylphenol	240 ug/mL
							4-Bromophenyl phenyl ether	120 ug/mL
							4-Chloro-3-methylphenol	120 ug/mL
							4-Chloroaniline	120 ug/mL
							4-Chlorophenyl phenyl ether	120 ug/mL
							4-Methylphenol	120 ug/mL
							4-Nitroaniline	120 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitrophenol	240 ug/mL
							Acenaphthene	120 ug/mL
							Acenaphthylene	120 ug/mL
							Acetophenone	120 ug/mL
							Aniline	120 ug/mL
							Anthracene	120 ug/mL
							Azobenzene	120 ug/mL
							Benzo[a]anthracene	120 ug/mL
							Benzo[a]pyrene	120 ug/mL
							Benzo[b]fluoranthene	120 ug/mL
							Benzo[g,h,i]perylene	120 ug/mL
							Benzo[k]fluoranthene	120 ug/mL
							Benzyl alcohol	120 ug/mL
							bis (2-chloroisopropyl) ether	120 ug/mL
							Bis (2-chloroethoxy) methane	120 ug/mL
							Bis (2-chloroethyl) ether	120 ug/mL
							Bis (2-ethylhexyl) phthalate	120 ug/mL
							Butyl benzyl phthalate	120 ug/mL
							Carbazole	120 ug/mL
							Chrysene	120 ug/mL
							Di-n-butyl phthalate	120 ug/mL
							Di-n-octyl phthalate	120 ug/mL
							Dibenz (a,h) anthracene	120 ug/mL
							Dibenzofuran	120 ug/mL
							Diethyl phthalate	120 ug/mL
							Dimethyl phthalate	120 ug/mL
							Diphenylamine	102 ug/mL
							Fluoranthene	120 ug/mL
							Fluorene	120 ug/mL
							Hexachlorobenzene	120 ug/mL
							Hexachlorobutadiene	120 ug/mL
							Hexachlorocyclopentadiene	120 ug/mL
							Hexachloroethane	120 ug/mL
							Hexadecane	120 ug/mL
							Indeno[1,2,3-cd]pyrene	120 ug/mL
							Isophorone	120 ug/mL
							n-Decane	120 ug/mL
							N-Nitrosodi-n-propylamine	120 ug/mL
							N-Nitrosodimethylamine	120 ug/mL
							N-Nitrosodiphenylamine	120 ug/mL
							Naphthalene	120 ug/mL
							Nitrobenzene	120 ug/mL
							Pentachlorophenol	240 ug/mL
							Phenanthrene	120 ug/mL
							Phenol	120 ug/mL
							Pyrene	120 ug/mL
							Pyridine	240 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.MS-HSLA_STK_00050	01/30/19	10/01/18	Methylene Chloride, Lot 187286	10 mL	MS-567685_00004	0.4 mL	Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
							2,4,6-Tribromophenol (Surr)	200 ug/mL
					MS-569730 HSL 00008	1 mL	2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
							Phenol-d5 (Surr)	200 ug/mL
					MS-569731 00079	2 mL	Terphenyl-d14 (Surr)	200 ug/mL
							3,3'-Dichlorobenzidine	200 ug/mL
					MS-569732 HSL_00006	1 mL	Benzoic acid	400 ug/mL
							Atrazine	200 ug/mL
					MS-571995_00002	2 mL	Caprolactam	200 ug/mL
							1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							bis (2-chloroisopropyl) ether	200 ug/mL
							Bis (2-chloroethoxy)methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz (a,h) anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-567685_00004	01/30/19		Restek, Lot A0130500		(Purchased Reagent)		2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
..MS-569730 HSL_00008	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
..MS-569731_00079	03/31/19		Restek, Lot A0130477		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-569732 HSL_00006	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Caprolactam	2000 ug/mL
..MS-571995_00002	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration						
					Reagent ID	Volume Added								
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL						
							Acenaphthene-d10	400 ug/mL						
							Chrysene-d12	400 ug/mL						
							Naphthalene-d8	400 ug/mL						
							Perylene-d12	400 ug/mL						
					MS-567684_00020	45 mL	Phenanthrene-d10	400 ug/mL						
							1,4-Dichlorobenzene-d4	400 ug/mL						
							Acenaphthene-d10	400 ug/mL						
							Chrysene-d12	400 ug/mL						
							Naphthalene-d8	400 ug/mL						
..MS-567684_00019	07/31/20	Restek, Lot A0112833			(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL							
						Acenaphthene-d10	2000 ug/mL							
						Chrysene-d12	2000 ug/mL							
						Naphthalene-d8	2000 ug/mL							
						Perylene-d12	2000 ug/mL							
						Phenanthrene-d10	2000 ug/mL							
						..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL	
												Acenaphthene-d10	2000 ug/mL	
												Chrysene-d12	2000 ug/mL	
												Naphthalene-d8	2000 ug/mL	
Perylene-d12	2000 ug/mL													
Phenanthrene-d10	2000 ug/mL													
MS-HSLA160_00040	01/30/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLA_STK_00050							400 uL	2,4,6-Tribromophenol (Surr)	160 ug/mL
													2-Fluorobiphenyl	160 ug/mL
													2-Fluorophenol (Surr)	160 ug/mL
													Nitrobenzene-d5 (Surr)	160 ug/mL
						Phenol-d5 (Surr)	160 ug/mL							
						Terphenyl-d14 (Surr)	160 ug/mL							
						3,3'-Dichlorobenzidine	160 ug/mL							
						Benzoic acid	320 ug/mL							
						Atrazine	160 ug/mL							
						Caprolactam	160 ug/mL							
						1,1'-Biphenyl	160 ug/mL							
						1,2,4,5-Tetrachlorobenzene	160 ug/mL							
						1,2,4-Trichlorobenzene	160 ug/mL							
						1,2-Dichlorobenzene	160 ug/mL							
						1,2-Diphenylhydrazine (as Azobenzene)	161.756 ug/mL							
						1,3-Dichlorobenzene	160 ug/mL							
						1,3-Dinitrobenzene	160 ug/mL							
						1,4-Dichlorobenzene	160 ug/mL							
						1,4-Dioxane	160 ug/mL							
						1-Methylnaphthalene	160 ug/mL							
						2,3,4,6-Tetrachlorophenol	160 ug/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,4,5-Trichlorophenol	160 ug/mL
							2,4,6-Trichlorophenol	160 ug/mL
							2,4-Dichlorophenol	160 ug/mL
							2,4-Dimethylphenol	160 ug/mL
							2,4-Dinitrophenol	320 ug/mL
							2,4-Dinitrotoluene	160 ug/mL
							2,6-Dichlorophenol	160 ug/mL
							2,6-Dinitrotoluene	160 ug/mL
							2-Chloronaphthalene	160 ug/mL
							2-Chlorophenol	160 ug/mL
							2-Methylnaphthalene	160 ug/mL
							2-Methylphenol	160 ug/mL
							2-Nitroaniline	160 ug/mL
							2-Nitrophenol	160 ug/mL
							3 & 4 Methylphenol	160 ug/mL
							3-Methylphenol	160 ug/mL
							3-Nitroaniline	160 ug/mL
							4,6-Dinitro-2-methylphenol	320 ug/mL
							4-Bromophenyl phenyl ether	160 ug/mL
							4-Chloro-3-methylphenol	160 ug/mL
							4-Chloroaniline	160 ug/mL
							4-Chlorophenyl phenyl ether	160 ug/mL
							4-Methylphenol	160 ug/mL
							4-Nitroaniline	160 ug/mL
							4-Nitrophenol	320 ug/mL
							Acenaphthene	160 ug/mL
							Acenaphthylene	160 ug/mL
							Acetophenone	160 ug/mL
							Aniline	160 ug/mL
							Anthracene	160 ug/mL
							Azobenzene	160 ug/mL
							Benzo[a]anthracene	160 ug/mL
							Benzo[a]pyrene	160 ug/mL
							Benzo[b]fluoranthene	160 ug/mL
							Benzo[g,h,i]perylene	160 ug/mL
							Benzo[k]fluoranthene	160 ug/mL
							Benzyl alcohol	160 ug/mL
							bis (2-chloroisopropyl) ether	160 ug/mL
							Bis (2-chloroethoxy) methane	160 ug/mL
							Bis (2-chloroethyl) ether	160 ug/mL
							Bis (2-ethylhexyl) phthalate	160 ug/mL
							Butyl benzyl phthalate	160 ug/mL
							Carbazole	160 ug/mL
							Chrysene	160 ug/mL
							Di-n-butyl phthalate	160 ug/mL
							Di-n-octyl phthalate	160 ug/mL
							Dibenz (a,h) anthracene	160 ug/mL
							Dibenzofuran	160 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Diethyl phthalate	160 ug/mL
							Dimethyl phthalate	160 ug/mL
							Diphenylamine	136 ug/mL
							Fluoranthene	160 ug/mL
							Fluorene	160 ug/mL
							Hexachlorobenzene	160 ug/mL
							Hexachlorobutadiene	160 ug/mL
							Hexachlorocyclopentadiene	160 ug/mL
							Hexachloroethane	160 ug/mL
							Hexadecane	160 ug/mL
							Indeno[1,2,3-cd]pyrene	160 ug/mL
							Isophorone	160 ug/mL
							n-Decane	160 ug/mL
							N-Nitrosodi-n-propylamine	160 ug/mL
							N-Nitrosodimethylamine	160 ug/mL
							N-Nitrosodiphenylamine	160 ug/mL
							Naphthalene	160 ug/mL
							Nitrobenzene	160 ug/mL
							Pentachlorophenol	320 ug/mL
							Phenanthrene	160 ug/mL
							Phenol	160 ug/mL
							Pyrene	160 ug/mL
							Pyridine	320 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
.MS-HSLA_STK_00050	01/30/19	10/01/18	Methylene Chloride, Lot 187286	10 mL	MS-567685_00004	0.4 mL	Phenanthrene-d10	40 ug/mL
							2,4,6-Tribromophenol (Surr)	200 ug/mL
							2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
							Phenol-d5 (Surr)	200 ug/mL
							Terphenyl-d14 (Surr)	200 ug/mL
					MS-569730 HSL_00008	1 mL	3,3'-Dichlorobenzidine	200 ug/mL
					MS-569731_00079	2 mL	Benzoic acid	400 ug/mL
					MS-569732 HSL_00006	1 mL	Atrazine	200 ug/mL
							Caprolactam	200 ug/mL
					MS-571995_00002	2 mL	1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							bis (2-chloroisopropyl) ether	200 ug/mL
							Bis (2-chloroethoxy)methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz(a,h)anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-567685_00004	01/30/19		Restek, Lot A0130500		(Purchased Reagent)		2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
..MS-569730 HSL_00008	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
..MS-569731_00079	03/31/19		Restek, Lot A0130477		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-569732 HSL_00006	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Caprolactam	2000 ug/mL
..MS-571995_00002	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20	Restek, Lot A0112833			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenanthrene-d10	2000 ug/mL
MS-HSLA200_00040	01/30/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLA_STK_00050	500 uL	2,4,6-Tribromophenol (Surr)	200 ug/mL
							2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
							Phenol-d5 (Surr)	200 ug/mL
							Terphenyl-d14 (Surr)	200 ug/mL
							3,3'-Dichlorobenzidine	200 ug/mL
							Benzoic acid	400 ug/mL
							Atrazine	200 ug/mL
							Caprolactam	200 ug/mL
							1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							bis (2-chloroisopropyl) ether	200 ug/mL
							Bis (2-chloroethoxy) methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz (a,h) anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
					MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.MS-HSLA_STK_00050	01/30/19	10/01/18	Methylene Chloride, Lot 187286	10 mL	MS-567685_00004	0.4 mL	Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
							2,4,6-Tribromophenol (Surr)	200 ug/mL
					MS-569730 HSL 00008	1 mL	2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
							Phenol-d5 (Surr)	200 ug/mL
					MS-569731 00079	2 mL	Terphenyl-d14 (Surr)	200 ug/mL
							3,3'-Dichlorobenzidine	200 ug/mL
					MS-569732 HSL_00006	1 mL	Benzoic acid	400 ug/mL
							Atrazine	200 ug/mL
					MS-571995_00002	2 mL	Caprolactam	200 ug/mL
							1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							bis (2-chloroisopropyl) ether	200 ug/mL
							Bis (2-chloroethoxy)methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz (a,h) anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-567685_00004	01/30/19		Restek, Lot A0130500		(Purchased Reagent)		2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Terphenyl-dl4 (Surr)	5000 ug/mL
..MS-569730 HSL_00008	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
..MS-569731_00079	03/31/19		Restek, Lot A0130477		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-569732 HSL_00006	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Caprolactam	2000 ug/mL
..MS-571995_00002	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							bis (2-chloroisopropyl) ether	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
..MS-567684_00019	07/31/20	Restek, Lot A0112833	(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL			
				Acenaphthene-d10	2000 ug/mL			
				Chrysene-d12	2000 ug/mL			
				Naphthalene-d8	2000 ug/mL			
				Perylene-d12	2000 ug/mL			
..MS-567684_00020	08/31/22	Restek, Lot A0129635	(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL			
				Acenaphthene-d10	2000 ug/mL			
				Chrysene-d12	2000 ug/mL			
				Naphthalene-d8	2000 ug/mL			
				Perylene-d12	2000 ug/mL			
MS-HSLACCV080_00178	01/30/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
..MS-567684_00019	07/31/20	Restek, Lot A0112833	(Purchased Reagent)	1,4-Dichlorobenzene-d4	2000 ug/mL			
				Acenaphthene-d10	2000 ug/mL			
				Chrysene-d12	2000 ug/mL			

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-HSLACCV080_00178	01/30/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLA_STK_00048	200 uL	2,4,6-Tribromophenol (Surr)	80 ug/mL
							2-Fluorobiphenyl	80 ug/mL
							2-Fluorophenol (Surr)	80 ug/mL
							Nitrobenzene-d5 (Surr)	80 ug/mL
							Phenol-d5 (Surr)	80 ug/mL
							Terphenyl-d14 (Surr)	80 ug/mL
							Famphur	80 ug/mL
							3,3'-Dichlorobenzidine	80 ug/mL
							Benzoic acid	160 ug/mL
							Atrazine	80 ug/mL
							Caprolactam	80 ug/mL
							1,1'-Biphenyl	80 ug/mL
							1,2,4,5-Tetrachlorobenzene	80 ug/mL
							1,2,4-Trichlorobenzene	80 ug/mL
							1,2-Dichlorobenzene	80 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	80.878 ug/mL
							1,3-Dichlorobenzene	80 ug/mL
							1,3-Dinitrobenzene	80 ug/mL
							1,4-Dichlorobenzene	80 ug/mL
							1,4-Dioxane	80 ug/mL
							1-Methylnaphthalene	80 ug/mL
							2,3,4,6-Tetrachlorophenol	80 ug/mL
							2,4,5-Trichlorophenol	80 ug/mL
							2,4,6-Trichlorophenol	80 ug/mL
							2,4-Dichlorophenol	80 ug/mL
							2,4-Dimethylphenol	80 ug/mL
							2,4-Dinitrophenol	160 ug/mL
							2,4-Dinitrotoluene	80 ug/mL
							2,6-Dichlorophenol	80 ug/mL
							2,6-Dinitrotoluene	80 ug/mL
							2-Chloronaphthalene	80 ug/mL
							2-Chlorophenol	80 ug/mL
							2-Methylnaphthalene	80 ug/mL
							2-Methylphenol	80 ug/mL
							2-Nitroaniline	80 ug/mL
							2-Nitrophenol	80 ug/mL
							3 & 4 Methylphenol	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							3-Methylphenol	80 ug/mL
							3-Nitroaniline	80 ug/mL
							4,6-Dinitro-2-methylphenol	160 ug/mL
							4-Bromophenyl phenyl ether	80 ug/mL
							4-Chloro-3-methylphenol	80 ug/mL
							4-Chloroaniline	80 ug/mL
							4-Chlorophenyl phenyl ether	80 ug/mL
							4-Methylphenol	80 ug/mL
							4-Nitroaniline	80 ug/mL
							4-Nitrophenol	160 ug/mL
							Acenaphthene	80 ug/mL
							Acenaphthylene	80 ug/mL
							Acetophenone	80 ug/mL
							Aniline	80 ug/mL
							Anthracene	80 ug/mL
							Azobenzene	80 ug/mL
							Benzo[a]anthracene	80 ug/mL
							Benzo[a]pyrene	80 ug/mL
							Benzo[b]fluoranthene	80 ug/mL
							Benzo[g,h,i]perylene	80 ug/mL
							Benzo[k]fluoranthene	80 ug/mL
							Benzyl alcohol	80 ug/mL
							Bis(2-chloroethoxy)methane	80 ug/mL
							Bis(2-chloroethyl)ether	80 ug/mL
							Bis(2-ethylhexyl) phthalate	80 ug/mL
							Butyl benzyl phthalate	80 ug/mL
							Carbazole	80 ug/mL
							Chrysene	80 ug/mL
							Di-n-butyl phthalate	80 ug/mL
							Di-n-octyl phthalate	80 ug/mL
							Dibenz(a,h)anthracene	80 ug/mL
							Dibenzofuran	80 ug/mL
							Diethyl phthalate	80 ug/mL
							Dimethyl phthalate	80 ug/mL
							Diphenylamine	68 ug/mL
							Fluoranthene	80 ug/mL
							Fluorene	80 ug/mL
							Hexachlorobenzene	80 ug/mL
							Hexachlorobutadiene	80 ug/mL
							Hexachlorocyclopentadiene	80 ug/mL
							Hexachloroethane	80 ug/mL
							Hexadecane	80 ug/mL
							Indeno[1,2,3-cd]pyrene	80 ug/mL
							Isophorone	80 ug/mL
							n-Decane	80 ug/mL
							N-Nitrosodi-n-propylamine	80 ug/mL
							N-Nitrosodimethylamine	80 ug/mL
							N-Nitrosodiphenylamine	80 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.MS-HSLA_STK_00048	01/30/19	10/01/18	Methylene Chloride, Lot 187286	10 mL	MS-567685_00004	0.4 mL	Naphthalene	80 ug/mL
							Nitrobenzene	80 ug/mL
							Pentachlorophenol	160 ug/mL
							Phenanthrene	80 ug/mL
							Phenol	80 ug/mL
							Pyrene	80 ug/mL
							Pyridine	160 ug/mL
					MS-567685_00004	0.4 mL	2,4,6-Tribromophenol (Surr)	200 ug/mL
							2-Fluorobiphenyl	200 ug/mL
							2-Fluorophenol (Surr)	200 ug/mL
							Nitrobenzene-d5 (Surr)	200 ug/mL
							Phenol-d5 (Surr)	200 ug/mL
							Terphenyl-d14 (Surr)	200 ug/mL
					MS-568023_00043	1 mL	Famphur	200 ug/mL
					MS-569730_HSL_00008	1 mL	3,3'-Dichlorobenzidine	200 ug/mL
					MS-569731_00079	2 mL	Benzoic acid	400 ug/mL
					MS-569732_HSL_00006	1 mL	Atrazine	200 ug/mL
					MS-571995_00002	2 mL	Caprolactam	200 ug/mL
							1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							Bis(2-chloroethoxy)methane	200 ug/mL
							Bis(2-chloroethyl)ether	200 ug/mL
							Bis(2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz(a,h)anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-567685_00004	01/30/19		Restek, Lot A0130500		(Purchased Reagent)		2,4,6-Tribromophenol (Surr)	5000 ug/mL
							2-Fluorobiphenyl	5000 ug/mL
							2-Fluorophenol (Surr)	5000 ug/mL
							Nitrobenzene-d5 (Surr)	5000 ug/mL
							Phenol-d5 (Surr)	5000 ug/mL
							Terphenyl-d14 (Surr)	5000 ug/mL
..MS-568023_00043	06/30/20		Restek, Lot A0139090		(Purchased Reagent)		Famphur	2000 ug/mL
..MS-569730_HSL_00008	10/31/19		Restek, Lot A0137351		(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL
..MS-569731_00079	03/31/19		Restek, Lot A0130477		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-569732_HSL_00006	10/31/19		Restek, Lot A0137125		(Purchased Reagent)		Atrazine	2000 ug/mL
							Caprolactam	2000 ug/mL
..MS-571995_00002	09/30/19		Restek, Lot A0136052		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							Bis (2-chloroethoxy)methane	1000 ug/mL
							Bis (2-chloroethyl) ether	1000 ug/mL
							Bis (2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz (a,h) anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
MS-HSLB1B3SSV_00052	03/06/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL
							Chrysene-d12	40 ug/mL
							Naphthalene-d8	40 ug/mL
							Perylene-d12	40 ug/mL
							Phenanthrene-d10	40 ug/mL
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
					MS-567684_00020	45 mL	1,4-Dichlorobenzene-d4	400 ug/mL
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
..MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
..MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MS-HSLB1B3SSV_00052	03/06/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLB1_STK_00012	250 uL	Benzoic acid	200 ug/mL
							1,1'-Biphenyl	100 ug/mL
							1,2,4,5-Tetrachlorobenzene	100 ug/mL
							1,2,4-Trichlorobenzene	100 ug/mL
							1,2-Dichlorobenzene	100 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	101.097 ug/mL
							1,3-Dichlorobenzene	100 ug/mL
							1,3-Dinitrobenzene	100 ug/mL
							1,4-Dichlorobenzene	100 ug/mL
							1,4-Dioxane	100 ug/mL
							1-Methylnaphthalene	100 ug/mL
							2,3,4,6-Tetrachlorophenol	100 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,4,5-Trichlorophenol	100 ug/mL
							2,4,6-Trichlorophenol	100 ug/mL
							2,4-Dichlorophenol	100 ug/mL
							2,4-Dimethylphenol	100 ug/mL
							2,4-Dinitrophenol	200 ug/mL
							2,4-Dinitrotoluene	100 ug/mL
							2,6-Dichlorophenol	100 ug/mL
							2,6-Dinitrotoluene	100 ug/mL
							2-Chloronaphthalene	100 ug/mL
							2-Chlorophenol	100 ug/mL
							2-Methylnaphthalene	100 ug/mL
							2-Methylphenol	100 ug/mL
							2-Nitroaniline	100 ug/mL
							2-Nitrophenol	100 ug/mL
							3 & 4 Methylphenol	100 ug/mL
							3-Methylphenol	100 ug/mL
							3-Nitroaniline	100 ug/mL
							4,6-Dinitro-2-methylphenol	200 ug/mL
							4-Bromophenyl phenyl ether	100 ug/mL
							4-Chloro-3-methylphenol	100 ug/mL
							4-Chloroaniline	100 ug/mL
							4-Chlorophenyl phenyl ether	100 ug/mL
							4-Methylphenol	100 ug/mL
							4-Nitroaniline	100 ug/mL
							4-Nitrophenol	200 ug/mL
							Acenaphthene	100 ug/mL
							Acenaphthylene	100 ug/mL
							Acetophenone	100 ug/mL
							Aniline	100 ug/mL
							Anthracene	100 ug/mL
							Azobenzene	100 ug/mL
							Benzo[a]anthracene	100 ug/mL
							Benzo[a]pyrene	100 ug/mL
							Benzo[b]fluoranthene	100 ug/mL
							Benzo[g,h,i]perylene	100 ug/mL
							Benzo[k]fluoranthene	100 ug/mL
							Benzyl alcohol	100 ug/mL
							Bis (2-chloroethoxy)methane	100 ug/mL
							Bis (2-chloroethyl) ether	100 ug/mL
							Bis (2-ethylhexyl) phthalate	100 ug/mL
							Butyl benzyl phthalate	100 ug/mL
							Carbazole	100 ug/mL
							Chrysene	100 ug/mL
							Di-n-butyl phthalate	100 ug/mL
							Di-n-octyl phthalate	100 ug/mL
							Dibenz (a,h) anthracene	100 ug/mL
							Dibenzofuran	100 ug/mL
							Diethyl phthalate	100 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dimethyl phthalate	100 ug/mL
							Diphenylamine	85 ug/mL
							Fluoranthene	100 ug/mL
							Fluorene	100 ug/mL
							Hexachlorobenzene	100 ug/mL
							Hexachlorobutadiene	100 ug/mL
							Hexachlorocyclopentadiene	100 ug/mL
							Hexachloroethane	100 ug/mL
							Hexadecane	100 ug/mL
							Indeno[1,2,3-cd]pyrene	100 ug/mL
							Isophorone	100 ug/mL
							n-Decane	100 ug/mL
							N-Nitrosodi-n-propylamine	100 ug/mL
							N-Nitrosodimethylamine	100 ug/mL
							N-Nitrosodiphenylamine	100 ug/mL
							Naphthalene	100 ug/mL
							Nitrobenzene	100 ug/mL
							Pentachlorophenol	200 ug/mL
							Phenanthrene	100 ug/mL
							Phenol	100 ug/mL
							Pyrene	100 ug/mL
							Pyridine	200 ug/mL
.MS-HSLB1_STK_00012	03/31/19	06/18/18	Methylene Chloride, Lot 187286	5 mL	MS-569731.SEC_00003	1 mL	Benzoic acid	400 ug/mL
					MS-571995.SEC_00002	1 mL	1,1'-Biphenyl	200 ug/mL
							1,2,4,5-Tetrachlorobenzene	200 ug/mL
							1,2,4-Trichlorobenzene	200 ug/mL
							1,2-Dichlorobenzene	200 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	202.195 ug/mL
							1,3-Dichlorobenzene	200 ug/mL
							1,3-Dinitrobenzene	200 ug/mL
							1,4-Dichlorobenzene	200 ug/mL
							1,4-Dioxane	200 ug/mL
							1-Methylnaphthalene	200 ug/mL
							2,3,4,6-Tetrachlorophenol	200 ug/mL
							2,4,5-Trichlorophenol	200 ug/mL
							2,4,6-Trichlorophenol	200 ug/mL
							2,4-Dichlorophenol	200 ug/mL
							2,4-Dimethylphenol	200 ug/mL
							2,4-Dinitrophenol	400 ug/mL
							2,4-Dinitrotoluene	200 ug/mL
							2,6-Dichlorophenol	200 ug/mL
							2,6-Dinitrotoluene	200 ug/mL
							2-Chloronaphthalene	200 ug/mL
							2-Chlorophenol	200 ug/mL
							2-Methylnaphthalene	200 ug/mL
							2-Methylphenol	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Nitroaniline	200 ug/mL
							2-Nitrophenol	200 ug/mL
							3 & 4 Methylphenol	200 ug/mL
							3-Methylphenol	200 ug/mL
							3-Nitroaniline	200 ug/mL
							4,6-Dinitro-2-methylphenol	400 ug/mL
							4-Bromophenyl phenyl ether	200 ug/mL
							4-Chloro-3-methylphenol	200 ug/mL
							4-Chloroaniline	200 ug/mL
							4-Chlorophenyl phenyl ether	200 ug/mL
							4-Methylphenol	200 ug/mL
							4-Nitroaniline	200 ug/mL
							4-Nitrophenol	400 ug/mL
							Acenaphthene	200 ug/mL
							Acenaphthylene	200 ug/mL
							Acetophenone	200 ug/mL
							Aniline	200 ug/mL
							Anthracene	200 ug/mL
							Azobenzene	200 ug/mL
							Benzo[a]anthracene	200 ug/mL
							Benzo[a]pyrene	200 ug/mL
							Benzo[b]fluoranthene	200 ug/mL
							Benzo[g,h,i]perylene	200 ug/mL
							Benzo[k]fluoranthene	200 ug/mL
							Benzyl alcohol	200 ug/mL
							Bis (2-chloroethoxy)methane	200 ug/mL
							Bis (2-chloroethyl) ether	200 ug/mL
							Bis (2-ethylhexyl) phthalate	200 ug/mL
							Butyl benzyl phthalate	200 ug/mL
							Carbazole	200 ug/mL
							Chrysene	200 ug/mL
							Di-n-butyl phthalate	200 ug/mL
							Di-n-octyl phthalate	200 ug/mL
							Dibenz (a,h) anthracene	200 ug/mL
							Dibenzofuran	200 ug/mL
							Diethyl phthalate	200 ug/mL
							Dimethyl phthalate	200 ug/mL
							Diphenylamine	170 ug/mL
							Fluoranthene	200 ug/mL
							Fluorene	200 ug/mL
							Hexachlorobenzene	200 ug/mL
							Hexachlorobutadiene	200 ug/mL
							Hexachlorocyclopentadiene	200 ug/mL
							Hexachloroethane	200 ug/mL
							Hexadecane	200 ug/mL
							Indeno[1,2,3-cd]pyrene	200 ug/mL
							Isophorone	200 ug/mL
							n-Decane	200 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-Nitrosodi-n-propylamine	200 ug/mL
							N-Nitrosodimethylamine	200 ug/mL
							N-Nitrosodiphenylamine	200 ug/mL
							Naphthalene	200 ug/mL
							Nitrobenzene	200 ug/mL
							Pentachlorophenol	400 ug/mL
							Phenanthrene	200 ug/mL
							Phenol	200 ug/mL
							Pyrene	200 ug/mL
							Pyridine	400 ug/mL
..MS-569731.SEC_00003	05/31/19		Restek, Lot A0132859		(Purchased Reagent)		Benzoic acid	2000 ug/mL
..MS-571995.SEC_00002	03/31/19		Restek, Lot A0131190		(Purchased Reagent)		1,1'-Biphenyl	1000 ug/mL
							1,2,4,5-Tetrachlorobenzene	1000 ug/mL
							1,2,4-Trichlorobenzene	1000 ug/mL
							1,2-Dichlorobenzene	1000 ug/mL
							1,2-Diphenylhydrazine (as Azobenzene)	1010.97 ug/mL
							1,3-Dichlorobenzene	1000 ug/mL
							1,3-Dinitrobenzene	1000 ug/mL
							1,4-Dichlorobenzene	1000 ug/mL
							1,4-Dioxane	1000 ug/mL
							1-Methylnaphthalene	1000 ug/mL
							2,3,4,6-Tetrachlorophenol	1000 ug/mL
							2,4,5-Trichlorophenol	1000 ug/mL
							2,4,6-Trichlorophenol	1000 ug/mL
							2,4-Dichlorophenol	1000 ug/mL
							2,4-Dimethylphenol	1000 ug/mL
							2,4-Dinitrophenol	2000 ug/mL
							2,4-Dinitrotoluene	1000 ug/mL
							2,6-Dichlorophenol	1000 ug/mL
							2,6-Dinitrotoluene	1000 ug/mL
							2-Chloronaphthalene	1000 ug/mL
							2-Chlorophenol	1000 ug/mL
							2-Methylnaphthalene	1000 ug/mL
							2-Methylphenol	1000 ug/mL
							2-Nitroaniline	1000 ug/mL
							2-Nitrophenol	1000 ug/mL
							3 & 4 Methylphenol	1000 ug/mL
							3-Methylphenol	1000 ug/mL
							3-Nitroaniline	1000 ug/mL
							4,6-Dinitro-2-methylphenol	2000 ug/mL
							4-Bromophenyl phenyl ether	1000 ug/mL
							4-Chloro-3-methylphenol	1000 ug/mL
							4-Chloroaniline	1000 ug/mL
							4-Chlorophenyl phenyl ether	1000 ug/mL
							4-Methylphenol	1000 ug/mL
							4-Nitroaniline	1000 ug/mL
							4-Nitrophenol	2000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Acenaphthene	1000 ug/mL
							Acenaphthylene	1000 ug/mL
							Acetophenone	1000 ug/mL
							Aniline	1000 ug/mL
							Anthracene	1000 ug/mL
							Azobenzene	1000 ug/mL
							Benzo[a]anthracene	1000 ug/mL
							Benzo[a]pyrene	1000 ug/mL
							Benzo[b]fluoranthene	1000 ug/mL
							Benzo[g,h,i]perylene	1000 ug/mL
							Benzo[k]fluoranthene	1000 ug/mL
							Benzyl alcohol	1000 ug/mL
							Bis(2-chloroethoxy)methane	1000 ug/mL
							Bis(2-chloroethyl)ether	1000 ug/mL
							Bis(2-ethylhexyl) phthalate	1000 ug/mL
							Butyl benzyl phthalate	1000 ug/mL
							Carbazole	1000 ug/mL
							Chrysene	1000 ug/mL
							Di-n-butyl phthalate	1000 ug/mL
							Di-n-octyl phthalate	1000 ug/mL
							Dibenz(a,h)anthracene	1000 ug/mL
							Dibenzofuran	1000 ug/mL
							Diethyl phthalate	1000 ug/mL
							Dimethyl phthalate	1000 ug/mL
							Diphenylamine	850 ug/mL
							Fluoranthene	1000 ug/mL
							Fluorene	1000 ug/mL
							Hexachlorobenzene	1000 ug/mL
							Hexachlorobutadiene	1000 ug/mL
							Hexachlorocyclopentadiene	1000 ug/mL
							Hexachloroethane	1000 ug/mL
							Hexadecane	1000 ug/mL
							Indeno[1,2,3-cd]pyrene	1000 ug/mL
							Isophorone	1000 ug/mL
							n-Decane	1000 ug/mL
							N-Nitrosodi-n-propylamine	1000 ug/mL
							N-Nitrosodimethylamine	1000 ug/mL
							N-Nitrosodiphenylamine	1000 ug/mL
							Naphthalene	1000 ug/mL
							Nitrobenzene	1000 ug/mL
							Pentachlorophenol	2000 ug/mL
							Phenanthrene	1000 ug/mL
							Phenol	1000 ug/mL
							Pyrene	1000 ug/mL
							Pyridine	2000 ug/mL
MS-HSLB2SSV_00047	02/28/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-IS_00014	50 uL	1,4-Dichlorobenzene-d4	40 ug/mL
							Acenaphthene-d10	40 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration							
					Reagent ID	Volume Added									
.MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	Chrysene-d12	40 ug/mL							
							Naphthalene-d8	40 ug/mL							
							Perylene-d12	40 ug/mL							
							Phenanthrene-d10	40 ug/mL							
							1,4-Dichlorobenzene-d4	400 ug/mL							
							Acenaphthene-d10	400 ug/mL							
					MS-567684_00020	45 mL	Chrysene-d12	400 ug/mL							
							Naphthalene-d8	400 ug/mL							
							Perylene-d12	400 ug/mL							
							Phenanthrene-d10	400 ug/mL							
							1,4-Dichlorobenzene-d4	400 ug/mL							
							Acenaphthene-d10	400 ug/mL							
..MS-567684_00019	07/31/20	Restek, Lot A0112833			(Purchased Reagent)		Chrysene-d12	400 ug/mL							
							Naphthalene-d8	400 ug/mL							
							Perylene-d12	400 ug/mL							
							Phenanthrene-d10	400 ug/mL							
							1,4-Dichlorobenzene-d4	400 ug/mL							
							Acenaphthene-d10	400 ug/mL							
							..MS-567684_00020	08/31/22	Restek, Lot A0129635			(Purchased Reagent)		Chrysene-d12	400 ug/mL
														Naphthalene-d8	400 ug/mL
														Perylene-d12	400 ug/mL
														Phenanthrene-d10	400 ug/mL
														1,4-Dichlorobenzene-d4	400 ug/mL
														Acenaphthene-d10	400 ug/mL
MS-HSLB2SSV_00047	02/28/19	10/23/18	Methylene Chloride, Lot 203837	0.5 mL	MS-HSLB2_STK_00010	250 uL								3,3'-Dichlorobenzidine	100 ug/mL
														Atrazine	100 ug/mL
														Caprolactam	100 ug/mL
.MS-HSLB2_STK_00010	02/28/19	06/18/18	Methylene Chloride, Lot 187286	10 mL	MS-569730SEC_00004	1 mL								3,3'-Dichlorobenzidine	200 ug/mL
					MS-569732HSEC_00003	1 mL								Atrazine	200 ug/mL
														Caprolactam	200 ug/mL
..MS-569730SEC_00004	04/30/19	Restek, Lot A0131614			(Purchased Reagent)		3,3'-Dichlorobenzidine	2000 ug/mL							
..MS-569732HSEC_00003	02/28/19	Restek, Lot A0130332			(Purchased Reagent)		Atrazine	2000 ug/mL							
							Caprolactam	2000 ug/mL							
MS-IS_00014	04/04/19	04/04/18	Methylene Chloride, Lot 181545	250 mL	MS-567684_00019	5 mL	1,4-Dichlorobenzene-d4	400 ug/mL							
							Acenaphthene-d10	400 ug/mL							
							Chrysene-d12	400 ug/mL							
							Naphthalene-d8	400 ug/mL							
							Perylene-d12	400 ug/mL							
					MS-567684_00020	45 mL	Phenanthrene-d10	400 ug/mL							
							1,4-Dichlorobenzene-d4	400 ug/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Acenaphthene-d10	400 ug/mL
							Chrysene-d12	400 ug/mL
							Naphthalene-d8	400 ug/mL
							Perylene-d12	400 ug/mL
							Phenanthrene-d10	400 ug/mL
.MS-567684_00019	07/31/20		Restek, Lot A0112833		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
.MS-567684_00020	08/31/22		Restek, Lot A0129635		(Purchased Reagent)		1,4-Dichlorobenzene-d4	2000 ug/mL
							Acenaphthene-d10	2000 ug/mL
							Chrysene-d12	2000 ug/mL
							Naphthalene-d8	2000 ug/mL
							Perylene-d12	2000 ug/mL
							Phenanthrene-d10	2000 ug/mL
MV-568718-D_00014	05/31/22		RESTEK, Lot A0127975		(Purchased Reagent)		1,4-Dichlorobenzene-d4	250 ug/mL
							Chlorobenzene-d5	250 ug/mL
							Fluorobenzene	250 ug/mL
							TBA-d9 (IS)	5000 ug/mL
MV-ARCH SS A_00108	04/18/19	11/01/18	P&T Methanol, Lot 196628	50 mL	MV-567650_00028	5 mL	1,2-Dichloroethane-d4 (Surr)	250 ug/mL
							4-Bromofluorobenzene (Surr)	250 ug/mL
							Dibromofluoromethane (Surr)	250 ug/mL
							Toluene-d8 (Surr)	250 ug/mL
.MV-567650_00028	11/30/22		Restek, Lot A0132615		(Purchased Reagent)		1,2-Dichloroethane-d4 (Surr)	2500 ug/mL
							4-Bromofluorobenzene (Surr)	2500 ug/mL
							Dibromofluoromethane (Surr)	2500 ug/mL
							Toluene-d8 (Surr)	2500 ug/mL
MV-BFB_00027							1,2-Dichloroethene, Total	
							1,2-Dichloroethene, Total (URS)	
							1,3-Dichloropropene, Total	
							TAH	
							Total BTEX	
							Trihalomethanes, Total	
							Unknown	
							Xylenes, Total	
							Xylenes, Total (URS)	
.MV-ST5110N1_00066	10/31/19		Ultra Scientific, Lot CH-3248Z		MV-ST5110N1_00066	1.25 mL	BFB	50 ug/mL
					(Purchased Reagent)		BFB	2000 ug/mL
MV-Gas A_00005	01/24/19	01/10/19	P&T Methanol, Lot 196628	30 mL	MV-569722_00009	600 uL	Bromomethane	50 ug/mL
							Chloroethane	50 ug/mL
							Chloromethane	50 ug/mL
							Dichlorodifluoromethane	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dichlorofluoromethane	50 ug/mL
							Trichlorofluoromethane	50 ug/mL
							Vinyl chloride	50 ug/mL
					MV-569723_00004	600 uL	2-Chloroethyl vinyl ether	50 ug/mL
.MV-569722_00009	09/30/21		RESTEK, Lot A0141380		(Purchased Reagent)		Bromomethane	2500 ug/mL
							Chloroethane	2500 ug/mL
							Chloromethane	2500 ug/mL
							Dichlorodifluoromethane	2500 ug/mL
							Dichlorofluoromethane	2500 ug/mL
							Trichlorofluoromethane	2500 ug/mL
							Vinyl chloride	2500 ug/mL
.MV-569723_00004	12/31/20		RESTEK, Lot A0133302		(Purchased Reagent)		2-Chloroethyl vinyl ether	2500 ug/mL
MV-Gas A_00006	02/04/19	01/23/19	P&T Methanol, Lot 196628	30 mL	MV-569722_00009	600 uL	Bromomethane	50 ug/mL
							Chloroethane	50 ug/mL
							Chloromethane	50 ug/mL
							Dichlorodifluoromethane	50 ug/mL
							Trichlorofluoromethane	50 ug/mL
							Vinyl chloride	50 ug/mL
.MV-569722_00009	09/30/21		RESTEK, Lot A0141380		(Purchased Reagent)		Bromomethane	2500 ug/mL
							Chloroethane	2500 ug/mL
							Chloromethane	2500 ug/mL
							Dichlorodifluoromethane	2500 ug/mL
							Trichlorofluoromethane	2500 ug/mL
							Vinyl chloride	2500 ug/mL
MV-Gas B_00006	01/24/19	01/10/19	P&T Methanol, Lot 196628	30 mL	MV-569722.sec_00005	600 uL	Bromomethane	50 ug/mL
							Chloroethane	50 ug/mL
							Chloromethane	50 ug/mL
							Dichlorodifluoromethane	50 ug/mL
							Trichlorofluoromethane	50 ug/mL
							Vinyl chloride	50 ug/mL
.MV-569722.sec_00005	06/30/20		RESTEK, Lot A0128832		(Purchased Reagent)		Bromomethane	2500 ug/mL
							Chloroethane	2500 ug/mL
							Chloromethane	2500 ug/mL
							Dichlorodifluoromethane	2500 ug/mL
							Trichlorofluoromethane	2500 ug/mL
							Vinyl chloride	2500 ug/mL
MV-Gas B_00007	02/04/19	01/23/19	P&T Methanol, Lot 196628	30 mL	MV-569722.sec_00005	600 uL	Bromomethane	50 ug/mL
							Chloroethane	50 ug/mL
							Chloromethane	50 ug/mL
							Dichlorodifluoromethane	50 ug/mL
							Trichlorofluoromethane	50 ug/mL
							Vinyl chloride	50 ug/mL
.MV-569722.sec_00005	06/30/20		RESTEK, Lot A0128832		(Purchased Reagent)		Bromomethane	2500 ug/mL
							Chloroethane	2500 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chloromethane	2500 ug/mL
							Dichlorodifluoromethane	2500 ug/mL
							Trichlorofluoromethane	2500 ug/mL
							Vinyl chloride	2500 ug/mL
MV-MegaMain B_00007	01/31/19	01/02/19	P&T Methanol, Lot 181124	50 mL	MV-568720.sec_00021	1266 uL	Acrolein	500.07 ug/mL
					MV-569721.sec_00005	800 uL	2-Butanone (MEK)	200 ug/mL
							2-Hexanone	200 ug/mL
							4-Methyl-2-pentanone (MIBK)	200 ug/mL
					MV-569723.sec_00004	1000 uL	Acetone	200 ug/mL
							2-Chloroethyl vinyl ether	50 ug/mL
					MV-569724.sec_00021	1000 uL	Vinyl acetate	100 ug/mL
					MV-569727.sec_00005	4000 uL	Cyclohexanone	2000 ug/mL
					MV-571992.sec_00002	1000 uL	1,1,1-Trichloroethane	50 ug/mL
							1,1,2,2-Tetrachloroethane	50 ug/mL
							1,1,2-Trichloroethane	50 ug/mL
							1,1,2-Trichlorotrifluoroethane	50 ug/mL
							1,1-Dichloroethane	50 ug/mL
							1,1-Dichloroethene	50 ug/mL
							1,2,3-Trichlorobenzene	50 ug/mL
							1,2,4-Trichlorobenzene	50 ug/mL
							1,2-Dibromo-3-Chloropropane	50 ug/mL
							1,2-Dibromoethane	50 ug/mL
							1,2-Dichlorobenzene	50 ug/mL
							1,2-Dichloroethane	50 ug/mL
							1,2-Dichloroethene, Total	100 ug/mL
							1,2-Dichloroethene, Total (URS)	100 ug/mL
							1,2-Dichloropropane	50 ug/mL
							1,3,5-Trimethylbenzene	50 ug/mL
							1,3-Dichlorobenzene	50 ug/mL
							1,3-Dichloropropene, Total	100 ug/mL
							1,4-Dichlorobenzene	50 ug/mL
							1,4-Dioxane	1000 ug/mL
							2-Methyl-2-propanol	500 ug/mL
							Acrylonitrile	500 ug/mL
							Benzene	50 ug/mL
							Bromoform	50 ug/mL
							Carbon disulfide	50 ug/mL
							Carbon tetrachloride	50 ug/mL
							Chlorobenzene	50 ug/mL
							Chlorobromomethane	50 ug/mL
							Chlorodibromomethane	50 ug/mL
							Chloroform	50 ug/mL
							cis-1,2-Dichloroethene	50 ug/mL
							cis-1,3-Dichloropropene	50 ug/mL
							Cyclohexane	50 ug/mL
							Dichlorobromomethane	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Ethylbenzene	50 ug/mL
							Isobutyl alcohol	1250 ug/mL
							Isopropylbenzene	50 ug/mL
							m-Xylene & p-Xylene	50 ug/mL
							Methyl acetate	100 ug/mL
							Methyl tert-butyl ether	50 ug/mL
							Methylcyclohexane	50 ug/mL
							Methylene Chloride	50 ug/mL
							o-Xylene	50 ug/mL
							Styrene	50 ug/mL
							Tetrachloroethene	50 ug/mL
							Tetrahydrofuran	100 ug/mL
							Toluene	50 ug/mL
							trans-1,2-Dichloroethene	50 ug/mL
							trans-1,3-Dichloropropene	50 ug/mL
							Trichloroethene	50 ug/mL
							Trihalomethanes, Total	200 ug/mL
					MV-CUS17739.s_00005	1250 uL	sec-Butyl Alcohol	750 ug/mL
.MV-568720.sec_00021	01/31/19		RESTEK, Lot A0139592		(Purchased Reagent)		Acrolein	19750 ug/mL
.MV-569721.sec_00005	01/31/20		RESTEK, Lot A0113880		(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
							2-Hexanone	12500 ug/mL
							4-Methyl-2-pentanone (MIBK)	12500 ug/mL
							Acetone	12500 ug/mL
.MV-569723.sec_00004	01/30/20		RESTEK, Lot A0123884		(Purchased Reagent)		2-Chloroethyl vinyl ether	2500 ug/mL
.MV-569724.sec_00021	02/28/19		RESTEK, Lot A0140470		(Purchased Reagent)		Vinyl acetate	5000 ug/mL
.MV-569727.sec_00005	10/31/20		RESTEK, Lot A0131573		(Purchased Reagent)		Cyclohexanone	25000 ug/mL
.MV-571992.sec_00002	06/30/19		RESTEK, Lot A0123775		(Purchased Reagent)		1,1,1-Trichloroethane	2500 ug/mL
							1,1,2,2-Tetrachloroethane	2500 ug/mL
							1,1,2-Trichloroethane	2500 ug/mL
							1,1,2-Trichlorotrifluoroethane	2500 ug/mL
							1,1-Dichloroethane	2500 ug/mL
							1,1-Dichloroethene	2500 ug/mL
							1,2,3-Trichlorobenzene	2500 ug/mL
							1,2,4-Trichlorobenzene	2500 ug/mL
							1,2-Dibromo-3-Chloropropane	2500 ug/mL
							1,2-Dibromoethane	2500 ug/mL
							1,2-Dichlorobenzene	2500 ug/mL
							1,2-Dichloroethane	2500 ug/mL
							1,2-Dichloroethene, Total	5000 ug/mL
							1,2-Dichloroethene, Total (URS)	5000 ug/mL
							1,2-Dichloropropane	2500 ug/mL
							1,3,5-Trimethylbenzene	2500 ug/mL
							1,3-Dichlorobenzene	2500 ug/mL
							1,3-Dichloropropene, Total	5000 ug/mL
							1,4-Dichlorobenzene	2500 ug/mL
							1,4-Dioxane	50000 ug/mL
							2-Methyl-2-propanol	25000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Acrylonitrile	25000 ug/mL
							Benzene	2500 ug/mL
							Bromoform	2500 ug/mL
							Carbon disulfide	2500 ug/mL
							Carbon tetrachloride	2500 ug/mL
							Chlorobenzene	2500 ug/mL
							Chlorobromomethane	2500 ug/mL
							Chlorodibromomethane	2500 ug/mL
							Chloroform	2500 ug/mL
							cis-1,2-Dichloroethene	2500 ug/mL
							cis-1,3-Dichloropropene	2500 ug/mL
							Cyclohexane	2500 ug/mL
							Dichlorobromomethane	2500 ug/mL
							Ethylbenzene	2500 ug/mL
							Isobutyl alcohol	62500 ug/mL
							Isopropylbenzene	2500 ug/mL
							m-Xylene & p-Xylene	2500 ug/mL
							Methyl acetate	5000 ug/mL
							Methyl tert-butyl ether	2500 ug/mL
							Methylcyclohexane	2500 ug/mL
							Methylene Chloride	2500 ug/mL
							o-Xylene	2500 ug/mL
							Styrene	2500 ug/mL
							Tetrachloroethene	2500 ug/mL
							Tetrahydrofuran	5000 ug/mL
							Toluene	2500 ug/mL
							trans-1,2-Dichloroethene	2500 ug/mL
							trans-1,3-Dichloropropene	2500 ug/mL
Trichloroethene	2500 ug/mL							
Trihalomethanes, Total	10000 ug/mL							
.MV-CUS17739.s_00005	10/31/20	Ultra, Lot CS-4706			(Purchased Reagent)		sec-Butyl Alcohol	30000 ug/mL
MV-MegaMainA_00009	01/31/19	12/15/18	P&T Methanol, Lot 181124	50 mL	MV-568720_00023	1266 uL	Acrolein	500.07 ug/mL
					MV-569721_00006	800 uL	2-Butanone (MEK)	200 ug/mL
							2-Hexanone	200 ug/mL
							4-Methyl-2-pentanone (MIBK)	200 ug/mL
							Acetone	200 ug/mL
					MV-569724_00017	1000 uL	Vinyl acetate	100 ug/mL
					MV-569727_00007	4000 uL	Cyclohexanone	2000 ug/mL
					MV-571992_00002	1000 uL	1,1,1,2-Tetrachloroethane	50 ug/mL
							1,1,1-Trichloroethane	50 ug/mL
							1,1,2,2-Tetrachloroethane	50 ug/mL
							1,1,2-Trichloroethane	50 ug/mL
							1,1,2-Trichlorotrifluoroethane	50 ug/mL
							1,1-Dichloroethane	50 ug/mL
							1,1-Dichloroethene	50 ug/mL
							1,1-Dichloropropene	50 ug/mL
							1,2,3-Trichlorobenzene	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,3-Trichloropropane	50 ug/mL
							1,2,4-Trichlorobenzene	50 ug/mL
							1,2,4-Trimethylbenzene	50 ug/mL
							1,2-Dibromo-3-Chloropropane	50 ug/mL
							1,2-Dibromoethane	50 ug/mL
							1,2-Dichlorobenzene	50 ug/mL
							1,2-Dichloroethane	50 ug/mL
							1,2-Dichloropropane	50 ug/mL
							1,3,5-Trimethylbenzene	50 ug/mL
							1,3-Dichlorobenzene	50 ug/mL
							1,3-Dichloropropane	50 ug/mL
							1,4-Dichlorobenzene	50 ug/mL
							1,4-Dioxane	1000 ug/mL
							2,2-Dichloropropane	50 ug/mL
							2-Chlorotoluene	50 ug/mL
							2-Methyl-2-propanol	500 ug/mL
							3-Chloro-1-propene	50 ug/mL
							4-Chlorotoluene	50 ug/mL
							4-Isopropyltoluene	50 ug/mL
							Acrylonitrile	500 ug/mL
							Benzene	50 ug/mL
							Bromobenzene	50 ug/mL
							Bromoform	50 ug/mL
							Carbon disulfide	50 ug/mL
							Carbon tetrachloride	50 ug/mL
							Chlorobenzene	50 ug/mL
							Chlorobromomethane	50 ug/mL
							Chlorodibromomethane	50 ug/mL
							Chloroform	50 ug/mL
							cis-1,2-Dichloroethene	50 ug/mL
							cis-1,3-Dichloropropene	50 ug/mL
							Cyclohexane	50 ug/mL
							Dibromomethane	50 ug/mL
							Dichlorobromomethane	50 ug/mL
							Ethyl ether	50 ug/mL
							Ethyl methacrylate	50 ug/mL
							Ethylbenzene	50 ug/mL
							Hexachlorobutadiene	50 ug/mL
							Hexane	50 ug/mL
							Iodomethane	50 ug/mL
							Isobutyl alcohol	1250 ug/mL
							Isopropylbenzene	50 ug/mL
							m-Xylene & p-Xylene	50 ug/mL
							Methyl acetate	100 ug/mL
							Methyl tert-butyl ether	50 ug/mL
							Methylcyclohexane	50 ug/mL
							Methylene Chloride	50 ug/mL
							n-Butylbenzene	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							n-Heptane	50 ug/mL
							N-Propylbenzene	50 ug/mL
							Naphthalene	50 ug/mL
							o-Xylene	50 ug/mL
							sec-Butylbenzene	50 ug/mL
							Styrene	50 ug/mL
							tert-Butylbenzene	50 ug/mL
							Tetrachloroethene	50 ug/mL
							Tetrahydrofuran	100 ug/mL
							Toluene	50 ug/mL
							trans-1,2-Dichloroethene	50 ug/mL
							trans-1,3-Dichloropropene	50 ug/mL
							trans-1,4-Dichloro-2-butene	50 ug/mL
							Trichloroethene	50 ug/mL
					MV-CUS17739_00004	2500 uL	1-Chlorohexane	50 ug/mL
							2-Pentanone	200 ug/mL
							sec-Butyl Alcohol	1500 ug/mL
.MV-568720_00023	03/31/19		RESTEK, Lot A0141320		(Purchased Reagent)		Acrolein	19750 ug/mL
.MV-569721_00006	10/31/20		RESTEK, Lot A0131486		(Purchased Reagent)		2-Butanone (MEK)	12500 ug/mL
							2-Hexanone	12500 ug/mL
							4-Methyl-2-pentanone (MIBK)	12500 ug/mL
							Acetone	12500 ug/mL
.MV-569724_00017	02/28/19		RESTEK, Lot A0140969		(Purchased Reagent)		Vinyl acetate	5000 ug/mL
.MV-569727_00007	02/29/20		RESTEK, Lot A0124672		(Purchased Reagent)		Cyclohexanone	25000 ug/mL
.MV-571992_00002	08/31/19		RESTEK, Lot A0123711		(Purchased Reagent)		1,1,1,2-Tetrachloroethane	2500 ug/mL
							1,1,1-Trichloroethane	2500 ug/mL
							1,1,2,2-Tetrachloroethane	2500 ug/mL
							1,1,2-Trichloroethane	2500 ug/mL
							1,1,2-Trichlorotrifluoroethane	2500 ug/mL
							1,1-Dichloroethane	2500 ug/mL
							1,1-Dichloroethene	2500 ug/mL
							1,1-Dichloropropene	2500 ug/mL
							1,2,3-Trichlorobenzene	2500 ug/mL
							1,2,3-Trichloropropene	2500 ug/mL
							1,2,4-Trichlorobenzene	2500 ug/mL
							1,2,4-Trimethylbenzene	2500 ug/mL
							1,2-Dibromo-3-Chloropropene	2500 ug/mL
							1,2-Dibromoethane	2500 ug/mL
							1,2-Dichlorobenzene	2500 ug/mL
							1,2-Dichloroethane	2500 ug/mL
							1,2-Dichloropropene	2500 ug/mL
							1,3,5-Trimethylbenzene	2500 ug/mL
							1,3-Dichlorobenzene	2500 ug/mL
							1,3-Dichloropropene	2500 ug/mL
							1,4-Dichlorobenzene	2500 ug/mL
							1,4-Dioxane	50000 ug/mL
							2,2-Dichloropropene	2500 ug/mL
							2-Chlorotoluene	2500 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Methyl-2-propanol	25000 ug/mL
							3-Chloro-1-propene	2500 ug/mL
							4-Chlorotoluene	2500 ug/mL
							4-Isopropyltoluene	2500 ug/mL
							Acrylonitrile	25000 ug/mL
							Benzene	2500 ug/mL
							Bromobenzene	2500 ug/mL
							Bromoform	2500 ug/mL
							Carbon disulfide	2500 ug/mL
							Carbon tetrachloride	2500 ug/mL
							Chlorobenzene	2500 ug/mL
							Chlorobromomethane	2500 ug/mL
							Chlorodibromomethane	2500 ug/mL
							Chloroform	2500 ug/mL
							cis-1,2-Dichloroethene	2500 ug/mL
							cis-1,3-Dichloropropene	2500 ug/mL
							Cyclohexane	2500 ug/mL
							Dibromomethane	2500 ug/mL
							Dichlorobromomethane	2500 ug/mL
							Ethyl ether	2500 ug/mL
							Ethyl methacrylate	2500 ug/mL
							Ethylbenzene	2500 ug/mL
							Hexachlorobutadiene	2500 ug/mL
							Hexane	2500 ug/mL
							Iodomethane	2500 ug/mL
							Isobutyl alcohol	62500 ug/mL
							Isopropylbenzene	2500 ug/mL
							m-Xylene & p-Xylene	2500 ug/mL
							Methyl acetate	5000 ug/mL
							Methyl tert-butyl ether	2500 ug/mL
							Methylcyclohexane	2500 ug/mL
							Methylene Chloride	2500 ug/mL
							n-Butylbenzene	2500 ug/mL
							n-Heptane	2500 ug/mL
							N-Propylbenzene	2500 ug/mL
							Naphthalene	2500 ug/mL
							o-Xylene	2500 ug/mL
							sec-Butylbenzene	2500 ug/mL
							Styrene	2500 ug/mL
							tert-Butylbenzene	2500 ug/mL
							Tetrachloroethene	2500 ug/mL
							Tetrahydrofuran	5000 ug/mL
							Toluene	2500 ug/mL
							trans-1,2-Dichloroethene	2500 ug/mL
							trans-1,3-Dichloropropene	2500 ug/mL
							trans-1,4-Dichloro-2-butene	2500 ug/mL
							Trichloroethene	2500 ug/mL
.MV-CUS17739_00004	10/31/20		Ultra, Lot CS-4707		(Purchased Reagent)		1-Chlorohexane	1000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Pentanone	4000 ug/mL
							sec-Butyl Alcohol	30000 ug/mL
MV-MegaMainA_00009	01/31/19	12/15/18	P&T Methanol, Lot 181124	50 mL	MV-569723_00004	1000 uL	2-Chloroethyl vinyl ether	50 ug/mL
					MV-571992_00002	1000 uL	1,2-Dichloroethene, Total	100 ug/mL
							1,2-Dichloroethene, Total (URS)	100 ug/mL
							Trihalomethanes, Total	200 ug/mL
.MV-569723_00004	12/31/20		RESTEK, Lot A0133302		(Purchased Reagent)		Xylenes, Total	100 ug/mL
.MV-571992_00002	08/31/19		RESTEK, Lot A0123711		(Purchased Reagent)		2-Chloroethyl vinyl ether	2500 ug/mL
							1,2-Dichloroethene, Total	5000 ug/mL
							1,2-Dichloroethene, Total (URS)	5000 ug/mL
							Trihalomethanes, Total	10000 ug/mL
							Xylenes, Total	5000 ug/mL
MV-Supp A_00033	05/19/19	11/19/18	P&T Methanol, Lot 199628	20 mL	mv-570808_00005	400 uL	1,2,3-Trimethylbenzene	50 ug/mL
							1,3,5-Trichlorobenzene	50 ug/mL
							2-Chloro-1,3-butadiene	50 ug/mL
							2-Nitropropane	100 ug/mL
							Isopropyl alcohol	500 ug/mL
							Methacrylonitrile	500 ug/mL
					mv-570809_00005	400 uL	n-Butanol	1250 ug/mL
							Ethyl acetate	100 ug/mL
							Methyl methacrylate	100 ug/mL
					mv-571993_00003	400 uL	Acetonitrile	500 ug/mL
							Isopropyl ether	50 ug/mL
							Propionitrile	500 ug/mL
							Tert-amyl methyl ether	50 ug/mL
							Tert-butyl ethyl ether	50 ug/mL
					mv-571994_00002	600 uL	Ethanol	3000 ug/mL
					mv-VO-TAOH-5_00006	2000 uL	cis-1,4-Dichloro-2-butene	100 ug/mL
.mv-570808_00005	09/30/19		Restek, Lot A0135915		(Purchased Reagent)		Ethylene oxide	5000 ug/mL
							Propene oxide	5000 ug/mL
							1,2,3-Trimethylbenzene	2500 ug/mL
							1,3,5-Trichlorobenzene	2500 ug/mL
							2-Chloro-1,3-butadiene	2500 ug/mL
							2-Nitropropane	5000 ug/mL
							Isopropyl alcohol	25000 ug/mL
.mv-570809_00005	08/31/19		Restek, Lot A0135442		(Purchased Reagent)		Methacrylonitrile	25000 ug/mL
							n-Butanol	62500 ug/mL
							Ethyl acetate	5000 ug/mL
.mv-571993_00003	07/31/20		RESTEK, Lot A0139911		(Purchased Reagent)		Methyl methacrylate	5000 ug/mL
							Acetonitrile	25000 ug/mL
							Isopropyl ether	2500 ug/mL
							Propionitrile	25000 ug/mL
							Tert-amyl methyl ether	2500 ug/mL
							Tert-butyl ethyl ether	2500 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Denver

Job No.: 160-32649-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.mv-571994_00002	11/30/20		RESTEK, Lot A0132270		(Purchased Reagent)		Ethanol	100000 ug/mL
.mv-VO-TAOH-5_00006	06/30/19		SPEX, Lot EN180524019		(Purchased Reagent)		cis-1,4-Dichloro-2-butene	1000 ug/mL
							Ethylene oxide	50000 ug/mL
							Propene oxide	50000 ug/mL
MV-Supp B_00023	03/31/19	01/02/19	P&T Methanol, Lot 127999	10 mL	mv-570808.sec_00002	200 uL	Isopropyl alcohol	500 ug/mL
							Methacrylonitrile	500 ug/mL
							n-Butanol	1250 ug/mL
					mv-570809.sec_00002	200 uL	Ethyl acetate	100 ug/mL
							Methyl methacrylate	100 ug/mL
					mv-571993.sec_00002	200 uL	Acetonitrile	500 ug/mL
							Propionitrile	500 ug/mL
					mv-571994.sec_00002	300 uL	Ethanol	3000 ug/mL
							cis-1,4-Dichloro-2-butene	100 ug/mL
					mv-VOTAOH5.se_00005	1000 uL	Ethylene oxide	5000 ug/mL
							Propene oxide	5000 ug/mL
.mv-570808.sec_00002	09/30/18		Restek, Lot A0126195		(Purchased Reagent)		Isopropyl alcohol	25000 ug/mL
							Methacrylonitrile	25000 ug/mL
							n-Butanol	62500 ug/mL
.mv-570809.sec_00002	10/31/18		Restek, Lot A0126533		(Purchased Reagent)		Ethyl acetate	5000 ug/mL
							Methyl methacrylate	5000 ug/mL
.mv-571993.sec_00002	04/30/19		RESTEK, Lot A0126826		(Purchased Reagent)		Acetonitrile	25000 ug/mL
							Propionitrile	25000 ug/mL
.mv-571994.sec_00002	06/30/20		RESTEK, Lot A0128874		(Purchased Reagent)		Ethanol	100000 ug/mL
.mv-VOTAOH5.se_00005	11/20/18		SPEX, Lot TS180524011		(Purchased Reagent)		cis-1,4-Dichloro-2-butene	1000 ug/mL
							Ethylene oxide	50000 ug/mL
							Propene oxide	50000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
10CSDFCL37CUP_00034	07/31/25	10/01/18	Hexane, Lot 196294	200 mL	10XXDFCL37INP_00001	0.02 mL	37C14-2,3,7,8-TCDD	0.2 ng/mL
.10XXDFCL37INP_00001	07/31/25	09/28/16	Nonane, Lot SHBH0333V	3 mL	10INDFCL37P_00001	0.12 mL	37C14-2,3,7,8-TCDD	2000 ng/mL
..10INDFCL37P_00001	07/31/25		Cambridge Isotope, Lot ER05211501		(Purchased Reagent)		37C14-2,3,7,8-TCDD	50 ug/mL
10IDDFC13WRKP_00051	08/31/22	12/03/18	ACETONE, Lot 179319	200 mL	10MXDFC13ISP_00020	2 mL	13C-1,2,3,4,6,7,8-HpCDD	1 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	1 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	1 ng/mL
							13C-1,2,3,4,7,8-HxCDD	1 ng/mL
							13C-1,2,3,4,7,8-HxCDF	1 ng/mL
							13C-1,2,3,6,7,8-HxCDD	1 ng/mL
							13C-1,2,3,6,7,8-HxCDF	1 ng/mL
							13C-1,2,3,7,8,9-HxCDF	1 ng/mL
							13C-1,2,3,7,8-PeCDD	1 ng/mL
							13C-1,2,3,7,8-PeCDF	1 ng/mL
							13C-2,3,4,6,7,8-HxCDF	1 ng/mL
							13C-2,3,4,7,8-PeCDF	1 ng/mL
							13C-2,3,7,8-TCDD	1 ng/mL
							13C-2,3,7,8-TCDF	1 ng/mL
							13C-OCDD	2 ng/mL
					10XX13COCDFP_00001	0.04 mL	13C-OCDF	2 ng/mL
.10MXDFC13ISP_00020	10/01/25		CIL, Lot ER05281501		(Purchased Reagent)		13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
.10XX13COCDFP_00001	08/31/22	10/20/16	Nonane, Lot SHBH0333V	5 mL	10INC13OCDFP_00001	1 mL	13C-OCDF	10 ug/mL
..10INC13OCDFP_00001	08/31/22		Cambridge Isotope, Lot ER080812-01		(Purchased Reagent)		13C-OCDF	50 ug/mL
10RSDFWRKP_00028	06/30/20	12/03/18	Nonane, Lot SHBK4119	10 mL	10XXDFRSINTP_00001	0.2 mL	13C-1,2,3,7,8,9-HxCDD	0.1 ug/mL
							13C-1,2,3,4-TCDD	0.1 ug/mL
.10XXDFRSINTP_00001	06/30/20	01/30/17	Nonane, Lot SHBH0333V	10 mL	10INDFHXCDRSP_00001	1 mL	13C-1,2,3,7,8,9-HxCDD	5 ug/mL
..10INDFHXCDRSP_00001	09/30/26		Cambridge Isotope, Lot ER08221601		10INDFTCDDRSP_00001	1 mL	13C-1,2,3,4-TCDD	5 ug/mL
..10INDFTCDDRSP_00001	06/30/20		Cambridge Isotope, Lot ER060710-01		(Purchased Reagent)		13C-1,2,3,7,8,9-HxCDD	50 ug/mL
					(Purchased Reagent)		13C-1,2,3,4-TCDD	50 ug/mL
10SPDFNATSPKP_00023	05/01/26	10/23/18	ACETONE, Lot 179319	100 mL	10XXDFNATP_00007	0.5 mL	1,2,3,4,6,7,8-HpCDD	1 ng/mL
							1,2,3,4,6,7,8-HpCDF	1 ng/mL
							1,2,3,4,7,8,9-HpCDF	1 ng/mL
							1,2,3,4,7,8-HxCDD	1 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,3,4,7,8-HxCDF	1 ng/mL
							1,2,3,6,7,8-HxCDD	1 ng/mL
							1,2,3,6,7,8-HxCDF	1 ng/mL
							1,2,3,7,8,9-HxCDD	1 ng/mL
							1,2,3,7,8,9-HxCDF	1 ng/mL
							1,2,3,7,8-PeCDD	1 ng/mL
							1,2,3,7,8-PeCDF	1 ng/mL
							2,3,4,6,7,8-HxCDF	1 ng/mL
							2,3,4,7,8-PeCDF	1 ng/mL
							2,3,7,8-TCDD	0.2 ng/mL
							2,3,7,8-TCDF	0.2 ng/mL
							OCDD	2 ng/mL
							OCDF	2 ng/mL
.10XXDFNATP_00007	05/01/26	09/18/18	Nonane, Lot SHBJ6527	3 mL	10MXDFNATP_00002	0.3 mL	1,2,3,4,6,7,8-HpCDD	200 ng/mL
							1,2,3,4,6,7,8-HpCDF	200 ng/mL
							1,2,3,4,7,8,9-HpCDF	200 ng/mL
							1,2,3,4,7,8-HxCDD	200 ng/mL
							1,2,3,4,7,8-HxCDF	200 ng/mL
							1,2,3,6,7,8-HxCDD	200 ng/mL
							1,2,3,6,7,8-HxCDF	200 ng/mL
							1,2,3,7,8,9-HxCDD	200 ng/mL
							1,2,3,7,8,9-HxCDF	200 ng/mL
							1,2,3,7,8-PeCDD	200 ng/mL
							1,2,3,7,8-PeCDF	200 ng/mL
							2,3,4,6,7,8-HxCDF	200 ng/mL
							2,3,4,7,8-PeCDF	200 ng/mL
							2,3,7,8-TCDD	40 ng/mL
							2,3,7,8-TCDF	40 ng/mL
							OCDD	400 ng/mL
							OCDF	400 ng/mL
..10MXDFNATP_00002	05/01/26	Cambridge Isotope, Lot ER02241602			(Purchased Reagent)		1,2,3,4,6,7,8-HpCDD	2000 ng/mL
							1,2,3,4,6,7,8-HpCDF	2000 ng/mL
							1,2,3,4,7,8,9-HpCDF	2000 ng/mL
							1,2,3,4,7,8-HxCDD	2000 ng/mL
							1,2,3,4,7,8-HxCDF	2000 ng/mL
							1,2,3,6,7,8-HxCDD	2000 ng/mL
							1,2,3,6,7,8-HxCDF	2000 ng/mL
							1,2,3,7,8,9-HxCDD	2000 ng/mL
							1,2,3,7,8,9-HxCDF	2000 ng/mL
							1,2,3,7,8-PeCDD	2000 ng/mL
							1,2,3,7,8-PeCDF	2000 ng/mL
							2,3,4,6,7,8-HxCDF	2000 ng/mL
							2,3,4,7,8-PeCDF	2000 ng/mL
							2,3,7,8-TCDD	400 ng/mL
							2,3,7,8-TCDF	400 ng/mL
							OCDD	4000 ng/mL
							OCDF	4000 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
61CV16130S_00005	04/01/20	04/08/15	Nonane, Lot 13CS30114	1 mL	61CV1613S_00001	1000 uL	13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,7,8-TCDD	10 ng/mL
							37C14-2,3,7,8-TCDD	10 ng/mL
					61XX13COCDFP_00001	20 uL	13C-OCDF	200 ng/mL
.61CV1613S_00001	04/01/20		WELLINGTON, Lot 13CS30114		(Purchased Reagent)		13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,7,8-TCDD	10 ng/mL
							37C14-2,3,7,8-TCDD	10 ng/mL
.61XX13COCDFP_00001	06/01/21	11/10/15	Nonane, Lot SHBC8566V	5 mL	61INC13OCDFP_00001	1 mL	13C-OCDF	10 ug/mL
..61INC13OCDFP_00001	06/01/21		Cerriliant, Lot ER062011-01		(Purchased Reagent)		13C-OCDF	50 ug/mL
61L116130P_00001	11/10/16	11/09/15	Nonane, Lot ER031611-01A	0.2 mL	61L11613P_00001	200 uL	1,2,3,4,6,7,8-HpCDD	2.5 ng/mL
							1,2,3,4,6,7,8-HpCDF	2.5 ng/mL
							1,2,3,4,7,8,9-HpCDF	2.5 ng/mL
							1,2,3,4,7,8-HxCDD	2.5 ng/mL
							1,2,3,4,7,8-HxCDF	2.5 ng/mL
							1,2,3,6,7,8-HxCDD	2.5 ng/mL
							1,2,3,6,7,8-HxCDF	2.5 ng/mL
							1,2,3,7,8,9-HxCDD	2.5 ng/mL
							1,2,3,7,8,9-HxCDF	2.5 ng/mL
							1,2,3,7,8-PeCDD	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,3,7,8-PeCDF	2.5 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	2.5 ng/mL
							2,3,4,7,8-PeCDF	2.5 ng/mL
							2,3,7,8-TCDD	0.5 ng/mL
							2,3,7,8-TCDF	0.5 ng/mL
							37Cl4-2,3,7,8-TCDD	0.5 ng/mL
							OCDD	5 ng/mL
							OCDF	5 ng/mL
					61XX13COCDFP_00001	4 uL	13C-OCDF	200 ng/mL
.61L11613P_00001	03/01/21	CERILLIANT, Lot ER031611-01A			(Purchased Reagent)		1,2,3,4,6,7,8-HpCDD	2.5 ng/mL
							1,2,3,4,6,7,8-HpCDF	2.5 ng/mL
							1,2,3,4,7,8,9-HpCDF	2.5 ng/mL
							1,2,3,4,7,8-HxCDD	2.5 ng/mL
							1,2,3,4,7,8-HxCDF	2.5 ng/mL
							1,2,3,6,7,8-HxCDD	2.5 ng/mL
							1,2,3,6,7,8-HxCDF	2.5 ng/mL
							1,2,3,7,8,9-HxCDD	2.5 ng/mL
							1,2,3,7,8,9-HxCDF	2.5 ng/mL
							1,2,3,7,8-PeCDD	2.5 ng/mL
							1,2,3,7,8-PeCDF	2.5 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	2.5 ng/mL
							2,3,4,7,8-PeCDF	2.5 ng/mL
							2,3,7,8-TCDD	0.5 ng/mL
							2,3,7,8-TCDF	0.5 ng/mL
							37C14-2,3,7,8-TCDD	0.5 ng/mL
							OCDD	5 ng/mL
							OCDF	5 ng/mL
.61XX13COCDFP_00001	06/01/21	11/10/15	Nonane, Lot SHBC8566V	5 mL	61INC13OCDFP_00001	1 mL	13C-OCDF	10 ug/mL
..61INC13OCDFP_00001	06/01/21		Cerriliant, Lot ER062011-01		(Purchased Reagent)		13C-OCDF	50 ug/mL
61L21613OP_00001	03/01/21	11/09/15	Nonane, Lot ER031611-01B	0.2 mL	61L21613P_00001	200 uL	1,2,3,4,6,7,8-HpCDD	10 ng/mL
							1,2,3,4,6,7,8-HpCDF	10 ng/mL
							1,2,3,4,7,8,9-HpCDF	10 ng/mL
							1,2,3,4,7,8-HxCDD	10 ng/mL
							1,2,3,4,7,8-HxCDF	10 ng/mL
							1,2,3,6,7,8-HxCDD	10 ng/mL
							1,2,3,6,7,8-HxCDF	10 ng/mL
							1,2,3,7,8,9-HxCDD	10 ng/mL
							1,2,3,7,8,9-HxCDF	10 ng/mL
							1,2,3,7,8-PeCDD	10 ng/mL
							1,2,3,7,8-PeCDF	10 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	10 ng/mL
							2,3,4,7,8-PeCDF	10 ng/mL
							2,3,7,8-TCDD	2 ng/mL
							2,3,7,8-TCDF	2 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							37C14-2,3,7,8-TCDD	2 ng/mL
							OCDD	20 ng/mL
							OCDF	20 ng/mL
					61XX13COCDFP_00001	4 uL	13C-OCDF	200 ng/mL
.61L21613P_00001	03/01/21		CERILLIANT, Lot ER031611-01B		(Purchased Reagent)		1,2,3,4,6,7,8-HpCDD	10 ng/mL
							1,2,3,4,6,7,8-HpCDF	10 ng/mL
							1,2,3,4,7,8,9-HpCDF	10 ng/mL
							1,2,3,4,7,8-HxCDD	10 ng/mL
							1,2,3,4,7,8-HxCDF	10 ng/mL
							1,2,3,6,7,8-HxCDD	10 ng/mL
							1,2,3,6,7,8-HxCDF	10 ng/mL
							1,2,3,7,8,9-HxCDD	10 ng/mL
							1,2,3,7,8,9-HxCDF	10 ng/mL
							1,2,3,7,8-PeCDD	10 ng/mL
							1,2,3,7,8-PeCDF	10 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	10 ng/mL
							2,3,4,7,8-PeCDF	10 ng/mL
							2,3,7,8-TCDD	2 ng/mL
							2,3,7,8-TCDF	2 ng/mL
							37C14-2,3,7,8-TCDD	2 ng/mL
							OCDD	20 ng/mL
							OCDF	20 ng/mL
.61XX13COCDFP_00001	06/01/21	11/10/15	Nonane, Lot SHBC8566V	5 mL	61INC13OCDFP_00001	1 mL	13C-OCDF	10 ug/mL
..61INC13OCDFP_00001	06/01/21		Cerriliant, Lot ER062011-01		(Purchased Reagent)		13C-OCDF	50 ug/mL
61L31613OP_00001	03/01/21	11/09/15	Nonane, Lot ER031611-01C	0.2 mL	61L31613P_00001	200 uL	1,2,3,4,6,7,8-HpCDD	50 ng/mL
							1,2,3,4,6,7,8-HpCDF	50 ng/mL
							1,2,3,4,7,8,9-HpCDF	50 ng/mL
							1,2,3,4,7,8-HxCDD	50 ng/mL
							1,2,3,4,7,8-HxCDF	50 ng/mL
							1,2,3,6,7,8-HxCDD	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,3,6,7,8-HxCDF	50 ng/mL
							1,2,3,7,8,9-HxCDD	50 ng/mL
							1,2,3,7,8,9-HxCDF	50 ng/mL
							1,2,3,7,8-PeCDD	50 ng/mL
							1,2,3,7,8-PeCDF	50 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	50 ng/mL
							2,3,4,7,8-PeCDF	50 ng/mL
							2,3,7,8-TCDD	10 ng/mL
							2,3,7,8-TCDF	10 ng/mL
							37Cl4-2,3,7,8-TCDD	10 ng/mL
							OCDD	100 ng/mL
							OCDF	100 ng/mL
					61XX13COCDFP_00001	4 uL	13C-OCDF	200 ng/mL
.61L31613P_00001	03/01/21	CERILLIANT, Lot ER031611-01C			(Purchased Reagent)		1,2,3,4,6,7,8-HpCDD	50 ng/mL
							1,2,3,4,6,7,8-HpCDF	50 ng/mL
							1,2,3,4,7,8,9-HpCDF	50 ng/mL
							1,2,3,4,7,8-HxCDD	50 ng/mL
							1,2,3,4,7,8-HxCDF	50 ng/mL
							1,2,3,6,7,8-HxCDD	50 ng/mL
							1,2,3,6,7,8-HxCDF	50 ng/mL
							1,2,3,7,8,9-HxCDD	50 ng/mL
							1,2,3,7,8,9-HxCDF	50 ng/mL
							1,2,3,7,8-PeCDD	50 ng/mL
							1,2,3,7,8-PeCDF	50 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	50 ng/mL
							2,3,4,7,8-PeCDF	50 ng/mL
							2,3,7,8-TCDD	10 ng/mL
							2,3,7,8-TCDF	10 ng/mL
							37Cl4-2,3,7,8-TCDD	10 ng/mL
							OCDD	100 ng/mL
							OCDF	100 ng/mL
.61XX13COCDFP_00001	06/01/21	11/10/15	Nonane, Lot SHBC8566V	5 mL	61INC13OCDFP_00001	1 mL	13C-OCDF	10 ug/mL
..61INC13OCDFP_00001	06/01/21		Cerriliant, Lot ER062011-01		(Purchased Reagent)		13C-OCDF	50 ug/mL
61L41613OP_00001	03/01/21	11/09/15	Nonane, Lot ER031611-01D	0.2 mL	61L41613P_00001	200 uL	1,2,3,4,6,7,8-HpCDD	200 ng/mL
							1,2,3,4,6,7,8-HpCDF	200 ng/mL
							1,2,3,4,7,8,9-HpCDF	200 ng/mL
							1,2,3,4,7,8-HxCDD	200 ng/mL
							1,2,3,4,7,8-HxCDF	200 ng/mL
							1,2,3,6,7,8-HxCDD	200 ng/mL
							1,2,3,6,7,8-HxCDF	200 ng/mL
							1,2,3,7,8,9-HxCDD	200 ng/mL
							1,2,3,7,8,9-HxCDF	200 ng/mL
							1,2,3,7,8-PeCDD	200 ng/mL
							1,2,3,7,8-PeCDF	200 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2,3,4,6,7,8-HxCDF	200 ng/mL
							2,3,4,7,8-PeCDF	200 ng/mL
							2,3,7,8-TCDD	40 ng/mL
							2,3,7,8-TCDF	40 ng/mL
							37C14-2,3,7,8-TCDD	40 ng/mL
							OCDD	400 ng/mL
							OCDF	400 ng/mL
					61XX13COCDFP_00001	4 uL	13C-OCDF	200 ng/mL
.61L41613P_00001	03/01/21		CERILLIANT, Lot ER031611-01D		(Purchased Reagent)		1,2,3,4,6,7,8-HpCDD	200 ng/mL
							1,2,3,4,6,7,8-HpCDF	200 ng/mL
							1,2,3,4,7,8,9-HpCDF	200 ng/mL
							1,2,3,4,7,8-HxCDD	200 ng/mL
							1,2,3,4,7,8-HxCDF	200 ng/mL
							1,2,3,6,7,8-HxCDD	200 ng/mL
							1,2,3,6,7,8-HxCDF	200 ng/mL
							1,2,3,7,8,9-HxCDD	200 ng/mL
							1,2,3,7,8,9-HxCDF	200 ng/mL
							1,2,3,7,8-PeCDD	200 ng/mL
							1,2,3,7,8-PeCDF	200 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	200 ng/mL
							2,3,4,7,8-PeCDF	200 ng/mL
							2,3,7,8-TCDD	40 ng/mL
							2,3,7,8-TCDF	40 ng/mL
							37C14-2,3,7,8-TCDD	40 ng/mL
							OCDD	400 ng/mL
							OCDF	400 ng/mL
.61XX13COCDFP_00001	06/01/21	11/10/15	Nonane, Lot SHBC8566V	5 mL	61INC13OCDFP_00001	1 mL	13C-OCDF	10 ug/mL
..61INC13OCDFP_00001	06/01/21		Cerriliant, Lot ER062011-01		(Purchased Reagent)		13C-OCDF	50 ug/mL
61L51613OP_00001	03/01/21	11/09/15	Nonane, Lot ER031611-01E	0.2 mL	61L51613P_00001	200 uL	1,2,3,4,6,7,8-HpCDD	1000 ng/mL
							1,2,3,4,6,7,8-HpCDF	1000 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville

Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,3,4,7,8,9-HpCDF	1000 ng/mL
							1,2,3,4,7,8-HxCDD	1000 ng/mL
							1,2,3,4,7,8-HxCDF	1000 ng/mL
							1,2,3,6,7,8-HxCDD	1000 ng/mL
							1,2,3,6,7,8-HxCDF	1000 ng/mL
							1,2,3,7,8,9-HxCDD	1000 ng/mL
							1,2,3,7,8,9-HxCDF	1000 ng/mL
							1,2,3,7,8-PeCDD	1000 ng/mL
							1,2,3,7,8-PeCDF	1000 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	1000 ng/mL
							2,3,4,7,8-PeCDF	1000 ng/mL
							2,3,7,8-TCDD	200 ng/mL
							2,3,7,8-TCDF	200 ng/mL
							37C14-2,3,7,8-TCDD	200 ng/mL
							OCDD	2000 ng/mL
							OCDF	2000 ng/mL
					61XX13COCDFP_00001	4 uL	13C-OCDF	200 ng/mL
.61L51613P_00001	03/01/21	CERILLIANT, Lot ER031611-01E			(Purchased Reagent)		1,2,3,4,6,7,8-HpCDD	1000 ng/mL
							1,2,3,4,6,7,8-HpCDF	1000 ng/mL
							1,2,3,4,7,8,9-HpCDF	1000 ng/mL
							1,2,3,4,7,8-HxCDD	1000 ng/mL
							1,2,3,4,7,8-HxCDF	1000 ng/mL
							1,2,3,6,7,8-HxCDD	1000 ng/mL
							1,2,3,6,7,8-HxCDF	1000 ng/mL
							1,2,3,7,8,9-HxCDD	1000 ng/mL
							1,2,3,7,8,9-HxCDF	1000 ng/mL
							1,2,3,7,8-PeCDD	1000 ng/mL
							1,2,3,7,8-PeCDF	1000 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,4-TCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	1000 ng/mL
							2,3,4,7,8-PeCDF	1000 ng/mL
							2,3,7,8-TCDD	200 ng/mL
							2,3,7,8-TCDF	200 ng/mL
							37C14-2,3,7,8-TCDD	200 ng/mL
							OCDD	2000 ng/mL
							OCDF	2000 ng/mL
.61XX13COCDFP_00001	06/01/21	11/10/15	Nonane, Lot SHBC8566V	5 mL	61INC13OCDFP_00001	1 mL	13C-OCDF	10 ug/mL
..61INC13OCDFP_00001	06/01/21		Cerriliant, Lot ER062011-01		(Purchased Reagent)		13C-OCDF	50 ug/mL
61WDML3OP_00001	01/31/21	08/22/16	Nonane, Lot ER031611-01C	0.2 mL	61WDML3P_00001	200 uL	1,2,3,4,6,7,8-HpCDD	50 ng/mL
							1,2,3,4,6,7,8-HpCDF	50 ng/mL
							1,2,3,4,7,8,9-HpCDF	50 ng/mL
							1,2,3,4,7,8-HxCDD	50 ng/mL
							1,2,3,4,7,8-HxCDF	50 ng/mL
							1,2,3,6,7,8-HxCDD	50 ng/mL
							1,2,3,6,7,8-HxCDF	50 ng/mL
							1,2,3,7,8,9-HxCDD	50 ng/mL
							1,2,3,7,8,9-HxCDF	50 ng/mL
							1,2,3,7,8-PeCDD	50 ng/mL
							1,2,3,7,8-PeCDF	50 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDD	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	50 ng/mL
							2,3,4,7,8-PeCDF	50 ng/mL
							2,3,7,8-TCDD	10 ng/mL
							2,3,7,8-TCDF	10 ng/mL
							37C14-2,3,7,8-TCDD	10 ng/mL
							OCDD	100 ng/mL
							OCDF	100 ng/mL
					61XX13COCDFP_00001	4 uL	13C-OCDF	200 ng/mL
.61WDML3P_00001	01/31/21		CERILLIANT, Lot ER011711-01		(Purchased Reagent)		1,2,3,4,6,7,8-HpCDD	50 ng/mL
							1,2,3,4,6,7,8-HpCDF	50 ng/mL
							1,2,3,4,7,8,9-HpCDF	50 ng/mL
							1,2,3,4,7,8-HxCDD	50 ng/mL
							1,2,3,4,7,8-HxCDF	50 ng/mL
							1,2,3,6,7,8-HxCDD	50 ng/mL
							1,2,3,6,7,8-HxCDF	50 ng/mL
							1,2,3,7,8,9-HxCDD	50 ng/mL
							1,2,3,7,8,9-HxCDF	50 ng/mL
							1,2,3,7,8-PeCDD	50 ng/mL
							1,2,3,7,8-PeCDF	50 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	50 ng/mL
							2,3,4,7,8-PeCDF	50 ng/mL
							2,3,7,8-TCDD	10 ng/mL
							2,3,7,8-TCDF	10 ng/mL
							37C14-2,3,7,8-TCDD	10 ng/mL
							OCDD	100 ng/mL
							OCDF	100 ng/mL
.61XX13COCDFP_00001	06/01/21	11/10/15	Nonane, Lot SHBC8566V	5 mL	61INC13OCDFP_00001	1 mL	13C-OCDF	10 ug/mL
..61INC13OCDFP_00001	06/01/21		Cerrilant, Lot ER062011-01		(Purchased Reagent)		13C-OCDF	50 ug/mL
61WDML3OP_F/L_00052	01/31/21	01/22/19	Nonane, Lot SHBJ6527	0.2 mL	61WDML3P_F/L_00010	200 uL	1,2,3,4,6,7,8-HpCDD	50 ng/mL
							1,2,3,4,6,7,8-HpCDF	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,3,4,7,8,9-HpCDF	50 ng/mL
							1,2,3,4,7,8-HxCDD	50 ng/mL
							1,2,3,4,7,8-HxCDF	50 ng/mL
							1,2,3,6,7,8-HxCDD	50 ng/mL
							1,2,3,6,7,8-HxCDF	50 ng/mL
							1,2,3,7,8,9-HxCDD	50 ng/mL
							1,2,3,7,8,9-HxCDF	50 ng/mL
							1,2,3,7,8-PeCDD	50 ng/mL
							1,2,3,7,8-PeCDF	50 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	50 ng/mL
							2,3,4,7,8-PeCDF	50 ng/mL
							2,3,7,8-TCDD	10 ng/mL
							2,3,7,8-TCDF	10 ng/mL
							37C14-2,3,7,8-TCDD	10 ng/mL
							OCDD	100 ng/mL
							OCDF	100 ng/mL
					61XX13COCDFP_00001	4 uL	13C-OCDF	200 ng/mL
.61WDML3P_F/L_00010	01/31/21	CERILLIANT, Lot ER011711-01			(Purchased Reagent)		1,2,3,4,6,7,8-HpCDD	50 ng/mL
							1,2,3,4,6,7,8-HpCDF	50 ng/mL
							1,2,3,4,7,8,9-HpCDF	50 ng/mL
							1,2,3,4,7,8-HxCDD	50 ng/mL
							1,2,3,4,7,8-HxCDF	50 ng/mL
							1,2,3,6,7,8-HxCDD	50 ng/mL
							1,2,3,6,7,8-HxCDF	50 ng/mL
							1,2,3,7,8,9-HxCDD	50 ng/mL
							1,2,3,7,8,9-HxCDF	50 ng/mL
							1,2,3,7,8-PeCDD	50 ng/mL
							1,2,3,7,8-PeCDF	50 ng/mL
							13C-1,2,3,4,6,7,8-HpCDD	100 ng/mL
							13C-1,2,3,4,6,7,8-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8,9-HpCDF	100 ng/mL
							13C-1,2,3,4,7,8-HxCDD	100 ng/mL
							13C-1,2,3,4,7,8-HxCDF	100 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C-1,2,3,6,7,8-HxCDD	100 ng/mL
							13C-1,2,3,6,7,8-HxCDF	100 ng/mL
							13C-1,2,3,7,8,9-HxCDF	100 ng/mL
							13C-1,2,3,7,8-PeCDD	100 ng/mL
							13C-1,2,3,7,8-PeCDF	100 ng/mL
							13C-2,3,4,6,7,8-HxCDF	100 ng/mL
							13C-2,3,4,7,8-PeCDF	100 ng/mL
							13C-2,3,7,8-TCDD	100 ng/mL
							13C-2,3,7,8-TCDF	100 ng/mL
							13C-OCDD	200 ng/mL
							2,3,4,6,7,8-HxCDF	50 ng/mL
							2,3,4,7,8-PeCDF	50 ng/mL
							2,3,7,8-TCDD	10 ng/mL
							2,3,7,8-TCDF	10 ng/mL
							37Cl4-2,3,7,8-TCDD	10 ng/mL
							OCDD	100 ng/mL
.61XX13COCDFP_00001	06/01/21	11/10/15	Nonane, Lot SHBC8566V	5 mL	61INC13OCDFP_00001	1 mL	13C-OCDF	10 ug/mL
..61INC13OCDFP_00001	06/01/21		Cerriliant, Lot ER062011-01		(Purchased Reagent)		13C-OCDF	50 ug/mL

Reagent

571995_00054



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 **Lot No.:** A0140111

Description : 8270 List 1 / Std #1 MegaMix (2017)

8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul

Container Size : 10 mL **Pkg Amt:** > 5 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1 (Lot SHBJ5124) Purity 99%	1,006.6 µg/mL	+/- 5.8525 µg/mL Gravimetric +/- 12.0330 µg/mL Unstressed +/- 19.1503 µg/mL Stressed
2	N-Nitrosodimethylamine CAS # 62-75-9 (Lot 180322JLM) Purity 99%	1,005.1 µg/mL	+/- 5.8437 µg/mL Gravimetric +/- 12.0150 µg/mL Unstressed +/- 19.1217 µg/mL Stressed
3	Pyridine CAS # 110-86-1 (Lot SHBC7174V) Purity 99%	2,012.7 µg/mL	+/- 11.7020 µg/mL Gravimetric +/- 24.0599 µg/mL Unstressed +/- 38.2910 µg/mL Stressed
4	Phenol CAS # 108-95-2 (Lot SHBF9719V) Purity 99%	1,008.6 µg/mL	+/- 5.8641 µg/mL Gravimetric +/- 12.0569 µg/mL Unstressed +/- 19.1883 µg/mL Stressed
5	Aniline CAS # 62-53-3 (Lot K22Z462) Purity 99%	1,006.2 µg/mL	+/- 5.8501 µg/mL Gravimetric +/- 12.0282 µg/mL Unstressed +/- 19.1427 µg/mL Stressed
6	Bis(2-chloroethyl)ether CAS # 111-44-4 (Lot SHBD4430V) Purity 99%	1,009.5 µg/mL	+/- 5.8693 µg/mL Gravimetric +/- 12.0676 µg/mL Unstressed +/- 19.2054 µg/mL Stressed
7	n-Decane (C10) CAS # 124-18-5 (Lot SHBJ8526) Purity 99%	1,010.0 µg/mL	+/- 5.8722 µg/mL Gravimetric +/- 12.0736 µg/mL Unstressed +/- 19.2150 µg/mL Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 5670100)	1,009.6 µg/mL	+/-	5.8699	µg/mL	Gravimetric
				+/-	12.0688	µg/mL	Unstressed
				+/-	19.2073	µg/mL	Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBJ8113V)	1,009.0 µg/mL	+/-	5.8664	µg/mL	Gravimetric
				+/-	12.0616	µg/mL	Unstressed
				+/-	19.1959	µg/mL	Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,008.4 µg/mL	+/-	5.8629	µg/mL	Gravimetric
				+/-	12.0545	µg/mL	Unstressed
				+/-	19.1845	µg/mL	Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,008.3 µg/mL	+/-	5.8623	µg/mL	Gravimetric
				+/-	12.0533	µg/mL	Unstressed
				+/-	19.1826	µg/mL	Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,008.6 µg/mL	+/-	5.8641	µg/mL	Gravimetric
				+/-	12.0569	µg/mL	Unstressed
				+/-	19.1883	µg/mL	Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBF0201V)	1,005.5 µg/mL	+/-	5.8461	µg/mL	Gravimetric
				+/-	12.0199	µg/mL	Unstressed
				+/-	19.1294	µg/mL	Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 98%	(Lot 523400-9)	1,002.4 µg/mL	+/-	5.8283	µg/mL	Gravimetric
				+/-	11.9833	µg/mL	Unstressed
				+/-	19.0712	µg/mL	Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,007.2 µg/mL	+/-	5.8559	µg/mL	Gravimetric
				+/-	12.0401	µg/mL	Unstressed
				+/-	19.1617	µg/mL	Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012015)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,009.2 µg/mL	+/-	5.8676	µg/mL	Gravimetric
				+/-	12.0640	µg/mL	Unstressed
				+/-	19.1997	µg/mL	Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,006.3 µg/mL	+/-	5.8507	µg/mL	Gravimetric
				+/-	12.0294	µg/mL	Unstressed
				+/-	19.1446	µg/mL	Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,007.5 µg/mL	+/-	5.8579	µg/mL	Gravimetric
				+/-	12.0442	µg/mL	Unstressed
				+/-	19.1681	µg/mL	Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot B180716L)	2,012.4 µg/mL	+/-	11.7003	µg/mL	Gravimetric
				+/-	24.0564	µg/mL	Unstressed
				+/-	38.2853	µg/mL	Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	856.1 µg/mL	+/-	4.9889	µg/mL	Gravimetric
				+/-	10.2395	µg/mL	Unstressed
				+/-	16.2906	µg/mL	Stressed
59	Azobenzene CAS # 103-33-3 Purity 97%	(Lot BCBS6535V)	1,009.8 µg/mL	+/-	5.8709	µg/mL	Gravimetric
				+/-	12.0709	µg/mL	Unstressed
				+/-	19.2106	µg/mL	Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,007.6 µg/mL	+/-	5.8583	µg/mL	Gravimetric
				+/-	12.0449	µg/mL	Unstressed
				+/-	19.1693	µg/mL	Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot LRAB8468)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170717KJA)	2,005.9 µg/mL	+/-	11.6625	µg/mL	Gravimetric
				+/-	23.9787	µg/mL	Unstressed
				+/-	38.1617	µg/mL	Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot T7N4E)	1,004.8 µg/mL	+/-	5.8420	µg/mL	Gravimetric
				+/-	12.0114	µg/mL	Unstressed
				+/-	19.1160	µg/mL	Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBR2268V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 7528800)	1,002.7 µg/mL	+/-	5.8298	µg/mL	Gravimetric
				+/-	11.9863	µg/mL	Unstressed
				+/-	19.0761	µg/mL	Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.6 µg/mL	+/-	5.8466	µg/mL	Gravimetric
				+/-	12.0210	µg/mL	Unstressed
				+/-	19.1312	µg/mL	Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,002.6 µg/mL	+/-	5.8294	µg/mL	Gravimetric
				+/-	11.9856	µg/mL	Unstressed
				+/-	19.0749	µg/mL	Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 99%	(Lot MKCF0058)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot 0012018)	1,004.8 µg/mL	+/-	5.8422	µg/mL	Gravimetric
				+/-	12.0118	µg/mL	Unstressed
				+/-	19.1166	µg/mL	Stressed

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant flow 1.8 mL/min.

Temp. Program:

80°C (hold 0.1 min.) to 330°C
@ 9.6°C/min. (hold 2.85 min.)

Inj. Temp:

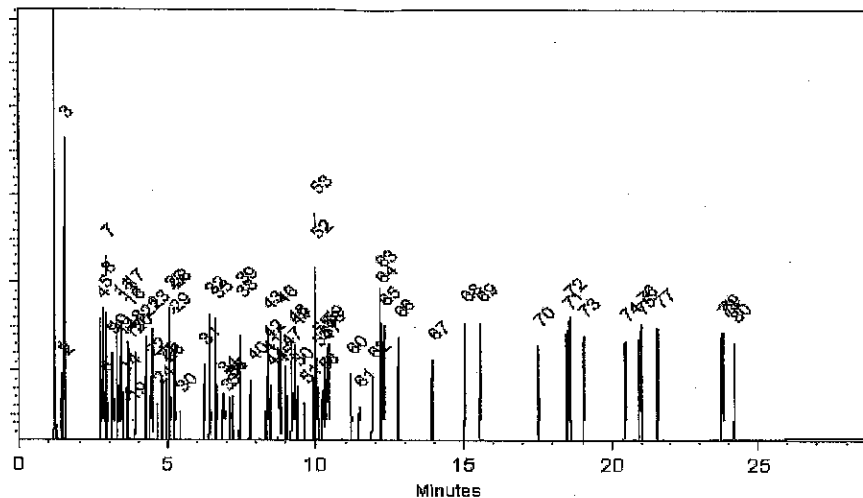
250°C

Det. Temp:

340°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Cydnei L. Crust
Cydnei L. Crust - Mix Technician

Date Mixed: 30-Jul-2018

Balance: B442140311

Jennifer J. Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 02-Aug-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

72	Chrysene		1,009.4	µg/mL	+/-	5.8687	µg/mL	Gravimetric
	CAS #	218-01-9 (Lot 012015)			+/-	12.0664	µg/mL	Unstressed
	Purity	99%			+/-	19.2035	µg/mL	Stressed
73	Bis(2-ethylhexyl)phthalate		1,007.3	µg/mL	+/-	5.8565	µg/mL	Gravimetric
	CAS #	117-81-7 (Lot MKBZ3868V)			+/-	12.0413	µg/mL	Unstressed
	Purity	99%			+/-	19.1636	µg/mL	Stressed
74	Di-n-octyl phthalate		1,007.0	µg/mL	+/-	5.8548	µg/mL	Gravimetric
	CAS #	117-84-0 (Lot 7170200)			+/-	12.0377	µg/mL	Unstressed
	Purity	99%			+/-	19.1579	µg/mL	Stressed
75	Benzo(b)fluoranthene		1,003.7	µg/mL	+/-	5.8356	µg/mL	Gravimetric
	CAS #	205-99-2 (Lot 012012B)			+/-	11.9983	µg/mL	Unstressed
	Purity	99%			+/-	19.0951	µg/mL	Stressed
76	Benzo(k)fluoranthene		1,005.7	µg/mL	+/-	5.8472	µg/mL	Gravimetric
	CAS #	207-08-9 (Lot 012012K)			+/-	12.0222	µg/mL	Unstressed
	Purity	99%			+/-	19.1332	µg/mL	Stressed
77	Benzo(a)pyrene		1,008.8	µg/mL	+/-	5.8653	µg/mL	Gravimetric
	CAS #	50-32-8 (Lot ER071309-02)			+/-	12.0593	µg/mL	Unstressed
	Purity	99%			+/-	19.1921	µg/mL	Stressed
78	Indeno(1,2,3-cd)pyrene		1,006.9	µg/mL	+/-	5.8542	µg/mL	Gravimetric
	CAS #	193-39-5 (Lot ER082107-02)			+/-	12.0365	µg/mL	Unstressed
	Purity	99%			+/-	19.1560	µg/mL	Stressed
79	Dibenz(a,h)anthracene		1,008.7	µg/mL	+/-	5.8647	µg/mL	Gravimetric
	CAS #	53-70-3 (Lot ER032211-01)			+/-	12.0581	µg/mL	Unstressed
	Purity	99%			+/-	19.1902	µg/mL	Stressed
80	Benzo(g,h,i)perylene		1,000.2	µg/mL	+/-	5.8152	µg/mL	Gravimetric
	CAS #	191-24-2 (Lot ER05121401)			+/-	11.9565	µg/mL	Unstressed
	Purity	99%			+/-	19.0285	µg/mL	Stressed
Solvent: Methylene chloride								
	CAS #	75-09-2						
	Purity	99%						

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,007.5 µg/mL	+/- 5.8577 +/- 12.0437 +/- 19.1674	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,007.2 µg/mL	+/- 5.8557 +/- 12.0395 +/- 19.1608	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,008.9 µg/mL	+/- 5.8658 +/- 12.0605 +/- 19.1940	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,009.2 µg/mL	+/- 5.8676 +/- 12.0640 +/- 19.1997	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot 1437483V)	1,009.1 µg/mL	+/- 5.8670 +/- 12.0628 +/- 19.1978	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,008.1 µg/mL	+/- 5.8612 +/- 12.0509 +/- 19.1788	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBG3580V)	2,013.2 µg/mL	+/- 11.7049 +/- 24.0659 +/- 38.3005	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKCD9952)	1,007.0 µg/mL	+/- 5.8548 +/- 12.0377 +/- 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBK1842V)	2,015.4 µg/mL	+/- 11.7177 +/- 24.0922 +/- 38.3424	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,009.5 µg/mL	+/- 5.8693 +/- 12.0676 +/- 19.2054	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot PR-30126)	1,005.3 µg/mL	+/- 5.8449 +/- 12.0174 +/- 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7 Purity 98%	(Lot 10174662)	1,007.7 µg/mL	+/- 5.8591 +/- 12.0465 +/- 19.1718	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBJ3997)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKCB0810V)	1,007.4 µg/mL	+/- 5.8571 +/- 12.0425 +/- 19.1655	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,006.7 µg/mL	+/- 5.8530 +/- 12.0342 +/- 19.1522	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

8	2-Chlorophenol		1,005.6	µg/mL	+/-	5.8466	µg/mL	Gravimetric
	CAS # 95-57-8	(Lot STBF2690V)			+/-	12.0210	µg/mL	Unstressed
	Purity 99%				+/-	19.1312	µg/mL	Stressed
9	1,3-Dichlorobenzene		1,009.7	µg/mL	+/-	5.8705	µg/mL	Gravimetric
	CAS # 541-73-1	(Lot BCBQ7100V)			+/-	12.0700	µg/mL	Unstressed
	Purity 99%				+/-	19.2092	µg/mL	Stressed
10	1,4-Dichlorobenzene		1,007.6	µg/mL	+/-	5.8583	µg/mL	Gravimetric
	CAS # 106-46-7	(Lot MKBS4401V)			+/-	12.0449	µg/mL	Unstressed
	Purity 99%				+/-	19.1693	µg/mL	Stressed
11	Benzyl alcohol		1,009.6	µg/mL	+/-	5.8699	µg/mL	Gravimetric
	CAS # 100-51-6	(Lot SHBJ0534)			+/-	12.0688	µg/mL	Unstressed
	Purity 99%				+/-	19.2073	µg/mL	Stressed
12	1,2-Dichlorobenzene		1,007.7	µg/mL	+/-	5.8589	µg/mL	Gravimetric
	CAS # 95-50-1	(Lot SHBG3111V)			+/-	12.0461	µg/mL	Unstressed
	Purity 99%				+/-	19.1712	µg/mL	Stressed
13	2-Methylphenol (o-cresol)		1,008.4	µg/mL	+/-	5.8629	µg/mL	Gravimetric
	CAS # 95-48-7	(Lot SHBH6379)			+/-	12.0545	µg/mL	Unstressed
	Purity 99%				+/-	19.1845	µg/mL	Stressed
14	2,2'-oxybis(1-chloropropane)		1,007.6	µg/mL	+/-	5.8583	µg/mL	Gravimetric
	CAS # 108-60-1	(Lot 7577400)			+/-	12.0449	µg/mL	Unstressed
	Purity 99%				+/-	19.1693	µg/mL	Stressed
15	Acetophenone		1,009.4	µg/mL	+/-	5.8687	µg/mL	Gravimetric
	CAS # 98-86-2	(Lot STBG8586)			+/-	12.0664	µg/mL	Unstressed
	Purity 99%				+/-	19.2035	µg/mL	Stressed
16	3-Methylphenol (m-cresol)		504.9	µg/mL	+/-	2.9423	µg/mL	Gravimetric
	CAS # 108-39-4	(Lot SHBD0627V)			+/-	6.0389	µg/mL	Unstressed
	Purity 99%				+/-	9.6077	µg/mL	Stressed
17	4-Methylphenol (p-cresol)		501.8	µg/mL	+/-	2.9242	µg/mL	Gravimetric
	CAS # 106-44-5	(Lot 49396APV)			+/-	6.0018	µg/mL	Unstressed
	Purity 99%				+/-	9.5487	µg/mL	Stressed
18	N-Nitroso-di-n-propylamine		1,006.6	µg/mL	+/-	5.8525	µg/mL	Gravimetric
	CAS # 621-64-7	(Lot OPAGF)			+/-	12.0330	µg/mL	Unstressed
	Purity 99%				+/-	19.1503	µg/mL	Stressed
19	Hexachloroethane		1,001.4	µg/mL	+/-	5.8222	µg/mL	Gravimetric
	CAS # 67-72-1	(Lot 4H3SF)			+/-	11.9708	µg/mL	Unstressed
	Purity 99%				+/-	19.0513	µg/mL	Stressed
20	Nitrobenzene		1,005.9	µg/mL	+/-	5.8484	µg/mL	Gravimetric
	CAS # 98-95-3	(Lot SHBG5577V)			+/-	12.0246	µg/mL	Unstressed
	Purity 99%				+/-	19.1370	µg/mL	Stressed
21	Isophorone		1,009.1	µg/mL	+/-	5.8670	µg/mL	Gravimetric
	CAS # 78-59-1	(Lot MKBG2442V)			+/-	12.0629	µg/mL	Unstressed
	Purity 98%				+/-	19.1979	µg/mL	Stressed
22	2-Nitrophenol		1,008.7	µg/mL	+/-	5.8647	µg/mL	Gravimetric
	CAS # 88-75-5	(Lot BCBH7602V)			+/-	12.0581	µg/mL	Unstressed
	Purity 99%				+/-	19.1902	µg/mL	Stressed
23	2,4-Dimethylphenol		1,008.6	µg/mL	+/-	5.8641	µg/mL	Gravimetric
	CAS # 105-67-9	(Lot 10165155)			+/-	12.0569	µg/mL	Unstressed
	Purity 99%				+/-	19.1883	µg/mL	Stressed

Reagent

571995_00057



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 Lot No.: A0140111

Description : 8270 List 1 / Std #1 MegaMix (2017)

8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul

Container Size : 10 mL Pkg Amt: > 5 mL

Expiration Date : January 31, 2020 Storage: 0°C or colder

Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1 (Lot SHBJ5124) Purity 99%	1,006.6 µg/mL	+/- 5.8525 µg/mL Gravimetric +/- 12.0330 µg/mL Unstressed +/- 19.1503 µg/mL Stressed
2	N-Nitrosodimethylamine CAS # 62-75-9 (Lot 180322JLM) Purity 99%	1,005.1 µg/mL	+/- 5.8437 µg/mL Gravimetric +/- 12.0150 µg/mL Unstressed +/- 19.1217 µg/mL Stressed
3	Pyridine CAS # 110-86-1 (Lot SHBC7174V) Purity 99%	2,012.7 µg/mL	+/- 11.7020 µg/mL Gravimetric +/- 24.0599 µg/mL Unstressed +/- 38.2910 µg/mL Stressed
4	Phenol CAS # 108-95-2 (Lot SHBF9719V) Purity 99%	1,008.6 µg/mL	+/- 5.8641 µg/mL Gravimetric +/- 12.0569 µg/mL Unstressed +/- 19.1883 µg/mL Stressed
5	Aniline CAS # 62-53-3 (Lot K22Z462) Purity 99%	1,006.2 µg/mL	+/- 5.8501 µg/mL Gravimetric +/- 12.0282 µg/mL Unstressed +/- 19.1427 µg/mL Stressed
6	Bis(2-chloroethyl)ether CAS # 111-44-4 (Lot SHBD4430V) Purity 99%	1,009.5 µg/mL	+/- 5.8693 µg/mL Gravimetric +/- 12.0676 µg/mL Unstressed +/- 19.2054 µg/mL Stressed
7	n-Decane (C10) CAS # 124-18-5 (Lot SHBJ8526) Purity 99%	1,010.0 µg/mL	+/- 5.8722 µg/mL Gravimetric +/- 12.0736 µg/mL Unstressed +/- 19.2150 µg/mL Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 5670100)	1,009.6 µg/mL	+/-	5.8699	µg/mL	Gravimetric
				+/-	12.0688	µg/mL	Unstressed
				+/-	19.2073	µg/mL	Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBJ8113V)	1,009.0 µg/mL	+/-	5.8664	µg/mL	Gravimetric
				+/-	12.0616	µg/mL	Unstressed
				+/-	19.1959	µg/mL	Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,008.4 µg/mL	+/-	5.8629	µg/mL	Gravimetric
				+/-	12.0545	µg/mL	Unstressed
				+/-	19.1845	µg/mL	Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,008.3 µg/mL	+/-	5.8623	µg/mL	Gravimetric
				+/-	12.0533	µg/mL	Unstressed
				+/-	19.1826	µg/mL	Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,008.6 µg/mL	+/-	5.8641	µg/mL	Gravimetric
				+/-	12.0569	µg/mL	Unstressed
				+/-	19.1883	µg/mL	Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBF0201V)	1,005.5 µg/mL	+/-	5.8461	µg/mL	Gravimetric
				+/-	12.0199	µg/mL	Unstressed
				+/-	19.1294	µg/mL	Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 98%	(Lot 523400-9)	1,002.4 µg/mL	+/-	5.8283	µg/mL	Gravimetric
				+/-	11.9833	µg/mL	Unstressed
				+/-	19.0712	µg/mL	Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,007.2 µg/mL	+/-	5.8559	µg/mL	Gravimetric
				+/-	12.0401	µg/mL	Unstressed
				+/-	19.1617	µg/mL	Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012015)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,009.2 µg/mL	+/-	5.8676	µg/mL	Gravimetric
				+/-	12.0640	µg/mL	Unstressed
				+/-	19.1997	µg/mL	Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,006.3 µg/mL	+/-	5.8507	µg/mL	Gravimetric
				+/-	12.0294	µg/mL	Unstressed
				+/-	19.1446	µg/mL	Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,007.5 µg/mL	+/-	5.8579	µg/mL	Gravimetric
				+/-	12.0442	µg/mL	Unstressed
				+/-	19.1681	µg/mL	Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot B180716L)	2,012.4 µg/mL	+/-	11.7003	µg/mL	Gravimetric
				+/-	24.0564	µg/mL	Unstressed
				+/-	38.2853	µg/mL	Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	856.1 µg/mL	+/-	4.9889	µg/mL	Gravimetric
				+/-	10.2395	µg/mL	Unstressed
				+/-	16.2906	µg/mL	Stressed
59	Azobenzene CAS # 103-33-3 Purity 97%	(Lot BCBS6535V)	1,009.8 µg/mL	+/-	5.8709	µg/mL	Gravimetric
				+/-	12.0709	µg/mL	Unstressed
				+/-	19.2106	µg/mL	Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,007.6 µg/mL	+/-	5.8583	µg/mL	Gravimetric
				+/-	12.0449	µg/mL	Unstressed
				+/-	19.1693	µg/mL	Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot LRAB8468)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170717KJA)	2,005.9 µg/mL	+/-	11.6625	µg/mL	Gravimetric
				+/-	23.9787	µg/mL	Unstressed
				+/-	38.1617	µg/mL	Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot T7N4E)	1,004.8 µg/mL	+/-	5.8420	µg/mL	Gravimetric
				+/-	12.0114	µg/mL	Unstressed
				+/-	19.1160	µg/mL	Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBR2268V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 7528800)	1,002.7 µg/mL	+/-	5.8298	µg/mL	Gravimetric
				+/-	11.9863	µg/mL	Unstressed
				+/-	19.0761	µg/mL	Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.6 µg/mL	+/-	5.8466	µg/mL	Gravimetric
				+/-	12.0210	µg/mL	Unstressed
				+/-	19.1312	µg/mL	Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,002.6 µg/mL	+/-	5.8294	µg/mL	Gravimetric
				+/-	11.9856	µg/mL	Unstressed
				+/-	19.0749	µg/mL	Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 99%	(Lot MKCF0058)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot 0012018)	1,004.8 µg/mL	+/-	5.8422	µg/mL	Gravimetric
				+/-	12.0118	µg/mL	Unstressed
				+/-	19.1166	µg/mL	Stressed

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant flow 1.8 mL/min.

Temp. Program:

80°C (hold 0.1 min.) to 330°C
@ 9.6°C/min. (hold 2.85 min.)

Inj. Temp:

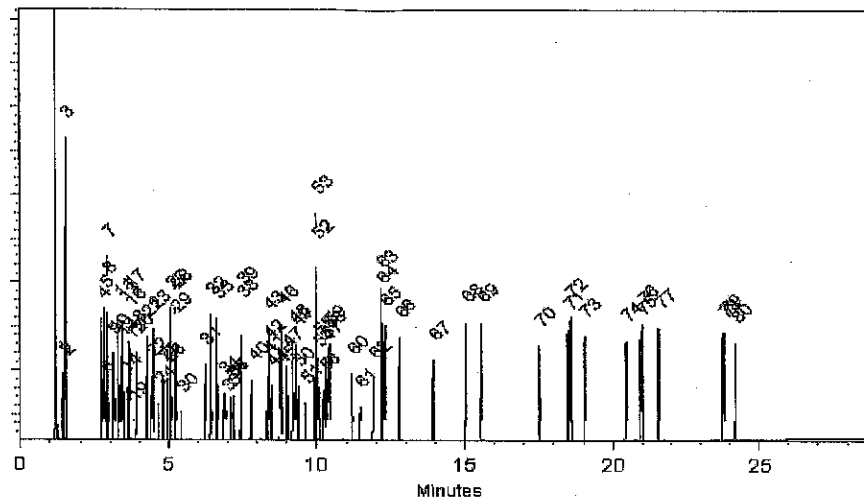
250°C

Det. Temp:

340°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Cydnei L. Crust
Cydnei L. Crust - Mix Technician

Date Mixed: 30-Jul-2018

Balance: B442140311

Jennifer J. Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 02-Aug-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

72	Chrysene		1,009.4	µg/mL	+/-	5.8687	µg/mL	Gravimetric
	CAS #	218-01-9 (Lot 012015)			+/-	12.0664	µg/mL	Unstressed
	Purity	99%			+/-	19.2035	µg/mL	Stressed
73	Bis(2-ethylhexyl)phthalate		1,007.3	µg/mL	+/-	5.8565	µg/mL	Gravimetric
	CAS #	117-81-7 (Lot MKBZ3868V)			+/-	12.0413	µg/mL	Unstressed
	Purity	99%			+/-	19.1636	µg/mL	Stressed
74	Di-n-octyl phthalate		1,007.0	µg/mL	+/-	5.8548	µg/mL	Gravimetric
	CAS #	117-84-0 (Lot 7170200)			+/-	12.0377	µg/mL	Unstressed
	Purity	99%			+/-	19.1579	µg/mL	Stressed
75	Benzo(b)fluoranthene		1,003.7	µg/mL	+/-	5.8356	µg/mL	Gravimetric
	CAS #	205-99-2 (Lot 012012B)			+/-	11.9983	µg/mL	Unstressed
	Purity	99%			+/-	19.0951	µg/mL	Stressed
76	Benzo(k)fluoranthene		1,005.7	µg/mL	+/-	5.8472	µg/mL	Gravimetric
	CAS #	207-08-9 (Lot 012012K)			+/-	12.0222	µg/mL	Unstressed
	Purity	99%			+/-	19.1332	µg/mL	Stressed
77	Benzo(a)pyrene		1,008.8	µg/mL	+/-	5.8653	µg/mL	Gravimetric
	CAS #	50-32-8 (Lot ER071309-02)			+/-	12.0593	µg/mL	Unstressed
	Purity	99%			+/-	19.1921	µg/mL	Stressed
78	Indeno(1,2,3-cd)pyrene		1,006.9	µg/mL	+/-	5.8542	µg/mL	Gravimetric
	CAS #	193-39-5 (Lot ER082107-02)			+/-	12.0365	µg/mL	Unstressed
	Purity	99%			+/-	19.1560	µg/mL	Stressed
79	Dibenz(a,h)anthracene		1,008.7	µg/mL	+/-	5.8647	µg/mL	Gravimetric
	CAS #	53-70-3 (Lot ER032211-01)			+/-	12.0581	µg/mL	Unstressed
	Purity	99%			+/-	19.1902	µg/mL	Stressed
80	Benzo(g,h,i)perylene		1,000.2	µg/mL	+/-	5.8152	µg/mL	Gravimetric
	CAS #	191-24-2 (Lot ER05121401)			+/-	11.9565	µg/mL	Unstressed
	Purity	99%			+/-	19.0285	µg/mL	Stressed
Solvent: Methylene chloride								
	CAS #	75-09-2						
	Purity	99%						

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,007.5 µg/mL	+/- 5.8577 +/- 12.0437 +/- 19.1674	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,007.2 µg/mL	+/- 5.8557 +/- 12.0395 +/- 19.1608	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,008.9 µg/mL	+/- 5.8658 +/- 12.0605 +/- 19.1940	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,009.2 µg/mL	+/- 5.8676 +/- 12.0640 +/- 19.1997	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot 1437483V)	1,009.1 µg/mL	+/- 5.8670 +/- 12.0628 +/- 19.1978	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,008.1 µg/mL	+/- 5.8612 +/- 12.0509 +/- 19.1788	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBG3580V)	2,013.2 µg/mL	+/- 11.7049 +/- 24.0659 +/- 38.3005	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKCD9952)	1,007.0 µg/mL	+/- 5.8548 +/- 12.0377 +/- 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBK1842V)	2,015.4 µg/mL	+/- 11.7177 +/- 24.0922 +/- 38.3424	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,009.5 µg/mL	+/- 5.8693 +/- 12.0676 +/- 19.2054	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot PR-30126)	1,005.3 µg/mL	+/- 5.8449 +/- 12.0174 +/- 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7 Purity 98%	(Lot 10174662)	1,007.7 µg/mL	+/- 5.8591 +/- 12.0465 +/- 19.1718	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBJ3997)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKCB0810V)	1,007.4 µg/mL	+/- 5.8571 +/- 12.0425 +/- 19.1655	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,006.7 µg/mL	+/- 5.8530 +/- 12.0342 +/- 19.1522	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

8	2-Chlorophenol		1,005.6	µg/mL	+/-	5.8466	µg/mL	Gravimetric
	CAS # 95-57-8	(Lot STBF2690V)			+/-	12.0210	µg/mL	Unstressed
	Purity 99%				+/-	19.1312	µg/mL	Stressed
9	1,3-Dichlorobenzene		1,009.7	µg/mL	+/-	5.8705	µg/mL	Gravimetric
	CAS # 541-73-1	(Lot BCBQ7100V)			+/-	12.0700	µg/mL	Unstressed
	Purity 99%				+/-	19.2092	µg/mL	Stressed
10	1,4-Dichlorobenzene		1,007.6	µg/mL	+/-	5.8583	µg/mL	Gravimetric
	CAS # 106-46-7	(Lot MKBS4401V)			+/-	12.0449	µg/mL	Unstressed
	Purity 99%				+/-	19.1693	µg/mL	Stressed
11	Benzyl alcohol		1,009.6	µg/mL	+/-	5.8699	µg/mL	Gravimetric
	CAS # 100-51-6	(Lot SHBJ0534)			+/-	12.0688	µg/mL	Unstressed
	Purity 99%				+/-	19.2073	µg/mL	Stressed
12	1,2-Dichlorobenzene		1,007.7	µg/mL	+/-	5.8589	µg/mL	Gravimetric
	CAS # 95-50-1	(Lot SHBG3111V)			+/-	12.0461	µg/mL	Unstressed
	Purity 99%				+/-	19.1712	µg/mL	Stressed
13	2-Methylphenol (o-cresol)		1,008.4	µg/mL	+/-	5.8629	µg/mL	Gravimetric
	CAS # 95-48-7	(Lot SHBH6379)			+/-	12.0545	µg/mL	Unstressed
	Purity 99%				+/-	19.1845	µg/mL	Stressed
14	2,2'-oxybis(1-chloropropane)		1,007.6	µg/mL	+/-	5.8583	µg/mL	Gravimetric
	CAS # 108-60-1	(Lot 7577400)			+/-	12.0449	µg/mL	Unstressed
	Purity 99%				+/-	19.1693	µg/mL	Stressed
15	Acetophenone		1,009.4	µg/mL	+/-	5.8687	µg/mL	Gravimetric
	CAS # 98-86-2	(Lot STBG8586)			+/-	12.0664	µg/mL	Unstressed
	Purity 99%				+/-	19.2035	µg/mL	Stressed
16	3-Methylphenol (m-cresol)		504.9	µg/mL	+/-	2.9423	µg/mL	Gravimetric
	CAS # 108-39-4	(Lot SHBD0627V)			+/-	6.0389	µg/mL	Unstressed
	Purity 99%				+/-	9.6077	µg/mL	Stressed
17	4-Methylphenol (p-cresol)		501.8	µg/mL	+/-	2.9242	µg/mL	Gravimetric
	CAS # 106-44-5	(Lot 49396APV)			+/-	6.0018	µg/mL	Unstressed
	Purity 99%				+/-	9.5487	µg/mL	Stressed
18	N-Nitroso-di-n-propylamine		1,006.6	µg/mL	+/-	5.8525	µg/mL	Gravimetric
	CAS # 621-64-7	(Lot OPAGF)			+/-	12.0330	µg/mL	Unstressed
	Purity 99%				+/-	19.1503	µg/mL	Stressed
19	Hexachloroethane		1,001.4	µg/mL	+/-	5.8222	µg/mL	Gravimetric
	CAS # 67-72-1	(Lot 4H3SF)			+/-	11.9708	µg/mL	Unstressed
	Purity 99%				+/-	19.0513	µg/mL	Stressed
20	Nitrobenzene		1,005.9	µg/mL	+/-	5.8484	µg/mL	Gravimetric
	CAS # 98-95-3	(Lot SHBG5577V)			+/-	12.0246	µg/mL	Unstressed
	Purity 99%				+/-	19.1370	µg/mL	Stressed
21	Isophorone		1,009.1	µg/mL	+/-	5.8670	µg/mL	Gravimetric
	CAS # 78-59-1	(Lot MKBG2442V)			+/-	12.0629	µg/mL	Unstressed
	Purity 98%				+/-	19.1979	µg/mL	Stressed
22	2-Nitrophenol		1,008.7	µg/mL	+/-	5.8647	µg/mL	Gravimetric
	CAS # 88-75-5	(Lot BCBH7602V)			+/-	12.0581	µg/mL	Unstressed
	Purity 99%				+/-	19.1902	µg/mL	Stressed
23	2,4-Dimethylphenol		1,008.6	µg/mL	+/-	5.8641	µg/mL	Gravimetric
	CAS # 105-67-9	(Lot 10165155)			+/-	12.0569	µg/mL	Unstressed
	Purity 99%				+/-	19.1883	µg/mL	Stressed

Reagent

571995_00062



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 **Lot No.:** A0140111

Description : 8270 List 1 / Std #1 MegaMix (2017)

8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul

Container Size : 10 mL **Pkg Amt:** > 5 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1 Purity 99% (Lot SHBJ5124)	1,006.6 µg/mL	+/- 5.8525 µg/mL +/- 12.0330 µg/mL +/- 19.1503 µg/mL Gravimetric Unstressed Stressed
2	N-Nitrosodimethylamine CAS # 62-75-9 Purity 99% (Lot 180322JLM)	1,005.1 µg/mL	+/- 5.8437 µg/mL +/- 12.0150 µg/mL +/- 19.1217 µg/mL Gravimetric Unstressed Stressed
3	Pyridine CAS # 110-86-1 Purity 99% (Lot SHBC7174V)	2,012.7 µg/mL	+/- 11.7020 µg/mL +/- 24.0599 µg/mL +/- 38.2910 µg/mL Gravimetric Unstressed Stressed
4	Phenol CAS # 108-95-2 Purity 99% (Lot SHBF9719V)	1,008.6 µg/mL	+/- 5.8641 µg/mL +/- 12.0569 µg/mL +/- 19.1883 µg/mL Gravimetric Unstressed Stressed
5	Aniline CAS # 62-53-3 Purity 99% (Lot K22Z462)	1,006.2 µg/mL	+/- 5.8501 µg/mL +/- 12.0282 µg/mL +/- 19.1427 µg/mL Gravimetric Unstressed Stressed
6	Bis(2-chloroethyl)ether CAS # 111-44-4 Purity 99% (Lot SHBD4430V)	1,009.5 µg/mL	+/- 5.8693 µg/mL +/- 12.0676 µg/mL +/- 19.2054 µg/mL Gravimetric Unstressed Stressed
7	n-Decane (C10) CAS # 124-18-5 Purity 99% (Lot SHBJ8526)	1,010.0 µg/mL	+/- 5.8722 µg/mL +/- 12.0736 µg/mL +/- 19.2150 µg/mL Gravimetric Unstressed Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 5670100)	1,009.6 µg/mL	+/-	5.8699	µg/mL	Gravimetric
				+/-	12.0688	µg/mL	Unstressed
				+/-	19.2073	µg/mL	Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBJ8113V)	1,009.0 µg/mL	+/-	5.8664	µg/mL	Gravimetric
				+/-	12.0616	µg/mL	Unstressed
				+/-	19.1959	µg/mL	Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,008.4 µg/mL	+/-	5.8629	µg/mL	Gravimetric
				+/-	12.0545	µg/mL	Unstressed
				+/-	19.1845	µg/mL	Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,008.3 µg/mL	+/-	5.8623	µg/mL	Gravimetric
				+/-	12.0533	µg/mL	Unstressed
				+/-	19.1826	µg/mL	Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,008.6 µg/mL	+/-	5.8641	µg/mL	Gravimetric
				+/-	12.0569	µg/mL	Unstressed
				+/-	19.1883	µg/mL	Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBF0201V)	1,005.5 µg/mL	+/-	5.8461	µg/mL	Gravimetric
				+/-	12.0199	µg/mL	Unstressed
				+/-	19.1294	µg/mL	Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 98%	(Lot 523400-9)	1,002.4 µg/mL	+/-	5.8283	µg/mL	Gravimetric
				+/-	11.9833	µg/mL	Unstressed
				+/-	19.0712	µg/mL	Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,007.2 µg/mL	+/-	5.8559	µg/mL	Gravimetric
				+/-	12.0401	µg/mL	Unstressed
				+/-	19.1617	µg/mL	Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012015)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,009.2 µg/mL	+/-	5.8676	µg/mL	Gravimetric
				+/-	12.0640	µg/mL	Unstressed
				+/-	19.1997	µg/mL	Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,006.3 µg/mL	+/-	5.8507	µg/mL	Gravimetric
				+/-	12.0294	µg/mL	Unstressed
				+/-	19.1446	µg/mL	Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,007.5 µg/mL	+/-	5.8579	µg/mL	Gravimetric
				+/-	12.0442	µg/mL	Unstressed
				+/-	19.1681	µg/mL	Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot B180716L)	2,012.4 µg/mL	+/-	11.7003	µg/mL	Gravimetric
				+/-	24.0564	µg/mL	Unstressed
				+/-	38.2853	µg/mL	Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	856.1 µg/mL	+/-	4.9889	µg/mL	Gravimetric
				+/-	10.2395	µg/mL	Unstressed
				+/-	16.2906	µg/mL	Stressed
59	Azobenzene CAS # 103-33-3 Purity 97%	(Lot BCBS6535V)	1,009.8 µg/mL	+/-	5.8709	µg/mL	Gravimetric
				+/-	12.0709	µg/mL	Unstressed
				+/-	19.2106	µg/mL	Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,007.6 µg/mL	+/-	5.8583	µg/mL	Gravimetric
				+/-	12.0449	µg/mL	Unstressed
				+/-	19.1693	µg/mL	Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot LRAB8468)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170717KJA)	2,005.9 µg/mL	+/-	11.6625	µg/mL	Gravimetric
				+/-	23.9787	µg/mL	Unstressed
				+/-	38.1617	µg/mL	Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot T7N4E)	1,004.8 µg/mL	+/-	5.8420	µg/mL	Gravimetric
				+/-	12.0114	µg/mL	Unstressed
				+/-	19.1160	µg/mL	Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBR2268V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 7528800)	1,002.7 µg/mL	+/-	5.8298	µg/mL	Gravimetric
				+/-	11.9863	µg/mL	Unstressed
				+/-	19.0761	µg/mL	Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.6 µg/mL	+/-	5.8466	µg/mL	Gravimetric
				+/-	12.0210	µg/mL	Unstressed
				+/-	19.1312	µg/mL	Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,002.6 µg/mL	+/-	5.8294	µg/mL	Gravimetric
				+/-	11.9856	µg/mL	Unstressed
				+/-	19.0749	µg/mL	Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 99%	(Lot MKCF0058)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot 0012018)	1,004.8 µg/mL	+/-	5.8422	µg/mL	Gravimetric
				+/-	12.0118	µg/mL	Unstressed
				+/-	19.1166	µg/mL	Stressed

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant flow 1.8 mL/min.

Temp. Program:

80°C (hold 0.1 min.) to 330°C
@ 9.6°C/min. (hold 2.85 min.)

Inj. Temp:

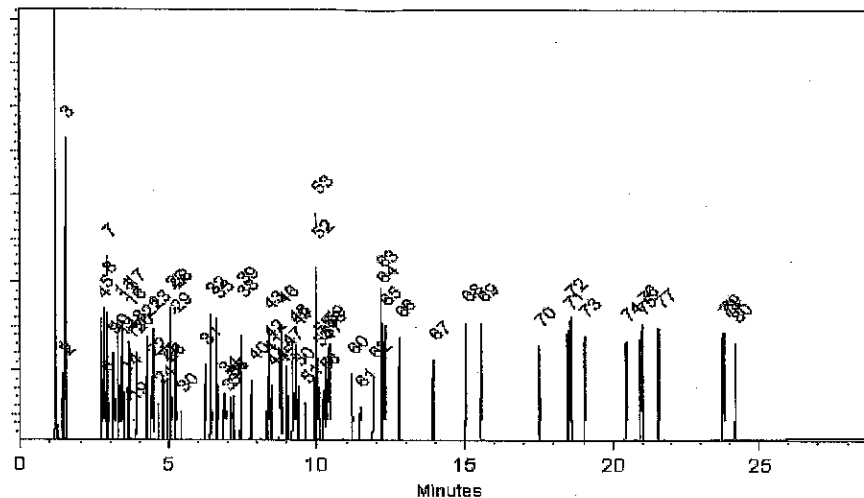
250°C

Det. Temp:

340°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Cydnei L. Crust
Cydnei L. Crust - Mix Technician

Date Mixed: 30-Jul-2018

Balance: B442140311

Jennifer J. Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 02-Aug-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

72	Chrysene		1,009.4	µg/mL	+/-	5.8687	µg/mL	Gravimetric
	CAS #	218-01-9 (Lot 012015)			+/-	12.0664	µg/mL	Unstressed
	Purity	99%			+/-	19.2035	µg/mL	Stressed
73	Bis(2-ethylhexyl)phthalate		1,007.3	µg/mL	+/-	5.8565	µg/mL	Gravimetric
	CAS #	117-81-7 (Lot MKBZ3868V)			+/-	12.0413	µg/mL	Unstressed
	Purity	99%			+/-	19.1636	µg/mL	Stressed
74	Di-n-octyl phthalate		1,007.0	µg/mL	+/-	5.8548	µg/mL	Gravimetric
	CAS #	117-84-0 (Lot 7170200)			+/-	12.0377	µg/mL	Unstressed
	Purity	99%			+/-	19.1579	µg/mL	Stressed
75	Benzo(b)fluoranthene		1,003.7	µg/mL	+/-	5.8356	µg/mL	Gravimetric
	CAS #	205-99-2 (Lot 012012B)			+/-	11.9983	µg/mL	Unstressed
	Purity	99%			+/-	19.0951	µg/mL	Stressed
76	Benzo(k)fluoranthene		1,005.7	µg/mL	+/-	5.8472	µg/mL	Gravimetric
	CAS #	207-08-9 (Lot 012012K)			+/-	12.0222	µg/mL	Unstressed
	Purity	99%			+/-	19.1332	µg/mL	Stressed
77	Benzo(a)pyrene		1,008.8	µg/mL	+/-	5.8653	µg/mL	Gravimetric
	CAS #	50-32-8 (Lot ER071309-02)			+/-	12.0593	µg/mL	Unstressed
	Purity	99%			+/-	19.1921	µg/mL	Stressed
78	Indeno(1,2,3-cd)pyrene		1,006.9	µg/mL	+/-	5.8542	µg/mL	Gravimetric
	CAS #	193-39-5 (Lot ER082107-02)			+/-	12.0365	µg/mL	Unstressed
	Purity	99%			+/-	19.1560	µg/mL	Stressed
79	Dibenz(a,h)anthracene		1,008.7	µg/mL	+/-	5.8647	µg/mL	Gravimetric
	CAS #	53-70-3 (Lot ER032211-01)			+/-	12.0581	µg/mL	Unstressed
	Purity	99%			+/-	19.1902	µg/mL	Stressed
80	Benzo(g,h,i)perylene		1,000.2	µg/mL	+/-	5.8152	µg/mL	Gravimetric
	CAS #	191-24-2 (Lot ER05121401)			+/-	11.9565	µg/mL	Unstressed
	Purity	99%			+/-	19.0285	µg/mL	Stressed
Solvent: Methylene chloride								
	CAS #	75-09-2						
	Purity	99%						

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,007.5 µg/mL	+/- 5.8577 +/- 12.0437 +/- 19.1674	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,007.2 µg/mL	+/- 5.8557 +/- 12.0395 +/- 19.1608	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,008.9 µg/mL	+/- 5.8658 +/- 12.0605 +/- 19.1940	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,009.2 µg/mL	+/- 5.8676 +/- 12.0640 +/- 19.1997	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot 1437483V)	1,009.1 µg/mL	+/- 5.8670 +/- 12.0628 +/- 19.1978	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,008.1 µg/mL	+/- 5.8612 +/- 12.0509 +/- 19.1788	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBG3580V)	2,013.2 µg/mL	+/- 11.7049 +/- 24.0659 +/- 38.3005	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKCD9952)	1,007.0 µg/mL	+/- 5.8548 +/- 12.0377 +/- 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBK1842V)	2,015.4 µg/mL	+/- 11.7177 +/- 24.0922 +/- 38.3424	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,009.5 µg/mL	+/- 5.8693 +/- 12.0676 +/- 19.2054	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot PR-30126)	1,005.3 µg/mL	+/- 5.8449 +/- 12.0174 +/- 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7 Purity 98%	(Lot 10174662)	1,007.7 µg/mL	+/- 5.8591 +/- 12.0465 +/- 19.1718	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBJ3997)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKCB0810V)	1,007.4 µg/mL	+/- 5.8571 +/- 12.0425 +/- 19.1655	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,006.7 µg/mL	+/- 5.8530 +/- 12.0342 +/- 19.1522	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

8	2-Chlorophenol		1,005.6	µg/mL	+/-	5.8466	µg/mL	Gravimetric
	CAS # 95-57-8	(Lot STBF2690V)			+/-	12.0210	µg/mL	Unstressed
	Purity 99%				+/-	19.1312	µg/mL	Stressed
9	1,3-Dichlorobenzene		1,009.7	µg/mL	+/-	5.8705	µg/mL	Gravimetric
	CAS # 541-73-1	(Lot BCBQ7100V)			+/-	12.0700	µg/mL	Unstressed
	Purity 99%				+/-	19.2092	µg/mL	Stressed
10	1,4-Dichlorobenzene		1,007.6	µg/mL	+/-	5.8583	µg/mL	Gravimetric
	CAS # 106-46-7	(Lot MKBS4401V)			+/-	12.0449	µg/mL	Unstressed
	Purity 99%				+/-	19.1693	µg/mL	Stressed
11	Benzyl alcohol		1,009.6	µg/mL	+/-	5.8699	µg/mL	Gravimetric
	CAS # 100-51-6	(Lot SHBJ0534)			+/-	12.0688	µg/mL	Unstressed
	Purity 99%				+/-	19.2073	µg/mL	Stressed
12	1,2-Dichlorobenzene		1,007.7	µg/mL	+/-	5.8589	µg/mL	Gravimetric
	CAS # 95-50-1	(Lot SHBG3111V)			+/-	12.0461	µg/mL	Unstressed
	Purity 99%				+/-	19.1712	µg/mL	Stressed
13	2-Methylphenol (o-cresol)		1,008.4	µg/mL	+/-	5.8629	µg/mL	Gravimetric
	CAS # 95-48-7	(Lot SHBH6379)			+/-	12.0545	µg/mL	Unstressed
	Purity 99%				+/-	19.1845	µg/mL	Stressed
14	2,2'-oxybis(1-chloropropane)		1,007.6	µg/mL	+/-	5.8583	µg/mL	Gravimetric
	CAS # 108-60-1	(Lot 7577400)			+/-	12.0449	µg/mL	Unstressed
	Purity 99%				+/-	19.1693	µg/mL	Stressed
15	Acetophenone		1,009.4	µg/mL	+/-	5.8687	µg/mL	Gravimetric
	CAS # 98-86-2	(Lot STBG8586)			+/-	12.0664	µg/mL	Unstressed
	Purity 99%				+/-	19.2035	µg/mL	Stressed
16	3-Methylphenol (m-cresol)		504.9	µg/mL	+/-	2.9423	µg/mL	Gravimetric
	CAS # 108-39-4	(Lot SHBD0627V)			+/-	6.0389	µg/mL	Unstressed
	Purity 99%				+/-	9.6077	µg/mL	Stressed
17	4-Methylphenol (p-cresol)		501.8	µg/mL	+/-	2.9242	µg/mL	Gravimetric
	CAS # 106-44-5	(Lot 49396APV)			+/-	6.0018	µg/mL	Unstressed
	Purity 99%				+/-	9.5487	µg/mL	Stressed
18	N-Nitroso-di-n-propylamine		1,006.6	µg/mL	+/-	5.8525	µg/mL	Gravimetric
	CAS # 621-64-7	(Lot OPAGF)			+/-	12.0330	µg/mL	Unstressed
	Purity 99%				+/-	19.1503	µg/mL	Stressed
19	Hexachloroethane		1,001.4	µg/mL	+/-	5.8222	µg/mL	Gravimetric
	CAS # 67-72-1	(Lot 4H3SF)			+/-	11.9708	µg/mL	Unstressed
	Purity 99%				+/-	19.0513	µg/mL	Stressed
20	Nitrobenzene		1,005.9	µg/mL	+/-	5.8484	µg/mL	Gravimetric
	CAS # 98-95-3	(Lot SHBG5577V)			+/-	12.0246	µg/mL	Unstressed
	Purity 99%				+/-	19.1370	µg/mL	Stressed
21	Isophorone		1,009.1	µg/mL	+/-	5.8670	µg/mL	Gravimetric
	CAS # 78-59-1	(Lot MKBG2442V)			+/-	12.0629	µg/mL	Unstressed
	Purity 98%				+/-	19.1979	µg/mL	Stressed
22	2-Nitrophenol		1,008.7	µg/mL	+/-	5.8647	µg/mL	Gravimetric
	CAS # 88-75-5	(Lot BCBH7602V)			+/-	12.0581	µg/mL	Unstressed
	Purity 99%				+/-	19.1902	µg/mL	Stressed
23	2,4-Dimethylphenol		1,008.6	µg/mL	+/-	5.8641	µg/mL	Gravimetric
	CAS # 105-67-9	(Lot 10165155)			+/-	12.0569	µg/mL	Unstressed
	Purity 99%				+/-	19.1883	µg/mL	Stressed

Reagent

571995_00063



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 Lot No.: A0140111
Description : 8270 List 1 / Std #1 MegaMix (2017)
8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 10 mL Pkg Amt: > 5 mL
Expiration Date : January 31, 2020 Storage: 0°C or colder
Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1 (Lot SHBJ5124) Purity 99%	1,006.6 µg/mL	+/- 5.8525 µg/mL Gravimetric +/- 12.0330 µg/mL Unstressed +/- 19.1503 µg/mL Stressed
2	N-Nitrosodimethylamine CAS # 62-75-9 (Lot 180322JLM) Purity 99%	1,005.1 µg/mL	+/- 5.8437 µg/mL Gravimetric +/- 12.0150 µg/mL Unstressed +/- 19.1217 µg/mL Stressed
3	Pyridine CAS # 110-86-1 (Lot SHBC7174V) Purity 99%	2,012.7 µg/mL	+/- 11.7020 µg/mL Gravimetric +/- 24.0599 µg/mL Unstressed +/- 38.2910 µg/mL Stressed
4	Phenol CAS # 108-95-2 (Lot SHBF9719V) Purity 99%	1,008.6 µg/mL	+/- 5.8641 µg/mL Gravimetric +/- 12.0569 µg/mL Unstressed +/- 19.1883 µg/mL Stressed
5	Aniline CAS # 62-53-3 (Lot K22Z462) Purity 99%	1,006.2 µg/mL	+/- 5.8501 µg/mL Gravimetric +/- 12.0282 µg/mL Unstressed +/- 19.1427 µg/mL Stressed
6	Bis(2-chloroethyl)ether CAS # 111-44-4 (Lot SHBD4430V) Purity 99%	1,009.5 µg/mL	+/- 5.8693 µg/mL Gravimetric +/- 12.0676 µg/mL Unstressed +/- 19.2054 µg/mL Stressed
7	n-Decane (C10) CAS # 124-18-5 (Lot SHBJ8526) Purity 99%	1,010.0 µg/mL	+/- 5.8722 µg/mL Gravimetric +/- 12.0736 µg/mL Unstressed +/- 19.2150 µg/mL Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 5670100)	1,009.6 µg/mL	+/-	5.8699	µg/mL	Gravimetric
				+/-	12.0688	µg/mL	Unstressed
				+/-	19.2073	µg/mL	Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBJ8113V)	1,009.0 µg/mL	+/-	5.8664	µg/mL	Gravimetric
				+/-	12.0616	µg/mL	Unstressed
				+/-	19.1959	µg/mL	Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,008.4 µg/mL	+/-	5.8629	µg/mL	Gravimetric
				+/-	12.0545	µg/mL	Unstressed
				+/-	19.1845	µg/mL	Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,008.3 µg/mL	+/-	5.8623	µg/mL	Gravimetric
				+/-	12.0533	µg/mL	Unstressed
				+/-	19.1826	µg/mL	Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,008.6 µg/mL	+/-	5.8641	µg/mL	Gravimetric
				+/-	12.0569	µg/mL	Unstressed
				+/-	19.1883	µg/mL	Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBF0201V)	1,005.5 µg/mL	+/-	5.8461	µg/mL	Gravimetric
				+/-	12.0199	µg/mL	Unstressed
				+/-	19.1294	µg/mL	Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 98%	(Lot 523400-9)	1,002.4 µg/mL	+/-	5.8283	µg/mL	Gravimetric
				+/-	11.9833	µg/mL	Unstressed
				+/-	19.0712	µg/mL	Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,007.2 µg/mL	+/-	5.8559	µg/mL	Gravimetric
				+/-	12.0401	µg/mL	Unstressed
				+/-	19.1617	µg/mL	Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012015)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,009.2 µg/mL	+/-	5.8676	µg/mL	Gravimetric
				+/-	12.0640	µg/mL	Unstressed
				+/-	19.1997	µg/mL	Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,006.3 µg/mL	+/-	5.8507	µg/mL	Gravimetric
				+/-	12.0294	µg/mL	Unstressed
				+/-	19.1446	µg/mL	Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,007.5 µg/mL	+/-	5.8579	µg/mL	Gravimetric
				+/-	12.0442	µg/mL	Unstressed
				+/-	19.1681	µg/mL	Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot B180716L)	2,012.4 µg/mL	+/-	11.7003	µg/mL	Gravimetric
				+/-	24.0564	µg/mL	Unstressed
				+/-	38.2853	µg/mL	Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	856.1 µg/mL	+/-	4.9889	µg/mL	Gravimetric
				+/-	10.2395	µg/mL	Unstressed
				+/-	16.2906	µg/mL	Stressed
59	Azobenzene CAS # 103-33-3 Purity 97%	(Lot BCBS6535V)	1,009.8 µg/mL	+/-	5.8709	µg/mL	Gravimetric
				+/-	12.0709	µg/mL	Unstressed
				+/-	19.2106	µg/mL	Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,007.6 µg/mL	+/-	5.8583	µg/mL	Gravimetric
				+/-	12.0449	µg/mL	Unstressed
				+/-	19.1693	µg/mL	Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot LRAB8468)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170717KJA)	2,005.9 µg/mL	+/-	11.6625	µg/mL	Gravimetric
				+/-	23.9787	µg/mL	Unstressed
				+/-	38.1617	µg/mL	Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot T7N4E)	1,004.8 µg/mL	+/-	5.8420	µg/mL	Gravimetric
				+/-	12.0114	µg/mL	Unstressed
				+/-	19.1160	µg/mL	Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBR2268V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 7528800)	1,002.7 µg/mL	+/-	5.8298	µg/mL	Gravimetric
				+/-	11.9863	µg/mL	Unstressed
				+/-	19.0761	µg/mL	Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.6 µg/mL	+/-	5.8466	µg/mL	Gravimetric
				+/-	12.0210	µg/mL	Unstressed
				+/-	19.1312	µg/mL	Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,002.6 µg/mL	+/-	5.8294	µg/mL	Gravimetric
				+/-	11.9856	µg/mL	Unstressed
				+/-	19.0749	µg/mL	Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 99%	(Lot MKCF0058)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot 0012018)	1,004.8 µg/mL	+/-	5.8422	µg/mL	Gravimetric
				+/-	12.0118	µg/mL	Unstressed
				+/-	19.1166	µg/mL	Stressed

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant flow 1.8 mL/min.

Temp. Program:

80°C (hold 0.1 min.) to 330°C
@ 9.6°C/min. (hold 2.86 min.)

Inj. Temp:

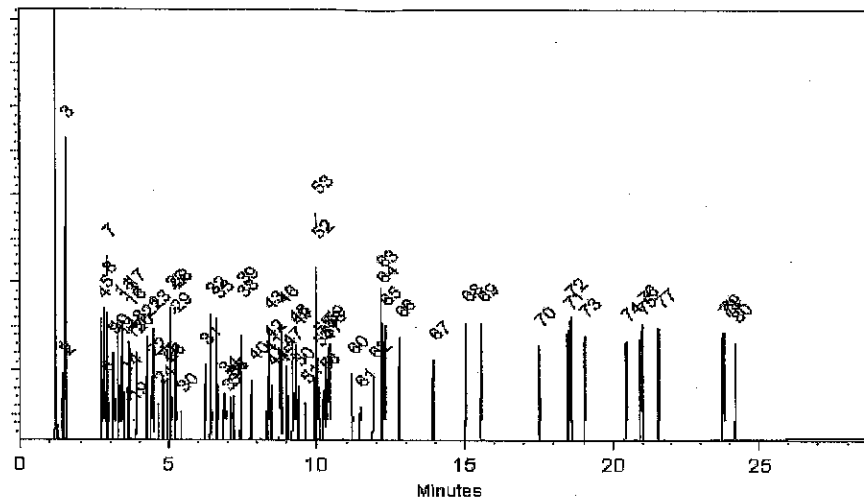
250°C

Det. Temp:

340°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Cydnei L. Crust
Cydnei L. Crust - Mix Technician

Date Mixed: 30-Jul-2018

Balance: B442140311

Jennifer J. Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 02-Aug-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

72	Chrysene		1,009.4	µg/mL	+/-	5.8687	µg/mL	Gravimetric
	CAS #	218-01-9 (Lot 012015)			+/-	12.0664	µg/mL	Unstressed
	Purity	99%			+/-	19.2035	µg/mL	Stressed
73	Bis(2-ethylhexyl)phthalate		1,007.3	µg/mL	+/-	5.8565	µg/mL	Gravimetric
	CAS #	117-81-7 (Lot MKBZ3868V)			+/-	12.0413	µg/mL	Unstressed
	Purity	99%			+/-	19.1636	µg/mL	Stressed
74	Di-n-octyl phthalate		1,007.0	µg/mL	+/-	5.8548	µg/mL	Gravimetric
	CAS #	117-84-0 (Lot 7170200)			+/-	12.0377	µg/mL	Unstressed
	Purity	99%			+/-	19.1579	µg/mL	Stressed
75	Benzo(b)fluoranthene		1,003.7	µg/mL	+/-	5.8356	µg/mL	Gravimetric
	CAS #	205-99-2 (Lot 012012B)			+/-	11.9983	µg/mL	Unstressed
	Purity	99%			+/-	19.0951	µg/mL	Stressed
76	Benzo(k)fluoranthene		1,005.7	µg/mL	+/-	5.8472	µg/mL	Gravimetric
	CAS #	207-08-9 (Lot 012012K)			+/-	12.0222	µg/mL	Unstressed
	Purity	99%			+/-	19.1332	µg/mL	Stressed
77	Benzo(a)pyrene		1,008.8	µg/mL	+/-	5.8653	µg/mL	Gravimetric
	CAS #	50-32-8 (Lot ER071309-02)			+/-	12.0593	µg/mL	Unstressed
	Purity	99%			+/-	19.1921	µg/mL	Stressed
78	Indeno(1,2,3-cd)pyrene		1,006.9	µg/mL	+/-	5.8542	µg/mL	Gravimetric
	CAS #	193-39-5 (Lot ER082107-02)			+/-	12.0365	µg/mL	Unstressed
	Purity	99%			+/-	19.1560	µg/mL	Stressed
79	Dibenz(a,h)anthracene		1,008.7	µg/mL	+/-	5.8647	µg/mL	Gravimetric
	CAS #	53-70-3 (Lot ER032211-01)			+/-	12.0581	µg/mL	Unstressed
	Purity	99%			+/-	19.1902	µg/mL	Stressed
80	Benzo(g,h,i)perylene		1,000.2	µg/mL	+/-	5.8152	µg/mL	Gravimetric
	CAS #	191-24-2 (Lot ER05121401)			+/-	11.9565	µg/mL	Unstressed
	Purity	99%			+/-	19.0285	µg/mL	Stressed
Solvent: Methylene chloride								
	CAS #	75-09-2						
	Purity	99%						

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,007.5 µg/mL	+/- 5.8577 +/- 12.0437 +/- 19.1674	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,007.2 µg/mL	+/- 5.8557 +/- 12.0395 +/- 19.1608	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,008.9 µg/mL	+/- 5.8658 +/- 12.0605 +/- 19.1940	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,009.2 µg/mL	+/- 5.8676 +/- 12.0640 +/- 19.1997	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot 1437483V)	1,009.1 µg/mL	+/- 5.8670 +/- 12.0628 +/- 19.1978	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,008.1 µg/mL	+/- 5.8612 +/- 12.0509 +/- 19.1788	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBG3580V)	2,013.2 µg/mL	+/- 11.7049 +/- 24.0659 +/- 38.3005	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKCD9952)	1,007.0 µg/mL	+/- 5.8548 +/- 12.0377 +/- 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBK1842V)	2,015.4 µg/mL	+/- 11.7177 +/- 24.0922 +/- 38.3424	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,009.5 µg/mL	+/- 5.8693 +/- 12.0676 +/- 19.2054	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot PR-30126)	1,005.3 µg/mL	+/- 5.8449 +/- 12.0174 +/- 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7 Purity 98%	(Lot 10174662)	1,007.7 µg/mL	+/- 5.8591 +/- 12.0465 +/- 19.1718	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBJ3997)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKCB0810V)	1,007.4 µg/mL	+/- 5.8571 +/- 12.0425 +/- 19.1655	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,006.7 µg/mL	+/- 5.8530 +/- 12.0342 +/- 19.1522	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

8	2-Chlorophenol CAS # 95-57-8 Purity 99%	(Lot STBF2690V)	1,005.6 µg/mL	+/-	5.8466 12.0210 19.1312	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	1,3-Dichlorobenzene CAS # 541-73-1 Purity 99%	(Lot BCBQ7100V)	1,009.7 µg/mL	+/-	5.8705 12.0700 19.2092	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	1,4-Dichlorobenzene CAS # 106-46-7 Purity 99%	(Lot MKBS4401V)	1,007.6 µg/mL	+/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benzyl alcohol CAS # 100-51-6 Purity 99%	(Lot SHBJ0534)	1,009.6 µg/mL	+/-	5.8699 12.0688 19.2073	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	1,2-Dichlorobenzene CAS # 95-50-1 Purity 99%	(Lot SHBG3111V)	1,007.7 µg/mL	+/-	5.8589 12.0461 19.1712	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	2-Methylphenol (o-cresol) CAS # 95-48-7 Purity 99%	(Lot SHBH6379)	1,008.4 µg/mL	+/-	5.8629 12.0545 19.1845	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	2,2'-oxybis(1-chloropropane) CAS # 108-60-1 Purity 99%	(Lot 7577400)	1,007.6 µg/mL	+/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Acetophenone CAS # 98-86-2 Purity 99%	(Lot STBG8586)	1,009.4 µg/mL	+/-	5.8687 12.0664 19.2035	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	3-Methylphenol (m-cresol) CAS # 108-39-4 Purity 99%	(Lot SHBD0627V)	504.9 µg/mL	+/-	2.9423 6.0389 9.6077	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	4-Methylphenol (p-cresol) CAS # 106-44-5 Purity 99%	(Lot 49396APV)	501.8 µg/mL	+/-	2.9242 6.0018 9.5487	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	N-Nitroso-di-n-propylamine CAS # 621-64-7 Purity 99%	(Lot OPAGF)	1,006.6 µg/mL	+/-	5.8525 12.0330 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	Hexachloroethane CAS # 67-72-1 Purity 99%	(Lot 4H3SF)	1,001.4 µg/mL	+/-	5.8222 11.9708 19.0513	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	Nitrobenzene CAS # 98-95-3 Purity 99%	(Lot SHBG5577V)	1,005.9 µg/mL	+/-	5.8484 12.0246 19.1370	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
21	Isophorone CAS # 78-59-1 Purity 98%	(Lot MKBG2442V)	1,009.1 µg/mL	+/-	5.8670 12.0629 19.1979	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
22	2-Nitrophenol CAS # 88-75-5 Purity 99%	(Lot BCBH7602V)	1,008.7 µg/mL	+/-	5.8647 12.0581 19.1902	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
23	2,4-Dimethylphenol CAS # 105-67-9 Purity 99%	(Lot 10165155)	1,008.6 µg/mL	+/-	5.8641 12.0569 19.1883	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Reagent

571995_00064



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 Lot No.: A0140111

Description : 8270 List 1 / Std #1 MegaMix (2017)

8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul

Container Size : 10 mL Pkg Amt: > 5 mL

Expiration Date : January 31, 2020 Storage: 0°C or colder

Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1 (Lot SHBJ5124) Purity 99%	1,006.6 µg/mL	+/- 5.8525 µg/mL Gravimetric +/- 12.0330 µg/mL Unstressed +/- 19.1503 µg/mL Stressed
2	N-Nitrosodimethylamine CAS # 62-75-9 (Lot 180322JLM) Purity 99%	1,005.1 µg/mL	+/- 5.8437 µg/mL Gravimetric +/- 12.0150 µg/mL Unstressed +/- 19.1217 µg/mL Stressed
3	Pyridine CAS # 110-86-1 (Lot SHBC7174V) Purity 99%	2,012.7 µg/mL	+/- 11.7020 µg/mL Gravimetric +/- 24.0599 µg/mL Unstressed +/- 38.2910 µg/mL Stressed
4	Phenol CAS # 108-95-2 (Lot SHBF9719V) Purity 99%	1,008.6 µg/mL	+/- 5.8641 µg/mL Gravimetric +/- 12.0569 µg/mL Unstressed +/- 19.1883 µg/mL Stressed
5	Aniline CAS # 62-53-3 (Lot K22Z462) Purity 99%	1,006.2 µg/mL	+/- 5.8501 µg/mL Gravimetric +/- 12.0282 µg/mL Unstressed +/- 19.1427 µg/mL Stressed
6	Bis(2-chloroethyl)ether CAS # 111-44-4 (Lot SHBD4430V) Purity 99%	1,009.5 µg/mL	+/- 5.8693 µg/mL Gravimetric +/- 12.0676 µg/mL Unstressed +/- 19.2054 µg/mL Stressed
7	n-Decane (C10) CAS # 124-18-5 (Lot SHBJ8526) Purity 99%	1,010.0 µg/mL	+/- 5.8722 µg/mL Gravimetric +/- 12.0736 µg/mL Unstressed +/- 19.2150 µg/mL Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 5670100)	1,009.6 µg/mL	+/-	5.8699	µg/mL	Gravimetric
				+/-	12.0688	µg/mL	Unstressed
				+/-	19.2073	µg/mL	Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBJ8113V)	1,009.0 µg/mL	+/-	5.8664	µg/mL	Gravimetric
				+/-	12.0616	µg/mL	Unstressed
				+/-	19.1959	µg/mL	Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,008.4 µg/mL	+/-	5.8629	µg/mL	Gravimetric
				+/-	12.0545	µg/mL	Unstressed
				+/-	19.1845	µg/mL	Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,008.3 µg/mL	+/-	5.8623	µg/mL	Gravimetric
				+/-	12.0533	µg/mL	Unstressed
				+/-	19.1826	µg/mL	Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,008.6 µg/mL	+/-	5.8641	µg/mL	Gravimetric
				+/-	12.0569	µg/mL	Unstressed
				+/-	19.1883	µg/mL	Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBF0201V)	1,005.5 µg/mL	+/-	5.8461	µg/mL	Gravimetric
				+/-	12.0199	µg/mL	Unstressed
				+/-	19.1294	µg/mL	Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 98%	(Lot 523400-9)	1,002.4 µg/mL	+/-	5.8283	µg/mL	Gravimetric
				+/-	11.9833	µg/mL	Unstressed
				+/-	19.0712	µg/mL	Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,007.2 µg/mL	+/-	5.8559	µg/mL	Gravimetric
				+/-	12.0401	µg/mL	Unstressed
				+/-	19.1617	µg/mL	Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012015)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,009.2 µg/mL	+/-	5.8676	µg/mL	Gravimetric
				+/-	12.0640	µg/mL	Unstressed
				+/-	19.1997	µg/mL	Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,006.3 µg/mL	+/-	5.8507	µg/mL	Gravimetric
				+/-	12.0294	µg/mL	Unstressed
				+/-	19.1446	µg/mL	Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,007.5 µg/mL	+/-	5.8579	µg/mL	Gravimetric
				+/-	12.0442	µg/mL	Unstressed
				+/-	19.1681	µg/mL	Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot B180716L)	2,012.4 µg/mL	+/-	11.7003	µg/mL	Gravimetric
				+/-	24.0564	µg/mL	Unstressed
				+/-	38.2853	µg/mL	Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	856.1 µg/mL	+/-	4.9889	µg/mL	Gravimetric
				+/-	10.2395	µg/mL	Unstressed
				+/-	16.2906	µg/mL	Stressed
59	Azobenzene CAS # 103-33-3 Purity 97%	(Lot BCBS6535V)	1,009.8 µg/mL	+/-	5.8709	µg/mL	Gravimetric
				+/-	12.0709	µg/mL	Unstressed
				+/-	19.2106	µg/mL	Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,007.6 µg/mL	+/-	5.8583	µg/mL	Gravimetric
				+/-	12.0449	µg/mL	Unstressed
				+/-	19.1693	µg/mL	Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot LRAB8468)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170717KJA)	2,005.9 µg/mL	+/-	11.6625	µg/mL	Gravimetric
				+/-	23.9787	µg/mL	Unstressed
				+/-	38.1617	µg/mL	Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot T7N4E)	1,004.8 µg/mL	+/-	5.8420	µg/mL	Gravimetric
				+/-	12.0114	µg/mL	Unstressed
				+/-	19.1160	µg/mL	Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBR2268V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 7528800)	1,002.7 µg/mL	+/-	5.8298	µg/mL	Gravimetric
				+/-	11.9863	µg/mL	Unstressed
				+/-	19.0761	µg/mL	Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.6 µg/mL	+/-	5.8466	µg/mL	Gravimetric
				+/-	12.0210	µg/mL	Unstressed
				+/-	19.1312	µg/mL	Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,002.6 µg/mL	+/-	5.8294	µg/mL	Gravimetric
				+/-	11.9856	µg/mL	Unstressed
				+/-	19.0749	µg/mL	Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 99%	(Lot MKCF0058)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot 0012018)	1,004.8 µg/mL	+/-	5.8422	µg/mL	Gravimetric
				+/-	12.0118	µg/mL	Unstressed
				+/-	19.1166	µg/mL	Stressed

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant flow 1.8 mL/min.

Temp. Program:

80°C (hold 0.1 min.) to 330°C
@ 9.6°C/min. (hold 2.85 min.)

Inj. Temp:

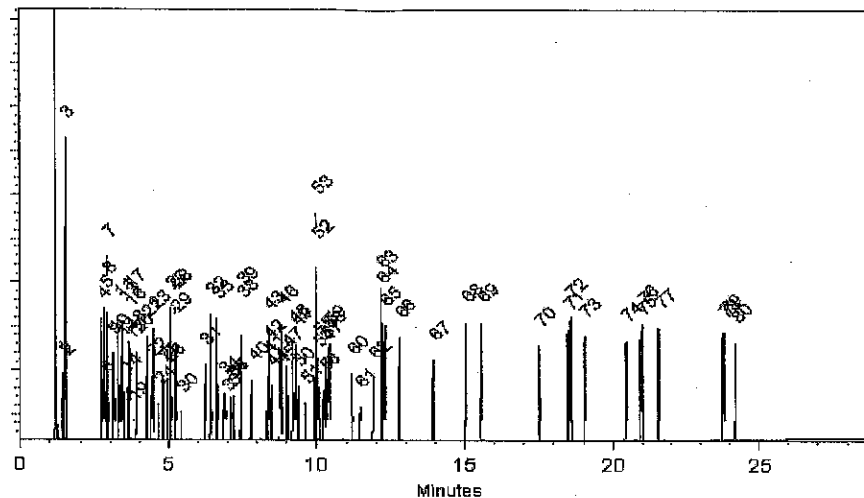
250°C

Det. Temp:

340°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Cydnei L. Crust
Cydnei L. Crust - Mix Technician

Date Mixed: 30-Jul-2018

Balance: B442140311

Jennifer J. Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 02-Aug-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

72	Chrysene		1,009.4	µg/mL	+/-	5.8687	µg/mL	Gravimetric
	CAS #	218-01-9 (Lot 012015)			+/-	12.0664	µg/mL	Unstressed
	Purity	99%			+/-	19.2035	µg/mL	Stressed
73	Bis(2-ethylhexyl)phthalate		1,007.3	µg/mL	+/-	5.8565	µg/mL	Gravimetric
	CAS #	117-81-7 (Lot MKBZ3868V)			+/-	12.0413	µg/mL	Unstressed
	Purity	99%			+/-	19.1636	µg/mL	Stressed
74	Di-n-octyl phthalate		1,007.0	µg/mL	+/-	5.8548	µg/mL	Gravimetric
	CAS #	117-84-0 (Lot 7170200)			+/-	12.0377	µg/mL	Unstressed
	Purity	99%			+/-	19.1579	µg/mL	Stressed
75	Benzo(b)fluoranthene		1,003.7	µg/mL	+/-	5.8356	µg/mL	Gravimetric
	CAS #	205-99-2 (Lot 012012B)			+/-	11.9983	µg/mL	Unstressed
	Purity	99%			+/-	19.0951	µg/mL	Stressed
76	Benzo(k)fluoranthene		1,005.7	µg/mL	+/-	5.8472	µg/mL	Gravimetric
	CAS #	207-08-9 (Lot 012012K)			+/-	12.0222	µg/mL	Unstressed
	Purity	99%			+/-	19.1332	µg/mL	Stressed
77	Benzo(a)pyrene		1,008.8	µg/mL	+/-	5.8653	µg/mL	Gravimetric
	CAS #	50-32-8 (Lot ER071309-02)			+/-	12.0593	µg/mL	Unstressed
	Purity	99%			+/-	19.1921	µg/mL	Stressed
78	Indeno(1,2,3-cd)pyrene		1,006.9	µg/mL	+/-	5.8542	µg/mL	Gravimetric
	CAS #	193-39-5 (Lot ER082107-02)			+/-	12.0365	µg/mL	Unstressed
	Purity	99%			+/-	19.1560	µg/mL	Stressed
79	Dibenz(a,h)anthracene		1,008.7	µg/mL	+/-	5.8647	µg/mL	Gravimetric
	CAS #	53-70-3 (Lot ER032211-01)			+/-	12.0581	µg/mL	Unstressed
	Purity	99%			+/-	19.1902	µg/mL	Stressed
80	Benzo(g,h,i)perylene		1,000.2	µg/mL	+/-	5.8152	µg/mL	Gravimetric
	CAS #	191-24-2 (Lot ER05121401)			+/-	11.9565	µg/mL	Unstressed
	Purity	99%			+/-	19.0285	µg/mL	Stressed
Solvent: Methylene chloride								
	CAS #	75-09-2						
	Purity	99%						

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,007.5 µg/mL	+/- 5.8577 +/- 12.0437 +/- 19.1674	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,007.2 µg/mL	+/- 5.8557 +/- 12.0395 +/- 19.1608	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,008.9 µg/mL	+/- 5.8658 +/- 12.0605 +/- 19.1940	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,009.2 µg/mL	+/- 5.8676 +/- 12.0640 +/- 19.1997	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot 1437483V)	1,009.1 µg/mL	+/- 5.8670 +/- 12.0628 +/- 19.1978	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,008.1 µg/mL	+/- 5.8612 +/- 12.0509 +/- 19.1788	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBG3580V)	2,013.2 µg/mL	+/- 11.7049 +/- 24.0659 +/- 38.3005	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKCD9952)	1,007.0 µg/mL	+/- 5.8548 +/- 12.0377 +/- 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBK1842V)	2,015.4 µg/mL	+/- 11.7177 +/- 24.0922 +/- 38.3424	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,009.5 µg/mL	+/- 5.8693 +/- 12.0676 +/- 19.2054	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot PR-30126)	1,005.3 µg/mL	+/- 5.8449 +/- 12.0174 +/- 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7 Purity 98%	(Lot 10174662)	1,007.7 µg/mL	+/- 5.8591 +/- 12.0465 +/- 19.1718	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBJ3997)	1,009.8 µg/mL	+/- 5.8711 +/- 12.0712 +/- 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKCB0810V)	1,007.4 µg/mL	+/- 5.8571 +/- 12.0425 +/- 19.1655	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,006.7 µg/mL	+/- 5.8530 +/- 12.0342 +/- 19.1522	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

8	2-Chlorophenol CAS # 95-57-8 Purity 99%	(Lot STBF2690V)	1,005.6 µg/mL	+/-	5.8466 12.0210 19.1312	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	1,3-Dichlorobenzene CAS # 541-73-1 Purity 99%	(Lot BCBQ7100V)	1,009.7 µg/mL	+/-	5.8705 12.0700 19.2092	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	1,4-Dichlorobenzene CAS # 106-46-7 Purity 99%	(Lot MKBS4401V)	1,007.6 µg/mL	+/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benzyl alcohol CAS # 100-51-6 Purity 99%	(Lot SHBJ0534)	1,009.6 µg/mL	+/-	5.8699 12.0688 19.2073	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	1,2-Dichlorobenzene CAS # 95-50-1 Purity 99%	(Lot SHBG3111V)	1,007.7 µg/mL	+/-	5.8589 12.0461 19.1712	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	2-Methylphenol (o-cresol) CAS # 95-48-7 Purity 99%	(Lot SHBH6379)	1,008.4 µg/mL	+/-	5.8629 12.0545 19.1845	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	2,2'-oxybis(1-chloropropane) CAS # 108-60-1 Purity 99%	(Lot 7577400)	1,007.6 µg/mL	+/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Acetophenone CAS # 98-86-2 Purity 99%	(Lot STBG8586)	1,009.4 µg/mL	+/-	5.8687 12.0664 19.2035	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	3-Methylphenol (m-cresol) CAS # 108-39-4 Purity 99%	(Lot SHBD0627V)	504.9 µg/mL	+/-	2.9423 6.0389 9.6077	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	4-Methylphenol (p-cresol) CAS # 106-44-5 Purity 99%	(Lot 49396APV)	501.8 µg/mL	+/-	2.9242 6.0018 9.5487	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	N-Nitroso-di-n-propylamine CAS # 621-64-7 Purity 99%	(Lot OPAGF)	1,006.6 µg/mL	+/-	5.8525 12.0330 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	Hexachloroethane CAS # 67-72-1 Purity 99%	(Lot 4H3SF)	1,001.4 µg/mL	+/-	5.8222 11.9708 19.0513	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	Nitrobenzene CAS # 98-95-3 Purity 99%	(Lot SHBG5577V)	1,005.9 µg/mL	+/-	5.8484 12.0246 19.1370	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
21	Isophorone CAS # 78-59-1 Purity 98%	(Lot MKBG2442V)	1,009.1 µg/mL	+/-	5.8670 12.0629 19.1979	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
22	2-Nitrophenol CAS # 88-75-5 Purity 99%	(Lot BCBH7602V)	1,008.7 µg/mL	+/-	5.8647 12.0581 19.1902	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
23	2,4-Dimethylphenol CAS # 105-67-9 Purity 99%	(Lot 10165155)	1,008.6 µg/mL	+/-	5.8641 12.0569 19.1883	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Reagent

571995_00065

8	2-Chlorophenol CAS # 95-57-8 Purity 99%	(Lot STBF2690V)	1,005.6 µg/mL	+/- +/- +/-	5.8466 12.0210 19.1312	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	1,3-Dichlorobenzene CAS # 541-73-1 Purity 99%	(Lot BCBQ7100V)	1,009.7 µg/mL	+/- +/- +/-	5.8705 12.0700 19.2092	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	1,4-Dichlorobenzene CAS # 106-46-7 Purity 99%	(Lot MKBS4401V)	1,007.6 µg/mL	+/- +/- +/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benzyl alcohol CAS # 100-51-6 Purity 99%	(Lot SHBJ0534)	1,009.6 µg/mL	+/- +/- +/-	5.8699 12.0688 19.2073	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	1,2-Dichlorobenzene CAS # 95-50-1 Purity 99%	(Lot SHBG3111V)	1,007.7 µg/mL	+/- +/- +/-	5.8589 12.0461 19.1712	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	2-Methylphenol (o-cresol) CAS # 95-48-7 Purity 99%	(Lot SHBH6379)	1,008.4 µg/mL	+/- +/- +/-	5.8629 12.0545 19.1845	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	2,2'-oxybis(1-chloropropane) CAS # 108-60-1 Purity 99%	(Lot 7577400)	1,007.6 µg/mL	+/- +/- +/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Acetophenone CAS # 98-86-2 Purity 99%	(Lot STBG8586)	1,009.4 µg/mL	+/- +/- +/-	5.8687 12.0664 19.2035	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	3-Methylphenol (m-cresol) CAS # 108-39-4 Purity 99%	(Lot SHBD0627V)	504.9 µg/mL	+/- +/- +/-	2.9423 6.0389 9.6077	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	4-Methylphenol (p-cresol) CAS # 106-44-5 Purity 99%	(Lot 49396APV)	501.8 µg/mL	+/- +/- +/-	2.9242 6.0018 9.5487	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	N-Nitroso-di-n-propylamine CAS # 621-64-7 Purity 99%	(Lot OPAGF)	1,006.6 µg/mL	+/- +/- +/-	5.8525 12.0330 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	Hexachloroethane CAS # 67-72-1 Purity 99%	(Lot 4H3SF)	1,001.4 µg/mL	+/- +/- +/-	5.8222 11.9708 19.0513	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	Nitrobenzene CAS # 98-95-3 Purity 99%	(Lot SHBG5577V)	1,005.9 µg/mL	+/- +/- +/-	5.8484 12.0246 19.1370	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
21	Isophorone CAS # 78-59-1 Purity 98%	(Lot MKBG2442V)	1,009.1 µg/mL	+/- +/- +/-	5.8670 12.0629 19.1979	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
22	2-Nitrophenol CAS # 88-75-5 Purity 99%	(Lot BCBH7602V)	1,008.7 µg/mL	+/- +/- +/-	5.8647 12.0581 19.1902	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
23	2,4-Dimethylphenol CAS # 105-67-9 Purity 99%	(Lot 10165155)	1,008.6 µg/mL	+/- +/- +/-	5.8641 12.0569 19.1883	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,007.5 µg/mL	+/- +/- +/-	5.8577 12.0437 19.1674	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,007.2 µg/mL	+/- +/- +/-	5.8557 12.0395 19.1608	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,008.9 µg/mL	+/- +/- +/-	5.8658 12.0605 19.1940	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,009.2 µg/mL	+/- +/- +/-	5.8676 12.0640 19.1997	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot 1437483V)	1,009.1 µg/mL	+/- +/- +/-	5.8670 12.0628 19.1978	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,009.8 µg/mL	+/- +/- +/-	5.8711 12.0712 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,008.1 µg/mL	+/- +/- +/-	5.8612 12.0509 19.1788	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBG3580V)	2,013.2 µg/mL	+/- +/- +/-	11.7049 24.0659 38.3005	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKCD9952)	1,007.0 µg/mL	+/- +/- +/-	5.8548 12.0377 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBK1842V)	2,015.4 µg/mL	+/- +/- +/-	11.7177 24.0922 38.3424	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,009.5 µg/mL	+/- +/- +/-	5.8693 12.0676 19.2054	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot PR-30126)	1,005.3 µg/mL	+/- +/- +/-	5.8449 12.0174 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7 Purity 98%	(Lot 10174662)	1,007.7 µg/mL	+/- +/- +/-	5.8591 12.0465 19.1718	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBJ3997)	1,009.8 µg/mL	+/- +/- +/-	5.8711 12.0712 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKCB0810V)	1,007.4 µg/mL	+/- +/- +/-	5.8571 12.0425 19.1655	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,006.7 µg/mL	+/- +/- +/-	5.8530 12.0342 19.1522	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

72	Chrysene CAS # 218-01-9 Purity 99%	(Lot 012015)	1,009.4 µg/mL	+/-	5.8687	µg/mL	Gravimetric
				+/-	12.0664	µg/mL	Unstressed
				+/-	19.2035	µg/mL	Stressed
73	Bis(2-ethylhexyl)phthalate CAS # 117-81-7 Purity 99%	(Lot MKBZ3868V)	1,007.3 µg/mL	+/-	5.8565	µg/mL	Gravimetric
				+/-	12.0413	µg/mL	Unstressed
				+/-	19.1636	µg/mL	Stressed
74	Di-n-octyl phthalate CAS # 117-84-0 Purity 99%	(Lot 7170200)	1,007.0 µg/mL	+/-	5.8548	µg/mL	Gravimetric
				+/-	12.0377	µg/mL	Unstressed
				+/-	19.1579	µg/mL	Stressed
75	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012012B)	1,003.7 µg/mL	+/-	5.8356	µg/mL	Gravimetric
				+/-	11.9983	µg/mL	Unstressed
				+/-	19.0951	µg/mL	Stressed
76	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012012K)	1,005.7 µg/mL	+/-	5.8472	µg/mL	Gravimetric
				+/-	12.0222	µg/mL	Unstressed
				+/-	19.1332	µg/mL	Stressed
77	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot ER071309-02)	1,008.8 µg/mL	+/-	5.8653	µg/mL	Gravimetric
				+/-	12.0593	µg/mL	Unstressed
				+/-	19.1921	µg/mL	Stressed
78	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot ER082107-02)	1,006.9 µg/mL	+/-	5.8542	µg/mL	Gravimetric
				+/-	12.0365	µg/mL	Unstressed
				+/-	19.1560	µg/mL	Stressed
79	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	1,008.7 µg/mL	+/-	5.8647	µg/mL	Gravimetric
				+/-	12.0581	µg/mL	Unstressed
				+/-	19.1902	µg/mL	Stressed
80	Benzo(g,h,i)perylene CAS # 191-24-2 Purity 99%	(Lot ER05121401)	1,000.2 µg/mL	+/-	5.8152	µg/mL	Gravimetric
				+/-	11.9565	µg/mL	Unstressed
				+/-	19.0285	µg/mL	Stressed
Solvent:	Methylene chloride CAS # 75-09-2 Purity 99%						

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.



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Bellefonte, PA 16823-8812
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www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 **Lot No.:** A0140111

Description : 8270 List 1 / Std #1 MegaMix (2017)

8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul

Container Size : 10 mL **Pkg Amt:** > 5 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1 (Lot SHBJ5124) Purity 99%	1,006.6 µg/mL	+/- 5.8525 µg/mL Gravimetric +/- 12.0330 µg/mL Unstressed +/- 19.1503 µg/mL Stressed
2	N-Nitrosodimethylamine CAS # 62-75-9 (Lot 180322JLM) Purity 99%	1,005.1 µg/mL	+/- 5.8437 µg/mL Gravimetric +/- 12.0150 µg/mL Unstressed +/- 19.1217 µg/mL Stressed
3	Pyridine CAS # 110-86-1 (Lot SHBC7174V) Purity 99%	2,012.7 µg/mL	+/- 11.7020 µg/mL Gravimetric +/- 24.0599 µg/mL Unstressed +/- 38.2910 µg/mL Stressed
4	Phenol CAS # 108-95-2 (Lot SHBF9719V) Purity 99%	1,008.6 µg/mL	+/- 5.8641 µg/mL Gravimetric +/- 12.0569 µg/mL Unstressed +/- 19.1883 µg/mL Stressed
5	Aniline CAS # 62-53-3 (Lot K22Z462) Purity 99%	1,006.2 µg/mL	+/- 5.8501 µg/mL Gravimetric +/- 12.0282 µg/mL Unstressed +/- 19.1427 µg/mL Stressed
6	Bis(2-chloroethyl)ether CAS # 111-44-4 (Lot SHBD4430V) Purity 99%	1,009.5 µg/mL	+/- 5.8693 µg/mL Gravimetric +/- 12.0676 µg/mL Unstressed +/- 19.2054 µg/mL Stressed
7	n-Decane (C10) CAS # 124-18-5 (Lot SHBJ8526) Purity 99%	1,010.0 µg/mL	+/- 5.8722 µg/mL Gravimetric +/- 12.0736 µg/mL Unstressed +/- 19.2150 µg/mL Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 5670100)	1,009.6 µg/mL	+/-	5.8699	µg/mL	Gravimetric
				+/-	12.0688	µg/mL	Unstressed
				+/-	19.2073	µg/mL	Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBJ8113V)	1,009.0 µg/mL	+/-	5.8664	µg/mL	Gravimetric
				+/-	12.0616	µg/mL	Unstressed
				+/-	19.1959	µg/mL	Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,008.4 µg/mL	+/-	5.8629	µg/mL	Gravimetric
				+/-	12.0545	µg/mL	Unstressed
				+/-	19.1845	µg/mL	Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,008.3 µg/mL	+/-	5.8623	µg/mL	Gravimetric
				+/-	12.0533	µg/mL	Unstressed
				+/-	19.1826	µg/mL	Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,008.6 µg/mL	+/-	5.8641	µg/mL	Gravimetric
				+/-	12.0569	µg/mL	Unstressed
				+/-	19.1883	µg/mL	Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBF0201V)	1,005.5 µg/mL	+/-	5.8461	µg/mL	Gravimetric
				+/-	12.0199	µg/mL	Unstressed
				+/-	19.1294	µg/mL	Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 98%	(Lot 523400-9)	1,002.4 µg/mL	+/-	5.8283	µg/mL	Gravimetric
				+/-	11.9833	µg/mL	Unstressed
				+/-	19.0712	µg/mL	Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,007.2 µg/mL	+/-	5.8559	µg/mL	Gravimetric
				+/-	12.0401	µg/mL	Unstressed
				+/-	19.1617	µg/mL	Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012015)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,009.2 µg/mL	+/-	5.8676	µg/mL	Gravimetric
				+/-	12.0640	µg/mL	Unstressed
				+/-	19.1997	µg/mL	Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,006.3 µg/mL	+/-	5.8507	µg/mL	Gravimetric
				+/-	12.0294	µg/mL	Unstressed
				+/-	19.1446	µg/mL	Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,007.5	µg/mL	+/-	5.8579 +/- 12.0442 +/- 19.1681	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot B180716L)	2,012.4	µg/mL	+/-	11.7003 +/- 24.0564 +/- 38.2853	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	856.1	µg/mL	+/-	4.9889 +/- 10.2395 +/- 16.2906	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
59	Azobenzene CAS # 103-33-3 Purity 97%	(Lot BCBS6535V)	1,009.8	µg/mL	+/-	5.8709 +/- 12.0709 +/- 19.2106	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,007.6	µg/mL	+/-	5.8583 +/- 12.0449 +/- 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot LRAB8468)	1,006.6	µg/mL	+/-	5.8525 +/- 12.0330 +/- 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170717KJA)	2,005.9	µg/mL	+/-	11.6625 +/- 23.9787 +/- 38.1617	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot T7N4E)	1,004.8	µg/mL	+/-	5.8420 +/- 12.0114 +/- 19.1160	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,005.3	µg/mL	+/-	5.8449 +/- 12.0174 +/- 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBR2268V)	1,006.2	µg/mL	+/-	5.8501 +/- 12.0282 +/- 19.1427	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 7528800)	1,002.7	µg/mL	+/-	5.8298 +/- 11.9863 +/- 19.0761	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.6	µg/mL	+/-	5.8466 +/- 12.0210 +/- 19.1312	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,002.6	µg/mL	+/-	5.8294 +/- 11.9856 +/- 19.0749	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,009.3	µg/mL	+/-	5.8682 +/- 12.0652 +/- 19.2016	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 99%	(Lot MKCF0058)	1,006.6	µg/mL	+/-	5.8525 +/- 12.0330 +/- 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot 0012018)	1,004.8	µg/mL	+/-	5.8422 +/- 12.0118 +/- 19.1166	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant flow 1.8 mL/min.

Temp. Program:

80°C (hold 0.1 min.) to 330°C
@ 9.6°C/min. (hold 2.86 min.)

Inj. Temp:

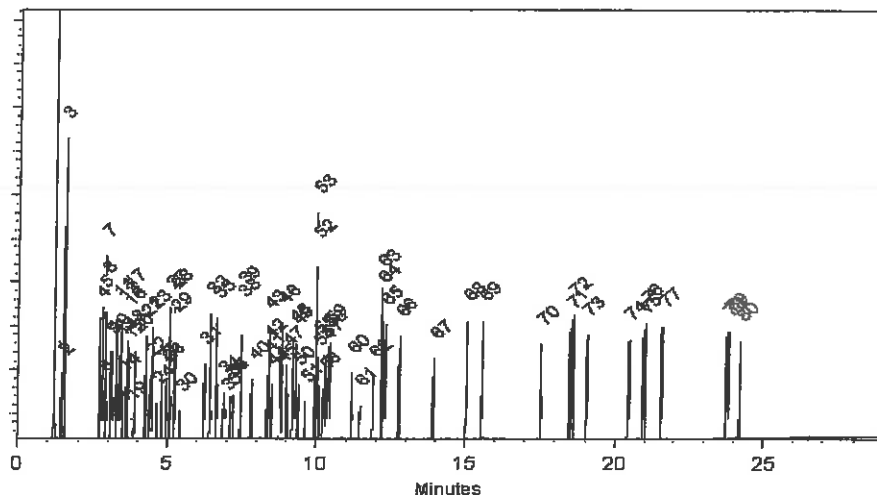
250°C

Det. Temp:

340°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Cyndee L. Crust
Cyndee L. Crust - Mix Technician

Date Mixed: 30-Jul-2018

Balance: B442140311

Jennifer L. Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 02-Aug-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

Reagent

571995_00068

8	2-Chlorophenol CAS # 95-57-8 Purity 99%	(Lot STBF2690V)	1,005.6 µg/mL	+/- +/- +/-	5.8466 12.0210 19.1312	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	1,3-Dichlorobenzene CAS # 541-73-1 Purity 99%	(Lot BCBQ7100V)	1,009.7 µg/mL	+/- +/- +/-	5.8705 12.0700 19.2092	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	1,4-Dichlorobenzene CAS # 106-46-7 Purity 99%	(Lot MKBS4401V)	1,007.6 µg/mL	+/- +/- +/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benzyl alcohol CAS # 100-51-6 Purity 99%	(Lot SHBJ0534)	1,009.6 µg/mL	+/- +/- +/-	5.8699 12.0688 19.2073	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	1,2-Dichlorobenzene CAS # 95-50-1 Purity 99%	(Lot SHBG3111V)	1,007.7 µg/mL	+/- +/- +/-	5.8589 12.0461 19.1712	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	2-Methylphenol (o-cresol) CAS # 95-48-7 Purity 99%	(Lot SHBH6379)	1,008.4 µg/mL	+/- +/- +/-	5.8629 12.0545 19.1845	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	2,2'-oxybis(1-chloropropane) CAS # 108-60-1 Purity 99%	(Lot 7577400)	1,007.6 µg/mL	+/- +/- +/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Acetophenone CAS # 98-86-2 Purity 99%	(Lot STBG8586)	1,009.4 µg/mL	+/- +/- +/-	5.8687 12.0664 19.2035	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	3-Methylphenol (m-cresol) CAS # 108-39-4 Purity 99%	(Lot SHBD0627V)	504.9 µg/mL	+/- +/- +/-	2.9423 6.0389 9.6077	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	4-Methylphenol (p-cresol) CAS # 106-44-5 Purity 99%	(Lot 49396APV)	501.8 µg/mL	+/- +/- +/-	2.9242 6.0018 9.5487	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	N-Nitroso-di-n-propylamine CAS # 621-64-7 Purity 99%	(Lot OPAGF)	1,006.6 µg/mL	+/- +/- +/-	5.8525 12.0330 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	Hexachloroethane CAS # 67-72-1 Purity 99%	(Lot 4H3SF)	1,001.4 µg/mL	+/- +/- +/-	5.8222 11.9708 19.0513	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	Nitrobenzene CAS # 98-95-3 Purity 99%	(Lot SHBG5577V)	1,005.9 µg/mL	+/- +/- +/-	5.8484 12.0246 19.1370	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
21	Isophorone CAS # 78-59-1 Purity 98%	(Lot MKBG2442V)	1,009.1 µg/mL	+/- +/- +/-	5.8670 12.0629 19.1979	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
22	2-Nitrophenol CAS # 88-75-5 Purity 99%	(Lot BCBH7602V)	1,008.7 µg/mL	+/- +/- +/-	5.8647 12.0581 19.1902	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
23	2,4-Dimethylphenol CAS # 105-67-9 Purity 99%	(Lot 10165155)	1,008.6 µg/mL	+/- +/- +/-	5.8641 12.0569 19.1883	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,007.5 µg/mL	+/- +/- +/-	5.8577 12.0437 19.1674	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,007.2 µg/mL	+/- +/- +/-	5.8557 12.0395 19.1608	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,008.9 µg/mL	+/- +/- +/-	5.8658 12.0605 19.1940	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,009.2 µg/mL	+/- +/- +/-	5.8676 12.0640 19.1997	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot 1437483V)	1,009.1 µg/mL	+/- +/- +/-	5.8670 12.0628 19.1978	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,009.8 µg/mL	+/- +/- +/-	5.8711 12.0712 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,008.1 µg/mL	+/- +/- +/-	5.8612 12.0509 19.1788	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBG3580V)	2,013.2 µg/mL	+/- +/- +/-	11.7049 24.0659 38.3005	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKCD9952)	1,007.0 µg/mL	+/- +/- +/-	5.8548 12.0377 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBK1842V)	2,015.4 µg/mL	+/- +/- +/-	11.7177 24.0922 38.3424	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,009.5 µg/mL	+/- +/- +/-	5.8693 12.0676 19.2054	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot PR-30126)	1,005.3 µg/mL	+/- +/- +/-	5.8449 12.0174 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7 Purity 98%	(Lot 10174662)	1,007.7 µg/mL	+/- +/- +/-	5.8591 12.0465 19.1718	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBJ3997)	1,009.8 µg/mL	+/- +/- +/-	5.8711 12.0712 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKCB0810V)	1,007.4 µg/mL	+/- +/- +/-	5.8571 12.0425 19.1655	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,006.7 µg/mL	+/- +/- +/-	5.8530 12.0342 19.1522	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

72	Chrysene CAS # 218-01-9 Purity 99%	(Lot 012015)	1,009.4 µg/mL	+/- +/- +/-	5.8687 12.0664 19.2035	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
73	Bis(2-ethylhexyl)phthalate CAS # 117-81-7 Purity 99%	(Lot MKBZ3868V)	1,007.3 µg/mL	+/- +/- +/-	5.8565 12.0413 19.1636	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
74	Di-n-octyl phthalate CAS # 117-84-0 Purity 99%	(Lot 7170200)	1,007.0 µg/mL	+/- +/- +/-	5.8548 12.0377 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
75	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012012B)	1,003.7 µg/mL	+/- +/- +/-	5.8356 11.9983 19.0951	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
76	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012012K)	1,005.7 µg/mL	+/- +/- +/-	5.8472 12.0222 19.1332	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
77	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot ER071309-02)	1,008.8 µg/mL	+/- +/- +/-	5.8653 12.0593 19.1921	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
78	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot ER082107-02)	1,006.9 µg/mL	+/- +/- +/-	5.8542 12.0365 19.1560	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
79	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	1,008.7 µg/mL	+/- +/- +/-	5.8647 12.0581 19.1902	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
80	Benzo(g,h,i)perylene CAS # 191-24-2 Purity 99%	(Lot ER05121401)	1,000.2 µg/mL	+/- +/- +/-	5.8152 11.9565 19.0285	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
Solvent: Methylene chloride CAS # 75-09-2 Purity 99%							

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.



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Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 **Lot No.:** A0140111

Description : 8270 List 1 / Std #1 MegaMix (2017)

8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul

Container Size : 10 mL **Pkg Amt:** > 5 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1 (Lot SHBJ5124) Purity 99%	1,006.6 µg/mL	+/- 5.8525 µg/mL Gravimetric +/- 12.0330 µg/mL Unstressed +/- 19.1503 µg/mL Stressed
2	N-Nitrosodimethylamine CAS # 62-75-9 (Lot 180322JLM) Purity 99%	1,005.1 µg/mL	+/- 5.8437 µg/mL Gravimetric +/- 12.0150 µg/mL Unstressed +/- 19.1217 µg/mL Stressed
3	Pyridine CAS # 110-86-1 (Lot SHBC7174V) Purity 99%	2,012.7 µg/mL	+/- 11.7020 µg/mL Gravimetric +/- 24.0599 µg/mL Unstressed +/- 38.2910 µg/mL Stressed
4	Phenol CAS # 108-95-2 (Lot SHBF9719V) Purity 99%	1,008.6 µg/mL	+/- 5.8641 µg/mL Gravimetric +/- 12.0569 µg/mL Unstressed +/- 19.1883 µg/mL Stressed
5	Aniline CAS # 62-53-3 (Lot K22Z462) Purity 99%	1,006.2 µg/mL	+/- 5.8501 µg/mL Gravimetric +/- 12.0282 µg/mL Unstressed +/- 19.1427 µg/mL Stressed
6	Bis(2-chloroethyl)ether CAS # 111-44-4 (Lot SHBD4430V) Purity 99%	1,009.5 µg/mL	+/- 5.8693 µg/mL Gravimetric +/- 12.0676 µg/mL Unstressed +/- 19.2054 µg/mL Stressed
7	n-Decane (C10) CAS # 124-18-5 (Lot SHBJ8526) Purity 99%	1,010.0 µg/mL	+/- 5.8722 µg/mL Gravimetric +/- 12.0736 µg/mL Unstressed +/- 19.2150 µg/mL Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 5670100)	1,009.6 µg/mL	+/-	5.8699	µg/mL	Gravimetric
				+/-	12.0688	µg/mL	Unstressed
				+/-	19.2073	µg/mL	Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBJ8113V)	1,009.0 µg/mL	+/-	5.8664	µg/mL	Gravimetric
				+/-	12.0616	µg/mL	Unstressed
				+/-	19.1959	µg/mL	Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,008.4 µg/mL	+/-	5.8629	µg/mL	Gravimetric
				+/-	12.0545	µg/mL	Unstressed
				+/-	19.1845	µg/mL	Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,008.3 µg/mL	+/-	5.8623	µg/mL	Gravimetric
				+/-	12.0533	µg/mL	Unstressed
				+/-	19.1826	µg/mL	Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,008.6 µg/mL	+/-	5.8641	µg/mL	Gravimetric
				+/-	12.0569	µg/mL	Unstressed
				+/-	19.1883	µg/mL	Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBF0201V)	1,005.5 µg/mL	+/-	5.8461	µg/mL	Gravimetric
				+/-	12.0199	µg/mL	Unstressed
				+/-	19.1294	µg/mL	Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 98%	(Lot 523400-9)	1,002.4 µg/mL	+/-	5.8283	µg/mL	Gravimetric
				+/-	11.9833	µg/mL	Unstressed
				+/-	19.0712	µg/mL	Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,007.2 µg/mL	+/-	5.8559	µg/mL	Gravimetric
				+/-	12.0401	µg/mL	Unstressed
				+/-	19.1617	µg/mL	Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012015)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,009.2 µg/mL	+/-	5.8676	µg/mL	Gravimetric
				+/-	12.0640	µg/mL	Unstressed
				+/-	19.1997	µg/mL	Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,006.3 µg/mL	+/-	5.8507	µg/mL	Gravimetric
				+/-	12.0294	µg/mL	Unstressed
				+/-	19.1446	µg/mL	Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,007.5	µg/mL	+/-	5.8579 12.0442 19.1681	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot B180716L)	2,012.4	µg/mL	+/-	11.7003 24.0564 38.2853	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	856.1	µg/mL	+/-	4.9889 10.2395 16.2906	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
59	Azobenzene CAS # 103-33-3 Purity 97%	(Lot BCBS6535V)	1,009.8	µg/mL	+/-	5.8709 12.0709 19.2106	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,007.6	µg/mL	+/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot LRAB8468)	1,006.6	µg/mL	+/-	5.8525 12.0330 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170717KJA)	2,005.9	µg/mL	+/-	11.6625 23.9787 38.1617	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot T7N4E)	1,004.8	µg/mL	+/-	5.8420 12.0114 19.1160	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,005.3	µg/mL	+/-	5.8449 12.0174 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBR2268V)	1,006.2	µg/mL	+/-	5.8501 12.0282 19.1427	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 7528800)	1,002.7	µg/mL	+/-	5.8298 11.9863 19.0761	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.6	µg/mL	+/-	5.8466 12.0210 19.1312	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,002.6	µg/mL	+/-	5.8294 11.9856 19.0749	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,009.3	µg/mL	+/-	5.8682 12.0652 19.2016	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 99%	(Lot MKCF0058)	1,006.6	µg/mL	+/-	5.8525 12.0330 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot 0012018)	1,004.8	µg/mL	+/-	5.8422 12.0118 19.1166	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant flow 1.8 mL/min.

Temp. Program:

80°C (hold 0.1 min.) to 330°C
@ 9.6°C/min. (hold 2.86 min.)

Inj. Temp:

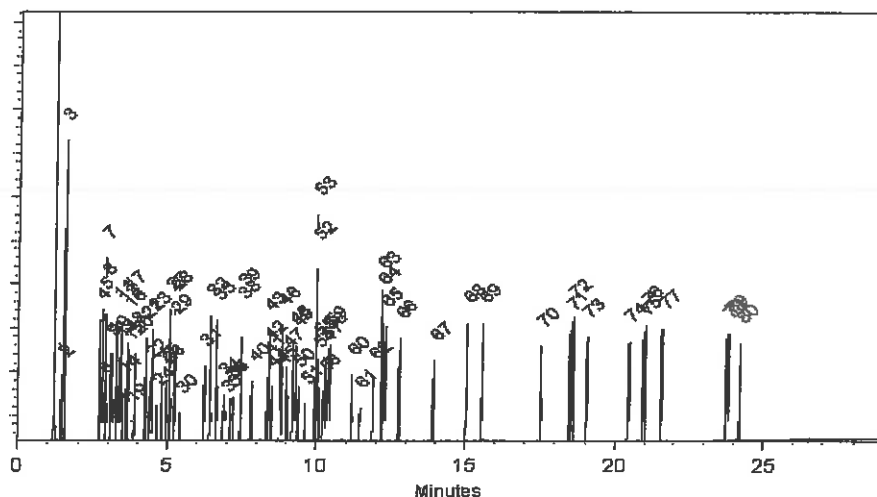
250°C

Det. Temp:

340°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Cyndee L. Crust
Cyndee L. Crust - Mix Technician

Date Mixed: 30-Jul-2018

Balance: B442140311

Jennifer L. Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 02-Aug-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

Reagent

571995_00069

8	2-Chlorophenol CAS # 95-57-8 Purity 99%	(Lot STBF2690V)	1,005.6 µg/mL	+/- +/- +/-	5.8466 12.0210 19.1312	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	1,3-Dichlorobenzene CAS # 541-73-1 Purity 99%	(Lot BCBQ7100V)	1,009.7 µg/mL	+/- +/- +/-	5.8705 12.0700 19.2092	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	1,4-Dichlorobenzene CAS # 106-46-7 Purity 99%	(Lot MKBS4401V)	1,007.6 µg/mL	+/- +/- +/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benzyl alcohol CAS # 100-51-6 Purity 99%	(Lot SHBJ0534)	1,009.6 µg/mL	+/- +/- +/-	5.8699 12.0688 19.2073	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	1,2-Dichlorobenzene CAS # 95-50-1 Purity 99%	(Lot SHBG3111V)	1,007.7 µg/mL	+/- +/- +/-	5.8589 12.0461 19.1712	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	2-Methylphenol (o-cresol) CAS # 95-48-7 Purity 99%	(Lot SHBH6379)	1,008.4 µg/mL	+/- +/- +/-	5.8629 12.0545 19.1845	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	2,2'-oxybis(1-chloropropane) CAS # 108-60-1 Purity 99%	(Lot 7577400)	1,007.6 µg/mL	+/- +/- +/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Acetophenone CAS # 98-86-2 Purity 99%	(Lot STBG8586)	1,009.4 µg/mL	+/- +/- +/-	5.8687 12.0664 19.2035	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	3-Methylphenol (m-cresol) CAS # 108-39-4 Purity 99%	(Lot SHBD0627V)	504.9 µg/mL	+/- +/- +/-	2.9423 6.0389 9.6077	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	4-Methylphenol (p-cresol) CAS # 106-44-5 Purity 99%	(Lot 49396APV)	501.8 µg/mL	+/- +/- +/-	2.9242 6.0018 9.5487	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	N-Nitroso-di-n-propylamine CAS # 621-64-7 Purity 99%	(Lot OPAGF)	1,006.6 µg/mL	+/- +/- +/-	5.8525 12.0330 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	Hexachloroethane CAS # 67-72-1 Purity 99%	(Lot 4H3SF)	1,001.4 µg/mL	+/- +/- +/-	5.8222 11.9708 19.0513	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	Nitrobenzene CAS # 98-95-3 Purity 99%	(Lot SHBG5577V)	1,005.9 µg/mL	+/- +/- +/-	5.8484 12.0246 19.1370	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
21	Isophorone CAS # 78-59-1 Purity 98%	(Lot MKBG2442V)	1,009.1 µg/mL	+/- +/- +/-	5.8670 12.0629 19.1979	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
22	2-Nitrophenol CAS # 88-75-5 Purity 99%	(Lot BCBH7602V)	1,008.7 µg/mL	+/- +/- +/-	5.8647 12.0581 19.1902	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
23	2,4-Dimethylphenol CAS # 105-67-9 Purity 99%	(Lot 10165155)	1,008.6 µg/mL	+/- +/- +/-	5.8641 12.0569 19.1883	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,007.5 µg/mL	+/- +/- +/-	5.8577 12.0437 19.1674	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,007.2 µg/mL	+/- +/- +/-	5.8557 12.0395 19.1608	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,008.9 µg/mL	+/- +/- +/-	5.8658 12.0605 19.1940	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,009.2 µg/mL	+/- +/- +/-	5.8676 12.0640 19.1997	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot 1437483V)	1,009.1 µg/mL	+/- +/- +/-	5.8670 12.0628 19.1978	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,009.8 µg/mL	+/- +/- +/-	5.8711 12.0712 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,008.1 µg/mL	+/- +/- +/-	5.8612 12.0509 19.1788	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBG3580V)	2,013.2 µg/mL	+/- +/- +/-	11.7049 24.0659 38.3005	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKCD9952)	1,007.0 µg/mL	+/- +/- +/-	5.8548 12.0377 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBK1842V)	2,015.4 µg/mL	+/- +/- +/-	11.7177 24.0922 38.3424	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,009.5 µg/mL	+/- +/- +/-	5.8693 12.0676 19.2054	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot PR-30126)	1,005.3 µg/mL	+/- +/- +/-	5.8449 12.0174 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7 Purity 98%	(Lot 10174662)	1,007.7 µg/mL	+/- +/- +/-	5.8591 12.0465 19.1718	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBJ3997)	1,009.8 µg/mL	+/- +/- +/-	5.8711 12.0712 19.2112	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKCB0810V)	1,007.4 µg/mL	+/- +/- +/-	5.8571 12.0425 19.1655	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,006.7 µg/mL	+/- +/- +/-	5.8530 12.0342 19.1522	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

72	Chrysene CAS # 218-01-9 Purity 99%	(Lot 012015)	1,009.4 µg/mL	+/- +/- +/-	5.8687 12.0664 19.2035	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
73	Bis(2-ethylhexyl)phthalate CAS # 117-81-7 Purity 99%	(Lot MKBZ3868V)	1,007.3 µg/mL	+/- +/- +/-	5.8565 12.0413 19.1636	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
74	Di-n-octyl phthalate CAS # 117-84-0 Purity 99%	(Lot 7170200)	1,007.0 µg/mL	+/- +/- +/-	5.8548 12.0377 19.1579	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
75	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012012B)	1,003.7 µg/mL	+/- +/- +/-	5.8356 11.9983 19.0951	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
76	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012012K)	1,005.7 µg/mL	+/- +/- +/-	5.8472 12.0222 19.1332	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
77	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot ER071309-02)	1,008.8 µg/mL	+/- +/- +/-	5.8653 12.0593 19.1921	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
78	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot ER082107-02)	1,006.9 µg/mL	+/- +/- +/-	5.8542 12.0365 19.1560	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
79	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	1,008.7 µg/mL	+/- +/- +/-	5.8647 12.0581 19.1902	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
80	Benzo(g,h,i)perylene CAS # 191-24-2 Purity 99%	(Lot ER05121401)	1,000.2 µg/mL	+/- +/- +/-	5.8152 11.9565 19.0285	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
Solvent: Methylene chloride CAS # 75-09-2 Purity 99%							

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.



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www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 **Lot No.:** A0140111

Description : 8270 List 1 / Std #1 MegaMix (2017)

8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul

Container Size : 10 mL **Pkg Amt:** > 5 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1 (Lot SHBJ5124) Purity 99%	1,006.6 µg/mL	+/- 5.8525 µg/mL Gravimetric +/- 12.0330 µg/mL Unstressed +/- 19.1503 µg/mL Stressed
2	N-Nitrosodimethylamine CAS # 62-75-9 (Lot 180322JLM) Purity 99%	1,005.1 µg/mL	+/- 5.8437 µg/mL Gravimetric +/- 12.0150 µg/mL Unstressed +/- 19.1217 µg/mL Stressed
3	Pyridine CAS # 110-86-1 (Lot SHBC7174V) Purity 99%	2,012.7 µg/mL	+/- 11.7020 µg/mL Gravimetric +/- 24.0599 µg/mL Unstressed +/- 38.2910 µg/mL Stressed
4	Phenol CAS # 108-95-2 (Lot SHBF9719V) Purity 99%	1,008.6 µg/mL	+/- 5.8641 µg/mL Gravimetric +/- 12.0569 µg/mL Unstressed +/- 19.1883 µg/mL Stressed
5	Aniline CAS # 62-53-3 (Lot K22Z462) Purity 99%	1,006.2 µg/mL	+/- 5.8501 µg/mL Gravimetric +/- 12.0282 µg/mL Unstressed +/- 19.1427 µg/mL Stressed
6	Bis(2-chloroethyl)ether CAS # 111-44-4 (Lot SHBD4430V) Purity 99%	1,009.5 µg/mL	+/- 5.8693 µg/mL Gravimetric +/- 12.0676 µg/mL Unstressed +/- 19.2054 µg/mL Stressed
7	n-Decane (C10) CAS # 124-18-5 (Lot SHBJ8526) Purity 99%	1,010.0 µg/mL	+/- 5.8722 µg/mL Gravimetric +/- 12.0736 µg/mL Unstressed +/- 19.2150 µg/mL Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 5670100)	1,009.6 µg/mL	+/-	5.8699	µg/mL	Gravimetric
				+/-	12.0688	µg/mL	Unstressed
				+/-	19.2073	µg/mL	Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBJ8113V)	1,009.0 µg/mL	+/-	5.8664	µg/mL	Gravimetric
				+/-	12.0616	µg/mL	Unstressed
				+/-	19.1959	µg/mL	Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,008.4 µg/mL	+/-	5.8629	µg/mL	Gravimetric
				+/-	12.0545	µg/mL	Unstressed
				+/-	19.1845	µg/mL	Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,008.3 µg/mL	+/-	5.8623	µg/mL	Gravimetric
				+/-	12.0533	µg/mL	Unstressed
				+/-	19.1826	µg/mL	Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,005.3 µg/mL	+/-	5.8449	µg/mL	Gravimetric
				+/-	12.0174	µg/mL	Unstressed
				+/-	19.1255	µg/mL	Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,008.6 µg/mL	+/-	5.8641	µg/mL	Gravimetric
				+/-	12.0569	µg/mL	Unstressed
				+/-	19.1883	µg/mL	Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/-	5.8501	µg/mL	Gravimetric
				+/-	12.0282	µg/mL	Unstressed
				+/-	19.1427	µg/mL	Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBF0201V)	1,005.5 µg/mL	+/-	5.8461	µg/mL	Gravimetric
				+/-	12.0199	µg/mL	Unstressed
				+/-	19.1294	µg/mL	Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 98%	(Lot 523400-9)	1,002.4 µg/mL	+/-	5.8283	µg/mL	Gravimetric
				+/-	11.9833	µg/mL	Unstressed
				+/-	19.0712	µg/mL	Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,007.2 µg/mL	+/-	5.8559	µg/mL	Gravimetric
				+/-	12.0401	µg/mL	Unstressed
				+/-	19.1617	µg/mL	Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012015)	1,006.6 µg/mL	+/-	5.8525	µg/mL	Gravimetric
				+/-	12.0330	µg/mL	Unstressed
				+/-	19.1503	µg/mL	Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,009.3 µg/mL	+/-	5.8682	µg/mL	Gravimetric
				+/-	12.0652	µg/mL	Unstressed
				+/-	19.2016	µg/mL	Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,009.2 µg/mL	+/-	5.8676	µg/mL	Gravimetric
				+/-	12.0640	µg/mL	Unstressed
				+/-	19.1997	µg/mL	Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,006.8 µg/mL	+/-	5.8536	µg/mL	Gravimetric
				+/-	12.0353	µg/mL	Unstressed
				+/-	19.1541	µg/mL	Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,006.3 µg/mL	+/-	5.8507	µg/mL	Gravimetric
				+/-	12.0294	µg/mL	Unstressed
				+/-	19.1446	µg/mL	Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,007.5	µg/mL	+/-	5.8579 12.0442 19.1681	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot B180716L)	2,012.4	µg/mL	+/-	11.7003 24.0564 38.2853	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	856.1	µg/mL	+/-	4.9889 10.2395 16.2906	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
59	Azobenzene CAS # 103-33-3 Purity 97%	(Lot BCBS6535V)	1,009.8	µg/mL	+/-	5.8709 12.0709 19.2106	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,007.6	µg/mL	+/-	5.8583 12.0449 19.1693	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot LRAB8468)	1,006.6	µg/mL	+/-	5.8525 12.0330 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170717KJA)	2,005.9	µg/mL	+/-	11.6625 23.9787 38.1617	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot T7N4E)	1,004.8	µg/mL	+/-	5.8420 12.0114 19.1160	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,005.3	µg/mL	+/-	5.8449 12.0174 19.1255	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBR2268V)	1,006.2	µg/mL	+/-	5.8501 12.0282 19.1427	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 7528800)	1,002.7	µg/mL	+/-	5.8298 11.9863 19.0761	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.6	µg/mL	+/-	5.8466 12.0210 19.1312	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,002.6	µg/mL	+/-	5.8294 11.9856 19.0749	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,009.3	µg/mL	+/-	5.8682 12.0652 19.2016	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 99%	(Lot MKCF0058)	1,006.6	µg/mL	+/-	5.8525 12.0330 19.1503	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot 0012018)	1,004.8	µg/mL	+/-	5.8422 12.0118 19.1166	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant flow 1.8 mL/min.

Temp. Program:

80°C (hold 0.1 min.) to 330°C
@ 9.6°C/min. (hold 2.86 min.)

Inj. Temp:

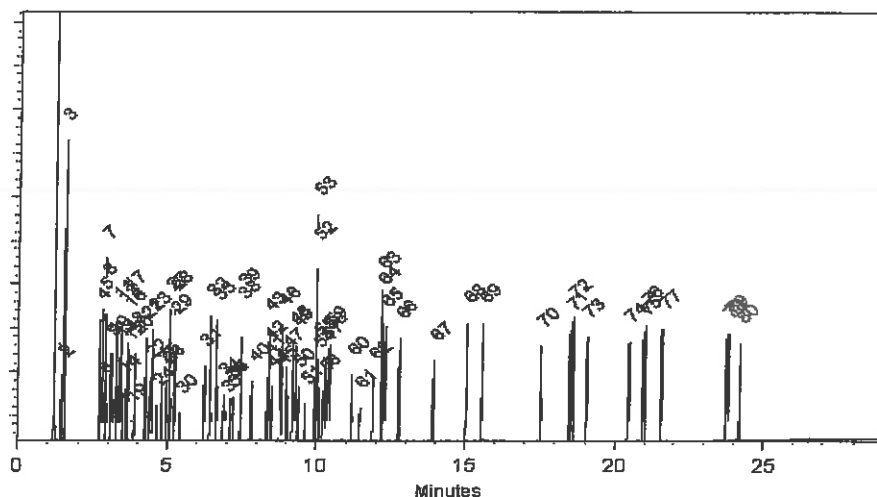
250°C

Det. Temp:

340°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Cyndee L. Crust
Cyndee L. Crust - Mix Technician

Date Mixed: 30-Jul-2018

Balance: B442140311

Jennifer L. Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 02-Aug-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

Reagent

571995_00090



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 Lot No.: A0136052

Description : 8270 List 1 / Std #1 MegaMix (2017)

8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul

Container Size : 10 mL Pkg Amt: > 5 mL

Expiration Date : September 30, 2019 Storage: 0°C or colder

Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1 (Lot SHBH5677) Purity 99%	1,002.0 µg/mL	+/- 5.8257 µg/mL +/- 11.9780 µg/mL +/- 19.0628 µg/mL
2	N-Nitrosodimethylamine CAS # 62-75-9 (Lot 161108JLM) Purity 99%	1,002.0 µg/mL	+/- 5.8257 µg/mL +/- 11.9780 µg/mL +/- 19.0628 µg/mL
3	Pyridine CAS # 110-86-1 (Lot SHBC7174V) Purity 99%	2,011.2 µg/mL	+/- 11.6933 µg/mL +/- 24.0420 µg/mL +/- 38.2625 µg/mL
4	Phenol CAS # 108-95-2 (Lot SHBF1351V) Purity 99%	1,005.1 µg/mL	+/- 5.8439 µg/mL +/- 12.0154 µg/mL +/- 19.1224 µg/mL
5	Aniline CAS # 62-53-3 (Lot K22Z462) Purity 99%	1,002.6 µg/mL	+/- 5.8292 µg/mL +/- 11.9851 µg/mL +/- 19.0742 µg/mL
6	Bis(2-chloroethyl)ether CAS # 111-44-4 (Lot SHBD4430V) Purity 99%	1,001.4 µg/mL	+/- 5.8222 µg/mL +/- 11.9708 µg/mL +/- 19.0513 µg/mL
7	n-Decane (C10) CAS # 124-18-5 (Lot SHBH3926V) Purity 99%	1,000.7 µg/mL	+/- 5.8180 µg/mL +/- 11.9620 µg/mL +/- 19.0374 µg/mL

8	2-Chlorophenol CAS # 95-57-8 Purity 99%	(Lot STBF2690V)	1,007.1 µg/mL	+/- 5.8552 +/- 12.0385 +/- 19.1592	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	1,3-Dichlorobenzene CAS # 541-73-1 Purity 99%	(Lot BCBM5751V)	1,001.0 µg/mL	+/- 5.8199 +/- 11.9660 +/- 19.0437	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	1,4-Dichlorobenzene CAS # 106-46-7 Purity 99%	(Lot MKBS4401V)	1,004.4 µg/mL	+/- 5.8397 +/- 12.0067 +/- 19.1084	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benzyl alcohol CAS # 100-51-6 Purity 99%	(Lot SHBC1850V)	1,005.2 µg/mL	+/- 5.8443 +/- 12.0162 +/- 19.1236	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	1,2-Dichlorobenzene CAS # 95-50-1 Purity 99%	(Lot 68996CMV)	1,001.2 µg/mL	+/- 5.8211 +/- 11.9684 +/- 19.0475	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	2-Methylphenol (o-cresol) CAS # 95-48-7 Purity 99%	(Lot SHBH6379)	1,001.6 µg/mL	+/- 5.8234 +/- 11.9732 +/- 19.0551	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	2,2'-oxybis(1-chloropropane) CAS # 108-60-1 Purity 98%	(Lot 5510800)	1,006.7 µg/mL	+/- 5.8528 +/- 12.0336 +/- 19.1513	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Acetophenone CAS # 98-86-2 Purity 99%	(Lot STBG7113)	1,005.5 µg/mL	+/- 5.8459 +/- 12.0194 +/- 19.1287	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	3-Methylphenol (m-cresol) CAS # 108-39-4 Purity 99%	(Lot SHBD0627V)	501.0 µg/mL	+/- 2.9196 +/- 5.9923 +/- 9.5334	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	4-Methylphenol (p-cresol) CAS # 106-44-5 Purity 99%	(Lot 49396APV)	501.7 µg/mL	+/- 2.9235 +/- 6.0002 +/- 9.5461	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	N-Nitroso-di-n-propylamine CAS # 621-64-7 Purity 99%	(Lot NOPCF)	1,003.1 µg/mL	+/- 5.8323 +/- 11.9915 +/- 19.0843	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	Hexachloroethane CAS # 67-72-1 Purity 99%	(Lot 4H3SF)	1,003.4 µg/mL	+/- 5.8339 +/- 11.9947 +/- 19.0894	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	Nitrobenzene CAS # 98-95-3 Purity 99%	(Lot SHBG5577V)	1,002.3 µg/mL	+/- 5.8273 +/- 11.9812 +/- 19.0678	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
21	Isophorone CAS # 78-59-1 Purity 98%	(Lot MKBG2442V)	1,003.3 µg/mL	+/- 5.8334 +/- 11.9938 +/- 19.0879	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
22	2-Nitrophenol CAS # 88-75-5 Purity 99%	(Lot BCBH7602V)	1,007.7 µg/mL	+/- 5.8587 +/- 12.0457 +/- 19.1706	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
23	2,4-Dimethylphenol CAS # 105-67-9 Purity 99%	(Lot 10165155)	1,000.9 µg/mL	+/- 5.8191 +/- 11.9644 +/- 19.0412	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 4621000)	1,001.3 µg/mL	+/- +/- +/-	5.8215 11.9692 19.0488	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBH1617V)	1,003.1 µg/mL	+/- +/- +/-	5.8323 11.9915 19.0843	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,005.0 µg/mL	+/- +/- +/-	5.8432 12.0138 19.1198	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,000.5 µg/mL	+/- +/- +/-	5.8168 11.9596 19.0336	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,001.3 µg/mL	+/- +/- +/-	5.8215 11.9692 19.0488	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,001.3 µg/mL	+/- +/- +/-	5.8215 11.9692 19.0488	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,002.5 µg/mL	+/- +/- +/-	5.8284 11.9835 19.0716	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/- +/- +/-	5.8501 12.0282 19.1427	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBG8884)	1,007.7 µg/mL	+/- +/- +/-	5.8587 12.0459 19.1708	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 99%	(Lot 525000-9)	1,005.5 µg/mL	+/- +/- +/-	5.8463 12.0202 19.1300	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,004.3 µg/mL	+/- +/- +/-	5.8389 12.0051 19.1059	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012017H)	1,007.1 µg/mL	+/- +/- +/-	5.8552 12.0385 19.1592	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,003.5 µg/mL	+/- +/- +/-	5.8342 11.9955 19.0907	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,006.4 µg/mL	+/- +/- +/-	5.8513 12.0306 19.1465	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,002.9 µg/mL	+/- +/- +/-	5.8308 11.9883 19.0792	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,001.2 µg/mL	+/- +/- +/-	5.8211 11.9684 19.0475	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,004.5 µg/mL	+/-	5.8401	µg/mL	Gravimetric
				+/-	12.0075	µg/mL	Unstressed
				+/-	19.1097	µg/mL	Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,006.0 µg/mL	+/-	5.8491	µg/mL	Gravimetric
				+/-	12.0260	µg/mL	Unstressed
				+/-	19.1392	µg/mL	Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,001.8 µg/mL	+/-	5.8246	µg/mL	Gravimetric
				+/-	11.9756	µg/mL	Unstressed
				+/-	19.0590	µg/mL	Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,003.7 µg/mL	+/-	5.8358	µg/mL	Gravimetric
				+/-	11.9987	µg/mL	Unstressed
				+/-	19.0957	µg/mL	Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot BCBB8606V)	1,000.7 µg/mL	+/-	5.8183	µg/mL	Gravimetric
				+/-	11.9628	µg/mL	Unstressed
				+/-	19.0387	µg/mL	Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,005.2 µg/mL	+/-	5.8443	µg/mL	Gravimetric
				+/-	12.0162	µg/mL	Unstressed
				+/-	19.1236	µg/mL	Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,005.9 µg/mL	+/-	5.8482	µg/mL	Gravimetric
				+/-	12.0242	µg/mL	Unstressed
				+/-	19.1363	µg/mL	Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBF9439V)	2,008.3 µg/mL	+/-	11.6766	µg/mL	Gravimetric
				+/-	24.0077	µg/mL	Unstressed
				+/-	38.2080	µg/mL	Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKBW2691V)	1,005.5 µg/mL	+/-	5.8463	µg/mL	Gravimetric
				+/-	12.0202	µg/mL	Unstressed
				+/-	19.1300	µg/mL	Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBV0501V)	2,009.3 µg/mL	+/-	11.6824	µg/mL	Gravimetric
				+/-	24.0197	µg/mL	Unstressed
				+/-	38.2270	µg/mL	Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,003.9 µg/mL	+/-	5.8366	µg/mL	Gravimetric
				+/-	12.0003	µg/mL	Unstressed
				+/-	19.0983	µg/mL	Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot B180305L)	1,001.9 µg/mL	+/-	5.8253	µg/mL	Gravimetric
				+/-	11.9772	µg/mL	Unstressed
				+/-	19.0615	µg/mL	Stressed
52	Fluorene CAS # 86-73-7 Purity 99%	(Lot 10193329)	1,002.0 µg/mL	+/-	5.8257	µg/mL	Gravimetric
				+/-	11.9780	µg/mL	Unstressed
				+/-	19.0628	µg/mL	Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBG2582V)	1,001.6 µg/mL	+/-	5.8234	µg/mL	Gravimetric
				+/-	11.9732	µg/mL	Unstressed
				+/-	19.0551	µg/mL	Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKBV9622V)	1,003.3 µg/mL	+/-	5.8335	µg/mL	Gravimetric
				+/-	11.9939	µg/mL	Unstressed
				+/-	19.0881	µg/mL	Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,001.1 µg/mL	+/-	5.8203	µg/mL	Gravimetric
				+/-	11.9668	µg/mL	Unstressed
				+/-	19.0450	µg/mL	Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,003.1 µg/mL	+/- 5.8319 +/- 11.9907 +/- 19.0830	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot LC25844V)	2,003.7 µg/mL	+/- 11.6495 +/- 23.9520 +/- 38.1192	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	852.3 µg/mL	+/- 4.9555 +/- 10.1888 +/- 16.2154	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
59	Azobenzene CAS # 103-33-3 Purity 99%	(Lot BCBQ0927V)	1,005.5 µg/mL	+/- 5.8463 +/- 12.0202 +/- 19.1300	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,022.3 µg/mL	+/- 5.9439 +/- 12.2210 +/- 19.4496	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot 7013600)	1,002.5 µg/mL	+/- 5.8288 +/- 11.9843 +/- 19.0729	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170306KJA)	2,002.1 µg/mL	+/- 11.6406 +/- 23.9336 +/- 38.0900	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot OGCDK)	1,002.9 µg/mL	+/- 5.8308 +/- 11.9883 +/- 19.0792	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,001.1 µg/mL	+/- 5.8203 +/- 11.9668 +/- 19.0450	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBV7759V)	1,000.3 µg/mL	+/- 5.8156 +/- 11.9573 +/- 19.0298	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 6489700)	1,000.5 µg/mL	+/- 5.8168 +/- 11.9596 +/- 19.0336	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.7 µg/mL	+/- 5.8470 +/- 12.0218 +/- 19.1325	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,005.5 µg/mL	+/- 5.8463 +/- 12.0204 +/- 19.1302	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,005.8 µg/mL	+/- 5.8478 +/- 12.0234 +/- 19.1351	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 98%	(Lot MKBZ4553V)	1,000.3 µg/mL	+/- 5.8156 +/- 11.9571 +/- 19.0295	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 98%	(Lot 0012012)	1,003.1 µg/mL	+/- 5.8323 +/- 11.9915 +/- 19.0842	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

72	Chrysene CAS # 218-01-9 Purity 99%	(Lot 012015)	1,004.6 µg/mL	+/- 5.8408 +/- 12.0091 +/- 19.1122	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
73	Bis(2-ethylhexyl)phthalate CAS # 117-81-7 Purity 99%	(Lot MKBZ3868V)	1,002.7 µg/mL	+/- 5.8296 +/- 11.9859 +/- 19.0754	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
74	Di-n-octyl phthalate CAS # 117-84-0 Purity 99%	(Lot 6016000)	1,007.9 µg/mL	+/- 5.8602 +/- 12.0489 +/- 19.1756	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
75	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012012B)	1,003.6 µg/mL	+/- 5.8350 +/- 11.9971 +/- 19.0932	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
76	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012017K)	1,006.2 µg/mL	+/- 5.8501 +/- 12.0282 +/- 19.1427	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
77	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot ER071309-02)	1,002.1 µg/mL	+/- 5.8261 +/- 11.9788 +/- 19.0640	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
78	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot ER082107-02)	1,004.0 µg/mL	+/- 5.8373 +/- 12.0019 +/- 19.1008	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
79	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	1,001.9 µg/mL	+/- 5.8249 +/- 11.9764 +/- 19.0602	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
80	Benzo(g,h,i)perylene CAS # 191-24-2 Purity 99%	(Lot ER05121401)	1,000.9 µg/mL	+/- 5.8195 +/- 11.9652 +/- 19.0425	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
Solvent: Methylene chloride CAS # 75-09-2 Purity 99%						

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant flow 1.8 mL/min.

Temp. Program:

80°C (hold 0.1 min.) to 330°C
@ 9.6°C/min. (hold 2.86 min.)

Inj. Temp:

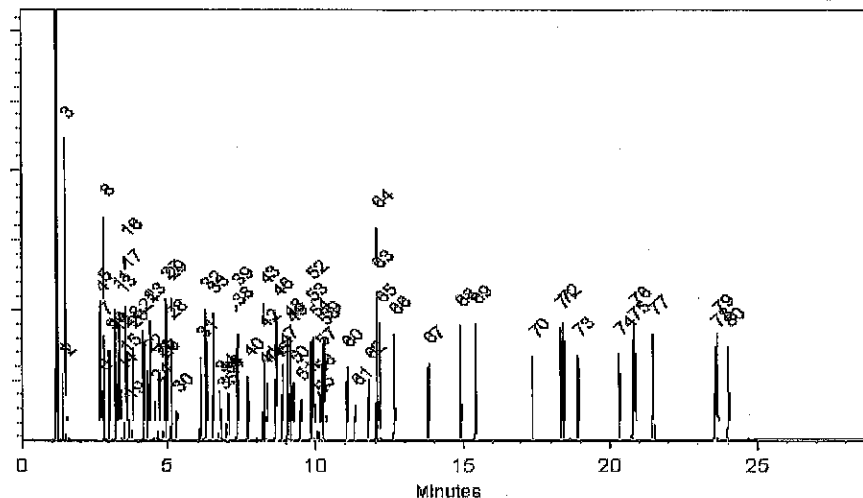
250°C

Det. Temp:

340°C

Det. Type:

FID

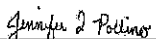


This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Joseph Jaglowski - Mix Technician

Date Mixed: 12-Mar-2018

Balance: 1128360905


Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 27-Mar-2018

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

Reagent

8081ABResPS_00027



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32415 Lot No.: A0129369

Description : Organochlorine Pesticide Mix AB #3

Organochlorine Pesticide Mix AB #3 2,000 µg/mL, Hexane/Toluene (
50:50), 1mL/ampul

Container Size : 2 mL Pkg Amt: > 1 mL

Expiration Date : July 31, 2021 Storage: 10°C or colder

Handling: Sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	alpha-BHC CAS # 319-84-6 (Lot 0911942) Purity 99%	2,012.0 µg/mL	+/- 11.8075 µg/mL Gravimetric +/- 91.6450 µg/mL Unstressed +/- 132.3230 µg/mL Stressed
2	gamma-BHC (Lindane) CAS # 58-89-9 (Lot 6357300) Purity 99%	2,010.5 µg/mL	+/- 11.7987 µg/mL Gravimetric +/- 91.5767 µg/mL Unstressed +/- 132.2244 µg/mL Stressed
3	beta-BHC CAS # 319-85-7 (Lot SZBD116XV) Purity 98%	2,011.9 µg/mL	+/- 11.8072 µg/mL Gravimetric +/- 91.6423 µg/mL Unstressed +/- 132.3191 µg/mL Stressed
4	delta-BHC CAS # 319-86-8 (Lot ER02101401) Purity 99%	2,017.0 µg/mL	+/- 11.8369 µg/mL Gravimetric +/- 91.8728 µg/mL Unstressed +/- 132.6518 µg/mL Stressed
5	Heptachlor CAS # 76-44-8 (Lot NT056422) Purity 99%	2,011.5 µg/mL	+/- 11.8046 µg/mL Gravimetric +/- 91.6223 µg/mL Unstressed +/- 132.2901 µg/mL Stressed
6	Aldrin CAS # 309-00-2 (Lot 5923100) Purity 98%	2,009.0 µg/mL	+/- 11.7899 µg/mL Gravimetric +/- 91.5084 µg/mL Unstressed +/- 132.1257 µg/mL Stressed
7	Heptachlor epoxide (isomer B) CAS # 1024-57-3 (Lot ER121511-01) Purity 99%	2,007.0 µg/mL	+/- 11.7782 µg/mL Gravimetric +/- 91.4173 µg/mL Unstressed +/- 131.9942 µg/mL Stressed

Column:
30m x .25mm x .2um
Rtx-CLP II (cat.# 11323)

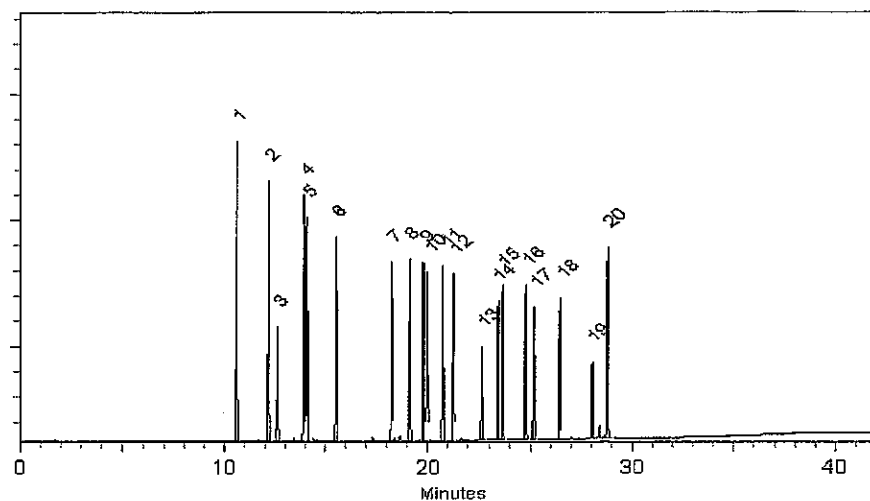
Carrier Gas:
helium-constant pressure 20 psi.

Temp. Program:
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@ 4°C/min. (hold 5 min.)

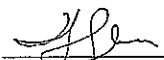
Inj. Temp:
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Det. Temp:
300°C

Det. Type:
ECD

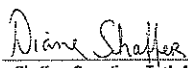


This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Tom Suckal - Mix Technician

Date Mixed: 24-Jul-2017

Balance: B442140311


Diane Shaffer - Operations Tech-ARM QC

Date Passed: 25-Jul-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

8	trans-Chlordane		2,007.0	µg/mL	+/-	11.7782	µg/mL	Gravimetric
	CAS # 5103-74-2	(Lot ER061906-04)			+/-	91.4173	µg/mL	Unstressed
	Purity 99%				+/-	131.9942	µg/mL	Stressed
9	cis-Chlordane		2,006.0	µg/mL	+/-	11.7723	µg/mL	Gravimetric
	CAS # 5103-71-9	(Lot ER062410-01)			+/-	91.3717	µg/mL	Unstressed
	Purity 99%				+/-	131.9284	µg/mL	Stressed
10	Endosulfan I		2,013.0	µg/mL	+/-	11.8134	µg/mL	Gravimetric
	CAS # 959-98-8	(Lot ER012105-02)			+/-	91.6906	µg/mL	Unstressed
	Purity 99%				+/-	132.3888	µg/mL	Stressed
11	4,4'-DDE		2,008.5	µg/mL	+/-	11.7870	µg/mL	Gravimetric
	CAS # 72-55-9	(Lot GHYQG)			+/-	91.4856	µg/mL	Unstressed
	Purity 99%				+/-	132.0928	µg/mL	Stressed
12	Dieldrin		2,006.0	µg/mL	+/-	11.7723	µg/mL	Gravimetric
	CAS # 60-57-1	(Lot ER030105-03)			+/-	91.3717	µg/mL	Unstressed
	Purity 99%				+/-	131.9284	µg/mL	Stressed
13	Endrin		2,019.3	µg/mL	+/-	11.8503	µg/mL	Gravimetric
	CAS # 72-20-8	(Lot 6429800)			+/-	91.9771	µg/mL	Unstressed
	Purity 98%				+/-	132.8025	µg/mL	Stressed
14	4,4'-DDD		2,014.9	µg/mL	+/-	11.8244	µg/mL	Gravimetric
	CAS # 72-54-8	(Lot ER061207-01)			+/-	91.7762	µg/mL	Unstressed
	Purity 98%				+/-	132.5124	µg/mL	Stressed
15	Endosulfan II		2,007.5	µg/mL	+/-	11.7811	µg/mL	Gravimetric
	CAS # 33213-65-9	(Lot ER102407-02)			+/-	91.4401	µg/mL	Unstressed
	Purity 99%				+/-	132.0271	µg/mL	Stressed
16	Endrin aldehyde		2,008.5	µg/mL	+/-	11.7870	µg/mL	Gravimetric
	CAS # 7421-93-4	(Lot ER082306-01)			+/-	91.4856	µg/mL	Unstressed
	Purity 99%				+/-	132.0928	µg/mL	Stressed
17	4,4'-DDT		2,009.0	µg/mL	+/-	11.7899	µg/mL	Gravimetric
	CAS # 50-29-3	(Lot S37912V)			+/-	91.5084	µg/mL	Unstressed
	Purity 99%				+/-	132.1257	µg/mL	Stressed
18	Endosulfan sulfate		2,009.3	µg/mL	+/-	11.7916	µg/mL	Gravimetric
	CAS # 1031-07-8	(Lot SZBC213XV)			+/-	91.5211	µg/mL	Unstressed
	Purity 96%				+/-	132.1441	µg/mL	Stressed
19	Methoxychlor		2,015.4	µg/mL	+/-	11.8273	µg/mL	Gravimetric
	CAS # 72-43-5	(Lot 6429900)			+/-	91.7985	µg/mL	Unstressed
	Purity 98%				+/-	132.5446	µg/mL	Stressed
20	Endrin ketone		2,007.5	µg/mL	+/-	11.7811	µg/mL	Gravimetric
	CAS # 53494-70-5	(Lot 160405JLM)			+/-	91.4401	µg/mL	Unstressed
	Purity 99%				+/-	132.0271	µg/mL	Stressed
Solvent: Hexane/Toluene (50:50)								
	CAS # 110-54-3/108-88-3							
	Purity 99%							

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

8081ABResPS_00030



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 32415 Lot No.: A0133751
Description: Organochlorine Pesticide Mix AB #3
Organochlorine Pesticide Mix AB #3 2,000 µg/mL, Hexane/Toluene (50:50), 1mL/ampul
Container Size: 2 mL Pkg Amt: > 1 mL
Expiration Date: April 30, 2022 Storage: 10°C or colder
Handling: Sonicate prior to use.

1x 1mL
Received 8/13/18
AMB

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	alpha-BHC CAS # 319-84-6 (Lot 0911942) Purity 99%	2,017.5 µg/mL	+/- 11.8398 µg/mL +/- 91.8956 µg/mL +/- 132.6847 µg/mL
2	gamma-BHC (Lindane) CAS # 58-89-9 (Lot 6815700) Purity 99%	2,010.5 µg/mL	+/- 11.7987 µg/mL +/- 91.5767 µg/mL +/- 132.2244 µg/mL
3	beta-BHC CAS # 319-85-7 (Lot BCBS8692V) Purity 98%	2,014.9 µg/mL	+/- 11.8244 µg/mL +/- 91.7762 µg/mL +/- 132.5124 µg/mL
4	delta-BHC CAS # 319-86-8 (Lot ER02101401) Purity 99%	2,010.0 µg/mL	+/- 11.7958 µg/mL +/- 91.5539 µg/mL +/- 132.1915 µg/mL
5	Heptachlor CAS # 76-44-8 (Lot NT057754) Purity 99%	2,016.5 µg/mL	+/- 11.8340 µg/mL +/- 91.8500 µg/mL +/- 132.6190 µg/mL
6	Aldrin CAS # 309-00-2 (Lot 6869200) Purity 97%	2,010.8 µg/mL	+/- 11.8006 µg/mL +/- 91.5908 µg/mL +/- 132.2447 µg/mL
7	Heptachlor epoxide (isomer B) CAS # 1024-57-3 (Lot ER121511-01) Purity 99%	2,017.5 µg/mL	+/- 11.8398 µg/mL +/- 91.8956 µg/mL +/- 132.6847 µg/mL

8	trans-Chlordane CAS # 5103-74-2 Purity 99%	(Lot ER061906-04)	2,012.5 µg/mL	+/- 11.8105 +/- 91.6678 +/- 132.3559	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	cis-Chlordane CAS # 5103-71-9 Purity 99%	(Lot ER062410-01)	2,014.0 µg/mL	+/- 11.8193 +/- 91.7361 +/- 132.4545	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Endosulfan I CAS # 959-98-8 Purity 99%	(Lot ER012105-02)	2,010.0 µg/mL	+/- 11.7958 +/- 91.5539 +/- 132.1915	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	4,4'-DDE CAS # 72-55-9 Purity 99%	(Lot ER011106-01)	2,011.0 µg/mL	+/- 11.8017 +/- 91.5995 +/- 132.2572	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	Dieldrin CAS # 60-57-1 Purity 99%	(Lot 5416800)	2,011.0 µg/mL	+/- 11.8017 +/- 91.5995 +/- 132.2572	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	Endrin CAS # 72-20-8 Purity 98%	(Lot 6898800)	2,016.4 µg/mL	+/- 11.8331 +/- 91.8432 +/- 132.6091	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	4,4'-DDD CAS # 72-54-8 Purity 99%	(Lot HAN02-KNCK)	2,010.5 µg/mL	+/- 11.7987 +/- 91.5767 +/- 132.2244	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Endosulfan II CAS # 33213-65-9 Purity 99%	(Lot 6815600)	2,009.5 µg/mL	+/- 11.7929 +/- 91.5312 +/- 132.1586	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	Endrin aldehyde CAS # 7421-93-4 Purity 99%	(Lot ER082306-01)	2,007.5 µg/mL	+/- 11.7811 +/- 91.4401 +/- 132.0271	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	4,4'-DDT CAS # 50-29-3 Purity 99%	(Lot S37912V)	2,012.5 µg/mL	+/- 11.8105 +/- 91.6678 +/- 132.3559	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	Endosulfan sulfate CAS # 1031-07-8 Purity 99%	(Lot BCBR9875V)	2,020.0 µg/mL	+/- 11.8545 +/- 92.0094 +/- 132.8491	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	Methoxychlor CAS # 72-43-5 Purity 99%	(Lot 6736800)	2,018.5 µg/mL	+/- 11.8457 +/- 91.9411 +/- 132.7505	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	Endrin ketone CAS # 53494-70-5 Purity 99%	(Lot 160405JLM)	2,015.5 µg/mL	+/- 11.8281 +/- 91.8045 +/- 132.5532	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
Solvent:		Hexane/Toluene (50:50) CAS # 110-54-3/108-88-3 Purity 99%				

Column:

30m x .25mm x .2um
Rtx-CLP II (cat.# 11323)

Carrier Gas:

helium-constant pressure 20 psi.

Temp. Program:

150°C to 300°C
@ 4°C/min. (hold 5 min.)

Inj. Temp:

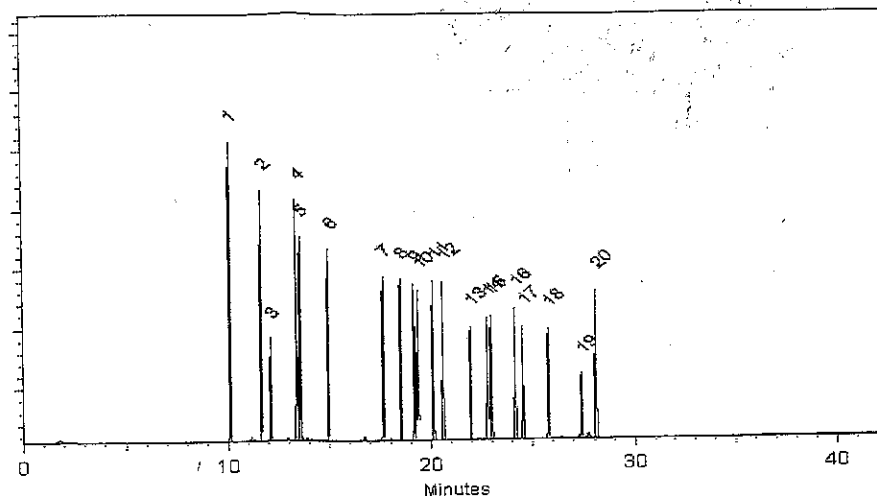
200°C

Det. Temp:

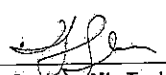
300°C

Det. Type:

ECD

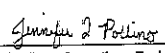


This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Tom Suckar - Mix Technician

Date Mixed: 27-Dec-2017

Balance: B442140311


Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 02-Jan-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

8081EvalBStk2_00020



CERTIFICATE OF ANALYSIS

Catalog No: M-8081-DS

Description: 4,4'-DDT & Endrin

Lot: 217101288

Solvent: Hexane

Hazards: Refer to SDS for complete safety information

Date Certified: Oct 30, 2017

Expiration: Nov 30, 2018

Sample Size: 1 mL

Components: 2

Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO Guide 34 Scope of Accreditation: Yes



Signal Word: Danger

Component	CAS #	Purity %	Prepared Concentration ¹	Certified Analyte Concentration ²
		(GC/MS)	(µg/mL)	(µg/mL)
4,4'-DDT	50-29-3	98.2	200.6	197.0
Endrin	72-20-8	98.1	200.8	197.0

Received
03-28-18 KOK

A product with a suffix (-1A, -2B, etc. or -01, -02, etc.) on its lot number has had its expiration date extended and is identical to the same lot number without the suffix.

¹ All weights are traceable through NIST, Test No. 822-275872-11

² Certified Analyte Concentration = Purity x Prepared Concentration.

The Uncertainty associated with the certified concentration reported on this certificate is $\pm 2.4\%$. This value is the combined expanded uncertainty and represents an estimated standard deviation equal to the positive square root of the total variation of the uncertainty of components. A normal distribution is assumed and a coverage factor of K=2 is chosen using approximately a 95% confidence level.

Labels and certificates follow U.S. Conventions in reporting numerical values: A comma (,) is used to separate units of one-thousand or greater. A period (.) is used as a decimal place marker.

See reverse side for additional information

Certified By:

Larry Decker, Organic QC Manager

Reagent

8081HCBStkSS_00038

Hexachlorobenzene Solution

Product Number: EPA-1125

Page: 1 of 1

Lot Number: CR-5129

Lot Issue Date: 08-Nov-2017

Expiration Date: 31-Dec-2021

This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
hexachlorobenzene	000118-74-1	RM03125	1003 ± 5 µg/mL

Matrix: acetone

Storage: Store at Room Temperature (15° to 30°C).

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

Reagent

8081ToxPS_00039



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32071 **Lot No.:** A0128388
Description : Toxaphene Standard
Toxaphene Standard 5,000 µg/mL, Isooctane, 1mL/ampul
Container Size : 2 mL **Pkg Amt:** > 1 mL
Expiration Date : September 30, 2021 **Storage:** 10°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Toxaphene	5,034.0 µg/mL	+/- 29.5423 µg/mL Gravimetric
	CAS # 8001-35-2 (Lot NT057448)		+/- 159.5474 µg/mL Unstressed
	Purity ----%		+/- 208.4220 µg/mL Stressed

Solvent: Isooctane
CAS # 540-84-1
Purity 99%

Column:
30m x .25mm x .2um
Rtx-CLP II (cat.# 11323)

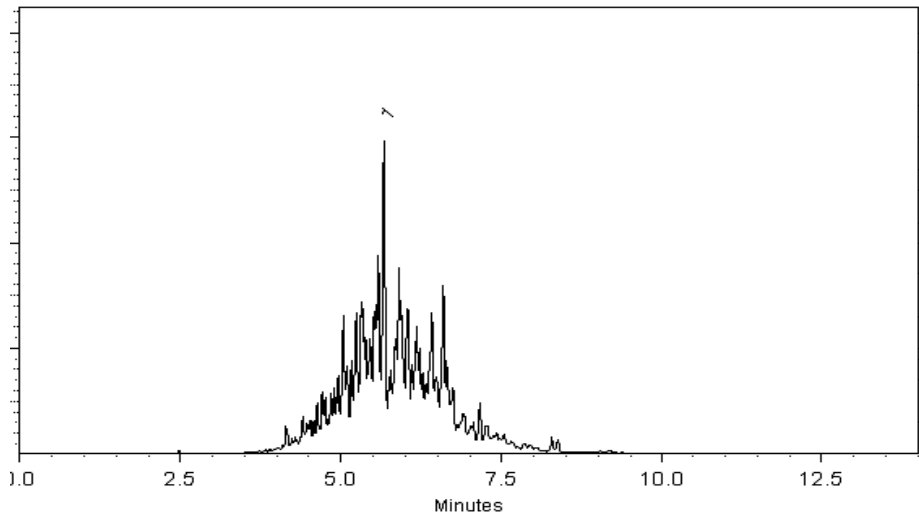
Carrier Gas:
helium-constant pressure 20 psi.

Temp. Program:
200°C to 300°C
@ 25°C/min. (hold 10 min.)

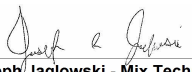
Inj. Temp:
250°C

Det. Temp:
300°C

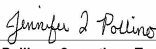
Det. Type:
ECD



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Joseph Jaglowski - Mix Technician

Date Mixed: 12-Jun-2017 Balance: B707717271


Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 03-Jul-2017

Manufactured under Restek's ISO 9001:2008 Registered Quality System Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

8082 LCS_00050

Preliminary Report

TestAmerica Denver

LCS, Lab Control Sample Report

Sample Path: \\ChromNA\Denver\ChromData\SGC_P3\20180928-74499.b\09281805.D

Lims ID: 8082 LCS 50

Inj. Date: 28-Sep-2018 11:44:22

Worklist ID: 280-0074499-005

Instrument: SGC_P3

Method: PCB_P3

Detector 1: GC ECD1A

Compound	Amount Added	Amount Recovered	%Rec	Limits 1 46_PCB_1'
1 PCB-1016	200.0	180.6	90.3	40-140
1 PCB-1016-1	200.0	156.3	78.2	40-140
1 PCB-1016-2	200.0	191.8	95.9	40-140
1 PCB-1016-3	200.0	185.7	92.9	40-140
1 PCB-1016-4	200.0	185.0	92.5	40-140
1 PCB-1016-5	200.0	184.2	92.1	40-140
12 PCB-1260	200.0	199.0	99.5	60-130
12 PCB-1260-1	200.0	187.2	93.6	60-130
12 PCB-1260-2	200.0	183.9	91.9	60-130
12 PCB-1260-3	200.0	209.6	104.8	60-130
12 PCB-1260-4	200.0	212.0	106.0	60-130
12 PCB-1260-5	200.0	202.3	101.2	60-130

Detector 2: GC ECD2B

Compound	Amount Added	Amount Recovered	%Rec	Limits 1 46_PCB_1'
1 PCB-1016	200.0	178.9	89.4	40-140
1 PCB-1016-1	200.0	184.9	92.4	40-140
1 PCB-1016-2	200.0	180.4	90.2	40-140
1 PCB-1016-3	200.0	174.7	87.4	40-140
1 PCB-1016-4	200.0	178.7	89.4	40-140
1 PCB-1016-5	200.0	175.5	87.7	40-140
12 PCB-1260	200.0	173.4	86.7	60-130
12 PCB-1260-1	200.0	166.1	83.0	60-130
12 PCB-1260-2	200.0	155.3	77.6	60-130
12 PCB-1260-3	200.0	182.1	91.0	60-130
12 PCB-1260-4	200.0	183.7	91.9	60-130
12 PCB-1260-5	200.0	179.6	89.8	60-130

Samples for Limit Group: 1, Lims Prep Method: 3546_PCB_1YR

280-114730-A-1-A

280-114730-A-2-A

280-114730-A-3-A

280-114730-A-4-A

280-114730-A-5-A

280-114730-A-6-A

280-114730-A-7-A

280-114730-A-8-A

280-114730-A-9-A

280-114730-A-10-A

280-114730-A-12-A

280-114730-A-13-A

280-114730-A-14-A

280-114730-A-15-A

280-114730-A-16-A

280-114730-A-17-A

280-114730-A-18-A

280-114730-A-20-A

Reagent

8082LCSSTOCK_00038



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32039 Lot No.: A0119290
Description : Aroclor® 1016/1260 Mix
Aroclor® 1016/1260 Mix 1,000 µg/mL, Hexane, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : August 31, 2022 Storage: 25°C nominal
Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	Aroclor 1016	1,005.0 µg/mL	+/- 5.8567	µg/mL	Gravimetric
	CAS # 12674-11-2 (Lot W-125-01)		+/- 31.8448	µg/mL	Unstressed
	Purity ----%		+/- 41.6041	µg/mL	Stressed
2	Aroclor 1260	1,007.2 µg/mL	+/- 5.8695	µg/mL	Gravimetric
	CAS # 11096-82-5 (Lot W-129-06)		+/- 31.9145	µg/mL	Unstressed
	Purity ----%		+/- 41.6951	µg/mL	Stressed
Solvent: Hexane					
CAS # 110-54-3					
Purity 99%					

5002

Reagent

8082LCSSTOCK_00039



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

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Certificate of Analysis



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This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32039 Lot No.: A0119290
Description : Aroclor® 1016/1260 Mix
Aroclor® 1016/1260 Mix 1,000 µg/mL, Hexane, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : August 31, 2022 Storage: 25°C nominal
Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)				
1	Aroclor 1016	(Lot W-125-01)	1,005.0 μg/mL	+/-	5.8567	μg/mL	Gravimetric	
	CAS #			12674-11-2	+/-	31.8448	μg/mL	Unstressed
	Purity			----%	+/-	41.6041	μg/mL	Stressed
2	Aroclor 1260	(Lot W-129-06)	1,007.2 μg/mL	+/-	5.8695	μg/mL	Gravimetric	
	CAS #			11096-82-5	+/-	31.9145	μg/mL	Unstressed
	Purity			----%	+/-	41.6951	μg/mL	Stressed
Solvent:	Hexane							
	CAS #	110-54-3						
	Purity	99%						

5002

Reagent

8270_LCS_Main_00060



Reagent ID: 8270_LCS_Main_00060

Description: USE IN CONJUNCTION WITH 8270_LCS_S
No. of Bottles: 4
Storage Location: North Prep
Reagent Volume: 500.000 mL
Creation Date: 12/06/2018
Open Date:
Container(s):
Comment:

Expiration Date: 05/31/2019
Laboratory: TestAmerica Denver
Prepared By: Becker, Chad B
Solvent: P&T Methanol
Solvent Lot: MethanolP&T_00214

5463425, 5463426, 5463427, 5463428
Make full volume. Place all stocks in a sonication bath for 5 minutes before use.
Dilute to 500mL in P&T MeOH
40mL of MS-570666 or 571995 "8270 List 1 Std 1 MegaMix"
20mL of MS-569731 "Benzoic Acid"
10mL of "OP-572556" HCP
1 year expiration
Exchange /MeCl2 verification
All Standards in fridge.

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
1,1'-Biphenyl	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
1,2,4,5-Tetrachlorobenzene	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
1,2,4-Trichlorobenzene	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
1,2-Dichlorobenzene	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
1,2-Diphenylhydrazine	571995_00054	01/31/2020	1010.97500	ug/mL	80.87796	ug/mL
1,3-Dichlorobenzene	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
1,3-Dinitrobenzene	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
1,4-Dichlorobenzene	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
1,4-Dioxane	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
1-Methylnaphthalene	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
2,2'-oxybis[1-chloropropane]	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
2,3,4,6-Tetrachlorophenol	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
2,4,5-Trichlorophenol	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
2,4,6-Trichlorophenol	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
2,4-Dichlorophenol	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL
2,4-Dimethylphenol	571995_00054	01/31/2020	1000.00000	ug/mL	80.00000	ug/mL

Preliminary Report

TestAmerica Denver

LCS, Lab Control Sample Report

Sample Path: \\chromna\Denver\ChromData\SMS_Y\20181210-77018.b\Y22464.D

Lims ID: 8270_LCS_Main_00060

Inj. Date: 10-Dec-2018 19:31:30

Worklist ID: 280-0077018-011

Instrument: SMS_Y

Method: SMSY_8270C

Compound	Amount Added	Amount Recovered	%Rec	Limits 1 3520C	Limits 2 3520C
15 1,4-Dioxane	80.0	74.2	92.7	40-110	
17 N-Nitrosodimethylamine	80.0	77.3	96.7	48-121	
18 Pyridine	160.0	146.7	91.7	34-112	
28 Phenol	80.0	79.1	98.8	50-127	10-115
30 Aniline	80.0	73.0	91.3	34-106	
31 Bis(2-chloroethyl)ether	80.0	82.2	102.7	53-132	
34 2-Chlorophenol	80.0	76.3	95.4	54-124	
35 n-Decane	80.0	76.0	95.0	14-120	
37 1,3-Dichlorobenzene	80.0	75.4	94.3	31-124	
38 1,4-Dichlorobenzene	80.0	75.1	93.9	34-123	
39 Benzyl alcohol	80.0	72.7	90.9	54-124	
40 1,2-Dichlorobenzene	80.0	74.7	93.3	36-123	
41 2-Methylphenol	80.0	77.7	97.2	55-123	40-110
43 2,2'-oxybis[1-chloropro	80.0	77.5	96.8	44-132	
44 Indene	80.0	78.3	97.9	49-111	
46 3-Methylphenol	80.0	78.7	98.4	51-124	
47 4-Methylphenol	80.0	78.7	98.4	51-124	30-110
48 3 & 4 Methylphenol	80.0	78.7	98.4	51-124	
50 N-Nitrosodi-n-propylami	80.0	77.1	96.4	57-117	
51 Acetophenone	80.0	76.6	95.7	46-127	
53 Hexachloroethane	80.0	74.0	92.5	27-123	
54 Nitrobenzene	80.0	75.8	94.8	59-117	
57 Isophorone	80.0	76.3	95.4	58-111	
58 2-Nitrophenol	80.0	75.0	93.7	61-121	
59 2,4-Dimethylphenol	80.0	76.1	95.1	33-117	
63 Bis(2-chloroethoxy)meth	80.0	74.9	93.7	62-114	
64 Benzoic acid	80.0	71.9	89.9	41-111	
68 2,4-Dichlorophenol	80.0	77.0	96.3	62-119	
69 1,2,4-Trichlorobenzene	80.0	73.3	91.6	44-117	
71 Naphthalene	80.0	76.1	95.2	50-119	
72 4-Chloroaniline	80.0	71.5	89.3	30-99	
73 2,6-Dichlorophenol	80.0	75.8	94.8	63-118	
75 Hexachlorobutadiene	80.0	76.5	95.6	36-118	
83 4-Chloro-3-methylphenol	80.0	77.7	97.2	65-121	
86 2-Methylnaphthalene	80.0	76.1	95.2	53-119	45-105
88 1-Methylnaphthalene	80.0	76.8	96.0	54-116	
89 1,2,4,5-Tetrachlorobenz	80.0	73.7	92.2	57-117	
90 Hexachlorocyclopentadie	160.0	148.8	93.0	10-106	
92 2,4,6-Trichlorophenol	80.0	78.1	97.6	60-137	
94 2,4,5-Trichlorophenol	80.0	75.9	94.8	60-129	
98 1,1'-Biphenyl	80.0	73.9	92.4	52-130	

Preliminary Report

Sample Path: \\chromna\Denver\ChromData\SMS_Y20181210-77018.b\Y22464.D

Compound	Amount Added	Amount Recovered	%Rec	Limits 1 3520C	Limits 2 3520C
99 2-Chloronaphthalene	80.0	73.2	91.5	51-128	
101 2-Nitroaniline	80.0	75.6	94.4	57-133	
104 Dimethyl phthalate	80.0	74.8	93.6	59-131	
105 1,3-Dinitrobenzene	80.0	78.7	98.3	65-135	
106 2,6-Dinitrotoluene	80.0	76.5	95.7	65-135	
107 Acenaphthylene	80.0	73.3	91.6	55-123	
108 3-Nitroaniline	80.0	71.4	89.2	27-111	
109 Acenaphthene	80.0	73.0	91.2	54-129	
111 2,4-Dinitrophenol	160.0	145.3	90.8	56-121	
112 4-Nitrophenol	160.0	150.3	93.9	50-140	
114 2,4-Dinitrotoluene	80.0	75.1	93.9	65-135	
116 Dibenzofuran	80.0	74.6	93.2	56-128	
119 2,3,4,6-Tetrachlorophen	80.0	75.8	94.7	64-128	
123 Diethyl phthalate	80.0	74.4	93.0	60-133	
124 Hexadecane	80.0	76.6	95.8	47-129	
127 4-Chlorophenyl phenyl e	80.0	75.1	93.9	56-130	
129 Fluorene	80.0	75.4	94.3	51-133	
130 4-Nitroaniline	80.0	74.4	92.9	54-128	
131 4,6-Dinitro-2-methylphe	160.0	169.2	105.7	63-122	
134 Diphenylamine	68.0	63.4	93.2	60-124	
135 N-Nitrosodiphenylamine	80.0	74.4	92.9	63-116	
136 1,2-Diphenylhydrazine	80.9	78.1	96.6	55-128	
137 Azobenzene	80.0	77.3	96.6	55-128	
148 4-Bromophenyl phenyl et	80.0	74.5	93.2	65-115	
151 Hexachlorobenzene	80.0	76.0	95.0	65-114	
155 Pentachlorophenol	160.0	165.4	103.4	56-115	
158 n-Octadecane	80.0	77.3	96.6		
161 Phenanthrene	80.0	73.9	92.3	63-119	
162 Anthracene	80.0	75.1	93.8	65-116	
164 Carbazole	80.0	74.2	92.7	68-116	
168 Di-n-butyl phthalate	80.0	75.7	94.7	65-118	
175 Fluoranthene	80.0	75.6	94.5	65-118	
178 Pyrene	80.0	69.9	87.4	59-124	
187 Butyl benzyl phthalate	80.0	71.2	88.9	64-121	
191 Benzo[a]anthracene	80.0	68.3	85.3	63-120	
192 Chrysene	80.0	72.6	90.7	65-122	
193 Bis(2-ethylhexyl) phtha	80.0	74.9	93.6	61-123	40-125
195 Di-n-octyl phthalate	80.0	74.6	93.2	56-119	
196 Benzo[b]fluoranthene	80.0	72.9	91.2	64-122	
198 Benzo[k]fluoranthene	80.0	72.9	91.1	69-125	
201 Benzo[a]pyrene	80.0	73.4	91.7	62-114	
207 Indeno[1,2,3-cd]pyrene	80.0	79.1	98.9	53-116	
208 Dibenz(a,h)anthracene	80.0	76.9	96.2	60-120	
209 Benzo[g,h,i]perylene	80.0	74.5	93.1	60-122	

Reagent

8270Surrogate_00130

Preliminary Report

TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SMS_G6\20181219-77367.b\G6_36905.D

Lims ID: 8270Surrogate_00130

Client ID:

Sample Type: Client

Inject. Date: 19-Dec-2018 19:06:30

ALS Bottle#: 9

Worklist Smp#: 33

Injection Vol: 0.5 ul

Dil. Factor: 1.0000

Sample Info: 8270Surrogate_00130

Operator ID: HOEFLERA

Instrument ID: SMS_G6

Method: \\chromna\Denver\ChromData\SMS_G6\20181219-77367.b\MSG6_8270C.m

Limit Group: MSSV - 8270C_625

Method Label: 8270C / 625

Last Update: 20-Dec-2018 11:06:02

Calib Date: 29-Nov-2018 12:35:30

Integrator: RTE

ID Type: Deconvolution ID

Quant Method: Internal Standard

Quant By: Initial Calibration

Last ICal File: \\chromdocs2018\q3\Denver\ChromData\SMS_G6\20181129-76654.b\G6_36542.D

Column 1: VF-5ms (0.50 mm)

Det: MS SCAN

Process Host: CTX0325

Compound	Amount Added	Amount Recovered	% Rec.
\$ 7 2-Fluorophenol	100.0	89.7	89.69
\$ 8 Phenol-d5	100.0	87.9	87.94
\$ 9 Nitrobenzene-d5	100.0	86.4	86.40
\$ 11 2-Fluorobiphenyl	100.0	83.3	83.30
\$ 12 2,4,6-Tribromophenol	100.0	88.0	87.97
\$ 13 Terphenyl-d14	100.0	84.8	84.76



Fridge Y

Reagent ID: 8270Surrogate_00130

Description: 8270 Surrogate 100ug/ml
No. of Bottles: 2
Storage Location: North Prep
Reagent Volume: 1000.000 mL
Creation Date: 12/17/2018
Open Date:
Container(s): 5484310, 5484311
Comment:

Expiration Date: 12/12/2019
Laboratory: TestAmerica Denver
Prepared By: Rood, Coady M
Solvent: ACETONE
Solvent Lot: Acetone_00250

Sonicate 8270SurrStkHL 5 mins before use.
Take 20mL of 8270SurrStkHL and dilute to 1000mL in acetone.
One year expiration date.
Split into 4x250mL bottles. Requires solvent exchange to MeCl2 prior to submission for verification.

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
2,4,6-Tribromophenol	8270SurStkHL_00299	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2,4,6-Tribromophenol	8270SurStkHL_00299	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2-Fluorobiphenyl	8270SurStkHL_00299	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2-Fluorophenol	8270SurStkHL_00299	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Nitrobenzene-d5	8270SurStkHL_00299	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Phenol-d5	8270SurStkHL_00299	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Phenol-d6	8270SurStkHL_00299	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Terphenyl-d14	8270SurStkHL_00299	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2,4,6-Tribromophenol	8270SurStkHL_00300	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2,4,6-Tribromophenol	8270SurStkHL_00300	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2-Fluorobiphenyl	8270SurStkHL_00300	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2-Fluorophenol	8270SurStkHL_00300	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Nitrobenzene-d5	8270SurStkHL_00300	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Phenol-d5	8270SurStkHL_00300	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Phenol-d6	8270SurStkHL_00300	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Terphenyl-d14	8270SurStkHL_00300	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2,4,6-Tribromophenol	8270SurStkHL_00305	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL



Reagent ID: 8270Surrogate_00130

Description: 8270 Surrogate 100ug/ml
No. of Bottles: 2
Storage Location: North Prep
Reagent Volume: 1000.000 mL
Creation Date: 12/17/2018
Open Date:
Container(s): 5484310, 5484311
Comment: Sonicate 8270SurrStkHL 5 mins before use.
Take 20mL of 8270SurrStkHL and dilute to 1000mL in acetone.
One year expiration date.
Split into 4x250mL bottles. Requires solvent exchange to MeCl2 prior to submission for verification.

Expiration Date: 12/12/2019
Laboratory: TestAmerica Denver
Prepared By: Rood, Coady M
Solvent: ACETONE
Solvent Lot: Acetone_00250

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
2,4,6-Tribromophenol	8270SurStkHL_00305	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2-Fluorobiphenyl	8270SurStkHL_00305	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2-Fluorophenol	8270SurStkHL_00305	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Nitrobenzene-d5	8270SurStkHL_00305	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Phenol-d5	8270SurStkHL_00305	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Phenol-d6	8270SurStkHL_00305	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Terphenyl-d14	8270SurStkHL_00305	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2,4,6 - Tribromophenol	8270SurStkHL_00306	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2,4,6-Tribromophenol	8270SurStkHL_00306	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2-Fluorobiphenyl	8270SurStkHL_00306	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
2-Fluorophenol	8270SurStkHL_00306	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Nitrobenzene-d5	8270SurStkHL_00306	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Phenol-d5	8270SurStkHL_00306	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Phenol-d6	8270SurStkHL_00306	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL
Terphenyl-d14	8270SurStkHL_00306	09/30/2023	5000.00000	ug/mL	100.00000	ug/mL



Source Reagents

Reagent	Description	Type	Expiration	Vendor	Vendor Lot #	Vendor Cat Lot #	Volume Used	Volume Units
8270SurStkHL_0029	5000 ug/ml of each compound	ASTD	09/30/23	Restek	A01411581	567685	5.00000	mL
9								
8270SurStkHL_0030	5000 ug/ml of each compound	ASTD	09/30/23	Restek	A01411581	567685	5.00000	mL
0								
8270SurStkHL_0030	5000 ug/ml of each compound	ASTD	09/30/23	Restek	A01411581	567685	5.00000	mL
5								
8270SurStkHL_0030	5000 ug/ml of each compound	ASTD	09/30/23	Restek	A01411581	567685	5.00000	mL
6								

Reagent

8270SurStkHL_00299

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Tech Tips:

Due to the limited solubility of p-terphenyl-d14 in methanol, we do not recommend that this mixture be diluted in methanol.

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

Inj. Temp:

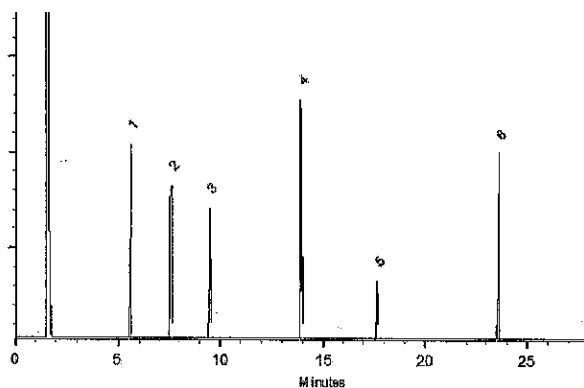
250°C

Det. Temp:

330°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


F. Joseph Tallon - Mix Technician

Date Mixed: 14-Sep-2018

Balance: B442140311


Justine Albartoon - Operations Tech-ARM QC

Date Passed: 18-Sep-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 567685 Lot No.: A0141581
Description: 8270 Surrogate Standard
8270 Surrogate Standard 5,000µg/mL, Methylene chloride, 5mL/ampul
Container Size: 5 mL Pkg Amt: > 5 mL
Expiration Date: September 30, 2023 Storage: 10°C or colder
Handling: Sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	2-Fluorophenol CAS # 367-12-4 (Lot STBF3761V) Purity 99%	5,002.0 µg/mL	+/- 29.0821 µg/mL Gravimetric +/- 145.9751 µg/mL Unstressed +/- 177.1352 µg/mL Stressed
2	Phenol-d5 CAS # 4165-62-2 (Lot CD-105) Purity 99%	5,000.6 µg/mL	+/- 29.0739 µg/mL Gravimetric +/- 145.9343 µg/mL Unstressed +/- 177.0856 µg/mL Stressed
3	Nitrobenzene-d5 CAS # 4165-60-0 (Lot PR-29603) Purity 99%	5,006.0 µg/mL	+/- 29.1053 µg/mL Gravimetric +/- 146.0919 µg/mL Unstressed +/- 177.2768 µg/mL Stressed
4	2-Fluorobiphenyl CAS # 321-60-8 (Lot M09E045) Purity 99%	5,000.8 µg/mL	+/- 29.0751 µg/mL Gravimetric +/- 145.9401 µg/mL Unstressed +/- 177.0927 µg/mL Stressed
5	2,4,6-Tribromophenol CAS # 118-79-6 (Lot 29699MJV) Purity 99%	5,000.8 µg/mL	+/- 29.0751 µg/mL Gravimetric +/- 145.9401 µg/mL Unstressed +/- 177.0927 µg/mL Stressed
6	p-Terphenyl-d14 CAS # 1718-51-0 (Lot PR-21037) Purity 99%	5,001.0 µg/mL	+/- 29.0762 µg/mL Gravimetric +/- 145.9459 µg/mL Unstressed +/- 177.0998 µg/mL Stressed

Reagent

8270SurStkHL_00300

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Tech Tips:

Due to the limited solubility of p-terphenyl-d14 in methanol, we do not recommend that this mixture be diluted in methanol.

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

Inj. Temp:

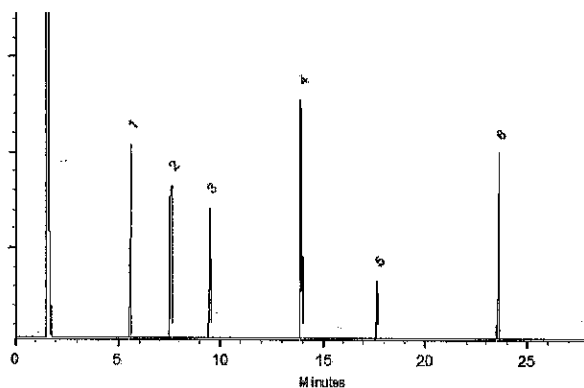
250°C

Det. Temp:

330°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


F. Joseph Tallon - Mix Technician

Date Mixed: 14-Sep-2018

Balance: B442140311


Justine Albartoon - Operations Tech-ARM QC

Date Passed: 18-Sep-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397



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FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 567685 Lot No.: A0141581
Description : 8270 Surrogate Standard
8270 Surrogate Standard 5,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 5 mL Pkg Amt: > 5 mL
Expiration Date : September 30, 2023 Storage: 10°C or colder
Handling: Sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	2-Fluorophenol CAS # 367-12-4 (Lot STBF3761V) Purity 99%	5,002.0 µg/mL	+/- 29.0821 µg/mL Gravimetric +/- 145.9751 µg/mL Unstressed +/- 177.1352 µg/mL Stressed
2	Phenol-d5 CAS # 4165-62-2 (Lot CD-105) Purity 99%	5,000.6 µg/mL	+/- 29.0739 µg/mL Gravimetric +/- 145.9343 µg/mL Unstressed +/- 177.0856 µg/mL Stressed
3	Nitrobenzene-d5 CAS # 4165-60-0 (Lot PR-29603) Purity 99%	5,006.0 µg/mL	+/- 29.1053 µg/mL Gravimetric +/- 146.0919 µg/mL Unstressed +/- 177.2768 µg/mL Stressed
4	2-Fluorobiphenyl CAS # 321-60-8 (Lot M09E045) Purity 99%	5,000.8 µg/mL	+/- 29.0751 µg/mL Gravimetric +/- 145.9401 µg/mL Unstressed +/- 177.0927 µg/mL Stressed
5	2,4,6-Tribromophenol CAS # 118-79-6 (Lot 29699MJV) Purity 99%	5,000.8 µg/mL	+/- 29.0751 µg/mL Gravimetric +/- 145.9401 µg/mL Unstressed +/- 177.0927 µg/mL Stressed
6	p-Terphenyl-d14 CAS # 1718-51-0 (Lot PR-21037) Purity 99%	5,001.0 µg/mL	+/- 29.0762 µg/mL Gravimetric +/- 145.9459 µg/mL Unstressed +/- 177.0998 µg/mL Stressed

Reagent

8270SurStkHL_00305

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Tech Tips:

Due to the limited solubility of p-terphenyl-d14 in methanol, we do not recommend that this mixture be diluted in methanol.

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

Inj. Temp:

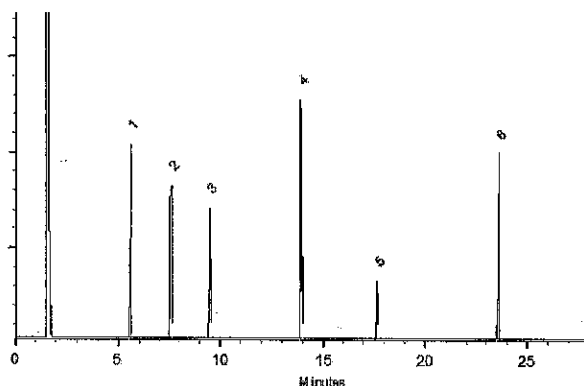
250°C

Det. Temp:

330°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


F. Joseph Tallon - Mix Technician

Date Mixed: 14-Sep-2018

Balance: B442140311


Justine Albartean - Operations Tech-ARM QC

Date Passed: 18-Sep-2018

Manufactured under Restek's ISO 9001:2015
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Certificate #FM 80397



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Catalog No.: 567685 Lot No.: A0141581
Description: 8270 Surrogate Standard
8270 Surrogate Standard 5,000µg/mL, Methylene chloride, 5mL/ampul
Container Size: 5 mL Pkg Amt: > 5 mL
Expiration Date: September 30, 2023 Storage: 10°C or colder
Handling: Sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	2-Fluorophenol CAS # 367-12-4 (Lot STBF3761V) Purity 99%	5,002.0 µg/mL	+/- 29.0821 µg/mL Gravimetric +/- 145.9751 µg/mL Unstressed +/- 177.1352 µg/mL Stressed
2	Phenol-d5 CAS # 4165-62-2 (Lot CD-105) Purity 99%	5,000.6 µg/mL	+/- 29.0739 µg/mL Gravimetric +/- 145.9343 µg/mL Unstressed +/- 177.0856 µg/mL Stressed
3	Nitrobenzene-d5 CAS # 4165-60-0 (Lot PR-29603) Purity 99%	5,006.0 µg/mL	+/- 29.1053 µg/mL Gravimetric +/- 146.0919 µg/mL Unstressed +/- 177.2768 µg/mL Stressed
4	2-Fluorobiphenyl CAS # 321-60-8 (Lot M09E045) Purity 99%	5,000.8 µg/mL	+/- 29.0751 µg/mL Gravimetric +/- 145.9401 µg/mL Unstressed +/- 177.0927 µg/mL Stressed
5	2,4,6-Tribromophenol CAS # 118-79-6 (Lot 29699MJV) Purity 99%	5,000.8 µg/mL	+/- 29.0751 µg/mL Gravimetric +/- 145.9401 µg/mL Unstressed +/- 177.0927 µg/mL Stressed
6	p-Terphenyl-d14 CAS # 1718-51-0 (Lot PR-21037) Purity 99%	5,001.0 µg/mL	+/- 29.0762 µg/mL Gravimetric +/- 145.9459 µg/mL Unstressed +/- 177.0998 µg/mL Stressed

Reagent

8270SurStkHL_00306

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Tech Tips:

Due to the limited solubility of p-terphenyl-d14 in methanol, we do not recommend that this mixture be diluted in methanol.

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

Inj. Temp:

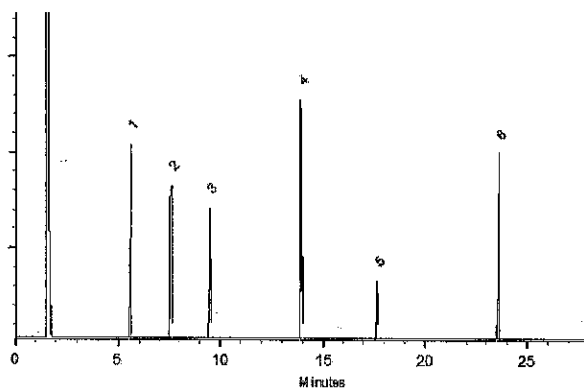
250°C

Det. Temp:

330°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


F. Joseph Tallon - Mix Technician

Date Mixed: 14-Sep-2018

Balance: B442140311


Justine Albartoon - Operations Tech-ARM QC

Date Passed: 18-Sep-2018

Manufactured under Restek's ISO 9001:2015
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Catalog No.: 567685 Lot No.: A0141581
Description: 8270 Surrogate Standard
8270 Surrogate Standard 5,000µg/mL, Methylene chloride, 5mL/ampul
Container Size: 5 mL Pkg Amt: > 5 mL
Expiration Date: September 30, 2023 Storage: 10°C or colder
Handling: Sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	2-Fluorophenol CAS # 367-12-4 (Lot STBF3761V) Purity 99%	5,002.0 µg/mL	+/- 29.0821 µg/mL Gravimetric +/- 145.9751 µg/mL Unstressed +/- 177.1352 µg/mL Stressed
2	Phenol-d5 CAS # 4165-62-2 (Lot CD-105) Purity 99%	5,000.6 µg/mL	+/- 29.0739 µg/mL Gravimetric +/- 145.9343 µg/mL Unstressed +/- 177.0856 µg/mL Stressed
3	Nitrobenzene-d5 CAS # 4165-60-0 (Lot PR-29603) Purity 99%	5,006.0 µg/mL	+/- 29.1053 µg/mL Gravimetric +/- 146.0919 µg/mL Unstressed +/- 177.2768 µg/mL Stressed
4	2-Fluorobiphenyl CAS # 321-60-8 (Lot M09E045) Purity 99%	5,000.8 µg/mL	+/- 29.0751 µg/mL Gravimetric +/- 145.9401 µg/mL Unstressed +/- 177.0927 µg/mL Stressed
5	2,4,6-Tribromophenol CAS # 118-79-6 (Lot 29699MJV) Purity 99%	5,000.8 µg/mL	+/- 29.0751 µg/mL Gravimetric +/- 145.9401 µg/mL Unstressed +/- 177.0927 µg/mL Stressed
6	p-Terphenyl-d14 CAS # 1718-51-0 (Lot PR-21037) Purity 99%	5,001.0 µg/mL	+/- 29.0762 µg/mL Gravimetric +/- 145.9459 µg/mL Unstressed +/- 177.0998 µg/mL Stressed

Reagent

AR_1248_RES_00013

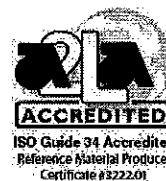


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Catalog No. : 32010 Lot No.: A0130978
Description : Aroclor® 1248 Standard
Aroclor® 1248 Standard 1,000µg/mL, Hexane, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : December 31, 2023 Storage: 25°C nominal
Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Aroclor 1248	1,001.6 µg/mL	+/- 5.8779 µg/mL	Gravimetric
	CAS # 12672-29-6 (Lot W-108-07)		+/- 31.7447 µg/mL	Unstressed
	Purity ----%		+/- 41.4691 µg/mL	Stressed

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Reagent

AR_1248_RESss_00011

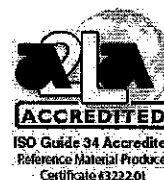


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Catalog No. : 32010.SEC Lot No.: A0124143
Description : Aroclor® 1248 Standard
Aroclor® 1248 Standard 1,000µg/mL, Hexane, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : April 30, 2023 Storage: 25°C nominal
Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Aroclor 1248	1,008.0 µg/mL	+/- 5.9872 µg/mL	Gravimetric
	CAS # 12672-29-6.SEC (Lot 106-248)		+/- 31.9609 µg/mL	Unstressed
	Purity ----%		+/- 41.7443 µg/mL	Stressed

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Reagent

AR_1660_RES_00002



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Catalog No. : 32039 Lot No.: A0134815
Description : Aroclor® 1016/1260 Mix
Aroclor® 1016/1260 Mix 1,000 µg/mL, Hexane, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : May 31, 2024 Storage: 25°C nominal
Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Aroclor 1016 CAS # 12674-11-2 (Lot 164887) Purity ----%	1,001.3 µg/mL	+/- 5.8348 µg/mL Gravimetric +/- 31.7260 µg/mL Unstressed +/- 41.4488 µg/mL Stressed
2	Aroclor 1260 CAS # 11096-82-5 (Lot 155463) Purity ----%	1,000.0 µg/mL	+/- 5.8275 µg/mL Gravimetric +/- 31.6864 µg/mL Unstressed +/- 41.3971 µg/mL Stressed

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Reagent

AR_1660_RESss_00011

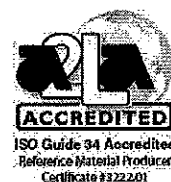


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Catalog No. : 32039.SEC Lot No.: A0133256

Description : Aroclor® 1016/1260 Mix

Aroclor® 1016/1260 Mix 1,000µg/mL, Hexane, 1mL/ampul

Container Size : 2 mL Pkg Amt: > 1 mL

Expiration Date : March 31, 2024 Storage: 25°C nominal

Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Aroclor 1016	1,008.0 µg/mL	+/- 5.9872	µg/mL Gravimetric
	CAS # 12674-11-2.SEC (Lot NTO1016)		+/- 31.9609	µg/mL Unstressed
	Purity ----%		+/- 41.7443	µg/mL Stressed
2	Aroclor 1260	1,004.0 µg/mL	+/- 5.9635	µg/mL Gravimetric
	CAS # 11096-82-5.SEC (Lot 021-020-1A)		+/- 31.8340	µg/mL Unstressed
	Purity ----%		+/- 41.5787	µg/mL Stressed

Solvent: Hexane
 CAS # 110-54-3
 Purity 99%

Reagent

AR_2154_RES_00002



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Catalog No. : 569745 Lot No.: A0131802
 Description : PCB-1221/1254 Standard
PCB-1221/1254 Standard 1,000µg/mL, Hexane, 1mL/ampul
 Container Size : 2 mL Pkg Amt: > 1 mL
 Expiration Date : January 31, 2024 Storage: 25°C nominal
 Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	Aroclor 1221	1,006.0 µg/mL	+/-	5.9753	µg/mL	Gravimetric
	CAS # 11104-28-2 (Lot 2781200)		+/-	31.8975	µg/mL	Unstressed
	Purity ---%		+/-	41.6615	µg/mL	Stressed
2	Aroclor 1254	1,002.0 µg/mL	+/-	5.9516	µg/mL	Gravimetric
	CAS # 11097-69-1 (Lot 124-191-B)		+/-	31.7706	µg/mL	Unstressed
	Purity ---%		+/-	41.4958	µg/mL	Stressed

Solvent: Hexane
 CAS # 110-54-3
 Purity 99%

Reagent

AR_2154_RESss_00002



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Catalog No. : 569745.SEC **Lot No.:** A0131779

Description : PCB-1221/1254 Standard
PCB-1221/1254 Standard 1,000µg/mL, Hexane, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : January 31, 2024 **Storage:** 25°C nominal

Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	Aroclor 1221		1,000.0 μg/mL	+/-	5.9397	μg/mL	Gravimetric
	CAS #	11104-28-2.SEC (Lot W-126-07)		+/-	31.7072	μg/mL	Unstressed
	Purity	----%		+/-	41.4130	μg/mL	Stressed
2	Aroclor 1254		1,002.0 μg/mL	+/-	5.9516	μg/mL	Gravimetric
	CAS #	11097-69-1.SEC (Lot RM00922)		+/-	31.7706	μg/mL	Unstressed
	Purity	----%		+/-	41.4958	μg/mL	Stressed
Solvent:	Hexane						
	CAS #	110-54-3					
	Purity	99%					

Reagent

AR_3262_RES_00002

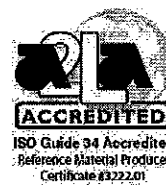


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Catalog No. : 569746 **Lot No.:** A0132023

Description : PCB-1232/1262 Standard

PCB-1232/1262 Standard 1,000µg/mL, Hexane, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : January 31, 2024 **Storage:** 25°C nominal

Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)				
1	Aroclor 1232		1,004.0 µg/mL	+/-	5.9635	µg/mL	Gravimetric	
	CAS #	11141-16-5		(Lot W-107-05)	+/-	31.8340	µg/mL	Unstressed
	Purity	----%			+/-	41.5787	µg/mL	Stressed
2	Aroclor 1262		1,002.0 µg/mL	+/-	5.9516	µg/mL	Gravimetric	
	CAS #	37324-23-5		(Lot 3067100)	+/-	31.7706	µg/mL	Unstressed
	Purity	----%			+/-	41.4958	µg/mL	Stressed
Solvent:		Hexane						
		CAS #	110-54-3					
		Purity	99%					

Reagent

AR_3262_RESss_00001

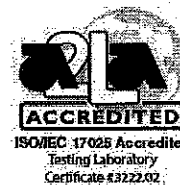


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Catalog No. : 569746.SEC Lot No.: A0134307
Description : PCB-1232/1262 Standard
PCB-1232/1262 Standard 1,000µg/mL, Hexane, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : April 30, 2024 Storage: 25°C nominal
Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)				
1	Aroclor 1232		1,006.0 µg/mL	+/-	5.9753	µg/mL	Gravimetric	
	CAS #	11141-16-5.SEC		(Lot 130604JLM)	+/-	31.8975	µg/mL	Unstressed
	Purity	----%			+/-	41.6615	µg/mL	Stressed
2	Aroclor 1262		1,006.0 µg/mL	+/-	5.9753	µg/mL	Gravimetric	
	CAS #	37324-23-5.SEC		(Lot W-130-05)	+/-	31.8975	µg/mL	Unstressed
	Purity	----%			+/-	41.6615	µg/mL	Stressed
Solvent:	Hexane							
	CAS #	110-54-3						
	Purity	99%						

Reagent

AR_4268_RES_00002



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Catalog No. : 569747 Lot No.: A0133093
 Description : PCB-1242/1268 Standard
PCB-1242/1268 Standard 1,000µg/mL, Hexane, 1mL/ampul
 Container Size : 2 mL Pkg Amt: > 1 mL
 Expiration Date : March 31, 2024 Storage: 25°C nominal
 Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	Aroclor 1242		1,008.0 μg/mL	+/-	5.9872	μg/mL	Gravimetric
	CAS # 53469-21-9	(Lot 01141-A)		+/-	31.9609	μg/mL	Unstressed
	Purity ----%			+/-	41.7443	μg/mL	Stressed
2	Aroclor 1268		1,000.0 μg/mL	+/-	5.9397	μg/mL	Gravimetric
	CAS # 11100-14-4	(Lot 2743900)		+/-	31.7072	μg/mL	Unstressed
	Purity ----%			+/-	41.4130	μg/mL	Stressed
Solvent:	Hexane						
	CAS # 110-54-3						
	Purity 99%						

Reagent

AR_4268_RESss_00001



110 Benner Circle
 Bellefonte, PA 16823-8812
 Tel: (800)356-1688
 Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569747.SEC Lot No.: A0133202

Description : PCB-1242/1268 Standard

PCB-1242/1268 Standard 1,000µg/mL, Hexane, 1mL/ampul

Container Size : 2 mL Pkg Amt: > 1 mL

Expiration Date : March 31, 2024 Storage: 25°C nominal

Handling: This product contains PCBs.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	Aroclor 1242	1,000.0 µg/mL	+/-	10.0737	µg/mL	Gravimetric
	CAS # 53469-21-9.SEC (Lot NTO1020)		+/-	32.7345	µg/mL	Unstressed
	Purity ----%		+/-	42.2047	µg/mL	Stressed
2	Aroclor 1268	1,008.0 µg/mL	+/-	10.1543	µg/mL	Gravimetric
	CAS # 11100-14-4.SEC (Lot W-131-05)		+/-	32.9964	µg/mL	Unstressed
	Purity ----%		+/-	42.5423	µg/mL	Stressed

Solvent: Hexane

CAS # 110-54-3

Purity 99%

Reagent

AR_SURR_RES_00099

Column:
30m x .25mm x .2um
Rtx-CLP II (cat.# 11323)

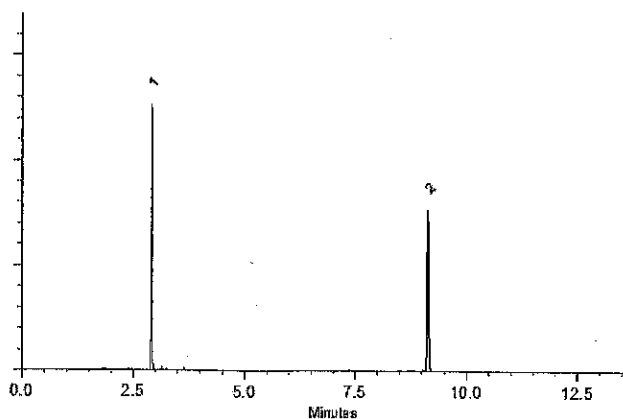
Carrier Gas:
helium-constant pressure 20 psi.

Temp. Program:
200°C to 300°C
@ 25°C/min. (hold 10 min.)

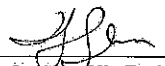
Inj. Temp:
250°C

Det. Temp:
300°C

Det. Type:
ECD



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Tom Suckar - Mix Technician

Date Mixed: 29-Aug-2018 Balance: B707717271


Justine Albertson - Operations Tech-ARM GC

Date Passed: 04-Sep-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

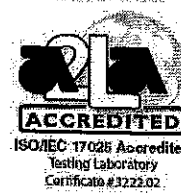


CERTIFIED REFERENCE MATERIAL

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Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 32000 Lot No.: A0141110
Description: Pesticide Surrogate Mix
Pesticide Surrogate Mix 200 µg/mL, Acetone, 1mL/ampul
Container Size: 2 mL Pkg Amt: > 1 mL
Expiration Date: November 30, 2024 Storage: 10°C or colder
Handling: Contains PCBs - sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)				
1	2,4,5,6-Tetrachloro-m-xylene		201.4 μg/mL	+/-	1.1736	μg/mL	Gravimetric	
	CAS #	877-09-8		(Lot 0052481)	+/-	6.3813	μg/mL	Unstressed
	Purity	98%			+/-	8.3370	μg/mL	Stressed
2	Decachlorobiphenyl (BZ# 209)		200.6 μg/mL	+/-	1.1690	μg/mL	Gravimetric	
	CAS #	2051-24-3		(Lot ER071509-01)	+/-	6.3563	μg/mL	Unstressed
	Purity	99%			+/-	8.3043	μg/mL	Stressed
Solvent:	Acetone							
	CAS #	67-64-1						
	Purity	99%						

Reagent

AR_SURR_RES_00101



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32000 Lot No.: A0141110
Description : Pesticide Surrogate Mix
Pesticide Surrogate Mix 200 µg/mL, Acetone, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : November 30, 2024 Storage: 10°C or colder
Handling: Contains PCBs - sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	2,4,5,6-Tetrachloro-m-xylene	201.4 µg/mL	+/-	1.1736	µg/mL	Gravimetric
	CAS # 877-09-8 (Lot 0052481)			6.3813	µg/mL	Unstressed
	Purity 98%			8.3370	µg/mL	Stressed
2	Decachlorobiphenyl (BZ# 209)	200.6 µg/mL	+/-	1.1690	µg/mL	Gravimetric
	CAS # 2051-24-3 (Lot ER071509-01)			6.3563	µg/mL	Unstressed
	Purity 99%			8.3043	µg/mL	Stressed
Solvent:	Acetone					
	CAS # 67-64-1					
	Purity 99%					

Column:

30m x .25mm x .2um
Rtx-CLP II (cat.# 11323)

Carrier Gas:

helium-constant pressure 20 psi.

Temp. Program:

200°C to 300°C
@ 25°C/min. (hold 10 min.)

Inj. Temp:

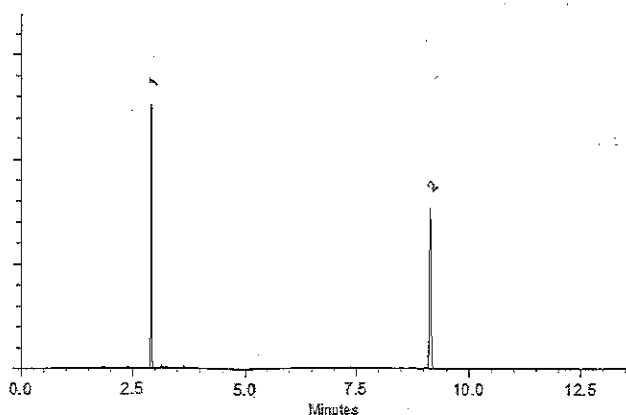
250°C

Det. Temp:

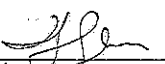
300°C

Det. Type:

ECD

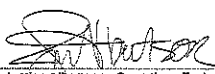


This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Tom Suckar - Mix Technician

Date Mixed: 29-Aug-2018

Balance: B707717271


Justin Albertson - Operations Tech-AROM GC

Date Passed: 04-Sep-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

BNB stock_00016



110 Benner Circle
Bellefonte, PA 16823-8812
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Fax: (814)353-1309

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32279 Lot No.: A0127264
Description : 1-Bromo-2-nitrobenzene Standard
1-Bromo-2-nitrobenzene Standard 1000 µg/mL, Acetone, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : August 31, 2020 Storage: 10°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	1-Bromo-2-nitrobenzene	1,004.0 µg/mL	+/- 5.9635	µg/mL	Gravimetric	
	CAS # 577-19-5 (Lot 643872/1)		+/- 56.3065	µg/mL	Unstressed	
	Purity 99%		+/- 57.6234	µg/mL	Stressed	

Solvent: Acetone
CAS # 67-64-1
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

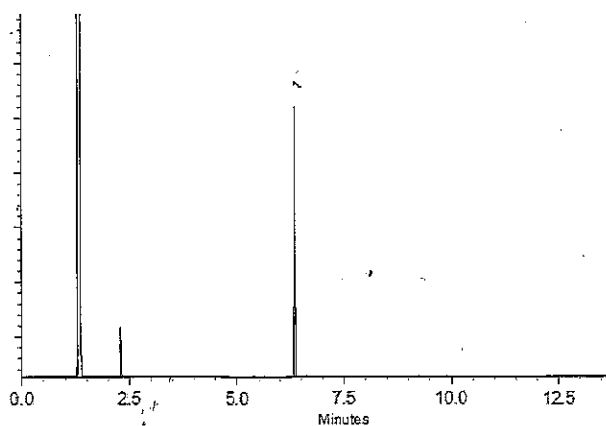
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°C

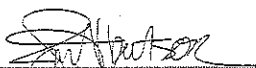
Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Matt Fragassi - Mix Technician

Date Mixed: 03-May-2017 Balance: B345965662


Justine Albertson - Operations Tech-ARM QC

Date Passed: 05-May-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

BNB stock_00017



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32279 Lot No.: A0127264
Description : 1-Bromo-2-nitrobenzene Standard
1-Bromo-2-nitrobenzene Standard 1000 µg/mL, Acetone, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : August 31, 2020 Storage: 10°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1-Bromo-2-nitrobenzene CAS # 577-19-5 (Lot 643872/1) Purity 99%	1,004.0 µg/mL	+/- 5.9635 µg/mL Gravimetric +/- 56.3065 µg/mL Unstressed +/- 57.6234 µg/mL Stressed

Solvent: Acetone
CAS # 67-64-1
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

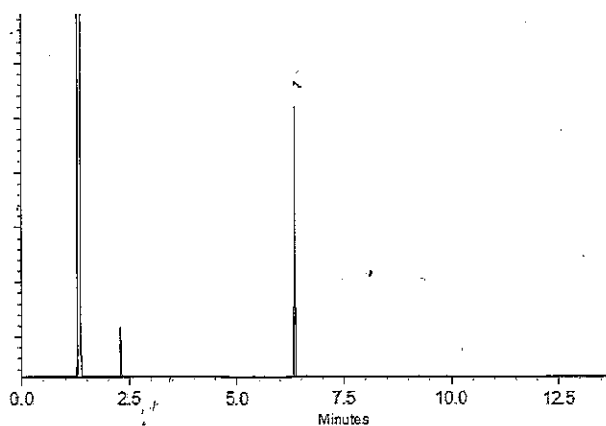
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°C

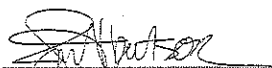
Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Matt Fragassi - Mix Technician

Date Mixed: 03-May-2017 Balance: B345965662


Justine Albertson - Operations Tech-ARM QC

Date Passed: 05-May-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MS-47548-U_00015

Certificate of Analysis

Description: EPA 8270 GC/MS Tuning Solution II, 1x1ml, 1000µg/ml in methylene chloride

Part Number: 47548-U

Lot Number: XA19099V

Expiration Date: March 2019

Storage: Refrigerate

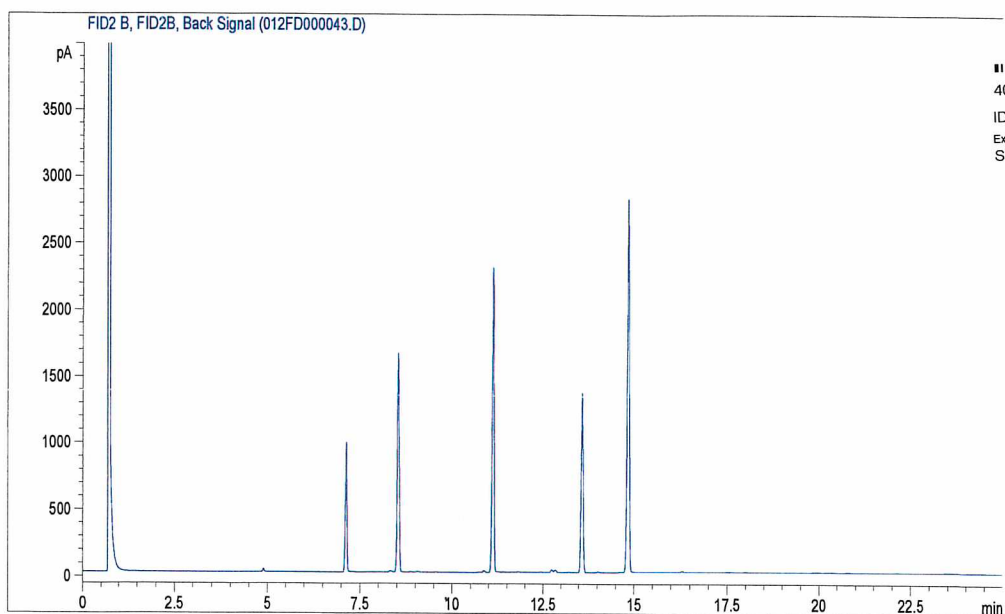
Analytical Method Parameters:

Column: Equity-5; 30 m x 0.53 mm, 1.5 µm df

150 °C to 280 °C (8.75 min) at 8 °C/min

Detector: FID; 310 °C

Injection Volume: 1µL



4089650
ID: MS-47548-U_00015
Exp:03/31/19 Prpd:DCK Opn:09/02/16
SUP Tuning Solution 1000

Elution	Analyte	Lot Number	CAS Number	Chromatographic Purity %	Certified Gravimetric Conc. µg/mL	Expanded Uncertainty µg/mL	Analytical Conc. µg/mL
1.	Pentachlorophenol	LC17897	87-86-5	97.5	1000.0	±38	945.6
2.	Decafluorotriphenylphosphine	LC14010	5074-71-5	98.6	986.0	±44	961.5
3.	Benzidine	LB83682	92-87-5	99.9	999.0	±38	1009.6
4.	4,4'-DDT	LA83013	50-29-3	98.0	980.8	±36	961.0
	Internal Standard	N/A	N/A	N/A	N/A	N/A	N/A

Reagent

MS-48379_00015

Certificate of Composition

FAMPHUR, 1X1ML, CH2CL2, 200UG/ML

Reference
Material

Product ID 48379

Lot LRAB9515

Expiration Date August 2021

Storage Conditions Room Temperature

Solvent/Matrix METHYLENE CHLORIDE



5306043

ID: MS-48379_00015

Exp: 08/31/21 Ppd: DCK
SUP Famphur 200 ug/mL

Analyte	Assigned Value ¹	Units	Raw Material Purity, %	Raw Material Lot No.	CAS
FAMPHUR	199 ± 6	µg/mL	98.7	LC04349	52-85-7

¹ Assigned value - the gravimetrically prepared value. Uncertainty is based on gravimetric preparation.

Traceability: The standard was manufactured under an ISO/IEC 17025:2005 certified quality system. The balance used to weigh raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were performed gravimetrically.

MSDS reports for components comprising greater than 1.0% of the solution or 0.1% for components known to be carcinogens are available upon request.

Robert O'Brien - Program Manager

Mark Pooler - QA Supervisor

Certification Date August 21, 2018

Version -8212018



**MILLIPORE
SIGMA**

2931 Soldier Springs Rd., Laramie, Wyoming 82070 USA
800-325-3010
www.sigma-aldrich.com

Reagent

MS-567684_00019



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 567684 Lot No.: A0112833
Description : 8270 Internal Standard
8270 Internal Standard 2,000µg/mL, Methylene Chloride, 5mL/ampul
Container Size : 5 mL Pkg Amt: > 5 mL
Expiration Date : July 31, 2020 Storage: 10°C or colder
Handling: Sonication required. Mix is photosensitive.



4101728

ID: MS-567684_00019
Exp: 07/31/20 Prep: DCK
RES 8270 Internal Std Mix

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dichlorobenzene-d4 CAS # 3855-82-1 (Lot PR-18488) Purity 99%	2,014.8 µg/mL	+/- 11.7142 µg/mL Gravimetric +/- 89.5186 µg/mL Unstressed +/- 98.3528 µg/mL Stressed
2	Naphthalene-d8 CAS # 1146-65-2 (Lot M-1452) Purity 99%	2,015.8 µg/mL	+/- 11.7202 µg/mL Gravimetric +/- 89.5645 µg/mL Unstressed +/- 98.4032 µg/mL Stressed
3	Acenaphthene-d10 CAS # 15067-26-2 (Lot PR-21070) Purity 97%	2,002.0 µg/mL	+/- 11.6397 µg/mL Gravimetric +/- 88.9491 µg/mL Unstressed +/- 97.7271 µg/mL Stressed
4	Phenanthrene-d10 CAS # 1517-22-2 (Lot PR-23065) Purity 99%	2,007.1 µg/mL	+/- 11.6693 µg/mL Gravimetric +/- 89.1750 µg/mL Unstressed +/- 97.9753 µg/mL Stressed
5	Chrysene-d12 CAS # 1719-03-5 (Lot PR-25081) Purity 99%	2,013.2 µg/mL	+/- 11.7047 µg/mL Gravimetric +/- 89.4460 µg/mL Unstressed +/- 98.2730 µg/mL Stressed
6	Perylene-d12 CAS # 1520-96-3 (Lot PR-24113) Purity 99%	2,005.4 µg/mL	+/- 11.6598 µg/mL Gravimetric +/- 89.1024 µg/mL Unstressed +/- 97.8955 µg/mL Stressed

Reagent

MS-567684_00020



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This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 567684 Lot No.: A0129635
Description: 8270 Internal Standard
8270 Internal Standard 2,000µg/mL, Methylene Chloride, 5mL/ampul
Container Size: 5 mL Pkg Amt: > 5 mL
Expiration Date: August 31, 2022 Storage: 10°C or colder
Handling: Sonication required. Mix is photosensitive.



5035055
ID: MS-567684_00020
Exp: 08/31/22 Ppdt: OCK
RES 8270 Internal Std Mix

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dichlorobenzene-d4 CAS # 3855-82-1 (Lot PR-18488) Purity 99%	2,014.1 µg/mL	+/- 11.7102 µg/mL Gravimetric +/- 90.7163 µg/mL Unstressed +/- 100.6609 µg/mL Stressed
2	Naphthalene-d8 CAS # 1146-65-2 (Lot M-1452) Purity 99%	2,004.1 µg/mL	+/- 11.6520 µg/mL Gravimetric +/- 90.2659 µg/mL Unstressed +/- 100.1611 µg/mL Stressed
3	Acenaphthene-d10 CAS # 15067-26-2 (Lot PR-25444) Purity 99%	2,011.1 µg/mL	+/- 11.6927 µg/mL Gravimetric +/- 90.5811 µg/mL Unstressed +/- 100.5110 µg/mL Stressed
4	Phenanthrene-d10 CAS # 1517-22-2 (Lot PR-27621) Purity 99%	2,014.5 µg/mL	+/- 11.7125 µg/mL Gravimetric +/- 90.7343 µg/mL Unstressed +/- 100.6809 µg/mL Stressed
5	Chrysene-d12 CAS # 1719-03-5 (Lot PR-27952) Purity 99%	2,013.6 µg/mL	+/- 11.7072 µg/mL Gravimetric +/- 90.6938 µg/mL Unstressed +/- 100.6359 µg/mL Stressed
6	Perylene-d12 CAS # 1520-96-3 (Lot PR-27342) Purity 99%	2,012.2 µg/mL	+/- 11.6991 µg/mL Gravimetric +/- 90.6307 µg/mL Unstressed +/- 100.5659 µg/mL Stressed

Reagent

MS-567685_00004



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Catalog No. : 567685 Lot No.: A0130500

Description : 8270 Surrogate Standard

8270 Surrogate Standard 5,000µg/mL, Methylene chloride, 5mL/ampul

Container Size : 5 mL Pkg Amt: > 5 mL

Expiration Date : September 30, 2022 Storage: 10°C or colder

Handling: Sonicate prior to use.



4941881
ID: MS-567685_00004
Exp: 09/30/22 Pipd: DCK
8270 Surrogates 5000ug/mL

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	2-Fluorophenol CAS # 367-12-4 (Lot STBD7945V) Purity 99%	5,009.8 µg/mL	+/- 29.1274 µg/mL +/- 146.2028 µg/mL +/- 177.4114 µg/mL	Gravimetric Unstressed Stressed	
2	Phenol-d5 CAS # 4165-62-2 (Lot X-479) Purity 99%	5,013.6 µg/mL	+/- 29.1495 µg/mL +/- 146.3137 µg/mL +/- 177.5460 µg/mL	Gravimetric Unstressed Stressed	
3	Nitrobenzene-d5 CAS # 4165-60-0 (Lot PR-25462) Purity 99%	5,000.0 µg/mL	+/- 29.0704 µg/mL +/- 145.9168 µg/mL +/- 177.0644 µg/mL	Gravimetric Unstressed Stressed	
4	2-Fluorobiphenyl CAS # 321-60-8 (Lot B19Z016) Purity 99%	5,001.2 µg/mL	+/- 29.0774 µg/mL +/- 145.9518 µg/mL +/- 177.1069 µg/mL	Gravimetric Unstressed Stressed	
5	2,4,6-Tribromophenol CAS # 118-79-6 (Lot 29699MJV) Purity 99%	5,002.6 µg/mL	+/- 29.0855 µg/mL +/- 145.9926 µg/mL +/- 177.1564 µg/mL	Gravimetric Unstressed Stressed	
6	p-Terphenyl-d14 CAS # 1718-51-0 (Lot PR-27278) Purity 99%	5,004.0 µg/mL	+/- 29.0937 µg/mL +/- 146.0335 µg/mL +/- 177.2060 µg/mL	Gravimetric Unstressed Stressed	

Reagent

MS-568023_00043



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Catalog No. : 568023 Lot No.: A0139090
Description : 8270 Famphur Standard
8270 Famphur Standard 2,000µg/mL, Methylene Chloride, 1mL/ampul
Container Size : 2 mL Pkg Amt: > 1 mL
Expiration Date : June 30, 2020 Storage: 10°C or colder
Handling: This product is photosensitive.



5199826
ID: MS-568023_00043
Exp: 06/30/20 Ppdt: DCK
RES HSLA Famphur 2000ug/mL

CERTIFIED VALUES

Component #	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Famphur CAS # 52-85-7 Purity 98% (Lot 6789600)	2,014.9 µg/mL	+/- 18.7373 µg/mL Gravimetric +/- 87.6407 µg/mL Unstressed +/- 87.6775 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Brandon Reish - Mix Technician

Date Mixed: 21-Jun-2018

Balance: B345965662

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

Reagent

MS-568023_00044



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Gravimetric Certificate



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This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 568023 Lot No.: A0139949
Description: 8270 Famphur Standard
8270 Famphur Standard 2,000µg/mL, Methylene Chloride, 1mL/ampul
Container Size: 2 mL Pkg Amt: > 1 mL
Expiration Date: July 31, 2020 Storage: 10°C or colder
Handling: This product is photosensitive.



5306176
ID: MS-568023_00044
Exp: 07/31/20 Prod: DCK
RES HSLA Famphur 2000ug/ml

CERTIFIED VALUES

Component #	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Famphur	1,996.8 µg/mL	+/- 18.5692 µg/mL Gravimetric
	CAS # 52-85-7 (Lot 5006000)		+/- 86.8543 µg/mL Unstressed
	Purity 96%		+/- 86.8907 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Greg Dawson
Greg Dawson - Mix Technician

Date Mixed: 24-Jul-2018

Balance: 1128353505

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

Reagent

MS-569730 AFC_00007



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Catalog No. : 569730 Lot No.: A0137351
Description : 8270 List 1 / Std #9
8270 List 1 / Std #9 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 10 mL Pkg Amt: > 5 mL
Expiration Date : October 31, 2019 Storage: 10°C or colder
Handling: Contains carcinogen/reproductive toxin.



5306168
ID: MS-569730 AFC_00007
Exp: 10/31/19 Prep: DCK
HSLA Amine Mix (2015) 200



5306172
ID: MS-569730 HSL_00008
Exp: 10/31/19 Prep: DCK
HSLA Amine Mix (2015) 200

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Benzidine CAS # 92-87-5 (Lot 171228KJA) Purity 99%	2,000.3 µg/mL	+/- 11.6301 µg/mL Gravimetric +/- 23.9121 µg/mL Unstressed +/- 38.0558 µg/mL Stressed
2	3,3'-Dichlorobenzidine CAS # 91-94-1 (Lot 180328JNA) Purity 99%	2,005.7 µg/mL	+/- 11.6611 µg/mL Gravimetric +/- 23.9759 µg/mL Unstressed +/- 38.1572 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

MS-569730 HSL_00008



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Catalog No. : 569730 Lot No.: A0137351
Description : 8270 List 1 / Std #9
8270 List 1 / Std #9 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 10 mL Pkg Amt: > 5 mL
Expiration Date : October 31, 2019 Storage: 10°C or colder
Handling: Contains carcinogen/reproductive toxin.



5306168
ID: MS-569730 AFC_00007
Exp: 10/31/19 Prep: DCK
HSLA Amine Mix (2015) 200



5306172
ID: MS-569730 HSL_00008
Exp: 10/31/19 Prep: DCK
HSLA Amine Mix (2015) 200

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Benzidine CAS # 92-87-5 (Lot 171228KJA) Purity 99%	2,000.3 µg/mL	+/- 11.6301 µg/mL Gravimetric +/- 23.9121 µg/mL Unstressed +/- 38.0558 µg/mL Stressed
2	3,3'-Dichlorobenzidine CAS # 91-94-1 (Lot 180328JNA) Purity 99%	2,005.7 µg/mL	+/- 11.6611 µg/mL Gravimetric +/- 23.9759 µg/mL Unstressed +/- 38.1572 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

MS-569730SEC_00004



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Catalog No.: 569730.SEC Lot No.: A0131614
Description: 8270 List 1 / Std #9
8270 List 1 / Std #9 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size: 10 mL Pkg Amt: > 5 mL
Expiration Date: April 30, 2019 Storage: 10°C or colder
Handling: Contains carcinogen/reproductive toxin.



5163418
ID: MS-569730SEC_00004
Exp: 04/30/19 Pripd: DCK
RES HSLB Amine Mix 2000ug



5163449
ID: MS-569730SECa_00004
Exp: 04/30/19 Pripd: DCK
RES Benzidine 2000ug/mL

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Benzidine	2,004.0 µg/mL	+/- 11.7606 µg/mL Gravimetric
	CAS # 92-87-5.SEC (Lot 2715900)		+/- 24.0092 µg/mL Unstressed
	Purity 99%		+/- 38.1590 µg/mL Stressed
2	3,3'-Dichlorobenzidine	2,014.0 µg/mL	+/- 11.8193 µg/mL Gravimetric
	CAS # 91-94-1.SEC (Lot 5340500)		+/- 24.1290 µg/mL Unstressed
	Purity 99%		+/- 38.3494 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

MS-569730SECa_00004



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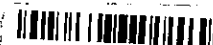
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This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569730.SEC Lot No.: A0131614
Description : 8270 List 1 / Std #9
8270 List 1 / Std #9 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 10 mL Pkg Amt: > 5 mL
Expiration Date : April 30, 2019 Storage: 10°C or colder
Handling: Contains carcinogen/reproductive toxin.



5163418
ID: MS-569730SEC_00004
Exp: 04/30/19 Prip: DCK
RES HSLB Amine Mix 2000ug



5163449
ID: MS-569730SECa_00004
Exp: 04/30/19 Prip: DCK
RES Benzidine 2000ug/mL

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Benzidine	2,004.0 µg/mL	+/- 11.7606 µg/mL Gravimetric
	CAS # 92-87-5.SEC (Lot 2715900)		+/- 24.0092 µg/mL Unstressed
	Purity 99%		+/- 38.1590 µg/mL Stressed
2	3,3'-Dichlorobenzidine	2,014.0 µg/mL	+/- 11.8193 µg/mL Gravimetric
	CAS # 91-94-1.SEC (Lot 5340500)		+/- 24.1290 µg/mL Unstressed
	Purity 99%		+/- 38.3494 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

MS-569731.SEC_00003



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Catalog No.: 569731.SEC Lot No.: A0132859
Description: 8270 List 1 / Std #10
8270 List 1 / Std #10 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size: 5 mL Pkg Amt: > 5 mL
Expiration Date: May 31, 2019 Storage: 10°C or colder
Handling: This product is photosensitive.



5163391
ID: MS-569731.SEC_00003
Exp: 05/31/19 Pkg: DCK
8270 List 1 #10 2,000ug/mL

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)				
1	Indene		2,017.0 μg/mL	+/-	11.7541	μg/mL	Gravimetric	
	CAS #	95-13-6.SEC		(Lot IG5TI)	+/-	113.0940	μg/mL	Unstressed
	Purity	99%			+/-	115.7401	μg/mL	Stressed
2	Benzoic acid		2,008.5 μg/mL	+/-	11.7046	μg/mL	Gravimetric	
	CAS #	65-85-0.SEC		(Lot QD3UO)	+/-	112.6174	μg/mL	Unstressed
	Purity	99%			+/-	115.2524	μg/mL	Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

MS-569731_00079



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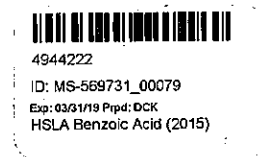
Certificate of Analysis



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Catalog No.: 569731 Lot No.: A0130477
 Description: 8270 List 1 / Std #10
8270 List 1 / Std #10 2,000µg/mL, Methylene chloride, 5mL/ampul
 Container Size: 5 mL Pkg Amt: > 5 mL
 Expiration Date: March 31, 2019 Storage: 10°C or colder
 Handling: This product is photosensitive.



CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Indene	1,996.3 µg/mL	+/- 11.6064 µg/mL Gravimetric
	CAS # 95-13-6 (Lot MKBT8433V)		+/- 111.9283 µg/mL Unstressed
	Purity 98%		+/- 114.5473 µg/mL Stressed
2	Benzoic acid	2,000.8 µg/mL	+/- 11.6328 µg/mL Gravimetric
	CAS # 65-85-0 (Lot MKBV5544V)		+/- 112.1829 µg/mL Unstressed
	Purity 99%		+/- 114.8078 µg/mL Stressed
Solvent: Methylene chloride			
CAS # 75-09-2			
Purity 99%			

Reagent

MS-569731_00101

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:

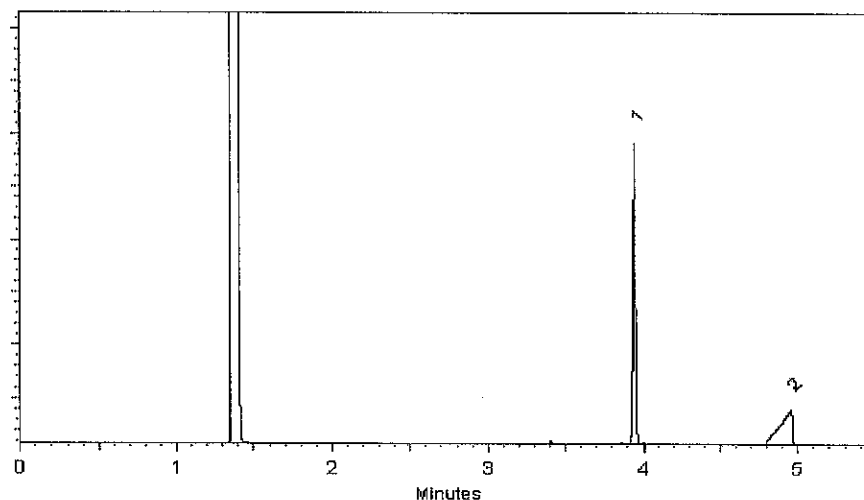
250°C

Det. Temp:

330°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Alice Brooks

Alice Brooks - Mix Technician

Date Mixed: 04-Apr-2018

Balance: B442140311

Jennifer L Pollino

Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 06-Apr-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397



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Catalog No. : 569731 Lot No.: A0136865
 Description : 8270 List 1 / Std #10
8270 List 1 / Std #10 2,000µg/mL, Methylene chloride, 5mL/ampul
 Container Size : 5 mL Pkg Amt: > 5 mL
 Expiration Date : October 31, 2019 Storage: 10°C or colder
 Handling: This product is photosensitive.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)				
1	Indene		2,004.3 µg/mL	+/-	11.6534	µg/mL	Gravimetric	
	CAS #	95-13-6		(Lot MKBV0236V)	+/-	112.3815	µg/mL	Unstressed
	Purity	97%		+/-	115.0111	µg/mL	Stressed	
2	Benzoic acid		2,013.3 µg/mL	+/-	11.7053	µg/mL	Gravimetric	
	CAS #	65-85-0		(Lot MKCC9722)	+/-	112.8819	µg/mL	Unstressed
	Purity	99%		+/-	115.5232	µg/mL	Stressed	
Solvent:	Methylene chloride							
	CAS #	75-09-2						
	Purity	99%						

Reagent

MS-569731_00103

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:

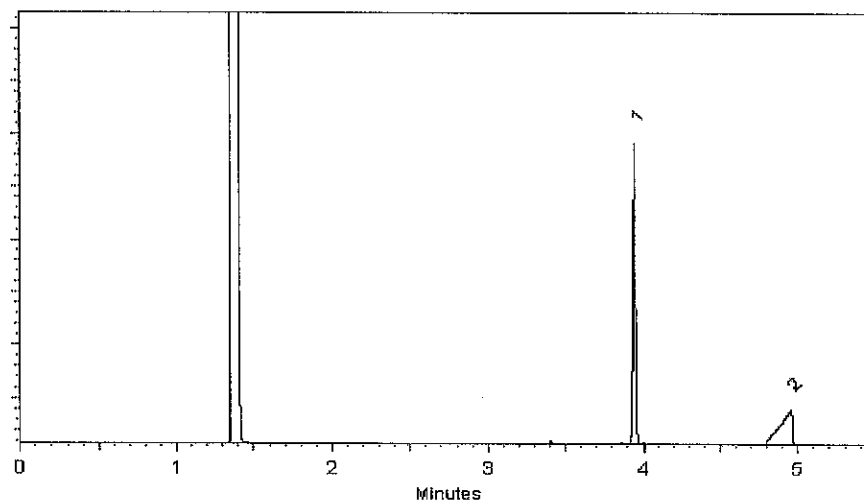
250°C

Det. Temp:

330°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Alice Brooks

Alice Brooks - Mix Technician

Date Mixed: 04-Apr-2018

Balance: B442140311

Jennifer L Pollino

Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 06-Apr-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397



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Catalog No. : 569731 Lot No.: A0136865
 Description : 8270 List 1 / Std #10
8270 List 1 / Std #10 2,000µg/mL, Methylene chloride, 5mL/ampul
 Container Size : 5 mL Pkg Amt: > 5 mL
 Expiration Date : October 31, 2019 Storage: 10°C or colder
 Handling: This product is photosensitive.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)				
1	Indene		2,004.3 µg/mL	+/-	11.6534	µg/mL	Gravimetric	
	CAS #	95-13-6		(Lot MKBV0236V)	+/-	112.3815	µg/mL	Unstressed
	Purity	97%		+/-	115.0111	µg/mL	Stressed	
2	Benzoic acid		2,013.3 µg/mL	+/-	11.7053	µg/mL	Gravimetric	
	CAS #	65-85-0		(Lot MKCC9722)	+/-	112.8819	µg/mL	Unstressed
	Purity	99%		+/-	115.5232	µg/mL	Stressed	
Solvent:	Methylene chloride							
	CAS #	75-09-2						
	Purity	99%						

Reagent

MS-569731_00104

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:

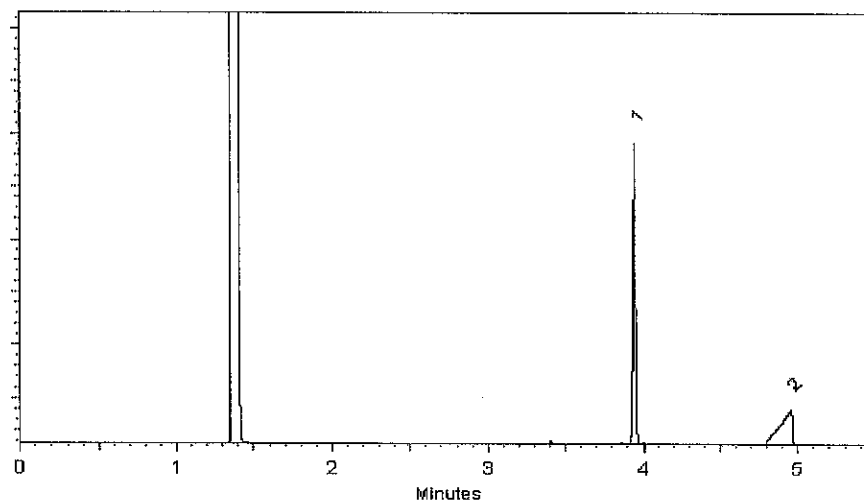
250°C

Det. Temp:

330°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Alice Brooks

Alice Brooks - Mix Technician

Date Mixed: 04-Apr-2018

Balance: B442140311

Jennifer L Pollino

Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 06-Apr-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397



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Catalog No. : 569731 Lot No.: A0136865
Description : 8270 List 1 / Std #10
8270 List 1 / Std #10 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 5 mL Pkg Amt: > 5 mL
Expiration Date : October 31, 2019 Storage: 10°C or colder
Handling: This product is photosensitive.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)				
1	Indene		2,004.3 µg/mL	+/-	11.6534	µg/mL	Gravimetric	
	CAS #	95-13-6		(Lot MKBV0236V)	+/-	112.3815	µg/mL	Unstressed
	Purity	97%		+/-	115.0111	µg/mL	Stressed	
2	Benzoic acid		2,013.3 µg/mL	+/-	11.7053	µg/mL	Gravimetric	
	CAS #	65-85-0		(Lot MKCC9722)	+/-	112.8819	µg/mL	Unstressed
	Purity	99%		+/-	115.5232	µg/mL	Stressed	
Solvent:	Methylene chloride							
	CAS #	75-09-2						
	Purity	99%						

Reagent

MS-569731_00105

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:

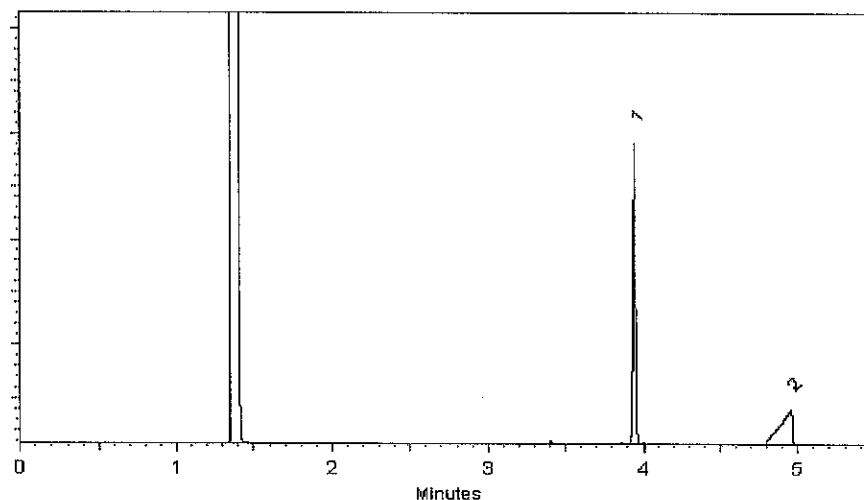
250°C

Det. Temp:

330°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Alice Brooks

Alice Brooks - Mix Technician

Date Mixed: 04-Apr-2018

Balance: B442140311

Jennifer L Pollino

Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 06-Apr-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397



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Fax: (814)353-1309

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569731 Lot No.: A0136865
Description : 8270 List 1 / Std #10
8270 List 1 / Std #10 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 5 mL Pkg Amt: > 5 mL
Expiration Date : October 31, 2019 Storage: 10°C or colder
Handling: This product is photosensitive.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)				
1	Indene		2,004.3 µg/mL	+/-	11.6534	µg/mL	Gravimetric	
	CAS #	95-13-6		(Lot MKBV0236V)	+/-	112.3815	µg/mL	Unstressed
	Purity	97%		+/-	115.0111	µg/mL	Stressed	
2	Benzoic acid		2,013.3 µg/mL	+/-	11.7053	µg/mL	Gravimetric	
	CAS #	65-85-0		(Lot MKCC9722)	+/-	112.8819	µg/mL	Unstressed
	Purity	99%		+/-	115.5232	µg/mL	Stressed	
Solvent:	Methylene chloride							
	CAS #	75-09-2						
	Purity	99%						

Reagent

MS-569732 BZH_00008



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Catalog No. : 569732 Lot No.: A0137125
Description : 8270 List 1 / Std #11
8270 List 1 / Std #11 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 5 mL Pkg Amt: > 5 mL
Expiration Date : October 31, 2019 Storage: 10°C or colder
Handling: This product is photosensitive.



5335192
ID: MS-569732 HSL_00006
Exp: 10/31/19 Prip: DCK
8270 List 1/ Std 11 (2015)



5335191
ID: MS-569732 BZH_00008
Exp: 10/31/19 Prip: DCK
8270 List 1/ Std 11 (2015)

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Benzaldehyde CAS # 100-52-7 (Lot SHBG8690V) Purity 99%	2,001.1 µg/mL	+/- 11.6345 µg/mL Gravimetric +/- 64.1460 µg/mL Unstressed +/- 74.5673 µg/mL Stressed
2	epsilon-Caprolactam CAS # 105-60-2 (Lot I16X016) Purity 99%	2,002.0 µg/mL	+/- 11.6398 µg/mL Gravimetric +/- 64.1754 µg/mL Unstressed +/- 74.6014 µg/mL Stressed
3	Atrazine CAS # 1912-24-9 (Lot 77P7D) Purity 99%	2,002.6 µg/mL	+/- 11.6432 µg/mL Gravimetric +/- 64.1941 µg/mL Unstressed +/- 74.6232 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

MS-569732 HSL_00006



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Catalog No.: 569732 Lot No.: A0137125
Description: 8270 List 1 / Std #11
8270 List 1 / Std #11 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size: 5 mL Pkg Amt: > 5 mL
Expiration Date: October 31, 2019 Storage: 10°C or colder
Handling: This product is photosensitive.



5335192
ID: MS-569732 HSL_00006
Exp: 10/31/19 Prip: DCK
8270 List 1/ Std 11 (2015)



5335191
ID: MS-569732 BZH_00008
Exp: 10/31/19 Prip: DCK
8270 List 1/ Std 11 (2015)

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Benzaldehyde CAS # 100-52-7 (Lot SHBG8690V) Purity 99%	2,001.1 µg/mL	+/- 11.6345 µg/mL Gravimetric +/- 64.1460 µg/mL Unstressed +/- 74.5673 µg/mL Stressed
2	epsilon-Caprolactam CAS # 105-60-2 (Lot I16X016) Purity 99%	2,002.0 µg/mL	+/- 11.6398 µg/mL Gravimetric +/- 64.1754 µg/mL Unstressed +/- 74.6014 µg/mL Stressed
3	Atrazine CAS # 1912-24-9 (Lot 77P7D) Purity 99%	2,002.6 µg/mL	+/- 11.6432 µg/mL Gravimetric +/- 64.1941 µg/mL Unstressed +/- 74.6232 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

MS-569732HSEC_00003



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This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 569732.SEC Lot No.: A0130332
Description: 8270 List 1 / Std #11
8270 List 1 / Std #11 2,000 ug/ml, Methylene Chloride, 5 ml/ampul
Container Size: 5 mL Pkg Amt: > 5 mL
Expiration Date: February 28, 2019 Storage: 10°C or colder
Handling: This product is photosensitive.



5163318
ID: MS-569732HSEC_00003
Exp: 02/28/19 Prpd: DCK
RES 8270 List 1 / Std# 11



5163319
ID: MS-569732SEC_00005
Exp: 02/28/19 Prpd: DCK
RES 8270 List 1 / Std# 11

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Benzaldehyde CAS # 100-52-7.SEC (Lot E7DWH) Purity 99%	2,000.0 µg/mL	+/- 11.7371 µg/mL Gravimetric +/- 64.1312 µg/mL Unstressed +/- 74.5440 µg/mL Stressed
2	epsilon-Caprolactam CAS # 105-60-2.SEC (Lot BLJTB) Purity 99%	2,002.4 µg/mL	+/- 11.7512 µg/mL Gravimetric +/- 64.2081 µg/mL Unstressed +/- 74.6334 µg/mL Stressed
3	Atrazine CAS # 1912-24-9.SEC (Lot 5671000) Purity 99%	2,000.4 µg/mL	+/- 11.7395 µg/mL Gravimetric +/- 64.1440 µg/mL Unstressed +/- 74.5589 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

MS-569732SEC_00005



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This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 569732.SEC Lot No.: A0130332
Description: 8270 List 1 / Std #11
8270 List 1 / Std #11 2,000 ug/ml, Methylene Chloride, 5 ml/ampul
Container Size: 5 mL Pkg Amt: > 5 mL
Expiration Date: February 28, 2019 Storage: 10°C or colder
Handling: This product is photosensitive.



5163318
ID: MS-569732HSEC_00003
Exp: 02/28/19 Prpd: DCK
RES 8270 List 1 / Std# 11



5163319
ID: MS-569732SEC_00005
Exp: 02/28/19 Prpd: DCK
RES 8270 List 1 / Std# 11

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Benzaldehyde CAS # 100-52-7.SEC (Lot E7DWH) Purity 99%	2,000.0 µg/mL	+/- 11.7371 µg/mL Gravimetric +/- 64.1312 µg/mL Unstressed +/- 74.5440 µg/mL Stressed
2	epsilon-Caprolactam CAS # 105-60-2.SEC (Lot BLJTB) Purity 99%	2,002.4 µg/mL	+/- 11.7512 µg/mL Gravimetric +/- 64.2081 µg/mL Unstressed +/- 74.6334 µg/mL Stressed
3	Atrazine CAS # 1912-24-9.SEC (Lot 5671000) Purity 99%	2,000.4 µg/mL	+/- 11.7395 µg/mL Gravimetric +/- 64.1440 µg/mL Unstressed +/- 74.5589 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

MS-571995.SEC_00002



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Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 571995.SEC Lot No.: A0131190
Description: 8270 List 1 / Std #1 MegaMix (2017)
8270 List 1 / Std #1 MegaMix (2017) 500-2,000 µg/mL, Methylene chloride, 5mL/ampul
Container Size: 10 mL Pkg Amt: > 5 mL
Expiration Date: March 31, 2019 Storage: 0°C or colder
Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.



4994417

ID: MS-571995.SEC_00002

Exp:03/31/19 Prip:DCK Opn:03/09/19

RES HSLB Mega Mix (2017)

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,4-Dioxane CAS # 123-91-1.SEC (Lot MUFZH) Purity 99%	1,000.0 µg/mL	+/- 5.8275 µg/mL Gravimetric +/- 11.9606 µg/mL Unstressed +/- 19.0288 µg/mL Stressed
2	N-Nitrosodimethylamine CAS # 62-75-9.SEC (Lot 61H72) Purity 99%	1,000.0 µg/mL	+/- 5.8275 µg/mL Gravimetric +/- 11.9606 µg/mL Unstressed +/- 19.0288 µg/mL Stressed
3	Pyridine CAS # 110-86-1.SEC (Lot QN8DK) Purity 99%	2,000.0 µg/mL	+/- 11.6282 µg/mL Gravimetric +/- 23.9081 µg/mL Unstressed +/- 38.0494 µg/mL Stressed
4	Phenol CAS # 108-95-2.SEC (Lot EDPYN) Purity 99%	1,000.6 µg/mL	+/- 5.8310 µg/mL Gravimetric +/- 11.9678 µg/mL Unstressed +/- 19.0402 µg/mL Stressed
5	Aniline CAS # 62-53-3.SEC (Lot ZCD3N) Purity 99%	1,000.4 µg/mL	+/- 5.8299 µg/mL Gravimetric +/- 11.9654 µg/mL Unstressed +/- 19.0364 µg/mL Stressed
6	Bis(2-chloroethyl)ether CAS # 111-44-4.SEC (Lot FA010143) Purity 99%	1,000.6 µg/mL	+/- 5.8310 µg/mL Gravimetric +/- 11.9678 µg/mL Unstressed +/- 19.0402 µg/mL Stressed
7	n-Decane (C10) CAS # 124-18-5.SEC (Lot UCVNN) Purity 99%	1,000.0 µg/mL	+/- 5.8275 µg/mL Gravimetric +/- 11.9606 µg/mL Unstressed +/- 19.0288 µg/mL Stressed

8	2-Chlorophenol CAS # 95-57-8.SEC Purity 99%	(Lot GJ01)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	1,3-Dichlorobenzene CAS # 541-73-1.SEC Purity 99%	(Lot FMDFD)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	1,4-Dichlorobenzene CAS # 106-46-7.SEC Purity 99%	(Lot 4Y5DC)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benzyl alcohol CAS # 100-51-6.SEC Purity 99%	(Lot QZBUO)	1,000.6 µg/mL	+/- +/- +/-	5.8310 11.9678 19.0402	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	1,2-Dichlorobenzene CAS # 95-50-1.SEC Purity 99%	(Lot R6QDM)	1,000.4 µg/mL	+/- +/- +/-	5.8299 11.9654 19.0364	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	2-Methylphenol (o-cresol) CAS # 95-48-7.SEC Purity 99%	(Lot NC7HL)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	2,2'-oxybis(1-chloropropane) CAS # 108-60-1.SEC Purity 99%	(Lot 2-KMW-57-8)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Acetophenone CAS # 98-86-2.SEC Purity 99%	(Lot NSGTI)	1,000.6 µg/mL	+/- +/- +/-	5.8310 11.9678 19.0402	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	3-Methylphenol (m-cresol) CAS # 108-39-4.SEC Purity 99%	(Lot 6LHTM)	500.0 µg/mL	+/- +/- +/-	2.9138 5.9803 9.5144	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	4-Methylphenol (p-cresol) CAS # 106-44-5.SEC Purity 99%	(Lot 65S2E)	501.0 µg/mL	+/- +/- +/-	2.9196 5.9923 9.5334	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	N-Nitroso-di-n-propylamine CAS # 621-64-7.SEC Purity 99%	(Lot 4423200)	1,001.4 µg/mL	+/- +/- +/-	5.8357 11.9773 19.0555	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	Hexachloroethane CAS # 67-72-1.SEC Purity 99%	(Lot 10173016)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	Nitrobenzene CAS # 98-95-3.SEC Purity 99%	(Lot FLYIG)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
21	Isophorone CAS # 78-59-1.SEC Purity 99%	(Lot XHGJI)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
22	2-Nitrophenol CAS # 88-75-5.SEC Purity 99%	(Lot GXJ7J)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
23	2,4-Dimethylphenol CAS # 105-67-9.SEC Purity 99%	(Lot MKBL3650V)	1,000.0 µg/mL	+/- +/- +/-	5.8275 11.9606 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 * Purity 99%	(Lot 5670100)	1,000.4 µg/mL	+/- 5.8299 +/- 11.9654 +/- 19.0364	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
25	2,4-Dichlorophenol CAS # 120-83-2.SEC Purity 99%	(Lot FHM01)	1,000.4 µg/mL	+/- 5.8299 +/- 11.9654 +/- 19.0364	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1.SEC Purity 99%	(Lot OGO01)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
27	Naphthalene CAS # 91-20-3.SEC Purity 99%	(Lot SKZ5N)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
28	2,6-Dichlorophenol CAS # 87-65-0.SEC Purity 99%	(Lot SIDBB)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
29	4-Chloroaniline CAS # 106-47-8.SEC Purity 99%	(Lot 10171860)	1,000.2 µg/mL	+/- 5.8287 +/- 11.9630 +/- 19.0326	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
30	Hexachlorobutadiene CAS # 87-68-3.SEC Purity 97%	(Lot 1068200)	1,000.5 µg/mL	+/- 5.8302 +/- 11.9661 +/- 19.0375	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7.SEC Purity 99%	(Lot FDO02)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
32	2-Methylnaphthalene CAS # 91-57-6.SEC Purity 98%	(Lot 76023-1)	1,000.8 µg/mL	+/- 5.8320 +/- 11.9699 +/- 19.0436	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
33	1-Methylnaphthalene CAS # 90-12-0.SEC Purity 97%	(Lot UATSA)	1,000.1 µg/mL	+/- 5.8279 +/- 11.9614 +/- 19.0302	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3.SEC Purity 99%	(Lot AF02)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4.SEC Purity 99%	(Lot 5608400)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2.SEC Purity 98%	(Lot UUMYM)	1,000.6 µg/mL	+/- 5.8309 +/- 11.9675 +/- 19.0399	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4.SEC Purity 97%	(Lot MKBQ9937V)	1,000.1 µg/mL	+/- 5.8279 +/- 11.9614 +/- 19.0302	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
38	2-Chloronaphthalene CAS # 91-58-7.SEC Purity 99%	(Lot LC07783V)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
39	Biphenyl CAS # 92-52-4.SEC Purity 99%	(Lot 330QE)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

40	2-Nitroaniline CAS # 88-74-4.SEC Purity 99%	(Lot T6E7B)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8.SEC Purity 96%	(Lot 0012014)	999.9 µg/mL	+/- 5.8271 +/- 11.9598 +/- 19.0276	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0.SEC Purity 99%	(Lot 3XXLB)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3.SEC Purity 99%	(Lot 483WC)	1,002.0 µg/mL	+/- 5.8392 +/- 11.9845 +/- 19.0669	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2.SEC Purity 99%	(Lot GE01)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2.SEC Purity 99%	(Lot FGN03)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9.SEC Purity 99%	(Lot BWZIE)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5.SEC Purity 99%	(Lot YTR6B)	2,000.0 µg/mL	+/- 11.6282 +/- 23.9081 +/- 38.0494	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9.SEC Purity 99%	(Lot 27ZGC)	1,000.8 µg/mL	+/- 5.8322 +/- 11.9702 +/- 19.0440	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7.SEC Purity 99%	(Lot 2J5LB)	2,000.0 µg/mL	+/- 11.6282 +/- 23.9081 +/- 38.0494	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2.SEC Purity 99%	(Lot SHRSA)	1,000.4 µg/mL	+/- 5.8299 +/- 11.9654 +/- 19.0364	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2.SEC Purity 99%	(Lot LC19623V)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7.SEC Purity 99%	(Lot 5027400)	1,000.6 µg/mL	+/- 5.8310 +/- 11.9678 +/- 19.0402	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3.SEC Purity 99%	(Lot A0328141)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2.SEC Purity 99%	(Lot UMBJC)	1,000.4 µg/mL	+/- 5.8299 +/- 11.9654 +/- 19.0364	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3.SEC Purity 99%	(Lot P31G)	1,000.4 µg/mL	+/- 5.8299 +/- 11.9654 +/- 19.0364	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

56	4-Nitroaniline CAS # 100-01-6.SEC Purity 99%	(Lot 5ITRC)	1,000.4 µg/mL	+/- 5.8299 +/- 11.9654 +/- 19.0364	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1.SEC Purity 99%	(Lot 6333400)	2,000.0 µg/mL	+/- 11.6282 +/- 23.9081 +/- 38.0494	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
58	Diphenylamine CAS # 122-39-4.SEC Purity 99%	(Lot 10164691)	850.0 µg/mL	+/- 4.9534 +/- 10.1665 +/- 16.1745	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
59	Azobenzene CAS # 103-33-3.SEC Purity 99%	(Lot JUWAG)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3.SEC Purity 99%	(Lot 84C6D)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
61	Hexachlorobenzene CAS # 118-74-1.SEC Purity 99%	(Lot G120431)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
62	Pentachlorophenol CAS # 87-86-5.SEC Purity 99%	(Lot 5784900)	2,000.4 µg/mL	+/- 11.6305 +/- 23.9129 +/- 38.0570	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
63	n-Octadecane (C18) CAS # 593-45-3.SEC Purity 99%	(Lot G14U045)	1,001.0 µg/mL	+/- 5.8333 +/- 11.9726 +/- 19.0478	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
64	Phenanthrene CAS # 85-01-8.SEC Purity 98%	(Lot 4708400)	1,002.0 µg/mL	+/- 5.8389 +/- 11.9839 +/- 19.0660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
65	Anthracene CAS # 120-12-7.SEC Purity 99%	(Lot WDFNJ)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
66	Carbazole CAS # 86-74-8.SEC Purity 99%	(Lot LMIZB)	1,000.4 µg/mL	+/- 5.8299 +/- 11.9654 +/- 19.0364	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
67	Di-n-butylphthalate CAS # 84-74-2.SEC Purity 99%	(Lot 42FSG)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
68	Fluoranthene CAS # 206-44-0.SEC Purity 99%	(Lot FREGF)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
69	Pyrene CAS # 129-00-0.SEC Purity 99%	(Lot ROVJC)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9606 +/- 19.0288	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
70	Benzyl butyl phthalate CAS # 85-68-7.SEC Purity 98%	(Lot GX3GL)	1,000.0 µg/mL	+/- 5.8275 +/- 11.9605 +/- 19.0287	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
71	Benz(a)anthracene CAS # 56-55-3.SEC Purity 99%	(Lot MTENF)	1,000.4 µg/mL	+/- 5.8299 +/- 11.9654 +/- 19.0364	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

72	chrysene			1,000.0	µg/mL	+/-	5.8275	µg/mL	Gravimetric
	CAS #	218-01-9.SEC	(Lot NICZC)			+/-	11.9606	µg/mL	Unstressed
	Purity	99%				+/-	19.0288	µg/mL	Stressed
73	Bis(2-ethylhexyl)phthalate			1,000.4	µg/mL	+/-	5.8299	µg/mL	Gravimetric
	CAS #	117-81-7.SEC	(Lot MT8AG)			+/-	11.9654	µg/mL	Unstressed
	Purity	99%				+/-	19.0364	µg/mL	Stressed
74	Di-n-octyl phthalate			1,000.8	µg/mL	+/-	5.8322	µg/mL	Gravimetric
	CAS #	117-84-0.SEC	(Lot O8DLD)			+/-	11.9702	µg/mL	Unstressed
	Purity	99%				+/-	19.0440	µg/mL	Stressed
75	Benzo(b)fluoranthene			1,000.0	µg/mL	+/-	5.8275	µg/mL	Gravimetric
	CAS #	205-99-2.SEC	(Lot 022011)			+/-	11.9606	µg/mL	Unstressed
	Purity	99%				+/-	19.0288	µg/mL	Stressed
76	Benzo(k)fluoranthene			1,000.6	µg/mL	+/-	5.8310	µg/mL	Gravimetric
	CAS #	207-08-9.SEC	(Lot ER041513-01)			+/-	11.9678	µg/mL	Unstressed
	Purity	99%				+/-	19.0402	µg/mL	Stressed
77	Benzo(a)pyrene			1,000.5	µg/mL	+/-	5.8302	µg/mL	Gravimetric
	CAS #	50-32-8.SEC	(Lot M8DFD)			+/-	11.9661	µg/mL	Unstressed
	Purity	97%				+/-	19.0375	µg/mL	Stressed
78	Indeno(1,2,3-cd)pyrene			1,000.4	µg/mL	+/-	5.8299	µg/mL	Gravimetric
	CAS #	193-39-5.SEC	(Lot 0012014)			+/-	11.9654	µg/mL	Unstressed
	Purity	99%				+/-	19.0364	µg/mL	Stressed
79	Dibenz(a,h)anthracene			1,000.0	µg/mL	+/-	5.8275	µg/mL	Gravimetric
	CAS #	53-70-3.SEC	(Lot 0012011)			+/-	11.9606	µg/mL	Unstressed
	Purity	99%				+/-	19.0288	µg/mL	Stressed
80	Benzo(g,h,i)perylene			1,000.1	µg/mL	+/-	5.8279	µg/mL	Gravimetric
	CAS #	191-24-2.SEC	(Lot 0022012)			+/-	11.9614	µg/mL	Unstressed
	Purity	97%				+/-	19.0302	µg/mL	Stressed
Solvent: Methylene chloride									
CAS # 75-09-2									
Purity 99%									

* Restek is unable to identify a reliable and/or acceptable second source for this material - the same batch of neat material may have been used to produce both the primary and secondary standard. The primary and secondary standards were prepared using different equipment and personnel.

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.

N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.

N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.

Reagent

MS-571995_00002



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 571995 Lot No.: A0136052
Description : 8270 List 1 / Std #1 MegaMix (2017)
8270 List 1 / Std #1 MegaMix (2017) 500-2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 10 mL Pkg Amt: > 5 mL
Expiration Date : September 30, 2019 Storage: 0°C or colder
Handling: Carcinogen/reproductive toxin. Photosensitive. Sonicate.



5163450

ID: MS-571995_00002

Exp: 09/30/19 Pripd: OCK

RES HSLB Mega Mix (2017)

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	1,4-Dioxane	1,002.0 µg/mL	+/-	5.8257	µg/mL	Gravimetric
	CAS # 123-91-1 (Lot SHBH5677)		+/-	11.9780	µg/mL	Unstressed
	Purity 99%		+/-	19.0628	µg/mL	Stressed
2	N-Nitrosodimethylamine	1,002.0 µg/mL	+/-	5.8257	µg/mL	Gravimetric
	CAS # 62-75-9 (Lot 161108JLM)		+/-	11.9780	µg/mL	Unstressed
	Purity 99%		+/-	19.0628	µg/mL	Stressed
3	Pyridine	2,011.2 µg/mL	+/-	11.6933	µg/mL	Gravimetric
	CAS # 110-86-1 (Lot SHBC7174V)		+/-	24.0420	µg/mL	Unstressed
	Purity 99%		+/-	38.2625	µg/mL	Stressed
4	Phenol	1,005.1 µg/mL	+/-	5.8439	µg/mL	Gravimetric
	CAS # 108-95-2 (Lot SHBF1351V)		+/-	12.0154	µg/mL	Unstressed
	Purity 99%		+/-	19.1224	µg/mL	Stressed
5	Aniline	1,002.6 µg/mL	+/-	5.8292	µg/mL	Gravimetric
	CAS # 62-53-3 (Lot K22Z462)		+/-	11.9851	µg/mL	Unstressed
	Purity 99%		+/-	19.0742	µg/mL	Stressed
6	Bis(2-chloroethyl)ether	1,001.4 µg/mL	+/-	5.8222	µg/mL	Gravimetric
	CAS # 111-44-4 (Lot SHBD4430V)		+/-	11.9708	µg/mL	Unstressed
	Purity 99%		+/-	19.0513	µg/mL	Stressed
7	n-Decane (C10)	1,000.7 µg/mL	+/-	5.8180	µg/mL	Gravimetric
	CAS # 124-18-5 (Lot SHBH3926V)		+/-	11.9620	µg/mL	Unstressed
	Purity 99%		+/-	19.0374	µg/mL	Stressed

8	2-Chlorophenol CAS # 95-57-8 Purity 99%	(Lot STBF2690V)	1,007.1 µg/mL	+/- 5.8552 +/- 12.0385 +/- 19.1592	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	1,3-Dichlorobenzene CAS # 541-73-1 Purity 99%	(Lot BCBM5751V)	1,001.0 µg/mL	+/- 5.8199 +/- 11.9660 +/- 19.0437	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	1,4-Dichlorobenzene CAS # 106-46-7 Purity 99%	(Lot MKBS4401V)	1,004.4 µg/mL	+/- 5.8397 +/- 12.0067 +/- 19.1084	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benzyl alcohol CAS # 100-51-6 Purity 99%	(Lot SHBC1850V)	1,005.2 µg/mL	+/- 5.8443 +/- 12.0162 +/- 19.1236	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	1,2-Dichlorobenzene CAS # 95-50-1 Purity 99%	(Lot 68996CMV)	1,001.2 µg/mL	+/- 5.8211 +/- 11.9684 +/- 19.0475	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	2-Methylphenol (o-cresol) CAS # 95-48-7 Purity 99%	(Lot SHBH6379)	1,001.6 µg/mL	+/- 5.8234 +/- 11.9732 +/- 19.0551	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	2,2'-oxybis(1-chloropropane) CAS # 108-60-1 Purity 98%	(Lot 5510800)	1,006.7 µg/mL	+/- 5.8528 +/- 12.0336 +/- 19.1513	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Acetophenone CAS # 98-86-2 Purity 99%	(Lot STBG7113)	1,005.5 µg/mL	+/- 5.8459 +/- 12.0194 +/- 19.1287	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	3-Methylphenol (m-cresol) CAS # 108-39-4 Purity 99%	(Lot SHBD0627V)	501.0 µg/mL	+/- 2.9196 +/- 5.9923 +/- 9.5334	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	4-Methylphenol (p-cresol) CAS # 106-44-5 Purity 99%	(Lot 49396APV)	501.7 µg/mL	+/- 2.9235 +/- 6.0002 +/- 9.5461	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	N-Nitroso-di-n-propylamine CAS # 621-64-7 Purity 99%	(Lot NOPCF)	1,003.1 µg/mL	+/- 5.8323 +/- 11.9915 +/- 19.0843	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	Hexachloroethane CAS # 67-72-1 Purity 99%	(Lot 4H3SF)	1,003.4 µg/mL	+/- 5.8339 +/- 11.9947 +/- 19.0894	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	Nitrobenzene CAS # 98-95-3 Purity 99%	(Lot SHBG5577V)	1,002.3 µg/mL	+/- 5.8273 +/- 11.9812 +/- 19.0678	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
21	Isophorone CAS # 78-59-1 Purity 98%	(Lot MKBG2442V)	1,003.3 µg/mL	+/- 5.8334 +/- 11.9938 +/- 19.0879	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
22	2-Nitrophenol CAS # 88-75-5 Purity 99%	(Lot BCBH7602V)	1,007.7 µg/mL	+/- 5.8587 +/- 12.0457 +/- 19.1706	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
23	2,4-Dimethylphenol CAS # 105-67-9 Purity 99%	(Lot 10165155)	1,000.9 µg/mL	+/- 5.8191 +/- 11.9644 +/- 19.0412	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

24	Bis(2-chloroethoxy)methane CAS # 111-91-1 Purity 99%	(Lot 4621000)	1,001.3 µg/mL	+/- +/- +/-	5.8215 11.9692 19.0488	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
25	2,4-Dichlorophenol CAS # 120-83-2 Purity 99%	(Lot BCBH1617V)	1,003.1 µg/mL	+/- +/- +/-	5.8323 11.9915 19.0843	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
26	1,2,4-Trichlorobenzene CAS # 120-82-1 Purity 99%	(Lot SHBJ0905)	1,005.0 µg/mL	+/- +/- +/-	5.8432 12.0138 19.1198	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
27	Naphthalene CAS # 91-20-3 Purity 99%	(Lot MKBW2603V)	1,000.5 µg/mL	+/- +/- +/-	5.8168 11.9596 19.0336	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
28	2,6-Dichlorophenol CAS # 87-65-0 Purity 99%	(Lot MKBP8620V)	1,001.3 µg/mL	+/- +/- +/-	5.8215 11.9692 19.0488	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
29	4-Chloroaniline CAS # 106-47-8 Purity 99%	(Lot BCBJ1580V)	1,001.3 µg/mL	+/- +/- +/-	5.8215 11.9692 19.0488	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
30	Hexachlorobutadiene CAS # 87-68-3 Purity 99%	(Lot J31X013)	1,002.5 µg/mL	+/- +/- +/-	5.8284 11.9835 19.0716	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
31	4-Chloro-3-methylphenol CAS # 59-50-7 Purity 99%	(Lot STBC7309V)	1,006.2 µg/mL	+/- +/- +/-	5.8501 12.0282 19.1427	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
32	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	(Lot STBG8884)	1,007.7 µg/mL	+/- +/- +/-	5.8587 12.0459 19.1708	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
33	1-Methylnaphthalene CAS # 90-12-0 Purity 99%	(Lot 525000-9)	1,005.5 µg/mL	+/- +/- +/-	5.8463 12.0202 19.1300	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
34	1,2,4,5-Tetrachlorobenzene CAS # 95-94-3 Purity 99%	(Lot MKBW7717V)	1,004.3 µg/mL	+/- +/- +/-	5.8389 12.0051 19.1059	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
35	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99%	(Lot 0012017H)	1,007.1 µg/mL	+/- +/- +/-	5.8552 12.0385 19.1592	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
36	2,4,6-Trichlorophenol CAS # 88-06-2 Purity 99%	(Lot STBF3742V)	1,003.5 µg/mL	+/- +/- +/-	5.8342 11.9955 19.0907	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
37	2,4,5-Trichlorophenol CAS # 95-95-4 Purity 99%	(Lot FHN01)	1,006.4 µg/mL	+/- +/- +/-	5.8513 12.0306 19.1465	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
38	2-Chloronaphthalene CAS # 91-58-7 Purity 99%	(Lot AJ2UI)	1,002.9 µg/mL	+/- +/- +/-	5.8308 11.9883 19.0792	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
39	Biphenyl CAS # 92-52-4 Purity 99%	(Lot MKBV9808V)	1,001.2 µg/mL	+/- +/- +/-	5.8211 11.9684 19.0475	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

40	2-Nitroaniline CAS # 88-74-4 Purity 99%	(Lot MKBK7597V)	1,004.5 µg/mL	+/- 5.8401 +/- 12.0075 +/- 19.1097	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	Acenaphthylene CAS # 208-96-8 Purity 97%	(Lot O03R)	1,006.0 µg/mL	+/- 5.8491 +/- 12.0260 +/- 19.1392	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,3-Dinitrobenzene CAS # 99-65-0 Purity 99%	(Lot BCBN4329V)	1,001.8 µg/mL	+/- 5.8246 +/- 11.9756 +/- 19.0590	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
43	Dimethylphthalate CAS # 131-11-3 Purity 99%	(Lot 10117699)	1,003.7 µg/mL	+/- 5.8358 +/- 11.9987 +/- 19.0957	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
44	2,6-Dinitrotoluene CAS # 606-20-2 Purity 99%	(Lot BCBB8606V)	1,000.7 µg/mL	+/- 5.8183 +/- 11.9628 +/- 19.0387	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
45	3-Nitroaniline CAS # 99-09-2 Purity 99%	(Lot MKBX1283V)	1,005.2 µg/mL	+/- 5.8443 +/- 12.0162 +/- 19.1236	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
46	Acenaphthene CAS # 83-32-9 Purity 99%	(Lot MKCC8329)	1,005.9 µg/mL	+/- 5.8482 +/- 12.0242 +/- 19.1363	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
47	2,4-Dinitrophenol CAS # 51-28-5 Purity 99%	(Lot STBF9439V)	2,008.3 µg/mL	+/- 11.6766 +/- 24.0077 +/- 38.2080	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
48	Dibenzofuran CAS # 132-64-9 Purity 99%	(Lot MKBW2691V)	1,005.5 µg/mL	+/- 5.8463 +/- 12.0202 +/- 19.1300	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
49	4-Nitrophenol CAS # 100-02-7 Purity 99%	(Lot MKBV0501V)	2,009.3 µg/mL	+/- 11.6824 +/- 24.0197 +/- 38.2270	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
50	2,4-Dinitrotoluene CAS # 121-14-2 Purity 99%	(Lot MKAA0690V)	1,003.9 µg/mL	+/- 5.8366 +/- 12.0003 +/- 19.0983	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
51	2,3,4,6-Tetrachlorophenol CAS # 58-90-2 Purity 99%	(Lot B180305L)	1,001.9 µg/mL	+/- 5.8253 +/- 11.9772 +/- 19.0615	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
52	Fluorene CAS # 86-73-7 Purity 99%	(Lot 10193329)	1,002.0 µg/mL	+/- 5.8257 +/- 11.9780 +/- 19.0628	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
53	n-Hexadecane (C16) CAS # 544-76-3 Purity 99%	(Lot SHBG2582V)	1,001.6 µg/mL	+/- 5.8234 +/- 11.9732 +/- 19.0551	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
54	Diethylphthalate CAS # 84-66-2 Purity 99%	(Lot MKBV9622V)	1,003.3 µg/mL	+/- 5.8335 +/- 11.9939 +/- 19.0881	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
55	4-Chlorophenyl phenyl ether CAS # 7005-72-3 Purity 99%	(Lot MKBX5225V)	1,001.1 µg/mL	+/- 5.8203 +/- 11.9668 +/- 19.0450	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

56	4-Nitroaniline CAS # 100-01-6 Purity 98%	(Lot BCBG4702V)	1,003.1 µg/mL	+/- +/- +/-	5.8319 11.9907 19.0830	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
57	4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) CAS # 534-52-1 Purity 99%	(Lot LC25844V)	2,003.7 µg/mL	+/- +/- +/-	11.6495 23.9520 38.1192	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
58	Diphenylamine CAS # 122-39-4 Purity 99%	(Lot MKBN8295V)	852.3 µg/mL	+/- +/- +/-	4.9555 10.1888 16.2154	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
59	Azobenzene CAS # 103-33-3 Purity 99%	(Lot BCBQ0927V)	1,005.5 µg/mL	+/- +/- +/-	5.8463 12.0202 19.1300	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
60	4-Bromophenyl phenyl ether CAS # 101-55-3 Purity 99%	(Lot STBB9729V)	1,022.3 µg/mL	+/- +/- +/-	5.9439 12.2210 19.4496	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
61	Hexachlorobenzene CAS # 118-74-1 Purity 99%	(Lot 7013600)	1,002.5 µg/mL	+/- +/- +/-	5.8288 11.9843 19.0729	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
62	Pentachlorophenol CAS # 87-86-5 Purity 99%	(Lot 170306KJA)	2,002.1 µg/mL	+/- +/- +/-	11.6406 23.9336 38.0900	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
63	n-Octadecane (C18) CAS # 593-45-3 Purity 99%	(Lot OGCDK)	1,002.9 µg/mL	+/- +/- +/-	5.8308 11.9883 19.0792	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
64	Phenanthrene CAS # 85-01-8 Purity 99%	(Lot MKCB1762V)	1,001.1 µg/mL	+/- +/- +/-	5.8203 11.9668 19.0450	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
65	Anthracene CAS # 120-12-7 Purity 99%	(Lot MKBV7759V)	1,000.3 µg/mL	+/- +/- +/-	5.8156 11.9573 19.0298	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
66	Carbazole CAS # 86-74-8 Purity 99%	(Lot 6489700)	1,000.5 µg/mL	+/- +/- +/-	5.8168 11.9596 19.0336	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
67	Di-n-butylphthalate CAS # 84-74-2 Purity 99%	(Lot MKBT0244V)	1,005.7 µg/mL	+/- +/- +/-	5.8470 12.0218 19.1325	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
68	Fluoranthene CAS # 206-44-0 Purity 98%	(Lot MKBQ6360V)	1,005.5 µg/mL	+/- +/- +/-	5.8463 12.0204 19.1302	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
69	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCBT5695)	1,005.8 µg/mL	+/- +/- +/-	5.8478 12.0234 19.1351	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
70	Benzyl butyl phthalate CAS # 85-68-7 Purity 98%	(Lot MKBZ4553V)	1,000.3 µg/mL	+/- +/- +/-	5.8156 11.9571 19.0295	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
71	Benz(a)anthracene CAS # 56-55-3 Purity 98%	(Lot 0012012)	1,003.1 µg/mL	+/- +/- +/-	5.8323 11.9915 19.0842	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

72	Chrysene CAS # 218-01-9 Purity 99%	(Lot 012015)	1,004.6 µg/mL	+/- +/- +/-	5.8408 12.0091 19.1122	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
73	Bis(2-ethylhexyl)phthalate CAS # 117-81-7 Purity 99%	(Lot MKBZ3868V)	1,002.7 µg/mL	+/- +/- +/-	5.8296 11.9859 19.0754	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
74	Di-n-octyl phthalate CAS # 117-84-0 Purity 99%	(Lot 6016000)	1,007.9 µg/mL	+/- +/- +/-	5.8602 12.0489 19.1756	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
75	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012012B)	1,003.6 µg/mL	+/- +/- +/-	5.8350 11.9971 19.0932	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
76	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012017K)	1,006.2 µg/mL	+/- +/- +/-	5.8501 12.0282 19.1427	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
77	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot ER071309-02)	1,002.1 µg/mL	+/- +/- +/-	5.8261 11.9788 19.0640	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
78	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot ER082107-02)	1,004.0 µg/mL	+/- +/- +/-	5.8373 12.0019 19.1008	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
79	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	1,001.9 µg/mL	+/- +/- +/-	5.8249 11.9764 19.0602	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
80	Benzo(g,h,i)perylene CAS # 191-24-2 Purity 99%	(Lot ER05121401)	1,000.9 µg/mL	+/- +/- +/-	5.8195 11.9652 19.0425	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
Solvent: Methylene chloride CAS # 75-09-2 Purity 99%							

Specific Reference Material Notes:

N-nitrosodiphenylamine 1000 ug/mL equivalent when used for GC analysis. Actual formulation is diphenylamine 855 ug/mL.
N-Nitrosodiphenylamine is prone to breakdown in the injection port and will be converted to diphenylamine.
N-Nitrosodiphenylamine is also a reactive species that can initiate premature decomposition of other compounds in the mix. For these reasons diphenylamine is used in the preparation of this mixture. When comparing the response of this compound to mixtures manufactured using N-nitrosodiphenylamine, a difference in response will be observed.
This lot was approved even though the %D for 4,6-DN-2-MP was greater than 10%.

Reagent

MV-568718-D_00014



110 Benner Circle
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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 568718 Lot No.: A0127975

Description : 8260 Internal Standard 2014

8260 Internal Standard 2014 250-5,000 ug/ml, P&T Methanol, 5 ml/ampul

Container Size : 5 mL Pkg Amt: > 5 mL

Expiration Date : May 31, 2022 Storage: 0°C or colder

rec'd 3/1/18

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	tert-Butyl-d9-alcohol CAS # 25725-11-5 Purity 99% (Lot I-201)	5,022.1 µg/mL	+/- 29.1976 µg/mL +/- 107.5241 µg/mL +/- 110.6500 µg/mL	Gravimetric Unstressed Stressed
2	2-Butanone-d5 CAS # 24313-50-6 Purity 99% (Lot M-276)	1,257.5 µg/mL	+/- 7.3114 µg/mL +/- 26.9239 µg/mL +/- 27.7067 µg/mL	Gravimetric Unstressed Stressed
3	Fluorobenzene CAS # 462-06-6 Purity 99% (Lot BCBK8171V)	250.8 µg/mL	+/- 1.4613 µg/mL +/- 5.3699 µg/mL +/- 5.5259 µg/mL	Gravimetric Unstressed Stressed
4	1,4-Dioxane-d8 CAS # 17647-74-4 Purity 99% (Lot I-19942)	5,009.4 µg/mL	+/- 29.1236 µg/mL +/- 107.2514 µg/mL +/- 110.3694 µg/mL	Gravimetric Unstressed Stressed
5	Chlorobenzene-d5 CAS # 3114-55-4 Purity 99% (Lot PR-21944)	251.7 µg/mL	+/- 1.4666 µg/mL +/- 5.3891 µg/mL +/- 5.5458 µg/mL	Gravimetric Unstressed Stressed
6	1,4-Dichlorobenzene-d4 CAS # 3855-82-1 Purity 99% (Lot PR-18488)	251.3 µg/mL	+/- 1.4645 µg/mL +/- 5.3813 µg/mL +/- 5.5377 µg/mL	Gravimetric Unstressed Stressed

Solvent: P&T Methanol/Water (90:10)
CAS # 67-56-1/7732-18-5
Purity 99%

Column:

105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

Carrier Gas:

hydrogen-constant pressure 11.0 psi.

Temp. Program:

40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:

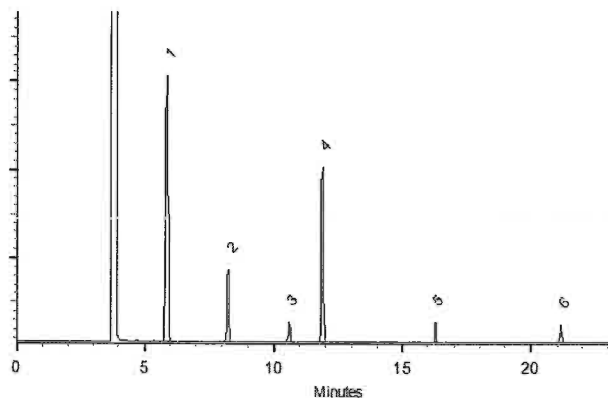
200°C

Det. Temp:

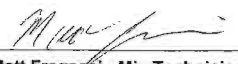
250°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Matt Fragassi - Mix Technician

Date Mixed: 30-May-2017 **Balance:** 1128342314


Justine Albartson - Operations Tech-ARM QC

Date Passed: 06-Jun-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-568720.sec_00021

Reagent

MV-569721.sec_00005



CERTIFIED REFERENCE MATERIAL

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Bellefonte, PA 16823-8812
Tel: (800)356-1688
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Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569721.sec **Lot No.:** A0123880

Description : 8260 List 1/ Std #2 Ketones (2015)

8260 List 1/ Std #2 Ketones (2015) 12,500 µg/ml, P&T Methanol/Water (90:10), 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Acetone CAS # 67-64-1.SEC (Lot P14A572) Purity 99%	12,501.6 µg/mL	+/- 73.1996 µg/mL Gravimetric +/- 754.3267 µg/mL Unstressed +/- 756.1173 µg/mL Stressed
2	2-Butanone (MEK) CAS # 78-93-3.SEC (Lot RA58J) Purity 99%	12,503.6 µg/mL	+/- 73.2113 µg/mL Gravimetric +/- 754.4473 µg/mL Unstressed +/- 756.2383 µg/mL Stressed
3	4-Methyl-2-pentanone (MIBK) CAS # 108-10-1.SEC (Lot E29T040) Purity 99%	12,506.0 µg/mL	+/- 73.2254 µg/mL Gravimetric +/- 754.5921 µg/mL Unstressed +/- 756.3834 µg/mL Stressed
4	2-Hexanone CAS # 591-78-6.SEC (Lot V3NRA) Purity 99%	12,504.0 µg/mL	+/- 73.2137 µg/mL Gravimetric +/- 754.4715 µg/mL Unstressed +/- 756.2625 µg/mL Stressed
Solvent:	P&T Methanol/Water (90:10) CAS # 67-56-1/7732-18-5 Purity 99%		

Column:

105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

Carrier Gas:

hydrogen-constant pressure 11.0 psi.

Temp. Program:

40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:

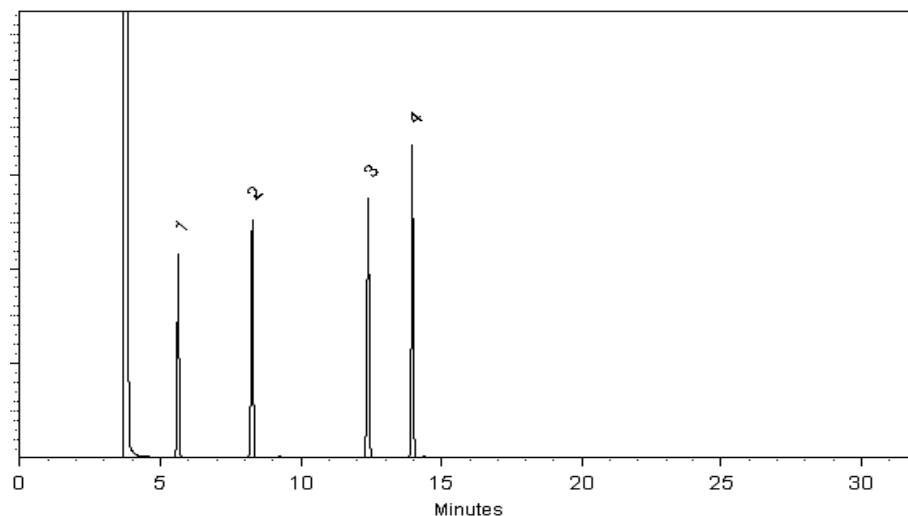
200°C

Det. Temp:

250°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Michael Maje

Date Mixed: 03-Jan-2017

Balance: 1127510105

Jennifer Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 05-Jan-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569721_00006

Reagent

MV-569722.sec_00005



CERTIFIED REFERENCE MATERIAL

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Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569722.SEC **Lot No.:** A0128832

Description : 8260 List 1 / Std #3 Gases (2015)

8260 List 1 / Std #3 Gases (2015) 2,500 ug/ml, P&T Methanol, 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : June 30, 2020 **Storage:** 0°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Dichlorodifluoromethane (CFC-12) CAS # 75-71-8.SEC (Lot 23586) Purity 99%	2,505.9 µg/mL	+/- 22.3986 µg/mL Gravimetric +/- 141.5312 µg/mL Unstressed +/- 144.7955 µg/mL Stressed
2	Chloromethane (methyl chloride) CAS # 74-87-3.SEC (Lot 18343) Purity 99%	2,503.7 µg/mL	+/- 24.8413 µg/mL Gravimetric +/- 141.8153 µg/mL Unstressed +/- 145.0675 µg/mL Stressed
3	Vinyl chloride CAS # 75-01-4.SEC (Lot MKBK6872V) Purity 99%	2,503.2 µg/mL	+/- 25.9197 µg/mL Gravimetric +/- 141.9813 µg/mL Unstressed +/- 145.2285 µg/mL Stressed
4	1,3-Butadiene CAS # 106-99-0.SEC (Lot 24033) Purity 99%	2,508.9 µg/mL	+/- 20.6969 µg/mL Gravimetric +/- 141.4379 µg/mL Unstressed +/- 144.7121 µg/mL Stressed
5	Bromomethane (methyl bromide) CAS # 74-83-9.SEC (Lot Q119-46) Purity 99%	2,502.6 µg/mL	+/- 26.2540 µg/mL Gravimetric +/- 142.0076 µg/mL Unstressed +/- 145.2526 µg/mL Stressed
6	Chloroethane (ethyl chloride) CAS # 75-00-3.SEC (Lot 00004202) Purity 99%	2,510.6 µg/mL	+/- 24.9094 µg/mL Gravimetric +/- 142.2038 µg/mL Unstressed +/- 145.4650 µg/mL Stressed
7	Dichlorofluoromethane (CFC-21) CAS # 75-43-4.SEC (Lot SHBC0858V) Purity 99%	2,510.9 µg/mL	+/- 25.6719 µg/mL Gravimetric +/- 142.3575 µg/mL Unstressed +/- 145.6160 µg/mL Stressed

8	Trichlorofluoromethane (CFC-11)	2,504.9	µg/mL	+/- 18.9312	µg/mL	Gravimetric
	CAS # 75-69-4.SEC (Lot 253600)			+/- 140.9660	µg/mL	Unstressed
	Purity 99%			+/- 144.2404	µg/mL	Stressed

Solvent: P&T Methanol
CAS # 67-56-1
Purity 99%

Column:
60m x 0.25mm x 1.4µm
Rtx-502.2 (cat.#10916)

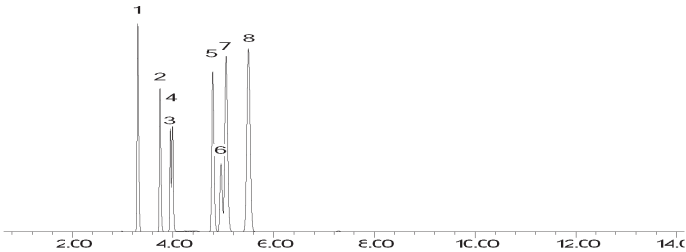
Carrier Gas:
helium-constant flow 2.0 mL/min.

Temp. Program:
40°C (hold 6 min.) to 100°C
@ 6°C/min.

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
MSD



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Brandon Reish
Brandon Reish - Mix Technician

Date Mixed: 29-Jun-2017 **Balance:** 1127510105

Jennifer A Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 24-Jul-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569723.sec_00004



CERTIFIED REFERENCE MATERIAL

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Certificate of Analysis



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Catalog No. : 569723.SEC **Lot No.:** A0123884

Description : 8260 List 1 / Std #4 2-CEVE (2015)

8260 List 1 / Std #4 2-CEVE (2015) 2,500 ug/ml, P&T Methanol, 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : January 31, 2020 **Storage:** 0°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	2-Chloroethyl vinyl ether CAS # 110-75-8.SEC (Lot BQZ2K-QD) Purity 99%	2,504.4 µg/mL	+/- 14.6972 µg/mL Gravimetric +/- 53.6567 µg/mL Unstressed +/- 55.2145 µg/mL Stressed

Solvent: P&T Methanol
CAS # 67-56-1
Purity 99%

Tech Tips:

Degradation of tetrachloroethylene to pentachloroethane may occur if solutions containing 2-chloroethyl vinyl ether are combined with solutions that contain tetrachloroethylene.

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

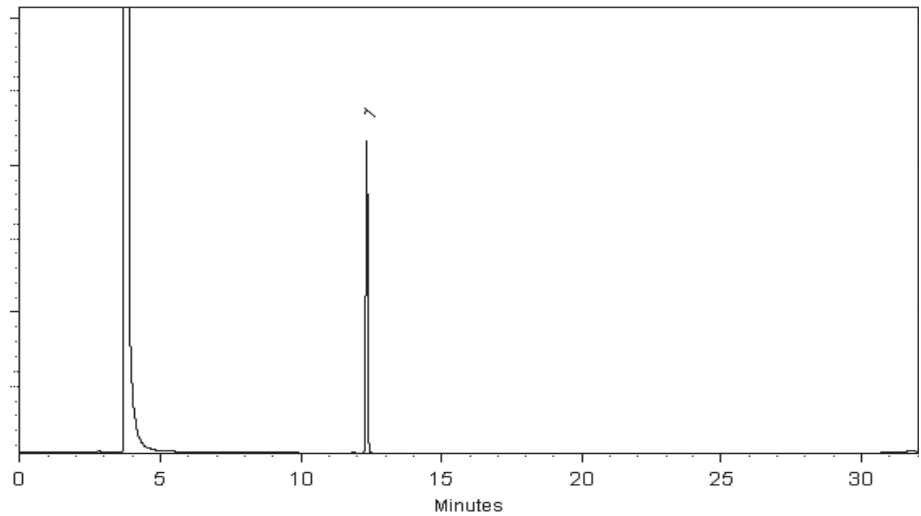
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

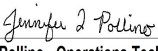
Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Brandon Reish - Mix Technician

Date Mixed: 03-Jan-2017 Balance: 1128342314


Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 06-Jan-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569723_00004

Reagent

MV-569727.sec_00005



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

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Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569727.SEC **Lot No.:** A0131573

Description : 8260 List 2/ Std #3 Cyclohexanone (2015)

8260 List 2/ Std #3 Cyclohexanone (2015) 25,000µg/mL, Water, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : October 31, 2020 **Storage:** 10°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Cyclohexanone	24,978.0 µg/mL	+/- 146.2517 µg/mL Gravimetric
	CAS # 108-94-1.SEC (Lot ZEHPG)		+/- 1,507.1328 µg/mL Unstressed
	Purity 99%		+/- 1,510.7105 µg/mL Stressed

Solvent: Water

CAS # 7732-18-5

Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

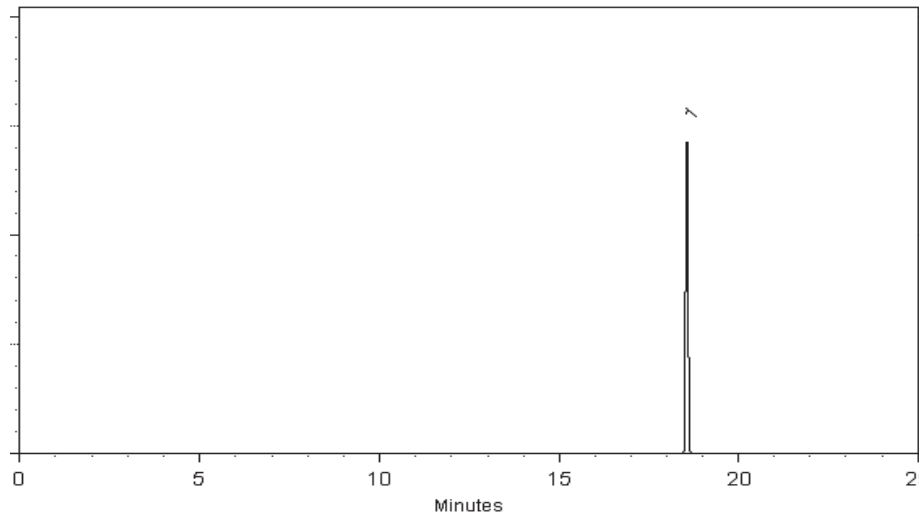
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

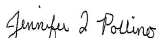
Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Larry J. Moore - Mix Technician

Date Mixed: 11-Oct-2017 Balance: 1128353505


Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 13-Oct-2017

Manufactured under Restek's ISO 9001:2008 Registered Quality System Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

MV-569727_00007



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569727 **Lot No.:** A0124672

Description : 8260 List 2/ Std #3 Cyclohexanone (2015)

8260 List 2/ Std #3 Cyclohexanone (2015) 25,000 µg/ml, Water, 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : February 29, 2020 **Storage:** 10°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Cyclohexanone CAS # 108-94-1 Purity 99% (Lot MKBN5282V)	25,006.0 µg/mL	+/- 146.4156 µg/mL Gravimetric +/- 1,508.8223 µg/mL Unstressed +/- 1,512.4040 µg/mL Stressed

Solvent: Water
CAS # 7732-18-5
Purity 99%

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

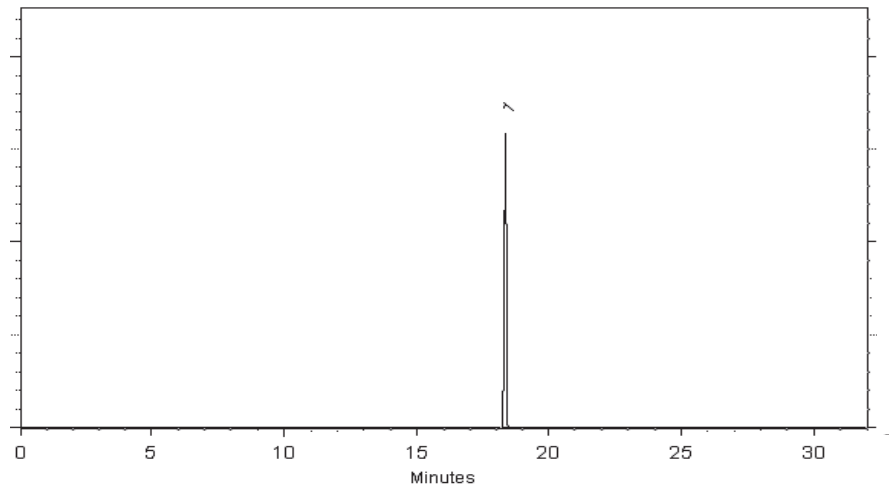
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

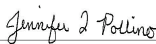
Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Tom Suckar - Mix Technician

Date Mixed: 03-Feb-2017 Balance: 1125113331


Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 07-Feb-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

mv-570808.sec_00002



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 570808.SEC **Lot No.:** A0126195

Description : 8260 List 2 / Std #6
8260 List 2 / Std #6 2500-62500 µg/ml, P&T Methanol, 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : September 30, 2018 **Storage:** 0°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	2-Propanol (isopropanol) CAS # 67-63-0.SEC (Lot NWVYK) Purity 98%	25,010.4 µg/mL	+/- 146.4413 µg/mL Gravimetric +/- 1,237.3312 µg/mL Unstressed +/- 1,268.0926 µg/mL Stressed
2	Chloroprene (2-chloro-1,3-butadiene) CAS # 126-99-8 * (Lot 170113JLM) Purity 99%	2,519.6 µg/mL	+/- 14.7864 µg/mL Gravimetric +/- 124.6554 µg/mL Unstressed +/- 127.7543 µg/mL Stressed
3	Methacrylonitrile CAS # 126-98-7 * (Lot 1012014) Purity 99%	25,013.6 µg/mL	+/- 146.4601 µg/mL Gravimetric +/- 1,237.4903 µg/mL Unstressed +/- 1,268.2556 µg/mL Stressed
4	2,2,4-Trimethylpentane (Isooctane) CAS # 540-84-1.SEC (Lot 4597900) Purity 99%	2,502.4 µg/mL	+/- 14.6855 µg/mL Gravimetric +/- 123.8044 µg/mL Unstressed +/- 126.8822 µg/mL Stressed
5	1-Butanol CAS # 71-36-3.SEC (Lot QBO2D) Purity 99%	62,532.0 µg/mL	+/- 366.1197 µg/mL Gravimetric +/- 3,093.6246 µg/mL Unstressed +/- 3,170.5355 µg/mL Stressed
6	2-Nitropropane CAS # 79-46-9.SEC (Lot 6M3NJ) Purity 98%	5,012.9 µg/mL	+/- 29.3516 µg/mL Gravimetric +/- 248.0015 µg/mL Unstressed +/- 254.1671 µg/mL Stressed
7	1-Chlorohexane CAS # 544-10-5.SEC (Lot 3890000) Purity 98%	2,507.6 µg/mL	+/- 14.7161 µg/mL Gravimetric +/- 124.0629 µg/mL Unstressed +/- 127.1470 µg/mL Stressed

8	1,2,3-Trimethylbenzene CAS # 526-73-8.SEC Purity 96%	(Lot 5602500)	2,505.6 µg/mL	+/- 14.7043 +/- 123.9628 +/- 127.0444	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	Benzyl chloride CAS # 100-44-7.SEC Purity 99%	(Lot H29N03)	2,506.4 µg/mL	+/- 14.7090 +/- 124.0023 +/- 127.0850	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	1,3,5-Trichlorobenzene CAS # 108-70-3.SEC Purity 99%	(Lot I28U021)	2,504.0 µg/mL	+/- 14.6949 +/- 123.8836 +/- 126.9633	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Solvent: P&T Methanol
CAS # 67-56-1
Purity 99%

* Restek is unable to identify a reliable and/or acceptable second source for this material - the same batch of neat material may have been used to produce both the primary and secondary standard. The primary and secondary standards were prepared using different equipment and personnel.

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

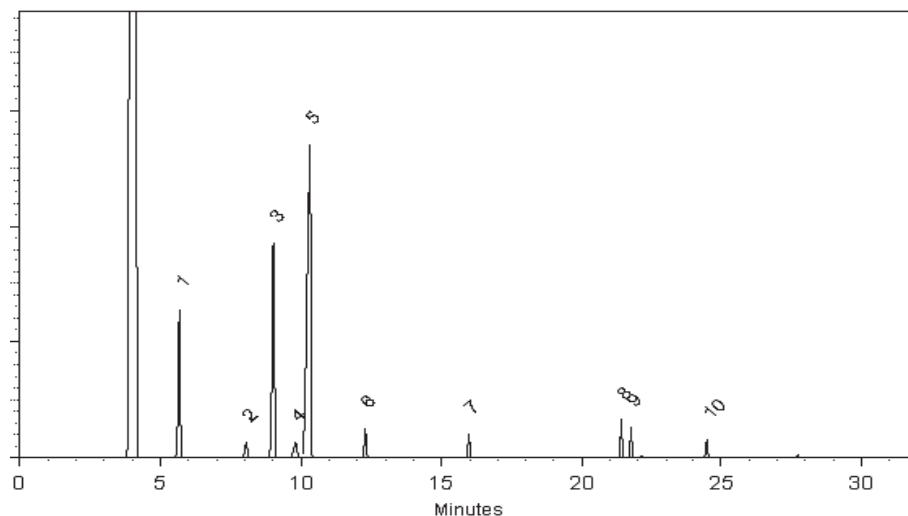
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Brandon Reish
Brandon Reish - Mix Technician

Date Mixed: 27-Mar-2017 **Balance:** 1127510105

Jennifer Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 29-Mar-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

mv-570809.sec_00002



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
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Fax: (814)353-1309

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Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 570809.sec **Lot No.:** A0126533

Description : 8260 List 2 / Std #7
8260 List 2 / Std #7 2500-5000 µg/ml, P&T Methanol, 1 ml/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : October 31, 2018 **Storage:** 0°C or colder

CERTIFIED VALUES

Elution Order	Compound			Grav. Conc. (weight/volume)		Expanded Uncertainty (95% C.L.; K=2)				
1	Ethyl acetate			5,005.0	µg/mL	+/-	29.3054	µg/mL	Gravimetric	
	CAS #	141-78-6.SEC	(Lot C386A-GG)				+/-	301.9937	µg/mL	Unstressed
	Purity	99%					+/-	302.7106	µg/mL	Stressed
2	Ethyl acrylate			2,502.0	µg/mL	+/-	14.6831	µg/mL	Gravimetric	
	CAS #	140-88-5.SEC	(Lot YIFAM-TG)				+/-	150.9699	µg/mL	Unstressed
	Purity	99%					+/-	151.3283	µg/mL	Stressed
3	Methyl methacrylate			5,003.5	µg/mL	+/-	29.2966	µg/mL	Gravimetric	
	CAS #	80-62-6.SEC	(Lot G01X021)				+/-	301.9032	µg/mL	Unstressed
	Purity	99%					+/-	302.6199	µg/mL	Stressed
4	Butyl acetate			2,505.0	µg/mL	+/-	14.7007	µg/mL	Gravimetric	
	CAS #	123-86-4.SEC	(Lot V2L2G-GT)				+/-	151.1510	µg/mL	Unstressed
	Purity	99%					+/-	151.5098	µg/mL	Stressed
Solvent:	P&T Methanol									
	CAS #	67-56-1								
	Purity	99%								

Column:
105m x 0.53mm x 3.0µm
Rtx-502.2 (cat.#10910)

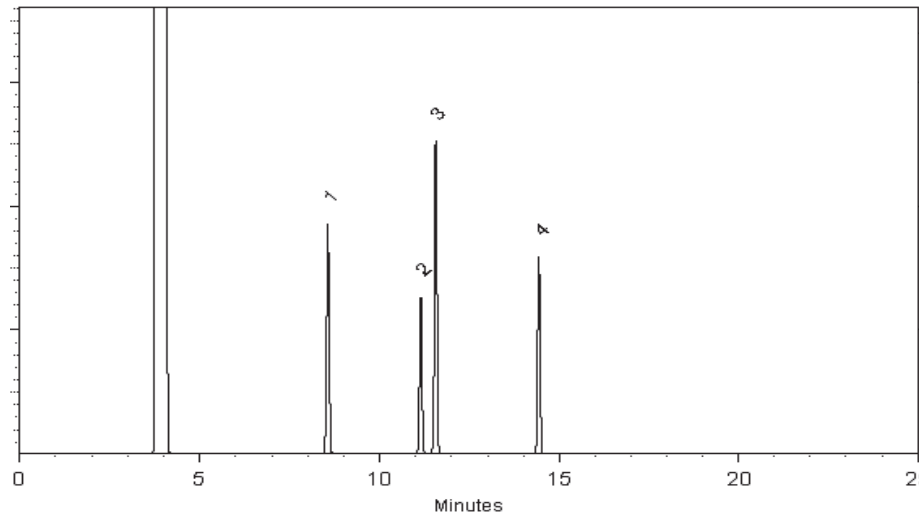
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

Temp. Program:
40°C (hold 2 min.) to 240°C
@ 8°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Michael Maje

Date Mixed: 05-Apr-2017 **Balance:** 1127510105

Jennifer I Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 10-Apr-2017

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

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k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
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0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

mv-571993.sec_00002

Reagent

mv-571994.sec_00002

Reagent

mv-571994_00002

Reagent

MV-ST5110N1_00066

4-Bromofluorobenzene Solution

Product Number: STS-110N

Page: 1 of 1

Lot Number: CH-3248Z

Lot Issue Date: 31-Aug-2016

Expiration Date: 31-Oct-2019

This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
4-bromofluorobenzene	000460-00-4	RM03365	2005 ± 10 µg/mL

Matrix: methanol (methyl alcohol)

Storage: Store Frozen (-25° to -10°C).

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

Reagent

OP-569730_00006



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

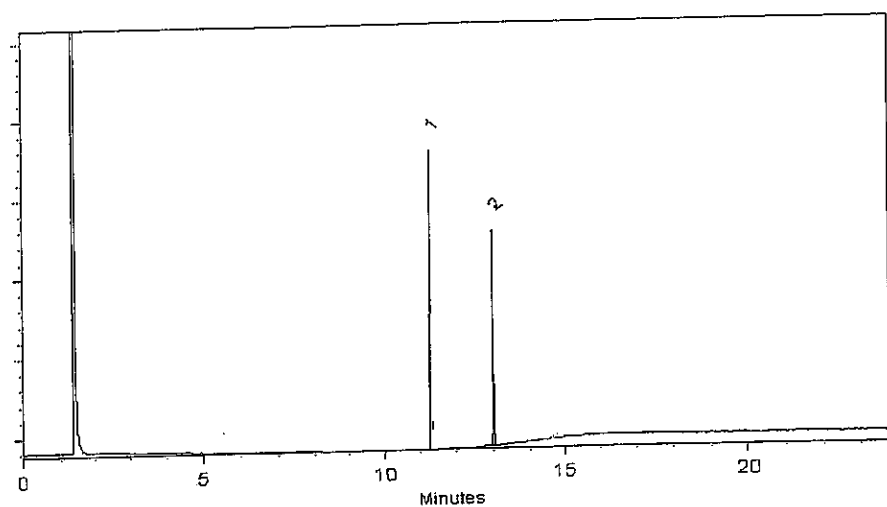
This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569730 Lot No.: A0137351
Description : 8270 List 1 / Std #9
8270 List 1 / Std #9 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 10 mL Pkg Amt: > 5 mL
Expiration Date : October 31, 2019 Storage: 10°C or colder
Handling: Contains carcinogen/reproductive toxin.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Benzidine	2,000.3 µg/mL	+/- 11.6301 µg/mL	Gravimetric
	CAS # 92-87-5 (Lot 171228KJA)		+/- 23.9121 µg/mL	Unstressed
	Purity 99%		+/- 38.0558 µg/mL	Stressed
2	3,3'-Dichlorobenzidine	2,005.7 µg/mL	+/- 11.6611 µg/mL	Gravimetric
	CAS # 91-94-1 (Lot 180328JNA)		+/- 23.9759 µg/mL	Unstressed
	Purity 99%		+/- 38.1572 µg/mL	Stressed
Solvent: Methylene chloride				
CAS # 75-09-2				
Purity 99%				

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)
Carrier Gas:
hydrogen-constant pressure 10 psi.
Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)
Inj. Temp:
250°C
Det. Temp:
330°C
Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Dawn Brown
Dawn Brownson - Mix Technician
Jennifer Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Mixed: 20-Apr-2018 Balance: 1128360905
Date Passed: 24-Apr-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 86397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

OP-569730_00009



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

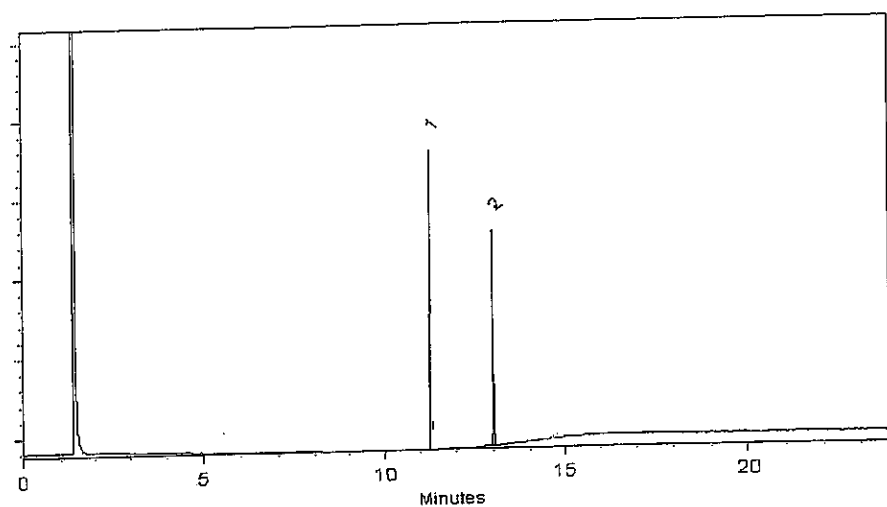
This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 569730 Lot No.: A0137351
Description : 8270 List 1 / Std #9
8270 List 1 / Std #9 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size : 10 mL Pkg Amt: > 5 mL
Expiration Date : October 31, 2019 Storage: 10°C or colder
Handling: Contains carcinogen/reproductive toxin.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Benzidine	2,000.3 µg/mL	+/- 11.6301 µg/mL	Gravimetric
	CAS # 92-87-5 (Lot 171228KJA)		+/- 23.9121 µg/mL	Unstressed
	Purity 99%		+/- 38.0558 µg/mL	Stressed
2	3,3'-Dichlorobenzidine	2,005.7 µg/mL	+/- 11.6611 µg/mL	Gravimetric
	CAS # 91-94-1 (Lot 180328JNA)		+/- 23.9759 µg/mL	Unstressed
	Purity 99%		+/- 38.1572 µg/mL	Stressed
Solvent: Methylene chloride				
CAS # 75-09-2				
Purity 99%				

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)
Carrier Gas:
hydrogen-constant pressure 10 psi.
Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)
Inj. Temp:
250°C
Det. Temp:
330°C
Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Dawn Brown
Dawn Brownson - Mix Technician
Jennifer Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Mixed: 20-Apr-2018 Balance: 1128360905
Date Passed: 24-Apr-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 86397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

OP-569732_00009

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:

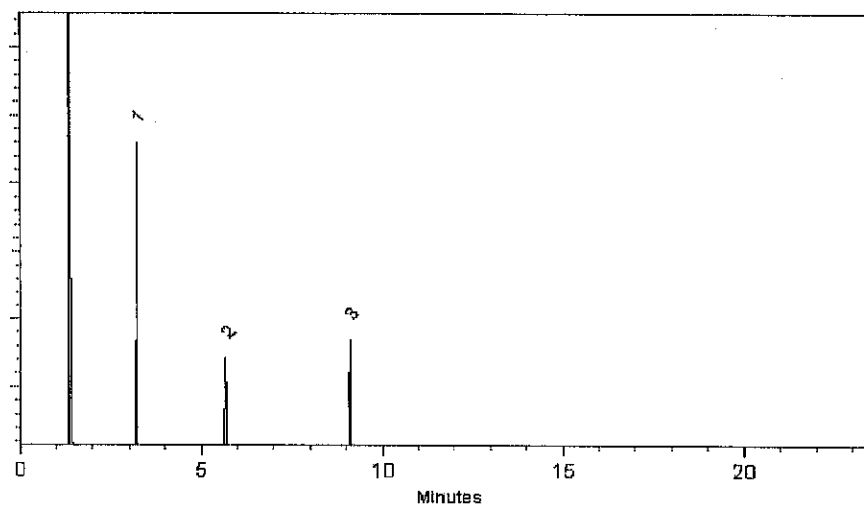
250°C

Det. Temp:

330°C

Det. Type:

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

F. Joseph Tallon
F. Joseph Tallon - Mix Technician

Date Mixed: 12-Apr-2018

Balance: B442140311

Jennifer 2 Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 16-Apr-2018

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

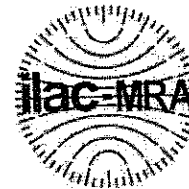


CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

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Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 569732 Lot No.: A0137125
Description: 8270 List 1 / Std #11
8270 List 1 / Std #11 2,000µg/mL, Methylene chloride, 5mL/ampul
Container Size: 5 mL Pkg Amt: > 5 mL
Expiration Date: October 31, 2019 Storage: 10°C or colder
Handling: This product is photosensitive.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	Benzaldehyde CAS # 100-52-7 Purity 99% (Lot SHBG8690V)	2,001.1 µg/mL	+/-	11.6345	µg/mL	Gravimetric
			+/-	64.1460	µg/mL	Unstressed
			+/-	74.5673	µg/mL	Stressed
2	epsilon-Caprolactam CAS # 105-60-2 Purity 99% (Lot I16X016)	2,002.0 µg/mL	+/-	11.6398	µg/mL	Gravimetric
			+/-	64.1754	µg/mL	Unstressed
			+/-	74.6014	µg/mL	Stressed
3	Atrazine CAS # 1912-24-9 Purity 99% (Lot 77P7D)	2,002.6 µg/mL	+/-	11.6432	µg/mL	Gravimetric
			+/-	64.1941	µg/mL	Unstressed
			+/-	74.6232	µg/mL	Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Reagent

OP-572556_00020



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

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CERTIFIED REFERENCE MATERIAL

Gravimetric Certificate



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 572556 **Lot No.:** A0143533
Description : Custom Hexachlorocyclopentadiene Standard
Custom Hexachlorocyclopentadiene Standard 4,000µg/mL, Methylene Chloride, 5mL/ampul
Container Size : 5 mL **Pkg Amt:** > 5 mL
Expiration Date : November 30, 2022 **Storage:** 10°C or colder

CERTIFIED VALUES

Component #	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99% (Lot 0012015)	4,015.0 µg/mL	+/- 23.562270 µg/mL Gravimetric +/- 225.139850 µg/mL Unstressed +/- 230.406784 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Brandon Reish - Mix Technician

Date Mixed: 27-Nov-2018

Balance: B442140311

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

Reagent

OP-572556_00027



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Gravimetric Certificate



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 572556 **Lot No.:** A0143533
Description : Custom Hexachlorocyclopentadiene Standard
Custom Hexachlorocyclopentadiene Standard 4,000µg/mL, Methylene Chloride, 5mL/ampul
Container Size : 5 mL **Pkg Amt:** > 5 mL
Expiration Date : November 30, 2022 **Storage:** 10°C or colder

CERTIFIED VALUES

Component #	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Hexachlorocyclopentadiene CAS # 77-47-4 Purity 99% (Lot 0012015)	4,015.0 µg/mL	+/- 23.562270 µg/mL Gravimetric +/- 225.139850 µg/mL Unstressed +/- 230.406784 µg/mL Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Brandon Reish - Mix Technician

Date Mixed: 27-Nov-2018

Balance: B442140311

Manufactured under Restek's ISO 9001:2008
Registered Quality System
Certificate #FM 80397

Reagent

10INC13OCDFP_00001

Rec'd 9/15/16
HRO 12-6

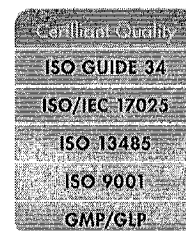
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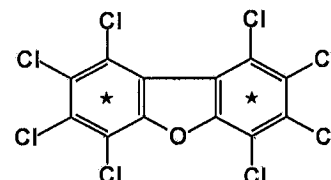
Revision 01
Page 1 of 5

Certificate of Analysis

Octachlorodibenzofuran-¹³C₁₂



Catalog Number: EF-983
Solution Lot: ER080812-01
Expiration Date: August 2022
Solvent: n-Nonane
Volume per Ampule: Not less than 1.2 mL
Storage: Store at room temperature. Do not store cold.
Intended Use: For R&D/analytical purposes only. Not suitable for human or animal consumption.
Safety: Danger. See Safety Data Sheet.



- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 1.2 mL volume fill. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

Component	Solution Purity	Certified Concentration
Octachlorodibenzofuran- ¹³ C ₁₂	> 99.9%	50.00 ± 0.31 µg/mL
- Uncertainty of the concentration is expressed as an expanded uncertainty in accordance with ISO 17025 and Guide 34 at the approximate 95% confidence interval using a coverage factor of k = 2 and has been calculated by statistical analysis of our production system and incorporates uncertainty of the purity factor, material density, and balance and weighing technique. - This standard is prepared gravimetrically and mass results are reported on the conventional basis for weighing in air. Concentration is calculated based on: the actual measured mass; Purity Factor of the analyte(s); measured mass of the solution; and the density of the pure diluent at 20°C. - Concentration is corrected for chromatographic purity, residual water, residual solvents and residual inorganics.		

Solution Standard Verification and Homogeneity

Standard Solution	Lot Number	Verified Concentration (µg/mL)		%RSD - Homogeneity	
		Actual Results	Acceptance Criteria	Actual Results	Acceptance Criteria
New Lot	ER080812-01	51.3	± 5%	0.2	≤ 3%
Previous Lot	ER062011-01	47.2	-----	0.7	≤ 3%
- Concentration is verified through multiple analyses and is calculated as the average of multiple analyses compared to an independently prepared calibration solution. - Homogeneity of the New Lot is ensured through rigorous production process controls statistically analyzed to evaluate risk and verified by analysis. The % RSD of samples pulled from across the lot demonstrate homogeneity of the New Lot. - The % RSD of the Previous Lot represents variability of the analysis performed at the time of release.					

Traceability

- Gravimetrically prepared using qualified balances calibrated semi-annually by Mettler Toledo using NIST traceable weights. Calibration verification performed weekly and prior to each use utilizing NIST traceable weights. Each balance has been assigned a minimum weighing by Mettler Toledo taking into consideration the balance and installed environmental conditions to ensure weighing complies with USP tolerances of no more than 0.1% relative error.
- Concentration is verified against an independently prepared 4-point calibration curve gravimetrically prepared using balances calibrated to NIST.
- In addition, each neat material utilized has been identified and thoroughly characterized through the use of multiple analytical techniques. Spectral data is provided on subsequent pages of the COA.

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.



[Signature]

Darron Ellsworth, Quality Assurance Manager

January 28, 2016

Date

Reagent

10INDEFCL37P_00001

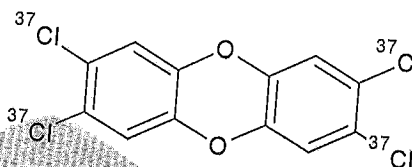
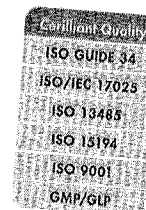
Rec'd 9/15/16
HR 0125



Revision 0
Page 1 of 4

Certificate of Analysis

2,3,7,8-Tetrachlorodibenzo-p-dioxin-³⁷Cl₄



Catalog Number: ED-907
Solution Lot: ER05211501
Expiration Date: July 2025
Solvent: n-Nonane
Volume per Ampule: Not less than 1.2 mL
Storage: Store at room temperature. Do not store cold.
Shipping: Ambient.
Intended Use: For R&D/analytical purposes only. Not suitable for human or animal consumption.
Instructions for Use: Sonicate before use.
Safety: **Danger. See Safety Data Sheet.**

- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 1.2 mL volume. We advise laboratories to quantitatively transfer desired volumes of this standard using established good laboratory practices to dilute to the desired concentration.
- For MS Applications, we advise laboratories not to mix lots during a single sequence.

Component	Solution Purity	Certified Concentration
2,3,7,8-Tetrachlorodibenzo-p-dioxin- ³⁷ Cl ₄	98.5%	50.00 ± 0.23 µg/mL
• Uncertainty of the concentration is expressed as an expanded uncertainty in accordance with ISO 17025 and Guide 34 at the approximate 95% confidence interval using a coverage factor of k = 2 and has been calculated by statistical analysis of our production system and incorporates uncertainty of the purity factor, material density, and balance and weighing technique. • This standard is prepared gravimetrically and mass results are reported on the conventional basis for weighing in air. Concentration is calculated based on: the actual measured mass; Purity Factor of the analyte(s); measured mass of the solution; and the density of the pure diluent at 20 °C. • Concentration is corrected for chromatographic purity, residual water, residual solvents and residual inorganics.		

Solution Standard Verification and Homogeneity

Standard Solution	Lot Number	Verified Concentration (µg/mL)		%RSD - Homogeneity	
		Actual Results	Acceptance Criteria	Actual Results	Acceptance Criteria
New Lot	ER05211501	50.60	± 10%	0.2	≤ 5%
Previous Lot	ER052010-02	49.73	± 10%	0.5	≤ 5%
• Concentration is verified through multiple analyses and is calculated as the average of multiple analyses compared to an independently prepared calibration solution. • Homogeneity of the New Lot is ensured through rigorous production process controls statistically analyzed to evaluate risk and verified by analysis. The % RSD of samples pulled from across the lot demonstrate homogeneity of the New Lot. • The % RSD of the Previous Lot represents variability of the analysis performed at the time of release.					

Traceability

- Gravimetrically prepared using qualified balances calibrated semi-annually by Mettler Toledo using NIST traceable weights. Calibration verification performed weekly and prior to each use utilizing NIST traceable weights. Each balance has been assigned a minimum weighing by Mettler Toledo taking into consideration the balance and installed environmental conditions to ensure weighing complies with USP tolerances of no more than 0.1% relative error.
- Concentration is verified against an independently prepared 4-point calibration curve gravimetrically prepared using balances calibrated to NIST.
- In addition, each neat material utilized has been identified and thoroughly characterized through the use of multiple analytical techniques. Spectral data is provided on subsequent pages of the COA.

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after



D. Ellsworth
Darron Ellsworth, Quality Assurance Manager

August 03, 2015

Date

Reagent

10INDFHXCDRSP_00001

Rec'd
12-5-16

HR0133



10 INDF HXCDRSP 00001

Revision 00
Page 1 of 4

Certificate of Analysis

1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin-¹³C₁₂

Certified Quality

ISO GUIDE 34
ISO/IEC 17025
ISO 13485
ISO 15194
ISO 9001
GMP/GLP

Catalog Number: ED-996
Solution Lot: ER08221601
Expiration Date: September 2026
Solvent: n-Nonane
Volume per Ampule: Not less than 1.2 mL
Storage: Store at room temperature. Do not store cold.
Intended Use: For R&D/analytical purposes only. Not suitable for human or animal consumption.
Safety: Danger. See Safety Data Sheet.

- Expiration Date has been established through real time stability studies
- Ampoules are overfilled to ensure a minimum 1.2 mL volume. We advise laboratories to quantitatively transfer desired volumes of this standard using established good laboratory practices to dilute to the desired concentration

Component	Solution Purity	Certified Concentration
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin- ¹³ C ₁₂	99.5%	50.00 ± 0.23 µg/mL
• Uncertainty of the concentration is expressed as an expanded uncertainty in accordance with ISO 17025 and Guide 34 at the approximate 95% confidence interval using a coverage factor of k = 2 and has been calculated by statistical analysis of our production system and incorporates uncertainty of the purity factor, material density, and balance and weighing technique. • This standard is prepared gravimetrically and mass results are reported on the conventional basis for weighing in air. Concentration is calculated based on: the actual measured mass; Purity Factor of the analyte(s); measured mass of the solution; and the density of the pure diluent at 20 °C. • Concentration is corrected for chromatographic purity, residual water, residual solvents and residual inorganics.		

Solution Standard Verification and Homogeneity

Standard Solution	Lot Number	Verified Concentration (µg/mL)		%RSD - Homogeneity	
		Actual Results	Acceptance Criteria	Actual Results	Acceptance Criteria
New Lot	ER08221601	49.20	± 5%	0.3	≤ 3%
Previous Lot	ER021313-01	49.56	± 5%	0.2	≤ 3%
• Concentration is verified through multiple analyses and is calculated as the average of multiple analyses compared to an independently prepared calibration solution. • Homogeneity of the New Lot is ensured through rigorous production process controls statistically analyzed to evaluate risk and verified by analysis. The % RSD of samples pulled from across the lot demonstrate homogeneity of the New Lot. • The % RSD of the Previous Lot represents variability of the analysis performed at the time of release.					

Traceability

- Gravimetrically prepared using qualified balances calibrated semi-annually by Mettler Toledo using NIST traceable weights. Calibration verification performed weekly and prior to each use utilizing NIST traceable weights. Each balance has been assigned a minimum weighing by Mettler Toledo taking into consideration the balance and installed environmental conditions to ensure weighing complies with USP tolerances of no more than 0.10% relative error.
- Concentration is verified against an independently prepared 4-point calibration curve gravimetrically prepared using balances calibrated to NIST.
- In addition, each neat material utilized has been identified and thoroughly characterized through the use of multiple analytical techniques. Spectral data is provided on subsequent pages of the COA.

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.



[Signature]

Darron Ellsworth, Quality Assurance Manager

September 28, 2016

Date

Reagent

10INDEFTCDDRSP_00001

Rec'd
 12-5-16

10INDFTCDORSPO0001

HRO132


 Revision 01
 Page 1 of 5

Certificate of Analysis

1,2,3,4-Tetrachlorodibenzo-p-dioxin-¹³C₁₂

Cerilliant Quality

ISO GUIDE 34

CERTIFICATE REFERENCE

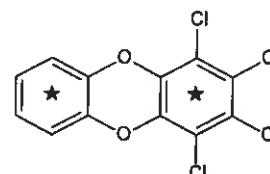
ISO/IEC 17025

CERTIFICATE ATTACHMENT

ISO 9001:2008

CERTIFICATE 3024

Catalog Number: ED-911
Solution Lot: ER060710-01
Expiration Date: June 2020
Solvent: n-Nonane
Volume per Ampule: Not less than 1.2 mL
Storage: Room temperature. Do not store cold.
Intended Use: For laboratory use only. Not suitable for human or animal consumption.
Safety: Danger. See Safety Data Sheet.



- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 1.2 mL volume fill. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

Component	Chromatographic Purity	Certified Concentration
1,2,3,4-TCDD- ¹³ C ₁₂	99.5%	50.00 ± 0.32 µg/mL
• Uncertainty of the concentration is expressed as an expanded uncertainty in accordance with ISO 17025 and Guide 34 at the approximate 95% confidence interval using a coverage factor of k = 2 and has been calculated by statistical analysis of our production system and incorporates uncertainty of the purity factor, material density, and balance and weighing technique. • Concentration is corrected for chromatographic purity, residual water, residual solvents and residual inorganics		

Solution Standard Verification and Homogeneity

Standard Solution	Lot Number	Verified Concentration (µg/mL)		%RSD - Homogeneity	
		Actual Results	Acceptance Criteria	Actual Results	Acceptance Criteria
New Lot	ER060710-01	49.1	± 3%	0.6	≤ 3%
Previous Lot	ER122203-01	49.8	± 3%	1.0	≤ 3%
• Concentration is verified through multiple analyses and is calculated as the average of multiple analyses compared to an independently prepared calibration solution. • Homogeneity of the New Lot is ensured through rigorous production process controls statistically analyzed to evaluate risk and verified by analysis. The % RSD of samples pulled from across the lot demonstrate homogeneity of the New Lot. • The % RSD of the Previous Lot represents variability of the analysis performed at the time of release.					

Traceability

- Gravimetrically prepared using qualified balances calibrated semi-annually by Mettler Toledo using NIST traceable weights. Calibration verification performed weekly and prior to each use utilizing NIST traceable weights. Each balance has been assigned a minimum weighing by Mettler Toledo taking into consideration the balance and installed environmental conditions to ensure weighing complies with USP tolerances of no more than 0.1% relative error.
- Concentration is verified against an independently prepared 4-point calibration curve gravimetrically prepared using balances calibrated to NIST.
- In addition, each neat material utilized has been identified and thoroughly characterized through the use of multiple analytical techniques. Spectral data is provided on subsequent pages of the COA.

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.




Darron Ellsworth, Quality Assurance Manager

July 18, 2015

Date

Reagent

10MXDFC13ISP_00020



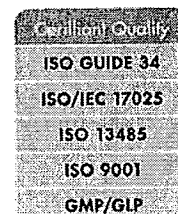
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11/11-28-18
10MX DF C13 ISP 000 20



Revision 00
Page 1 of 3

Certificate of Analysis

Labeled Compound Stock Solution



Catalog Number: EDF-8999
Solution Lot: ER05281501
Expiration Date: September 2025
Solvent: n-Nonane
Volume per Ampule: Not less than 500 μ L
Storage: Store at room temperature. Do not store cold.
Intended Use: **Sonicate before use.** For R&D/ analytical purposes only. Not suitable for human or animal consumption.
Safety: **Danger. See Safety Data Sheet.**

- * Expiration Date has been established through real time stability studies.
- * Ampules are overfilled to ensure a minimum 500 μ L volume. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

Component	Lot Number	CAS Number	Chemical Formula	Molecular Weight	Chromatographic Purity	Concentration
2,3,7,8-TCDD- $^{13}\text{C}_{12}$	ER01031401	76523-40-5	$^{13}\text{C}_{12}\text{H}_4\text{O}_2\text{Cl}_4$	333.88	98.9%	100.0 $\pm$ 1.0 ng/mL
2,3,7,8-TCDF- $^{13}\text{C}_{12}$	ER12101304	89059-46-1	$^{13}\text{C}_{12}\text{H}_4\text{OCl}_4$	317.88	99.2%	100.0 $\pm$ 1.0 ng/mL
1,2,3,7,8-PCDD- $^{13}\text{C}_{12}$	ER08041401	109719-79-1	$^{13}\text{C}_{12}\text{H}_2\text{O}_2\text{Cl}_5$	368.33	98.9%	100.0 $\pm$ 1.0 ng/mL
1,2,3,7,8-PCDF- $^{13}\text{C}_{12}$	ER012111-01	109719-77-9	$^{13}\text{C}_{12}\text{H}_3\text{OCl}_5$	352.33	99.2%	100.0 $\pm$ 1.0 ng/mL
2,3,4,7,8-PCDF- $^{13}\text{C}_{12}$	ER102607-01	116843-02-8	$^{13}\text{C}_{12}\text{H}_3\text{OCl}_5$	352.33	99.0%	100.0 $\pm$ 1.0 ng/mL
1,2,3,4,7,8-HxCDD- $^{13}\text{C}_{12}$	ER102711-01	109719-80-4	$^{13}\text{C}_{12}\text{H}_2\text{O}_2\text{Cl}_6$	402.77	99.2%	100.0 $\pm$ 1.0 ng/mL
1,2,3,6,7,8-HxCDD- $^{13}\text{C}_{12}$	ER010209-01	109719-81-5	$^{13}\text{C}_{12}\text{H}_2\text{O}_2\text{Cl}_6$	402.77	99.5%	100.0 $\pm$ 1.0 ng/mL
1,2,3,4,7,8-HxCDF- $^{13}\text{C}_{12}$	ER072810-02	114423-98-2	$^{13}\text{C}_{12}\text{H}_2\text{OCl}_6$	386.77	99.6%	100.0 $\pm$ 1.0 ng/mL
1,2,3,6,7,8-HxCDF- $^{13}\text{C}_{12}$	ER053107-03	116843-03-9	$^{13}\text{C}_{12}\text{H}_2\text{OCl}_6$	386.77	98.1%	100.0 $\pm$ 1.0 ng/mL
1,2,3,7,8,9-HxCDF- $^{13}\text{C}_{12}$	ER100610-01	116843-04-0	$^{13}\text{C}_{12}\text{H}_2\text{OCl}_6$	386.77	99.5%	100.0 $\pm$ 1.0 ng/mL
2,3,4,6,7,8-HxCDF- $^{13}\text{C}_{12}$	ER100610-02	116843-05-1	$^{13}\text{C}_{12}\text{H}_2\text{OCl}_6$	386.77	99.4%	100.0 $\pm$ 1.0 ng/mL
1,2,3,4,6,7,8-HpCDD- $^{13}\text{C}_{12}$	ER111010-01	109719-83-7	$^{13}\text{C}_{12}\text{HO}_2\text{Cl}_7$	437.22	98.9%	100.0 $\pm$ 1.0 ng/mL
1,2,3,4,6,7,8-HpCDF- $^{13}\text{C}_{12}$	ER08101404	109719-84-8	$^{13}\text{C}_{12}\text{HOCl}_7$	421.22	98.7%	100.0 $\pm$ 1.0 ng/mL
1,2,3,4,7,8,9-HpCDF- $^{13}\text{C}_{12}$	ER053107-02	109719-94-0	$^{13}\text{C}_{12}\text{HOCl}_7$	421.22	98.3%	100.0 $\pm$ 1.0 ng/mL
OCDD- $^{13}\text{C}_{12}$	ER071610-01	114423-97-1	$^{13}\text{C}_{12}\text{O}_2\text{Cl}_8$	471.66	98.9%	200.0 $\pm$ 2.0 ng/mL

* Uncertainty of the concentration is expressed as an expanded uncertainty in accordance with ISO 17025 and Guide 34 at the approximate 95% confidence interval using a coverage factor of $k = 2$ and has been calculated by statistical analysis of our production system and incorporates uncertainty of the purity factor, material density, and balance and weighing technique.

* Stock solution concentration is corrected for chromatographic purity, residual water, residual solvents and residual inorganics.

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.



Darren Ellsworth, Quality Assurance Manager

November 11, 2015

Date

Reagent

10MXDFNATP_00002



Rec'd 9/12/18
10MXDFNATP00002

HR0164

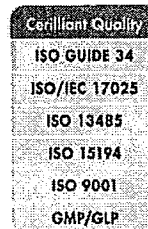


Revision 01
Page 1 of 4

Certificate of Analysis

Method 1613 PAR Stock Solution

Catalog Number: EDF-7999-10X
Solution Lot: ER02241602
Expiration Date: April 2026
Solvent: n-Nonane
Volume per Ampule: Not less than 1.2 mL
Storage: Store at room temperature. Do not store cold.
Intended Use: For R&D/ analytical purposes only. Not suitable for human or animal consumption.
Safety: Danger. See Safety Data Sheet.



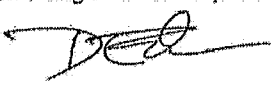
- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 1.2 volume. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

Component	Lot Number	CAS Number	Chemical Formula	Molecular Weight	Chromatographic Purity	Concentration
2,3,7,8-TeCDD	ER04271502	1746-01-6	C ₁₂ H ₄ Cl ₄ O ₂	321.97	99.2%	399.9 ± 4.0 ng/mL
2,3,7,8-TeCDF	ER101211-02	51207-31-9	C ₁₂ H ₃ Cl ₃ O	305.97	99.4%	399.9 ± 4.0 ng/mL
1,2,3,7,8-PeCDD	ER110909-02	40321-76-4	C ₁₂ H ₃ Cl ₃ O ₂	356.42	99.2%	2000 ± 20 ng/mL
1,2,3,7,8-PeCDF	ER03121401	57117-41-6	C ₁₂ H ₃ Cl ₃ O	340.42	99.5%	1999 ± 20 ng/mL
2,3,4,7,8-PeCDF	ER070710-01	57117-31-4	C ₁₂ H ₃ Cl ₃ O	340.42	99.4%	1999 ± 20 ng/mL
1,2,3,4,7,8-HxCDD	ER080108-02	39227-28-6	C ₁₂ H ₂ Cl ₆ O ₂	390.86	98.6%	2000 ± 20 ng/mL
1,2,3,6,7,8-HxCDD	ER03231501	57653-85-7	C ₁₂ H ₂ Cl ₆ O ₂	390.86	99.6%	2000 ± 20 ng/mL
1,2,3,7,8,9-HxCDD	ER02041601	19408-74-3	C ₁₂ H ₂ Cl ₆ O ₂	390.86	99.2%	2000 ± 20 ng/mL
1,2,3,4,7,8-HxCDF	ER021110-01	70648-26-9	C ₁₂ H ₃ Cl ₅ O	374.86	99.0%	2000 ± 20 ng/mL
1,2,3,6,7,8-HxCDF	ER04161501	57117-44-9	C ₁₂ H ₃ Cl ₅ O	374.86	99.8%	2000 ± 20 ng/mL
1,2,3,7,8,9-HxCDF	ER060107-01	72918-21-9	C ₁₂ H ₃ Cl ₅ O	374.86	97.5%	1999 ± 20 ng/mL
2,3,4,6,7,8-HxCDF	ER02041602	60851-34-5	C ₁₂ H ₃ Cl ₅ O	374.86	99.1%	2001 ± 20 ng/mL
1,2,3,4,6,7,8-HpCDD	ER01201504	35822-46-9	C ₁₂ HCl ₇ O ₂	425.31	98.5%	1999 ± 20 ng/mL
1,2,3,4,6,7,8-HpCDF	ER02281403	67562-39-4	C ₁₂ HCl ₇ O	409.31	98.9%	1999 ± 20 ng/mL
1,2,3,4,7,8,9-HpCDF	ER01121503	55673-89-7	C ₁₂ HCl ₇ O	409.31	99.1%	1999 ± 20 ng/mL
OCDD	ER05221301	3268-87-9	C ₁₂ Cl ₈ O ₂	459.75	99.9%	3999 ± 40 ng/mL
OCDF	ER040811-01	39001-02-0	C ₁₂ Cl ₈ O	443.75	98.9%	4000 ± 40 ng/mL

- Uncertainty of the concentration is expressed as an expanded uncertainty in accordance with ISO 17025 and Guide 34 at the approximate 95% confidence interval using a coverage factor of k = 2 and has been calculated by statistical analysis of our production system and incorporates uncertainty of the purity factor, material density, and balance and weighing technique.
- Stock solution concentration is corrected for chromatographic purity, residual water, residual solvents and residual inorganics.

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.




Darron Ellsworth, Quality Assurance Manager

April 28, 2016

Date

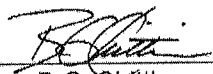
Reagent

61CV1613S_00001

Table A: EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5);
Components and Concentrations (ng/ml, $\pm$ 5% in nonane/toluene)

Compound	Concentration (ng/ml)						
	CS1	CS2	CS3	CS4	CS5	CSL	CS0.5
Native PCDDs and PCDFs:							
2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
2,3,7,8-TCDF	0.5	2	10	40	200	0.1	0.25
1,2,3,7,8-PeCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8,9-HpCDF	2.5	10	50	200	1000	0.5	1.25
OCDD	5.0	20	100	400	2000	1.0	2.5
OCDF	5.0	20	100	400	2000	1.0	2.5
Labelled PCDDs and PCDFs:							
¹³ C ₁₂ -2,3,7,8-TCDD	100	100	100	100	100	100	100
¹³ C ₁₂ -2,3,7,8-TCDF	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,7,8-PeCDD	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,7,8-PeCDF	100	100	100	100	100	100	100
¹³ C ₁₂ -2,3,4,7,8-PeCDF	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,4,7,8-HxCDD	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,6,7,8-HxCDD	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,4,7,8-HxCDF	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,6,7,8-HxCDF	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,7,8,9-HxCDF	100	100	100	100	100	100	100
¹³ C ₁₂ -2,3,4,6,7,8-HxCDF	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDD	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDF	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,4,7,8,9-HpCDF	100	100	100	100	100	100	100
¹³ C ₁₂ -OCDD	200	200	200	200	200	200	200
Cleanup Standard:							
³⁷ Cl ₄ -2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
Internal Standards:							
¹³ C ₁₂ -1,2,3,4-TCDD	100	100	100	100	100	100	100
¹³ C ₁₂ -1,2,3,7,8,9-HxCDD	100	100	100	100	100	100	100
Percent toluene (v/v)	3.6%	3.7%	4.2%	6.1%	16.2%	3.6%	3.6%

Certified By:


B.G. Chittim

Date: 02/03/2014
(mm/dd/yyyy)



WELLINGTON
LABORATORIES

Rec'd
5-27-09

opened 4-12-10
4104:51

CERTIFICATE OF ANALYSIS/DOCUMENTATION

EPA-1613CVS
U.S. EPA Method 1613
Calibration and Verification Solutions
plus
Supplemental Calibration Solutions
EPA-1613CSL & EPA-1613CS0.5

DESCRIPTION:

EPA-1613CVS is a series of 5 HRGC/HRMS calibration solutions containing native and mass-labelled chlorinated dibenzo-p-dioxin (PCDD) and dibenzofuran (PCDF) congeners in nonane.

PRODUCT CODES

EPA-1613CVS
EPA-1613CS1
EPA-1613CS2
EPA-1613CS3
EPA-1613CS4
EPA-1613CS5

LOT NUMBERS

see below
13CS11107
13CS21107
13CS31107
13CS41107
13CS51107

Note: EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to this calibration set and are ordered separately.

EPA-1613CS0.5
EPA-1613CSL

13CS0.51107
13CSL1107

DATE PREPARED: (mm/dd/yyyy)

12/07/2007

LAST TESTED: (mm/dd/yyyy)

12/07/2007 (HRGC/HRMS)

EXPIRY DATE:

12/07/2014

DETAILS:

These solutions contain native ($^{12}\text{C}_{12}$) and mass-labelled ($^{13}\text{C}_{12}$ and $^{37}\text{Cl}_4$) PCDDs and PCDFs in the concentrations given in Table A in nonane. They are designed to be used as received.

According to U.S. EPA Method 1613, these solutions (CS1-CS5) are used to calibrate the HRGC/HRMS system prior to performing analyses on cleaned-up sample extracts. In addition, solution CS3 is used to verify the original calibration and CS1 is used to establish the required sensitivity of the HRGC/HRMS.

EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to EPA-1613CVS. Neither is required by the method but either or both can be used to extend the calibration to lower levels.

EPA-1613CVS with EPA-1613CSL and EPA-1613CS0.5 were tested by HRGC/HRMS and found to give a linear calibration. The 5-point calibration summary for EPA-1613CVS is given in Table B and the 7-point calibration summary including both EPA-1613CSL and EPA-1613CS0.5 is shown in Table C. HRGC/HRMS data acquired for EPA-1613CS3, is shown in Figure 1.

ADDITIONAL INFORMATION:

For additional information including potential hazards, handling/storage, accuracy, and shelf life please request a copy of our Reference and Handling Guide. For your convenience this can be downloaded from our website at www.well-labs.com.

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA

Reagent

61INC13OCDFP_00001



Rec'd

61INC130CPFP
HR0078

DH/10-17-13

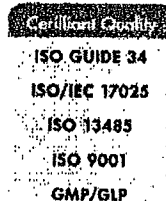


Revision 0

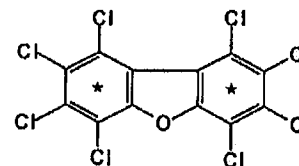
Page 1 of 4

Certificate of Analysis

Octachlorodibenzofuran-¹³C₁₂



Catalog Number: EF-983
Solution Lot: ER062011-01
Expiration Date: June 2021
Solvent: n-Nonane
Volume per Ampule: Not less than 1.2 mL
Storage: Store at room temperature. Do not store cold.
Intended Use: For R&D/analytical purposes only. Not suitable for human or animal consumption.
Safety: Flammable



- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 1.2 mL volume fill. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

Component	Solution Purity	Certified Concentration
Octachlorodibenzofuran- ¹³ C ₁₂	99.4%	49.88 ± 0.31 µg/mL
• Uncertainty of the concentration is expressed as an expanded uncertainty in accordance with ISO 17025 and Guide 34 at the approximate 95% confidence interval using a coverage factor of k = 2 and has been calculated by statistical analysis of our production system and incorporates uncertainty of the purity factor, material density, and balance and weighing technique. • This standard is prepared gravimetrically and mass results are reported on the conventional basis for weighing in air. Concentration is calculated based on: the actual measured mass; Purity Factor of the analyte(s); measured mass of the solution; and the density of the pure diluent at 20°C. • Concentration is corrected for chromatographic purity, residual water, residual solvents and residual inorganics.		

Solution Standard Verification and Homogeneity

Standard Solution	Lot Number	Verified Concentration (µg/mL)		%RSD - Homogeneity	
		Actual Results	Acceptance Criteria	Actual Results	Acceptance Criteria
New Lot	ER062011-01	47.3	± 5%	0.7	≤ 3%
Previous Lot	ER121410-01	50.5	± 5%	0.8	≤ 3%
• Concentration is verified through multiple analyses and is calculated as the average of multiple analyses compared to an independently prepared calibration solution. • Homogeneity of the New Lot is ensured through rigorous production process controls statistically analyzed to evaluate risk and verified by analysis. The % RSD of samples pulled from across the lot demonstrate homogeneity of the New Lot. • The % RSD of the Previous Lot represents variability of the analysis performed at the time of release					

Traceability

- Gravimetrically prepared using qualified balances calibrated semi-annually by Mettler Toledo using NIST traceable weights. Calibration verification performed weekly and prior to each use utilizing NIST traceable weights. Each balance has been assigned a minimum weighing by Mettler Toledo taking into consideration the balance and installed environmental conditions to ensure weighing complies with USP tolerances of no more than 0.1% relative error.
- Concentration is verified against an independently prepared 4-point calibration curve gravimetrically prepared using balances calibrated to NIST.
- In addition, each neat material utilized has been identified and thoroughly characterized through the use of multiple analytical techniques. Spectral data is provided on subsequent pages of the COA.

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.



Lara Sparks
Lara Sparks, Quality Assurance Director

October 26, 2011

Date

Reagent

61L11613P_00001



Cerilliant
Analytical Reference Standards
a SIGMA-ALDRICH company

Rec'd
DM/10-17-13

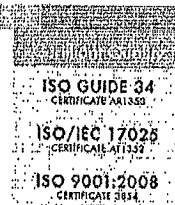
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Revision 0
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Certificate of Analysis

Method 1613 Calibration Solutions (CS1 - CS5)



Catalog Number: EDF-9999
Kit Lot: ER031611-01

Solution	C1	C2	C3	C4	C5
Product Number	EDF-9999-1	EDF-9999-2	EDF-9999-3	EDF-9999-4	EDF-9999-5
Lot Number	ER031611-01A	ER031611-01B	ER031611-01C	ER031611-01D	ER031611-01E

Expiration Date: March 2021
Solvent: n-Nonane
Volume per Ampule: Not less than 0.2 mL
Storage: Store at room temperature. Do not store cold.
Intended Use: For R&D/analytical purposes only. Not suitable for human or animal consumption.
Safety: Flammable

- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 0.2 mL volume. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.

Lara Sparks

Lara Sparks, Quality Assurance Director

April 25, 2011

Date

Compound	Prepared Concentration (ng/mL)				
	CS1	CS2	CS3	CS4	CS5
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.50	2.00	10.0	40.0	200.0
2,3,7,8-Tetrachlorodibenzofuran	0.50	2.00	10.0	40.0	200.0
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	2.50	10.0	50.0	200.0	1000
1,2,3,7,8-Pentachlorodibenzofuran	2.50	10.0	50.0	200.0	1000
2,3,4,7,8-Pentachlorodibenzofuran	2.50	10.0	50.0	200.0	1000
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	2.50	10.0	50.0	200.0	1000
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	2.50	10.0	50.0	200.0	1000
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.50	10.0	50.0	200.0	1000
1,2,3,4,7,8-Hexachlorodibenzofuran	2.50	10.0	50.0	200.0	1000
1,2,3,6,7,8-Hexachlorodibenzofuran	2.50	10.0	50.0	200.0	1000
1,2,3,7,8,9-Hexachlorodibenzofuran	2.50	10.0	50.0	200.0	1000
2,3,4,6,7,8-Hexachlorodibenzofuran	2.50	10.0	50.0	200.0	1000
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.50	10.0	50.0	200.0	1000
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.50	10.0	50.0	200.0	1000
1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.50	10.0	50.0	200.0	1000
Octachlorodibenzo-p-dioxin	5.00	20.0	100.0	400.0	2000
Octachlorodibenzofuran	5.00	20.0	100.0	400.0	2000
1,2,3,4-Tetrachlorodibenzo-p-dioxin- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
2,3,7,8-Tetrachlorodibenzo-p-dioxin- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
2,3,7,8-Tetrachlorodibenzo-p-dioxin- ³⁷ Cl ₄	0.50	2.00	10.0	40.0	200.0
2,3,7,8-Tetrachlorodibenzofuran- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,7,8-Pentachlorodibenzo-p-dioxin- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,7,8-Pentachlorodibenzofuran- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
2,3,4,7,8-Pentachlorodibenzofuran- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,4,7,8-Hexachlorodibenzofuran- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,6,7,8-Hexachlorodibenzofuran- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,7,8,9-Hexachlorodibenzofuran- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
2,3,4,6,7,8-Hexachlorodibenzofuran- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,4,6,7,8-Heptachlorodibenzofuran- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
1,2,3,4,7,8,9-Heptachlorodibenzofuran- ¹³ C ₁₂	100.0	100.0	100.0	100.0	100.0
Octachlorodibenzo-p-dioxin- ¹³ C ₁₂	200.0	200.0	200.0	200.0	200.0

Reagent

61L31613P_00001

Certificate of Analysis



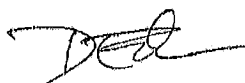
Method 1613 Daily Calibration with Window Definer and Isomer Specificity

Catalog Number: EDF-4141 *A-E (Svials)*
Solution Lot: ER011711-01
Expiration Date: January 2021
Solvent: n-Nonane
Volume per Ampule: Not less than 200 µL
Storage: Store at room temperature. Do not store cold.
Intended Use: For laboratory use only. Not suitable for human or animal consumption.
Safety: **Danger. See Safety Data Sheet.**

- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 200 µL volume. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

*Rec'd 8/10/16
W/S Barlow*

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.



Darron Ellsworth, Quality Assurance Manager

February 25, 2016

Date

Native Dioxins/Furans

Compound	Lot Number	CAS Number	Chemical Formula	Molecular Weight	Chromatographic Purity	Concentration ¹
1,2,3,4-TCDD	ER080408-01	30746-58-8	C ₁₂ H ₄ O ₂ Cl ₄	321.97	97%	10.0 ± 1.0 ng/mL
1,2,3,7/1,2,3,8-TCDD	ER021510-01	67326-52-7	C ₁₂ H ₄ O ₂ Cl ₄	321.97	100%	10.0 ± 1.0 ng/mL
1,2,3,9-TCDD	ER122804-01	712669-26-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	98%	10.0 ± 1.0 ng/mL
1,2,8,9-TCDD	35166-60	62740-54-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	98%	10.0 ± 1.0 ng/mL
1,3,6,8-TCDD	34706-74	33423-92-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	100%	10.0 ± 1.0 ng/mL
2,3,7,8-TCDD	ER030907-02	1746-01-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	99%	10.0 ± 1.0 ng/mL
1,2,3,7,8-PeCDD	ER010209-01	40321-76-4	C ₁₃ H ₃ O ₂ Cl ₅	356.42	99%	50.0 ± 5.0 ng/mL
1,2,3,8,9-PeCDD	ER122704-02	71925-18-3	C ₁₃ H ₃ O ₂ Cl ₅	356.42	98%	50.0 ± 5.0 ng/mL
1,2,4,6,8/1,2,4,7,9-PeCDD	35124-73	NA	C ₁₃ H ₃ O ₂ Cl ₅	356.42	99%	50.0 ± 5.0 ng/mL
1,2,3,4,7,8-HxCDD	ER092005-03	39227-28-6	C ₁₄ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,3,6,7,8-HxCDD	ER092507-01	57653-85-7	C ₁₄ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,3,7,8,9-HxCDD	35166-61	19408-74-3	C ₁₄ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,4,6,7,9/1,2,4,6,8,9-HxCDD	ER010705-01	NA	C ₁₄ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,3,4,6,7,8-HpCDD	ER031507-03	35822-46-9	C ₁₂ HO ₂ Cl ₇	425.31	99%	50.0 ± 5.0 ng/mL
1,2,3,4,6,7,9-HpCDD	ER021105-05	58200-70-7	C ₁₂ HO ₂ Cl ₇	425.31	99%	50.0 ± 5.0 ng/mL
OCDD	ER082306-02	3268-87-9	C ₁₂ O ₂ Cl ₈	459.75	99%	100 ± 10 ng/mL
1,2,8,9-TCDF	ER041508-03	70648-22-5	C ₁₂ H ₄ OC ₂ Cl ₄	305.97	99%	10.0 ± 1.0 ng/mL
1,3,6,8-TCDF	ER021808-01	71998-72-6	C ₁₂ H ₄ OC ₂ Cl ₄	305.97	99%	10.0 ± 1.0 ng/mL
2,3,7,8-TCDF	ER02208-01	51207-31-9	C ₁₂ H ₄ OC ₂ Cl ₄	305.98	99%	10.0 ± 1.0 ng/mL
1,2,3,7,8-PeCDF	ER082508-01	57117-41-6	C ₁₃ H ₃ OC ₂ Cl ₅	340.42	98%	50.0 ± 5.0 ng/mL
1,2,3,8,9-PeCDF	ER061604-05	83704-54-5	C ₁₃ H ₃ OC ₂ Cl ₅	340.42	98%	50.0 ± 5.0 ng/mL
1,3,4,6,8-PeCDF	ER102904-01	83704-55-6	C ₁₃ H ₃ OC ₂ Cl ₅	340.42	99%	50.0 ± 5.0 ng/mL
2,3,4,7,8-PeCDF	ER011807-01	57117-31-4	C ₁₃ H ₃ OC ₂ Cl ₅	340.42	98%	50.0 ± 5.0 ng/mL
1,2,3,4,6,8-HxCDF	ER111704-01	69698-60-8	C ₁₄ H ₂ OC ₂ Cl ₆	374.86	99%	50.0 ± 5.0 ng/mL
1,2,3,4,7,8-HxCDF	ER102607-01	70648-26-9	C ₁₄ H ₂ OC ₂ Cl ₆	374.86	99%	50.0 ± 5.0 ng/mL
1,2,3,4,8,9-HxCDF	ER031105-01	93241-07-6	C ₁₄ H ₂ OC ₂ Cl ₆	374.86	99%	50.0 ± 5.0 ng/mL
1,2,3,6,7,8-HxCDF	ER011907-01	57117-44-9	C ₁₄ H ₂ OC ₂ Cl ₆	374.86	98%	50.0 ± 5.0 ng/mL
1,2,3,7,8,9-HxCDF	ER053107-03	72918-21-9	C ₁₄ H ₂ OC ₂ Cl ₆	374.86	98%	50.0 ± 5.0 ng/mL
2,3,4,6,7,8-HxCDF	ER020705-01	60851-34-5	C ₁₄ H ₂ OC ₂ Cl ₆	374.86	98%	50.0 ± 5.0 ng/mL
1,2,3,4,6,7,8-HpCDF	ER020907-02	67562-39-4	C ₁₂ HOCl ₇	409.31	99%	50.0 ± 5.0 ng/mL
1,2,3,4,7,8,9-HpCDF	ER053107-02	55673-89-7	C ₁₂ HOCl ₇	409.31	99%	50.0 ± 5.0 ng/mL
OCDF	ER072004-03	39001-02-0	C ₁₂ OC ₂ Cl ₈	443.75	99%	100 ± 10 ng/mL

¹ The estimated uncertainty for this standard is ± 10% at 95% confidence interval (k=2). This value incorporates uncertainty estimate from manufacturing process and analytical verification of concentration and homogeneity.

Labeled Dioxins/Furans

Compound	Lot Number	CAS Number	Chemical Formula	Molecular Weight	Chromatographic Purity	Concentration ¹
1,2,3,4-TCDD- ¹³ C ₁₂	ER122203-01	114423-99-3	¹³ C ₁₂ H ₄ O ₂ Cl ₄	333.88	99%	100 ± 10 ng/mL
2,3,7,8-TCDD- ¹³ C ₁₂	ER060407-02	76523-40-5	¹³ C ₁₂ H ₄ O ₂ Cl ₄	333.88	99%	100 ± 10 ng/mL
2,3,7,8-TCDD- ³⁷ Cl ₄	ER060407-02	85508-50-5	C ₁₂ H ₄ O ₂ ³⁷ Cl ₄	333.88	97%	10.0 ± 1.0 ng/mL
1,2,3,7,8-PeCDD- ¹³ C ₁₂	ER030907-01	109719-79-1	¹³ C ₁₂ H ₃ O ₂ Cl ₅	368.33	99%	100 ± 10 ng/mL
1,2,3,4,7,8-HxCDD- ¹³ C ₁₂	ER012208-01	109719-80-4	¹³ C ₁₂ H ₂ O ₂ Cl ₆	402.77	98%	100 ± 10 ng/mL
1,2,3,6,7,8-HxCDD- ¹³ C ₁₂	ER010209-01	109719-81-5	¹³ C ₁₂ H ₂ O ₂ Cl ₆	402.77	99%	100 ± 10 ng/mL
1,2,3,7,8,9-HxCDD- ¹³ C ₁₂	ER082508-01	109719-82-6	¹³ C ₁₂ H ₂ O ₂ Cl ₆	402.77	99%	100 ± 10 ng/mL
1,2,3,4,6,7,8-HpCDD- ¹³ C ₁₂	ER011807-01	109719-83-7	¹³ C ₁₂ H ₂ O ₂ Cl ₇	437.22	98%	100 ± 10 ng/mL
OCDD- ¹³ C ₁₂	ER092005-03	114423-97-1	¹³ C ₁₂ O ₂ Cl ₈	471.66	99%	200 ± 20 ng/mL
2,3,7,8-TCDF- ¹³ C ₁₂	ER092507-01	89059-46-1	¹³ C ₁₂ H ₃ OCl ₅	317.88	99%	100 ± 10 ng/mL
1,2,3,7,8-PeCDF- ¹³ C ₁₂	35166-61	109719-77-9	¹³ C ₁₂ H ₃ OCl ₅	352.33	99%	100 ± 10 ng/mL
2,3,4,7,8-PeCDF- ¹³ C ₁₂	ER102607-01	116843-02-8	¹³ C ₁₂ H ₃ OCl ₅	352.33	99%	100 ± 10 ng/mL
1,2,3,4,7,8-HxCDF- ¹³ C ₁₂	ER011907-01	114423-98-2	¹³ C ₁₂ H ₂ OCl ₆	386.77	99%	100 ± 10 ng/mL
1,2,3,6,7,8-HxCDF- ¹³ C ₁₂	ER053107-03	116843-03-9	¹³ C ₁₂ H ₂ OCl ₆	386.77	98%	100 ± 10 ng/mL
1,2,3,7,8,9-HxCDF- ¹³ C ₁₂	ER100107-01	116843-04-0	¹³ C ₁₂ H ₂ OCl ₆	386.77	99%	100 ± 10 ng/mL
2,3,4,6,7,8-HxCDF- ¹³ C ₁₂	ER031507-03	116843-05-1	¹³ C ₁₂ H ₂ OCl ₆	386.77	99%	100 ± 10 ng/mL
1,2,3,4,6,7,8-HpCDF- ¹³ C ₁₂	ER020907-02	109719-84-8	¹³ C ₁₂ HOCl ₇	421.22	98%	100 ± 10 ng/mL
1,2,3,4,7,8,9-HpCDF- ¹³ C ₁₂	ER053107-02	109719-94-0	¹³ C ₁₂ HOCl ₇	421.22	98%	100 ± 10 ng/mL

¹ The estimated uncertainty for this standard is ± 10% at 95% confidence interval (k=2). This value incorporates uncertainty estimate from manufacturing process and analytical verification of concentration and homogeneity.

Reagent

61WDML3P_00001

Certificate of Analysis



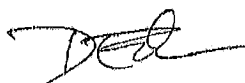
Method 1613 Daily Calibration with Window Definer and Isomer Specificity

Catalog Number: EDF-4141 *A-E (Svials)*
Solution Lot: ER011711-01
Expiration Date: January 2021
Solvent: n-Nonane
Volume per Ampule: Not less than 200 µL
Storage: Store at room temperature. Do not store cold.
Intended Use: For laboratory use only. Not suitable for human or animal consumption.
Safety: **Danger. See Safety Data Sheet.**

- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 200 µL volume. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

*Rec'd 8/10/16
W/S Barlow*

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.



Darron Ellsworth, Quality Assurance Manager

February 25, 2016

Date

Native Dioxins/Furans

Compound	Lot Number	CAS Number	Chemical Formula	Molecular Weight	Chromatographic Purity	Concentration ¹
1,2,3,4-TCDD	ER080408-01	30746-58-8	C ₁₂ H ₄ O ₂ Cl ₄	321.97	97%	10.0 ± 1.0 ng/mL
1,2,3,7/1,2,3,8-TCDD	ER021510-01	67326-52-7	C ₁₂ H ₄ O ₂ Cl ₄	321.97	100%	10.0 ± 1.0 ng/mL
1,2,3,9-TCDD	ER122804-01	712669-26-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	98%	10.0 ± 1.0 ng/mL
1,2,8,9-TCDD	35166-60	62740-54-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	98%	10.0 ± 1.0 ng/mL
1,3,6,8-TCDD	34706-74	33423-92-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	100%	10.0 ± 1.0 ng/mL
2,3,7,8-TCDD	ER030907-02	1746-01-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	99%	10.0 ± 1.0 ng/mL
1,2,3,7,8-PeCDD	ER010209-01	40321-76-4	C ₁₂ H ₃ O ₂ Cl ₅	356.42	99%	50.0 ± 5.0 ng/mL
1,2,3,8,9-PeCDD	ER122704-02	71925-18-3	C ₁₂ H ₃ O ₂ Cl ₅	356.42	98%	50.0 ± 5.0 ng/mL
1,2,4,6,8/1,2,4,7,9-PeCDD	35124-73	NA	C ₁₂ H ₃ O ₂ Cl ₅	356.42	99%	50.0 ± 5.0 ng/mL
1,2,3,4,7,8-HxCDD	ER092005-03	39227-28-6	C ₁₂ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,3,6,7,8-HxCDD	ER092507-01	57653-85-7	C ₁₂ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,3,7,8,9-HxCDD	35166-61	19408-74-3	C ₁₂ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,4,6,7,9/1,2,4,6,8,9-HxCDD	ER010705-01	NA	C ₁₂ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,3,4,6,7,8-HpCDD	ER031507-03	35822-46-9	C ₁₂ HO ₂ Cl ₇	425.31	99%	50.0 ± 5.0 ng/mL
1,2,3,4,6,7,9-HpCDD	ER021105-05	58200-70-7	C ₁₂ HO ₂ Cl ₇	425.31	99%	50.0 ± 5.0 ng/mL
OCDD	ER082306-02	3268-87-9	C ₁₂ O ₂ Cl ₈	459.75	99%	100 ± 10 ng/mL
1,2,8,9-TCDF	ER041508-03	70648-22-5	C ₁₂ H ₄ OCl ₄	305.97	99%	10.0 ± 1.0 ng/mL
1,3,6,8-TCDF	ER021808-01	71998-72-6	C ₁₂ H ₄ OCl ₄	305.97	99%	10.0 ± 1.0 ng/mL
2,3,7,8-TCDF	ER02208-01	51207-31-9	C ₁₂ H ₄ OCl ₄	305.98	99%	10.0 ± 1.0 ng/mL
1,2,3,7,8-PeCDF	ER082508-01	57117-41-6	C ₁₂ H ₃ OCl ₅	340.42	98%	50.0 ± 5.0 ng/mL
1,2,3,8,9-PeCDF	ER061604-05	83704-54-5	C ₁₂ H ₃ OCl ₅	340.42	98%	50.0 ± 5.0 ng/mL
1,3,4,6,8-PeCDF	ER102904-01	83704-55-6	C ₁₂ H ₃ OCl ₅	340.42	99%	50.0 ± 5.0 ng/mL
2,3,4,7,8-PeCDF	ER011807-01	57117-31-4	C ₁₂ H ₃ OCl ₅	340.42	98%	50.0 ± 5.0 ng/mL
1,2,3,4,6,8-HxCDF	ER111704-01	69698-60-8	C ₁₂ H ₂ OCl ₆	374.86	99%	50.0 ± 5.0 ng/mL
1,2,3,4,7,8-HxCDF	ER102607-01	70648-26-9	C ₁₂ H ₂ OCl ₆	374.86	99%	50.0 ± 5.0 ng/mL
1,2,3,4,8,9-HxCDF	ER031105-01	93241-07-6	C ₁₂ H ₂ OCl ₆	374.86	99%	50.0 ± 5.0 ng/mL
1,2,3,6,7,8-HxCDF	ER011907-01	57117-44-9	C ₁₂ H ₂ OCl ₆	374.86	98%	50.0 ± 5.0 ng/mL
1,2,3,7,8,9-HxCDF	ER053107-03	72918-21-9	C ₁₂ H ₂ OCl ₆	374.86	98%	50.0 ± 5.0 ng/mL
2,3,4,6,7,8-HxCDF	ER020705-01	60851-34-5	C ₁₂ H ₂ OCl ₆	374.86	98%	50.0 ± 5.0 ng/mL
1,2,3,4,6,7,8-HpCDF	ER020907-02	67562-39-4	C ₁₂ HOCl ₇	409.31	99%	50.0 ± 5.0 ng/mL
1,2,3,4,7,8,9-HpCDF	ER053107-02	55673-89-7	C ₁₂ HOCl ₇	409.31	99%	50.0 ± 5.0 ng/mL
OCDF	ER072004-03	39001-02-0	C ₁₂ OCl ₈	443.75	99%	100 ± 10 ng/mL

¹ The estimated uncertainty for this standard is ± 10% at 95% confidence interval (k=2). This value incorporates uncertainty estimate from manufacturing process and analytical verification of concentration and homogeneity.

Labeled Dioxins/Furans

Compound	Lot Number	CAS Number	Chemical Formula	Molecular Weight	Chromatographic Purity	Concentration ¹
1,2,3,4-TCDD- ¹³ C ₁₂	ER122203-01	114423-99-3	¹³ C ₁₂ H ₄ O ₂ Cl ₄	333.88	99%	100 ± 10 ng/mL
2,3,7,8-TCDD- ¹³ C ₁₂	ER060407-02	76523-40-5	¹³ C ₁₂ H ₄ O ₂ Cl ₄	333.88	99%	100 ± 10 ng/mL
2,3,7,8-TCDD- ³⁷ Cl ₄	ER060407-02	85508-50-5	C ₁₂ H ₄ O ₂ ³⁷ Cl ₄	333.88	97%	10.0 ± 1.0 ng/mL
1,2,3,7,8-PeCDD- ¹³ C ₁₂	ER030907-01	109719-79-1	¹³ C ₁₂ H ₃ O ₂ Cl ₅	368.33	99%	100 ± 10 ng/mL
1,2,3,4,7,8-HxCDD- ¹³ C ₁₂	ER012208-01	109719-80-4	¹³ C ₁₂ H ₂ O ₂ Cl ₆	402.77	98%	100 ± 10 ng/mL
1,2,3,6,7,8-HxCDD- ¹³ C ₁₂	ER010209-01	109719-81-5	¹³ C ₁₂ H ₂ O ₂ Cl ₆	402.77	99%	100 ± 10 ng/mL
1,2,3,7,8,9-HxCDD- ¹³ C ₁₂	ER082508-01	109719-82-6	¹³ C ₁₂ H ₂ O ₂ Cl ₆	402.77	99%	100 ± 10 ng/mL
1,2,3,4,6,7,8-HpCDD- ¹³ C ₁₂	ER011807-01	109719-83-7	¹³ C ₁₂ HO ₂ Cl ₇	437.22	98%	100 ± 10 ng/mL
OCDD- ¹³ C ₁₂	ER092005-03	114423-97-1	¹³ C ₁₂ O ₂ Cl ₈	471.66	99%	200 ± 20 ng/mL
2,3,7,8-TCDF- ¹³ C ₁₂	ER092507-01	89059-46-1	¹³ C ₁₂ H ₃ OCl ₅	317.88	99%	100 ± 10 ng/mL
1,2,3,7,8-PeCDF- ¹³ C ₁₂	35166-61	109719-77-9	¹³ C ₁₂ H ₃ OCl ₅	352.33	99%	100 ± 10 ng/mL
2,3,4,7,8-PeCDF- ¹³ C ₁₂	ER102607-01	116843-02-8	¹³ C ₁₂ H ₃ OCl ₅	352.33	99%	100 ± 10 ng/mL
1,2,3,4,7,8-HxCDF- ¹³ C ₁₂	ER011907-01	114423-98-2	¹³ C ₁₂ H ₂ OCl ₆	386.77	99%	100 ± 10 ng/mL
1,2,3,6,7,8-HxCDF- ¹³ C ₁₂	ER053107-03	116843-03-9	¹³ C ₁₂ H ₂ OCl ₆	386.77	98%	100 ± 10 ng/mL
1,2,3,7,8,9-HxCDF- ¹³ C ₁₂	ER100107-01	116843-04-0	¹³ C ₁₂ H ₂ OCl ₆	386.77	99%	100 ± 10 ng/mL
2,3,4,6,7,8-HxCDF- ¹³ C ₁₂	ER031507-03	116843-05-1	¹³ C ₁₂ H ₂ OCl ₆	386.77	99%	100 ± 10 ng/mL
1,2,3,4,6,7,8-HpCDF- ¹³ C ₁₂	ER020907-02	109719-84-8	¹³ C ₁₂ HOCl ₇	421.22	98%	100 ± 10 ng/mL
1,2,3,4,7,8,9-HpCDF- ¹³ C ₁₂	ER053107-02	109719-94-0	¹³ C ₁₂ HOCl ₇	421.22	98%	100 ± 10 ng/mL

¹ The estimated uncertainty for this standard is ± 10% at 95% confidence interval (k=2). This value incorporates uncertainty estimate from manufacturing process and analytical verification of concentration and homogeneity.

Reagent

61WDML3P_F/L_00010

Rec'd: 11/7/19 HRD169



Revision 02
Page 1 of 4

Source name: 61WDML3P-F/L-00010

Certificate of Analysis

Cerilliant Quality

ISO GUIDE 34
CERTIFICATE ARI.353

ISO/IEC 17025
CERTIFICATE ARI.352

ISO 9001:2008
CERTIFICATE 3854

Method 1613 Daily Calibration with Window Definer and Isomer Specificity

Catalog Number: EDF-4141
Solution Lot: ER011711-01
Expiration Date: January 2021
Solvent: n-Nonane
Volume per Ampule: Not less than 200 μ L
Storage: Store at room temperature. Do not store cold.
Intended Use: For laboratory use only. Not suitable for human or animal consumption.
Safety: **Danger. See Safety Data Sheet.**

- Expiration Date has been established through real time stability studies.
- Ampules are overfilled to ensure a minimum 200 μ L volume. We advise laboratories to use measured volumes of this standard solution before diluting to the desired concentration.

Vial A
B
C
D
E

Cerilliant certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiration/retest date when stored unopened as recommended. Product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to ampoules stored after opening.

Darron Ellsworth, Quality Assurance Manager

February 25, 2016

Date

Native Dioxins/Furans

Compound	Lot Number	CAS Number	Chemical Formula	Molecular Weight	Chromatographic Purity	Concentration ¹
1,2,3,4-TCDD	ER080408-01	30746-58-8	C ₁₂ H ₄ O ₂ Cl ₄	321.97	97%	10.0 ± 1.0 ng/mL
1,2,3,7/1,2,3,8-TCDD	ER021510-01	67326-52-7	C ₁₂ H ₄ O ₂ Cl ₄	321.97	100%	10.0 ± 1.0 ng/mL
1,2,3,9-TCDD	ER122804-01	712669-26-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	98%	10.0 ± 1.0 ng/mL
1,2,8,9-TCDD	35166-60	62740-54-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	98%	10.0 ± 1.0 ng/mL
1,3,6,8-TCDD	34706-74	33423-92-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	100%	10.0 ± 1.0 ng/mL
2,3,7,8-TCDD	ER030907-02	1746-01-6	C ₁₂ H ₄ O ₂ Cl ₄	321.97	99%	10.0 ± 1.0 ng/mL
1,2,3,7,8-PeCDD	ER010209-01	40321-76-4	C ₁₂ H ₃ O ₂ Cl ₅	356.42	99%	50.0 ± 5.0 ng/mL
1,2,3,8,9-PeCDD	ER122704-02	71925-18-3	C ₁₂ H ₃ O ₂ Cl ₅	356.42	98%	50.0 ± 5.0 ng/mL
1,2,4,6,8/1,2,4,7,9-PeCDD	35124-73	NA	C ₁₂ H ₃ O ₂ Cl ₅	356.42	99%	50.0 ± 5.0 ng/mL
1,2,3,4,7,8-HxCDD	ER092005-03	39227-28-6	C ₁₂ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,3,6,7,8-HxCDD	ER092507-01	57653-85-7	C ₁₂ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,3,7,8,9-HxCDD	35166-61	19408-74-3	C ₁₂ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,4,6,7,9/1,2,4,6,8,9-HxCDD	ER010705-01	NA	C ₁₂ H ₂ O ₂ Cl ₆	390.86	99%	50.0 ± 5.0 ng/mL
1,2,3,4,6,7,8-HpCDD	ER031507-03	35822-46-9	C ₁₂ HO ₂ Cl ₇	425.31	99%	50.0 ± 5.0 ng/mL
1,2,3,4,6,7,9-HpCDD	ER021105-05	58200-70-7	C ₁₂ HO ₂ Cl ₇	425.31	99%	50.0 ± 5.0 ng/mL
OCDD	ER082306-02	3268-87-9	C ₁₂ O ₂ Cl ₈	459.75	99%	100 ± 10 ng/mL
1,2,8,9-TCDF	ER041508-03	70648-22-5	C ₁₂ H ₄ OCl ₄	305.97	99%	10.0 ± 1.0 ng/mL
1,3,6,8-TCDF	ER021808-01	71998-72-6	C ₁₂ H ₄ OCl ₄	305.97	99%	10.0 ± 1.0 ng/mL
2,3,7,8-TCDF	ER02208-01	51207-31-9	C ₁₂ H ₄ OCl ₄	305.98	99%	10.0 ± 1.0 ng/mL
1,2,3,7,8-PeCDF	ER082508-01	57117-41-6	C ₁₂ H ₃ OCl ₅	340.42	98%	50.0 ± 5.0 ng/mL
1,2,3,8,9-PeCDF	ER061604-05	83704-54-5	C ₁₂ H ₃ OCl ₅	340.42	98%	50.0 ± 5.0 ng/mL
1,3,4,6,8-PeCDF	ER102904-01	83704-55-6	C ₁₂ H ₃ OCl ₅	340.42	99%	50.0 ± 5.0 ng/mL
2,3,4,7,8-PeCDF	ER011807-01	57117-31-4	C ₁₂ H ₃ OCl ₅	340.42	98%	50.0 ± 5.0 ng/mL
1,2,3,4,6,8-HxCDF	ER111704-01	69698-60-8	C ₁₂ H ₂ OCl ₆	374.86	99%	50.0 ± 5.0 ng/mL
1,2,3,4,7,8-HxCDF	ER102607-01	70648-26-9	C ₁₂ H ₂ OCl ₆	374.86	99%	50.0 ± 5.0 ng/mL
1,2,3,4,8,9-HxCDF	ER031105-01	93241-07-6	C ₁₂ H ₂ OCl ₆	374.86	99%	50.0 ± 5.0 ng/mL
1,2,3,6,7,8-HxCDF	ER011907-01	57117-44-9	C ₁₂ H ₂ OCl ₆	374.86	98%	50.0 ± 5.0 ng/mL
1,2,3,7,8,9-HxCDF	ER053107-03	72918-21-9	C ₁₂ H ₂ OCl ₆	374.86	98%	50.0 ± 5.0 ng/mL
2,3,4,6,7,8-HxCDF	ER020705-01	60851-34-5	C ₁₂ H ₂ OCl ₆	374.86	98%	50.0 ± 5.0 ng/mL
1,2,3,4,6,7,8-HpCDF	ER020907-02	67562-39-4	C ₁₂ HOCl ₇	409.31	99%	50.0 ± 5.0 ng/mL
1,2,3,4,7,8,9-HpCDF	ER053107-02	55673-89-7	C ₁₂ HOCl ₇	409.31	99%	50.0 ± 5.0 ng/mL
OCDF	ER072004-03	39001-02-0	C ₁₂ OCl ₈	443.75	99%	100 ± 10 ng/mL

¹ The estimated uncertainty for this standard is ± 10% at 95% confidence interval (k=2). This value incorporates uncertainty estimate from manufacturing process and analytical verification of concentration and homogeneity.

Labeled Dioxins/Furans

Compound	Lot Number	CAS Number	Chemical Formula	Molecular Weight	Chromatographic Purity	Concentration ¹
1,2,3,4-TCDD- ¹³ C ₁₂	ER122203-01	114423-99-3	¹³ C ₁₂ H ₄ O ₂ Cl ₄	333.88	99%	100 ± 10 ng/mL
2,3,7,8-TCDD- ¹³ C ₁₂	ER060407-02	76523-40-5	¹³ C ₁₂ H ₄ O ₂ Cl ₄	333.88	99%	100 ± 10 ng/mL
2,3,7,8-TCDD- ³⁷ Cl ₄	ER060407-02	85508-50-5	C ₁₂ H ₄ O ₂ ³⁷ Cl ₄	333.88	97%	10.0 ± 1.0 ng/mL
1,2,3,7,8-PeCDD- ¹³ C ₁₂	ER030907-01	109719-79-1	¹³ C ₁₂ H ₃ O ₂ Cl ₅	368.33	99%	100 ± 10 ng/mL
1,2,3,4,7,8-HxCDD- ¹³ C ₁₂	ER012208-01	109719-80-4	¹³ C ₁₂ H ₂ O ₂ Cl ₆	402.77	98%	100 ± 10 ng/mL
1,2,3,6,7,8-HxCDD- ¹³ C ₁₂	ER010209-01	109719-81-5	¹³ C ₁₂ H ₂ O ₂ Cl ₆	402.77	99%	100 ± 10 ng/mL
1,2,3,7,8,9-HxCDD- ¹³ C ₁₂	ER082508-01	109719-82-6	¹³ C ₁₂ H ₂ O ₂ Cl ₆	402.77	99%	100 ± 10 ng/mL
1,2,3,4,6,7,8-HpCDD- ¹³ C ₁₂	ER011807-01	109719-83-7	¹³ C ₁₂ HO ₂ Cl ₇	437.22	98%	100 ± 10 ng/mL
OCDD- ¹³ C ₁₂	ER092005-03	114423-97-1	¹³ C ₁₂ O ₂ Cl ₈	471.66	99%	200 ± 20 ng/mL
2,3,7,8-TCDF- ¹³ C ₁₂	ER092507-01	89059-46-1	¹³ C ₁₂ H ₄ OCl ₄	317.88	99%	100 ± 10 ng/mL
1,2,3,7,8-PeCDF- ¹³ C ₁₂	35166-61	109719-77-9	¹³ C ₁₂ H ₃ OCl ₅	352.33	99%	100 ± 10 ng/mL
2,3,4,7,8-PeCDF- ¹³ C ₁₂	ER102607-01	116843-02-8	¹³ C ₁₂ H ₃ OCl ₅	352.33	99%	100 ± 10 ng/mL
1,2,3,4,7,8-HxCDF- ¹³ C ₁₂	ER011907-01	114423-98-2	¹³ C ₁₂ H ₂ OCl ₆	386.77	99%	100 ± 10 ng/mL
1,2,3,6,7,8-HxCDF- ¹³ C ₁₂	ER053107-03	116843-03-9	¹³ C ₁₂ H ₂ OCl ₆	386.77	98%	100 ± 10 ng/mL
1,2,3,7,8,9-HxCDF- ¹³ C ₁₂	ER100107-01	116843-04-0	¹³ C ₁₂ H ₂ OCl ₆	386.77	99%	100 ± 10 ng/mL
2,3,4,6,7,8-HxCDF- ¹³ C ₁₂	ER031507-03	116843-05-1	¹³ C ₁₂ H ₂ OCl ₆	386.77	99%	100 ± 10 ng/mL
1,2,3,4,6,7,8-HpCDF- ¹³ C ₁₂	ER020907-02	109719-84-8	¹³ C ₁₂ HOCl ₇	421.22	98%	100 ± 10 ng/mL
1,2,3,4,7,8,9-HpCDF- ¹³ C ₁₂	ER053107-02	109719-94-0	¹³ C ₁₂ HOCl ₇	421.22	98%	100 ± 10 ng/mL

¹ The estimated uncertainty for this standard is ± 10% at 95% confidence interval (k=2). This value incorporates uncertainty estimate from manufacturing process and analytical verification of concentration and homogeneity.

COA Revision History

Revision No.	Date	Reason for Revision
00	February 28, 2011	Initial version
01	November 04, 2015	Updated Safety information.
02	February 25, 2016	Updated Volume from 0.2 mL to 200 μ L.
		Added uncertainty to all concentrations. Added statement regarding uncertainty.

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Method 1613 Calibration with Window Definer and Isomer Specificity Solution in n-Nonane

Product Number : EDF-4141
Brand : Cerilliant

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 3), H226

Skin irritation (Category 2), H315

Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

Aspiration hazard (Category 1), H304

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H226

H304

H315

Flammable liquid and vapour.

May be fatal if swallowed and enters airways.

Causes skin irritation.

	Muta. 2; STOT SE 3; Aquatic Acute 1; Aquatic Chronic 1; H301, H319, H335, H341, H410	
1,2,3,7,8,9-Hexachlorodibenzofuran		
	Acute Tox. 3; Eye Irrit. 2A; Muta. 2; STOT SE 3; Aquatic Acute 1; Aquatic Chronic 1; H301, H319, H335, H341, H410	< 0.1 %
1,2,3,7,8-Pentachloro-dibenzofuran		
	Acute Tox. 3; Eye Irrit. 2A; Muta. 2; STOT SE 3; Aquatic Acute 1; Aquatic Chronic 1; H301, H319, H335, H341, H410	< 0.1 %
2,3,4,7,8-Pentachloro-dibenzofuran		
	Acute Tox. 1; Eye Irrit. 2A; Carc. 1A; STOT SE 3; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H300, H319, H335, H350, H373, H410	< 0.1 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

Component	CAS-No	Value	Control parameters	Basis
Nonane	111-84-2	TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment		
		TWA	200.000000 ppm 1,050.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment		
		TWA	200 ppm 1,050 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	200 ppm 1,050 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Potential Occupational Carcinogen Formed during past production of 2,4,5-trichlorophenol, 2,4,5-T & 2(2,4,5-trichlorophenoxy)propionic acid. See Appendix A		

Hazardous components without workplace control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

- 10.4 Conditions to avoid**
Heat, flames and sparks.
- 10.5 Incompatible materials**
Strong oxidizing agents
- 10.6 Hazardous decomposition products**
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Nonane	111-84-2	1994-04-01
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Nonane	111-84-2	1994-04-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Nonane	111-84-2	1994-04-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

	CAS-No.	Revision Date
1,3,6,8-TCDD	33423-92-6	2007-09-28
1,2,3,7,8-Pentachlorodibenzo-p-dioxin-1C12	109719-79-1	2007-09-28
1,2,3,7,8,9-Hexachlorodibenzodioxin-13C12	109719-82-6	2007-09-28
1,2,3,4-Tetrachlorodibenzodioxin-13C12	114423-99-3	2007-09-28
1,2,3,4-tetrachlorodibenzo-p-dioxin	30746-58-8	2007-09-28
2,3,4,7,8-Pentachloro-dibenzofuran	57117-31-4	2007-09-28
1,2,3,7,8-Pentachloro-dibenzofuran	57117-41-6	2007-09-28
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	2007-09-28
Hexachloro-dibenzo-p-dioxin	39227-28-6	2007-09-28
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	2007-09-28
2,3,4,6,7,8-Hexachloro-dibenzofuran	60851-34-5	2007-09-28
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	2007-09-28
1,2,3,4,6,7,8-Heptachloro-dibenzo-p-dioxin	35822-46-9	2007-09-28
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	2007-09-28
1,2,3,4,6,7,8,9-octachlorodibenzofuran	39001-02-0	2007-09-28
1,2,3,7,8,9-Hexachloro-dibenzo-p-dioxin	19408-74-3	2007-09-28
1,2,3,4,6,7,8,9-Octachloro-dibenzo-p-dioxin	3268-87-9	2007-09-28
1,2,3,7,8-Pentachloro-dibenzo-p-dioxin	40321-76-4	2007-09-28
1,2,3,6,7,8-Hexachloro-dibenzo-p-dioxin	57653-85-7	2007-09-28
1,2,3,4,7,8-Hexachloro-dibenzofuran	70648-26-9	2007-09-28
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	2007-09-28
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	2007-09-28

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

2,3,7,8-Tetrachlorodibenzo-p-dioxin

16. OTHER INFORMATION**Full text of H-Statements referred to under sections 2 and 3.**

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard

Method 8260B

Volatile Organic Compounds (GC/MS)
by Method 8260B

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low
 GC Column (1): DB-624 (60. ID: 0.25 (mm))

Client Sample ID	Lab Sample ID	DBFM #	DCA #	TOL #	BFB #
CRC-MW-1-011519	160-32649-1	107	110	106	100
	MB 280-445753/8	109	113	110	102
	LCS 280-445753/4	109	114	111	105
	LCS 280-445753/6	110	114	111	106
	LCSD 280-445753/5	107	112	106	102
	LCSD 280-445753/7	109	114	108	103
	280-119359-C-1 MS	108	112	105	102
	280-119359-C-1 MS	102	103	101	95
	280-119359-A-1 MSD	103	108	102	99
	280-119359-A-1 MSD	105	106	103	97

	<u>QC LIMITS</u>
DBFM = Dibromofluoromethane (Surr)	77-120
DCA = 1,2-Dichloroethane-d4 (Surr)	70-127
TOL = Toluene-d8 (Surr)	80-125
BFB = 4-Bromofluorobenzene (Surr)	78-120

Column to be used to flag recovery values

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: MS1_1908.D
 Lab ID: LCS 280-445753/4 Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	5.00	5.71	114	65-135	
1,1,2,2-Tetrachloroethane	5.00	5.12	102	58-135	
1,1,2-Trichloroethane	5.00	5.20	104	64-135	
1,1,2-Trichlorotrifluoroethane	5.00	5.61	112	65-140	
1,1-Dichloroethane	5.00	5.75	115	65-135	
1,1-Dichloroethene	5.00	5.39	108	65-136	
1,2,3-Trichlorobenzene	5.00	5.20	104	60-135	
1,2,4-Trichlorobenzene	5.00	5.09	102	58-135	
1,2-Dibromo-3-Chloropropane	5.00	4.16 J	83	57-135	
1,2-Dibromoethane	5.00	4.71	94	65-135	
1,2-Dichlorobenzene	5.00	5.04	101	65-135	
1,2-Dichloroethane	5.00	5.58	112	65-135	
1,2-Dichloropropane	5.00	5.58	112	64-135	
1,3,5-Trimethylbenzene	5.00	5.32	106	65-135	
1,3-Dichlorobenzene	5.00	5.10	102	65-135	
1,4-Dichlorobenzene	5.00	5.12	102	65-135	
1,4-Dioxane	100	106 J	106	31-147	
2-Butanone (MEK)	20.0	20.6	103	44-177	
2-Chloroethyl vinyl ether	10.0	11.3	113	10-159	
2-Hexanone	20.0	20.4	102	57-139	
4-Methyl-2-pentanone (MIBK)	20.0	21.9	109	60-150	
Acetone	20.0	22.6	113	39-156	
Benzene	5.00	5.57	111	65-135	
Bromoform	5.00	4.20	84	62-135	
Bromomethane	5.00	6.61	132	45-135	
Carbon disulfide	5.00	5.33	107	55-143	
Carbon tetrachloride	5.00	5.62	112	65-135	
Chlorobenzene	5.00	5.27	105	65-135	
Chlorobromomethane	5.00	5.01	100	65-135	
Chlorodibromomethane	5.00	4.62	92	65-135	
Chloroethane	5.00	7.01	140	46-136	*
Chloroform	5.00	5.54	111	65-135	
Chloromethane	5.00	6.53	131	34-145	
cis-1,2-Dichloroethene	5.00	5.23	105	65-135	
cis-1,3-Dichloropropene	5.00	5.01	100	65-135	
Cyclohexane	5.00	5.93	119	62-135	
Dichlorobromomethane	5.00	5.17	103	65-135	
Dichlorodifluoromethane	5.00	7.28	146	43-142	*
Ethylbenzene	5.00	5.23	105	65-135	
Isopropylbenzene	5.00	4.84	97	65-135	
Methyl acetate	10.0	10.2	102	52-135	
Methyl tert-butyl ether	5.00	4.89 J	98	54-135	

Column to be used to flag recovery and RPD values

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: MS1_1908.D
 Lab ID: LCS 280-445753/4 Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Methylcyclohexane	5.00	5.98	120	63-135	
Methylene Chloride	5.00	4.94	99	54-141	
m-Xylene & p-Xylene	5.00	5.21	104	65-135	
o-Xylene	5.00	5.26	105	65-135	
Styrene	5.00	4.79	96	65-135	
Tetrachloroethene	5.00	5.44	109	65-135	
Toluene	5.00	5.59	112	65-135	
trans-1,2-Dichloroethene	5.00	5.60	112	65-135	
trans-1,3-Dichloropropene	5.00	5.00	100	65-135	
Trichloroethene	5.00	5.33	107	65-135	
Trichlorofluoromethane	5.00	6.81	136	53-137	
Vinyl chloride	5.00	6.50	130	40-137	

Column to be used to flag recovery and RPD values

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: MS1_1909.D
Lab ID: LCSD 280-445753/5 Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
1,1,1-Trichloroethane	5.00	5.42	108	5	20	65-135	
1,1,2,2-Tetrachloroethane	5.00	4.94	99	3	20	58-135	
1,1,2-Trichloroethane	5.00	5.10	102	2	27	64-135	
1,1,2-Trichlorotrifluoroethane	5.00	5.24	105	7	20	65-140	
1,1-Dichloroethane	5.00	5.53	111	4	21	65-135	
1,1-Dichloroethene	5.00	5.18	104	4	20	65-136	
1,2,3-Trichlorobenzene	5.00	5.15	103	1	36	60-135	
1,2,4-Trichlorobenzene	5.00	4.92	98	4	25	58-135	
1,2-Dibromo-3-Chloropropane	5.00	4.08 J	82	2	22	57-135	
1,2-Dibromoethane	5.00	4.60	92	2	27	65-135	
1,2-Dichlorobenzene	5.00	4.86	97	4	20	65-135	
1,2-Dichloroethane	5.00	5.42	108	3	20	65-135	
1,2-Dichloropropane	5.00	5.41	108	3	20	64-135	
1,3,5-Trimethylbenzene	5.00	5.07	101	5	20	65-135	
1,3-Dichlorobenzene	5.00	4.86	97	5	20	65-135	
1,4-Dichlorobenzene	5.00	4.85	97	6	23	65-135	
1,4-Dioxane	100	104 J	104	2	30	31-147	
2-Butanone (MEK)	20.0	20.7	103	0	32	44-177	
2-Chloroethyl vinyl ether	10.0	11.2	112	1	23	10-159	
2-Hexanone	20.0	20.1	101	2	25	57-139	
4-Methyl-2-pentanone (MIBK)	20.0	21.7	108	1	22	60-150	
Acetone	20.0	22.0	110	3	23	39-156	
Benzene	5.00	5.33	107	4	20	65-135	
Bromoform	5.00	4.07	81	3	27	62-135	
Bromomethane	5.00	6.28	126	5	33	45-135	
Carbon disulfide	5.00	5.00	100	6	20	55-143	
Carbon tetrachloride	5.00	5.31	106	6	21	65-135	
Chlorobenzene	5.00	5.01	100	5	20	65-135	
Chlorobromomethane	5.00	4.88	98	3	29	65-135	
Chlorodibromomethane	5.00	4.48	90	3	20	65-135	
Chloroethane	5.00	6.65	133	5	25	46-136	
Chloroform	5.00	5.35	107	4	20	65-135	
Chloromethane	5.00	6.11	122	7	24	34-145	
cis-1,2-Dichloroethene	5.00	5.06	101	3	20	65-135	
cis-1,3-Dichloropropene	5.00	4.79	96	5	26	65-135	
Cyclohexane	5.00	5.67	113	4	20	62-135	
Dichlorobromomethane	5.00	4.98	100	4	20	65-135	
Dichlorodifluoromethane	5.00	6.92	138	5	30	43-142	
Ethylbenzene	5.00	5.02	100	4	20	65-135	
Isopropylbenzene	5.00	4.60	92	5	20	65-135	
Methyl acetate	10.0	10.2	102	0	27	52-135	
Methyl tert-butyl ether	5.00	4.82 J	96	1	21	54-135	

Column to be used to flag recovery and RPD values

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: MS1_1909.D
 Lab ID: LCSD 280-445753/5 Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Methylcyclohexane	5.00	5.58	112	7	20	63-135	
Methylene Chloride	5.00	4.70	94	5	26	54-141	
m-Xylene & p-Xylene	5.00	5.00	100	4	20	65-135	
o-Xylene	5.00	5.03	101	5	20	65-135	
Styrene	5.00	4.61	92	4	26	65-135	
Tetrachloroethene	5.00	5.10	102	6	20	65-135	
Toluene	5.00	5.40	108	3	20	65-135	
trans-1,2-Dichloroethene	5.00	5.38	108	4	24	65-135	
trans-1,3-Dichloropropene	5.00	4.88	98	2	26	65-135	
Trichloroethene	5.00	5.17	103	3	20	65-135	
Trichlorofluoromethane	5.00	6.54	131	4	27	53-137	
Vinyl chloride	5.00	6.15	123	6	24	40-137	

Column to be used to flag recovery and RPD values

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: MS1_1913.D
Lab ID: 280-119359-C-1 MS Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	20000	640 U	21700	109	65-135	
1,1,2,2-Tetrachloroethane	20000	840 U	21000	105	58-135	
1,1,2-Trichloroethane	20000	1100 U	21700	109	64-135	
1,1,2-Trichlorotrifluoroethane	20000	1700 U	20500	102	65-140	
1,1-Dichloroethane	20000	880 U	22500	113	65-135	
1,1-Dichloroethene	20000	920 U	20300	102	65-136	
1,2,3-Trichlorobenzene	20000	840 U	20700	104	60-135	
1,2,4-Trichlorobenzene	20000	840 U	20100	101	58-135	
1,2-Dibromo-3-Chloropropane	20000	1900 U	17500 J	87	57-135	
1,2-Dibromoethane	20000	720 U	19200	96	65-135	
1,2-Dichlorobenzene	20000	5100	25400	101	65-135	
1,2-Dichloroethane	20000	520 U	22500	113	65-135	
1,2-Dichloropropane	20000	720 U	22300	111	64-135	
1,3,5-Trimethylbenzene	20000	640 U	20400	102	65-135	
1,3-Dichlorobenzene	20000	520 U	19900	99	65-135	
1,4-Dichlorobenzene	20000	640 U	20100	100	65-135	
1,4-Dioxane	400000	230000 U	422000 J	106	31-147	
2-Butanone (MEK)	80000	8000 U	84000	105	44-177	
2-Chloroethyl vinyl ether	40000	2800 U	47000	118	10-159	
2-Hexanone	80000	6800 U	85000	106	57-139	
4-Methyl-2-pentanone (MIBK)	80000	3900 U	89700	112	60-150	
Acetone	80000	7600 U	82800	103	39-156	
Benzene	20000	640 U	21800	109	65-135	
Bromoform	20000	760 U	18100	91	62-135	
Bromomethane	20000	840 U	24600	123	45-135	
Carbon disulfide	20000	1800 U	19700	99	55-143	
Carbon tetrachloride	20000	760 U	21400	107	65-135	
Chlorobenzene	20000	680 U	20500	103	65-135	
Chlorobromomethane	20000	400 U	20500	102	65-135	
Chlorodibromomethane	20000	680 U	19700	99	65-135	
Chloroethane	20000	1600 U	26200	131	46-136	
Chloroform	20000	16000	37600	110	65-135	
Chloromethane	20000	1200 U	24800	124	34-145	
cis-1,2-Dichloroethene	20000	600 U	21100	105	65-135	
cis-1,3-Dichloropropene	20000	640 U	20300	101	65-135	
Cyclohexane	20000	1100 U	22600	113	62-135	
Dichlorobromomethane	20000	680 U	21400	107	65-135	
Dichlorodifluoromethane	20000	1200 U	27500	137	43-142	
Ethylbenzene	20000	640 U	20100	101	65-135	
Isopropylbenzene	20000	760 U	18400	92	65-135	
Methyl acetate	40000	6600 U	42400	106	52-135	
Methyl tert-butyl ether	20000	1000 U	20100	101	54-135	

Column to be used to flag recovery and RPD values

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: MS1_1913.D
 Lab ID: 280-119359-C-1 MS Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Methylcyclohexane	20000	1400 U	22400	112	63-135	
Methylene Chloride	20000	1700000	1750000	60	54-141	E 4
m-Xylene & p-Xylene	20000	1400 U	20200	101	65-135	
o-Xylene	20000	760 U	20500	103	65-135	
Styrene	20000	680 U	18800	94	65-135	
Tetrachloroethene	20000	800 U	20400	102	65-135	
Toluene	20000	680 U	22300	111	65-135	
trans-1,2-Dichloroethene	20000	600 U	21900	110	65-135	
trans-1,3-Dichloropropene	20000	760 U	21300	106	65-135	
Trichloroethene	20000	640 U	20700	103	65-135	
Trichlorofluoromethane	20000	1200 U	25900	129	53-137	
Vinyl chloride	20000	400 U	24800	124	40-137	

Column to be used to flag recovery and RPD values

FORM III
GC/MS VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: MS1_1914.D
Lab ID: 280-119359-A-1 MSD Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
1,1,1-Trichloroethane	20000	20600	103	5	20	65-135	
1,1,2,2-Tetrachloroethane	20000	19800	99	6	20	58-135	
1,1,2-Trichloroethane	20000	20000	100	8	27	64-135	
1,1,2-Trichlorotrifluoroethane	20000	19700	99	4	20	65-140	
1,1-Dichloroethane	20000	20900	105	7	21	65-135	
1,1-Dichloroethene	20000	19600	98	4	20	65-136	
1,2,3-Trichlorobenzene	20000	19700	99	5	36	60-135	
1,2,4-Trichlorobenzene	20000	19600	98	3	25	58-135	
1,2-Dibromo-3-Chloropropane	20000	17600 J	88	1	22	57-135	
1,2-Dibromoethane	20000	18100	91	6	27	65-135	
1,2-Dichlorobenzene	20000	24900	99	2	20	65-135	
1,2-Dichloroethane	20000	21000	105	7	20	65-135	
1,2-Dichloropropane	20000	21000	105	6	20	64-135	
1,3,5-Trimethylbenzene	20000	19700	98	4	20	65-135	
1,3-Dichlorobenzene	20000	18900	95	5	20	65-135	
1,4-Dichlorobenzene	20000	19100	96	5	23	65-135	
1,4-Dioxane	400000	376000 J	94	11	30	31-147	
2-Butanone (MEK)	80000	77900	97	8	32	44-177	
2-Chloroethyl vinyl ether	40000	40900	102	14	23	10-159	
2-Hexanone	80000	78500	98	8	25	57-139	
4-Methyl-2-pentanone (MIBK)	80000	83000	104	8	22	60-150	
Acetone	80000	82000	102	1	23	39-156	
Benzene	20000	20600	103	6	20	65-135	
Bromoform	20000	17400	87	4	27	62-135	
Bromomethane	20000	21200	106	15	33	45-135	
Carbon disulfide	20000	18700	93	6	20	55-143	
Carbon tetrachloride	20000	20700	104	3	21	65-135	
Chlorobenzene	20000	19200	96	7	20	65-135	
Chlorobromomethane	20000	19100	96	7	29	65-135	
Chlorodibromomethane	20000	18300	92	7	20	65-135	
Chloroethane	20000	23000	115	13	25	46-136	
Chloroform	20000	37400	109	0	20	65-135	
Chloromethane	20000	21400	107	15	24	34-145	
cis-1,2-Dichloroethene	20000	19800	99	6	20	65-135	
cis-1,3-Dichloropropene	20000	19100	95	6	26	65-135	
Cyclohexane	20000	21300	106	6	20	62-135	
Dichlorobromomethane	20000	19500	98	9	20	65-135	
Dichlorodifluoromethane	20000	23800	119	14	30	43-142	
Ethylbenzene	20000	19100	96	5	20	65-135	
Isopropylbenzene	20000	17900	90	2	20	65-135	
Methyl acetate	40000	38600	96	9	27	52-135	
Methyl tert-butyl ether	20000	18800 J	94	7	21	54-135	

Column to be used to flag recovery and RPD values

FORM III
GC/MS VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: MS1_1914.D
 Lab ID: 280-119359-A-1 MSD Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Methylcyclohexane	20000	21100	106	6	20	63-135	
Methylene Chloride	20000	1700000	-198	3	26	54-141	E 4
m-Xylene & p-Xylene	20000	19200	96	5	20	65-135	
o-Xylene	20000	19500	97	5	20	65-135	
Styrene	20000	17600	88	6	26	65-135	
Tetrachloroethene	20000	19300	96	6	20	65-135	
Toluene	20000	20900	104	6	20	65-135	
trans-1,2-Dichloroethene	20000	20900	104	5	24	65-135	
trans-1,3-Dichloropropene	20000	19500	98	9	26	65-135	
Trichloroethene	20000	19700	98	5	20	65-135	
Trichlorofluoromethane	20000	22100	111	15	27	53-137	
Vinyl chloride	20000	21900	110	12	24	40-137	

Column to be used to flag recovery and RPD values

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab File ID: MS1_1907.D Lab Sample ID: MB 280-445753/8
Matrix: Water Heated Purge: (Y/N) N
Instrument ID: VMS_MS1 Date Analyzed: 01/28/2019 19:09
GC Column: DB-624 (60.25) ID: 0.25 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-445753/4	MS1_1908.D	01/28/2019 19:36
	LCSD 280-445753/5	MS1_1909.D	01/28/2019 19:56
	LCS 280-445753/6	MS1_1910.D	01/28/2019 20:16
	LCSD 280-445753/7	MS1_1911.D	01/28/2019 20:37
	280-119359-C-1 MS	MS1_1913.D	01/28/2019 21:18
	280-119359-A-1 MSD	MS1_1914.D	01/28/2019 21:38
	280-119359-C-1 MS	MS1_1915.D	01/28/2019 21:59
	280-119359-A-1 MSD	MS1_1916.D	01/28/2019 22:19
CRC-MW-1-011519	160-32649-1	MS1_1919.D	01/28/2019 23:21

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab File ID: MS1_1065.D BFB Injection Date: 01/08/2019
 Instrument ID: VMS_MS1 BFB Injection Time: 08:17
 Analysis Batch No.: 443512

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0 % of mass 95	17.4
75	30.0 - 60.0 % of mass 95	48.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0 % of mass 95	7.3
173	Less than 2.0 % of mass 174	0.0 (0.0) 1
174	50.0 - 120.00 % of mass 95	68.6
175	5.0 - 9.0 % of mass 174	4.7 (6.9) 1
176	95.0 - 101.0 % of mass 174	66.2 (96.4) 1
177	5.0 - 9.0 % of mass 176	3.9 (5.9) 2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD 280-443512/20	MS1_1077.D	01/08/2019	12:31
	STD 280-443512/21	MS1_1078.D	01/08/2019	12:52
	STD 280-443512/22	MS1_1079.D	01/08/2019	13:13
	STD 280-443512/23	MS1_1080.D	01/08/2019	13:33
	STD 280-443512/24	MS1_1081.D	01/08/2019	13:54
	STD 280-443512/25	MS1_1082.D	01/08/2019	14:14
	ICV 280-443512/26	MS1_1084.D	01/08/2019	14:55

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab File ID: MS1_1418.D BFB Injection Date: 01/18/2019
Instrument ID: VMS_MS1 BFB Injection Time: 09:52
Analysis Batch No.: 444687

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0 % of mass 95	15.7
75	30.0 - 60.0 % of mass 95	45.1
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0 % of mass 95	8.0
173	Less than 2.0 % of mass 174	0.0 (0.0) 1
174	50.0 - 120.00 % of mass 95	79.4
175	5.0 - 9.0 % of mass 174	5.8 (7.4) 1
176	95.0 - 101.0 % of mass 174	78.8 (99.3) 1
177	5.0 - 9.0 % of mass 176	5.9 (7.5) 2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD 280-444687/12	MS1_1421.D	01/18/2019	11:48
	STD 280-444687/13	MS1_1422.D	01/18/2019	12:09
	STD 280-444687/14	MS1_1423.D	01/18/2019	12:29
	STD 280-444687/15	MS1_1424.D	01/18/2019	12:50
	ICIS 280-444687/16	MS1_1425.D	01/18/2019	13:10
	STD 280-444687/17	MS1_1426.D	01/18/2019	13:31
	STD 280-444687/18	MS1_1427.D	01/18/2019	13:52
	ICV 280-444687/19	MS1_1429.D	01/18/2019	14:33

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab File ID: MS1_1904.D BFB Injection Date: 01/28/2019
Instrument ID: VMS_MS1 BFB Injection Time: 17:51
Analysis Batch No.: 445753

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0 % of mass 95	16.6
75	30.0 - 60.0 % of mass 95	47.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0 % of mass 95	7.2
173	Less than 2.0 % of mass 174	0.2 (0.2) 1
174	50.0 - 120.00 % of mass 95	83.2
175	5.0 - 9.0 % of mass 174	5.8 (6.9) 1
176	95.0 - 101.0 % of mass 174	81.4 (97.7) 1
177	5.0 - 9.0 % of mass 176	5.2 (6.4) 2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-445753/2	MS1_1905.D	01/28/2019	18:23
	CCV 280-445753/3	MS1_1906.D	01/28/2019	18:48
	MB 280-445753/8	MS1_1907.D	01/28/2019	19:09
	LCS 280-445753/4	MS1_1908.D	01/28/2019	19:36
	LCSD 280-445753/5	MS1_1909.D	01/28/2019	19:56
	LCS 280-445753/6	MS1_1910.D	01/28/2019	20:16
	LCSD 280-445753/7	MS1_1911.D	01/28/2019	20:37
	280-119359-C-1 MS	MS1_1913.D	01/28/2019	21:18
	280-119359-A-1 MSD	MS1_1914.D	01/28/2019	21:38
	280-119359-C-1 MS	MS1_1915.D	01/28/2019	21:59
	280-119359-A-1 MSD	MS1_1916.D	01/28/2019	22:19
CRC-MW-1-011519	160-32649-1	MS1_1919.D	01/28/2019	23:21

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Sample No.: ICIS 280-444687/16 Date Analyzed: 01/18/2019 13:10
 Instrument ID: VMS_MS1 GC Column: DB-624 (60.25) ID: 0.25 (mm)
 Lab File ID (Standard): MS1_1425.D Heated Purge: (Y/N) N
 Calibration ID: 34948

	TBAd9		FB		CBNZd5		
	AREA #	RT #	AREA #	RT #	AREA #	RT #	
INITIAL CALIBRATION MID-POINT	585242	5.57	3226220	7.51	740423	9.79	
UPPER LIMIT	1170484	6.07	6452440	8.01	1480846	10.29	
LOWER LIMIT	292621	5.07	1613110	7.01	370212	9.29	
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-444687/19		646532	5.57	3475339	7.51	799224	9.79
CCV 280-445753/2		536780	5.57	3067525	7.51	716789	9.79
CCV 280-445753/3		536940	5.56	3012871	7.51	701328	9.79
MB 280-445753/8		507284	5.57	3010287	7.51	687321	9.79
LCS 280-445753/4		503449	5.57	3001882	7.51	693912	9.79
LCSD 280-445753/5		566568	5.57	3182142	7.51	742529	9.79
LCS 280-445753/6		530072	5.57	3162407	7.51	710409	9.79
LCSD 280-445753/7		541859	5.57	3087873	7.51	710150	9.77
280-119359-C-1 MS		527335	5.57	3196191	7.51	755868	9.77
280-119359-A-1 MSD		513656	5.56	3442086	7.51	800599	9.77
280-119359-C-1 MS		554440	5.57	3200508	7.51	731753	9.77
280-119359-A-1 MSD		548178	5.57	3331082	7.51	766101	9.79
160-32649-1	CRC-MW-1-011519	433964	5.57	3076948	7.51	697916	9.79

TBAd9 = TBA-d9 (IS)

FB = Fluorobenzene

CBNZd5 = Chlorobenzene-d5

Area Limit = 50%-200% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Sample No.: ICIS 280-444687/16 Date Analyzed: 01/18/2019 13:10
 Instrument ID: VMS_MS1 GC Column: DB-624 (60.25) ID: 0.25 (mm)
 Lab File ID (Standard): MS1_1425.D Heated Purge: (Y/N) N
 Calibration ID: 34948

		DCBd4					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		1126170	11.60				
UPPER LIMIT		2252340	12.10				
LOWER LIMIT		563085	11.10				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-444687/19		1204600	11.60				
CCV 280-445753/2		1139766	11.60				
CCV 280-445753/3		1072362	11.60				
MB 280-445753/8		1059066	11.60				
LCS 280-445753/4		1093147	11.60				
LCSD 280-445753/5		1170096	11.60				
LCS 280-445753/6		1087064	11.60				
LCSD 280-445753/7		1094220	11.60				
280-119359-C-1 MS		1182196	11.60				
280-119359-A-1 MSD		1219522	11.60				
280-119359-C-1 MS		1119488	11.60				
280-119359-A-1 MSD		1182542	11.60				
160-32649-1	CRC-MW-1-011519	1063114	11.60				

DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: <u>CRC-MW-1-011519</u>	Lab Sample ID: <u>160-32649-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>MS1_1919.D</u>
Analysis Method: <u>8260B</u>	Date Collected: <u>01/15/2019 12:30</u>
Sample wt/vol: <u>20 (mL)</u>	Date Analyzed: <u>01/28/2019 23:21</u>
Soil Aliquot Vol: _____	Dilution Factor: <u>1</u>
Soil Extract Vol.: _____	GC Column: <u>DB-624 (60.25)</u> ID: <u>0.25 (mm)</u>
% Moisture: _____	Level: (low/med) <u>Low</u>
Analysis Batch No.: <u>445753</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	0.16	U	1.0	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.21	U	1.0	0.21
79-00-5	1,1,2-Trichloroethane	0.27	U	1.0	0.27
76-13-1	1,1,2-Trichlorotrifluoroethane	0.42	U	3.0	0.42
75-34-3	1,1-Dichloroethane	0.22	U	1.0	0.22
75-35-4	1,1-Dichloroethene	0.23	U	1.0	0.23
87-61-6	1,2,3-Trichlorobenzene	0.21	U	1.0	0.21
120-82-1	1,2,4-Trichlorobenzene	0.21	U	1.0	0.21
96-12-8	1,2-Dibromo-3-Chloropropane	0.47	U	5.0	0.47
106-93-4	1,2-Dibromoethane	0.18	U	1.0	0.18
95-50-1	1,2-Dichlorobenzene	0.15	U	1.0	0.15
107-06-2	1,2-Dichloroethane	0.13	U	1.0	0.13
78-87-5	1,2-Dichloropropane	0.18	U	1.0	0.18
108-67-8	1,3,5-Trimethylbenzene	0.16	U	1.0	0.16
541-73-1	1,3-Dichlorobenzene	0.13	U	1.0	0.13
106-46-7	1,4-Dichlorobenzene	0.16	U	1.0	0.16
123-91-1	1,4-Dioxane	57	U	200	57
78-93-3	2-Butanone (MEK)	2.0	U	6.0	2.0
110-75-8	2-Chloroethyl vinyl ether	0.69	U	3.0	0.69
591-78-6	2-Hexanone	1.7	U	5.0	1.7
108-10-1	4-Methyl-2-pentanone (MIBK)	0.98	U	5.0	0.98
67-64-1	Acetone	8.7	J	10	1.9
75-05-8	Acetonitrile	9.6	U	30	9.6
107-02-8	Acrolein	2.8	U	20	2.8
107-13-1	Acrylonitrile	1.4	U	20	1.4
71-43-2	Benzene	0.16	U	1.0	0.16
75-25-2	Bromoform	0.19	U	1.0	0.19
74-83-9	Bromomethane	0.21	U	2.0	0.21
75-15-0	Carbon disulfide	0.45	U	2.0	0.45
56-23-5	Carbon tetrachloride	0.19	U	1.0	0.19
108-90-7	Chlorobenzene	0.17	U	1.0	0.17
74-97-5	Chlorobromomethane	0.10	U	1.0	0.10
124-48-1	Chlorodibromomethane	0.17	U	1.0	0.17
75-00-3	Chloroethane	0.41	U *	2.0	0.41
67-66-3	Chloroform	0.16	U	1.0	0.16
74-87-3	Chloromethane	0.30	U	2.0	0.30

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: CRC-MW-1-011519 Lab Sample ID: 160-32649-1
 Matrix: Water Lab File ID: MS1_1919.D
 Analysis Method: 8260B Date Collected: 01/15/2019 12:30
 Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 23:21
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
156-59-2	cis-1,2-Dichloroethene	0.15	U	1.0	0.15
10061-01-5	cis-1,3-Dichloropropene	0.16	U	1.0	0.16
110-82-7	Cyclohexane	0.28	U	2.0	0.28
75-27-4	Dichlorobromomethane	0.17	U	1.0	0.17
75-71-8	Dichlorodifluoromethane	0.31	U *	2.0	0.31
100-41-4	Ethylbenzene	0.16	U	1.0	0.16
98-82-8	Isopropylbenzene	0.19	U	1.0	0.19
79-20-9	Methyl acetate	1.6	U	5.0	1.6
1634-04-4	Methyl tert-butyl ether	0.25	U	5.0	0.25
108-87-2	Methylcyclohexane	0.36	U	1.0	0.36
75-09-2	Methylene Chloride	0.40	J	2.0	0.32
179601-23-1	m-Xylene & p-Xylene	0.34	U	2.0	0.34
95-47-6	o-Xylene	0.19	U	1.0	0.19
100-42-5	Styrene	0.17	U	1.0	0.17
127-18-4	Tetrachloroethene	0.20	U	1.0	0.20
108-88-3	Toluene	0.17	U	1.0	0.17
156-60-5	trans-1,2-Dichloroethene	0.15	U	1.0	0.15
10061-02-6	trans-1,3-Dichloropropene	0.19	U	3.0	0.19
79-01-6	Trichloroethene	0.16	U	1.0	0.16
75-69-4	Trichlorofluoromethane	0.29	U	2.0	0.29
75-01-4	Vinyl chloride	0.10	U	1.0	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	110		70-127
460-00-4	4-Bromofluorobenzene (Surr)	100		78-120
1868-53-7	Dibromofluoromethane (Surr)	107		77-120
2037-26-5	Toluene-d8 (Surr)	106		80-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Client Sample ID: CRC-MW-1-011519 Lab Sample ID: 160-32649-1
Matrix: Water Lab File ID: MS1_1919.D
Analysis Method: 8260B Date Collected: 01/15/2019 12:30
Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 23:21
Soil Aliquot Vol: _____ Dilution Factor: 1
Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)
% Moisture: _____ Level: (low/med) Low
Analysis Batch No.: 445753 Units: ug/L
Number TICs Found: 2 TIC Result Total: 3.2

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	6.53	1.7	T J	
	Unknown	10.54	1.5	T J	

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1919.D
 Lims ID: 160-32649-A-1
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 28-Jan-2019 23:21:30 ALS Bottle#: 15 Worklist Smp#: 19
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: 160-32649-A-1 pH<2
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 23:41:05

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.570	5.557	0.013	35	433964	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3076948	12.5	
* 149 1,4-Dioxane-d8	96	8.713	8.727	-0.014	0	24488	0	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	85	697916	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1063114	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	695836	10.7	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	555225	11.0	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2770471	10.6	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.654	-0.014	0	908814	9.98	
24 Dichlorodifluoromethane	85		3.894				ND	
26 Chloromethane	50		4.132				ND	
27 Vinyl chloride	62		4.244				ND	
29 Bromomethane	94		4.607				ND	
31 Chloroethane	64		4.663				ND	
33 Trichlorofluoromethane	101		4.914				ND	
39 Acrolein	56		5.193				ND	
40 Acetone	43	5.305	5.291	0.014	61	60507	8.71	
42 1,1,2-Trichloro-1,2,2-trif	151		5.305				ND	
43 1,1-Dichloroethene	96		5.333				ND	
44 Acetonitrile	41		5.501				ND	U
46 Methyl acetate	43		5.528				ND	
48 Carbon disulfide	76		5.598				ND	
50 Methylene Chloride	84	5.668	5.668	0.000	89	31314	0.3986	
51 Acrylonitrile	53		5.808				ND	
52 Methyl tert-butyl ether	73		5.864				ND	
53 trans-1,2-Dichloroethene	96		5.892				ND	
57 1,1-Dichloroethane	63		6.213				ND	
61 2-Butanone (MEK)	43		6.576				ND	
64 cis-1,2-Dichloroethene	96		6.632				ND	
67 Chlorobromomethane	128		6.827				ND	
68 Chloroform	83		6.841				ND	
71 1,1,1-Trichloroethane	97		7.065				ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/l	Flags
72 Cyclohexane	56		7.149				ND	
74 Carbon tetrachloride	117		7.204				ND	
75 1,2-Dichloroethane	62		7.302				ND	
77 Benzene	78		7.344				ND	
79 Trichloroethene	95		7.805				ND	
82 1,2-Dichloropropane	63		7.987				ND	
83 Methylcyclohexane	55		8.014				ND	
84 1,4-Dioxane	88		8.028				ND	
86 Dichlorobromomethane	83		8.154				ND	
88 2-Chloroethyl vinyl ether	63		8.294				ND	
89 cis-1,3-Dichloropropene	75		8.475				ND	
90 4-Methyl-2-pentanone (MIBK)	43		8.531				ND	
91 Toluene	91		8.769				ND	
93 trans-1,3-Dichloropropene	75		8.852				ND	
94 1,1,2-Trichloroethane	97		9.006				ND	
95 2-Hexanone	43		9.118				ND	
97 Tetrachloroethene	164		9.188				ND	
98 Chlorodibromomethane	129		9.341				ND	
100 Ethylene Dibromide	107		9.467				ND	
102 Chlorobenzene	112		9.802				ND	
104 Ethylbenzene	106		9.844				ND	
105 m-Xylene & p-Xylene	106		9.928				ND	
106 Styrene	104		10.235				ND	
109 o-Xylene	106		10.235				ND	
107 Bromoform	173		10.431				ND	
108 Isopropylbenzene	105		10.500				ND	
112 1,1,2,2-Tetrachloroethane	83		10.696				ND	
120 1,3,5-Trimethylbenzene	105		10.933				ND	
124 1,3-Dichlorobenzene	146		11.562				ND	
126 1,4-Dichlorobenzene	146		11.632				ND	
128 1,2-Dichlorobenzene	146		11.981				ND	
129 1,2-Dibromo-3-Chloropropan	157		12.707				ND	
130 1,2,4-Trichlorobenzene	180		13.671				ND	
133 1,2,3-Trichlorobenzene	180		14.341				ND	

QC Flag Legend

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

Run Reagent

MV-ARCH SS A_00108

Amount Added: 0.80

Units: uL

Run Reagent

TestAmerica Denver
Tentatively Identified Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1919.D
 Lims ID: 160-32649-A-1
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 28-Jan-2019 23:21:30 ALS Bottle#: 15 Worklist Smp#: 19
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: 160-32649-A-1 pH<2
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Tic RT Window: 0.000 -0.000 Response: area
 Quant By: Nearest ISTD Quant LOD: 10.00000
 MS Library: \\chromna\Denver\Database\NIST98.L
 Min. Match: 85
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327
 First Level Reviewer: nwangumaf Date: 28-Jan-2019 23:41:05

Tentative Identified Compound Results

RT	Area	Amount ug/l	Quant Cpnd	Qual	Lib Entry	Molecular Formula	Mol. Weight	Flags
6.534	842450	1.70	1		Unknown			
10.542	738931	1.48	2		Unknown			

Quantitation Compounds

Compound	RT	Area	Amount ug/l
* 1 Fluorobenzene	7.512	6187123	12.5
* 2 Chlorobenzene-d5	9.774	6250901	12.5

QC Flag Legend

Processing Flags

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL	Run Reagent
MV-ARCH SS A_00108	Amount Added: 0.80	Units: uL	Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1919.D

Injection Date: 28-Jan-2019 23:21:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: 160-32649-A-1

Lab Sample ID: 280-32649-1

Worklist Smp#: 19

Client ID: CRC-MW-1-011519

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

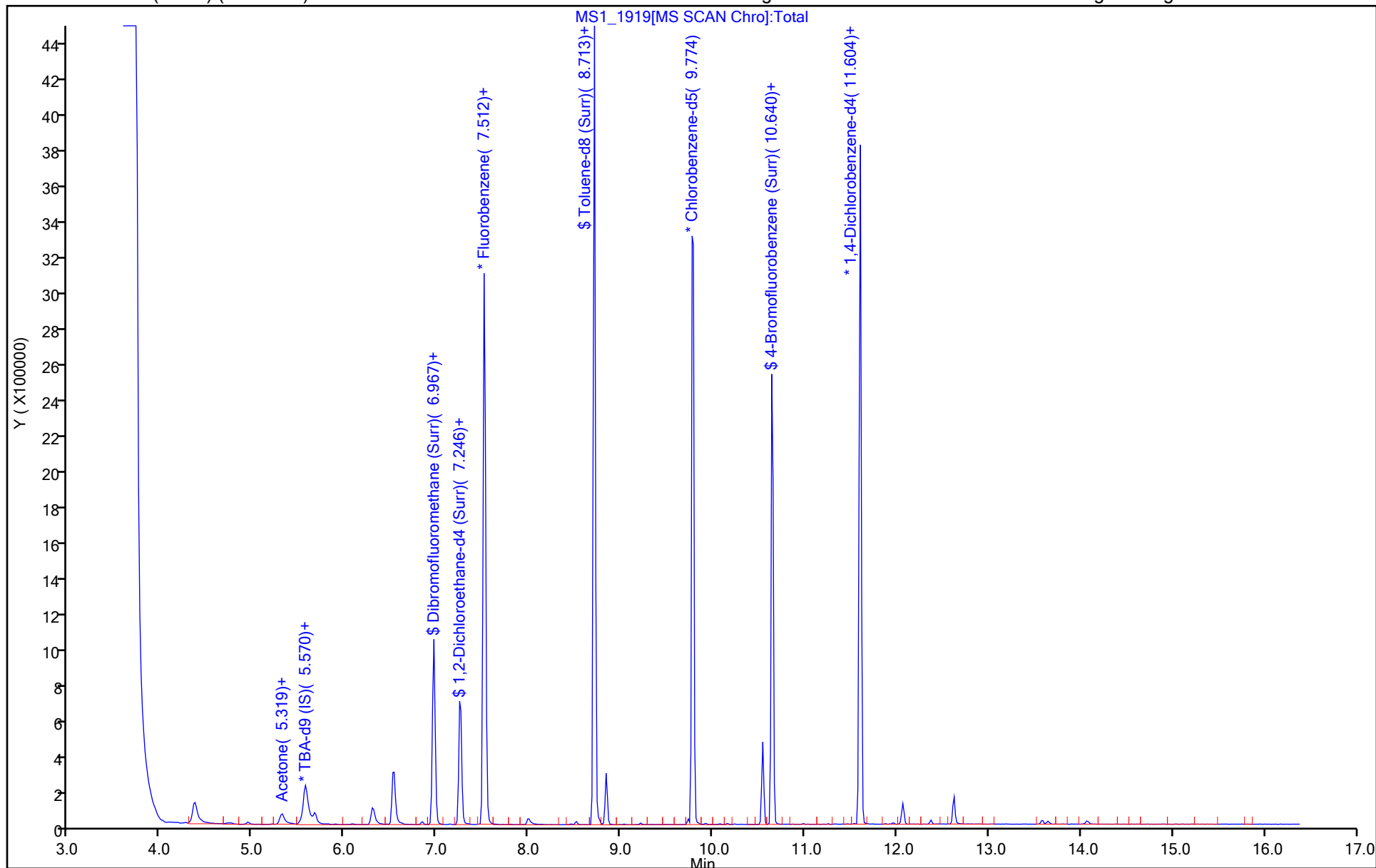
ALS Bottle#: 15

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1919.D
Lims ID: 160-32649-A-1
Client ID: CRC-MW-1-011519
Sample Type: Client
Inject. Date: 28-Jan-2019 23:21:30 ALS Bottle#: 15 Worklist Smp#: 19
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: 160-32649-A-1 pH<2
Operator ID: nwangumaf Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 23:41:05

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	10.7	107.48
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	11.0	109.83
\$ 7 Toluene-d8 (Surr)	10.0	10.6	106.14
\$ 8 4-Bromofluorobenzene (Surr)	10.0	9.98	99.82

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1919.D

Injection Date: 28-Jan-2019 23:21:30

Instrument ID: VMS_MS1

Lims ID: 160-32649-A-1

Lab Sample ID: 280-32649-1

Client ID: CRC-MW-1-011519

Operator ID: nwangumaf

ALS Bottle#: 15

Worklist Smp#: 19

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

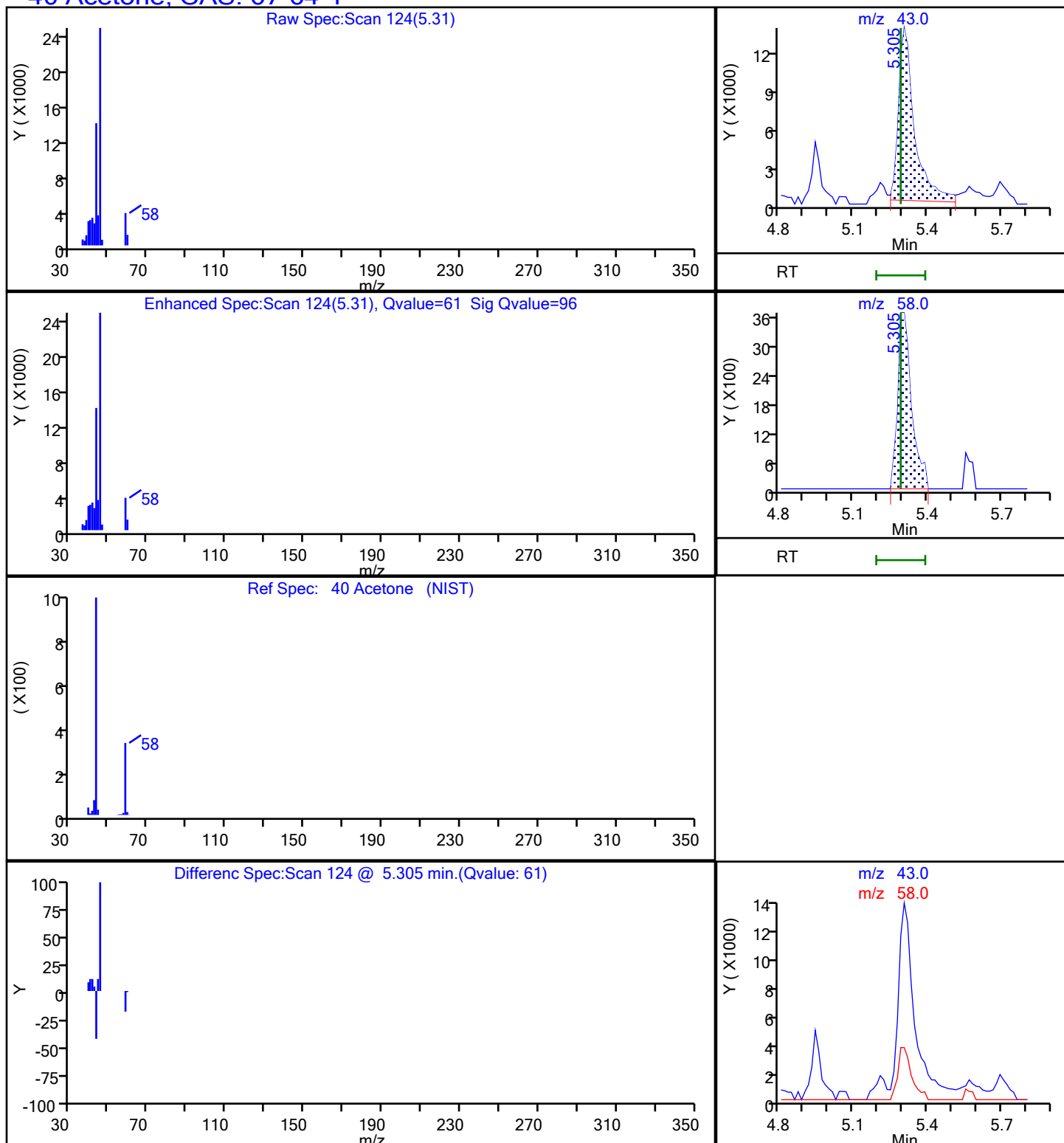
Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Detector: MS SCAN

40 Acetone, CAS: 67-64-1



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1919.D

Injection Date: 28-Jan-2019 23:21:30

Instrument ID: VMS_MS1

Lims ID: 160-32649-A-1

Lab Sample ID: 280-32649-1

Client ID: CRC-MW-1-011519

Operator ID: nwangumaf

ALS Bottle#: 15

Worklist Smp#: 19

Purge Vol: 20.000 mL

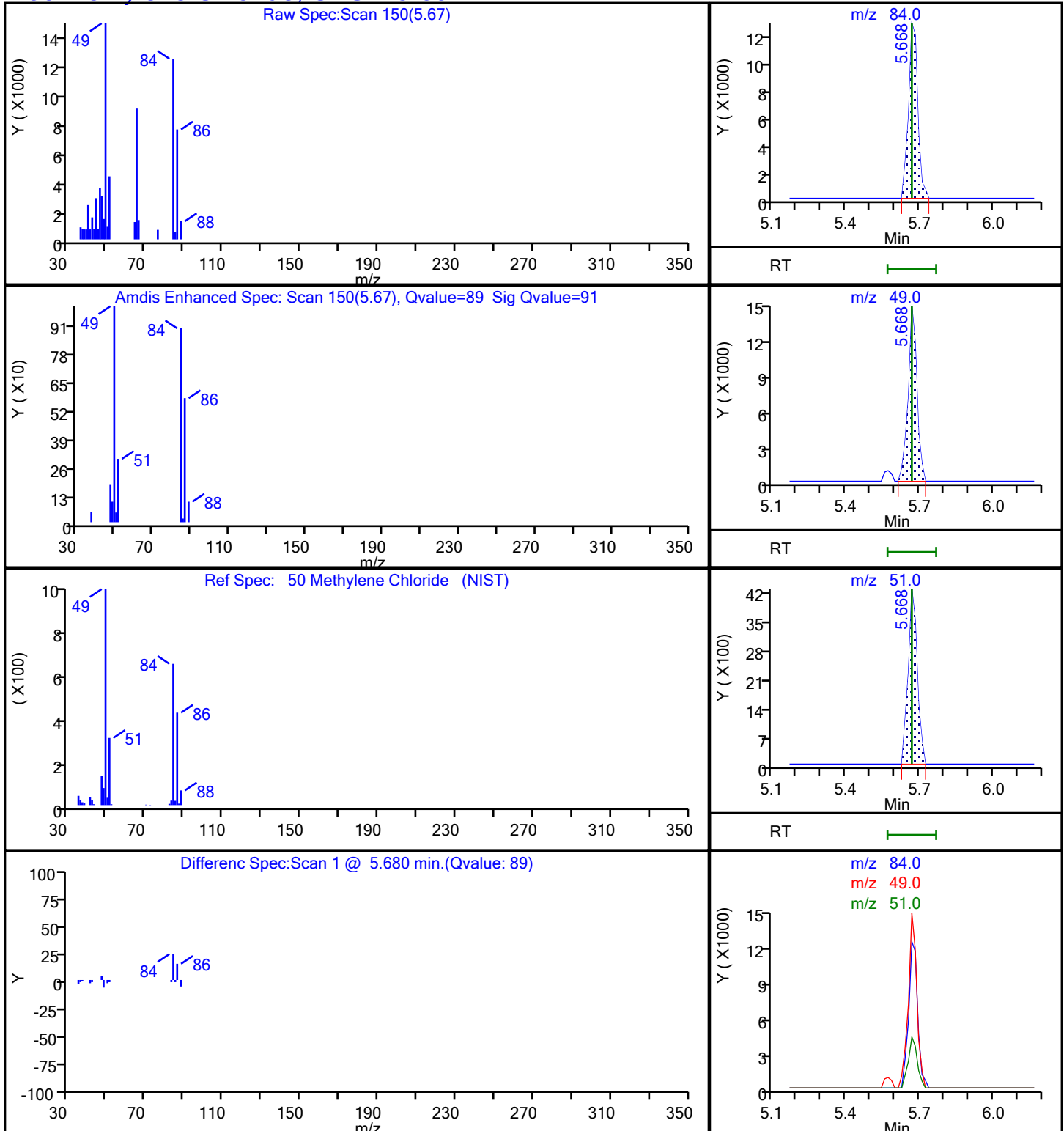
Dil. Factor: 1.0000

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Detector: MS SCAN

50 Methylene Chloride, CAS: 75-09-2

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1919.D

Injection Date: 28-Jan-2019 23:21:30

Instrument ID: VMS_MS1

Lims ID: 160-32649-A-1

Lab Sample ID: 280-32649-1

Client ID: CRC-MW-1-011519

Operator ID: nwangumaf

ALS Bottle#:

15

Worklist Smp#: 19

Purge Vol: 20.000 mL

Dil. Factor:

1.0000

Method: AQ_VMS1_8260

Limit Group:

MSV - 8260B Water and Solid

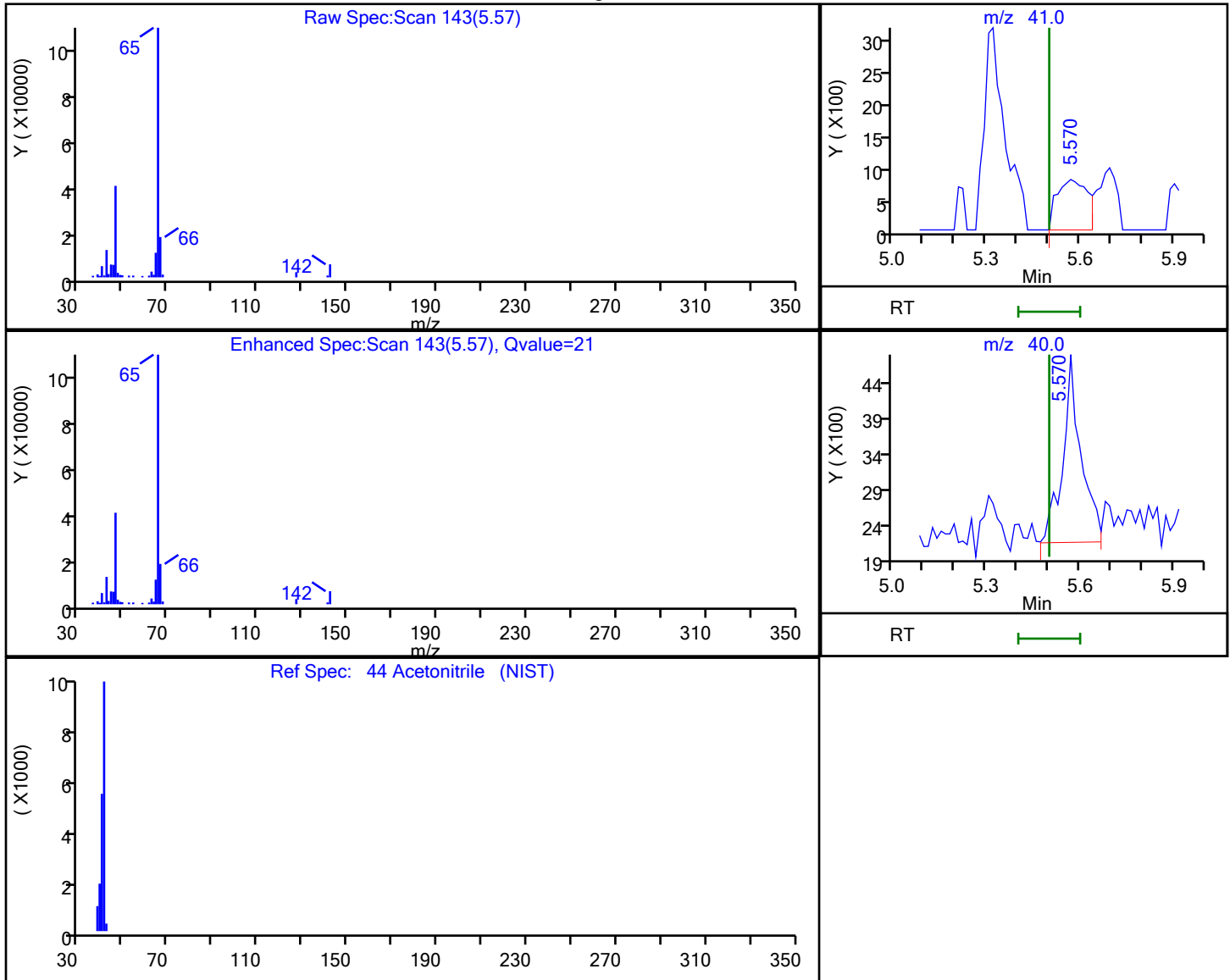
Column: DB-624 (60.25) (0.25 mm)

Detector

MS SCAN

44 Acetonitrile, CAS: 75-05-8

Processing Results



RT	Mass	Response	Amount
5.57	41.00	5451	1.609498
5.57	40.00	10401	

Reviewer: nwangumaf, 28-Jan-2019 23:41:01

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1919.D

Injection Date: 28-Jan-2019 23:21:30

Instrument ID: VMS_MS1

Lims ID: 160-32649-A-1

Lab Sample ID: 280-32649-1

Client ID: CRC-MW-1-011519

Operator ID: nwangumaf

ALS Bottle#: 15 Worklist Smp#: 19

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

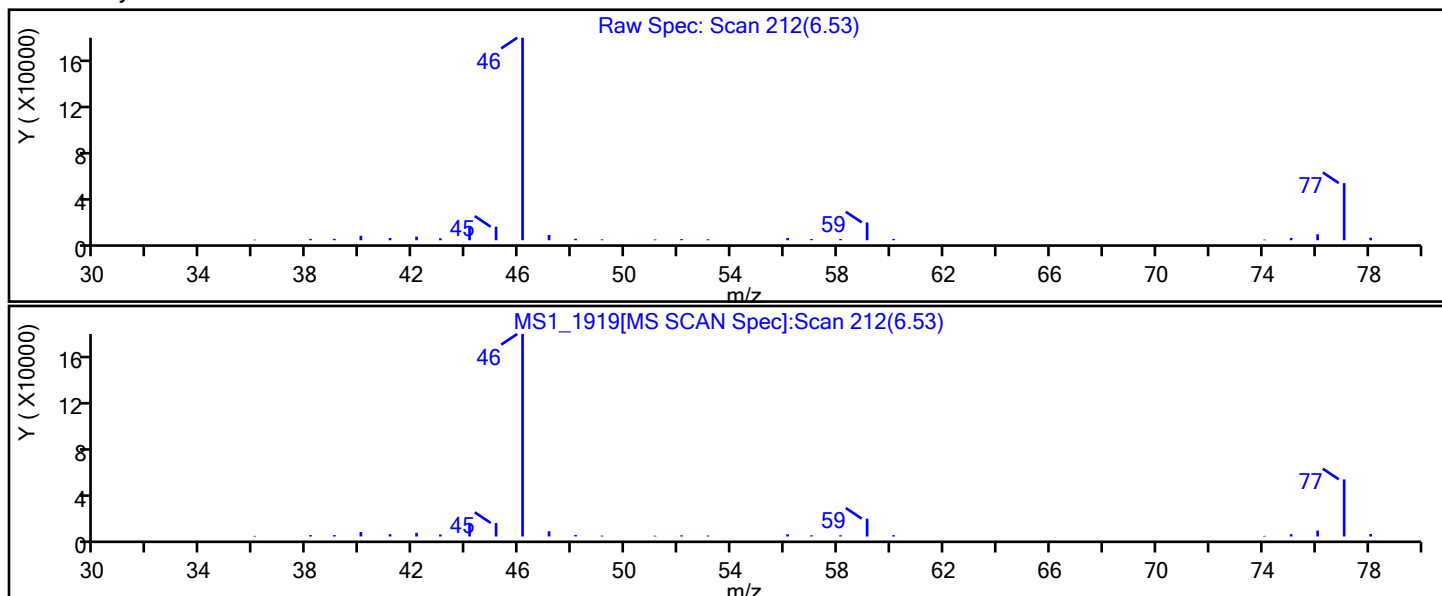
Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column:

Detector MS SCAN

No Library Matches Found above the Threshold: 85



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1919.D

Injection Date: 28-Jan-2019 23:21:30

Instrument ID: VMS_MS1

Lims ID: 160-32649-A-1

Lab Sample ID: 280-32649-1

Client ID: CRC-MW-1-011519

Operator ID: nwangumaf

ALS Bottle#: 15 Worklist Smp#: 19

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

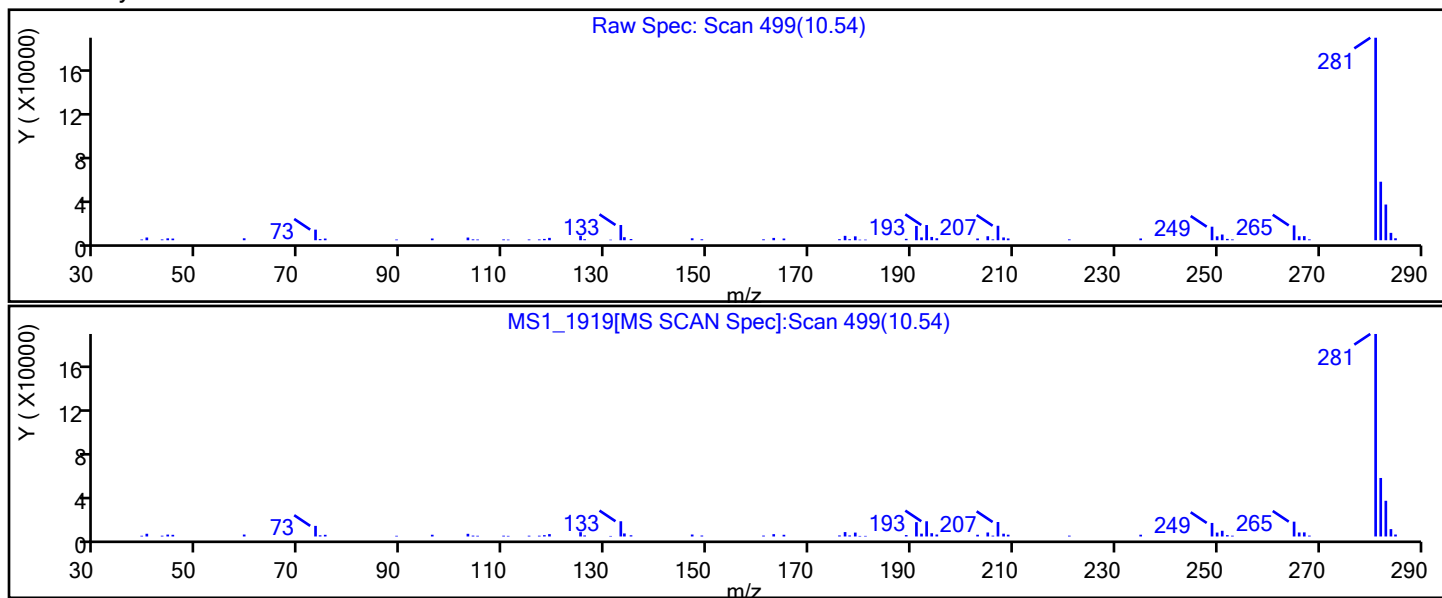
Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column:

Detector MS SCAN

No Library Matches Found above the Threshold: 85



FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443512

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25 (mm)) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 12:31 Calibration End Date: 01/08/2019 14:14 Calibration ID: 34749

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 280-443512/20	MS1_1077.D
Level 2	STD 280-443512/21	MS1_1078.D
Level 3	STD 280-443512/22	MS1_1079.D
Level 4	STD 280-443512/23	MS1_1080.D
Level 5	STD 280-443512/24	MS1_1081.D
Level 6	STD 280-443512/25	MS1_1082.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Ethylene oxide	0.0038 0.0024	0.0034	0.0033	0.0032	0.0026	Lin1	0.2058	0.0025							0.9930		0.9900
Ethanol	0.1448 0.1413	0.1402	0.1484	0.1522	0.1310	Ave		0.1430				5.2		15.0			
Propene oxide	0.0193 0.0144	0.0183	0.0188	0.0183	0.0173	Ave		0.0177				10.0		15.0			
2-Propanol	1.0998 0.8500	0.9604	0.8626	0.9115	0.8210	Ave		0.9175				11.1		15.0			
Acetonitrile	0.0167 0.0121	0.0142	0.0139	0.0133	0.0124	Ave		0.0138				11.9		15.0			
Di-isopropyl ether (DIPE)	0.2139 0.2250	0.2130	0.2281	0.2283	0.2181	Ave		0.2211				3.1		15.0			
Chloroprene	0.3429 0.3549	0.3549	0.3752	0.3832	0.3569	Ave		0.3613				4.1		15.0			
Tert-butyl ethyl ether	0.6299 0.6426	0.6151	0.6578	0.6519	0.6484	Ave		0.6410				2.5		15.0			
Ethyl acetate	0.1249 0.0978	0.1071	0.1094	0.1037	0.1021	Ave		0.1075				8.8		15.0			
Propionitrile	0.0175 0.0157	0.0168	0.0171	0.0166	0.0163	Ave		0.0167				3.9		15.0			
Methacrylonitrile	0.0723 0.0604	0.0687	0.0711	0.0690	0.0657	Ave		0.0679				6.4		15.0			
Tert-amyl methyl ether	0.5005 0.5535	0.4925	0.5356	0.5438	0.5494	Ave		0.5292				4.9		15.0			
n-Butanol	0.5937 0.4456	0.4570	0.4187	0.4121	0.4005	Lin2	4.5269	0.4016							0.9950		0.9900
Methyl methacrylate	0.0274 0.0364	0.0298	0.0327	0.0341	0.0360	Ave		0.0327				10.9		15.0			
2-Nitropropane	0.0149 0.0197	0.0156	0.0170	0.0182	0.0188	Ave		0.0174				10.9		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443512

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 12:31 Calibration End Date: 01/08/2019 14:14 Calibration ID: 34749

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
cis-1,4-Dichloro-2-butene	0.0715 0.0855	0.0672	0.0735	0.0780	0.0825	Ave		0.0764				9.1		15.0			
1,2,3-Trimethylbenzene	3.3414 3.3872	3.4569	3.7427	3.7640	3.4348	Ave		3.5212				5.2		15.0			
1,3,5-Trichlorobenzene	1.4103 1.3785	1.4515	1.4726	1.5029	1.3576	Ave		1.4289				3.9		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443512

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 12:31 Calibration End Date: 01/08/2019 14:14 Calibration ID: 34749

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 280-443512/20	MS1_1077.D
Level 2	STD 280-443512/21	MS1_1078.D
Level 3	STD 280-443512/22	MS1_1079.D
Level 4	STD 280-443512/23	MS1_1080.D
Level 5	STD 280-443512/24	MS1_1081.D
Level 6	STD 280-443512/25	MS1_1082.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Ethylene oxide	FB	Lin1	72670 2950906	152697	302877	582616	1309879	100 6000	250	500	1000	2500
Ethanol	TBAd 9	Ave	15008 851566	31980	68501	136306	363447	60.0 3600	150	300	600	1500
Propene oxide	FB	Ave	370152 17350846	834642	1720495	3390234	8827109	100 6000	250	500	1000	2500
2-Propanol	TBAd 9	Ave	18994 853742	36499	66357	136037	379605	10.0 600	25.0	50.0	100	250
Acetonitrile	FB	Ave	32024 1465081	64494	126755	245942	632086	10.0 600	25.0	50.0	100	250
Di-isopropyl ether (DIPE)	FB	Ave	41096 2717578	96995	208218	422142	1111224	1.00 60.0	2.50	5.00	10.0	25.0
Chloroprene	FB	Ave	65870 4285925	161653	342596	708645	1818368	1.00 60.0	2.50	5.00	10.0	25.0
Tert-butyl ethyl ether	FB	Ave	121000 7759960	280167	600592	1205740	3303441	1.00 60.0	2.50	5.00	10.0	25.0
Ethyl acetate	FB	Ave	47977 2361886	97520	199828	383642	1040349	2.00 120	5.00	10.0	20.0	50.0
Propionitrile	FB	Ave	33674 1893250	76390	156266	307633	830627	10.0 600	25.0	50.0	100	250
Methacrylonitrile	FB	Ave	138909 7289084	312865	649149	1276442	3346408	10.0 600	25.0	50.0	100	250
Tert-amyl methyl ether	FB	Ave	96149 6683287	224320	489019	1005803	2798986	1.00 60.0	2.50	5.00	10.0	25.0
n-Butanol	TBAd 9	Lin2	25634 1118938	43416	80512	153764	462965	25.0 1500	62.5	125	250	625
Methyl methacrylate	FB	Ave	10521 879328	27106	59630	126053	366669	2.00 120	5.00	10.0	20.0	50.0
2-Nitropropane	FB	Ave	5709 475461	14171	31034	67477	191997	2.00 120	5.00	10.0	20.0	50.0
cis-1,4-Dichloro-2-butene	DCBd 4	Ave	7679 582954	17086	36933	79672	240511	2.00 120	5.00	10.0	20.0	50.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443512

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 12:31 Calibration End Date: 01/08/2019 14:14 Calibration ID: 34749

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
1,2,3-Trimethylbenzene	DCBd 4	Ave	179339 11543777	439635	940961	1922556	5008297	1.00 60.0	2.50	5.00	10.0	25.0
1,3,5-Trichlorobenzene	DCBd 4	Ave	75694 4698114	184590	370236	767642	1979598	1.00 60.0	2.50	5.00	10.0	25.0

Curve Type Legend:

Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1077.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 08-Jan-2019 12:31:30 ALS Bottle#: 12 Worklist Smp#: 20
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickhamt Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub109
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 09-Jan-2019 06:41:59 Calib Date: 08-Jan-2019 14:14:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0314

First Level Reviewer: wickhamt

Date: 09-Jan-2019 06:29:50

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.584	0.000	69	431764	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	99	2401119	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	86	483937	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	96	670899	12.5	12.5	
28 Ethylene oxide	43	4.551	4.551	0.000	98	72670	100.0	69.0	
34 Ethanol	45	4.942	4.942	0.000	68	15008	60.0	60.8	
38 Propene oxide	58	5.166	5.166	0.000	0	370152	100.0	108.6	
41 Isopropyl alcohol	45	5.333	5.333	0.000	94	18994	10.0	12.0	
44 Acetonitrile	41	5.529	5.529	0.000	100	32024	10.0	12.1	
56 Isopropyl ether	87	6.185	6.185	0.000	94	41096	1.00	0.9678	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	89	65870	1.00	0.9490	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	96	121000	1.00	0.9828	
60 Ethyl acetate	43	6.576	6.590	-0.014	96	47977	2.00	2.32	
63 Propionitrile	54	6.632	6.632	0.000	98	33674	10.0	10.5	
66 Methacrylonitrile	41	6.758	6.758	0.000	89	138909	10.0	10.7	
76 Tert-amyl methyl ether	73	7.344	7.358	-0.014	96	96149	1.00	0.9458	
78 n-Butanol	56	7.540	7.540	0.000	85	25634	25.0	25.7	
81 Methyl methacrylate	100	7.945	7.945	0.000	85	10521	2.00	1.67	
87 2-Nitropropane	41	8.294	8.294	0.000	94	5709	2.00	1.71	
99 Tetrahydrothiophene	60		9.397				ND	ND	U
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	90	7679	2.00	1.87	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	97	179339	1.00	0.9489	
21 1,3,5-Trichlorobenzene	180	12.931	12.931	0.000	97	75694	1.00	0.9870	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp A_00033

Amount Added: 0.40

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1077.D

Injection Date: 08-Jan-2019 12:31:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 20

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

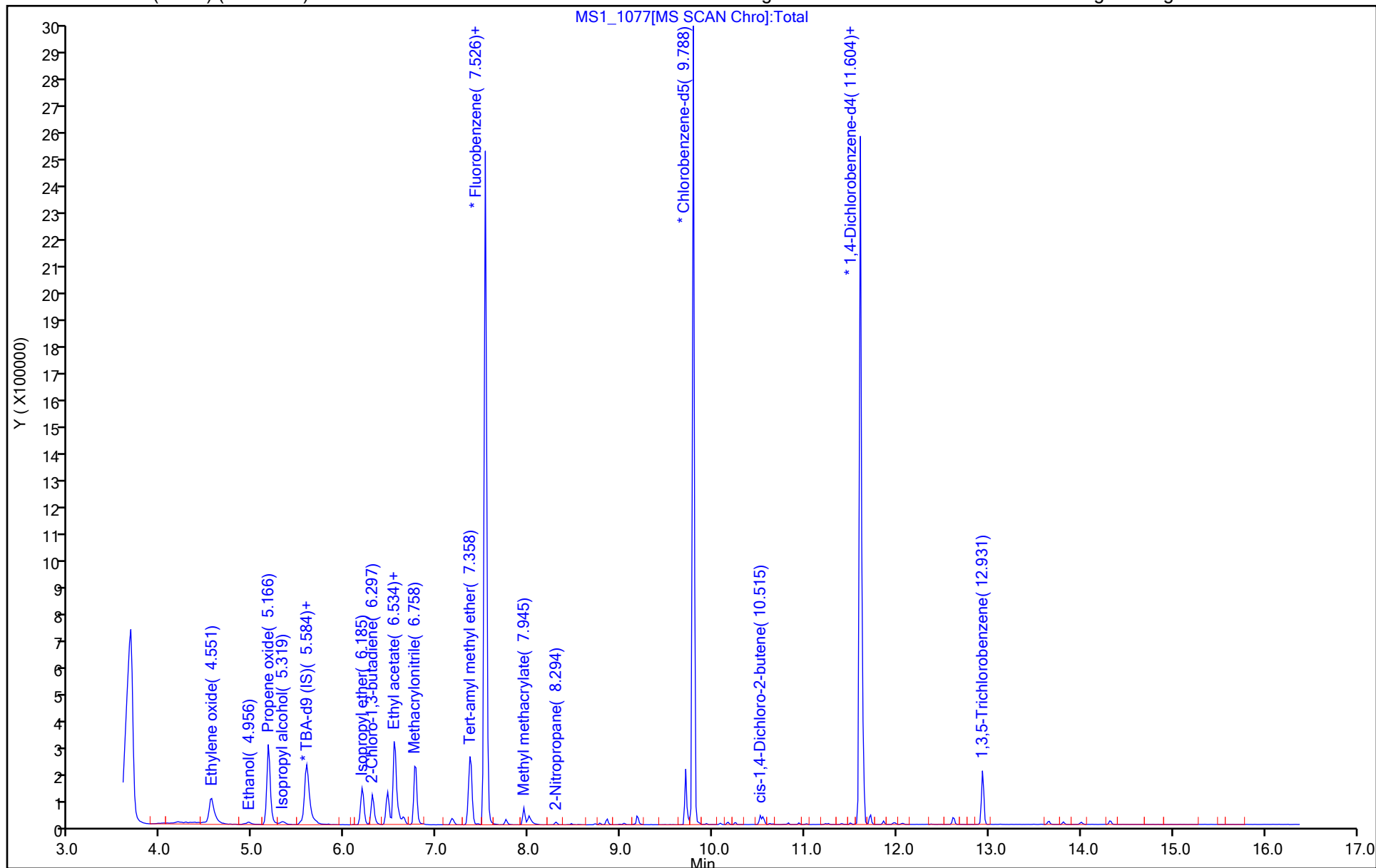
ALS Bottle#: 12

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1078.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 08-Jan-2019 12:52:30 ALS Bottle#: 13 Worklist Smp#: 21
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickhamt Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub109
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 09-Jan-2019 06:42:02 Calib Date: 08-Jan-2019 14:14:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0314

First Level Reviewer: wickhamt

Date: 09-Jan-2019 06:30:11

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.584	0.001	69	380039	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	99	2277314	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	86	458062	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	635877	12.5	12.5	
28 Ethylene oxide	43	4.551	4.551	0.000	98	152697	250.0	252.9	
34 Ethanol	45	4.928	4.942	-0.014	92	31980	150.0	147.1	
38 Propene oxide	58	5.166	5.166	0.000	0	834642	250.0	258.2	
41 Isopropyl alcohol	45	5.319	5.333	-0.014	97	36499	25.0	26.2	
44 Acetonitrile	41	5.529	5.529	0.000	99	64494	25.0	25.7	
56 Isopropyl ether	87	6.185	6.185	0.000	94	96995	2.50	2.41	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	90	161653	2.50	2.46	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	96	280167	2.50	2.40	
60 Ethyl acetate	43	6.576	6.590	-0.014	97	97520	5.00	4.98	
63 Propionitrile	54	6.632	6.632	0.000	99	76390	25.0	25.1	
66 Methacrylonitrile	41	6.758	6.758	0.000	88	312865	25.0	25.3	
76 Tert-amyl methyl ether	73	7.344	7.358	-0.014	96	224320	2.50	2.33	
78 n-Butanol	56	7.540	7.540	0.000	86	43416	62.5	59.8	
81 Methyl methacrylate	100	7.945	7.945	0.000	87	27106	5.00	4.55	
87 2-Nitropropane	41	8.294	8.294	0.000	96	14171	5.00	4.48	
99 Tetrahydrothiophene	60		9.397				ND	ND	U
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	87	17086	5.00	4.40	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	439635	2.50	2.45	
21 1,3,5-Trichlorobenzene	180	12.931	12.931	0.000	97	184590	2.50	2.54	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp A_00033

Amount Added: 1.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1078.D

Injection Date: 08-Jan-2019 12:52:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 21

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

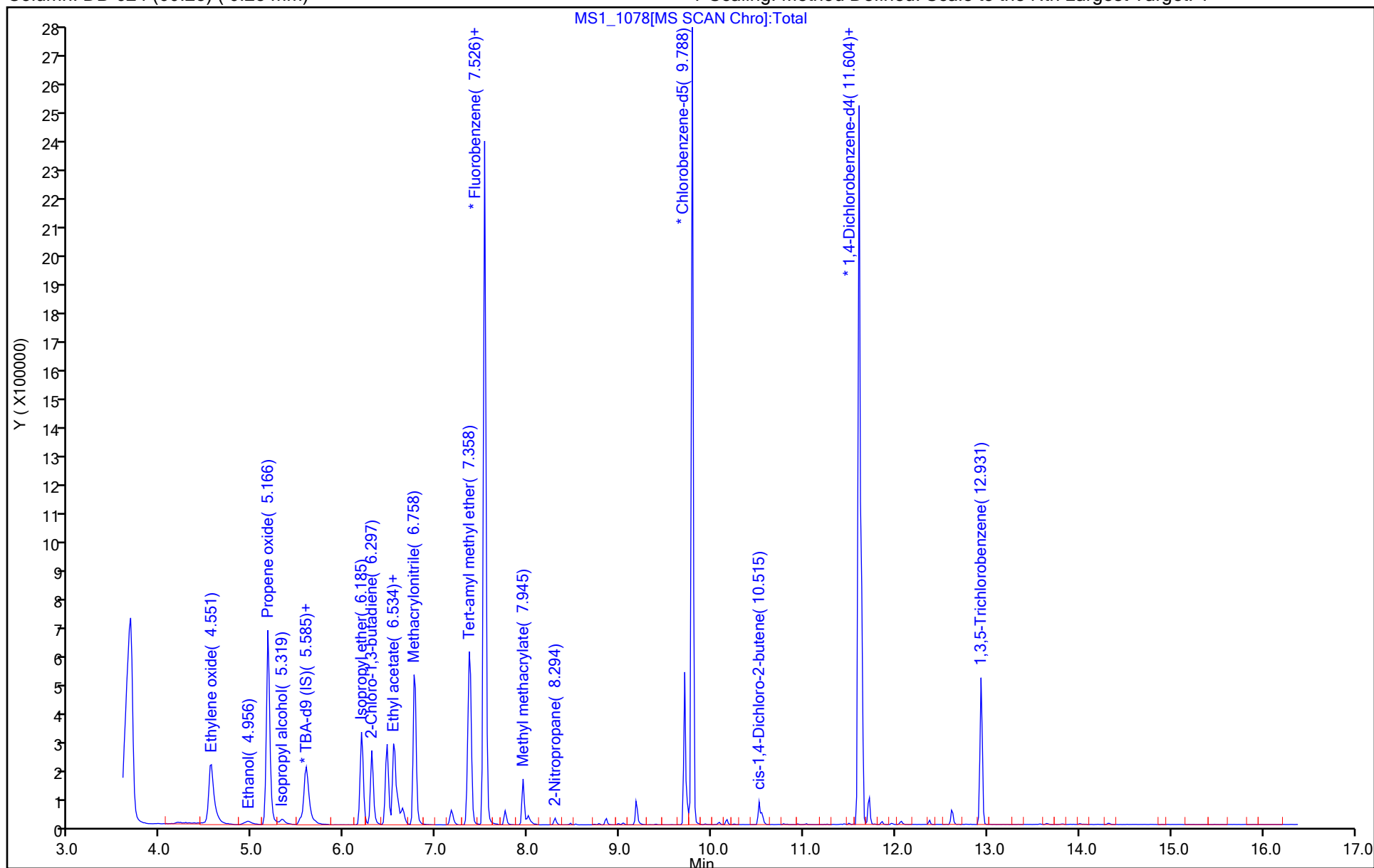
ALS Bottle#: 13

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1079.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 08-Jan-2019 13:13:30 ALS Bottle#: 14 Worklist Smp#: 22
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickhamt Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub109
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 09-Jan-2019 06:42:05 Calib Date: 08-Jan-2019 14:14:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0314

First Level Reviewer: wickhamt

Date: 09-Jan-2019 06:30:45

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.584	0.000	68	384624	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	99	2282532	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	86	462313	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	628528	12.5	12.5	
28 Ethylene oxide	43	4.551	4.551	0.000	98	302877	500.0	581.0	
34 Ethanol	45	4.928	4.942	-0.014	93	68501	300.0	311.4	
38 Propene oxide	58	5.165	5.166	-0.001	0	1720495	500.0	531.0	
41 Isopropyl alcohol	45	5.319	5.333	-0.014	98	66357	50.0	47.0	
44 Acetonitrile	41	5.529	5.529	0.000	100	126755	50.0	50.5	
56 Isopropyl ether	87	6.185	6.185	0.000	94	208218	5.00	5.16	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	89	342596	5.00	5.19	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	600592	5.00	5.13	
60 Ethyl acetate	43	6.576	6.590	-0.014	97	199828	10.0	10.2	
63 Propionitrile	54	6.632	6.632	0.000	99	156266	50.0	51.3	
66 Methacrylonitrile	41	6.758	6.758	0.000	88	649149	50.0	52.4	
76 Tert-amyl methyl ether	73	7.344	7.358	-0.014	96	489019	5.00	5.06	
78 n-Butanol	56	7.540	7.540	0.000	85	80512	125.0	119.0	
81 Methyl methacrylate	100	7.945	7.945	0.000	87	59630	10.0	9.98	
87 2-Nitropropane	41	8.294	8.294	0.000	98	31034	10.0	9.79	
99 Tetrahydrothiophene	60		9.397				ND	ND	U
110 cis-1,4-Dichloro-2-butene	53	10.514	10.515	-0.001	85	36933	10.0	9.62	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	940961	5.00	5.31	
21 1,3,5-Trichlorobenzene	180	12.931	12.931	0.000	97	370236	5.00	5.15	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp A_00033

Amount Added: 2.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1079.D

Injection Date: 08-Jan-2019 13:13:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 22

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

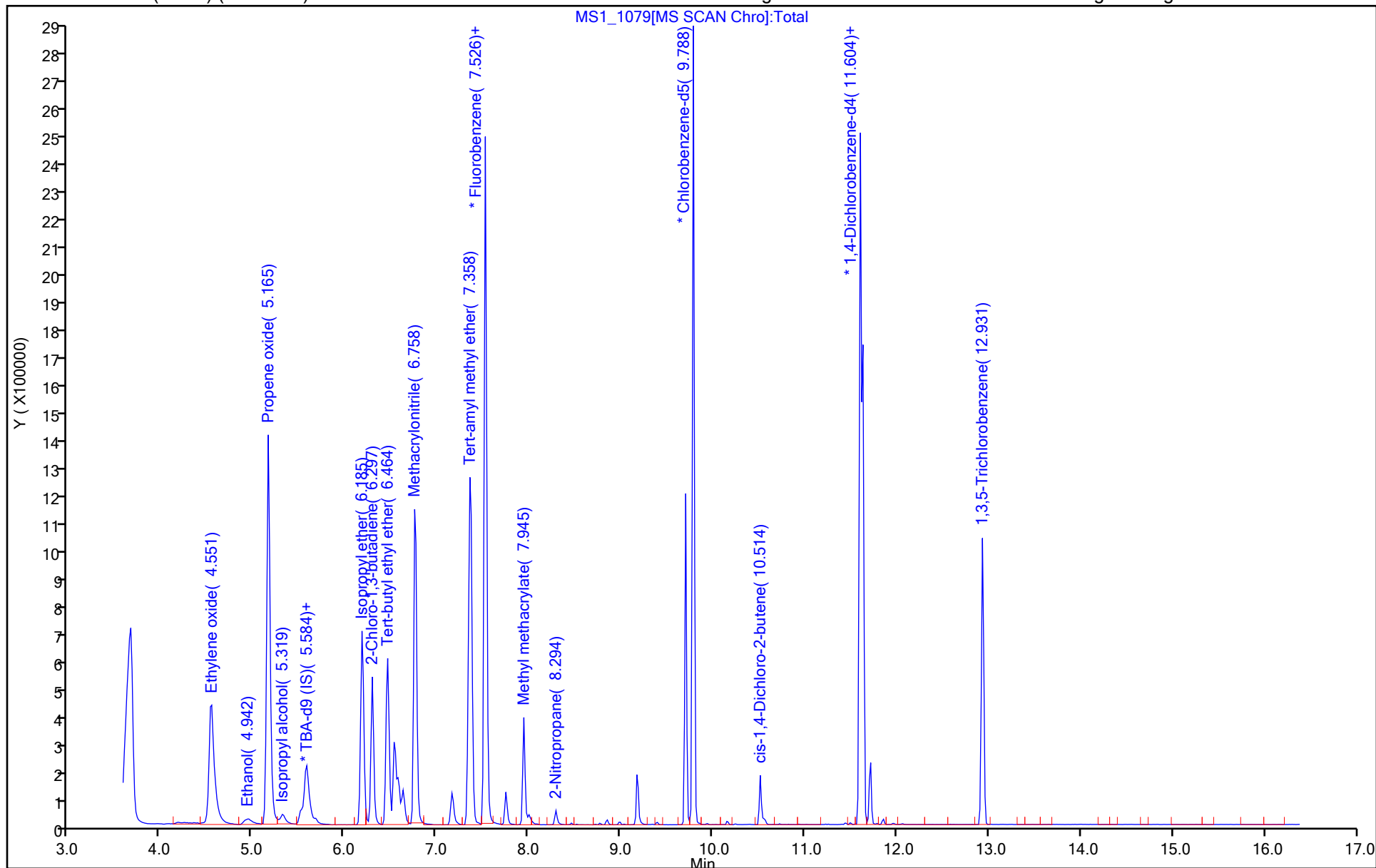
ALS Bottle#: 14

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1080.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 08-Jan-2019 13:33:30 ALS Bottle#: 15 Worklist Smp#: 23
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickhamt Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub109
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 09-Jan-2019 06:42:08 Calib Date: 08-Jan-2019 14:14:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0314

First Level Reviewer: wickhamt

Date: 09-Jan-2019 06:31:06

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.585	0.000	68	373122	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	99	2311825	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	86	466744	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	96	638470	12.5	12.5	
28 Ethylene oxide	43	4.551	4.551	0.000	98	582616	1000.0	1177.5	
34 Ethanol	45	4.942	4.942	0.000	98	136306	600.0	638.6	
38 Propene oxide	58	5.166	5.166	0.000	0	3390234	1000.0	1033.1	
41 Isopropyl alcohol	45	5.333	5.333	0.000	99	136037	100.0	99.3	
44 Acetonitrile	41	5.529	5.529	0.000	99	245942	100.0	96.7	
56 Isopropyl ether	87	6.185	6.185	0.000	95	422142	10.0	10.3	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	89	708645	10.0	10.6	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	1205740	10.0	10.2	
60 Ethyl acetate	43	6.590	6.590	0.000	98	383642	20.0	19.3	
63 Propionitrile	54	6.632	6.632	0.000	99	307633	100.0	99.8	
66 Methacrylonitrile	41	6.758	6.758	0.000	88	1276442	100.0	101.7	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	97	1005803	10.0	10.3	
78 n-Butanol	56	7.540	7.540	0.000	83	153764	250.0	245.3	
81 Methyl methacrylate	100	7.945	7.945	0.000	87	126053	20.0	20.8	
87 2-Nitropropane	41	8.294	8.294	0.000	98	67477	20.0	21.0	
99 Tetrahydrothiophene	60		9.397				ND	ND	U
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	83	79672	20.0	20.4	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	1922556	10.0	10.7	
21 1,3,5-Trichlorobenzene	180	12.931	12.931	0.000	97	767642	10.0	10.5	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp A_00033

Amount Added: 4.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1080.D

Injection Date: 08-Jan-2019 13:33:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 23

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

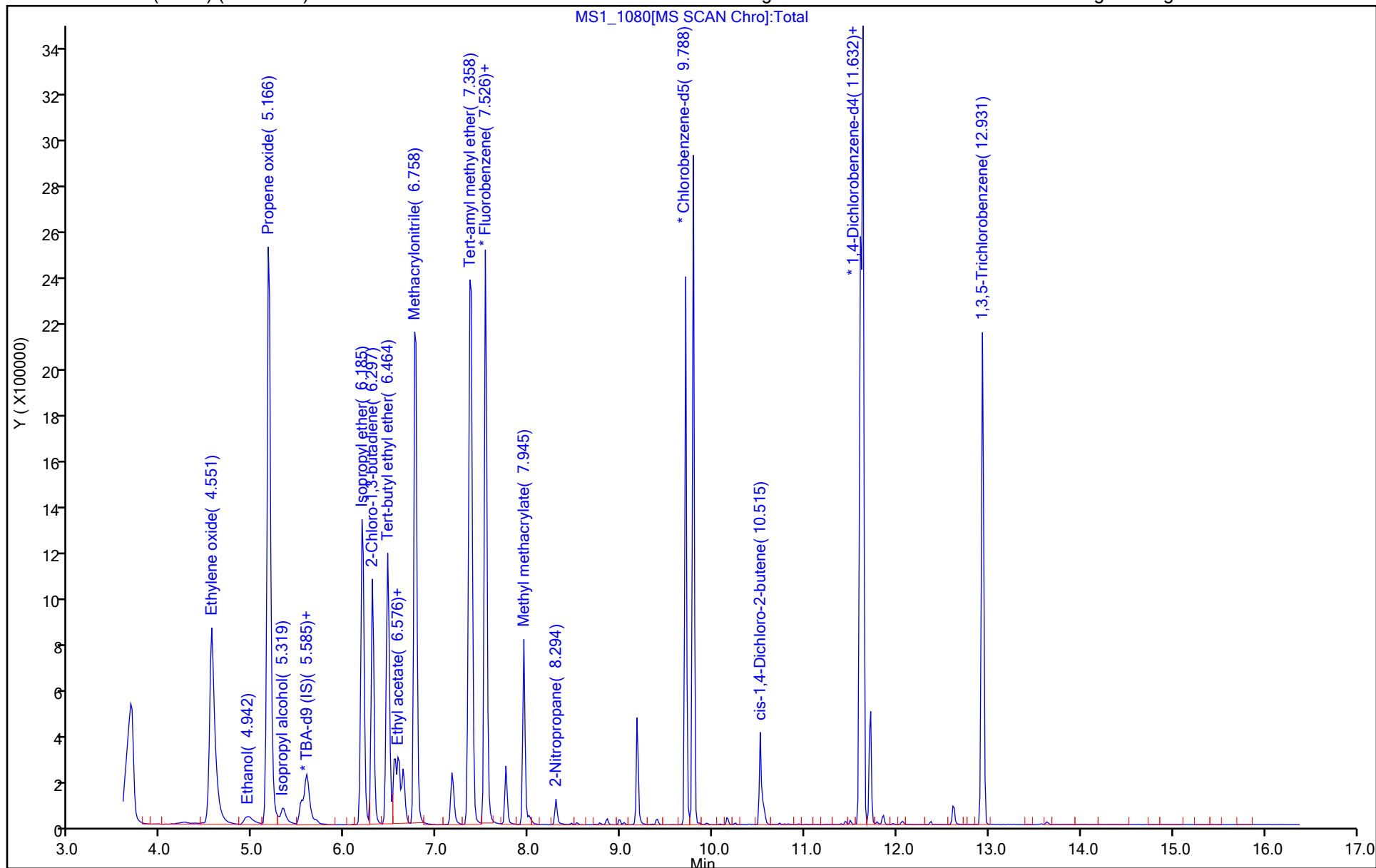
ALS Bottle#: 15

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1081.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 08-Jan-2019 13:54:30 ALS Bottle#: 16 Worklist Smp#: 24
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickhamt Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub109
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 09-Jan-2019 06:42:11 Calib Date: 08-Jan-2019 14:14:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0314

First Level Reviewer: wickhamt

Date: 09-Jan-2019 06:31:27

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.585	-0.001	68	462387	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	99	2547394	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	86	513861	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	96	729061	12.5	12.5	
28 Ethylene oxide	43	4.551	4.551	0.000	98	1309879	2500.0	2488.2	
34 Ethanol	45	4.942	4.942	0.000	100	363447	1500.0	1374.1	
38 Propene oxide	58	5.165	5.166	-0.001	0	8827109	2500.0	2441.1	
41 Isopropyl alcohol	45	5.333	5.333	0.000	99	379605	250.0	223.7	
44 Acetonitrile	41	5.529	5.529	-0.001	99	632086	250.0	225.4	
56 Isopropyl ether	87	6.185	6.185	0.000	94	1111224	25.0	24.7	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	89	1818368	25.0	24.7	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	3303441	25.0	25.3	
60 Ethyl acetate	43	6.576	6.590	-0.014	98	1040349	50.0	47.5	
63 Propionitrile	54	6.632	6.632	0.000	99	830627	250.0	244.5	
66 Methacrylonitrile	41	6.758	6.758	0.000	88	3346408	250.0	242.0	
76 Tert-amyl methyl ether	73	7.358	7.358	0.000	98	2798986	25.0	26.0	
78 n-Butanol	56	7.540	7.540	0.000	84	462965	625.0	612.1	
81 Methyl methacrylate	100	7.945	7.945	0.000	87	366669	50.0	55.0	
87 2-Nitropropane	41	8.294	8.294	0.000	98	191997	50.0	54.3	
99 Tetrahydrothiophene	60		9.397				ND	ND	U
110 cis-1,4-Dichloro-2-butene	53	10.514	10.515	-0.001	79	240511	50.0	54.0	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	5008297	25.0	24.4	
21 1,3,5-Trichlorobenzene	180	12.931	12.931	0.000	97	1979598	25.0	23.8	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp A_00033

Amount Added: 10.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1081.D

Injection Date: 08-Jan-2019 13:54:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 24

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

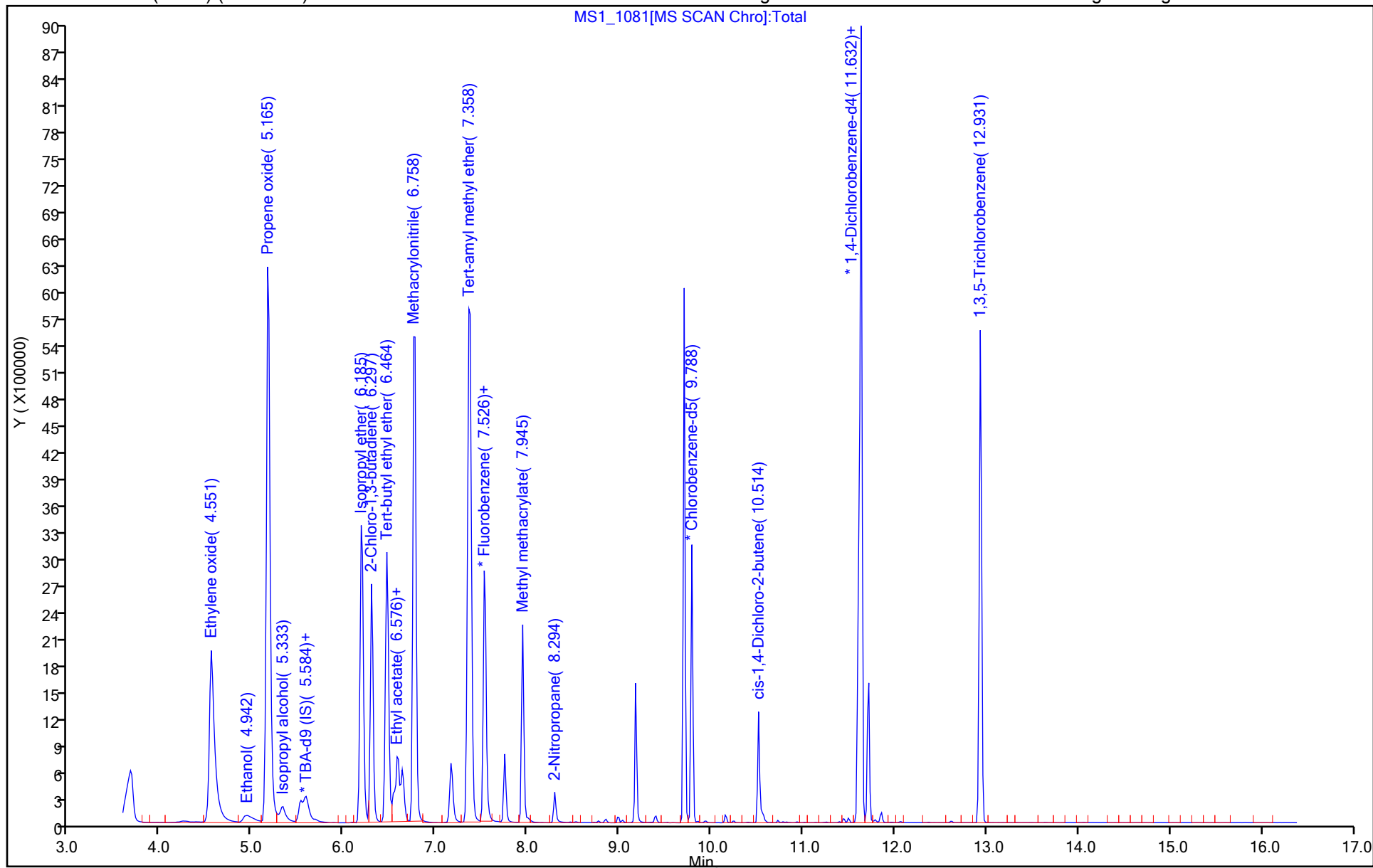
ALS Bottle#: 16

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 08-Jan-2019 14:14:30 ALS Bottle#: 17 Worklist Smp#: 25
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickhamt Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub109
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 09-Jan-2019 06:42:14 Calib Date: 08-Jan-2019 14:14:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0314

First Level Reviewer: wickhamt

Date: 09-Jan-2019 06:31:49

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.584	5.585	-0.001	69	418493	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	98	2515736	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	86	508975	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	96	710019	12.5	12.5	
28 Ethylene oxide	43	4.537	4.551	-0.014	99	2950906	6000.0	5781.4	
34 Ethanol	45	4.914	4.942	-0.028	99	851566	3600.0	3557.3	
38 Propene oxide	58	5.166	5.166	0.000	0	17350846	6000.0	4858.6	
41 Isopropyl alcohol	45	5.319	5.333	-0.014	100	853742	600.0	555.8	
44 Acetonitrile	41	5.515	5.529	-0.014	99	1465081	600.0	529.1	
56 Isopropyl ether	87	6.185	6.185	0.000	94	2717578	60.0	61.1	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	89	4285925	60.0	58.9	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	96	7759960	60.0	60.2	
60 Ethyl acetate	43	6.576	6.590	-0.014	98	2361886	120.0	109.2	
63 Propionitrile	54	6.632	6.632	0.000	99	1893250	600.0	564.2	
66 Methacrylonitrile	41	6.758	6.758	0.000	86	7289084	600.0	533.7	
76 Tert-amyl methyl ether	73	7.344	7.358	-0.014	98	6683287	60.0	62.7	
78 n-Butanol	56	7.540	7.540	0.000	83	1118938	1500.0	1653.3	
81 Methyl methacrylate	100	7.945	7.945	0.000	86	879328	120.0	133.6	
87 2-Nitropropane	41	8.294	8.294	0.000	97	475461	120.0	136.1	
99 Tetrahydrothiophene	60		9.397				ND	ND	U
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	77	582954	120.0	134.4	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	97	11543777	60.0	57.7	
21 1,3,5-Trichlorobenzene	180	12.931	12.931	0.000	97	4698114	60.0	57.9	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp A_00033

Amount Added: 24.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D

Injection Date: 08-Jan-2019 14:14:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 25

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

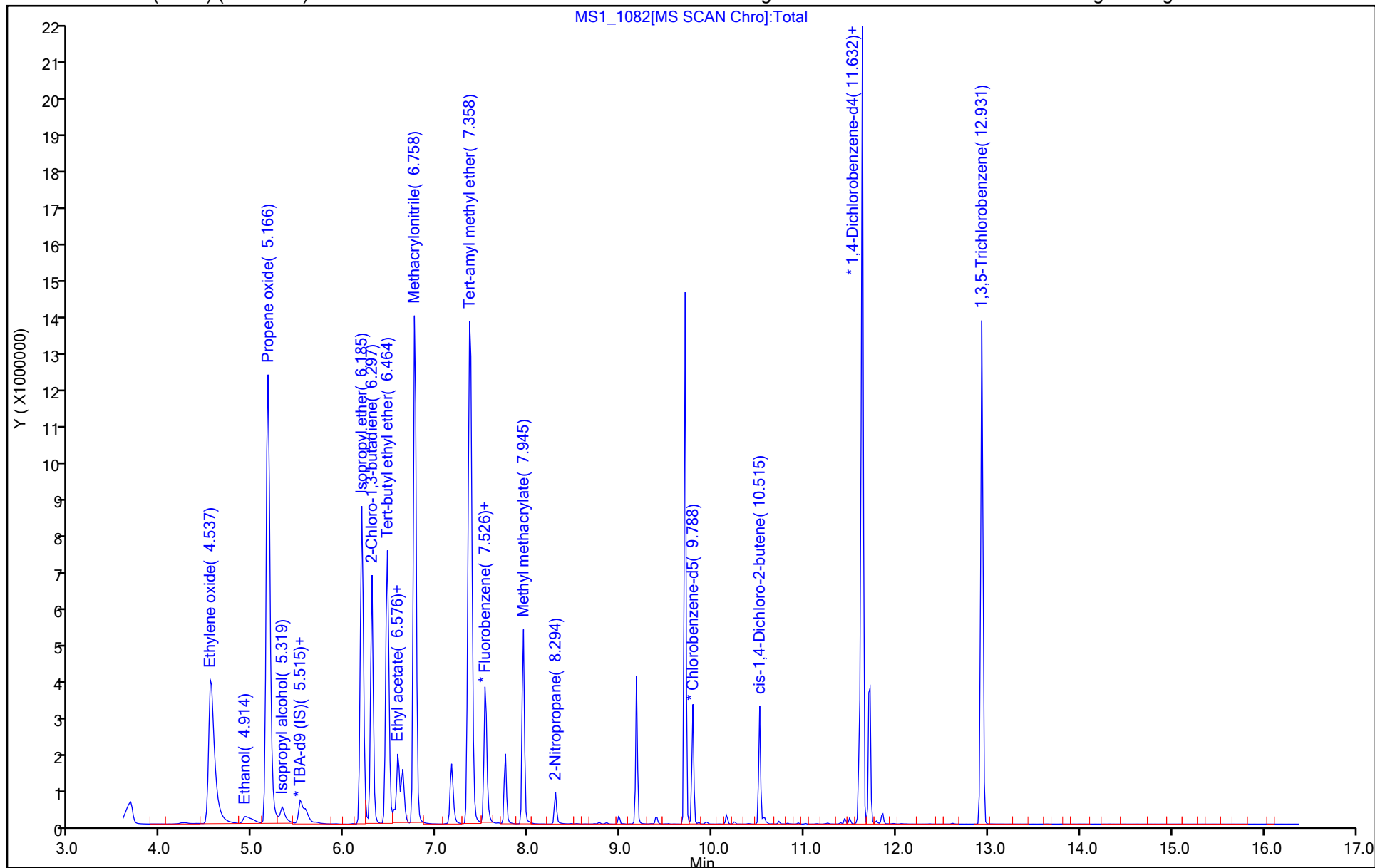
ALS Bottle#: 17

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25 (mm)) Heated Purge: (Y/N) N

Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 280-444687/12	MS1_1421.D
Level 2	STD 280-444687/13	MS1_1422.D
Level 3	STD 280-444687/14	MS1_1423.D
Level 4	STD 280-444687/15	MS1_1424.D
Level 5	ICIS 280-444687/16	MS1_1425.D
Level 6	STD 280-444687/17	MS1_1426.D
Level 7	STD 280-444687/18	MS1_1427.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Dichlorodifluoromethane	0.3052 0.3740	0.2880 0.3696	0.3254	0.4538	0.4541	Lin1	-0.029	0.3826							0.9920		0.9900
Chloromethane	0.2626 0.2068	0.2168 0.2050	0.2195	0.2426	0.2434	Ave		0.2281			0.1000	9.5		15.0			
Vinyl chloride	0.2440 0.2166	0.2364 0.2081	0.2309	0.2625	0.2641	Ave		0.2375				9.0		30.0			
Bromomethane	0.2817 0.2672	0.2828 0.2156	0.2885	0.3189	0.3274	Ave		0.2831				13.0		15.0			
Chloroethane	0.2409 0.2086	0.2250 0.1746	0.2341	0.2475	0.2537	Ave		0.2263				12.0		15.0			
Dichlorofluoromethane	0.5221 0.4950	0.5250 0.4834	0.5391	0.5783	0.5870	Ave		0.5328				7.3		15.0			
Trichlorofluoromethane	0.4477 0.4362	0.4703 0.4327	0.4689	0.5204	0.5292	Ave		0.4722				8.2		15.0			
Ethyl ether	0.1504 0.1558	0.1489 0.1570	0.1561	0.1681	0.1745	Ave		0.1587				5.9		15.0			
Acrolein	0.0157 0.0147	0.0150 0.0145	0.0150	0.0167	0.0168	Ave		0.0155				6.1		15.0			
Acetone	0.0367 0.0246	0.0278 0.0239	0.0284	0.0288	0.0274	Ave		0.0282				14.8		15.0			
1,1,2-Trichlorotrifluoroethane	0.2270 0.2306	0.2306 0.2252	0.2373	0.2551	0.2640	Ave		0.2385				6.3		15.0			
1,1-Dichloroethene	0.2747 0.2777	0.2745 0.2698	0.2846	0.3106	0.3170	Ave		0.2870				6.6		30.0			
Iodomethane	0.4765 0.4910	0.4910 0.4832	0.5038	0.5481	0.5655	Ave		0.5084				6.8		15.0			
Methyl acetate	0.0984 0.0685	0.0694 0.0686	0.0697	0.0742	0.0777	Ave		0.0752				14.3		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687
SDG No.: _____
Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Allyl chloride	0.3874 0.3648	0.3944 0.3395	0.3995	0.4244	0.4252	Ave		0.3907				7.9		15.0			
Carbon disulfide	1.2644 1.1247	1.2251 1.0326	1.2173	1.3055	1.3248	Ave		1.2135				8.5		15.0			
Tert-butyl alcohol (2-methyl-2-propanol)	1.3577 1.3822	1.3108 1.3522	1.4443	1.5161	1.4743	Ave		1.4053				5.3		15.0			
Methylene Chloride	0.3857 0.2811	0.3383 0.2751	0.3144	0.3166	0.3227	Ave		0.3191				11.6		15.0			
Acrylonitrile	0.0377 0.0365	0.0367 0.0361	0.0376	0.0404	0.0419	Ave		0.0381				5.8		15.0			
Methyl tert-butyl ether	0.5257 0.5185	0.5261 0.5122	0.5358	0.5726	0.5943	Ave		0.5408				5.7		15.0			
trans-1,2-Dichloroethene	0.3134 0.3119	0.3160 0.3049	0.3260	0.3485	0.3557	Ave		0.3252				6.0		15.0			
Hexane	2.0167 1.8657	2.0110 1.7281	2.0056	2.1578	2.1422	Ave		1.9896				7.6		15.0			
Vinyl acetate	0.2308 0.2244	0.2265 0.2085	0.2241	0.2465	0.2596	Ave		0.2315				7.2		15.0			
1,1-Dichloroethane	0.4797 0.4716	0.4844 0.4543	0.4984	0.5316	0.5460	Ave		0.4951			0.1000	6.6		15.0			
2-Butanone (MEK)	++++ 0.0481	0.0553 0.0481	0.0512	0.0537	0.0548	Ave		0.0519				6.3		15.0			
sec-Butyl Alcohol	0.9782 0.9865	0.9326 0.9439	1.0008	1.0651	1.0671	Ave		0.9963				5.3		15.0			
cis-1,2-Dichloroethene	0.3394 0.3391	0.3389 0.3328	0.3521	0.3741	0.3859	Ave		0.3518				5.8		15.0			
2,2-Dichloropropane	0.4556 0.3933	0.4387 0.3797	0.4390	0.4550	0.4609	Ave		0.4318				7.5		15.0			
Chlorobromomethane	0.1284 0.1282	0.1251 0.1293	0.1273	0.1380	0.1453	Ave		0.1317				5.5		15.0			
Chloroform	0.4817 0.4730	0.4729 0.4558	0.4953	0.5248	0.5406	Ave		0.4920				6.2		30.0			
Tetrahydrofuran	0.0397 0.0277	0.0406 0.0280	0.0284	0.0310	0.0319	Lin1	0.0163	0.0281							0.9980		0.9900
Isobutyl alcohol	0.3935 0.3639	0.3198 0.3550	0.3538	0.3782	0.3827	Ave		0.3638				6.7		15.0			
1,1,1-Trichloroethane	0.4472 0.4412	0.4561 0.4300	0.4651	0.4968	0.5082	Ave		0.4635				6.3		15.0			
Cyclohexane	0.5049 0.4943	0.5392 0.4574	0.5429	0.5626	0.5820	Ave		0.5262				8.2		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687
SDG No.: _____
Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
1,1-Dichloropropene	0.4067 0.3968	0.4169 0.3770	0.4234	0.4492	0.4588	Ave		0.4184				6.8		15.0			
Carbon tetrachloride	0.3774 0.3840	0.3915 0.3728	0.4011	0.4249	0.4411	Ave		0.3990				6.4		15.0			
1,2-Dichloroethane	0.2420 0.2406	0.2400 0.2364	0.2468	0.2659	0.2754	Ave		0.2496				6.0		15.0			
Benzene	1.2287 1.1553	1.2213 1.0415	1.2527	1.3227	1.3446	Ave		1.2238				8.4		15.0			
n-Heptane	0.3915 0.3793	0.4068 0.3425	0.4083	0.4354	0.4446	Ave		0.4012				8.6		15.0			
Trichloroethene	0.3171 0.3125	0.3112 0.3053	0.3248	0.3427	0.3514	Ave		0.3236				5.3		15.0			
2-Pentanone	0.0668 0.0688	0.0670 0.0680	0.0698	0.0740	0.0774	Ave		0.0703				5.7		15.0			
1,2-Dichloropropane	0.2685 0.2602	0.2645 0.2536	0.2724	0.2866	0.2971	Ave		0.2718				5.6		30.0			
Methylcyclohexane	0.4116 0.3983	0.4153 0.3682	0.4272	0.4520	0.4660	Ave		0.4198				7.8		15.0			
1,4-Dioxane	0.0010 0.0012	0.0013 0.0012	0.0013	0.0014	0.0014	Ave		0.0013				12.3		15.0			
Dibromomethane	0.1137 0.1186	0.1147 0.1198	0.1205	0.1278	0.1333	Ave		0.1212				5.8		15.0			
Dichlorobromomethane	0.3190 0.3283	0.3177 0.3249	0.3345	0.3515	0.3702	Ave		0.3352				5.7		15.0			
2-Chloroethyl vinyl ether	0.0632 0.0788	0.0654 0.0836	0.0712	0.0766	0.0829	Ave		0.0745				10.9		15.0			
cis-1,3-Dichloropropene	1.6720 1.7156	1.6823 1.6638	1.7739	1.9012	1.9084	Ave		1.7596				6.0		15.0			
4-Methyl-2-pentanone (MIBK)	0.0968 0.0963	0.0976 0.0931	0.0999	0.1068	0.1110	Ave		0.1002				6.4		15.0			
Toluene	1.3209 1.2061	1.3094 0.9987	1.3363	1.3992	1.4212	Ave		1.2845				11.2		30.0			
Ethyl methacrylate	0.9758 0.9306	0.9308 0.9232	0.9723	1.0169	1.0549	Ave		0.9721				5.1		15.0			
trans-1,3-Dichloropropene	0.2920 0.3050	0.2961 0.2992	0.3074	0.3320	0.3474	Ave		0.3113				6.6		15.0			
1,1,2-Trichloroethane	0.1648 0.1696	0.1676 0.1717	0.1710	0.1827	0.1911	Ave		0.1741				5.4		15.0			
2-Hexanone	0.2981 0.2903	0.2909 0.2794	0.3035	0.3223	0.3205	Ave		0.3007				5.3		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687
SDG No.: _____
Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25 (mm)) Heated Purge: (Y/N) N
Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
1,3-Dichloropropane	1.2620 1.2820	1.2859 1.2526	1.3277	1.4124	1.4364	Ave		1.3227				5.6		15.0			
Tetrachloroethene	1.1768 1.1653	1.1819 1.1204	1.2301	1.2976	1.3035	Ave		1.2108				5.7		15.0			
Chlorodibromomethane	0.8602 0.9404	0.8687 0.9518	0.9074	0.9932	1.0215	Ave		0.9347				6.5		15.0			
1,2-Dibromoethane	0.6699 0.7140	0.6907 0.7260	0.7145	0.7741	0.7924	Ave		0.7259				6.0		15.0			
1-Chlorohexane	1.9971 1.9385	2.0164 1.8036	2.0582	2.1760	2.1948	Ave		2.0264				6.7		15.0			
Chlorobenzene	3.6158 3.4750	3.6096 3.1500	3.7615	3.9470	3.9663	Ave		3.6465			0.3000	7.8		15.0			
1,1,1,2-Tetrachloroethane	1.1387 1.2123	1.1599 1.1556	1.2166	1.3005	1.3406	Ave		1.2177				6.3		15.0			
Ethylbenzene	2.1034 2.1097	2.1324 1.8899	2.2251	2.3258	2.3567	Ave		2.1633				7.3		30.0			
m-Xylene & p-Xylene	2.6724 2.5605	2.5883 2.3510	2.7190	2.8477	2.8995	Ave		2.6626				7.0		15.0			
o-Xylene	2.4865 2.4326	2.5095 2.1205	2.6212	2.7465	2.8035	Ave		2.5315				9.0		15.0			
Styrene	3.9025 3.8460	3.9799 3.2372	4.1218	4.3716	4.4621	Ave		3.9887				10.1		15.0			
Bromoform	0.4246 0.5059	0.4500 0.5313	0.4668	0.5153	0.5488	Ave		0.4918			0.1000	9.3		15.0			
Isopropylbenzene	++++ 3.8657	4.3905 2.8358	4.5817	4.7412	4.7356	Qua	0.8154	4.6662	-0.030787						0.9990		0.9900
Cyclohexanone	++++ 0.0311	0.0272 0.0296	0.0345	0.0373	0.0341	Ave		0.0323				11.3		15.0			
1,1,2,2-Tetrachloroethane	0.5151 0.5120	0.5007 0.5191	0.5264	0.5727	0.5855	Ave		0.5331			0.3000	6.1		15.0			
trans-1,4-Dichloro-2-butene	0.1159 0.1119	0.1109 0.1141	0.1085	0.1258	0.1282	Ave		0.1165				6.5		15.0			
1,2,3-Trichloropropane	0.1328 0.1471	0.1468 0.1525	0.1524	0.1602	0.1681	Ave		0.1514				7.4		15.0			
Bromobenzene	0.9111 0.9368	0.9195 0.8963	0.9789	1.0259	1.0633	Ave		0.9617				6.6		15.0			
N-Propylbenzene	1.2165 1.1951	1.2103 1.1043	1.2782	1.3497	1.3797	Ave		1.2477				7.6		15.0			
1,3,5-Trimethylbenzene	3.5892 3.2868	3.5521 2.6972	3.7335	3.9005	3.9876	Ave		3.5353				12.4		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687
SDG No.: _____
Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25 (mm)) Heated Purge: (Y/N) N
Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
2-Chlorotoluene	1.0021 0.9803	1.0221 0.8834	1.0486	1.1071	1.1328	Ave		1.0252				8.1		15.0			
4-Chlorotoluene	1.0010 0.9966	1.0089 0.9507	1.0634	1.1021	1.1546	Ave		1.0396				6.8		15.0			
tert-Butylbenzene	3.6082 3.4192	3.5977 2.9390	3.7953	3.9284	4.0340	Ave		3.6174				10.1		15.0			
1,2,4-Trimethylbenzene	3.6109 3.3576	3.6078 2.7169	3.7900	3.9522	4.0332	Ave		3.5812				12.4		15.0			
sec-Butylbenzene	0.9856 0.9855	1.0155 0.9309	1.0439	1.1101	1.1396	Ave		1.0302				7.2		15.0			
4-Isopropyltoluene	4.0509 3.6765	4.0957 2.7730	4.2538	4.4301	4.5317	Qua	0.4378	4.4260	-0.027734						0.9990		0.9900
1,3-Dichlorobenzene	1.9267 1.8397	1.9205 1.7192	2.0063	2.0874	2.1583	Ave		1.9512				7.6		15.0			
1,4-Dichlorobenzene	1.9464 1.8257	1.9132 1.7066	1.9876	2.0731	2.1311	Ave		1.9405				7.4		15.0			
n-Butylbenzene	3.6587 3.3528	3.7008 2.6758	3.8661	3.9761	4.1020	Ave		3.6189				13.3		15.0			
1,2-Dichlorobenzene	1.6408 1.5954	1.6259 1.5293	1.6931	1.7885	1.8530	Ave		1.6751				6.7		15.0			
1,2-Dibromo-3-Chloropropane	0.0806 0.1000	0.0869 0.1049	0.0963	0.1048	0.1117	Ave		0.0979				11.1		15.0			
1,2,4-Trichlorobenzene	1.1882 1.1859	1.1574 1.1863	1.2404	1.3006	1.3999	Ave		1.2370				7.0		15.0			
Hexachlorobutadiene	0.7439 0.7463	0.7430 0.7434	0.7949	0.8266	0.8822	Ave		0.7829				7.0		15.0			
Naphthalene	1.7846 1.7841	1.7485 1.8029	1.8273	1.9974	2.1293	Ave		1.8677				7.5		15.0			
1,2,3-Trichlorobenzene	0.9441 0.9541	0.9460 0.9717	0.9949	1.0561	1.1464	Ave		1.0019				7.5		15.0			
Dibromofluoromethane (Surr)	++++ 0.2512	0.2613 0.2552	0.2590	0.2701	0.2813	Ave		0.2630				4.2		15.0			
1,2-Dichloroethane-d4 (Surr)	++++ 0.1929	0.2114 0.1964	0.2007	0.2121	0.2188	Ave		0.2054				5.0		15.0			
Toluene-d8 (Surr)	++++ 4.2521	5.0018 3.8609	4.9734	4.9750	4.9865	Ave		4.6749				10.6		15.0			
4-Bromofluorobenzene (Surr)	++++ 0.9856	1.1439 0.9827	1.0752	1.1024	1.1328	Ave		1.0704				6.6		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 280-444687/12	MS1_1421.D
Level 2	STD 280-444687/13	MS1_1422.D
Level 3	STD 280-444687/14	MS1_1423.D
Level 4	STD 280-444687/15	MS1_1424.D
Level 5	ICIS 280-444687/16	MS1_1425.D
Level 6	STD 280-444687/17	MS1_1426.D
Level 7	STD 280-444687/18	MS1_1427.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Dichlorodifluoromethane	FB	Lin1	42506 2755734	81000 6166967	226645	617482	1171966	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Chloromethane	FB	Ave	36572 1524004	60980 3421101	152857	330166	628325	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Vinyl chloride	FB	Ave	33991 1596019	66500 3472179	160837	357201	681643	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Bromomethane	FB	Ave	39238 1968771	79534 3596940	200925	433937	845059	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Chloroethane	FB	Ave	33548 1536922	63280 2913143	163041	336778	654681	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Dichlorofluoromethane	FB	Ave	72728 3647134	147672 8064893	375483	786920	1514981	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Trichlorofluoromethane	FB	Ave	62359 3214343	132301 7219290	326600	708084	1365881	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Ethyl ether	FB	Ave	20955 1148307	41880 2619692	108706	228735	450400	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Acrolein	FB	Ave	21897 1083086	42270 2424818	104834	227935	434014	5.00 250	10.0 600	25.0	50.0	100
Acetone	FB	Ave	20458 724562	31272 1597385	79094	156501	282912	2.00 100	4.00 240	10.0	20.0	40.0
1,1,2-Trichlorotrifluoroethane	FB	Ave	31619 1699288	64851 3757398	165261	347160	681313	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,1-Dichloroethene	FB	Ave	38258 2046414	77225 4500944	198198	422593	818273	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Iodomethane	FB	Ave	66370 3617706	138103 8061514	350930	745744	1459534	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Methyl acetate	FB	Ave	27412 1009810	39047 2289449	97080	201795	401302	1.00 50.0	2.00 120	5.00	10.0	20.0
Allyl chloride	FB	Ave	53954 2688245	110924 5664648	278279	577462	1097527	0.500 25.0	1.00 60.0	2.50	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25 (mm)) Heated Purge: (Y/N) N

Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Carbon disulfide	FB	Ave	176111 8287243	344607 17228126	847862	1776366	3419341	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Tert-butyl alcohol (2-methyl-2-propanol)	TBAd 9	Ave	16891 869689	33829 1987739	86065	180533	345121	5.00 250	10.0 600	25.0	50.0	100
Methylene Chloride	FB	Ave	53718 2071405	95166 4589531	219009	430812	832794	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Acrylonitrile	FB	Ave	52463 2689827	103219 6018440	261579	550005	1081364	5.00 250	10.0 600	25.0	50.0	100
Methyl tert-butyl ether	FB	Ave	73230 3820736	147977 8545378	373196	779088	1533979	0.500 25.0	1.00 60.0	2.50	5.00	10.0
trans-1,2-Dichloroethene	FB	Ave	43656 2298004	88872 5086564	227067	474238	918029	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Hexane	CBNZ d5	Ave	63029 3119695	127282 6585828	313434	656431	1268896	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Vinyl acetate	FB	Ave	64289 3306095	127433 6958320	312175	670735	1339954	1.00 50.0	2.00 120	5.00	10.0	20.0
1,1-Dichloroethane	FB	Ave	66813 3474463	136254 7580767	347127	723273	1409113	0.500 25.0	1.00 60.0	2.50	5.00	10.0
2-Butanone (MEK)	FB	Ave	++++ 1418529	62195 3206890	142529	292072	566227	++++ 100	4.00 240	10.0	20.0	40.0
sec-Butyl Alcohol	TBAd 9	Ave	36512 1862088	72203 4162502	178911	380489	749412	15.0 750	30.0 1800	75.0	150	300
cis-1,2-Dichloroethene	FB	Ave	47270 2498241	95336 5552817	245234	509057	996019	0.500 25.0	1.00 60.0	2.50	5.00	10.0
2,2-Dichloropropane	FB	Ave	63463 2898201	123409 6334823	305762	619089	1189653	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Chlorobromomethane	FB	Ave	17879 944402	35184 2157417	88693	187779	375027	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Chloroform	FB	Ave	67094 3484996	133017 7604455	344966	714035	1395397	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Tetrahydrofuran	FB	Lin1	11057 407809	22822 934688	39518	84394	164865	1.00 50.0	2.00 120	5.00	10.0	20.0
Isobutyl alcohol	TBAd 9	Ave	12238 572428	20633 1304557	52714	112578	223951	12.5 625	25.0 1500	62.5	125	250
1,1,1-Trichloroethane	FB	Ave	62290 3250627	128286 7173707	323928	675964	1311669	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Cyclohexane	FB	Ave	70333 3642411	151656 7631263	378136	765511	1502194	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,1-Dichloropropene	FB	Ave	56646 2923720	117256 6290244	294869	611162	1184111	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Carbon tetrachloride	FB	Ave	52562 2829288	110112 6220315	279352	578186	1138428	0.500 25.0	1.00 60.0	2.50	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25 (mm)) Heated Purge: (Y/N) N

Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
1,2-Dichloroethane	FB	Ave	33702 1772537	67513 3944821	171915	361743	710689	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Benzene	FB	Ave	171141 8512447	343541 17377078	872512	1799735	3470438	0.500 25.0	1.00 60.0	2.50	5.00	10.0
n-Heptane	FB	Ave	54535 2794861	114421 5714314	284389	592484	1147621	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Trichloroethene	FB	Ave	44168 2302650	87547 5093263	226235	466283	906869	0.500 25.0	1.00 60.0	2.50	5.00	10.0
2-Pentanone	FB	Ave	37209 2027143	75379 4539381	194406	402782	799547	2.00 100	4.00 240	10.0	20.0	40.0
1,2-Dichloropropane	FB	Ave	37396 1917043	74397 4230718	189717	389975	766794	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Methylcyclohexane	FB	Ave	57328 2934952	116804 6142671	297554	615003	1202753	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,4-Dioxane	FB	Ave	2687 179458	7059 406440	17992	39080	72472	10.0 500	20.0 1200	50.0	100	200
Dibromomethane	FB	Ave	15838 873941	32263 1999575	83918	173924	344068	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Dichlorobromomethane	FB	Ave	44437 2418940	89350 5420232	233014	478287	955495	0.500 25.0	1.00 60.0	2.50	5.00	10.0
2-Chloroethyl vinyl ether	FB	Ave	17604 1160995	36776 2790762	99198	208371	427974	1.00 50.0	2.00 120	5.00	10.0	20.0
cis-1,3-Dichloropropene	CBNZ d5	Ave	52258 2868741	106479 6340608	277222	578361	1130448	0.500 25.0	1.00 60.0	2.50	5.00	10.0
4-Methyl-2-pentanone (MIBK)	FB	Ave	53960 2836911	109775 6215576	278328	581176	1146299	2.00 100	4.00 240	10.0	20.0	40.0
Toluene	FB	Ave	183980 8886654	368323 16663360	930711	1903843	3668181	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Ethyl methacrylate	CBNZ d5	Ave	30499 1556039	58911 3518432	151949	309338	624874	0.500 25.0	1.00 60.0	2.50	5.00	10.0
trans-1,3-Dichloropropene	FB	Ave	40672 2246928	83296 4991365	214088	451708	896600	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,1,2-Trichloroethane	FB	Ave	22960 1249882	47138 2864131	119128	248643	493250	0.500 25.0	1.00 60.0	2.50	5.00	10.0
2-Hexanone	CBNZ d5	Ave	37263 1941952	73659 4259574	189723	392202	759469	2.00 100	4.00 240	10.0	20.0	40.0
1,3-Dichloropropane	CBNZ d5	Ave	39441 2143737	81385 4773527	207485	429655	850812	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Tetrachloroethene	CBNZ d5	Ave	36780 1948502	74804 4269613	192241	394732	772120	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Chlorodibromomethane	CBNZ d5	Ave	26884 1572542	54980 3627417	141802	302141	605059	0.500 25.0	1.00 60.0	2.50	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25 (mm)) Heated Purge: (Y/N) N

Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
1,2-Dibromoethane	CBNZ d5	Ave	20937 1193909	43713 2766596	111666	235500	469389	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1-Chlorohexane	CBNZ d5	Ave	62418 3241360	127622 6873379	321657	661955	1300046	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Chlorobenzene	CBNZ d5	Ave	113008 5810648	228460 12004410	587851	1200703	2349381	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,1,1,2-Tetrachloroethane	CBNZ d5	Ave	35590 2027070	73411 4404026	190126	395625	794088	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Ethylbenzene	CBNZ d5	Ave	65739 3527761	134964 7202198	347743	707523	1395967	0.500 25.0	1.00 60.0	2.50	5.00	10.0
m-Xylene & p-Xylene	CBNZ d5	Ave	83523 4281499	163818 8959315	424915	866303	1717480	0.500 25.0	1.00 60.0	2.50	5.00	10.0
o-Xylene	CBNZ d5	Ave	77714 4067594	158829 8081245	409633	835498	1660638	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Styrene	CBNZ d5	Ave	121968 6431083	251897 12336644	644153	1329887	2643061	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Bromoform	CBNZ d5	Ave	13271 845942	28482 2024587	72950	156767	325072	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Isopropylbenzene	DCBd 4	Qua	++++ 10027852	424580 16649604	1078810	2183142	4266474	++++ 25.0	1.00 60.0	2.50	5.00	10.0
Cyclohexanone	CBNZ d5	Ave	++++ 2078277	68962 4512595	215895	453424	807200	++++ 1000	40.0 2400	100	200	400
1,1,2,2-Tetrachloroethane	DCBd 4	Ave	24326 1328163	48418 3047475	123938	263699	527516	0.500 25.0	1.00 60.0	2.50	5.00	10.0
trans-1,4-Dichloro-2-butene	DCBd 4	Ave	5475 290248	10724 669658	25545	57938	115500	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,2,3-Trichloropropane	DCBd 4	Ave	6273 381483	14192 895480	35881	73778	151486	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Bromobenzene	DCBd 4	Ave	43028 2430041	88916 5262250	230485	472386	958002	0.500 25.0	1.00 60.0	2.50	5.00	10.0
N-Propylbenzene	DCBd 4	Ave	57455 3100243	117044 6483693	300968	621485	1243004	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,3,5-Trimethylbenzene	DCBd 4	Ave	169511 8526075	343505 15836029	879081	1796031	3592583	0.500 25.0	1.00 60.0	2.50	5.00	10.0
2-Chlorotoluene	DCBd 4	Ave	47329 2543045	98837 5186436	246900	509791	1020584	0.500 25.0	1.00 60.0	2.50	5.00	10.0
4-Chlorotoluene	DCBd 4	Ave	47275 2585286	97568 5581654	250380	507490	1040244	0.500 25.0	1.00 60.0	2.50	5.00	10.0
tert-Butylbenzene	DCBd 4	Ave	170411 8869613	347913 17255519	893627	1808885	3634412	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,2,4-Trimethylbenzene	DCBd 4	Ave	170535 8709650	348885 15951842	892379	1819813	3633619	0.500 25.0	1.00 60.0	2.50	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 444687

SDG No.: _____

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/18/2019 11:48 Calibration End Date: 01/18/2019 13:52 Calibration ID: 34948

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
sec-Butylbenzene	DCBd 4	Ave	46549 2556477	98199 5465780	245793	511160	1026741	0.500 25.0	1.00 60.0	2.50	5.00	10.0
4-Isopropyltoluene	DCBd 4	Qua	191318 9536958	396072 16280804	1001589	2039873	4082802	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,3-Dichlorobenzene	DCBd 4	Ave	90993 4772169	185725 10093815	472406	961160	1944498	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,4-Dichlorobenzene	DCBd 4	Ave	91925 4736011	185014 10019669	467999	954591	1919952	0.500 25.0	1.00 60.0	2.50	5.00	10.0
n-Butylbenzene	DCBd 4	Ave	172793 8697203	357880 15710223	910306	1830811	3695681	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,2-Dichlorobenzene	DCBd 4	Ave	77494 4138624	157229 8978699	398658	823552	1669394	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,2-Dibromo-3-Chloropropane	DCBd 4	Ave	3808 259331	8406 615705	22668	48255	100644	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,2,4-Trichlorobenzene	DCBd 4	Ave	56117 3076277	111922 6965105	292063	598862	1261251	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Hexachlorobutadiene	DCBd 4	Ave	35134 1935981	71849 4364826	187175	380632	794800	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Naphthalene	DCBd 4	Ave	84284 4627993	169087 10585375	430242	919731	1918358	0.500 25.0	1.00 60.0	2.50	5.00	10.0
1,2,3-Trichlorobenzene	DCBd 4	Ave	44587 2474963	91481 5705267	234259	486301	1032802	0.500 25.0	1.00 60.0	2.50	5.00	10.0
Dibromofluoromethane (Surr)	FB	Ave	++++ 2221023	73493 4258269	144295	367529	726028	++++ 30.0	1.00 60.0	2.00	5.00	10.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	++++ 1705149	59454 3276937	111817	288650	564701	++++ 30.0	1.00 60.0	2.00	5.00	10.0
Toluene-d8 (Surr)	CBNZ d5	Ave	++++ 8532119	316574 14713483	621791	1513428	2953719	++++ 30.0	1.00 60.0	2.00	5.00	10.0
4-Bromofluorobenzene (Surr)	DCBd 4	Ave	++++ 3068055	110619 5769717	202535	507631	1020600	++++ 30.0	1.00 60.0	2.00	5.00	10.0

Curve Type Legend:

Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Qua = Quadratic ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1421.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 18-Jan-2019 11:48:30 ALS Bottle#: 3 Worklist Smp#: 12
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickhamt Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub76
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 24-Jan-2019 11:46:27 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0316

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.571	0.001	85	622064	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3482193	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	84	781347	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1180709	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111		6.967				ND	ND	
\$ 6 1,2-Dichloroethane-d4 (Sur	65		7.246				ND	ND	
\$ 7 Toluene-d8 (Surr)	98		8.713				ND	ND	U
\$ 8 4-Bromofluorobenzene (Surr	95		10.640				ND	ND	
24 Dichlorodifluoromethane	85	3.895	3.909	-0.014	98	42506	0.5000	0.4741	
26 Chloromethane	50	4.132	4.132	0.000	98	36572	0.5000	0.5755	
27 Vinyl chloride	62	4.258	4.258	0.000	91	33991	0.5000	0.5137	
29 Bromomethane	94	4.607	4.607	0.000	90	39238	0.5000	0.4974	
31 Chloroethane	64	4.663	4.663	0.000	99	33548	0.5000	0.5321	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	97	72728	0.5000	0.4900	
33 Trichlorofluoromethane	101	4.914	4.928	-0.014	98	62359	0.5000	0.4740	
36 Ethyl ether	59	5.068	5.068	0.000	87	20955	0.5000	0.4740	
39 Acrolein	56	5.193	5.193	0.000	98	21897	5.00	5.07	
40 Acetone	43	5.291	5.291	0.000	94	20458	2.00	2.60	
42 1,1,2-Trichloro-1,2,2-trif	151	5.305	5.319	-0.014	92	31619	0.5000	0.4758	
43 1,1-Dichloroethene	96	5.333	5.347	-0.014	95	38258	0.5000	0.4785	
45 Iodomethane	142	5.501	5.515	-0.014	97	66370	0.5000	0.4686	
46 Methyl acetate	43	5.529	5.529	0.000	93	27412	1.00	1.31	
47 3-Chloro-1-propene	41	5.585	5.584	0.001	82	53954	0.5000	0.4957	
48 Carbon disulfide	76	5.612	5.612	0.000	99	176111	0.5000	0.5210	
49 2-Methyl-2-propanol	59	5.626	5.640	-0.014	34	16891	5.00	4.83	
50 Methylene Chloride	84	5.668	5.668	0.000	84	53718	0.5000	0.6042	
51 Acrylonitrile	53	5.808	5.808	0.000	100	52463	5.00	4.94	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	92	73230	0.5000	0.4861	
53 trans-1,2-Dichloroethene	96	5.892	5.906	-0.014	97	43656	0.5000	0.4819	
54 Hexane	57	6.073	6.073	0.000	85	63029	0.5000	0.5068	
55 Vinyl acetate	43	6.143	6.143	0.000	96	64289	1.00	1.00	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	95	66813	0.5000	0.4844	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	97	31139	2.00	2.16	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	94	36512	15.0	14.7	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	78	47270	0.5000	0.4824	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	83	63463	0.5000	0.5276	
67 Chlorobromomethane	128	6.828	6.827	0.001	92	17879	0.5000	0.4875	
68 Chloroform	83	6.841	6.841	0.000	92	67094	0.5000	0.4895	
69 Tetrahydrofuran	42	6.869	6.869	0.000	81	11057	1.00	0.8322	
70 Isobutyl alcohol	41	7.023	7.023	0.000	93	12238	12.5	13.5	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	97	62290	0.5000	0.4824	
72 Cyclohexane	56	7.149	7.149	0.000	85	70333	0.5000	0.4798	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	98	56646	0.5000	0.4860	
74 Carbon tetrachloride	117	7.205	7.219	-0.014	97	52562	0.5000	0.4729	
75 1,2-Dichloroethane	62	7.316	7.316	0.000	96	33702	0.5000	0.4847	
77 Benzene	78	7.344	7.344	0.000	93	171141	0.5000	0.5020	
9 n-Heptane	43	7.428	7.442	-0.014	86	54535	0.5000	0.4879	
79 Trichloroethene	95	7.805	7.805	0.000	97	44168	0.5000	0.4900	
80 2-Pentanone	43	7.833	7.833	0.000	97	37209	2.00	1.90	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	86	37396	0.5000	0.4938	
83 Methylcyclohexane	55	8.015	8.015	0.000	87	57328	0.5000	0.4902	
84 1,4-Dioxane	88	8.029	8.029	0.000	80	2687	10.0	7.68	
85 Dibromomethane	93	8.084	8.084	0.000	93	15838	0.5000	0.4690	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	44437	0.5000	0.4759	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	89	17604	1.00	0.8480	
89 cis-1,3-Dichloropropene	75	8.476	8.475	0.001	99	52258	0.5000	0.4751	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	91	53960	2.00	1.93	
91 Toluene	91	8.769	8.769	0.000	98	183980	0.5000	0.5141	
92 Ethyl methacrylate	69	8.839	8.839	0.000	79	30499	0.5000	0.5019	
93 trans-1,3-Dichloropropene	75	8.853	8.853	0.000	93	40672	0.5000	0.4690	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	88	22960	0.5000	0.4734	
95 2-Hexanone	43	9.118	9.118	0.000	91	37263	2.00	1.98	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	87	39441	0.5000	0.4770	
97 Tetrachloroethene	164	9.188	9.188	0.000	97	36780	0.5000	0.4860	
98 Chlorodibromomethane	129	9.341	9.341	0.000	89	26884	0.5000	0.4601	
100 Ethylene Dibromide	107	9.467	9.467	0.000	100	20937	0.5000	0.4614	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	62418	0.5000	0.4928	
102 Chlorobenzene	112	9.802	9.802	0.000	98	113008	0.5000	0.4958	
104 Ethylbenzene	106	9.844	9.844	0.000	97	65739	0.5000	0.4862	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	96	35590	0.5000	0.4676	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	97	83523	0.5000	0.5018	
109 o-Xylene	106	10.235	10.235	0.000	88	77714	0.5000	0.4911	
106 Styrene	104	10.235	10.235	0.000	88	121968	0.5000	0.4892	
107 Bromoform	173	10.431	10.431	0.000	97	13271	0.5000	0.4317	
108 Isopropylbenzene	105	10.501	10.501	0.000	94	206820	0.5000	0.2951	
111 Cyclohexanone	55	10.612	10.612	0.000	86	41753	20.0	20.7	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.682	0.000	93	24326	0.5000	0.4831	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	85	5475	0.5000	0.4977	
114 1,2,3-Trichloropropane	110	10.752	10.752	0.000	82	6273	0.5000	0.4386	
116 Bromobenzene	156	10.808	10.808	0.000	94	43028	0.5000	0.4737	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	57455	0.5000	0.4875	
117 2-Chlorotoluene	126	10.934	10.934	0.000	96	47329	0.5000	0.4887	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	94	169511	0.5000	0.5076	
118 4-Chlorotoluene	126	11.017	11.003	0.014	96	47275	0.5000	0.4814	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	91	170411	0.5000	0.4987	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	95	170535	0.5000	0.5041	
122 sec-Butylbenzene	134	11.408	11.394	0.014	93	46549	0.5000	0.4784	
123 4-Isopropyltoluene	119	11.492	11.492	0.000	97	191318	0.5000	0.3595	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	95	90993	0.5000	0.4937	
126 1,4-Dichlorobenzene	146	11.618	11.618	0.000	95	91925	0.5000	0.5015	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	172793	0.5000	0.5055	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	98	77494	0.5000	0.4898	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	87	3808	0.5000	0.4119	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	95	56117	0.5000	0.4803	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	95	35134	0.5000	0.4751	
132 Naphthalene	128	14.020	14.006	0.014	96	84284	0.5000	0.4777	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	95	44587	0.5000	0.4711	
S 140 1,2-Dichloroethene, Total	96				0		1.00	0.9643	
S 139 Xylenes, Total (URS)	1				0		1.00	0.99	
S 134 Trihalomethanes, Total	1				0		2.00	1.86	
S 138 Xylenes, Total	106				0		1.00	0.99	
S 137 Total BTEX	1				0			2.50	
S 136 1,2-Dichloroethene, Total	1				0		1.00	0.9643	
S 135 1,3-Dichloropropene, Total	1				0		1.00	0.9441	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-ARCH SS A_00108	Amount Added: 0.04	Units: uL
MV-MegaMainA_00009	Amount Added: 0.20	Units: uL
MV-Gas A_00005	Amount Added: 0.20	Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1421.D

Injection Date: 18-Jan-2019 11:48:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 12

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

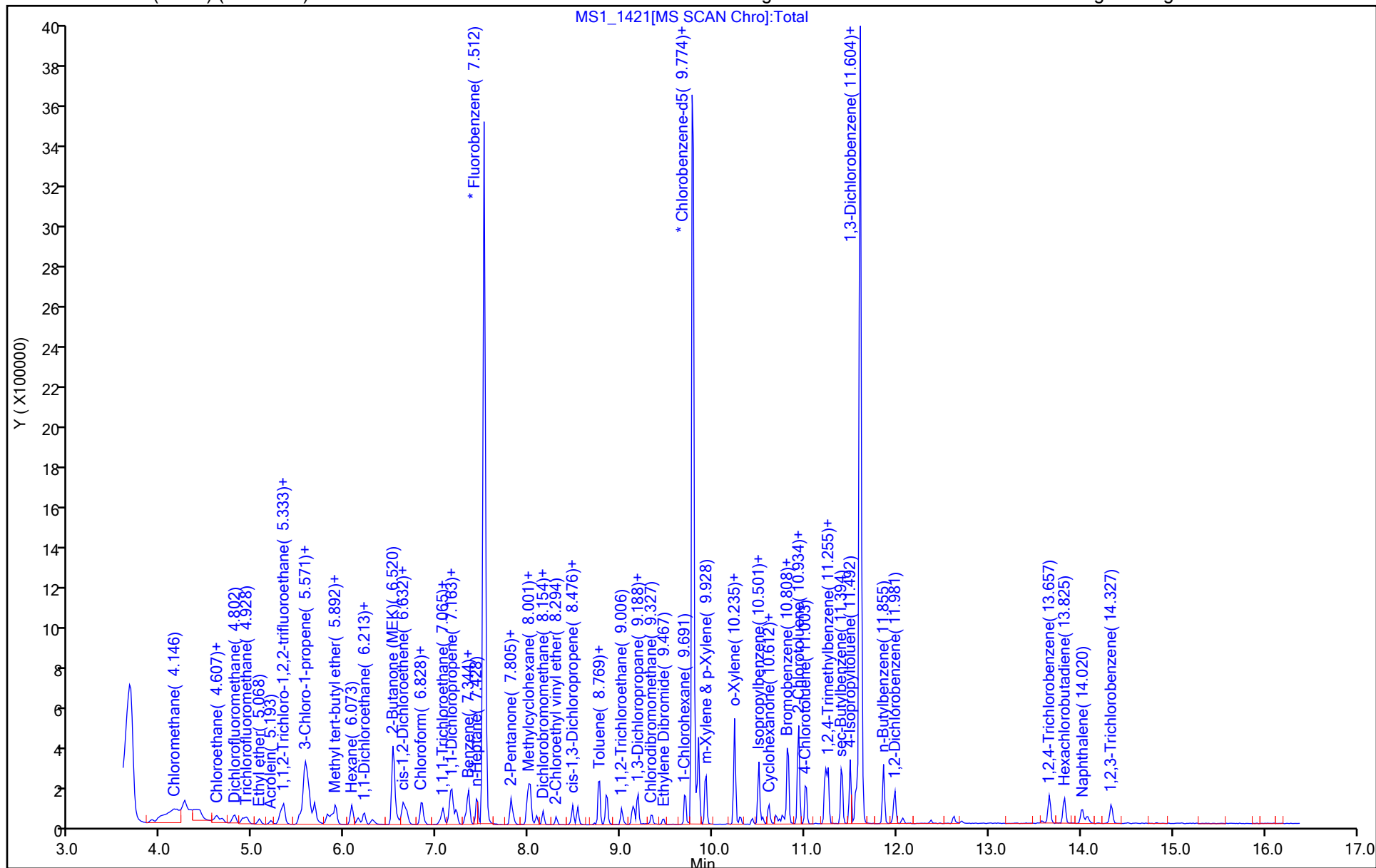
ALS Bottle#: 3

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1421.D

Injection Date: 18-Jan-2019 11:48:30

Instrument ID: VMS_MS1

Lims ID: std

Client ID:

Operator ID: wickhamt

ALS Bottle#:

3

Worklist Smp#: 12

Purge Vol: 20.000 mL

Dil. Factor:

1.0000

Method: AQ_VMS1_8260

Limit Group:

MSV - 8260B Water and Solid

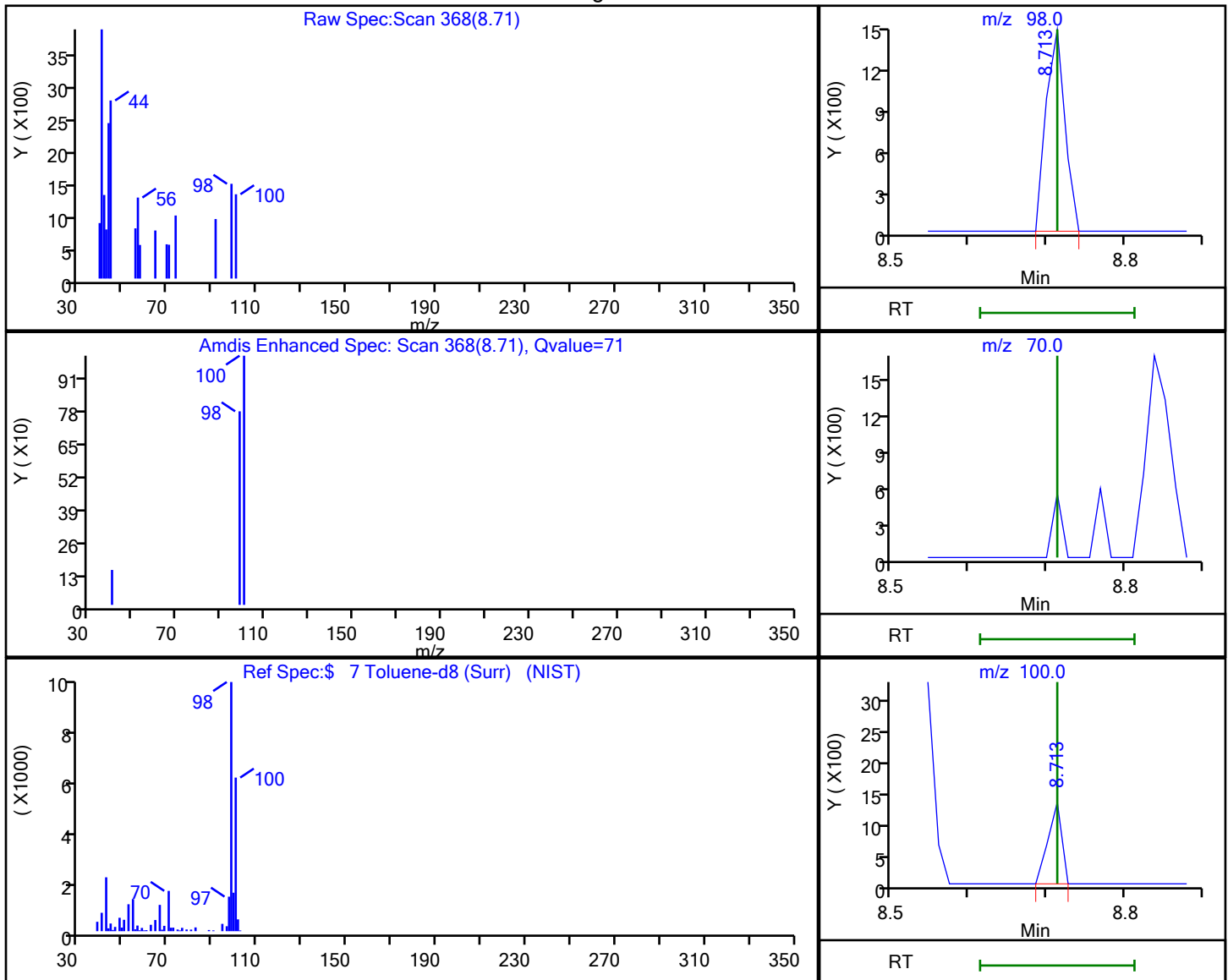
Column: DB-624 (60.25) (0.25 mm)

Detector

MS SCAN

\$ 7 Toluene-d8 (Surr), CAS: 2037-26-5

Processing Results



RT	Mass	Response	Amount
8.71	98.00	2481	0.009877
8.71	70.00	0	
8.71	100.00	1606	

Reviewer: ornelasg, 22-Jan-2019 17:07:44

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1422.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 18-Jan-2019 12:09:30 ALS Bottle#: 4 Worklist Smp#: 13
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickham Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub76
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 24-Jan-2019 11:46:39 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0316

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.570	5.571	0.000	84	645195	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3516029	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	84	791152	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1208803	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	73493	1.00	0.99	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	59454	1.00	1.03	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	316574	1.00	1.07	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.640	0.000	0	110619	1.00	1.07	
24 Dichlorodifluoromethane	85	3.908	3.909	-0.001	98	81000	1.00	0.8280	
26 Chloromethane	50	4.132	4.132	0.000	99	60980	1.00	0.9504	
27 Vinyl chloride	62	4.258	4.258	0.000	90	66500	1.00	1.00	
29 Bromomethane	94	4.607	4.607	0.000	88	79534	1.00	1.00	
31 Chloroethane	64	4.663	4.663	0.000	98	63280	1.00	0.99	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	96	147672	1.00	0.9853	
33 Trichlorofluoromethane	101	4.900	4.928	-0.028	98	132301	1.00	1.00	
36 Ethyl ether	59	5.082	5.068	0.014	85	41880	1.00	0.9382	
39 Acrolein	56	5.193	5.193	0.000	98	42270	10.0	9.69	
40 Acetone	43	5.305	5.291	0.014	97	31272	4.00	3.94	
42 1,1,2-Trichloro-1,2,2-trif	151	5.319	5.319	0.000	93	64851	1.00	0.9665	
43 1,1-Dichloroethene	96	5.347	5.347	0.000	96	77225	1.00	0.9567	
45 Iodomethane	142	5.515	5.515	-0.001	97	138103	1.00	0.9657	
46 Methyl acetate	43	5.528	5.529	-0.001	96	39047	2.00	1.85	
47 3-Chloro-1-propene	41	5.584	5.584	0.000	83	110924	1.00	1.01	
48 Carbon disulfide	76	5.612	5.612	0.000	98	344607	1.00	1.01	
49 2-Methyl-2-propanol	59	5.640	5.640	0.000	93	33829	10.0	9.33	
50 Methylene Chloride	84	5.682	5.668	0.014	85	95166	1.00	1.06	
51 Acrylonitrile	53	5.822	5.808	0.014	99	103219	10.0	9.63	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	92	147977	1.00	0.9729	
53 trans-1,2-Dichloroethene	96	5.906	5.906	0.000	96	88872	1.00	0.9716	
54 Hexane	57	6.073	6.073	0.000	87	127282	1.00	1.01	
55 Vinyl acetate	43	6.143	6.143	0.000	96	127433	2.00	1.96	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	95	136254	1.00	0.9783	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	97	62195	4.00	4.26	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	94	72203	30.0	28.1	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	78	95336	1.00	0.9635	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	86	123409	1.00	1.02	
67 Chlorobromomethane	128	6.827	6.827	0.000	93	35184	1.00	0.9501	
68 Chloroform	83	6.841	6.841	0.000	92	133017	1.00	0.9612	
69 Tetrahydrofuran	42	6.869	6.869	0.000	89	22822	2.00	2.31	
70 Isobutyl alcohol	41	7.023	7.023	0.000	95	20633	25.0	22.0	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	97	128286	1.00	0.9840	
72 Cyclohexane	56	7.149	7.149	0.000	87	151656	1.00	1.02	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	98	117256	1.00	1.00	
74 Carbon tetrachloride	117	7.218	7.219	-0.001	94	110112	1.00	0.9812	
75 1,2-Dichloroethane	62	7.316	7.316	0.000	98	67513	1.00	0.9617	
77 Benzene	78	7.344	7.344	0.000	94	343541	1.00	1.00	
9 n-Heptane	43	7.442	7.442	0.000	87	114421	1.00	1.01	
79 Trichloroethene	95	7.805	7.805	0.000	97	87547	1.00	0.9619	
80 2-Pentanone	43	7.833	7.833	0.000	97	75379	4.00	3.81	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	91	74397	1.00	0.9730	
83 Methylcyclohexane	55	8.014	8.015	-0.001	87	116804	1.00	0.9892	
84 1,4-Dioxane	88	8.042	8.029	0.013	87	7059	20.0	20.0	
85 Dibromomethane	93	8.084	8.084	0.000	95	32263	1.00	0.9463	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	89350	1.00	0.9478	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	36776	2.00	1.75	
89 cis-1,3-Dichloropropene	75	8.475	8.475	0.000	99	106479	1.00	0.9561	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	92	109775	4.00	3.89	
91 Toluene	91	8.769	8.769	0.000	99	368323	1.00	1.02	
92 Ethyl methacrylate	69	8.838	8.839	-0.001	81	58911	1.00	0.9575	
93 trans-1,3-Dichloropropene	75	8.852	8.853	-0.001	94	83296	1.00	0.9513	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	89	47138	1.00	0.9626	
95 2-Hexanone	43	9.118	9.118	0.000	90	73659	4.00	3.87	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	94	81385	1.00	0.9722	
97 Tetrachloroethene	164	9.188	9.188	0.000	97	74804	1.00	0.9761	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	54980	1.00	0.9293	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	43713	1.00	0.9514	
101 1-Chlorohexane	91	9.704	9.705	-0.001	0	127622	1.00	1.00	
102 Chlorobenzene	112	9.802	9.802	0.000	97	228460	1.00	0.9899	
104 Ethylbenzene	106	9.844	9.844	0.000	98	134964	1.00	0.9857	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	82	73411	1.00	0.9525	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	98	163818	1.00	0.9721	
109 o-Xylene	106	10.235	10.235	0.000	88	158829	1.00	0.99	
106 Styrene	104	10.235	10.235	0.000	88	251897	1.00	1.00	
107 Bromoform	173	10.431	10.431	0.000	98	28482	1.00	0.9150	
108 Isopropylbenzene	105	10.500	10.501	-0.001	94	424580	1.00	0.7701	
111 Cyclohexanone	55	10.612	10.612	0.000	89	68962	40.0	33.7	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.682	0.000	93	48418	1.00	0.9393	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	89	10724	1.00	0.9521	
114 1,2,3-Trichloropropane	110	10.752	10.752	0.000	83	14192	1.00	0.9692	
116 Bromobenzene	156	10.808	10.808	0.000	95	88916	1.00	0.9561	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	117044	1.00	0.9700	
117 2-Chlorotoluene	126	10.933	10.934	-0.001	96	98837	1.00	1.00	
120 1,3,5-Trimethylbenzene	105	10.933	10.934	-0.001	96	343505	1.00	1.00	
118 4-Chlorotoluene	126	11.017	11.003	0.014	97	97568	1.00	0.9705	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	91	347913	1.00	0.99	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	348885	1.00	1.01	
122 sec-Butylbenzene	134	11.408	11.394	0.014	93	98199	1.00	0.9857	
123 4-Isopropyltoluene	119	11.492	11.492	0.000	97	396072	1.00	0.8308	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	185725	1.00	0.9843	
126 1,4-Dichlorobenzene	146	11.632	11.618	0.014	95	185014	1.00	0.9859	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	357880	1.00	1.02	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	98	157229	1.00	0.9706	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	89	8406	1.00	0.8881	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	95	111922	1.00	0.9357	
131 Hexachlorobutadiene	225	13.824	13.825	-0.001	97	71849	1.00	0.9490	
132 Naphthalene	128	14.020	14.006	0.014	96	169087	1.00	0.9362	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	96	91481	1.00	0.9442	
S 140 1,2-Dichloroethene, Total	96				0		2.00	1.94	
S 134 Trihalomethanes, Total	1				0		4.00	3.75	
S 138 Xylenes, Total	106				0		2.00	1.96	
S 139 Xylenes, Total (URS)	1				0		2.00	1.96	
S 136 1,2-Dichloroethene, Total	1				0		2.00	1.94	
S 135 1,3-Dichloropropene, Total	1				0		2.00	1.91	
S 137 Total BTEX	1				0			4.97	

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-ARCH SS A_00108	Amount Added: 0.08	Units: uL
MV-MegaMainA_00009	Amount Added: 0.40	Units: uL
MV-Gas A_00005	Amount Added: 0.40	Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1422.D

Injection Date: 18-Jan-2019 12:09:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 13

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

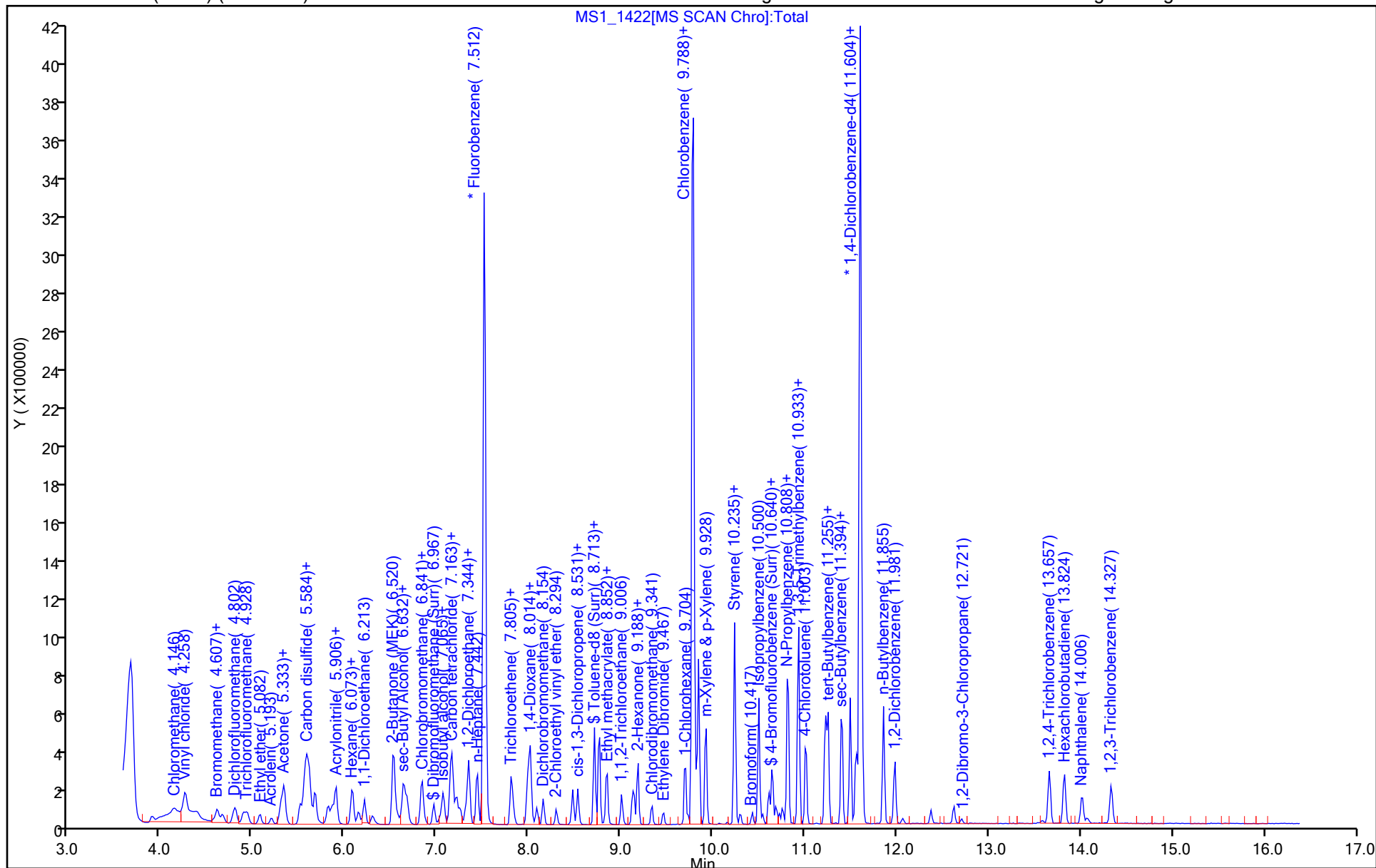
ALS Bottle#: 4

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1423.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 18-Jan-2019 12:29:30 ALS Bottle#: 5 Worklist Smp#: 14
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickham Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub76
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 24-Jan-2019 11:46:50 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0316

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.571	0.001	86	595902	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	100	3482523	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.774	9.788	-0.014	85	781395	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1177293	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	144295	2.00	1.97	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.247	7.246	0.001	97	111817	2.00	1.95	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	621791	2.00	2.13	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.640	0.000	0	202535	2.00	2.01	
24 Dichlorodifluoromethane	85	3.895	3.909	-0.014	99	226645	2.50	2.20	
26 Chloromethane	50	4.132	4.132	0.000	99	152857	2.50	2.41	
27 Vinyl chloride	62	4.258	4.258	0.000	88	160837	2.50	2.43	
29 Bromomethane	94	4.607	4.607	0.000	88	200925	2.50	2.55	
31 Chloroethane	64	4.663	4.663	0.000	99	163041	2.50	2.59	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	96	375483	2.50	2.53	
33 Trichlorofluoromethane	101	4.914	4.928	-0.014	98	326600	2.50	2.48	
36 Ethyl ether	59	5.068	5.068	0.000	87	108706	2.50	2.46	
39 Acrolein	56	5.194	5.193	0.001	99	104834	25.0	24.3	
40 Acetone	43	5.291	5.291	0.000	97	79094	10.0	10.1	
42 1,1,2-Trichloro-1,2,2-trif	151	5.305	5.319	-0.014	93	165261	2.50	2.49	
43 1,1-Dichloroethene	96	5.333	5.347	-0.014	95	198198	2.50	2.48	
45 Iodomethane	142	5.501	5.515	-0.014	98	350930	2.50	2.48	
46 Methyl acetate	43	5.529	5.529	0.000	94	97080	5.00	4.63	
47 3-Chloro-1-propene	41	5.585	5.584	0.001	84	278279	2.50	2.56	
48 Carbon disulfide	76	5.613	5.612	0.000	98	847862	2.50	2.51	
49 2-Methyl-2-propanol	59	5.626	5.640	-0.014	94	86065	25.0	25.7	
50 Methylene Chloride	84	5.668	5.668	0.000	84	219009	2.50	2.46	
51 Acrylonitrile	53	5.808	5.808	0.000	100	261579	25.0	24.6	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	92	373196	2.50	2.48	
53 trans-1,2-Dichloroethene	96	5.892	5.906	-0.014	97	227067	2.50	2.51	
54 Hexane	57	6.073	6.073	0.000	87	313434	2.50	2.52	
55 Vinyl acetate	43	6.143	6.143	0.000	97	312175	5.00	4.84	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	96	347127	2.50	2.52	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	97	142529	10.0	9.87	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	94	178911	75.0	75.3	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	78	245234	2.50	2.50	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	85	305762	2.50	2.54	
67 Chlorobromomethane	128	6.828	6.827	0.001	90	88693	2.50	2.42	
68 Chloroform	83	6.842	6.841	0.001	92	344966	2.50	2.52	
69 Tetrahydrofuran	42	6.869	6.869	0.000	83	39518	5.00	4.47	
70 Isobutyl alcohol	41	7.023	7.023	0.000	95	52714	62.5	60.8	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	97	323928	2.50	2.51	
72 Cyclohexane	56	7.149	7.149	0.000	86	378136	2.50	2.58	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	98	294869	2.50	2.53	
74 Carbon tetrachloride	117	7.205	7.219	-0.014	96	279352	2.50	2.51	
75 1,2-Dichloroethane	62	7.302	7.316	-0.014	97	171915	2.50	2.47	
77 Benzene	78	7.344	7.344	0.000	94	872512	2.50	2.56	
9 n-Heptane	43	7.428	7.442	-0.014	87	284389	2.50	2.54	
79 Trichloroethene	95	7.805	7.805	0.000	97	226235	2.50	2.51	
80 2-Pentanone	43	7.833	7.833	0.000	97	194406	10.0	9.93	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	96	189717	2.50	2.51	
83 Methylcyclohexane	55	8.015	8.015	0.000	90	297554	2.50	2.54	
84 1,4-Dioxane	88	8.029	8.029	0.000	81	17992	50.0	51.4	
85 Dibromomethane	93	8.085	8.084	0.001	95	83918	2.50	2.49	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	233014	2.50	2.50	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	90	99198	5.00	4.78	
89 cis-1,3-Dichloropropene	75	8.476	8.475	0.001	99	277222	2.50	2.52	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	91	278328	10.0	9.97	
91 Toluene	91	8.769	8.769	0.000	99	930711	2.50	2.60	
92 Ethyl methacrylate	69	8.839	8.839	0.000	87	151949	2.50	2.50	
93 trans-1,3-Dichloropropene	75	8.853	8.853	0.000	95	214088	2.50	2.47	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	89	119128	2.50	2.46	
95 2-Hexanone	43	9.118	9.118	0.000	90	189723	10.0	10.1	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	87	207485	2.50	2.51	
97 Tetrachloroethene	164	9.188	9.188	0.000	97	192241	2.50	2.54	
98 Chlorodibromomethane	129	9.341	9.341	0.000	89	141802	2.50	2.43	
100 Ethylene Dibromide	107	9.453	9.467	-0.014	100	111666	2.50	2.46	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	321657	2.50	2.54	
102 Chlorobenzene	112	9.802	9.802	0.000	97	587851	2.50	2.58	
104 Ethylbenzene	106	9.844	9.844	0.000	97	347743	2.50	2.57	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	92	190126	2.50	2.50	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	99	424915	2.50	2.55	
109 o-Xylene	106	10.235	10.235	0.000	87	409633	2.50	2.59	
106 Styrene	104	10.235	10.235	0.000	88	644153	2.50	2.58	
107 Bromoform	173	10.431	10.431	0.000	98	72950	2.50	2.37	
108 Isopropylbenzene	105	10.501	10.501	0.000	94	1078810	2.50	2.32	
111 Cyclohexanone	55	10.612	10.612	0.000	87	215895	100.0	106.9	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.682	0.000	94	123938	2.50	2.47	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	90	25545	2.50	2.33	
114 1,2,3-Trichloropropane	110	10.752	10.752	0.000	82	35881	2.50	2.52	
116 Bromobenzene	156	10.808	10.808	0.000	93	230485	2.50	2.54	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	300968	2.50	2.56	
117 2-Chlorotoluene	126	10.934	10.934	0.000	96	246900	2.50	2.56	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	95	879081	2.50	2.64	
118 4-Chlorotoluene	126	11.017	11.003	0.014	97	250380	2.50	2.56	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	91	893627	2.50	2.62	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	892379	2.50	2.65	
122 sec-Butylbenzene	134	11.395	11.394	0.001	94	245793	2.50	2.53	
123 4-Isopropyltoluene	119	11.492	11.492	0.000	97	1001589	2.50	2.34	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	472406	2.50	2.57	
126 1,4-Dichlorobenzene	146	11.618	11.618	0.000	95	467999	2.50	2.56	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	910306	2.50	2.67	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	99	398658	2.50	2.53	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	88	22668	2.50	2.46	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	292063	2.50	2.51	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	97	187175	2.50	2.54	
132 Naphthalene	128	14.006	14.006	0.000	96	430242	2.50	2.45	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	96	234259	2.50	2.48	
S 140 1,2-Dichloroethene, Total	96				0		5.00	5.01	
S 138 Xylenes, Total	106				0		5.00	5.14	
S 139 Xylenes, Total (URS)	1				0		5.00	5.14	
S 134 Trihalomethanes, Total	1				0		10.0	9.81	
S 136 1,2-Dichloroethene, Total	1				0		5.00	5.01	
S 135 1,3-Dichloropropene, Total	1				0		5.00	4.99	
S 137 Total BTEX	1				0			12.9	

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-ARCH SS A_00108	Amount Added: 0.16	Units: uL
MV-MegaMainA_00009	Amount Added: 1.00	Units: uL
MV-Gas A_00005	Amount Added: 1.00	Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1423.D

Injection Date: 18-Jan-2019 12:29:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 14

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

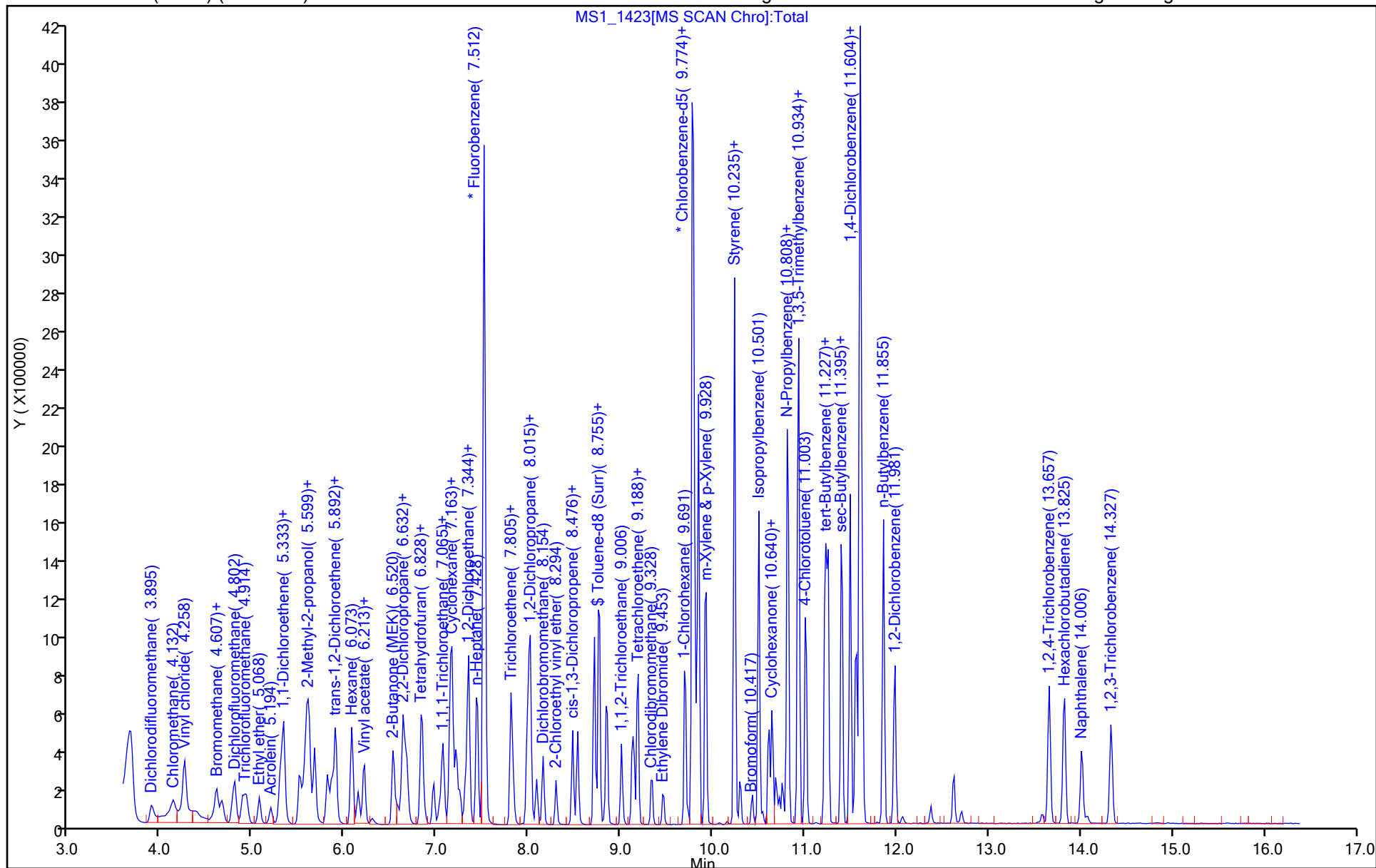
ALS Bottle#: 5

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1424.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 18-Jan-2019 12:50:30 ALS Bottle#: 6 Worklist Smp#: 15
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickham Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub76
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 24-Jan-2019 11:47:02 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0316

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.570	5.571	0.000	86	595404	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3401695	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	83	760521	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	1151145	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	367529	5.00	5.13	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	288650	5.00	5.16	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	91	1513428	5.00	5.32	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.640	0.000	0	507631	5.00	5.15	
24 Dichlorodifluoromethane	85	3.908	3.909	-0.001	99	617482	5.00	6.01	
26 Chloromethane	50	4.132	4.132	0.000	99	330166	5.00	5.32	
27 Vinyl chloride	62	4.258	4.258	0.000	89	357201	5.00	5.53	
29 Bromomethane	94	4.607	4.607	0.000	90	433937	5.00	5.63	
31 Chloroethane	64	4.663	4.663	0.000	99	336778	5.00	5.47	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	96	786920	5.00	5.43	
33 Trichlorofluoromethane	101	4.928	4.928	0.000	97	708084	5.00	5.51	
36 Ethyl ether	59	5.082	5.068	0.014	86	228735	5.00	5.30	
39 Acrolein	56	5.193	5.193	0.000	100	227935	50.0	54.0	
40 Acetone	43	5.305	5.291	0.014	98	156501	20.0	20.4	
42 1,1,2-Trichloro-1,2,2-trif	151	5.319	5.319	0.000	93	347160	5.00	5.35	
43 1,1-Dichloroethene	96	5.347	5.347	0.000	95	422593	5.00	5.41	
45 Iodomethane	142	5.515	5.515	0.000	97	745744	5.00	5.39	
46 Methyl acetate	43	5.529	5.529	0.000	94	201795	10.0	9.86	
47 3-Chloro-1-propene	41	5.584	5.584	0.000	84	577462	5.00	5.43	
48 Carbon disulfide	76	5.612	5.612	0.000	98	1776366	5.00	5.38	
49 2-Methyl-2-propanol	59	5.640	5.640	0.000	93	180533	50.0	53.9	
50 Methylene Chloride	84	5.682	5.668	0.014	84	430812	5.00	4.96	
51 Acrylonitrile	53	5.808	5.808	0.000	100	550005	50.0	53.0	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	92	779088	5.00	5.29	
53 trans-1,2-Dichloroethene	96	5.906	5.906	0.000	96	474238	5.00	5.36	
54 Hexane	57	6.073	6.073	0.000	87	656431	5.00	5.42	
55 Vinyl acetate	43	6.143	6.143	0.000	97	670735	10.0	10.6	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	95	723273	5.00	5.37	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	97	292072	20.0	20.7	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	96	380489	150.0	160.4	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	75	509057	5.00	5.32	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	86	619089	5.00	5.27	
67 Chlorobromomethane	128	6.827	6.827	0.000	90	187779	5.00	5.24	
68 Chloroform	83	6.841	6.841	0.000	92	714035	5.00	5.33	
69 Tetrahydrofuran	42	6.869	6.869	0.000	83	84394	10.0	10.5	
70 Isobutyl alcohol	41	7.023	7.023	0.000	96	112578	125.0	129.9	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	97	675964	5.00	5.36	
72 Cyclohexane	56	7.149	7.149	0.000	87	765511	5.00	5.35	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	97	611162	5.00	5.37	
74 Carbon tetrachloride	117	7.218	7.219	-0.001	94	578186	5.00	5.33	
75 1,2-Dichloroethane	62	7.316	7.316	0.000	97	361743	5.00	5.33	
77 Benzene	78	7.344	7.344	0.000	94	1799735	5.00	5.40	
9 n-Heptane	43	7.442	7.442	0.000	85	592484	5.00	5.43	
79 Trichloroethene	95	7.805	7.805	0.000	97	466283	5.00	5.30	
80 2-Pentanone	43	7.833	7.833	0.000	97	402782	20.0	21.1	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	96	389975	5.00	5.27	
83 Methylcyclohexane	55	8.015	8.015	0.000	87	615003	5.00	5.38	
84 1,4-Dioxane	88	8.042	8.029	0.013	90	39080	100.0	114.4	
85 Dibromomethane	93	8.084	8.084	0.000	94	173924	5.00	5.27	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	478287	5.00	5.24	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	208371	10.0	10.3	
89 cis-1,3-Dichloropropene	75	8.475	8.475	0.000	99	578361	5.00	5.40	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	92	581176	20.0	21.3	
91 Toluene	91	8.769	8.769	0.000	99	1903843	5.00	5.45	
92 Ethyl methacrylate	69	8.839	8.839	0.000	87	309338	5.00	5.23	
93 trans-1,3-Dichloropropene	75	8.853	8.853	-0.001	94	451708	5.00	5.33	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	88	248643	5.00	5.25	
95 2-Hexanone	43	9.118	9.118	0.000	91	392202	20.0	21.4	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	87	429655	5.00	5.34	
97 Tetrachloroethene	164	9.188	9.188	0.000	97	394732	5.00	5.36	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	302141	5.00	5.31	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	235500	5.00	5.33	
101 1-Chlorohexane	91	9.704	9.705	-0.001	0	661955	5.00	5.37	
102 Chlorobenzene	112	9.802	9.802	0.000	97	1200703	5.00	5.41	
104 Ethylbenzene	106	9.844	9.844	0.000	97	707523	5.00	5.38	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	395625	5.00	5.34	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	98	866303	5.00	5.35	
109 o-Xylene	106	10.235	10.235	0.000	87	835498	5.00	5.42	
106 Styrene	104	10.235	10.235	0.000	88	1329887	5.00	5.48	
107 Bromoform	173	10.431	10.431	0.000	98	156767	5.00	5.24	
108 Isopropylbenzene	105	10.501	10.501	0.000	95	2183142	5.00	5.08	
111 Cyclohexanone	55	10.612	10.612	0.000	88	453424	200.0	230.7	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.682	0.000	94	263699	5.00	5.37	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	90	57938	5.00	5.40	
114 1,2,3-Trichloropropane	110	10.752	10.752	0.000	83	73778	5.00	5.29	
116 Bromobenzene	156	10.808	10.808	0.000	93	472386	5.00	5.33	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	621485	5.00	5.41	
117 2-Chlorotoluene	126	10.933	10.934	-0.001	96	509791	5.00	5.40	
120 1,3,5-Trimethylbenzene	105	10.933	10.934	-0.001	95	1796031	5.00	5.52	
118 4-Chlorotoluene	126	11.017	11.003	0.014	97	507490	5.00	5.30	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	91	1808885	5.00	5.43	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	1819813	5.00	5.52	
122 sec-Butylbenzene	134	11.408	11.394	0.014	93	511160	5.00	5.39	
123 4-Isopropyltoluene	119	11.492	11.492	0.000	97	2039873	5.00	5.07	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	961160	5.00	5.35	
126 1,4-Dichlorobenzene	146	11.618	11.618	0.000	95	954591	5.00	5.34	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	1830811	5.00	5.49	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	99	823552	5.00	5.34	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	90	48255	5.00	5.35	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	598862	5.00	5.26	
131 Hexachlorobutadiene	225	13.824	13.825	-0.001	96	380632	5.00	5.28	
132 Naphthalene	128	14.006	14.006	0.000	97	919731	5.00	5.35	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	96	486301	5.00	5.27	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.7	
S 139 Xylenes, Total (URS)	1				0		10.0	10.8	
S 134 Trihalomethanes, Total	1				0		20.0	21.1	
S 138 Xylenes, Total	106				0		10.0	10.8	
S 135 1,3-Dichloropropene, Total	1				0		10.0	10.7	
S 137 Total BTEX	1				0			27.0	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.7	

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-ARCH SS A_00108	Amount Added: 0.40	Units: uL
MV-MegaMainA_00009	Amount Added: 2.00	Units: uL
MV-Gas A_00005	Amount Added: 2.00	Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1424.D

Injection Date: 18-Jan-2019 12:50:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 15

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

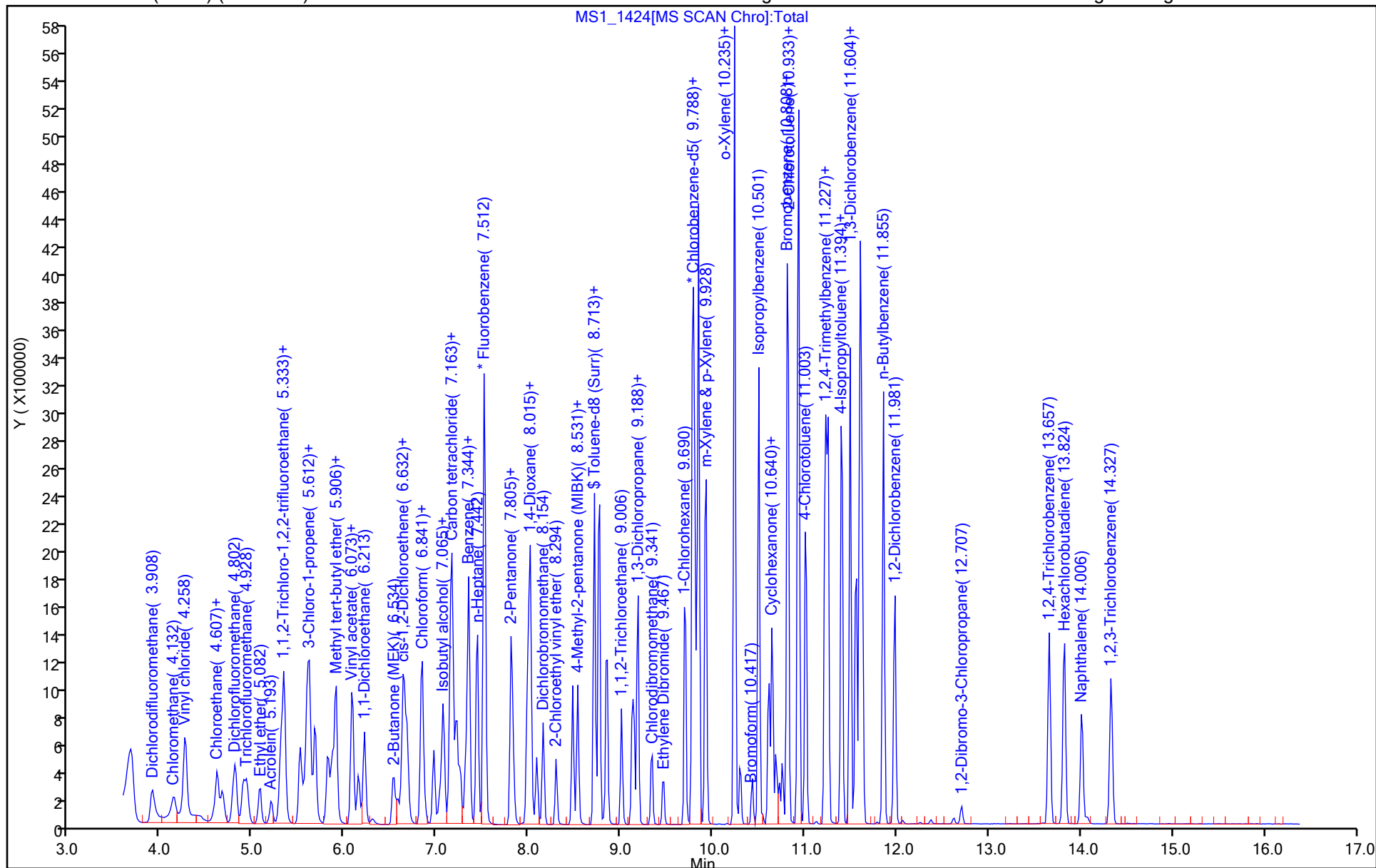
ALS Bottle#: 6

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1425.D
 Lims ID: icis
 Client ID:
 Sample Type: ICIS Calib Level: 5
 Inject. Date: 18-Jan-2019 13:10:30 ALS Bottle#: 7 Worklist Smp#: 16
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: icis
 Operator ID: wickhamt Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub76
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 24-Jan-2019 11:47:13 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0316

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.571	0.000	86	585242	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3226220	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	83	740423	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	93	1126170	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	726028	10.0	10.7	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	564701	10.0	10.7	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2953719	10.0	10.7	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.640	0.000	0	1020600	10.0	10.6	
24 Dichlorodifluoromethane	85	3.909	3.909	0.000	99	1171966	10.0	11.9	
26 Chloromethane	50	4.132	4.132	0.000	99	628325	10.0	10.7	
27 Vinyl chloride	62	4.258	4.258	0.000	89	681643	10.0	11.1	
29 Bromomethane	94	4.607	4.607	0.000	89	845059	10.0	11.6	
31 Chloroethane	64	4.663	4.663	0.000	99	654681	10.0	11.2	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	96	1514981	10.0	11.0	
33 Trichlorofluoromethane	101	4.928	4.928	0.000	98	1365881	10.0	11.2	
36 Ethyl ether	59	5.068	5.068	0.000	86	450400	10.0	11.0	
39 Acrolein	56	5.193	5.193	0.000	99	434014	100.0	108.4	
40 Acetone	43	5.291	5.291	0.000	98	282912	40.0	38.8	
42 1,1,2-Trichloro-1,2,2-trif	151	5.319	5.319	0.000	93	681313	10.0	11.1	
43 1,1-Dichloroethene	96	5.347	5.347	0.000	95	818273	10.0	11.0	
45 Iodomethane	142	5.515	5.515	0.000	97	1459534	10.0	11.1	
46 Methyl acetate	43	5.529	5.529	0.000	95	401302	20.0	20.7	
47 3-Chloro-1-propene	41	5.584	5.584	0.000	83	1097527	10.0	10.9	
48 Carbon disulfide	76	5.612	5.612	0.000	98	3419341	10.0	10.9	
49 2-Methyl-2-propanol	59	5.640	5.640	0.000	93	345121	100.0	104.9	
50 Methylene Chloride	84	5.668	5.668	0.000	84	832794	10.0	10.1	
51 Acrylonitrile	53	5.808	5.808	0.000	100	1081364	100.0	109.9	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	92	1533979	10.0	11.0	
53 trans-1,2-Dichloroethene	96	5.906	5.906	0.000	96	918029	10.0	10.9	
54 Hexane	57	6.073	6.073	0.000	87	1268896	10.0	10.8	
55 Vinyl acetate	43	6.143	6.143	0.000	97	1339954	20.0	22.4	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	95	1409113	10.0	11.0	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	96	566227	40.0	42.3	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	96	749412	300.0	321.3	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	79	996019	10.0	11.0	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	87	1189653	10.0	10.7	
67 Chlorobromomethane	128	6.827	6.827	0.000	91	375027	10.0	11.0	
68 Chloroform	83	6.841	6.841	0.000	92	1395397	10.0	11.0	
69 Tetrahydrofuran	42	6.869	6.869	0.000	84	164865	20.0	22.2	
70 Isobutyl alcohol	41	7.023	7.023	0.000	95	223951	250.0	262.9	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	97	1311669	10.0	11.0	
72 Cyclohexane	56	7.149	7.149	0.000	87	1502194	10.0	11.1	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	97	1184111	10.0	11.0	
74 Carbon tetrachloride	117	7.219	7.219	0.000	94	1138428	10.0	11.1	
75 1,2-Dichloroethane	62	7.316	7.316	0.000	97	710689	10.0	11.0	
77 Benzene	78	7.344	7.344	0.000	94	3470438	10.0	11.0	
9 n-Heptane	43	7.442	7.442	0.000	85	1147621	10.0	11.1	
79 Trichloroethene	95	7.805	7.805	0.000	97	906869	10.0	10.9	
80 2-Pentanone	43	7.833	7.833	0.000	97	799547	40.0	44.1	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	96	766794	10.0	10.9	
83 Methylcyclohexane	55	8.015	8.015	0.000	91	1202753	10.0	11.1	
84 1,4-Dioxane	88	8.029	8.029	0.000	86	72472	200.0	223.7	
85 Dibromomethane	93	8.084	8.084	0.000	95	344068	10.0	11.0	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	955495	10.0	11.0	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	427974	20.0	22.3	
89 cis-1,3-Dichloropropene	75	8.475	8.475	0.000	99	1130448	10.0	10.8	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	92	1146299	40.0	44.3	
91 Toluene	91	8.769	8.769	0.000	99	3668181	10.0	11.1	
92 Ethyl methacrylate	69	8.839	8.839	0.000	88	624874	10.0	10.9	
93 trans-1,3-Dichloropropene	75	8.853	8.853	0.000	95	896600	10.0	11.2	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	89	493250	10.0	11.0	
95 2-Hexanone	43	9.118	9.118	0.000	91	759469	40.0	42.6	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	87	850812	10.0	10.9	
97 Tetrachloroethene	164	9.188	9.188	0.000	97	772120	10.0	10.8	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	605059	10.0	10.9	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	469389	10.0	10.9	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	1300046	10.0	10.8	
102 Chlorobenzene	112	9.802	9.802	0.000	98	2349381	10.0	10.9	
104 Ethylbenzene	106	9.844	9.844	0.000	97	1395967	10.0	10.9	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	794088	10.0	11.0	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	98	1717480	10.0	10.9	
109 o-Xylene	106	10.235	10.235	0.000	87	1660638	10.0	11.1	
106 Styrene	104	10.235	10.235	0.000	88	2643061	10.0	11.2	
107 Bromoform	173	10.431	10.431	0.000	99	325072	10.0	11.2	
108 Isopropylbenzene	105	10.501	10.501	0.000	95	4266474	10.0	10.7	
111 Cyclohexanone	55	10.612	10.612	0.000	88	807200	400.0	421.9	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.682	0.000	94	527516	10.0	11.0	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	90	115500	10.0	11.0	
114 1,2,3-Trichloropropane	110	10.752	10.752	0.000	83	151486	10.0	11.1	
116 Bromobenzene	156	10.808	10.808	0.000	92	958002	10.0	11.1	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	1243004	10.0	11.1	
117 2-Chlorotoluene	126	10.934	10.934	0.000	96	1020584	10.0	11.0	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	96	3592583	10.0	11.3	
118 4-Chlorotoluene	126	11.003	11.003	0.000	98	1040244	10.0	11.1	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	91	3634412	10.0	11.2	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	3633619	10.0	11.3	
122 sec-Butylbenzene	134	11.394	11.394	0.000	94	1026741	10.0	11.1	
123 4-Isopropyltoluene	119	11.492	11.492	0.000	96	4082802	10.0	10.9	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	1944498	10.0	11.1	
126 1,4-Dichlorobenzene	146	11.618	11.618	0.000	95	1919952	10.0	11.0	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	3695681	10.0	11.3	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	99	1669394	10.0	11.1	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	91	100644	10.0	11.4	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	1261251	10.0	11.3	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	97	794800	10.0	11.3	
132 Naphthalene	128	14.006	14.006	0.000	97	1918358	10.0	11.4	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	96	1032802	10.0	11.4	
S 140 1,2-Dichloroethene, Total	96				0		20.0	21.9	
S 134 Trihalomethanes, Total	1				0		40.0	44.1	
S 138 Xylenes, Total	106				0		20.0	22.0	
S 139 Xylenes, Total (URS)	1				0		20.0	22.0	
S 136 1,2-Dichloroethene, Total	1				0		20.0	21.9	
S 135 1,3-Dichloropropene, Total	1				0		20.0	22.0	

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-ARCH SS A_00108	Amount Added: 0.80	Units: uL
MV-MegaMainA_00009	Amount Added: 4.00	Units: uL
MV-Gas A_00005	Amount Added: 4.00	Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1425.D

Injection Date: 18-Jan-2019 13:10:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: icis

Worklist Smp#: 16

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

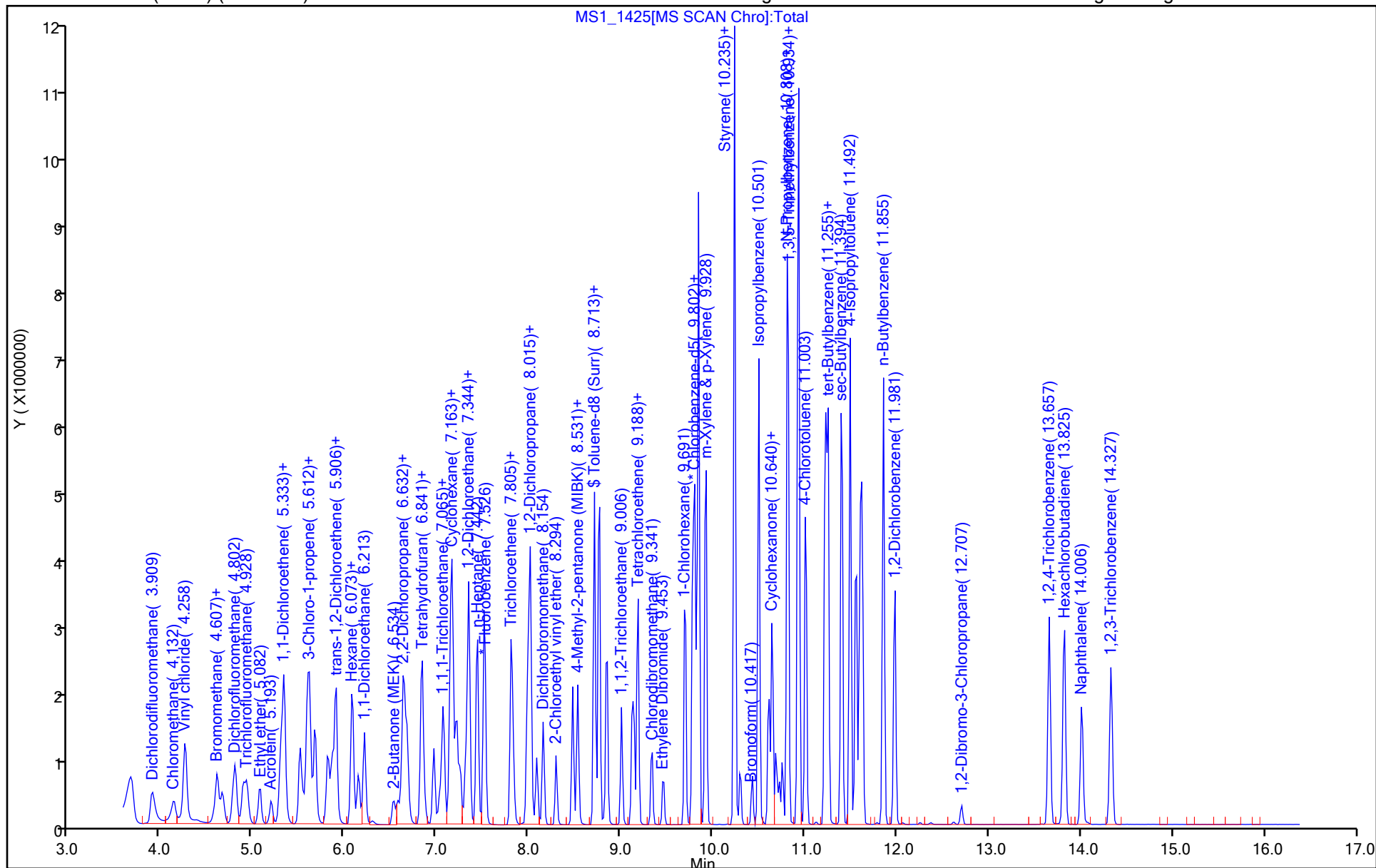
ALS Bottle#: 7

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1426.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 18-Jan-2019 13:31:30 ALS Bottle#: 8 Worklist Smp#: 17
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickham Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub76
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 24-Jan-2019 11:47:25 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0316

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.571	0.000	86	629220	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3684080	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	89	836068	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1297016	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	2221023	30.0	28.7	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	96	1705149	30.0	28.2	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	91	8532119	30.0	27.3	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.640	0.000	0	3068055	30.0	27.6	
24 Dichlorodifluoromethane	85	3.895	3.909	-0.014	99	2755734	25.0	24.5	
26 Chloromethane	50	4.132	4.132	0.000	98	1524004	25.0	22.7	
27 Vinyl chloride	62	4.258	4.258	0.000	89	1596019	25.0	22.8	
29 Bromomethane	94	4.607	4.607	0.000	89	1968771	25.0	23.6	
31 Chloroethane	64	4.663	4.663	0.000	99	1536922	25.0	23.0	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	96	3647134	25.0	23.2	
33 Trichlorofluoromethane	101	4.914	4.928	-0.014	98	3214343	25.0	23.1	
36 Ethyl ether	59	5.068	5.068	0.000	86	1148307	25.0	24.6	
39 Acrolein	56	5.193	5.193	0.000	99	1083086	250.0	236.9	
40 Acetone	43	5.291	5.291	0.000	98	724562	100.0	87.1	
42 1,1,2-Trichloro-1,2,2-trif	151	5.305	5.319	-0.014	93	1699288	25.0	24.2	
43 1,1-Dichloroethene	96	5.333	5.347	-0.014	95	2046414	25.0	24.2	
45 Iodomethane	142	5.501	5.515	-0.014	98	3617706	25.0	24.1	
46 Methyl acetate	43	5.529	5.529	0.000	95	1009810	50.0	45.6	
47 3-Chloro-1-propene	41	5.584	5.584	0.000	84	2688245	25.0	23.3	
48 Carbon disulfide	76	5.612	5.612	0.000	98	8287243	25.0	23.2	
49 2-Methyl-2-propanol	59	5.626	5.640	-0.014	95	869689	250.0	245.9	
50 Methylene Chloride	84	5.668	5.668	0.000	84	2071405	25.0	22.0	
51 Acrylonitrile	53	5.808	5.808	0.000	100	2689827	250.0	239.4	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	92	3820736	25.0	24.0	
53 trans-1,2-Dichloroethene	96	5.892	5.906	-0.014	95	2298004	25.0	24.0	
54 Hexane	57	6.073	6.073	0.000	86	3119695	25.0	23.4	
55 Vinyl acetate	43	6.143	6.143	0.000	96	3306095	50.0	48.5	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	95	3474463	25.0	23.8	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	96	1418529	100.0	92.8	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	96	1862088	750.0	742.6	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	74	2498241	25.0	24.1	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	85	2898201	25.0	22.8	
67 Chlorobromomethane	128	6.827	6.827	0.000	90	944402	25.0	24.3	
68 Chloroform	83	6.841	6.841	0.000	92	3484996	25.0	24.0	
69 Tetrahydrofuran	42	6.869	6.869	0.000	82	407809	50.0	48.7	
70 Isobutyl alcohol	41	7.023	7.023	0.000	96	572428	625.0	625.1	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	97	3250627	25.0	23.8	
72 Cyclohexane	56	7.149	7.149	0.000	85	3642411	25.0	23.5	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	97	2923720	25.0	23.7	
74 Carbon tetrachloride	117	7.205	7.219	-0.014	96	2829288	25.0	24.1	
75 1,2-Dichloroethane	62	7.316	7.316	0.000	97	1772537	25.0	24.1	
77 Benzene	78	7.344	7.344	0.000	95	8512447	25.0	23.6	
9 n-Heptane	43	7.428	7.442	-0.014	86	2794861	25.0	23.6	
79 Trichloroethene	95	7.805	7.805	0.000	97	2302650	25.0	24.1	
80 2-Pentanone	43	7.833	7.833	0.000	97	2027143	100.0	97.9	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	96	1917043	25.0	23.9	
83 Methylcyclohexane	55	8.015	8.015	0.000	89	2934952	25.0	23.7	
84 1,4-Dioxane	88	8.029	8.029	0.000	85	179458	500.0	485.1	
85 Dibromomethane	93	8.084	8.084	0.000	94	873941	25.0	24.5	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	2418940	25.0	24.5	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	90	1160995	50.0	52.9	
89 cis-1,3-Dichloropropene	75	8.475	8.475	0.000	99	2868741	25.0	24.4	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	91	2836911	100.0	96.0	
91 Toluene	91	8.769	8.769	0.000	99	8886654	25.0	23.5	
92 Ethyl methacrylate	69	8.839	8.839	0.000	88	1556039	25.0	23.9	
93 trans-1,3-Dichloropropene	75	8.853	8.853	0.000	93	2246928	25.0	24.5	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	89	1249882	25.0	24.4	
95 2-Hexanone	43	9.118	9.118	0.000	90	1941952	100.0	96.5	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	86	2143737	25.0	24.2	
97 Tetrachloroethene	164	9.188	9.188	0.000	97	1948502	25.0	24.1	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	1572542	25.0	25.2	
100 Ethylene Dibromide	107	9.453	9.467	-0.014	99	1193909	25.0	24.6	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	3241360	25.0	23.9	
102 Chlorobenzene	112	9.802	9.802	0.000	96	5810648	25.0	23.8	
104 Ethylbenzene	106	9.844	9.844	0.000	97	3527761	25.0	24.4	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	96	2027070	25.0	24.9	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	97	4281499	25.0	24.0	
109 o-Xylene	106	10.235	10.235	0.000	86	4067594	25.0	24.0	
106 Styrene	104	10.235	10.235	0.000	88	6431083	25.0	24.1	
107 Bromoform	173	10.431	10.431	0.000	99	845942	25.0	25.7	
108 Isopropylbenzene	105	10.501	10.501	0.000	95	10027852	25.0	24.5	
111 Cyclohexanone	55	10.612	10.612	0.000	87	2078277	1000.0	962.1	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.682	0.000	93	1328163	25.0	24.0	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	91	290248	25.0	24.0	
114 1,2,3-Trichloropropane	110	10.752	10.752	0.000	83	381483	25.0	24.3	
116 Bromobenzene	156	10.808	10.808	0.000	91	2430041	25.0	24.4	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	3100243	25.0	23.9	
117 2-Chlorotoluene	126	10.934	10.934	0.000	97	2543045	25.0	23.9	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	96	8526075	25.0	23.2	
118 4-Chlorotoluene	126	11.003	11.003	0.000	97	2585286	25.0	24.0	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	91	8869613	25.0	23.6	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	95	8709650	25.0	23.4	
122 sec-Butylbenzene	134	11.394	11.394	0.000	94	2556477	25.0	23.9	
123 4-Isopropyltoluene	119	11.492	11.492	0.000	95	9536958	25.0	24.4	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	98	4772169	25.0	23.6	
126 1,4-Dichlorobenzene	146	11.618	11.618	0.000	94	4736011	25.0	23.5	
127 n-Butylbenzene	91	11.855	11.855	0.000	96	8697203	25.0	23.2	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	99	4138624	25.0	23.8	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	92	259331	25.0	25.5	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	3076277	25.0	24.0	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	96	1935981	25.0	23.8	
132 Naphthalene	128	14.006	14.006	0.000	97	4627993	25.0	23.9	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	96	2474963	25.0	23.8	
S 140 1,2-Dichloroethene, Total	96				0		50.0	48.1	
S 138 Xylenes, Total	106				0		50.0	48.1	
S 139 Xylenes, Total (URS)	1				0		50.0	48.1	
S 134 Trihalomethanes, Total	1				0		100.0	99.4	
S 136 1,2-Dichloroethene, Total	1				0		50.0	48.1	
S 135 1,3-Dichloropropene, Total	1				0		50.0	48.9	
S 137 Total BTEX	1				0			119.5	

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-ARCH SS A_00108

Amount Added: 2.40

Units: uL

MV-MegaMainA_00009

Amount Added: 10.00

Units: uL

MV-Gas A_00005

Amount Added: 10.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1426.D

Injection Date: 18-Jan-2019 13:31:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 17

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

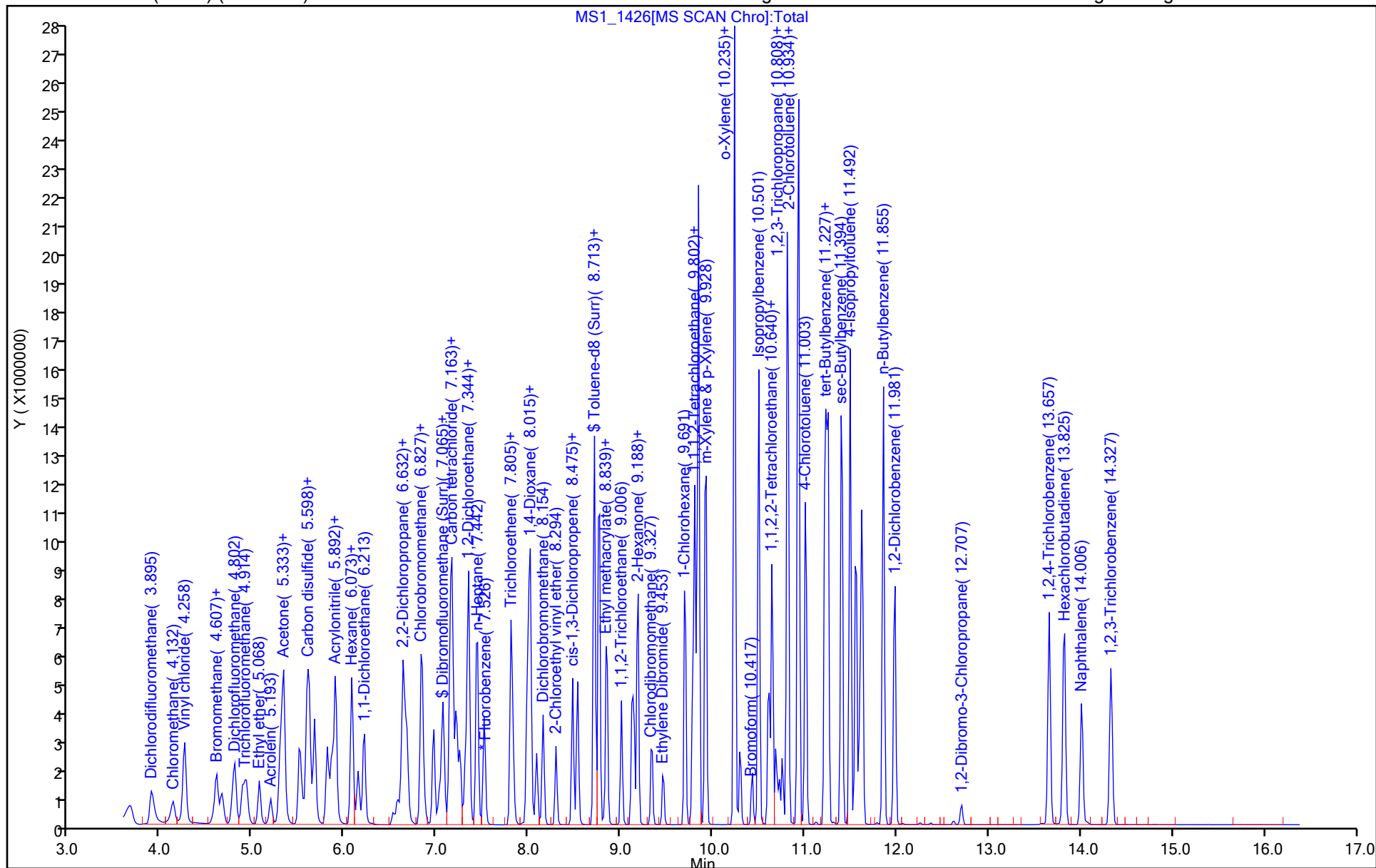
ALS Bottle#: 8

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Lims ID: std
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 18-Jan-2019 13:52:30 ALS Bottle#: 9 Worklist Smp#: 18
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: std
 Operator ID: wickham Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub76
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 24-Jan-2019 11:47:40 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0316

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.571	0.001	87	612511	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3476033	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	92	793943	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1223177	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	4258269	60.0	58.2	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	96	3276937	60.0	57.4	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	91	14713483	60.0	49.6	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.640	0.000	0	5769717	60.0	55.1	
24 Dichlorodifluoromethane	85	3.895	3.909	-0.014	99	6166967	60.0	58.0	
26 Chloromethane	50	4.132	4.132	0.000	98	3421101	60.0	53.9	
27 Vinyl chloride	62	4.258	4.258	0.000	89	3472179	60.0	52.6	
29 Bromomethane	94	4.607	4.607	0.000	90	3596940	60.0	45.7	
31 Chloroethane	64	4.663	4.663	0.000	99	2913143	60.0	46.3	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	96	8064893	60.0	54.4	
33 Trichlorofluoromethane	101	4.928	4.928	0.000	98	7219290	60.0	55.0	
36 Ethyl ether	59	5.068	5.068	0.000	86	2619692	60.0	59.4	
39 Acrolein	56	5.193	5.193	0.000	100	2424818	600.1	562.1	
40 Acetone	43	5.291	5.291	0.000	97	1597385	240.0	203.5	
42 1,1,2-Trichloro-1,2,2-trif	151	5.305	5.319	-0.014	93	3757398	60.0	56.6	
43 1,1-Dichloroethene	96	5.333	5.347	-0.014	94	4500944	60.0	56.4	
45 Iodomethane	142	5.515	5.515	0.000	98	8061514	60.0	57.0	
46 Methyl acetate	43	5.529	5.529	0.000	95	2289449	120.0	109.5	
47 3-Chloro-1-propene	41	5.584	5.584	0.000	86	5664648	60.0	52.1	
48 Carbon disulfide	76	5.612	5.612	0.000	98	17228126	60.0	51.1	
49 2-Methyl-2-propanol	59	5.626	5.640	-0.014	93	1987739	600.0	577.3	
50 Methylene Chloride	84	5.668	5.668	0.000	83	4589531	60.0	51.7	
51 Acrylonitrile	53	5.808	5.808	0.000	100	6018440	600.0	567.8	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	92	8545378	60.0	56.8	
53 trans-1,2-Dichloroethene	96	5.906	5.906	0.000	94	5086564	60.0	56.2	
54 Hexane	57	6.073	6.073	0.000	86	6585828	60.0	52.1	
55 Vinyl acetate	43	6.143	6.143	0.000	96	6958320	120.0	108.1	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	95	7580767	60.0	55.1	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	96	3206890	240.0	222.4	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	96	4162502	1800.0	1705.3	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	73	5552817	60.0	56.8	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	86	6334823	60.0	52.8	
67 Chlorobromomethane	128	6.827	6.827	0.000	89	2157417	60.0	58.9	
68 Chloroform	83	6.841	6.841	0.000	92	7604455	60.0	55.6	
69 Tetrahydrofuran	42	6.869	6.869	0.000	82	934688	120.0	119.1	
70 Isobutyl alcohol	41	7.023	7.023	0.000	97	1304557	1500.0	1463.5	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	97	7173707	60.0	55.7	
72 Cyclohexane	56	7.149	7.149	0.000	87	7631263	60.0	52.2	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	96	6290244	60.0	54.1	
74 Carbon tetrachloride	117	7.219	7.219	0.000	95	6220315	60.0	56.1	
75 1,2-Dichloroethane	62	7.316	7.316	0.000	97	3944821	60.0	56.8	
77 Benzene	78	7.344	7.344	0.000	96	17377078	60.0	51.1	
9 n-Heptane	43	7.442	7.442	0.000	82	5714314	60.0	51.2	
79 Trichloroethene	95	7.805	7.805	0.000	97	5093263	60.0	56.6	
80 2-Pentanone	43	7.833	7.833	0.000	96	4539381	240.0	232.3	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	95	4230718	60.0	56.0	
83 Methylcyclohexane	55	8.015	8.015	0.000	87	6142671	60.0	52.6	
84 1,4-Dioxane	88	8.029	8.029	0.000	88	406440	1200.0	1164.4	
85 Dibromomethane	93	8.084	8.084	0.000	96	1999575	60.0	59.3	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	5420232	60.0	58.2	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	2790762	120.0	134.7	
89 cis-1,3-Dichloropropene	75	8.475	8.475	0.000	98	6340608	60.0	56.7	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	90	6215576	240.0	223.0	
91 Toluene	91	8.769	8.769	0.000	95	16663360	60.0	46.6	e
92 Ethyl methacrylate	69	8.839	8.839	0.000	87	3518432	60.0	57.0	
93 trans-1,3-Dichloropropene	75	8.853	8.853	0.000	93	4991365	60.0	57.7	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	89	2864131	60.0	59.2	
95 2-Hexanone	43	9.118	9.118	0.000	89	4259574	240.0	223.0	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	86	4773527	60.0	56.8	
97 Tetrachloroethene	164	9.188	9.188	0.000	96	4269613	60.0	55.5	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	3627417	60.0	61.1	
100 Ethylene Dibromide	107	9.453	9.467	-0.014	98	2766596	60.0	60.0	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	6873379	60.0	53.4	
102 Chlorobenzene	112	9.802	9.802	0.000	94	12004410	60.0	51.8	
104 Ethylbenzene	106	9.844	9.844	0.000	92	7202198	60.0	52.4	e
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	96	4404026	60.0	56.9	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	95	8959315	60.0	53.0	
109 o-Xylene	106	10.235	10.235	0.000	81	8081245	60.0	50.3	
106 Styrene	104	10.235	10.235	0.000	86	12336644	60.0	48.7	
107 Bromoform	173	10.431	10.431	0.000	99	2024587	60.0	64.8	
108 Isopropylbenzene	105	10.501	10.501	0.000	94	16649604	60.0	60.2	e
111 Cyclohexanone	55	10.612	10.612	0.000	86	4512595	2400.0	2199.8	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.682	0.000	94	3047475	60.0	58.4	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	91	669658	60.0	58.8	
114 1,2,3-Trichloropropane	110	10.752	10.752	0.000	83	895480	60.0	60.4	
116 Bromobenzene	156	10.808	10.808	0.000	90	5262250	60.0	55.9	
115 N-Propylbenzene	120	10.822	10.822	0.000	90	6483693	60.0	53.1	
117 2-Chlorotoluene	126	10.934	10.934	0.000	97	5186436	60.0	51.7	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	97	15836029	60.0	45.8	
118 4-Chlorotoluene	126	11.017	11.003	0.014	95	5581654	60.0	54.9	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	90	17255519	60.0	48.7	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	95	15951842	60.0	45.5	e
122 sec-Butylbenzene	134	11.408	11.394	0.014	93	5465780	60.0	54.2	
123 4-Isopropyltoluene	119	11.492	11.492	0.000	90	16280804	60.0	60.2	e
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	10093815	60.0	52.9	
126 1,4-Dichlorobenzene	146	11.618	11.618	0.000	94	10019669	60.0	52.8	
127 n-Butylbenzene	91	11.855	11.855	0.000	90	15710223	60.0	44.4	e
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	97	8978699	60.0	54.8	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	92	615705	60.0	64.3	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	95	6965105	60.0	57.5	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	97	4364826	60.0	57.0	
132 Naphthalene	128	14.006	14.006	0.000	97	10585375	60.0	57.9	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	96	5705267	60.0	58.2	
S 140 1,2-Dichloroethene, Total	96				0		120.0	113.0	
S 139 Xylenes, Total (URS)	1				0		120.0	103.2	
S 134 Trihalomethanes, Total	1				0		240.0	239.6	
S 138 Xylenes, Total	106				0		120.0	103.2	
S 136 1,2-Dichloroethene, Total	1				0		120.0	113.0	
S 135 1,3-Dichloropropene, Total	1				0		120.0	114.4	
S 137 Total BTEX	1				0			253.4	

QC Flag Legend

Processing Flags

e - Potential Peak Saturated

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-ARCH SS A_00108	Amount Added: 4.80	Units: uL
MV-MegaMainA_00009	Amount Added: 24.00	Units: uL
MV-Gas A_00005	Amount Added: 24.00	Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D

Injection Date: 18-Jan-2019 13:52:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: std

Worklist Smp#: 18

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

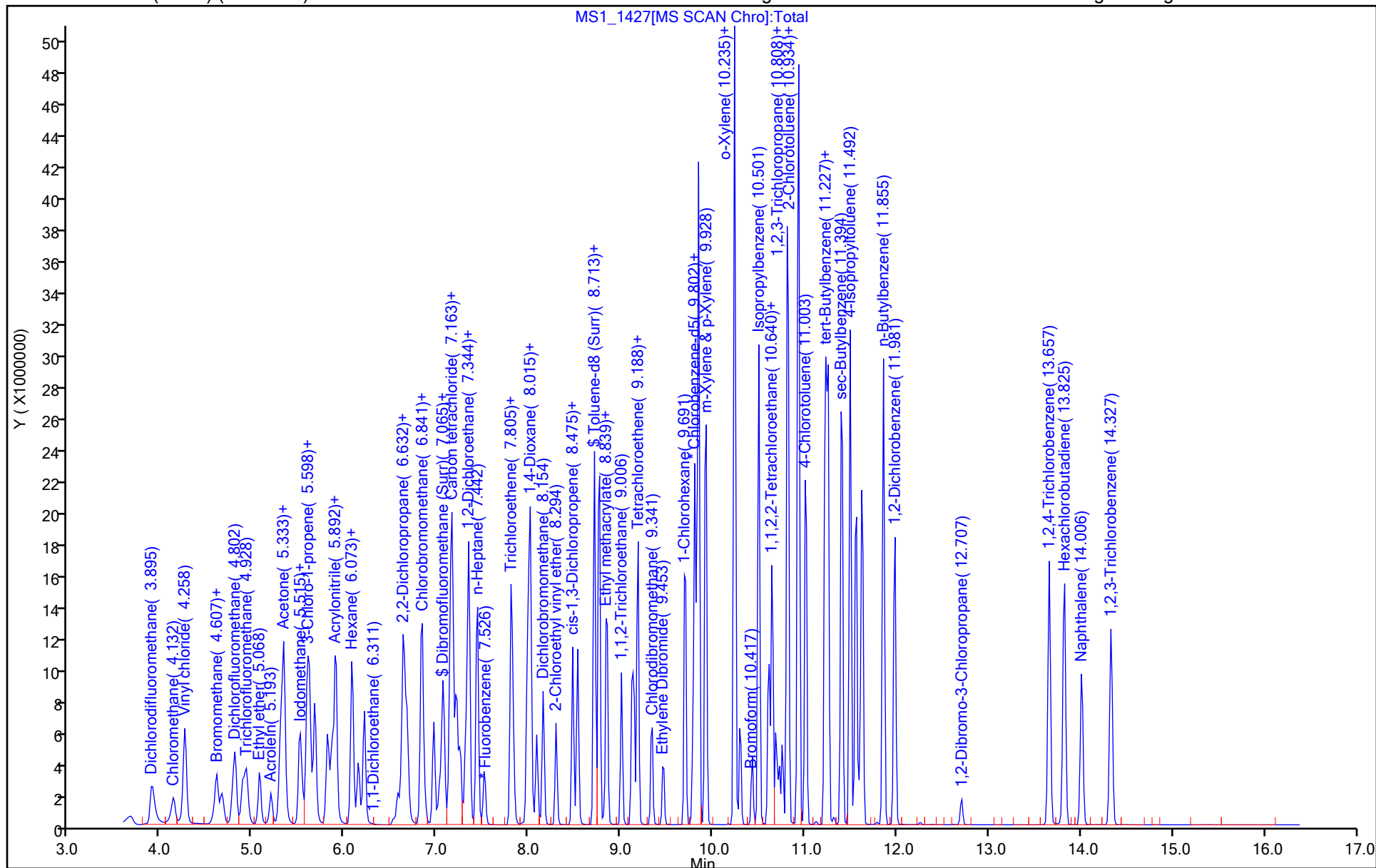
ALS Bottle#: 9

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-443512/26 Calibration Date: 01/08/2019 14:55
Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 11:55
GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 08/02/2018 13:37
Lab File ID: MS1_1084.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Tetrahydrothiophene	Ave	0.0250			0.600	20.0		

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1084.D
 Lims ID: icv
 Client ID:
 Sample Type: ICV
 Inject. Date: 08-Jan-2019 14:55:30 ALS Bottle#: 19 Worklist Smp#: 26
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: icv
 Operator ID: wickham Instrument ID: VMS_MS1
 Sublist:
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 09-Jan-2019 06:55:22 Calib Date: 08-Jan-2019 14:14:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0314

First Level Reviewer: nwangumaf

Date: 08-Jan-2019 18:39:01

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.585	0.000	71	412199	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	99	2484717	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	86	500628	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	685942	12.5	12.5	
28 Ethylene oxide	43	4.537	4.551	-0.014	98	595036	1000.0	1114.8	
34 Ethanol	45	4.928	4.942	-0.014	97	142594	600.0	604.8	
38 Propene oxide	58	5.166	5.166	0.000	0	3472012	1000.0	984.4	
41 Isopropyl alcohol	45	5.319	5.333	-0.014	98	140734	100.0	93.0	
44 Acetonitrile	41	5.515	5.529	-0.014	99	266504	100.0	97.4	
56 Isopropyl ether	87	6.185	6.185	0.000	94	463797	10.0	10.6	
58 2-Chloro-1,3-butadiene	53	6.297	6.297	0.000	89	798536	10.0	11.1	
59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	1319185	10.0	10.4	
60 Ethyl acetate	43	6.576	6.590	-0.014	98	380708	20.0	17.8	
63 Propionitrile	54	6.632	6.632	0.000	99	328706	100.0	99.2	
66 Methacrylonitrile	41	6.758	6.758	0.000	88	1346316	100.0	99.8	
76 Tert-amyl methyl ether	73	7.344	7.358	-0.014	97	1094986	10.0	10.4	
78 n-Butanol	56	7.540	7.540	0.000	84	166576	250.0	240.3	
81 Methyl methacrylate	100	7.945	7.945	0.000	87	139641	20.0	21.5	
87 2-Nitropropane	41	8.294	8.294	0.000	98	49302	20.0	14.3	
99 Tetrahydrothiophene	60		9.397				ND	ND	U
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	83	71650	20.0	17.1	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	2000891	10.0	10.4	
21 1,3,5-Trichlorobenzene	180	12.931	12.931	0.000	97	746798	10.0	9.52	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp B_00023

Amount Added: 4.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1084.D

Injection Date: 08-Jan-2019 14:55:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: icv

Worklist Smp#: 26

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

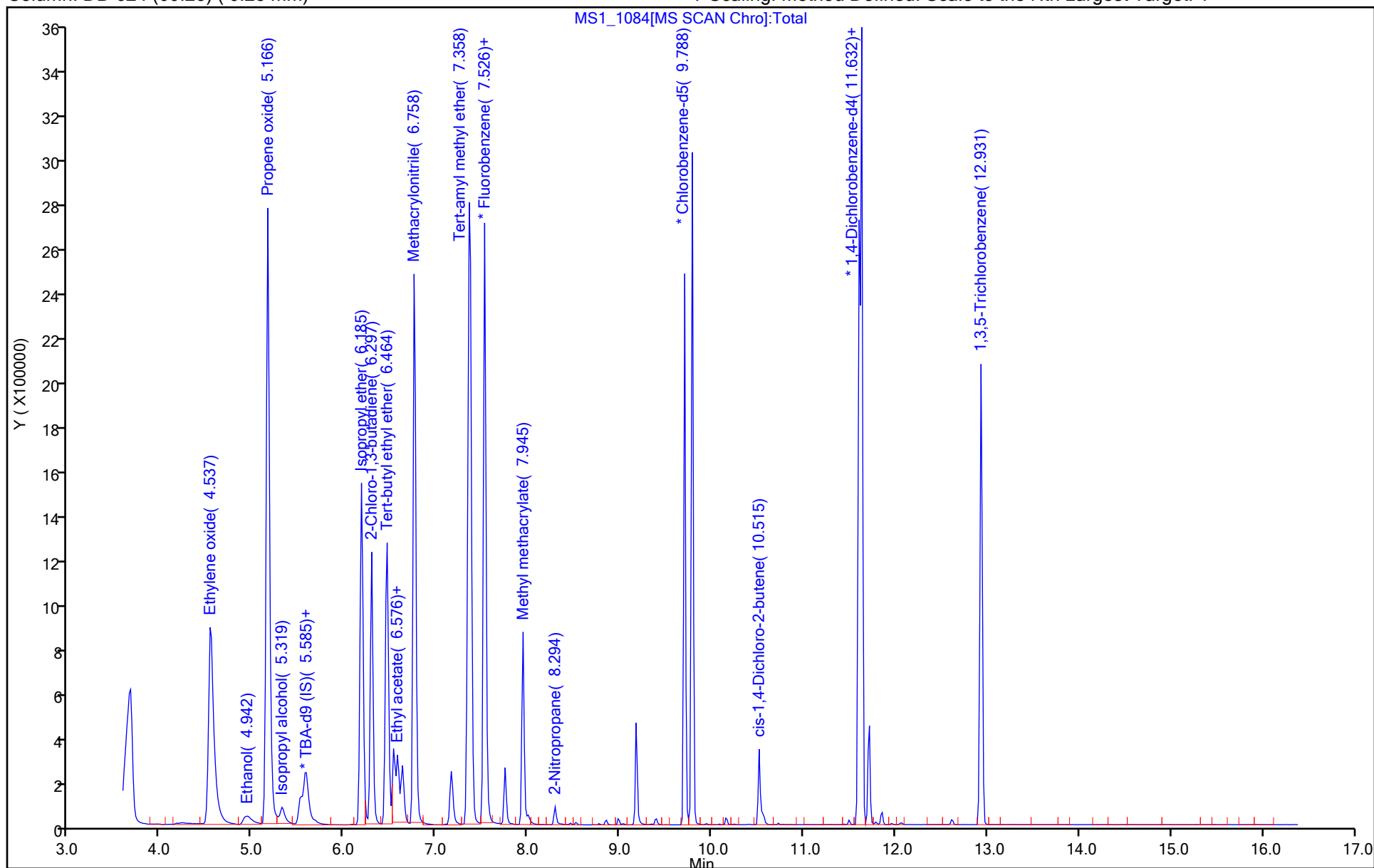
ALS Bottle#: 19

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1084.D

Injection Date: 08-Jan-2019 14:55:30

Instrument ID: VMS_MS1

Lims ID: icv

Client ID:

Operator ID: wickhamt

ALS Bottle#:

19

Worklist Smp#: 26

Purge Vol: 20.000 mL

Dil. Factor:

1.0000

Method: AQ_VMS1_8260

Limit Group:

MSV - 8260B Water and Solid

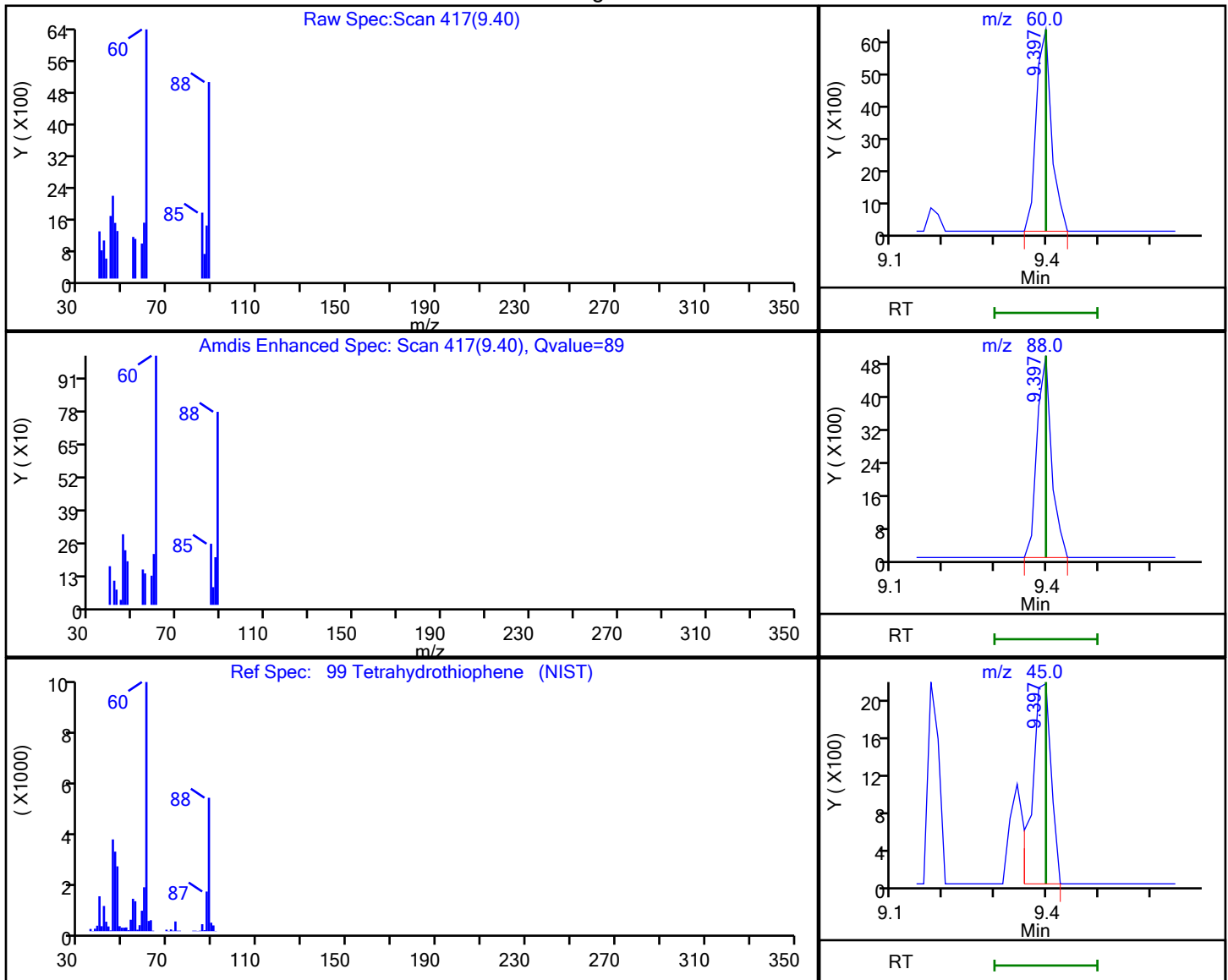
Column: DB-624 (60.25) (0.25 mm)

Detector

MS SCAN

99 Tetrahydrothiophene, CAS: 110-01-0

Processing Results



RT	Mass	Response	Amount
9.40	60.00	12931	
9.40	88.00	9710	
9.40	45.00	5266	

Reviewer: wickhamt, 09-Jan-2019 06:36:25

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-443512/26 Calibration Date: 01/08/2019 14:55
 Instrument ID: VMS_MS1 Calib Start Date: 01/08/2019 12:31
 GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 01/08/2019 14:14
 Lab File ID: MS1_1084.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ethylene oxide	Lin1		0.0030		1110	1000	11.5	55.0
Ethanol	Ave	0.1430	0.1441		605	600	0.8	55.0
Propene oxide	Ave	0.0177	0.0175		984	1000	-1.6	
2-Propanol	Ave	0.9175	0.8536		93.0	100	-7.0	55.0
Acetonitrile	Ave	0.0138	0.0134		97.4	100	-2.6	55.0
Di-isopropyl ether (DIPE)	Ave	0.2211	0.2333		10.6	10.0	5.5	35.0
Chloroprene	Ave	0.3613	0.4017		11.1	10.0	11.2	35.0
Tert-butyl ethyl ether	Ave	0.6410	0.6637		10.4	10.0	3.5	35.0
Ethyl acetate	Ave	0.1075	0.0958		17.8	20.0	-10.9	55.0
Propionitrile	Ave	0.0167	0.0165		99.2	100	-0.8	55.0
Methacrylonitrile	Ave	0.0679	0.0677		99.8	100	-0.2	55.0
Tert-amyl methyl ether	Ave	0.5292	0.5509		10.4	10.0	4.1	35.0
n-Butanol	Lin2		0.4041		240	250	-3.9	55.0
Methyl methacrylate	Ave	0.0327	0.0351		21.5	20.0	7.4	35.0
2-Nitropropane	Ave	0.0174	0.0124		14.3	20.0	-28.6	55.0
cis-1,4-Dichloro-2-butene	Ave	0.0764	0.0653		17.1	20.0	-14.5	55.0
1,2,3-Trimethylbenzene	Ave	3.521	3.646		10.4	10.0	3.6	35.0
1,3,5-Trichlorobenzene	Ave	1.429	1.361		9.52	10.0	-4.8	50.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1084.D
 Lims ID: icv
 Client ID:
 Sample Type: ICV
 Inject. Date: 08-Jan-2019 14:55:30 ALS Bottle#: 19 Worklist Smp#: 26
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: icv
 Operator ID: wickham Instrument ID: VMS_MS1
 Sublist:
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 09-Jan-2019 06:55:22 Calib Date: 08-Jan-2019 14:14:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1082.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0314

First Level Reviewer: nwangumaf

Date: 08-Jan-2019 18:39:01

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.585	5.585	0.000	71	412199	250.0	250.0	
* 1 Fluorobenzene	96	7.526	7.526	0.000	99	2484717	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	86	500628	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	685942	12.5	12.5	
28 Ethylene oxide	43	4.537	4.551	-0.014	98	595036	1000.0	1114.8	
34 Ethanol	45	4.928	4.942	-0.014	97	142594	600.0	604.8	
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59 Tert-butyl ethyl ether	59	6.464	6.464	0.000	97	1319185	10.0	10.4	
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76 Tert-amyl methyl ether	73	7.344	7.358	-0.014	97	1094986	10.0	10.4	
78 n-Butanol	56	7.540	7.540	0.000	84	166576	250.0	240.3	
81 Methyl methacrylate	100	7.945	7.945	0.000	87	139641	20.0	21.5	
87 2-Nitropropane	41	8.294	8.294	0.000	98	49302	20.0	14.3	
99 Tetrahydrothiophene	60		9.397				ND	ND	U
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	83	71650	20.0	17.1	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	2000891	10.0	10.4	
21 1,3,5-Trichlorobenzene	180	12.931	12.931	0.000	97	746798	10.0	9.52	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp B_00023

Amount Added: 4.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1084.D

Injection Date: 08-Jan-2019 14:55:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: icv

Worklist Smp#: 26

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

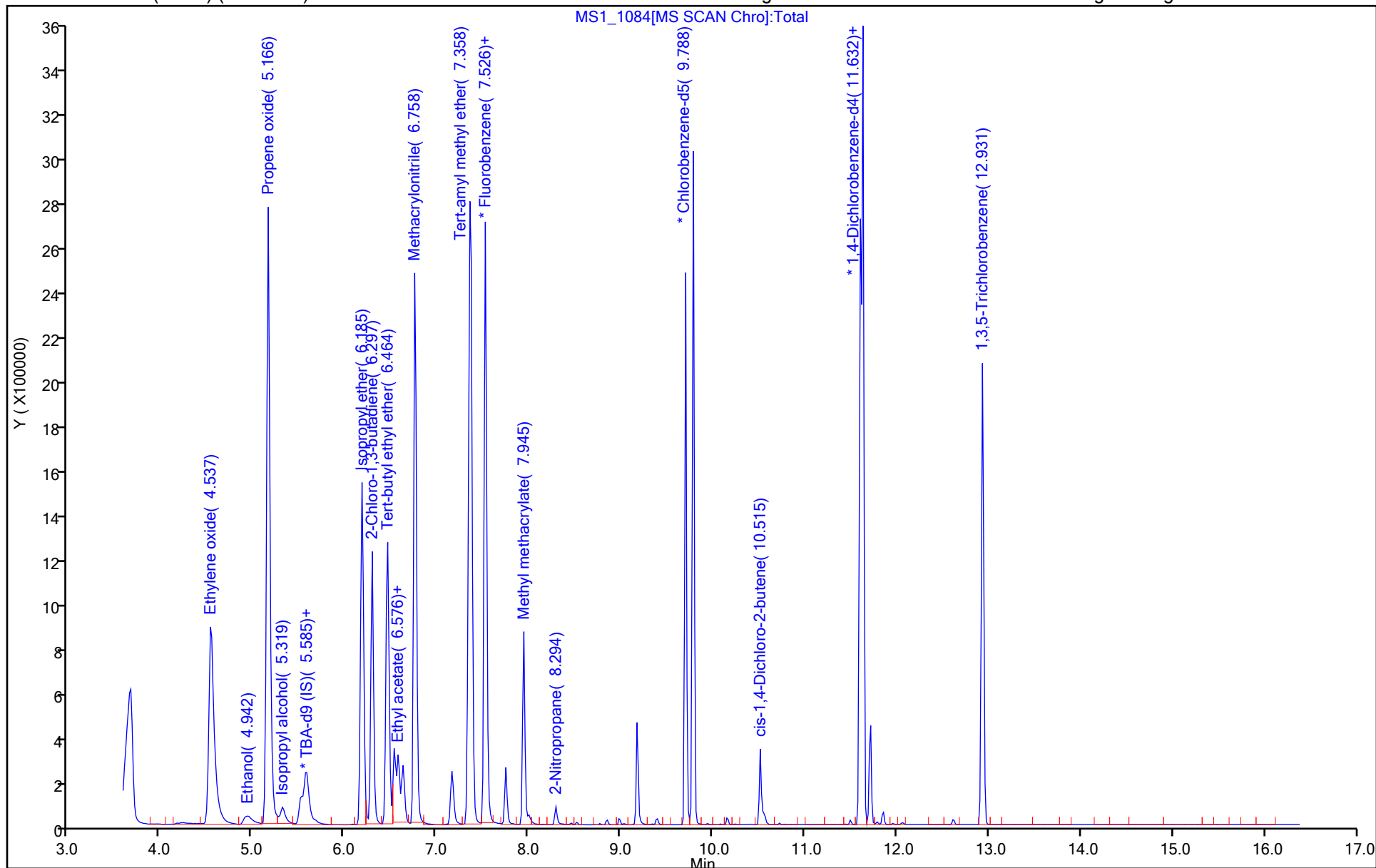
ALS Bottle#: 19

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: ICV 280-444687/19 Calibration Date: 01/18/2019 14:33

Instrument ID: VMS_MS1 Calib Start Date: 01/18/2019 11:48

GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 01/18/2019 13:52

Lab File ID: MS1_1429.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.3949		10.4	10.0	4.0	55.0
Chloromethane	Ave	0.2281	0.2291	0.1000	10.0	10.0	0.4	35.0
Vinyl chloride	Ave	0.2375	0.2413		10.2	10.0	1.6	35.0
Bromomethane	Ave	0.2831	0.3056		10.8	10.0	7.9	35.0
Chloroethane	Ave	0.2263	0.2383		10.5	10.0	5.3	35.0
Dichlorofluoromethane	Ave	0.5328	0.5445		10.2	10.0	2.2	55.0
Trichlorofluoromethane	Ave	0.4722	0.4779		10.1	10.0	1.2	50.0
Ethyl ether	Ave	0.1587	0.1697		10.7	10.0	6.9	35.0
Acrolein	Ave	0.0155	0.0152		98.0	100	-2.0	55.0
Acetone	Ave	0.0282	0.0258		36.5	40.0	-8.8	55.0
1,1,2-Trichlorotrifluoroethane	Ave	0.2385	0.2313		9.69	10.0	-3.1	55.0
1,1-Dichloroethene	Ave	0.2870	0.2838		9.89	10.0	-1.1	35.0
Iodomethane	Ave	0.5084	0.5137		10.1	10.0	1.0	35.0
Methyl acetate	Ave	0.0752	0.0661		17.6	20.0	-12.1	55.0
Allyl chloride	Ave	0.3907	0.3902		9.99	10.0	-0.1	35.0
Carbon disulfide	Ave	1.213	1.141		9.40	10.0	-6.0	55.0
Tert-butyl alcohol (2-methyl-2-propanol)	Ave	1.405	1.414		101	100	0.6	55.0
Methylene Chloride	Ave	0.3191	0.2946		9.23	10.0	-7.7	35.0
Acrylonitrile	Ave	0.0381	0.0388		102	100	1.7	55.0
Methyl tert-butyl ether	Ave	0.5408	0.5546		10.3	10.0	2.6	35.0
trans-1,2-Dichloroethene	Ave	0.3252	0.3285		10.1	10.0	1.0	35.0
Hexane	Ave	1.990	1.811		9.10	10.0	-9.0	35.0
Vinyl acetate	Ave	0.2315	0.2397		20.7	20.0	3.6	55.0
1,1-Dichloroethane	Ave	0.4951	0.4940	0.1000	9.98	10.0	-0.2	35.0
2-Butanone (MEK)	Ave	0.0519	0.0463		35.7	40.0	-10.8	55.0
sec-Butyl Alcohol	Ave	0.996	0.9751		147	150	-2.1	
cis-1,2-Dichloroethene	Ave	0.3518	0.3516		10.0	10.0	-0.0	35.0
2,2-Dichloropropane	Ave	0.4318	0.3929		9.10	10.0	-9.0	35.0
Chlorobromomethane	Ave	0.1317	0.1326		10.1	10.0	0.7	35.0
Chloroform	Ave	0.4920	0.4944		10.0	10.0	0.5	35.0
Tetrahydrofuran	Lin1		0.0302		20.9	20.0	4.6	55.0
Isobutyl alcohol	Ave	0.3638	0.3559		245	250	-2.2	55.0
1,1,1-Trichloroethane	Ave	0.4635	0.4567		9.85	10.0	-1.5	35.0
Cyclohexane	Ave	0.5262	0.4979		9.46	10.0	-5.4	35.0
1,1-Dichloropropene	Ave	0.4184	0.3982		9.52	10.0	-4.8	35.0
Carbon tetrachloride	Ave	0.3990	0.3852		9.66	10.0	-3.4	35.0
1,2-Dichloroethane	Ave	0.2496	0.2509		10.1	10.0	0.5	35.0
Benzene	Ave	1.224	1.207		9.86	10.0	-1.4	35.0
n-Heptane	Ave	0.4012	0.3815		9.51	10.0	-4.9	50.0
Trichloroethene	Ave	0.3236	0.3144		9.72	10.0	-2.8	35.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: ICV 280-444687/19 Calibration Date: 01/18/2019 14:33

Instrument ID: VMS_MS1 Calib Start Date: 01/18/2019 11:48

GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 01/18/2019 13:52

Lab File ID: MS1_1429.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
2-Pentanone	Ave	0.0703	0.0697		19.8	20.0	-0.8	55.0
1,2-Dichloropropane	Ave	0.2718	0.2750		10.1	10.0	1.1	35.0
Methylcyclohexane	Ave	0.4198	0.3881		9.25	10.0	-7.5	35.0
1,4-Dioxane	Ave	0.0013	0.0013		210	200	5.0	55.0
Dibromomethane	Ave	0.1212	0.1205		9.94	10.0	-0.6	35.0
Dichlorobromomethane	Ave	0.3352	0.3368		10.0	10.0	0.5	35.0
2-Chloroethyl vinyl ether	Ave	0.0745	0.0767		20.6	20.0	2.9	55.0
cis-1,3-Dichloropropene	Ave	1.760	1.802		10.2	10.0	2.4	35.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1002	0.1011		40.4	40.0	0.9	55.0
Toluene	Ave	1.285	1.279		9.95	10.0	-0.5	35.0
Ethyl methacrylate	Ave	0.9721	0.9348		9.62	10.0	-3.8	35.0
trans-1,3-Dichloropropene	Ave	0.3113	0.3092		9.93	10.0	-0.7	35.0
1,1,2-Trichloroethane	Ave	0.1741	0.1781		10.2	10.0	2.3	35.0
2-Hexanone	Ave	0.3007	0.2949		39.2	40.0	-1.9	55.0
1,3-Dichloropropane	Ave	1.323	1.283		9.70	10.0	-3.0	35.0
Tetrachloroethene	Ave	1.211	1.130		9.33	10.0	-6.7	35.0
Chlorodibromomethane	Ave	0.9347	0.9397		10.1	10.0	0.5	35.0
1,2-Dibromoethane	Ave	0.7259	0.7145		9.84	10.0	-1.6	35.0
1-Chlorohexane	Ave	2.026	1.801		4.44	5.00	-11.1	35.0
Chlorobenzene	Ave	3.646	3.524	0.3000	9.67	10.0	-3.3	35.0
1,1,1,2-Tetrachloroethane	Ave	1.218	1.214		9.97	10.0	-0.3	35.0
Ethylbenzene	Ave	2.163	2.055		9.50	10.0	-5.0	35.0
m-Xylene & p-Xylene	Ave	2.663	2.495		9.37	10.0	-6.3	35.0
o-Xylene	Ave	2.531	2.444		9.66	10.0	-3.4	35.0
Styrene	Ave	3.989	3.762		9.43	10.0	-5.7	35.0
Bromoform	Ave	0.4918	0.4944	0.1000	10.1	10.0	0.5	35.0
Isopropylbenzene	Qua		4.083		9.12	10.0	-8.8	35.0
Cyclohexanone	Ave	0.0323	0.0245		303	400	-24.2	35.0
1,1,2,2-Tetrachloroethane	Ave	0.5331	0.5241	0.3000	9.83	10.0	-1.7	35.0
trans-1,4-Dichloro-2-butene	Ave	0.1165	0.1172		10.1	10.0	0.7	55.0
1,2,3-Trichloropropane	Ave	0.1514	0.1575		10.4	10.0	4.0	35.0
Bromobenzene	Ave	0.9617	0.9396		9.77	10.0	-2.3	35.0
N-Propylbenzene	Ave	1.248	1.180		9.45	10.0	-5.5	35.0
1,3,5-Trimethylbenzene	Ave	3.535	3.397		9.61	10.0	-3.9	35.0
2-Chlorotoluene	Ave	1.025	0.9880		9.64	10.0	-3.6	35.0
4-Chlorotoluene	Ave	1.040	0.996		9.58	10.0	-4.2	35.0
tert-Butylbenzene	Ave	3.617	3.423		9.46	10.0	-5.4	35.0
1,2,4-Trimethylbenzene	Ave	3.581	3.427		9.57	10.0	-4.3	35.0
sec-Butylbenzene	Ave	1.030	0.9587		9.31	10.0	-6.9	35.0
4-Isopropyltoluene	Qua		3.799		8.99	10.0	-10.1	35.0
1,3-Dichlorobenzene	Ave	1.951	1.863		9.55	10.0	-4.5	35.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-444687/19 Calibration Date: 01/18/2019 14:33
 Instrument ID: VMS_MS1 Calib Start Date: 01/18/2019 11:48
 GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 01/18/2019 13:52
 Lab File ID: MS1_1429.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,4-Dichlorobenzene	Ave	1.941	1.841		9.49	10.0	-5.1	35.0
n-Butylbenzene	Ave	3.619	3.319		9.17	10.0	-8.3	35.0
1,2-Dichlorobenzene	Ave	1.675	1.637		9.77	10.0	-2.3	35.0
1,2-Dibromo-3-Chloropropane	Ave	0.0979	0.1032		10.5	10.0	5.5	55.0
1,2,4-Trichlorobenzene	Ave	1.237	1.214		9.82	10.0	-1.8	35.0
Hexachlorobutadiene	Ave	0.7829	0.7201		9.20	10.0	-8.0	35.0
Naphthalene	Ave	1.868	1.912		10.2	10.0	2.4	35.0
1,2,3-Trichlorobenzene	Ave	1.002	1.017		10.1	10.0	1.5	35.0
Dibromofluoromethane (Surr)	Ave	0.2630	0.2678		10.2	10.0	1.8	35.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2054	0.2093		10.2	10.0	1.9	35.0
Toluene-d8 (Surr)	Ave	4.675	4.627		9.90	10.0	-1.0	35.0
4-Bromofluorobenzene (Surr)	Ave	1.070	1.046		9.77	10.0	-2.3	35.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1429.D

Lims ID: icv

Client ID:

Sample Type: ICV

Inject. Date: 18-Jan-2019 14:33:30

ALS Bottle#: 11

Worklist Smp#: 19

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

Sample Info: icv

Operator ID: wickhamt

Instrument ID: VMS_MS1

Sublist:

Method: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\AQ_VMS1_8260.m

Limit Group: MSV - 8260B Water and Solid

Last Update: 24-Jan-2019 12:00:20

Calib Date: 18-Jan-2019 13:52:30

Integrator: RTE

ID Type: Deconvolution ID

Quant Method: Internal Standard

Quant By: Initial Calibration

Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D

Column 1 : DB-624 (60.25) (0.25 mm)

Det: MS SCAN

Process Host: CTX0315

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.571	0.001	87	646532	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3475339	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	83	799224	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	93	1204600	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	744483	10.0	10.2	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	581766	10.0	10.2	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2958606	10.0	9.90	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.640	0.000	0	1008164	10.0	9.77	
24 Dichlorodifluoromethane	85	3.909	3.909	0.000	99	1098027	10.0	10.4	
26 Chloromethane	50	4.132	4.132	0.000	98	636961	10.0	10.0	
27 Vinyl chloride	62	4.258	4.258	0.000	92	670849	10.0	10.2	
29 Bromomethane	94	4.607	4.607	0.000	89	849509	10.0	10.8	
31 Chloroethane	64	4.663	4.663	0.000	99	662521	10.0	10.5	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	96	1513897	10.0	10.2	
33 Trichlorofluoromethane	101	4.928	4.928	0.000	98	1328569	10.0	10.1	
36 Ethyl ether	59	5.082	5.068	0.014	86	471744	10.0	10.7	
39 Acrolein	56	5.193	5.193	0.000	99	422853	100.0	98.0	
40 Acetone	43	5.291	5.291	0.000	98	286365	40.0	36.5	
42 1,1,2-Trichloro-1,2,2-trif	151	5.319	5.319	0.000	92	642946	10.0	9.69	
43 1,1-Dichloroethene	96	5.347	5.347	0.000	95	788963	10.0	9.89	
45 Iodomethane	142	5.515	5.515	0.000	97	1428171	10.0	10.1	
46 Methyl acetate	43	5.529	5.529	0.000	95	367565	20.0	17.6	
47 3-Chloro-1-propene	41	5.585	5.584	0.000	84	1084884	10.0	9.99	
48 Carbon disulfide	76	5.612	5.612	0.000	98	3171075	10.0	9.40	
49 2-Methyl-2-propanol	59	5.626	5.640	-0.014	93	365800	100.0	100.6	
50 Methylene Chloride	84	5.668	5.668	0.000	84	819053	10.0	9.23	
51 Acrylonitrile	53	5.808	5.808	0.000	100	1077657	100.0	101.7	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	92	1541819	10.0	10.3	
53 trans-1,2-Dichloroethene	96	5.906	5.906	0.000	96	913169	10.0	10.1	
54 Hexane	57	6.073	6.073	0.000	86	1157942	10.0	9.10	
55 Vinyl acetate	43	6.143	6.143	0.000	97	1333026	20.0	20.7	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	95	1373314	10.0	9.98	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	97	514329	40.0	35.7	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	94	378243	150.0	146.8	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	75	977620	10.0	10.0	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	86	1092468	10.0	9.10	
67 Chlorobromomethane	128	6.827	6.827	0.000	89	368719	10.0	10.1	
68 Chloroform	83	6.841	6.841	0.000	92	1374562	10.0	10.0	
69 Tetrahydrofuran	42	6.869	6.869	0.000	83	167915	20.0	20.9	
70 Isobutyl alcohol	41	7.023	7.023	0.000	96	230118	250.0	244.6	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	97	1269645	10.0	9.85	
72 Cyclohexane	56	7.149	7.149	0.000	86	1384328	10.0	9.46	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	97	1107027	10.0	9.52	
74 Carbon tetrachloride	117	7.219	7.219	0.000	96	1071039	10.0	9.66	
75 1,2-Dichloroethane	62	7.316	7.316	0.000	97	697618	10.0	10.1	
77 Benzene	78	7.344	7.344	0.000	95	3354625	10.0	9.86	
9 n-Heptane	43	7.442	7.442	0.000	85	1060662	10.0	9.51	
79 Trichloroethene	95	7.805	7.805	0.000	97	874221	10.0	9.72	
80 2-Pentanone	43	7.833	7.833	0.000	97	387718	20.0	19.8	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	96	764425	10.0	10.1	
83 Methylcyclohexane	55	8.015	8.015	0.000	91	1079109	10.0	9.25	
84 1,4-Dioxane	88	8.043	8.029	0.014	91	73276	200.0	210.0	
85 Dibromomethane	93	8.084	8.084	0.000	95	334985	10.0	9.94	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	936284	10.0	10.0	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	426562	20.0	20.6	
89 cis-1,3-Dichloropropene	75	8.476	8.475	0.001	99	1152000	10.0	10.2	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	91	1124582	40.0	40.4	
91 Toluene	91	8.769	8.769	0.000	99	3554862	10.0	9.95	
92 Ethyl methacrylate	69	8.839	8.839	0.000	87	597703	10.0	9.62	
93 trans-1,3-Dichloropropene	75	8.853	8.853	0.000	95	859698	10.0	9.93	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	89	495034	10.0	10.2	
95 2-Hexanone	43	9.118	9.118	0.000	91	754265	40.0	39.2	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	87	820255	10.0	9.70	
97 Tetrachloroethene	164	9.188	9.188	0.000	97	722544	10.0	9.33	
98 Chlorodibromomethane	129	9.341	9.341	0.000	89	600825	10.0	10.1	
100 Ethylene Dibromide	107	9.453	9.467	-0.014	99	456806	10.0	9.84	
101 1-Chlorohexane	91	9.705	9.705	0.000	0	575644	5.00	4.44	
102 Chlorobenzene	112	9.802	9.802	0.000	98	2253410	10.0	9.67	
104 Ethylbenzene	106	9.844	9.844	0.000	97	1314125	10.0	9.50	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	776351	10.0	9.97	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	98	1595518	10.0	9.37	
109 o-Xylene	106	10.235	10.235	0.000	87	1562909	10.0	9.66	
106 Styrene	104	10.235	10.235	0.000	88	2405114	10.0	9.43	
107 Bromoform	173	10.431	10.431	0.000	99	316133	10.0	10.1	
108 Isopropylbenzene	105	10.501	10.501	0.000	95	3934262	10.0	9.12	
111 Cyclohexanone	55	10.612	10.612	0.000	88	625699	400.0	303.0	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.682	0.000	94	505095	10.0	9.83	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	91	112982	10.0	10.1	
114 1,2,3-Trichloropropane	110	10.752	10.752	0.000	83	151762	10.0	10.4	
116 Bromobenzene	156	10.808	10.808	0.000	92	905454	10.0	9.77	
115 N-Propylbenzene	120	10.822	10.822	0.000	97	1136845	10.0	9.45	
117 2-Chlorotoluene	126	10.934	10.934	0.000	96	952083	10.0	9.64	
120 1,3,5-Trimethylbenzene	105	10.934	10.934	0.000	96	3273650	10.0	9.61	
118 4-Chlorotoluene	126	11.003	11.003	0.000	98	960154	10.0	9.58	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	91	3298645	10.0	9.46	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	3302411	10.0	9.57	
122 sec-Butylbenzene	134	11.394	11.394	0.000	94	923920	10.0	9.31	
123 4-Isopropyltoluene	119	11.492	11.492	0.000	96	3661284	10.0	8.99	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	1795148	10.0	9.55	
126 1,4-Dichlorobenzene	146	11.618	11.618	0.000	94	1774466	10.0	9.49	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	3198805	10.0	9.17	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	99	1577844	10.0	9.77	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	90	99473	10.0	10.5	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	1170106	10.0	9.82	
131 Hexachlorobutadiene	225	13.825	13.825	0.000	96	693948	10.0	9.20	
132 Naphthalene	128	14.006	14.006	0.000	97	1842298	10.0	10.2	
133 1,2,3-Trichlorobenzene	180	14.327	14.327	0.000	96	979623	10.0	10.1	
S 140 1,2-Dichloroethene, Total	96				0		20.0	20.1	
S 134 Trihalomethanes, Total	1				0		40.0	40.2	
S 138 Xylenes, Total	106				0		20.0	19.0	
S 139 Xylenes, Total (URS)	1				0		20.0	19.0	
S 135 1,3-Dichloropropene, Total	1				0		20.0	20.2	
S 136 1,2-Dichloroethene, Total	1				0		20.0	20.1	

Reagents:

MV-568718-D_00014	Amount Added: 1.00	Units: uL
MV-ARCH SS A_00108	Amount Added: 0.80	Units: uL
MV-MegaMain B_00007	Amount Added: 4.00	Units: uL
MV-Gas B_00006	Amount Added: 4.00	Units: uL

Report Date: 24-Jan-2019 12:00:25

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1429.D

Injection Date: 18-Jan-2019 14:33:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: icv

Worklist Smp#: 19

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

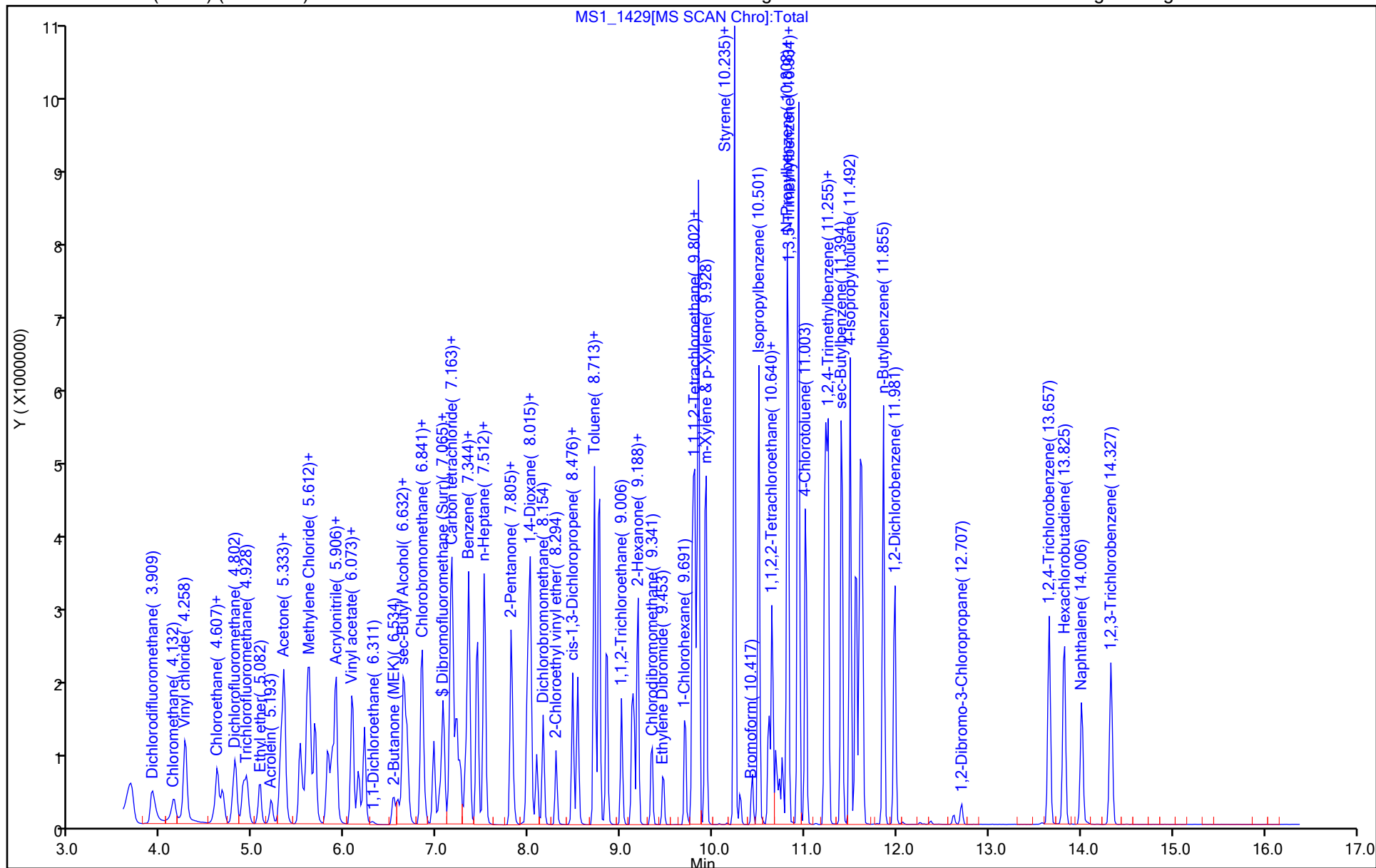
ALS Bottle#: 11

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: CCV 280-445753/2 Calibration Date: 01/28/2019 18:23

Instrument ID: VMS_MS1 Calib Start Date: 01/18/2019 11:48

GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 01/18/2019 13:52

Lab File ID: MS1_1905.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.4106		10.8	10.0	8.1	50.0
Chloromethane	Ave	0.2281	0.2389	0.1000	10.5	10.0	4.7	35.0
Vinyl chloride	Ave	0.2375	0.2631		11.1	10.0	10.8	20.0
Bromomethane	Ave	0.2831	0.3306		11.7	10.0	16.8	35.0
Chloroethane	Ave	0.2263	0.2887		12.8	10.0	27.6	35.0
Dichlorofluoromethane	Ave	0.5328	0.6979		13.1	10.0	31.0	50.0
Trichlorofluoromethane	Ave	0.4722	0.5946		12.6	10.0	25.9	50.0
Ethyl ether	Ave	0.1587	0.1770		11.2	10.0	11.5	35.0
Acrolein	Ave	0.0155	0.0182		117	100	17.0	50.0
Acetone	Ave	0.0282	0.0336		47.6	40.0	19.1	50.0
1,1,2-Trichlorotrifluoroethane	Ave	0.2385	0.2497		10.5	10.0	4.7	50.0
1,1-Dichloroethene	Ave	0.2870	0.2917		10.2	10.0	1.6	20.0
Iodomethane	Ave	0.5084	0.5193		10.2	10.0	2.1	35.0
Methyl acetate	Ave	0.0752	0.0893		23.7	20.0	18.7	50.0
Allyl chloride	Ave	0.3907	0.4706		12.0	10.0	20.4	35.0
Carbon disulfide	Ave	1.213	1.181		9.73	10.0	-2.7	50.0
Tert-butyl alcohol (2-methyl-2-propanol)	Ave	1.405	1.461		104	100	4.0	50.0
Methylene Chloride	Ave	0.3191	0.3201		10.0	10.0	0.3	35.0
Acrylonitrile	Ave	0.0381	0.0469		123	100	23.2	50.0
Methyl tert-butyl ether	Ave	0.5408	0.5726		10.6	10.0	5.9	35.0
trans-1,2-Dichloroethene	Ave	0.3252	0.3540		10.9	10.0	8.8	35.0
Hexane	Ave	1.990	1.887		9.49	10.0	-5.1	35.0
Vinyl acetate	Ave	0.2315	0.2872		24.8	20.0	24.1	50.0
1,1-Dichloroethane	Ave	0.4951	0.5786	0.1000	11.7	10.0	16.9	35.0
2-Butanone (MEK)	Ave	0.0519	0.0632		48.7	40.0	21.9	50.0
sec-Butyl Alcohol	Ave	0.996	1.051		317	300	5.5	50.0
cis-1,2-Dichloroethene	Ave	0.3518	0.3815		10.8	10.0	8.4	35.0
2,2-Dichloropropane	Ave	0.4318	0.4915		11.4	10.0	13.8	35.0
Chlorobromomethane	Ave	0.1317	0.1409		10.7	10.0	7.0	35.0
Chloroform	Ave	0.4920	0.5616		11.4	10.0	14.1	20.0
Tetrahydrofuran	Lin1		0.0349		24.3	20.0	21.3	50.0
Isobutyl alcohol	Ave	0.3638	0.4499		309	250	23.6	50.0
1,1,1-Trichloroethane	Ave	0.4635	0.5333		11.5	10.0	15.1	35.0
Cyclohexane	Ave	0.5262	0.6036		11.5	10.0	14.7	35.0
1,1-Dichloropropene	Ave	0.4184	0.4872		11.6	10.0	16.4	35.0
Carbon tetrachloride	Ave	0.3990	0.4538		11.4	10.0	13.7	35.0
1,2-Dichloroethane	Ave	0.2496	0.2946		11.8	10.0	18.1	35.0
Benzene	Ave	1.224	1.380		11.3	10.0	12.8	35.0
n-Heptane	Ave	0.4012	0.4927		12.3	10.0	22.8	50.0
Trichloroethene	Ave	0.3236	0.3530		10.9	10.0	9.1	35.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: CCV 280-445753/2 Calibration Date: 01/28/2019 18:23

Instrument ID: VMS_MS1 Calib Start Date: 01/18/2019 11:48

GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 01/18/2019 13:52

Lab File ID: MS1_1905.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
2-Pentanone	Ave	0.0703	0.0819		46.6	40.0	16.6	50.0
1,2-Dichloropropane	Ave	0.2718	0.3102		11.4	10.0	14.1	20.0
Methylcyclohexane	Ave	0.4198	0.5080		12.1	10.0	21.0	35.0
1,4-Dioxane	Ave	0.0013	0.0014		225	200	12.5	50.0
Dibromomethane	Ave	0.1212	0.1351		11.1	10.0	11.4	35.0
Dichlorobromomethane	Ave	0.3352	0.3696		11.0	10.0	10.3	35.0
2-Chloroethyl vinyl ether	Ave	0.0745	0.0970		26.0	20.0	30.2	50.0
cis-1,3-Dichloropropene	Ave	1.760	1.815		10.3	10.0	3.2	35.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1002	0.1229		49.0	40.0	22.6	50.0
Toluene	Ave	1.285	1.447		11.3	10.0	12.6	20.0
Ethyl methacrylate	Ave	0.9721	0.9519		9.79	10.0	-2.1	35.0
trans-1,3-Dichloropropene	Ave	0.3113	0.3428		11.0	10.0	10.1	35.0
1,1,2-Trichloroethane	Ave	0.1741	0.1912		11.0	10.0	9.8	35.0
2-Hexanone	Ave	0.3007	0.3482		46.3	40.0	15.8	50.0
1,3-Dichloropropane	Ave	1.323	1.476		11.2	10.0	11.6	35.0
Tetrachloroethene	Ave	1.211	1.316		10.9	10.0	8.7	35.0
Chlorodibromomethane	Ave	0.9347	0.9218		9.86	10.0	-1.4	35.0
1,2-Dibromoethane	Ave	0.7259	0.7417		10.2	10.0	2.2	35.0
1-Chlorohexane	Ave	2.026	2.171		10.7	10.0	7.2	35.0
Chlorobenzene	Ave	3.646	3.913	0.3000	10.7	10.0	7.3	35.0
1,1,1,2-Tetrachloroethane	Ave	1.218	1.307		10.7	10.0	7.4	35.0
Ethylbenzene	Ave	2.163	2.366		10.9	10.0	9.4	20.0
m-Xylene & p-Xylene	Ave	2.663	2.865		10.8	10.0	7.6	35.0
o-Xylene	Ave	2.531	2.765		10.9	10.0	9.2	35.0
Styrene	Ave	3.989	4.228		10.6	10.0	6.0	35.0
Bromoform	Ave	0.4918	0.4613	0.1000	9.38	10.0	-6.2	35.0
Isopropylbenzene	Qua		4.620		10.4	10.0	4.5	35.0
Cyclohexanone	Ave	0.0323	0.0576		714	400	78.4*	50.0
1,1,2,2-Tetrachloroethane	Ave	0.5331	0.5728	0.3000	10.7	10.0	7.5	35.0
trans-1,4-Dichloro-2-butene	Ave	0.1165	0.1172		10.1	10.0	0.6	50.0
1,2,3-Trichloropropane	Ave	0.1514	0.1604		10.6	10.0	6.0	35.0
Bromobenzene	Ave	0.9617	0.9850		10.2	10.0	2.4	35.0
N-Propylbenzene	Ave	1.248	1.340		10.7	10.0	7.4	35.0
1,3,5-Trimethylbenzene	Ave	3.535	3.841		10.9	10.0	8.7	35.0
2-Chlorotoluene	Ave	1.025	1.096		10.7	10.0	6.9	35.0
4-Chlorotoluene	Ave	1.040	1.084		10.4	10.0	4.2	35.0
tert-Butylbenzene	Ave	3.617	3.910		10.8	10.0	8.1	35.0
1,2,4-Trimethylbenzene	Ave	3.581	3.874		10.8	10.0	8.2	35.0
sec-Butylbenzene	Ave	1.030	1.094		10.6	10.0	6.2	35.0
4-Isopropyltoluene	Qua		4.413		10.6	10.0	5.7	35.0
1,3-Dichlorobenzene	Ave	1.951	2.026		10.4	10.0	3.8	35.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCV 280-445753/2 Calibration Date: 01/28/2019 18:23
 Instrument ID: VMS_MS1 Calib Start Date: 01/18/2019 11:48
 GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 01/18/2019 13:52
 Lab File ID: MS1_1905.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,4-Dichlorobenzene	Ave	1.941	2.056		10.6	10.0	6.0	35.0
n-Butylbenzene	Ave	3.619	4.159		11.5	10.0	14.9	35.0
1,2-Dichlorobenzene	Ave	1.675	1.735		10.4	10.0	3.6	35.0
1,2-Dibromo-3-Chloropropane	Ave	0.0979	0.0921		9.41	10.0	-5.9	50.0
1,2,4-Trichlorobenzene	Ave	1.237	1.351		10.9	10.0	9.2	35.0
Hexachlorobutadiene	Ave	0.7829	0.8971		11.5	10.0	14.6	35.0
Naphthalene	Ave	1.868	1.916		10.3	10.0	2.6	35.0
1,2,3-Trichlorobenzene	Ave	1.002	1.113		11.1	10.0	11.1	35.0
Dibromofluoromethane (Surr)	Ave	0.2630	0.2984		11.3	10.0	13.5	35.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2054	0.2513		12.2	10.0	22.4	35.0
Toluene-d8 (Surr)	Ave	4.675	5.135		11.0	10.0	9.8	35.0
4-Bromofluorobenzene (Surr)	Ave	1.070	1.160		10.8	10.0	8.3	35.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1905.D
 Lims ID: CCV
 Client ID:
 Sample Type: CCV
 Inject. Date: 28-Jan-2019 18:23:30 ALS Bottle#: 1 Worklist Smp#: 2
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: CCV
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub76
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:53:50 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 19:13:22

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.570	5.570	0.000	88	536780	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3067525	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	84	716789	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	1139766	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	732291	10.0	11.3	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	616740	10.0	12.2	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2944750	10.0	11.0	
\$ 8 4-Bromofluorobenzene (Surr	95	10.654	10.654	0.000	0	1057513	10.0	10.8	
24 Dichlorodifluoromethane	85	3.894	3.894	0.000	99	1007507	10.0	10.8	
26 Chloromethane	50	4.132	4.132	0.000	99	586253	10.0	10.5	
27 Vinyl chloride	62	4.244	4.244	0.000	93	645692	10.0	11.1	
29 Bromomethane	94	4.607	4.607	0.000	90	811312	10.0	11.7	
31 Chloroethane	64	4.663	4.663	0.000	99	708453	10.0	12.8	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	97	1712705	10.0	13.1	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	98	1459178	10.0	12.6	
36 Ethyl ether	59	5.068	5.068	0.000	90	434291	10.0	11.2	
39 Acrolein	56	5.193	5.193	0.000	99	445359	100.0	117.0	
40 Acetone	43	5.291	5.291	0.000	99	329925	40.0	47.6	
42 1,1,2-Trichloro-1,2,2-trif	151	5.305	5.305	0.000	94	612761	10.0	10.5	
43 1,1-Dichloroethene	96	5.333	5.333	0.000	98	715806	10.0	10.2	
45 Iodomethane	142	5.501	5.501	0.000	98	1274252	10.0	10.2	
46 Methyl acetate	43	5.528	5.528	0.000	96	438034	20.0	23.7	
47 3-Chloro-1-propene	41	5.584	5.584	0.000	84	1154901	10.0	12.0	
48 Carbon disulfide	76	5.598	5.598	0.000	98	2897715	10.0	9.73	
49 2-Methyl-2-propanol	59	5.626	5.626	0.000	93	313745	100.0	104.0	
50 Methylene Chloride	84	5.668	5.668	0.000	89	785634	10.0	10.0	
51 Acrylonitrile	53	5.808	5.808	0.000	100	1151964	100.0	123.2	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	94	1405047	10.0	10.6	
53 trans-1,2-Dichloroethene	96	5.892	5.892	0.000	98	868589	10.0	10.9	
54 Hexane	57	6.073	6.073	0.000	89	1082300	10.0	9.49	
55 Vinyl acetate	43	6.143	6.143	0.000	97	1409688	20.0	24.8	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
57 1,1-Dichloroethane	63	6.213	6.213	0.000	96	1419819	10.0	11.7	
61 2-Butanone (MEK)	43	6.576	6.576	0.000	98	620347	40.0	48.7	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	94	677263	300.0	316.6	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	78	936096	10.0	10.8	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	88	1206161	10.0	11.4	
67 Chlorobromomethane	128	6.827	6.827	0.000	93	345830	10.0	10.7	
68 Chloroform	83	6.841	6.841	0.000	93	1378182	10.0	11.4	
69 Tetrahydrofuran	42	6.869	6.869	0.000	86	171171	20.0	24.3	
70 Isobutyl alcohol	41	7.023	7.023	0.000	94	241468	250.0	309.1	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	98	1308823	10.0	11.5	
72 Cyclohexane	56	7.149	7.149	0.000	0	1481149	10.0	11.5	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	98	1195536	10.0	11.6	
74 Carbon tetrachloride	117	7.204	7.204	0.000	97	1113512	10.0	11.4	
75 1,2-Dichloroethane	62	7.302	7.302	0.000	97	723036	10.0	11.8	
77 Benzene	78	7.344	7.344	0.000	96	3386901	10.0	11.3	
9 n-Heptane	43	7.442	7.442	0.000	88	1208961	10.0	12.3	
79 Trichloroethene	95	7.805	7.805	0.000	98	866278	10.0	10.9	
80 2-Pentanone	43	7.833	7.833	0.000	98	804214	40.0	46.6	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	97	761337	10.0	11.4	
83 Methylcyclohexane	55	8.014	8.014	0.000	0	1246676	10.0	12.1	
84 1,4-Dioxane	88	8.028	8.028	0.000	88	69283	200.0	224.9	
85 Dibromomethane	93	8.084	8.084	0.000	96	331467	10.0	11.1	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	906990	10.0	11.0	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	476115	20.0	26.0	
89 cis-1,3-Dichloropropene	75	8.475	8.475	0.000	98	1040870	10.0	10.3	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	94	1206186	40.0	49.0	
91 Toluene	91	8.769	8.769	0.000	99	3550075	10.0	11.3	
92 Ethyl methacrylate	69	8.838	8.838	0.000	87	545874	10.0	9.79	
93 trans-1,3-Dichloropropene	75	8.852	8.852	0.000	95	841276	10.0	11.0	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	90	469246	10.0	11.0	
95 2-Hexanone	43	9.118	9.118	0.000	94	798694	40.0	46.3	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	88	846599	10.0	11.2	
97 Tetrachloroethene	164	9.188	9.188	0.000	98	754791	10.0	10.9	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	528573	10.0	9.86	
100 Ethylene Dibromide	107	9.467	9.467	0.000	98	425283	10.0	10.2	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	1245157	10.0	10.7	
102 Chlorobenzene	112	9.802	9.802	0.000	98	2244101	10.0	10.7	
104 Ethylbenzene	106	9.844	9.844	0.000	98	1356799	10.0	10.9	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	749747	10.0	10.7	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	98	1642627	10.0	10.8	
106 Styrene	104	10.235	10.235	0.000	88	2424681	10.0	10.6	
109 o-Xylene	106	10.235	10.235	0.000	87	1585752	10.0	10.9	
107 Bromoform	173	10.431	10.431	0.000	98	264521	10.0	9.38	
108 Isopropylbenzene	105	10.500	10.500	0.000	96	4213024	10.0	10.4	
111 Cyclohexanone	55	10.612	10.612	0.000	89	1321645	400.0	713.6	
112 1,1,2,2-Tetrachloroethane	83	10.696	10.696	0.000	95	522303	10.0	10.7	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	94	106853	10.0	10.1	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	83	146279	10.0	10.6	
116 Bromobenzene	156	10.822	10.822	0.000	96	898111	10.0	10.2	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	1221779	10.0	10.7	
120 1,3,5-Trimethylbenzene	105	10.933	10.933	0.000	96	3502724	10.0	10.9	
117 2-Chlorotoluene	126	10.933	10.933	0.000	96	999729	10.0	10.7	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
118 4-Chlorotoluene	126	11.017	11.017	0.000	97	988056	10.0	10.4	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	3565217	10.0	10.8	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	97	3532714	10.0	10.8	
122 sec-Butylbenzene	134	11.408	11.408	0.000	94	997298	10.0	10.6	
123 4-Isopropyltoluene	119	11.506	11.506	0.000	96	4023954	10.0	10.6	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	1847408	10.0	10.4	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	96	1874831	10.0	10.6	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	3791953	10.0	11.5	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	98	1581774	10.0	10.4	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	86	83958	10.0	9.41	
130 1,2,4-Trichlorobenzene	180	13.671	13.671	0.000	94	1231928	10.0	10.9	
131 Hexachlorobutadiene	225	13.824	13.824	0.000	97	817973	10.0	11.5	
132 Naphthalene	128	14.020	14.020	0.000	97	1746953	10.0	10.3	
133 1,2,3-Trichlorobenzene	180	14.341	14.341	0.000	96	1014714	10.0	11.1	
S 140 1,2-Dichloroethene, Total	96				0		20.0	21.7	
S 134 Trihalomethanes, Total	1				0		40.0	41.7	
S 138 Xylenes, Total	106				0		20.0	21.7	
S 139 Xylenes, Total (URS)	1				0		20.0	21.7	
S 135 1,3-Dichloropropene, Total	1				0		20.0	21.3	
S 136 1,2-Dichloroethene, Total	1				0		20.0	21.7	

Reagents:

MV-MegaMainA_00009

Amount Added: 4.00

Units: uL

MV-Gas A_00006

Amount Added: 4.00

Units: uL

MV-568718-D_00014

Amount Added: 1.00

Units: uL

Run Reagent

MV-ARCH SS A_00108

Amount Added: 0.80

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1905.D

Injection Date: 28-Jan-2019 18:23:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: CCV

Worklist Smp#: 2

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

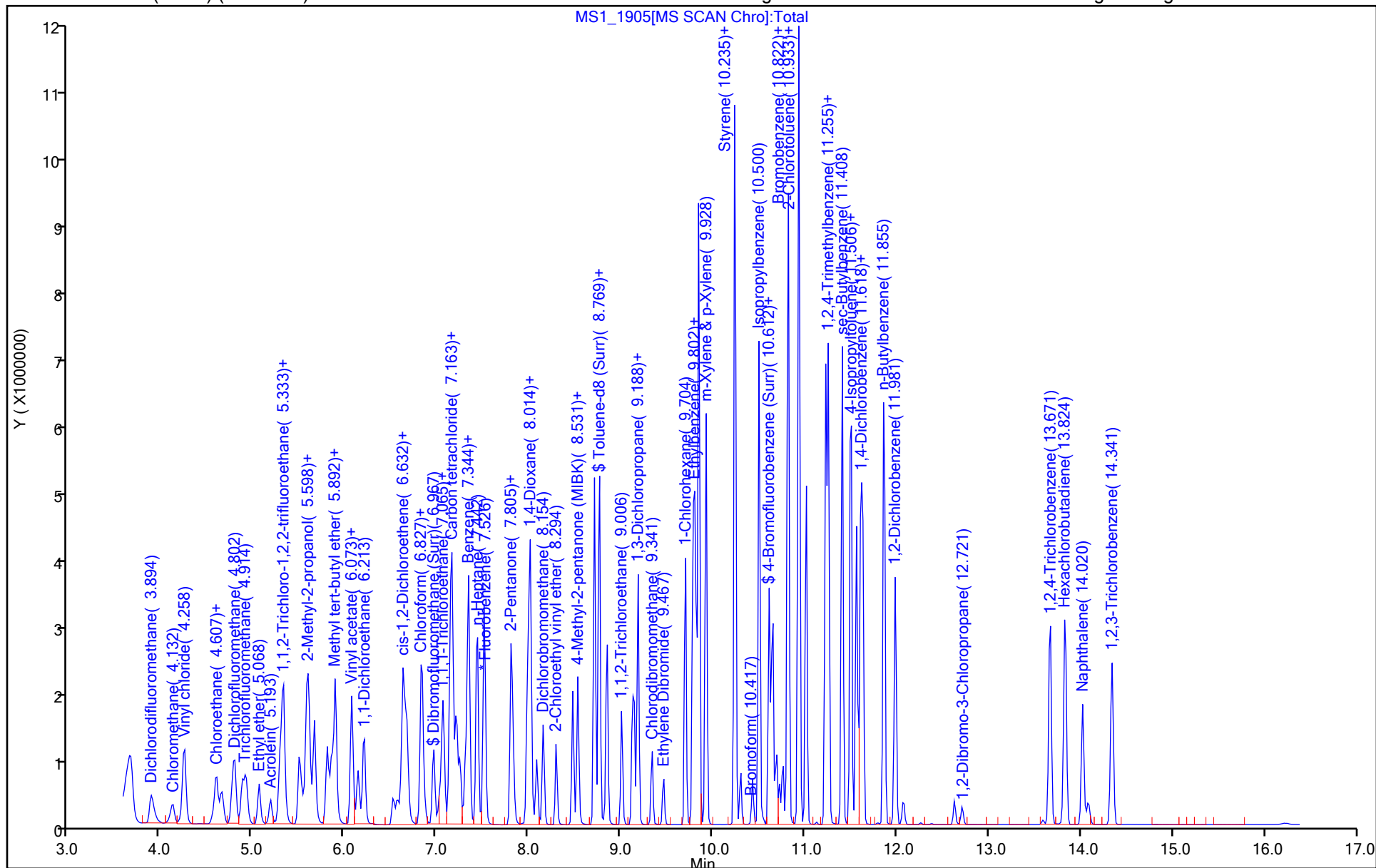
ALS Bottle#: 1

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: CCV 280-445753/3 Calibration Date: 01/28/2019 18:48
Instrument ID: VMS_MS1 Calib Start Date: 08/02/2018 11:55
GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 08/02/2018 13:37
Lab File ID: MS1_1906.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Tetrahydrothiophene	Ave	0.0250	0.0149			20.0	-40.5	50.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1906.D
 Lims ID: CCV
 Client ID:
 Sample Type: CCV
 Inject. Date: 28-Jan-2019 18:48:30 ALS Bottle#: 2 Worklist Smp#: 3
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: CCV
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub109
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:53:57 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.557	5.557	0.000	67	536940	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3012871	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	85	701328	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	1072362	12.5	12.5	
28 Ethylene oxide	43	4.523	4.523	0.000	99	636582	1000.0	973.9	
34 Ethanol	45	4.900	4.900	0.000	100	157431	600.0	512.6	
38 Propene oxide	58	5.152	5.152	0.000	0	4071254	1000.0	951.9	
41 Isopropyl alcohol	45	5.305	5.305	0.000	98	163721	100.0	83.1	
44 Acetonitrile	41	5.501	5.501	0.000	99	290064	100.0	87.5	
56 Isopropyl ether	87	6.171	6.171	0.000	93	545284	10.0	10.2	
58 2-Chloro-1,3-butadiene	53	6.283	6.283	0.000	89	1051956	10.0	12.1	
59 Tert-butyl ethyl ether	59	6.450	6.450	0.000	97	1610362	10.0	10.4	
60 Ethyl acetate	43	6.562	6.562	0.000	98	478516	20.0	18.5	
63 Propionitrile	54	6.618	6.618	0.000	99	370215	100.0	92.1	
66 Methacrylonitrile	41	6.744	6.744	0.000	89	1561776	100.0	95.5	
76 Tert-amyl methyl ether	73	7.330	7.330	0.000	98	1366201	10.0	10.7	
78 n-Butanol	56	7.526	7.526	0.000	87	188175	250.0	206.9	
81 Methyl methacrylate	100	7.931	7.931	0.000	87	183390	20.0	23.3	
87 2-Nitropropane	41	8.280	8.280	0.000	97	99076	20.0	23.7	
99 Tetrahydrothiophene	60	9.383	9.383	0.000	89	16692	NC	NC	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	78	107438	20.0	16.4	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	2841995	10.0	9.41	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	98	1284608	10.0	10.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp A_00033

Amount Added: 4.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1906.D

Injection Date: 28-Jan-2019 18:48:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: CCV

Worklist Smp#: 3

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

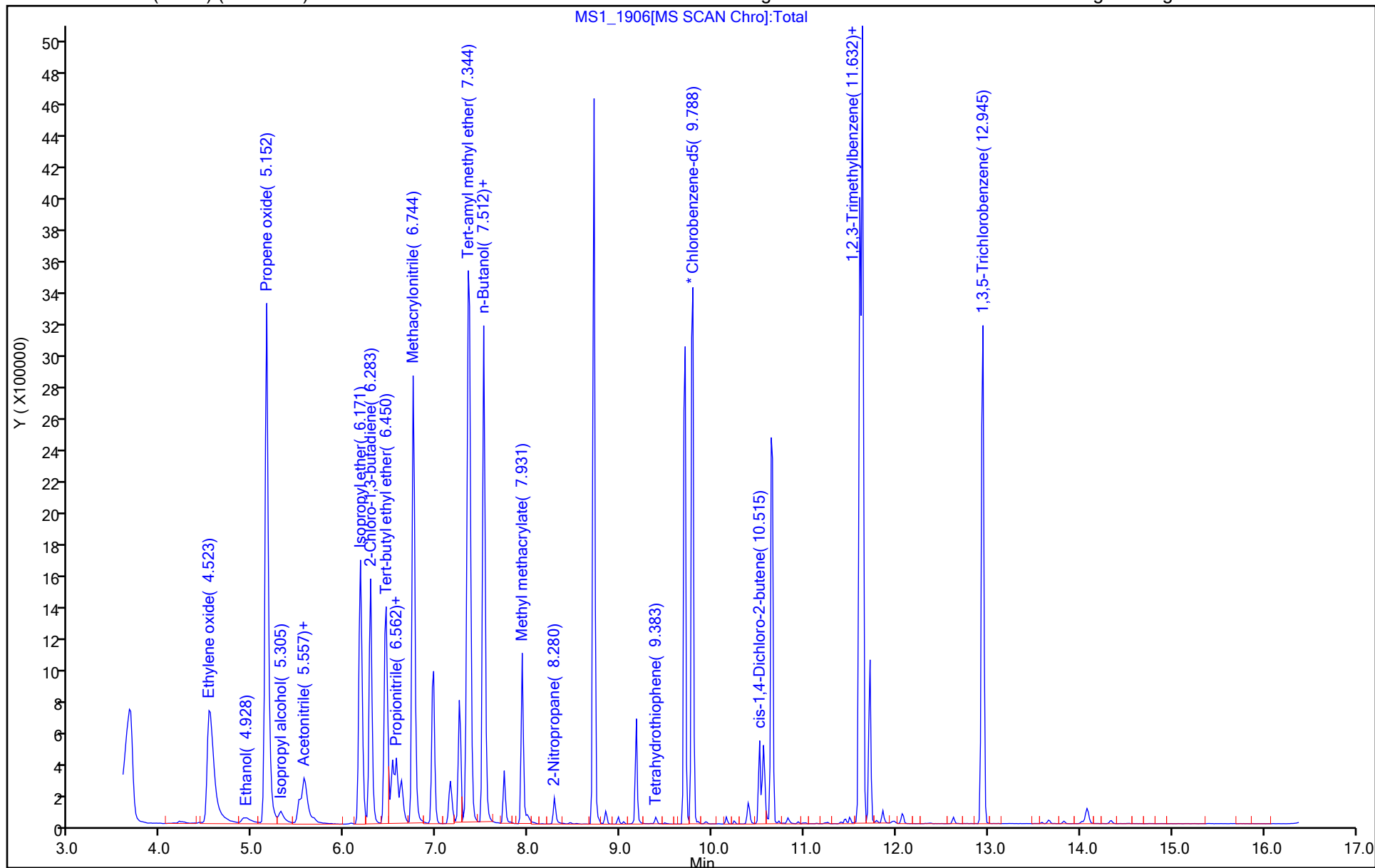
ALS Bottle#: 2

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCV 280-445753/3 Calibration Date: 01/28/2019 18:48
 Instrument ID: VMS_MS1 Calib Start Date: 01/08/2019 12:31
 GC Column: DB-624 (60.25) ID: 0.25 (mm) Calib End Date: 01/08/2019 14:14
 Lab File ID: MS1_1906.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ethylene oxide	Lin1		0.0026		974	1000	-2.6	50.0
Ethanol	Ave	0.1430	0.1222		513	600	-14.6	50.0
Propene oxide	Ave	0.0177	0.0169		952	1000	-4.8	50.0
2-Propanol	Ave	0.9175	0.7623		83.1	100	-16.9	50.0
Acetonitrile	Ave	0.0138	0.0120		87.5	100	-12.5	50.0
Di-isopropyl ether (DIPE)	Ave	0.2211	0.2262		10.2	10.0	2.3	35.0
Chloroprene	Ave	0.3613	0.4364		12.1	10.0	20.8	35.0
Tert-butyl ethyl ether	Ave	0.6410	0.6681		10.4	10.0	4.2	35.0
Ethyl acetate	Ave	0.1075	0.0993		18.5	20.0	-7.7	50.0
Propionitrile	Ave	0.0167	0.0154		92.1	100	-7.9	50.0
Methacrylonitrile	Ave	0.0679	0.0648		95.5	100	-4.5	50.0
Tert-amyl methyl ether	Ave	0.5292	0.5668		10.7	10.0	7.1	35.0
n-Butanol	Lin2		0.3505		207	250	-17.2	50.0
Methyl methacrylate	Ave	0.0327	0.0380		23.3	20.0	16.3	35.0
2-Nitropropane	Ave	0.0174	0.0206		23.7	20.0	18.4	50.0
cis-1,4-Dichloro-2-butene	Ave	0.0764	0.0626		16.4	20.0	-18.0	50.0
1,2,3-Trimethylbenzene	Ave	3.521	3.313		9.41	10.0	-5.9	35.0
1,3,5-Trichlorobenzene	Ave	1.429	1.497		10.5	10.0	4.8	50.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1906.D
 Lims ID: CCV
 Client ID:
 Sample Type: CCV
 Inject. Date: 28-Jan-2019 18:48:30 ALS Bottle#: 2 Worklist Smp#: 3
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: CCV
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Sublist: chrom-AQ_VMS1_8260*sub109
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:53:57 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.557	5.557	0.000	67	536940	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3012871	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	85	701328	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	1072362	12.5	12.5	
28 Ethylene oxide	43	4.523	4.523	0.000	99	636582	1000.0	973.9	
34 Ethanol	45	4.900	4.900	0.000	100	157431	600.0	512.6	
38 Propene oxide	58	5.152	5.152	0.000	0	4071254	1000.0	951.9	
41 Isopropyl alcohol	45	5.305	5.305	0.000	98	163721	100.0	83.1	
44 Acetonitrile	41	5.501	5.501	0.000	99	290064	100.0	87.5	
56 Isopropyl ether	87	6.171	6.171	0.000	93	545284	10.0	10.2	
58 2-Chloro-1,3-butadiene	53	6.283	6.283	0.000	89	1051956	10.0	12.1	
59 Tert-butyl ethyl ether	59	6.450	6.450	0.000	97	1610362	10.0	10.4	
60 Ethyl acetate	43	6.562	6.562	0.000	98	478516	20.0	18.5	
63 Propionitrile	54	6.618	6.618	0.000	99	370215	100.0	92.1	
66 Methacrylonitrile	41	6.744	6.744	0.000	89	1561776	100.0	95.5	
76 Tert-amyl methyl ether	73	7.330	7.330	0.000	98	1366201	10.0	10.7	
78 n-Butanol	56	7.526	7.526	0.000	87	188175	250.0	206.9	
81 Methyl methacrylate	100	7.931	7.931	0.000	87	183390	20.0	23.3	
87 2-Nitropropane	41	8.280	8.280	0.000	97	99076	20.0	23.7	
99 Tetrahydrothiophene	60	9.383	9.383	0.000	89	16692	NC	NC	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	78	107438	20.0	16.4	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	2841995	10.0	9.41	
21 1,3,5-Trichlorobenzene	180	12.945	12.945	0.000	98	1284608	10.0	10.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

MV-Supp A_00033

Amount Added: 4.00

Units: uL

Report Date: 29-Jan-2019 17:53:58

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1906.D

Injection Date: 28-Jan-2019 18:48:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: CCV

Worklist Smp#: 3

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

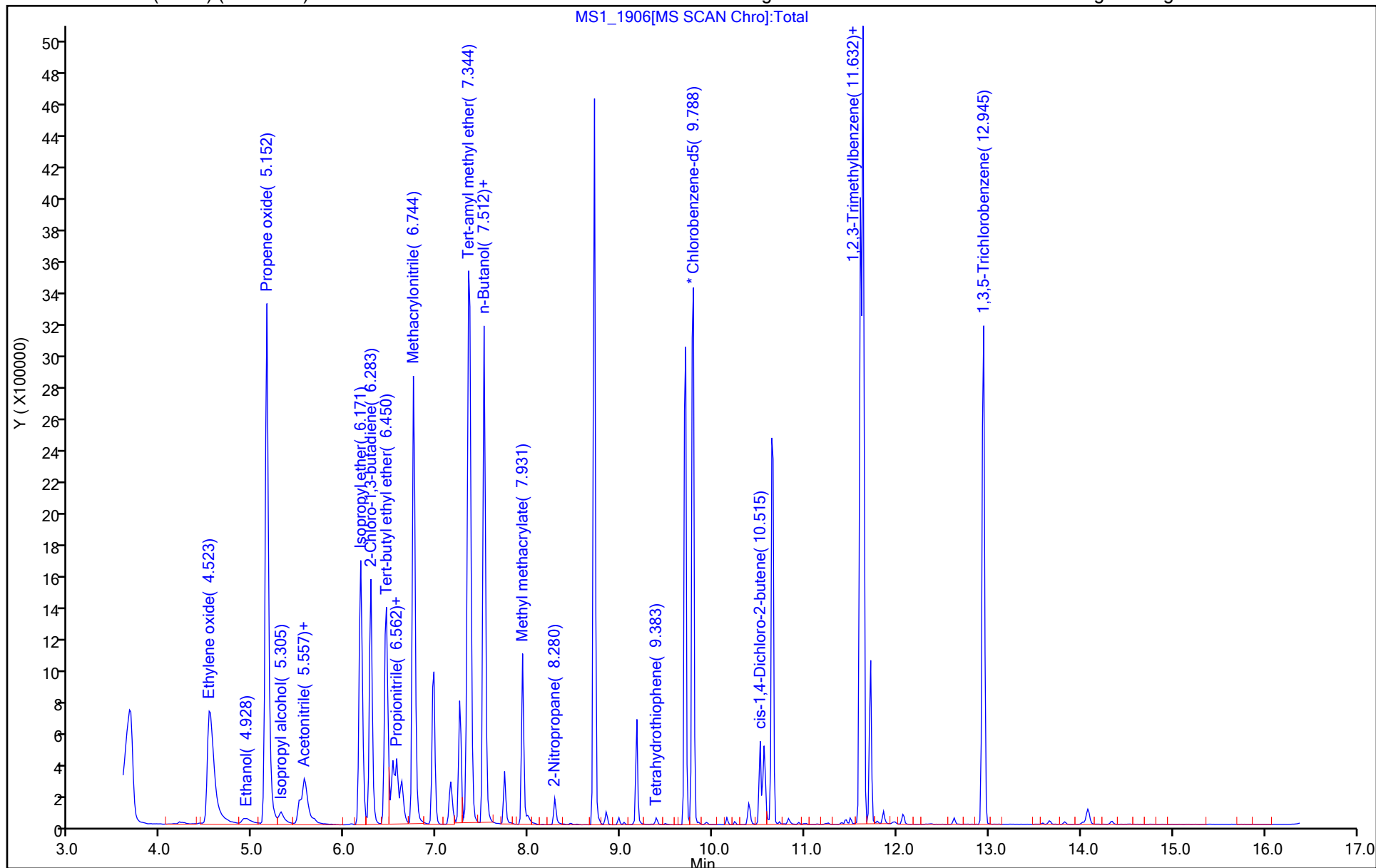
ALS Bottle#: 2

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\VMS1_1065.D
Lims ID: BFB
Client ID:
Sample Type: BFB
Inject. Date: 08-Jan-2019 08:17:30 ALS Bottle#: 100 Worklist Smp#: 1
Injection Vol: 1.0 uL Dil. Factor: 1.0000
Sample Info: BFB
Operator ID: wickhamt Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 09-Jan-2019 06:42:17 Calib Date: 08-Jan-2019 14:14:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\VMS1_1082.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0314

First Level Reviewer: wickhamt

Date: 08-Jan-2019 08:28:49

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
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\$ 4 BFB 95 4.597 4.597 0.000 93 53796 NR NR

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

MV-BFB_00027

Amount Added: 1.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1065.D

Injection Date: 08-Jan-2019 08:17:30

Instrument ID: VMS_MS1

Lims ID: BFB

Client ID:

Operator ID: wickhamt

ALS Bottle#: 100

Worklist Smp#: 1

Injection Vol: 1.0 uL

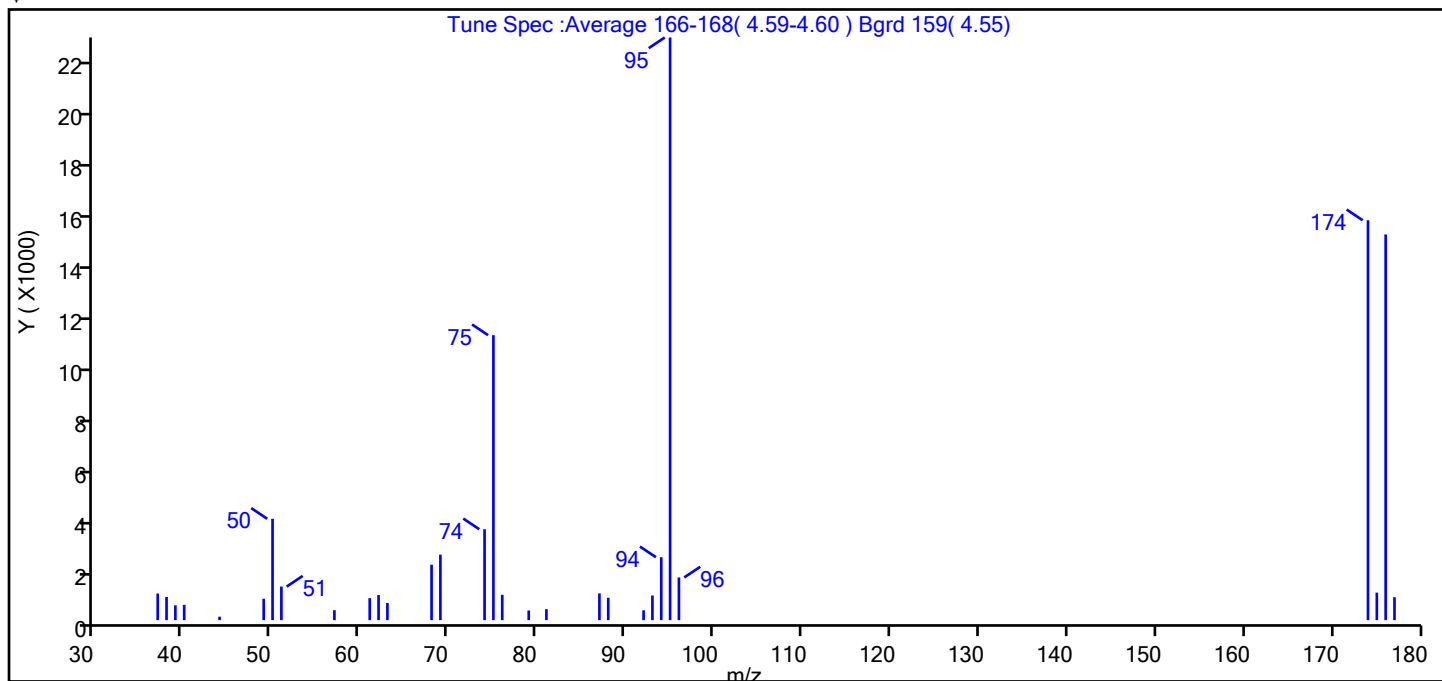
Dil. Factor: 1.0000

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Tune Method: BFB Method 8260

\$ 4 BFB



m/z	Ion Abundance Criteria	% Relative Abundance
95	Base peak, 100% relative abundance	100.0
50	15 to 40% of m/z 95	17.4
75	30 to 60% of m/z 95	48.9
96	5 to 9% of m/z 95	7.3
173	Less than 2% of m/z 174	0.0 (0.0)
174	50 to 120% of m/z 95	68.6
175	5 to 9% of m/z 174	4.7 (6.9)
176	Greater than 95% but less than 101% of m/z 174	66.2 (96.4)
177	5 to 9% of m/z 176	3.9 (5.9)

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1065.D\AQ_VMS1_8260.rslt\spectra.d
Injection Date: 08-Jan-2019 08:17:30
Spectrum: Tune Spec :Average 166-168(4.59-4.60) Bgrd 159(4.55)
Base Peak: 95.00
Minimum % Base Peak: 0
Number of Points: 30

m/z	Y	m/z	Y	m/z	Y	m/z	Y
37.00	1008	57.00	377	76.00	962	95.00	22096
38.00	878	61.00	835	79.00	367	96.00	1620
39.00	562	62.00	950	81.00	415	174.00	15165
40.00	581	63.00	650	87.00	1014	175.00	1043
44.00	132	68.00	2102	88.00	847	176.00	14625
49.00	811	69.00	2484	92.00	374	177.00	869
50.00	3844	74.00	3448	93.00	933		
51.00	1273	75.00	10807	94.00	2386		

Report Date: 09-Jan-2019 06:42:18

Chrom Revision: 2.3 19-Dec-2018 21:47:38

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b\MS1_1065.D

Injection Date: 08-Jan-2019 08:17:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: BFB

Worklist Smp#: 1

Client ID:

Injection Vol: 1.0 uL

Dil. Factor: 1.0000

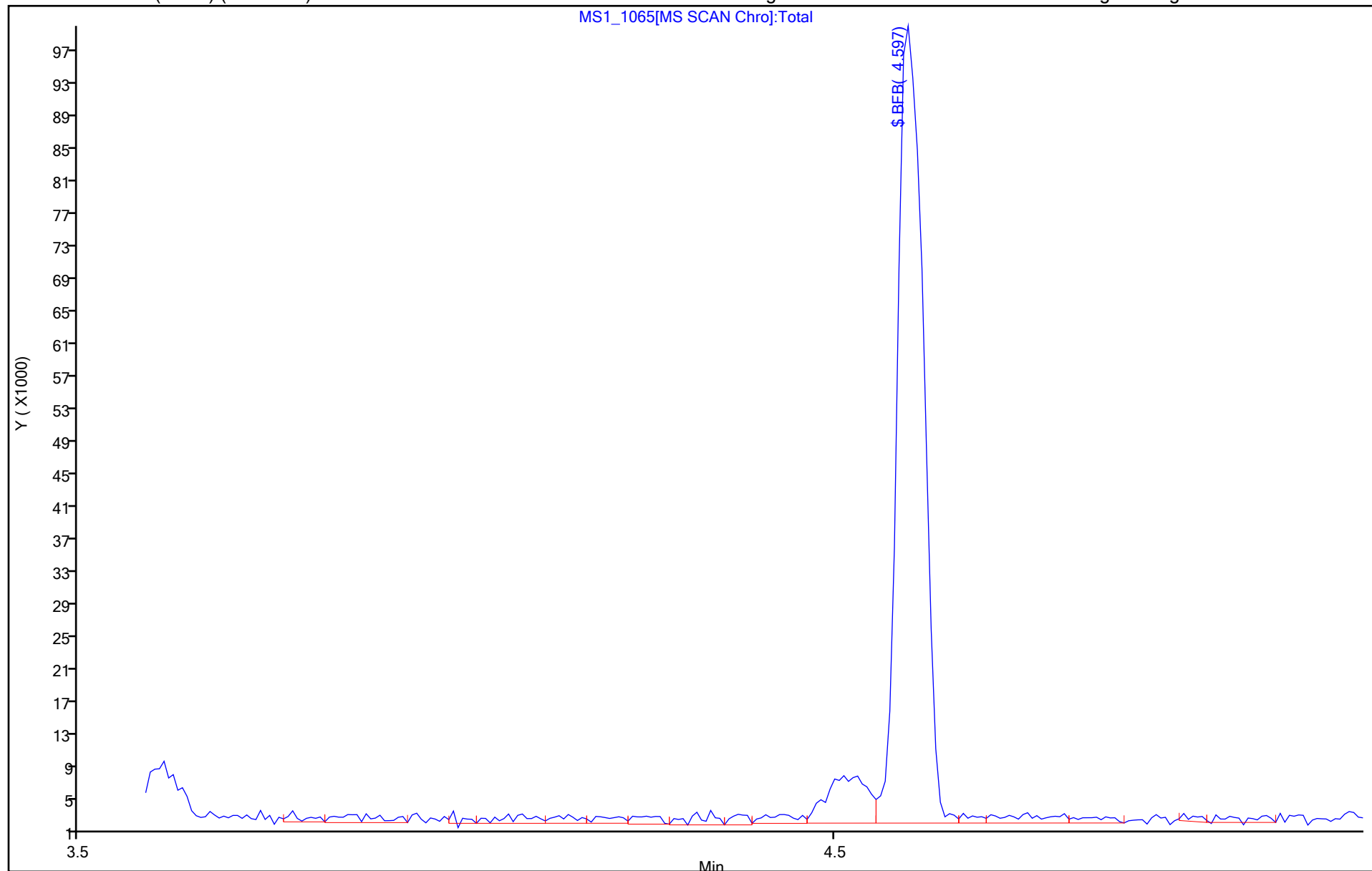
ALS Bottle#: 100

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1418.D
Lims ID: BFB
Client ID:
Sample Type: BFB
Inject. Date: 18-Jan-2019 09:52:30 ALS Bottle#: 100 Worklist Smp#: 1
Injection Vol: 1.0 uL Dil. Factor: 1.0000
Sample Info: bfb
Operator ID: wickhamt Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 22-Jan-2019 17:28:05 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0304

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
\$ 4 BFB	95	4.609	4.609	0.000	95	148866	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

MV-BFB_00027

Amount Added: 1.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1418.D

Injection Date: 18-Jan-2019 09:52:30

Instrument ID: VMS_MS1

Lims ID: BFB

Client ID:

Operator ID: wickhamt

ALS Bottle#: 100

Worklist Smp#: 1

Injection Vol: 1.0 uL

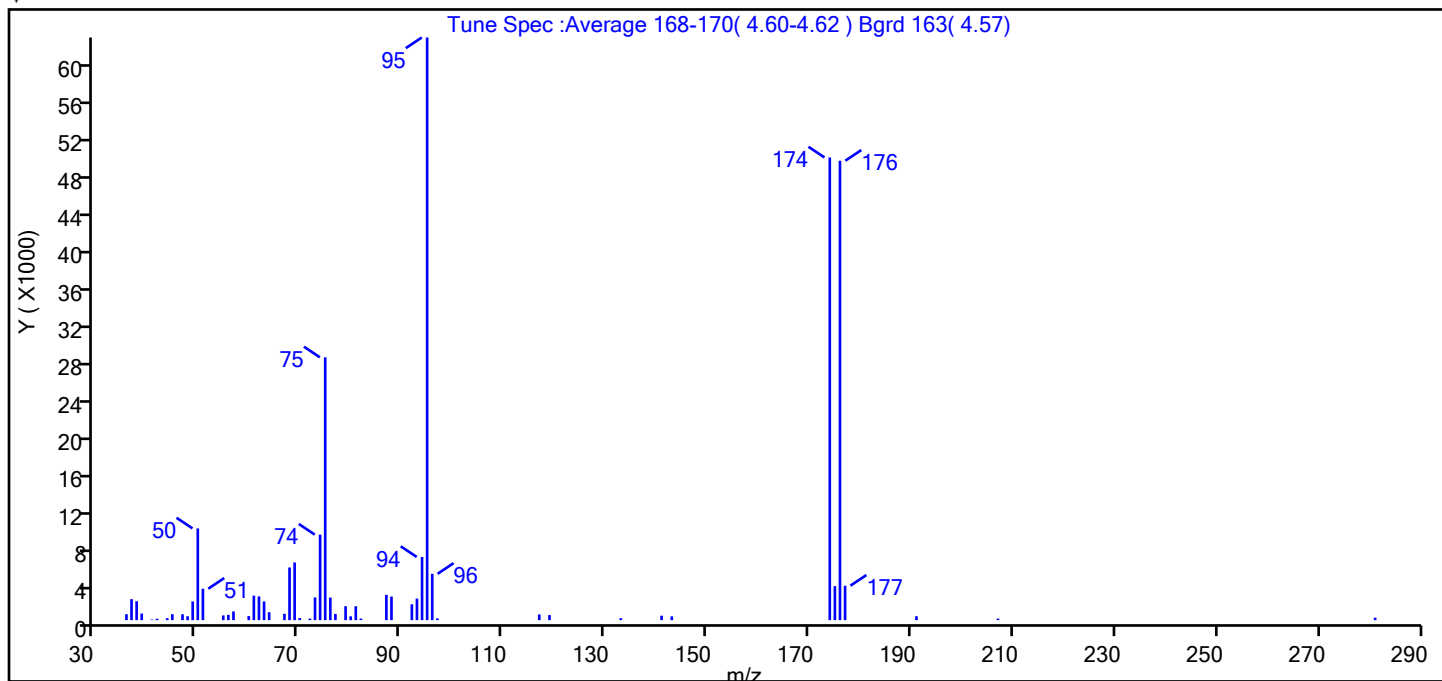
Dil. Factor: 1.0000

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Tune Method: BFB Method 8260

\$ 4 BFB



m/z	Ion Abundance Criteria	% Relative Abundance
95	Base peak, 100% relative abundance	100.0
50	15 to 40% of m/z 95	15.7
75	30 to 60% of m/z 95	45.1
96	5 to 9% of m/z 95	8.0
173	Less than 2% of m/z 174	0.0 (0.0)
174	50 to 120% of m/z 95	79.4
175	5 to 9% of m/z 174	5.8 (7.4)
176	Greater than 95% but less than 101% of m/z 174	78.8 (99.3)
177	5 to 9% of m/z 176	5.9 (7.5)

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1418.D\AQ_VMS1_8260.rslt\spectra.d
Injection Date: 18-Jan-2019 09:52:30
Spectrum: Tune Spec :Average 168-170(4.60-4.62) Bgrd 163(4.57)
Base Peak: 95.00
Minimum % Base Peak: 0
Number of Points: 55

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	640	56.00	571	75.00	28216	97.00	192
37.00	2253	57.00	938	76.00	2425	117.00	611
38.00	2033	60.00	437	77.00	667	119.00	546
39.00	708	61.00	2630	79.00	1500	133.00	212
41.00	65	62.00	2550	80.00	406	141.00	479
42.00	153	63.00	2010	81.00	1493	143.00	409
44.00	211	64.00	849	82.00	171	174.00	49672
45.00	637	67.00	682	87.00	2714	175.00	3655
47.00	633	68.00	5658	88.00	2532	176.00	49320
48.00	415	69.00	6190	92.00	1706	177.00	3698
49.00	2007	70.00	222	93.00	2317	191.00	421
50.00	9850	72.00	168	94.00	6782	207.00	165
51.00	3372	73.00	2436	95.00	62552	281.00	266
55.00	505	74.00	9181	96.00	4974		

Report Date: 22-Jan-2019 17:28:06

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1418.D

Injection Date: 18-Jan-2019 09:52:30

Instrument ID: VMS_MS1

Operator ID: wickhamt

Lims ID: BFB

Worklist Smp#: 1

Client ID:

Injection Vol: 1.0 uL

Dil. Factor: 1.0000

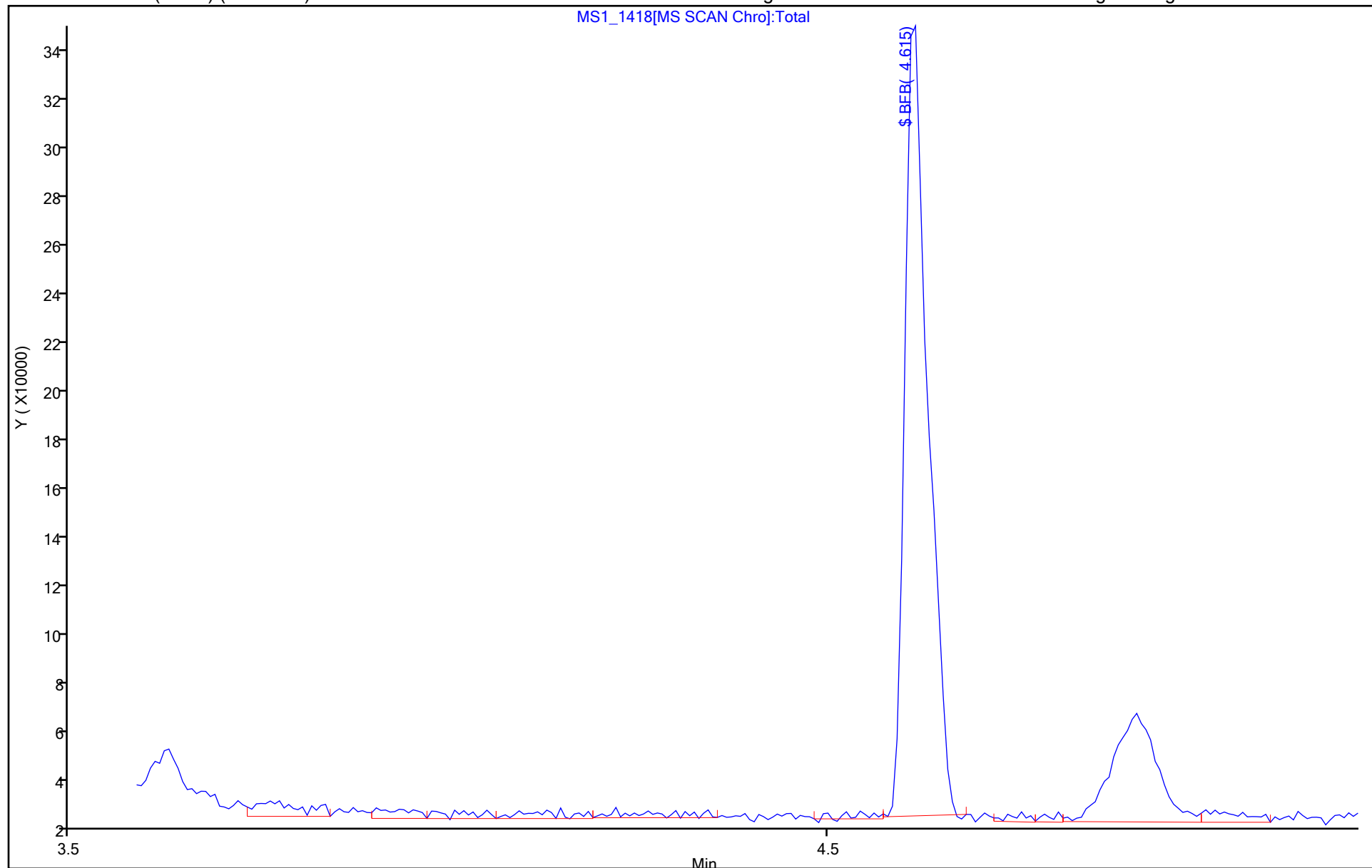
ALS Bottle#: 100

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1904.D
Lims ID: BFB
Client ID:
Sample Type: BFB
Inject. Date: 28-Jan-2019 17:51:30 ALS Bottle#: 100 Worklist Smp#: 1
Injection Vol: 1.0 uL Dil. Factor: 1.0000
Sample Info: bfb
Operator ID: nwangumaf Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 29-Jan-2019 17:53:46 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 18:13:11

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
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\$ 4 BFB	95	4.585	4.585	0.000	92	200839	NR	NR	
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QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

MV-BFB_00027

Amount Added: 1.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1904.D

Injection Date: 28-Jan-2019 17:51:30

Instrument ID: VMS_MS1

Lims ID: BFB

Client ID:

Operator ID: nwangumaf

ALS Bottle#: 100

Worklist Smp#: 1

Injection Vol: 1.0 uL

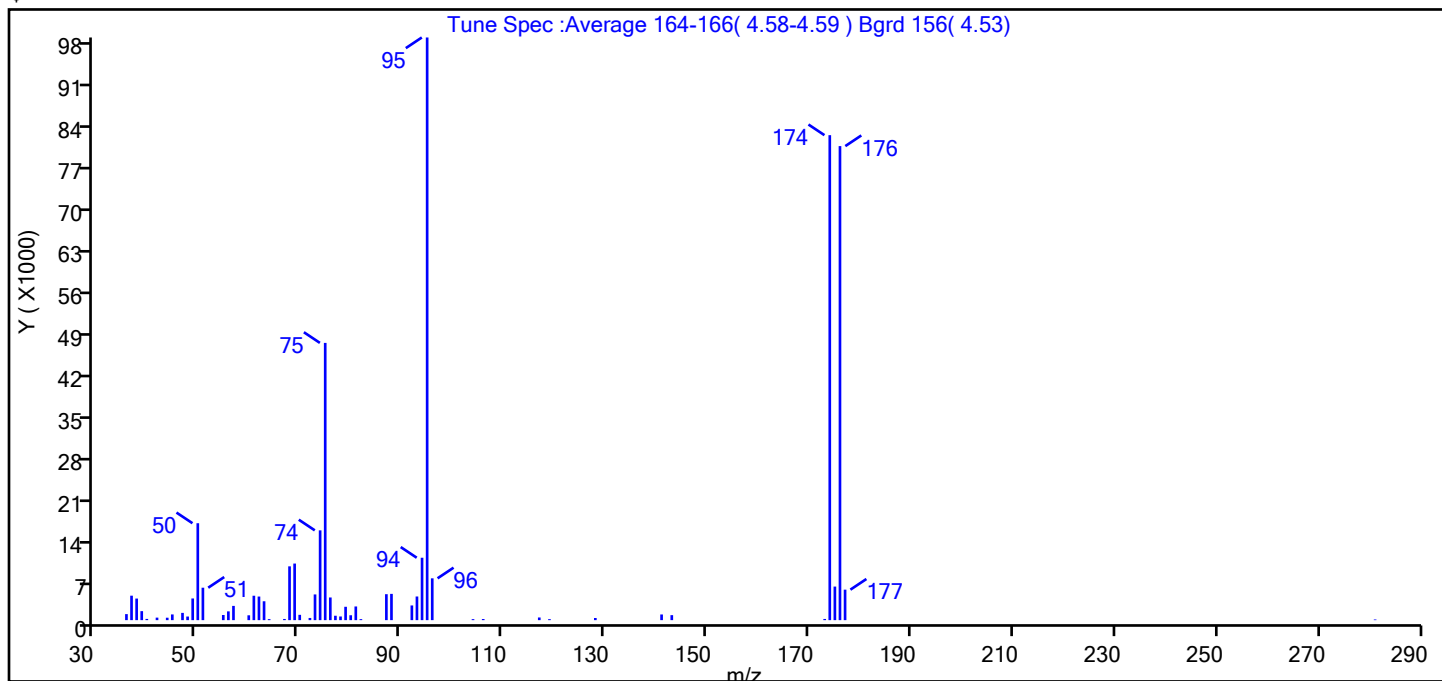
Dil. Factor: 1.0000

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Tune Method: BFB Method 8260

\$ 4 BFB



m/z	Ion Abundance Criteria	% Relative Abundance
95	Base peak, 100% relative abundance	100.0
50	15 to 40% of m/z 95	16.6
75	30 to 60% of m/z 95	47.6
96	5 to 9% of m/z 95	7.2
173	Less than 2% of m/z 174	0.2 (0.2)
174	50 to 120% of m/z 95	83.2
175	5 to 9% of m/z 174	5.8 (6.9)
176	Greater than 95% but less than 101% of m/z 174	81.4 (97.7)
177	5 to 9% of m/z 176	5.2 (6.4)

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1904.D\AQ_VMS1_8260.rsl\spectra.d
Injection Date: 28-Jan-2019 17:51:30
Spectrum: Tune Spec :Average 164-166(4.58-4.59) Bgrd 156(4.53)
Base Peak: 95.00
Minimum % Base Peak: 0
Number of Points: 56

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	1019	56.00	1482	75.00	46840	96.00	7065
37.00	4133	57.00	2407	76.00	3829	104.00	168
38.00	3646	60.00	818	77.00	743	106.00	186
39.00	1521	61.00	4124	78.00	619	117.00	449
40.00	206	62.00	3987	79.00	2257	119.00	167
42.00	425	63.00	3190	80.00	826	128.00	363
44.00	410	64.00	170	81.00	2311	141.00	960
45.00	965	67.00	199	82.00	169	143.00	844
47.00	1226	68.00	9090	87.00	4385	173.00	200
48.00	612	69.00	9560	88.00	4438	174.00	81936
49.00	3662	70.00	898	92.00	2482	175.00	5672
50.00	16374	72.00	369	93.00	3996	176.00	80088
51.00	5479	73.00	4344	94.00	10544	177.00	5149
55.00	869	74.00	15170	95.00	98440	281.00	111

Report Date: 29-Jan-2019 17:53:47

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1904.D

Injection Date: 28-Jan-2019 17:51:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: BFB

Worklist Smp#: 1

Client ID:

Injection Vol: 1.0 uL

Dil. Factor: 1.0000

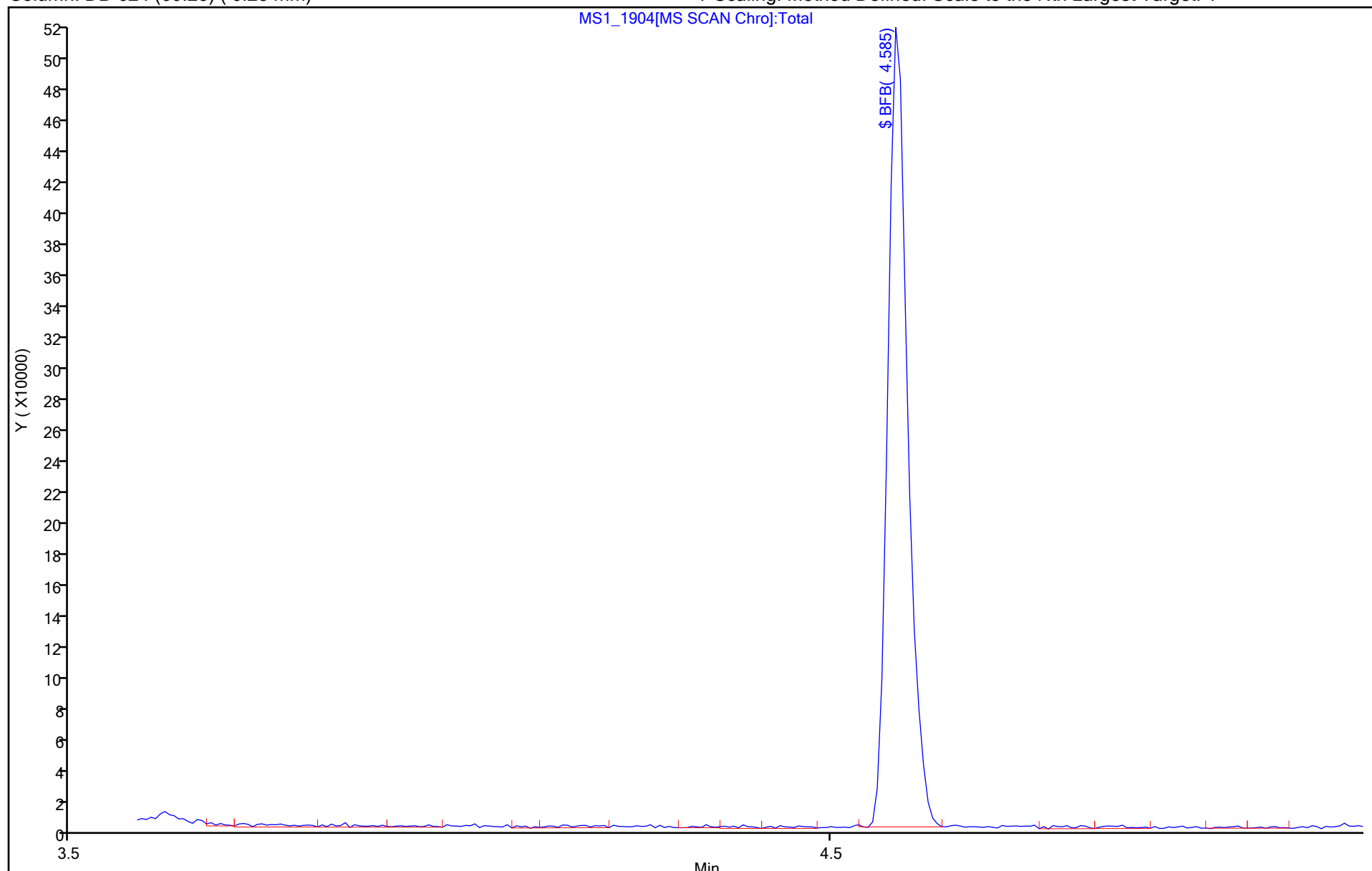
ALS Bottle#: 100

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Client Sample ID: _____ Lab Sample ID: MB 280-445753/8

Matrix: Water Lab File ID: MS1_1907.D

Analysis Method: 8260B Date Collected: _____

Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 19:09

Soil Aliquot Vol: _____ Dilution Factor: 1

Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)

% Moisture: _____ Level: (low/med) Low

Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	0.16	U	1.0	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.21	U	1.0	0.21
79-00-5	1,1,2-Trichloroethane	0.27	U	1.0	0.27
76-13-1	1,1,2-Trichlorotrifluoroethane	0.42	U	3.0	0.42
75-34-3	1,1-Dichloroethane	0.22	U	1.0	0.22
75-35-4	1,1-Dichloroethene	0.23	U	1.0	0.23
87-61-6	1,2,3-Trichlorobenzene	0.21	U	1.0	0.21
120-82-1	1,2,4-Trichlorobenzene	0.21	U	1.0	0.21
96-12-8	1,2-Dibromo-3-Chloropropane	0.47	U	5.0	0.47
106-93-4	1,2-Dibromoethane	0.18	U	1.0	0.18
95-50-1	1,2-Dichlorobenzene	0.15	U	1.0	0.15
107-06-2	1,2-Dichloroethane	0.13	U	1.0	0.13
78-87-5	1,2-Dichloropropane	0.18	U	1.0	0.18
108-67-8	1,3,5-Trimethylbenzene	0.16	U	1.0	0.16
541-73-1	1,3-Dichlorobenzene	0.13	U	1.0	0.13
106-46-7	1,4-Dichlorobenzene	0.16	U	1.0	0.16
123-91-1	1,4-Dioxane	57	U	200	57
78-93-3	2-Butanone (MEK)	2.0	U	6.0	2.0
110-75-8	2-Chloroethyl vinyl ether	0.69	U	3.0	0.69
591-78-6	2-Hexanone	1.7	U	5.0	1.7
108-10-1	4-Methyl-2-pentanone (MIBK)	0.98	U	5.0	0.98
67-64-1	Acetone	1.9	U	10	1.9
75-05-8	Acetonitrile	9.6	U	30	9.6
107-02-8	Acrolein	2.8	U	20	2.8
107-13-1	Acrylonitrile	1.4	U	20	1.4
71-43-2	Benzene	0.16	U	1.0	0.16
75-25-2	Bromoform	0.19	U	1.0	0.19
74-83-9	Bromomethane	0.21	U	2.0	0.21
75-15-0	Carbon disulfide	0.45	U	2.0	0.45
56-23-5	Carbon tetrachloride	0.19	U	1.0	0.19
108-90-7	Chlorobenzene	0.17	U	1.0	0.17
74-97-5	Chlorobromomethane	0.10	U	1.0	0.10
124-48-1	Chlorodibromomethane	0.17	U	1.0	0.17
75-00-3	Chloroethane	0.41	U	2.0	0.41
67-66-3	Chloroform	0.16	U	1.0	0.16
74-87-3	Chloromethane	0.30	U	2.0	0.30

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 280-445753/8
 Matrix: Water Lab File ID: MS1_1907.D
 Analysis Method: 8260B Date Collected: _____
 Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 19:09
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
156-59-2	cis-1,2-Dichloroethene	0.15	U	1.0	0.15
10061-01-5	cis-1,3-Dichloropropene	0.16	U	1.0	0.16
110-82-7	Cyclohexane	0.28	U	2.0	0.28
75-27-4	Dichlorobromomethane	0.17	U	1.0	0.17
75-71-8	Dichlorodifluoromethane	0.31	U	2.0	0.31
100-41-4	Ethylbenzene	0.16	U	1.0	0.16
98-82-8	Isopropylbenzene	0.19	U	1.0	0.19
79-20-9	Methyl acetate	1.6	U	5.0	1.6
1634-04-4	Methyl tert-butyl ether	0.25	U	5.0	0.25
108-87-2	Methylcyclohexane	0.36	U	1.0	0.36
75-09-2	Methylene Chloride	0.32	U	2.0	0.32
179601-23-1	m-Xylene & p-Xylene	0.34	U	2.0	0.34
95-47-6	o-Xylene	0.19	U	1.0	0.19
100-42-5	Styrene	0.17	U	1.0	0.17
127-18-4	Tetrachloroethene	0.20	U	1.0	0.20
108-88-3	Toluene	0.17	U	1.0	0.17
156-60-5	trans-1,2-Dichloroethene	0.15	U	1.0	0.15
10061-02-6	trans-1,3-Dichloropropene	0.19	U	3.0	0.19
79-01-6	Trichloroethene	0.16	U	1.0	0.16
75-69-4	Trichlorofluoromethane	0.29	U	2.0	0.29
75-01-4	Vinyl chloride	0.10	U	1.0	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	113		70-127
460-00-4	4-Bromofluorobenzene (Surr)	102		78-120
1868-53-7	Dibromofluoromethane (Surr)	109		77-120
2037-26-5	Toluene-d8 (Surr)	110		80-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: MB 280-445753/8
Matrix: Water Lab File ID: MS1_1907.D
Analysis Method: 8260B Date Collected: _____
Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 19:09
Soil Aliquot Vol: _____ Dilution Factor: 1
Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)
% Moisture: _____ Level: (low/med) Low
Analysis Batch No.: 445753 Units: ug/L
Number TICs Found: 1 TIC Result Total: 0.39

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		
74-88-4	Iodomethane	5.52	0.390	J	98%

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1907.D
 Lims ID: MB
 Client ID:
 Sample Type: MB
 Inject. Date: 28-Jan-2019 19:09:30 ALS Bottle#: 3 Worklist Smp#: 8
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: MB
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 19:30:06

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.557	0.014	34	507284	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3010287	12.5	12.5	
* 149 1,4-Dioxane-d8	96	8.713	8.727	-0.014	0	26347		0	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	85	687321	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1059066	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	689844	10.0	10.9	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.247	7.246	0.001	97	560792	10.0	11.3	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2820442	10.0	11.0	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.654	-0.014	0	925935	10.0	10.2	
\$ 152 Trifluorotoluene (Surr)	1		0.000					ND	
\$ 4 BFB	95		4.585					ND	
24 Dichlorodifluoromethane	85		3.894					ND	
26 Chloromethane	50		4.132					ND	
27 Vinyl chloride	62		4.244					ND	
22 Chlorotrifluoroethene	116		4.248					ND	
25 1,2-Dichloro-1,1,2,2-tetra	85		4.472					ND	
28 Ethylene oxide	43		4.523					ND	
29 Bromomethane	94		4.607					ND	
31 Chloroethane	64		4.663					ND	
23 2-Chloro-1,1,1-Trifluoroet	118		4.737					ND	
32 Dichlorofluoromethane	67		4.802					ND	
34 Ethanol	45		4.900					ND	
33 Trichlorofluoromethane	101		4.914					ND	
36 Ethyl ether	59		5.068					ND	
38 Propene oxide	58		5.152					ND	U
39 Acrolein	56		5.193					ND	
40 Acetone	43	5.291	5.291	0.000	99	12736		1.87	
42 1,1,2-Trichloro-1,2,2-trif	151		5.305					ND	
41 Isopropyl alcohol	45		5.305					ND	U
43 1,1-Dichloroethene	96		5.333					ND	
45 Iodomethane	142	5.515	5.501	0.014	98	47748		0.3900	
44 Acetonitrile	41		5.501					ND	U

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
35 1,2-Dichloro-1,1,2-trifluo	117		5.505					ND	
46 Methyl acetate	43		5.528					ND	
37 1,1,1-Trifluoro-2,2-dichlo	83		5.533					ND	
47 3-Chloro-1-propene	41		5.584					ND	
48 Carbon disulfide	76		5.598					ND	
49 2-Methyl-2-propanol	59		5.626					ND	
50 Methylene Chloride	84		5.668					ND	
51 Acrylonitrile	53		5.808					ND	
52 Methyl tert-butyl ether	73		5.864					ND	
53 trans-1,2-Dichloroethene	96		5.892					ND	
54 Hexane	57		6.073					ND	
55 Vinyl acetate	43		6.143					ND	
56 Isopropyl ether	87		6.171					ND	
57 1,1-Dichloroethane	63		6.213					ND	
58 2-Chloro-1,3-butadiene	53		6.283					ND	
59 Tert-butyl ethyl ether	59		6.450					ND	
60 Ethyl acetate	43		6.562					ND	U
61 2-Butanone (MEK)	43		6.576					ND	
62 sec-Butyl Alcohol	45		6.618					ND	U
63 Propionitrile	54		6.618					ND	U
64 cis-1,2-Dichloroethene	96		6.632					ND	
65 2,2-Dichloropropane	77		6.674					ND	
66 Methacrylonitrile	41		6.744					ND	
67 Chlorobromomethane	128		6.827					ND	
68 Chloroform	83		6.841					ND	
69 Tetrahydrofuran	42		6.869					ND	
70 Isobutyl alcohol	41		7.023					ND	
71 1,1,1-Trichloroethane	97		7.065					ND	
72 Cyclohexane	56		7.149					ND	
73 1,1-Dichloropropene	75		7.163					ND	
74 Carbon tetrachloride	117		7.204					ND	
19 2,2-Dimethylpentane	57		7.251					ND	
17 2,4-Dimethylpentane	43	7.344	7.293	0.051	19	923		NC	
75 1,2-Dichloroethane	62		7.302					ND	
76 Tert-amyl methyl ether	73		7.330					ND	
77 Benzene	78		7.344					ND	
9 n-Heptane	43		7.442					ND	
10 2,2,3-Trimethylbutane	57		7.502					ND	
78 n-Butanol	56		7.526					ND	U
12 3,3-Dimethylpentane	43		7.768					ND	
79 Trichloroethene	95		7.805					ND	
18 2-Methylhexane	43		7.810					ND	
80 2-Pentanone	43		7.833					ND	
81 Methyl methacrylate	100		7.931					ND	
15 3-Methylhexane	43		7.949					ND	
11 2,3-Dimethylpentane	56		7.949					ND	
82 1,2-Dichloropropane	63		7.987					ND	
83 Methylcyclohexane	55		8.014					ND	
84 1,4-Dioxane	88		8.028					ND	
85 Dibromomethane	93		8.084					ND	
86 Dichlorobromomethane	83		8.154					ND	
20 3-Ethylpentane	43		8.214					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
87 2-Nitropropane	41		8.280					ND	
88 2-Chloroethyl vinyl ether	63		8.294					ND	
89 cis-1,3-Dichloropropene	75		8.475					ND	
90 4-Methyl-2-pentanone (MIBK)	43		8.531					ND	
91 Toluene	91		8.769					ND	
92 Ethyl methacrylate	69		8.838					ND	
93 trans-1,3-Dichloropropene	75		8.852					ND	
94 1,1,2-Trichloroethane	97		9.006					ND	
95 2-Hexanone	43		9.118					ND	
96 1,3-Dichloropropane	76		9.146					ND	
97 Tetrachloroethene	164		9.188					ND	
98 Chlorodibromomethane	129		9.341					ND	
99 Tetrahydrothiophene	60		9.383					ND	
13 Dimethyl disulfide	94		9.388					ND	
100 Ethylene Dibromide	107		9.467					ND	
101 1-Chlorohexane	91		9.704					ND	
102 Chlorobenzene	112		9.802					ND	
104 Ethylbenzene	106		9.844					ND	
103 1,1,1,2-Tetrachloroethane	131		9.844					ND	
105 m-Xylene & p-Xylene	106		9.928					ND	
106 Styrene	104		10.235					ND	
109 o-Xylene	106		10.235					ND	
107 Bromoform	173		10.431					ND	
108 Isopropylbenzene	105		10.500					ND	
110 cis-1,4-Dichloro-2-butene	53		10.515					ND	
111 Cyclohexanone	55		10.612					ND	U
112 1,1,2,2-Tetrachloroethane	83		10.696					ND	
113 trans-1,4-Dichloro-2-buten	53		10.724					ND	
114 1,2,3-Trichloropropane	110		10.766					ND	
116 Bromobenzene	156		10.822					ND	
115 N-Propylbenzene	120		10.822					ND	
120 1,3,5-Trimethylbenzene	105		10.933					ND	
117 2-Chlorotoluene	126		10.933					ND	
118 4-Chlorotoluene	126		11.017					ND	
119 tert-Butylbenzene	119		11.227					ND	
121 1,2,4-Trimethylbenzene	105		11.255					ND	
143 Pentachloroethane	167		11.283					ND	
122 sec-Butylbenzene	134		11.408					ND	
123 4-Isopropyltoluene	119		11.506					ND	
124 1,3-Dichlorobenzene	146		11.562					ND	
126 1,4-Dichlorobenzene	146		11.632					ND	
125 1,2,3-Trimethylbenzene	105		11.632					ND	
127 n-Butylbenzene	91		11.855					ND	
128 1,2-Dichlorobenzene	146		11.981					ND	
129 1,2-Dibromo-3-Chloropropan	157		12.707					ND	
21 1,3,5-Trichlorobenzene	180		12.945					ND	
14 n-Nonyl Aldehyde	57		13.340					ND	
130 1,2,4-Trichlorobenzene	180		13.671					ND	
131 Hexachlorobutadiene	225		13.824					ND	
132 Naphthalene	128		14.020					ND	
133 1,2,3-Trichlorobenzene	180		14.341					ND	
158 1-Chlorohexane TIC	1		0.000					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
160 Cyclohexane TIC	1		0.000					ND	
161 n-Nonane TIC	1		0.000					ND	
159 Methyl cyclohexane TIC	1		0.000					ND	
S 140 1,2-Dichloroethene, Total	96		2.000					ND	
S 134 Trihalomethanes, Total	1		0.000					ND	
S 138 Xylenes, Total	106		0.000					ND	
S 139 Xylenes, Total (URS)	1		0.000					ND	
S 135 1,3-Dichloropropene, Total	1		0.000					ND	
S 137 Total BTEX	1		0.000					ND	
S 153 TAH	1				0			0	
S 136 1,2-Dichloroethene, Total	1		0.000					ND	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

U - Marked Undetected

Reagents:

MV-568718-D_00014

Amount Added: 1.00

Units: uL

Run Reagent

MV-ARCH SS A_00108

Amount Added: 0.80

Units: uL

Run Reagent

Report Date: 29-Jan-2019 17:54:20

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1907.D

Injection Date: 28-Jan-2019 19:09:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: MB

Worklist Smp#: 8

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

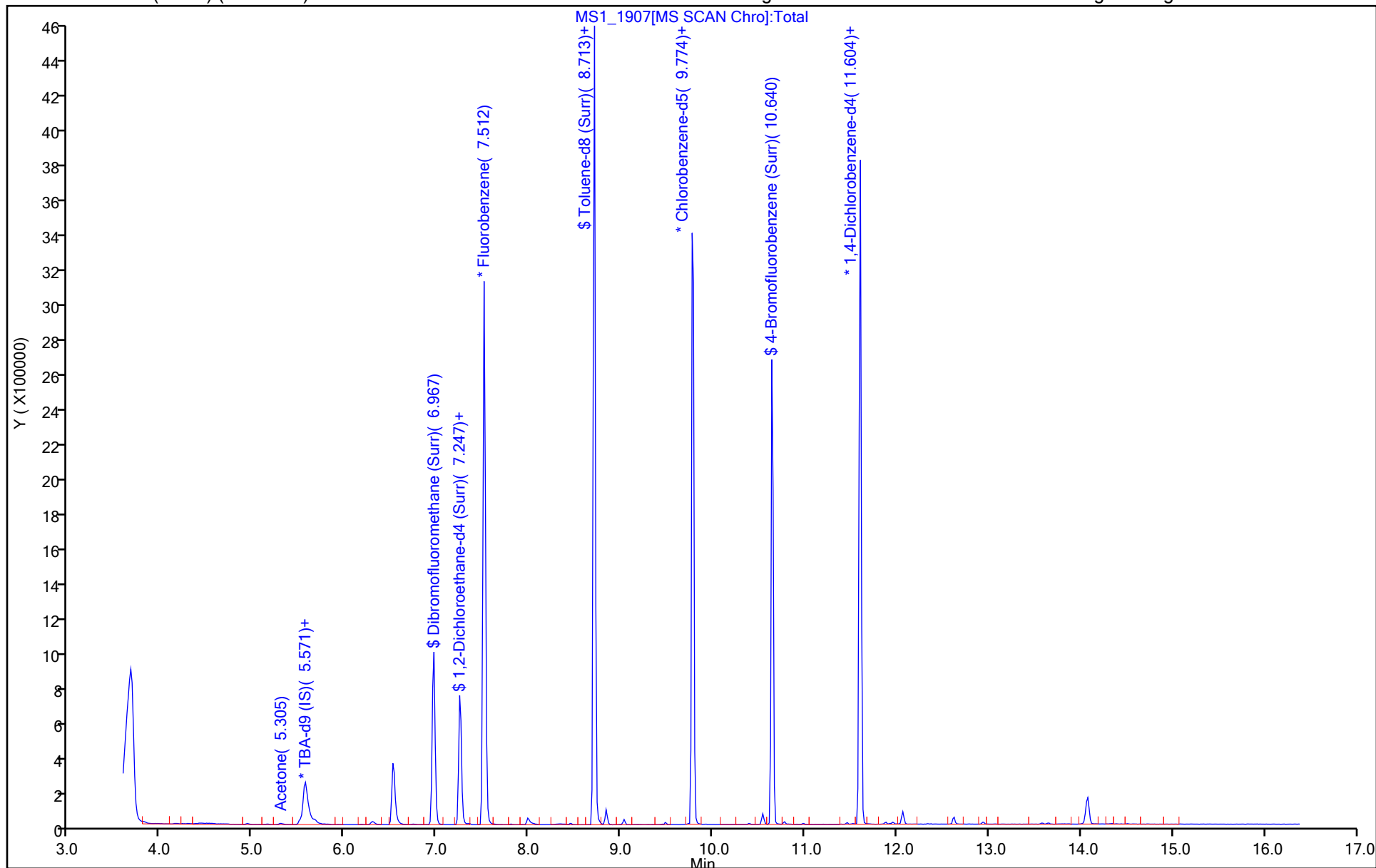
ALS Bottle#: 3

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1907.D
Lims ID: MB
Client ID:
Sample Type: MB
Inject. Date: 28-Jan-2019 19:09:30 ALS Bottle#: 3 Worklist Smp#: 8
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: MB
Operator ID: nwangumaf Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 19:30:06

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	10.9	108.91
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	11.3	113.39
\$ 7 Toluene-d8 (Surr)	10.0	11.0	109.72
\$ 8 4-Bromofluorobenzene (Surr)	10.0	10.2	102.09

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1907.D

Injection Date: 28-Jan-2019 19:09:30

Instrument ID: VMS_MS1

Lims ID: MB

Client ID:

Operator ID: nwangumaf

ALS Bottle#: 3

Worklist Smp#: 8

Purge Vol: 20.000 mL

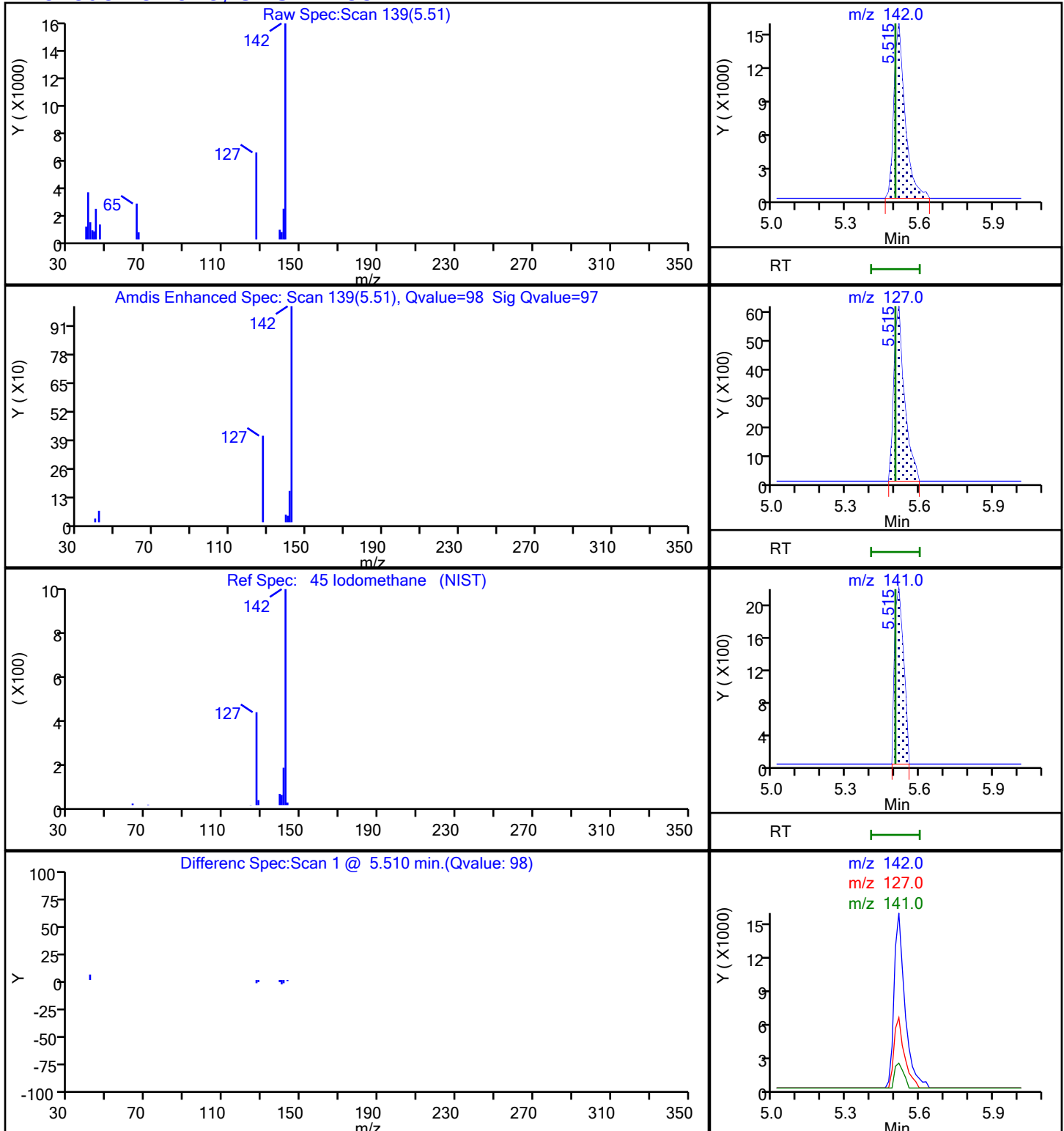
Dil. Factor: 1.0000

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Detector: MS SCAN

45 Iodomethane, CAS: 74-88-4

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1907.D

Injection Date: 28-Jan-2019 19:09:30

Instrument ID: VMS_MS1

Lims ID: MB

Client ID:

Operator ID: nwangumaf

ALS Bottle#:

3

Worklist Smp#: 8

Purge Vol: 20.000 mL

Dil. Factor:

1.0000

Method: AQ_VMS1_8260

Limit Group:

MSV - 8260B Water and Solid

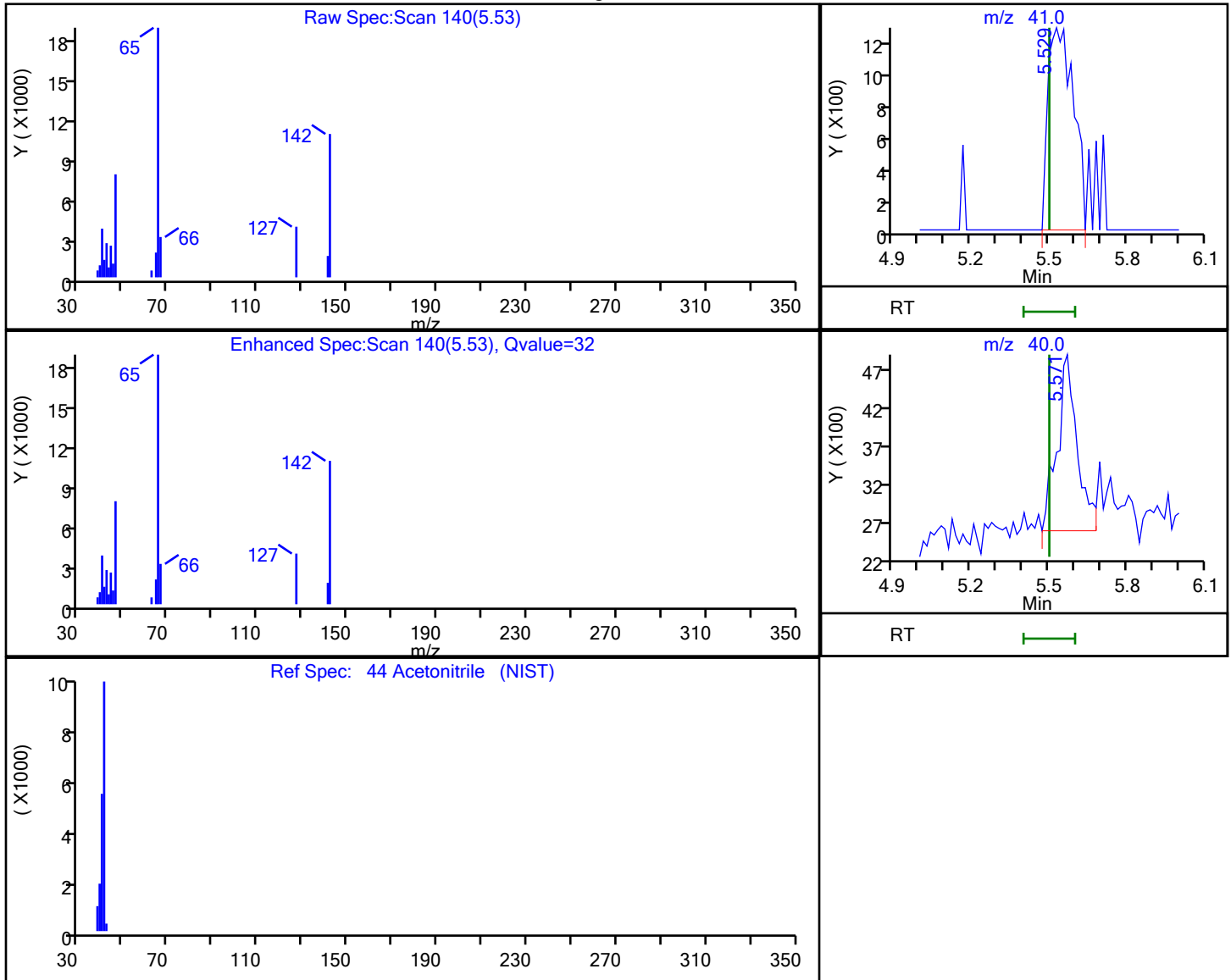
Column: DB-624 (60.25) (0.25 mm)

Detector

MS SCAN

44 Acetonitrile, CAS: 75-05-8

Processing Results



RT	Mass	Response	Amount
5.53	41.00	8863	2.674898
5.57	40.00	12071	

Reviewer: nwangumaf, 28-Jan-2019 19:29:48

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Client Sample ID: _____ Lab Sample ID: LCS 280-445753/4

Matrix: Water Lab File ID: MS1_1908.D

Analysis Method: 8260B Date Collected: _____

Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 19:36

Soil Aliquot Vol: _____ Dilution Factor: 1

Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)

% Moisture: _____ Level: (low/med) Low

Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	5.71		1.0	0.16
79-34-5	1,1,2,2-Tetrachloroethane	5.12		1.0	0.21
79-00-5	1,1,2-Trichloroethane	5.20		1.0	0.27
76-13-1	1,1,2-Trichlorotrifluoroethane	5.61		3.0	0.42
75-34-3	1,1-Dichloroethane	5.75		1.0	0.22
75-35-4	1,1-Dichloroethene	5.39		1.0	0.23
87-61-6	1,2,3-Trichlorobenzene	5.20		1.0	0.21
120-82-1	1,2,4-Trichlorobenzene	5.09		1.0	0.21
96-12-8	1,2-Dibromo-3-Chloropropane	4.16	J	5.0	0.47
106-93-4	1,2-Dibromoethane	4.71		1.0	0.18
95-50-1	1,2-Dichlorobenzene	5.04		1.0	0.15
107-06-2	1,2-Dichloroethane	5.58		1.0	0.13
78-87-5	1,2-Dichloropropane	5.58		1.0	0.18
108-67-8	1,3,5-Trimethylbenzene	5.32		1.0	0.16
541-73-1	1,3-Dichlorobenzene	5.10		1.0	0.13
106-46-7	1,4-Dichlorobenzene	5.12		1.0	0.16
123-91-1	1,4-Dioxane	106	J	200	57
78-93-3	2-Butanone (MEK)	20.6		6.0	2.0
110-75-8	2-Chloroethyl vinyl ether	11.3		3.0	0.69
591-78-6	2-Hexanone	20.4		5.0	1.7
108-10-1	4-Methyl-2-pentanone (MIBK)	21.9		5.0	0.98
67-64-1	Acetone	22.6		10	1.9
107-02-8	Acrolein	54.3		20	2.8
107-13-1	Acrylonitrile	56.8		20	1.4
71-43-2	Benzene	5.57		1.0	0.16
75-25-2	Bromoform	4.20		1.0	0.19
74-83-9	Bromomethane	6.61		2.0	0.21
75-15-0	Carbon disulfide	5.33		2.0	0.45
56-23-5	Carbon tetrachloride	5.62		1.0	0.19
108-90-7	Chlorobenzene	5.27		1.0	0.17
74-97-5	Chlorobromomethane	5.01		1.0	0.10
124-48-1	Chlorodibromomethane	4.62		1.0	0.17
75-00-3	Chloroethane	7.01		2.0	0.41
67-66-3	Chloroform	5.54		1.0	0.16
74-87-3	Chloromethane	6.53		2.0	0.30
156-59-2	cis-1,2-Dichloroethene	5.23		1.0	0.15

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 280-445753/4
 Matrix: Water Lab File ID: MS1_1908.D
 Analysis Method: 8260B Date Collected: _____
 Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 19:36
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
10061-01-5	cis-1,3-Dichloropropene	5.01		1.0	0.16
110-82-7	Cyclohexane	5.93		2.0	0.28
75-27-4	Dichlorobromomethane	5.17		1.0	0.17
75-71-8	Dichlorodifluoromethane	7.28		2.0	0.31
100-41-4	Ethylbenzene	5.23		1.0	0.16
98-82-8	Isopropylbenzene	4.84		1.0	0.19
79-20-9	Methyl acetate	10.2		5.0	1.6
1634-04-4	Methyl tert-butyl ether	4.89	J	5.0	0.25
108-87-2	Methylcyclohexane	5.98		1.0	0.36
75-09-2	Methylene Chloride	4.94		2.0	0.32
179601-23-1	m-Xylene & p-Xylene	5.21		2.0	0.34
95-47-6	o-Xylene	5.26		1.0	0.19
100-42-5	Styrene	4.79		1.0	0.17
127-18-4	Tetrachloroethene	5.44		1.0	0.20
108-88-3	Toluene	5.59		1.0	0.17
156-60-5	trans-1,2-Dichloroethene	5.60		1.0	0.15
10061-02-6	trans-1,3-Dichloropropene	5.00		3.0	0.19
79-01-6	Trichloroethene	5.33		1.0	0.16
75-69-4	Trichlorofluoromethane	6.81		2.0	0.29
75-01-4	Vinyl chloride	6.50		1.0	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	114		70-127
460-00-4	4-Bromofluorobenzene (Surr)	105		78-120
1868-53-7	Dibromofluoromethane (Surr)	109		77-120
2037-26-5	Toluene-d8 (Surr)	111		80-125

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1908.D
 Lims ID: LCS
 Client ID:
 Sample Type: LCS
 Inject. Date: 28-Jan-2019 19:36:30 ALS Bottle#: 4 Worklist Smp#: 4
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: LCS
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 19:58:43

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.570	5.570	0.000	87	503449	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3001882	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	85	693912	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	1093147	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	691250	10.0	10.9	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	564228	10.0	11.4	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2873354	10.0	11.1	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.640	0.000	0	985145	10.0	10.5	
24 Dichlorodifluoromethane	85	3.894	3.894	0.000	99	661657	5.00	7.28	
26 Chloromethane	50	4.132	4.132	0.000	99	357961	5.00	6.53	
27 Vinyl chloride	62	4.258	4.258	0.000	92	370788	5.00	6.50	
29 Bromomethane	94	4.607	4.607	0.000	89	449709	5.00	6.61	
31 Chloroethane	64	4.663	4.663	0.000	99	381239	5.00	7.01	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	97	863764	5.00	6.75	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	98	772057	5.00	6.81	
36 Ethyl ether	59	5.068	5.068	0.000	90	204293	5.00	5.36	
39 Acrolein	56	5.193	5.193	0.000	98	202246	50.0	54.3	
40 Acetone	43	5.291	5.291	0.000	99	153239	20.0	22.6	
42 1,1,2-Trichloro-1,2,2-trif	151	5.305	5.305	0.000	94	321586	5.00	5.61	
43 1,1-Dichloroethene	96	5.333	5.333	0.000	98	371784	5.00	5.39	
45 Iodomethane	142	5.501	5.501	0.000	98	651431	5.00	5.34	
46 Methyl acetate	43	5.529	5.529	0.000	95	184019	10.0	10.2	
47 3-Chloro-1-propene	41	5.584	5.584	0.000	85	571391	5.00	6.09	
48 Carbon disulfide	76	5.598	5.598	0.000	98	1552119	5.00	5.33	
49 2-Methyl-2-propanol	59	5.626	5.626	0.000	94	140858	50.0	49.8	
50 Methylene Chloride	84	5.668	5.668	0.000	88	378696	5.00	4.94	
51 Acrylonitrile	53	5.808	5.808	0.000	100	520211	50.0	56.8	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	94	635130	5.00	4.89	
53 trans-1,2-Dichloroethene	96	5.892	5.892	0.000	99	436956	5.00	5.60	
54 Hexane	57	6.073	6.073	0.000	89	575921	5.00	5.21	
55 Vinyl acetate	43	6.143	6.143	0.000	97	709174	10.0	12.8	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	96	683523	5.00	5.75	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	98	256432	20.0	20.6	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	95	140404	75.0	70.0	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	80	442044	5.00	5.23	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	89	587527	5.00	5.67	
67 Chlorobromomethane	128	6.827	6.827	0.000	95	158470	5.00	5.01	
68 Chloroform	83	6.841	6.841	0.000	93	654644	5.00	5.54	
69 Tetrahydrofuran	42	6.869	6.869	0.000	86	77674	10.0	10.9	
70 Isobutyl alcohol	41	7.023	7.023	0.000	93	102702	125.0	140.2	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	98	636022	5.00	5.71	
72 Cyclohexane	56	7.149	7.149	0.000	0	749391	5.00	5.93	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	98	574510	5.00	5.72	
74 Carbon tetrachloride	117	7.204	7.204	0.000	96	538838	5.00	5.62	
75 1,2-Dichloroethane	62	7.302	7.302	0.000	97	334194	5.00	5.58	
77 Benzene	78	7.344	7.344	0.000	95	1637716	5.00	5.57	
9 n-Heptane	43	7.428	7.428	0.000	90	604791	5.00	6.28	
79 Trichloroethene	95	7.805	7.805	0.000	98	413863	5.00	5.33	
80 2-Pentanone	43	7.833	7.833	0.000	98	166408	10.0	9.86	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	97	364282	5.00	5.58	
83 Methylcyclohexane	55	8.015	8.015	0.000	0	602732	5.00	5.98	
84 1,4-Dioxane	88	8.028	8.028	0.000	92	31903	100.0	105.8	
85 Dibromomethane	93	8.084	8.084	0.000	97	152234	5.00	5.23	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	416188	5.00	5.17	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	201628	10.0	11.3	
89 cis-1,3-Dichloropropene	75	8.475	8.475	0.000	98	489137	5.00	5.01	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	94	526536	20.0	21.9	
91 Toluene	91	8.769	8.769	0.000	99	1723092	5.00	5.59	
92 Ethyl methacrylate	69	8.839	8.839	0.000	89	227349	5.00	4.21	
93 trans-1,3-Dichloropropene	75	8.852	8.852	0.000	95	373539	5.00	5.00	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	90	217343	5.00	5.20	
95 2-Hexanone	43	9.118	9.118	0.000	94	341237	20.0	20.4	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	97	384049	5.00	5.23	
97 Tetrachloroethene	164	9.188	9.188	0.000	97	365350	5.00	5.44	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	239830	5.00	4.62	
100 Ethylene Dibromide	107	9.467	9.467	0.000	99	189849	5.00	4.71	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	270258	2.50	2.40	
102 Chlorobenzene	112	9.802	9.802	0.000	95	1066042	5.00	5.27	
104 Ethylbenzene	106	9.844	9.844	0.000	98	627518	5.00	5.23	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	93	348434	5.00	5.15	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	98	770422	5.00	5.21	
106 Styrene	104	10.235	10.235	0.000	88	1059959	5.00	4.79	
109 o-Xylene	106	10.235	10.235	0.000	88	739507	5.00	5.26	
107 Bromoform	173	10.431	10.431	0.000	97	114579	5.00	4.20	
108 Isopropylbenzene	105	10.501	10.501	0.000	95	1984787	5.00	4.84	
111 Cyclohexanone	55	10.612	10.612	0.000	89	341180	200.0	190.3	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.682	0.000	92	238553	5.00	5.12	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	93	49543	5.00	4.86	
114 1,2,3-Trichloropropane	110	10.766	10.766	0.000	84	65164	5.00	4.92	
116 Bromobenzene	156	10.808	10.808	0.000	96	416515	5.00	4.95	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	570919	5.00	5.23	
120 1,3,5-Trimethylbenzene	105	10.933	10.933	0.000	96	1645694	5.00	5.32	
117 2-Chlorotoluene	126	10.933	10.933	0.000	95	465460	5.00	5.19	
118 4-Chlorotoluene	126	11.017	11.017	0.000	97	461503	5.00	5.08	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	91	1661984	5.00	5.25	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	97	1649481	5.00	5.27	
122 sec-Butylbenzene	134	11.408	11.408	0.000	93	465760	5.00	5.17	
123 4-Isopropyltoluene	119	11.492	11.492	0.000	97	1924708	5.00	5.03	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	869778	5.00	5.10	
126 1,4-Dichlorobenzene	146	11.632	11.632	0.000	96	869585	5.00	5.12	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	1768618	5.00	5.59	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	98	739006	5.00	5.04	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	86	35633	5.00	4.16	
130 1,2,4-Trichlorobenzene	180	13.657	13.657	0.000	94	550885	5.00	5.09	
131 Hexachlorobutadiene	225	13.824	13.824	0.000	97	386902	5.00	5.65	
132 Naphthalene	128	14.020	14.020	0.000	97	727055	5.00	4.45	
133 1,2,3-Trichlorobenzene	180	14.341	14.341	0.000	95	455322	5.00	5.20	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.8	
S 134 Trihalomethanes, Total	1				0		20.0	19.5	
S 138 Xylenes, Total	106				0		10.0	10.5	
S 139 Xylenes, Total (URS)	1				0		10.0	10.5	
S 135 1,3-Dichloropropene, Total	1				0		10.0	10.0	
S 137 Total BTEX	1				0			26.9	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.8	

Reagents:

MV-MegaMain B_00007

Amount Added: 2.00

Units: uL

MV-Gas B_00007

Amount Added: 2.00

Units: uL

MV-568718-D_00014

Amount Added: 1.00

Units: uL

Run Reagent

MV-ARCH SS A_00108

Amount Added: 0.80

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1908.D

Injection Date: 28-Jan-2019 19:36:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: LCS

Worklist Smp#: 4

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

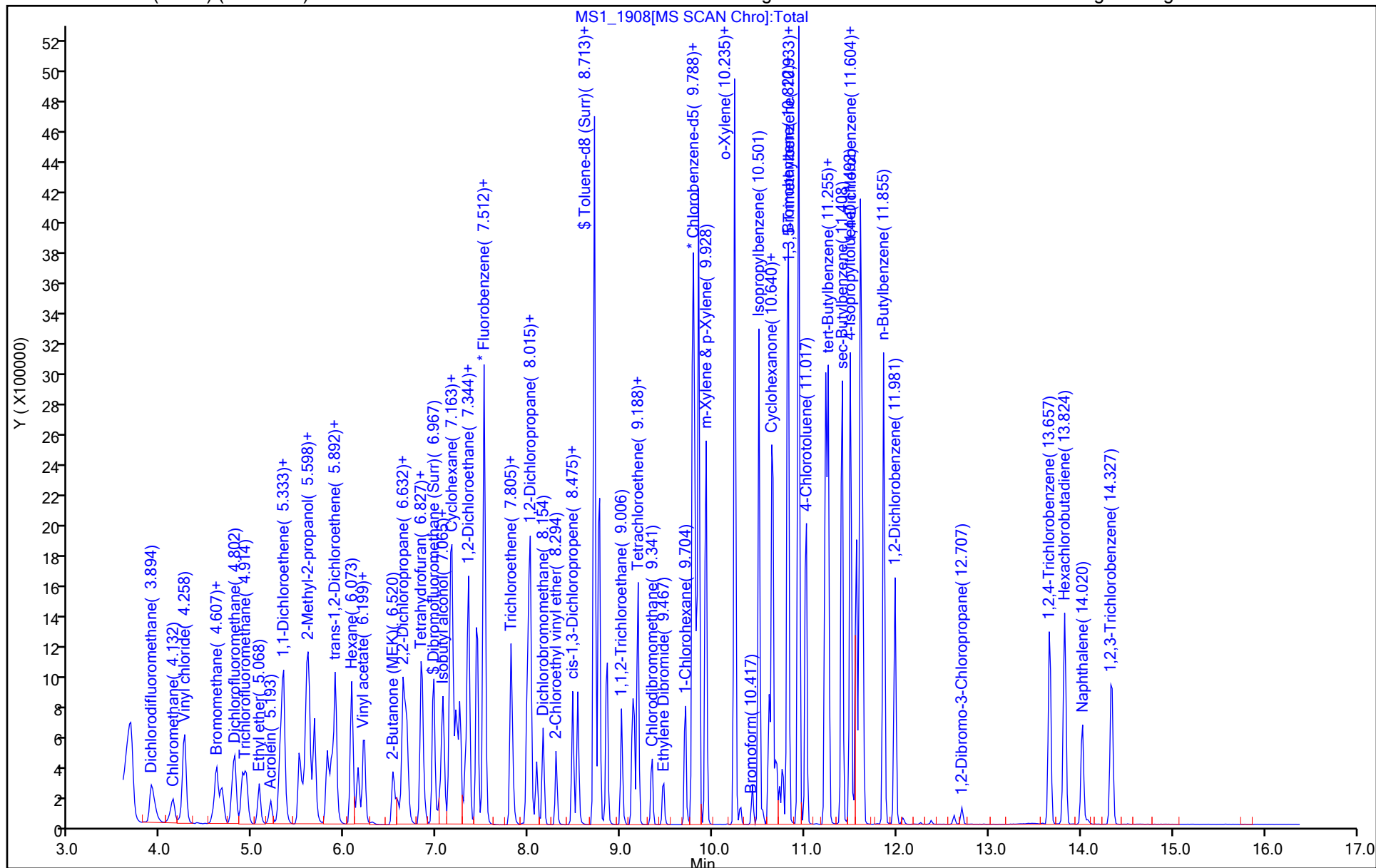
ALS Bottle#: 4

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1908.D
Lims ID: LCS
Client ID:
Sample Type: LCS
Inject. Date: 28-Jan-2019 19:36:30 ALS Bottle#: 4 Worklist Smp#: 4
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: LCS
Operator ID: nwangumaf Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 19:58:43

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	10.9	109.44
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	11.4	114.40
\$ 7 Toluene-d8 (Surr)	10.0	11.1	110.72
\$ 8 4-Bromofluorobenzene (Surr)	10.0	10.5	105.24

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 280-445753/6
 Matrix: Water Lab File ID: MS1_1910.D
 Analysis Method: 8260B Date Collected: _____
 Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 20:16
 Soil Aliquot Vol: _____ Dilution Factor: 1
 Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-05-8	Acetonitrile	52.8		30	9.6

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	114		70-127
460-00-4	4-Bromofluorobenzene (Surr)	106		78-120
1868-53-7	Dibromofluoromethane (Surr)	110		77-120
2037-26-5	Toluene-d8 (Surr)	111		80-125

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1910.D
 Lims ID: lcs
 Client ID:
 Sample Type: LCS
 Inject. Date: 28-Jan-2019 20:16:30 ALS Bottle#: 6 Worklist Smp#: 6
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: LCS s
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 20:44:32

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.570	5.557	0.013	73	530072	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3162407	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	85	710409	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1087064	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	732384	10.0	11.0	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	594255	10.0	11.4	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2946146	10.0	11.1	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.654	-0.014	0	987231	10.0	10.6	
28 Ethylene oxide	43	4.537	4.523	0.014	98	299085	500.0	390.5	
34 Ethanol	45	4.914	4.900	0.014	97	88900	300.0	293.2	
38 Propene oxide	58	5.151	5.152	-0.001	0	2109321	500.0	469.9	
41 Isopropyl alcohol	45	5.319	5.305	0.014	96	90801	50.0	46.7	
44 Acetonitrile	41	5.515	5.501	0.014	99	183768	50.0	52.8	
56 Isopropyl ether	87	6.171	6.171	0.000	93	314327	5.00	5.62	
58 2-Chloro-1,3-butadiene	53	6.283	6.283	0.000	89	594104	5.00	6.50	
59 Tert-butyl ethyl ether	59	6.450	6.450	0.000	97	872976	5.00	5.38	
60 Ethyl acetate	43	6.562	6.562	0.000	98	242252	10.0	8.91	
63 Propionitrile	54	6.618	6.618	0.000	99	208184	50.0	49.4	
66 Methacrylonitrile	41	6.744	6.744	0.000	89	886661	50.0	51.6	
76 Tert-amyl methyl ether	73	7.344	7.330	0.014	98	757865	5.00	5.66	
78 n-Butanol	56	7.526	7.526	0.000	83	110108	125.0	118.0	
81 Methyl methacrylate	100	7.931	7.931	0.000	87	100206	10.0	12.1	
87 2-Nitropropane	41	8.280	8.280	0.000	98	44846	10.0	10.2	
99 Tetrahydrothiophene	60	9.383	9.383	0.000	89	9105	NC	NC	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	81	52797	10.0	7.95	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	1587535	5.00	5.18	
21 1,3,5-Trichlorobenzene	180	12.931	12.945	-0.014	98	699616	5.00	5.63	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

MV-Supp B_00023	Amount Added: 2.00	Units: uL	
MV-568718-D_00014	Amount Added: 1.00	Units: uL	Run Reagent
MV-ARCH SS A_00108	Amount Added: 0.80	Units: uL	Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1910.D

Injection Date: 28-Jan-2019 20:16:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: lcs

Worklist Smp#: 6

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

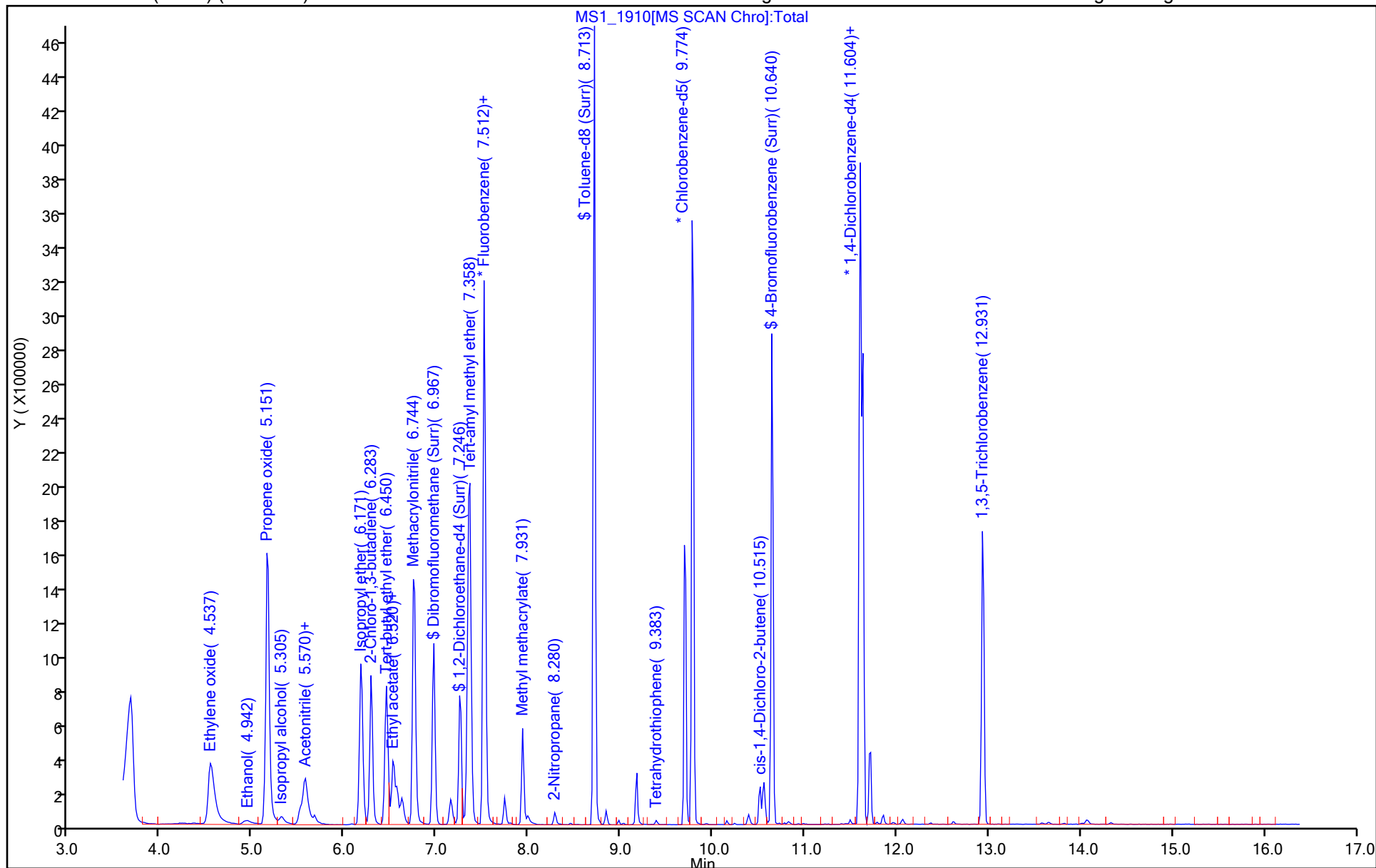
ALS Bottle#: 6

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1910.D
Lims ID: lcs
Client ID:
Sample Type: LCS
Inject. Date: 28-Jan-2019 20:16:30 ALS Bottle#: 6 Worklist Smp#: 6
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: LCS s
Operator ID: nwangumaf Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 20:44:32

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	11.0	110.07
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	11.4	114.37
\$ 7 Toluene-d8 (Surr)	10.0	11.1	110.89
\$ 8 4-Bromofluorobenzene (Surr)	10.0	10.6	106.05

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Client Sample ID: _____ Lab Sample ID: LCSD 280-445753/5

Matrix: Water Lab File ID: MS1_1909.D

Analysis Method: 8260B Date Collected: _____

Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 19:56

Soil Aliquot Vol: _____ Dilution Factor: 1

Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)

% Moisture: _____ Level: (low/med) Low

Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	5.42		1.0	0.16
79-34-5	1,1,2,2-Tetrachloroethane	4.94		1.0	0.21
79-00-5	1,1,2-Trichloroethane	5.10		1.0	0.27
76-13-1	1,1,2-Trichlorotrifluoroethane	5.24		3.0	0.42
75-34-3	1,1-Dichloroethane	5.53		1.0	0.22
75-35-4	1,1-Dichloroethene	5.18		1.0	0.23
87-61-6	1,2,3-Trichlorobenzene	5.15		1.0	0.21
120-82-1	1,2,4-Trichlorobenzene	4.92		1.0	0.21
96-12-8	1,2-Dibromo-3-Chloropropane	4.08	J	5.0	0.47
106-93-4	1,2-Dibromoethane	4.60		1.0	0.18
95-50-1	1,2-Dichlorobenzene	4.86		1.0	0.15
107-06-2	1,2-Dichloroethane	5.42		1.0	0.13
78-87-5	1,2-Dichloropropane	5.41		1.0	0.18
108-67-8	1,3,5-Trimethylbenzene	5.07		1.0	0.16
541-73-1	1,3-Dichlorobenzene	4.86		1.0	0.13
106-46-7	1,4-Dichlorobenzene	4.85		1.0	0.16
123-91-1	1,4-Dioxane	104	J	200	57
78-93-3	2-Butanone (MEK)	20.7		6.0	2.0
110-75-8	2-Chloroethyl vinyl ether	11.2		3.0	0.69
591-78-6	2-Hexanone	20.1		5.0	1.7
108-10-1	4-Methyl-2-pentanone (MIBK)	21.7		5.0	0.98
67-64-1	Acetone	22.0		10	1.9
107-02-8	Acrolein	52.2		20	2.8
107-13-1	Acrylonitrile	56.0		20	1.4
71-43-2	Benzene	5.33		1.0	0.16
75-25-2	Bromoform	4.07		1.0	0.19
74-83-9	Bromomethane	6.28		2.0	0.21
75-15-0	Carbon disulfide	5.00		2.0	0.45
56-23-5	Carbon tetrachloride	5.31		1.0	0.19
108-90-7	Chlorobenzene	5.01		1.0	0.17
74-97-5	Chlorobromomethane	4.88		1.0	0.10
124-48-1	Chlorodibromomethane	4.48		1.0	0.17
75-00-3	Chloroethane	6.65		2.0	0.41
67-66-3	Chloroform	5.35		1.0	0.16
74-87-3	Chloromethane	6.11		2.0	0.30
156-59-2	cis-1,2-Dichloroethene	5.06		1.0	0.15

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Client Sample ID: _____ Lab Sample ID: LCSD 280-445753/5

Matrix: Water Lab File ID: MS1_1909.D

Analysis Method: 8260B Date Collected: _____

Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 19:56

Soil Aliquot Vol: _____ Dilution Factor: 1

Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)

% Moisture: _____ Level: (low/med) Low

Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
10061-01-5	cis-1,3-Dichloropropene	4.79		1.0	0.16
110-82-7	Cyclohexane	5.67		2.0	0.28
75-27-4	Dichlorobromomethane	4.98		1.0	0.17
75-71-8	Dichlorodifluoromethane	6.92		2.0	0.31
100-41-4	Ethylbenzene	5.02		1.0	0.16
98-82-8	Isopropylbenzene	4.60		1.0	0.19
79-20-9	Methyl acetate	10.2		5.0	1.6
1634-04-4	Methyl tert-butyl ether	4.82	J	5.0	0.25
108-87-2	Methylcyclohexane	5.58		1.0	0.36
75-09-2	Methylene Chloride	4.70		2.0	0.32
179601-23-1	m-Xylene & p-Xylene	5.00		2.0	0.34
95-47-6	o-Xylene	5.03		1.0	0.19
100-42-5	Styrene	4.61		1.0	0.17
127-18-4	Tetrachloroethene	5.10		1.0	0.20
108-88-3	Toluene	5.40		1.0	0.17
156-60-5	trans-1,2-Dichloroethene	5.38		1.0	0.15
10061-02-6	trans-1,3-Dichloropropene	4.88		3.0	0.19
79-01-6	Trichloroethene	5.17		1.0	0.16
75-69-4	Trichlorofluoromethane	6.54		2.0	0.29
75-01-4	Vinyl chloride	6.15		1.0	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	112		70-127
460-00-4	4-Bromofluorobenzene (Surr)	102		78-120
1868-53-7	Dibromofluoromethane (Surr)	107		77-120
2037-26-5	Toluene-d8 (Surr)	106		80-125

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1909.D
 Lims ID: LCSD
 Client ID:
 Sample Type: LCSD
 Inject. Date: 28-Jan-2019 19:56:30 ALS Bottle#: 5 Worklist Smp#: 5
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: LCSD
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.557	0.014	88	566568	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3182142	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	84	742529	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1170096	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	713939	10.0	10.7	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	586820	10.0	11.2	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2935301	10.0	10.6	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.654	-0.014	0	1019461	10.0	10.2	
24 Dichlorodifluoromethane	85	3.909	3.894	0.015	99	666298	5.00	6.92	
26 Chloromethane	50	4.132	4.132	0.000	98	354525	5.00	6.11	
27 Vinyl chloride	62	4.258	4.244	0.014	89	371903	5.00	6.15	
29 Bromomethane	94	4.607	4.607	0.000	90	452799	5.00	6.28	
31 Chloroethane	64	4.663	4.663	0.000	99	382905	5.00	6.65	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	97	871206	5.00	6.42	
33 Trichlorofluoromethane	101	4.928	4.914	0.014	98	785781	5.00	6.54	
36 Ethyl ether	59	5.068	5.068	0.000	90	215483	5.00	5.33	
39 Acrolein	56	5.193	5.193	0.000	99	206215	50.0	52.2	
40 Acetone	43	5.291	5.291	0.000	99	157959	20.0	22.0	
42 1,1,2-Trichloro-1,2,2-trif	151	5.319	5.305	0.014	94	318474	5.00	5.24	
43 1,1-Dichloroethene	96	5.333	5.333	0.000	97	378338	5.00	5.18	
45 Iodomethane	142	5.515	5.501	0.014	98	657461	5.00	5.08	
46 Methyl acetate	43	5.529	5.528	0.001	96	194644	10.0	10.2	
47 3-Chloro-1-propene	41	5.585	5.584	0.000	83	591501	5.00	5.95	
48 Carbon disulfide	76	5.612	5.598	0.014	98	1544878	5.00	5.00	
49 2-Methyl-2-propanol	59	5.626	5.626	0.000	92	154819	50.0	48.6	
50 Methylene Chloride	84	5.668	5.668	0.000	89	382095	5.00	4.70	
51 Acrylonitrile	53	5.808	5.808	0.000	100	543491	50.0	56.0	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	94	663252	5.00	4.82	
53 trans-1,2-Dichloroethene	96	5.906	5.892	0.014	98	445747	5.00	5.38	
54 Hexane	57	6.073	6.073	0.000	90	587151	5.00	4.97	
55 Vinyl acetate	43	6.143	6.143	0.000	97	696076	10.0	11.8	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	96	696472	5.00	5.53	
61 2-Butanone (MEK)	43	6.576	6.576	0.000	98	272861	20.0	20.7	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	94	154132	75.0	68.3	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	80	453231	5.00	5.06	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	89	588217	5.00	5.35	
67 Chlorobromomethane	128	6.827	6.827	0.000	95	163624	5.00	4.88	
68 Chloroform	83	6.841	6.841	0.000	93	669837	5.00	5.35	
69 Tetrahydrofuran	42	6.869	6.869	0.000	84	80019	10.0	10.6	
70 Isobutyl alcohol	41	7.023	7.023	0.000	93	114622	125.0	139.0	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	98	638990	5.00	5.42	
72 Cyclohexane	56	7.149	7.149	0.000	0	759441	5.00	5.67	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	98	583801	5.00	5.48	
74 Carbon tetrachloride	117	7.219	7.204	0.015	95	539111	5.00	5.31	
75 1,2-Dichloroethane	62	7.316	7.302	0.014	97	344608	5.00	5.42	
77 Benzene	78	7.344	7.344	0.000	95	1660486	5.00	5.33	
9 n-Heptane	43	7.442	7.442	0.000	88	604658	5.00	5.92	
79 Trichloroethene	95	7.805	7.805	0.000	98	426126	5.00	5.17	
80 2-Pentanone	43	7.833	7.833	0.000	98	180279	10.0	10.1	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	97	374170	5.00	5.41	
83 Methylcyclohexane	55	8.015	8.014	0.001	0	596715	5.00	5.58	
84 1,4-Dioxane	88	8.029	8.028	0.001	89	33151	100.0	103.7	
85 Dibromomethane	93	8.084	8.084	0.000	96	155070	5.00	5.03	
86 Dichlorobromomethane	83	8.154	8.154	0.000	100	424654	5.00	4.98	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	211861	10.0	11.2	
89 cis-1,3-Dichloropropene	75	8.476	8.475	0.001	98	500165	5.00	4.79	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	94	552573	20.0	21.7	
91 Toluene	91	8.769	8.769	0.000	99	1765511	5.00	5.40	
92 Ethyl methacrylate	69	8.839	8.838	0.001	89	243335	5.00	4.21	
93 trans-1,3-Dichloropropene	75	8.853	8.852	0.001	96	386600	5.00	4.88	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	90	226140	5.00	5.10	
95 2-Hexanone	43	9.118	9.118	0.000	93	359664	20.0	20.1	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	89	397768	5.00	5.06	
97 Tetrachloroethene	164	9.188	9.188	0.000	98	366613	5.00	5.10	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	248911	5.00	4.48	
100 Ethylene Dibromide	107	9.453	9.467	-0.014	98	198331	5.00	4.60	
101 1-Chlorohexane	91	9.705	9.704	0.001	0	280475	2.50	2.33	
102 Chlorobenzene	112	9.802	9.802	0.000	96	1085476	5.00	5.01	
104 Ethylbenzene	106	9.844	9.844	0.000	98	644612	5.00	5.02	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	94	350504	5.00	4.85	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	98	790120	5.00	5.00	
106 Styrene	104	10.235	10.235	0.000	87	1092809	5.00	4.61	
109 o-Xylene	106	10.235	10.235	0.000	88	755858	5.00	5.03	
107 Bromoform	173	10.431	10.431	0.000	98	118885	5.00	4.07	
108 Isopropylbenzene	105	10.501	10.500	0.001	95	2025940	5.00	4.60	
111 Cyclohexanone	55	10.612	10.612	0.000	90	373501	200.0	194.7	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.696	-0.014	92	246643	5.00	4.94	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	92	51416	5.00	4.72	
114 1,2,3-Trichloropropane	110	10.752	10.766	-0.014	84	68117	5.00	4.81	
116 Bromobenzene	156	10.808	10.822	-0.014	95	427417	5.00	4.75	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	580737	5.00	4.97	
120 1,3,5-Trimethylbenzene	105	10.934	10.933	0.001	95	1677814	5.00	5.07	
117 2-Chlorotoluene	126	10.934	10.933	0.001	96	475570	5.00	4.96	
118 4-Chlorotoluene	126	11.017	11.017	0.000	97	468803	5.00	4.82	
119 tert-Butylbenzene	119	11.227	11.227	0.000	91	1679774	5.00	4.96	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	1659206	5.00	4.95	
122 sec-Butylbenzene	134	11.408	11.408	0.000	94	480000	5.00	4.98	
123 4-Isopropyltoluene	119	11.492	11.506	-0.014	97	1940465	5.00	4.72	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	888438	5.00	4.86	
126 1,4-Dichlorobenzene	146	11.618	11.632	-0.014	95	880451	5.00	4.85	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	1807976	5.00	5.34	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	98	762140	5.00	4.86	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	86	37398	5.00	4.08	
130 1,2,4-Trichlorobenzene	180	13.657	13.671	-0.014	94	569311	5.00	4.92	
131 Hexachlorobutadiene	225	13.825	13.824	0.001	97	394897	5.00	5.39	
132 Naphthalene	128	14.006	14.020	-0.014	97	780644	5.00	4.47	
133 1,2,3-Trichlorobenzene	180	14.327	14.341	-0.014	96	483383	5.00	5.15	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.4	
S 134 Trihalomethanes, Total	1				0		20.0	18.9	
S 138 Xylenes, Total	106				0		10.0	10.0	
S 139 Xylenes, Total (URS)	1				0		10.0	10.0	
S 135 1,3-Dichloropropene, Total	1				0		10.0	9.66	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.4	

Reagents:

MV-MegaMain B_00007

Amount Added: 2.00

Units: uL

MV-Gas B_00007

Amount Added: 2.00

Units: uL

MV-568718-D_00014

Amount Added: 1.00

Units: uL

Run Reagent

MV-ARCH SS A_00108

Amount Added: 0.80

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1909.D

Injection Date: 28-Jan-2019 19:56:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: LCSD

Worklist Smp#: 5

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

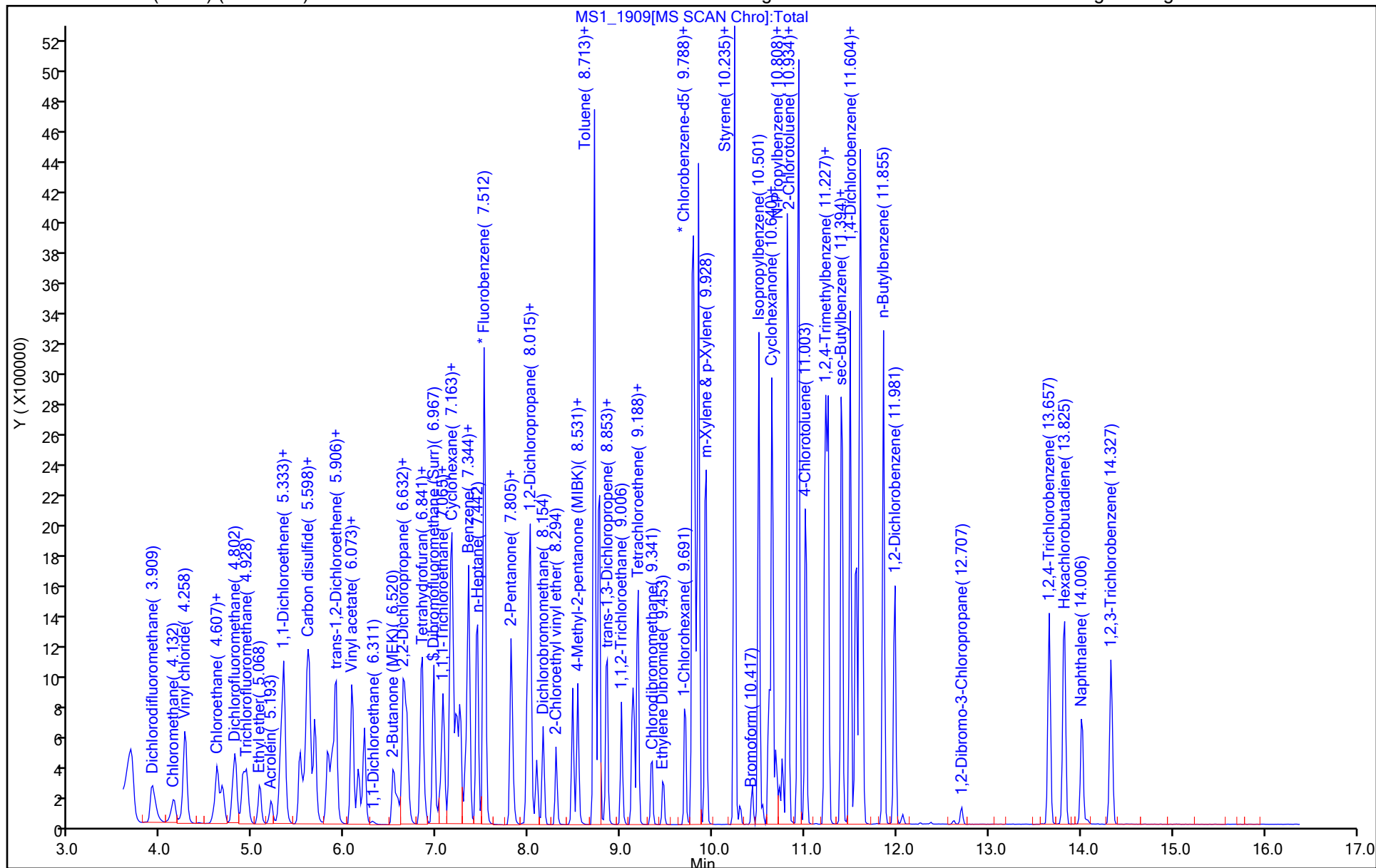
ALS Bottle#: 5

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1909.D
Lims ID: LCSD
Client ID:
Sample Type: LCSD
Inject. Date: 28-Jan-2019 19:56:30 ALS Bottle#: 5 Worklist Smp#: 5
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: LCSD
Operator ID: nwangumaf Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0327

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	10.7	106.63
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	11.2	112.24
\$ 7 Toluene-d8 (Surr)	10.0	10.6	105.70
\$ 8 4-Bromofluorobenzene (Surr)	10.0	10.2	101.74

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: LCSD 280-445753/7
Matrix: Water Lab File ID: MS1_1911.D
Analysis Method: 8260B Date Collected: _____
Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 20:37
Soil Aliquot Vol: _____ Dilution Factor: 1
Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)
% Moisture: _____ Level: (low/med) Low
Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-05-8	Acetonitrile	51.3		30	9.6

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	114		70-127
460-00-4	4-Bromofluorobenzene (Surr)	103		78-120
1868-53-7	Dibromofluoromethane (Surr)	109		77-120
2037-26-5	Toluene-d8 (Surr)	108		80-125

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1911.D
 Lims ID: lcsd
 Client ID:
 Sample Type: LCSD
 Inject. Date: 28-Jan-2019 20:37:30 ALS Bottle#: 7 Worklist Smp#: 7
 Purge Vol: 20.000 mL Dil. Factor: 1.0000
 Sample Info: LCSD s
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.557	0.013	72	541859	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3087873	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.774	9.788	-0.014	86	710150	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	93	1094220	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	710528	10.0	10.9	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	98	579034	10.0	11.4	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2879521	10.0	10.8	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.654	-0.014	0	961732	10.0	10.3	
28 Ethylene oxide	43	4.537	4.523	0.014	98	314642	500.0	427.1	
34 Ethanol	45	4.914	4.900	0.014	98	91770	300.0	296.1	
38 Propene oxide	58	5.152	5.152	0.000	0	2133249	500.0	486.7	
41 Isopropyl alcohol	45	5.305	5.305	0.000	97	94113	50.0	47.3	
44 Acetonitrile	41	5.515	5.501	0.014	99	174410	50.0	51.3	
56 Isopropyl ether	87	6.171	6.171	0.000	93	305198	5.00	5.59	
58 2-Chloro-1,3-butadiene	53	6.283	6.283	0.000	89	568824	5.00	6.37	
59 Tert-butyl ethyl ether	59	6.450	6.450	0.000	97	862923	5.00	5.45	
60 Ethyl acetate	43	6.562	6.562	0.000	98	255059	10.0	9.60	
63 Propionitrile	54	6.618	6.618	0.000	98	209081	50.0	50.8	
66 Methacrylonitrile	41	6.744	6.744	0.000	89	897445	50.0	53.5	
76 Tert-amyl methyl ether	73	7.330	7.330	0.000	98	753485	5.00	5.76	
78 n-Butanol	56	7.526	7.526	0.000	84	113090	125.0	118.7	
81 Methyl methacrylate	100	7.931	7.931	0.000	88	100340	10.0	12.4	
87 2-Nitropropane	41	8.280	8.280	0.000	99	45185	10.0	10.5	
99 Tetrahydrothiophene	60	9.383	9.383	0.000	90	9840	NC	NC	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	81	49005	10.0	7.33	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	1553363	5.00	5.04	
21 1,3,5-Trichlorobenzene	180	12.931	12.945	-0.014	98	696947	5.00	5.57	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

MV-Supp B_00023	Amount Added: 2.00	Units: uL	
MV-568718-D_00014	Amount Added: 1.00	Units: uL	Run Reagent
MV-ARCH SS A_00108	Amount Added: 0.80	Units: uL	Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1911.D

Injection Date: 28-Jan-2019 20:37:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: lcsd

Worklist Smp#: 7

Client ID:

Purge Vol: 20.000 mL

Dil. Factor: 1.0000

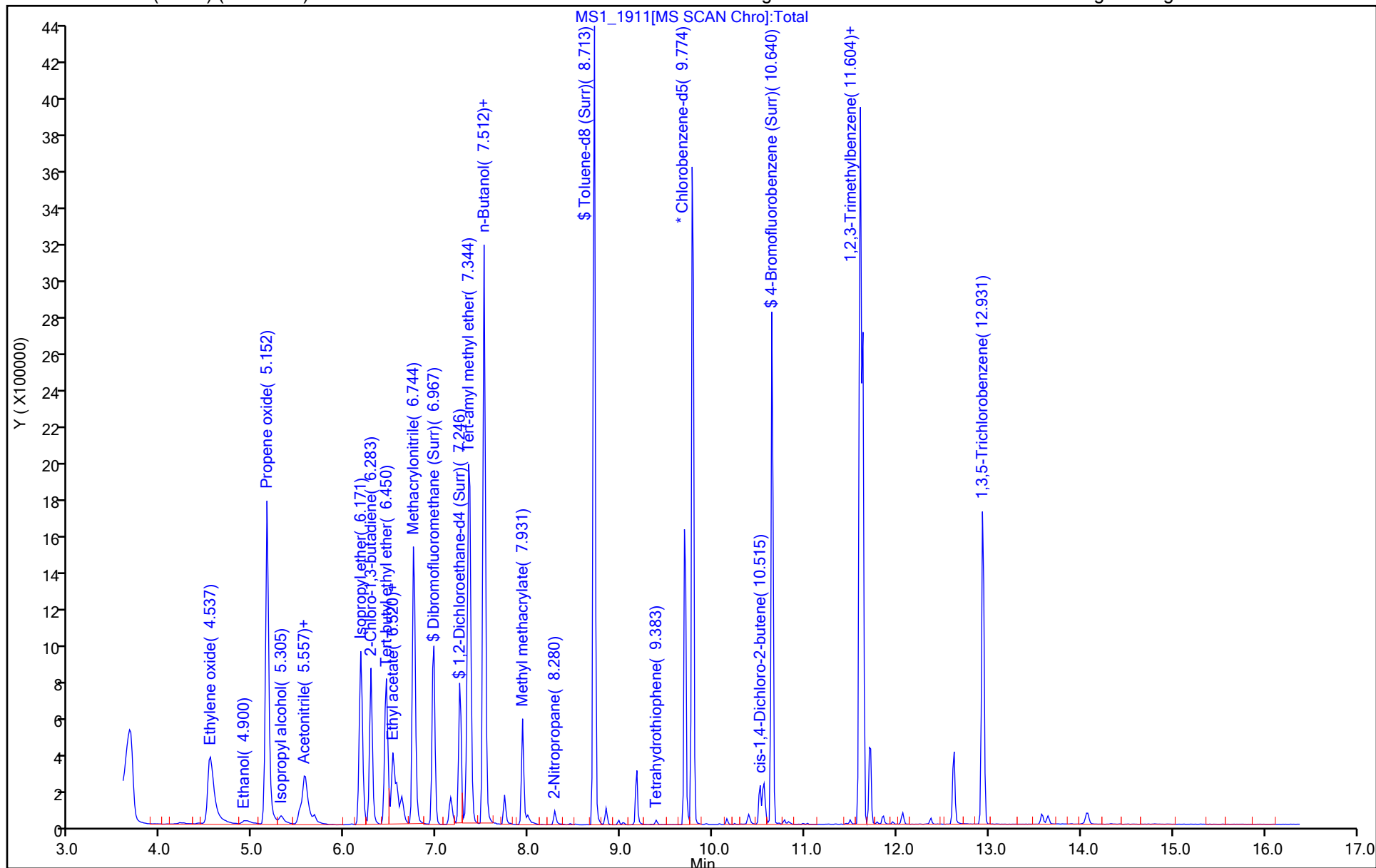
ALS Bottle#: 7

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1911.D
Lims ID: lcsd
Client ID:
Sample Type: LCSD
Inject. Date: 28-Jan-2019 20:37:30 ALS Bottle#: 7 Worklist Smp#: 7
Purge Vol: 20.000 mL Dil. Factor: 1.0000
Sample Info: LCSD s
Operator ID: nwangumaf Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0327

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	10.9	109.36
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	11.4	114.13
\$ 7 Toluene-d8 (Surr)	10.0	10.8	108.42
\$ 8 4-Bromofluorobenzene (Surr)	10.0	10.3	102.63

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>280-119359-C-1 MS</u>
Matrix: <u>Water</u>	Lab File ID: <u>MS1_1913.D</u>
Analysis Method: <u>8260B</u>	Date Collected: <u>01/17/2019 16:20</u>
Sample wt/vol: <u>20 (mL)</u>	Date Analyzed: <u>01/28/2019 21:18</u>
Soil Aliquot Vol: _____	Dilution Factor: <u>4000</u>
Soil Extract Vol.: _____	GC Column: <u>DB-624 (60.25)</u> ID: <u>0.25 (mm)</u>
% Moisture: _____	Level: (low/med) <u>Low</u>
Analysis Batch No.: <u>445753</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	21700		4000	640
79-34-5	1,1,2,2-Tetrachloroethane	21000		4000	840
79-00-5	1,1,2-Trichloroethane	21700		4000	1100
76-13-1	1,1,2-Trichlorotrifluoroethane	20500		12000	1700
75-34-3	1,1-Dichloroethane	22500		4000	880
75-35-4	1,1-Dichloroethene	20300		4000	920
87-61-6	1,2,3-Trichlorobenzene	20700		4000	840
120-82-1	1,2,4-Trichlorobenzene	20100		4000	840
96-12-8	1,2-Dibromo-3-Chloropropane	17500	J	20000	1900
106-93-4	1,2-Dibromoethane	19200		4000	720
95-50-1	1,2-Dichlorobenzene	25400		4000	600
107-06-2	1,2-Dichloroethane	22500		4000	520
78-87-5	1,2-Dichloropropane	22300		4000	720
108-67-8	1,3,5-Trimethylbenzene	20400		4000	640
541-73-1	1,3-Dichlorobenzene	19900		4000	520
106-46-7	1,4-Dichlorobenzene	20100		4000	640
123-91-1	1,4-Dioxane	422000	J	800000	230000
78-93-3	2-Butanone (MEK)	84000		24000	8000
110-75-8	2-Chloroethyl vinyl ether	47000		12000	2800
591-78-6	2-Hexanone	85000		20000	6800
108-10-1	4-Methyl-2-pentanone (MIBK)	89700		20000	3900
67-64-1	Acetone	82800		40000	7600
107-02-8	Acrolein	216000		80000	11000
107-13-1	Acrylonitrile	232000		80000	5600
71-43-2	Benzene	21800		4000	640
75-25-2	Bromoform	18100		4000	760
74-83-9	Bromomethane	24600		8000	840
75-15-0	Carbon disulfide	19700		8000	1800
56-23-5	Carbon tetrachloride	21400		4000	760
108-90-7	Chlorobenzene	20500		4000	680
74-97-5	Chlorobromomethane	20500		4000	400
124-48-1	Chlorodibromomethane	19700		4000	680
75-00-3	Chloroethane	26200		8000	1600
67-66-3	Chloroform	37600		4000	640
74-87-3	Chloromethane	24800		8000	1200
156-59-2	cis-1,2-Dichloroethene	21100		4000	600

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>280-119359-C-1 MS</u>
Matrix: <u>Water</u>	Lab File ID: <u>MS1_1913.D</u>
Analysis Method: <u>8260B</u>	Date Collected: <u>01/17/2019 16:20</u>
Sample wt/vol: <u>20 (mL)</u>	Date Analyzed: <u>01/28/2019 21:18</u>
Soil Aliquot Vol: _____	Dilution Factor: <u>4000</u>
Soil Extract Vol.: _____	GC Column: <u>DB-624 (60.25)</u> ID: <u>0.25 (mm)</u>
% Moisture: _____	Level: (low/med) <u>Low</u>
Analysis Batch No.: <u>445753</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
10061-01-5	cis-1,3-Dichloropropene	20300		4000	640
110-82-7	Cyclohexane	22600		8000	1100
75-27-4	Dichlorobromomethane	21400		4000	680
75-71-8	Dichlorodifluoromethane	27500		8000	1200
100-41-4	Ethylbenzene	20100		4000	640
98-82-8	Isopropylbenzene	18400		4000	760
79-20-9	Methyl acetate	42400		20000	6600
1634-04-4	Methyl tert-butyl ether	20100		20000	1000
108-87-2	Methylcyclohexane	22400		4000	1400
75-09-2	Methylene Chloride	1750000		8000	1300
179601-23-1	m-Xylene & p-Xylene	20200		8000	1400
95-47-6	o-Xylene	20500		4000	760
100-42-5	Styrene	18800		4000	680
127-18-4	Tetrachloroethene	20400		4000	800
108-88-3	Toluene	22300		4000	680
156-60-5	trans-1,2-Dichloroethene	21900		4000	600
10061-02-6	trans-1,3-Dichloropropene	21300		12000	760
79-01-6	Trichloroethene	20700		4000	640
75-69-4	Trichlorofluoromethane	25900		8000	1200
75-01-4	Vinyl chloride	24800		4000	400

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	112		70-127
460-00-4	4-Bromofluorobenzene (Surr)	102		78-120
1868-53-7	Dibromofluoromethane (Surr)	108		77-120
2037-26-5	Toluene-d8 (Surr)	105		80-125

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1913.D
 Lims ID: 280-119359-C-1 MS
 Client ID: GW0119-MW-041
 Sample Type: MS
 Inject. Date: 28-Jan-2019 21:18:30 ALS Bottle#: 9 Worklist Smp#: 13
 Purge Vol: 20.000 mL Dil. Factor: 4000.0000
 Sample Info: 280-119359-C-1 MS pH<2 4000x
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 21:44:43

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.570	5.557	0.013	87	527335	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3196191	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.774	9.788	-0.014	86	755868	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1182196	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	725836	10.0	10.8	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	586071	10.0	11.2	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2961956	10.0	10.5	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.654	-0.014	0	1031091	10.0	10.2	
24 Dichlorodifluoromethane	85	3.894	3.894	0.000	99	665015	5.00	6.87	
26 Chloromethane	50	4.132	4.132	0.000	99	362078	5.00	6.21	
27 Vinyl chloride	62	4.258	4.244	0.014	91	376612	5.00	6.20	
29 Bromomethane	94	4.607	4.607	0.000	89	444634	5.00	6.14	
31 Chloroethane	64	4.663	4.663	0.000	99	378635	5.00	6.54	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	97	859265	5.00	6.31	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	99	780732	5.00	6.47	
36 Ethyl ether	59	5.068	5.068	0.000	90	225933	5.00	5.57	
39 Acrolein	56	5.193	5.193	0.000	99	214002	50.0	54.0	
40 Acetone	43	5.291	5.291	0.000	98	149346	20.0	20.7	
42 1,1,2-Trichloro-1,2,2-trif	151	5.305	5.305	0.000	94	311858	5.00	5.11	
43 1,1-Dichloroethene	96	5.333	5.333	0.000	98	373119	5.00	5.08	
45 Iodomethane	142	5.501	5.501	0.000	99	812232	5.00	6.25	
46 Methyl acetate	43	5.529	5.528	0.000	96	203663	10.0	10.6	
47 3-Chloro-1-propene	41	5.584	5.584	0.000	88	575243	5.00	5.76	
48 Carbon disulfide	76	5.612	5.598	0.014	98	1531617	5.00	4.94	
49 2-Methyl-2-propanol	59	5.626	5.626	0.000	92	145173	50.0	49.0	
50 Methylene Chloride	84	5.654	5.668	-0.014	81	35779949	5.00	438.5	Ee
51 Acrylonitrile	53	5.808	5.808	0.000	99	566255	50.0	58.1	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	94	694916	5.00	5.03	
53 trans-1,2-Dichloroethene	96	5.892	5.892	0.000	99	455535	5.00	5.48	
54 Hexane	57	6.073	6.073	0.000	89	587490	5.00	4.88	
55 Vinyl acetate	43	6.143	6.143	0.000	97	791495	10.0	13.4	
57 1,1-Dichloroethane	63	6.213	6.213	0.000	96	712727	5.00	5.63	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
61 2-Butanone (MEK)	43	6.576	6.576	0.000	98	278540	20.0	21.0	
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	95	165770	75.0	78.9	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	80	473564	5.00	5.27	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	88	589822	5.00	5.34	
67 Chlorobromomethane	128	6.827	6.827	0.000	92	172382	5.00	5.12	
68 Chloroform	83	6.841	6.841	0.000	93	1181189	5.00	9.39	
69 Tetrahydrofuran	42	6.869	6.869	0.000	85	86658	10.0	11.5	
70 Isobutyl alcohol	41	7.023	7.023	0.000	92	115123	125.0	150.0	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	98	643694	5.00	5.43	
72 Cyclohexane	56	7.149	7.149	0.000	0	761088	5.00	5.66	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	99	596721	5.00	5.58	
74 Carbon tetrachloride	117	7.204	7.204	0.000	97	545440	5.00	5.35	
75 1,2-Dichloroethane	62	7.302	7.302	0.000	97	359432	5.00	5.63	
77 Benzene	78	7.344	7.344	0.000	96	1706532	5.00	5.45	
9 n-Heptane	43	7.428	7.442	-0.014	89	604209	5.00	5.89	
79 Trichloroethene	95	7.805	7.805	0.000	98	427590	5.00	5.17	
80 2-Pentanone	43	7.833	7.833	0.000	98	190024	10.0	10.6	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	97	386740	5.00	5.56	
83 Methylcyclohexane	55	8.014	8.014	0.000	0	600635	5.00	5.60	
84 1,4-Dioxane	88	8.028	8.028	0.000	90	33882	100.0	105.6	
85 Dibromomethane	93	8.084	8.084	0.000	96	160749	5.00	5.19	
86 Dichlorobromomethane	83	8.154	8.154	0.000	99	458375	5.00	5.35	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	223998	10.0	11.8	
89 cis-1,3-Dichloropropene	75	8.475	8.475	0.000	98	539209	5.00	5.07	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	94	574695	20.0	22.4	
91 Toluene	91	8.755	8.769	-0.014	99	1827990	5.00	5.57	
92 Ethyl methacrylate	69	8.839	8.838	0.000	87	265247	5.00	4.51	
93 trans-1,3-Dichloropropene	75	8.852	8.852	0.000	95	423562	5.00	5.32	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	90	241658	5.00	5.43	
95 2-Hexanone	43	9.118	9.118	0.000	94	386352	20.0	21.2	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	90	420785	5.00	5.26	
97 Tetrachloroethene	164	9.188	9.188	0.000	98	373168	5.00	5.10	
98 Chlorodibromomethane	129	9.341	9.341	0.000	89	278825	5.00	4.93	
100 Ethylene Dibromide	107	9.453	9.467	-0.014	98	210550	5.00	4.80	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	282858	2.50	2.31	
102 Chlorobenzene	112	9.802	9.802	0.000	97	1132273	5.00	5.14	
104 Ethylbenzene	106	9.844	9.844	0.000	98	657616	5.00	5.03	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	373625	5.00	5.07	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	99	812655	5.00	5.05	
106 Styrene	104	10.235	10.235	0.000	87	1133392	5.00	4.70	
109 o-Xylene	106	10.235	10.235	0.000	88	784598	5.00	5.13	
107 Bromoform	173	10.431	10.431	0.000	98	134926	5.00	4.54	
108 Isopropylbenzene	105	10.500	10.500	0.000	95	2041424	5.00	4.59	
111 Cyclohexanone	55	10.612	10.612	0.000	89	302076	200.0	154.7	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.696	-0.014	93	264594	5.00	5.25	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	95	55840	5.00	5.07	
114 1,2,3-Trichloropropane	110	10.752	10.766	-0.014	84	73855	5.00	5.16	
116 Bromobenzene	156	10.808	10.822	-0.014	94	443524	5.00	4.88	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	587407	5.00	4.98	
120 1,3,5-Trimethylbenzene	105	10.919	10.933	-0.014	94	1701357	5.00	5.09	
117 2-Chlorotoluene	126	10.933	10.933	0.000	96	486077	5.00	5.01	
118 4-Chlorotoluene	126	11.003	11.017	-0.014	98	479357	5.00	4.88	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	1709835	5.00	5.00	
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	1704522	5.00	5.03	
122 sec-Butylbenzene	134	11.394	11.408	-0.014	94	482111	5.00	4.95	
123 4-Isopropyltoluene	119	11.492	11.506	-0.014	97	1962062	5.00	4.73	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	917991	5.00	4.97	
126 1,4-Dichlorobenzene	146	11.618	11.632	-0.014	95	920119	5.00	5.01	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	1819383	5.00	5.32	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	99	1004212	5.00	6.34	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	87	40400	5.00	4.36	
130 1,2,4-Trichlorobenzene	180	13.657	13.671	-0.014	94	588745	5.00	5.03	
131 Hexachlorobutadiene	225	13.824	13.824	0.000	97	389549	5.00	5.26	
132 Naphthalene	128	14.006	14.020	-0.014	97	802460	5.00	4.54	
133 1,2,3-Trichlorobenzene	180	14.327	14.341	-0.014	95	490780	5.00	5.18	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.7	
S 134 Trihalomethanes, Total	1				0		20.0	24.2	
S 138 Xylenes, Total	106				0		10.0	10.2	
S 139 Xylenes, Total (URS)	1				0		10.0	10.2	
S 135 1,3-Dichloropropene, Total	1				0		10.0	10.4	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.7	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

e - Potential Peak Saturated

Reagents:

MV-MegaMain B_00007

Amount Added: 2.00

Units: uL

MV-Gas B_00007

Amount Added: 2.00

Units: uL

MV-568718-D_00014

Amount Added: 1.00

Units: uL

Run Reagent

MV-ARCH SS A_00108

Amount Added: 0.80

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1913.D

Injection Date: 28-Jan-2019 21:18:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: 280-119359-C-1 MS

Worklist Smp#: 13

Client ID: GW0119-MW-041

Purge Vol: 20.000 mL

Dil. Factor: 4000.0000

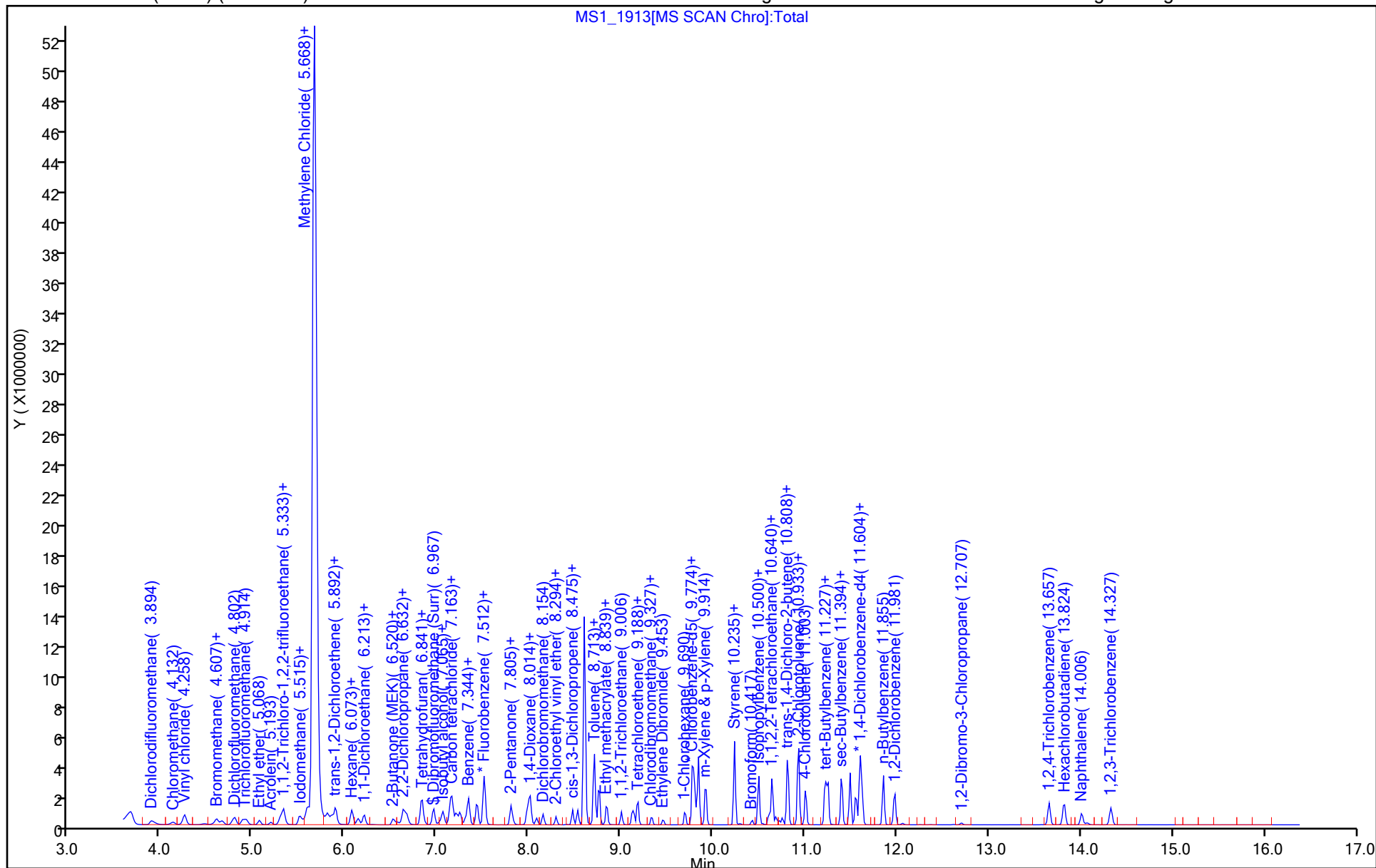
ALS Bottle#: 9

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1913.D
 Lims ID: 280-119359-C-1 MS
 Client ID: GW0119-MW-041
 Sample Type: MS
 Inject. Date: 28-Jan-2019 21:18:30 ALS Bottle#: 9 Worklist Smp#: 13
 Purge Vol: 20.000 mL Dil. Factor: 4000.0000
 Sample Info: 280-119359-C-1 MS pH<2 4000x
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 21:44:43

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	10.8	107.93
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	11.2	111.61
\$ 7 Toluene-d8 (Surr)	10.0	10.5	104.78
\$ 8 4-Bromofluorobenzene (Surr)	10.0	10.2	101.85
\$ 4 BFB	0.0	0	0.00

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: 280-119359-C-1 MS
 Matrix: Water Lab File ID: MS1_1915.D
 Analysis Method: 8260B Date Collected: 01/17/2019 16:20
 Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 21:59
 Soil Aliquot Vol: _____ Dilution Factor: 4000
 Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)
 % Moisture: _____ Level: (low/med) Low
 Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-05-8	Acetonitrile	323000		120000	38000

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		70-127
460-00-4	4-Bromofluorobenzene (Surr)	95		78-120
1868-53-7	Dibromofluoromethane (Surr)	102		77-120
2037-26-5	Toluene-d8 (Surr)	101		80-125

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1915.D
 Lims ID: 280-119359-C-1 MS
 Client ID: GW0119-MW-041
 Sample Type: MS
 Inject. Date: 28-Jan-2019 21:59:30 ALS Bottle#: 11 Worklist Smp#: 15
 Purge Vol: 20.000 mL Dil. Factor: 4000.0000
 Sample Info: 280-119359-C-1 MS pH<2 4000x
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 23:41:41

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.557	0.014	71	554440	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3200508	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.774	9.788	-0.014	86	731753	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	94	1119488	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	686141	10.0	10.2	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	541310	10.0	10.3	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2771776	10.0	10.1	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.654	-0.014	0	913456	10.0	9.53	
28 Ethylene oxide	43	4.537	4.523	0.014	98	343400	500.0	454.1	
34 Ethanol	45	4.914	4.900	0.014	99	89690	300.0	282.8	
38 Propene oxide	58	5.152	5.152	0.000	0	2332860	500.0	513.5	
41 Isopropyl alcohol	45	5.319	5.305	0.014	98	105131	50.0	51.7	
44 Acetonitrile	41	5.515	5.501	0.014	100	284877	50.0	80.9	
56 Isopropyl ether	87	6.171	6.171	0.000	94	347449	5.00	6.14	
58 2-Chloro-1,3-butadiene	53	6.283	6.283	0.000	89	655613	5.00	7.09	
59 Tert-butyl ethyl ether	59	6.450	6.450	0.000	97	993038	5.00	6.05	
60 Ethyl acetate	43	6.562	6.562	0.000	98	268301	10.0	9.75	
63 Propionitrile	54	6.618	6.618	0.000	98	229596	50.0	53.8	
66 Methacrylonitrile	41	6.744	6.744	0.000	89	976048	50.0	56.2	
76 Tert-amyl methyl ether	73	7.344	7.330	0.014	99	860252	5.00	6.35	
78 n-Butanol	56	7.526	7.526	0.000	83	127264	125.0	131.6	
81 Methyl methacrylate	100	7.931	7.931	0.000	86	112474	10.0	13.4	
87 2-Nitropropane	41	8.280	8.280	0.000	97	58210	10.0	13.1	
99 Tetrahydrothiophene	60	9.383	9.383	0.000	89	12018	NC	NC	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	79	62925	10.0	9.20	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	97	1745047	5.00	5.53	
21 1,3,5-Trichlorobenzene	180	12.931	12.945	-0.014	97	776927	5.00	6.07	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

MV-Supp B_00023	Amount Added: 2.00	Units: uL	
MV-568718-D_00014	Amount Added: 1.00	Units: uL	Run Reagent
MV-ARCH SS A_00108	Amount Added: 0.80	Units: uL	Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1915.D

Injection Date: 28-Jan-2019 21:59:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: 280-119359-C-1 MS

Worklist Smp#: 15

Client ID: GW0119-MW-041

Purge Vol: 20.000 mL

Dil. Factor: 4000.0000

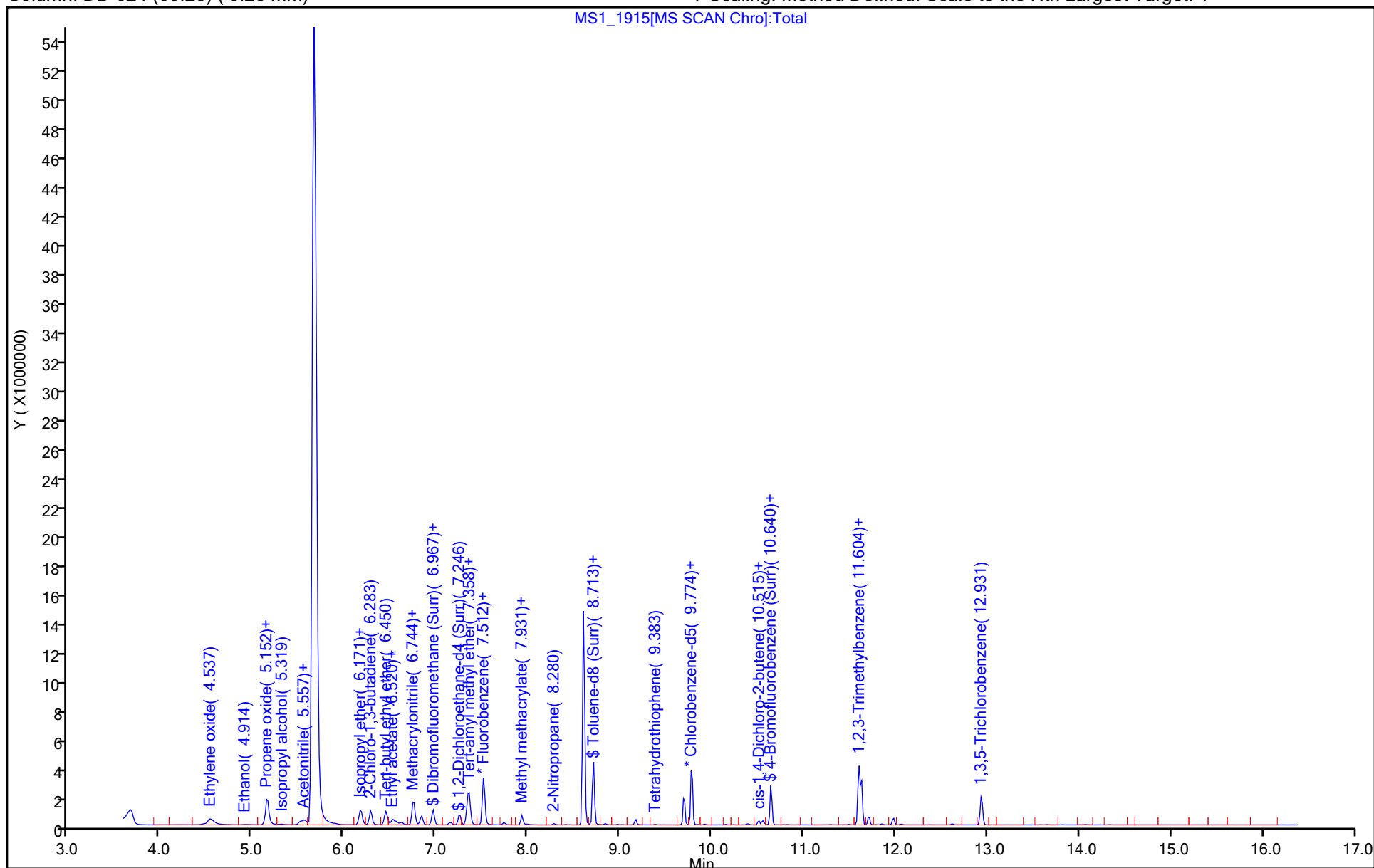
ALS Bottle#: 11

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1915.D
 Lims ID: 280-119359-C-1 MS
 Client ID: GW0119-MW-041
 Sample Type: MS
 Inject. Date: 28-Jan-2019 21:59:30 ALS Bottle#: 11 Worklist Smp#: 15
 Purge Vol: 20.000 mL Dil. Factor: 4000.0000
 Sample Info: 280-119359-C-1 MS pH<2 4000x
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 23:41:41

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	10.2	101.89
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	10.3	102.94
\$ 7 Toluene-d8 (Surr)	10.0	10.1	101.28
\$ 8 4-Bromofluorobenzene (Surr)	10.0	9.53	95.28

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>280-119359-A-1 MSD</u>
Matrix: <u>Water</u>	Lab File ID: <u>MS1_1914.D</u>
Analysis Method: <u>8260B</u>	Date Collected: <u>01/17/2019 16:20</u>
Sample wt/vol: <u>20 (mL)</u>	Date Analyzed: <u>01/28/2019 21:38</u>
Soil Aliquot Vol: _____	Dilution Factor: <u>4000</u>
Soil Extract Vol.: _____	GC Column: <u>DB-624 (60.25)</u> ID: <u>0.25 (mm)</u>
% Moisture: _____	Level: (low/med) <u>Low</u>
Analysis Batch No.: <u>445753</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	20600		4000	640
79-34-5	1,1,2,2-Tetrachloroethane	19800		4000	840
79-00-5	1,1,2-Trichloroethane	20000		4000	1100
76-13-1	1,1,2-Trichlorotrifluoroethane	19700		12000	1700
75-34-3	1,1-Dichloroethane	20900		4000	880
75-35-4	1,1-Dichloroethene	19600		4000	920
87-61-6	1,2,3-Trichlorobenzene	19700		4000	840
120-82-1	1,2,4-Trichlorobenzene	19600		4000	840
96-12-8	1,2-Dibromo-3-Chloropropane	17600	J	20000	1900
106-93-4	1,2-Dibromoethane	18100		4000	720
95-50-1	1,2-Dichlorobenzene	24900		4000	600
107-06-2	1,2-Dichloroethane	21000		4000	520
78-87-5	1,2-Dichloropropane	21000		4000	720
108-67-8	1,3,5-Trimethylbenzene	19700		4000	640
541-73-1	1,3-Dichlorobenzene	18900		4000	520
106-46-7	1,4-Dichlorobenzene	19100		4000	640
123-91-1	1,4-Dioxane	376000	J	800000	230000
78-93-3	2-Butanone (MEK)	77900		24000	8000
110-75-8	2-Chloroethyl vinyl ether	40900		12000	2800
591-78-6	2-Hexanone	78500		20000	6800
108-10-1	4-Methyl-2-pentanone (MIBK)	83000		20000	3900
67-64-1	Acetone	82000		40000	7600
107-02-8	Acrolein	200000		80000	11000
107-13-1	Acrylonitrile	211000		80000	5600
71-43-2	Benzene	20600		4000	640
75-25-2	Bromoform	17400		4000	760
74-83-9	Bromomethane	21200		8000	840
75-15-0	Carbon disulfide	18700		8000	1800
56-23-5	Carbon tetrachloride	20700		4000	760
108-90-7	Chlorobenzene	19200		4000	680
74-97-5	Chlorobromomethane	19100		4000	400
124-48-1	Chlorodibromomethane	18300		4000	680
75-00-3	Chloroethane	23000		8000	1600
67-66-3	Chloroform	37400		4000	640
74-87-3	Chloromethane	21400		8000	1200
156-59-2	cis-1,2-Dichloroethene	19800		4000	600

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>280-119359-A-1 MSD</u>
Matrix: <u>Water</u>	Lab File ID: <u>MS1_1914.D</u>
Analysis Method: <u>8260B</u>	Date Collected: <u>01/17/2019 16:20</u>
Sample wt/vol: <u>20 (mL)</u>	Date Analyzed: <u>01/28/2019 21:38</u>
Soil Aliquot Vol: _____	Dilution Factor: <u>4000</u>
Soil Extract Vol.: _____	GC Column: <u>DB-624 (60.25)</u> ID: <u>0.25 (mm)</u>
% Moisture: _____	Level: (low/med) <u>Low</u>
Analysis Batch No.: <u>445753</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
10061-01-5	cis-1,3-Dichloropropene	19100		4000	640
110-82-7	Cyclohexane	21300		8000	1100
75-27-4	Dichlorobromomethane	19500		4000	680
75-71-8	Dichlorodifluoromethane	23800		8000	1200
100-41-4	Ethylbenzene	19100		4000	640
98-82-8	Isopropylbenzene	17900		4000	760
79-20-9	Methyl acetate	38600		20000	6600
1634-04-4	Methyl tert-butyl ether	18800	J	20000	1000
108-87-2	Methylcyclohexane	21100		4000	1400
75-09-2	Methylene Chloride	1700000		8000	1300
179601-23-1	m-Xylene & p-Xylene	19200		8000	1400
95-47-6	o-Xylene	19500		4000	760
100-42-5	Styrene	17600		4000	680
127-18-4	Tetrachloroethene	19300		4000	800
108-88-3	Toluene	20900		4000	680
156-60-5	trans-1,2-Dichloroethene	20900		4000	600
10061-02-6	trans-1,3-Dichloropropene	19500		12000	760
79-01-6	Trichloroethene	19700		4000	640
75-69-4	Trichlorofluoromethane	22100		8000	1200
75-01-4	Vinyl chloride	21900		4000	400

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	108		70-127
460-00-4	4-Bromofluorobenzene (Surr)	99		78-120
1868-53-7	Dibromofluoromethane (Surr)	103		77-120
2037-26-5	Toluene-d8 (Surr)	102		80-125

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1914.D
 Lims ID: 280-119359-A-1 MSD
 Client ID: GW0119-MW-041
 Sample Type: MSD
 Inject. Date: 28-Jan-2019 21:38:30 ALS Bottle#: 10 Worklist Smp#: 14
 Purge Vol: 20.000 mL Dil. Factor: 4000.0000
 Sample Info: 280-119359-A-1 MSD pH<2 4000x
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.556	5.557	-0.001	86	513656	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3442086	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.774	9.788	-0.014	86	800599	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	95	1219522	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	93	748978	10.0	10.3	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	97	608501	10.0	10.8	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	3065076	10.0	10.2	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.654	-0.014	0	1032553	10.0	9.89	
24 Dichlorodifluoromethane	85	3.894	3.894	0.000	99	618812	5.00	5.95	
26 Chloromethane	50	4.132	4.132	0.000	99	336548	5.00	5.36	
27 Vinyl chloride	62	4.258	4.244	0.014	91	358452	5.00	5.48	
29 Bromomethane	94	4.607	4.607	0.000	90	413039	5.00	5.30	
31 Chloroethane	64	4.663	4.663	0.000	99	358149	5.00	5.75	
32 Dichlorofluoromethane	67	4.802	4.802	0.000	97	800405	5.00	5.46	
33 Trichlorofluoromethane	101	4.914	4.914	0.000	98	719938	5.00	5.54	
36 Ethyl ether	59	5.068	5.068	0.000	89	227685	5.00	5.21	
39 Acrolein	56	5.193	5.193	0.000	99	213096	50.0	49.9	
40 Acetone	43	5.291	5.291	0.000	99	159262	20.0	20.5	
42 1,1,2-Trichloro-1,2,2-trif	151	5.305	5.305	0.000	93	323531	5.00	4.93	
43 1,1-Dichloroethene	96	5.333	5.333	0.000	97	387986	5.00	4.91	
45 Iodomethane	142	5.501	5.501	0.000	98	879110	5.00	6.28	
46 Methyl acetate	43	5.529	5.528	0.001	95	199632	10.0	9.64	
47 3-Chloro-1-propene	41	5.584	5.584	0.000	84	580467	5.00	5.39	
48 Carbon disulfide	76	5.612	5.598	0.014	98	1558953	5.00	4.67	
49 2-Methyl-2-propanol	59	5.626	5.626	0.000	92	138119	50.0	47.8	
50 Methylene Chloride	84	5.654	5.668	-0.014	82	37396408	5.00	425.5	Ee
51 Acrylonitrile	53	5.808	5.808	0.000	98	553799	50.0	52.8	
52 Methyl tert-butyl ether	73	5.864	5.864	0.000	94	698449	5.00	4.69	
53 trans-1,2-Dichloroethene	96	5.892	5.892	0.000	98	466974	5.00	5.21	
54 Hexane	57	6.073	6.073	0.000	88	596138	5.00	4.68	
55 Vinyl acetate	43	6.143	6.143	0.000	97	775028	10.0	12.2	
57 1,1-Dichloroethane	63	6.199	6.213	-0.014	96	713124	5.00	5.23	
61 2-Butanone (MEK)	43	6.576	6.576	0.000	98	277949	20.0	19.5	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
62 sec-Butyl Alcohol	45	6.618	6.618	0.000	94	159143	75.0	77.7	
64 cis-1,2-Dichloroethene	96	6.632	6.632	0.000	80	479965	5.00	4.96	
65 2,2-Dichloropropane	77	6.674	6.674	0.000	87	596243	5.00	5.02	
67 Chlorobromomethane	128	6.827	6.827	0.000	95	173167	5.00	4.78	
68 Chloroform	83	6.841	6.841	0.000	93	1267942	5.00	9.36	
69 Tetrahydrofuran	42	6.869	6.869	0.000	86	85853	10.0	10.5	
70 Isobutyl alcohol	41	7.023	7.023	0.000	95	110240	125.0	147.5	
71 1,1,1-Trichloroethane	97	7.065	7.065	0.000	98	658552	5.00	5.16	
72 Cyclohexane	56	7.149	7.149	0.000	0	770902	5.00	5.32	
73 1,1-Dichloropropene	75	7.163	7.163	0.000	99	594163	5.00	5.16	
74 Carbon tetrachloride	117	7.204	7.204	0.000	95	569079	5.00	5.18	
75 1,2-Dichloroethane	62	7.302	7.302	0.000	97	360586	5.00	5.25	
77 Benzene	78	7.344	7.344	0.000	96	1734634	5.00	5.15	
9 n-Heptane	43	7.428	7.442	-0.014	90	623416	5.00	5.64	
79 Trichloroethene	95	7.805	7.805	0.000	98	438168	5.00	4.92	
80 2-Pentanone	43	7.833	7.833	0.000	98	187689	10.0	9.70	
82 1,2-Dichloropropane	63	7.987	7.987	0.000	97	392084	5.00	5.24	
83 Methylcyclohexane	55	8.015	8.014	0.001	0	610429	5.00	5.28	
84 1,4-Dioxane	88	8.028	8.028	0.000	93	32530	100.0	94.1	
85 Dibromomethane	93	8.084	8.084	0.000	96	162528	5.00	4.87	
86 Dichlorobromomethane	83	8.154	8.154	0.000	100	450166	5.00	4.88	
88 2-Chloroethyl vinyl ether	63	8.294	8.294	0.000	91	209651	10.0	10.2	
89 cis-1,3-Dichloropropene	75	8.475	8.475	0.000	98	537449	5.00	4.77	
90 4-Methyl-2-pentanone (MIBK)	43	8.531	8.531	0.000	94	572963	20.0	20.8	
91 Toluene	91	8.755	8.769	-0.014	99	1844943	5.00	5.22	
92 Ethyl methacrylate	69	8.839	8.838	0.001	88	259046	5.00	4.16	
93 trans-1,3-Dichloropropene	75	8.852	8.852	0.000	95	417909	5.00	4.88	
94 1,1,2-Trichloroethane	97	9.006	9.006	0.000	90	239321	5.00	4.99	
95 2-Hexanone	43	9.118	9.118	0.000	94	377967	20.0	19.6	
96 1,3-Dichloropropane	76	9.146	9.146	0.000	93	417314	5.00	4.93	
97 Tetrachloroethene	164	9.188	9.188	0.000	98	373927	5.00	4.82	
98 Chlorodibromomethane	129	9.341	9.341	0.000	90	274258	5.00	4.58	
100 Ethylene Dibromide	107	9.453	9.467	-0.014	100	210889	5.00	4.54	
101 1-Chlorohexane	91	9.704	9.704	0.000	0	289574	2.50	2.23	
102 Chlorobenzene	112	9.802	9.802	0.000	97	1123700	5.00	4.81	
104 Ethylbenzene	106	9.844	9.844	0.000	98	662709	5.00	4.78	
103 1,1,1,2-Tetrachloroethane	131	9.844	9.844	0.000	95	373912	5.00	4.79	
105 m-Xylene & p-Xylene	106	9.928	9.928	0.000	99	818467	5.00	4.80	
106 Styrene	104	10.235	10.235	0.000	87	1126730	5.00	4.41	
109 o-Xylene	106	10.235	10.235	0.000	88	789245	5.00	4.87	
107 Bromoform	173	10.431	10.431	0.000	98	137085	5.00	4.35	
108 Isopropylbenzene	105	10.501	10.500	0.000	95	2060317	5.00	4.48	
111 Cyclohexanone	55	10.612	10.612	0.000	89	366429	200.0	177.1	
112 1,1,2,2-Tetrachloroethane	83	10.682	10.696	-0.014	92	257735	5.00	4.96	
113 trans-1,4-Dichloro-2-buten	53	10.724	10.724	0.000	91	55269	5.00	4.86	
114 1,2,3-Trichloropropane	110	10.752	10.766	-0.014	84	72428	5.00	4.90	
116 Bromobenzene	156	10.808	10.822	-0.014	94	443323	5.00	4.73	
115 N-Propylbenzene	120	10.822	10.822	0.000	98	588579	5.00	4.84	
120 1,3,5-Trimethylbenzene	105	10.920	10.933	-0.013	96	1694446	5.00	4.91	
117 2-Chlorotoluene	126	10.933	10.933	0.000	96	488660	5.00	4.89	
118 4-Chlorotoluene	126	11.003	11.017	-0.014	98	479741	5.00	4.73	
119 tert-Butylbenzene	119	11.227	11.227	0.000	92	1702377	5.00	4.82	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
121 1,2,4-Trimethylbenzene	105	11.255	11.255	0.000	96	1717256	5.00	4.92	
122 sec-Butylbenzene	134	11.394	11.408	-0.014	94	483640	5.00	4.81	
123 4-Isopropyltoluene	119	11.492	11.506	-0.014	97	1942918	5.00	4.53	
124 1,3-Dichlorobenzene	146	11.562	11.562	0.000	97	899574	5.00	4.73	
126 1,4-Dichlorobenzene	146	11.618	11.632	-0.014	95	905246	5.00	4.78	
127 n-Butylbenzene	91	11.855	11.855	0.000	97	1803425	5.00	5.11	
128 1,2-Dichlorobenzene	146	11.981	11.981	0.000	99	1016420	5.00	6.22	
129 1,2-Dibromo-3-Chloropropan	157	12.707	12.707	0.000	87	42095	5.00	4.41	
130 1,2,4-Trichlorobenzene	180	13.657	13.671	-0.014	95	591180	5.00	4.90	
131 Hexachlorobutadiene	225	13.824	13.824	0.000	97	390811	5.00	5.12	
132 Naphthalene	128	14.006	14.020	-0.014	97	806363	5.00	4.43	
133 1,2,3-Trichlorobenzene	180	14.327	14.341	-0.014	96	481650	5.00	4.93	
S 140 1,2-Dichloroethene, Total	96				0		10.0	10.2	
S 134 Trihalomethanes, Total	1				0		20.0	23.2	
S 138 Xylenes, Total	106				0		10.0	9.67	
S 139 Xylenes, Total (URS)	1				0		10.0	9.67	
S 135 1,3-Dichloropropene, Total	1				0		10.0	9.64	
S 136 1,2-Dichloroethene, Total	1				0		10.0	10.2	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

e - Potential Peak Saturated

Reagents:

MV-MegaMain B_00007

Amount Added: 2.00

Units: uL

MV-Gas B_00007

Amount Added: 2.00

Units: uL

MV-568718-D_00014

Amount Added: 1.00

Units: uL

Run Reagent

MV-ARCH SS A_00108

Amount Added: 0.80

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1914.D

Injection Date: 28-Jan-2019 21:38:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: 280-119359-A-1 MSD

Worklist Smp#: 14

Client ID: GW0119-MW-041

Purge Vol: 20.000 mL

Dil. Factor: 4000.0000

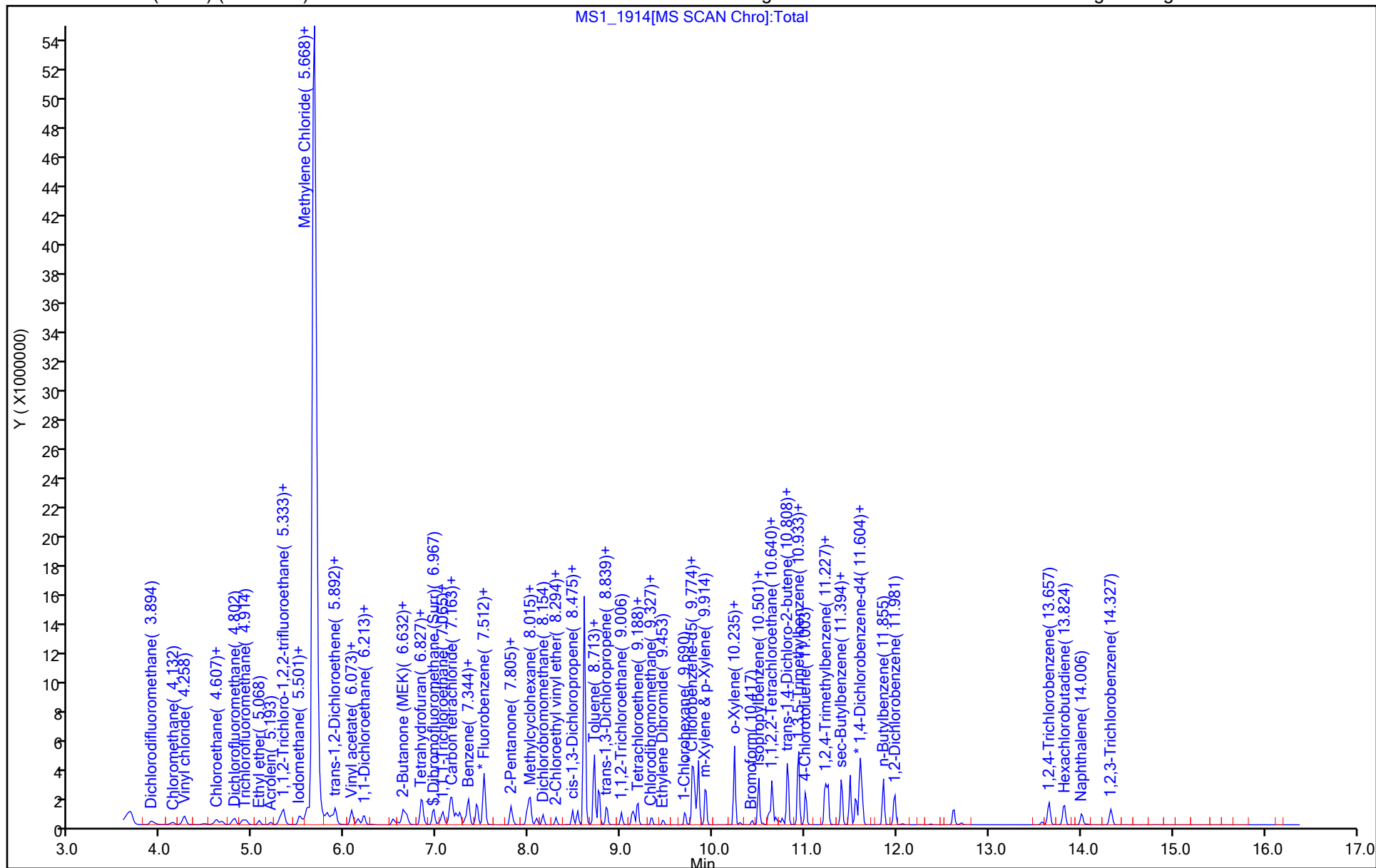
ALS Bottle#: 10

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1914.D
Lims ID: 280-119359-A-1 MSD
Client ID: GW0119-MW-041
Sample Type: MSD
Inject. Date: 28-Jan-2019 21:38:30 ALS Bottle#: 10 Worklist Smp#: 14
Purge Vol: 20.000 mL Dil. Factor: 4000.0000
Sample Info: 280-119359-A-1 MSD pH<2 4000x
Operator ID: nwangumaf Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0327

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	10.3	103.42
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	10.8	107.60
\$ 7 Toluene-d8 (Surr)	10.0	10.2	102.37
\$ 8 4-Bromofluorobenzene (Surr)	10.0	9.89	98.87
\$ 4 BFB	0.0	0	0.00

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: 280-119359-A-1 MSD
Matrix: Water Lab File ID: MS1_1916.D
Analysis Method: 8260B Date Collected: 01/17/2019 16:20
Sample wt/vol: 20 (mL) Date Analyzed: 01/28/2019 22:19
Soil Aliquot Vol: _____ Dilution Factor: 4000
Soil Extract Vol.: _____ GC Column: DB-624 (60.25) ID: 0.25 (mm)
% Moisture: _____ Level: (low/med) Low
Analysis Batch No.: 445753 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-05-8	Acetonitrile	310000		120000	38000

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	106		70-127
460-00-4	4-Bromofluorobenzene (Surr)	97		78-120
1868-53-7	Dibromofluoromethane (Surr)	105		77-120
2037-26-5	Toluene-d8 (Surr)	103		80-125

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1916.D
 Lims ID: 280-119359-A-1 MSD
 Client ID: GW0119-MW-041
 Sample Type: MSD
 Inject. Date: 28-Jan-2019 22:19:30 ALS Bottle#: 12 Worklist Smp#: 20
 Purge Vol: 20.000 mL Dil. Factor: 4000.0000
 Sample Info: 280-119359-A-1 MSD pH<2 4000x
 Operator ID: nwangumaf Instrument ID: VMS_MS1
 Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
 Limit Group: MSV - 8260B Water and Solid
 Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\MS1_1427.D
 Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
 Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 23:43:44

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/l	OnCol Amt ug/l	Flags
* 150 TBA-d9 (IS)	65	5.571	5.557	0.013	71	548178	250.0	250.0	
* 1 Fluorobenzene	96	7.512	7.512	0.000	99	3331082	12.5	12.5	
* 2 Chlorobenzene-d5	119	9.788	9.788	0.000	85	766101	12.5	12.5	
* 3 1,4-Dichlorobenzene-d4	152	11.604	11.604	0.000	93	1182542	12.5	12.5	
\$ 5 Dibromofluoromethane (Surr	111	6.967	6.967	0.000	94	732514	10.0	10.5	
\$ 6 1,2-Dichloroethane-d4 (Sur	65	7.246	7.246	0.000	98	582788	10.0	10.6	
\$ 7 Toluene-d8 (Surr)	98	8.713	8.713	0.000	92	2938028	10.0	10.3	
\$ 8 4-Bromofluorobenzene (Surr	95	10.640	10.654	-0.014	0	984596	10.0	9.72	
28 Ethylene oxide	43	4.537	4.523	0.014	98	317652	500.0	394.4	
34 Ethanol	45	4.914	4.900	0.014	99	96278	300.0	307.0	
38 Propene oxide	58	5.165	5.152	0.013	0	2185770	500.0	462.2	
41 Isopropyl alcohol	45	5.319	5.305	0.014	97	101165	50.0	50.3	
44 Acetonitrile	41	5.515	5.501	0.014	100	284158	50.0	77.5	
56 Isopropyl ether	87	6.185	6.171	0.014	94	325029	5.00	5.52	
58 2-Chloro-1,3-butadiene	53	6.283	6.283	0.000	89	594259	5.00	6.17	
59 Tert-butyl ethyl ether	59	6.450	6.450	0.000	97	921841	5.00	5.40	
60 Ethyl acetate	43	6.562	6.562	0.000	98	260198	10.0	9.08	
63 Propionitrile	54	6.618	6.618	0.000	98	218704	50.0	49.2	
66 Methacrylonitrile	41	6.744	6.744	0.000	90	913981	50.0	50.5	
76 Tert-amyl methyl ether	73	7.344	7.330	0.014	98	806866	5.00	5.72	
78 n-Butanol	56	7.526	7.526	0.000	85	123962	125.0	129.5	
81 Methyl methacrylate	100	7.931	7.931	0.000	87	104858	10.0	12.0	
87 2-Nitropropane	41	8.280	8.280	0.000	98	52509	10.0	11.3	
99 Tetrahydrothiophene	60	9.383	9.383	0.000	91	11160	NC	NC	
110 cis-1,4-Dichloro-2-butene	53	10.515	10.515	0.000	78	57146	10.0	7.91	
125 1,2,3-Trimethylbenzene	105	11.632	11.632	0.000	98	1642309	5.00	4.93	
21 1,3,5-Trichlorobenzene	180	12.931	12.945	-0.014	97	732018	5.00	5.42	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

MV-Supp B_00023	Amount Added: 2.00	Units: uL	
MV-568718-D_00014	Amount Added: 1.00	Units: uL	Run Reagent
MV-ARCH SS A_00108	Amount Added: 0.80	Units: uL	Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\MS1_1916.D

Injection Date: 28-Jan-2019 22:19:30

Instrument ID: VMS_MS1

Operator ID: nwangumaf

Lims ID: 280-119359-A-1 MSD

Worklist Smp#: 20

Client ID: GW0119-MW-041

Purge Vol: 20.000 mL

Dil. Factor: 4000.0000

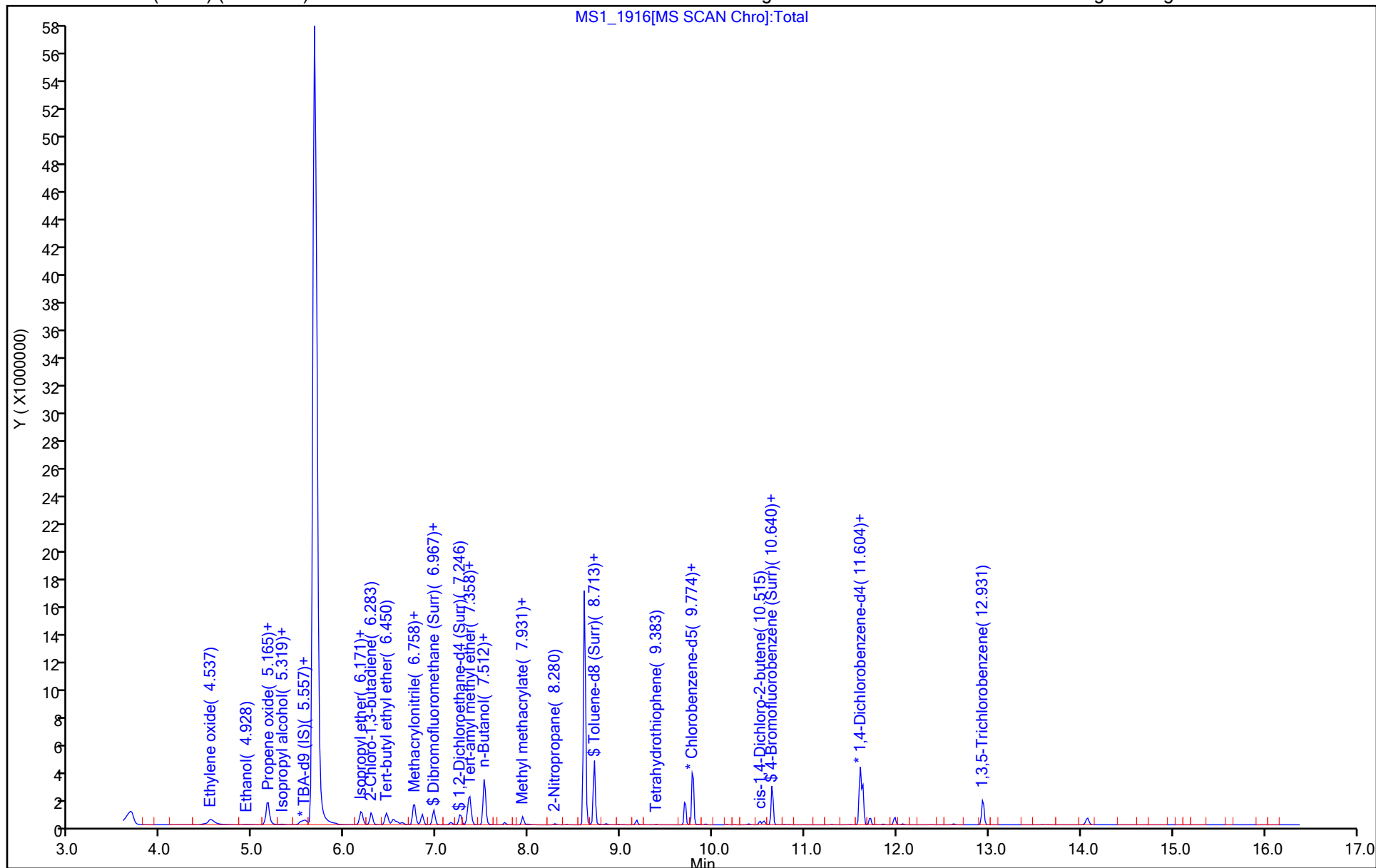
ALS Bottle#: 12

Method: AQ_VMS1_8260

Limit Group: MSV - 8260B Water and Solid

Column: DB-624 (60.25) (0.25 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\VMS1_1916.D
Lims ID: 280-119359-A-1 MSD
Client ID: GW0119-MW-041
Sample Type: MSD
Inject. Date: 28-Jan-2019 22:19:30 ALS Bottle#: 12 Worklist Smp#: 20
Purge Vol: 20.000 mL Dil. Factor: 4000.0000
Sample Info: 280-119359-A-1 MSD pH<2 4000x
Operator ID: nwangumaf Instrument ID: VMS_MS1
Method: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b\AQ_VMS1_8260.m
Limit Group: MSV - 8260B Water and Solid
Last Update: 29-Jan-2019 17:54:01 Calib Date: 18-Jan-2019 13:52:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b\VMS1_1427.D
Column 1 : DB-624 (60.25) (0.25 mm) Det: MS SCAN
Process Host: CTX0327

First Level Reviewer: nwangumaf

Date: 28-Jan-2019 23:43:44

Compound	Amount Added	Amount Recovered	% Rec.
\$ 5 Dibromofluoromethane (Surr)	10.0	10.5	104.51
\$ 6 1,2-Dichloroethane-d4 (Surr)	10.0	10.6	106.49
\$ 7 Toluene-d8 (Surr)	10.0	10.3	102.54
\$ 8 4-Bromofluorobenzene (Surr)	10.0	9.72	97.23

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Instrument ID: VMS_MS1Start Date: 01/08/2019 08:17Analysis Batch Number: 443512End Date: 01/08/2019 18:21

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-443512/1		01/08/2019 08:17	1	MS1_1065.D	DB-624 (60.25) 0.25 (mm)
STD 280-443512/12 IC		01/08/2019 09:26	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 09:26	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/13 IC		01/08/2019 09:46	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 09:46	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/14 IC		01/08/2019 10:07	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 10:07	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/15 IC		01/08/2019 10:28	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 10:28	1		DB-624 (60.25) 0.25 (mm)
ICIS 280-443512/16		01/08/2019 10:48	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 10:48	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/17 IC		01/08/2019 11:09	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/18 IC		01/08/2019 11:30	1		DB-624 (60.25) 0.25 (mm)
ICV 280-443512/19		01/08/2019 12:11	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/20 IC		01/08/2019 12:31	1	MS1_1077.D	DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 12:31	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/21 IC		01/08/2019 12:52	1	MS1_1078.D	DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 12:52	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/22 IC		01/08/2019 13:13	1	MS1_1079.D	DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 13:13	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/23 IC		01/08/2019 13:33	1	MS1_1080.D	DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 13:33	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/24 IC		01/08/2019 13:54	1	MS1_1081.D	DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/08/2019 13:54	1		DB-624 (60.25) 0.25 (mm)
STD 280-443512/25 IC		01/08/2019 14:14	1	MS1_1082.D	DB-624 (60.25) 0.25 (mm)
ICV 280-443512/26		01/08/2019 14:55	1	MS1_1084.D	DB-624 (60.25) 0.25 (mm)
280-117879-A-1 MDLV		01/08/2019 15:16	1		DB-624 (60.25) 0.25 (mm)
280-117879-A-2 MDLV		01/08/2019 15:37	1		DB-624 (60.25) 0.25 (mm)
280-117879-A-3 MDLV		01/08/2019 15:57	1		DB-624 (60.25) 0.25 (mm)
280-117879-A-4 MDLV		01/08/2019 16:18	1		DB-624 (60.25) 0.25 (mm)
280-117879-A-5 MDLV		01/08/2019 16:38	1		DB-624 (60.25) 0.25 (mm)
280-117879-A-7 MDLV		01/08/2019 16:59	1		DB-624 (60.25) 0.25 (mm)
280-117879-A-8 MDLV		01/08/2019 17:19	1		DB-624 (60.25) 0.25 (mm)
280-117879-A-9 MDLV		01/08/2019 17:40	1		DB-624 (60.25) 0.25 (mm)
280-117879-A-10 MDLV		01/08/2019 18:00	1		DB-624 (60.25) 0.25 (mm)
280-117879-A-11 MDLV		01/08/2019 18:21	1		DB-624 (60.25) 0.25 (mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: VMS_MS1 Start Date: 01/18/2019 09:52Analysis Batch Number: 444687 End Date: 01/18/2019 14:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-444687/1		01/18/2019 09:52	1	MS1_1418.D	DB-624 (60.25) 0.25 (mm)
STD 280-444687/12 IC		01/18/2019 11:48	1	MS1_1421.D	DB-624 (60.25) 0.25 (mm)
STD 280-444687/13 IC		01/18/2019 12:09	1	MS1_1422.D	DB-624 (60.25) 0.25 (mm)
STD 280-444687/14 IC		01/18/2019 12:29	1	MS1_1423.D	DB-624 (60.25) 0.25 (mm)
STD 280-444687/15 IC		01/18/2019 12:50	1	MS1_1424.D	DB-624 (60.25) 0.25 (mm)
ICIS 280-444687/16		01/18/2019 13:10	1	MS1_1425.D	DB-624 (60.25) 0.25 (mm)
STD 280-444687/17 IC		01/18/2019 13:31	1	MS1_1426.D	DB-624 (60.25) 0.25 (mm)
STD 280-444687/18 IC		01/18/2019 13:52	1	MS1_1427.D	DB-624 (60.25) 0.25 (mm)
ICV 280-444687/19		01/18/2019 14:33	1	MS1_1429.D	DB-624 (60.25) 0.25 (mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Instrument ID: VMS_MS1Start Date: 01/28/2019 17:51Analysis Batch Number: 445753End Date: 01/29/2019 05:09

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-445753/1		01/28/2019 17:51	1	MS1_1904.D	DB-624 (60.25) 0.25 (mm)
CCV 280-445753/2		01/28/2019 18:23	1	MS1_1905.D	DB-624 (60.25) 0.25 (mm)
CCV 280-445753/3		01/28/2019 18:48	1	MS1_1906.D	DB-624 (60.25) 0.25 (mm)
MB 280-445753/8		01/28/2019 19:09	1	MS1_1907.D	DB-624 (60.25) 0.25 (mm)
LCS 280-445753/4		01/28/2019 19:36	1	MS1_1908.D	DB-624 (60.25) 0.25 (mm)
LCSD 280-445753/5		01/28/2019 19:56	1	MS1_1909.D	DB-624 (60.25) 0.25 (mm)
LCS 280-445753/6		01/28/2019 20:16	1	MS1_1910.D	DB-624 (60.25) 0.25 (mm)
LCSD 280-445753/7		01/28/2019 20:37	1	MS1_1911.D	DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/28/2019 20:57	4000		DB-624 (60.25) 0.25 (mm)
280-119359-C-1 MS		01/28/2019 21:18	4000	MS1_1913.D	DB-624 (60.25) 0.25 (mm)
280-119359-A-1 MSD		01/28/2019 21:38	4000	MS1_1914.D	DB-624 (60.25) 0.25 (mm)
280-119359-C-1 MS		01/28/2019 21:59	4000	MS1_1915.D	DB-624 (60.25) 0.25 (mm)
280-119359-A-1 MSD		01/28/2019 22:19	4000	MS1_1916.D	DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/28/2019 22:40	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/28/2019 23:00	100000		DB-624 (60.25) 0.25 (mm)
160-32649-1		01/28/2019 23:21	1	MS1_1919.D	DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/28/2019 23:41	50		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 00:02	500		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 00:22	10		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 00:43	100000		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 01:03	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 01:24	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 01:44	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 02:05	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 02:25	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 02:46	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 03:06	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 03:27	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 03:47	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 04:08	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 04:28	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 04:49	1		DB-624 (60.25) 0.25 (mm)
ZZZZZ		01/29/2019 05:09	1		DB-624 (60.25) 0.25 (mm)

Sequence Name: C:\msdchem\1\sequence\012819pm.s

Comment:

Operator: nwangumaf

Data Path: C:\MSDCHEM\1\DATA\012819pm\

Instrument Control Pre-Seq Cmd:

Data Analysis Pre-Seq Cmd:

Instrument Control Post-Seq Cmd:

Data Analysis Post-Seq Cmd:

Method Sections To Run

(X) Full Method

() Reprocessing Only

Sequence Barcode Options

(X) On Mismatch, Inject Anyway

() On Mismatch, Don't Inject

() Barcode Disabled

MSI

17:51-05:09

445753

Line	Sample Name/Misc Info
1) Sample 100	MS1_1904 BFB bfb
2) Sample 1	MS1_1905 8260 CCV
3) Sample 2	MS1_1906 8260 CCV
4) Sample 3	MS1_1907 8260 MB
5) Sample 4	MS1_1908 8260 LCS
6) Sample 5	MS1_1909 8260 LCSD
7) Sample 6	MS1_1910 8260 LCS s
8) Sample 7	MS1_1911 8260 LCSD s
9) Sample 8	MS1_1912 8260 280-119359-B-1 pH<2 4000x
10) Sample 9	MS1_1913 8260 280-119359-C-1 MS pH<2 4000x
11) Sample 10	MS1_1914 8260 280-119359-A-1 MSD pH<2 4000x
12) Sample 11	MS1_1915 8260 280-119359-C-1 MS pH<2 4000x
13) Sample 12	MS1_1916 8260 280-119359-A-1 MSD pH<2 4000x
14) Sample 13	MS1_1917 8260 BLK
15) Sample 14	MS1_1918 8260 280-119359-B-1 pH<2 100,000x
16) Sample 15	MS1_1919 8260 160-32649-A-1 pH<2
17) Sample 16	MS1_1920 8260 280-119356-A-7 pH<2 50x
18) Sample 17	MS1_1921 8260 280-119356-A-7 pH<2 500x
19) Sample 18	MS1_1922 8260 280-119356-B-8 pH<2 10x
20) Sample 19	MS1_1923 8260 280-119359-B-1 pH<2 100,000x
21) Sample 20	MS1_1924 8260 280-119250-A-1 pH<2
22) Sample 21	MS1_1925 8260 280-119250-C-2 pH<2
23) Sample 22	MS1_1926 8260 280-119250-A-3 pH<2
24) Sample 23	MS1_1927 8260 280-119250-A-4 pH<2
25) Sample 24	MS1_1928 8260 280-119250-B-5 pH<2
26) Sample 25	MS1_1929 8260 280-119250-K-6 pH<2
27) Sample 26	MS1_1930 8260 280-119250-B-7 pH<2
28) Sample 27	MS1_1931 8260 280-119334-C-1 pH=7!
29) Sample 28	MS1_1932 8260 280-119334-C-2 pH=7!
30) Sample 29	MS1_1933 8260 280-119334-D-3 pH=7!
31) Sample 30	MS1_1934 8260 280-119334-D-4 pH=7!
32) Sample 31	MS1_1935 8260 280-119334-B-5 pH=7!
33) Sample 32	MS1_1936 8260 280-119334-A-6 pH=7! <2

7CA
01/29/19

Preliminary Report

TestAmerica Laboratories
Qc Batch Report

Data Path: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b

Worklist Name: 012819pm

Worklist Num:

78474

Instrument: VMS_MS1

Method:

AQ_VMS1_8260

Analysis Type: VOA

Creator:

Nwanguma, Frankline C

Inj Volume: 20

Inj Vol Units:

mL

QC Batching: Disabled

Limit Group Batching: Disabled

QC Batch: 1	MSV - 8260B Water and Solid Raw Batch: 445753
# 1 BFB	# 1 BFB
# 2 CCV	# 2 CCV
# 3 CCV	# 3 CCV
# 4 LCS	# 4 LCS
# 5 LCSD	# 5 LCSD
# 6 lcs	# 6 lcs
# 7 lcsd	# 7 lcsd
# 8 MB	# 8 MB
# 9 280-108595-A-1	# 9 280-108595-A-1
# 10 280-108595-A-2	# 10 280-108595-A-2
# 11 280-108595-A-3	# 11 280-108595-A-3
# 12 280-119359-B-1	# 12 280-119359-B-1
# 13 280-119359-C-1 MS	# 13 280-119359-C-1 MS
# 14 280-119359-A-1 MSD	# 14 280-119359-A-1 MSD
# 15 280-119359-C-1 MS	# 15 280-119359-C-1 MS
# 20 280-119359-A-1 MSD	# 20 280-119359-A-1 MSD
# 18 BLK	# 18 BLK
# 17 280-119359-B-1	# 17 280-119359-B-1
# 19 160-32649-A-1	# 19 160-32649-A-1
# 21 280-119356-A-7	# 21 280-119356-A-7
# 22 280-119356-A-7	# 22 280-119356-A-7
# 23 280-119356-B-8	# 23 280-119356-B-8
# 39 280-119359-B-1	# 39 280-119359-B-1
# 24 280-119250-A-1	# 24 280-119250-A-1
# 25 280-119250-C-2	# 25 280-119250-C-2
# 26 280-119250-A-3	# 26 280-119250-A-3
# 27 280-119250-A-4	# 27 280-119250-A-4
# 28 280-119250-B-5	# 28 280-119250-B-5
# 29 280-119250-K-6	# 29 280-119250-K-6
# 30 280-119250-B-7	# 30 280-119250-B-7
# 31 280-119334-C-1	# 31 280-119334-C-1
# 32 280-119334-C-2	# 32 280-119334-C-2
# 33 280-119334-D-3	# 33 280-119334-D-3
# 34 280-119334-D-4	# 34 280-119334-D-4
# 35 280-119334-B-5	# 35 280-119334-B-5
# 36 280-119334-A-6	# 36 280-119334-A-6
# 38 Samp 38	# 38 Samp 38

FCW
01/29/19

TestAmerica Laboratories
Worklist Report

Worklist Name: 012819pm
Instrument Name: VMS_MS1
Purge Volume: 20.00
Analysis Type: VOA
Batch Directory: \\chromna\Denver\ChromData\VMS_MS1\20190128-78474.b
Upload Directory: \\CorpTALSAPP16\280-DN-RawData\Organics\VMS\MS1
Run Reagent: MV-568718-D_00014
Run Reagent: MV-ARCH SS A_00108

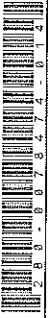
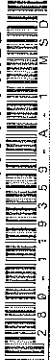
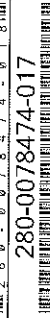
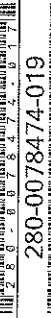
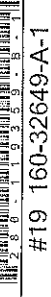
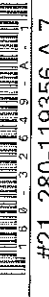
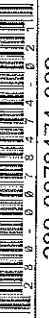
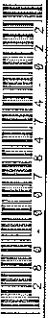
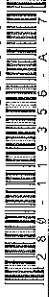
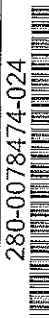
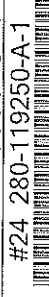
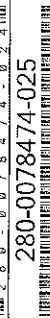
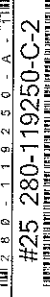
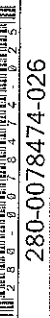
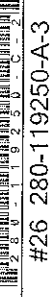
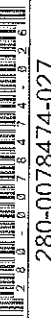
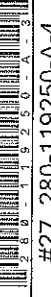
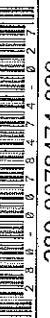
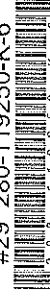
Worklist Number: 78474

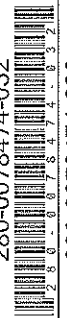
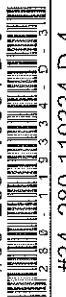
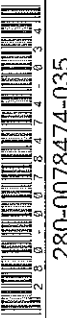
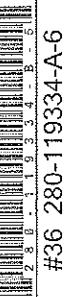
Chrom Method: AQ_VMS1_8260

Units: mL

78474
01/29/19

Worklist ID	Lims ID	Sample Reagents	Smp Type	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0078474-001	# 1 BFB	MV-BFB_00027	BFB	voaWater	1.000	uL	1.000
280-0078474-002	# 2 CCV	MV-MegaMain A_00009 MV-Gas A_00006	CCV	voaWater	20.00	mL	1.000
280-0078474-003	# 3 CCV	MV-568718-D_00014 MV-Supp A_00033	CCV	voaWater	20.00	mL	1.000
280-0078474-004	# 4 LCS	MV-MegaMain B_00007 MV-Gas B_00007	LCS	voaWater	20.00	mL	1.000
280-0078474-005	# 5 LCSD	MV-MegaMain B_00007 MV-Gas B_00007	LCSD	voaWater	20.00	mL	1.000
280-0078474-006	# 6 lcs	MV-Supp B_00023	LCS	voaWater	20.00	mL	1.000
280-0078474-007	# 7 lcsd	MV-Supp B_00023	LCSD	voaWater	20.00	mL	1.000
280-0078474-008	# 8 MB		MB	voaWater	20.00	mL	1.000
280-0078474-009	# 9 280-108595-A-1						
280-0078474-010	# 10 280-108595-A-2						
280-0078474-011	# 11 280-108595-A-3						
280-0078474-012	# 12 280-119359-B-1						
280-0078474-013	# 13 280-119359-C-1 MS						

Worklist ID	Lims ID	Sample Reagents	Smp Type	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0078474-014 	#14 280-119359-A-1 MSD 	MV-MegaMain B_00007 MV-Gas B_00007	MSD	voaWater	20.00	mL	4000.0
280-0078474-015 	#15 280-119359-C-1 MS 	MV-Supp B_00023	MS	voaWater	20.00	mL	4000.0
280-0078474-020 	#20 280-119359-A-1 MSD 	MV-Supp B_00023	MSD	voaWater	20.00	mL	4000.0
280-0078474-018 	#18 BLK 		Client	voaWater	20.00	mL	1.000
280-0078474-017 	#17 280-119359-B-1 		Client	voaWater	20.00	mL	100000
280-0078474-019 	#19 160-32649-A-1 		Client	voaWater	20.00	mL	1.000
280-0078474-021 	#21 280-119356-A-7 		Client	voaWater	20.00	mL	50.00
280-0078474-022 	#22 280-119356-A-7 		Client	voaWater	20.00	mL	500.0
280-0078474-023 	#23 280-119356-B-8 		Client	voaWater	20.00	mL	10.00
280-0078474-039 	#39 280-119359-B-1 		Client	voaWater	20.00	mL	100000
280-0078474-024 	#24 280-119250-A-1 		Client	voaWater	20.00	mL	1.000
280-0078474-025 	#25 280-119250-C-2 		Client	voaWater	20.00	mL	1.000
280-0078474-026 	#26 280-119250-A-3 		Client	voaWater	20.00	mL	1.000
280-0078474-027 	#27 280-119250-A-4 		Client	voaWater	20.00	mL	1.000
280-0078474-028 	#28 280-119250-B-5 		Client	voaWater	20.00	mL	1.000
280-0078474-029 	#29 280-119250-K-6 		Client	voaWater	20.00	mL	1.000
280-0078474-030 	#30 280-119250-B-7 		Client	voaWater	20.00	mL	1.000
280-0078474-031 	#31 280-119334-C-1 		Client	voaWater	20.00	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0078474-032 	#32 280-119334-C-2 		Client	voaWater	20.00	mL	1.000
280-0078474-033 	#33 280-119334-D-3 		Client	voaWater	20.00	mL	1.000
280-0078474-034 	#34 280-119334-D-4 		Client	voaWater	20.00	mL	1.000
280-0078474-035 	#35 280-119334-B-5 		Client	voaWater	20.00	mL	1.000
280-0078474-036 	#36 280-119334-A-6 		Client	voaWater	20.00	mL	1.000
280-0078474-038 	#38 Samp 38 		Client	voaWater	20.00	mL	1.000

1/29/2019
6:03PM

Sample Request Form: 53180

Page 2 of 2

den_msvoa_totalbacklog 1/29/2019 6:03:45 PM Assigned to: Nwanguma, Frankie C

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
280-119334-3	DB-33	20	8260B	8260B	01/31 23:59	01/29/19	EMH	LA	MS-Strge & Mtls-Strge	Unconfirmed
M DIL3; No reanalyze outside of HT										
280-119334-4	PROCESS #1	20	8260B	8260B	01/31 23:59	01/29/19	EMH	LA	Mtls-Strge & MS-Strge	Unconfirmed
M DIL3; No reanalyze outside of HT										
280-119334-5	PROCESS #2	20	8260B	8260B	01/31 23:59	01/29/19	EMH	LA	Mtls-Strge & MS-Strge	Unconfirmed
M DIL3; No reanalyze outside of HT										
280-119334-6	TRIP BLANK #17-1	20	8260B	8260B	01/31 23:59	01/29/19	EMH	LA	MS-Strge	Unconfirmed
M DIL3; No reanalyze outside of HT										
280-119335-1	GW0119-MW-041	0.005/100, 0.005/000x	8260B	8260B	01/31 23:59	01/25/19	MAJ	TX	MS-Strge	Unconfirmed
DuPont QAS_TRRP_DIL3_All targets must be spiked_LCS/LCSD required_8260 Supp Spk										
Late 8260B 1/28/19										
280-119335-1MS	GW0119-MW-041	0.005/100, 0.005/000x	8260B	8260B	01/31 23:59	01/25/19	MAJ	TX	MS-Strge	Unconfirmed
M DuPont QAS_TRRP_DIL3_All targets must be spiked_LCS/LCSD required_8260 Supp Spk										
280-119335-1MSD	GW0119-MW-041	0.005	8260B	8260B	01/31 23:59	01/25/19	MAJ	TX	MS-Strge	Unconfirmed
M DuPont QAS_TRRP_DIL3_All targets must be spiked_LCS/LCSD required_8260 Supp Spk										

den_msvoa_totalbacklog 1/29/2019 6:03:45 PM Assigned to:Nwanguma, Frankline C

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
160-32849-1	CRC-MW-1-01151 9	20	8260B	8260B	01/29 23:59	02/01/19	CYLS	IL	MS-Strge & 86	Unconfirmed
280-119250-1	16A	20	8260B	8260B	01/30 23:59	02/04/19	EMH	LA	MS-Strge	Unconfirmed
M DIL3;No reanalyze outside of HT										
280-119250-2	39A	20	8260B	8260B	01/30 23:59	02/04/19	EMH	LA	MS-Strge	Unconfirmed
M DIL3;No reanalyze outside of HT										
280-119250-3	39B-2	20	8260B	8260B	01/30 23:59	02/04/19	EMH	LA	MS-Strge	Unconfirmed
M DIL3;No reanalyze outside of HT										
280-119250-4	40A	20	8260B	8260B	01/30 23:59	02/04/19	EMH	LA	MS-Strge	Unconfirmed
M DIL3;No reanalyze outside of HT										
280-119250-5	40B-2	20	8260B	8260B	01/30 23:59	02/04/19	EMH	LA	MS-Strge	Unconfirmed
M DIL3;No reanalyze outside of HT										
280-119250-6	5C	20	8260B	8260B	01/30 23:59	02/04/19	EMH	LA	Mtis-Strge & 88 & MS-Strge	Unconfirmed
M DIL3;No reanalyze outside of HT										
280-119250-7	TRIP BLANK #16-1	20	8260B	8260B	01/30 23:59	02/04/19	EMH	LA	MS-Strge	Unconfirmed
M DIL3;No reanalyze outside of HT										
280-119334-1	11B	20	8260B	8260B	01/31 23:59	01/29/19	EMH	LA	MS-Strge	Unconfirmed
M DIL3;No reanalyze outside of HT										
280-119334-2	11C	20	8260B	8260B	01/31 23:59	01/29/19	EMH	LA	MS-Strge & Mtls-Strge	Unconfirmed
M DIL3;No reanalyze outside of HT										

Fca
01/29/19

Sequence Name: C:\msdchem\1\sequence\010819am.s

Comment:

Operator: wickhamt

Data Path: C:\MSDCHEM\1\DATA\010819am\

Instrument Control Pre-Seq Cmd:

Data Analysis Pre-Seq Cmd:

Instrument Control Post-Seq Cmd:

Data Analysis Post-Seq Cmd:

Test America Denver

Instrument: MS1
OV-MS-0010 (260B/624) (Circle)
Purge Volume: (20mL/5mL/5g)
(Circle)

Tune Time: 08:17-18:21

Line Date: 443512

Method Sections To Run

(X) Full Method

() Reprocessing Only

Sequence Barcode Options

(X) On Mismatch, Inject Anyway

() On Mismatch, Don't Inject

() Barcode Disabled

1-9-19
Taw

Line	Sample Name/Misc Info
1) Sample	100 MS1_1064 BFB BFB
2) Sample	100 MS1_1065 BFB BFB 08:17
3) Sample	1 MS1_1066 8260 blank
4) Sample	2 MS1_1067 8260 blank
5) Sample	3 MS1_1068 8260 std
6) Sample	4 MS1_1069 8260 std
7) Sample	5 MS1_1070 8260 std
8) Sample	6 MS1_1071 8260 std
9) Sample	7 MS1_1072 8260 icis
10) Sample	8 MS1_1073 8260 std
11) Sample	9 MS1_1074 8260 std
12) Sample	10 MS1_1075 8260 blank
13) Sample	11 MS1_1076 8260 icv
14) Sample	12 MS1_1077 8260 std
15) Sample	13 MS1_1078 8260 std
16) Sample	14 MS1_1079 8260 std
17) Sample	15 MS1_1080 8260 std
18) Sample	16 MS1_1081 8260 std
19) Sample	17 MS1_1082 8260 std
20) Sample	18 MS1_1083 8260 blank
21) Sample	19 MS1_1084 8260 icv
22) Sample	20 MS1_1085 8260 mdlv m/g/s 1
23) Sample	21 MS1_1086 8260 mdlv m/g/s 2
24) Sample	22 MS1_1087 8260 mdlv m/g/s 3
25) Sample	23 MS1_1088 8260 mdlv m/g/s 4
26) Sample	24 MS1_1089 8260 mdlv m/g/s 5
27) Sample	25 MS1_1090 8260 mdlv supp 1
28) Sample	26 MS1_1091 8260 mdlv supp 2
29) Sample	27 MS1_1092 8260 mdlv supp 3
30) Sample	28 MS1_1093 8260 mdlv supp 4
31) Sample	29 MS1_1094 8260 mdlv supp 5 18:21
32) Sample	30 MS1_1095 8260 primer

MAIN/GAS/SURR ICAL

Calib ID: 34748

WL: 77845

ICIS: 16

ICV: 19

ICV good for Q4/Q5 except:
2-cler -21.0%
cyclohexanone -28.9%

SUPP ICAL

Calib ID: 34749

WL: 77845

ICV: 26

ICV good for Q4/Q5 except:
2-nitropropane -28.6%

1st level: Taw 1-9-19

2nd level: Aut 1/11/19

TestAmerica Laboratories
Worklist Report

Worklist Name: 010819am
Instrument Name: VMS_MS1
Purge Volume: 20.00
Analysis Type: VOA
Batch Directory: \\chromna\Denver\ChromData\VMS_MS1\20190108-77845.b
Upload Directory: \\CorpTALSAPP16\280-DN-RawData\Organics\MS\VMS_MS1
Run Reagent: MV-568718-D_00014
Run Reagent: MV-ARCH SS A_00108

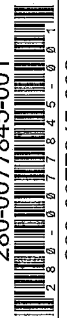
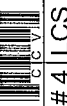
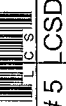
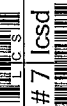
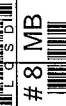
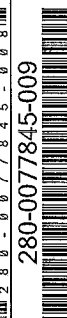
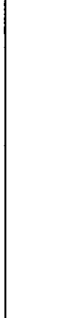
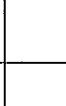
Worklist Number: 77845

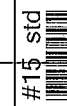
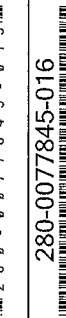
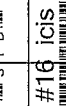
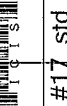
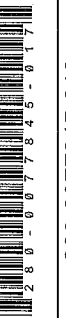
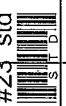
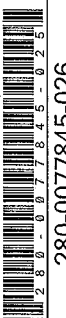
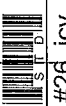
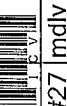
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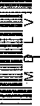
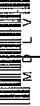
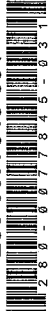
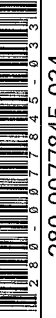
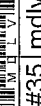
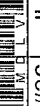
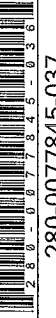
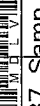
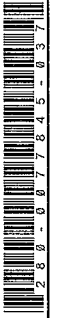
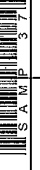
Units: mL

Amount Added: 1.000, Units: uL

Amount Added: 0.800, Units: uL

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0077845-001 	# 1 BFB 	MV-BFB_00027	BFB		voaWater	1.000	uL	1.000
280-0077845-002 	# 2 CCV 	MV-MegaMainA_00009 MV-Gas A_00003	CCV		voaWater	20.00	mL	1.000
280-0077845-003 	# 3 CCV 	MV-568718-D_00014 MV-Supp A_00033	CCV		voaWater	20.00	mL	1.000
280-0077845-004 	# 4 LCS 	MV-Gas B_00004 MV-MegaMain B_00007	LCS		voaWater	20.00	mL	1.000
280-0077845-005 	# 5 LCSD 	MV-Gas B_00004 MV-MegaMain B_00007	LCSD		voaWater	20.00	mL	1.000
280-0077845-006 	# 6 lcs 	MV-Supp B_00023	LCS		voaWater	20.00	mL	1.000
280-0077845-007 	# 7 lcsd 	MV-Supp B_00023	LCSD		voaWater	20.00	mL	1.000
280-0077845-008 	# 8 MB 		MB		voaWater	20.00	mL	1.000
280-0077845-009 	# 9 280-108595-A-1 		Client		voaWater	20.00	mL	1.000
280-0077845-010 	#10 280-108595-A-2 		Client		voaWater	20.00	mL	1.000
280-0077845-011 	#11 280-108595-A-3 		Client		voaWater	20.00	mL	1.000
280-0077845-012 	#12 std 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	IC	1	voaWater	20.00	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0077845-013 	#13 std 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	IC	2	voaWater	20.00	mL	1.000
280-0077845-014 	#14 std 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	IC	3	voaWater	20.00	mL	1.000
280-0077845-015 	#15 std 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	IC	4	voaWater	20.00	mL	1.000
280-0077845-016 	#16 icis 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	ICIS	5	voaWater	20.00	mL	1.000
280-0077845-017 	#17 std 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	IC	6	voaWater	20.00	mL	1.000
280-0077845-018 	#18 std 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	IC	7	voaWater	20.00	mL	1.000
280-0077845-019 	#19 icv 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMain B_00007 MV-Gas B_00004	ICV		voaWater	20.00	mL	1.000
280-0077845-020 	#20 std 	MV-568718-D_00014 MV-Supp A_00033	IC	2	voaWater	20.00	mL	1.000
280-0077845-021 	#21 std 	MV-568718-D_00014 MV-Supp A_00033	IC	3	voaWater	20.00	mL	1.000
280-0077845-022 	#22 std 	MV-568718-D_00014 MV-Supp A_00033	IC	4	voaWater	20.00	mL	1.000
280-0077845-023 	#23 std 	MV-568718-D_00014 MV-Supp A_00033	IC	5	voaWater	20.00	mL	1.000
280-0077845-024 	#24 std 	MV-568718-D_00014 MV-Supp A_00033	IC	6	voaWater	20.00	mL	1.000
280-0077845-025 	#25 std 	MV-568718-D_00014 MV-Supp A_00033	IC	7	voaWater	20.00	mL	1.000
280-0077845-026 	#26 icv 	MV-568718-D_00014 MV-Supp B_00023	ICV		voaWater	20.00	mL	1.000
280-0077845-027 	#27 mdlv 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	MDLV		voaWater	20.00	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0077845-028 	#28 mdlv 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	MDLV		voaWater	20.00	mL	1.000
280-0077845-029 	#29 mdlv 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	MDLV		voaWater	20.00	mL	1.000
280-0077845-030 	#30 mdlv 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	MDLV		voaWater	20.00	mL	1.000
280-0077845-031 	#31 mdlv 	MV-568718-D_00014 MV-ARCH SS A_00108 MV-MegaMainA_00009 MV-Gas A_00003	MDLV		voaWater	20.00	mL	1.000
280-0077845-032 	#32 mdlv 	MV-568718-D_00014 MV-Supp A_00033	MDLV		voaWater	20.00	mL	1.000
280-0077845-033 	#33 mdlv 	MV-568718-D_00014 MV-Supp A_00033	MDLV		voaWater	20.00	mL	1.000
280-0077845-034 	#34 mdlv 	MV-568718-D_00014 MV-Supp A_00033	MDLV		voaWater	20.00	mL	1.000
280-0077845-035 	#35 mdlv 	MV-568718-D_00014 MV-Supp A_00033	MDLV		voaWater	20.00	mL	1.000
280-0077845-036 	#36 mdlv 	MV-568718-D_00014 MV-Supp A_00033	MDLV		voaWater	20.00	mL	1.000
280-0077845-037 	#37 Samp 37 		Client		voaWater	20.00	mL	1.000

Sequence Name: C:\msdchem\1\sequence\011819am.s

Comment:

Operator: wickhamt

Data Path: C:\MSDCHEM\1\DATA\011819am\

Instrument Control Pre-Seq Cmd:

Data Analysis Pre-Seq Cmd:

Instrument Control Post-Seq Cmd:

Data Analysis Post-Seq Cmd:

Method Sections To Run

Sequence Barcode Options

(X) Full Method

(X) On Mismatch, Inject Anyway

() Reprocessing Only

() On Mismatch, Don't Inject

() Barcode Disabled

Line	Sample Name/Misc Info
1) Sample	1 MS1_1415 8260 primer
2) Sample	2 MS1_1416 8260 ccv test
3) Sample	100 MS1_1417 BFB bfb
4) Sample	100 MS1_1418 BFB bfb
5) Sample	1 MS1_1419 8260 blank
6) Sample	2 MS1_1420 8260 blank
7) Sample	3 MS1_1421 8260 std
8) Sample	4 MS1_1422 8260 std
9) Sample	5 MS1_1423 8260 std
10) Sample	6 MS1_1424 8260 std
11) Sample	7 MS1_1425 8260 icis
12) Sample	8 MS1_1426 8260 std
13) Sample	9 MS1_1427 8260 std
14) Sample	10 MS1_1428 8260 blank
15) Sample	11 MS1_1429 8260 icv

Test America Denver

Instrument: VMS-MS1

OV-MS-0010 (22603/624) (Circle)

Purge Volume: (20mL/5mL/5g)

Tune Time: 0952 / 1433 (Circle)

Line Batch: 444687

WL#7816973

501/22/19

- Main + Gases + Surr ICAL

- ICV is $\leq 20\%$ for All except
cyclohexanone (-21.3%)

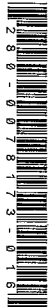
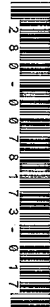
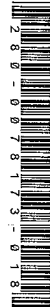
2 1/22/19

RSN 1/22/19

TestAmerica Laboratories
Worklist Report

Worklist Name: 011819am
 Instrument Name: VMS_MS1
 Purge Volume: 20.00
 Analysis Type: VOA
 Batch Directory: \\chromal\Denver\ChromData\VMS_MS1\20190118-78173.b
 Upload Directory: \\CorPTAL\SAPP16\280-DN-RawData\Organics\VMS_MS1
 Run Reagent: MV-568718-D_00014 Amount Added: 1.000, Units: uL
 Run Reagent: MV-ARCH SS_A_00108 Amount Added: 0.800, Units: uL

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0078173-001	#1 BFB	MV-BFB_00027	BFB		voaWater	1.000	uL	1.000
280-0078173-002	#2 CCV	MV-MegaMainA_00009	CCV		voaWater	20.00	mL	1.000
280-0078173-003	#3 CCV	MV-568718-D_00014 MV-Supp A_00033	CCV		voaWater	20.00	mL	1.000
280-0078173-004	#4 LCS	MV-MegaMain B_00007 MV-Gas B_00005	LCS		voaWater	20.00	mL	1.000
280-0078173-005	#5 LCSD	MV-MegaMain B_00007 MV-Gas B_00005	LCSD		voaWater	20.00	mL	1.000
280-0078173-006	#6 LCS	MV-Supp B_00023	LCS		voaWater	20.00	mL	1.000
280-0078173-007	#7 LCSD	MV-Supp B_00023	LCSD		voaWater	20.00	mL	1.000
280-0078173-008	#8 MB		MB		voaWater	20.00	mL	1.000
280-0078173-009	#9 280-108595-A-1		Client		voaWater	20.00	mL	1.000
280-0078173-010	#10 280-108595-A-2		Client		voaWater	20.00	mL	1.000
280-0078173-011	#11 280-108595-A-3		Client		voaWater	20.00	mL	1.000
280-0078173-012	#12 Std	MV-568718-D_00014 MV-ARCH SS_A_00108 MV-MegaMainA_00009 MV-Gas A_00005	IC	1	voaWater	20.00	mL	1.000

Worklist ID	Lims ID	Sample Reagents	Smp Type	Cal Lvl	Fract	Initial Vol/Wt	Vol/Wt Units	Dil Fact
280-0078173-013 	#13 std 	MV-568718-D_00014 MV-ARCH SS_A_00108 MV-MegaMainA_00009 MV-Gas_A_00005	IC	2	voaWater	20.00	mL	1.000
280-0078173-014 	#14 std 	MV-568718-D_00014 MV-ARCH SS_A_00108 MV-MegaMainA_00009 MV-Gas_A_00005	IC	3	voaWater	20.00	mL	1.000
280-0078173-015 	#15 std 	MV-568718-D_00014 MV-ARCH SS_A_00108 MV-MegaMainA_00009 MV-Gas_A_00005	IC	4	voaWater	20.00	mL	1.000
280-0078173-016 	#16 icis 	MV-568718-D_00014 MV-ARCH SS_A_00108 MV-MegaMainA_00009 MV-Gas_A_00005	ICIS	5	voaWater	20.00	mL	1.000
280-0078173-017 	#17 std 	MV-568718-D_00014 MV-ARCH SS_A_00108 MV-MegaMainA_00009 MV-Gas_A_00005	IC	6	voaWater	20.00	mL	1.000
280-0078173-018 	#18 std 	MV-568718-D_00014 MV-ARCH SS_A_00108 MV-MegaMainA_00009 MV-Gas_A_00005	IC	7	voaWater	20.00	mL	1.000
280-0078173-019 	#19 icv 	MV-568718-D_00014 MV-ARCH SS_A_00108 MV-MegaMain B_00007 MV-Gas_B_00006	ICV		voaWater	20.00	mL	1.000

Preliminary Report

TestAmerica Laboratories
Qc Batch Report

Data Path: \\chromna\Denver\ChromData\VMS_MS1\20190118-78173.b

Worklist Name: 011819am

Worklist Num:

78173

Instrument: VMS_MS1

Method:

AQ_VMS1_8260

Analysis Type: VOA

Creator:

Wickham, Tom A

Inj Volume: 20

Inj Vol Units:

mL

QC Batching: Disabled

Limit Group Batching: Disabled

QC Batch: 1	MSV - 8260B Water and Solid Raw Batch: 444687
# 1 BFB	# 1 BFB
# 2 CCV	# 2 CCV
# 3 CCV	# 3 CCV
# 4 LCS	# 4 LCS
# 5 LCSD	# 5 LCSD
# 6 lcs	# 6 lcs
# 7 lcsd	# 7 lcsd
# 8 MB	# 8 MB
# 9 280-108595-A-1	# 9 280-108595-A-1
# 10 280-108595-A-2	# 10 280-108595-A-2
# 11 280-108595-A-3	# 11 280-108595-A-3
# 12 std	# 12 std
# 13 std	# 13 std
# 14 std	# 14 std
# 15 std	# 15 std
# 16 icis	# 16 icis
# 17 std	# 17 std
# 18 std	# 18 std
# 19 icv	# 19 icv

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 443512 Batch Start Date: 01/08/19 08:17 Batch Analyst: Wickham, Tom ABatch Method: 8260B Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MV-568718-D 00014	MV-BFB 00027	MV-Supp A 00033	MV-Supp B 00023
BFB 280-443512/1		8260B		1 uL	1 uL		1 uL		
STD 280-443512/20 IC		8260B		20 mL	20 mL	1 uL		0.4 uL	
STD 280-443512/21 IC		8260B		20 mL	20 mL	1 uL		1 uL	
STD 280-443512/22 IC		8260B		20 mL	20 mL	1 uL		2 uL	
STD 280-443512/23 IC		8260B		20 mL	20 mL	1 uL		4 uL	
STD 280-443512/24 IC		8260B		20 mL	20 mL	1 uL		10 uL	
STD 280-443512/25 IC		8260B		20 mL	20 mL	1 uL		24 uL	
ICV 280-443512/26		8260B		20 mL	20 mL	1 uL			4 uL

Batch Notes	

Basis	Basis Description

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 444687 Batch Start Date: 01/18/19 09:52 Batch Analyst: Ornelas, GabrielBatch Method: 8260B Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MV-568718-D 00014	MV-ARCH SS A 00108	MV-BFB 00027	MV-Gas A 00005
BFB 280-444687/1		8260B		1 uL	1 uL			1 uL	
STD 280-444687/12 IC		8260B		20 mL	20 mL	1 uL	0.04 uL		0.2 uL
STD 280-444687/13 IC		8260B		20 mL	20 mL	1 uL	0.08 uL		0.4 uL
STD 280-444687/14 IC		8260B		20 mL	20 mL	1 uL	0.16 uL		1 uL
STD 280-444687/15 IC		8260B		20 mL	20 mL	1 uL	0.4 uL		2 uL
ICIS 280-444687/16		8260B		20 mL	20 mL	1 uL	0.8 uL		4 uL
STD 280-444687/17 IC		8260B		20 mL	20 mL	1 uL	2.4 uL		10 uL
STD 280-444687/18 IC		8260B		20 mL	20 mL	1 uL	4.8 uL		24 uL
ICV 280-444687/19		8260B		20 mL	20 mL	1 uL	0.8 uL		

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas B 00006	MV-MegaMain B 00007	MV-MegaMainA 00009			
BFB 280-444687/1		8260B							
STD 280-444687/12 IC		8260B				0.2 uL			
STD 280-444687/13 IC		8260B				0.4 uL			
STD 280-444687/14 IC		8260B				1 uL			
STD 280-444687/15 IC		8260B				2 uL			

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 444687 Batch Start Date: 01/18/19 09:52 Batch Analyst: Ornelas, GabrielBatch Method: 8260B Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas B 00006	MV-MegaMain B 00007	MV-MegaMainA 00009			
ICIS 280-444687/16		8260B				4 uL			
STD 280-444687/17 IC		8260B				10 uL			
STD 280-444687/18 IC		8260B				24 uL			
ICV 280-444687/19		8260B		4 uL	4 uL				

Batch Notes	

Basis	Basis Description

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 445753 Batch Start Date: 01/28/19 17:51 Batch Analyst: Nwanguma, Frankline CBatch Method: 8260B Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MV-568718-D 00014	MV-ARCH SS A 00108	MV-BFB 00027	MV-Gas A 00006
BFB 280-445753/1		8260B		1 uL	1 uL			1 uL	
CCV 280-445753/2		8260B		20 mL	20 mL	1 uL	0.8 uL		4 uL
CCV 280-445753/3		8260B		20 mL	20 mL	1 uL			
LCS 280-445753/4		8260B		20 mL	20 mL	1 uL	0.8 uL		
LCSD 280-445753/5		8260B		20 mL	20 mL	1 uL	0.8 uL		
LCS 280-445753/6		8260B		20 mL	20 mL	1 uL	0.8 uL		
LCSD 280-445753/7		8260B		20 mL	20 mL	1 uL	0.8 uL		
MB 280-445753/8		8260B		20 mL	20 mL	1 uL	0.8 uL		
280-119359-C-1 MS	GW0119-MW-041	8260B	T	20 mL	20 mL	1 uL	0.8 uL		
280-119359-A-1 MSD	GW0119-MW-041	8260B	T	20 mL	20 mL	1 uL	0.8 uL		
280-119359-C-1 MS	GW0119-MW-041	8260B	T	20 mL	20 mL	1 uL	0.8 uL		
160-32649-A-1	CRC-MW-1-011519	8260B	T	20 mL	20 mL	1 uL	0.8 uL		
280-119359-A-1 MSD	GW0119-MW-041	8260B	T	20 mL	20 mL	1 uL	0.8 uL		

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas B 00007	MV-MegaMain B 00007	MV-MegaMainA 00009	MV-Supp A 00033	MV-Supp B 00023	
BFB 280-445753/1		8260B							
CCV 280-445753/2		8260B				4 uL			
CCV 280-445753/3		8260B					4 uL		
LCS 280-445753/4		8260B		2 uL	2 uL				
LCSD 280-445753/5		8260B		2 uL	2 uL				
LCS 280-445753/6		8260B						2 uL	
LCSD 280-445753/7		8260B						2 uL	

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

8260B

Page 1 of 2

GC/MS VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 445753 Batch Start Date: 01/28/19 17:51 Batch Analyst: Nwanguma, Frankline CBatch Method: 8260B Batch End Date: _____

Lab Sample ID	Client Sample ID	Method Chain	Basis	MV-Gas B 00007	MV-MegaMain B 00007	MV-MegaMainA 00009	MV-Supp A 00033	MV-Supp B 00023	
MB 280-445753/8		8260B							
280-119359-C-1 MS	GW0119-MW-041	8260B	T	2 uL	2 uL				
280-119359-A-1 MSD	GW0119-MW-041	8260B	T	2 uL	2 uL				
280-119359-C-1 MS	GW0119-MW-041	8260B	T					2 uL	
160-32649-A-1	CRC-MW-1-011519	8260B	T						
280-119359-A-1 MSD	GW0119-MW-041	8260B	T					2 uL	

Batch Notes	

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Method 8270D

Semivolatile Organic Compounds
(GC/MS) by Method 8270D

FORM II
GC/MS SEMI VOA SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low
GC Column (1): Rxi-5Sil MS ID: 0.25 (mm)

Client Sample ID	Lab Sample ID	2FP #	PHL #	NBZ #	FBP #	TBP #	TPHL #
CRC-MW-1-011519	160-32649-1	49	34	67	65	77	74
	MB 280-444835/1-A	44	30	59	56	73	81
	LCS 280-444835/2-A	42	26	82	80	86	82
	LCSD 280-444835/3-A	54	38	75	74	84	82

	<u>QC LIMITS</u>
2FP = 2-Fluorophenol (Surr)	17-71
PHL = Phenol-d5 (Surr)	10-52
NBZ = Nitrobenzene-d5 (Surr)	45-113
FBP = 2-Fluorobiphenyl	47-119
TBP = 2,4,6-Tribromophenol (Surr)	52-123
TPHL = Terphenyl-d14 (Surr)	50-123

Column to be used to flag recovery values

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: D31290.D
 Lab ID: LCS 280-444835/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1'-Biphenyl	80.0	65.2	81	53-116	
1,2,4,5-Tetrachlorobenzene	80.0	67.4	84	52-110	
1,2,4-Trichlorobenzene	80.0	62.7	78	47-103	
1,2-Dichlorobenzene	80.0	56.8	71	44-103	
1,2-Diphenylhydrazine (as Azobenzene)	80.9	67.5	83	59-116	
1,3-Dichlorobenzene	80.0	56.1	70	42-100	
1,3-Dinitrobenzene	80.0	69.6	87	66-124	
1,4-Dichlorobenzene	80.0	56.9	71	43-101	
1,4-Dioxane	80.0	31.8	40	20-63	
1-Methylnaphthalene	80.0	70.4	88	57-108	
2,3,4,6-Tetrachlorophenol	80.0	69.3	87	53-129	
2,4,5-Trichlorophenol	80.0	67.2	84	58-121	
2,4,6-Trichlorophenol	80.0	70.1	88	52-132	
2,4-Dichlorophenol	80.0	68.8	86	60-108	
2,4-Dimethylphenol	80.0	66.7	83	54-105	
2,4-Dinitrophenol	160	126	79	38-125	
2,4-Dinitrotoluene	80.0	68.9	86	63-124	
2,6-Dichlorophenol	80.0	69.6	87	56-114	
2,6-Dinitrotoluene	80.0	68.8	86	64-123	
2-Chloronaphthalene	80.0	63.9	80	52-116	
2-Chlorophenol	80.0	58.5	73	50-105	
2-Methylnaphthalene	80.0	68.6	86	55-107	
2-Methylphenol	80.0	54.1	68	43-94	
2-Nitroaniline	80.0	65.3	82	59-121	
2-Nitrophenol	80.0	66.7	83	58-110	
3 & 4 Methylphenol	80.0	49.8	62	34-88	
3,3'-Dichlorobenzidine	160	148	93	38-118	
3-Nitroaniline	80.0	55.7	70	40-108	
4,6-Dinitro-2-methylphenol	160	167	104	48-126	
4-Bromophenyl phenyl ether	80.0	72.8	91	60-115	
4-Chloro-3-methylphenol	80.0	69.5	87	63-107	
4-Chloroaniline	80.0	60.6	76	41-93	
4-Chlorophenyl phenyl ether	80.0	66.5	83	57-120	
4-Methylphenol	80.0	49.8	62	34-88	
4-Nitroaniline	80.0	65.6	82	55-123	
4-Nitrophenol	160	52.3	33	15-60	
Acenaphthene	80.0	66.1	83	52-122	
Acenaphthylene	80.0	65.3	82	58-112	
Acetophenone	80.0	64.3	80	58-108	
Aniline	80.0	51.2	64	29-87	
Anthracene	80.0	75.1	94	62-113	

Column to be used to flag recovery and RPD values

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: D31290.D
 Lab ID: LCS 280-444835/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Azobenzene	80.0	66.7	83	59-115	
Benzaldehyde	80.0	38.2	48	31-91	
Benzidine	160	64.7 J	40	5-82	
Benzo[a]anthracene	80.0	68.1	85	61-115	
Benzo[a]pyrene	80.0	74.7	93	61-114	
Benzo[b]fluoranthene	80.0	75.4	94	61-117	
Benzo[g,h,i]perylene	80.0	75.4	94	67-111	
Benzo[k]fluoranthene	80.0	75.7	95	69-119	
Benzoic acid	80.0	20.9 J	26	10-54	
Benzyl alcohol	80.0	52.5	66	40-91	
bis (2-chloroisopropyl) ether	80.0	60.7	76	49-114	
Bis (2-chloroethoxy)methane	80.0	67.8	85	61-107	
Bis (2-chloroethyl) ether	80.0	64.9	81	56-112	
Bis (2-ethylhexyl) phthalate	80.0	72.7	91	60-116	
Butyl benzyl phthalate	80.0	70.3	88	66-111	
Caprolactam	80.0	14.6	18	10-50	
Carbazole	80.0	74.4	93	69-109	
Chrysene	80.0	72.4	90	63-118	
Dibenz (a,h) anthracene	80.0	76.4	96	65-111	
Dibenzofuran	80.0	67.0	84	58-116	
Diethyl phthalate	80.0	68.1	85	65-121	
Dimethyl phthalate	80.0	67.4	84	63-120	
Di-n-butyl phthalate	80.0	74.6	93	68-110	
Di-n-octyl phthalate	80.0	73.0	91	60-111	
Diphenylamine	68.0	57.9	85	62-118	
Fluoranthene	80.0	74.3	93	68-111	
Fluorene	80.0	67.8	85	48-130	
Hexachlorobenzene	80.0	75.7	95	64-112	
Hexachlorobutadiene	80.0	62.6	78	41-102	
Hexachlorocyclopentadiene	160	114	71	27-107	
Hexachloroethane	80.0	53.2	66	39-100	
Hexadecane	80.0	64.8	81	54-112	
Indeno[1,2,3-cd]pyrene	80.0	72.2	90	56-111	
Isophorone	80.0	66.8	84	59-100	
Naphthalene	80.0	64.9	81	53-105	
Nitrobenzene	80.0	65.2	82	56-106	
N-Nitrosodimethylamine	80.0	33.3	42	22-70	
N-Nitrosodi-n-propylamine	80.0	65.6	82	59-106	
N-Nitrosodiphenylamine	80.0	75.9	95	64-112	
Pentachlorophenol	160	147	92	41-121	
Phenanthrene	80.0	74.8	93	63-113	
Phenol	80.0	22.9	29	11-52	

Column to be used to flag recovery and RPD values

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: D31290.D
Lab ID: LCS 280-444835/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Pyrene	80.0	72.4	91	62-114	
Pyridine	160	59.1	37	10-69	

Column to be used to flag recovery and RPD values

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: D31291.D
 Lab ID: LCSD 280-444835/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
1,1'-Biphenyl	80.0	60.9	76	7	30	53-116	
1,2,4,5-Tetrachlorobenzene	80.0	60.7	76	11	30	52-110	
1,2,4-Trichlorobenzene	80.0	56.6	71	10	30	47-103	
1,2-Dichlorobenzene	80.0	51.7	65	9	30	44-103	
1,2-Diphenylhydrazine (as Azobenzene)	80.9	66.1	82	2	30	59-116	
1,3-Dichlorobenzene	80.0	49.8	62	12	30	42-100	
1,3-Dinitrobenzene	80.0	66.9	84	4	30	66-124	
1,4-Dichlorobenzene	80.0	51.0	64	11	30	43-101	
1,4-Dioxane	80.0	25.1	31	23	30	20-63	
1-Methylnaphthalene	80.0	64.2	80	9	30	57-108	
2,3,4,6-Tetrachlorophenol	80.0	66.2	83	5	30	53-129	
2,4,5-Trichlorophenol	80.0	64.6	81	4	30	58-121	
2,4,6-Trichlorophenol	80.0	65.6	82	7	30	52-132	
2,4-Dichlorophenol	80.0	61.0	76	12	30	60-108	
2,4-Dimethylphenol	80.0	59.3	74	12	30	54-105	
2,4-Dinitrophenol	160	124	77	2	30	38-125	
2,4-Dinitrotoluene	80.0	66.5	83	4	30	63-124	
2,6-Dichlorophenol	80.0	62.9	79	10	50	56-114	
2,6-Dinitrotoluene	80.0	65.9	82	4	30	64-123	
2-Chloronaphthalene	80.0	59.4	74	7	30	52-116	
2-Chlorophenol	80.0	55.2	69	6	30	50-105	
2-Methylnaphthalene	80.0	63.0	79	9	30	55-107	
2-Methylphenol	80.0	55.2	69	2	30	43-94	
2-Nitroaniline	80.0	63.3	79	3	30	59-121	
2-Nitrophenol	80.0	61.5	77	8	30	58-110	
3 & 4 Methylphenol	80.0	55.5	69	11	30	34-88	
3,3'-Dichlorobenzidine	160	147	92	1	30	38-118	
3-Nitroaniline	80.0	57.9	72	4	30	40-108	
4,6-Dinitro-2-methylphenol	160	160	100	4	30	48-126	
4-Bromophenyl phenyl ether	80.0	70.8	88	3	30	60-115	
4-Chloro-3-methylphenol	80.0	65.9	82	5	30	63-107	
4-Chloroaniline	80.0	32.4	40	61	30	41-93	*
4-Chlorophenyl phenyl ether	80.0	64.1	80	4	30	57-120	
4-Methylphenol	80.0	55.5	69	11	30	34-88	
4-Nitroaniline	80.0	63.8	80	3	30	55-123	
4-Nitrophenol	160	79.5	50	41	30	15-60	*
Acenaphthene	80.0	61.9	77	7	30	52-122	
Acenaphthylene	80.0	61.7	77	6	30	58-112	
Acetophenone	80.0	59.3	74	8	30	58-108	
Aniline	80.0	2.37 J	3	182	30	29-87	*
Anthracene	80.0	73.4	92	2	30	62-113	

Column to be used to flag recovery and RPD values

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: D31291.D
Lab ID: LCSD 280-444835/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Azobenzene	80.0	65.4	82	2	30	59-115	
Benzaldehyde	80.0	48.5	61	24	50	31-91	
Benzidine	160	13.9 J	9	129	50	5-82	*
Benzo[a]anthracene	80.0	65.5	82	4	30	61-115	
Benzo[a]pyrene	80.0	72.3	90	3	30	61-114	
Benzo[b]fluoranthene	80.0	72.6	91	4	30	61-117	
Benzo[g,h,i]perylene	80.0	74.2	93	2	30	67-111	
Benzo[k]fluoranthene	80.0	73.7	92	3	30	69-119	
Benzoic acid	80.0	30.3	38	36	30	10-54	*
Benzyl alcohol	80.0	46.1	58	13	30	40-91	
bis (2-chloroisopropyl) ether	80.0	55.3	69	9	30	49-114	
Bis (2-chloroethoxy)methane	80.0	61.2	77	10	30	61-107	
Bis (2-chloroethyl) ether	80.0	58.5	73	10	30	56-112	
Bis (2-ethylhexyl) phthalate	80.0	72.0	90	1	30	60-116	
Butyl benzyl phthalate	80.0	68.9	86	2	30	66-111	
Caprolactam	80.0	13.1	16	11	30	10-50	
Carbazole	80.0	71.9	90	3	30	69-109	
Chrysene	80.0	70.2	88	3	30	63-118	
Dibenz (a,h) anthracene	80.0	74.5	93	3	30	65-111	
Dibenzofuran	80.0	63.5	79	5	30	58-116	
Diethyl phthalate	80.0	66.8	84	2	30	65-121	
Dimethyl phthalate	80.0	65.7	82	3	30	63-120	
Di-n-butyl phthalate	80.0	72.6	91	3	30	68-110	
Di-n-octyl phthalate	80.0	71.2	89	3	30	60-111	
Diphenylamine	68.0	55.6	82	4	50	62-118	
Fluoranthene	80.0	70.6	88	5	30	68-111	
Fluorene	80.0	65.0	81	4	30	48-130	
Hexachlorobenzene	80.0	72.6	91	4	30	64-112	
Hexachlorobutadiene	80.0	56.1	70	11	30	41-102	
Hexachlorocyclopentadiene	160	105	66	8	50	27-107	
Hexachloroethane	80.0	46.9	59	12	30	39-100	
Hexadecane	80.0	61.4	77	5	30	54-112	
Indeno[1,2,3-cd]pyrene	80.0	71.0	89	2	30	56-111	
Isophorone	80.0	60.8	76	9	30	59-100	
Naphthalene	80.0	60.0	75	8	30	53-105	
Nitrobenzene	80.0	59.8	75	9	30	56-106	
N-Nitrosodimethylamine	80.0	28.1	35	17	34	22-70	
N-Nitrosodi-n-propylamine	80.0	59.6	74	10	30	59-106	
N-Nitrosodiphenylamine	80.0	73.0	91	4	30	64-112	
Pentachlorophenol	160	147	92	0	30	41-121	
Phenanthrene	80.0	72.7	91	3	30	63-113	
Phenol	80.0	31.7	40	32	30	11-52	*

Column to be used to flag recovery and RPD values

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: D31291.D
 Lab ID: LCSD 280-444835/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Pyrene	80.0	70.4	88	3	30	62-114	
Pyridine	160	1.8 U	0	200	41	10-69	*

Column to be used to flag recovery and RPD values

FORM IV
GC/MS SEMI VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab File ID: D31289.D Lab Sample ID: MB 280-444835/1-A
Matrix: Water Date Extracted: 01/21/2019 06:56
Instrument ID: SMS_D Date Analyzed: 01/22/2019 17:40
Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-444835/2-A	D31290.D	01/22/2019 18:10
	LCSD 280-444835/3-A	D31291.D	01/22/2019 18:40
CRC-MW-1-011519	160-32649-1	D31299.D	01/22/2019 22:36

FORM V
GC/MS SEMI VOA INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab File ID: D30601.D DFTPP Injection Date: 12/05/2018
Instrument ID: SMS_D DFTPP Injection Time: 12:48
Analysis Batch No.: 440161

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10-80% of Base Peak	36.1
68	Less than 2% of mass 69	0.0 (0.0) 1
69	Mass 69 Relative abundance	45.2
70	Less than 2% of mass 69	0.0 (0.0) 1
127	10-80% of Base Peak	46.6
197	Less than 2% of mass 198	0.0
198	Base peak	100.0
199	5-9% of mass 198	7.0
275	10-60% of Base Peak	24.3
365	Greater than 1% of mass 198	2.7
441	present but less than 24% of mass 442	13.6 (15.0) 2
442	Greater than 50% of mass 198	90.5
443	15-24% of mass 442	17.4 (19.3) 2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD080 280-440161/13	D30612.D	12/05/2018	18:02
	STD004 280-440161/14	D30613.D	12/05/2018	18:27
	STD010 280-440161/15	D30614.D	12/05/2018	18:52
	STD020 280-440161/16	D30615.D	12/05/2018	19:17
	STD050 280-440161/17	D30616.D	12/05/2018	19:42
	STD120 280-440161/18	D30617.D	12/05/2018	20:07
	STD160 280-440161/19	D30618.D	12/05/2018	20:32
	STD200 280-440161/20	D30619.D	12/05/2018	20:57
	ICV 280-440161/21	D30620.D	12/05/2018	21:22

FORM V
GC/MS SEMI VOA INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab File ID: D30601.D DFTPP Injection Date: 12/05/2018
Instrument ID: SMS_D DFTPP Injection Time: 12:48
Analysis Batch No.: 440162

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10-80% of Base Peak	36.1
68	Less than 2% of mass 69	0.0 (0.0) 1
69	Mass 69 Relative abundance	45.2
70	Less than 2% of mass 69	0.0 (0.0) 1
127	10-80% of Base Peak	46.6
197	Less than 2% of mass 198	0.0
198	Base peak	100.0
199	5-9% of mass 198	7.0
275	10-60% of Base Peak	24.3
365	Greater than 1% of mass 198	2.7
441	present but less than 24% of mass 442	13.6 (15.0) 2
442	Greater than 50% of mass 198	90.5
443	15-24% of mass 442	17.4 (19.3) 2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD080 280-440162/22	D30621.D	12/05/2018	21:46
	STD010 280-440162/23	D30622.D	12/05/2018	22:11
	STD020 280-440162/24	D30623.D	12/05/2018	22:36
	STD050 280-440162/25	D30624.D	12/05/2018	23:01
	STD120 280-440162/26	D30625.D	12/05/2018	23:26
	STD160 280-440162/27	D30626.D	12/05/2018	23:51
	STD200 280-440162/28	D30627.D	12/06/2018	00:16
	ICV 280-440162/29	D30628.D	12/06/2018	00:40

FORM V
GC/MS SEMI VOA INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab File ID: D30630.D DFTPP Injection Date: 12/06/2018
Instrument ID: SMS_D DFTPP Injection Time: 08:39
Analysis Batch No.: 440302

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10-80% of Base Peak	33.6
68	Less than 2% of mass 69	0.0 (0.0) 1
69	Mass 69 Relative abundance	42.2
70	Less than 2% of mass 69	0.2 (0.4) 1
127	10-80% of Base Peak	44.4
197	Less than 2% of mass 198	0.0
198	Base peak	100.0
199	5-9% of mass 198	7.1
275	10-60% of Base Peak	25.7
365	Greater than 1% of mass 198	2.9
441	present but less than 24% of mass 442	16.4 (16.5) 2
442	Greater than 50% of mass 198	99.8
443	15-24% of mass 442	19.3 (19.3) 2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD080 280-440302/3	D30631.D	12/06/2018	08:53
	STD010 280-440302/4	D30632.D	12/06/2018	09:17
	STD020 280-440302/5	D30633.D	12/06/2018	09:42
	STD050 280-440302/6	D30634.D	12/06/2018	10:07
	STD120 280-440302/7	D30635.D	12/06/2018	10:32
	STD160 280-440302/8	D30636.D	12/06/2018	10:56
	STD200 280-440302/9	D30637.D	12/06/2018	11:21
	ICV 280-440302/10	D30638.D	12/06/2018	11:46

FORM V
GC/MS SEMI VOA INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab File ID: D31075.D DFTPP Injection Date: 01/08/2019
Instrument ID: SMS_D DFTPP Injection Time: 14:30
Analysis Batch No.: 443607

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10-80% of Base Peak	40.6
68	Less than 2% of mass 69	0.0 (0.0) 1
69	Mass 69 Relative abundance	47.5
70	Less than 2% of mass 69	0.3 (0.6) 1
127	10-80% of Base Peak	49.6
197	Less than 2% of mass 198	0.0
198	Base peak	100.0
199	5-9% of mass 198	7.0
275	10-60% of Base Peak	21.8
365	Greater than 1% of mass 198	2.3
441	present but less than 24% of mass 442	11.6 (15.3) 2
442	Greater than 50% of mass 198	75.6
443	15-24% of mass 442	14.5 (19.2) 2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	ICIS 280-443607/3	D31076.D	01/08/2019	14:43
	STD004 280-443607/4	D31077.D	01/08/2019	15:12
	STD010 280-443607/5	D31078.D	01/08/2019	15:42
	STD020 280-443607/6	D31079.D	01/08/2019	16:11
	STD050 280-443607/7	D31080.D	01/08/2019	16:40
	STD120 280-443607/8	D31081.D	01/08/2019	17:10
	STD160 280-443607/9	D31082.D	01/08/2019	17:39
	STD200 280-443607/10	D31083.D	01/08/2019	18:08
	ICV 280-443607/11	D31084.D	01/08/2019	18:38
	ICV 280-443607/12	D31085.D	01/08/2019	19:07

FORM V
GC/MS SEMI VOA INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab File ID: D31280.D DFTPP Injection Date: 01/22/2019
Instrument ID: SMS_D DFTPP Injection Time: 13:47
Analysis Batch No.: 445019

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10-80% of Base Peak	37.5
68	Less than 2% of mass 69	0.0 (0.0) 1
69	Mass 69 Relative abundance	45.1
70	Less than 2% of mass 69	0.2 (0.5) 1
127	10-80% of Base Peak	46.7
197	Less than 2% of mass 198	0.0
198	Base peak	100.0
199	5-9% of mass 198	6.2
275	10-60% of Base Peak	22.4
365	Greater than 1% of mass 198	2.3
441	present but less than 24% of mass 442	11.2 (15.2) 2
442	Greater than 50% of mass 198	73.7
443	15-24% of mass 442	14.2 (19.3) 2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-445019/3	D31281.D	01/22/2019	13:59
	CCV 280-445019/4	D31282.D	01/22/2019	14:29
	CCV 280-445019/5	D31283.D	01/22/2019	14:54
	CCV 280-445019/6	D31285.D	01/22/2019	15:47
	MB 280-444835/1-A	D31289.D	01/22/2019	17:40
	LCS 280-444835/2-A	D31290.D	01/22/2019	18:10
	LCSD 280-444835/3-A	D31291.D	01/22/2019	18:40
CRC-MW-1-011519	160-32649-1	D31299.D	01/22/2019	22:36

FORM VIII
GC/MS SEMI VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Sample No.: ICIS 280-443607/3 Date Analyzed: 01/08/2019 14:43
 Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm)
 Lab File ID (Standard): D31076.D Heated Purge: (Y/N) N
 Calibration ID: 34752

	DCBd4		NPT		ANT		
	AREA #	RT #	AREA #	RT #	AREA #	RT #	
INITIAL CALIBRATION MID-POINT	131559	4.59	537462	5.83	311721	7.58	
UPPER LIMIT	263118	5.09	1074924	6.33	623442	8.08	
LOWER LIMIT	65780	4.09	268731	5.33	155861	7.08	
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-443607/11		125201	4.60	517009	5.83	304800	7.58
ICV 280-443607/12		110316	4.60	443859	5.83	259621	7.58
CCV 280-445019/3		152080	4.51	605546	5.74	347168	7.48
CCV 280-445019/4		130916	4.50	524852	5.74	301972	7.48
CCV 280-445019/5		156088	4.50	623656	5.74	358059	7.48
CCV 280-445019/6		140784	4.51	555420	5.74	328488	7.48
MB 280-444835/1-A		133680	4.51	516611	5.74	327764	7.48
LCS 280-444835/2-A		132748	4.51	529049	5.74	332199	7.48
LCSD 280-444835/3-A		137307	4.51	549546	5.74	341796	7.49
160-32649-1	CRC-MW-1-011519	138895	4.51	537028	5.74	346380	7.48

DCBd4 = 1,4-Dichlorobenzene-d4

NPT = Naphthalene-d8

ANT = Acenaphthene-d10

Area Limit = 50%-200% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
GC/MS SEMI VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Sample No.: ICIS 280-443607/3 Date Analyzed: 01/08/2019 14:43
 Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm)
 Lab File ID (Standard): D31076.D Heated Purge: (Y/N) N
 Calibration ID: 34752

	PHN		CRY		PRY		
	AREA #	RT #	AREA #	RT #	AREA #	RT #	
INITIAL CALIBRATION MID-POINT	646286	9.07	635088	13.13	630299	17.05	
UPPER LIMIT	1292572	9.57	1270176	13.63	1260598	17.55	
LOWER LIMIT	323143	8.57	317544	12.63	315150	16.55	
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-443607/11		642482	9.07	644059	13.13	649435	17.07
ICV 280-443607/12		546221	9.07	627075	13.12	633770	17.05
CCV 280-445019/3		710100	8.97	710819	12.91	704464	16.76
CCV 280-445019/4		602486	8.97	612471	12.90	598458	16.74
CCV 280-445019/5		739697	8.96	759793	12.90	777964	16.75
CCV 280-445019/6		666770	8.96	676799	12.90	696625	16.76
MB 280-444835/1-A		618832	8.97	643464	12.90	618251	16.75
LCS 280-444835/2-A		608169	8.96	625943	12.91	611322	16.75
LCSD 280-444835/3-A		625676	8.97	626631	12.91	612773	16.75
160-32649-1	CRC-MW-1-011519	644442	8.97	665593	12.90	647263	16.75

PHN = Phenanthrene-d10
 CRY = Chrysene-d12
 PRY = Perylene-d12

Area Limit = 50%-200% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: <u>CRC-MW-1-011519</u>	Lab Sample ID: <u>160-32649-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31299.D</u>
Analysis Method: <u>8270D</u>	Date Collected: <u>01/15/2019 12:30</u>
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>968(mL)</u>	Date Analyzed: <u>01/22/2019 22:36</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
92-52-4	1,1'-Biphenyl	0.42	U	10	0.42
95-94-3	1,2,4,5-Tetrachlorobenzene	2.1	U	10	2.1
120-82-1	1,2,4-Trichlorobenzene	2.1	U	5.2	2.1
95-50-1	1,2-Dichlorobenzene	2.1	U	5.2	2.1
122-66-7	1,2-Diphenylhydrazine (as Azobenzene)	0.56	U	10	0.56
541-73-1	1,3-Dichlorobenzene	2.1	U	10	2.1
99-65-0	1,3-Dinitrobenzene	1.0	U	10	1.0
106-46-7	1,4-Dichlorobenzene	2.1	U	5.2	2.1
123-91-1	1,4-Dioxane	0.73	U	21	0.73
90-12-0	1-Methylnaphthalene	0.36	U	4.1	0.36
58-90-2	2,3,4,6-Tetrachlorophenol	0.99	U	52	0.99
95-95-4	2,4,5-Trichlorophenol	0.54	U	10	0.54
88-06-2	2,4,6-Trichlorophenol	0.76	U	10	0.76
120-83-2	2,4-Dichlorophenol	0.70	U	10	0.70
105-67-9	2,4-Dimethylphenol	0.69	U	10	0.69
51-28-5	2,4-Dinitrophenol	7.7	U	31	7.7
121-14-2	2,4-Dinitrotoluene	0.96	U	10	0.96
87-65-0	2,6-Dichlorophenol	0.77	U	10	0.77
606-20-2	2,6-Dinitrotoluene	0.74	U	10	0.74
91-58-7	2-Chloronaphthalene	0.48	U	4.1	0.48
95-57-8	2-Chlorophenol	0.44	U	10	0.44
91-57-6	2-Methylnaphthalene	0.42	U	4.1	0.42
95-48-7	2-Methylphenol	0.58	U	10	0.58
88-74-4	2-Nitroaniline	0.93	U	10	0.93
88-75-5	2-Nitrophenol	0.64	U	10	0.64
15831-10-4	3 & 4 Methylphenol	0.41	U	10	0.41
91-94-1	3,3'-Dichlorobenzidine	0.86	U	52	0.86
108-39-4	3-Methylphenol	0.41	U	10	0.41
99-09-2	3-Nitroaniline	0.81	U	10	0.81
534-52-1	4,6-Dinitro-2-methylphenol	6.1	U	52	6.1
101-55-3	4-Bromophenyl phenyl ether	0.42	U	10	0.42
59-50-7	4-Chloro-3-methylphenol	0.46	U	10	0.46
106-47-8	4-Chloroaniline	0.58	U *	10	0.58
7005-72-3	4-Chlorophenyl phenyl ether	0.65	U	10	0.65

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: <u>CRC-MW-1-011519</u>	Lab Sample ID: <u>160-32649-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31299.D</u>
Analysis Method: <u>8270D</u>	Date Collected: <u>01/15/2019 12:30</u>
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>968(mL)</u>	Date Analyzed: <u>01/22/2019 22:36</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
106-44-5	4-Methylphenol	0.41	U	10	0.41
100-01-6	4-Nitroaniline	0.87	U	10	0.87
100-02-7	4-Nitrophenol	1.0	U *	10	1.0
83-32-9	Acenaphthene	0.46	U	4.1	0.46
208-96-8	Acenaphthylene	0.52	U	4.1	0.52
98-86-2	Acetophenone	0.54	U	10	0.54
62-53-3	Aniline	0.91	U *	10	0.91
120-12-7	Anthracene	0.46	U	4.1	0.46
103-33-3	Azobenzene	0.56	U	4.1	0.56
100-52-7	Benzaldehyde	0.55	U	10	0.55
92-87-5	Benzidine	4.5	U *	100	4.5
56-55-3	Benzo[a]anthracene	0.60	U	4.1	0.60
50-32-8	Benzo[a]pyrene	0.66	U	4.1	0.66
205-99-2	Benzo[b]fluoranthene	0.55	U	4.1	0.55
191-24-2	Benzo[g,h,i]perylene	0.82	U	4.1	0.82
207-08-9	Benzo[k]fluoranthene	0.58	U	4.1	0.58
65-85-0	Benzoic acid	5.8	U *	26	5.8
100-51-6	Benzyl alcohol	0.36	U	10	0.36
108-60-1	bis (2-chloroisopropyl) ether	0.43	U	10	0.43
111-91-1	Bis(2-chloroethoxy)methane	0.63	U	10	0.63
111-44-4	Bis(2-chloroethyl)ether	0.51	U	10	0.51
117-81-7	Bis(2-ethylhexyl) phthalate	5.2	J	10	1.2
85-68-7	Butyl benzyl phthalate	2.1	U	5.2	2.1
105-60-2	Caprolactam	1.2	U	10	1.2
86-74-8	Carbazole	0.46	U	4.1	0.46
218-01-9	Chrysene	0.54	U	4.1	0.54
53-70-3	Dibenz(a,h)anthracene	0.67	U	4.1	0.67
132-64-9	Dibenzofuran	0.37	U	4.1	0.37
84-66-2	Diethyl phthalate	0.77	U	4.1	0.77
131-11-3	Dimethyl phthalate	0.55	U	4.1	0.55
84-74-2	Di-n-butyl phthalate	0.91	U	4.1	0.91
117-84-0	Di-n-octyl phthalate	1.6	U	5.2	1.6
122-39-4	Diphenylamine	0.51	U	10	0.51
52-85-7	Famphur	2.1	U	100	2.1

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: <u>CRC-MW-1-011519</u>	Lab Sample ID: <u>160-32649-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31299.D</u>
Analysis Method: <u>8270D</u>	Date Collected: <u>01/15/2019 12:30</u>
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>968(mL)</u>	Date Analyzed: <u>01/22/2019 22:36</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
206-44-0	Fluoranthene	0.66	U	4.1	0.66
86-73-7	Fluorene	0.51	U	4.1	0.51
118-74-1	Hexachlorobenzene	0.99	U	10	0.99
87-68-3	Hexachlorobutadiene	7.8	U	31	7.8
77-47-4	Hexachlorocyclopentadiene	6.8	U	52	6.8
67-72-1	Hexachloroethane	7.9	U	31	7.9
544-76-3	Hexadecane	0.36	U	10	0.36
193-39-5	Indeno[1,2,3-cd]pyrene	1.7	U	4.1	1.7
78-59-1	Isophorone	0.69	U	10	0.69
91-20-3	Naphthalene	0.41	U	4.1	0.41
98-95-3	Nitrobenzene	0.44	U	10	0.44
62-75-9	N-Nitrosodimethylamine	0.64	U	10	0.64
621-64-7	N-Nitrosodi-n-propylamine	0.58	U	10	0.58
86-30-6	N-Nitrosodiphenylamine	0.63	U	10	0.63
87-86-5	Pentachlorophenol	5.7	U	52	5.7
85-01-8	Phenanthrene	0.29	U	4.1	0.29
108-95-2	Phenol	0.58	U *	10	0.58
129-00-0	Pyrene	0.44	U	10	0.44
110-86-1	Pyridine	1.8	U *	21	1.8

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol (Surr)	77		52-123
321-60-8	2-Fluorobiphenyl	65		47-119
367-12-4	2-Fluorophenol (Surr)	49		17-71
4165-60-0	Nitrobenzene-d5 (Surr)	67		45-113
4165-62-2	Phenol-d5 (Surr)	34		10-52
1718-51-0	Terphenyl-d14 (Surr)	74		50-123

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: <u>CRC-MW-1-011519</u>	Lab Sample ID: <u>160-32649-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31299.D</u>
Analysis Method: <u>8270D</u>	Date Collected: <u>01/15/2019 12:30</u>
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>968 (mL)</u>	Date Analyzed: <u>01/22/2019 22:36</u>
Con. Extract Vol.: <u>1 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1 (uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>
Number TICs Found: <u>1</u>	TIC Result Total: <u>4.6</u>

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	3.01	4.6	T J	

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31299.D
 Lims ID: 160-32649-F-1-A
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 22-Jan-2019 22:36:30 ALS Bottle#: 20 Worklist Smp#: 22
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: 160-32649-F-1-A
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 23-Jan-2019 09:17:44

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.506	4.503	0.003	96	138895	40.0	
* 2 Naphthalene-d8	136	5.740	5.737	0.003	99	537028	40.0	
* 3 Acenaphthene-d10	164	7.482	7.484	-0.002	91	346380	40.0	
* 4 Phenanthrene-d10	188	8.967	8.964	0.003	97	644442	40.0	
* 5 Chrysene-d12	240	12.898	12.901	-0.003	98	665593	40.0	
* 6 Perylene-d12	264	16.750	16.752	-0.002	97	647263	40.0	
\$ 7 2-Fluorophenol	112	3.315	3.309	0.006	93	253581	48.6	
\$ 8 Phenol-d5	99	4.153	4.153	0.000	98	237079	34.1	
\$ 9 Nitrobenzene-d5	82	5.024	5.023	0.001	86	386132	66.7	
\$ 10 2-Fluorobiphenyl	172	6.798	6.797	0.001	99	781902	64.9	
\$ 11 2,4,6-Tribromophenol	330	8.267	8.271	-0.004	94	128642	76.9	
\$ 12 Terphenyl-d14	244	10.858	10.857	0.001	100	1135580	74.2	
13 1,4-Dioxane	88		1.856				ND	
14 N-Nitrosodimethylamine	74		2.096				ND	
15 Pyridine	79		2.149				ND	
22 Benzaldehyde	106		4.091				ND	
24 Phenol	94		4.169				ND	
25 Aniline	93		4.190				ND	
27 Bis(2-chloroethyl)ether	93		4.233				ND	
28 2-Chlorophenol	128		4.313				ND	
29 1,3-Dichlorobenzene	146		4.457				ND	
30 1,4-Dichlorobenzene	146		4.521				ND	
31 Benzyl alcohol	108		4.623				ND	
32 1,2-Dichlorobenzene	146		4.671				ND	
34 2,2'-oxybis[1-chloropropan	45		4.746				ND	
35 2-Methylphenol	108		4.735				ND	
38 N-Nitrosodi-n-propylamine	70		4.874				ND	
39 Acetophenone	105		4.879				ND	
40 4-Methylphenol	108		4.879				ND	
41 3-Methylphenol	108		4.879				ND	
42 3 & 4 Methylphenol	108		4.879				ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	Flags
44 Hexachloroethane	117		4.997				ND	
45 Nitrobenzene	77		5.045				ND	
47 Isophorone	82		5.275				ND	
48 2-Nitrophenol	139		5.355				ND	
49 2,4-Dimethylphenol	107		5.392				ND	
51 Bis(2-chloroethoxy)methane	93		5.472				ND	
52 Benzoic acid	105		5.536				ND	
53 2,4-Dichlorophenol	162		5.600				ND	
55 1,2,4-Trichlorobenzene	180		5.681				ND	
56 Naphthalene	128		5.761				ND	
57 4-Chloroaniline	127		5.798				ND	
58 2,6-Dichlorophenol	162		5.819				ND	
60 Hexachlorobutadiene	225		5.884				ND	
63 Caprolactam	55		6.145				ND	
64 4-Chloro-3-methylphenol	107		6.290				ND	
66 2-Methylnaphthalene	142		6.439				ND	
67 1-Methylnaphthalene	142		6.541				ND	
68 Hexachlorocyclopentadiene	237		6.610				ND	
69 1,2,4,5-Tetrachlorobenzene	216		6.615				ND	
71 2,4,6-Trichlorophenol	196		6.722				ND	
72 2,4,5-Trichlorophenol	196		6.765				ND	
74 1,1'-Biphenyl	154		6.899				ND	
75 2-Chloronaphthalene	162		6.925				ND	
77 2-Nitroaniline	65		7.016				ND	
80 Dimethyl phthalate	163		7.192				ND	
81 1,3-Dinitrobenzene	168		7.219				ND	
82 2,6-Dinitrotoluene	165		7.251				ND	
83 Acenaphthylene	152		7.342				ND	
84 3-Nitroaniline	138		7.427				ND	
85 Acenaphthene	153		7.513				ND	
86 2,4-Dinitrophenol	184		7.529				ND	
88 4-Nitrophenol	109		7.609				ND	
89 2,4-Dinitrotoluene	165		7.657				ND	
90 Dibenzofuran	168		7.684				ND	
92 Hexadecane	57		7.914				ND	
93 2,3,4,6-Tetrachlorophenol	232		7.812				ND	
95 Diethyl phthalate	149		7.892				ND	
97 4-Chlorophenyl phenyl ethe	204		8.015				ND	
99 Fluorene	166		8.026				ND	
100 4-Nitroaniline	138		8.042				ND	
101 4,6-Dinitro-2-methylphenol	198		8.074				ND	
102 N-Nitrosodiphenylamine	169		8.133				ND	
103 Diphenylamine	169		8.133				ND	
105 1,2-Diphenylhydrazine	77		8.175				ND	
106 Azobenzene	77		8.175				ND	
114 4-Bromophenyl phenyl ether	248		8.507				ND	
116 Hexachlorobenzene	284		8.592				ND	
119 Pentachlorophenol	266		8.784				ND	
123 Phenanthrene	178		8.993				ND	
124 Anthracene	178		9.041				ND	
125 Carbazole	167		9.196				ND	
127 Di-n-butyl phthalate	149		9.527				ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	Flags
132 Fluoranthene	202		10.312				ND	U
133 Benzidine	184		10.477				ND	
134 Pyrene	202		10.638				ND	
139 Famphur	218		11.600				ND	
141 Butyl benzyl phthalate	149		11.717				ND	
144 3,3'-Dichlorobenzidine	252		12.850				ND	
145 Benzo[a]anthracene	228		12.887				ND	
146 Chrysene	228		12.973				ND	
147 Bis(2-ethylhexyl) phthalat	149	13.053	13.053	0.000	97	61253	5.02	
148 Di-n-octyl phthalate	149		14.821				ND	
150 Benzo[b]fluoranthene	252		15.686				ND	
151 Benzo[k]fluoranthene	252		15.766				ND	
153 Benzo[a]pyrene	252		16.600				ND	
156 Indeno[1,2,3-cd]pyrene	276		19.837				ND	
157 Dibenz(a,h)anthracene	278		19.939				ND	
158 Benzo[g,h,i]perylene	276		20.574				ND	

QC Flag Legend

Review Flags

U - Marked Undetected

Reagents:

MS-IS_00014

Amount Added: 20.00

Units: uL

Run Reagent

TestAmerica Denver
Tentatively Identified Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31299.D
Lims ID: 160-32649-F-1-A
Client ID: CRC-MW-1-011519
Sample Type: Client
Inject. Date: 22-Jan-2019 22:36:30 ALS Bottle#: 20 Worklist Smp#: 22
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 160-32649-F-1-A
Operator ID: KIEKELD Instrument ID: SMS_D
Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
Limit Group: MSSV - 8270D
Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
Tic RT Window: 0.000 -0.000 Response: area
Quant By: Nearest ISTD Quant LOD: 10.00000
MS Library: \\chromna\Denver\Database\NIST98.L
Min. Match: 80
Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
Process Host: CTX0325
First Level Reviewer: kiekeld Date: 23-Jan-2019 09:17:44

Calibrated Tentative Identified Compound Results

Compound	RT	Response	Amount ug/ml	Flags
----------	----	----------	-----------------	-------

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31299.D

Tentative Identified Compound Results

RT	Area	Amount ug/ml	Quant Cpnd	Qual	Lib Entry	Molecular Formula	Mol. Weight	Flags
----	------	-----------------	---------------	------	--------------	----------------------	----------------	-------

Unknown
3.005 88950 4.42 1

Quantitation Compounds

Compound	RT	Area	Amount ug/ml
----------	----	------	-----------------

* 1 1,4-Dichlorobenzene-d4 4.506 805621 40.0

QC Flag Legend

Processing Flags

Reagents:

MS-IS_00014

Amount Added: 20.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31299.D

Injection Date: 22-Jan-2019 22:36:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: 160-32649-F-1-A

Lab Sample ID: 280-32649-1

Worklist Smp#: 22

Client ID: CRC-MW-1-011519

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

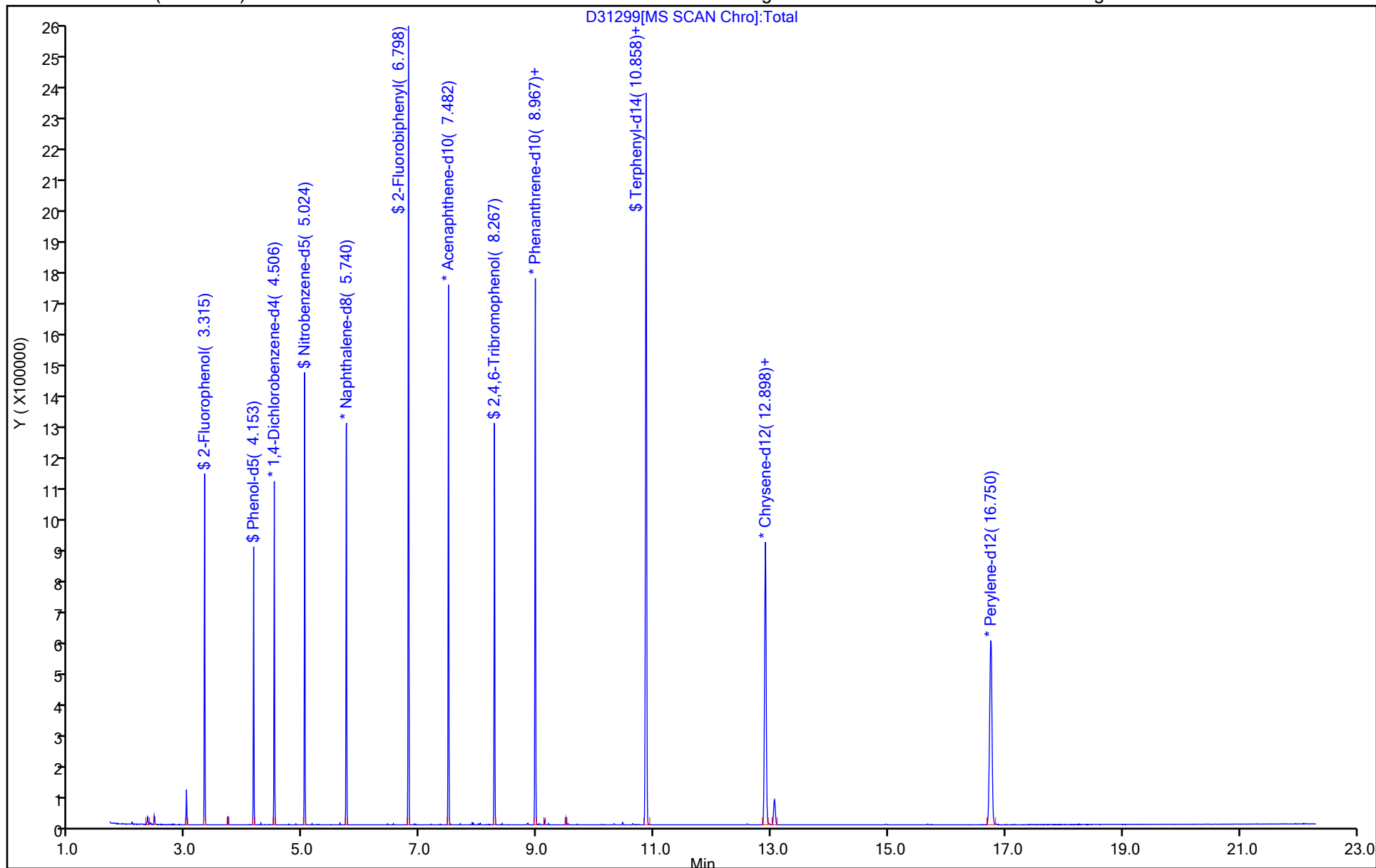
ALS Bottle#: 20

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31299.D
 Lims ID: 160-32649-F-1-A
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 22-Jan-2019 22:36:30 ALS Bottle#: 20 Worklist Smp#: 22
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: 160-32649-F-1-A
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

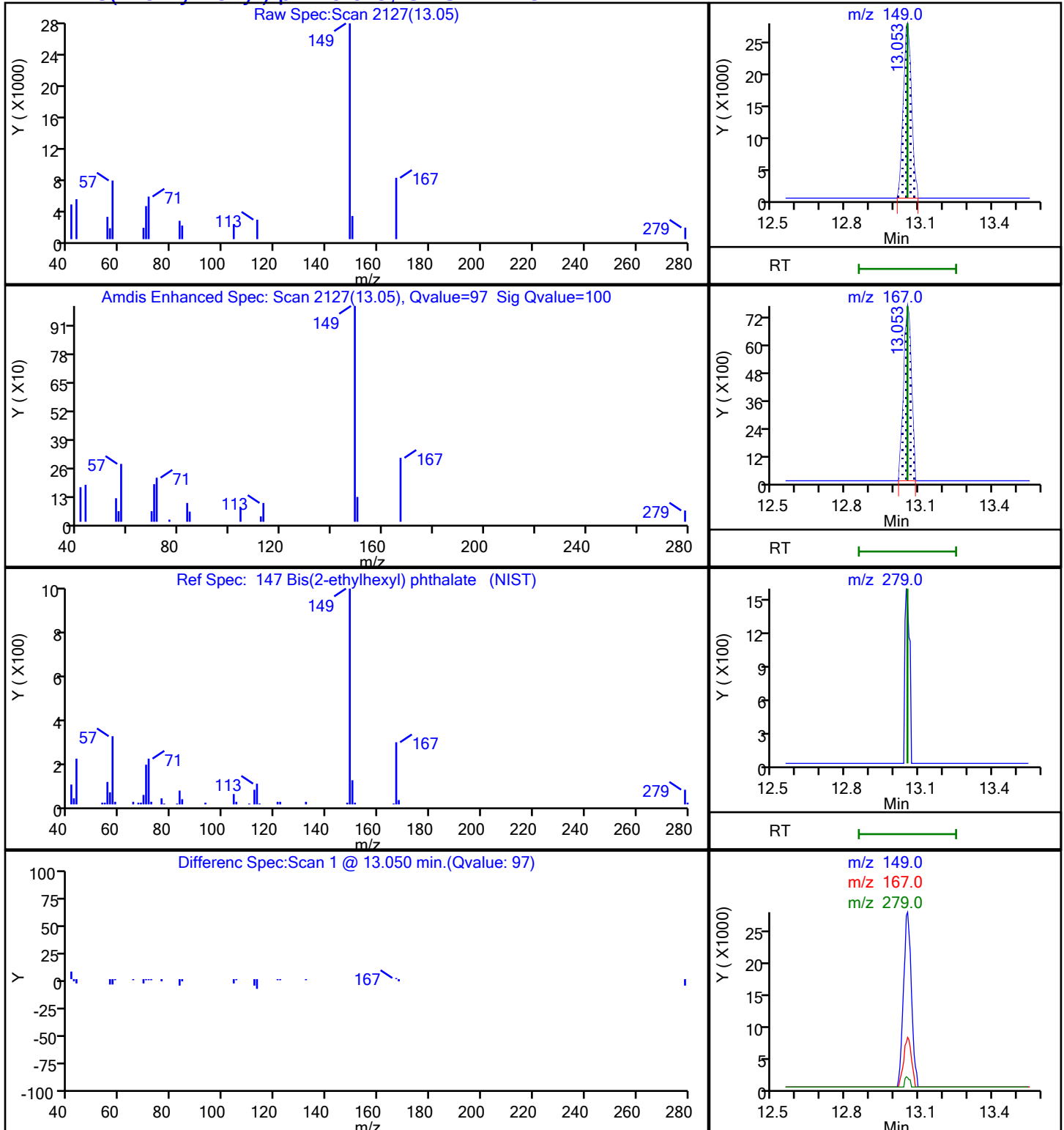
First Level Reviewer: kiekeld

Date: 23-Jan-2019 09:17:44

Compound	Amount Added	Amount Recovered	% Rec.
\$ 7 2-Fluorophenol	100.0	48.6	48.59
\$ 8 Phenol-d5	100.0	34.1	34.11
\$ 9 Nitrobenzene-d5	100.0	66.7	66.72
\$ 10 2-Fluorobiphenyl	100.0	64.9	64.92
\$ 11 2,4,6-Tribromophenol	100.0	76.9	76.88
\$ 12 Terphenyl-d14	100.0	74.2	74.22

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31299.D
Injection Date: 22-Jan-2019 22:36:30 Instrument ID: SMS_D
Lims ID: 160-32649-F-1-A Lab Sample ID: 280-32649-1
Client ID: CRC-MW-1-011519
Operator ID: KIEKELD ALS Bottle#: 20 Worklist Smp#: 22
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector MS SCAN

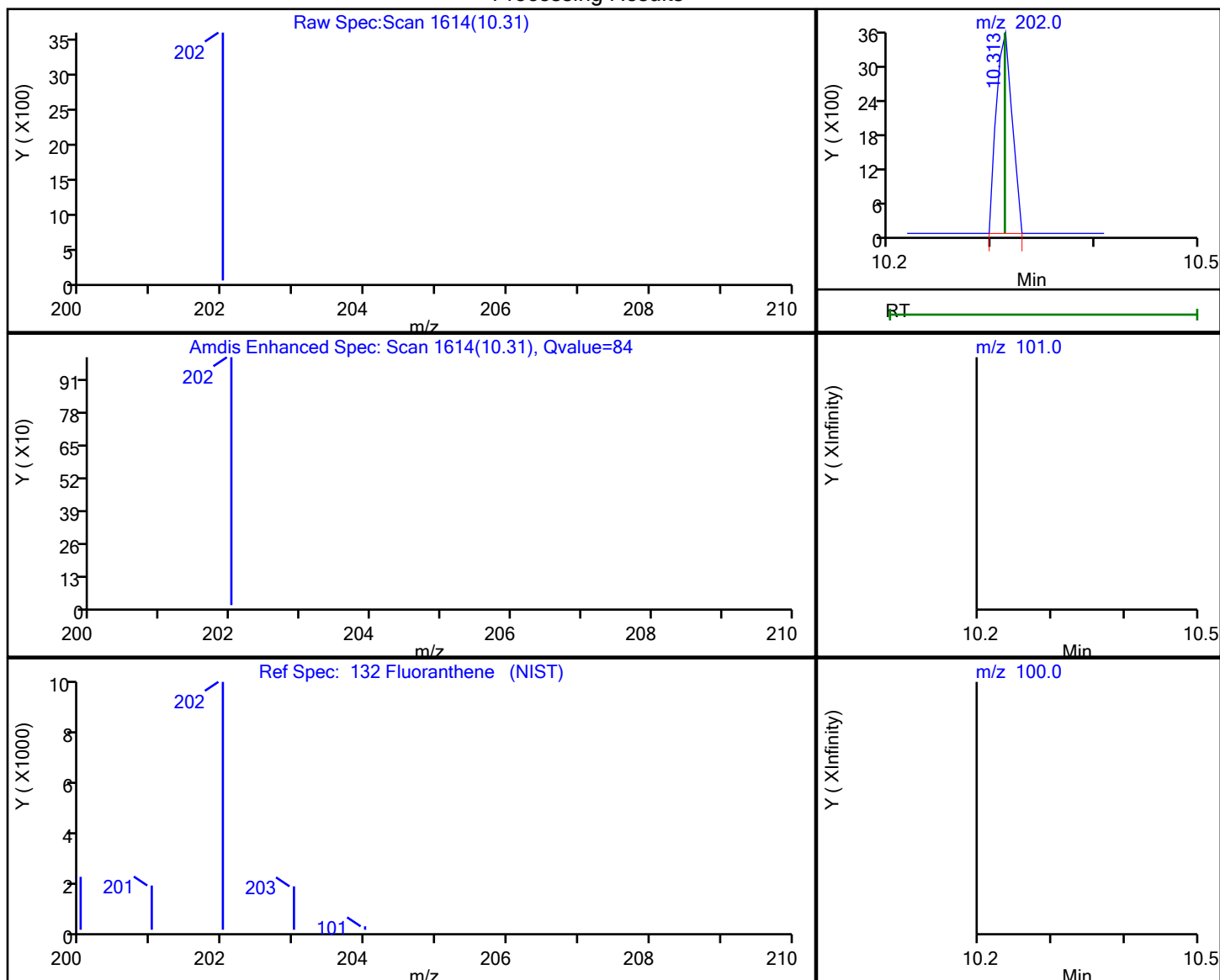
147 Bis(2-ethylhexyl) phthalate, CAS: 117-81-7

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31299.D
Injection Date: 22-Jan-2019 22:36:30 Instrument ID: SMS_D
Lims ID: 160-32649-F-1-A Lab Sample ID: 280-32649-1
Client ID: CRC-MW-1-011519
Operator ID: KIEKELD ALS Bottle#: 20 Worklist Smp#: 22
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

132 Fluoranthene, CAS: 206-44-0

Processing Results



RT	Mass	Response	Amount
10.31	202.00	3851	0.199158
10.31	101.00	0	
10.31	100.00	0	

Reviewer: kiekeld, 23-Jan-2019 09:17:39

Audit Action: Marked Compound Undetected

Audit Reason: Invalid Compound ID

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31299.D

Injection Date: 22-Jan-2019 22:36:30

Instrument ID: SMS_D

Lims ID: 160-32649-F-1-A

Lab Sample ID: 280-32649-1

Client ID: CRC-MW-1-011519

Operator ID: KIEKELD

ALS Bottle#: 20 Worklist Smp#: 22

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

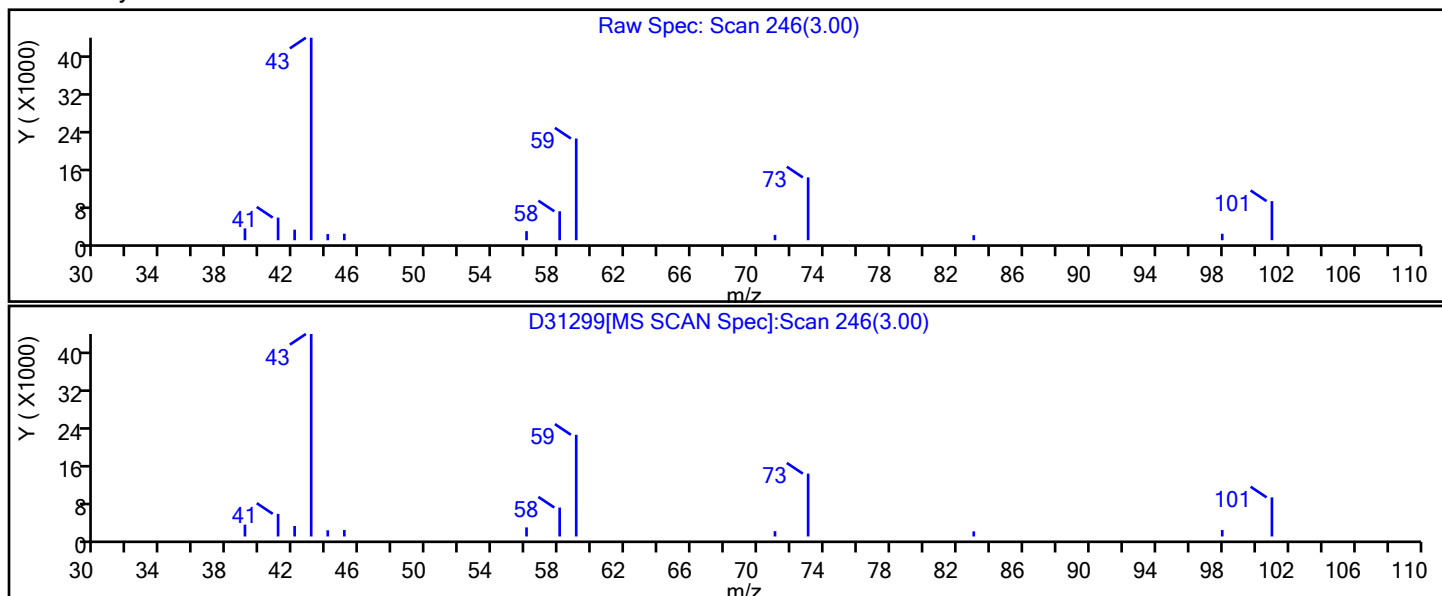
Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column:

Detector MS SCAN

No Library Matches Found above the Threshold: 80



FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 440161

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/05/2018 18:02 Calibration End Date: 12/05/2018 20:57 Calibration ID: 34483

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD004 280-440161/14	D30613.D
Level 2	STD010 280-440161/15	D30614.D
Level 3	STD020 280-440161/16	D30615.D
Level 4	STD050 280-440161/17	D30616.D
Level 5	STD080 280-440161/13	D30612.D
Level 6	STD120 280-440161/18	D30617.D
Level 7	STD160 280-440161/19	D30618.D
Level 8	STD200 280-440161/20	D30619.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5		B	M1	M2								
Famphur	0.3816 0.4199	0.4013 0.4172	0.4168 0.4068	0.4266	0.4363	Ave		0.4133				4.1		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 440161

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/05/2018 18:02 Calibration End Date: 12/05/2018 20:57 Calibration ID: 34483

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD004 280-440161/14	D30613.D
Level 2	STD010 280-440161/15	D30614.D
Level 3	STD020 280-440161/16	D30615.D
Level 4	STD050 280-440161/17	D30616.D
Level 5	STD080 280-440161/13	D30612.D
Level 6	STD120 280-440161/18	D30617.D
Level 7	STD160 280-440161/19	D30618.D
Level 8	STD200 280-440161/20	D30619.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
Famphur	CRY	Ave	29972 1000982	79270 1347504	163981 1610368	430104	686828	4.00 120	10.0 160	20.0 200	50.0	80.0

Curve Type Legend:

Ave = Average ISTD

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 440161

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/05/2018 18:02 Calibration End Date: 12/05/2018 20:57 Calibration ID: 34483

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD004 280-440161/14	D30613.D
Level 2	STD010 280-440161/15	D30614.D
Level 3	STD020 280-440161/16	D30615.D
Level 4	STD050 280-440161/17	D30616.D
Level 5	STD080 280-440161/13	D30612.D
Level 6	STD120 280-440161/18	D30617.D
Level 7	STD160 280-440161/19	D30618.D
Level 8	STD200 280-440161/20	D30619.D

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
	LVL 7 #	LVL 8 #					LVL 7	LVL 8				
Famphur	-7.7						30					

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30612.D
 Lims ID: STD080 FAM
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 05-Dec-2018 18:02:30 ALS Bottle#: 12 Worklist Smp#: 13
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD080 FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub15
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:21 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:08:22

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.673	4.673	0.000	96	125461	40.0	40.0	
* 2 Naphthalene-d8	136	5.896	5.896	0.000	99	508221	40.0	40.0	
* 3 Acenaphthene-d10	164	7.649	7.649	0.000	94	317822	40.0	40.0	
* 4 Phenanthrene-d10	188	9.139	9.139	0.000	97	688070	40.0	40.0	
* 5 Chrysene-d12	240	13.290	13.290	0.000	99	787183	40.0	40.0	
* 6 Perylene-d12	264	17.280	17.280	0.000	98	832202	40.0	40.0	
139 Famphur	218	11.917	11.917	0.000	99	686828	80.0	84.4	

Reagents:

MS-FAM080_00001

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30612.D

Injection Date: 05-Dec-2018 18:02:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD080 FAM

Worklist Smp#: 13

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

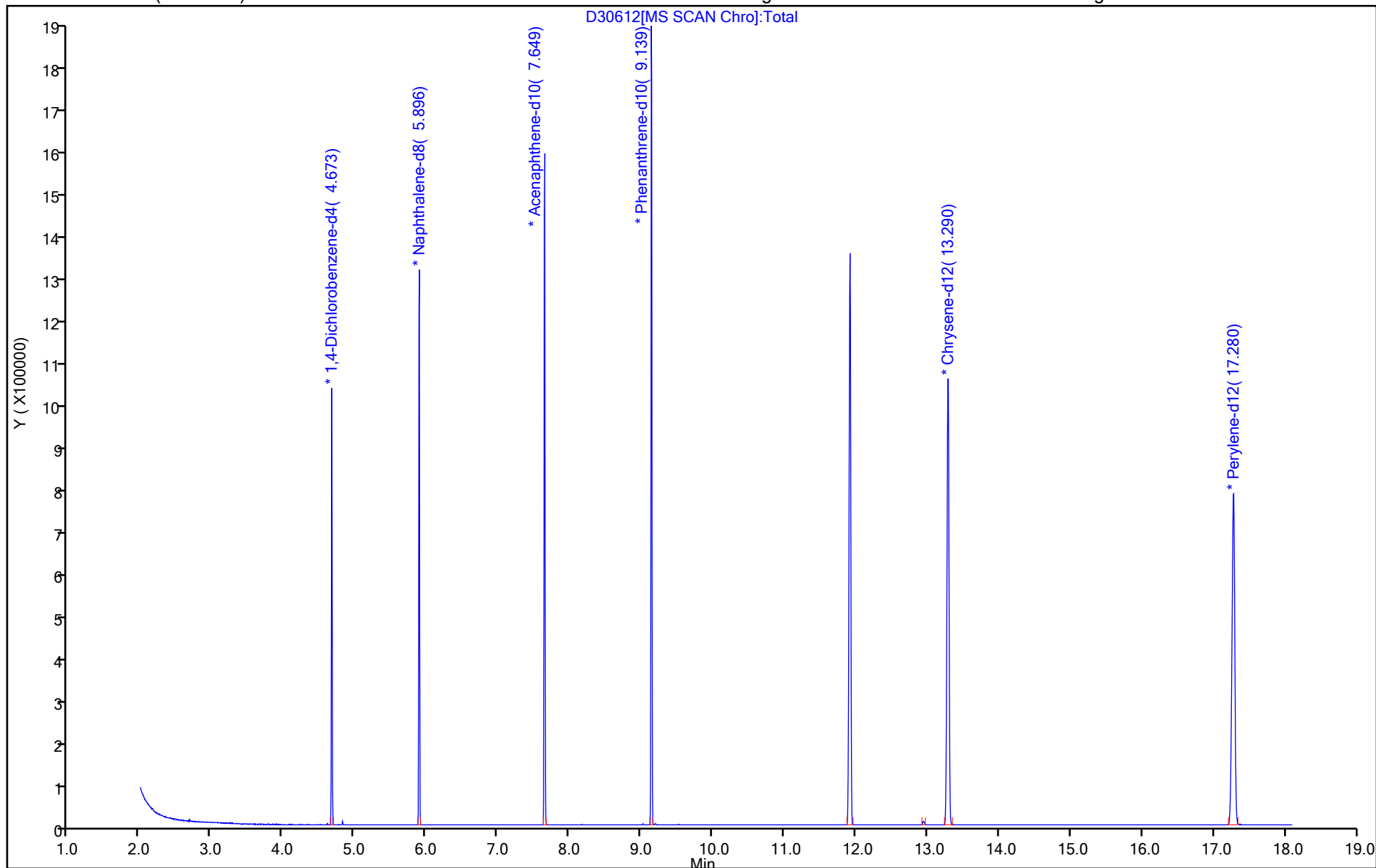
ALS Bottle#: 12

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30613.D
 Lims ID: STD004 FAM
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 05-Dec-2018 18:27:30 ALS Bottle#: 13 Worklist Smp#: 14
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD004 FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub15
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:23 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:08:30

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.675	4.673	0.002	96	124399	40.0	40.0	
* 2 Naphthalene-d8	136	5.893	5.896	-0.003	99	504832	40.0	40.0	
* 3 Acenaphthene-d10	164	7.645	7.649	-0.004	94	317908	40.0	40.0	
* 4 Phenanthrene-d10	188	9.141	9.139	0.002	98	694656	40.0	40.0	
* 5 Chrysene-d12	240	13.286	13.290	-0.004	99	785361	40.0	40.0	
* 6 Perylene-d12	264	17.277	17.280	-0.003	98	843216	40.0	40.0	
139 Famphur	218	11.908	11.917	-0.009	96	29972	4.00	3.69	

Reagents:

MS-FAM004_00001

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30613.D

Injection Date: 05-Dec-2018 18:27:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD004 FAM

Worklist Smp#: 14

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

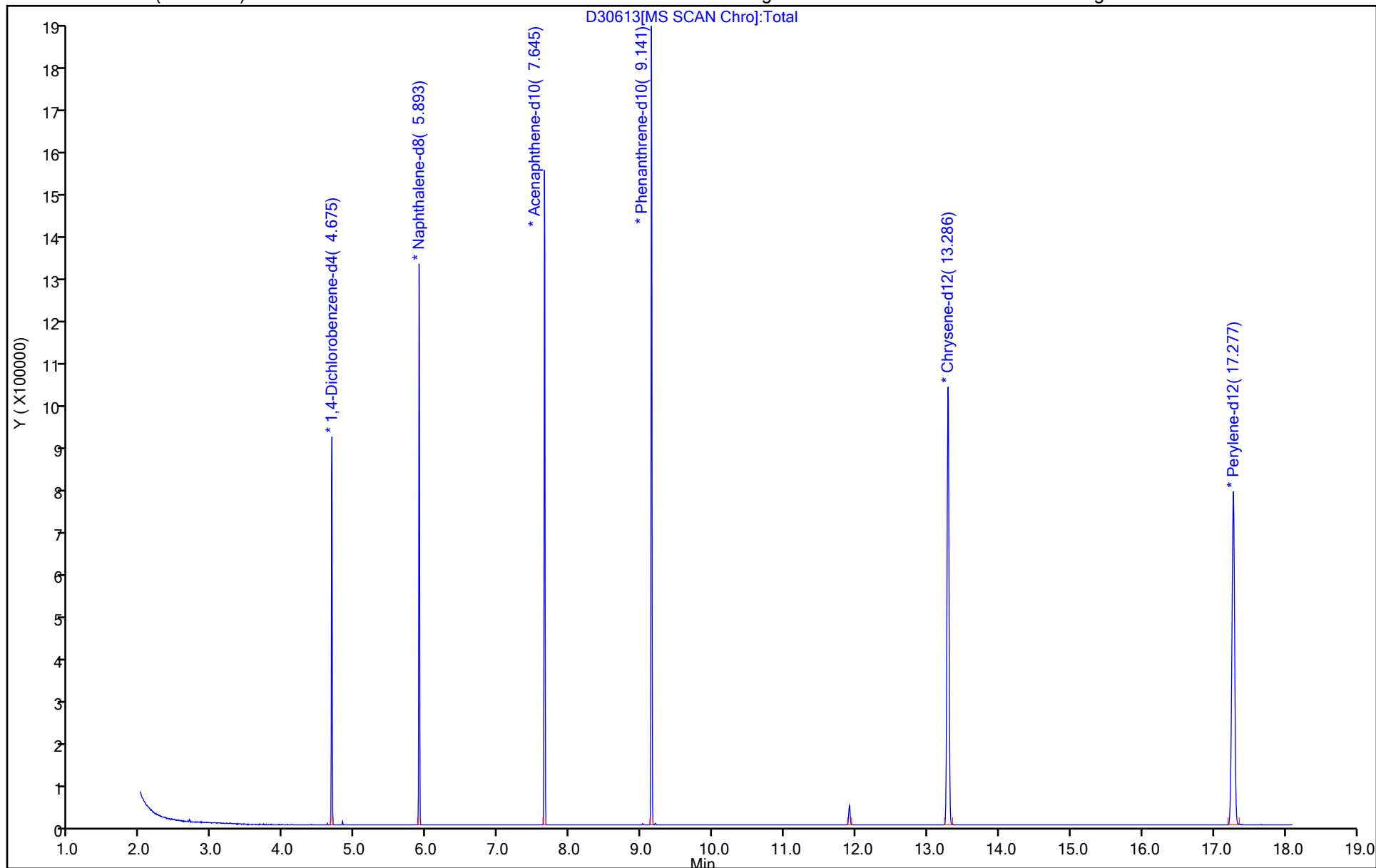
ALS Bottle#: 13

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30614.D
 Lims ID: STD010 FAM
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 05-Dec-2018 18:52:30 ALS Bottle#: 14 Worklist Smp#: 15
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD010 FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub15
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:24 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:08:36

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.674	4.673	0.001	96	124156	40.0	40.0	
* 2 Naphthalene-d8	136	5.898	5.896	0.002	99	508496	40.0	40.0	
* 3 Acenaphthene-d10	164	7.644	7.649	-0.005	95	312399	40.0	40.0	
* 4 Phenanthrene-d10	188	9.140	9.139	0.001	98	696445	40.0	40.0	
* 5 Chrysene-d12	240	13.286	13.290	-0.004	99	790122	40.0	40.0	
* 6 Perylene-d12	264	17.276	17.280	-0.004	98	849419	40.0	40.0	
139 Famphur	218	11.907	11.917	-0.010	99	79270	10.0	9.71	

Reagents:

MS-FAM010_00001

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30614.D

Injection Date: 05-Dec-2018 18:52:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD010 FAM

Worklist Smp#: 15

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

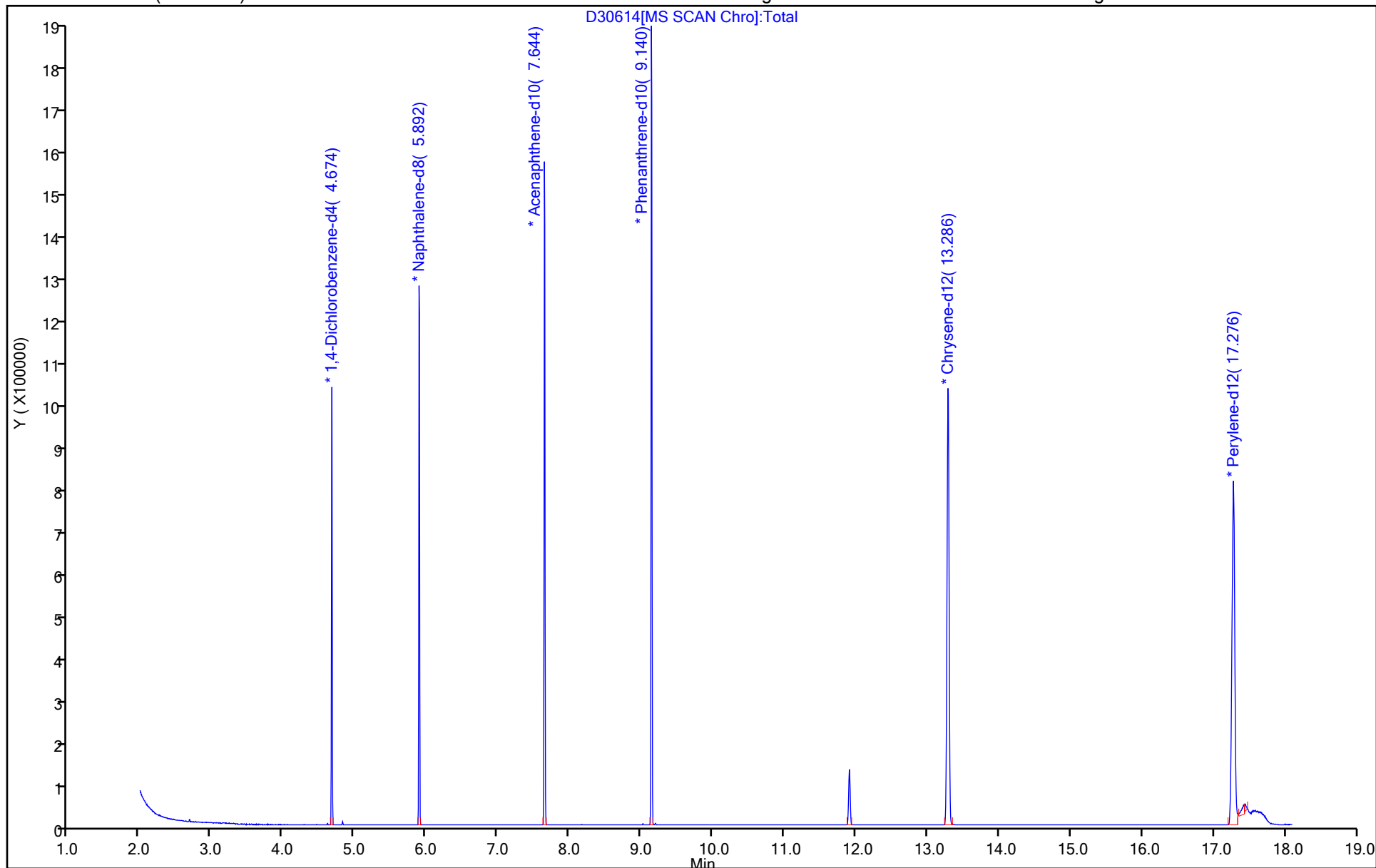
ALS Bottle#: 14

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30615.D
 Lims ID: STD020 FAM
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 05-Dec-2018 19:17:30 ALS Bottle#: 15 Worklist Smp#: 16
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD020 FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub15
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:25 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:08:45

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.671	4.673	-0.002	96	122555	40.0	40.0	
* 2 Naphthalene-d8	136	5.894	5.896	-0.002	99	498974	40.0	40.0	
* 3 Acenaphthene-d10	164	7.647	7.649	-0.003	95	310100	40.0	40.0	
* 4 Phenanthrene-d10	188	9.142	9.139	0.003	97	685360	40.0	40.0	
* 5 Chrysene-d12	240	13.288	13.290	-0.002	99	786877	40.0	40.0	
* 6 Perylene-d12	264	17.278	17.280	-0.002	98	850259	40.0	40.0	
139 Famphur	218	11.910	11.917	-0.007	99	163981	20.0	20.2	

Reagents:

MS-FAM020_00001

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30615.D

Injection Date: 05-Dec-2018 19:17:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD020 FAM

Worklist Smp#: 16

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

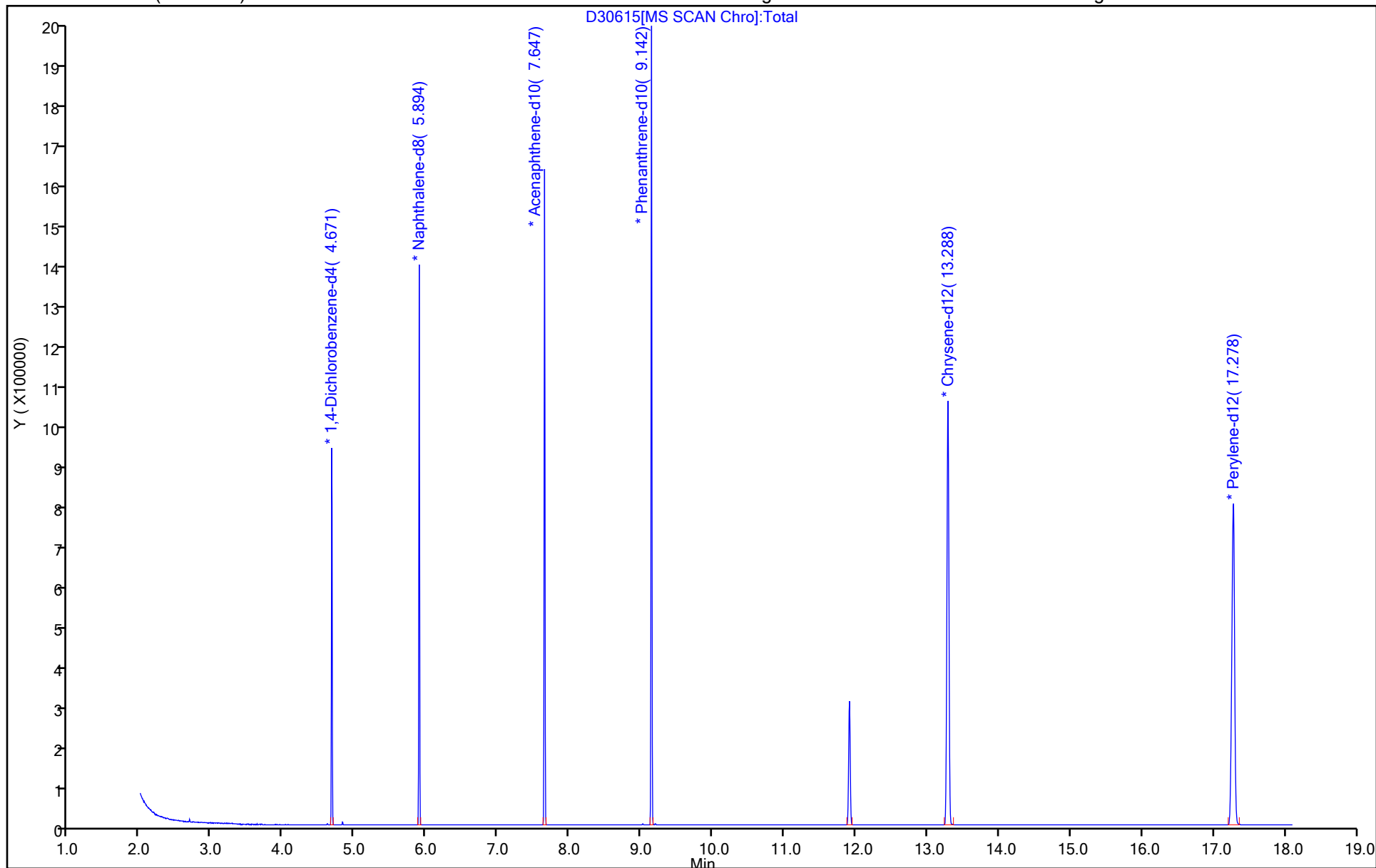
ALS Bottle#: 15

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30616.D
 Lims ID: STD050 FAM
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 05-Dec-2018 19:42:30 ALS Bottle#: 16 Worklist Smp#: 17
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD050 FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub15
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:26 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:08:55

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.676	4.673	0.003	96	123833	40.0	40.0	
* 2 Naphthalene-d8	136	5.894	5.896	-0.002	99	508054	40.0	40.0	
* 3 Acenaphthene-d10	164	7.646	7.649	-0.003	95	319235	40.0	40.0	
* 4 Phenanthrene-d10	188	9.142	9.139	0.003	97	708677	40.0	40.0	
* 5 Chrysene-d12	240	13.287	13.290	-0.003	99	806561	40.0	40.0	
* 6 Perylene-d12	264	17.278	17.280	-0.002	98	852960	40.0	40.0	
139 Famphur	218	11.914	11.917	-0.003	99	430104	50.0	51.6	

Reagents:

MS-FAM050_00001

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30616.D

Injection Date: 05-Dec-2018 19:42:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD050 FAM

Worklist Smp#: 17

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

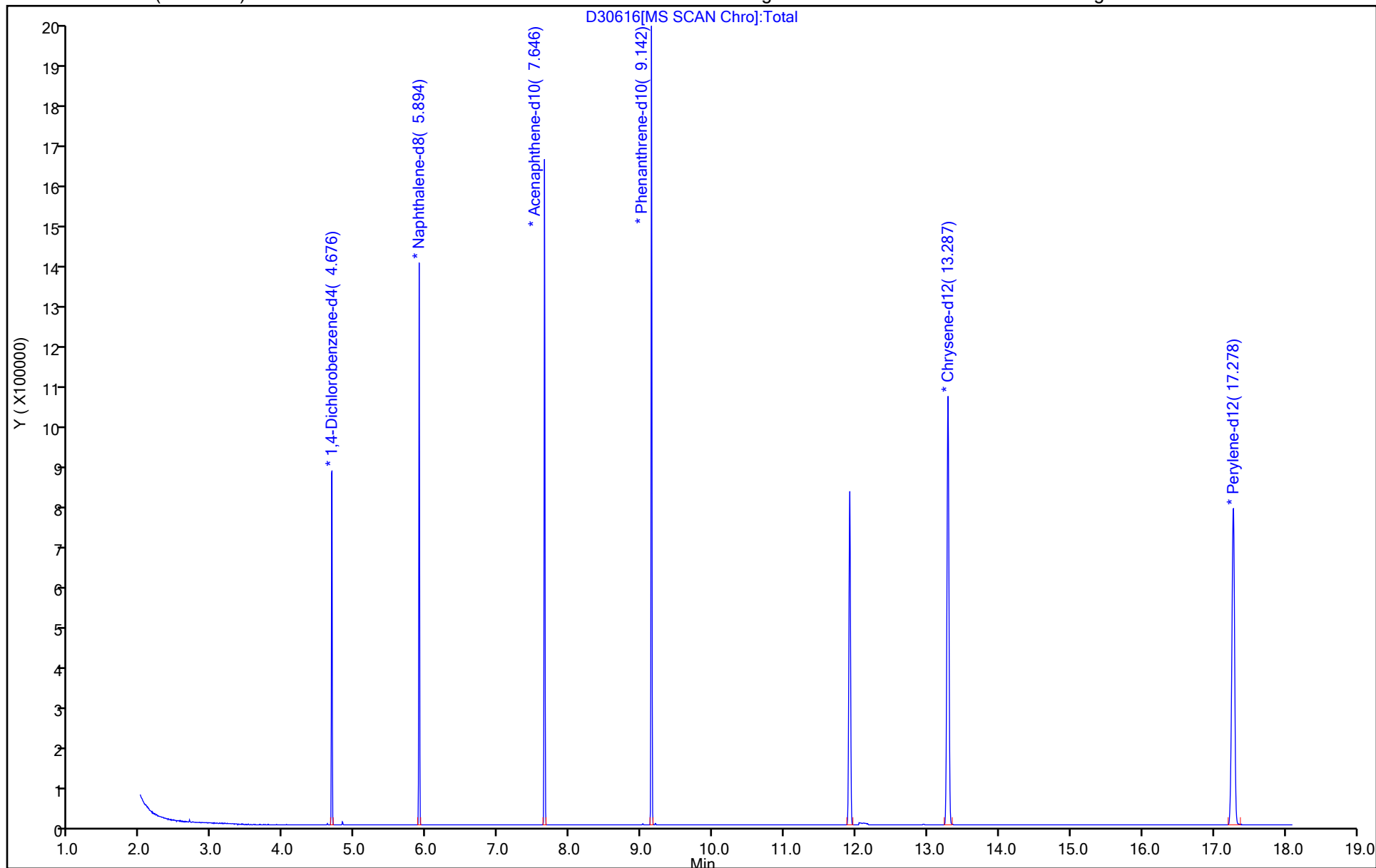
ALS Bottle#: 16

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30617.D
 Lims ID: STD120 FAM
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 05-Dec-2018 20:07:30 ALS Bottle#: 17 Worklist Smp#: 18
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD120 FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub15
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:27 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:09:08

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.673	4.673	0.000	96	123979	40.0	40.0	
* 2 Naphthalene-d8	136	5.897	5.896	0.001	99	511305	40.0	40.0	
* 3 Acenaphthene-d10	164	7.649	7.649	0.000	94	325233	40.0	40.0	
* 4 Phenanthrene-d10	188	9.139	9.139	0.000	98	703967	40.0	40.0	
* 5 Chrysene-d12	240	13.285	13.290	-0.005	99	794662	40.0	40.0	
* 6 Perylene-d12	264	17.275	17.280	-0.005	98	830802	40.0	40.0	
139 Famphur	218	11.922	11.917	0.005	99	1000982	120.0	121.9	

Reagents:

MS-FAM120_00001

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30617.D

Injection Date: 05-Dec-2018 20:07:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD120 FAM

Worklist Smp#: 18

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

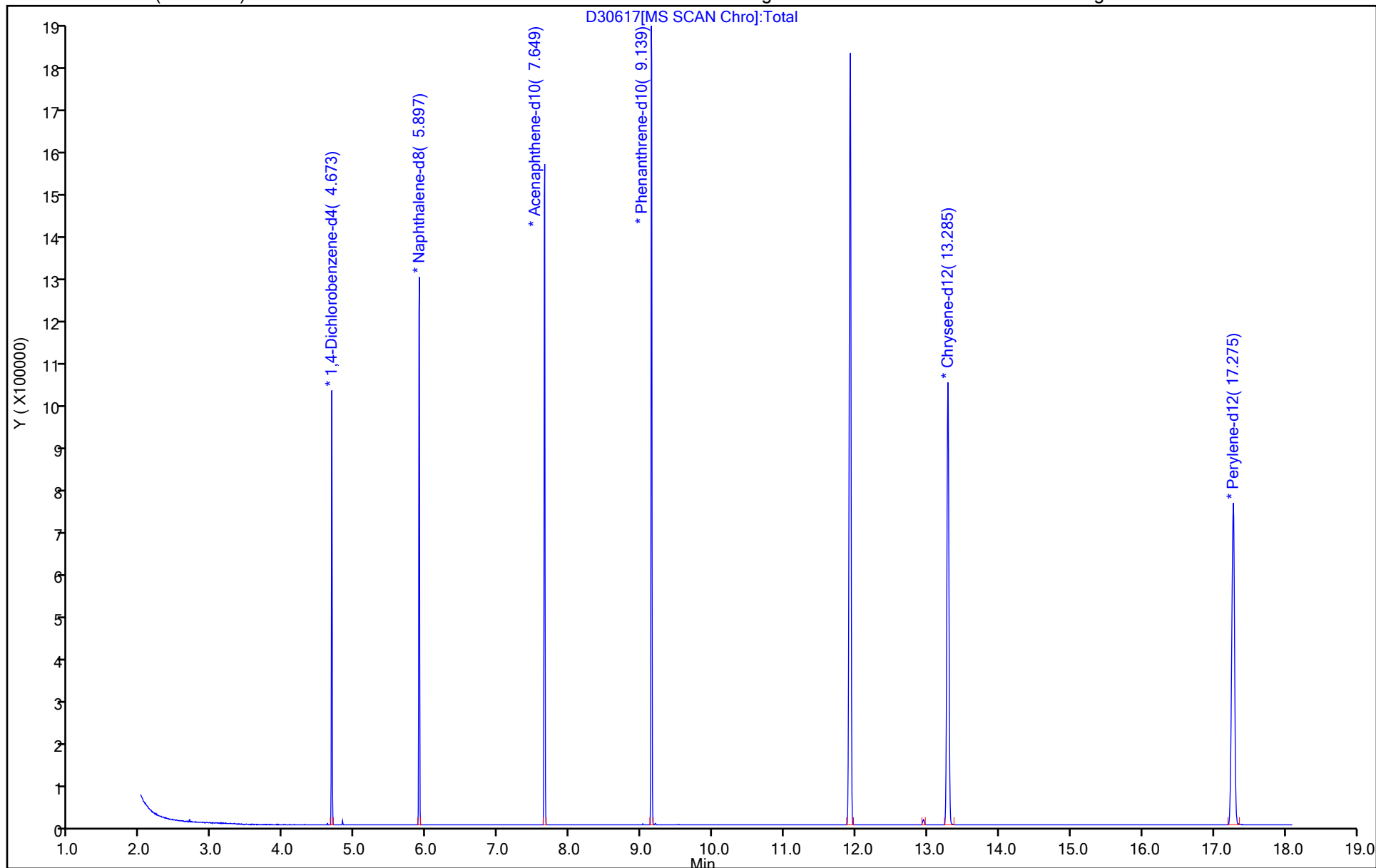
ALS Bottle#: 17

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30618.D
 Lims ID: STD160 FAM
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 05-Dec-2018 20:32:30 ALS Bottle#: 18 Worklist Smp#: 19
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD160 FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub15
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:29 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:09:19

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.675	4.673	0.002	96	125341	40.0	40.0	
* 2 Naphthalene-d8	136	5.893	5.896	-0.003	99	511458	40.0	40.0	
* 3 Acenaphthene-d10	164	7.645	7.649	-0.004	95	321539	40.0	40.0	
* 4 Phenanthrene-d10	188	9.141	9.139	0.002	98	710203	40.0	40.0	
* 5 Chrysene-d12	240	13.286	13.290	-0.004	99	807406	40.0	40.0	
* 6 Perylene-d12	264	17.271	17.280	-0.009	98	845587	40.0	40.0	
139 Famphur	218	11.924	11.917	0.007	99	1347504	160.0	161.5	

Reagents:

MS-FAM160_00001

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30618.D

Injection Date: 05-Dec-2018 20:32:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD160 FAM

Worklist Smp#: 19

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

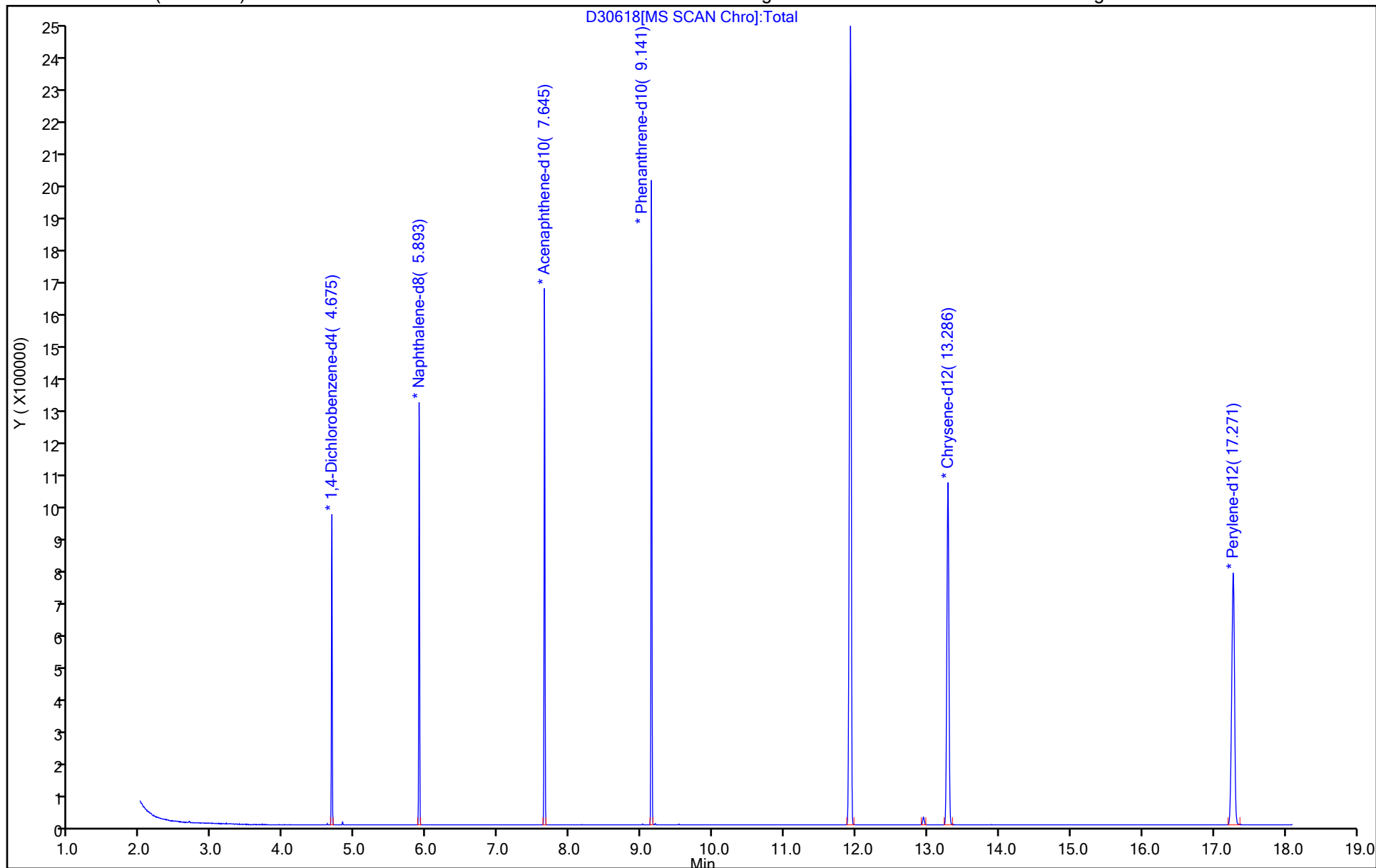
ALS Bottle#: 18

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30619.D
 Lims ID: STD200 FAM
 Client ID:
 Sample Type: IC Calib Level: 8
 Inject. Date: 05-Dec-2018 20:57:30 ALS Bottle#: 19 Worklist Smp#: 20
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD200 FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub15
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:30 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:09:52

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.671	4.673	-0.002	96	124478	40.0	40.0	
* 2 Naphthalene-d8	136	5.894	5.896	-0.002	99	504134	40.0	40.0	
* 3 Acenaphthene-d10	164	7.646	7.649	-0.003	95	315009	40.0	40.0	
* 4 Phenanthrene-d10	188	9.142	9.139	0.003	98	692601	40.0	40.0	
* 5 Chrysene-d12	240	13.288	13.290	-0.002	99	791732	40.0	40.0	
* 6 Perylene-d12	264	17.278	17.280	-0.002	98	832154	40.0	40.0	
139 Famphur	218	11.931	11.917	0.014	99	1610368	200.0	196.8	

Reagents:

MS-FAM200_00001

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30619.D

Injection Date: 05-Dec-2018 20:57:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD200 FAM

Worklist Smp#: 20

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

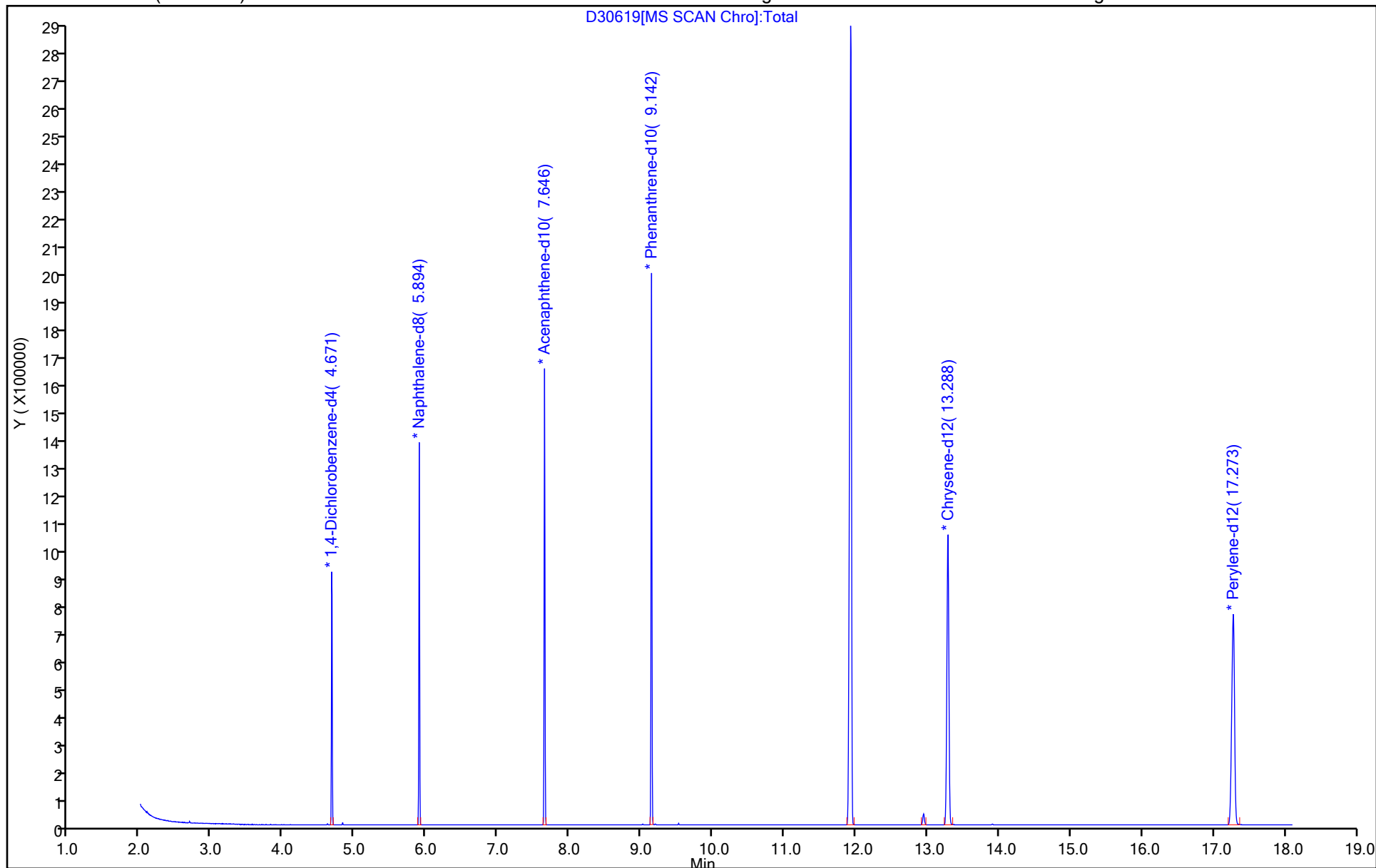
ALS Bottle#: 19

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 440162

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/05/2018 21:46 Calibration End Date: 12/06/2018 00:16 Calibration ID: 34484

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD010 280-440162/23	D30622.D
Level 2	STD020 280-440162/24	D30623.D
Level 3	STD050 280-440162/25	D30624.D
Level 4	STD080 280-440162/22	D30621.D
Level 5	STD120 280-440162/26	D30625.D
Level 6	STD160 280-440162/27	D30626.D
Level 7	STD200 280-440162/28	D30627.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Benzidine	0.7404 0.7915	0.7929 0.7601	0.8228	0.8226	0.8157	Ave		0.7923				4.0		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 440162

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/05/2018 21:46 Calibration End Date: 12/06/2018 00:16 Calibration ID: 34484

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD010 280-440162/23	D30622.D
Level 2	STD020 280-440162/24	D30623.D
Level 3	STD050 280-440162/25	D30624.D
Level 4	STD080 280-440162/22	D30621.D
Level 5	STD120 280-440162/26	D30625.D
Level 6	STD160 280-440162/27	D30626.D
Level 7	STD200 280-440162/28	D30627.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Benzidine	CRY	Ave	142664 2362565	285005 2944429	772950	1233636	1783090	10.0 160	20.0 200	50.0	80.0	120

Curve Type Legend:

Ave = Average ISTD

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 440162

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/05/2018 21:46 Calibration End Date: 12/06/2018 00:16 Calibration ID: 34484

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD010 280-440162/23	D30622.D
Level 2	STD020 280-440162/24	D30623.D
Level 3	STD050 280-440162/25	D30624.D
Level 4	STD080 280-440162/22	D30621.D
Level 5	STD120 280-440162/26	D30625.D
Level 6	STD160 280-440162/27	D30626.D
Level 7	STD200 280-440162/28	D30627.D

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Benzidine	-6.6						30					

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30621.D
 Lims ID: STD080 AFC
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 05-Dec-2018 21:46:30 ALS Bottle#: 21 Worklist Smp#: 22
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD080 AFC
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub10
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:32 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:10:59

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.673	4.673	0.000	96	121189	40.0	40.0	
* 2 Naphthalene-d8	136	5.896	5.896	0.000	99	496642	40.0	40.0	
* 3 Acenaphthene-d10	164	7.648	7.648	0.000	94	308691	40.0	40.0	
* 4 Phenanthrene-d10	188	9.139	9.139	0.000	97	667461	40.0	40.0	
* 5 Chrysene-d12	240	13.290	13.290	0.000	99	749798	40.0	40.0	
* 6 Perylene-d12	264	17.270	17.270	0.000	98	784277	40.0	40.0	
133 Benzidine	184	10.725	10.725	0.000	100	1233636	80.0	83.1	

Reagents:

MS-AFCA080_00022

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30621.D

Injection Date: 05-Dec-2018 21:46:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD080 AFC

Worklist Smp#: 22

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

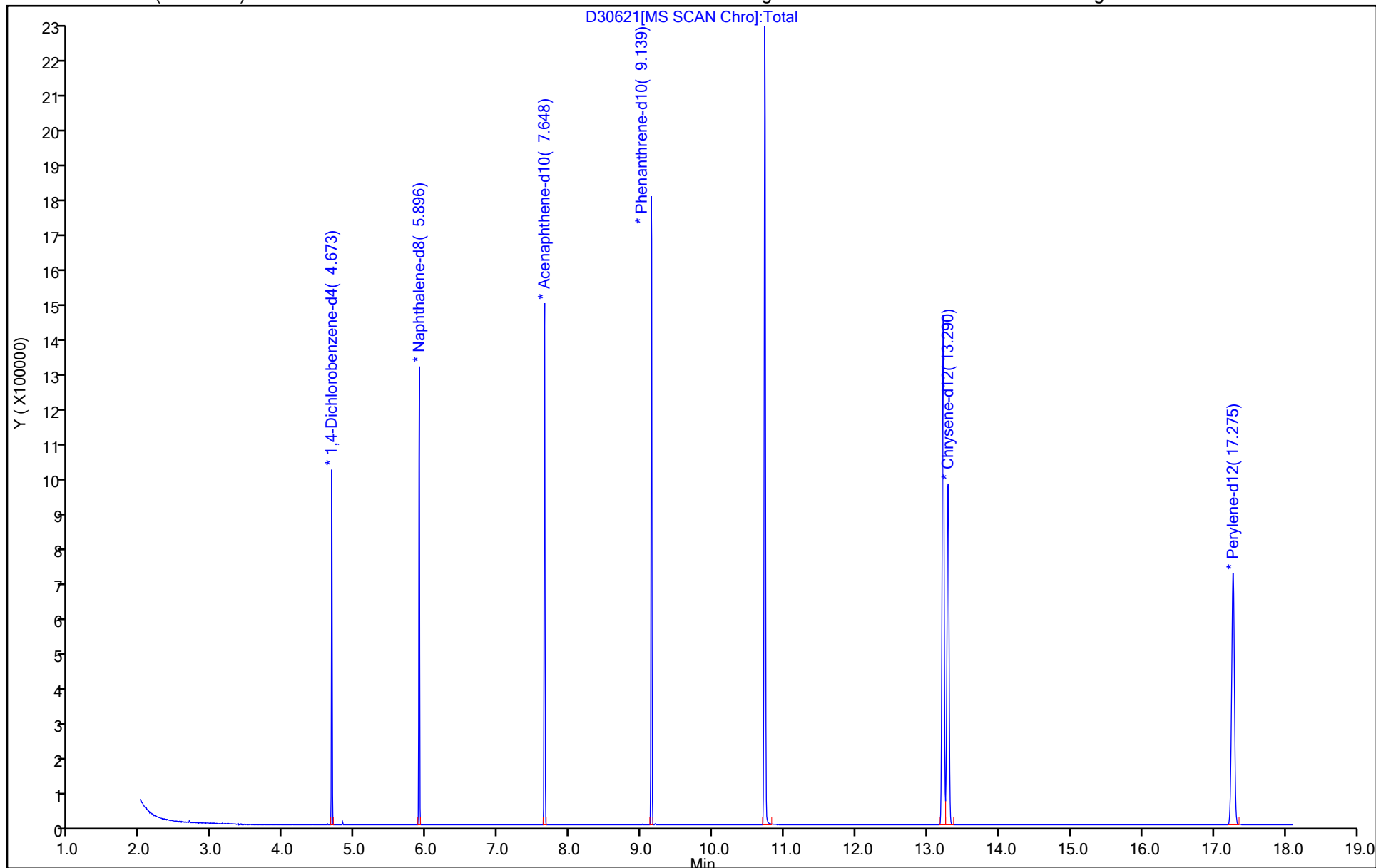
ALS Bottle#: 21

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30622.D
 Lims ID: STD010 AFC
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 05-Dec-2018 22:11:30 ALS Bottle#: 22 Worklist Smp#: 23
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD010 AFC
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub10
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:33 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:11:09

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.675	4.673	0.002	96	121592	40.0	40.0	
* 2 Naphthalene-d8	136	5.893	5.896	-0.003	99	499853	40.0	40.0	
* 3 Acenaphthene-d10	164	7.645	7.648	-0.003	95	313544	40.0	40.0	
* 4 Phenanthrene-d10	188	9.141	9.139	0.002	97	687283	40.0	40.0	
* 5 Chrysene-d12	240	13.286	13.290	-0.004	99	770767	40.0	40.0	
* 6 Perylene-d12	264	17.272	17.270	0.002	98	810903	40.0	40.0	
133 Benzidine	184	10.722	10.725	-0.003	100	142664	10.0	9.34	

Reagents:

MS-AFCA010_00017

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30622.D

Injection Date: 05-Dec-2018 22:11:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD010 AFC

Worklist Smp#: 23

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

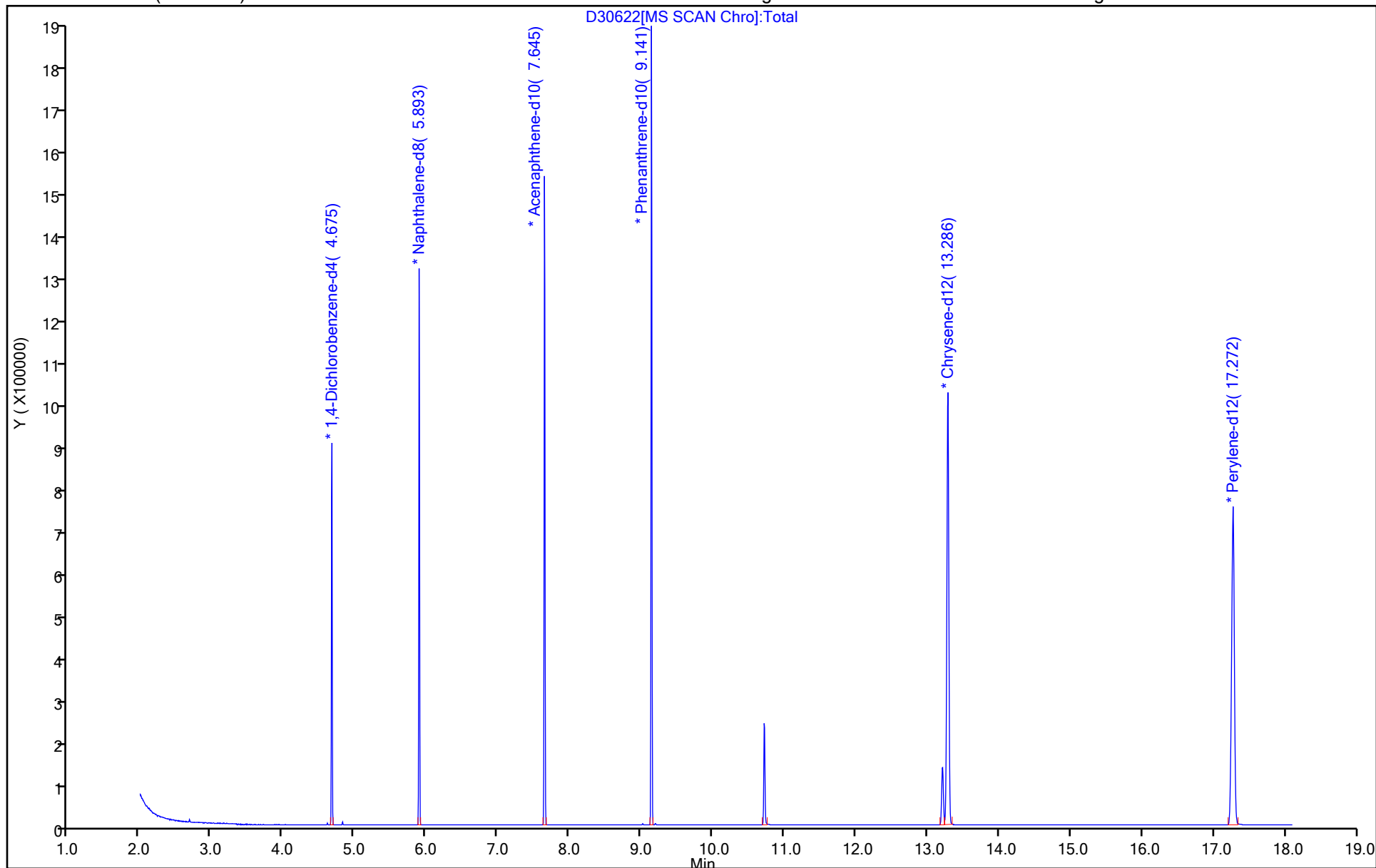
ALS Bottle#: 22

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30623.D
 Lims ID: STD020 AFC
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 05-Dec-2018 22:36:30 ALS Bottle#: 23 Worklist Smp#: 24
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD020 AFC
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub10
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:34 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:11:17

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.674	4.673	0.001	96	117051	40.0	40.0	
* 2 Naphthalene-d8	136	5.892	5.896	-0.004	99	474662	40.0	40.0	
* 3 Acenaphthene-d10	164	7.644	7.648	-0.004	95	293155	40.0	40.0	
* 4 Phenanthrene-d10	188	9.140	9.139	0.001	98	649317	40.0	40.0	
* 5 Chrysene-d12	240	13.286	13.290	-0.004	99	718877	40.0	40.0	
* 6 Perylene-d12	264	17.271	17.270	0.001	98	762657	40.0	40.0	
133 Benzidine	184	10.721	10.725	-0.004	100	285005	20.0	20.0	

Reagents:

MS-AFCA020_00018

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30623.D

Injection Date: 05-Dec-2018 22:36:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD020 AFC

Worklist Smp#: 24

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

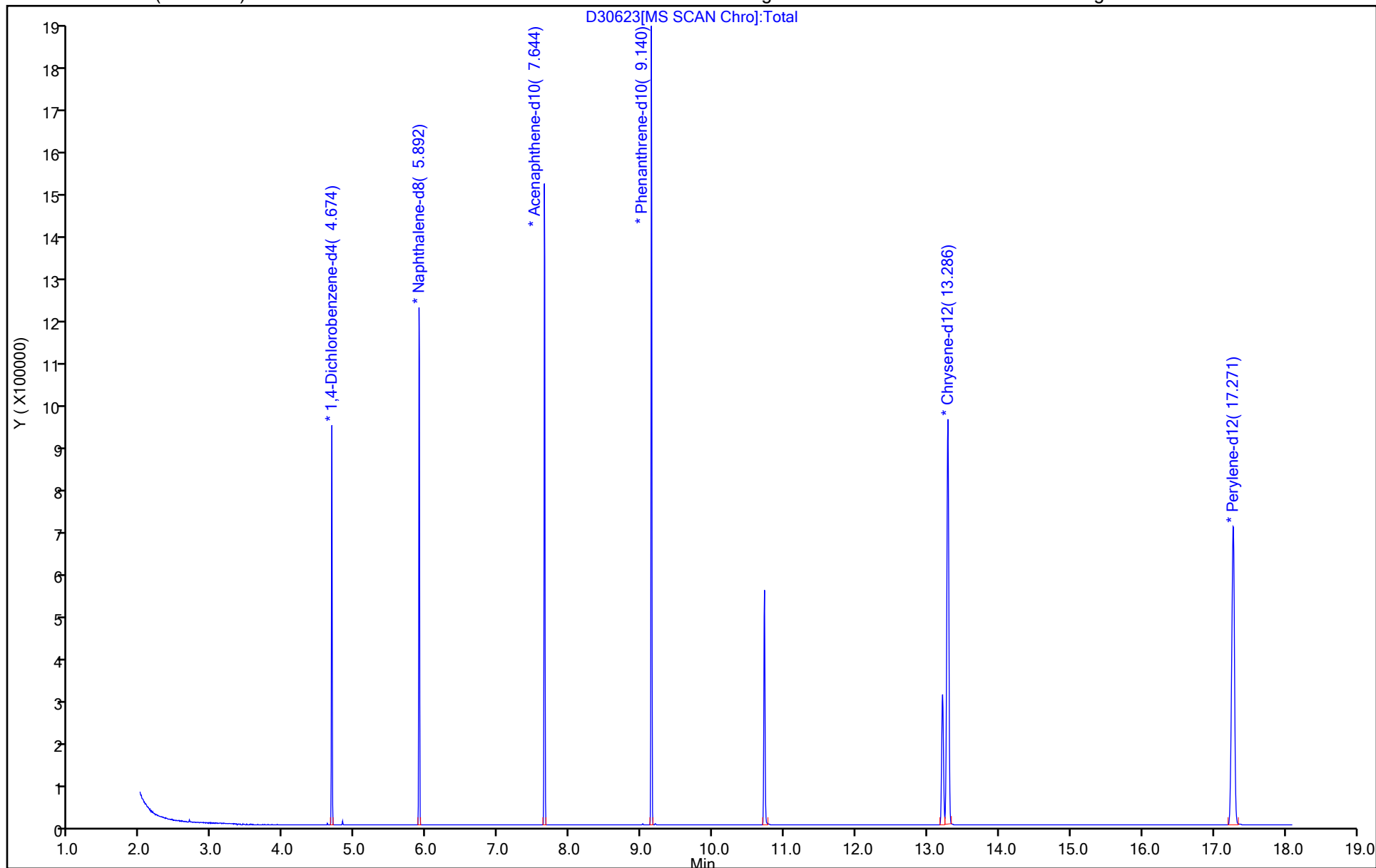
ALS Bottle#: 23

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30624.D
 Lims ID: STD050 AFC
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 05-Dec-2018 23:01:30 ALS Bottle#: 24 Worklist Smp#: 25
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD050 AFC
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub10
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:35 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:11:24

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.675	4.673	0.002	96	119338	40.0	40.0	
* 2 Naphthalene-d8	136	5.893	5.896	-0.003	99	485359	40.0	40.0	
* 3 Acenaphthene-d10	164	7.645	7.648	-0.003	95	309586	40.0	40.0	
* 4 Phenanthrene-d10	188	9.141	9.139	0.002	97	667847	40.0	40.0	
* 5 Chrysene-d12	240	13.281	13.290	-0.009	99	751526	40.0	40.0	
* 6 Perylene-d12	264	17.272	17.270	0.002	99	780654	40.0	40.0	
133 Benzidine	184	10.722	10.725	-0.003	100	772950	50.0	51.9	

Reagents:

MS-AFCA050_00017

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30624.D

Injection Date: 05-Dec-2018 23:01:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD050 AFC

Worklist Smp#: 25

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

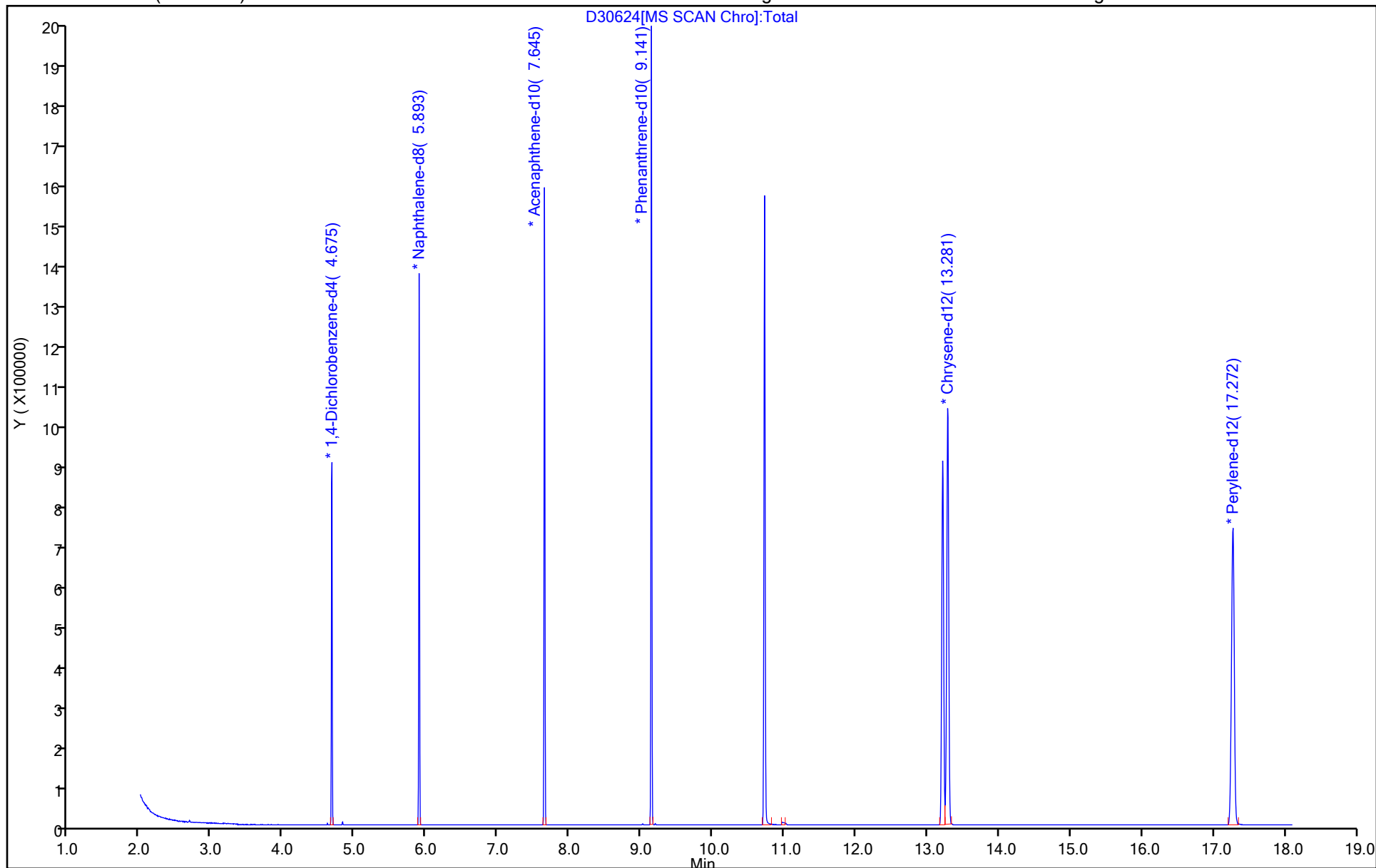
ALS Bottle#: 24

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30625.D
 Lims ID: STD120 AFC
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 05-Dec-2018 23:26:30 ALS Bottle#: 25 Worklist Smp#: 26
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD120 AFC
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub10
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:36 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:11:31

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.671	4.673	-0.002	96	115964	40.0	40.0	
* 2 Naphthalene-d8	136	5.895	5.896	-0.001	99	482288	40.0	40.0	
* 3 Acenaphthene-d10	164	7.647	7.648	-0.001	94	298920	40.0	40.0	
* 4 Phenanthrene-d10	188	9.143	9.139	0.004	97	647437	40.0	40.0	
* 5 Chrysene-d12	240	13.283	13.290	-0.007	99	728612	40.0	40.0	
* 6 Perylene-d12	264	17.273	17.270	0.003	98	759387	40.0	40.0	
133 Benzidine	184	10.729	10.725	0.004	100	1783090	120.0	123.6	

Reagents:

MS-AFCA120_00017

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30625.D

Injection Date: 05-Dec-2018 23:26:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD120 AFC

Worklist Smp#: 26

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

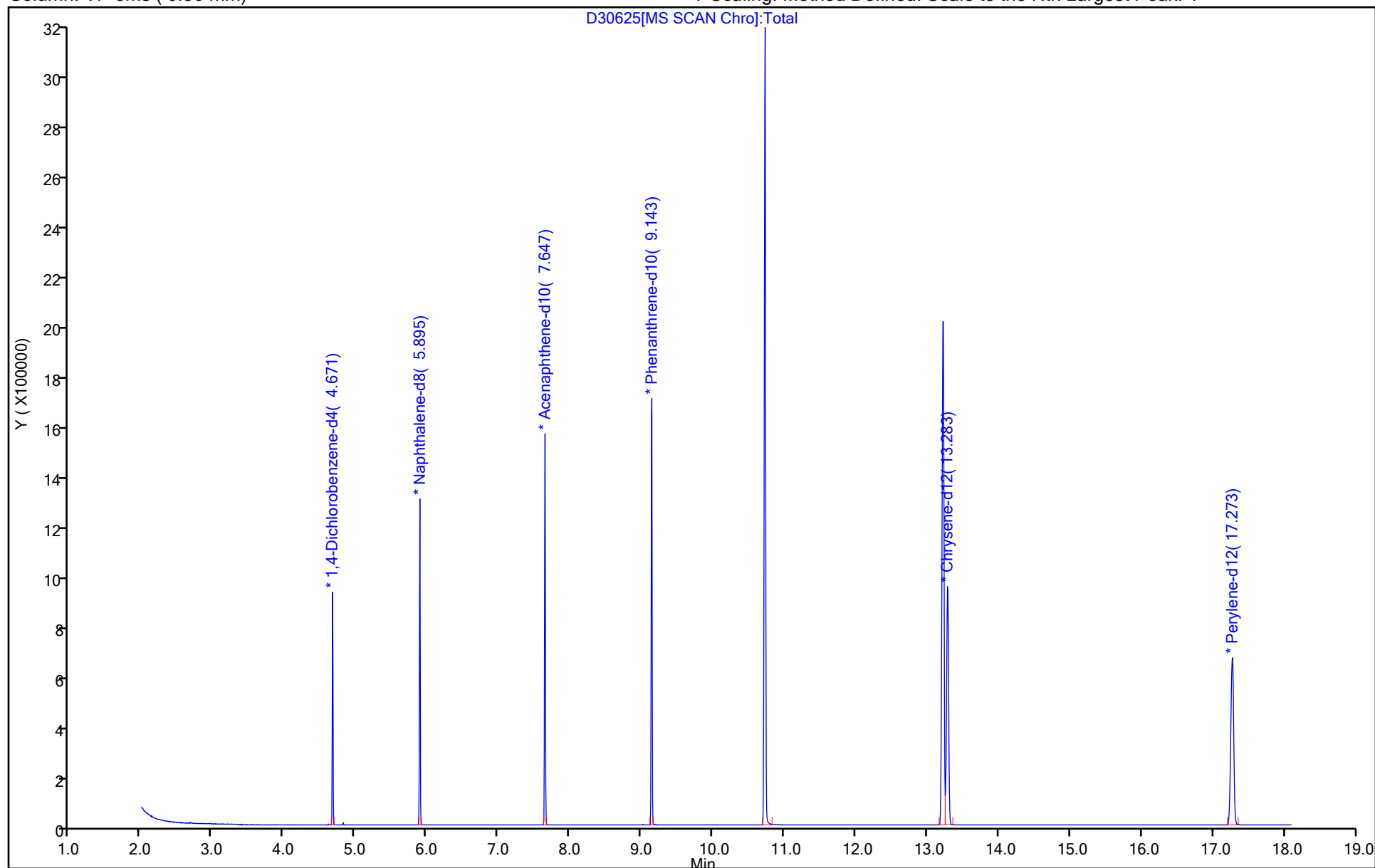
ALS Bottle#: 25

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30626.D
 Lims ID: STD160 AFC
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 05-Dec-2018 23:51:30 ALS Bottle#: 26 Worklist Smp#: 27
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD160 AFC
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub10
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:37 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:11:40

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.672	4.673	-0.001	96	117656	40.0	40.0	
* 2 Naphthalene-d8	136	5.895	5.896	-0.001	99	479673	40.0	40.0	
* 3 Acenaphthene-d10	164	7.647	7.648	-0.001	94	305576	40.0	40.0	
* 4 Phenanthrene-d10	188	9.138	9.139	-0.001	98	660353	40.0	40.0	
* 5 Chrysene-d12	240	13.289	13.290	-0.001	99	746207	40.0	40.0	
* 6 Perylene-d12	264	17.274	17.270	0.004	98	774937	40.0	40.0	
133 Benzidine	184	10.730	10.725	0.005	100	2362565	160.0	159.8	

Reagents:

MS-AFCA160_00018

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30626.D

Injection Date: 05-Dec-2018 23:51:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD160 AFC

Worklist Smp#: 27

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

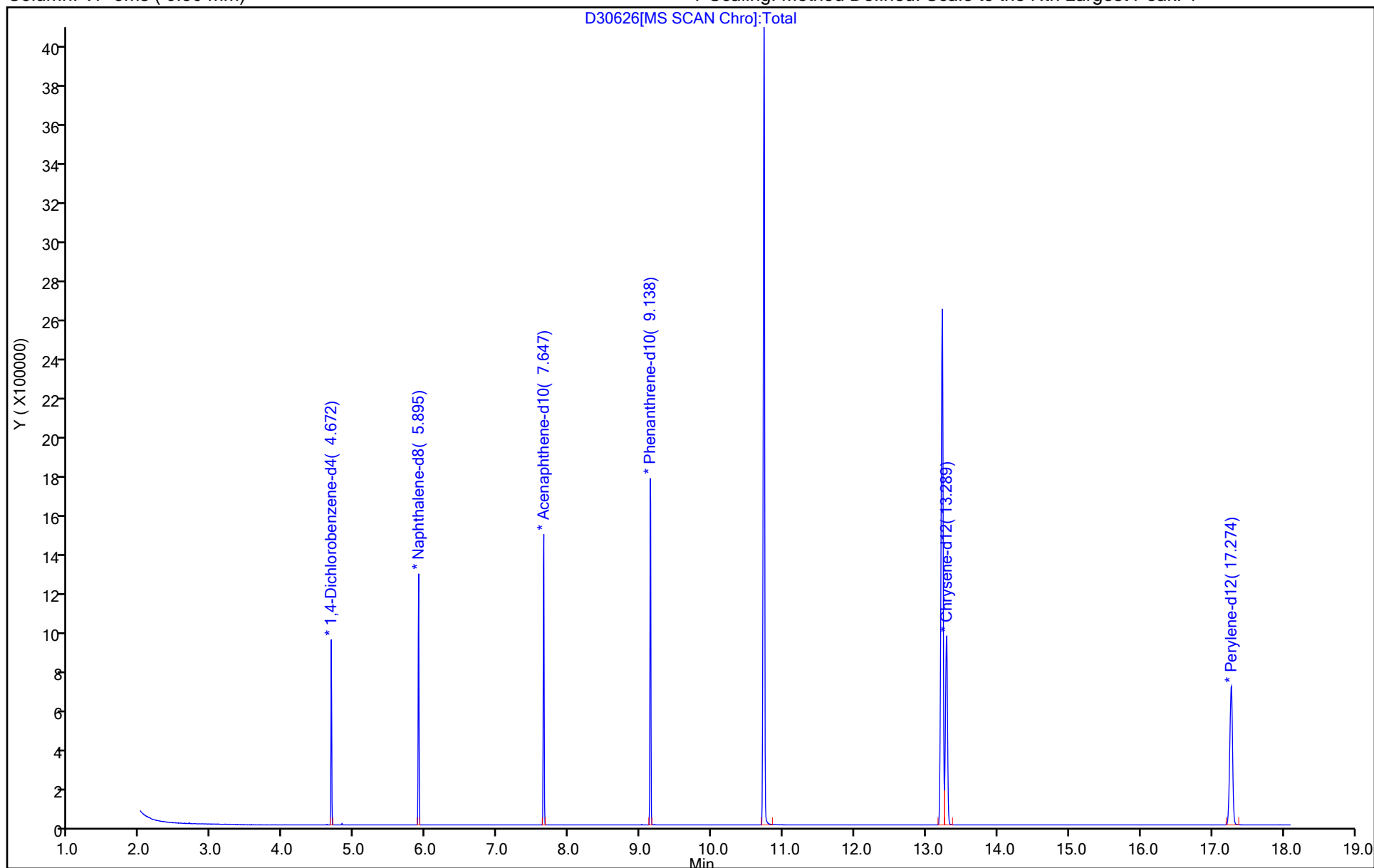
ALS Bottle#: 26

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Lims ID: STD200 AFC
 Client ID:
 Sample Type: IC Calib Level: 8
 Inject. Date: 06-Dec-2018 00:16:30 ALS Bottle#: 27 Worklist Smp#: 28
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD200 AFC
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub10
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:38 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:11:50

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.674	4.673	0.001	96	118922	40.0	40.0	
* 2 Naphthalene-d8	136	5.892	5.896	-0.004	99	494141	40.0	40.0	
* 3 Acenaphthene-d10	164	7.644	7.648	-0.004	95	311171	40.0	40.0	
* 4 Phenanthrene-d10	188	9.140	9.139	0.001	98	669188	40.0	40.0	
* 5 Chrysene-d12	240	13.285	13.290	-0.005	99	774783	40.0	40.0	
* 6 Perylene-d12	264	17.270	17.270	0.000	98	795773	40.0	40.0	
133 Benzidine	184	10.737	10.725	0.012	100	2944429	200.0	191.9	

Reagents:

MS-AFCA200_00017

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D

Injection Date: 06-Dec-2018 00:16:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD200 AFC

Worklist Smp#: 28

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

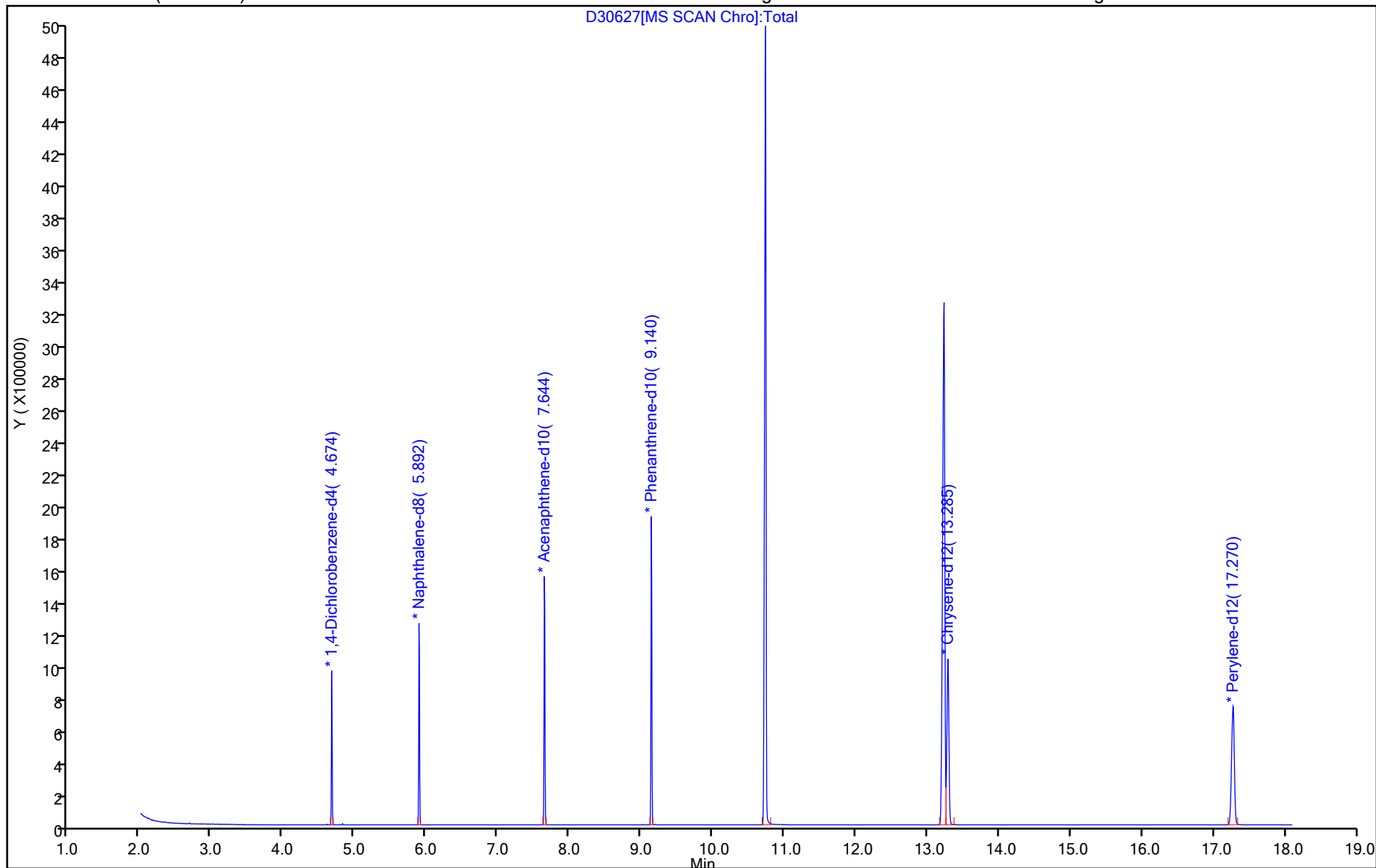
ALS Bottle#: 27

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 440302

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/06/2018 08:53 Calibration End Date: 12/06/2018 11:21 Calibration ID: 34500

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD010 280-440302/4	D30632.D
Level 2	STD020 280-440302/5	D30633.D
Level 3	STD050 280-440302/6	D30634.D
Level 4	STD080 280-440302/3	D30631.D
Level 5	STD120 280-440302/7	D30635.D
Level 6	STD160 280-440302/8	D30636.D
Level 7	STD200 280-440302/9	D30637.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Benzaldehyde	1.1988 1.2212	1.2333 1.2134	1.2343	1.2462	1.2095	Ave		1.2224				1.3		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 440302

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/06/2018 08:53 Calibration End Date: 12/06/2018 11:21 Calibration ID: 34500

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD010 280-440302/4	D30632.D
Level 2	STD020 280-440302/5	D30633.D
Level 3	STD050 280-440302/6	D30634.D
Level 4	STD080 280-440302/3	D30631.D
Level 5	STD120 280-440302/7	D30635.D
Level 6	STD160 280-440302/8	D30636.D
Level 7	STD200 280-440302/9	D30637.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Benzaldehyde	DCBd 4	Ave	36028 579635	74371 705350	190475	309338	451396	10.0 160	20.0 200	50.0	80.0	120

Curve Type Legend:

Ave = Average ISTD

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 440302

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/06/2018 08:53 Calibration End Date: 12/06/2018 11:21 Calibration ID: 34500

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD010 280-440302/4	D30632.D
Level 2	STD020 280-440302/5	D30633.D
Level 3	STD050 280-440302/6	D30634.D
Level 4	STD080 280-440302/3	D30631.D
Level 5	STD120 280-440302/7	D30635.D
Level 6	STD160 280-440302/8	D30636.D
Level 7	STD200 280-440302/9	D30637.D

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Benzaldehyde	-1.9						30					

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30631.D
 Lims ID: STD080 BZHD
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 06-Dec-2018 08:53:30 ALS Bottle#: 2 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD080 BZHD
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub6
 Method: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 07-Dec-2018 08:57:40 Calib Date: 06-Dec-2018 18:25:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30653.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0328

First Level Reviewer: kiekeld

Date: 07-Dec-2018 07:54:06

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.673	4.673	0.000	96	124113	40.0	40.0	
* 2 Naphthalene-d8	136	5.891	5.891	0.000	99	499862	40.0	40.0	
* 3 Acenaphthene-d10	164	7.644	7.644	0.000	95	313510	40.0	40.0	
* 4 Phenanthrene-d10	188	9.139	9.139	0.000	97	684843	40.0	40.0	
* 5 Chrysene-d12	240	13.274	13.274	0.000	99	747988	40.0	40.0	
* 6 Perylene-d12	264	17.259	17.259	0.000	98	769804	40.0	40.0	
22 Benzaldehyde	106	4.267	4.267	0.000	98	309338	80.0	81.6	

Reagents:

MS-BZHDA080_00018

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30631.D

Injection Date: 06-Dec-2018 08:53:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD080 BZHD

Worklist Smp#: 3

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

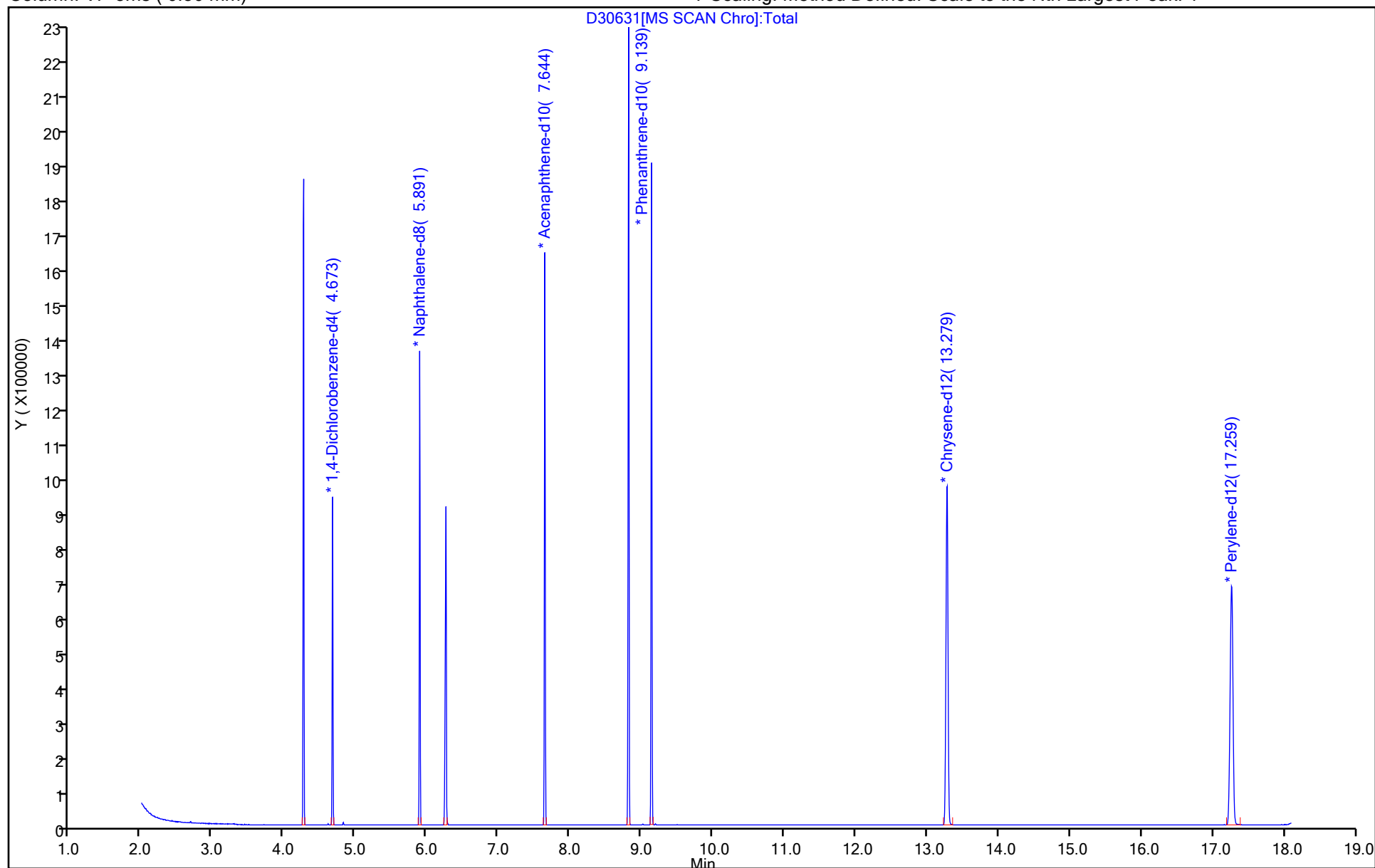
ALS Bottle#: 2

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30632.D
 Lims ID: STD010 BZHD
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 06-Dec-2018 09:17:30 ALS Bottle#: 3 Worklist Smp#: 4
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD010 BZHD
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub6
 Method: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 07-Dec-2018 08:57:41 Calib Date: 06-Dec-2018 18:25:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30653.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0328

First Level Reviewer: kiekeld

Date: 07-Dec-2018 08:55:04

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.669	4.673	-0.004	97	120213	40.0	40.0	
* 2 Naphthalene-d8	136	5.892	5.891	0.001	99	490230	40.0	40.0	
* 3 Acenaphthene-d10	164	7.645	7.644	0.001	93	304811	40.0	40.0	
* 4 Phenanthrene-d10	188	9.135	9.139	-0.004	98	670058	40.0	40.0	
* 5 Chrysene-d12	240	13.275	13.274	0.001	99	747931	40.0	40.0	
* 6 Perylene-d12	264	17.260	17.259	0.001	98	773572	40.0	40.0	
22 Benzaldehyde	106	4.263	4.267	-0.004	97	36028	10.0	9.81	

Reagents:

MS-BZHDA010_00019

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30632.D

Injection Date: 06-Dec-2018 09:17:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD010 BZHD

Worklist Smp#: 4

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

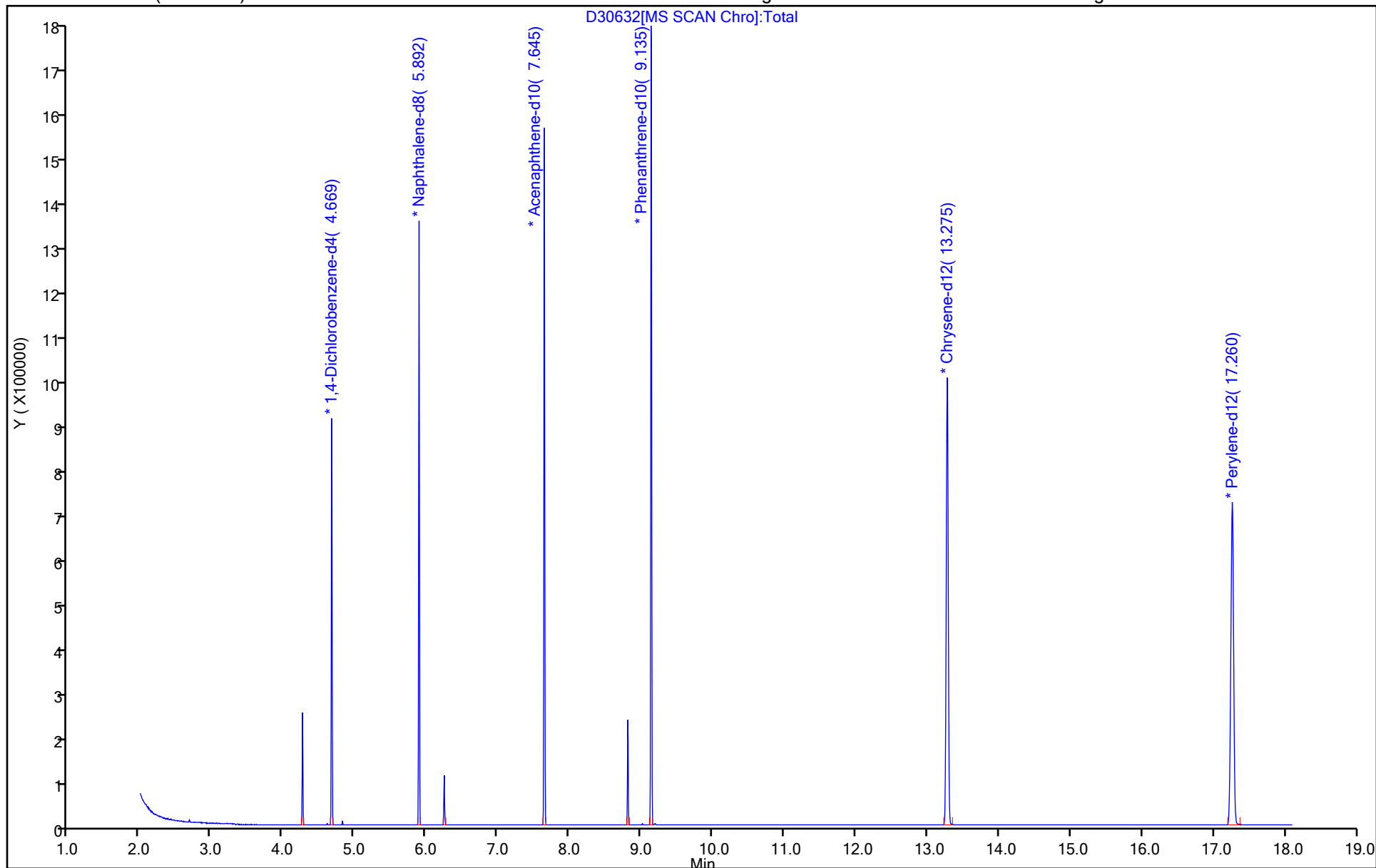
ALS Bottle#: 3

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30633.D
 Lims ID: STD020 BZHD
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 06-Dec-2018 09:42:30 ALS Bottle#: 4 Worklist Smp#: 5
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD020 BZHD
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub6
 Method: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 07-Dec-2018 08:57:42 Calib Date: 06-Dec-2018 18:25:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30653.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0328

First Level Reviewer: kiekeld

Date: 07-Dec-2018 08:55:19

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.670	4.673	-0.003	97	120606	40.0	40.0	
* 2 Naphthalene-d8	136	5.894	5.891	0.003	99	489540	40.0	40.0	
* 3 Acenaphthene-d10	164	7.646	7.644	0.002	95	301792	40.0	40.0	
* 4 Phenanthrene-d10	188	9.137	9.139	-0.002	98	662058	40.0	40.0	
* 5 Chrysene-d12	240	13.277	13.274	0.003	99	741737	40.0	40.0	
* 6 Perylene-d12	264	17.262	17.259	0.003	98	776431	40.0	40.0	
22 Benzaldehyde	106	4.264	4.267	-0.003	98	74371	20.0	20.2	

Reagents:

MS-BZFDA020_00019

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30633.D

Injection Date: 06-Dec-2018 09:42:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD020 BZHD

Worklist Smp#: 5

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

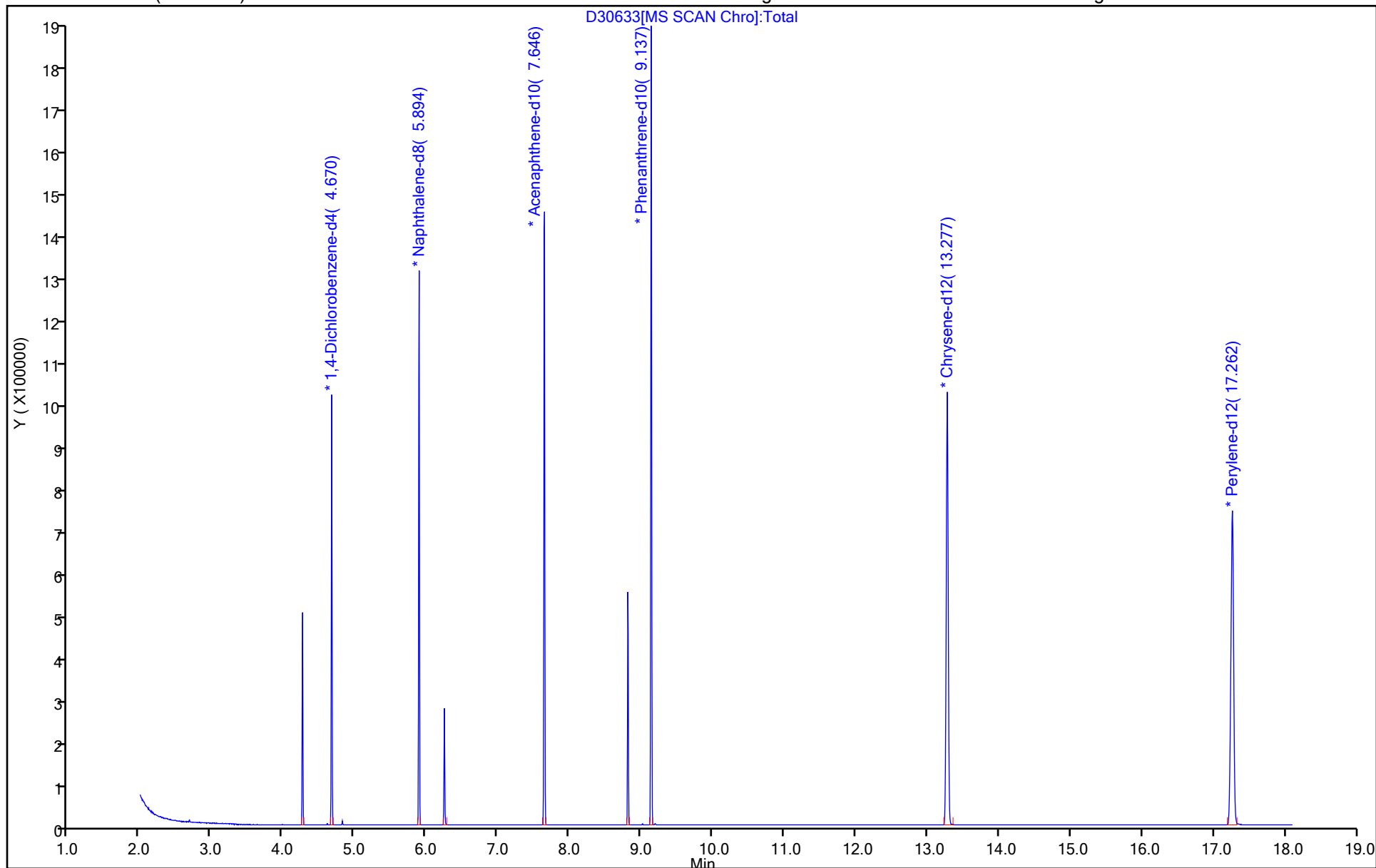
ALS Bottle#: 4

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30634.D
 Lims ID: STD050 BZHD
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 06-Dec-2018 10:07:30 ALS Bottle#: 5 Worklist Smp#: 6
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD050 BZHD
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub6
 Method: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 07-Dec-2018 08:57:44 Calib Date: 06-Dec-2018 18:25:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30653.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0328

First Level Reviewer: kiekeld

Date: 07-Dec-2018 08:55:31

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.670	4.673	-0.003	97	123451	40.0	40.0	
* 2 Naphthalene-d8	136	5.893	5.891	0.002	99	493568	40.0	40.0	
* 3 Acenaphthene-d10	164	7.645	7.644	0.001	95	307227	40.0	40.0	
* 4 Phenanthrene-d10	188	9.136	9.139	-0.003	98	678343	40.0	40.0	
* 5 Chrysene-d12	240	13.276	13.274	0.002	99	756851	40.0	40.0	
* 6 Perylene-d12	264	17.267	17.259	0.008	98	792695	40.0	40.0	
22 Benzaldehyde	106	4.264	4.267	-0.003	98	190475	50.0	50.5	

Reagents:

MS-BZHDA050_00018

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30634.D

Injection Date: 06-Dec-2018 10:07:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD050 BZHD

Worklist Smp#: 6

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

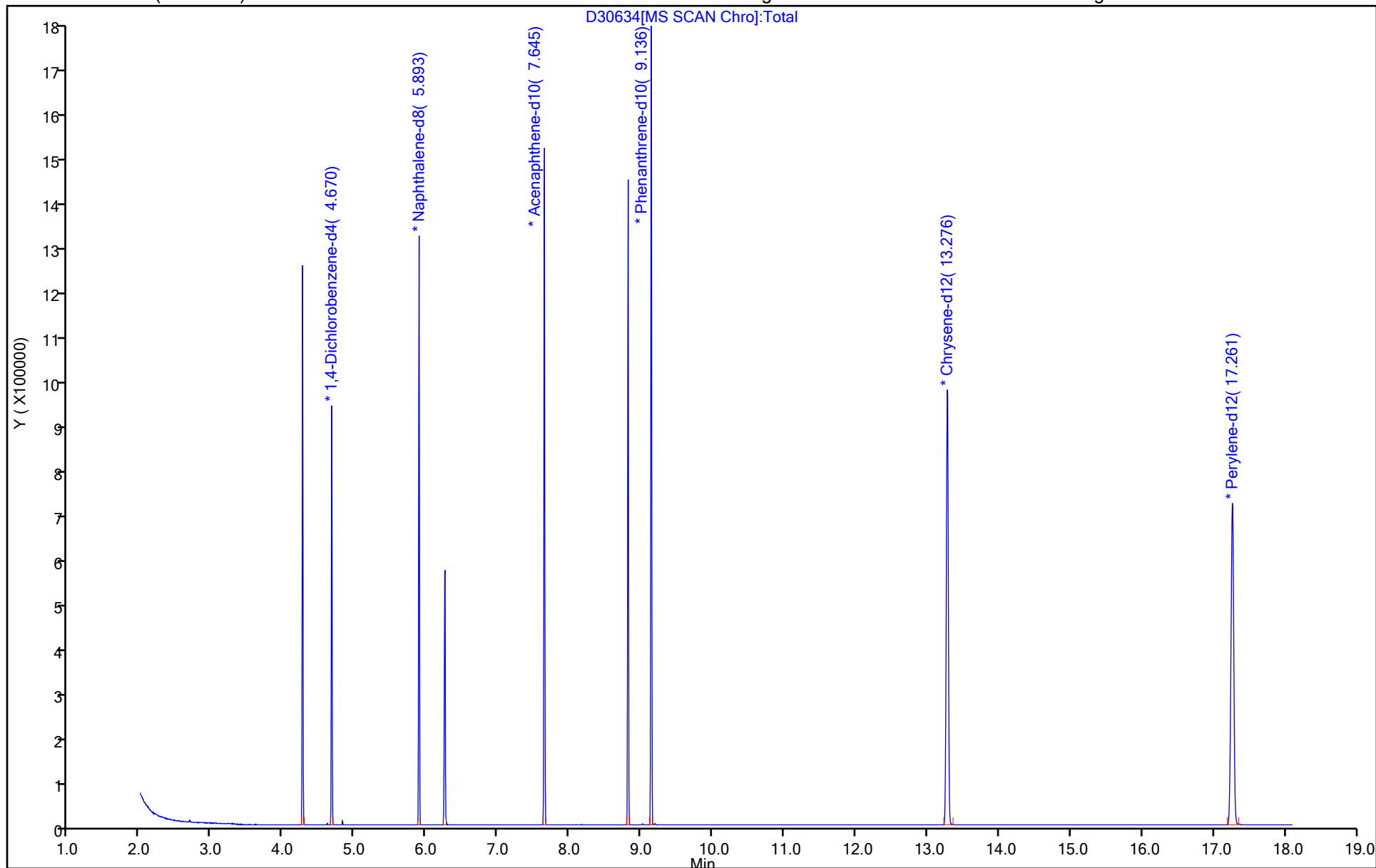
ALS Bottle#: 5

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30635.D
 Lims ID: STD120 BZHD
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 06-Dec-2018 10:32:30 ALS Bottle#: 6 Worklist Smp#: 7
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD120 BZHD
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub6
 Method: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 07-Dec-2018 08:57:45 Calib Date: 06-Dec-2018 18:25:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30653.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0328

First Level Reviewer: kiekeld

Date: 07-Dec-2018 08:55:39

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.670	4.673	-0.003	96	124405	40.0	40.0	
* 2 Naphthalene-d8	136	5.894	5.891	0.003	99	503647	40.0	40.0	
* 3 Acenaphthene-d10	164	7.646	7.644	0.002	94	308403	40.0	40.0	
* 4 Phenanthrene-d10	188	9.136	9.139	-0.003	98	670988	40.0	40.0	
* 5 Chrysene-d12	240	13.277	13.274	0.002	99	750098	40.0	40.0	
* 6 Perylene-d12	264	17.262	17.259	0.003	98	784707	40.0	40.0	
22 Benzaldehyde	106	4.264	4.267	-0.003	98	451396	120.0	118.7	

Reagents:

MS-BZHDA120_00018

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30635.D

Injection Date: 06-Dec-2018 10:32:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD120 BZHD

Worklist Smp#: 7

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

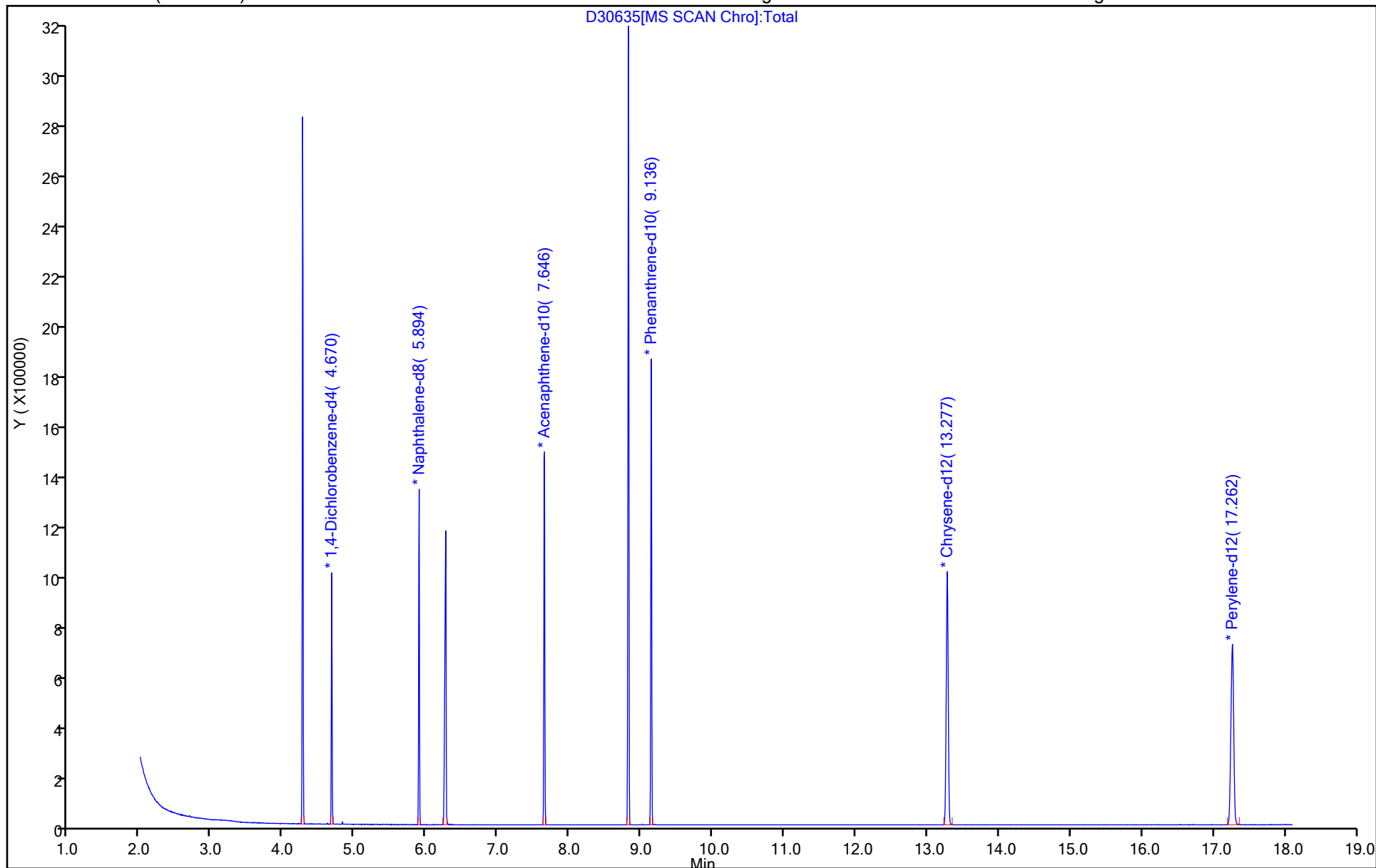
ALS Bottle#: 6

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30636.D
 Lims ID: STD160 BZHD
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 06-Dec-2018 10:56:30 ALS Bottle#: 7 Worklist Smp#: 8
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD160 BZHD
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub6
 Method: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 07-Dec-2018 08:57:46 Calib Date: 06-Dec-2018 18:25:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30653.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0328

First Level Reviewer: kiekeld

Date: 07-Dec-2018 08:55:48

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.670	4.673	-0.003	96	118659	40.0	40.0	
* 2 Naphthalene-d8	136	5.893	5.891	0.002	99	498789	40.0	40.0	
* 3 Acenaphthene-d10	164	7.645	7.644	0.001	94	312014	40.0	40.0	
* 4 Phenanthrene-d10	188	9.141	9.139	0.002	97	675500	40.0	40.0	
* 5 Chrysene-d12	240	13.276	13.274	0.002	99	736934	40.0	40.0	
* 6 Perylene-d12	264	17.266	17.259	0.007	98	777220	40.0	40.0	
22 Benzaldehyde	106	4.269	4.267	0.002	98	579635	160.0	159.8	

Reagents:

MS-BZHDA160_00018

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30636.D

Injection Date: 06-Dec-2018 10:56:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD160 BZHD

Worklist Smp#: 8

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

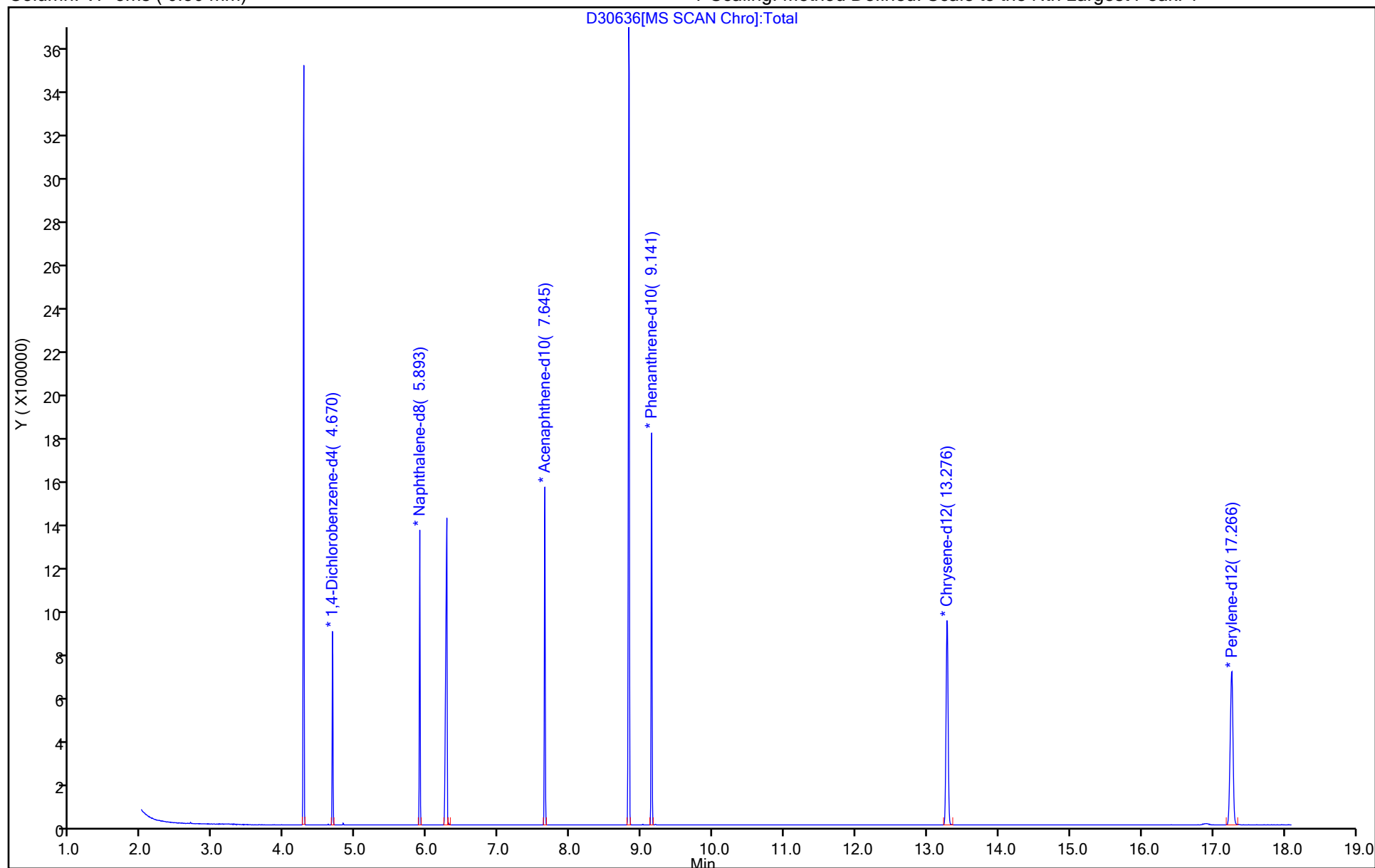
ALS Bottle#: 7

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30637.D
 Lims ID: STD200 BZHD
 Client ID:
 Sample Type: IC Calib Level: 8
 Inject. Date: 06-Dec-2018 11:21:30 ALS Bottle#: 8 Worklist Smp#: 9
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD200 BZHD
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub6
 Method: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 07-Dec-2018 08:57:47 Calib Date: 06-Dec-2018 18:25:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30653.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0328

First Level Reviewer: kiekeld

Date: 07-Dec-2018 08:56:01

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.670	4.673	-0.003	97	116257	40.0	40.0	
* 2 Naphthalene-d8	136	5.893	5.891	0.002	99	485178	40.0	40.0	
* 3 Acenaphthene-d10	164	7.645	7.644	0.001	94	300556	40.0	40.0	
* 4 Phenanthrene-d10	188	9.141	9.139	0.002	98	655483	40.0	40.0	
* 5 Chrysene-d12	240	13.276	13.274	0.002	99	709435	40.0	40.0	
* 6 Perylene-d12	264	17.261	17.259	0.002	98	733591	40.0	40.0	
22 Benzaldehyde	106	4.269	4.267	0.002	98	705350	200.0	198.5	

Reagents:

MS-BZHDA200_00018

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30637.D

Injection Date: 06-Dec-2018 11:21:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD200 BZHD

Worklist Smp#: 9

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

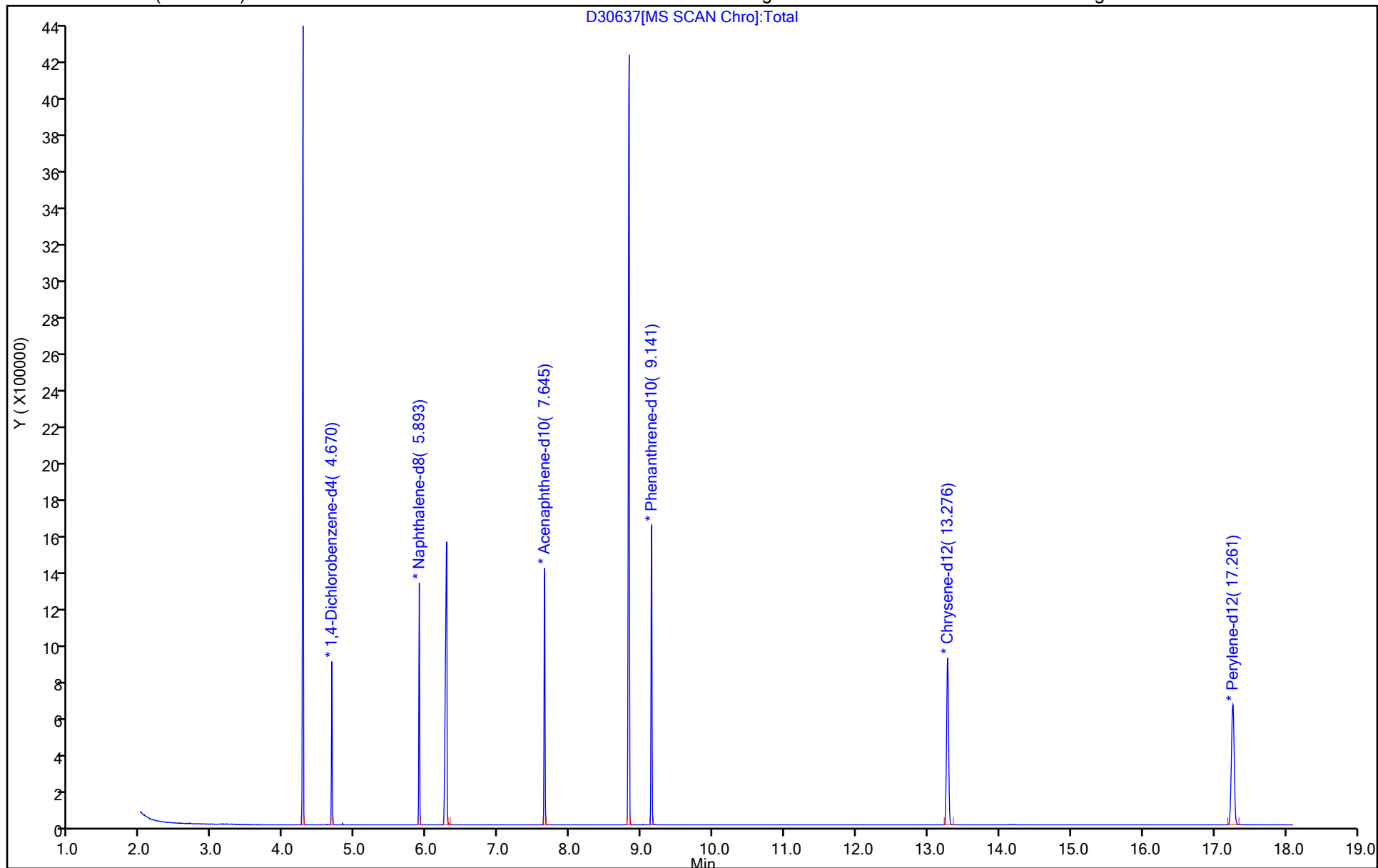
ALS Bottle#: 8

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD004 280-443607/4	D31077.D
Level 2	STD010 280-443607/5	D31078.D
Level 3	STD020 280-443607/6	D31079.D
Level 4	STD050 280-443607/7	D31080.D
Level 5	ICIS 280-443607/3	D31076.D
Level 6	STD120 280-443607/8	D31081.D
Level 7	STD160 280-443607/9	D31082.D
Level 8	STD200 280-443607/10	D31083.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7	LVL 8														
1,4-Dioxane	0.7694 0.7108	0.7433 0.6959	0.7317 0.7015	0.7400	0.7248	Ave		0.7272				3.3		20.0			
N-Nitrosodimethylamine	1.2038 1.1344	1.1336 1.1087	1.1671 1.1420	1.1704	1.1686	Ave		1.1536				2.6		20.0			
Pyridine	1.9349 1.8176	1.8923 1.7524	1.8683 1.7817	1.8724	1.8734	Ave		1.8491				3.3		20.0			
Phenol	2.1864 2.0316	2.1339 1.9832	2.1527 2.0291	2.1460	2.1282	Ave		2.0989			0.8000	3.5		20.0			
Aniline	2.6292 2.5609	2.6965 2.5057	2.6979 2.5710	2.6884	2.6475	Ave		2.6246				2.7		20.0			
Bis(2-chloroethyl)ether	1.5967 1.4090	1.5839 1.3607	1.5797 1.3397	1.5533	1.5164	Ave		1.4924			0.7000	7.1		20.0			
2-Chlorophenol	1.5113 1.4508	1.5421 1.4228	1.5560 1.4288	1.5073	1.5276	Ave		1.4933			0.8000	3.5		20.0			
n-Decane	1.6508 1.5288	1.6387 1.5097	1.5978 1.4643	1.6096	1.5785	Ave		1.5723				4.2		20.0			
1,3-Dichlorobenzene	1.6675 1.4747	1.6448 1.4297	1.6540 1.4232	1.6116	1.5795	Ave		1.5606				6.6		20.0			
1,4-Dichlorobenzene	1.6532 1.4972	1.6405 1.4517	1.6487 1.4383	1.6198	1.6040	Ave		1.5692				5.8		20.0			
Benzyl alcohol	1.1051 1.0911	1.0886 1.0754	1.1446 1.1049	1.1364	1.1365	Ave		1.1103				2.3		20.0			
1,2-Dichlorobenzene	1.6306 1.4499	1.5595 1.4049	1.5804 1.3909	1.5565	1.5224	Ave		1.5119				5.8		20.0			
2-Methylphenol	1.5845 1.4945	1.5538 1.4538	1.5809 1.4839	1.5533	1.5675	Ave		1.5340			0.7000	3.2		20.0			
bis (2-chloroisopropyl) ether	2.1444 1.9204	2.0437 1.8656	2.1143 1.8246	2.0540	2.0230	Ave		1.9988			0.0100	5.8		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607
SDG No.: _____
Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5		B	M1	M2								
N-Nitrosodi-n-propylamine	1.2318 1.0880	1.2246 1.0531	1.2295 1.0531	1.2261	1.1755	Ave		1.1602			0.5000	7.0		20.0			
3 & 4 Methylphenol	1.6529 1.3942	1.6309 1.3203	1.6450 1.3179	1.5948	1.5688	Ave		1.5156				9.7		20.0			
3-Methylphenol	1.6529 1.3942	1.6309 1.3203	1.6450 1.3179	1.5948	1.5688	Ave		1.5156				9.7		20.0			
4-Methylphenol	1.6529 1.3942	1.6309 1.3203	1.6450 1.3179	1.5948	1.5688	Ave		1.5156			0.6000	9.7		20.0			
Acetophenone	2.3170 1.9549	2.2756 1.8547	2.2910 1.8377	2.2227	2.1501	Ave		2.1129			0.0100	9.5		20.0			
Hexachloroethane	0.6102 0.5757	0.6137 0.5728	0.6049 0.5512	0.6038	0.6069	Ave		0.5924			0.3000	3.8		20.0			
Nitrobenzene	0.4524 0.4273	0.4548 0.4268	0.4423 0.4056	0.4422	0.4502	Ave		0.4377				3.8		20.0			
Isophorone	0.8362 0.7817	0.8333 0.7949	0.8304 0.7710	0.8213	0.8243	Ave		0.8116			0.4000	3.1		20.0			
2-Nitrophenol	0.1898 0.1939	0.1967 0.1932	0.1959 0.1905	0.1968	0.2018	Ave		0.1948			0.1000	2.0		20.0			
2,4-Dimethylphenol	0.4025 0.3716	0.4137 0.3693	0.3942 0.3568	0.3891	0.3985	Ave		0.3870			0.2000	5.0		20.0			
Bis(2-chloroethoxy)methane	0.4958 0.4425	0.4832 0.4520	0.4657 0.4275	0.4699	0.4673	Ave		0.4630			0.3000	4.7		20.0			
Benzoic acid	++++ 0.3333	0.2633 0.3395	0.2804 0.3423	0.3171	0.3279	Lin2	-1.691	0.3392							0.9990		0.9900
2,4-Dichlorophenol	0.3289 0.2916	0.3109 0.2916	0.3148 0.2809	0.3092	0.3129	Ave		0.3051			0.2000	5.1		20.0			
1,2,4-Trichlorobenzene	0.3632 0.3167	0.3569 0.3161	0.3429 0.2969	0.3392	0.3386	Ave		0.3338				6.7		20.0			
Naphthalene	1.1779 0.9745	1.1244 0.9572	1.1114 0.9218	1.0680	1.0638	Ave		1.0499			0.7000	8.6		20.0			
4-Chloroaniline	0.4632 0.4562	0.5028 0.4447	0.4963 0.4370	0.4831	0.4874	Ave		0.4713			0.0100	5.2		20.0			
2,6-Dichlorophenol	0.3235 0.2848	0.3224 0.2844	0.3137 0.2712	0.3087	0.3112	Ave		0.3025				6.5		20.0			
Hexachlorobutadiene	0.1803 0.1684	0.1858 0.1684	0.1826 0.1584	0.1812	0.1806	Ave		0.1757			0.0100	5.4		20.0			
Caprolactam	0.1863 0.1835	0.1782 0.1870	0.1877 0.1984	0.1884	0.1908	Ave		0.1875				3.1		20.0			
4-Chloro-3-methylphenol	0.3504 0.3267	0.3446 0.3339	0.3484 0.3234	0.3467	0.3492	Ave		0.3404			0.2000	3.2		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607
SDG No.: _____
Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5		B	M1	M2								
2-Methylnaphthalene	0.7975 0.6579	0.7717 0.6487	0.7413 0.6108	0.7250	0.7213	Ave		0.7093			0.4000	9.1		20.0			
1-Methylnaphthalene	0.7132 0.6173	0.7217 0.6079	0.7018 0.5793	0.6827	0.6758	Ave		0.6625				8.1		20.0			
Hexachlorocyclopentadiene	0.3371 0.3550	0.3505 0.3522	0.3578 0.3275	0.3710	0.3778	Ave		0.3536			0.0500	4.6		20.0			
1,2,4,5-Tetrachlorobenzene	0.3647 0.2999	0.3549 0.2945	0.3572 0.2794	0.3330	0.3325	Ave		0.3270			0.0100	9.8		20.0			
2,4,6-Trichlorophenol	0.4157 0.3642	0.4118 0.3516	0.3982 0.3353	0.3943	0.3926	Ave		0.3830			0.2000	7.6		20.0			
2,4,5-Trichlorophenol	0.4296 0.4249	0.4406 0.4193	0.4333 0.4073	0.4411	0.4478	Ave		0.4305			0.2000	3.1		20.0			
1,1'-Biphenyl	1.6605 1.3651	1.5944 1.3124	1.4980 1.2329	1.4715	1.4669	Ave		1.4502				9.8		20.0			
2-Chloronaphthalene	1.3013 1.1024	1.2410 1.0784	1.1709 1.0262	1.1598	1.1663	Ave		1.1558			0.8000	7.6		20.0			
2-Nitroaniline	0.3940 0.4228	0.4111 0.4205	0.4166 0.4125	0.4235	0.4381	Ave		0.4174			0.0100	3.0		20.0			
Dimethyl phthalate	1.4077 1.2640	1.3826 1.2518	1.3740 1.2005	1.3316	1.3639	Ave		1.3220			0.0100	5.6		20.0			
1,3-Dinitrobenzene	0.2129 0.2430	0.2125 0.2461	0.2319 0.2422	0.2370	0.2495	Ave		0.2344				6.1		20.0			
2,6-Dinitrotoluene	0.3106 0.3268	0.3259 0.3317	0.3297 0.3184	0.3369	0.3418	Ave		0.3277			0.2000	3.0		20.0			
Acenaphthylene	2.0608 1.7931	2.0425 1.7305	1.9844 1.6511	1.9239	1.9213	Ave		1.8885			0.9000	7.9		20.0			
3-Nitroaniline	0.3651 0.3848	0.3822 0.3856	0.4012 0.3743	0.3904	0.3936	Ave		0.3847			0.0100	2.9		20.0			
Acenaphthene	1.2981 1.0479	1.2672 1.0175	1.2106 0.9635	1.1483	1.1315	Ave		1.1356			0.9000	10.6		20.0			
2,4-Dinitrophenol	++++ 0.2108	0.1555 0.2152	0.1827 0.2122	0.2074	0.2220	Lin2	-1.308	0.2197			0.0100				0.9990		0.9900
4-Nitrophenol	0.1870 0.1945	0.1902 0.1958	0.2062 0.1927	0.1979	0.2028	Ave		0.1959			0.0100	3.2		20.0			
2,4-Dinitrotoluene	0.4126 0.4474	0.4474 0.4544	0.4512 0.4416	0.4579	0.4704	Ave		0.4479			0.2000	3.7		20.0			
Dibenzofuran	1.9373 1.6304	1.8975 1.5969	1.8012 1.5223	1.7561	1.7486	Ave		1.7363			0.8000	8.4		20.0			
2,3,4,6-Tetrachlorophenol	0.3357 0.3674	0.3605 0.3613	0.3653 0.3468	0.3750	0.3809	Ave		0.3616			0.0100	4.0		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607
SDG No.: _____
Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5		B	M1	M2								
Diethyl phthalate	1.3958 1.2418	1.4001 1.2270	1.3638 1.1349	1.3392	1.3389	Ave		1.3052			0.0100	7.2		20.0			
Hexadecane	0.8490 0.7959	0.8674 0.7881	0.8411 0.6998	0.8476	0.8263	Ave		0.8144				6.6		20.0			
4-Chlorophenyl phenyl ether	0.7209 0.6425	0.7193 0.6303	0.6997 0.5956	0.6875	0.6871	Ave		0.6729			0.4000	6.7		20.0			
Fluorene	1.5958 1.2638	1.5308 1.2360	1.4785 1.1671	1.3850	1.3757	Ave		1.3791			0.9000	10.9		20.0			
4-Nitroaniline	0.3936 0.4015	0.4080 0.4115	0.4296 0.4048	0.4047	0.4265	Ave		0.4100			0.0100	3.0		20.0			
4,6-Dinitro-2-methylphenol	++++ 0.1297	0.1089 0.1299	0.1217 0.1260	0.1323	0.1322	Lin2	-0.443	0.1322			0.0100				0.9990		0.9900
Diphenylamine	1.3624 1.1723	1.3104 1.1494	1.2874 1.0915	1.2461	1.2515	Ave		1.2339				7.3		20.0			
N-Nitrosodiphenylamine	0.5791 0.4885	0.5509 0.4745	0.5319 0.4460	0.5270	0.5131	Ave		0.5139			0.0100	8.4		20.0			
1,2-Diphenylhydrazine(as Azobenzene)	1.6569 1.5275	1.6364 1.5257	1.6080 1.4536	1.6061	1.6054	Ave		1.5774				4.3		20.0			
Azobenzene	1.6751 1.5443	1.6544 1.5425	1.6256 1.4695	1.6237	1.6230	Ave		1.5948				4.3		20.0			
4-Bromophenyl phenyl ether	0.2198 0.1957	0.2150 0.1958	0.2091 0.1831	0.2074	0.2027	Ave		0.2036			0.1000	5.8		20.0			
Hexachlorobenzene	0.2066 0.1886	0.2110 0.1886	0.2021 0.1799	0.1993	0.1964	Ave		0.1966			0.1000	5.3		20.0			
Atrazine	0.2058 0.1861	0.2037 0.1854	0.2116 0.1697	0.2051	0.2017	Ave		0.1961				7.3		20.0			
Pentachlorophenol	++++ 0.1223	0.1103 0.1232	0.1201 0.1178	0.1268	0.1252	Lin2	-0.246	0.1244			0.0500				0.9990		0.9900
Phenanthrene	1.1763 0.9495	1.1120 0.9096	1.1009 0.8549	1.0511	1.0256	Ave		1.0225			0.7000	10.8		20.0			
Anthracene	1.1935 0.9786	1.1502 0.9544	1.1379 0.8940	1.0981	1.0593	Ave		1.0583			0.7000	10.0		20.0			
Carbazole	1.1519 0.9579	1.1002 0.9287	1.0996 0.8682	1.0461	1.0194	Ave		1.0215			0.0100	9.5		20.0			
Di-n-butyl phthalate	1.1603 1.0831	1.1849 1.0750	1.1937 0.9980	1.1706	1.1565	Ave		1.1278			0.0100	6.1		20.0			
Fluoranthene	1.3018 1.1246	1.2781 1.1200	1.2945 1.0400	1.2293	1.2133	Ave		1.2002			0.6000	8.0		20.0			
Pyrene	1.3094 1.2346	1.3240 1.2338	1.2944 1.1620	1.2830	1.3004	Ave		1.2677			0.6000	4.3		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607
SDG No.: _____
Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5		B	M1	M2								
Butyl benzyl phthalate	0.4924 0.5485	0.5264 0.5614	0.5349 0.5349	0.5483	0.5663	Ave		0.5391			0.0100	4.3		20.0			
3,3'-Dichlorobenzidine	0.3948 0.4135	0.4255 0.4112	0.4297 0.3984	0.4392	0.4422	Ave		0.4193			0.0100	4.2		20.0			
Benzo[a]anthracene	1.3221 1.2361	1.3165 1.2371	1.2861 1.1802	1.2807	1.2871	Ave		1.2682			0.8000	3.7		20.0			
Chrysene	1.3201 1.1720	1.2325 1.1724	1.2339 1.1250	1.2033	1.2265	Ave		1.2107			0.7000	4.8		20.0			
Bis(2-ethylhexyl) phthalate	0.6461 0.7531	0.7202 0.7864	0.7250 0.7369	0.7388	0.7583	Ave		0.7331			0.0100	5.6		20.0			
Di-n-octyl phthalate	1.0875 1.3160	1.2067 1.3479	1.2052 1.2859	1.2963	1.3387	Ave		1.2665			0.0100	6.8		20.0			
Benzo[b]fluoranthene	1.1207 1.1963	1.1666 1.2198	1.1800 1.1840	1.1883	1.2289	Ave		1.1856			0.7000	2.8		20.0			
Benzo[k]fluoranthene	1.2521 1.1931	1.2081 1.1799	1.2377 1.1361	1.2201	1.2471	Ave		1.2093			0.7000	3.2		20.0			
Benzo[a]pyrene	1.1611 1.1727	1.1762 1.1723	1.1845 1.1501	1.1912	1.2303	Ave		1.1798			0.7000	2.0		20.0			
Indeno[1,2,3-cd]pyrene	1.0819 1.0796	1.0480 1.0751	1.0025 1.0764	1.0467	1.0872	Ave		1.0622			0.5000	2.7		20.0			
Dibenz(a,h)anthracene	0.9920 1.0714	1.0233 1.0764	1.0162 1.0394	1.0425	1.0782	Ave		1.0424			0.4000	3.0		20.0			
Benzo[g,h,i]perylene	1.1244 1.1084	1.1012 1.1074	1.0773 1.0831	1.1020	1.1370	Ave		1.1051			0.5000	1.8		20.0			
2-Fluorophenol (Surr)	1.5997 1.4483	1.5348 1.4278	1.5011 1.4495	1.5281	1.5345	Ave		1.5030				3.9		20.0			
Phenol-d5 (Surr)	2.1132 1.9433	2.0540 1.8919	2.0492 1.9277	2.0113	2.0244	Ave		2.0019				3.7		20.0			
Nitrobenzene-d5 (Surr)	0.4374 0.4195	0.4452 0.4230	0.4377 0.4091	0.4408	0.4355	Ave		0.4310				2.9		20.0			
2-Fluorobiphenyl	1.5586 1.3213	1.5200 1.2728	1.4417 1.1802	1.4140	1.4181	Ave		1.3908				9.1		20.0			
2,4,6-Tribromophenol (Surr)	0.1711 0.1960	0.1850 0.2037	0.1907 0.1943	0.1990	0.2060	Ave		0.1932				5.8		20.0			
Terphenyl-d14 (Surr)	0.9507 0.9011	0.9316 0.9129	0.9312 0.8614	0.9318	0.9348	Ave		0.9194				3.0		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD004 280-443607/4	D31077.D
Level 2	STD010 280-443607/5	D31078.D
Level 3	STD020 280-443607/6	D31079.D
Level 4	STD050 280-443607/7	D31080.D
Level 5	ICIS 280-443607/3	D31076.D
Level 6	STD120 280-443607/8	D31081.D
Level 7	STD160 280-443607/9	D31082.D
Level 8	STD200 280-443607/10	D31083.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
1,4-Dioxane	DCBd 4	Ave	9913 307587	25732 402332	47765 460538	129073	190702	4.00 120	10.0 160	20.0 200	50.0	80.0
N-Nitrosodimethylamine	DCBd 4	Ave	15509 490898	39244 641059	76181 749726	204140	307486	4.00 120	10.0 160	20.0 200	50.0	80.0
Pyridine	DCBd 4	Ave	49857 1573082	131018 2026462	243905 2339362	653155	985834	8.00 240	20.0 320	40.0 400	100	160
Phenol	DCBd 4	Ave	28169 879157	73873 1146631	140519 1332114	374311	559962	4.00 120	10.0 160	20.0 200	50.0	80.0
Aniline	DCBd 4	Ave	33873 1108208	93349 1448745	176106 1687895	468907	696599	4.00 120	10.0 160	20.0 200	50.0	80.0
Bis(2-chloroethyl)ether	DCBd 4	Ave	20571 609707	54832 786709	103116 879541	270922	398994	4.00 120	10.0 160	20.0 200	50.0	80.0
2-Chlorophenol	DCBd 4	Ave	19471 627808	53385 822639	101568 938018	262909	401940	4.00 120	10.0 160	20.0 200	50.0	80.0
n-Decane	DCBd 4	Ave	21268 661555	56729 872874	104301 961365	280752	415332	4.00 120	10.0 160	20.0 200	50.0	80.0
1,3-Dichlorobenzene	DCBd 4	Ave	21484 638164	56943 826606	107968 934356	281103	415596	4.00 120	10.0 160	20.0 200	50.0	80.0
1,4-Dichlorobenzene	DCBd 4	Ave	21299 647894	56791 839330	107619 944233	282534	422029	4.00 120	10.0 160	20.0 200	50.0	80.0
Benzyl alcohol	DCBd 4	Ave	14238 472179	37687 621774	74713 725360	198218	299024	4.00 120	10.0 160	20.0 200	50.0	80.0
1,2-Dichlorobenzene	DCBd 4	Ave	21008 627435	53989 812271	103159 913128	271479	400569	4.00 120	10.0 160	20.0 200	50.0	80.0
2-Methylphenol	DCBd 4	Ave	20414 646730	53791 840546	103193 974233	270929	412432	4.00 120	10.0 160	20.0 200	50.0	80.0
bis (2-chloroisopropyl) ether	DCBd 4	Ave	27628 831030	70752 1078662	138014 1197893	358264	532283	4.00 120	10.0 160	20.0 200	50.0	80.0
N-Nitrosodi-n-propylamine	DCBd 4	Ave	15870 470824	42394 608898	80260 691357	213856	309288	4.00 120	10.0 160	20.0 200	50.0	80.0

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
3 & 4 Methylphenol	DCBd 4	Ave	21295 603319	56460 763356	107378 865249	278158	412775	4.00 120	10.0 160	20.0 200	50.0	80.0
3-Methylphenol	DCBd 4	Ave	21295 603319	56460 763356	107378 865249	278158	412775	4.00 120	10.0 160	20.0 200	50.0	80.0
4-Methylphenol	DCBd 4	Ave	21295 603319	56460 763356	107378 865249	278158	412775	4.00 120	10.0 160	20.0 200	50.0	80.0
Acetophenone	DCBd 4	Ave	29851 845945	78778 1072369	149547 1206469	387677	565720	4.00 120	10.0 160	20.0 200	50.0	80.0
Hexachloroethane	DCBd 4	Ave	7861 249146	21247 331194	39487 361877	105311	159699	4.00 120	10.0 160	20.0 200	50.0	80.0
Nitrobenzene	NPT	Ave	23298 763607	62301 1003108	118803 1140969	318957	483963	4.00 120	10.0 160	20.0 200	50.0	80.0
Isophorone	NPT	Ave	43063 1396991	114150 1868434	223051 2168836	592446	886069	4.00 120	10.0 160	20.0 200	50.0	80.0
2-Nitrophenol	NPT	Ave	9772 346493	26949 454068	52612 535947	141945	216905	4.00 120	10.0 160	20.0 200	50.0	80.0
2,4-Dimethylphenol	NPT	Ave	20728 664096	56677 867946	105883 1003685	280702	428352	4.00 120	10.0 160	20.0 200	50.0	80.0
Bis(2-chloroethoxy)methane	NPT	Ave	25533 790735	66195 1062320	125080 1202706	338951	502339	4.00 120	10.0 160	20.0 200	50.0	80.0
Benzoic acid	NPT	Lin2	++++ 1191150	72139 1595917	150617 1925795	457487	705029	++++ 240	20.0 320	40.0 400	100	160
2,4-Dichlorophenol	NPT	Ave	16936 521067	42597 685342	84548 790157	223022	336336	4.00 120	10.0 160	20.0 200	50.0	80.0
1,2,4-Trichlorobenzene	NPT	Ave	18703 565994	48896 742865	92112 835054	244722	363917	4.00 120	10.0 160	20.0 200	50.0	80.0
Naphthalene	NPT	Ave	60659 1741390	154038 2249718	298523 2592923	770453	1143456	4.00 120	10.0 160	20.0 200	50.0	80.0
4-Chloroaniline	NPT	Ave	23855 815232	68875 1045234	133302 1229395	348487	523895	4.00 120	10.0 160	20.0 200	50.0	80.0
2,6-Dichlorophenol	NPT	Ave	16661 508954	44164 668568	84253 762902	222681	334463	4.00 120	10.0 160	20.0 200	50.0	80.0
Hexachlorobutadiene	NPT	Ave	9283 300849	25455 395890	49060 445542	130741	194139	4.00 120	10.0 160	20.0 200	50.0	80.0
Caprolactam	NPT	Ave	9595 327857	24412 439583	50417 558175	135910	205112	4.00 120	10.0 160	20.0 200	50.0	80.0
4-Chloro-3-methylphenol	NPT	Ave	18045 583877	47211 784920	93587 909647	250093	375337	4.00 120	10.0 160	20.0 200	50.0	80.0
2-Methylnaphthalene	NPT	Ave	41071 1175767	105716 1524783	199129 1718227	522992	775340	4.00 120	10.0 160	20.0 200	50.0	80.0
1-Methylnaphthalene	NPT	Ave	36726 1103154	98870 1428935	188521 1629454	492503	726449	4.00 120	10.0 160	20.0 200	50.0	80.0

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
Hexachlorocyclopentadiene	ANT	Ave	9729 360132	27518 476920	56652 536926	156135	235549	4.00 120	10.0 160	20.0 200	50.0	80.0
1,2,4,5-Tetrachlorobenzene	NPT	Ave	18779 535974	48622 692087	95949 786079	240223	357396	4.00 120	10.0 160	20.0 200	50.0	80.0
2,4,6-Trichlorophenol	ANT	Ave	11999 369412	32334 476142	63046 549679	165935	244736	4.00 120	10.0 160	20.0 200	50.0	80.0
2,4,5-Trichlorophenol	ANT	Ave	12399 431027	34596 567790	68602 667655	185648	279195	4.00 120	10.0 160	20.0 200	50.0	80.0
1,1'-Biphenyl	ANT	Ave	47930 1384712	125190 1777024	237170 2020940	619252	914529	4.00 120	10.0 160	20.0 200	50.0	80.0
2-Chloronaphthalene	ANT	Ave	37562 1118198	97441 1460257	185382 1682156	488099	727151	4.00 120	10.0 160	20.0 200	50.0	80.0
2-Nitroaniline	ANT	Ave	11373 428814	32281 569403	65961 676229	178212	273107	4.00 120	10.0 160	20.0 200	50.0	80.0
Dimethyl phthalate	ANT	Ave	40633 1282083	108559 1695013	217533 1967810	560364	850298	4.00 120	10.0 160	20.0 200	50.0	80.0
1,3-Dinitrobenzene	ANT	Ave	6145 246481	16683 333184	36720 396998	99719	155520	4.00 120	10.0 160	20.0 200	50.0	80.0
2,6-Dinitrotoluene	ANT	Ave	8964 331501	25586 449143	52194 521853	141761	213079	4.00 120	10.0 160	20.0 200	50.0	80.0
Acenaphthylene	ANT	Ave	59485 1818824	160369 2343276	314177 2706501	809651	1197798	4.00 120	10.0 160	20.0 200	50.0	80.0
3-Nitroaniline	ANT	Ave	10537 390295	30013 522141	63526 613589	164285	245400	4.00 120	10.0 160	20.0 200	50.0	80.0
Acenaphthene	ANT	Ave	37468 1062915	99494 1377704	191660 1579408	483257	705420	4.00 120	10.0 160	20.0 200	50.0	80.0
2,4-Dinitrophenol	ANT	Lin2	++++ 427561	24423 582678	57850 695834	174556	276839	++++ 240	20.0 320	40.0 400	100	160
4-Nitrophenol	ANT	Ave	10796 394623	29874 530260	65307 631866	166566	252882	8.00 240	20.0 320	40.0 400	100	160
2,4-Dinitrotoluene	ANT	Ave	11910 453779	35129 615236	71435 723911	192684	293273	4.00 120	10.0 160	20.0 200	50.0	80.0
Dibenzofuran	ANT	Ave	55918 1653754	148989 2162251	285162 2495330	739019	1090175	4.00 120	10.0 160	20.0 200	50.0	80.0
2,3,4,6-Tetrachlorophenol	ANT	Ave	9690 372644	28309 489234	57836 568410	157807	237469	4.00 120	10.0 160	20.0 200	50.0	80.0
Diethyl phthalate	ANT	Ave	40289 1259638	109935 1661414	215915 1860367	563588	834700	4.00 120	10.0 160	20.0 200	50.0	80.0
Hexadecane	ANT	Ave	24507 807349	68108 1067159	133171 1147152	356700	515159	4.00 120	10.0 160	20.0 200	50.0	80.0
4-Chlorophenyl phenyl ether	ANT	Ave	20808 651732	56477 853450	110775 976269	289327	428354	4.00 120	10.0 160	20.0 200	50.0	80.0

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
Fluorene	ANT	Ave	46063 1281942	120198 1673571	234082 1913056	582856	857693	4.00 120	10.0 160	20.0 200	50.0	80.0
4-Nitroaniline	ANT	Ave	11362 407250	32038 557221	68008 663634	170293	265875	4.00 120	10.0 160	20.0 200	50.0	80.0
4,6-Dinitro-2-methylphenol	PHN	Lin2	++++ 536894	34574 724181	79305 859529	223780	341878	++++ 240	20.0 320	40.0 400	100	160
Diphenylamine	ANT	Ave	33425 1010725	87454 1322951	173256 1520758	445731	663216	3.40 102	8.50 136	17.0 170	42.5	68.0
N-Nitrosodiphenylamine	PHN	Ave	33425 1010725	87454 1322951	173256 1520758	445731	663216	4.00 120	10.0 160	20.0 200	50.0	80.0
1,2-Diphenylhydrazine(as Azobenzene)	ANT	Ave	48350 1566448	129897 2088645	257374 2408873	683303	1011827	4.04 121	10.1 162	20.2 202	50.5	80.9
Azobenzene	ANT	Ave	48350 1566448	129897 2088645	257374 2408873	683303	1011827	4.00 120	10.0 160	20.0 200	50.0	80.0
4-Bromophenyl phenyl ether	PHN	Ave	12687 404951	34133 546023	68109 624404	175399	261980	4.00 120	10.0 160	20.0 200	50.0	80.0
Hexachlorobenzene	PHN	Ave	11927 390256	33492 525800	65840 613523	168529	253903	4.00 120	10.0 160	20.0 200	50.0	80.0
Atrazine	PHN	Ave	11880 385072	32333 516950	68922 578521	173466	260650	4.00 120	10.0 160	20.0 200	50.0	80.0
Pentachlorophenol	PHN	Lin2	++++ 505960	35005 687005	78241 803355	214569	323650	++++ 240	20.0 320	40.0 400	100	160
Phenanthrene	PHN	Ave	67900 1964379	176527 2536109	358582 2914974	889037	1325631	4.00 120	10.0 160	20.0 200	50.0	80.0
Anthracene	PHN	Ave	68893 2024606	182594 2661233	370647 3048557	928800	1369181	4.00 120	10.0 160	20.0 200	50.0	80.0
Carbazole	PHN	Ave	66491 1981809	174644 2589574	358158 2960303	884804	1317674	4.00 120	10.0 160	20.0 200	50.0	80.0
Di-n-butyl phthalate	PHN	Ave	66977 2240806	188100 2997486	388821 3403027	990118	1494854	4.00 120	10.0 160	20.0 200	50.0	80.0
Fluoranthene	PHN	Ave	75143 2326683	202884 3122903	421659 3546381	1039769	1568241	4.00 120	10.0 160	20.0 200	50.0	80.0
Pyrene	CRY	Ave	78114 2458283	214875 3265650	446655 3747222	1094905	1651677	4.00 120	10.0 160	20.0 200	50.0	80.0
Butyl benzyl phthalate	CRY	Ave	29374 1092153	85437 1486074	184563 1724832	467884	719289	4.00 120	10.0 160	20.0 200	50.0	80.0
3,3'-Dichlorobenzidine	CRY	Ave	23553 823380	69062 1088511	148285 1284759	374819	561666	4.00 120	10.0 160	20.0 200	50.0	80.0
Benzo[a]anthracene	CRY	Ave	78873 2461177	213650 3274513	443781 3805757	1092871	1634853	4.00 120	10.0 160	20.0 200	50.0	80.0
Chrysene	CRY	Ave	78755 2333671	200025 3103122	425783 3627777	1026819	1557877	4.00 120	10.0 160	20.0 200	50.0	80.0

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
Bis(2-ethylhexyl) phthalate	CRY	Ave	38544 1499559	116885 2081456	250170 2376408	630472	963191	4.00 120	10.0 160	20.0 200	50.0	80.0
Di-n-octyl phthalate	CRY	Ave	64878 2620290	195842 3567745	432437 4146803	1106216	1700342	4.00 120	10.0 160	20.0 200	50.0	80.0
Benzo[b]fluoranthene	PRY	Ave	70562 2385522	194845 3220136	409054 3864797	1014014	1549112	4.00 120	10.0 160	20.0 200	50.0	80.0
Benzo[k]fluoranthene	PRY	Ave	78834 2379166	201769 3114890	429051 3708496	1041209	1572108	4.00 120	10.0 160	20.0 200	50.0	80.0
Benzo[a]pyrene	PRY	Ave	73104 2338543	196452 3094828	410594 3754449	1016514	1550874	4.00 120	10.0 160	20.0 200	50.0	80.0
Indeno[1,2,3-cd]pyrene	CRY	Ave	64545 2149619	170084 2845711	345952 3471270	893181	1380975	4.00 120	10.0 160	20.0 200	50.0	80.0
Dibenz(a,h)anthracene	PRY	Ave	62461 2136529	170901 2841429	352280 3393012	889641	1359159	4.00 120	10.0 160	20.0 200	50.0	80.0
Benzo[g,h,i]perylene	PRY	Ave	70796 2210276	183928 2923519	373458 3535561	940354	1433293	4.00 120	10.0 160	20.0 200	50.0	80.0
2-Fluorophenol (Surr)	DCBd 4	Ave	20610 626732	53134 825503	97986 951610	266536	403762	4.00 120	10.0 160	20.0 200	50.0	80.0
Phenol-d5 (Surr)	DCBd 4	Ave	27225 840930	71107 1093895	133764 1265556	350818	532668	4.00 120	10.0 160	20.0 200	50.0	80.0
Nitrobenzene-d5 (Surr)	NPT	Ave	22526 749742	60983 994187	117579 1150946	318001	468170	4.00 120	10.0 160	20.0 200	50.0	80.0
2-Fluorobiphenyl	ANT	Ave	44988 1340250	119349 1723413	228257 1934642	595059	884115	4.00 120	10.0 160	20.0 200	50.0	80.0
2,4,6-Tribromophenol (Surr)	ANT	Ave	4939 198814	14527 275770	30193 318553	83751	128434	4.00 120	10.0 160	20.0 200	50.0	80.0
Terphenyl-d14 (Surr)	CRY	Ave	56716 1794275	151186 2416263	321347 2777694	795196	1187408	4.00 120	10.0 160	20.0 200	50.0	80.0

Curve Type Legend:

Ave = Average ISTD
Lin2 = Linear 1/conc^2 ISTD

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607

SDG No.: _____

Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD004 280-443607/4	D31077.D
Level 2	STD010 280-443607/5	D31078.D
Level 3	STD020 280-443607/6	D31079.D
Level 4	STD050 280-443607/7	D31080.D
Level 5	ICIS 280-443607/3	D31076.D
Level 6	STD120 280-443607/8	D31081.D
Level 7	STD160 280-443607/9	D31082.D
Level 8	STD200 280-443607/10	D31083.D

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 # LVL 8 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2 LVL 8	LVL 3	LVL 4	LVL 5	LVL 6
1,4-Dioxane	5.8						30					
N-Nitrosodimethylamine	4.4						30					
Pyridine	4.6						30					
Phenol	4.2						30					
Aniline	0.2						30					
Bis(2-chloroethyl)ether	7.0						30					
2-Chlorophenol	1.2						30					
n-Decane	5.0						30					
1,3-Dichlorobenzene	6.8						30					
1,4-Dichlorobenzene	5.4						30					
Benzyl alcohol	-0.5						30					
1,2-Dichlorobenzene	7.9						30					
2-Methylphenol	3.3						30					
bis (2-chloroisopropyl) ether	7.3						30					
N-Nitrosodi-n-propylamine	6.2						30					

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607
SDG No.: _____
Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 # LVL 8 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2 LVL 8	LVL 3	LVL 4	LVL 5	LVL 6
3 & 4 Methylphenol	9.1						30					
3-Methylphenol	9.1						30					
4-Methylphenol	9.1						30					
Acetophenone	9.7						30					
Hexachloroethane	3.0						30					
Nitrobenzene	3.4						30					
Isophorone	3.0						30					
2-Nitrophenol	-2.6						30					
2,4-Dimethylphenol	4.0						30					
Bis (2-chloroethoxy) methane	7.1						30					
Benzoic acid	+++++	2.5						30				
2,4-Dichlorophenol	7.8						30					
1,2,4-Trichlorobenzene	8.8						30					
Naphthalene	12.2						30					
4-Chloroaniline	-1.7						30					
2,6-Dichlorophenol	7.0						30					
Hexachlorobutadiene	2.6						30					
Caprolactam	-0.7						30					
4-Chloro-3-methylphenol	2.9						30					
2-Methylnaphthalene	12.4						30					
1-Methylnaphthalene	7.7						30					

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607
SDG No.: _____
Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 # LVL 8 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2 LVL 8	LVL 3	LVL 4	LVL 5	LVL 6
Hexachlorocyclopentadiene	-4.7						30					
1,2,4,5-Tetrachlorobenzene	11.5						30					
2,4,6-Trichlorophenol	8.5						30					
2,4,5-Trichlorophenol	-0.2						30					
1,1'-Biphenyl	14.5						30					
2-Chloronaphthalene	12.6						30					
2-Nitroaniline	-5.6						30					
Dimethyl phthalate	6.5						30					
1,3-Dinitrobenzene	-9.2						30					
2,6-Dinitrotoluene	-5.2						30					
Acenaphthylene	9.1						30					
3-Nitroaniline	-5.1						30					
Acenaphthene	14.3						30					
2,4-Dinitrophenol	+++++	0.6						30				
4-Nitrophenol	-4.5						30					
2,4-Dinitrotoluene	-7.9						30					
Dibenzofuran	11.6						30					
2,3,4,6-Tetrachlorophenol	-7.2						30					
Diethyl phthalate	6.9						30					
Hexadecane	4.3						30					
4-Chlorophenyl phenyl ether	7.1						30					

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607
SDG No.: _____
Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 # LVL 8 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2 LVL 8	LVL 3	LVL 4	LVL 5	LVL 6
Fluorene	15.7						30					
4-Nitroaniline	-4.0						30					
4,6-Dinitro-2-methylphenol	+++++	-0.9						30				
Diphenylamine	10.4						30					
N-Nitrosodiphenylamine	12.7						30					
1,2-Diphenylhydrazine (as Azobenzene)	5.0						30					
Azobenzene	5.0						30					
4-Bromophenyl phenyl ether	8.0						30					
Hexachlorobenzene	5.1						30					
Atrazine	4.9						30					
Pentachlorophenol	+++++	-1.5						30				
Phenanthrene	15.0						30					
Anthracene	12.8						30					
Carbazole	12.8						30					
Di-n-butyl phthalate	2.9						30					
Fluoranthene	8.5						30					
Pyrene	3.3						30					
Butyl benzyl phthalate	-8.7						30					
3,3'-Dichlorobenzidine	-5.9						30					
Benzo[a]anthracene	4.2						30					
Chrysene	9.0						30					

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 443607
SDG No.: _____
Instrument ID: SMS_D GC Column: Rxi-5Sil MS ID: 0.25 (mm) Heated Purge: (Y/N) N
Calibration Start Date: 01/08/2019 14:43 Calibration End Date: 01/08/2019 18:08 Calibration ID: 34752

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 # LVL 8 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2 LVL 8	LVL 3	LVL 4	LVL 5	LVL 6
Bis(2-ethylhexyl) phthalate	-11.9						30					
Di-n-octyl phthalate	-14.1						30					
Benzo[b]fluoranthene	-5.5						30					
Benzo[k]fluoranthene	3.5						30					
Benzo[a]pyrene	-1.6						30					
Indeno[1,2,3-cd]pyrene	1.9						30					
Dibenz(a,h)anthracene	-4.8						30					
Benzo[g,h,i]perylene	1.7						30					
2-Fluorophenol (Surr)	6.4						30					
Phenol-d5 (Surr)	5.6						30					
Nitrobenzene-d5 (Surr)	1.5						30					
2-Fluorobiphenyl	12.1						30					
2,4,6-Tribromophenol (Surr)	-11.4						30					
Terphenyl-d14 (Surr)	3.4						30					

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
 Lims ID: ICIS HSL
 Client ID:
 Sample Type: ICIS Calib Level: 5
 Inject. Date: 08-Jan-2019 14:43:30 ALS Bottle#: 2 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICIS HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub14
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:19:56 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 08-Jan-2019 15:51:11

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.592	4.592	0.000	96	131559	40.0	40.0	
* 2 Naphthalene-d8	136	5.832	5.832	0.000	99	537462	40.0	40.0	
* 3 Acenaphthene-d10	164	7.578	7.578	0.000	95	311721	40.0	40.0	
* 4 Phenanthrene-d10	188	9.069	9.069	0.000	98	646286	40.0	40.0	
* 5 Chrysene-d12	240	13.129	13.129	0.000	98	635088	40.0	40.0	
* 6 Perylene-d12	264	17.050	17.050	0.000	97	630299	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.396	3.396	0.000	93	403762	80.0	81.7	
\$ 8 Phenol-d5	99	4.234	4.234	0.000	98	532668	80.0	80.9	
\$ 9 Nitrobenzene-d5	82	5.116	5.116	0.000	87	468170	80.0	80.8	
\$ 10 2-Fluorobiphenyl	172	6.889	6.889	0.000	99	884115	80.0	81.6	
\$ 11 2,4,6-Tribromophenol	330	8.369	8.369	0.000	93	128434	80.0	85.3	
\$ 12 Terphenyl-d14	244	11.008	11.008	0.000	98	1187408	80.0	81.3	
13 1,4-Dioxane	88	1.953	1.953	0.000	92	190702	80.0	79.7	
14 N-Nitrosodimethylamine	74	2.194	2.194	0.000	93	307486	80.0	81.0	
15 Pyridine	79	2.247	2.247	0.000	98	985834	160.0	162.1	
23 n-Decane	57	4.432	4.432	0.000	98	415332	80.0	80.3	
24 Phenol	94	4.245	4.245	0.000	98	559962	80.0	81.1	a
25 Aniline	93	4.277	4.277	0.000	98	696599	80.0	80.7	a
27 Bis(2-chloroethyl)ether	93	4.320	4.320	0.000	95	398994	80.0	81.3	a
28 2-Chlorophenol	128	4.400	4.400	0.000	97	401940	80.0	81.8	
29 1,3-Dichlorobenzene	146	4.544	4.544	0.000	97	415596	80.0	81.0	
30 1,4-Dichlorobenzene	146	4.608	4.608	0.000	93	422029	80.0	81.8	
31 Benzyl alcohol	108	4.710	4.710	0.000	93	299024	80.0	81.9	
32 1,2-Dichlorobenzene	146	4.758	4.758	0.000	95	400569	80.0	80.6	
34 2,2'-oxybis[1-chloropropan	45	4.833	4.833	0.000	92	532283	80.0	81.0	
35 2-Methylphenol	108	4.817	4.817	0.000	94	412432	80.0	81.7	
38 N-Nitrosodi-n-propylamine	70	4.961	4.961	0.000	80	309288	80.0	81.1	
39 Acetophenone	105	4.966	4.966	0.000	92	565720	80.0	81.4	
40 4-Methylphenol	108	4.961	4.961	0.000	89	412775	80.0	82.8	
41 3-Methylphenol	108	4.961	4.961	0.000	85	412775	80.0	82.8	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.961	4.961	0.000	88	412775	80.0	82.8	a
44 Hexachloroethane	117	5.089	5.089	0.000	94	159699	80.0	82.0	
45 Nitrobenzene	77	5.132	5.132	0.000	86	483963	80.0	82.3	
47 Isophorone	82	5.361	5.361	0.000	98	886069	80.0	81.2	a
48 2-Nitrophenol	139	5.447	5.447	0.000	95	216905	80.0	82.9	
49 2,4-Dimethylphenol	107	5.479	5.479	0.000	96	428352	80.0	82.4	
51 Bis(2-chloroethoxy)methane	93	5.559	5.559	0.000	99	502339	80.0	80.8	a
52 Benzoic acid	105	5.607	5.607	0.000	64	705029	160.0	159.7	a
53 2,4-Dichlorophenol	162	5.687	5.687	0.000	95	336336	80.0	82.0	
55 1,2,4-Trichlorobenzene	180	5.773	5.773	0.000	93	363917	80.0	81.1	
56 Naphthalene	128	5.853	5.853	0.000	97	1143456	80.0	81.1	a
57 4-Chloroaniline	127	5.890	5.890	0.000	96	523895	80.0	82.7	
58 2,6-Dichlorophenol	162	5.906	5.906	0.000	97	334463	80.0	82.3	
60 Hexachlorobutadiene	225	5.976	5.976	0.000	95	194139	80.0	82.2	
63 Caprolactam	55	6.232	6.232	0.000	83	205112	80.0	81.4	
64 4-Chloro-3-methylphenol	107	6.371	6.371	0.000	97	375337	80.0	82.1	
66 2-Methylnaphthalene	142	6.537	6.537	0.000	93	775340	80.0	81.4	
67 1-Methylnaphthalene	142	6.633	6.633	0.000	94	726449	80.0	81.6	a
68 Hexachlorocyclopentadiene	237	6.702	6.702	0.000	95	235549	80.0	85.5	
69 1,2,4,5-Tetrachlorobenzene	216	6.708	6.708	0.000	97	357396	80.0	81.3	
71 2,4,6-Trichlorophenol	196	6.815	6.815	0.000	93	244736	80.0	82.0	
72 2,4,5-Trichlorophenol	196	6.857	6.857	0.000	95	279195	80.0	83.2	
74 1,1'-Biphenyl	154	6.996	6.996	0.000	95	914529	80.0	80.9	
75 2-Chloronaphthalene	162	7.023	7.023	0.000	96	727151	80.0	80.7	
77 2-Nitroaniline	65	7.108	7.108	0.000	83	273107	80.0	84.0	
80 Dimethyl phthalate	163	7.285	7.285	0.000	98	850298	80.0	82.5	
81 1,3-Dinitrobenzene	168	7.311	7.311	0.000	86	155520	80.0	85.1	
82 2,6-Dinitrotoluene	165	7.343	7.343	0.000	96	213079	80.0	83.4	
83 Acenaphthylene	152	7.440	7.440	0.000	99	1197798	80.0	81.4	
84 3-Nitroaniline	138	7.520	7.520	0.000	94	245400	80.0	81.9	
85 Acenaphthene	153	7.611	7.611	0.000	95	705420	80.0	79.7	
86 2,4-Dinitrophenol	184	7.621	7.621	0.000	82	276839	160.0	167.6	a
88 4-Nitrophenol	109	7.696	7.696	0.000	93	252882	160.0	165.6	a
89 2,4-Dinitrotoluene	165	7.749	7.749	0.000	93	293273	80.0	84.0	
90 Dibenzofuran	168	7.787	7.787	0.000	98	1090175	80.0	80.6	
92 Hexadecane	57	8.006	8.006	0.000	97	515159	80.0	81.2	
93 2,3,4,6-Tetrachlorophenol	232	7.910	7.910	0.000	71	237469	80.0	84.3	
95 Diethyl phthalate	149	7.990	7.990	0.000	98	834700	80.0	82.1	
97 4-Chlorophenyl phenyl ethe	204	8.113	8.113	0.000	92	428354	80.0	81.7	
99 Fluorene	166	8.129	8.129	0.000	94	857693	80.0	79.8	
100 4-Nitroaniline	138	8.134	8.134	0.000	86	265875	80.0	83.2	
101 4,6-Dinitro-2-methylphenol	198	8.171	8.171	0.000	91	341878	160.0	163.4	
102 N-Nitrosodiphenylamine	169	8.230	8.230	0.000	62	663216	80.0	79.9	
103 Diphenylamine	169	8.230	8.230	0.000	96	663216	68.0	69.0	
105 1,2-Diphenylhydrazine	77	8.273	8.273	0.000	98	1011827	80.9	82.3	
106 Azobenzene	77	8.273	8.273	0.000	98	1011827	80.0	81.4	
112 Atrazine	200	8.754	8.754	0.000	95	260650	80.0	82.3	
114 4-Bromophenyl phenyl ether	248	8.604	8.604	0.000	66	261980	80.0	79.6	
116 Hexachlorobenzene	284	8.695	8.695	0.000	95	253903	80.0	79.9	
119 Pentachlorophenol	266	8.882	8.882	0.000	94	323650	160.0	163.1	
123 Phenanthrene	178	9.096	9.096	0.000	98	1325631	80.0	80.2	
124 Anthracene	178	9.144	9.144	0.000	98	1369181	80.0	80.1	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.293	9.293	0.000	95	1317674	80.0	79.8	
127 Di-n-butyl phthalate	149	9.630	9.630	0.000	100	1494854	80.0	82.0	
132 Fluoranthene	202	10.453	10.453	0.000	99	1568241	80.0	80.9	
134 Pyrene	202	10.789	10.789	0.000	97	1651677	80.0	82.1	
141 Butyl benzyl phthalate	149	11.900	11.900	0.000	97	719289	80.0	84.0	
144 3,3'-Dichlorobenzidine	252	13.059	13.059	0.000	74	561666	80.0	84.4	
145 Benzo[a]anthracene	228	13.102	13.102	0.000	99	1634853	80.0	81.2	a
146 Chrysene	228	13.193	13.193	0.000	98	1557877	80.0	81.0	a
147 Bis(2-ethylhexyl) phthalat	149	13.268	13.268	0.000	97	963191	80.0	82.8	
148 Di-n-octyl phthalate	149	15.073	15.073	0.000	99	1700342	80.0	84.6	
150 Benzo[b]fluoranthene	252	15.966	15.966	0.000	98	1549112	80.0	82.9	
151 Benzo[k]fluoranthene	252	16.046	16.046	0.000	99	1572108	80.0	82.5	
153 Benzo[a]pyrene	252	16.895	16.895	0.000	78	1550874	80.0	83.4	
156 Indeno[1,2,3-cd]pyrene	276	20.175	20.175	0.000	98	1380975	80.0	81.9	a
157 Dibenz(a,h)anthracene	278	20.271	20.271	0.000	93	1359159	80.0	82.7	
158 Benzo[g,h,i]perylene	276	20.918	20.918	0.000	97	1433293	80.0	82.3	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

MS-HSLA080_00040

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D

Injection Date: 08-Jan-2019 14:43:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: ICIS HSL

Worklist Smp#: 3

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

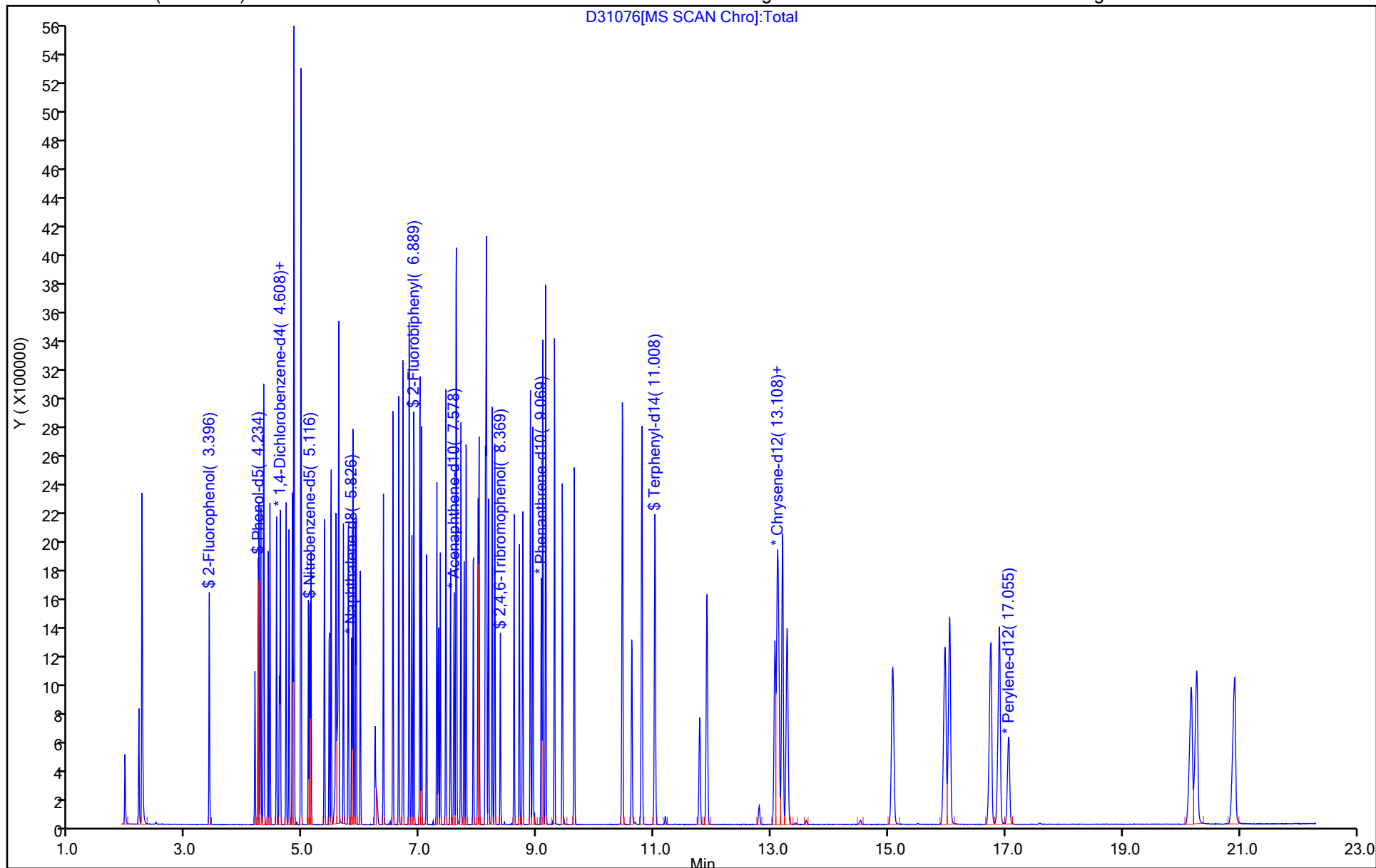
ALS Bottle#: 2

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

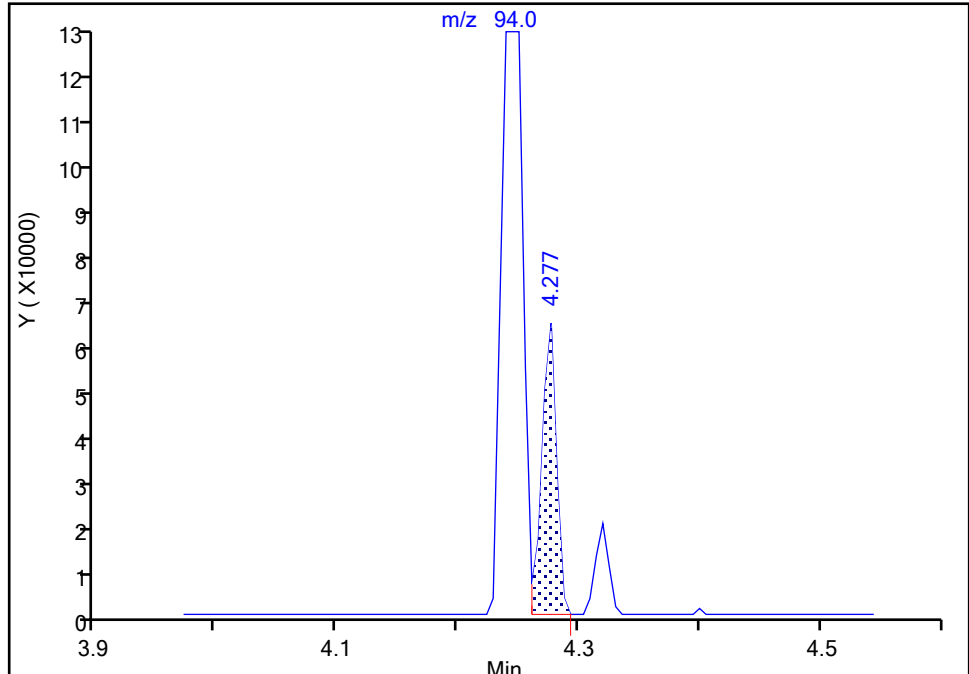
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Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

24 Phenol, CAS: 108-95-2

Signal: 1

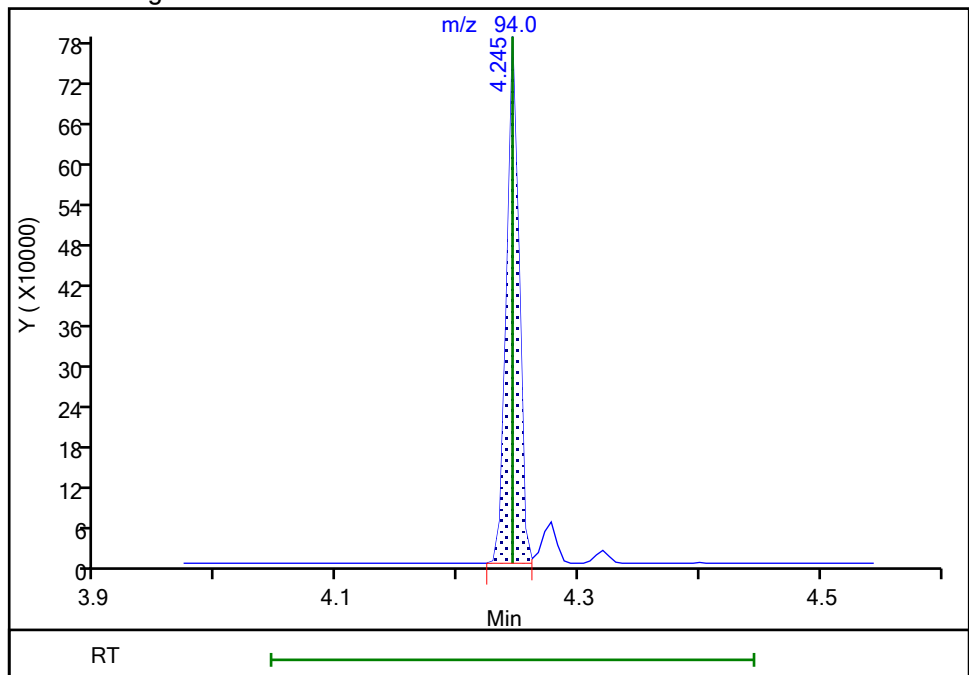
RT: 4.28
Area: 52048
Amount: 80.000000
Amount Units: ug/ml

Processing Integration Results



RT: 4.24
Area: 559962
Amount: 81.116656
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:47:45
Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

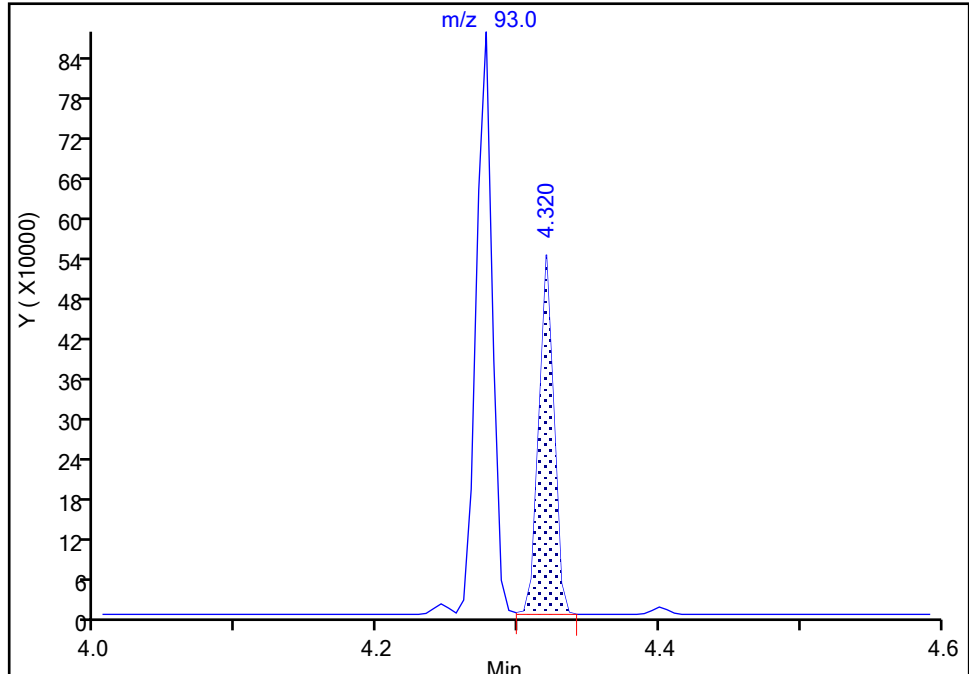
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Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

25 Aniline, CAS: 62-53-3

Signal: 1

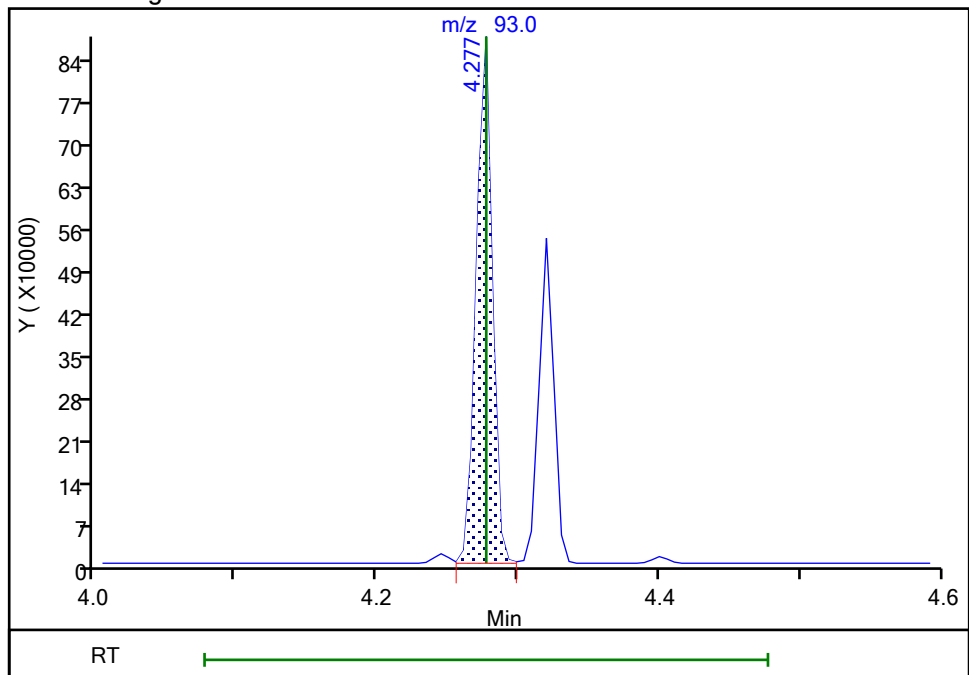
RT: 4.32
Area: 398994
Amount: 80.000000
Amount Units: ug/ml

Processing Integration Results



RT: 4.28
Area: 696599
Amount: 80.696779
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:47:51

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

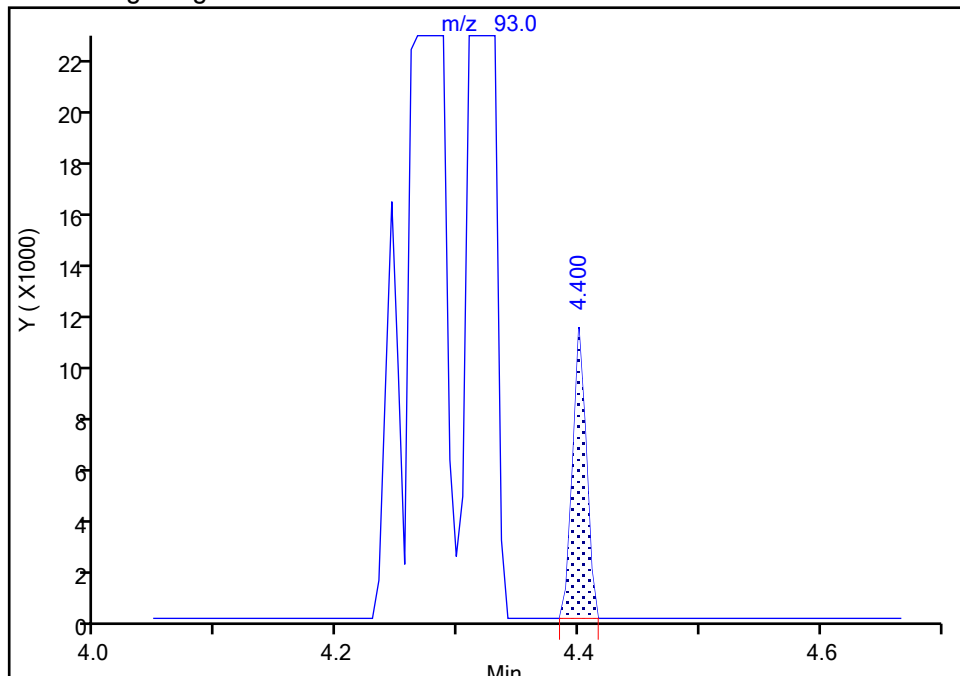
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

27 Bis(2-chloroethyl)ether, CAS: 111-44-4

Signal: 1

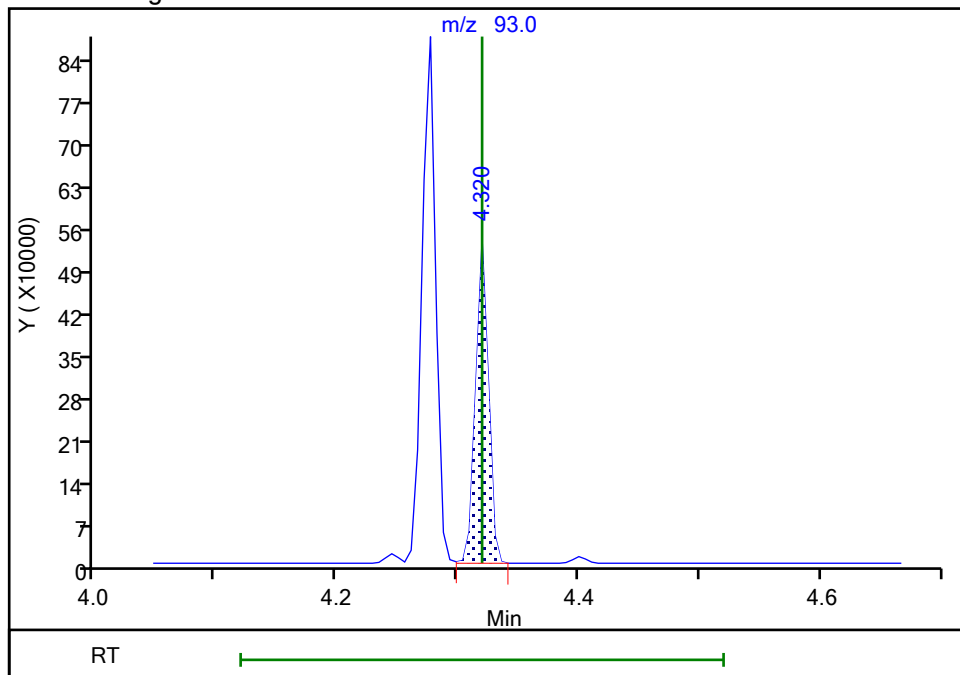
RT: 4.40
Area: 8619
Amount: 80.000000
Amount Units: ug/ml

Processing Integration Results



RT: 4.32
Area: 398994
Amount: 81.286604
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:47:57

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

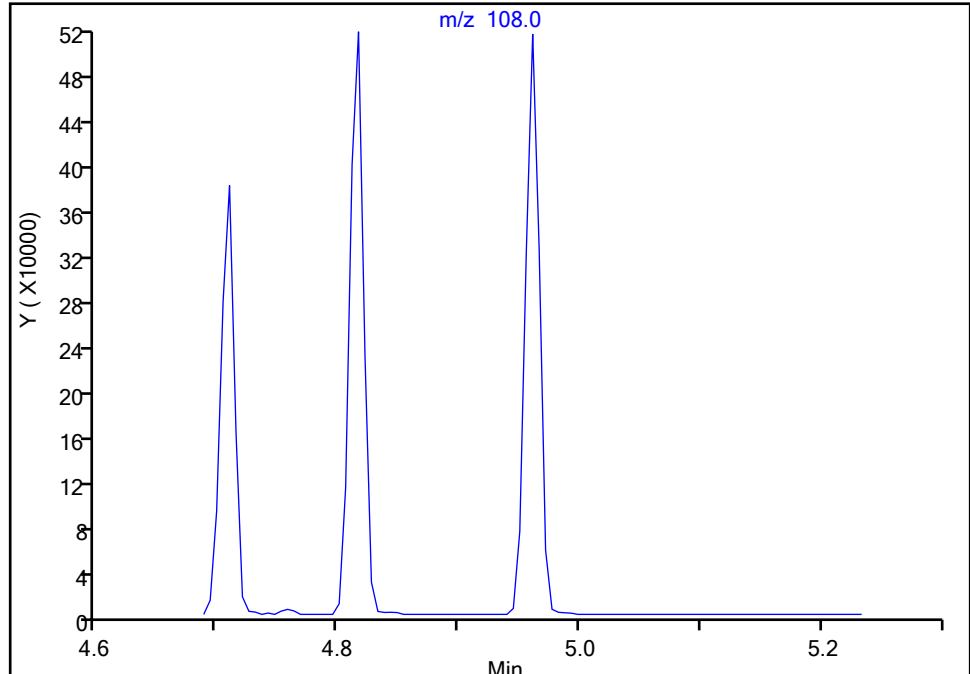
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

42 3 & 4 Methylphenol, CAS: 15831-10-4

Signal: 1

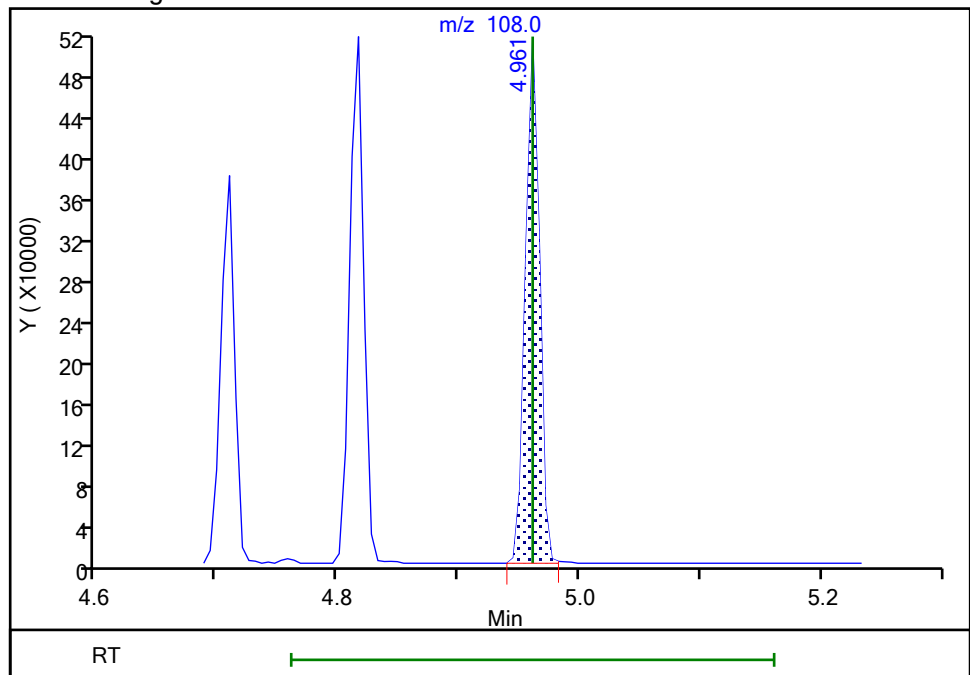
Not Detected
Expected RT: 4.96

Processing Integration Results



RT: 4.96
Area: 412775
Amount: 82.807925
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:48:12

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

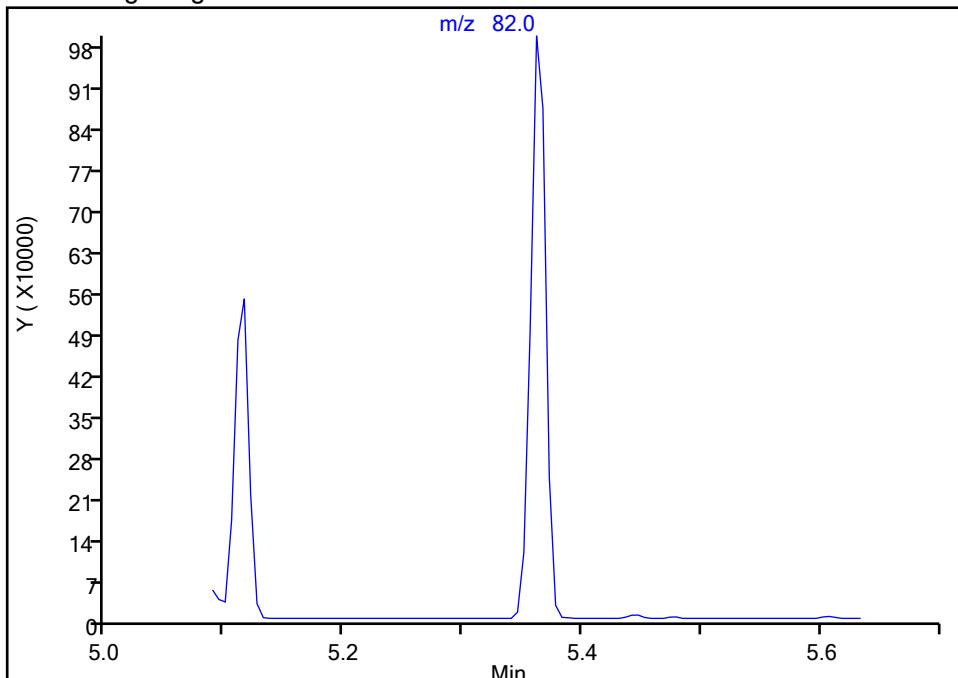
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

47 Isophorone, CAS: 78-59-1

Signal: 1

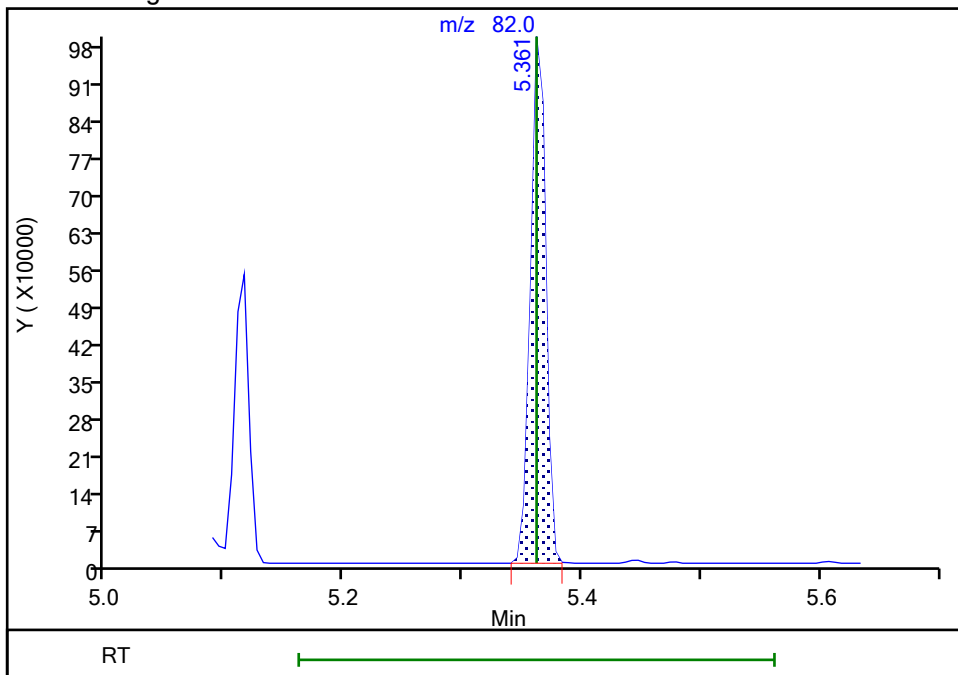
Not Detected
Expected RT: 5.36

Processing Integration Results



RT: 5.36
Area: 886069
Amount: 81.248985
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:48:28

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

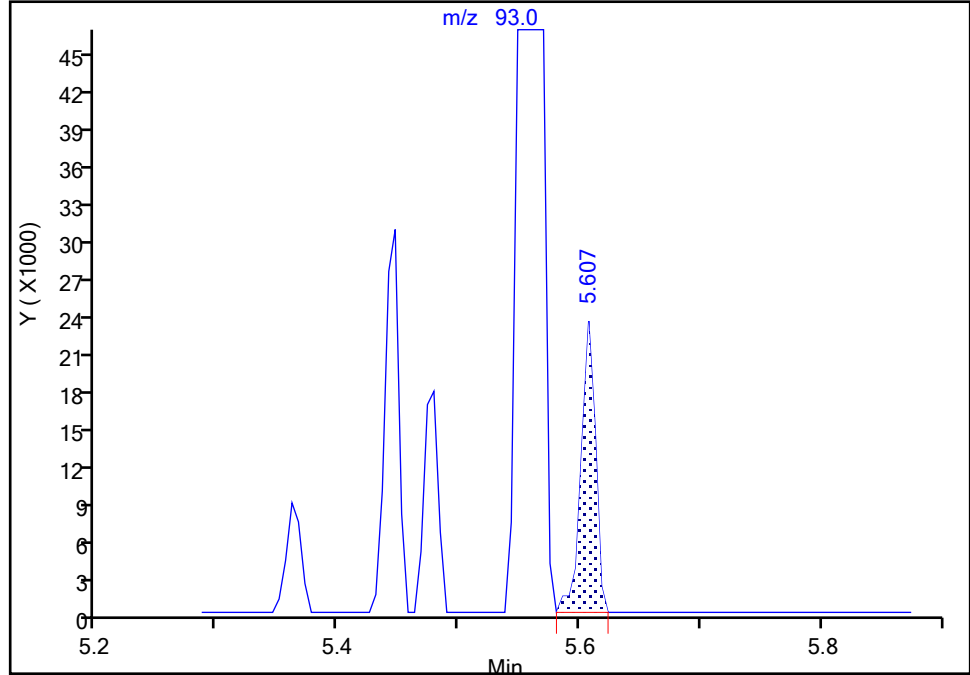
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

51 Bis(2-chloroethoxy)methane, CAS: 111-91-1

Signal: 1

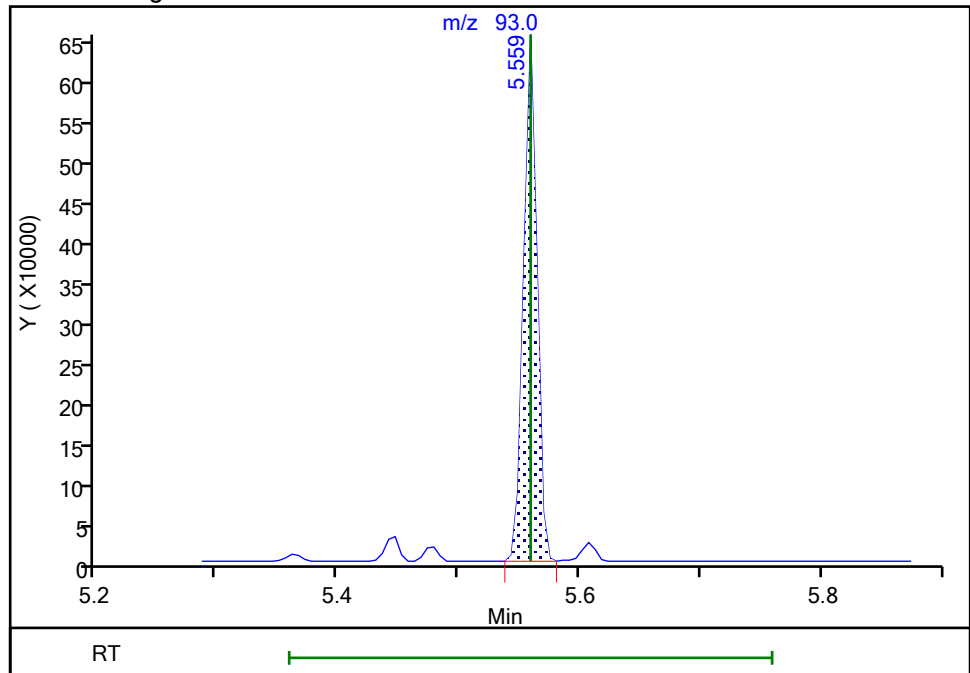
RT: 5.61
Area: 19220
Amount: 80.000000
Amount Units: ug/ml

Processing Integration Results



RT: 5.56
Area: 502339
Amount: 80.750498
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:48:36

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

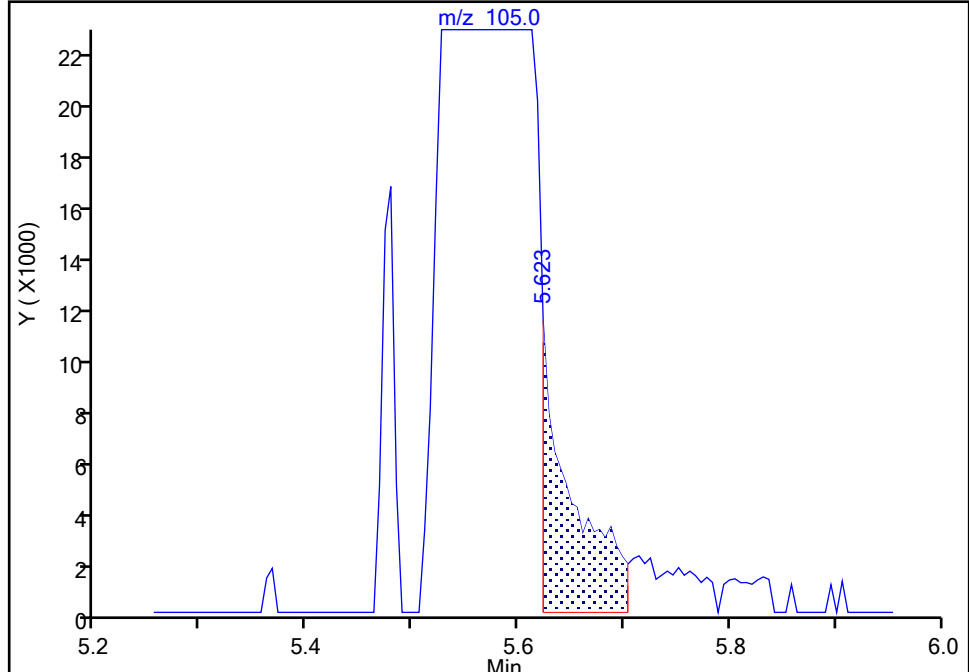
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

52 Benzoic acid, CAS: 65-85-0

Signal: 1

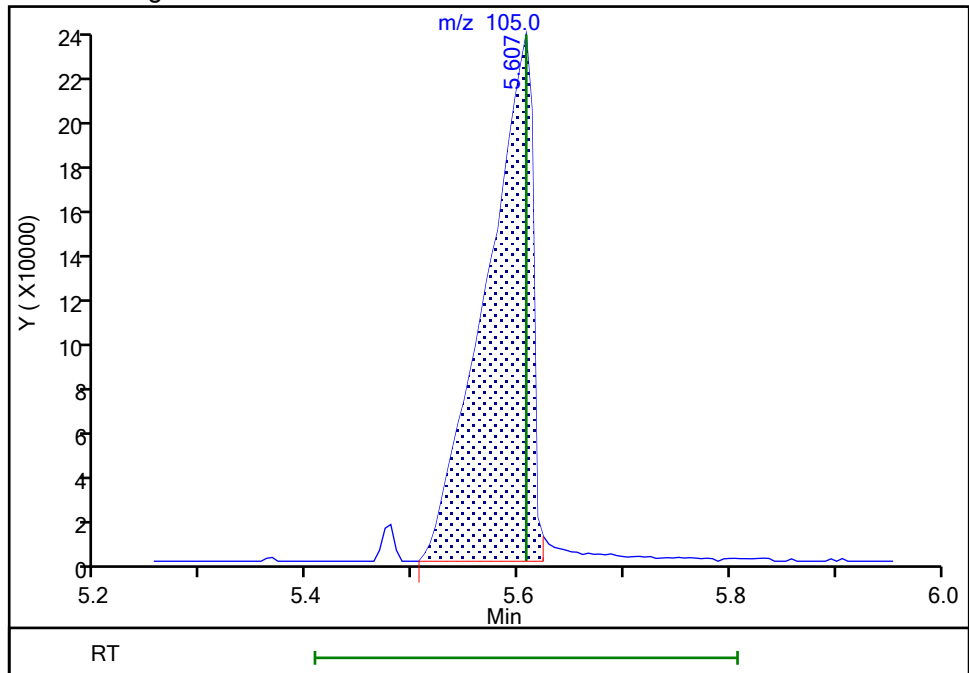
RT: 5.62
Area: 21964
Amount: 14.824502
Amount Units: ug/ml

Processing Integration Results



RT: 5.61
Area: 705029
Amount: 159.6587
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:48:40

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

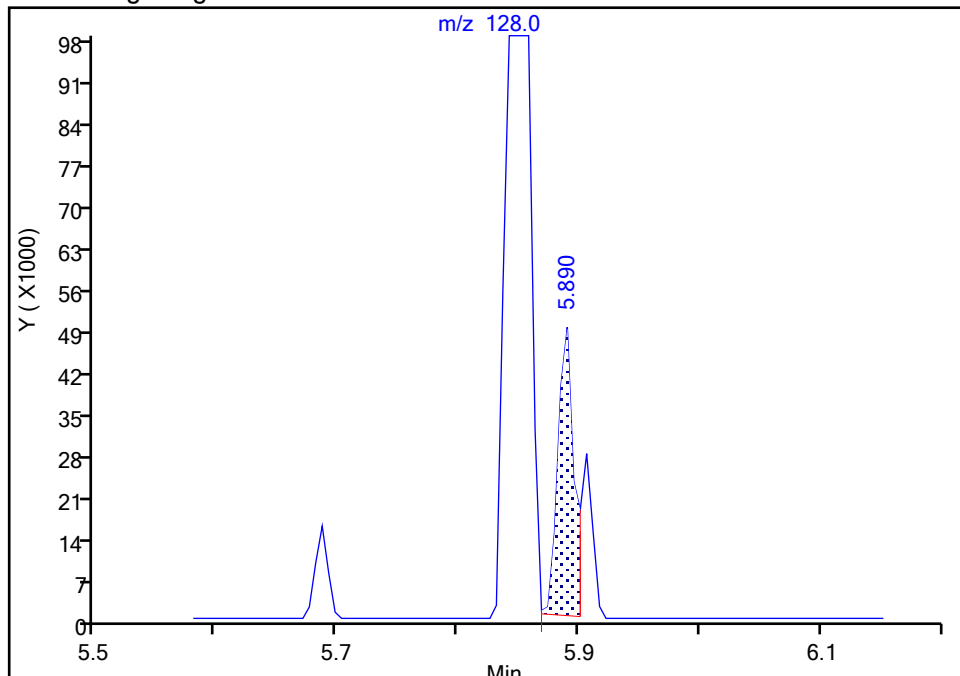
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

56 Naphthalene, CAS: 91-20-3

Signal: 1

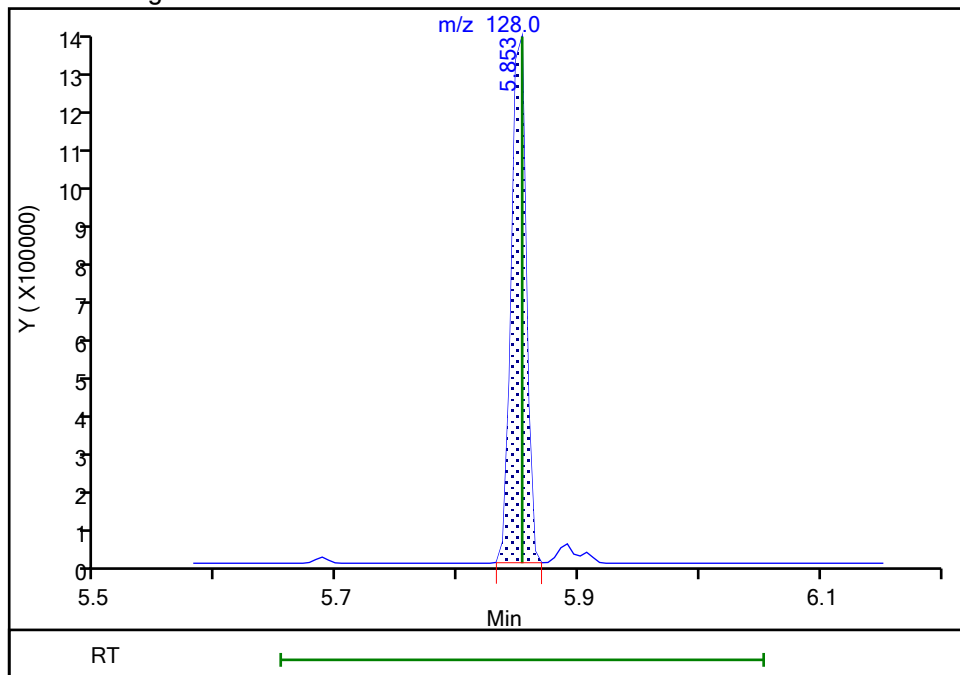
RT: 5.89
Area: 46206
Amount: 80.000000
Amount Units: ug/ml

Processing Integration Results



RT: 5.85
Area: 1143456
Amount: 81.059366
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:48:48

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

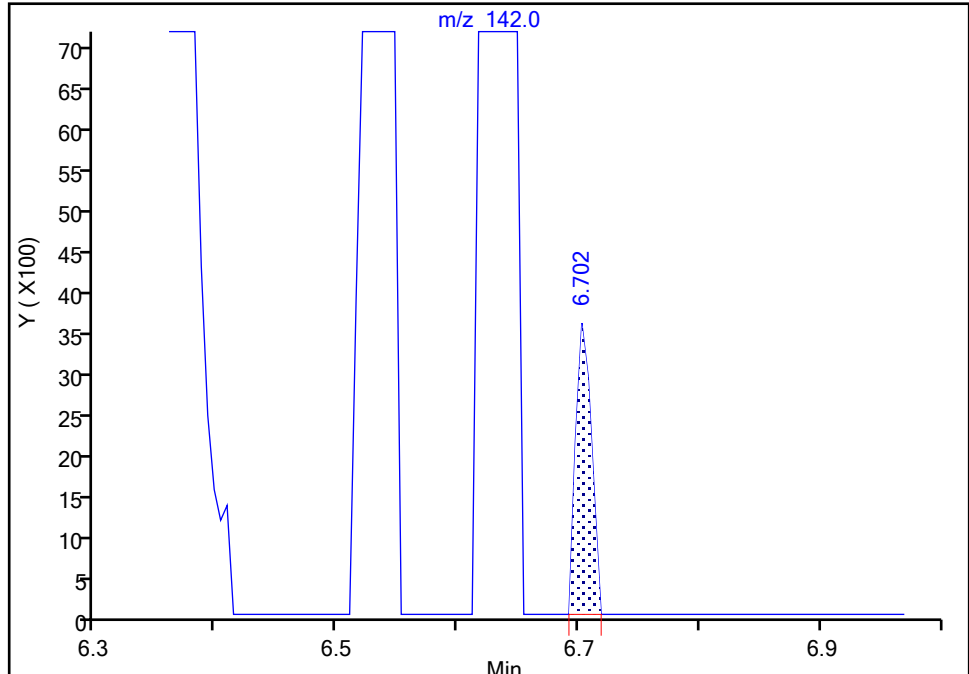
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

67 1-Methylnaphthalene, CAS: 90-12-0

Signal: 1

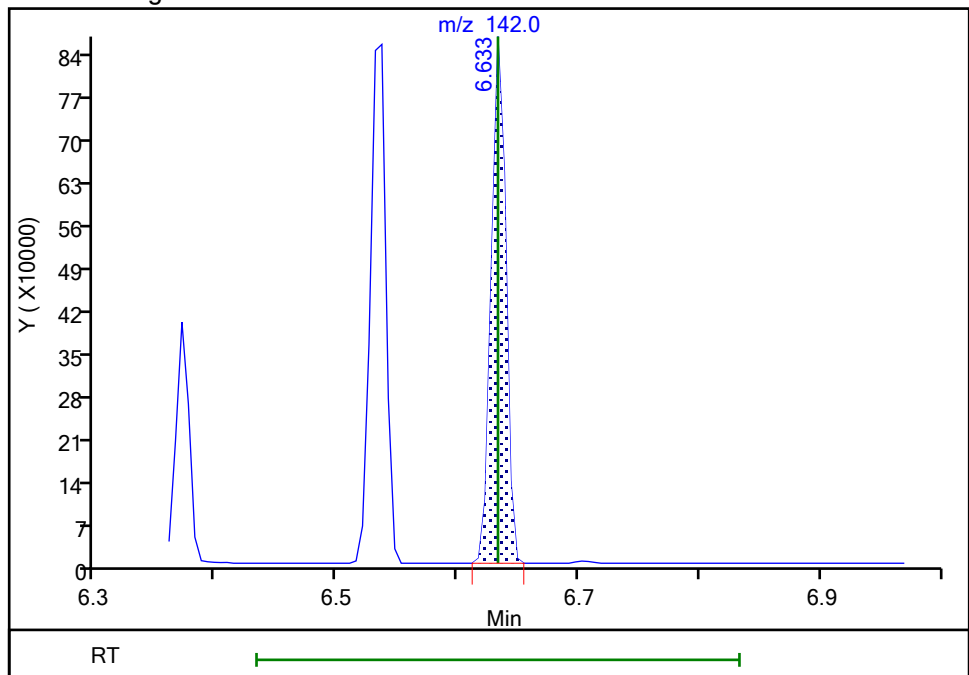
RT: 6.70
Area: 3187
Amount: 80.000000
Amount Units: ug/ml

Processing Integration Results



RT: 6.63
Area: 726449
Amount: 81.611509
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:49:03

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

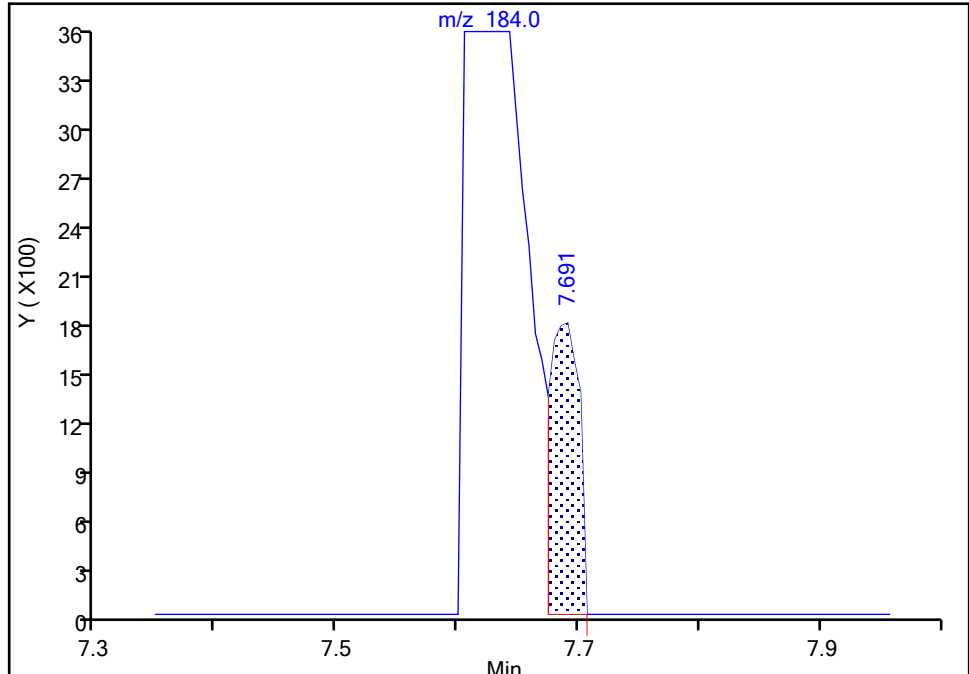
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

86 2,4-Dinitrophenol, CAS: 51-28-5

Signal: 1

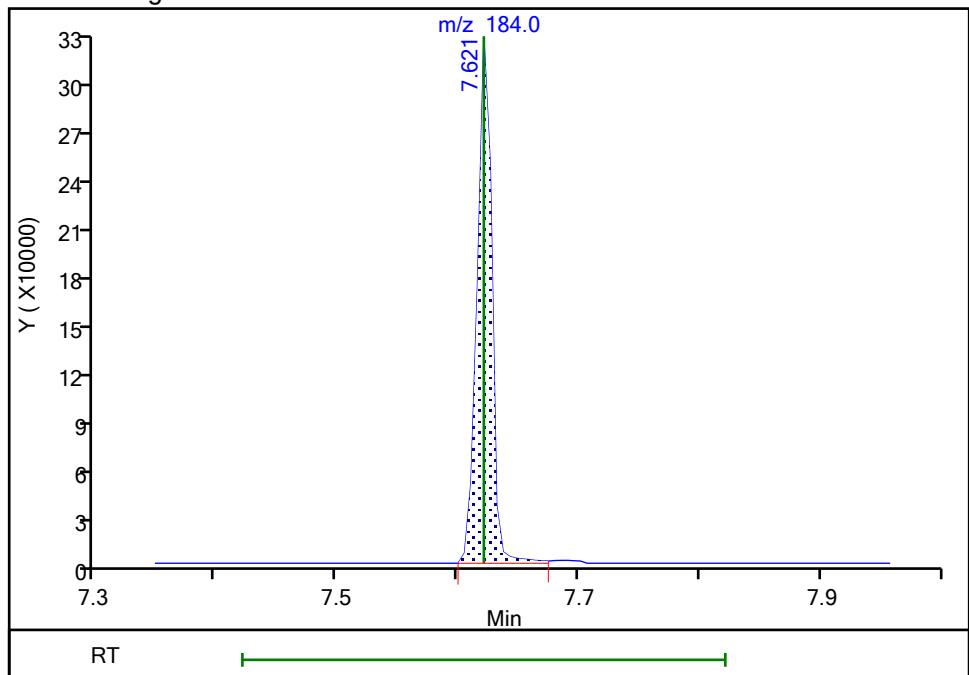
RT: 7.69
Area: 3065
Amount: 16.805586
Amount Units: ug/ml

Processing Integration Results



RT: 7.62
Area: 276839
Amount: 167.6381
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:49:21

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

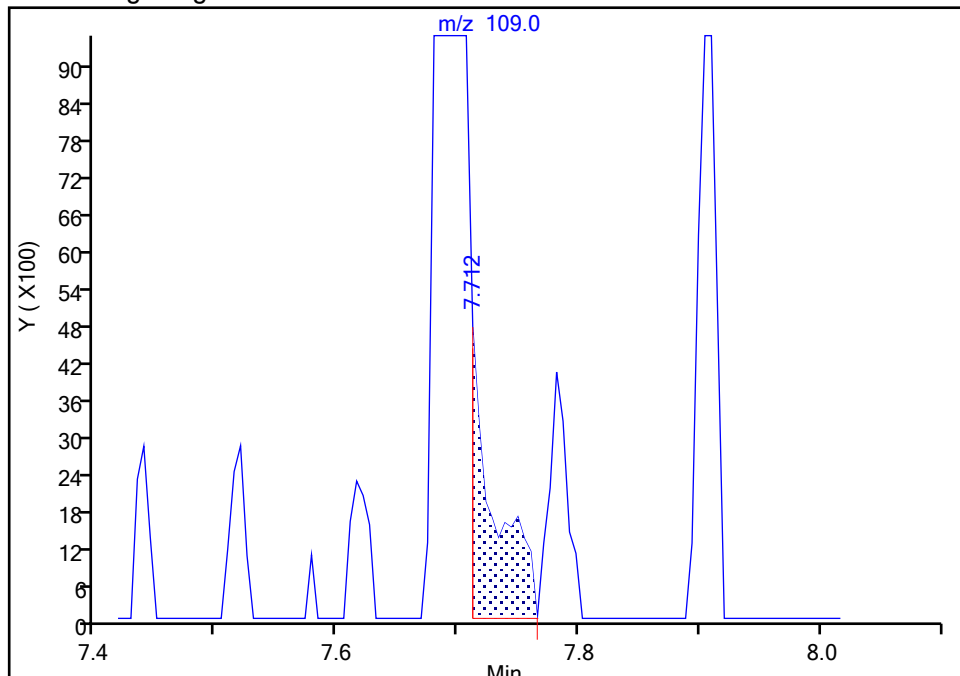
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

88 4-Nitrophenol, CAS: 100-02-7

Signal: 1

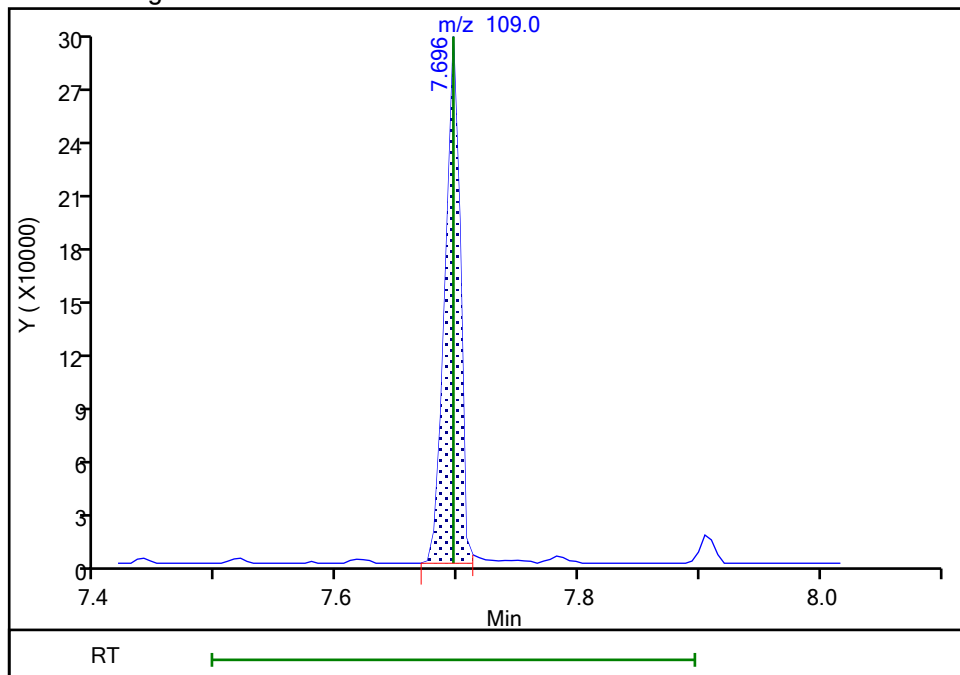
RT: 7.71
Area: 6321
Amount: 160.0000
Amount Units: ug/ml

Processing Integration Results



RT: 7.70
Area: 252882
Amount: 165.6373
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:49:25

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

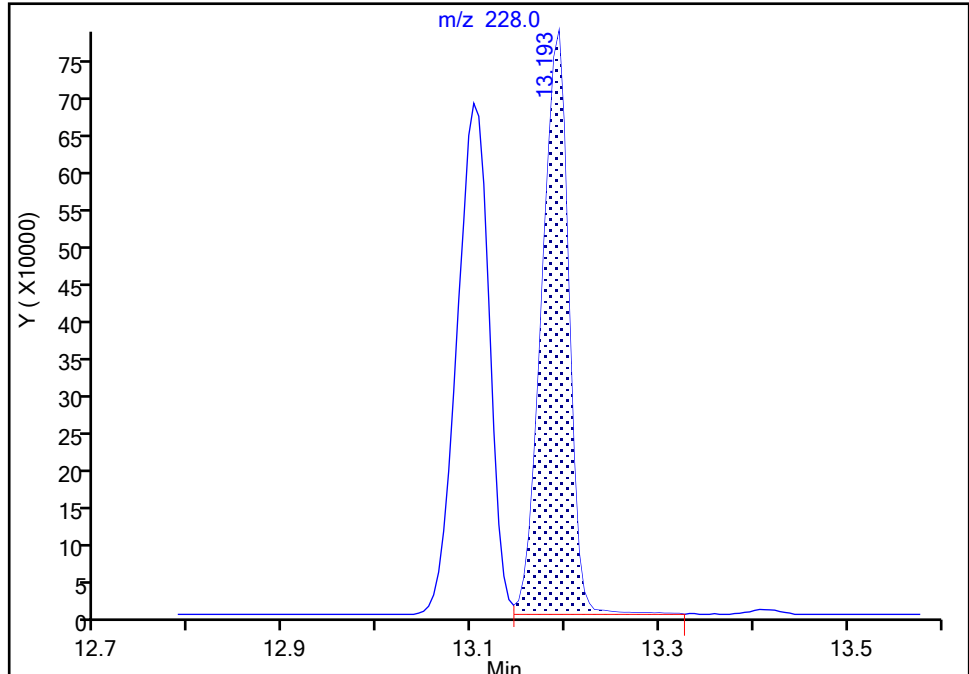
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

145 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

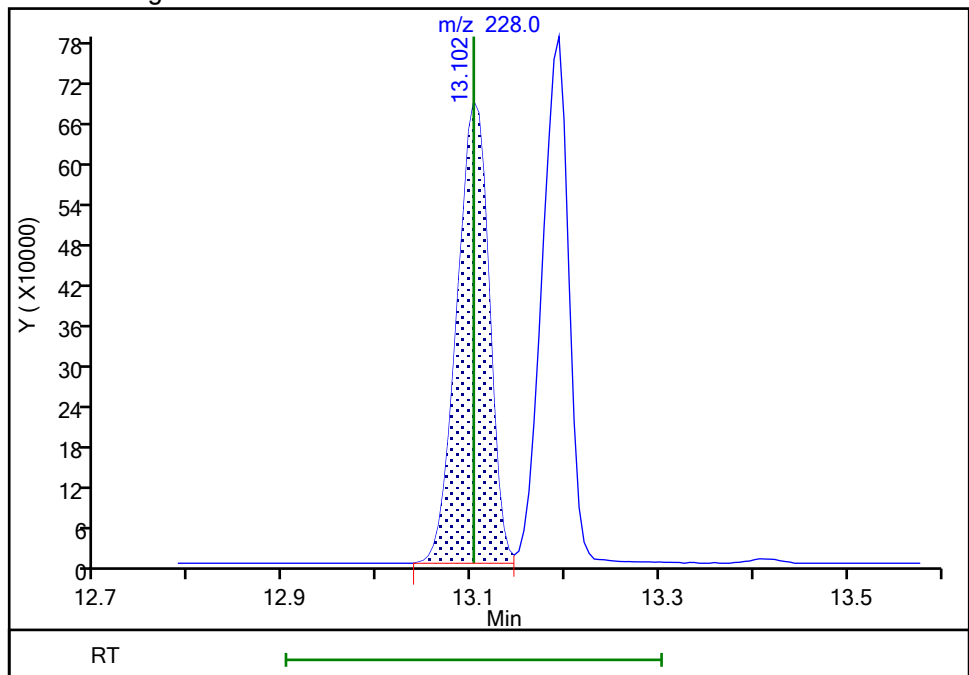
RT: 13.19
Area: 1557877
Amount: 80.000000
Amount Units: ug/ml

Processing Integration Results



RT: 13.10
Area: 1634853
Amount: 81.191696
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:49:49

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

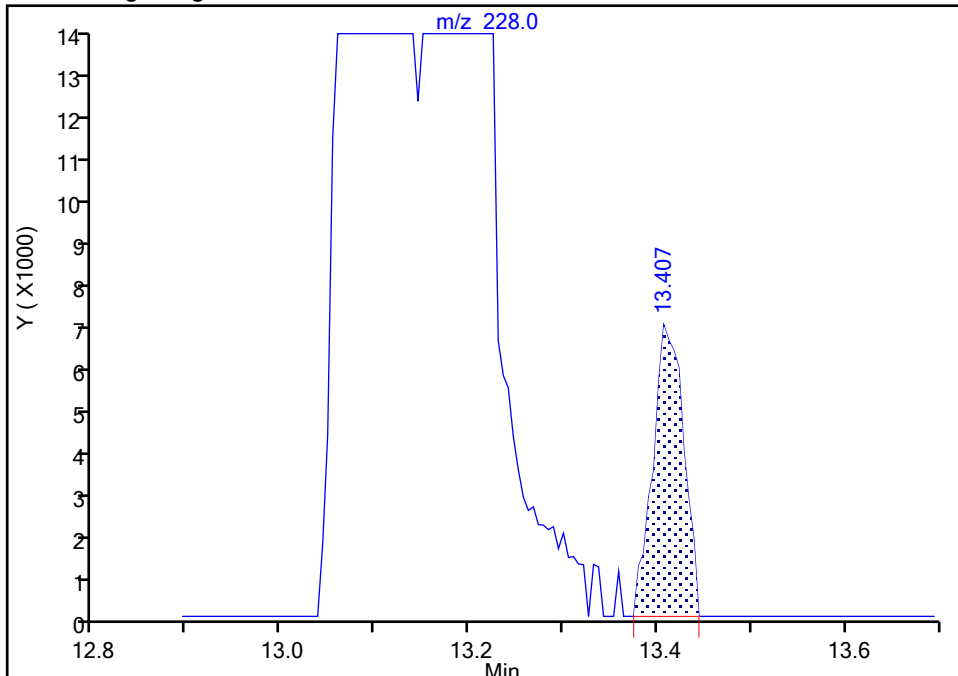
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

146 Chrysene, CAS: 218-01-9

Signal: 1

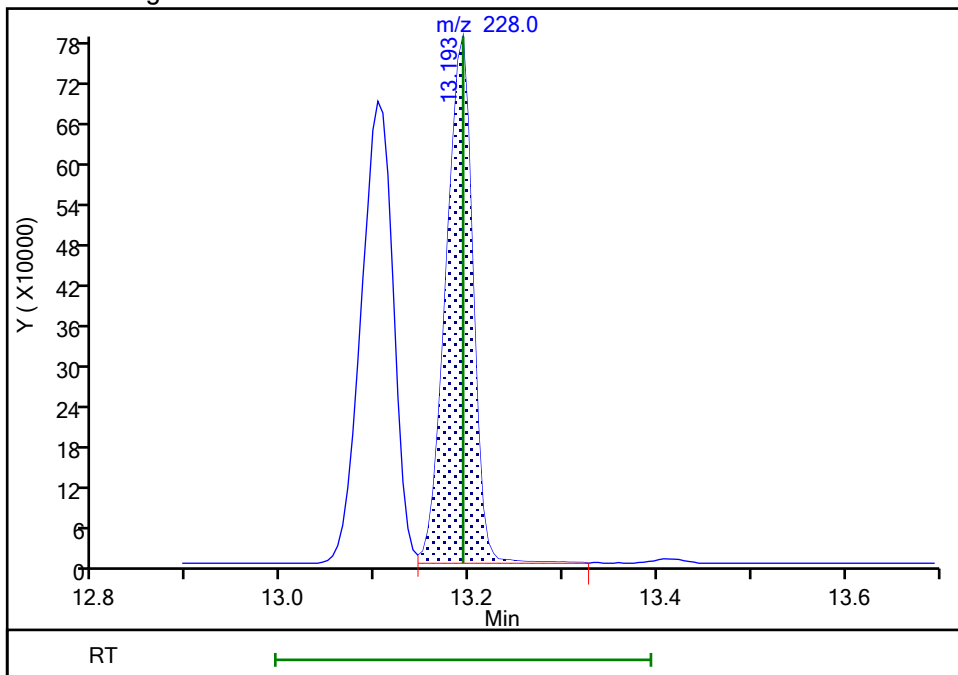
RT: 13.41
Area: 14996
Amount: 80.000000
Amount Units: ug/ml

Processing Integration Results



RT: 13.19
Area: 1557877
Amount: 81.043910
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:49:52

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver

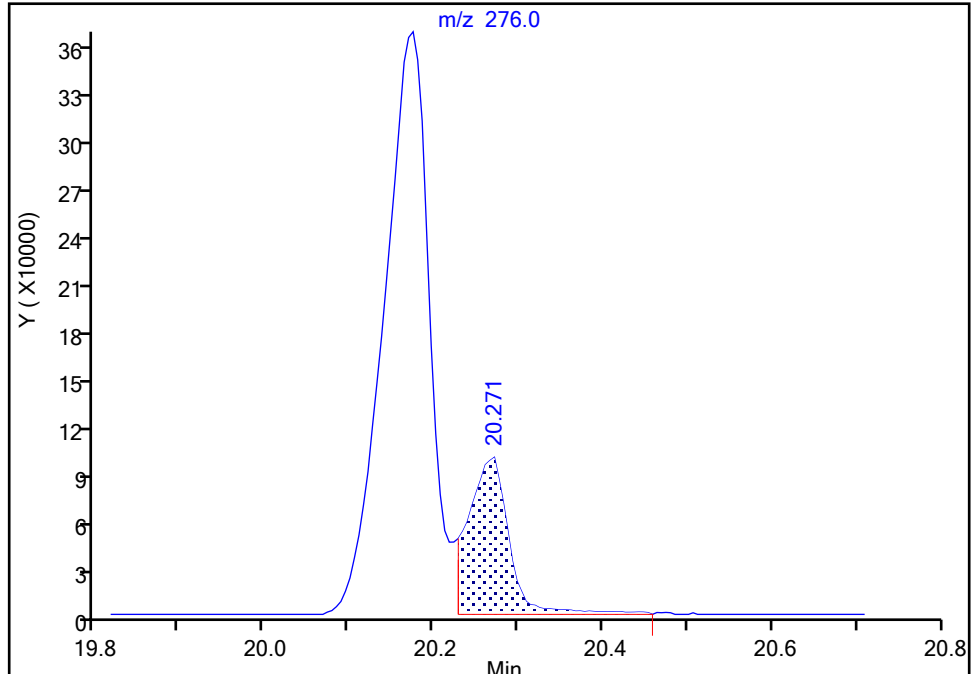
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31076.D
Injection Date: 08-Jan-2019 14:43:30 Instrument ID: SMS_D
Lims ID: ICIS HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

156 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

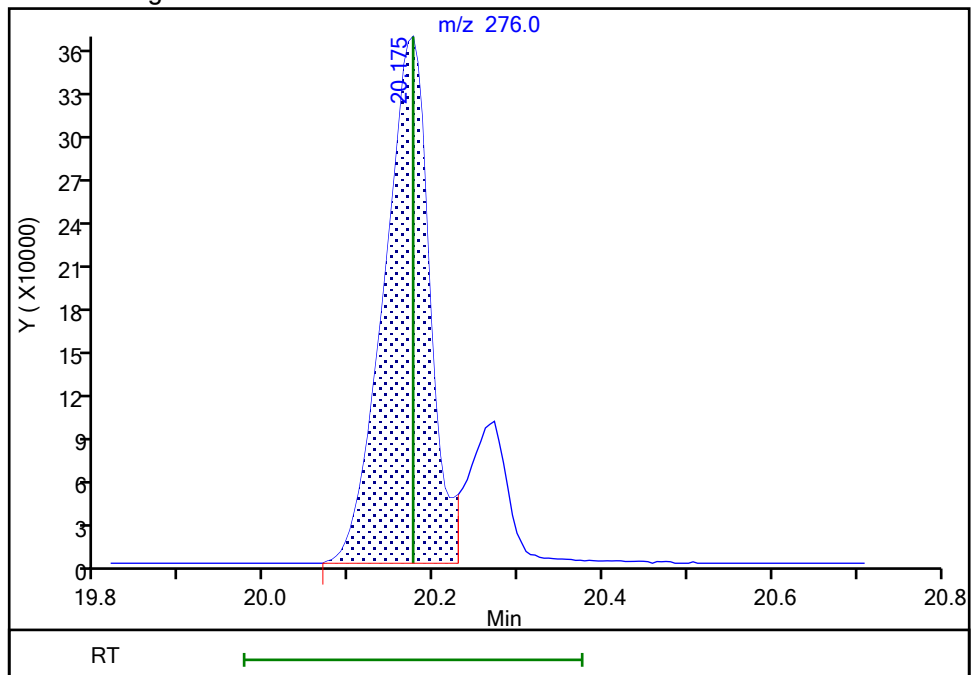
RT: 20.27
Area: 330138
Amount: 80.000000
Amount Units: ug/ml

Processing Integration Results



RT: 20.18
Area: 1380975
Amount: 81.885894
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:50:02

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31077.D
 Lims ID: STD004 HSL
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 08-Jan-2019 15:12:30 ALS Bottle#: 3 Worklist Smp#: 4
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD004 HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub14
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:20:00 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 08-Jan-2019 15:52:05

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.596	4.592	0.004	96	128836	40.0	40.0	
* 2 Naphthalene-d8	136	5.830	5.832	-0.002	99	514981	40.0	40.0	
* 3 Acenaphthene-d10	164	7.577	7.578	-0.001	95	288644	40.0	40.0	
* 4 Phenanthrene-d10	188	9.068	9.069	-0.001	98	577225	40.0	40.0	
* 5 Chrysene-d12	240	13.117	13.129	-0.012	99	596585	40.0	40.0	
* 6 Perylene-d12	264	17.043	17.050	-0.007	97	629619	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.400	3.396	0.004	90	20610	4.00	4.26	
\$ 8 Phenol-d5	99	4.228	4.234	-0.006	97	27225	4.00	4.22	
\$ 9 Nitrobenzene-d5	82	5.109	5.116	-0.007	89	22526	4.00	4.06	
\$ 10 2-Fluorobiphenyl	172	6.888	6.889	-0.001	99	44988	4.00	4.48	
\$ 11 2,4,6-Tribromophenol	330	8.368	8.369	-0.001	88	4939	4.00	3.54	
\$ 12 Terphenyl-d14	244	11.007	11.008	-0.001	97	56716	4.00	4.14	
13 1,4-Dioxane	88	1.957	1.953	0.004	91	9913	4.00	4.23	
14 N-Nitrosodimethylamine	74	2.192	2.194	-0.002	94	15509	4.00	4.17	
15 Pyridine	79	2.251	2.247	0.004	97	49857	8.00	8.37	
23 n-Decane	57	4.431	4.432	-0.001	97	21268	4.00	4.20	
24 Phenol	94	4.244	4.245	-0.001	97	28169	4.00	4.17	
25 Aniline	93	4.276	4.277	-0.001	98	33873	4.00	4.01	
27 Bis(2-chloroethyl)ether	93	4.319	4.320	-0.001	96	20571	4.00	4.28	
28 2-Chlorophenol	128	4.399	4.400	-0.001	96	19471	4.00	4.05	
29 1,3-Dichlorobenzene	146	4.543	4.544	-0.001	97	21484	4.00	4.27	
30 1,4-Dichlorobenzene	146	4.607	4.608	-0.001	91	21299	4.00	4.21	
31 Benzyl alcohol	108	4.703	4.710	-0.007	94	14238	4.00	3.98	
32 1,2-Dichlorobenzene	146	4.762	4.758	0.004	96	21008	4.00	4.31	
34 2,2'-oxybis[1-chloropropan	45	4.831	4.833	-0.002	92	27628	4.00	4.29	
35 2-Methylphenol	108	4.810	4.817	-0.007	94	20414	4.00	4.13	
38 N-Nitrosodi-n-propylamine	70	4.954	4.961	-0.007	84	15870	4.00	4.25	
39 Acetophenone	105	4.960	4.966	-0.006	88	29851	4.00	4.39	
40 4-Methylphenol	108	4.960	4.961	-0.001	92	21295	4.00	4.36	
41 3-Methylphenol	108	4.960	4.961	-0.001	87	21295	4.00	4.36	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.960	4.961	-0.001	84	21295	4.00	4.36	
44 Hexachloroethane	117	5.088	5.089	-0.001	92	7861	4.00	4.12	
45 Nitrobenzene	77	5.131	5.132	-0.001	86	23298	4.00	4.13	
47 Isophorone	82	5.355	5.361	-0.006	99	43063	4.00	4.12	
48 2-Nitrophenol	139	5.446	5.447	-0.001	92	9772	4.00	3.90	
49 2,4-Dimethylphenol	107	5.472	5.479	-0.007	96	20728	4.00	4.16	
51 Bis(2-chloroethoxy)methane	93	5.558	5.559	-0.001	99	25533	4.00	4.28	
52 Benzoic acid	105	5.526	5.607	-0.081	89	22702	8.00	10.2	
53 2,4-Dichlorophenol	162	5.686	5.687	-0.001	93	16936	4.00	4.31	
55 1,2,4-Trichlorobenzene	180	5.772	5.773	-0.001	92	18703	4.00	4.35	
56 Naphthalene	128	5.846	5.853	-0.007	96	60659	4.00	4.49	
57 4-Chloroaniline	127	5.884	5.890	-0.006	96	23855	4.00	3.93	
58 2,6-Dichlorophenol	162	5.905	5.906	-0.001	96	16661	4.00	4.28	
60 Hexachlorobutadiene	225	5.980	5.976	0.004	94	9283	4.00	4.10	
63 Caprolactam	55	6.188	6.232	-0.044	81	9595	4.00	3.97	
64 4-Chloro-3-methylphenol	107	6.365	6.371	-0.006	96	18045	4.00	4.12	
66 2-Methylnaphthalene	142	6.530	6.537	-0.007	94	41071	4.00	4.50	
67 1-Methylnaphthalene	142	6.632	6.633	-0.001	93	36726	4.00	4.31	
68 Hexachlorocyclopentadiene	237	6.701	6.702	-0.001	92	9729	4.00	3.81	
69 1,2,4,5-Tetrachlorobenzene	216	6.706	6.708	-0.002	96	18779	4.00	4.46	
71 2,4,6-Trichlorophenol	196	6.813	6.815	-0.002	90	11999	4.00	4.34	
72 2,4,5-Trichlorophenol	196	6.856	6.857	-0.001	93	12399	4.00	3.99	
74 1,1'-Biphenyl	154	6.990	6.996	-0.006	95	47930	4.00	4.58	
75 2-Chloronaphthalene	162	7.016	7.023	-0.007	96	37562	4.00	4.50	
77 2-Nitroaniline	65	7.107	7.108	-0.001	78	11373	4.00	3.78	
80 Dimethyl phthalate	163	7.278	7.285	-0.007	98	40633	4.00	4.26	
81 1,3-Dinitrobenzene	168	7.305	7.311	-0.006	85	6145	4.00	3.63	
82 2,6-Dinitrotoluene	165	7.337	7.343	-0.006	92	8964	4.00	3.79	
83 Acenaphthylene	152	7.438	7.440	-0.002	99	59485	4.00	4.37	
84 3-Nitroaniline	138	7.513	7.520	-0.007	91	10537	4.00	3.80	a
85 Acenaphthene	153	7.609	7.611	-0.002	94	37468	4.00	4.57	
86 2,4-Dinitrophenol	184	7.615	7.621	-0.006	74	6248	8.00	9.89	
88 4-Nitrophenol	109	7.684	7.696	-0.012	93	10796	8.00	7.64	
89 2,4-Dinitrotoluene	165	7.743	7.749	-0.006	91	11910	4.00	3.69	
90 Dibenzofuran	168	7.780	7.787	-0.007	98	55918	4.00	4.46	
92 Hexadecane	57	8.005	8.006	-0.001	95	24507	4.00	4.17	
93 2,3,4,6-Tetrachlorophenol	232	7.908	7.910	-0.002	67	9690	4.00	3.71	
95 Diethyl phthalate	149	7.978	7.990	-0.012	98	40289	4.00	4.28	
97 4-Chlorophenyl phenyl ethe	204	8.111	8.113	-0.002	91	20808	4.00	4.29	
99 Fluorene	166	8.122	8.129	-0.007	96	46063	4.00	4.63	
100 4-Nitroaniline	138	8.117	8.134	-0.017	84	11362	4.00	3.84	
101 4,6-Dinitro-2-methylphenol	198	8.160	8.171	-0.011	86	10455	8.00	8.83	
102 N-Nitrosodiphenylamine	169	8.224	8.230	-0.006	62	33425	4.00	4.51	
103 Diphenylamine	169	8.224	8.230	-0.006	94	33425	3.40	3.75	
105 1,2-Diphenylhydrazine	77	8.272	8.273	-0.001	97	48350	4.04	4.25	
106 Azobenzene	77	8.272	8.273	-0.001	97	48350	4.00	4.20	
112 Atrazine	200	8.742	8.754	-0.012	93	11880	4.00	4.20	
114 4-Bromophenyl phenyl ether	248	8.603	8.604	-0.001	66	12687	4.00	4.32	
116 Hexachlorobenzene	284	8.688	8.695	-0.007	93	11927	4.00	4.20	
119 Pentachlorophenol	266	8.881	8.882	-0.001	91	10824	8.00	8.01	
123 Phenanthrene	178	9.089	9.096	-0.007	97	67900	4.00	4.60	
124 Anthracene	178	9.142	9.144	-0.002	98	68893	4.00	4.51	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.292	9.293	-0.001	95	66491	4.00	4.51	
127 Di-n-butyl phthalate	149	9.629	9.630	-0.001	100	66977	4.00	4.12	
132 Fluoranthene	202	10.451	10.453	-0.002	98	75143	4.00	4.34	
134 Pyrene	202	10.783	10.789	-0.007	97	78114	4.00	4.13	
141 Butyl benzyl phthalate	149	11.888	11.900	-0.012	95	29374	4.00	3.65	
144 3,3'-Dichlorobenzidine	252	13.042	13.059	-0.017	70	23553	4.00	3.77	
145 Benzo[a]anthracene	228	13.090	13.102	-0.012	98	78873	4.00	4.17	
146 Chrysene	228	13.176	13.193	-0.017	97	78755	4.00	4.36	
147 Bis(2-ethylhexyl) phthalat	149	13.267	13.268	-0.001	96	38544	4.00	3.53	
148 Di-n-octyl phthalate	149	15.062	15.073	-0.011	98	64878	4.00	3.43	
150 Benzo[b]fluoranthene	252	15.938	15.966	-0.028	98	70562	4.00	3.78	
151 Benzo[k]fluoranthene	252	16.018	16.046	-0.028	98	78834	4.00	4.14	
153 Benzo[a]pyrene	252	16.862	16.895	-0.033	78	73104	4.00	3.94	
156 Indeno[1,2,3-cd]pyrene	276	20.137	20.175	-0.038	96	64545	4.00	4.07	
157 Dibenz(a,h)anthracene	278	20.227	20.271	-0.044	93	62461	4.00	3.81	
158 Benzo[g,h,i]perylene	276	20.868	20.918	-0.050	95	70796	4.00	4.07	
S 169 Methyl Phenols, Total	108				0			8.49	
S 170 Total Cresols	108				0			4.13	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

MS-HSLA004_00041

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31077.D

Injection Date: 08-Jan-2019 15:12:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD004 HSL

Worklist Smp#: 4

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

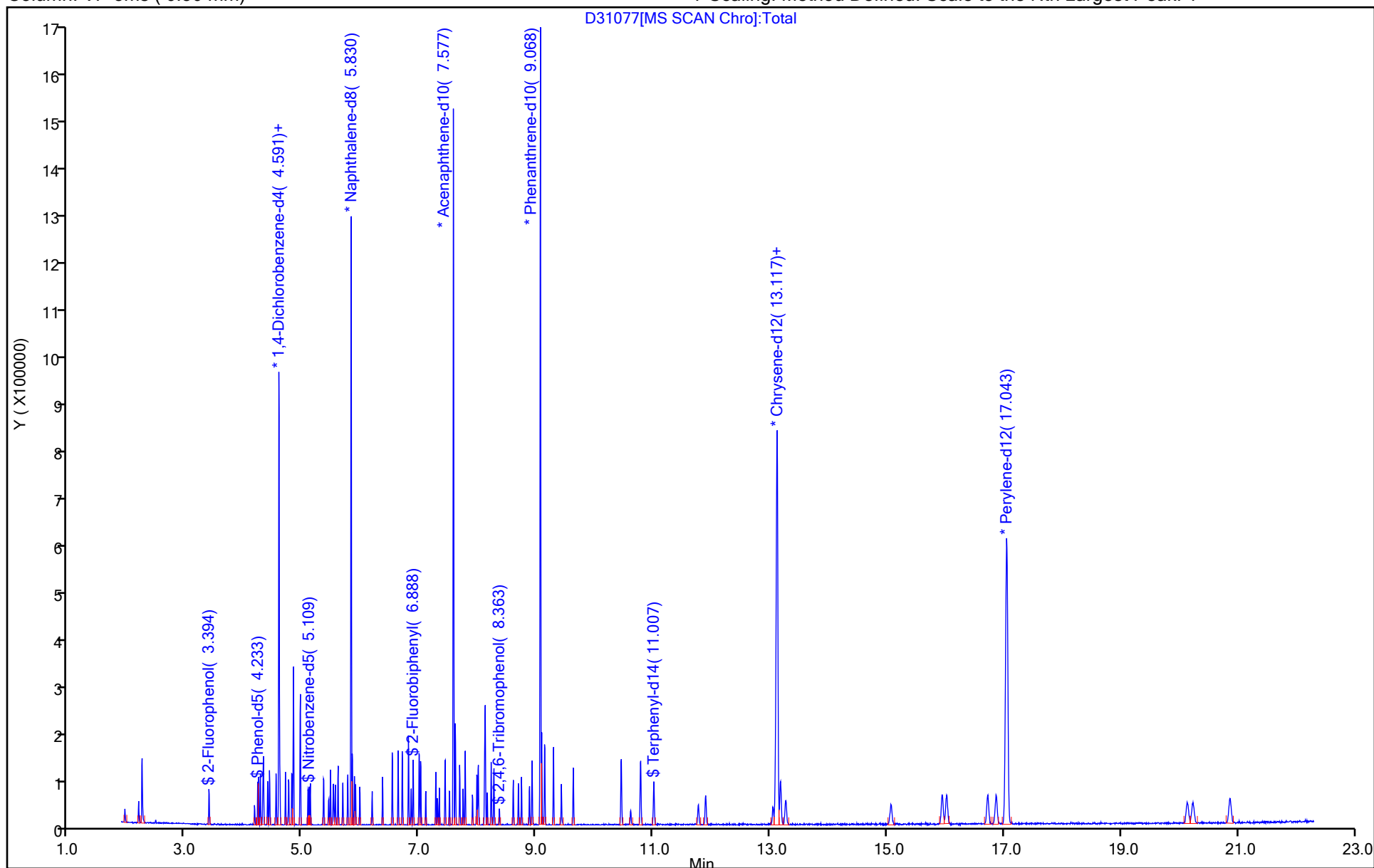
ALS Bottle#: 3

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

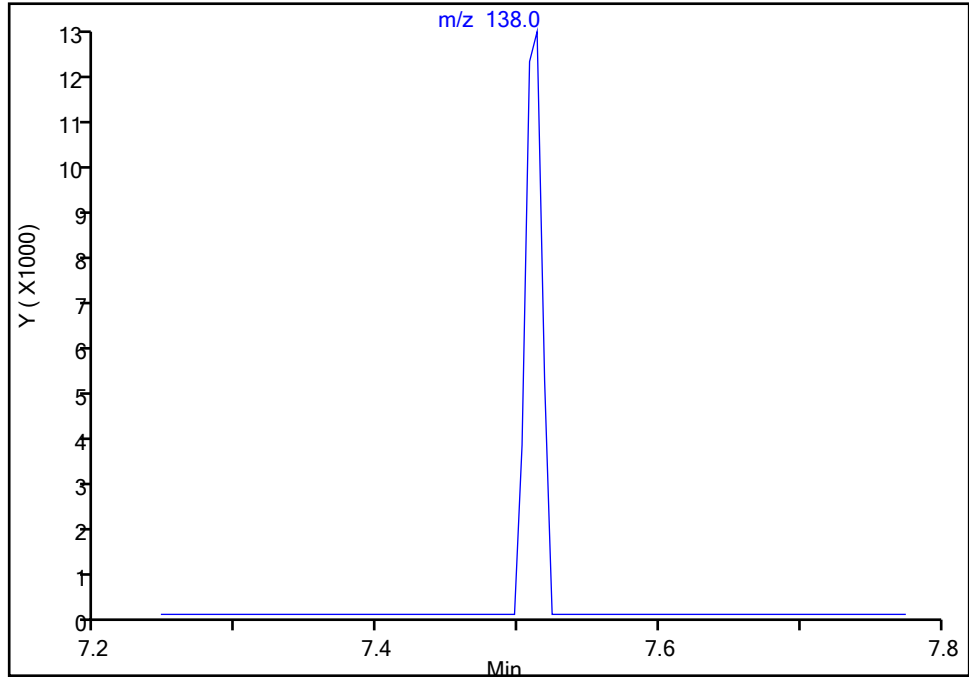
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Injection Date: 08-Jan-2019 15:12:30 Instrument ID: SMS_D
Lims ID: STD004 HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 3 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

84 3-Nitroaniline, CAS: 99-09-2

Signal: 1

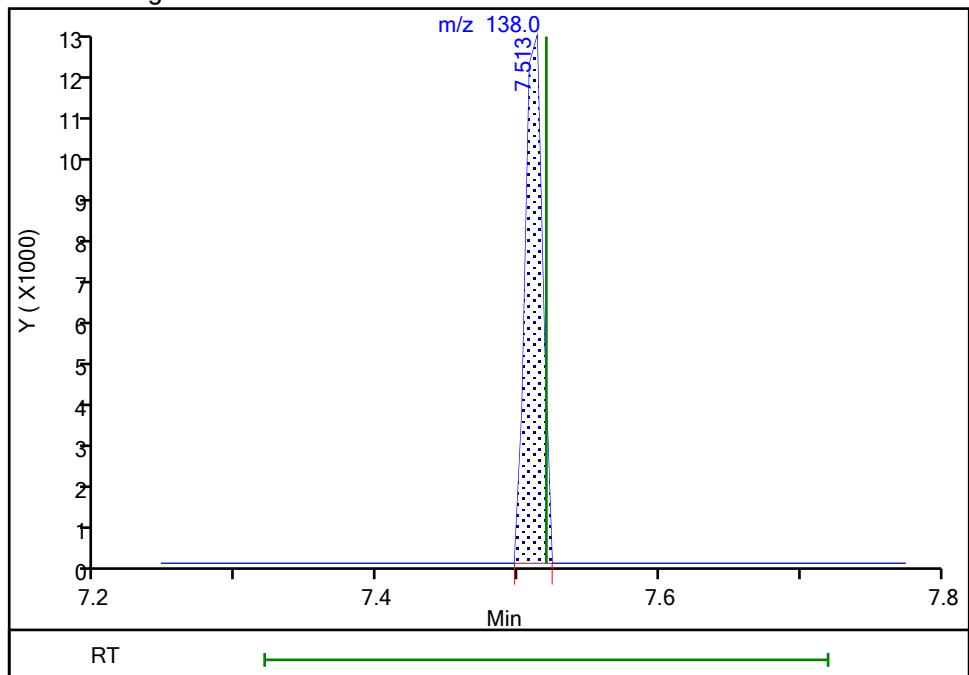
Not Detected
Expected RT: 7.52

Processing Integration Results



RT: 7.51
Area: 10537
Amount: 3.796132
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 08-Jan-2019 15:51:25

Audit Action: Assigned Compound ID

Audit Reason: Assign Peak

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31078.D
 Lims ID: STD010 HSL
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 08-Jan-2019 15:42:30 ALS Bottle#: 4 Worklist Smp#: 5
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD010 HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub14
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:20:04 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 09-Jan-2019 10:01:44

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.597	4.592	0.005	96	138476	40.0	40.0	
* 2 Naphthalene-d8	136	5.831	5.832	-0.001	99	547968	40.0	40.0	
* 3 Acenaphthene-d10	164	7.583	7.578	0.005	94	314070	40.0	40.0	
* 4 Phenanthrene-d10	188	9.068	9.069	-0.001	98	634978	40.0	40.0	
* 5 Chrysene-d12	240	13.117	13.129	-0.012	99	649159	40.0	40.0	
* 6 Perylene-d12	264	17.049	17.050	-0.001	98	668070	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.400	3.396	0.004	93	53134	10.0	10.2	
\$ 8 Phenol-d5	99	4.233	4.234	-0.001	98	71107	10.0	10.3	
\$ 9 Nitrobenzene-d5	82	5.115	5.116	-0.001	86	60983	10.0	10.3	
\$ 10 2-Fluorobiphenyl	172	6.894	6.889	0.005	99	119349	10.0	10.9	
\$ 11 2,4,6-Tribromophenol	330	8.368	8.369	-0.001	91	14527	10.0	9.57	
\$ 12 Terphenyl-d14	244	11.007	11.008	-0.001	98	151186	10.0	10.1	
13 1,4-Dioxane	88	1.963	1.953	0.010	93	25732	10.0	10.2	
14 N-Nitrosodimethylamine	74	2.198	2.194	0.004	94	39244	10.0	9.83	
15 Pyridine	79	2.257	2.247	0.010	98	131018	20.0	20.5	
23 n-Decane	57	4.436	4.432	0.004	98	56729	10.0	10.4	
24 Phenol	94	4.244	4.245	-0.001	97	73873	10.0	10.2	
25 Aniline	93	4.276	4.277	-0.001	98	93349	10.0	10.3	
27 Bis(2-chloroethyl)ether	93	4.319	4.320	-0.001	96	54832	10.0	10.6	
28 2-Chlorophenol	128	4.404	4.400	0.004	97	53385	10.0	10.3	
29 1,3-Dichlorobenzene	146	4.549	4.544	0.005	97	56943	10.0	10.5	
30 1,4-Dichlorobenzene	146	4.613	4.608	0.005	95	56791	10.0	10.5	
31 Benzyl alcohol	108	4.709	4.710	-0.001	93	37687	10.0	9.80	
32 1,2-Dichlorobenzene	146	4.762	4.758	0.004	95	53989	10.0	10.3	
34 2,2'-oxybis[1-chloropropan	45	4.837	4.833	0.004	93	70752	10.0	10.2	
35 2-Methylphenol	108	4.816	4.817	-0.001	93	53791	10.0	10.1	
38 N-Nitrosodi-n-propylamine	70	4.955	4.961	-0.006	84	42394	10.0	10.6	
39 Acetophenone	105	4.965	4.966	-0.001	93	78778	10.0	10.8	
40 4-Methylphenol	108	4.960	4.961	-0.001	96	56460	10.0	10.8	
41 3-Methylphenol	108	4.960	4.961	-0.001	89	56460	10.0	10.8	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.960	4.961	-0.001	90	56460	10.0	10.8	
44 Hexachloroethane	117	5.093	5.089	0.004	93	21247	10.0	10.4	
45 Nitrobenzene	77	5.131	5.132	-0.001	85	62301	10.0	10.4	
47 Isophorone	82	5.361	5.361	0.000	99	114150	10.0	10.3	
48 2-Nitrophenol	139	5.446	5.447	-0.001	95	26949	10.0	10.1	
49 2,4-Dimethylphenol	107	5.478	5.479	-0.001	96	56677	10.0	10.7	
51 Bis(2-chloroethoxy)methane	93	5.558	5.559	-0.001	98	66195	10.0	10.4	
52 Benzoic acid	105	5.542	5.607	-0.065	88	72139	20.0	20.5	a
53 2,4-Dichlorophenol	162	5.686	5.687	-0.001	95	42597	10.0	10.2	
55 1,2,4-Trichlorobenzene	180	5.772	5.773	-0.001	93	48896	10.0	10.7	
56 Naphthalene	128	5.852	5.853	-0.001	97	154038	10.0	10.7	
57 4-Chloroaniline	127	5.889	5.890	-0.001	97	68875	10.0	10.7	
58 2,6-Dichlorophenol	162	5.905	5.906	-0.001	97	44164	10.0	10.7	
60 Hexachlorobutadiene	225	5.980	5.976	0.004	95	25455	10.0	10.6	
63 Caprolactam	55	6.194	6.232	-0.038	82	24412	10.0	9.50	
64 4-Chloro-3-methylphenol	107	6.370	6.371	-0.001	97	47211	10.0	10.1	
66 2-Methylnaphthalene	142	6.536	6.537	-0.001	93	105716	10.0	10.9	
67 1-Methylnaphthalene	142	6.632	6.633	-0.001	94	98870	10.0	10.9	
68 Hexachlorocyclopentadiene	237	6.701	6.702	-0.001	94	27518	10.0	9.91	
69 1,2,4,5-Tetrachlorobenzene	216	6.707	6.708	-0.001	97	48622	10.0	10.9	
71 2,4,6-Trichlorophenol	196	6.814	6.815	-0.001	94	32334	10.0	10.8	
72 2,4,5-Trichlorophenol	196	6.856	6.857	-0.001	96	34596	10.0	10.2	
74 1,1'-Biphenyl	154	6.995	6.996	-0.001	95	125190	10.0	11.0	
75 2-Chloronaphthalene	162	7.022	7.023	-0.001	96	97441	10.0	10.7	
77 2-Nitroaniline	65	7.107	7.108	-0.001	83	32281	10.0	9.85	
80 Dimethyl phthalate	163	7.278	7.285	-0.007	98	108559	10.0	10.5	
81 1,3-Dinitrobenzene	168	7.310	7.311	-0.001	85	16683	10.0	9.07	
82 2,6-Dinitrotoluene	165	7.342	7.343	-0.001	95	25586	10.0	9.94	
83 Acenaphthylene	152	7.439	7.440	-0.001	99	160369	10.0	10.8	
84 3-Nitroaniline	138	7.513	7.520	-0.007	94	30013	10.0	9.94	
85 Acenaphthene	153	7.610	7.611	-0.001	94	99494	10.0	11.2	
86 2,4-Dinitrophenol	184	7.615	7.621	-0.006	83	24423	20.0	20.1	
88 4-Nitrophenol	109	7.684	7.696	-0.012	92	29874	20.0	19.4	
89 2,4-Dinitrotoluene	165	7.748	7.749	-0.001	92	35129	10.0	9.99	
90 Dibenzofuran	168	7.781	7.787	-0.006	98	148989	10.0	10.9	
92 Hexadecane	57	8.005	8.006	-0.001	97	68108	10.0	10.7	
93 2,3,4,6-Tetrachlorophenol	232	7.909	7.910	-0.001	71	28309	10.0	9.97	
95 Diethyl phthalate	149	7.984	7.990	-0.006	98	109935	10.0	10.7	
97 4-Chlorophenyl phenyl ethe	204	8.112	8.113	-0.001	91	56477	10.0	10.7	
99 Fluorene	166	8.128	8.129	-0.001	94	120198	10.0	11.1	
100 4-Nitroaniline	138	8.122	8.134	-0.012	86	32038	10.0	9.95	
101 4,6-Dinitro-2-methylphenol	198	8.160	8.171	-0.011	86	34574	20.0	19.8	
102 N-Nitrosodiphenylamine	169	8.224	8.230	-0.006	62	87454	10.0	10.7	
103 Diphenylamine	169	8.224	8.230	-0.006	95	87454	8.50	9.03	
105 1,2-Diphenylhydrazine	77	8.272	8.273	-0.001	98	129897	10.1	10.5	
106 Azobenzene	77	8.272	8.273	-0.001	98	129897	10.0	10.4	
112 Atrazine	200	8.747	8.754	-0.007	95	32333	10.0	10.4	
114 4-Bromophenyl phenyl ether	248	8.603	8.604	-0.001	65	34133	10.0	10.6	
116 Hexachlorobenzene	284	8.694	8.695	-0.001	94	33492	10.0	10.7	
119 Pentachlorophenol	266	8.881	8.882	-0.001	93	35005	20.0	19.7	
123 Phenanthrene	178	9.089	9.096	-0.007	97	176527	10.0	10.9	
124 Anthracene	178	9.143	9.144	-0.001	98	182594	10.0	10.9	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.292	9.293	-0.001	95	174644	10.0	10.8	
127 Di-n-butyl phthalate	149	9.629	9.630	-0.001	100	188100	10.0	10.5	
132 Fluoranthene	202	10.452	10.453	-0.001	98	202884	10.0	10.6	
134 Pyrene	202	10.783	10.789	-0.006	97	214875	10.0	10.4	
141 Butyl benzyl phthalate	149	11.899	11.900	-0.001	98	85437	10.0	9.76	
144 3,3'-Dichlorobenzidine	252	13.048	13.059	-0.011	74	69062	10.0	10.1	
145 Benzo[a]anthracene	228	13.096	13.102	-0.006	99	213650	10.0	10.4	
146 Chrysene	228	13.181	13.193	-0.012	97	200025	10.0	10.2	
147 Bis(2-ethylhexyl) phthalat	149	13.272	13.268	0.004	97	116885	10.0	9.82	
148 Di-n-octyl phthalate	149	15.067	15.073	-0.006	99	195842	10.0	9.53	
150 Benzo[b]fluoranthene	252	15.949	15.966	-0.017	98	194845	10.0	9.84	
151 Benzo[k]fluoranthene	252	16.023	16.046	-0.023	99	201769	10.0	9.99	
153 Benzo[a]pyrene	252	16.873	16.895	-0.022	78	196452	10.0	9.97	
156 Indeno[1,2,3-cd]pyrene	276	20.142	20.175	-0.033	98	170084	10.0	9.87	
157 Dibenz(a,h)anthracene	278	20.233	20.271	-0.038	93	170901	10.0	9.82	
158 Benzo[g,h,i]perylene	276	20.874	20.918	-0.044	98	183928	10.0	9.97	
S 169 Methyl Phenols, Total	108				0			20.9	
S 170 Total Cresols	108				0			10.1	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

MS-HSLA010_00040

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31078.D

Injection Date: 08-Jan-2019 15:42:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD010 HSL

Worklist Smp#: 5

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

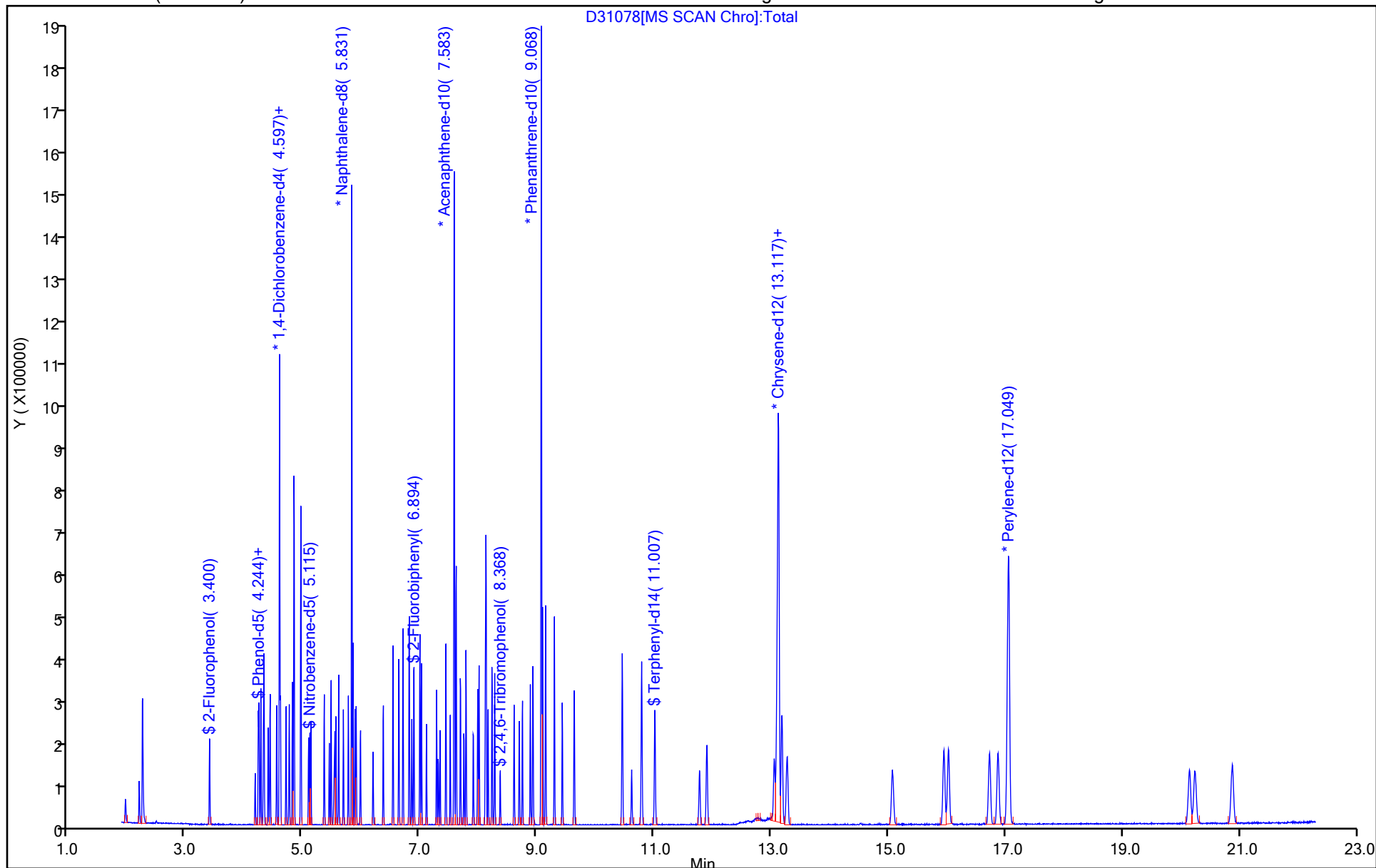
ALS Bottle#: 4

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

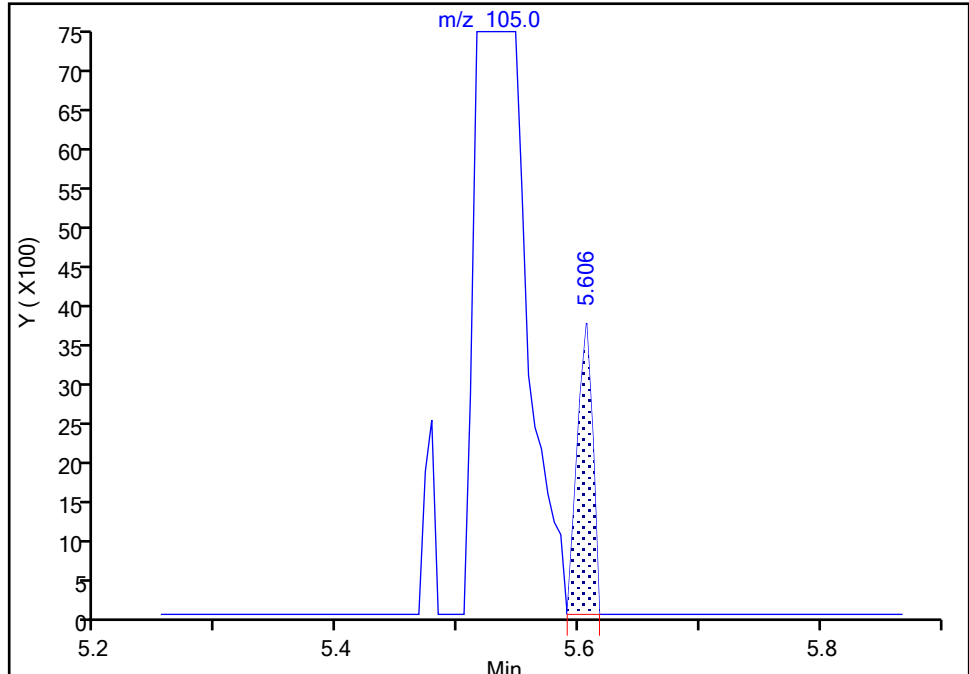
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Injection Date: 08-Jan-2019 15:42:30 Instrument ID: SMS_D
Lims ID: STD010 HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 4 Worklist Smp#: 5
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

52 Benzoic acid, CAS: 65-85-0

Signal: 1

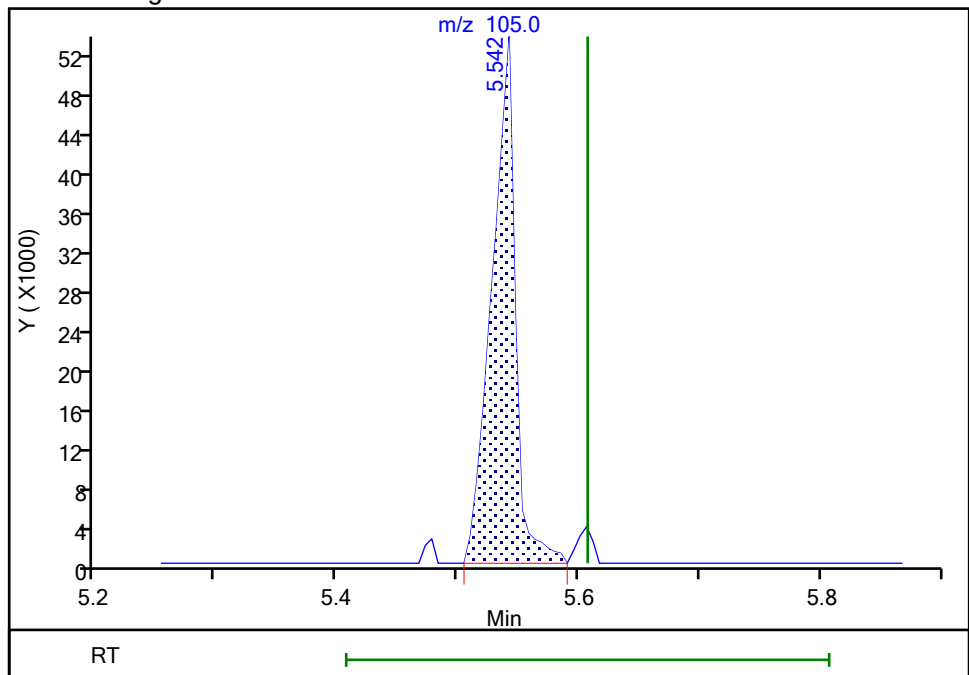
RT: 5.61
Area: 3218
Amount: 5.046366
Amount Units: ug/ml

Processing Integration Results



RT: 5.54
Area: 72139
Amount: 20.508833
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 09-Jan-2019 10:01:19

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31079.D
 Lims ID: STD020 HSL
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 08-Jan-2019 16:11:30 ALS Bottle#: 5 Worklist Smp#: 6
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD020 HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub14
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:20:08 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 09-Jan-2019 10:02:37

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.596	4.592	0.004	96	130552	40.0	40.0	
* 2 Naphthalene-d8	136	5.830	5.832	-0.002	99	537224	40.0	40.0	
* 3 Acenaphthene-d10	164	7.582	7.578	0.004	94	316643	40.0	40.0	
* 4 Phenanthrene-d10	188	9.067	9.069	-0.002	97	651451	40.0	40.0	
* 5 Chrysene-d12	240	13.122	13.129	-0.007	98	690145	40.0	40.0	
* 6 Perylene-d12	264	17.054	17.050	0.004	97	693306	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.399	3.396	0.003	93	97986	20.0	20.0	
\$ 8 Phenol-d5	99	4.232	4.234	-0.002	98	133764	20.0	20.5	
\$ 9 Nitrobenzene-d5	82	5.114	5.116	-0.002	87	117579	20.0	20.3	
\$ 10 2-Fluorobiphenyl	172	6.893	6.889	0.004	99	228257	20.0	20.7	
\$ 11 2,4,6-Tribromophenol	330	8.367	8.369	-0.002	92	30193	20.0	19.7	
\$ 12 Terphenyl-d14	244	11.012	11.008	0.004	98	321347	20.0	20.3	
13 1,4-Dioxane	88	1.957	1.953	0.004	93	47765	20.0	20.1	
14 N-Nitrosodimethylamine	74	2.192	2.194	-0.002	93	76181	20.0	20.2	
15 Pyridine	79	2.245	2.247	-0.002	98	243905	40.0	40.4	
23 n-Decane	57	4.435	4.432	0.003	98	104301	20.0	20.3	
24 Phenol	94	4.243	4.245	-0.002	97	140519	20.0	20.5	
25 Aniline	93	4.275	4.277	-0.002	99	176106	20.0	20.6	
27 Bis(2-chloroethyl)ether	93	4.318	4.320	-0.002	97	103116	20.0	21.2	
28 2-Chlorophenol	128	4.403	4.400	0.003	97	101568	20.0	20.8	
29 1,3-Dichlorobenzene	146	4.548	4.544	0.004	98	107968	20.0	21.2	
30 1,4-Dichlorobenzene	146	4.612	4.608	0.004	93	107619	20.0	21.0	
31 Benzyl alcohol	108	4.708	4.710	-0.002	94	74713	20.0	20.6	
32 1,2-Dichlorobenzene	146	4.761	4.758	0.003	96	103159	20.0	20.9	
34 2,2'-oxybis[1-chloropropan	45	4.836	4.833	0.003	93	138014	20.0	21.2	
35 2-Methylphenol	108	4.815	4.817	-0.002	93	103193	20.0	20.6	
38 N-Nitrosodi-n-propylamine	70	4.959	4.961	-0.002	85	80260	20.0	21.2	
39 Acetophenone	105	4.964	4.966	-0.002	91	149547	20.0	21.7	
40 4-Methylphenol	108	4.959	4.961	-0.002	96	107378	20.0	21.7	
41 3-Methylphenol	108	4.959	4.961	-0.002	87	107378	20.0	21.7	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.959	4.961	-0.002	85	107378	20.0	21.7	
44 Hexachloroethane	117	5.093	5.089	0.004	94	39487	20.0	20.4	
45 Nitrobenzene	77	5.130	5.132	-0.002	86	118803	20.0	20.2	
47 Isophorone	82	5.360	5.361	-0.001	99	223051	20.0	20.5	
48 2-Nitrophenol	139	5.445	5.447	-0.002	96	52612	20.0	20.1	
49 2,4-Dimethylphenol	107	5.477	5.479	-0.002	96	105883	20.0	20.4	
51 Bis(2-chloroethoxy)methane	93	5.557	5.559	-0.002	98	125080	20.0	20.1	
52 Benzoic acid	105	5.557	5.607	-0.050	88	150617	40.0	38.0	a
53 2,4-Dichlorophenol	162	5.686	5.687	-0.001	93	84548	20.0	20.6	
55 1,2,4-Trichlorobenzene	180	5.771	5.773	-0.002	94	92112	20.0	20.5	
56 Naphthalene	128	5.851	5.853	-0.002	97	298523	20.0	21.2	
57 4-Chloroaniline	127	5.889	5.890	-0.001	96	133302	20.0	21.1	
58 2,6-Dichlorophenol	162	5.905	5.906	-0.001	97	84253	20.0	20.7	
60 Hexachlorobutadiene	225	5.979	5.976	0.003	95	49060	20.0	20.8	
63 Caprolactam	55	6.204	6.232	-0.028	82	50417	20.0	20.0	
64 4-Chloro-3-methylphenol	107	6.369	6.371	-0.002	96	93587	20.0	20.5	
66 2-Methylnaphthalene	142	6.535	6.537	-0.002	93	199129	20.0	20.9	
67 1-Methylnaphthalene	142	6.636	6.633	0.003	94	188521	20.0	21.2	
68 Hexachlorocyclopentadiene	237	6.706	6.702	0.004	96	56652	20.0	20.2	
69 1,2,4,5-Tetrachlorobenzene	216	6.706	6.708	-0.002	97	95949	20.0	21.8	
71 2,4,6-Trichlorophenol	196	6.813	6.815	-0.002	92	63046	20.0	20.8	
72 2,4,5-Trichlorophenol	196	6.855	6.857	-0.002	95	68602	20.0	20.1	
74 1,1'-Biphenyl	154	6.994	6.996	-0.002	95	237170	20.0	20.7	
75 2-Chloronaphthalene	162	7.021	7.023	-0.002	96	185382	20.0	20.3	
77 2-Nitroaniline	65	7.107	7.108	-0.001	83	65961	20.0	20.0	
80 Dimethyl phthalate	163	7.283	7.285	-0.002	98	217533	20.0	20.8	
81 1,3-Dinitrobenzene	168	7.310	7.311	-0.001	87	36720	20.0	19.8	
82 2,6-Dinitrotoluene	165	7.342	7.343	-0.001	95	52194	20.0	20.1	
83 Acenaphthylene	152	7.438	7.440	-0.002	99	314177	20.0	21.0	
84 3-Nitroaniline	138	7.513	7.520	-0.007	95	63526	20.0	20.9	
85 Acenaphthene	153	7.614	7.611	0.003	95	191660	20.0	21.3	
86 2,4-Dinitrophenol	184	7.619	7.621	-0.002	83	57850	40.0	39.2	
88 4-Nitrophenol	109	7.689	7.696	-0.007	93	65307	40.0	42.1	
89 2,4-Dinitrotoluene	165	7.748	7.749	-0.001	93	71435	20.0	20.1	
90 Dibenzofuran	168	7.785	7.787	-0.002	98	285162	20.0	20.7	
92 Hexadecane	57	8.004	8.006	-0.002	98	133171	20.0	20.7	
93 2,3,4,6-Tetrachlorophenol	232	7.908	7.910	-0.002	71	57836	20.0	20.2	
95 Diethyl phthalate	149	7.983	7.990	-0.007	98	215915	20.0	20.9	
97 4-Chlorophenyl phenyl ethe	204	8.116	8.113	0.003	88	110775	20.0	20.8	
99 Fluorene	166	8.127	8.129	-0.002	94	234082	20.0	21.4	
100 4-Nitroaniline	138	8.127	8.134	-0.007	86	68008	20.0	21.0	
101 4,6-Dinitro-2-methylphenol	198	8.164	8.171	-0.007	88	79305	40.0	40.2	
102 N-Nitrosodiphenylamine	169	8.228	8.230	-0.002	61	173256	20.0	20.7	
103 Diphenylamine	169	8.228	8.230	-0.002	96	173256	17.0	17.7	
105 1,2-Diphenylhydrazine	77	8.271	8.273	-0.002	98	257374	20.2	20.6	
106 Azobenzene	77	8.271	8.273	-0.002	98	257374	20.0	20.4	
112 Atrazine	200	8.747	8.754	-0.007	95	68922	20.0	21.6	
114 4-Bromophenyl phenyl ether	248	8.608	8.604	0.004	65	68109	20.0	20.5	
116 Hexachlorobenzene	284	8.693	8.695	-0.002	95	65840	20.0	20.6	
119 Pentachlorophenol	266	8.880	8.882	-0.002	93	78241	40.0	40.6	
123 Phenanthrene	178	9.094	9.096	-0.002	97	358582	20.0	21.5	
124 Anthracene	178	9.142	9.144	-0.002	98	370647	20.0	21.5	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.291	9.293	-0.002	95	358158	20.0	21.5	
127 Di-n-butyl phthalate	149	9.633	9.630	0.003	100	388821	20.0	21.2	
132 Fluoranthene	202	10.456	10.453	0.003	98	421659	20.0	21.6	
134 Pyrene	202	10.787	10.789	-0.002	97	446655	20.0	20.4	
141 Butyl benzyl phthalate	149	11.898	11.900	-0.002	97	184563	20.0	19.8	
144 3,3'-Dichlorobenzidine	252	13.052	13.059	-0.007	74	148285	20.0	20.5	
145 Benzo[a]anthracene	228	13.095	13.102	-0.007	98	443781	20.0	20.3	
146 Chrysene	228	13.186	13.193	-0.007	98	425783	20.0	20.4	
147 Bis(2-ethylhexyl) phthalat	149	13.271	13.268	0.003	97	250170	20.0	19.8	
148 Di-n-octyl phthalate	149	15.066	15.073	-0.007	99	432437	20.0	19.8	
150 Benzo[b]fluoranthene	252	15.953	15.966	-0.013	98	409054	20.0	19.9	
151 Benzo[k]fluoranthene	252	16.028	16.046	-0.018	99	429051	20.0	20.5	
153 Benzo[a]pyrene	252	16.872	16.895	-0.023	78	410594	20.0	20.1	
156 Indeno[1,2,3-cd]pyrene	276	20.152	20.175	-0.023	98	345952	20.0	18.9	
157 Dibenz(a,h)anthracene	278	20.243	20.271	-0.028	94	352280	20.0	19.5	
158 Benzo[g,h,i]perylene	276	20.879	20.918	-0.039	97	373458	20.0	19.5	
S 169 Methyl Phenols, Total	108				0			42.3	
S 170 Total Cresols	108				0			20.6	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

MS-HSLA020_00040

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31079.D

Injection Date: 08-Jan-2019 16:11:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD020 HSL

Worklist Smp#: 6

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

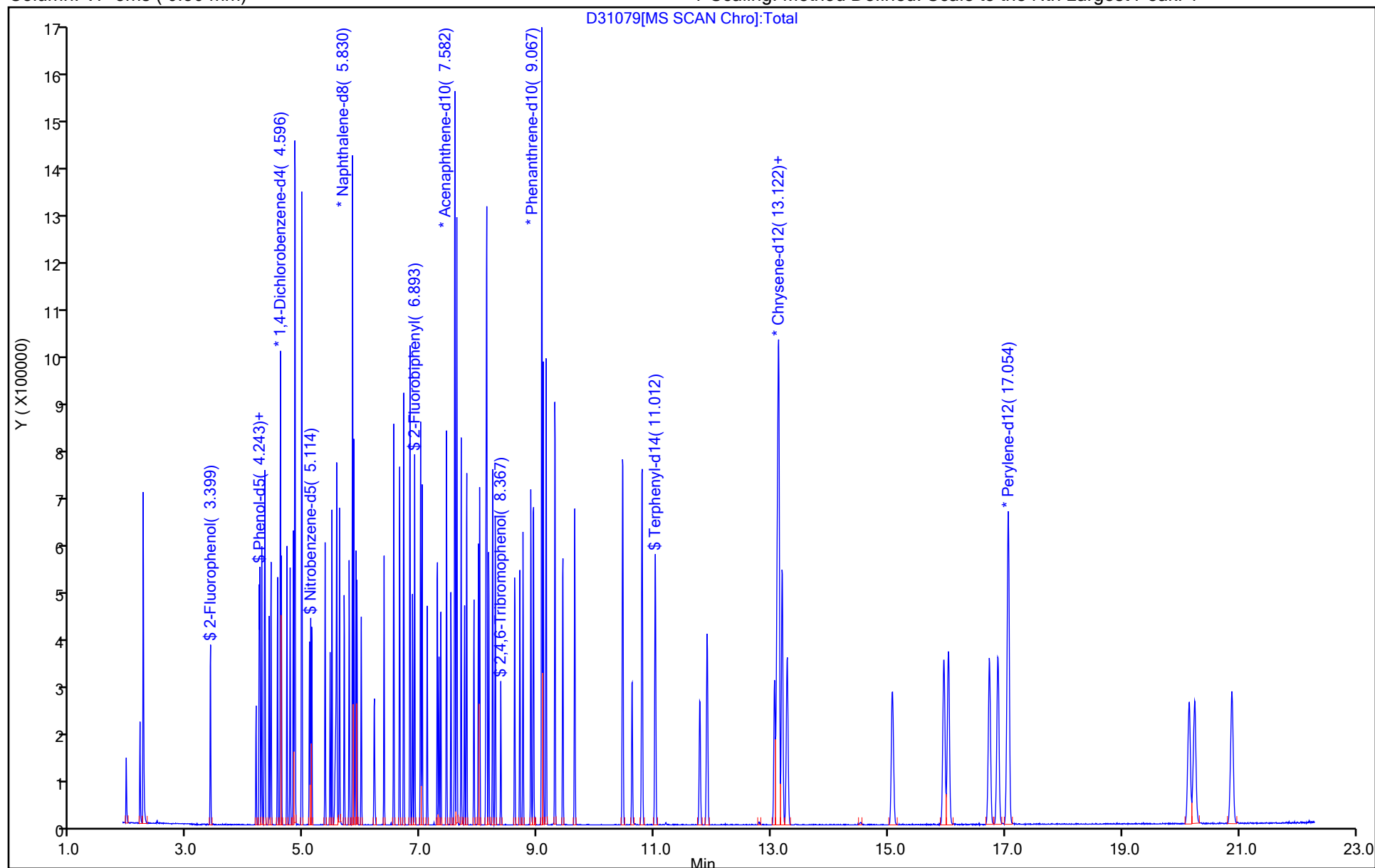
ALS Bottle#: 5

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

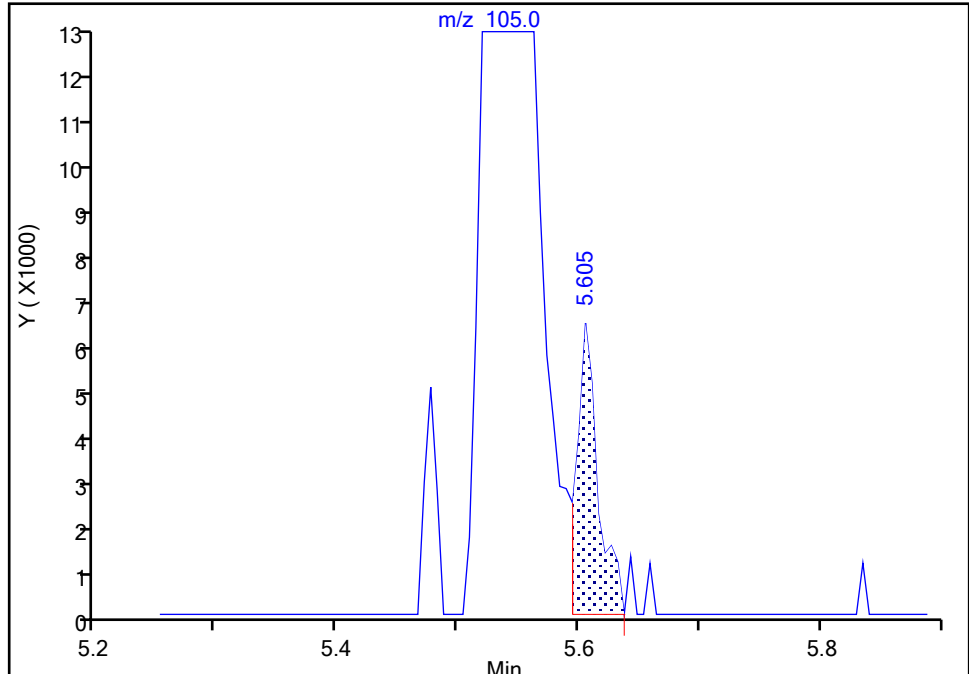
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31079.D
Injection Date: 08-Jan-2019 16:11:30 Instrument ID: SMS_D
Lims ID: STD020 HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 5 Worklist Smp#: 6
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

52 Benzoic acid, CAS: 65-85-0

Signal: 1

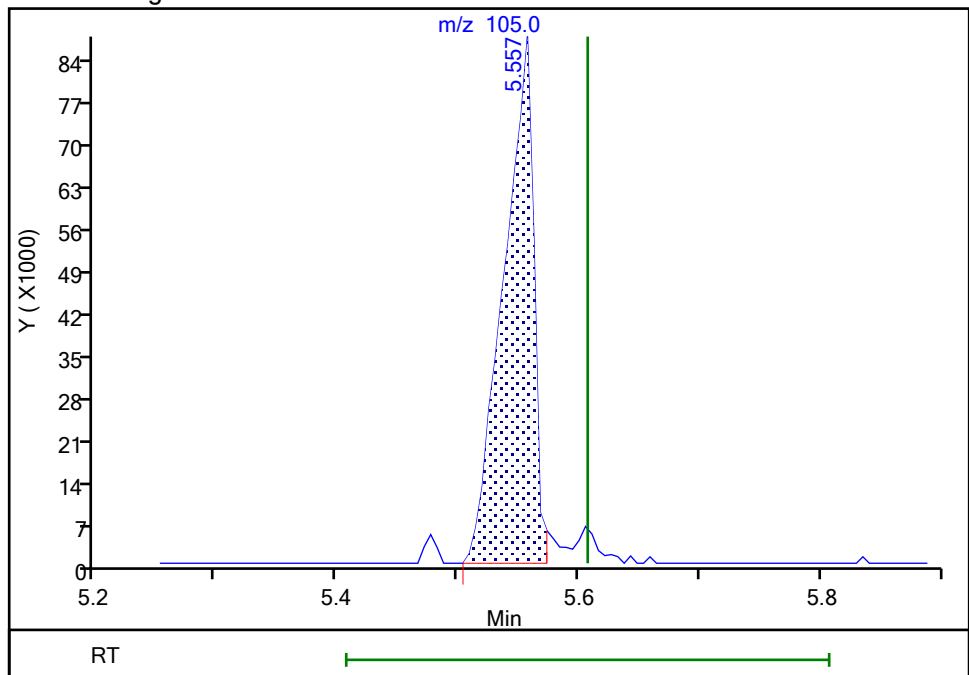
RT: 5.61
Area: 7337
Amount: 4.144826
Amount Units: ug/ml

Processing Integration Results



RT: 5.56
Area: 150617
Amount: 38.043781
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 09-Jan-2019 10:02:15

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31080.D
 Lims ID: STD050 HSL
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 08-Jan-2019 16:40:30 ALS Bottle#: 6 Worklist Smp#: 7
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD050 HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub14
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:20:12 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 09-Jan-2019 10:03:31

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.597	4.592	0.005	96	139536	40.0	40.0	
* 2 Naphthalene-d8	136	5.831	5.832	-0.001	99	577100	40.0	40.0	
* 3 Acenaphthene-d10	164	7.583	7.578	0.005	94	336666	40.0	40.0	
* 4 Phenanthrene-d10	188	9.069	9.069	0.000	98	676652	40.0	40.0	
* 5 Chrysene-d12	240	13.129	13.129	0.000	99	682695	40.0	40.0	
* 6 Perylene-d12	264	17.060	17.050	0.010	97	682678	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.395	3.396	-0.001	93	266536	50.0	50.8	
\$ 8 Phenol-d5	99	4.234	4.234	0.000	98	350818	50.0	50.2	
\$ 9 Nitrobenzene-d5	82	5.115	5.116	-0.001	87	318001	50.0	51.1	
\$ 10 2-Fluorobiphenyl	172	6.894	6.889	0.005	99	595059	50.0	50.8	
\$ 11 2,4,6-Tribromophenol	330	8.369	8.369	0.000	94	83751	50.0	51.5	
\$ 12 Terphenyl-d14	244	11.013	11.008	0.005	98	795196	50.0	50.7	
13 1,4-Dioxane	88	1.958	1.953	0.005	91	129073	50.0	50.9	
14 N-Nitrosodimethylamine	74	2.193	2.194	-0.001	93	204140	50.0	50.7	
15 Pyridine	79	2.247	2.247	0.000	98	653155	100.0	101.3	
23 n-Decane	57	4.437	4.432	0.005	97	280752	50.0	51.2	
24 Phenol	94	4.245	4.245	0.000	99	374311	50.0	51.1	
25 Aniline	93	4.277	4.277	0.000	98	468907	50.0	51.2	
27 Bis(2-chloroethyl)ether	93	4.319	4.320	-0.001	96	270922	50.0	52.0	
28 2-Chlorophenol	128	4.405	4.400	0.005	97	262909	50.0	50.5	
29 1,3-Dichlorobenzene	146	4.549	4.544	0.005	97	281103	50.0	51.6	
30 1,4-Dichlorobenzene	146	4.613	4.608	0.005	93	282534	50.0	51.6	
31 Benzyl alcohol	108	4.709	4.710	-0.001	93	198218	50.0	51.2	
32 1,2-Dichlorobenzene	146	4.763	4.758	0.005	96	271479	50.0	51.5	
34 2,2'-oxybis[1-chloropropan	45	4.838	4.833	0.005	94	358264	50.0	51.4	
35 2-Methylphenol	108	4.816	4.817	-0.001	95	270929	50.0	50.6	
38 N-Nitrosodi-n-propylamine	70	4.960	4.961	-0.001	85	213856	50.0	52.8	
39 Acetophenone	105	4.966	4.966	0.000	90	387677	50.0	52.6	
40 4-Methylphenol	108	4.960	4.961	-0.001	92	278158	50.0	52.6	
41 3-Methylphenol	108	4.960	4.961	-0.001	94	278158	50.0	52.6	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.960	4.961	-0.001	85	278158	50.0	52.6	
44 Hexachloroethane	117	5.094	5.089	0.005	95	105311	50.0	51.0	
45 Nitrobenzene	77	5.137	5.132	0.005	85	318957	50.0	50.5	
47 Isophorone	82	5.366	5.361	0.005	99	592446	50.0	50.6	
48 2-Nitrophenol	139	5.447	5.447	0.000	96	141945	50.0	50.5	
49 2,4-Dimethylphenol	107	5.479	5.479	0.000	96	280702	50.0	50.3	
51 Bis(2-chloroethoxy)methane	93	5.564	5.559	0.005	99	338951	50.0	50.7	
52 Benzoic acid	105	5.591	5.607	-0.016	78	457487	100.0	98.5	a
53 2,4-Dichlorophenol	162	5.692	5.687	0.005	94	223022	50.0	50.7	
55 1,2,4-Trichlorobenzene	180	5.772	5.773	-0.001	94	244722	50.0	50.8	
56 Naphthalene	128	5.853	5.853	0.000	98	770453	50.0	50.9	
57 4-Chloroaniline	127	5.890	5.890	0.000	96	348487	50.0	51.2	
58 2,6-Dichlorophenol	162	5.906	5.906	0.000	96	222681	50.0	51.0	
60 Hexachlorobutadiene	225	5.981	5.976	0.005	95	130741	50.0	51.6	
63 Caprolactam	55	6.221	6.232	-0.011	82	135910	50.0	50.2	
64 4-Chloro-3-methylphenol	107	6.371	6.371	0.000	97	250093	50.0	50.9	
66 2-Methylnaphthalene	142	6.536	6.537	-0.001	93	522992	50.0	51.1	
67 1-Methylnaphthalene	142	6.638	6.633	0.005	94	492503	50.0	51.5	
68 Hexachlorocyclopentadiene	237	6.707	6.702	0.005	94	156135	50.0	52.5	
69 1,2,4,5-Tetrachlorobenzene	216	6.707	6.708	-0.001	97	240223	50.0	50.9	
71 2,4,6-Trichlorophenol	196	6.814	6.815	-0.001	93	165935	50.0	51.5	
72 2,4,5-Trichlorophenol	196	6.857	6.857	0.000	95	185648	50.0	51.2	
74 1,1'-Biphenyl	154	6.996	6.996	0.000	96	619252	50.0	50.7	
75 2-Chloronaphthalene	162	7.023	7.023	0.000	96	488099	50.0	50.2	
77 2-Nitroaniline	65	7.108	7.108	0.000	83	178212	50.0	50.7	
80 Dimethyl phthalate	163	7.284	7.285	-0.001	98	560364	50.0	50.4	
81 1,3-Dinitrobenzene	168	7.311	7.311	0.000	88	99719	50.0	50.6	
82 2,6-Dinitrotoluene	165	7.343	7.343	0.000	96	141761	50.0	51.4	
83 Acenaphthylene	152	7.439	7.440	-0.001	99	809651	50.0	50.9	
84 3-Nitroaniline	138	7.519	7.520	-0.001	94	164285	50.0	50.7	
85 Acenaphthene	153	7.616	7.611	0.005	93	483257	50.0	50.6	
86 2,4-Dinitrophenol	184	7.621	7.621	0.000	82	174556	100.0	100.3	
88 4-Nitrophenol	109	7.696	7.696	0.000	93	166566	100.0	101.0	
89 2,4-Dinitrotoluene	165	7.749	7.749	0.000	93	192684	50.0	51.1	
90 Dibenzofuran	168	7.786	7.787	-0.001	98	739019	50.0	50.6	
92 Hexadecane	57	8.005	8.006	-0.001	97	356700	50.0	52.0	
93 2,3,4,6-Tetrachlorophenol	232	7.909	7.910	-0.001	72	157807	50.0	51.8	
95 Diethyl phthalate	149	7.989	7.990	-0.001	98	563588	50.0	51.3	
97 4-Chlorophenyl phenyl ethe	204	8.118	8.113	0.005	89	289327	50.0	51.1	
99 Fluorene	166	8.128	8.129	-0.001	94	582856	50.0	50.2	
100 4-Nitroaniline	138	8.134	8.134	0.000	85	170293	50.0	49.3	
101 4,6-Dinitro-2-methylphenol	198	8.166	8.171	-0.005	88	223780	100.0	103.4	
102 N-Nitrosodiphenylamine	169	8.230	8.230	0.000	62	445731	50.0	51.3	
103 Diphenylamine	169	8.230	8.230	0.000	95	445731	42.5	42.9	
105 1,2-Diphenylhydrazine	77	8.278	8.273	0.005	98	683303	50.5	51.5	
106 Azobenzene	77	8.278	8.273	0.005	98	683303	50.0	50.9	
112 Atrazine	200	8.753	8.754	-0.001	95	173466	50.0	52.3	
114 4-Bromophenyl phenyl ether	248	8.604	8.604	0.000	66	175399	50.0	50.9	
116 Hexachlorobenzene	284	8.695	8.695	0.000	94	168529	50.0	50.7	
119 Pentachlorophenol	266	8.887	8.882	0.005	93	214569	100.0	104.0	
123 Phenanthrene	178	9.095	9.096	-0.001	98	889037	50.0	51.4	
124 Anthracene	178	9.143	9.144	-0.001	98	928800	50.0	51.9	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.298	9.293	0.005	95	884804	50.0	51.2	
127 Di-n-butyl phthalate	149	9.635	9.630	0.005	100	990118	50.0	51.9	
132 Fluoranthene	202	10.458	10.453	0.005	98	1039769	50.0	51.2	
134 Pyrene	202	10.789	10.789	0.000	97	1094905	50.0	50.6	
141 Butyl benzyl phthalate	149	11.900	11.900	0.000	98	467884	50.0	50.8	
144 3,3'-Dichlorobenzidine	252	13.059	13.059	0.000	73	374819	50.0	52.4	
145 Benzo[a]anthracene	228	13.107	13.102	0.005	99	1092871	50.0	50.5	
146 Chrysene	228	13.193	13.193	0.000	98	1026819	50.0	49.7	
147 Bis(2-ethylhexyl) phthalat	149	13.273	13.268	0.005	97	630472	50.0	50.4	
148 Di-n-octyl phthalate	149	15.078	15.073	0.005	99	1106216	50.0	51.2	
150 Benzo[b]fluoranthene	252	15.965	15.966	-0.001	89	1014014	50.0	50.1	
151 Benzo[k]fluoranthene	252	16.045	16.046	-0.001	99	1041209	50.0	50.4	
153 Benzo[a]pyrene	252	16.889	16.895	-0.006	78	1016514	50.0	50.5	
156 Indeno[1,2,3-cd]pyrene	276	20.170	20.175	-0.005	99	893181	50.0	49.3	
157 Dibenz(a,h)anthracene	278	20.260	20.271	-0.011	94	889641	50.0	50.0	
158 Benzo[g,h,i]perylene	276	20.901	20.918	-0.017	97	940354	50.0	49.9	
S 169 Methyl Phenols, Total	108				0			103.2	
S 170 Total Cresols	108				0			50.6	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

MS-HSLA050_00041

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31080.D

Injection Date: 08-Jan-2019 16:40:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD050 HSL

Worklist Smp#: 7

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

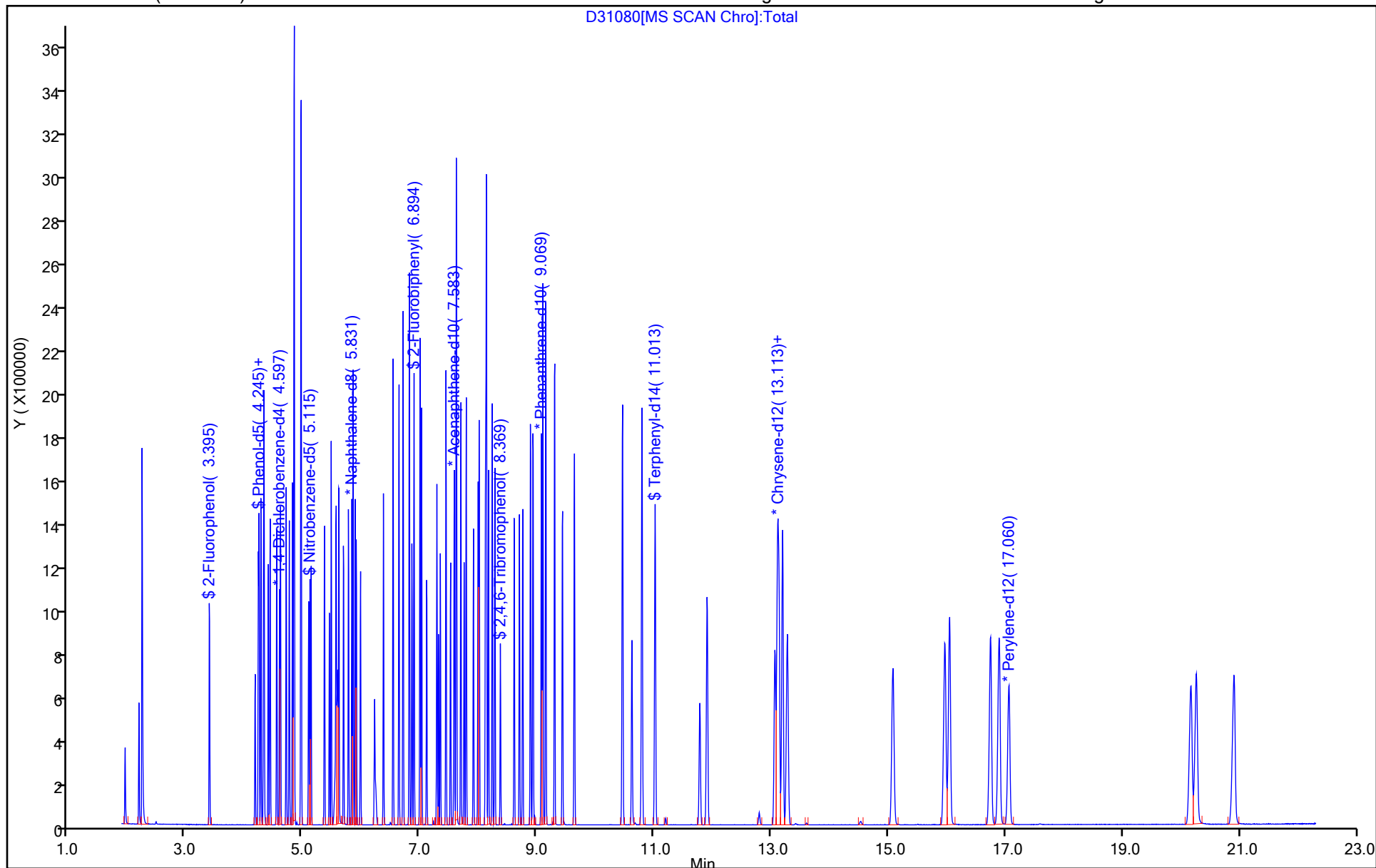
ALS Bottle#: 6

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

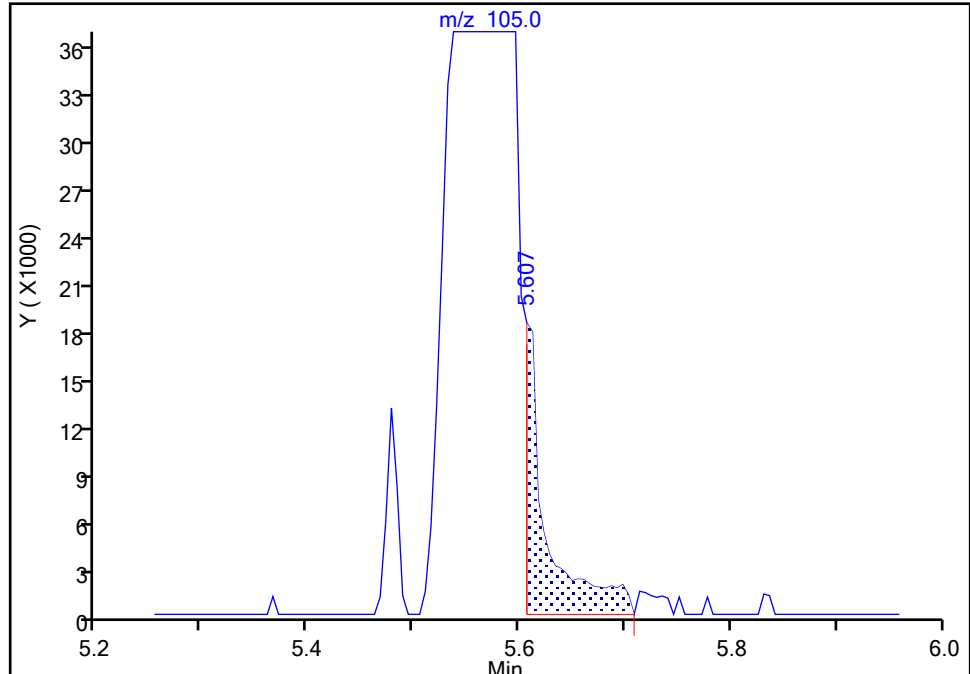
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Injection Date: 08-Jan-2019 16:40:30 Instrument ID: SMS_D
Lims ID: STD050 HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 6 Worklist Smp#: 7
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

52 Benzoic acid, CAS: 65-85-0

Signal: 1

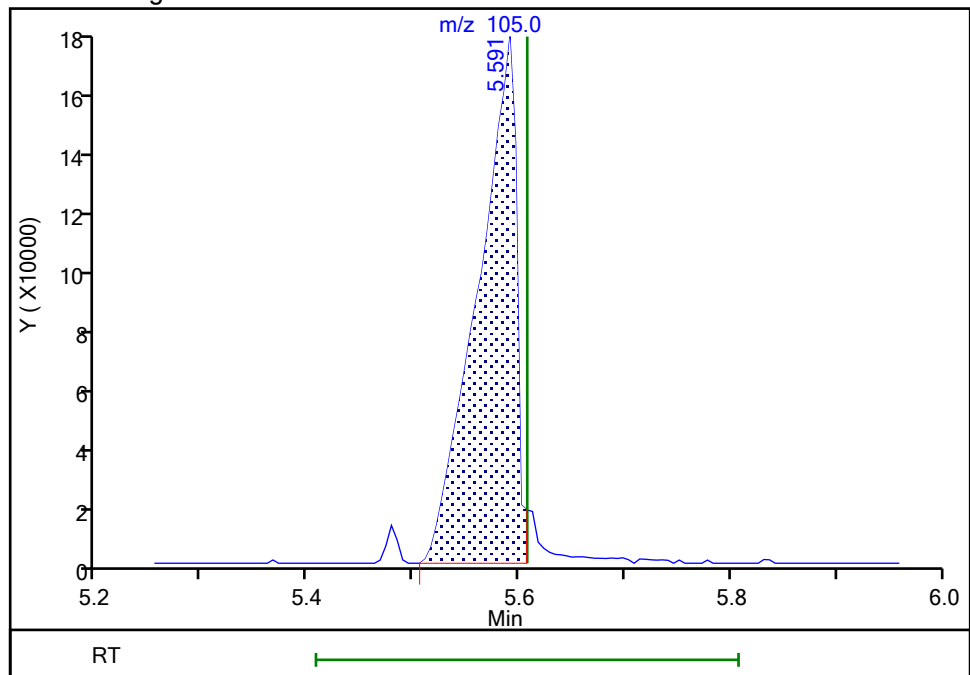
RT: 5.61
Area: 25770
Amount: 8.284493
Amount Units: ug/ml

Processing Integration Results



RT: 5.59
Area: 457487
Amount: 98.458155
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 09-Jan-2019 10:03:09

Audit Action: Assigned Compound ID

Audit Reason: Wrong peak

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31081.D
 Lims ID: STD120 HSL
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 08-Jan-2019 17:10:30 ALS Bottle#: 7 Worklist Smp#: 8
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD120 HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub14
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:20:16 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 09-Jan-2019 10:04:39

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.597	4.592	0.005	95	144246	40.0	40.0	
* 2 Naphthalene-d8	136	5.837	5.832	0.005	99	595681	40.0	40.0	
* 3 Acenaphthene-d10	164	7.583	7.578	0.005	96	338111	40.0	40.0	
* 4 Phenanthrene-d10	188	9.074	9.069	0.005	97	689653	40.0	40.0	
* 5 Chrysene-d12	240	13.139	13.129	0.010	99	663705	40.0	40.0	
* 6 Perylene-d12	264	17.066	17.050	0.016	97	664692	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.401	3.396	0.005	94	626732	120.0	115.6	
\$ 8 Phenol-d5	99	4.239	4.234	0.005	98	840930	120.0	116.5	
\$ 9 Nitrobenzene-d5	82	5.121	5.116	0.005	87	749742	120.0	116.8	
\$ 10 2-Fluorobiphenyl	172	6.900	6.889	0.011	99	1340250	120.0	114.0	
\$ 11 2,4,6-Tribromophenol	330	8.374	8.369	0.005	94	198814	120.0	121.7	
\$ 12 Terphenyl-d14	244	11.018	11.008	0.010	98	1794275	120.0	117.6	
13 1,4-Dioxane	88	1.958	1.953	0.005	92	307587	120.0	117.3	
14 N-Nitrosodimethylamine	74	2.199	2.194	0.005	93	490898	120.0	118.0	
15 Pyridine	79	2.252	2.247	0.005	98	1573082	240.0	235.9	
23 n-Decane	57	4.437	4.432	0.005	97	661555	120.0	116.7	
24 Phenol	94	4.255	4.245	0.010	98	879157	120.0	116.2	
25 Aniline	93	4.282	4.277	0.005	98	1108208	120.0	117.1	
27 Bis(2-chloroethyl)ether	93	4.325	4.320	0.005	94	609707	120.0	113.3	
28 2-Chlorophenol	128	4.405	4.400	0.005	98	627808	120.0	116.6	
29 1,3-Dichlorobenzene	146	4.549	4.544	0.005	97	638164	120.0	113.4	
30 1,4-Dichlorobenzene	146	4.613	4.608	0.005	92	647894	120.0	114.5	
31 Benzyl alcohol	108	4.715	4.710	0.005	93	472179	120.0	117.9	
32 1,2-Dichlorobenzene	146	4.763	4.758	0.005	96	627435	120.0	115.1	
34 2,2'-oxybis[1-chloropropan	45	4.838	4.833	0.005	93	831030	120.0	115.3	
35 2-Methylphenol	108	4.822	4.817	0.005	95	646730	120.0	116.9	
38 N-Nitrosodi-n-propylamine	70	4.966	4.961	0.005	79	470824	120.0	112.5	
39 Acetophenone	105	4.971	4.966	0.005	88	845945	120.0	111.0	
40 4-Methylphenol	108	4.971	4.961	0.010	93	603319	120.0	110.4	
41 3-Methylphenol	108	4.971	4.961	0.010	90	603319	120.0	110.4	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.971	4.961	0.010	90	603319	120.0	110.4	
44 Hexachloroethane	117	5.094	5.089	0.005	93	249146	120.0	116.6	
45 Nitrobenzene	77	5.142	5.132	0.010	86	763607	120.0	117.2	
47 Isophorone	82	5.372	5.361	0.011	99	1396991	120.0	115.6	
48 2-Nitrophenol	139	5.452	5.447	0.005	95	346493	120.0	119.4	
49 2,4-Dimethylphenol	107	5.484	5.479	0.005	96	664096	120.0	115.2	
51 Bis(2-chloroethoxy)methane	93	5.564	5.559	0.005	99	790735	120.0	114.7	
52 Benzoic acid	105	5.639	5.607	0.032	87	1191150	240.0	240.8	
53 2,4-Dichlorophenol	162	5.692	5.687	0.005	95	521067	120.0	114.7	
55 1,2,4-Trichlorobenzene	180	5.778	5.773	0.005	93	565994	120.0	113.9	
56 Naphthalene	128	5.858	5.853	0.005	98	1741390	120.0	111.4	
57 4-Chloroaniline	127	5.895	5.890	0.005	96	815232	120.0	116.1	
58 2,6-Dichlorophenol	162	5.911	5.906	0.005	96	508954	120.0	113.0	
60 Hexachlorobutadiene	225	5.981	5.976	0.005	95	300849	120.0	115.0	
63 Caprolactam	55	6.248	6.232	0.016	82	327857	120.0	117.4	M
64 4-Chloro-3-methylphenol	107	6.382	6.371	0.011	96	583877	120.0	115.2	
66 2-Methylnaphthalene	142	6.542	6.537	0.005	93	1175767	120.0	111.3	
67 1-Methylnaphthalene	142	6.638	6.633	0.005	94	1103154	120.0	111.8	
68 Hexachlorocyclopentadiene	237	6.707	6.702	0.005	95	360132	120.0	120.5	
69 1,2,4,5-Tetrachlorobenzene	216	6.713	6.708	0.005	97	535974	120.0	110.1	
71 2,4,6-Trichlorophenol	196	6.820	6.815	0.005	95	369412	120.0	114.1	
72 2,4,5-Trichlorophenol	196	6.862	6.857	0.005	96	431027	120.0	118.4	
74 1,1'-Biphenyl	154	7.001	6.996	0.005	95	1384712	120.0	113.0	
75 2-Chloronaphthalene	162	7.028	7.023	0.005	96	1118198	120.0	114.5	
77 2-Nitroaniline	65	7.113	7.108	0.005	83	428814	120.0	121.5	
80 Dimethyl phthalate	163	7.295	7.285	0.010	98	1282083	120.0	114.7	
81 1,3-Dinitrobenzene	168	7.322	7.311	0.011	87	246481	120.0	124.4	
82 2,6-Dinitrotoluene	165	7.354	7.343	0.011	96	331501	120.0	119.7	
83 Acenaphthylene	152	7.445	7.440	0.005	99	1818824	120.0	113.9	
84 3-Nitroaniline	138	7.525	7.520	0.005	94	390295	120.0	120.0	
85 Acenaphthene	153	7.621	7.611	0.010	94	1062915	120.0	110.7	
86 2,4-Dinitrophenol	184	7.632	7.621	0.011	82	427561	240.0	236.2	
88 4-Nitrophenol	109	7.706	7.696	0.010	94	394623	240.0	238.3	
89 2,4-Dinitrotoluene	165	7.760	7.749	0.011	93	453779	120.0	119.9	
90 Dibenzofuran	168	7.792	7.787	0.005	98	1653754	120.0	112.7	
92 Hexadecane	57	8.011	8.006	0.005	97	807349	120.0	117.3	
93 2,3,4,6-Tetrachlorophenol	232	7.915	7.910	0.005	71	372644	120.0	121.9	
95 Diethyl phthalate	149	7.995	7.990	0.005	98	1259638	120.0	114.2	
97 4-Chlorophenyl phenyl ethe	204	8.118	8.113	0.005	91	651732	120.0	114.6	
99 Fluorene	166	8.134	8.129	0.005	93	1281942	120.0	110.0	
100 4-Nitroaniline	138	8.150	8.134	0.016	86	407250	120.0	117.5	
101 4,6-Dinitro-2-methylphenol	198	8.176	8.171	0.005	87	536894	240.0	238.9	
102 N-Nitrosodiphenylamine	169	8.235	8.230	0.005	62	1010725	120.0	114.1	
103 Diphenylamine	169	8.235	8.230	0.005	96	1010725	102.0	96.9	
105 1,2-Diphenylhydrazine	77	8.278	8.273	0.005	98	1566448	121.3	117.5	
106 Azobenzene	77	8.278	8.273	0.005	98	1566448	120.0	116.2	
112 Atrazine	200	8.759	8.754	0.005	96	385072	120.0	113.9	
114 4-Bromophenyl phenyl ether	248	8.609	8.604	0.005	65	404951	120.0	115.4	
116 Hexachlorobenzene	284	8.700	8.695	0.005	95	390256	120.0	115.2	
119 Pentachlorophenol	266	8.887	8.882	0.005	94	505960	240.0	238.0	
123 Phenanthrene	178	9.101	9.096	0.005	98	1964379	120.0	111.4	
124 Anthracene	178	9.149	9.144	0.005	98	2024606	120.0	111.0	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.304	9.293	0.011	95	1981809	120.0	112.5	
127 Di-n-butyl phthalate	149	9.635	9.630	0.005	100	2240806	120.0	115.2	
132 Fluoranthene	202	10.463	10.453	0.010	99	2326683	120.0	112.4	
134 Pyrene	202	10.794	10.789	0.005	97	2458283	120.0	116.9	
141 Butyl benzyl phthalate	149	11.905	11.900	0.005	98	1092153	120.0	122.1	
144 3,3'-Dichlorobenzidine	252	13.070	13.059	0.011	74	823380	120.0	118.3	
145 Benzo[a]anthracene	228	13.118	13.102	0.016	99	2461177	120.0	117.0	
146 Chrysene	228	13.203	13.193	0.010	98	2333671	120.0	116.2	
147 Bis(2-ethylhexyl) phthalat	149	13.278	13.268	0.010	97	1499559	120.0	123.3	
148 Di-n-octyl phthalate	149	15.084	15.073	0.011	99	2620290	120.0	124.7	
150 Benzo[b]fluoranthene	252	15.987	15.966	0.021	98	2385522	120.0	121.1	
151 Benzo[k]fluoranthene	252	16.067	16.046	0.021	99	2379166	120.0	118.4	
153 Benzo[a]pyrene	252	16.916	16.895	0.021	78	2338543	120.0	119.3	
156 Indeno[1,2,3-cd]pyrene	276	20.196	20.175	0.021	99	2149619	120.0	122.0	
157 Dibenz(a,h)anthracene	278	20.287	20.271	0.016	94	2136529	120.0	123.3	
158 Benzo[g,h,i]perylene	276	20.939	20.918	0.021	97	2210276	120.0	120.4	
S 169 Methyl Phenols, Total	108				0			227.3	
S 170 Total Cresols	108				0			116.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MS-HSLA120_00040

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31081.D

Injection Date: 08-Jan-2019 17:10:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD120 HSL

Worklist Smp#: 8

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

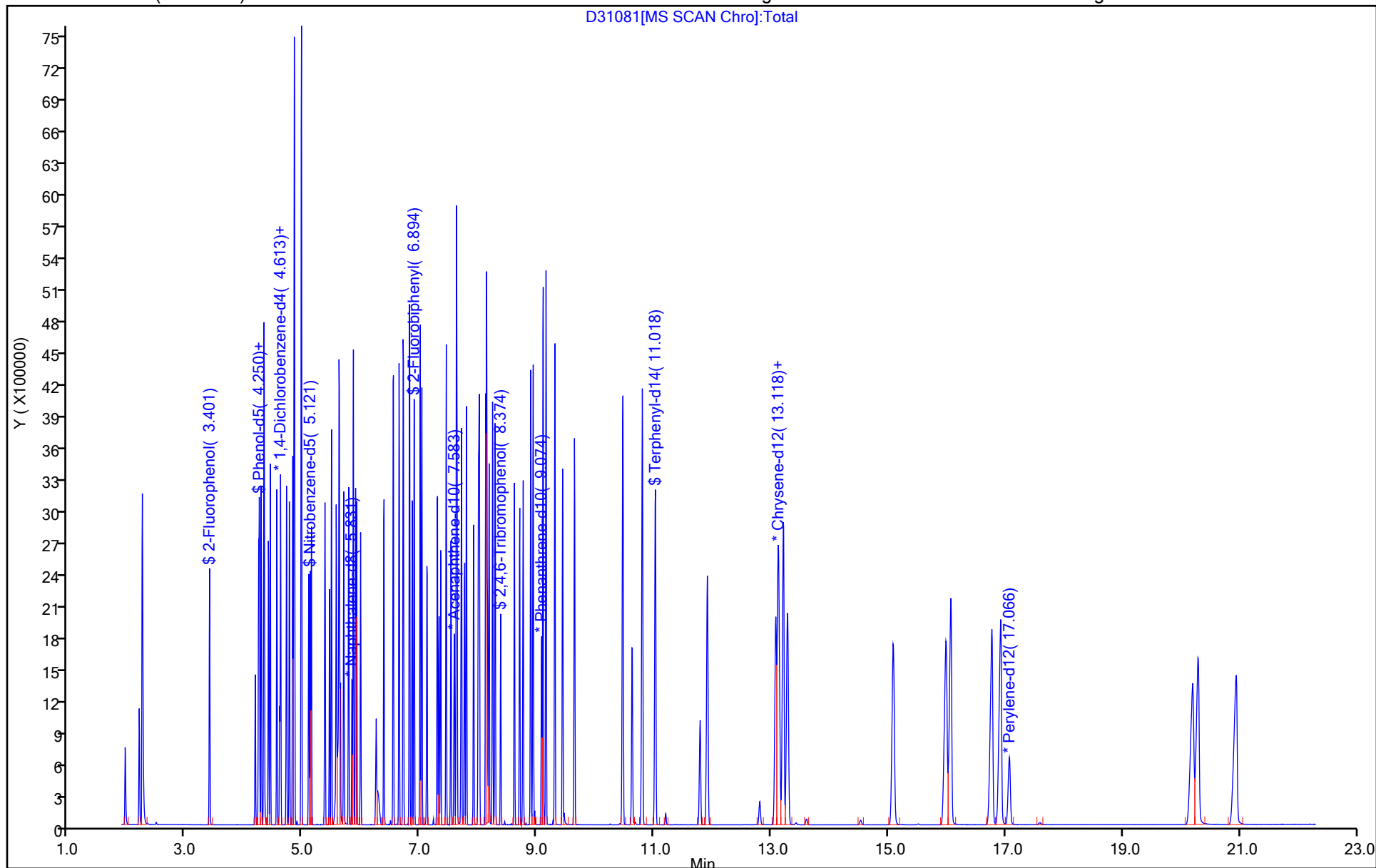
ALS Bottle#: 7

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

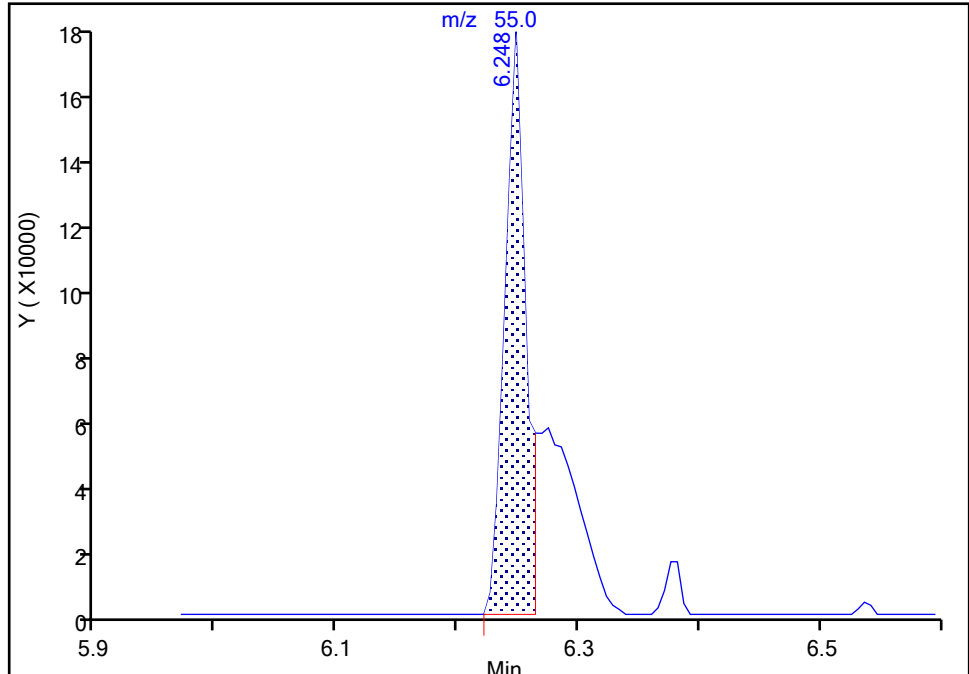
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Injection Date: 08-Jan-2019 17:10:30 Instrument ID: SMS_D
Lims ID: STD120 HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 7 Worklist Smp#: 8
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

63 Caprolactam, CAS: 105-60-2

Signal: 1

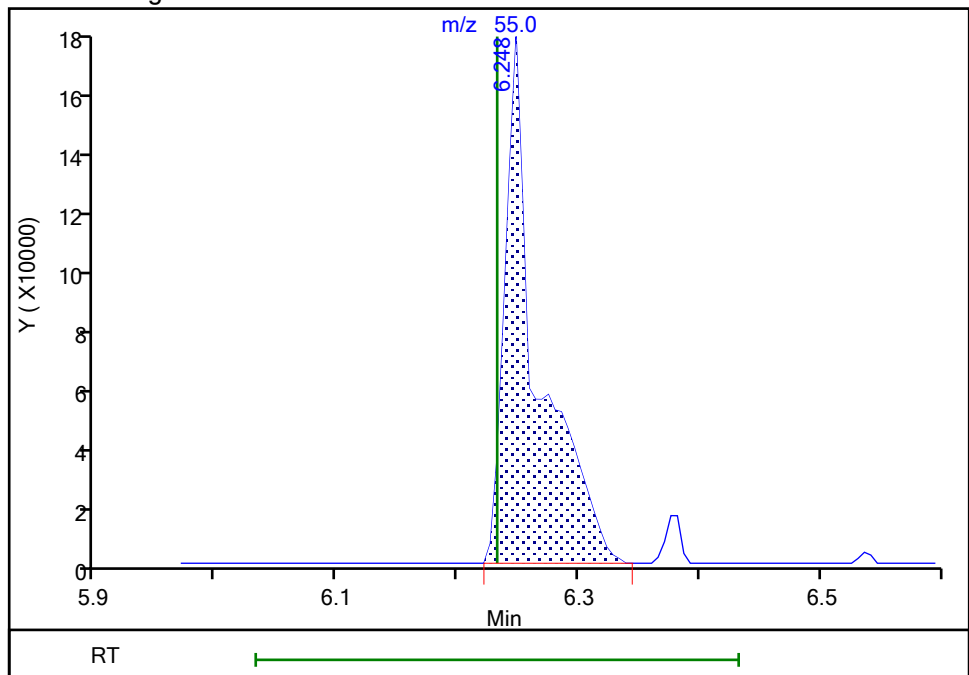
RT: 6.25
Area: 206260
Amount: 88.173550
Amount Units: ug/ml

Processing Integration Results



RT: 6.25
Area: 327857
Amount: 117.3898
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 09-Jan-2019 10:04:12
Audit Action: Manually Integrated

Audit Reason: Split Peak

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31082.D
 Lims ID: STD160 HSL
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 08-Jan-2019 17:39:30 ALS Bottle#: 8 Worklist Smp#: 9
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD160 HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub14
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:20:20 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 09-Jan-2019 10:05:58

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.596	4.592	0.004	96	144546	40.0	40.0	
* 2 Naphthalene-d8	136	5.836	5.832	0.004	99	587605	40.0	40.0	
* 3 Acenaphthene-d10	164	7.583	7.578	0.005	96	338518	40.0	40.0	
* 4 Phenanthrene-d10	188	9.073	9.069	0.004	97	697060	40.0	40.0	
* 5 Chrysene-d12	240	13.149	13.129	0.020	98	661717	40.0	40.0	
* 6 Perylene-d12	264	17.070	17.050	0.020	97	659967	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.400	3.396	0.004	93	825503	160.0	152.0	
\$ 8 Phenol-d5	99	4.244	4.234	0.010	98	1093895	160.0	151.2	
\$ 9 Nitrobenzene-d5	82	5.125	5.116	0.009	87	994187	160.0	157.0	
\$ 10 2-Fluorobiphenyl	172	6.899	6.889	0.010	99	1723413	160.0	146.4	
\$ 11 2,4,6-Tribromophenol	330	8.379	8.369	0.010	94	275770	160.0	168.6	
\$ 12 Terphenyl-d14	244	11.023	11.008	0.015	98	2416263	160.0	158.9	
13 1,4-Dioxane	88	1.957	1.953	0.004	92	402332	160.0	153.1	
14 N-Nitrosodimethylamine	74	2.203	2.194	0.009	93	641059	160.0	153.8	
15 Pyridine	79	2.251	2.247	0.004	98	2026462	320.0	303.3	
23 n-Decane	57	4.436	4.432	0.004	98	872874	160.0	153.6	
24 Phenol	94	4.254	4.245	0.009	99	1146631	160.0	151.2	
25 Aniline	93	4.286	4.277	0.009	98	1448745	160.0	152.7	
27 Bis(2-chloroethyl)ether	93	4.329	4.320	0.009	97	786709	160.0	145.9	
28 2-Chlorophenol	128	4.409	4.400	0.009	98	822639	160.0	152.4	
29 1,3-Dichlorobenzene	146	4.554	4.544	0.010	96	826606	160.0	146.6	
30 1,4-Dichlorobenzene	146	4.618	4.608	0.010	93	839330	160.0	148.0	
31 Benzyl alcohol	108	4.719	4.710	0.009	93	621774	160.0	155.0	
32 1,2-Dichlorobenzene	146	4.767	4.758	0.009	95	812271	160.0	148.7	
34 2,2'-oxybis[1-chloropropan	45	4.842	4.833	0.009	94	1078662	160.0	149.3	
35 2-Methylphenol	108	4.821	4.817	0.004	95	840546	160.0	151.6	
38 N-Nitrosodi-n-propylamine	70	4.970	4.961	0.009	72	608898	160.0	145.2	
39 Acetophenone	105	4.976	4.966	0.010	84	1072369	160.0	140.4	
40 4-Methylphenol	108	4.970	4.961	0.009	76	763356	160.0	139.4	
41 3-Methylphenol	108	4.970	4.961	0.009	78	763356	160.0	139.4	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.970	4.961	0.009	83	763356	160.0	139.4	
44 Hexachloroethane	117	5.093	5.089	0.004	95	331194	160.0	154.7	
45 Nitrobenzene	77	5.141	5.132	0.009	86	1003108	160.0	156.0	
47 Isophorone	82	5.376	5.361	0.015	99	1868434	160.0	156.7	
48 2-Nitrophenol	139	5.451	5.447	0.004	96	454068	160.0	158.7	
49 2,4-Dimethylphenol	107	5.488	5.479	0.009	97	867946	160.0	152.7	
51 Bis(2-chloroethoxy)methane	93	5.569	5.559	0.010	99	1062320	160.0	156.2	
52 Benzoic acid	105	5.659	5.607	0.052	87	1595917	320.0	325.2	
53 2,4-Dichlorophenol	162	5.697	5.687	0.010	95	685342	160.0	152.9	
55 1,2,4-Trichlorobenzene	180	5.777	5.773	0.004	93	742865	160.0	151.5	
56 Naphthalene	128	5.857	5.853	0.004	98	2249718	160.0	145.9	
57 4-Chloroaniline	127	5.900	5.890	0.010	96	1045234	160.0	151.0	
58 2,6-Dichlorophenol	162	5.916	5.906	0.010	96	668568	160.0	150.5	
60 Hexachlorobutadiene	225	5.980	5.976	0.004	96	395890	160.0	153.4	
63 Caprolactam	55	6.258	6.232	0.026	82	439583	160.0	159.6	M
64 4-Chloro-3-methylphenol	107	6.381	6.371	0.010	96	784920	160.0	157.0	
66 2-Methylnaphthalene	142	6.541	6.537	0.004	93	1524783	160.0	146.3	
67 1-Methylnaphthalene	142	6.642	6.633	0.009	93	1428935	160.0	146.8	
68 Hexachlorocyclopentadiene	237	6.706	6.702	0.004	96	476920	160.0	159.4	
69 1,2,4,5-Tetrachlorobenzene	216	6.717	6.708	0.009	97	692087	160.0	144.1	
71 2,4,6-Trichlorophenol	196	6.824	6.815	0.009	94	476142	160.0	146.9	
72 2,4,5-Trichlorophenol	196	6.867	6.857	0.010	96	567790	160.0	155.8	
74 1,1'-Biphenyl	154	7.000	6.996	0.004	96	1777024	160.0	144.8	
75 2-Chloronaphthalene	162	7.032	7.023	0.009	96	1460257	160.0	149.3	
77 2-Nitroaniline	65	7.118	7.108	0.010	82	569403	160.0	161.2	
80 Dimethyl phthalate	163	7.299	7.285	0.014	98	1695013	160.0	151.5	
81 1,3-Dinitrobenzene	168	7.326	7.311	0.015	87	333184	160.0	168.0	
82 2,6-Dinitrotoluene	165	7.358	7.343	0.015	96	449143	160.0	162.0	
83 Acenaphthylene	152	7.449	7.440	0.009	99	2343276	160.0	146.6	
84 3-Nitroaniline	138	7.529	7.520	0.009	93	522141	160.0	160.4	
85 Acenaphthene	153	7.620	7.611	0.009	95	1377704	160.0	143.4	
86 2,4-Dinitrophenol	184	7.636	7.621	0.015	82	582678	320.0	319.3	
88 4-Nitrophenol	109	7.716	7.696	0.020	92	530260	320.0	319.8	
89 2,4-Dinitrotoluene	165	7.764	7.749	0.015	93	615236	160.0	162.3	
90 Dibenzofuran	168	7.791	7.787	0.004	98	2162251	160.0	147.2	
92 Hexadecane	57	8.010	8.006	0.004	98	1067159	160.0	154.8	
93 2,3,4,6-Tetrachlorophenol	232	7.914	7.910	0.004	71	489234	160.0	159.9	
95 Diethyl phthalate	149	7.999	7.990	0.009	98	1661414	160.0	150.4	
97 4-Chlorophenyl phenyl ethe	204	8.122	8.113	0.009	90	853450	160.0	149.9	
99 Fluorene	166	8.138	8.129	0.009	93	1673571	160.0	143.4	
100 4-Nitroaniline	138	8.160	8.134	0.026	86	557221	160.0	160.6	
101 4,6-Dinitro-2-methylphenol	198	8.186	8.171	0.015	90	724181	320.0	317.6	
102 N-Nitrosodiphenylamine	169	8.240	8.230	0.010	62	1322951	160.0	147.7	
103 Diphenylamine	169	8.240	8.230	0.010	95	1322951	136.0	126.7	
105 1,2-Diphenylhydrazine	77	8.282	8.273	0.009	98	2088645	161.8	156.5	
106 Azobenzene	77	8.282	8.273	0.009	98	2088645	160.0	154.8	
112 Atrazine	200	8.763	8.754	0.009	96	516950	160.0	151.3	
114 4-Bromophenyl phenyl ether	248	8.614	8.604	0.010	65	546023	160.0	153.9	
116 Hexachlorobenzene	284	8.699	8.695	0.004	95	525800	160.0	153.5	
119 Pentachlorophenol	266	8.891	8.882	0.009	94	687005	320.0	319.0	
123 Phenanthrene	178	9.100	9.096	0.004	98	2536109	160.0	142.3	
124 Anthracene	178	9.153	9.144	0.009	98	2661233	160.0	144.3	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.303	9.293	0.010	95	2589574	160.0	145.5	
127 Di-n-butyl phthalate	149	9.639	9.630	0.009	100	2997486	160.0	152.5	
132 Fluoranthene	202	10.467	10.453	0.014	99	3122903	160.0	149.3	
134 Pyrene	202	10.804	10.789	0.015	96	3265650	160.0	155.7	
141 Butyl benzyl phthalate	149	11.910	11.900	0.010	98	1486074	160.0	166.6	
144 3,3'-Dichlorobenzidine	252	13.085	13.059	0.026	74	1088511	160.0	156.9	
145 Benzo[a]anthracene	228	13.128	13.102	0.026	99	3274513	160.0	156.1	
146 Chrysene	228	13.219	13.193	0.026	98	3103122	160.0	154.9	
147 Bis(2-ethylhexyl) phthalat	149	13.283	13.268	0.015	97	2081456	160.0	171.6	
148 Di-n-octyl phthalate	149	15.088	15.073	0.015	99	3567745	160.0	170.3	
150 Benzo[b]fluoranthene	252	15.996	15.966	0.030	99	3220136	160.0	164.6	
151 Benzo[k]fluoranthene	252	16.082	16.046	0.036	99	3114890	160.0	156.1	
153 Benzo[a]pyrene	252	16.937	16.895	0.042	78	3094828	160.0	159.0	
156 Indeno[1,2,3-cd]pyrene	276	20.217	20.175	0.042	99	2845711	160.0	161.9	M
157 Dibenz(a,h)anthracene	278	20.308	20.271	0.037	93	2841429	160.0	165.2	
158 Benzo[g,h,i]perylene	276	20.959	20.918	0.041	97	2923519	160.0	160.3	
S 169 Methyl Phenols, Total	108				0			291.0	
S 170 Total Cresols	108				0			151.6	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MS-HSLA160_00040

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31082.D

Injection Date: 08-Jan-2019 17:39:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD160 HSL

Worklist Smp#: 9

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

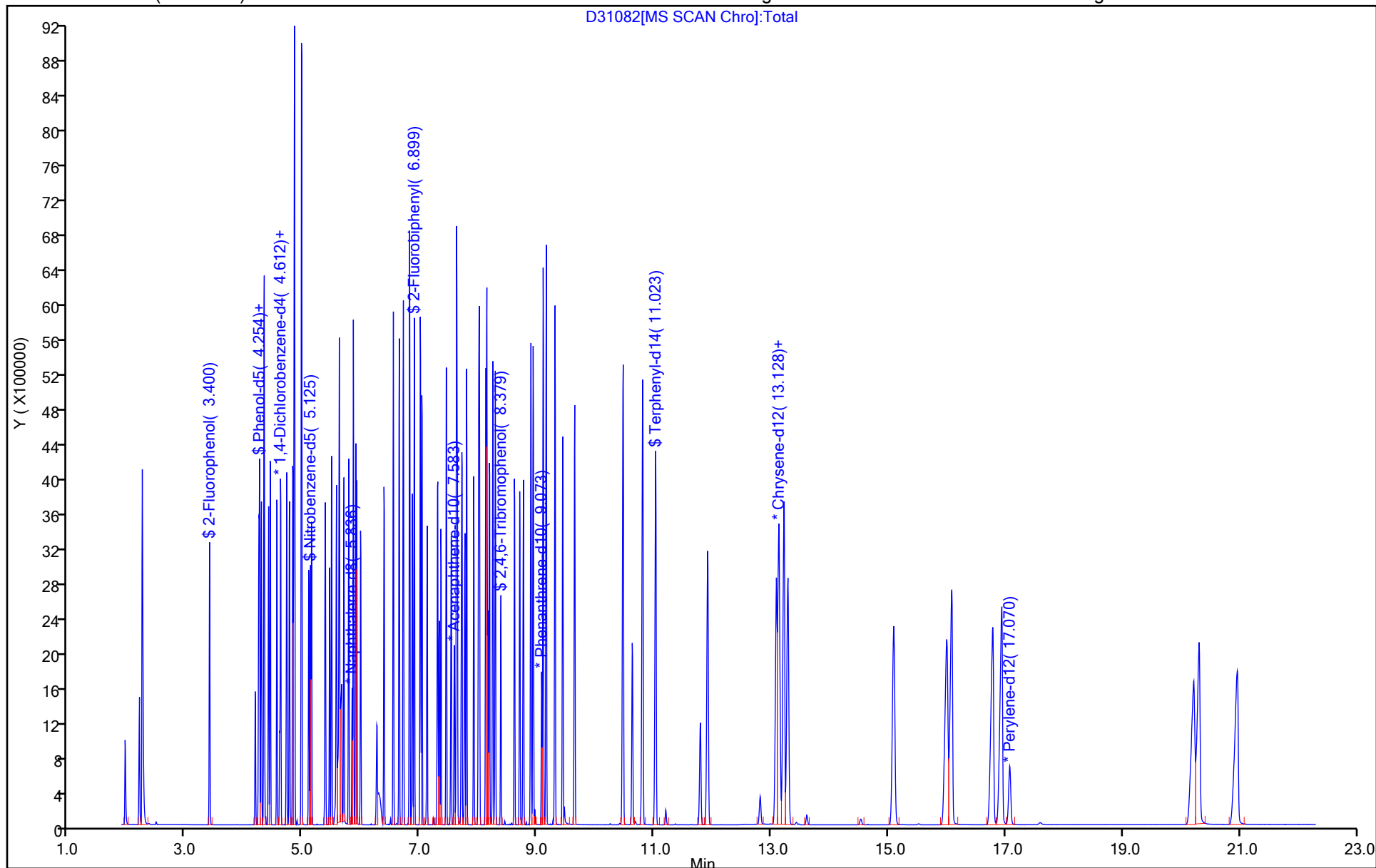
ALS Bottle#: 8

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

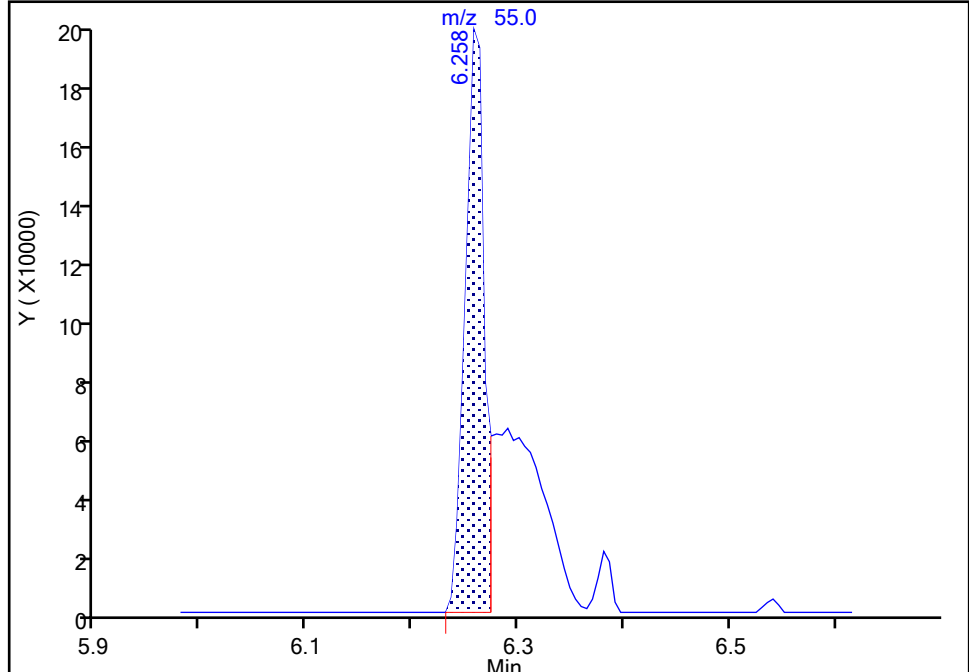
Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31082.D
Injection Date: 08-Jan-2019 17:39:30 Instrument ID: SMS_D
Lims ID: STD160 HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 8 Worklist Smp#: 9
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

63 Caprolactam, CAS: 105-60-2

Signal: 1

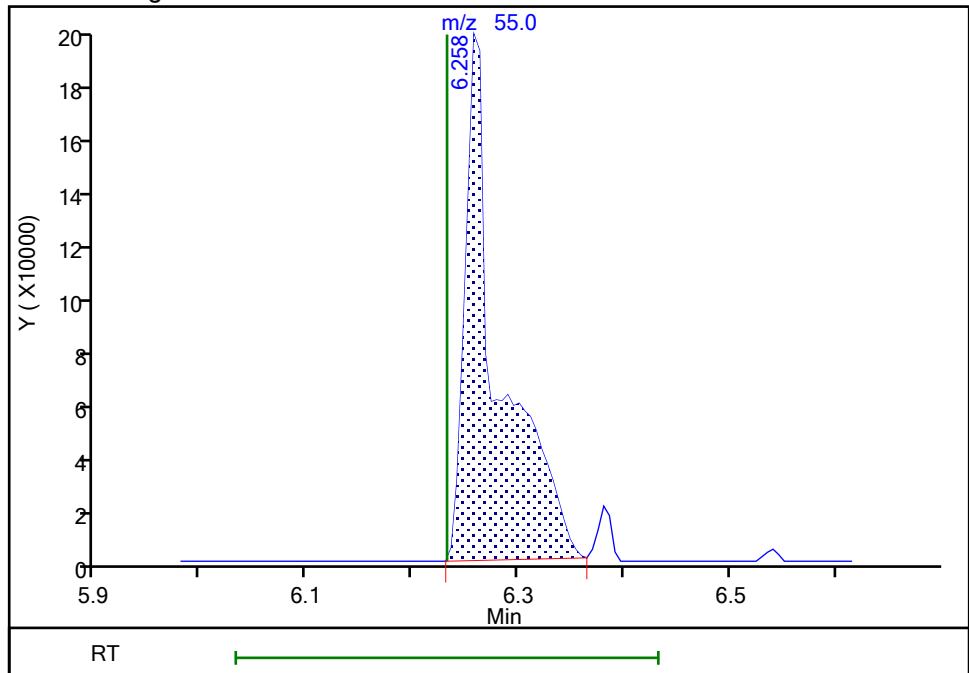
RT: 6.26
Area: 247412
Amount: 101.7118
Amount Units: ug/ml

Processing Integration Results



RT: 6.26
Area: 439583
Amount: 159.5566
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 09-Jan-2019 10:05:24
Audit Action: Manually Integrated

Audit Reason: Split Peak

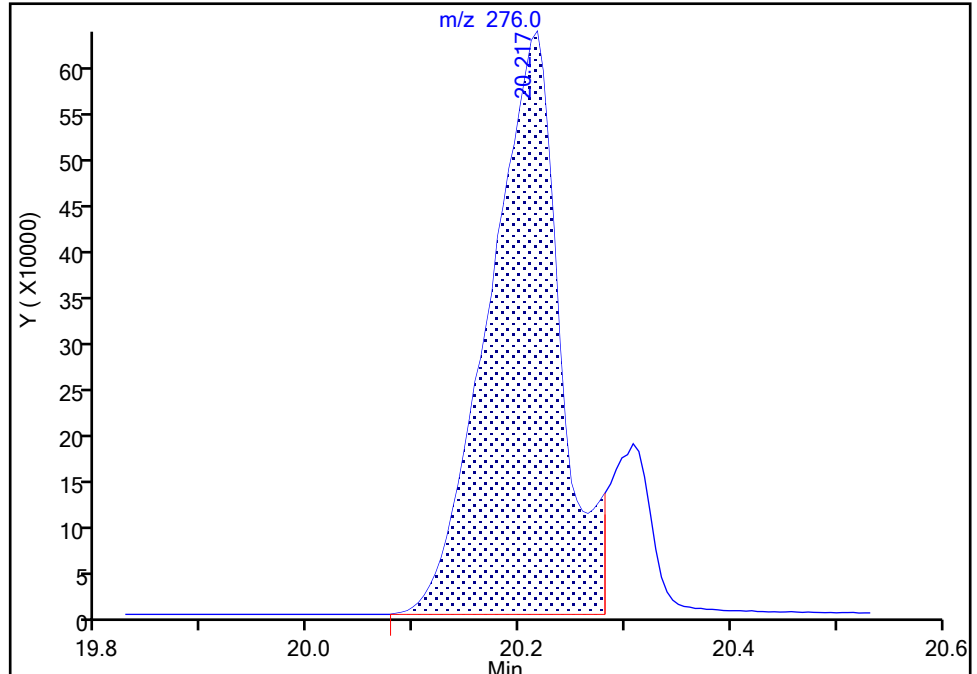
TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31082.D
Injection Date: 08-Jan-2019 17:39:30 Instrument ID: SMS_D
Lims ID: STD160 HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 8 Worklist Smp#: 9
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

156 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5
Signal: 1

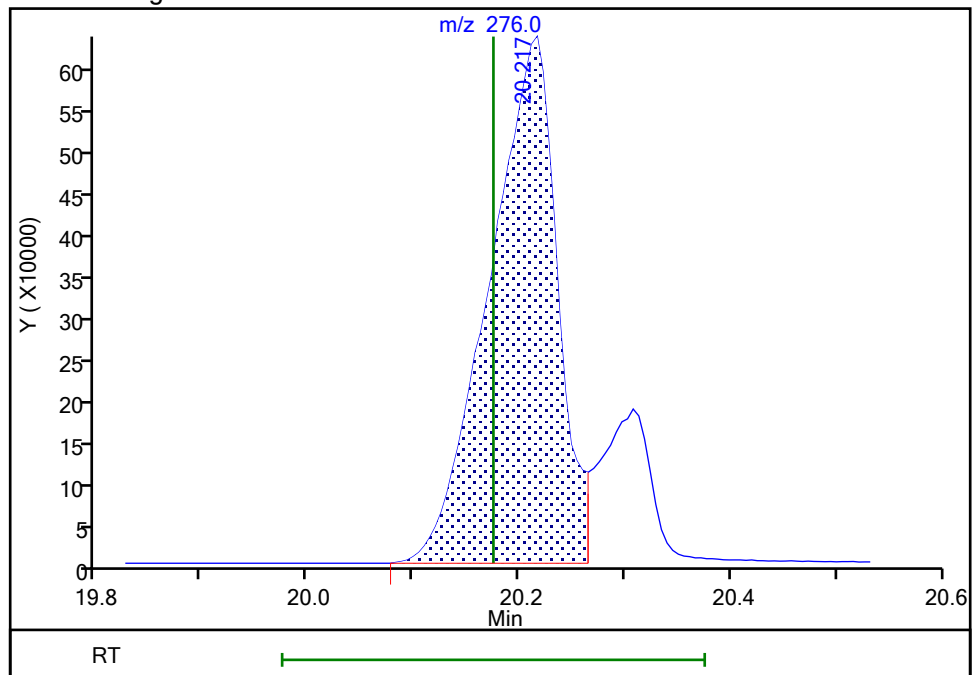
RT: 20.22
Area: 2963977
Amount: 163.5838
Amount Units: ug/ml

Processing Integration Results



RT: 20.22
Area: 2845711
Amount: 161.9480
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 09-Jan-2019 10:05:51
Audit Action: Split an Integrated Peak

Audit Reason: Shouldering

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Lims ID: STD200 HSL
 Client ID:
 Sample Type: IC Calib Level: 8
 Inject. Date: 08-Jan-2019 18:08:30 ALS Bottle#: 9 Worklist Smp#: 10
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD200 HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub14
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:20:23 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 09-Jan-2019 10:16:55

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.597	4.592	0.005	96	131303	40.0	40.0	
* 2 Naphthalene-d8	136	5.836	5.832	0.004	99	562607	40.0	40.0	
* 3 Acenaphthene-d10	164	7.588	7.578	0.010	96	327844	40.0	40.0	
* 4 Phenanthrene-d10	188	9.074	9.069	0.005	97	681977	40.0	40.0	
* 5 Chrysene-d12	240	13.150	13.129	0.021	99	644957	40.0	40.0	
* 6 Perylene-d12	264	17.076	17.050	0.026	97	652863	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.400	3.396	0.004	93	951610	200.0	192.9	
\$ 8 Phenol-d5	99	4.244	4.234	0.010	98	1265556	200.0	192.6	
\$ 9 Nitrobenzene-d5	82	5.126	5.116	0.010	87	1150946	200.0	189.8	
\$ 10 2-Fluorobiphenyl	172	6.899	6.889	0.010	99	1934642	200.0	169.7	
\$ 11 2,4,6-Tribromophenol	330	8.379	8.369	0.010	94	318553	200.0	201.1	
\$ 12 Terphenyl-d14	244	11.023	11.008	0.015	98	2777694	200.0	187.4	
13 1,4-Dioxane	88	1.958	1.953	0.005	92	460538	200.0	192.9	
14 N-Nitrosodimethylamine	74	2.204	2.194	0.010	93	749726	200.0	198.0	
15 Pyridine	79	2.252	2.247	0.005	98	2339362	400.0	385.4	
23 n-Decane	57	4.437	4.432	0.005	98	961365	200.0	186.3	
24 Phenol	94	4.255	4.245	0.010	98	1332114	200.0	193.3	
25 Aniline	93	4.287	4.277	0.010	98	1687895	200.0	195.9	
27 Bis(2-chloroethyl)ether	93	4.330	4.320	0.010	93	879541	200.0	179.5	
28 2-Chlorophenol	128	4.410	4.400	0.010	98	938018	200.0	191.4	
29 1,3-Dichlorobenzene	146	4.549	4.544	0.005	97	934356	200.0	182.4	
30 1,4-Dichlorobenzene	146	4.613	4.608	0.005	92	944233	200.0	183.3	
31 Benzyl alcohol	108	4.720	4.710	0.010	93	725360	200.0	199.0	
32 1,2-Dichlorobenzene	146	4.768	4.758	0.010	96	913128	200.0	184.0	
34 2,2'-oxybis[1-chloropropan	45	4.843	4.833	0.010	94	1197893	200.0	182.6	
35 2-Methylphenol	108	4.821	4.817	0.004	95	974233	200.0	193.5	
38 N-Nitrosodi-n-propylamine	70	4.976	4.961	0.015	65	691357	200.0	181.5	
39 Acetophenone	105	4.976	4.966	0.010	81	1206469	200.0	173.9	
40 4-Methylphenol	108	4.976	4.961	0.015	70	865249	200.0	173.9	
41 3-Methylphenol	108	4.976	4.961	0.015	74	865249	200.0	173.9	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.976	4.961	0.015	76	865249	200.0	173.9	
44 Hexachloroethane	117	5.094	5.089	0.005	95	361877	200.0	186.1	
45 Nitrobenzene	77	5.147	5.132	0.015	86	1140969	200.0	185.3	
47 Isophorone	82	5.382	5.361	0.021	99	2168836	200.0	190.0	
48 2-Nitrophenol	139	5.452	5.447	0.005	96	535947	200.0	195.6	
49 2,4-Dimethylphenol	107	5.489	5.479	0.010	97	1003685	200.0	184.4	
51 Bis(2-chloroethoxy)methane	93	5.569	5.559	0.010	98	1202706	200.0	184.7	
52 Benzoic acid	105	5.671	5.607	0.064	87	1925795	400.0	408.6	
53 2,4-Dichlorophenol	162	5.697	5.687	0.010	95	790157	200.0	184.1	
55 1,2,4-Trichlorobenzene	180	5.777	5.773	0.004	93	835054	200.0	177.9	
56 Naphthalene	128	5.858	5.853	0.005	98	2592923	200.0	175.6	
57 4-Chloroaniline	127	5.900	5.890	0.010	95	1229395	200.0	185.4	
58 2,6-Dichlorophenol	162	5.916	5.906	0.010	97	762902	200.0	179.3	
60 Hexachlorobutadiene	225	5.980	5.976	0.004	95	445542	200.0	180.3	
63 Caprolactam	55	6.269	6.232	0.037	82	558175	200.0	211.6	M
64 4-Chloro-3-methylphenol	107	6.386	6.371	0.015	96	909647	200.0	190.0	
66 2-Methylnaphthalene	142	6.541	6.537	0.004	93	1718227	200.0	172.2	
67 1-Methylnaphthalene	142	6.643	6.633	0.010	93	1629454	200.0	174.9	
68 Hexachlorocyclopentadiene	237	6.707	6.702	0.005	95	536926	200.0	185.3	
69 1,2,4,5-Tetrachlorobenzene	216	6.718	6.708	0.010	97	786079	200.0	170.9	
71 2,4,6-Trichlorophenol	196	6.824	6.815	0.009	95	549679	200.0	175.1	
72 2,4,5-Trichlorophenol	196	6.867	6.857	0.010	95	667655	200.0	189.2	
74 1,1'-Biphenyl	154	7.006	6.996	0.010	96	2020940	200.0	170.0	
75 2-Chloronaphthalene	162	7.033	7.023	0.010	96	1682156	200.0	177.6	
77 2-Nitroaniline	65	7.118	7.108	0.010	83	676229	200.0	197.7	
80 Dimethyl phthalate	163	7.300	7.285	0.015	98	1967810	200.0	181.6	
81 1,3-Dinitrobenzene	168	7.327	7.311	0.016	88	396998	200.0	206.7	
82 2,6-Dinitrotoluene	165	7.359	7.343	0.016	96	521853	200.0	194.3	
83 Acenaphthylene	152	7.449	7.440	0.009	99	2706501	200.0	174.9	
84 3-Nitroaniline	138	7.535	7.520	0.015	94	613589	200.0	194.6	
85 Acenaphthene	153	7.620	7.611	0.009	96	1579408	200.0	169.7	
86 2,4-Dinitrophenol	184	7.636	7.621	0.015	82	695834	400.0	392.4	
88 4-Nitrophenol	109	7.717	7.696	0.021	94	631866	400.0	393.5	
89 2,4-Dinitrotoluene	165	7.765	7.749	0.016	93	723911	200.0	197.2	
90 Dibenzofuran	168	7.797	7.787	0.010	98	2495330	200.0	175.3	
92 Hexadecane	57	8.010	8.006	0.004	98	1147152	200.0	171.9	
93 2,3,4,6-Tetrachlorophenol	232	7.920	7.910	0.010	71	568410	200.0	191.8	
95 Diethyl phthalate	149	8.000	7.990	0.010	98	1860367	200.0	173.9	
97 4-Chlorophenyl phenyl ethe	204	8.123	8.113	0.010	91	976269	200.0	177.0	
99 Fluorene	166	8.139	8.129	0.010	93	1913056	200.0	169.2	
100 4-Nitroaniline	138	8.160	8.134	0.026	86	663634	200.0	197.5	
101 4,6-Dinitro-2-methylphenol	198	8.187	8.171	0.016	88	859529	400.0	384.6	
102 N-Nitrosodiphenylamine	169	8.245	8.230	0.015	62	1520758	200.0	173.6	
103 Diphenylamine	169	8.245	8.230	0.015	95	1520758	170.0	150.4	
105 1,2-Diphenylhydrazine	77	8.283	8.273	0.010	98	2408873	202.2	186.3	
106 Azobenzene	77	8.283	8.273	0.010	98	2408873	200.0	184.3	
112 Atrazine	200	8.769	8.754	0.015	95	578521	200.0	173.0	
114 4-Bromophenyl phenyl ether	248	8.614	8.604	0.010	66	624404	200.0	179.9	
116 Hexachlorobenzene	284	8.705	8.695	0.010	95	613523	200.0	183.1	
119 Pentachlorophenol	266	8.892	8.882	0.010	95	803355	400.0	380.9	
123 Phenanthrene	178	9.106	9.096	0.010	98	2914974	200.0	167.2	
124 Anthracene	178	9.154	9.144	0.010	98	3048557	200.0	169.0	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.309	9.293	0.016	96	2960303	200.0	170.0	
127 Di-n-butyl phthalate	149	9.640	9.630	0.010	100	3403027	200.0	177.0	
132 Fluoranthene	202	10.468	10.453	0.015	99	3546381	200.0	173.3	
134 Pyrene	202	10.804	10.789	0.015	96	3747222	200.0	183.3	
141 Butyl benzyl phthalate	149	11.910	11.900	0.010	98	1724832	200.0	198.4	
144 3,3'-Dichlorobenzidine	252	13.085	13.059	0.026	73	1284759	200.0	190.0	
145 Benzo[a]anthracene	228	13.128	13.102	0.026	99	3805757	200.0	186.1	
146 Chrysene	228	13.219	13.193	0.026	98	3627777	200.0	185.8	
147 Bis(2-ethylhexyl) phthalat	149	13.283	13.268	0.015	97	2376408	200.0	201.0	
148 Di-n-octyl phthalate	149	15.094	15.073	0.021	99	4146803	200.0	203.1	
150 Benzo[b]fluoranthene	252	16.002	15.966	0.036	98	3864797	200.0	199.7	
151 Benzo[k]fluoranthene	252	16.088	16.046	0.042	99	3708496	200.0	187.9	
153 Benzo[a]pyrene	252	16.942	16.895	0.047	78	3754449	200.0	195.0	
156 Indeno[1,2,3-cd]pyrene	276	20.223	20.175	0.048	99	3471270	200.0	202.7	M
157 Dibenz(a,h)anthracene	278	20.319	20.271	0.048	93	3393012	200.0	199.4	
158 Benzo[g,h,i]perylene	276	20.970	20.918	0.052	97	3535561	200.0	196.0	
S 169 Methyl Phenols, Total	108				0			367.4	
S 170 Total Cresols	108				0			193.5	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MS-HSLA200_00040

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D

Injection Date: 08-Jan-2019 18:08:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: STD200 HSL

Worklist Smp#: 10

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

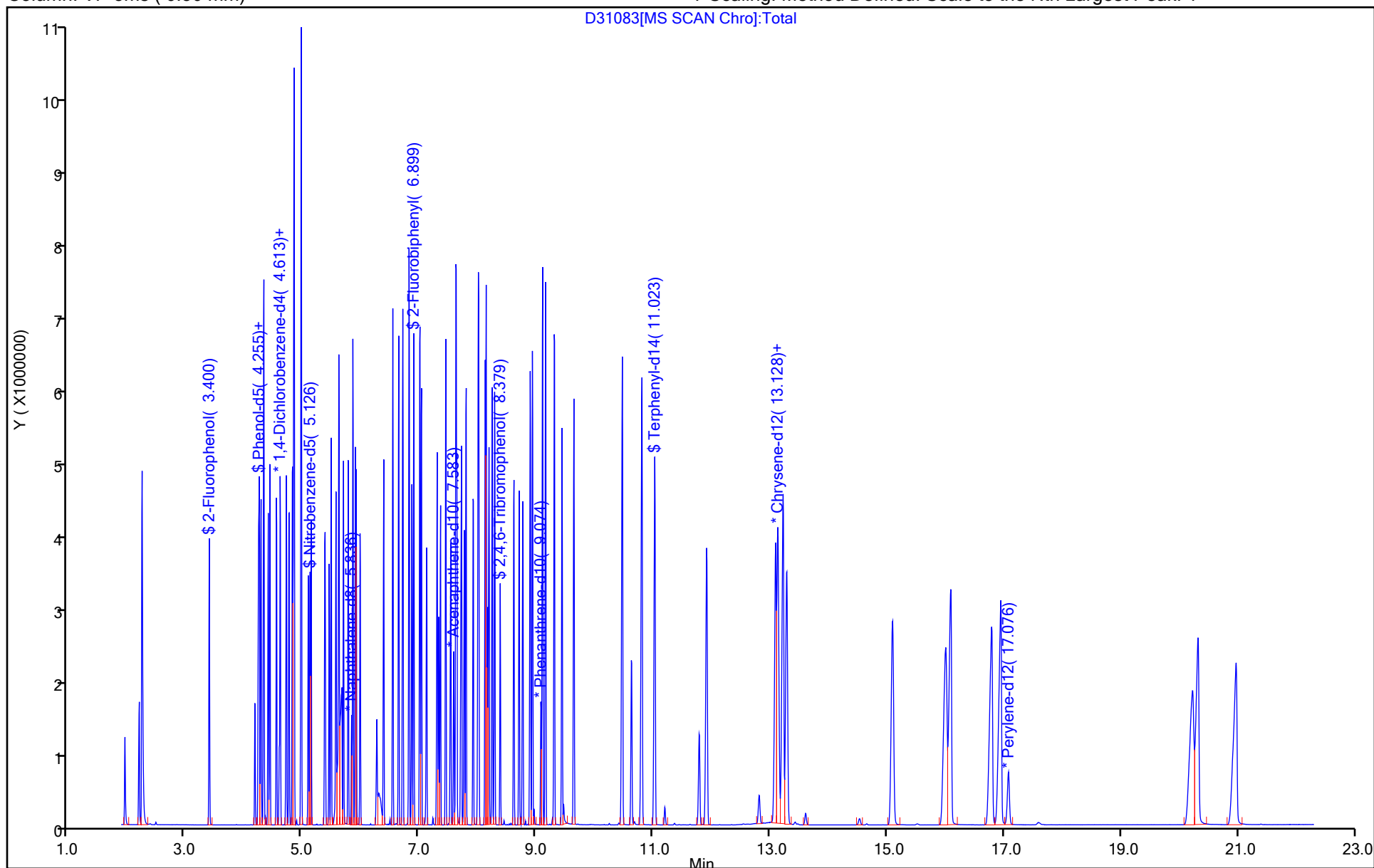
ALS Bottle#: 9

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

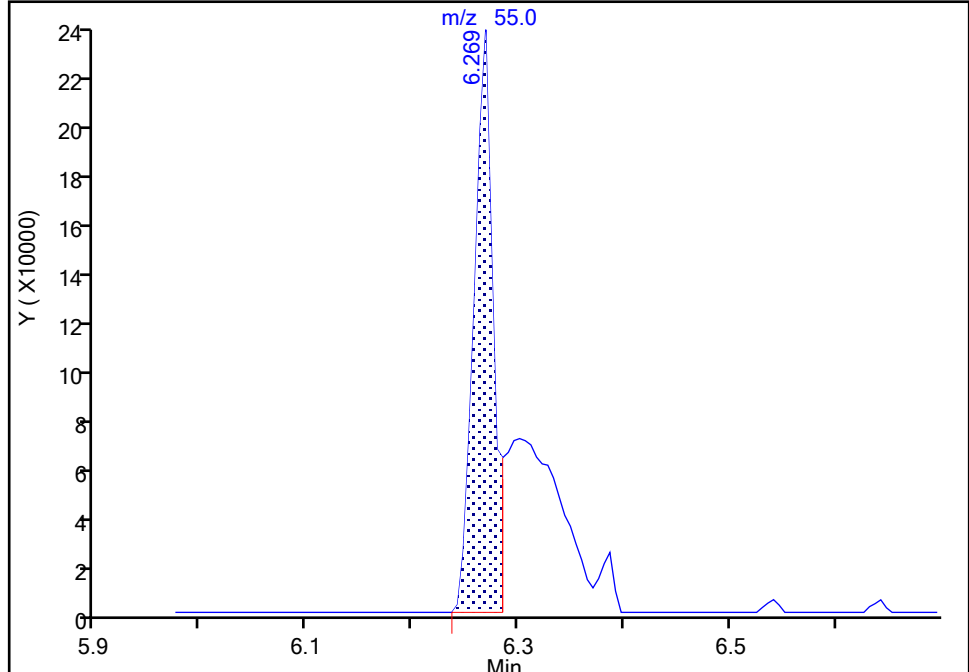
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Injection Date: 08-Jan-2019 18:08:30 Instrument ID: SMS_D
Lims ID: STD200 HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 9 Worklist Smp#: 10
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

63 Caprolactam, CAS: 105-60-2

Signal: 1

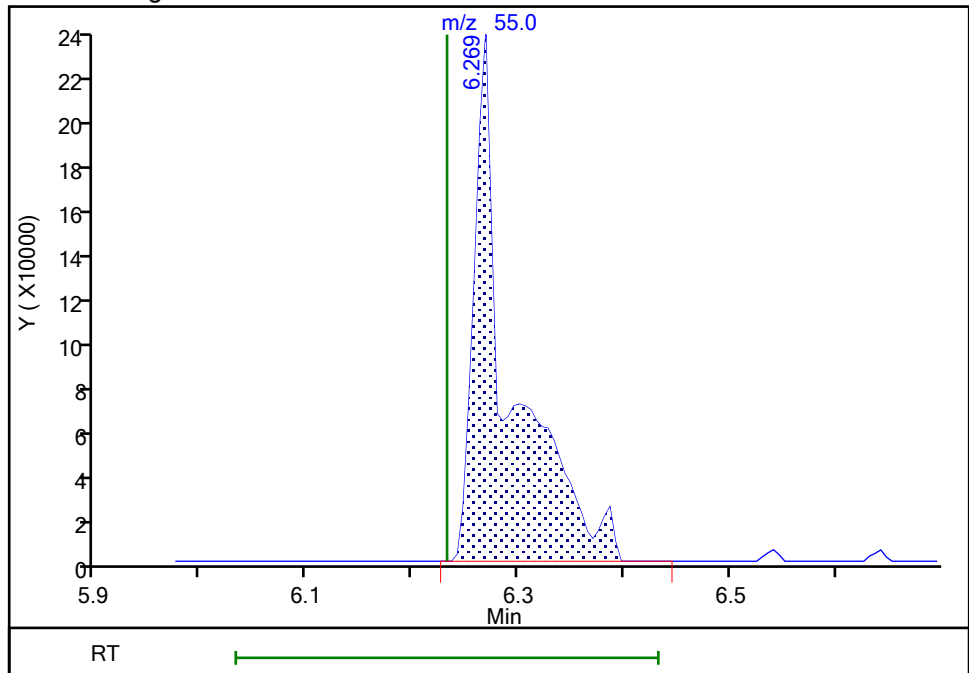
RT: 6.27
Area: 294051
Amount: 118.9168
Amount Units: ug/ml

Processing Integration Results



RT: 6.27
Area: 558175
Amount: 211.6044
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 09-Jan-2019 10:06:46
Audit Action: Manually Integrated

Audit Reason: Split Peak

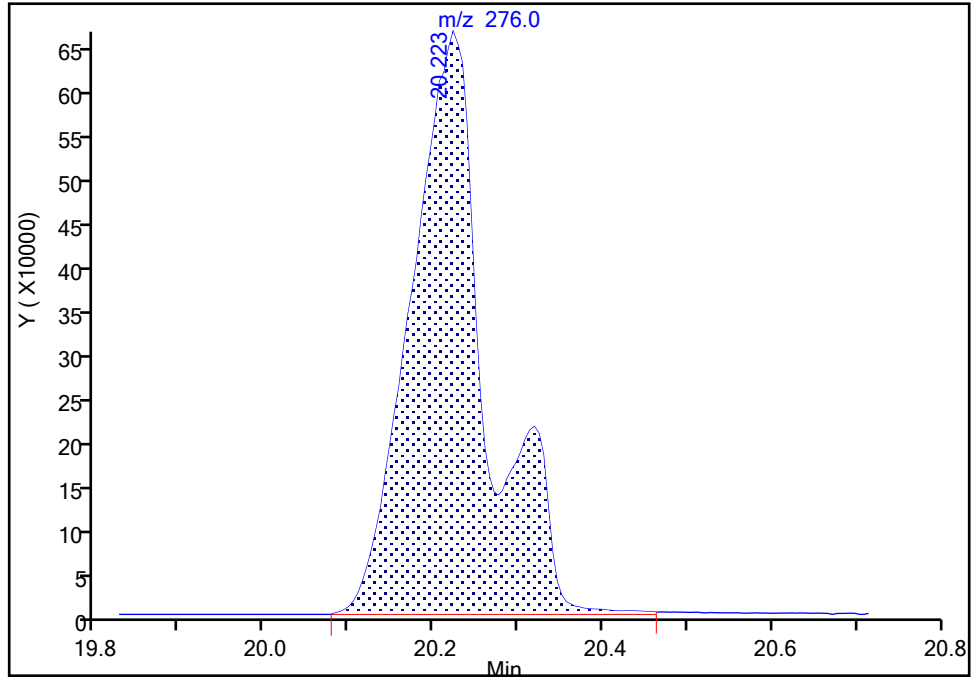
TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
Injection Date: 08-Jan-2019 18:08:30 Instrument ID: SMS_D
Lims ID: STD200 HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 9 Worklist Smp#: 10
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

156 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5
Signal: 1

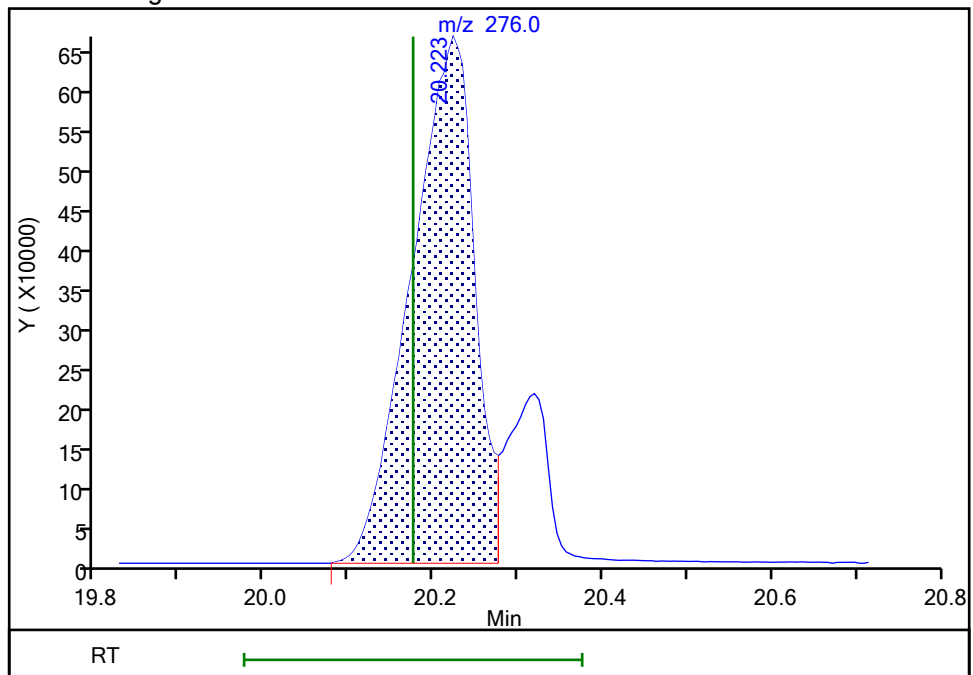
RT: 20.22
Area: 4180620
Amount: 237.9403
Amount Units: ug/ml

Processing Integration Results



RT: 20.22
Area: 3471270
Amount: 202.6818
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 09-Jan-2019 10:06:16
Audit Action: Split an Integrated Peak

Audit Reason: Shouldering

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-440161/21 Calibration Date: 12/05/2018 21:22
Instrument ID: SMS_D Calib Start Date: 12/05/2018 18:02
GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 12/05/2018 20:57
Lab File ID: D30620.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Famphur	Ave	0.4133	0.4479		108000	100000	8.4	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30620.D
 Lims ID: ICV FAM
 Client ID:
 Sample Type: ICV
 Inject. Date: 05-Dec-2018 21:22:30 ALS Bottle#: 20 Worklist Smp#: 21
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist:
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:30 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:10:15

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.673	4.673	0.000	96	118020	40.0	40.0	
* 2 Naphthalene-d8	136	5.896	5.896	0.000	99	482642	40.0	40.0	
* 3 Acenaphthene-d10	164	7.649	7.649	-0.001	95	301746	40.0	40.0	
* 4 Phenanthrene-d10	188	9.139	9.139	0.000	98	658077	40.0	40.0	
* 5 Chrysene-d12	240	13.284	13.290	-0.006	99	735279	40.0	40.0	
* 6 Perylene-d12	264	17.270	17.280	-0.010	98	774649	40.0	40.0	
139 Famphur	218	11.917	11.917	0.000	99	823277	100.0	108.4	

Reagents:

MS-FAMSSV_100_00020

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30620.D

Injection Date: 05-Dec-2018 21:22:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: ICV FAM

Worklist Smp#: 21

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

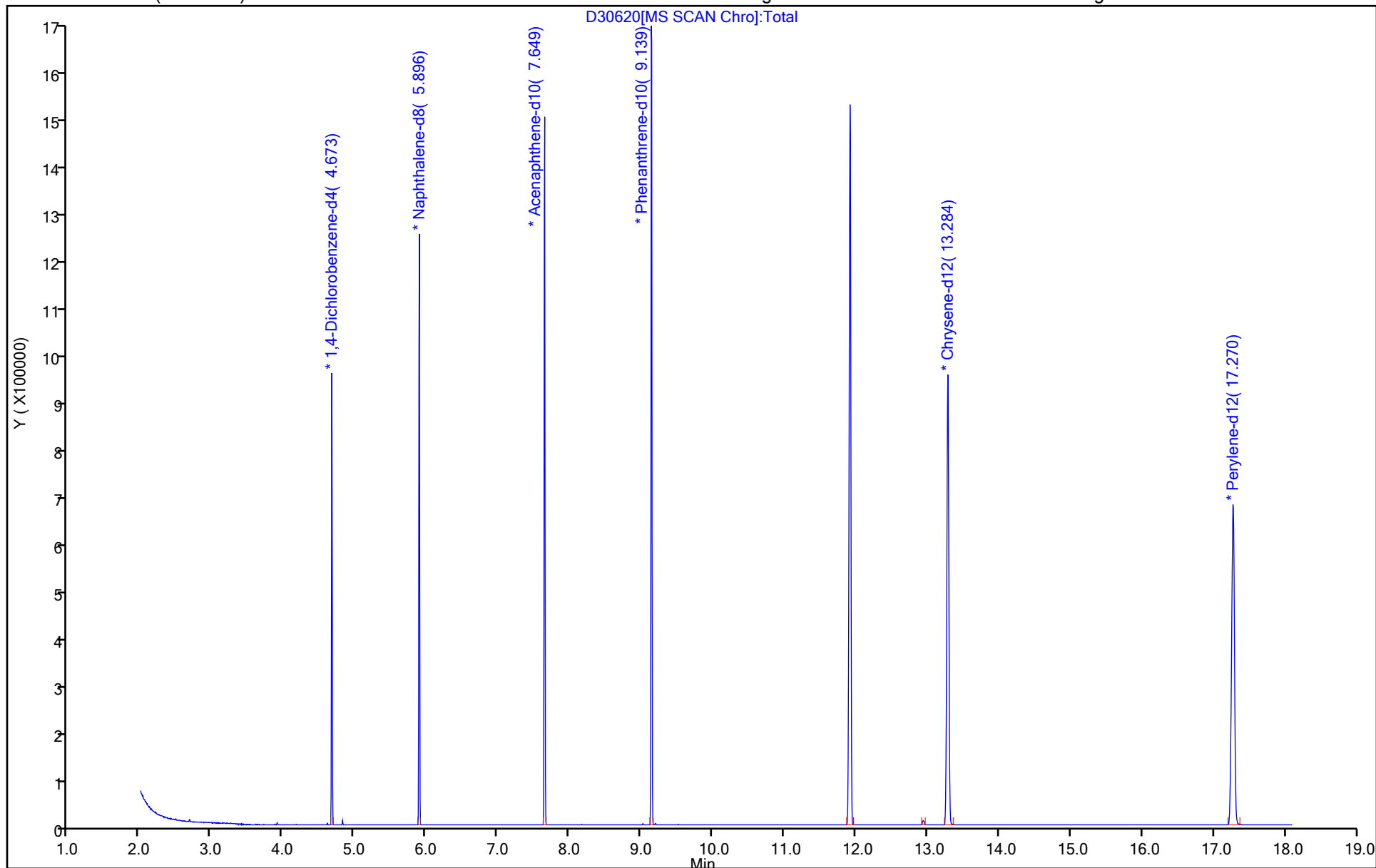
ALS Bottle#: 20

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-440162/29 Calibration Date: 12/06/2018 00:40
Instrument ID: SMS_D Calib Start Date: 12/05/2018 21:46
GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 12/06/2018 00:16
Lab File ID: D30628.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Benzidine	Ave	0.7923	0.8388		106000	100000	5.9	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30628.D
 Lims ID: ICV AFC
 Client ID:
 Sample Type: ICV
 Inject. Date: 06-Dec-2018 00:40:30 ALS Bottle#: 28 Worklist Smp#: 29
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV AFC
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist:
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:13:38 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 12:12:01

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.673	4.673	0.000	96	116885	40.0	40.0	
* 2 Naphthalene-d8	136	5.896	5.896	0.000	99	486286	40.0	40.0	
* 3 Acenaphthene-d10	164	7.643	7.648	-0.005	95	309957	40.0	40.0	
* 4 Phenanthrene-d10	188	9.139	9.139	0.000	98	668925	40.0	40.0	
* 5 Chrysene-d12	240	13.284	13.290	-0.006	99	748478	40.0	40.0	
* 6 Perylene-d12	264	17.269	17.270	-0.001	98	775156	40.0	40.0	
133 Benzidine	184	10.725	10.725	0.000	100	1569640	100.0	105.9	

Reagents:

MS-AFCBSSV100_00021

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30628.D

Injection Date: 06-Dec-2018 00:40:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: ICV AFC

Worklist Smp#: 29

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

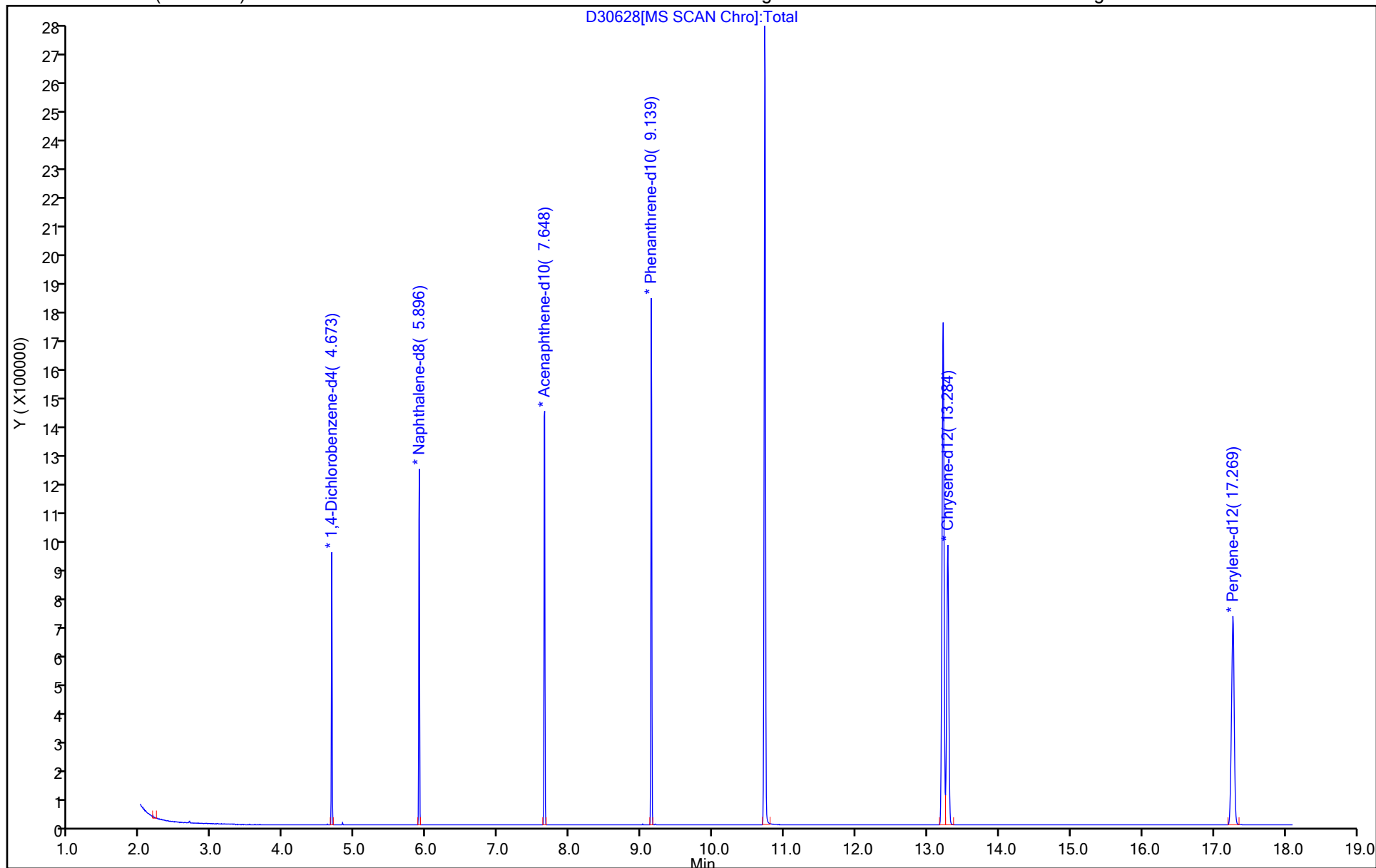
ALS Bottle#: 28

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-440302/10 Calibration Date: 12/06/2018 11:46
Instrument ID: SMS_D Calib Start Date: 12/06/2018 08:53
GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 12/06/2018 11:21
Lab File ID: D30638.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Benzaldehyde	Ave	1.222	1.244		102000	100000	1.8	55.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30638.D
 Lims ID: ICV BZHD
 Client ID:
 Sample Type: ICV
 Inject. Date: 06-Dec-2018 11:46:30 ALS Bottle#: 9 Worklist Smp#: 10
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV BZHD
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist:
 Method: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 07-Dec-2018 08:57:47 Calib Date: 06-Dec-2018 18:25:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30653.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0328

First Level Reviewer: kiekeld

Date: 07-Dec-2018 08:56:11

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.669	4.673	-0.004	96	121637	40.0	40.0	
* 2 Naphthalene-d8	136	5.893	5.891	0.002	99	494669	40.0	40.0	
* 3 Acenaphthene-d10	164	7.645	7.644	0.001	94	310543	40.0	40.0	
* 4 Phenanthrene-d10	188	9.141	9.139	0.002	98	673597	40.0	40.0	
* 5 Chrysene-d12	240	13.275	13.274	0.001	99	749436	40.0	40.0	
* 6 Perylene-d12	264	17.266	17.259	0.007	98	776570	40.0	40.0	
22 Benzaldehyde	106	4.263	4.267	-0.004	98	378412	100.0	101.8	

Reagents:

MS-BZHDB-SSV_00023

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30638.D

Injection Date: 06-Dec-2018 11:46:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: ICV BZHD

Worklist Smp#: 10

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

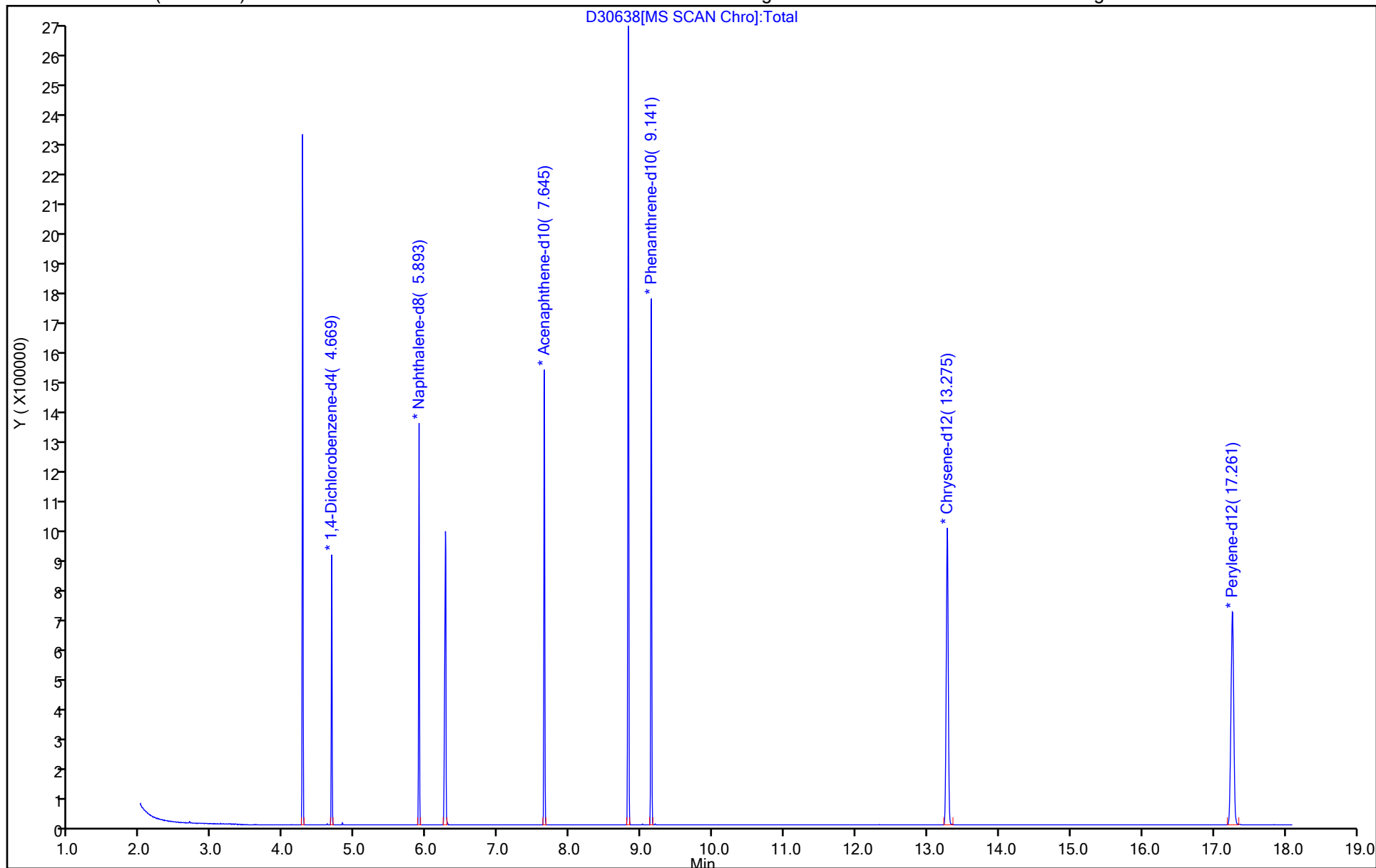
ALS Bottle#: 9

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: ICV 280-443607/11 Calibration Date: 01/08/2019 18:38

Instrument ID: SMS_D Calib Start Date: 01/08/2019 14:43

GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 01/08/2019 18:08

Lab File ID: D31084.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,4-Dioxane	Ave	0.7272	0.7333		101000	100000	0.8	20.0
N-Nitrosodimethylamine	Ave	1.154	1.168		101000	100000	1.2	20.0
Pyridine	Ave	1.849	2.004		217000	200000	8.4	20.0
Phenol	Ave	2.099	2.148		102000	100000	2.3	20.0
Aniline	Ave	2.625	2.536		96600	100000	-3.4	20.0
Bis(2-chloroethyl)ether	Ave	1.492	1.488		99700	100000	-0.3	20.0
2-Chlorophenol	Ave	1.493	1.467		98300	100000	-1.7	20.0
n-Decane	Ave	1.572	1.540		98000	100000	-2.0	20.0
1,3-Dichlorobenzene	Ave	1.561	1.536		98400	100000	-1.6	20.0
1,4-Dichlorobenzene	Ave	1.569	1.563		99600	100000	-0.4	20.0
Benzyl alcohol	Ave	1.110	1.122		101000	100000	1.1	20.0
1,2-Dichlorobenzene	Ave	1.512	1.498		99100	100000	-0.9	20.0
2-Methylphenol	Ave	1.534	1.557		102000	100000	1.5	20.0
3 & 4 Methylphenol	Ave	1.516	1.487		98100	100000	-1.9	20.0
3-Methylphenol	Ave	1.516	1.487		98100	100000	-1.9	20.0
4-Methylphenol	Ave	1.516	1.487		98100	100000	-1.9	20.0
N-Nitrosodi-n-propylamine	Ave	1.160	1.151	0.0500	99200	100000	-0.8	20.0
Acetophenone	Ave	2.113	2.077		98300	100000	-1.7	20.0
Hexachloroethane	Ave	0.5924	0.5778		97500	100000	-2.5	20.0
Nitrobenzene	Ave	0.4377	0.4342		99200	100000	-0.8	20.0
Isophorone	Ave	0.8116	0.8024		98900	100000	-1.1	20.0
2-Nitrophenol	Ave	0.1948	0.1965		101000	100000	0.9	20.0
2,4-Dimethylphenol	Ave	0.3870	0.3745		96800	100000	-3.2	20.0
Bis(2-chloroethoxy)methane	Ave	0.4630	0.4589		99100	100000	-0.9	20.0
Benzoic acid	Lin2		0.3417		206000	200000	3.2	20.0
2,4-Dichlorophenol	Ave	0.3051	0.3002		98400	100000	-1.6	20.0
1,2,4-Trichlorobenzene	Ave	0.3338	0.3278		98200	100000	-1.8	20.0
Naphthalene	Ave	1.050	1.029		98000	100000	-2.0	20.0
4-Chloroaniline	Ave	0.4713	0.4655		98800	100000	-1.2	20.0
2,6-Dichlorophenol	Ave	0.3025	0.2995		99000	100000	-1.0	20.0
Hexachlorobutadiene	Ave	0.1757	0.1753		99800	100000	-0.2	20.0
4-Chloro-3-methylphenol	Ave	0.3404	0.3437		101000	100000	0.9	20.0
2-Methylnaphthalene	Ave	0.7093	0.6830		96300	100000	-3.7	20.0
1-Methylnaphthalene	Ave	0.6625	0.6558		99000	100000	-1.0	20.0
Hexachlorocyclopentadiene	Ave	0.3536	0.3499	0.0500	98900	100000	-1.1	20.0
1,2,4,5-Tetrachlorobenzene	Ave	0.3270	0.3149		96300	100000	-3.7	20.0
2,4,6-Trichlorophenol	Ave	0.3830	0.3819		99700	100000	-0.3	20.0
2,4,5-Trichlorophenol	Ave	0.4305	0.4402		102000	100000	2.2	20.0
1,1'-Biphenyl	Ave	1.450	1.391		95900	100000	-4.1	20.0
2-Chloronaphthalene	Ave	1.156	1.114		96400	100000	-3.6	20.0
2-Nitroaniline	Ave	0.4174	0.4356		104000	100000	4.4	20.0

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: ICV 280-443607/11 Calibration Date: 01/08/2019 18:38

Instrument ID: SMS_D Calib Start Date: 01/08/2019 14:43

GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 01/08/2019 18:08

Lab File ID: D31084.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dimethyl phthalate	Ave	1.322	1.301		98400	100000	-1.6	20.0
1,3-Dinitrobenzene	Ave	0.2344	0.2508		107000	100000	7.0	20.0
2,6-Dinitrotoluene	Ave	0.3277	0.3374		103000	100000	3.0	20.0
Acenaphthylene	Ave	1.888	1.867		98900	100000	-1.1	20.0
3-Nitroaniline	Ave	0.3847	0.3960		103000	100000	3.0	20.0
Acenaphthene	Ave	1.136	1.081		95200	100000	-4.8	20.0
2,4-Dinitrophenol	Lin2		0.2298	0.0500	215000	200000	7.6	20.0
4-Nitrophenol	Ave	0.1959	0.2033	0.0500	208000	200000	3.8	20.0
2,4-Dinitrotoluene	Ave	0.4479	0.4664		104000	100000	4.1	20.0
Dibenzofuran	Ave	1.736	1.686		97100	100000	-2.9	20.0
2,3,4,6-Tetrachlorophenol	Ave	0.3616	0.3693		102000	100000	2.1	20.0
Diethyl phthalate	Ave	1.305	1.290		98800	100000	-1.2	20.0
Hexadecane	Ave	0.8144	0.7786		95600	100000	-4.4	20.0
4-Chlorophenyl phenyl ether	Ave	0.6729	0.6527		97000	100000	-3.0	20.0
Fluorene	Ave	1.379	1.328		96300	100000	-3.7	20.0
4-Nitroaniline	Ave	0.4100	0.3952		96400	100000	-3.6	20.0
4,6-Dinitro-2-methylphenol	Lin2		0.1484		228000	200000	13.9	20.0
Diphenylamine	Ave	1.234	1.215		83700	85000	-1.5	20.0
N-Nitrosodiphenylamine	Ave	0.5139	0.4899		95300	100000	-4.7	20.0
1,2-Diphenylhydrazine (as Azobenzene)	Ave	1.577	1.573		101000	101000	-0.3	20.0
Azobenzene	Ave	1.595	1.590		99700	100000	-0.3	20.0
4-Bromophenyl phenyl ether	Ave	0.2036	0.1910		93800	100000	-6.2	20.0
Hexachlorobenzene	Ave	0.1966	0.1933		98300	100000	-1.7	20.0
Pentachlorophenol	Lin2		0.1319		214000	200000	7.0	20.0
Phenanthrene	Ave	1.022	0.9814		96000	100000	-4.0	20.0
Anthracene	Ave	1.058	1.014		95800	100000	-4.2	20.0
Carbazole	Ave	1.021	0.997		97600	100000	-2.4	20.0
Di-n-butyl phthalate	Ave	1.128	1.096		97200	100000	-2.8	20.0
Fluoranthene	Ave	1.200	1.162		96900	100000	-3.1	20.0
Pyrene	Ave	1.268	1.212		95600	100000	-4.4	20.0
Butyl benzyl phthalate	Ave	0.5391	0.5398		100000	100000	0.1	20.0
Benzo[a]anthracene	Ave	1.268	1.199		94500	100000	-5.5	20.0
Chrysene	Ave	1.211	1.173		96900	100000	-3.1	20.0
Bis(2-ethylhexyl) phthalate	Ave	0.7331	0.7341		100000	100000	0.1	20.0
Di-n-octyl phthalate	Ave	1.267	1.291		102000	100000	1.9	20.0
Benzo[b]fluoranthene	Ave	1.186	1.134		95600	100000	-4.4	20.0
Benzo[k]fluoranthene	Ave	1.209	1.192		98500	100000	-1.5	20.0
Benzo[a]pyrene	Ave	1.180	1.162		98500	100000	-1.5	20.0
Indeno[1,2,3-cd]pyrene	Ave	1.062	1.040		97900	100000	-2.1	20.0
Dibenz(a,h)anthracene	Ave	1.042	1.039		99700	100000	-0.3	20.0

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-443607/11 Calibration Date: 01/08/2019 18:38
Instrument ID: SMS_D Calib Start Date: 01/08/2019 14:43
GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 01/08/2019 18:08
Lab File ID: D31084.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Benzo[g,h,i]perylene	Ave	1.105	1.053		95300	100000	-4.7	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31084.D
 Lims ID: ICV HSL 1
 Client ID:
 Sample Type: ICV
 Inject. Date: 08-Jan-2019 18:38:30 ALS Bottle#: 10 Worklist Smp#: 11
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV HSL 1
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist:

Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:20:23 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D

Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 09-Jan-2019 10:18:55

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.597	4.592	0.005	96	125201	40.0	40.0	
* 2 Naphthalene-d8	136	5.831	5.832	-0.001	99	517009	40.0	40.0	
* 3 Acenaphthene-d10	164	7.583	7.578	0.005	95	304800	40.0	40.0	
* 4 Phenanthrene-d10	188	9.073	9.069	0.004	98	642482	40.0	40.0	
* 5 Chrysene-d12	240	13.133	13.129	0.004	99	644059	40.0	40.0	
* 6 Perylene-d12	264	17.065	17.050	0.015	97	649435	40.0	40.0	
13 1,4-Dioxane	88	1.958	1.953	0.005	92	229531	100.0	100.8	
14 N-Nitrosodimethylamine	74	2.198	2.194	0.004	93	365511	100.0	101.2	
15 Pyridine	79	2.246	2.247	-0.001	99	1254287	200.0	216.7	
23 n-Decane	57	4.436	4.432	0.004	98	482059	100.0	98.0	
24 Phenol	94	4.249	4.245	0.004	97	672235	100.0	102.3	
25 Aniline	93	4.281	4.277	0.004	98	793783	100.0	96.6	
27 Bis(2-chloroethyl)ether	93	4.324	4.320	0.004	96	465864	100.0	99.7	
28 2-Chlorophenol	128	4.404	4.400	0.004	98	459272	100.0	98.3	
29 1,3-Dichlorobenzene	146	4.549	4.544	0.005	97	480902	100.0	98.4	
30 1,4-Dichlorobenzene	146	4.613	4.608	0.005	95	489124	100.0	99.6	
31 Benzyl alcohol	108	4.714	4.710	0.004	93	351227	100.0	101.1	
32 1,2-Dichlorobenzene	146	4.762	4.758	0.004	96	468867	100.0	99.1	
34 2,2'-oxybis[1-chloropropan	45	4.842	4.833	0.009	93	575915	100.0	92.1	
35 2-Methylphenol	108	4.821	4.817	0.004	93	487371	100.0	101.5	
38 N-Nitrosodi-n-propylamine	70	4.965	4.961	0.004	79	360304	100.0	99.2	a
39 Acetophenone	105	4.971	4.966	0.005	93	650045	100.0	98.3	
40 4-Methylphenol	108	4.965	4.961	0.004	90	465426	100.0	98.1	
41 3-Methylphenol	108	4.965	4.961	0.004	86	465426	100.0	98.1	
42 3 & 4 Methylphenol	108	4.965	4.961	0.004	88	465426	100.0	98.1	
44 Hexachloroethane	117	5.093	5.089	0.004	95	180838	100.0	97.5	
45 Nitrobenzene	77	5.136	5.132	0.004	86	561147	100.0	99.2	
47 Isophorone	82	5.371	5.361	0.010	99	1037112	100.0	98.9	
48 2-Nitrophenol	139	5.451	5.447	0.004	96	254017	100.0	100.9	
49 2,4-Dimethylphenol	107	5.483	5.479	0.004	96	484042	100.0	96.8	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
51 Bis(2-chloroethoxy)methane	93	5.564	5.559	0.005	99	593147	100.0	99.1	
52 Benzoic acid	105	5.622	5.607	0.015	92	883366	200.0	206.4	
53 2,4-Dichlorophenol	162	5.692	5.687	0.005	95	387992	100.0	98.4	
55 1,2,4-Trichlorobenzene	180	5.777	5.773	0.004	93	423731	100.0	98.2	
56 Naphthalene	128	5.857	5.853	0.004	97	1329869	100.0	98.0	
57 4-Chloroaniline	127	5.895	5.890	0.005	96	601616	100.0	98.8	
58 2,6-Dichlorophenol	162	5.911	5.906	0.005	97	387058	100.0	99.0	
60 Hexachlorobutadiene	225	5.980	5.976	0.004	96	226591	100.0	99.8	
64 4-Chloro-3-methylphenol	107	6.370	6.371	-0.001	97	444169	100.0	100.9	
66 2-Methylnaphthalene	142	6.536	6.537	-0.001	93	882773	100.0	96.3	
67 1-Methylnaphthalene	142	6.637	6.633	0.004	94	847675	100.0	99.0	
68 Hexachlorocyclopentadiene	237	6.707	6.702	0.005	95	266596	100.0	98.9	
69 1,2,4,5-Tetrachlorobenzene	216	6.712	6.708	0.004	97	406945	100.0	96.3	
71 2,4,6-Trichlorophenol	196	6.819	6.815	0.004	91	291020	100.0	99.7	
72 2,4,5-Trichlorophenol	196	6.856	6.857	-0.001	96	335401	100.0	102.2	
74 1,1'-Biphenyl	154	7.001	6.996	0.005	95	1060282	100.0	95.9	
75 2-Chloronaphthalene	162	7.027	7.023	0.004	96	848711	100.0	96.4	
77 2-Nitroaniline	65	7.113	7.108	0.005	82	331911	100.0	104.4	
80 Dimethyl phthalate	163	7.289	7.285	0.004	98	991539	100.0	98.4	
81 1,3-Dinitrobenzene	168	7.316	7.311	0.005	87	191130	100.0	107.0	
82 2,6-Dinitrotoluene	165	7.348	7.343	0.005	96	257098	100.0	103.0	
83 Acenaphthylene	152	7.444	7.440	0.004	99	1422498	100.0	98.9	
84 3-Nitroaniline	138	7.524	7.520	0.004	94	301784	100.0	103.0	
85 Acenaphthene	153	7.615	7.611	0.004	95	823862	100.0	95.2	
86 2,4-Dinitrophenol	184	7.626	7.621	0.005	83	350256	200.0	215.2	
88 4-Nitrophenol	109	7.700	7.696	0.004	93	309864	200.0	207.6	
89 2,4-Dinitrotoluene	165	7.754	7.749	0.005	93	355408	100.0	104.1	
90 Dibenzofuran	168	7.786	7.787	-0.001	98	1284767	100.0	97.1	
92 Hexadecane	57	8.010	8.006	0.004	97	593312	100.0	95.6	
93 2,3,4,6-Tetrachlorophenol	232	7.914	7.910	0.004	72	281366	100.0	102.1	
95 Diethyl phthalate	149	7.994	7.990	0.004	98	983093	100.0	98.8	
97 4-Chlorophenyl phenyl ether	204	8.117	8.113	0.004	91	497332	100.0	97.0	
99 Fluorene	166	8.133	8.129	0.004	94	1011850	100.0	96.3	
100 4-Nitroaniline	138	8.144	8.134	0.010	86	301131	100.0	96.4	
101 4,6-Dinitro-2-methylphenol	198	8.176	8.171	0.005	88	476732	200.0	227.8	
102 N-Nitrosodiphenylamine	169	8.235	8.230	0.005	62	786897	100.0	95.3	
103 Diphenylamine	169	8.235	8.230	0.005	96	786897	85.0	83.7	
105 1,2-Diphenylhydrazine	77	8.277	8.273	0.004	98	1211567	101.1	100.8	
106 Azobenzene	77	8.277	8.273	0.004	98	1211567	100.0	99.7	
114 4-Bromophenyl phenyl ether	248	8.609	8.604	0.005	66	306832	100.0	93.8	
116 Hexachlorobenzene	284	8.699	8.695	0.004	95	310514	100.0	98.3	
119 Pentachlorophenol	266	8.886	8.882	0.004	94	423605	200.0	214.1	
123 Phenanthrene	178	9.100	9.096	0.004	98	1576286	100.0	96.0	
124 Anthracene	178	9.148	9.144	0.004	98	1629050	100.0	95.8	
125 Carbazole	167	9.298	9.293	0.005	95	1602084	100.0	97.6	
127 Di-n-butyl phthalate	149	9.634	9.630	0.004	100	1760786	100.0	97.2	
132 Fluoranthene	202	10.462	10.453	0.009	99	1867192	100.0	96.9	
134 Pyrene	202	10.793	10.789	0.004	96	1951148	100.0	95.6	
141 Butyl benzyl phthalate	149	11.905	11.900	0.005	98	869078	100.0	100.1	
145 Benzo[a]anthracene	228	13.112	13.102	0.010	99	1930017	100.0	94.5	
146 Chrysene	228	13.197	13.193	0.004	98	1888269	100.0	96.9	
147 Bis(2-ethylhexyl) phthalat	149	13.272	13.268	0.004	97	1182037	100.0	100.1	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
148 Di-n-octyl phthalate	149	15.078	15.073	0.005	99	2078137	100.0	101.9	
150 Benzo[b]fluoranthene	252	15.975	15.966	0.009	98	1840620	100.0	95.6	
151 Benzo[k]fluoranthene	252	16.061	16.046	0.015	99	1934531	100.0	98.5	
153 Benzo[a]pyrene	252	16.910	16.895	0.015	81	1886579	100.0	98.5	
156 Indeno[1,2,3-cd]pyrene	276	20.190	20.175	0.015	99	1673826	100.0	97.9	
157 Dibenz(a,h)anthracene	278	20.281	20.271	0.010	94	1687682	100.0	99.7	
158 Benzo[g,h,i]perylene	276	20.928	20.918	0.010	97	1709062	100.0	95.3	

QC Flag Legend

Review Flags

a - User Assigned ID

Reagents:

MS-HSLB1B3SSV_00052

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31084.D

Injection Date: 08-Jan-2019 18:38:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: ICV HSL 1

Worklist Smp#: 11

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

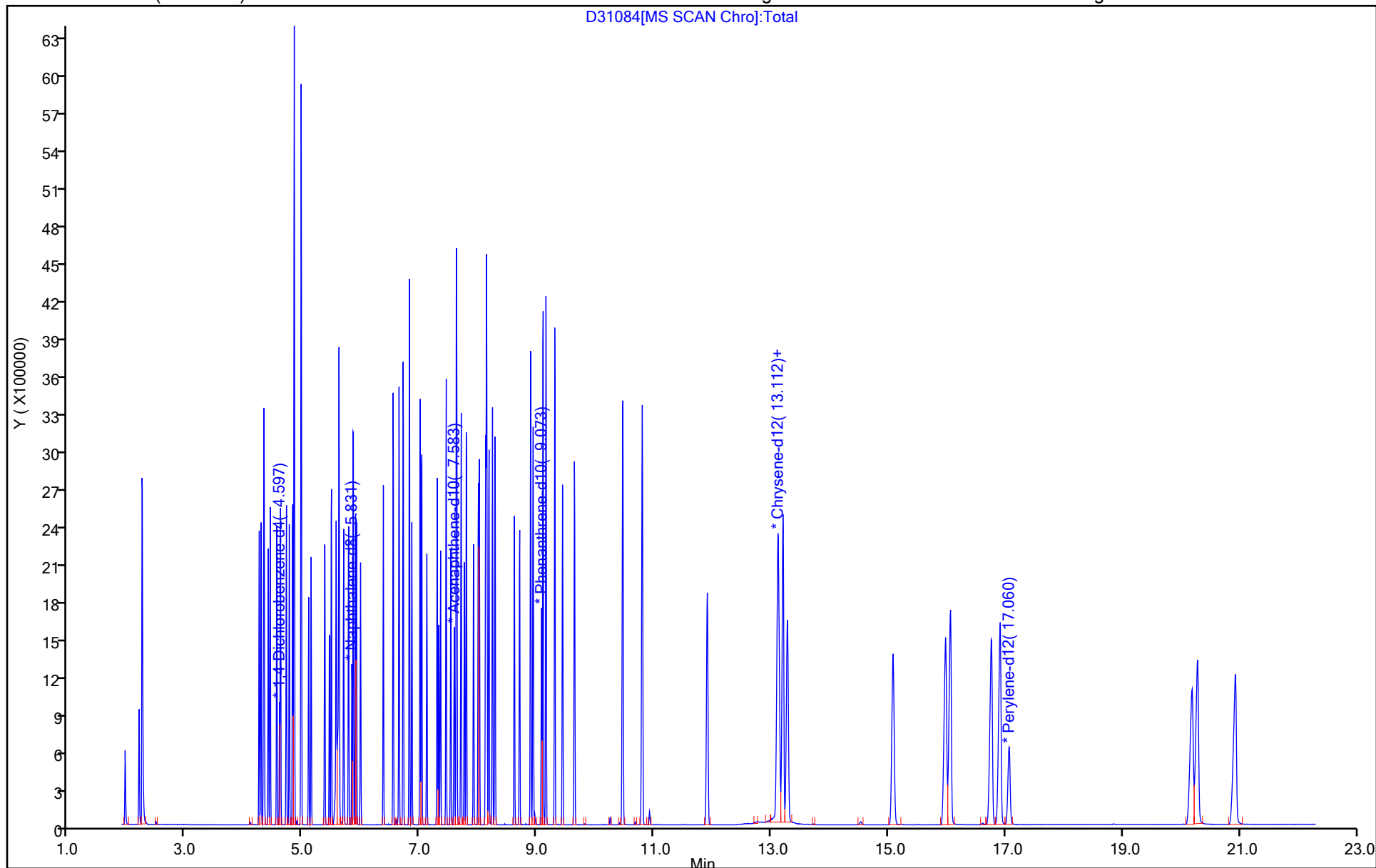
ALS Bottle#: 10

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

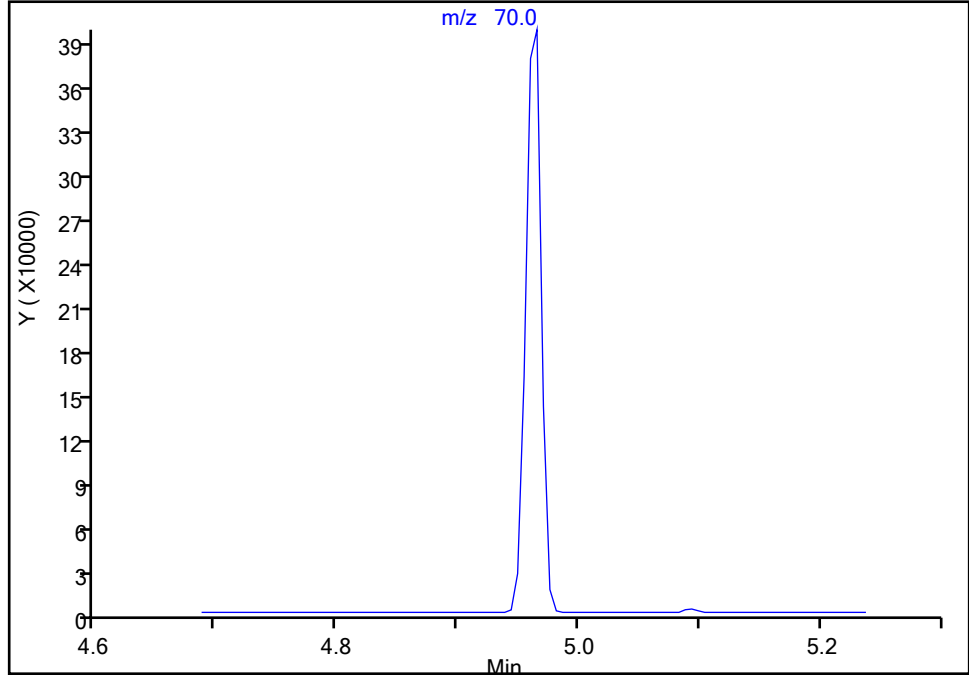
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Injection Date: 08-Jan-2019 18:38:30 Instrument ID: SMS_D
Lims ID: ICV HSL 1
Client ID:
Operator ID: KIEKELD ALS Bottle#: 10 Worklist Smp#: 11
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

38 N-Nitrosodi-n-propylamine, CAS: 621-64-7

Signal: 1

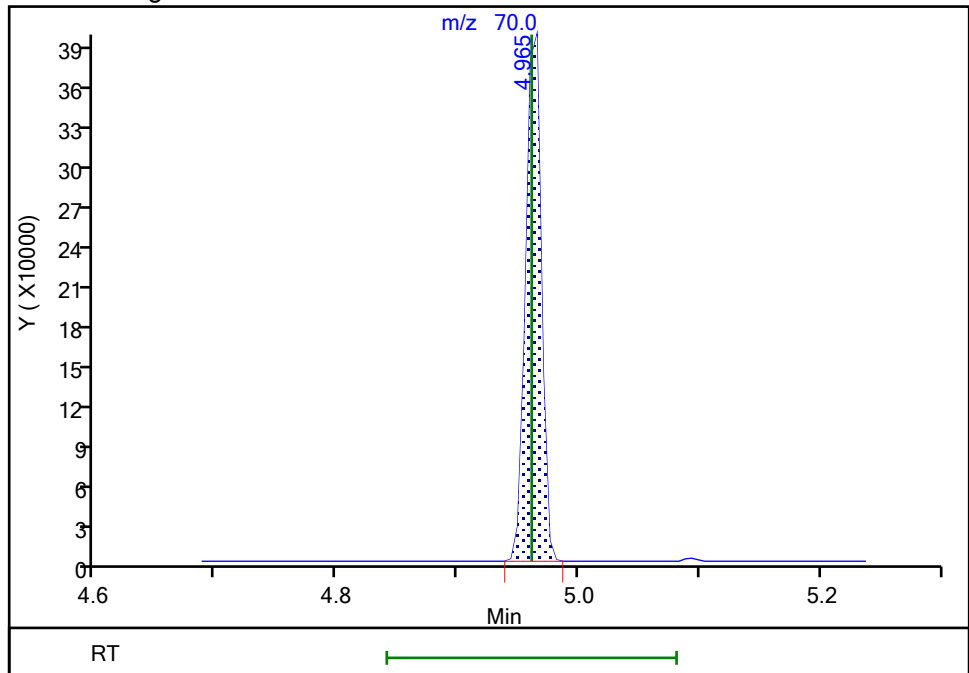
Not Detected
Expected RT: 4.96

Processing Integration Results



RT: 4.97
Area: 360304
Amount: 99.216361
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 09-Jan-2019 10:17:08
Audit Action: Assigned Compound ID

Audit Reason: Assign Peak

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-443607/12 Calibration Date: 01/08/2019 19:07
Instrument ID: SMS_D Calib Start Date: 01/08/2019 14:43
GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 01/08/2019 18:08
Lab File ID: D31085.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Caprolactam	Ave	0.1875	0.1868		99600	100000	-0.4	20.0
Atrazine	Ave	0.1961	0.2018		103000	100000	2.9	20.0
3,3'-Dichlorobenzidine	Ave	0.4193	0.4737		113000	100000	13.0	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31085.D
 Lims ID: ICV HSL 2
 Client ID:
 Sample Type: ICV
 Inject. Date: 08-Jan-2019 19:07:30 ALS Bottle#: 11 Worklist Smp#: 12
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV HSL 2
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist:
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:20:23 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 09-Jan-2019 10:19:10

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.597	4.592	0.005	96	110316	40.0	40.0	
* 2 Naphthalene-d8	136	5.831	5.832	-0.001	99	443859	40.0	40.0	
* 3 Acenaphthene-d10	164	7.577	7.578	-0.001	95	259621	40.0	40.0	
* 4 Phenanthrene-d10	188	9.068	9.069	-0.001	98	546221	40.0	40.0	
* 5 Chrysene-d12	240	13.123	13.129	-0.006	99	627075	40.0	40.0	
* 6 Perylene-d12	264	17.054	17.050	0.004	97	633770	40.0	40.0	
63 Caprolactam	55	6.205	6.232	-0.027	83	207307	100.0	99.6	
112 Atrazine	200	8.753	8.754	-0.001	95	275532	100.0	102.9	
144 3,3'-Dichlorobenzidine	252	13.059	13.059	-0.001	75	742569	100.0	113.0	

Reagents:

MS-HSLB2SSV_00047

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31085.D

Injection Date: 08-Jan-2019 19:07:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: ICV HSL 2

Worklist Smp#: 12

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

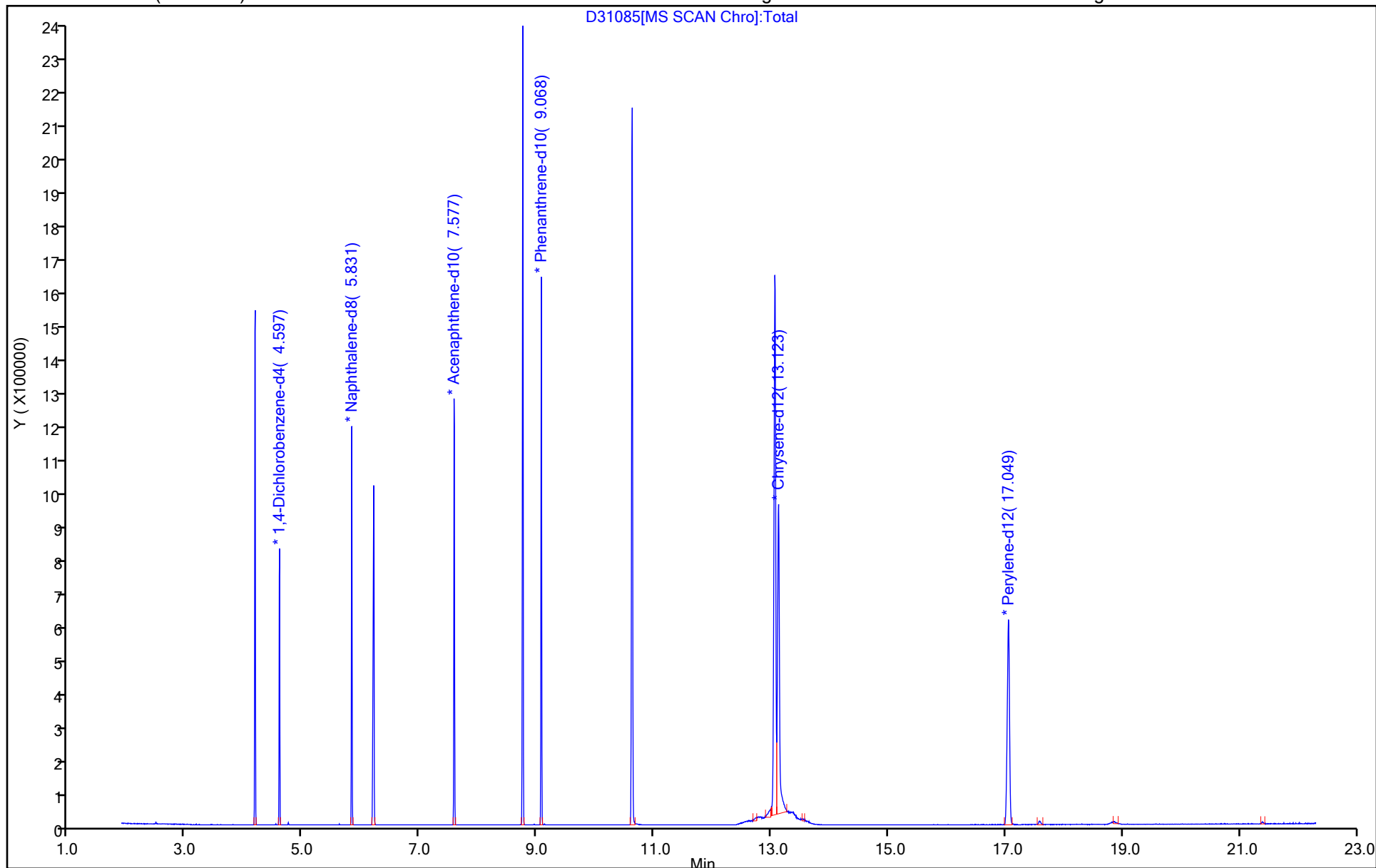
ALS Bottle#: 11

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: CCV 280-445019/3 Calibration Date: 01/22/2019 13:59
Instrument ID: SMS_D Calib Start Date: 12/05/2018 18:02
GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 12/05/2018 20:57
Lab File ID: D31281.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Famphur	Ave	0.4133	0.2997		58000	80000	-27.5*	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31281.D
 Lims ID: CCV HSL
 Client ID:
 Sample Type: CCV
 Inject. Date: 22-Jan-2019 13:59:30 ALS Bottle#: 2 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCV HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub8
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:35 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 22-Jan-2019 15:53:21

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.505	4.505	0.000	95	152080	40.0	40.0	
* 2 Naphthalene-d8	136	5.739	5.739	0.000	99	605546	40.0	40.0	
* 3 Acenaphthene-d10	164	7.481	7.481	0.000	94	347168	40.0	40.0	
* 4 Phenanthrene-d10	188	8.966	8.966	0.000	97	710100	40.0	40.0	
* 5 Chrysene-d12	240	12.908	12.908	0.000	99	710819	40.0	40.0	
* 6 Perylene-d12	264	16.755	16.755	0.000	97	704464	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.309	3.309	0.000	92	460859	80.0	80.6	
\$ 8 Phenol-d5	99	4.153	4.153	0.000	98	594791	80.0	78.1	
\$ 9 Nitrobenzene-d5	82	5.023	5.023	0.000	87	529900	80.0	81.2	
\$ 10 2-Fluorobiphenyl	172	6.797	6.797	0.000	99	1008295	80.0	83.5	
\$ 11 2,4,6-Tribromophenol	330	8.271	8.271	0.000	94	140396	80.0	83.7	
\$ 12 Terphenyl-d14	244	10.857	10.857	0.000	98	1334829	80.0	81.7	
13 1,4-Dioxane	88	1.856	1.856	0.000	92	215004	80.0	77.8	
14 N-Nitrosodimethylamine	74	2.096	2.096	0.000	93	335392	80.0	76.5	
15 Pyridine	79	2.149	2.149	0.000	98	1113198	160.0	158.3	
23 n-Decane	57	4.345	4.345	0.000	97	461162	80.0	77.1	
24 Phenol	94	4.169	4.169	0.000	98	637406	80.0	79.9	
25 Aniline	93	4.190	4.190	0.000	98	773672	80.0	77.5	
27 Bis(2-chloroethyl)ether	93	4.233	4.233	0.000	93	442317	80.0	78.0	
28 2-Chlorophenol	128	4.313	4.313	0.000	97	457187	80.0	80.5	
29 1,3-Dichlorobenzene	146	4.457	4.457	0.000	97	481218	80.0	81.1	
30 1,4-Dichlorobenzene	146	4.521	4.521	0.000	93	489223	80.0	82.0	
31 Benzyl alcohol	108	4.623	4.623	0.000	94	334872	80.0	79.3	
32 1,2-Dichlorobenzene	146	4.671	4.671	0.000	96	471288	80.0	82.0	
34 2,2'-oxybis[1-chloropropan	45	4.746	4.746	0.000	94	580191	80.0	76.3	
35 2-Methylphenol	108	4.735	4.735	0.000	95	463129	80.0	79.4	
38 N-Nitrosodi-n-propylamine	70	4.874	4.874	0.000	86	343388	80.0	77.8	
39 Acetophenone	105	4.879	4.879	0.000	90	635679	80.0	79.1	
40 4-Methylphenol	108	4.879	4.879	0.000	93	462897	80.0	80.3	
41 3-Methylphenol	108	4.879	4.879	0.000	92	462897	80.0	80.3	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.879	4.879	0.000	73	462897	80.0	80.3	
44 Hexachloroethane	117	4.997	4.997	0.000	94	182076	80.0	80.8	
45 Nitrobenzene	77	5.045	5.045	0.000	85	532044	80.0	80.3	
47 Isophorone	82	5.275	5.275	0.000	99	955596	80.0	77.8	
48 2-Nitrophenol	139	5.355	5.355	0.000	96	246198	80.0	83.5	
49 2,4-Dimethylphenol	107	5.392	5.392	0.000	96	481491	80.0	82.2	
51 Bis(2-chloroethoxy)methane	93	5.472	5.472	0.000	99	567635	80.0	81.0	
52 Benzoic acid	105	5.536	5.536	0.000	88	786558	160.0	158.1	
53 2,4-Dichlorophenol	162	5.600	5.600	0.000	93	395732	80.0	85.7	
55 1,2,4-Trichlorobenzene	180	5.681	5.681	0.000	93	421171	80.0	83.3	
56 Naphthalene	128	5.761	5.761	0.000	97	1323788	80.0	83.3	
57 4-Chloroaniline	127	5.798	5.798	0.000	96	583776	80.0	81.8	
58 2,6-Dichlorophenol	162	5.819	5.819	0.000	97	387073	80.0	84.5	
60 Hexachlorobutadiene	225	5.884	5.884	0.000	96	226387	80.0	85.1	
63 Caprolactam	55	6.145	6.145	0.000	88	207327	80.0	73.0	M
64 4-Chloro-3-methylphenol	107	6.290	6.290	0.000	96	419780	80.0	81.5	
66 2-Methylnaphthalene	142	6.439	6.439	0.000	93	895880	80.0	83.4	
67 1-Methylnaphthalene	142	6.541	6.541	0.000	94	842577	80.0	84.0	
68 Hexachlorocyclopentadiene	237	6.610	6.610	0.000	95	269598	80.0	87.8	
69 1,2,4,5-Tetrachlorobenzene	216	6.615	6.615	0.000	97	414101	80.0	83.6	
71 2,4,6-Trichlorophenol	196	6.722	6.722	0.000	93	284893	80.0	85.7	
72 2,4,5-Trichlorophenol	196	6.765	6.765	0.000	96	321205	80.0	86.0	
74 1,1'-Biphenyl	154	6.899	6.899	0.000	95	1053308	80.0	83.7	
75 2-Chloronaphthalene	162	6.925	6.925	0.000	97	827910	80.0	82.5	
77 2-Nitroaniline	65	7.016	7.016	0.000	83	288341	80.0	79.6	
80 Dimethyl phthalate	163	7.192	7.192	0.000	98	941120	80.0	82.0	
81 1,3-Dinitrobenzene	168	7.219	7.219	0.000	86	168679	80.0	82.9	
82 2,6-Dinitrotoluene	165	7.251	7.251	0.000	96	236770	80.0	83.2	
83 Acenaphthylene	152	7.342	7.342	0.000	99	1357333	80.0	82.8	
84 3-Nitroaniline	138	7.427	7.427	0.000	95	270743	80.0	81.1	
85 Acenaphthene	153	7.513	7.513	0.000	95	810339	80.0	82.2	
86 2,4-Dinitrophenol	184	7.529	7.529	0.000	83	289490	160.0	157.8	
88 4-Nitrophenol	109	7.609	7.609	0.000	93	293745	160.0	172.8	
89 2,4-Dinitrotoluene	165	7.657	7.657	0.000	94	324921	80.0	83.6	
90 Dibenzofuran	168	7.684	7.684	0.000	98	1222760	80.0	81.1	
92 Hexadecane	57	7.914	7.914	0.000	97	564406	80.0	79.8	
93 2,3,4,6-Tetrachlorophenol	232	7.812	7.812	0.000	72	268888	80.0	85.7	
95 Diethyl phthalate	149	7.892	7.892	0.000	98	940426	80.0	83.0	
97 4-Chlorophenyl phenyl ethe	204	8.015	8.015	0.000	92	474015	80.0	81.2	
99 Fluorene	166	8.026	8.026	0.000	94	974453	80.0	81.4	
100 4-Nitroaniline	138	8.042	8.042	0.000	86	287108	80.0	80.7	
101 4,6-Dinitro-2-methylphenol	198	8.074	8.074	0.000	90	373541	160.0	162.5	
102 N-Nitrosodiphenylamine	169	8.133	8.133	0.000	61	742439	80.0	81.4	
103 Diphenylamine	169	8.133	8.133	0.000	96	742439	68.0	69.3	
105 1,2-Diphenylhydrazine	77	8.175	8.175	0.000	98	1104798	80.9	80.7	
106 Azobenzene	77	8.175	8.175	0.000	98	1104798	80.0	79.8	
112 Atrazine	200	8.656	8.656	0.000	95	270548	80.0	77.7	
114 4-Bromophenyl phenyl ether	248	8.507	8.507	0.000	65	297381	80.0	82.3	
116 Hexachlorobenzene	284	8.592	8.592	0.000	95	288365	80.0	82.6	
119 Pentachlorophenol	266	8.784	8.784	0.000	93	368800	160.0	169.0	
123 Phenanthrene	178	8.993	8.993	0.000	98	1463291	80.0	80.6	
124 Anthracene	178	9.041	9.041	0.000	98	1516181	80.0	80.7	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.196	9.196	0.000	95	1465094	80.0	80.8	
127 Di-n-butyl phthalate	149	9.527	9.527	0.000	100	1649203	80.0	82.4	
132 Fluoranthene	202	10.312	10.312	0.000	98	1736612	80.0	81.5	
134 Pyrene	202	10.638	10.638	0.000	97	1819194	80.0	80.8	
139 Famphur	218	11.600	11.600	0.000	99	425993	80.0	58.0	
141 Butyl benzyl phthalate	149	11.717	11.717	0.000	98	800373	80.0	83.5	
144 3,3'-Dichlorobenzidine	252	12.850	12.850	0.000	73	599451	80.0	80.4	
145 Benzo[a]anthracene	228	12.887	12.887	0.000	99	1847066	80.0	82.0	
146 Chrysene	228	12.973	12.973	0.000	97	1779075	80.0	82.7	
147 Bis(2-ethylhexyl) phthalat	149	13.053	13.053	0.000	97	1102334	80.0	84.6	
148 Di-n-octyl phthalate	149	14.821	14.821	0.000	99	1899070	80.0	84.4	
150 Benzo[b]fluoranthene	252	15.686	15.686	0.000	98	1773210	80.0	84.9	
151 Benzo[k]fluoranthene	252	15.766	15.766	0.000	99	1810273	80.0	85.0	
153 Benzo[a]pyrene	252	16.600	16.600	0.000	78	1751258	80.0	84.3	
156 Indeno[1,2,3-cd]pyrene	276	19.837	19.837	0.000	98	1526449	80.0	80.9	
157 Dibenz(a,h)anthracene	278	19.939	19.939	0.000	93	1527225	80.0	83.2	
158 Benzo[g,h,i]perylene	276	20.574	20.574	0.000	97	1606530	80.0	82.5	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MS-HSLACCV080_00178

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31281.D

Injection Date: 22-Jan-2019 13:59:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: CCV HSL

Worklist Smp#: 3

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

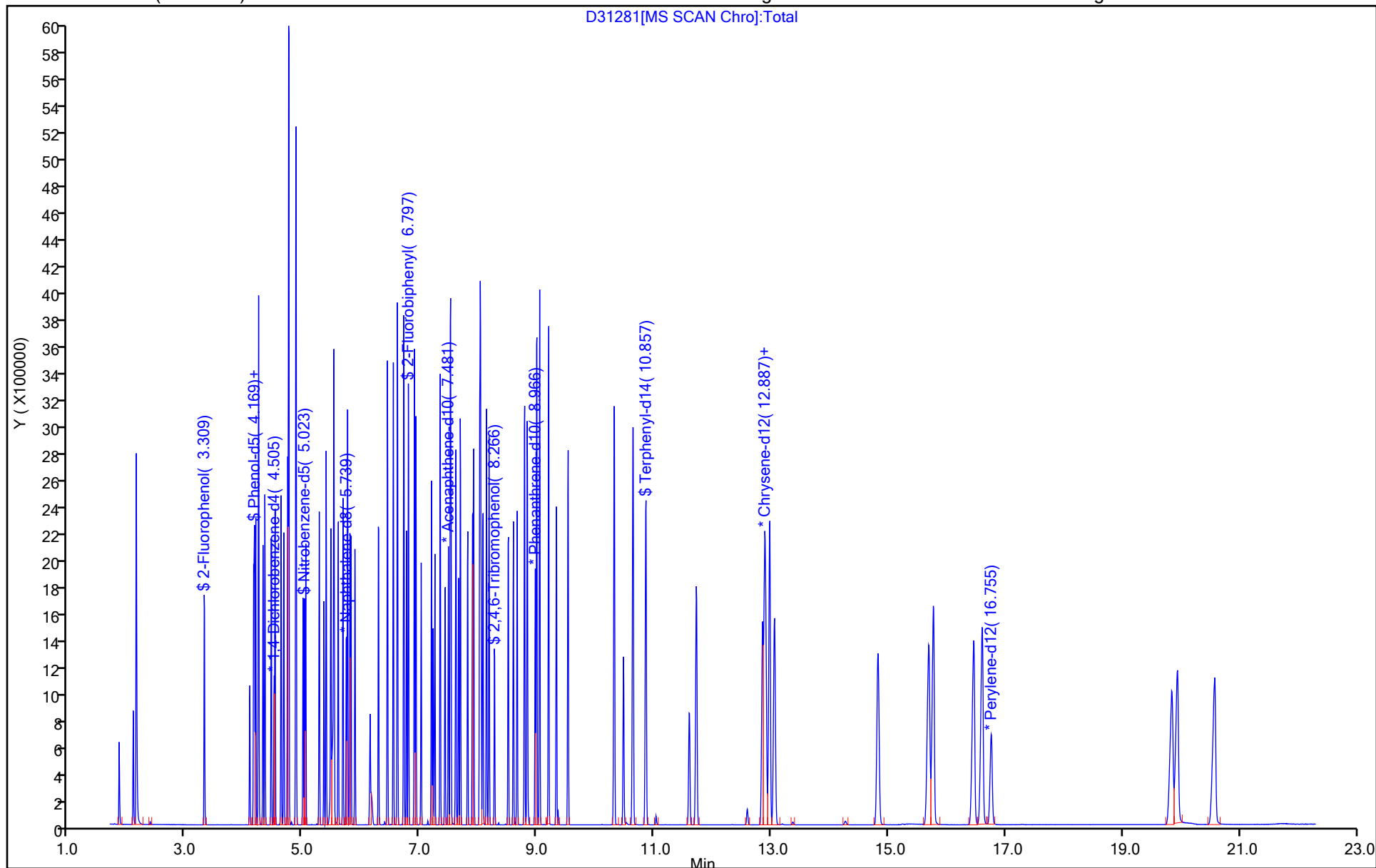
ALS Bottle#: 2

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: CCV 280-445019/3 Calibration Date: 01/22/2019 13:59

Instrument ID: SMS_D Calib Start Date: 01/08/2019 14:43

GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 01/08/2019 18:08

Lab File ID: D31281.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,4-Dioxane	Ave	0.7272	0.7069		77800	80000	-2.8	20.0
N-Nitrosodimethylamine	Ave	1.154	1.103		76500	80000	-4.4	20.0
Pyridine	Ave	1.849	1.830		158000	160000	-1.0	20.0
Phenol	Ave	2.099	2.096		79900	80000	-0.2	20.0
Aniline	Ave	2.625	2.544		77500	80000	-3.1	20.0
Bis(2-chloroethyl)ether	Ave	1.492	1.454		78000	80000	-2.6	20.0
2-Chlorophenol	Ave	1.493	1.503		80500	80000	0.7	20.0
n-Decane	Ave	1.572	1.516		77100	80000	-3.6	20.0
1,3-Dichlorobenzene	Ave	1.561	1.582		81100	80000	1.4	20.0
1,4-Dichlorobenzene	Ave	1.569	1.608		82000	80000	2.5	20.0
Benzyl alcohol	Ave	1.110	1.101		79300	80000	-0.8	20.0
1,2-Dichlorobenzene	Ave	1.512	1.549		82000	80000	2.5	20.0
2-Methylphenol	Ave	1.534	1.523		79400	80000	-0.7	20.0
N-Nitrosodi-n-propylamine	Ave	1.160	1.129	0.0500	77800	80000	-2.7	20.0
3 & 4 Methylphenol	Ave	1.516	1.522		80300	80000	0.4	20.0
3-Methylphenol	Ave	1.516	1.522		80300	80000	0.4	20.0
4-Methylphenol	Ave	1.516	1.522		80300	80000	0.4	20.0
Acetophenone	Ave	2.113	2.090		79100	80000	-1.1	20.0
Hexachloroethane	Ave	0.5924	0.5986		80800	80000	1.0	20.0
Nitrobenzene	Ave	0.4377	0.4393		80300	80000	0.4	20.0
Isophorone	Ave	0.8116	0.7890		77800	80000	-2.8	20.0
2-Nitrophenol	Ave	0.1948	0.2033		83500	80000	4.3	20.0
2,4-Dimethylphenol	Ave	0.3870	0.3976		82200	80000	2.7	20.0
Bis(2-chloroethoxy)methane	Ave	0.4630	0.4687		81000	80000	1.2	20.0
Benzoic acid	Lin2		0.3247		158000	160000	-1.2	20.0
2,4-Dichlorophenol	Ave	0.3051	0.3268		85700	80000	7.1	20.0
1,2,4-Trichlorobenzene	Ave	0.3338	0.3478		83300	80000	4.2	20.0
Naphthalene	Ave	1.050	1.093		83300	80000	4.1	20.0
4-Chloroaniline	Ave	0.4713	0.4820		81800	80000	2.3	20.0
2,6-Dichlorophenol	Ave	0.3025	0.3196		84500	80000	5.7	20.0
Hexachlorobutadiene	Ave	0.1757	0.1869		85100	80000	6.4	20.0
Caprolactam	Ave	0.1875	0.1712		73000	80000	-8.7	20.0
4-Chloro-3-methylphenol	Ave	0.3404	0.3466		81500	80000	1.8	20.0
2-Methylnaphthalene	Ave	0.7093	0.7397		83400	80000	4.3	20.0
1-Methylnaphthalene	Ave	0.6625	0.6957		84000	80000	5.0	20.0
Hexachlorocyclopentadiene	Ave	0.3536	0.3883	0.0500	87800	80000	9.8	20.0
1,2,4,5-Tetrachlorobenzene	Ave	0.3270	0.3419		83600	80000	4.6	20.0
2,4,6-Trichlorophenol	Ave	0.3830	0.4103		85700	80000	7.1	20.0
2,4,5-Trichlorophenol	Ave	0.4305	0.4626		86000	80000	7.5	20.0
1,1'-Biphenyl	Ave	1.450	1.517		83700	80000	4.6	20.0
2-Chloronaphthalene	Ave	1.156	1.192		82500	80000	3.2	20.0

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: CCV 280-445019/3 Calibration Date: 01/22/2019 13:59

Instrument ID: SMS_D Calib Start Date: 01/08/2019 14:43

GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 01/08/2019 18:08

Lab File ID: D31281.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
2-Nitroaniline	Ave	0.4174	0.4153		79600	80000	-0.5	20.0
Dimethyl phthalate	Ave	1.322	1.355		82000	80000	2.5	20.0
1,3-Dinitrobenzene	Ave	0.2344	0.2429		82900	80000	3.7	20.0
2,6-Dinitrotoluene	Ave	0.3277	0.3410		83200	80000	4.1	20.0
Acenaphthylene	Ave	1.888	1.955		82800	80000	3.5	20.0
3-Nitroaniline	Ave	0.3847	0.3899		81100	80000	1.4	20.0
Acenaphthene	Ave	1.136	1.167		82200	80000	2.8	20.0
2,4-Dinitrophenol	Lin2		0.2085	0.0500	158000	160000	-1.4	20.0
4-Nitrophenol	Ave	0.1959	0.2115	0.0500	173000	160000	8.0	20.0
2,4-Dinitrotoluene	Ave	0.4479	0.4680		83600	80000	4.5	20.0
Dibenzofuran	Ave	1.736	1.761		81100	80000	1.4	20.0
2,3,4,6-Tetrachlorophenol	Ave	0.3616	0.3873		85700	80000	7.1	20.0
Diethyl phthalate	Ave	1.305	1.354		83000	80000	3.8	20.0
Hexadecane	Ave	0.8144	0.8129		79800	80000	-0.2	20.0
4-Chlorophenyl phenyl ether	Ave	0.6729	0.6827		81200	80000	1.5	20.0
Fluorene	Ave	1.379	1.403		81400	80000	1.8	20.0
4-Nitroaniline	Ave	0.4100	0.4135		80700	80000	0.8	20.0
4,6-Dinitro-2-methylphenol	Lin2		0.1315		162000	160000	1.6	20.0
Diphenylamine	Ave	1.234	1.258		69300	68000	2.0	20.0
N-Nitrosodiphenylamine	Ave	0.5139	0.5228		81400	80000	1.7	20.0
1,2-Diphenylhydrazine (as Azobenzene)	Ave	1.577	1.574		80700	80900	-0.2	20.0
Azobenzene	Ave	1.595	1.591		79800	80000	-0.2	20.0
4-Bromophenyl phenyl ether	Ave	0.2036	0.2094		82300	80000	2.9	20.0
Hexachlorobenzene	Ave	0.1966	0.2031		82600	80000	3.3	20.0
Atrazine	Ave	0.1961	0.1905		77700	80000	-2.9	20.0
Pentachlorophenol	Lin2		0.1298		169000	160000	5.6	20.0
Phenanthrene	Ave	1.022	1.030		80600	80000	0.8	20.0
Anthracene	Ave	1.058	1.068		80700	80000	0.9	20.0
Carbazole	Ave	1.021	1.032		80800	80000	1.0	20.0
Di-n-butyl phthalate	Ave	1.128	1.161		82400	80000	3.0	20.0
Fluoranthene	Ave	1.200	1.223		81500	80000	1.9	20.0
Pyrene	Ave	1.268	1.280		80800	80000	0.9	20.0
Butyl benzyl phthalate	Ave	0.5391	0.5630		83500	80000	4.4	20.0
3,3'-Dichlorobenzidine	Ave	0.4193	0.4217		80400	80000	0.6	20.0
Benzo[a]anthracene	Ave	1.268	1.299		82000	80000	2.4	20.0
Chrysene	Ave	1.211	1.251		82700	80000	3.4	20.0
Bis(2-ethylhexyl) phthalate	Ave	0.7331	0.7754		84600	80000	5.8	20.0
Di-n-octyl phthalate	Ave	1.267	1.336		84400	80000	5.5	20.0
Benzo[b]fluoranthene	Ave	1.186	1.259		84900	80000	6.2	20.0
Benzo[k]fluoranthene	Ave	1.209	1.285		85000	80000	6.2	20.0

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCV 280-445019/3 Calibration Date: 01/22/2019 13:59
 Instrument ID: SMS_D Calib Start Date: 01/08/2019 14:43
 GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 01/08/2019 18:08
 Lab File ID: D31281.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Benzo[a]pyrene	Ave	1.180	1.243		84300	80000	5.4	20.0
Indeno[1,2,3-cd]pyrene	Ave	1.062	1.074		80900	80000	1.1	20.0
Dibenz(a,h)anthracene	Ave	1.042	1.084		83200	80000	4.0	20.0
Benzo[g,h,i]perylene	Ave	1.105	1.140		82500	80000	3.2	20.0
2-Fluorophenol (Surr)	Ave	1.503	1.515		80600	80000	0.8	20.0
Phenol-d5 (Surr)	Ave	2.002	1.956		78100	80000	-2.3	20.0
Nitrobenzene-d5 (Surr)	Ave	0.4310	0.4375		81200	80000	1.5	20.0
2-Fluorobiphenyl	Ave	1.391	1.452		83500	80000	4.4	20.0
2,4,6-Tribromophenol (Surr)	Ave	0.1932	0.2022		83700	80000	4.6	20.0
Terphenyl-d14 (Surr)	Ave	0.9194	0.9389		81700	80000	2.1	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31281.D
 Lims ID: CCV HSL
 Client ID:
 Sample Type: CCV
 Inject. Date: 22-Jan-2019 13:59:30 ALS Bottle#: 2 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCV HSL
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub8
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:35 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 22-Jan-2019 15:53:21

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.505	4.505	0.000	95	152080	40.0	40.0	
* 2 Naphthalene-d8	136	5.739	5.739	0.000	99	605546	40.0	40.0	
* 3 Acenaphthene-d10	164	7.481	7.481	0.000	94	347168	40.0	40.0	
* 4 Phenanthrene-d10	188	8.966	8.966	0.000	97	710100	40.0	40.0	
* 5 Chrysene-d12	240	12.908	12.908	0.000	99	710819	40.0	40.0	
* 6 Perylene-d12	264	16.755	16.755	0.000	97	704464	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.309	3.309	0.000	92	460859	80.0	80.6	
\$ 8 Phenol-d5	99	4.153	4.153	0.000	98	594791	80.0	78.1	
\$ 9 Nitrobenzene-d5	82	5.023	5.023	0.000	87	529900	80.0	81.2	
\$ 10 2-Fluorobiphenyl	172	6.797	6.797	0.000	99	1008295	80.0	83.5	
\$ 11 2,4,6-Tribromophenol	330	8.271	8.271	0.000	94	140396	80.0	83.7	
\$ 12 Terphenyl-d14	244	10.857	10.857	0.000	98	1334829	80.0	81.7	
13 1,4-Dioxane	88	1.856	1.856	0.000	92	215004	80.0	77.8	
14 N-Nitrosodimethylamine	74	2.096	2.096	0.000	93	335392	80.0	76.5	
15 Pyridine	79	2.149	2.149	0.000	98	1113198	160.0	158.3	
23 n-Decane	57	4.345	4.345	0.000	97	461162	80.0	77.1	
24 Phenol	94	4.169	4.169	0.000	98	637406	80.0	79.9	
25 Aniline	93	4.190	4.190	0.000	98	773672	80.0	77.5	
27 Bis(2-chloroethyl)ether	93	4.233	4.233	0.000	93	442317	80.0	78.0	
28 2-Chlorophenol	128	4.313	4.313	0.000	97	457187	80.0	80.5	
29 1,3-Dichlorobenzene	146	4.457	4.457	0.000	97	481218	80.0	81.1	
30 1,4-Dichlorobenzene	146	4.521	4.521	0.000	93	489223	80.0	82.0	
31 Benzyl alcohol	108	4.623	4.623	0.000	94	334872	80.0	79.3	
32 1,2-Dichlorobenzene	146	4.671	4.671	0.000	96	471288	80.0	82.0	
34 2,2'-oxybis[1-chloropropan	45	4.746	4.746	0.000	94	580191	80.0	76.3	
35 2-Methylphenol	108	4.735	4.735	0.000	95	463129	80.0	79.4	
38 N-Nitrosodi-n-propylamine	70	4.874	4.874	0.000	86	343388	80.0	77.8	
39 Acetophenone	105	4.879	4.879	0.000	90	635679	80.0	79.1	
40 4-Methylphenol	108	4.879	4.879	0.000	93	462897	80.0	80.3	
41 3-Methylphenol	108	4.879	4.879	0.000	92	462897	80.0	80.3	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.879	4.879	0.000	73	462897	80.0	80.3	
44 Hexachloroethane	117	4.997	4.997	0.000	94	182076	80.0	80.8	
45 Nitrobenzene	77	5.045	5.045	0.000	85	532044	80.0	80.3	
47 Isophorone	82	5.275	5.275	0.000	99	955596	80.0	77.8	
48 2-Nitrophenol	139	5.355	5.355	0.000	96	246198	80.0	83.5	
49 2,4-Dimethylphenol	107	5.392	5.392	0.000	96	481491	80.0	82.2	
51 Bis(2-chloroethoxy)methane	93	5.472	5.472	0.000	99	567635	80.0	81.0	
52 Benzoic acid	105	5.536	5.536	0.000	88	786558	160.0	158.1	
53 2,4-Dichlorophenol	162	5.600	5.600	0.000	93	395732	80.0	85.7	
55 1,2,4-Trichlorobenzene	180	5.681	5.681	0.000	93	421171	80.0	83.3	
56 Naphthalene	128	5.761	5.761	0.000	97	1323788	80.0	83.3	
57 4-Chloroaniline	127	5.798	5.798	0.000	96	583776	80.0	81.8	
58 2,6-Dichlorophenol	162	5.819	5.819	0.000	97	387073	80.0	84.5	
60 Hexachlorobutadiene	225	5.884	5.884	0.000	96	226387	80.0	85.1	
63 Caprolactam	55	6.145	6.145	0.000	88	207327	80.0	73.0	M
64 4-Chloro-3-methylphenol	107	6.290	6.290	0.000	96	419780	80.0	81.5	
66 2-Methylnaphthalene	142	6.439	6.439	0.000	93	895880	80.0	83.4	
67 1-Methylnaphthalene	142	6.541	6.541	0.000	94	842577	80.0	84.0	
68 Hexachlorocyclopentadiene	237	6.610	6.610	0.000	95	269598	80.0	87.8	
69 1,2,4,5-Tetrachlorobenzene	216	6.615	6.615	0.000	97	414101	80.0	83.6	
71 2,4,6-Trichlorophenol	196	6.722	6.722	0.000	93	284893	80.0	85.7	
72 2,4,5-Trichlorophenol	196	6.765	6.765	0.000	96	321205	80.0	86.0	
74 1,1'-Biphenyl	154	6.899	6.899	0.000	95	1053308	80.0	83.7	
75 2-Chloronaphthalene	162	6.925	6.925	0.000	97	827910	80.0	82.5	
77 2-Nitroaniline	65	7.016	7.016	0.000	83	288341	80.0	79.6	
80 Dimethyl phthalate	163	7.192	7.192	0.000	98	941120	80.0	82.0	
81 1,3-Dinitrobenzene	168	7.219	7.219	0.000	86	168679	80.0	82.9	
82 2,6-Dinitrotoluene	165	7.251	7.251	0.000	96	236770	80.0	83.2	
83 Acenaphthylene	152	7.342	7.342	0.000	99	1357333	80.0	82.8	
84 3-Nitroaniline	138	7.427	7.427	0.000	95	270743	80.0	81.1	
85 Acenaphthene	153	7.513	7.513	0.000	95	810339	80.0	82.2	
86 2,4-Dinitrophenol	184	7.529	7.529	0.000	83	289490	160.0	157.8	
88 4-Nitrophenol	109	7.609	7.609	0.000	93	293745	160.0	172.8	
89 2,4-Dinitrotoluene	165	7.657	7.657	0.000	94	324921	80.0	83.6	
90 Dibenzofuran	168	7.684	7.684	0.000	98	1222760	80.0	81.1	
92 Hexadecane	57	7.914	7.914	0.000	97	564406	80.0	79.8	
93 2,3,4,6-Tetrachlorophenol	232	7.812	7.812	0.000	72	268888	80.0	85.7	
95 Diethyl phthalate	149	7.892	7.892	0.000	98	940426	80.0	83.0	
97 4-Chlorophenyl phenyl ethe	204	8.015	8.015	0.000	92	474015	80.0	81.2	
99 Fluorene	166	8.026	8.026	0.000	94	974453	80.0	81.4	
100 4-Nitroaniline	138	8.042	8.042	0.000	86	287108	80.0	80.7	
101 4,6-Dinitro-2-methylphenol	198	8.074	8.074	0.000	90	373541	160.0	162.5	
102 N-Nitrosodiphenylamine	169	8.133	8.133	0.000	61	742439	80.0	81.4	
103 Diphenylamine	169	8.133	8.133	0.000	96	742439	68.0	69.3	
105 1,2-Diphenylhydrazine	77	8.175	8.175	0.000	98	1104798	80.9	80.7	
106 Azobenzene	77	8.175	8.175	0.000	98	1104798	80.0	79.8	
112 Atrazine	200	8.656	8.656	0.000	95	270548	80.0	77.7	
114 4-Bromophenyl phenyl ether	248	8.507	8.507	0.000	65	297381	80.0	82.3	
116 Hexachlorobenzene	284	8.592	8.592	0.000	95	288365	80.0	82.6	
119 Pentachlorophenol	266	8.784	8.784	0.000	93	368800	160.0	169.0	
123 Phenanthrene	178	8.993	8.993	0.000	98	1463291	80.0	80.6	
124 Anthracene	178	9.041	9.041	0.000	98	1516181	80.0	80.7	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.196	9.196	0.000	95	1465094	80.0	80.8	
127 Di-n-butyl phthalate	149	9.527	9.527	0.000	100	1649203	80.0	82.4	
132 Fluoranthene	202	10.312	10.312	0.000	98	1736612	80.0	81.5	
134 Pyrene	202	10.638	10.638	0.000	97	1819194	80.0	80.8	
139 Famphur	218	11.600	11.600	0.000	99	425993	80.0	58.0	
141 Butyl benzyl phthalate	149	11.717	11.717	0.000	98	800373	80.0	83.5	
144 3,3'-Dichlorobenzidine	252	12.850	12.850	0.000	73	599451	80.0	80.4	
145 Benzo[a]anthracene	228	12.887	12.887	0.000	99	1847066	80.0	82.0	
146 Chrysene	228	12.973	12.973	0.000	97	1779075	80.0	82.7	
147 Bis(2-ethylhexyl) phthalat	149	13.053	13.053	0.000	97	1102334	80.0	84.6	
148 Di-n-octyl phthalate	149	14.821	14.821	0.000	99	1899070	80.0	84.4	
150 Benzo[b]fluoranthene	252	15.686	15.686	0.000	98	1773210	80.0	84.9	
151 Benzo[k]fluoranthene	252	15.766	15.766	0.000	99	1810273	80.0	85.0	
153 Benzo[a]pyrene	252	16.600	16.600	0.000	78	1751258	80.0	84.3	
156 Indeno[1,2,3-cd]pyrene	276	19.837	19.837	0.000	98	1526449	80.0	80.9	
157 Dibenz(a,h)anthracene	278	19.939	19.939	0.000	93	1527225	80.0	83.2	
158 Benzo[g,h,i]perylene	276	20.574	20.574	0.000	97	1606530	80.0	82.5	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

MS-HSLACCV080_00178

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31281.D

Injection Date: 22-Jan-2019 13:59:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: CCV HSL

Worklist Smp#: 3

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

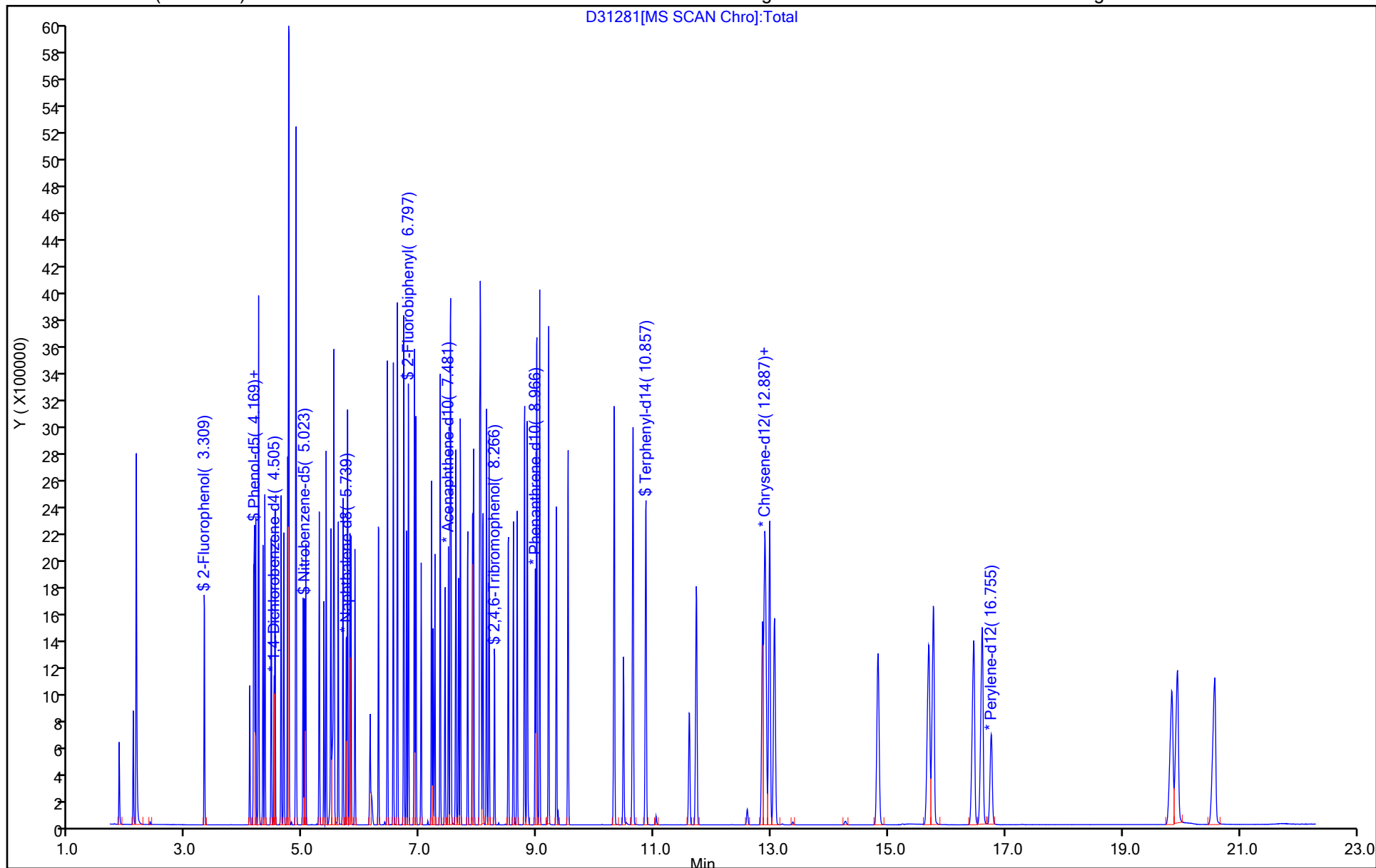
ALS Bottle#: 2

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver

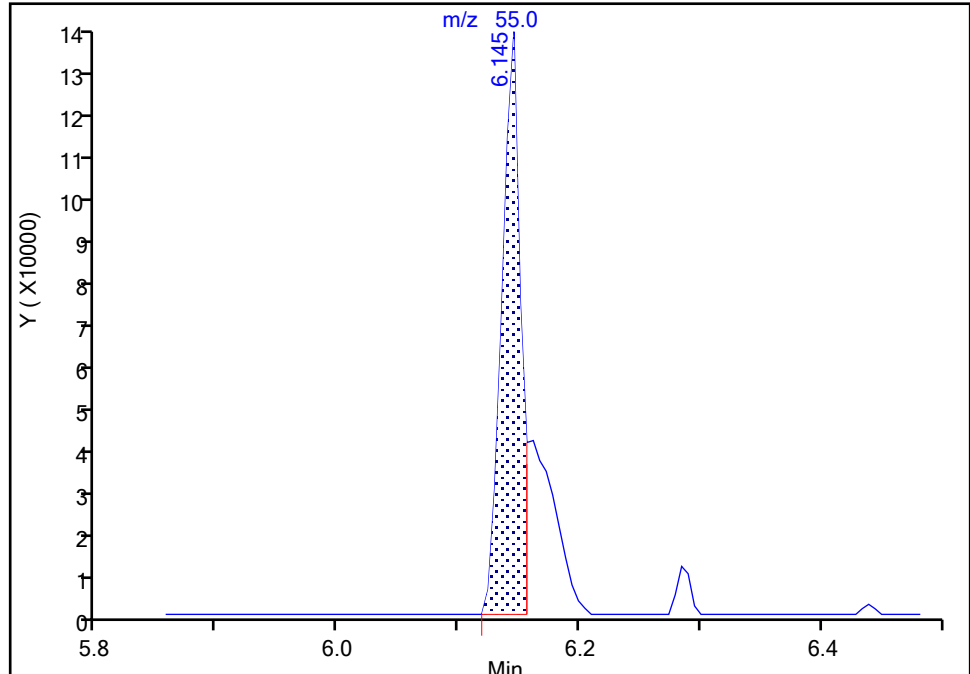
Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31281.D
Injection Date: 22-Jan-2019 13:59:30 Instrument ID: SMS_D
Lims ID: CCV HSL
Client ID:
Operator ID: KIEKELD ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

63 Caprolactam, CAS: 105-60-2

Signal: 1

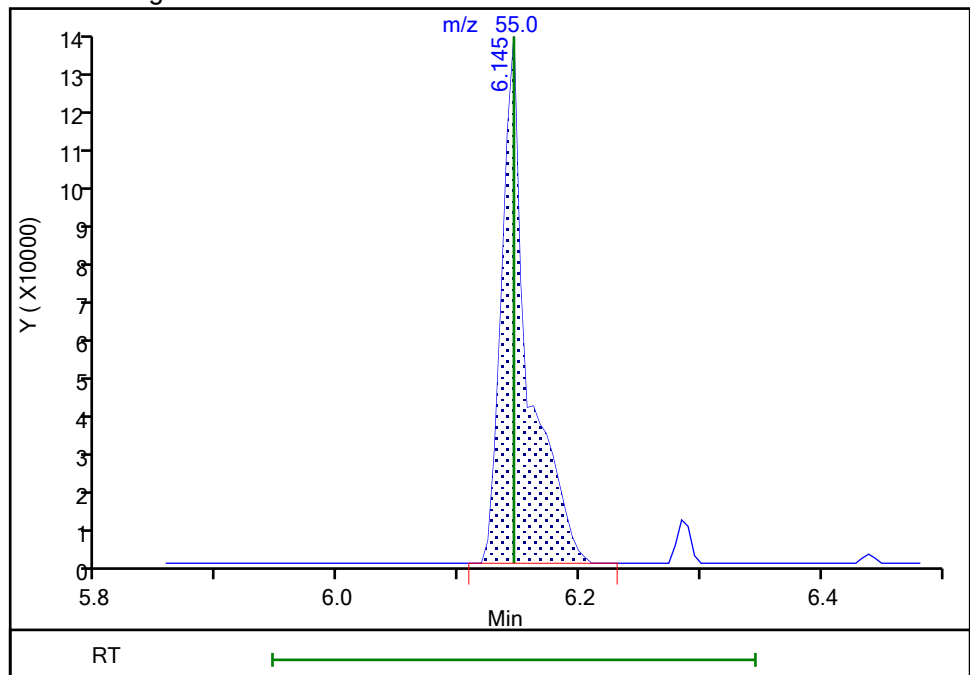
RT: 6.15
Area: 148436
Amount: 52.281928
Amount Units: ug/ml

Processing Integration Results



RT: 6.15
Area: 207327
Amount: 73.024437
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 22-Jan-2019 14:27:53

Audit Action: Manually Integrated

Audit Reason: Split Peak

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: CCV 280-445019/4 Calibration Date: 01/22/2019 14:29
Instrument ID: SMS_D Calib Start Date: 12/05/2018 21:46
GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 12/06/2018 00:16
Lab File ID: D31282.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Benzidine	Ave	0.7923	0.8648		87300	80000	9.2	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31282.D
 Lims ID: CCV AFC
 Client ID:
 Sample Type: CCV
 Inject. Date: 22-Jan-2019 14:29:30 ALS Bottle#: 3 Worklist Smp#: 4
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCV AFC
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub10
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:37 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 22-Jan-2019 15:53:31

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.504	4.504	0.000	96	130916	40.0	40.0	
* 2 Naphthalene-d8	136	5.738	5.738	0.000	99	524852	40.0	40.0	
* 3 Acenaphthene-d10	164	7.480	7.480	0.000	95	301972	40.0	40.0	
* 4 Phenanthrene-d10	188	8.965	8.965	0.000	97	602486	40.0	40.0	
* 5 Chrysene-d12	240	12.897	12.897	0.000	99	612471	40.0	40.0	
* 6 Perylene-d12	264	16.743	16.743	0.000	98	598458	40.0	40.0	
133 Benzidine	184	10.477	10.477	0.000	100	1059349	80.0	87.3	

Reagents:

MS-AFCACCV080_00080

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31282.D

Injection Date: 22-Jan-2019 14:29:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: CCV AFC

Worklist Smp#: 4

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

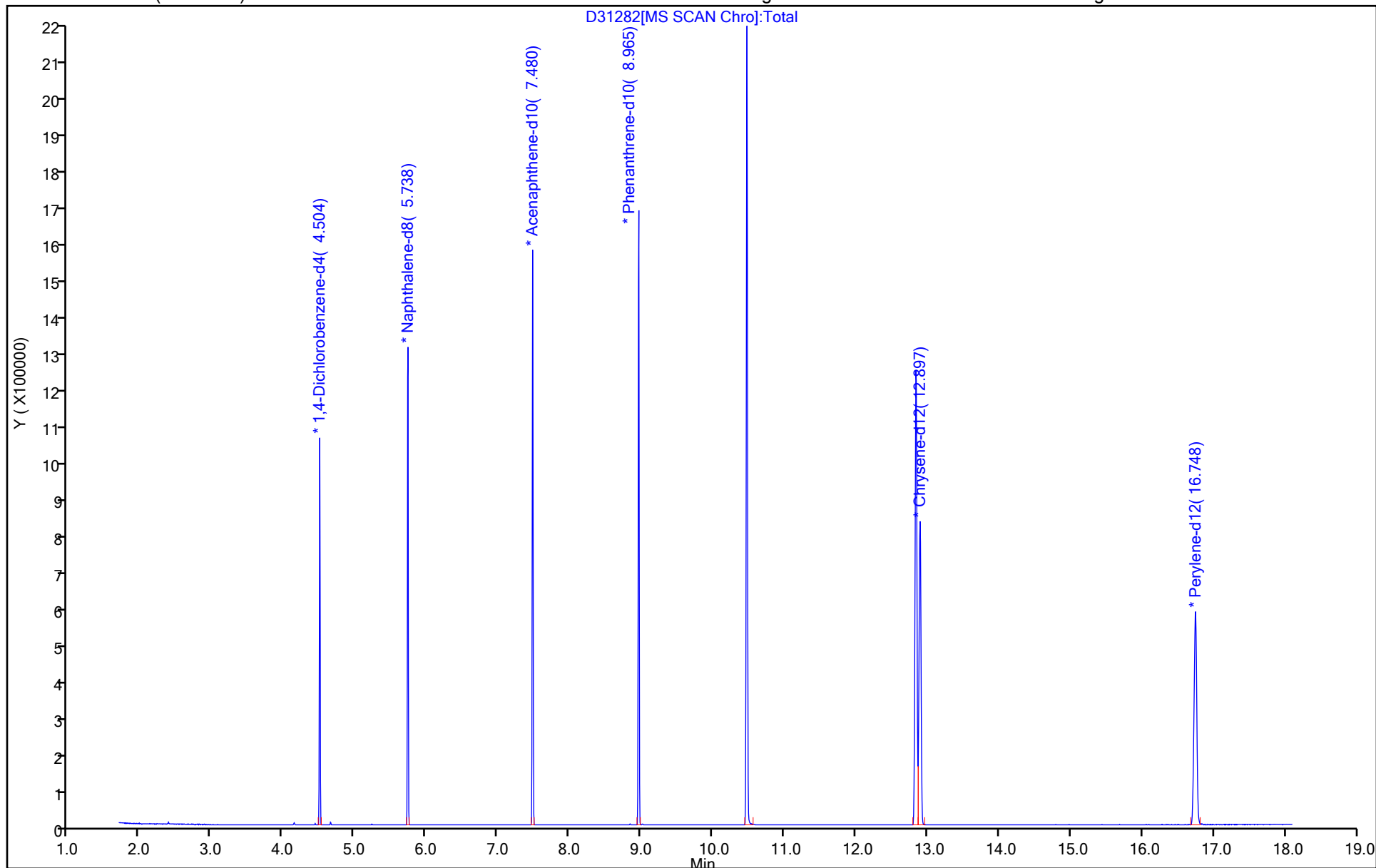
ALS Bottle#: 3

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: CCV 280-445019/5 Calibration Date: 01/22/2019 14:54
Instrument ID: SMS_D Calib Start Date: 12/05/2018 18:02
GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 12/05/2018 20:57
Lab File ID: D31283.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Famphur	Ave	0.4133	0.4432		85800	80000	7.2	20.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31283.D
 Lims ID: CCV FAM
 Client ID:
 Sample Type: CCV
 Inject. Date: 22-Jan-2019 14:54:30 ALS Bottle#: 4 Worklist Smp#: 5
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCV FAM
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub15
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:39 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 22-Jan-2019 15:53:44

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.503	4.503	0.000	97	156088	40.0	40.0	
* 2 Naphthalene-d8	136	5.737	5.737	0.000	99	623656	40.0	40.0	
* 3 Acenaphthene-d10	164	7.484	7.484	0.000	94	358059	40.0	40.0	
* 4 Phenanthrene-d10	188	8.964	8.964	0.000	97	739697	40.0	40.0	
* 5 Chrysene-d12	240	12.901	12.901	0.000	99	759793	40.0	40.0	
* 6 Perylene-d12	264	16.752	16.752	0.000	97	777964	40.0	40.0	
139 Famphur	218	11.603	11.603	0.000	99	673471	80.0	85.8	

Reagents:

MS-FAM CCV_00002

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31283.D

Injection Date: 22-Jan-2019 14:54:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: CCV FAM

Worklist Smp#: 5

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

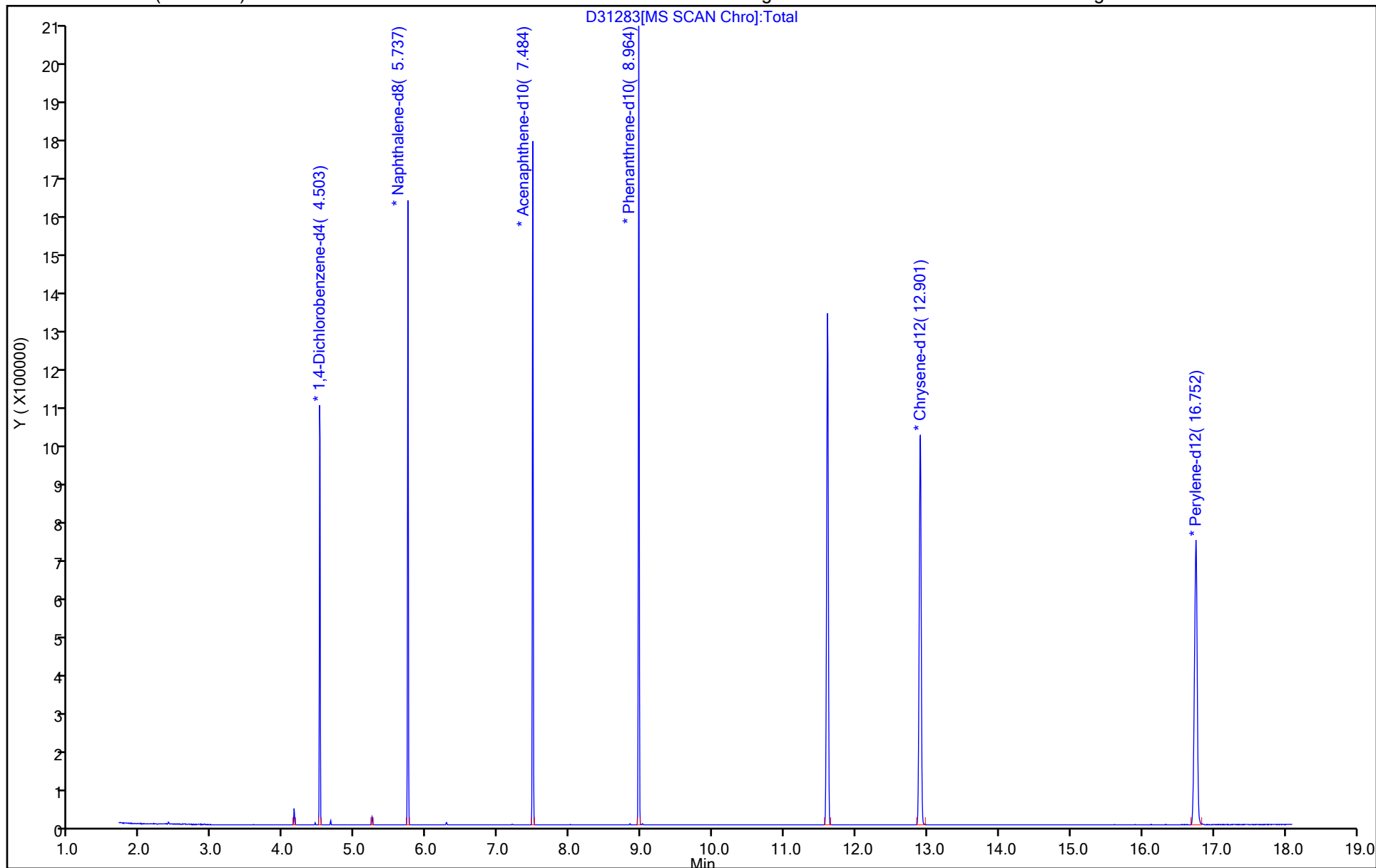
ALS Bottle#: 4

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: CCV 280-445019/6 Calibration Date: 01/22/2019 15:47
Instrument ID: SMS_D Calib Start Date: 12/06/2018 08:53
GC Column: Rxi-5Sil MS ID: 0.25 (mm) Calib End Date: 12/06/2018 11:21
Lab File ID: D31285.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Benzaldehyde	Ave	1.222	1.251		81900	80000	2.3	50.0

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31285.D
 Lims ID: CCV BZHD
 Client ID:
 Sample Type: CCV
 Inject. Date: 22-Jan-2019 15:47:30 ALS Bottle#: 6 Worklist Smp#: 6
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCV BZHD
 Operator ID: KIEKELD Instrument ID: SMS_D
 Sublist: chrom-SMS_D_8270D*sub6
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 22-Jan-2019 16:07:04

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.508	4.508	0.000	96	140784	40.0	40.0	
* 2 Naphthalene-d8	136	5.737	5.737	0.000	99	555420	40.0	40.0	
* 3 Acenaphthene-d10	164	7.483	7.483	0.000	94	328488	40.0	40.0	
* 4 Phenanthrene-d10	188	8.963	8.963	0.000	98	666770	40.0	40.0	
* 5 Chrysene-d12	240	12.900	12.900	0.000	99	676799	40.0	40.0	
* 6 Perylene-d12	264	16.757	16.757	0.000	97	696625	40.0	40.0	
22 Benzaldehyde	106	4.091	4.091	0.000	98	352248	80.0	81.9	

Reagents:

MS-BZHDA-CCV_00052

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31285.D

Injection Date: 22-Jan-2019 15:47:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: CCV BZHD

Worklist Smp#: 6

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

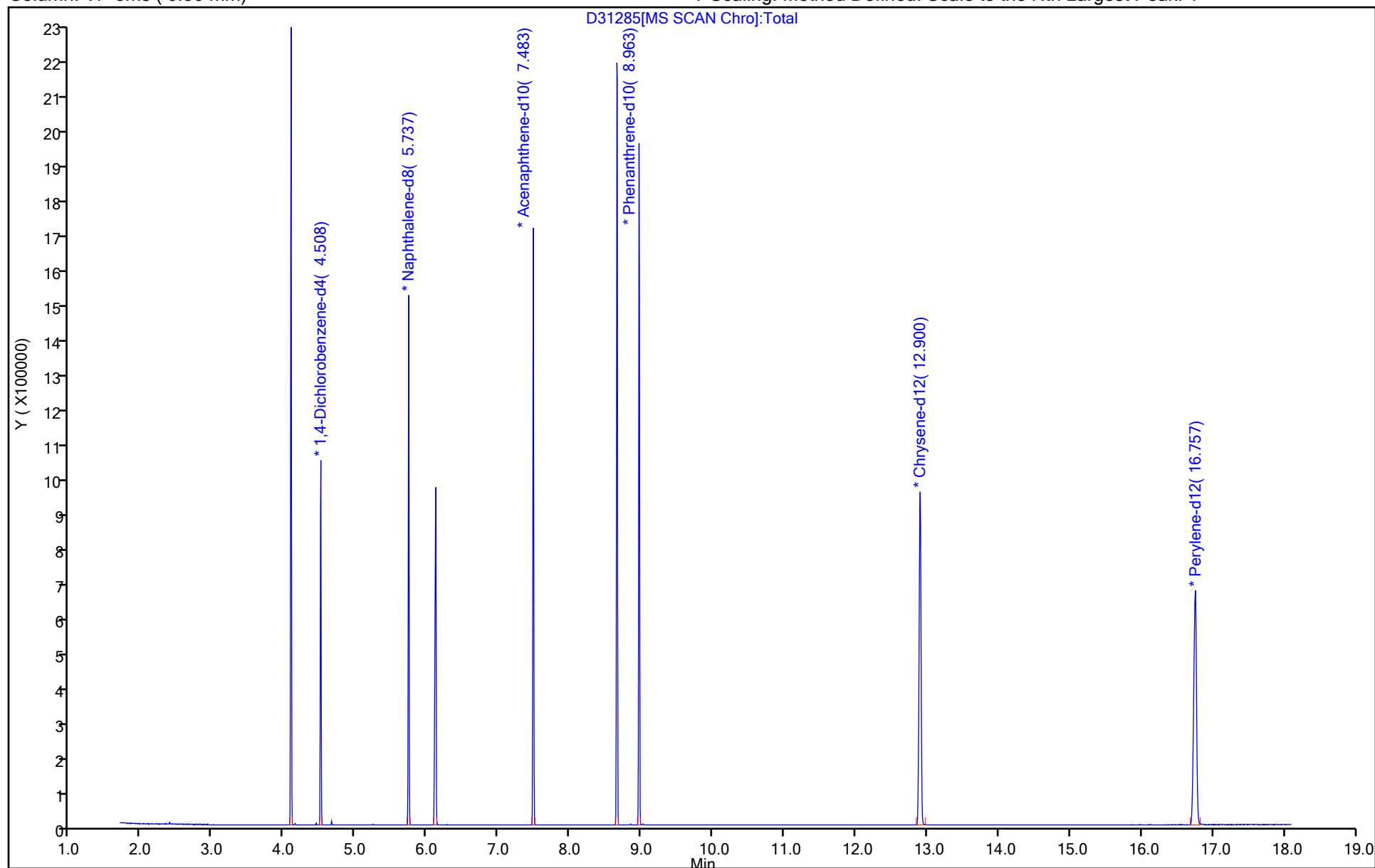
ALS Bottle#: 6

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30601.D
 Lims ID: DFTPP
 Client ID:
 Sample Type: DFTPP
 Inject. Date: 05-Dec-2018 12:48:30 ALS Bottle#: 1 Worklist Smp#: 2
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: DFTPP
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:12:53 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 11:45:41

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
20 Pentachlorophenol_T	266	3.795	3.795	0.000	93	102516	NR	NR	
33 Benzidine_T	184	4.878	4.878	0.000	100	747950	NR	NR	
162 DFTPP									
163 4,4'-DDE	246	5.014	5.014	0.000	1	505	NR	NR	a
164 4,4'-DDD	235	5.307	5.307	0.000	94	4058	NR	NR	
165 4,4'-DDT	235	5.528	5.528	0.000	99	299727	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Review Flags

a - User Assigned ID

Reagents:

MS-DFTPP_00047

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30601.D

Injection Date: 05-Dec-2018 12:48:30

Instrument ID: SMS_D

Lims ID: DFTPP

Client ID:

Operator ID: KIEKELD

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 1.0 ul

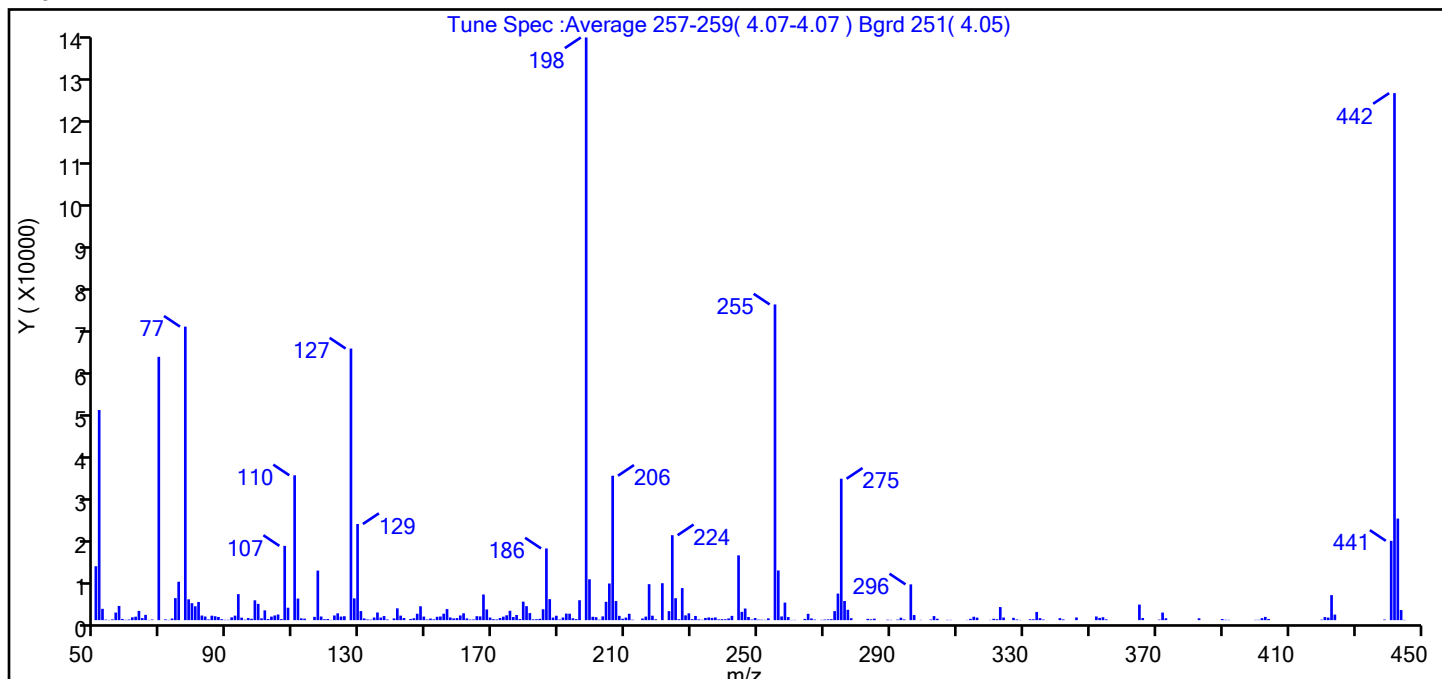
Dil. Factor: 1.0000

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Tune Method: DFTPP Method 8270

162 DFTPP



m/z	Ion Abundance Criteria	% Relative Abundance
198	Base peak, 100% relative abundance	100.0
51	30-60% of mass 198	36.1
68	<2% of mass 69	0.0 (0.0)
69	Present	45.2
70	<2% of mass 69	0.0 (0.0)
127	40-60% of mass 198	46.6
197	<1% of mass 198	0.0
199	5-9% of mass 198	7.0
275	10-30% of mass 198	24.3
365	>1% of mass 198	2.7
441	Present but less than mass 443	13.6 (78.1)
442	>40% of mass 198	90.5
443	17-23% of mass 442	17.4 (19.3)

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\30601.D\SMS_D_8270D.rslt\spectra.d
Injection Date: 05-Dec-2018 12:48:30
Spectrum: Tune Spec :Average 257-259(4.07-4.07) Bgrd 251(4.05)
Base Peak: 198.00
Minimum % Base Peak: 0
Number of Points: 275

m/z	Y	m/z	Y	m/z	Y	m/z	Y
50.00	12117	125.00	878	198.00	130944	276.00	4306
51.00	47224	127.00	61040	199.00	9183	277.00	2327
52.00	2540	128.00	4892	200.00	752	278.00	435
53.00	125	129.00	21608	201.00	665	283.00	287
54.00	50	130.00	2036	202.00	106	284.00	188
55.00	174	131.00	386	203.00	842	285.00	332
56.00	1707	132.00	155	204.00	4120	289.00	108
57.00	3190	133.00	115	205.00	8234	290.00	59
58.00	270	134.00	582	206.00	32456	292.00	118
59.00	73	135.00	1719	207.00	4300	293.00	547
60.00	140	136.00	574	208.00	963	294.00	164
61.00	635	137.00	915	209.00	317	296.00	8041
62.00	770	138.00	154	210.00	577	297.00	1147
63.00	2083	140.00	395	211.00	1431	299.00	61
64.00	459	141.00	2649	212.00	100	302.00	142
65.00	1187	142.00	1013	215.00	374	303.00	913
66.00	56	143.00	471	216.00	797	304.00	315
67.00	136	145.00	266	217.00	8083	307.00	69
69.00	59176	146.00	427	218.00	997	308.00	58
71.00	173	147.00	1436	219.00	188	313.00	50
72.00	57	148.00	3119	221.00	8301	314.00	302
73.00	367	149.00	803	223.00	2030	315.00	768
74.00	4947	150.00	149	224.00	19088	316.00	568
75.00	8626	151.00	362	225.00	4927	320.00	54
77.00	65960	152.00	180	226.00	207	321.00	308
78.00	4679	153.00	753	227.00	7209	322.00	210
79.00	3816	154.00	817	228.00	1077	323.00	2941
80.00	3116	155.00	1448	229.00	1532	324.00	583
81.00	4080	156.00	2484	230.00	221	327.00	522
82.00	1034	157.00	597	231.00	940	328.00	153
83.00	818	158.00	383	232.00	168	329.00	53
84.00	161	159.00	458	233.00	84	332.00	197
85.00	995	160.00	1049	234.00	490	333.00	196

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\30601.D\SMS_D_8270D.rslt\spectra.d

Injection Date: 05-Dec-2018 12:48:30

Spectrum: Tune Spec :Average 257-259(4.07-4.07) Bgrd 251(4.05)

Base Peak: 198.00

Minimum % Base Peak: 0

Number of Points: 275

m/z	Y	m/z	Y	m/z	Y	m/z	Y
86.00	881	161.00	1541	235.00	608	334.00	1841
87.00	718	162.00	385	236.00	505	335.00	447
88.00	211	163.00	124	237.00	610	336.00	135
89.00	75	164.00	159	238.00	170	341.00	448
90.00	79	165.00	891	239.00	216	342.00	166
91.00	630	166.00	836	240.00	203	346.00	602
92.00	1015	167.00	5767	241.00	386	352.00	819
93.00	5841	168.00	2403	242.00	961	353.00	501
94.00	557	169.00	589	244.00	14559	354.00	659
95.00	111	170.00	212	245.00	1871	355.00	183
96.00	469	171.00	159	246.00	2609	365.00	3496
97.00	304	172.00	472	247.00	705	366.00	487
98.00	4458	173.00	781	248.00	135	371.00	117
99.00	3666	174.00	1090	249.00	473	372.00	1704
100.00	405	175.00	2108	250.00	119	373.00	427
101.00	2198	176.00	695	251.00	96	383.00	417
102.00	244	177.00	1155	252.00	66	390.00	253
103.00	795	178.00	245	253.00	399	391.00	85
104.00	1053	179.00	4156	255.00	70944	392.00	69
105.00	1269	180.00	3138	256.00	11165	400.00	63
106.00	233	181.00	1587	257.00	829	401.00	70
107.00	16688	182.00	180	258.00	3942	402.00	440
108.00	2793	183.00	206	259.00	697	403.00	730
110.00	32552	184.00	297	260.00	52	404.00	266
111.00	4858	185.00	2444	261.00	59	420.00	113
112.00	407	186.00	16110	264.00	280	421.00	688
113.00	336	187.00	4720	265.00	1423	422.00	572
116.00	736	188.00	579	266.00	378	423.00	5624
117.00	11137	189.00	992	267.00	124	424.00	1247
118.00	813	190.00	136	269.00	65	439.00	134
119.00	207	191.00	590	270.00	126	441.00	17824
120.00	253	192.00	1477	271.00	172	442.00	118440
121.00	56	193.00	1446	272.00	212	443.00	22824
122.00	1052	194.00	421	273.00	2029	444.00	2274

Report Date: 06-Dec-2018 12:12:54

Chrom Revision: 2.3 03-Dec-2018 18:32:22

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\30601.D\SMS_D_8270D.rslt\spectra.d

Injection Date: 05-Dec-2018 12:48:30

Spectrum: Tune Spec :Average 257-259(4.07-4.07) Bgrd 251(4.05)

Base Peak: 198.00

Minimum % Base Peak: 0

Number of Points: 275

m/z	Y	m/z	Y	m/z	Y	m/z	Y
123.00	1534	195.00	227	274.00	5969	445.00	62
124.00	802	196.00	4476	275.00	31784		

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30601.D

Injection Date: 05-Dec-2018 12:48:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: DFTPP

Worklist Smp#: 2

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

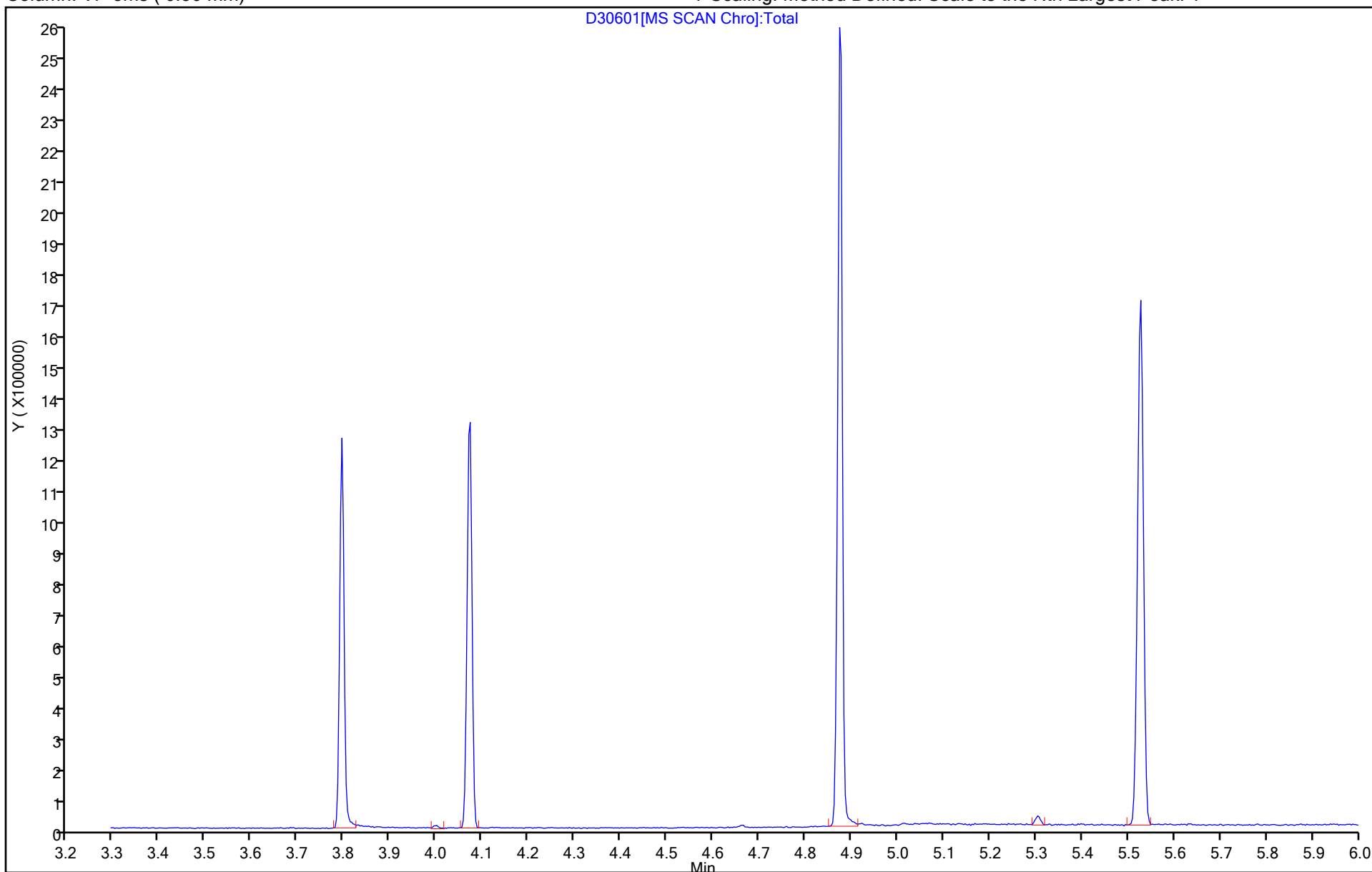
ALS Bottle#: 1

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30601.D
 Lims ID: DFTPP
 Client ID:
 Sample Type: DFTPP
 Inject. Date: 05-Dec-2018 12:48:30 ALS Bottle#: 1 Worklist Smp#: 2
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: DFTPP
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 06-Dec-2018 12:12:53 Calib Date: 06-Dec-2018 00:16:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30627.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0311

First Level Reviewer: kiekeld

Date: 06-Dec-2018 11:45:41

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
20 Pentachlorophenol_T	266	3.795	3.795	0.000	93	102516	NR	NR	
33 Benzidine_T	184	4.878	4.878	0.000	100	747950	NR	NR	
162 DFTPP									
163 4,4'-DDE	246	5.014	5.014	0.000	1	505	NR	NR	a
164 4,4'-DDD	235	5.307	5.307	0.000	94	4058	NR	NR	
165 4,4'-DDT	235	5.528	5.528	0.000	99	299727	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Review Flags

a - User Assigned ID

Reagents:

MS-DFTPP_00047

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30601.D

Injection Date: 05-Dec-2018 12:48:30

Instrument ID: SMS_D

Lims ID: DFTPP

Client ID:

Operator ID: KIEKELD

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 1.0 ul

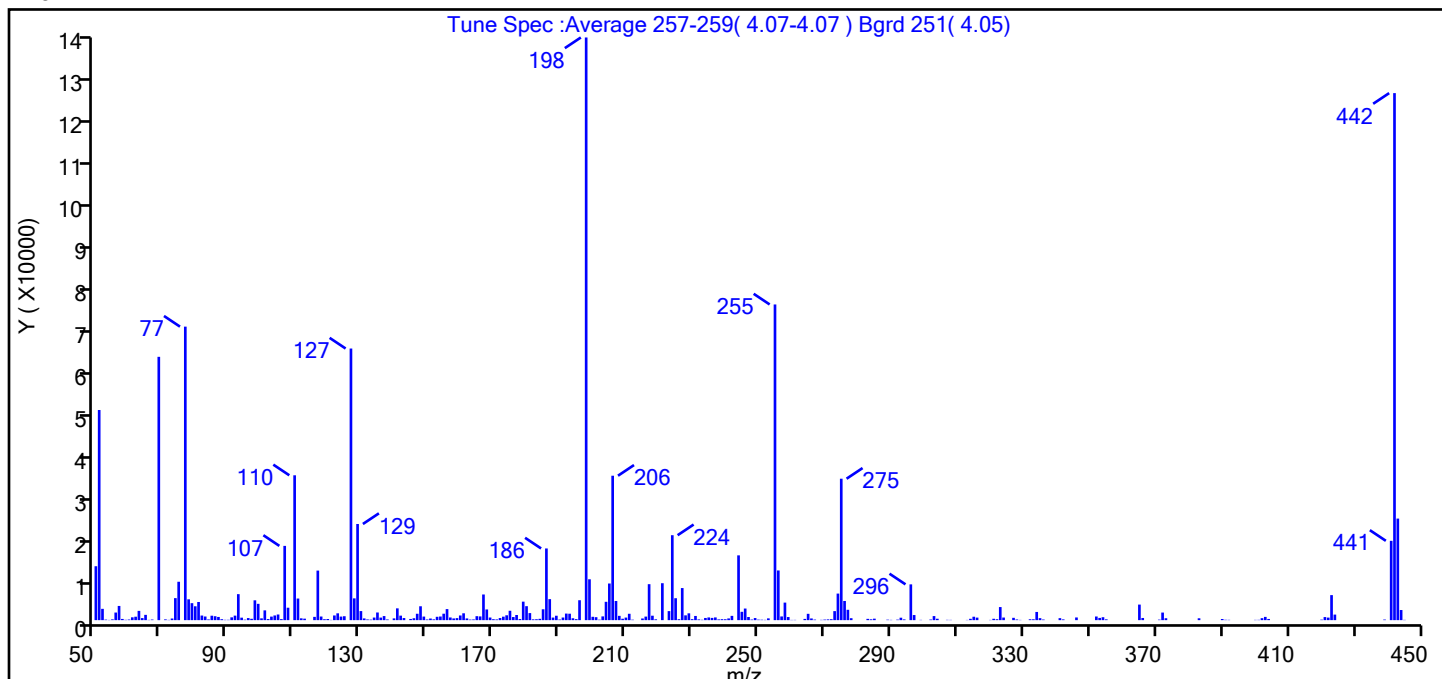
Dil. Factor: 1.0000

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Tune Method: DFTPP Method 8270

162 DFTPP



m/z	Ion Abundance Criteria	% Relative Abundance
198	Base peak, 100% relative abundance	100.0
51	30-60% of mass 198	36.1
68	<2% of mass 69	0.0 (0.0)
69	Present	45.2
70	<2% of mass 69	0.0 (0.0)
127	40-60% of mass 198	46.6
197	<1% of mass 198	0.0
199	5-9% of mass 198	7.0
275	10-30% of mass 198	24.3
365	>1% of mass 198	2.7
441	Present but less than mass 443	13.6 (78.1)
442	>40% of mass 198	90.5
443	17-23% of mass 442	17.4 (19.3)

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\30601.D\SMS_D_8270D.rslt\spectra.d
Injection Date: 05-Dec-2018 12:48:30
Spectrum: Tune Spec :Average 257-259(4.07-4.07) Bgrd 251(4.05)
Base Peak: 198.00
Minimum % Base Peak: 0
Number of Points: 275

m/z	Y	m/z	Y	m/z	Y	m/z	Y
50.00	12117	125.00	878	198.00	130944	276.00	4306
51.00	47224	127.00	61040	199.00	9183	277.00	2327
52.00	2540	128.00	4892	200.00	752	278.00	435
53.00	125	129.00	21608	201.00	665	283.00	287
54.00	50	130.00	2036	202.00	106	284.00	188
55.00	174	131.00	386	203.00	842	285.00	332
56.00	1707	132.00	155	204.00	4120	289.00	108
57.00	3190	133.00	115	205.00	8234	290.00	59
58.00	270	134.00	582	206.00	32456	292.00	118
59.00	73	135.00	1719	207.00	4300	293.00	547
60.00	140	136.00	574	208.00	963	294.00	164
61.00	635	137.00	915	209.00	317	296.00	8041
62.00	770	138.00	154	210.00	577	297.00	1147
63.00	2083	140.00	395	211.00	1431	299.00	61
64.00	459	141.00	2649	212.00	100	302.00	142
65.00	1187	142.00	1013	215.00	374	303.00	913
66.00	56	143.00	471	216.00	797	304.00	315
67.00	136	145.00	266	217.00	8083	307.00	69
69.00	59176	146.00	427	218.00	997	308.00	58
71.00	173	147.00	1436	219.00	188	313.00	50
72.00	57	148.00	3119	221.00	8301	314.00	302
73.00	367	149.00	803	223.00	2030	315.00	768
74.00	4947	150.00	149	224.00	19088	316.00	568
75.00	8626	151.00	362	225.00	4927	320.00	54
77.00	65960	152.00	180	226.00	207	321.00	308
78.00	4679	153.00	753	227.00	7209	322.00	210
79.00	3816	154.00	817	228.00	1077	323.00	2941
80.00	3116	155.00	1448	229.00	1532	324.00	583
81.00	4080	156.00	2484	230.00	221	327.00	522
82.00	1034	157.00	597	231.00	940	328.00	153
83.00	818	158.00	383	232.00	168	329.00	53
84.00	161	159.00	458	233.00	84	332.00	197
85.00	995	160.00	1049	234.00	490	333.00	196

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\30601.D\SMS_D_8270D.rslt\spectra.d

Injection Date: 05-Dec-2018 12:48:30

Spectrum: Tune Spec :Average 257-259(4.07-4.07) Bgrd 251(4.05)

Base Peak: 198.00

Minimum % Base Peak: 0

Number of Points: 275

m/z	Y	m/z	Y	m/z	Y	m/z	Y
86.00	881	161.00	1541	235.00	608	334.00	1841
87.00	718	162.00	385	236.00	505	335.00	447
88.00	211	163.00	124	237.00	610	336.00	135
89.00	75	164.00	159	238.00	170	341.00	448
90.00	79	165.00	891	239.00	216	342.00	166
91.00	630	166.00	836	240.00	203	346.00	602
92.00	1015	167.00	5767	241.00	386	352.00	819
93.00	5841	168.00	2403	242.00	961	353.00	501
94.00	557	169.00	589	244.00	14559	354.00	659
95.00	111	170.00	212	245.00	1871	355.00	183
96.00	469	171.00	159	246.00	2609	365.00	3496
97.00	304	172.00	472	247.00	705	366.00	487
98.00	4458	173.00	781	248.00	135	371.00	117
99.00	3666	174.00	1090	249.00	473	372.00	1704
100.00	405	175.00	2108	250.00	119	373.00	427
101.00	2198	176.00	695	251.00	96	383.00	417
102.00	244	177.00	1155	252.00	66	390.00	253
103.00	795	178.00	245	253.00	399	391.00	85
104.00	1053	179.00	4156	255.00	70944	392.00	69
105.00	1269	180.00	3138	256.00	11165	400.00	63
106.00	233	181.00	1587	257.00	829	401.00	70
107.00	16688	182.00	180	258.00	3942	402.00	440
108.00	2793	183.00	206	259.00	697	403.00	730
110.00	32552	184.00	297	260.00	52	404.00	266
111.00	4858	185.00	2444	261.00	59	420.00	113
112.00	407	186.00	16110	264.00	280	421.00	688
113.00	336	187.00	4720	265.00	1423	422.00	572
116.00	736	188.00	579	266.00	378	423.00	5624
117.00	11137	189.00	992	267.00	124	424.00	1247
118.00	813	190.00	136	269.00	65	439.00	134
119.00	207	191.00	590	270.00	126	441.00	17824
120.00	253	192.00	1477	271.00	172	442.00	118440
121.00	56	193.00	1446	272.00	212	443.00	22824
122.00	1052	194.00	421	273.00	2029	444.00	2274

Report Date: 06-Dec-2018 12:12:55

Chrom Revision: 2.3 03-Dec-2018 18:32:22

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\30601.D\SMS_D_8270D.rslt\spectra.d

Injection Date: 05-Dec-2018 12:48:30

Spectrum: Tune Spec :Average 257-259(4.07-4.07) Bgrd 251(4.05)

Base Peak: 198.00

Minimum % Base Peak: 0

Number of Points: 275

m/z	Y	m/z	Y	m/z	Y	m/z	Y
123.00	1534	195.00	227	274.00	5969	445.00	62
124.00	802	196.00	4476	275.00	31784		

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181206-76895.b\D30601.D

Injection Date: 05-Dec-2018 12:48:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: DFTPP

Worklist Smp#: 2

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

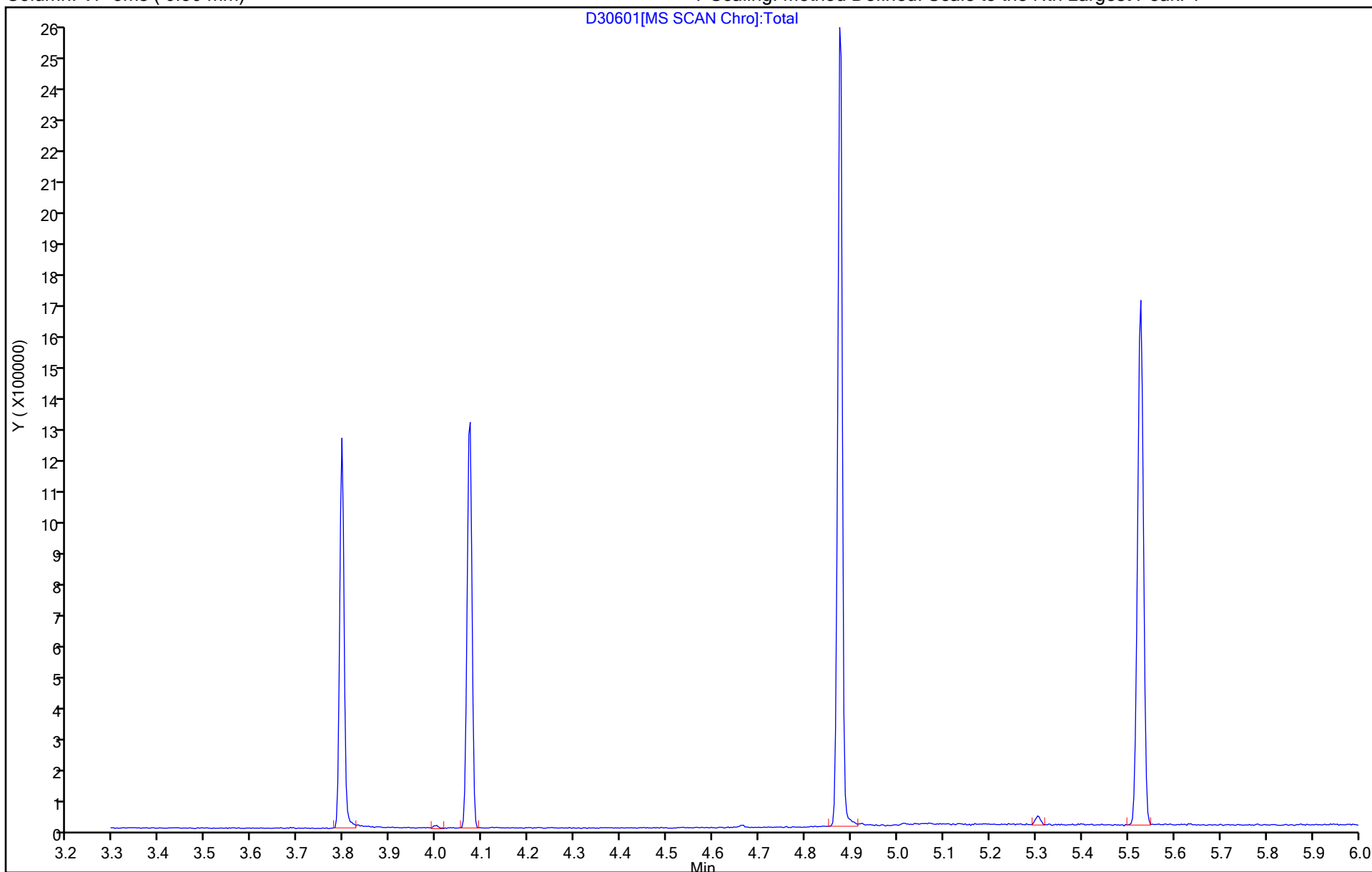
ALS Bottle#: 1

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30630.D
 Lims ID: DFTPP
 Client ID:
 Sample Type: DFTPP
 Inject. Date: 06-Dec-2018 08:39:30 ALS Bottle#: 1 Worklist Smp#: 2
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: DFTPP
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 07-Dec-2018 08:57:38 Calib Date: 06-Dec-2018 18:25:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30653.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0328

First Level Reviewer: kiekeld

Date: 07-Dec-2018 07:53:04

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
20 Pentachlorophenol_T	266	3.792	3.792	0.000	94	118878	NR	NR	
33 Benzidine_T	184	4.875	4.875	0.000	100	762951	NR	NR	
162 DFTPP									
163 4,4'-DDE	246	5.011	5.011	0.000	84	658	NR	NR	
164 4,4'-DDD	235	5.298	5.298	0.000	95	3809	NR	NR	
165 4,4'-DDT	235	5.522	5.522	0.000	99	332909	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

MS-DFTPP_00047

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30630.D

Injection Date: 06-Dec-2018 08:39:30

Instrument ID: SMS_D

Lims ID: DFTPP

Client ID:

Operator ID: KIEKELD

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 1.0 ul

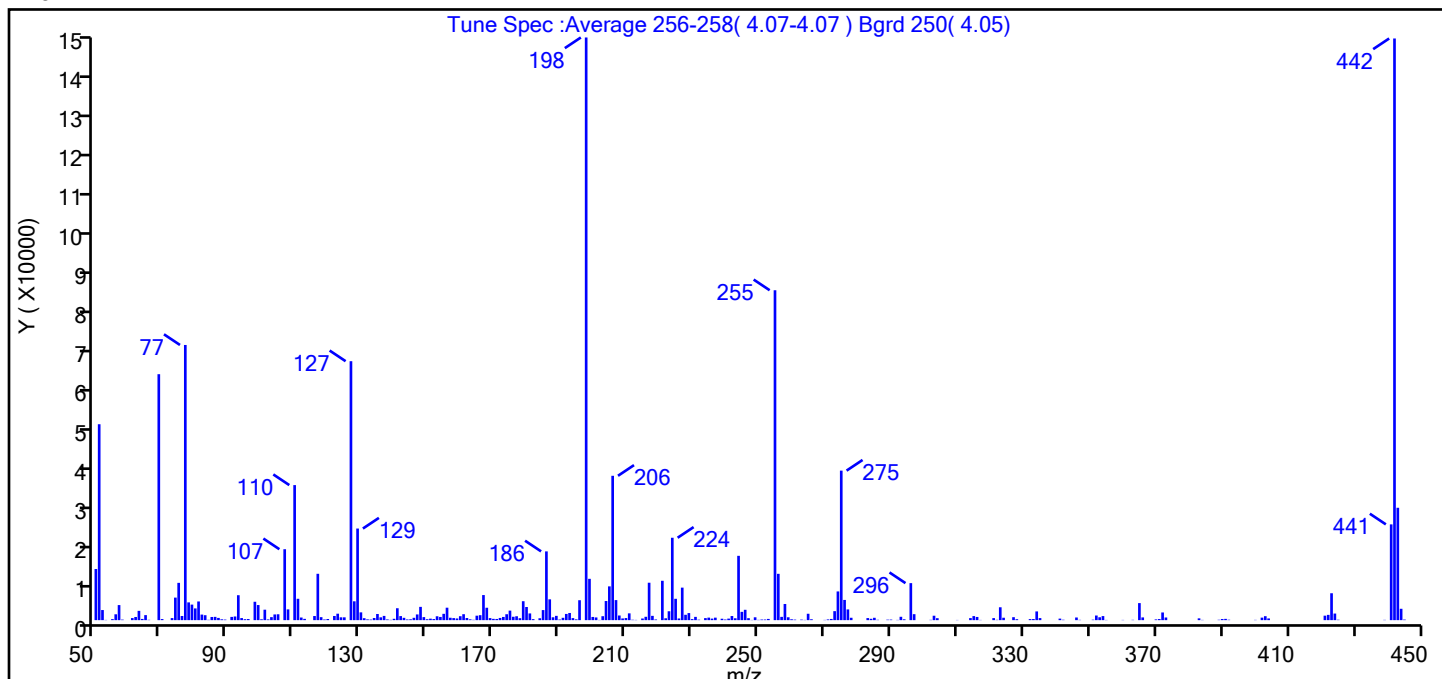
Dil. Factor: 1.0000

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Tune Method: DFTPP Method 8270

162 DFTPP



m/z	Ion Abundance Criteria	% Relative Abundance
198	Base peak, 100% relative abundance	100.0
51	30-60% of mass 198	33.6
68	<2% of mass 69	0.0 (0.0)
69	Present	42.2
70	<2% of mass 69	0.2 (0.4)
127	40-60% of mass 198	44.4
197	<1% of mass 198	0.0
199	5-9% of mass 198	7.1
275	10-30% of mass 198	25.7
365	>1% of mass 198	2.9
441	Present but less than mass 443	16.4 (85.2)
442	>40% of mass 198	99.8
443	17-23% of mass 442	19.3 (19.3)

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\30630.D\SMS_D_8270D.rslt\spectra.d
Injection Date: 06-Dec-2018 08:39:30
Spectrum: Tune Spec :Average 256-258(4.07-4.07) Bgrd 250(4.05)
Base Peak: 198.00
Minimum % Base Peak: 0
Number of Points: 270

m/z	Y	m/z	Y	m/z	Y	m/z	Y
50.00	13059	133.00	143	203.00	1007	284.00	345
51.00	50032	134.00	544	204.00	4885	285.00	601
52.00	2579	135.00	1571	205.00	8625	286.00	88
53.00	58	136.00	720	206.00	36864	289.00	125
55.00	261	137.00	1082	207.00	5119	290.00	141
56.00	1496	138.00	181	208.00	1186	292.00	60
57.00	3846	139.00	74	209.00	435	293.00	857
58.00	137	140.00	346	210.00	532	294.00	216
61.00	529	141.00	3041	211.00	1734	296.00	9454
62.00	807	142.00	1035	212.00	98	297.00	1525
63.00	2374	143.00	593	213.00	60	302.00	80
64.00	305	144.00	174	215.00	420	303.00	1128
65.00	1284	145.00	219	216.00	857	304.00	499
66.00	82	146.00	598	217.00	9556	310.00	51
69.00	62808	147.00	1457	218.00	1094	314.00	522
70.00	275	148.00	3389	219.00	174	315.00	1035
73.00	527	149.00	773	221.00	10050	316.00	814
74.00	5753	150.00	237	222.00	477	317.00	56
75.00	9523	151.00	379	223.00	2270	321.00	522
76.00	1061	152.00	278	224.00	21040	322.00	87
77.00	70272	153.00	988	225.00	5449	323.00	3289
78.00	4535	154.00	815	226.00	428	324.00	613
79.00	3968	155.00	1614	227.00	8303	327.00	754
80.00	2993	156.00	3178	228.00	1367	328.00	239
81.00	4770	157.00	608	229.00	1805	332.00	268
82.00	1420	158.00	524	230.00	264	333.00	286
83.00	1260	159.00	432	231.00	836	334.00	2229
84.00	85	160.00	1007	232.00	121	335.00	526
85.00	808	161.00	1515	234.00	520	341.00	389
86.00	837	162.00	546	235.00	643	342.00	98
87.00	568	163.00	206	236.00	393	346.00	676
88.00	215	164.00	86	237.00	635	347.00	72
89.00	142	165.00	1139	239.00	360	351.00	118

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\30630.D\SMS_D_8270D.rslt\spectra.d

Injection Date: 06-Dec-2018 08:39:30

Spectrum: Tune Spec :Average 256-258(4.07-4.07) Bgrd 250(4.05)

Base Peak: 198.00

Minimum % Base Peak: 0

Number of Points: 270

m/z	Y	m/z	Y	m/z	Y	m/z	Y
91.00	826	166.00	1269	240.00	162	352.00	1181
92.00	933	167.00	6406	241.00	392	353.00	737
93.00	6367	168.00	3166	242.00	1049	354.00	1036
94.00	530	169.00	521	243.00	479	355.00	54
95.00	242	170.00	332	244.00	16424	360.00	59
96.00	285	171.00	302	245.00	2117	363.00	80
98.00	4694	172.00	560	246.00	2642	365.00	4353
99.00	3856	173.00	816	247.00	499	366.00	698
100.00	216	174.00	1510	248.00	52	370.00	189
101.00	2667	175.00	2431	249.00	728	371.00	282
102.00	183	176.00	862	250.00	70	372.00	1960
103.00	768	177.00	994	251.00	155	373.00	676
104.00	1456	178.00	496	252.00	161	383.00	455
105.00	1501	179.00	4833	253.00	312	384.00	61
107.00	18112	180.00	3355	255.00	84248	389.00	96
108.00	2749	181.00	1715	256.00	11829	390.00	285
110.00	34488	182.00	256	257.00	836	391.00	325
111.00	5455	184.00	482	258.00	4125	392.00	105
112.00	669	185.00	2570	259.00	734	400.00	68
113.00	330	186.00	17560	260.00	224	402.00	641
116.00	1051	187.00	5312	261.00	133	403.00	1009
117.00	11838	188.00	733	263.00	135	404.00	437
118.00	763	189.00	1095	264.00	64	421.00	1141
119.00	164	190.00	153	265.00	1632	422.00	1346
120.00	293	191.00	599	266.00	226	423.00	6869
122.00	1062	192.00	1584	270.00	61	424.00	1682
123.00	1647	193.00	1829	271.00	185	425.00	105
124.00	723	194.00	520	272.00	305	439.00	72
125.00	718	195.00	203	273.00	2297	441.00	24456
127.00	66128	196.00	5088	274.00	7332	442.00	148544
128.00	4810	198.00	148800	275.00	38184	443.00	28696
129.00	23392	199.00	10551	276.00	5161	444.00	2901
130.00	1989	200.00	813	277.00	2739	445.00	143
131.00	498	201.00	691	278.00	608		

Report Date: 07-Dec-2018 08:57:39

Chrom Revision: 2.3 03-Dec-2018 18:32:22

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30630.D\SMS_D_8270D.rslt\spectra.d

Injection Date: 06-Dec-2018 08:39:30

Spectrum: Tune Spec :Average 256-258(4.07-4.07) Bgrd 250(4.05)

Base Peak: 198.00

Minimum % Base Peak: 0

Number of Points: 270

m/z	Y	m/z	Y	m/z	Y	m/z	Y
132.00	195	202.00	54	283.00	527		

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20181207-76932.b\D30630.D

Injection Date: 06-Dec-2018 08:39:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: DFTPP

Worklist Smp#: 2

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

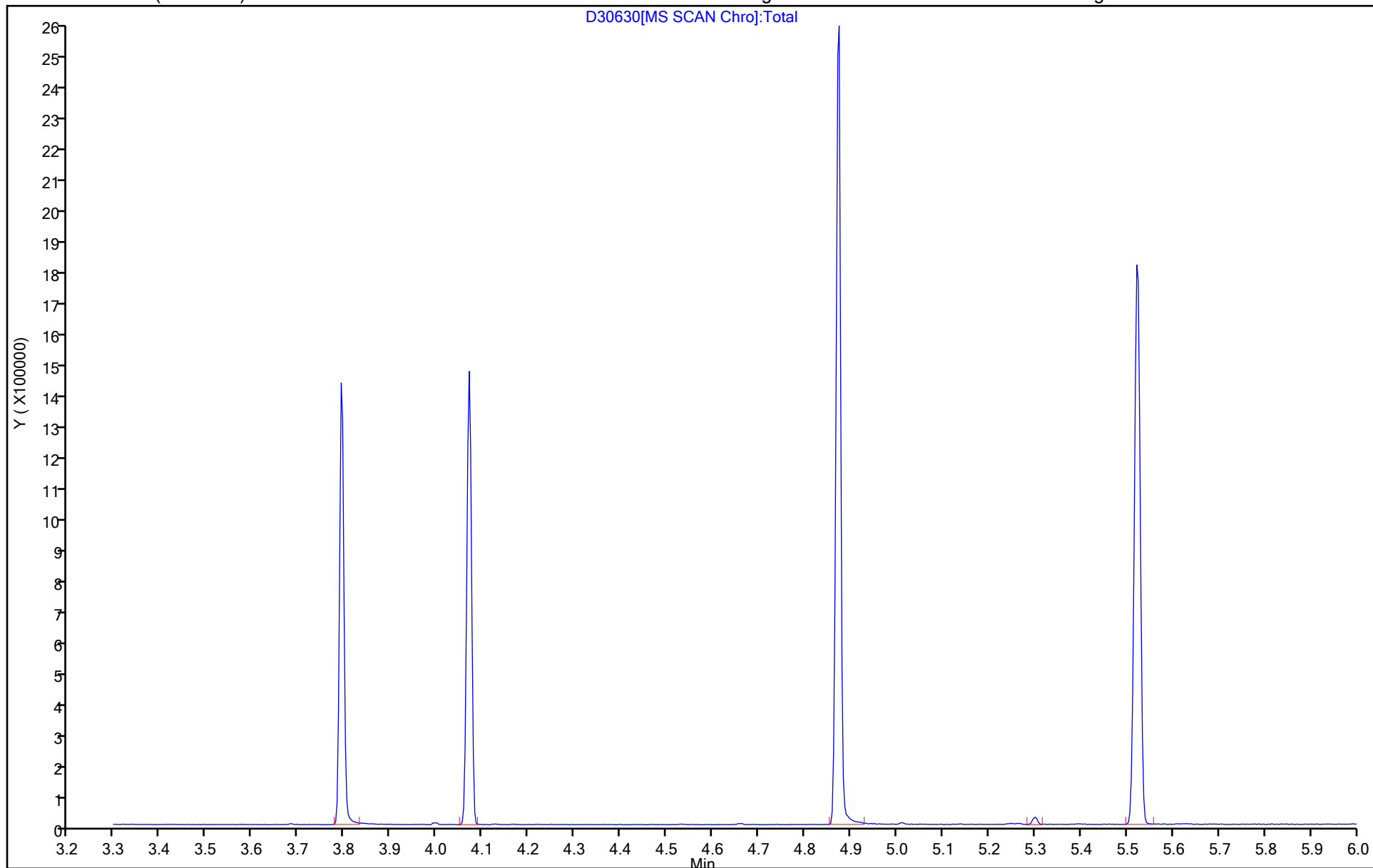
ALS Bottle#: 1

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31075.D
 Lims ID: DFTPP
 Client ID:
 Sample Type: DFTPP
 Inject. Date: 08-Jan-2019 14:30:30 ALS Bottle#: 1 Worklist Smp#: 2
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: DFTPP
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 09-Jan-2019 10:19:52 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0312

First Level Reviewer: kiekeld

Date: 08-Jan-2019 15:47:05

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
20 Pentachlorophenol_T	266	3.724	3.724	0.000	92	62314	NR	NR	
33 Benzidine_T	184	4.804	4.804	0.000	100	503994	NR	NR	
162 DFTPP									
163 4,4'-DDE	246	4.940	4.940	0.000	1	248	NR	NR	a
164 4,4'-DDD	235	5.225	5.225	0.000	94	2349	NR	NR	
165 4,4'-DDT	235	5.436	5.436	0.000	98	189744	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Review Flags

a - User Assigned ID

Reagents:

MS-DFTPP_00047

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31075.D

Injection Date: 08-Jan-2019 14:30:30

Instrument ID: SMS_D

Lims ID: DFTPP

Client ID:

Operator ID: KIEKELD

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 1.0 ul

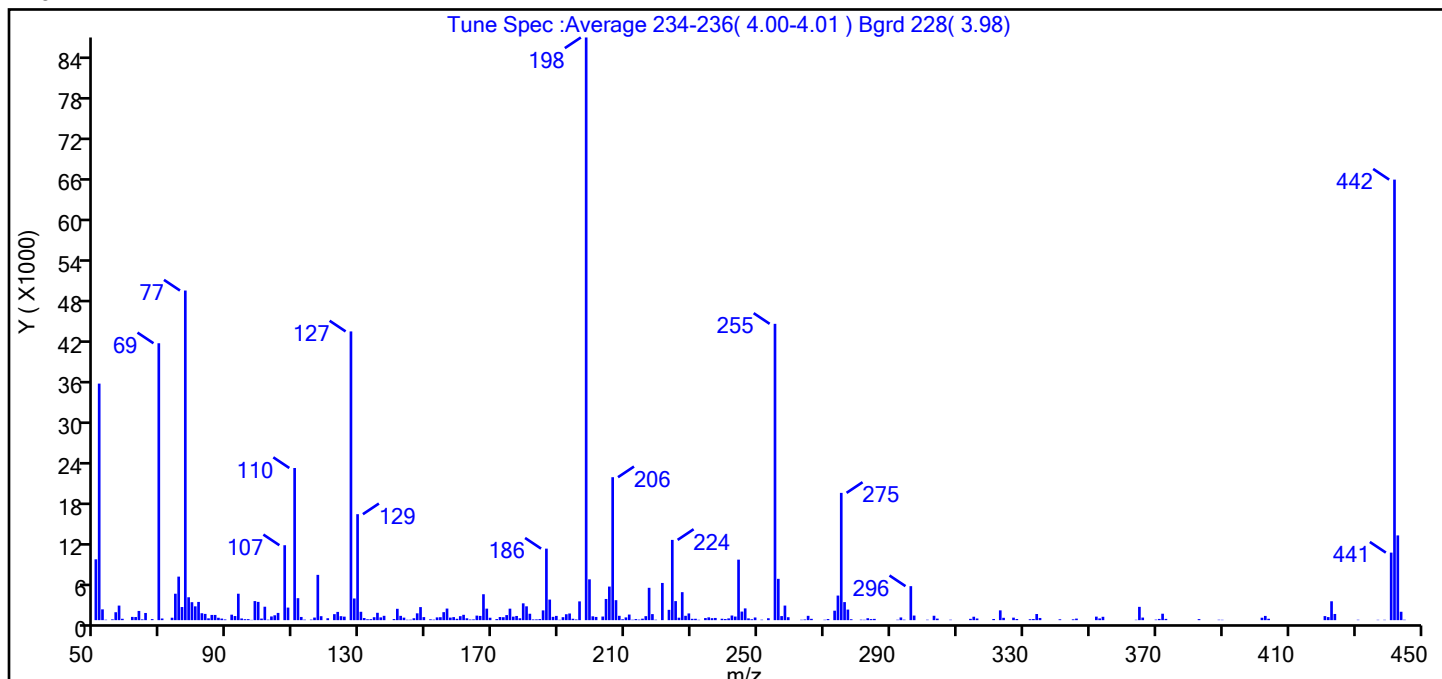
Dil. Factor: 1.0000

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Tune Method: DFTPP Method 8270

162 DFTPP



m/z	Ion Abundance Criteria	% Relative Abundance
198	Base peak, 100% relative abundance	100.0
51	30-60% of mass 198	40.6
68	<2% of mass 69	0.0 (0.0)
69	Present	47.5
70	<2% of mass 69	0.3 (0.6)
127	40-60% of mass 198	49.6
197	<1% of mass 198	0.0
199	5-9% of mass 198	7.0
275	10-30% of mass 198	21.8
365	>1% of mass 198	2.3
441	Present but less than mass 443	11.6 (79.7)
442	>40% of mass 198	75.6
443	17-23% of mass 442	14.5 (19.2)

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\31075.D\SMS_D_8270D.rsl\spectra.d
Injection Date: 08-Jan-2019 14:30:30
Spectrum: Tune Spec :Average 234-236(4.00-4.01) Bgrd 228(3.98)
Base Peak: 198.00
Minimum % Base Peak: 0
Number of Points: 252

m/z	Y	m/z	Y	m/z	Y	m/z	Y
50.00	9046	127.00	42936	194.00	207	273.00	1406
51.00	35176	128.00	3221	195.00	104	274.00	3655
52.00	1606	129.00	15756	196.00	2790	275.00	18928
53.00	65	130.00	1243	198.00	86648	276.00	2683
55.00	118	131.00	312	199.00	6069	277.00	1571
56.00	1178	132.00	130	200.00	569	278.00	132
57.00	2166	133.00	146	201.00	478	281.00	70
58.00	204	134.00	436	203.00	536	282.00	54
61.00	482	135.00	1093	204.00	3149	283.00	282
62.00	465	136.00	411	205.00	4993	284.00	156
63.00	1370	137.00	643	206.00	21256	285.00	188
64.00	115	140.00	159	207.00	2970	292.00	61
65.00	1066	141.00	1686	208.00	643	293.00	401
67.00	154	142.00	638	209.00	132	294.00	73
69.00	41176	143.00	373	210.00	408	296.00	5054
70.00	243	144.00	61	211.00	831	297.00	681
73.00	360	145.00	69	212.00	64	301.00	64
74.00	3929	146.00	282	213.00	158	303.00	653
75.00	6472	147.00	1014	214.00	77	304.00	226
76.00	1948	148.00	1941	215.00	217	308.00	63
77.00	49016	149.00	450	216.00	593	314.00	194
78.00	3402	151.00	123	217.00	4809	315.00	508
79.00	2672	152.00	74	218.00	897	316.00	243
80.00	2052	153.00	410	219.00	66	321.00	172
81.00	2709	154.00	439	221.00	5531	323.00	1455
82.00	1028	155.00	1188	223.00	1532	324.00	346
83.00	928	156.00	1722	224.00	11933	327.00	371
84.00	268	157.00	380	225.00	2829	328.00	168
85.00	775	158.00	450	226.00	365	332.00	135
86.00	774	159.00	201	227.00	4161	333.00	167
87.00	354	160.00	590	228.00	645	334.00	911
88.00	230	161.00	793	229.00	999	335.00	322
89.00	105	162.00	275	230.00	198	341.00	128

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31075.D\SMS_D_8270D.rslt\spectra.d

Injection Date: 08-Jan-2019 14:30:30

Spectrum: Tune Spec :Average 234-236(4.00-4.01) Bgrd 228(3.98)

Base Peak: 198.00

Minimum % Base Peak: 0

Number of Points: 252

m/z	Y	m/z	Y	m/z	Y	m/z	Y
91.00	813	163.00	89	231.00	205	345.00	118
92.00	610	164.00	112	232.00	52	346.00	229
93.00	3930	165.00	676	234.00	310	352.00	521
94.00	247	166.00	629	235.00	415	353.00	254
95.00	143	167.00	3853	236.00	292	354.00	499
96.00	150	168.00	1711	237.00	326	364.00	54
97.00	38	169.00	358	239.00	209	365.00	1976
98.00	2834	171.00	157	240.00	163	366.00	383
99.00	2715	172.00	465	241.00	259	370.00	77
100.00	231	173.00	438	242.00	690	371.00	181
101.00	1996	174.00	750	243.00	536	372.00	956
102.00	72	175.00	1707	244.00	8997	373.00	186
103.00	549	176.00	520	245.00	1273	383.00	154
104.00	722	177.00	622	246.00	1747	389.00	62
105.00	1075	178.00	277	247.00	261	390.00	51
107.00	11141	179.00	2500	248.00	135	402.00	360
108.00	1868	180.00	2055	249.00	396	403.00	628
110.00	22624	181.00	952	251.00	67	404.00	205
111.00	3268	182.00	106	253.00	281	421.00	602
112.00	474	183.00	113	255.00	44064	422.00	454
113.00	77	184.00	155	256.00	6143	423.00	2806
115.00	83	185.00	1451	257.00	604	424.00	918
116.00	383	186.00	10635	258.00	2167	431.00	59
117.00	6733	187.00	3058	259.00	435	437.00	50
118.00	588	188.00	492	263.00	60	439.00	54
120.00	283	189.00	632	264.00	101	441.00	10042
122.00	892	190.00	50	265.00	642	442.00	65512
123.00	1226	191.00	441	266.00	196	443.00	12601
124.00	590	192.00	879	270.00	59	444.00	1246
125.00	522	193.00	990	271.00	164	445.00	63

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31075.D

Injection Date: 08-Jan-2019 14:30:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: DFTPP

Worklist Smp#: 2

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

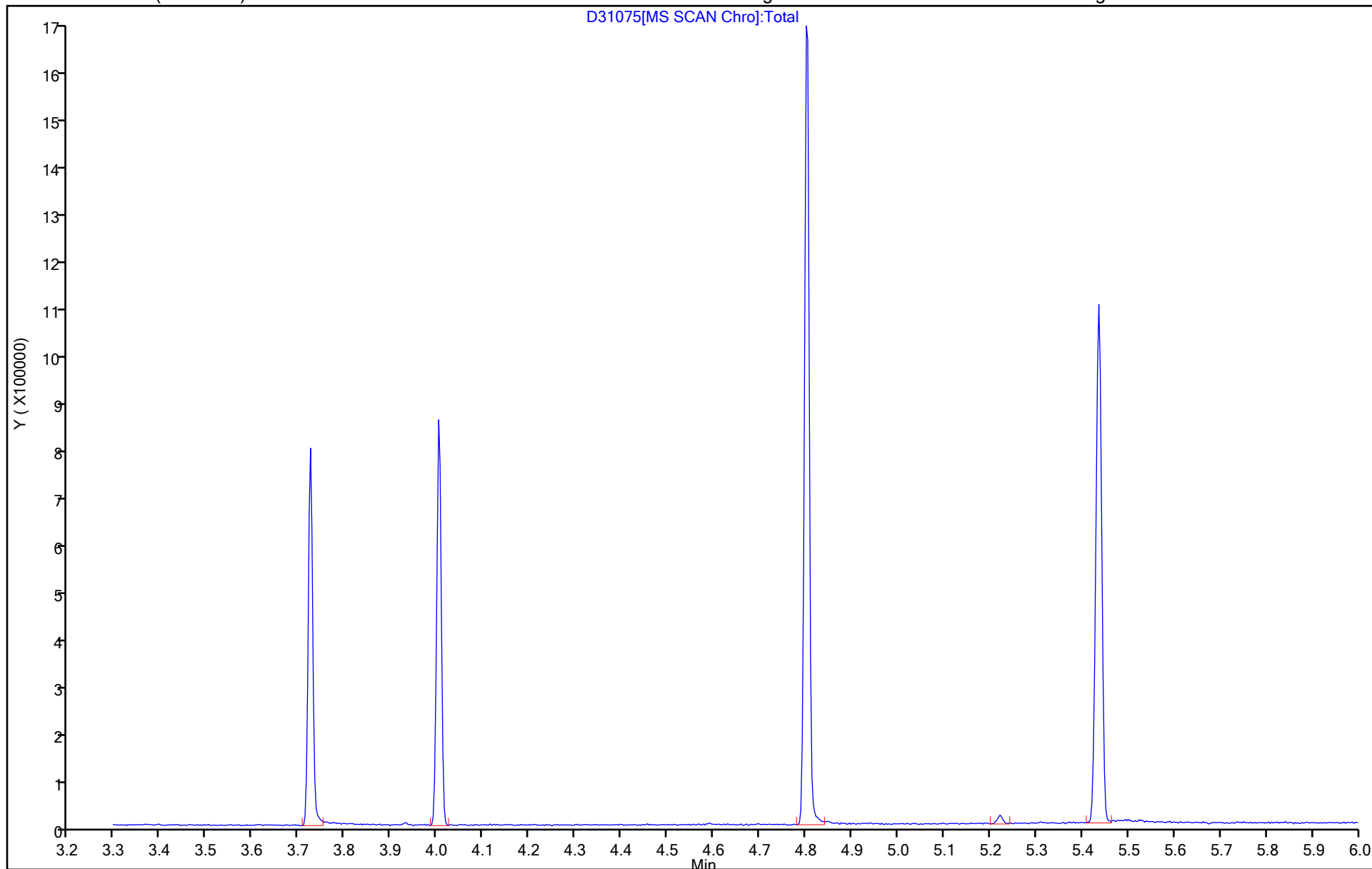
ALS Bottle#: 1

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31280.D
 Lims ID: DFTPP
 Client ID:
 Sample Type: DFTPP
 Inject. Date: 22-Jan-2019 13:47:30 ALS Bottle#: 1 Worklist Smp#: 2
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: DFTPP
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:33 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 22-Jan-2019 14:24:08

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
20 Pentachlorophenol_T	266	3.643	3.643	0.000	93	73445	NR	NR	
33 Benzidine_T	184	4.720	4.720	0.000	100	524841	NR	NR	
162 DFTPP									
163 4,4'-DDE	246		4.912				ND	ND	
164 4,4'-DDD	235	5.132	5.132	0.000	94	2276	NR	NR	
165 4,4'-DDT	235	5.337	5.337	0.000	98	221646	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

ND - Not Detected or Marked ND

Reagents:

MS-DFTPP_00047

Amount Added: 200.00

Units: uL

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31280.D

Injection Date: 22-Jan-2019 13:47:30

Instrument ID: SMS_D

Lims ID: DFTPP

Client ID:

Operator ID: KIEKELD

ALS Bottle#: 1 Worklist Smp#: 2

Injection Vol: 1.0 ul

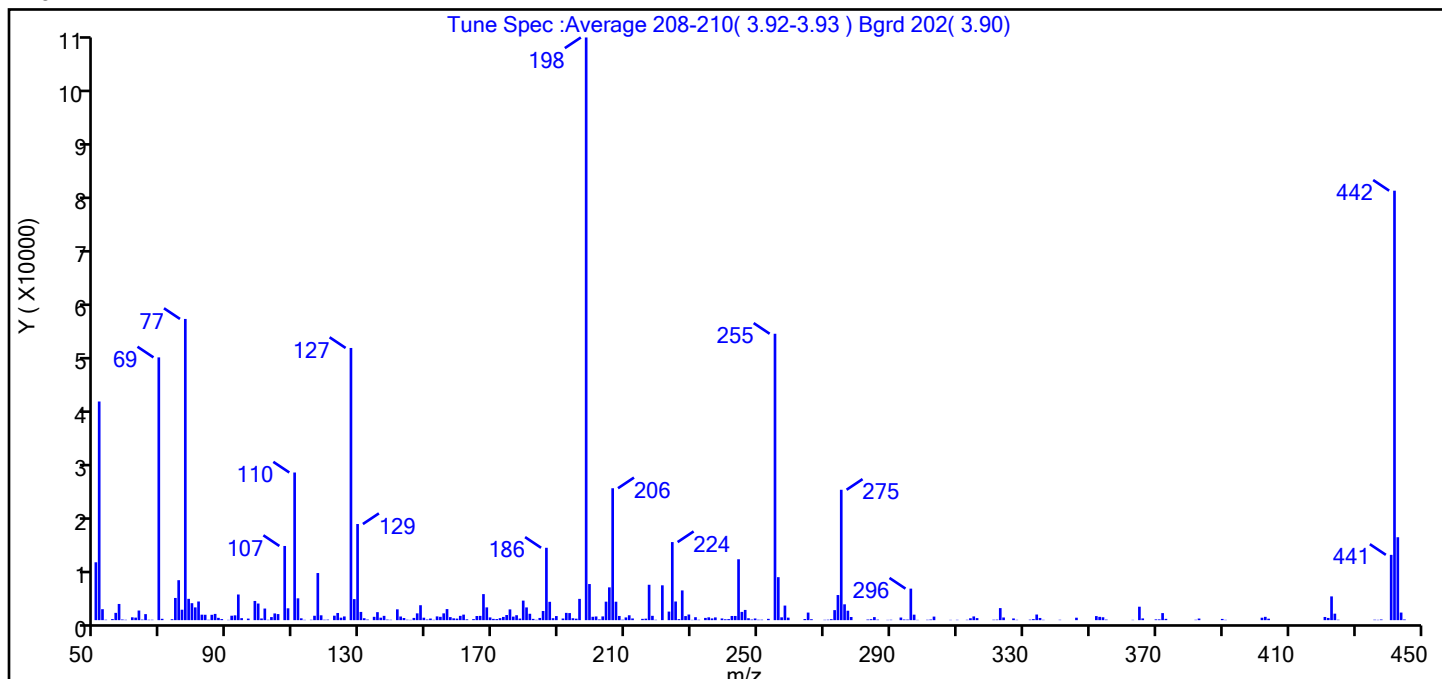
Dil. Factor: 1.0000

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Tune Method: DFTPP Method 8270

162 DFTPP



m/z	Ion Abundance Criteria	% Relative Abundance
198	Base peak, 100% relative abundance	100.0
51	30-60% of mass 198	37.5
68	<2% of mass 69	0.0 (0.0)
69	Present	45.1
70	<2% of mass 69	0.2 (0.5)
127	40-60% of mass 198	46.7
197	<1% of mass 198	0.0
199	5-9% of mass 198	6.2
275	10-30% of mass 198	22.4
365	>1% of mass 198	2.3
441	Present but less than mass 443	11.2 (78.8)
442	>40% of mass 198	73.7
443	17-23% of mass 442	14.2 (19.3)

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\31280.D\SMS_D_8270D.rslt\spectra.d
Injection Date: 22-Jan-2019 13:47:30
Spectrum: Tune Spec :Average 208-210(3.92-3.93) Bgrd 202(3.90)
Base Peak: 198.00
Minimum % Base Peak: 0
Number of Points: 261

m/z	Y	m/z	Y	m/z	Y	m/z	Y
50.00	10620	129.00	17640	200.00	617	285.00	557
51.00	40128	130.00	1508	201.00	676	286.00	94
52.00	2013	131.00	351	202.00	134	289.00	50
53.00	80	132.00	108	203.00	687	290.00	70
55.00	197	134.00	608	204.00	3391	293.00	480
56.00	1336	135.00	1465	205.00	6017	294.00	118
57.00	2971	136.00	451	206.00	24208	295.00	106
58.00	119	137.00	787	207.00	3383	296.00	5784
59.00	66	138.00	105	208.00	766	297.00	1006
61.00	523	139.00	66	209.00	79	298.00	52
62.00	465	141.00	1986	210.00	499	301.00	70
63.00	1765	142.00	667	211.00	895	302.00	115
64.00	104	143.00	390	212.00	311	303.00	652
65.00	1105	144.00	81	215.00	237	308.00	51
66.00	68	145.00	56	216.00	273	310.00	63
67.00	70	146.00	408	217.00	6492	313.00	66
69.00	48224	147.00	1246	218.00	792	314.00	343
70.00	245	148.00	2739	219.00	69	315.00	684
73.00	169	149.00	447	221.00	6393	316.00	374
74.00	4072	150.00	116	223.00	1571	321.00	79
75.00	7333	151.00	293	224.00	14326	322.00	97
76.00	1914	152.00	60	225.00	3421	323.00	2211
77.00	55280	153.00	689	226.00	186	324.00	487
78.00	3911	154.00	609	227.00	5453	327.00	310
79.00	3114	155.00	1247	228.00	749	328.00	62
80.00	2341	156.00	2031	229.00	1034	332.00	90
81.00	3423	157.00	556	230.00	52	333.00	189
82.00	1005	158.00	333	231.00	540	334.00	1032
83.00	987	159.00	285	232.00	71	335.00	400
84.00	70	160.00	786	234.00	409	336.00	60
85.00	980	161.00	1013	235.00	517	341.00	68
86.00	1145	162.00	148	236.00	315	346.00	447
87.00	423	164.00	188	237.00	503	352.00	745

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\31280.D\SMS_D_8270D.rslt\spectra.d

Injection Date: 22-Jan-2019 13:47:30

Spectrum: Tune Spec :Average 208-210(3.92-3.93) Bgrd 202(3.90)

Base Peak: 198.00

Minimum % Base Peak: 0

Number of Points: 261

m/z	Y	m/z	Y	m/z	Y	m/z	Y
88.00	197	165.00	756	239.00	309	353.00	603
90.00	52	166.00	782	240.00	160	354.00	533
91.00	812	167.00	4778	241.00	193	355.00	105
92.00	880	168.00	2342	242.00	765	363.00	56
93.00	4708	169.00	504	243.00	768	365.00	2466
94.00	365	170.00	234	244.00	11174	366.00	318
96.00	286	171.00	197	245.00	1514	370.00	143
98.00	3523	172.00	364	246.00	1874	371.00	140
99.00	3050	173.00	591	247.00	347	372.00	1294
100.00	307	174.00	938	248.00	113	373.00	235
101.00	2129	175.00	1972	249.00	305	382.00	66
102.00	68	176.00	647	250.00	79	383.00	293
103.00	563	177.00	903	251.00	84	390.00	224
104.00	1230	178.00	290	253.00	240	391.00	58
105.00	1114	179.00	3587	255.00	52560	402.00	447
107.00	13613	180.00	2336	256.00	7887	403.00	606
108.00	2174	181.00	1170	257.00	517	404.00	266
110.00	27096	182.00	233	258.00	2675	421.00	581
111.00	4006	183.00	63	259.00	462	422.00	405
112.00	334	184.00	404	264.00	201	423.00	4360
113.00	57	185.00	1679	265.00	1390	424.00	1189
115.00	75	186.00	13281	266.00	169	425.00	75
116.00	804	187.00	3365	270.00	62	436.00	79
117.00	8646	188.00	356	271.00	83	437.00	56
118.00	889	189.00	749	272.00	177	438.00	121
119.00	79	191.00	299	273.00	1839	441.00	11983
120.00	99	192.00	1336	274.00	4607	442.00	78816
122.00	818	193.00	1299	275.00	23928	443.00	15215
123.00	1314	194.00	350	276.00	2906	444.00	1392
124.00	455	195.00	271	277.00	1728	445.00	124
125.00	681	196.00	3904	278.00	576		
127.00	49952	198.00	106936	283.00	112		
128.00	3861	199.00	6627	284.00	173		

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31280.D

Injection Date: 22-Jan-2019 13:47:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: DFTPP

Worklist Smp#: 2

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

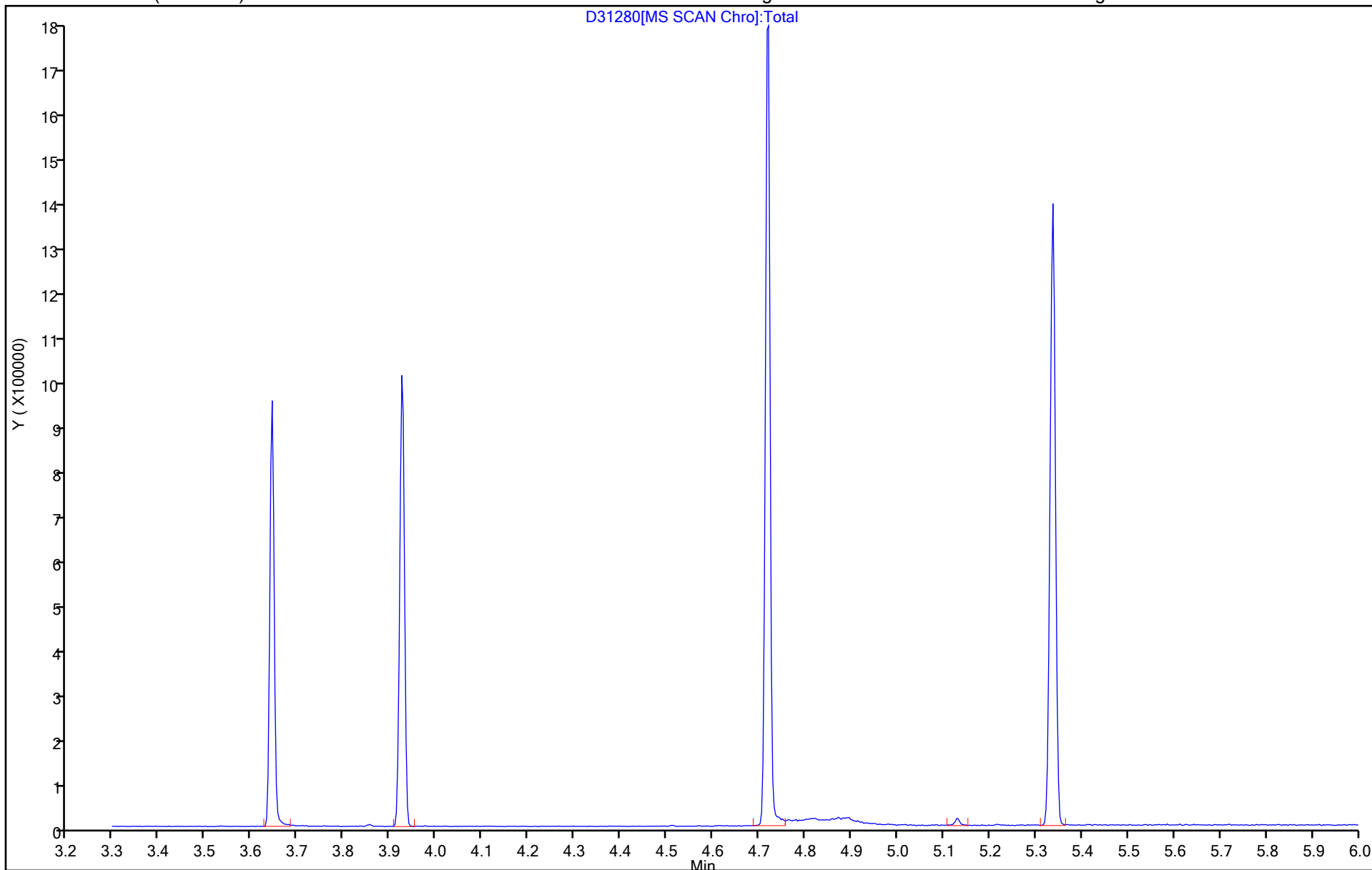
ALS Bottle#: 1

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 280-444835/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31289.D</u>
Analysis Method: <u>8270D</u>	Date Collected: _____
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>1000(mL)</u>	Date Analyzed: <u>01/22/2019 17:40</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
92-52-4	1,1'-Biphenyl	0.41	U	10	0.41
95-94-3	1,2,4,5-Tetrachlorobenzene	2.0	U	10	2.0
120-82-1	1,2,4-Trichlorobenzene	2.0	U	5.0	2.0
95-50-1	1,2-Dichlorobenzene	2.0	U	5.0	2.0
122-66-7	1,2-Diphenylhydrazine (as Azobenzene)	0.54	U	10	0.54
541-73-1	1,3-Dichlorobenzene	2.0	U	10	2.0
99-65-0	1,3-Dinitrobenzene	0.97	U	10	0.97
106-46-7	1,4-Dichlorobenzene	2.0	U	5.0	2.0
123-91-1	1,4-Dioxane	0.71	U	20	0.71
90-12-0	1-Methylnaphthalene	0.35	U	4.0	0.35
58-90-2	2,3,4,6-Tetrachlorophenol	0.96	U	50	0.96
95-95-4	2,4,5-Trichlorophenol	0.52	U	10	0.52
88-06-2	2,4,6-Trichlorophenol	0.74	U	10	0.74
120-83-2	2,4-Dichlorophenol	0.68	U	10	0.68
105-67-9	2,4-Dimethylphenol	0.67	U	10	0.67
51-28-5	2,4-Dinitrophenol	7.5	U	30	7.5
121-14-2	2,4-Dinitrotoluene	0.93	U	10	0.93
87-65-0	2,6-Dichlorophenol	0.75	U	10	0.75
606-20-2	2,6-Dinitrotoluene	0.72	U	10	0.72
91-58-7	2-Chloronaphthalene	0.46	U	4.0	0.46
95-57-8	2-Chlorophenol	0.43	U	10	0.43
91-57-6	2-Methylnaphthalene	0.41	U	4.0	0.41
95-48-7	2-Methylphenol	0.56	U	10	0.56
88-74-4	2-Nitroaniline	0.90	U	10	0.90
88-75-5	2-Nitrophenol	0.62	U	10	0.62
15831-10-4	3 & 4 Methylphenol	0.40	U	10	0.40
91-94-1	3,3'-Dichlorobenzidine	0.83	U	50	0.83
108-39-4	3-Methylphenol	0.40	U	10	0.40
99-09-2	3-Nitroaniline	0.78	U	10	0.78
534-52-1	4,6-Dinitro-2-methylphenol	5.9	U	50	5.9
101-55-3	4-Bromophenyl phenyl ether	0.41	U	10	0.41
59-50-7	4-Chloro-3-methylphenol	0.45	U	10	0.45
106-47-8	4-Chloroaniline	0.56	U	10	0.56
7005-72-3	4-Chlorophenyl phenyl ether	0.63	U	10	0.63

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 280-444835/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31289.D</u>
Analysis Method: <u>8270D</u>	Date Collected: _____
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>1000(mL)</u>	Date Analyzed: <u>01/22/2019 17:40</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
106-44-5	4-Methylphenol	0.40	U	10	0.40
100-01-6	4-Nitroaniline	0.84	U	10	0.84
100-02-7	4-Nitrophenol	1.0	U	10	1.0
83-32-9	Acenaphthene	0.45	U	4.0	0.45
208-96-8	Acenaphthylene	0.50	U	4.0	0.50
98-86-2	Acetophenone	0.52	U	10	0.52
62-53-3	Aniline	0.88	U	10	0.88
120-12-7	Anthracene	0.45	U	4.0	0.45
103-33-3	Azobenzene	0.54	U	4.0	0.54
100-52-7	Benzaldehyde	0.53	U	10	0.53
92-87-5	Benzidine	4.4	U	100	4.4
56-55-3	Benzo[a]anthracene	0.58	U	4.0	0.58
50-32-8	Benzo[a]pyrene	0.64	U	4.0	0.64
205-99-2	Benzo[b]fluoranthene	0.53	U	4.0	0.53
191-24-2	Benzo[g,h,i]perylene	0.79	U	4.0	0.79
207-08-9	Benzo[k]fluoranthene	0.56	U	4.0	0.56
65-85-0	Benzoic acid	5.7	U	25	5.7
100-51-6	Benzyl alcohol	0.35	U	10	0.35
108-60-1	bis (2-chloroisopropyl) ether	0.42	U	10	0.42
111-91-1	Bis(2-chloroethoxy)methane	0.61	U	10	0.61
111-44-4	Bis(2-chloroethyl)ether	0.49	U	10	0.49
117-81-7	Bis(2-ethylhexyl) phthalate	1.1	U	10	1.1
85-68-7	Butyl benzyl phthalate	2.0	U	5.0	2.0
105-60-2	Caprolactam	1.2	U	10	1.2
86-74-8	Carbazole	0.45	U	4.0	0.45
218-01-9	Chrysene	0.52	U	4.0	0.52
53-70-3	Dibenz(a,h)anthracene	0.65	U	4.0	0.65
132-64-9	Dibenzofuran	0.36	U	4.0	0.36
84-66-2	Diethyl phthalate	0.75	U	4.0	0.75
131-11-3	Dimethyl phthalate	0.53	U	4.0	0.53
84-74-2	Di-n-butyl phthalate	0.88	U	4.0	0.88
117-84-0	Di-n-octyl phthalate	1.6	U	5.0	1.6
122-39-4	Diphenylamine	0.49	U	10	0.49
52-85-7	Famphur	2.0	U	100	2.0

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 280-444835/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31289.D</u>
Analysis Method: <u>8270D</u>	Date Collected: _____
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>1000(mL)</u>	Date Analyzed: <u>01/22/2019 17:40</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
206-44-0	Fluoranthene	0.64	U	4.0	0.64
86-73-7	Fluorene	0.49	U	4.0	0.49
118-74-1	Hexachlorobenzene	0.96	U	10	0.96
87-68-3	Hexachlorobutadiene	7.5	U	30	7.5
77-47-4	Hexachlorocyclopentadiene	6.6	U	50	6.6
67-72-1	Hexachloroethane	7.6	U	30	7.6
544-76-3	Hexadecane	0.35	U	10	0.35
193-39-5	Indeno[1,2,3-cd]pyrene	1.6	U	4.0	1.6
78-59-1	Isophorone	0.67	U	10	0.67
91-20-3	Naphthalene	0.40	U	4.0	0.40
98-95-3	Nitrobenzene	0.43	U	10	0.43
62-75-9	N-Nitrosodimethylamine	0.62	U	10	0.62
621-64-7	N-Nitrosodi-n-propylamine	0.56	U	10	0.56
86-30-6	N-Nitrosodiphenylamine	0.61	U	10	0.61
87-86-5	Pentachlorophenol	5.5	U	50	5.5
85-01-8	Phenanthrene	0.28	U	4.0	0.28
108-95-2	Phenol	0.56	U	10	0.56
129-00-0	Pyrene	0.43	U	10	0.43
110-86-1	Pyridine	1.8	U	20	1.8

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol (Surr)	73		52-123
321-60-8	2-Fluorobiphenyl	56		47-119
367-12-4	2-Fluorophenol (Surr)	44		17-71
4165-60-0	Nitrobenzene-d5 (Surr)	59		45-113
4165-62-2	Phenol-d5 (Surr)	30		10-52
1718-51-0	Terphenyl-d14 (Surr)	81		50-123

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: MB 280-444835/1-A
Matrix: Water Lab File ID: D31289.D
Analysis Method: 8270D Date Collected: _____
Extract. Method: 3510C Date Extracted: 01/21/2019 06:56
Sample wt/vol: 1000 (mL) Date Analyzed: 01/22/2019 17:40
Con. Extract Vol.: 1 (mL) Dilution Factor: 1
Injection Volume: 1 (uL) Level: (low/med) Low
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 445019 Units: ug/L
Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31289.D
 Lims ID: MB 280-444835/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 22-Jan-2019 17:40:30 ALS Bottle#: 10 Worklist Smp#: 19
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: MB 280-444835_1-A
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 23-Jan-2019 09:22:55

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.505	4.503	0.002	96	133680	40.0	40.0	
* 2 Naphthalene-d8	136	5.739	5.737	0.002	99	516611	40.0	40.0	
* 3 Acenaphthene-d10	164	7.481	7.484	-0.003	90	327764	40.0	40.0	
* 4 Phenanthrene-d10	188	8.966	8.964	0.002	97	618832	40.0	40.0	
* 5 Chrysene-d12	240	12.898	12.901	-0.003	98	643464	40.0	40.0	
* 6 Perylene-d12	264	16.750	16.752	-0.002	97	618251	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.314	3.309	0.005	92	221231	100.0	44.0	
\$ 8 Phenol-d5	99	4.153	4.153	0.000	98	201066	100.0	30.1	
\$ 9 Nitrobenzene-d5	82	5.024	5.023	0.001	87	330891	100.0	59.4	
\$ 10 2-Fluorobiphenyl	172	6.797	6.797	0.000	99	642073	100.0	56.3	
\$ 11 2,4,6-Tribromophenol	330	8.272	8.271	0.001	94	115121	100.0	72.7	
\$ 12 Terphenyl-d14	244	10.857	10.857	0.000	100	1198001	100.0	81.0	
13 1,4-Dioxane	88		1.856					ND	
14 N-Nitrosodimethylamine	74		2.096					ND	
15 Pyridine	79		2.149					ND	
16 2-Picoline	93		2.847					ND	
17 N-Nitrosomethylethylamine	88		2.922					ND	
18 Methyl methanesulfonate	80		3.189					ND	
19 N-Nitrosodiethylamine	102		3.558					ND	
20 Pentachlorophenol_T	266		3.643					ND	
21 Ethyl methanesulfonate	79		3.814					ND	
22 Benzaldehyde	106		4.091					ND	
23 n-Decane	57		4.345					ND	
24 Phenol	94		4.169					ND	
25 Aniline	93		4.190					ND	
26 Pentachloroethane	117		4.306					ND	
27 Bis(2-chloroethyl)ether	93		4.233					ND	
28 2-Chlorophenol	128		4.313					ND	
29 1,3-Dichlorobenzene	146		4.457					ND	
30 1,4-Dichlorobenzene	146		4.521					ND	
31 Benzyl alcohol	108		4.623					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
32 1,2-Dichlorobenzene	146		4.671					ND	
33 Benzidine_T	184		4.720					ND	
34 2,2'-oxybis[1-chloropropan	45		4.746					ND	
35 2-Methylphenol	108		4.735					ND	
36 N-Nitrosopyrrolidine	100		4.899					ND	
37 N-Nitrosomorpholine	116		4.936					ND	
38 N-Nitrosodi-n-propylamine	70		4.874					ND	
39 Acetophenone	105		4.879					ND	
40 4-Methylphenol	108		4.879					ND	
41 3-Methylphenol	108		4.879					ND	
42 3 & 4 Methylphenol	108		4.879					ND	
43 2-Toluidine	106		4.974					ND	
44 Hexachloroethane	117		4.997					ND	
45 Nitrobenzene	77		5.045					ND	
46 N-Nitrosopiperidine	114		5.241					ND	
47 Isophorone	82		5.275					ND	
48 2-Nitrophenol	139		5.355					ND	
49 2,4-Dimethylphenol	107		5.392					ND	
50 o,o',o''-Triethylphosphoro	198		5.502					ND	
51 Bis(2-chloroethoxy)methane	93		5.472					ND	
52 Benzoic acid	105		5.536					ND	
53 2,4-Dichlorophenol	162		5.600					ND	
54 alpha,alpha-Dimethyl phene	58		5.684					ND	
55 1,2,4-Trichlorobenzene	180		5.681					ND	
56 Naphthalene	128		5.761					ND	
57 4-Chloroaniline	127		5.798					ND	
58 2,6-Dichlorophenol	162		5.819					ND	
59 Hexachloropropene	213		5.914					ND	
60 Hexachlorobutadiene	225		5.884					ND	
61 N-Nitrosodi-n-butylamine	84		6.186					ND	
62 p-Phenylene diamine	108		6.197					ND	
63 Caprolactam	55		6.145					ND	
64 4-Chloro-3-methylphenol	107		6.290					ND	
65 Safrole, Total	162		6.405					ND	
66 2-Methylnaphthalene	142		6.439					ND	
67 1-Methylnaphthalene	142		6.541					ND	
68 Hexachlorocyclopentadiene	237		6.610					ND	
69 1,2,4,5-Tetrachlorobenzene	216		6.615					ND	
70 Isosafrole Peak 1	162		6.694					ND	
71 2,4,6-Trichlorophenol	196		6.722					ND	
72 2,4,5-Trichlorophenol	196		6.765					ND	
73 Isosafrole Peak 2	104		6.918					ND	
74 1,1'-Biphenyl	154		6.899					ND	
75 2-Chloronaphthalene	162		6.925					ND	
76 1-Chloronaphthalene	162		7.014					ND	
77 2-Nitroaniline	65		7.016					ND	
78 1,4-Naphthoquinone	158		7.148					ND	
79 1,4-Dinitrobenzene	168		7.196					ND	
80 Dimethyl phthalate	163		7.192					ND	
81 1,3-Dinitrobenzene	168		7.219					ND	
82 2,6-Dinitrotoluene	165		7.251					ND	
83 Acenaphthylene	152		7.342					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
84 3-Nitroaniline	138		7.427					ND	
85 Acenaphthene	153		7.513					ND	
86 2,4-Dinitrophenol	184		7.529					ND	
87 Pentachlorobenzene	250		7.719					ND	
88 4-Nitrophenol	109		7.609					ND	
89 2,4-Dinitrotoluene	165		7.657					ND	
90 Dibenzofuran	168		7.684					ND	
91 1-Naphthylamine	143		7.821					ND	
92 Hexadecane	57		7.914					ND	
93 2,3,4,6-Tetrachlorophenol	232		7.812					ND	
94 2-Naphthylamine	143		7.896					ND	
95 Diethyl phthalate	149		7.892					ND	
96 Thionazin	97		8.035					ND	
97 4-Chlorophenyl phenyl ethe	204		8.015					ND	
98 N-Nitro-o-toluidine	152		8.088					ND	
99 Fluorene	166		8.026					ND	
100 4-Nitroaniline	138		8.042					ND	
101 4,6-Dinitro-2-methylphenol	198		8.074					ND	
102 N-Nitrosodiphenylamine	169		8.133					ND	
103 Diphenylamine	169		8.133					ND	
104 Tributyl phosphate	99		8.250					ND	
105 1,2-Diphenylhydrazine	77		8.175					ND	
106 Azobenzene	77		8.175					ND	
107 Sulfotepp	97		8.339					ND	
108 1,3,5-Trinitrobenzene	213		8.435					ND	
109 Diallate Peak 1	86		8.483					ND	
110 Phorate	121		8.489					ND	
111 Phenacetin	108		8.494					ND	
112 Atrazine	200		8.656					ND	
113 Diallate Peak 2	86		8.574					ND	
114 4-Bromophenyl phenyl ether	248		8.507					ND	
115 Dimethoate	87		8.654					ND	
116 Hexachlorobenzene	284		8.592					ND	
117 4-Aminobiphenyl	169		8.825					ND	
118 Pentachloronitrobenzene	237		8.863					ND	
119 Pentachlorophenol	266		8.784					ND	
120 Pronamide	173		8.884					ND	
121 Disulfoton	88		9.012					ND	
122 Dinoseb	211		9.018					ND	
123 Phenanthrene	178		8.993					ND	
124 Anthracene	178		9.041					ND	
125 Carbazole	167		9.196					ND	
126 Methyl parathion	109		9.386					ND	
127 Di-n-butyl phthalate	149		9.527					ND	
128 Ethyl Parathion	109		9.808					ND	
129 4-Nitroquinoline-1-oxide	190		9.851					ND	
130 Methapyrilene	97		9.942					ND	
131 Isodrin	193		10.209					ND	
132 Fluoranthene	202		10.312					ND	
133 Benzidine	184		10.477					ND	
134 Pyrene	202		10.638					ND	
135 Aramite Peak 1	185		10.909					ND	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
136 Aramite Peak 2	185		11.032					ND	
137 p-Dimethylamino azobenzene	120		11.187					ND	
138 Chlorobenzilate	251		11.272					ND	
139 Famphur	218		11.600					ND	
140 3,3'-Dimethylbenzidine	212		11.801					ND	
141 Butyl benzyl phthalate	149		11.717					ND	
142 2-Acetylaminofluorene	181		12.324					ND	
143 4,4'-Methylene bis(2-chlor	231		12.987					ND	
144 3,3'-Dichlorobenzidine	252		12.850					ND	
145 Benzo[a]anthracene	228		12.887					ND	
146 Chrysene	228		12.973					ND	
147 Bis(2-ethylhexyl) phthalat	149		13.053					ND	
148 Di-n-octyl phthalate	149		14.821					ND	
149 7,12-Dimethylbenz(a)anthra	256		15.861					ND	
150 Benzo[b]fluoranthene	252		15.686					ND	
151 Benzo[k]fluoranthene	252		15.766					ND	
152 Hexachlorophene	196		16.930					ND	
153 Benzo[a]pyrene	252		16.600					ND	
154 3-Methylcholanthrene	268		17.859					ND	
155 Dibenz[a,j]acridine	279		19.584					ND	
156 Indeno[1,2,3-cd]pyrene	276		19.837					ND	
157 Dibenz(a,h)anthracene	278		19.939					ND	
158 Benzo[g,h,i]perylene	276		20.574					ND	
S 166 Diallate	86		15.047					ND	
S 167 Isosafrole	162		15.047					ND	
S 168 Aramite, Total	185		15.047					ND	
S 169 Methyl Phenols, Total	108		15.500					ND	
S 170 Total Cresols	108		15.500					ND	
159 Tetraethyl Pyrophosphate (	1		0.000					ND	
160 Kepone TIC	1		0.000					ND	
161 Kepone	272		0.000					ND	
163 4,4'-DDE	246		4.912					ND	
164 4,4'-DDD	235		5.132					ND	
165 4,4'-DDT	235		5.337					ND	

Reagents:

MS-IS_00014

Amount Added: 20.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31289.D

Injection Date: 22-Jan-2019 17:40:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: MB 280-444835/1-A

Worklist Smp#: 19

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

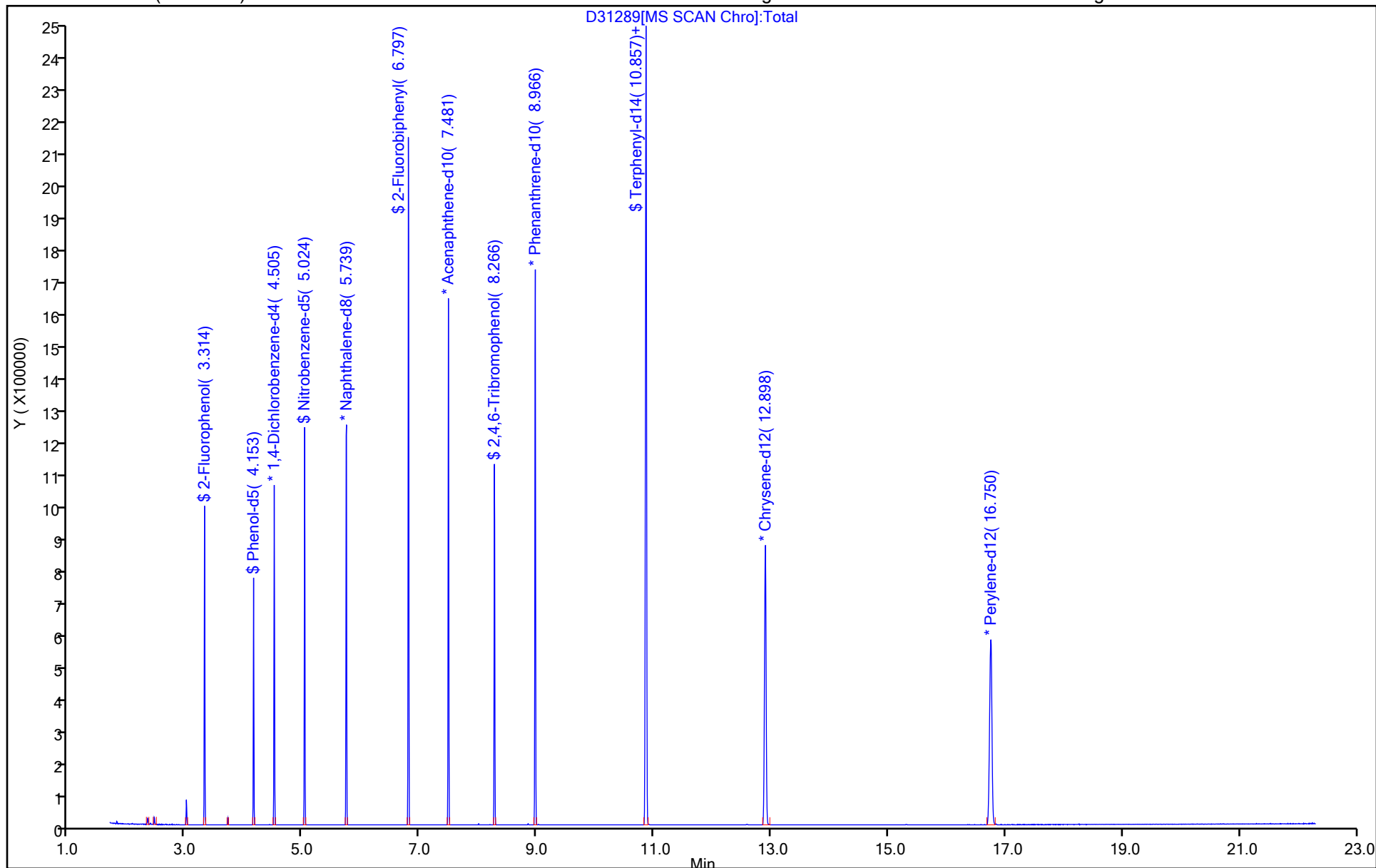
ALS Bottle#: 10

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31289.D
 Lims ID: MB 280-444835/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 22-Jan-2019 17:40:30 ALS Bottle#: 10 Worklist Smp#: 19
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: MB 280-444835_1-A
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 23-Jan-2019 09:22:55

Compound	Amount Added	Amount Recovered	% Rec.
\$ 7 2-Fluorophenol	100.0	44.0	44.04
\$ 8 Phenol-d5	100.0	30.1	30.05
\$ 9 Nitrobenzene-d5	100.0	59.4	59.44
\$ 10 2-Fluorobiphenyl	100.0	56.3	56.34
\$ 11 2,4,6-Tribromophenol	100.0	72.7	72.71
\$ 12 Terphenyl-d14	100.0	81.0	81.00

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCS 280-444835/2-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31290.D</u>
Analysis Method: <u>8270D</u>	Date Collected: _____
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>1000(mL)</u>	Date Analyzed: <u>01/22/2019 18:10</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
92-52-4	1,1'-Biphenyl	65.2		10	0.41
95-94-3	1,2,4,5-Tetrachlorobenzene	67.4		10	2.0
120-82-1	1,2,4-Trichlorobenzene	62.7		5.0	2.0
95-50-1	1,2-Dichlorobenzene	56.8		5.0	2.0
122-66-7	1,2-Diphenylhydrazine (as Azobenzene)	67.5		10	0.54
541-73-1	1,3-Dichlorobenzene	56.1		10	2.0
99-65-0	1,3-Dinitrobenzene	69.6		10	0.97
106-46-7	1,4-Dichlorobenzene	56.9		5.0	2.0
123-91-1	1,4-Dioxane	31.8		20	0.71
90-12-0	1-Methylnaphthalene	70.4		4.0	0.35
58-90-2	2,3,4,6-Tetrachlorophenol	69.3		50	0.96
95-95-4	2,4,5-Trichlorophenol	67.2		10	0.52
88-06-2	2,4,6-Trichlorophenol	70.1		10	0.74
120-83-2	2,4-Dichlorophenol	68.8		10	0.68
105-67-9	2,4-Dimethylphenol	66.7		10	0.67
51-28-5	2,4-Dinitrophenol	126		30	7.5
121-14-2	2,4-Dinitrotoluene	68.9		10	0.93
87-65-0	2,6-Dichlorophenol	69.6		10	0.75
606-20-2	2,6-Dinitrotoluene	68.8		10	0.72
91-58-7	2-Chloronaphthalene	63.9		4.0	0.46
95-57-8	2-Chlorophenol	58.5		10	0.43
91-57-6	2-Methylnaphthalene	68.6		4.0	0.41
95-48-7	2-Methylphenol	54.1		10	0.56
88-74-4	2-Nitroaniline	65.3		10	0.90
88-75-5	2-Nitrophenol	66.7		10	0.62
15831-10-4	3 & 4 Methylphenol	49.8		10	0.40
91-94-1	3,3'-Dichlorobenzidine	148		50	0.83
108-39-4	3-Methylphenol	49.8		10	0.40
99-09-2	3-Nitroaniline	55.7		10	0.78
534-52-1	4,6-Dinitro-2-methylphenol	167		50	5.9
101-55-3	4-Bromophenyl phenyl ether	72.8		10	0.41
59-50-7	4-Chloro-3-methylphenol	69.5		10	0.45
106-47-8	4-Chloroaniline	60.6		10	0.56
7005-72-3	4-Chlorophenyl phenyl ether	66.5		10	0.63

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCS 280-444835/2-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31290.D</u>
Analysis Method: <u>8270D</u>	Date Collected: _____
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>1000(mL)</u>	Date Analyzed: <u>01/22/2019 18:10</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
106-44-5	4-Methylphenol	49.8		10	0.40
100-01-6	4-Nitroaniline	65.6		10	0.84
100-02-7	4-Nitrophenol	52.3		10	1.0
83-32-9	Acenaphthene	66.1		4.0	0.45
208-96-8	Acenaphthylene	65.3		4.0	0.50
98-86-2	Acetophenone	64.3		10	0.52
62-53-3	Aniline	51.2		10	0.88
120-12-7	Anthracene	75.1		4.0	0.45
103-33-3	Azobenzene	66.7		4.0	0.54
100-52-7	Benzaldehyde	38.2		10	0.53
92-87-5	Benzidine	64.7	J	100	4.4
56-55-3	Benzo[a]anthracene	68.1		4.0	0.58
50-32-8	Benzo[a]pyrene	74.7		4.0	0.64
205-99-2	Benzo[b]fluoranthene	75.4		4.0	0.53
191-24-2	Benzo[g,h,i]perylene	75.4		4.0	0.79
207-08-9	Benzo[k]fluoranthene	75.7		4.0	0.56
65-85-0	Benzoic acid	20.9	J	25	5.7
100-51-6	Benzyl alcohol	52.5		10	0.35
108-60-1	bis (2-chloroisopropyl) ether	60.7		10	0.42
111-91-1	Bis(2-chloroethoxy)methane	67.8		10	0.61
111-44-4	Bis(2-chloroethyl)ether	64.9		10	0.49
117-81-7	Bis(2-ethylhexyl) phthalate	72.7		10	1.1
85-68-7	Butyl benzyl phthalate	70.3		5.0	2.0
105-60-2	Caprolactam	14.6		10	1.2
86-74-8	Carbazole	74.4		4.0	0.45
218-01-9	Chrysene	72.4		4.0	0.52
53-70-3	Dibenz(a,h)anthracene	76.4		4.0	0.65
132-64-9	Dibenzofuran	67.0		4.0	0.36
84-66-2	Diethyl phthalate	68.1		4.0	0.75
131-11-3	Dimethyl phthalate	67.4		4.0	0.53
84-74-2	Di-n-butyl phthalate	74.6		4.0	0.88
117-84-0	Di-n-octyl phthalate	73.0		5.0	1.6
122-39-4	Diphenylamine	57.9		10	0.49
206-44-0	Fluoranthene	74.3		4.0	0.64

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCS 280-444835/2-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31290.D</u>
Analysis Method: <u>8270D</u>	Date Collected: _____
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>1000 (mL)</u>	Date Analyzed: <u>01/22/2019 18:10</u>
Con. Extract Vol.: <u>1 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1 (uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
86-73-7	Fluorene	67.8		4.0	0.49
118-74-1	Hexachlorobenzene	75.7		10	0.96
87-68-3	Hexachlorobutadiene	62.6		30	7.5
77-47-4	Hexachlorocyclopentadiene	114		50	6.6
67-72-1	Hexachloroethane	53.2		30	7.6
544-76-3	Hexadecane	64.8		10	0.35
193-39-5	Indeno[1,2,3-cd]pyrene	72.2		4.0	1.6
78-59-1	Isophorone	66.8		10	0.67
91-20-3	Naphthalene	64.9		4.0	0.40
98-95-3	Nitrobenzene	65.2		10	0.43
62-75-9	N-Nitrosodimethylamine	33.3		10	0.62
621-64-7	N-Nitrosodi-n-propylamine	65.6		10	0.56
86-30-6	N-Nitrosodiphenylamine	75.9		10	0.61
87-86-5	Pentachlorophenol	147		50	5.5
85-01-8	Phenanthrene	74.8		4.0	0.28
108-95-2	Phenol	22.9		10	0.56
129-00-0	Pyrene	72.4		10	0.43
110-86-1	Pyridine	59.1		20	1.8

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol (Surr)	86		52-123
321-60-8	2-Fluorobiphenyl	80		47-119
367-12-4	2-Fluorophenol (Surr)	42		17-71
4165-60-0	Nitrobenzene-d5 (Surr)	82		45-113
4165-62-2	Phenol-d5 (Surr)	26		10-52
1718-51-0	Terphenyl-d14 (Surr)	82		50-123

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31290.D
 Lims ID: LCS 280-444835/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 22-Jan-2019 18:10:30 ALS Bottle#: 11 Worklist Smp#: 20
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCS 280-444835_2-A
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 23-Jan-2019 09:22:29

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.509	4.503	0.006	95	132748	40.0	40.0	
* 2 Naphthalene-d8	136	5.738	5.737	0.001	99	529049	40.0	40.0	
* 3 Acenaphthene-d10	164	7.484	7.484	0.000	91	332199	40.0	40.0	
* 4 Phenanthrene-d10	188	8.964	8.964	0.000	97	608169	40.0	40.0	
* 5 Chrysene-d12	240	12.907	12.901	0.006	98	625943	40.0	40.0	
* 6 Perylene-d12	264	16.753	16.752	0.001	97	611322	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.318	3.309	0.009	92	208772	100.0	41.9	
\$ 8 Phenol-d5	99	4.156	4.153	0.003	98	174331	100.0	26.2	
\$ 9 Nitrobenzene-d5	82	5.027	5.023	0.004	86	465194	100.0	81.6	
\$ 10 2-Fluorobiphenyl	172	6.801	6.797	0.004	99	925777	100.0	80.1	
\$ 11 2,4,6-Tribromophenol	330	8.270	8.271	-0.001	94	137841	100.0	85.9	
\$ 12 Terphenyl-d14	244	10.855	10.857	-0.002	100	1183717	100.0	82.3	
13 1,4-Dioxane	88	1.859	1.856	0.003	91	76725	80.0	31.8	
14 N-Nitrosodimethylamine	74	2.100	2.096	0.004	92	127365	80.0	33.3	
15 Pyridine	79	2.153	2.149	0.004	97	362770	160.0	59.1	
22 Benzaldehyde	106	4.092	4.091	0.001	98	154992	80.0	38.2	
23 n-Decane	57	4.349	4.345	0.004	97	257038	80.0	49.3	
24 Phenol	94	4.167	4.169	-0.002	96	159357	80.0	22.9	
25 Aniline	93	4.188	4.190	-0.002	98	446115	80.0	51.2	
27 Bis(2-chloroethyl)ether	93	4.236	4.233	0.003	96	321335	80.0	64.9	
28 2-Chlorophenol	128	4.317	4.313	0.004	97	289942	80.0	58.5	
29 1,3-Dichlorobenzene	146	4.455	4.457	-0.002	97	290411	80.0	56.1	
30 1,4-Dichlorobenzene	146	4.525	4.521	0.004	93	296077	80.0	56.9	
31 Benzyl alcohol	108	4.626	4.623	0.003	95	193446	80.0	52.5	
32 1,2-Dichlorobenzene	146	4.674	4.671	0.003	96	284900	80.0	56.8	
34 2,2'-oxybis[1-chloropropan	45	4.749	4.746	0.003	94	402965	80.0	60.7	
35 2-Methylphenol	108	4.739	4.735	0.004	93	275439	80.0	54.1	
38 N-Nitrosodi-n-propylamine	70	4.872	4.874	-0.002	88	252726	80.0	65.6	
39 Acetophenone	105	4.877	4.879	-0.002	93	451148	80.0	64.3	
40 4-Methylphenol	108	4.883	4.879	0.004	93	250515	80.0	49.8	
41 3-Methylphenol	108	4.883	4.879	0.004	93	250515	80.0	49.8	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.883	4.879	0.004	72	250515	80.0	49.8	
44 Hexachloroethane	117	5.000	4.997	0.003	93	104511	80.0	53.2	
45 Nitrobenzene	77	5.048	5.045	0.003	85	377643	80.0	65.2	
47 Isophorone	82	5.273	5.275	-0.002	99	717499	80.0	66.8	
48 2-Nitrophenol	139	5.358	5.355	0.003	96	171826	80.0	66.7	
49 2,4-Dimethylphenol	107	5.396	5.392	0.004	96	341495	80.0	66.7	
51 Bis(2-chloroethoxy)methane	93	5.476	5.472	0.004	99	415402	80.0	67.8	
52 Benzoic acid	105	5.460	5.536	-0.076	87	71546	80.0	20.9	
53 2,4-Dichlorophenol	162	5.599	5.600	-0.001	95	277661	80.0	68.8	
55 1,2,4-Trichlorobenzene	180	5.684	5.681	0.003	93	276756	80.0	62.7	
56 Naphthalene	128	5.759	5.761	-0.002	97	901379	80.0	64.9	
57 4-Chloroaniline	127	5.802	5.798	0.004	96	377895	80.0	60.6	
58 2,6-Dichlorophenol	162	5.818	5.819	-0.001	97	278619	80.0	69.6	
60 Hexachlorobutadiene	225	5.887	5.884	0.003	95	145443	80.0	62.6	
63 Caprolactam	55	6.122	6.145	-0.023	83	36233	80.0	14.6	
64 4-Chloro-3-methylphenol	107	6.282	6.290	-0.008	97	313088	80.0	69.5	
66 2-Methylnaphthalene	142	6.443	6.439	0.004	93	643217	80.0	68.6	
67 1-Methylnaphthalene	142	6.544	6.541	0.003	94	616734	80.0	70.4	
68 Hexachlorocyclopentadiene	237	6.614	6.610	0.004	95	335321	160.0	114.2	
69 1,2,4,5-Tetrachlorobenzene	216	6.614	6.615	-0.001	96	291539	80.0	67.4	
71 2,4,6-Trichlorophenol	196	6.726	6.722	0.004	93	223050	80.0	70.1	
72 2,4,5-Trichlorophenol	196	6.769	6.765	0.004	95	240233	80.0	67.2	
74 1,1'-Biphenyl	154	6.902	6.899	0.003	95	785174	80.0	65.2	
75 2-Chloronaphthalene	162	6.929	6.925	0.004	96	613601	80.0	63.9	
77 2-Nitroaniline	65	7.020	7.016	0.004	84	226188	80.0	65.3	
80 Dimethyl phthalate	163	7.191	7.192	-0.001	99	739629	80.0	67.4	
81 1,3-Dinitrobenzene	168	7.223	7.219	0.004	88	135484	80.0	69.6	
82 2,6-Dinitrotoluene	165	7.249	7.251	-0.002	96	187150	80.0	68.8	
83 Acenaphthylene	152	7.340	7.342	-0.002	99	1023814	80.0	65.3	
84 3-Nitroaniline	138	7.426	7.427	-0.001	94	177931	80.0	55.7	
85 Acenaphthene	153	7.516	7.513	0.003	95	623564	80.0	66.1	
86 2,4-Dinitrophenol	184	7.527	7.529	-0.002	85	219153	160.0	126.1	
88 4-Nitrophenol	109	7.602	7.609	-0.007	93	85021	160.0	52.3	
89 2,4-Dinitrotoluene	165	7.655	7.657	-0.002	94	256381	80.0	68.9	
90 Dibenzofuran	168	7.687	7.684	0.003	98	965627	80.0	67.0	
92 Hexadecane	57	7.912	7.914	-0.002	97	438159	80.0	64.8	
93 2,3,4,6-Tetrachlorophenol	232	7.810	7.812	-0.002	71	208240	80.0	69.3	
95 Diethyl phthalate	149	7.896	7.892	0.004	98	738399	80.0	68.1	
97 4-Chlorophenyl phenyl ethe	204	8.019	8.015	0.004	90	371786	80.0	66.5	
99 Fluorene	166	8.029	8.026	0.003	94	776358	80.0	67.8	
100 4-Nitroaniline	138	8.040	8.042	-0.002	86	223222	80.0	65.6	
101 4,6-Dinitro-2-methylphenol	198	8.072	8.074	-0.002	89	328344	160.0	166.7	
102 N-Nitrosodiphenylamine	169	8.136	8.133	0.003	61	592903	80.0	75.9	
103 Diphenylamine	169	8.136	8.133	0.003	95	592903	68.0	57.9	
105 1,2-Diphenylhydrazine	77	8.179	8.175	0.004	98	883911	80.9	67.5	
106 Azobenzene	77	8.179	8.175	0.004	97	883911	80.0	66.7	
112 Atrazine	200	8.660	8.656	0.004	94	229631	80.0	77.0	
114 4-Bromophenyl phenyl ether	248	8.505	8.507	-0.002	65	225300	80.0	72.8	
116 Hexachlorobenzene	284	8.596	8.592	0.004	95	226361	80.0	75.7	
119 Pentachlorophenol	266	8.783	8.784	-0.001	93	274550	160.0	147.2	
123 Phenanthrene	178	8.991	8.993	-0.002	98	1162183	80.0	74.8	
124 Anthracene	178	9.044	9.041	0.003	98	1208458	80.0	75.1	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.194	9.196	-0.002	95	1156089	80.0	74.4	
127 Di-n-butyl phthalate	149	9.525	9.527	-0.002	100	1279352	80.0	74.6	
132 Fluoranthene	202	10.316	10.312	0.004	98	1355332	80.0	74.3	
133 Benzidine	184	10.476	10.477	-0.001	100	801736	160.0	64.7	
134 Pyrene	202	10.636	10.638	-0.002	97	1436397	80.0	72.4	
141 Butyl benzyl phthalate	149	11.721	11.717	0.004	98	593192	80.0	70.3	
144 3,3'-Dichlorobenzidine	252	12.853	12.850	0.003	73	973387	160.0	148.3	
145 Benzo[a]anthracene	228	12.885	12.887	-0.002	98	1351325	80.0	68.1	
146 Chrysene	228	12.971	12.973	-0.002	98	1370973	80.0	72.4	
147 Bis(2-ethylhexyl) phthalat	149	13.051	13.053	-0.002	97	834531	80.0	72.7	
148 Di-n-octyl phthalate	149	14.819	14.821	-0.002	99	1447411	80.0	73.0	
150 Benzo[b]fluoranthene	252	15.685	15.686	-0.001	98	1365922	80.0	75.4	
151 Benzo[k]fluoranthene	252	15.765	15.766	-0.001	99	1399677	80.0	75.7	
153 Benzo[a]pyrene	252	16.593	16.600	-0.007	78	1346816	80.0	74.7	
156 Indeno[1,2,3-cd]pyrene	276	19.841	19.837	0.004	99	1199821	80.0	72.2	
157 Dibenz(a,h)anthracene	278	19.932	19.939	-0.007	94	1217373	80.0	76.4	
158 Benzo[g,h,i]perylene	276	20.567	20.574	-0.007	97	1272878	80.0	75.4	

Reagents:

MS-IS_00014

Amount Added: 20.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31290.D

Injection Date: 22-Jan-2019 18:10:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: LCS 280-444835/2-A

Worklist Smp#: 20

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

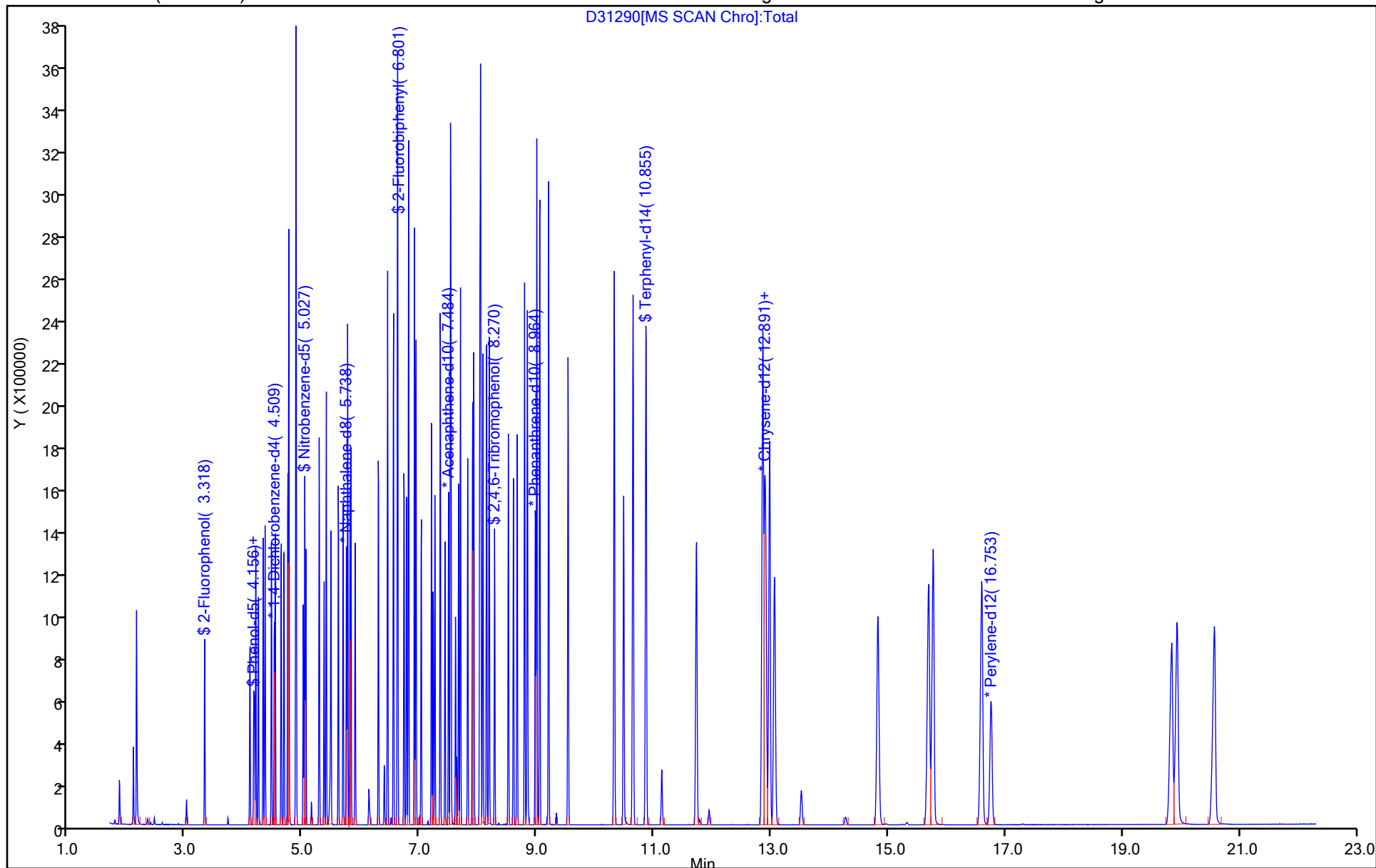
ALS Bottle#: 11

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31290.D
 Lims ID: LCS 280-444835/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 22-Jan-2019 18:10:30 ALS Bottle#: 11 Worklist Smp#: 20
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCS 280-444835_2-A
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 23-Jan-2019 09:22:29

Compound	Amount Added	Amount Recovered	% Rec.
\$ 7 2-Fluorophenol	100.0	41.9	41.86
\$ 8 Phenol-d5	100.0	26.2	26.24
\$ 9 Nitrobenzene-d5	100.0	81.6	81.60
\$ 10 2-Fluorobiphenyl	100.0	80.1	80.15
\$ 11 2,4,6-Tribromophenol	100.0	85.9	85.89
\$ 12 Terphenyl-d14	100.0	82.3	82.27

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCSD 280-444835/3-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31291.D</u>
Analysis Method: <u>8270D</u>	Date Collected: _____
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>1000(mL)</u>	Date Analyzed: <u>01/22/2019 18:40</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
92-52-4	1,1'-Biphenyl	60.9		10	0.41
95-94-3	1,2,4,5-Tetrachlorobenzene	60.7		10	2.0
120-82-1	1,2,4-Trichlorobenzene	56.6		5.0	2.0
95-50-1	1,2-Dichlorobenzene	51.7		5.0	2.0
122-66-7	1,2-Diphenylhydrazine (as Azobenzene)	66.1		10	0.54
541-73-1	1,3-Dichlorobenzene	49.8		10	2.0
99-65-0	1,3-Dinitrobenzene	66.9		10	0.97
106-46-7	1,4-Dichlorobenzene	51.0		5.0	2.0
123-91-1	1,4-Dioxane	25.1		20	0.71
90-12-0	1-Methylnaphthalene	64.2		4.0	0.35
58-90-2	2,3,4,6-Tetrachlorophenol	66.2		50	0.96
95-95-4	2,4,5-Trichlorophenol	64.6		10	0.52
88-06-2	2,4,6-Trichlorophenol	65.6		10	0.74
120-83-2	2,4-Dichlorophenol	61.0		10	0.68
105-67-9	2,4-Dimethylphenol	59.3		10	0.67
51-28-5	2,4-Dinitrophenol	124		30	7.5
121-14-2	2,4-Dinitrotoluene	66.5		10	0.93
87-65-0	2,6-Dichlorophenol	62.9		10	0.75
606-20-2	2,6-Dinitrotoluene	65.9		10	0.72
91-58-7	2-Chloronaphthalene	59.4		4.0	0.46
95-57-8	2-Chlorophenol	55.2		10	0.43
91-57-6	2-Methylnaphthalene	63.0		4.0	0.41
95-48-7	2-Methylphenol	55.2		10	0.56
88-74-4	2-Nitroaniline	63.3		10	0.90
88-75-5	2-Nitrophenol	61.5		10	0.62
15831-10-4	3 & 4 Methylphenol	55.5		10	0.40
91-94-1	3,3'-Dichlorobenzidine	147		50	0.83
108-39-4	3-Methylphenol	55.5		10	0.40
99-09-2	3-Nitroaniline	57.9		10	0.78
534-52-1	4,6-Dinitro-2-methylphenol	160		50	5.9
101-55-3	4-Bromophenyl phenyl ether	70.8		10	0.41
59-50-7	4-Chloro-3-methylphenol	65.9		10	0.45
106-47-8	4-Chloroaniline	32.4		10	0.56
7005-72-3	4-Chlorophenyl phenyl ether	64.1		10	0.63

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCSD 280-444835/3-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31291.D</u>
Analysis Method: <u>8270D</u>	Date Collected: _____
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>1000(mL)</u>	Date Analyzed: <u>01/22/2019 18:40</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
106-44-5	4-Methylphenol	55.5		10	0.40
100-01-6	4-Nitroaniline	63.8		10	0.84
100-02-7	4-Nitrophenol	79.5		10	1.0
83-32-9	Acenaphthene	61.9		4.0	0.45
208-96-8	Acenaphthylene	61.7		4.0	0.50
98-86-2	Acetophenone	59.3		10	0.52
62-53-3	Aniline	2.37	J	10	0.88
120-12-7	Anthracene	73.4		4.0	0.45
103-33-3	Azobenzene	65.4		4.0	0.54
100-52-7	Benzaldehyde	48.5		10	0.53
92-87-5	Benzidine	13.9	J	100	4.4
56-55-3	Benzo[a]anthracene	65.5		4.0	0.58
50-32-8	Benzo[a]pyrene	72.3		4.0	0.64
205-99-2	Benzo[b]fluoranthene	72.6		4.0	0.53
191-24-2	Benzo[g,h,i]perylene	74.2		4.0	0.79
207-08-9	Benzo[k]fluoranthene	73.7		4.0	0.56
65-85-0	Benzoic acid	30.3		25	5.7
100-51-6	Benzyl alcohol	46.1		10	0.35
108-60-1	bis (2-chloroisopropyl) ether	55.3		10	0.42
111-91-1	Bis(2-chloroethoxy)methane	61.2		10	0.61
111-44-4	Bis(2-chloroethyl)ether	58.5		10	0.49
117-81-7	Bis(2-ethylhexyl) phthalate	72.0		10	1.1
85-68-7	Butyl benzyl phthalate	68.9		5.0	2.0
105-60-2	Caprolactam	13.1		10	1.2
86-74-8	Carbazole	71.9		4.0	0.45
218-01-9	Chrysene	70.2		4.0	0.52
53-70-3	Dibenz(a,h)anthracene	74.5		4.0	0.65
132-64-9	Dibenzofuran	63.5		4.0	0.36
84-66-2	Diethyl phthalate	66.8		4.0	0.75
131-11-3	Dimethyl phthalate	65.7		4.0	0.53
84-74-2	Di-n-butyl phthalate	72.6		4.0	0.88
117-84-0	Di-n-octyl phthalate	71.2		5.0	1.6
122-39-4	Diphenylamine	55.6		10	0.49
206-44-0	Fluoranthene	70.6		4.0	0.64

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCSD 280-444835/3-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>D31291.D</u>
Analysis Method: <u>8270D</u>	Date Collected: _____
Extract. Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 06:56</u>
Sample wt/vol: <u>1000 (mL)</u>	Date Analyzed: <u>01/22/2019 18:40</u>
Con. Extract Vol.: <u>1 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1 (uL)</u>	Level: (low/med) <u>Low</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>445019</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
86-73-7	Fluorene	65.0		4.0	0.49
118-74-1	Hexachlorobenzene	72.6		10	0.96
87-68-3	Hexachlorobutadiene	56.1		30	7.5
77-47-4	Hexachlorocyclopentadiene	105		50	6.6
67-72-1	Hexachloroethane	46.9		30	7.6
544-76-3	Hexadecane	61.4		10	0.35
193-39-5	Indeno[1,2,3-cd]pyrene	71.0		4.0	1.6
78-59-1	Isophorone	60.8		10	0.67
91-20-3	Naphthalene	60.0		4.0	0.40
98-95-3	Nitrobenzene	59.8		10	0.43
62-75-9	N-Nitrosodimethylamine	28.1		10	0.62
621-64-7	N-Nitrosodi-n-propylamine	59.6		10	0.56
86-30-6	N-Nitrosodiphenylamine	73.0		10	0.61
87-86-5	Pentachlorophenol	147		50	5.5
85-01-8	Phenanthrene	72.7		4.0	0.28
108-95-2	Phenol	31.7		10	0.56
129-00-0	Pyrene	70.4		10	0.43
110-86-1	Pyridine	1.8	U	20	1.8

CAS NO.	SURROGATE	%REC	Q	LIMITS
118-79-6	2,4,6-Tribromophenol (Surr)	84		52-123
321-60-8	2-Fluorobiphenyl	74		47-119
367-12-4	2-Fluorophenol (Surr)	54		17-71
4165-60-0	Nitrobenzene-d5 (Surr)	75		45-113
4165-62-2	Phenol-d5 (Surr)	38		10-52
1718-51-0	Terphenyl-d14 (Surr)	82		50-123

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31291.D
 Lims ID: LCSD 280-444835/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 22-Jan-2019 18:40:30 ALS Bottle#: 12 Worklist Smp#: 21
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCSD 280-444835_3-A
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 23-Jan-2019 09:19:23

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
* 1 1,4-Dichlorobenzene-d4	152	4.509	4.503	0.006	95	137307	40.0	40.0	
* 2 Naphthalene-d8	136	5.738	5.737	0.001	99	549546	40.0	40.0	
* 3 Acenaphthene-d10	164	7.485	7.484	0.001	91	341796	40.0	40.0	
* 4 Phenanthrene-d10	188	8.970	8.964	0.006	97	625676	40.0	40.0	
* 5 Chrysene-d12	240	12.907	12.901	0.006	98	626631	40.0	40.0	
* 6 Perylene-d12	264	16.753	16.752	0.001	97	612773	40.0	40.0	
\$ 7 2-Fluorophenol	112	3.318	3.309	0.009	92	278396	100.0	54.0	
\$ 8 Phenol-d5	99	4.157	4.153	0.004	98	263076	100.0	38.3	
\$ 9 Nitrobenzene-d5	82	5.027	5.023	0.004	86	442951	100.0	74.8	
\$ 10 2-Fluorobiphenyl	172	6.801	6.797	0.004	99	875039	100.0	73.6	
\$ 11 2,4,6-Tribromophenol	330	8.270	8.271	-0.001	94	138663	100.0	84.0	
\$ 12 Terphenyl-d14	244	10.856	10.857	-0.001	100	1175625	100.0	81.6	
13 1,4-Dioxane	88	1.865	1.856	0.009	91	62686	80.0	25.1	
14 N-Nitrosodimethylamine	74	2.100	2.096	0.004	92	111377	80.0	28.1	
15 Pyridine	79		2.149				ND	ND	
22 Benzaldehyde	106	4.093	4.091	0.002	98	203704	80.0	48.5	
23 n-Decane	57	4.349	4.345	0.004	97	236110	80.0	43.7	
24 Phenol	94	4.167	4.169	-0.002	98	228540	80.0	31.7	
25 Aniline	93	4.189	4.190	-0.001	98	21316	80.0	2.37	
27 Bis(2-chloroethyl)ether	93	4.237	4.233	0.004	96	299763	80.0	58.5	
28 2-Chlorophenol	128	4.317	4.313	0.004	97	282717	80.0	55.2	
29 1,3-Dichlorobenzene	146	4.461	4.457	0.004	97	266656	80.0	49.8	
30 1,4-Dichlorobenzene	146	4.525	4.521	0.004	93	274484	80.0	51.0	
31 Benzyl alcohol	108	4.621	4.623	-0.002	94	175618	80.0	46.1	
32 1,2-Dichlorobenzene	146	4.675	4.671	0.004	97	268502	80.0	51.7	
34 2,2'-oxybis[1-chloropropan	45	4.750	4.746	0.004	94	379255	80.0	55.3	
35 2-Methylphenol	108	4.739	4.735	0.004	94	290690	80.0	55.2	
38 N-Nitrosodi-n-propylamine	70	4.872	4.874	-0.002	86	237263	80.0	59.6	
39 Acetophenone	105	4.878	4.879	-0.001	92	429878	80.0	59.3	
40 4-Methylphenol	108	4.883	4.879	0.004	90	288633	80.0	55.5	
41 3-Methylphenol	108	4.883	4.879	0.004	95	288633	80.0	55.5	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
42 3 & 4 Methylphenol	108	4.883	4.879	0.004	70	288633	80.0	55.5	
44 Hexachloroethane	117	5.001	4.997	0.004	92	95428	80.0	46.9	
45 Nitrobenzene	77	5.049	5.045	0.004	85	359530	80.0	59.8	
47 Isophorone	82	5.273	5.275	-0.002	99	677810	80.0	60.8	
48 2-Nitrophenol	139	5.359	5.355	0.004	94	164734	80.0	61.5	
49 2,4-Dimethylphenol	107	5.396	5.392	0.004	96	315278	80.0	59.3	
51 Bis(2-chloroethoxy)methane	93	5.476	5.472	0.004	99	389289	80.0	61.2	
52 Benzoic acid	105	5.471	5.536	-0.065	88	117751	80.0	30.3	
53 2,4-Dichlorophenol	162	5.599	5.600	-0.001	95	255478	80.0	61.0	
55 1,2,4-Trichlorobenzene	180	5.684	5.681	0.003	93	259489	80.0	56.6	
56 Naphthalene	128	5.759	5.761	-0.002	97	864801	80.0	60.0	
57 4-Chloroaniline	127	5.802	5.798	0.004	96	209671	80.0	32.4	
58 2,6-Dichlorophenol	162	5.818	5.819	-0.001	97	261244	80.0	62.9	
60 Hexachlorobutadiene	225	5.887	5.884	0.003	95	135324	80.0	56.1	
63 Caprolactam	55	6.123	6.145	-0.023	84	33702	80.0	13.1	M
64 4-Chloro-3-methylphenol	107	6.283	6.290	-0.007	97	308071	80.0	65.9	
66 2-Methylnaphthalene	142	6.443	6.439	0.004	93	613542	80.0	63.0	
67 1-Methylnaphthalene	142	6.545	6.541	0.004	94	584708	80.0	64.2	
68 Hexachlorocyclopentadiene	237	6.614	6.610	0.004	95	317881	160.0	105.2	
69 1,2,4,5-Tetrachlorobenzene	216	6.614	6.615	-0.001	97	272617	80.0	60.7	
71 2,4,6-Trichlorophenol	196	6.721	6.722	-0.001	93	214753	80.0	65.6	
72 2,4,5-Trichlorophenol	196	6.769	6.765	0.004	96	237498	80.0	64.6	
74 1,1'-Biphenyl	154	6.902	6.899	0.003	95	754620	80.0	60.9	
75 2-Chloronaphthalene	162	6.929	6.925	0.004	96	586674	80.0	59.4	
77 2-Nitroaniline	65	7.020	7.016	0.004	84	225601	80.0	63.3	
80 Dimethyl phthalate	163	7.196	7.192	0.004	99	741954	80.0	65.7	
81 1,3-Dinitrobenzene	168	7.223	7.219	0.004	88	134034	80.0	66.9	
82 2,6-Dinitrotoluene	165	7.250	7.251	-0.001	97	184511	80.0	65.9	
83 Acenaphthylene	152	7.346	7.342	0.004	99	995569	80.0	61.7	
84 3-Nitroaniline	138	7.426	7.427	-0.001	95	190450	80.0	57.9	
85 Acenaphthene	153	7.517	7.513	0.004	95	600914	80.0	61.9	
86 2,4-Dinitrophenol	184	7.527	7.529	-0.002	86	221069	160.0	123.7	
88 4-Nitrophenol	109	7.608	7.609	-0.001	91	133023	160.0	79.5	
89 2,4-Dinitrotoluene	165	7.656	7.657	-0.001	93	254342	80.0	66.5	
90 Dibenzofuran	168	7.688	7.684	0.004	98	941903	80.0	63.5	
92 Hexadecane	57	7.912	7.914	-0.002	97	426995	80.0	61.4	
93 2,3,4,6-Tetrachlorophenol	232	7.811	7.812	-0.001	71	204479	80.0	66.2	
95 Diethyl phthalate	149	7.896	7.892	0.004	98	745408	80.0	66.8	
97 4-Chlorophenyl phenyl ethe	204	8.019	8.015	0.004	90	368619	80.0	64.1	
99 Fluorene	166	8.030	8.026	0.004	95	765878	80.0	65.0	
100 4-Nitroaniline	138	8.040	8.042	-0.002	86	223411	80.0	63.8	
101 4,6-Dinitro-2-methylphenol	198	8.072	8.074	-0.002	88	323931	160.0	160.0	
102 N-Nitrosodiphenylamine	169	8.136	8.133	0.003	61	586478	80.0	73.0	
103 Diphenylamine	169	8.136	8.133	0.003	95	586478	68.0	55.6	
105 1,2-Diphenylhydrazine	77	8.179	8.175	0.004	98	890591	80.9	66.1	
106 Azobenzene	77	8.179	8.175	0.004	97	890591	80.0	65.4	
112 Atrazine	200	8.660	8.656	0.004	94	227890	80.0	74.3	
114 4-Bromophenyl phenyl ether	248	8.505	8.507	-0.002	65	225361	80.0	70.8	
116 Hexachlorobenzene	284	8.596	8.592	0.004	95	223377	80.0	72.6	
119 Pentachlorophenol	266	8.783	8.784	-0.001	93	282481	160.0	147.2	
123 Phenanthrene	178	8.991	8.993	-0.002	98	1162719	80.0	72.7	
124 Anthracene	178	9.045	9.041	0.004	98	1215159	80.0	73.4	

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
125 Carbazole	167	9.194	9.196	-0.002	95	1148643	80.0	71.9	
127 Di-n-butyl phthalate	149	9.525	9.527	-0.002	100	1280878	80.0	72.6	
132 Fluoranthene	202	10.316	10.312	0.004	98	1326252	80.0	70.6	
133 Benzidine	184	10.471	10.477	-0.006	100	172688	160.0	13.9	7
134 Pyrene	202	10.637	10.638	-0.001	97	1397735	80.0	70.4	
141 Butyl benzyl phthalate	149	11.721	11.717	0.004	98	582321	80.0	68.9	
144 3,3'-Dichlorobenzidine	252	12.854	12.850	0.004	74	968627	160.0	147.5	
145 Benzo[a]anthracene	228	12.886	12.887	-0.001	99	1302131	80.0	65.5	
146 Chrysene	228	12.971	12.973	-0.002	98	1331521	80.0	70.2	
147 Bis(2-ethylhexyl) phthalat	149	13.051	13.053	-0.002	97	827323	80.0	72.0	
148 Di-n-octyl phthalate	149	14.820	14.821	-0.001	99	1413163	80.0	71.2	
150 Benzo[b]fluoranthene	252	15.685	15.686	-0.001	98	1319050	80.0	72.6	
151 Benzo[k]fluoranthene	252	15.765	15.766	-0.001	99	1365722	80.0	73.7	
153 Benzo[a]pyrene	252	16.588	16.600	-0.012	78	1307276	80.0	72.3	
156 Indeno[1,2,3-cd]pyrene	276	19.836	19.837	-0.001	99	1182249	80.0	71.0	
157 Dibenz(a,h)anthracene	278	19.932	19.939	-0.007	94	1189423	80.0	74.5	
158 Benzo[g,h,i]perylene	276	20.568	20.574	-0.006	98	1255710	80.0	74.2	

QC Flag Legend

Processing Flags

ND - Not Detected or Marked ND

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

MS-IS_00014

Amount Added: 20.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31291.D

Injection Date: 22-Jan-2019 18:40:30

Instrument ID: SMS_D

Operator ID: KIEKELD

Lims ID: LCSD 280-444835/3-A

Worklist Smp#: 21

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

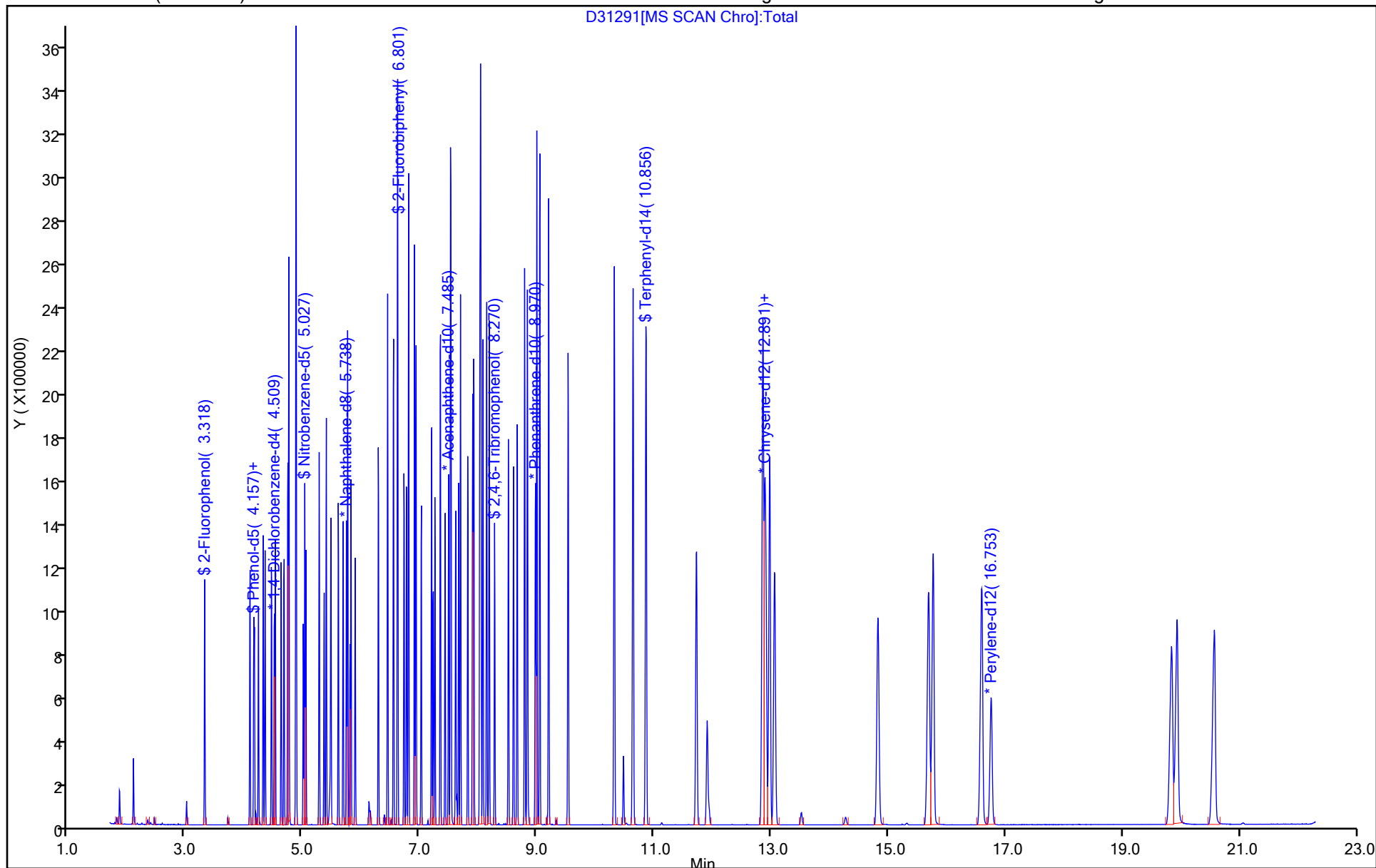
ALS Bottle#: 12

Method: SMS_D_8270D

Limit Group: MSSV - 8270D

Column: VF-5ms (0.50 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 1



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31291.D
 Lims ID: LCSD 280-444835/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 22-Jan-2019 18:40:30 ALS Bottle#: 12 Worklist Smp#: 21
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCSD 280-444835_3-A
 Operator ID: KIEKELD Instrument ID: SMS_D
 Method: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\SMS_D_8270D.m
 Limit Group: MSSV - 8270D
 Method Label: 8270D
 Last Update: 23-Jan-2019 10:44:40 Calib Date: 08-Jan-2019 18:08:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SMS_D\20190108-77879.b\D31083.D
 Column 1 : VF-5ms (0.50 mm) Det: MS SCAN
 Process Host: CTX0325

First Level Reviewer: kiekeld

Date: 23-Jan-2019 09:19:23

Compound	Amount Added	Amount Recovered	% Rec.
\$ 7 2-Fluorophenol	100.0	54.0	53.96
\$ 8 Phenol-d5	100.0	38.3	38.28
\$ 9 Nitrobenzene-d5	100.0	74.8	74.80
\$ 10 2-Fluorobiphenyl	100.0	73.6	73.63
\$ 11 2,4,6-Tribromophenol	100.0	84.0	83.98
\$ 12 Terphenyl-d14	100.0	81.6	81.62

TestAmerica Denver

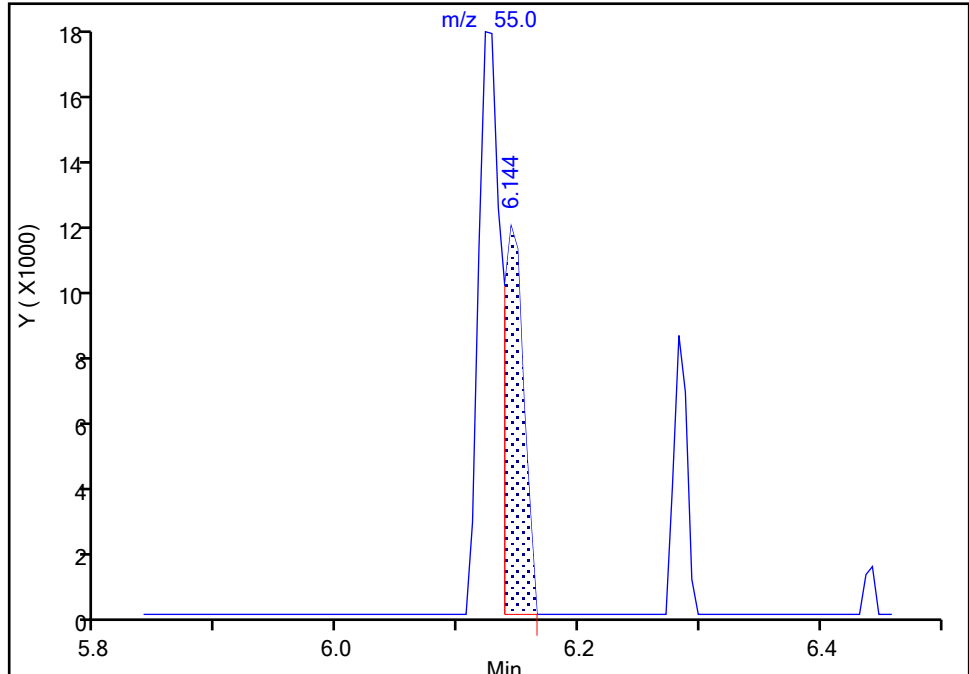
Data File: \\chromna\Denver\ChromData\SMS_D\20190122-78264.b\D31291.D
Injection Date: 22-Jan-2019 18:40:30 Instrument ID: SMS_D
Lims ID: LCSD 280-444835/3-A
Client ID:
Operator ID: KIEKELD ALS Bottle#: 12 Worklist Smp#: 21
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SMS_D_8270D Limit Group: MSSV - 8270D
Column: VF-5ms (0.50 mm) Detector: MS SCAN

63 Caprolactam, CAS: 105-60-2

Signal: 1

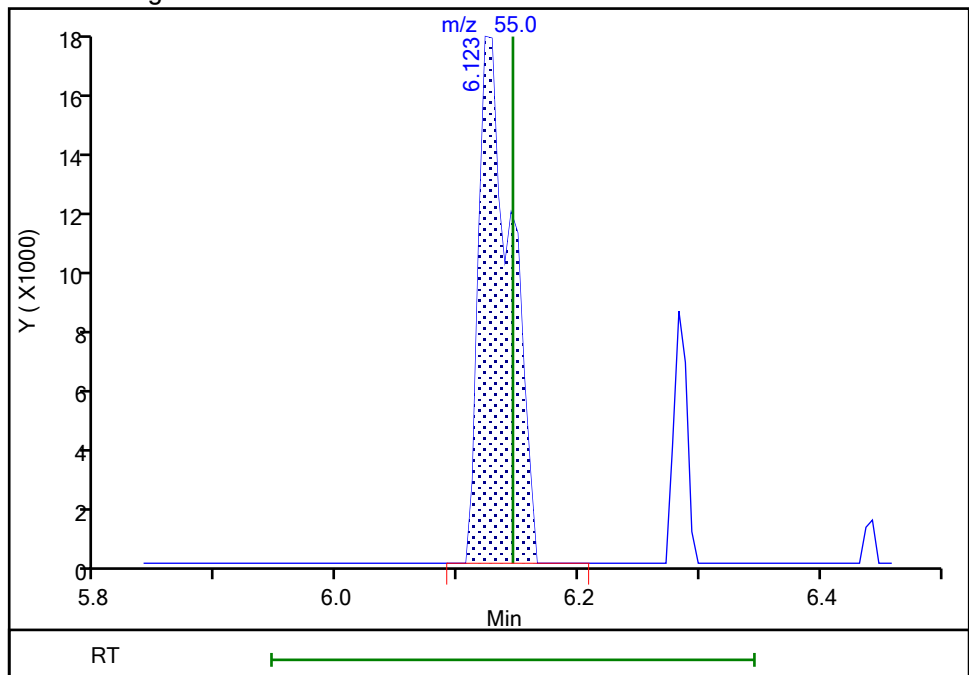
RT: 6.14
Area: 13695
Amount: 5.315174
Amount Units: ug/ml

Processing Integration Results



RT: 6.12
Area: 33702
Amount: 13.080102
Amount Units: ug/ml

Manual Integration Results



Reviewer: kiekeld, 23-Jan-2019 09:18:34

Audit Action: Manually Integrated

Audit Reason: Split Peak

GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SMS_D Start Date: 12/05/2018 12:48Analysis Batch Number: 440161 End Date: 12/05/2018 21:22

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
DFTPP 280-440161/2		12/05/2018 12:48	1	D30601.D	Rxi-5Sil MS 0.25 (mm)
STD080 280-440161/13 IC		12/05/2018 18:02	1	D30612.D	Rxi-5Sil MS 0.25 (mm)
STD004 280-440161/14 IC		12/05/2018 18:27	1	D30613.D	Rxi-5Sil MS 0.25 (mm)
STD010 280-440161/15 IC		12/05/2018 18:52	1	D30614.D	Rxi-5Sil MS 0.25 (mm)
STD020 280-440161/16 IC		12/05/2018 19:17	1	D30615.D	Rxi-5Sil MS 0.25 (mm)
STD050 280-440161/17 IC		12/05/2018 19:42	1	D30616.D	Rxi-5Sil MS 0.25 (mm)
STD120 280-440161/18 IC		12/05/2018 20:07	1	D30617.D	Rxi-5Sil MS 0.25 (mm)
STD160 280-440161/19 IC		12/05/2018 20:32	1	D30618.D	Rxi-5Sil MS 0.25 (mm)
STD200 280-440161/20 IC		12/05/2018 20:57	1	D30619.D	Rxi-5Sil MS 0.25 (mm)
ICV 280-440161/21		12/05/2018 21:22	1	D30620.D	Rxi-5Sil MS 0.25 (mm)

GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SMS_D Start Date: 12/05/2018 12:48Analysis Batch Number: 440162 End Date: 12/06/2018 00:40

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
DFTPP 280-440162/2		12/05/2018 12:48	1	D30601.D	Rxi-5Sil MS 0.25 (mm)
STD080 280-440162/22 IC		12/05/2018 21:46	1	D30621.D	Rxi-5Sil MS 0.25 (mm)
STD010 280-440162/23 IC		12/05/2018 22:11	1	D30622.D	Rxi-5Sil MS 0.25 (mm)
STD020 280-440162/24 IC		12/05/2018 22:36	1	D30623.D	Rxi-5Sil MS 0.25 (mm)
STD050 280-440162/25 IC		12/05/2018 23:01	1	D30624.D	Rxi-5Sil MS 0.25 (mm)
STD120 280-440162/26 IC		12/05/2018 23:26	1	D30625.D	Rxi-5Sil MS 0.25 (mm)
STD160 280-440162/27 IC		12/05/2018 23:51	1	D30626.D	Rxi-5Sil MS 0.25 (mm)
STD200 280-440162/28 IC		12/06/2018 00:16	1	D30627.D	Rxi-5Sil MS 0.25 (mm)
ICV 280-440162/29		12/06/2018 00:40	1	D30628.D	Rxi-5Sil MS 0.25 (mm)

GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SMS_D Start Date: 12/06/2018 08:39Analysis Batch Number: 440302 End Date: 12/06/2018 11:46

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
DFTPP 280-440302/2		12/06/2018 08:39	1	D30630.D	Rxi-5Sil MS 0.25 (mm)
STD080 280-440302/3 IC		12/06/2018 08:53	1	D30631.D	Rxi-5Sil MS 0.25 (mm)
STD010 280-440302/4 IC		12/06/2018 09:17	1	D30632.D	Rxi-5Sil MS 0.25 (mm)
STD020 280-440302/5 IC		12/06/2018 09:42	1	D30633.D	Rxi-5Sil MS 0.25 (mm)
STD050 280-440302/6 IC		12/06/2018 10:07	1	D30634.D	Rxi-5Sil MS 0.25 (mm)
STD120 280-440302/7 IC		12/06/2018 10:32	1	D30635.D	Rxi-5Sil MS 0.25 (mm)
STD160 280-440302/8 IC		12/06/2018 10:56	1	D30636.D	Rxi-5Sil MS 0.25 (mm)
STD200 280-440302/9 IC		12/06/2018 11:21	1	D30637.D	Rxi-5Sil MS 0.25 (mm)
ICV 280-440302/10		12/06/2018 11:46	1	D30638.D	Rxi-5Sil MS 0.25 (mm)

GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SMS_D Start Date: 01/08/2019 14:30Analysis Batch Number: 443607 End Date: 01/08/2019 19:07

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
DFTPP 280-443607/2		01/08/2019 14:30	1	D31075.D	Rxi-5Sil MS 0.25 (mm)
ICIS 280-443607/3		01/08/2019 14:43	1	D31076.D	Rxi-5Sil MS 0.25 (mm)
STD004 280-443607/4 IC		01/08/2019 15:12	1	D31077.D	Rxi-5Sil MS 0.25 (mm)
STD010 280-443607/5 IC		01/08/2019 15:42	1	D31078.D	Rxi-5Sil MS 0.25 (mm)
STD020 280-443607/6 IC		01/08/2019 16:11	1	D31079.D	Rxi-5Sil MS 0.25 (mm)
STD050 280-443607/7 IC		01/08/2019 16:40	1	D31080.D	Rxi-5Sil MS 0.25 (mm)
STD120 280-443607/8 IC		01/08/2019 17:10	1	D31081.D	Rxi-5Sil MS 0.25 (mm)
STD160 280-443607/9 IC		01/08/2019 17:39	1	D31082.D	Rxi-5Sil MS 0.25 (mm)
STD200 280-443607/10 IC		01/08/2019 18:08	1	D31083.D	Rxi-5Sil MS 0.25 (mm)
ICV 280-443607/11		01/08/2019 18:38	1	D31084.D	Rxi-5Sil MS 0.25 (mm)
ICV 280-443607/12		01/08/2019 19:07	1	D31085.D	Rxi-5Sil MS 0.25 (mm)

GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SMS_D Start Date: 01/22/2019 13:47Analysis Batch Number: 445019 End Date: 01/23/2019 00:04

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
DFTPP 280-445019/2		01/22/2019 13:47	1	D31280.D	Rxi-5Sil MS 0.25 (mm)
CCV 280-445019/3		01/22/2019 13:59	1	D31281.D	Rxi-5Sil MS 0.25 (mm)
CCV 280-445019/4		01/22/2019 14:29	1	D31282.D	Rxi-5Sil MS 0.25 (mm)
CCV 280-445019/5		01/22/2019 14:54	1	D31283.D	Rxi-5Sil MS 0.25 (mm)
CCV 280-445019/6		01/22/2019 15:47	1	D31285.D	Rxi-5Sil MS 0.25 (mm)
MB 280-444835/1-A		01/22/2019 17:40	1	D31289.D	Rxi-5Sil MS 0.25 (mm)
LCS 280-444835/2-A		01/22/2019 18:10	1	D31290.D	Rxi-5Sil MS 0.25 (mm)
LCSD 280-444835/3-A		01/22/2019 18:40	1	D31291.D	Rxi-5Sil MS 0.25 (mm)
160-32649-1		01/22/2019 22:36	1	D31299.D	Rxi-5Sil MS 0.25 (mm)
ZZZZZ		01/22/2019 23:05	1		Rxi-5Sil MS 0.25 (mm)
ZZZZZ		01/22/2019 23:34	1		Rxi-5Sil MS 0.25 (mm)
ZZZZZ		01/23/2019 00:04	1		Rxi-5Sil MS 0.25 (mm)

GC/MS SEMI VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 444835 Batch Start Date: 01/21/19 06:56 Batch Analyst: Matsumoto, Jordan TBatch Method: 3510C Batch End Date: 01/21/19 19:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	FirstAdjustpH
MB 280-444835/1		3510C, 8270D				1000 mL	1 mL	7 SU	1-2 SU
LCS 280-444835/2		3510C, 8270D				1000 mL	1 mL	7 SU	1-2 SU
LCSD 280-444835/3		3510C, 8270D				1000 mL	1 mL	7 SU	1-2 SU
160-32649-F-1	CRC-MW-1-011519	3510C, 8270D	T	1364.7 g	396.7 g	968 mL	1 mL	7 SU	1-2 SU

Lab Sample ID	Client Sample ID	Method Chain	Basis	SecondAdjustpH	8270 LCS Main 00060	8270 LCS Supp 00324	8270Surrogate 00130		
MB 280-444835/1		3510C, 8270D		11-12 SU			1 mL		
LCS 280-444835/2		3510C, 8270D		11-12 SU	1 mL	1 mL	1 mL		
LCSD 280-444835/3		3510C, 8270D		11-12 SU	1 mL	1 mL	1 mL		
160-32649-F-1	CRC-MW-1-011519	3510C, 8270D	T	11-12 SU			1 mL		

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS SEMI VOA BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 444835 Batch Start Date: 01/21/19 06:56 Batch Analyst: Matsumoto, Jordan TBatch Method: 3510C Batch End Date: 01/21/19 19:45

Batch Notes	
Acid Used for pH Adjustment ID	1:1 H2SO4_00075
Balance ID	24750399
Base Used to Adjust pH ID	10N_NaOH_00133
Batch Comment	DV-OP-0006/0007
Analyst ID - Concentration	CR
Concentration 1 Corrected Temperature	84 Degrees C
Equipment ID - Concentration 1	A
Analyst ID - Extraction	JM
Method/Fraction	3510C/8270D
Na2SO4 ID	0000213903_00002
NaCl ID	184223
Pipette/Syringe/Dispenser ID	1n2s
Prep Solvent ID	MeCl2_Cycl_00422
Prep Solvent Volume Used	180 mL
Analyst ID - Spike Analyst	JM
Analyst ID - Spike Witness Analyst	Reviewer: AAG
Sufficient Volume for Batch QC	NO
Concentration 1 Uncorrected Temperature	85 Degrees C
Reagent Water ID	S. ELGA

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Method 8081B

Organochlorine Pesticides (GC) by
Method 8081B

FORM II
PESTICIDES SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low
GC Column (1): Rxi-35Sil M ID: 0.32 (mm)

Client Sample ID	Lab Sample ID	TCX1 #	DCBP1 #
CRC-MW-1-011519	160-32649-1	78	48
	MB 280-444680/1-A	54	70
	LCS 280-444680/2-A	74	86
	LCSD 280-444680/3-A	85	95

TCX = Tetrachloro-m-xylene
DCBP = DCB Decachlorobiphenyl

QC LIMITS
28-115
34-122

Column to be used to flag recovery values

FORM III
PESTICIDES LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 053F5901.D
 Lab ID: LCS 280-444680/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
4,4'-DDD	0.500	0.457	91	73-115	
4,4'-DDE	0.500	0.421	84	71-112	
4,4'-DDT	0.500	0.407	81	71-121	
Aldrin	0.500	0.408	82	50-114	
alpha-BHC	0.500	0.433	87	68-113	
alpha-Chlordane	0.500	0.417	83	70-113	
beta-BHC	0.500	0.442	88	54-113	
delta-BHC	0.500	0.452	90	72-113	
Dieldrin	0.500	0.434	87	74-116	
Endosulfan I	0.500	0.398	80	69-111	
Endosulfan II	0.500	0.388	78	69-109	
Endosulfan sulfate	0.500	0.417	83	71-116	
Endrin	0.500	0.430	86	69-128	
Endrin aldehyde	0.500	0.376	75	47-119	
Endrin ketone	0.500	0.423	85	65-113	
gamma-BHC (Lindane)	0.500	0.459	92	70-112	
gamma-Chlordane	0.500	0.430	86	65-121	
Heptachlor	0.500	0.420	84	61-115	
Heptachlor epoxide	0.500	0.430	86	72-114	
Methoxychlor	0.500	0.432	86	66-131	

Column to be used to flag recovery and RPD values

FORM III
PESTICIDES LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 054F6001.D
 Lab ID: LCSD 280-444680/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
4,4'-DDD	0.500	0.504	101	10	50	73-115	
4,4'-DDE	0.500	0.466	93	10	50	71-112	
4,4'-DDT	0.500	0.444	89	9	25	71-121	
Aldrin	0.500	0.453	91	10	33	50-114	
alpha-BHC	0.500	0.474	95	9	50	68-113	
alpha-Chlordane	0.500	0.459	92	10	50	70-113	
beta-BHC	0.500	0.485	97	9	50	54-113	
delta-BHC	0.500	0.496	99	9	50	72-113	
Dieldrin	0.500	0.476	95	9	22	74-116	
Endosulfan I	0.500	0.438	88	10	50	69-111	
Endosulfan II	0.500	0.424	85	9	50	69-109	
Endosulfan sulfate	0.500	0.455	91	9	50	71-116	
Endrin	0.500	0.466	93	8	39	69-128	
Endrin aldehyde	0.500	0.406	81	8	50	47-119	
Endrin ketone	0.500	0.466	93	10	50	65-113	
gamma-BHC (Lindane)	0.500	0.507	101	10	26	70-112	
gamma-Chlordane	0.500	0.479	96	11	50	65-121	
Heptachlor	0.500	0.462	92	10	27	61-115	
Heptachlor epoxide	0.500	0.472	94	9	50	72-114	
Methoxychlor	0.500	0.468	94	8	50	66-131	

Column to be used to flag recovery and RPD values

FORM IV
PESTICIDES METHOD BLANK SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: MB 280-444680/1-A
Matrix: Water Date Extracted: 01/18/2019 12:03
Lab File ID: (1) 052F5801.D Lab File ID: (2) 052F5801.D
Date Analyzed: (1) 01/23/2019 01:19 Date Analyzed: (2) 01/23/2019 01:19
Instrument ID: (1) SGC_C Instrument ID: (2) SGC_C
GC Column: (1) Rxi-35Sil MS ID: 0.32 (mm) GC Column: (2) Rxi-XLB ID: 0.32 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 280-444680/2-A	01/23/2019 01:37	01/23/2019 01:37
	LCSD 280-444680/3-A	01/23/2019 01:55	01/23/2019 01:55
CRC-MW-1-011519	160-32649-1	01/23/2019 03:22	01/23/2019 03:22

FORM VIII
PESTICIDES INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Sample No.: CCVIS 280-444894/13 Date Analyzed: 01/21/2019 15:39
 Instrument ID: SGC_C GC Column: Rxi-35Sil MS ID: 0.32 (mm)
 Lab File ID (Standard): 01210013.D Heated Purge: (Y/N) N
 Calibration ID: 34877

		BNB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		142135528	2.56				
UPPER LIMIT		284271056	3.06				
LOWER LIMIT		71067764	2.06				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCV 280-444894/45		137014848	2.56				
CCV 280-444894/47		132625285	2.56				
MB 280-444680/1-A		171836980	2.56				
LCS 280-444680/2-A		138063018	2.56				
LCSD 280-444680/3-A		127215702	2.56				
160-32649-1	CRC-MW-1-011519	134370922	2.56				

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
PESTICIDES INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Sample No.: CCVIS 280-444894/13 Date Analyzed: 01/21/2019 15:39
 Instrument ID: SGC_C GC Column: Rxi-XLB ID: 0.32 (mm)
 Lab File ID (Standard): 01210013.D Heated Purge: (Y/N) N
 Calibration ID: 34878

		BNB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		115763826	2.81				
UPPER LIMIT		231527652	3.31				
LOWER LIMIT		57881913	2.31				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCV 280-444894/45		117517794	2.81				
CCV 280-444894/47		113355876	2.81				
MB 280-444680/1-A		146756474	2.81				
LCS 280-444680/2-A		117004484	2.82				
LCSD 280-444680/3-A		107758581	2.82				
160-32649-1	CRC-MW-1-011519	113308614	2.81				

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Client Sample ID: _____ Lab Sample ID: LCS 280-444680/2-A

Instrument ID (1): SGC_C Instrument ID (2): SGC_C

Date Analyzed (1): 01/23/2019 01:37 Date Analyzed (2): 01/23/2019 01:37

GC Column (1): Rxi-35Sil MS ID: 0.32 (mm) GC Column (2): Rxi-XLB ID: 0.32 (mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
alpha-BHC	1		4.06	4.05	4.08	0.433		0.3
	2		4.44	4.43	4.45	0.434		
gamma-BHC (Lindane)	1		4.35	4.34	4.37	0.459		8.0
	2		4.68	4.67	4.70	0.423		
beta-BHC	1		4.54	4.53	4.55	0.442		2.0
	2		4.89	4.88	4.90	0.451		
Heptachlor	1		4.60	4.59	4.62	0.420		6.1
	2		5.13	5.11	5.14	0.447		
delta-BHC	1		4.73	4.72	4.75	0.452		2.1
	2		5.08	5.06	5.09	0.442		
Aldrin	1		4.82	4.81	4.83	0.408		4.4
	2		5.39	5.38	5.41	0.427		
Heptachlor epoxide	1		5.22	5.21	5.24	0.430		4.3
	2		5.81	5.80	5.83	0.449		
gamma-Chlordane	1		5.42	5.41	5.43	0.430		4.8
	2		6.17	6.16	6.18	0.451		
alpha-Chlordane	1		5.51	5.49	5.52	0.417		3.6
	2		6.23	6.22	6.24	0.432		
Endosulfan I	1		5.55	5.54	5.56	0.398		9.5
	2		6.27	6.26	6.29	0.437		
4,4'-DDE	1		5.72	5.71	5.73	0.421		8.6
	2		6.45	6.44	6.46	0.386		
Dieldrin	1		5.83	5.82	5.85	0.445		2.4
	2		6.60	6.59	6.62	0.434		
Endrin	1		6.18	6.17	6.20	0.430		1.5
	2		6.89	6.87	6.90	0.437		
4,4'-DDD	1		6.39	6.38	6.40	0.431		6.0
	2		7.10	7.09	7.11	0.457		
Endosulfan II	1		6.53	6.52	6.55	0.388		4.5
	2		7.21	7.20	7.23	0.405		
4,4'-DDT	1		6.75	6.74	6.76	0.407		10.3
	2		7.46	7.45	7.48	0.452		
Endrin aldehyde	1		6.83	6.82	6.85	0.376		4.3
	2		7.34	7.33	7.36	0.393		
Endosulfan sulfate	1		7.08	7.07	7.10	0.417		10.4
	2		7.67	7.66	7.69	0.462		
Methoxychlor	1		7.61	7.60	7.62	0.432		2.9
	2		7.98	7.97	7.99	0.445		
Endrin ketone	1		7.77	7.76	7.78	0.423		5.5
	2		8.12	8.11	8.13	0.447		

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Client Sample ID: _____ Lab Sample ID: LCSD 280-444680/3-A

Instrument ID (1): SGC_C Instrument ID (2): SGC_C

Date Analyzed (1): 01/23/2019 01:55 Date Analyzed (2): 01/23/2019 01:55

GC Column (1): Rxi-35Sil MS ID: 0.32 (mm) GC Column (2): Rxi-XLB ID: 0.32 (mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
alpha-BHC	1		4.06	4.05	4.08	0.474		0.5
	2		4.44	4.43	4.45	0.477		
gamma-BHC (Lindane)	1		4.35	4.34	4.37	0.507		7.4
	2		4.68	4.67	4.70	0.471		
beta-BHC	1		4.54	4.53	4.55	0.485		2.6
	2		4.89	4.88	4.90	0.497		
Heptachlor	1		4.60	4.59	4.62	0.462		7.0
	2		5.13	5.11	5.14	0.496		
delta-BHC	1		4.73	4.72	4.75	0.496		2.0
	2		5.07	5.06	5.09	0.486		
Aldrin	1		4.82	4.81	4.83	0.453		5.0
	2		5.39	5.38	5.41	0.476		
Heptachlor epoxide	1		5.22	5.21	5.24	0.472		4.3
	2		5.81	5.80	5.83	0.492		
gamma-Chlordane	1		5.42	5.41	5.43	0.479		3.7
	2		6.17	6.16	6.18	0.497		
alpha-Chlordane	1		5.50	5.49	5.52	0.459		4.1
	2		6.23	6.22	6.24	0.478		
Endosulfan I	1		5.54	5.54	5.56	0.438		10.1
	2		6.27	6.26	6.29	0.485		
4,4'-DDE	1		5.72	5.71	5.73	0.466		8.7
	2		6.45	6.44	6.46	0.427		
Dieldrin	1		5.83	5.82	5.85	0.492		3.2
	2		6.60	6.59	6.62	0.476		
Endrin	1		6.18	6.17	6.20	0.466		1.7
	2		6.89	6.87	6.90	0.474		
4,4'-DDD	1		6.39	6.38	6.40	0.473		6.4
	2		7.10	7.09	7.11	0.504		
Endosulfan II	1		6.53	6.52	6.55	0.424		5.7
	2		7.21	7.20	7.23	0.449		
4,4'-DDT	1		6.75	6.74	6.76	0.444		10.6
	2		7.46	7.45	7.48	0.494		
Endrin aldehyde	1		6.83	6.82	6.85	0.406		4.6
	2		7.34	7.33	7.36	0.425		
Endosulfan sulfate	1		7.08	7.07	7.10	0.455		10.3
	2		7.67	7.66	7.69	0.505		
Methoxychlor	1		7.61	7.60	7.62	0.468		2.3
	2		7.98	7.97	7.99	0.479		
Endrin ketone	1		7.77	7.76	7.78	0.466		6.2
	2		8.12	8.11	8.13	0.496		

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: <u>CRC-MW-1-011519</u>	Lab Sample ID: <u>160-32649-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>059F6501.D</u>
Analysis Method: <u>8081B</u>	Date Collected: <u>01/15/2019 12:30</u>
Extraction Method: <u>3510C</u>	Date Extracted: <u>01/18/2019 12:03</u>
Sample wt/vol: <u>967.7(mL)</u>	Date Analyzed: <u>01/23/2019 03:22</u>
Con. Extract Vol.: <u>10(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	GC Column: <u>Rxi-35Sil MS</u> ID: <u>0.32 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>444894</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-55-9	4,4'-DDE	0.0078	U	0.052	0.0078
50-29-3	4,4'-DDT	0.015	U	0.052	0.015
309-00-2	Aldrin	0.0061	U	0.052	0.0061
319-84-6	alpha-BHC	0.0055	U	0.052	0.0055
5103-71-9	alpha-Chlordane	0.0055	U	0.052	0.0055
319-85-7	beta-BHC	0.0090	U	0.052	0.0090
319-86-8	delta-BHC	0.0060	U	0.052	0.0060
959-98-8	Endosulfan I	0.0060	U	0.052	0.0060
33213-65-9	Endosulfan II	0.0072	U	0.052	0.0072
72-20-8	Endrin	0.0082	U	0.052	0.0082
7421-93-4	Endrin aldehyde	0.0091	U	0.052	0.0091
53494-70-5	Endrin ketone	0.0072	U	0.052	0.0072
58-89-9	gamma-BHC (Lindane)	0.0071	U	0.052	0.0071
76-44-8	Heptachlor	0.0080	U	0.052	0.0080
1024-57-3	Heptachlor epoxide	0.0078	U	0.052	0.0078
72-43-5	Methoxychlor	0.013	U	0.10	0.013
8001-35-2	Toxaphene	0.38	U	2.1	0.38

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	48		34-122
877-09-8	Tetrachloro-m-xylene	78		28-115

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D
 Lims ID: 160-32649-E-1-A
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 23-Jan-2019 03:22:25 ALS Bottle#: 59 Worklist Smp#: 82
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: 160-32649-E-1-A
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

First Level Reviewer: bacat

Date: 23-Jan-2019 11:14:09

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/mL	Flags
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* 2 1-Bromo-2-nitrobenzene

1	2.557	2.559	-0.002	134370922	150.0
2	2.814	2.816	-0.002	113308614	150.0

\$ 3 Tetrachloro-m-xylene

1	3.535	3.537	-0.002	18936392	15.6
2	4.113	4.113	0.000	23133157	15.4

RPD = 1.63

7 alpha-BHC

1	4.064	4.066	-0.002	247166	-0.6458
2	4.434	4.438	-0.004	207504	0.1459

RPD = -316.77

8 gamma-BHC (Lindane)

1	4.349	4.353	-0.004	299099	0.2221
2	4.684	4.683	0.001	207347	0.1942

RPD = 13.42

11 beta-BHC

1	4.537	4.540	-0.003	173318	-0.8502
2	4.884	4.888	-0.004	431884	-0.3289

RPD = -88.42

LOD = 0.002000

12 Heptachlor

1		4.605			ND
2		5.126			

13 delta-BHC

1		4.734			ND
2		5.075			

15 Aldrin

1	4.819	4.821	-0.002	190422	-0.7559
2	5.394	5.394	0.000	163048	-0.5436

RPD = -32.69

LOD = 0.002000

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/mL	Flags
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22 Toxaphene

1		4.858			ND	
1		6.241				
1		6.852				
1		7.407				
1		7.546				
2		6.061				
2		6.552				
2		6.876				
2		7.593				
2		8.163				

19 Heptachlor epoxide

1		5.227			ND	
2		5.814				

20 trans-Chlordane

1	5.414	5.418	-0.004	170982	1.03	
2	6.167	6.170	-0.003	160500	-0.8299	
RPD = 1885.49						

23 cis-Chlordane

1		5.507			ND	
2		6.231				

24 Endosulfan I

1		5.548			ND	
2		6.272				

25 4,4'-DDE

1	5.714	5.718	-0.004	102002	-1.90	
2	6.448	6.449	-0.001	127273	-0.7460	
RPD = -87.25						

LOD = 0.002000

26 Dieldrin

1		5.832			ND	
2		6.603				

29 Endrin

1	6.180	6.184	-0.004	191211	-0.8384	
2	6.888	6.886	0.002	151284	-0.7648	
RPD = -9.18						

LOD = 0.002000

32 4,4'-DDD

1		6.391			ND	
2		7.100				

33 Endosulfan II

1	6.528	6.533	-0.005	298773	0.2203	
2	7.216	7.213	0.003	405707	-0.7907	
RPD = -354.55						

34 4,4'-DDT

1	6.745	6.750	-0.005	186559	-0.4815	
2	7.462	7.464	-0.002	127237	-0.2317	
RPD = -70.04						

LOD = 0.002000

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/mL	Flags
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35 Endrin aldehyde

1	6.830	6.836	-0.006	335740	-0.7731	
2	7.344	7.343	0.001	304778	-0.8267	
					RPD = -6.70	

LOD = 0.002000

36 Endosulfan sulfate

1	7.094	7.084	0.010	3083732	2.40	
2	7.672	7.673	-0.001	382938	-0.7088	
					RPD = 367.84	

37 Methoxychlor

1		7.611			ND	
2		7.981				

38 Endrin ketone

1	7.765	7.770	-0.005	402824	-0.9707	
2	8.120	8.121	-0.001	204013	-0.7803	
					RPD = -21.74	

LOD = 0.002000

\$ 40 DCB Decachlorobiphenyl

1	8.999	9.004	-0.005	11897548	9.55	
2	9.864	9.869	-0.005	10497261	9.13	
					RPD = 4.50	

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Reagents:

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D

Injection Date: 23-Jan-2019 03:22:25

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: 160-32649-E-1-A

Lab Sample ID: 280-32649-1

Worklist Smp#: 82

Client ID: CRC-MW-1-011519

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

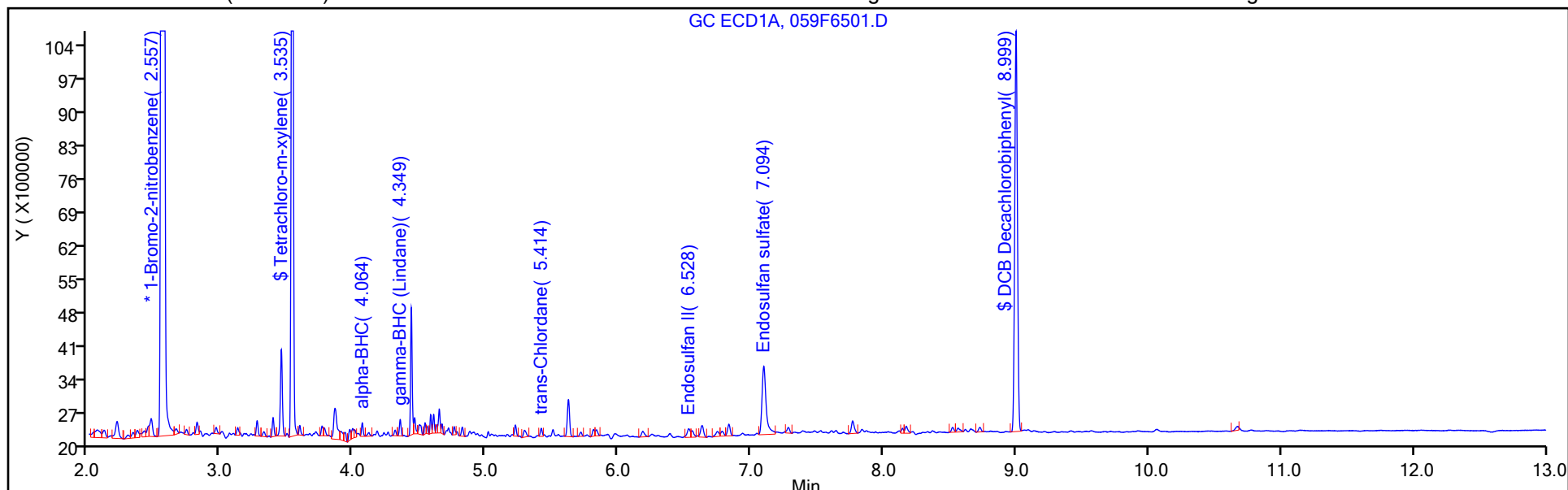
ALS Bottle#: 59

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

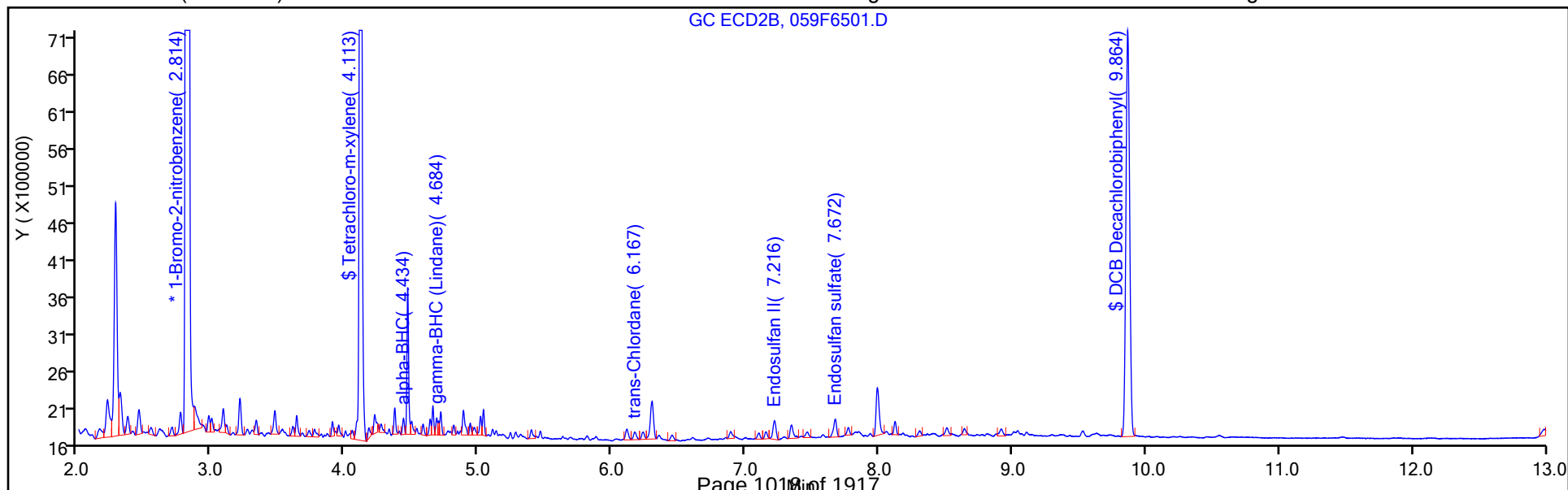
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D
 Lims ID: 160-32649-E-1-A
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 23-Jan-2019 03:22:25 ALS Bottle#: 59 Worklist Smp#: 82
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: 160-32649-E-1-A
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

First Level Reviewer: bacat

Date: 23-Jan-2019 11:14:09

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	15.6	78.16
\$ 40 DCB Decachlorobiphenyl	20.0	9.55	47.74

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	15.4	76.90
\$ 40 DCB Decachlorobiphenyl	20.0	9.13	45.64

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Client Sample ID: CRC-MW-1-011519 Lab Sample ID: 160-32649-1
Matrix: Water Lab File ID: 059F6501.D
Analysis Method: 8081B Date Collected: 01/15/2019 12:30
Extraction Method: 3510C Date Extracted: 01/18/2019 12:03
Sample wt/vol: 967.7(mL) Date Analyzed: 01/23/2019 03:22
Con. Extract Vol.: 10(mL) Dilution Factor: 1
Injection Volume: 1(uL) GC Column: Rxi-XLB ID: 0.32(mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 444894 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	0.0080	U	0.052	0.0080
60-57-1	Dieldrin	0.0065	U	0.052	0.0065
1031-07-8	Endosulfan sulfate	0.0059	U	0.052	0.0059
5103-74-2	gamma-Chlordane	0.0094	U	0.052	0.0094

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D
 Lims ID: 160-32649-E-1-A
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 23-Jan-2019 03:22:25 ALS Bottle#: 59 Worklist Smp#: 82
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: 160-32649-E-1-A
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

First Level Reviewer: bacat

Date: 23-Jan-2019 11:14:09

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	--------------------	-------

* 2 1-Bromo-2-nitrobenzene

1	2.557	2.559	-0.002	134370922	150.0
2	2.814	2.816	-0.002	113308614	150.0

\$ 3 Tetrachloro-m-xylene

1	3.535	3.537	-0.002	18936392	15.6
2	4.113	4.113	0.000	23133157	15.4

RPD = 1.63

7 alpha-BHC

1	4.064	4.066	-0.002	247166	-0.6458
2	4.434	4.438	-0.004	207504	0.1459

RPD = -316.77

8 gamma-BHC (Lindane)

1	4.349	4.353	-0.004	299099	0.2221
2	4.684	4.683	0.001	207347	0.1942

RPD = 13.42

11 beta-BHC

1	4.537	4.540	-0.003	173318	-0.8502
2	4.884	4.888	-0.004	431884	-0.3289

RPD = -88.42

LOD = 0.002000

12 Heptachlor

1		4.605			ND
2		5.126			

13 delta-BHC

1		4.734			ND
2		5.075			

15 Aldrin

1	4.819	4.821	-0.002	190422	-0.7559
2	5.394	5.394	0.000	163048	-0.5436

RPD = -32.69

LOD = 0.002000

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	--------------------	-------

22 Toxaphene

1		4.858			ND	
1		6.241				
1		6.852				
1		7.407				
1		7.546				
2		6.061				
2		6.552				
2		6.876				
2		7.593				
2		8.163				

19 Heptachlor epoxide

1		5.227			ND	
2		5.814				

20 trans-Chlordane

1	5.414	5.418	-0.004	170982	1.03	
2	6.167	6.170	-0.003	160500	-0.8299	
RPD = 1885.49						

23 cis-Chlordane

1		5.507			ND	
2		6.231				

24 Endosulfan I

1		5.548			ND	
2		6.272				

25 4,4'-DDE

1	5.714	5.718	-0.004	102002	-1.90	
2	6.448	6.449	-0.001	127273	-0.7460	
RPD = -87.25						

LOD = 0.002000

26 Dieldrin

1		5.832			ND	
2		6.603				

29 Endrin

1	6.180	6.184	-0.004	191211	-0.8384	
2	6.888	6.886	0.002	151284	-0.7648	
RPD = -9.18						

LOD = 0.002000

32 4,4'-DDD

1		6.391			ND	
2		7.100				

33 Endosulfan II

1	6.528	6.533	-0.005	298773	0.2203	
2	7.216	7.213	0.003	405707	-0.7907	
RPD = -354.55						

34 4,4'-DDT

1	6.745	6.750	-0.005	186559	-0.4815	
2	7.462	7.464	-0.002	127237	-0.2317	
RPD = -70.04						

LOD = 0.002000

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	--------------------	-------

35 Endrin aldehyde

1	6.830	6.836	-0.006	335740	-0.7731	
2	7.344	7.343	0.001	304778	-0.8267	
					RPD = -6.70	

LOD = 0.002000

36 Endosulfan sulfate

1	7.094	7.084	0.010	3083732	2.40	
2	7.672	7.673	-0.001	382938	-0.7088	
					RPD = 367.84	

37 Methoxychlor

1		7.611			ND	
2		7.981				

38 Endrin ketone

1	7.765	7.770	-0.005	402824	-0.9707	
2	8.120	8.121	-0.001	204013	-0.7803	
					RPD = -21.74	

LOD = 0.002000

\$ 40 DCB Decachlorobiphenyl

1	8.999	9.004	-0.005	11897548	9.55	
2	9.864	9.869	-0.005	10497261	9.13	
					RPD = 4.50	

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Reagents:

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:17:22

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D

Injection Date: 23-Jan-2019 03:22:25

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: 160-32649-E-1-A

Lab Sample ID: 280-32649-1

Worklist Smp#: 82

Client ID: CRC-MW-1-011519

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

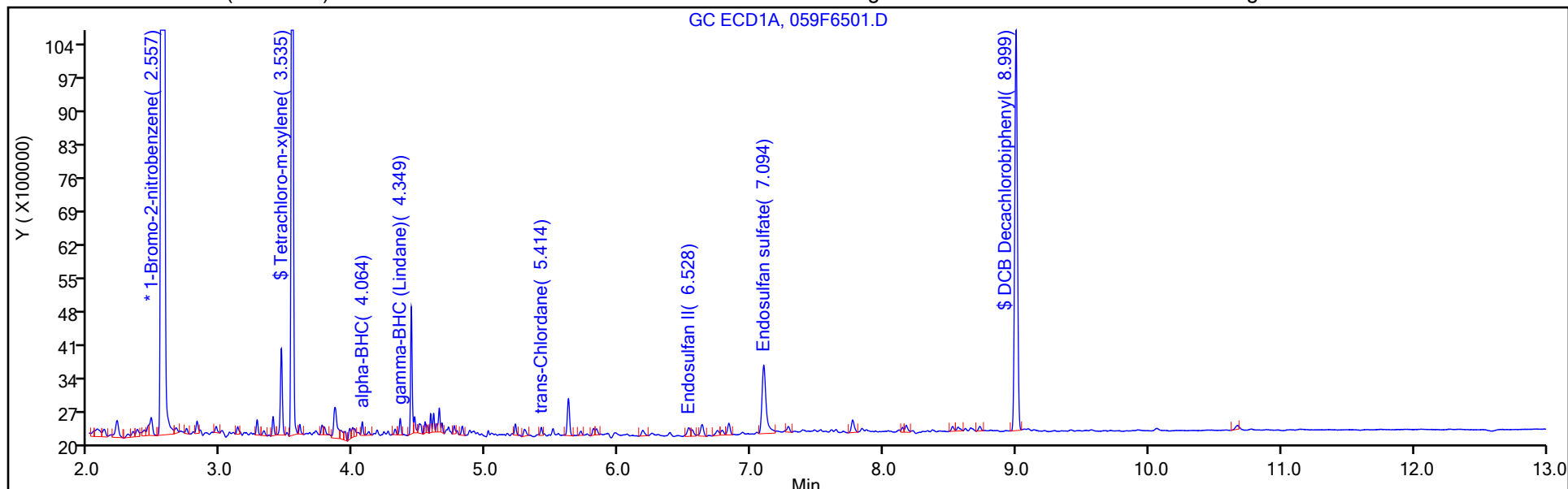
ALS Bottle#: 59

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

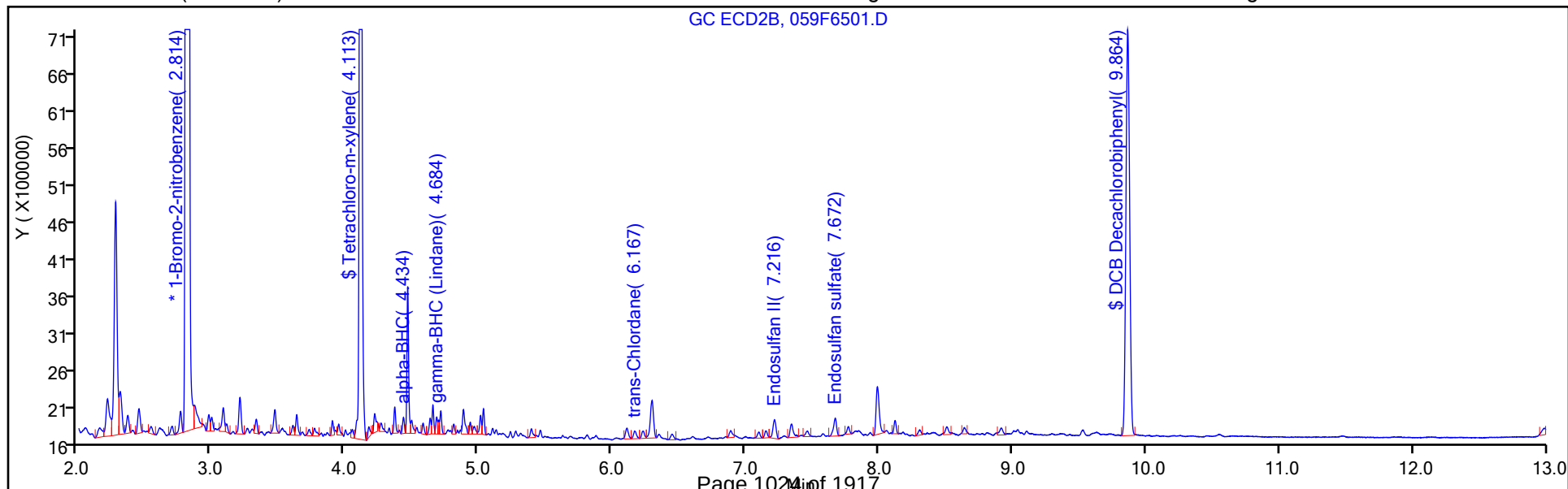
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\059F6501.D
Lims ID: 160-32649-E-1-A
Client ID: CRC-MW-1-011519
Sample Type: Client
Inject. Date: 23-Jan-2019 03:22:25 ALS Bottle#: 59 Worklist Smp#: 82
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 160-32649-E-1-A
Operator ID: TEB Instrument ID: SGC_C
Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
Limit Group: GCSV - 8081A - IS
Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
Process Host: CTX0329
First Level Reviewer: bacat Date: 23-Jan-2019 11:14:09

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	15.6	78.16
\$ 40 DCB Decachlorobiphenyl	20.0	9.55	47.74

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	15.4	76.90
\$ 40 DCB Decachlorobiphenyl	20.0	9.13	45.64

FORM VII
PESTICIDES PERFORMANCE EVALUATION MIXTURE (PEM)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: PEM 280-444894/48 Calibration Date: 01/22/2019 22:25
 Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04
 GC Column: Rxi-35Sil MS ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30
 Lab File ID: 042F4801.D Conc. Units: ng/mL

ANALYTE	RT	RESPONSE	BREAKDOWN (%)	LIMIT	#
Endrin	6.18	53790959	3.13	15	
Endrin aldehyde	6.83	394309			
Endrin ketone	7.77	1342968			

ANALYTE	RT	RESPONSE	BREAKDOWN (%)	LIMIT	#
4,4'-DDT	6.75	44020010	1.68	15	
4,4'-DDD	6.39	753847			
4,4'-DDE		0			

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\042F4801.D
 Lims ID: PEM
 Client ID:
 Sample Type: PEM
 Inject. Date: 22-Jan-2019 22:25:22 ALS Bottle#: 42 Worklist Smp#: 48
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: PEM
 Operator ID: TEB Instrument ID: SGC_C
 Sublist:
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

First Level Reviewer: bacat

Date: 23-Jan-2019 11:10:13

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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* 2 1-Bromo-2-nitrobenzene

1	2.557	2.559	-0.001	133696228	150.0	150.0	
2	2.814	2.816	-0.002	114485112	150.0	150.0	

25 4,4'-DDE

1		5.718				ND	
2		6.449					

29 Endrin

1	6.181	6.184	-0.003	53790959	40.0	39.7	
2	6.885	6.886	-0.001	44451072	40.0	39.9	

RPD = 0.42

32 4,4'-DDD

1	6.387	6.391	-0.004	753847		0.6166	
2	7.101	7.100	0.001	666851		-0.4062	

RPD = 972.42

34 4,4'-DDT

1	6.746	6.750	-0.004	44020010	40.0	39.9	
2	7.461	7.464	-0.003	36792040	40.0	43.5	

RPD = 8.76

35 Endrin aldehyde

1	6.831	6.836	-0.005	394309		-0.7161	
2	7.341	7.343	-0.002	425790		-0.6827	

RPD = -4.78

38 Endrin ketone

1	7.765	7.770	-0.005	1342968		-0.2421	
2	8.121	8.121	0.000	993610		0.0345	

RPD = -266.42

Reagents:

8081_EvalBPEM_00013

Amount Added: 1.00

Units: mL

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\042F4801.D

Injection Date: 22-Jan-2019 22:25:22

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: PEM

Worklist Smp#: 48

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

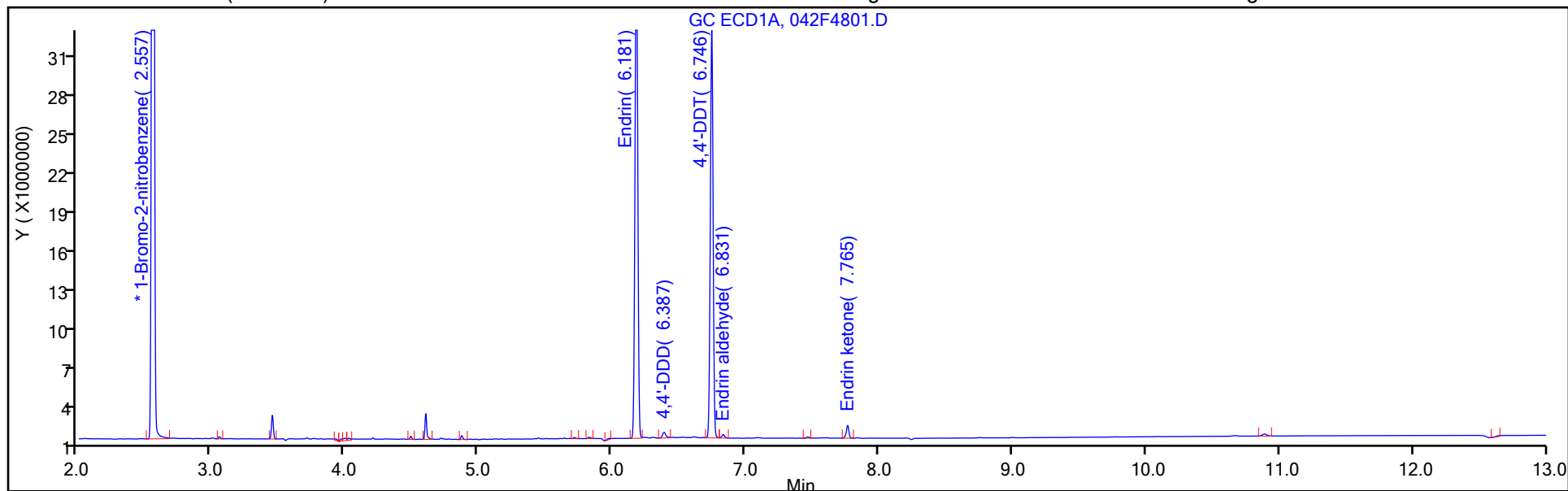
ALS Bottle#: 42

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

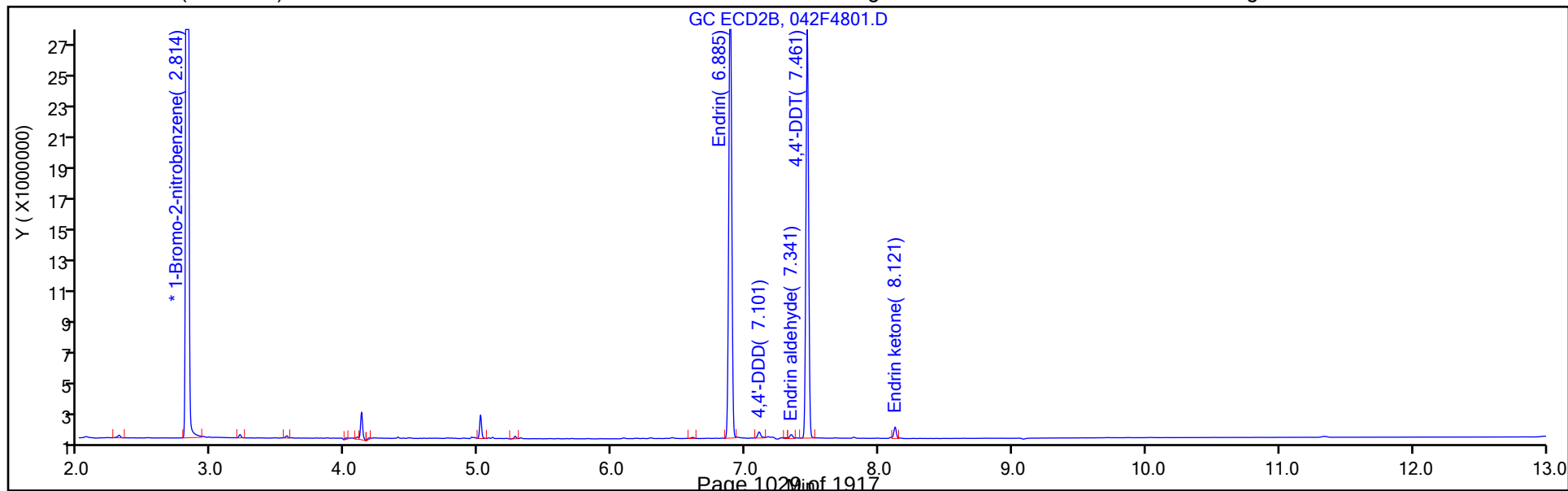
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



FORM VII
PESTICIDES PERFORMANCE EVALUATION MIXTURE (PEM)

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: PEM 280-444894/48 Calibration Date: 01/22/2019 22:25
 Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04
 GC Column: Rxi-XLB ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30
 Lab File ID: 042F4801.D Conc. Units: ng/mL

ANALYTE	RT	RESPONSE	BREAKDOWN (%)	LIMIT	#
Endrin	6.89	44451072	3.09	15	
Endrin aldehyde	7.34	425790			
Endrin ketone	8.12	993610			

ANALYTE	RT	RESPONSE	BREAKDOWN (%)	LIMIT	#
4,4'-DDT	7.46	36792040	1.78	15	
4,4'-DDD	7.10	666851			
4,4'-DDE		0			

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\042F4801.D
 Lims ID: PEM
 Client ID:
 Sample Type: PEM
 Inject. Date: 22-Jan-2019 22:25:22 ALS Bottle#: 42 Worklist Smp#: 48
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: PEM
 Operator ID: TEB Instrument ID: SGC_C
 Sublist:
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

First Level Reviewer: bacat

Date: 23-Jan-2019 11:10:13

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 2 1-Bromo-2-nitrobenzene

1	2.557	2.559	-0.001	133696228	150.0	150.0
2	2.814	2.816	-0.002	114485112	150.0	150.0

25 4,4'-DDE

1		5.718				ND
2		6.449				

29 Endrin

1	6.181	6.184	-0.003	53790959	40.0	39.7
2	6.885	6.886	-0.001	44451072	40.0	39.9

RPD = 0.42

32 4,4'-DDD

1	6.387	6.391	-0.004	753847		0.6166
2	7.101	7.100	0.001	666851		-0.4062

RPD = 972.42

34 4,4'-DDT

1	6.746	6.750	-0.004	44020010	40.0	39.9
2	7.461	7.464	-0.003	36792040	40.0	43.5

RPD = 8.76

35 Endrin aldehyde

1	6.831	6.836	-0.005	394309		-0.7161
2	7.341	7.343	-0.002	425790		-0.6827

RPD = -4.78

38 Endrin ketone

1	7.765	7.770	-0.005	1342968		-0.2421
2	8.121	8.121	0.000	993610		0.0345

RPD = -266.42

Reagents:

8081_EvalBPEM_00013

Amount Added: 1.00

Units: mL

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:16:39

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\042F4801.D

Injection Date: 22-Jan-2019 22:25:22

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: PEM

Worklist Smp#: 48

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

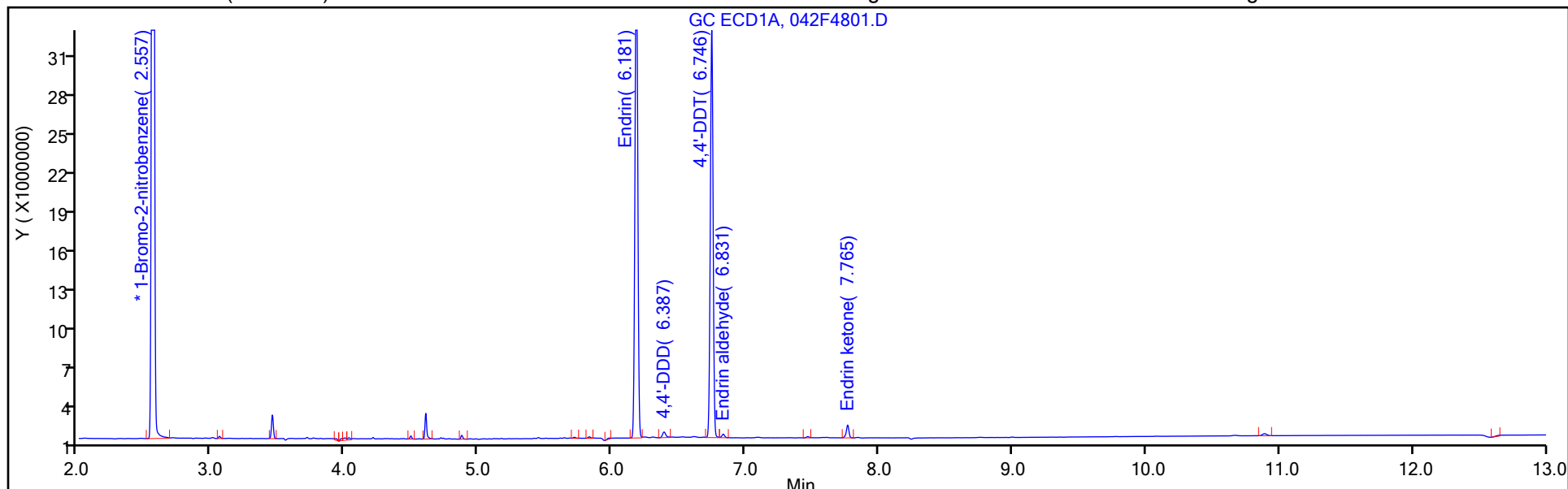
ALS Bottle#: 42

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

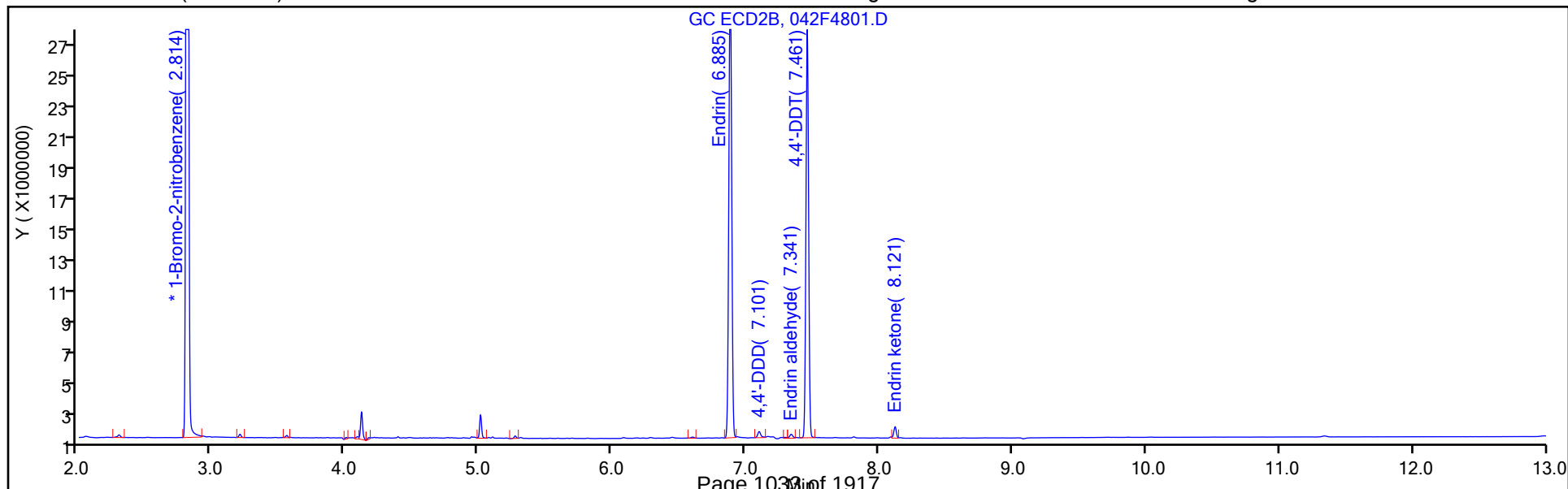
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



FORM VII
PESTICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: CCVIS 280-444894/13 Calibration Date: 01/21/2019 15:39

Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04

GC Column: Rxi-35Sil MS ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30

Lab File ID: 01210013.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Hexachlorobenzene	Lin2		1.147		41.9	50.0	-16.2	20.0
alpha-BHC	Lin2		1.740		43.3	50.0	-13.4	20.0
gamma-BHC (Lindane)	Ave	1.503	1.292		43.0	50.0	-14.0	20.0
beta-BHC	Lin2		0.6665		43.6	50.0	-12.9	20.0
Heptachlor	Lin2		1.279		43.9	50.0	-12.3	20.0
delta-BHC	Lin2		1.534		43.6	50.0	-12.8	20.0
Aldrin	Lin2		1.482		41.6	50.0	-16.7	20.0
Isodrin	Lin2		1.243		41.6	50.0	-16.8	20.0
Heptachlor epoxide	Ave	1.512	1.253		41.4	50.0	-17.1	20.0
gamma-Chlordane	Qua		1.308		40.0	50.0	-20.0	20.0
alpha-Chlordane	Ave	1.644	1.338		40.7	50.0	-18.6	20.0
Endosulfan I	Ave	1.574	1.276		40.5	50.0	-18.9	20.0
4,4'-DDE	Lin		1.417		41.6	50.0	-16.8	20.0
Dieldrin	Ave	1.411	1.030		36.5	50.0	-27.1*	20.0
Endrin	Lin2		1.343		44.3	50.0	-11.4	20.0
4,4'-DDD	Ave	1.372	1.084		39.5	50.0	-21.0*	20.0
Endosulfan II	Ave	1.514	1.256		41.5	50.0	-17.0	20.0
4,4'-DDT	Lin2		1.066		43.1	50.0	-13.9	20.0
Endrin aldehyde	Lin2		1.040		42.7	50.0	-14.5	20.0
Endosulfan sulfate	Ave	1.436	1.151		40.1	50.0	-19.8	20.0
Methoxychlor	Lin2		0.5176		43.9	50.0	-12.1	20.0
Endrin ketone	Lin2		1.302		43.6	50.0	-12.8	20.0
Mirex	Lin2		0.8850		42.9	50.0	-14.2	20.0
Tetrachloro-m-xylene	Lin2		1.067		41.2	50.0	-17.5	20.0
DCB Decachlorobiphenyl	Lin2		1.025		40.6	50.0	-18.9	20.0

FORM VII
PESTICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCVIS 280-444894/13 Calibration Date: 01/21/2019 15:39
 Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04
 GC Column: Rxi-35Sil MS ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30
 Lab File ID: 01210013.D

Analyte	RT	RT WINDOW	
		FROM	TO
Hexachlorobenzene	3.97	3.96	3.98
alpha-BHC	4.07	4.05	4.08
gamma-BHC (Lindane)	4.35	4.34	4.37
beta-BHC	4.54	4.53	4.55
Heptachlor	4.61	4.59	4.62
delta-BHC	4.73	4.72	4.75
Aldrin	4.82	4.81	4.83
Isodrin	5.12	5.11	5.13
Heptachlor epoxide	5.23	5.21	5.24
gamma-Chlordane	5.42	5.41	5.43
alpha-Chlordane	5.51	5.49	5.52
Endosulfan I	5.55	5.54	5.56
4,4'-DDE	5.72	5.71	5.73
Dieldrin	5.83	5.82	5.85
Endrin	6.18	6.17	6.20
4,4'-DDD	6.39	6.38	6.40
Endosulfan II	6.53	6.52	6.55
4,4'-DDT	6.75	6.74	6.76
Endrin aldehyde	6.84	6.82	6.85
Endosulfan sulfate	7.08	7.07	7.10
Methoxychlor	7.61	7.60	7.62
Endrin ketone	7.77	7.76	7.78
Mirex	7.88	7.87	7.89
Tetrachloro-m-xylene	3.54	3.52	3.55
DCB Decachlorobiphenyl	9.00	8.99	9.02

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\01210013.D
 Lims ID: CCVIS AB
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 21-Jan-2019 15:39:57 ALS Bottle#: 7 Worklist Smp#: 13
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCVIS AB
 Misc. Info.: 280-0078230-013
 Operator ID: TEB Instrument ID: SGC_C
 Sublist: chrom-C 8081 IS*sub5
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:14:44 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 2 1-Bromo-2-nitrobenzene

1	2.558	2.558	0.000	142135528	150.0	150.0	
2	2.814	2.814	0.000	115763826	150.0	150.0	

\$ 3 Tetrachloro-m-xylene

1	3.537	3.537	0.000	50563040	50.0	41.2	
2	4.113	4.113	0.000	56687734	50.0	38.8	

RPD = 5.99

6 Hexachlorobenzene

1	3.971	3.971	0.000	54353686	50.0	41.9	
2	4.498	4.498	0.000	56026037	50.0	39.3	

RPD = 6.35

7 alpha-BHC

1	4.066	4.066	0.000	82453641	50.0	43.3	
2	4.438	4.438	0.000	63738823	50.0	43.9	

RPD = 1.36

8 gamma-BHC (Lindane)

1	4.353	4.353	0.000	61233780	50.0	43.0	
2	4.683	4.683	0.000	48523359	50.0	44.5	

RPD = 3.40

11 beta-BHC

1	4.540	4.540	0.000	31576056	50.0	43.6	
2	4.888	4.888	0.000	25236073	50.0	45.9	

RPD = 5.32

12 Heptachlor

1	4.605	4.605	0.000	60573662	50.0	43.9	
2	5.126	5.126	0.000	44277153	50.0	46.1	

RPD = 5.04

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\01210013.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

13 delta-BHC

1	4.734	4.734	0.000	72688892	50.0	43.6	
2	5.075	5.075	0.000	59764116	50.0	45.0	
RPD = 3.04							

15 Aldrin

1	4.821	4.821	0.000	70224840	50.0	41.6	
2	5.394	5.394	0.000	56222243	50.0	44.4	
RPD = 6.37							

17 Isodrin

1	5.118	5.118	0.000	58910907	50.0	41.6	
2	5.699	5.699	0.000	49236552	50.0	44.9	
RPD = 7.60							

19 Heptachlor epoxide

1	5.227	5.227	0.000	59375219	50.0	41.4	
2	5.814	5.814	0.000	50886165	50.0	44.9	
RPD = 8.00							

20 trans-Chlordane

1	5.418	5.418	0.000	61977412	50.0	40.0	
2	6.170	6.170	0.000	53995674	50.0	45.5	
RPD = 12.86							

23 cis-Chlordane

1	5.507	5.507	0.000	63371006	50.0	40.7	
2	6.231	6.231	0.000	47654405	50.0	40.6	
RPD = 0.21							

24 Endosulfan I

1	5.548	5.548	0.000	60476154	50.0	40.5	
2	6.272	6.272	0.000	38804441	50.0	39.7	
RPD = 2.21							

25 4,4'-DDE

1	5.718	5.718	0.000	67135311	50.0	41.6	
2	6.449	6.449	0.000	58407921	50.0	40.1	
RPD = 3.64							

26 Dieldrin

1	5.832	5.832	0.000	48781446	50.0	36.5	
2	6.603	6.603	0.000	55234680	50.0	43.2	
RPD = 16.89							

29 Endrin

1	6.184	6.184	0.000	63630706	50.0	44.3	
2	6.886	6.886	0.000	51456120	50.0	45.8	
RPD = 3.31							

32 4,4'-DDD

1	6.391	6.391	0.000	51364148	50.0	39.5	
2	7.100	7.100	0.000	44177749	50.0	44.8	
RPD = 12.52							

33 Endosulfan II

1	6.533	6.533	0.000	59520319	50.0	41.5	
2	7.213	7.213	0.000	46698513	50.0	45.4	
RPD = 9.08							

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\01210013.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

34 4,4'-DDT

1	6.750	6.750	0.000	50509221	50.0	43.1	
2	7.464	7.464	0.000	40422572	50.0	47.3	
RPD = 9.38							

35 Endrin aldehyde

1	6.836	6.836	0.000	49259160	50.0	42.7	
2	7.343	7.343	0.000	38460929	50.0	45.3	
RPD = 5.80							

36 Endosulfan sulfate

1	7.084	7.084	0.000	54525448	50.0	40.1	
2	7.673	7.673	0.000	43411342	50.0	46.2	
RPD = 14.20							

37 Methoxychlor

1	7.611	7.611	0.000	24524252	50.0	43.9	
2	7.981	7.981	0.000	21441414	50.0	47.8	
RPD = 8.53							

38 Endrin ketone

1	7.770	7.770	0.000	61690469	50.0	43.6	
2	8.121	8.121	0.000	41676443	50.0	41.7	
RPD = 4.56							

39 Mirex

1	7.878	7.878	0.000	41932037	50.0	42.9	
2	8.642	8.642	0.000	28911603	50.0	41.8	
RPD = 2.67							

\$ 40 DCB Decachlorobiphenyl

1	9.004	9.004	0.000	48558602	50.0	40.6	
2	9.869	9.869	0.000	42806601	50.0	41.3	
RPD = 1.68							

Reagents:

8081IcalL4_00033

Amount Added: 1.00

Units: mL

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\01210013.D

Injection Date: 21-Jan-2019 15:39:57

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: CCVIS AB

Worklist Smp#: 13

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

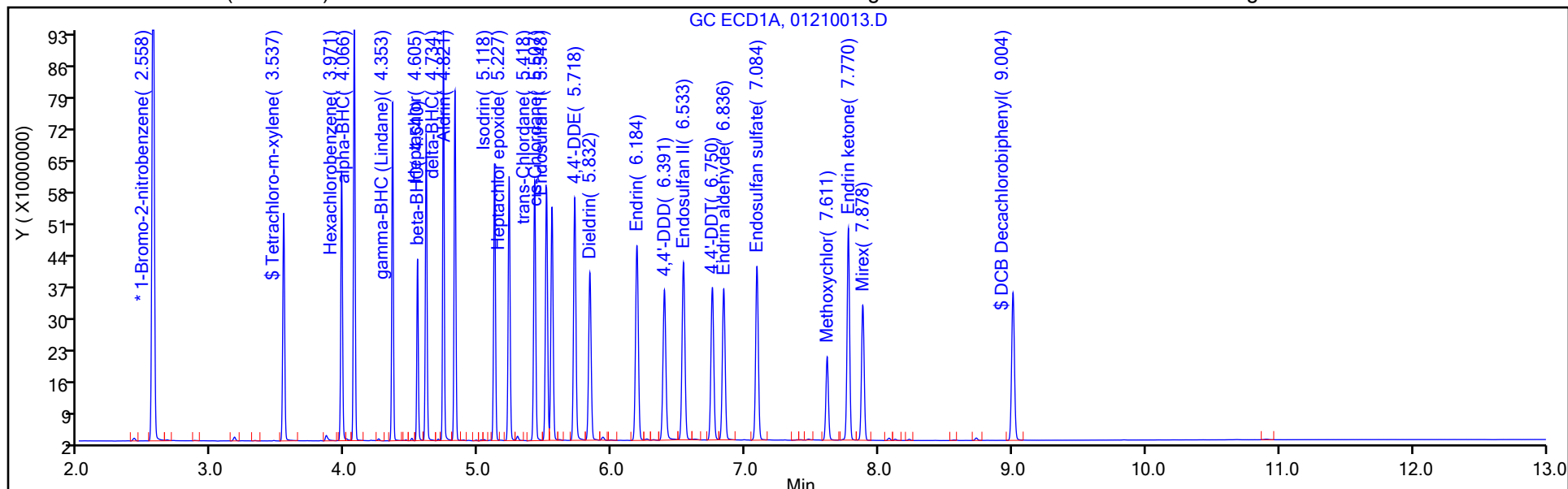
ALS Bottle#: 7

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

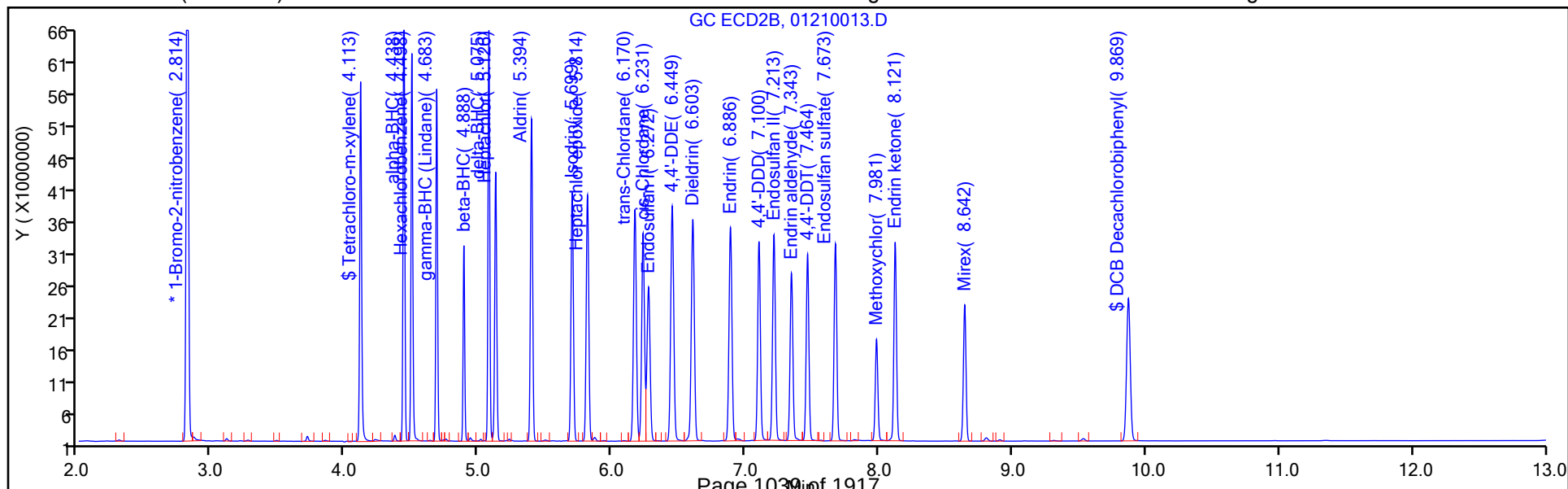
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



FORM VII
PESTICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: CCVIS 280-444894/13 Calibration Date: 01/21/2019 15:39

Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04

GC Column: Rxi-XLB ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30

Lab File ID: 01210013.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
alpha-BHC	Ave	1.882	1.652		43.9	50.0	-12.3	20.0
Hexachlorobenzene	Lin2		1.452		39.3	50.0	-21.3*	20.0
gamma-BHC (Lindane)	Ave	1.413	1.257		44.5	50.0	-11.0	20.0
beta-BHC	Lin2		0.6540		45.9	50.0	-8.1	20.0
delta-BHC	Lin2		1.549		45.0	50.0	-10.1	20.0
Heptachlor	Lin2		1.147		46.1	50.0	-7.8	20.0
Aldrin	Lin2		1.457		44.4	50.0	-11.2	20.0
Isodrin	Lin2		1.276		44.9	50.0	-10.2	20.0
Heptachlor epoxide	Lin2		1.319		44.9	50.0	-10.2	20.0
gamma-Chlordane	Lin2		1.399		45.5	50.0	-9.0	20.0
alpha-Chlordane	Ave	1.521	1.235		40.6	50.0	-18.8	20.0
Endosulfan I	Ave	1.268	1.006		39.7	50.0	-20.7*	20.0
4,4'-DDE	Lin2		1.514		40.1	50.0	-19.8	20.0
Dieldrin	Ave	1.657	1.431		43.2	50.0	-13.6	20.0
Endrin	Lin2		1.333		45.8	50.0	-8.5	20.0
4,4'-DDD	Lin2		1.145		44.8	50.0	-10.4	20.0
Endosulfan II	Lin2		1.210		45.4	50.0	-9.1	20.0
Endrin aldehyde	Lin2		0.997		45.3	50.0	-9.4	20.0
4,4'-DDT	Lin2		1.048		47.3	50.0	-5.4	20.0
Endosulfan sulfate	Lin2		1.125		46.2	50.0	-7.6	20.0
Methoxychlor	Lin2		0.5557		47.8	50.0	-4.3	20.0
Endrin ketone	Lin2		1.080		41.7	50.0	-16.7	20.0
Mirex	Ave	0.8964	0.7492		41.8	50.0	-16.4	20.0
Tetrachloro-m-xylene	Lin2		1.469		38.8	50.0	-22.3*	20.0
DCB Decachlorobiphenyl	Lin2		1.109		41.3	50.0	-17.5	20.0

FORM VII
PESTICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCVIS 280-444894/13 Calibration Date: 01/21/2019 15:39
 Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04
 GC Column: Rxi-XLB ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30
 Lab File ID: 01210013.D

Analyte	RT	RT WINDOW	
		FROM	TO
alpha-BHC	4.44	4.43	4.45
Hexachlorobenzene	4.50	4.49	4.51
gamma-BHC (Lindane)	4.68	4.67	4.70
beta-BHC	4.89	4.88	4.90
delta-BHC	5.08	5.06	5.09
Heptachlor	5.13	5.11	5.14
Aldrin	5.39	5.38	5.41
Isodrin	5.70	5.69	5.71
Heptachlor epoxide	5.81	5.80	5.83
gamma-Chlordane	6.17	6.16	6.18
alpha-Chlordane	6.23	6.22	6.24
Endosulfan I	6.27	6.26	6.29
4,4'-DDE	6.45	6.44	6.46
Dieldrin	6.60	6.59	6.62
Endrin	6.89	6.87	6.90
4,4'-DDD	7.10	7.09	7.11
Endosulfan II	7.21	7.20	7.23
Endrin aldehyde	7.34	7.33	7.36
4,4'-DDT	7.46	7.45	7.48
Endosulfan sulfate	7.67	7.66	7.69
Methoxychlor	7.98	7.97	7.99
Endrin ketone	8.12	8.11	8.13
Mirex	8.64	8.63	8.66
Tetrachloro-m-xylene	4.11	4.10	4.13
DCB Decachlorobiphenyl	9.87	9.86	9.88

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\01210013.D
 Lims ID: CCVIS AB
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 21-Jan-2019 15:39:57 ALS Bottle#: 7 Worklist Smp#: 13
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCVIS AB
 Misc. Info.: 280-0078230-013
 Operator ID: TEB Instrument ID: SGC_C
 Sublist: chrom-C 8081 IS*sub5
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:14:44 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 2 1-Bromo-2-nitrobenzene

1	2.558	2.558	0.000	142135528	150.0	150.0	
2	2.814	2.814	0.000	115763826	150.0	150.0	

\$ 3 Tetrachloro-m-xylene

1	3.537	3.537	0.000	50563040	50.0	41.2	
2	4.113	4.113	0.000	56687734	50.0	38.8	

RPD = 5.99

6 Hexachlorobenzene

1	3.971	3.971	0.000	54353686	50.0	41.9	
2	4.498	4.498	0.000	56026037	50.0	39.3	

RPD = 6.35

7 alpha-BHC

1	4.066	4.066	0.000	82453641	50.0	43.3	
2	4.438	4.438	0.000	63738823	50.0	43.9	

RPD = 1.36

8 gamma-BHC (Lindane)

1	4.353	4.353	0.000	61233780	50.0	43.0	
2	4.683	4.683	0.000	48523359	50.0	44.5	

RPD = 3.40

11 beta-BHC

1	4.540	4.540	0.000	31576056	50.0	43.6	
2	4.888	4.888	0.000	25236073	50.0	45.9	

RPD = 5.32

12 Heptachlor

1	4.605	4.605	0.000	60573662	50.0	43.9	
2	5.126	5.126	0.000	44277153	50.0	46.1	

RPD = 5.04

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\01210013.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
13 delta-BHC							
1	4.734	4.734	0.000	72688892	50.0	43.6	
2	5.075	5.075	0.000	59764116	50.0	45.0	
						RPD = 3.04	
15 Aldrin							
1	4.821	4.821	0.000	70224840	50.0	41.6	
2	5.394	5.394	0.000	56222243	50.0	44.4	
						RPD = 6.37	
17 Isodrin							
1	5.118	5.118	0.000	58910907	50.0	41.6	
2	5.699	5.699	0.000	49236552	50.0	44.9	
						RPD = 7.60	
19 Heptachlor epoxide							
1	5.227	5.227	0.000	59375219	50.0	41.4	
2	5.814	5.814	0.000	50886165	50.0	44.9	
						RPD = 8.00	
20 trans-Chlordane							
1	5.418	5.418	0.000	61977412	50.0	40.0	
2	6.170	6.170	0.000	53995674	50.0	45.5	
						RPD = 12.86	
23 cis-Chlordane							
1	5.507	5.507	0.000	63371006	50.0	40.7	
2	6.231	6.231	0.000	47654405	50.0	40.6	
						RPD = 0.21	
24 Endosulfan I							
1	5.548	5.548	0.000	60476154	50.0	40.5	
2	6.272	6.272	0.000	38804441	50.0	39.7	
						RPD = 2.21	
25 4,4'-DDE							
1	5.718	5.718	0.000	67135311	50.0	41.6	
2	6.449	6.449	0.000	58407921	50.0	40.1	
						RPD = 3.64	
26 Dieldrin							
1	5.832	5.832	0.000	48781446	50.0	36.5	
2	6.603	6.603	0.000	55234680	50.0	43.2	
						RPD = 16.89	
29 Endrin							
1	6.184	6.184	0.000	63630706	50.0	44.3	
2	6.886	6.886	0.000	51456120	50.0	45.8	
						RPD = 3.31	
32 4,4'-DDD							
1	6.391	6.391	0.000	51364148	50.0	39.5	
2	7.100	7.100	0.000	44177749	50.0	44.8	
						RPD = 12.52	
33 Endosulfan II							
1	6.533	6.533	0.000	59520319	50.0	41.5	
2	7.213	7.213	0.000	46698513	50.0	45.4	
						RPD = 9.08	

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\01210013.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

34 4,4'-DDT

1	6.750	6.750	0.000	50509221	50.0	43.1	
2	7.464	7.464	0.000	40422572	50.0	47.3	
RPD = 9.38							

35 Endrin aldehyde

1	6.836	6.836	0.000	49259160	50.0	42.7	
2	7.343	7.343	0.000	38460929	50.0	45.3	
RPD = 5.80							

36 Endosulfan sulfate

1	7.084	7.084	0.000	54525448	50.0	40.1	
2	7.673	7.673	0.000	43411342	50.0	46.2	
RPD = 14.20							

37 Methoxychlor

1	7.611	7.611	0.000	24524252	50.0	43.9	
2	7.981	7.981	0.000	21441414	50.0	47.8	
RPD = 8.53							

38 Endrin ketone

1	7.770	7.770	0.000	61690469	50.0	43.6	
2	8.121	8.121	0.000	41676443	50.0	41.7	
RPD = 4.56							

39 Mirex

1	7.878	7.878	0.000	41932037	50.0	42.9	
2	8.642	8.642	0.000	28911603	50.0	41.8	
RPD = 2.67							

\$ 40 DCB Decachlorobiphenyl

1	9.004	9.004	0.000	48558602	50.0	40.6	
2	9.869	9.869	0.000	42806601	50.0	41.3	
RPD = 1.68							

Reagents:

8081IcalL4_00033

Amount Added: 1.00

Units: mL

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\01210013.D

Injection Date: 21-Jan-2019 15:39:57

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: CCVIS AB

Worklist Smp#: 13

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

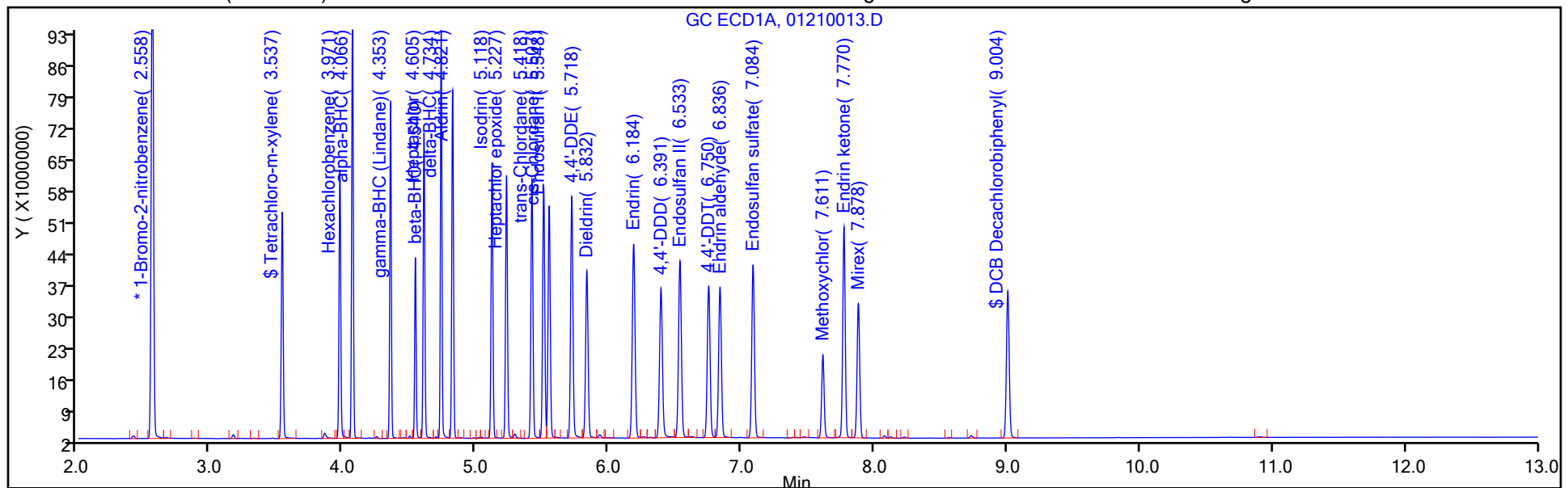
ALS Bottle#: 7

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

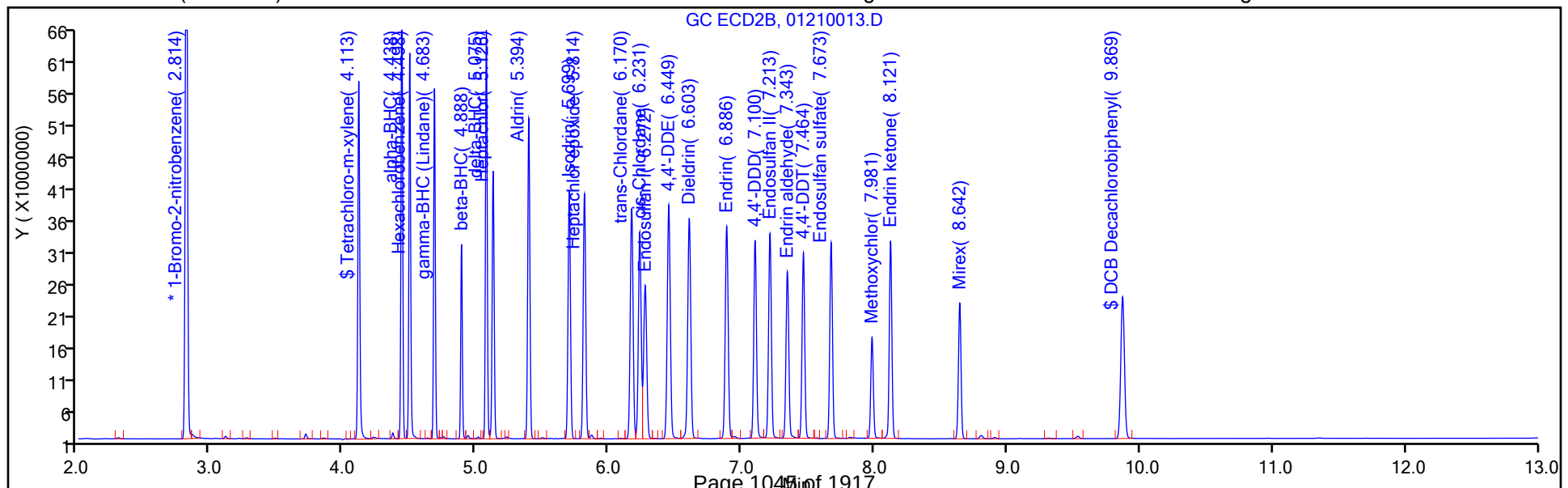
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



FORM VII
PESTICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCV 280-444894/45 Calibration Date: 01/22/2019 21:32
 Instrument ID: SGC_C Calib Start Date: 01/08/2019 20:54
 GC Column: Rxi-35Sil MS ID: 0.32 (mm) Calib End Date: 01/08/2019 22:20
 Lab File ID: 039F4501.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Toxaphene Peak 1	Ave	0.0031	0.0038		2420	2000	21.2*	20.0
Toxaphene Peak 2	Lin2		0.0214		2130	2000	6.7	20.0
Toxaphene Peak 3	Lin2		0.0249		2140	2000	6.8	20.0
Toxaphene Peak 4	Lin2		0.0391		2010	2000	0.6	20.0
Toxaphene Peak 5	Lin2		0.0289		2020	2000	1.1	20.0

FORM VII
PESTICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: CCV 280-444894/45 Calibration Date: 01/22/2019 21:32
Instrument ID: SGC_C Calib Start Date: 01/08/2019 20:54
GC Column: Rxi-35Sil MS ID: 0.32 (mm) Calib End Date: 01/08/2019 22:20
Lab File ID: 039F4501.D

Analyte	RT	RT WINDOW	
		FROM	TO
Toxaphene Peak 1	4.86	4.85	4.87
Toxaphene Peak 2	6.24	6.23	6.25
Toxaphene Peak 3	6.85	6.84	6.87
Toxaphene Peak 4	7.40	7.39	7.42
Toxaphene Peak 5	7.54	7.53	7.56

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\039F4501.D
 Lims ID: CCV TOX
 Client ID:
 Sample Type: CCV
 Inject. Date: 22-Jan-2019 21:32:44 ALS Bottle#: 39 Worklist Smp#: 45
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCV TOX
 Operator ID: TEB Instrument ID: SGC_C
 Sublist: chrom-C 8081 IS*sub3
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:30 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

First Level Reviewer: bacat Date: 23-Jan-2019 11:10:51

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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* 2 1-Bromo-2-nitrobenzene

1	2.558	2.559	-0.001	137014848	150.0	150.0	
2	2.814	2.816	-0.002	117517794	150.0	150.0	

22 Toxaphene

1	4.856	4.858	-0.002	6930038	2000.0	2423.0	M
1	6.236	6.241	-0.005	39070413	2000.0	2134.1	M
1	6.847	6.852	-0.005	45491252	2000.0	2136.2	M
1	7.401	7.407	-0.006	71368920	2000.0	2011.9	M
1	7.543	7.546	-0.003	52766884	2000.0	2021.7	M

Average of Peak Amounts = 2145.4

2	6.059	6.061	-0.002	15783593	2000.0	1986.8	M
2	6.548	6.552	-0.004	22464432	2000.0	2153.6	M
2	6.872	6.876	-0.004	23427251	2000.0	1551.7	M
2	7.590	7.593	-0.003	49296540	2000.0	2002.3	M
2	8.161	8.163	-0.002	65608798	2000.0	2145.4	M

Average of Peak Amounts = 1968.0

RPD = 8.62

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

8081TOXCCVL4_00015

Amount Added: 1.00

Units: mL

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:16:31

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\039F4501.D

Injection Date: 22-Jan-2019 21:32:44

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: CCV TOX

Worklist Smp#: 45

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

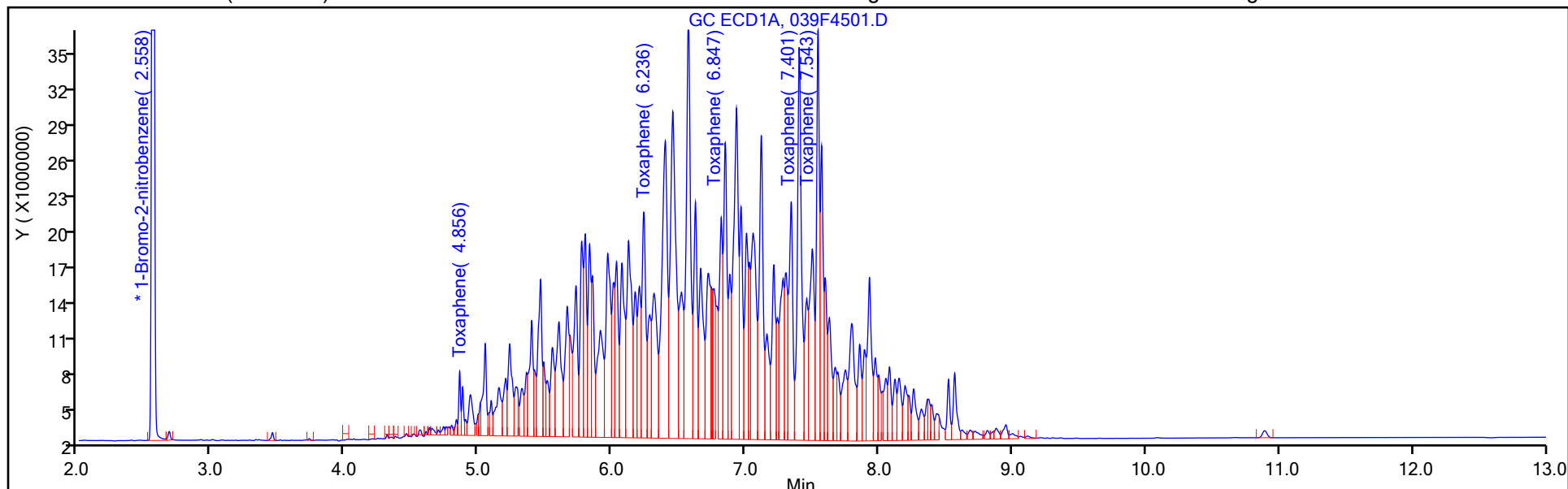
ALS Bottle#: 39

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

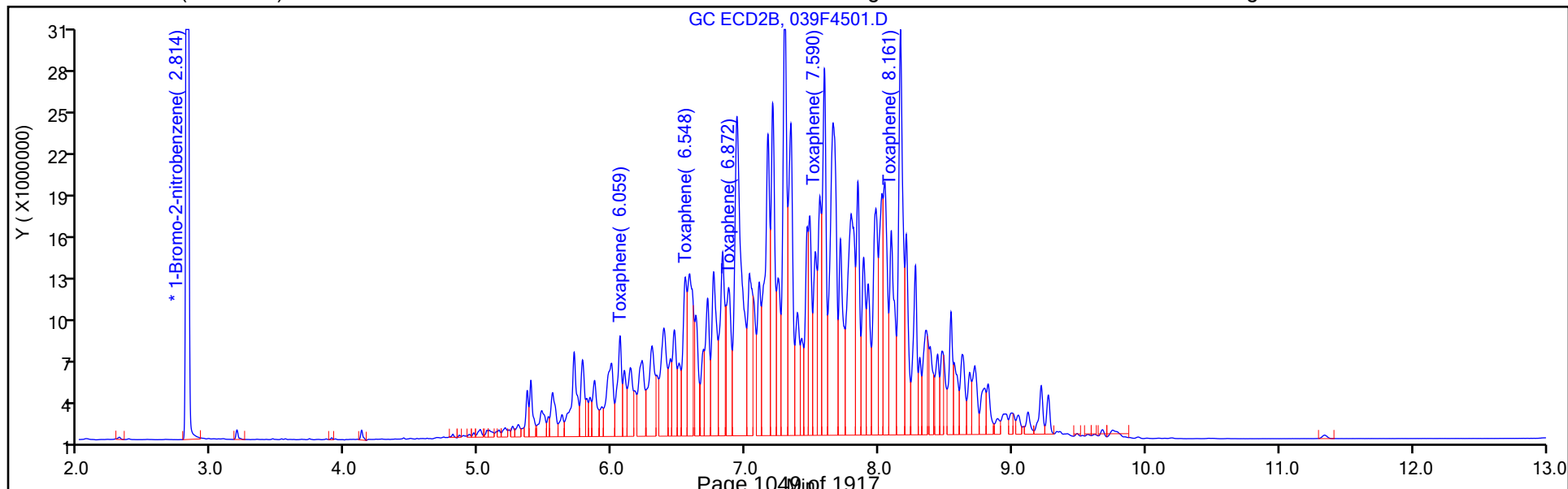
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\039F4501.D

Injection Date: 22-Jan-2019 21:32:44

Instrument ID: SGC_C

Lims ID: CCV TOX

Client ID:

Operator ID: TEB

ALS Bottle#:

39

Worklist Smp#:

45

Injection Vol: 1.0 ul

Dil. Factor:

1.0000

Method: C 8081 IS

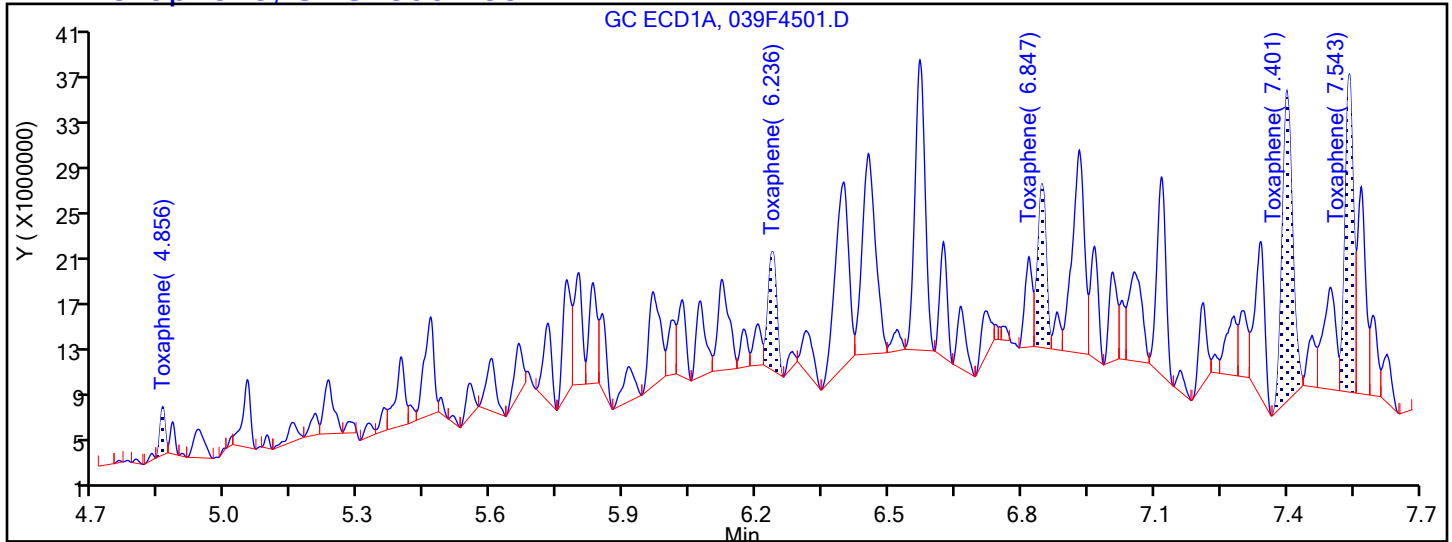
Limit Group:

GCSV - 8081A - IS

Column: Rxi-35Sil MS (0.32 mm)

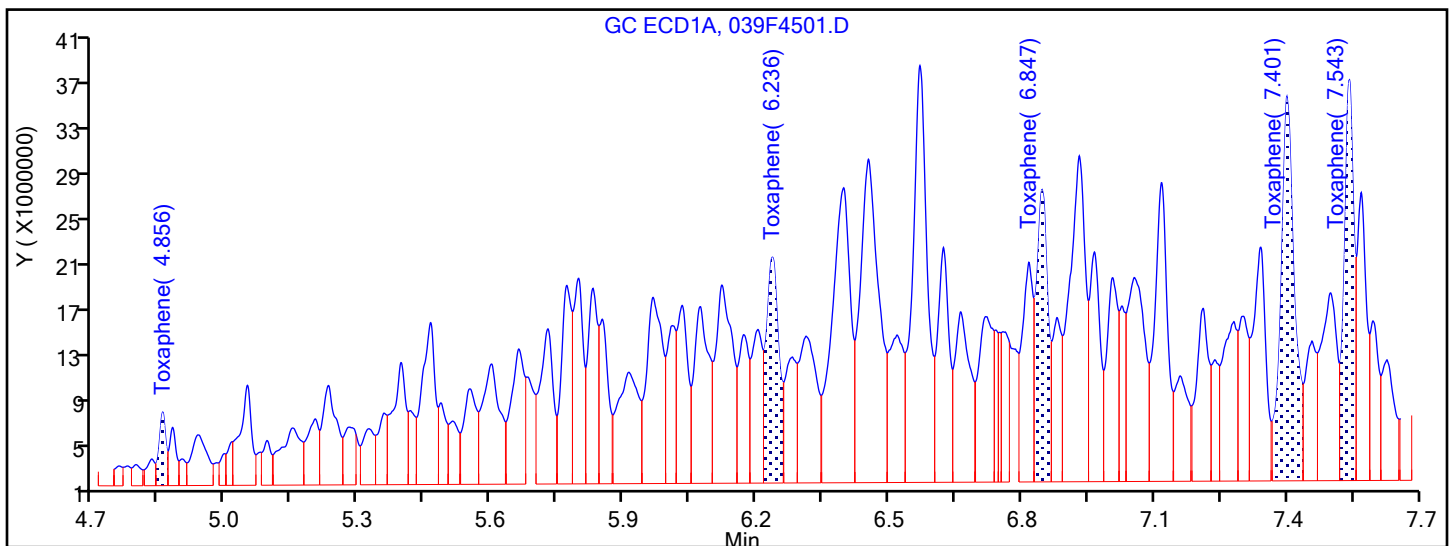
Detector

GC ECD1A

22 Toxaphene, CAS: 8001-35-2

Processing Integration Results

4.856	Response = 3384251
6.236	Response = 14070161
6.847	Response = 19236566
7.401	Response = 44154100
7.543	Response = 36518705



Manual Integration Results

4.856	Response = 6930038	M
6.236	Response = 39070413	M
6.847	Response = 45491252	M
7.401	Response = 71368920	M
7.543	Response = 52766884	M

Reviewer: bacat, 23-Jan-2019 11:10:46

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
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FORM VII
PESTICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCV 280-444894/45 Calibration Date: 01/22/2019 21:32
 Instrument ID: SGC_C Calib Start Date: 01/08/2019 20:54
 GC Column: Rxi-XLB ID: 0.32 (mm) Calib End Date: 01/08/2019 22:20
 Lab File ID: 039F4501.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Toxaphene Peak 1	Qua		0.0101		1990	2000	-0.7	20.0
Toxaphene Peak 2	Lin1		0.0143		2150	2000	7.7	20.0
Toxaphene Peak 3	Lin1		0.0150		1550	2000	-22.4*	20.0
Toxaphene Peak 4	Ave	0.0314	0.0315		2000	2000	0.1	20.0
Toxaphene Peak 5	Ave	0.0390	0.0419		2150	2000	7.3	20.0

FORM VII
PESTICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: CCV 280-444894/45 Calibration Date: 01/22/2019 21:32
Instrument ID: SGC_C Calib Start Date: 01/08/2019 20:54
GC Column: Rxi-XLB ID: 0.32 (mm) Calib End Date: 01/08/2019 22:20
Lab File ID: 039F4501.D

Analyte	RT	RT WINDOW	
		FROM	TO
Toxaphene Peak 1	6.06	6.05	6.07
Toxaphene Peak 2	6.55	6.54	6.57
Toxaphene Peak 3	6.87	6.86	6.89
Toxaphene Peak 4	7.59	7.58	7.61
Toxaphene Peak 5	8.16	8.15	8.18

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\039F4501.D
 Lims ID: CCV TOX
 Client ID:
 Sample Type: CCV
 Inject. Date: 22-Jan-2019 21:32:44 ALS Bottle#: 39 Worklist Smp#: 45
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCV TOX
 Operator ID: TEB Instrument ID: SGC_C
 Sublist: chrom-C 8081 IS*sub3
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:30 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

First Level Reviewer: bacat

Date: 23-Jan-2019 11:10:51

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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* 2 1-Bromo-2-nitrobenzene

1	2.558	2.559	-0.001	137014848	150.0	150.0	
2	2.814	2.816	-0.002	117517794	150.0	150.0	

22 Toxaphene

1	4.856	4.858	-0.002	6930038	2000.0	2423.0	M
1	6.236	6.241	-0.005	39070413	2000.0	2134.1	M
1	6.847	6.852	-0.005	45491252	2000.0	2136.2	M
1	7.401	7.407	-0.006	71368920	2000.0	2011.9	M
1	7.543	7.546	-0.003	52766884	2000.0	2021.7	M

Average of Peak Amounts = 2145.4

2	6.059	6.061	-0.002	15783593	2000.0	1986.8	M
2	6.548	6.552	-0.004	22464432	2000.0	2153.6	M
2	6.872	6.876	-0.004	23427251	2000.0	1551.7	M
2	7.590	7.593	-0.003	49296540	2000.0	2002.3	M
2	8.161	8.163	-0.002	65608798	2000.0	2145.4	M

Average of Peak Amounts = 1968.0

RPD = 8.62

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

8081TOXCCVL4_00015

Amount Added: 1.00

Units: mL

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:16:32

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\039F4501.D

Injection Date: 22-Jan-2019 21:32:44

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: CCV TOX

Worklist Smp#: 45

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

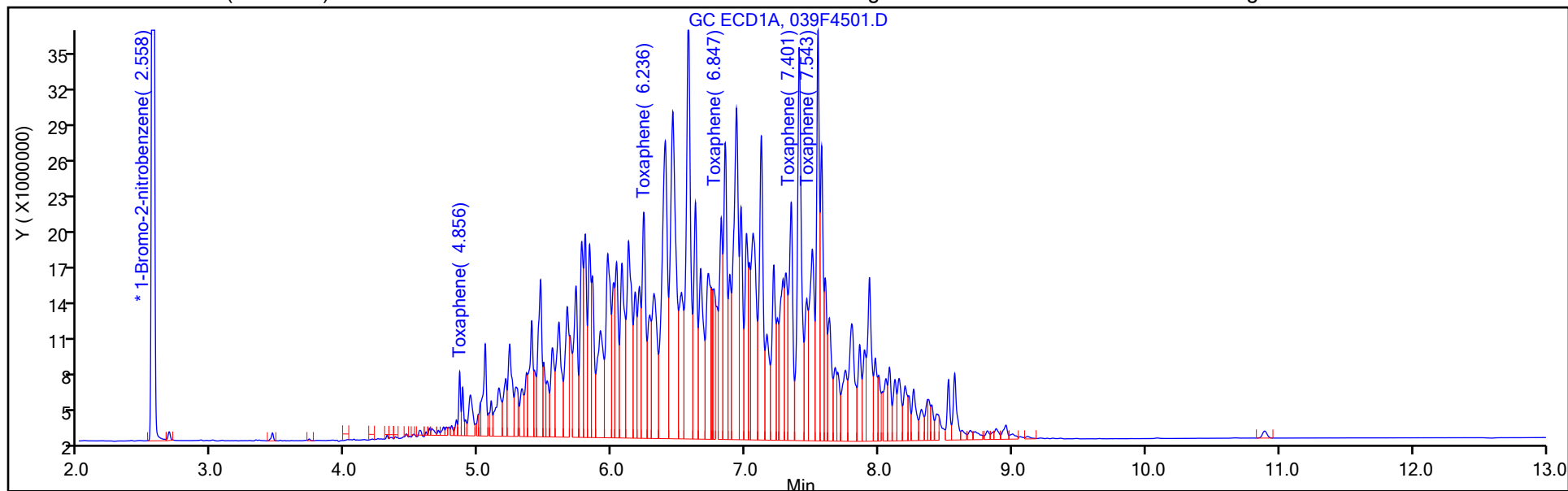
ALS Bottle#: 39

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

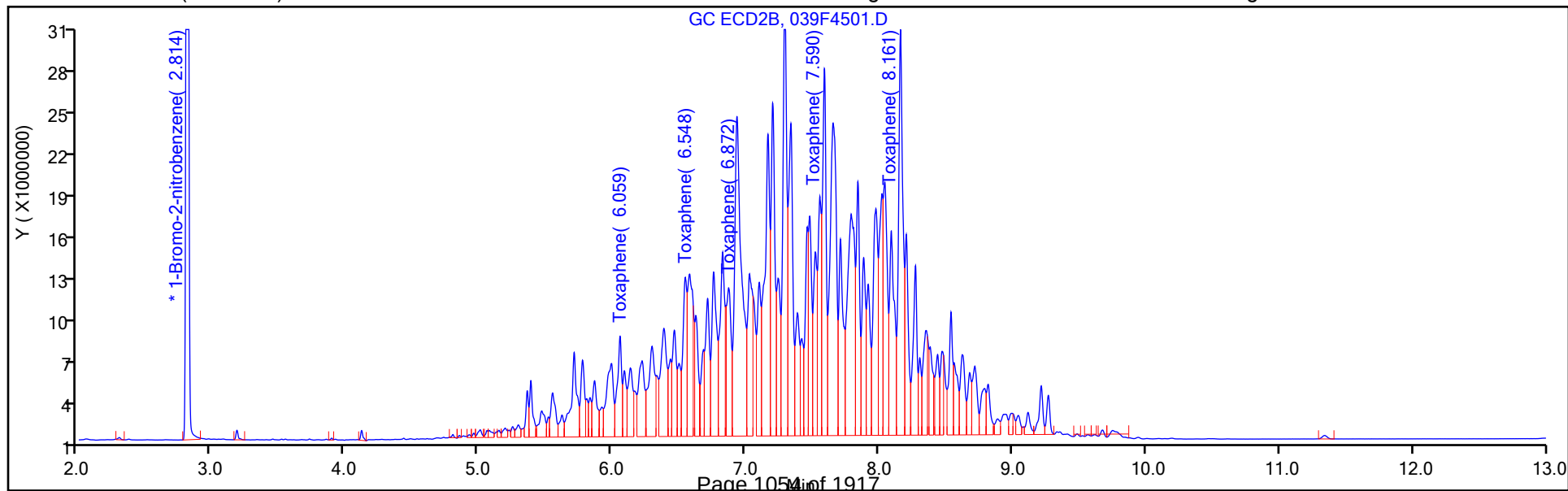
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\039F4501.D

Injection Date: 22-Jan-2019 21:32:44

Instrument ID: SGC_C

Lims ID: CCV TOX

Client ID:

Operator ID: TEB

ALS Bottle#: 39

Worklist Smp#: 45

Injection Vol: 1.0 ul

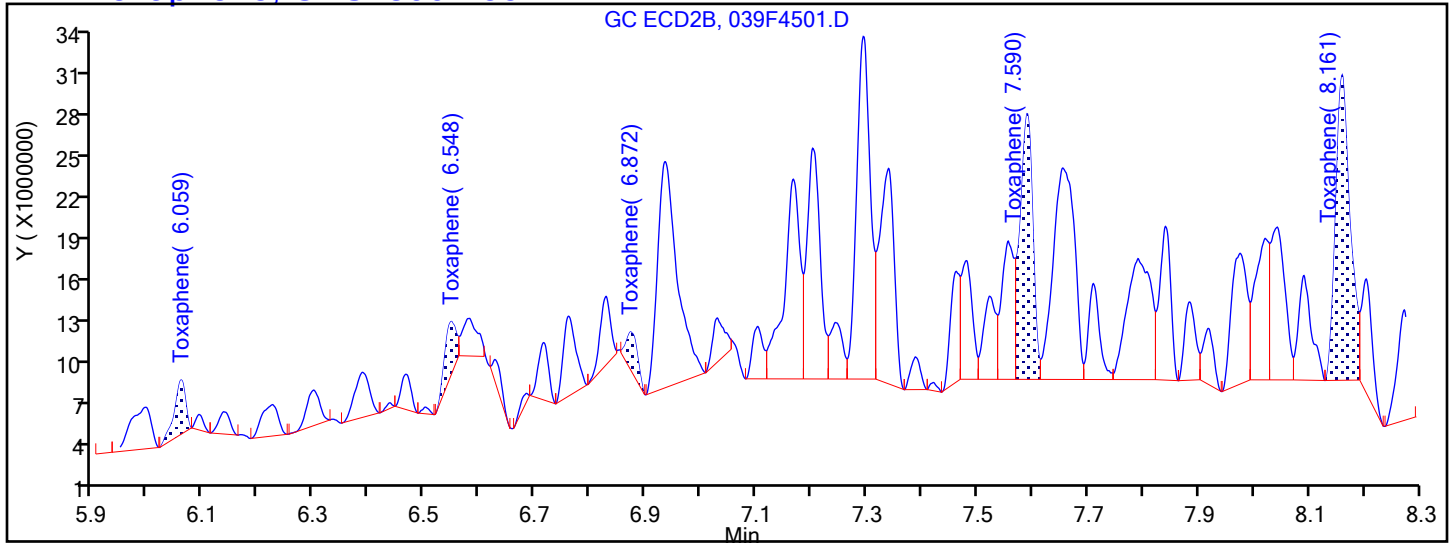
Dil. Factor: 1.0000

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

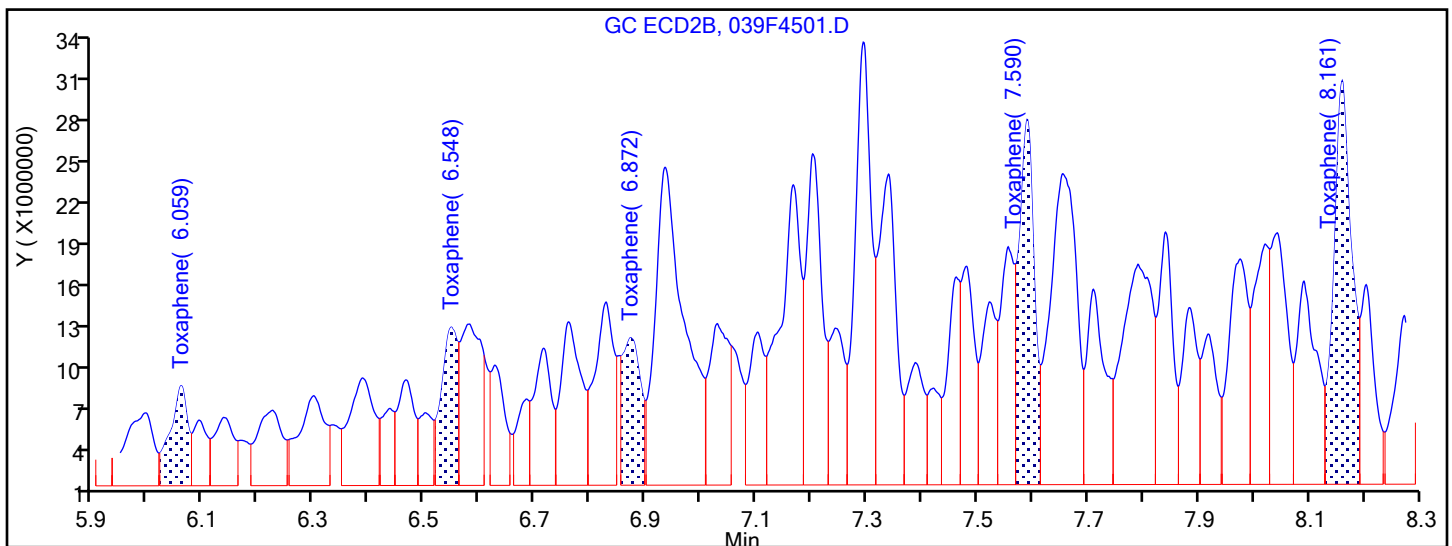
Column: Rxi-XLB (0.32 mm)

Detector GC ECD2B

22 Toxaphene, CAS: 8001-35-2

Processing Integration Results

6.059	Response = 5421192
6.548	Response = 5400038
6.872	Response = 3954794
7.590	Response = 30269560
8.161	Response = 39527439



Manual Integration Results

6.059	Response = 15783593	M
6.548	Response = 22464432	M
6.872	Response = 23427251	M
7.590	Response = 49296540	M
8.161	Response = 65608798	M

Reviewer: bacat, 23-Jan-2019 11:10:49

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
Page 1055 of 1917

FORM VII
PESTICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: CCV 280-444894/47 Calibration Date: 01/22/2019 22:07

Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04

GC Column: Rxi-35Sil MS ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30

Lab File ID: 041F4701.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Hexachlorobenzene	Lin2		1.233		45.1	50.0	-9.7	20.0
alpha-BHC	Lin2		1.869		46.5	50.0	-6.9	20.0
gamma-BHC (Lindane)	Ave	1.503	1.414		47.1	50.0	-5.9	20.0
beta-BHC	Lin2		0.7192		47.1	50.0	-5.8	20.0
Heptachlor	Lin2		1.357		46.6	50.0	-6.8	20.0
delta-BHC	Lin2		1.665		47.4	50.0	-5.2	20.0
Aldrin	Lin2		1.593		44.8	50.0	-10.4	20.0
Isodrin	Lin2		1.342		45.0	50.0	-10.0	20.0
Heptachlor epoxide	Ave	1.512	1.352		44.7	50.0	-10.6	20.0
gamma-Chlordane	Qua		1.420		43.7	50.0	-12.5	20.0
alpha-Chlordane	Ave	1.644	1.427		43.4	50.0	-13.2	20.0
Endosulfan I	Ave	1.574	1.375		43.7	50.0	-12.7	20.0
4,4'-DDE	Lin		1.517		44.7	50.0	-10.7	20.0
Dieldrin	Ave	1.411	1.123		39.8	50.0	-20.4*	20.0
Endrin	Lin2		1.424		47.0	50.0	-6.0	20.0
4,4'-DDD	Ave	1.372	1.151		41.9	50.0	-16.1	20.0
Endosulfan II	Ave	1.514	1.343		44.4	50.0	-11.3	20.0
4,4'-DDT	Lin2		1.135		45.9	50.0	-8.2	20.0
Endrin aldehyde	Lin2		1.119		46.1	50.0	-7.9	20.0
Endosulfan sulfate	Ave	1.436	1.237		43.1	50.0	-13.8	20.0
Methoxychlor	Lin2		0.5665		48.2	50.0	-3.6	20.0
Endrin ketone	Lin2		1.418		47.6	50.0	-4.8	20.0
Mirex	Lin2		0.9671		47.0	50.0	-5.9	20.0
Tetrachloro-m-xylene	Lin2		1.161		45.0	50.0	-10.1	20.0
DCB Decachlorobiphenyl	Lin2		1.131		44.9	50.0	-10.2	20.0

FORM VII
PESTICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCV 280-444894/47 Calibration Date: 01/22/2019 22:07
 Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04
 GC Column: Rxi-35Sil MS ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30
 Lab File ID: 041F4701.D

Analyte	RT	RT WINDOW	
		FROM	TO
Hexachlorobenzene	3.97	3.96	3.98
alpha-BHC	4.06	4.05	4.08
gamma-BHC (Lindane)	4.35	4.34	4.37
beta-BHC	4.54	4.53	4.55
Heptachlor	4.60	4.59	4.62
delta-BHC	4.73	4.72	4.75
Aldrin	4.82	4.81	4.83
Isodrin	5.11	5.11	5.13
Heptachlor epoxide	5.22	5.21	5.24
gamma-Chlordane	5.41	5.41	5.43
alpha-Chlordane	5.50	5.49	5.52
Endosulfan I	5.55	5.54	5.56
4,4'-DDE	5.72	5.71	5.73
Dieldrin	5.83	5.82	5.85
Endrin	6.18	6.17	6.20
4,4'-DDD	6.39	6.38	6.40
Endosulfan II	6.53	6.52	6.55
4,4'-DDT	6.74	6.74	6.76
Endrin aldehyde	6.83	6.82	6.85
Endosulfan sulfate	7.08	7.07	7.10
Methoxychlor	7.61	7.60	7.62
Endrin ketone	7.77	7.76	7.78
Mirex	7.87	7.87	7.89
Tetrachloro-m-xylene	3.53	3.52	3.55
DCB Decachlorobiphenyl	9.00	8.99	9.02

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\041F4701.D
 Lims ID: CCV AB
 Client ID:
 Sample Type: CCV
 Inject. Date: 22-Jan-2019 22:07:53 ALS Bottle#: 41 Worklist Smp#: 47
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCV AB
 Operator ID: TEB Instrument ID: SGC_C
 Sublist: chrom-C 8081 IS*sub5
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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S 1 Hexachlorocyclohexane, technical

1					188.1		
2					190.0		
RPD = 1.01							

* 2 1-Bromo-2-nitrobenzene

1	2.557	2.559	-0.002	132625285	150.0	150.0	
2	2.814	2.816	-0.002	113355876	150.0	150.0	

\$ 3 Tetrachloro-m-xylene

1	3.534	3.537	-0.003	51337070	50.0	45.0	
2	4.112	4.113	-0.001	56929427	50.0	39.9	
RPD = 12.04							

6 Hexachlorobenzene

1	3.969	3.971	-0.002	54492771	50.0	45.1	
2	4.495	4.498	-0.003	57194118	50.0	41.1	
RPD = 9.45							

7 alpha-BHC

1	4.064	4.066	-0.002	82611992	50.0	46.5	
2	4.436	4.438	-0.002	65797334	50.0	46.3	
RPD = 0.60							

8 gamma-BHC (Lindane)

1	4.350	4.353	-0.003	62527072	50.0	47.1	
2	4.682	4.683	-0.001	51136156	50.0	47.9	
RPD = 1.73							

11 beta-BHC

1	4.538	4.540	-0.002	31794453	50.0	47.1	
2	4.886	4.888	-0.002	26057940	50.0	48.5	
RPD = 2.96							

12 Heptachlor

1	4.603	4.605	-0.002	59972757	50.0	46.6	
2	5.124	5.126	-0.002	46023065	50.0	49.0	

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\041F4701.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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13 delta-BHC

1	4.732	4.734	-0.002	73626991	50.0	47.4	
2	5.073	5.075	-0.002	61574455	50.0	47.3	
RPD = 0.12							

15 Aldrin

1	4.818	4.821	-0.003	70415501	50.0	44.8	
2	5.393	5.394	-0.001	57794574	50.0	46.6	
RPD = 3.96							

17 Isodrin

1	5.114	5.118	-0.004	59308141	50.0	45.0	
2	5.697	5.699	-0.002	50569359	50.0	47.2	
RPD = 4.73							

19 Heptachlor epoxide

1	5.224	5.227	-0.003	59779772	50.0	44.7	
2	5.811	5.814	-0.003	52428845	50.0	47.3	
RPD = 5.61							

20 trans-Chlordane

1	5.414	5.418	-0.004	62755640	50.0	43.7	
2	6.168	6.170	-0.002	55756609	50.0	48.0	
RPD = 9.33							

23 cis-Chlordane

1	5.503	5.507	-0.004	63070006	50.0	43.4	
2	6.229	6.231	-0.002	48563185	50.0	42.3	
RPD = 2.66							

24 Endosulfan I

1	5.545	5.548	-0.003	60790968	50.0	43.7	
2	6.269	6.272	-0.003	40290097	50.0	42.0	
RPD = 3.79							

25 4,4'-DDE

1	5.715	5.718	-0.003	67059784	50.0	44.7	
2	6.447	6.449	-0.002	58766408	50.0	41.2	
RPD = 7.99							

26 Dieldrin

1	5.829	5.832	-0.003	49648165	50.0	39.8	
2	6.602	6.603	-0.001	56814996	50.0	45.4	
RPD = 13.15							

29 Endrin

1	6.181	6.184	-0.003	62932941	50.0	47.0	
2	6.884	6.886	-0.002	52318943	50.0	47.6	
RPD = 1.20							

32 4,4'-DDD

1	6.386	6.391	-0.005	50875160	50.0	41.9	
2	7.099	7.100	-0.001	46386128	50.0	48.1	
RPD = 13.70							

33 Endosulfan II

1	6.529	6.533	-0.004	59366884	50.0	44.4	
2	7.209	7.213	-0.004	48304287	50.0	48.1	
RPD = 8.04							

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\041F4701.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

34 4,4'-DDT

1	6.744	6.750	-0.006	50177420	50.0	45.9
2	7.461	7.464	-0.003	41333356	50.0	49.4

RPD = 7.39

35 Endrin aldehyde

1	6.831	6.836	-0.005	49454459	50.0	46.1
2	7.341	7.343	-0.002	39706392	50.0	47.8

RPD = 3.73

36 Endosulfan sulfate

1	7.081	7.084	-0.003	54699157	50.0	43.1
2	7.670	7.673	-0.003	45089143	50.0	49.1

RPD = 12.99

37 Methoxychlor

1	7.607	7.611	-0.004	25044721	50.0	48.2
2	7.978	7.981	-0.003	22096594	50.0	50.4

RPD = 4.44

38 Endrin ketone

1	7.766	7.770	-0.004	62674372	50.0	47.6
2	8.119	8.121	-0.002	43712616	50.0	44.7

RPD = 6.28

39 Mirex

1	7.874	7.878	-0.004	42755010	50.0	47.0
2	8.639	8.642	-0.003	30174575	50.0	44.5

RPD = 5.44

\$ 40 DCB Decachlorobiphenyl

1	8.998	9.004	-0.006	50003246	50.0	44.9
2	9.864	9.869	-0.005	43960247	50.0	43.3

RPD = 3.54

S 42 Endosulfan, Total

1						131.1
2						139.2

RPD = 5.98

Reagents:

8081IcalL4_00033

Amount Added: 1.00

Units: mL

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:16:37

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\041F4701.D

Injection Date: 22-Jan-2019 22:07:53

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: CCV AB

Worklist Smp#: 47

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

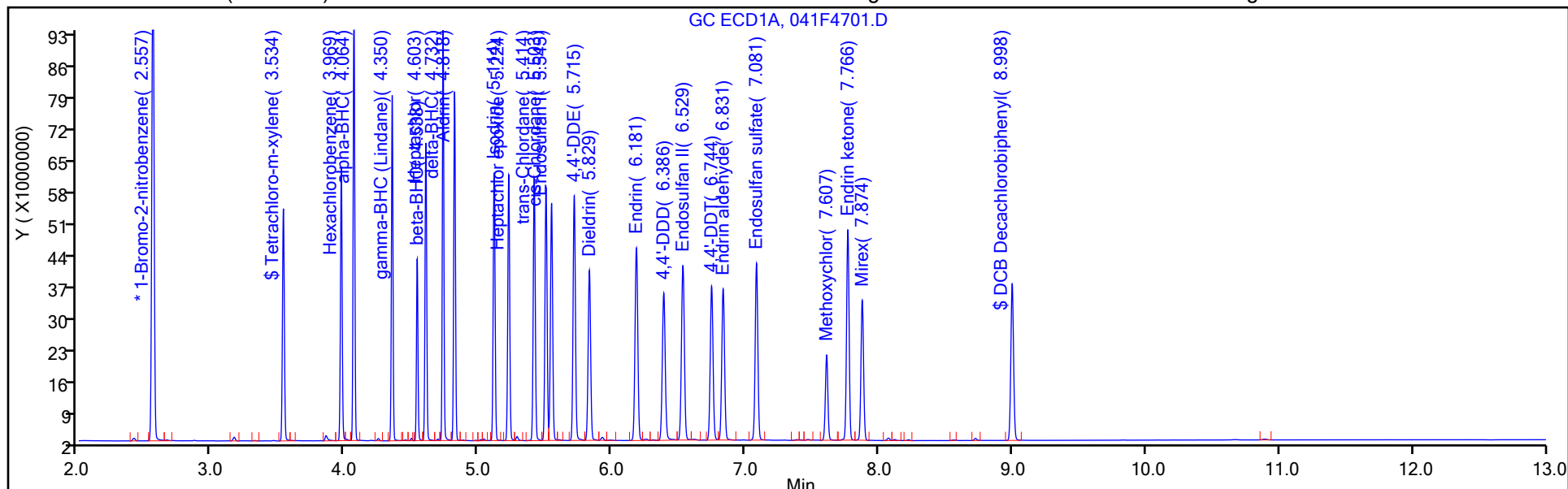
ALS Bottle#: 41

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

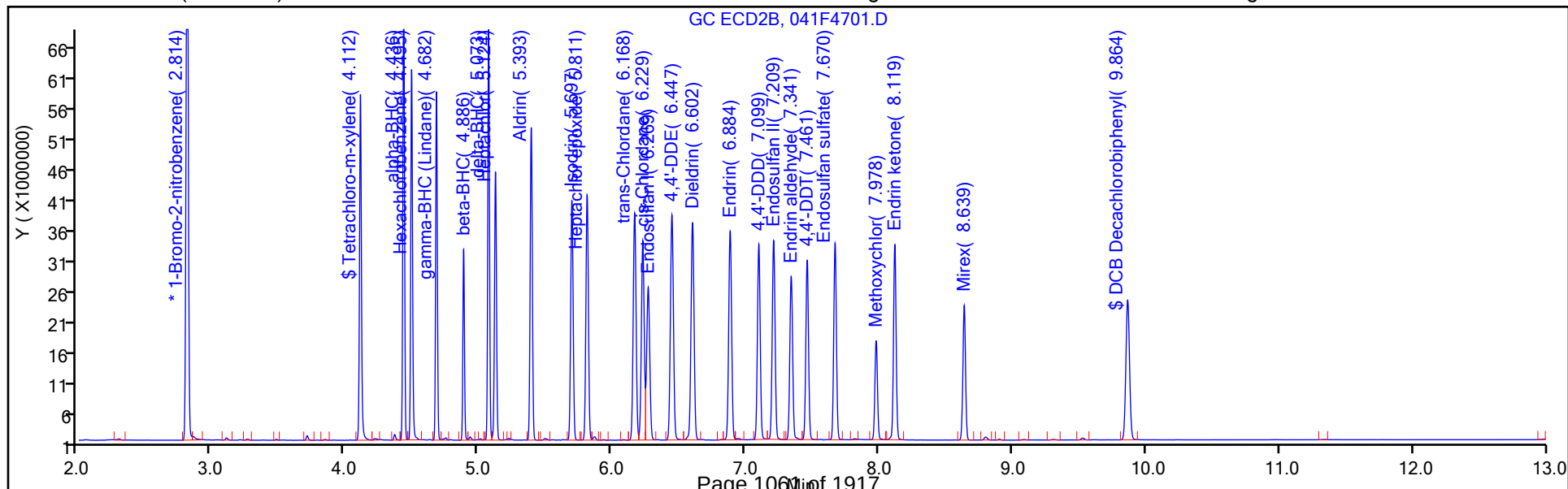
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



FORM VII
PESTICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: CCV 280-444894/47 Calibration Date: 01/22/2019 22:07

Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04

GC Column: Rxi-XLB ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30

Lab File ID: 041F4701.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
alpha-BHC	Ave	1.882	1.741		46.3	50.0	-7.5	20.0
Hexachlorobenzene	Lin2		1.514		41.1	50.0	-17.9	20.0
gamma-BHC (Lindane)	Ave	1.413	1.353		47.9	50.0	-4.3	20.0
beta-BHC	Lin2		0.6896		48.5	50.0	-3.0	20.0
delta-BHC	Lin2		1.630		47.3	50.0	-5.3	20.0
Heptachlor	Lin2		1.218		49.0	50.0	-2.0	20.0
Aldrin	Lin2		1.530		46.6	50.0	-6.7	20.0
Isodrin	Lin2		1.338		47.2	50.0	-5.7	20.0
Heptachlor epoxide	Lin2		1.388		47.3	50.0	-5.4	20.0
gamma-Chlordane	Lin2		1.476		48.0	50.0	-4.0	20.0
alpha-Chlordane	Ave	1.521	1.285		42.3	50.0	-15.5	20.0
Endosulfan I	Ave	1.268	1.066		42.0	50.0	-15.9	20.0
4,4'-DDE	Lin2		1.555		41.2	50.0	-17.6	20.0
Dieldrin	Ave	1.657	1.504		45.4	50.0	-9.2	20.0
Endrin	Lin2		1.385		47.6	50.0	-4.9	20.0
4,4'-DDD	Lin2		1.228		48.1	50.0	-3.8	20.0
Endosulfan II	Lin2		1.278		48.1	50.0	-3.9	20.0
Endrin aldehyde	Lin2		1.051		47.8	50.0	-4.4	20.0
4,4'-DDT	Lin2		1.094		49.4	50.0	-1.2	20.0
Endosulfan sulfate	Lin2		1.193		49.1	50.0	-1.8	20.0
Methoxychlor	Lin2		0.5848		50.4	50.0	0.8	20.0
Endrin ketone	Lin2		1.157		44.7	50.0	-10.6	20.0
Mirex	Ave	0.8964	0.7986		44.5	50.0	-10.9	20.0
Tetrachloro-m-xylene	Lin2		1.507		39.9	50.0	-20.3*	20.0
DCB Decachlorobiphenyl	Lin2		1.163		43.3	50.0	-13.3	20.0

FORM VII
PESTICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCV 280-444894/47 Calibration Date: 01/22/2019 22:07
 Instrument ID: SGC_C Calib Start Date: 01/09/2019 00:04
 GC Column: Rxi-XLB ID: 0.32 (mm) Calib End Date: 01/09/2019 01:30
 Lab File ID: 041F4701.D

Analyte	RT	RT WINDOW	
		FROM	TO
alpha-BHC	4.44	4.43	4.45
Hexachlorobenzene	4.50	4.49	4.51
gamma-BHC (Lindane)	4.68	4.67	4.70
beta-BHC	4.89	4.88	4.90
delta-BHC	5.07	5.06	5.09
Heptachlor	5.12	5.11	5.14
Aldrin	5.39	5.38	5.41
Isodrin	5.70	5.69	5.71
Heptachlor epoxide	5.81	5.80	5.83
gamma-Chlordane	6.17	6.16	6.18
alpha-Chlordane	6.23	6.22	6.24
Endosulfan I	6.27	6.26	6.29
4,4'-DDE	6.45	6.44	6.46
Dieldrin	6.60	6.59	6.62
Endrin	6.88	6.87	6.90
4,4'-DDD	7.10	7.09	7.11
Endosulfan II	7.21	7.20	7.23
Endrin aldehyde	7.34	7.33	7.36
4,4'-DDT	7.46	7.45	7.48
Endosulfan sulfate	7.67	7.66	7.69
Methoxychlor	7.98	7.97	7.99
Endrin ketone	8.12	8.11	8.13
Mirex	8.64	8.63	8.66
Tetrachloro-m-xylene	4.11	4.10	4.13
DCB Decachlorobiphenyl	9.86	9.86	9.88

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\041F4701.D
 Lims ID: CCV AB
 Client ID:
 Sample Type: CCV
 Inject. Date: 22-Jan-2019 22:07:53 ALS Bottle#: 41 Worklist Smp#: 47
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCV AB
 Operator ID: TEB Instrument ID: SGC_C
 Sublist: chrom-C 8081 IS*sub5
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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S 1 Hexachlorocyclohexane, technical

1						188.1	
2						190.0	
						RPD = 1.01	

* 2 1-Bromo-2-nitrobenzene

1	2.557	2.559	-0.002	132625285	150.0	150.0	
2	2.814	2.816	-0.002	113355876	150.0	150.0	

\$ 3 Tetrachloro-m-xylene

1	3.534	3.537	-0.003	51337070	50.0	45.0	
2	4.112	4.113	-0.001	56929427	50.0	39.9	
						RPD = 12.04	

6 Hexachlorobenzene

1	3.969	3.971	-0.002	54492771	50.0	45.1	
2	4.495	4.498	-0.003	57194118	50.0	41.1	
						RPD = 9.45	

7 alpha-BHC

1	4.064	4.066	-0.002	82611992	50.0	46.5	
2	4.436	4.438	-0.002	65797334	50.0	46.3	
						RPD = 0.60	

8 gamma-BHC (Lindane)

1	4.350	4.353	-0.003	62527072	50.0	47.1	
2	4.682	4.683	-0.001	51136156	50.0	47.9	
						RPD = 1.73	

11 beta-BHC

1	4.538	4.540	-0.002	31794453	50.0	47.1	
2	4.886	4.888	-0.002	26057940	50.0	48.5	
						RPD = 2.96	

12 Heptachlor

1	4.603	4.605	-0.002	59972757	50.0	46.6	
2	5.124	5.126	-0.002	46023065	50.0	49.0	

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\041F4701.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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13 delta-BHC

1	4.732	4.734	-0.002	73626991	50.0	47.4	
2	5.073	5.075	-0.002	61574455	50.0	47.3	
RPD = 0.12							

15 Aldrin

1	4.818	4.821	-0.003	70415501	50.0	44.8	
2	5.393	5.394	-0.001	57794574	50.0	46.6	
RPD = 3.96							

17 Isodrin

1	5.114	5.118	-0.004	59308141	50.0	45.0	
2	5.697	5.699	-0.002	50569359	50.0	47.2	
RPD = 4.73							

19 Heptachlor epoxide

1	5.224	5.227	-0.003	59779772	50.0	44.7	
2	5.811	5.814	-0.003	52428845	50.0	47.3	
RPD = 5.61							

20 trans-Chlordane

1	5.414	5.418	-0.004	62755640	50.0	43.7	
2	6.168	6.170	-0.002	55756609	50.0	48.0	
RPD = 9.33							

23 cis-Chlordane

1	5.503	5.507	-0.004	63070006	50.0	43.4	
2	6.229	6.231	-0.002	48563185	50.0	42.3	
RPD = 2.66							

24 Endosulfan I

1	5.545	5.548	-0.003	60790968	50.0	43.7	
2	6.269	6.272	-0.003	40290097	50.0	42.0	
RPD = 3.79							

25 4,4'-DDE

1	5.715	5.718	-0.003	67059784	50.0	44.7	
2	6.447	6.449	-0.002	58766408	50.0	41.2	
RPD = 7.99							

26 Dieldrin

1	5.829	5.832	-0.003	49648165	50.0	39.8	
2	6.602	6.603	-0.001	56814996	50.0	45.4	
RPD = 13.15							

29 Endrin

1	6.181	6.184	-0.003	62932941	50.0	47.0	
2	6.884	6.886	-0.002	52318943	50.0	47.6	
RPD = 1.20							

32 4,4'-DDD

1	6.386	6.391	-0.005	50875160	50.0	41.9	
2	7.099	7.100	-0.001	46386128	50.0	48.1	
RPD = 13.70							

33 Endosulfan II

1	6.529	6.533	-0.004	59366884	50.0	44.4	
2	7.209	7.213	-0.004	48304287	50.0	48.1	
RPD = 8.04							

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\041F4701.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

34 4,4'-DDT

1	6.744	6.750	-0.006	50177420	50.0	45.9	
2	7.461	7.464	-0.003	41333356	50.0	49.4	
RPD = 7.39							

35 Endrin aldehyde

1	6.831	6.836	-0.005	49454459	50.0	46.1	
2	7.341	7.343	-0.002	39706392	50.0	47.8	
RPD = 3.73							

36 Endosulfan sulfate

1	7.081	7.084	-0.003	54699157	50.0	43.1	
2	7.670	7.673	-0.003	45089143	50.0	49.1	
RPD = 12.99							

37 Methoxychlor

1	7.607	7.611	-0.004	25044721	50.0	48.2	
2	7.978	7.981	-0.003	22096594	50.0	50.4	
RPD = 4.44							

38 Endrin ketone

1	7.766	7.770	-0.004	62674372	50.0	47.6	
2	8.119	8.121	-0.002	43712616	50.0	44.7	
RPD = 6.28							

39 Mirex

1	7.874	7.878	-0.004	42755010	50.0	47.0	
2	8.639	8.642	-0.003	30174575	50.0	44.5	
RPD = 5.44							

\$ 40 DCB Decachlorobiphenyl

1	8.998	9.004	-0.006	50003246	50.0	44.9	
2	9.864	9.869	-0.005	43960247	50.0	43.3	
RPD = 3.54							

S 42 Endosulfan, Total

1						131.1	
2						139.2	
RPD = 5.98							

Reagents:

8081IcalL4_00033

Amount Added: 1.00

Units: mL

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:16:37

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\041F4701.D

Injection Date: 22-Jan-2019 22:07:53

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: CCV AB

Worklist Smp#: 47

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

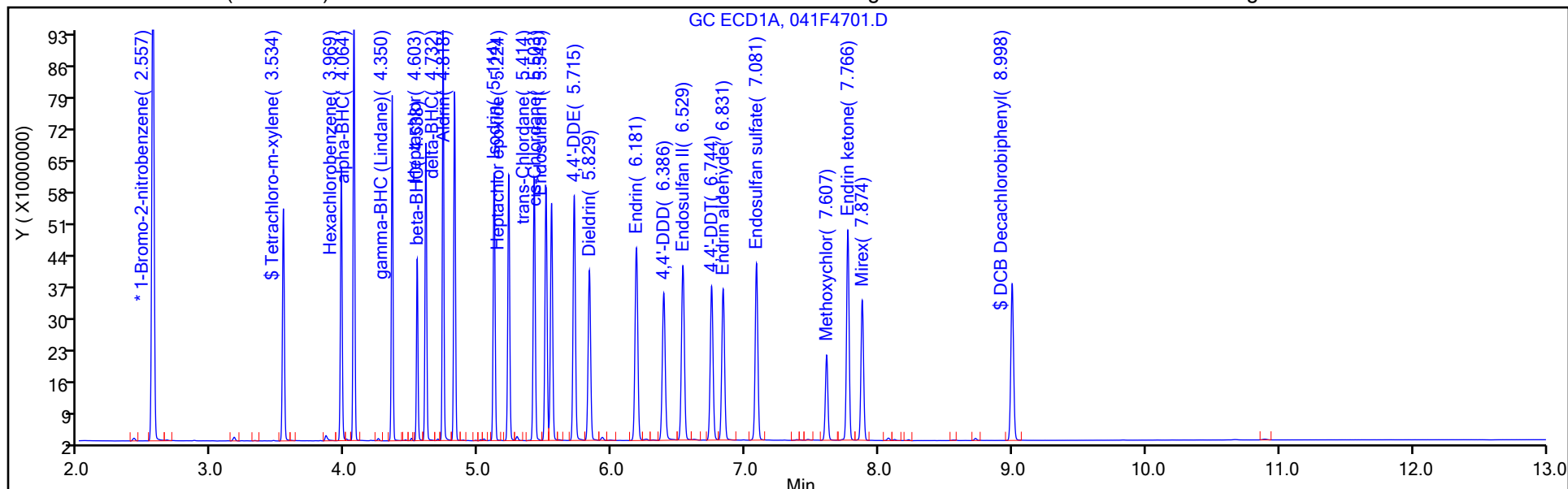
ALS Bottle#: 41

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

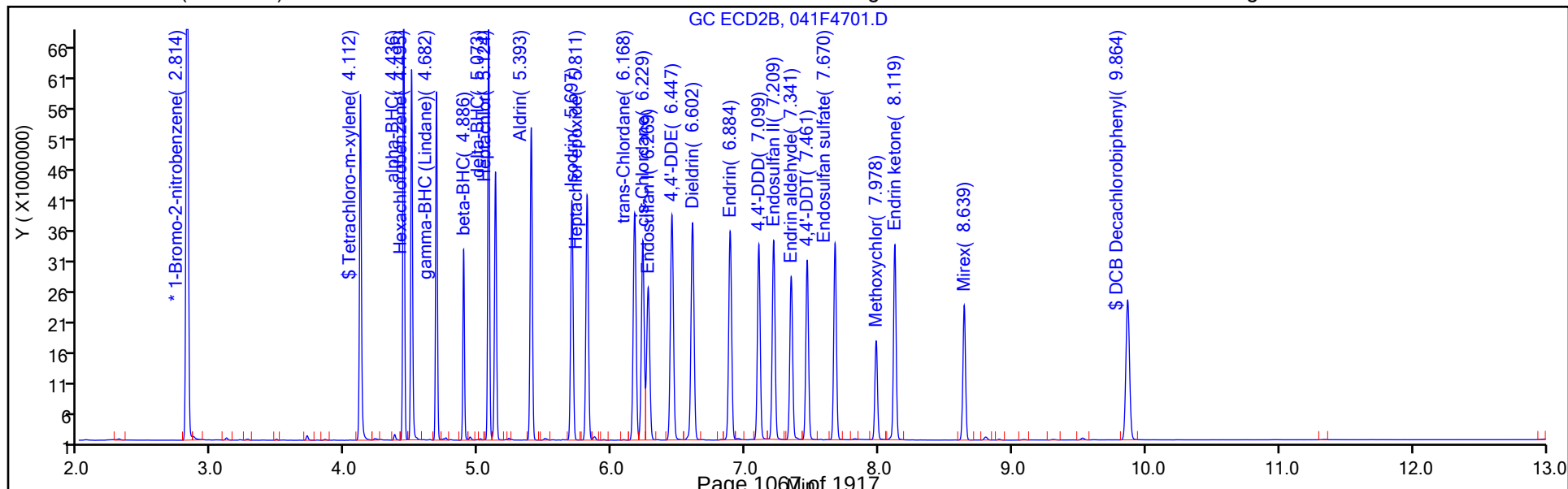
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 280-444680/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>052F5801.D</u>
Analysis Method: <u>8081B</u>	Date Collected: _____
Extraction Method: <u>3510C</u>	Date Extracted: <u>01/18/2019 12:03</u>
Sample wt/vol: <u>1000 (mL)</u>	Date Analyzed: <u>01/23/2019 01:19</u>
Con. Extract Vol.: <u>10 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1 (uL)</u>	GC Column: <u>Rxi-35Sil MS</u> ID: <u>0.32 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>444894</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-55-9	4,4'-DDE	0.0075	U	0.050	0.0075
50-29-3	4,4'-DDT	0.015	U	0.050	0.015
309-00-2	Aldrin	0.0059	U	0.050	0.0059
319-84-6	alpha-BHC	0.0053	U	0.050	0.0053
5103-71-9	alpha-Chlordane	0.0053	U	0.050	0.0053
319-85-7	beta-BHC	0.0087	U	0.050	0.0087
319-86-8	delta-BHC	0.0058	U	0.050	0.0058
959-98-8	Endosulfan I	0.0058	U	0.050	0.0058
33213-65-9	Endosulfan II	0.0070	U	0.050	0.0070
1031-07-8	Endosulfan sulfate	0.0057	U	0.050	0.0057
72-20-8	Endrin	0.0079	U	0.050	0.0079
7421-93-4	Endrin aldehyde	0.0088	U	0.050	0.0088
53494-70-5	Endrin ketone	0.0070	U	0.050	0.0070
58-89-9	gamma-BHC (Lindane)	0.0069	U	0.050	0.0069
76-44-8	Heptachlor	0.0077	U	0.050	0.0077
1024-57-3	Heptachlor epoxide	0.0075	U	0.050	0.0075
72-43-5	Methoxychlor	0.013	U	0.10	0.013
8001-35-2	Toxaphene	0.37	U	2.0	0.37

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	70		34-122
877-09-8	Tetrachloro-m-xylene	54		28-115

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D
 Lims ID: MB 280-444680/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 23-Jan-2019 01:19:59 ALS Bottle#: 52 Worklist Smp#: 75
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: MB 280-444680/1-
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

S 1 Hexachlorocyclohexane, technical

1		1.000				ND
2		0.000				

* 2 1-Bromo-2-nitrobenzene

1	2.557	2.559	-0.001	171836980	150.0	150.0
2	2.813	2.816	-0.003	146756474	150.0	150.0

\$ 3 Tetrachloro-m-xylene

1	3.535	3.537	-0.002	17251143	20.0	10.8
2	4.112	4.113	-0.001	22305535	20.0	11.1

RPD = 2.68

4 Propachlor

1		3.676				ND
2		4.142				

5 Diallate

1		3.816				ND
2		4.241				

6 Hexachlorobenzene

1		3.971				ND
2		4.498				

7 alpha-BHC

1		4.066				ND
2		4.438				

8 gamma-BHC (Lindane)

1		4.353				ND
2		4.683				

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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10 Technical Chlordane

1	4.475					ND	
1	4.934						
1	5.419						
1	5.507						
1	6.568						
2	4.966						
2	5.413						
2	6.172						
2	6.295						
2	7.293						

9 Chlordane (technical)

1	4.475					ND	
1	4.934						
1	5.419						
1	5.507						
1	6.568						
2	4.966						
2	5.413						
2	6.172						
2	6.295						
2	7.293						

11 beta-BHC

1	4.540					ND	
2	4.888						

12 Heptachlor

1	4.605					ND	
2	5.126						

13 delta-BHC

1	4.734					ND	
2	5.075						

15 Aldrin

1	4.821					ND	
2	5.394						

22 Toxaphene

1	4.858					ND	
1	6.241						
1	6.852						
1	7.407						
1	7.546						
2	6.061						
2	6.552						
2	6.876						
2	7.593						
2	8.163						

14 2,4,5-Trichlorophenol

1	4.861					ND	
2	4.772						

16 Chlorpyrifos

1	4.939					ND	
2	5.328						

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
17 Isodrin							
1		5.118				ND	
2		5.699					
18 Dicofol							
1		5.141				ND	
2		5.599					
19 Heptachlor epoxide							
1		5.227				ND	
2		5.814					
20 trans-Chlordane							
1	5.422	5.418	0.004	375133		1.10	
2	6.167	6.170	-0.003	144268		-0.8730	
						RPD = 1732.79	
21 2,4'-DDE							
1		5.436				ND	
2		6.000					
23 cis-Chlordane							
1		5.507				ND	
2		6.231					
24 Endosulfan I							
1		5.548				ND	
2		6.272					
25 4,4'-DDE							
1		5.718				ND	
2		6.449					
26 Dieldrin							
1		5.832				ND	
2		6.603					
27 2,4'-DDD							
1		5.930				ND	
2		6.571					
28 Chlorobenzilate							
1		6.048				ND	
2		6.772					
29 Endrin							
1		6.184				ND	
2		6.886					
30 2,4'-DDT							
1		6.260				ND	
2		6.957					
31 Kepone							
1		6.307				ND	
2		7.235					
32 4,4'-DDD							
1		6.391				ND	
2		7.100					
33 Endosulfan II							
1		6.533				ND	
2		7.213					

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

34 4,4'-DDT

1	6.750					ND	
2	7.464						

35 Endrin aldehyde

1	6.836					ND	
2	7.343						

36 Endosulfan sulfate

1	7.084					ND	
2	7.673						

37 Methoxychlor

1	7.611					ND	
2	7.981						

38 Endrin ketone

1	7.770					ND	
2	8.121						

39 Mirex

1	7.878					ND	
2	8.642						

\$ 40 DCB Decachlorobiphenyl

1	8.998	9.004	-0.006	21332772	20.0	13.9	
2	9.866	9.869	-0.003	18338885	20.0	12.9	
RPD = 7.75							

41 Tris(2,3-dibromopropyl)phosphate

1	10.902					ND	
2	11.348						

S 42 Endosulfan, Total

1	0.000					ND	
2	0.000						

Reagents:

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:17:07

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D

Injection Date: 23-Jan-2019 01:19:59

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: MB 280-444680/1-A

Worklist Smp#: 75

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

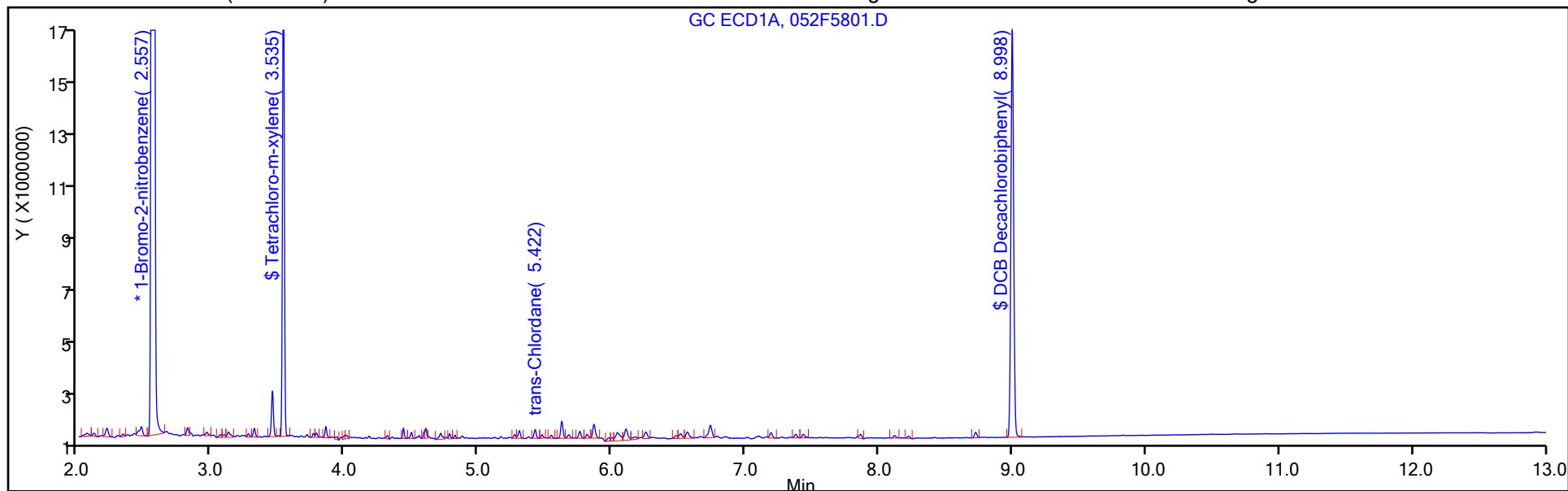
ALS Bottle#: 52

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

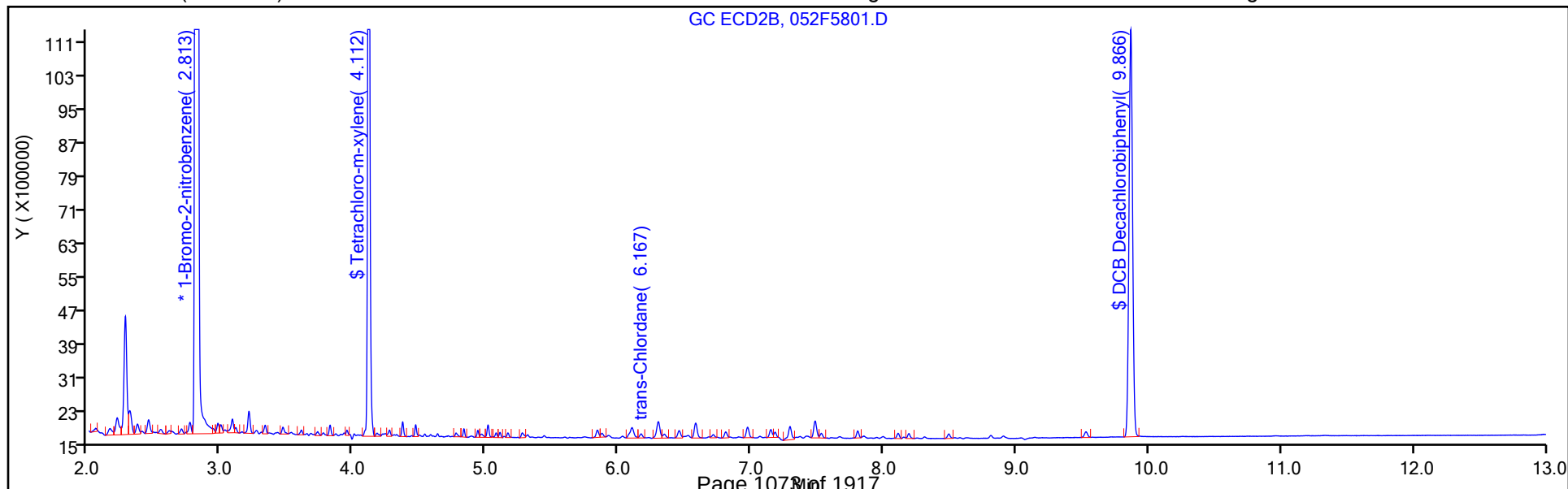
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D
 Lims ID: MB 280-444680/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 23-Jan-2019 01:19:59 ALS Bottle#: 52 Worklist Smp#: 75
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: MB 280-444680/1-
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	10.8	54.01
\$ 40 DCB Decachlorobiphenyl	20.0	13.9	69.56

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	11.1	55.48
\$ 40 DCB Decachlorobiphenyl	20.0	12.9	64.37

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: MB 280-444680/1-A
Matrix: Water Lab File ID: 052F5801.D
Analysis Method: 8081B Date Collected: _____
Extraction Method: 3510C Date Extracted: 01/18/2019 12:03
Sample wt/vol: 1000 (mL) Date Analyzed: 01/23/2019 01:19
Con. Extract Vol.: 10 (mL) Dilution Factor: 1
Injection Volume: 1 (uL) GC Column: Rxi-XLB ID: 0.32 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 444894 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	0.0077	U	0.050	0.0077
60-57-1	Dieldrin	0.0063	U	0.050	0.0063
5103-74-2	gamma-Chlordane	0.0091	U	0.050	0.0091

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D
 Lims ID: MB 280-444680/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 23-Jan-2019 01:19:59 ALS Bottle#: 52 Worklist Smp#: 75
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: MB 280-444680/1-
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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S 1 Hexachlorocyclohexane, technical

1		1.000				ND
2		0.000				

* 2 1-Bromo-2-nitrobenzene

1	2.557	2.559	-0.001	171836980	150.0	150.0
2	2.813	2.816	-0.003	146756474	150.0	150.0

\$ 3 Tetrachloro-m-xylene

1	3.535	3.537	-0.002	17251143	20.0	10.8
2	4.112	4.113	-0.001	22305535	20.0	11.1

RPD = 2.68

4 Propachlor

1		3.676				ND
2		4.142				

5 Diallate

1		3.816				ND
2		4.241				

6 Hexachlorobenzene

1		3.971				ND
2		4.498				

7 alpha-BHC

1		4.066				ND
2		4.438				

8 gamma-BHC (Lindane)

1		4.353				ND
2		4.683				

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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10 Technical Chlordane

1	4.475					ND	
1	4.934						
1	5.419						
1	5.507						
1	6.568						
2	4.966						
2	5.413						
2	6.172						
2	6.295						
2	7.293						

9 Chlordane (technical)

1	4.475					ND	
1	4.934						
1	5.419						
1	5.507						
1	6.568						
2	4.966						
2	5.413						
2	6.172						
2	6.295						
2	7.293						

11 beta-BHC

1	4.540					ND	
2	4.888						

12 Heptachlor

1	4.605					ND	
2	5.126						

13 delta-BHC

1	4.734					ND	
2	5.075						

15 Aldrin

1	4.821					ND	
2	5.394						

22 Toxaphene

1	4.858					ND	
1	6.241						
1	6.852						
1	7.407						
1	7.546						
2	6.061						
2	6.552						
2	6.876						
2	7.593						
2	8.163						

14 2,4,5-Trichlorophenol

1	4.861					ND	
2	4.772						

16 Chlorpyrifos

1	4.939					ND	
2	5.328						

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
17 Isodrin							
1		5.118				ND	
2		5.699					
18 Dicofol							
1		5.141				ND	
2		5.599					
19 Heptachlor epoxide							
1		5.227				ND	
2		5.814					
20 trans-Chlordane							
1	5.422	5.418	0.004	375133		1.10	
2	6.167	6.170	-0.003	144268		-0.8730	
						RPD = 1732.79	
21 2,4'-DDE							
1		5.436				ND	
2		6.000					
23 cis-Chlordane							
1		5.507				ND	
2		6.231					
24 Endosulfan I							
1		5.548				ND	
2		6.272					
25 4,4'-DDE							
1		5.718				ND	
2		6.449					
26 Dieldrin							
1		5.832				ND	
2		6.603					
27 2,4'-DDD							
1		5.930				ND	
2		6.571					
28 Chlorobenzilate							
1		6.048				ND	
2		6.772					
29 Endrin							
1		6.184				ND	
2		6.886					
30 2,4'-DDT							
1		6.260				ND	
2		6.957					
31 Kepone							
1		6.307				ND	
2		7.235					
32 4,4'-DDD							
1		6.391				ND	
2		7.100					
33 Endosulfan II							
1		6.533				ND	
2		7.213					

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

34 4,4'-DDT

1	6.750					ND	
2	7.464						

35 Endrin aldehyde

1	6.836					ND	
2	7.343						

36 Endosulfan sulfate

1	7.084					ND	
2	7.673						

37 Methoxychlor

1	7.611					ND	
2	7.981						

38 Endrin ketone

1	7.770					ND	
2	8.121						

39 Mirex

1	7.878					ND	
2	8.642						

\$ 40 DCB Decachlorobiphenyl

1	8.998	9.004	-0.006	21332772	20.0	13.9	
2	9.866	9.869	-0.003	18338885	20.0	12.9	
RPD = 7.75							

41 Tris(2,3-dibromopropyl)phosphate

1	10.902					ND	
2	11.348						

S 42 Endosulfan, Total

1	0.000					ND	
2	0.000						

Reagents:

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:17:07

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D

Injection Date: 23-Jan-2019 01:19:59

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: MB 280-444680/1-A

Worklist Smp#: 75

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

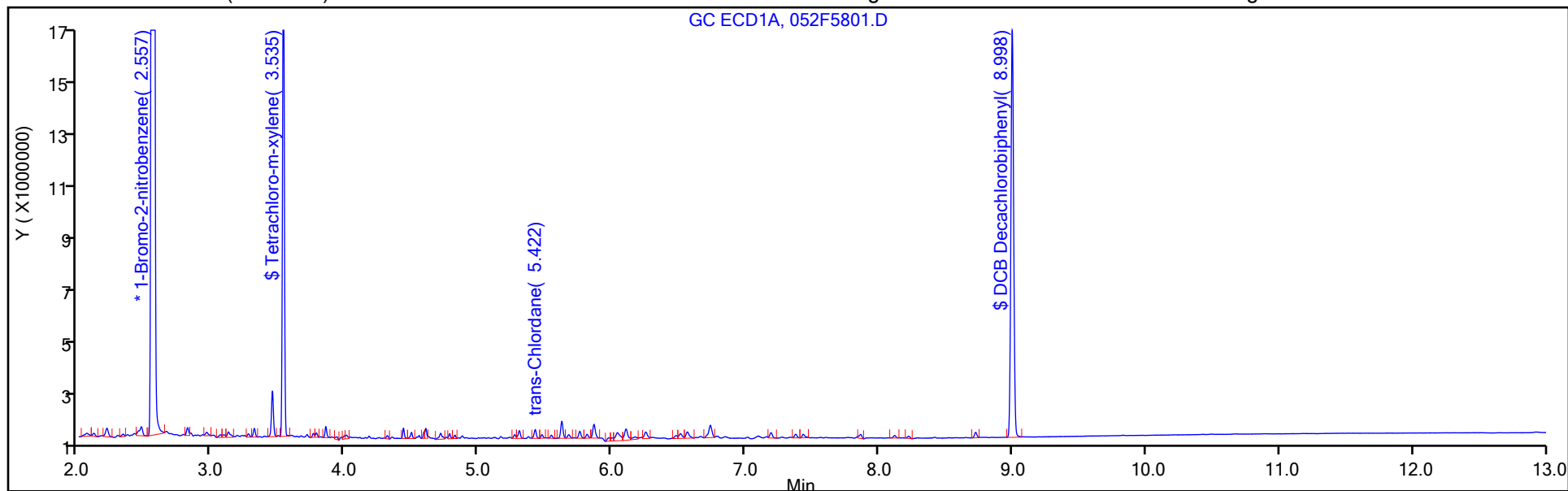
ALS Bottle#: 52

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

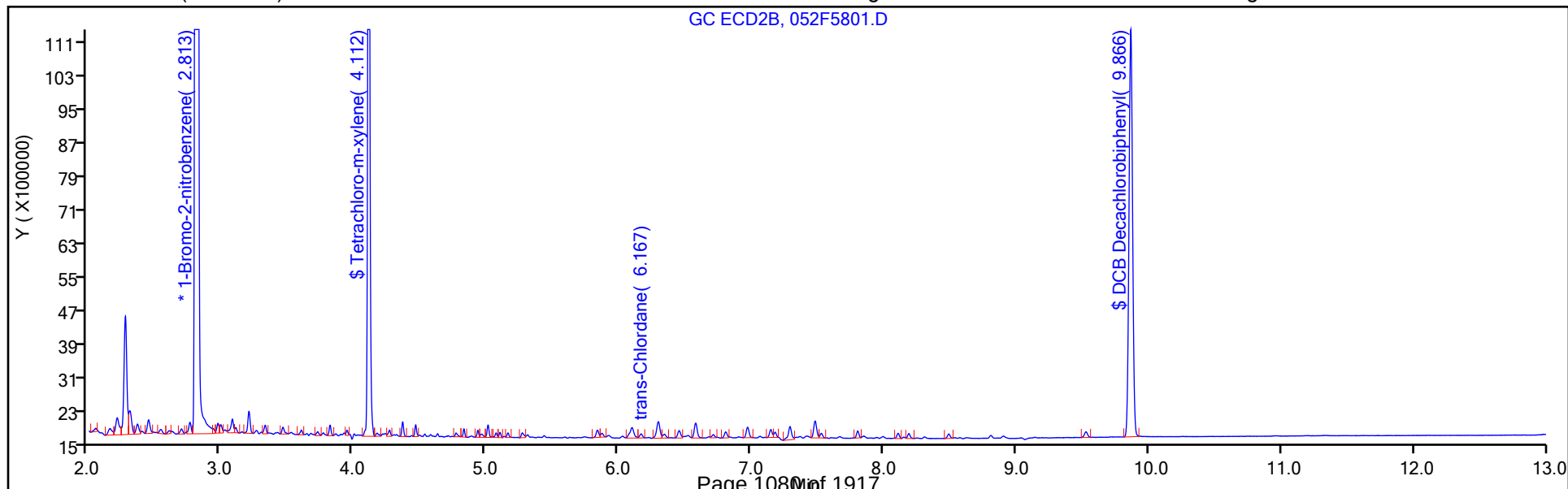
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\052F5801.D
 Lims ID: MB 280-444680/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 23-Jan-2019 01:19:59 ALS Bottle#: 52 Worklist Smp#: 75
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: MB 280-444680/1-
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	10.8	54.01
\$ 40 DCB Decachlorobiphenyl	20.0	13.9	69.56

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	11.1	55.48
\$ 40 DCB Decachlorobiphenyl	20.0	12.9	64.37

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCS 280-444680/2-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>053F5901.D</u>
Analysis Method: <u>8081B</u>	Date Collected: _____
Extraction Method: <u>3510C</u>	Date Extracted: <u>01/18/2019 12:03</u>
Sample wt/vol: <u>1000 (mL)</u>	Date Analyzed: <u>01/23/2019 01:37</u>
Con. Extract Vol.: <u>10 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1 (uL)</u>	GC Column: <u>Rxi-35Sil MS</u> ID: <u>0.32 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>444894</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-55-9	4,4'-DDE	0.421		0.050	0.0075
50-29-3	4,4'-DDT	0.407		0.050	0.015
309-00-2	Aldrin	0.408		0.050	0.0059
319-84-6	alpha-BHC	0.433		0.050	0.0053
5103-71-9	alpha-Chlordane	0.417		0.050	0.0053
319-85-7	beta-BHC	0.442		0.050	0.0087
319-86-8	delta-BHC	0.452		0.050	0.0058
959-98-8	Endosulfan I	0.398		0.050	0.0058
33213-65-9	Endosulfan II	0.388		0.050	0.0070
1031-07-8	Endosulfan sulfate	0.417		0.050	0.0057
72-20-8	Endrin	0.430		0.050	0.0079
7421-93-4	Endrin aldehyde	0.376		0.050	0.0088
53494-70-5	Endrin ketone	0.423		0.050	0.0070
58-89-9	gamma-BHC (Lindane)	0.459		0.050	0.0069
5103-74-2	gamma-Chlordane	0.430		0.050	0.0091
76-44-8	Heptachlor	0.420		0.050	0.0077
1024-57-3	Heptachlor epoxide	0.430		0.050	0.0075
72-43-5	Methoxychlor	0.432		0.10	0.013

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	86		34-122
877-09-8	Tetrachloro-m-xylene	74		28-115

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D
 Lims ID: LCS 280-444680/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 23-Jan-2019 01:37:35 ALS Bottle#: 53 Worklist Smp#: 76
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCS 280-444680/2
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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* 2 1-Bromo-2-nitrobenzene

1	2.558	2.559	0.000	138063018	150.0	150.0
2	2.815	2.816	-0.001	117004484	150.0	150.0

\$ 3 Tetrachloro-m-xylene

1	3.536	3.537	-0.001	18599826	20.0	14.9
2	4.113	4.113	0.000	23104317	20.0	14.8

RPD = 0.42

6 Hexachlorobenzene

1	3.969	3.971	-0.002	53123077	50.0	42.2
2	4.496	4.498	-0.002	54646341	50.0	37.9

RPD = 10.65

7 alpha-BHC

1	4.064	4.066	-0.002	80053646	50.0	43.3
2	4.437	4.438	-0.001	63718737	50.0	43.4

RPD = 0.31

8 gamma-BHC (Lindane)

1	4.351	4.353	-0.002	63447748	50.0	45.9
2	4.683	4.683	0.000	46664884	50.0	42.3

RPD = 8.02

11 beta-BHC

1	4.538	4.540	-0.002	31099151	50.0	44.2
2	4.887	4.888	-0.001	25045867	50.0	45.1

RPD = 2.03

12 Heptachlor

1	4.603	4.605	-0.002	56427721	50.0	42.0
2	5.126	5.126	0.000	43356139	50.0	44.7

RPD = 6.08

13 delta-BHC

1	4.732	4.734	-0.002	73119421	50.0	45.2
2	5.075	5.075	0.000	59456338	50.0	44.2

RPD = 2.13

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

15 Aldrin

1	4.818	4.821	-0.003	66900051	50.0	40.8	
2	5.394	5.394	0.000	54664976	50.0	42.7	
RPD = 4.42							

19 Heptachlor epoxide

1	5.224	5.227	-0.003	59857314	50.0	43.0	
2	5.812	5.814	-0.002	51426285	50.0	44.9	
RPD = 4.27							

20 trans-Chlordane

1	5.416	5.418	-0.002	64344329	50.0	43.0	
2	6.169	6.170	-0.001	54134390	50.0	45.1	
RPD = 4.76							

23 cis-Chlordane

1	5.505	5.507	-0.002	63052168	50.0	41.7	
2	6.231	6.231	0.000	51230717	50.0	43.2	
RPD = 3.56							

24 Endosulfan I

1	5.546	5.548	-0.002	57636253	50.0	39.8	
2	6.271	6.272	-0.001	43249884	50.0	43.7	
RPD = 9.47							

25 4,4'-DDE

1	5.715	5.718	-0.003	65931921	50.0	42.1	
2	6.449	6.449	0.000	56893101	50.0	38.6	
RPD = 8.56							

26 Dieldrin

1	5.828	5.832	-0.004	57762183	50.0	44.5	
2	6.603	6.603	0.000	56070564	50.0	43.4	
RPD = 2.44							

29 Endrin

1	6.181	6.184	-0.003	60073378	50.0	43.0	
2	6.885	6.886	-0.001	49677313	50.0	43.7	
RPD = 1.54							

32 4,4'-DDD

1	6.387	6.391	-0.004	54355378	50.0	43.1	
2	7.099	7.100	-0.001	45533535	50.0	45.7	
RPD = 5.98							

33 Endosulfan II

1	6.530	6.533	-0.003	54007941	50.0	38.8	
2	7.211	7.213	-0.002	42244915	50.0	40.5	
RPD = 4.50							

34 4,4'-DDT

1	6.746	6.750	-0.004	46462695	50.0	40.7	
2	7.462	7.464	-0.002	39024171	50.0	45.2	
RPD = 10.28							

35 Endrin aldehyde

1	6.832	6.836	-0.004	42263795	50.0	37.6	
2	7.342	7.343	-0.001	33857947	50.0	39.3	
RPD = 4.34							

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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36 Endosulfan sulfate

1	7.081	7.084	-0.003	55044057	50.0	41.7	
2	7.671	7.673	-0.002	43886009	50.0	46.2	
RPD = 10.38							

37 Methoxychlor

1	7.606	7.611	-0.005	23453573	50.0	43.2	
2	7.979	7.981	-0.002	20192361	50.0	44.5	
RPD = 2.92							

38 Endrin ketone

1	7.766	7.770	-0.004	58246942	50.0	42.3	
2	8.120	8.121	-0.001	45172243	50.0	44.7	
RPD = 5.51							

\$ 40 DCB Decachlorobiphenyl

1	8.999	9.004	-0.005	20830593	20.0	17.2	
2	9.865	9.869	-0.004	17988822	20.0	16.2	
RPD = 5.85							

Reagents:

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:17:09

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D

Injection Date: 23-Jan-2019 01:37:35

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: LCS 280-444680/2-A

Worklist Smp#: 76

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

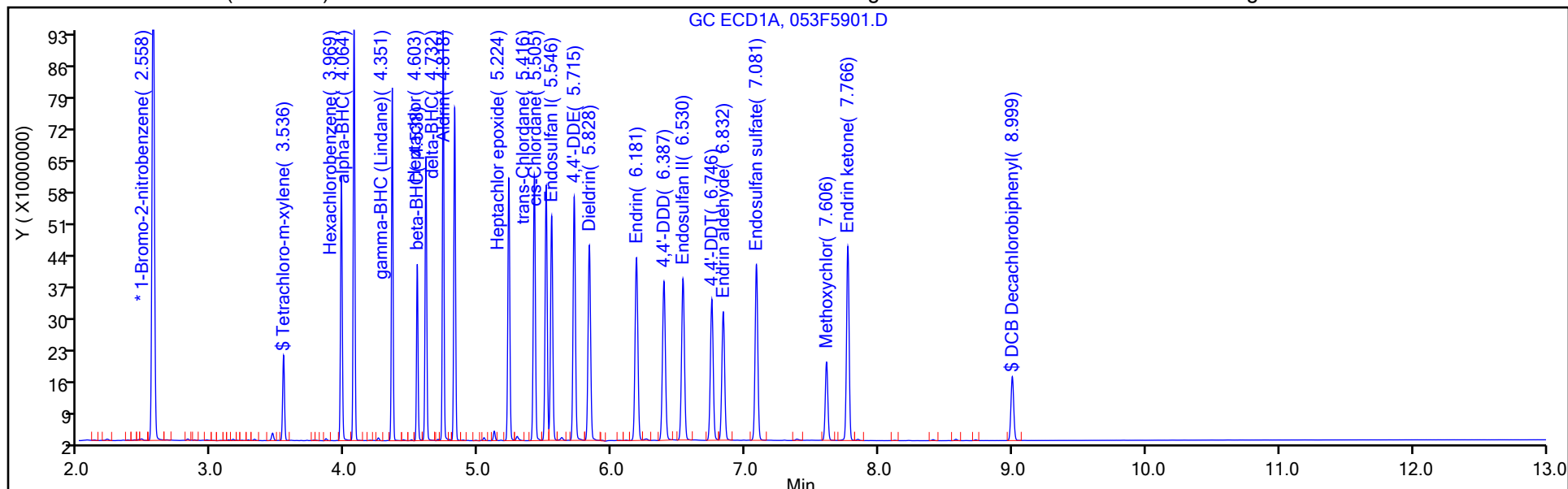
ALS Bottle#: 53

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

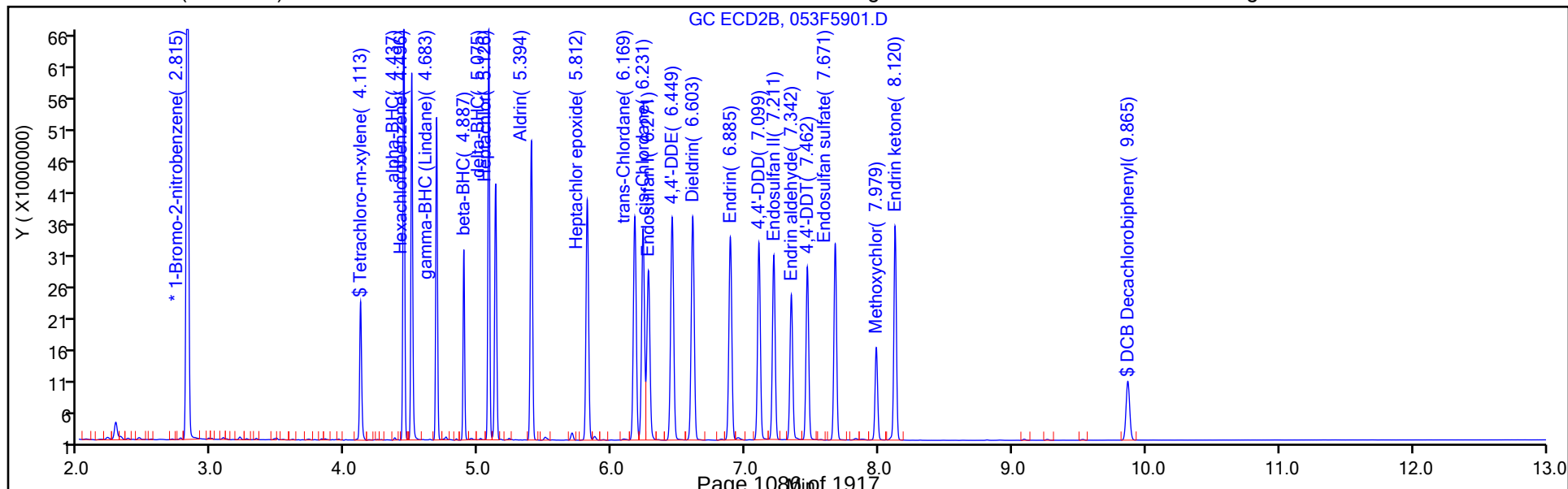
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D
 Lims ID: LCS 280-444680/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 23-Jan-2019 01:37:35 ALS Bottle#: 53 Worklist Smp#: 76
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCS 280-444680/2
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	14.9	74.47
\$ 40 DCB Decachlorobiphenyl	20.0	17.2	85.94

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	14.8	74.15
\$ 40 DCB Decachlorobiphenyl	20.0	16.2	81.06

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: LCS 280-444680/2-A
Matrix: Water Lab File ID: 053F5901.D
Analysis Method: 8081B Date Collected: _____
Extraction Method: 3510C Date Extracted: 01/18/2019 12:03
Sample wt/vol: 1000 (mL) Date Analyzed: 01/23/2019 01:37
Con. Extract Vol.: 10 (mL) Dilution Factor: 1
Injection Volume: 1 (uL) GC Column: Rxi-XLB ID: 0.32 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 444894 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	0.457		0.050	0.0077
60-57-1	Dieldrin	0.434		0.050	0.0063

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D
 Lims ID: LCS 280-444680/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 23-Jan-2019 01:37:35 ALS Bottle#: 53 Worklist Smp#: 76
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCS 280-444680/2
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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* 2 1-Bromo-2-nitrobenzene

1	2.558	2.559	0.000	138063018	150.0	150.0
2	2.815	2.816	-0.001	117004484	150.0	150.0

\$ 3 Tetrachloro-m-xylene

1	3.536	3.537	-0.001	18599826	20.0	14.9
2	4.113	4.113	0.000	23104317	20.0	14.8

RPD = 0.42

6 Hexachlorobenzene

1	3.969	3.971	-0.002	53123077	50.0	42.2
2	4.496	4.498	-0.002	54646341	50.0	37.9

RPD = 10.65

7 alpha-BHC

1	4.064	4.066	-0.002	80053646	50.0	43.3
2	4.437	4.438	-0.001	63718737	50.0	43.4

RPD = 0.31

8 gamma-BHC (Lindane)

1	4.351	4.353	-0.002	63447748	50.0	45.9
2	4.683	4.683	0.000	46664884	50.0	42.3

RPD = 8.02

11 beta-BHC

1	4.538	4.540	-0.002	31099151	50.0	44.2
2	4.887	4.888	-0.001	25045867	50.0	45.1

RPD = 2.03

12 Heptachlor

1	4.603	4.605	-0.002	56427721	50.0	42.0
2	5.126	5.126	0.000	43356139	50.0	44.7

RPD = 6.08

13 delta-BHC

1	4.732	4.734	-0.002	73119421	50.0	45.2
2	5.075	5.075	0.000	59456338	50.0	44.2

RPD = 2.13

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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15 Aldrin

1	4.818	4.821	-0.003	66900051	50.0	40.8	
2	5.394	5.394	0.000	54664976	50.0	42.7	
RPD = 4.42							

19 Heptachlor epoxide

1	5.224	5.227	-0.003	59857314	50.0	43.0	
2	5.812	5.814	-0.002	51426285	50.0	44.9	
RPD = 4.27							

20 trans-Chlordane

1	5.416	5.418	-0.002	64344329	50.0	43.0	
2	6.169	6.170	-0.001	54134390	50.0	45.1	
RPD = 4.76							

23 cis-Chlordane

1	5.505	5.507	-0.002	63052168	50.0	41.7	
2	6.231	6.231	0.000	51230717	50.0	43.2	
RPD = 3.56							

24 Endosulfan I

1	5.546	5.548	-0.002	57636253	50.0	39.8	
2	6.271	6.272	-0.001	43249884	50.0	43.7	
RPD = 9.47							

25 4,4'-DDE

1	5.715	5.718	-0.003	65931921	50.0	42.1	
2	6.449	6.449	0.000	56893101	50.0	38.6	
RPD = 8.56							

26 Dieldrin

1	5.828	5.832	-0.004	57762183	50.0	44.5	
2	6.603	6.603	0.000	56070564	50.0	43.4	
RPD = 2.44							

29 Endrin

1	6.181	6.184	-0.003	60073378	50.0	43.0	
2	6.885	6.886	-0.001	49677313	50.0	43.7	
RPD = 1.54							

32 4,4'-DDD

1	6.387	6.391	-0.004	54355378	50.0	43.1	
2	7.099	7.100	-0.001	45533535	50.0	45.7	
RPD = 5.98							

33 Endosulfan II

1	6.530	6.533	-0.003	54007941	50.0	38.8	
2	7.211	7.213	-0.002	42244915	50.0	40.5	
RPD = 4.50							

34 4,4'-DDT

1	6.746	6.750	-0.004	46462695	50.0	40.7	
2	7.462	7.464	-0.002	39024171	50.0	45.2	
RPD = 10.28							

35 Endrin aldehyde

1	6.832	6.836	-0.004	42263795	50.0	37.6	
2	7.342	7.343	-0.001	33857947	50.0	39.3	
RPD = 4.34							

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

36 Endosulfan sulfate

1	7.081	7.084	-0.003	55044057	50.0	41.7	
2	7.671	7.673	-0.002	43886009	50.0	46.2	
RPD = 10.38							

37 Methoxychlor

1	7.606	7.611	-0.005	23453573	50.0	43.2	
2	7.979	7.981	-0.002	20192361	50.0	44.5	
RPD = 2.92							

38 Endrin ketone

1	7.766	7.770	-0.004	58246942	50.0	42.3	
2	8.120	8.121	-0.001	45172243	50.0	44.7	
RPD = 5.51							

\$ 40 DCB Decachlorobiphenyl

1	8.999	9.004	-0.005	20830593	20.0	17.2	
2	9.865	9.869	-0.004	17988822	20.0	16.2	
RPD = 5.85							

Reagents:

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D

Injection Date: 23-Jan-2019 01:37:35

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: LCS 280-444680/2-A

Worklist Smp#: 76

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

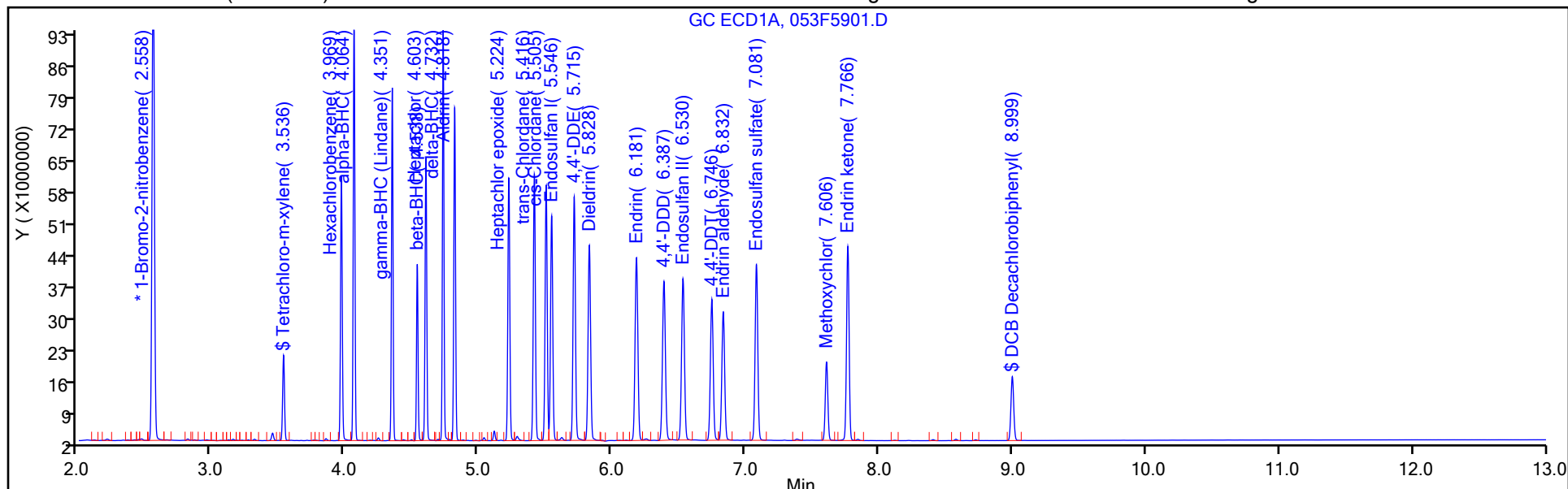
ALS Bottle#: 53

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

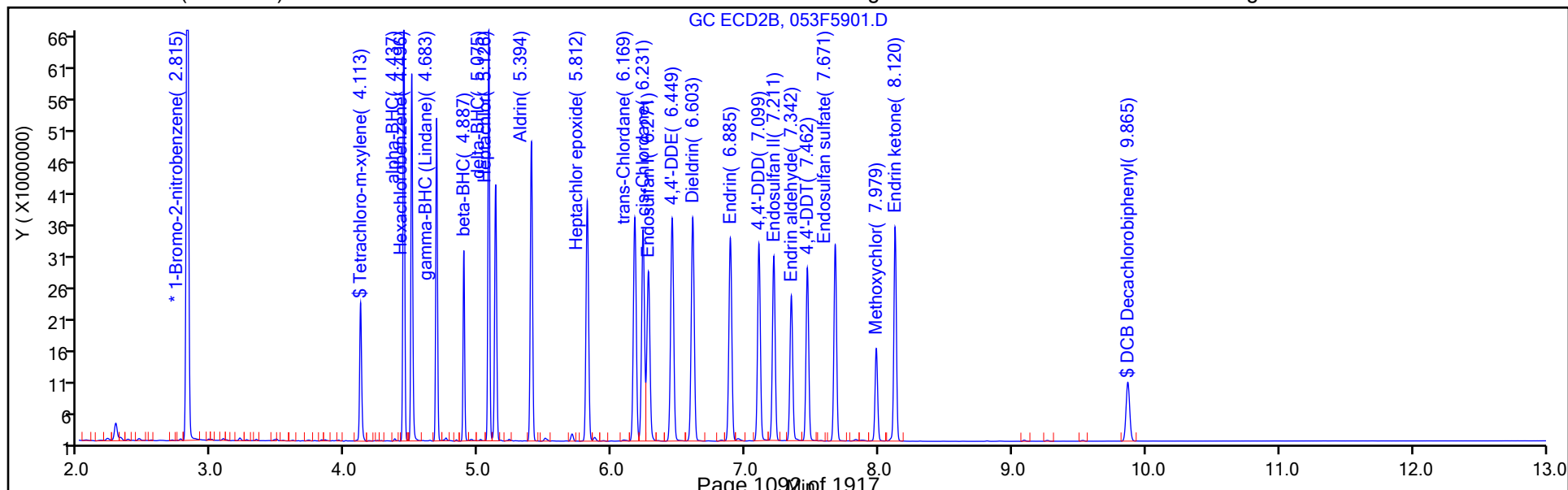
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\053F5901.D
 Lims ID: LCS 280-444680/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 23-Jan-2019 01:37:35 ALS Bottle#: 53 Worklist Smp#: 76
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCS 280-444680/2
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	14.9	74.47
\$ 40 DCB Decachlorobiphenyl	20.0	17.2	85.94

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	14.8	74.15
\$ 40 DCB Decachlorobiphenyl	20.0	16.2	81.06

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCSD 280-444680/3-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>054F6001.D</u>
Analysis Method: <u>8081B</u>	Date Collected: _____
Extraction Method: <u>3510C</u>	Date Extracted: <u>01/18/2019 12:03</u>
Sample wt/vol: <u>1000 (mL)</u>	Date Analyzed: <u>01/23/2019 01:55</u>
Con. Extract Vol.: <u>10 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1 (uL)</u>	GC Column: <u>Rxi-35Sil MS</u> ID: <u>0.32 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>444894</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-55-9	4,4'-DDE	0.466		0.050	0.0075
50-29-3	4,4'-DDT	0.444		0.050	0.015
309-00-2	Aldrin	0.453		0.050	0.0059
319-84-6	alpha-BHC	0.474		0.050	0.0053
5103-71-9	alpha-Chlordane	0.459		0.050	0.0053
319-85-7	beta-BHC	0.485		0.050	0.0087
319-86-8	delta-BHC	0.496		0.050	0.0058
959-98-8	Endosulfan I	0.438		0.050	0.0058
33213-65-9	Endosulfan II	0.424		0.050	0.0070
1031-07-8	Endosulfan sulfate	0.455		0.050	0.0057
72-20-8	Endrin	0.466		0.050	0.0079
7421-93-4	Endrin aldehyde	0.406		0.050	0.0088
53494-70-5	Endrin ketone	0.466		0.050	0.0070
58-89-9	gamma-BHC (Lindane)	0.507		0.050	0.0069
5103-74-2	gamma-Chlordane	0.479		0.050	0.0091
76-44-8	Heptachlor	0.462		0.050	0.0077
1024-57-3	Heptachlor epoxide	0.472		0.050	0.0075
72-43-5	Methoxychlor	0.468		0.10	0.013

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	95		34-122
877-09-8	Tetrachloro-m-xylene	85		28-115

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D
 Lims ID: LCSD 280-444680/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 23-Jan-2019 01:55:06 ALS Bottle#: 54 Worklist Smp#: 77
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCSD 280-444680/
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 2 1-Bromo-2-nitrobenzene

1	2.558	2.559	0.000	127215702	150.0	150.0
2	2.815	2.816	-0.001	107758581	150.0	150.0

\$ 3 Tetrachloro-m-xylene

1	3.536	3.537	-0.001	19434585	20.0	17.0
2	4.112	4.113	-0.001	23711136	20.0	16.7

RPD = 2.13

6 Hexachlorobenzene

1	3.969	3.971	-0.002	54473930	50.0	47.1
2	4.496	4.498	-0.002	55183885	50.0	41.7

RPD = 12.16

7 alpha-BHC

1	4.064	4.066	-0.002	80745743	50.0	47.4
2	4.437	4.438	-0.001	64440089	50.0	47.7

RPD = 0.46

8 gamma-BHC (Lindane)

1	4.351	4.353	-0.002	64574513	50.0	50.7
2	4.682	4.683	-0.001	47784466	50.0	47.1

RPD = 7.37

11 beta-BHC

1	4.538	4.540	-0.002	31352942	50.0	48.5
2	4.886	4.888	-0.002	25376252	50.0	49.7

RPD = 2.60

12 Heptachlor

1	4.602	4.605	-0.003	57087255	50.0	46.2
2	5.125	5.126	-0.001	44249358	50.0	49.6

RPD = 7.03

13 delta-BHC

1	4.732	4.734	-0.002	73810759	50.0	49.6
2	5.073	5.075	-0.002	60048562	50.0	48.6

RPD = 1.99

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

15 Aldrin

1	4.818	4.821	-0.003	68256998	50.0	45.3	
2	5.393	5.394	-0.001	56089411	50.0	47.6	
RPD = 4.99							

19 Heptachlor epoxide

1	5.223	5.227	-0.004	60463226	50.0	47.2	
2	5.812	5.814	-0.002	51828746	50.0	49.2	
RPD = 4.32							

20 trans-Chlordane

1	5.415	5.418	-0.003	65353355	50.0	47.9	
2	6.168	6.170	-0.002	54861570	50.0	49.7	
RPD = 3.70							

23 cis-Chlordane

1	5.503	5.507	-0.004	63930674	50.0	45.9	
2	6.230	6.231	-0.001	52210303	50.0	47.8	
RPD = 4.12							

24 Endosulfan I

1	5.544	5.548	-0.004	58477602	50.0	43.8	
2	6.269	6.272	-0.003	44147492	50.0	48.5	
RPD = 10.12							

25 4,4'-DDE

1	5.715	5.718	-0.003	66973902	50.0	46.6	
2	6.447	6.449	-0.002	57798199	50.0	42.7	
RPD = 8.73							

26 Dieldrin

1	5.827	5.832	-0.005	58857879	50.0	49.2	
2	6.602	6.603	-0.001	56673513	50.0	47.6	
RPD = 3.20							

29 Endrin

1	6.181	6.184	-0.003	59868182	50.0	46.6	
2	6.885	6.886	-0.001	49545889	50.0	47.4	
RPD = 1.65							

32 4,4'-DDD

1	6.387	6.391	-0.004	55075888	50.0	47.3	
2	7.099	7.100	-0.001	46184489	50.0	50.4	
RPD = 6.35							

33 Endosulfan II

1	6.528	6.533	-0.005	54478392	50.0	42.4	
2	7.210	7.213	-0.003	42979849	50.0	44.9	
RPD = 5.68							

34 4,4'-DDT

1	6.747	6.750	-0.003	46620349	50.0	44.4	
2	7.462	7.464	-0.002	39289033	50.0	49.4	
RPD = 10.61							

35 Endrin aldehyde

1	6.832	6.836	-0.004	41908915	50.0	40.6	
2	7.342	7.343	-0.001	33625430	50.0	42.5	
RPD = 4.56							

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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36 Endosulfan sulfate

1	7.082	7.084	-0.002	55423725	50.0	45.5	
2	7.671	7.673	-0.002	44045864	50.0	50.5	
RPD = 10.31							

37 Methoxychlor

1	7.606	7.611	-0.005	23349881	50.0	46.8	
2	7.978	7.981	-0.003	19991384	50.0	47.9	
RPD = 2.32							

38 Endrin ketone

1	7.766	7.770	-0.004	58869658	50.0	46.6	
2	8.120	8.121	-0.001	45980828	50.0	49.6	
RPD = 6.21							

\$ 40 DCB Decachlorobiphenyl

1	8.999	9.004	-0.005	21069843	20.0	19.0	
2	9.865	9.869	-0.004	18140560	20.0	17.9	
RPD = 5.92							

Reagents:

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D

Injection Date: 23-Jan-2019 01:55:06

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: LCSD 280-444680/3-A

Worklist Smp#: 77

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

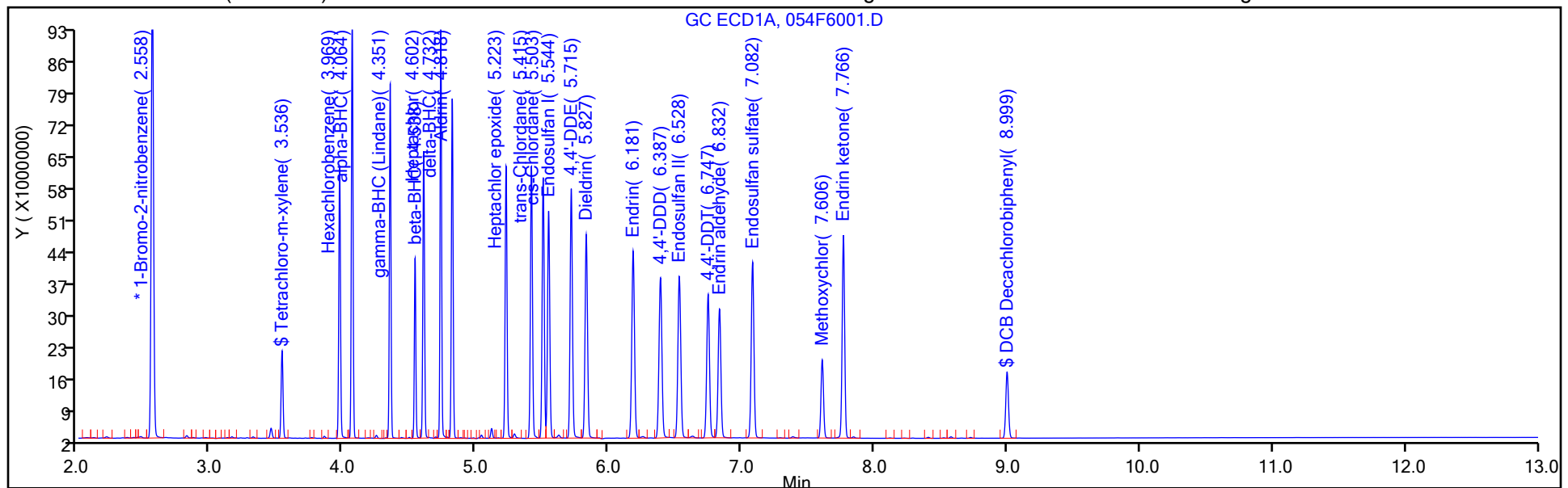
ALS Bottle#: 54

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

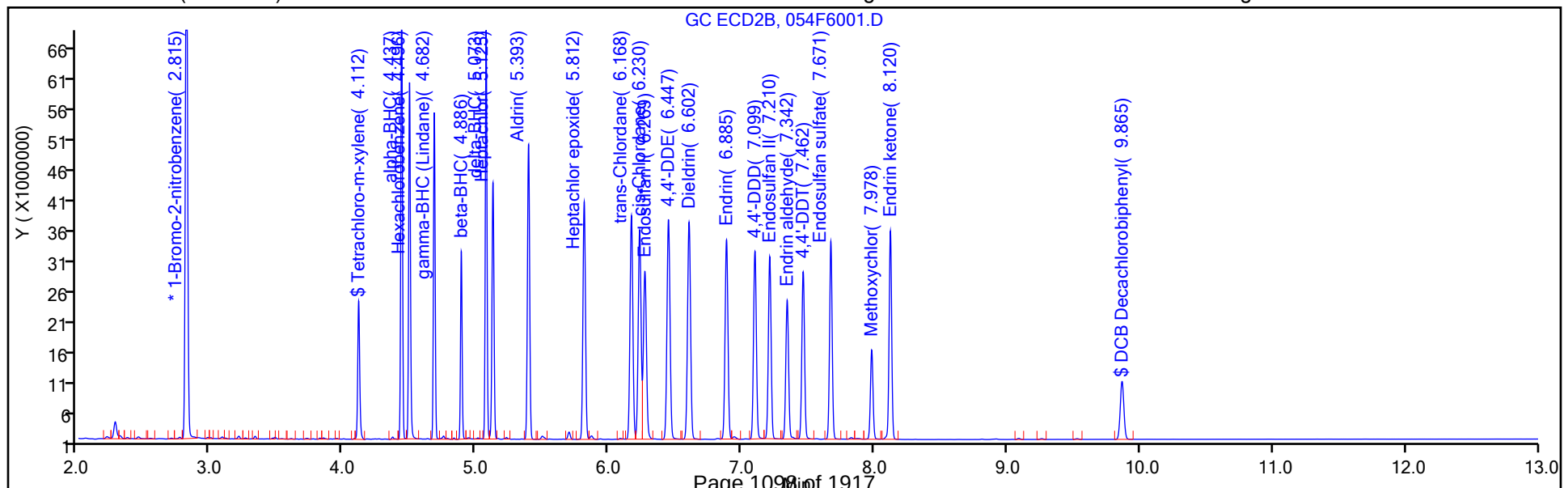
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D
 Lims ID: LCSD 280-444680/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 23-Jan-2019 01:55:06 ALS Bottle#: 54 Worklist Smp#: 77
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCSD 280-444680/
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	17.0	85.22
\$ 40 DCB Decachlorobiphenyl	20.0	19.0	94.98

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	16.7	83.42
\$ 40 DCB Decachlorobiphenyl	20.0	17.9	89.52

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: LCSD 280-444680/3-A
Matrix: Water Lab File ID: 054F6001.D
Analysis Method: 8081B Date Collected: _____
Extraction Method: 3510C Date Extracted: 01/18/2019 12:03
Sample wt/vol: 1000 (mL) Date Analyzed: 01/23/2019 01:55
Con. Extract Vol.: 10 (mL) Dilution Factor: 1
Injection Volume: 1 (uL) GC Column: Rxi-XLB ID: 0.32 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 444894 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	0.504		0.050	0.0077
60-57-1	Dieldrin	0.476		0.050	0.0063

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D
 Lims ID: LCSD 280-444680/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 23-Jan-2019 01:55:06 ALS Bottle#: 54 Worklist Smp#: 77
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCSD 280-444680/
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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* 2 1-Bromo-2-nitrobenzene

1	2.558	2.559	0.000	127215702	150.0	150.0
2	2.815	2.816	-0.001	107758581	150.0	150.0

\$ 3 Tetrachloro-m-xylene

1	3.536	3.537	-0.001	19434585	20.0	17.0
2	4.112	4.113	-0.001	23711136	20.0	16.7

RPD = 2.13

6 Hexachlorobenzene

1	3.969	3.971	-0.002	54473930	50.0	47.1
2	4.496	4.498	-0.002	55183885	50.0	41.7

RPD = 12.16

7 alpha-BHC

1	4.064	4.066	-0.002	80745743	50.0	47.4
2	4.437	4.438	-0.001	64440089	50.0	47.7

RPD = 0.46

8 gamma-BHC (Lindane)

1	4.351	4.353	-0.002	64574513	50.0	50.7
2	4.682	4.683	-0.001	47784466	50.0	47.1

RPD = 7.37

11 beta-BHC

1	4.538	4.540	-0.002	31352942	50.0	48.5
2	4.886	4.888	-0.002	25376252	50.0	49.7

RPD = 2.60

12 Heptachlor

1	4.602	4.605	-0.003	57087255	50.0	46.2
2	5.125	5.126	-0.001	44249358	50.0	49.6

RPD = 7.03

13 delta-BHC

1	4.732	4.734	-0.002	73810759	50.0	49.6
2	5.073	5.075	-0.002	60048562	50.0	48.6

RPD = 1.99

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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15 Aldrin

1	4.818	4.821	-0.003	68256998	50.0	45.3	
2	5.393	5.394	-0.001	56089411	50.0	47.6	
RPD = 4.99							

19 Heptachlor epoxide

1	5.223	5.227	-0.004	60463226	50.0	47.2	
2	5.812	5.814	-0.002	51828746	50.0	49.2	
RPD = 4.32							

20 trans-Chlordane

1	5.415	5.418	-0.003	65353355	50.0	47.9	
2	6.168	6.170	-0.002	54861570	50.0	49.7	
RPD = 3.70							

23 cis-Chlordane

1	5.503	5.507	-0.004	63930674	50.0	45.9	
2	6.230	6.231	-0.001	52210303	50.0	47.8	
RPD = 4.12							

24 Endosulfan I

1	5.544	5.548	-0.004	58477602	50.0	43.8	
2	6.269	6.272	-0.003	44147492	50.0	48.5	
RPD = 10.12							

25 4,4'-DDE

1	5.715	5.718	-0.003	66973902	50.0	46.6	
2	6.447	6.449	-0.002	57798199	50.0	42.7	
RPD = 8.73							

26 Dieldrin

1	5.827	5.832	-0.005	58857879	50.0	49.2	
2	6.602	6.603	-0.001	56673513	50.0	47.6	
RPD = 3.20							

29 Endrin

1	6.181	6.184	-0.003	59868182	50.0	46.6	
2	6.885	6.886	-0.001	49545889	50.0	47.4	
RPD = 1.65							

32 4,4'-DDD

1	6.387	6.391	-0.004	55075888	50.0	47.3	
2	7.099	7.100	-0.001	46184489	50.0	50.4	
RPD = 6.35							

33 Endosulfan II

1	6.528	6.533	-0.005	54478392	50.0	42.4	
2	7.210	7.213	-0.003	42979849	50.0	44.9	
RPD = 5.68							

34 4,4'-DDT

1	6.747	6.750	-0.003	46620349	50.0	44.4	
2	7.462	7.464	-0.002	39289033	50.0	49.4	
RPD = 10.61							

35 Endrin aldehyde

1	6.832	6.836	-0.004	41908915	50.0	40.6	
2	7.342	7.343	-0.001	33625430	50.0	42.5	
RPD = 4.56							

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
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36 Endosulfan sulfate

1	7.082	7.084	-0.002	55423725	50.0	45.5	
2	7.671	7.673	-0.002	44045864	50.0	50.5	
RPD = 10.31							

37 Methoxychlor

1	7.606	7.611	-0.005	23349881	50.0	46.8	
2	7.978	7.981	-0.003	19991384	50.0	47.9	
RPD = 2.32							

38 Endrin ketone

1	7.766	7.770	-0.004	58869658	50.0	46.6	
2	8.120	8.121	-0.001	45980828	50.0	49.6	
RPD = 6.21							

\$ 40 DCB Decachlorobiphenyl

1	8.999	9.004	-0.005	21069843	20.0	19.0	
2	9.865	9.869	-0.004	18140560	20.0	17.9	
RPD = 5.92							

Reagents:

8081_IS_00010

Amount Added: 75.00

Units: uL

Run Reagent

Report Date: 23-Jan-2019 11:17:11

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D

Injection Date: 23-Jan-2019 01:55:06

Instrument ID: SGC_C

Operator ID: TEB

Lims ID: LCSD 280-444680/3-A

Worklist Smp#: 77

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

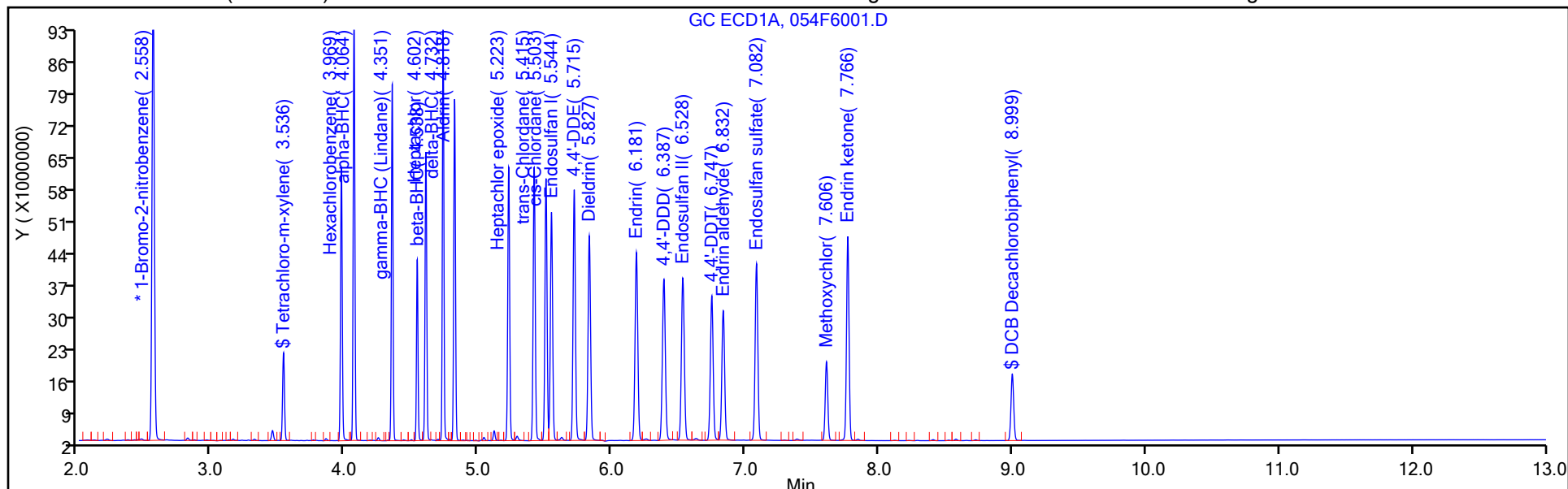
ALS Bottle#: 54

Method: C 8081 IS

Limit Group: GCSV - 8081A - IS

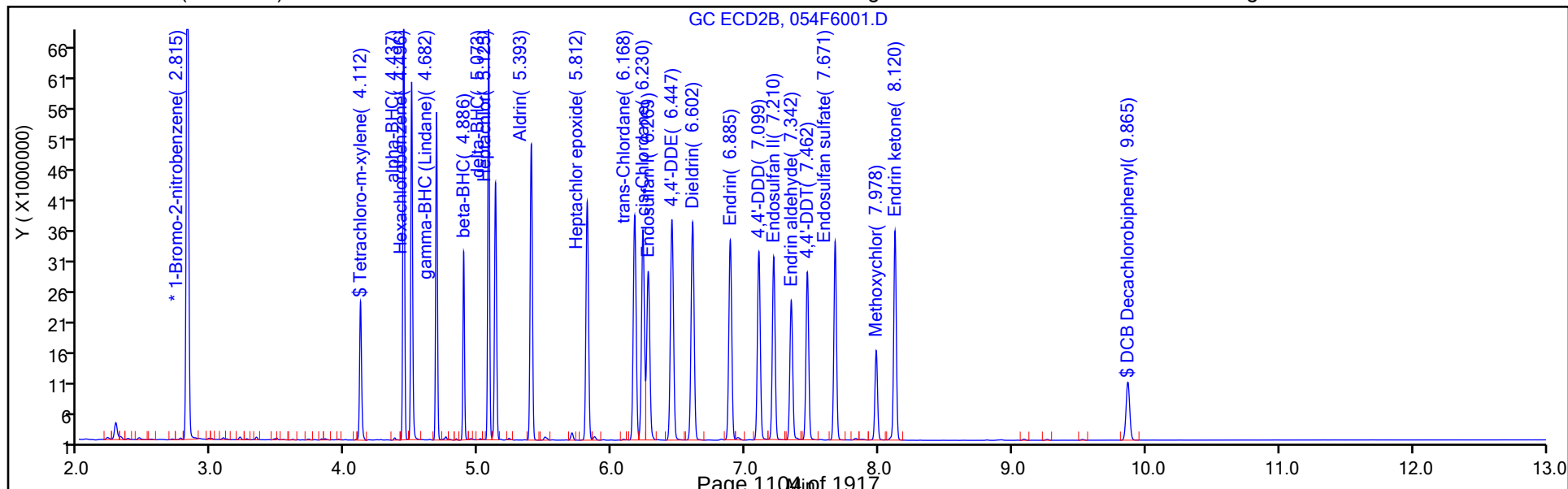
Column: Rxi-35Sil MS (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: Rxi-XLB (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\054F6001.D
 Lims ID: LCSD 280-444680/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 23-Jan-2019 01:55:06 ALS Bottle#: 54 Worklist Smp#: 77
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCSD 280-444680/
 Operator ID: TEB Instrument ID: SGC_C
 Method: \\chromna\Denver\ChromData\SGC_C\20190121-78230.b\C 8081 IS.m
 Limit Group: GCSV - 8081A - IS
 Last Update: 23-Jan-2019 11:16:36 Calib Date: 17-Jan-2019 18:56:49
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_C\20190118-78177.b\01170015.D
 Column 1 : Rxi-35Sil MS (0.32 mm) Det: GC ECD1A
 Column 2 : Rxi-XLB (0.32 mm) Det: GC ECD2B
 Process Host: CTX0329

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	17.0	85.22
\$ 40 DCB Decachlorobiphenyl	20.0	19.0	94.98

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 3 Tetrachloro-m-xylene	20.0	16.7	83.42
\$ 40 DCB Decachlorobiphenyl	20.0	17.9	89.52

PESTICIDES ANALYSIS RUN LOG

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_CStart Date: 01/21/2019 13:54Analysis Batch Number: 444894End Date: 01/23/2019 03:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
PEM 280-444894/7		01/21/2019 13:54	1		Rxi-35Sil MS 0.32 (mm)
PEM 280-444894/7		01/21/2019 13:54	1		Rxi-XLB 0.32 (mm)
CCV 280-444894/10		01/21/2019 14:47	1		Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/10		01/21/2019 14:47	1		Rxi-XLB 0.32 (mm)
CCV 280-444894/11		01/21/2019 15:04	1		Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/11		01/21/2019 15:04	1		Rxi-XLB 0.32 (mm)
CCV 280-444894/12		01/21/2019 15:22	1		Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/12		01/21/2019 15:22	1		Rxi-XLB 0.32 (mm)
CCVIS 280-444894/13		01/21/2019 15:39	1	01210013.D	Rxi-35Sil MS 0.32 (mm)
CCVIS 280-444894/13		01/21/2019 15:39	1	01210013.D	Rxi-XLB 0.32 (mm)
ZZZZZ		01/21/2019 15:57	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/21/2019 15:57	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/21/2019 16:15	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/21/2019 16:15	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/21/2019 16:32	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/21/2019 16:32	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/21/2019 16:50	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/21/2019 16:50	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/21/2019 17:07	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/21/2019 17:07	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/21/2019 17:25	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/21/2019 17:25	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/21/2019 17:42	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/21/2019 17:42	1		Rxi-XLB 0.32 (mm)
CCV 280-444894/24		01/21/2019 18:52	1		Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/24		01/21/2019 18:52	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 14:51	100		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 14:51	100		Rxi-XLB 0.32 (mm)
CCV 280-444894/25		01/22/2019 15:43	1		Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/25		01/22/2019 15:43	1		Rxi-XLB 0.32 (mm)
CCV 280-444894/26		01/22/2019 16:01	1		Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/26		01/22/2019 16:01	1		Rxi-XLB 0.32 (mm)
CCV 280-444894/27		01/22/2019 16:18	1		Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/27		01/22/2019 16:18	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 16:36	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 16:36	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 16:53	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 16:53	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 17:11	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 17:11	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 17:28	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 17:28	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 17:45	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 17:45	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 18:03	1		Rxi-35Sil MS 0.32 (mm)

PESTICIDES ANALYSIS RUN LOG

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_CStart Date: 01/21/2019 13:54Analysis Batch Number: 444894End Date: 01/23/2019 03:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		01/22/2019 18:03	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 18:20	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 18:20	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 18:38	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 18:38	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 18:55	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 18:55	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 19:13	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 19:13	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 19:30	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 19:30	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 19:48	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 19:48	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 20:05	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 20:05	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 20:23	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 20:23	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 20:40	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 20:40	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 20:57	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 20:57	1		Rxi-XLB 0.32 (mm)
CCV 280-444894/44		01/22/2019 21:15	1		Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/44		01/22/2019 21:15	1		Rxi-XLB 0.32 (mm)
CCV 280-444894/45		01/22/2019 21:32	1	039F4501.D	Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/45		01/22/2019 21:32	1	039F4501.D	Rxi-XLB 0.32 (mm)
CCV 280-444894/46		01/22/2019 21:50	1		Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/46		01/22/2019 21:50	1		Rxi-XLB 0.32 (mm)
CCV 280-444894/47		01/22/2019 22:07	1	041F4701.D	Rxi-35Sil MS 0.32 (mm)
CCV 280-444894/47		01/22/2019 22:07	1	041F4701.D	Rxi-XLB 0.32 (mm)
PEM 280-444894/48		01/22/2019 22:25	1	042F4801.D	Rxi-35Sil MS 0.32 (mm)
PEM 280-444894/48		01/22/2019 22:25	1	042F4801.D	Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 22:42	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 22:42	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 23:00	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 23:00	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/22/2019 23:17	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/22/2019 23:17	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/23/2019 00:10	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/23/2019 00:10	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/23/2019 00:27	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/23/2019 00:27	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/23/2019 00:44	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/23/2019 00:44	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/23/2019 01:02	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/23/2019 01:02	1		Rxi-XLB 0.32 (mm)

PESTICIDES ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_C Start Date: 01/21/2019 13:54Analysis Batch Number: 444894 End Date: 01/23/2019 03:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
MB 280-444680/1-A		01/23/2019 01:19	1	052F5801.D	Rxi-35Sil MS 0.32 (mm)
MB 280-444680/1-A		01/23/2019 01:19	1	052F5801.D	Rxi-XLB 0.32 (mm)
LCS 280-444680/2-A		01/23/2019 01:37	1	053F5901.D	Rxi-35Sil MS 0.32 (mm)
LCS 280-444680/2-A		01/23/2019 01:37	1	053F5901.D	Rxi-XLB 0.32 (mm)
LCSD 280-444680/3-A		01/23/2019 01:55	1	054F6001.D	Rxi-35Sil MS 0.32 (mm)
LCSD 280-444680/3-A		01/23/2019 01:55	1	054F6001.D	Rxi-XLB 0.32 (mm)
ZZZZZ		01/23/2019 02:12	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/23/2019 02:12	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/23/2019 02:30	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/23/2019 02:30	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/23/2019 02:47	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/23/2019 02:47	1		Rxi-XLB 0.32 (mm)
ZZZZZ		01/23/2019 03:04	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/23/2019 03:04	1		Rxi-XLB 0.32 (mm)
160-32649-1		01/23/2019 03:22	1	059F6501.D	Rxi-35Sil MS 0.32 (mm)
160-32649-1		01/23/2019 03:22	1	059F6501.D	Rxi-XLB 0.32 (mm)
ZZZZZ		01/23/2019 03:39	1		Rxi-35Sil MS 0.32 (mm)
ZZZZZ		01/23/2019 03:39	1		Rxi-XLB 0.32 (mm)

PESTICIDES BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 444680 Batch Start Date: 01/18/19 12:03 Batch Analyst: Stewart, Klaudia J

Batch Method: 3510C Batch End Date: 01/21/19 19:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	8081 LCS 00460
MB 280-444680/1		3510C, 8081B				1000 mL	10 mL	7 SU	
LCS 280-444680/2		3510C, 8081B				1000 mL	10 mL	7 SU	1 mL
LCSD 280-444680/3		3510C, 8081B				1000 mL	10 mL	7 SU	1 mL
160-32649-E-1	CRC-MW-1-011519	3510C, 8081B	T	1360.8 g	393.1 g	967.7 mL	10 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	8081/82 Surr 00106	AnalysisComment				
MB 280-444680/1		3510C, 8081B		1 mL					
LCS 280-444680/2		3510C, 8081B		1 mL	8081				
LCSD 280-444680/3		3510C, 8081B		1 mL	8081				
160-32649-E-1	CRC-MW-1-011519	3510C, 8081B	T	1 mL	CAT 1				

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

PESTICIDES BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 444680 Batch Start Date: 01/18/19 12:03 Batch Analyst: Stewart, Klaudia JBatch Method: 3510C Batch End Date: 01/21/19 19:20

Batch Notes	
Balance ID	24750399
Batch Comment	DV-OP-0006/0007; r2d2 @ 2x5.00 mL
Analyst ID - Concentration	CR
Concentration 1 Corrected Temperature	88 Degrees C
Equipment ID - Concentration 1	C
Exchange Solvent ID	Hexane_Cycl_00054
Analyst ID - Extraction	KS
Method/Fraction	3510C/8081A/8082
Na2SO4 ID	0000213903_00002
NaCl ID	184223
Pipette/Syringe/Dispenser ID	1n2s
Prep Solvent ID	MeCl2_Cycl_00422
Prep Solvent Volume Used	180 mL
Analyst ID - Spike Analyst	KS (trainer) + EB (trainee)
Analyst ID - Spike Witness Analyst	Reviewer: MM
Sufficient Volume for Batch QC	No
Concentration 1 Uncorrected Temperature	87 Degrees C
Reagent Water ID	S. ELGA

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Method 8082A

Polychlorinated Biphenyls (PCBs)
(GC) by Method 8082A

FORM II
PCBS SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): CLP2 ID: 0.32 (mm)

Client Sample ID	Lab Sample ID	TCX1 #	DCBP1 #
CRC-MW-1-011519	160-32649-1	87	41
	MB 280-444887/1-A	73	77
	LCS 280-444887/2-A	90	84
	LCSD 280-444887/3-A	93	88

TCX = Tetrachloro-m-xylene
DCBP = DCB Decachlorobiphenyl

QC LIMITS
25-120
30-136

Column to be used to flag recovery values

FORM III
PCBS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 02040009.D

Lab ID: LCS 280-444887/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
PCB-1016	2.00	1.85	92	71-128	
PCB-1260	2.00	1.92	96	75-126	

Column to be used to flag recovery and RPD values

FORM III
PCBS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: 02040010.D
Lab ID: LCSD 280-444887/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
PCB-1016	2.00	1.85	93	0	30	71-128	
PCB-1260	2.00	1.95	97	2	30	75-126	

Column to be used to flag recovery and RPD values

FORM IV
PCBS METHOD BLANK SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: MB 280-444887/1-A
Matrix: Water Date Extracted: 01/21/2019 11:30
Lab File ID: (1) 02040008.D Lab File ID: (2) 02040008.D
Date Analyzed: (1) 02/05/2019 14:49 Date Analyzed: (2) 02/05/2019 14:49
Instrument ID: (1) SGC_J Instrument ID: (2) SGC_J
GC Column: (1) CLP2 ID: 0.32 (mm) GC Column: (2) CLP1 ID: 0.32 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 280-444887/2-A	02/05/2019 15:11	02/05/2019 15:11
	LCSD 280-444887/3-A	02/05/2019 15:32	02/05/2019 15:32
CRC-MW-1-011519	160-32649-1	02/05/2019 16:14	02/05/2019 16:14

FORM VIII
PCBS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Sample No.: STD5 280-445745/23 Date Analyzed: 01/29/2019 21:55
Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm)
Lab File ID (Standard): 01290023.D Heated Purge: (Y/N) N
Calibration ID: 35091

	BNB					
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT	20507310	1.98				
UPPER LIMIT	41014620	2.48				
LOWER LIMIT	10253655	1.48				
LAB SAMPLE ID	CLIENT SAMPLE ID					
ICV 280-445745/26		19116825	1.98			
ICV 280-445745/34		17204313	1.98			
ICV 280-445745/42		19419783	1.98			

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
PCBS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Sample No.: STD5 280-445745/23 Date Analyzed: 01/29/2019 21:55
 Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm)
 Lab File ID (Standard): 01290023.D Heated Purge: (Y/N) N
 Calibration ID: 35092

	BNB					
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT	113907969	1.79				
UPPER LIMIT	227815938	2.29				
LOWER LIMIT	56953985	1.29				
LAB SAMPLE ID	CLIENT SAMPLE ID					
ICV 280-445745/26		106734485	1.79			
ICV 280-445745/34		95342219	1.79			
ICV 280-445745/42		105092238	1.79			

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
PCBS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Sample No.: CCVIS 280-446463/5 Date Analyzed: 02/05/2019 13:46
 Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm)
 Lab File ID (Standard): 02040005.D Heated Purge: (Y/N) N
 Calibration ID: 35079

		BNB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		17452101	1.97				
UPPER LIMIT		34904202	2.47				
LOWER LIMIT		8726051	1.47				
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 280-444887/1-A		15288773	1.98				
LCS 280-444887/2-A		17684531	1.98				
LCSD 280-444887/3-A		18878202	1.98				
160-32649-1	CRC-MW-1-011519	18989951	1.97				

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
PCBS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Sample No.: CCVIS 280-446463/5 Date Analyzed: 02/05/2019 13:46
 Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm)
 Lab File ID (Standard): 02040005.D Heated Purge: (Y/N) N
 Calibration ID: 35080

		BNB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		102812303	1.79				
UPPER LIMIT		205624606	2.29				
LOWER LIMIT		51406152	1.29				
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 280-444887/1-A		85555457	1.79				
LCS 280-444887/2-A		98778426	1.79				
LCSD 280-444887/3-A		104653224	1.79				
160-32649-1	CRC-MW-1-011519	104796641	1.79				

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 280-444887/2-A
 Instrument ID (1): SGC_J Instrument ID (2): SGC_J
 Date Analyzed (1): 02/05/2019 15:11 Date Analyzed (2): 02/05/2019 15:11
 GC Column (1): CLP2 ID: 0.32 (mm) GC Column (2): CLP1 ID: 0.32 (mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
PCB-1016	1	1	3.71	3.46	3.96	1.88	1.85	5.7
		2	4.17	3.92	4.42	1.76		
		3	4.32	4.07	4.57	1.82		
		4	4.55	4.30	4.80	1.81		
		5	4.85	4.60	5.10	1.96		
	2	1	3.28	3.03	3.53	2.07	1.95	
		2	3.65	3.40	3.90	1.98		
		3	4.14	3.89	4.39	1.75		
		4	4.29	4.04	4.54	1.97		
		5	4.76	4.51	5.01	2.01		
PCB-1260	1	1	6.72	6.47	6.97	2.06	1.92	2.5
		2	7.19	6.94	7.44	2.09		
		3	7.32	7.07	7.57	1.83		
		4	8.09	7.84	8.34	1.79		
		5	8.60	8.35	8.85	1.81		
	2	1	6.28	6.03	6.53	2.23	1.97	
		2	6.82	6.57	7.07	2.00		
		3	7.53	7.28	7.78	1.87		
		4	7.97	7.72	8.22	1.80		
		5	8.36	8.11	8.61	1.93		

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 280-444887/3-A
 Instrument ID (1): SGC_J Instrument ID (2): SGC_J
 Date Analyzed (1): 02/05/2019 15:32 Date Analyzed (2): 02/05/2019 15:32
 GC Column (1): CLP2 ID: 0.32 (mm) GC Column (2): CLP1 ID: 0.32 (mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
PCB-1016	1	1	3.71	3.46	3.96	1.88	1.85	4.7
		2	4.17	3.92	4.42	1.79		
		3	4.32	4.07	4.57	1.88		
		4	4.55	4.30	4.80	1.79		
		5	4.85	4.60	5.10	1.93		
	2	1	3.29	3.03	3.53	2.08	1.94	
		2	3.65	3.40	3.90	1.98		
		3	4.14	3.89	4.39	1.74		
		4	4.29	4.04	4.54	1.93		
		5	4.76	4.51	5.01	1.98		
PCB-1260	1	1	6.72	6.47	6.97	2.07	1.95	2.7
		2	7.19	6.94	7.44	2.08		
		3	7.33	7.07	7.57	1.86		
		4	8.09	7.84	8.34	1.86		
		5	8.60	8.35	8.85	1.86		
	2	1	6.28	6.03	6.53	2.20	2.00	
		2	6.82	6.57	7.07	2.00		
		3	7.53	7.28	7.78	1.97		
		4	7.97	7.72	8.22	1.85		
		5	8.36	8.11	8.61	1.97		

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: <u>CRC-MW-1-011519</u>	Lab Sample ID: <u>160-32649-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>02040012.D</u>
Analysis Method: <u>8082A</u>	Date Collected: <u>01/15/2019 12:30</u>
Extraction Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 11:30</u>
Sample wt/vol: <u>983.6(mL)</u>	Date Analyzed: <u>02/05/2019 16:14</u>
Con. Extract Vol.: <u>10(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1(uL)</u>	GC Column: <u>CLP2</u> ID: <u>0.32 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>446463</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
11104-28-2	PCB-1221	0.22	U	1.0	0.22
12674-11-2	PCB-1016	0.13	U	1.0	0.13
11141-16-5	PCB-1232	0.17	U	1.0	0.17
53469-21-9	PCB-1242	0.11	U	1.0	0.11
12672-29-6	PCB-1248	0.093	U	1.0	0.093
11097-69-1	PCB-1254	0.12	U	1.0	0.12
11096-82-5	PCB-1260	0.16	U	1.0	0.16
37324-23-5	PCB-1262	0.086	U	1.0	0.086
11100-14-4	PCB-1268	0.37	U	1.0	0.37

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	87		25-120
2051-24-3	DCB Decachlorobiphenyl	41		30-136

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040012.D
 Lims ID: 160-32649-G-1-A
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 05-Feb-2019 16:14:26 ALS Bottle#: 12 Worklist Smp#: 12
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: 160-32649-G-1-A
 Misc. Info.: 280-0078693-012
 Operator ID: TEM Instrument ID: SGC_J
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

First Level Reviewer: mooret

Date: 06-Feb-2019 10:46:07

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.973	1.973	0.000	18989951	100.0
2	1.786	1.787	-0.001	104796641	100.0

RPD = 0.00

\$ 14 Tetrachloro-m-xylene

1	2.890	2.890	0.000	13290795	16.7
2	2.816	2.817	-0.001	34702749	17.4

RPD = 3.86

3 PCB-1221

1		3.100		ND	U
1		3.243			
1		3.283			
2		3.130			
2		3.260			
2		3.316			

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040012.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/ml	Flags
1 PCB-1016						U
1	3.283			ND		
1	3.650					
1	4.140					
1	4.286					
1	4.760					
2	3.710					
2	4.173					
2	4.317					
2	4.553					
2	4.847					
7 PCB-1232						U
1	3.284			ND		
1	3.651					
1	4.137					
1	4.287					
1	4.757					
2	3.314					
2	3.711					
2	4.171					
2	4.317					
2	4.844					
10 PCB-1242						U
1	3.650			ND		
1	4.140					
1	4.757					
1	5.274					
1	5.290					
2	3.710					
2	4.170					
2	4.317					
2	4.844					
2	4.984					
4 PCB-1248						U
1	4.522			ND		
1	4.759					
1	4.855					
1	5.535					
1	6.039					
2	4.169					
2	4.549					
2	4.845					
2	4.985					
2	6.169					

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040012.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	--------------------	-------

9 PCB-1254

U

1	5.540			ND		
1	5.883					
1	6.040					
1	6.406					
1	7.030					
2	5.593					
2	6.020					
2	6.166					
2	6.720					
2	7.193					

12 PCB-1260

U

1	6.283			ND		
1	6.823					
1	7.526					
1	7.970					
1	8.360					
2	6.720					
2	7.190					
2	7.323					
2	8.090					
2	8.597					

5 PCB-1262

U

1	6.657			ND		
1	7.194					
1	7.527					
1	7.971					
1	8.361					
2	6.721					
2	7.324					
2	7.724					
2	8.091					
2	8.597					

13 PCB-1268

U

1	8.423			ND		
1	8.473					
1	8.747					
1	8.867					
1	9.680					
2	8.594					
2	8.654					
2	9.010					
2	9.150					
2	9.907					

\$ 15 DCB Decachlorobiphenyl

1	9.953	9.953	0.000	4870207	7.94	
2	10.273	10.273	0.000	13972617	8.11	

RPD = 2.07

QC Flag Legend

Review Flags

U - Marked Undetected

Reagents:

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040012.D

Injection Date: 05-Feb-2019 16:14:26

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: 160-32649-G-1-A

Lab Sample ID: 280-32649-1

Worklist Smp#: 12

Client ID: CRC-MW-1-011519

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

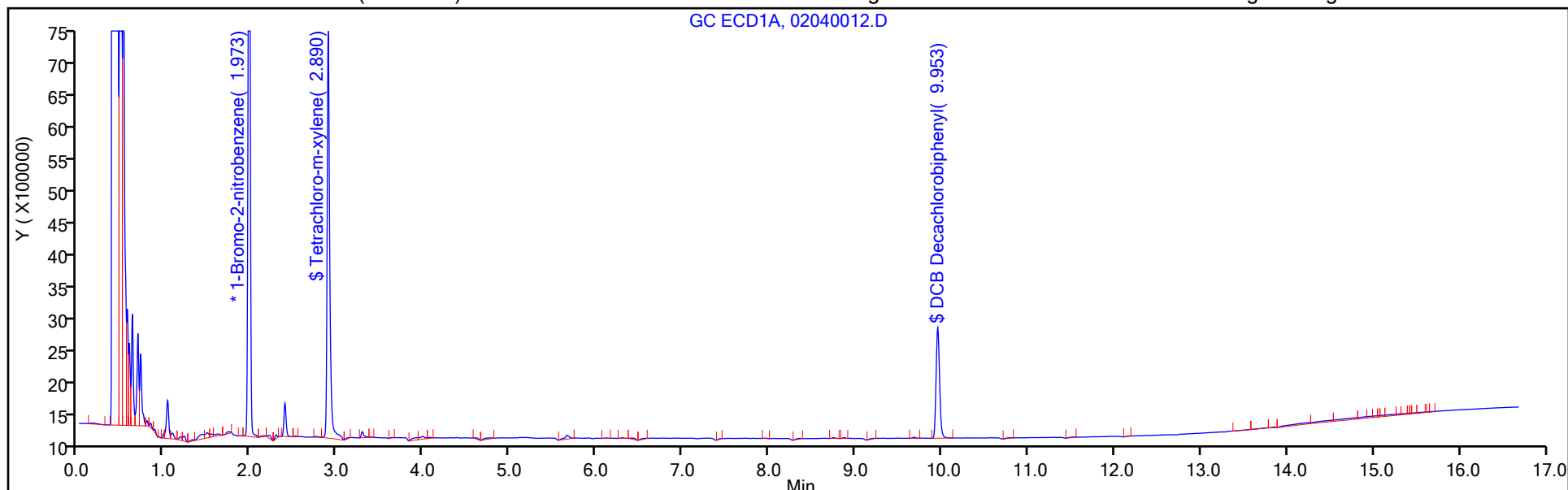
ALS Bottle#: 12

Method: 8082_J

Limit Group: GCSV - 8082 - IS

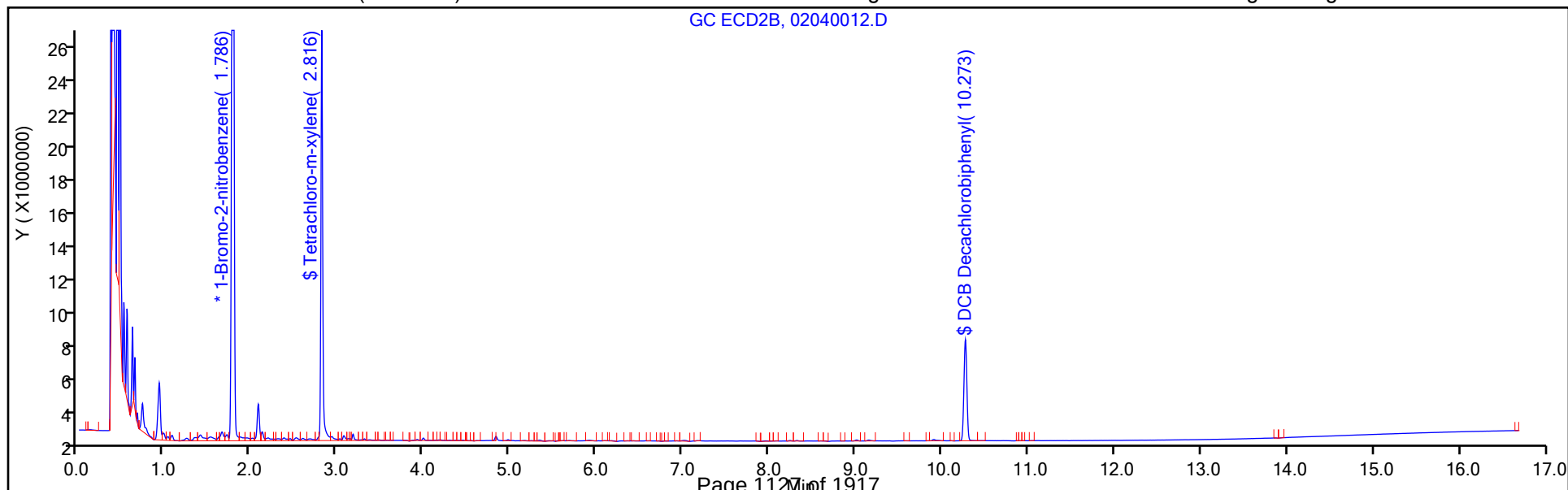
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040012.D
 Lims ID: 160-32649-G-1-A
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 05-Feb-2019 16:14:26 ALS Bottle#: 12 Worklist Smp#: 12
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: 160-32649-G-1-A
 Misc. Info.: 280-0078693-012
 Operator ID: TEM Instrument ID: SGC_J
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

First Level Reviewer: mooret

Date: 06-Feb-2019 10:46:07

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 14 Tetrachloro-m-xylene	20.0	16.7	83.75
\$ 15 DCB Decachlorobiphenyl	20.0	7.94	39.70

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 14 Tetrachloro-m-xylene	20.0	17.4	87.04
\$ 15 DCB Decachlorobiphenyl	20.0	8.11	40.53

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 14:54 Calibration End Date: 01/29/2019 17:00 Calibration ID: 35083

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/3	01290003.D
Level 2	STD2 280-445745/4	01290004.D
Level 3	STD3 280-445745/5	01290005.D
Level 4	STD4 280-445745/6	01290006.D
Level 5	STD5 280-445745/7	01290007.D
Level 6	STD6 280-445745/8	01290008.D
Level 7	STD7 280-445745/9	01290009.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
PCB-1248 Peak 1	0.2741 0.2009	0.2709 0.1933	0.2507	0.2399	0.2131	Lin1	3.1311	0.1997							0.9950		0.9900
PCB-1248 Peak 2	0.2311 0.1877	0.2373 0.1796	0.2205	0.2104	0.1984	Lin1	2.0931	0.1859							0.9970		0.9900
PCB-1248 Peak 3	0.1149 0.1057	0.1190 0.1031	0.1153	0.1144	0.1094	Lin1	0.5530	0.1055							0.9990		0.9900
PCB-1248 Peak 4	0.1483 0.1264	0.1445 0.1181	0.1420	0.1478	0.1340	Lin1	1.1030	0.1249							0.9940		0.9900
PCB-1248 Peak 5	0.0947 0.0853	0.0891 0.0832	0.0924	0.0943	0.0897	Lin1	0.3753	0.0856							0.9980		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 14:54 Calibration End Date: 01/29/2019 17:00 Calibration ID: 35083

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/3	01290003.D
Level 2	STD2 280-445745/4	01290004.D
Level 3	STD3 280-445745/5	01290005.D
Level 4	STD4 280-445745/6	01290006.D
Level 5	STD5 280-445745/7	01290007.D
Level 6	STD6 280-445745/8	01290008.D
Level 7	STD7 280-445745/9	01290009.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1248 Peak 1	BNB	Lin1	1163827 27736945	2266683 35853709	4240796	10590722	18857597	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 2	BNB	Lin1	981347 25906293	1985725 33304383	3730445	9286249	17551899	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 3	BNB	Lin1	487917 14594133	995524 19127578	1949790	5049650	9676529	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 4	BNB	Lin1	629616 17442778	1209560 21903990	2401447	6522540	11855327	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 5	BNB	Lin1	401944 11771745	745755 15423807	1562529	4162761	7933541	25.0 750	50.0 1000	100	250	500

Curve Type Legend:

Lin1 = Linear 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290003.D
 Lims ID: STD1 1248
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 29-Jan-2019 14:54:21 ALS Bottle#: 3 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 1248
 Misc. Info.: 280-0078470-003
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:52 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 10:24:44

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.975	0.001	16982149	100.0	100.0	
2	1.790	1.788	0.002	102558174	100.0	100.0	
RPD = 0.00							

4 PCB-1248

1	4.523	4.528	-0.005	1163827	25.0	18.6	
1	4.759	4.761	-0.002	981347	25.0	19.8	
1	4.859	4.861	-0.002	487917	25.0	22.0	
1	5.543	5.541	0.002	629616	25.0	20.8	
1	6.043	6.045	-0.002	401944	25.0	23.3	
Average of Peak Amounts =						20.9	
2	4.173	4.175	-0.002	2748219	25.0	19.4	
2	4.556	4.555	0.001	1657466	25.0	17.8	
2	4.850	4.851	-0.001	2371071	25.0	22.7	
2	4.990	4.991	-0.001	2513977	25.0	18.0	
2	6.173	6.175	-0.002	1553798	25.0	17.2	
Average of Peak Amounts =						19.0	

RPD = 9.45

S 8 Polychlorinated biphenyls, Total

1						20.9	
2						19.0	
RPD = 9.45							

Reagents:

AR_1248_L7_00018

Amount Added: 0.03

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:53

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290003.D

Injection Date: 29-Jan-2019 14:54:21

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD1 1248

Worklist Smp#: 3

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

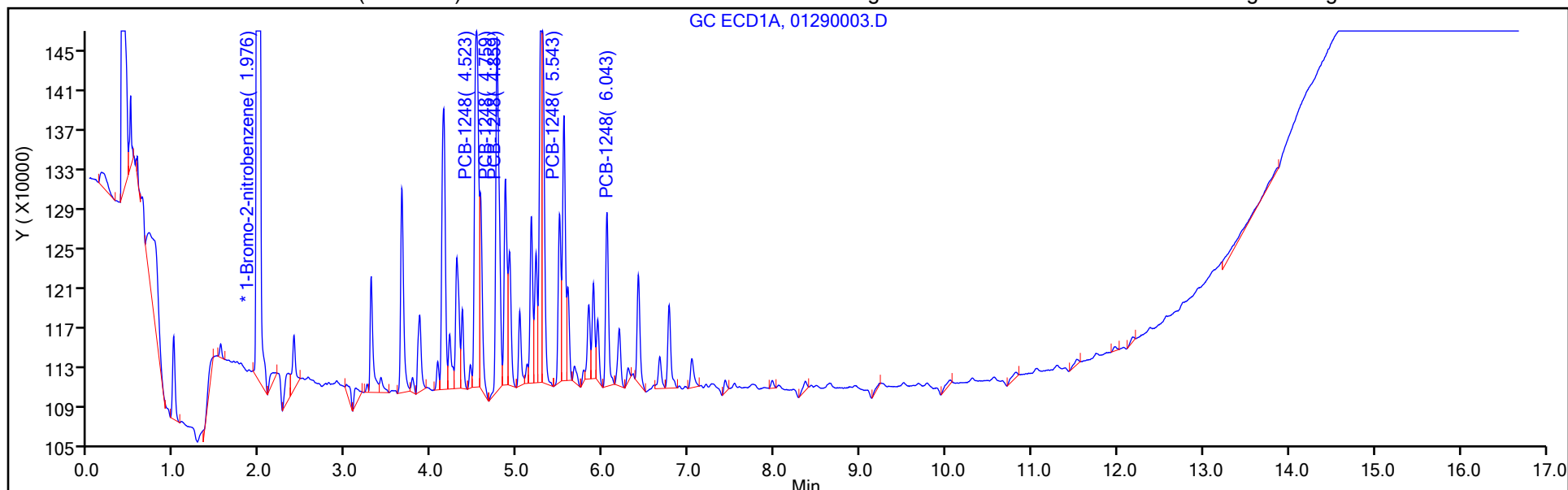
ALS Bottle#: 3

Method: 8082_J

Limit Group: GCSV - 8082 - IS

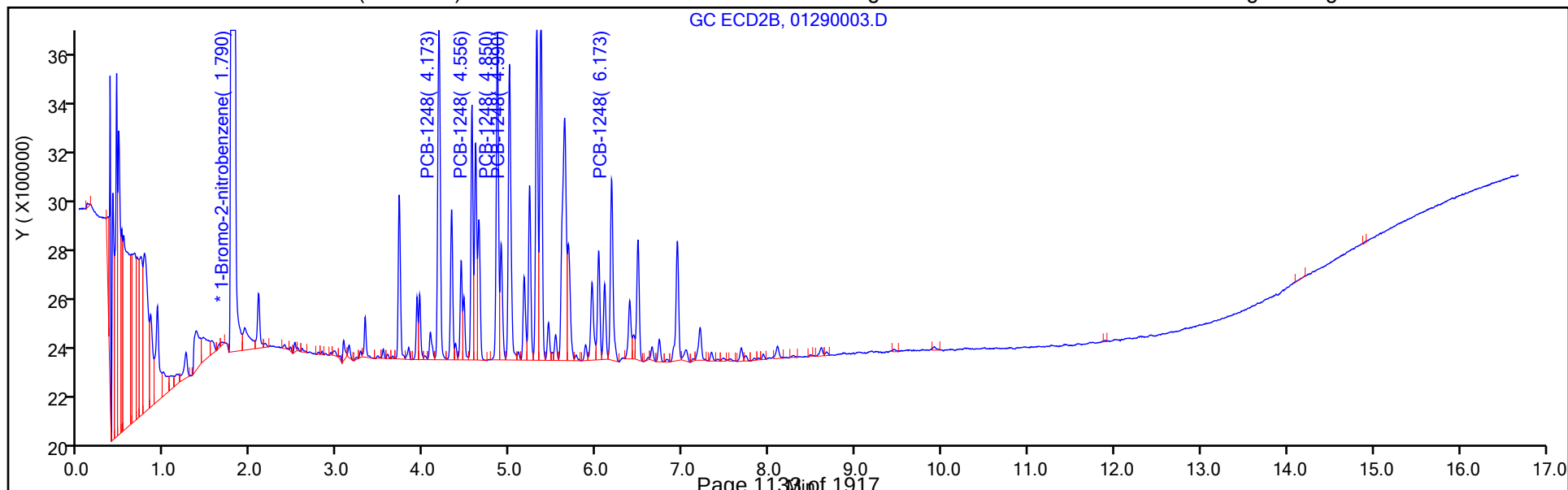
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290004.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 29-Jan-2019 15:15:24 ALS Bottle#: 4 Worklist Smp#: 4
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-004
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:50 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:19:15

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.975	0.002	16736886	100.0	100.0	
2	1.790	1.788	0.002	100380199	100.0	100.0	
RPD = 0.00							

4 PCB-1248

1	4.524	4.528	-0.004	2266683	50.0	52.1	
1	4.760	4.761	-0.001	1985725	50.0	52.6	
1	4.857	4.861	-0.004	995524	50.0	51.1	
1	5.540	5.541	-0.001	1209560	50.0	49.0	
1	6.043	6.045	-0.002	745755	50.0	47.7	

Average of Peak Amounts = 50.5

2	4.174	4.175	-0.001	4949630	50.0	52.4	
2	4.557	4.555	0.002	2949575	50.0	52.1	
2	4.850	4.851	-0.001	4239416	50.0	53.0	
2	4.990	4.991	-0.001	4580946	50.0	53.6	
2	6.174	6.175	-0.001	2907338	50.0	53.7	

Average of Peak Amounts = 52.9

RPD = 4.71

S 8 Polychlorinated biphenyls, Total

1	50.5	
2	52.9	
RPD = 4.71		

Reagents:

AR_1248_L7_00018

Amount Added: 0.05

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:50

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290004.D

Injection Date: 29-Jan-2019 15:15:24

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 4

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

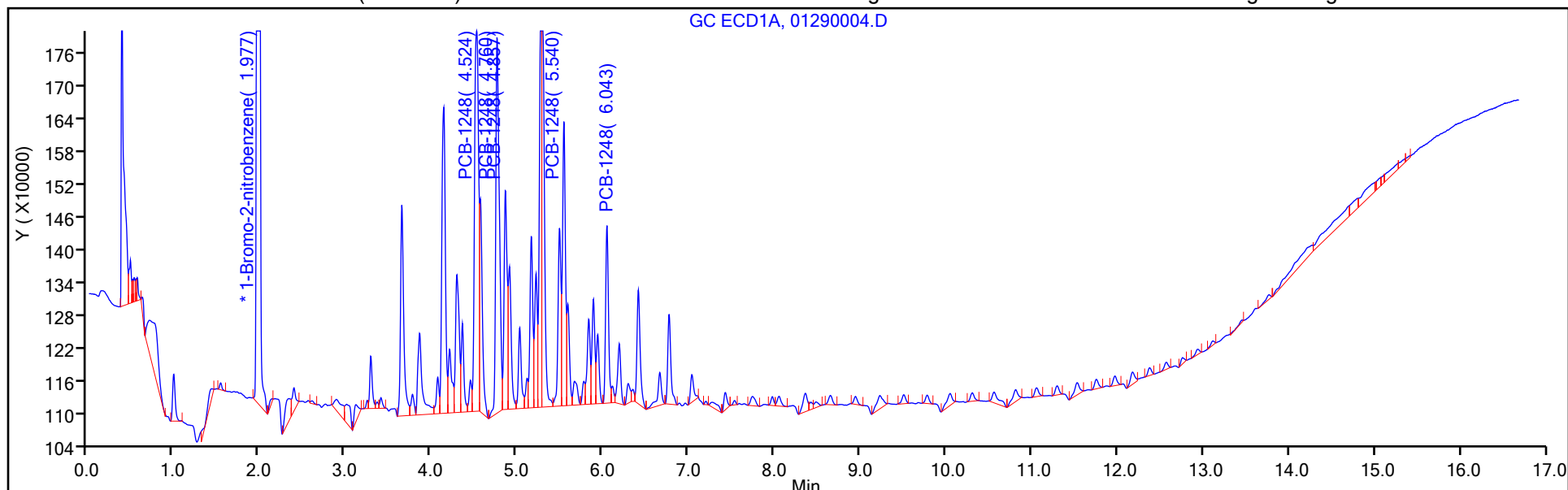
ALS Bottle#: 4

Method: 8082_J

Limit Group: GCSV - 8082 - IS

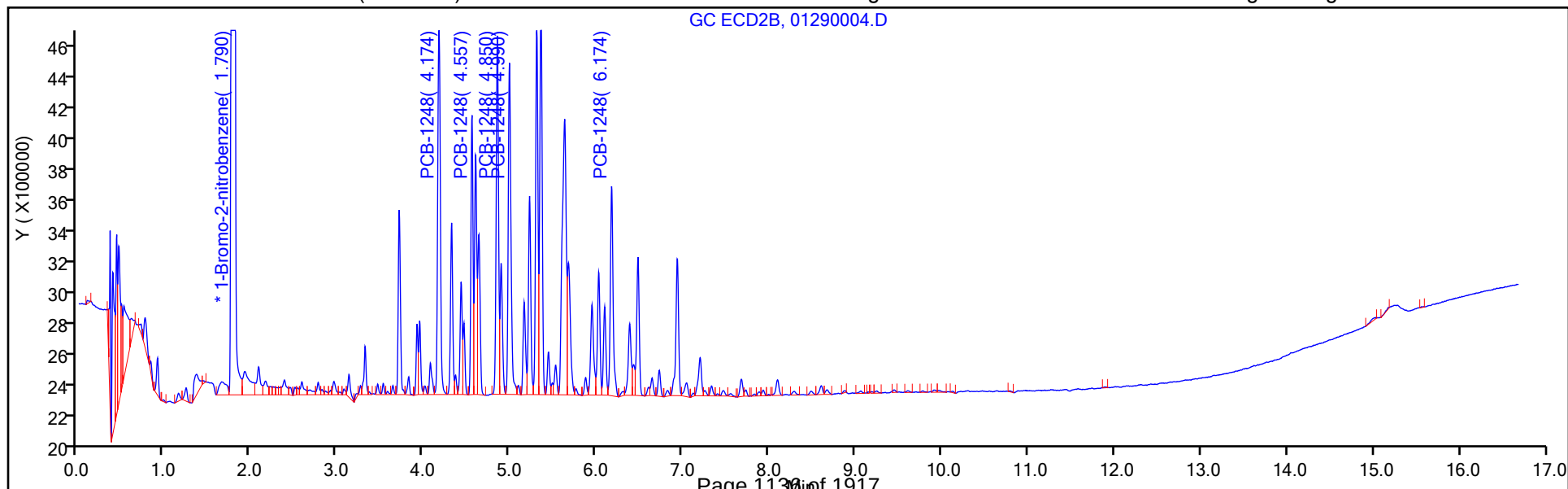
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290005.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 29-Jan-2019 15:36:28 ALS Bottle#: 5 Worklist Smp#: 5
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-005
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:48 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:19:29

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.975	0.003	16917073	100.0	100.0	
2	1.788	1.788	0.000	100351458	100.0	100.0	
RPD = 0.00							

4 PCB-1248

1	4.524	4.528	-0.004	4240796	100.0	109.9	
1	4.761	4.761	0.000	3730445	100.0	107.4	
1	4.858	4.861	-0.003	1949790	100.0	104.0	
1	5.541	5.541	0.000	2401447	100.0	104.8	
1	6.044	6.045	-0.001	1562529	100.0	103.5	

Average of Peak Amounts = 105.9

2	4.174	4.175	-0.001	8848809	100.0	109.3	
2	4.554	4.555	-0.001	5311539	100.0	113.1	
2	4.851	4.851	0.000	7421848	100.0	104.1	
2	4.991	4.991	0.000	8043947	100.0	111.7	
2	6.174	6.175	-0.001	5181312	100.0	113.7	

Average of Peak Amounts = 110.4

RPD = 4.11

S 8 Polychlorinated biphenyls, Total

1	105.9	
2	110.4	
RPD = 4.11		

Reagents:

AR_1248_L7_00018

Amount Added: 0.10

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:48

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290005.D

Injection Date: 29-Jan-2019 15:36:28

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD3

Worklist Smp#: 5

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

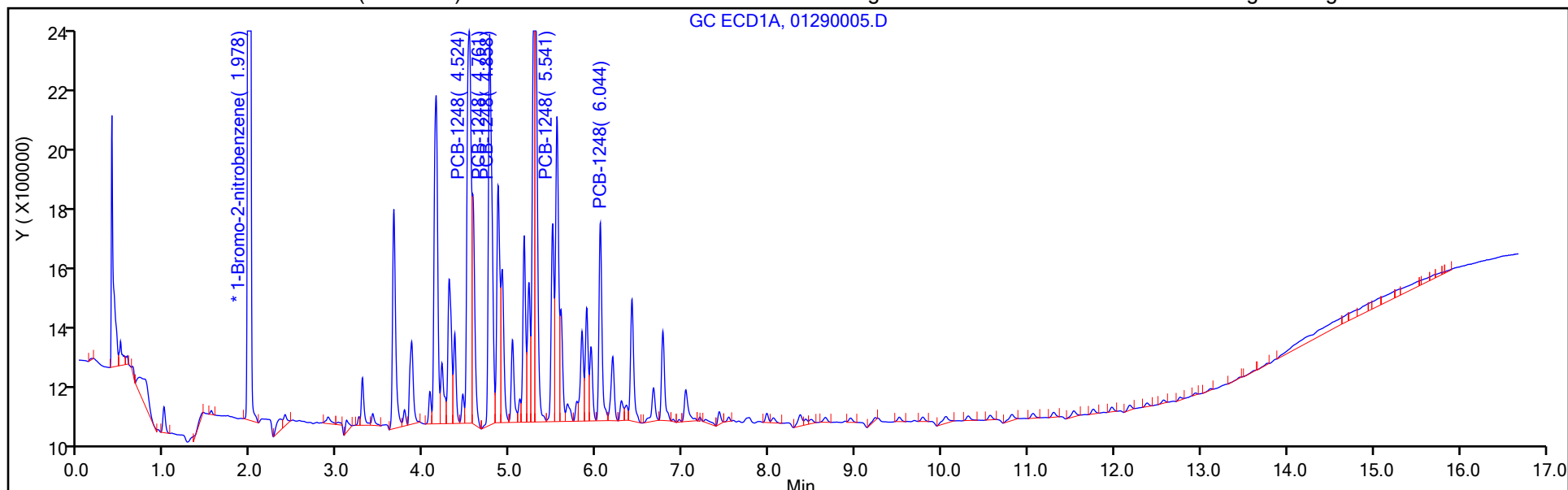
ALS Bottle#: 5

Method: 8082_J

Limit Group: GCSV - 8082 - IS

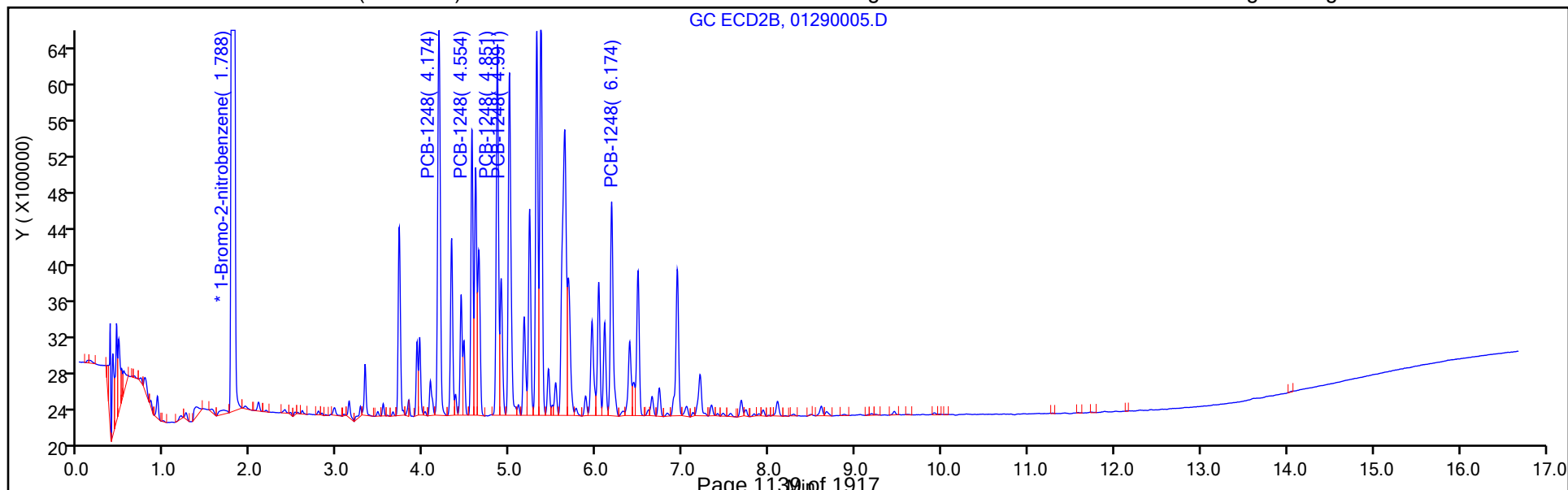
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290006.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 29-Jan-2019 15:57:37 ALS Bottle#: 6 Worklist Smp#: 6
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-006
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:46 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 10:20:52

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.975	0.000	17656818	100.0	100.0
2	1.789	1.788	0.001	104102185	100.0	100.0

RPD = 0.00

4 PCB-1248

1	4.525	4.528	-0.003	10590722	250.0	284.7	M
1	4.762	4.761	0.001	9286249	250.0	271.7	M
1	4.859	4.861	-0.002	5049650	250.0	265.9	
1	5.542	5.541	0.001	6522540	250.0	286.8	
1	6.045	6.045	0.000	4162761	250.0	271.0	

Average of Peak Amounts = 276.0

2	4.176	4.175	0.001	20829423	250.0	273.1	
2	4.556	4.555	0.001	12340855	250.0	283.3	
2	4.852	4.851	0.001	16893460	250.0	252.8	
2	4.992	4.991	0.001	18586781	250.0	277.2	
2	6.176	6.175	0.001	11892704	250.0	279.2	

Average of Peak Amounts = 273.1

RPD = 1.06

S 8 Polychlorinated biphenyls, Total

1						276.0	
2						273.1	

RPD = 1.06

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1248_L7_00018

Amount Added: 0.25

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290006.D

Injection Date: 29-Jan-2019 15:57:37

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 6

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

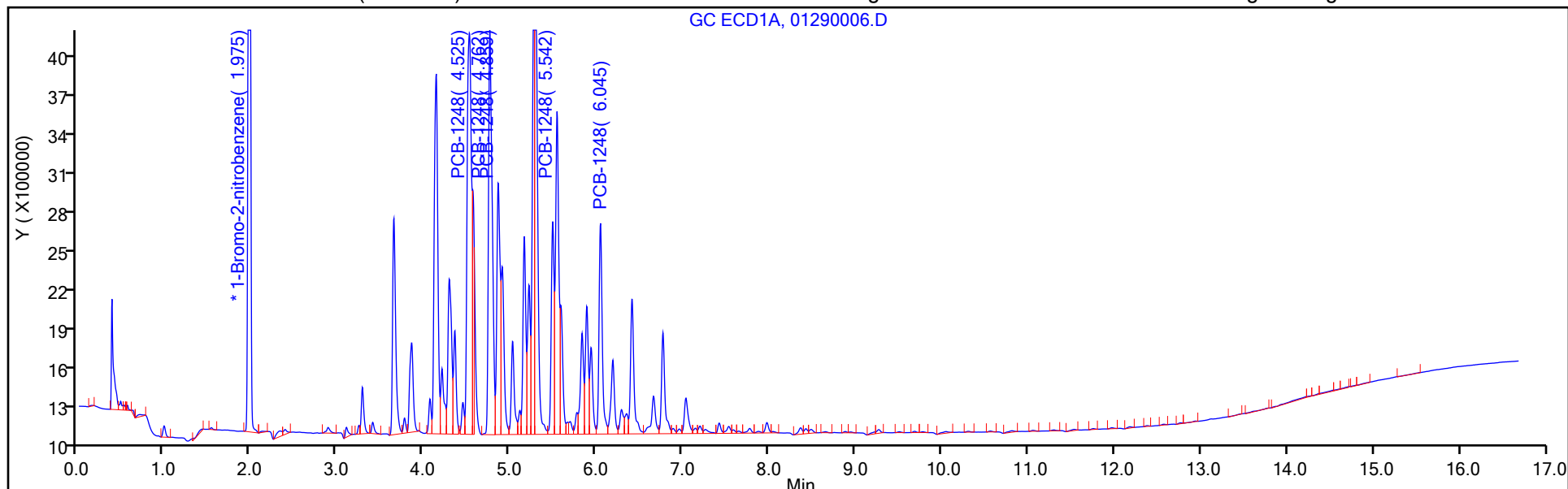
ALS Bottle#: 6

Method: 8082_J

Limit Group: GCSV - 8082 - IS

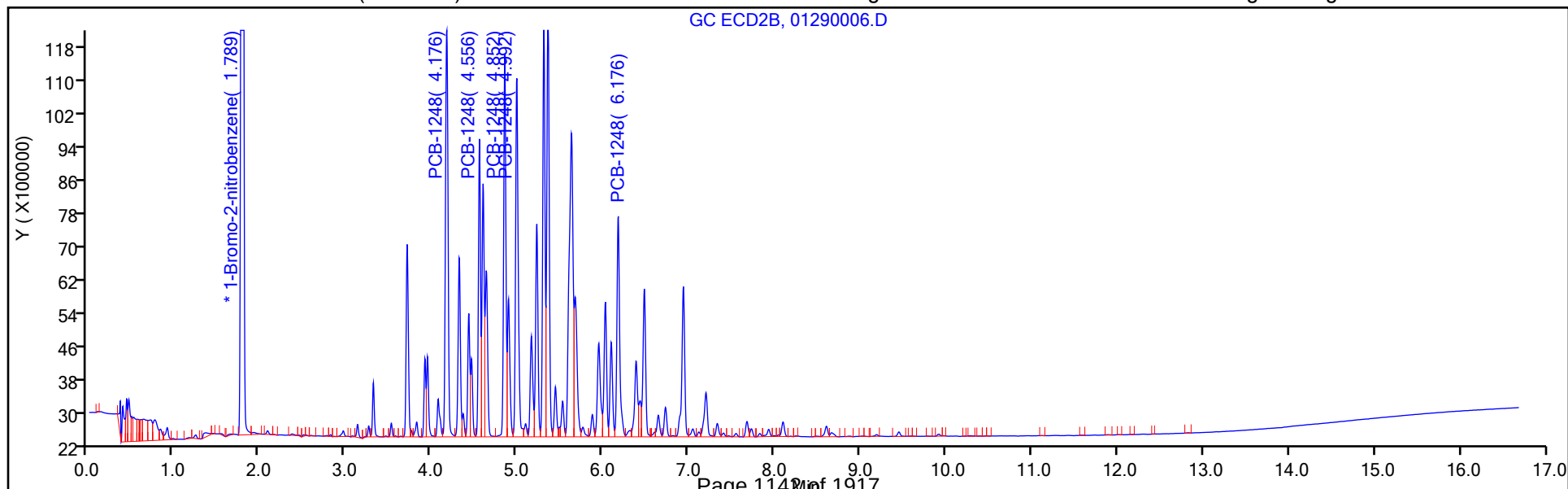
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290006.D

Injection Date: 29-Jan-2019 15:57:37

Instrument ID: SGC_J

Lims ID: STD4

Client ID:

Operator ID: TEM

ALS Bottle#: 6

Worklist Smp#: 6

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

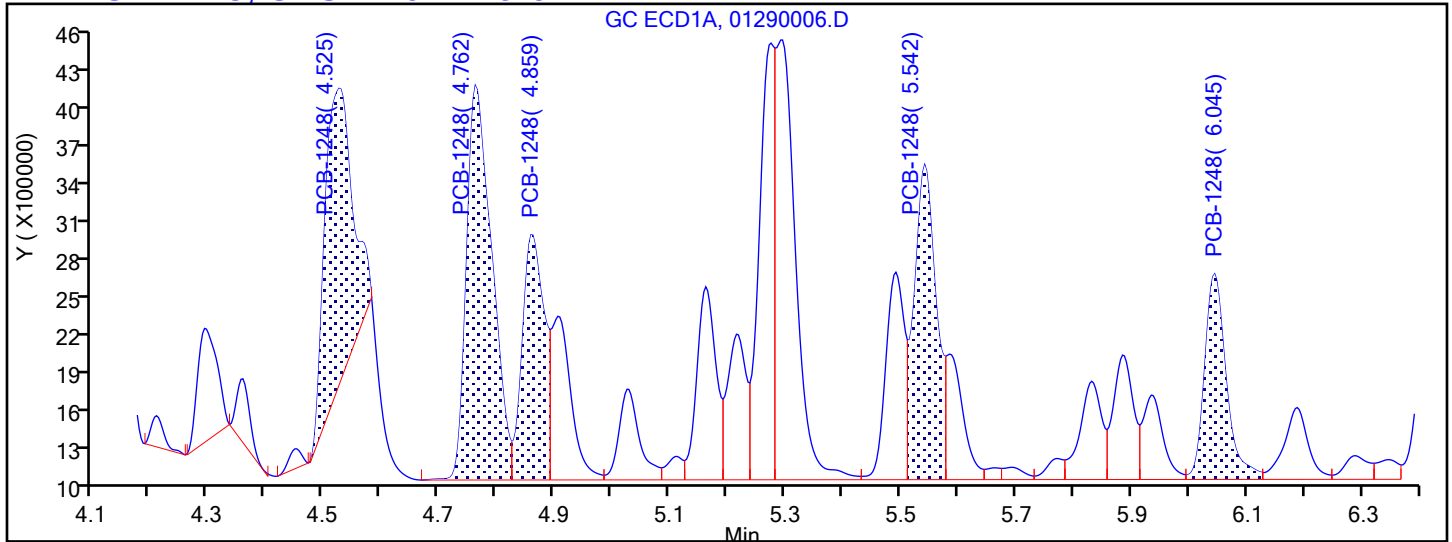
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

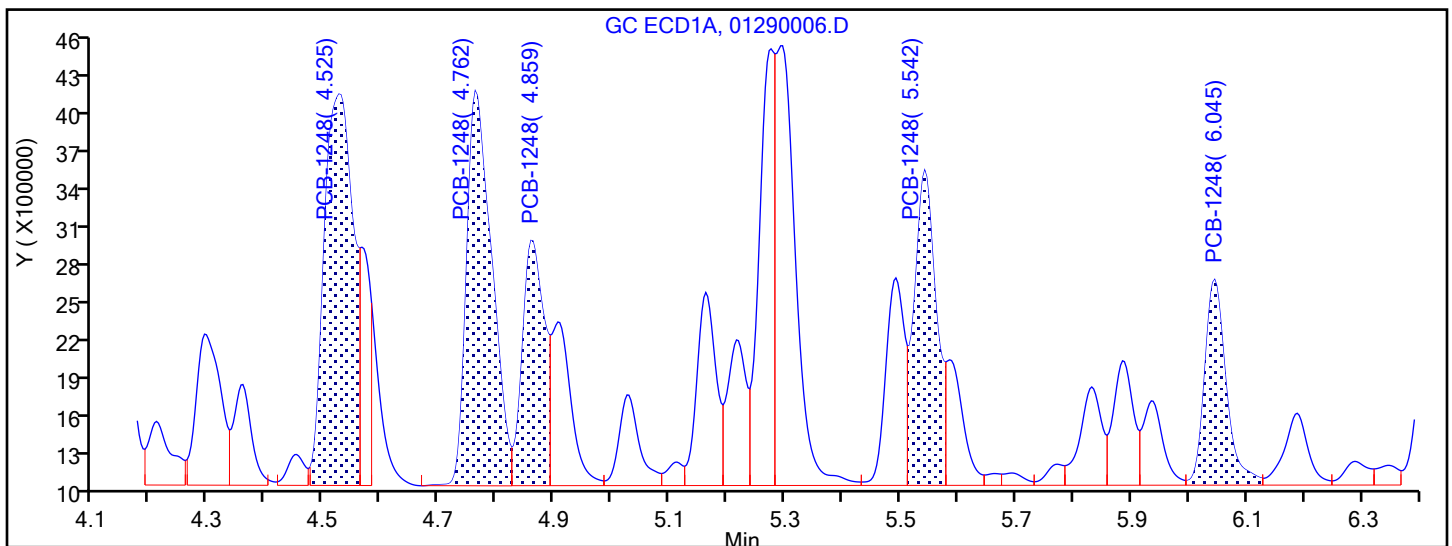
GC ECD1A

4 PCB-1248, CAS: 12672-29-6



Processing Integration Results

4.525	Response = 7722637
4.762	Response = 9283612
4.859	Response = 5049650
5.542	Response = 6522540
6.045	Response = 4162761



Manual Integration Results

4.525	Response = 10590722	M
4.762	Response = 9286249	M
4.859	Response = 5049650	
5.542	Response = 6522540	
6.045	Response = 4162761	

Reviewer: mooret, 30-Jan-2019 11:44:26

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
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TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290007.D
 Lims ID: STD5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 29-Jan-2019 16:18:40 ALS Bottle#: 7 Worklist Smp#: 7
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-007
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:43 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:22:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.975	0.000	17694680	100.0	100.0
2	1.788	1.788	0.000	103772524	100.0	100.0

RPD = 0.00

4 PCB-1248

M

1	4.528	4.528	0.000	18857597	500.0	518.0	M
1	4.761	4.761	0.000	17551899	500.0	522.4	
1	4.861	4.861	0.000	9676529	500.0	513.1	
1	5.541	5.541	0.000	11855327	500.0	527.4	
1	6.045	6.045	0.000	7933541	500.0	519.4	

Average of Peak Amounts = 520.1

2	4.175	4.175	0.000	38272064	500.0	520.1
2	4.555	4.555	0.000	22021490	500.0	526.3
2	4.851	4.851	0.000	30313300	500.0	492.4
2	4.991	4.991	0.000	33411377	500.0	518.6
2	6.175	6.175	0.000	21533148	500.0	525.8

Average of Peak Amounts = 516.6

RPD = 0.67

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1248_L7_00018

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:44

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290007.D

Injection Date: 29-Jan-2019 16:18:40

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 7

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

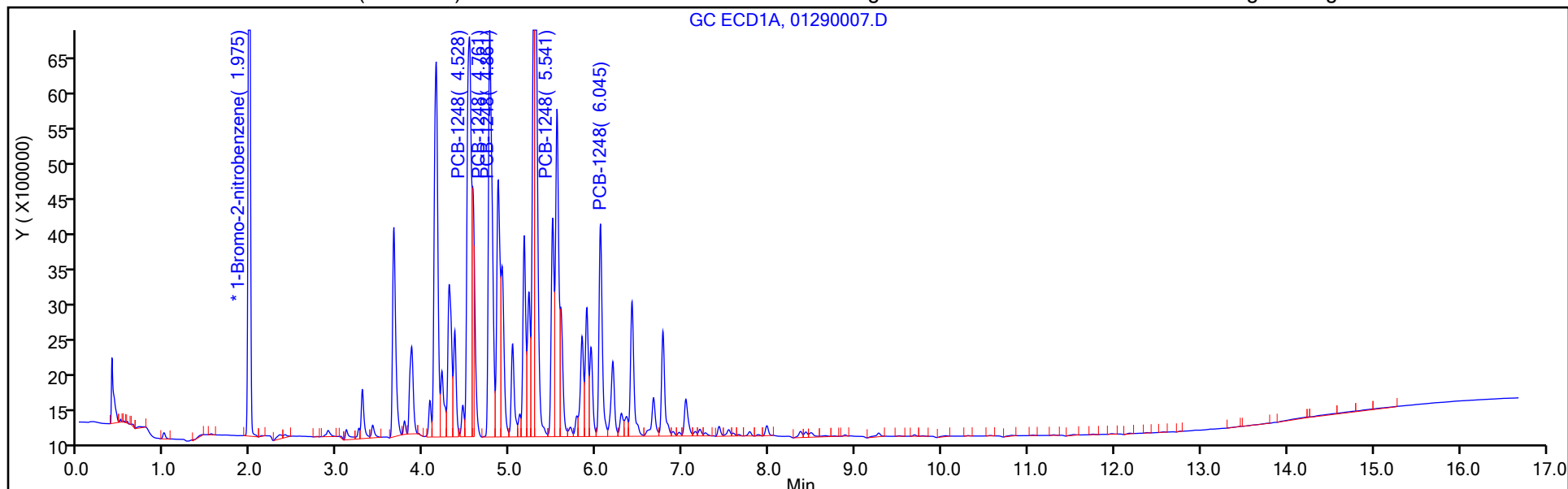
ALS Bottle#: 7

Method: 8082_J

Limit Group: GCSV - 8082 - IS

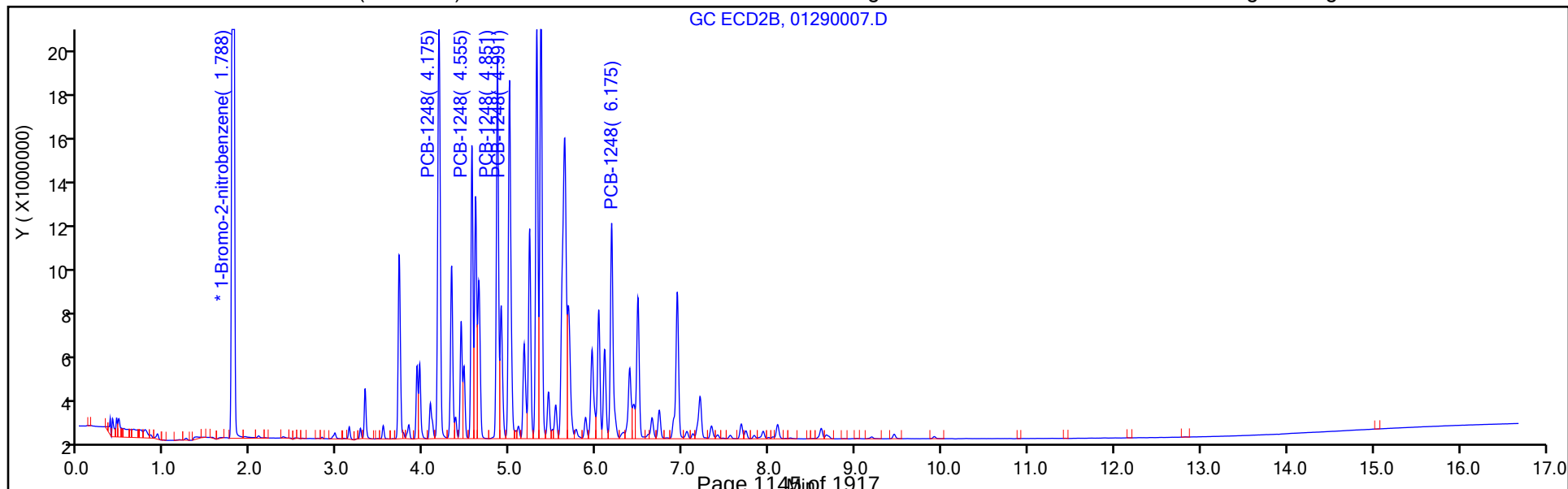
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290007.D

Injection Date: 29-Jan-2019 16:18:40

Instrument ID: SGC_J

Lims ID: STD5

Client ID:

Operator ID: TEM

ALS Bottle#: 7

Worklist Smp#: 7

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

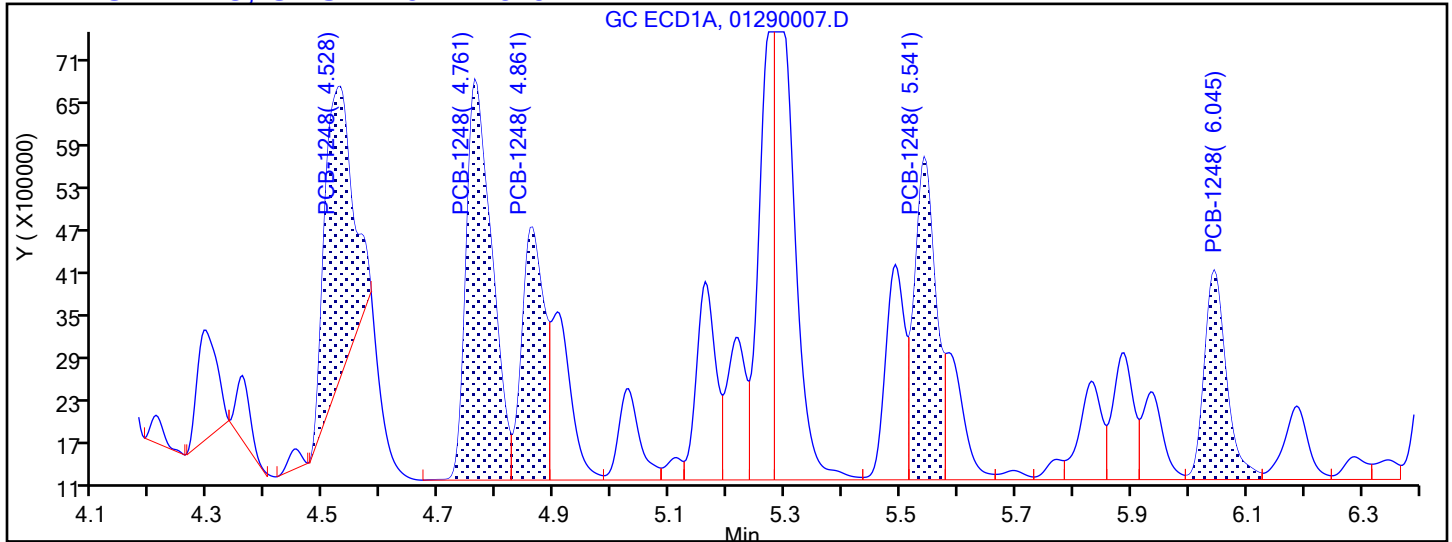
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

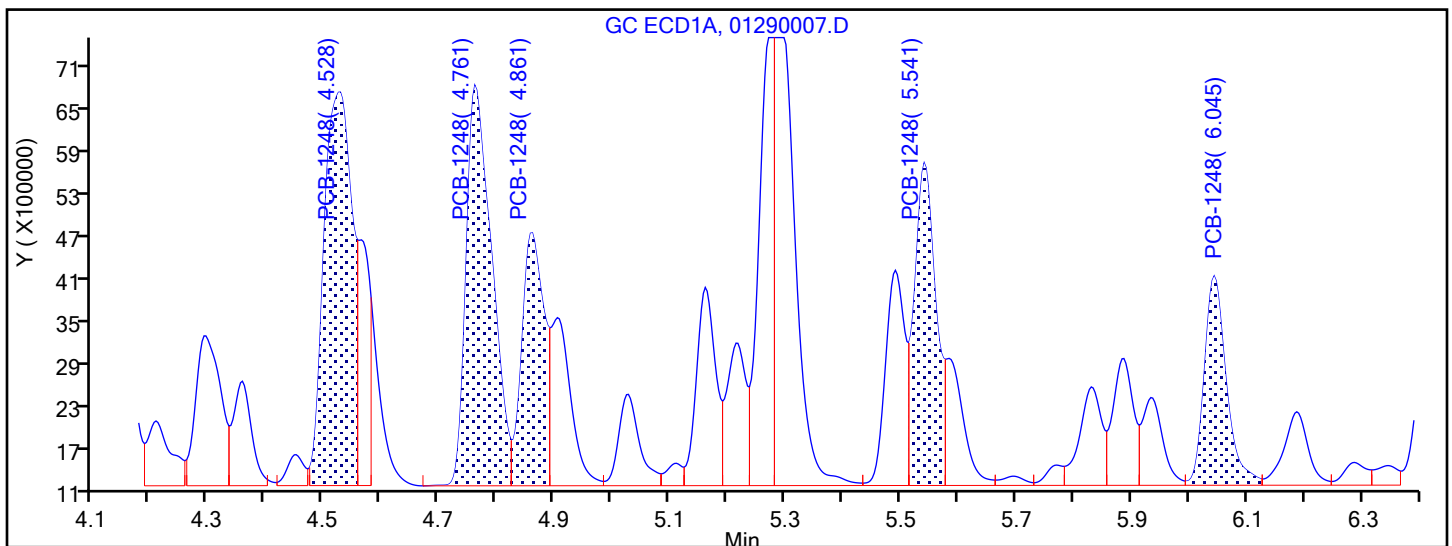
GC ECD1A

4 PCB-1248, CAS: 12672-29-6



Processing Integration Results

4.528	Response = 14154129
4.761	Response = 17551899
4.861	Response = 9676529
5.541	Response = 11855327
6.045	Response = 7933541



Manual Integration Results

4.528	Response = 18857597
4.761	Response = 17551899
4.861	Response = 9676529
5.541	Response = 11855327
6.045	Response = 7933541

M

Reviewer: mooret, 30-Jan-2019 11:45:02

Audit Action: Split an Integrated Peak

Audit Reason: Baseline Smoothing
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TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290008.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 29-Jan-2019 16:39:43 ALS Bottle#: 8 Worklist Smp#: 8
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-008
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:40 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:36:47

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.977	-0.001	18406030	100.0	100.0
2	1.789	1.791	-0.002	106858223	100.0	100.0

RPD = 0.00

4 PCB-1248

1	4.526	4.528	-0.002	27736945	750.0	739.0	M
1	4.762	4.761	0.001	25906293	750.0	746.0	
1	4.859	4.861	-0.002	14594133	750.0	746.4	
1	5.539	5.541	-0.002	17442778	750.0	749.6	
1	6.046	6.045	0.001	11771745	750.0	742.8	

Average of Peak Amounts = 744.8

2	4.172	4.175	-0.003	56286634	750.0	751.3	
2	4.556	4.555	0.001	31814524	750.0	748.1	
2	4.852	4.851	0.001	43474403	750.0	732.9	
2	4.989	4.991	-0.002	48741818	750.0	744.3	
2	6.172	6.175	-0.003	30729957	750.0	737.5	

Average of Peak Amounts = 742.8

RPD = 0.26

S 8 Polychlorinated biphenyls, Total

1						744.8	
2						742.8	

RPD = 0.26

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1248_L7_00018

Amount Added: 0.75

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290008.D

Injection Date: 29-Jan-2019 16:39:43

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 8

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

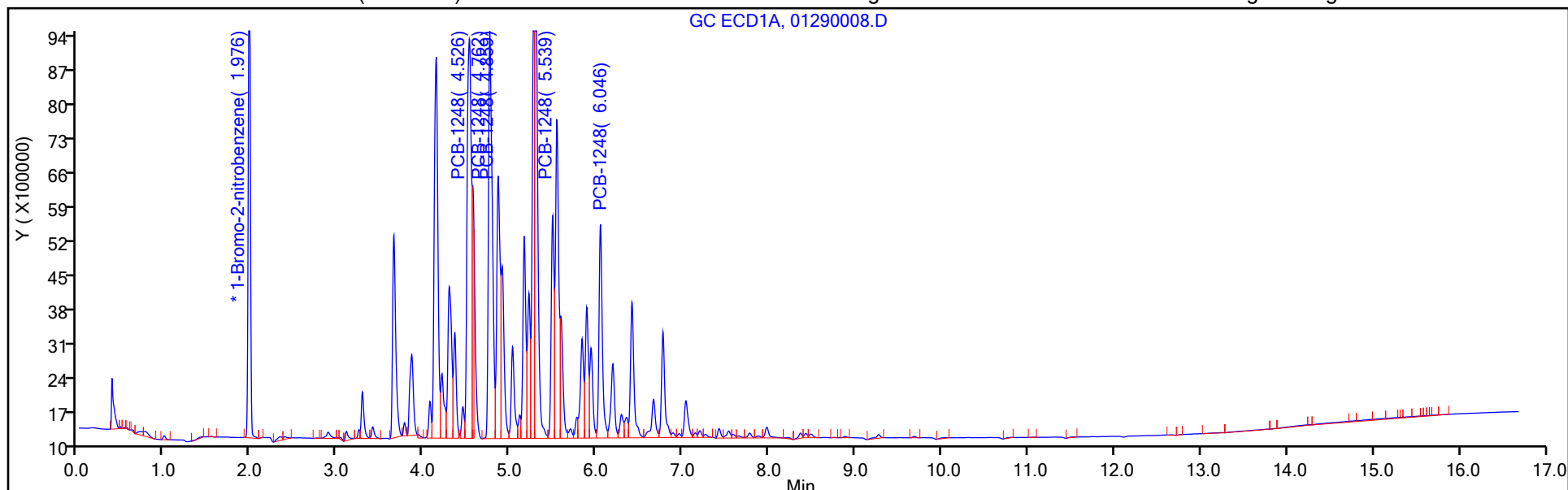
ALS Bottle#: 8

Method: 8082_J

Limit Group: GCSV - 8082 - IS

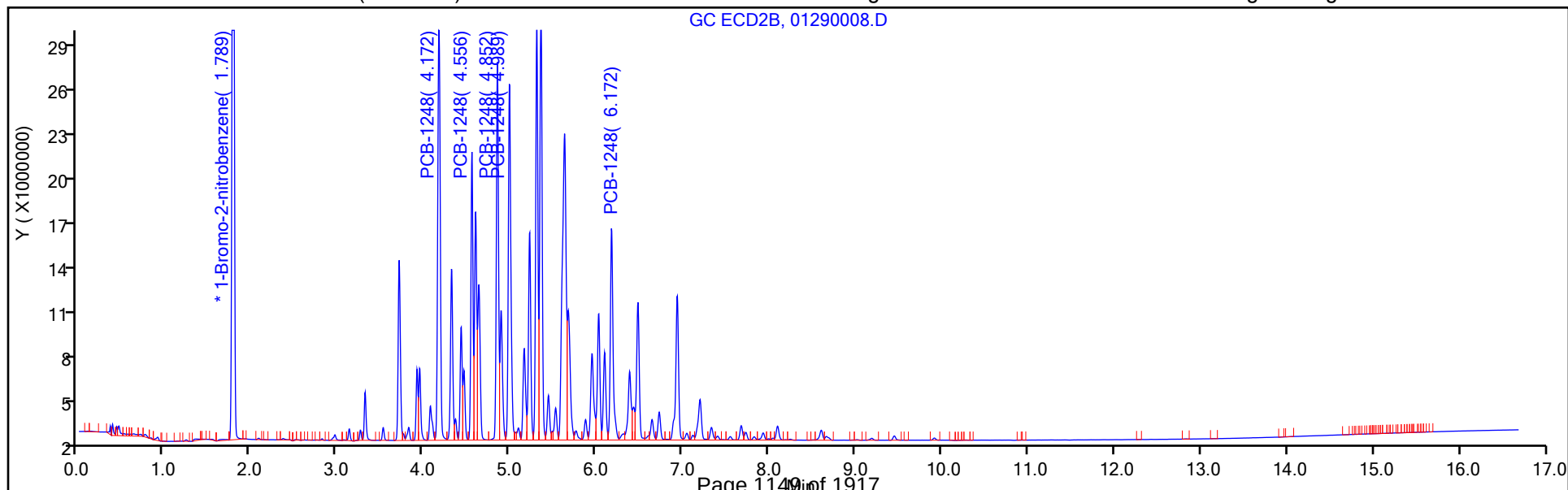
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290008.D

Injection Date: 29-Jan-2019 16:39:43

Instrument ID: SGC_J

Lims ID: STD6

Client ID:

Operator ID: TEM

ALS Bottle#: 8

Worklist Smp#: 8

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

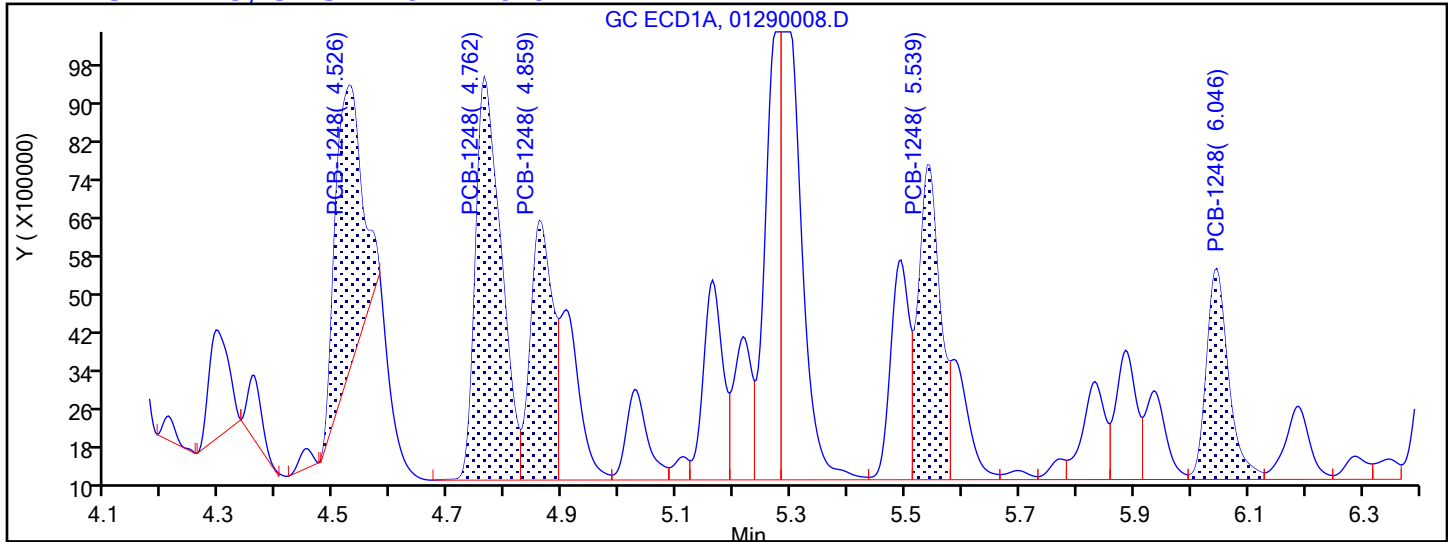
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

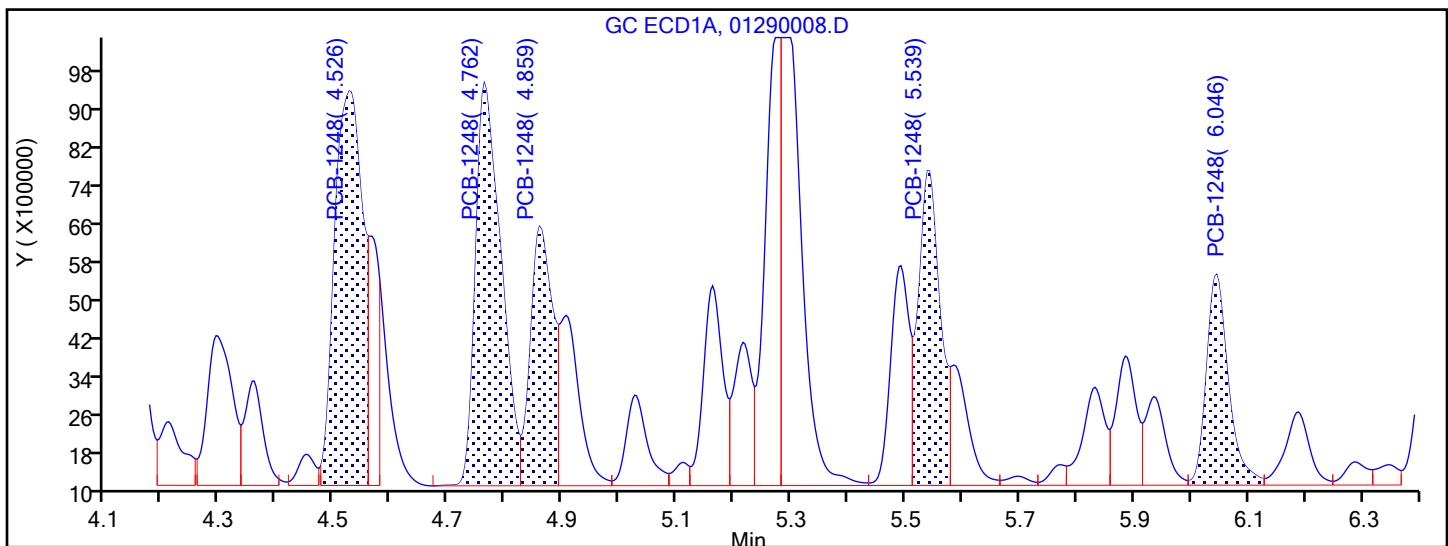
GC ECD1A

4 PCB-1248, CAS: 12672-29-6



Processing Integration Results

4.526	Response = 19300669
4.762	Response = 25906293
4.859	Response = 14594133
5.539	Response = 17442778
6.046	Response = 11771745



Manual Integration Results

4.526	Response = 27736945	M
4.762	Response = 25906293	
4.859	Response = 14594133	
5.539	Response = 17442778	
6.046	Response = 11771745	

Reviewer: mooret, 30-Jan-2019 11:46:54

Audit Action: Split an Integrated Peak

Audit Reason: Baseline Smoothing
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TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290009.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 29-Jan-2019 17:00:54 ALS Bottle#: 9 Worklist Smp#: 9
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-009
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:38 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:31:10

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.977	0.000	18544340	100.0	100.0	
2	1.788	1.791	-0.003	107714909	100.0	100.0	
RPD = 0.00							

4 PCB-1248

1	4.527	4.528	-0.001	35853709	1000.0	952.6	M
1	4.764	4.761	0.003	33304383	1000.0	955.0	M
1	4.861	4.861	0.000	19127578	1000.0	972.5	
1	5.541	5.541	0.000	21903990	1000.0	936.5	
1	6.044	6.045	-0.001	15423807	1000.0	967.3	
Average of Peak Amounts =						956.8	
2	4.174	4.175	-0.001	71321502	1000.0	949.5	
2	4.554	4.555	-0.001	39804527	1000.0	934.4	
2	4.851	4.851	0.000	56321052	1000.0	1018.6	
2	4.991	4.991	0.000	62401335	1000.0	951.6	
2	6.174	6.175	-0.001	39545554	1000.0	947.8	
Average of Peak Amounts =						960.4	
RPD = 0.37							

S 8 Polychlorinated biphenyls, Total

1	956.8	
2	960.4	
RPD = 0.37		

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1248_L7_00018

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:38

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290009.D

Injection Date: 29-Jan-2019 17:00:54

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 9

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

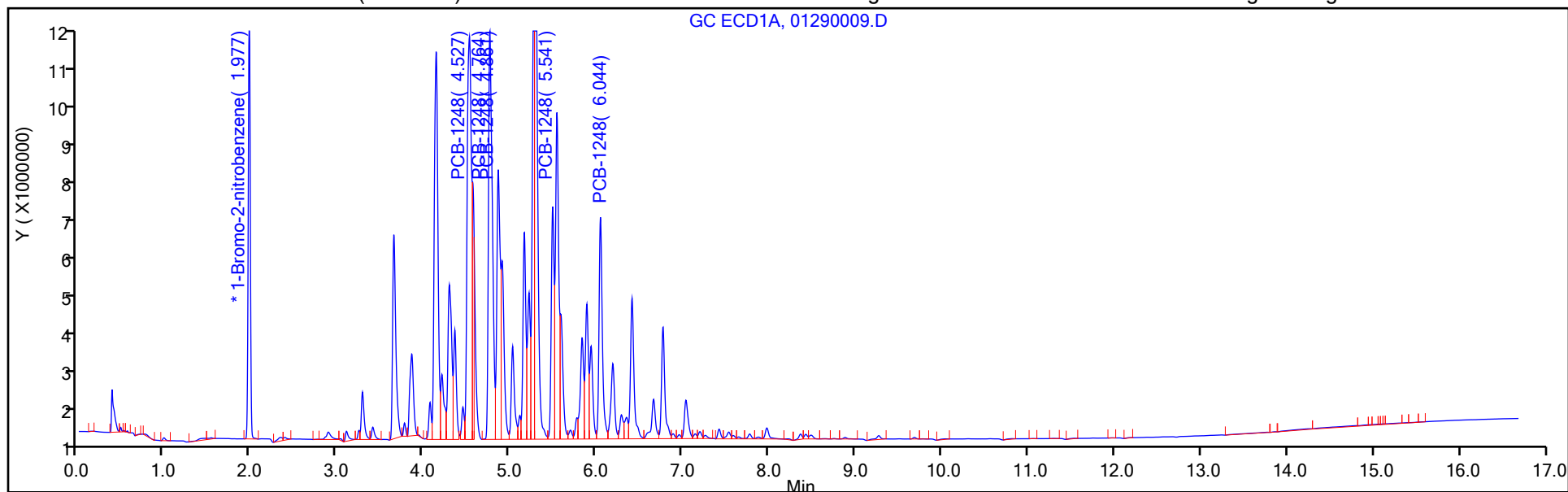
ALS Bottle#: 9

Method: 8082_J

Limit Group: GCSV - 8082 - IS

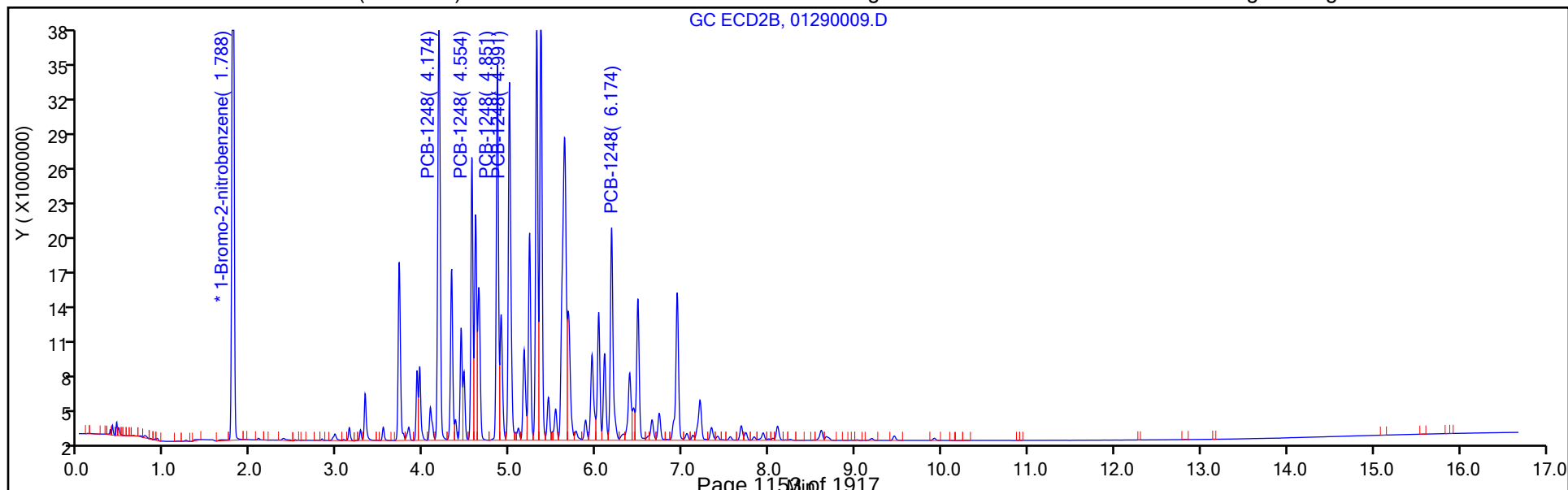
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290009.D

Injection Date: 29-Jan-2019 17:00:54

Instrument ID: SGC_J

Lims ID: STD7

Client ID:

Operator ID: TEM

ALS Bottle#: 9

Worklist Smp#: 9

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

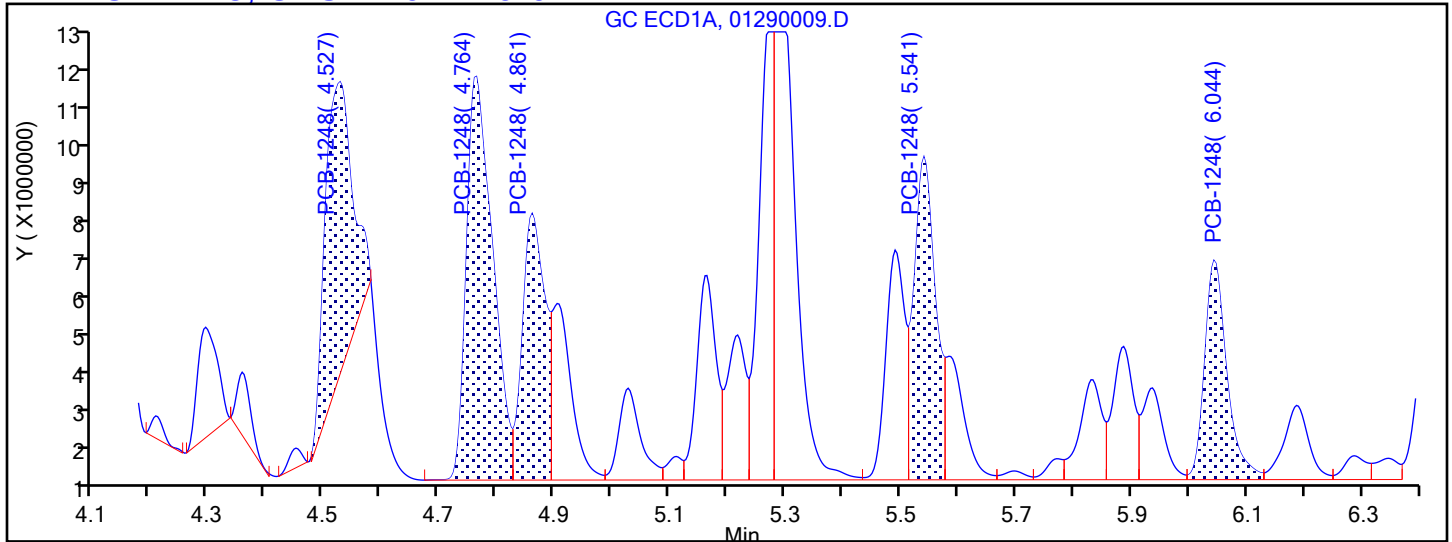
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

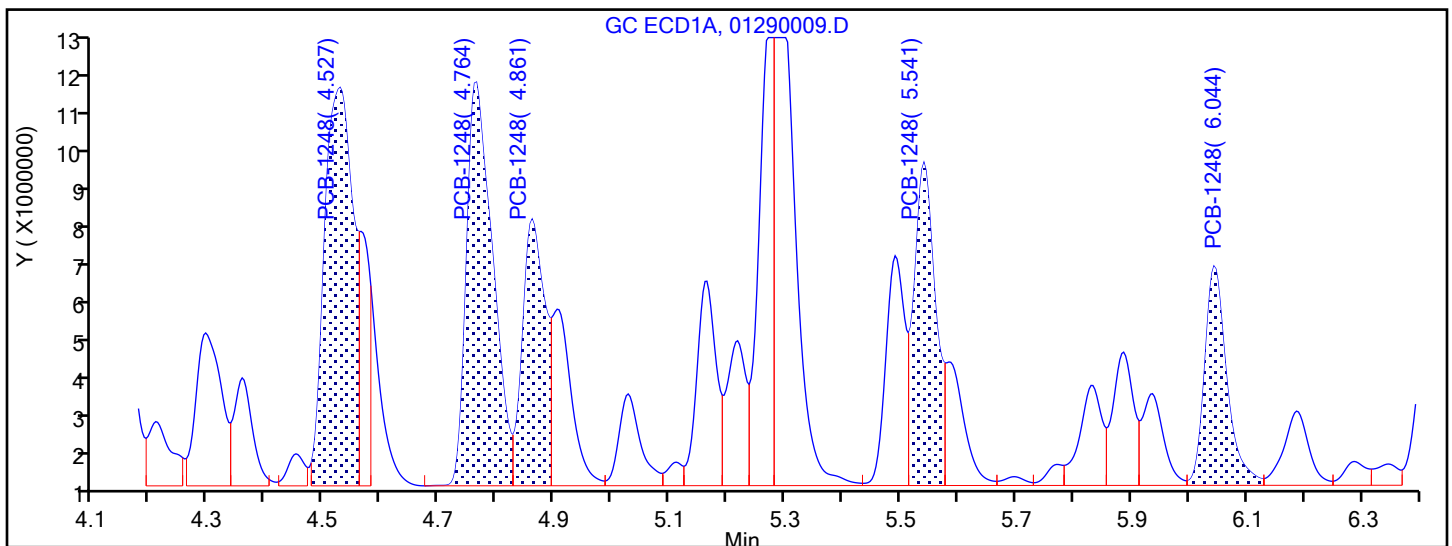
GC ECD1A

4 PCB-1248, CAS: 12672-29-6



Processing Integration Results

4.527	Response = 25647822
4.764	Response = 33304383
4.861	Response = 19127578
5.541	Response = 21903990
6.044	Response = 15423807



Manual Integration Results

4.527	Response = 35853709
4.764	Response = 33304383
4.861	Response = 19127578
5.541	Response = 21903990
6.044	Response = 15423807

M

Reviewer: mooret, 30-Jan-2019 12:40:48

Audit Action: Split an Integrated Peak

Audit Reason: Baseline Smoothing
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FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 14:54 Calibration End Date: 01/29/2019 17:00 Calibration ID: 35084

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/3	01290003.D
Level 2	STD2 280-445745/4	01290004.D
Level 3	STD3 280-445745/5	01290005.D
Level 4	STD4 280-445745/6	01290006.D
Level 5	STD5 280-445745/7	01290007.D
Level 6	STD6 280-445745/8	01290008.D
Level 7	STD7 280-445745/9	01290009.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
PCB-1248 Peak 1	0.1072 0.0702	0.0986 0.0662	0.0882	0.0800	0.0738	Lin1	1.3539	0.0683							0.9960		0.9900
PCB-1248 Peak 2	0.0646 0.0397	0.0588 0.0370	0.0529	0.0474	0.0424	Lin1	0.9318	0.0386							0.9930		0.9900
PCB-1248 Peak 3	0.0925 0.0542	0.0845 0.0523	0.0740	0.0649	0.0584	Qua1	0.8600	0.0642	-0.000013						0.9990		0.9900
PCB-1248 Peak 4	0.0981 0.0608	0.0913 0.0579	0.0802	0.0714	0.0644	Lin1	1.3792	0.0594							0.9950		0.9900
PCB-1248 Peak 5	0.0606 0.0383	0.0579 0.0367	0.0516	0.0457	0.0415	Lin1	0.8637	0.0378							0.9940		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 14:54 Calibration End Date: 01/29/2019 17:00 Calibration ID: 35084

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/3	01290003.D
Level 2	STD2 280-445745/4	01290004.D
Level 3	STD3 280-445745/5	01290005.D
Level 4	STD4 280-445745/6	01290006.D
Level 5	STD5 280-445745/7	01290007.D
Level 6	STD6 280-445745/8	01290008.D
Level 7	STD7 280-445745/9	01290009.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1248 Peak 1	BNB	Lin1	2748219 56286634	4949630 71321502	8848809	20829423	38272064	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 2	BNB	Lin1	1657466 31814524	2949575 39804527	5311539	12340855	22021490	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 3	BNB	Qual	2371071 43474403	4239416 56321052	7421848	16893460	30313300	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 4	BNB	Lin1	2513977 48741818	4580946 62401335	8043947	18586781	33411377	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 5	BNB	Lin1	1553798 30729957	2907338 39545554	5181312	11892704	21533148	25.0 750	50.0 1000	100	250	500

Curve Type Legend:

Lin1 = Linear 1/conc ISTD
Qual = Quadratic 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290003.D
 Lims ID: STD1 1248
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 29-Jan-2019 14:54:21 ALS Bottle#: 3 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 1248
 Misc. Info.: 280-0078470-003
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:52 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 10:24:44

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.975	0.001	16982149	100.0	100.0	
2	1.790	1.788	0.002	102558174	100.0	100.0	
						RPD = 0.00	

4 PCB-1248

1	4.523	4.528	-0.005	1163827	25.0	18.6	
1	4.759	4.761	-0.002	981347	25.0	19.8	
1	4.859	4.861	-0.002	487917	25.0	22.0	
1	5.543	5.541	0.002	629616	25.0	20.8	
1	6.043	6.045	-0.002	401944	25.0	23.3	
Average of Peak Amounts =						20.9	
2	4.173	4.175	-0.002	2748219	25.0	19.4	
2	4.556	4.555	0.001	1657466	25.0	17.8	
2	4.850	4.851	-0.001	2371071	25.0	22.7	
2	4.990	4.991	-0.001	2513977	25.0	18.0	
2	6.173	6.175	-0.002	1553798	25.0	17.2	
Average of Peak Amounts =						19.0	

RPD = 9.45

S 8 Polychlorinated biphenyls, Total

1						20.9	
2						19.0	
						RPD = 9.45	

Reagents:

AR_1248_L7_00018

Amount Added: 0.03

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:53

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290003.D

Injection Date: 29-Jan-2019 14:54:21

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD1 1248

Worklist Smp#: 3

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

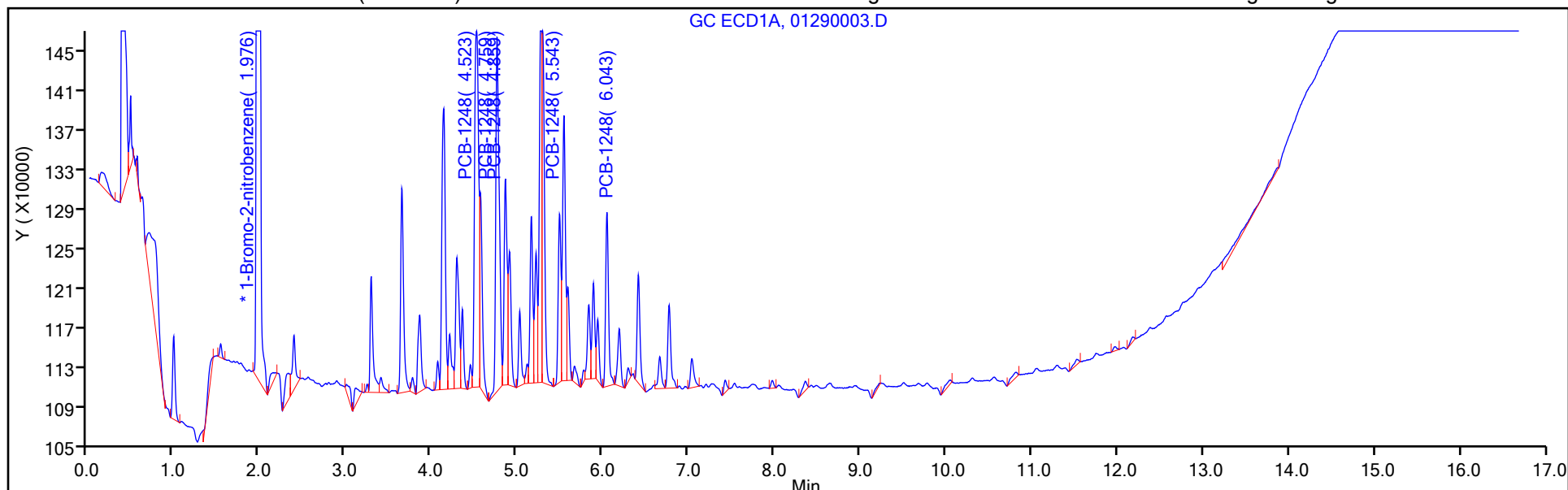
ALS Bottle#: 3

Method: 8082_J

Limit Group: GCSV - 8082 - IS

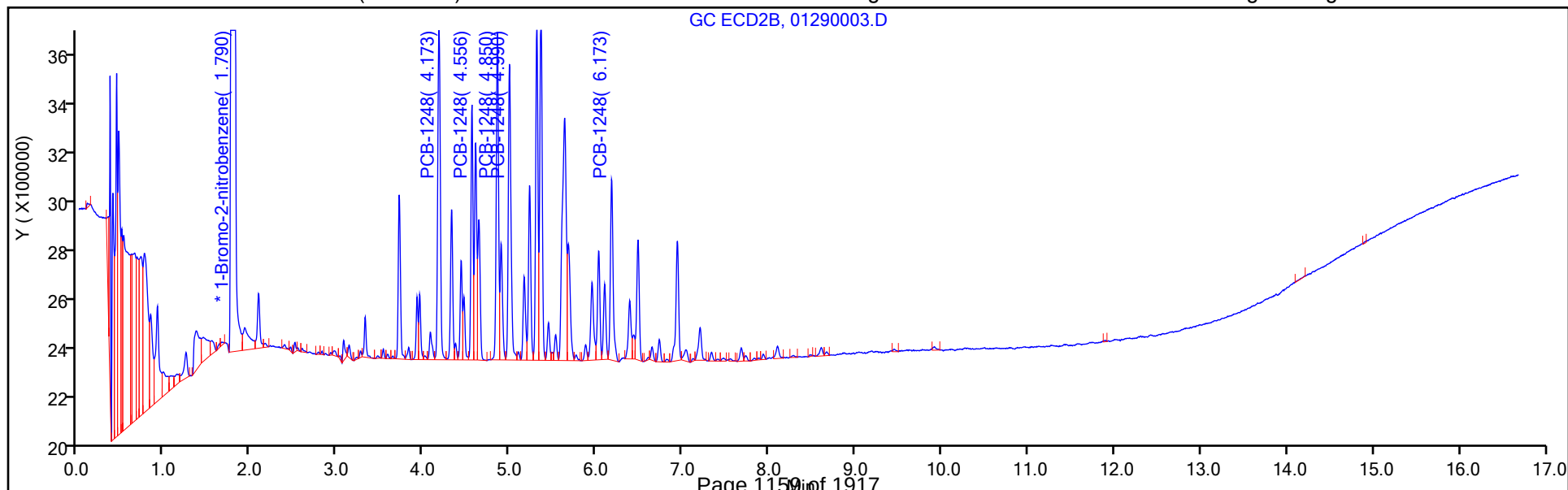
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290004.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 29-Jan-2019 15:15:24 ALS Bottle#: 4 Worklist Smp#: 4
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-004
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:50 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:19:15

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.975	0.002	16736886	100.0	100.0	
2	1.790	1.788	0.002	100380199	100.0	100.0	
						RPD = 0.00	

4 PCB-1248

1	4.524	4.528	-0.004	2266683	50.0	52.1	
1	4.760	4.761	-0.001	1985725	50.0	52.6	
1	4.857	4.861	-0.004	995524	50.0	51.1	
1	5.540	5.541	-0.001	1209560	50.0	49.0	
1	6.043	6.045	-0.002	745755	50.0	47.7	

Average of Peak Amounts = 50.5

2	4.174	4.175	-0.001	4949630	50.0	52.4	
2	4.557	4.555	0.002	2949575	50.0	52.1	
2	4.850	4.851	-0.001	4239416	50.0	53.0	
2	4.990	4.991	-0.001	4580946	50.0	53.6	
2	6.174	6.175	-0.001	2907338	50.0	53.7	

Average of Peak Amounts = 52.9

RPD = 4.71

S 8 Polychlorinated biphenyls, Total

1	50.5	
2	52.9	
		RPD = 4.71

Reagents:

AR_1248_L7_00018

Amount Added: 0.05

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:51

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290004.D

Injection Date: 29-Jan-2019 15:15:24

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 4

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

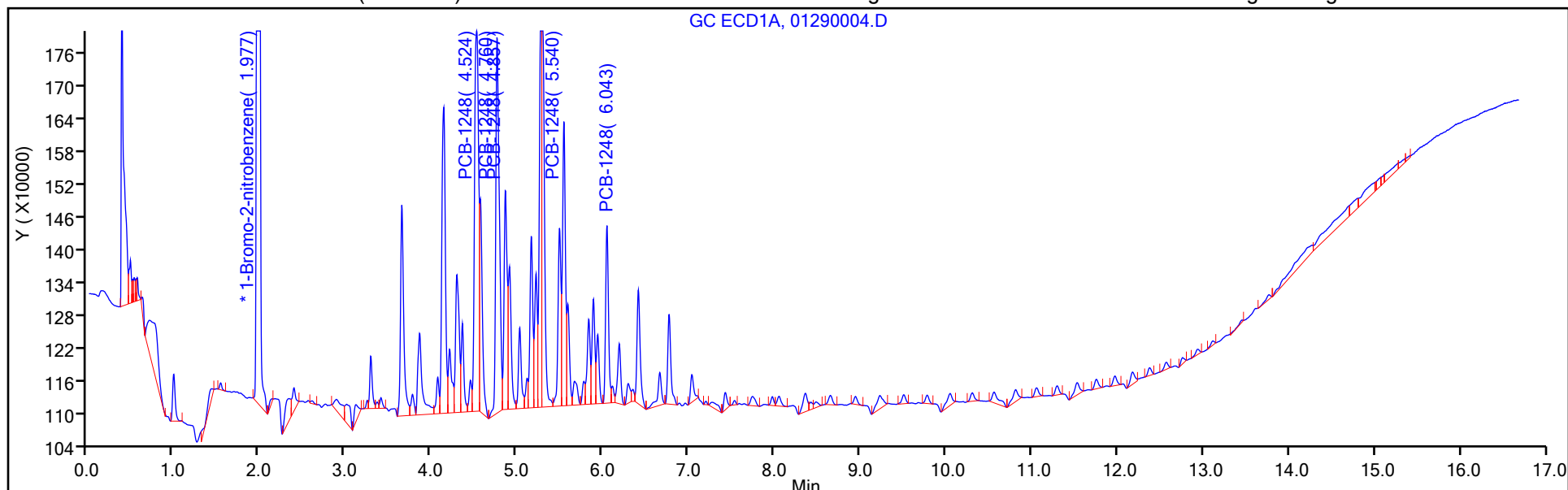
ALS Bottle#: 4

Method: 8082_J

Limit Group: GCSV - 8082 - IS

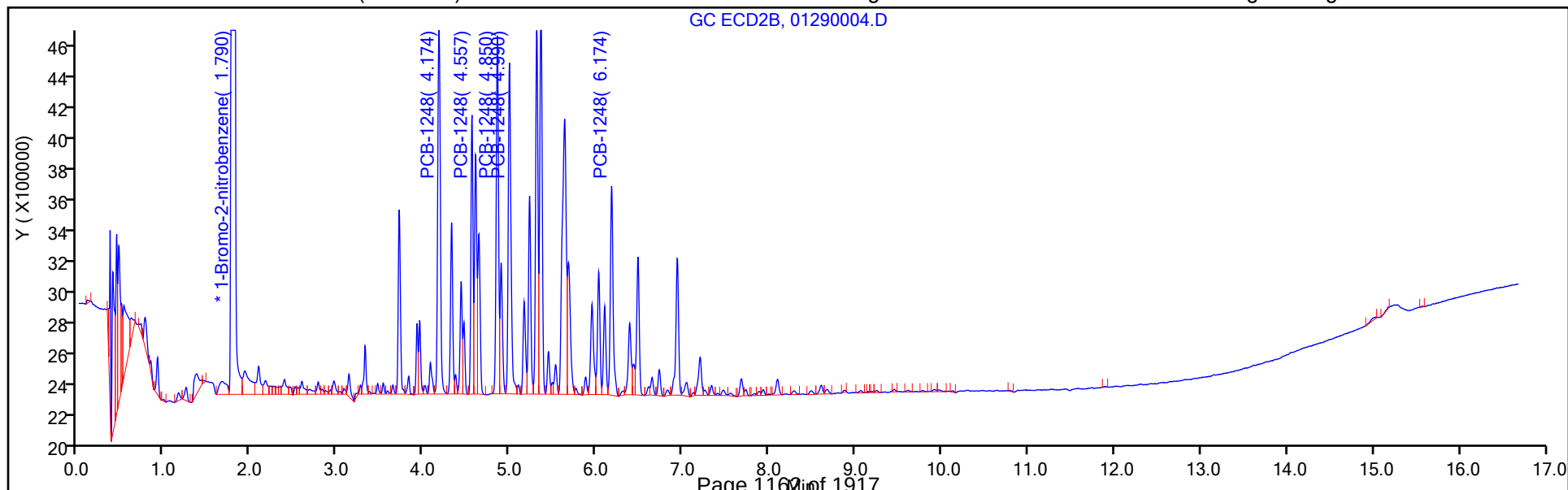
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290005.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 29-Jan-2019 15:36:28 ALS Bottle#: 5 Worklist Smp#: 5
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-005
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:48 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:19:29

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.975	0.003	16917073	100.0	100.0	
2	1.788	1.788	0.000	100351458	100.0	100.0	
						RPD = 0.00	

4 PCB-1248

1	4.524	4.528	-0.004	4240796	100.0	109.9	
1	4.761	4.761	0.000	3730445	100.0	107.4	
1	4.858	4.861	-0.003	1949790	100.0	104.0	
1	5.541	5.541	0.000	2401447	100.0	104.8	
1	6.044	6.045	-0.001	1562529	100.0	103.5	
Average of Peak Amounts =						105.9	
2	4.174	4.175	-0.001	8848809	100.0	109.3	
2	4.554	4.555	-0.001	5311539	100.0	113.1	
2	4.851	4.851	0.000	7421848	100.0	104.1	
2	4.991	4.991	0.000	8043947	100.0	111.7	
2	6.174	6.175	-0.001	5181312	100.0	113.7	
Average of Peak Amounts =						110.4	

RPD = 4.11

S 8 Polychlorinated biphenyls, Total

1	105.9	
2	110.4	
		RPD = 4.11

Reagents:

AR_1248_L7_00018

Amount Added: 0.10

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:48

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290005.D

Injection Date: 29-Jan-2019 15:36:28

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD3

Worklist Smp#: 5

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

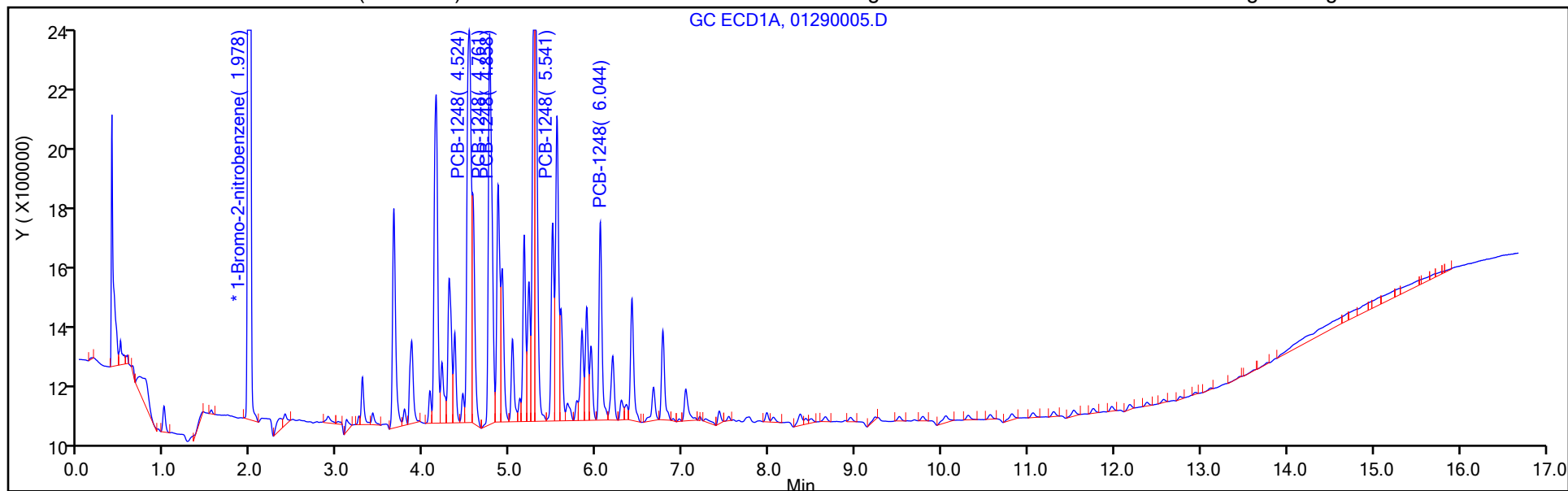
ALS Bottle#: 5

Method: 8082_J

Limit Group: GCSV - 8082 - IS

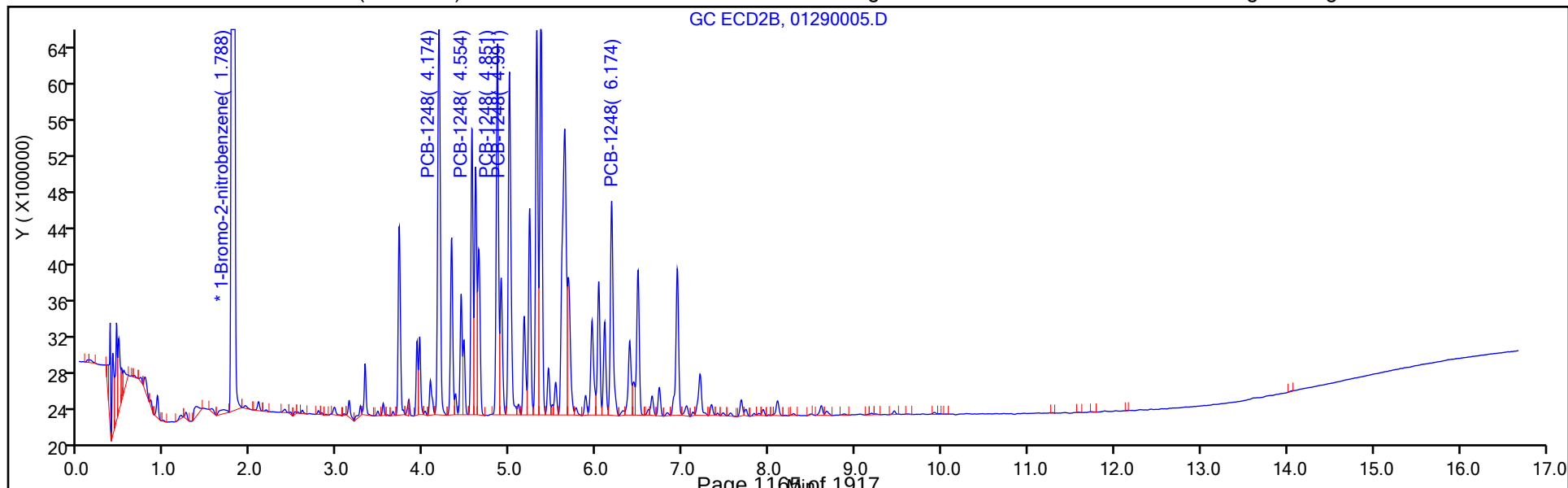
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290006.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 29-Jan-2019 15:57:37 ALS Bottle#: 6 Worklist Smp#: 6
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-006
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:46 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 10:20:52

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.975	0.000	17656818	100.0	100.0
2	1.789	1.788	0.001	104102185	100.0	100.0

RPD = 0.00

4 PCB-1248

1	4.525	4.528	-0.003	10590722	250.0	284.7	M
1	4.762	4.761	0.001	9286249	250.0	271.7	M
1	4.859	4.861	-0.002	5049650	250.0	265.9	
1	5.542	5.541	0.001	6522540	250.0	286.8	
1	6.045	6.045	0.000	4162761	250.0	271.0	

Average of Peak Amounts = 276.0

2	4.176	4.175	0.001	20829423	250.0	273.1	
2	4.556	4.555	0.001	12340855	250.0	283.3	
2	4.852	4.851	0.001	16893460	250.0	252.8	
2	4.992	4.991	0.001	18586781	250.0	277.2	
2	6.176	6.175	0.001	11892704	250.0	279.2	

Average of Peak Amounts = 273.1

RPD = 1.06

S 8 Polychlorinated biphenyls, Total

1						276.0	
2						273.1	

RPD = 1.06

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1248_L7_00018

Amount Added: 0.25

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:46

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290006.D

Injection Date: 29-Jan-2019 15:57:37

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 6

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

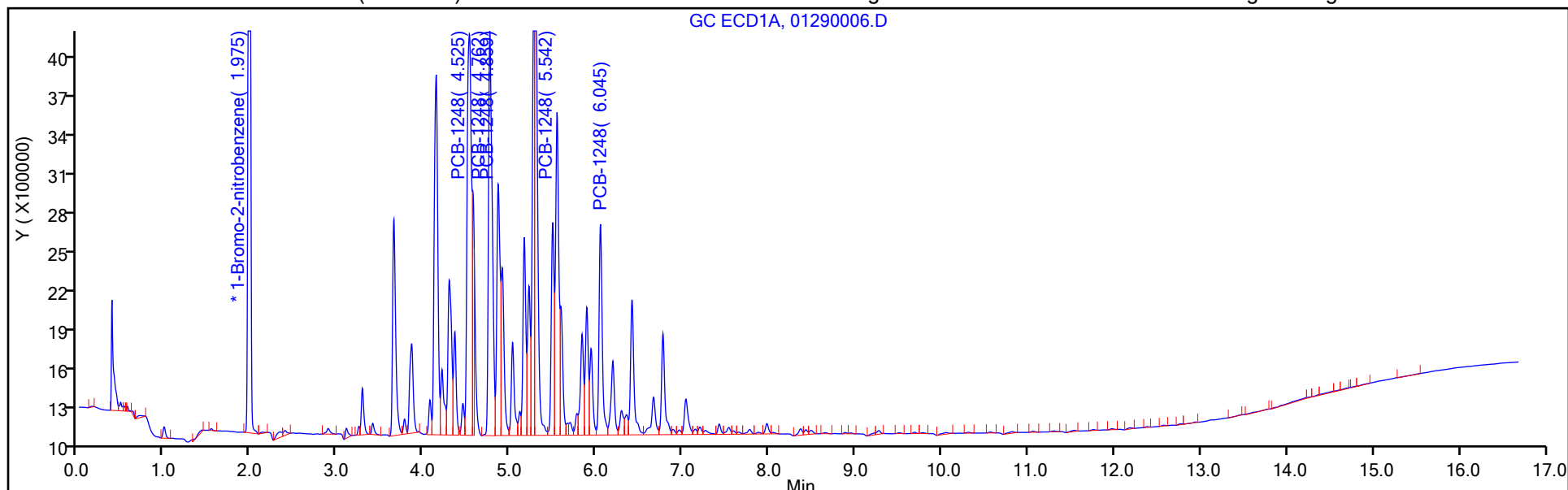
ALS Bottle#: 6

Method: 8082_J

Limit Group: GCSV - 8082 - IS

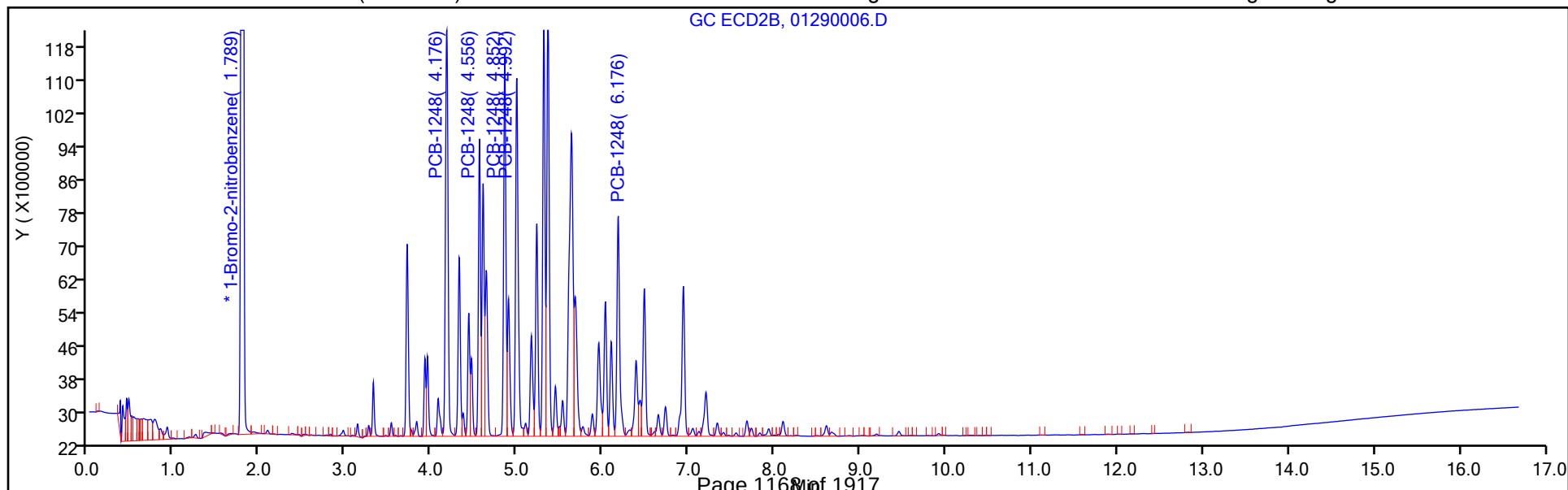
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290007.D
 Lims ID: STD5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 29-Jan-2019 16:18:40 ALS Bottle#: 7 Worklist Smp#: 7
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-007
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:43 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:22:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.975	0.000	17694680	100.0	100.0
2	1.788	1.788	0.000	103772524	100.0	100.0

RPD = 0.00

4 PCB-1248

1	4.528	4.528	0.000	18857597	500.0	518.0	M
1	4.761	4.761	0.000	17551899	500.0	522.4	
1	4.861	4.861	0.000	9676529	500.0	513.1	
1	5.541	5.541	0.000	11855327	500.0	527.4	
1	6.045	6.045	0.000	7933541	500.0	519.4	

Average of Peak Amounts = 520.1

2	4.175	4.175	0.000	38272064	500.0	520.1
2	4.555	4.555	0.000	22021490	500.0	526.3
2	4.851	4.851	0.000	30313300	500.0	492.4
2	4.991	4.991	0.000	33411377	500.0	518.6
2	6.175	6.175	0.000	21533148	500.0	525.8

Average of Peak Amounts = 516.6

RPD = 0.67

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1248_L7_00018

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:44

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290007.D

Injection Date: 29-Jan-2019 16:18:40

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 7

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

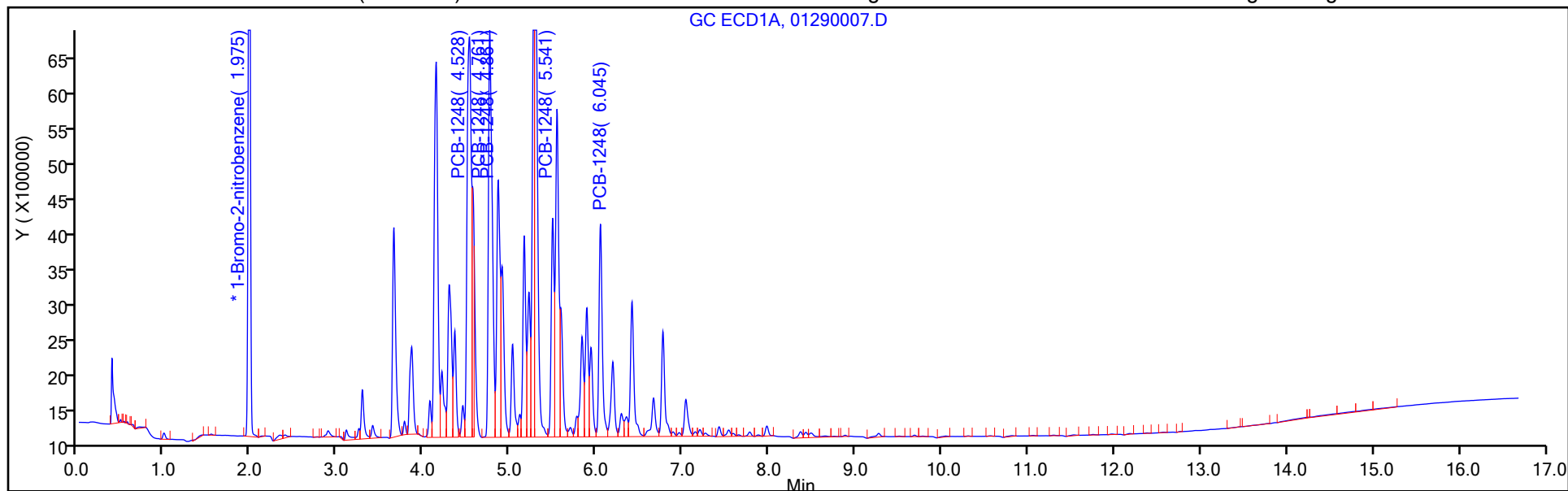
ALS Bottle#: 7

Method: 8082_J

Limit Group: GCSV - 8082 - IS

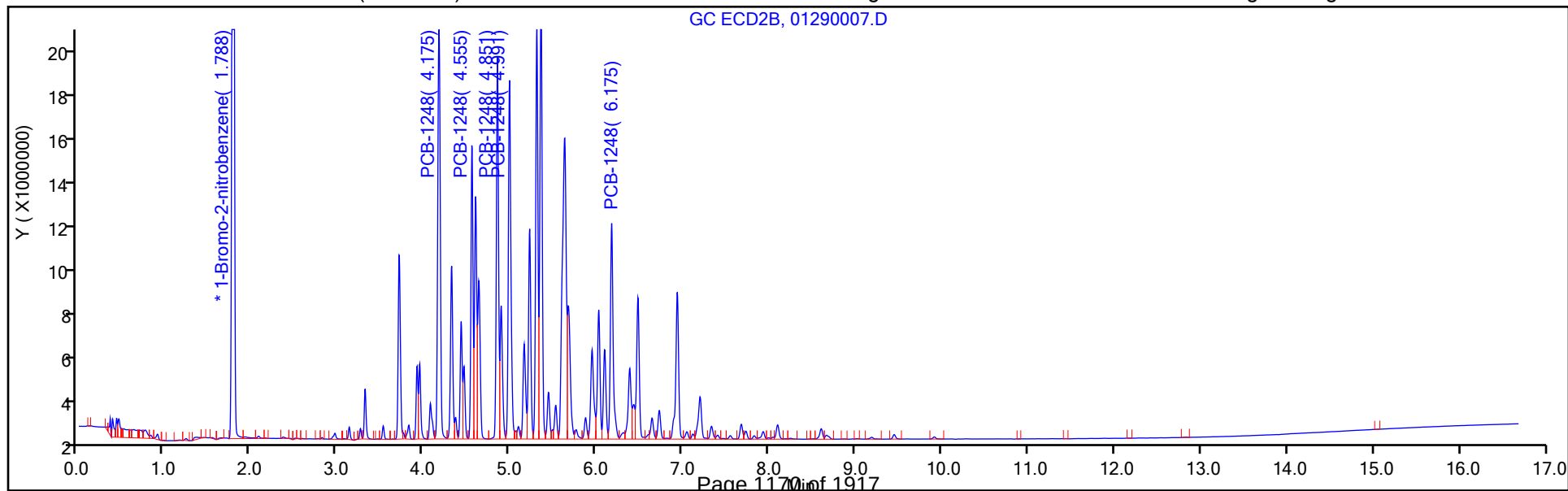
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290008.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 29-Jan-2019 16:39:43 ALS Bottle#: 8 Worklist Smp#: 8
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-008
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:40 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:36:47

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.977	-0.001	18406030	100.0	100.0	
2	1.789	1.791	-0.002	106858223	100.0	100.0	
RPD = 0.00							

4 PCB-1248

1	4.526	4.528	-0.002	27736945	750.0	739.0	M
1	4.762	4.761	0.001	25906293	750.0	746.0	M
1	4.859	4.861	-0.002	14594133	750.0	746.4	
1	5.539	5.541	-0.002	17442778	750.0	749.6	
1	6.046	6.045	0.001	11771745	750.0	742.8	
Average of Peak Amounts =						744.8	
2	4.172	4.175	-0.003	56286634	750.0	751.3	
2	4.556	4.555	0.001	31814524	750.0	748.1	
2	4.852	4.851	0.001	43474403	750.0	732.9	
2	4.989	4.991	-0.002	48741818	750.0	744.3	
2	6.172	6.175	-0.003	30729957	750.0	737.5	
Average of Peak Amounts =						742.8	
RPD = 0.26							

S 8 Polychlorinated biphenyls, Total

1						744.8	
2						742.8	
RPD = 0.26							

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1248_L7_00018

Amount Added: 0.75

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:40

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290008.D

Injection Date: 29-Jan-2019 16:39:43

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 8

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

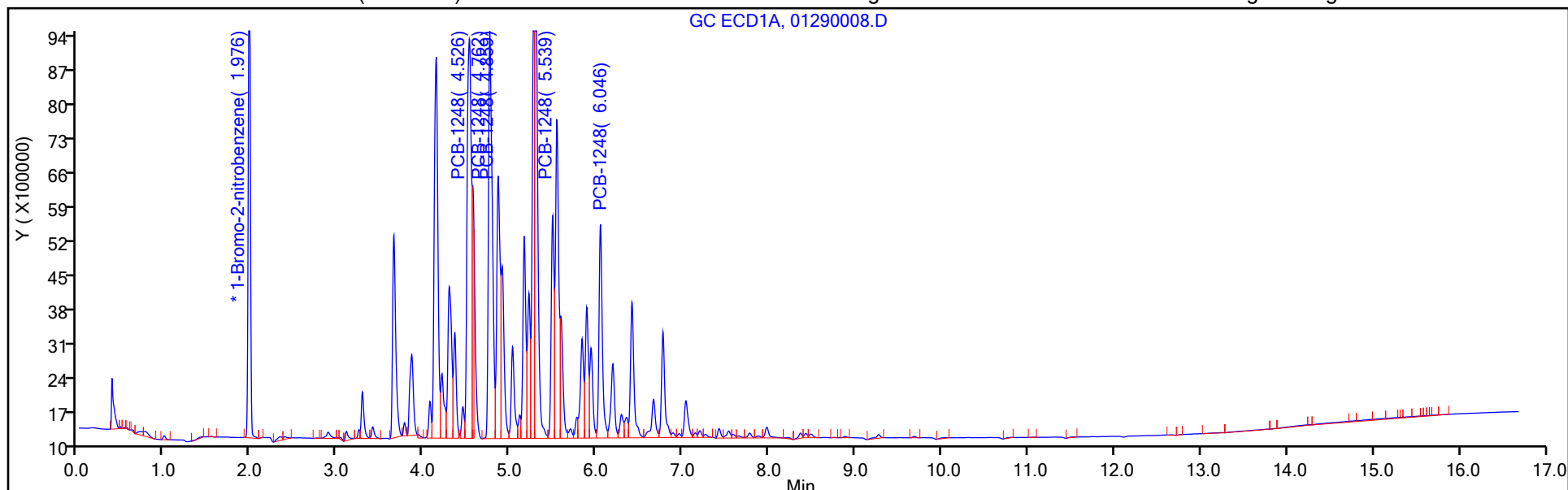
ALS Bottle#: 8

Method: 8082_J

Limit Group: GCSV - 8082 - IS

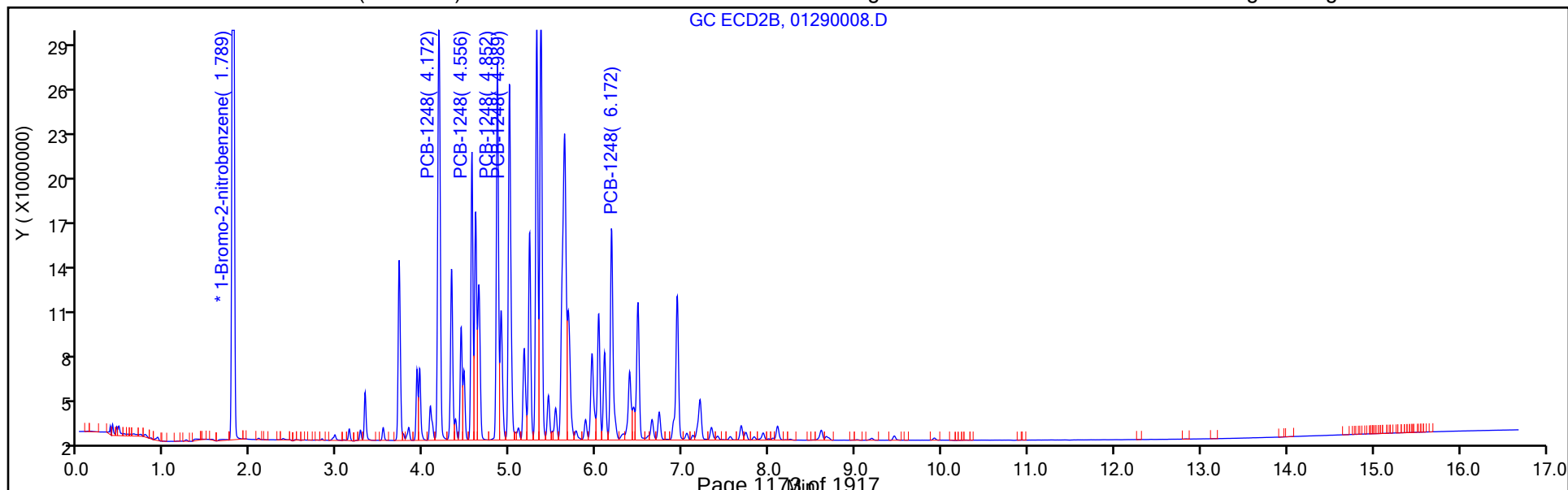
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290009.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 29-Jan-2019 17:00:54 ALS Bottle#: 9 Worklist Smp#: 9
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-009
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub2
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:38 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:31:10

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.977	0.000	18544340	100.0	100.0	
2	1.788	1.791	-0.003	107714909	100.0	100.0	
RPD = 0.00							

4 PCB-1248

1	4.527	4.528	-0.001	35853709	1000.0	952.6	M
1	4.764	4.761	0.003	33304383	1000.0	955.0	M
1	4.861	4.861	0.000	19127578	1000.0	972.5	
1	5.541	5.541	0.000	21903990	1000.0	936.5	
1	6.044	6.045	-0.001	15423807	1000.0	967.3	
Average of Peak Amounts =						956.8	
2	4.174	4.175	-0.001	71321502	1000.0	949.5	
2	4.554	4.555	-0.001	39804527	1000.0	934.4	
2	4.851	4.851	0.000	56321052	1000.0	1018.6	
2	4.991	4.991	0.000	62401335	1000.0	951.6	
2	6.174	6.175	-0.001	39545554	1000.0	947.8	
Average of Peak Amounts =						960.4	
RPD = 0.37							

S 8 Polychlorinated biphenyls, Total

1						956.8	
2						960.4	
RPD = 0.37							

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1248_L7_00018

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:38

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290009.D

Injection Date: 29-Jan-2019 17:00:54

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 9

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

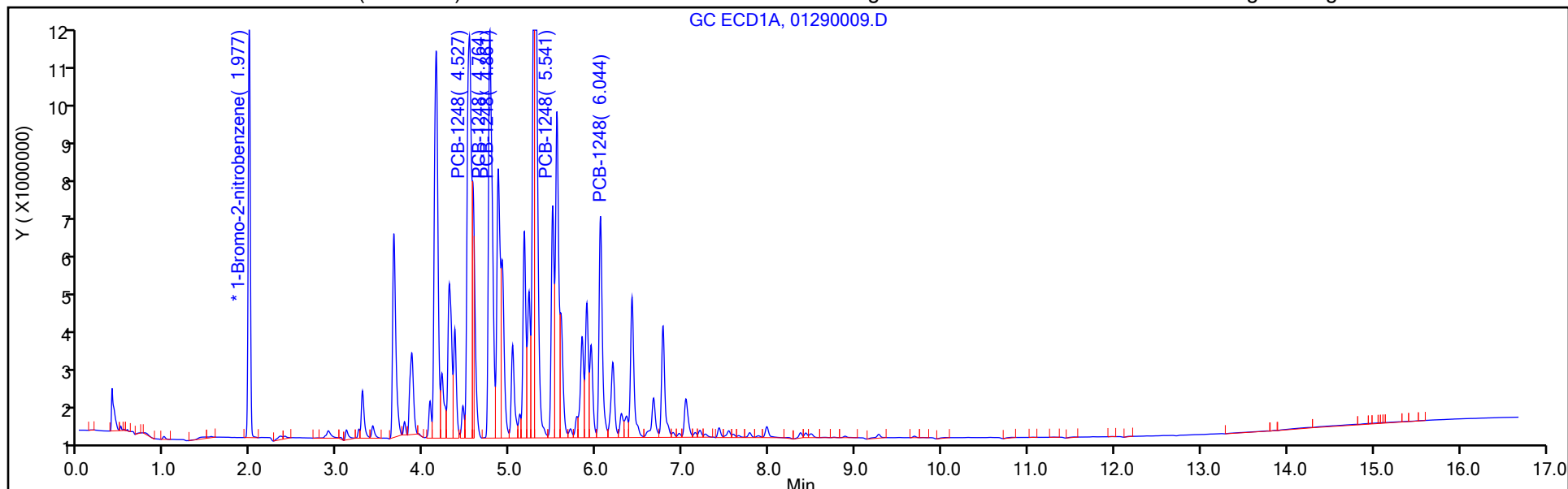
ALS Bottle#: 9

Method: 8082_J

Limit Group: GCSV - 8082 - IS

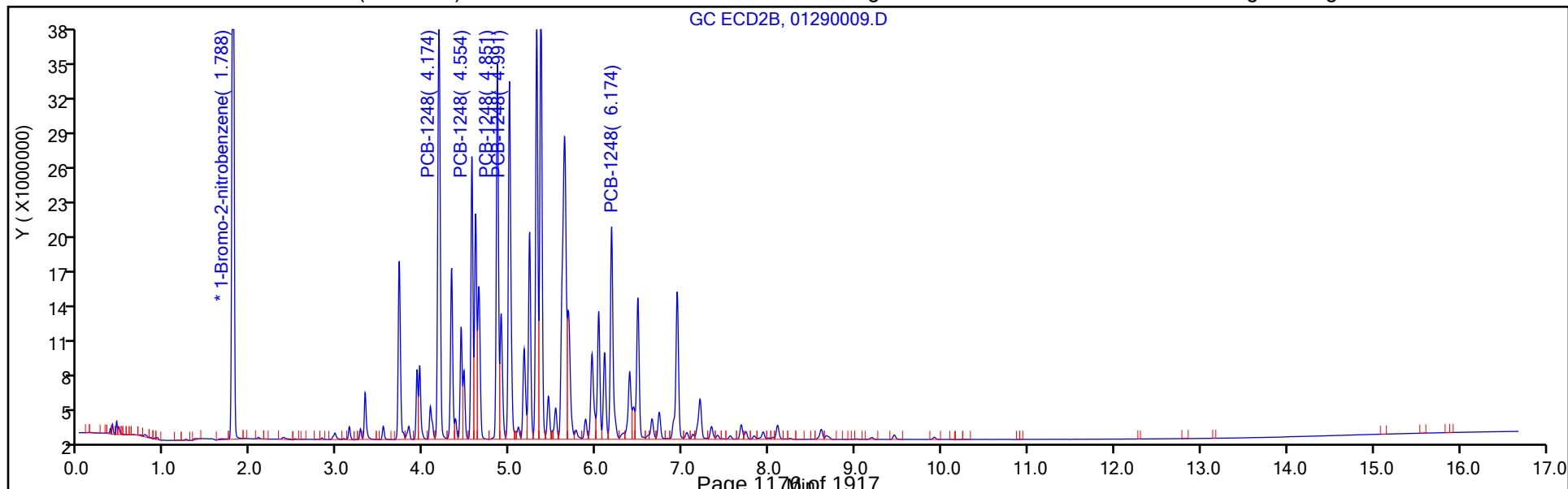
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 17:42 Calibration End Date: 01/29/2019 19:49 Calibration ID: 35087

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/11	01290011.D
Level 2	STD2 280-445745/12	01290012.D
Level 3	STD3 280-445745/13	01290013.D
Level 4	STD4 280-445745/14	01290014.D
Level 5	STD5 280-445745/15	01290015.D
Level 6	STD6 280-445745/16	01290016.D
Level 7	STD7 280-445745/17	01290017.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
PCB-1221 Peak 1	0.0584 0.0442	0.0589 0.0414	0.0486	0.0484	0.0467	Lin1	0.5765	0.0431							0.9970		0.9900
PCB-1221 Peak 2	0.0313 0.0242	0.0337 0.0205	0.0274	0.0265	0.0263	Ave		0.0271				16.1		20.0			
PCB-1221 Peak 3	0.1577 0.1202	0.1719 0.1130	0.1398	0.1360	0.1263	Lin1	1.8264	0.1174							0.9950		0.9900
PCB-1254 Peak 1	0.2680 0.2095	0.2628 0.1976	0.2368	0.2173	0.2208	Lin1	2.3262	0.2044							0.9980		0.9900
PCB-1254 Peak 2	0.1713 0.1582	0.1710 0.1506	0.1601	0.1574	0.1636	Lin1	0.5856	0.1552							0.9990		0.9900
PCB-1254 Peak 3	0.2970 0.2945	0.3260 0.2788	0.2997	0.3004	0.3047	Lin1	0.9636	0.2894							0.9980		0.9900
PCB-1254 Peak 4	0.2342 0.2041	0.2281 0.1940	0.2115	0.2078	0.2101	Lin1	1.1687	0.1998							0.9990		0.9900
PCB-1254 Peak 5	0.2850 0.2538	0.2819 0.2419	0.2568	0.2566	0.2607	Lin1	1.2303	0.2486							0.9990		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 17:42 Calibration End Date: 01/29/2019 19:49 Calibration ID: 35087

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/11	01290011.D
Level 2	STD2 280-445745/12	01290012.D
Level 3	STD3 280-445745/13	01290013.D
Level 4	STD4 280-445745/14	01290014.D
Level 5	STD5 280-445745/15	01290015.D
Level 6	STD6 280-445745/16	01290016.D
Level 7	STD7 280-445745/17	01290017.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1221 Peak 1	BNB	Lin1	271388 6278067	517623 8210089	916734	2285661	4272039	25.0 750	50.0 1000	100	250	500
PCB-1221 Peak 2	BNB	Ave	145270 3444943	296349 4067237	515801	1249862	2406564	25.0 750	50.0 1000	100	250	500
PCB-1221 Peak 3	BNB	Lin1	732373 17079944	1511237 22436428	2635112	6425270	11538084	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 1	BNB	Lin1	1244696 29777425	2310745 39222684	4464480	10267263	20181603	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 2	BNB	Lin1	795719 22481604	1503421 29892070	3017451	7436629	14946862	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 3	BNB	Lin1	1379206 41851991	2866737 55340228	5649387	14193865	27850289	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 4	BNB	Lin1	1087587 29009498	2005621 38512069	3986775	9819643	19201872	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 5	BNB	Lin1	1323649 36062168	2478744 48030061	4841126	12124818	23827137	25.0 750	50.0 1000	100	250	500

Curve Type Legend:

Ave = Average ISTD
Lin1 = Linear 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290011.D
 Lims ID: STD1 2154
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 29-Jan-2019 17:42:59 ALS Bottle#: 11 Worklist Smp#: 11
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 2154
 Misc. Info.: 280-0078470-011
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:33 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 10:24:54

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene M

1	1.976	1.977	-0.001	18575299	100.0	100.0	
2	1.790	1.791	-0.001	106959292	100.0	100.0	M
RPD = 0.00							

3 PCB-1221

1	3.100	3.101	-0.001	271388	25.0	20.5	
1	3.246	3.247	-0.001	145270	25.0	28.8	
1	3.286	3.287	-0.001	732373	25.0	18.0	
Average of Peak Amounts =							22.5
2	3.133	3.134	-0.001	933825	25.0	23.3	
2	3.263	3.264	-0.001	521534	25.0	19.5	
2	3.320	3.318	0.002	1938038	25.0	20.7	
Average of Peak Amounts =							21.2
RPD = 6.01							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290011.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.543	5.544	-0.001	1244696	25.0	21.4	
1	5.883	5.887	-0.004	795719	25.0	23.8	
1	6.043	6.044	-0.001	1379206	25.0	22.3	
1	6.410	6.411	-0.001	1087587	25.0	23.5	
1	7.033	7.037	-0.004	1323649	25.0	23.7	

Average of Peak Amounts = 22.9

2	5.600	5.598	0.002	3175288	25.0	20.1	
2	6.023	6.024	-0.001	2350402	25.0	20.1	
2	6.173	6.174	-0.001	4341968	25.0	21.3	
2	6.727	6.724	0.003	1881749	25.0	18.7	
2	7.200	7.198	0.002	4441497	25.0	20.6	

Average of Peak Amounts = 20.2

RPD = 12.94

S 8 Polychlorinated biphenyls, Total

1						45.4	
2						41.3	

RPD = 9.46

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_2154_L7_00022

Amount Added: 0.03

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:34

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290011.D

Injection Date: 29-Jan-2019 17:42:59

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD1 2154

Worklist Smp#: 11

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

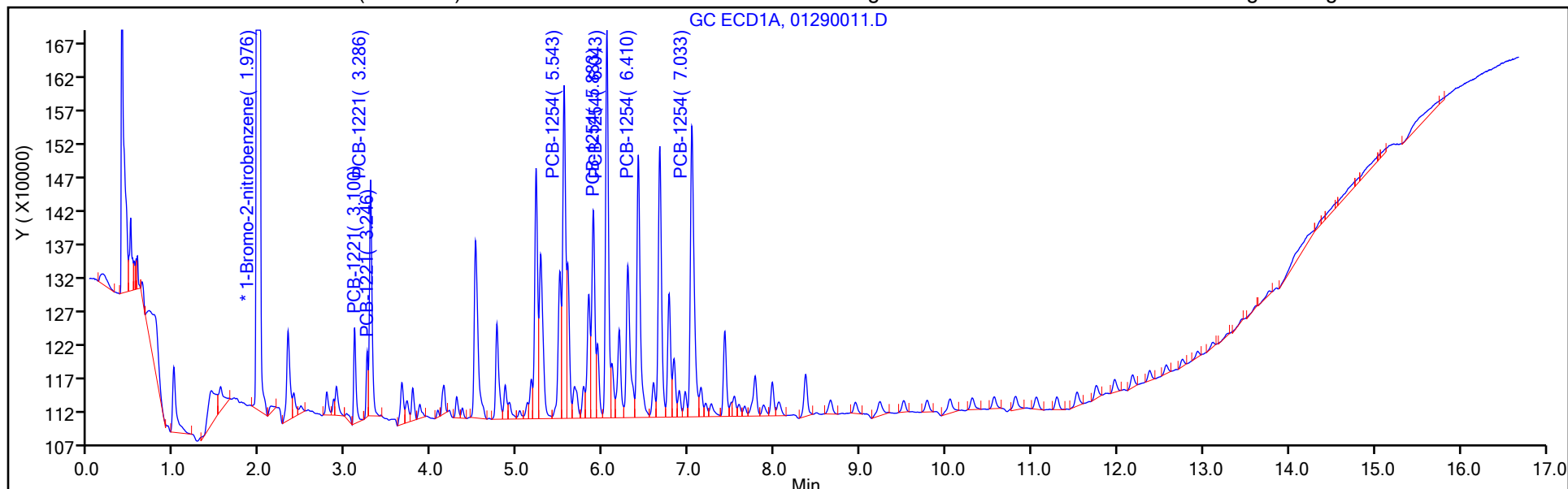
ALS Bottle#: 11

Method: 8082_J

Limit Group: GCSV - 8082 - IS

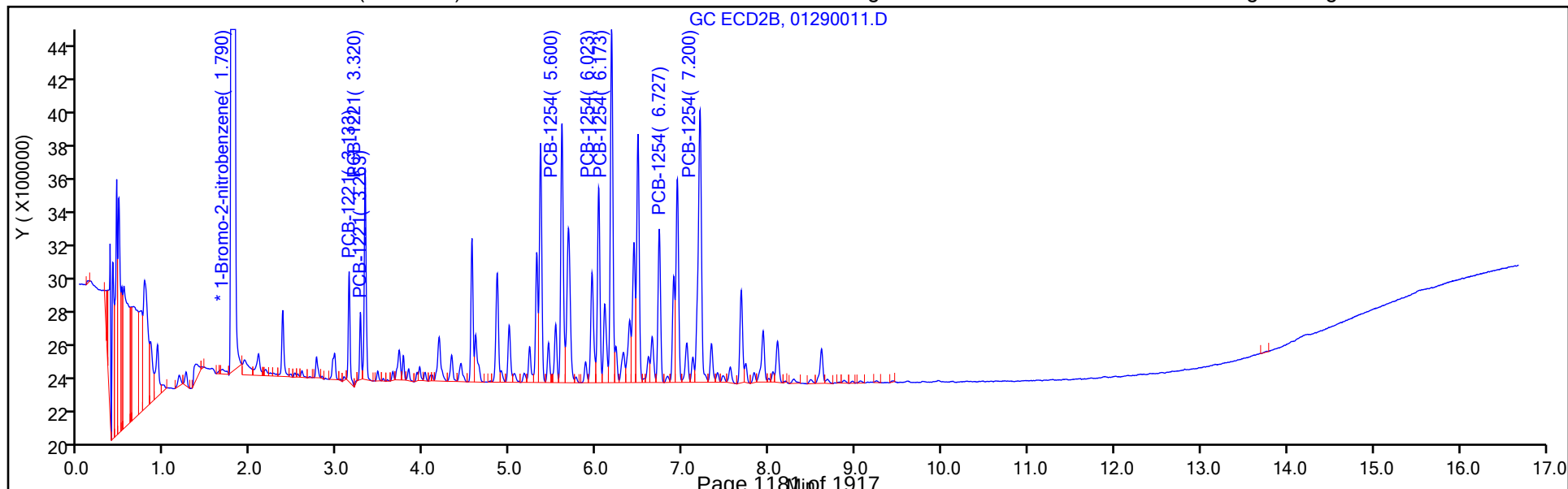
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290012.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 29-Jan-2019 18:04:08 ALS Bottle#: 12 Worklist Smp#: 12
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-012
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:31 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 10:25:13

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.977	-0.001	17586845	100.0	100.0	
2	1.789	1.791	-0.002	100750684	100.0	100.0	
RPD = 0.00							

3 PCB-1221

1	3.099	3.101	-0.002	517623	50.0	55.0	
1	3.246	3.247	-0.001	296349	50.0	62.1	
1	3.286	3.287	-0.001	1511237	50.0	57.6	
Average of Peak Amounts =							58.2
2	3.133	3.134	-0.001	1509377	50.0	54.3	
2	3.263	3.264	-0.001	859909	50.0	48.8	
2	3.319	3.318	0.001	3151722	50.0	50.4	
Average of Peak Amounts =							51.2
RPD = 12.89							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290012.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.542	5.544	-0.002	2310745	50.0	52.9	
1	5.886	5.887	-0.001	1503421	50.0	51.3	
1	6.042	6.044	-0.002	2866737	50.0	53.0	
1	6.409	6.411	-0.002	2005621	50.0	51.2	
1	7.036	7.037	-0.001	2478744	50.0	51.7	

Average of Peak Amounts = 52.0

2	5.599	5.598	0.001	5581046	50.0	53.8	
2	6.026	6.024	0.002	4183934	50.0	53.9	
2	6.176	6.174	0.002	7601087	50.0	53.2	
2	6.726	6.724	0.002	3407544	50.0	54.8	
2	7.199	7.198	0.001	7834897	50.0	53.7	

Average of Peak Amounts = 53.9

RPD = 3.45

S 8 Polychlorinated biphenyls, Total

1	110.3
2	105.1

RPD = 4.85

Reagents:

AR_2154_L7_00022

Amount Added: 0.05

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:31

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290012.D

Injection Date: 29-Jan-2019 18:04:08

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 12

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

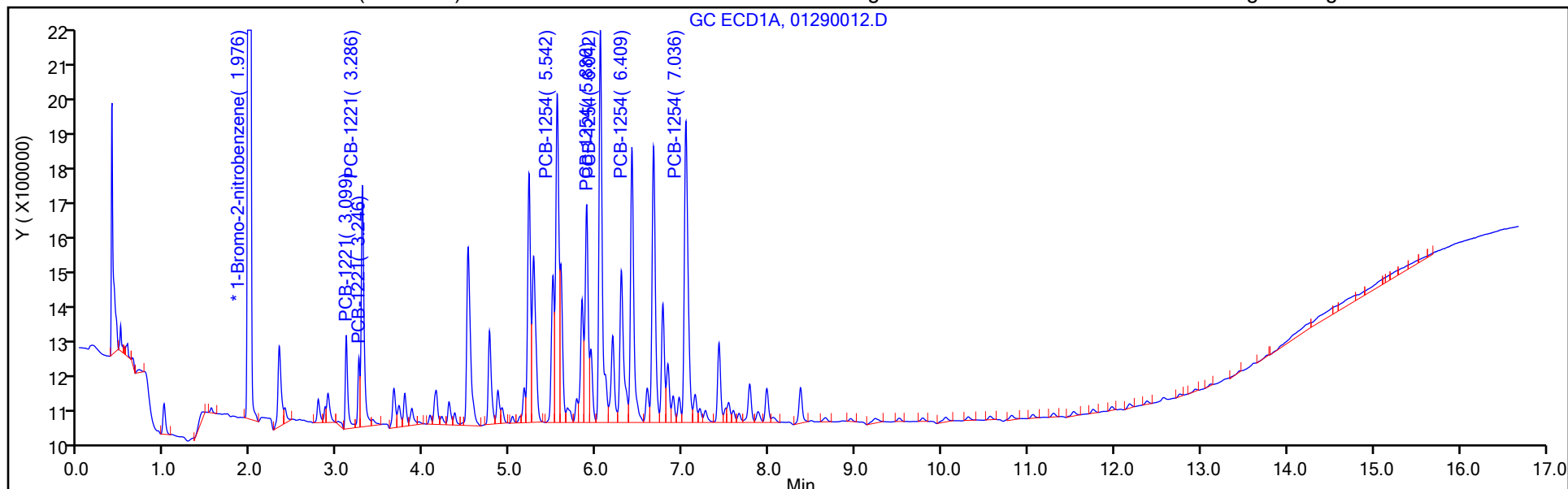
ALS Bottle#: 12

Method: 8082_J

Limit Group: GCSV - 8082 - IS

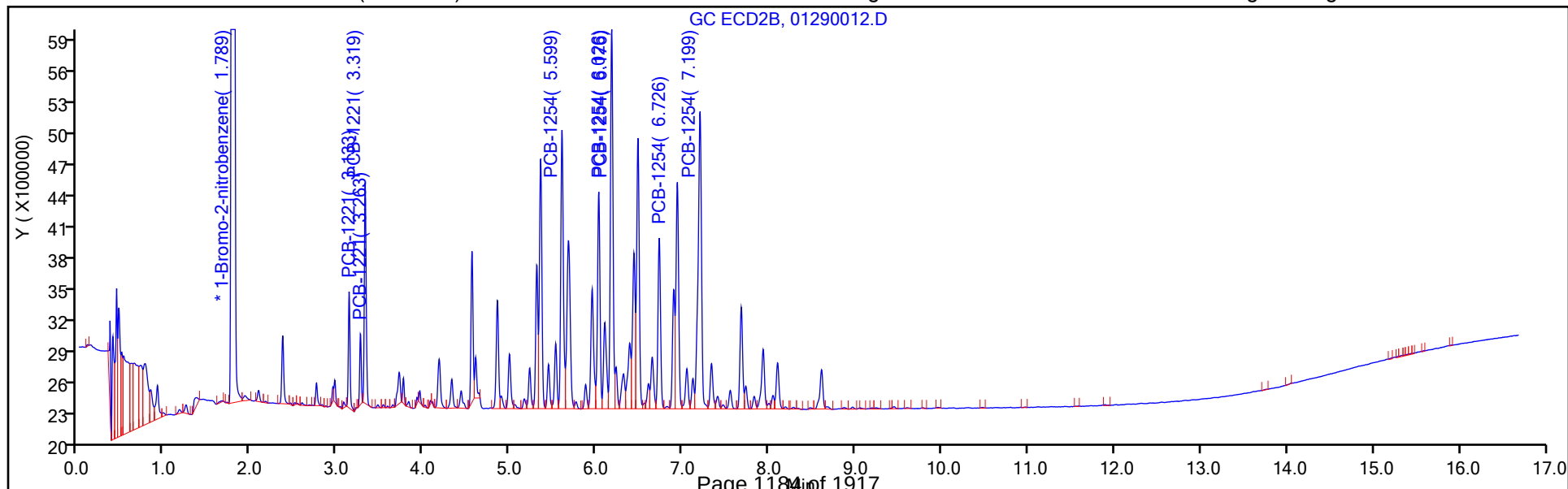
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290013.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 29-Jan-2019 18:25:10 ALS Bottle#: 13 Worklist Smp#: 13
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-013
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:29 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:11:02

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.977	-0.002	18852776	100.0	100.0	
2	1.789	1.791	-0.002	107171763	100.0	100.0	
						RPD = 0.00	

3 PCB-1221

1	3.099	3.101	-0.002	916734	100.0	99.5	
1	3.245	3.247	-0.002	515801	100.0	100.9	
1	3.285	3.287	-0.002	2635112	100.0	103.5	
Average of Peak Amounts =						101.3	
2	3.132	3.134	-0.002	2788840	100.0	109.1	
2	3.265	3.264	0.001	1758737	100.0	112.0	
2	3.319	3.318	0.001	6011586	100.0	106.4	
Average of Peak Amounts =						109.2	
						RPD = 7.49	

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290013.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.545	5.544	0.001	4464480	100.0	104.5	
1	5.885	5.887	-0.002	3017451	100.0	99.4	
1	6.045	6.044	0.001	5649387	100.0	100.2	
1	6.409	6.411	-0.002	3986775	100.0	100.0	
1	7.035	7.037	-0.002	4841126	100.0	98.3	

Average of Peak Amounts =

100.5

2	5.599	5.598	0.001	10043995	100.0	104.0	
2	6.025	6.024	0.001	7543706	100.0	103.8	
2	6.175	6.174	0.001	13724956	100.0	101.4	
2	6.725	6.724	0.001	6080405	100.0	105.7	
2	7.199	7.198	0.001	14072003	100.0	102.6	

Average of Peak Amounts =

103.5

RPD = 2.95

S 8 Polychlorinated biphenyls, Total

1						201.8	
2						212.7	

RPD = 5.26

Reagents:

AR_2154_L7_00022

Amount Added: 0.10

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290013.D

Injection Date: 29-Jan-2019 18:25:10

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD3

Worklist Smp#: 13

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

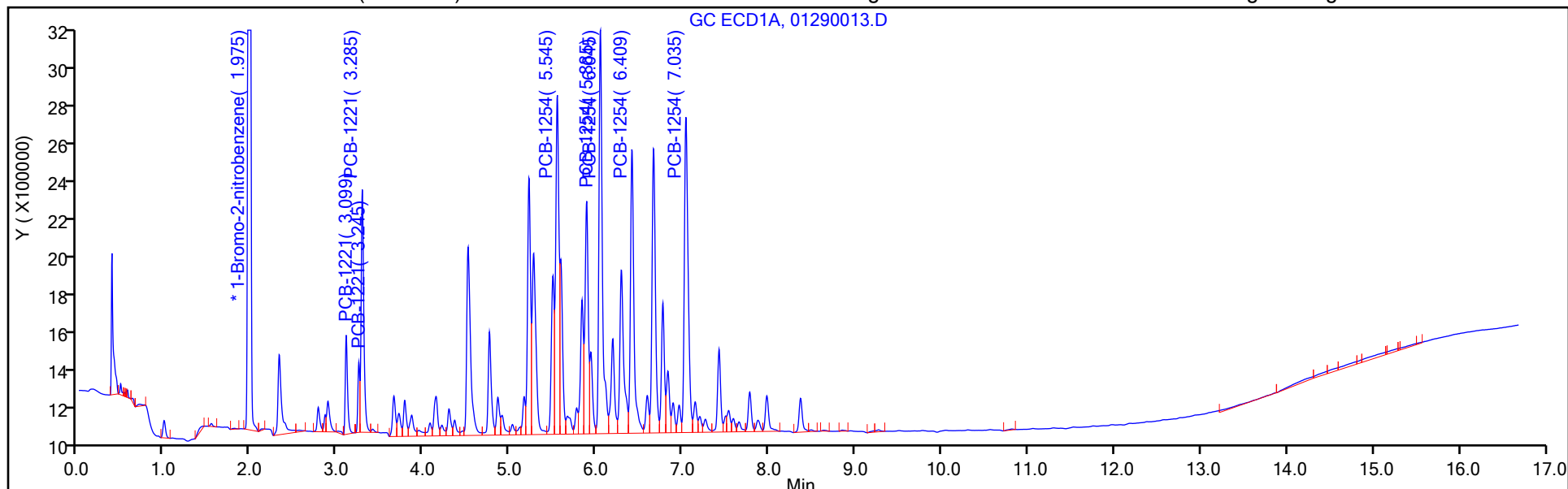
ALS Bottle#: 13

Method: 8082_J

Limit Group: GCSV - 8082 - IS

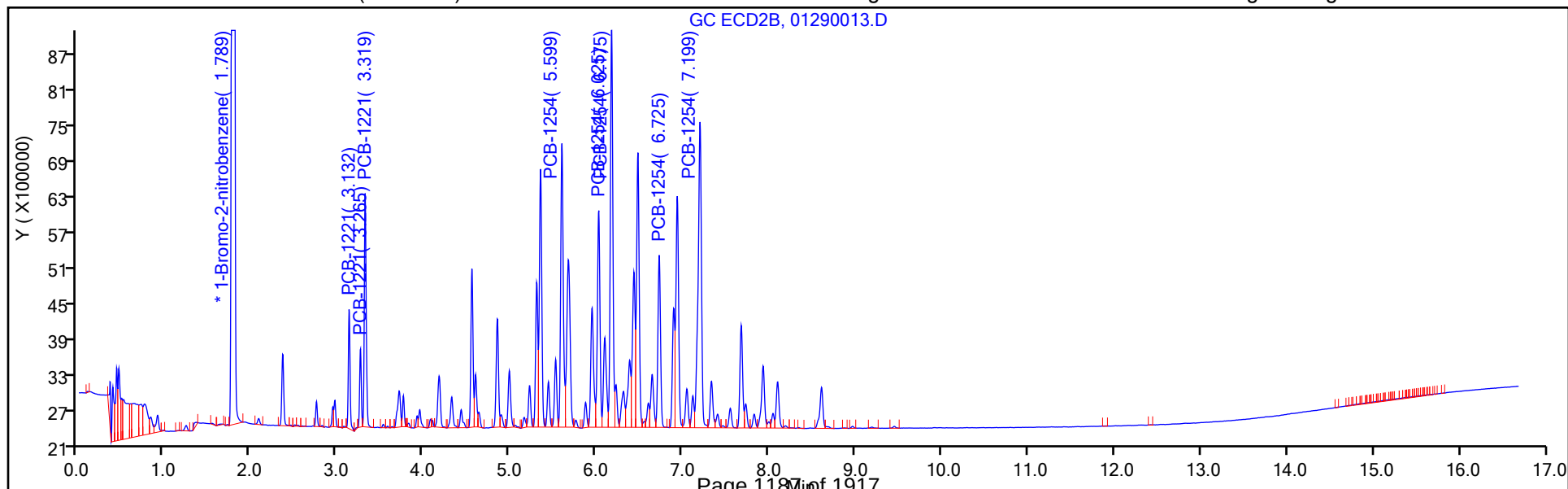
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290014.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 29-Jan-2019 18:46:13 ALS Bottle#: 14 Worklist Smp#: 14
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-014
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:27 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.977	0.001	18900475	100.0	100.0
2	1.792	1.791	0.001	107254921	100.0	100.0

RPD = 0.00

3 PCB-1221

1	3.102	3.101	0.001	2285661	250.0	267.4
1	3.245	3.247	-0.002	1249862	250.0	243.8
1	3.285	3.287	-0.002	6425270	250.0	274.0

Average of Peak Amounts = 261.8

2	3.132	3.134	-0.002	6160075	250.0	265.0
2	3.265	3.264	0.001	4019733	250.0	281.1
2	3.318	3.318	0.000	13912643	250.0	272.6

Average of Peak Amounts = 272.9

RPD = 4.17

9 PCB-1254

1	5.545	5.544	0.001	10267263	250.0	254.4
1	5.885	5.887	-0.002	7436629	250.0	249.8
1	6.045	6.044	0.001	14193865	250.0	256.2
1	6.412	6.411	0.001	9819643	250.0	254.2
1	7.035	7.037	-0.002	12124818	250.0	253.1

Average of Peak Amounts = 253.5

2	5.598	5.598	0.000	23360585	250.0	266.5
2	6.025	6.024	0.001	17638723	250.0	266.4
2	6.175	6.174	0.001	32639179	250.0	262.9
2	6.725	6.724	0.001	14070462	250.0	271.0
2	7.198	7.198	0.000	33156680	250.0	265.0

Average of Peak Amounts = 266.4

RPD = 4.94

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290014.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

S 8 Polychlorinated biphenyls, Total

1 515.3

2 539.3

RPD = 4.55

Reagents:

AR_2154_L7_00022

Amount Added: 0.25

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:28

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290014.D

Injection Date: 29-Jan-2019 18:46:13

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 14

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

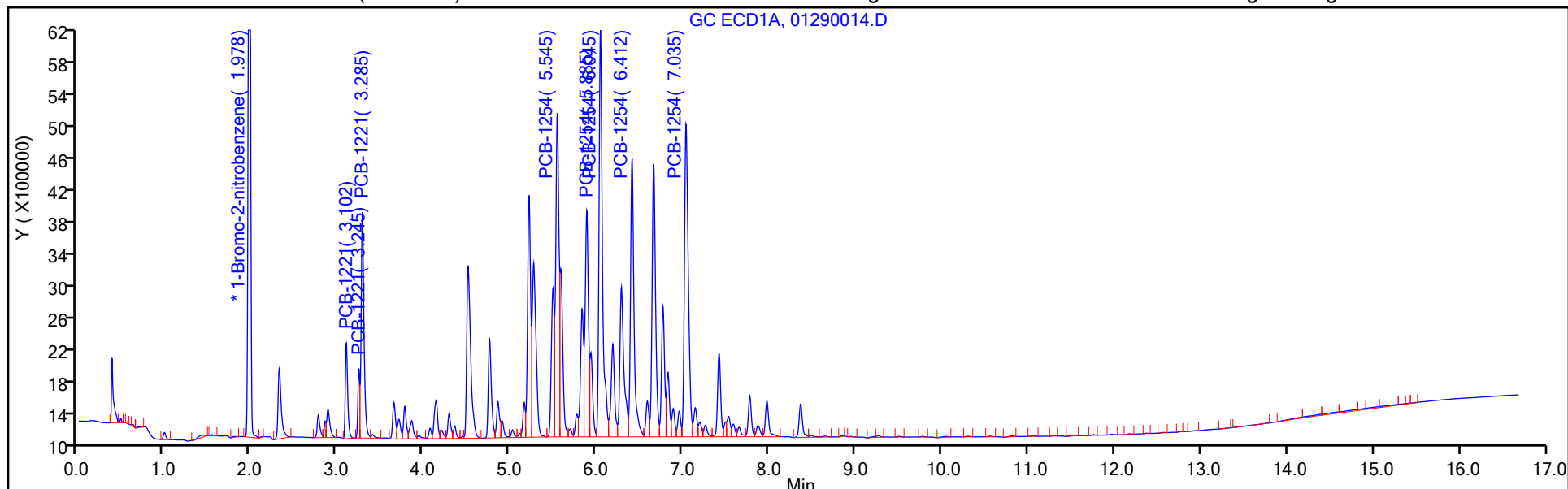
ALS Bottle#: 14

Method: 8082_J

Limit Group: GCSV - 8082 - IS

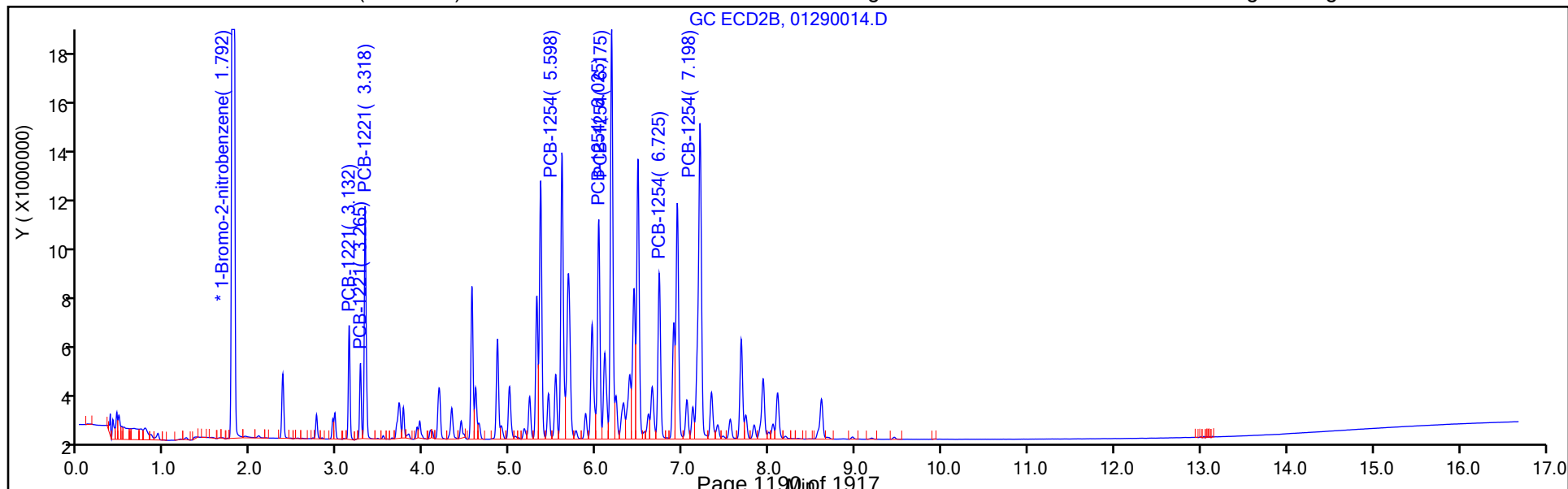
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290015.D
 Lims ID: STD5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 29-Jan-2019 19:07:23 ALS Bottle#: 15 Worklist Smp#: 15
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-015
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:25 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:44:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.977	0.000	18277877	100.0	100.0	
2	1.791	1.791	0.000	103309156	100.0	100.0	
RPD = 0.00							

3 PCB-1221

1	3.101	3.101	0.000	4272039	500.0	529.4	
1	3.247	3.247	0.000	2406564	500.0	485.4	
1	3.287	3.287	0.000	11538084	500.0	522.2	
Average of Peak Amounts =						512.3	
2	3.134	3.134	0.000	10921675	500.0	504.7	
2	3.264	3.264	0.000	7137136	500.0	534.8	
2	3.318	3.318	0.000	25213380	500.0	530.7	
Average of Peak Amounts =						523.4	
RPD = 2.13							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290015.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.544	5.544	0.000	20181603	500.0	528.9	
1	5.887	5.887	0.000	14946862	500.0	523.2	
1	6.044	6.044	0.000	27850289	500.0	523.2	
1	6.411	6.411	0.000	19201872	500.0	520.1	
1	7.037	7.037	0.000	23827137	500.0	519.4	

Average of Peak Amounts = 523.0

2	5.598	5.598	0.000	43434124	500.0	531.9	
2	6.024	6.024	0.000	32807117	500.0	531.0	
2	6.174	6.174	0.000	61775552	500.0	532.0	
2	6.724	6.724	0.000	25966972	500.0	537.9	
2	7.198	7.198	0.000	62140948	500.0	532.1	

Average of Peak Amounts = 533.0

RPD = 1.91

Reagents:

AR_2154_L7_00022

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:25

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290015.D

Injection Date: 29-Jan-2019 19:07:23

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 15

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

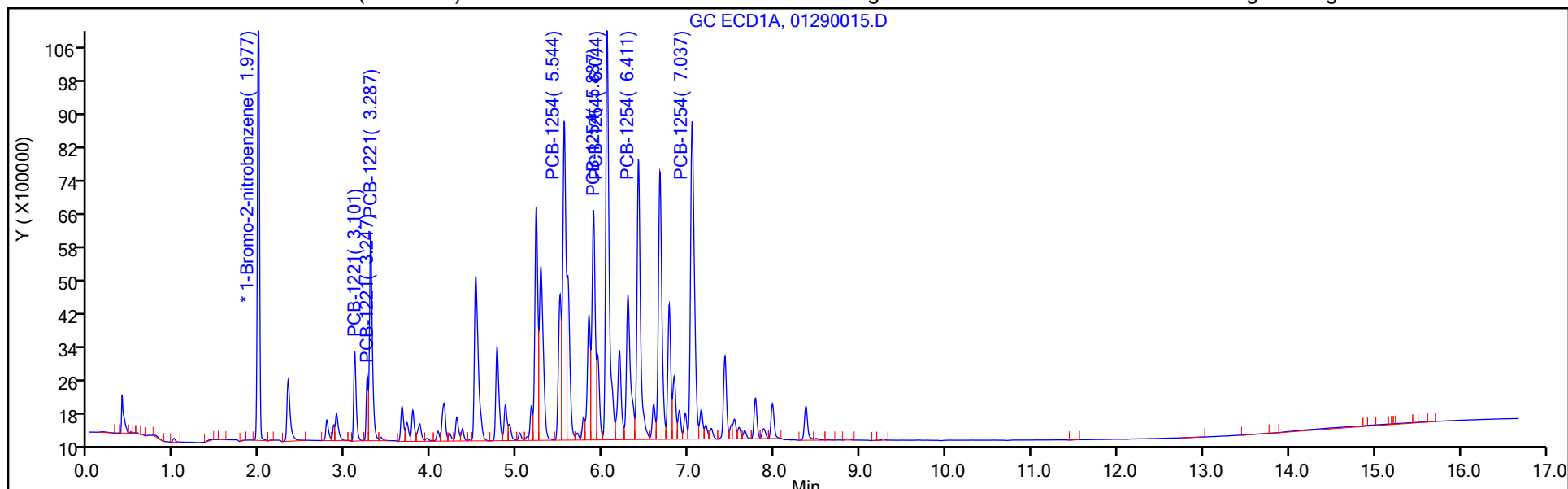
ALS Bottle#: 15

Method: 8082_J

Limit Group: GCSV - 8082 - IS

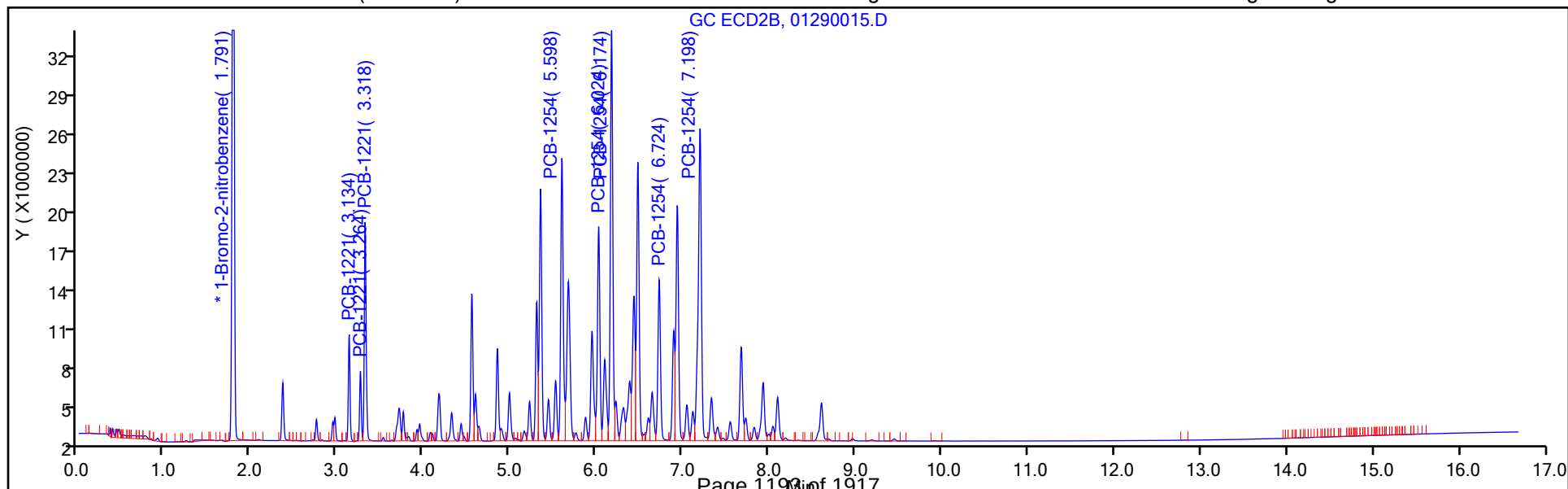
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290016.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 29-Jan-2019 19:28:26 ALS Bottle#: 16 Worklist Smp#: 16
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-016
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:23 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	18947639	100.0	100.0	
2	1.790	1.789	0.001	107224784	100.0	100.0	
RPD = 0.00							

3 PCB-1221

1	3.100	3.101	-0.001	6278067	750.0	756.1	
1	3.246	3.247	-0.001	3444943	750.0	670.3	
1	3.286	3.287	-0.001	17079944	750.0	752.3	
Average of Peak Amounts =						726.3	
2	3.133	3.134	-0.001	15773177	750.0	710.1	
2	3.263	3.264	-0.001	10378441	750.0	757.2	
2	3.320	3.318	0.002	36996950	750.0	758.6	
Average of Peak Amounts =						742.0	
RPD = 2.14							

9 PCB-1254

1	5.543	5.544	-0.001	29777425	750.0	757.6	
1	5.886	5.887	-0.001	22481604	750.0	760.9	
1	6.043	6.044	-0.001	41851991	750.0	760.0	
1	6.410	6.411	-0.001	29009498	750.0	760.6	
1	7.036	7.037	-0.001	36062168	750.0	760.6	
Average of Peak Amounts =						759.9	
2	5.600	5.598	0.002	63195207	750.0	753.2	
2	6.023	6.024	-0.001	47912197	750.0	754.5	
2	6.173	6.174	-0.001	90177116	750.0	754.8	
2	6.727	6.724	0.003	37439825	750.0	755.2	
2	7.200	7.198	0.002	91035999	750.0	758.2	
Average of Peak Amounts =						755.2	
RPD = 0.62							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290016.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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S 8 Polychlorinated biphenyls, Total

1 1486.2

2 1497.1

RPD = 0.74

Reagents:

AR_2154_L7_00022

Amount Added: 0.75

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290016.D

Injection Date: 29-Jan-2019 19:28:26

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 16

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

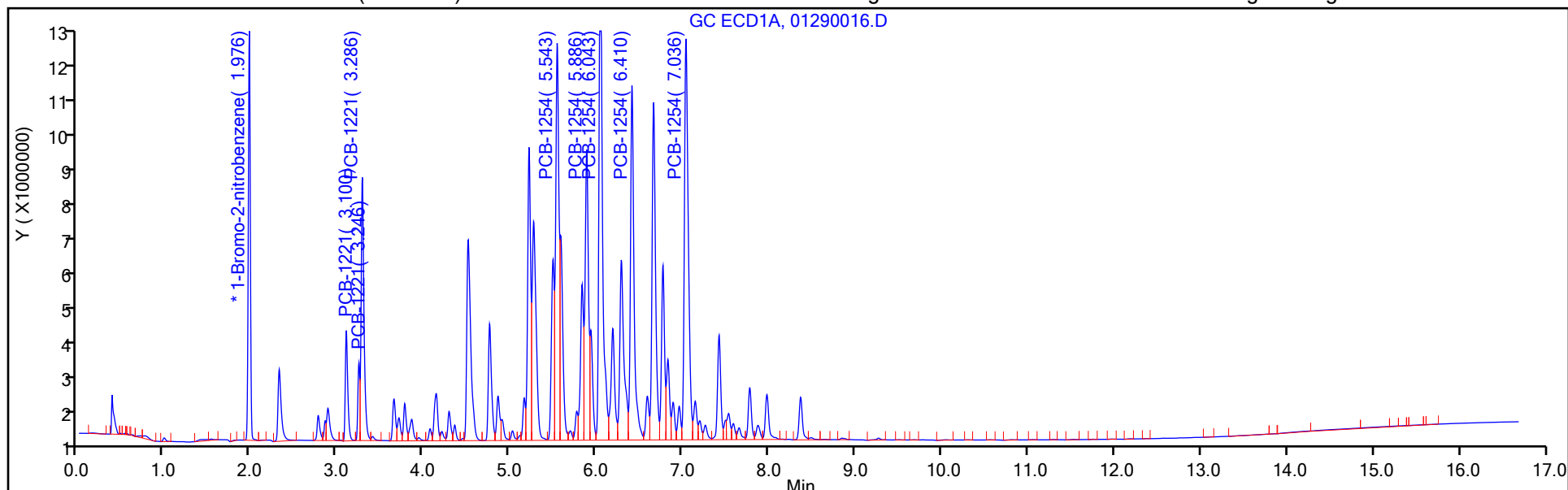
ALS Bottle#: 16

Method: 8082_J

Limit Group: GCSV - 8082 - IS

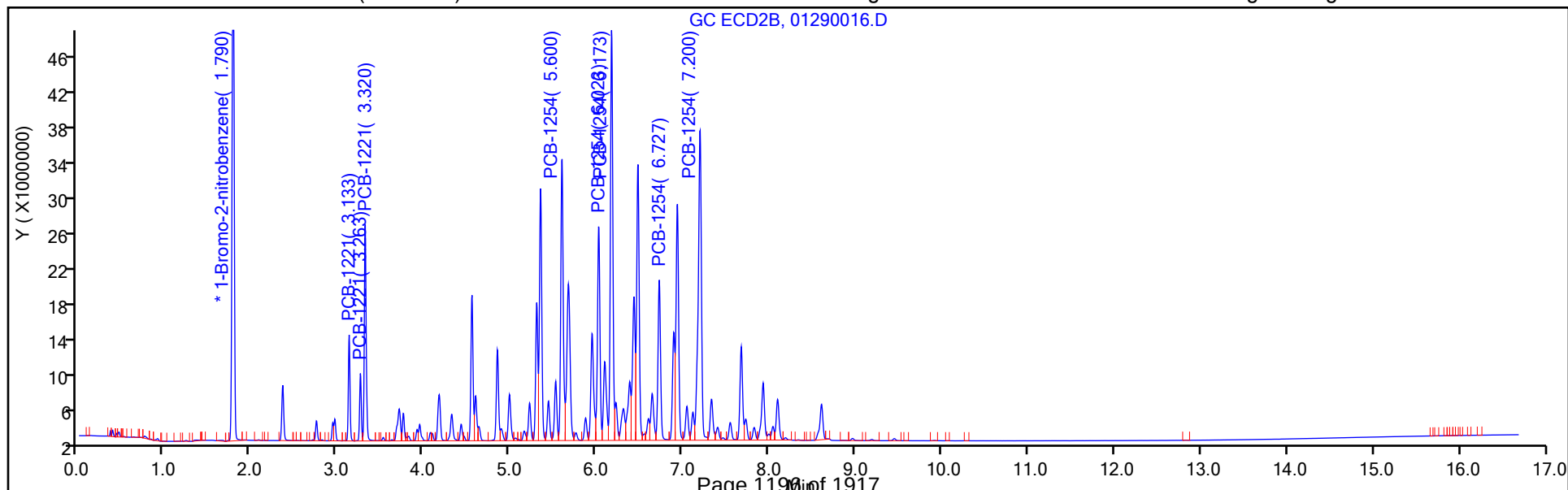
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290017.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 29-Jan-2019 19:49:27 ALS Bottle#: 17 Worklist Smp#: 17
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-017
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:21 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:41:20

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.979	-0.002	19851473	100.0	100.0	
2	1.787	1.789	-0.002	112694816	100.0	100.0	
						RPD =	0.00

3 PCB-1221

1	3.100	3.101	-0.001	8210089	1000.0	947.0	
1	3.247	3.247	0.000	4067237	1000.0	755.4	
1	3.287	3.287	0.000	22436428	1000.0	947.2	
Average of Peak Amounts =						883.2	
2	3.134	3.134	0.000	20283315	1000.0	873.3	
2	3.264	3.264	0.000	13216442	1000.0	921.6	
2	3.317	3.318	-0.001	47720495	1000.0	935.6	
Average of Peak Amounts =						910.2	
						RPD =	3.00

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290017.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.544	5.544	0.000	39222684	1000.0	955.4	
1	5.887	5.887	0.000	29892070	1000.0	966.6	
1	6.044	6.044	0.000	55340228	1000.0	960.0	
1	6.410	6.411	-0.001	38512069	1000.0	965.4	
1	7.037	7.037	0.000	48030061	1000.0	968.2	

Average of Peak Amounts = 963.1

2	5.597	5.598	-0.001	82953892	1000.0	945.4	
2	6.024	6.024	0.000	62789497	1000.0	945.2	
2	6.174	6.174	0.000	118710548	1000.0	949.4	
2	6.724	6.724	0.000	48305997	1000.0	931.7	
2	7.197	7.198	-0.001	118446332	1000.0	942.8	

Average of Peak Amounts = 942.9

RPD = 2.12

S 8 Polychlorinated biphenyls, Total

1	1846.3
2	1853.1

RPD = 0.36

Reagents:

AR_2154_L7_00022

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290017.D

Injection Date: 29-Jan-2019 19:49:27

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 17

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

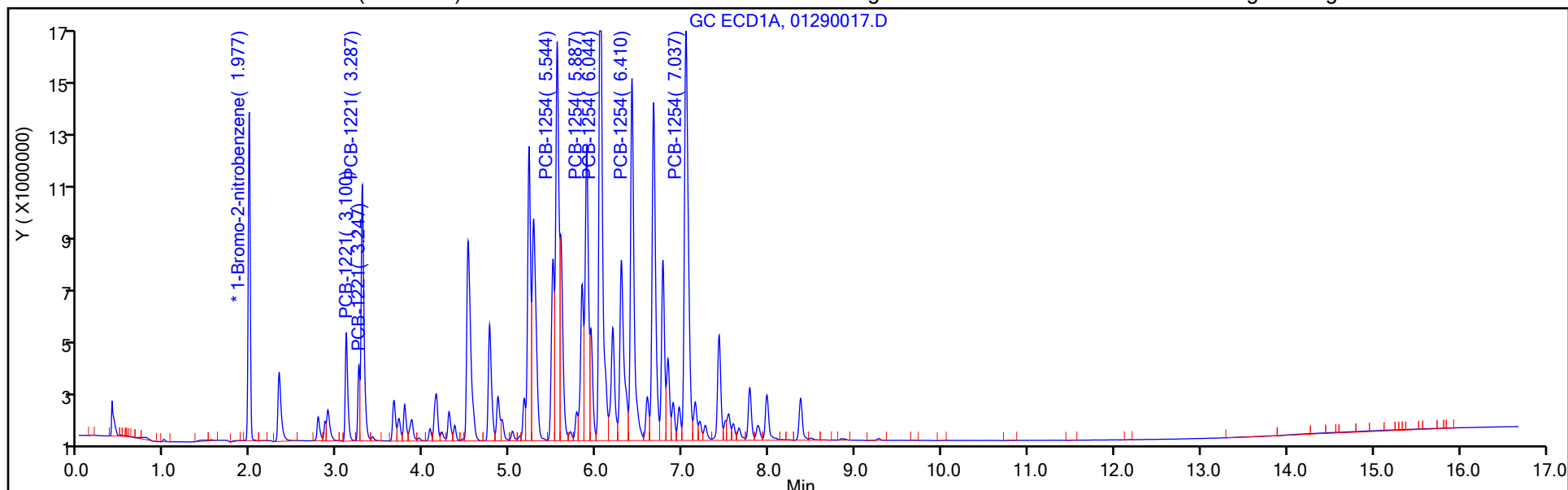
ALS Bottle#: 17

Method: 8082_J

Limit Group: GCSV - 8082 - IS

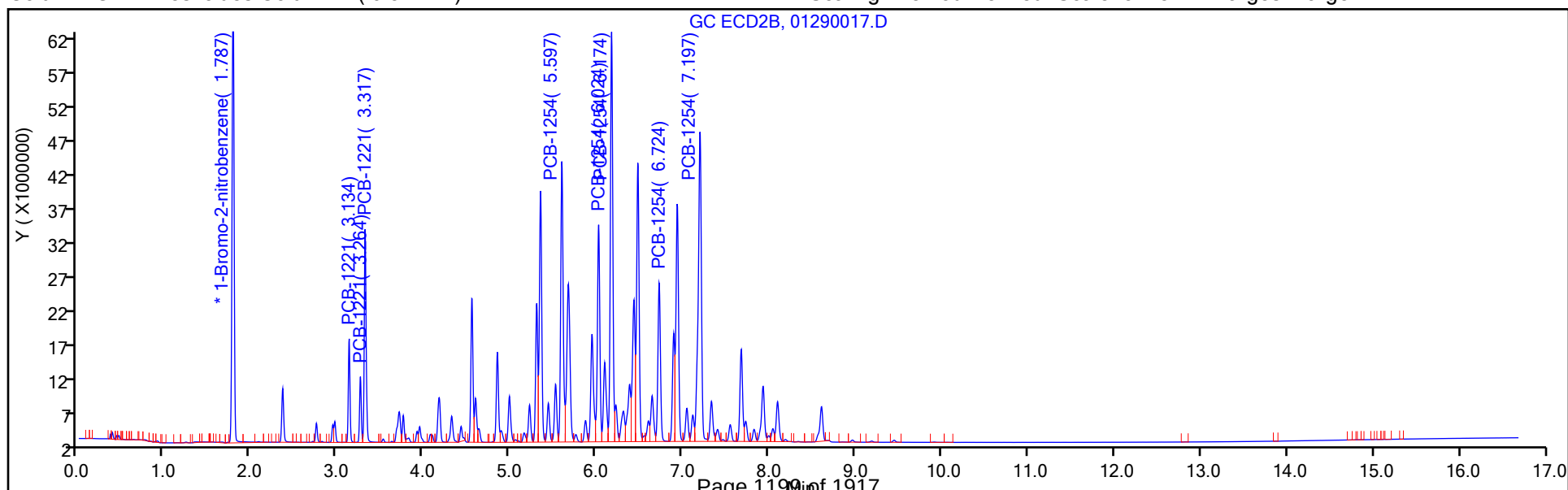
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 17:42 Calibration End Date: 01/29/2019 19:49 Calibration ID: 35088

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/11	01290011.D
Level 2	STD2 280-445745/12	01290012.D
Level 3	STD3 280-445745/13	01290013.D
Level 4	STD4 280-445745/14	01290014.D
Level 5	STD5 280-445745/15	01290015.D
Level 6	STD6 280-445745/16	01290016.D
Level 7	STD7 280-445745/17	01290017.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
PCB-1221 Peak 1	0.0349 0.0196	0.0300 0.0180	0.0260	0.0230	0.0211	Lin2	0.4035	0.0201							0.9900		0.9900
PCB-1221 Peak 2	0.0195 0.0129	0.0171 0.0117	0.0164	0.0150	0.0138	Lin1	0.2452	0.0125							0.9930		0.9900
PCB-1221 Peak 3	0.0725 0.0460	0.0626 0.0423	0.0561	0.0519	0.0488	Lin1	0.8942	0.0443							0.9950		0.9900
PCB-1254 Peak 1	0.1187 0.0786	0.1108 0.0736	0.0937	0.0871	0.0841	Lin1	1.4330	0.0763							0.9960		0.9900
PCB-1254 Peak 2	0.0879 0.0596	0.0831 0.0557	0.0704	0.0658	0.0635	Lin1	1.0336	0.0579							0.9960		0.9900
PCB-1254 Peak 3	0.1624 0.1121	0.1509 0.1053	0.1281	0.1217	0.1196	Lin1	1.7397	0.1091							0.9970		0.9900
PCB-1254 Peak 4	0.0704 0.0466	0.0676 0.0429	0.0567	0.0525	0.0503	Lin1	0.9160	0.0450							0.9940		0.9900
PCB-1254 Peak 5	0.1661 0.1132	0.1555 0.1051	0.1313	0.1237	0.1203	Lin1	1.9014	0.1095							0.9960		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 17:42 Calibration End Date: 01/29/2019 19:49 Calibration ID: 35088

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/11	01290011.D
Level 2	STD2 280-445745/12	01290012.D
Level 3	STD3 280-445745/13	01290013.D
Level 4	STD4 280-445745/14	01290014.D
Level 5	STD5 280-445745/15	01290015.D
Level 6	STD6 280-445745/16	01290016.D
Level 7	STD7 280-445745/17	01290017.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1221 Peak 1	BNB	Lin2	933825 15773177	1509377 20283315	2788840	6160075	10921675	25.0 750	50.0 1000	100	250	500
PCB-1221 Peak 2	BNB	Lin1	521534 10378441	859909 13216442	1758737	4019733	7137136	25.0 750	50.0 1000	100	250	500
PCB-1221 Peak 3	BNB	Lin1	1938038 36996950	3151722 47720495	6011586	13912643	25213380	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 1	BNB	Lin1	3175288 63195207	5581046 82953892	10043995	23360585	43434124	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 2	BNB	Lin1	2350402 47912197	4183934 62789497	7543706	17638723	32807117	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 3	BNB	Lin1	4341968 90177116	7601087 118710548	13724956	32639179	61775552	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 4	BNB	Lin1	1881749 37439825	3407544 48305997	6080405	14070462	25966972	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 5	BNB	Lin1	4441497 91035999	7834897 118446332	14072003	33156680	62140948	25.0 750	50.0 1000	100	250	500

Curve Type Legend:

Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290011.D
 Lims ID: STD1 2154
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 29-Jan-2019 17:42:59 ALS Bottle#: 11 Worklist Smp#: 11
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 2154
 Misc. Info.: 280-0078470-011
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:33 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 10:24:54

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene M

1	1.976	1.977	-0.001	18575299	100.0	100.0	
2	1.790	1.791	-0.001	106959292	100.0	100.0	M
						RPD =	0.00

3 PCB-1221

1	3.100	3.101	-0.001	271388	25.0	20.5	
1	3.246	3.247	-0.001	145270	25.0	28.8	
1	3.286	3.287	-0.001	732373	25.0	18.0	
Average of Peak Amounts =						22.5	
2	3.133	3.134	-0.001	933825	25.0	23.3	
2	3.263	3.264	-0.001	521534	25.0	19.5	
2	3.320	3.318	0.002	1938038	25.0	20.7	
Average of Peak Amounts =						21.2	
						RPD =	6.01

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290011.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.543	5.544	-0.001	1244696	25.0	21.4	
1	5.883	5.887	-0.004	795719	25.0	23.8	
1	6.043	6.044	-0.001	1379206	25.0	22.3	
1	6.410	6.411	-0.001	1087587	25.0	23.5	
1	7.033	7.037	-0.004	1323649	25.0	23.7	

Average of Peak Amounts =

22.9

2	5.600	5.598	0.002	3175288	25.0	20.1	
2	6.023	6.024	-0.001	2350402	25.0	20.1	
2	6.173	6.174	-0.001	4341968	25.0	21.3	
2	6.727	6.724	0.003	1881749	25.0	18.7	
2	7.200	7.198	0.002	4441497	25.0	20.6	

Average of Peak Amounts =

20.2

RPD = 12.94

S 8 Polychlorinated biphenyls, Total

1						45.4	
2						41.3	

RPD = 9.46

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_2154_L7_00022

Amount Added: 0.03

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Chrom Revision: 2.3 15-Jan-2019 08:51:34

Data File: \\chromna\Denver\ChromData\SGC J\20190128-78470.b\01290011.D

Instrument ID: SGC J

Lims ID: STD1 2154

Worklist Smp#: 11

Client ID:

Dil. Factor: 1.0000

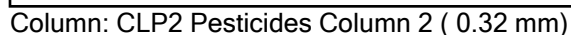
ALS Bottle#: 11

Method: 8082 J

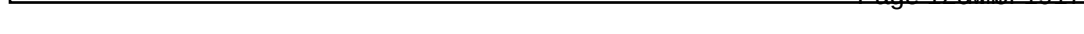
Limit Group: GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

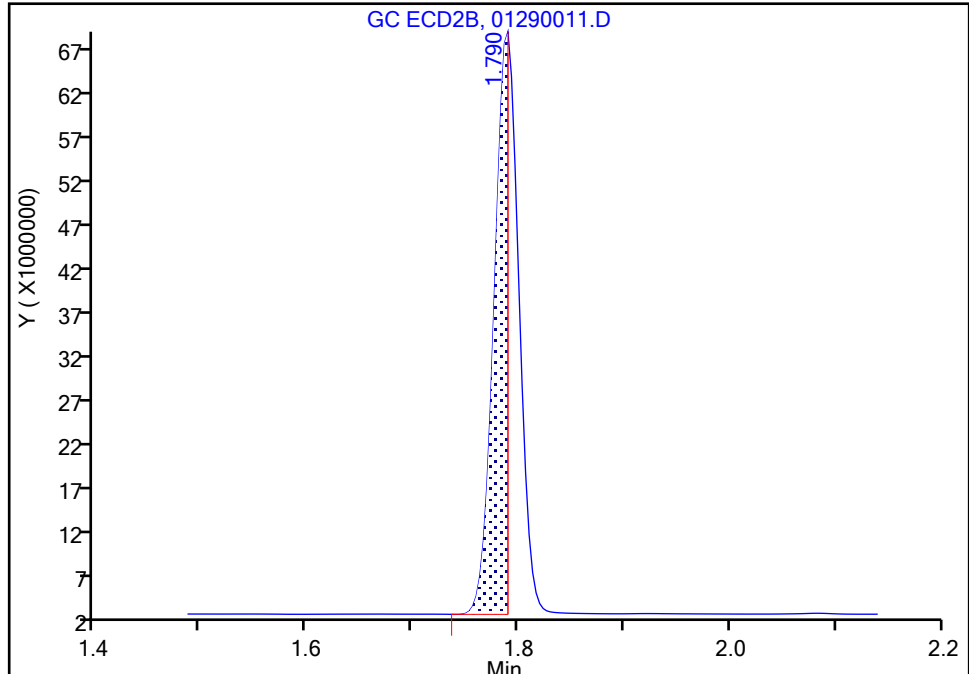
Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290011.D
Injection Date: 29-Jan-2019 17:42:59 Instrument ID: SGC_J
Lims ID: STD1 2154
Client ID:
Operator ID: TEM ALS Bottle#: 11 Worklist Smp#: 11
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: 8082_J Limit Group: GCSV - 8082 - IS
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector: GC ECD2B

* 17 1-Bromo-2-nitrobenzene, CAS: 577-19-5

Signal: 2

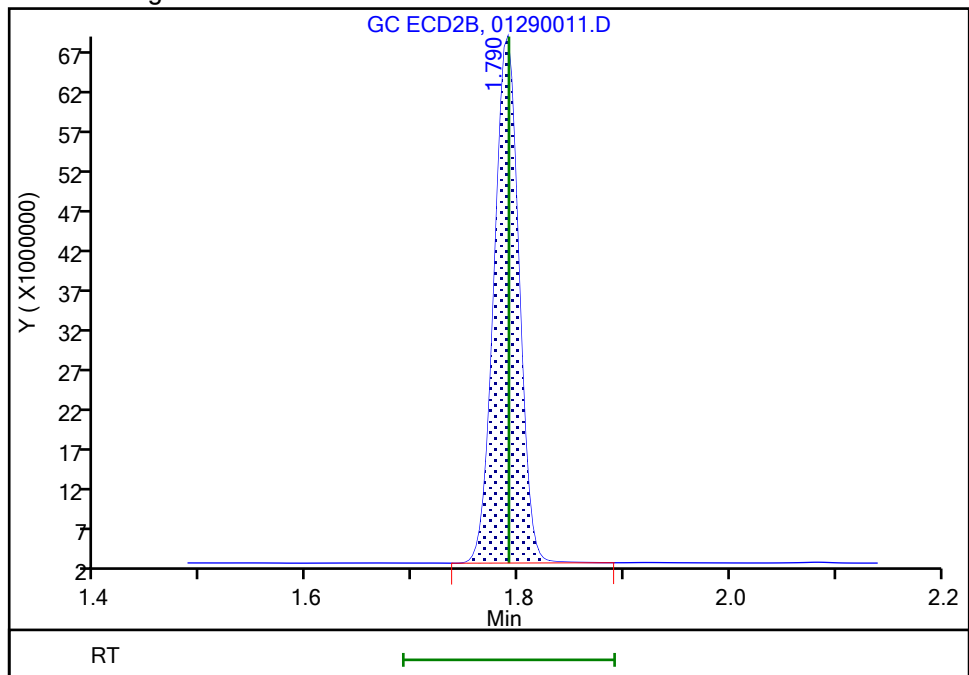
RT: 1.79
Area: 58050339
Amount: 100.0000
Amount Units: ng/ml

Processing Integration Results



RT: 1.79
Area: 106959292
Amount: 100.0000
Amount Units: ng/ml

Manual Integration Results



Reviewer: mooret, 30-Jan-2019 12:58:45

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290012.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 29-Jan-2019 18:04:08 ALS Bottle#: 12 Worklist Smp#: 12
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-012
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:31 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 10:25:13

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.977	-0.001	17586845	100.0	100.0	
2	1.789	1.791	-0.002	100750684	100.0	100.0	
RPD = 0.00							

3 PCB-1221

1	3.099	3.101	-0.002	517623	50.0	55.0	
1	3.246	3.247	-0.001	296349	50.0	62.1	
1	3.286	3.287	-0.001	1511237	50.0	57.6	
Average of Peak Amounts =							58.2
2	3.133	3.134	-0.001	1509377	50.0	54.3	
2	3.263	3.264	-0.001	859909	50.0	48.8	
2	3.319	3.318	0.001	3151722	50.0	50.4	
Average of Peak Amounts =							51.2
RPD = 12.89							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290012.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.542	5.544	-0.002	2310745	50.0	52.9	
1	5.886	5.887	-0.001	1503421	50.0	51.3	
1	6.042	6.044	-0.002	2866737	50.0	53.0	
1	6.409	6.411	-0.002	2005621	50.0	51.2	
1	7.036	7.037	-0.001	2478744	50.0	51.7	

Average of Peak Amounts = 52.0

2	5.599	5.598	0.001	5581046	50.0	53.8	
2	6.026	6.024	0.002	4183934	50.0	53.9	
2	6.176	6.174	0.002	7601087	50.0	53.2	
2	6.726	6.724	0.002	3407544	50.0	54.8	
2	7.199	7.198	0.001	7834897	50.0	53.7	

Average of Peak Amounts = 53.9

RPD = 3.45

S 8 Polychlorinated biphenyls, Total

1	110.3
2	105.1

RPD = 4.85

Reagents:

AR_2154_L7_00022

Amount Added: 0.05

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:32

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290012.D

Injection Date: 29-Jan-2019 18:04:08

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 12

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

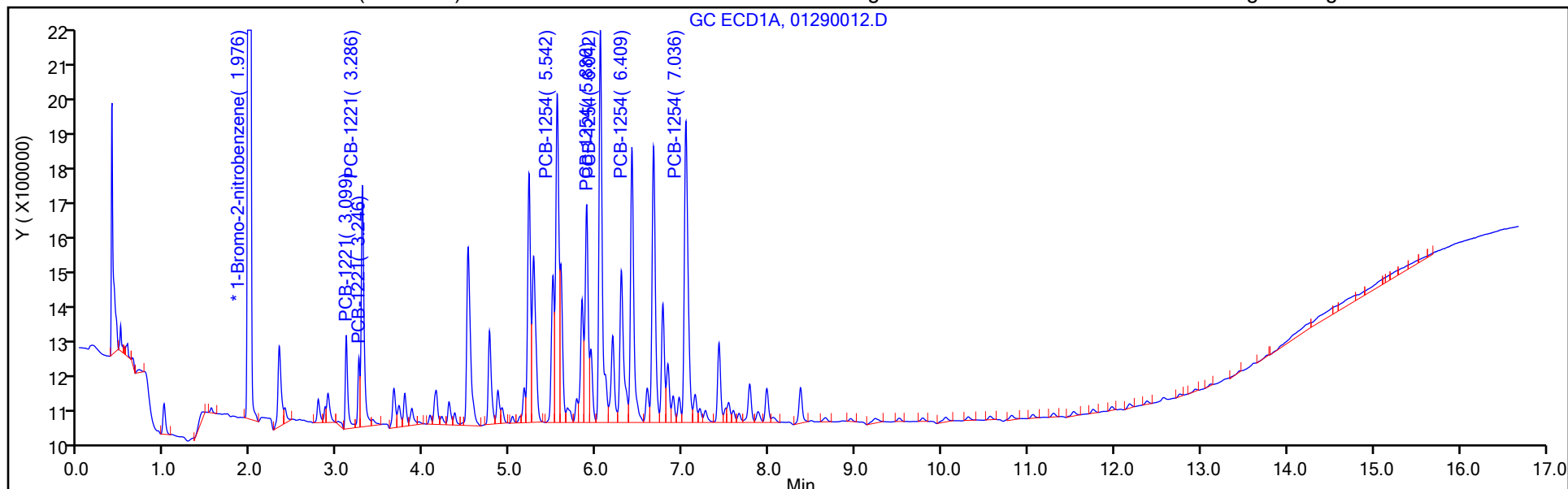
ALS Bottle#: 12

Method: 8082_J

Limit Group: GCSV - 8082 - IS

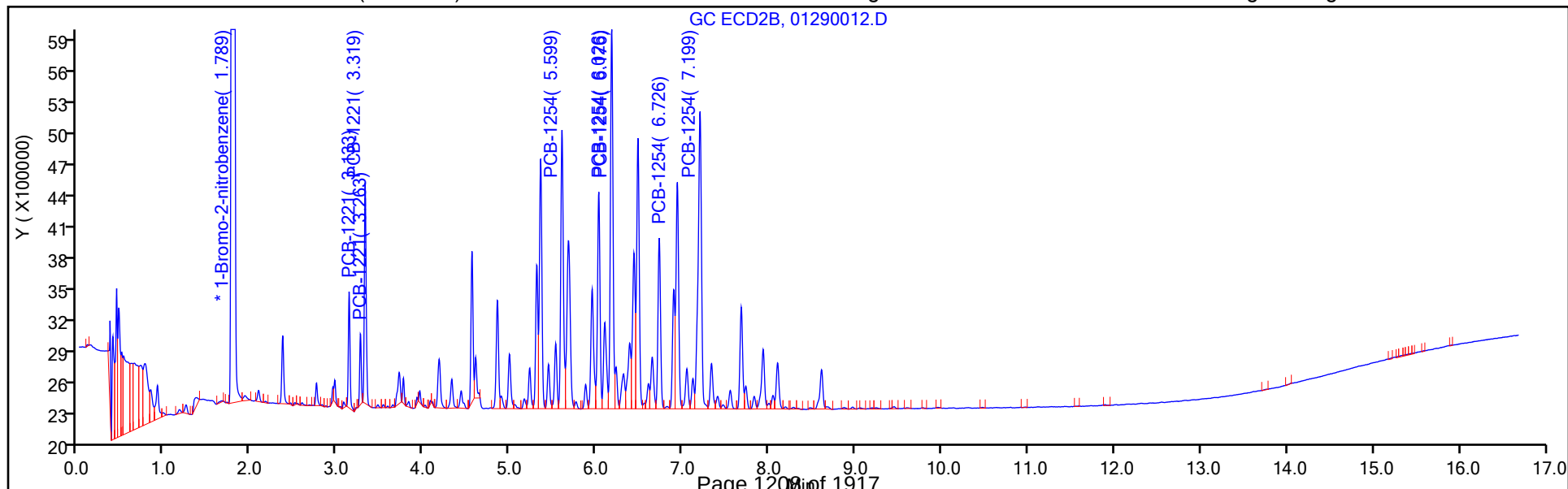
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290013.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 29-Jan-2019 18:25:10 ALS Bottle#: 13 Worklist Smp#: 13
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-013
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:29 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:11:02

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.977	-0.002	18852776	100.0	100.0	
2	1.789	1.791	-0.002	107171763	100.0	100.0	
						RPD =	0.00

3 PCB-1221

1	3.099	3.101	-0.002	916734	100.0	99.5	
1	3.245	3.247	-0.002	515801	100.0	100.9	
1	3.285	3.287	-0.002	2635112	100.0	103.5	
Average of Peak Amounts =						101.3	
2	3.132	3.134	-0.002	2788840	100.0	109.1	
2	3.265	3.264	0.001	1758737	100.0	112.0	
2	3.319	3.318	0.001	6011586	100.0	106.4	
Average of Peak Amounts =						109.2	
						RPD =	7.49

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290013.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.545	5.544	0.001	4464480	100.0	104.5	
1	5.885	5.887	-0.002	3017451	100.0	99.4	
1	6.045	6.044	0.001	5649387	100.0	100.2	
1	6.409	6.411	-0.002	3986775	100.0	100.0	
1	7.035	7.037	-0.002	4841126	100.0	98.3	

Average of Peak Amounts = 100.5

2	5.599	5.598	0.001	10043995	100.0	104.0	
2	6.025	6.024	0.001	7543706	100.0	103.8	
2	6.175	6.174	0.001	13724956	100.0	101.4	
2	6.725	6.724	0.001	6080405	100.0	105.7	
2	7.199	7.198	0.001	14072003	100.0	102.6	

Average of Peak Amounts = 103.5

RPD = 2.95

S 8 Polychlorinated biphenyls, Total

1	201.8	
2	212.7	

RPD = 5.26

Reagents:

AR_2154_L7_00022

Amount Added: 0.10

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Chrom Revision: 2.3 15-Jan-2019 08:51:34

Data File: \\chromna\Denver\ChromData\SGC J\20190128-78470.b\01290013.D

Instrument ID: SGC J

Lims ID: STD3

Worklist Smp#: 13

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

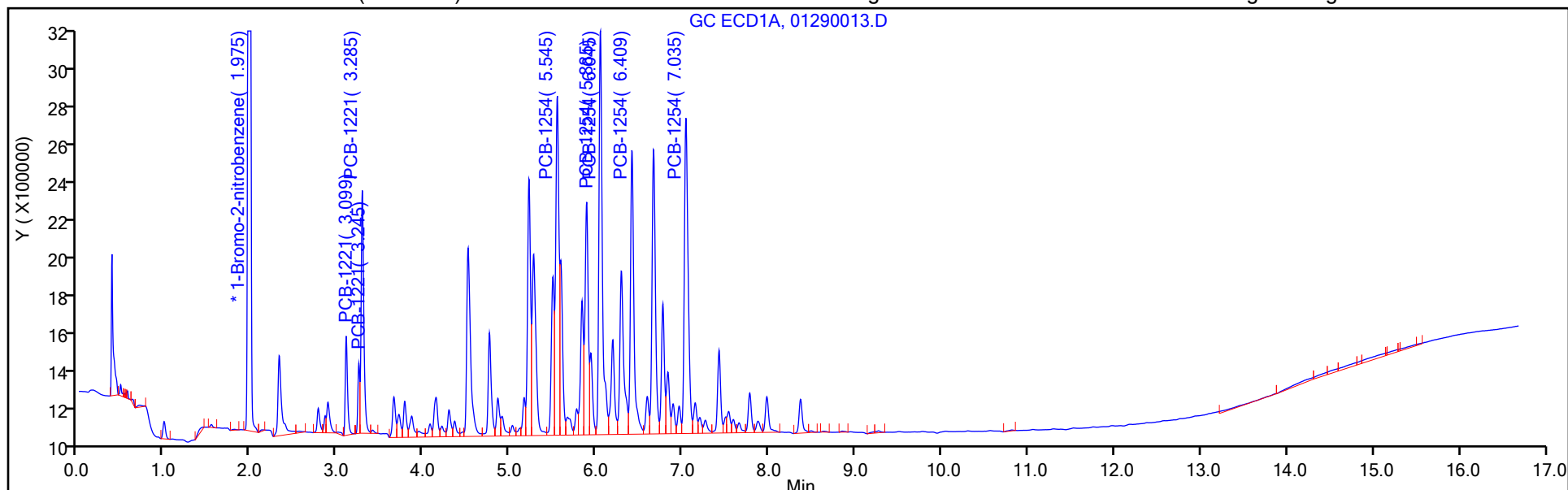
ALS Bottle#: 13

Method: 8082 J

Limit Group: GCSV - 8082 - IS

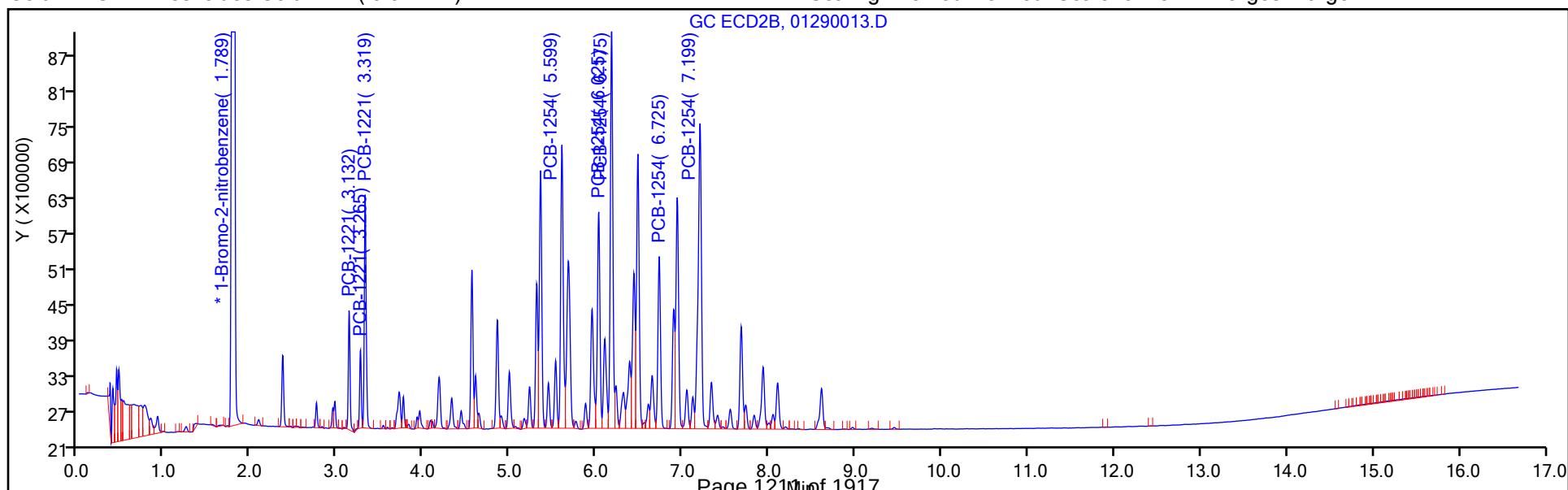
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290014.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 29-Jan-2019 18:46:13 ALS Bottle#: 14 Worklist Smp#: 14
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-014
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:27 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.977	0.001	18900475	100.0	100.0	
2	1.792	1.791	0.001	107254921	100.0	100.0	
RPD = 0.00							

3 PCB-1221

1	3.102	3.101	0.001	2285661	250.0	267.4	
1	3.245	3.247	-0.002	1249862	250.0	243.8	
1	3.285	3.287	-0.002	6425270	250.0	274.0	
Average of Peak Amounts =						261.8	
2	3.132	3.134	-0.002	6160075	250.0	265.0	
2	3.265	3.264	0.001	4019733	250.0	281.1	
2	3.318	3.318	0.000	13912643	250.0	272.6	
Average of Peak Amounts =						272.9	
RPD = 4.17							

9 PCB-1254

1	5.545	5.544	0.001	10267263	250.0	254.4	
1	5.885	5.887	-0.002	7436629	250.0	249.8	
1	6.045	6.044	0.001	14193865	250.0	256.2	
1	6.412	6.411	0.001	9819643	250.0	254.2	
1	7.035	7.037	-0.002	12124818	250.0	253.1	
Average of Peak Amounts =						253.5	
2	5.598	5.598	0.000	23360585	250.0	266.5	
2	6.025	6.024	0.001	17638723	250.0	266.4	
2	6.175	6.174	0.001	32639179	250.0	262.9	
2	6.725	6.724	0.001	14070462	250.0	271.0	
2	7.198	7.198	0.000	33156680	250.0	265.0	
Average of Peak Amounts =						266.4	
RPD = 4.94							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290014.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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S 8 Polychlorinated biphenyls, Total

1 515.3

2 539.3

RPD = 4.55

Reagents:

AR_2154_L7_00022

Amount Added: 0.25

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290014.D

Injection Date: 29-Jan-2019 18:46:13

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 14

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

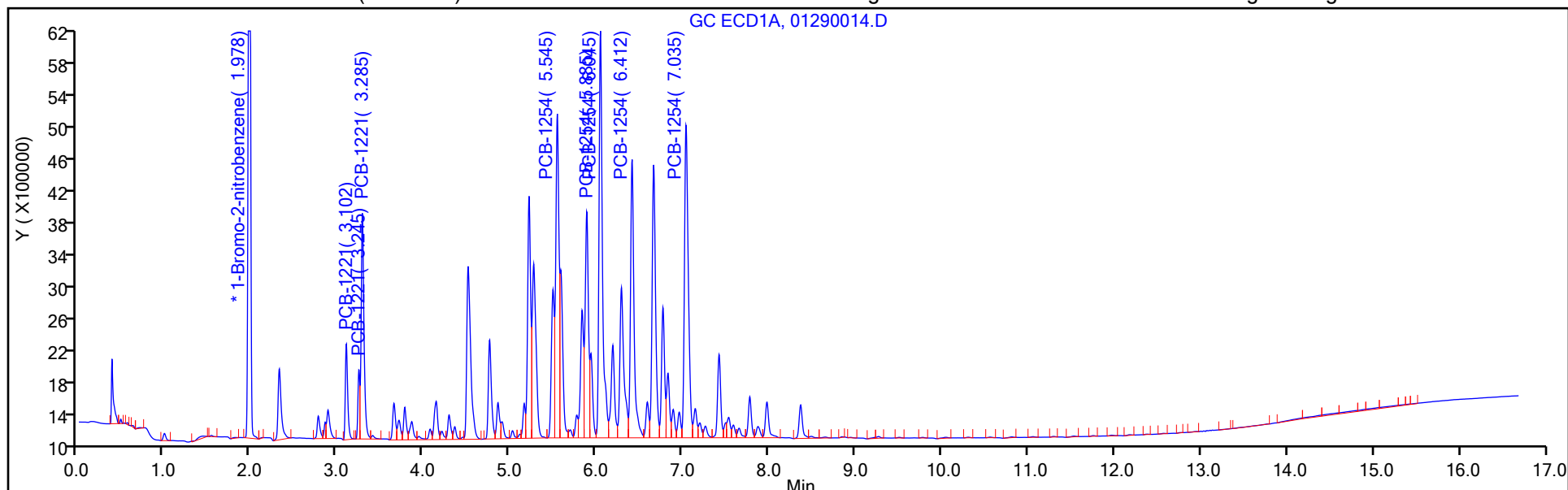
ALS Bottle#: 14

Method: 8082_J

Limit Group: GCSV - 8082 - IS

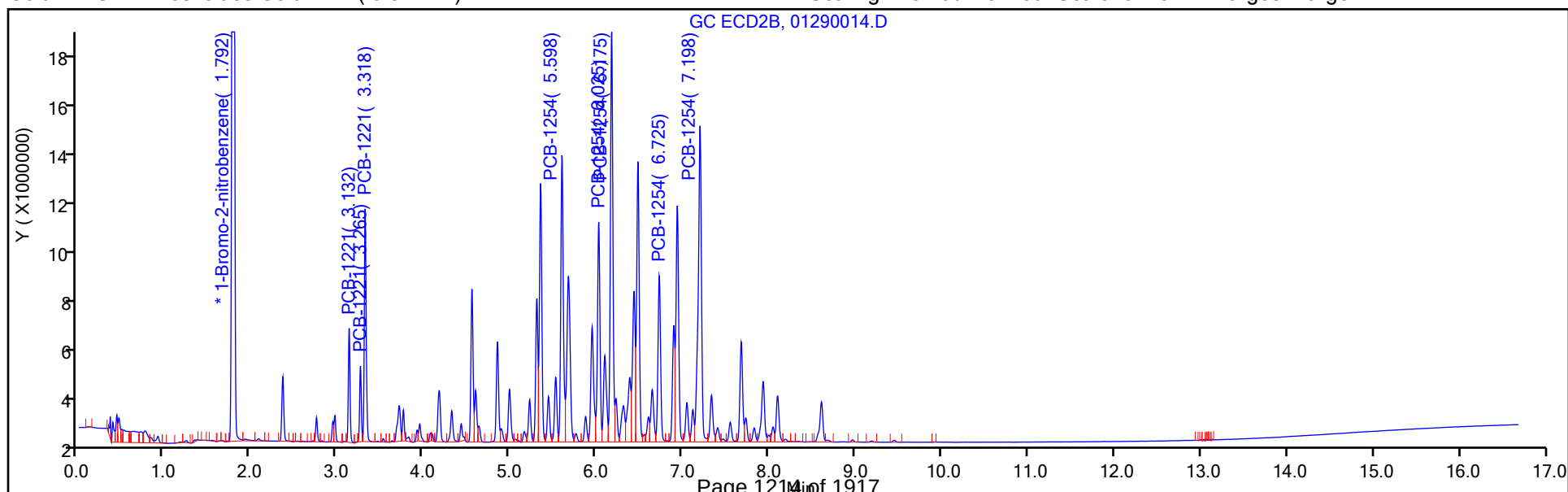
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290015.D
 Lims ID: STD5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 29-Jan-2019 19:07:23 ALS Bottle#: 15 Worklist Smp#: 15
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-015
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:25 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:44:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.977	0.000	18277877	100.0	100.0	
2	1.791	1.791	0.000	103309156	100.0	100.0	
RPD = 0.00							

3 PCB-1221

1	3.101	3.101	0.000	4272039	500.0	529.4	
1	3.247	3.247	0.000	2406564	500.0	485.4	
1	3.287	3.287	0.000	11538084	500.0	522.2	
Average of Peak Amounts =						512.3	
2	3.134	3.134	0.000	10921675	500.0	504.7	
2	3.264	3.264	0.000	7137136	500.0	534.8	
2	3.318	3.318	0.000	25213380	500.0	530.7	
Average of Peak Amounts =						523.4	
RPD = 2.13							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290015.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.544	5.544	0.000	20181603	500.0	528.9	
1	5.887	5.887	0.000	14946862	500.0	523.2	
1	6.044	6.044	0.000	27850289	500.0	523.2	
1	6.411	6.411	0.000	19201872	500.0	520.1	
1	7.037	7.037	0.000	23827137	500.0	519.4	

Average of Peak Amounts = 523.0

2	5.598	5.598	0.000	43434124	500.0	531.9	
2	6.024	6.024	0.000	32807117	500.0	531.0	
2	6.174	6.174	0.000	61775552	500.0	532.0	
2	6.724	6.724	0.000	25966972	500.0	537.9	
2	7.198	7.198	0.000	62140948	500.0	532.1	

Average of Peak Amounts = 533.0

RPD = 1.91

Reagents:

AR_2154_L7_00022

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:25

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290015.D

Injection Date: 29-Jan-2019 19:07:23

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 15

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

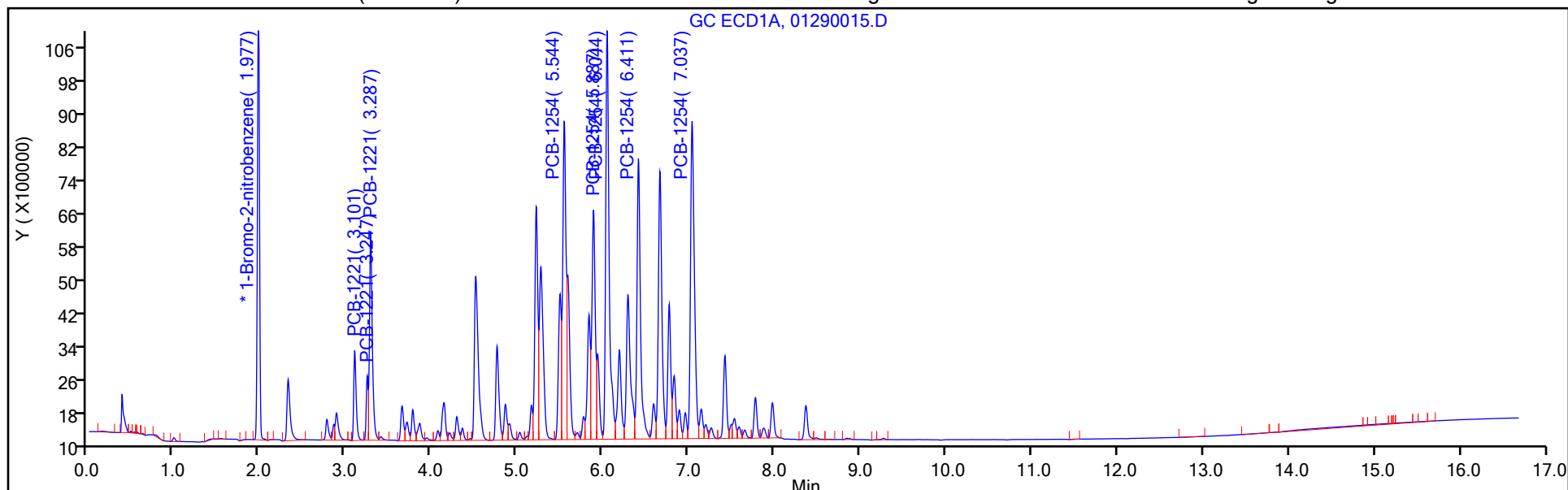
ALS Bottle#: 15

Method: 8082_J

Limit Group: GCSV - 8082 - IS

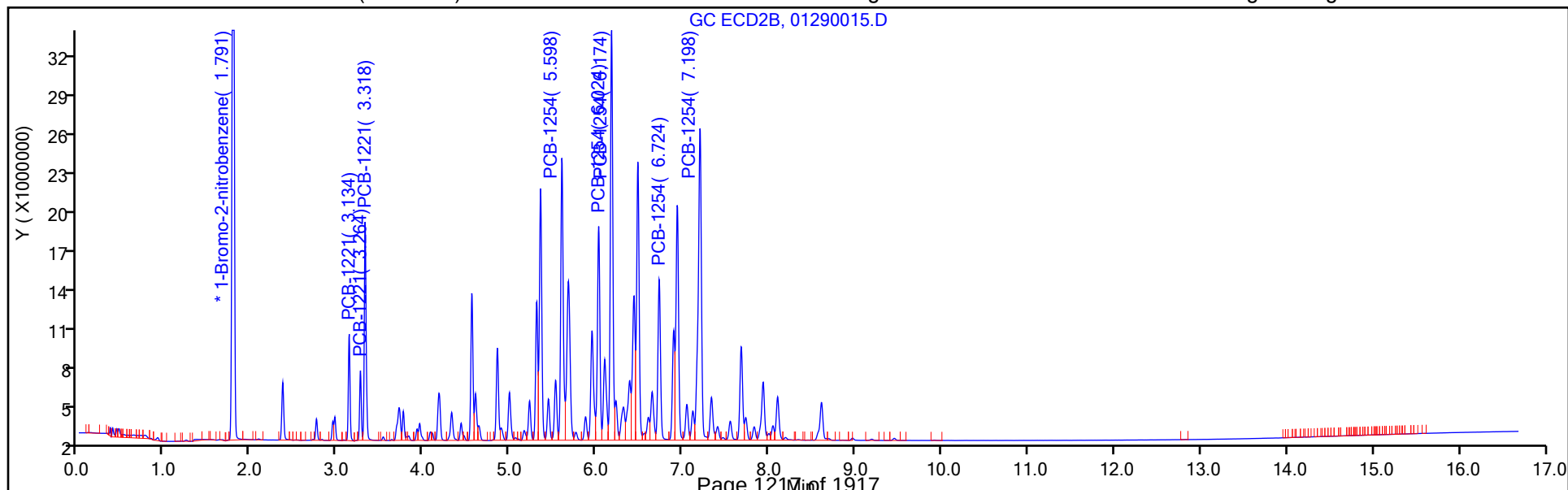
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290016.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 29-Jan-2019 19:28:26 ALS Bottle#: 16 Worklist Smp#: 16
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-016
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:23 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	18947639	100.0	100.0
2	1.790	1.789	0.001	107224784	100.0	100.0

RPD = 0.00

3 PCB-1221

1	3.100	3.101	-0.001	6278067	750.0	756.1
1	3.246	3.247	-0.001	3444943	750.0	670.3
1	3.286	3.287	-0.001	17079944	750.0	752.3

Average of Peak Amounts = 726.3

2	3.133	3.134	-0.001	15773177	750.0	710.1
2	3.263	3.264	-0.001	10378441	750.0	757.2
2	3.320	3.318	0.002	36996950	750.0	758.6

Average of Peak Amounts = 742.0

RPD = 2.14

9 PCB-1254

1	5.543	5.544	-0.001	29777425	750.0	757.6
1	5.886	5.887	-0.001	22481604	750.0	760.9
1	6.043	6.044	-0.001	41851991	750.0	760.0
1	6.410	6.411	-0.001	29009498	750.0	760.6
1	7.036	7.037	-0.001	36062168	750.0	760.6

Average of Peak Amounts = 759.9

2	5.600	5.598	0.002	63195207	750.0	753.2
2	6.023	6.024	-0.001	47912197	750.0	754.5
2	6.173	6.174	-0.001	90177116	750.0	754.8
2	6.727	6.724	0.003	37439825	750.0	755.2
2	7.200	7.198	0.002	91035999	750.0	758.2

Average of Peak Amounts = 755.2

RPD = 0.62

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290016.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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S 8 Polychlorinated biphenyls, Total

1 1486.2

2 1497.1

RPD = 0.74

Reagents:

AR_2154_L7_00022

Amount Added: 0.75

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290016.D

Injection Date: 29-Jan-2019 19:28:26

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 16

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

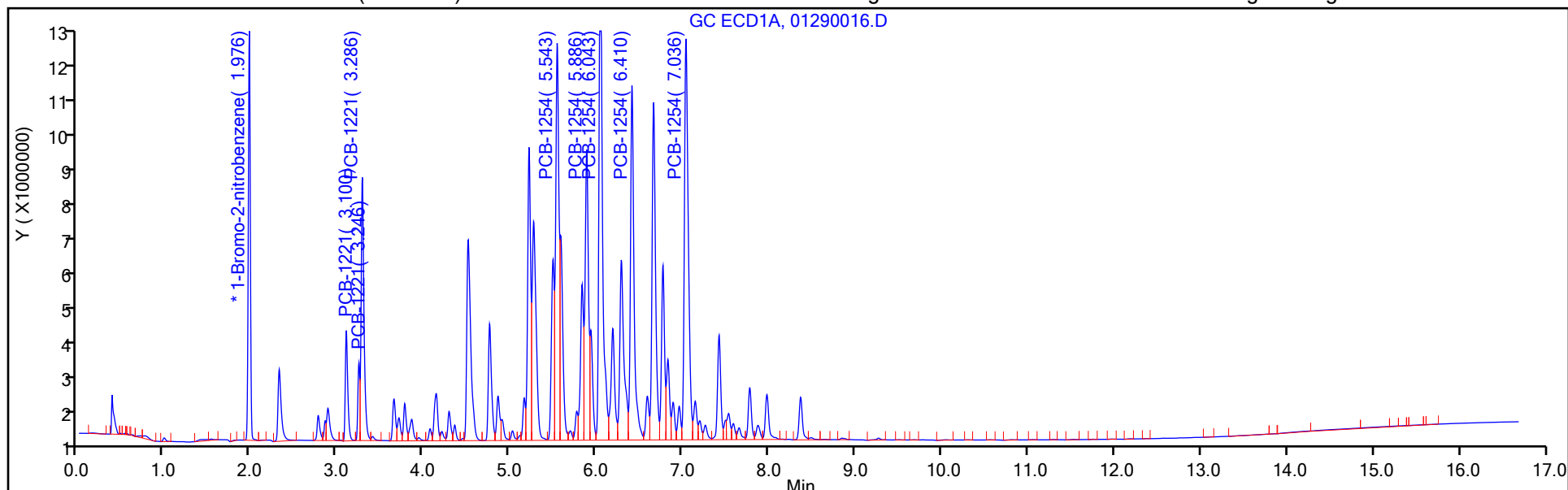
ALS Bottle#: 16

Method: 8082_J

Limit Group: GCSV - 8082 - IS

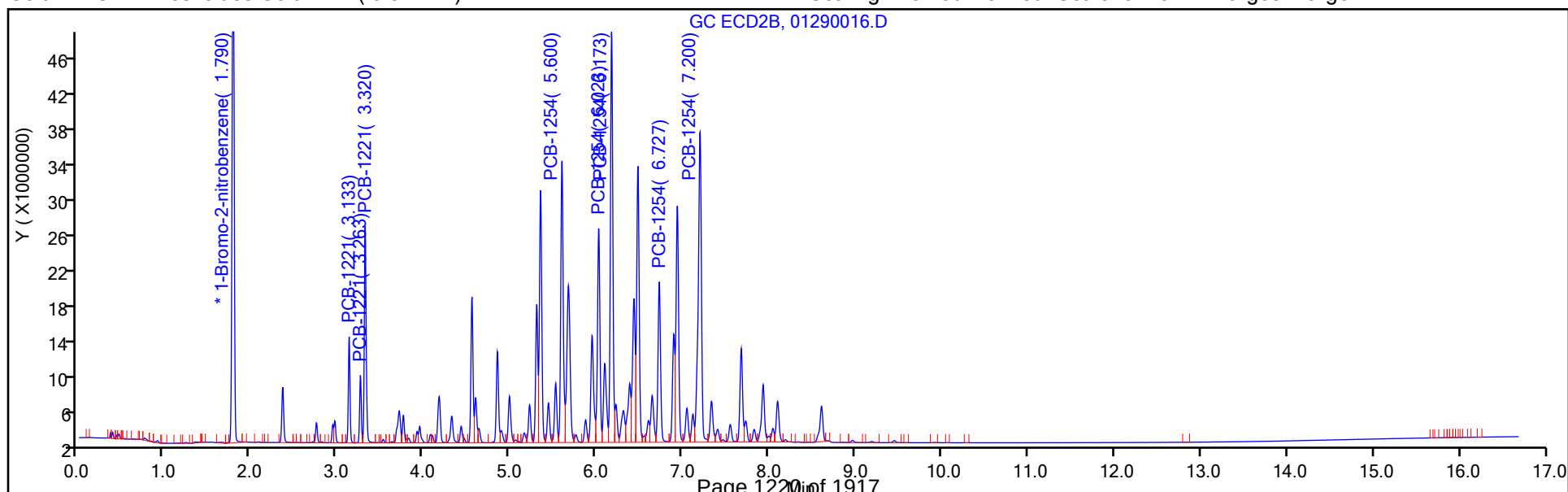
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290017.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 29-Jan-2019 19:49:27 ALS Bottle#: 17 Worklist Smp#: 17
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-017
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub3
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:21 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:41:20

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.979	-0.002	19851473	100.0	100.0	
2	1.787	1.789	-0.002	112694816	100.0	100.0	
						RPD =	0.00

3 PCB-1221

1	3.100	3.101	-0.001	8210089	1000.0	947.0	
1	3.247	3.247	0.000	4067237	1000.0	755.4	
1	3.287	3.287	0.000	22436428	1000.0	947.2	
Average of Peak Amounts =						883.2	
2	3.134	3.134	0.000	20283315	1000.0	873.3	
2	3.264	3.264	0.000	13216442	1000.0	921.6	
2	3.317	3.318	-0.001	47720495	1000.0	935.6	
Average of Peak Amounts =						910.2	
						RPD =	3.00

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290017.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.544	5.544	0.000	39222684	1000.0	955.4	
1	5.887	5.887	0.000	29892070	1000.0	966.6	
1	6.044	6.044	0.000	55340228	1000.0	960.0	
1	6.410	6.411	-0.001	38512069	1000.0	965.4	
1	7.037	7.037	0.000	48030061	1000.0	968.2	

Average of Peak Amounts = 963.1

2	5.597	5.598	-0.001	82953892	1000.0	945.4	
2	6.024	6.024	0.000	62789497	1000.0	945.2	
2	6.174	6.174	0.000	118710548	1000.0	949.4	
2	6.724	6.724	0.000	48305997	1000.0	931.7	
2	7.197	7.198	-0.001	118446332	1000.0	942.8	

Average of Peak Amounts = 942.9

RPD = 2.12

S 8 Polychlorinated biphenyls, Total

1	1846.3
2	1853.1

RPD = 0.36

Reagents:

AR_2154_L7_00022

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290017.D

Injection Date: 29-Jan-2019 19:49:27

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 17

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

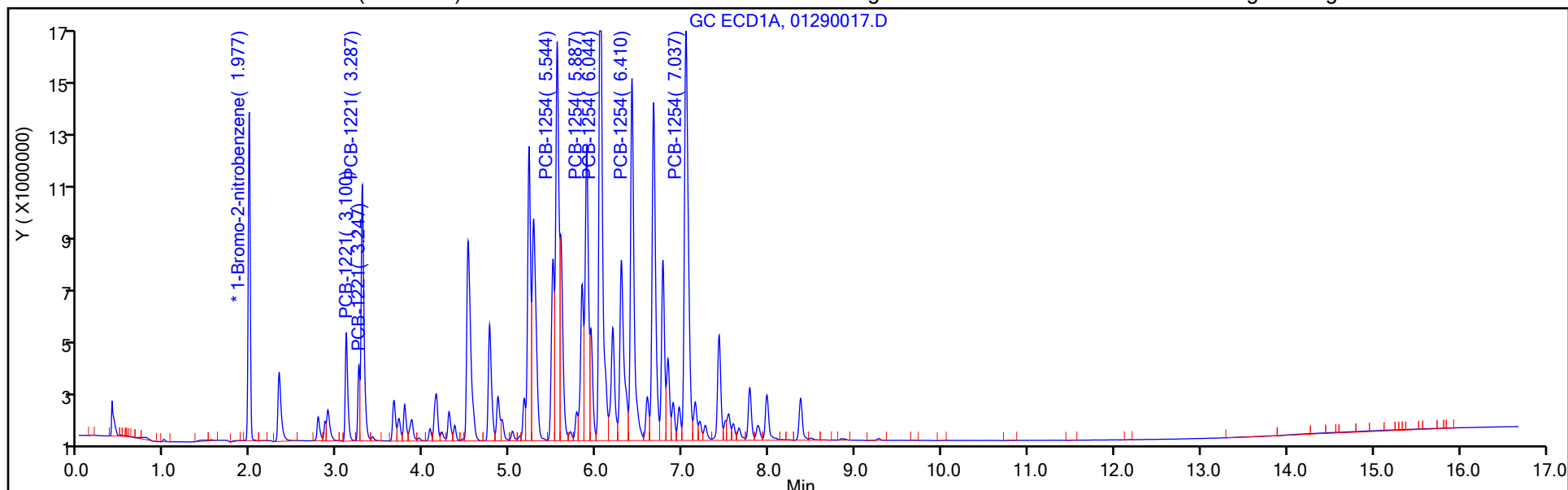
ALS Bottle#: 17

Method: 8082_J

Limit Group: GCSV - 8082 - IS

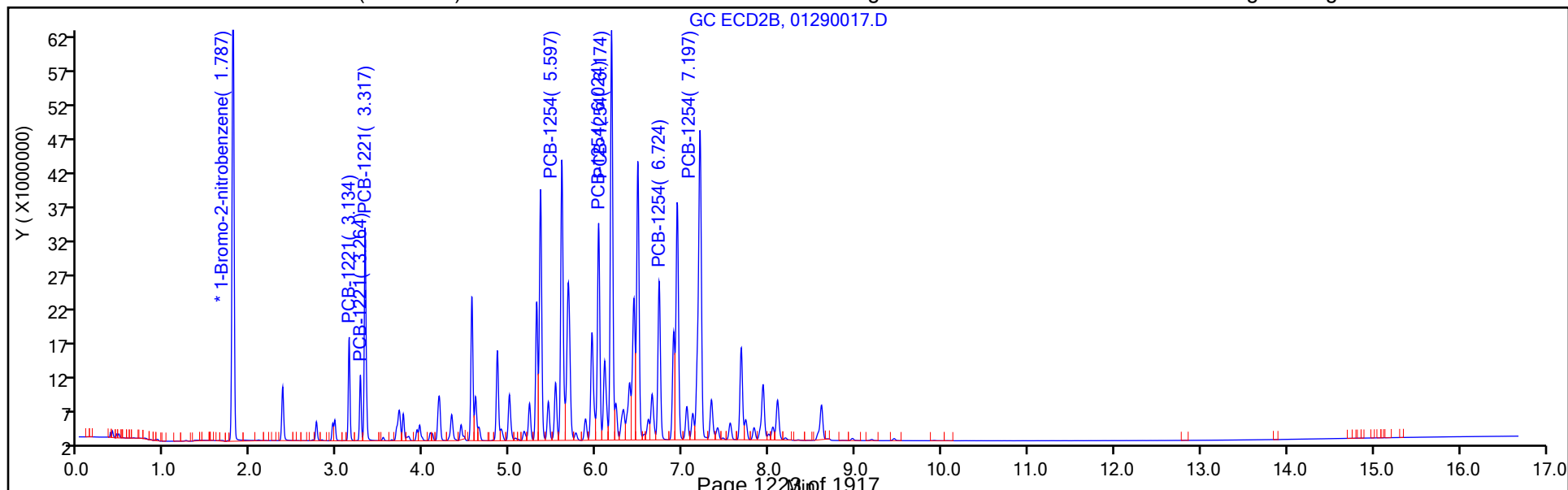
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 20:31 Calibration End Date: 01/29/2019 22:38 Calibration ID: 35091

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/19	01290019.D
Level 2	STD2 280-445745/20	01290020.D
Level 3	STD3 280-445745/21	01290021.D
Level 4	STD4 280-445745/22	01290022.D
Level 5	STD5 280-445745/23	01290023.D
Level 6	STD6 280-445745/24	01290024.D
Level 7	STD7 280-445745/25	01290025.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
PCB-1016 Peak 1	0.1196 0.0767	0.1060 0.0775	0.0976	0.0880	0.0776	Lin1	1.3891	0.0763							0.9980		0.9900
PCB-1016 Peak 2	0.2583 0.1714	0.2383 0.1726	0.2215	0.1978	0.1730	Lin1	3.0509	0.1706							0.9980		0.9900
PCB-1016 Peak 3	0.3439 0.3426	0.3419 0.3545	0.3313	0.3283	0.3116	Lin1	-0.371	0.3404							0.9970		0.9900
PCB-1016 Peak 4	0.1651 0.1306	0.1625 0.1340	0.1547	0.1442	0.1294	Lin1	1.2883	0.1314							0.9990		0.9900
PCB-1016 Peak 5	0.1701 0.1409	0.1676 0.1445	0.1612	0.1526	0.1394	Lin1	1.0695	0.1418							0.9990		0.9900
PCB-1260 Peak 1	0.2539 0.1968	0.2501 0.2026	0.2356	0.2163	0.1964	Lin1	2.0959	0.1982							0.9990		0.9900
PCB-1260 Peak 2	0.1288 0.1125	0.1240 0.1176	0.1228	0.1163	0.1095	Lin1	0.4461	0.1138							0.9990		0.9900
PCB-1260 Peak 3	0.2108 0.1724	0.2080 0.1789	0.1962	0.1883	0.1708	Lin1	1.3330	0.1744							0.9990		0.9900
PCB-1260 Peak 4	0.4322 0.3894	0.4281 0.4079	0.4152	0.4041	0.3841	Lin1	1.1576	0.3958							0.9990		0.9900
PCB-1260 Peak 5	0.1870 0.1627	0.1850 0.1705	0.1756	0.1710	0.1609	Lin1	0.7084	0.1653							0.9990		0.9900
Tetrachloro-m-xylene	3.9062 4.1507	4.0008 4.3462	3.9478	4.0947	4.0308	Lin1	-0.672	4.2187							0.9990		0.9900
DCB Decachlorobiphenyl	3.7196 3.0165	3.8070 3.0860	3.6412	3.3171	3.0423	Lin1	1.4906	3.0421							0.9990		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 20:31 Calibration End Date: 01/29/2019 22:38 Calibration ID: 35091

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/19	01290019.D
Level 2	STD2 280-445745/20	01290020.D
Level 3	STD3 280-445745/21	01290021.D
Level 4	STD4 280-445745/22	01290022.D
Level 5	STD5 280-445745/23	01290023.D
Level 6	STD6 280-445745/24	01290024.D
Level 7	STD7 280-445745/25	01290025.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1016 Peak 1	BNB	Lin1	559860 11548704	965503 15000661	1792682	4226504	7952245	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 2	BNB	Lin1	1209479 25823234	2171469 33410558	4067241	9498775	17733988	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 3	BNB	Lin1	1610058 51613620	3115498 68613189	6083533	15763921	31945318	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 4	BNB	Lin1	773065 19679998	1480509 25930063	2839877	6921564	13273314	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 5	BNB	Lin1	796349 21228575	1527261 27973098	2960668	7327932	14291318	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 1	BNB	Lin1	1188688 29648276	2279107 39224988	4326070	10387117	20138087	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 2	BNB	Lin1	603264 16947271	1129457 22769035	2254364	5585726	11232542	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 3	BNB	Lin1	987009 25970807	1895416 34623161	3603564	9041388	17517262	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 4	BNB	Lin1	2023732 58668909	3900466 78962273	7624671	19402857	39380635	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 5	BNB	Lin1	875716 24515178	1685702 32994132	3223947	8209562	16493612	25.0 750	50.0 1000	100	250	500
Tetrachloro-m-xylene	BNB	Lin1	914469 31266518	1822602 42063367	3624536	9829518	20664986	1.25 37.5	2.50 50.0	5.00	12.5	25.0
DCB Decachlorobiphenyl	BNB	Lin1	870801 22722769	1734330 29866597	3343034	7962949	15597466	1.25 37.5	2.50 50.0	5.00	12.5	25.0

Curve Type Legend:

Lin1 = Linear 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290019.D
 Lims ID: STD1 1660
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 29-Jan-2019 20:31:38 ALS Bottle#: 19 Worklist Smp#: 19
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 1660
 Misc. Info.: 280-0078470-019
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:16 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:31:19

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.979	-0.004	18728713	100.0	100.0	
2	1.788	1.789	-0.001	104727389	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.891	2.892	-0.001	914469	1.25	1.32	
2	2.818	2.819	-0.001	1471633	1.25	0.7573	
RPD = 53.95							

1 PCB-1016

1	3.288	3.286	0.002	559860	25.0	21.0	
1	3.651	3.652	-0.001	1209479	25.0	20.0	
1	4.141	4.142	-0.001	1610058	25.0	26.3	
1	4.291	4.292	-0.001	773065	25.0	21.6	
1	4.761	4.762	-0.001	796349	25.0	22.4	
Average of Peak Amounts =						22.3	
2	3.715	3.712	0.003	2627578	25.0	23.2	
2	4.175	4.176	-0.001	5204108	25.0	24.0	
2	4.322	4.322	0.000	2375701	25.0	23.3	
2	4.558	4.556	0.002	1320720	25.0	20.8	
2	4.852	4.852	0.000	2068748	25.0	20.7	
Average of Peak Amounts =						22.4	
RPD = 0.57							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290019.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.288	6.289	-0.001	1188688	25.0	21.4	
1	6.825	6.829	-0.004	603264	25.0	24.4	
1	7.531	7.532	-0.001	987009	25.0	22.6	
1	7.971	7.976	-0.005	2023732	25.0	24.4	
1	8.361	8.366	-0.005	875716	25.0	24.0	

Average of Peak Amounts = 23.4

2	6.725	6.726	-0.001	3698458	25.0	23.4	
2	7.195	7.196	-0.001	5216162	25.0	23.5	
2	7.328	7.332	-0.004	2963336	25.0	23.2	
2	8.098	8.099	-0.001	6339377	25.0	23.9	
2	8.605	8.606	-0.001	4773952	25.0	23.4	

Average of Peak Amounts = 23.5

RPD = 0.57

\$ 15 DCB Decachlorobiphenyl

1	9.955	9.956	-0.001	870801	1.25	1.04	
2	10.278	10.279	-0.001	3010343	1.25	1.16	

RPD = 10.80

S 8 Polychlorinated biphenyls, Total

1						45.6	
2						45.9	

RPD = 0.57

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.03
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:17

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290019.D

Injection Date: 29-Jan-2019 20:31:38

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD1 1660

Worklist Smp#: 19

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

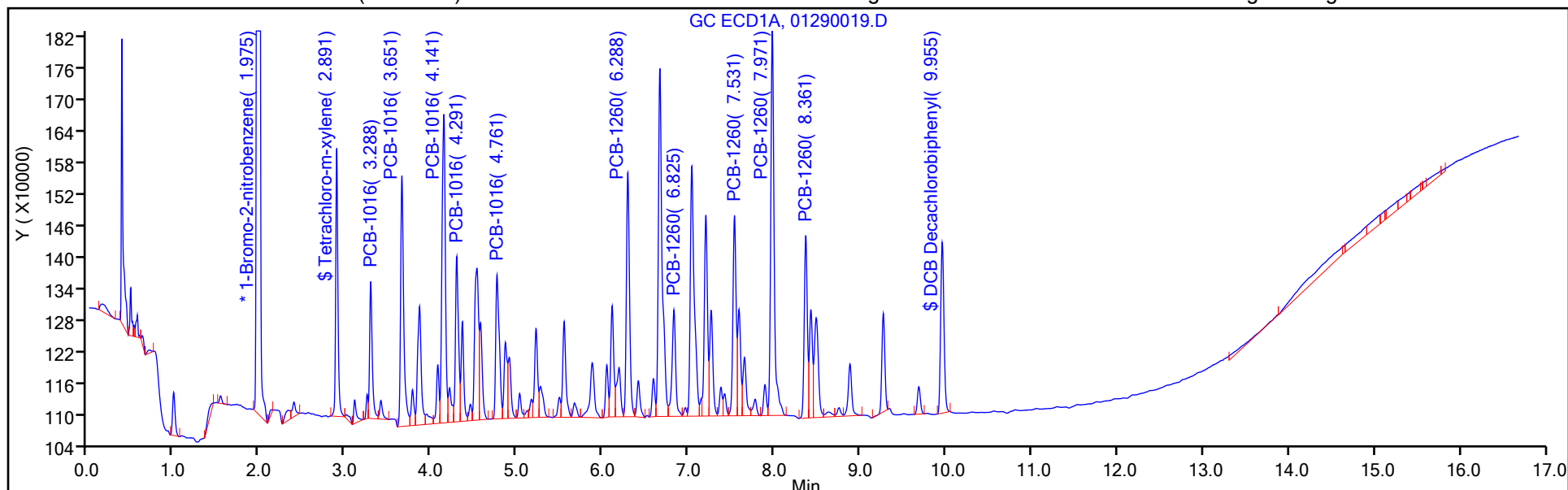
ALS Bottle#: 19

Method: 8082_J

Limit Group: GCSV - 8082 - IS

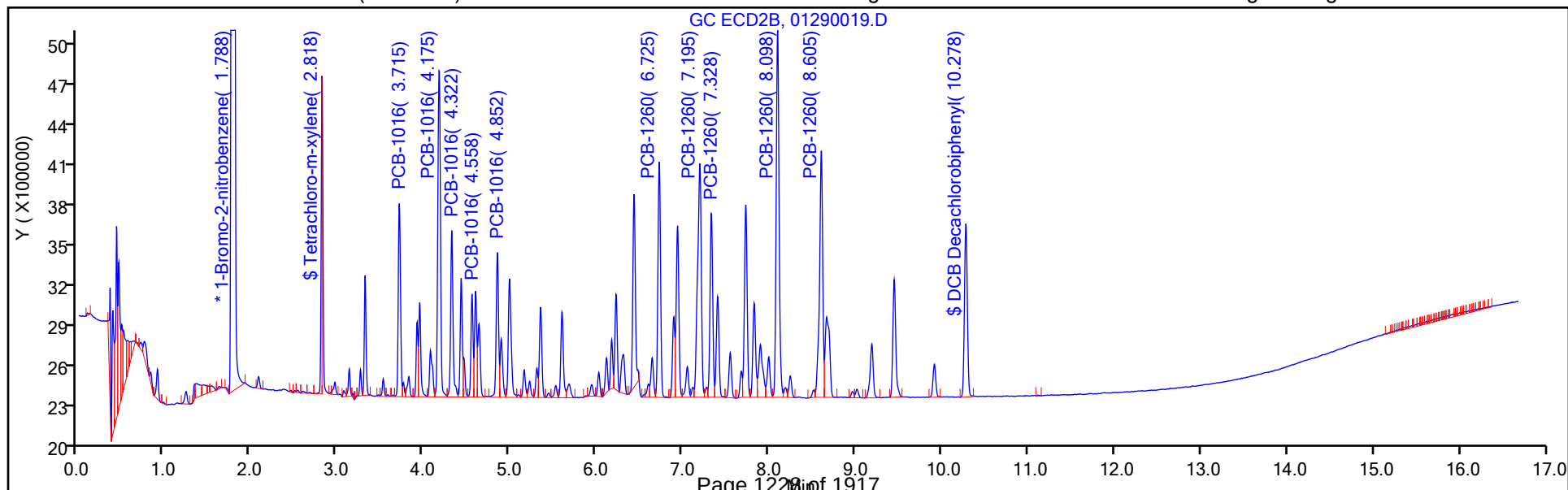
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290020.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 29-Jan-2019 20:52:40 ALS Bottle#: 20 Worklist Smp#: 20
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-020
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:15 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.979	-0.002	18222309	100.0	100.0	
2	1.791	1.789	0.002	101690991	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.891	2.892	-0.001	1822602	2.50	2.53	
2	2.821	2.819	0.002	5982700	2.50	3.11	
RPD = 20.52							

1 PCB-1016

1	3.287	3.286	0.001	965503	50.0	51.2	
1	3.651	3.652	-0.001	2171469	50.0	52.0	
1	4.141	4.142	-0.001	3115498	50.0	51.3	
1	4.291	4.292	-0.001	1480509	50.0	52.0	
1	4.761	4.762	-0.001	1527261	50.0	51.6	

Average of Peak Amounts = 51.6

2	3.714	3.712	0.002	4577403	50.0	54.7	
2	4.177	4.176	0.001	9101267	50.0	52.6	
2	4.321	4.322	-0.001	4153755	50.0	54.4	
2	4.557	4.556	0.001	2340987	50.0	54.0	
2	4.851	4.852	-0.001	3559060	50.0	55.3	

Average of Peak Amounts = 54.2

RPD = 4.84

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290020.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.287	6.289	-0.002	2279107	50.0	52.5	
1	6.824	6.829	-0.005	1129457	50.0	50.5	
1	7.531	7.532	-0.001	1895416	50.0	52.0	
1	7.974	7.976	-0.002	3900466	50.0	51.2	
1	8.364	8.366	-0.002	1685702	50.0	51.7	

Average of Peak Amounts =

2	6.724	6.726	-0.002	6505968	50.0	54.3	
2	7.197	7.196	0.001	9249707	50.0	54.2	
2	7.331	7.332	-0.001	5272800	50.0	55.0	
2	8.097	8.099	-0.002	11393234	50.0	53.3	
2	8.604	8.606	-0.002	8594861	50.0	54.5	

Average of Peak Amounts =

54.3

RPD = 5.07

\$ 15 DCB Decachlorobiphenyl

1	9.954	9.956	-0.002	1734330	2.50	2.64	
2	10.277	10.279	-0.002	5392068	2.50	2.77	

RPD = 4.87

S 8 Polychlorinated biphenyls, Total

1						103.2	
2						108.4	

RPD = 4.96

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.05
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:15

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290020.D

Injection Date: 29-Jan-2019 20:52:40

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 20

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

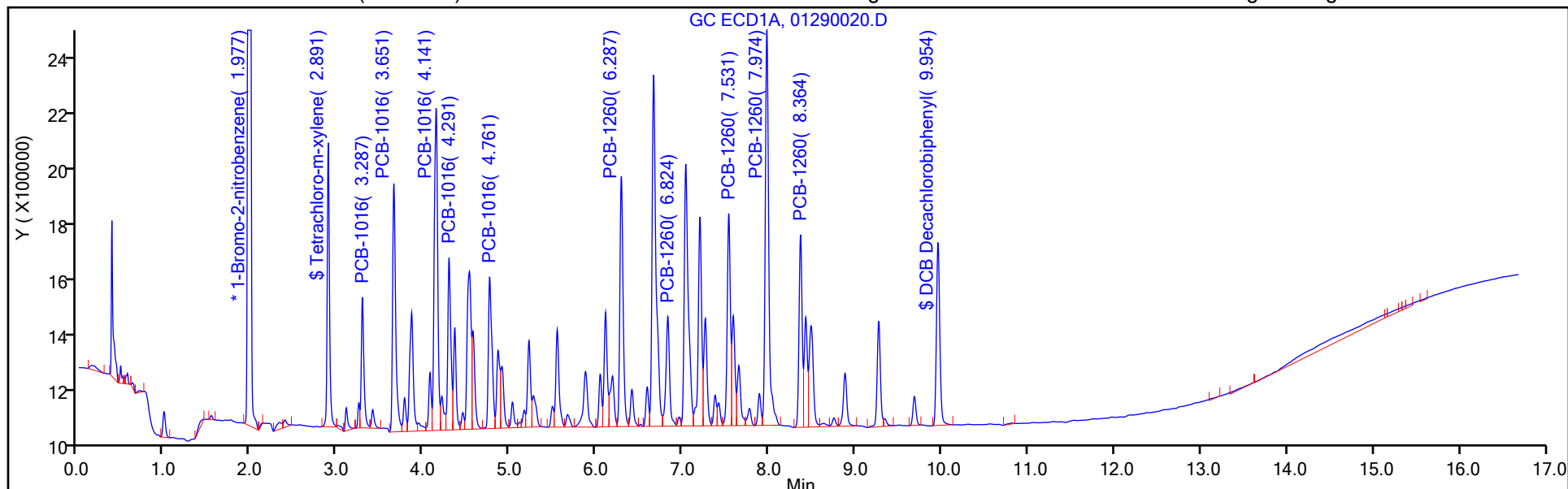
ALS Bottle#: 20

Method: 8082_J

Limit Group: GCSV - 8082 - IS

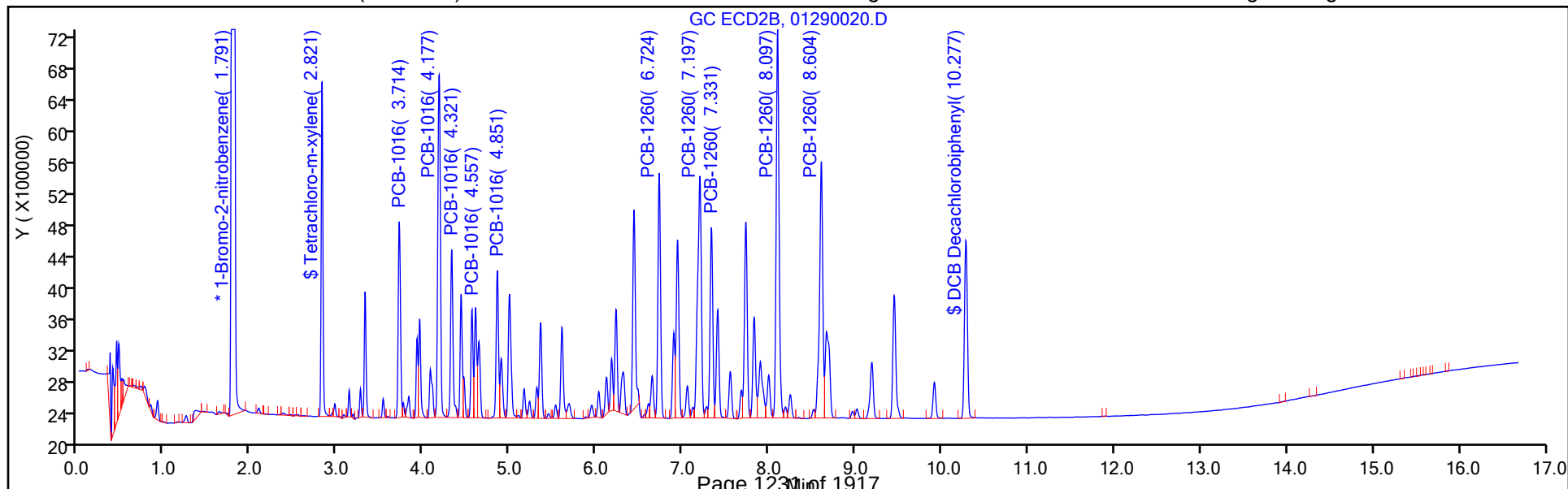
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290021.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 29-Jan-2019 21:13:50 ALS Bottle#: 21 Worklist Smp#: 21
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-021
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:13 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.979	-0.002	18362303	100.0	100.0	
2	1.790	1.789	0.001	102438475	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.894	2.892	0.002	3624536	5.00	4.84	
2	2.820	2.819	0.001	11113729	5.00	5.72	
RPD = 16.64							

1 PCB-1016

1	3.287	3.286	0.001	1792682	100.0	109.7	
1	3.650	3.652	-0.002	4067241	100.0	112.0	
1	4.144	4.142	0.002	6083533	100.0	98.4	
1	4.290	4.292	-0.002	2839877	100.0	107.9	
1	4.760	4.762	-0.002	2960668	100.0	106.2	

Average of Peak Amounts = 106.8

2	3.714	3.712	0.002	8229745	100.0	110.6	
2	4.177	4.176	0.001	16770420	100.0	105.8	
2	4.320	4.322	-0.002	7524499	100.0	110.1	
2	4.557	4.556	0.001	4120556	100.0	109.4	
2	4.850	4.852	-0.002	5895931	100.0	106.9	

Average of Peak Amounts = 108.6

RPD = 1.60

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290021.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.287	6.289	-0.002	4326070	100.0	108.3	
1	6.827	6.829	-0.002	2254364	100.0	104.0	
1	7.534	7.532	0.002	3603564	100.0	104.9	
1	7.974	7.976	-0.002	7624671	100.0	102.0	
1	8.364	8.366	-0.002	3223947	100.0	101.9	

Average of Peak Amounts =

104.2

2	6.727	6.726	0.001	11751902	100.0	108.9	
2	7.197	7.196	0.001	16730388	100.0	108.2	
2	7.330	7.332	-0.002	9497849	100.0	110.1	
2	8.097	8.099	-0.002	20878089	100.0	105.8	
2	8.604	8.606	-0.002	15503715	100.0	107.9	

Average of Peak Amounts =

108.2

RPD = 3.74

\$ 15 DCB Decachlorobiphenyl

1	9.957	9.956	0.001	3343034	5.00	5.49	
2	10.277	10.279	-0.002	9597384	5.00	5.47	

RPD = 0.40

S 8 Polychlorinated biphenyls, Total

1						211.0	
2						216.7	

RPD = 2.66

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.10
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:13

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290021.D

Injection Date: 29-Jan-2019 21:13:50

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD3

Worklist Smp#: 21

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

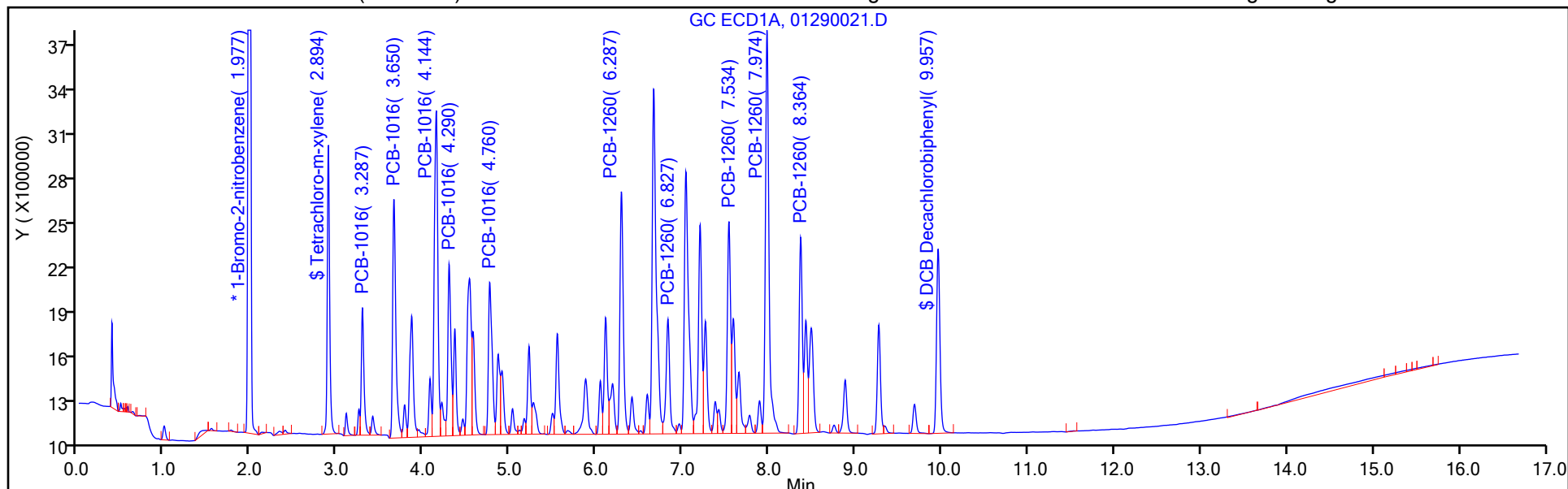
ALS Bottle#: 21

Method: 8082_J

Limit Group: GCSV - 8082 - IS

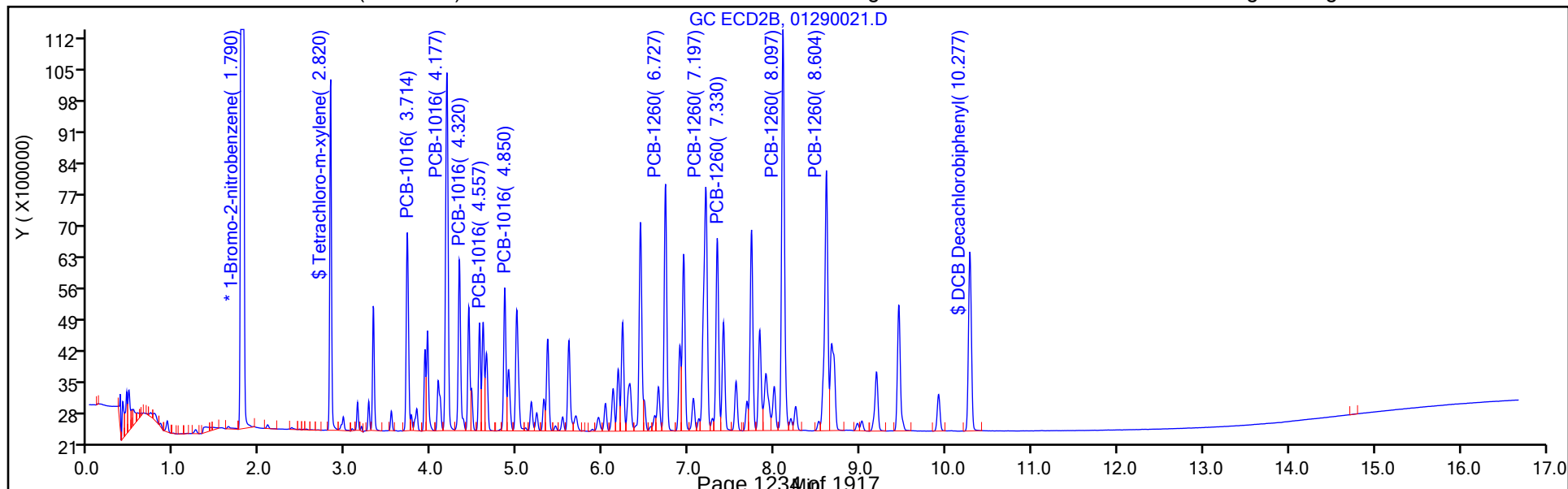
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290022.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 29-Jan-2019 21:34:52 ALS Bottle#: 22 Worklist Smp#: 22
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-022
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:11 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:28:15

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	19204388	100.0	100.0	
2	1.790	1.789	0.001	106896067	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.893	2.892	0.001	9829518	12.5	12.3	
2	2.820	2.819	0.001	27059584	12.5	13.3	
RPD = 7.97							

1 PCB-1016

1	3.286	3.286	0.000	4226504	250.0	270.2	
1	3.653	3.652	0.001	9498775	250.0	272.1	
1	4.143	4.142	0.001	15763921	250.0	242.2	
1	4.290	4.292	-0.002	6921564	250.0	264.6	
1	4.763	4.762	0.001	7327932	250.0	261.6	
Average of Peak Amounts =						262.1	
2	3.713	3.712	0.001	18866059	250.0	262.8	
2	4.176	4.176	0.000	40287772	250.0	258.7	
2	4.320	4.322	-0.002	17287413	250.0	260.9	
2	4.556	4.556	0.000	9287733	250.0	263.5	
2	4.850	4.852	-0.002	13302362	250.0	262.3	
Average of Peak Amounts =						261.7	
RPD = 0.18							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290022.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.286	6.289	-0.003	10387117	250.0	262.3	
1	6.826	6.829	-0.003	5585726	250.0	251.7	
1	7.533	7.532	0.001	9041388	250.0	262.3	
1	7.973	7.976	-0.003	19402857	250.0	252.4	
1	8.363	8.366	-0.003	8209562	250.0	254.3	

Average of Peak Amounts = 256.6

2	6.726	6.726	0.000	27060107	250.0	257.9	
2	7.196	7.196	0.000	38721098	250.0	256.6	
2	7.330	7.332	-0.002	21659841	250.0	258.3	
2	8.096	8.099	-0.003	49828439	250.0	255.8	
2	8.603	8.606	-0.003	35981937	250.0	255.8	

Average of Peak Amounts = 256.9

RPD = 0.12

\$ 15 DCB Decachlorobiphenyl

1	9.956	9.956	0.000	7962949	12.5	13.1	
2	10.280	10.279	0.001	21805920	12.5	12.8	

RPD = 2.61

S 8 Polychlorinated biphenyls, Total

1						518.7	
2						518.5	

RPD = 0.03

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.25
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290022.D

Injection Date: 29-Jan-2019 21:34:52

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 22

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

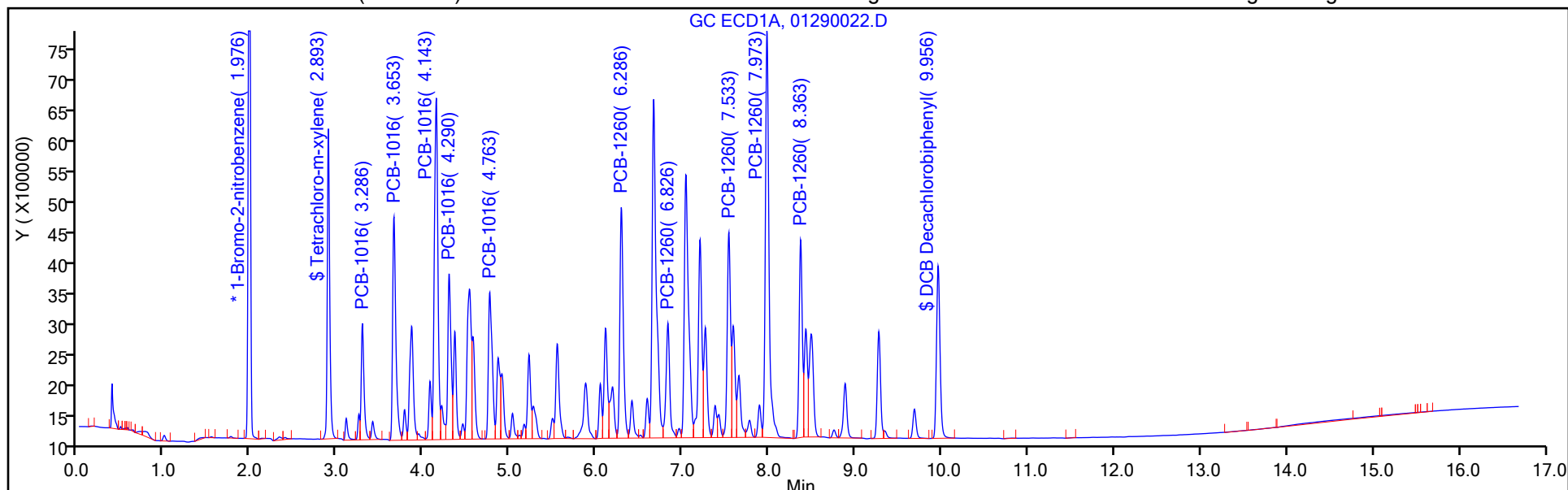
ALS Bottle#: 22

Method: 8082_J

Limit Group: GCSV - 8082 - IS

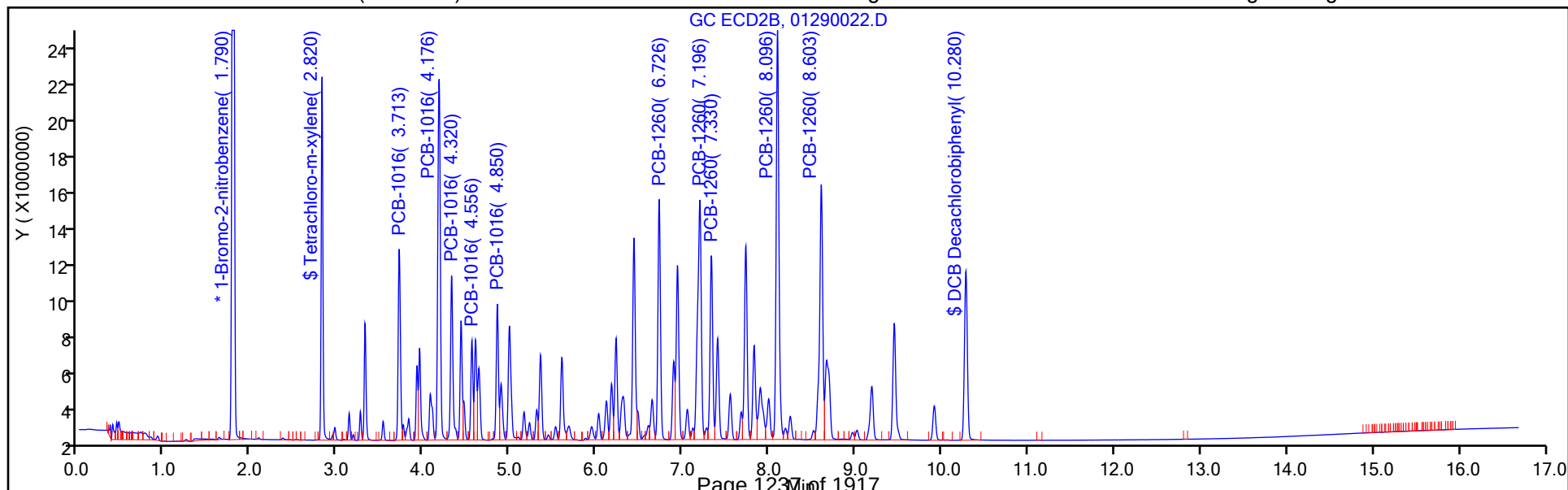
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290023.D
 Lims ID: STD5
 Client ID:
 Sample Type: ICIS Calib Level: 5
 Inject. Date: 29-Jan-2019 21:55:55 ALS Bottle#: 23 Worklist Smp#: 23
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-023
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:09 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:30:04

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.979	1.979	0.000	20507310	100.0	100.0	
2	1.789	1.789	0.000	113907969	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.892	2.892	0.000	20664986	25.0	24.0	
2	2.819	2.819	0.000	52211718	25.0	24.1	
RPD = 0.18							

1 PCB-1016

M

1	3.286	3.286	0.000	7952245	500.0	490.0	
1	3.652	3.652	0.000	17733988	500.0	489.1	
1	4.142	4.142	0.000	31945318	500.0	458.6	
1	4.292	4.292	0.000	13273314	500.0	482.9	
1	4.762	4.762	0.000	14291318	500.0	483.9	
Average of Peak Amounts =						480.9	
2	3.712	3.712	0.000	34998168	500.0	469.8	M
2	4.176	4.176	0.000	77642819	500.0	477.4	M
2	4.322	4.322	0.000	32426114	500.0	471.0	M
2	4.556	4.556	0.000	16726012	500.0	470.6	M
2	4.852	4.852	0.000	24328109	500.0	475.3	M
Average of Peak Amounts =						472.8	
RPD = 1.70							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290023.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.289	6.289	0.000	20138087	500.0	484.8	
1	6.829	6.829	0.000	11232542	500.0	477.4	
1	7.532	7.532	0.000	17517262	500.0	482.0	
1	7.976	7.976	0.000	39380635	500.0	482.3	
1	8.366	8.366	0.000	16493612	500.0	482.2	

Average of Peak Amounts = 481.7

2	6.726	6.726	0.000	51025026	500.0	467.6	
2	7.196	7.196	0.000	73709863	500.0	469.1	
2	7.332	7.332	0.000	40499657	500.0	464.6	
2	8.099	8.099	0.000	96609483	500.0	474.2	
2	8.606	8.606	0.000	69150252	500.0	471.7	

Average of Peak Amounts = 469.4

RPD = 2.59

\$ 15 DCB Decachlorobiphenyl

1	9.956	9.956	0.000	15597466	25.0	24.5	
2	10.279	10.279	0.000	41760348	25.0	23.6	

RPD = 3.76

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1660_L7_00028

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290023.D

Injection Date: 29-Jan-2019 21:55:55

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 23

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

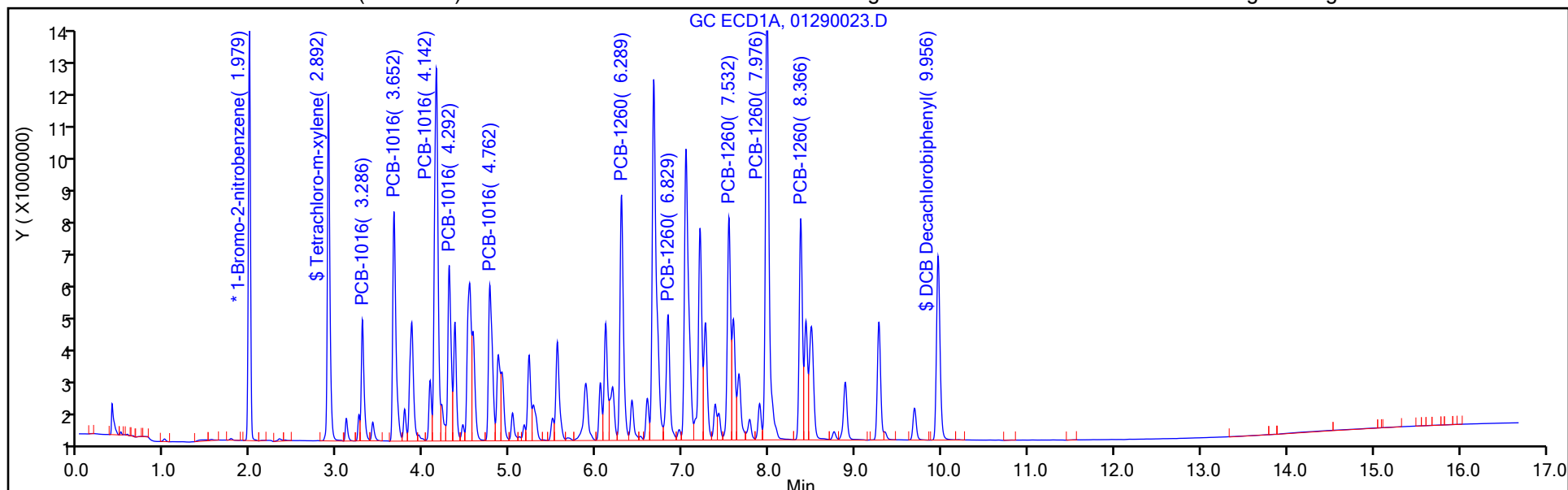
ALS Bottle#: 23

Method: 8082_J

Limit Group: GCSV - 8082 - IS

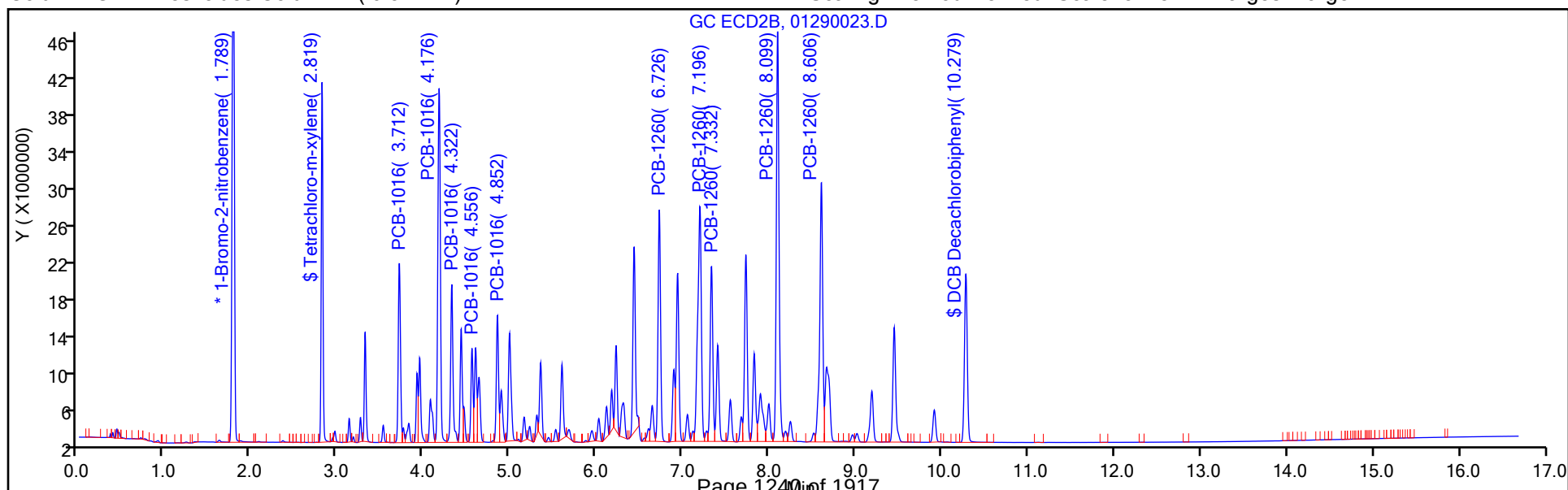
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290024.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 29-Jan-2019 22:17:03 ALS Bottle#: 24 Worklist Smp#: 24
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-024
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	20087397	100.0	100.0	
2	1.790	1.789	0.001	111093747	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.893	2.892	0.001	31266518	37.5	37.1	
2	2.820	2.819	0.001	77232852	37.5	36.5	
RPD = 1.44							

1 PCB-1016

1	3.286	3.286	0.000	11548704	750.0	735.3	
1	3.653	3.652	0.001	25823234	750.0	735.8	
1	4.143	4.142	0.001	51613620	750.0	755.8	
1	4.293	4.292	0.001	19679998	750.0	736.0	
1	4.763	4.762	0.001	21228575	750.0	737.7	
Average of Peak Amounts =						740.1	
2	3.713	3.712	0.001	50261441	750.0	699.5	
2	4.176	4.176	0.000	112828669	750.0	717.0	
2	4.320	4.322	-0.002	46628474	750.0	701.7	
2	4.556	4.556	0.000	24121030	750.0	728.7	
2	4.850	4.852	-0.002	35171114	750.0	730.5	
Average of Peak Amounts =						715.5	
RPD = 3.39							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290024.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.286	6.289	-0.003	29648276	750.0	734.0	
1	6.826	6.829	-0.003	16947271	750.0	737.4	
1	7.533	7.532	0.001	25970807	750.0	733.5	
1	7.976	7.976	0.000	58668909	750.0	735.0	
1	8.366	8.366	0.000	24515178	750.0	734.0	

Average of Peak Amounts = 734.8

2	6.726	6.726	0.000	74489703	750.0	707.2	
2	7.196	7.196	0.000	107647491	750.0	709.3	
2	7.330	7.332	-0.002	59223019	750.0	704.1	
2	8.096	8.099	-0.003	141474198	750.0	717.3	
2	8.603	8.606	-0.003	100507503	750.0	709.3	

Average of Peak Amounts = 709.4

RPD = 3.51

\$ 15 DCB Decachlorobiphenyl

1	9.959	9.956	0.003	22722769	37.5	36.7	
2	10.280	10.279	0.001	59811197	37.5	35.0	

RPD = 4.66

S 8 Polychlorinated biphenyls, Total

1						1474.9	
2						1424.9	

RPD = 3.45

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.75
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:07

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290024.D

Injection Date: 29-Jan-2019 22:17:03

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 24

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

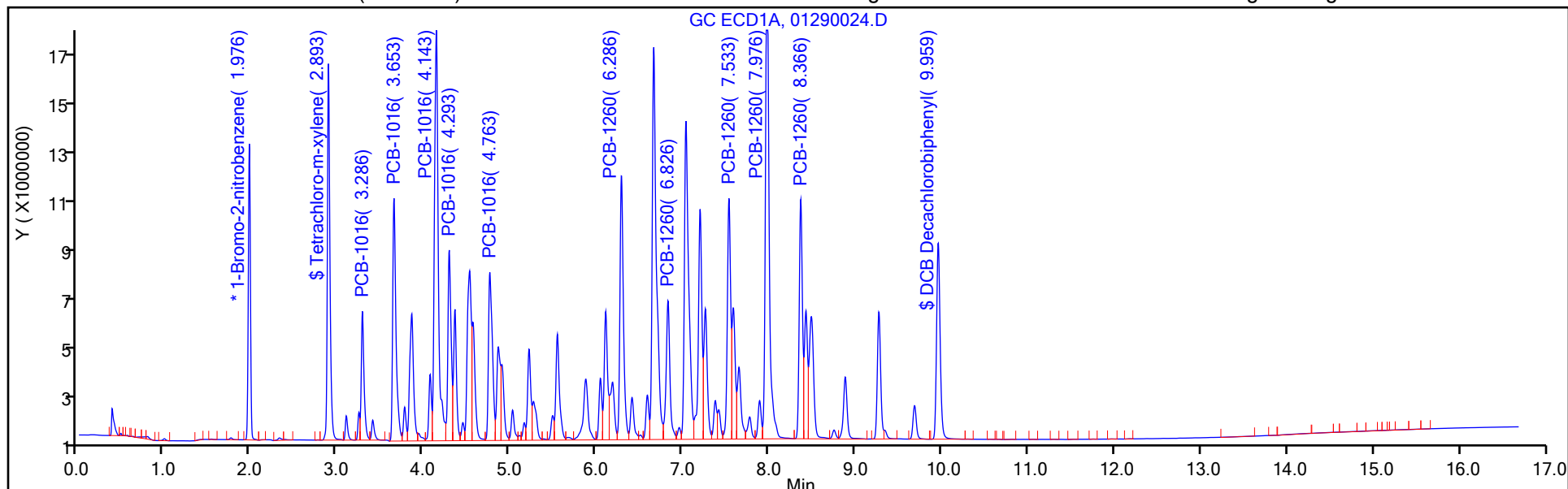
ALS Bottle#: 24

Method: 8082_J

Limit Group: GCSV - 8082 - IS

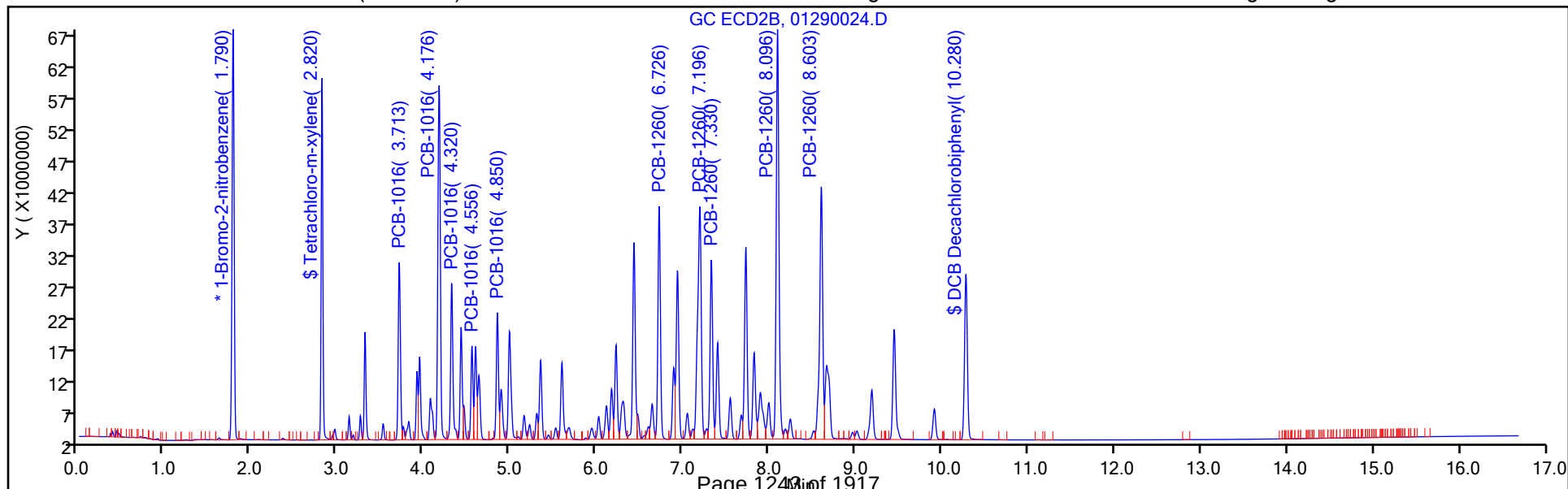
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290025.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 29-Jan-2019 22:38:06 ALS Bottle#: 25 Worklist Smp#: 25
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-025
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:05 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:32:26

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	19356422	100.0	100.0	
2	1.789	1.789	0.000	106973467	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.892	2.892	0.000	42063367	50.0	51.7	
2	2.819	2.819	0.000	102309976	50.0	50.2	
RPD = 2.81							

1 PCB-1016

1	3.286	3.286	0.000	15000661	1000.0	997.5	
1	3.652	3.652	0.000	33410558	1000.0	994.1	
1	4.142	4.142	0.000	68613189	1000.0	1042.3	
1	4.292	4.292	0.000	25930063	1000.0	1010.0	
1	4.762	4.762	0.000	27973098	1000.0	1011.6	
Average of Peak Amounts =						1011.1	
2	3.713	3.712	0.001	65204162	1000.0	948.2	
2	4.176	4.176	0.000	148508749	1000.0	984.4	
2	4.323	4.322	0.001	60950394	1000.0	958.1	
2	4.556	4.556	0.000	31312479	1000.0	1028.9	
2	4.849	4.852	-0.003	45994315	1000.0	1024.3	
Average of Peak Amounts =						988.8	
RPD = 2.23							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290025.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.286	6.289	-0.003	39224988	1000.0	1011.7	
1	6.829	6.829	0.000	22769035	1000.0	1029.7	
1	7.532	7.532	0.000	34623161	1000.0	1017.8	
1	7.976	7.976	0.000	78962273	1000.0	1027.8	
1	8.366	8.366	0.000	32994132	1000.0	1026.9	

Average of Peak Amounts = 1022.8

2	6.726	6.726	0.000	98609065	1000.0	977.8	
2	7.196	7.196	0.000	142990875	1000.0	983.6	
2	7.329	7.332	-0.003	78139671	1000.0	970.3	
2	8.096	8.099	-0.003	187991129	1000.0	994.0	
2	8.603	8.606	-0.003	133156158	1000.0	980.7	

Average of Peak Amounts = 981.3

RPD = 4.14

\$ 15 DCB Decachlorobiphenyl

1	9.956	9.956	0.000	29866597	50.0	50.2	
2	10.279	10.279	0.000	79228295	50.0	48.5	

RPD = 3.58

S 8 Polychlorinated biphenyls, Total

1						2033.8	
2						1970.0	

RPD = 3.19

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 1.00
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:05

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290025.D

Injection Date: 29-Jan-2019 22:38:06

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 25

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

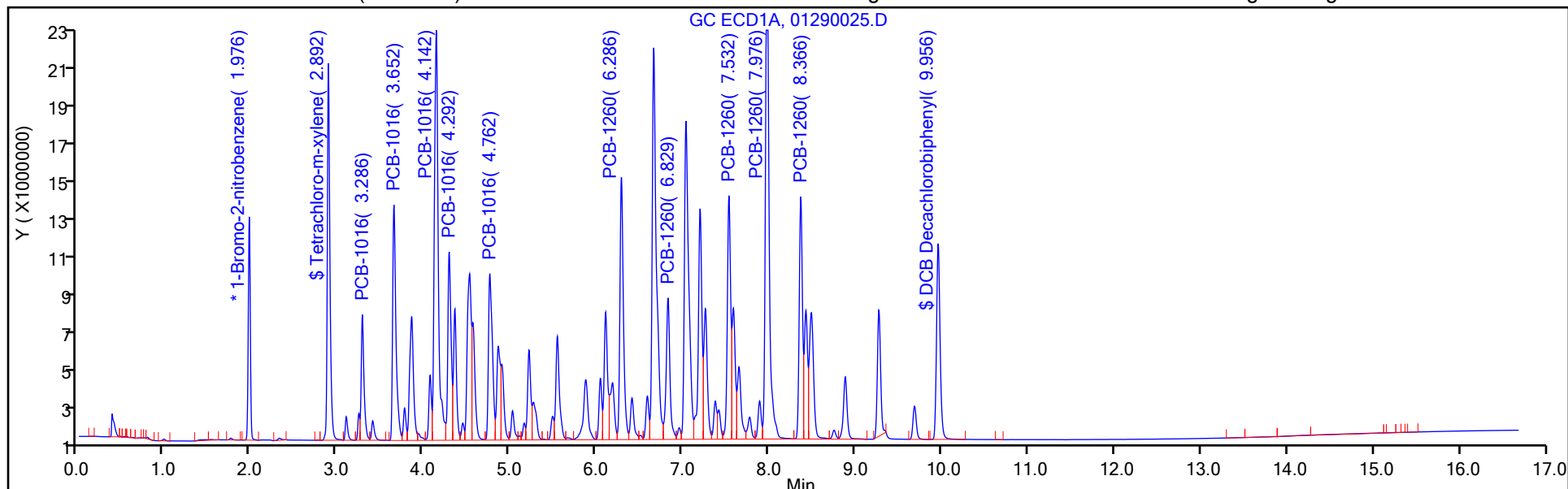
ALS Bottle#: 25

Method: 8082_J

Limit Group: GCSV - 8082 - IS

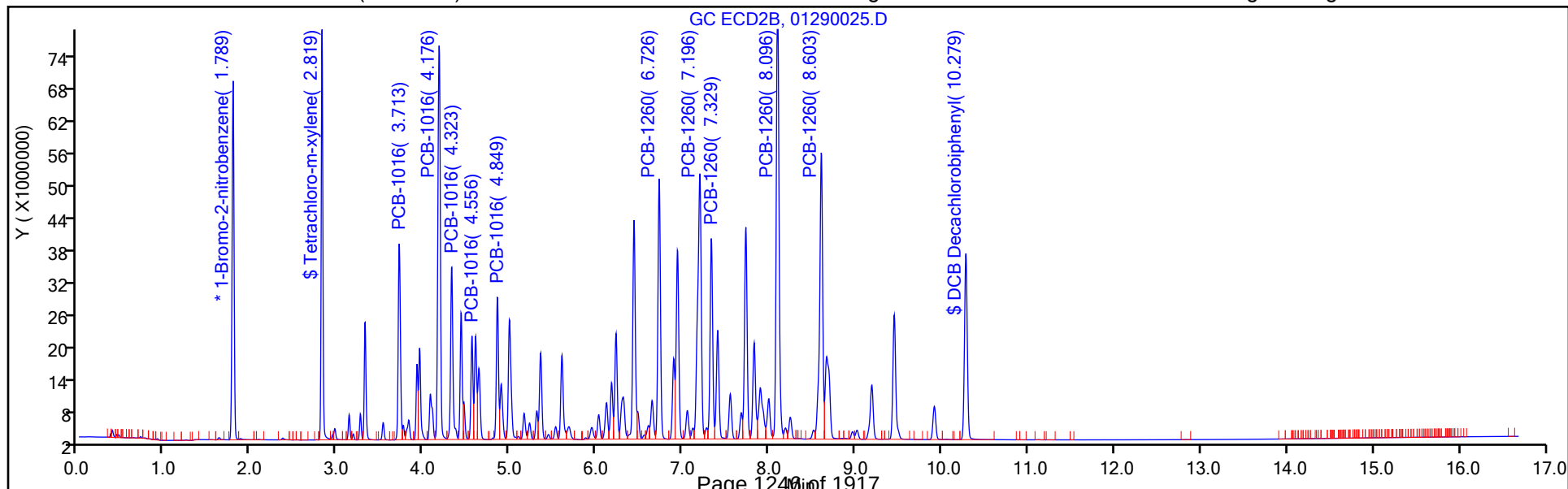
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 20:31 Calibration End Date: 01/29/2019 22:38 Calibration ID: 35092

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/19	01290019.D
Level 2	STD2 280-445745/20	01290020.D
Level 3	STD3 280-445745/21	01290021.D
Level 4	STD4 280-445745/22	01290022.D
Level 5	STD5 280-445745/23	01290023.D
Level 6	STD6 280-445745/24	01290024.D
Level 7	STD7 280-445745/25	01290025.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
PCB-1016 Peak 1	0.1004 0.0603	0.0900 0.0610	0.0803	0.0706	0.0614	Lin2	1.0437	0.0632							0.9910		0.9900
PCB-1016 Peak 2	0.1988 0.1354	0.1790 0.1388	0.1637	0.1508	0.1363	Lin2	1.6225	0.1394							0.9970		0.9900
PCB-1016 Peak 3	0.0907 0.0560	0.0817 0.0570	0.0735	0.0647	0.0569	Lin2	0.9033	0.0585							0.9920		0.9900
PCB-1016 Peak 4	0.0504 0.0289	0.0460 0.0293	0.0402	0.0348	0.0294	Qua1	0.6048	0.0316	-0.000004						0.9970		0.9900
PCB-1016 Peak 5	0.0790 0.0422	0.0700 0.0430	0.0576	0.0498	0.0427	Qua1	1.0628	0.0442	-0.000003						0.9980		0.9900
PCB-1260 Peak 1	0.1413 0.0894	0.1280 0.0922	0.1147	0.1013	0.0896	Lin2	1.3547	0.0929							0.9930		0.9900
PCB-1260 Peak 2	0.1992 0.1292	0.1819 0.1337	0.1633	0.1449	0.1294	Lin2	1.8303	0.1340							0.9940		0.9900
PCB-1260 Peak 3	0.1132 0.0711	0.1037 0.0730	0.0927	0.0811	0.0711	Lin2	1.1095	0.0741							0.9910		0.9900
PCB-1260 Peak 4	0.2421 0.1698	0.2241 0.1757	0.2038	0.1865	0.1696	Lin2	1.8800	0.1749							0.9960		0.9900
PCB-1260 Peak 5	0.1823 0.1206	0.1690 0.1245	0.1513	0.1346	0.1214	Lin2	1.6214	0.1253							0.9940		0.9900
Tetrachloro-m-xylene	1.1242 1.8539	2.3533 1.9128	2.1698	2.0251	1.8335	Lin1	-0.037	1.9044							0.9950		0.9900
DCB Decachlorobiphenyl	2.2996 1.4357	2.1210 1.4813	1.8738	1.6319	1.4665	Lin2	1.1332	1.5049							0.9920		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 20:31 Calibration End Date: 01/29/2019 22:38 Calibration ID: 35092

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/19	01290019.D
Level 2	STD2 280-445745/20	01290020.D
Level 3	STD3 280-445745/21	01290021.D
Level 4	STD4 280-445745/22	01290022.D
Level 5	STD5 280-445745/23	01290023.D
Level 6	STD6 280-445745/24	01290024.D
Level 7	STD7 280-445745/25	01290025.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1016 Peak 1	BNB	Lin2	2627578 50261441	4577403 65204162	8229745	18866059	34998168	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 2	BNB	Lin2	5204108 112828669	9101267 148508749	16770420	40287772	77642819	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 3	BNB	Lin2	2375701 46628474	4153755 60950394	7524499	17287413	32426114	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 4	BNB	Qual	1320720 24121030	2340987 31312479	4120556	9287733	16726012	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 5	BNB	Qual	2068748 35171114	3559060 45994315	5895931	13302362	24328109	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 1	BNB	Lin2	3698458 74489703	6505968 98609065	11751902	27060107	51025026	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 2	BNB	Lin2	5216162 107647491	9249707 142990875	16730388	38721098	73709863	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 3	BNB	Lin2	2963336 59223019	5272800 78139671	9497849	21659841	40499657	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 4	BNB	Lin2	6339377 141474198	11393234 187991129	20878089	49828439	96609483	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 5	BNB	Lin2	4773952 100507503	8594861 133156158	15503715	35981937	69150252	25.0 750	50.0 1000	100	250	500
Tetrachloro-m-xylene	BNB	Lin1	1471633 77232852	5982700 102309976	11113729	27059584	52211718	1.25 37.5	2.50 50.0	5.00	12.5	25.0
DCB Decachlorobiphenyl	BNB	Lin2	3010343 59811197	5392068 79228295	9597384	21805920	41760348	1.25 37.5	2.50 50.0	5.00	12.5	25.0

Curve Type Legend:

Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD
Qual = Quadratic 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290019.D
 Lims ID: STD1 1660
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 29-Jan-2019 20:31:38 ALS Bottle#: 19 Worklist Smp#: 19
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 1660
 Misc. Info.: 280-0078470-019
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:16 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:31:19

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.979	-0.004	18728713	100.0	100.0	
2	1.788	1.789	-0.001	104727389	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.891	2.892	-0.001	914469	1.25	1.32	
2	2.818	2.819	-0.001	1471633	1.25	0.7573	
RPD = 53.95							

1 PCB-1016

1	3.288	3.286	0.002	559860	25.0	21.0	
1	3.651	3.652	-0.001	1209479	25.0	20.0	
1	4.141	4.142	-0.001	1610058	25.0	26.3	
1	4.291	4.292	-0.001	773065	25.0	21.6	
1	4.761	4.762	-0.001	796349	25.0	22.4	
Average of Peak Amounts =						22.3	
2	3.715	3.712	0.003	2627578	25.0	23.2	
2	4.175	4.176	-0.001	5204108	25.0	24.0	
2	4.322	4.322	0.000	2375701	25.0	23.3	
2	4.558	4.556	0.002	1320720	25.0	20.8	
2	4.852	4.852	0.000	2068748	25.0	20.7	
Average of Peak Amounts =						22.4	
RPD = 0.57							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290019.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.288	6.289	-0.001	1188688	25.0	21.4	
1	6.825	6.829	-0.004	603264	25.0	24.4	
1	7.531	7.532	-0.001	987009	25.0	22.6	
1	7.971	7.976	-0.005	2023732	25.0	24.4	
1	8.361	8.366	-0.005	875716	25.0	24.0	

Average of Peak Amounts = 23.4

2	6.725	6.726	-0.001	3698458	25.0	23.4	
2	7.195	7.196	-0.001	5216162	25.0	23.5	
2	7.328	7.332	-0.004	2963336	25.0	23.2	
2	8.098	8.099	-0.001	6339377	25.0	23.9	
2	8.605	8.606	-0.001	4773952	25.0	23.4	

Average of Peak Amounts = 23.5

RPD = 0.57

\$ 15 DCB Decachlorobiphenyl

1	9.955	9.956	-0.001	870801	1.25	1.04	
2	10.278	10.279	-0.001	3010343	1.25	1.16	

RPD = 10.80

S 8 Polychlorinated biphenyls, Total

1						45.6	
2						45.9	

RPD = 0.57

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.03
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:17

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290019.D

Injection Date: 29-Jan-2019 20:31:38

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD1 1660

Worklist Smp#: 19

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

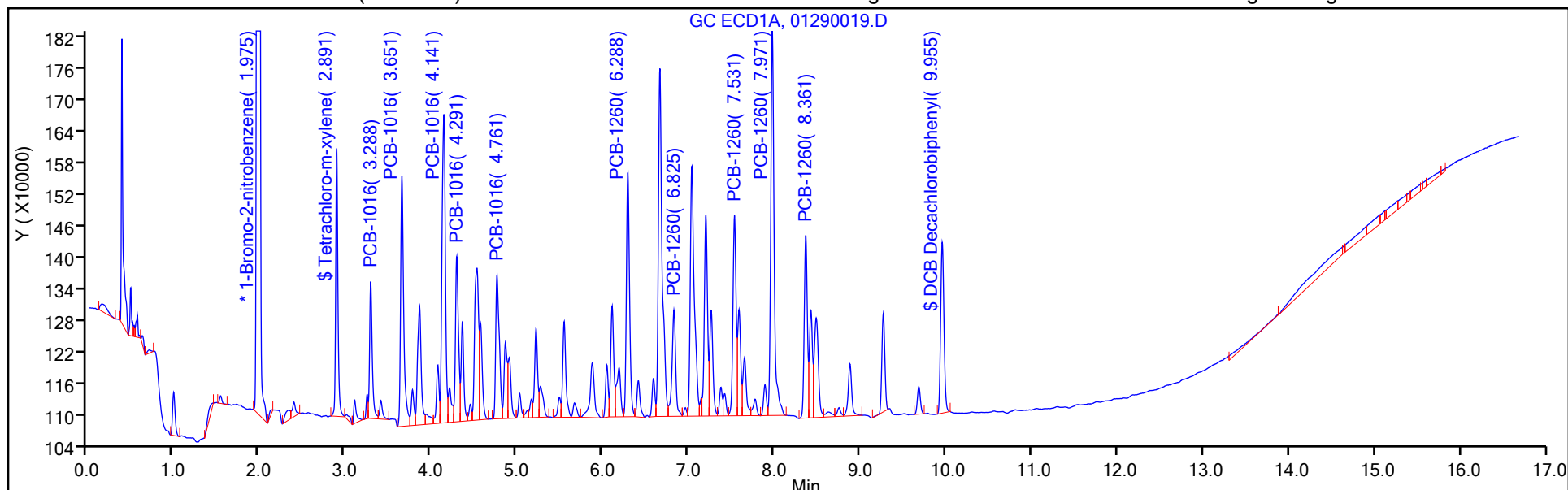
ALS Bottle#: 19

Method: 8082_J

Limit Group: GCSV - 8082 - IS

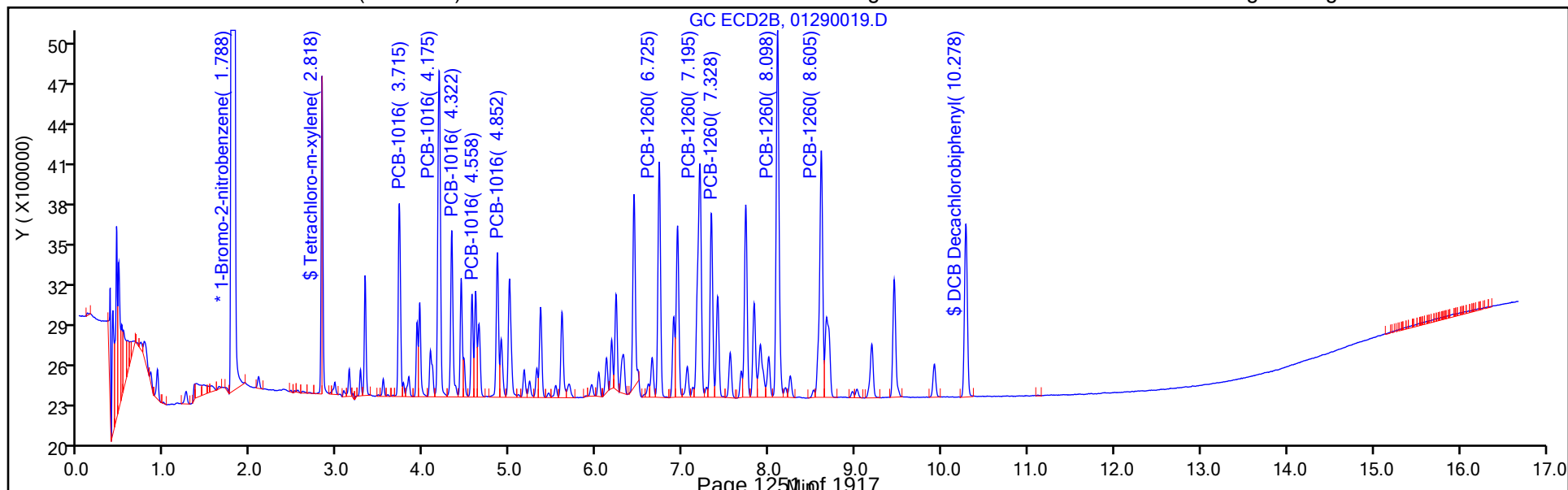
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290020.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 29-Jan-2019 20:52:40 ALS Bottle#: 20 Worklist Smp#: 20
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-020
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:15 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.979	-0.002	18222309	100.0	100.0	
2	1.791	1.789	0.002	101690991	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.891	2.892	-0.001	1822602	2.50	2.53	
2	2.821	2.819	0.002	5982700	2.50	3.11	
RPD = 20.52							

1 PCB-1016

1	3.287	3.286	0.001	965503	50.0	51.2	
1	3.651	3.652	-0.001	2171469	50.0	52.0	
1	4.141	4.142	-0.001	3115498	50.0	51.3	
1	4.291	4.292	-0.001	1480509	50.0	52.0	
1	4.761	4.762	-0.001	1527261	50.0	51.6	

Average of Peak Amounts = 51.6

2	3.714	3.712	0.002	4577403	50.0	54.7	
2	4.177	4.176	0.001	9101267	50.0	52.6	
2	4.321	4.322	-0.001	4153755	50.0	54.4	
2	4.557	4.556	0.001	2340987	50.0	54.0	
2	4.851	4.852	-0.001	3559060	50.0	55.3	

Average of Peak Amounts = 54.2

RPD = 4.84

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290020.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.287	6.289	-0.002	2279107	50.0	52.5	
1	6.824	6.829	-0.005	1129457	50.0	50.5	
1	7.531	7.532	-0.001	1895416	50.0	52.0	
1	7.974	7.976	-0.002	3900466	50.0	51.2	
1	8.364	8.366	-0.002	1685702	50.0	51.7	

Average of Peak Amounts =

2	6.724	6.726	-0.002	6505968	50.0	54.3	
2	7.197	7.196	0.001	9249707	50.0	54.2	
2	7.331	7.332	-0.001	5272800	50.0	55.0	
2	8.097	8.099	-0.002	11393234	50.0	53.3	
2	8.604	8.606	-0.002	8594861	50.0	54.5	

Average of Peak Amounts =

54.3

RPD = 5.07

\$ 15 DCB Decachlorobiphenyl

1	9.954	9.956	-0.002	1734330	2.50	2.64	
2	10.277	10.279	-0.002	5392068	2.50	2.77	

RPD = 4.87

S 8 Polychlorinated biphenyls, Total

1						103.2	
2						108.4	

RPD = 4.96

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.05
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:15

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290020.D

Injection Date: 29-Jan-2019 20:52:40

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 20

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

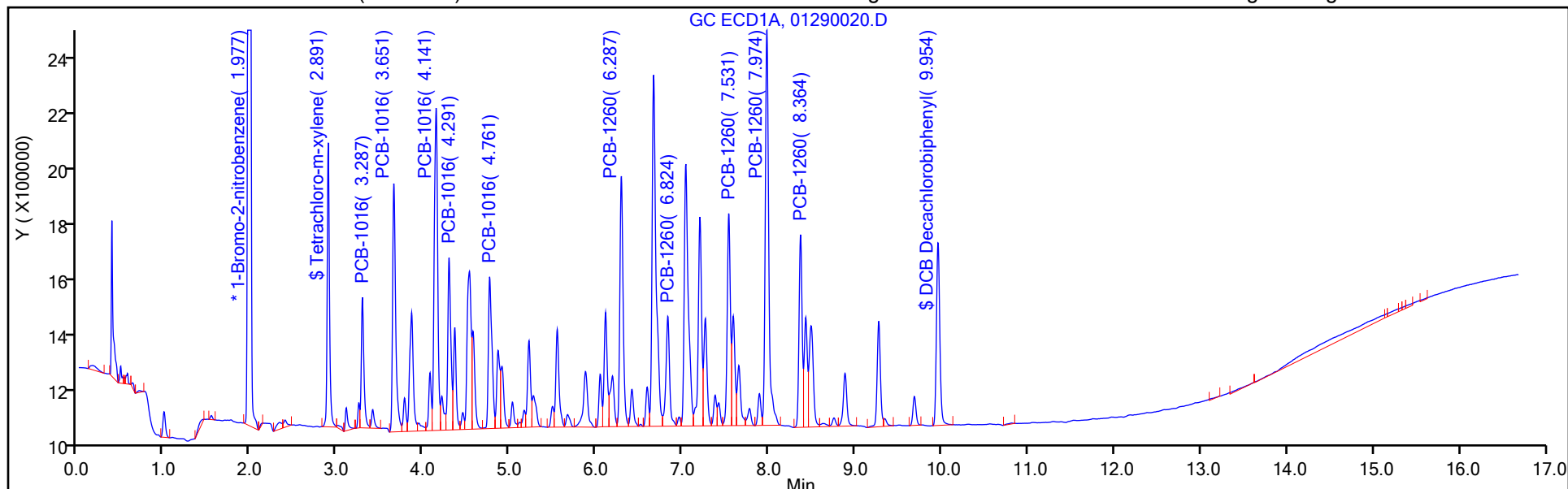
ALS Bottle#: 20

Method: 8082_J

Limit Group: GCSV - 8082 - IS

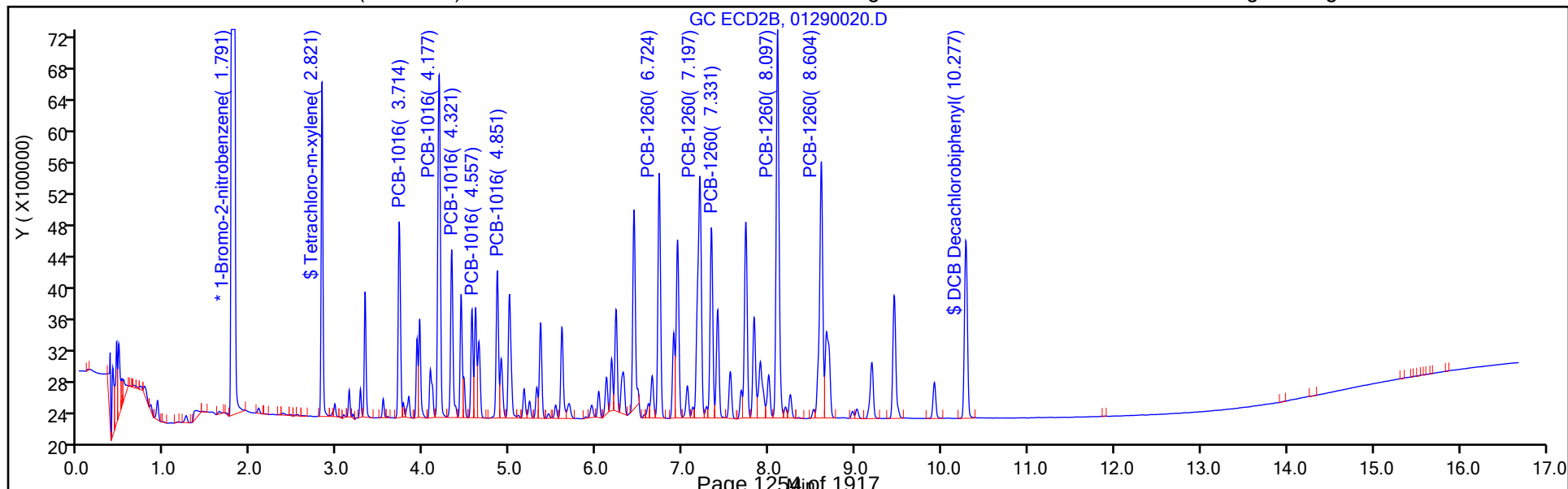
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290021.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 29-Jan-2019 21:13:50 ALS Bottle#: 21 Worklist Smp#: 21
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-021
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:13 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.979	-0.002	18362303	100.0	100.0	
2	1.790	1.789	0.001	102438475	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.894	2.892	0.002	3624536	5.00	4.84	
2	2.820	2.819	0.001	11113729	5.00	5.72	
RPD = 16.64							

1 PCB-1016

1	3.287	3.286	0.001	1792682	100.0	109.7	
1	3.650	3.652	-0.002	4067241	100.0	112.0	
1	4.144	4.142	0.002	6083533	100.0	98.4	
1	4.290	4.292	-0.002	2839877	100.0	107.9	
1	4.760	4.762	-0.002	2960668	100.0	106.2	

Average of Peak Amounts = 106.8

2	3.714	3.712	0.002	8229745	100.0	110.6	
2	4.177	4.176	0.001	16770420	100.0	105.8	
2	4.320	4.322	-0.002	7524499	100.0	110.1	
2	4.557	4.556	0.001	4120556	100.0	109.4	
2	4.850	4.852	-0.002	5895931	100.0	106.9	

Average of Peak Amounts = 108.6

RPD = 1.60

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290021.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.287	6.289	-0.002	4326070	100.0	108.3	
1	6.827	6.829	-0.002	2254364	100.0	104.0	
1	7.534	7.532	0.002	3603564	100.0	104.9	
1	7.974	7.976	-0.002	7624671	100.0	102.0	
1	8.364	8.366	-0.002	3223947	100.0	101.9	

Average of Peak Amounts =

104.2

2	6.727	6.726	0.001	11751902	100.0	108.9	
2	7.197	7.196	0.001	16730388	100.0	108.2	
2	7.330	7.332	-0.002	9497849	100.0	110.1	
2	8.097	8.099	-0.002	20878089	100.0	105.8	
2	8.604	8.606	-0.002	15503715	100.0	107.9	

Average of Peak Amounts =

108.2

RPD = 3.74

\$ 15 DCB Decachlorobiphenyl

1	9.957	9.956	0.001	3343034	5.00	5.49	
2	10.277	10.279	-0.002	9597384	5.00	5.47	

RPD = 0.40

S 8 Polychlorinated biphenyls, Total

1						211.0	
2						216.7	

RPD = 2.66

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.10
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:13

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290021.D

Injection Date: 29-Jan-2019 21:13:50

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD3

Worklist Smp#: 21

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

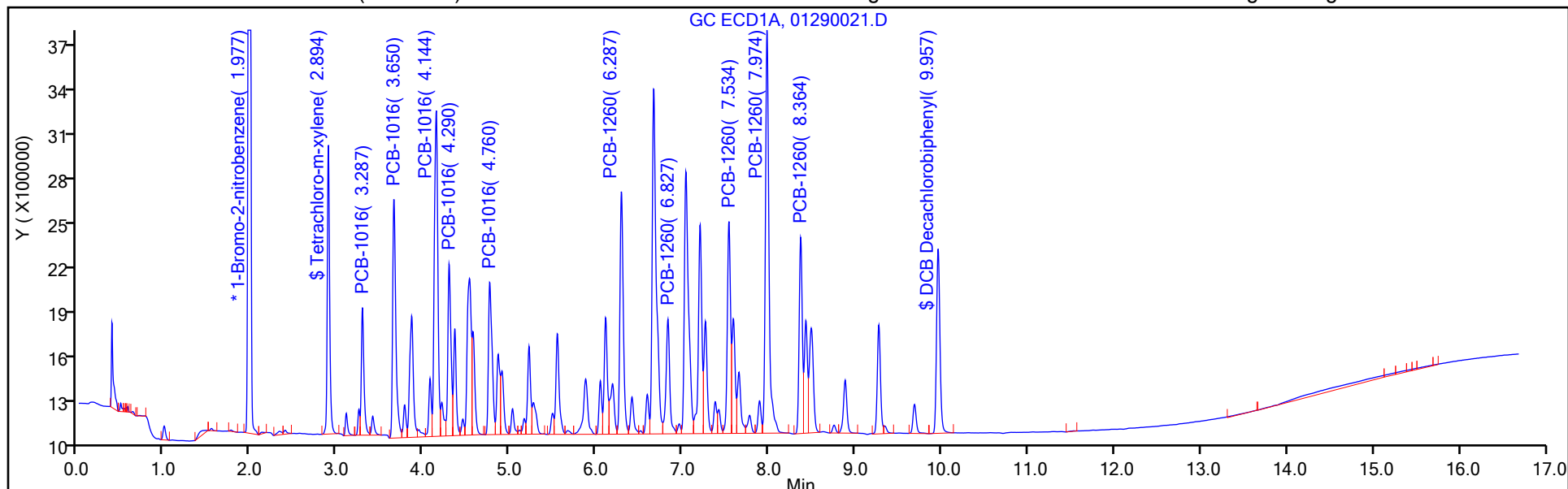
ALS Bottle#: 21

Method: 8082_J

Limit Group: GCSV - 8082 - IS

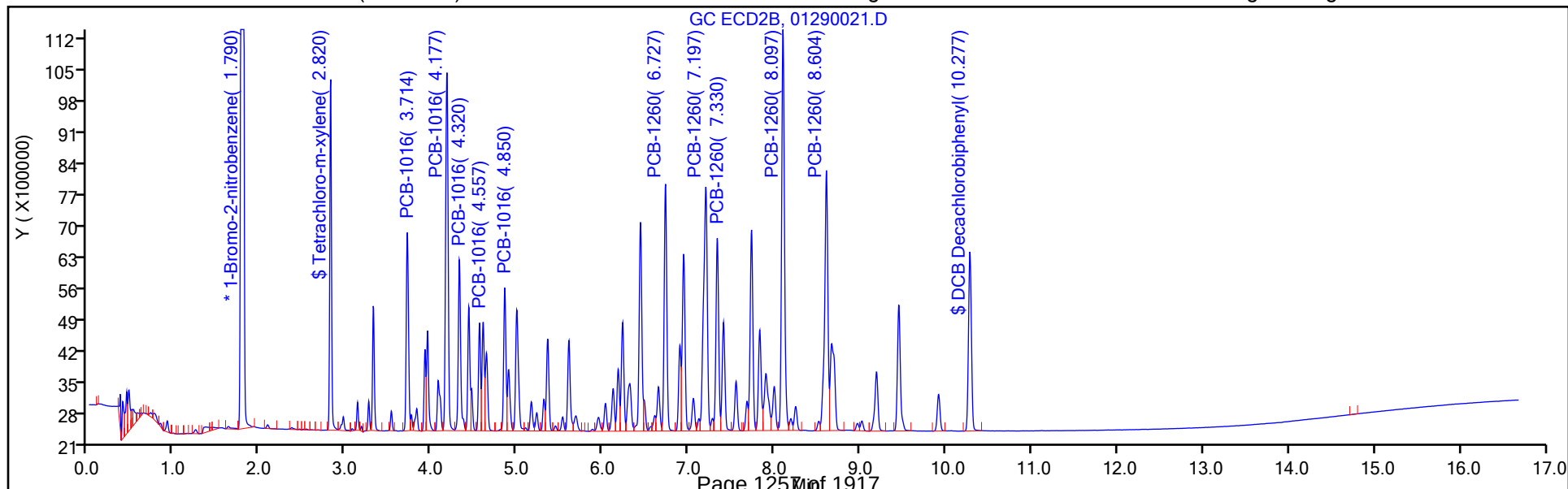
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290022.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 29-Jan-2019 21:34:52 ALS Bottle#: 22 Worklist Smp#: 22
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-022
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:11 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:28:15

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	19204388	100.0	100.0	
2	1.790	1.789	0.001	106896067	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.893	2.892	0.001	9829518	12.5	12.3	
2	2.820	2.819	0.001	27059584	12.5	13.3	
RPD = 7.97							

1 PCB-1016

1	3.286	3.286	0.000	4226504	250.0	270.2	
1	3.653	3.652	0.001	9498775	250.0	272.1	
1	4.143	4.142	0.001	15763921	250.0	242.2	
1	4.290	4.292	-0.002	6921564	250.0	264.6	
1	4.763	4.762	0.001	7327932	250.0	261.6	
Average of Peak Amounts =						262.1	
2	3.713	3.712	0.001	18866059	250.0	262.8	
2	4.176	4.176	0.000	40287772	250.0	258.7	
2	4.320	4.322	-0.002	17287413	250.0	260.9	
2	4.556	4.556	0.000	9287733	250.0	263.5	
2	4.850	4.852	-0.002	13302362	250.0	262.3	
Average of Peak Amounts =						261.7	
RPD = 0.18							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290022.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.286	6.289	-0.003	10387117	250.0	262.3	
1	6.826	6.829	-0.003	5585726	250.0	251.7	
1	7.533	7.532	0.001	9041388	250.0	262.3	
1	7.973	7.976	-0.003	19402857	250.0	252.4	
1	8.363	8.366	-0.003	8209562	250.0	254.3	

Average of Peak Amounts = 256.6

2	6.726	6.726	0.000	27060107	250.0	257.9	
2	7.196	7.196	0.000	38721098	250.0	256.6	
2	7.330	7.332	-0.002	21659841	250.0	258.3	
2	8.096	8.099	-0.003	49828439	250.0	255.8	
2	8.603	8.606	-0.003	35981937	250.0	255.8	

Average of Peak Amounts = 256.9

RPD = 0.12

\$ 15 DCB Decachlorobiphenyl

1	9.956	9.956	0.000	7962949	12.5	13.1	
2	10.280	10.279	0.001	21805920	12.5	12.8	

RPD = 2.61

S 8 Polychlorinated biphenyls, Total

1						518.7	
2						518.5	

RPD = 0.03

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.25
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:11

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290022.D

Injection Date: 29-Jan-2019 21:34:52

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 22

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

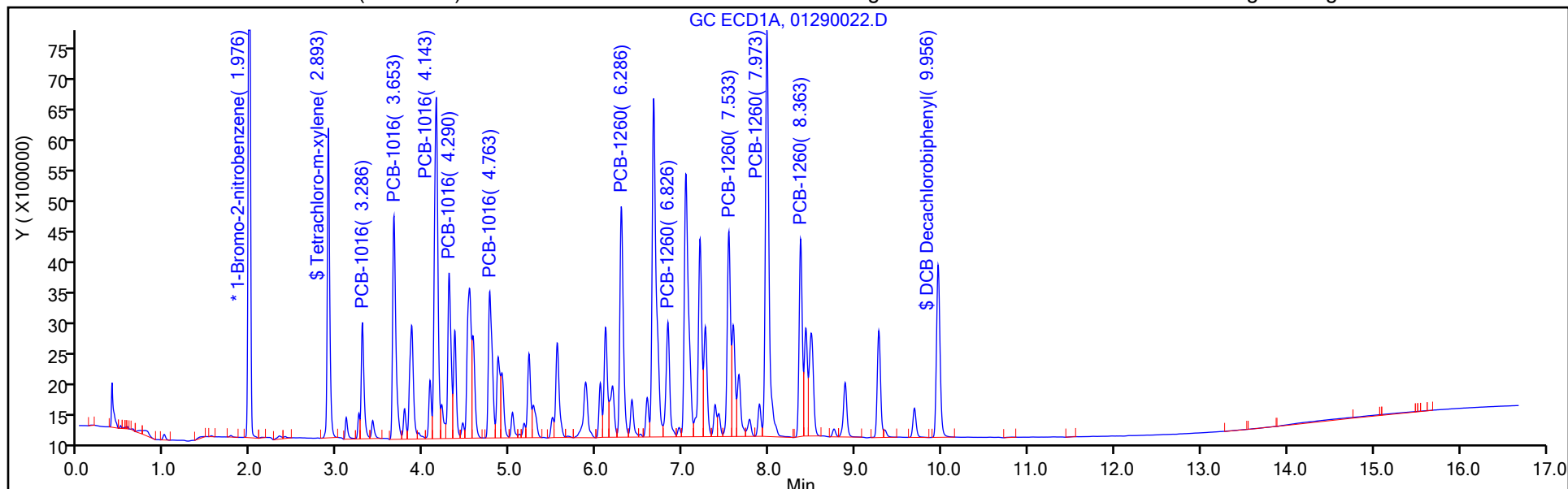
ALS Bottle#: 22

Method: 8082_J

Limit Group: GCSV - 8082 - IS

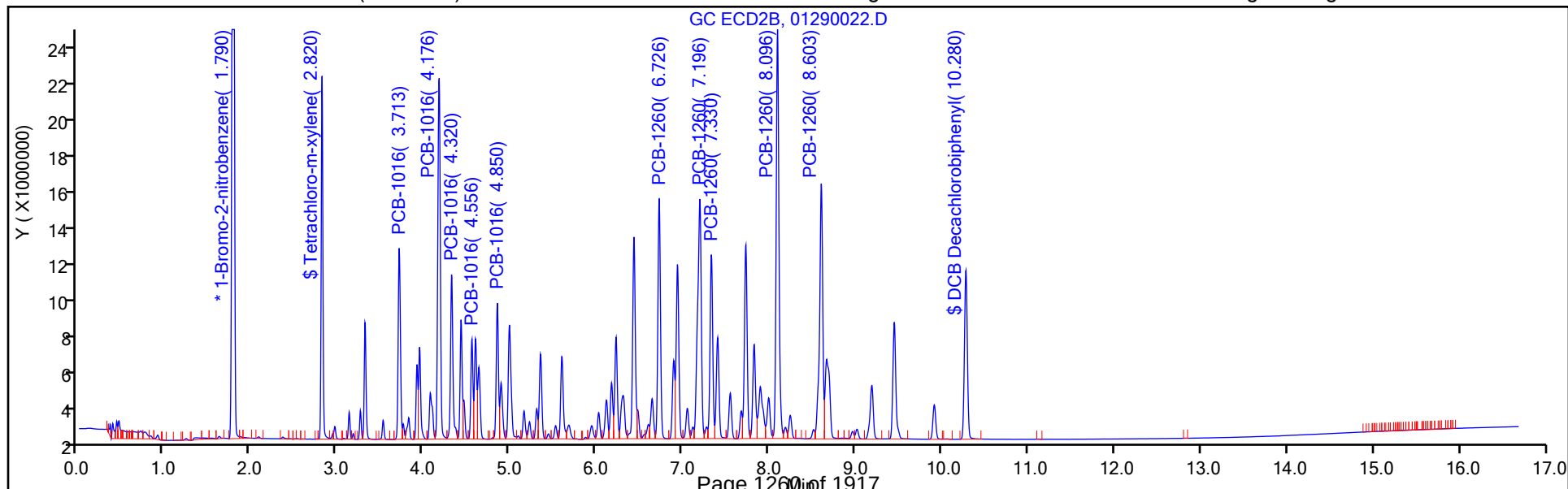
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290023.D
 Lims ID: STD5
 Client ID:
 Sample Type: ICIS Calib Level: 5
 Inject. Date: 29-Jan-2019 21:55:55 ALS Bottle#: 23 Worklist Smp#: 23
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-023
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:09 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:30:04

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.979	1.979	0.000	20507310	100.0	100.0	
2	1.789	1.789	0.000	113907969	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.892	2.892	0.000	20664986	25.0	24.0	
2	2.819	2.819	0.000	52211718	25.0	24.1	
RPD = 0.18							

1 PCB-1016

M

1	3.286	3.286	0.000	7952245	500.0	490.0	
1	3.652	3.652	0.000	17733988	500.0	489.1	
1	4.142	4.142	0.000	31945318	500.0	458.6	
1	4.292	4.292	0.000	13273314	500.0	482.9	
1	4.762	4.762	0.000	14291318	500.0	483.9	
Average of Peak Amounts =						480.9	
2	3.712	3.712	0.000	34998168	500.0	469.8	M
2	4.176	4.176	0.000	77642819	500.0	477.4	M
2	4.322	4.322	0.000	32426114	500.0	471.0	M
2	4.556	4.556	0.000	16726012	500.0	470.6	M
2	4.852	4.852	0.000	24328109	500.0	475.3	M
Average of Peak Amounts =						472.8	
RPD = 1.70							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290023.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.289	6.289	0.000	20138087	500.0	484.8	
1	6.829	6.829	0.000	11232542	500.0	477.4	
1	7.532	7.532	0.000	17517262	500.0	482.0	
1	7.976	7.976	0.000	39380635	500.0	482.3	
1	8.366	8.366	0.000	16493612	500.0	482.2	

Average of Peak Amounts = 481.7

2	6.726	6.726	0.000	51025026	500.0	467.6	
2	7.196	7.196	0.000	73709863	500.0	469.1	
2	7.332	7.332	0.000	40499657	500.0	464.6	
2	8.099	8.099	0.000	96609483	500.0	474.2	
2	8.606	8.606	0.000	69150252	500.0	471.7	

Average of Peak Amounts = 469.4

RPD = 2.59

\$ 15 DCB Decachlorobiphenyl

1	9.956	9.956	0.000	15597466	25.0	24.5	
2	10.279	10.279	0.000	41760348	25.0	23.6	

RPD = 3.76

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1660_L7_00028

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290023.D

Injection Date: 29-Jan-2019 21:55:55

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 23

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

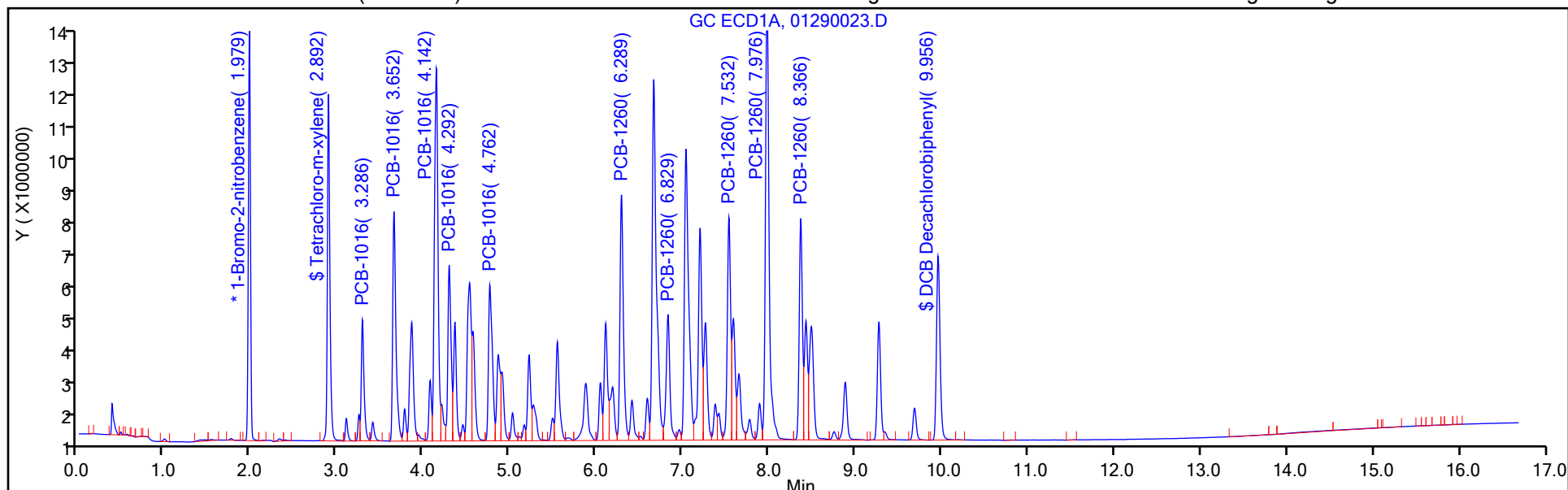
ALS Bottle#: 23

Method: 8082_J

Limit Group: GCSV - 8082 - IS

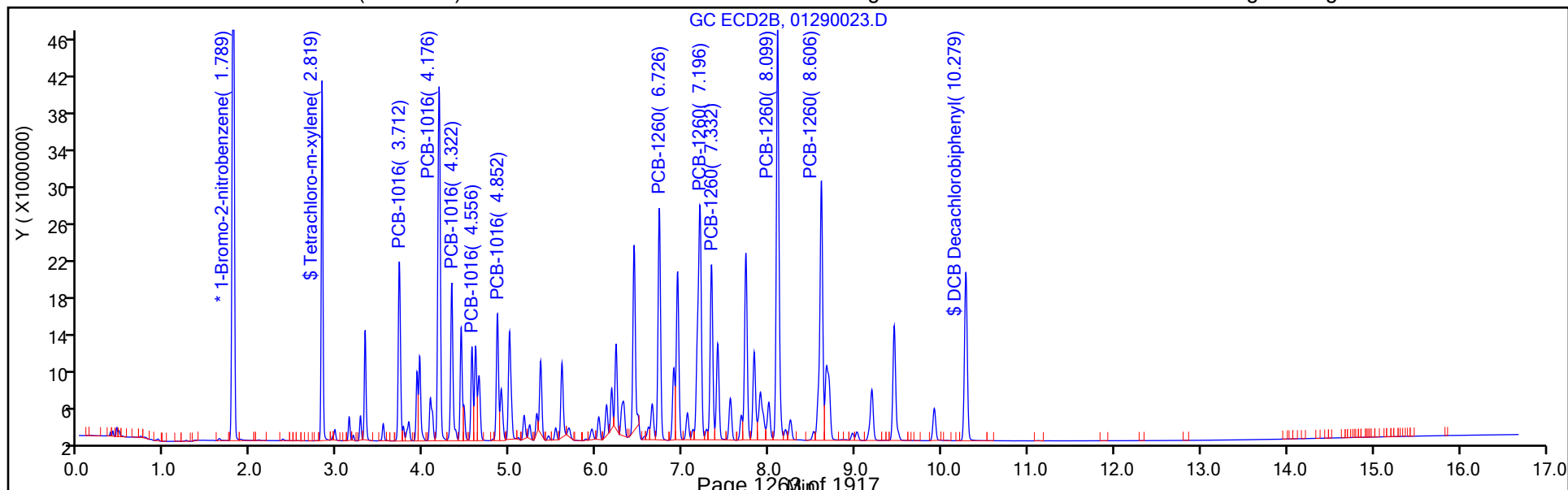
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290023.D

Injection Date: 29-Jan-2019 21:55:55

Instrument ID: SGC_J

Lims ID: STD5

Client ID:

Operator ID: TEM

ALS Bottle#: 23

Worklist Smp#: 23

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

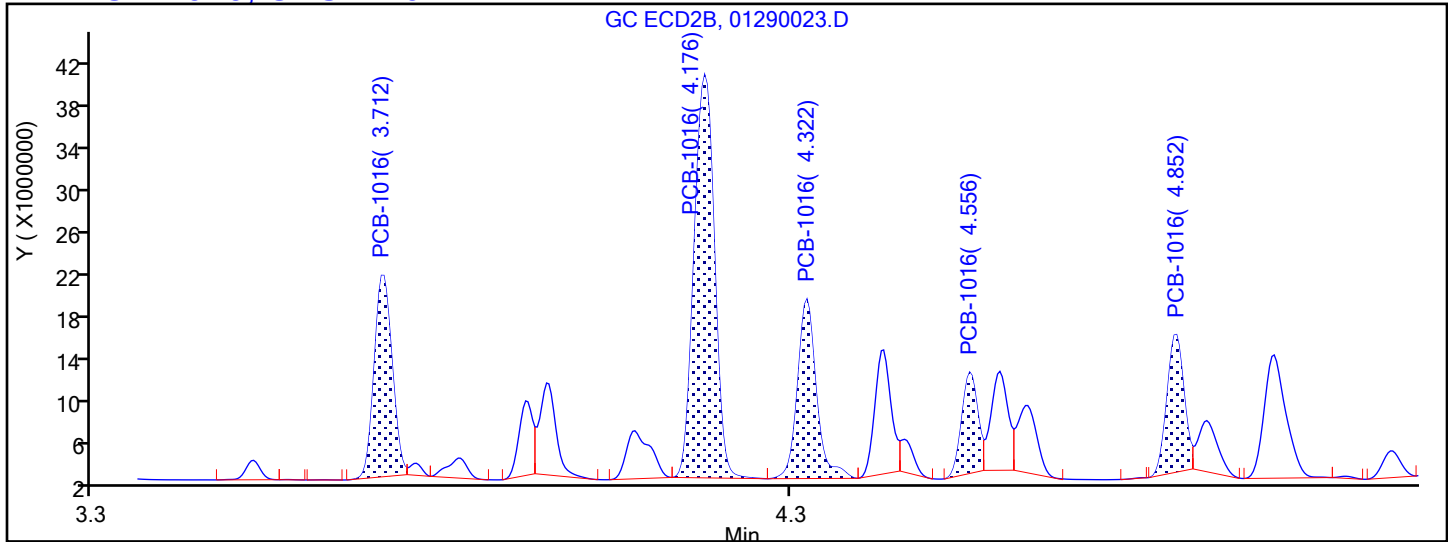
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

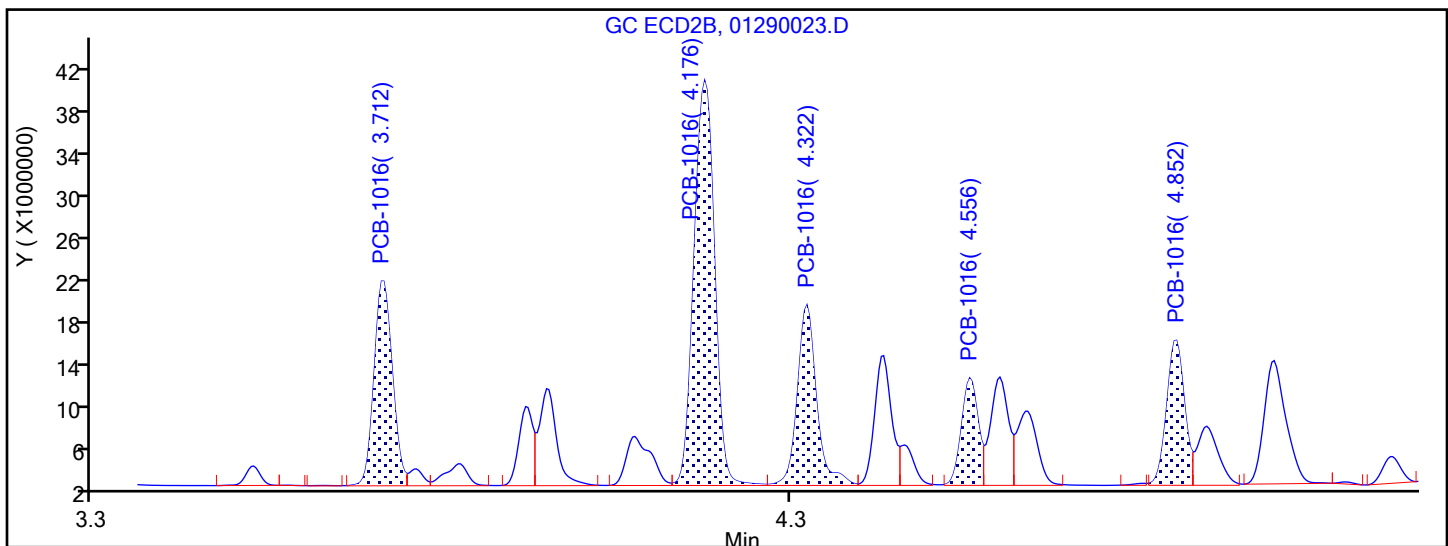
GC ECD2B

1 PCB-1016, CAS: 12674-11-2



Processing Integration Results

3.712	Response = 33625401
4.176	Response = 76320909
4.322	Response = 31521739
4.556	Response = 15145979
4.852	Response = 22064079



Manual Integration Results

3.712	Response = 34998168	M
4.176	Response = 77642819	M
4.322	Response = 32426114	M
4.556	Response = 16726012	M
4.852	Response = 24328109	M

Reviewer: mooret, 30-Jan-2019 14:29:59

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
Page 1264 of 1917

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290024.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 29-Jan-2019 22:17:03 ALS Bottle#: 24 Worklist Smp#: 24
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-024
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	20087397	100.0	100.0	
2	1.790	1.789	0.001	111093747	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.893	2.892	0.001	31266518	37.5	37.1	
2	2.820	2.819	0.001	77232852	37.5	36.5	
RPD = 1.44							

1 PCB-1016

1	3.286	3.286	0.000	11548704	750.0	735.3	
1	3.653	3.652	0.001	25823234	750.0	735.8	
1	4.143	4.142	0.001	51613620	750.0	755.8	
1	4.293	4.292	0.001	19679998	750.0	736.0	
1	4.763	4.762	0.001	21228575	750.0	737.7	
Average of Peak Amounts =						740.1	
2	3.713	3.712	0.001	50261441	750.0	699.5	
2	4.176	4.176	0.000	112828669	750.0	717.0	
2	4.320	4.322	-0.002	46628474	750.0	701.7	
2	4.556	4.556	0.000	24121030	750.0	728.7	
2	4.850	4.852	-0.002	35171114	750.0	730.5	
Average of Peak Amounts =						715.5	
RPD = 3.39							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290024.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.286	6.289	-0.003	29648276	750.0	734.0	
1	6.826	6.829	-0.003	16947271	750.0	737.4	
1	7.533	7.532	0.001	25970807	750.0	733.5	
1	7.976	7.976	0.000	58668909	750.0	735.0	
1	8.366	8.366	0.000	24515178	750.0	734.0	

Average of Peak Amounts = 734.8

2	6.726	6.726	0.000	74489703	750.0	707.2	
2	7.196	7.196	0.000	107647491	750.0	709.3	
2	7.330	7.332	-0.002	59223019	750.0	704.1	
2	8.096	8.099	-0.003	141474198	750.0	717.3	
2	8.603	8.606	-0.003	100507503	750.0	709.3	

Average of Peak Amounts = 709.4

RPD = 3.51

\$ 15 DCB Decachlorobiphenyl

1	9.959	9.956	0.003	22722769	37.5	36.7	
2	10.280	10.279	0.001	59811197	37.5	35.0	

RPD = 4.66

S 8 Polychlorinated biphenyls, Total

1						1474.9	
2						1424.9	

RPD = 3.45

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 0.75
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:07

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290024.D

Injection Date: 29-Jan-2019 22:17:03

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 24

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

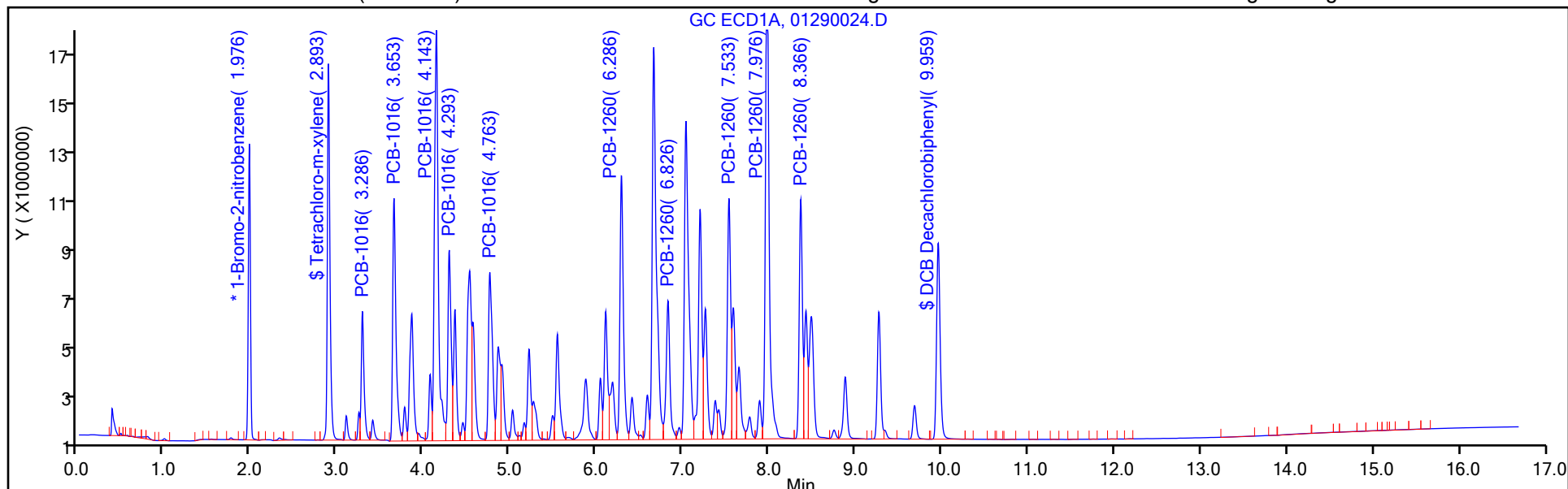
ALS Bottle#: 24

Method: 8082_J

Limit Group: GCSV - 8082 - IS

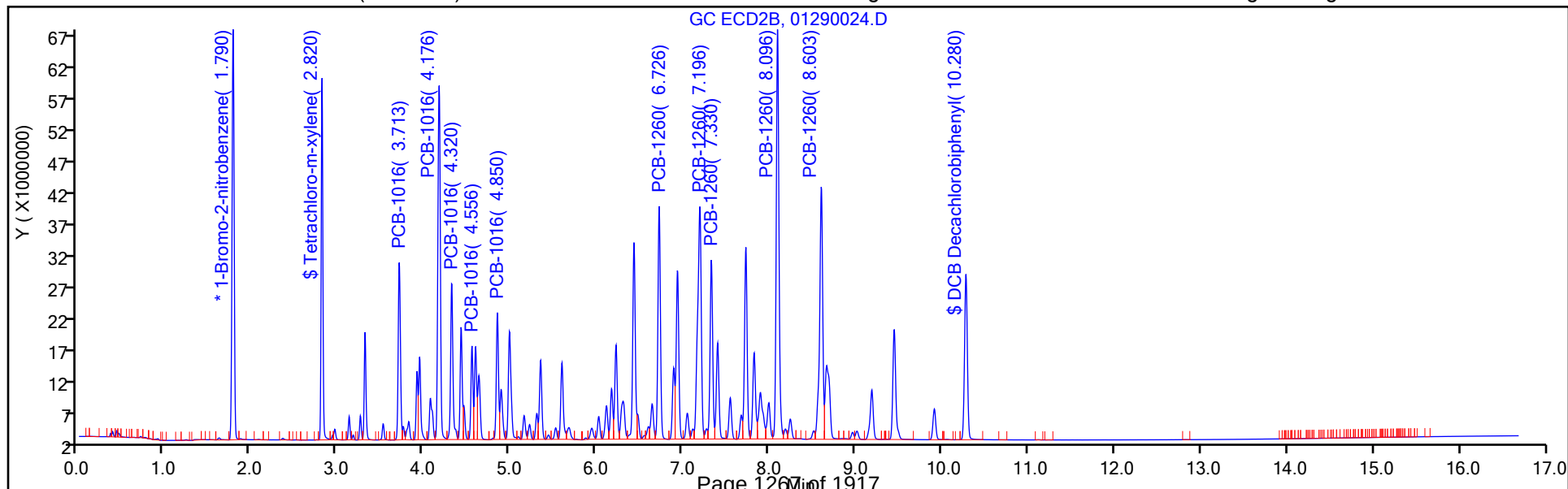
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290025.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 29-Jan-2019 22:38:06 ALS Bottle#: 25 Worklist Smp#: 25
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-025
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:05 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:32:26

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	19356422	100.0	100.0	
2	1.789	1.789	0.000	106973467	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.892	2.892	0.000	42063367	50.0	51.7	
2	2.819	2.819	0.000	102309976	50.0	50.2	
RPD = 2.81							

1 PCB-1016

1	3.286	3.286	0.000	15000661	1000.0	997.5	
1	3.652	3.652	0.000	33410558	1000.0	994.1	
1	4.142	4.142	0.000	68613189	1000.0	1042.3	
1	4.292	4.292	0.000	25930063	1000.0	1010.0	
1	4.762	4.762	0.000	27973098	1000.0	1011.6	
Average of Peak Amounts =						1011.1	
2	3.713	3.712	0.001	65204162	1000.0	948.2	
2	4.176	4.176	0.000	148508749	1000.0	984.4	
2	4.323	4.322	0.001	60950394	1000.0	958.1	
2	4.556	4.556	0.000	31312479	1000.0	1028.9	
2	4.849	4.852	-0.003	45994315	1000.0	1024.3	
Average of Peak Amounts =						988.8	
RPD = 2.23							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290025.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.286	6.289	-0.003	39224988	1000.0	1011.7	
1	6.829	6.829	0.000	22769035	1000.0	1029.7	
1	7.532	7.532	0.000	34623161	1000.0	1017.8	
1	7.976	7.976	0.000	78962273	1000.0	1027.8	
1	8.366	8.366	0.000	32994132	1000.0	1026.9	

Average of Peak Amounts = 1022.8

2	6.726	6.726	0.000	98609065	1000.0	977.8	
2	7.196	7.196	0.000	142990875	1000.0	983.6	
2	7.329	7.332	-0.003	78139671	1000.0	970.3	
2	8.096	8.099	-0.003	187991129	1000.0	994.0	
2	8.603	8.606	-0.003	133156158	1000.0	980.7	

Average of Peak Amounts = 981.3

RPD = 4.14

\$ 15 DCB Decachlorobiphenyl

1	9.956	9.956	0.000	29866597	50.0	50.2	
2	10.279	10.279	0.000	79228295	50.0	48.5	

RPD = 3.58

S 8 Polychlorinated biphenyls, Total

1						2033.8	
2						1970.0	

RPD = 3.19

Reagents:

AR_1660_L7_00028
BNB IS_00013Amount Added: 1.00
Amount Added: 0.10Units: mL
Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:05

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290025.D

Injection Date: 29-Jan-2019 22:38:06

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 25

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

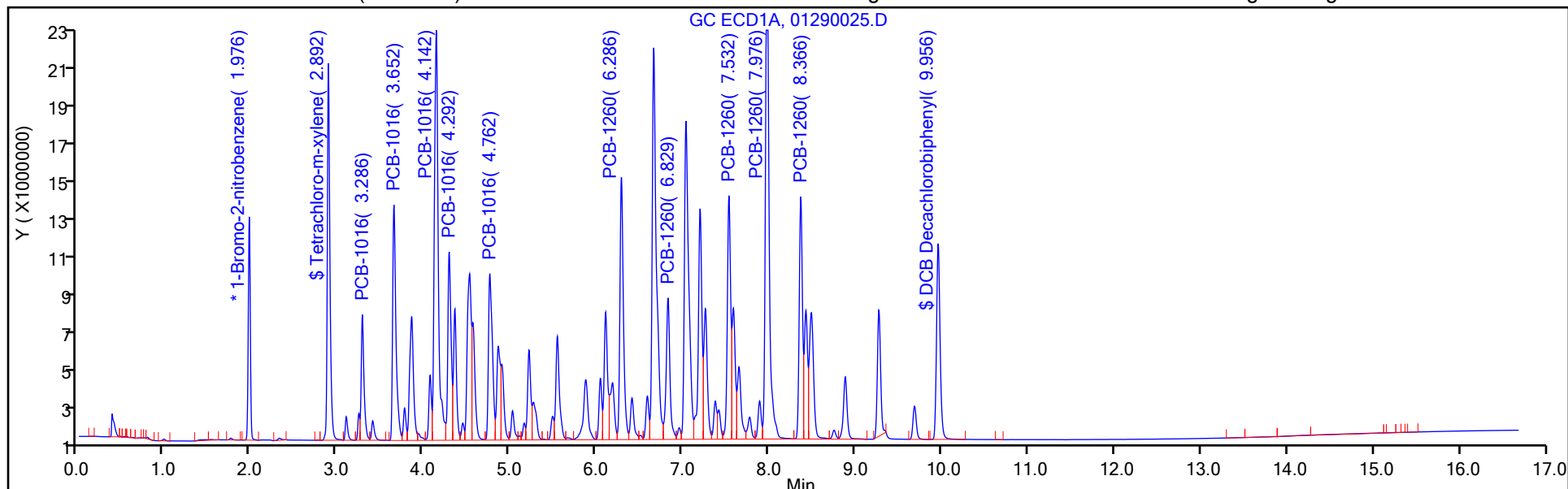
ALS Bottle#: 25

Method: 8082_J

Limit Group: GCSV - 8082 - IS

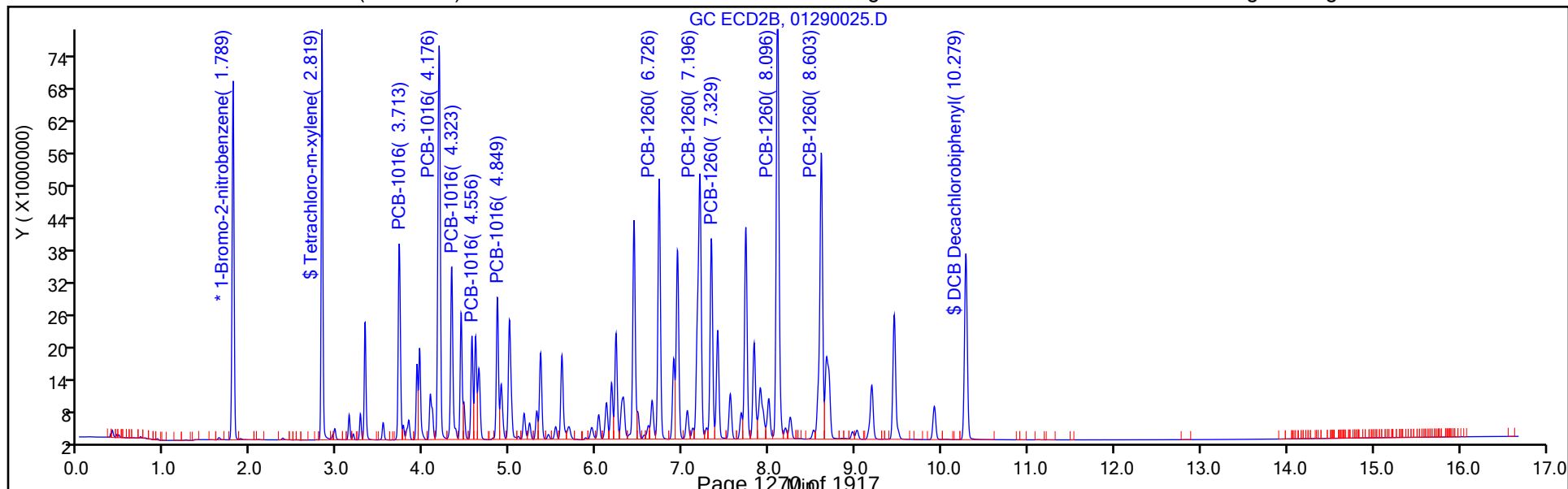
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 23:20 Calibration End Date: 01/30/2019 01:26 Calibration ID: 35075

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/27	01290027.D
Level 2	STD2 280-445745/28	01290028.D
Level 3	STD3 280-445745/29	01290029.D
Level 4	STD4 280-445745/30	01290030.D
Level 5	STD5 280-445745/31	01290031.D
Level 6	STD6 280-445745/32	01290032.D
Level 7	STD7 280-445745/33	01290033.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
PCB-1232 Peak 1	0.1391 0.0898	0.1195 0.0933	0.1246	0.1075	0.0975	Lin1	1.5932	0.0924							0.9960		0.9900
PCB-1232 Peak 2	0.1241 0.0846	0.1181 0.0869	0.1189	0.0999	0.0900	Lin1	1.5213	0.0862							0.9950		0.9900
PCB-1232 Peak 3	0.1404 0.1331	0.1459 0.1398	0.1506	0.1399	0.1383	Lin1	0.3468	0.1373							0.9990		0.9900
PCB-1232 Peak 4	0.0692 0.0589	0.0716 0.0615	0.0742	0.0667	0.0615	Lin1	0.4917	0.0607							0.9970		0.9900
PCB-1232 Peak 5	0.0679 0.0588	0.0673 0.0612	0.0739	0.0676	0.0622	Lin1	0.4182	0.0609							0.9970		0.9900
PCB-1262 Peak 1	0.2594 0.3263	0.2576 0.3437	0.2937	0.3187	0.3423	Lin1	-3.032	0.3399							0.9990		0.9900
PCB-1262 Peak 2	0.3131 0.2717	0.3108 0.2840	0.3568	0.3101	0.2821	Lin1	2.0940	0.2807							0.9960		0.9900
PCB-1262 Peak 3	0.2616 0.2421	0.2672 0.2536	0.3026	0.2755	0.2493	Lin1	1.2587	0.2505							0.9970		0.9900
PCB-1262 Peak 4	0.4882 0.4896	0.4887 0.5273	0.5772	0.5388	0.5046	Lin1	0.2349	0.5137							0.9980		0.9900
PCB-1262 Peak 5	0.1448 0.1398	0.1452 0.1487	0.1728	0.1574	0.1430	Lin1	0.4071	0.1457							0.9970		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 23:20 Calibration End Date: 01/30/2019 01:26 Calibration ID: 35075

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/27	01290027.D
Level 2	STD2 280-445745/28	01290028.D
Level 3	STD3 280-445745/29	01290029.D
Level 4	STD4 280-445745/30	01290030.D
Level 5	STD5 280-445745/31	01290031.D
Level 6	STD6 280-445745/32	01290032.D
Level 7	STD7 280-445745/33	01290033.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1232 Peak 1	BNB	Lin1	693248 12676511	1118140 16507067	1919629	4641793	9022765	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 2	BNB	Lin1	618262 11929931	1104878 15376163	1832930	4313490	8322978	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 3	BNB	Lin1	699435 18782266	1364870 24725808	2320975	6043672	12795158	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 4	BNB	Lin1	344732 8317170	669721 10885313	1142874	2881266	5689339	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 5	BNB	Lin1	338220 8301972	629687 10827109	1138677	2920818	5757161	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 1	BNB	Lin1	1292278 46035892	2409794 60805698	4526234	13766939	31665893	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 2	BNB	Lin1	1560094 38341756	2907641 50241058	5498128	13395489	26099961	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 3	BNB	Lin1	1303552 34157747	2499853 44863477	4663641	11901000	23061459	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 4	BNB	Lin1	2432737 69084143	4572344 93284117	8895019	23270420	46682586	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 5	BNB	Lin1	721259 19726998	1358687 26303379	2662832	6798468	13233559	25.0 750	50.0 1000	100	250	500

Curve Type Legend:

Lin1 = Linear 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290027.D
 Lims ID: STD1 3262
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 29-Jan-2019 23:20:15 ALS Bottle#: 27 Worklist Smp#: 27
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 3262
 Misc. Info.: 280-0078470-027
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:00 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:12:37

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.979	-0.001	19930472	100.0	100.0
2	1.788	1.789	-0.001	110786865	100.0	100.0

RPD = 0.00

7 PCB-1232

1	3.288	3.285	0.003	693248	25.0	20.4
1	3.651	3.652	-0.001	618262	25.0	18.3
1	4.141	4.142	-0.001	699435	25.0	23.0
1	4.291	4.292	-0.001	344732	25.0	20.4
1	4.761	4.762	-0.001	338220	25.0	21.0
Average of Peak Amounts =						20.6
2	3.318	3.319	-0.001	1496532	25.0	17.7
2	3.714	3.712	0.002	1233959	25.0	15.5
2	4.174	4.176	-0.002	2506015	25.0	19.0
2	4.321	4.322	-0.001	1140508	25.0	17.3
2	4.848	4.852	-0.004	1101509	25.0	18.9
Average of Peak Amounts =						17.7

RPD = 15.37

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290027.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

1	6.661	6.665	-0.004	1292278	25.0	28.0	
1	7.198	7.202	-0.004	1560094	25.0	20.4	
1	7.531	7.535	-0.004	1303552	25.0	21.1	
1	7.974	7.975	-0.001	2432737	25.0	23.3	
1	8.364	8.365	-0.001	721259	25.0	22.0	

Average of Peak Amounts = 23.0

2	6.724	6.726	-0.002	3056339	25.0	18.9	
2	7.331	7.329	0.002	4209181	25.0	19.6	
2	7.728	7.729	-0.001	4000469	25.0	19.6	
2	8.098	8.096	0.002	7272798	25.0	21.1	
2	8.601	8.602	-0.001	5444960	25.0	20.2	

Average of Peak Amounts = 19.9

RPD = 14.38

S 8 Polychlorinated biphenyls, Total

1	43.6	
2	37.6	

RPD = 14.84

Reagents:

AR_3262_L7_00018

Amount Added: 0.03

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:00

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290027.D

Injection Date: 29-Jan-2019 23:20:15

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD1 3262

Worklist Smp#: 27

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

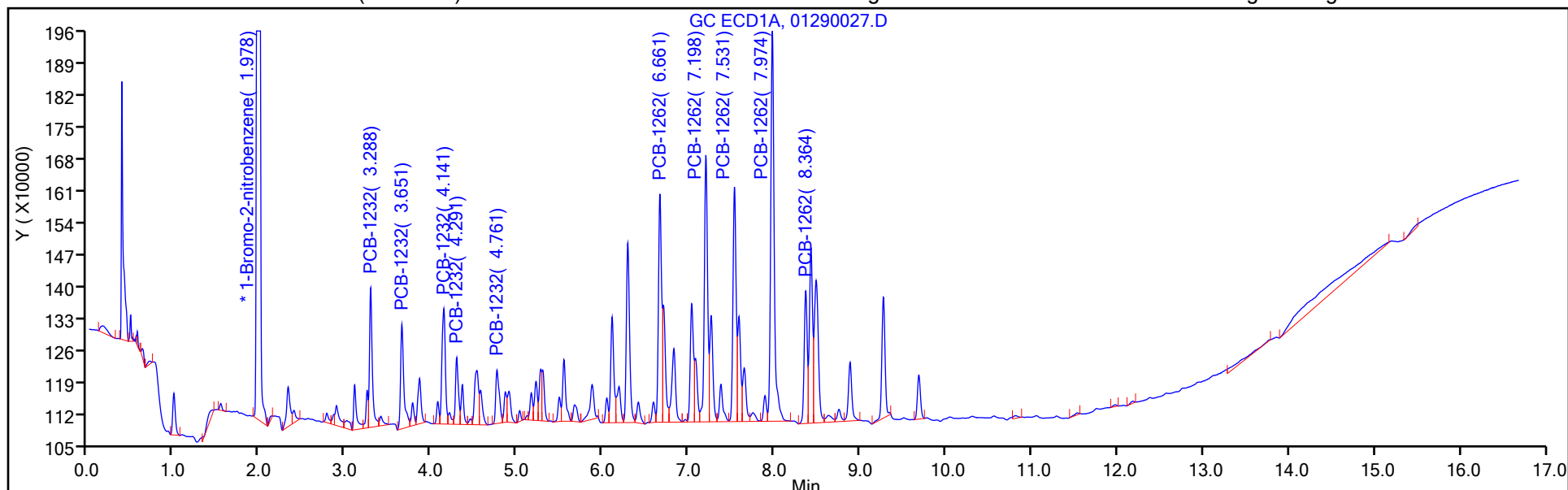
ALS Bottle#: 27

Method: 8082_J

Limit Group: GCSV - 8082 - IS

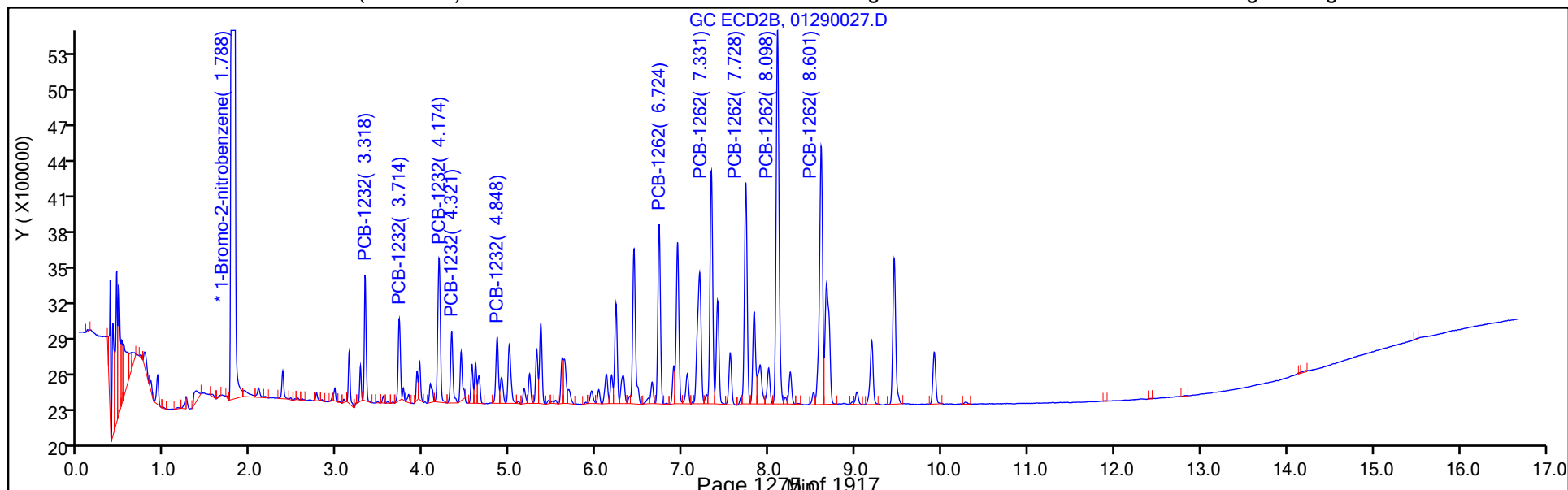
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290028.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 29-Jan-2019 23:41:16 ALS Bottle#: 28 Worklist Smp#: 28
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-028
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:58 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:41:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	18712922	100.0	100.0	
2	1.790	1.789	0.001	103173235	100.0	100.0	
						RPD = 0.00	

7 PCB-1232

1	3.286	3.285	0.001	1118140	50.0	47.4	
1	3.650	3.652	-0.002	1104878	50.0	50.9	
1	4.140	4.142	-0.002	1364870	50.0	50.6	
1	4.290	4.292	-0.002	669721	50.0	50.8	
1	4.760	4.762	-0.002	629687	50.0	48.4	
Average of Peak Amounts =						49.6	
2	3.317	3.319	-0.002	2748487	50.0	53.1	
2	3.713	3.712	0.001	2360172	50.0	53.1	
2	4.177	4.176	0.001	4397390	50.0	51.0	
2	4.320	4.322	-0.002	1999602	50.0	49.8	
2	4.850	4.852	-0.002	1779819	50.0	51.7	
Average of Peak Amounts =						51.7	

RPD = 4.15

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290028.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

1	6.663	6.665	-0.002	2409794	50.0	46.8	
1	7.200	7.202	-0.002	2907641	50.0	47.9	
1	7.533	7.535	-0.002	2499853	50.0	48.3	
1	7.973	7.975	-0.002	4572344	50.0	47.1	
1	8.363	8.365	-0.002	1358687	50.0	47.0	

Average of Peak Amounts =

47.4

2	6.727	6.726	0.001	5453862	50.0	50.1	
2	7.330	7.329	0.001	7472482	50.0	49.3	
2	7.730	7.729	0.001	7122870	50.0	49.2	
2	8.097	8.096	0.001	12954262	50.0	48.2	
2	8.603	8.602	0.001	9679909	50.0	48.9	

Average of Peak Amounts =

49.2

RPD = 3.56

S 8 Polychlorinated biphenyls, Total

1						97.1	
2						100.9	

RPD = 3.86

Reagents:

AR_3262_L7_00018

Amount Added: 0.05

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:59

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290028.D

Injection Date: 29-Jan-2019 23:41:16

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 28

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

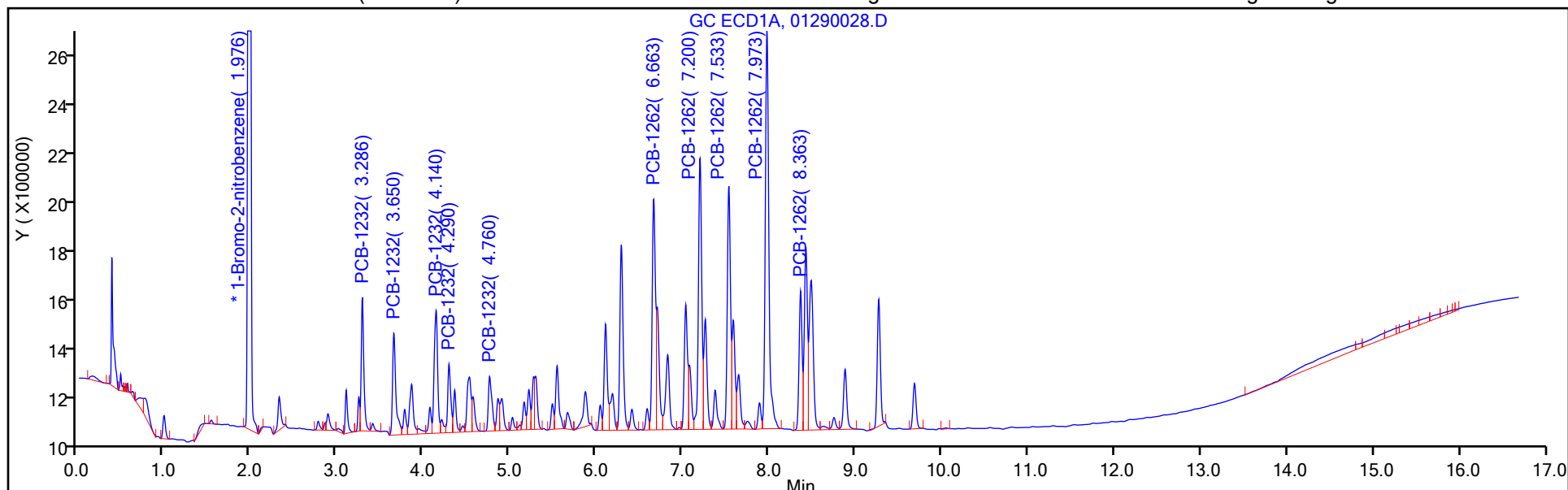
ALS Bottle#: 28

Method: 8082_J

Limit Group: GCSV - 8082 - IS

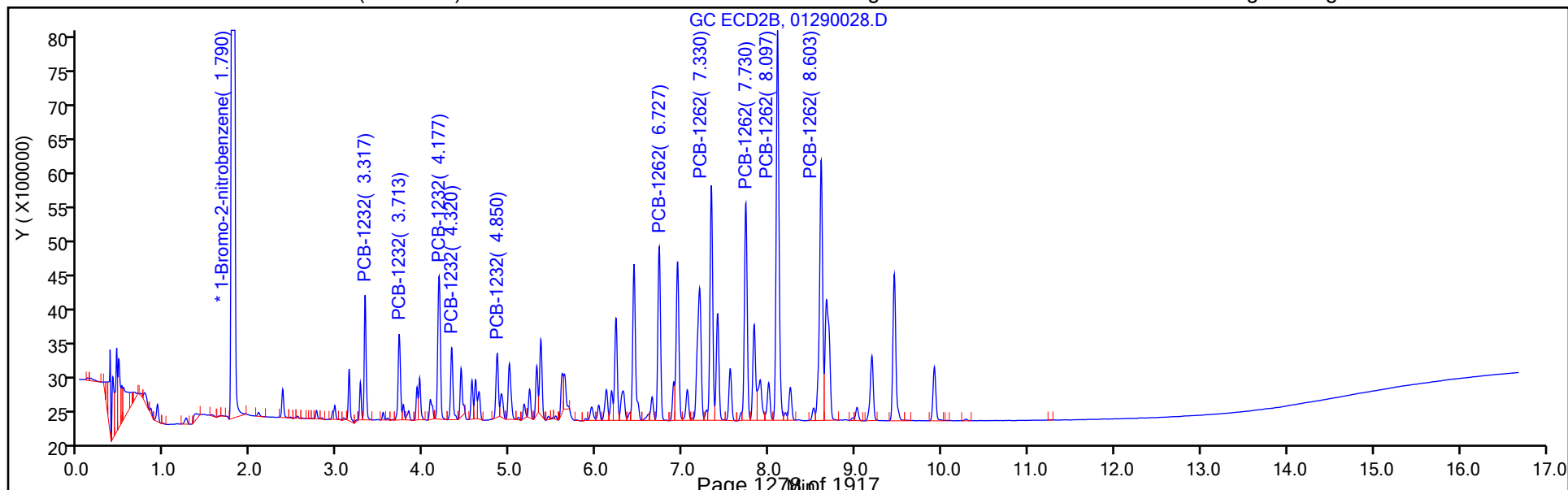
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290029.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 30-Jan-2019 00:02:19 ALS Bottle#: 29 Worklist Smp#: 29
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-029
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:57 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:38:27

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.979	-0.004	15410247	100.0	100.0	
2	1.789	1.789	0.000	85324946	100.0	100.0	
						RPD = 0.00	

7 PCB-1232

M

1	3.285	3.285	0.000	1919629	100.0	117.6	
1	3.652	3.652	0.000	1832930	100.0	120.4	
1	4.142	4.142	0.000	2320975	100.0	107.2	
1	4.289	4.292	-0.003	1142874	100.0	114.0	
1	4.762	4.762	0.000	1138677	100.0	114.5	
Average of Peak Amounts =						114.7	
2	3.319	3.319	0.000	4309382	100.0	117.4	
2	3.712	3.712	0.000	3908201	100.0	126.4	M
2	4.176	4.176	0.000	7329760	100.0	120.2	M
2	4.322	4.322	0.000	3484604	100.0	126.7	M
2	4.849	4.852	-0.003	2892417	100.0	128.0	M
Average of Peak Amounts =						123.7	
						RPD = 7.54	

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290029.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

1	6.662	6.665	-0.003	4526234	100.0	95.3	
1	7.199	7.202	-0.003	5498128	100.0	119.7	
1	7.532	7.535	-0.003	4663641	100.0	115.8	
1	7.975	7.975	0.000	8895019	100.0	111.9	
1	8.365	8.365	0.000	2662832	100.0	115.8	

Average of Peak Amounts = 111.7

2	6.726	6.726	0.000	9445459	100.0	121.4	
2	7.329	7.329	0.000	13226656	100.0	120.6	
2	7.729	7.729	0.000	12704521	100.0	120.8	
2	8.096	8.096	0.000	23821211	100.0	117.9	
2	8.602	8.602	0.000	17440956	100.0	120.1	

Average of Peak Amounts = 120.2

RPD = 7.29

S 8 Polychlorinated biphenyls, Total

1						226.4	
2						243.9	

RPD = 7.42

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_L7_00018

Amount Added: 0.10

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290029.D

Injection Date: 30-Jan-2019 00:02:19

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD3

Worklist Smp#: 29

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

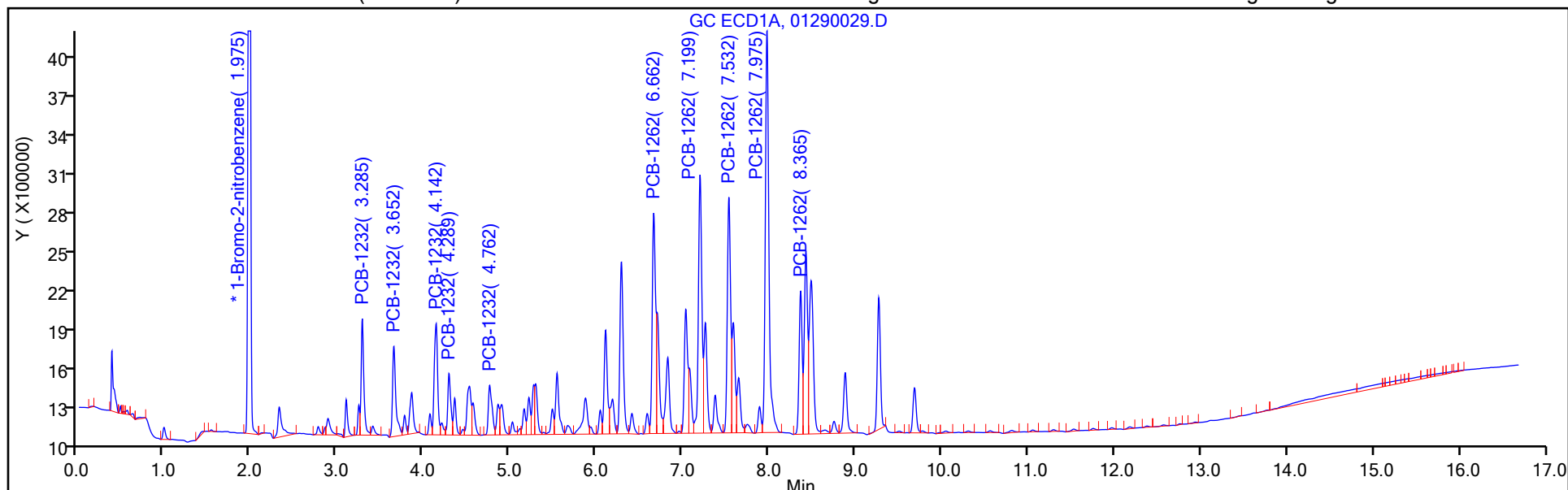
ALS Bottle#: 29

Method: 8082_J

Limit Group: GCSV - 8082 - IS

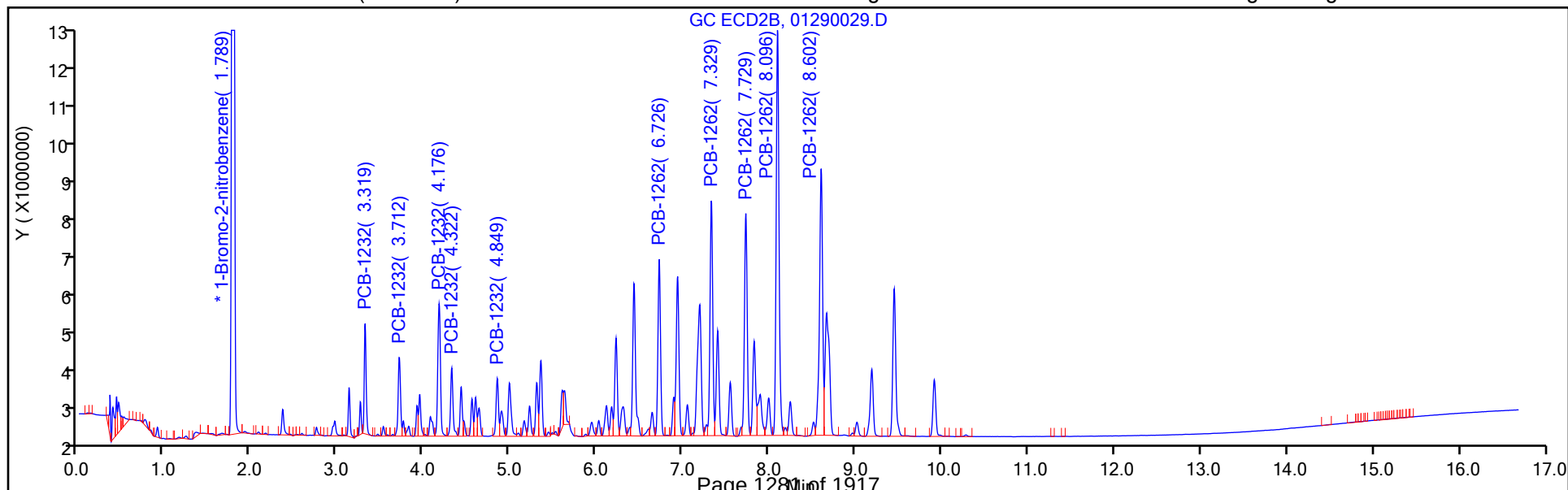
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290030.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 30-Jan-2019 00:23:27 ALS Bottle#: 30 Worklist Smp#: 30
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-030
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:55 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:13:34

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.979	-0.001	17277006	100.0	100.0	
2	1.788	1.789	-0.001	95129968	100.0	100.0	

RPD = 0.00

7 PCB-1232

M

1	3.285	3.285	0.000	4641793	250.0	273.6	
1	3.651	3.652	-0.001	4313490	250.0	272.1	M
1	4.141	4.142	-0.001	6043672	250.0	252.3	M
1	4.291	4.292	-0.001	2881266	250.0	266.5	M
1	4.761	4.762	-0.001	2920818	250.0	270.8	M

Average of Peak Amounts =

267.1

2	3.318	3.319	-0.001	10324727	250.0	273.8	
2	3.715	3.712	0.003	8800849	250.0	275.7	
2	4.175	4.176	-0.001	16600503	250.0	261.8	
2	4.322	4.322	0.000	7752050	250.0	272.4	
2	4.852	4.852	0.000	5567666	250.0	245.4	

Average of Peak Amounts =

265.8

RPD = 0.47

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290030.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

M

1	6.661	6.665	-0.004	13766939	250.0	243.4	M
1	7.198	7.202	-0.004	13395489	250.0	268.8	M
1	7.531	7.535	-0.004	11901000	250.0	270.0	M
1	7.975	7.975	0.000	23270420	250.0	261.7	M
1	8.365	8.365	0.000	6798468	250.0	267.3	M

Average of Peak Amounts =

262.2

2	6.725	6.726	-0.001	21896336	250.0	268.7	
2	7.328	7.329	-0.001	30972003	250.0	267.7	
2	7.728	7.729	-0.001	29773062	250.0	268.1	
2	8.095	8.096	-0.001	57437514	250.0	265.1	
2	8.602	8.602	0.000	41037918	250.0	266.1	

Average of Peak Amounts =

267.1

RPD = 1.85

S 8 Polychlorinated biphenyls, Total

1	529.3
2	532.9

RPD = 0.69

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_L7_00018

Amount Added: 0.25

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:55

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290030.D

Injection Date: 30-Jan-2019 00:23:27

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 30

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

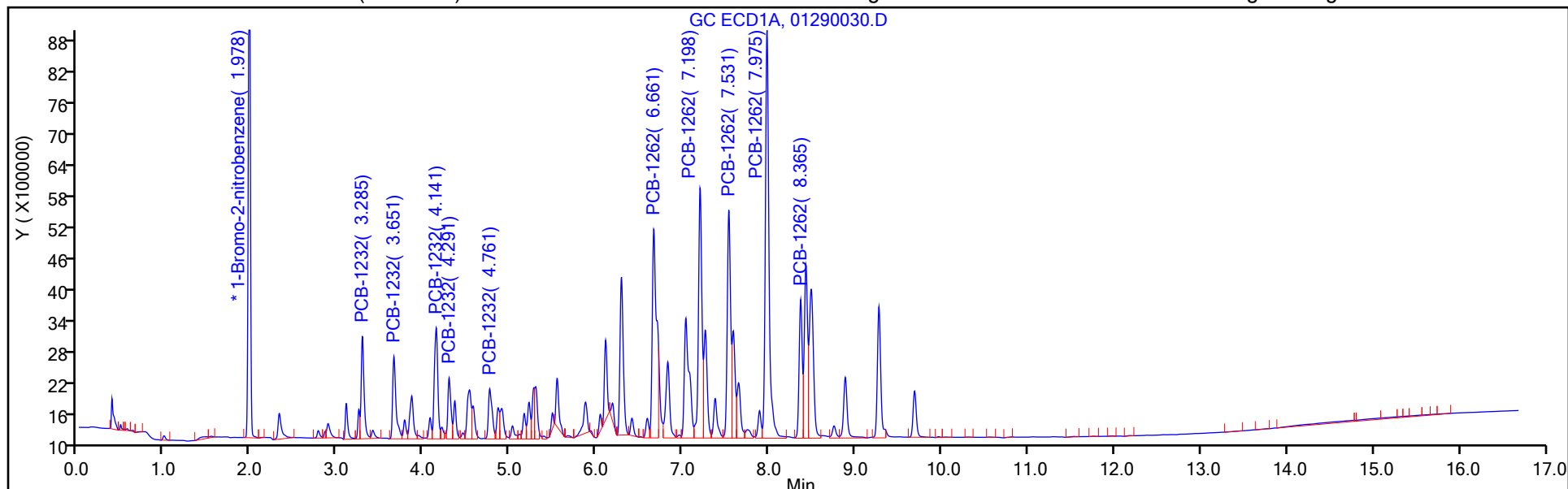
ALS Bottle#: 30

Method: 8082_J

Limit Group: GCSV - 8082 - IS

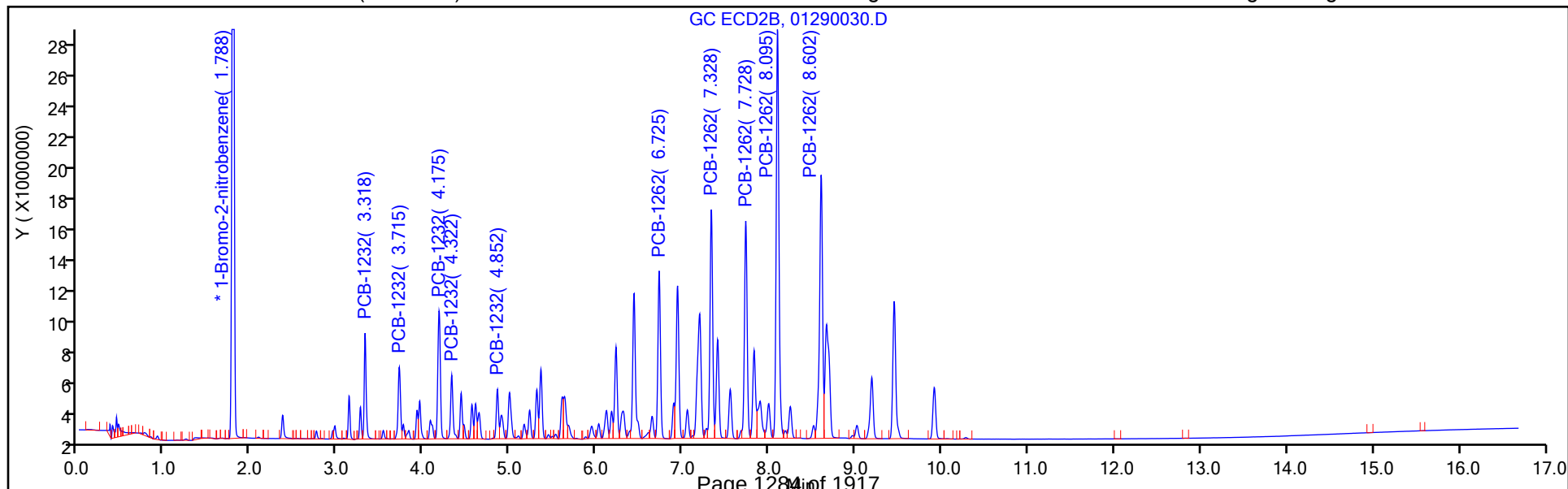
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290030.D

Injection Date: 30-Jan-2019 00:23:27

Instrument ID: SGC_J

Lims ID: STD4

Client ID:

Operator ID: TEM

ALS Bottle#: 30

Worklist Smp#: 30

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

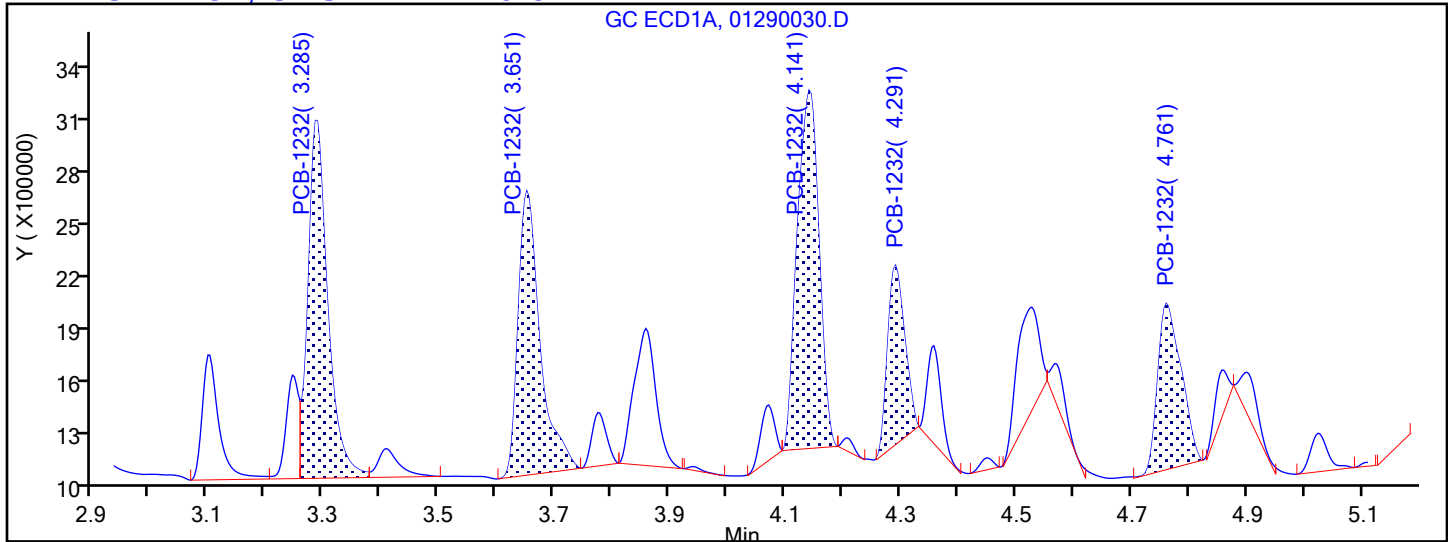
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

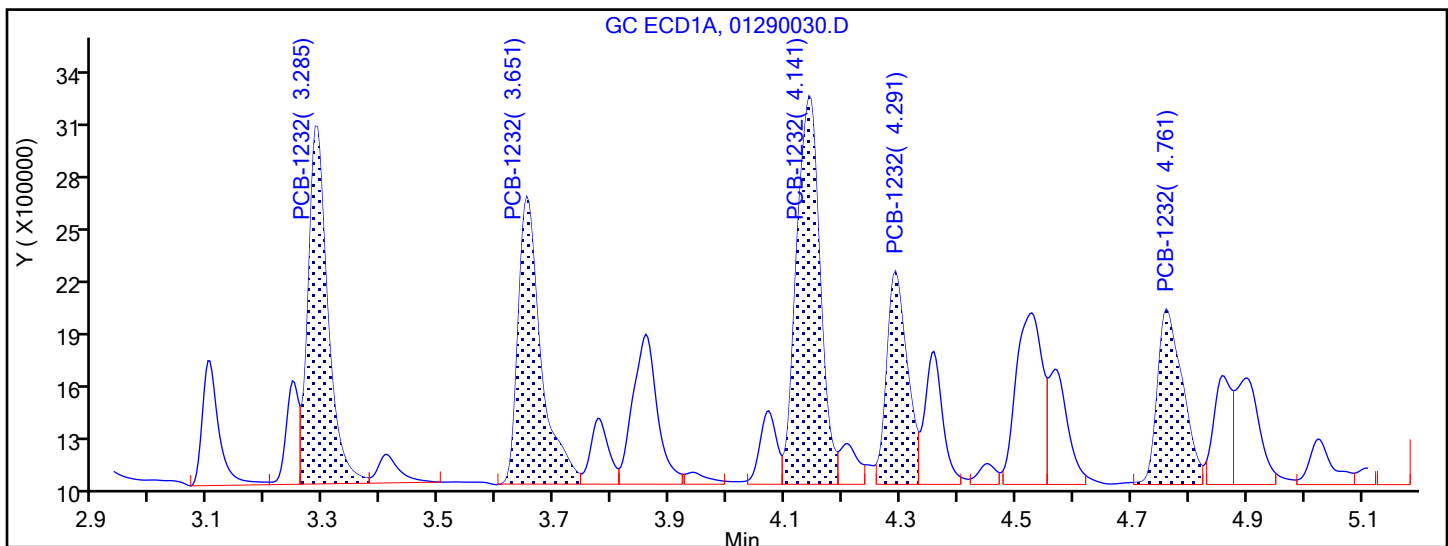
GC ECD1A

7 PCB-1232, CAS: 11141-16-5



Processing Integration Results

3.285	Response = 4641793
3.651	Response = 4088496
4.141	Response = 5085074
4.291	Response = 2026531
4.761	Response = 2543131



Manual Integration Results

3.285	Response = 4641793	
3.651	Response = 4313490	M
4.141	Response = 6043672	M
4.291	Response = 2881266	M
4.761	Response = 2920818	M

Reviewer: mooret, 30-Jan-2019 14:38:42

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
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TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290030.D

Injection Date: 30-Jan-2019 00:23:27

Instrument ID: SGC_J

Lims ID: STD4

Client ID:

Operator ID: TEM

ALS Bottle#: 30

Worklist Smp#: 30

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

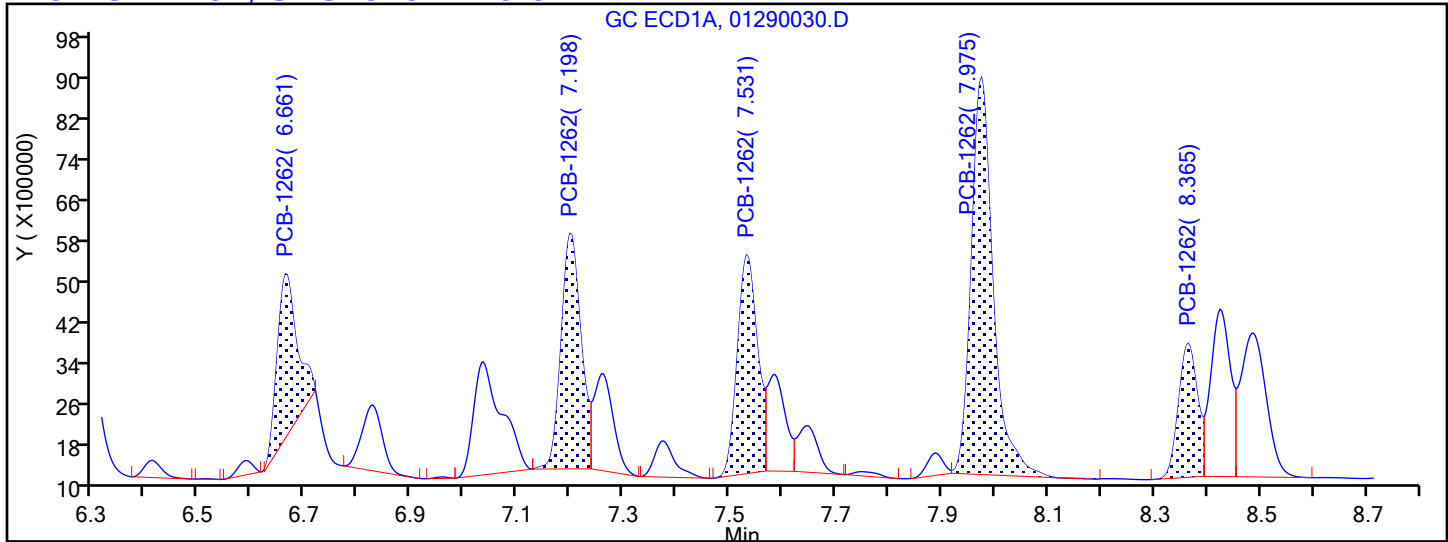
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

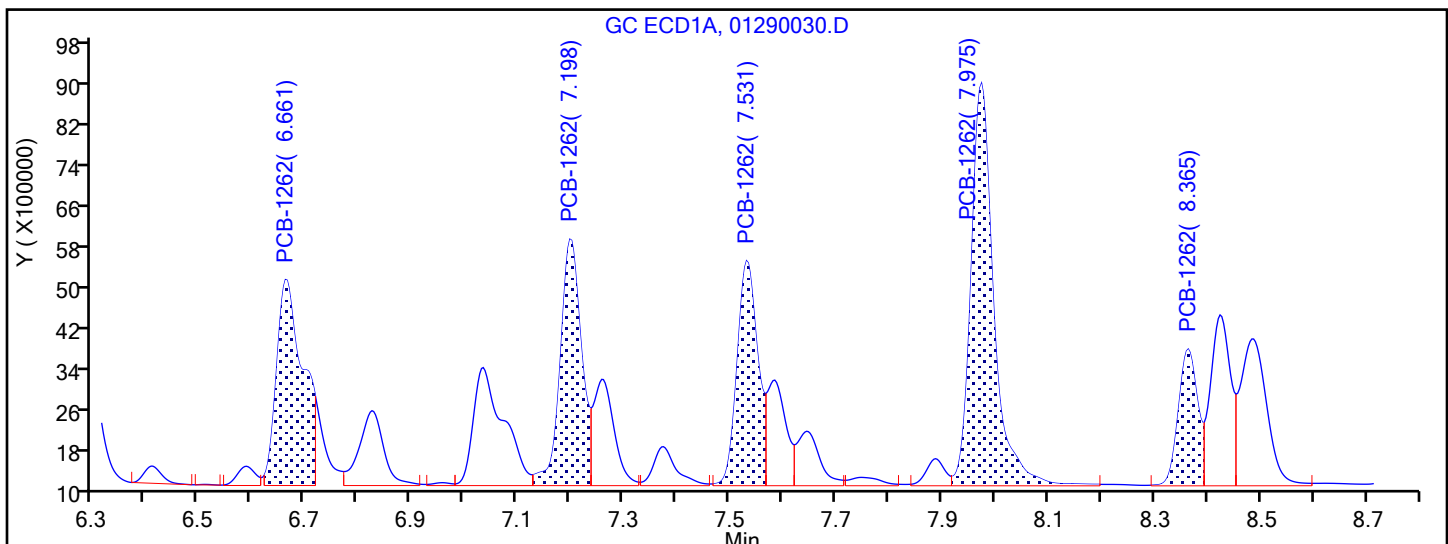
GC ECD1A

5 PCB-1262, CAS: 37324-23-5



Processing Integration Results

6.661	Response = 8266799
7.198	Response = 11986525
7.531	Response = 11275665
7.975	Response = 22074058
8.365	Response = 6546393



Manual Integration Results

6.661	Response = 13766939	M
7.198	Response = 13395489	M
7.531	Response = 11901000	M
7.975	Response = 23270420	M
8.365	Response = 6798468	M

Reviewer: mooret, 30-Jan-2019 14:38:49

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
Page 1286 of 1917

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290031.D
 Lims ID: STD5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 30-Jan-2019 00:44:48 ALS Bottle#: 31 Worklist Smp#: 31
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-031
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:53 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:17:09

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.979	1.979	0.000	18503197	100.0	100.0	
2	1.789	1.789	0.000	101555118	100.0	100.0	

RPD = 0.00

7 PCB-1232

M

1	3.285	3.285	0.000	9022765	500.0	510.7	
1	3.652	3.652	0.000	8322978	500.0	504.3	
1	4.142	4.142	0.000	12795158	500.0	501.3	
1	4.292	4.292	0.000	5689339	500.0	498.2	
1	4.762	4.762	0.000	5757161	500.0	504.2	

Average of Peak Amounts =

503.7

2	3.319	3.319	0.000	19890713	500.0	509.2	M
2	3.712	3.712	0.000	16824422	500.0	509.6	M
2	4.176	4.176	0.000	33406438	500.0	508.7	M
2	4.322	4.322	0.000	15015730	500.0	510.2	M
2	4.852	4.852	0.000	10657721	500.0	484.5	M

Average of Peak Amounts =

504.4

RPD = 0.14

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290031.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

5 PCB-1262

1	6.665	6.665	0.000	31665893	500.0	512.5	
1	7.202	7.202	0.000	26099961	500.0	495.1	
1	7.535	7.535	0.000	23061459	500.0	492.6	
1	7.975	7.975	0.000	46682586	500.0	490.7	
1	8.365	8.365	0.000	13233559	500.0	488.1	

Average of Peak Amounts = 495.8

2	6.726	6.726	0.000	42240800	500.0	497.8	
2	7.329	7.329	0.000	60041530	500.0	496.8	
2	7.729	7.729	0.000	57508699	500.0	495.3	
2	8.096	8.096	0.000	112291389	500.0	492.6	
2	8.602	8.602	0.000	79435986	500.0	491.8	

Average of Peak Amounts = 494.9

RPD = 0.19

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_L7_00018

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290031.D

Injection Date: 30-Jan-2019 00:44:48

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 31

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

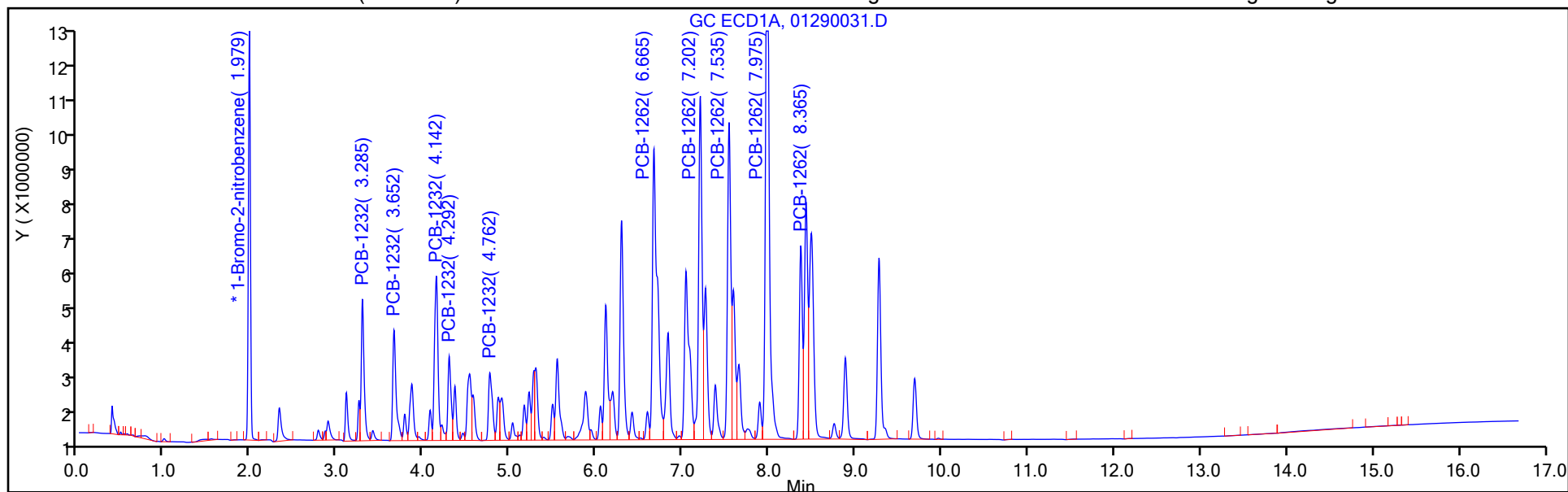
ALS Bottle#: 31

Method: 8082_J

Limit Group: GCSV - 8082 - IS

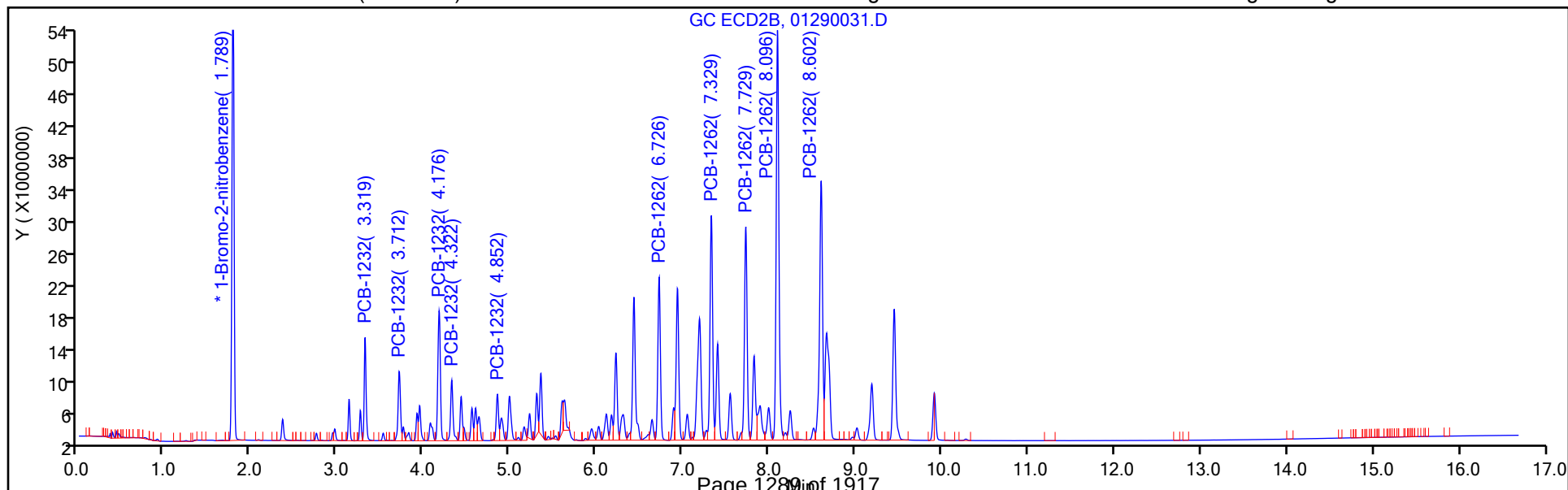
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290032.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 30-Jan-2019 01:05:50 ALS Bottle#: 32 Worklist Smp#: 32
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-032
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:51 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.975	1.974	0.001	18812752	100.0	100.0
2	1.788	1.788	0.000	103158822	100.0	100.0

RPD = 0.00

7 PCB-1232

1	3.285	3.285	0.000	12676511	750.0	712.3
1	3.651	3.652	-0.001	11929931	750.0	718.2
1	4.141	4.142	-0.001	18782266	750.0	724.9
1	4.291	4.292	-0.001	8317170	750.0	719.9
1	4.761	4.762	-0.001	8301972	750.0	717.9

Average of Peak Amounts = 718.6

2	3.318	3.319	-0.001	28136423	750.0	716.4
2	3.715	3.712	0.003	23589575	750.0	711.0
2	4.175	4.176	-0.001	47384099	750.0	717.1
2	4.321	4.322	-0.001	21054657	750.0	711.8
2	4.851	4.852	-0.001	14563335	750.0	691.9

Average of Peak Amounts = 709.6

RPD = 1.26

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290032.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

5 PCB-1262

1	6.661	6.665	-0.004	46035892	750.0	728.9	
1	7.198	7.202	-0.004	38341756	750.0	718.7	
1	7.531	7.535	-0.004	34157747	750.0	719.9	
1	7.975	7.975	0.000	69084143	750.0	714.4	
1	8.365	8.365	0.000	19726998	750.0	717.0	

Average of Peak Amounts = 719.8

2	6.725	6.726	-0.001	61101092	750.0	715.2	
2	7.328	7.329	-0.001	86881411	750.0	713.3	
2	7.728	7.729	-0.001	83506182	750.0	713.6	
2	8.095	8.096	-0.001	164230890	750.0	713.1	
2	8.601	8.602	-0.001	115507342	750.0	709.0	

Average of Peak Amounts = 712.8

RPD = 0.97

S 8 Polychlorinated biphenyls, Total

1	1438.4
2	1422.5

RPD = 1.11

Reagents:

AR_3262_L7_00018

Amount Added: 0.75

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:51

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290032.D

Injection Date: 30-Jan-2019 01:05:50

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 32

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

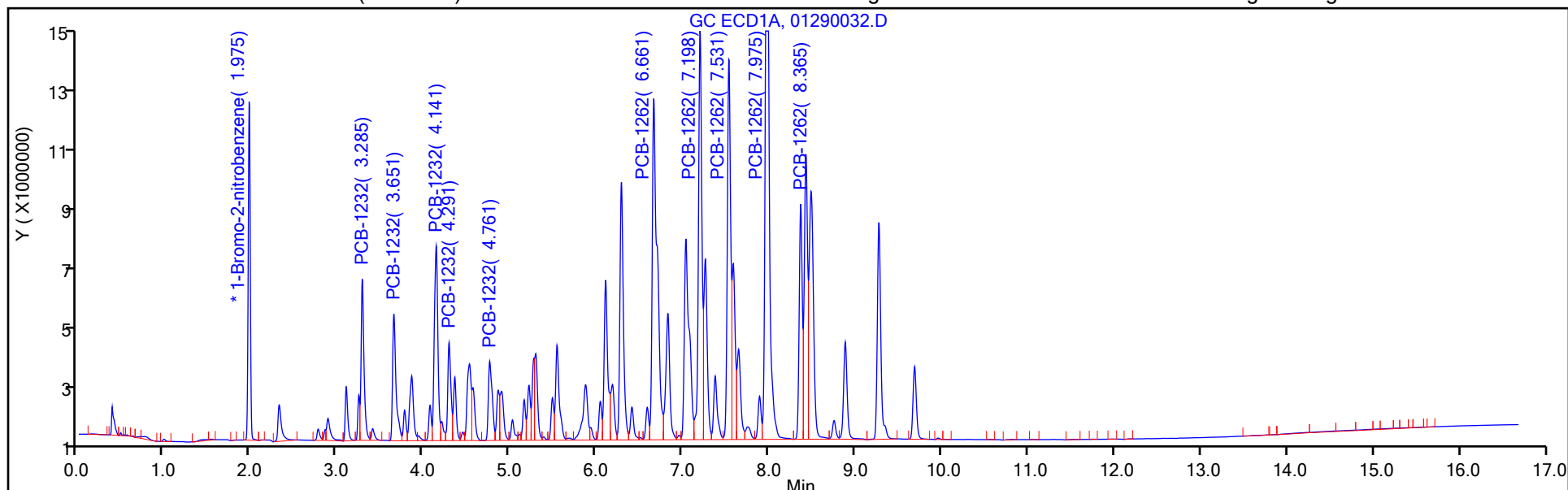
ALS Bottle#: 32

Method: 8082_J

Limit Group: GCSV - 8082 - IS

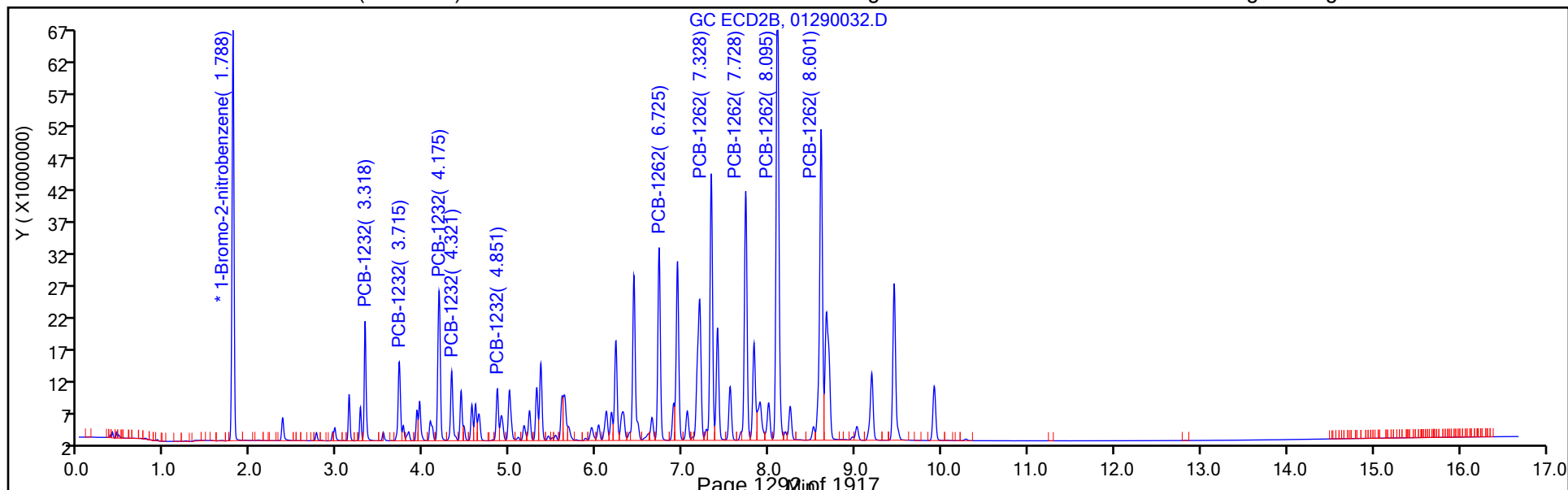
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290033.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 30-Jan-2019 01:26:59 ALS Bottle#: 33 Worklist Smp#: 33
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-033
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:49 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:39:46

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.974	0.003	17692445	100.0	100.0	
2	1.787	1.788	-0.001	97032804	100.0	100.0	
						RPD = 0.00	

7 PCB-1232

M

1	3.287	3.285	0.002	16507067	1000.0	992.9	
1	3.653	3.652	0.001	15376163	1000.0	990.8	
1	4.143	4.142	0.001	24725808	1000.0	1015.7	
1	4.290	4.292	-0.002	10885313	1000.0	1005.1	
1	4.763	4.762	0.001	10827109	1000.0	998.2	
Average of Peak Amounts =						1000.5	
2	3.317	3.319	-0.002	36225380	1000.0	987.5	M
2	3.714	3.712	0.002	30469249	1000.0	983.8	M
2	4.174	4.176	-0.002	61574579	1000.0	997.2	M
2	4.320	4.322	-0.002	27250311	1000.0	986.8	M
2	4.850	4.852	-0.002	19038677	1000.0	1060.0	M
Average of Peak Amounts =						1003.1	
						RPD = 0.25	

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290033.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

5 PCB-1262

1	6.663	6.665	-0.002	60805698	1000.0	1020.1	
1	7.200	7.202	-0.002	50241058	1000.0	1004.3	
1	7.533	7.535	-0.002	44863477	1000.0	1007.4	
1	7.973	7.975	-0.002	93284117	1000.0	1025.9	
1	8.367	8.365	0.002	26303379	1000.0	1017.7	

Average of Peak Amounts = 1015.1

2	6.723	6.726	-0.003	80102455	1000.0	1002.8	
2	7.330	7.329	0.001	114854535	1000.0	1007.8	
2	7.727	7.729	-0.002	110434783	1000.0	1008.4	
2	8.097	8.096	0.001	219516811	1000.0	1017.0	
2	8.603	8.602	0.001	155377462	1000.0	1018.8	

Average of Peak Amounts = 1011.0

RPD = 0.41

S 8 Polychlorinated biphenyls, Total

1	2015.6
2	2014.0

RPD = 0.08

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_L7_00018

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290033.D

Injection Date: 30-Jan-2019 01:26:59

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 33

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

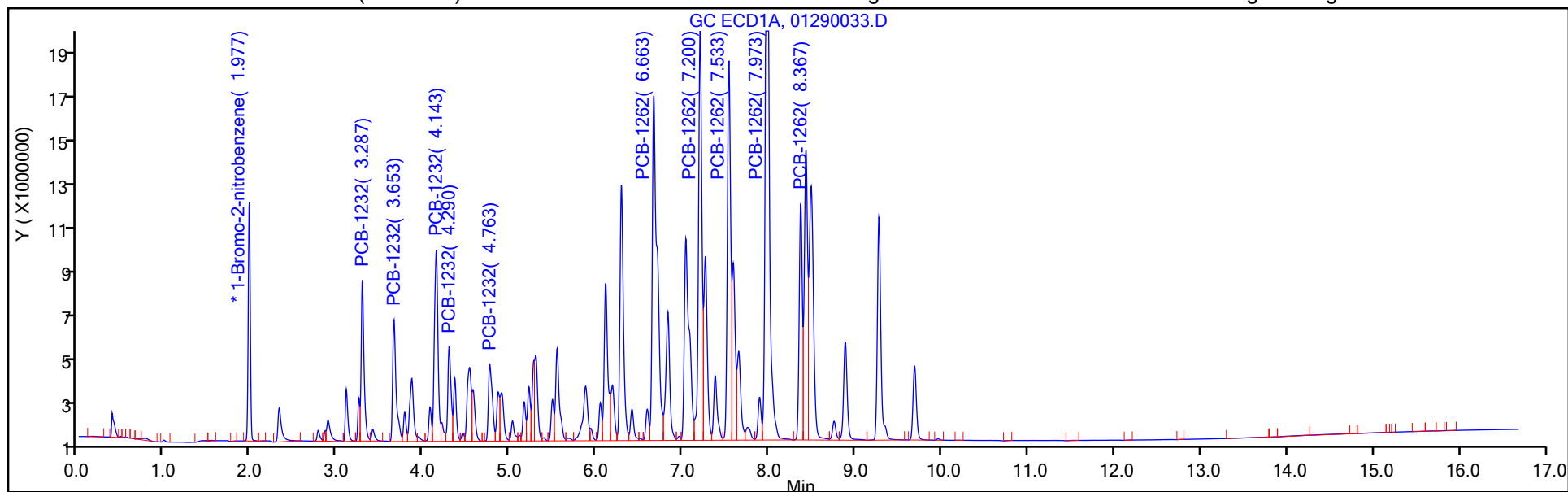
ALS Bottle#: 33

Method: 8082_J

Limit Group: GCSV - 8082 - IS

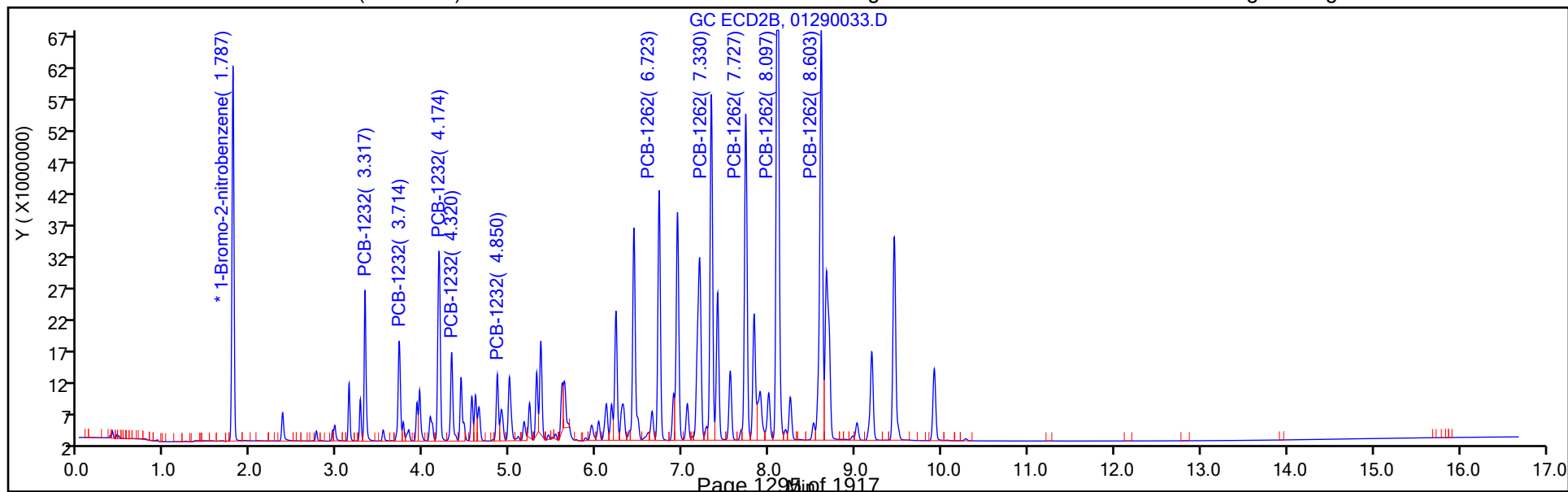
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 23:20 Calibration End Date: 01/30/2019 01:26 Calibration ID: 35076

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/27	01290027.D
Level 2	STD2 280-445745/28	01290028.D
Level 3	STD3 280-445745/29	01290029.D
Level 4	STD4 280-445745/30	01290030.D
Level 5	STD5 280-445745/31	01290031.D
Level 6	STD6 280-445745/32	01290032.D
Level 7	STD7 280-445745/33	01290033.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
PCB-1232 Peak 1	0.0540 0.0364	0.0533 0.0373	0.0505	0.0434	0.0392	Lin1	0.6941	0.0371							0.9950		0.9900
PCB-1232 Peak 2	0.0446 0.0305	0.0458 0.0314	0.0458	0.0370	0.0331	Lin1	0.6278	0.0313							0.9920		0.9900
PCB-1232 Peak 3	0.0905 0.0612	0.0852 0.0635	0.0859	0.0698	0.0658	Lin1	1.0725	0.0626							0.9960		0.9900
PCB-1232 Peak 4	0.0412 0.0272	0.0388 0.0281	0.0408	0.0326	0.0296	Lin1	0.5478	0.0279							0.9930		0.9900
PCB-1232 Peak 5	0.0398 0.0188	0.0345 0.0196	0.0339	0.0234	0.0210	Qua1	0.5675	0.0226	-0.000004						0.9910		0.9900
PCB-1262 Peak 1	0.1104 0.0790	0.1057 0.0826	0.1107	0.0921	0.0832	Lin1	1.2237	0.0811							0.9960		0.9900
PCB-1262 Peak 2	0.1520 0.1123	0.1449 0.1184	0.1550	0.1302	0.1182	Lin1	1.5242	0.1159							0.9960		0.9900
PCB-1262 Peak 3	0.1444 0.1079	0.1381 0.1138	0.1489	0.1252	0.1133	Lin1	1.4226	0.1115							0.9960		0.9900
PCB-1262 Peak 4	0.2626 0.2123	0.2511 0.2262	0.2792	0.2415	0.2211	Lin1	1.9161	0.2206							0.9970		0.9900
PCB-1262 Peak 5	0.1966 0.1493	0.1876 0.1601	0.2044	0.1726	0.1564	Lin1	1.7753	0.1554							0.9960		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/29/2019 23:20 Calibration End Date: 01/30/2019 01:26 Calibration ID: 35076

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/27	01290027.D
Level 2	STD2 280-445745/28	01290028.D
Level 3	STD3 280-445745/29	01290029.D
Level 4	STD4 280-445745/30	01290030.D
Level 5	STD5 280-445745/31	01290031.D
Level 6	STD6 280-445745/32	01290032.D
Level 7	STD7 280-445745/33	01290033.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1232 Peak 1	BNB	Lin1	1496532 28136423	2748487 36225380	4309382	10324727	19890713	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 2	BNB	Lin1	1233959 23589575	2360172 30469249	3908201	8800849	16824422	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 3	BNB	Lin1	2506015 47384099	4397390 61574579	7329760	16600503	33406438	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 4	BNB	Lin1	1140508 21054657	1999602 27250311	3484604	7752050	15015730	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 5	BNB	Qual	1101509 14563335	1779819 19038677	2892417	5567666	10657721	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 1	BNB	Lin1	3056339 61101092	5453862 80102455	9445459	21896336	42240800	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 2	BNB	Lin1	4209181 86881411	7472482 114854535	13226656	30972003	60041530	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 3	BNB	Lin1	4000469 83506182	7122870 110434783	12704521	29773062	57508699	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 4	BNB	Lin1	7272798 164230890	12954262 219516811	23821211	57437514	112291389	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 5	BNB	Lin1	5444960 115507342	9679909 155377462	17440956	41037918	79435986	25.0 750	50.0 1000	100	250	500

Curve Type Legend:

Lin1 = Linear 1/conc ISTD
Qual = Quadratic 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290027.D
 Lims ID: STD1 3262
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 29-Jan-2019 23:20:15 ALS Bottle#: 27 Worklist Smp#: 27
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 3262
 Misc. Info.: 280-0078470-027
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:00 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:12:37

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.979	-0.001	19930472	100.0	100.0	
2	1.788	1.789	-0.001	110786865	100.0	100.0	

RPD = 0.00

7 PCB-1232

1	3.288	3.285	0.003	693248	25.0	20.4	
1	3.651	3.652	-0.001	618262	25.0	18.3	
1	4.141	4.142	-0.001	699435	25.0	23.0	
1	4.291	4.292	-0.001	344732	25.0	20.4	
1	4.761	4.762	-0.001	338220	25.0	21.0	
Average of Peak Amounts =						20.6	
2	3.318	3.319	-0.001	1496532	25.0	17.7	
2	3.714	3.712	0.002	1233959	25.0	15.5	
2	4.174	4.176	-0.002	2506015	25.0	19.0	
2	4.321	4.322	-0.001	1140508	25.0	17.3	
2	4.848	4.852	-0.004	1101509	25.0	18.9	
Average of Peak Amounts =						17.7	
						RPD = 15.37	

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290027.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

5 PCB-1262

1	6.661	6.665	-0.004	1292278	25.0	28.0	
1	7.198	7.202	-0.004	1560094	25.0	20.4	
1	7.531	7.535	-0.004	1303552	25.0	21.1	
1	7.974	7.975	-0.001	2432737	25.0	23.3	
1	8.364	8.365	-0.001	721259	25.0	22.0	

Average of Peak Amounts = 23.0

2	6.724	6.726	-0.002	3056339	25.0	18.9	
2	7.331	7.329	0.002	4209181	25.0	19.6	
2	7.728	7.729	-0.001	4000469	25.0	19.6	
2	8.098	8.096	0.002	7272798	25.0	21.1	
2	8.601	8.602	-0.001	5444960	25.0	20.2	

Average of Peak Amounts = 19.9

RPD = 14.38

S 8 Polychlorinated biphenyls, Total

1						43.6	
2						37.6	

RPD = 14.84

Reagents:

AR_3262_L7_00018

Amount Added: 0.03

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:00

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290027.D

Injection Date: 29-Jan-2019 23:20:15

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD1 3262

Worklist Smp#: 27

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

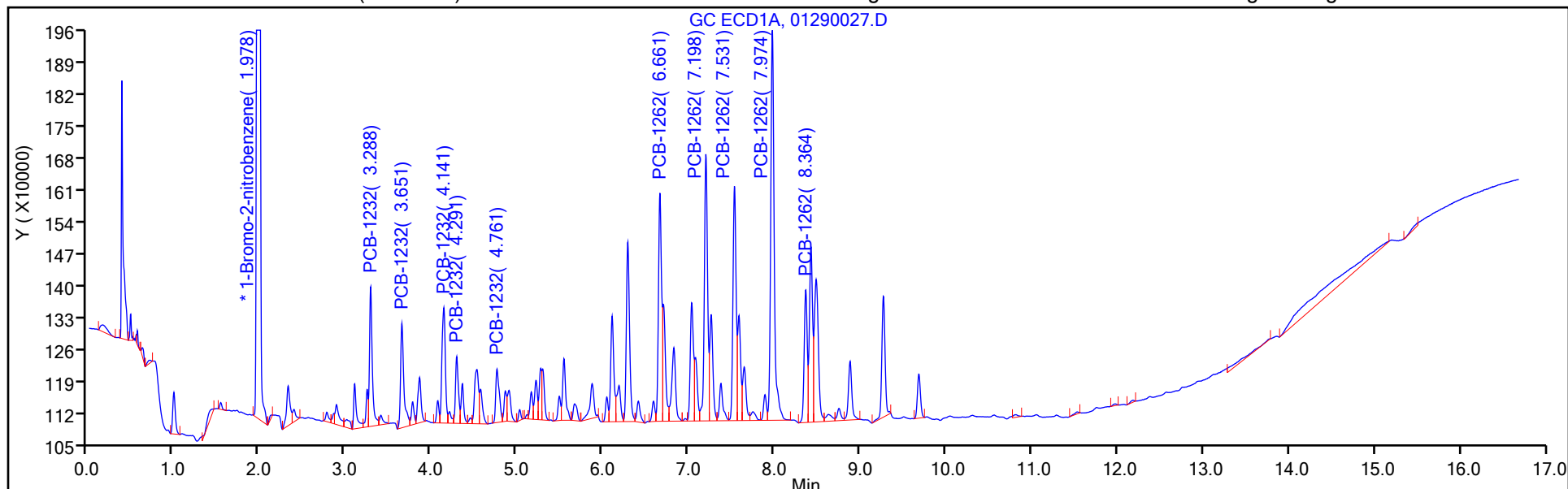
ALS Bottle#: 27

Method: 8082_J

Limit Group: GCSV - 8082 - IS

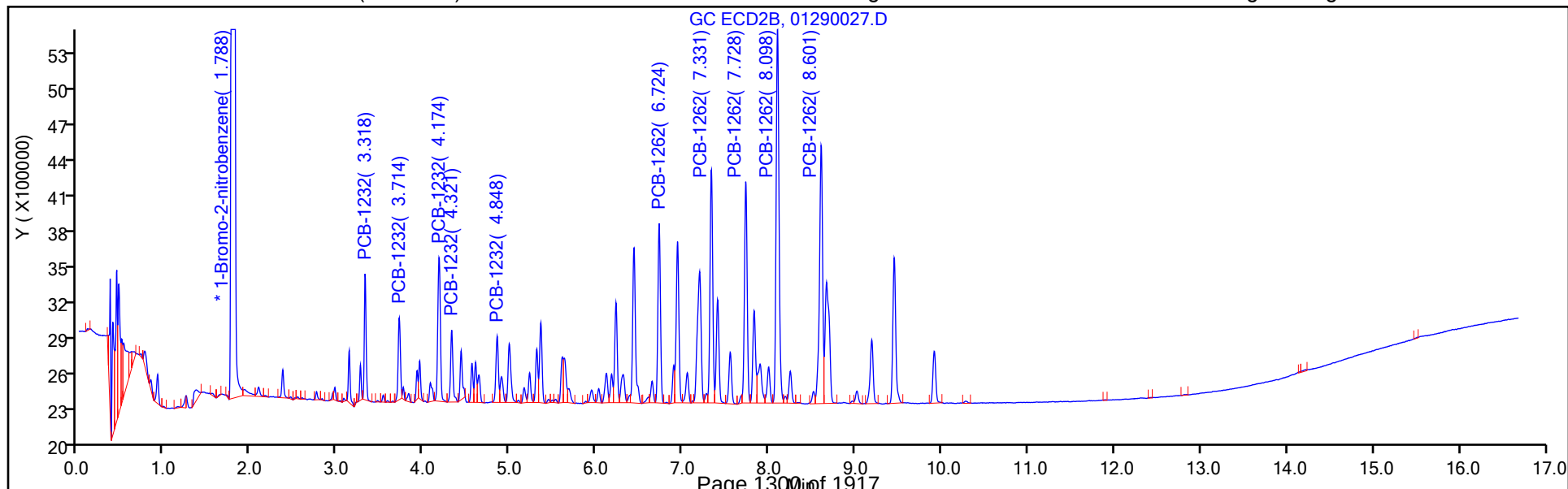
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290028.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 29-Jan-2019 23:41:16 ALS Bottle#: 28 Worklist Smp#: 28
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-028
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:58 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:41:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	18712922	100.0	100.0	
2	1.790	1.789	0.001	103173235	100.0	100.0	
						RPD = 0.00	

7 PCB-1232

1	3.286	3.285	0.001	1118140	50.0	47.4	
1	3.650	3.652	-0.002	1104878	50.0	50.9	
1	4.140	4.142	-0.002	1364870	50.0	50.6	
1	4.290	4.292	-0.002	669721	50.0	50.8	
1	4.760	4.762	-0.002	629687	50.0	48.4	
Average of Peak Amounts =						49.6	
2	3.317	3.319	-0.002	2748487	50.0	53.1	
2	3.713	3.712	0.001	2360172	50.0	53.1	
2	4.177	4.176	0.001	4397390	50.0	51.0	
2	4.320	4.322	-0.002	1999602	50.0	49.8	
2	4.850	4.852	-0.002	1779819	50.0	51.7	
Average of Peak Amounts =						51.7	

RPD = 4.15

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290028.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

5 PCB-1262

1	6.663	6.665	-0.002	2409794	50.0	46.8	
1	7.200	7.202	-0.002	2907641	50.0	47.9	
1	7.533	7.535	-0.002	2499853	50.0	48.3	
1	7.973	7.975	-0.002	4572344	50.0	47.1	
1	8.363	8.365	-0.002	1358687	50.0	47.0	

Average of Peak Amounts = 47.4

2	6.727	6.726	0.001	5453862	50.0	50.1	
2	7.330	7.329	0.001	7472482	50.0	49.3	
2	7.730	7.729	0.001	7122870	50.0	49.2	
2	8.097	8.096	0.001	12954262	50.0	48.2	
2	8.603	8.602	0.001	9679909	50.0	48.9	

Average of Peak Amounts = 49.2

RPD = 3.56

S 8 Polychlorinated biphenyls, Total

1	97.1	
2	100.9	

RPD = 3.86

Reagents:

AR_3262_L7_00018

Amount Added: 0.05

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:59

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290028.D

Injection Date: 29-Jan-2019 23:41:16

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 28

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

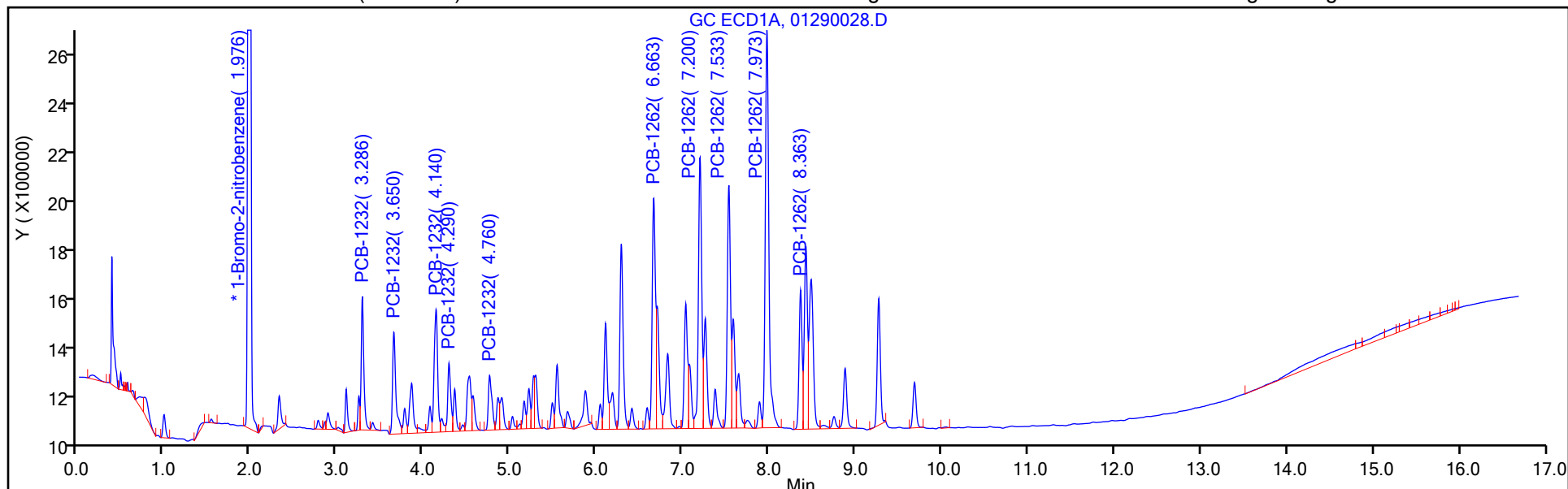
ALS Bottle#: 28

Method: 8082_J

Limit Group: GCSV - 8082 - IS

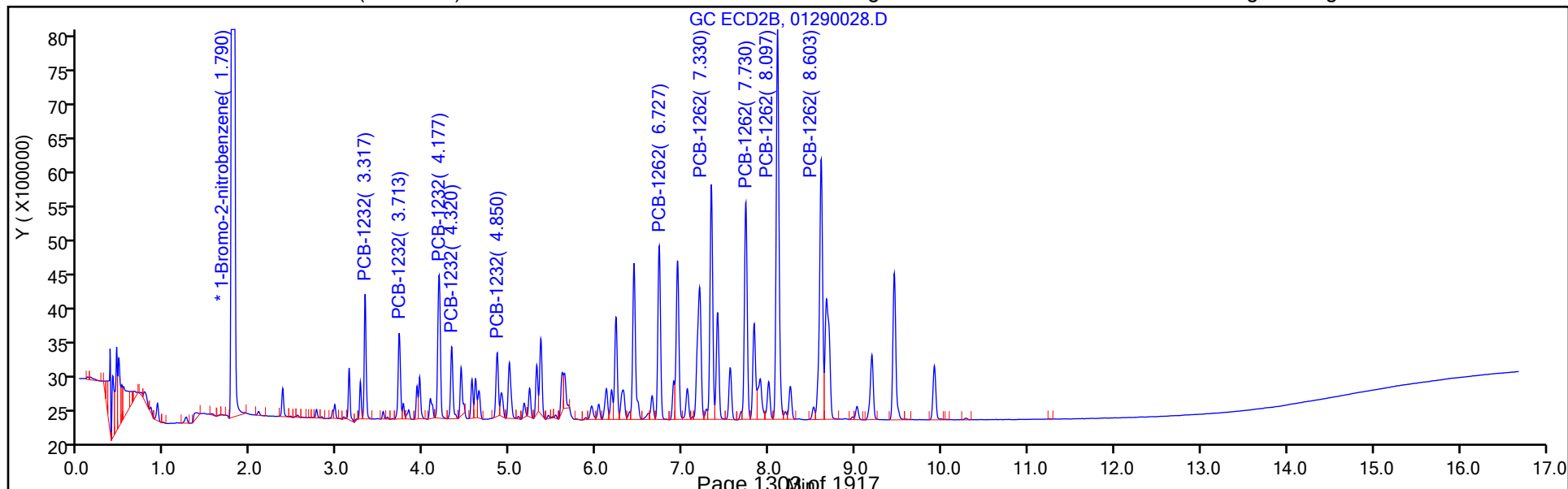
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290029.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 30-Jan-2019 00:02:19 ALS Bottle#: 29 Worklist Smp#: 29
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-029
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:57 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:38:27

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.979	-0.004	15410247	100.0	100.0	
2	1.789	1.789	0.000	85324946	100.0	100.0	
						RPD = 0.00	

7 PCB-1232

M

1	3.285	3.285	0.000	1919629	100.0	117.6	
1	3.652	3.652	0.000	1832930	100.0	120.4	
1	4.142	4.142	0.000	2320975	100.0	107.2	
1	4.289	4.292	-0.003	1142874	100.0	114.0	
1	4.762	4.762	0.000	1138677	100.0	114.5	
Average of Peak Amounts =						114.7	
2	3.319	3.319	0.000	4309382	100.0	117.4	
2	3.712	3.712	0.000	3908201	100.0	126.4	M
2	4.176	4.176	0.000	7329760	100.0	120.2	M
2	4.322	4.322	0.000	3484604	100.0	126.7	M
2	4.849	4.852	-0.003	2892417	100.0	128.0	M
Average of Peak Amounts =						123.7	
						RPD = 7.54	

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290029.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

1	6.662	6.665	-0.003	4526234	100.0	95.3	
1	7.199	7.202	-0.003	5498128	100.0	119.7	
1	7.532	7.535	-0.003	4663641	100.0	115.8	
1	7.975	7.975	0.000	8895019	100.0	111.9	
1	8.365	8.365	0.000	2662832	100.0	115.8	

Average of Peak Amounts = 111.7

2	6.726	6.726	0.000	9445459	100.0	121.4	
2	7.329	7.329	0.000	13226656	100.0	120.6	
2	7.729	7.729	0.000	12704521	100.0	120.8	
2	8.096	8.096	0.000	23821211	100.0	117.9	
2	8.602	8.602	0.000	17440956	100.0	120.1	

Average of Peak Amounts = 120.2

RPD = 7.29

S 8 Polychlorinated biphenyls, Total

1						226.4	
2						243.9	

RPD = 7.42

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_L7_00018

Amount Added: 0.10

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:57

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290029.D

Injection Date: 30-Jan-2019 00:02:19

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD3

Worklist Smp#: 29

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

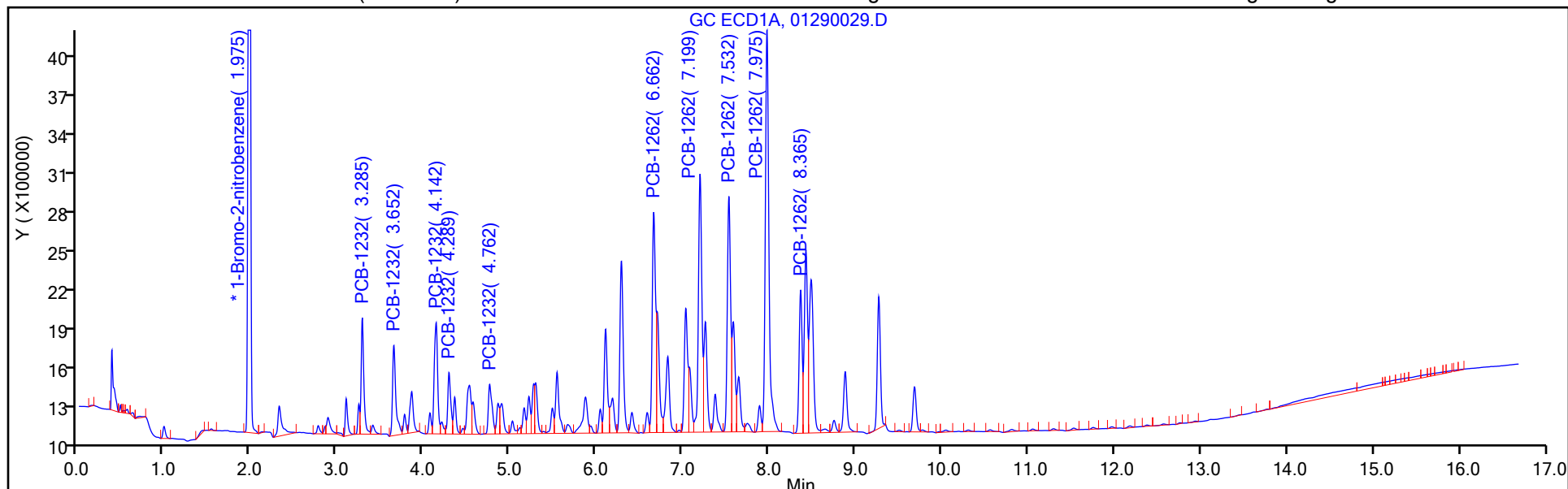
ALS Bottle#: 29

Method: 8082_J

Limit Group: GCSV - 8082 - IS

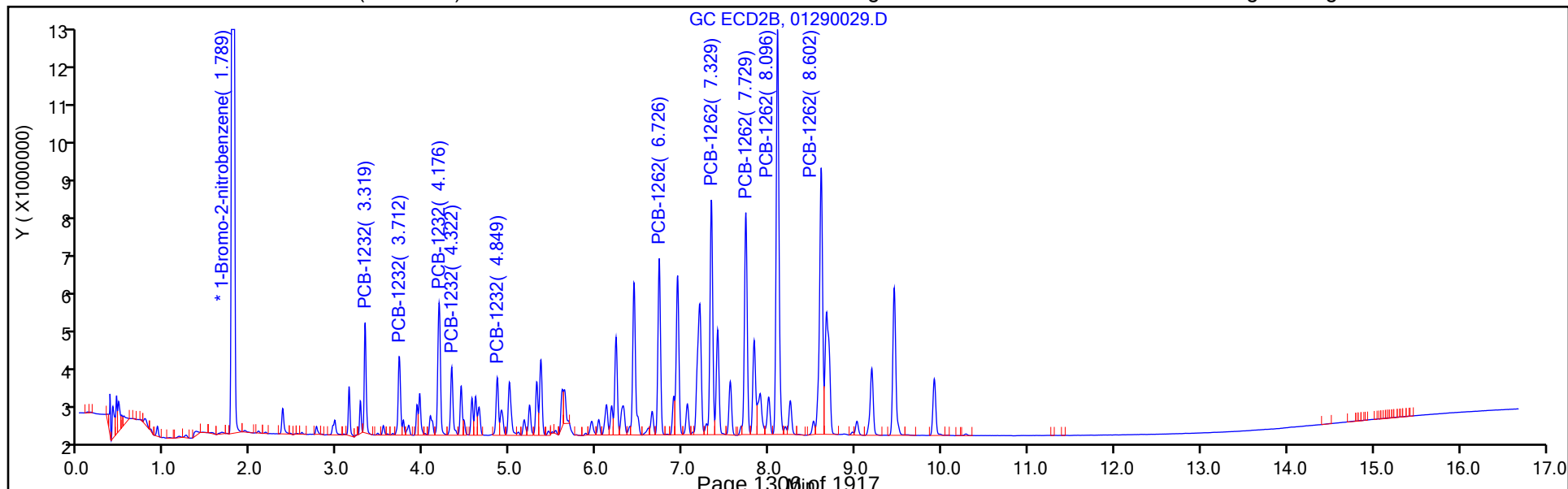
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290029.D

Injection Date: 30-Jan-2019 00:02:19

Instrument ID: SGC_J

Lims ID: STD3

Client ID:

Operator ID: TEM

ALS Bottle#: 29

Worklist Smp#: 29

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

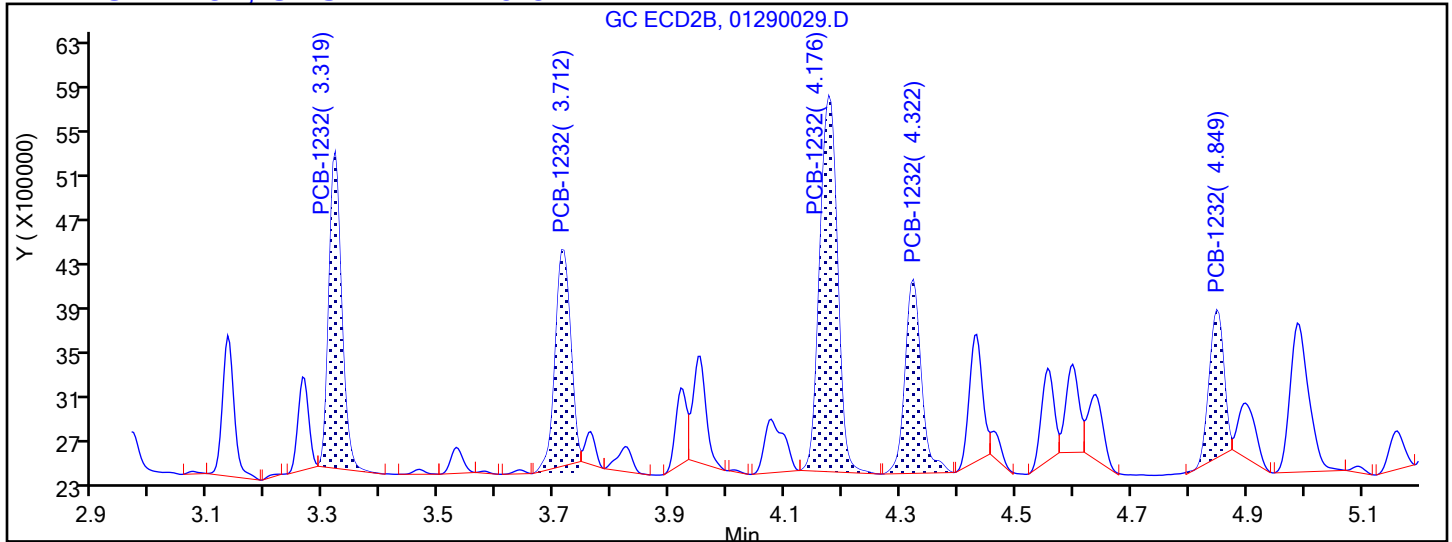
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

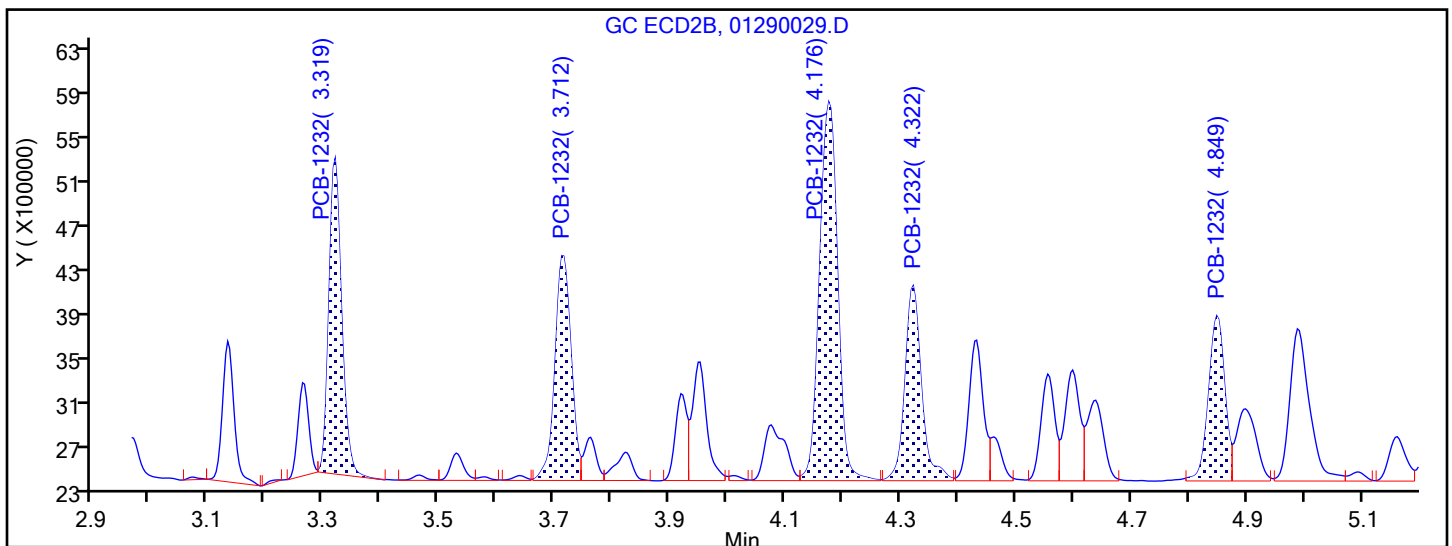
GC ECD2B

7 PCB-1232, CAS: 11141-16-5



Processing Integration Results

3.319	Response = 4309382
3.712	Response = 3584301
4.176	Response = 7124863
4.322	Response = 3369297
4.849	Response = 2325066



Manual Integration Results

3.319	Response = 4309382	
3.712	Response = 3908201	M
4.176	Response = 7329760	M
4.322	Response = 3484604	M
4.849	Response = 2892417	M

Reviewer: mooret, 30-Jan-2019 14:46:26

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
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TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290030.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 30-Jan-2019 00:23:27 ALS Bottle#: 30 Worklist Smp#: 30
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-030
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:55 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:13:34

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.979	-0.001	17277006	100.0	100.0	
2	1.788	1.789	-0.001	95129968	100.0	100.0	

RPD = 0.00

7 PCB-1232

M

1	3.285	3.285	0.000	4641793	250.0	273.6	
1	3.651	3.652	-0.001	4313490	250.0	272.1	M
1	4.141	4.142	-0.001	6043672	250.0	252.3	M
1	4.291	4.292	-0.001	2881266	250.0	266.5	M
1	4.761	4.762	-0.001	2920818	250.0	270.8	M

Average of Peak Amounts = 267.1

2	3.318	3.319	-0.001	10324727	250.0	273.8	
2	3.715	3.712	0.003	8800849	250.0	275.7	
2	4.175	4.176	-0.001	16600503	250.0	261.8	
2	4.322	4.322	0.000	7752050	250.0	272.4	
2	4.852	4.852	0.000	5567666	250.0	245.4	

Average of Peak Amounts = 265.8

RPD = 0.47

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290030.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

M

1	6.661	6.665	-0.004	13766939	250.0	243.4	M
1	7.198	7.202	-0.004	13395489	250.0	268.8	M
1	7.531	7.535	-0.004	11901000	250.0	270.0	M
1	7.975	7.975	0.000	23270420	250.0	261.7	M
1	8.365	8.365	0.000	6798468	250.0	267.3	M

Average of Peak Amounts =

262.2

2	6.725	6.726	-0.001	21896336	250.0	268.7	
2	7.328	7.329	-0.001	30972003	250.0	267.7	
2	7.728	7.729	-0.001	29773062	250.0	268.1	
2	8.095	8.096	-0.001	57437514	250.0	265.1	
2	8.602	8.602	0.000	41037918	250.0	266.1	

Average of Peak Amounts =

267.1

RPD = 1.85

S 8 Polychlorinated biphenyls, Total

1	529.3
2	532.9

RPD = 0.69

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_L7_00018

Amount Added: 0.25

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:55

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290030.D

Injection Date: 30-Jan-2019 00:23:27

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 30

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

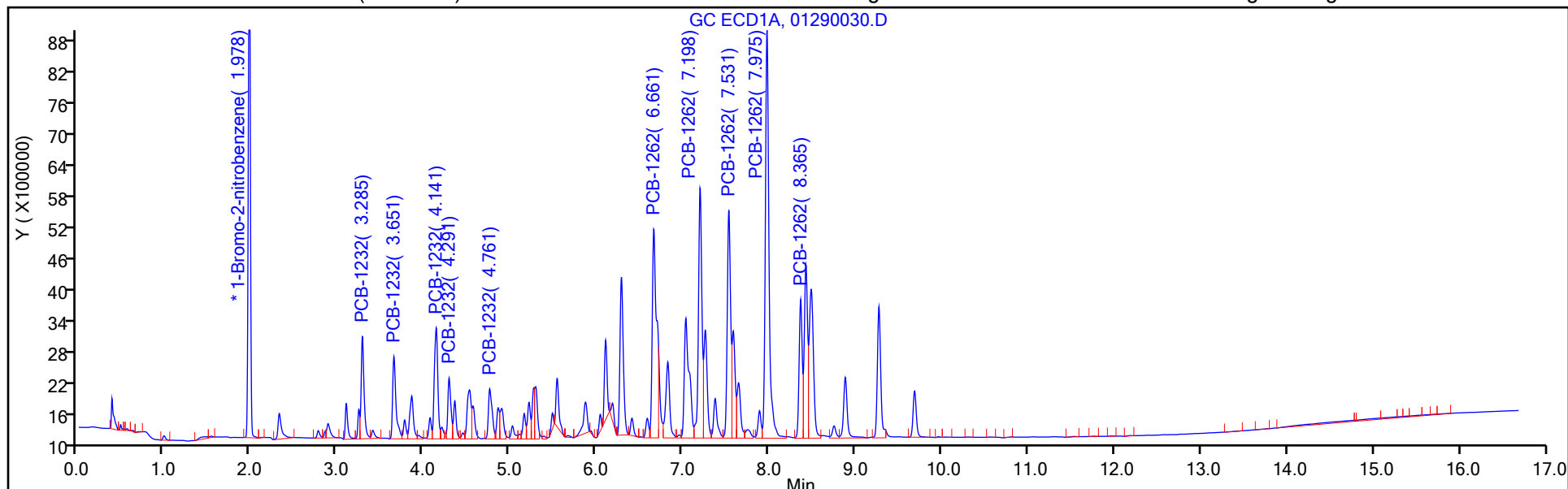
ALS Bottle#: 30

Method: 8082_J

Limit Group: GCSV - 8082 - IS

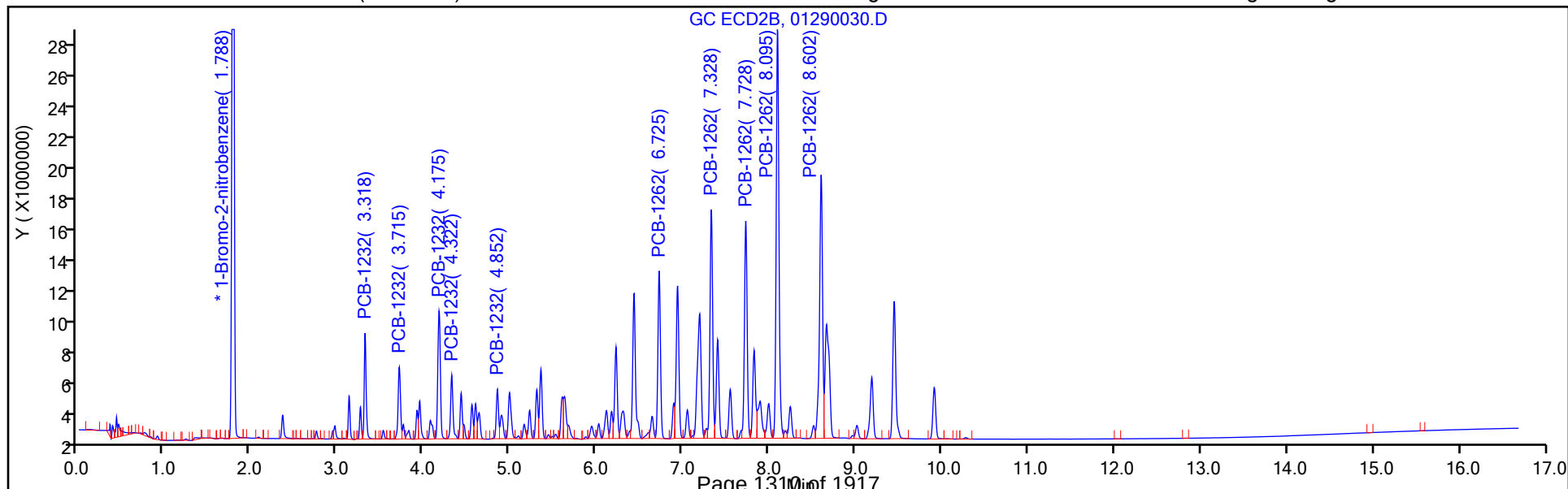
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290031.D
 Lims ID: STD5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 30-Jan-2019 00:44:48 ALS Bottle#: 31 Worklist Smp#: 31
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-031
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:53 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:17:09

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.979	1.979	0.000	18503197	100.0	100.0	
2	1.789	1.789	0.000	101555118	100.0	100.0	

RPD = 0.00

7 PCB-1232

M

1	3.285	3.285	0.000	9022765	500.0	510.7	
1	3.652	3.652	0.000	8322978	500.0	504.3	
1	4.142	4.142	0.000	12795158	500.0	501.3	
1	4.292	4.292	0.000	5689339	500.0	498.2	
1	4.762	4.762	0.000	5757161	500.0	504.2	

Average of Peak Amounts =

503.7

2	3.319	3.319	0.000	19890713	500.0	509.2	M
2	3.712	3.712	0.000	16824422	500.0	509.6	M
2	4.176	4.176	0.000	33406438	500.0	508.7	M
2	4.322	4.322	0.000	15015730	500.0	510.2	M
2	4.852	4.852	0.000	10657721	500.0	484.5	M

Average of Peak Amounts =

504.4

RPD = 0.14

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290031.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

1	6.665	6.665	0.000	31665893	500.0	512.5	
1	7.202	7.202	0.000	26099961	500.0	495.1	
1	7.535	7.535	0.000	23061459	500.0	492.6	
1	7.975	7.975	0.000	46682586	500.0	490.7	
1	8.365	8.365	0.000	13233559	500.0	488.1	

Average of Peak Amounts = 495.8

2	6.726	6.726	0.000	42240800	500.0	497.8	
2	7.329	7.329	0.000	60041530	500.0	496.8	
2	7.729	7.729	0.000	57508699	500.0	495.3	
2	8.096	8.096	0.000	112291389	500.0	492.6	
2	8.602	8.602	0.000	79435986	500.0	491.8	

Average of Peak Amounts = 494.9

RPD = 0.19

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_L7_00018

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290031.D

Injection Date: 30-Jan-2019 00:44:48

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 31

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

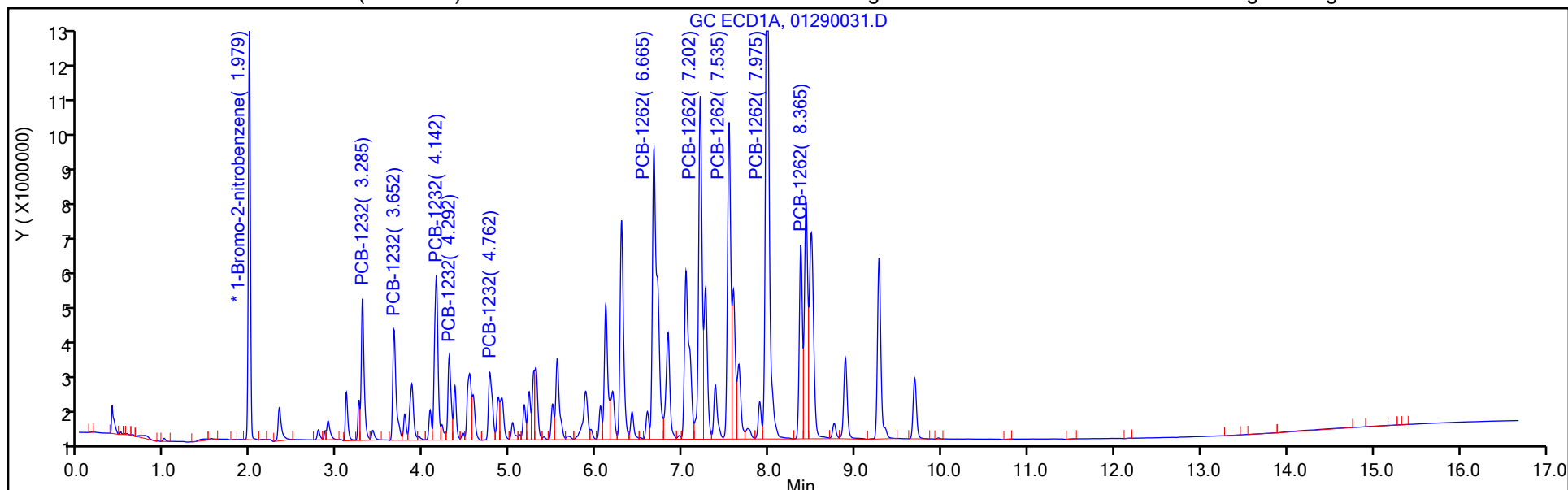
ALS Bottle#: 31

Method: 8082_J

Limit Group: GCSV - 8082 - IS

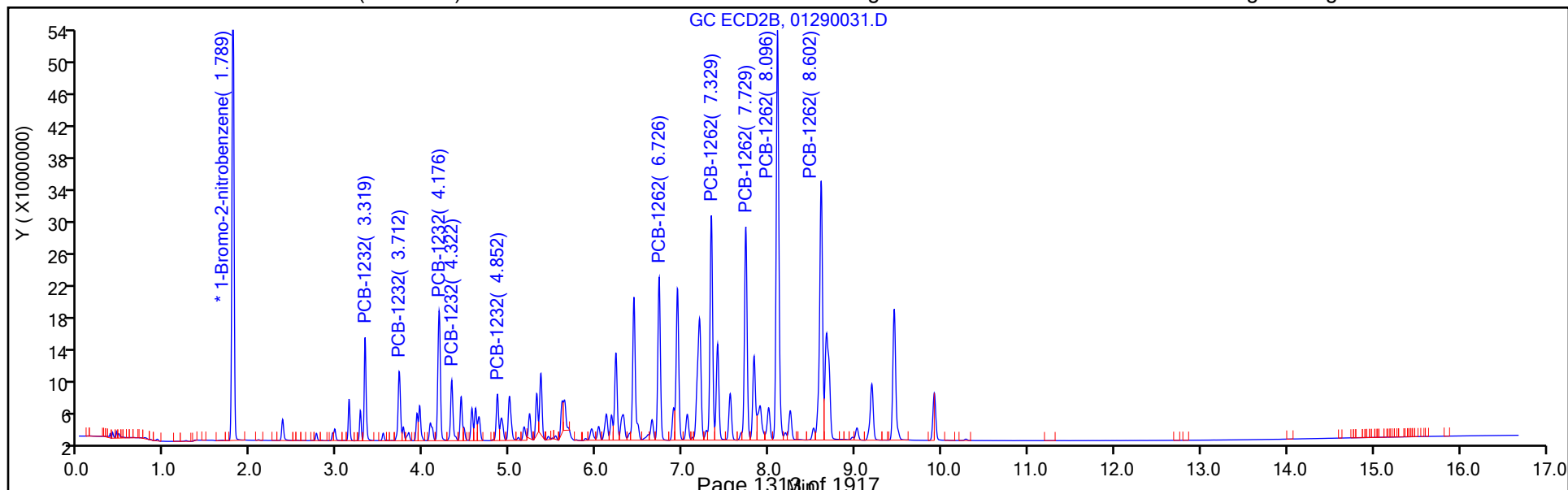
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290031.D

Injection Date: 30-Jan-2019 00:44:48

Instrument ID: SGC_J

Lims ID: STD5

Client ID:

Operator ID: TEM

ALS Bottle#: 31

Worklist Smp#: 31

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

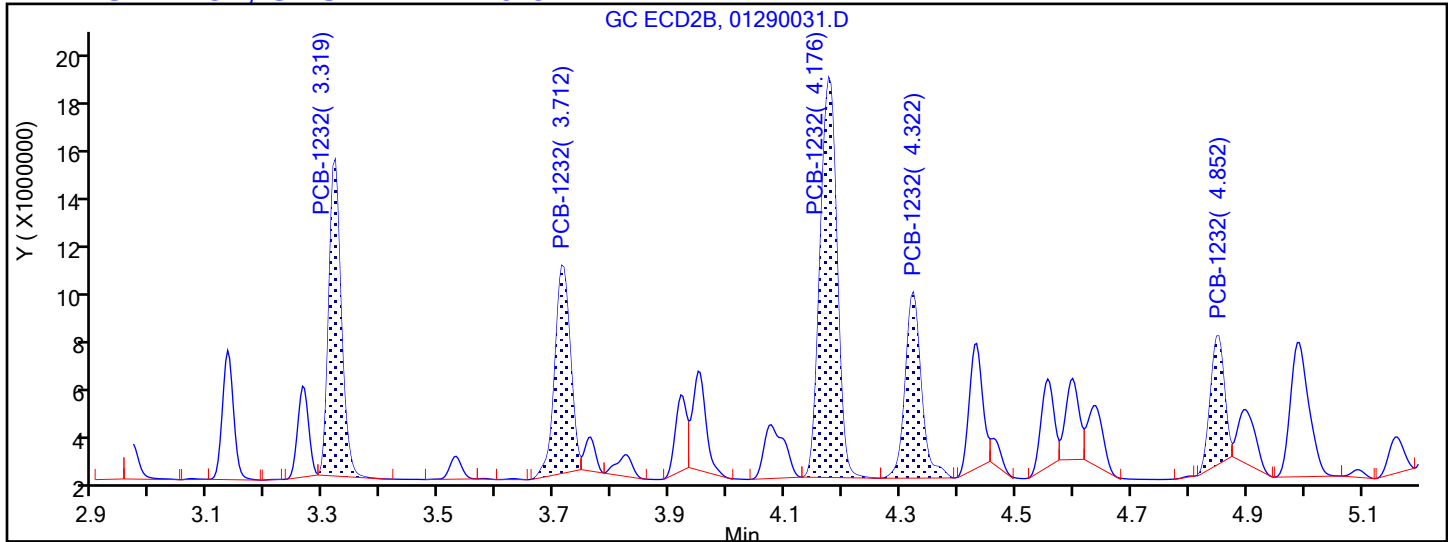
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

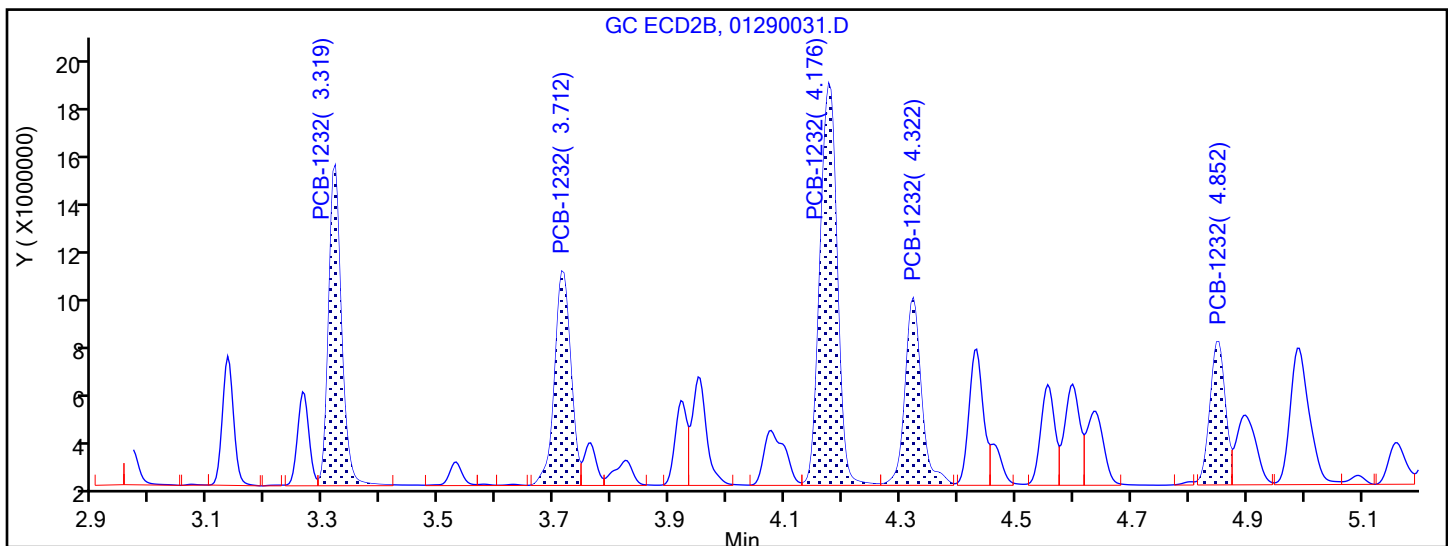
GC ECD2B

7 PCB-1232, CAS: 11141-16-5



Processing Integration Results

3.319	Response = 19019418
3.712	Response = 15749148
4.176	Response = 32752340
4.322	Response = 14546707
4.852	Response = 8772505



Manual Integration Results

3.319	Response = 19890713	M
3.712	Response = 16824422	M
4.176	Response = 33406438	M
4.322	Response = 15015730	M
4.852	Response = 10657721	M

Reviewer: mooret, 30-Jan-2019 14:39:12

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
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TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290032.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 30-Jan-2019 01:05:50 ALS Bottle#: 32 Worklist Smp#: 32
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-032
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:51 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.974	0.001	18812752	100.0	100.0
2	1.788	1.788	0.000	103158822	100.0	100.0

RPD = 0.00

7 PCB-1232

1	3.285	3.285	0.000	12676511	750.0	712.3
1	3.651	3.652	-0.001	11929931	750.0	718.2
1	4.141	4.142	-0.001	18782266	750.0	724.9
1	4.291	4.292	-0.001	8317170	750.0	719.9
1	4.761	4.762	-0.001	8301972	750.0	717.9

Average of Peak Amounts = 718.6

2	3.318	3.319	-0.001	28136423	750.0	716.4
2	3.715	3.712	0.003	23589575	750.0	711.0
2	4.175	4.176	-0.001	47384099	750.0	717.1
2	4.321	4.322	-0.001	21054657	750.0	711.8
2	4.851	4.852	-0.001	14563335	750.0	691.9

Average of Peak Amounts = 709.6

RPD = 1.26

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290032.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

1	6.661	6.665	-0.004	46035892	750.0	728.9	
1	7.198	7.202	-0.004	38341756	750.0	718.7	
1	7.531	7.535	-0.004	34157747	750.0	719.9	
1	7.975	7.975	0.000	69084143	750.0	714.4	
1	8.365	8.365	0.000	19726998	750.0	717.0	

Average of Peak Amounts = 719.8

2	6.725	6.726	-0.001	61101092	750.0	715.2	
2	7.328	7.329	-0.001	86881411	750.0	713.3	
2	7.728	7.729	-0.001	83506182	750.0	713.6	
2	8.095	8.096	-0.001	164230890	750.0	713.1	
2	8.601	8.602	-0.001	115507342	750.0	709.0	

Average of Peak Amounts = 712.8

RPD = 0.97

S 8 Polychlorinated biphenyls, Total

1	1438.4
2	1422.5

RPD = 1.11

Reagents:

AR_3262_L7_00018

Amount Added: 0.75

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:51

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290032.D

Injection Date: 30-Jan-2019 01:05:50

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 32

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

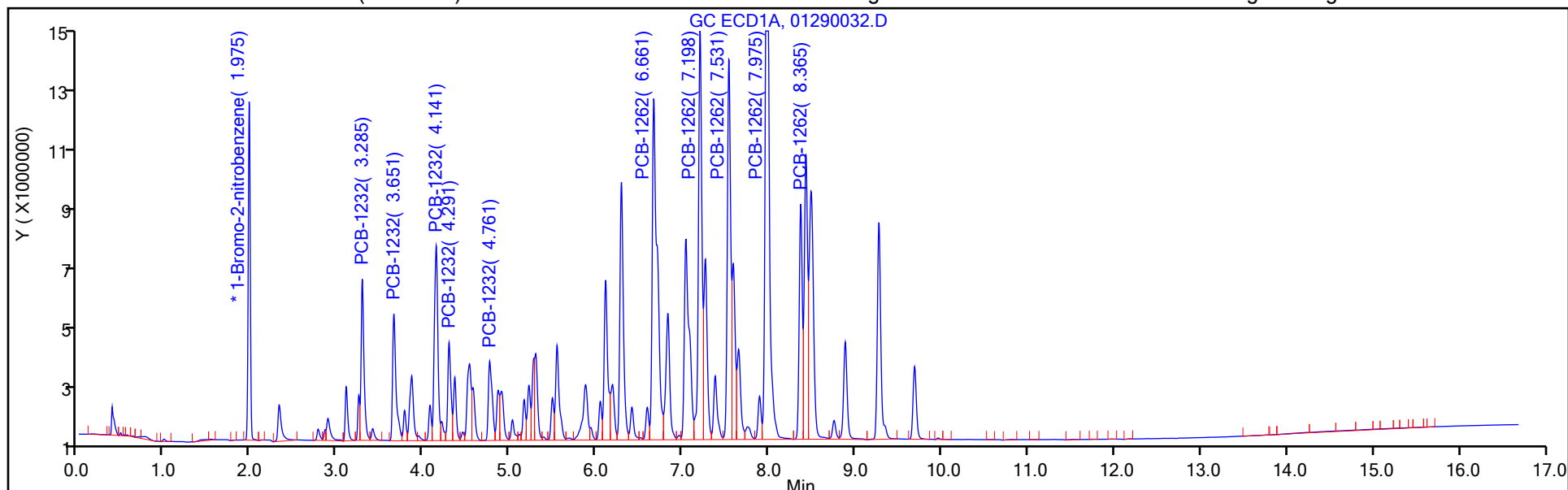
ALS Bottle#: 32

Method: 8082_J

Limit Group: GCSV - 8082 - IS

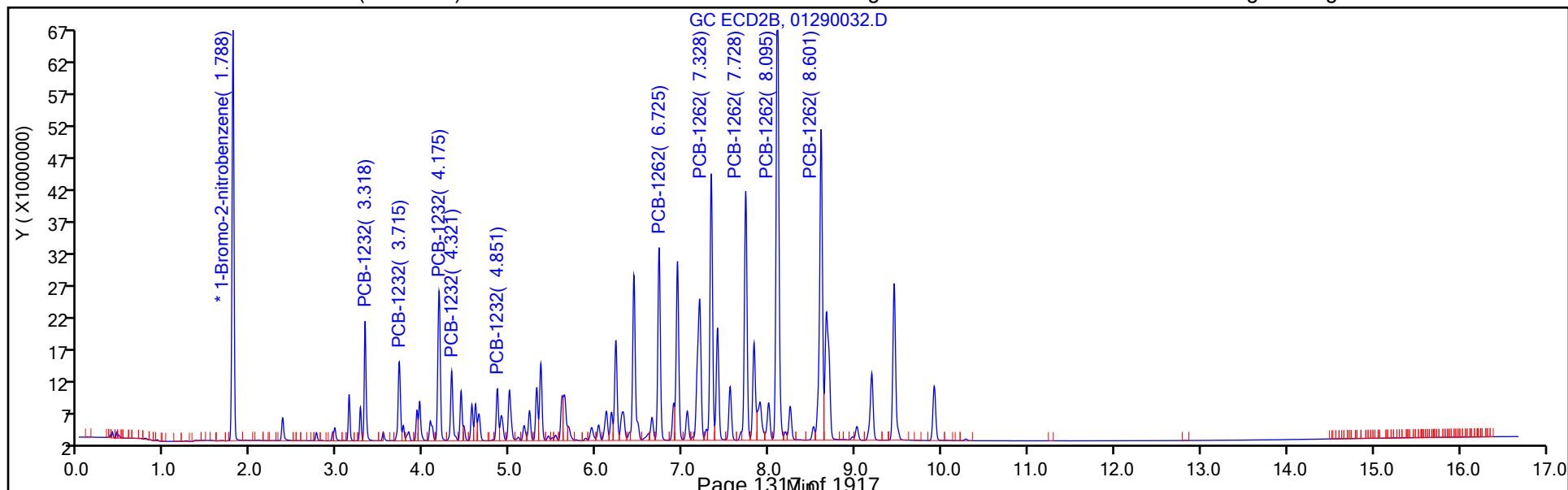
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290033.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 30-Jan-2019 01:26:59 ALS Bottle#: 33 Worklist Smp#: 33
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-033
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub4
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:49 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:39:46

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.977	1.974	0.003	17692445	100.0	100.0	
2	1.787	1.788	-0.001	97032804	100.0	100.0	
						RPD = 0.00	

7 PCB-1232

M

1	3.287	3.285	0.002	16507067	1000.0	992.9	
1	3.653	3.652	0.001	15376163	1000.0	990.8	
1	4.143	4.142	0.001	24725808	1000.0	1015.7	
1	4.290	4.292	-0.002	10885313	1000.0	1005.1	
1	4.763	4.762	0.001	10827109	1000.0	998.2	
Average of Peak Amounts =						1000.5	
2	3.317	3.319	-0.002	36225380	1000.0	987.5	M
2	3.714	3.712	0.002	30469249	1000.0	983.8	M
2	4.174	4.176	-0.002	61574579	1000.0	997.2	M
2	4.320	4.322	-0.002	27250311	1000.0	986.8	M
2	4.850	4.852	-0.002	19038677	1000.0	1060.0	M
Average of Peak Amounts =						1003.1	
						RPD = 0.25	

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290033.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

1	6.663	6.665	-0.002	60805698	1000.0	1020.1	
1	7.200	7.202	-0.002	50241058	1000.0	1004.3	
1	7.533	7.535	-0.002	44863477	1000.0	1007.4	
1	7.973	7.975	-0.002	93284117	1000.0	1025.9	
1	8.367	8.365	0.002	26303379	1000.0	1017.7	

Average of Peak Amounts = 1015.1

2	6.723	6.726	-0.003	80102455	1000.0	1002.8	
2	7.330	7.329	0.001	114854535	1000.0	1007.8	
2	7.727	7.729	-0.002	110434783	1000.0	1008.4	
2	8.097	8.096	0.001	219516811	1000.0	1017.0	
2	8.603	8.602	0.001	155377462	1000.0	1018.8	

Average of Peak Amounts = 1011.0

RPD = 0.41

S 8 Polychlorinated biphenyls, Total

1	2015.6
2	2014.0

RPD = 0.08

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_L7_00018

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:49

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290033.D

Injection Date: 30-Jan-2019 01:26:59

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 33

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

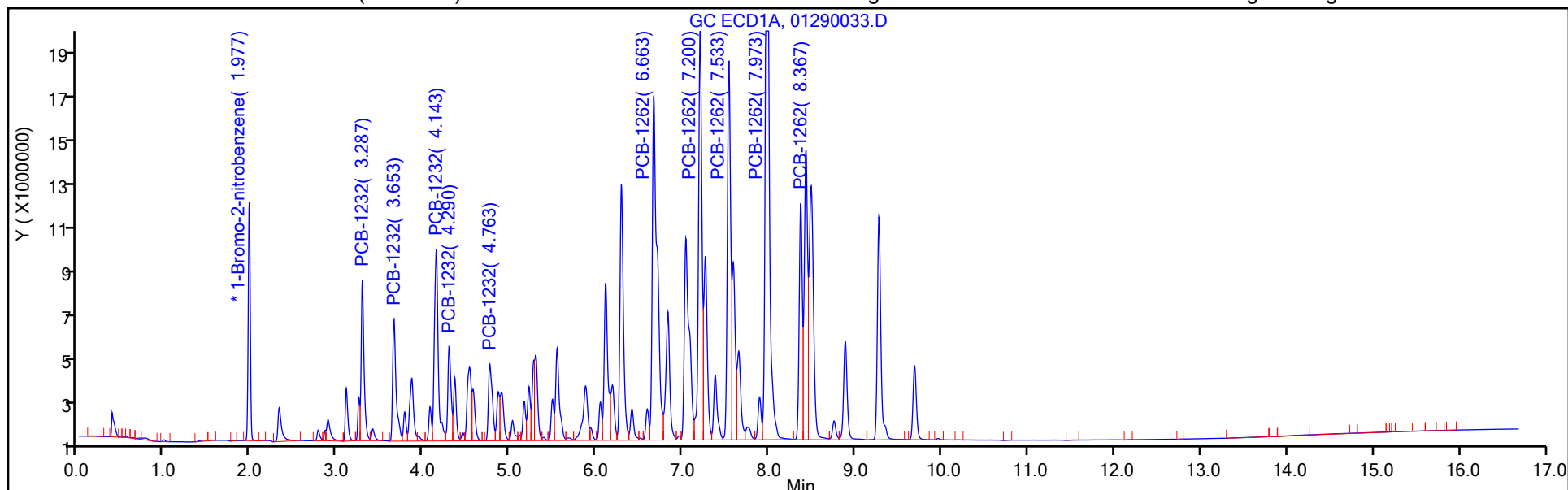
ALS Bottle#: 33

Method: 8082_J

Limit Group: GCSV - 8082 - IS

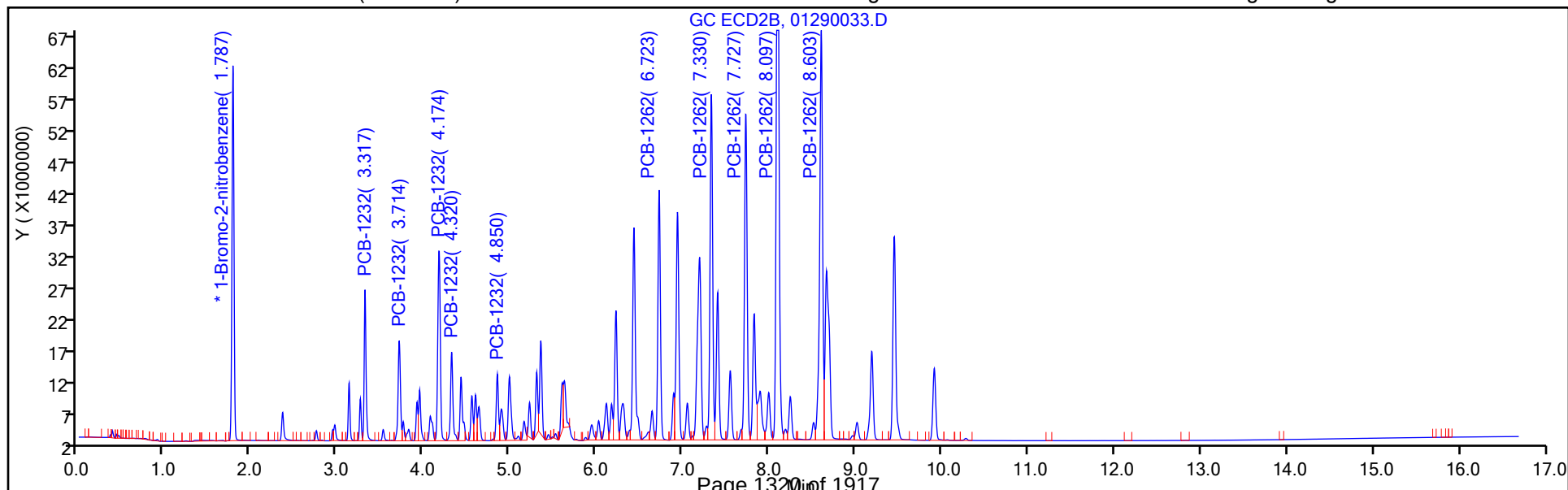
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290033.D

Injection Date: 30-Jan-2019 01:26:59

Instrument ID: SGC_J

Lims ID: STD7

Client ID:

Operator ID: TEM

ALS Bottle#:

33

Worklist Smp#:

33

Injection Vol: 1.0 ul

Dil. Factor:

1.0000

Method: 8082_J

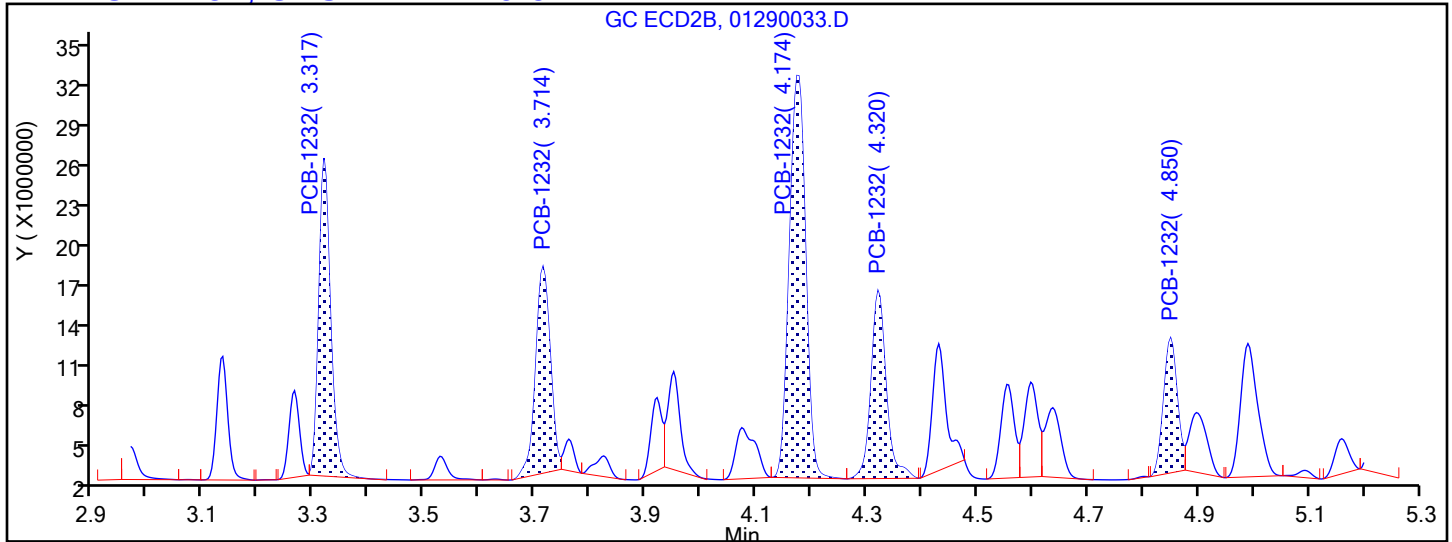
Limit Group:

GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

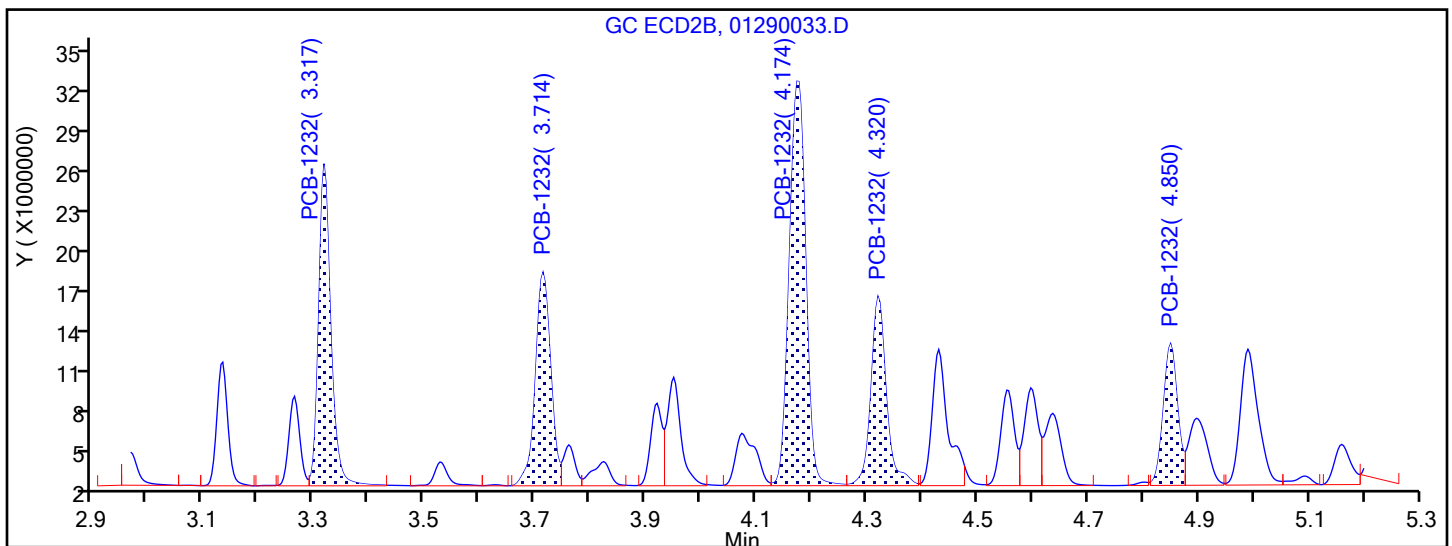
GC ECD2B

7 PCB-1232, CAS: 11141-16-5



Processing Integration Results

3.317	Response = 34624827
3.714	Response = 28283343
4.174	Response = 60427526
4.320	Response = 26427290
4.850	Response = 17283058



Manual Integration Results

3.317	Response = 36225380	M
3.714	Response = 30469249	M
4.174	Response = 61574579	M
4.320	Response = 27250311	M
4.850	Response = 19038677	M

Reviewer: mooret, 30-Jan-2019 14:39:39

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
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FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/30/2019 02:09 Calibration End Date: 01/30/2019 04:15 Calibration ID: 35079

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/35	01290035.D
Level 2	STD2 280-445745/36	01290036.D
Level 3	STD3 280-445745/37	01290037.D
Level 4	STD4 280-445745/38	01290038.D
Level 5	STD5 280-445745/39	01290039.D
Level 6	STD6 280-445745/40	01290040.D
Level 7	STD7 280-445745/41	01290041.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
PCB-1242 Peak 1	0.1996 0.1473	0.1866 0.1463	0.1753	0.1638	0.1519	Lin1	1.8240	0.1469							0.9990		0.9900
PCB-1242 Peak 2	0.2630 0.2655	0.2577 0.2691	0.2622	0.2635	0.2622	Lin1	-0.281	0.2665							1.0000		0.9900
PCB-1242 Peak 3	0.1409 0.1238	0.1352 0.1243	0.1334	0.1317	0.1254	Lin1	0.5729	0.1243							1.0000		0.9900
PCB-1242 Peak 4	0.0894 0.0738	0.0819 0.0729	0.0802	0.0708	0.0653	Lin1	0.4885	0.0709							0.9970		0.9900
PCB-1242 Peak 5	0.1042 0.1022	0.1032 0.1086	0.1032	0.1095	0.1111	Lin1	-0.117	0.1073							0.9990		0.9900
PCB-1268 Peak 1	0.6271 0.5148	0.5774 0.5519	0.5676	0.5378	0.5203	Lin1	2.4104	0.5297							0.9990		0.9900
PCB-1268 Peak 2	0.5962 0.5662	0.5477 0.5835	0.5599	0.5758	0.5739	Lin1	-0.330	0.5756							1.0000		0.9900
PCB-1268 Peak 3	0.4990 0.4338	0.4590 0.4583	0.4572	0.4456	0.4381	Lin1	1.0527	0.4441							0.9990		0.9900
PCB-1268 Peak 4	0.1452 0.1290	0.1395 0.1351	0.1399	0.1404	0.1313	Lin1	0.4294	0.1324							0.9990		0.9900
PCB-1268 Peak 5	1.3516 1.1920	1.2301 1.2582	1.2613	1.2352	1.2114	Lin1	2.2543	1.2233							0.9990		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP1 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/30/2019 02:09 Calibration End Date: 01/30/2019 04:15 Calibration ID: 35079

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/35	01290035.D
Level 2	STD2 280-445745/36	01290036.D
Level 3	STD3 280-445745/37	01290037.D
Level 4	STD4 280-445745/38	01290038.D
Level 5	STD5 280-445745/39	01290039.D
Level 6	STD6 280-445745/40	01290040.D
Level 7	STD7 280-445745/41	01290041.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1242 Peak 1	BNB	Lin1	890684 20436558	1727881 25682595	3097090	7523219	13850439	25.0 750	50.0 1000	100	250	500
PCB-1242 Peak 2	BNB	Lin1	1173772 36820339	2387021 47217057	4630602	12107353	23902080	25.0 750	50.0 1000	100	250	500
PCB-1242 Peak 3	BNB	Lin1	628889 17174944	1252095 21818304	2356728	6049722	11429020	25.0 750	50.0 1000	100	250	500
PCB-1242 Peak 4	BNB	Lin1	398786 10241882	758673 12792205	1416318	3252568	5955544	25.0 750	50.0 1000	100	250	500
PCB-1242 Peak 5	BNB	Lin1	465060 14178945	955844 19049422	1822769	5028906	10127961	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 1	BNB	Lin1	2798591 71398443	5347927 96858701	10025616	24707685	47439190	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 2	BNB	Lin1	2660297 78534053	5072699 102396601	9889169	26453565	52328366	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 3	BNB	Lin1	2226742 60169301	4250708 80428947	8075356	20470625	39942164	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 4	BNB	Lin1	648010 17887994	1291998 23705193	2471735	6447955	11970820	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 5	BNB	Lin1	6031607 165330861	11392218 220805131	22278589	56746001	110452712	25.0 750	50.0 1000	100	250	500

Curve Type Legend:

Lin1 = Linear 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290035.D
 Lims ID: STD1 4268
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 30-Jan-2019 02:09:04 ALS Bottle#: 35 Worklist Smp#: 35
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 4268
 Misc. Info.: 280-0078470-035
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:45 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:49:43

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.974	0.004	17849726	100.0	100.0	
2	1.789	1.788	0.001	98372823	100.0	100.0	
RPD = 0.00							

10 PCB-1242

1	3.652	3.651	0.001	890684	25.0	21.6	M
1	4.142	4.141	0.001	1173772	25.0	25.7	M
1	4.762	4.761	0.001	628889	25.0	23.7	M
1	5.272	5.274	-0.002	398786	25.0	24.6	M
1	5.295	5.294	0.001	465060	25.0	25.4	M
Average of Peak Amounts =						24.2	
2	3.712	3.715	-0.003	2053069	25.0	23.7	
2	4.175	4.175	0.000	4226320	25.0	23.1	
2	4.322	4.321	0.001	1908586	25.0	23.7	
2	4.849	4.851	-0.002	1763198	25.0	22.2	
2	4.989	4.991	-0.002	1918680	25.0	23.5	
Average of Peak Amounts =						23.3	
RPD = 4.03							

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290035.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.425	8.428	-0.003	2798591	25.0	25.0	
1	8.475	8.478	-0.003	2660297	25.0	26.5	
1	8.752	8.754	-0.002	2226742	25.0	25.7	
1	8.872	8.874	-0.002	648010	25.0	24.2	
1	9.685	9.684	0.001	6031607	25.0	25.8	

Average of Peak Amounts = 25.4

2	8.599	8.601	-0.002	8321833	25.0	25.2	
2	8.662	8.661	0.001	7880092	25.0	24.5	
2	9.015	9.018	-0.003	6612801	25.0	25.0	
2	9.159	9.158	0.001	2270836	25.0	21.5	
2	9.912	9.911	0.001	17846924	25.0	26.1	

Average of Peak Amounts = 24.5

RPD = 3.96

S 8 Polychlorinated biphenyls, Total

1	49.6	
2	47.7	

RPD = 3.99

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_4268_L7_00017

Amount Added: 0.03

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:45

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290035.D

Injection Date: 30-Jan-2019 02:09:04

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD1 4268

Worklist Smp#: 35

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

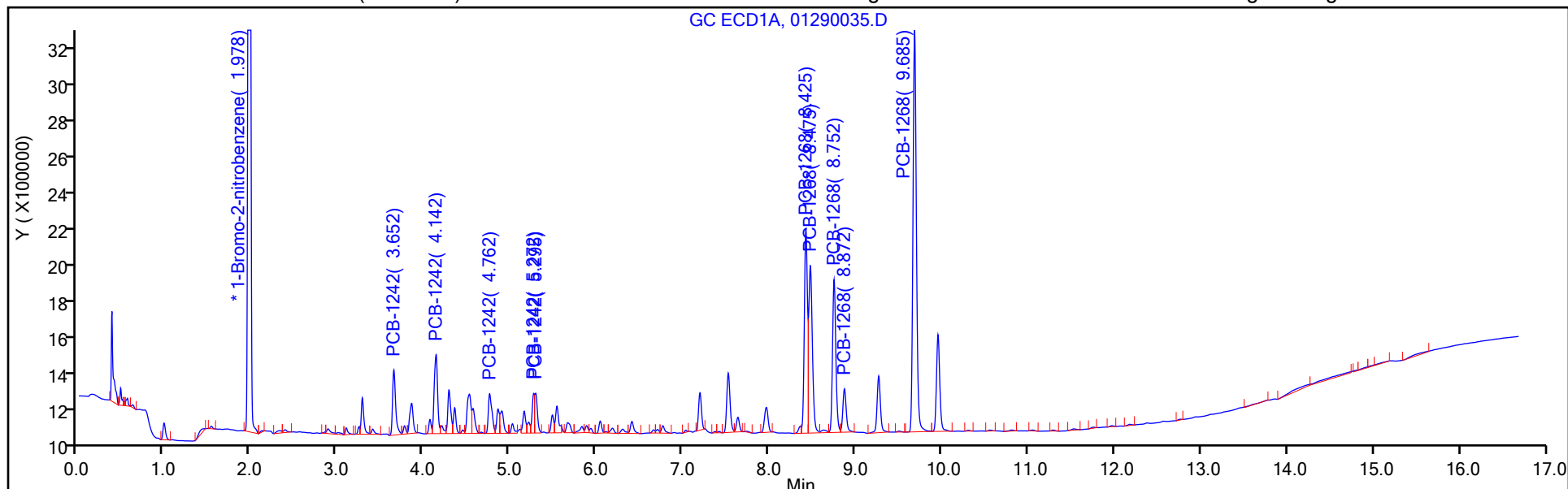
ALS Bottle#: 35

Method: 8082_J

Limit Group: GCSV - 8082 - IS

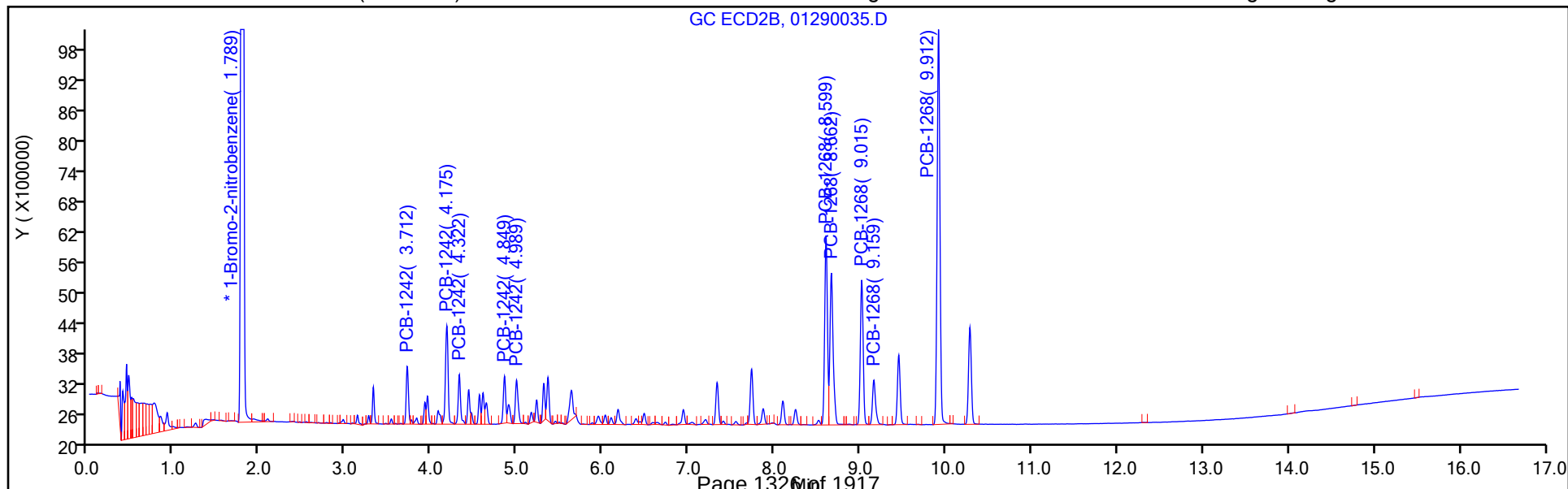
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290035.D

Injection Date: 30-Jan-2019 02:09:04

Instrument ID: SGC_J

Lims ID: STD1 4268

Client ID:

Operator ID: TEM

ALS Bottle#:

35

Worklist Smp#:

35

Injection Vol: 1.0 ul

Dil. Factor:

1.0000

Method: 8082_J

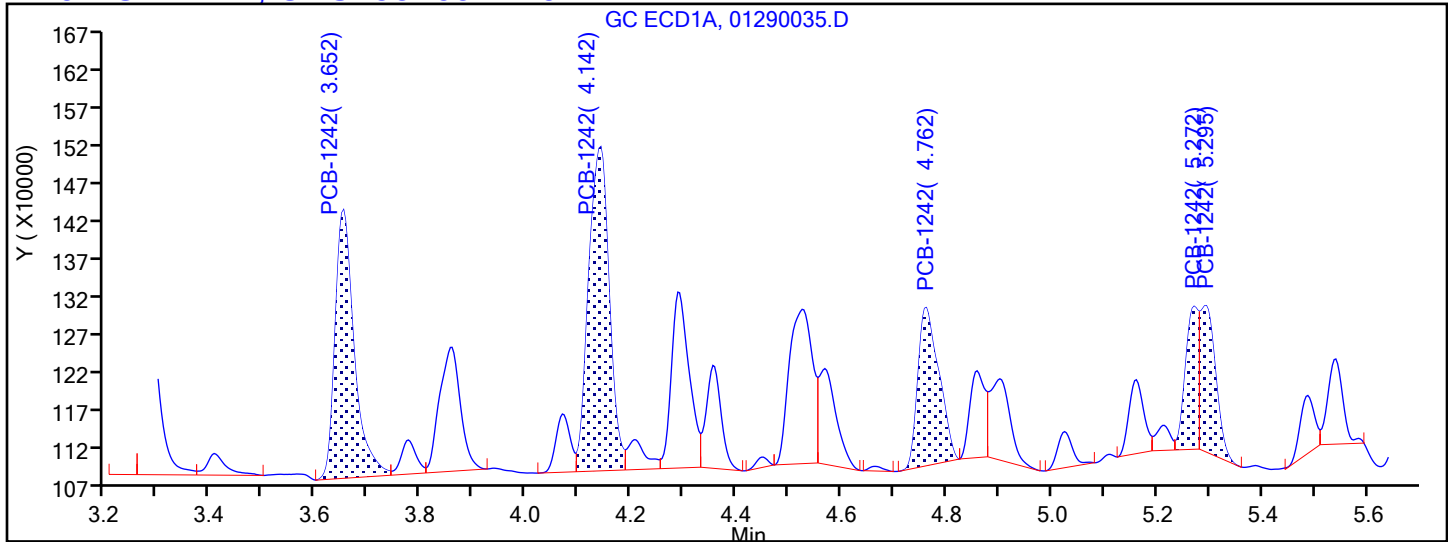
Limit Group:

GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm)

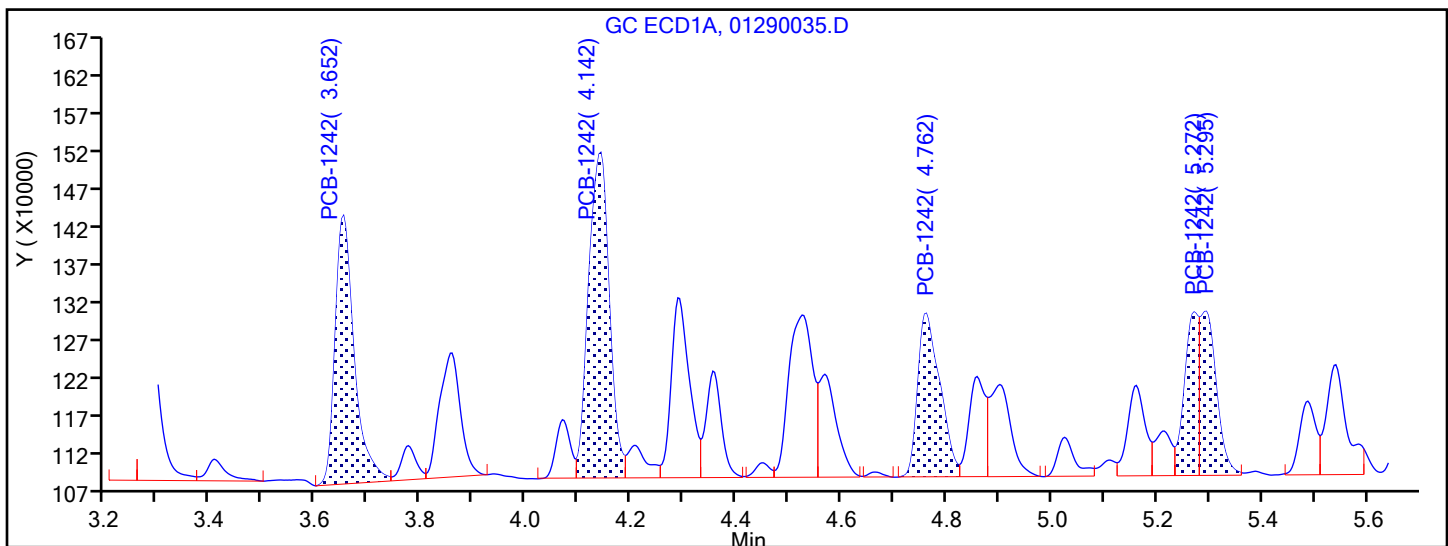
Detector

GC ECD1A

10 PCB-1242, CAS: 53469-21-9

Processing Integration Results

3.652	Response = 890684
4.142	Response = 1163183
4.762	Response = 574888
5.272	Response = 323774
5.295	Response = 392853



Manual Integration Results

3.652	Response = 890684	
4.142	Response = 1173772	M
4.762	Response = 628889	M
5.272	Response = 398786	M
5.295	Response = 465060	M

Reviewer: mooret, 30-Jan-2019 14:49:39

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
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TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290036.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 30-Jan-2019 02:30:14 ALS Bottle#: 36 Worklist Smp#: 36
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-036
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:43 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.974	0.001	18523014	100.0	100.0
2	1.788	1.788	0.000	101851657	100.0	100.0

RPD = 0.00

10 PCB-1242

1	3.651	3.651	0.000	1727881	50.0	51.1
1	4.141	4.141	0.000	2387021	50.0	49.4
1	4.761	4.761	0.000	1252095	50.0	49.8
1	5.271	5.274	-0.003	758673	50.0	50.9
1	5.295	5.294	0.001	955844	50.0	49.2

Average of Peak Amounts = 50.1

2	3.712	3.715	-0.003	3764385	50.0	52.7
2	4.175	4.175	0.000	7598379	50.0	50.3
2	4.322	4.321	0.001	3480963	50.0	52.6
2	4.848	4.851	-0.003	3145414	50.0	52.6
2	4.988	4.991	-0.003	3461851	50.0	53.3

Average of Peak Amounts = 52.3

RPD = 4.35

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290036.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.425	8.428	-0.003	5347927	50.0	50.0	
1	8.478	8.478	0.000	5072699	50.0	48.2	
1	8.751	8.754	-0.003	4250708	50.0	49.3	
1	8.871	8.874	-0.003	1291998	50.0	49.4	
1	9.685	9.684	0.001	11392218	50.0	48.4	

Average of Peak Amounts = 49.1

2	8.598	8.601	-0.003	14853251	50.0	49.1	
2	8.662	8.661	0.001	13908255	50.0	48.7	
2	9.015	9.018	-0.003	11807955	50.0	49.1	
2	9.158	9.158	0.000	4168802	50.0	50.6	
2	9.912	9.911	0.001	32446855	50.0	48.7	

Average of Peak Amounts = 49.2

RPD = 0.34

S 8 Polychlorinated biphenyls, Total

1	99.1	
2	101.5	

RPD = 2.39

Reagents:

AR_4268_L7_00017

Amount Added: 0.05

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290036.D

Injection Date: 30-Jan-2019 02:30:14

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 36

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

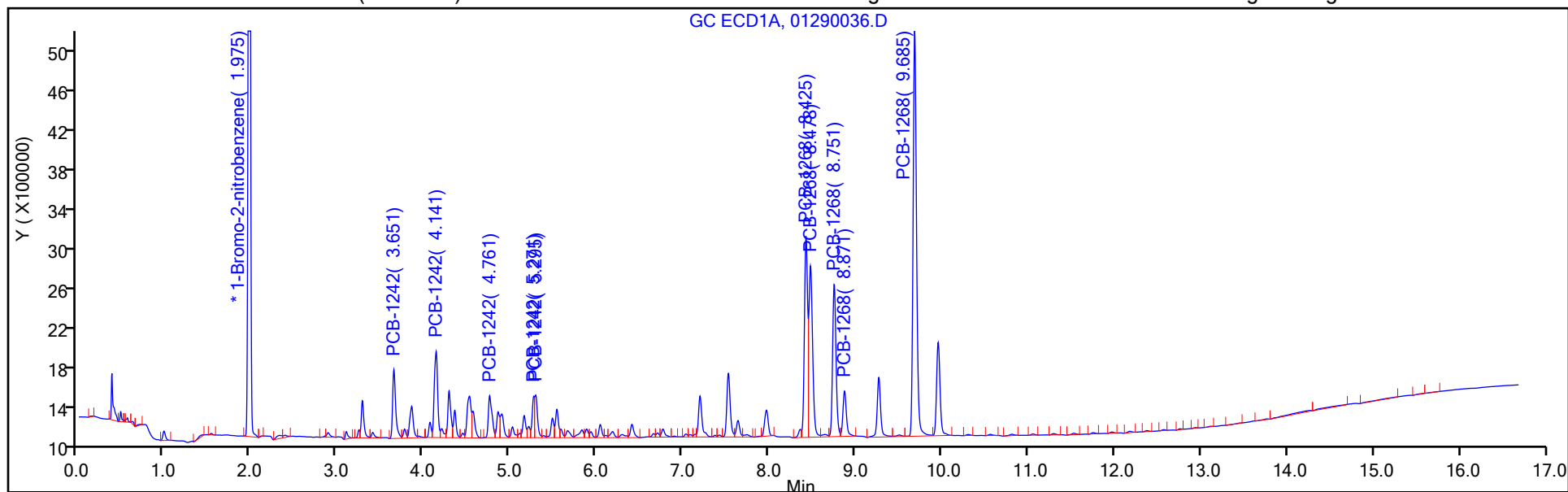
ALS Bottle#: 36

Method: 8082_J

Limit Group: GCSV - 8082 - IS

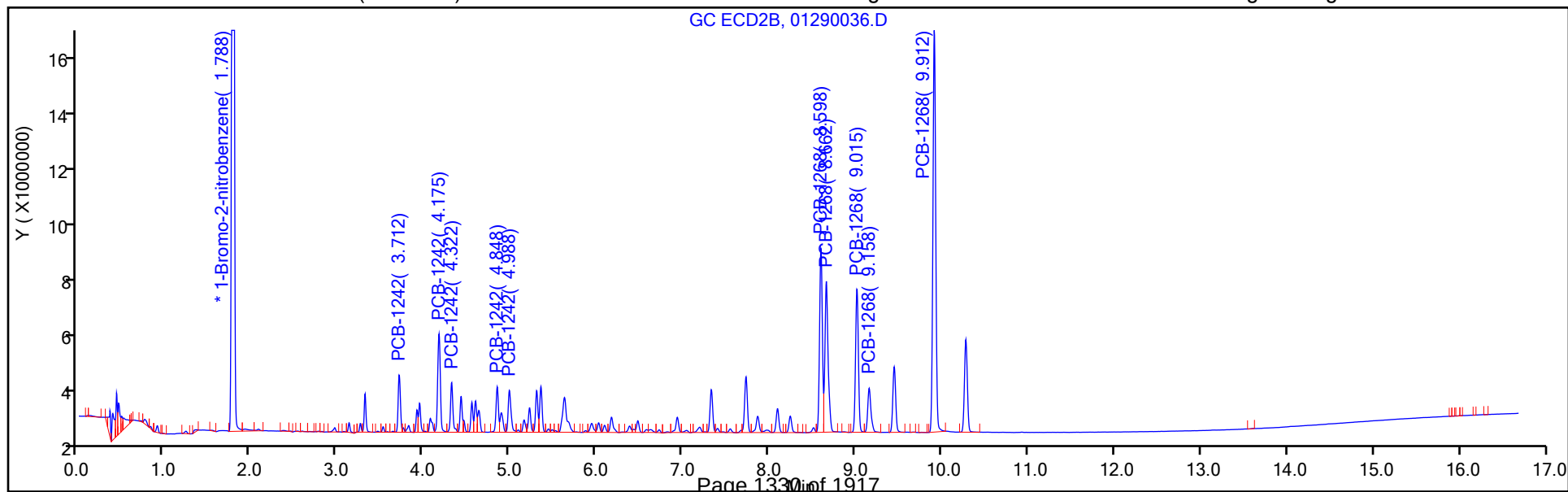
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290037.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 30-Jan-2019 02:51:17 ALS Bottle#: 37 Worklist Smp#: 37
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-037
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:41 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:50:09

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.974	1.974	0.000	17663648	100.0	100.0
2	1.788	1.788	0.000	96450940	100.0	100.0

RPD = 0.00

10 PCB-1242

M

1	3.651	3.651	0.000	3097090	100.0	107.0	
1	4.141	4.141	0.000	4630602	100.0	99.4	M
1	4.761	4.761	0.000	2356728	100.0	102.8	M
1	5.274	5.274	0.000	1416318	100.0	106.3	M
1	5.294	5.294	0.000	1822769	100.0	97.3	M

Average of Peak Amounts = 102.5

2	3.715	3.715	0.000	6646160	100.0	110.3	
2	4.175	4.175	0.000	13380929	100.0	105.5	
2	4.321	4.321	0.000	6186577	100.0	111.0	
2	4.851	4.851	0.000	5210508	100.0	107.6	
2	4.991	4.991	0.000	5992567	100.0	111.3	

Average of Peak Amounts = 109.2

RPD = 6.25

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290037.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.428	8.428	0.000	10025616	100.0	102.6	
1	8.478	8.478	0.000	9889169	100.0	97.8	
1	8.754	8.754	0.000	8075356	100.0	100.6	
1	8.874	8.874	0.000	2471735	100.0	102.5	
1	9.684	9.684	0.000	22278589	100.0	101.3	

Average of Peak Amounts = 100.9

2	8.601	8.601	0.000	27302807	100.0	102.6	
2	8.661	8.661	0.000	25792195	100.0	104.8	
2	9.018	9.018	0.000	21737104	100.0	103.2	
2	9.158	9.158	0.000	7519864	100.0	111.0	
2	9.911	9.911	0.000	60590316	100.0	99.6	

Average of Peak Amounts = 104.3

RPD = 3.23

S 8 Polychlorinated biphenyls, Total

1	203.5	
2	213.4	

RPD = 4.77

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_4268_L7_00017

Amount Added: 0.10

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC J\20190128-78470.b\01290037.D

Injection Date: 30-Jan-2019 02:51:17

Instrument ID: SGC J

Operator ID: TEM

Lims ID: STD3

Worklist Smp#: 37

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

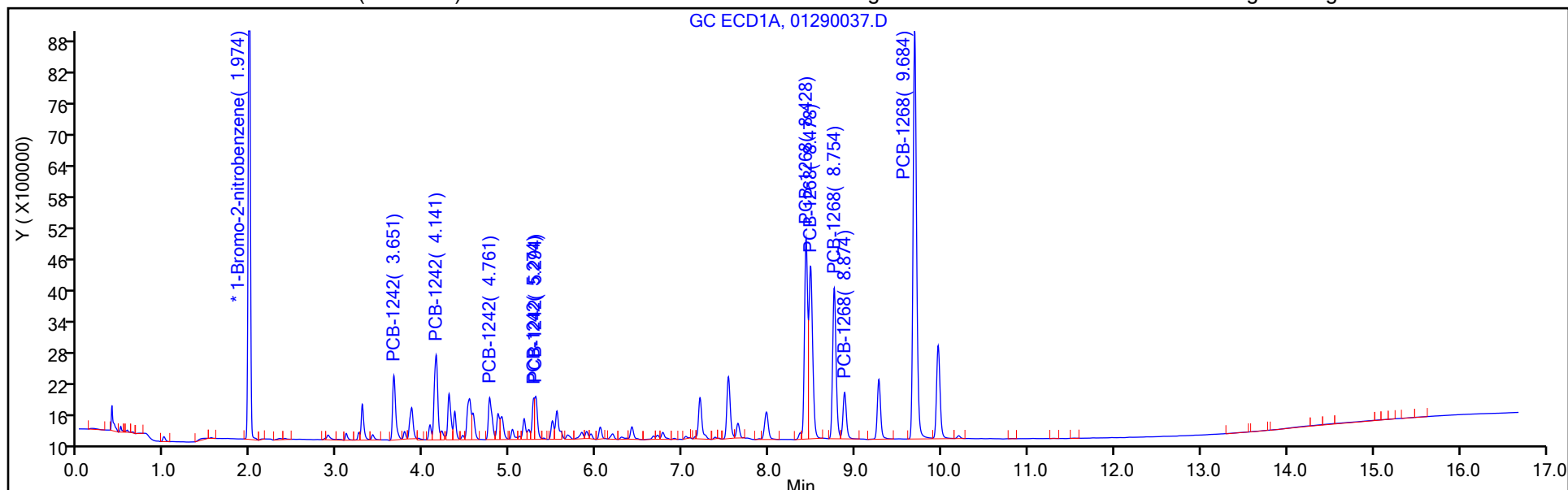
ALS Bottle#: 37

Method: 8082 J

Limit Group: GCSV - 8082 - IS

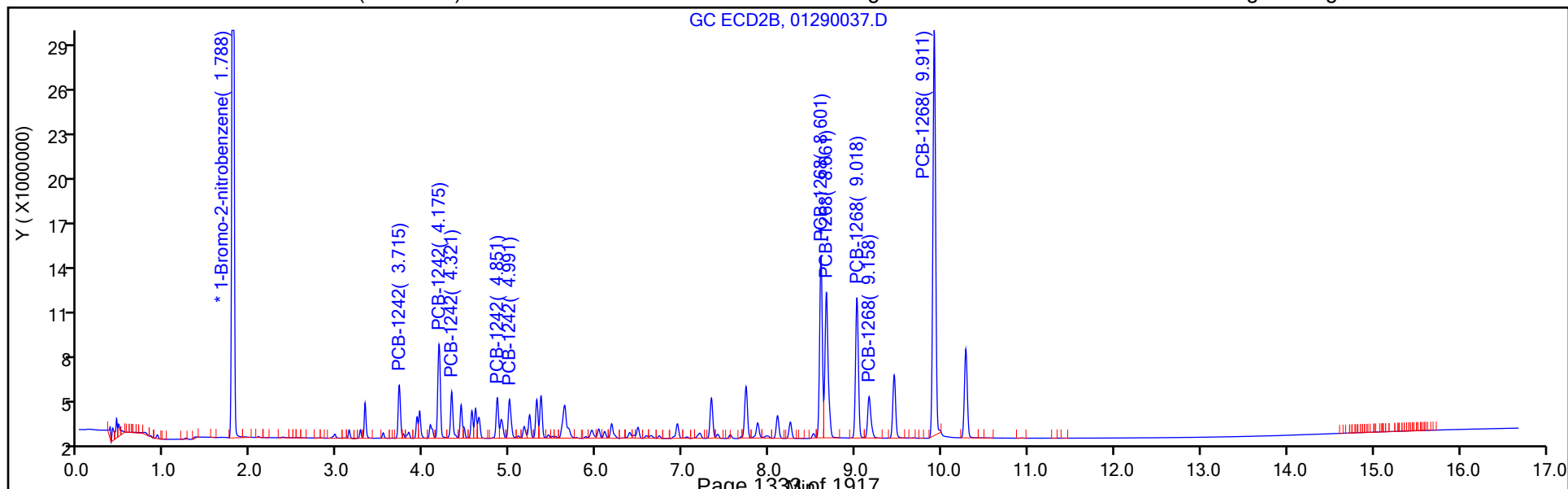
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290037.D

Injection Date: 30-Jan-2019 02:51:17

Instrument ID: SGC_J

Lims ID: STD3

Client ID:

Operator ID: TEM

ALS Bottle#: 37

Worklist Smp#: 37

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

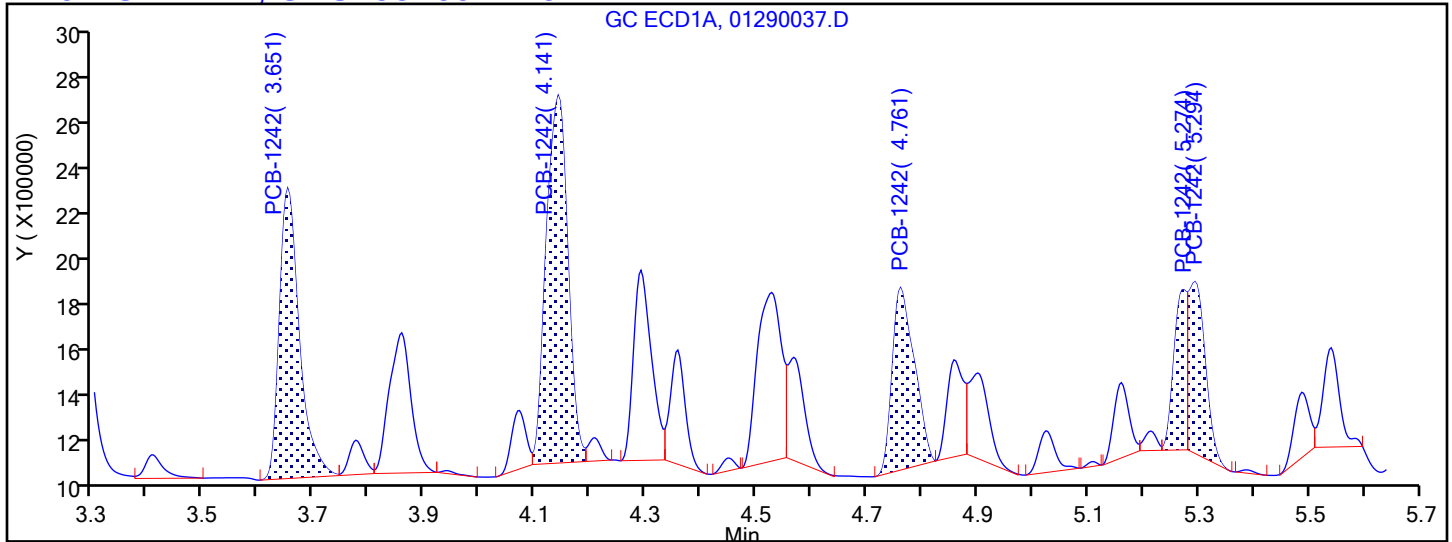
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

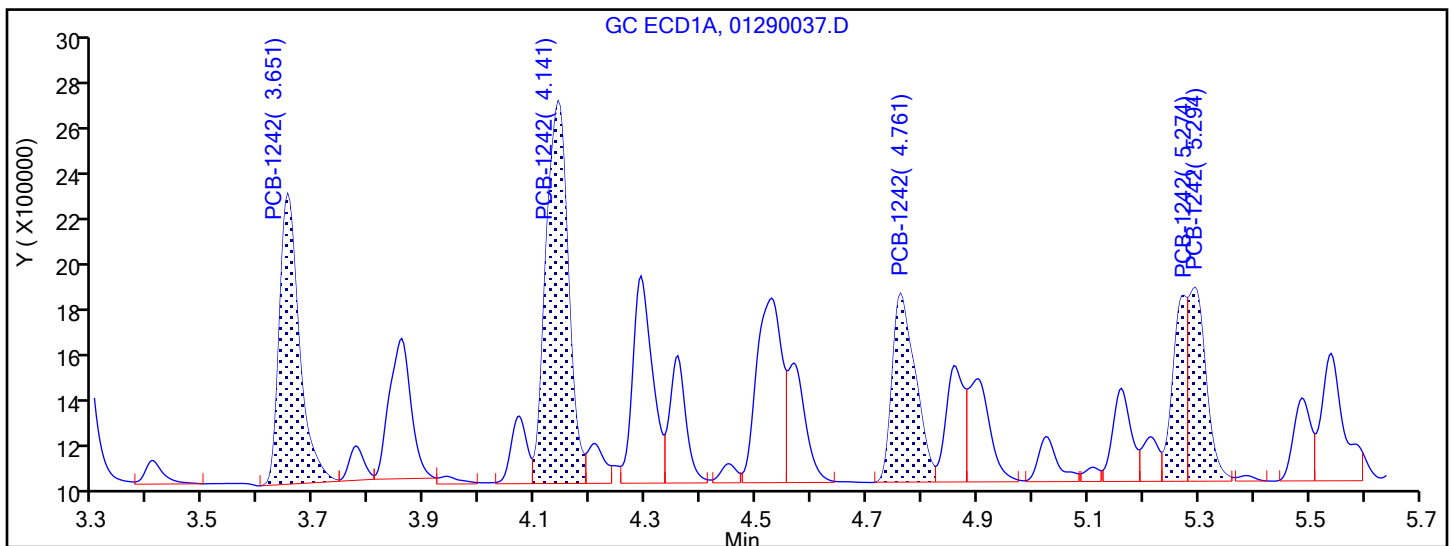
GC ECD1A

10 PCB-1242, CAS: 53469-21-9



Processing Integration Results

3.651	Response = 3097090
4.141	Response = 4263931
4.761	Response = 2144331
5.274	Response = 1110895
5.294	Response = 1522870



Manual Integration Results

3.651	Response = 3097090	
4.141	Response = 4630602	M
4.761	Response = 2356728	M
5.274	Response = 1416318	M
5.294	Response = 1822769	M

Reviewer: mooret, 30-Jan-2019 14:50:04

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
Page 1334 of 1917

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290038.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 30-Jan-2019 03:12:20 ALS Bottle#: 38 Worklist Smp#: 38
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-038
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:40 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:54:39

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.975	0.001	18375903	100.0	100.0	
2	1.789	1.789	0.000	100433048	100.0	100.0	
RPD = 0.00							

10 PCB-1242

M

1	3.653	3.652	0.001	7523219	250.0	266.4	
1	4.143	4.142	0.001	12107353	250.0	248.3	
1	4.763	4.762	0.001	6049722	250.0	260.3	
1	5.276	5.279	-0.003	3252568	250.0	242.9	
1	5.296	5.295	0.001	5028906	250.0	256.1	
Average of Peak Amounts =						254.8	
2	3.713	3.712	0.001	15218217	250.0	259.4	M
2	4.176	4.175	0.001	31390564	250.0	255.0	
2	4.319	4.322	-0.003	13736592	250.0	252.7	
2	4.849	4.849	0.000	11327610	250.0	252.5	M
2	4.989	4.989	0.000	13455405	250.0	259.4	M
Average of Peak Amounts =						255.8	

RPD = 0.39

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290038.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.426	8.425	0.001	24707685	250.0	249.3	
1	8.479	8.479	0.000	26453565	250.0	250.7	
1	8.753	8.752	0.001	20470625	250.0	248.5	
1	8.873	8.875	-0.002	6447955	250.0	261.8	
1	9.686	9.685	0.001	56746001	250.0	250.6	

Average of Peak Amounts = 252.2

2	8.599	8.599	0.000	66072977	250.0	248.8	
2	8.659	8.662	-0.003	61884354	250.0	254.4	
2	9.016	9.015	0.001	52553311	250.0	250.6	
2	9.156	9.159	-0.003	17181511	250.0	262.9	
2	9.913	9.912	0.001	155849809	250.0	251.7	

Average of Peak Amounts = 253.7

RPD = 0.60

S 8 Polychlorinated biphenyls, Total

1	507.0	
2	509.5	

RPD = 0.49

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_4268_L7_00017

Amount Added: 0.25

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:40

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290038.D

Injection Date: 30-Jan-2019 03:12:20

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 38

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

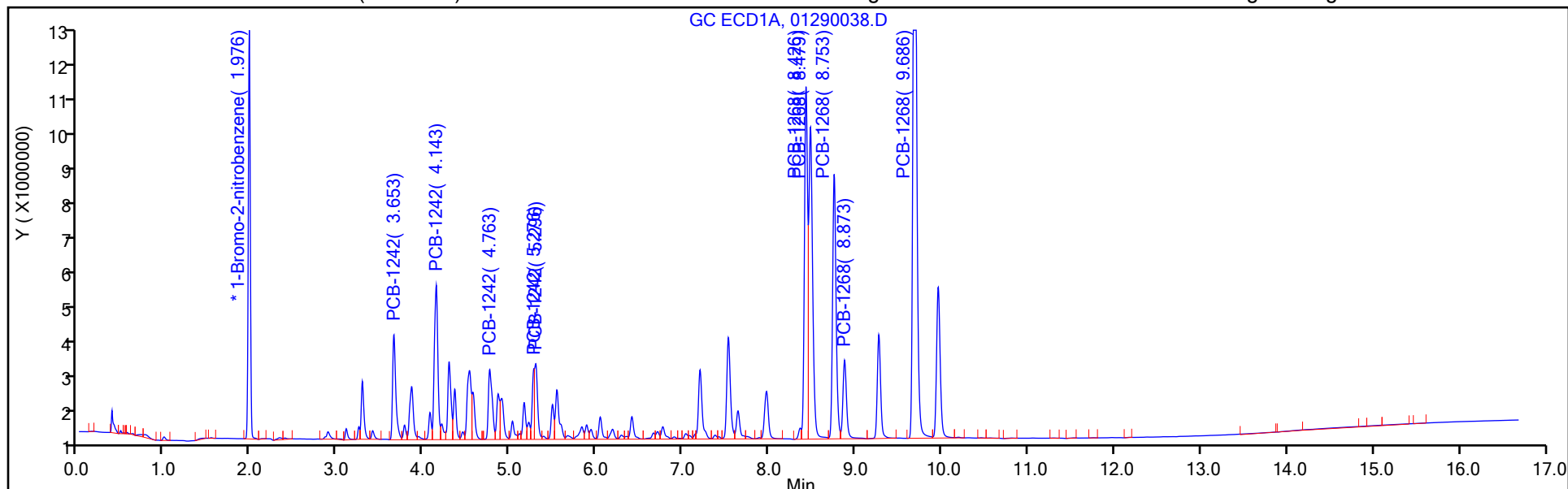
ALS Bottle#: 38

Method: 8082_J

Limit Group: GCSV - 8082 - IS

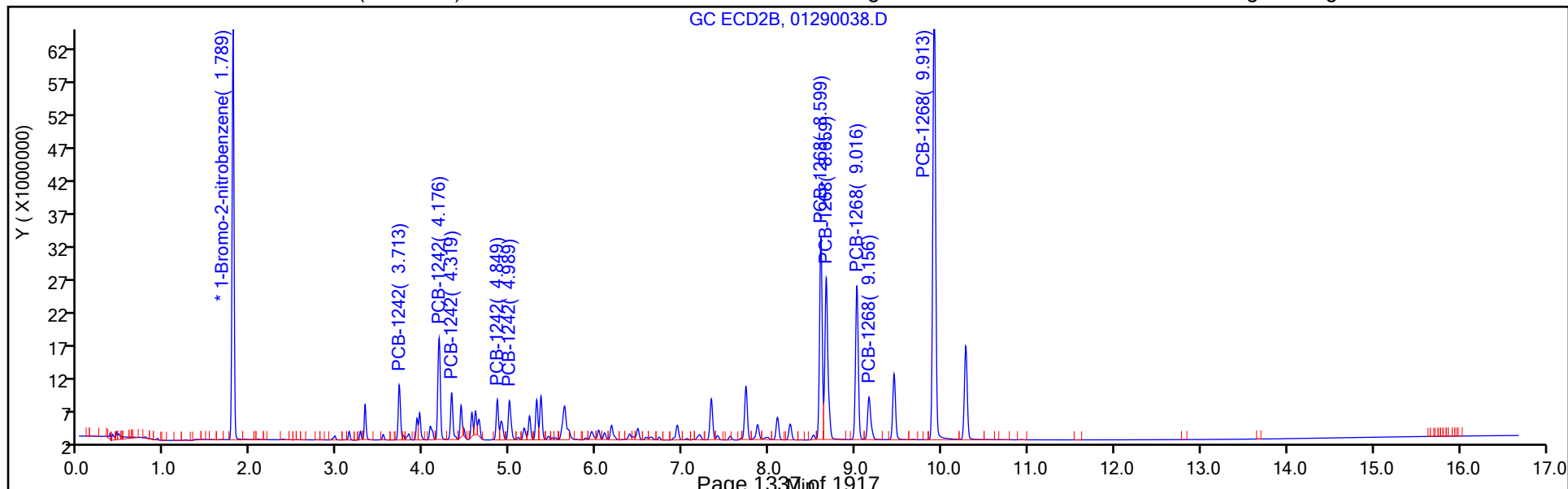
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290039.D
 Lims ID: STD5
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 30-Jan-2019 03:33:28 ALS Bottle#: 39 Worklist Smp#: 39
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-039
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:38 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:50:59

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.975	0.000	18234826	100.0	100.0	
2	1.789	1.789	0.000	99488732	100.0	100.0	

RPD = 0.00

10 PCB-1242

Ma

1	3.652	3.652	0.000	13850439	500.0	504.8	
1	4.142	4.142	0.000	23902080	500.0	493.0	
1	4.762	4.762	0.000	11429020	500.0	499.8	
1	5.279	5.279	0.000	5955544	500.0	454.0	M
1	5.295	5.295	0.000	10127961	500.0	518.7	M

Average of Peak Amounts = 494.0

2	3.712	3.712	0.000	27633355	500.0	487.0	
2	4.175	4.175	0.000	59948090	500.0	504.6	
2	4.322	4.322	0.000	25800424	500.0	491.8	
2	4.849	4.849	0.000	19982771	500.0	486.0	
2	4.989	4.989	0.000	24466187	500.0	490.0	

Average of Peak Amounts = 491.9

RPD = 0.44

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290039.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.425	8.425	0.000	47439190	500.0	486.6	
1	8.479	8.479	0.000	52328366	500.0	499.2	
1	8.752	8.752	0.000	39942164	500.0	490.9	
1	8.875	8.875	0.000	11970820	500.0	492.6	
1	9.685	9.685	0.000	110452712	500.0	493.3	

Average of Peak Amounts = 492.5

2	8.599	8.599	0.000	128201924	500.0	494.8	
2	8.662	8.662	0.000	117548669	500.0	496.9	
2	9.015	9.015	0.000	101311192	500.0	495.4	
2	9.159	9.159	0.000	31603183	500.0	502.0	
2	9.912	9.912	0.000	298576048	500.0	490.3	

Average of Peak Amounts = 495.9

RPD = 0.68

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

Reagents:

AR_4268_L7_00017

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:38

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290039.D

Injection Date: 30-Jan-2019 03:33:28

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 39

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

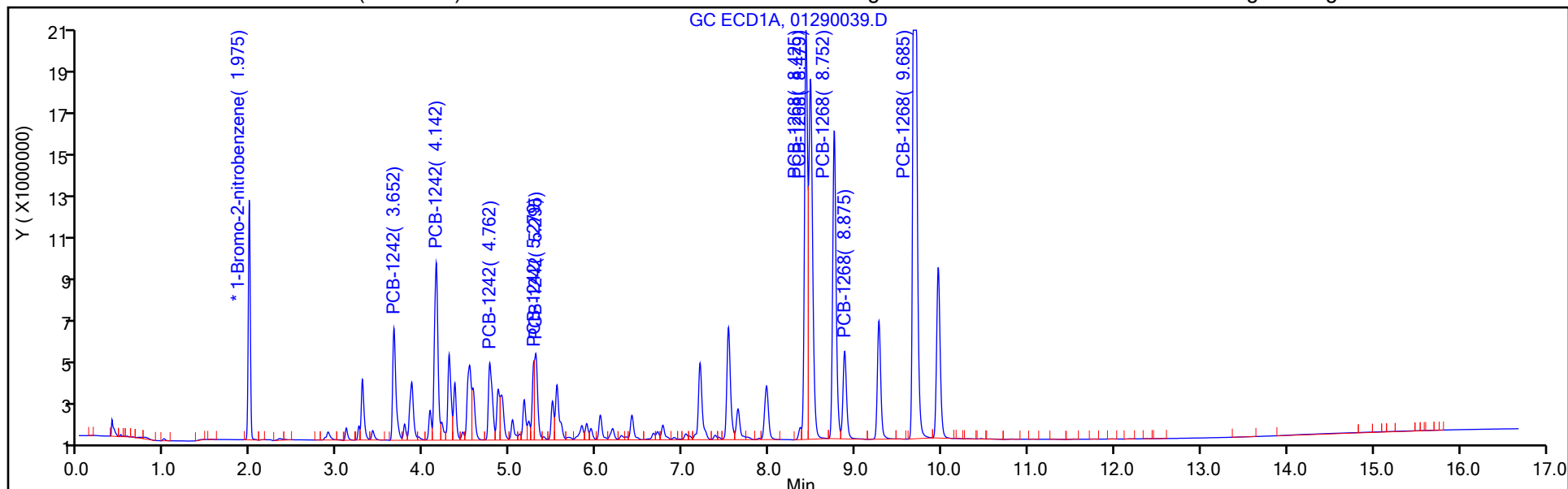
ALS Bottle#: 39

Method: 8082_J

Limit Group: GCSV - 8082 - IS

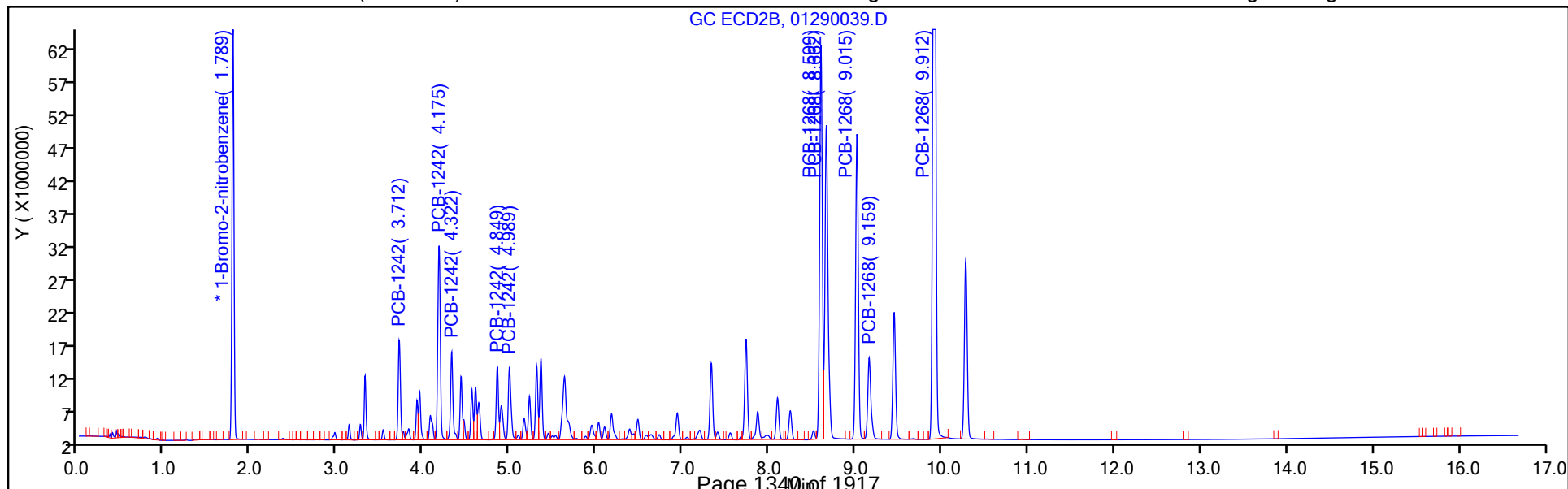
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290039.D

Injection Date: 30-Jan-2019 03:33:28

Instrument ID: SGC_J

Lims ID: STD5

Client ID:

Operator ID: TEM

ALS Bottle#: 39

Worklist Smp#: 39

Injection Vol: 1.0 ul

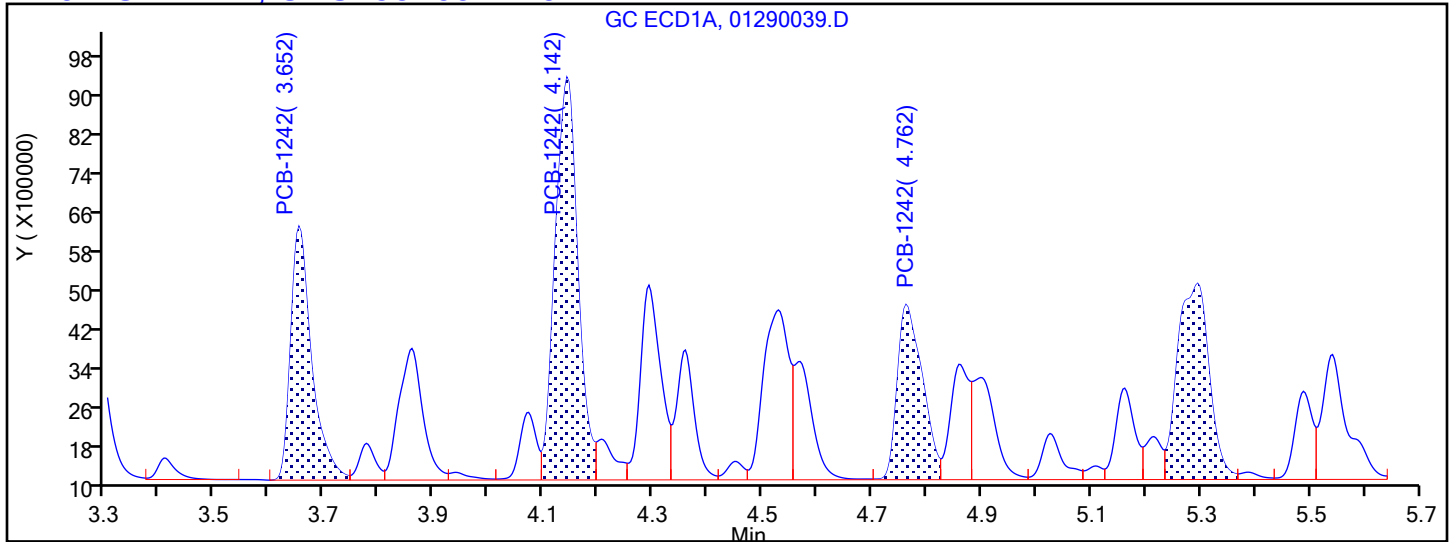
Dil. Factor: 1.0000

Method: 8082_J

Limit Group: GCSV - 8082 - IS

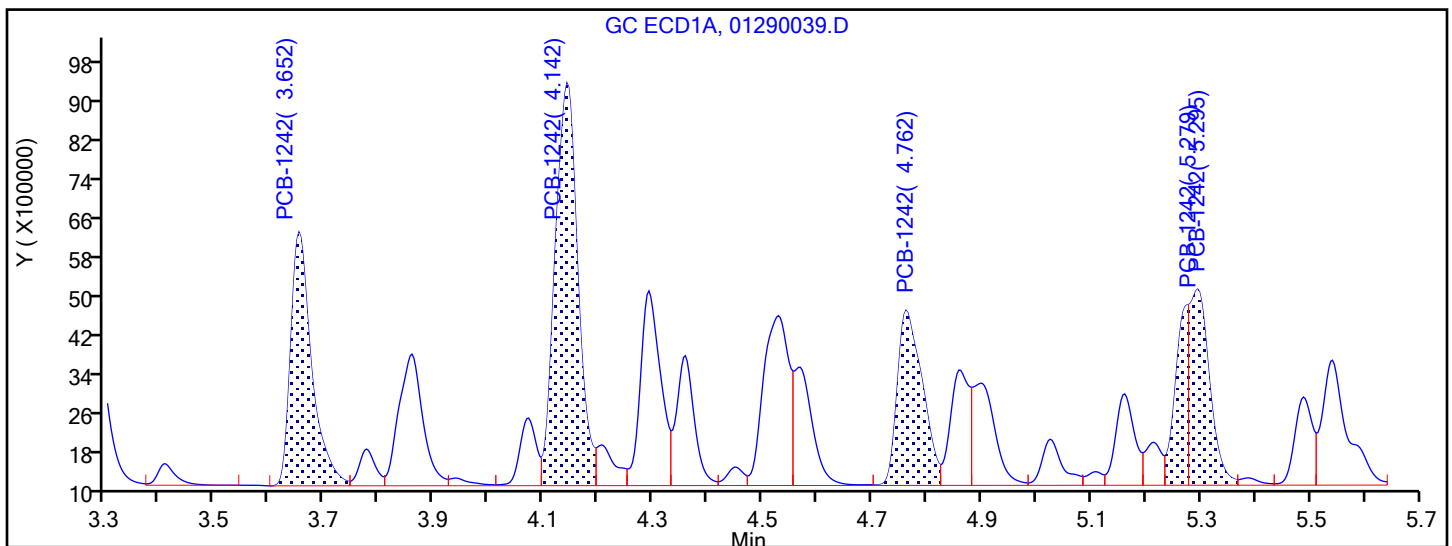
Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

GC ECD1A

10 PCB-1242, CAS: 53469-21-9

Processing Integration Results

3.652	Response = 13850439
4.142	Response = 23902080
4.762	Response = 11429020
5.294	Response = 0
5.295	Response = 16083555



Manual Integration Results

3.652	Response = 13850439	
4.142	Response = 23902080	
4.762	Response = 11429020	
5.279	Response = 5955544	M
5.295	Response = 10127961	M

Reviewer: mooret, 30-Jan-2019 14:50:45

Audit Action: Manually Integrated/Assigned Compound ID Audit Reason: Split Peak

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290040.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 30-Jan-2019 03:54:30 ALS Bottle#: 40 Worklist Smp#: 40
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-040
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:37 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:52:11

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.975	0.001	18493251	100.0	100.0	
2	1.789	1.789	0.000	100896616	100.0	100.0	

RPD = 0.00

10 PCB-1242

Ma

1	3.653	3.652	0.001	20436558	750.0	740.1	
1	4.143	4.142	0.001	36820339	750.0	748.3	
1	4.763	4.762	0.001	17174944	750.0	742.7	
1	5.283	5.279	0.004	10241882	750.0	774.6	M
1	5.296	5.295	0.001	14178945	750.0	715.6	M

Average of Peak Amounts =

744.3

2	3.713	3.712	0.001	40471357	750.0	709.5	
2	4.176	4.175	0.001	89341350	750.0	748.0	
2	4.323	4.322	0.001	37797912	750.0	716.7	
2	4.849	4.849	0.000	28913314	750.0	737.7	
2	4.989	4.989	0.000	35516837	750.0	708.6	

Average of Peak Amounts =

724.1

RPD = 2.75

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290040.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

13 PCB-1268

1	8.426	8.425	0.001	71398443	750.0	724.3	
1	8.479	8.479	0.000	78534053	750.0	738.4	
1	8.753	8.752	0.001	60169301	750.0	730.3	
1	8.873	8.875	-0.002	17887994	750.0	727.4	
1	9.686	9.685	0.001	165330861	750.0	729.0	

Average of Peak Amounts =

729.9

2	8.599	8.599	0.000	190574103	750.0	728.9	
2	8.663	8.662	0.001	173302179	750.0	726.9	
2	9.016	9.015	0.001	149272844	750.0	723.5	
2	9.159	9.159	0.000	44905318	750.0	709.9	
2	9.913	9.912	0.001	445890342	750.0	723.7	

Average of Peak Amounts =

722.6

RPD = 1.00

S 8 Polychlorinated biphenyls, Total

1	1474.1
2	1446.7

RPD = 1.88

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

Reagents:

AR_4268_L7_00017

Amount Added: 0.75

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:37

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290040.D

Injection Date: 30-Jan-2019 03:54:30

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 40

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

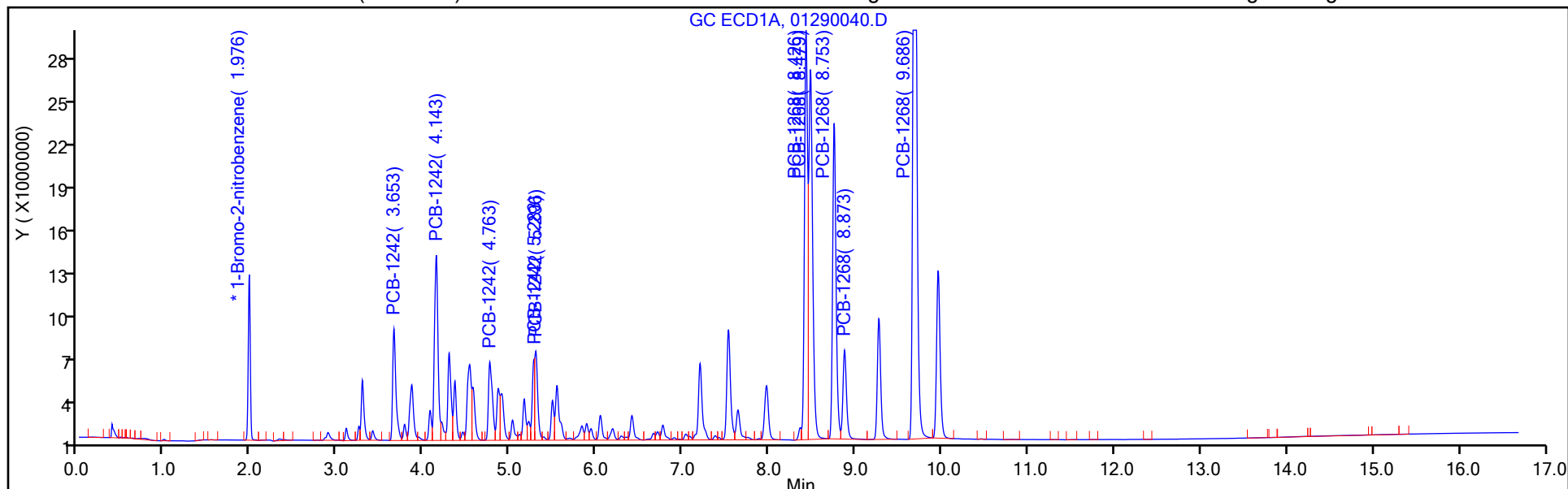
ALS Bottle#: 40

Method: 8082_J

Limit Group: GCSV - 8082 - IS

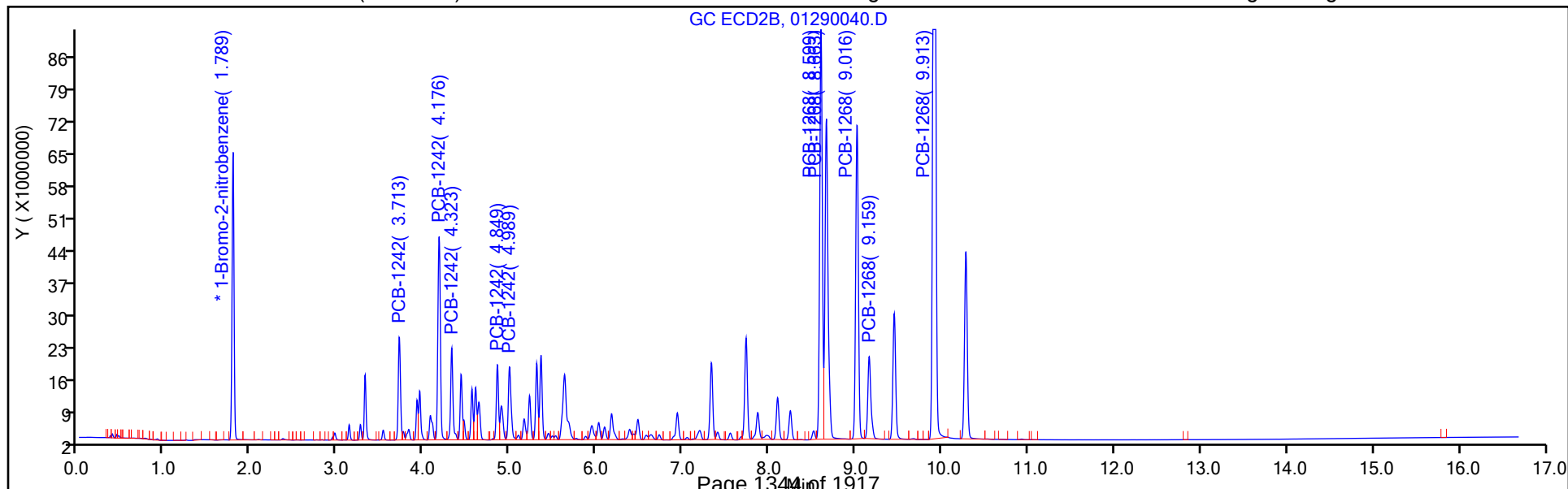
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290040.D

Injection Date: 30-Jan-2019 03:54:30

Instrument ID: SGC_J

Lims ID: STD6

Client ID:

Operator ID: TEM

ALS Bottle#:

40

Worklist Smp#:

40

Injection Vol: 1.0 ul

Dil. Factor:

1.0000

Method: 8082_J

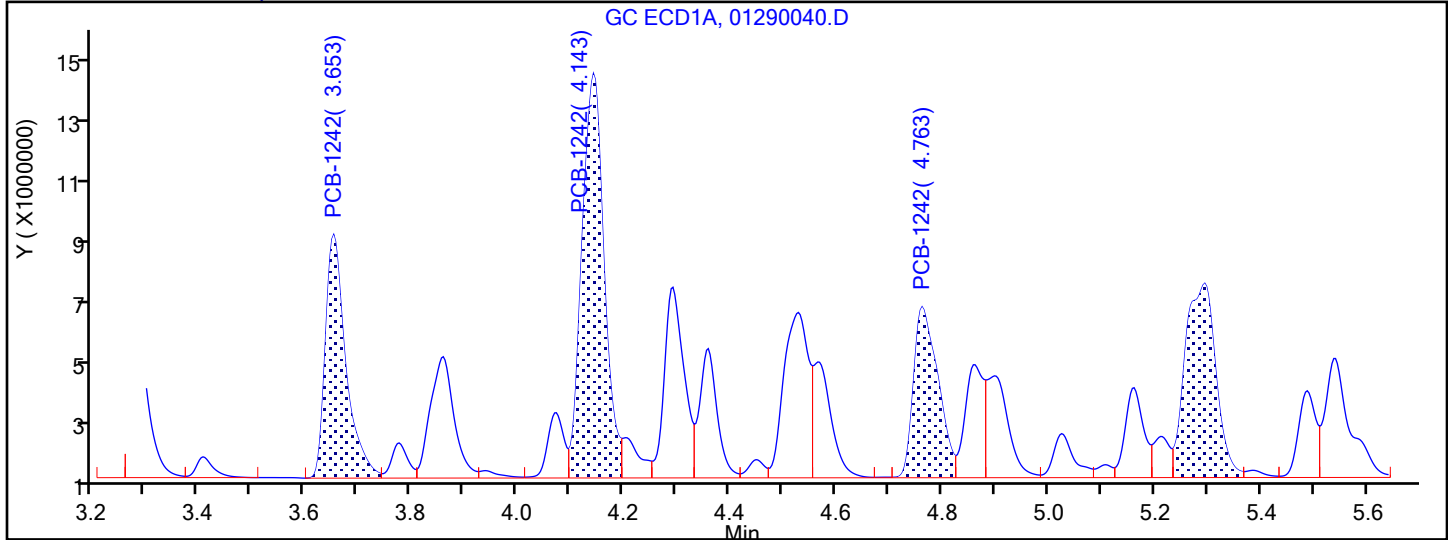
Limit Group:

GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

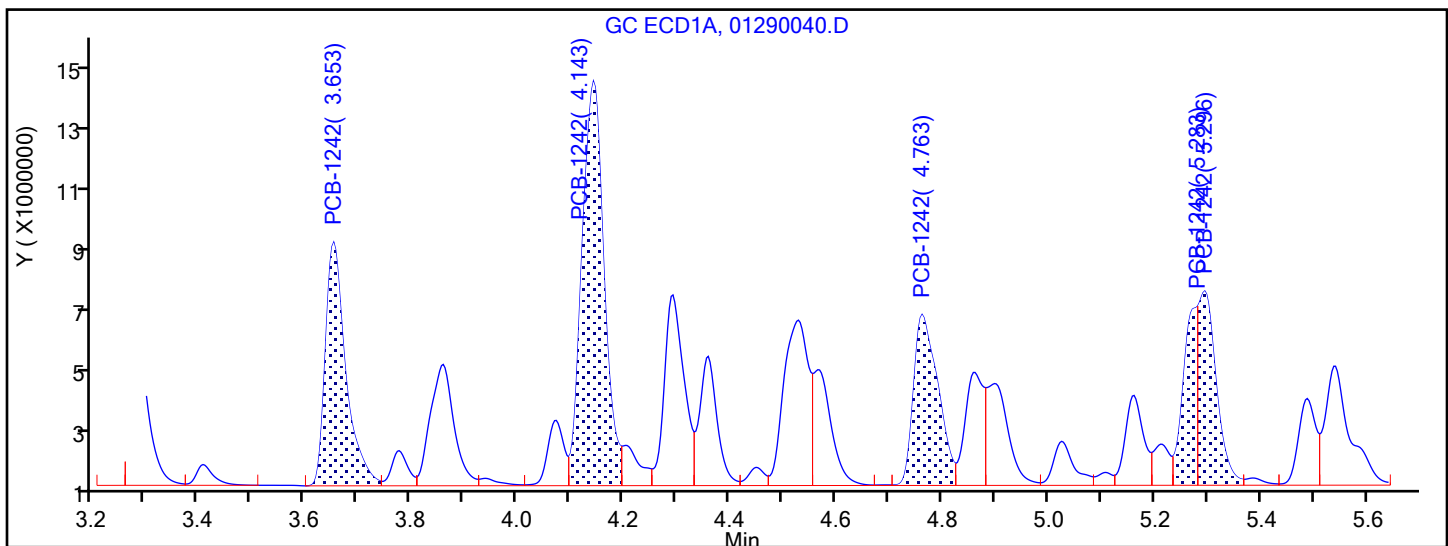
GC ECD1A

10 PCB-1242, CAS: 53469-21-9



Processing Integration Results

3.653	Response = 20436558
4.143	Response = 36820339
4.763	Response = 17174944
5.295	Response = 0
5.296	Response = 24420790



Manual Integration Results

3.653	Response = 20436558	
4.143	Response = 36820339	
4.763	Response = 17174944	
5.283	Response = 10241882	M
5.296	Response = 14178945	M

Reviewer: mooret, 30-Jan-2019 14:51:58

Audit Action: Split an Integrated Peak

Audit Reason: Split Peak
Page 1345 of 1917

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 30-Jan-2019 04:15:34 ALS Bottle#: 41 Worklist Smp#: 41
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-041
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:35 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:52:40

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.975	1.975	0.000	17548982	100.0	100.0	
2	1.788	1.789	-0.001	95395643	100.0	100.0	

RPD = 0.00

10 PCB-1242

Ma

1	3.652	3.652	0.000	25682595	1000.0	984.1	
1	4.142	4.142	0.000	47217057	1000.0	1010.8	
1	4.762	4.762	0.000	21818304	1000.0	995.9	
1	5.282	5.279	0.003	12792205	1000.0	1021.7	M
1	5.295	5.295	0.000	19049422	1000.0	1012.7	M

Average of Peak Amounts = 1005.1

2	3.715	3.712	0.003	50291519	1000.0	936.9	
2	4.175	4.175	0.000	111142815	1000.0	988.5	
2	4.322	4.322	0.000	46600766	1000.0	938.9	
2	4.852	4.849	0.003	35357888	1000.0	1017.4	
2	4.992	4.989	0.003	43289708	1000.0	918.3	

Average of Peak Amounts = 960.0

RPD = 4.59

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

13 PCB-1268

1	8.428	8.425	0.003	96858701	1000.0	1037.3	
1	8.478	8.479	-0.001	102396601	1000.0	1014.3	
1	8.755	8.752	0.003	80428947	1000.0	1029.7	
1	8.875	8.875	0.000	23705193	1000.0	1017.1	
1	9.685	9.685	0.000	220805131	1000.0	1026.7	

Average of Peak Amounts = 1025.0

2	8.598	8.599	-0.001	252691663	1000.0	1025.4	
2	8.662	8.662	0.000	228773239	1000.0	1018.8	
2	9.015	9.015	0.000	199897377	1000.0	1028.2	
2	9.158	9.159	-0.001	60429111	1000.0	1017.2	
2	9.912	9.912	0.000	601966686	1000.0	1035.0	

Average of Peak Amounts = 1024.9

RPD = 0.01

S 8 Polychlorinated biphenyls, Total

1	2030.1
2	1984.9

RPD = 2.25

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

Reagents:

AR_4268_L7_00017

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:35

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D

Injection Date: 30-Jan-2019 04:15:34

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 41

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

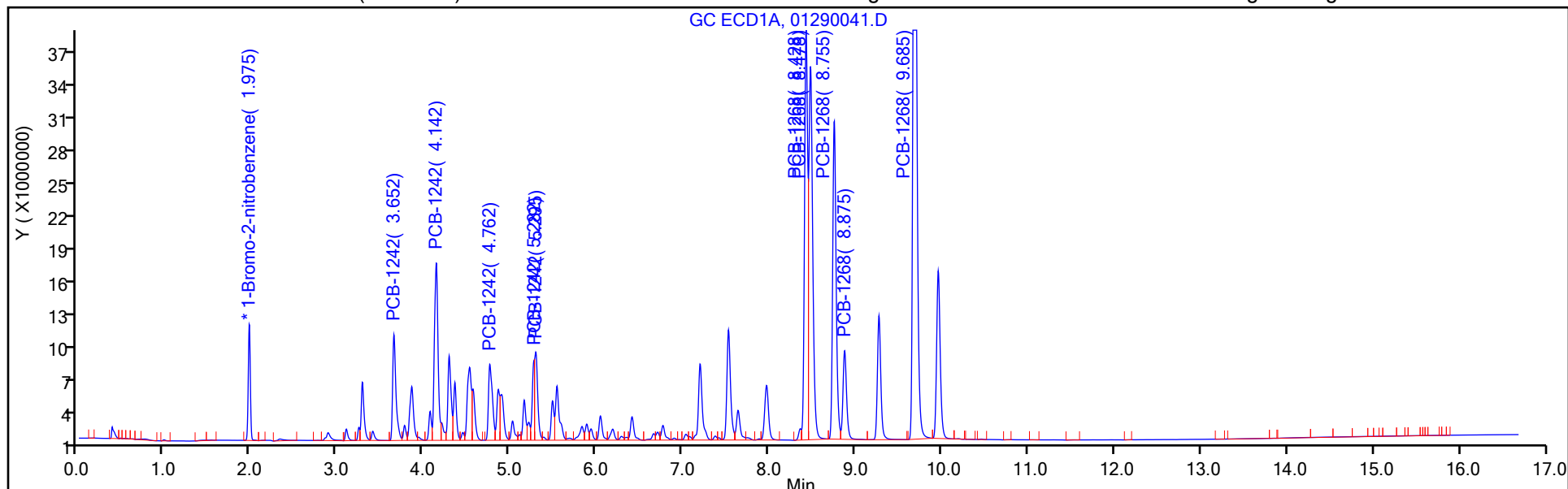
ALS Bottle#: 41

Method: 8082_J

Limit Group: GCSV - 8082 - IS

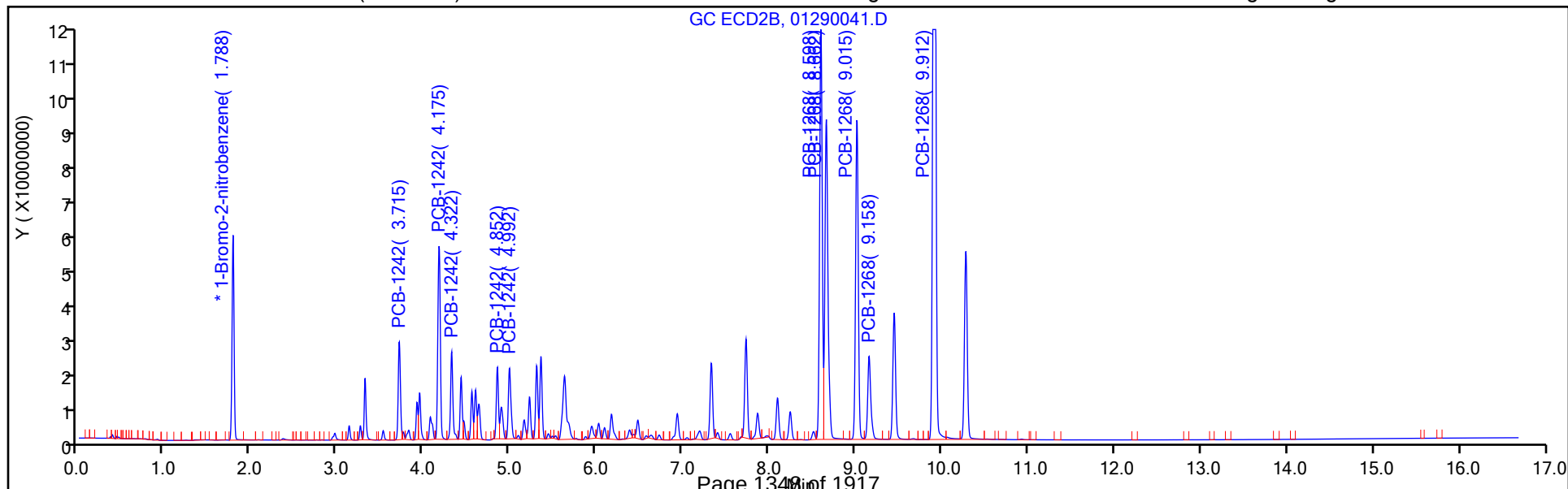
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D

Injection Date: 30-Jan-2019 04:15:34

Instrument ID: SGC_J

Lims ID: STD7

Client ID:

Operator ID: TEM

ALS Bottle#:

41

Worklist Smp#:

41

Injection Vol: 1.0 ul

Dil. Factor:

1.0000

Method: 8082_J

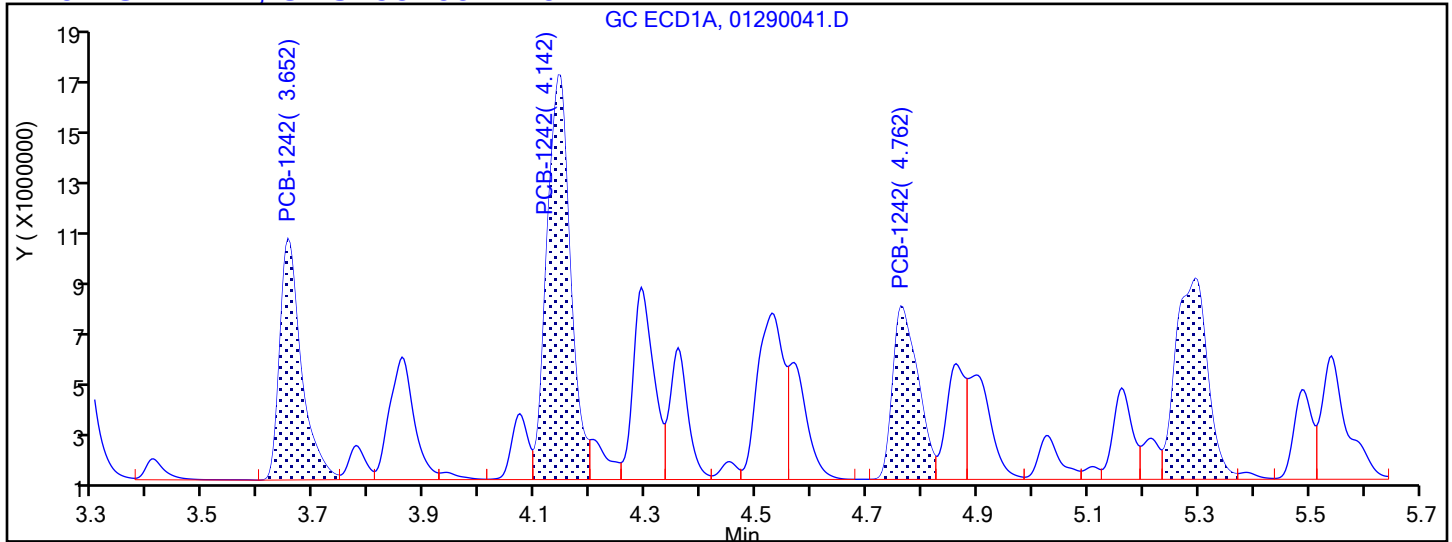
Limit Group:

GCSV - 8082 - IS

Column: CLP1 Pesticides Column 1 (0.32 mm) Detector

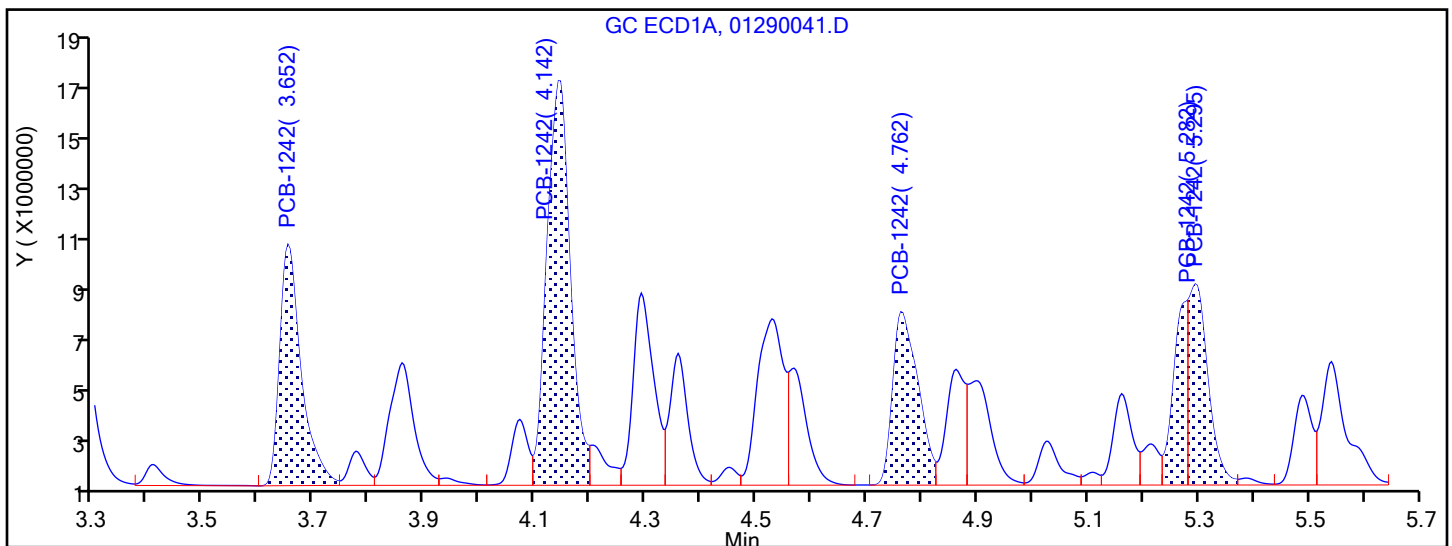
GC ECD1A

10 PCB-1242, CAS: 53469-21-9



Processing Integration Results

3.652	Response = 25682595
4.142	Response = 47217057
4.762	Response = 21818304
5.295	Response = 0
5.295	Response = 31841601



Manual Integration Results

3.652	Response = 25682595	
4.142	Response = 47217057	
4.762	Response = 21818304	
5.282	Response = 12792205	M
5.295	Response = 19049422	M

Reviewer: mooret, 30-Jan-2019 14:52:28

Audit Action: Manually Integrated/Assigned Compound ID Audit Reason: Split Peak

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/30/2019 02:09 Calibration End Date: 01/30/2019 04:15 Calibration ID: 35080

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/35	01290035.D
Level 2	STD2 280-445745/36	01290036.D
Level 3	STD3 280-445745/37	01290037.D
Level 4	STD4 280-445745/38	01290038.D
Level 5	STD5 280-445745/39	01290039.D
Level 6	STD6 280-445745/40	01290040.D
Level 7	STD7 280-445745/41	01290041.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
PCB-1242 Peak 1	0.0835 0.0535	0.0739 0.0527	0.0689	0.0606	0.0556	Lin2	0.7731	0.0554							0.9940		0.9900
PCB-1242 Peak 2	0.1718 0.1181	0.1492 0.1165	0.1387	0.1250	0.1205	Lin1	1.6123	0.1162							1.0000		0.9900
PCB-1242 Peak 3	0.0776 0.0499	0.0684 0.0488	0.0641	0.0547	0.0519	Lin2	0.7233	0.0513							0.9940		0.9900
PCB-1242 Peak 4	0.0717 0.0382	0.0618 0.0371	0.0540	0.0451	0.0402	Qua1	0.8337	0.0433	-0.000008						0.9990		0.9900
PCB-1242 Peak 5	0.0780 0.0469	0.0680 0.0454	0.0621	0.0536	0.0492	Lin2	0.8105	0.0485							0.9920		0.9900
PCB-1268 Peak 1	0.3384 0.2518	0.2917 0.2649	0.2831	0.2632	0.2577	Lin1	1.9920	0.2564							0.9990		0.9900
PCB-1268 Peak 2	0.3204 0.2290	0.2731 0.2398	0.2674	0.2465	0.2363	Lin1	2.3064	0.2331							0.9990		0.9900
PCB-1268 Peak 3	0.2689 0.1973	0.2319 0.2095	0.2254	0.2093	0.2037	Lin1	1.6679	0.2022							0.9990		0.9900
PCB-1268 Peak 4	0.0923 0.0593	0.0819 0.0633	0.0780	0.0684	0.0635	Lin1	0.9920	0.0613							0.9980		0.9900
PCB-1268 Peak 5	0.7257 0.5892	0.6371 0.6310	0.6282	0.6207	0.6002	Lin1	2.2971	0.6075							0.9990		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-32649-1 Analy Batch No.: 445745

SDG No.: _____

Instrument ID: SGC_J GC Column: CLP2 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/30/2019 02:09 Calibration End Date: 01/30/2019 04:15 Calibration ID: 35080

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-445745/35	01290035.D
Level 2	STD2 280-445745/36	01290036.D
Level 3	STD3 280-445745/37	01290037.D
Level 4	STD4 280-445745/38	01290038.D
Level 5	STD5 280-445745/39	01290039.D
Level 6	STD6 280-445745/40	01290040.D
Level 7	STD7 280-445745/41	01290041.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-1242 Peak 1	BNB	Lin2	2053069 40471357	3764385 50291519	6646160	15218217	27633355	25.0 750	50.0 1000	100	250	500
PCB-1242 Peak 2	BNB	Lin1	4226320 89341350	7598379 111142815	13380929	31390564	59948090	25.0 750	50.0 1000	100	250	500
PCB-1242 Peak 3	BNB	Lin2	1908586 37797912	3480963 46600766	6186577	13736592	25800424	25.0 750	50.0 1000	100	250	500
PCB-1242 Peak 4	BNB	Qual	1763198 28913314	3145414 35357888	5210508	11327610	19982771	25.0 750	50.0 1000	100	250	500
PCB-1242 Peak 5	BNB	Lin2	1918680 35516837	3461851 43289708	5992567	13455405	24466187	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 1	BNB	Lin1	8321833 190574103	14853251 252691663	27302807	66072977	128201924	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 2	BNB	Lin1	7880092 173302179	13908255 228773239	25792195	61884354	117548669	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 3	BNB	Lin1	6612801 149272844	11807955 199897377	21737104	52553311	101311192	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 4	BNB	Lin1	2270836 44905318	4168802 60429111	7519864	17181511	31603183	25.0 750	50.0 1000	100	250	500
PCB-1268 Peak 5	BNB	Lin1	17846924 445890342	32446855 601966686	60590316	155849809	298576048	25.0 750	50.0 1000	100	250	500

Curve Type Legend:

Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD
Qual = Quadratic 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290035.D
 Lims ID: STD1 4268
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 30-Jan-2019 02:09:04 ALS Bottle#: 35 Worklist Smp#: 35
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD1 4268
 Misc. Info.: 280-0078470-035
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:45 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:49:43

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.974	0.004	17849726	100.0	100.0	
2	1.789	1.788	0.001	98372823	100.0	100.0	
RPD = 0.00							

10 PCB-1242

1	3.652	3.651	0.001	890684	25.0	21.6	M
1	4.142	4.141	0.001	1173772	25.0	25.7	M
1	4.762	4.761	0.001	628889	25.0	23.7	M
1	5.272	5.274	-0.002	398786	25.0	24.6	M
1	5.295	5.294	0.001	465060	25.0	25.4	M

Average of Peak Amounts = 24.2

2	3.712	3.715	-0.003	2053069	25.0	23.7	
2	4.175	4.175	0.000	4226320	25.0	23.1	
2	4.322	4.321	0.001	1908586	25.0	23.7	
2	4.849	4.851	-0.002	1763198	25.0	22.2	
2	4.989	4.991	-0.002	1918680	25.0	23.5	

Average of Peak Amounts = 23.3

RPD = 4.03

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290035.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

13 PCB-1268

1	8.425	8.428	-0.003	2798591	25.0	25.0	
1	8.475	8.478	-0.003	2660297	25.0	26.5	
1	8.752	8.754	-0.002	2226742	25.0	25.7	
1	8.872	8.874	-0.002	648010	25.0	24.2	
1	9.685	9.684	0.001	6031607	25.0	25.8	

Average of Peak Amounts = 25.4

2	8.599	8.601	-0.002	8321833	25.0	25.2	
2	8.662	8.661	0.001	7880092	25.0	24.5	
2	9.015	9.018	-0.003	6612801	25.0	25.0	
2	9.159	9.158	0.001	2270836	25.0	21.5	
2	9.912	9.911	0.001	17846924	25.0	26.1	

Average of Peak Amounts = 24.5

RPD = 3.96

S 8 Polychlorinated biphenyls, Total

1						49.6	
2						47.7	

RPD = 3.99

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_4268_L7_00017

Amount Added: 0.03

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:45

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290035.D

Injection Date: 30-Jan-2019 02:09:04

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD1 4268

Worklist Smp#: 35

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

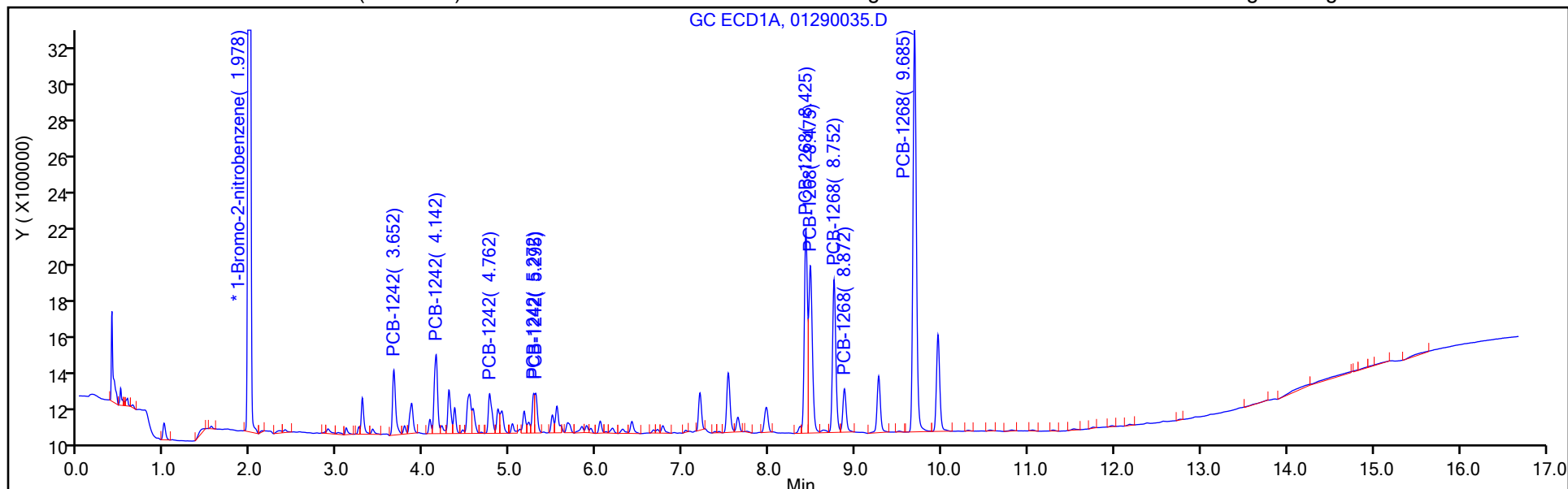
ALS Bottle#: 35

Method: 8082_J

Limit Group: GCSV - 8082 - IS

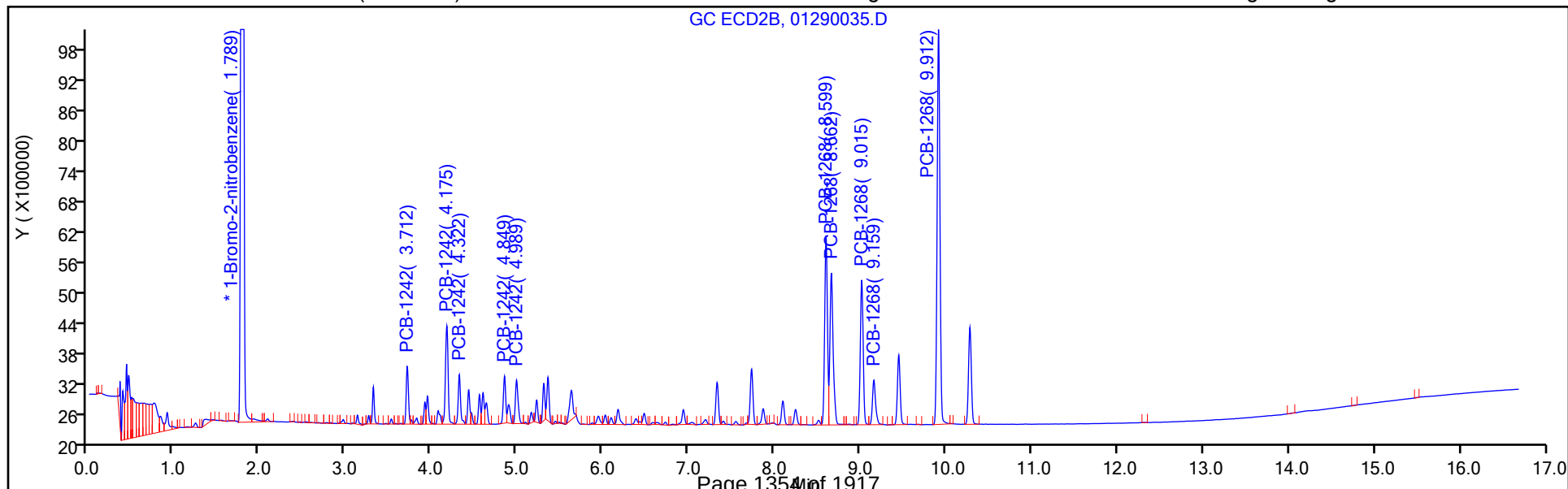
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290036.D
 Lims ID: STD2
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 30-Jan-2019 02:30:14 ALS Bottle#: 36 Worklist Smp#: 36
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD2
 Misc. Info.: 280-0078470-036
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:43 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.974	0.001	18523014	100.0	100.0
2	1.788	1.788	0.000	101851657	100.0	100.0

RPD = 0.00

10 PCB-1242

1	3.651	3.651	0.000	1727881	50.0	51.1
1	4.141	4.141	0.000	2387021	50.0	49.4
1	4.761	4.761	0.000	1252095	50.0	49.8
1	5.271	5.274	-0.003	758673	50.0	50.9
1	5.295	5.294	0.001	955844	50.0	49.2

Average of Peak Amounts = 50.1

2	3.712	3.715	-0.003	3764385	50.0	52.7
2	4.175	4.175	0.000	7598379	50.0	50.3
2	4.322	4.321	0.001	3480963	50.0	52.6
2	4.848	4.851	-0.003	3145414	50.0	52.6
2	4.988	4.991	-0.003	3461851	50.0	53.3

Average of Peak Amounts = 52.3

RPD = 4.35

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290036.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.425	8.428	-0.003	5347927	50.0	50.0	
1	8.478	8.478	0.000	5072699	50.0	48.2	
1	8.751	8.754	-0.003	4250708	50.0	49.3	
1	8.871	8.874	-0.003	1291998	50.0	49.4	
1	9.685	9.684	0.001	11392218	50.0	48.4	

Average of Peak Amounts = 49.1

2	8.598	8.601	-0.003	14853251	50.0	49.1	
2	8.662	8.661	0.001	13908255	50.0	48.7	
2	9.015	9.018	-0.003	11807955	50.0	49.1	
2	9.158	9.158	0.000	4168802	50.0	50.6	
2	9.912	9.911	0.001	32446855	50.0	48.7	

Average of Peak Amounts = 49.2

RPD = 0.34

S 8 Polychlorinated biphenyls, Total

1	99.1	
2	101.5	

RPD = 2.39

Reagents:

AR_4268_L7_00017

Amount Added: 0.05

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290036.D

Injection Date: 30-Jan-2019 02:30:14

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD2

Worklist Smp#: 36

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

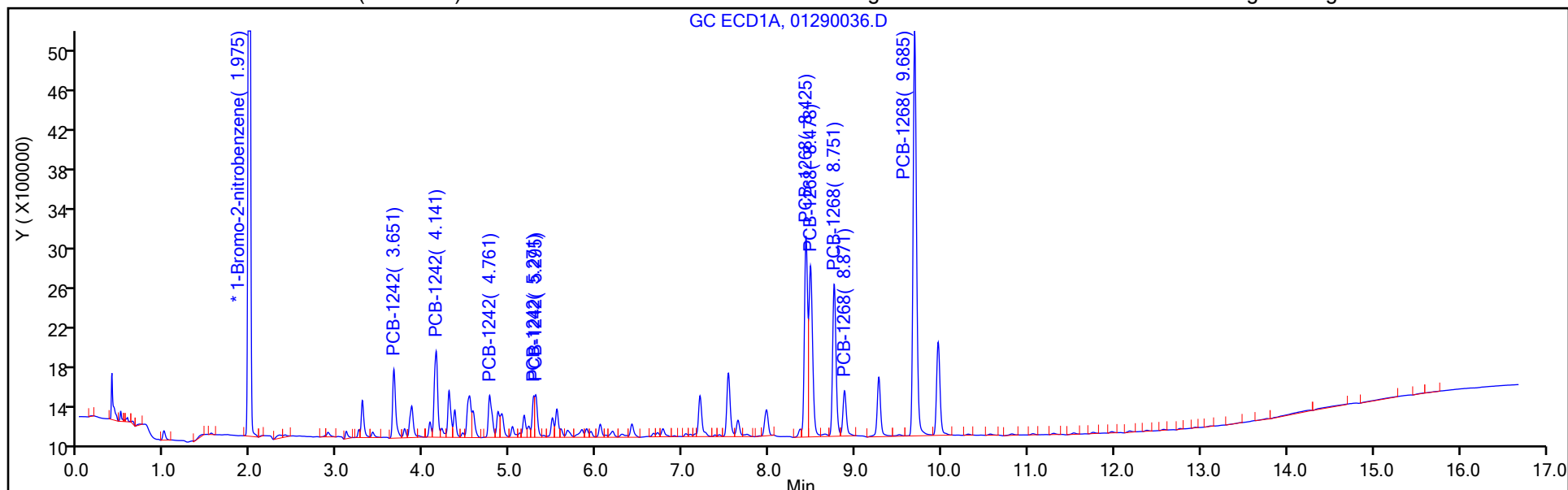
ALS Bottle#: 36

Method: 8082_J

Limit Group: GCSV - 8082 - IS

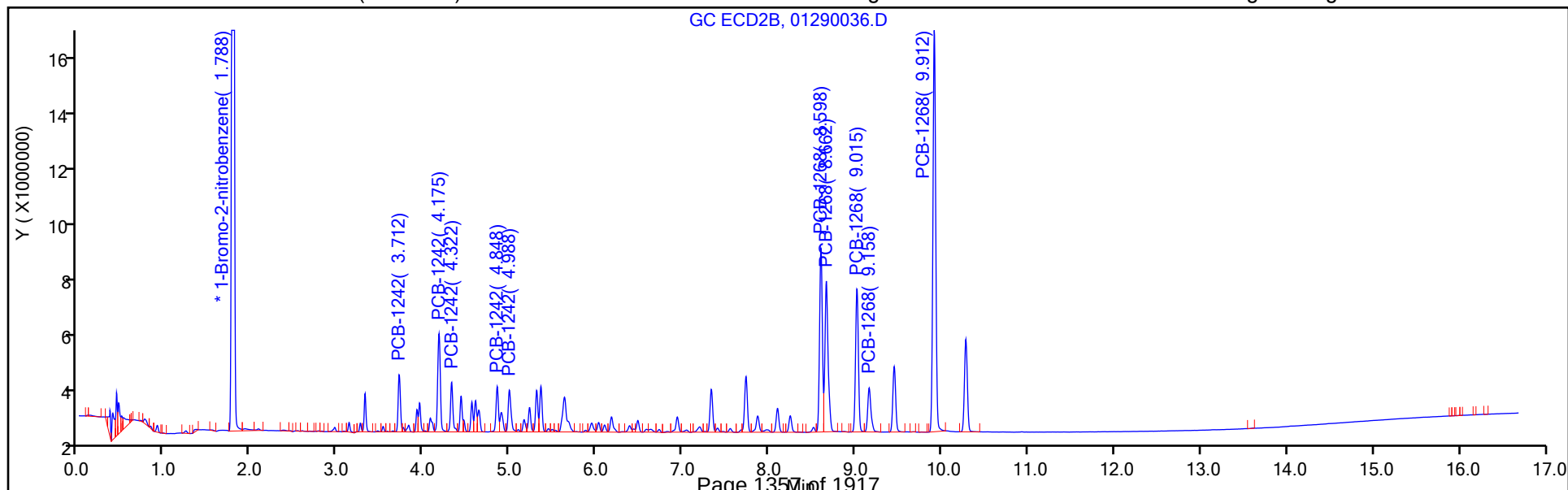
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290037.D
 Lims ID: STD3
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 30-Jan-2019 02:51:17 ALS Bottle#: 37 Worklist Smp#: 37
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD3
 Misc. Info.: 280-0078470-037
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:41 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:50:09

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.974	1.974	0.000	17663648	100.0	100.0	
2	1.788	1.788	0.000	96450940	100.0	100.0	
RPD = 0.00							

10 PCB-1242

1	3.651	3.651	0.000	3097090	100.0	107.0	M
1	4.141	4.141	0.000	4630602	100.0	99.4	M
1	4.761	4.761	0.000	2356728	100.0	102.8	M
1	5.274	5.274	0.000	1416318	100.0	106.3	M
1	5.294	5.294	0.000	1822769	100.0	97.3	M

Average of Peak Amounts = 102.5

2	3.715	3.715	0.000	6646160	100.0	110.3	
2	4.175	4.175	0.000	13380929	100.0	105.5	
2	4.321	4.321	0.000	6186577	100.0	111.0	
2	4.851	4.851	0.000	5210508	100.0	107.6	
2	4.991	4.991	0.000	5992567	100.0	111.3	

Average of Peak Amounts = 109.2

RPD = 6.25

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290037.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.428	8.428	0.000	10025616	100.0	102.6	
1	8.478	8.478	0.000	9889169	100.0	97.8	
1	8.754	8.754	0.000	8075356	100.0	100.6	
1	8.874	8.874	0.000	2471735	100.0	102.5	
1	9.684	9.684	0.000	22278589	100.0	101.3	

Average of Peak Amounts = 100.9

2	8.601	8.601	0.000	27302807	100.0	102.6	
2	8.661	8.661	0.000	25792195	100.0	104.8	
2	9.018	9.018	0.000	21737104	100.0	103.2	
2	9.158	9.158	0.000	7519864	100.0	111.0	
2	9.911	9.911	0.000	60590316	100.0	99.6	

Average of Peak Amounts = 104.3

RPD = 3.23

S 8 Polychlorinated biphenyls, Total

1						203.5	
2						213.4	

RPD = 4.77

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_4268_L7_00017

Amount Added: 0.10

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC J\20190128-78470.b\01290037.D

Injection Date: 30-Jan-2019 02:51:17

Instrument ID: SGC J

Operator ID: TEM

Lims ID: STD3

Worklist Smp#: 37

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

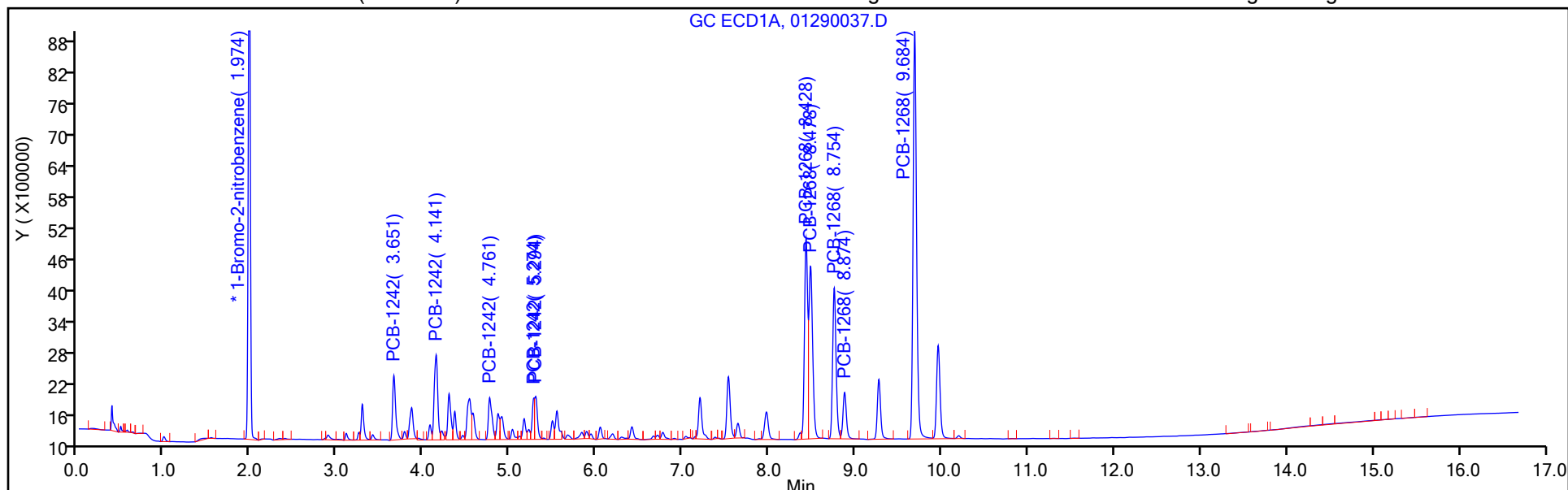
ALS Bottle#: 37

Method: 8082 J

Limit Group: GCSV - 8082 - IS

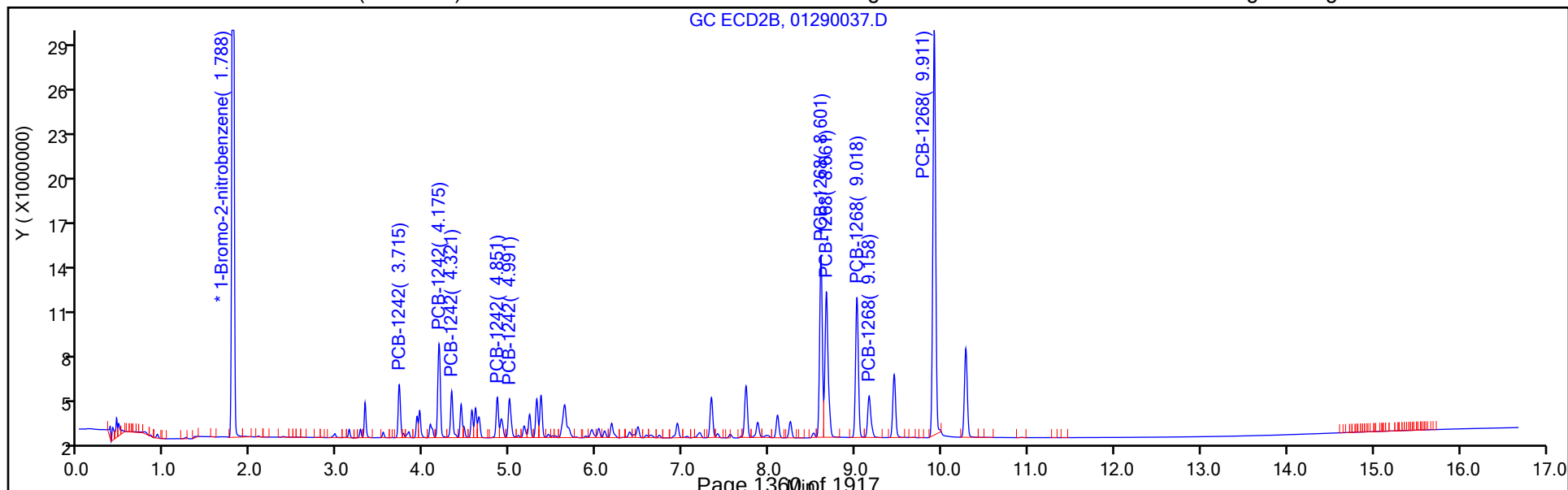
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290038.D
 Lims ID: STD4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 30-Jan-2019 03:12:20 ALS Bottle#: 38 Worklist Smp#: 38
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD4
 Misc. Info.: 280-0078470-038
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:40 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:54:39

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.975	0.001	18375903	100.0	100.0
2	1.789	1.789	0.000	100433048	100.0	100.0

RPD = 0.00

10 PCB-1242

M

1	3.653	3.652	0.001	7523219	250.0	266.4
1	4.143	4.142	0.001	12107353	250.0	248.3
1	4.763	4.762	0.001	6049722	250.0	260.3
1	5.276	5.279	-0.003	3252568	250.0	242.9
1	5.296	5.295	0.001	5028906	250.0	256.1

Average of Peak Amounts =

254.8

2	3.713	3.712	0.001	15218217	250.0	259.4	M
2	4.176	4.175	0.001	31390564	250.0	255.0	
2	4.319	4.322	-0.003	13736592	250.0	252.7	
2	4.849	4.849	0.000	11327610	250.0	252.5	M
2	4.989	4.989	0.000	13455405	250.0	259.4	M

Average of Peak Amounts =

255.8

RPD = 0.39

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290038.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.426	8.425	0.001	24707685	250.0	249.3	
1	8.479	8.479	0.000	26453565	250.0	250.7	
1	8.753	8.752	0.001	20470625	250.0	248.5	
1	8.873	8.875	-0.002	6447955	250.0	261.8	
1	9.686	9.685	0.001	56746001	250.0	250.6	

Average of Peak Amounts = 252.2

2	8.599	8.599	0.000	66072977	250.0	248.8	
2	8.659	8.662	-0.003	61884354	250.0	254.4	
2	9.016	9.015	0.001	52553311	250.0	250.6	
2	9.156	9.159	-0.003	17181511	250.0	262.9	
2	9.913	9.912	0.001	155849809	250.0	251.7	

Average of Peak Amounts = 253.7

RPD = 0.60

S 8 Polychlorinated biphenyls, Total

1						507.0	
2						509.5	

RPD = 0.49

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_4268_L7_00017

Amount Added: 0.25

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:40

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290038.D

Injection Date: 30-Jan-2019 03:12:20

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD4

Worklist Smp#: 38

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

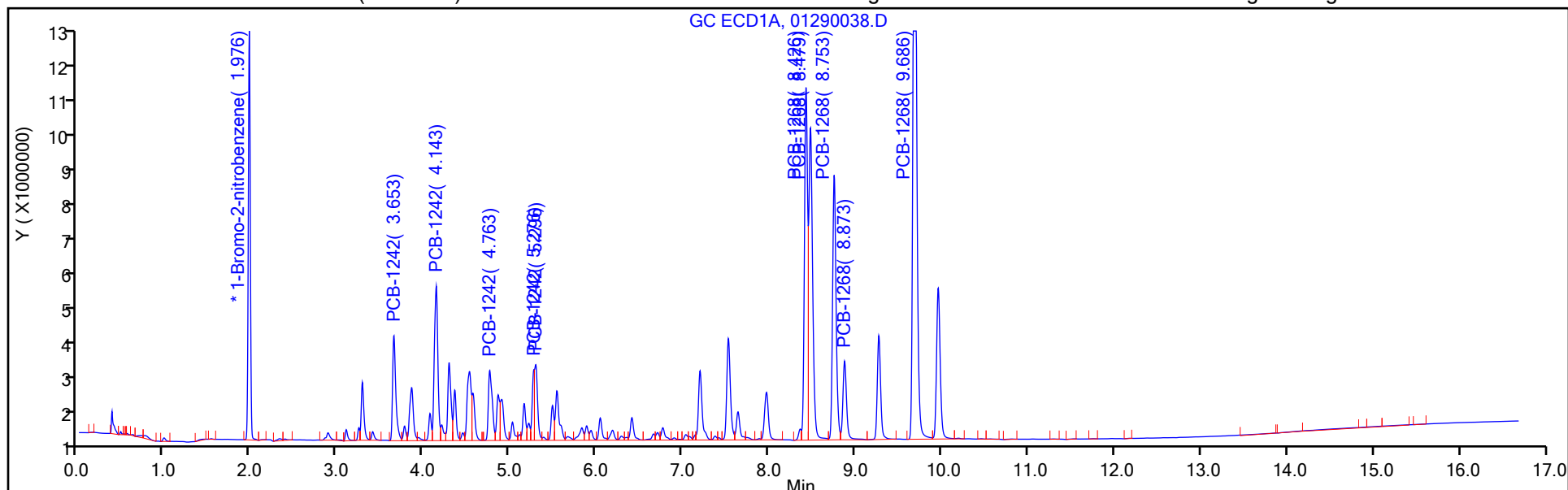
ALS Bottle#: 38

Method: 8082_J

Limit Group: GCSV - 8082 - IS

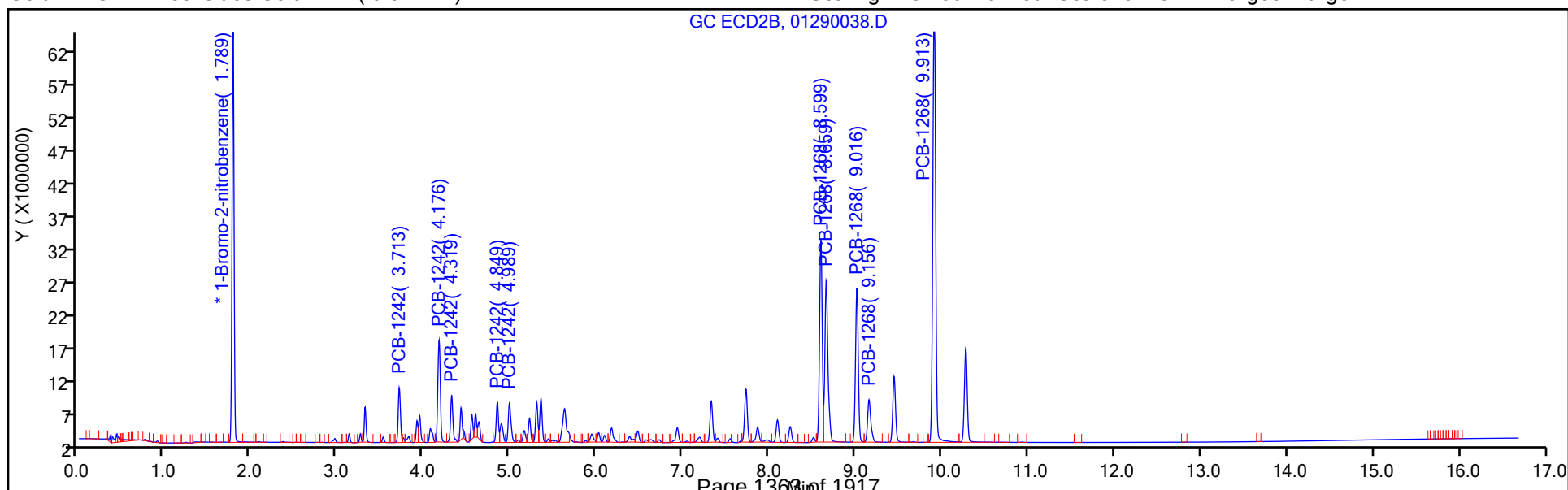
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290038.D

Injection Date: 30-Jan-2019 03:12:20

Instrument ID: SGC_J

Lims ID: STD4

Client ID:

Operator ID: TEM

ALS Bottle#:

38

Worklist Smp#:

38

Injection Vol: 1.0 ul

Dil. Factor:

1.0000

Method: 8082_J

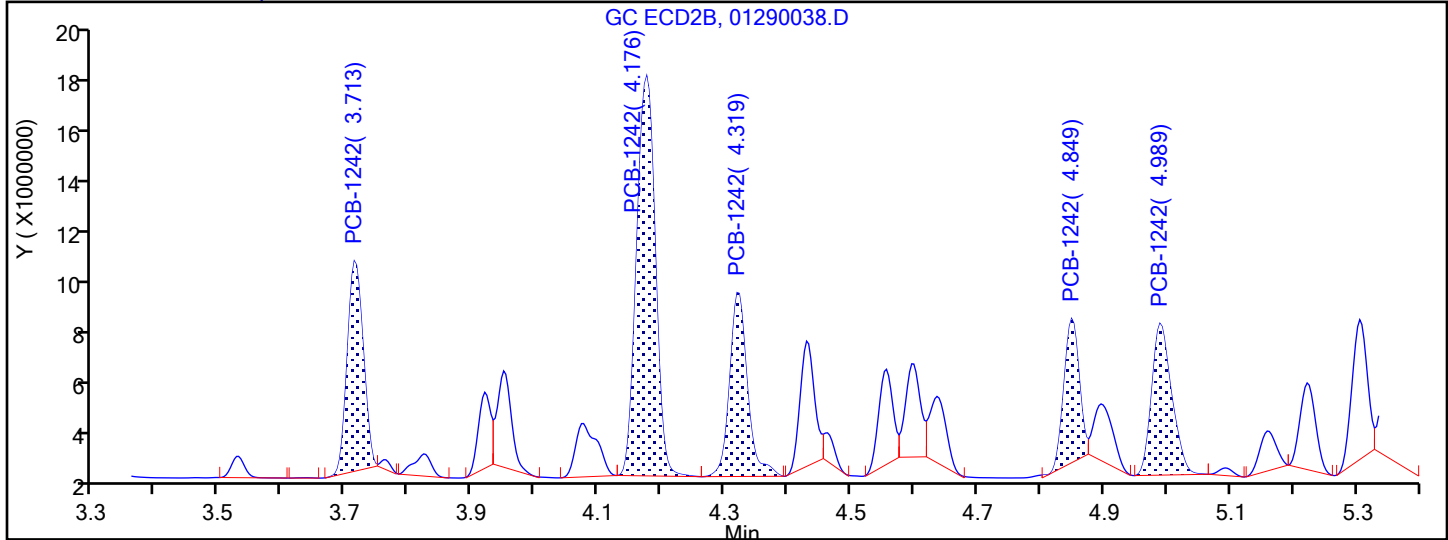
Limit Group:

GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

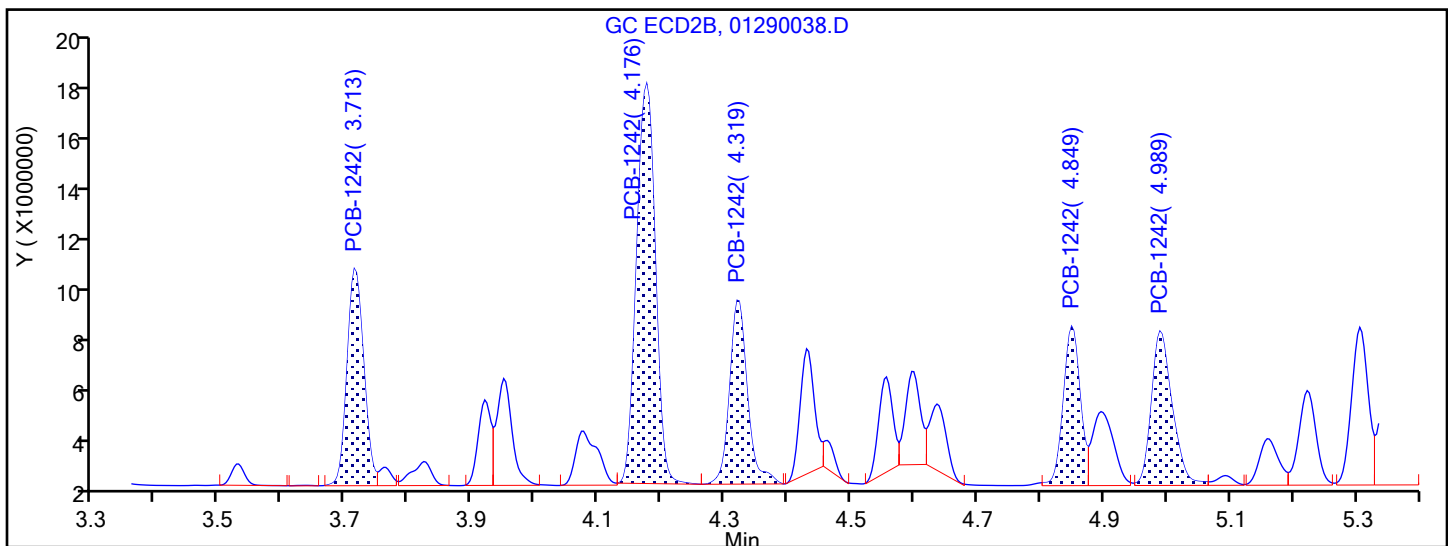
GC ECD2B

10 PCB-1242, CAS: 53469-21-9



Processing Integration Results

3.713	Response = 14061462
4.176	Response = 31390564
4.319	Response = 13736592
4.849	Response = 9302045
4.989	Response = 12685758



Manual Integration Results

3.713	Response = 15218217	M
4.176	Response = 31390564	
4.319	Response = 13736592	
4.849	Response = 11327610	M
4.989	Response = 13455405	M

Reviewer: mooret, 30-Jan-2019 14:54:31

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
Page 1364 of 1917

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290039.D
 Lims ID: STD5
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 30-Jan-2019 03:33:28 ALS Bottle#: 39 Worklist Smp#: 39
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD5
 Misc. Info.: 280-0078470-039
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:38 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:50:59

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.975	0.000	18234826	100.0	100.0	
2	1.789	1.789	0.000	99488732	100.0	100.0	

RPD = 0.00

10 PCB-1242

Ma

1	3.652	3.652	0.000	13850439	500.0	504.8	
1	4.142	4.142	0.000	23902080	500.0	493.0	
1	4.762	4.762	0.000	11429020	500.0	499.8	
1	5.279	5.279	0.000	5955544	500.0	454.0	M
1	5.295	5.295	0.000	10127961	500.0	518.7	M

Average of Peak Amounts = 494.0

2	3.712	3.712	0.000	27633355	500.0	487.0	
2	4.175	4.175	0.000	59948090	500.0	504.6	
2	4.322	4.322	0.000	25800424	500.0	491.8	
2	4.849	4.849	0.000	19982771	500.0	486.0	
2	4.989	4.989	0.000	24466187	500.0	490.0	

Average of Peak Amounts = 491.9

RPD = 0.44

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290039.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

13 PCB-1268

1	8.425	8.425	0.000	47439190	500.0	486.6	
1	8.479	8.479	0.000	52328366	500.0	499.2	
1	8.752	8.752	0.000	39942164	500.0	490.9	
1	8.875	8.875	0.000	11970820	500.0	492.6	
1	9.685	9.685	0.000	110452712	500.0	493.3	

Average of Peak Amounts = 492.5

2	8.599	8.599	0.000	128201924	500.0	494.8	
2	8.662	8.662	0.000	117548669	500.0	496.9	
2	9.015	9.015	0.000	101311192	500.0	495.4	
2	9.159	9.159	0.000	31603183	500.0	502.0	
2	9.912	9.912	0.000	298576048	500.0	490.3	

Average of Peak Amounts = 495.9

RPD = 0.68

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

Reagents:

AR_4268_L7_00017

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:39

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290039.D

Injection Date: 30-Jan-2019 03:33:28

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD5

Worklist Smp#: 39

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

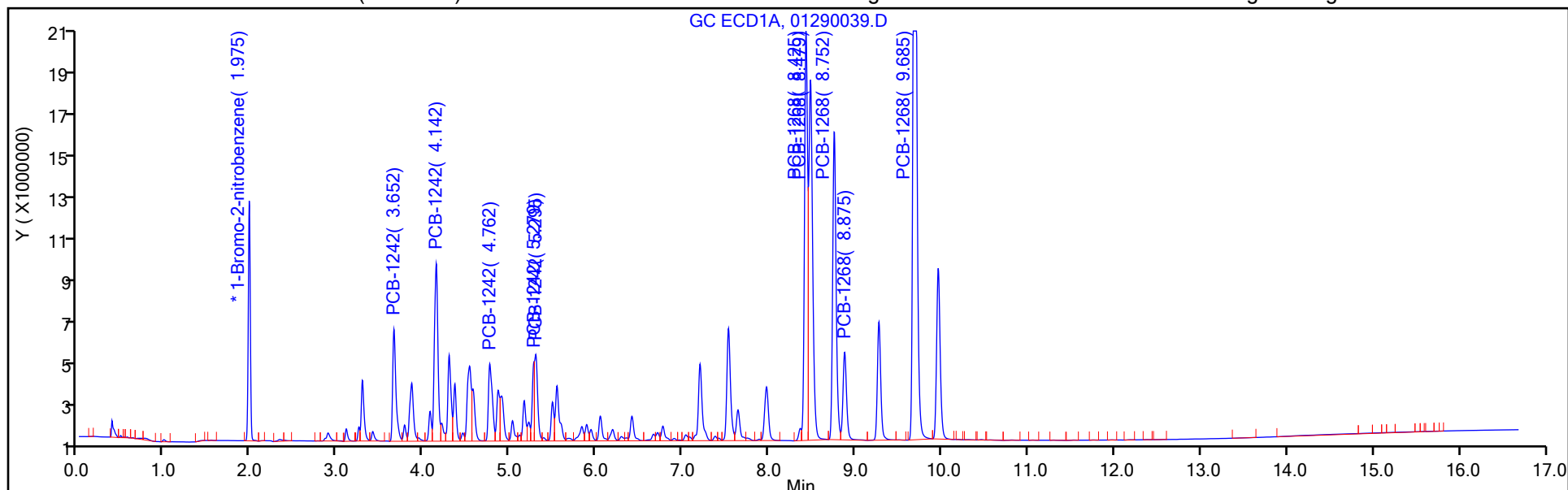
ALS Bottle#: 39

Method: 8082_J

Limit Group: GCSV - 8082 - IS

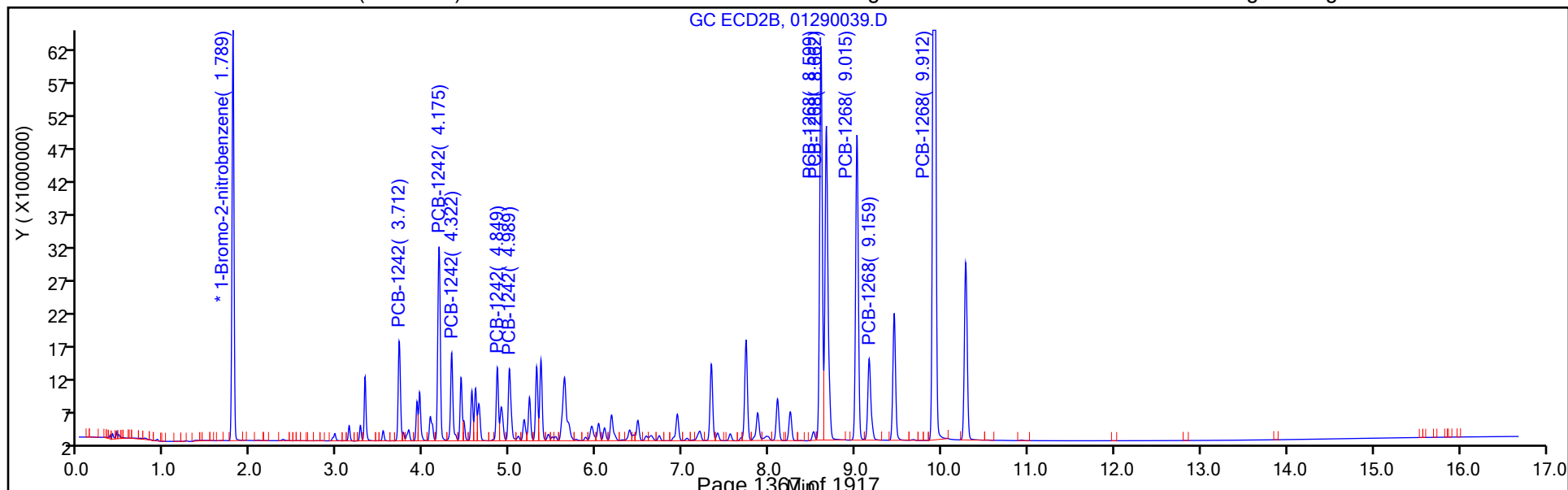
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290040.D
 Lims ID: STD6
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 30-Jan-2019 03:54:30 ALS Bottle#: 40 Worklist Smp#: 40
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD6
 Misc. Info.: 280-0078470-040
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:37 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:52:11

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.976	1.975	0.001	18493251	100.0	100.0	
2	1.789	1.789	0.000	100896616	100.0	100.0	

RPD = 0.00

10 PCB-1242

Ma

1	3.653	3.652	0.001	20436558	750.0	740.1	
1	4.143	4.142	0.001	36820339	750.0	748.3	
1	4.763	4.762	0.001	17174944	750.0	742.7	
1	5.283	5.279	0.004	10241882	750.0	774.6	M
1	5.296	5.295	0.001	14178945	750.0	715.6	M

Average of Peak Amounts =

744.3

2	3.713	3.712	0.001	40471357	750.0	709.5	
2	4.176	4.175	0.001	89341350	750.0	748.0	
2	4.323	4.322	0.001	37797912	750.0	716.7	
2	4.849	4.849	0.000	28913314	750.0	737.7	
2	4.989	4.989	0.000	35516837	750.0	708.6	

Average of Peak Amounts =

724.1

RPD = 2.75

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290040.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.426	8.425	0.001	71398443	750.0	724.3	
1	8.479	8.479	0.000	78534053	750.0	738.4	
1	8.753	8.752	0.001	60169301	750.0	730.3	
1	8.873	8.875	-0.002	17887994	750.0	727.4	
1	9.686	9.685	0.001	165330861	750.0	729.0	

Average of Peak Amounts = 729.9

2	8.599	8.599	0.000	190574103	750.0	728.9	
2	8.663	8.662	0.001	173302179	750.0	726.9	
2	9.016	9.015	0.001	149272844	750.0	723.5	
2	9.159	9.159	0.000	44905318	750.0	709.9	
2	9.913	9.912	0.001	445890342	750.0	723.7	

Average of Peak Amounts = 722.6

RPD = 1.00

S 8 Polychlorinated biphenyls, Total

1	1474.1
2	1446.7

RPD = 1.88

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

Reagents:

AR_4268_L7_00017

Amount Added: 0.75

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:37

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290040.D

Injection Date: 30-Jan-2019 03:54:30

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD6

Worklist Smp#: 40

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

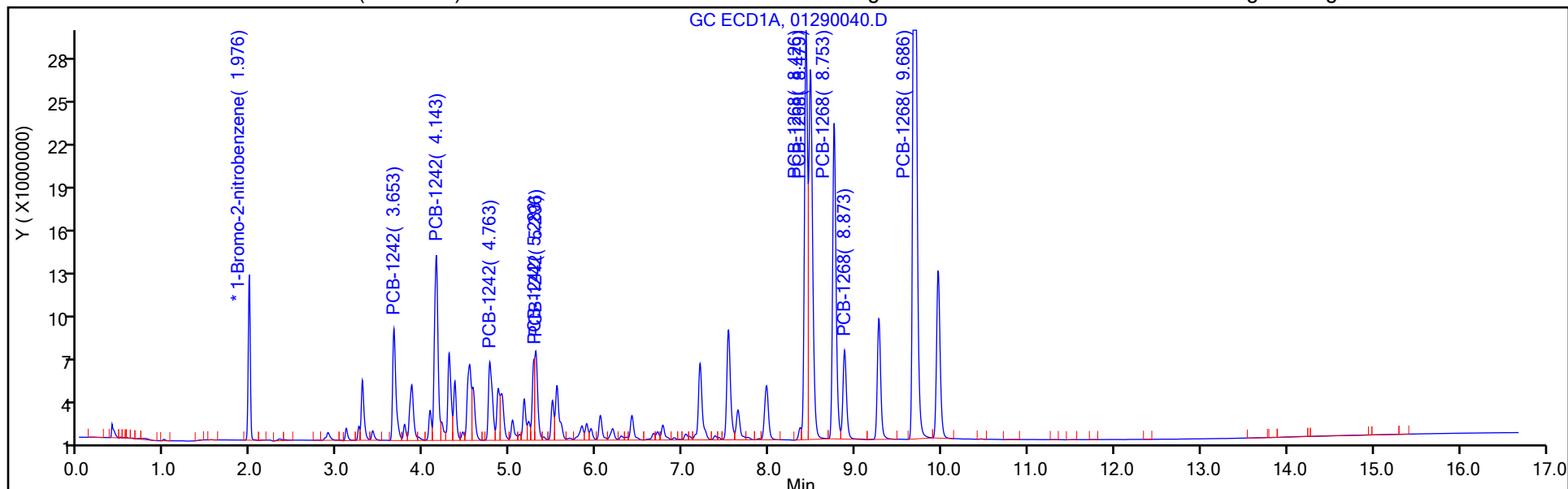
ALS Bottle#: 40

Method: 8082_J

Limit Group: GCSV - 8082 - IS

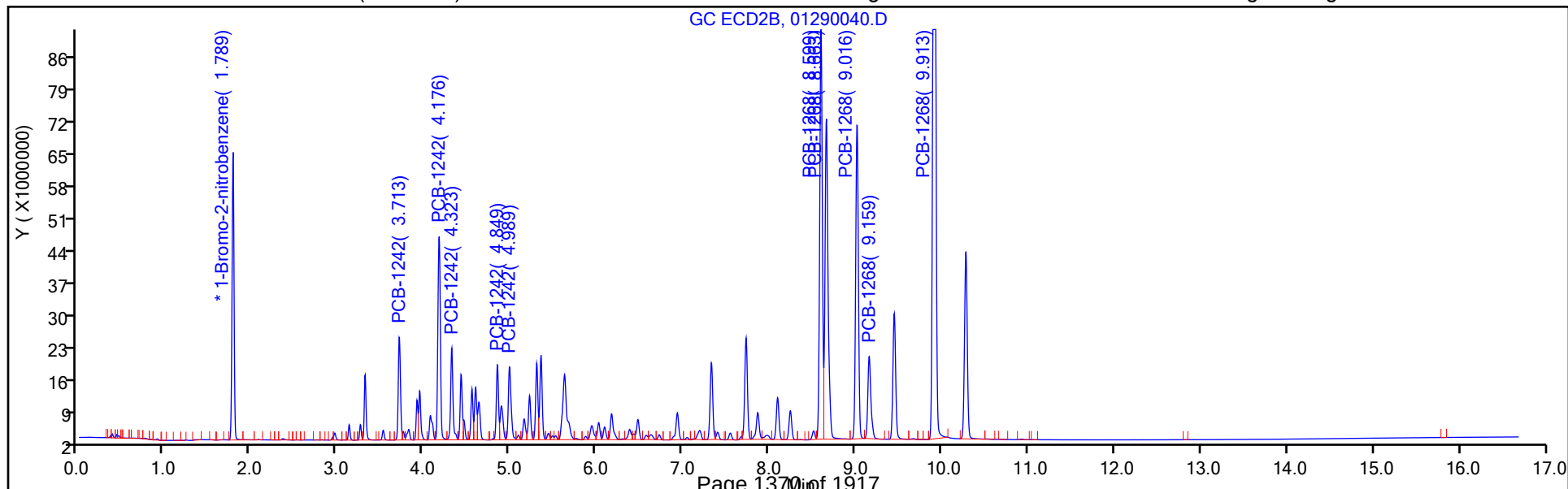
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Lims ID: STD7
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 30-Jan-2019 04:15:34 ALS Bottle#: 41 Worklist Smp#: 41
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: STD7
 Misc. Info.: 280-0078470-041
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub5
 Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:35 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:52:40

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.975	0.000	17548982	100.0	100.0
2	1.788	1.789	-0.001	95395643	100.0	100.0

RPD = 0.00

10 PCB-1242

Ma

1	3.652	3.652	0.000	25682595	1000.0	984.1
1	4.142	4.142	0.000	47217057	1000.0	1010.8
1	4.762	4.762	0.000	21818304	1000.0	995.9
1	5.282	5.279	0.003	12792205	1000.0	1021.7
1	5.295	5.295	0.000	19049422	1000.0	1012.7

M

M

Average of Peak Amounts = 1005.1

2	3.715	3.712	0.003	50291519	1000.0	936.9
2	4.175	4.175	0.000	111142815	1000.0	988.5
2	4.322	4.322	0.000	46600766	1000.0	938.9
2	4.852	4.849	0.003	35357888	1000.0	1017.4
2	4.992	4.989	0.003	43289708	1000.0	918.3

Average of Peak Amounts = 960.0

RPD = 4.59

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.428	8.425	0.003	96858701	1000.0	1037.3	
1	8.478	8.479	-0.001	102396601	1000.0	1014.3	
1	8.755	8.752	0.003	80428947	1000.0	1029.7	
1	8.875	8.875	0.000	23705193	1000.0	1017.1	
1	9.685	9.685	0.000	220805131	1000.0	1026.7	

Average of Peak Amounts = 1025.0

2	8.598	8.599	-0.001	252691663	1000.0	1025.4	
2	8.662	8.662	0.000	228773239	1000.0	1018.8	
2	9.015	9.015	0.000	199897377	1000.0	1028.2	
2	9.158	9.159	-0.001	60429111	1000.0	1017.2	
2	9.912	9.912	0.000	601966686	1000.0	1035.0	

Average of Peak Amounts = 1024.9

RPD = 0.01

S 8 Polychlorinated biphenyls, Total

1	2030.1
2	1984.9

RPD = 2.25

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

Reagents:

AR_4268_L7_00017

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:35

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D

Injection Date: 30-Jan-2019 04:15:34

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: STD7

Worklist Smp#: 41

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

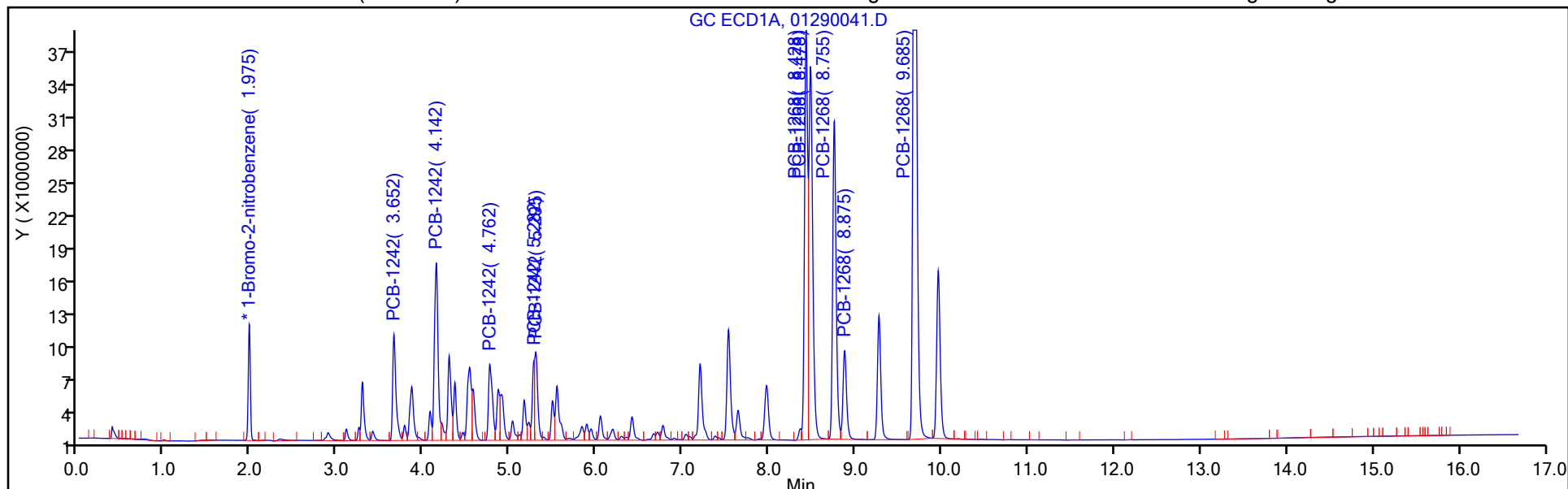
ALS Bottle#: 41

Method: 8082_J

Limit Group: GCSV - 8082 - IS

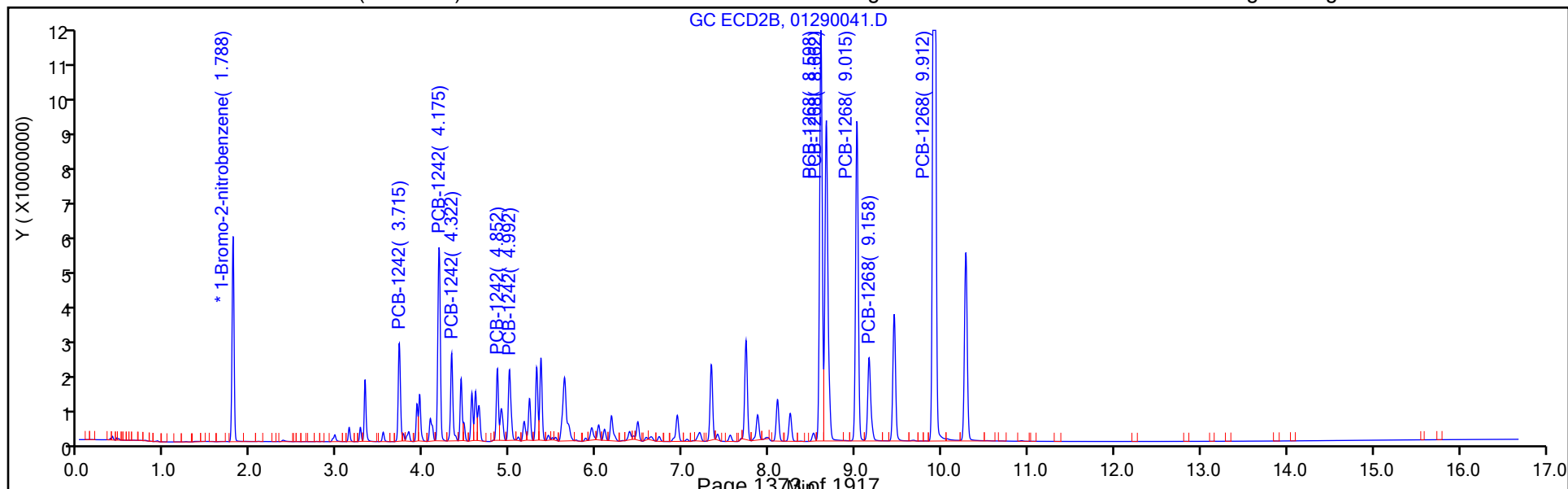
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/10 Calibration Date: 01/29/2019 17:21
Instrument ID: SGC_J Calib Start Date: 01/29/2019 14:54
GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/29/2019 17:00
Lab File ID: 01290010.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1248 Peak 1	Lin1		0.2238		265	250	5.8	20.0
PCB-1248 Peak 2	Lin1		0.2059		266	250	6.3	20.0
PCB-1248 Peak 3	Lin1		0.1177		274	250	9.5	20.0
PCB-1248 Peak 4	Lin1		0.1308		253	250	1.1	20.0
PCB-1248 Peak 5	Lin1		0.0912		262	250	4.8	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/10 Calibration Date: 01/29/2019 17:21
Instrument ID: SGC_J Calib Start Date: 01/29/2019 14:54
GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/29/2019 17:00
Lab File ID: 01290010.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1248 Peak 1	4.53	4.28	4.78
PCB-1248 Peak 2	4.76	4.51	5.01
PCB-1248 Peak 3	4.86	4.61	5.11
PCB-1248 Peak 4	5.54	5.29	5.79
PCB-1248 Peak 5	6.05	5.80	6.30

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290010.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 29-Jan-2019 17:21:57 ALS Bottle#: 10 Worklist Smp#: 10
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-010
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:33 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret Date: 30-Jan-2019 11:33:58

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.977	-0.002	18185848	100.0	100.0
2	1.788	1.791	-0.003	105428216	100.0	100.0

RPD = 0.00

4 PCB-1248

1	4.528	4.528	0.000	10176463	250.0	264.6
1	4.761	4.761	0.000	9360400	250.0	265.7
1	4.858	4.861	-0.003	5352975	250.0	273.8
1	5.541	5.541	0.000	5946524	250.0	252.9
1	6.045	6.045	0.000	4148205	250.0	262.1
Average of Peak Amounts =						263.8
2	4.175	4.175	0.000	22148350	250.0	287.7
2	4.555	4.555	0.000	11347948	250.0	255.0
2	4.851	4.851	0.000	16302160	250.0	239.5
2	4.991	4.991	0.000	18975478	250.0	279.6
2	6.175	6.175	0.000	10556875	250.0	241.9
Average of Peak Amounts =						260.8

RPD = 1.16

Reagents:

AR_1248_ICV_00014	Amount Added: 1.00	Units: mL	
BNB IS_00013	Amount Added: 0.10	Units: mL	Run Reagent

Report Date: 30-Jan-2019 14:59:36

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290010.D

Injection Date: 29-Jan-2019 17:21:57

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 10

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

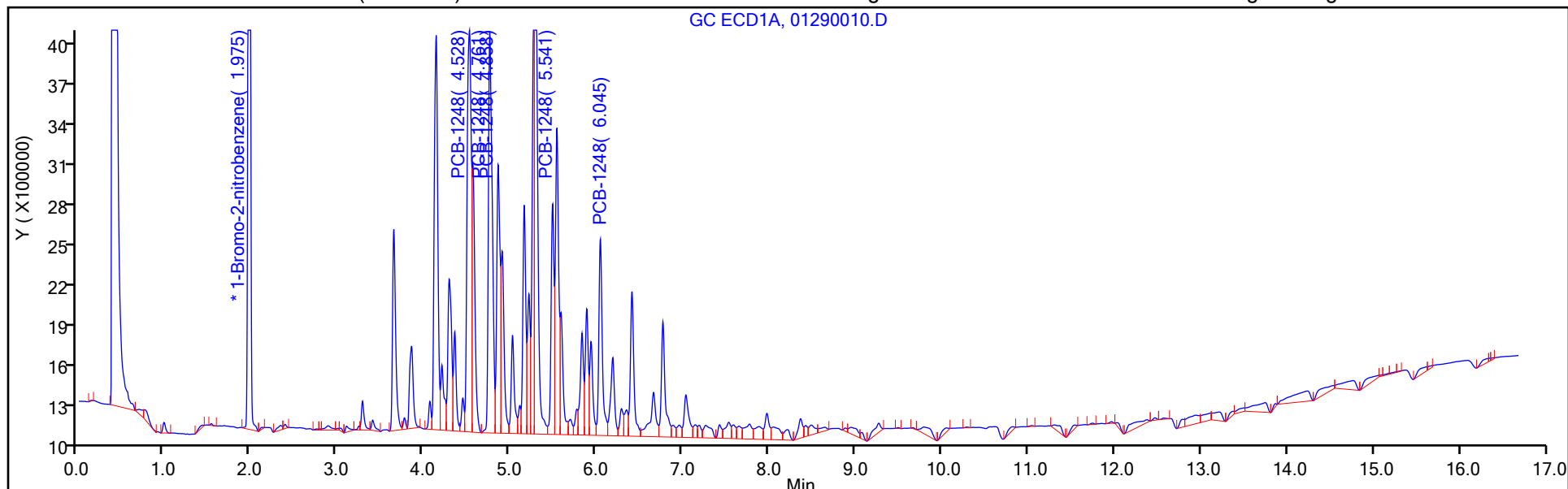
ALS Bottle#: 10

Method: 8082_J

Limit Group: GCSV - 8082 - IS

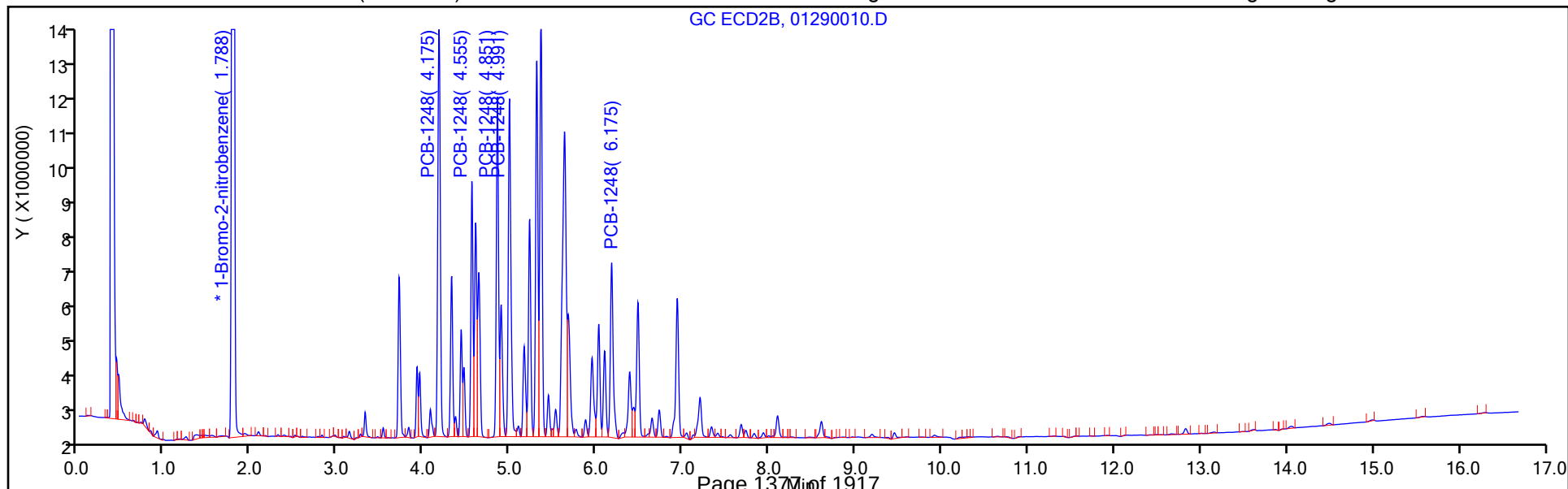
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/10 Calibration Date: 01/29/2019 17:21
Instrument ID: SGC_J Calib Start Date: 01/29/2019 14:54
GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/29/2019 17:00
Lab File ID: 01290010.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1248 Peak 1	Lin1		0.0840		288	250	15.1	20.0
PCB-1248 Peak 2	Lin1		0.0431		255	250	2.0	20.0
PCB-1248 Peak 3	Qual		0.0619		239	250	-4.2	20.0
PCB-1248 Peak 4	Lin1		0.0720		280	250	11.9	20.0
PCB-1248 Peak 5	Lin1		0.0401		242	250	-3.2	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/10 Calibration Date: 01/29/2019 17:21
Instrument ID: SGC_J Calib Start Date: 01/29/2019 14:54
GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/29/2019 17:00
Lab File ID: 01290010.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1248 Peak 1	4.18	3.93	4.43
PCB-1248 Peak 2	4.56	4.31	4.81
PCB-1248 Peak 3	4.85	4.60	5.10
PCB-1248 Peak 4	4.99	4.74	5.24
PCB-1248 Peak 5	6.18	5.93	6.43

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290010.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 29-Jan-2019 17:21:57 ALS Bottle#: 10 Worklist Smp#: 10
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-010
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:33 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret Date: 30-Jan-2019 11:33:58

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.977	-0.002	18185848	100.0	100.0
2	1.788	1.791	-0.003	105428216	100.0	100.0

RPD = 0.00

4 PCB-1248

1	4.528	4.528	0.000	10176463	250.0	264.6
1	4.761	4.761	0.000	9360400	250.0	265.7
1	4.858	4.861	-0.003	5352975	250.0	273.8
1	5.541	5.541	0.000	5946524	250.0	252.9
1	6.045	6.045	0.000	4148205	250.0	262.1
Average of Peak Amounts =						263.8
2	4.175	4.175	0.000	22148350	250.0	287.7
2	4.555	4.555	0.000	11347948	250.0	255.0
2	4.851	4.851	0.000	16302160	250.0	239.5
2	4.991	4.991	0.000	18975478	250.0	279.6
2	6.175	6.175	0.000	10556875	250.0	241.9
Average of Peak Amounts =						260.8

RPD = 1.16

Reagents:

AR_1248_ICV_00014	Amount Added: 1.00	Units: mL	
BNB IS_00013	Amount Added: 0.10	Units: mL	Run Reagent

Report Date: 30-Jan-2019 14:59:36

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290010.D

Injection Date: 29-Jan-2019 17:21:57

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 10

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

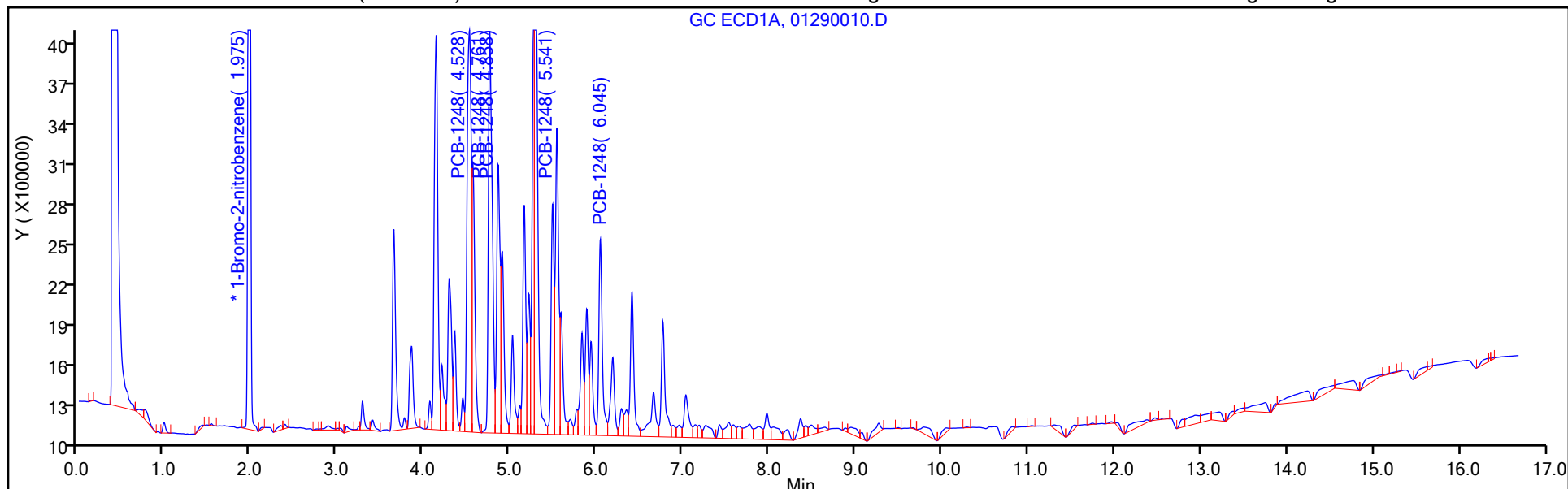
ALS Bottle#: 10

Method: 8082_J

Limit Group: GCSV - 8082 - IS

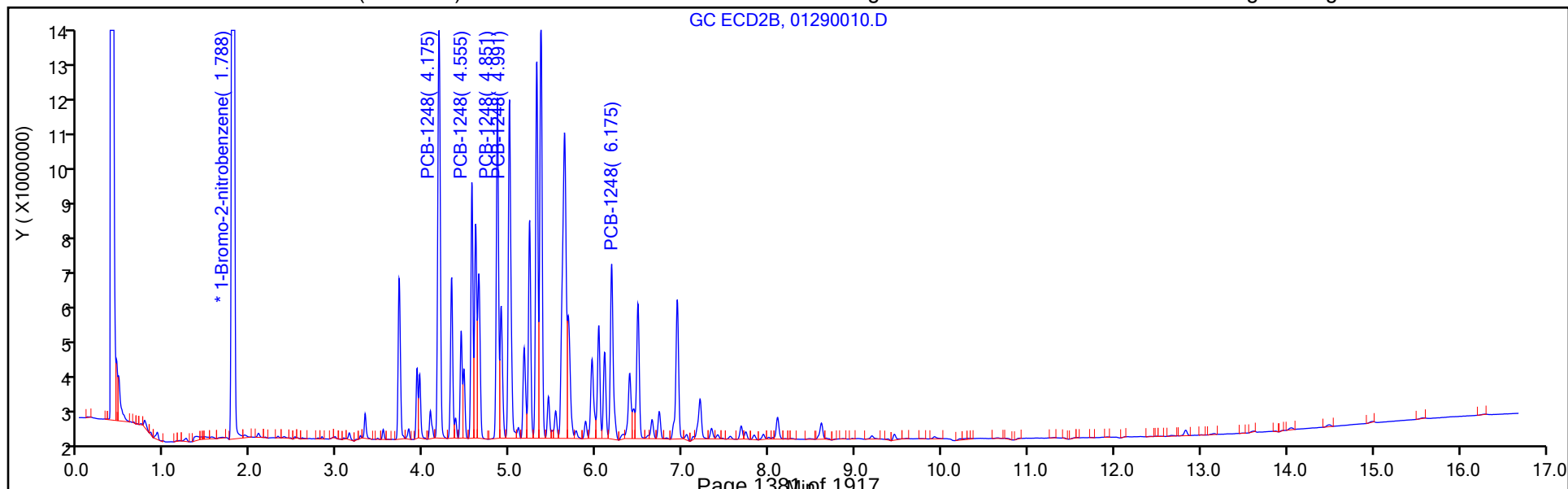
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-445745/18 Calibration Date: 01/29/2019 20:10
 Instrument ID: SGC_J Calib Start Date: 01/29/2019 17:42
 GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/29/2019 19:49
 Lab File ID: 01290018.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1221 Peak 1	Lin1		0.0418		229	250	-8.3	20.0
PCB-1221 Peak 2	Ave	0.0271	0.0248		229	250	-8.6	20.0
PCB-1221 Peak 3	Lin1		0.1147		229	250	-8.5	20.0
PCB-1254 Peak 1	Lin1		0.2096		245	250	-2.0	20.0
PCB-1254 Peak 2	Lin1		0.1439		228	250	-8.8	20.0
PCB-1254 Peak 3	Lin1		0.2729		232	250	-7.0	20.0
PCB-1254 Peak 4	Lin1		0.1930		236	250	-5.7	20.0
PCB-1254 Peak 5	Lin1		0.2512		248	250	-1.0	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/18 Calibration Date: 01/29/2019 20:10
Instrument ID: SGC_J Calib Start Date: 01/29/2019 17:42
GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/29/2019 19:49
Lab File ID: 01290018.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1221 Peak 1	3.10	2.85	3.35
PCB-1221 Peak 2	3.25	3.00	3.50
PCB-1221 Peak 3	3.29	3.04	3.54
PCB-1254 Peak 1	5.54	5.29	5.79
PCB-1254 Peak 2	5.88	5.64	6.14
PCB-1254 Peak 3	6.04	5.79	6.29
PCB-1254 Peak 4	6.41	6.16	6.66
PCB-1254 Peak 5	7.03	6.79	7.29

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290018.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 29-Jan-2019 20:10:36 ALS Bottle#: 18 Worklist Smp#: 18
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-018
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:16 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D

Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret Date: 30-Jan-2019 11:42:37

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.979	-0.001	19058571	100.0	100.0	
2	1.788	1.789	-0.001	107097769	100.0	100.0	
						RPD =	0.00

3 PCB-1221

1	3.101	3.101	0.000	1991619	250.0	229.3	
1	3.248	3.247	0.001	1181241	250.0	228.5	
1	3.288	3.287	0.001	5463585	250.0	228.7	
Average of Peak Amounts =						228.8	
2	3.135	3.134	0.001	5596575	250.0	239.3	
2	3.265	3.264	0.001	3845210	250.0	268.5	
2	3.318	3.318	0.000	12687564	250.0	247.2	
Average of Peak Amounts =						251.7	
						RPD =	9.52

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290018.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.544	5.544	0.000	9986534	250.0	245.0	
1	5.884	5.887	-0.003	6855426	250.0	228.0	
1	6.044	6.044	0.000	13001483	250.0	232.4	
1	6.411	6.411	0.000	9197007	250.0	235.7	
1	7.034	7.037	-0.003	11966810	250.0	247.6	

Average of Peak Amounts = 237.8

2	5.598	5.598	0.000	21693422	250.0	246.6	
2	6.025	6.024	0.001	16207339	250.0	243.7	
2	6.175	6.174	0.001	29870350	250.0	239.7	
2	6.725	6.724	0.001	13887779	250.0	267.7	
2	7.198	7.198	0.000	32755505	250.0	262.0	

Average of Peak Amounts = 251.9

RPD = 5.79

Reagents:

AR_2154_ICV_00015

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:19

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290018.D

Injection Date: 29-Jan-2019 20:10:36

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 18

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

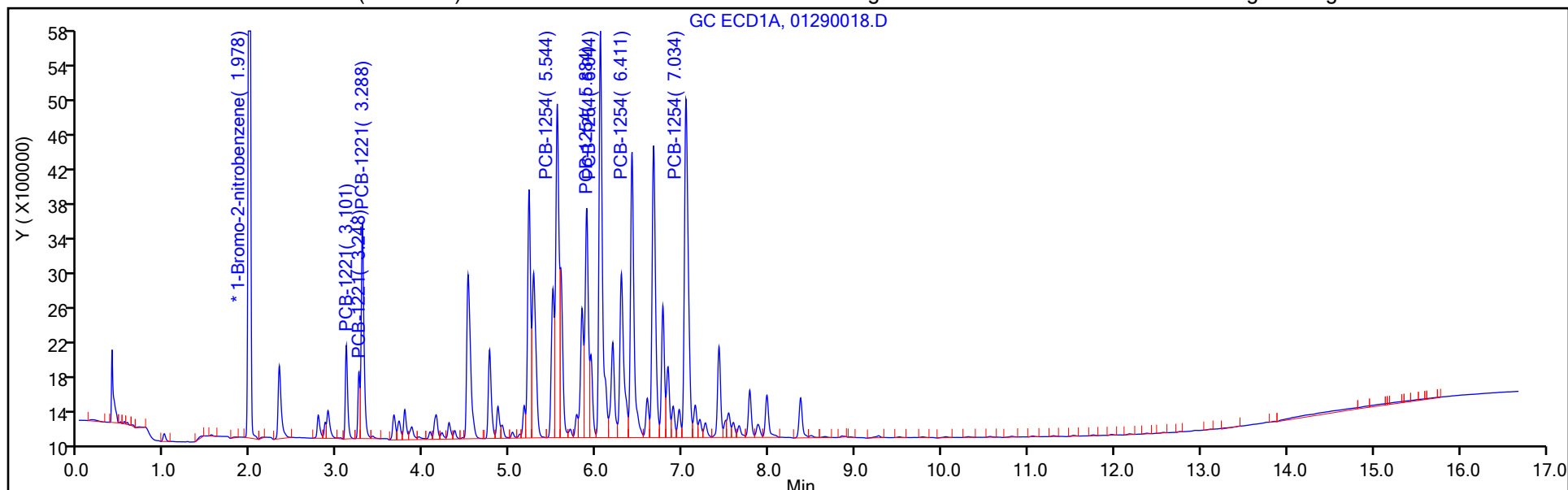
ALS Bottle#: 18

Method: 8082_J

Limit Group: GCSV - 8082 - IS

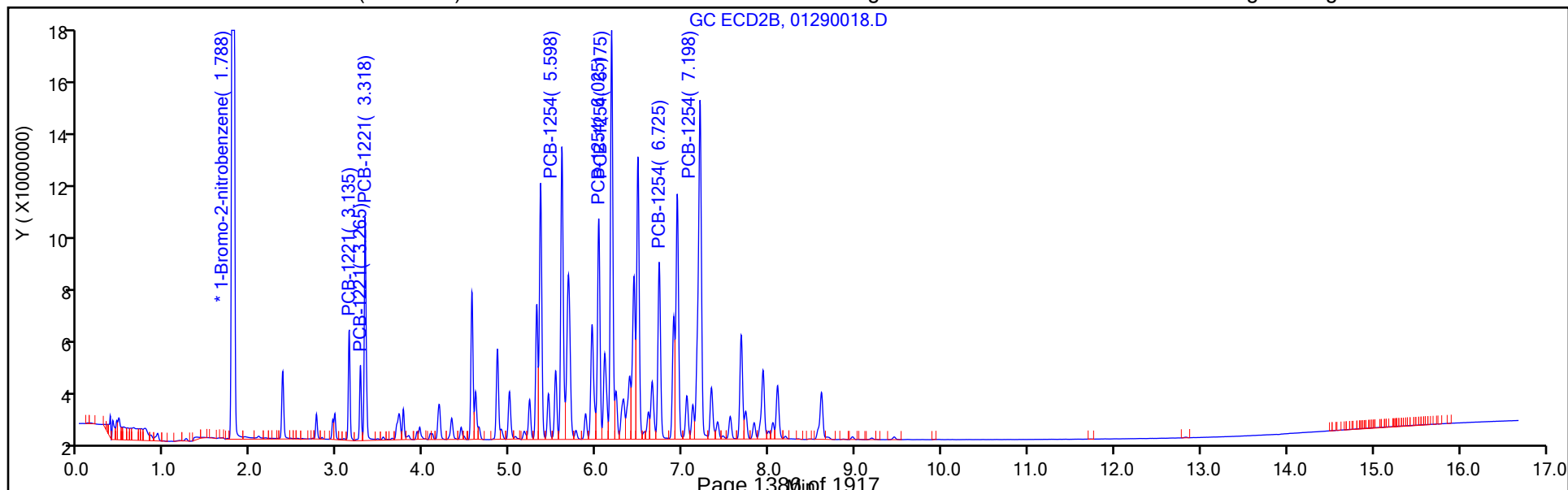
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-445745/18 Calibration Date: 01/29/2019 20:10
 Instrument ID: SGC_J Calib Start Date: 01/29/2019 17:42
 GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/29/2019 19:49
 Lab File ID: 01290018.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1221 Peak 1	Lin2		0.0209		239	250	-4.3	20.0
PCB-1221 Peak 2	Lin1		0.0144		268	250	7.4	20.0
PCB-1221 Peak 3	Lin1		0.0474		247	250	-1.1	20.0
PCB-1254 Peak 1	Lin1		0.0810		247	250	-1.4	20.0
PCB-1254 Peak 2	Lin1		0.0605		244	250	-2.5	20.0
PCB-1254 Peak 3	Lin1		0.1116		240	250	-4.1	20.0
PCB-1254 Peak 4	Lin1		0.0519		268	250	7.1	20.0
PCB-1254 Peak 5	Lin1		0.1223		262	250	4.8	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/18 Calibration Date: 01/29/2019 20:10
Instrument ID: SGC_J Calib Start Date: 01/29/2019 17:42
GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/29/2019 19:49
Lab File ID: 01290018.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1221 Peak 1	3.14	2.88	3.38
PCB-1221 Peak 2	3.27	3.01	3.51
PCB-1221 Peak 3	3.32	3.07	3.57
PCB-1254 Peak 1	5.60	5.35	5.85
PCB-1254 Peak 2	6.03	5.77	6.27
PCB-1254 Peak 3	6.18	5.92	6.42
PCB-1254 Peak 4	6.73	6.47	6.97
PCB-1254 Peak 5	7.20	6.95	7.45

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290018.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 29-Jan-2019 20:10:36 ALS Bottle#: 18 Worklist Smp#: 18
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-018
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:16 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 11:42:37

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.978	1.979	-0.001	19058571	100.0	100.0	
2	1.788	1.789	-0.001	107097769	100.0	100.0	
						RPD =	0.00

3 PCB-1221

1	3.101	3.101	0.000	1991619	250.0	229.3	
1	3.248	3.247	0.001	1181241	250.0	228.5	
1	3.288	3.287	0.001	5463585	250.0	228.7	
Average of Peak Amounts =						228.8	
2	3.135	3.134	0.001	5596575	250.0	239.3	
2	3.265	3.264	0.001	3845210	250.0	268.5	
2	3.318	3.318	0.000	12687564	250.0	247.2	
Average of Peak Amounts =						251.7	
						RPD =	9.52

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290018.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

9 PCB-1254

1	5.544	5.544	0.000	9986534	250.0	245.0	
1	5.884	5.887	-0.003	6855426	250.0	228.0	
1	6.044	6.044	0.000	13001483	250.0	232.4	
1	6.411	6.411	0.000	9197007	250.0	235.7	
1	7.034	7.037	-0.003	11966810	250.0	247.6	

Average of Peak Amounts = 237.8

2	5.598	5.598	0.000	21693422	250.0	246.6	
2	6.025	6.024	0.001	16207339	250.0	243.7	
2	6.175	6.174	0.001	29870350	250.0	239.7	
2	6.725	6.724	0.001	13887779	250.0	267.7	
2	7.198	7.198	0.000	32755505	250.0	262.0	

Average of Peak Amounts = 251.9

RPD = 5.79

Reagents:

AR_2154_ICV_00015

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290018.D

Injection Date: 29-Jan-2019 20:10:36

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 18

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

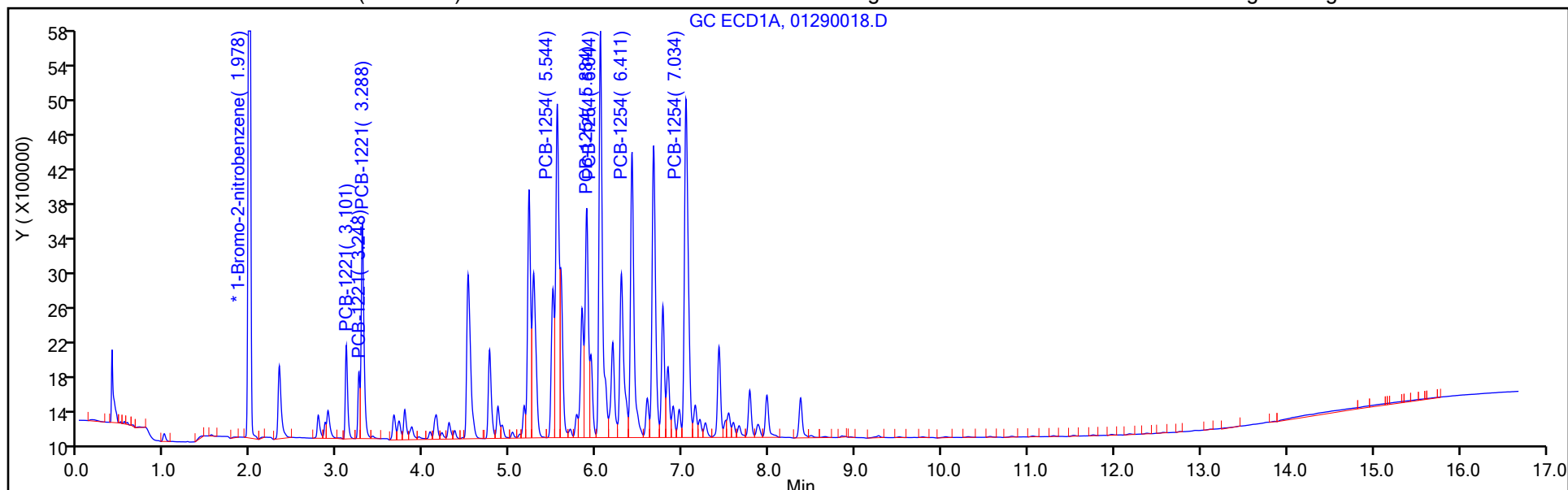
ALS Bottle#: 18

Method: 8082_J

Limit Group: GCSV - 8082 - IS

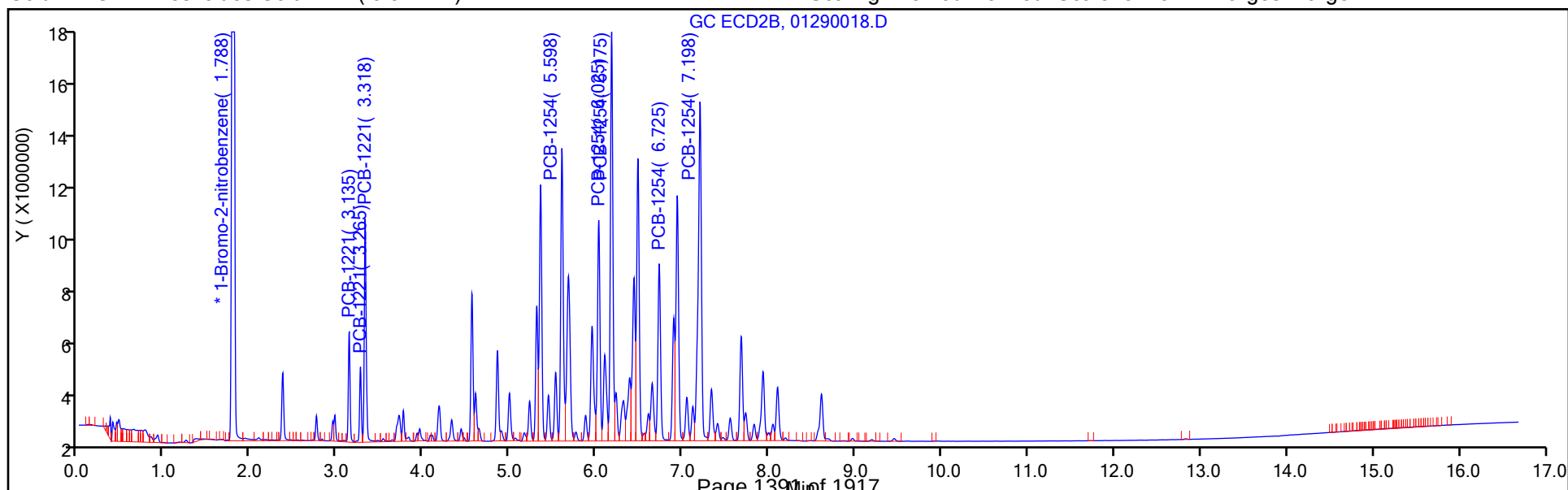
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-445745/26 Calibration Date: 01/29/2019 22:59
 Instrument ID: SGC_J Calib Start Date: 01/29/2019 20:31
 GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/29/2019 22:38
 Lab File ID: 01290026.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin1		0.0868		266	250	6.4	20.0
PCB-1016 Peak 2	Lin1		0.1862		255	250	2.0	20.0
PCB-1016 Peak 3	Lin1		0.3016		223	250	-11.0	20.0
PCB-1016 Peak 4	Lin1		0.1352		247	250	-1.0	20.0
PCB-1016 Peak 5	Lin1		0.1496		256	250	2.5	20.0
PCB-1260 Peak 1	Lin1		0.2221		270	250	7.8	20.0
PCB-1260 Peak 2	Lin1		0.1304		283	250	13.0	20.0
PCB-1260 Peak 3	Lin1		0.1658		230	250	-8.0	20.0
PCB-1260 Peak 4	Lin1		0.3524		220	250	-12.1	20.0
PCB-1260 Peak 5	Lin1		0.1548		230	250	-8.1	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/26 Calibration Date: 01/29/2019 22:59
Instrument ID: SGC_J Calib Start Date: 01/29/2019 20:31
GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/29/2019 22:38
Lab File ID: 01290026.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.29	3.04	3.54
PCB-1016 Peak 2	3.65	3.40	3.90
PCB-1016 Peak 3	4.14	3.89	4.39
PCB-1016 Peak 4	4.29	4.04	4.54
PCB-1016 Peak 5	4.76	4.51	5.01
PCB-1260 Peak 1	6.29	6.04	6.54
PCB-1260 Peak 2	6.83	6.58	7.08
PCB-1260 Peak 3	7.53	7.28	7.78
PCB-1260 Peak 4	7.97	7.73	8.23
PCB-1260 Peak 5	8.36	8.12	8.62

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290026.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 29-Jan-2019 22:59:07 ALS Bottle#: 26 Worklist Smp#: 26
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-026
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:00 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:36:56

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	19116825	100.0	100.0	
2	1.790	1.789	0.001	106734485	100.0	100.0	

RPD = 0.00

1 PCB-1016

1	3.286	3.286	0.000	4146191	250.0	266.1	
1	3.653	3.652	0.001	8900489	250.0	255.1	
1	4.143	4.142	0.001	14415346	250.0	222.6	
1	4.290	4.292	-0.002	6459210	250.0	247.4	
1	4.763	4.762	0.001	7151240	250.0	256.3	
Average of Peak Amounts =						249.5	
2	3.713	3.712	0.001	17521396	250.0	243.3	
2	4.176	4.176	0.000	37138015	250.0	238.0	
2	4.320	4.322	-0.002	16127839	250.0	242.7	
2	4.556	4.556	0.000	8172222	250.0	228.9	
2	4.850	4.852	-0.002	12903521	250.0	254.0	
Average of Peak Amounts =						241.4	

RPD = 3.30

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290026.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.286	6.289	-0.003	10613825	250.0	269.5	
1	6.826	6.829	-0.003	6231743	250.0	282.5	
1	7.533	7.532	0.001	7921591	250.0	229.9	
1	7.973	7.976	-0.003	16841673	250.0	219.7	
1	8.363	8.366	-0.003	7399485	250.0	229.9	

Average of Peak Amounts = 246.3

2	6.726	6.726	0.000	27602477	250.0	263.8	
2	7.196	7.196	0.000	41150915	250.0	274.0	
2	7.330	7.332	-0.002	18634642	250.0	220.5	
2	8.096	8.099	-0.003	43570058	250.0	222.6	
2	8.603	8.606	-0.003	31704282	250.0	224.2	

Average of Peak Amounts = 241.0

RPD = 2.16

Reagents:

AR_1660_ICV_00015

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:03

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290026.D

Injection Date: 29-Jan-2019 22:59:07

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 26

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

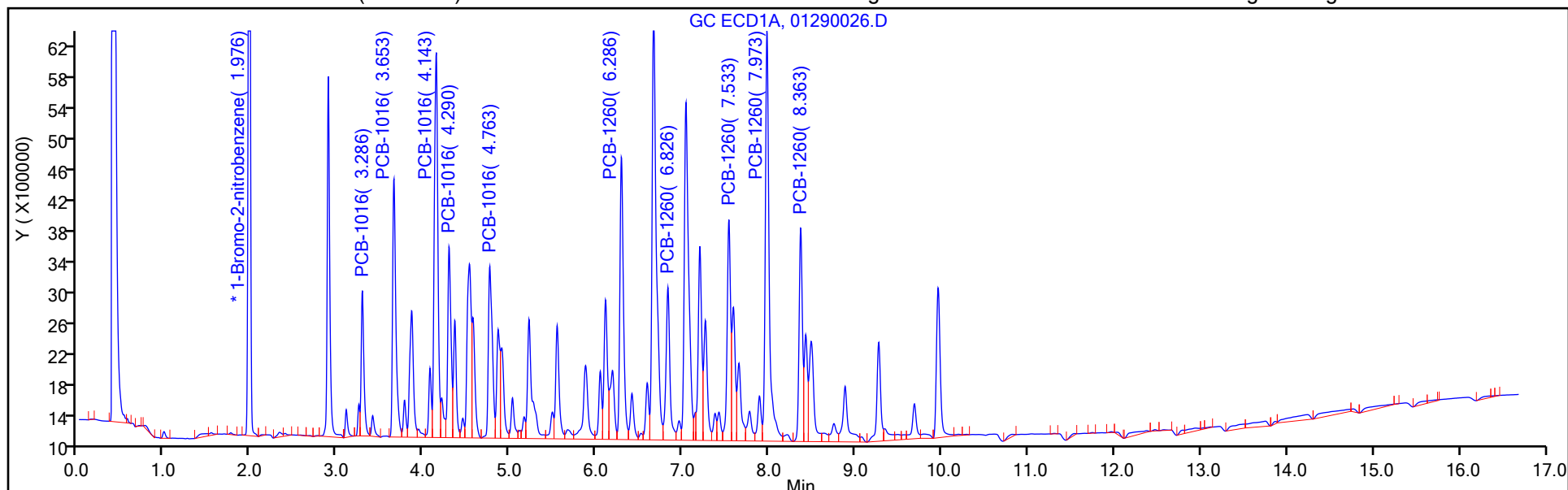
ALS Bottle#: 26

Method: 8082_J

Limit Group: GCSV - 8082 - IS

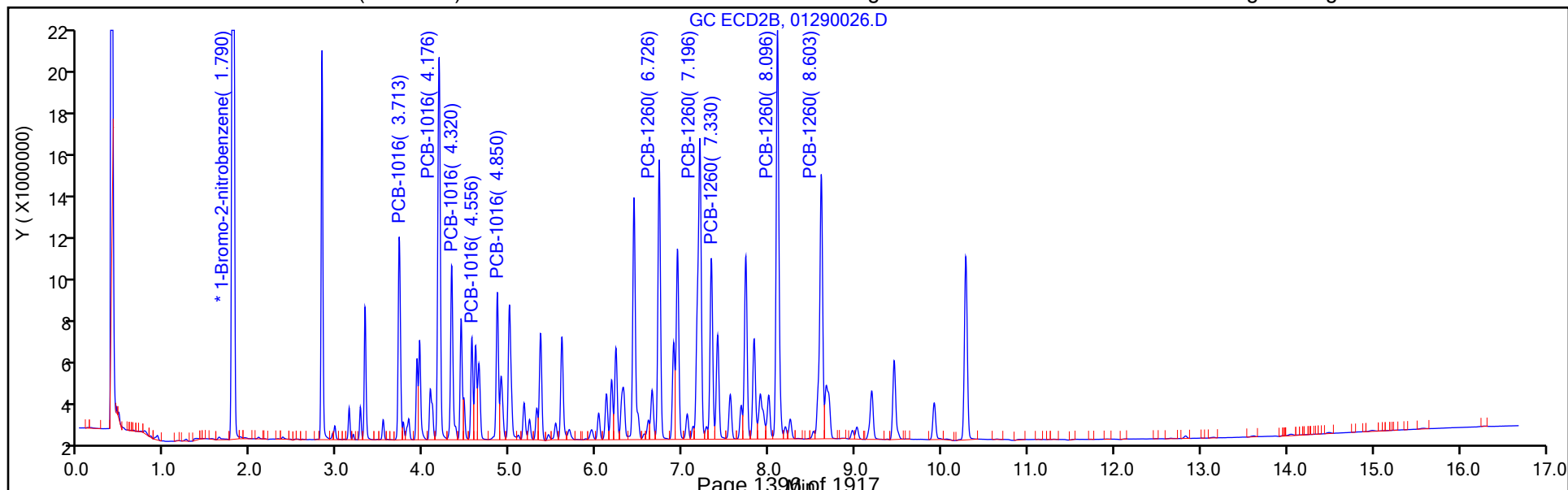
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-445745/26 Calibration Date: 01/29/2019 22:59
 Instrument ID: SGC_J Calib Start Date: 01/29/2019 20:31
 GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/29/2019 22:38
 Lab File ID: 01290026.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin2		0.0657		243	250	-2.7	20.0
PCB-1016 Peak 2	Lin2		0.1392		238	250	-4.8	20.0
PCB-1016 Peak 3	Lin2		0.0604		243	250	-2.9	20.0
PCB-1016 Peak 4	Qual		0.0306		229	250	-8.4	20.0
PCB-1016 Peak 5	Qual		0.0484		254	250	1.6	20.0
PCB-1260 Peak 1	Lin2		0.1034		264	250	5.5	20.0
PCB-1260 Peak 2	Lin2		0.1542		274	250	9.6	20.0
PCB-1260 Peak 3	Lin2		0.0698		221	250	-11.8	20.0
PCB-1260 Peak 4	Lin2		0.1633		223	250	-10.9	20.0
PCB-1260 Peak 5	Lin2		0.1188		224	250	-10.3	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/26 Calibration Date: 01/29/2019 22:59
Instrument ID: SGC_J Calib Start Date: 01/29/2019 20:31
GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/29/2019 22:38
Lab File ID: 01290026.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.71	3.46	3.96
PCB-1016 Peak 2	4.18	3.93	4.43
PCB-1016 Peak 3	4.32	4.07	4.57
PCB-1016 Peak 4	4.56	4.31	4.81
PCB-1016 Peak 5	4.85	4.60	5.10
PCB-1260 Peak 1	6.73	6.48	6.98
PCB-1260 Peak 2	7.20	6.95	7.45
PCB-1260 Peak 3	7.33	7.08	7.58
PCB-1260 Peak 4	8.10	7.85	8.35
PCB-1260 Peak 5	8.60	8.36	8.86

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290026.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 29-Jan-2019 22:59:07 ALS Bottle#: 26 Worklist Smp#: 26
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-026
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:59:00 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:36:56

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.976	1.979	-0.003	19116825	100.0	100.0
2	1.790	1.789	0.001	106734485	100.0	100.0

RPD = 0.00

1 PCB-1016

1	3.286	3.286	0.000	4146191	250.0	266.1
1	3.653	3.652	0.001	8900489	250.0	255.1
1	4.143	4.142	0.001	14415346	250.0	222.6
1	4.290	4.292	-0.002	6459210	250.0	247.4
1	4.763	4.762	0.001	7151240	250.0	256.3
Average of Peak Amounts =						249.5
2	3.713	3.712	0.001	17521396	250.0	243.3
2	4.176	4.176	0.000	37138015	250.0	238.0
2	4.320	4.322	-0.002	16127839	250.0	242.7
2	4.556	4.556	0.000	8172222	250.0	228.9
2	4.850	4.852	-0.002	12903521	250.0	254.0
Average of Peak Amounts =						241.4
						RPD = 3.30

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290026.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

12 PCB-1260

1	6.286	6.289	-0.003	10613825	250.0	269.5	
1	6.826	6.829	-0.003	6231743	250.0	282.5	
1	7.533	7.532	0.001	7921591	250.0	229.9	
1	7.973	7.976	-0.003	16841673	250.0	219.7	
1	8.363	8.366	-0.003	7399485	250.0	229.9	

Average of Peak Amounts = 246.3

2	6.726	6.726	0.000	27602477	250.0	263.8	
2	7.196	7.196	0.000	41150915	250.0	274.0	
2	7.330	7.332	-0.002	18634642	250.0	220.5	
2	8.096	8.099	-0.003	43570058	250.0	222.6	
2	8.603	8.606	-0.003	31704282	250.0	224.2	

Average of Peak Amounts = 241.0

RPD = 2.16

Reagents:

AR_1660_ICV_00015

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:59:03

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290026.D

Injection Date: 29-Jan-2019 22:59:07

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 26

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

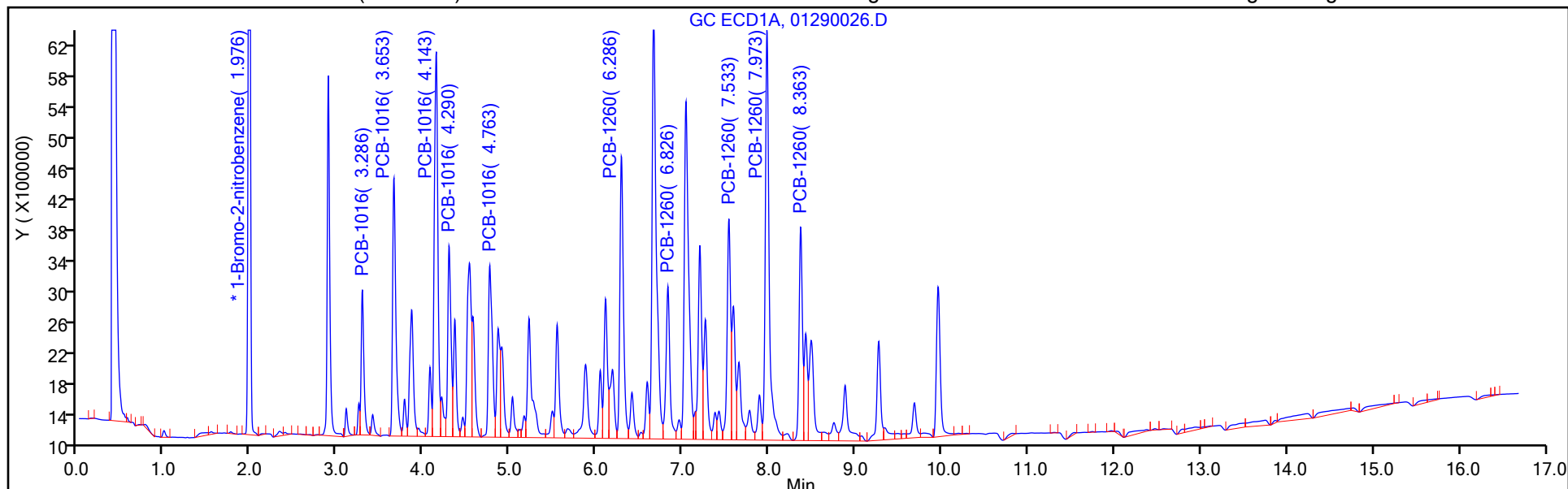
ALS Bottle#: 26

Method: 8082_J

Limit Group: GCSV - 8082 - IS

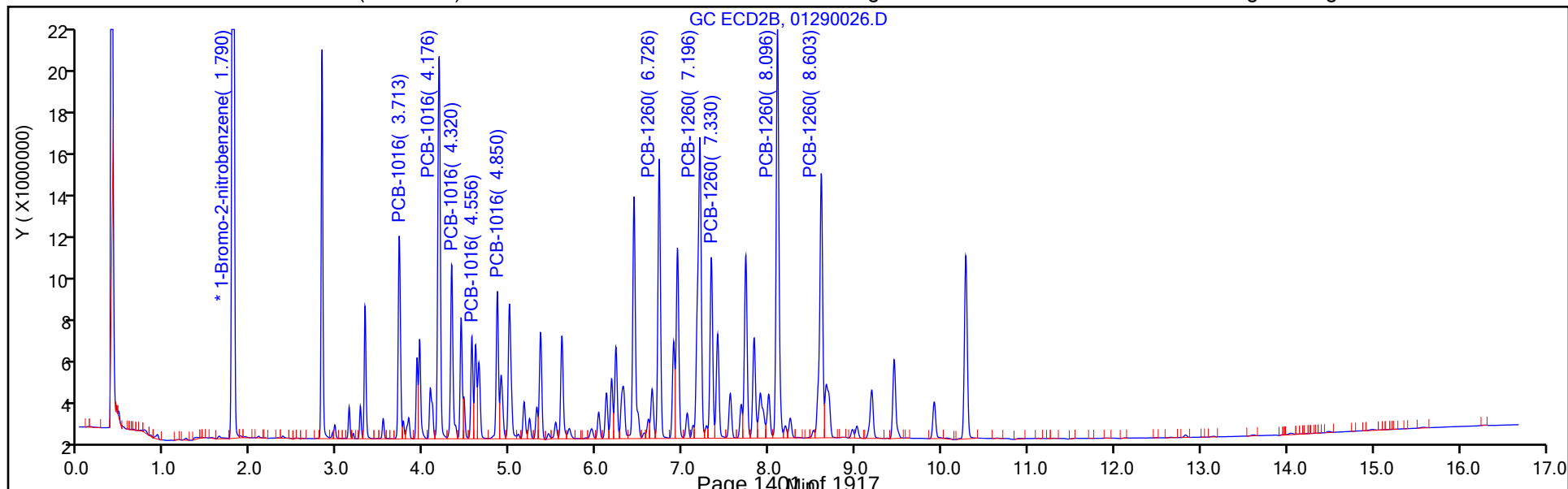
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-445745/34 Calibration Date: 01/30/2019 01:48
 Instrument ID: SGC_J Calib Start Date: 01/29/2019 23:20
 GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/30/2019 01:26
 Lab File ID: 01290034.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1232 Peak 1	Lin1		0.0956		242	250	-3.4	20.0
PCB-1232 Peak 2	Lin1		0.0943		256	250	2.3	20.0
PCB-1232 Peak 3	Lin1		0.1292		233	250	-6.9	20.0
PCB-1232 Peak 4	Lin1		0.0639		255	250	2.0	20.0
PCB-1232 Peak 5	Lin1		0.0692		277	250	10.9	20.0
PCB-1262 Peak 1	Lin1		0.3470		264	250	5.7	20.0
PCB-1262 Peak 2	Lin1		0.2506		216	250	-13.7	20.0
PCB-1262 Peak 3	Lin1		0.2306		225	250	-10.0	20.0
PCB-1262 Peak 4	Lin1		0.4843		235	250	-5.9	20.0
PCB-1262 Peak 5	Lin1		0.1437		244	250	-2.5	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/34 Calibration Date: 01/30/2019 01:48
Instrument ID: SGC_J Calib Start Date: 01/29/2019 23:20
GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/30/2019 01:26
Lab File ID: 01290034.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1232 Peak 1	3.29	3.04	3.54
PCB-1232 Peak 2	3.65	3.40	3.90
PCB-1232 Peak 3	4.14	3.89	4.39
PCB-1232 Peak 4	4.29	4.04	4.54
PCB-1232 Peak 5	4.76	4.51	5.01
PCB-1262 Peak 1	6.66	6.42	6.92
PCB-1262 Peak 2	7.20	6.95	7.45
PCB-1262 Peak 3	7.53	7.29	7.79
PCB-1262 Peak 4	7.98	7.73	8.23
PCB-1262 Peak 5	8.37	8.12	8.62

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290034.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 30-Jan-2019 01:48:01 ALS Bottle#: 34 Worklist Smp#: 34
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-034
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:45 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:48:47

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.974	0.001	17204313	100.0	100.0
2	1.789	1.788	0.001	95342219	100.0	100.0

RPD = 0.00

7 PCB-1232

M

1	3.285	3.285	0.000	4112582	250.0	241.6
1	3.652	3.652	0.000	4053559	250.0	255.8
1	4.142	4.142	0.000	5558688	250.0	232.9
1	4.289	4.292	-0.003	2748024	250.0	254.9
1	4.762	4.762	0.000	2974865	250.0	277.1

Average of Peak Amounts = 252.4

2	3.319	3.319	0.000	9320032	250.0	244.7	M
2	3.712	3.712	0.000	8369249	250.0	260.6	M
2	4.176	4.176	0.000	15713368	250.0	246.3	M
2	4.322	4.322	0.000	7466479	250.0	261.0	M
2	4.849	4.852	-0.003	5685674	250.0	250.9	M

Average of Peak Amounts = 252.7

RPD = 0.10

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290034.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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5 PCB-1262

1	6.662	6.665	-0.003	14923577	250.0	264.1	
1	7.199	7.202	-0.003	10776903	250.0	215.7	
1	7.532	7.535	-0.003	9916190	250.0	225.1	
1	7.975	7.975	0.000	20830226	250.0	235.2	
1	8.365	8.365	0.000	6181309	250.0	243.8	

Average of Peak Amounts = 236.8

2	6.726	6.726	0.000	20537264	250.0	250.5	
2	7.329	7.329	0.000	26147960	250.0	223.4	
2	7.729	7.729	0.000	24455707	250.0	217.4	
2	8.096	8.096	0.000	52007383	250.0	238.6	
2	8.602	8.602	0.000	37621729	250.0	242.5	

Average of Peak Amounts = 234.5

RPD = 0.99

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_ICV_00014

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC J\20190128-78470.b\01290034.D

Injection Date: 30-Jan-2019 01:48:01

Instrument ID: SGC J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 34

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

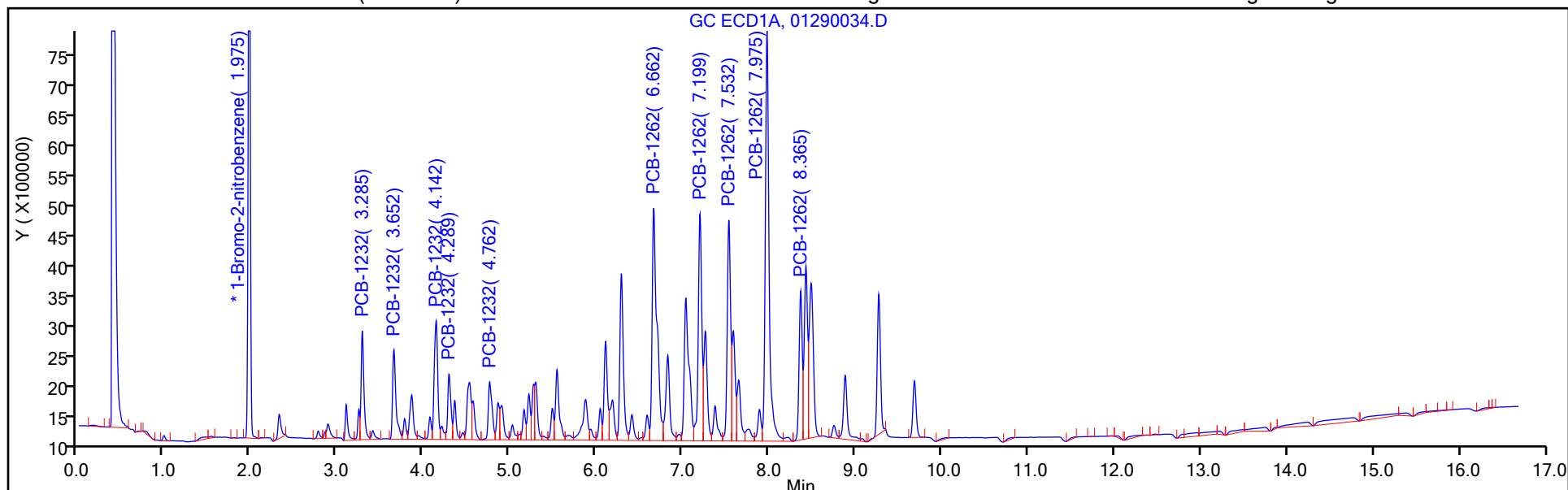
ALS Bottle#: 34

Method: 8082 J

Limit Group: GCSV - 8082 - IS

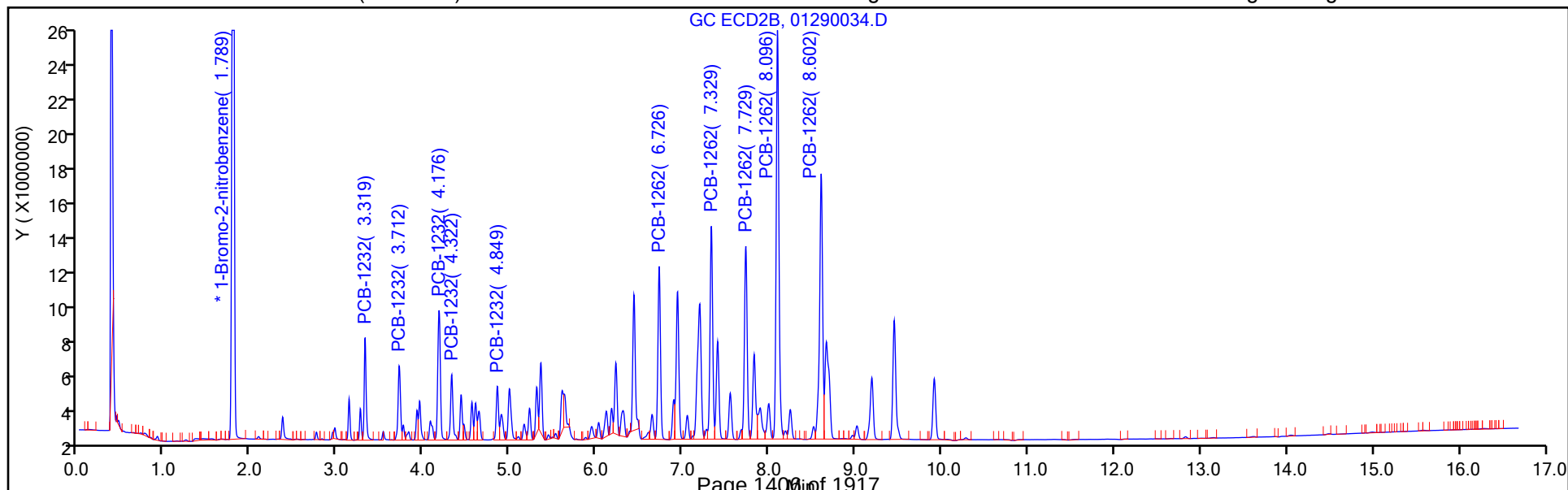
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-445745/34 Calibration Date: 01/30/2019 01:48
 Instrument ID: SGC_J Calib Start Date: 01/29/2019 23:20
 GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/30/2019 01:26
 Lab File ID: 01290034.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1232 Peak 1	Lin1		0.0391		245	250	-2.1	20.0
PCB-1232 Peak 2	Lin1		0.0351		261	250	4.2	20.0
PCB-1232 Peak 3	Lin1		0.0659		246	250	-1.5	20.0
PCB-1232 Peak 4	Lin1		0.0313		261	250	4.4	20.0
PCB-1232 Peak 5	Qual		0.0239		251	250	0.3	20.0
PCB-1262 Peak 1	Lin1		0.0862		251	250	0.2	20.0
PCB-1262 Peak 2	Lin1		0.1097		223	250	-10.6	20.0
PCB-1262 Peak 3	Lin1		0.1026		217	250	-13.0	20.0
PCB-1262 Peak 4	Lin1		0.2182		239	250	-4.5	20.0
PCB-1262 Peak 5	Lin1		0.1578		242	250	-3.0	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/34 Calibration Date: 01/30/2019 01:48
Instrument ID: SGC_J Calib Start Date: 01/29/2019 23:20
GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/30/2019 01:26
Lab File ID: 01290034.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1232 Peak 1	3.32	3.07	3.57
PCB-1232 Peak 2	3.71	3.46	3.96
PCB-1232 Peak 3	4.18	3.93	4.43
PCB-1232 Peak 4	4.32	4.07	4.57
PCB-1232 Peak 5	4.85	4.60	5.10
PCB-1262 Peak 1	6.73	6.48	6.98
PCB-1262 Peak 2	7.33	7.08	7.58
PCB-1262 Peak 3	7.73	7.48	7.98
PCB-1262 Peak 4	8.10	7.85	8.35
PCB-1262 Peak 5	8.60	8.35	8.85

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290034.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 30-Jan-2019 01:48:01 ALS Bottle#: 34 Worklist Smp#: 34
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-034
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:58:45 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:48:47

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.975	1.974	0.001	17204313	100.0	100.0	
2	1.789	1.788	0.001	95342219	100.0	100.0	

RPD = 0.00

7 PCB-1232

M

1	3.285	3.285	0.000	4112582	250.0	241.6	
1	3.652	3.652	0.000	4053559	250.0	255.8	
1	4.142	4.142	0.000	5558688	250.0	232.9	
1	4.289	4.292	-0.003	2748024	250.0	254.9	
1	4.762	4.762	0.000	2974865	250.0	277.1	

Average of Peak Amounts =

252.4

2	3.319	3.319	0.000	9320032	250.0	244.7	M
2	3.712	3.712	0.000	8369249	250.0	260.6	M
2	4.176	4.176	0.000	15713368	250.0	246.3	M
2	4.322	4.322	0.000	7466479	250.0	261.0	M
2	4.849	4.852	-0.003	5685674	250.0	250.9	M

Average of Peak Amounts =

252.7

RPD = 0.10

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290034.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

5 PCB-1262

1	6.662	6.665	-0.003	14923577	250.0	264.1	
1	7.199	7.202	-0.003	10776903	250.0	215.7	
1	7.532	7.535	-0.003	9916190	250.0	225.1	
1	7.975	7.975	0.000	20830226	250.0	235.2	
1	8.365	8.365	0.000	6181309	250.0	243.8	

Average of Peak Amounts = 236.8

2	6.726	6.726	0.000	20537264	250.0	250.5	
2	7.329	7.329	0.000	26147960	250.0	223.4	
2	7.729	7.729	0.000	24455707	250.0	217.4	
2	8.096	8.096	0.000	52007383	250.0	238.6	
2	8.602	8.602	0.000	37621729	250.0	242.5	

Average of Peak Amounts = 234.5

RPD = 0.99

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_3262_ICV_00014

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290034.D

Injection Date: 30-Jan-2019 01:48:01

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 34

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

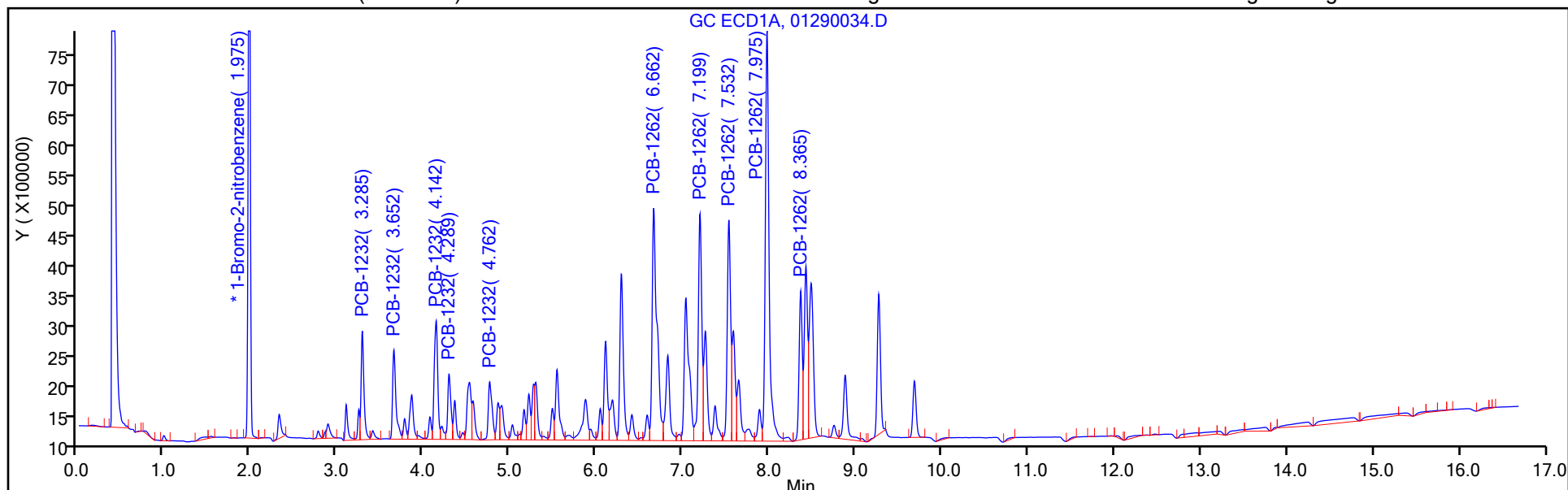
ALS Bottle#: 34

Method: 8082_J

Limit Group: GCSV - 8082 - IS

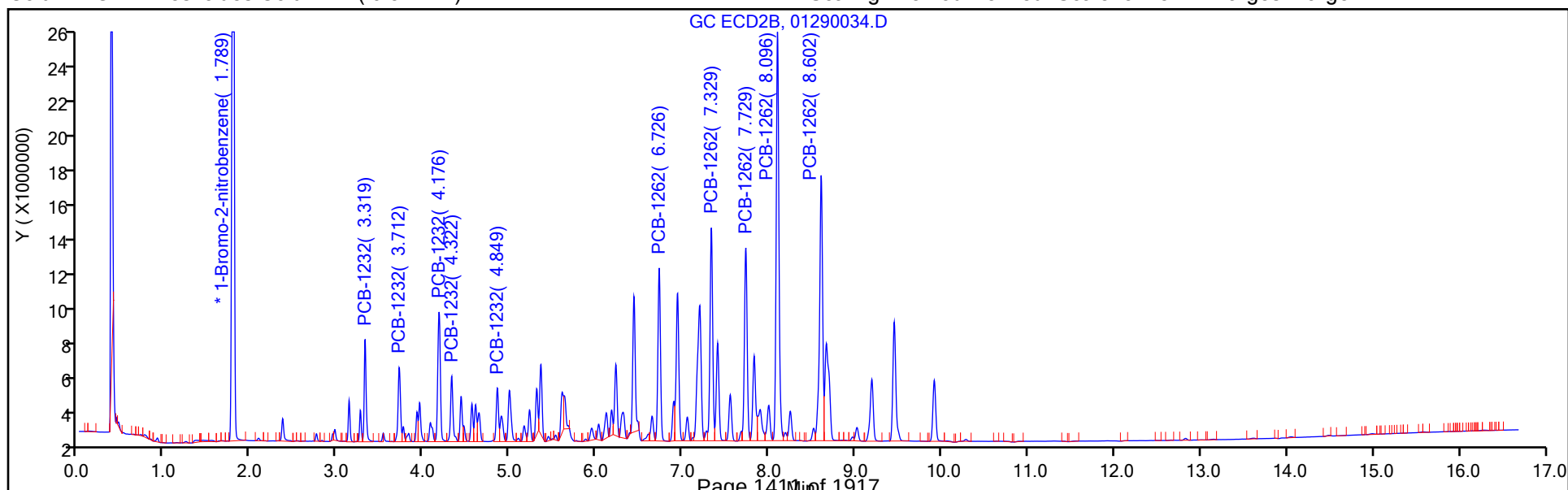
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290034.D

Injection Date: 30-Jan-2019 01:48:01

Instrument ID: SGC_J

Lims ID: ICV

Client ID:

Operator ID: TEM

ALS Bottle#: 34

Worklist Smp#: 34

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

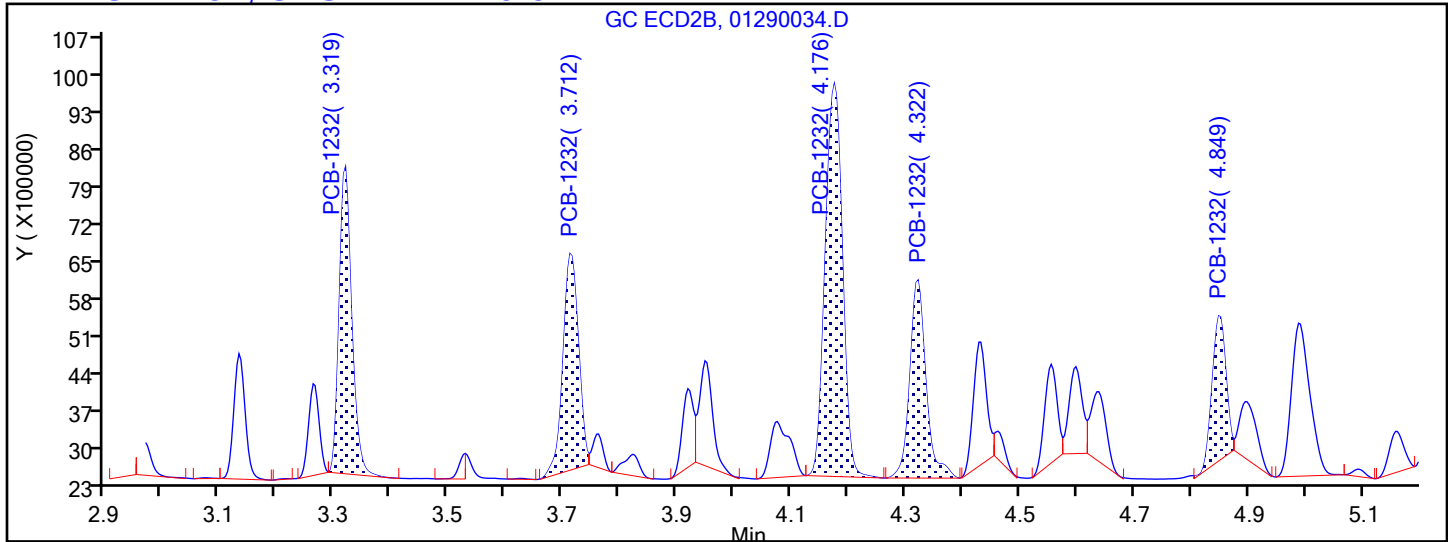
Method: 8082_J

Limit Group: GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

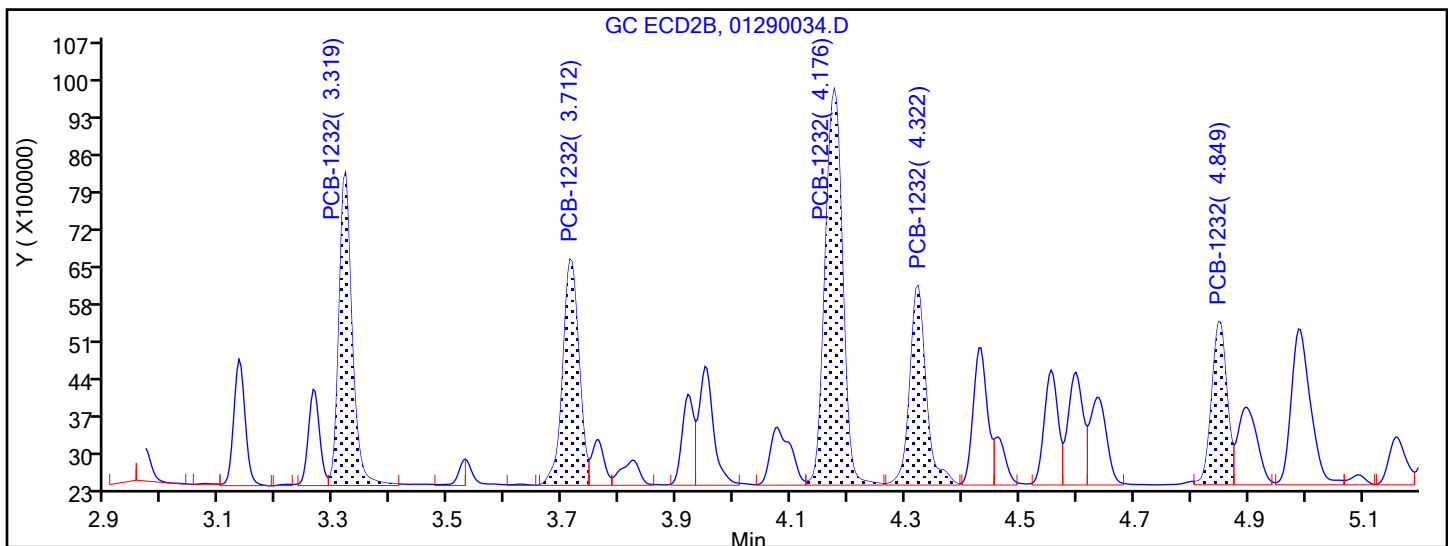
GC ECD2B

7 PCB-1232, CAS: 11141-16-5



Processing Integration Results

3.319	Response = 8712521
3.712	Response = 7624144
4.176	Response = 15310272
4.322	Response = 7274213
4.849	Response = 4532383



Manual Integration Results

3.319	Response = 9320032	M
3.712	Response = 8369249	M
4.176	Response = 15713368	M
4.322	Response = 7466479	M
4.849	Response = 5685674	M

Reviewer: mooret, 30-Jan-2019 14:48:30

Audit Action: Assigned New Baseline

Audit Reason: Baseline Smoothing
Page 1412 of 1917

FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-445745/42 Calibration Date: 01/30/2019 04:36
 Instrument ID: SGC_J Calib Start Date: 01/30/2019 02:09
 GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/30/2019 04:15
 Lab File ID: 01290042.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1242 Peak 1	Lin1		0.1482		240	250	-4.1	20.0
PCB-1242 Peak 2	Lin1		0.2344		221	250	-11.6	20.0
PCB-1242 Peak 3	Lin1		0.1219		241	250	-3.7	20.0
PCB-1242 Peak 4	Lin1		0.0614		210	250	-16.1	20.0
PCB-1242 Peak 5	Lin1		0.0880		206	250	-17.6	20.0
PCB-1268 Peak 1	Lin1		0.4901		227	250	-9.3	20.0
PCB-1268 Peak 2	Lin1		0.5191		226	250	-9.6	20.0
PCB-1268 Peak 3	Lin1		0.4558		254	250	1.7	20.0
PCB-1268 Peak 4	Lin1		0.1189		221	250	-11.5	20.0
PCB-1268 Peak 5	Lin1		1.001		203	250	-18.9	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: ICV 280-445745/42 Calibration Date: 01/30/2019 04:36
Instrument ID: SGC_J Calib Start Date: 01/30/2019 02:09
GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/30/2019 04:15
Lab File ID: 01290042.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1242 Peak 1	3.65	3.40	3.90
PCB-1242 Peak 2	4.14	3.89	4.39
PCB-1242 Peak 3	4.76	4.51	5.01
PCB-1242 Peak 4	5.27	5.03	5.53
PCB-1242 Peak 5	5.29	5.05	5.55
PCB-1268 Peak 1	8.43	8.18	8.68
PCB-1268 Peak 2	8.48	8.23	8.73
PCB-1268 Peak 3	8.75	8.50	9.00
PCB-1268 Peak 4	8.87	8.63	9.13
PCB-1268 Peak 5	9.68	9.44	9.94

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290042.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 30-Jan-2019 04:36:42 ALS Bottle#: 42 Worklist Smp#: 42
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-042
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:57:53 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:56:39

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.975	0.002	19419783	100.0	100.0	
2	1.790	1.789	0.001	105092238	100.0	100.0	

RPD = 0.00

10 PCB-1242

1	3.654	3.652	0.002	7194507	250.0	239.9	
1	4.144	4.142	0.002	11382148	250.0	221.0	
1	4.760	4.762	-0.002	5919376	250.0	240.7	
1	5.274	5.279	-0.005	2980752	250.0	209.7	
1	5.294	5.295	-0.001	4272177	250.0	206.1	
Average of Peak Amounts =						223.5	
2	3.714	3.712	0.002	14370433	250.0	232.7	
2	4.174	4.175	-0.001	29861019	250.0	230.6	
2	4.320	4.322	-0.002	13217105	250.0	231.2	
2	4.850	4.849	0.001	10952569	250.0	230.9	
2	4.990	4.989	0.001	12525766	250.0	228.9	
Average of Peak Amounts =						230.9	
						RPD = 3.25	

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290042.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.427	8.425	0.002	23791900	250.0	226.7	
1	8.477	8.479	-0.002	25201296	250.0	226.0	
1	8.754	8.752	0.002	22127452	250.0	254.2	
1	8.874	8.875	-0.001	5773559	250.0	221.3	
1	9.684	9.685	-0.001	48621838	250.0	202.8	

Average of Peak Amounts = 226.2

2	8.600	8.599	0.001	65281234	250.0	234.5	
2	8.660	8.662	-0.002	49881751	250.0	193.7	
2	9.017	9.015	0.002	57509315	250.0	262.4	
2	9.157	9.159	-0.002	15971423	250.0	231.7	
2	9.914	9.912	0.002	139727299	250.0	215.1	

Average of Peak Amounts = 227.5

RPD = 0.56

Reagents:

AR_4268_ICV_00014

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:33

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290042.D

Injection Date: 30-Jan-2019 04:36:42

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 42

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

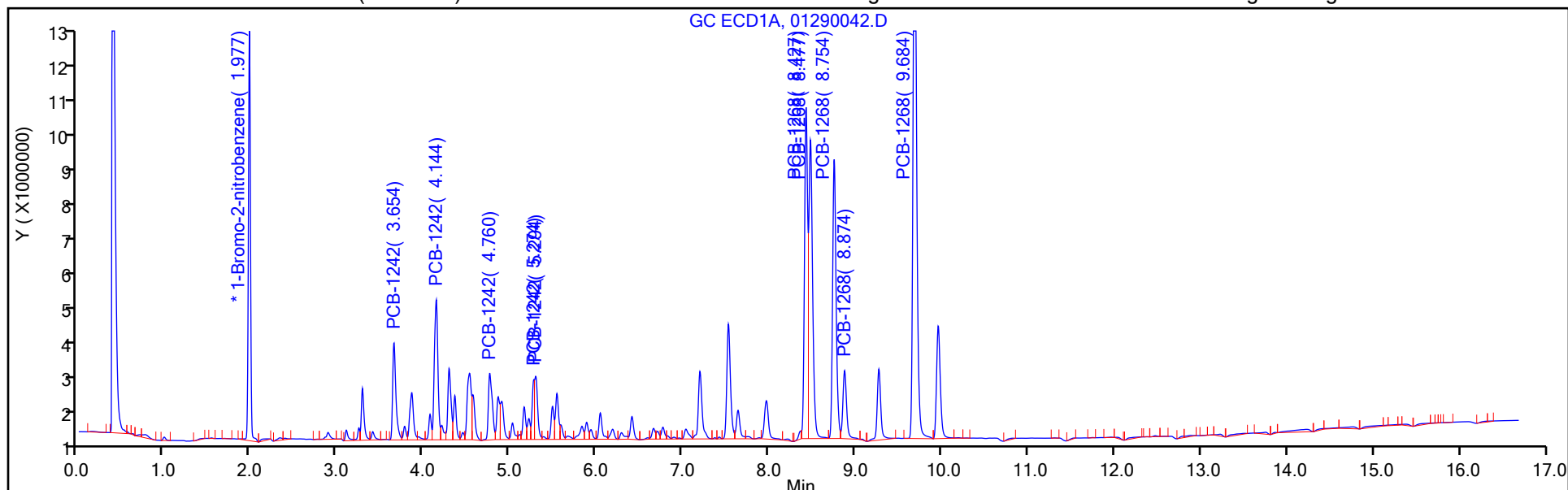
ALS Bottle#: 42

Method: 8082_J

Limit Group: GCSV - 8082 - IS

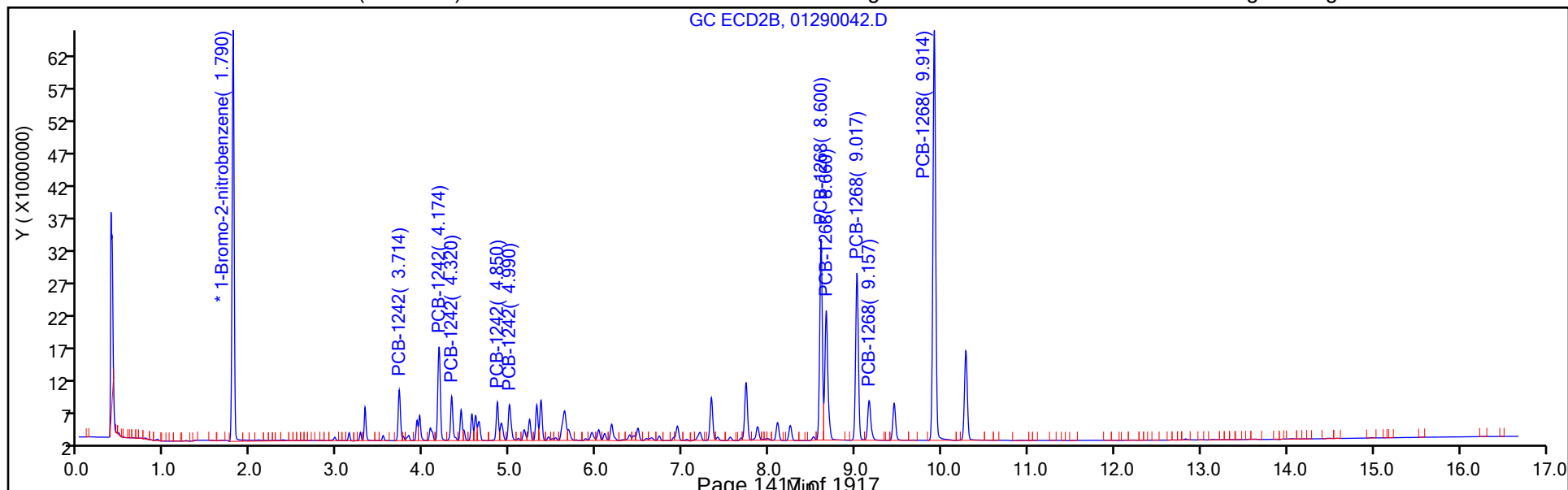
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-445745/42 Calibration Date: 01/30/2019 04:36
 Instrument ID: SGC_J Calib Start Date: 01/30/2019 02:09
 GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/30/2019 04:15
 Lab File ID: 01290042.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1242 Peak 1	Lin2		0.0547		233	250	-6.9	20.0
PCB-1242 Peak 2	Lin1		0.1137		231	250	-7.8	20.0
PCB-1242 Peak 3	Lin2		0.0503		231	250	-7.5	20.0
PCB-1242 Peak 4	Qual		0.0417		231	250	-7.6	20.0
PCB-1242 Peak 5	Lin2		0.0477		229	250	-8.4	20.0
PCB-1268 Peak 1	Lin1		0.2485		235	250	-6.2	20.0
PCB-1268 Peak 2	Lin1		0.1899		194	250	-22.5*	20.0
PCB-1268 Peak 3	Lin1		0.2189		262	250	5.0	20.0
PCB-1268 Peak 4	Lin1		0.0608		232	250	-7.3	20.0
PCB-1268 Peak 5	Lin1		0.5318		215	250	-14.0	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: ICV 280-445745/42 Calibration Date: 01/30/2019 04:36
 Instrument ID: SGC_J Calib Start Date: 01/30/2019 02:09
 GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/30/2019 04:15
 Lab File ID: 01290042.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1242 Peak 1	3.71	3.46	3.96
PCB-1242 Peak 2	4.17	3.93	4.43
PCB-1242 Peak 3	4.32	4.07	4.57
PCB-1242 Peak 4	4.85	4.60	5.10
PCB-1242 Peak 5	4.99	4.74	5.24
PCB-1268 Peak 1	8.60	8.35	8.85
PCB-1268 Peak 2	8.66	8.41	8.91
PCB-1268 Peak 3	9.02	8.77	9.27
PCB-1268 Peak 4	9.16	8.91	9.41
PCB-1268 Peak 5	9.91	9.66	10.16

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290042.D
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 30-Jan-2019 04:36:42 ALS Bottle#: 42 Worklist Smp#: 42
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: 280-0078470-042
 Operator ID: TEM Instrument ID: SGC_J
 Sublist:

Method: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 30-Jan-2019 14:57:53 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0315

First Level Reviewer: mooret

Date: 30-Jan-2019 14:56:39

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.977	1.975	0.002	19419783	100.0	100.0	
2	1.790	1.789	0.001	105092238	100.0	100.0	
						RPD = 0.00	

10 PCB-1242

1	3.654	3.652	0.002	7194507	250.0	239.9	
1	4.144	4.142	0.002	11382148	250.0	221.0	
1	4.760	4.762	-0.002	5919376	250.0	240.7	
1	5.274	5.279	-0.005	2980752	250.0	209.7	
1	5.294	5.295	-0.001	4272177	250.0	206.1	
Average of Peak Amounts =						223.5	
2	3.714	3.712	0.002	14370433	250.0	232.7	
2	4.174	4.175	-0.001	29861019	250.0	230.6	
2	4.320	4.322	-0.002	13217105	250.0	231.2	
2	4.850	4.849	0.001	10952569	250.0	230.9	
2	4.990	4.989	0.001	12525766	250.0	228.9	
Average of Peak Amounts =						230.9	
						RPD = 3.25	

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290042.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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13 PCB-1268

1	8.427	8.425	0.002	23791900	250.0	226.7	
1	8.477	8.479	-0.002	25201296	250.0	226.0	
1	8.754	8.752	0.002	22127452	250.0	254.2	
1	8.874	8.875	-0.001	5773559	250.0	221.3	
1	9.684	9.685	-0.001	48621838	250.0	202.8	

Average of Peak Amounts = 226.2

2	8.600	8.599	0.001	65281234	250.0	234.5	
2	8.660	8.662	-0.002	49881751	250.0	193.7	
2	9.017	9.015	0.002	57509315	250.0	262.4	
2	9.157	9.159	-0.002	15971423	250.0	231.7	
2	9.914	9.912	0.002	139727299	250.0	215.1	

Average of Peak Amounts = 227.5

RPD = 0.56

Reagents:

AR_4268_ICV_00014

Amount Added: 1.00

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 30-Jan-2019 14:58:33

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290042.D

Injection Date: 30-Jan-2019 04:36:42

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: ICV

Worklist Smp#: 42

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

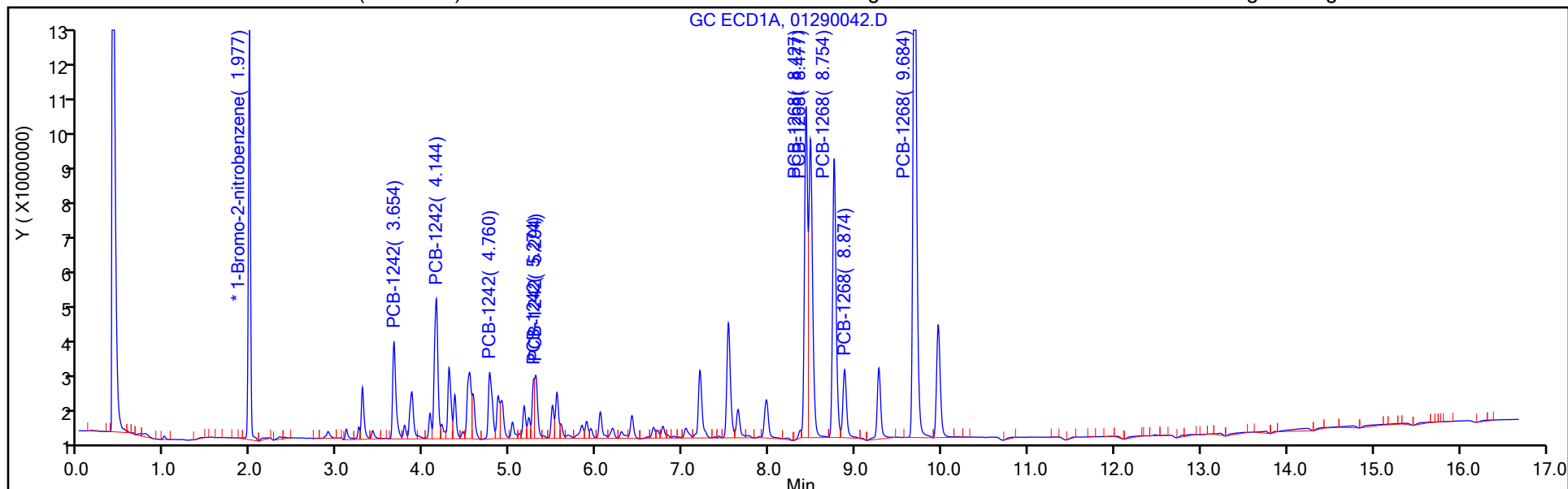
ALS Bottle#: 42

Method: 8082_J

Limit Group: GCSV - 8082 - IS

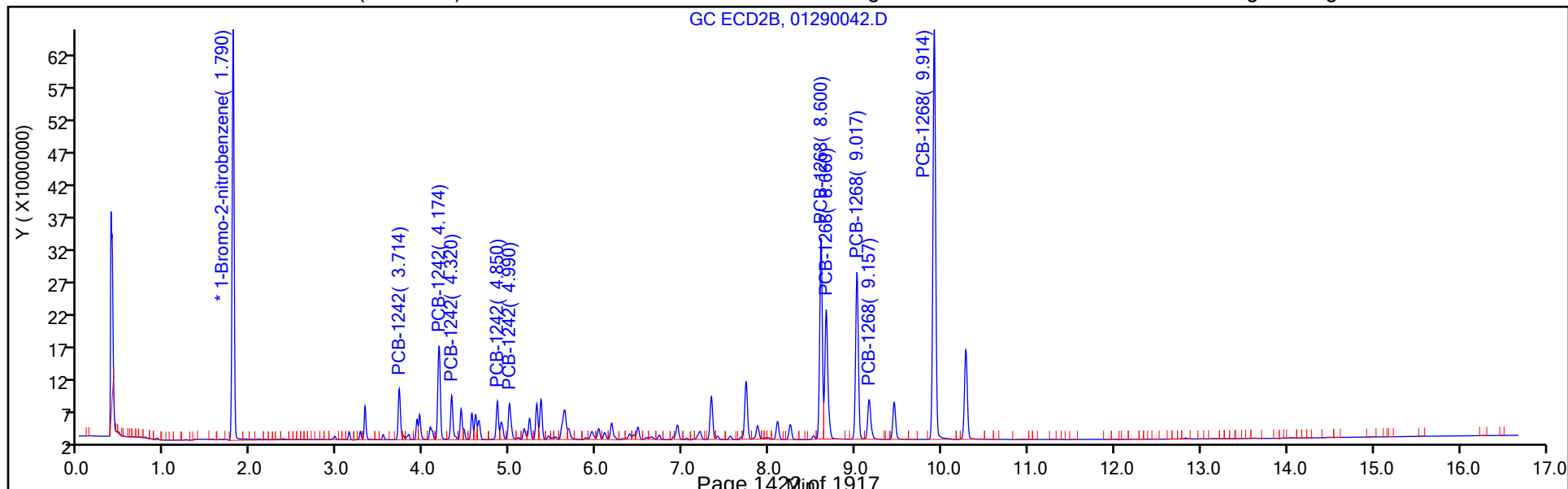
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCVIS 280-446463/5 Calibration Date: 02/05/2019 13:46
 Instrument ID: SGC_J Calib Start Date: 01/29/2019 20:31
 GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/29/2019 22:38
 Lab File ID: 02040005.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin1		0.0963		613	500	22.5*	20.0
PCB-1016 Peak 2	Lin1		0.2148		612	500	22.4*	20.0
PCB-1016 Peak 3	Lin1		0.3823		563	500	12.5	20.0
PCB-1016 Peak 4	Lin1		0.1598		598	500	19.7	20.0
PCB-1016 Peak 5	Lin1		0.1716		598	500	19.5	20.0
PCB-1260 Peak 1	Lin1		0.2451		608	500	21.5*	20.0
PCB-1260 Peak 2	Lin1		0.1348		588	500	17.6	20.0
PCB-1260 Peak 3	Lin1		0.2102		595	500	19.0	20.0
PCB-1260 Peak 4	Lin1		0.4753		598	500	19.5	20.0
PCB-1260 Peak 5	Lin1		0.1988		597	500	19.4	20.0
Tetrachloro-m-xylene	Lin1		4.972		29.6	25.0	18.5	20.0
DCB Decachlorobiphenyl	Lin1		3.915		31.7	25.0	26.7*	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCVIS 280-446463/5 Calibration Date: 02/05/2019 13:46
 Instrument ID: SGC_J Calib Start Date: 01/29/2019 20:31
 GC Column: CLP1 ID: 0.32 (mm) Calib End Date: 01/29/2019 22:38
 Lab File ID: 02040005.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.28	3.03	3.53
PCB-1016 Peak 2	3.65	3.40	3.90
PCB-1016 Peak 3	4.14	3.89	4.39
PCB-1016 Peak 4	4.29	4.04	4.54
PCB-1016 Peak 5	4.76	4.51	5.01
PCB-1260 Peak 1	6.28	6.03	6.53
PCB-1260 Peak 2	6.82	6.57	7.07
PCB-1260 Peak 3	7.53	7.28	7.78
PCB-1260 Peak 4	7.97	7.72	8.22
PCB-1260 Peak 5	8.36	8.11	8.61
Tetrachloro-m-xylene	2.89	2.64	3.14
DCB Decachlorobiphenyl	9.95	9.70	10.20

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040005.D
 Lims ID: CCVIS
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 05-Feb-2019 13:46:31 ALS Bottle#: 5 Worklist Smp#: 5
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCVIS
 Misc. Info.: 280-0078693-005
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:36 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.973	1.973	0.000	17452101	100.0	100.0	
2	1.787	1.787	0.000	102812303	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.890	2.890	0.000	21692417	25.0	29.6	
2	2.817	2.817	0.000	52609377	25.0	26.9	
RPD = 9.67							

1 PCB-1016

1	3.283	3.283	0.000	8399622	500.0	612.6	
1	3.650	3.650	0.000	18744959	500.0	611.8	
1	4.140	4.140	0.000	33358316	500.0	562.5	
1	4.286	4.286	0.000	13944938	500.0	598.5	
1	4.760	4.760	0.000	14976405	500.0	597.6	
Average of Peak Amounts =						596.6	
2	3.710	3.710	0.000	34729863	500.0	518.1	
2	4.173	4.173	0.000	75706973	500.0	516.6	
2	4.317	4.317	0.000	32096418	500.0	518.0	
2	4.553	4.553	0.000	17144996	500.0	542.0	
2	4.847	4.847	0.000	25065006	500.0	549.1	
Average of Peak Amounts =						528.8	
RPD = 12.06							

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040005.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.283	6.283	0.000	21383298	500.0	607.5	
1	6.823	6.823	0.000	11758938	500.0	588.1	
1	7.526	7.526	0.000	18340562	500.0	594.8	
1	7.970	7.970	0.000	41476762	500.0	597.6	
1	8.360	8.360	0.000	17346751	500.0	597.0	

Average of Peak Amounts = 597.0

2	6.720	6.720	0.000	52241834	500.0	532.4	
2	7.190	7.190	0.000	75621680	500.0	535.1	
2	7.323	7.323	0.000	41582311	500.0	530.6	
2	8.090	8.090	0.000	101070795	500.0	551.3	
2	8.597	8.597	0.000	72951558	500.0	553.5	

Average of Peak Amounts = 540.6

RPD = 9.92

\$ 15 DCB Decachlorobiphenyl

1	9.953	9.953	0.000	17082284	25.0	31.7	
2	10.273	10.273	0.000	45003352	25.0	28.3	

RPD = 11.17

19 1260 Res 1

1	8.360	8.360	0.000	17346751	NR	NR	
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16 1260 Res 2

1	8.420	8.420	0.000	9853681	NR	NR	
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18 1260 Res 3

1	8.483	8.483	0.000	11986997	NR	NR	
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QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

AR_1660_L7_00028

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 06-Feb-2019 10:46:36

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040005.D

Injection Date: 05-Feb-2019 13:46:31

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: CCVIS

Worklist Smp#: 5

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

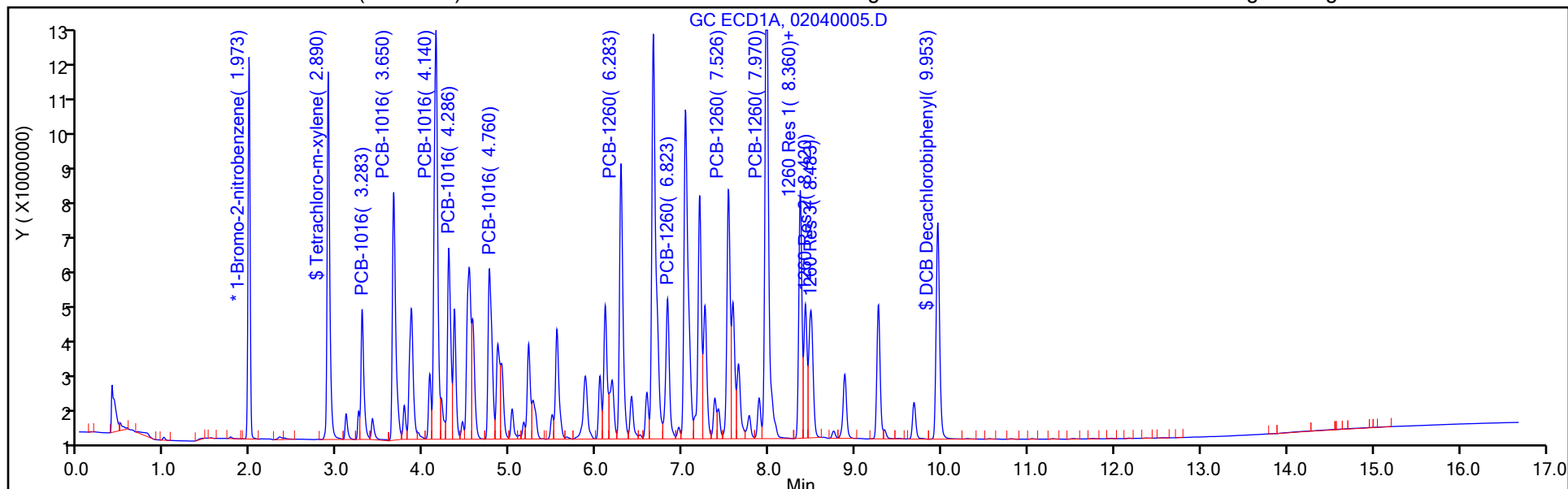
ALS Bottle#: 5

Method: 8082_J

Limit Group: GCSV - 8082 - IS

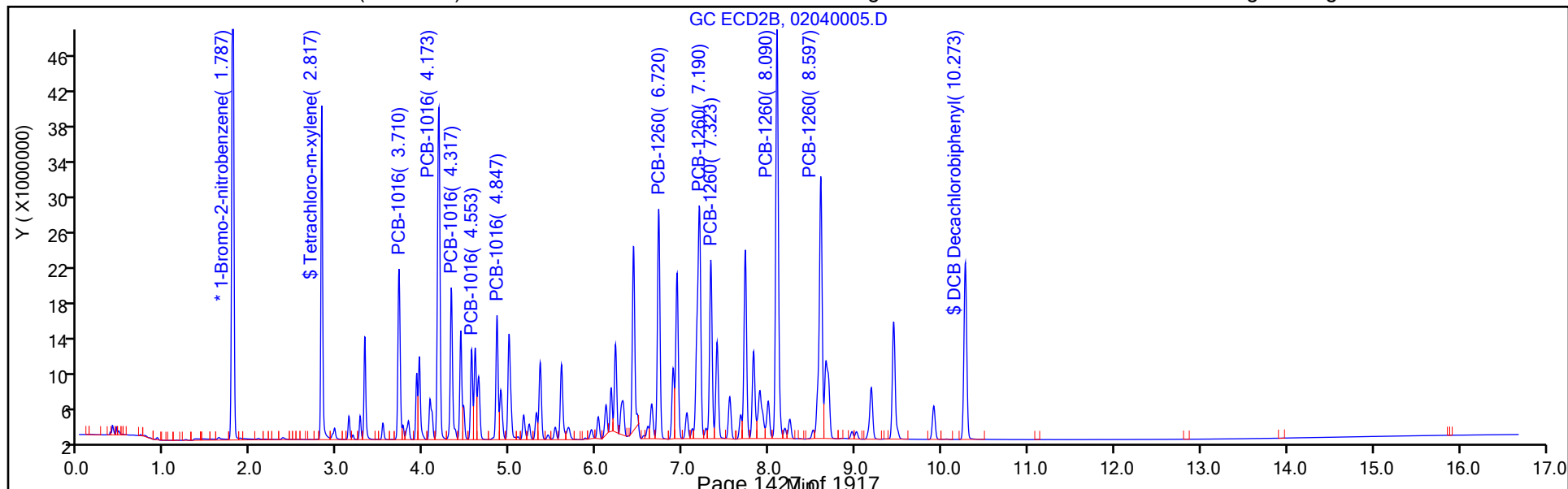
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Lab Sample ID: CCVIS 280-446463/5 Calibration Date: 02/05/2019 13:46
 Instrument ID: SGC_J Calib Start Date: 01/29/2019 20:31
 GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/29/2019 22:38
 Lab File ID: 02040005.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin2		0.0676		518	500	3.6	20.0
PCB-1016 Peak 2	Lin2		0.1473		517	500	3.3	20.0
PCB-1016 Peak 3	Lin2		0.0624		518	500	3.6	20.0
PCB-1016 Peak 4	Qual		0.0334		542	500	8.4	20.0
PCB-1016 Peak 5	Qual		0.0488		549	500	9.8	20.0
PCB-1260 Peak 1	Lin2		0.1016		532	500	6.5	20.0
PCB-1260 Peak 2	Lin2		0.1471		535	500	7.0	20.0
PCB-1260 Peak 3	Lin2		0.0809		531	500	6.1	20.0
PCB-1260 Peak 4	Lin2		0.1966		551	500	10.3	20.0
PCB-1260 Peak 5	Lin2		0.1419		553	500	10.7	20.0
Tetrachloro-m-xylene	Lin1		2.047		26.9	25.0	7.6	20.0
DCB Decachlorobiphenyl	Lin2		1.751		28.3	25.0	13.3	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID: CCVIS 280-446463/5 Calibration Date: 02/05/2019 13:46
Instrument ID: SGC_J Calib Start Date: 01/29/2019 20:31
GC Column: CLP2 ID: 0.32 (mm) Calib End Date: 01/29/2019 22:38
Lab File ID: 02040005.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.71	3.46	3.96
PCB-1016 Peak 2	4.17	3.92	4.42
PCB-1016 Peak 3	4.32	4.07	4.57
PCB-1016 Peak 4	4.55	4.30	4.80
PCB-1016 Peak 5	4.85	4.60	5.10
PCB-1260 Peak 1	6.72	6.47	6.97
PCB-1260 Peak 2	7.19	6.94	7.44
PCB-1260 Peak 3	7.32	7.07	7.57
PCB-1260 Peak 4	8.09	7.84	8.34
PCB-1260 Peak 5	8.60	8.35	8.85
Tetrachloro-m-xylene	2.82	2.57	3.07
DCB Decachlorobiphenyl	10.27	10.02	10.52

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040005.D
 Lims ID: CCVIS
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 05-Feb-2019 13:46:31 ALS Bottle#: 5 Worklist Smp#: 5
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: CCVIS
 Misc. Info.: 280-0078693-005
 Operator ID: TEM Instrument ID: SGC_J
 Sublist: chrom-8082_J*sub1
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:36 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.973	1.973	0.000	17452101	100.0	100.0	
2	1.787	1.787	0.000	102812303	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.890	2.890	0.000	21692417	25.0	29.6	
2	2.817	2.817	0.000	52609377	25.0	26.9	
RPD = 9.67							

1 PCB-1016

1	3.283	3.283	0.000	8399622	500.0	612.6	
1	3.650	3.650	0.000	18744959	500.0	611.8	
1	4.140	4.140	0.000	33358316	500.0	562.5	
1	4.286	4.286	0.000	13944938	500.0	598.5	
1	4.760	4.760	0.000	14976405	500.0	597.6	
Average of Peak Amounts =						596.6	
2	3.710	3.710	0.000	34729863	500.0	518.1	
2	4.173	4.173	0.000	75706973	500.0	516.6	
2	4.317	4.317	0.000	32096418	500.0	518.0	
2	4.553	4.553	0.000	17144996	500.0	542.0	
2	4.847	4.847	0.000	25065006	500.0	549.1	
Average of Peak Amounts =						528.8	
RPD = 12.06							

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040005.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.283	6.283	0.000	21383298	500.0	607.5	
1	6.823	6.823	0.000	11758938	500.0	588.1	
1	7.526	7.526	0.000	18340562	500.0	594.8	
1	7.970	7.970	0.000	41476762	500.0	597.6	
1	8.360	8.360	0.000	17346751	500.0	597.0	

Average of Peak Amounts = 597.0

2	6.720	6.720	0.000	52241834	500.0	532.4	
2	7.190	7.190	0.000	75621680	500.0	535.1	
2	7.323	7.323	0.000	41582311	500.0	530.6	
2	8.090	8.090	0.000	101070795	500.0	551.3	
2	8.597	8.597	0.000	72951558	500.0	553.5	

Average of Peak Amounts = 540.6

RPD = 9.92

\$ 15 DCB Decachlorobiphenyl

1	9.953	9.953	0.000	17082284	25.0	31.7	
2	10.273	10.273	0.000	45003352	25.0	28.3	

RPD = 11.17

19 1260 Res 1

1	8.360	8.360	0.000	17346751	NR	NR	
---	-------	-------	-------	----------	----	----	--

16 1260 Res 2

1	8.420	8.420	0.000	9853681	NR	NR	
---	-------	-------	-------	---------	----	----	--

18 1260 Res 3

1	8.483	8.483	0.000	11986997	NR	NR	
---	-------	-------	-------	----------	----	----	--

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

AR_1660_L7_00028

Amount Added: 0.50

Units: mL

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 06-Feb-2019 10:46:37

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040005.D

Injection Date: 05-Feb-2019 13:46:31

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: CCVIS

Worklist Smp#: 5

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

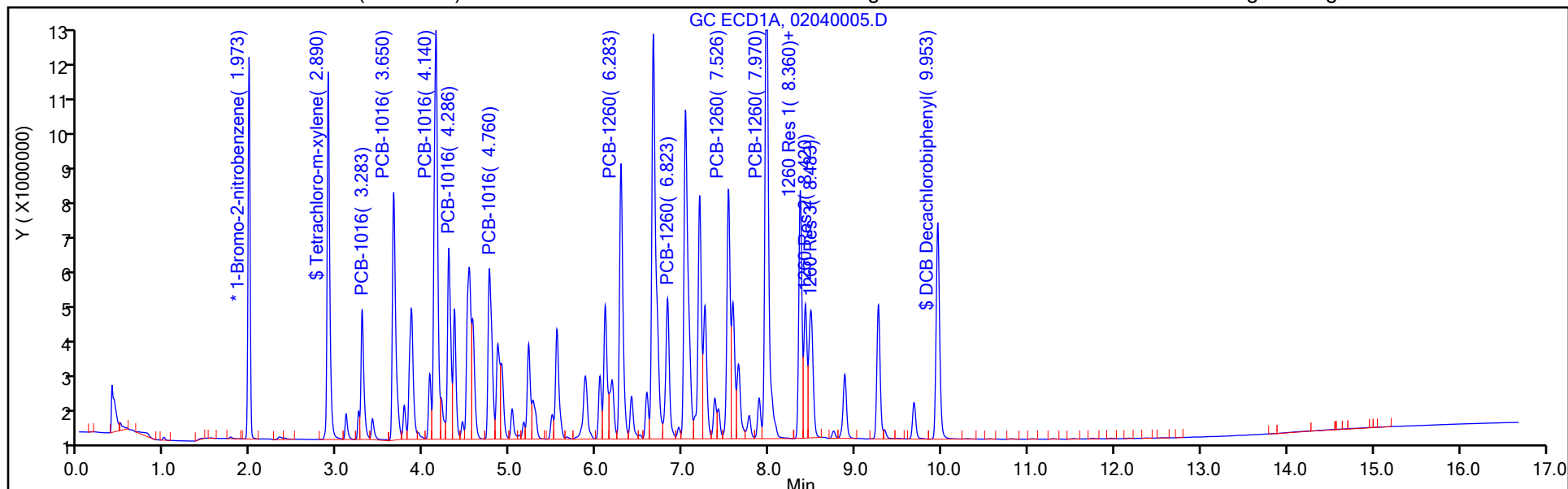
ALS Bottle#: 5

Method: 8082_J

Limit Group: GCSV - 8082 - IS

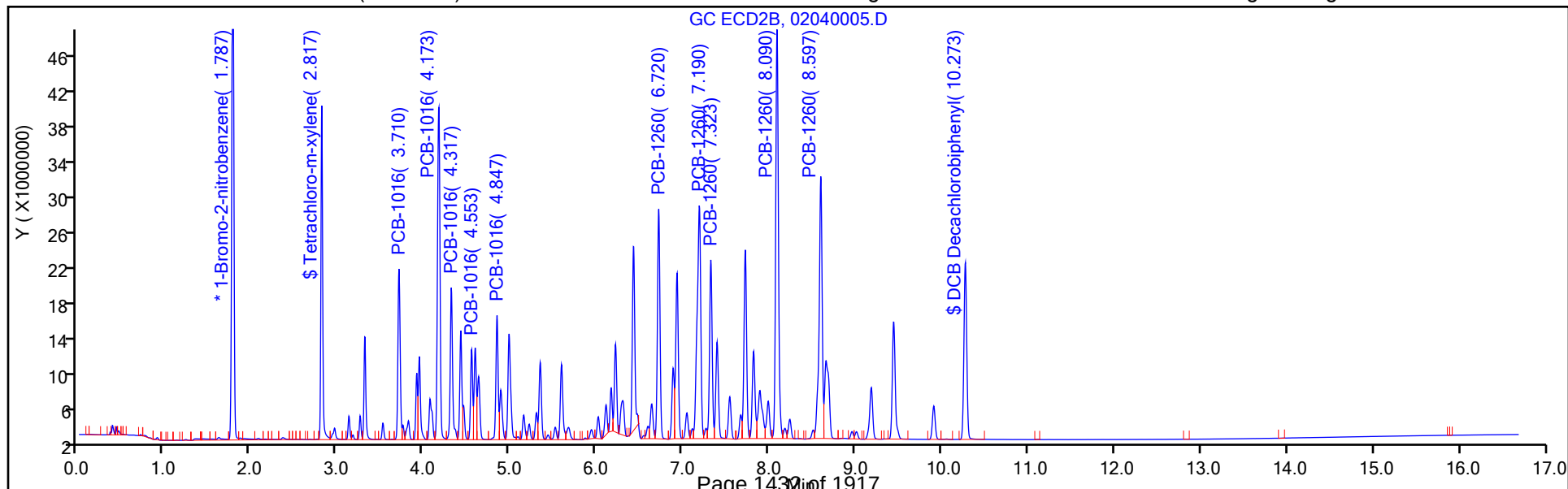
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Client Sample ID: _____ Lab Sample ID: MB 280-444887/1-A

Matrix: Water Lab File ID: 02040008.D

Analysis Method: 8082A Date Collected: _____

Extraction Method: 3510C Date Extracted: 01/21/2019 11:30

Sample wt/vol: 1000 (mL) Date Analyzed: 02/05/2019 14:49

Con. Extract Vol.: 10 (mL) Dilution Factor: 1

Injection Volume: 1 (uL) GC Column: CLP2 ID: 0.32 (mm)

% Moisture: _____ GPC Cleanup: (Y/N) N

Analysis Batch No.: 446463 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
11104-28-2	PCB-1221	0.21	U	1.0	0.21
12674-11-2	PCB-1016	0.12	U	1.0	0.12
11141-16-5	PCB-1232	0.17	U	1.0	0.17
53469-21-9	PCB-1242	0.10	U	1.0	0.10
12672-29-6	PCB-1248	0.092	U	1.0	0.092
11097-69-1	PCB-1254	0.11	U	1.0	0.11
11096-82-5	PCB-1260	0.16	U	1.0	0.16
37324-23-5	PCB-1262	0.085	U	1.0	0.085
11100-14-4	PCB-1268	0.36	U	1.0	0.36

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	73		25-120
2051-24-3	DCB Decachlorobiphenyl	77		30-136

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040008.D
 Lims ID: MB 280-444887/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 05-Feb-2019 14:49:53 ALS Bottle#: 8 Worklist Smp#: 8
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: MB 280-444887/1-
 Misc. Info.: 280-0078693-008
 Operator ID: TEM Instrument ID: SGC_J
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

First Level Reviewer: mooret

Date: 06-Feb-2019 10:45:40

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.975	1.973	0.002	15288773	100.0	100.0	
2	1.788	1.787	0.001	85555457	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.891	2.890	0.001	8604752	20.0	13.5	
2	2.815	2.817	-0.002	23659564	20.0	14.5	
RPD = 7.42							

3 PCB-1221

1		3.100				ND	U
1		3.243					
1		3.283					
2		3.130					
2		3.260					
2		3.316					

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040008.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

1 PCB-1016

1	3.283
1	3.650
1	4.140
1	4.286
1	4.760
2	3.710
2	4.173
2	4.317
2	4.553
2	4.847

ND

U

7 PCB-1232

1	3.284
1	3.651
1	4.137
1	4.287
1	4.757
2	3.314
2	3.711
2	4.171
2	4.317
2	4.844

ND

U

10 PCB-1242

1	3.650
1	4.140
1	4.757
1	5.274
1	5.290
2	3.710
2	4.170
2	4.317
2	4.844
2	4.984

ND

U

4 PCB-1248

1	4.522
1	4.759
1	4.855
1	5.535
1	6.039
2	4.169
2	4.549
2	4.845
2	4.985
2	6.169

ND

U

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040008.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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9 PCB-1254

1	5.540
1	5.883
1	6.040
1	6.406
1	7.030
2	5.593
2	6.020
2	6.166
2	6.720
2	7.193

ND

U

12 PCB-1260

1	6.283
1	6.823
1	7.526
1	7.970
1	8.360
2	6.720
2	7.190
2	7.323
2	8.090
2	8.597

ND

U

5 PCB-1262

1	6.657
1	7.194
1	7.527
1	7.971
1	8.361
2	6.721
2	7.324
2	7.724
2	8.091
2	8.597

ND

U

13 PCB-1268

1	8.423
1	8.473
1	8.747
1	8.867
1	9.680
2	8.594
2	8.654
2	9.010
2	9.150
2	9.907

ND

U

\$ 15 DCB Decachlorobiphenyl

1	9.951	9.953	-0.002	7553072	20.0	15.7
2	10.272	10.273	-0.002	20775183	20.0	15.4

RPD = 2.36

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040008.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

2 PCB-5460

1	0.000					ND	
1	12.739						
1	0.000						
1	13.802						
1	14.259						
2	0.000						
2	0.000						
2	0.000						
2	0.000						
2	0.000						

S 8 Polychlorinated biphenyls, Total

1	0.000					ND	
2	0.000						

6 PCB-5432

1	7.063					ND	
1	7.693						
1	8.203						
1	9.029						
1	9.459						
2	0.000						
2	0.000						
2	0.000						
2	0.000						
2	0.000						

11 PCB-5442

1	9.459					ND	
1	9.923						
1	10.079						
1	10.289						
1	0.000						
2	0.000						
2	0.000						
2	0.000						
2	0.000						
2	0.000						

QC Flag Legend

Review Flags

U - Marked Undetected

Reagents:

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040008.D

Injection Date: 05-Feb-2019 14:49:53

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: MB 280-444887/1-A

Worklist Smp#: 8

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

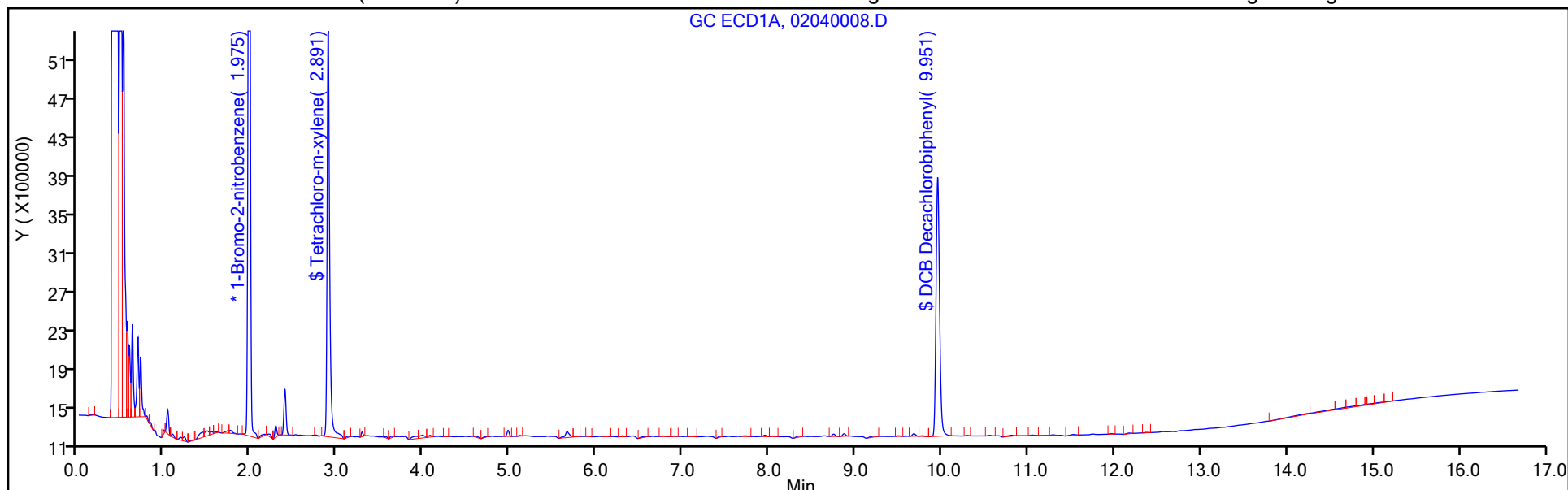
ALS Bottle#: 8

Method: 8082_J

Limit Group: GCSV - 8082 - IS

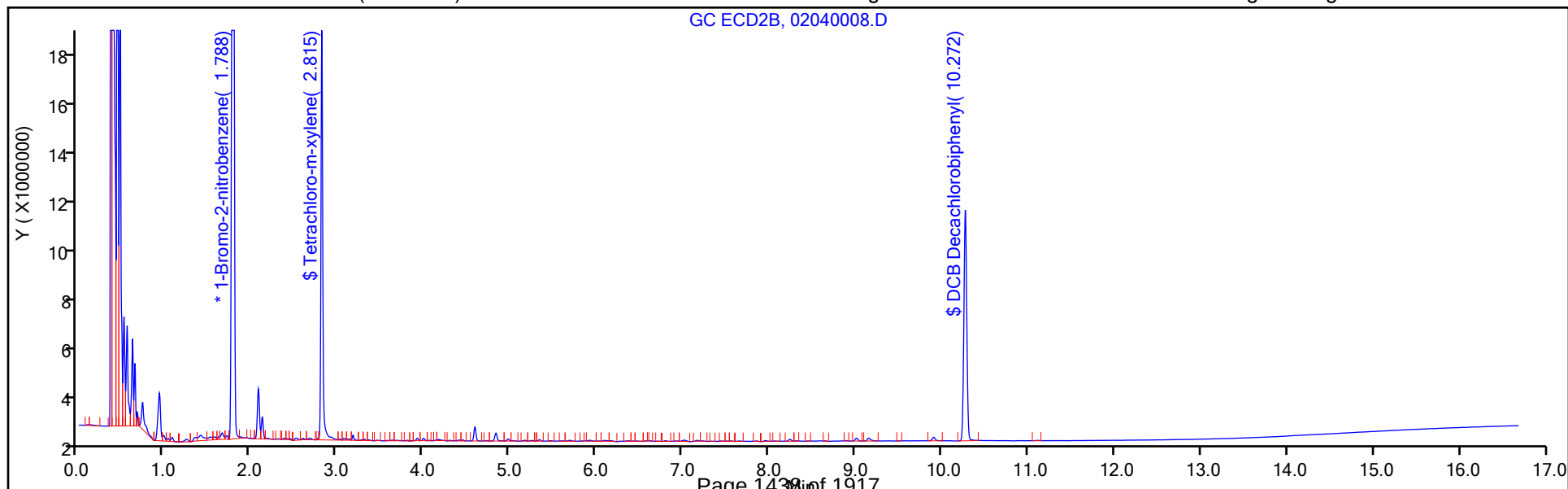
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040008.D
 Lims ID: MB 280-444887/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 05-Feb-2019 14:49:53 ALS Bottle#: 8 Worklist Smp#: 8
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: MB 280-444887/1-
 Misc. Info.: 280-0078693-008
 Operator ID: TEM Instrument ID: SGC_J
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

First Level Reviewer: mooret

Date: 06-Feb-2019 10:45:40

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 14 Tetrachloro-m-xylene	20.0	13.5	67.50
\$ 15 DCB Decachlorobiphenyl	20.0	15.7	78.75

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 14 Tetrachloro-m-xylene	20.0	14.5	72.70
\$ 15 DCB Decachlorobiphenyl	20.0	15.4	76.91

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 280-444887/2-A
 Matrix: Water Lab File ID: 02040009.D
 Analysis Method: 8082A Date Collected: _____
 Extraction Method: 3510C Date Extracted: 01/21/2019 11:30
 Sample wt/vol: 1000 (mL) Date Analyzed: 02/05/2019 15:11
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) GC Column: CLP2 ID: 0.32 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 446463 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	1.85		1.0	0.12
11096-82-5	PCB-1260	1.92		1.0	0.16

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	90		25-120
2051-24-3	DCB Decachlorobiphenyl	84		30-136

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040009.D
 Lims ID: LCS 280-444887/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 05-Feb-2019 15:11:04 ALS Bottle#: 9 Worklist Smp#: 9
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCS 280-444887/2
 Misc. Info.: 280-0078693-009
 Operator ID: TEM Instrument ID: SGC_J
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
-----	--------------	------------------	------------------	----------	------------------	--------------------	-------

* 17 1-Bromo-2-nitrobenzene

1	1.975	1.973	0.002	17684531	100.0	100.0	
2	1.786	1.787	-0.001	98778426	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.892	2.890	0.002	13453715	20.0	18.2	
2	2.816	2.817	-0.001	33912057	20.0	18.0	
RPD = 0.80							

1 PCB-1016

1	3.282	3.283	-0.001	3040704	200.0	207.1	
1	3.649	3.650	-0.001	6503878	200.0	197.7	
1	4.139	4.140	-0.001	10445539	200.0	174.6	
1	4.289	4.286	0.003	4793190	200.0	196.5	
1	4.759	4.760	-0.001	5229865	200.0	201.0	
Average of Peak Amounts =						195.4	
2	3.709	3.710	-0.001	12735612	200.0	187.5	
2	4.172	4.173	-0.001	25848380	200.0	176.1	
2	4.316	4.317	-0.001	11402107	200.0	181.8	
2	4.552	4.553	-0.001	6126730	200.0	180.7	
2	4.846	4.847	-0.001	9511237	200.0	196.5	
Average of Peak Amounts =						184.5	
RPD = 5.73							

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040009.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.282	6.283	-0.001	8171476	200.0	222.5	
1	6.822	6.823	-0.001	4113120	200.0	200.4	
1	7.529	7.526	0.003	6007405	200.0	187.1	
1	7.969	7.970	-0.001	12805911	200.0	180.0	
1	8.359	8.360	-0.001	5755864	200.0	192.6	

Average of Peak Amounts = 196.5

2	6.719	6.720	-0.001	20269610	200.0	206.3	
2	7.192	7.190	0.002	29503563	200.0	209.2	
2	7.322	7.323	-0.001	14470561	200.0	182.6	
2	8.092	8.090	0.002	32830073	200.0	179.3	
2	8.599	8.597	0.002	23948708	200.0	180.6	

Average of Peak Amounts = 191.6

RPD = 2.55

\$ 15 DCB Decachlorobiphenyl

1	9.952	9.953	-0.001	9445788	20.0	17.1	
2	10.272	10.273	-0.001	25970103	20.0	16.7	

RPD = 2.07

Reagents:

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 06-Feb-2019 10:46:29

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040009.D

Injection Date: 05-Feb-2019 15:11:04

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: LCS 280-444887/2-A

Worklist Smp#: 9

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

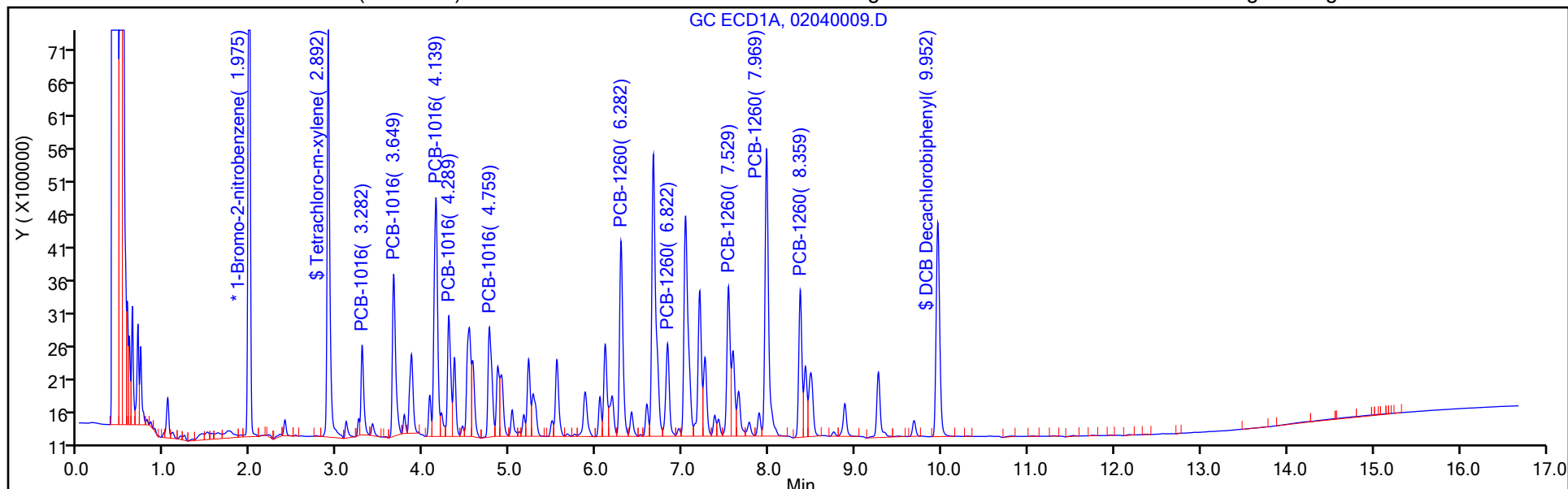
ALS Bottle#: 9

Method: 8082_J

Limit Group: GCSV - 8082 - IS

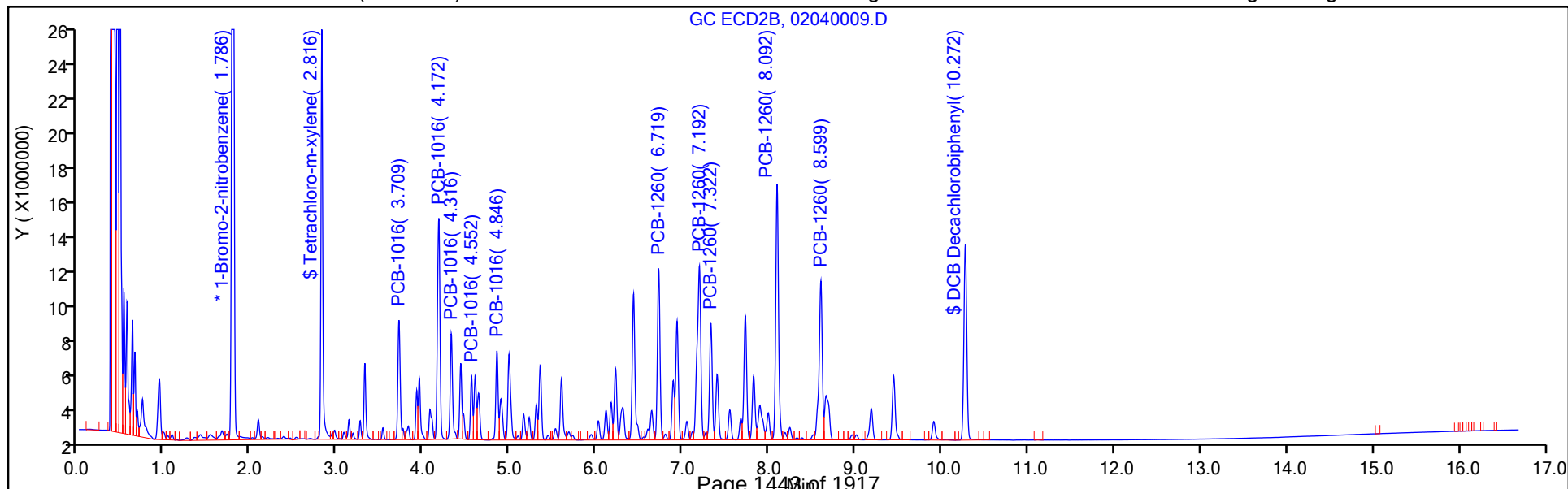
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040009.D
 Lims ID: LCS 280-444887/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 05-Feb-2019 15:11:04 ALS Bottle#: 9 Worklist Smp#: 9
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCS 280-444887/2
 Misc. Info.: 280-0078693-009
 Operator ID: TEM Instrument ID: SGC_J
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 14 Tetrachloro-m-xylene	20.0	18.2	90.96
\$ 15 DCB Decachlorobiphenyl	20.0	17.1	85.34

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 14 Tetrachloro-m-xylene	20.0	18.0	90.24
\$ 15 DCB Decachlorobiphenyl	20.0	16.7	83.59

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040009.D

Injection Date: 05-Feb-2019 15:11:04

Instrument ID: SGC_J

Lims ID: LCS 280-444887/2-A

Client ID:

Operator ID: TEM

ALS Bottle#: 9

Worklist Smp#: 9

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 8082_J

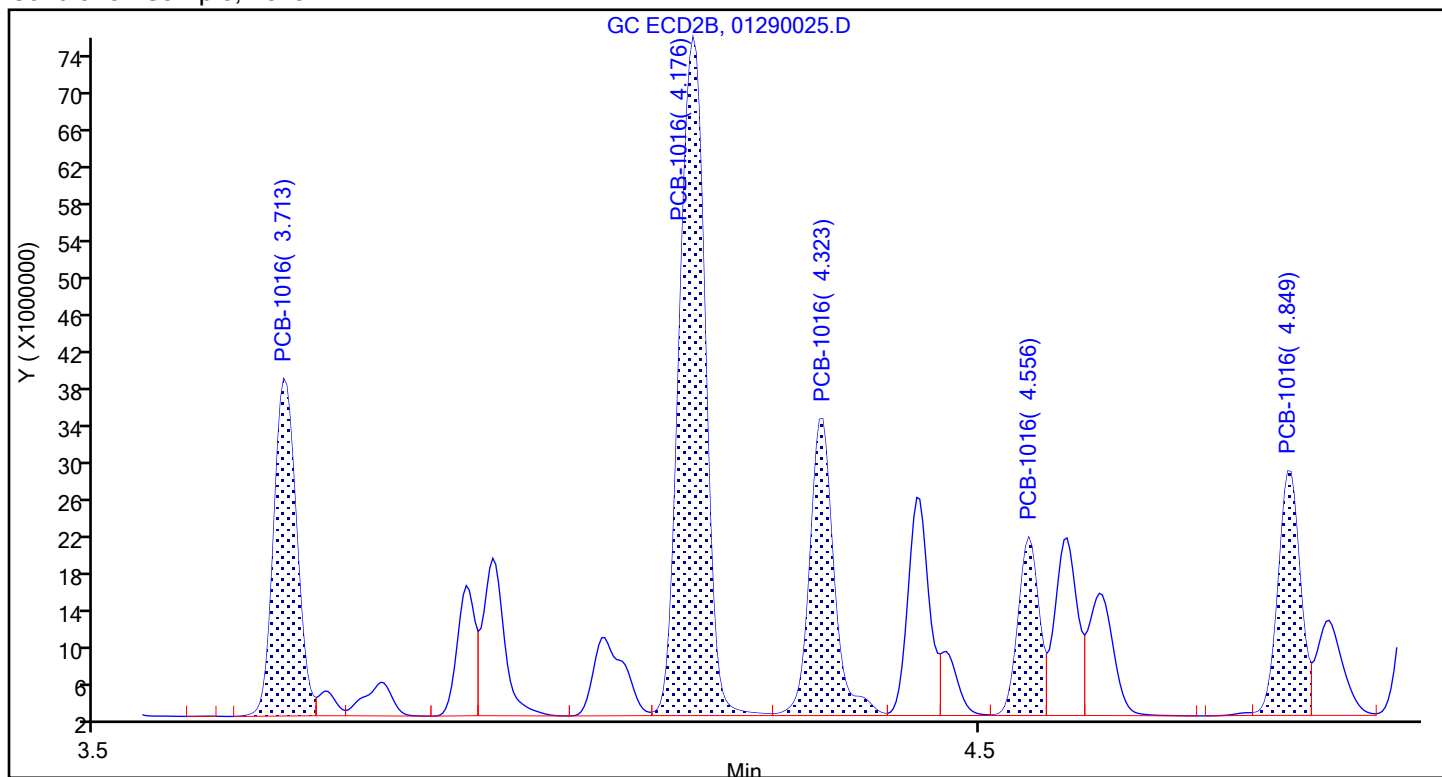
Limit Group: GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

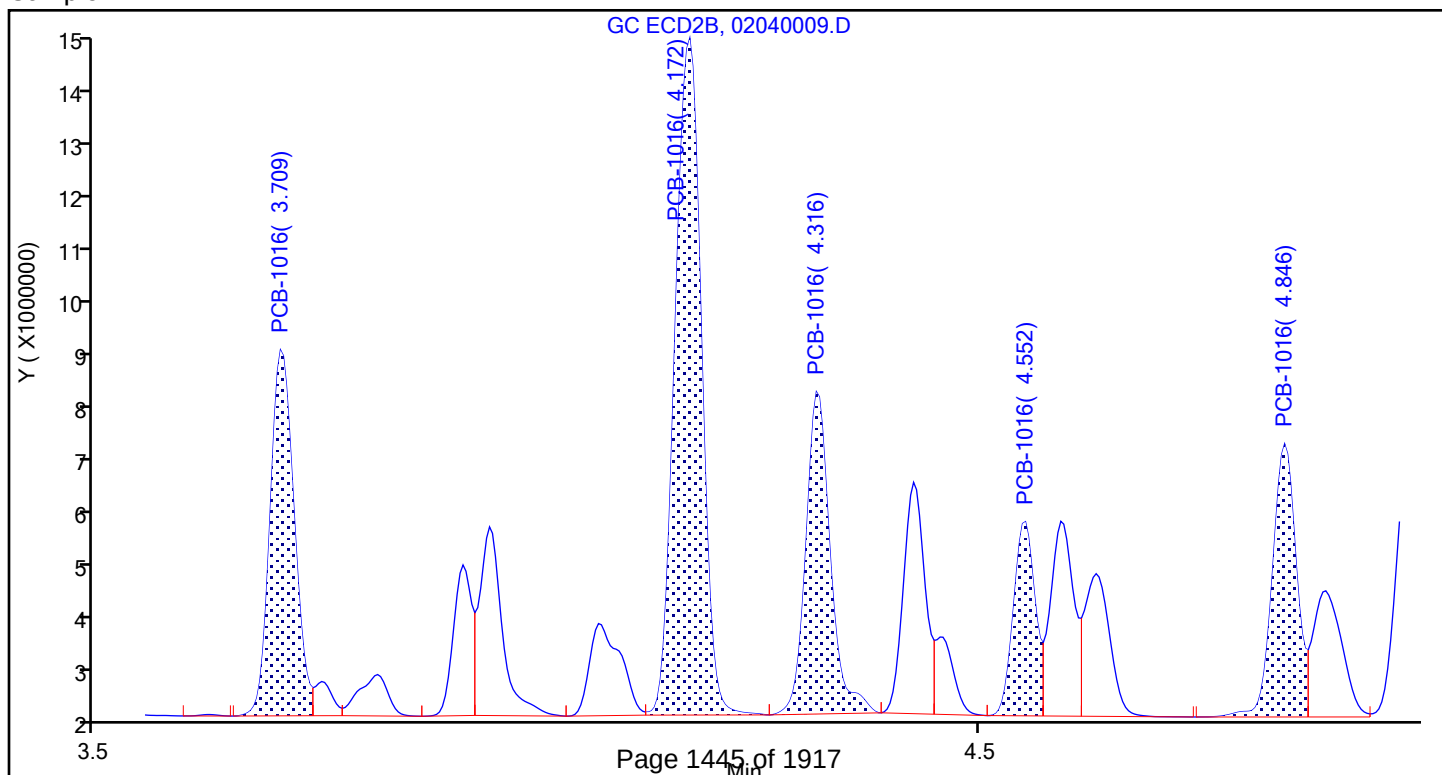
GC ECD2B

1 PCB-1016, CAS: 12674-11-2

Calibration Sample, Level: 7



Sample



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040009.D

Injection Date: 05-Feb-2019 15:11:04

Instrument ID: SGC_J

Lims ID: LCS 280-444887/2-A

Client ID:

Operator ID: TEM

ALS Bottle#: 9

Worklist Smp#: 9

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 8082_J

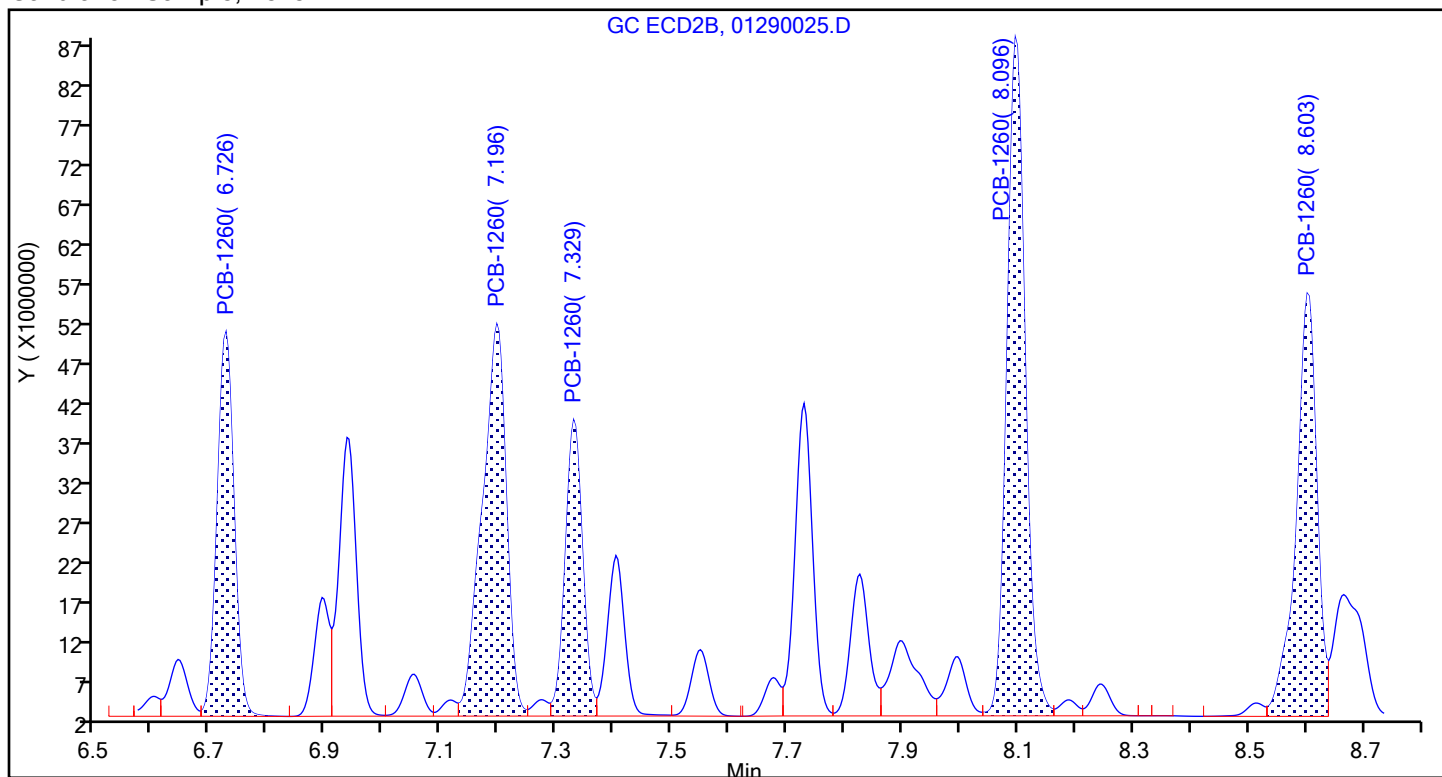
Limit Group: GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

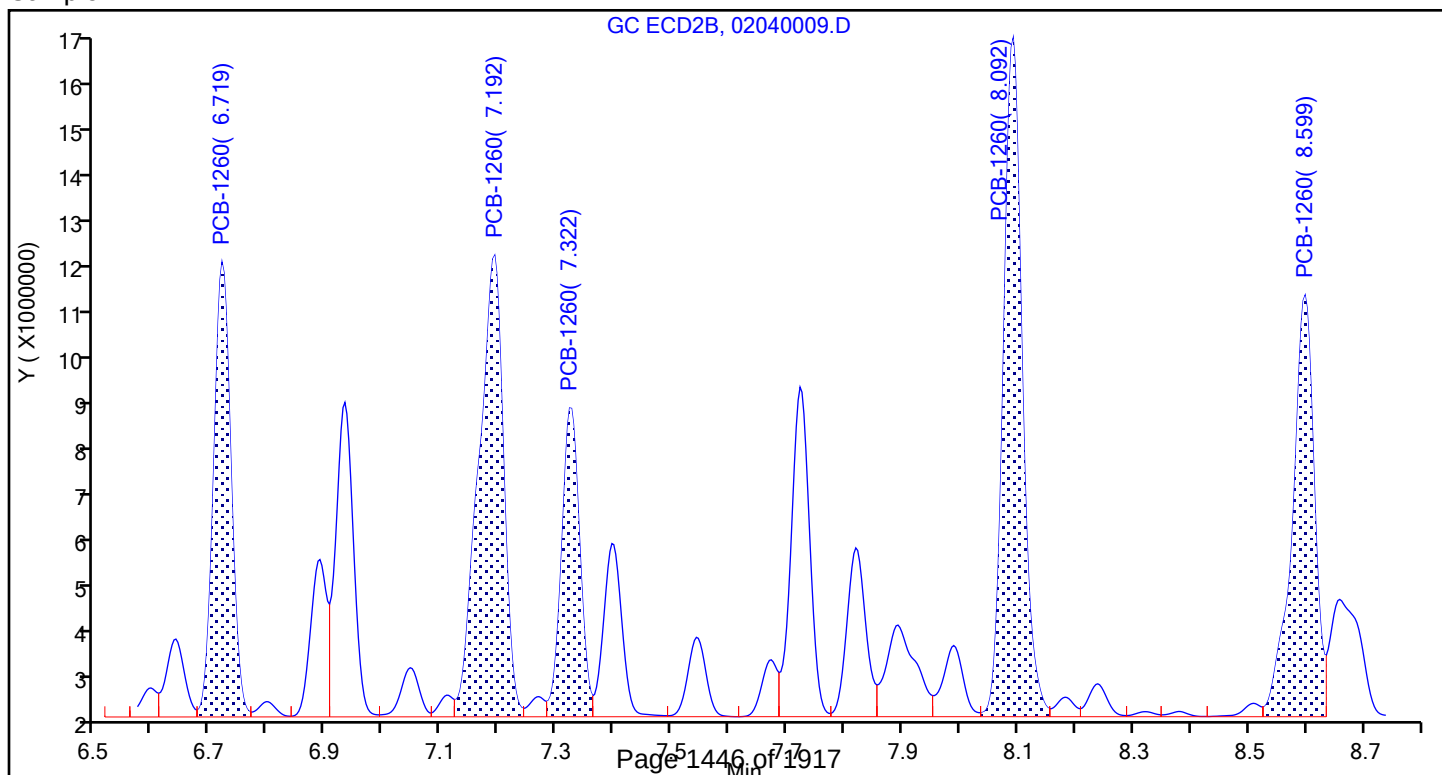
GC ECD2B

12 PCB-1260, CAS: 11096-82-5

Calibration Sample, Level: 7



Sample



FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>160-32649-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCSD 280-444887/3-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>02040010.D</u>
Analysis Method: <u>8082A</u>	Date Collected: _____
Extraction Method: <u>3510C</u>	Date Extracted: <u>01/21/2019 11:30</u>
Sample wt/vol: <u>1000 (mL)</u>	Date Analyzed: <u>02/05/2019 15:32</u>
Con. Extract Vol.: <u>10 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>1 (uL)</u>	GC Column: <u>CLP2</u> ID: <u>0.32 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>446463</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	1.85		1.0	0.12
11096-82-5	PCB-1260	1.95		1.0	0.16

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	93		25-120
2051-24-3	DCB Decachlorobiphenyl	88		30-136

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040010.D
 Lims ID: LCSD 280-444887/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 05-Feb-2019 15:32:10 ALS Bottle#: 10 Worklist Smp#: 10
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCSD 280-444887/
 Misc. Info.: 280-0078693-010
 Operator ID: TEM Instrument ID: SGC_J
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1: CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2: CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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* 17 1-Bromo-2-nitrobenzene

1	1.975	1.973	0.002	18878202	100.0	100.0	
2	1.785	1.787	-0.002	104653224	100.0	100.0	
RPD = 0.00							

\$ 14 Tetrachloro-m-xylene

1	2.891	2.890	0.001	14610834	20.0	18.5	
2	2.815	2.817	-0.002	36987562	20.0	18.6	
RPD = 0.39							

1 PCB-1016

1	3.285	3.283	0.002	3262907	200.0	208.3	
1	3.648	3.650	-0.002	6936605	200.0	197.5	
1	4.138	4.140	-0.002	11125065	200.0	174.2	
1	4.288	4.286	0.002	5038527	200.0	193.4	
1	4.758	4.760	-0.002	5505447	200.0	198.1	
Average of Peak Amounts =						194.3	
2	3.711	3.710	0.001	13492789	200.0	187.5	
2	4.171	4.173	-0.002	27760450	200.0	178.7	
2	4.318	4.317	0.001	12485330	200.0	188.4	
2	4.551	4.553	-0.002	6431987	200.0	178.8	
2	4.845	4.847	-0.002	9923957	200.0	193.1	
Average of Peak Amounts =						185.3	
RPD = 4.74							

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040010.D

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
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12 PCB-1260

1	6.281	6.283	-0.002	8642715	200.0	220.4	
1	6.821	6.823	-0.002	4388861	200.0	200.4	
1	7.528	7.526	0.002	6735369	200.0	196.9	
1	7.968	7.970	-0.002	14074652	200.0	185.5	
1	8.361	8.360	0.001	6271082	200.0	196.7	

Average of Peak Amounts = 199.9

2	6.721	6.720	0.001	21511586	200.0	206.7	
2	7.191	7.190	0.001	31128869	200.0	208.3	
2	7.325	7.323	0.002	15595630	200.0	186.0	
2	8.091	8.090	0.001	35962044	200.0	185.7	
2	8.598	8.597	0.001	26092924	200.0	186.1	

Average of Peak Amounts = 194.6

RPD = 2.73

\$ 15 DCB Decachlorobiphenyl

1	9.955	9.953	0.002	10739884	20.0	18.2	
2	10.271	10.273	-0.002	28996180	20.0	17.7	

RPD = 3.08

Reagents:

BNB IS_00013

Amount Added: 0.10

Units: mL

Run Reagent

Report Date: 06-Feb-2019 10:46:31

Chrom Revision: 2.3 15-Jan-2019 08:51:34

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040010.D

Injection Date: 05-Feb-2019 15:32:10

Instrument ID: SGC_J

Operator ID: TEM

Lims ID: LCSD 280-444887/3-A

Worklist Smp#: 10

Client ID:

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

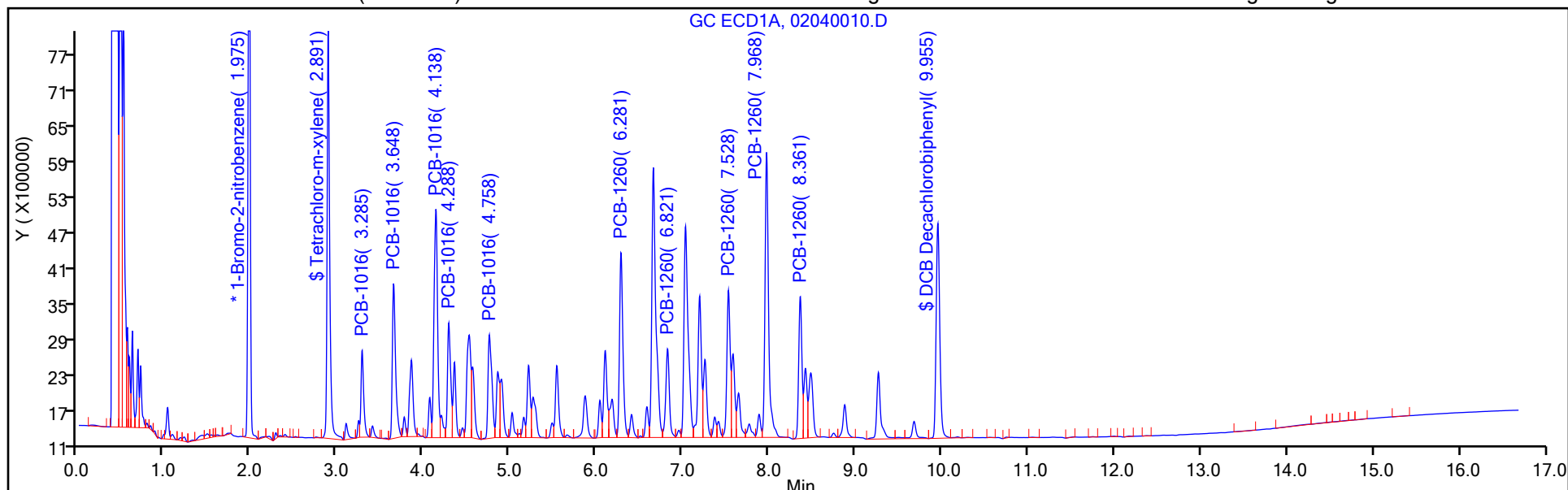
ALS Bottle#: 10

Method: 8082_J

Limit Group: GCSV - 8082 - IS

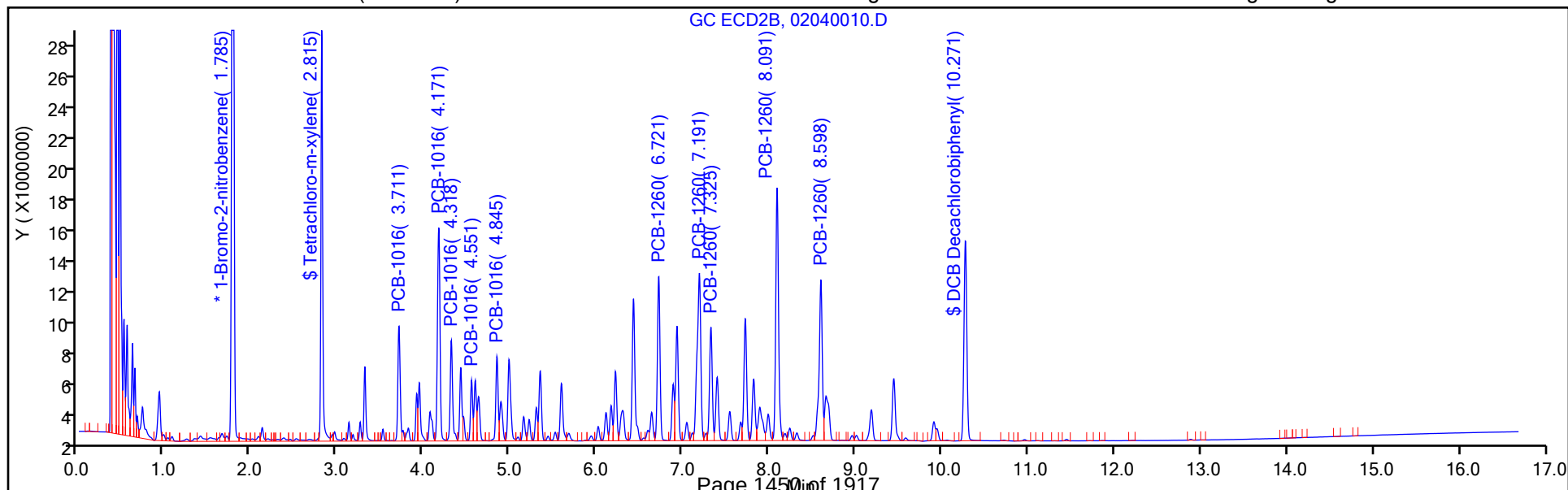
Column: CLP1 Pesticides Column 1 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



Column: CLP2 Pesticides Column 2 (0.32 mm)

Y Scaling: Method Defined: Scale to the Nth Largest Target: 2



TestAmerica Denver
Recovery Report

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040010.D
 Lims ID: LCSD 280-444887/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 05-Feb-2019 15:32:10 ALS Bottle#: 10 Worklist Smp#: 10
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: LCSD 280-444887/
 Misc. Info.: 280-0078693-010
 Operator ID: TEM Instrument ID: SGC_J
 Method: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\8082_J.m
 Limit Group: GCSV - 8082 - IS
 Last Update: 06-Feb-2019 10:46:07 Calib Date: 30-Jan-2019 04:15:34
 Integrator: Falcon
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\chromna\Denver\ChromData\SGC_J\20190128-78470.b\01290041.D
 Column 1 : CLP1 Pesticides Column 1 (0.32 mm) Det: GC ECD1A
 Column 2 : CLP2 Pesticides Column 2 (0.32 mm) Det: GC ECD2B
 Process Host: CTX0325

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
\$ 14 Tetrachloro-m-xylene	20.0	18.5	92.53
\$ 15 DCB Decachlorobiphenyl	20.0	18.2	91.06

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
\$ 14 Tetrachloro-m-xylene	20.0	18.6	92.89
\$ 15 DCB Decachlorobiphenyl	20.0	17.7	88.29

TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040010.D

Injection Date: 05-Feb-2019 15:32:10

Instrument ID: SGC_J

Lims ID: LCSD 280-444887/3-A

Client ID:

Operator ID: TEM

ALS Bottle#: 10

Worklist Smp#: 10

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 8082_J

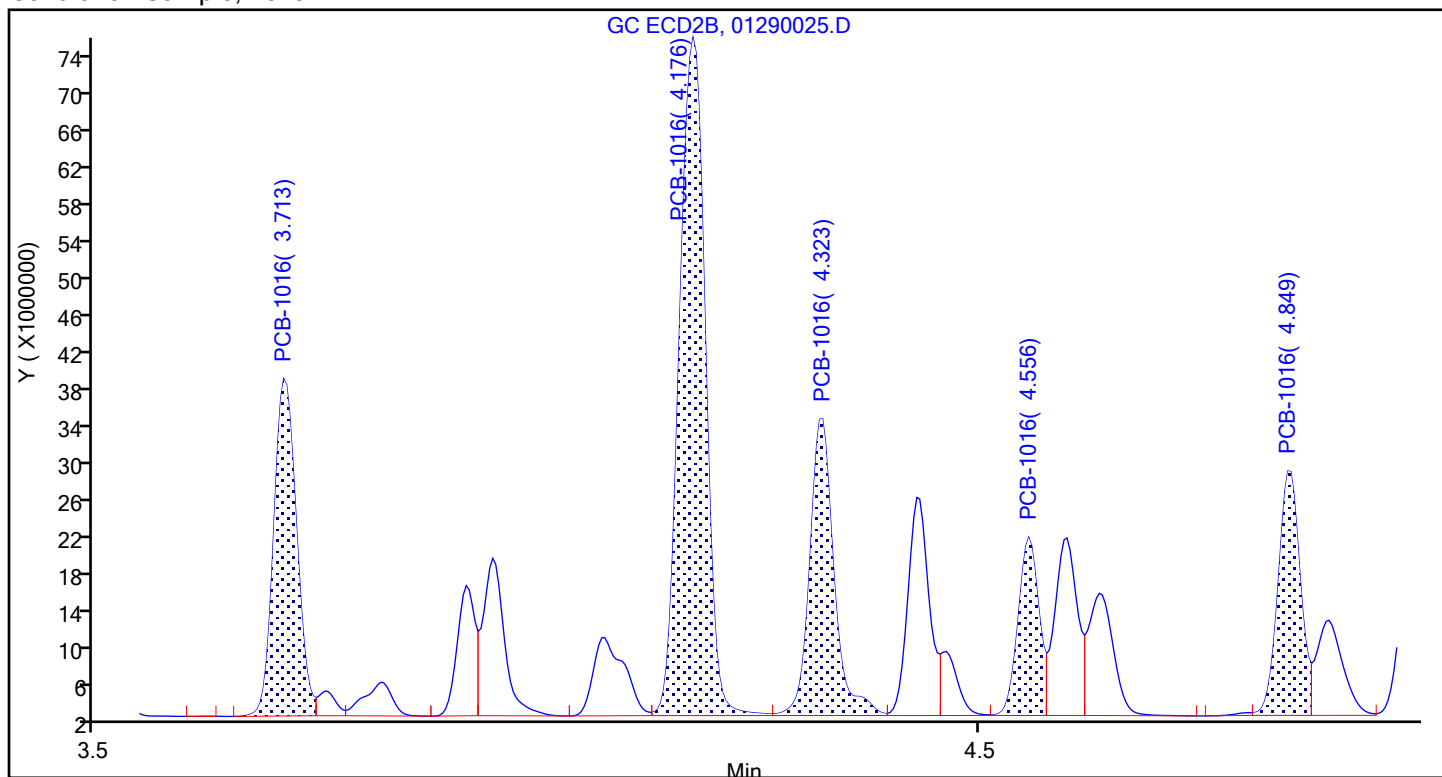
Limit Group: GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

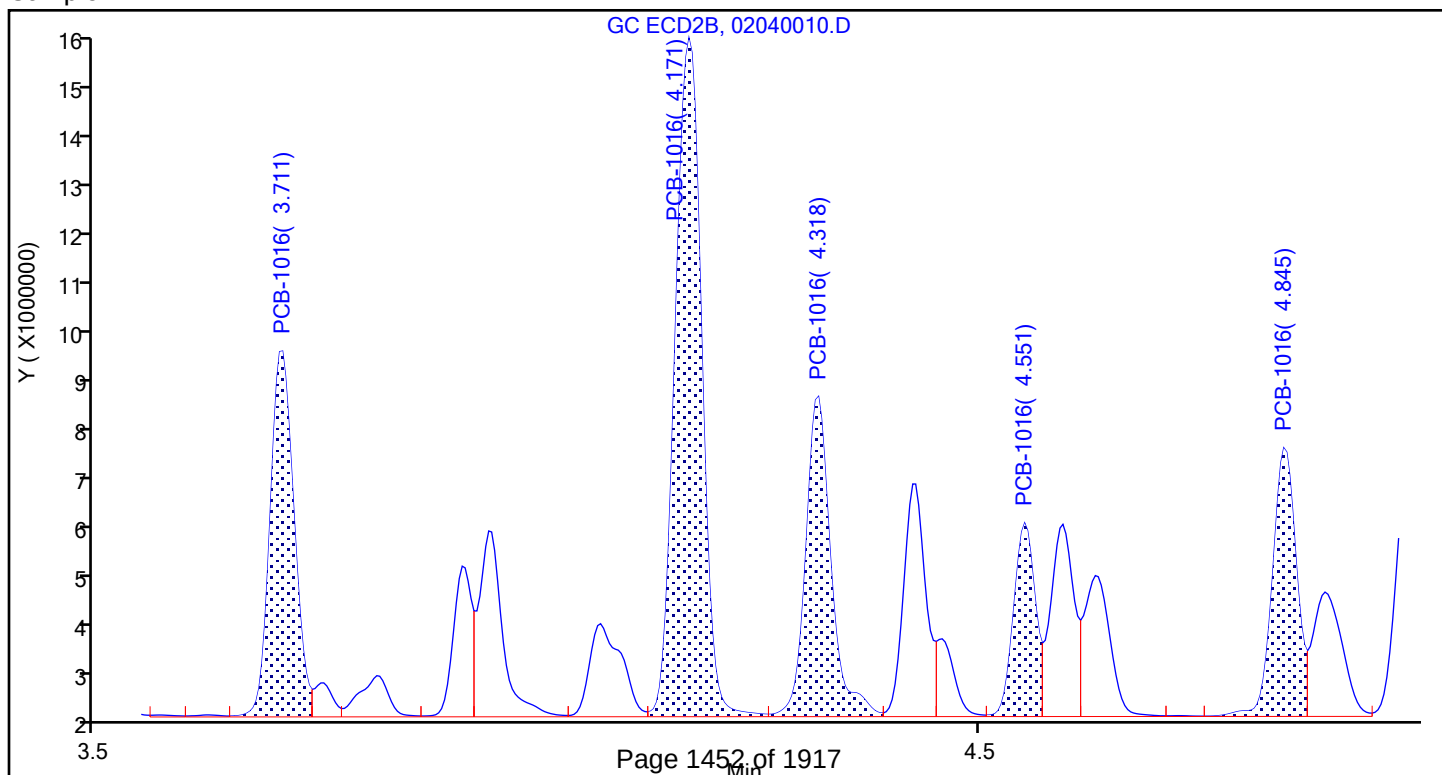
GC ECD2B

1 PCB-1016, CAS: 12674-11-2

Calibration Sample, Level: 7



Sample



TestAmerica Denver

Data File: \\chromna\Denver\ChromData\SGC_J\20190204-78693.b\02040010.D

Injection Date: 05-Feb-2019 15:32:10

Instrument ID: SGC_J

Lims ID: LCSD 280-444887/3-A

Client ID:

Operator ID: TEM

ALS Bottle#: 10

Worklist Smp#: 10

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 8082_J

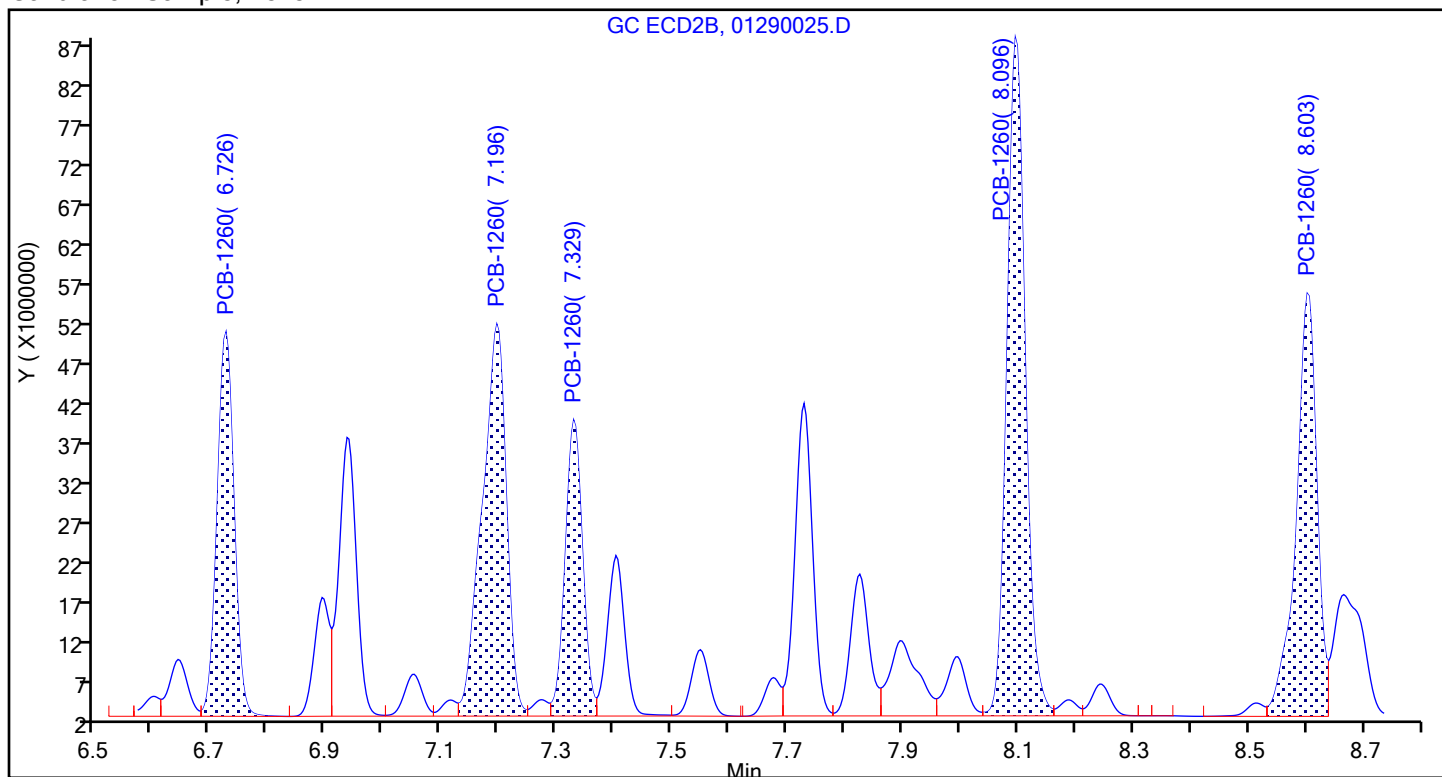
Limit Group: GCSV - 8082 - IS

Column: CLP2 Pesticides Column 2 (0.32 mm) Detector

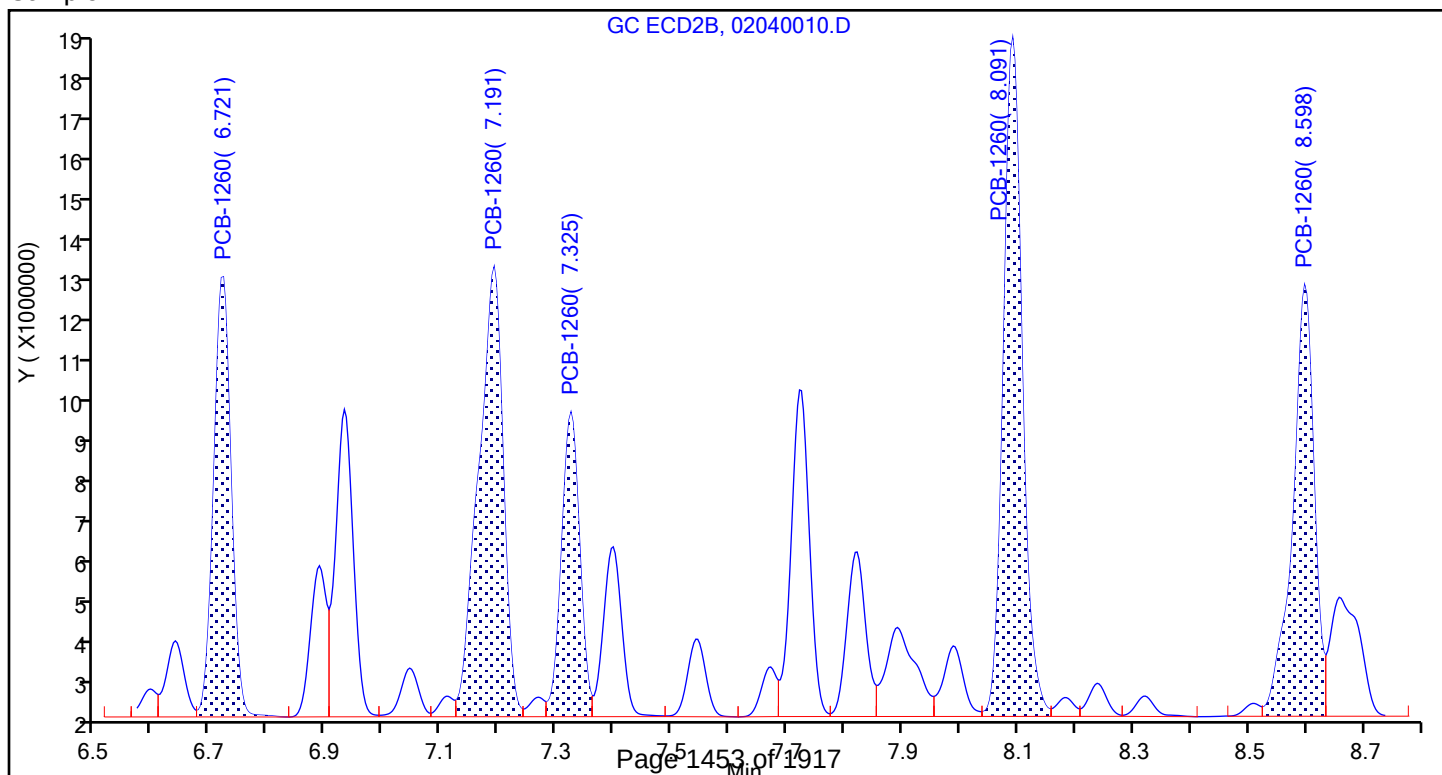
GC ECD2B

12 PCB-1260, CAS: 11096-82-5

Calibration Sample, Level: 7



Sample



PCBS ANALYSIS RUN LOG

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_JStart Date: 01/29/2019 14:54Analysis Batch Number: 445745End Date: 01/30/2019 09:10

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD1 280-445745/3 IC		01/29/2019 14:54	1	01290003.D	CLP1 0.32 (mm)
STD1 280-445745/3 IC		01/29/2019 14:54	1	01290003.D	CLP2 0.32 (mm)
STD2 280-445745/4 IC		01/29/2019 15:15	1	01290004.D	CLP1 0.32 (mm)
STD2 280-445745/4 IC		01/29/2019 15:15	1	01290004.D	CLP2 0.32 (mm)
STD3 280-445745/5 IC		01/29/2019 15:36	1	01290005.D	CLP1 0.32 (mm)
STD3 280-445745/5 IC		01/29/2019 15:36	1	01290005.D	CLP2 0.32 (mm)
STD4 280-445745/6 IC		01/29/2019 15:57	1	01290006.D	CLP1 0.32 (mm)
STD4 280-445745/6 IC		01/29/2019 15:57	1	01290006.D	CLP2 0.32 (mm)
STD5 280-445745/7 IC		01/29/2019 16:18	1	01290007.D	CLP1 0.32 (mm)
STD5 280-445745/7 IC		01/29/2019 16:18	1	01290007.D	CLP2 0.32 (mm)
STD6 280-445745/8 IC		01/29/2019 16:39	1	01290008.D	CLP1 0.32 (mm)
STD6 280-445745/8 IC		01/29/2019 16:39	1	01290008.D	CLP2 0.32 (mm)
STD7 280-445745/9 IC		01/29/2019 17:00	1	01290009.D	CLP1 0.32 (mm)
STD7 280-445745/9 IC		01/29/2019 17:00	1	01290009.D	CLP2 0.32 (mm)
ICV 280-445745/10		01/29/2019 17:21	1	01290010.D	CLP1 0.32 (mm)
ICV 280-445745/10		01/29/2019 17:21	1	01290010.D	CLP2 0.32 (mm)
STD1 280-445745/11 IC		01/29/2019 17:42	1	01290011.D	CLP1 0.32 (mm)
STD1 280-445745/11 IC		01/29/2019 17:42	1	01290011.D	CLP2 0.32 (mm)
STD2 280-445745/12 IC		01/29/2019 18:04	1	01290012.D	CLP1 0.32 (mm)
STD2 280-445745/12 IC		01/29/2019 18:04	1	01290012.D	CLP2 0.32 (mm)
STD3 280-445745/13 IC		01/29/2019 18:25	1	01290013.D	CLP1 0.32 (mm)
STD3 280-445745/13 IC		01/29/2019 18:25	1	01290013.D	CLP2 0.32 (mm)
STD4 280-445745/14 IC		01/29/2019 18:46	1	01290014.D	CLP1 0.32 (mm)
STD4 280-445745/14 IC		01/29/2019 18:46	1	01290014.D	CLP2 0.32 (mm)
STD5 280-445745/15 IC		01/29/2019 19:07	1	01290015.D	CLP1 0.32 (mm)
STD5 280-445745/15 IC		01/29/2019 19:07	1	01290015.D	CLP2 0.32 (mm)
STD6 280-445745/16 IC		01/29/2019 19:28	1	01290016.D	CLP1 0.32 (mm)
STD6 280-445745/16 IC		01/29/2019 19:28	1	01290016.D	CLP2 0.32 (mm)
STD7 280-445745/17 IC		01/29/2019 19:49	1	01290017.D	CLP1 0.32 (mm)
STD7 280-445745/17 IC		01/29/2019 19:49	1	01290017.D	CLP2 0.32 (mm)
ICV 280-445745/18		01/29/2019 20:10	1	01290018.D	CLP1 0.32 (mm)
ICV 280-445745/18		01/29/2019 20:10	1	01290018.D	CLP2 0.32 (mm)
STD1 280-445745/19 IC		01/29/2019 20:31	1	01290019.D	CLP1 0.32 (mm)
STD1 280-445745/19 IC		01/29/2019 20:31	1	01290019.D	CLP2 0.32 (mm)
STD2 280-445745/20 IC		01/29/2019 20:52	1	01290020.D	CLP1 0.32 (mm)
STD2 280-445745/20 IC		01/29/2019 20:52	1	01290020.D	CLP2 0.32 (mm)
STD3 280-445745/21 IC		01/29/2019 21:13	1	01290021.D	CLP1 0.32 (mm)

PCBS ANALYSIS RUN LOG

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_JStart Date: 01/29/2019 14:54Analysis Batch Number: 445745End Date: 01/30/2019 09:10

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD3 280-445745/21 IC		01/29/2019 21:13	1	01290021.D	CLP2 0.32 (mm)
STD4 280-445745/22 IC		01/29/2019 21:34	1	01290022.D	CLP1 0.32 (mm)
STD4 280-445745/22 IC		01/29/2019 21:34	1	01290022.D	CLP2 0.32 (mm)
STD5 280-445745/23 ICIS		01/29/2019 21:55	1	01290023.D	CLP1 0.32 (mm)
STD5 280-445745/23 ICIS		01/29/2019 21:55	1	01290023.D	CLP2 0.32 (mm)
STD6 280-445745/24 IC		01/29/2019 22:17	1	01290024.D	CLP1 0.32 (mm)
STD6 280-445745/24 IC		01/29/2019 22:17	1	01290024.D	CLP2 0.32 (mm)
STD7 280-445745/25 IC		01/29/2019 22:38	1	01290025.D	CLP1 0.32 (mm)
STD7 280-445745/25 IC		01/29/2019 22:38	1	01290025.D	CLP2 0.32 (mm)
ICV 280-445745/26		01/29/2019 22:59	1	01290026.D	CLP1 0.32 (mm)
ICV 280-445745/26		01/29/2019 22:59	1	01290026.D	CLP2 0.32 (mm)
STD1 280-445745/27 IC		01/29/2019 23:20	1	01290027.D	CLP1 0.32 (mm)
STD1 280-445745/27 IC		01/29/2019 23:20	1	01290027.D	CLP2 0.32 (mm)
STD2 280-445745/28 IC		01/29/2019 23:41	1	01290028.D	CLP1 0.32 (mm)
STD2 280-445745/28 IC		01/29/2019 23:41	1	01290028.D	CLP2 0.32 (mm)
STD3 280-445745/29 IC		01/30/2019 00:02	1	01290029.D	CLP1 0.32 (mm)
STD3 280-445745/29 IC		01/30/2019 00:02	1	01290029.D	CLP2 0.32 (mm)
STD4 280-445745/30 IC		01/30/2019 00:23	1	01290030.D	CLP1 0.32 (mm)
STD4 280-445745/30 IC		01/30/2019 00:23	1	01290030.D	CLP2 0.32 (mm)
STD5 280-445745/31 IC		01/30/2019 00:44	1	01290031.D	CLP1 0.32 (mm)
STD5 280-445745/31 IC		01/30/2019 00:44	1	01290031.D	CLP2 0.32 (mm)
STD6 280-445745/32 IC		01/30/2019 01:05	1	01290032.D	CLP1 0.32 (mm)
STD6 280-445745/32 IC		01/30/2019 01:05	1	01290032.D	CLP2 0.32 (mm)
STD7 280-445745/33 IC		01/30/2019 01:26	1	01290033.D	CLP1 0.32 (mm)
STD7 280-445745/33 IC		01/30/2019 01:26	1	01290033.D	CLP2 0.32 (mm)
ICV 280-445745/34		01/30/2019 01:48	1	01290034.D	CLP1 0.32 (mm)
ICV 280-445745/34		01/30/2019 01:48	1	01290034.D	CLP2 0.32 (mm)
STD1 280-445745/35 IC		01/30/2019 02:09	1	01290035.D	CLP1 0.32 (mm)
STD1 280-445745/35 IC		01/30/2019 02:09	1	01290035.D	CLP2 0.32 (mm)
STD2 280-445745/36 IC		01/30/2019 02:30	1	01290036.D	CLP1 0.32 (mm)
STD2 280-445745/36 IC		01/30/2019 02:30	1	01290036.D	CLP2 0.32 (mm)
STD3 280-445745/37 IC		01/30/2019 02:51	1	01290037.D	CLP1 0.32 (mm)
STD3 280-445745/37 IC		01/30/2019 02:51	1	01290037.D	CLP2 0.32 (mm)

PCBS ANALYSIS RUN LOG

Lab Name: TestAmerica DenverJob No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_JStart Date: 01/29/2019 14:54Analysis Batch Number: 445745End Date: 01/30/2019 09:10

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD4 280-445745/38 IC		01/30/2019 03:12	1	01290038.D	CLP1 0.32 (mm)
STD4 280-445745/38 IC		01/30/2019 03:12	1	01290038.D	CLP2 0.32 (mm)
STD5 280-445745/39 IC		01/30/2019 03:33	1	01290039.D	CLP1 0.32 (mm)
STD5 280-445745/39 IC		01/30/2019 03:33	1	01290039.D	CLP2 0.32 (mm)
STD6 280-445745/40 IC		01/30/2019 03:54	1	01290040.D	CLP1 0.32 (mm)
STD6 280-445745/40 IC		01/30/2019 03:54	1	01290040.D	CLP2 0.32 (mm)
STD7 280-445745/41 IC		01/30/2019 04:15	1	01290041.D	CLP1 0.32 (mm)
STD7 280-445745/41 IC		01/30/2019 04:15	1	01290041.D	CLP2 0.32 (mm)
ICV 280-445745/42		01/30/2019 04:36	1	01290042.D	CLP1 0.32 (mm)
ICV 280-445745/42		01/30/2019 04:36	1	01290042.D	CLP2 0.32 (mm)
ZZZZZ		01/30/2019 05:18	1		CLP1 0.32 (mm)
ZZZZZ		01/30/2019 05:18	1		CLP2 0.32 (mm)
ZZZZZ		01/30/2019 07:04	1		CLP1 0.32 (mm)
ZZZZZ		01/30/2019 07:04	1		CLP2 0.32 (mm)
ZZZZZ		01/30/2019 07:25	1		CLP1 0.32 (mm)
ZZZZZ		01/30/2019 07:25	1		CLP2 0.32 (mm)
ZZZZZ		01/30/2019 07:46	1		CLP1 0.32 (mm)
ZZZZZ		01/30/2019 07:46	1		CLP2 0.32 (mm)
ZZZZZ		01/30/2019 08:07	1		CLP1 0.32 (mm)
ZZZZZ		01/30/2019 08:07	1		CLP2 0.32 (mm)
ZZZZZ		01/30/2019 08:28	1		CLP1 0.32 (mm)
ZZZZZ		01/30/2019 08:28	1		CLP2 0.32 (mm)
ZZZZZ		01/30/2019 08:49	1		CLP1 0.32 (mm)
ZZZZZ		01/30/2019 08:49	1		CLP2 0.32 (mm)
ZZZZZ		01/30/2019 09:10	1		CLP1 0.32 (mm)
ZZZZZ		01/30/2019 09:10	1		CLP2 0.32 (mm)

PCBS ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Instrument ID: SGC_J Start Date: 02/05/2019 13:46Analysis Batch Number: 446463 End Date: 02/05/2019 16:14

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVIS 280-446463/5		02/05/2019 13:46	1	02040005.D	CLP1 0.32 (mm)
CCVIS 280-446463/5		02/05/2019 13:46	1	02040005.D	CLP2 0.32 (mm)
MB 280-444887/1-A		02/05/2019 14:49	1	02040008.D	CLP1 0.32 (mm)
MB 280-444887/1-A		02/05/2019 14:49	1	02040008.D	CLP2 0.32 (mm)
LCS 280-444887/2-A		02/05/2019 15:11	1	02040009.D	CLP1 0.32 (mm)
LCS 280-444887/2-A		02/05/2019 15:11	1	02040009.D	CLP2 0.32 (mm)
LCSD 280-444887/3-A		02/05/2019 15:32	1	02040010.D	CLP1 0.32 (mm)
LCSD 280-444887/3-A		02/05/2019 15:32	1	02040010.D	CLP2 0.32 (mm)
ZZZZZ		02/05/2019 15:53	1		CLP1 0.32 (mm)
ZZZZZ		02/05/2019 15:53	1		CLP2 0.32 (mm)
160-32649-1		02/05/2019 16:14	1	02040012.D	CLP1 0.32 (mm)
160-32649-1		02/05/2019 16:14	1	02040012.D	CLP2 0.32 (mm)

PCBS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 444887 Batch Start Date: 01/21/19 11:30 Batch Analyst: Getahun, Abaynesh ABatch Method: 3510C Batch End Date: 01/22/19 11:03

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	8081/82 Surr 00106
MB 280-444887/1		3510C, 8082A				1000 mL	10 mL	7 SU	1 mL
LCS 280-444887/2		3510C, 8082A				1000 mL	10 mL	7 SU	1 mL
LCSD 280-444887/3		3510C, 8082A				1000 mL	10 mL	7 SU	1 mL
160-32649-G-1	CRC-MW-1-011519	3510C, 8082A	T	1378.7 g	395.1 g	983.6 mL	10 mL	6 SU	1 mL

Lab Sample ID	Client Sample ID	Method Chain	Basis	8082 LCS 00050					
MB 280-444887/1		3510C, 8082A							
LCS 280-444887/2		3510C, 8082A		1 mL					
LCSD 280-444887/3		3510C, 8082A		1 mL					
160-32649-G-1	CRC-MW-1-011519	3510C, 8082A	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

PCBS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-32649-1

SDG No.: _____

Batch Number: 444887 Batch Start Date: 01/21/19 11:30 Batch Analyst: Getahun, Abaynesh ABatch Method: 3510C Batch End Date: 01/22/19 11:03

Batch Notes	
Balance ID	24750399
Batch Comment	DV-OP-0006/0007 r2d2 @ 5.00mL x2
Analyst ID - Concentration	KS (under supervision of MM)
Concentration 1 Corrected Temperature	88 Degrees C
Equipment ID - Concentration 1	C
Exchange Solvent ID	Hexane_Cycl_00054
Analyst ID - Extraction	AAG
Method/Fraction	3510C/8082
Na2SO4 ID	0000213903_00002
NaCl ID	184223
Pipette/Syringe/Dispenser ID	1n2s
Prep Solvent ID	MeCl2_Cycl_00422/423
Prep Solvent Volume Used	180 mL
Analyst ID - Spike Analyst	AAG
Analyst ID - Spike Witness Analyst	Reviewer: MM
Sufficient Volume for Batch QC	no
Concentration 1 Uncorrected Temperature	87 Degrees C
Reagent Water ID	S. ELGA

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Method 1613B

Dioxins and Furans (HRGC/HRMS) by
Method 1613B

FORM II
DIOXIN SURROGATE RECOVERY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low
GC Column (1): RTX-5 ID: 0.32 (mm)

Client Sample ID	Lab Sample ID	TCDD #	37TCDD #
	LCS 140-27087/11-A	83	100

TCDD = 13C-2,3,7,8-TCDD
37TCDD = 37C14-2,3,7,8-TCDD

QC LIMITS
20-175
31-191

Column to be used to flag recovery values

FORM II 1613B

FORM II
DIOXIN SURROGATE RECOVERY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low
GC Column (1): RTX-5 ID: 0.32 (mm)

Client Sample ID	Lab Sample ID	TCDD #	37TCDD #
CRC-MW-1-011519	160-32649-1	63	95
	MB 140-27087/10-A	84	97

TCDD = 13C-2,3,7,8-TCDD	QC LIMITS
37TCDD = 37C14-2,3,7,8-TCDD	<u>25-164</u>
	35-197

Column to be used to flag recovery values

FORM III
DIOXIN LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: LCS140-270885-Aa.d
Lab ID: LCS 140-27087/11-A Client ID: _____

COMPOUND	SPIKE ADDED (pg/L)	LCS CONCENTRATION (pg/L)	LCS % REC	QC LIMITS REC	#
2,3,7,8-TCDD	200	183	92	67-158	
13C-2,3,7,8-TCDD	1000	826	83	20-175	

Column to be used to flag recovery and RPD values

FORM IV
DIOXIN METHOD BLANK SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1
SDG No.: _____
Lab File ID: MB140-270884-Aa.d Lab Sample ID: MB 140-27087/10-A
Matrix: Water Date Extracted: 01/22/2019 13:19
Instrument ID: D2A Date Analyzed: 01/28/2019 03:56
Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 140-27087/11-A	LCS140-2708 85-Aa.d	01/28/2019 02:07
CRC-MW-1-011519	160-32649-1	160-32649-n -1-a.d	01/29/2019 12:43

FORM I
DIOXIN ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: CRC-MW-1-011519 Lab Sample ID: 160-32649-1
 Matrix: Water Lab File ID: 160-32649-n-1-a.d
 Analysis Method: 1613B Date Collected: 01/15/2019 12:30
 Extract. Method: HRMS-Sepf Date Extracted: 01/22/2019 13:19
 Sample wt/vol: 953.4 (mL) Date Analyzed: 01/29/2019 12:43
 Con. Extract Vol.: 20 (uL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 27242 Units: pg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	EDL
1746-01-6	2,3,7,8-TCDD	0.35	U	10	0.35

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
76523-40-5	13C-2,3,7,8-TCDD	63		25-164

CAS NO.	SURROGATE	%REC	Q	LIMITS
85508-50-5	37C14-2,3,7,8-TCDD	95		35-197

TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
 Lims ID: 160-32649-N-1-A
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 29-Jan-2019 12:43:00 ALS Bottle#: 0 Worklist Smp#: 7
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010667-007
 Operator ID: Xcalibur_System Instrument ID: D2A
 Method: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 29-Jan-2019 13:51:58 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: CTX1017

First Level Reviewer: davidsonm

Date: 29-Jan-2019 13:51:58

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	30:59						0.0166	0.0166		
A Non-2,3,7,8-sub-TCDD	29:36						0.0166	0.0373		RQU
S Total TCDD							0.0373	0.0373		
A Non-2,3,7,8-sub-TCDF	28:18	10421	0.77	0.0000						RQ
S Total TCDF							0.0	0.0		RQ
A Non-2,3,7,8-sub-PeCDD	39:30	5449	1.55	0.0000						RQ
S Total PeCDD							0.0	0.0		RQ
A Non-2,3,7,8-sub-PeCDF	38:06						0.0	0.0		
S Total PeCDF							0.0	0.0		
A Non-2,3,7,8-sub-HxCDD	44:21	2744	1.20	0.0000						
S Total HxCDD							0.0	0.0		
A Non-2,3,7,8-sub-HxCDF	44:13						0.0	0.0		
S Total HxCDF							0.0	0.0		
A Non-2,3,7,8-sub-HpCDD	49:07	9449	1.04	0.0000						RQ
S Total HpCDD							0.0	0.0		RQ
A Non-2,3,7,8-sub-HpCDF	49:20	4268	1.04	0.0000						RQ
S Total HpCDF							0.0	0.0		RQ
D 13C-2,3,7,8-TCDD	31:01	1680418	0.82	1.0709	31.5	31.5	0.2921	0.2921	62.93	
\$ 37CI4-2,3,7,8-TCDD	31:03	579525		1.2266	9.475	9.475	0.0399	0.0399	94.75	
* 13C-1,2,3,4-TCDD	30:30	4986536	0.79	9.1E+04	100.0	100.0				
* 13C-1,2,3,7,8,9-HxCDD	45:24	5600820	1.26	1E+05	100.0	100.0				

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
 Lims ID: 160-32649-N-1-A
 Client ID: CRC-MW-1-011519
 Sample Type: Client
 Inject. Date: 29-Jan-2019 12:43:00 ALS Bottle#: 0 Worklist Smp#: 7
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010667-007
 Operator ID: Xcalibur_System Instrument ID: D2A
 Method: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 29-Jan-2019 13:51:58 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: CTX1017

First Level Reviewer: davidsonm

Date: 29-Jan-2019 13:51:58

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
--------	--------------	------------------	------	-----------	------	--------	--------------	---------------	-----	---------------	-------

2,3,7,8-TCDD

319.8965 30:59

11 27

321.8936 30:59

17 42

A Non-2,3,7,8-sub-TCDD

U

319.8965 25:07 29:36

-268 0.810

320

139

11

27

13

321.8936 25:07 29:36

-268 0.810

450

141

17

42

0.71(0.65-0.89)

A Non-2,3,7,8-sub-TCDF

RQ

303.9016 25:15 28:18

-183 0.871

661

152

21

52

7

305.8987 25:16 28:18

-182 0.872

1316

342

47

117

7

0.50(0.65-0.89)

303.9016 28:28 28:18

10 0.982

1954

160

21

52

8

305.8987 28:28 28:18

10 0.982

2962

314

47

117

7

0.66(0.65-0.89)

303.9016 33:53 28:18

334 1.168

1584

228

21

52

11

305.8987 33:52 28:18

333 1.168

2402

272

47

117

6

0.66(0.65-0.89)

A Non-2,3,7,8-sub-PeCDD

RQ

355.8546 37:46 39:30

-104 0.929

1088

111

16

40

7

357.8516 37:53 39:30

-97 0.932

1921

380

27

67

14

0.57(1.32-1.78)

355.8546 39:55 39:30

25 0.982

2225

403

16

40

25

357.8516 39:55 39:30

25 0.982

1731

289

27

67

11

1.29(1.32-1.78)

A Non-2,3,7,8-sub-PeCDF

339.8597 38:06

58

145

341.8567 38:06

72

180

A Non-2,3,7,8-sub-HxCDD

389.8158 43:21 44:21

-60 0.963

1494

342

75

187

5

391.8127 43:20 44:21

-61 0.962

1250

297

40

100

7

1.20(1.05-1.43)

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-HxCDF											
373.8208	44:13						40	100			
375.8178	44:13						76	190			
A Non-2,3,7,8-sub-HpCDD											
423.7767	48:34	49:07	-33	0.977	2279	494	13	32	38		RQ
425.7737	48:33	49:07	-34	0.977	4107	638	61	152	10	0.55(0.88-1.20)	
423.7767	49:44	49:07	37	1.000	2537	602	13	32	46		
425.7737	49:45	49:07	38	1.001	2442	310	61	152	5	1.04(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDF											
407.7817	48:05	49:20	-76	1.000	2176	533	55	137	10		RQ
409.7788	48:05	49:20	-76	1.000	2909	714	33	82	22	0.75(0.88-1.20)	
13C-2,3,7,8-TCDD											
331.9368	31:01	31:04	1	1.017	757156	81815	391	977	209		
333.9338	31:00	31:04	0	1.017	923262	98007	279	697	351	0.82(0.65-0.89)	
37Cl4-2,3,7,8-TCDD											
327.8847	31:03	31:03	3	1.018	579525	61650	105	262	587		
13C-1,2,3,4-TCDD											
331.9368	30:30	30:26	3		2204558	242544	391	977	620		
333.9338	30:30	30:26	3		2781978	292949	279	697	1050	0.79(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45:24	45:22	2		3126278	730114	226	565	3231		
403.8529	45:24	45:22	2		2474542	576150	130	325	4432	1.26(1.05-1.43)	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

U - Marked Undetected

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
 Lims ID: 160-32649-N-1-A
 Client ID: CRC-MW-1-011519
 Inject. Date: 29-Jan-2019 12:43:00 Dil. Factor: 1.0000
 Sample Type: Client Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 7

Non-2,3,7,8-sub-TCDD, RT: 29.595

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
2,3,7,8-TCDD	1.173	D 13C-2,3,7,8-TCDD	50.000	1680418	179822

Averages:

	RRF _n		Qis	Ris Area	Ris Height
	1.173		50.000	1680418	179822

Sum the Uncalibrated Results

RT	319.8965 Area	319.8965 Height	321.8936 Area	321.8936 Height	Amount	Ratio	Flags
25:07	320	139	450	141	0.0195	0.71	
27:58	1037	141	674	180	0.0434	1.54	RQ
27:58	518	138	674	180	0.0302		Empc Correction
28:54	495	105	374	101	0.0220	1.32	RQ
28:54	287	77	374	101	0.0168		Empc Correction
29:37	481	103	588	97	0.0271	0.82	
30:29	640	107	1299	236	0.0492	0.49	RQ
30:29	640	107	831	138	0.0373		Empc Correction
33:34	321	93	925	177	0.0316	0.35	RQ
33:34	321	93	416	120	0.0187		Empc Correction
34:08	682	182	503	207	0.0301	1.36	RQ
34:08	387	159	503	207	0.0226		Empc Correction

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
 Lims ID: 160-32649-N-1-A
 Client ID: CRC-MW-1-011519
 Inject. Date: 29-Jan-2019 12:43:00 Dil. Factor: 1.0000
 Sample Type: Client Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 7

Non-2,3,7,8-sub-TCDF, RT: 28.298

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
2,3,7,8-TCDF	1.088				
Averages:					
	RRFn		Qis	Ris Area	Ris Height
	0.000		0.0	0	0

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
25:15	661	152	1316	342		0.50	R
28:28	1954	160	2962	314		0.66	
33:53	1584	228	2402	272		0.66	
Signal Totals:							
	4199	540	6680	928			

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	10879	1468				0.63	RQ
	10421	1323					Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (10879 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (10421 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
 Lims ID: 160-32649-N-1-A
 Client ID: CRC-MW-1-011519
 Inject. Date: 29-Jan-2019 12:43:00 Dil. Factor: 1.0000
 Sample Type: Client Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 7

Non-2,3,7,8-sub-PeCDD, RT: 39.487

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,7,8-PeCDD	1.043				

Averages:

	RRFn		Qis	Ris Area	Ris Height
	0.000		0.0	0	0

Sum the Uncalibrated Results

RT	355.8546 Area	355.8546 Height	357.8516 Area	357.8516 Height	Amount	Ratio	Flags
37:46	1088	111	1921	380		0.57	R
39:55	2225	403	1731	289		1.29	R
Signal Totals:	3313	514	3652	669			

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	6965	1183				0.91	RQ
	5449	845					Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (6965 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (5449 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
 Lims ID: 160-32649-N-1-A
 Client ID: CRC-MW-1-011519
 Inject. Date: 29-Jan-2019 12:43:00 Dil. Factor: 1.0000
 Sample Type: Client Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 7

Non-2,3,7,8-sub-HxCDD, RT: 44.344

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,4,7,8-HxCDD	1.141				
1,2,3,6,7,8-HxCDD	1.148				
1,2,3,7,8,9-HxCDD	1.221				

Averages:

	RRFn		Qis	Ris Area	Ris Height
	0.000		0.0	0	0

Sum the Uncalibrated Results

RT	389.8158 Area	389.8158 Height	391.8127 Area	391.8127 Height	Amount	Ratio	Flags
43:21	1494	342	1250	297		1.20	
Signal Totals:	1494	342	1250	297			

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	2744	639				1.20	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (2744 * 0.0) / (0 * 0.000)

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
 Lims ID: 160-32649-N-1-A
 Client ID: CRC-MW-1-011519
 Inject. Date: 29-Jan-2019 12:43:00 Dil. Factor: 1.0000
 Sample Type: Client Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 7

Non-2,3,7,8-sub-HpCDD, RT: 49.112

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,4,6,7,8-HpCDD	1.120				

Averages:

	RRFn		Qis	Ris Area	Ris Height
	0.000		0.0	0	0

Sum the Uncalibrated Results

RT	423.7767 Area	423.7767 Height	425.7737 Area	425.7737 Height	Amount	Ratio	Flags
48:34	2279	494	4107	638		0.55	R
49:44	2537	602	2442	310		1.04	
Signal Totals:	4816	1096	6549	948			

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	11365	2044				0.74	RQ
	9449	1881					Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (11365 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (9449 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
 Lims ID: 160-32649-N-1-A
 Client ID: CRC-MW-1-011519
 Inject. Date: 29-Jan-2019 12:43:00 Dil. Factor: 1.0000
 Sample Type: Client Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 7

Non-2,3,7,8-sub-HpCDF, RT: 49.331

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,4,6,7,8-HpCDF	1.498				
1,2,3,4,7,8,9-HpCDF	1.381				

Averages:

	RRFn		Qis	Ris Area	Ris Height
	0.000		0.0	0	0

Sum the Uncalibrated Results

RT	407.7817 Area	407.7817 Height	409.7788 Area	409.7788 Height	Amount	Ratio	Flags
48:05	2176	533	2909	714		0.75	R
Signal Totals:	2176	533	2909	714			

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	5085	1247				0.75	RQ
	4268	1045					Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (5085 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (4268 * 0.0) / (0 * 0.000)

QC Flag Legend

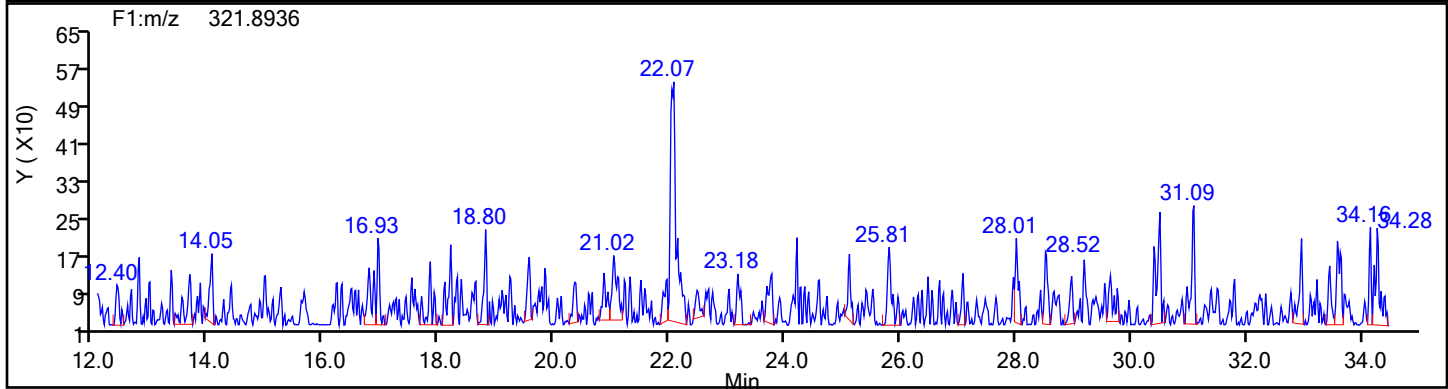
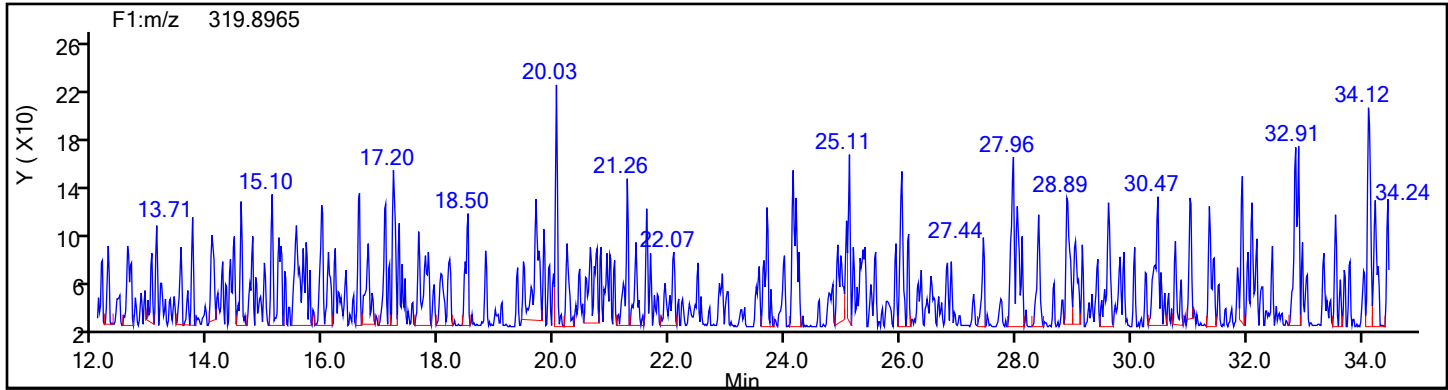
Processing Flags

R - Failed Signal Ratio Test

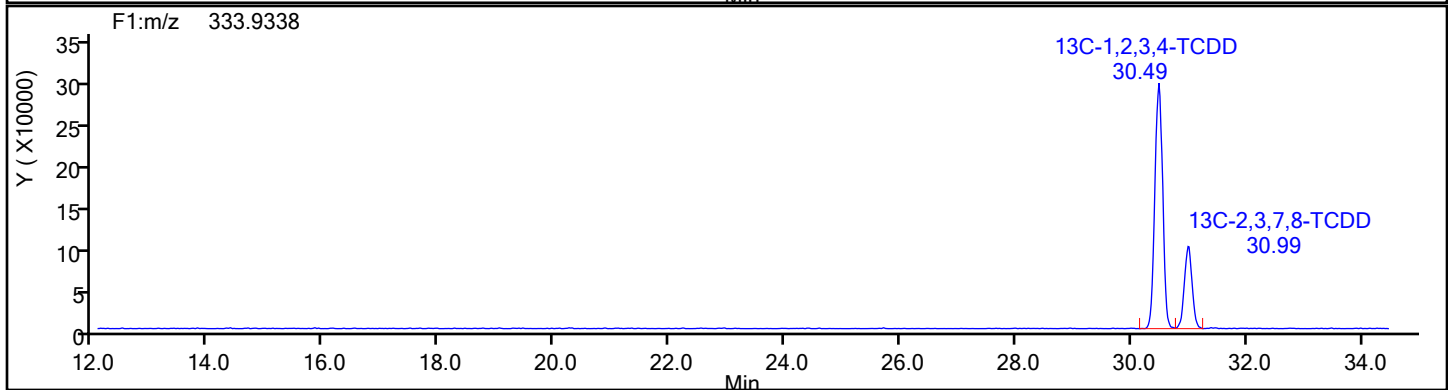
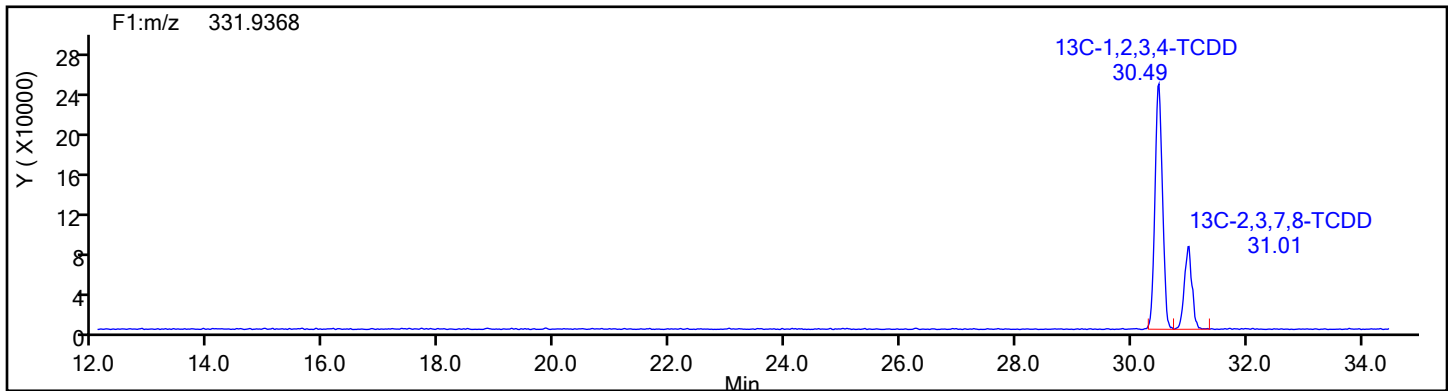
Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
Injection Date: 29-Jan-2019 12:43:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID: CRC-MW-1-011519
Worklist#: 27242 Sample Line#: 7
Column Type: TCDD Column Dia:

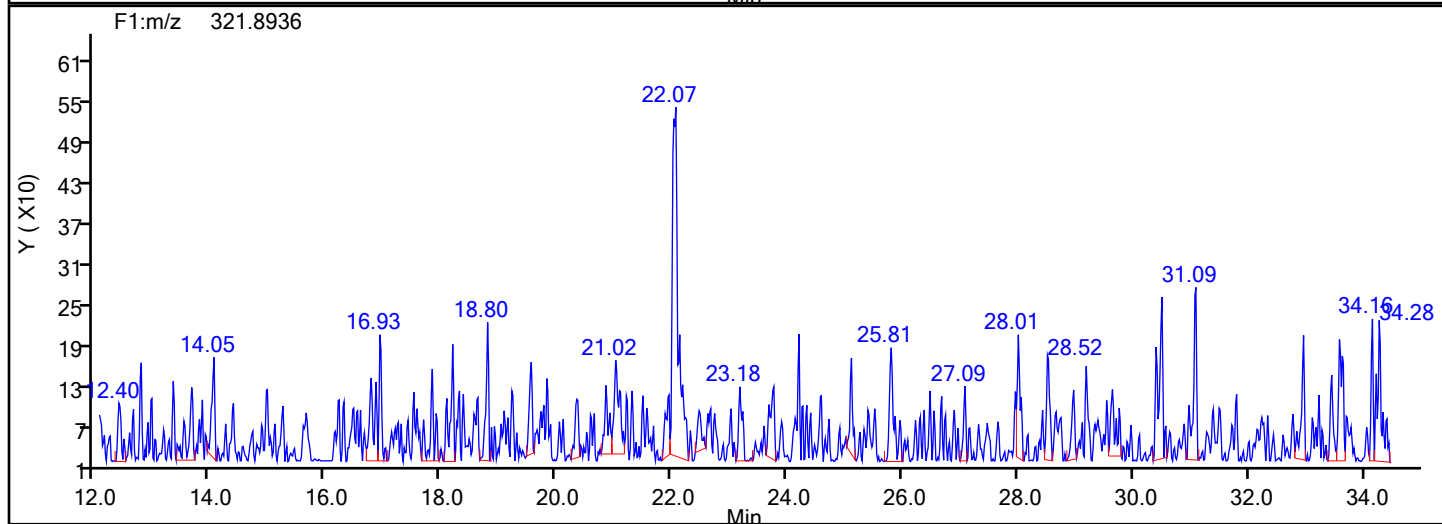
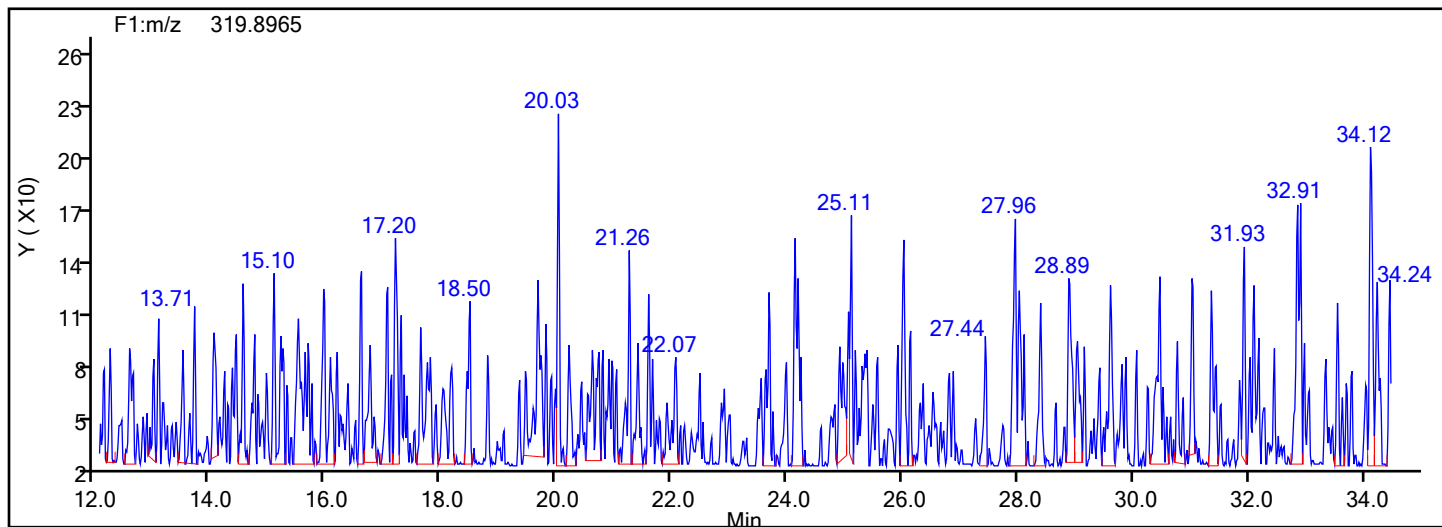


TCDD Standards

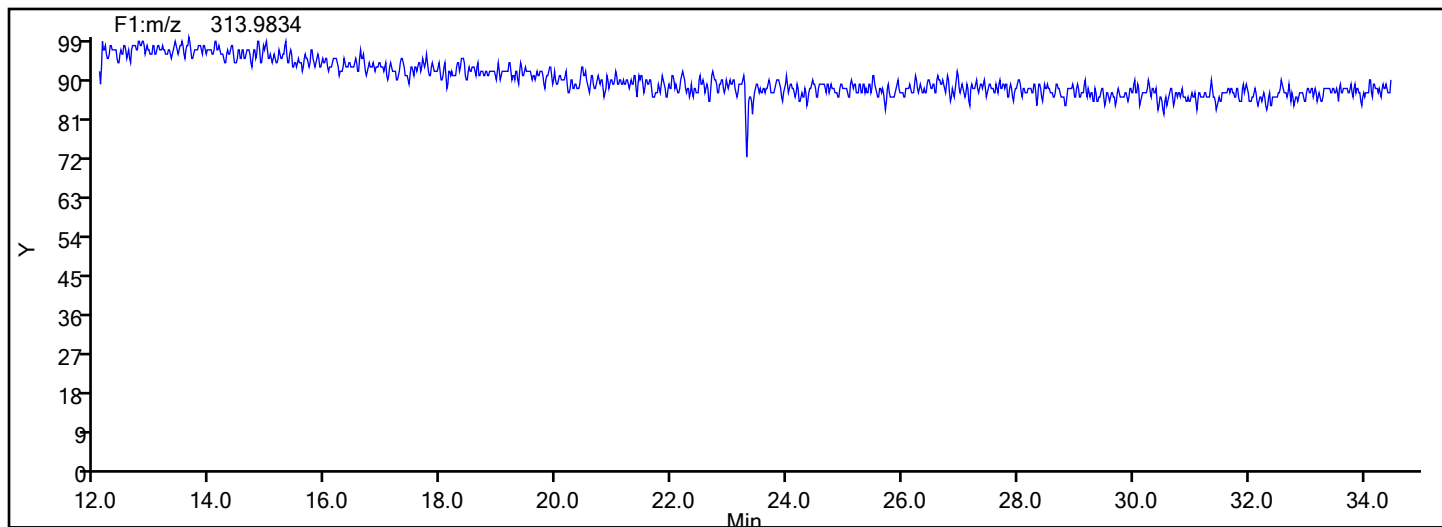


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
Injection Date: 29-Jan-2019 12:43:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID: CRC-MW-1-011519
Worklist#: 27242 Sample Line#: 7
Column Type: Column Dia:
TCDD

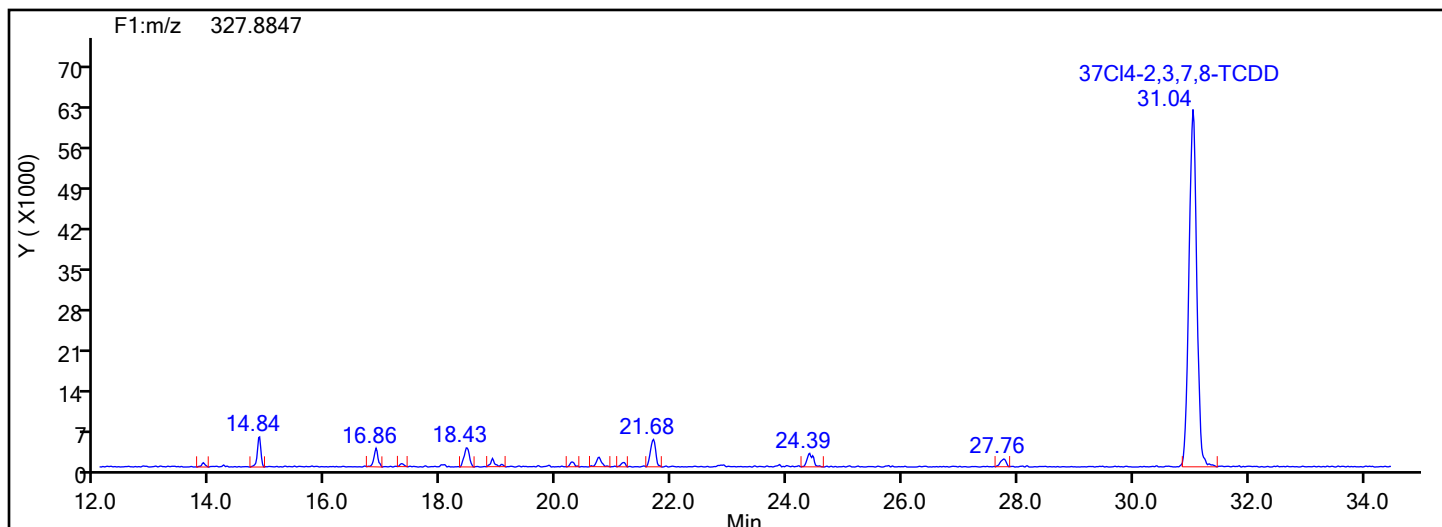


TCDD Lock Mass

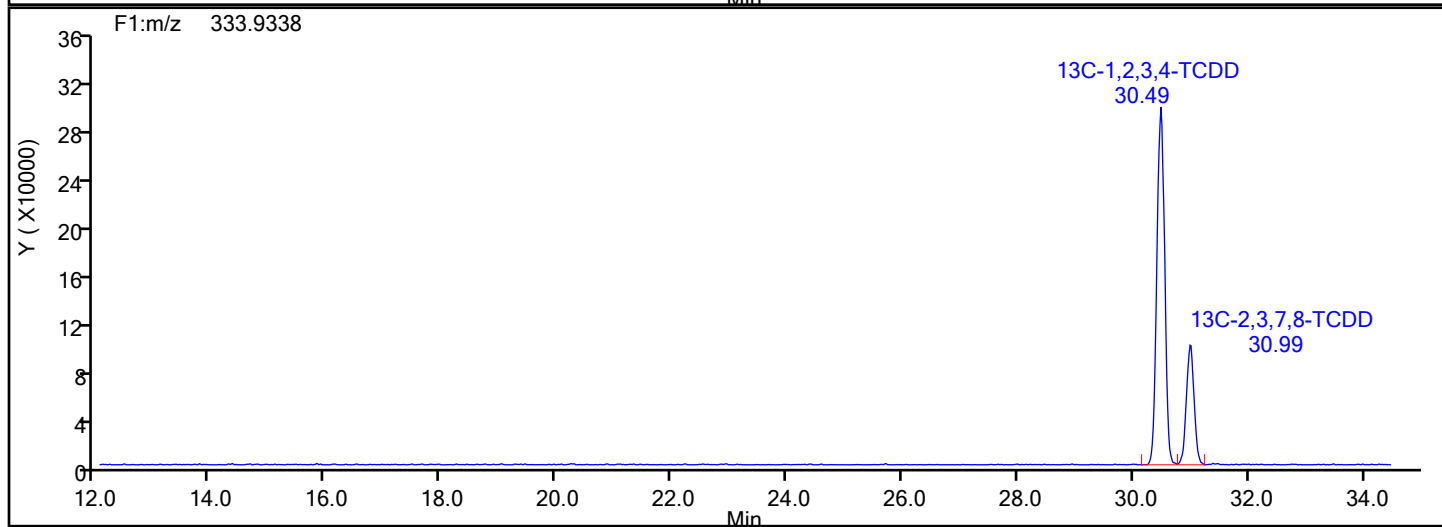
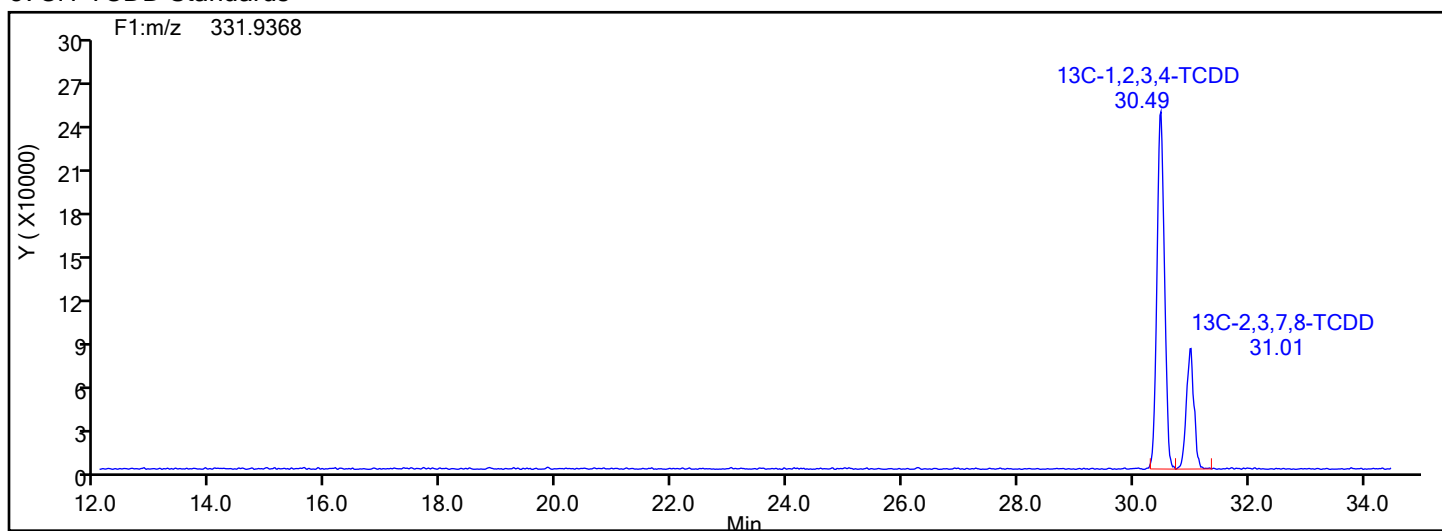


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\160-32649-n-1-a.d
Injection Date: 29-Jan-2019 12:43:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID: CRC-MW-1-011519
Worklist#: 27242 Sample Line#: 7
Column Type: Column Dia:
37Cl4-TCDD

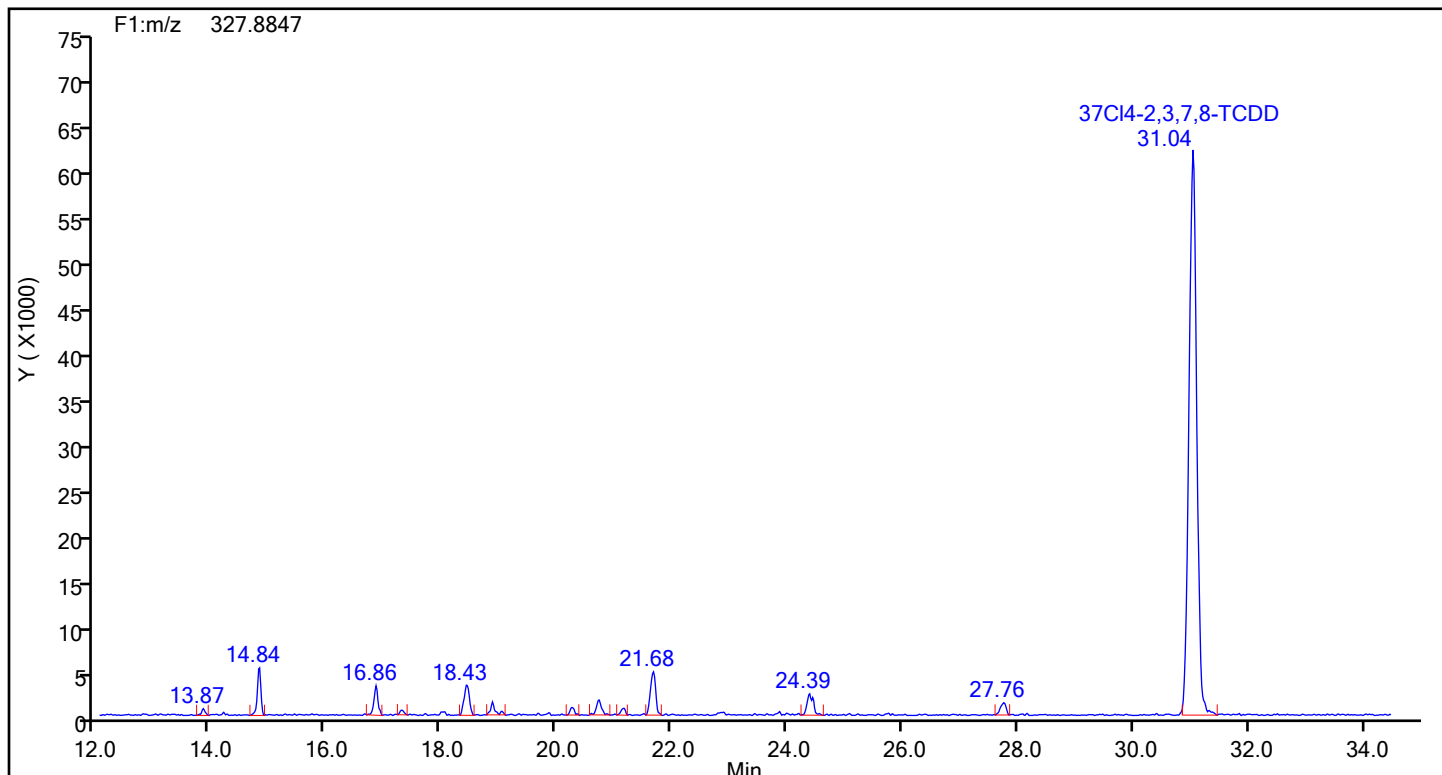


37Cl4-TCDD Standards

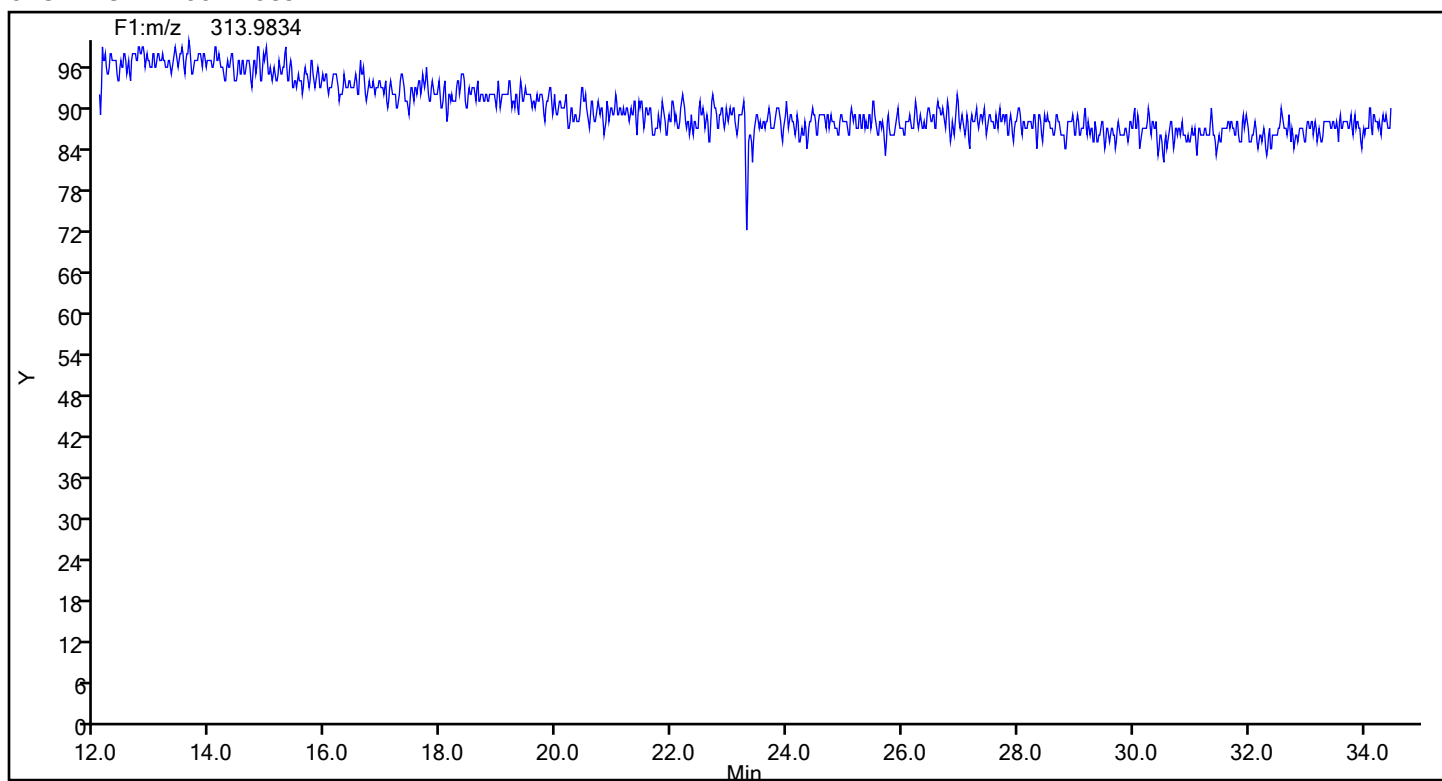


TestAmerica Knoxville

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Injection Date: 29-Jan-2019 12:43:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID: CRC-MW-1-011519
Worklist#: 27242 Sample Line#: 7
Column Type: 37CI4-TCDD
Column Dia:



37CI4-TCDD Lock Mass



FORM VI
DIOXIN BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1 Analy Batch No.: 7768

SDG No.: _____

Instrument ID: D2A GC Column: RTX-5 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/16/2014 14:26 Calibration End Date: 05/16/2014 18:31 Calibration ID: 825

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 140-7768/2	d3140516i1.d
Level 2	IC 140-7768/3	d3140516i2.d
Level 3	IC 140-7768/4	d3140516i3.d
Level 4	IC 140-7768/5	d3140516i4.d
Level 5	IC 140-7768/6	d3140516i5.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
2,3,7,8-TCDF	1.1620	1.0787	1.0761	1.0664	1.0575	AveID		1.0881				3.9		20.0			
2,3,7,8-TCDD	1.1914	1.2413	1.1477	1.1335	1.1525	AveID		1.1733				3.7		20.0			
1,2,3,7,8-PeCDF	1.2525	1.1873	1.1447	1.1539	1.2106	AveID		1.1898				3.7		20.0			
2,3,4,7,8-PeCDF	1.1621	1.1000	1.0763	1.0701	1.1388	AveID		1.1095				3.6		20.0			
1,2,3,7,8-PeCDD	1.1072	1.0520	1.0113	1.0030	1.0435	AveID		1.0434				4.0		20.0			
1,2,3,4,7,8-HxCDF	1.4252	1.3521	1.3239	1.3123	1.4010	AveID		1.3629				3.6		20.0			
1,2,3,6,7,8-HxCDF	1.4070	1.2610	1.2346	1.2159	1.2627	AveID		1.2762				5.9		20.0			
2,3,4,6,7,8-HxCDF	1.3654	1.2309	1.2243	1.2236	1.2827	AveID		1.2654				4.8		20.0			
1,2,3,4,7,8-HxCDD	1.2224	1.1235	1.1211	1.1013	1.1360	AveID		1.1409				4.1		20.0			
1,2,3,6,7,8-HxCDD	1.1974	1.1789	1.1380	1.0905	1.1358	AveID		1.1481				3.6		20.0			
1,2,3,7,8,9-HxCDD	1.2071	1.2833	1.1953	1.1788	1.2414	AveID		1.2212				3.4		35.0			
1,2,3,7,8,9-HxCDF	1.2857	1.2741	1.2331	1.2330	1.2608	AveID		1.2573				1.9		20.0			
1,2,3,4,6,7,8-HpCDF	1.6046	1.5139	1.4534	1.4467	1.4732	AveID		1.4984				4.3		20.0			
1,2,3,4,6,7,8-HpCDD	1.1769	1.1205	1.1094	1.0801	1.1151	AveID		1.1204				3.1		20.0			
1,2,3,4,7,8,9-HpCDF	1.4220	1.4030	1.3414	1.3478	1.3894	AveID		1.3807				2.5		20.0			
OCDD	1.2833	1.1839	1.1963	1.1493	1.2234	AveID		1.2073				4.2		20.0			
OCDF	1.1506	1.1271	1.0957	1.0561	1.1513	AveID		1.1162				3.6		35.0			
13C-2,3,7,8-TCDF	1.7281	1.7612	1.7382	1.7730	1.7721	Ave		1.7545				1.2		35.0			
13C-2,3,7,8-TCDD	1.0524	1.0711	1.0580	1.0797	1.0934	Ave		1.0709				1.5		35.0			
13C-1,2,3,7,8-PeCDF	1.3121	1.2910	1.3370	1.4108	1.5012	Ave		1.3704				6.3		35.0			
13C-2,3,4,7,8-PeCDF	1.3287	1.3226	1.3322	1.4302	1.5050	Ave		1.3837				5.9		35.0			
13C-1,2,3,7,8-PeCDD	0.8255	0.8165	0.8307	0.9110	0.9879	Ave		0.8743				8.5		35.0			
13C-1,2,3,4,7,8-HxCDF	1.1989	1.1941	1.2026	1.2023	1.1481	Ave		1.1892				2.0		35.0			
13C-1,2,3,6,7,8-HxCDF	1.4353	1.4571	1.4933	1.4944	1.4322	Ave		1.4625				2.1		35.0			
13C-2,3,4,6,7,8-HxCDF	1.3243	1.3372	1.3420	1.3289	1.2660	Ave		1.3197				2.3		35.0			
13C-1,2,3,4,7,8-HxCDD	0.8799	0.8733	0.8778	0.8876	0.8675	Ave		0.8772				0.9		35.0			
13C-1,2,3,6,7,8-HxCDD	0.9056	0.9046	0.9264	0.9561	0.8927	Ave		0.9171				2.7		35.0			
13C-1,2,3,7,8,9-HxCDF	1.1673	1.2100	1.2020	1.2237	1.1977	Ave		1.2001				1.7		35.0			
13C-1,2,3,4,6,7,8-HpCDF	1.0428	1.0485	1.0503	1.0601	1.0464	Ave		1.0496				0.6		35.0			
13C-1,2,3,4,6,7,8-HpCDD	0.8259	0.8151	0.8034	0.8291	0.8039	Ave		0.8155				1.5		35.0			
13C-1,2,3,4,7,8,9-HpCDF	0.8929	0.8842	0.8895	0.9041	0.9030	Ave		0.8947				1.0		35.0			
13C-OCDD	0.6790	0.6985	0.6669	0.7374	0.7401	Ave		0.7044				4.7		35.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
DIOXIN BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1 Analy Batch No.: 7768

SDG No.: _____

Instrument ID: D2A GC Column: RTX-5 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/16/2014 14:26 Calibration End Date: 05/16/2014 18:31 Calibration ID: 825

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
13C-OCDF	1.0271	1.0311	1.0122	1.1195	1.1174	Ave		1.0615				4.9		35.0			
37C14-2,3,7,8-TCDD	1.2785	1.2086	1.1875	1.2224	1.2357	Ave		1.2266				2.8					

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
DIOXIN BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1 Analy Batch No.: 7768

SDG No.: _____

Instrument ID: D2A GC Column: RTX-5 ID: 0.32 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/16/2014 14:26 Calibration End Date: 05/16/2014 18:31 Calibration ID: 825

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 140-7768/2	d3140516i1.d
Level 2	IC 140-7768/3	d3140516i2.d
Level 3	IC 140-7768/4	d3140516i3.d
Level 4	IC 140-7768/5	d3140516i4.d
Level 5	IC 140-7768/6	d3140516i5.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PG/UL)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
2,3,7,8-TCDF		AveID	94226	328832	1699244	6586510	35566472	0.500	2.00	10.0	40.0	200
2,3,7,8-TCDD		AveID	58834	230135	1103093	4263534	23916178	0.500	2.00	10.0	40.0	200
1,2,3,7,8-PeCDF		AveID	385579	1326472	6951995	28353659	172459555	2.50	10.0	50.0	200	1000
2,3,4,7,8-PeCDF		AveID	362268	1259085	6512875	26657615	162647050	2.50	10.0	50.0	200	1000
1,2,3,7,8-PeCDD		AveID	214444	743339	3815716	15915139	97828013	2.50	10.0	50.0	200	1000
1,2,3,4,7,8-HxCDF		AveID	433645	1500520	7655800	31660907	205245281	2.50	10.0	50.0	200	1000
1,2,3,6,7,8-HxCDF		AveID	512529	1707727	8864531	36461883	230766405	2.50	10.0	50.0	200	1000
2,3,4,6,7,8-HxCDF		AveID	458923	1529879	7899628	32628769	207212834	2.50	10.0	50.0	200	1000
1,2,3,4,7,8-HxCDD		AveID	272992	911864	4731492	19615008	125745795	2.50	10.0	50.0	200	1000
1,2,3,6,7,8-HxCDD		AveID	275227	991123	5069185	20922527	129376084	2.50	10.0	50.0	200	1000
1,2,3,7,8,9-HxCDD		AveID	273517	1060210	5184383	21806109	139413717	2.50	10.0	50.0	200	1000
1,2,3,7,8,9-HxCDF		AveID	380908	1432850	7126497	30276117	192682603	2.50	10.0	50.0	200	1000
1,2,3,4,6,7,8-HpCDF		AveID	424692	1475215	7340131	30775593	196710947	2.50	10.0	50.0	200	1000
1,2,3,4,6,7,8-HpCDD		AveID	246709	848864	4285504	17971175	114386892	2.50	10.0	50.0	200	1000
1,2,3,4,7,8,9-HpCDF		AveID	322253	1153014	5736971	24451442	160075574	2.50	10.0	50.0	200	1000
OCDD		AveID	442341	1537141	7672456	34014604	231071676	5.00	20.0	100	400	2000
OCDF		AveID	599861	2160278	10665891	47454024	328275681	5.00	20.0	100	400	2000
13C-2,3,7,8-TCDF	13CTC	Ave	16217882	15241754	15790178	15441140	16816585	100	100	100	100	100
13C-2,3,7,8-TCDD	13CTC	Ave	9876576	9269717	9611208	9403373	10375862	100	100	100	100	100
13C-1,2,3,7,8-PeCDF	13CTC	Ave	12314088	11172583	12146075	12286310	14246063	100	100	100	100	100
13C-2,3,4,7,8-PeCDF	13CTC	Ave	12469187	11446462	12102314	12455454	14282105	100	100	100	100	100
13C-1,2,3,7,8-PeCDD	13CTC	Ave	7747378	7066036	7546076	7933559	9374768	100	100	100	100	100
13C-1,2,3,4,7,8-HxCDF	13CHx	Ave	12171006	11097986	11565241	12063156	14649659	100	100	100	100	100
13C-1,2,3,6,7,8-HxCDF	13CHx	Ave	14571209	13542561	14360417	14993755	18275058	100	100	100	100	100
13C-2,3,4,6,7,8-HxCDF	13CHx	Ave	13444179	12428502	12905207	13333182	16154097	100	100	100	100	100
13C-1,2,3,4,7,8-HxCDD	13CHx	Ave	8933187	8116369	8441043	8905352	11068991	100	100	100	100	100
13C-1,2,3,6,7,8-HxCDD	13CHx	Ave	9193835	8407393	8908892	9593131	11391028	100	100	100	100	100
13C-1,2,3,7,8,9-HxCDF	13CHx	Ave	11850370	11246135	11559055	12277599	15282343	100	100	100	100	100
13C-1,2,3,4,6,7,8-HpCDF	13CHx	Ave	10586908	9744462	10100696	10636138	13352459	100	100	100	100	100
13C-1,2,3,4,6,7,8-HpCDD	13CHx	Ave	8384746	7575508	7725803	8319073	10257853	100	100	100	100	100
13C-1,2,3,4,7,8,9-HpCDF	13CHx	Ave	9064964	8217931	8553669	9071146	11521506	100	100	100	100	100
13C-OCDD	13CHx	Ave	13787078	12983405	12827376	14797795	18887158	200	200	200	200	200
13C-OCDF	13CHx	Ave	20853570	19166588	19467909	22466050	28514559	200	200	200	200	200
37C14-2,3,7,8-TCDD	13CTC	Ave	59993	209201	1078771	4258282	23452691	0.500	2.00	10.0	40.0	200

FORM VI
DIOXIN BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1 Analy Batch No.: 7768
SDG No.: _____
Instrument ID: D2A GC Column: RTX-5 ID: 0.32 (mm) Heated Purge: (Y/N) N
Calibration Start Date: 05/16/2014 14:26 Calibration End Date: 05/16/2014 18:31 Calibration ID: 825

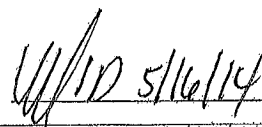
Curve Type Legend:

Ave = Average ISTD AveID = Average isotope dilution
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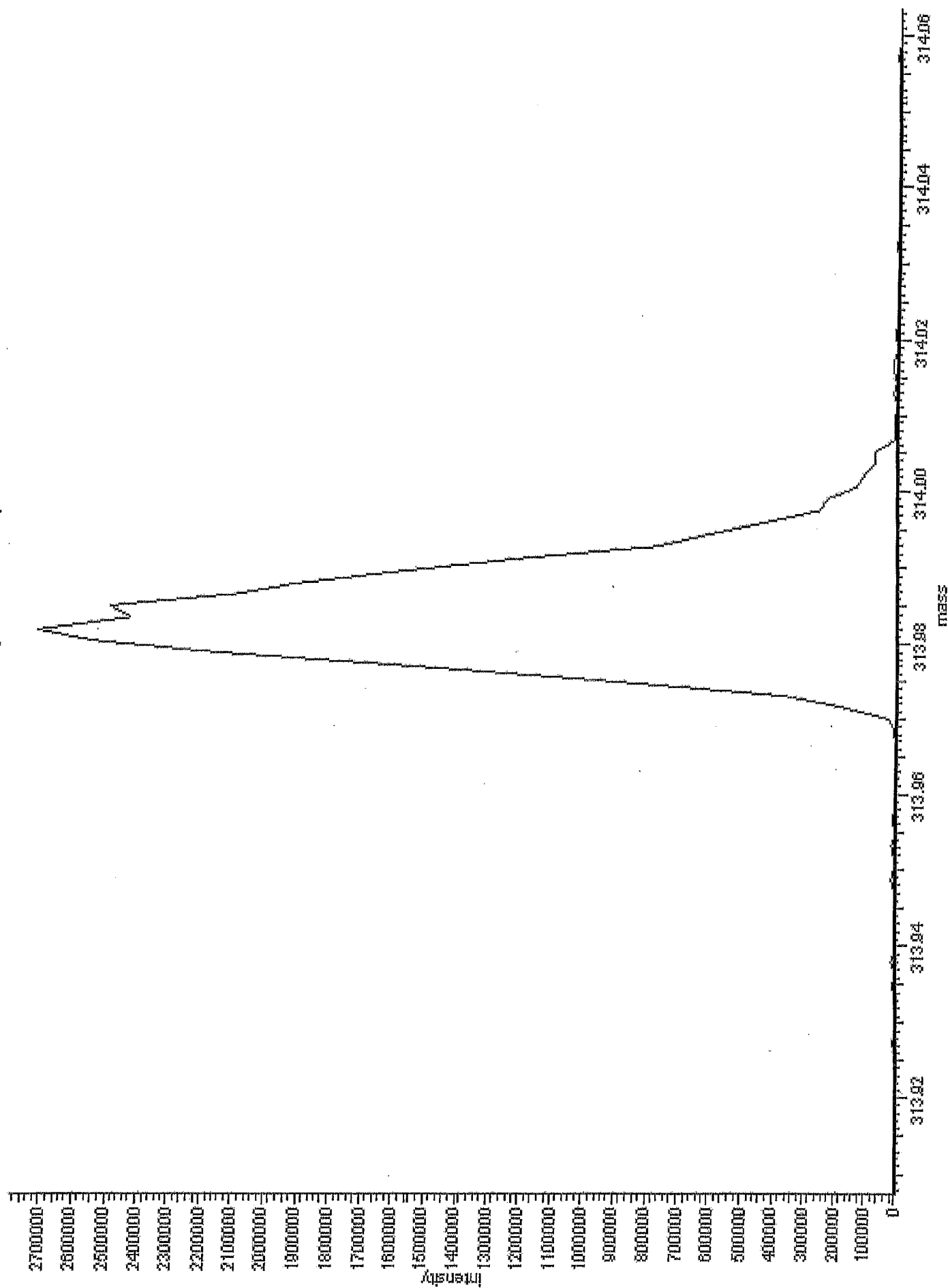
Reports

10:08:13: Peak matching procedure started
10:08:14:
10:08:14: Reference mass: 313.98336
10:08:15: Sample mass: 364.0
10:08:15:
10:08:16: Finding reference mass
10:08:17: Finding sample mass
10:08:17:
10:08:23: [1] 363.9794 amu, mean: 363.9794 SD: 0.48 mmu or: 1.31 ppm
10:08:26: [2] 363.9801 amu, mean: 363.9798 SD: 0.90 mmu or: 2.48 ppm
10:08:29: [3] 363.9812 amu, mean: 363.9802 SD: 0.79 mmu or: 2.18 ppm
10:08:32: [4] 363.9808 amu, mean: 363.9804 SD: 0.69 mmu or: 1.90 ppm
10:08:36: [5] 363.9802 amu, mean: 363.9804 SD: 0.65 mmu or: 1.78 ppm
10:08:39: [6] 363.9808 amu, mean: 363.9804 SD: 0.64 mmu or: 1.76 ppm
10:08:42: [7] 363.9798 amu, mean: 363.9803 SD: 0.64 mmu or: 1.76 ppm
10:08:45: [8] 363.9810 amu, mean: 363.9804 SD: 0.63 mmu or: 1.73 ppm
10:08:48: [9] 363.9810 amu, mean: 363.9805 SD: 0.59 mmu or: 1.63 ppm
10:08:51: [10] 363.9806 amu, mean: 363.9805
10:08:52:
10:08:52: Stop requested. Please wait for procedure to finish.
10:08:52:

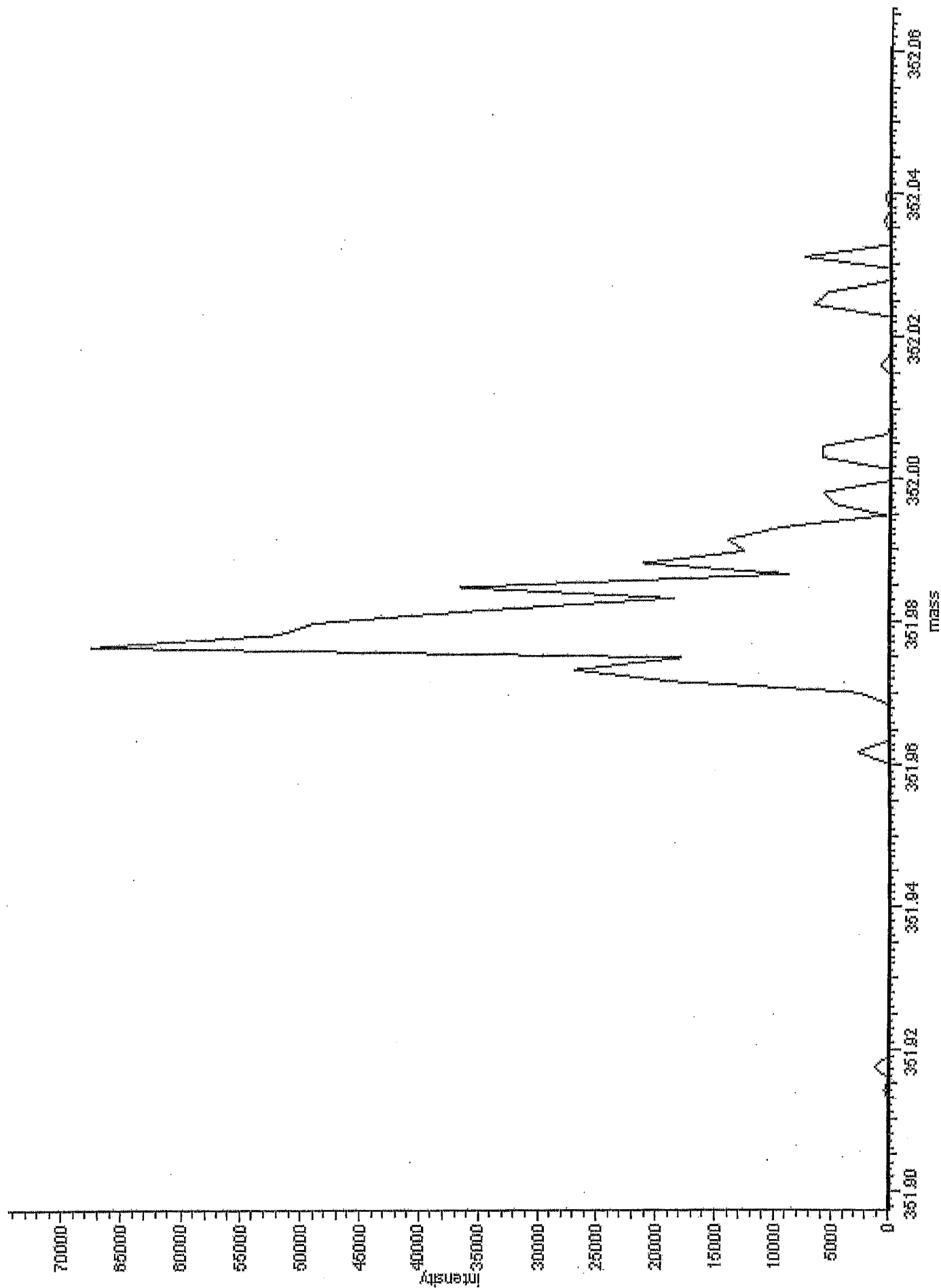
Signature

Handwritten signature in black ink, appearing to read "U/ID 5/16/14".

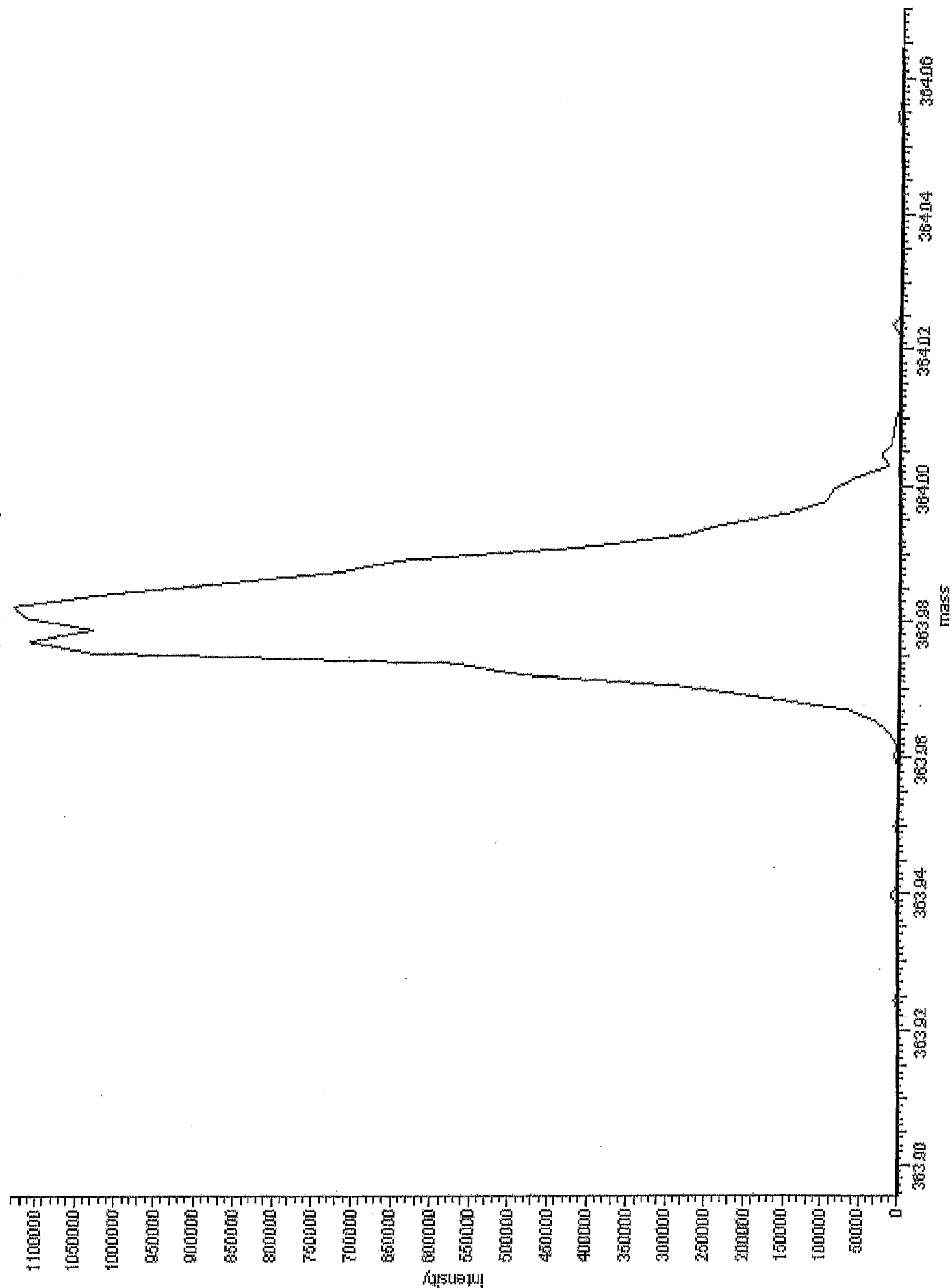
LockMass: 313.9838 Instr.: DFS-3097
Resolution: 10281 (05/16/14 10:01:15)



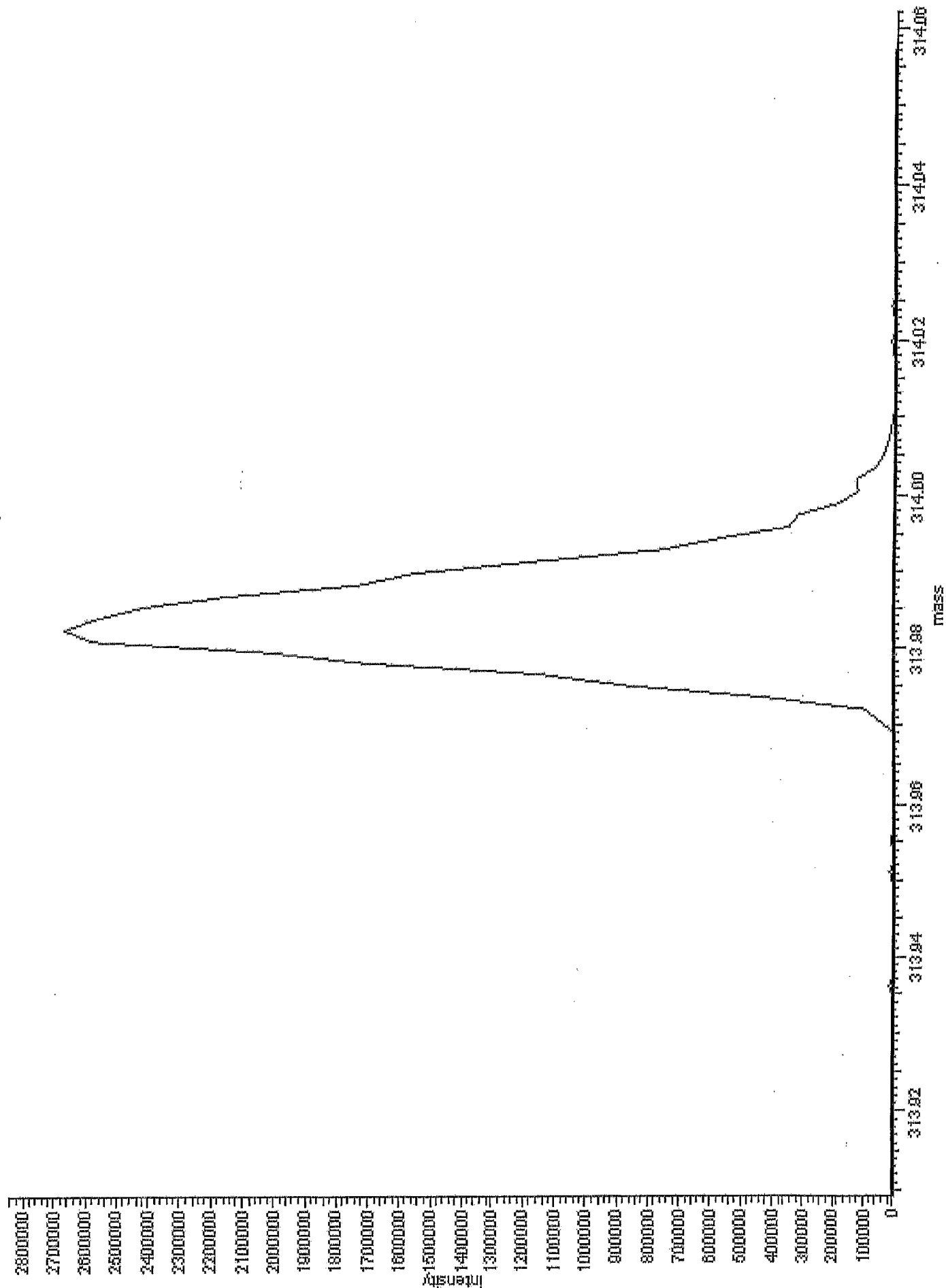
Mass: 351.9802 Instr.: DFS-3097
Resolution: 12224 (05/16/14 10:02:01)



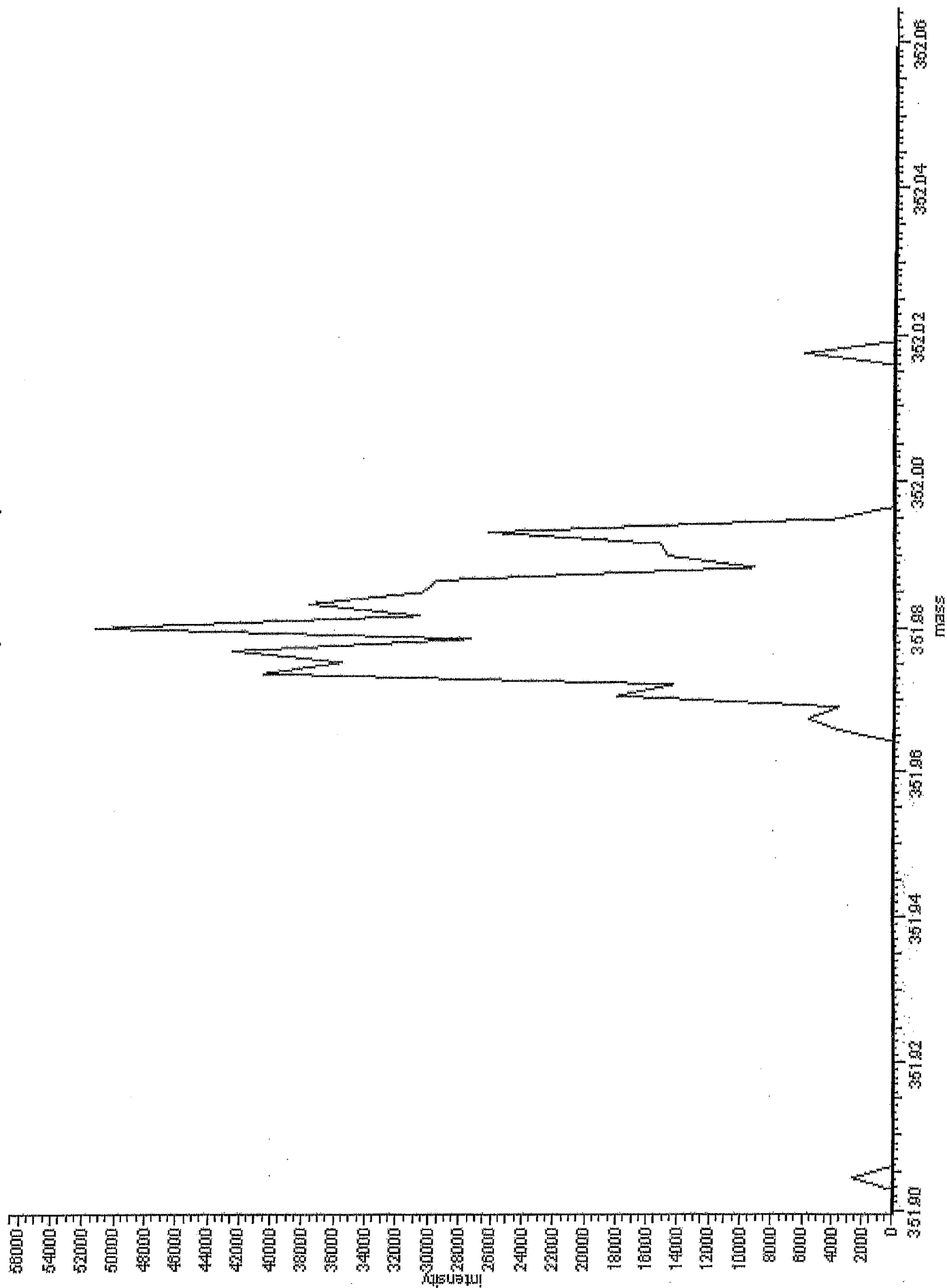
CalMass:363.9807 hstr.:DFS-3097
Resolution: 10510 (05/16/14 10:02:04)



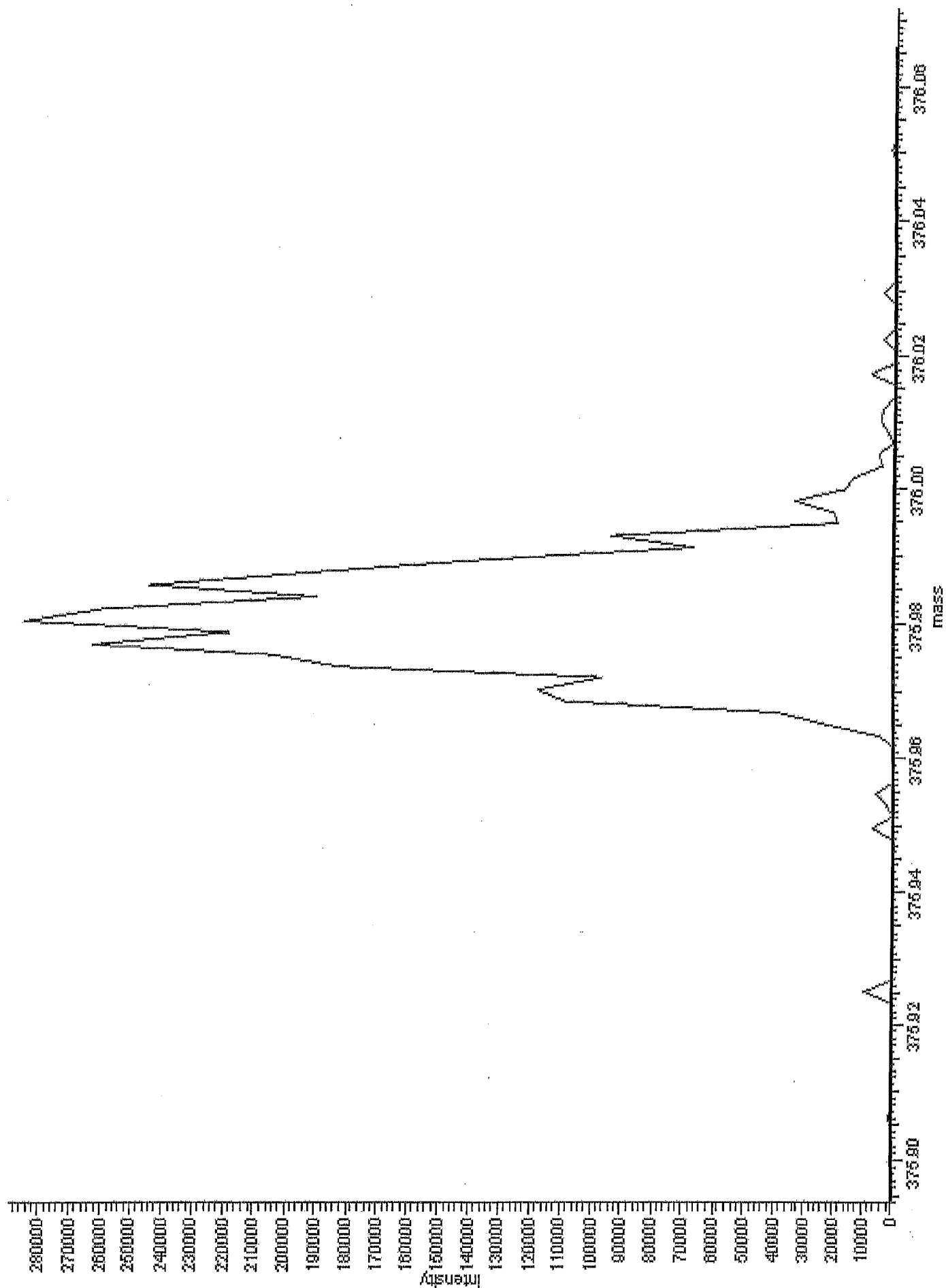
LockMass: 313.9839 Instr.: DFS-3097
Resolution: 10510 (05/18/14 10:02:20)



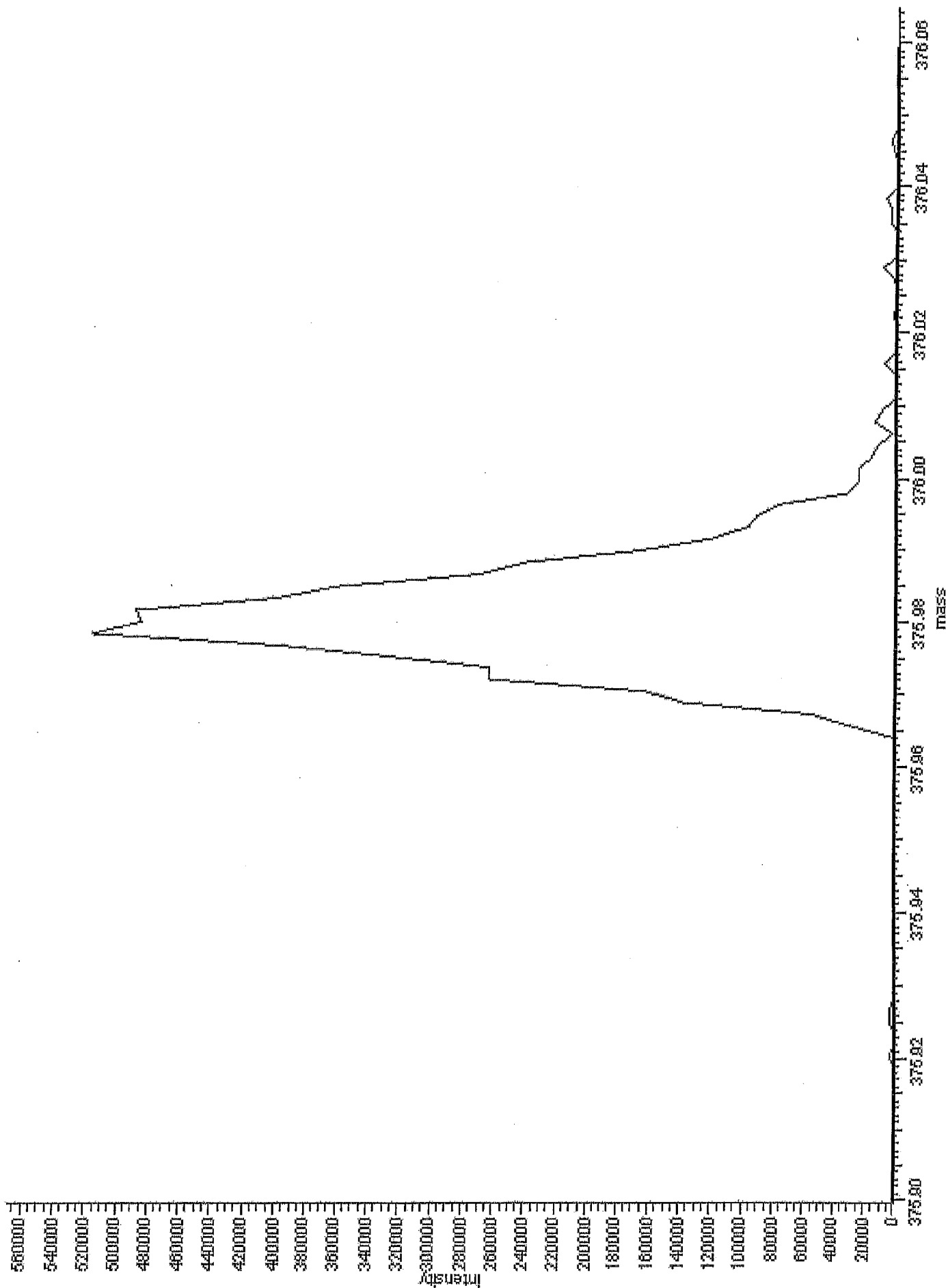
Mass: 351.9802 Instr.: DFS-3097
Resolution: 12894 (05/16/14 10:03:17)



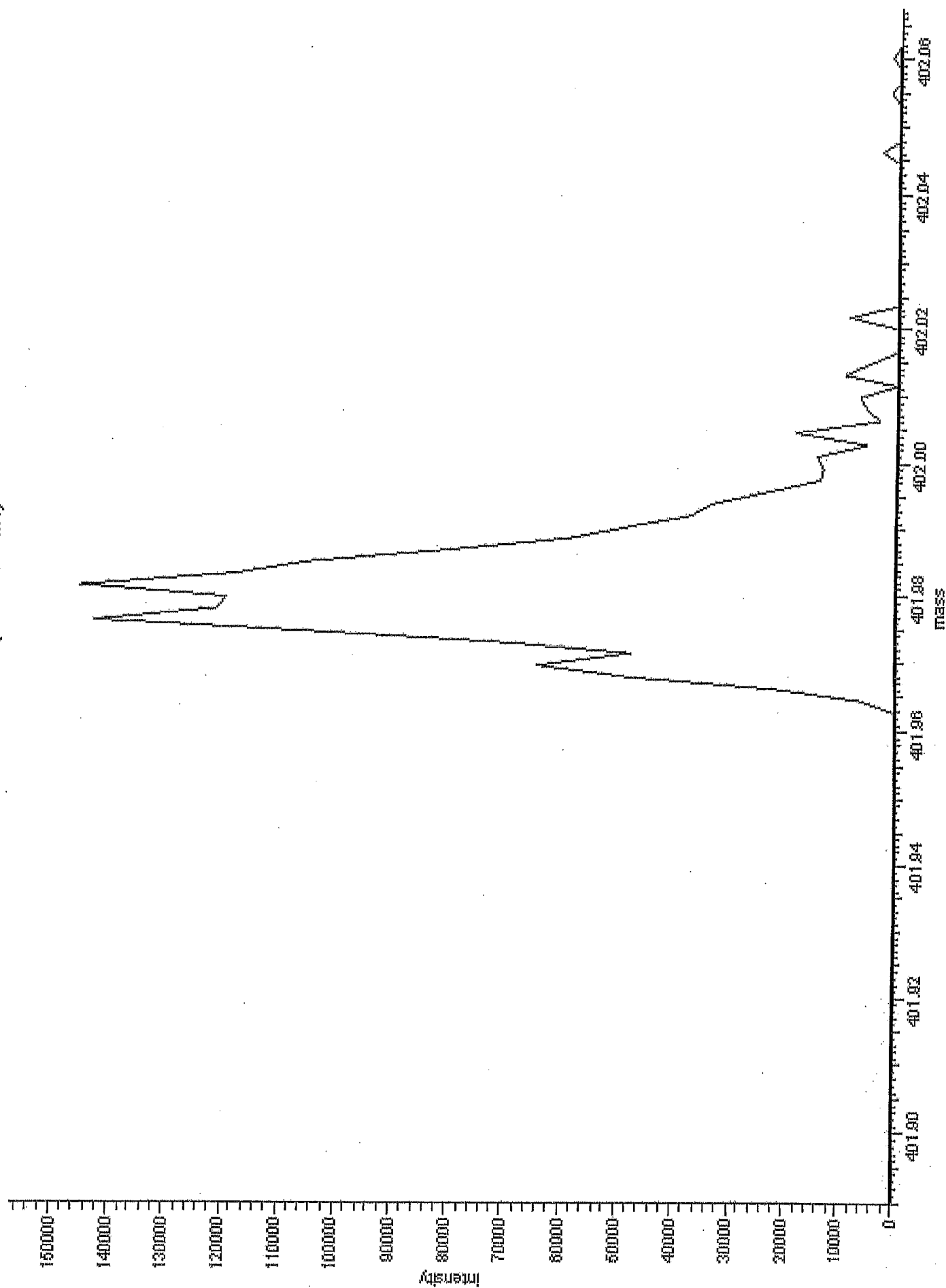
CalMass: 375.9802 Instr.: DFS-3097
Resolution: 11628 (05/16/14 10:03:10)



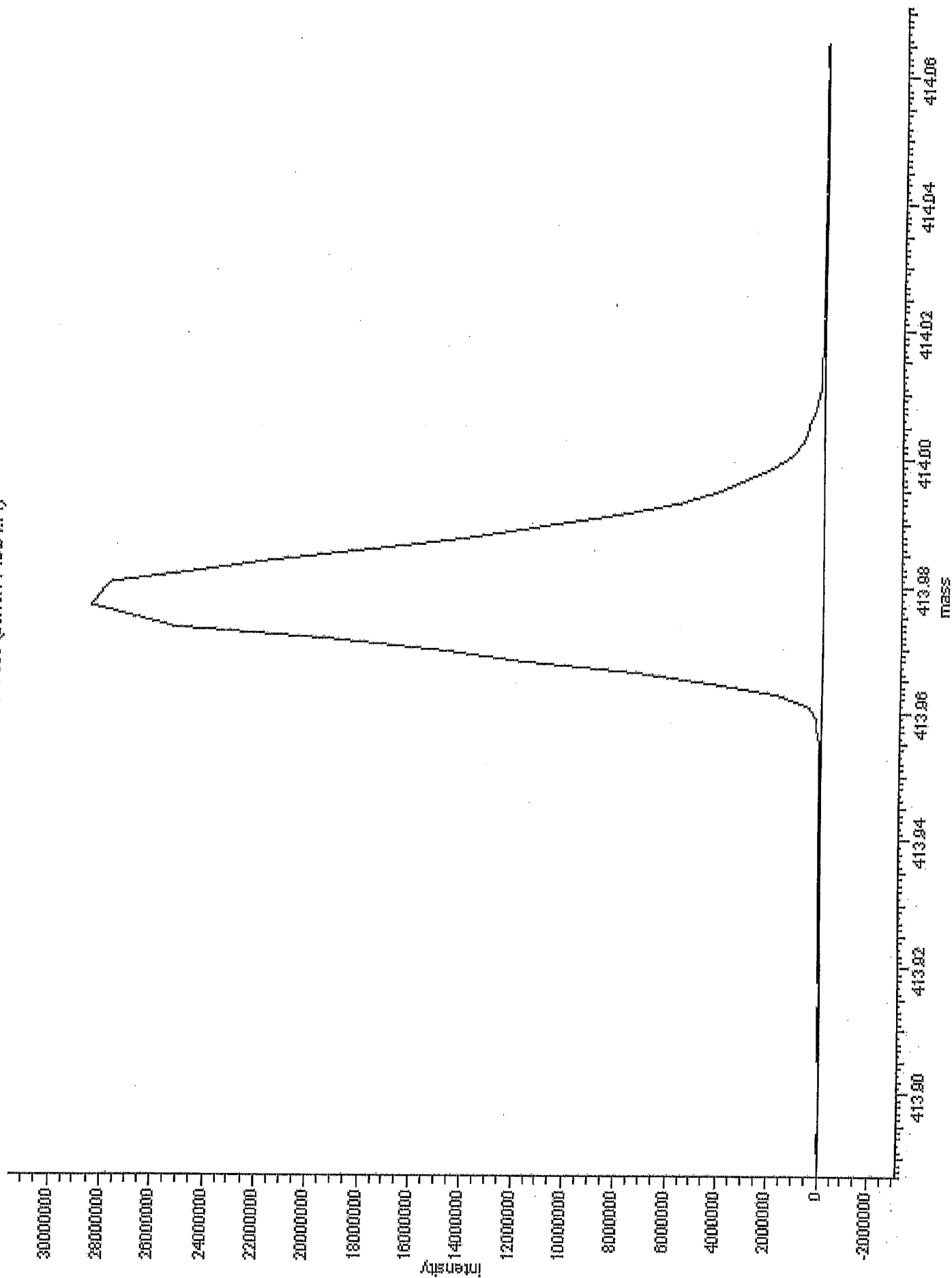
LockMass:375.9802 Instr:DFS-3007
Resolution:11628 (05/16/14 10:03:25)



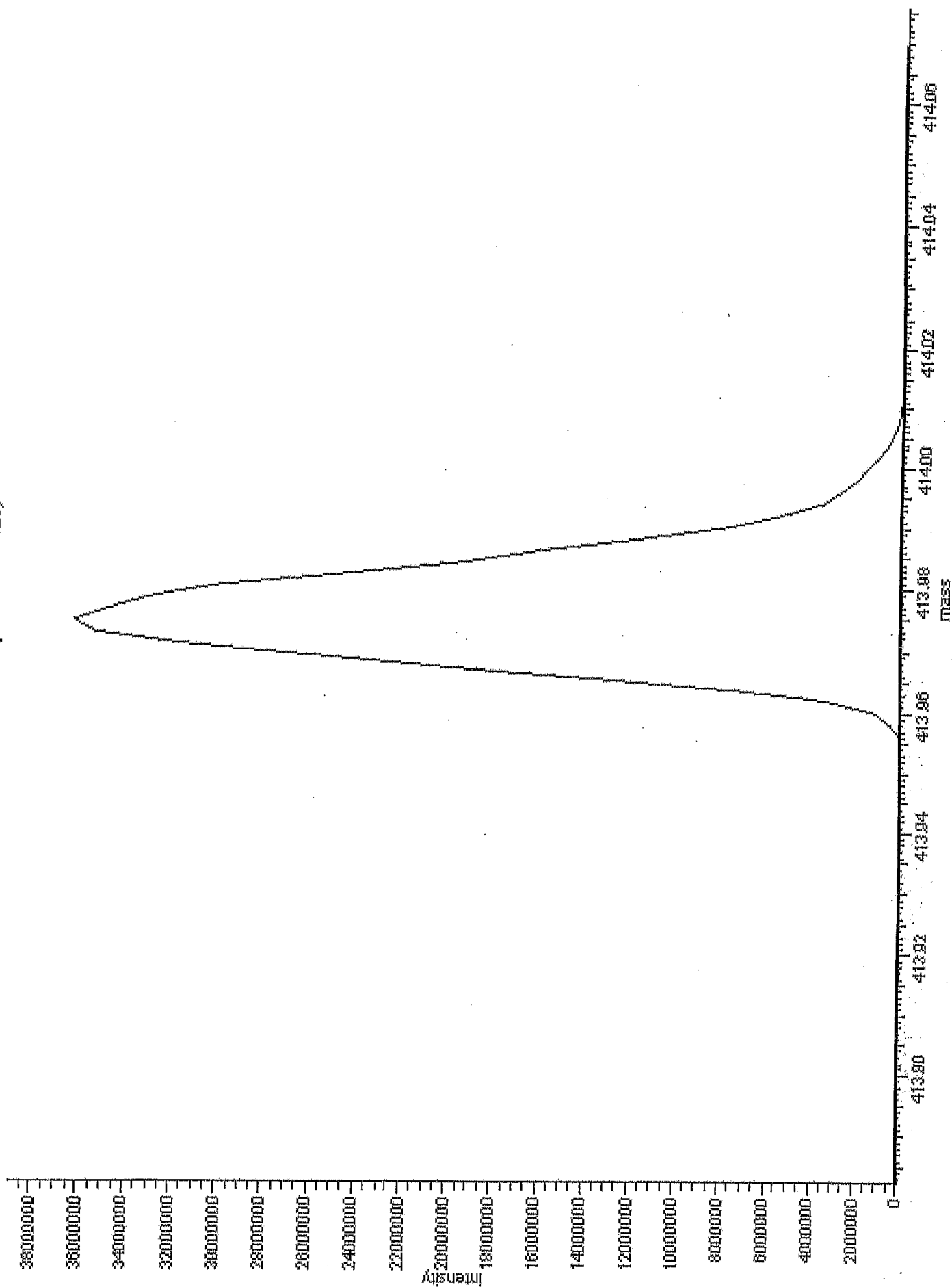
Mass: 401.9770 Instr.: DFS-3097
Resolution: 10656 (05/16/14 10:04:11)



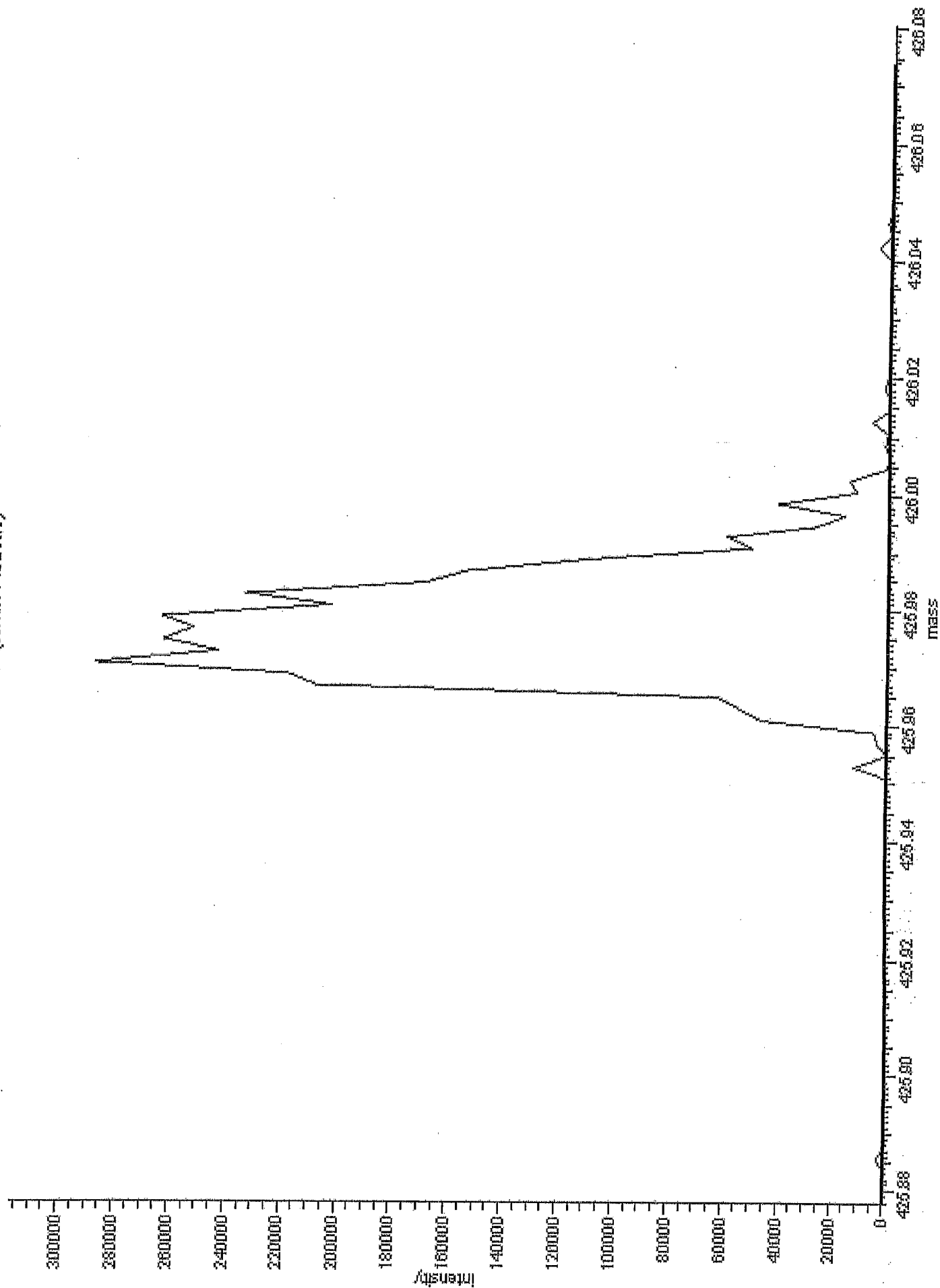
CalMass: 413.9770 hstr.: DFS-3097
Resolution: 10868 (05/16/14 10:04:14)



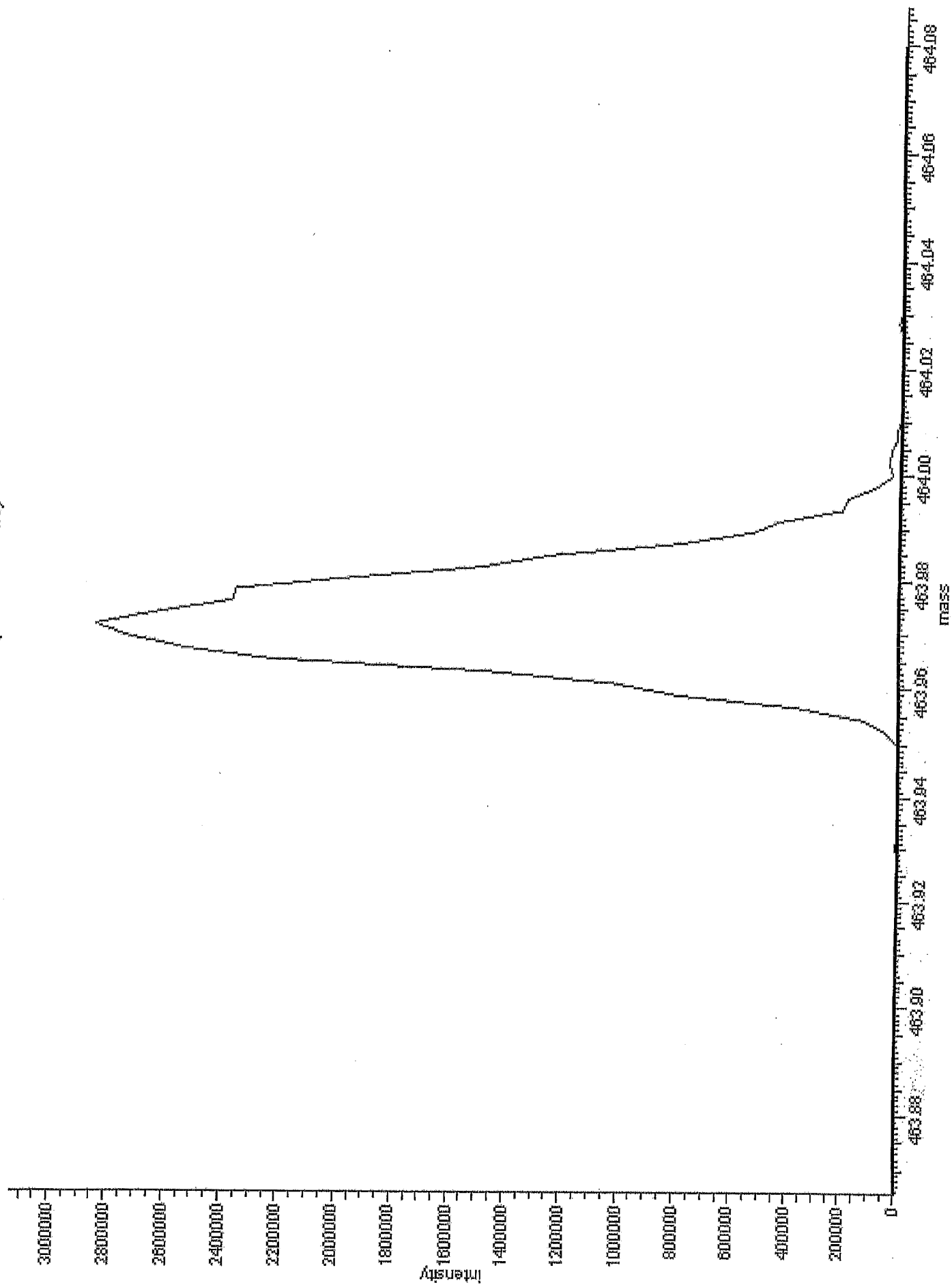
LockMass: 413.9775 Instr.: DFS-3097
Resolution: 10868 (05/16/14 10:04:29)



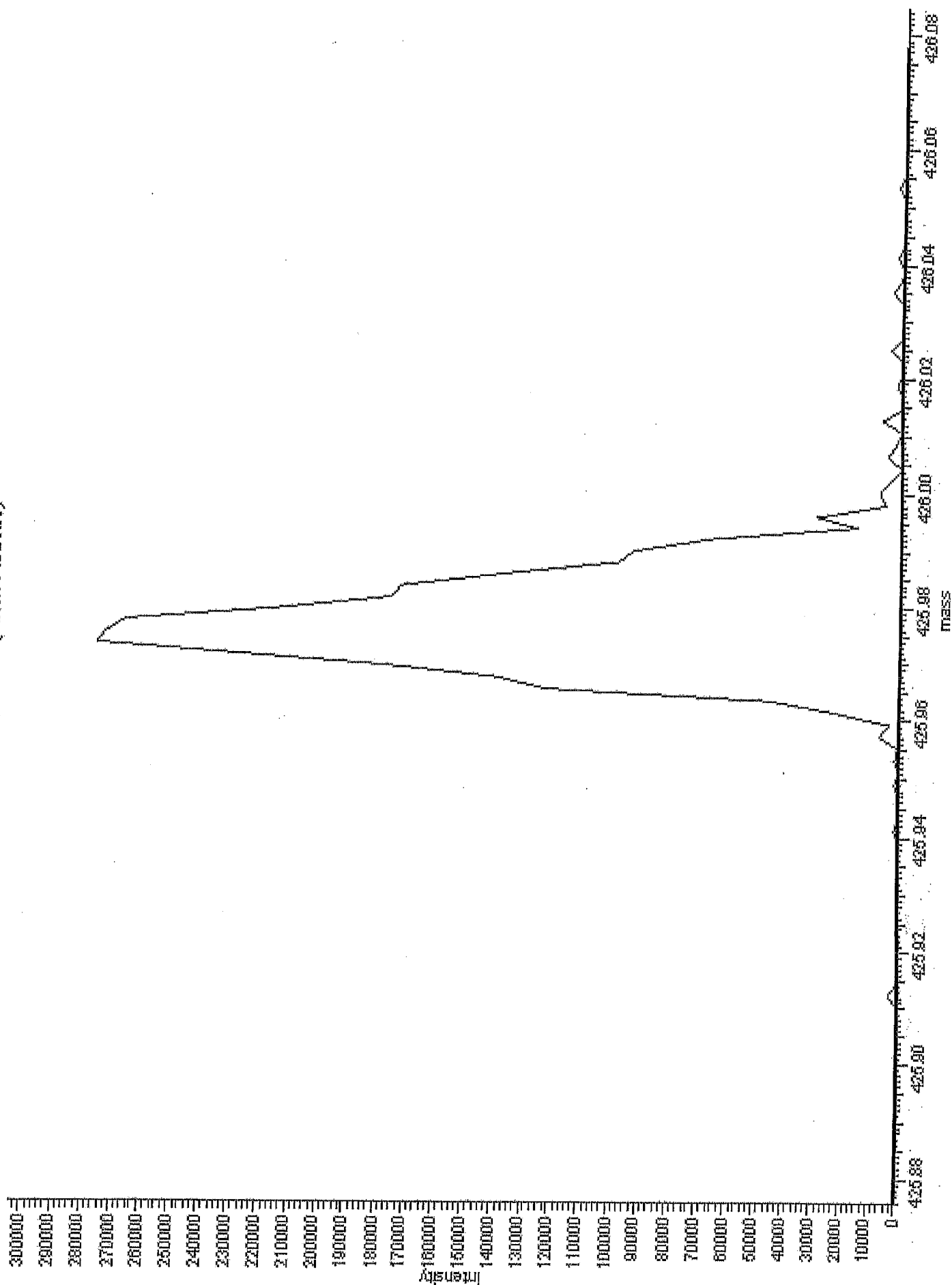
Mass: 425.9770 Instr.: DFS-3097
Resolution: 10853 (05/16/14 10:05:16)



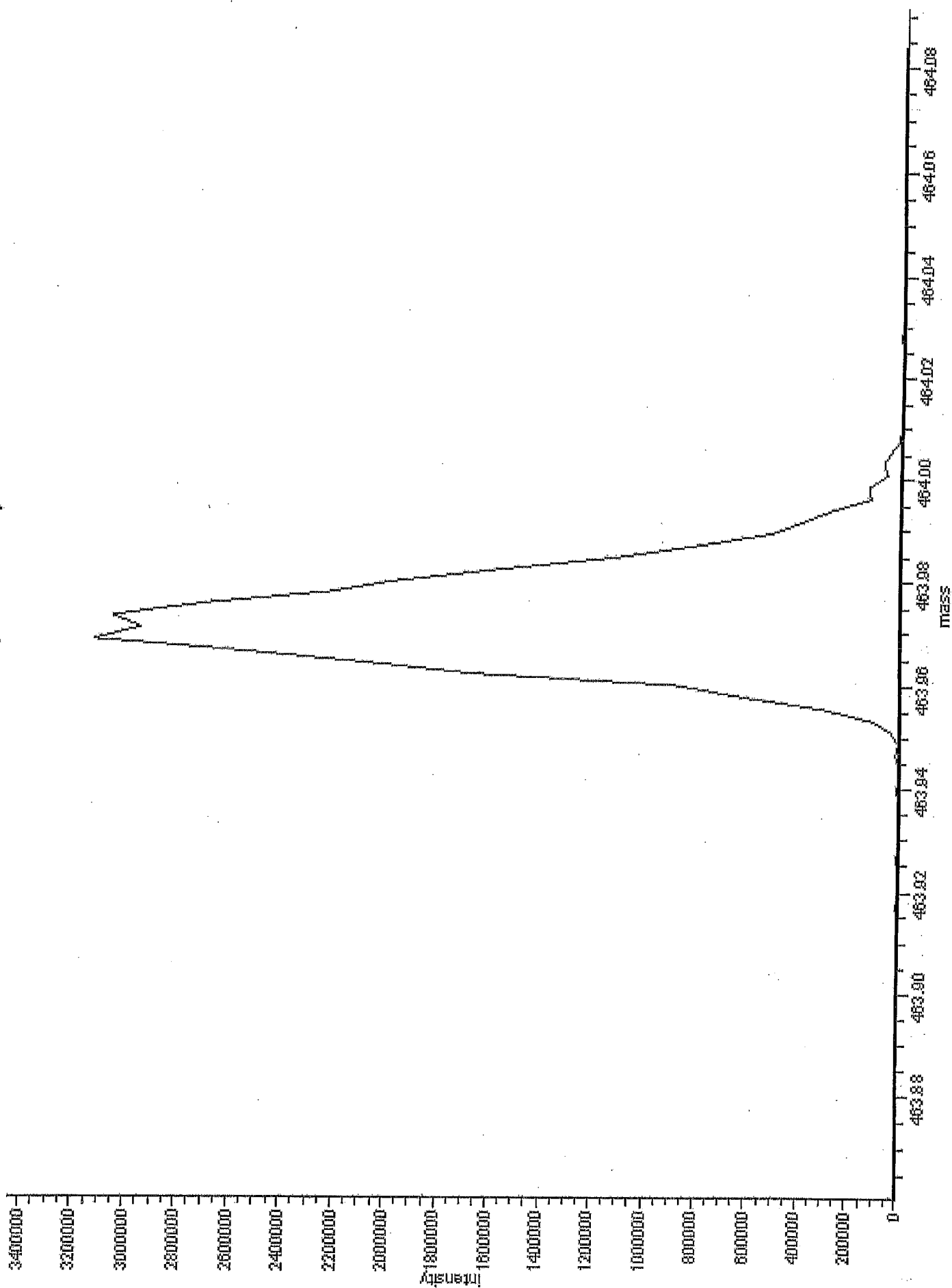
CalMass: 463.9738 Instr.: DFS-3097
Resolution: 10446 (05/16/14 10:05:19)



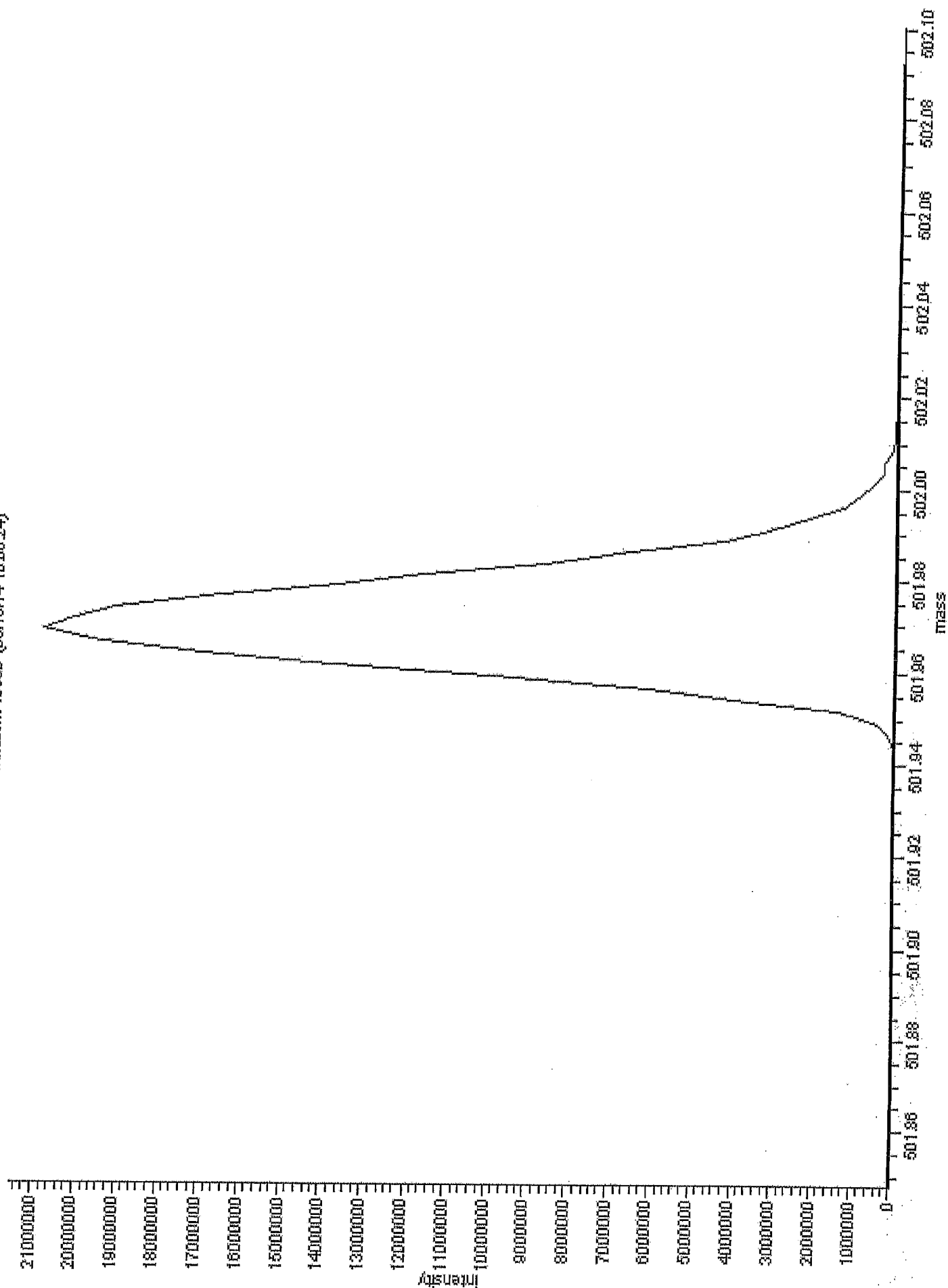
LockMass: 425.8775 Instr.: DFS-3097
Resolution: 10446 (05/18/14 10:05:35)



Mass: 463.9743 Instr: DFS-3097
Resolution: 11159 (05/16/14 10:16:21)



CalMass: 501.9708 Instr.: DFS-3097
Resolution: 10650 (05/18/14 10:08:24)



TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 16-May-2014 14:26:00 ALS Bottle#: 0 Worklist Smp#: 2
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs1 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:09:11 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:11:15

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31.872	58834	0.71	1.1733	0.5077	0.5077	0.008979	0.008979	102	M
A Non-2,3,7,8-sub-TCDD	30.308	1807	0.77	0.0000						RQ
S Total TCDD					0.5077	0.5077	0.008979	0.008979		RQ
2,3,7,8-TCDF	29.761	94226	0.75	1.0881	0.5339	0.5339	0.007514	0.007514	107	M
A Non-2,3,7,8-sub-TCDF	28.995	5764	0.77	0.0000						RQ
S Total TCDF					0.5339	0.5339	0.007514	0.007514		RQ
1,2,3,7,8-PeCDD	41.018	214444	1.73	1.0434	2.653	2.653	0.0167	0.0167	106	M
A Non-2,3,7,8-sub-PeCDD	39.915	9515	1.55	0.0000						RQ
S Total PeCDD					2.653	2.653	0.0167	0.0167		RQ
1,2,3,7,8-PeCDF	39.296	385579	1.56	1.1898	2.632	2.632	0.0410	0.0410	105	
2,3,4,7,8-PeCDF	40.502	362268	1.54	1.1095	2.619	2.619	0.0392	0.0392	105	
A Non-2,3,7,8-sub-PeCDF	38.623						0.0	0.0		
S Total PeCDF					5.250	5.250	0.0401	0.0401		
1,2,3,4,7,8-HxCDD	45.253	272992	1.21	1.1409	2.679	2.679	0.0596	0.0596	107	
1,2,3,6,7,8-HxCDD	45.371	275227	1.26	1.1481	2.607	2.607	0.0639	0.0639	104	
1,2,3,7,8,9-HxCDD	45.759	273517	1.28	1.2212	2.471	2.471	0.0578	0.0578	98.85	M
A Non-2,3,7,8-sub-HxCDD	44.687						0.0	0.0		
S Total HxCDD					7.757	7.757	0.0604	0.0604		
1,2,3,4,7,8-HxCDF	44.190	433645	1.27	1.3629	2.614	2.614	0.0448	0.0448	105	
1,2,3,6,7,8-HxCDF	44.325	512529	1.17	1.2762	2.756	2.756	0.0425	0.0425	110	
2,3,4,6,7,8-HxCDF	45.067	458923	1.25	1.2654	2.698	2.698	0.0454	0.0454	108	
1,2,3,7,8,9-HxCDF	46.029	380908	1.28	1.2573	2.556	2.556	0.0581	0.0581	102	M
A Non-2,3,7,8-sub-HxCDF	44.552						0.0	0.0		
S Total HxCDF					10.6	10.6	0.0477	0.0477		
1,2,3,4,6,7,8-HpCDD	50.184	246709	1.04	1.1204	2.626	2.626	0.0231	0.0231	105	
A Non-2,3,7,8-sub-HpCDD	49.566	11997	1.03	0.0000						
S Total HpCDD					2.626	2.626	0.0231	0.0231		
1,2,3,4,6,7,8-HpCDF	48.464	424692	1.05	1.4984	2.677	2.677	0.0197	0.0197	107	
1,2,3,4,7,8,9-HpCDF	50.808	322253	1.06	1.3807	2.575	2.575	0.0270	0.0270	103	

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
A Non-2,3,7,8-sub-HpCDF	49.625						0.0	0.0		
S Total HpCDF					5.252	5.252	0.0233	0.0233		
OCDD	54.297	442341	0.82	1.2073	5.315	5.315	0.0289	0.0289	106	M
OCDF	54.435	599861	0.89	1.1162	5.154	5.154	0.0184	0.0184	103	
D 13C-2,3,7,8-TCDD	31.806	9876576	0.82	1.0709	98.3	98.3	0.2664	0.2664	98.27	
D 13C-2,3,7,8-TCDF	29.728	16217882	0.80	1.7545	98.5	98.5	0.1062	0.1062	98.50	
D 13C-1,2,3,7,8-PeCDD	41.001	7747378	1.61	0.8743	94.4	94.4	0.2068	0.2068	94.42	
D 13C-1,2,3,7,8-PeCDF	39.279	12314088	1.61	1.3704	95.7	95.7	0.1532	0.1532	95.75	
D 13C-2,3,4,7,8-PeCDF	40.484	12469187	1.55	1.3837	96.0	96.0	0.1518	0.1518	96.02	
D 13C-1,2,3,4,7,8-HxCDD	45.219	8933187	1.28	0.8772	100.3	100.3	0.2134	0.2134	100	
D 13C-1,2,3,6,7,8-HxCDD	45.354	9193835	1.27	0.9171	98.7	98.7	0.2042	0.2042	98.75	
D 13C-1,2,3,4,7,8-HxCDF	44.173	12171006	0.54	1.1892	100.8	100.8	0.2095	0.2095	101	
D 13C-1,2,3,6,7,8-HxCDF	44.308	14571209	0.53	1.4625	98.1	98.1	0.1704	0.1704	98.14	
D 13C-2,3,4,6,7,8-HxCDF	45.050	13444179	0.53	1.3197	100.3	100.3	0.1888	0.1888	100	
D 13C-1,2,3,7,8,9-HxCDF	46.012	11850370	0.52	1.2001	97.3	97.3	0.2076	0.2076	97.26	
D 13C-1,2,3,4,6,7,8-HpCDD	50.167	8384746	1.04	0.8155	101.3	101.3	0.2339	0.2339	101	
D 13C-1,2,3,4,6,7,8-HpCDF	48.447	10586908	0.46	1.0496	99.4	99.4	0.1656	0.1656	99.35	
D 13C-1,2,3,4,7,8,9-HpCDF	50.791	9064964	0.45	0.8947	99.8	99.8	0.1943	0.1943	99.80	
D 13C-OCDD	54.280	13787078	0.91	0.7044	192.8	192.8	0.1251	0.1251	96.40	
D 13C-OCDF	54.418	20853570	0.91	1.0615	193.5	193.5	0.1275	0.1275	96.76	
\$ 37Cl4-2,3,7,8-TCDD	31.872	59993		1.2266	0.5212	0.5212	0.006980	0.006980	104	
* 13C-1,2,3,4-TCDD	31.274	9384699	0.81	9.1E+04	100.0	100.0				
* 13C-1,2,3,7,8,9-HxCDD	45.742	10152105	1.26	1E+05	100.0	100.0				

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

Review Flags

M - Manually Integrated

Reagents:

61L11613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 16-May-2014 14:26:00 ALS Bottle#: 0 Worklist Smp#: 2
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs1 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:09:11 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:11:15

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,7,8-TCDD											M
319.8965	31.872	31.871	0	1.002	24519	2882	21	52	137		M
321.8936	31.855	31.871	-1	1.002	34315	3876	22	55	176	0.71(0.65-0.89)	
A Non-2,3,7,8-sub-TCDD											RQ
319.8965	29.711	30.308	-36		2771	391	21	52	19		
321.8936	29.728	30.308	-35		556	220	22	55	10	4.98(0.65-0.89)	
319.8965	33.883	30.308	214		504	146	21	52	7		
321.8936	33.783	30.308	208		465	154	22	55	7	1.08(0.65-0.89)	
2,3,7,8-TCDF											M
303.9016	29.761	29.793	-2	1.001	40361	4525	30	75	151		
305.8987	29.761	29.793	-2	1.001	53865	5573	29	72	192	0.75(0.65-0.89)	M
A Non-2,3,7,8-sub-TCDF											RQ
303.9016	23.163	28.995	-349		1692	366	30	75	12		
305.8987	23.197	28.995	-347		1794	405	29	72	14	0.94(0.65-0.89)	
303.9016	34.797	28.995	347		1857	215	30	75	7		
305.8987	34.814	28.995	348		1463	313	29	72	11	1.27(0.65-0.89)	
1,2,3,7,8-PeCDD											M
355.8546	41.018	41.031	-1	1.000	135749	31927	97	242	329		M
357.8516	41.018	41.031	-1	1.000	78695	19726	31	77	636	1.73(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDD											RQ
355.8546	38.194	39.915	-103		1765	451	97	242	5		
357.8516	38.194	39.915	-103		2696	674	31	77	22	0.65(1.32-1.78)	
355.8546	41.672	39.915	105		4067	957	97	242	10		
357.8516	41.655	39.915	104		2545	554	31	77	18	1.60(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
1,2,3,7,8-PeCDF											
339.8597	39.296	39.309	-1	1.000	235054	48686	354	885	138		
341.8567	39.296	39.309	-1	1.000	150525	31066	142	355	219	1.56(1.32-1.78)	
2,3,4,7,8-PeCDF											
339.8597	40.502	40.497	0	1.000	219584	51785	354	885	146		
341.8567	40.502	40.497	0	1.000	142684	34471	142	355	243	1.54(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDF											
339.8597	38.623						354	885			
341.8567	38.623						142	355			
1,2,3,4,7,8-HxCDD											
389.8158	45.253	45.249	0	1.001	149638	37533	423	1057	89		
391.8127	45.236	45.249	-1	1.000	123354	32012	181	452	177	1.21(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45.371	45.367	0	1.000	153521	34384	423	1057	81		
391.8127	45.371	45.367	0	1.000	121706	27207	181	452	150	1.26(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45.759	45.755	0	1.012	153733	36630	423	1057	87		M
391.8127	45.759	45.755	0	1.012	119784	29431	181	452	163	1.28(1.05-1.43)	M
A Non-2,3,7,8-sub-HxCDD											
389.8158	44.687						423	1057			
391.8127	44.687						181	452			
1,2,3,4,7,8-HxCDF											
373.8208	44.190	44.203	-1	1.000	242335	65094	413	1032	158		
375.8178	44.190	44.203	-1	1.000	191310	51020	354	885	144	1.27(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44.325	44.338	-1	1.000	276616	66473	413	1032	161		
375.8178	44.325	44.338	-1	1.000	235913	54461	354	885	154	1.17(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	45.067	45.064	0	1.000	255321	65716	413	1032	159		
375.8178	45.067	45.064	0	1.000	203602	50722	354	885	143	1.25(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	46.029	46.042	-1	1.000	214140	50304	413	1032	122		M
375.8178	46.029	46.042	-1	1.000	166768	39105	354	885	110	1.28(1.05-1.43)	M
A Non-2,3,7,8-sub-HxCDF											
373.8208	44.552						413	1032			
375.8178	44.552						354	885			
1,2,3,4,6,7,8-HpCDD											
423.7767	50.184	50.180	0	1.000	125747	23404	83	207	282		
425.7737	50.167	50.180	-1	1.000	120962	22652	77	192	294	1.04(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											
423.7767	48.970	49.566	-36		6090	1428	83	207	17		
425.7737	48.970	49.566	-36		5907	1470	77	192	19	1.03(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF											
407.7817	48.464	48.476	-1	1.000	217042	43963	163	407	270		
409.7788	48.464	48.476	-1	1.000	207650	43189	99	247	436	1.05(0.88-1.20)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
1,2,3,4,7,8,9-HpCDF											
407.7817	50.808	50.821	-1	1.000	165938	32114	163	407	197		
409.7788	50.808	50.821	-1	1.000	156315	30199	99	247	305	1.06(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDF											
407.7817	49.625						163	407			
409.7788	49.625						99	247			
OCDD											
457.7377	54.297	54.308	-1	1.000	199351	51267	126	315	407		M
459.7348	54.297	54.308	-1	1.000	242990	61264	95	237	645	0.82(0.76-1.02)	M
OCDF											
441.7428	54.435	54.429	0	1.000	283026	67060	102	255	657		
443.7399	54.435	54.429	0	1.000	316835	71889	100	250	719	0.89(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	31.806	31.804	0	1.017	4437123	467967	669	1672	700		
333.9338	31.806	31.804	0	1.017	5439453	547707	464	1160	1180	0.82(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	29.728	29.743	-1	0.951	7185850	815684	396	990	2060		
317.9389	29.728	29.743	-1	0.951	9032032	982215	344	860	2855	0.80(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	41.001	40.997	0	1.311	4779816	1137566	490	1225	2322		
369.8919	41.001	40.997	0	1.311	2967562	702235	228	570	3080	1.61(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	39.279	39.275	0	1.256	7591474	1554308	508	1270	3060		
353.8970	39.279	39.275	0	1.256	4722614	987940	326	815	3030	1.61(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40.484	40.480	0	1.295	7579346	1742048	508	1270	3429		
353.8970	40.484	40.480	0	1.295	4889841	1111024	326	815	3408	1.55(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	45.219	45.232	-1	0.989	5015628	1237419	1042	2605	1188		
403.8529	45.219	45.232	-1	0.989	3917559	984923	688	1720	1432	1.28(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45.354	45.350	0	0.992	5145363	1157530	1042	2605	1111		
403.8529	45.354	45.350	0	0.992	4048472	899419	688	1720	1307	1.27(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	44.173	44.187	-1	0.966	4246020	1077139	873	2182	1234		
385.8610	44.173	44.187	-1	0.966	7924986	2065178	1429	3572	1445	0.54(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	44.308	44.322	-1	0.969	5039793	1226005	873	2182	1404		
385.8610	44.308	44.322	-1	0.969	9531416	2307784	1429	3572	1615	0.53(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	45.050	45.047	0	0.985	4651413	1154874	873	2182	1323		
385.8610	45.050	45.047	0	0.985	8792766	2185623	1429	3572	1529	0.53(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	46.012	46.025	-1	1.006	4046541	920385	873	2182	1054		
385.8610	46.012	46.025	-1	1.006	7803829	1705753	1429	3572	1194	0.52(0.43-0.59)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	50.167	50.163	0	1.097	4279476	793115	734	1835	1081		
437.8140	50.150	50.163	-1	1.096	4105270	754273	1029	2572	733	1.04(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48.447	48.443	0	1.059	3349222	701857	545	1362	1288		
419.8220	48.447	48.443	0	1.059	7237686	1522777	1061	2652	1435	0.46(0.51-0.37)	
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50.791	50.804	-1	1.110	2793241	540408	545	1362	992		
419.8220	50.791	50.804	-1	1.110	6271723	1218464	1061	2652	1148	0.45(0.37-0.51)	
13C-OCDD											
469.7780	54.280	54.291	-1	1.187	6563250	1489277	461	1152	3231		
471.7750	54.280	54.291	-1	1.187	7223828	1670709	353	882	4733	0.91(0.76-1.02)	
13C-OCDF											
453.7830	54.418	54.429	-1	1.190	9942521	2332902	412	1030	5662		
455.7801	54.418	54.429	-1	1.190	10911049	2581911	839	2097	3077	0.91(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31.872	31.871	0	1.019	59993	6803	34	85	200		
13C-1,2,3,4-TCDD											
331.9368	31.274	31.289	-1		4187037	433867	669	1672	649		
333.9338	31.290	31.289	0		5197662	558966	464	1160	1205	0.81(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45.742	45.738	0		5654695	1276930	1042	2605	1225		
403.8529	45.742	45.738	0		4497410	1033032	688	1720	1502	1.26(1.05-1.43)	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Review Flags

M - Manually Integrated

Reagents:

61L11613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
 Lims ID: IC L1
 Client ID:
 Inject. Date: 16-May-2014 14:26:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 1
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 2
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDD, RT: 30.308

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
-----------------	-----	----------------------	--------------	------	--------

Invalid SimRptGroup

Sum the Uncalibrated Results

RT	319.8965 Area	319.8965 Height	321.8936 Area	321.8936 Height	Amount	Ratio	Flags
----	---------------	-----------------	---------------	-----------------	--------	-------	-------

29.711	2771	391	556	220		4.98	R
33.883	504	146	465	154		1.08	Rn

Signal Totals:

3275	537	1021	374
------	-----	------	-----

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	4296	911				3.21	RQ
	1807	661					Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (4296 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (1807 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
 Lims ID: IC L1
 Client ID:
 Inject. Date: 16-May-2014 14:26:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 1
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 2
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDF, RT: 28.995

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
-----------------	-----	----------------------	--------------	------	--------

Invalid SimRptGroup

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
----	---------------	-----------------	---------------	-----------------	--------	-------	-------

23.163	1692	366	1794	405		0.94	R
34.797	1857	215	1463	313		1.27	Rn

Signal Totals:

	3549	581	3257	718			
--	------	-----	------	-----	--	--	--

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
--	---------	-----------	--	--	--------	-------	-------

	6806	1299				1.09	RQ
	5764	1270					Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)
 Quant By: Area

Amount: 0.0 = (6806 * 0.0) / (0 * 0.000)
 Empc Amount: 0.0 = (5764 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
 Lims ID: IC L1
 Client ID:
 Inject. Date: 16-May-2014 14:26:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 1
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 2
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-PeCDD, RT: 39.915

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
-----------------	-----	----------------------	--------------	------	--------

Invalid SimRptGroup

Sum the Uncalibrated Results

RT	355.8546 Area	355.8546 Height	357.8516 Area	357.8516 Height	Amount	Ratio	Flags
----	---------------	-----------------	---------------	-----------------	--------	-------	-------

38.194 1765 451 2696 674 0.65 Rn
 41.672 4067 957 2545 554 1.60 n

Signal Totals:
 5832 1408 5241 1228

Total Responses:

Rx Area	Rx Height	Amount	Ratio	Flags
11073	2636		1.11	RQ
9515	2252			Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (11073 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (9515 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
Lims ID: IC L1
Client ID:
Inject. Date: 16-May-2014 14:26:00 Dil. Factor: 1.0000
Sample Type: IC, ICal Standard Calib Level: 1
Instrument ID: D2A Operator: DavidsonM
Lims Batch ID: 7768 Lims Sample ID: 2
Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-HxCDF, RT: 44.552

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	373.8208 Area	373.8208 Height	375.8178 Area	375.8178 Height	Amount	Ratio	Flags
----	------------------	--------------------	------------------	--------------------	--------	-------	-------

Signal Totals:

0 0 0 0

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
 Lims ID: IC L1
 Client ID:
 Inject. Date: 16-May-2014 14:26:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 1
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 2
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-HpCDD, RT: 49.566

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
-----------------	-----	----------------------	--------------	------	--------

Invalid SimRptGroup

Sum the Uncalibrated Results

RT	423.7767 Area	423.7767 Height	425.7737 Area	425.7737 Height	Amount	Ratio	Flags
----	---------------	-----------------	---------------	-----------------	--------	-------	-------

48.970 6090 1428 5907 1470 1.03

Signal Totals:

6090 1428 5907 1470

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	11997	2898				1.03	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (11997 * 0.0) / (0 * 0.000)

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

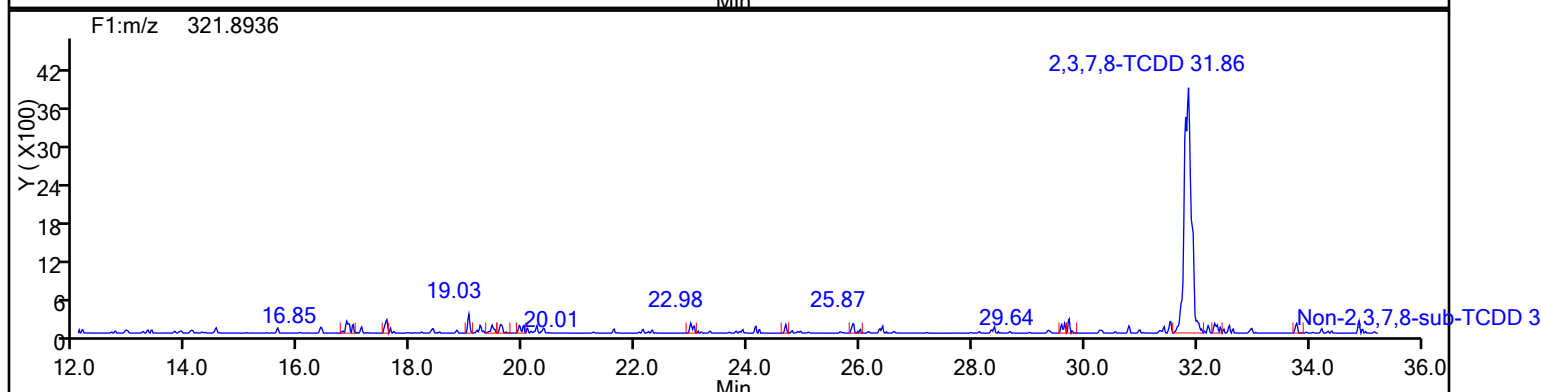
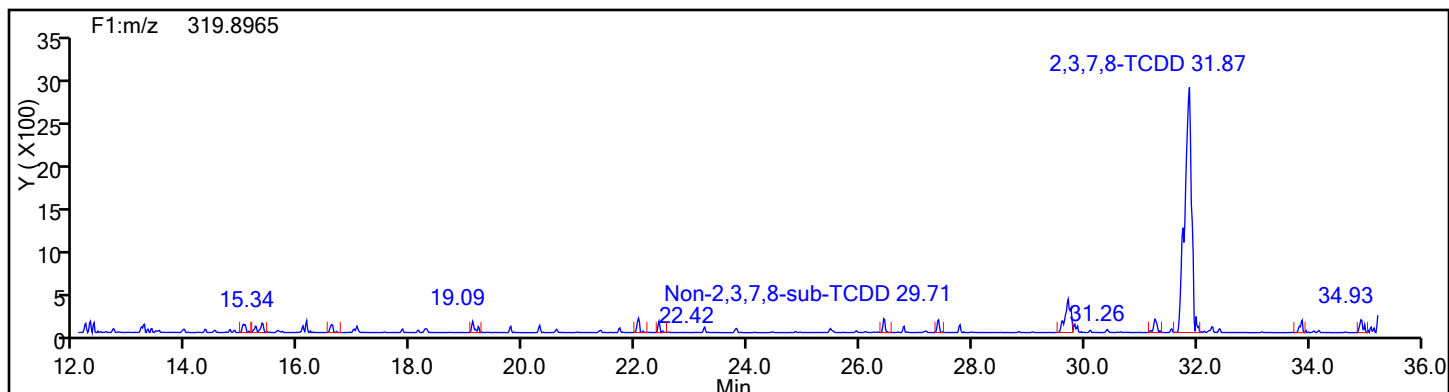
Worklist#: 7768

Sample Line#: 2

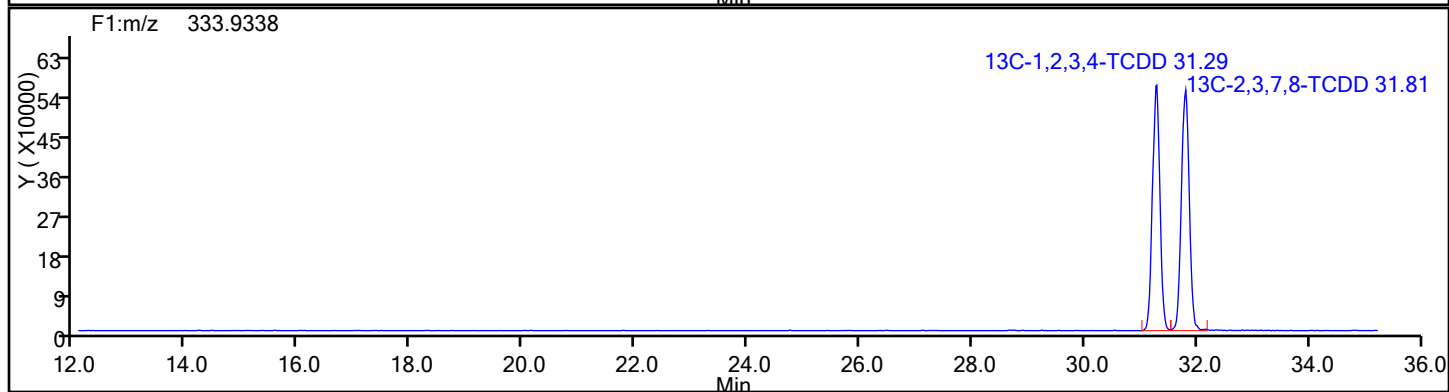
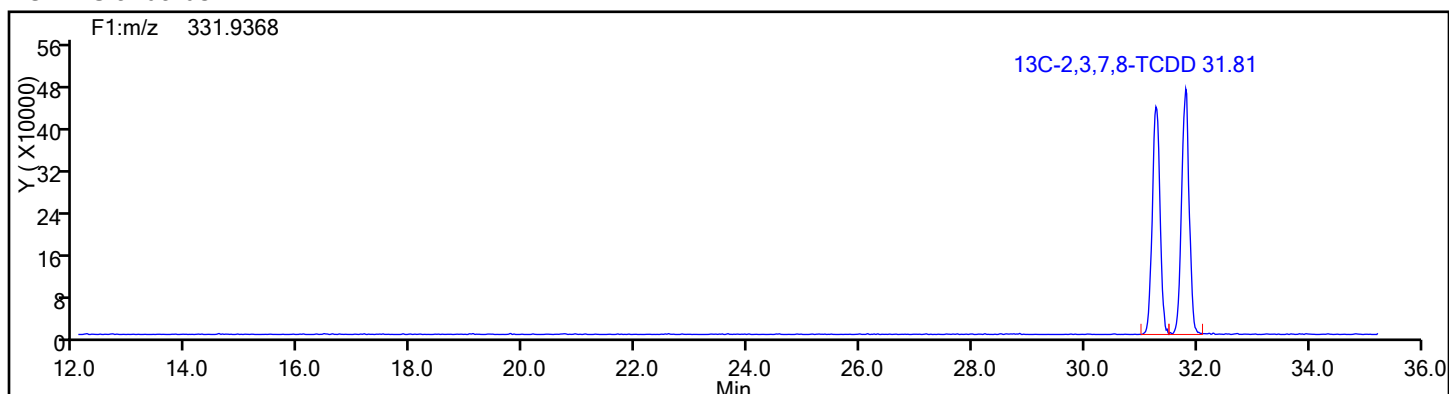
Column Type:

Column Dia:

TCDD

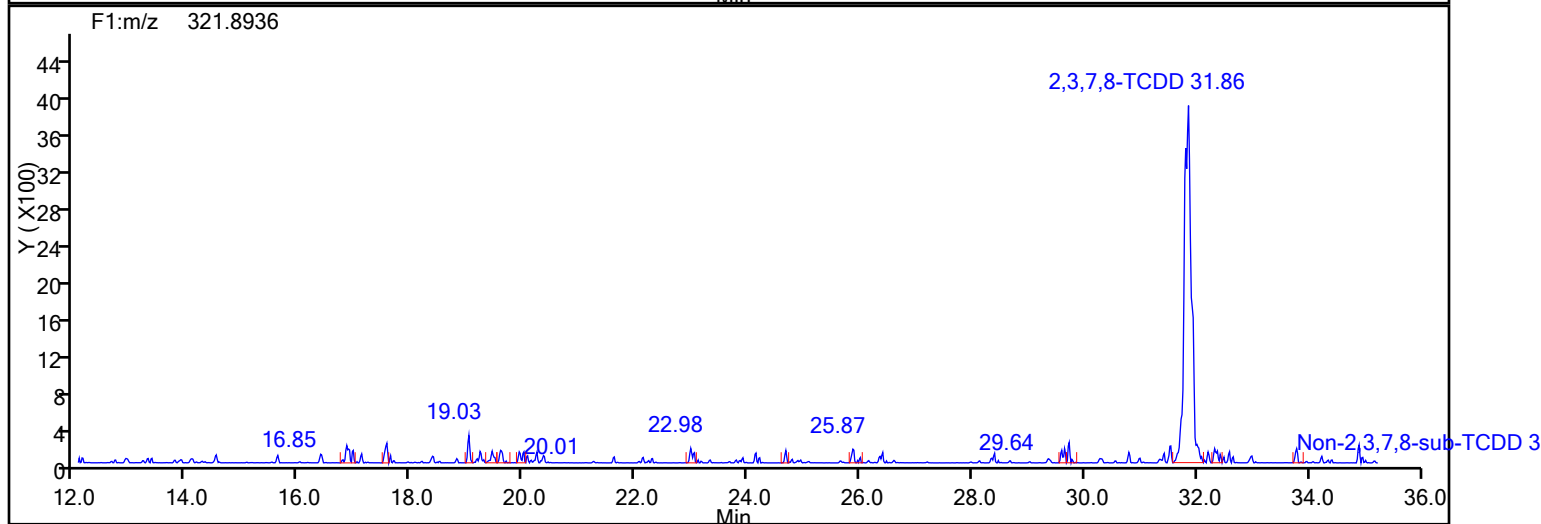
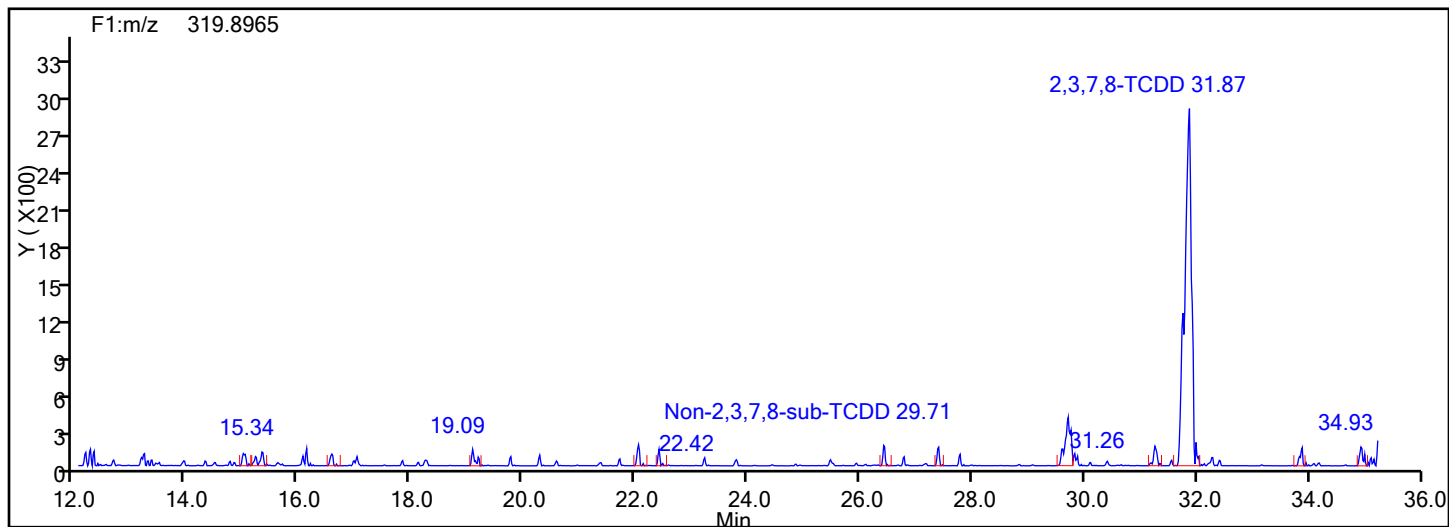


TCDD Standards

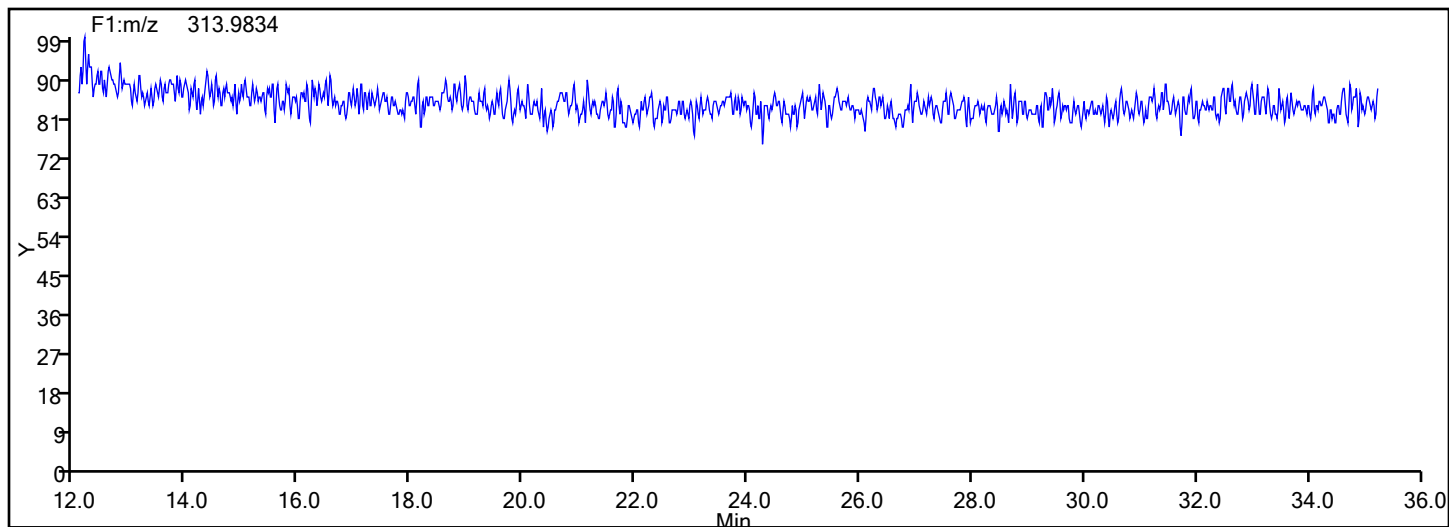


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
Injection Date: 16-May-2014 14:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 2
Column Type: Column Dia:
TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Instrument ID: D2A

Lims ID: IC L1

Client ID:

Operator ID: DavidsonM

ALS Bottle#:

0

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

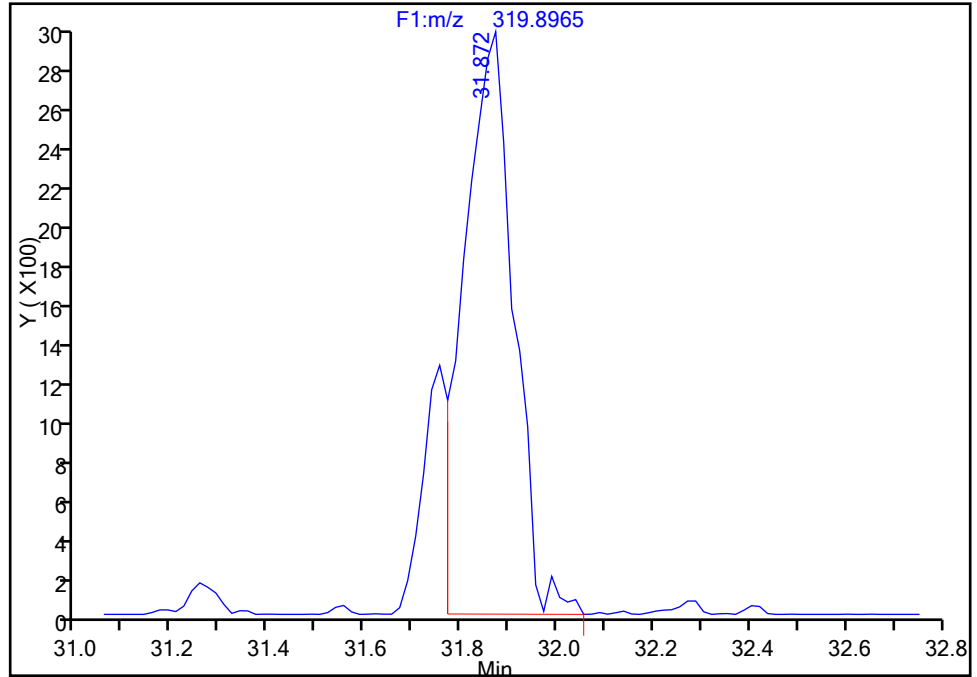
Detector F1(12.07 :34.29)

2,3,7,8-TCDD, CAS: 1746-01-6

Signal: 1

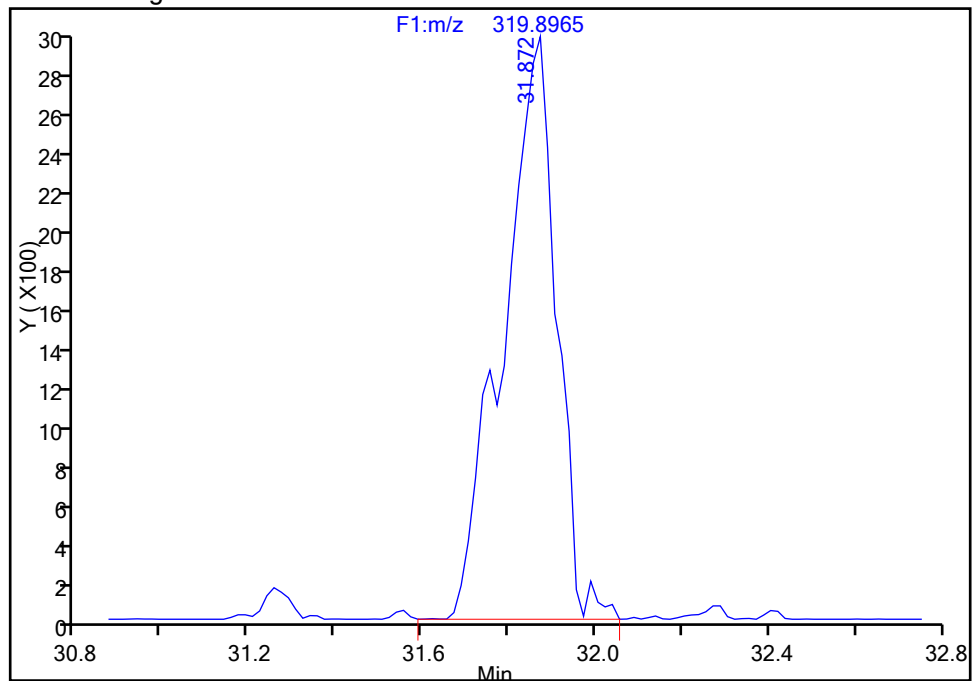
RT: 31.87
Area: 20351
Amount: 0.478631
Amount Units: pg/ul

Processing Integration Results



RT: 31.87
Area: 24519
Amount: 0.507713
Amount Units: pg/ul

Manual Integration Results



Reviewer: davidsonm, 11-Jan-2017 16:11:15

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

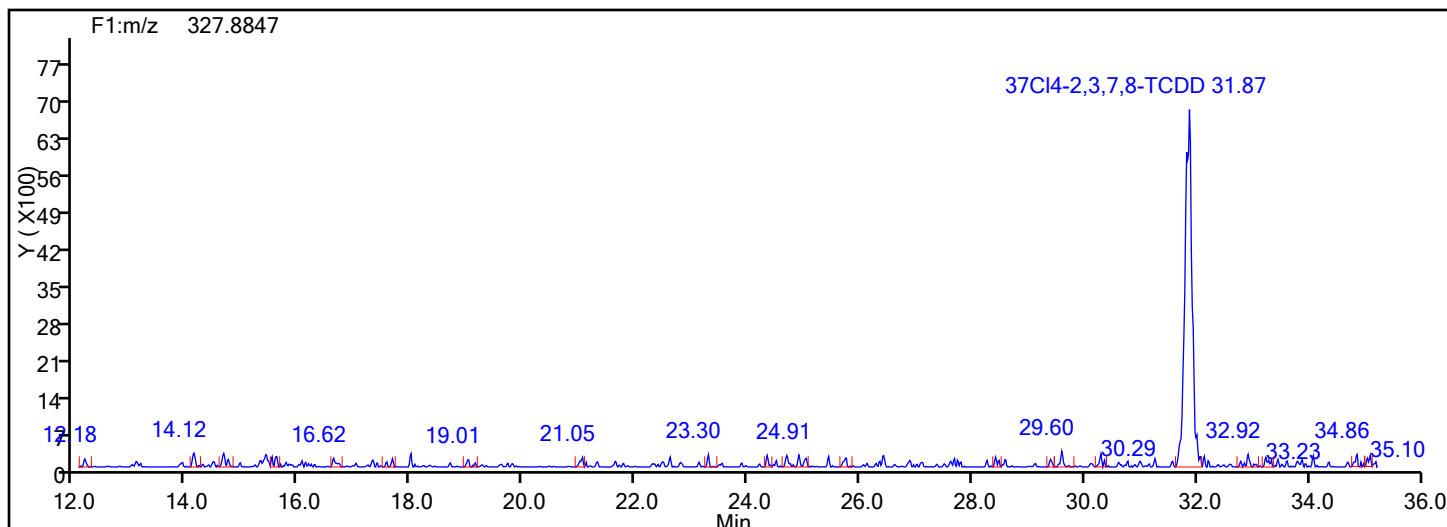
Worklist#: 7768

Sample Line#: 2

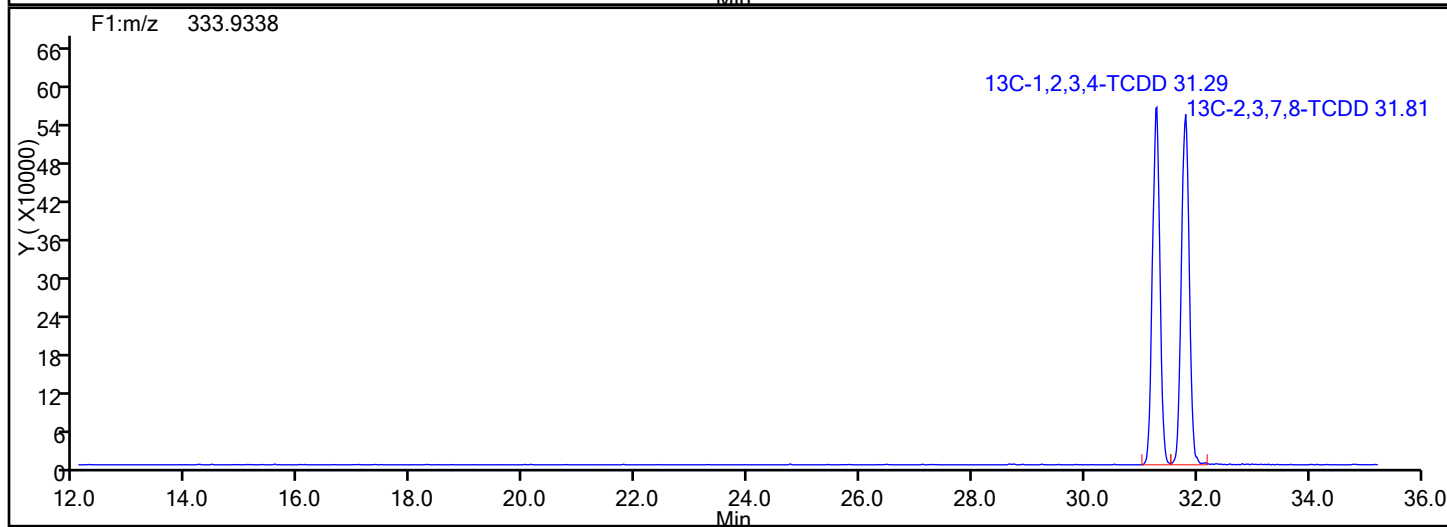
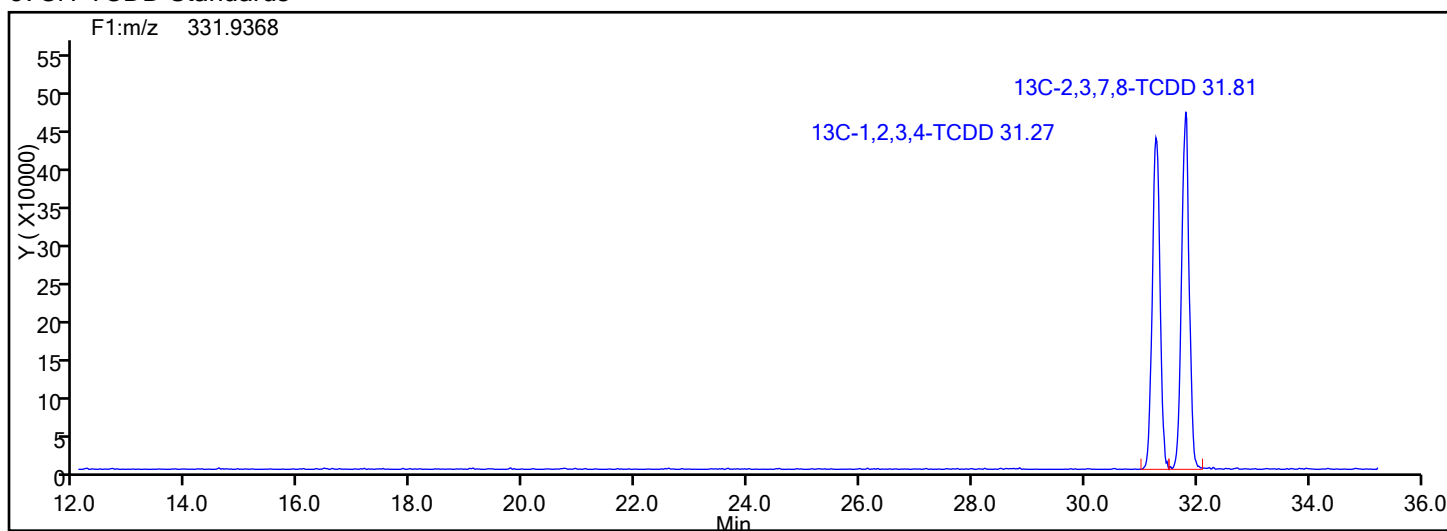
Column Type:

Column Dia:

37Cl4-TCDD

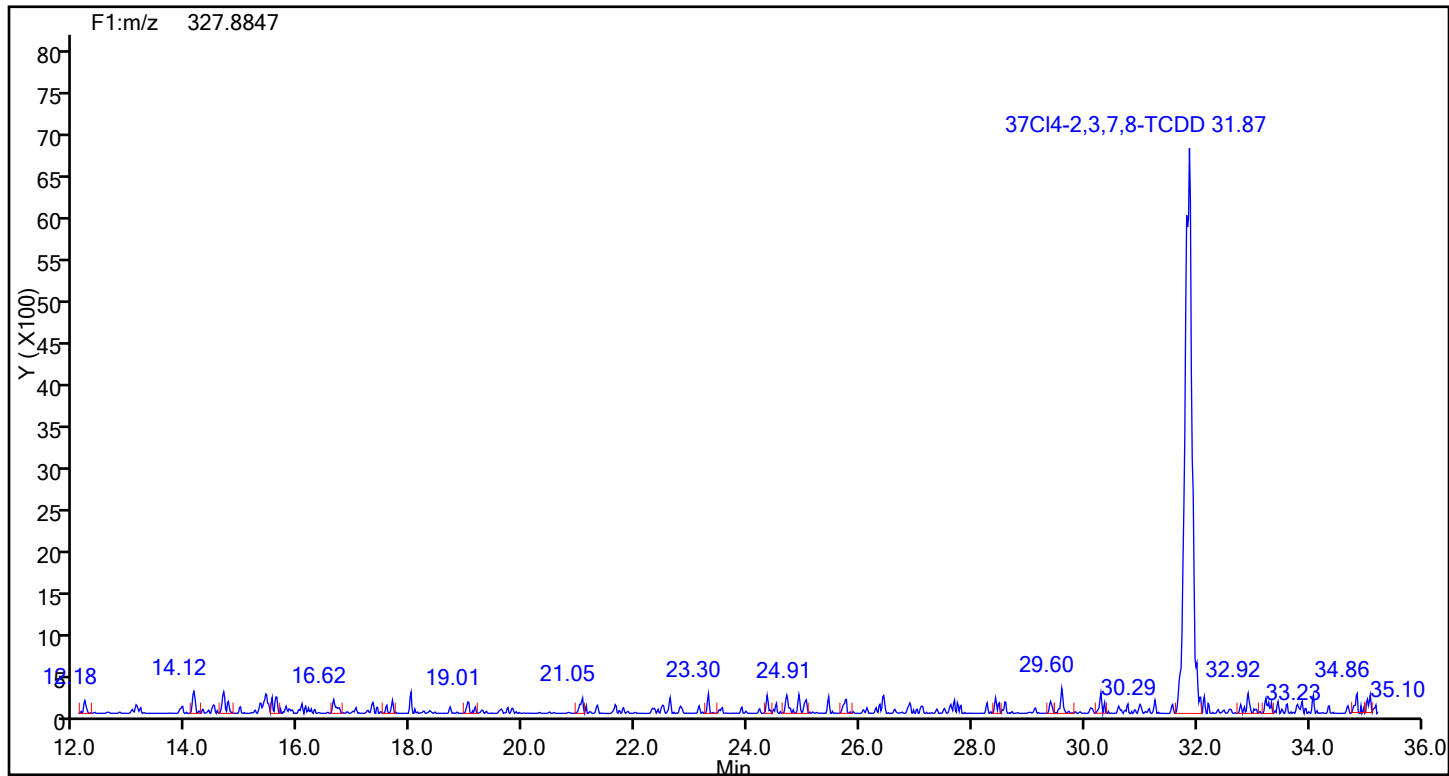


37Cl4-TCDD Standards

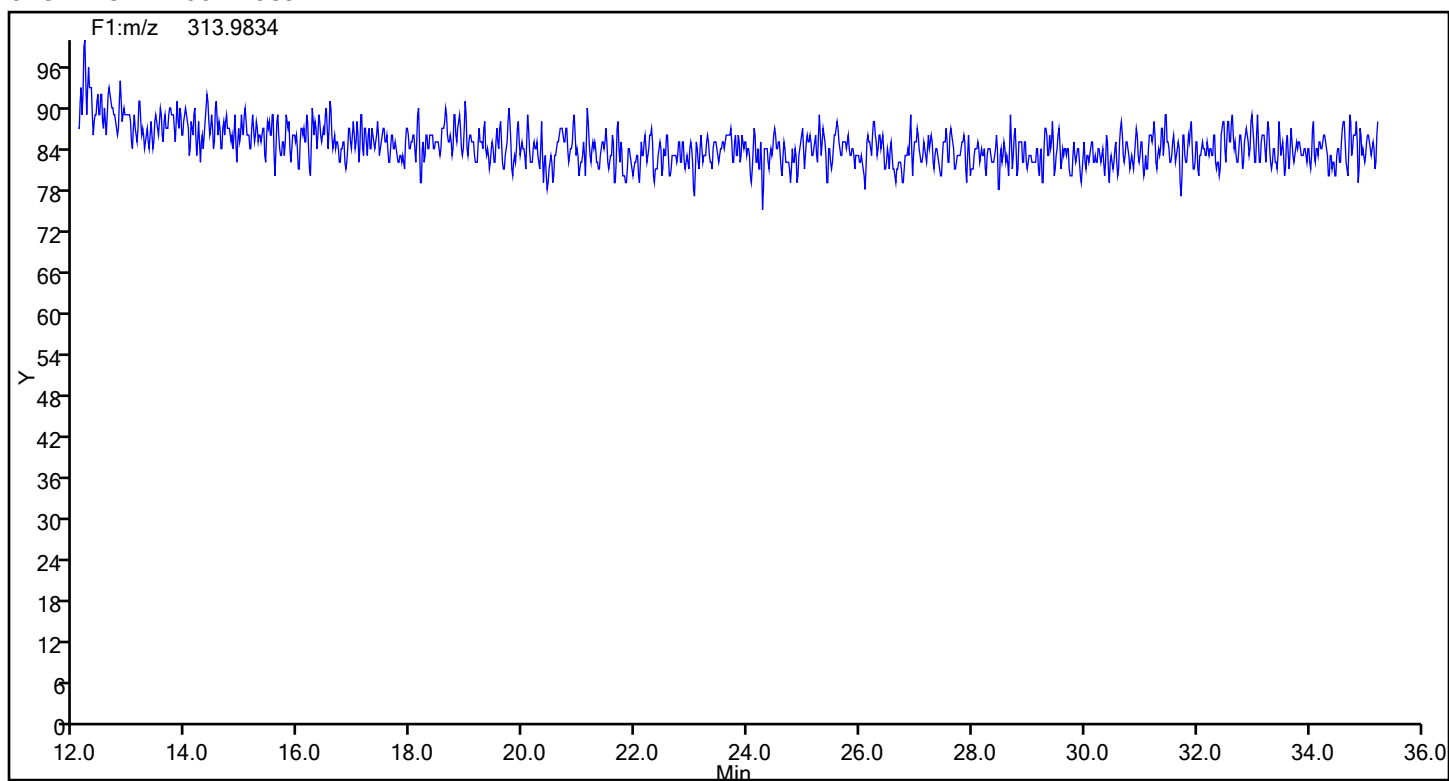


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
Injection Date: 16-May-2014 14:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 2
Column Type: Column Dia:
37Cl4-TCDD



37Cl4-TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

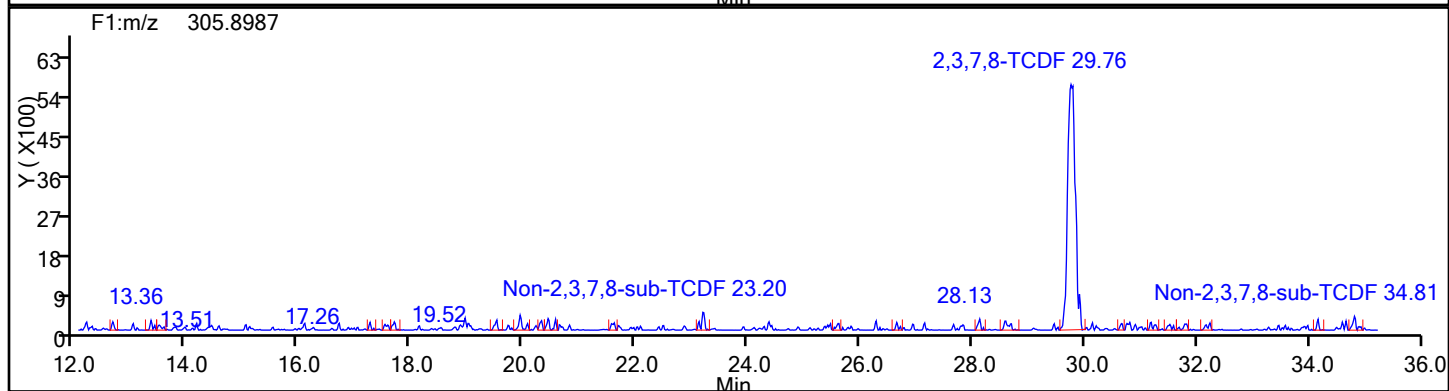
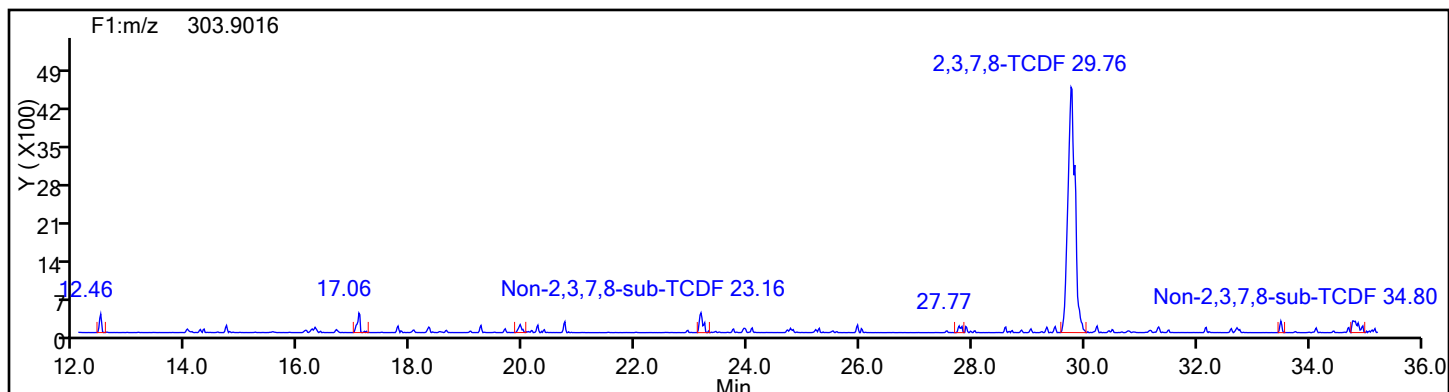
Worklist#: 7768

Sample Line#: 2

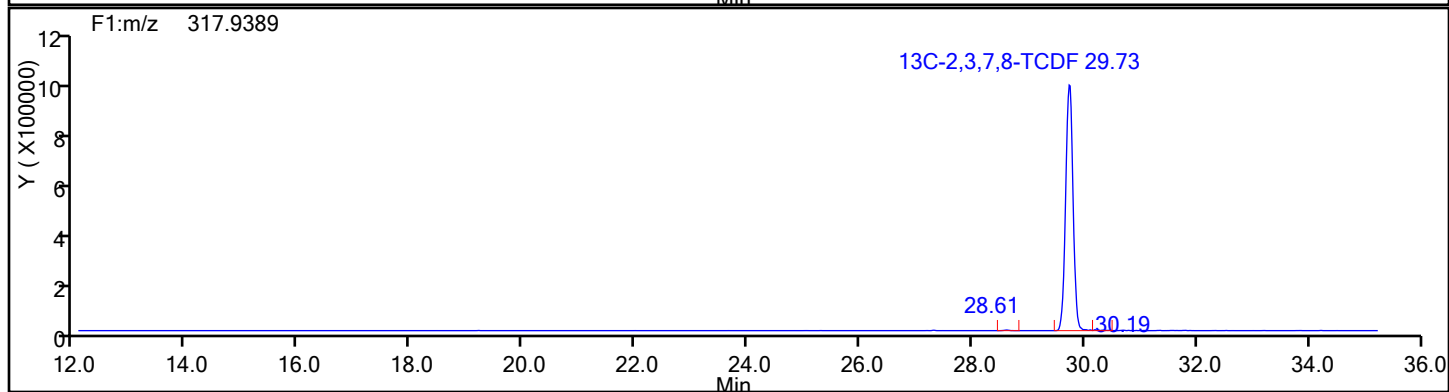
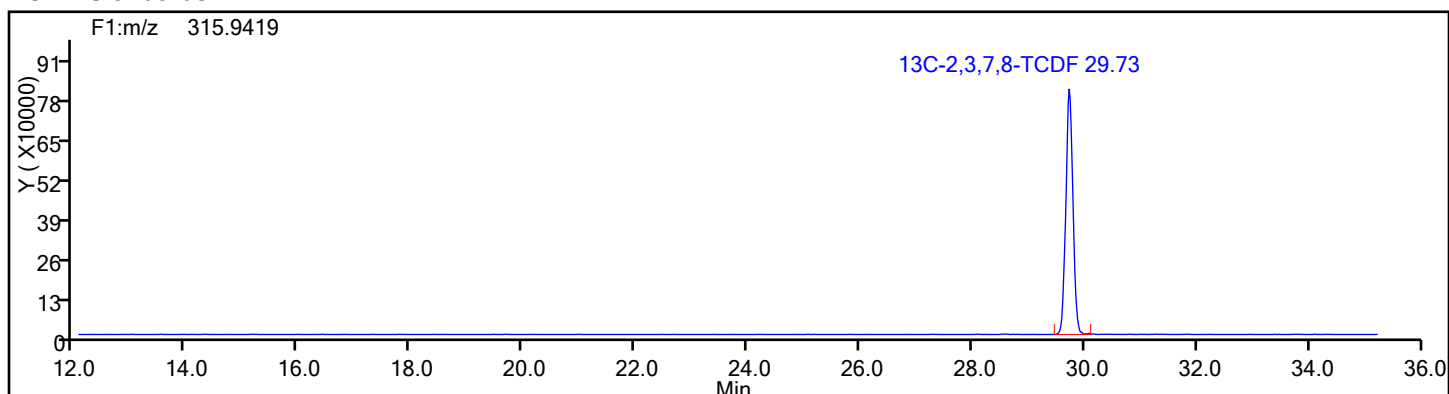
Column Type:

Column Dia:

TCDF



TCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

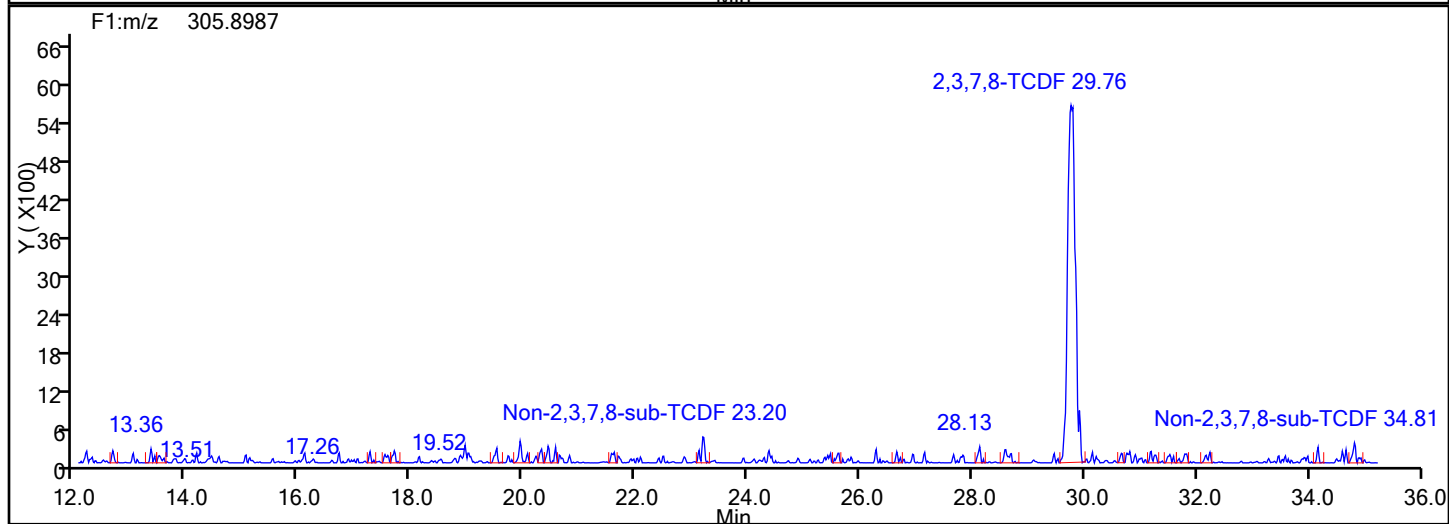
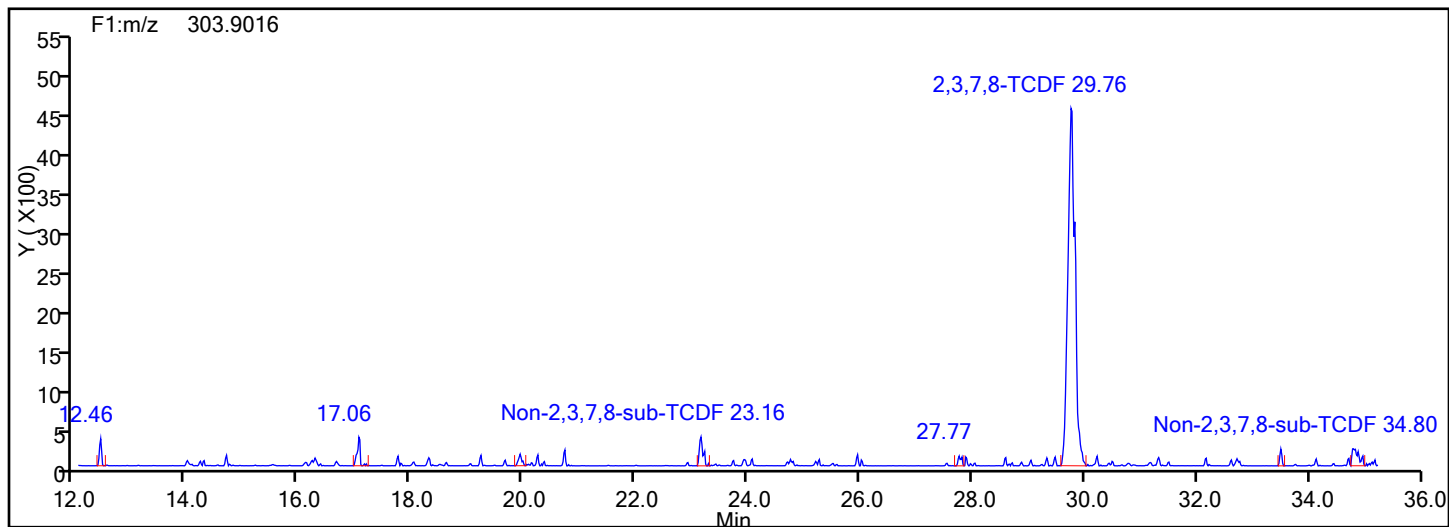
Worklist#: 7768

Sample Line#: 2

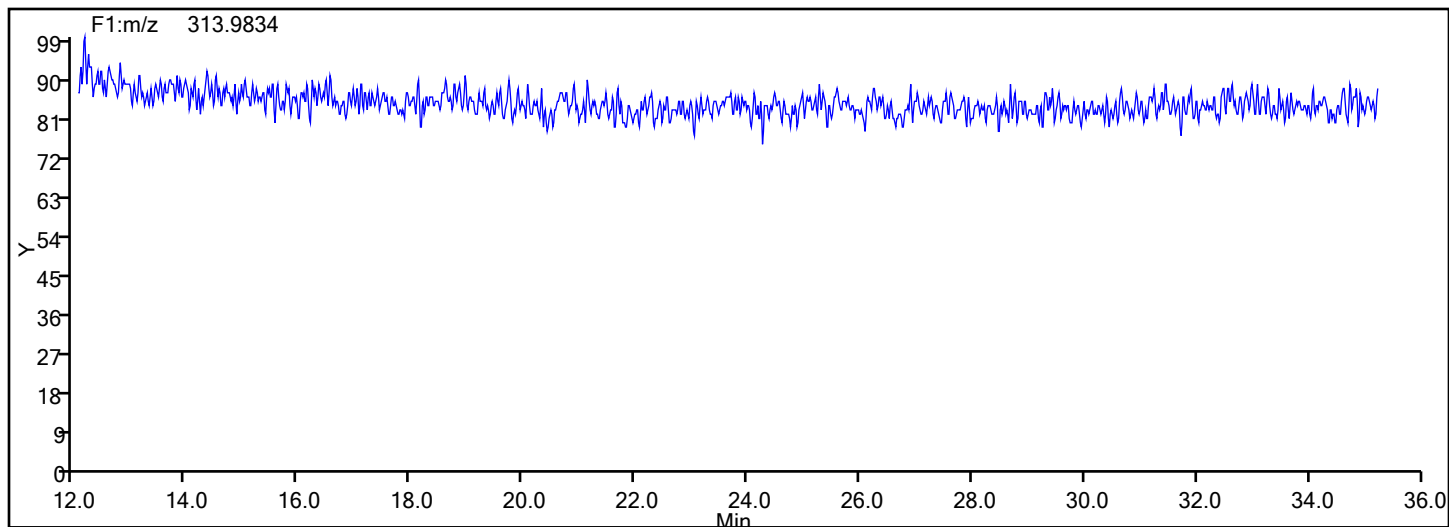
Column Type:

Column Dia:

TCDF



TCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

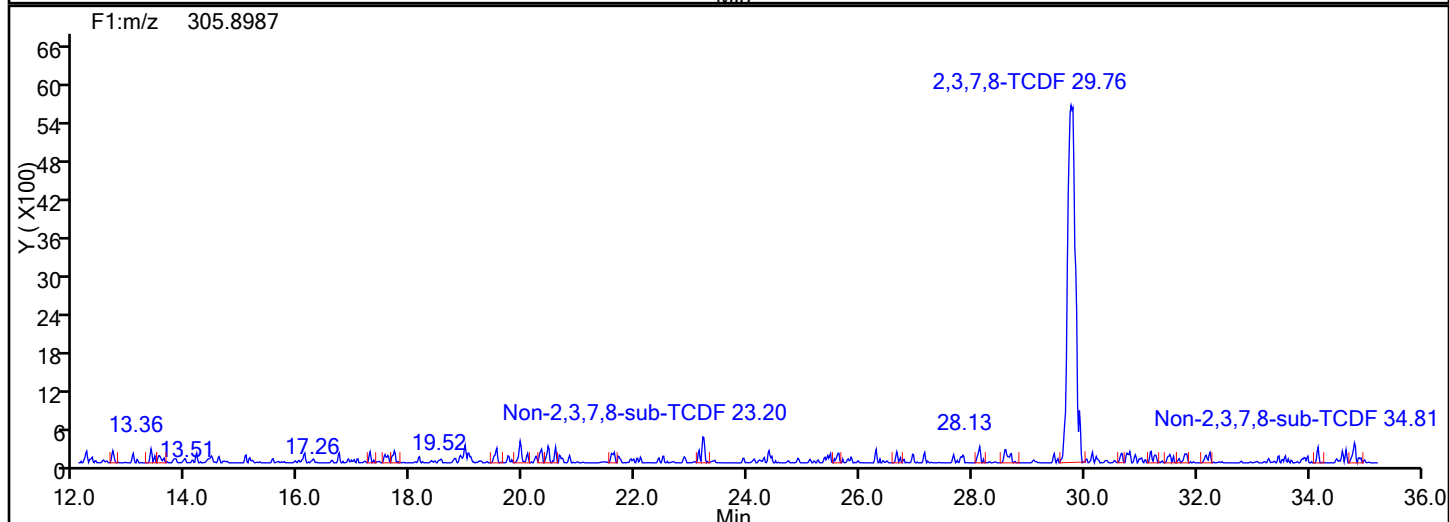
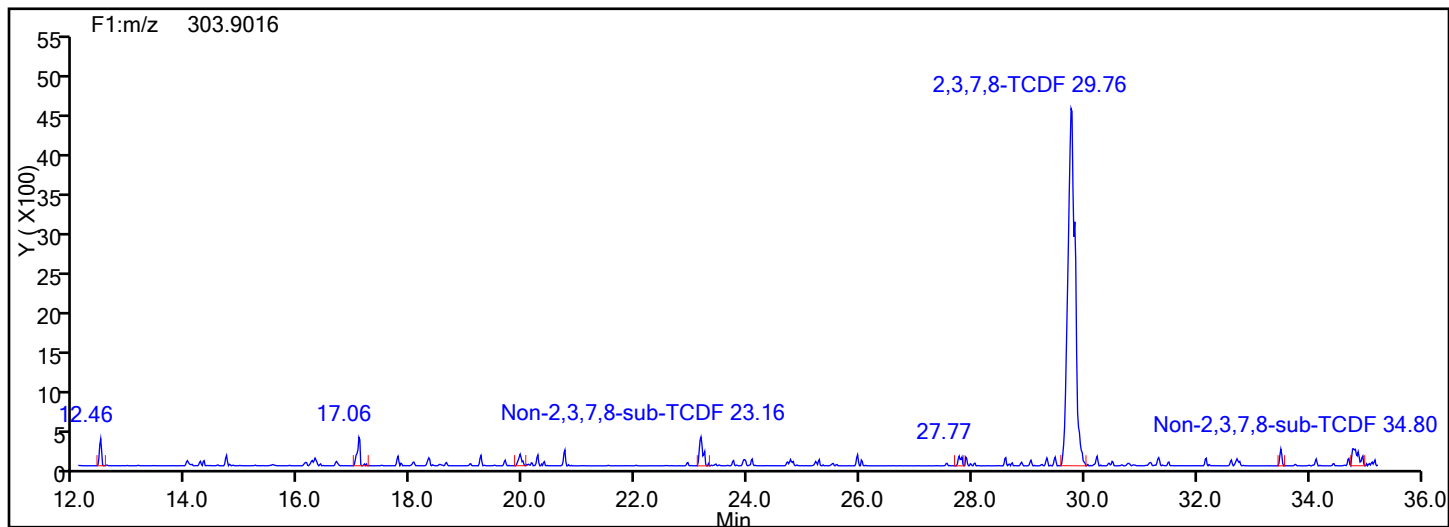
Worklist#: 7768

Sample Line#: 2

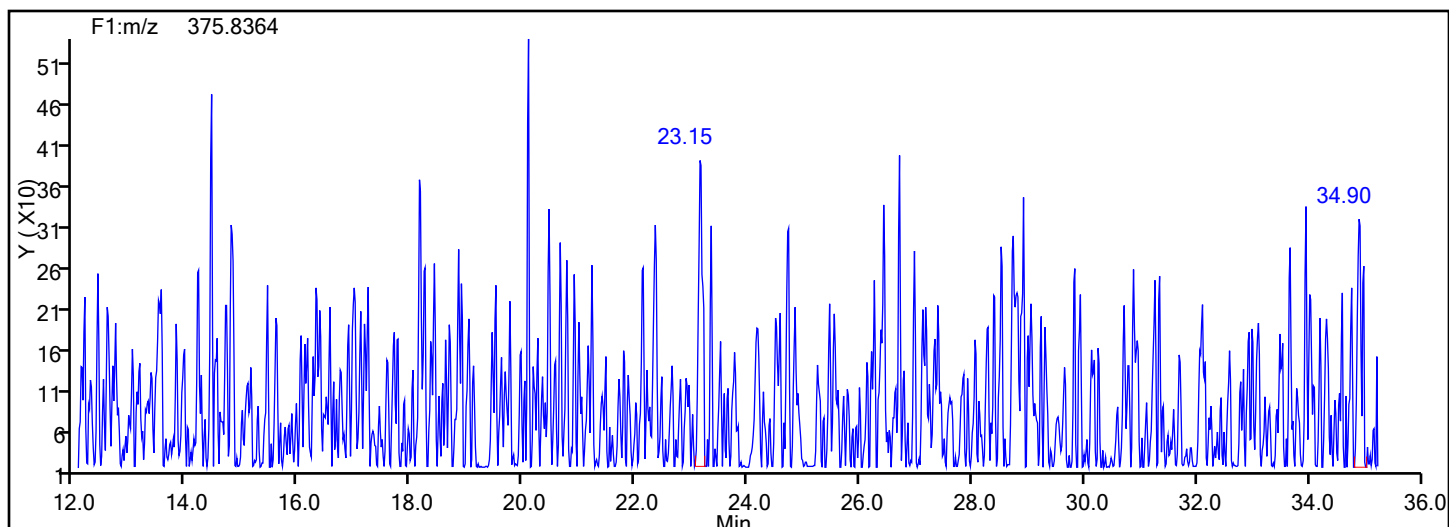
Column Type:

Column Dia:

TCDF



TCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Instrument ID: D2A

Lims ID: IC L1

Client ID:

Operator ID: DavidsonM

ALS Bottle#:

0

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

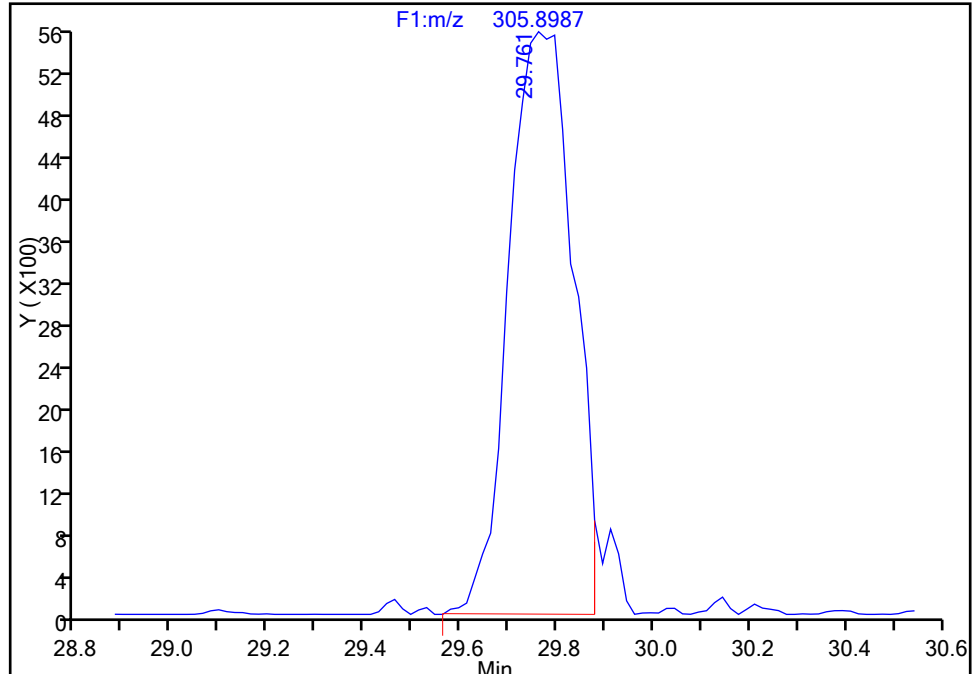
Detector F1(12.07 :34.29)

2,3,7,8-TCDF, CAS: 51207-31-9

Signal: 2

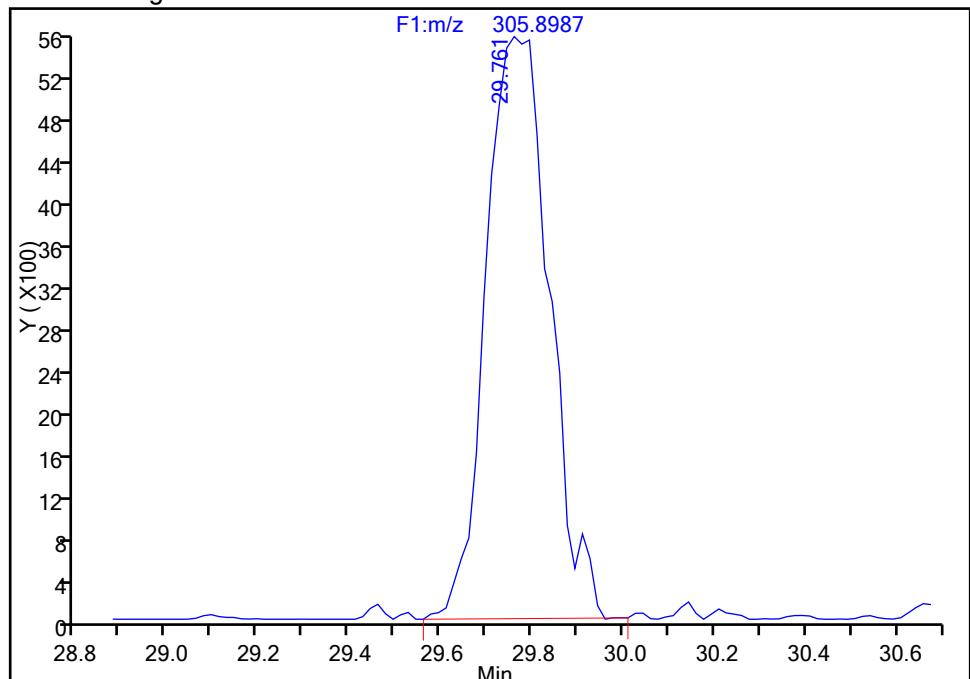
RT: 29.76
Area: 51483
Amount: 0.523263
Amount Units: pg/ul

Processing Integration Results



RT: 29.76
Area: 53865
Amount: 0.533936
Amount Units: pg/ul

Manual Integration Results



Reviewer: davidsonm, 11-Jan-2017 16:11:15

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

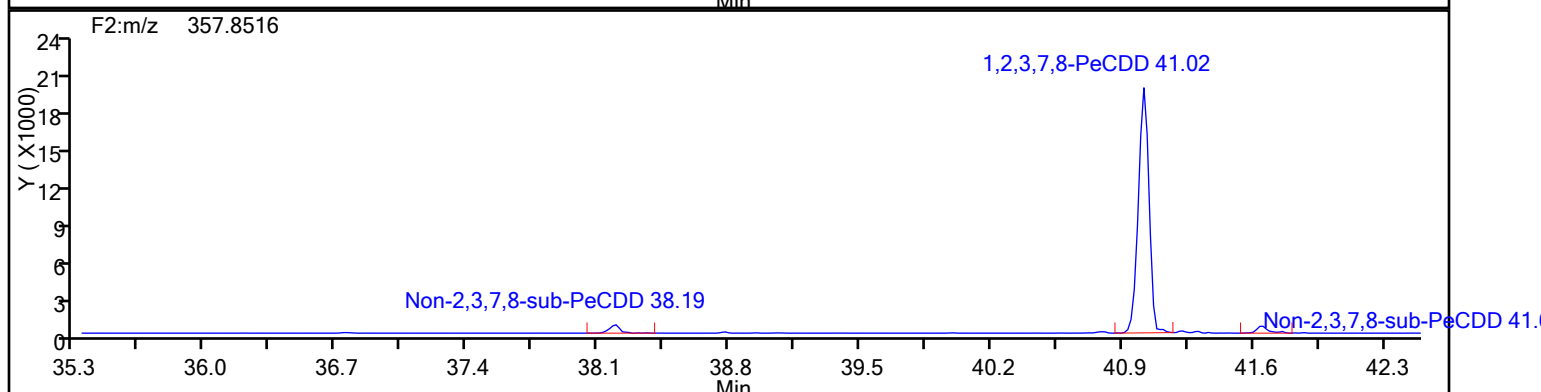
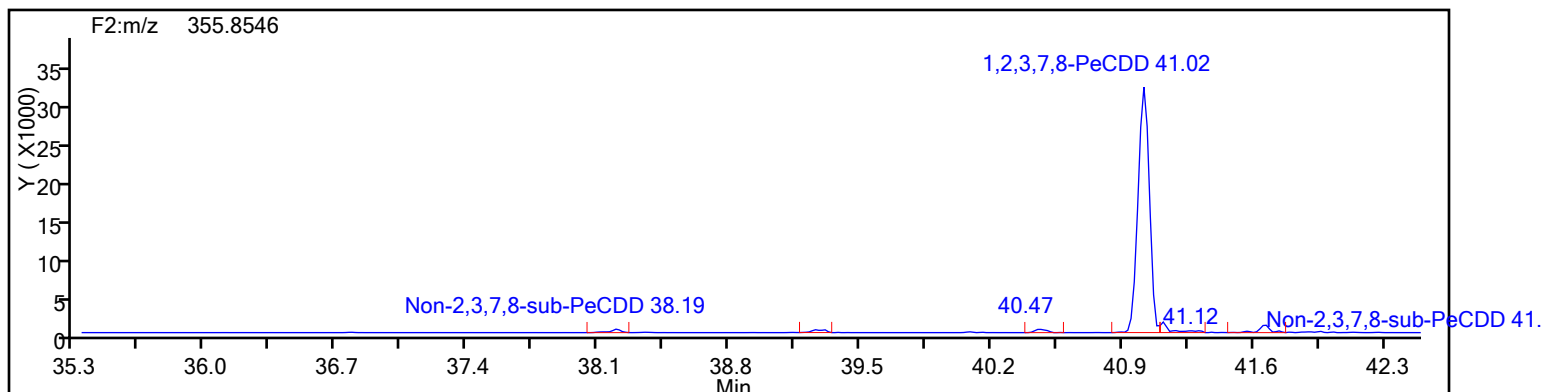
Worklist#: 7768

Sample Line#: 2

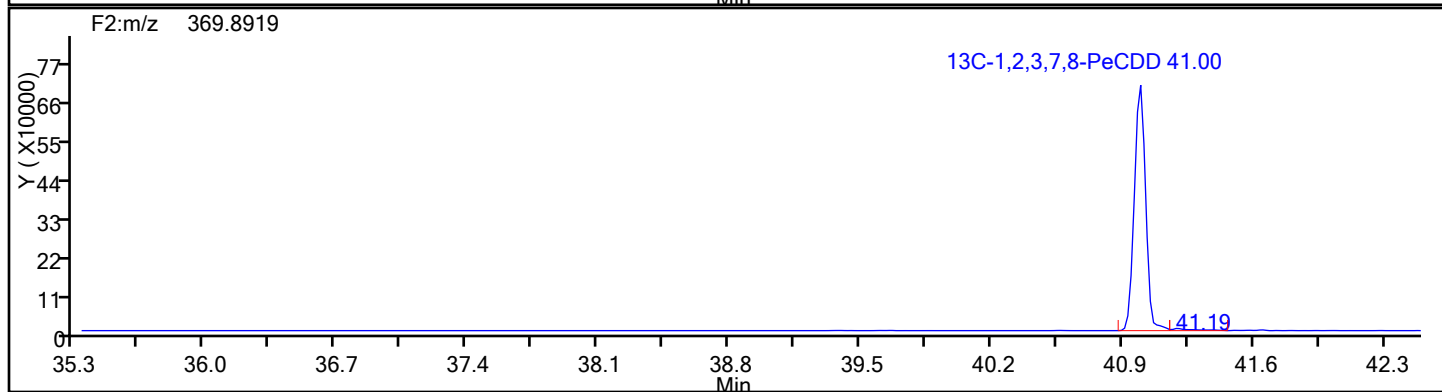
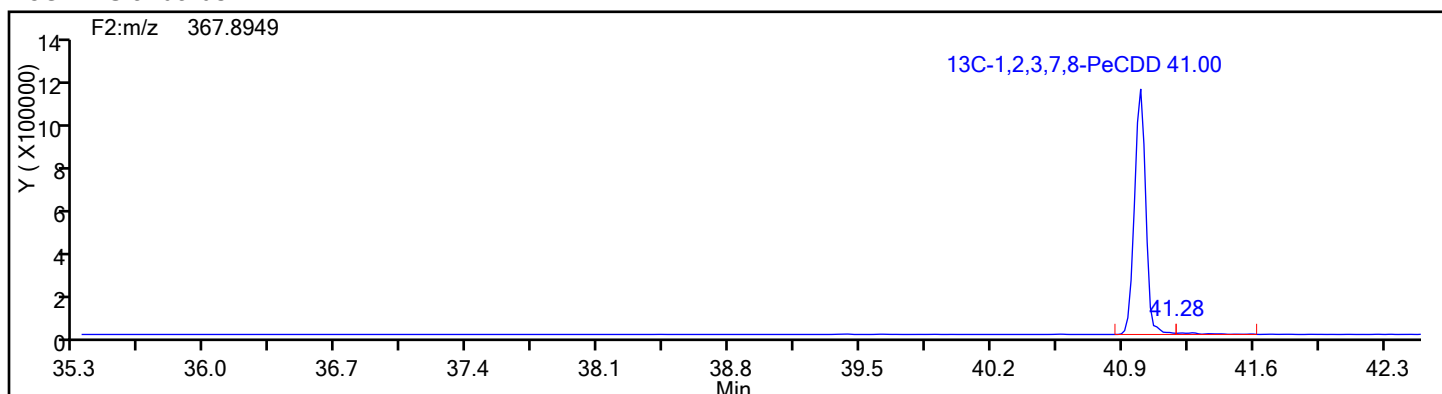
Column Type:

Column Dia:

PeCDD



PeCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

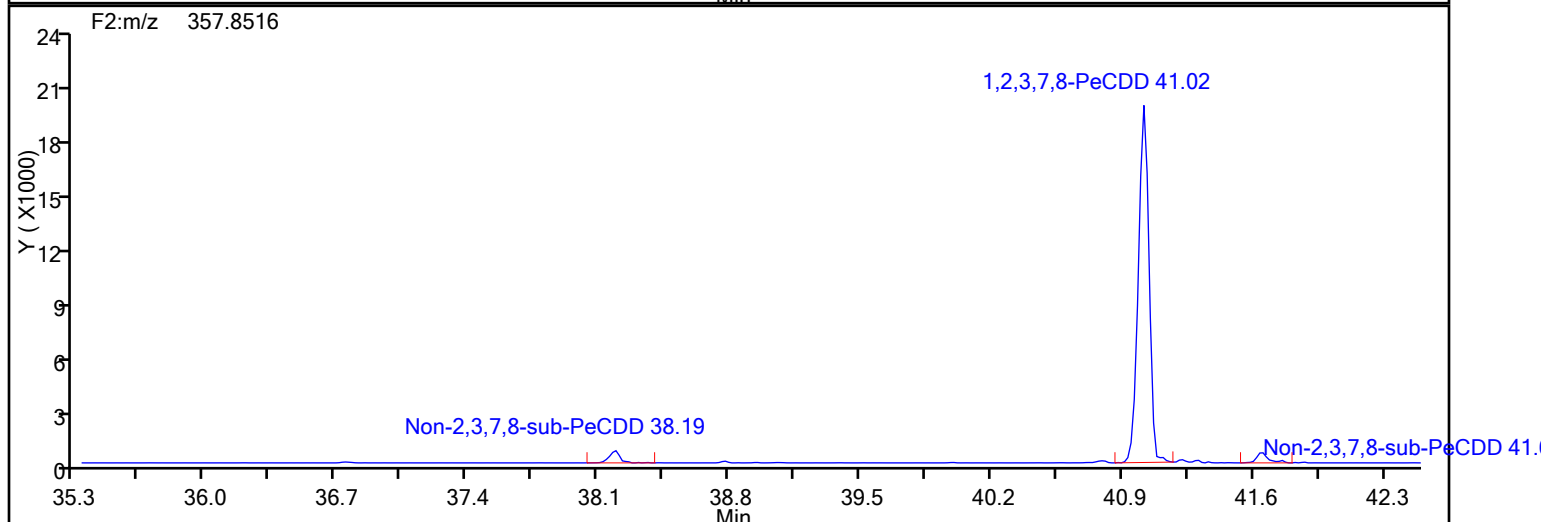
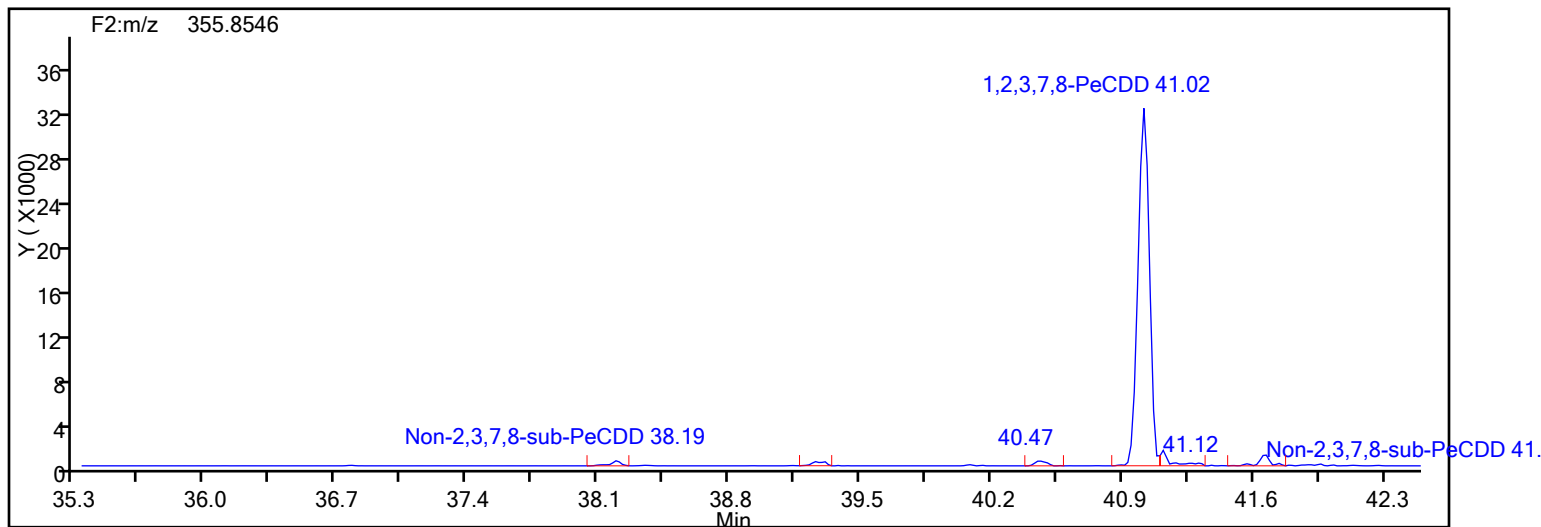
Worklist#: 7768

Sample Line#: 2

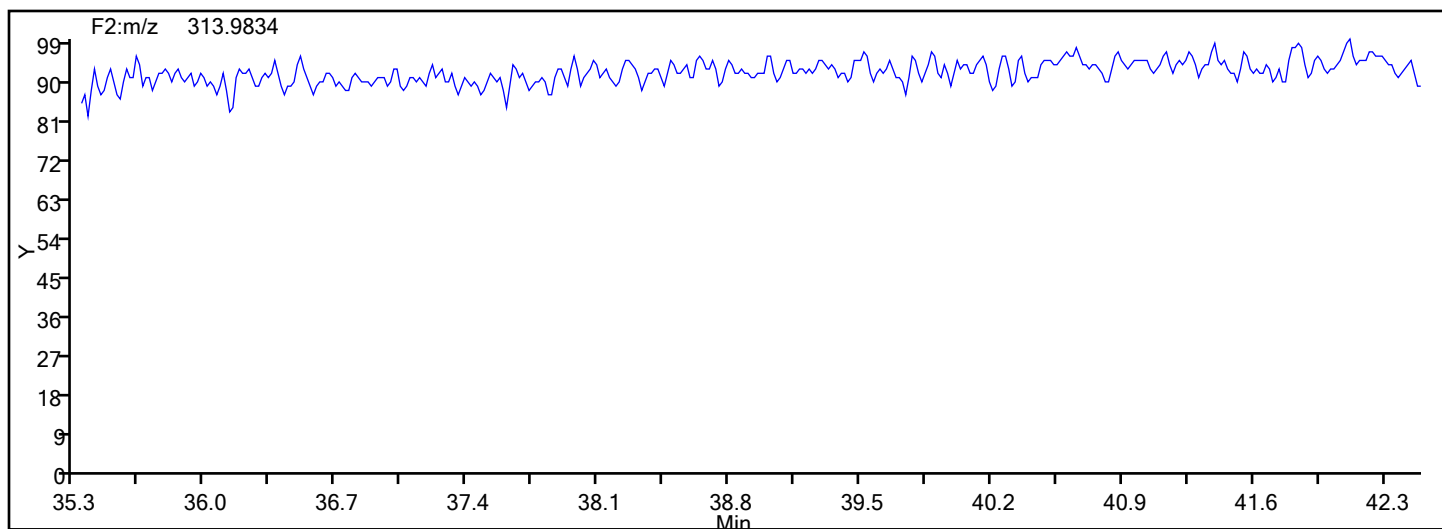
Column Type:

Column Dia:

PeCDD



PeCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Instrument ID: D2A

Lims ID: IC L1

Client ID:

Operator ID: DavidsonM

ALS Bottle#:

0

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

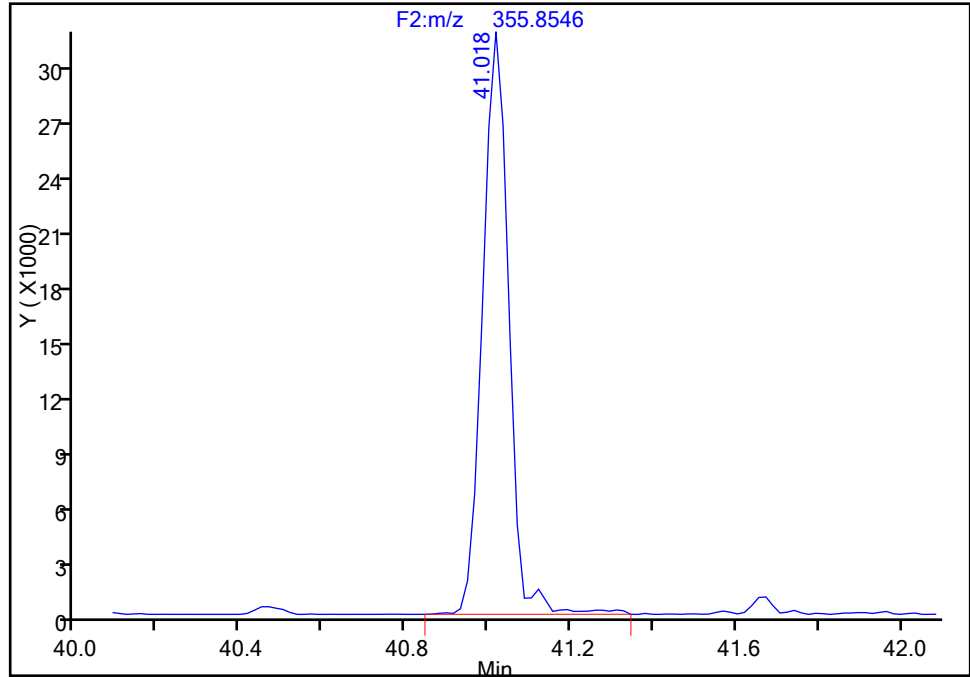
Detector F2(34.39 :42.21)

1,2,3,7,8-PeCDD, CAS: 40321-76-4

Signal: 1

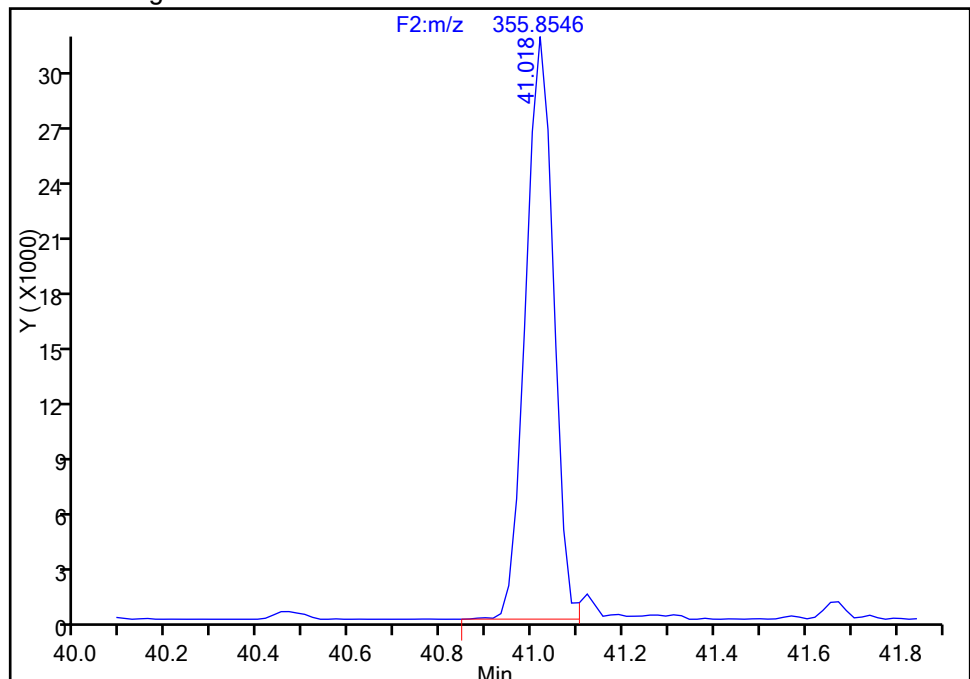
RT: 41.02
Area: 140642
Amount: 2.700260
Amount Units: pg/ul

Processing Integration Results



RT: 41.02
Area: 135749
Amount: 2.652806
Amount Units: pg/ul

Manual Integration Results



Reviewer: davidsonm, 11-Jan-2017 16:11:15

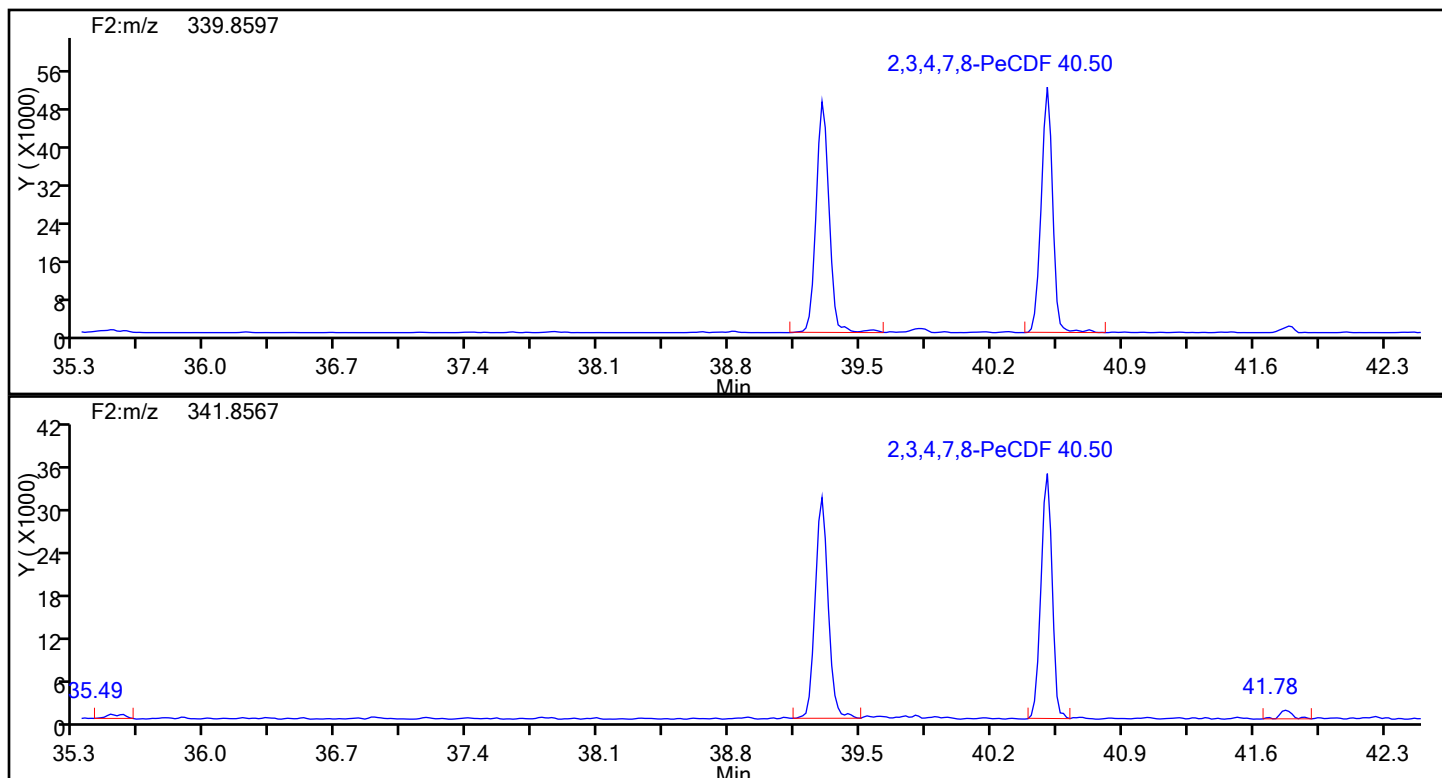
Audit Action: Split an Integrated Peak

Audit Reason: Shouldering

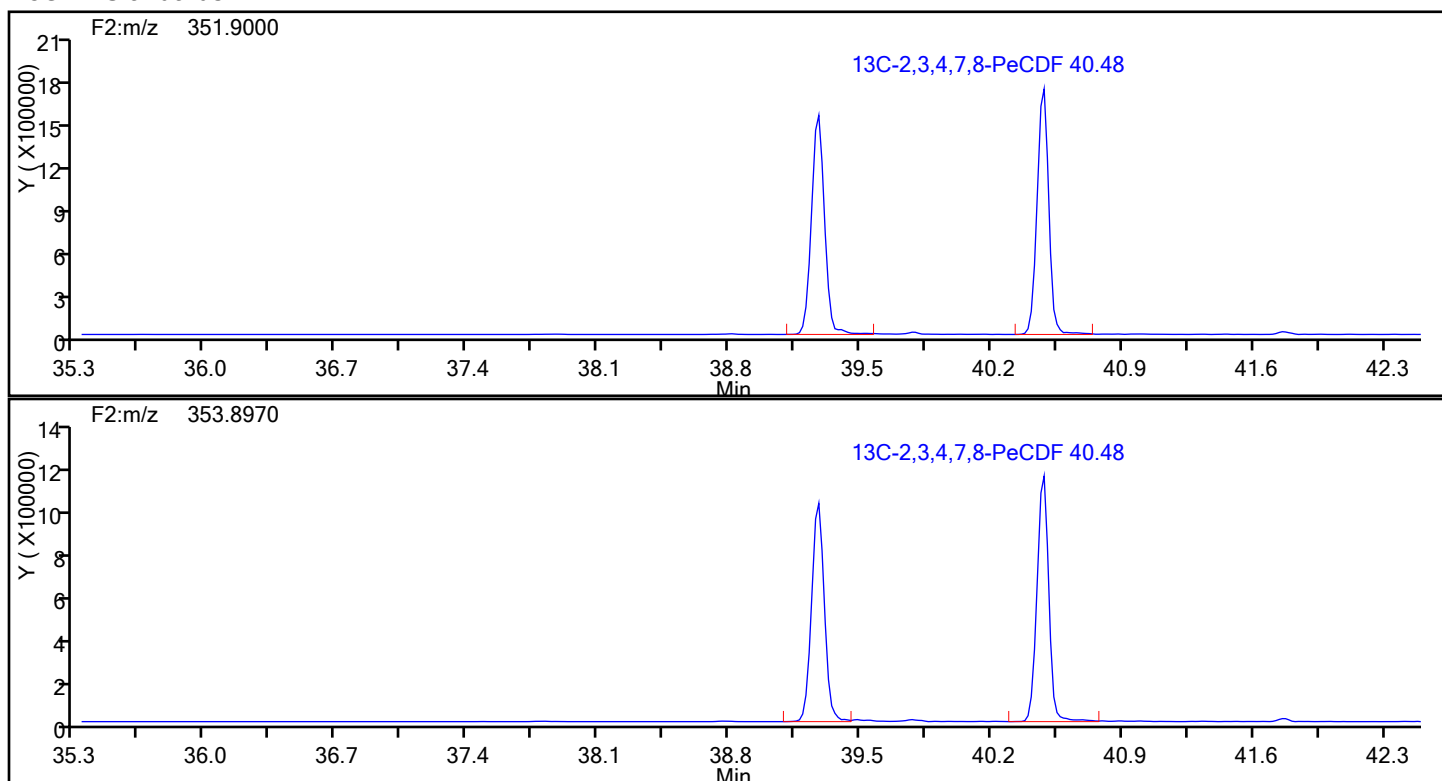
TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
Injection Date: 16-May-2014 14:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 2
Column Type: Column Dia:

PeCDF



PeCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

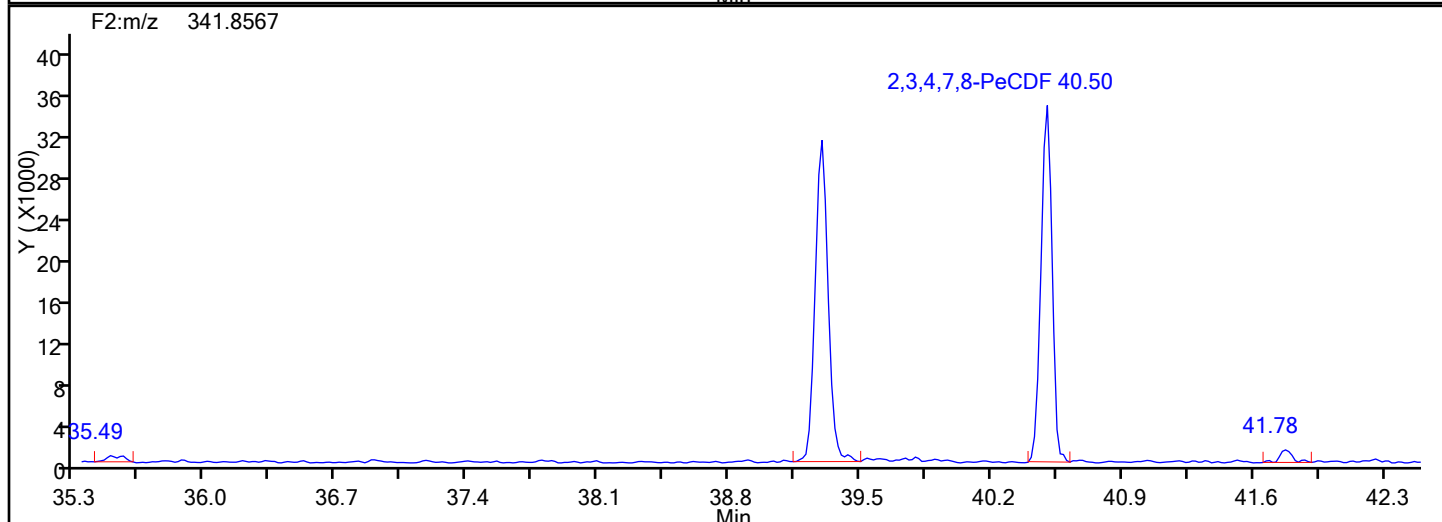
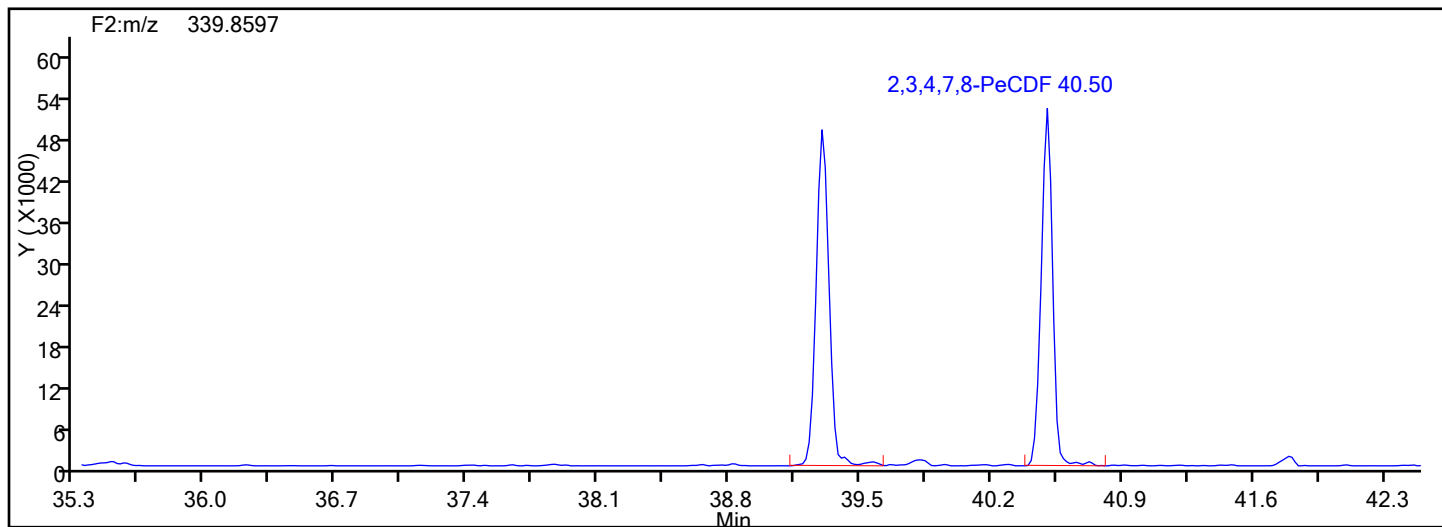
Worklist#: 7768

Sample Line#: 2

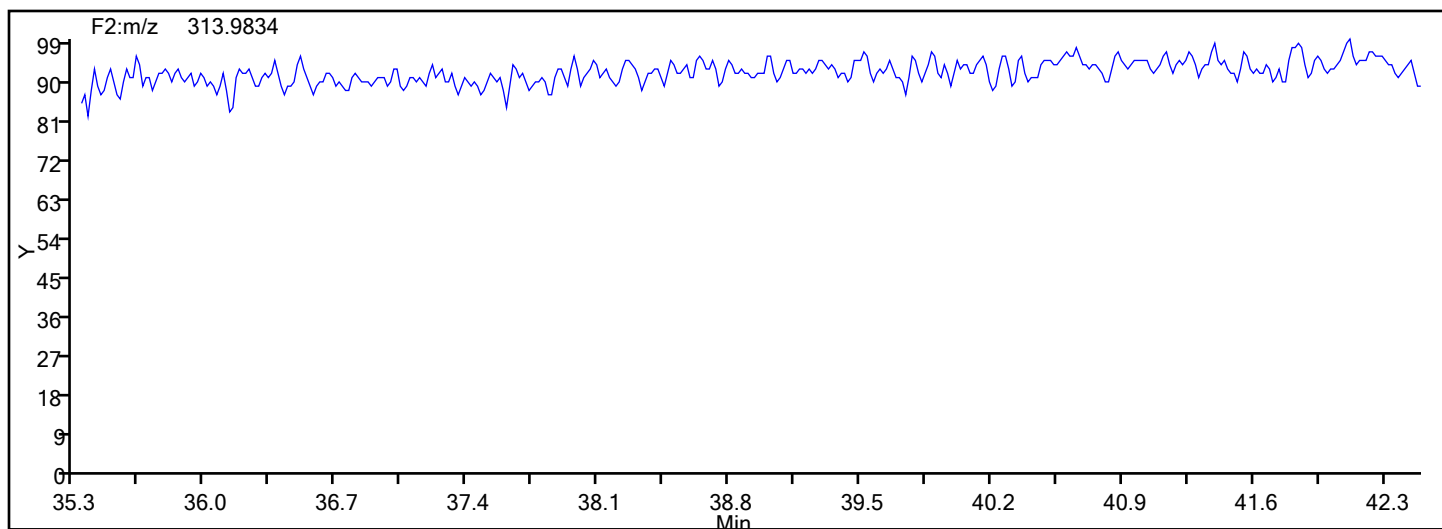
Column Type:

Column Dia:

PeCDF



PeCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

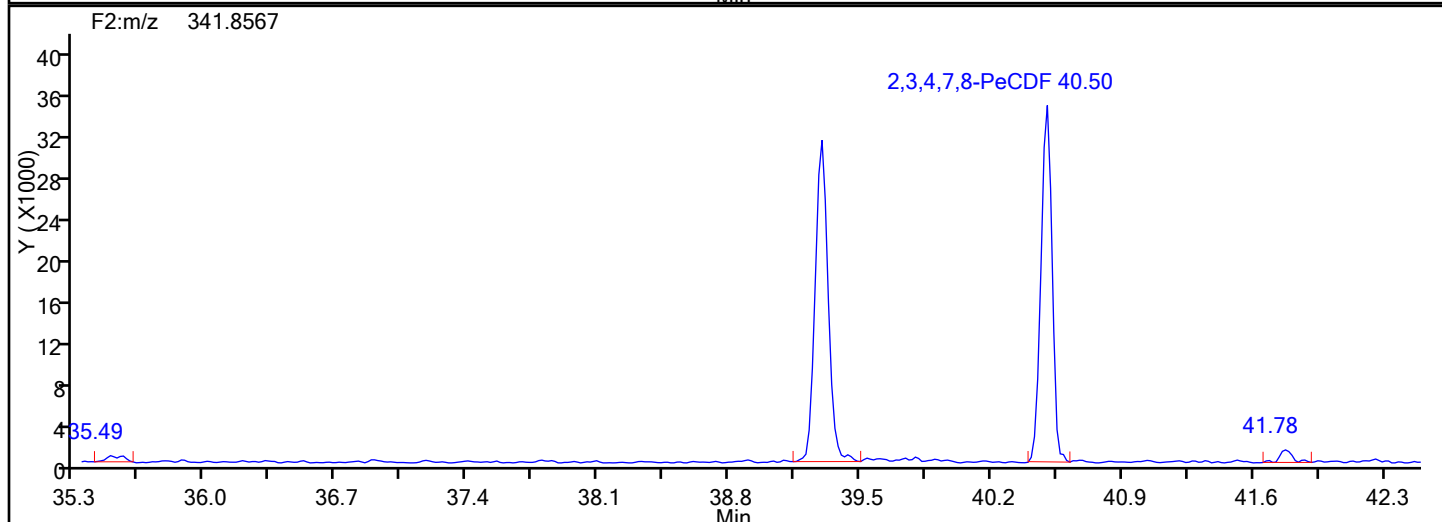
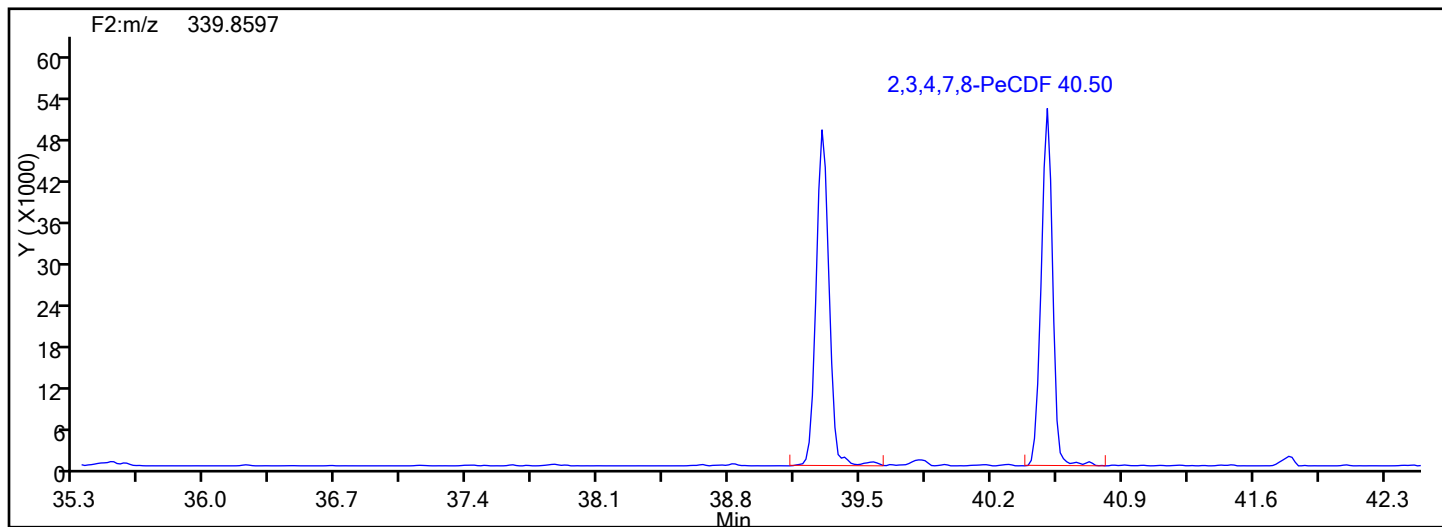
Worklist#: 7768

Sample Line#: 2

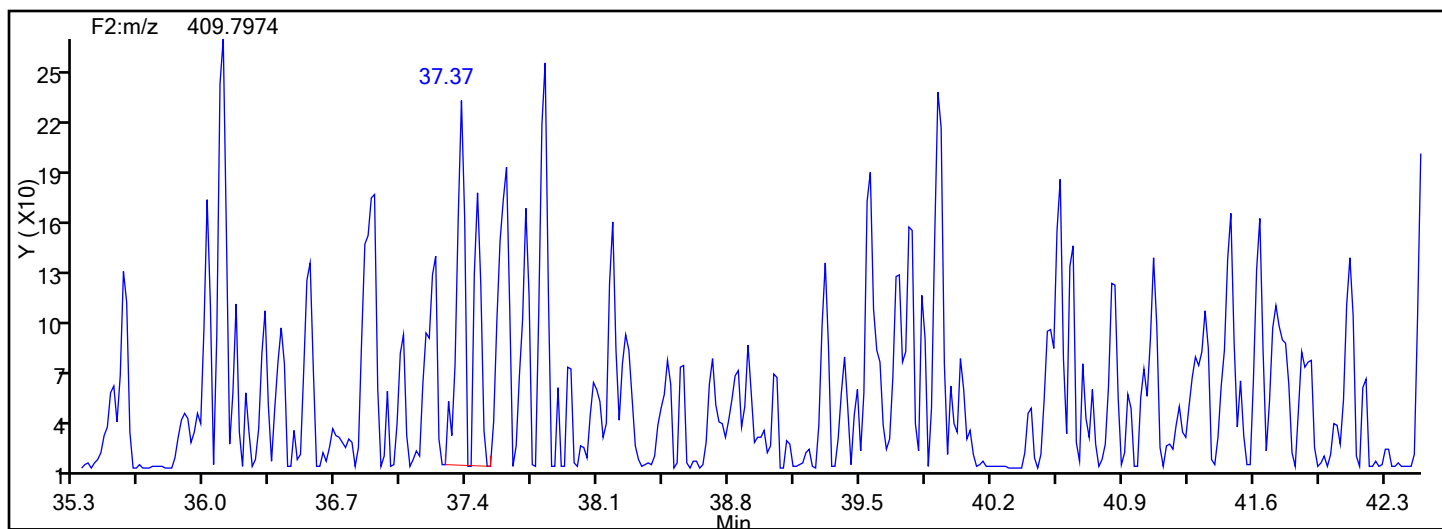
Column Type:

Column Dia:

PeCDF



PeCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

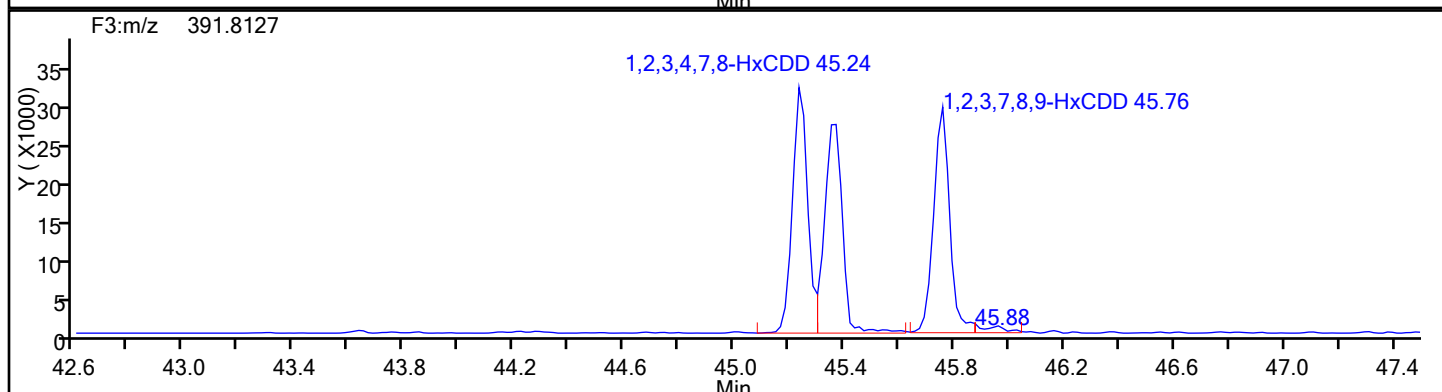
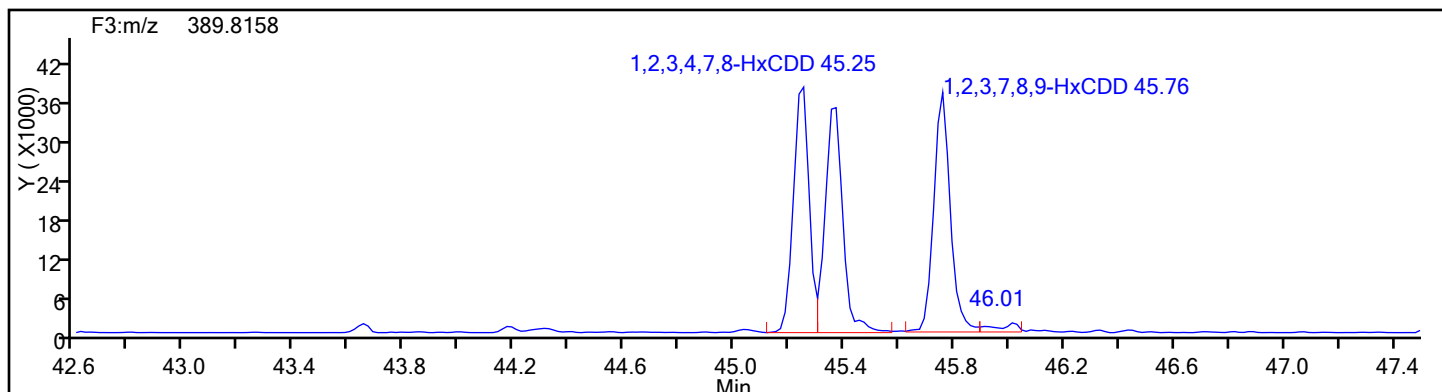
Worklist#: 7768

Sample Line#: 2

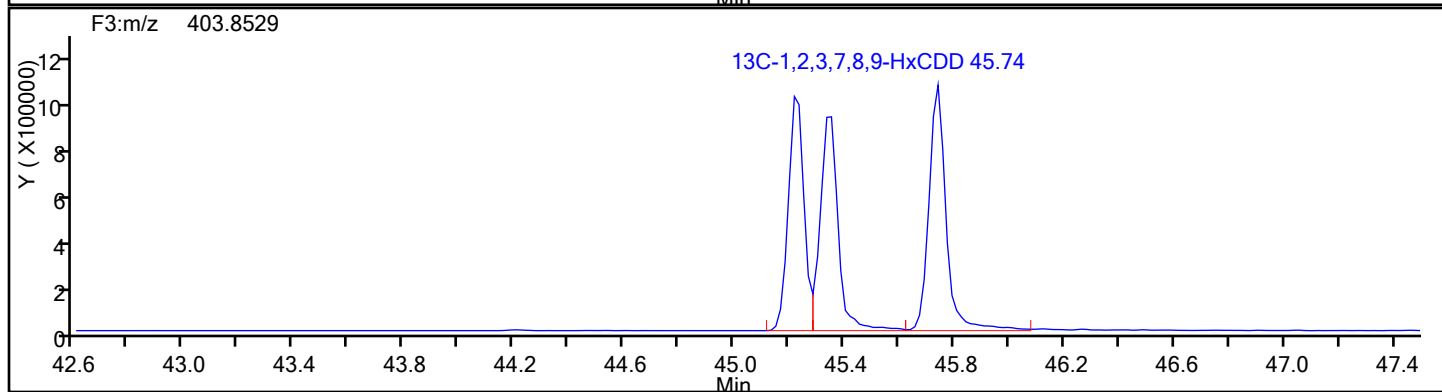
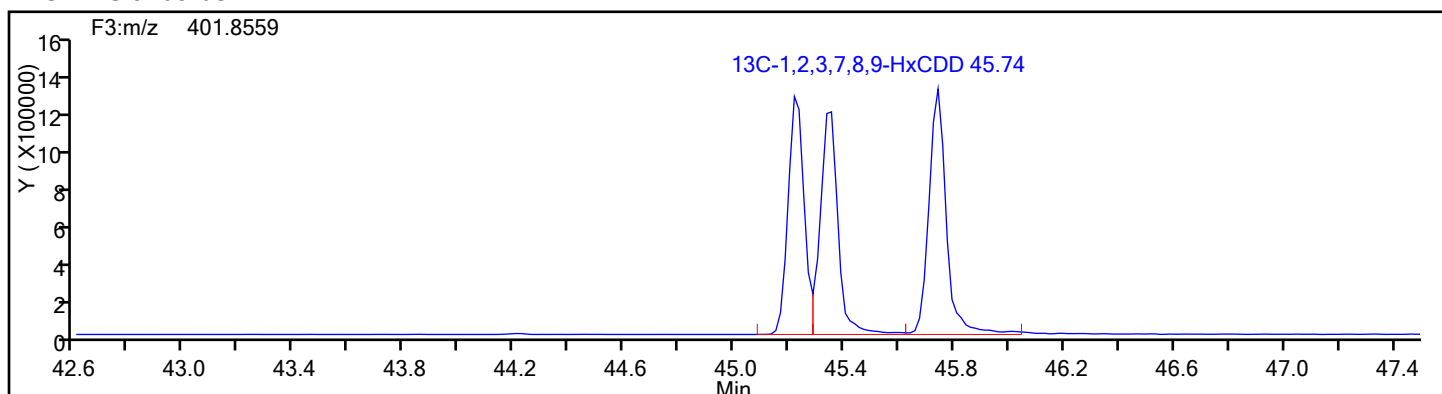
Column Type:

Column Dia:

HxCDD



HxCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

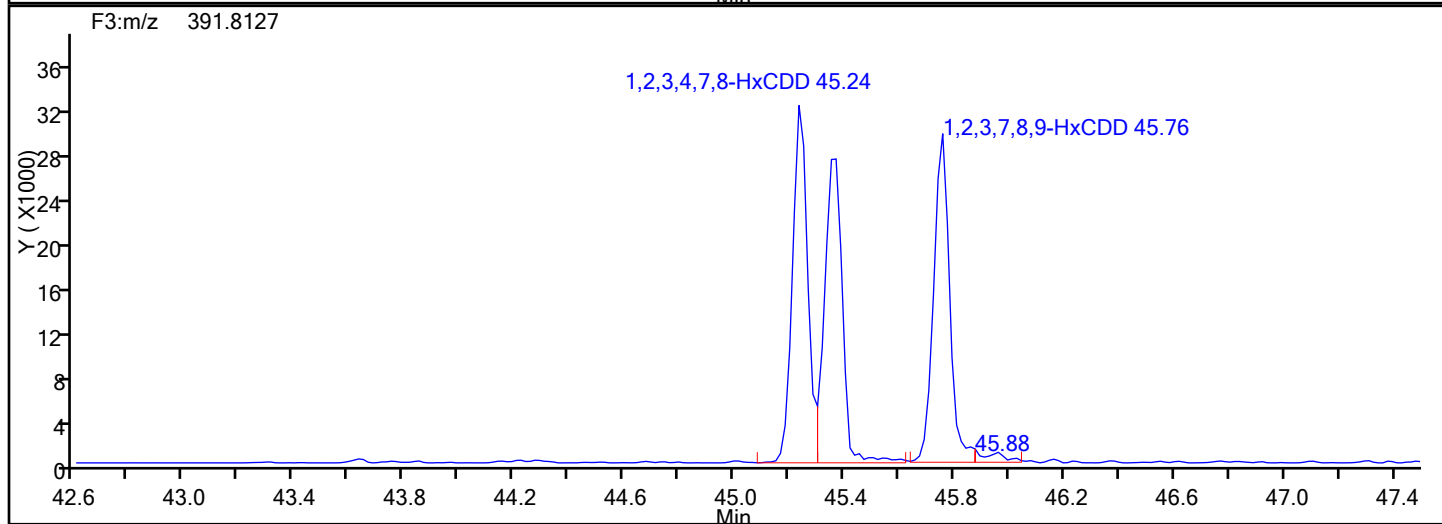
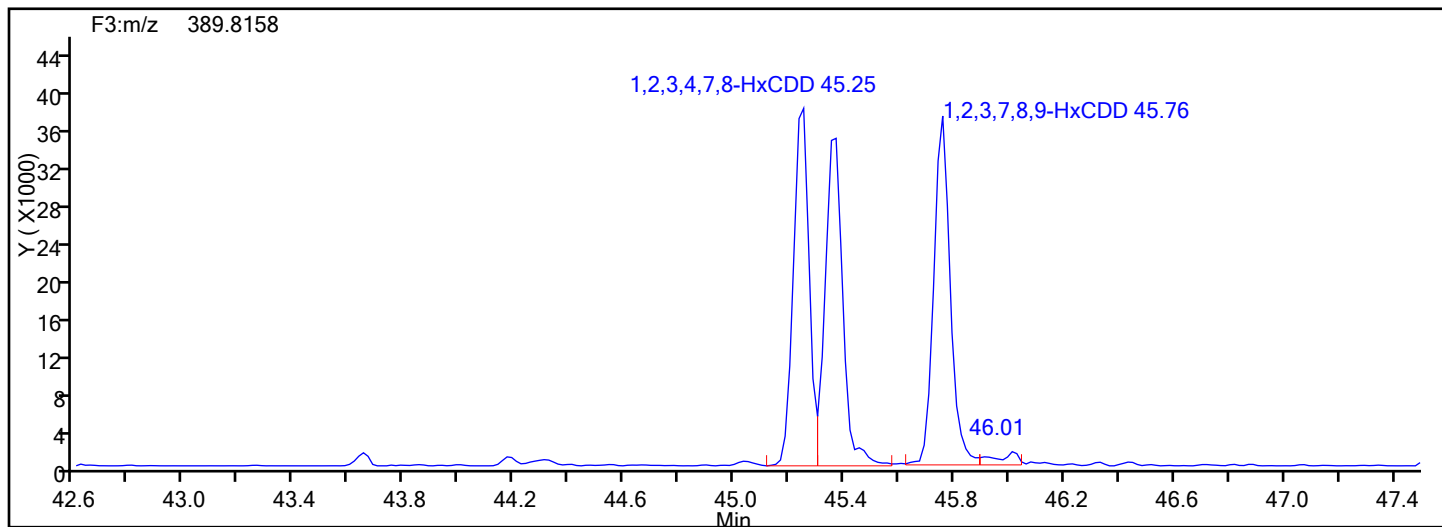
Worklist#: 7768

Sample Line#: 2

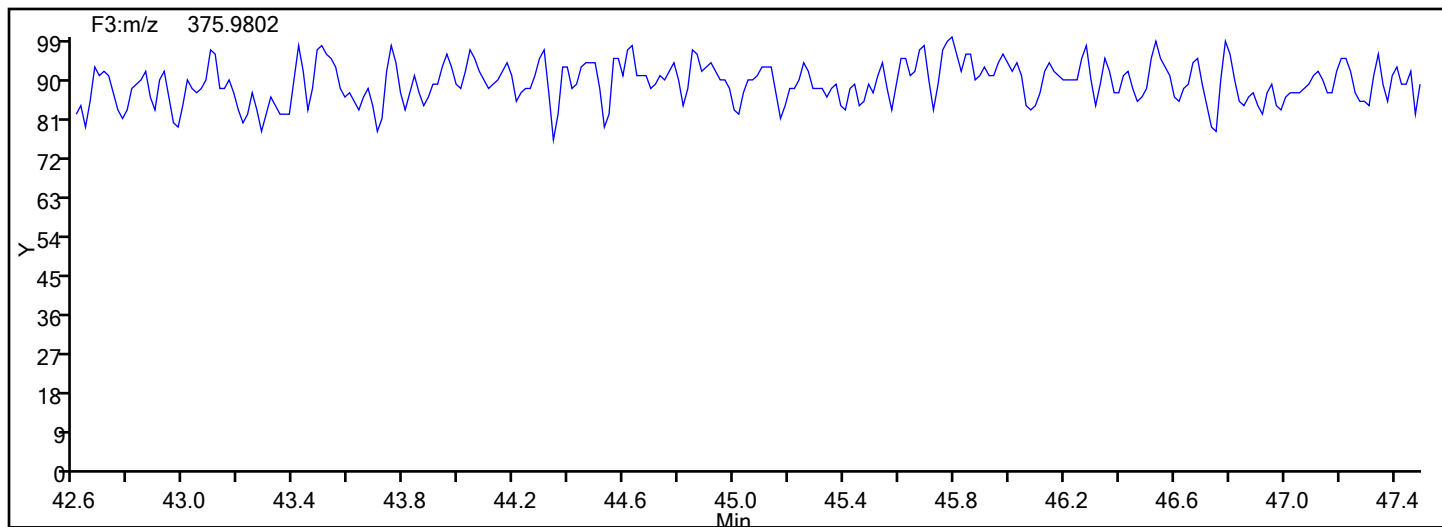
Column Type:

Column Dia:

HxCDD



HxCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Instrument ID: D2A

Lims ID: IC L1

Client ID:

Operator ID: DavidsonM

ALS Bottle#:

0

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

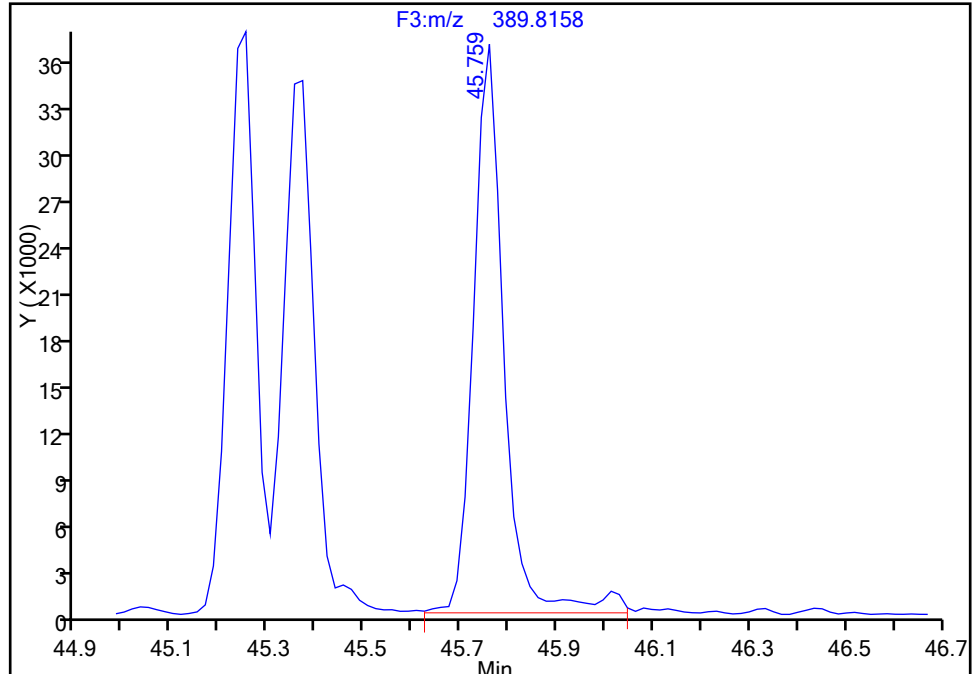
Detector F3(42.31 :47.08)

1,2,3,7,8,9-HxCDD, CAS: 19408-74-3

Signal: 1

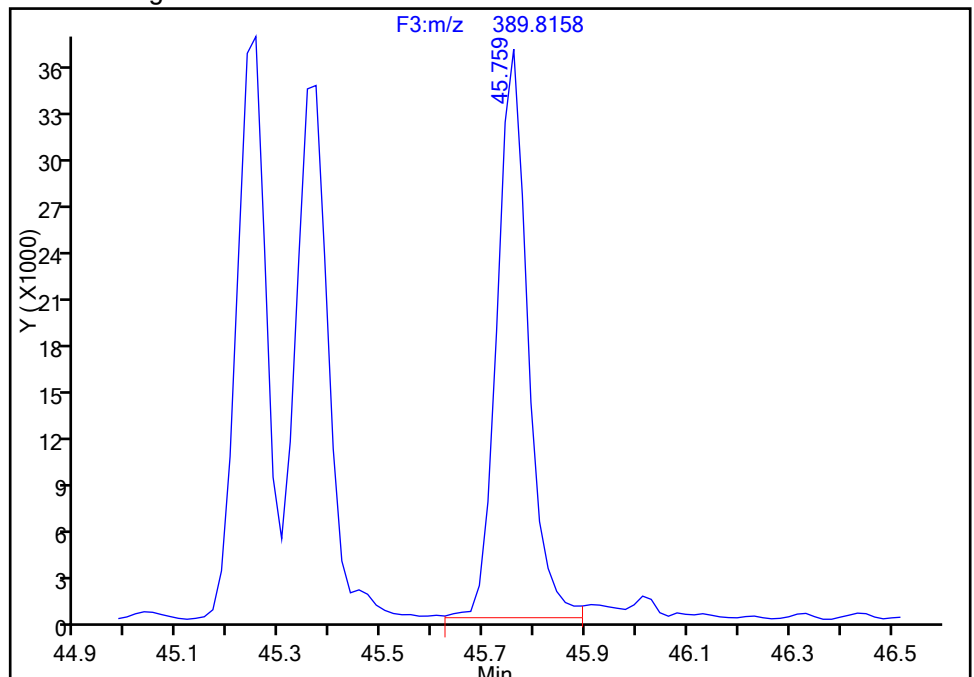
RT: 45.76
Area: 161258
Amount: 2.563620
Amount Units: pg/ul

Processing Integration Results



RT: 45.76
Area: 153733
Amount: 2.471216
Amount Units: pg/ul

Manual Integration Results



Reviewer: davidsonm, 11-Jan-2017 16:11:15

Audit Action: Split an Integrated Peak

Audit Reason: Shouldering

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Instrument ID: D2A

Lims ID: IC L1

Client ID:

Operator ID: DavidsonM

ALS Bottle#: 0

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

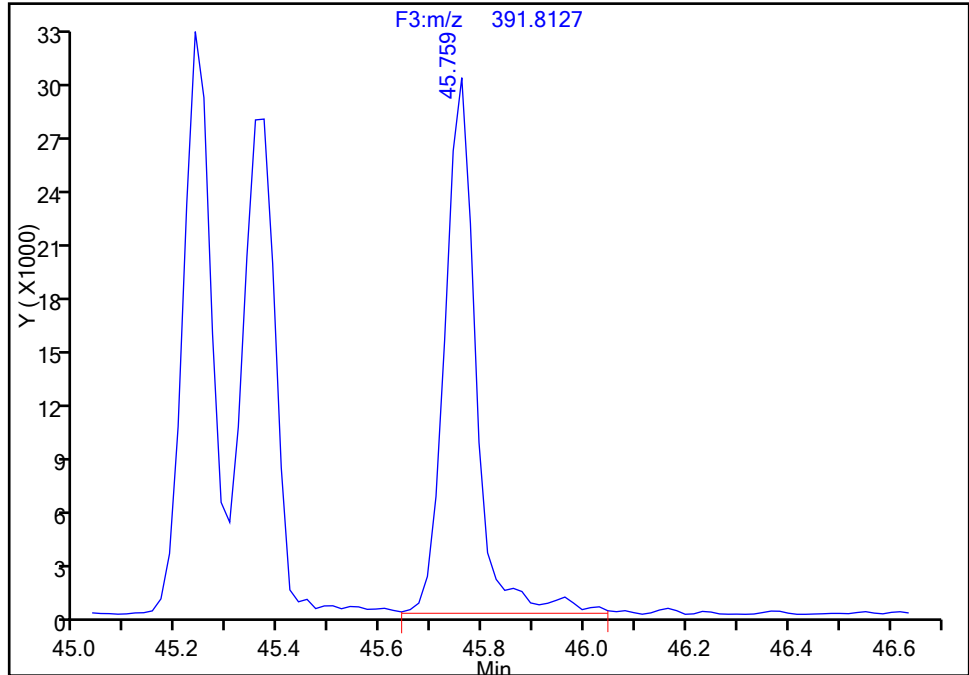
Detector F3(42.31 :47.08)

1,2,3,7,8,9-HxCDD, CAS: 19408-74-3

Signal: 2

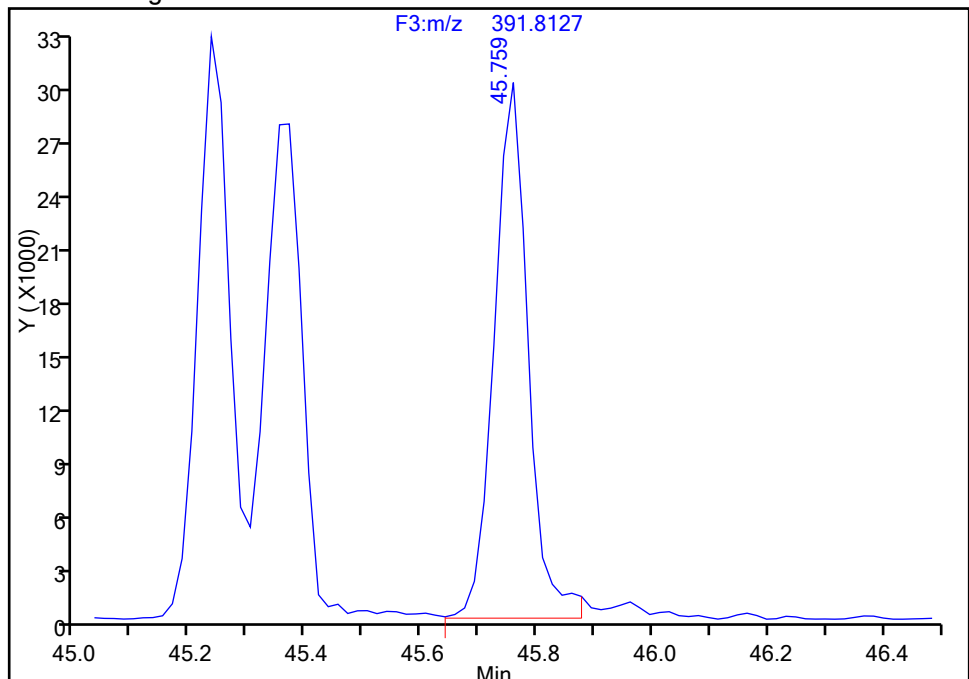
RT: 45.76
Area: 125125
Amount: 2.563620
Amount Units: pg/ul

Processing Integration Results



RT: 45.76
Area: 119784
Amount: 2.471216
Amount Units: pg/ul

Manual Integration Results



Reviewer: davidsonm, 11-Jan-2017 16:11:15

Audit Action: Split an Integrated Peak

Audit Reason: Shouldering

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

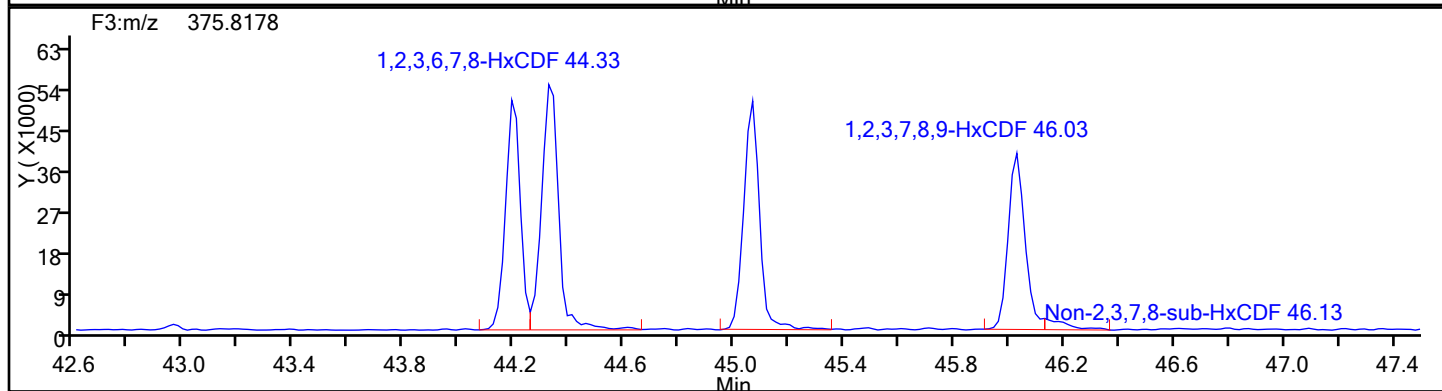
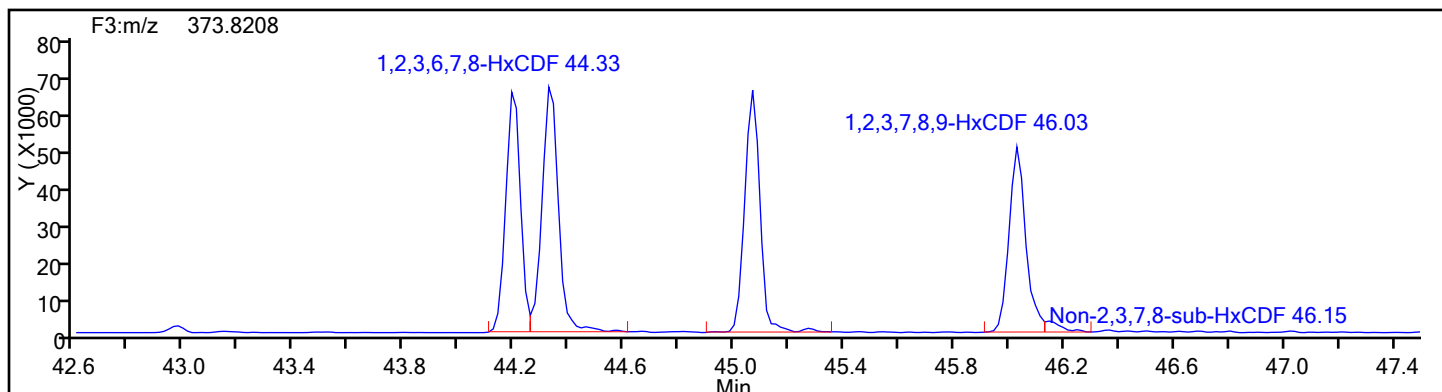
Worklist#: 7768

Sample Line#: 2

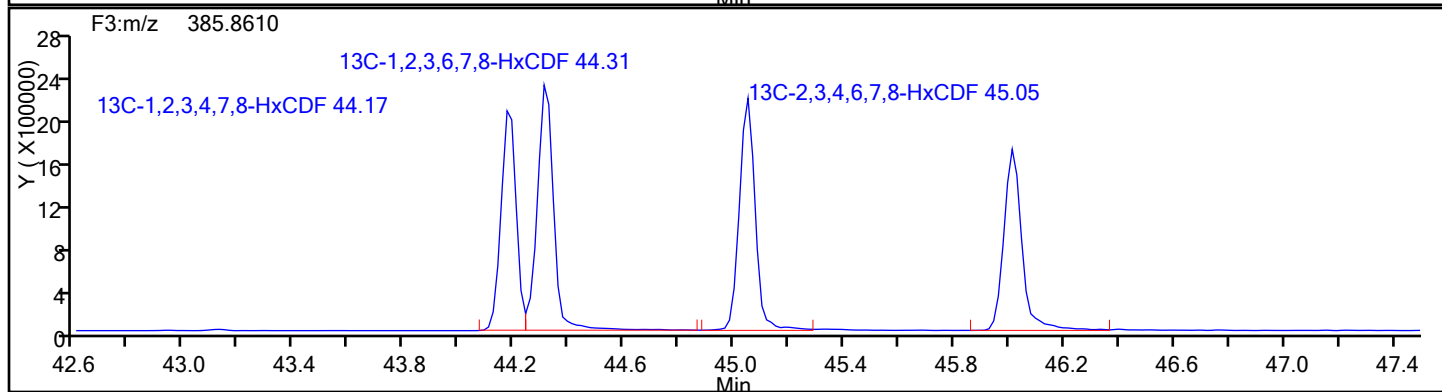
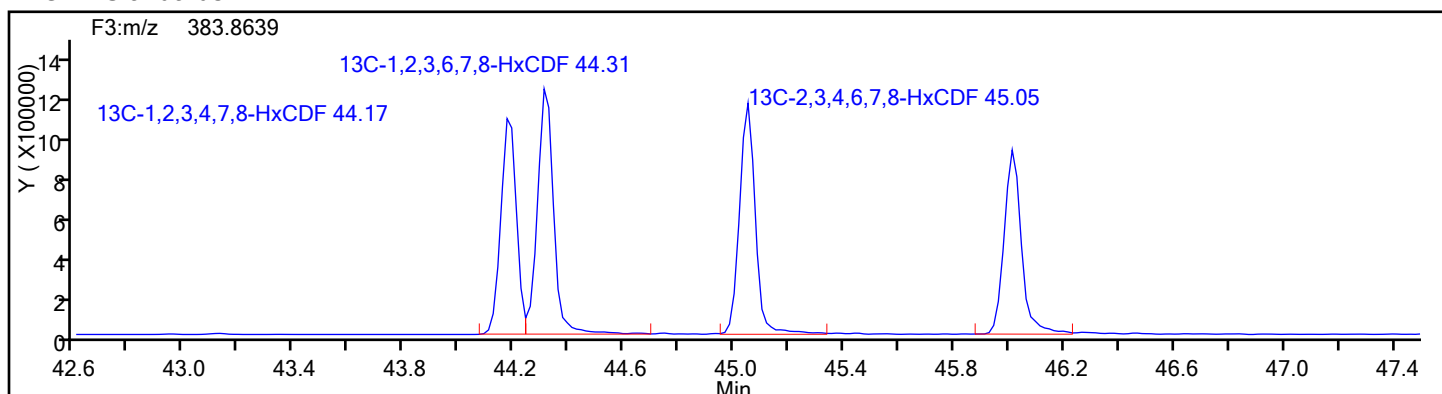
Column Type:

Column Dia:

HxCDF



HxCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

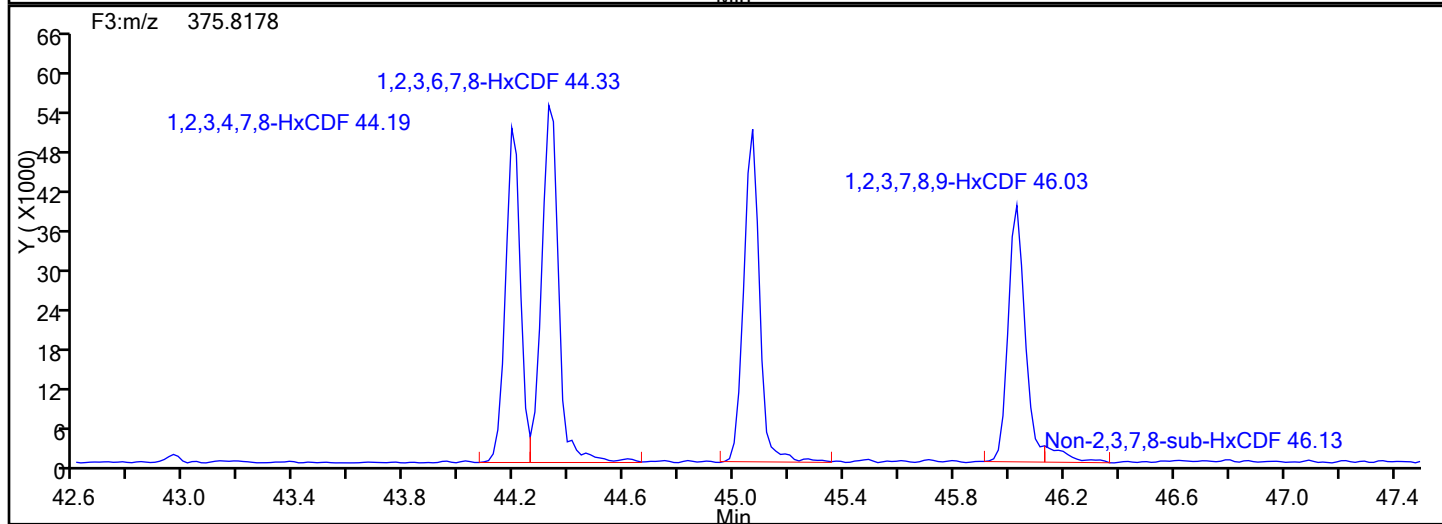
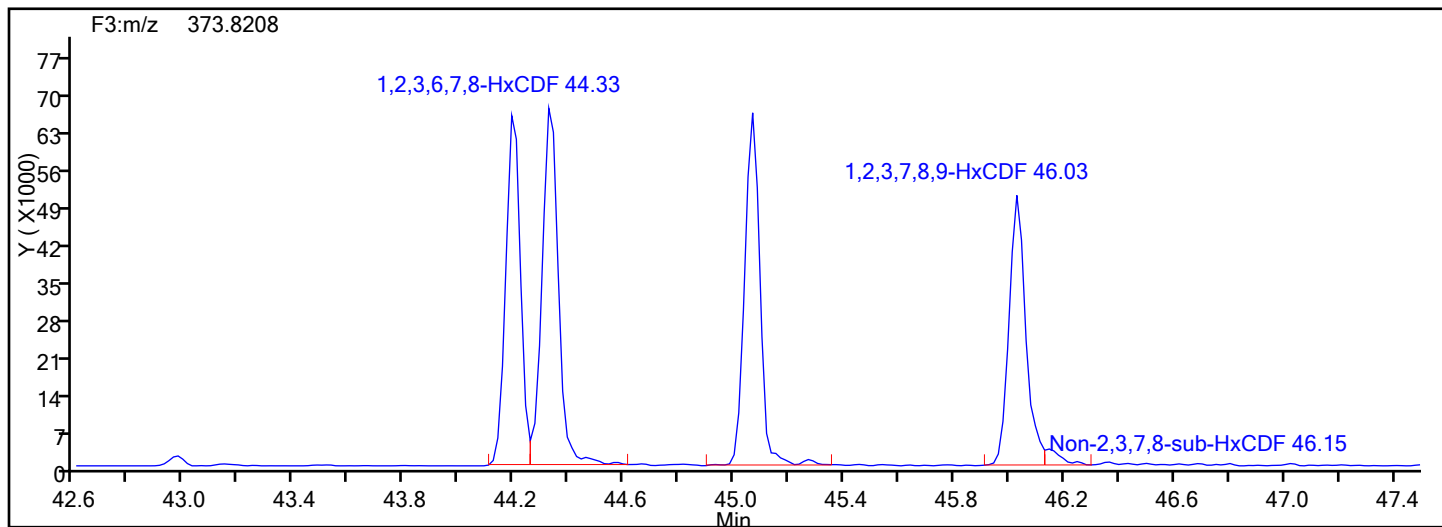
Worklist#: 7768

Sample Line#: 2

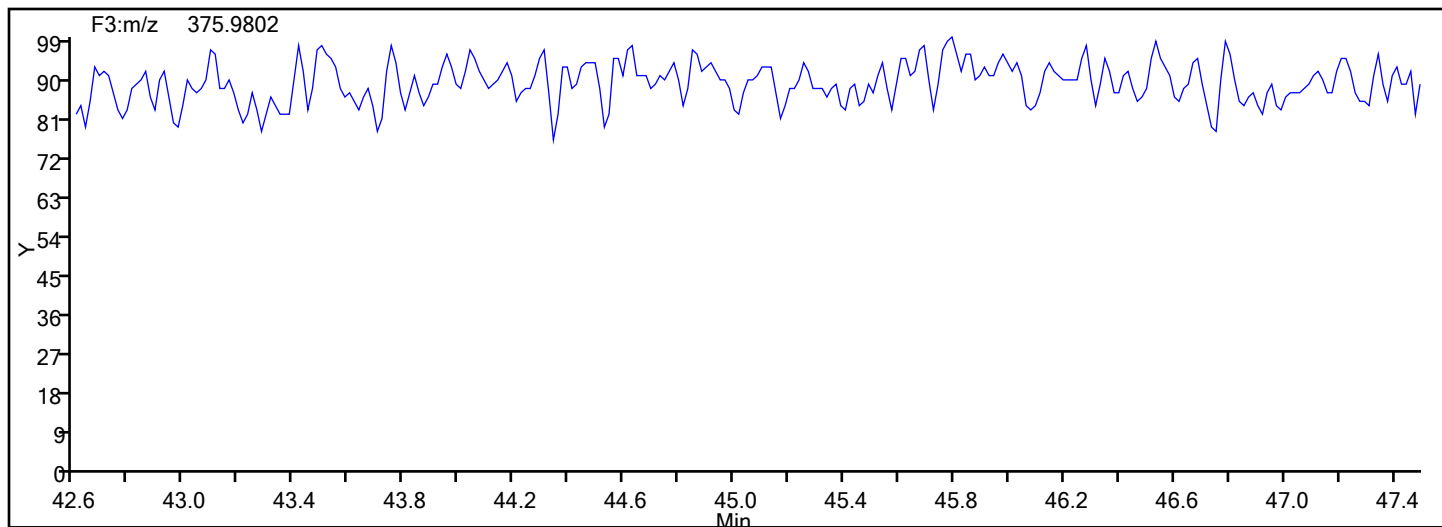
Column Type:

Column Dia:

HxCDF



HxCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

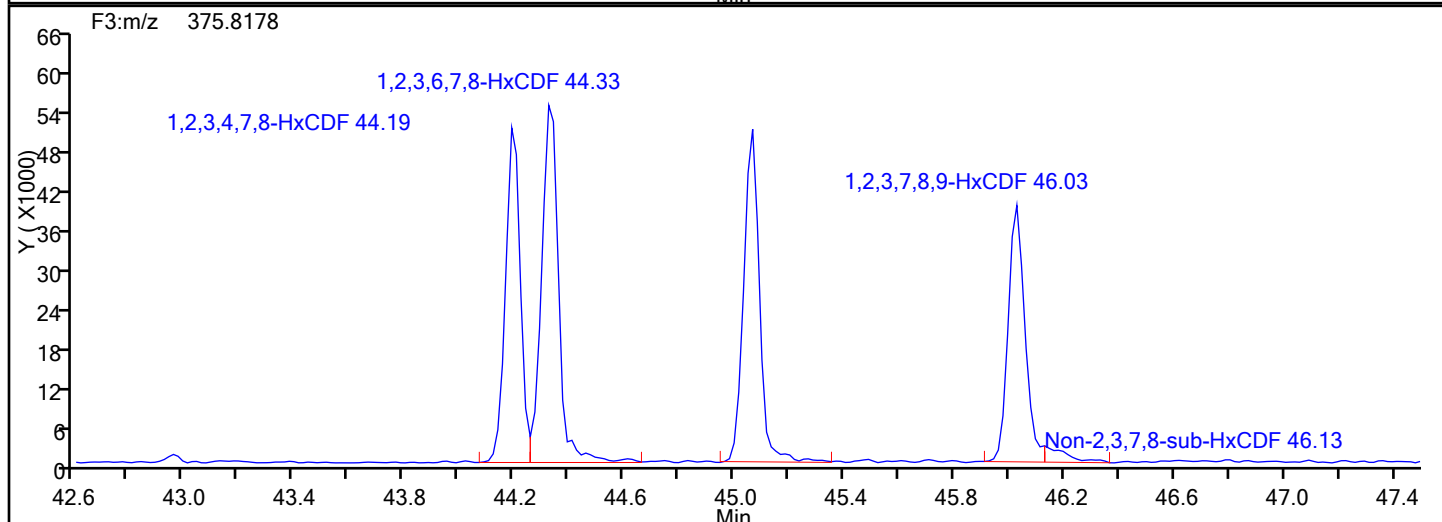
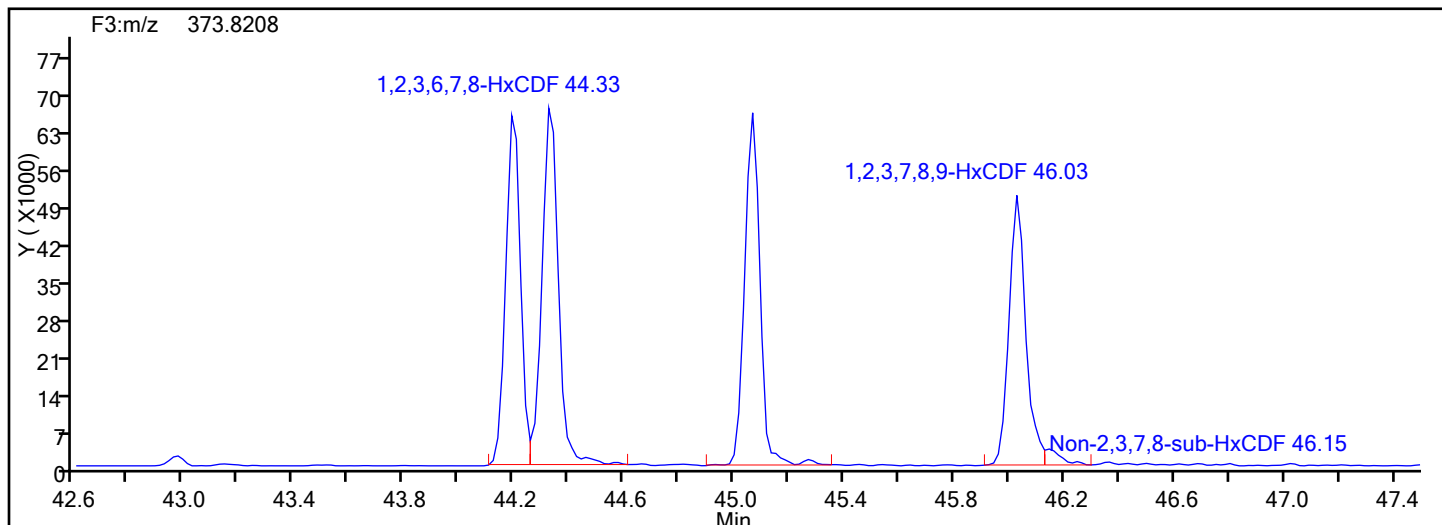
Worklist#: 7768

Sample Line#: 2

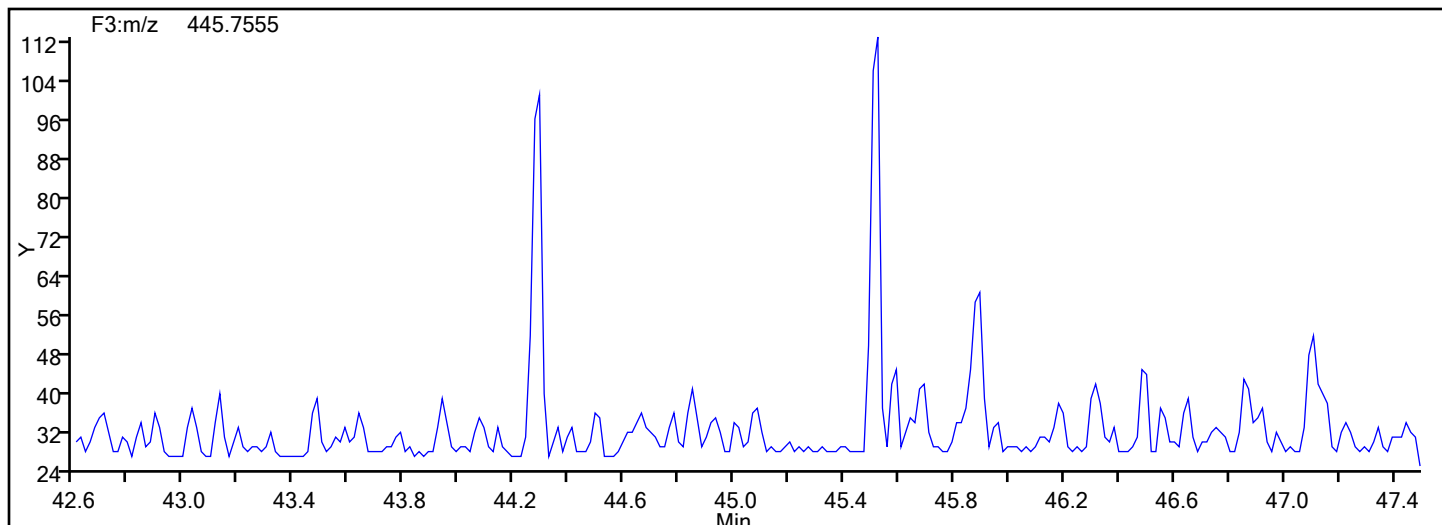
Column Type:

Column Dia:

HxCDF



HxCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Instrument ID: D2A

Lims ID: IC L1

Client ID:

Operator ID: DavidsonM

ALS Bottle#:

0

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

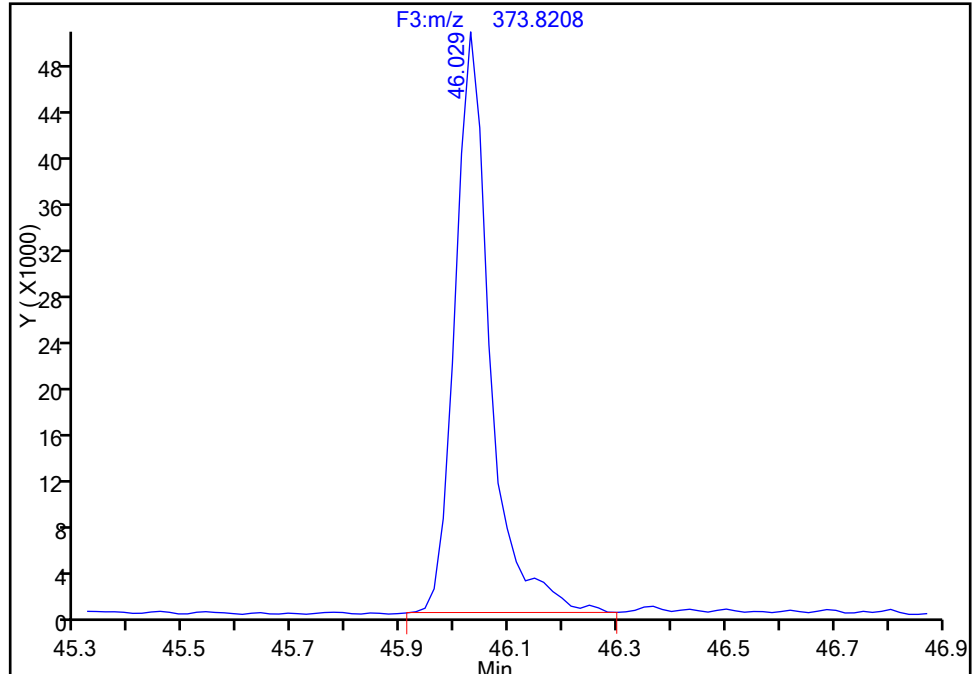
Detector F3(42.31 :47.08)

1,2,3,7,8,9-HxCDF, CAS: 72918-21-9

Signal: 1

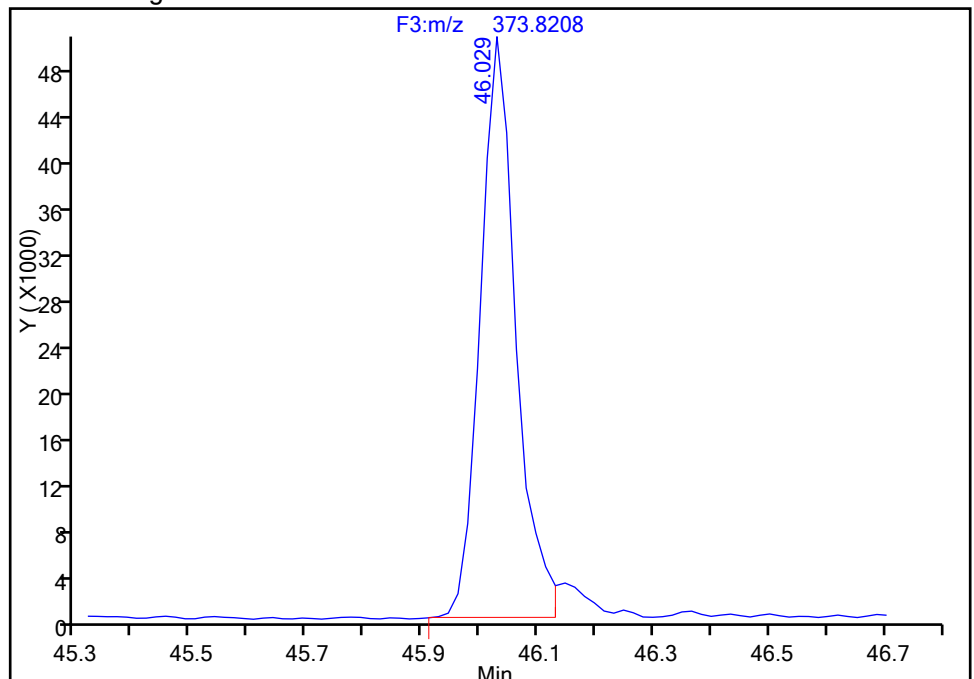
RT: 46.03
Area: 226236
Amount: 2.690381
Amount Units: pg/ul

Processing Integration Results



RT: 46.03
Area: 214140
Amount: 2.556453
Amount Units: pg/ul

Manual Integration Results



Reviewer: davidsonm, 11-Jan-2017 16:11:15

Audit Action: Split an Integrated Peak

Audit Reason: Shouldering

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Instrument ID: D2A

Lims ID: IC L1

Client ID:

Operator ID: DavidsonM

ALS Bottle#: 0

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

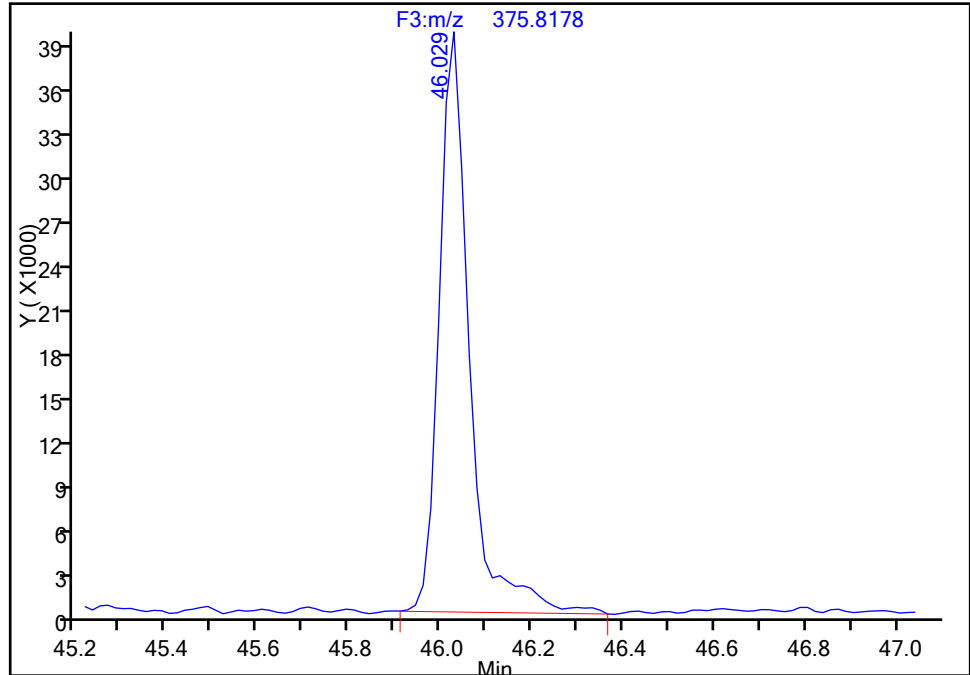
Detector F3(42.31 :47.08)

1,2,3,7,8,9-HxCDF, CAS: 72918-21-9

Signal: 2

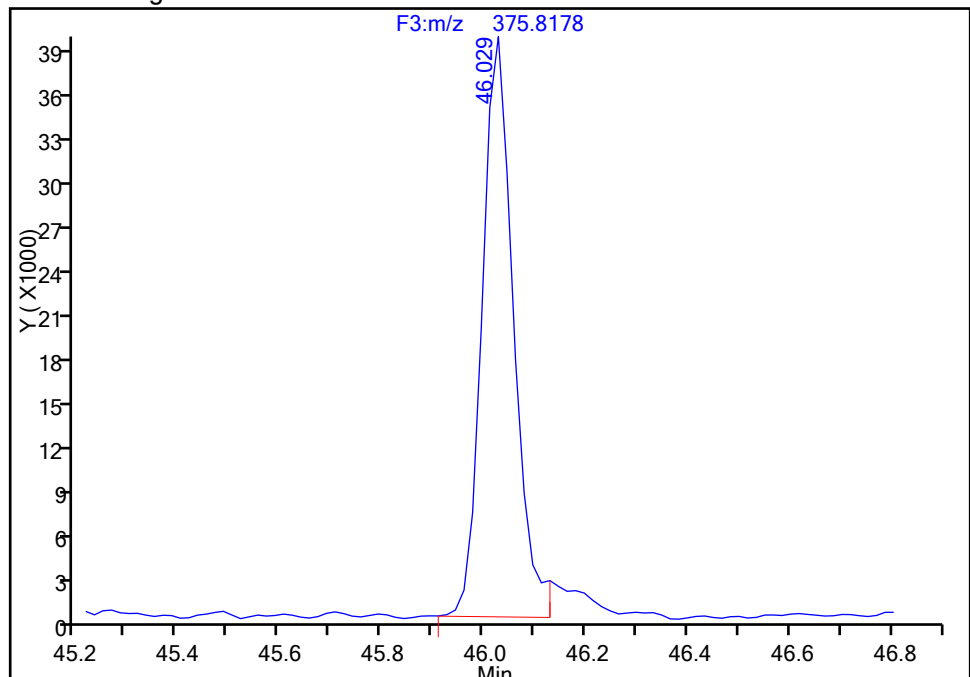
RT: 46.03
Area: 180100
Amount: 2.690381
Amount Units: pg/ul

Processing Integration Results



RT: 46.03
Area: 166768
Amount: 2.556453
Amount Units: pg/ul

Manual Integration Results



Reviewer: davidsonm, 11-Jan-2017 16:11:15

Audit Action: Split an Integrated Peak

Audit Reason: Shouldering

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

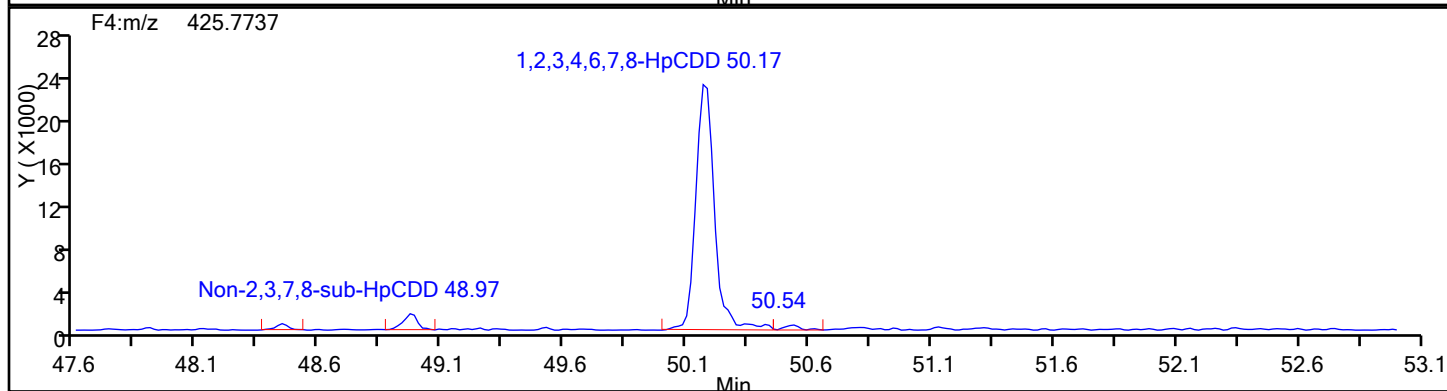
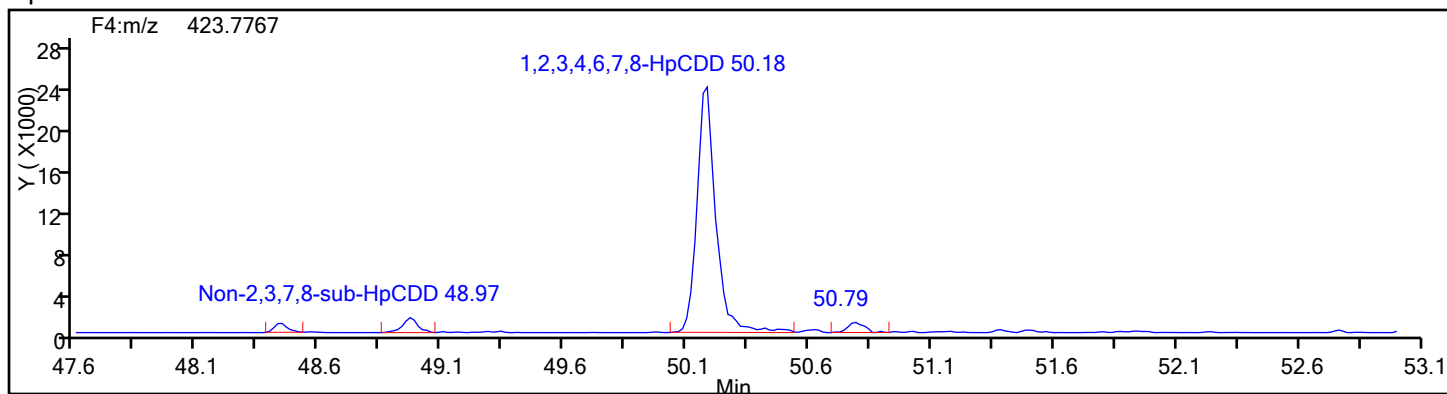
Worklist#: 7768

Sample Line#: 2

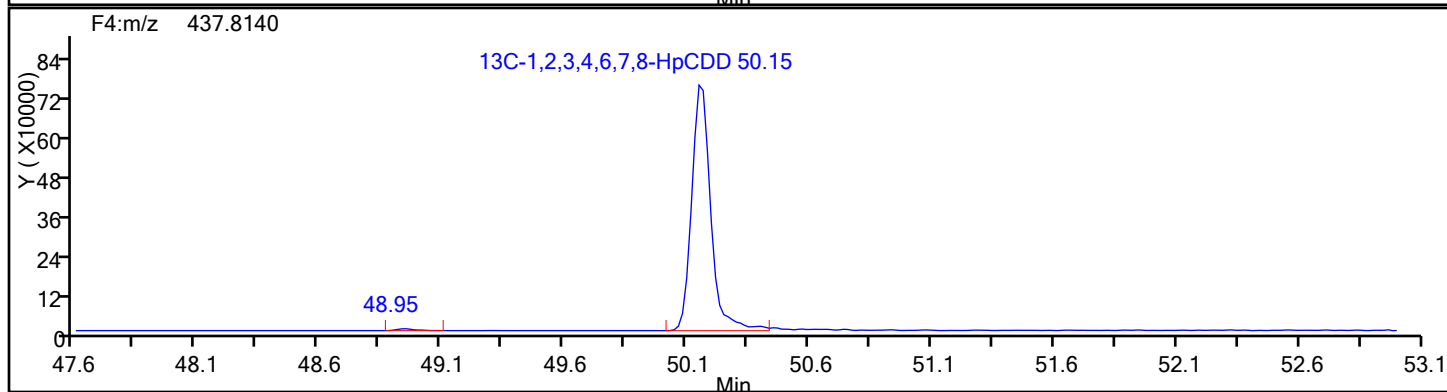
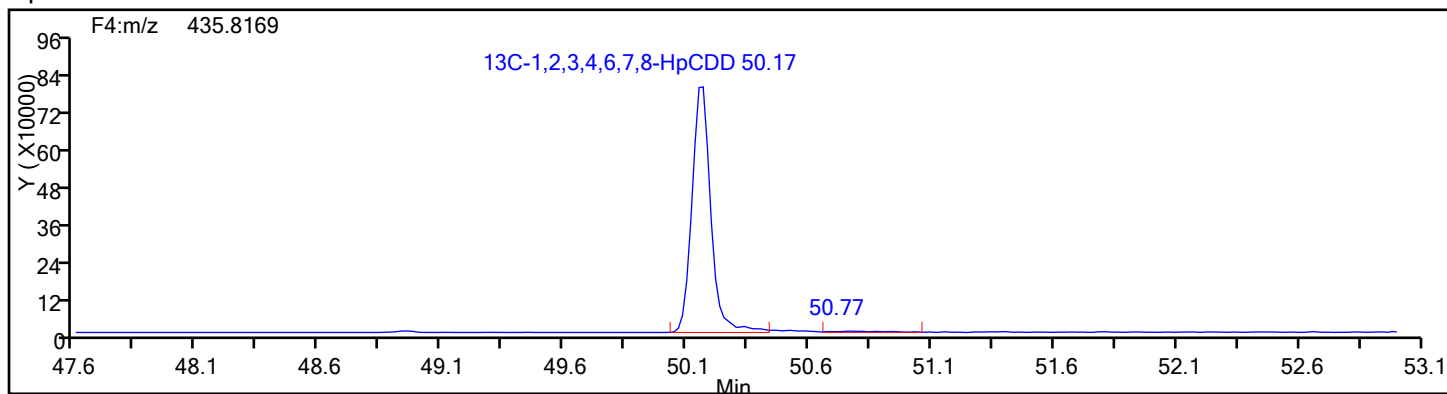
Column Type:

Column Dia:

HpCDD

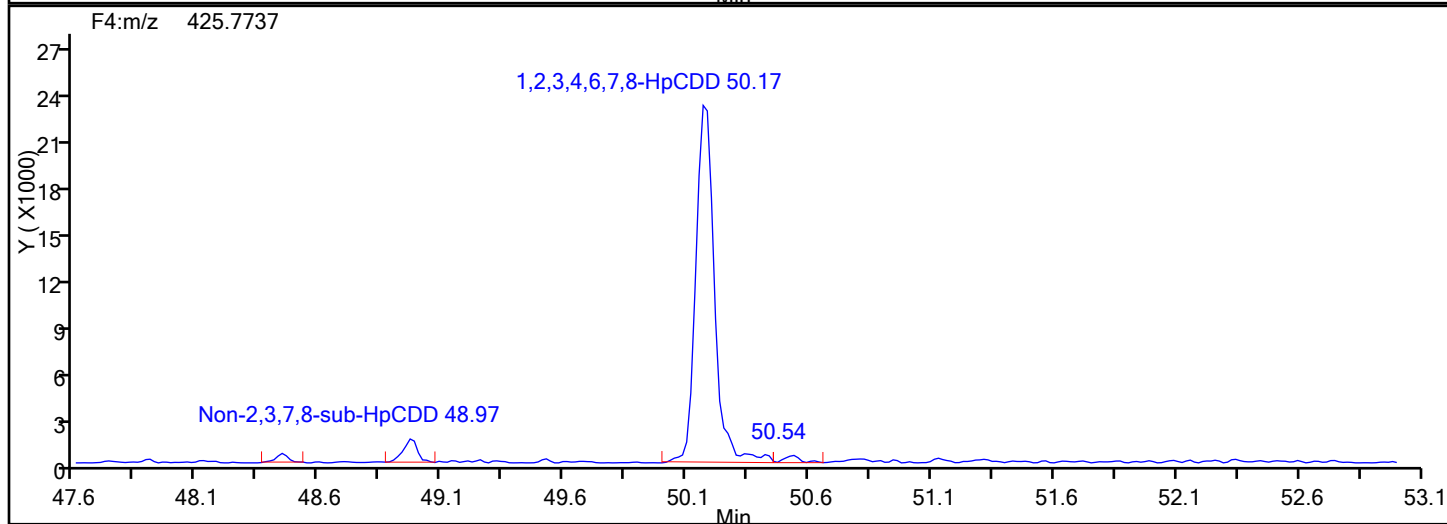
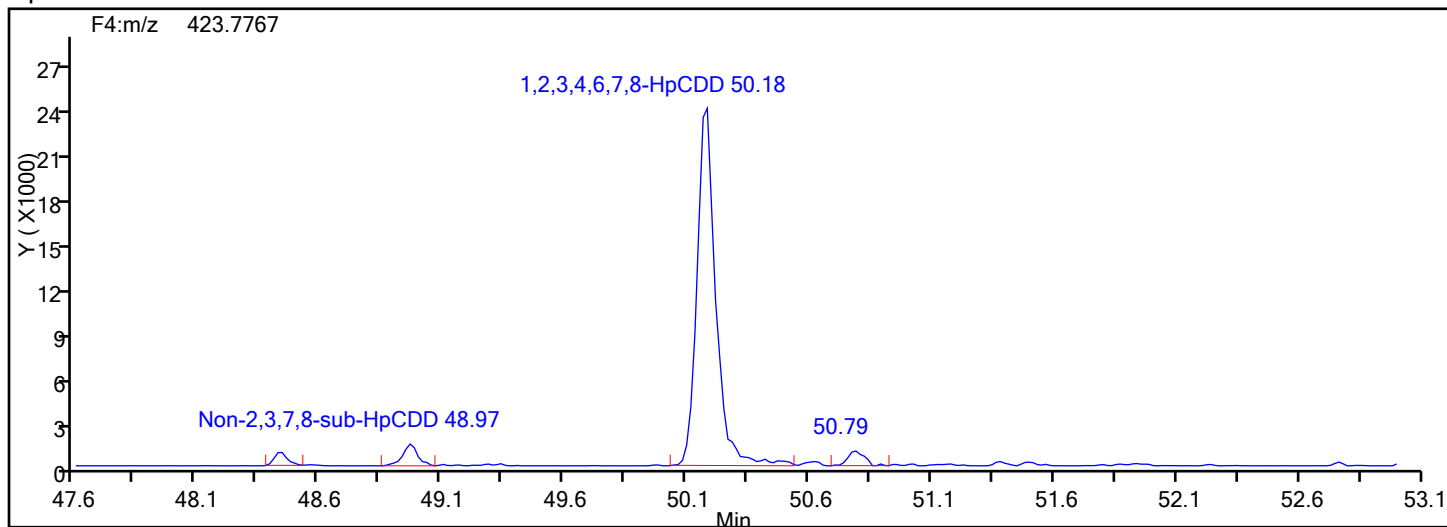


HpCDD Standards

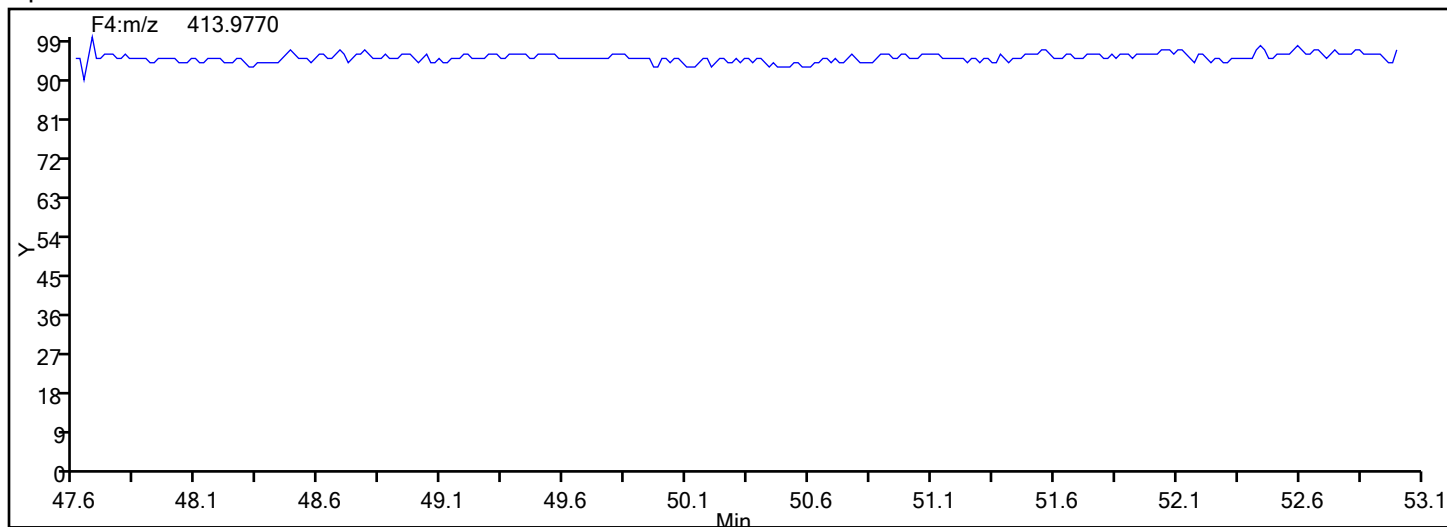


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d
Injection Date: 16-May-2014 14:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 2
Column Type: Column Dia:
HpCDD



HpCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

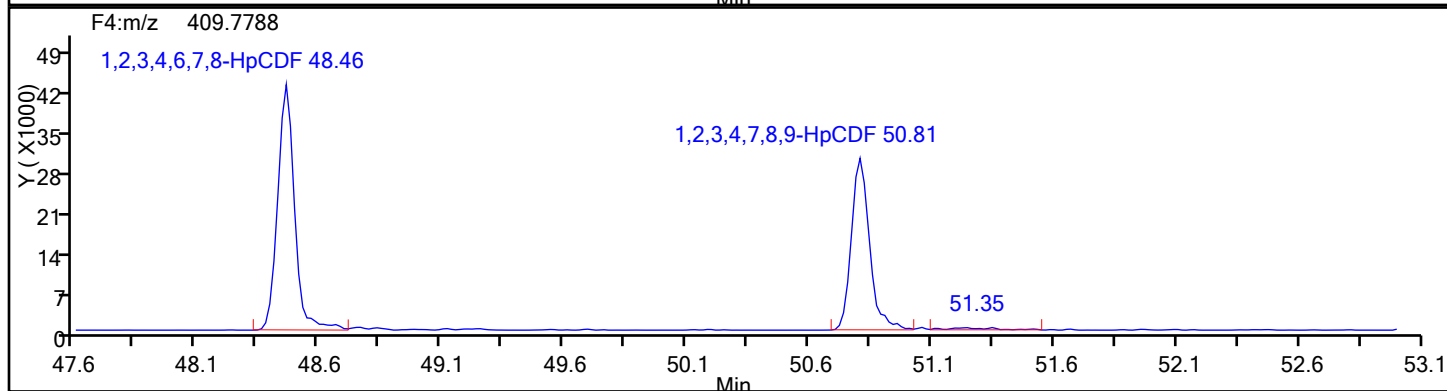
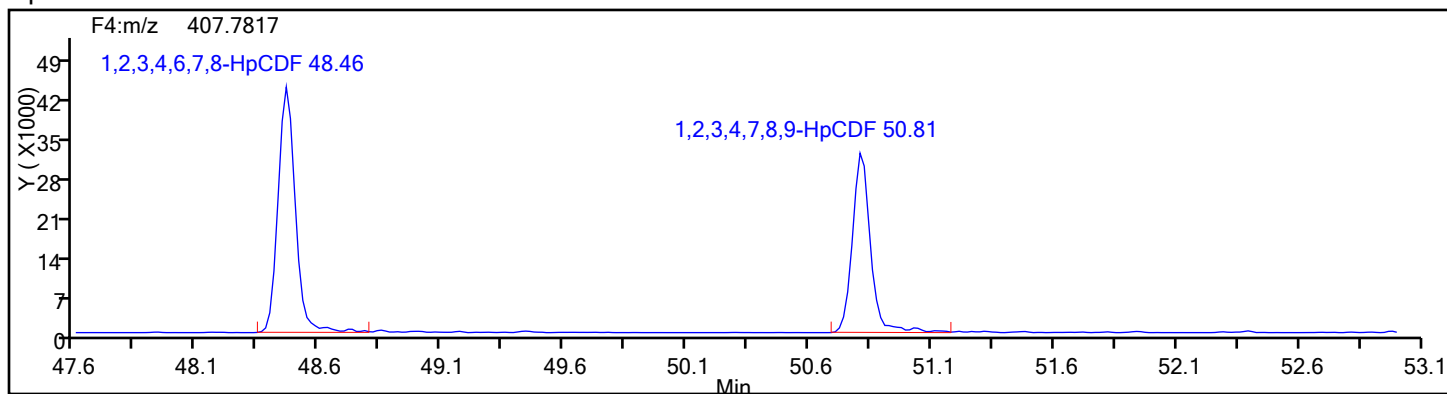
Worklist#: 7768

Sample Line#: 2

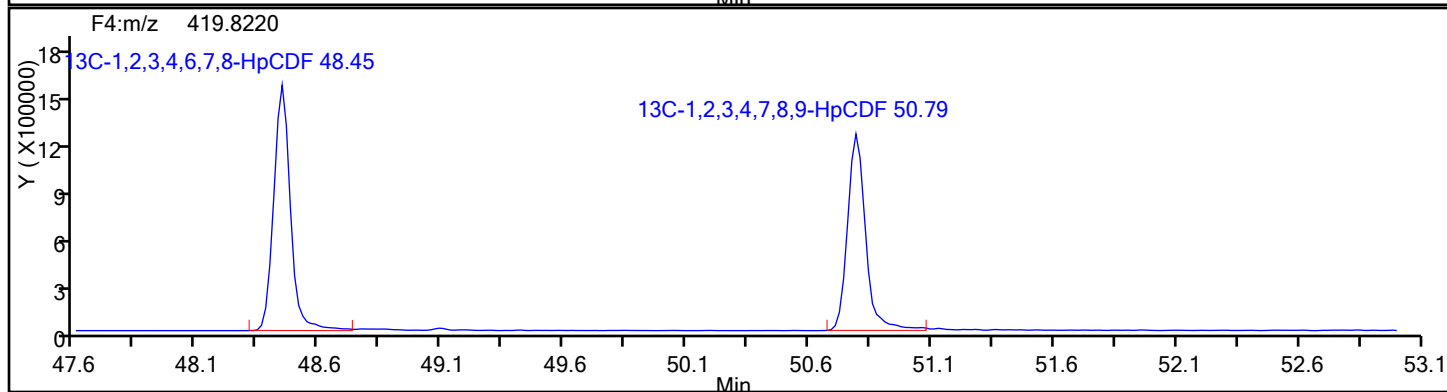
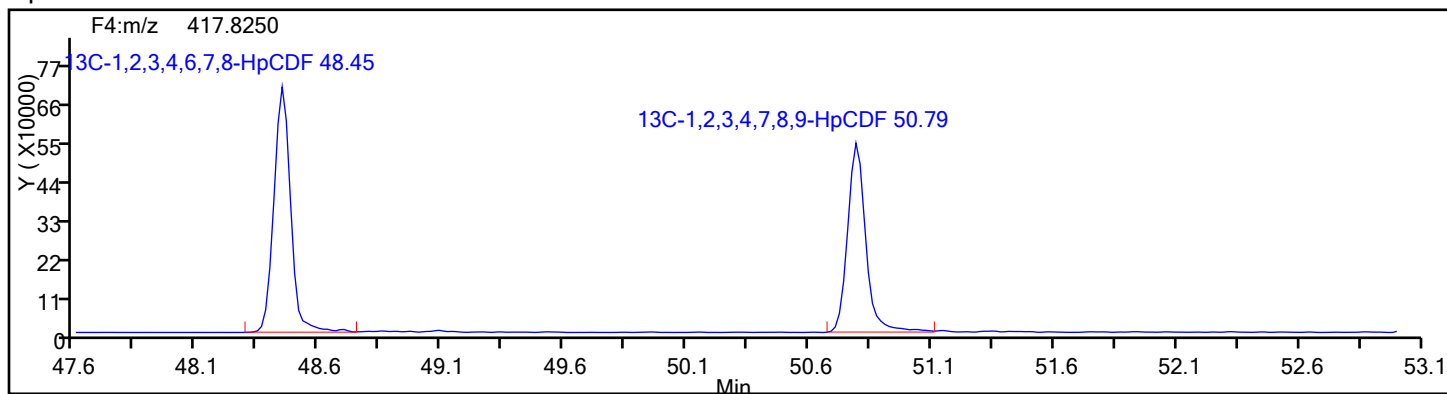
Column Type:

Column Dia:

HpCDF



HpCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

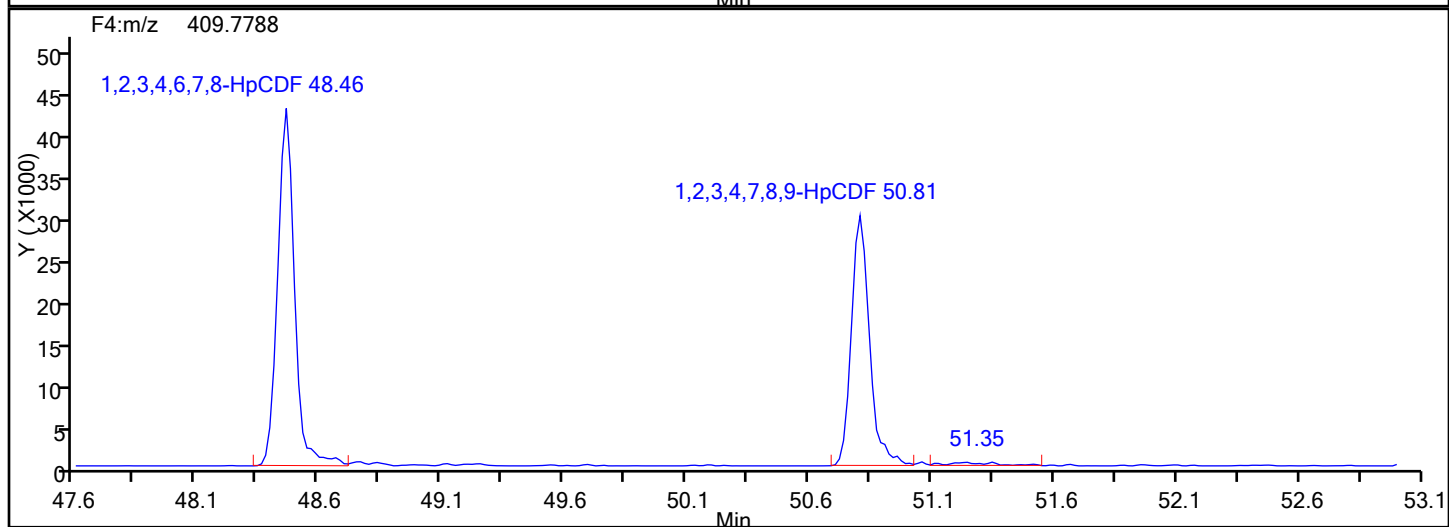
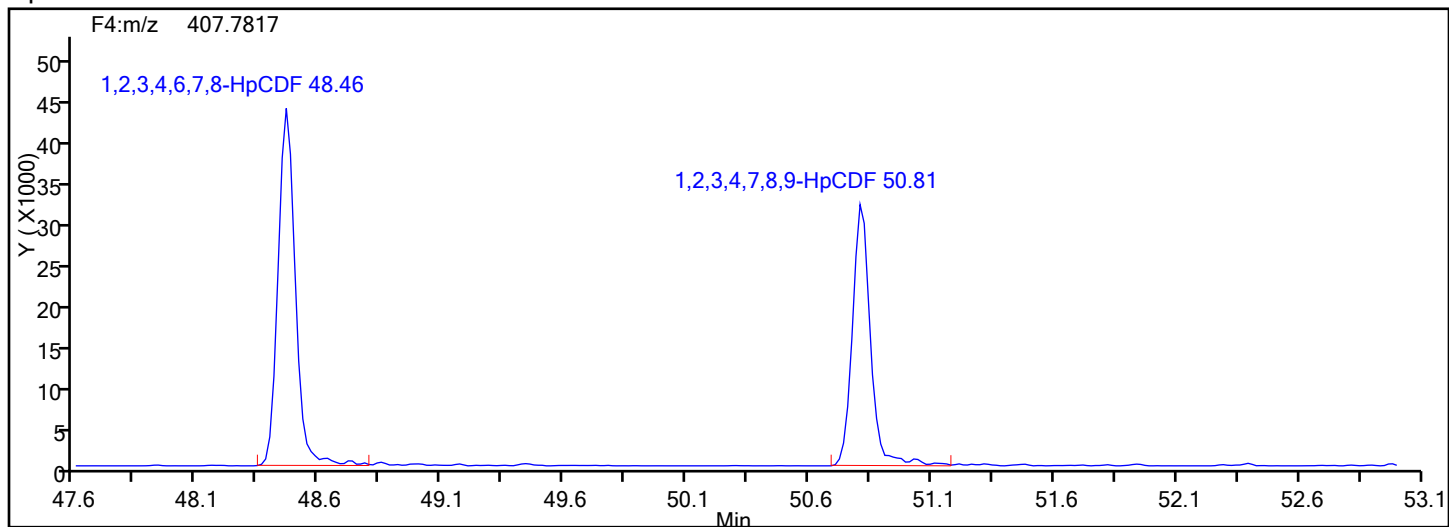
Worklist#: 7768

Sample Line#: 2

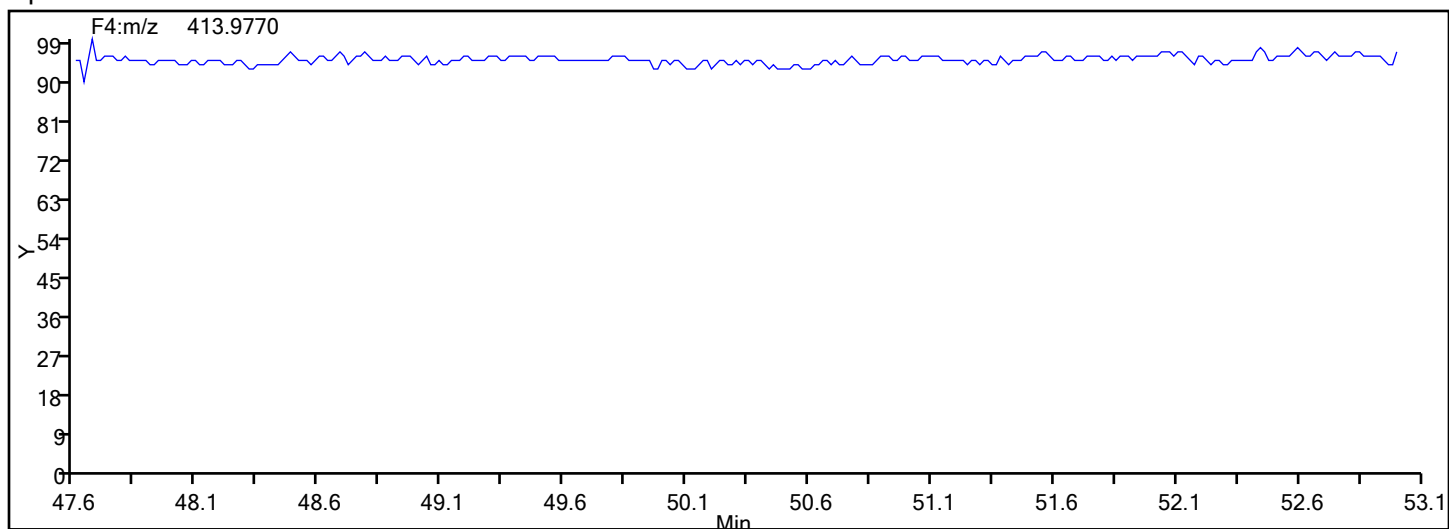
Column Type:

Column Dia:

HpCDF



HpCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

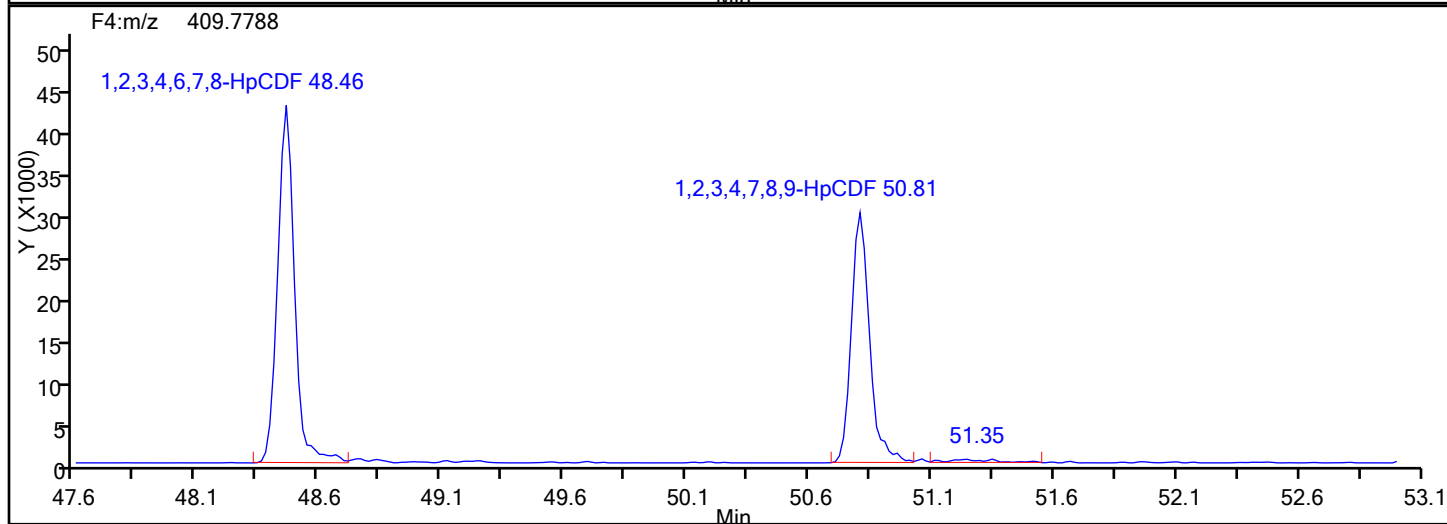
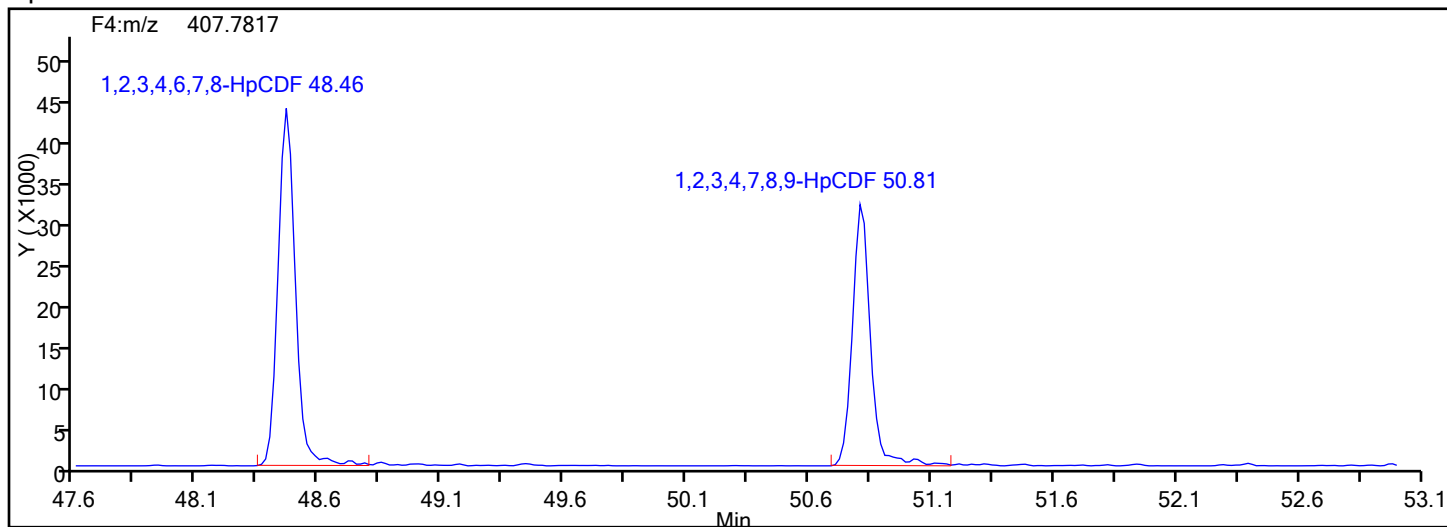
Worklist#: 7768

Sample Line#: 2

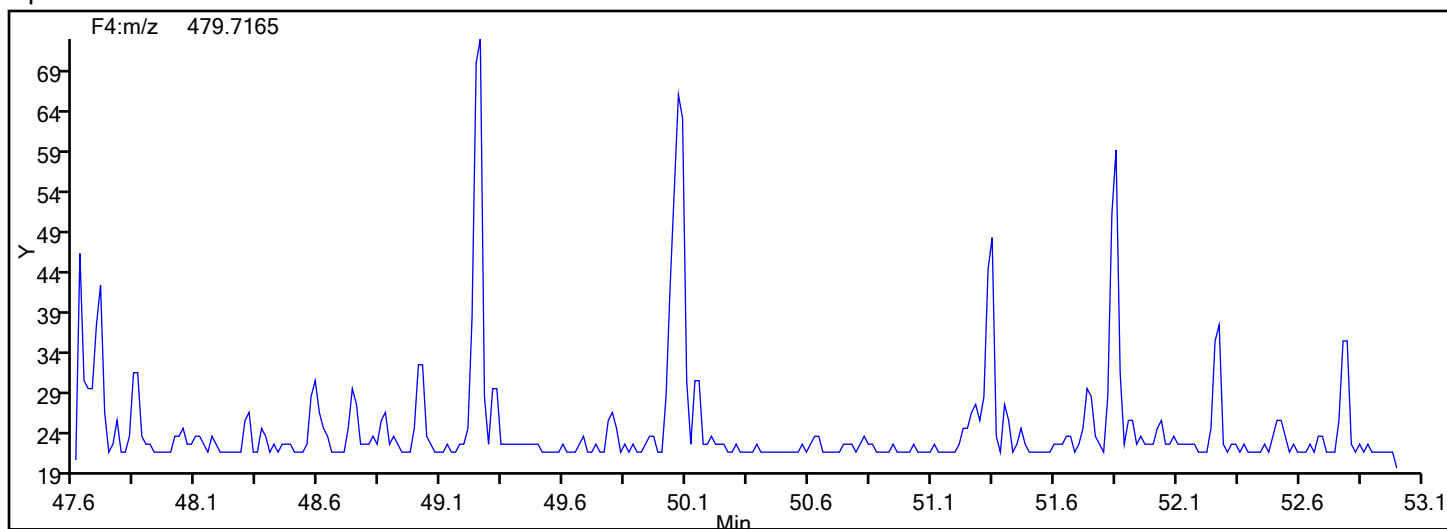
Column Type:

Column Dia:

HpCDF



HpCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

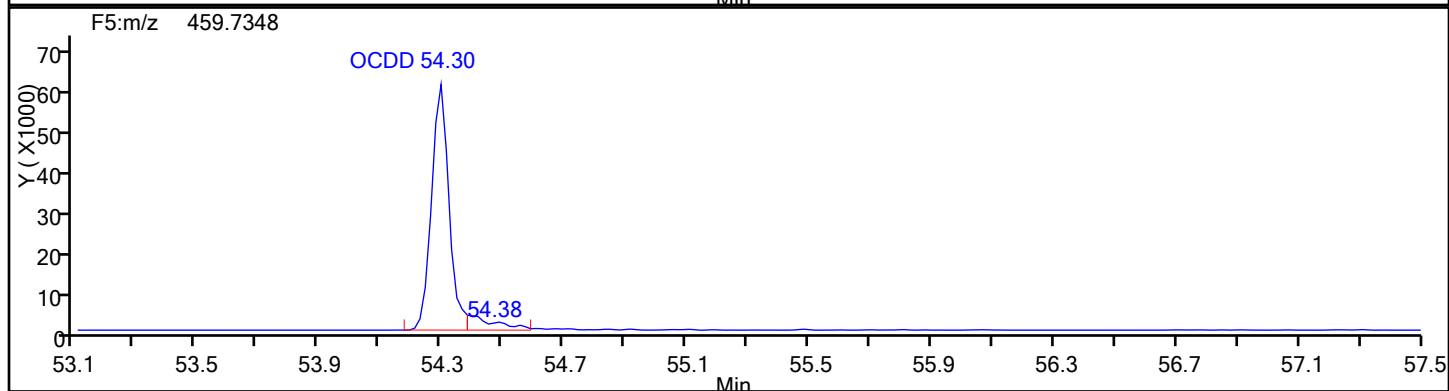
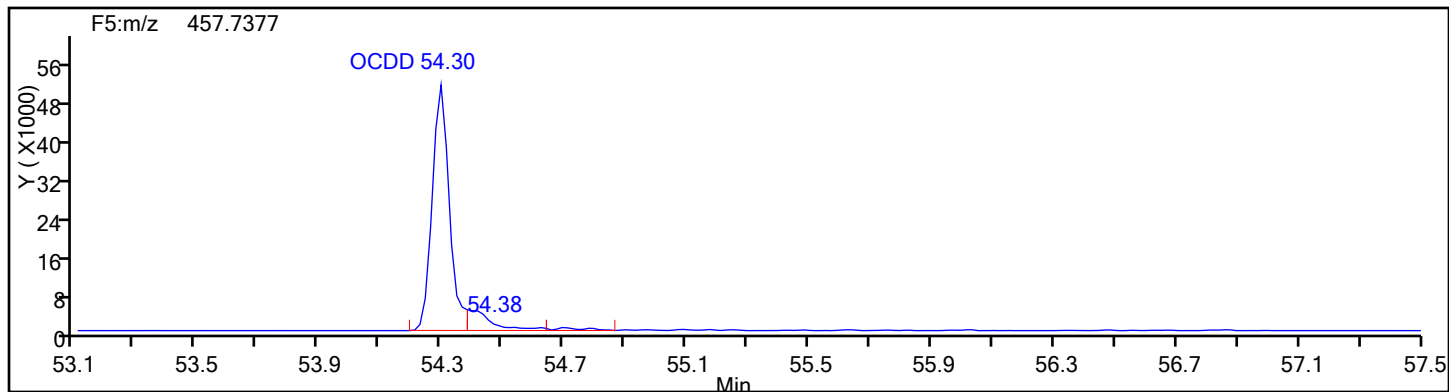
Worklist#: 7768

Sample Line#: 2

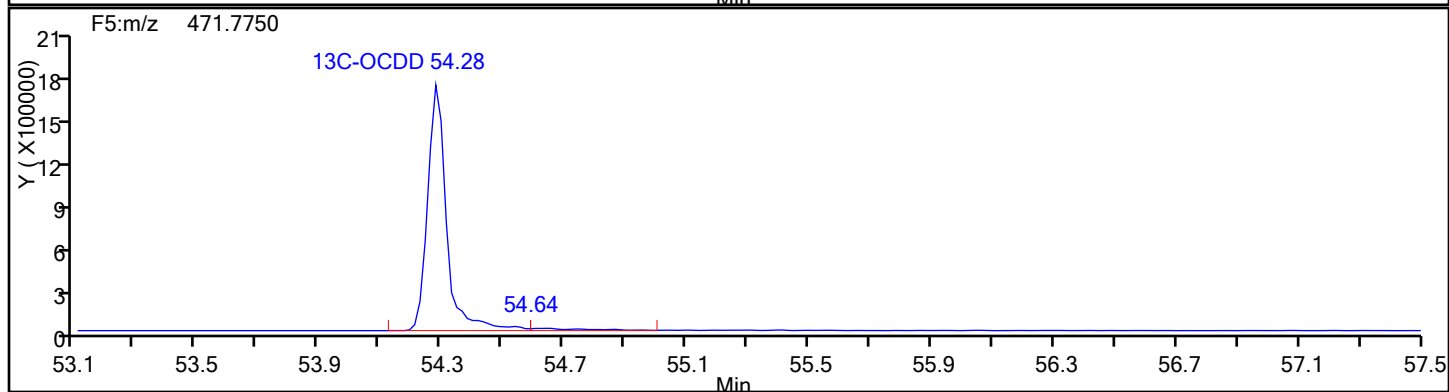
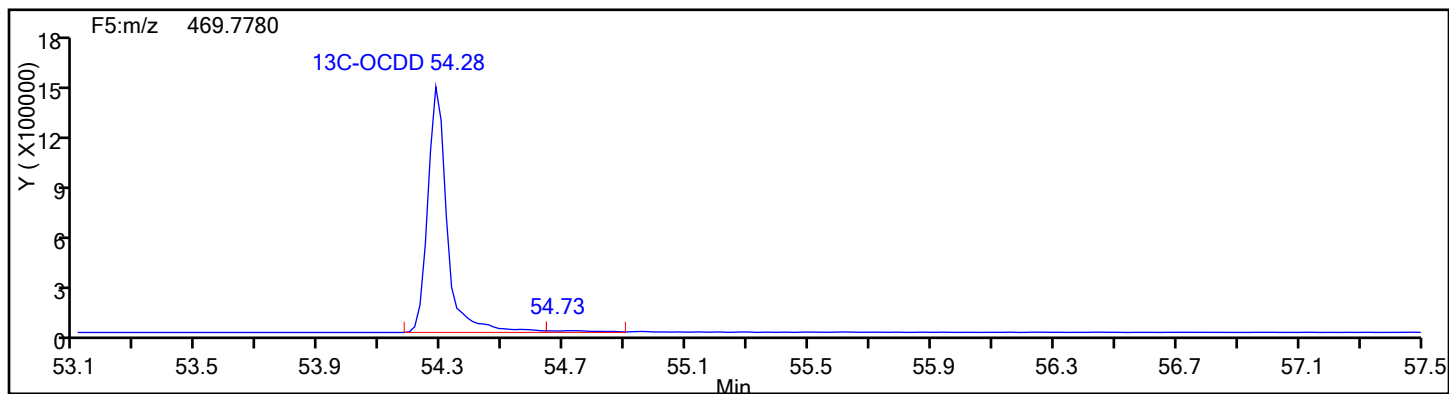
Column Type:

Column Dia:

OCDD



OCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

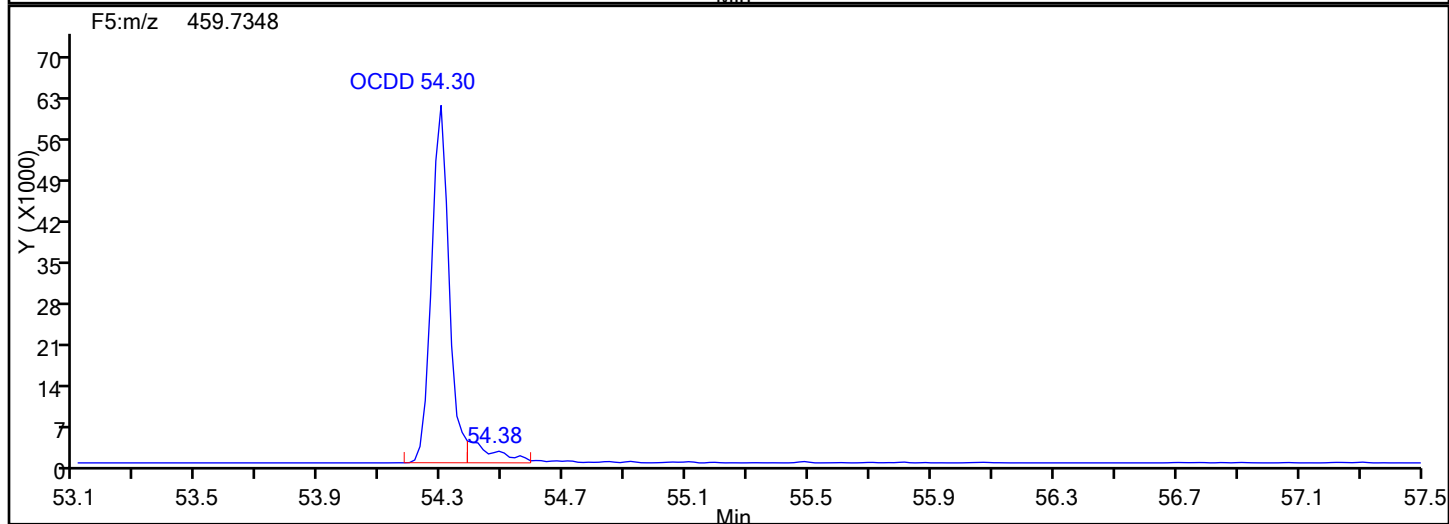
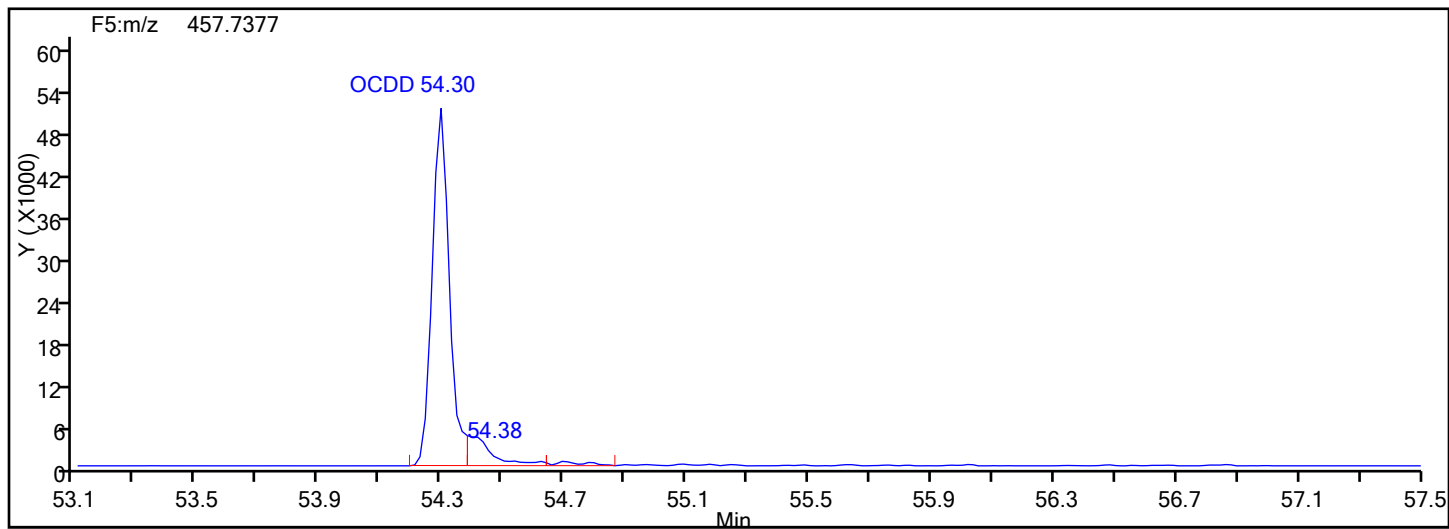
Worklist#: 7768

Sample Line#: 2

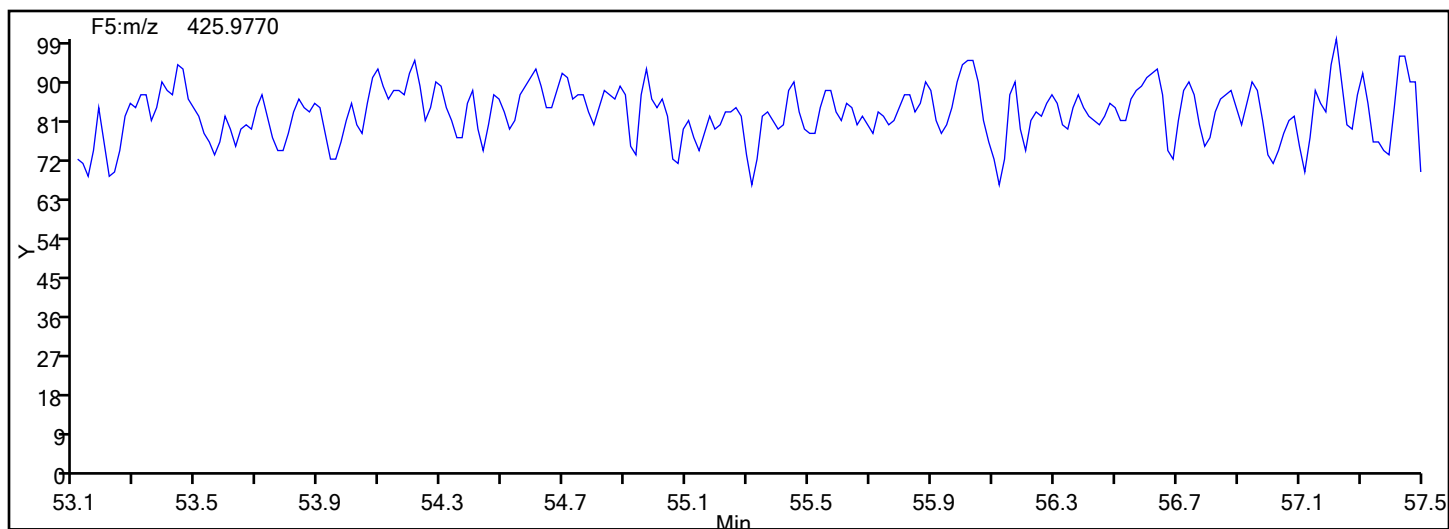
Column Type:

Column Dia:

OCDD



OCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Instrument ID: D2A

Lims ID: IC L1

Client ID:

Operator ID: DavidsonM

ALS Bottle#:

0

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

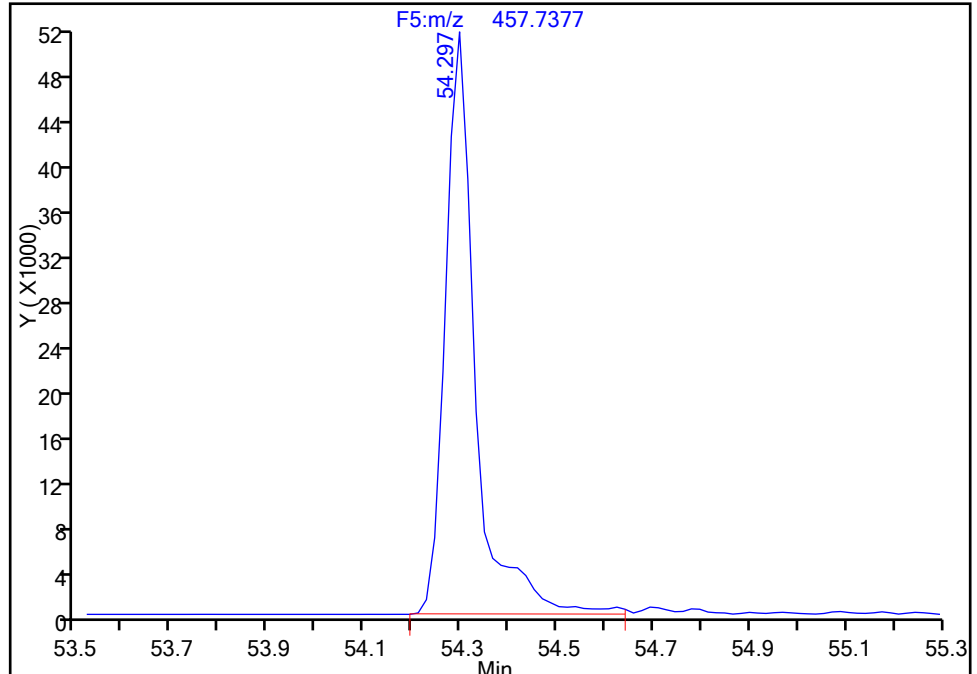
Detector F5(52.61 :57.22)

OCDD, CAS: 3268-87-9

Signal: 1

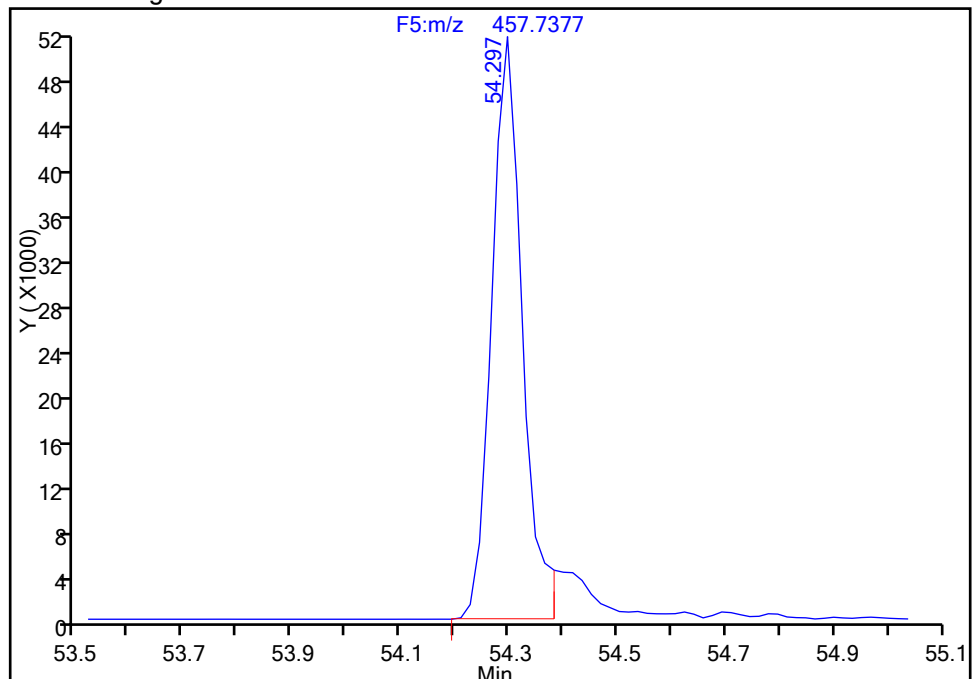
RT: 54.30
Area: 222852
Amount: 5.743015
Amount Units: pg/ul

Processing Integration Results



RT: 54.30
Area: 199351
Amount: 5.315146
Amount Units: pg/ul

Manual Integration Results



Reviewer: davidsonm, 11-Jan-2017 16:11:15

Audit Action: Split an Integrated Peak

Audit Reason: Shouldering

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Instrument ID: D2A

Lims ID: IC L1

Client ID:

Operator ID: DavidsonM

ALS Bottle#: 0

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

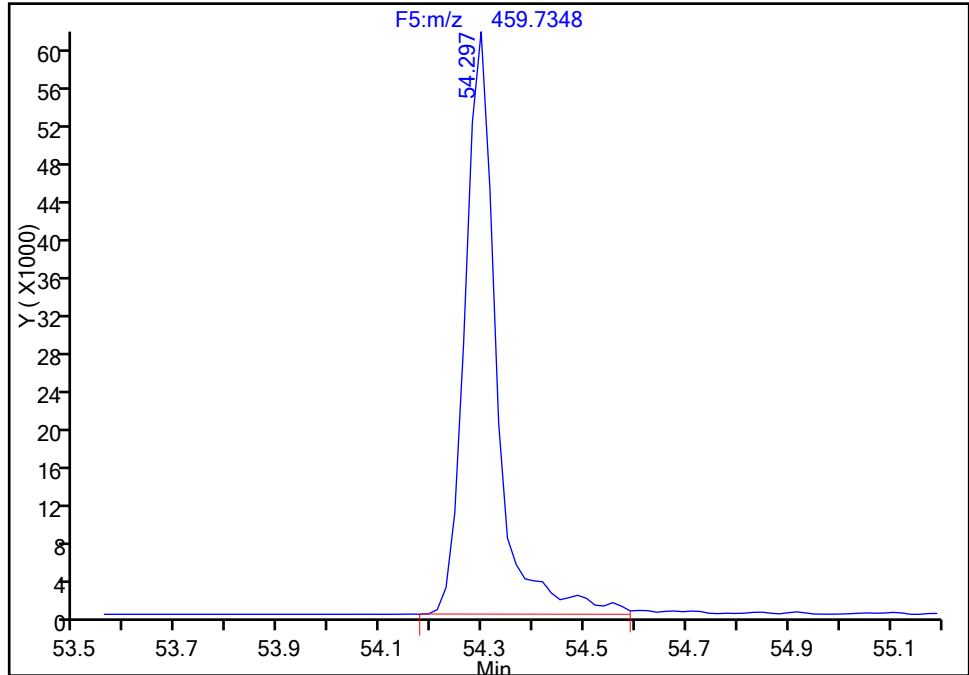
Detector F5(52.61 :57.22)

OCDD, CAS: 3268-87-9

Signal: 2

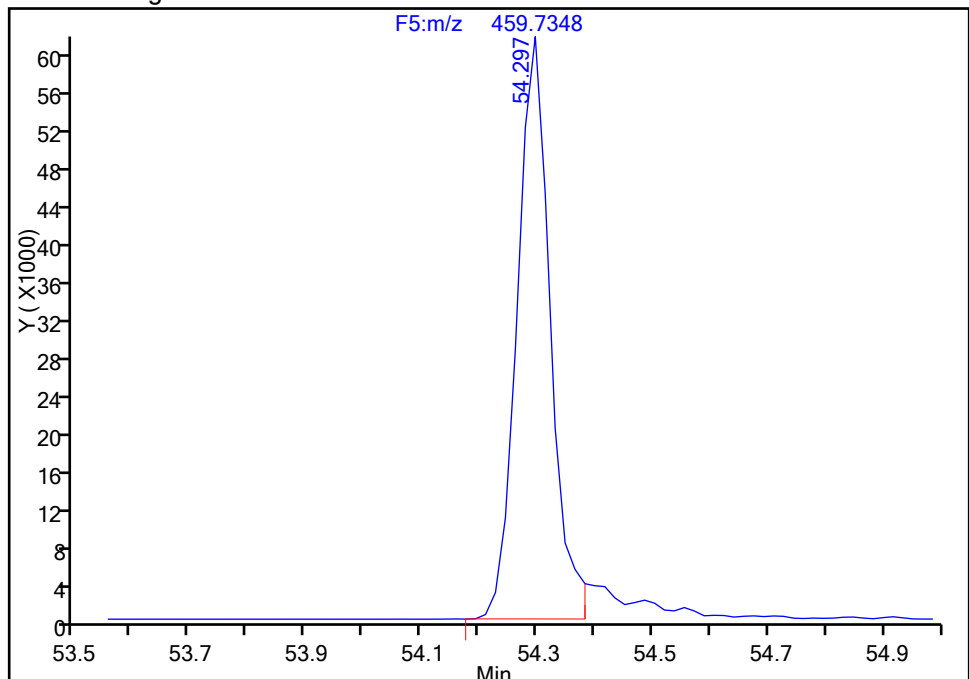
RT: 54.30
Area: 265717
Amount: 5.743015
Amount Units: pg/ul

Processing Integration Results



RT: 54.30
Area: 242990
Amount: 5.315146
Amount Units: pg/ul

Manual Integration Results



Reviewer: davidsonm, 11-Jan-2017 16:11:15

Audit Action: Split an Integrated Peak

Audit Reason: Shouldering

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

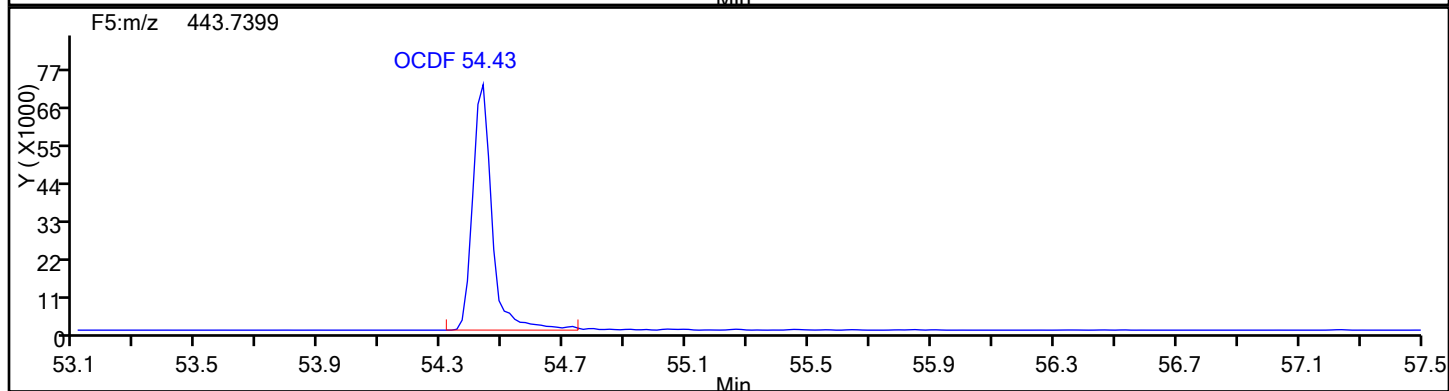
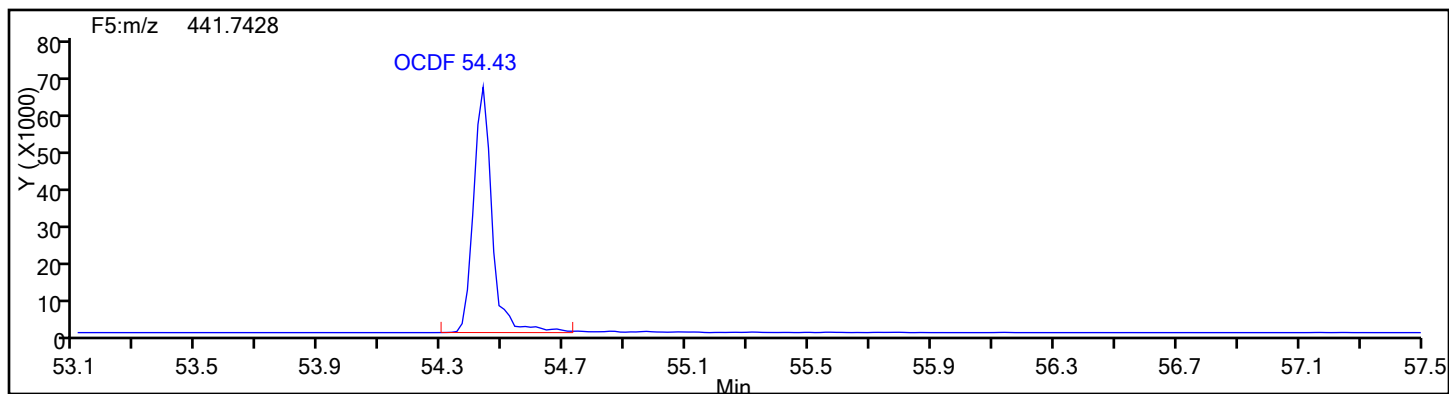
Worklist#: 7768

Sample Line#: 2

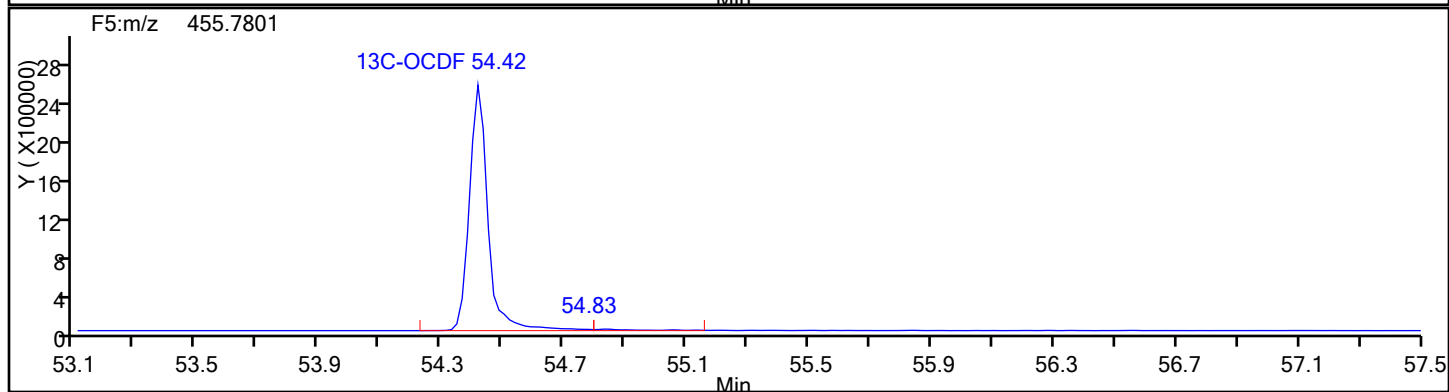
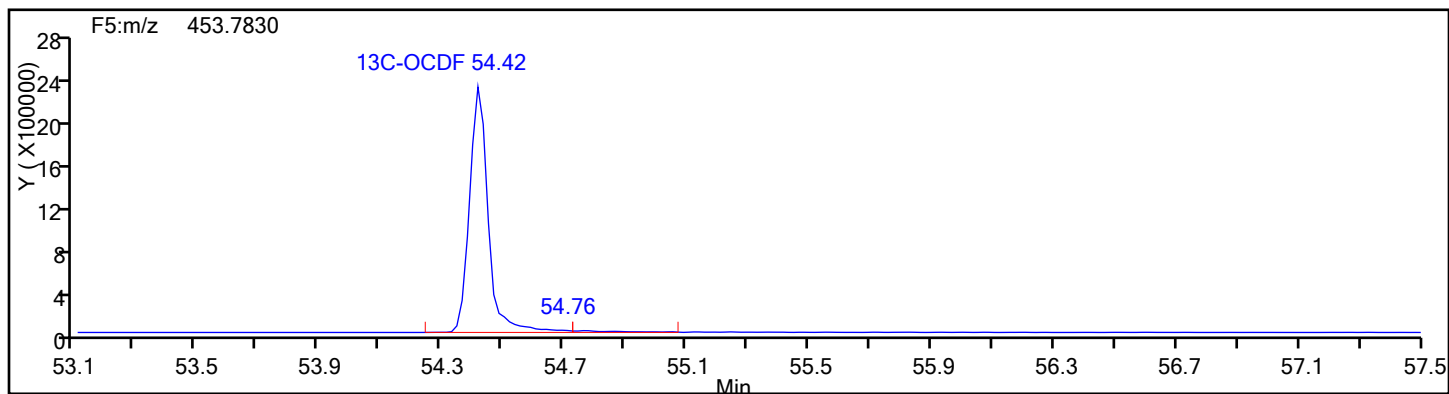
Column Type:

Column Dia:

OCDF



OCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

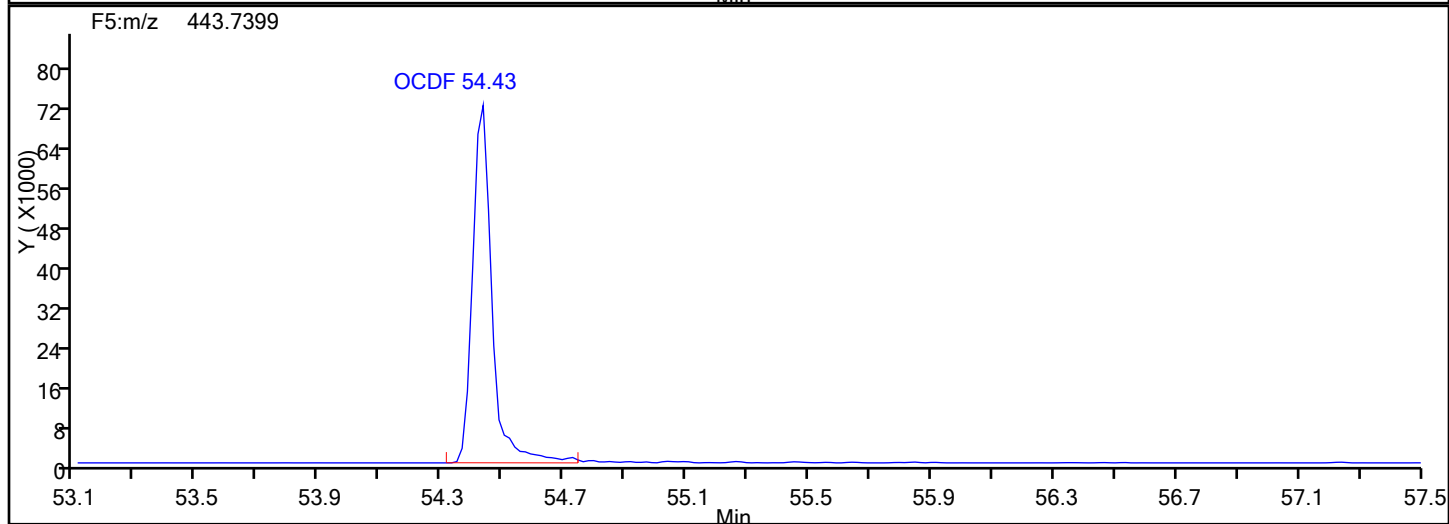
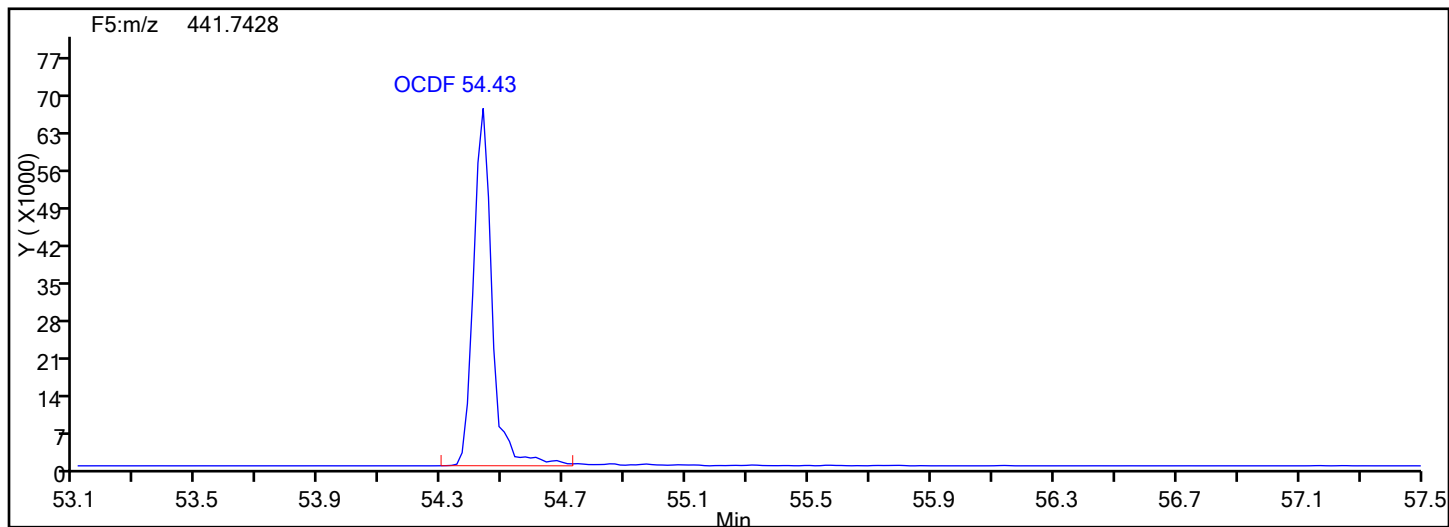
Worklist#: 7768

Sample Line#: 2

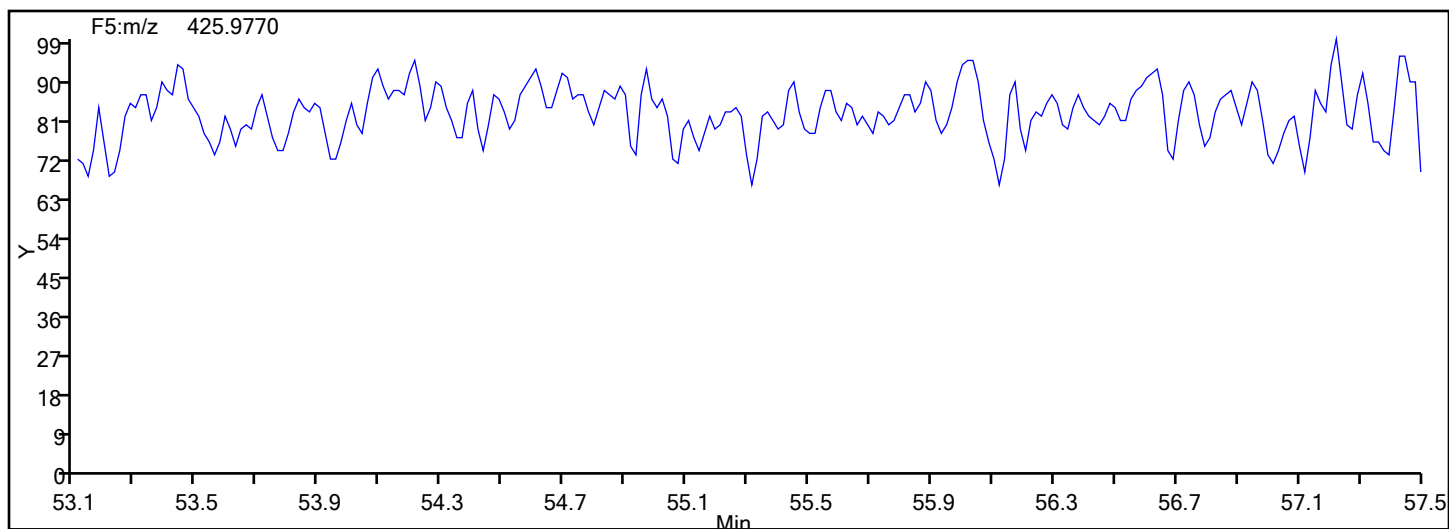
Column Type:

Column Dia:

OCDF



OCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i1.d

Injection Date: 16-May-2014 14:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

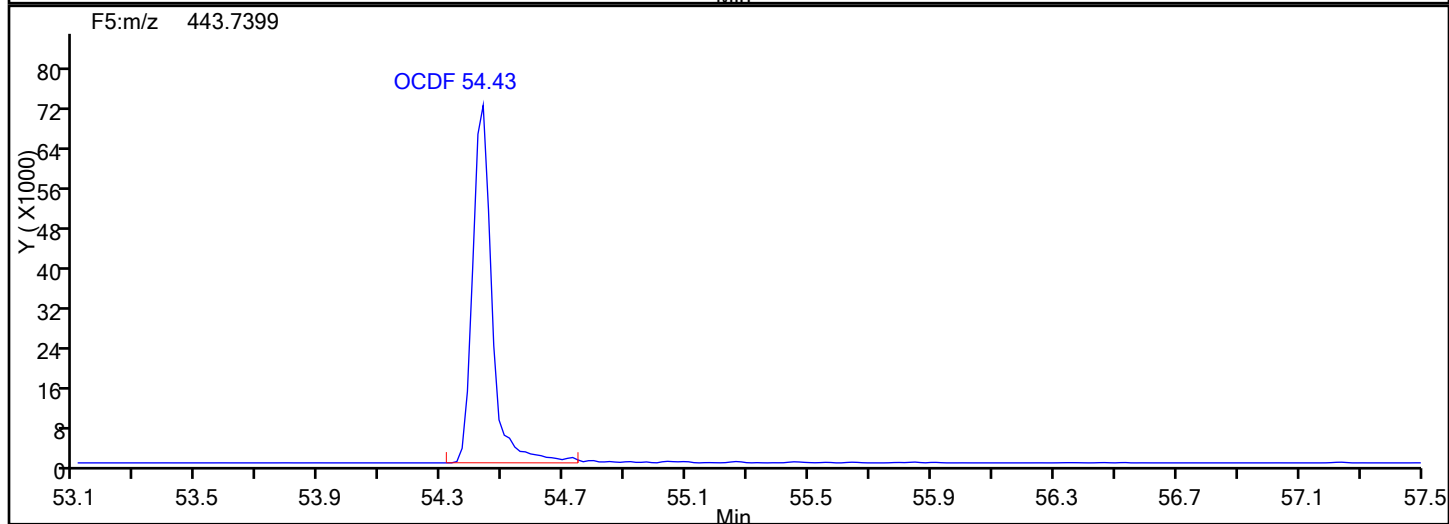
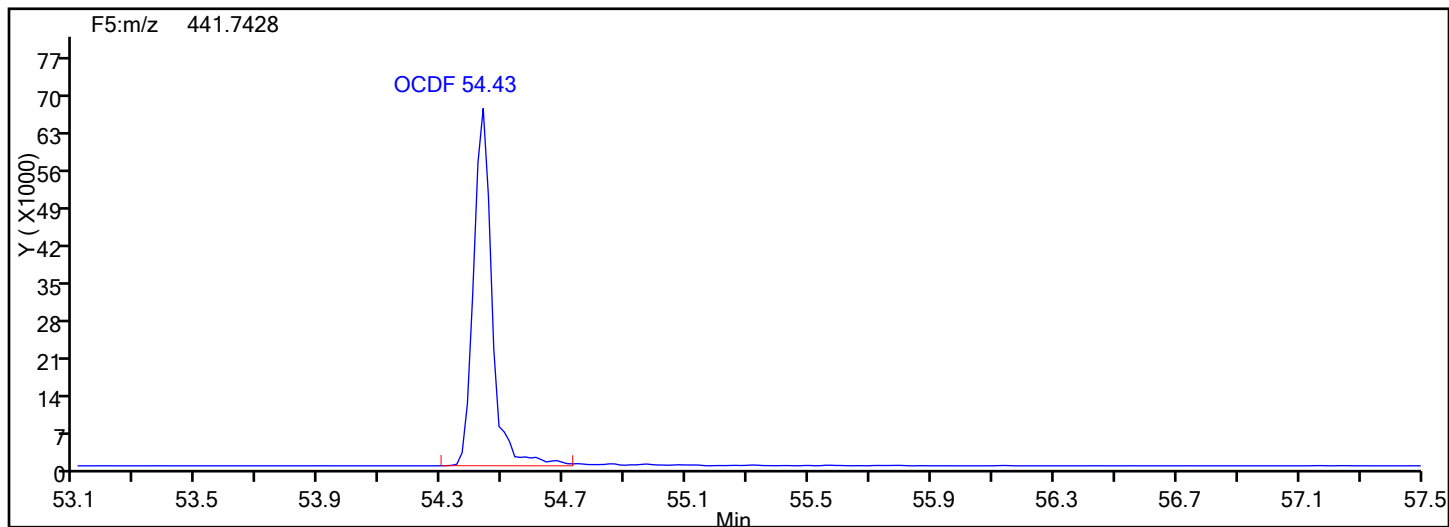
Worklist#: 7768

Sample Line#: 2

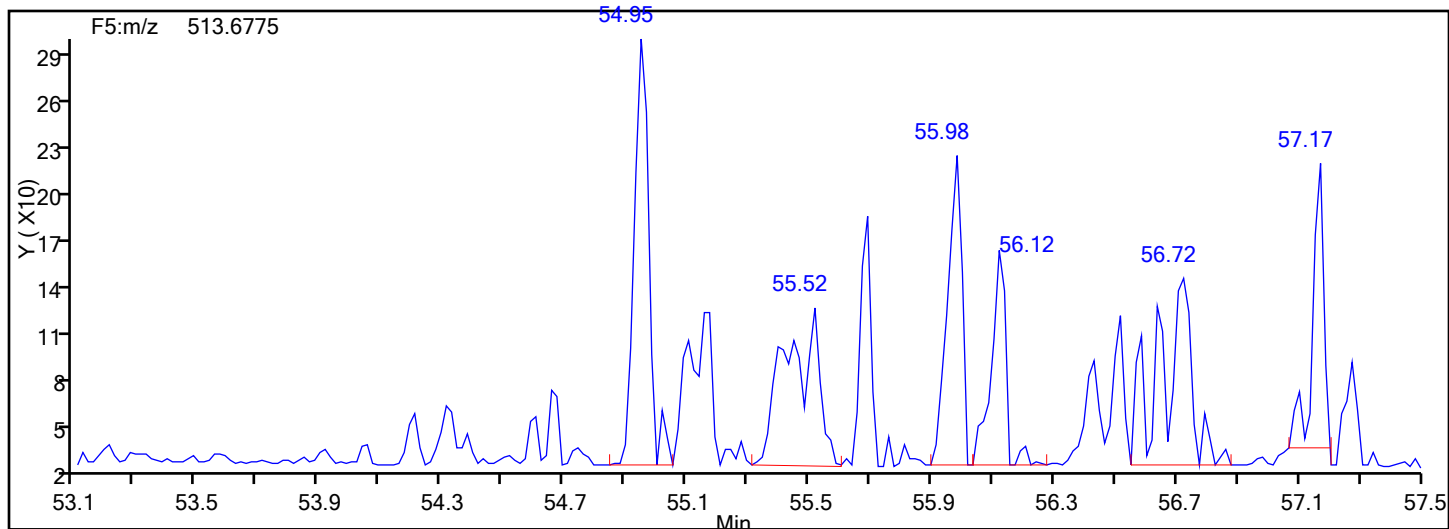
Column Type:

Column Dia:

OCDF



OCDF Interference Mass



TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 16-May-2014 15:26:00 ALS Bottle#: 0 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs2 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:09:19 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:13:09

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31.872	230135	0.84	1.1733	2.116	2.116	0.0116	0.0116	106	
A Non-2,3,7,8-sub-TCDD	30.308	2309	0.77	0.0000						RQ
S Total TCDD					2.116	2.116	0.0116	0.0116		RQ
2,3,7,8-TCDF	29.778	328832	0.81	1.0881	1.983	1.983	0.0162	0.0162	99.13	
A Non-2,3,7,8-sub-TCDF	28.995						0.0	0.0		
S Total TCDF					1.983	1.983	0.0162	0.0162		
1,2,3,7,8-PeCDD	41.016	743339	1.63	1.0434	10.1	10.1	0.0242	0.0242	101	
A Non-2,3,7,8-sub-PeCDD	39.915						0.0	0.0		
S Total PeCDD					10.1	10.1	0.0242	0.0242		
1,2,3,7,8-PeCDF	39.294	1326472	1.74	1.1898	9.979	9.979	0.0602	0.0602	99.79	
2,3,4,7,8-PeCDF	40.500	1259085	1.60	1.1095	9.914	9.914	0.0581	0.0581	99.14	
A Non-2,3,7,8-sub-PeCDF	38.623						0.0	0.0		
S Total PeCDF					19.9	19.9	0.0592	0.0592		
1,2,3,4,7,8-HxCDD	45.234	911864	1.31	1.1409	9.848	9.848	0.0574	0.0574	98.48	
1,2,3,6,7,8-HxCDD	45.352	991123	1.20	1.1481	10.3	10.3	0.0611	0.0611	103	
1,2,3,7,8,9-HxCDD	45.757	1060210	1.31	1.2212	10.5	10.5	0.0555	0.0555	105	
A Non-2,3,7,8-sub-HxCDD	44.687						0.0	0.0		
S Total HxCDD					30.6	30.6	0.0580	0.0580		
1,2,3,4,7,8-HxCDF	44.189	1500520	1.23	1.3629	9.921	9.921	0.0398	0.0398	99.21	
1,2,3,6,7,8-HxCDF	44.324	1707727	1.29	1.2762	9.881	9.881	0.0369	0.0369	98.81	
2,3,4,6,7,8-HxCDF	45.066	1529879	1.31	1.2654	9.728	9.728	0.0415	0.0415	97.28	
1,2,3,7,8,9-HxCDF	46.027	1432850	1.26	1.2573	10.1	10.1	0.0503	0.0503	101	
A Non-2,3,7,8-sub-HxCDF	44.552						0.0	0.0		
S Total HxCDF					39.7	39.7	0.0421	0.0421		
1,2,3,4,6,7,8-HpCDD	50.166	848864	1.01	1.1204	10.0	10.0	0.0501	0.0501	100	
A Non-2,3,7,8-sub-HpCDD	49.566	6350	1.04	0.0000						RQ
S Total HpCDD					10.0	10.0	0.0501	0.0501		RQ
1,2,3,4,6,7,8-HpCDF	48.463	1475215	1.04	1.4984	10.1	10.1	0.0435	0.0435	101	
1,2,3,4,7,8,9-HpCDF	50.808	1153014	1.04	1.3807	10.2	10.2	0.0586	0.0586	102	

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
A Non-2,3,7,8-sub-HpCDF	49.625						0.0	0.0		
S Total HpCDF					20.3	20.3	0.0510	0.0510		
OCDD	54.294	1537141	0.91	1.2073	19.6	19.6	0.0762	0.0762	98.07	
OCDF	54.432	2160278	0.93	1.1162	20.2	20.2	0.0484	0.0484	101	
D 13C-2,3,7,8-TCDD	31.805	9269717	0.82	1.0709	100.0	100.0	0.2668	0.2668	100	
D 13C-2,3,7,8-TCDF	29.728	15241754	0.81	1.7545	100.4	100.4	0.1062	0.1062	100	
D 13C-1,2,3,7,8-PeCDD	40.999	7066036	1.63	0.8743	93.4	93.4	0.2755	0.2755	93.39	
D 13C-1,2,3,7,8-PeCDF	39.277	11172583	1.58	1.3704	94.2	94.2	0.1693	0.1693	94.20	
D 13C-2,3,4,7,8-PeCDF	40.482	11446462	1.55	1.3837	95.6	95.6	0.1676	0.1676	95.58	
D 13C-1,2,3,4,7,8-HxCDD	45.217	8116369	1.26	0.8772	99.6	99.6	0.2015	0.2015	99.55	
D 13C-1,2,3,6,7,8-HxCDD	45.336	8407393	1.21	0.9171	98.6	98.6	0.1928	0.1928	98.64	
D 13C-1,2,3,4,7,8-HxCDF	44.172	11097986	0.53	1.1892	100.4	100.4	0.1771	0.1771	100	
D 13C-1,2,3,6,7,8-HxCDF	44.307	13542561	0.54	1.4625	99.6	99.6	0.1440	0.1440	99.63	
D 13C-2,3,4,6,7,8-HxCDF	45.049	12428502	0.55	1.3197	101.3	101.3	0.1596	0.1596	101	
D 13C-1,2,3,7,8,9-HxCDF	46.010	11246135	0.55	1.2001	100.8	100.8	0.1755	0.1755	101	
D 13C-1,2,3,4,6,7,8-HpCDD	50.150	7575508	1.08	0.8155	100.0	100.0	0.3177	0.3177	99.95	
D 13C-1,2,3,4,6,7,8-HpCDF	48.446	9744462	0.47	1.0496	99.9	99.9	0.1813	0.1813	99.89	
D 13C-1,2,3,4,7,8,9-HpCDF	50.791	8217931	0.47	0.8947	98.8	98.8	0.2127	0.2127	98.82	
D 13C-OCDD	54.277	12983405	0.91	0.7044	198.3	198.3	0.1912	0.1912	99.16	
D 13C-OCDF	54.415	19166588	0.91	1.0615	194.3	194.3	0.1123	0.1123	97.14	
\$ 37Cl4-2,3,7,8-TCDD	31.872	209201		1.2266	1.971	1.971	0.0120	0.0120	98.54	
* 13C-1,2,3,4-TCDD	31.273	8654331	0.82	9.1E+04	100.0	100.0				
* 13C-1,2,3,7,8,9-HxCDD	45.740	9294113	1.25	1E+05	100.0	100.0				

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

Reagents:

61L21613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 16-May-2014 15:26:00 ALS Bottle#: 0 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs2 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:09:19 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:13:09

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,7,8-TCDD											
319.8965	31.872	31.871	0	1.002	105137	10705	24	60	446		
321.8936	31.872	31.871	0	1.002	124998	12622	29	72	435	0.84(0.65-0.89)	
A Non-2,3,7,8-sub-TCDD											RQ
319.8965	25.705	30.308	-276		1151	291	24	60	12		
321.8936	25.705	30.308	-276		550	169	29	72	6	2.09(0.65-0.89)	
319.8965	29.778	30.308	-32		2272	356	24	60	15		
321.8936	29.744	30.308	-34		755	219	29	72	8	3.01(0.65-0.89)	
2,3,7,8-TCDF											
303.9016	29.778	29.793	-1	1.002	147166	16694	44	110	379		
305.8987	29.778	29.793	-1	1.002	181666	20565	77	192	267	0.81(0.65-0.89)	
A Non-2,3,7,8-sub-TCDF											
303.9016	28.995						44	110			
305.8987	28.995						77	192			
1,2,3,7,8-PeCDD											
355.8546	41.016	41.031	-1	1.000	460269	109322	93	232	1176		
357.8516	41.016	41.031	-1	1.000	283070	69655	78	195	893	1.63(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDD											
355.8546	39.915						93	232			
357.8516	39.915						78	195			
1,2,3,7,8-PeCDF											
339.8597	39.294	39.309	-1	1.000	842515	173754	306	765	568		
341.8567	39.294	39.309	-1	1.000	483957	102696	354	885	290	1.74(1.32-1.78)	
2,3,4,7,8-PeCDF											
339.8597	40.500	40.497	0	1.000	774900	176689	306	765	577		
341.8567	40.500	40.497	0	1.000	484185	107161	354	885	303	1.60(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-PeCDF											
339.8597	38.623						306	765			
341.8567	38.623						354	885			
1,2,3,4,7,8-HxCDD											
389.8158	45.234	45.249	-1	1.000	517114	131641	379	947	347		
391.8127	45.234	45.249	-1	1.000	394750	105750	159	397	665	1.31(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45.352	45.367	-1	1.000	540243	124591	379	947	329		
391.8127	45.352	45.367	-1	1.000	450880	101458	159	397	638	1.20(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45.757	45.755	0	1.012	601411	131634	379	947	347		
391.8127	45.757	45.755	0	1.012	458799	102497	159	397	645	1.31(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDD											
389.8158	44.687						379	947			
391.8127	44.687						159	397			
1,2,3,4,7,8-HxCDF											
373.8208	44.189	44.203	-1	1.000	827290	222657	289	722	770		
375.8178	44.189	44.203	-1	1.000	673230	180873	347	867	521	1.23(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44.324	44.338	-1	1.000	960846	235756	289	722	816		
375.8178	44.324	44.338	-1	1.000	746881	183324	347	867	528	1.29(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	45.066	45.064	0	1.000	866416	213222	289	722	738		
375.8178	45.066	45.064	0	1.000	663463	158603	347	867	457	1.31(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	46.027	46.042	-1	1.000	797958	175751	289	722	608		
375.8178	46.027	46.042	-1	1.000	634892	142607	347	867	411	1.26(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDF											
373.8208	44.552						289	722			
375.8178	44.552						347	867			
1,2,3,4,6,7,8-HpCDD											
423.7767	50.166	50.180	-1	1.000	427584	80925	123	307	658		
425.7737	50.166	50.180	-1	1.000	421280	81582	202	505	404	1.01(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											
423.7767	48.985	49.566	-35		4300	861	123	307	7		
425.7737	48.935	49.566	-38		3113	807	202	505	4	1.38(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF											
407.7817	48.463	48.476	-1	1.000	750395	153068	256	640	598		
409.7788	48.463	48.476	-1	1.000	724820	145983	260	650	561	1.04(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50.808	50.821	-1	1.000	587255	115873	256	640	453		
409.7788	50.808	50.821	-1	1.000	565759	108261	260	650	416	1.04(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDF											
407.7817	49.625						256	640			
409.7788	49.625						260	650			

RQ

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
OCDD											
457.7377	54.294	54.308	-1	1.000	730971	169627	183	457	927		
459.7348	54.294	54.308	-1	1.000	806170	185096	363	907	510	0.91(0.76-1.02)	
OCDF											
441.7428	54.432	54.429	0	1.000	1042747	243488	254	635	959		
443.7399	54.432	54.429	0	1.000	1117531	261792	237	592	1105	0.93(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	31.805	31.804	0	1.017	4184694	440025	599	1497	735		
333.9338	31.805	31.804	0	1.017	5085023	528497	490	1225	1079	0.82(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	29.728	29.743	-1	0.951	6812939	771003	420	1050	1836		
317.9389	29.728	29.743	-1	0.951	8428815	941455	290	725	3246	0.81(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40.999	40.997	0	1.311	4380561	1046952	545	1362	1921		
369.8919	40.999	40.997	0	1.311	2685475	644525	373	932	1728	1.63(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	39.277	39.275	0	1.256	6848053	1415913	538	1345	2632		
353.8970	39.277	39.275	0	1.256	4324530	886761	346	865	2563	1.58(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40.482	40.480	0	1.294	6951956	1552875	538	1345	2886		
353.8970	40.482	40.480	0	1.294	4494506	1006563	346	865	2909	1.55(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	45.217	45.232	-1	0.989	4529719	1128595	642	1605	1758		
403.8529	45.217	45.232	-1	0.989	3586650	926324	827	2067	1120	1.26(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45.336	45.350	-1	0.991	4600091	1049243	642	1605	1634		
403.8529	45.336	45.350	-1	0.991	3807302	867168	827	2067	1049	1.21(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	44.172	44.187	-1	0.966	3853425	1005394	766	1915	1313		
385.8610	44.172	44.187	-1	0.966	7244561	1927282	984	2460	1959	0.53(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	44.307	44.322	-1	0.969	4736265	1199842	766	1915	1566		
385.8610	44.307	44.322	-1	0.969	8806296	2175827	984	2460	2211	0.54(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	45.049	45.047	0	0.985	4388561	1067375	766	1915	1393		
385.8610	45.049	45.047	0	0.985	8039941	1958619	984	2460	1990	0.55(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	46.010	46.025	-1	1.006	3979151	877838	766	1915	1146		
385.8610	46.010	46.025	-1	1.006	7266984	1638180	984	2460	1665	0.55(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	50.150	50.163	-1	1.096	3934053	755146	1326	3315	569		
437.8140	50.150	50.163	-1	1.096	3641455	691211	827	2067	836	1.08(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48.446	48.443	0	1.059	3102669	628947	672	1680	936		
419.8220	48.446	48.443	0	1.059	6641793	1352437	909	2272	1488	0.47(0.51-0.37)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50.791	50.804	-1	1.110	2611435	505141	672	1680	752		
419.8220	50.791	50.804	-1	1.110	5606496	1088299	909	2272	1197	0.47(0.37-0.51)	
13C-OCDD											
469.7780	54.277	54.291	-1	1.187	6185183	1427483	463	1157	3083		
471.7750	54.277	54.291	-1	1.187	6798222	1539237	656	1640	2346	0.91(0.76-1.02)	
13C-OCDF											
453.7830	54.415	54.429	-1	1.190	9156675	2180826	439	1097	4968		
455.7801	54.415	54.429	-1	1.190	10009913	2358456	551	1377	4280	0.91(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31.872	31.871	0	1.019	209201	21001	56	140	375		
13C-1,2,3,4-TCDD											
331.9368	31.273	31.289	-1		3894273	420853	599	1497	703		
333.9338	31.273	31.289	-1		4760058	531850	490	1225	1085	0.82(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45.740	45.738	0		5160532	1151072	642	1605	1793		
403.8529	45.740	45.738	0		4133581	926028	827	2067	1120	1.25(1.05-1.43)	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Reagents:

61L21613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
 Lims ID: IC L2
 Client ID:
 Inject. Date: 16-May-2014 15:26:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 2
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 3
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDD, RT: 30.308

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
-----------------	-----	----------------------	--------------	------	--------

Invalid SimRptGroup

Sum the Uncalibrated Results

RT	319.8965 Area	319.8965 Height	321.8936 Area	321.8936 Height	Amount	Ratio	Flags
----	---------------	-----------------	---------------	-----------------	--------	-------	-------

25.705	1151	291	550	169		2.09	Rn
29.778	2272	356	755	219		3.01	Rn

Signal Totals:

3423	647	1305	388
------	-----	------	-----

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
--	---------	-----------	--	--	--------	-------	-------

4728	1035				2.62	RQ
2309	686					Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (4728 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (2309 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
 Lims ID: IC L2
 Client ID:
 Inject. Date: 16-May-2014 15:26:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 2
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 3
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-HpCDD, RT: 49.566

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
-----------------	-----	----------------------	--------------	------	--------

Invalid SimRptGroup

Sum the Uncalibrated Results

RT	423.7767 Area	423.7767 Height	425.7737 Area	425.7737 Height	Amount	Ratio	Flags
----	---------------	-----------------	---------------	-----------------	--------	-------	-------

48.985 4300 861 3113 807 1.38 Rn

Signal Totals:

4300 861 3113 807

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
--	---------	-----------	--	--	--------	-------	-------

7413 1668 1.38 RQ

6350 1646 Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (7413 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (6350 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

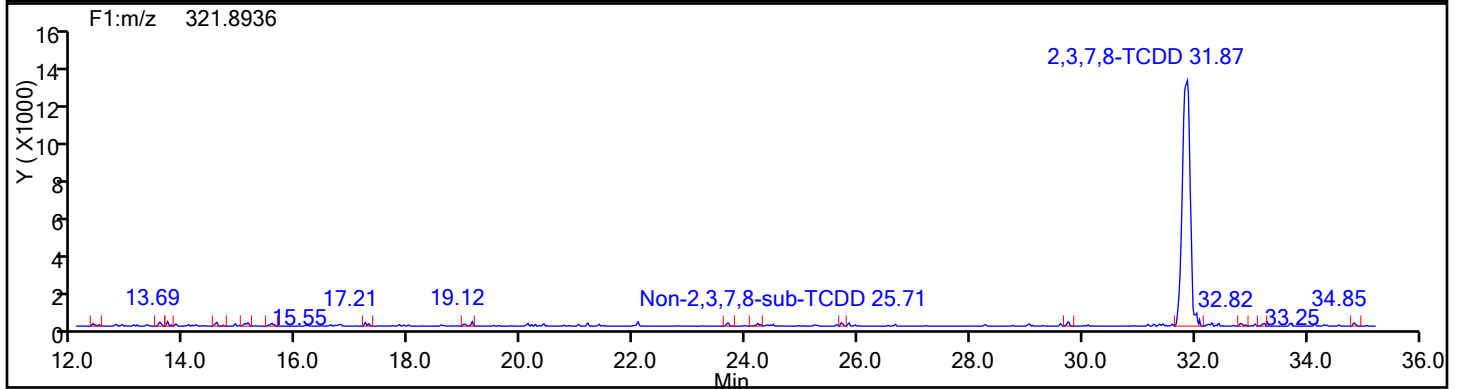
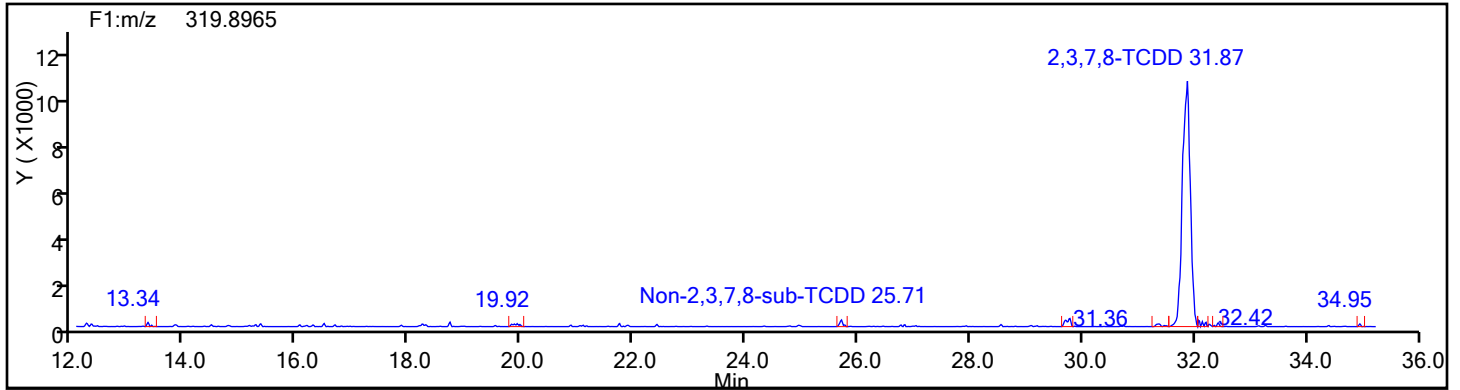
Worklist#: 7768

Sample Line#: 3

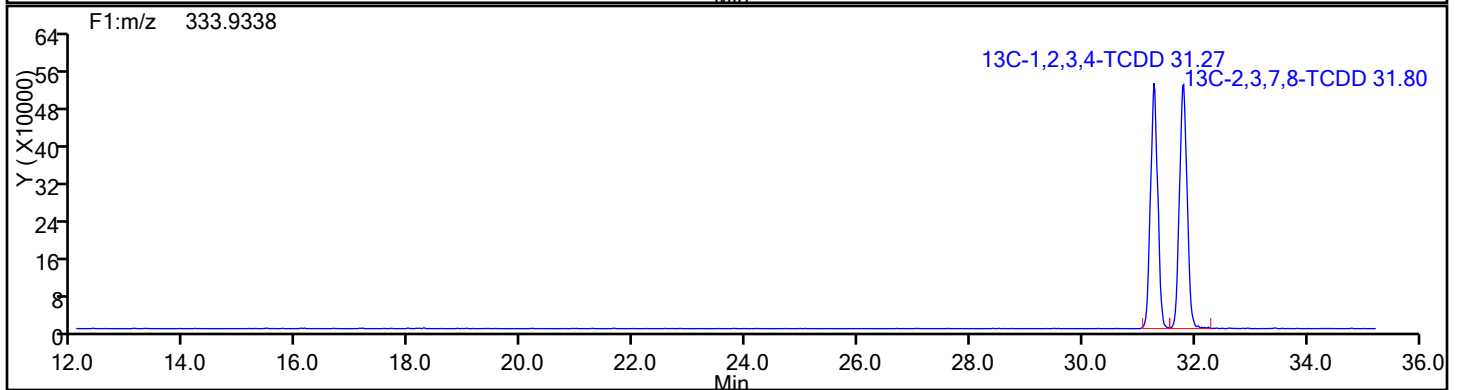
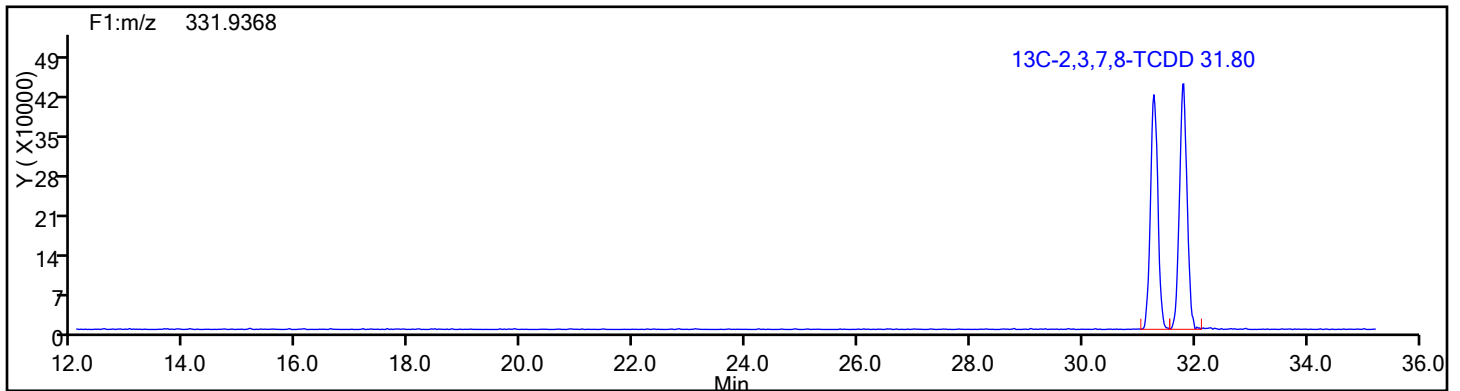
Column Type:

Column Dia:

TCDD

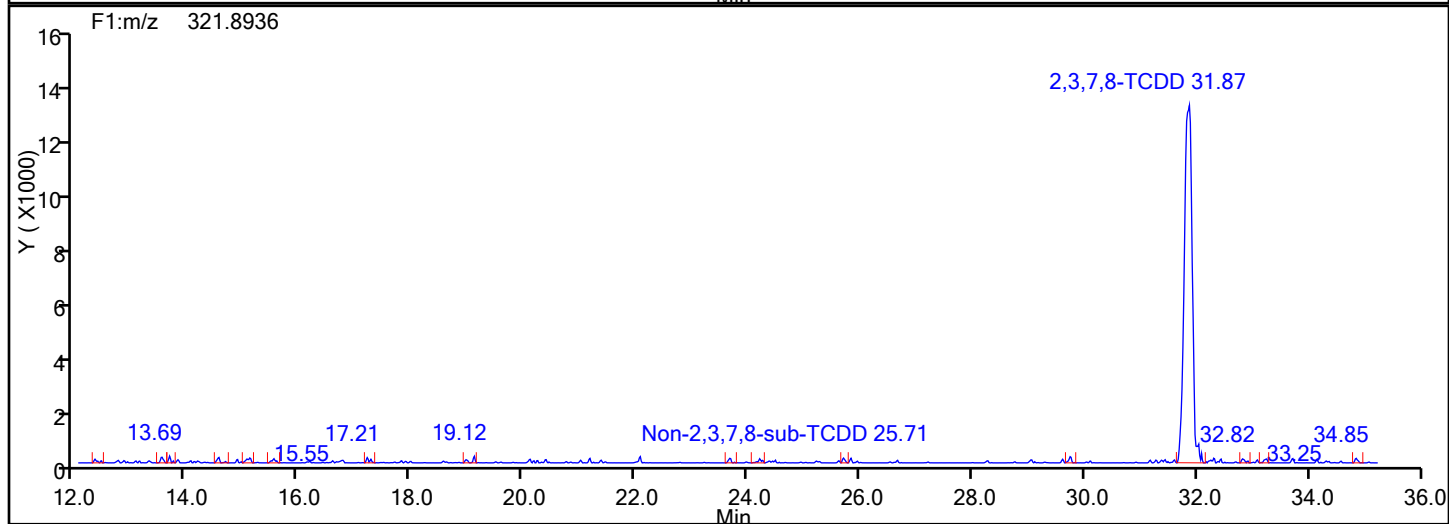
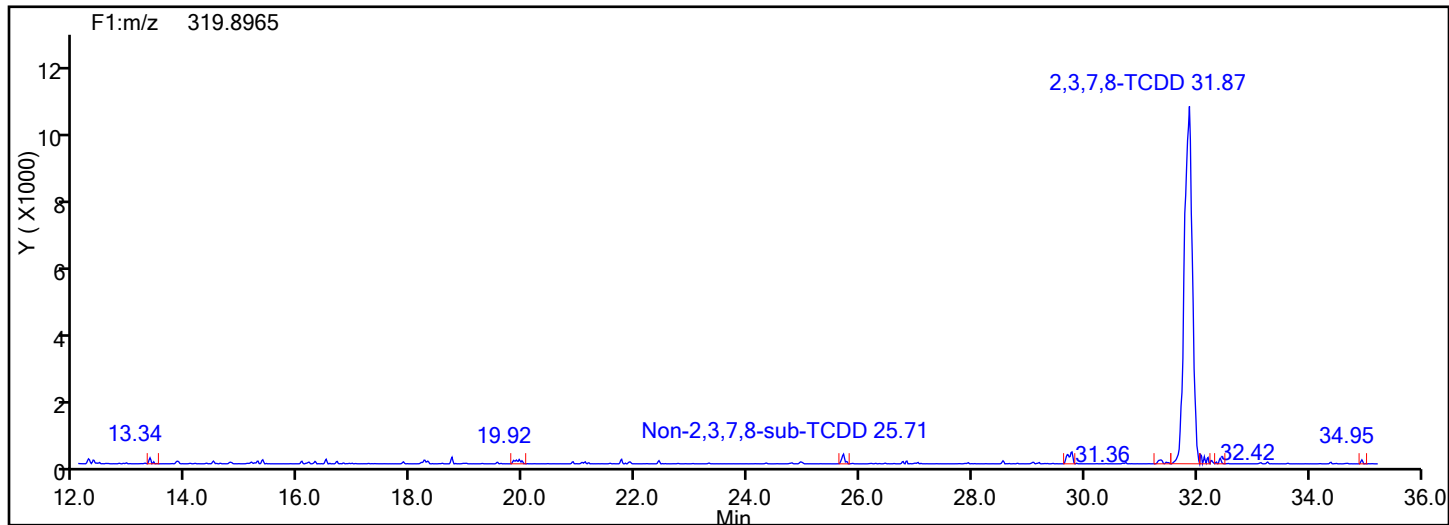


TCDD Standards

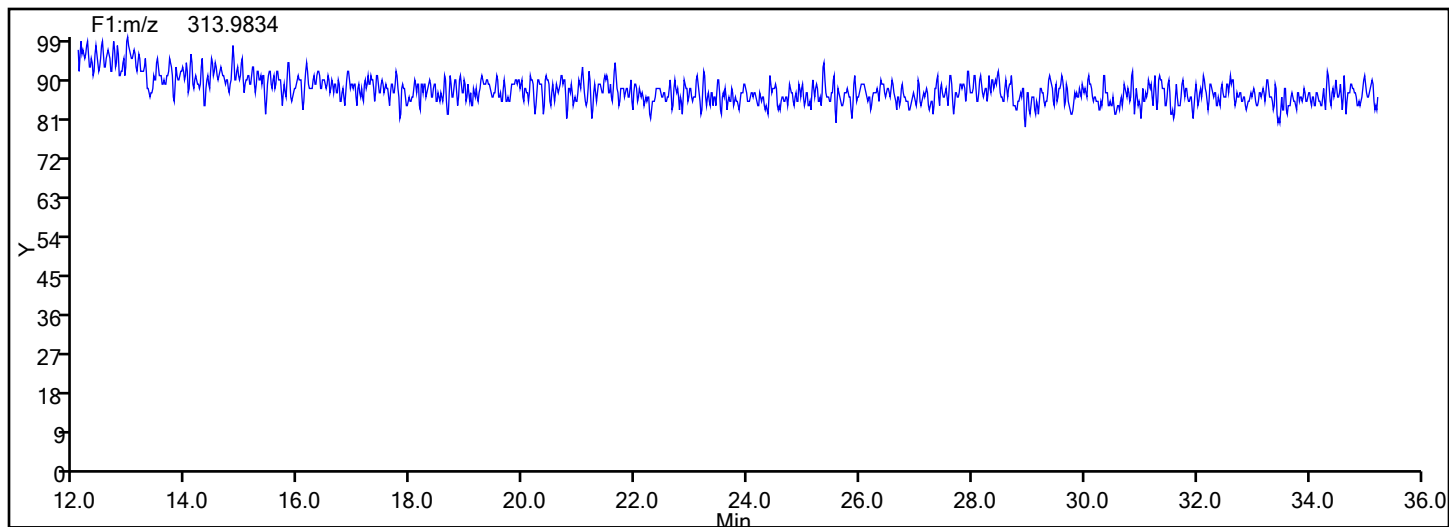


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
Injection Date: 16-May-2014 15:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 3
Column Type: Column Dia:
TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

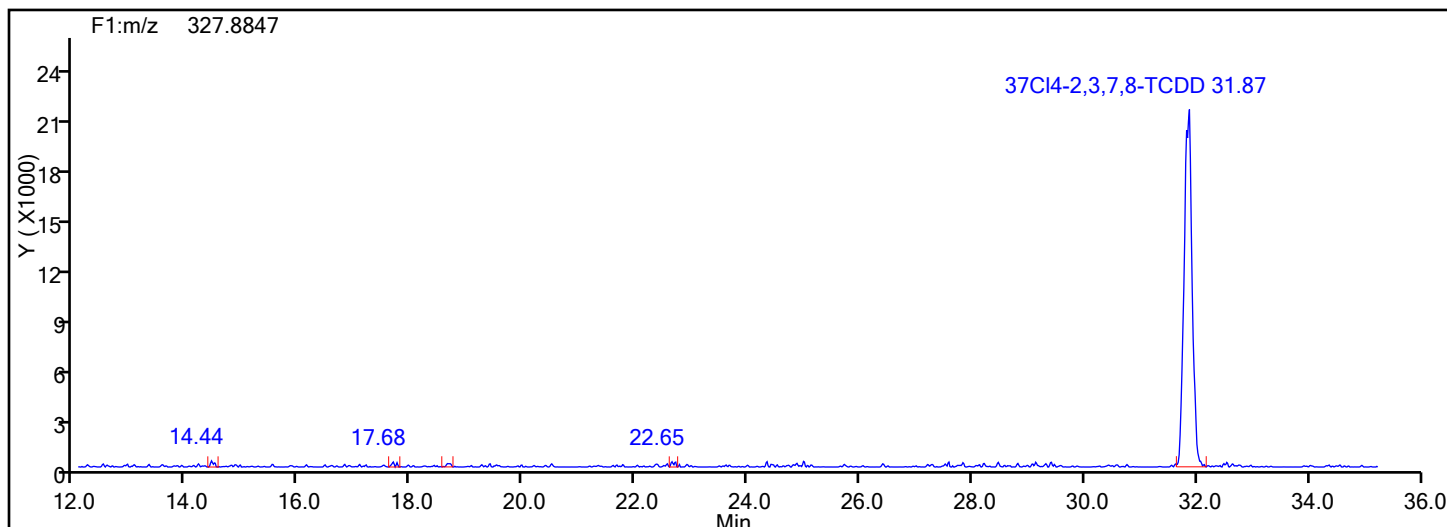
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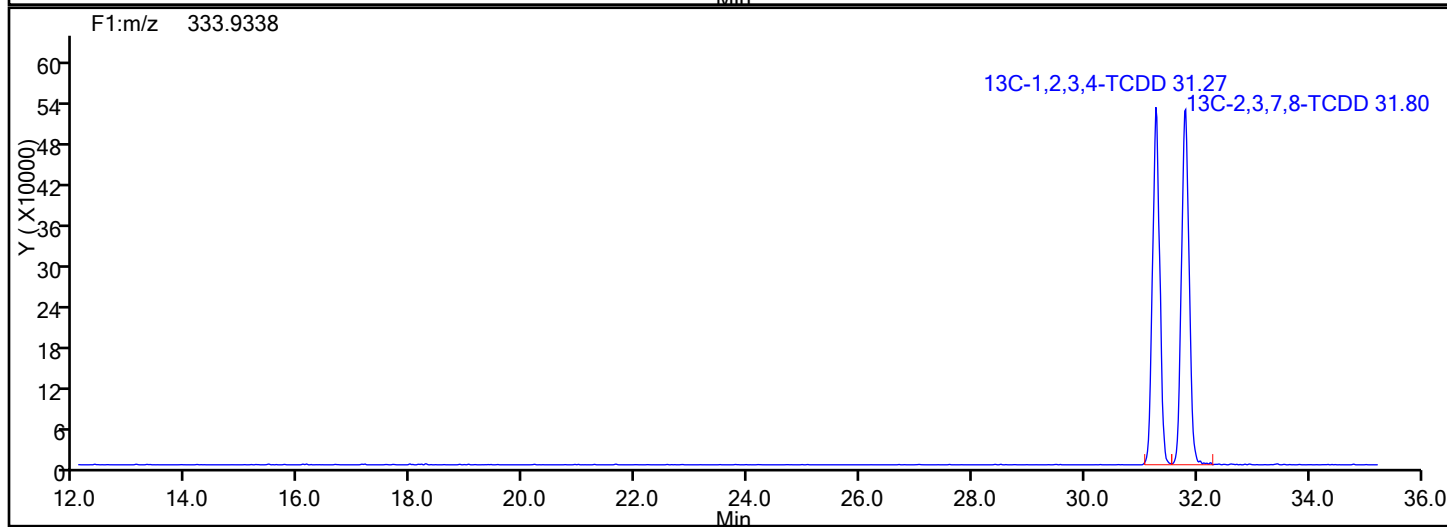
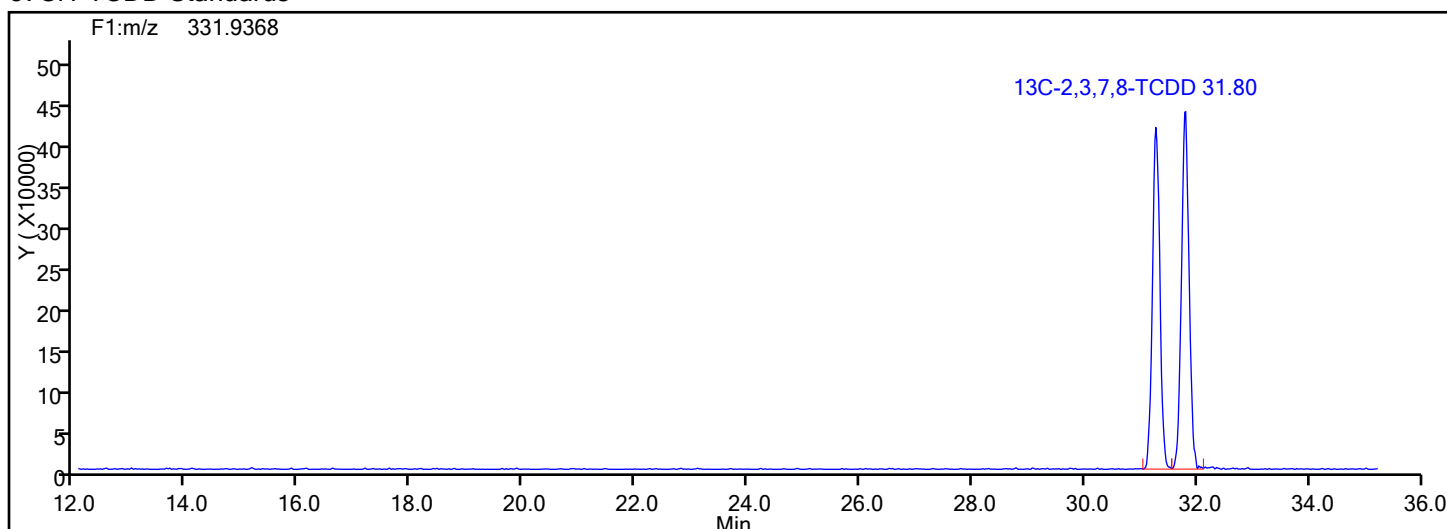
Column Type:

Column Dia:

37Cl4-TCDD

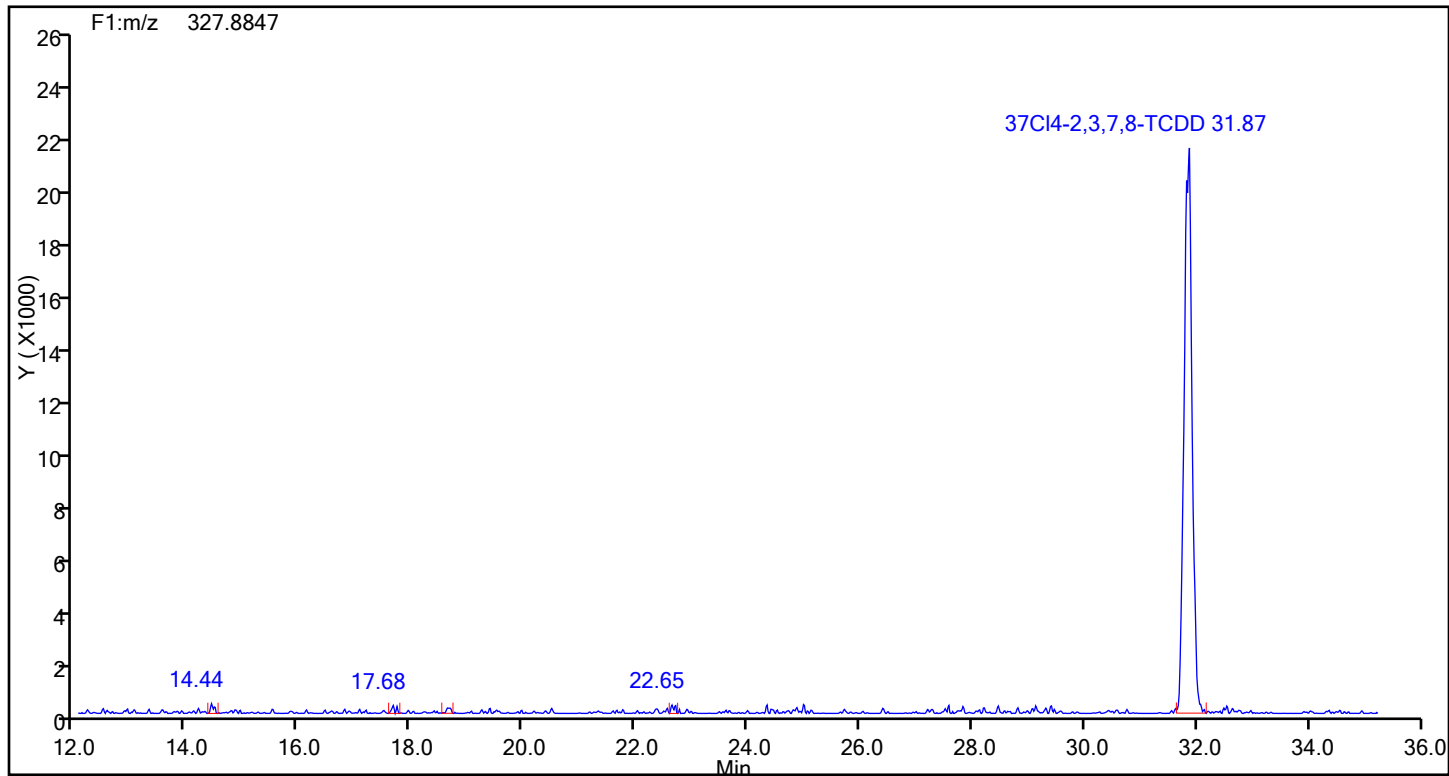


37Cl4-TCDD Standards

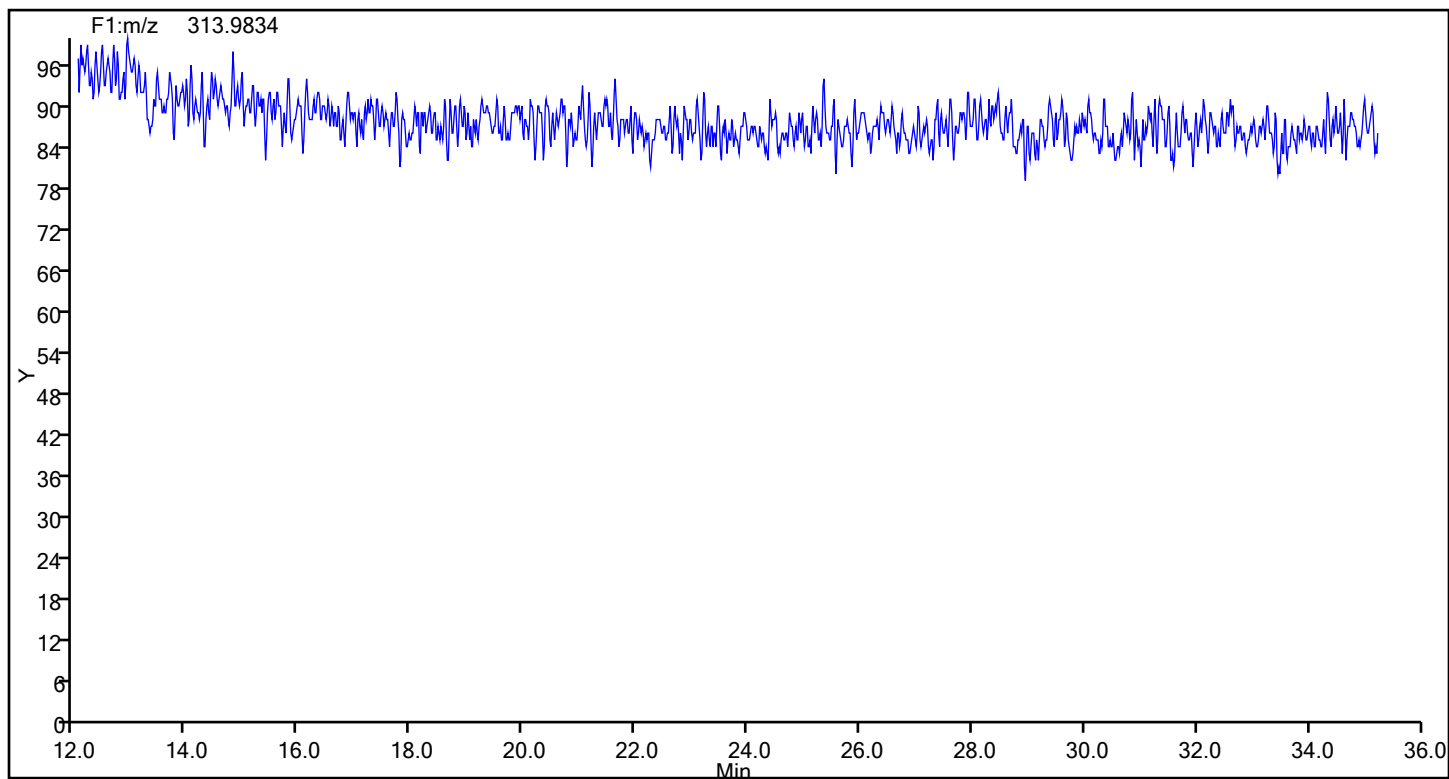


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
Injection Date: 16-May-2014 15:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 3
Column Type: Column Dia:
37Cl4-TCDD



37Cl4-TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

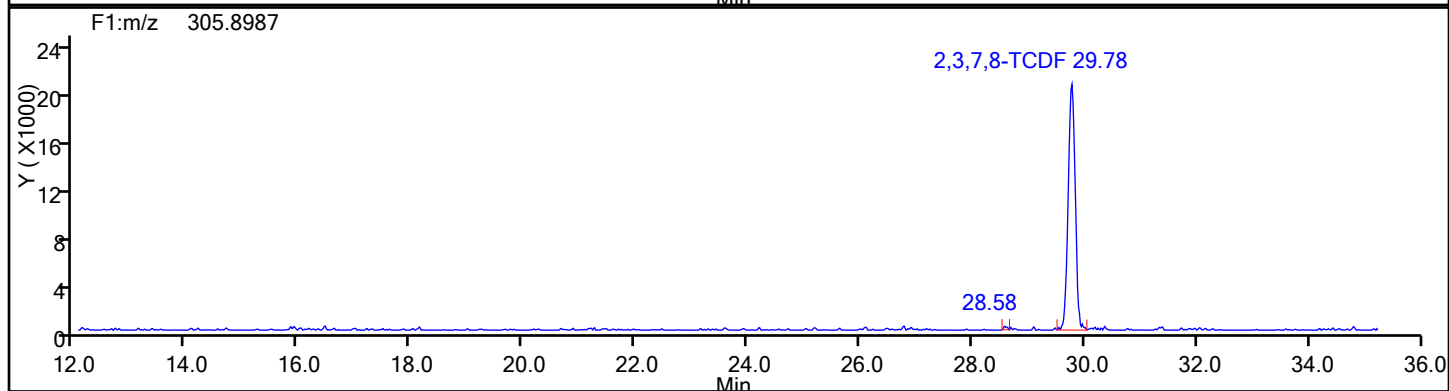
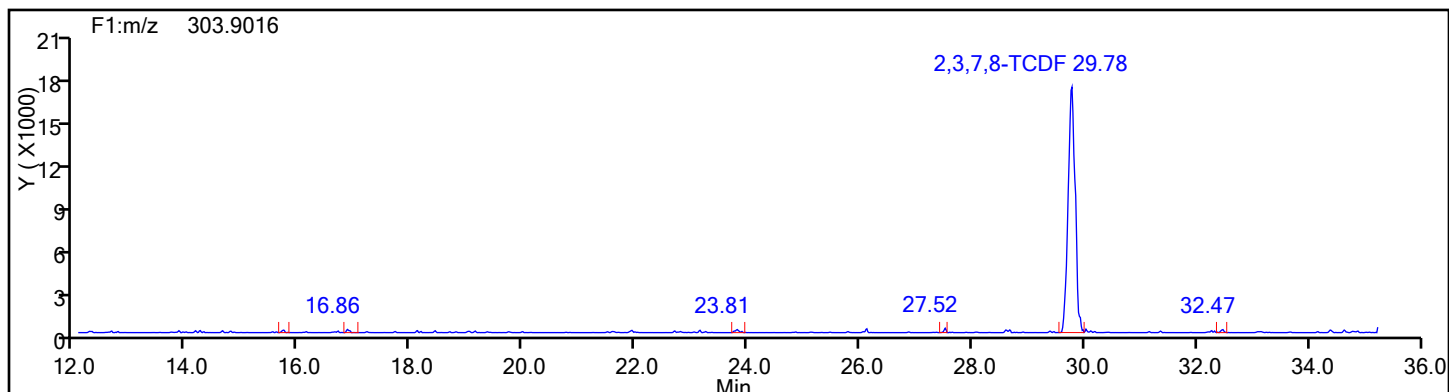
Worklist#: 7768

Sample Line#: 3

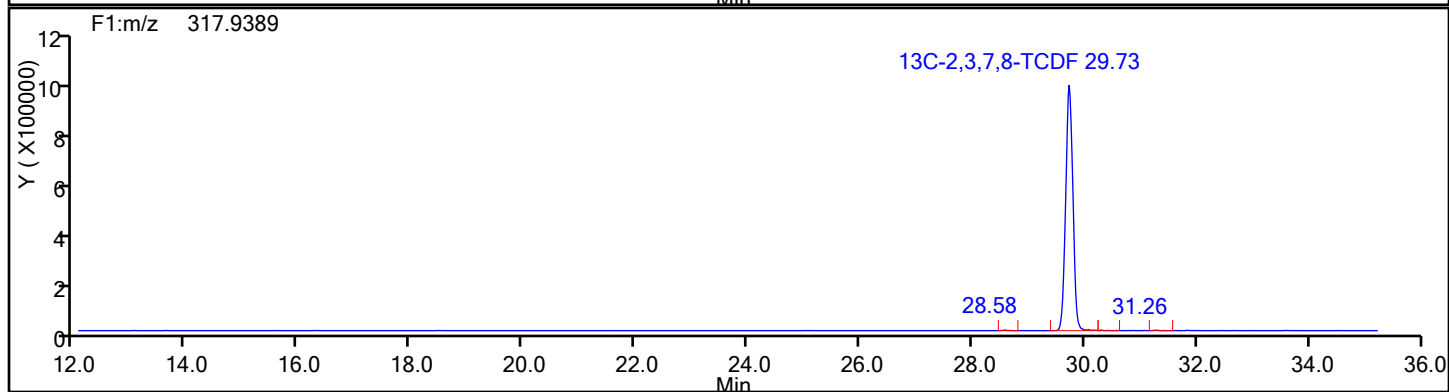
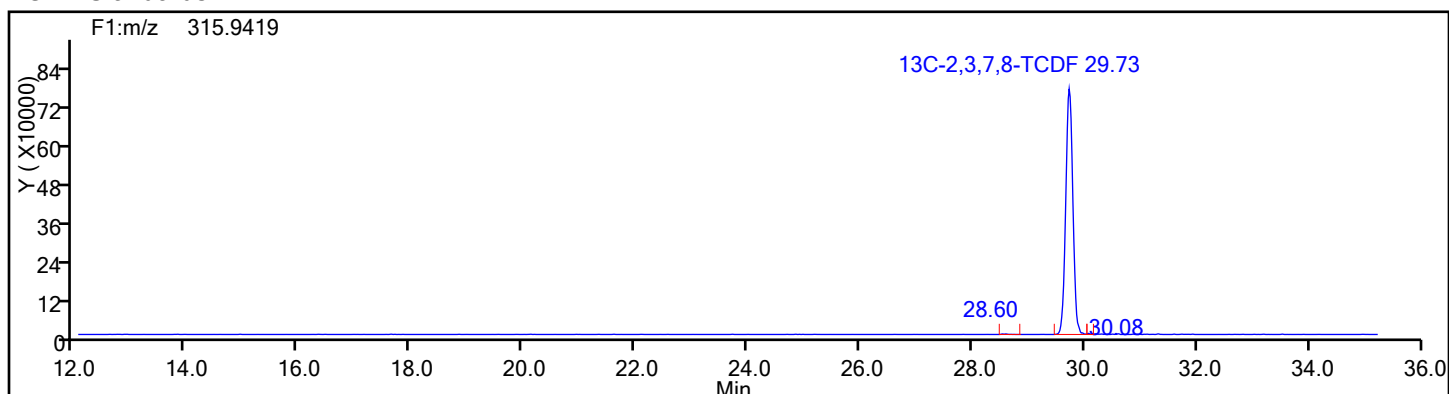
Column Type:

Column Dia:

TCDF

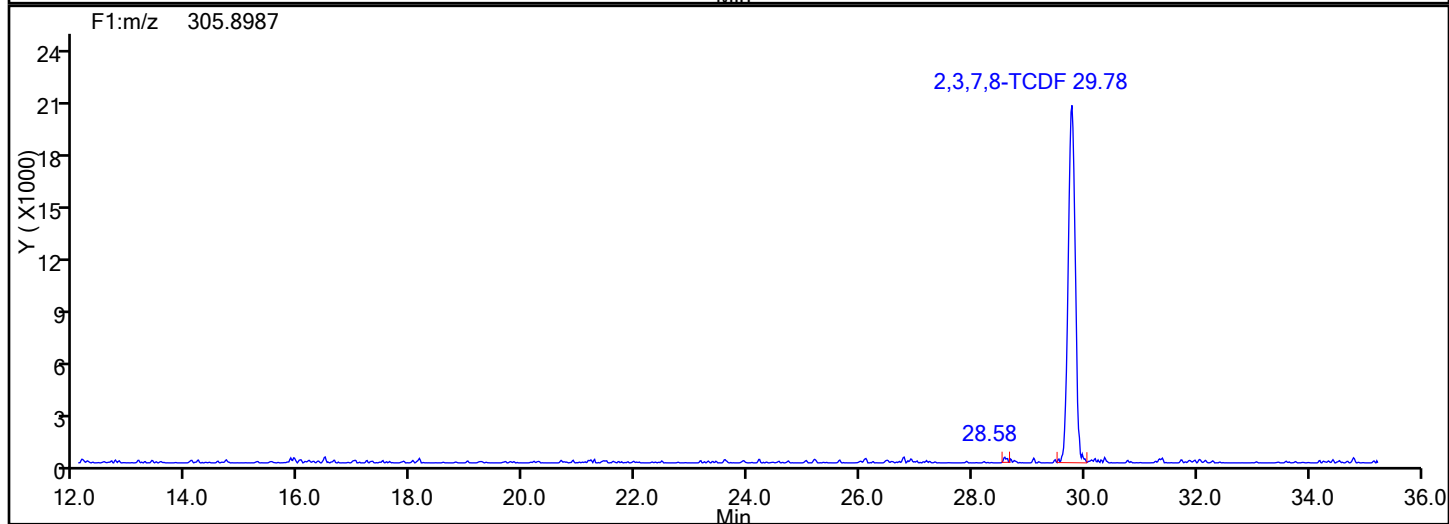
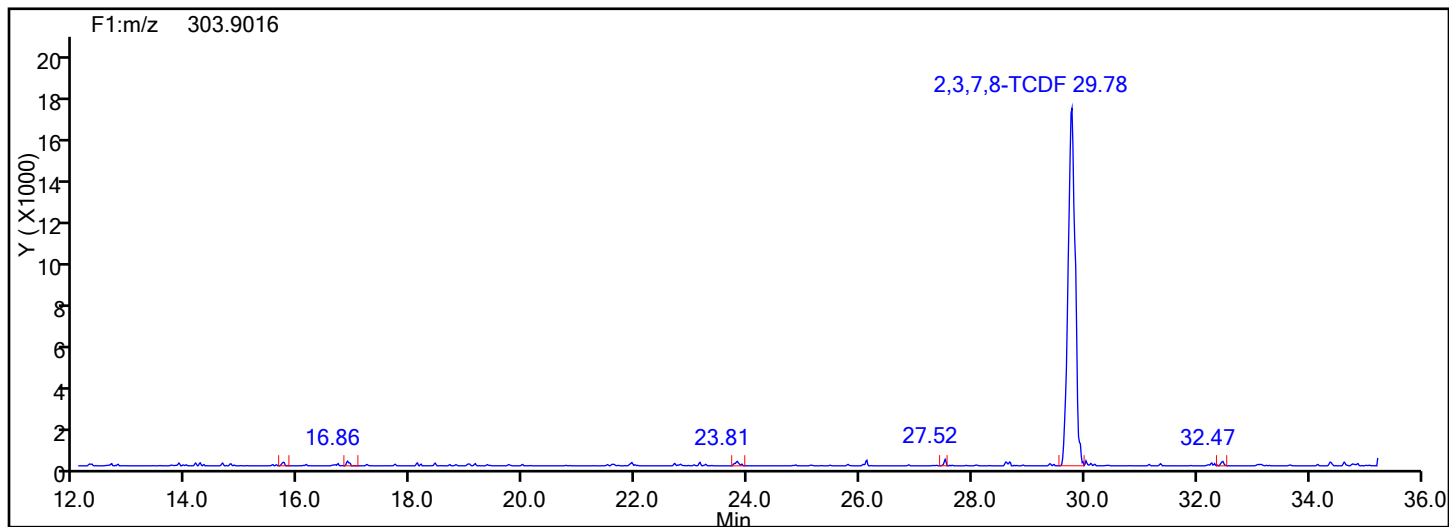


TCDF Standards

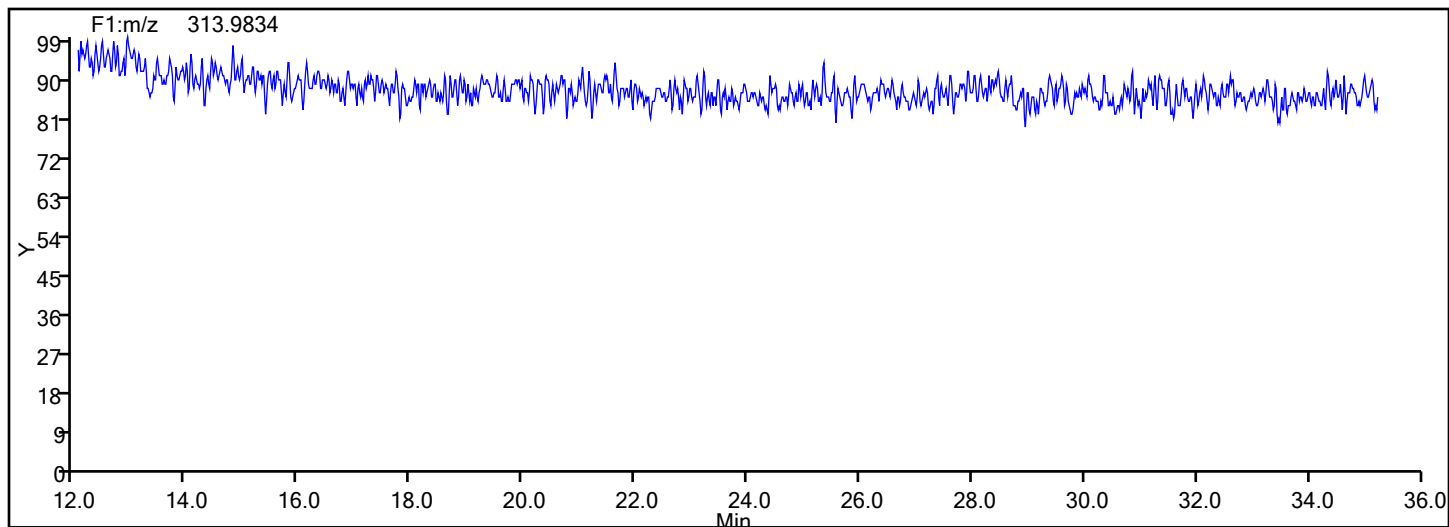


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
Injection Date: 16-May-2014 15:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 3
Column Type: Column Dia:
TCDF

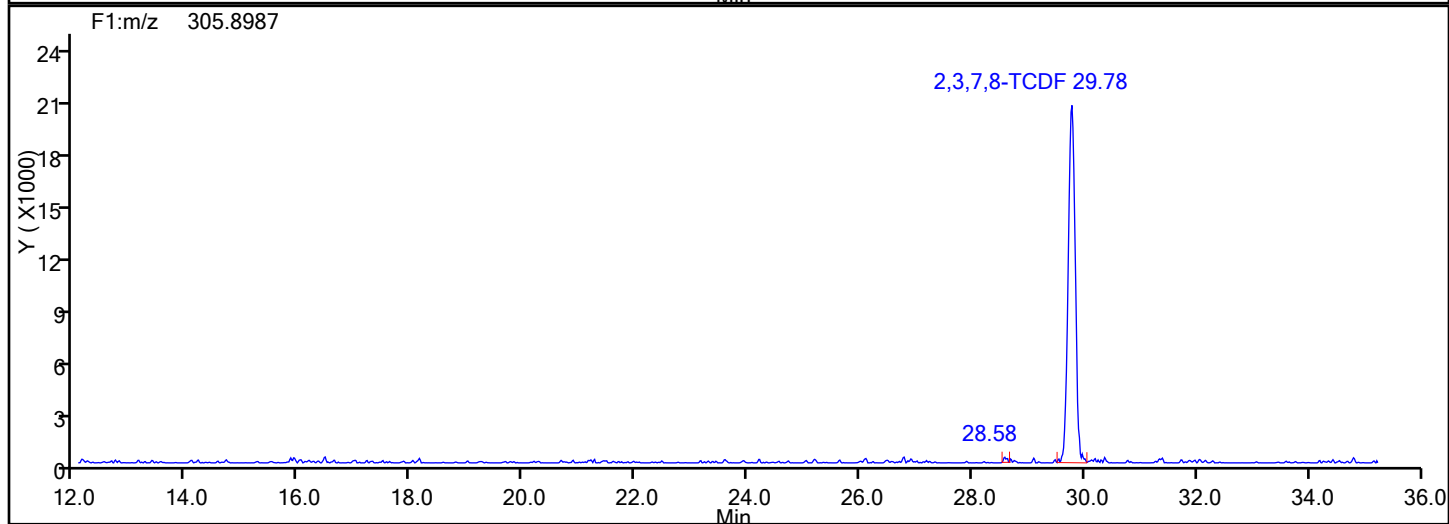
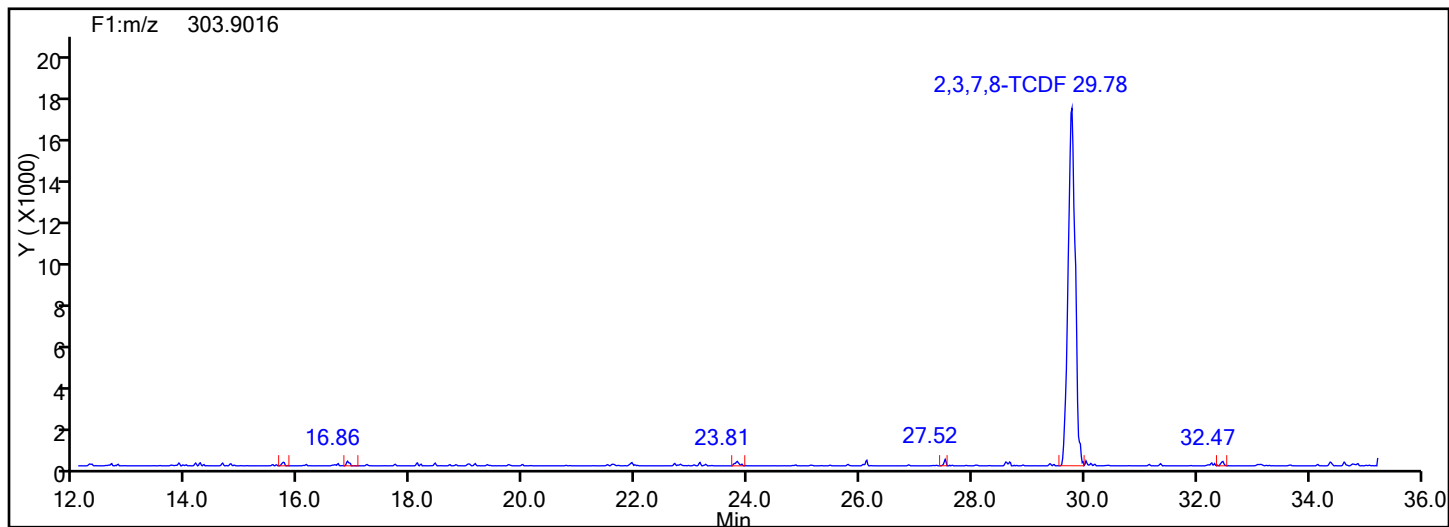


TCDF Lock Mass

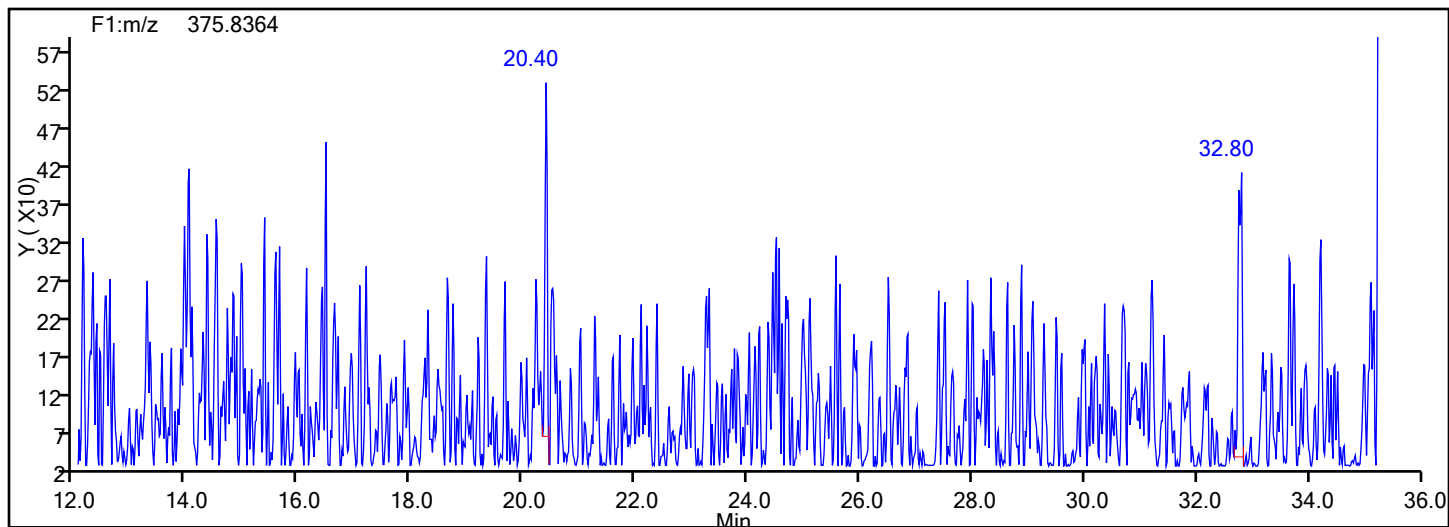


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
Injection Date: 16-May-2014 15:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 3
Column Type: Column Dia:
TCDF



TCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

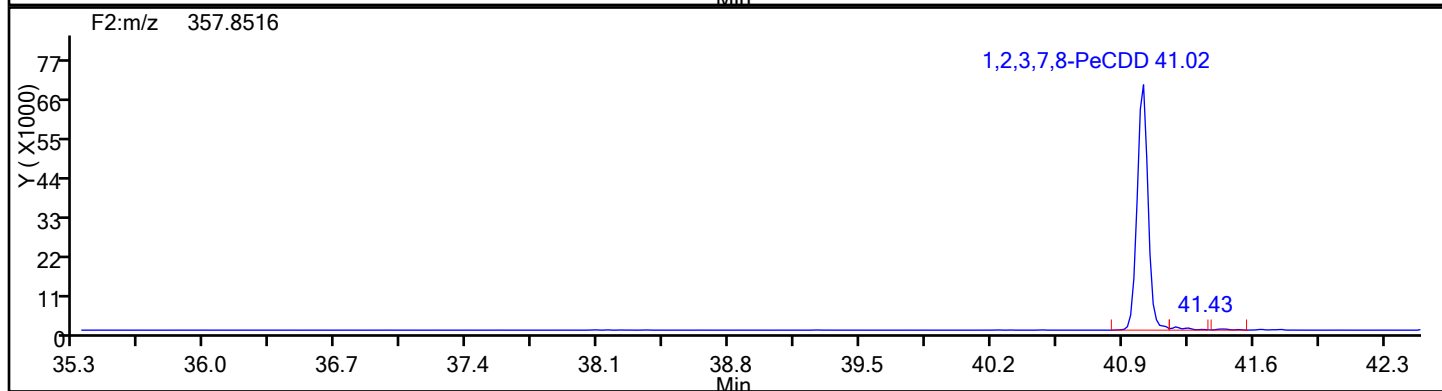
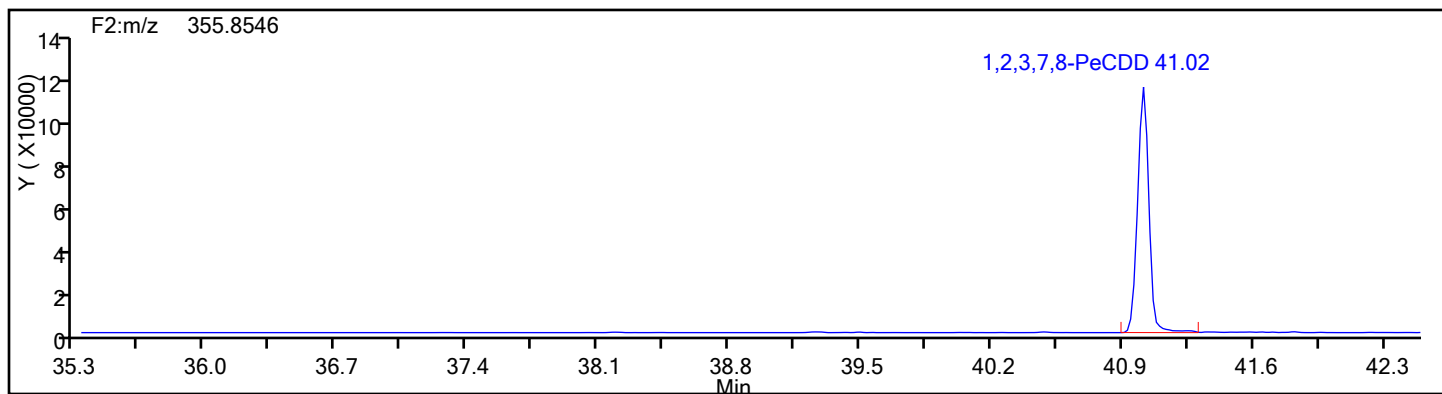
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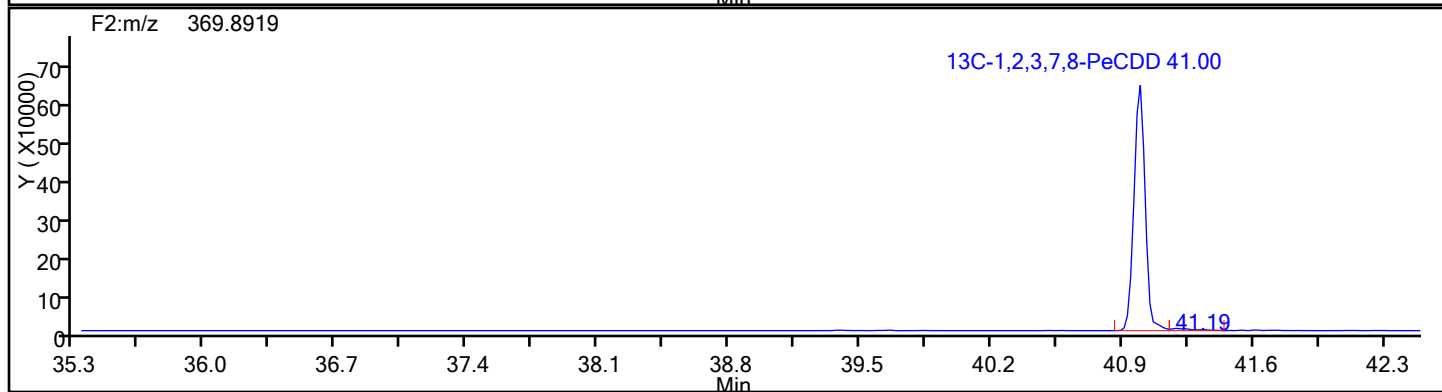
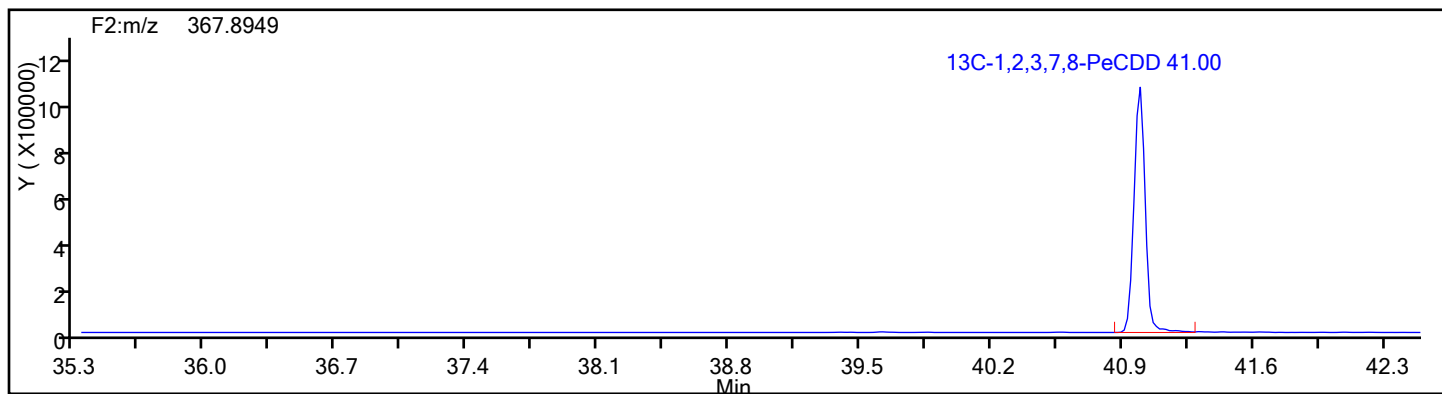
Column Type:

Column Dia:

PeCDD



PeCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

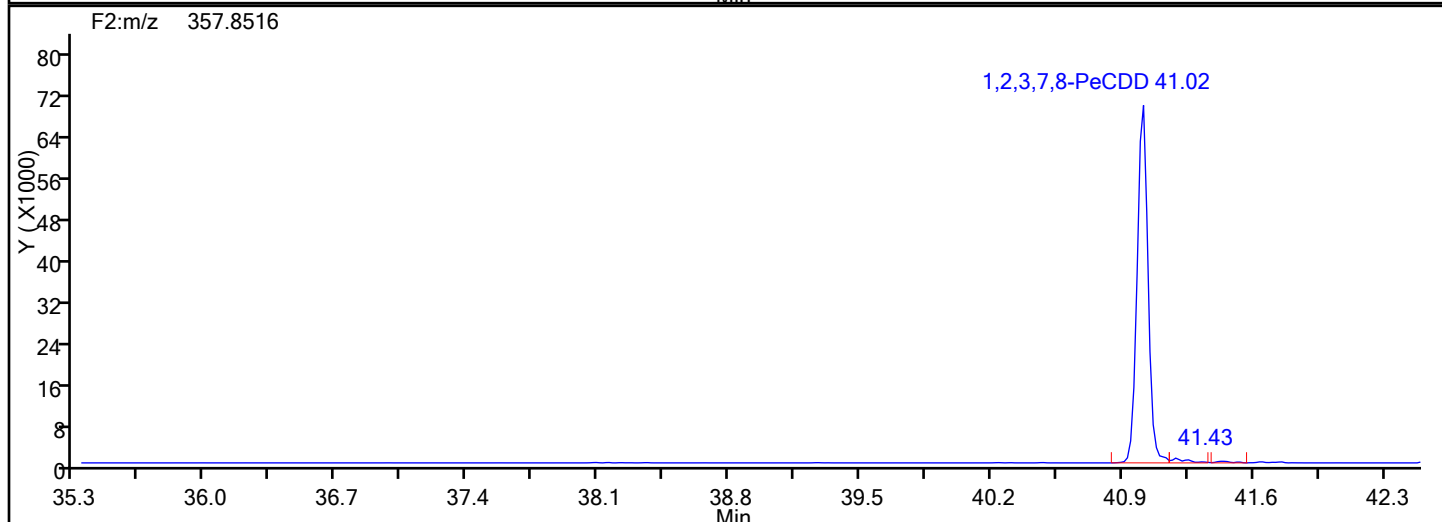
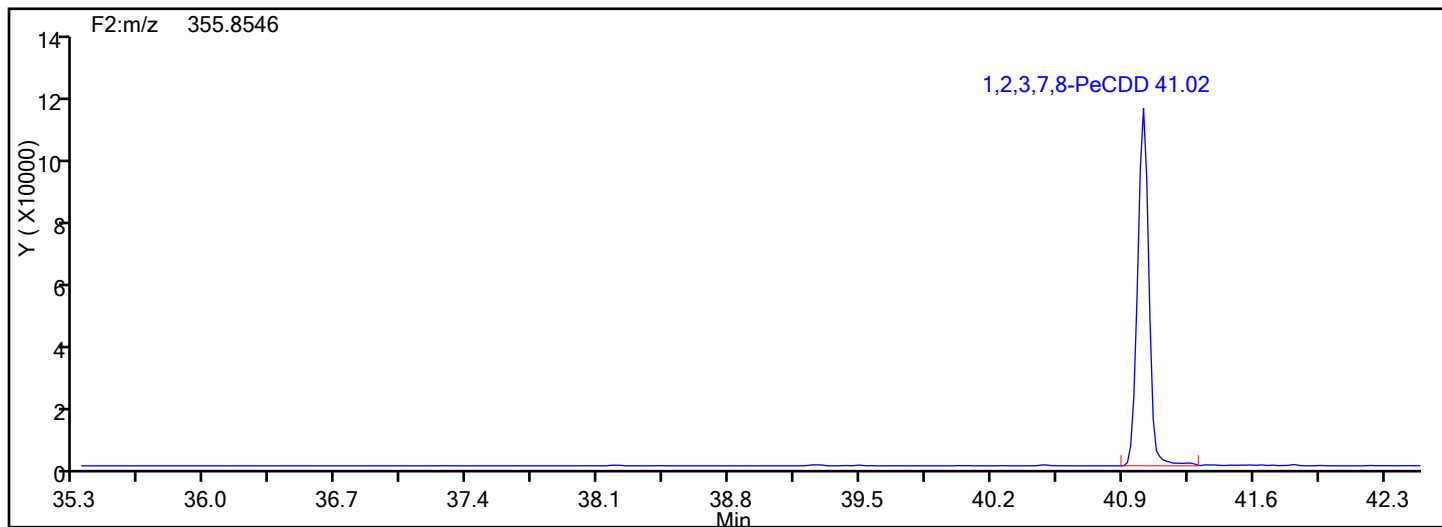
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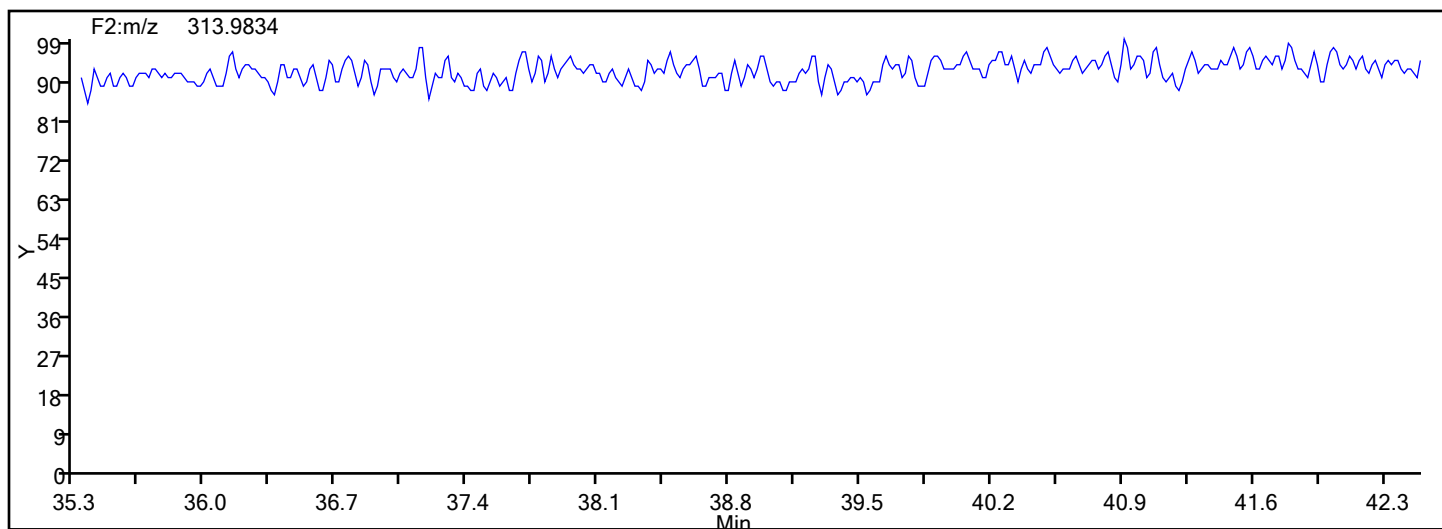
Column Type:

Column Dia:

PeCDD



PeCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

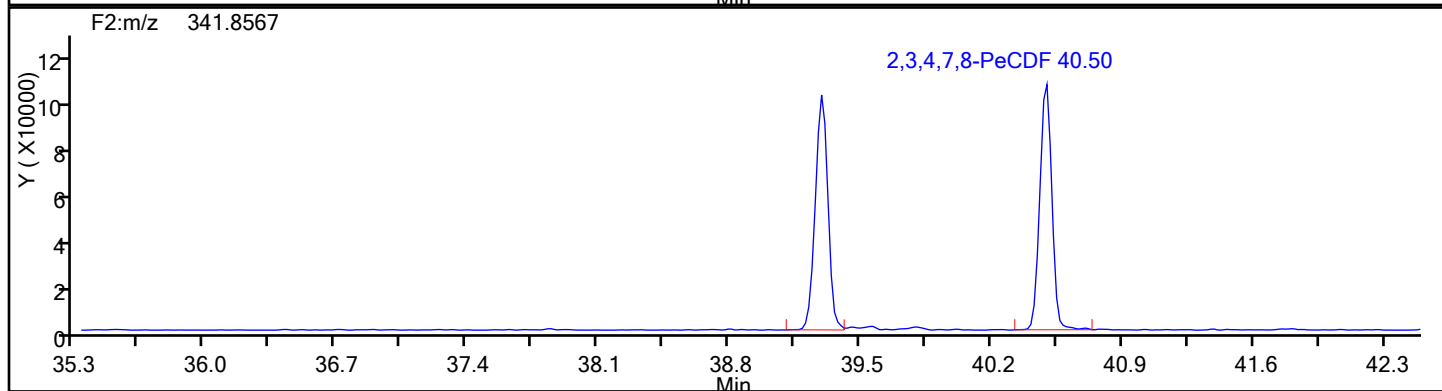
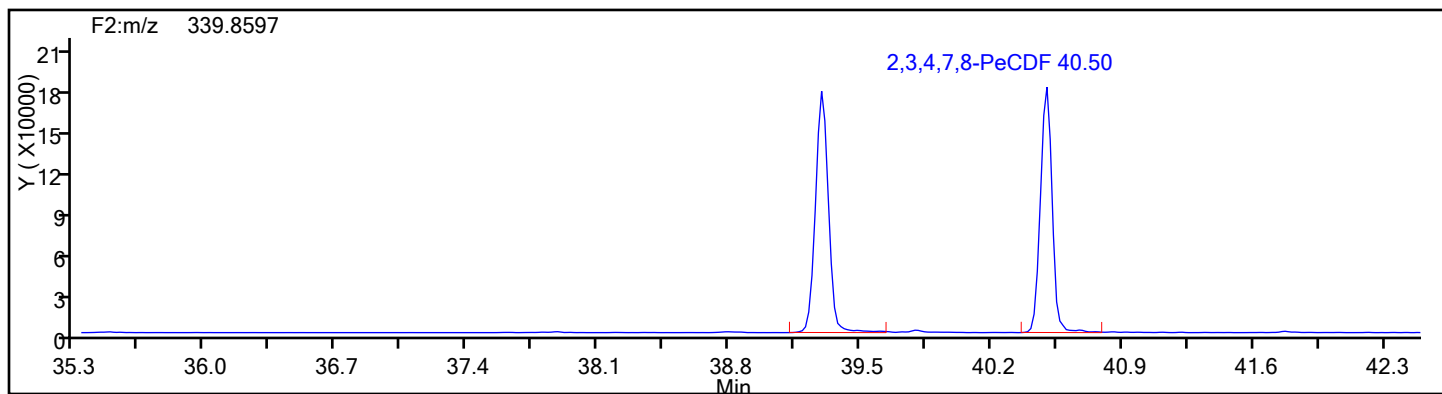
Worklist#: 7768

Sample Line#: 3

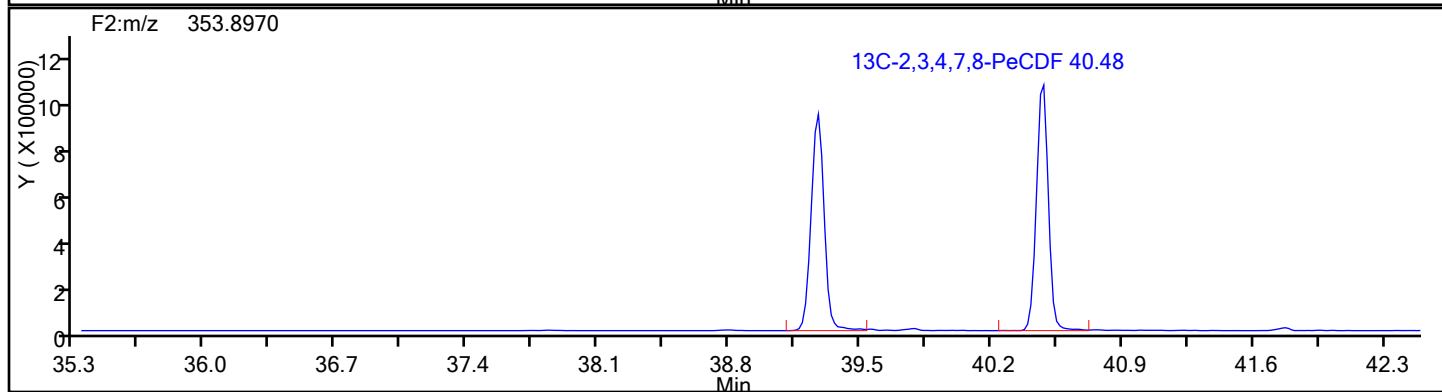
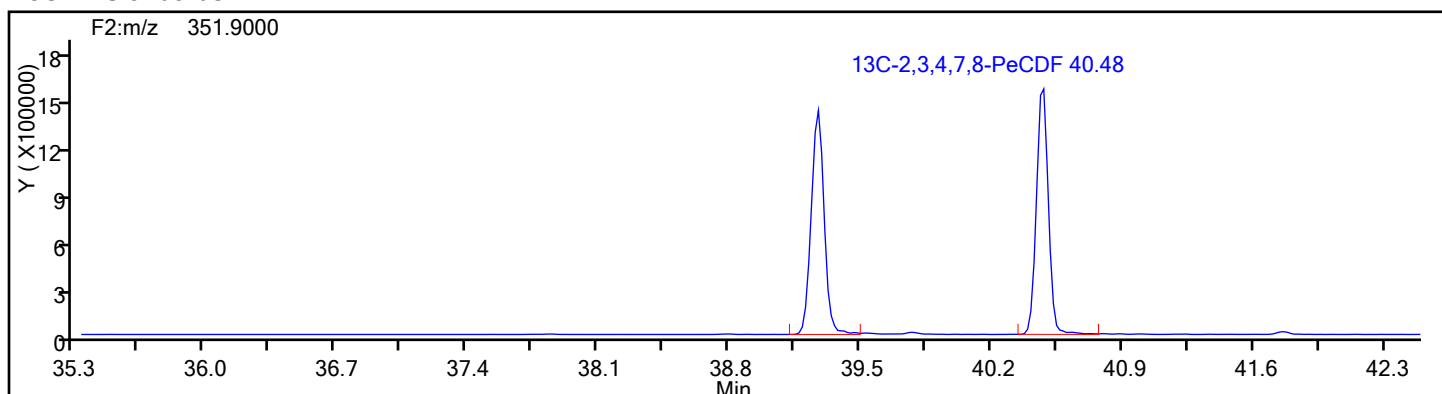
Column Type:

Column Dia:

PeCDF

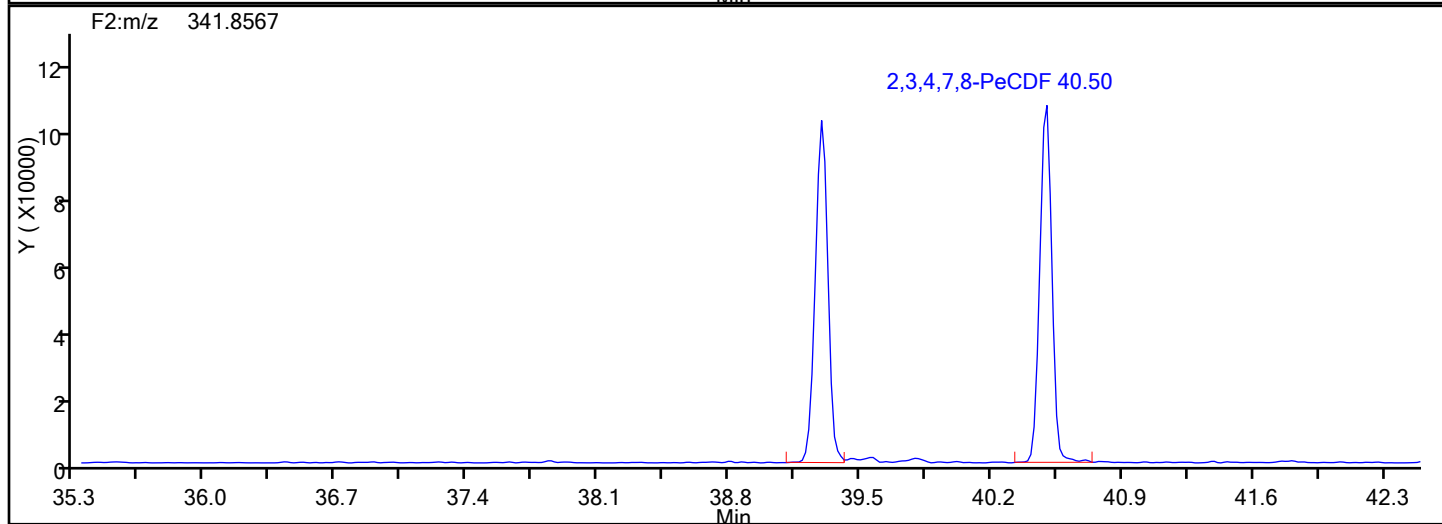
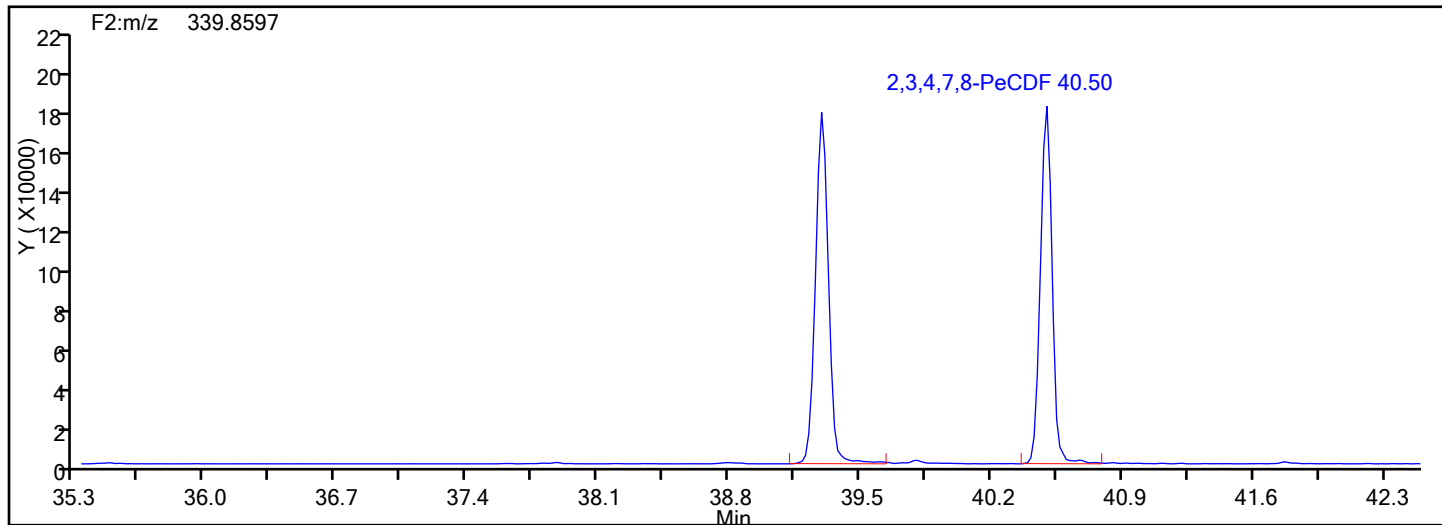


PeCDF Standards

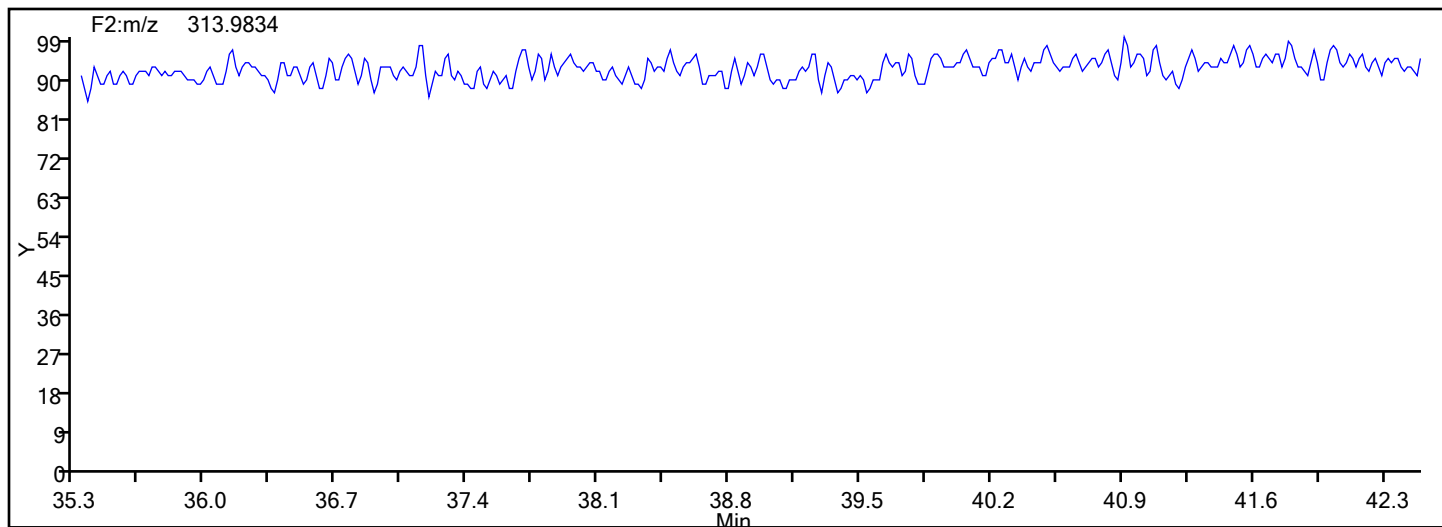


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
Injection Date: 16-May-2014 15:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 3
Column Type: Column Dia:
PeCDF



PeCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

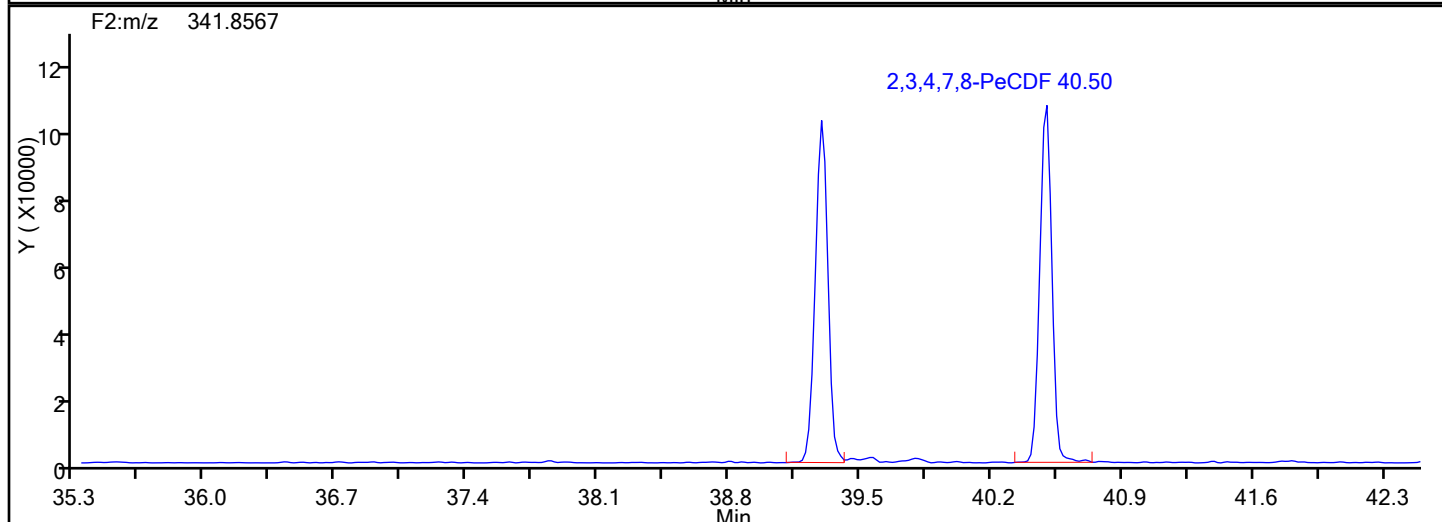
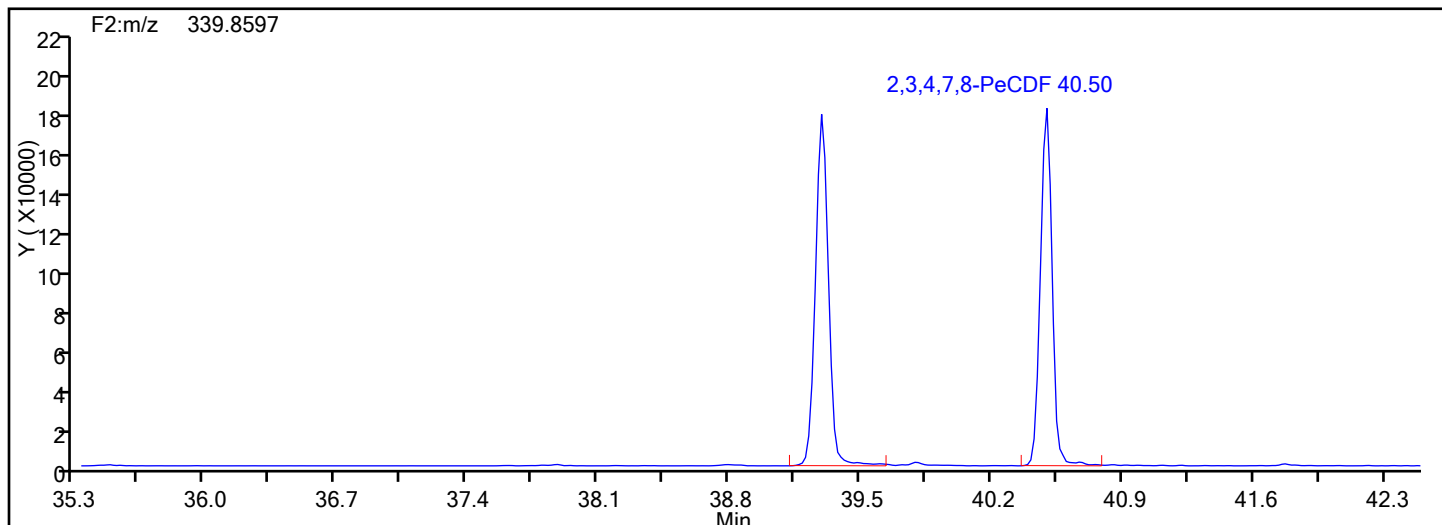
Worklist#: 7768

Sample Line#: 3

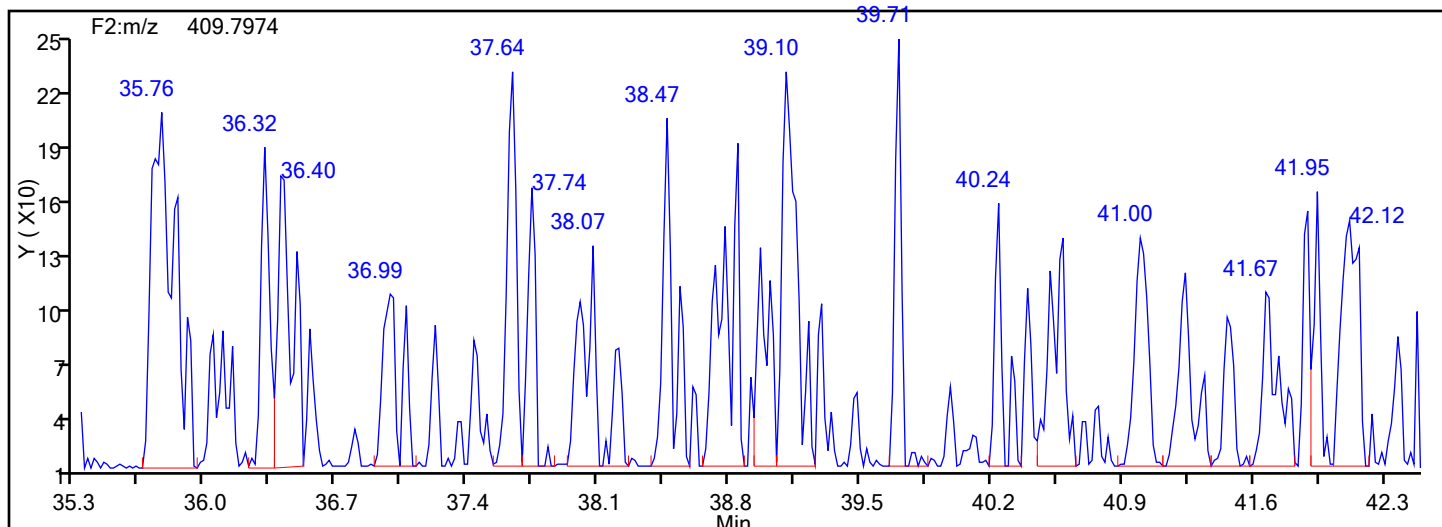
Column Type:

Column Dia:

PeCDF



PeCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

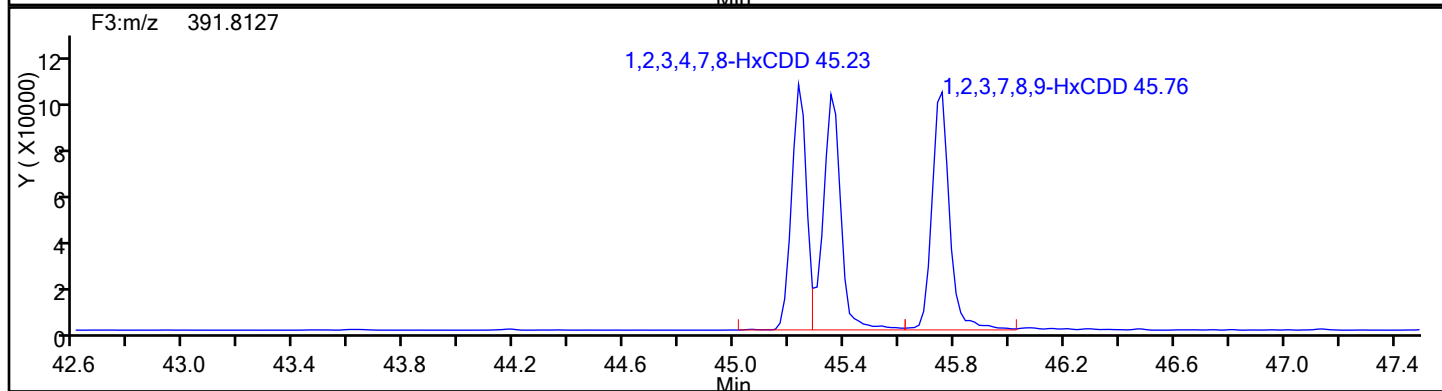
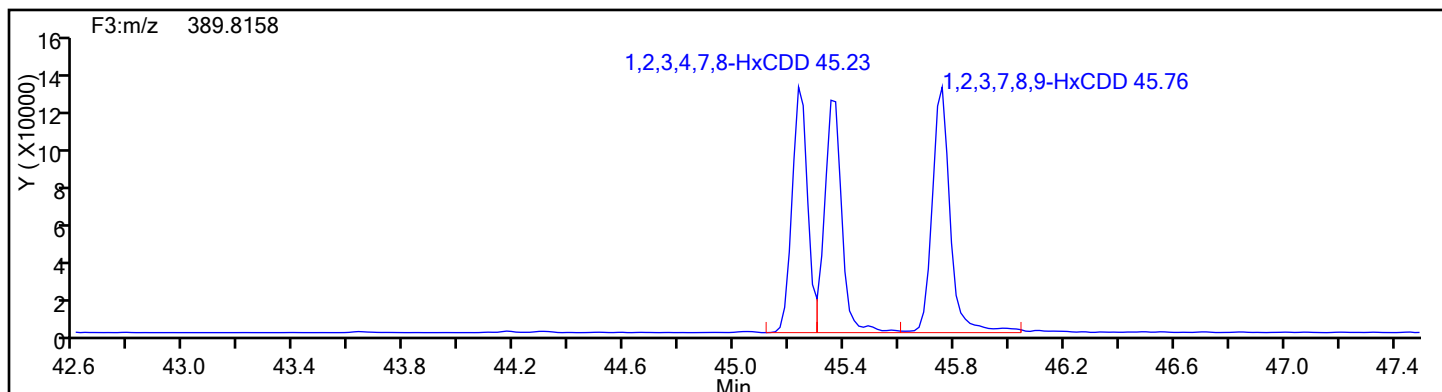
Worklist#: 7768

Sample Line#: 3

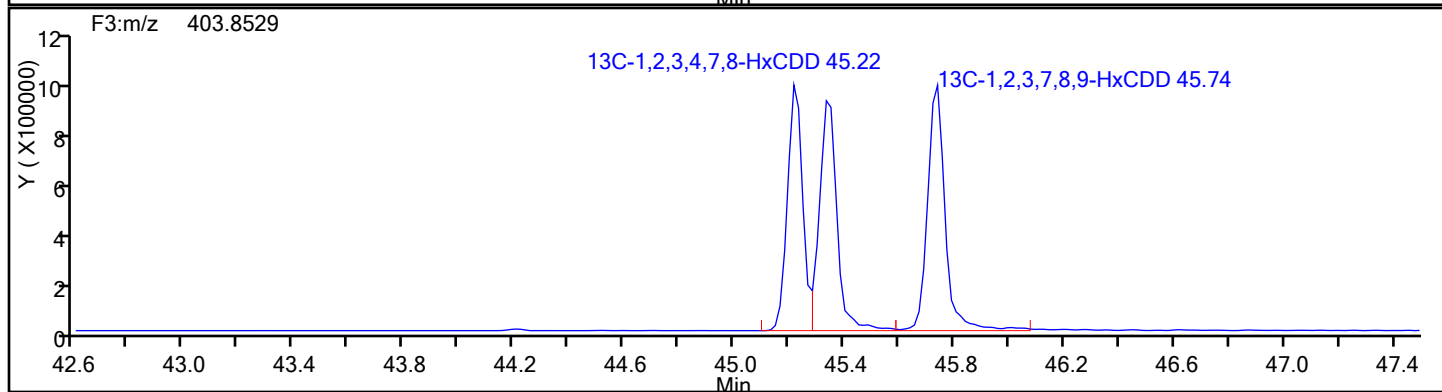
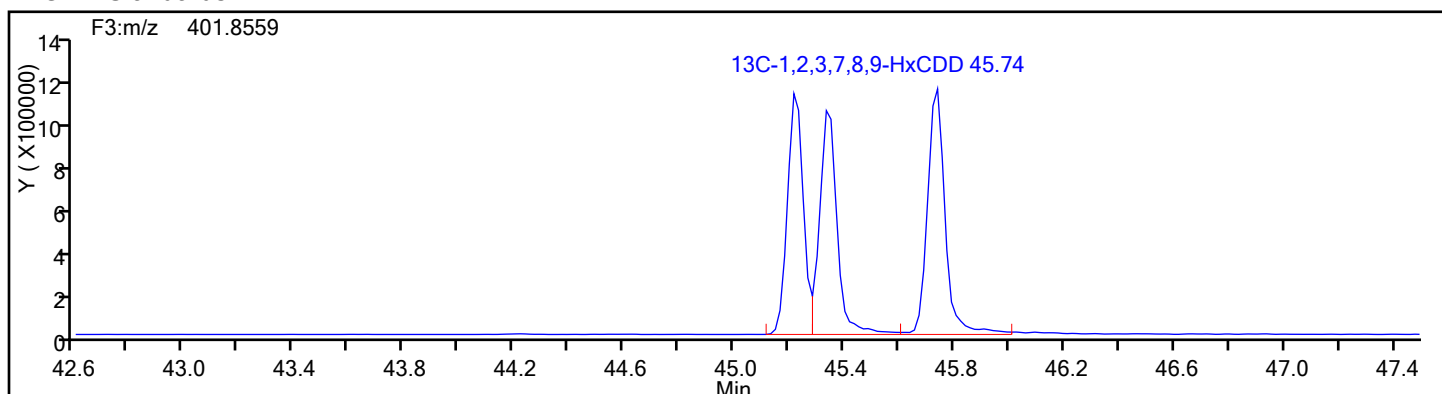
Column Type:

Column Dia:

HxCDD



HxCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

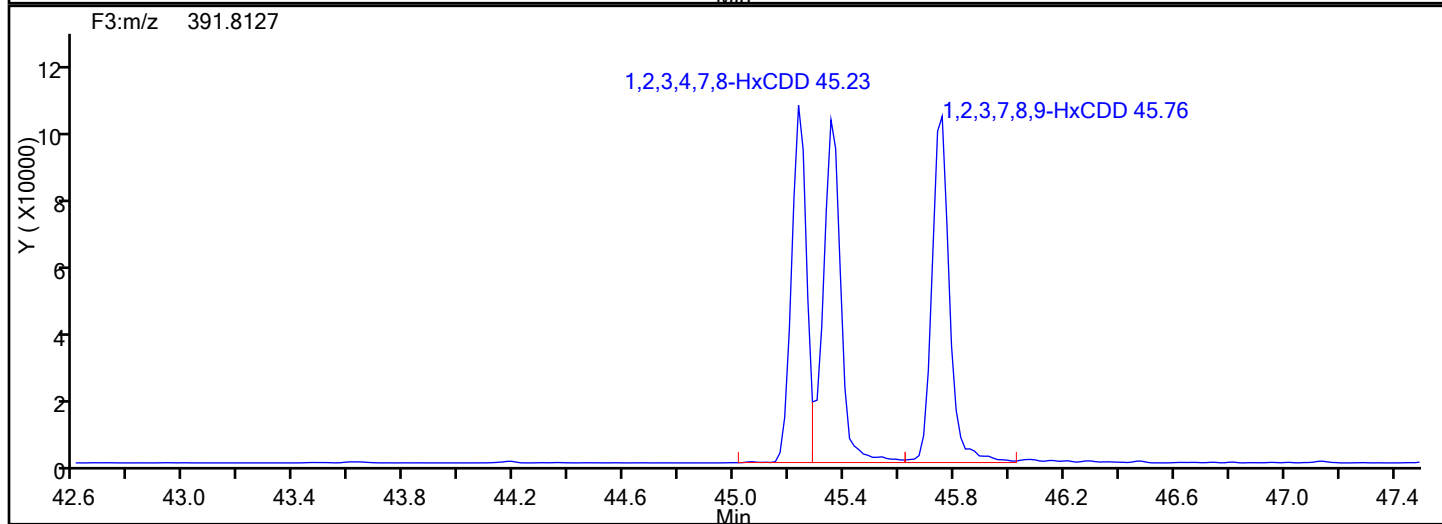
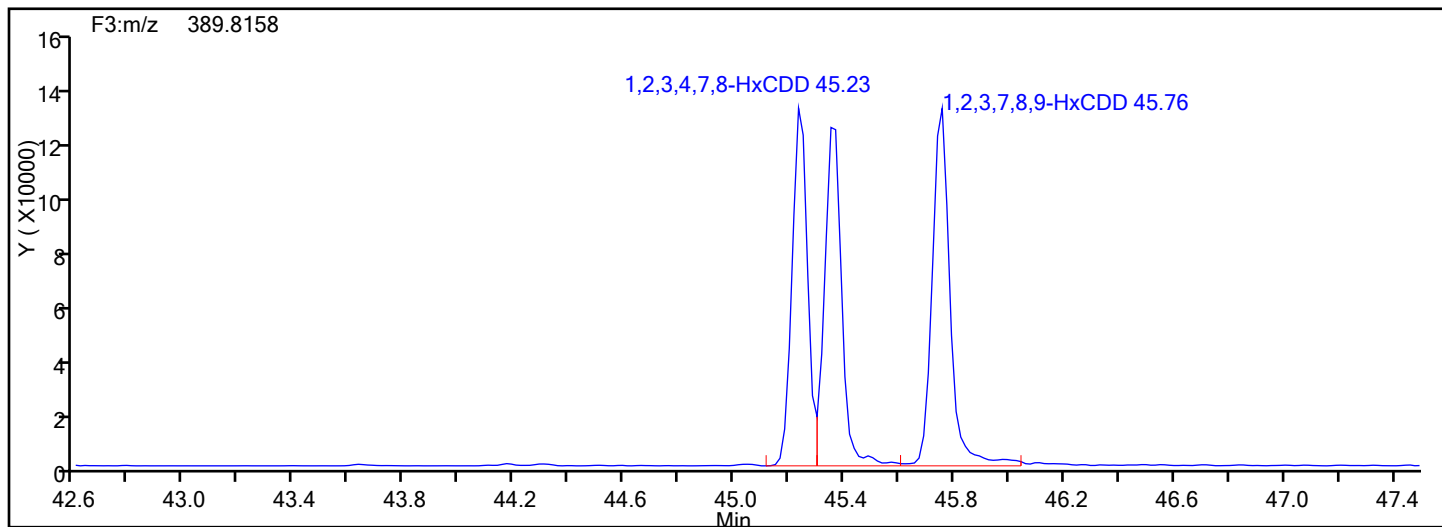
Worklist#: 7768

Sample Line#: 3

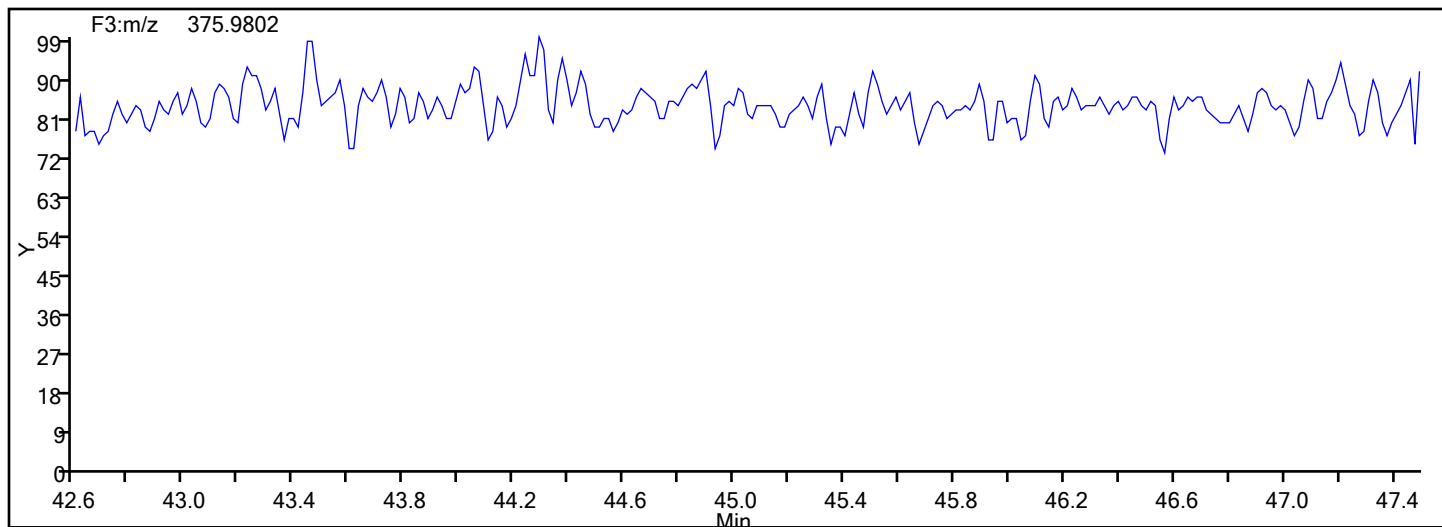
Column Type:

Column Dia:

HxCDD



HxCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

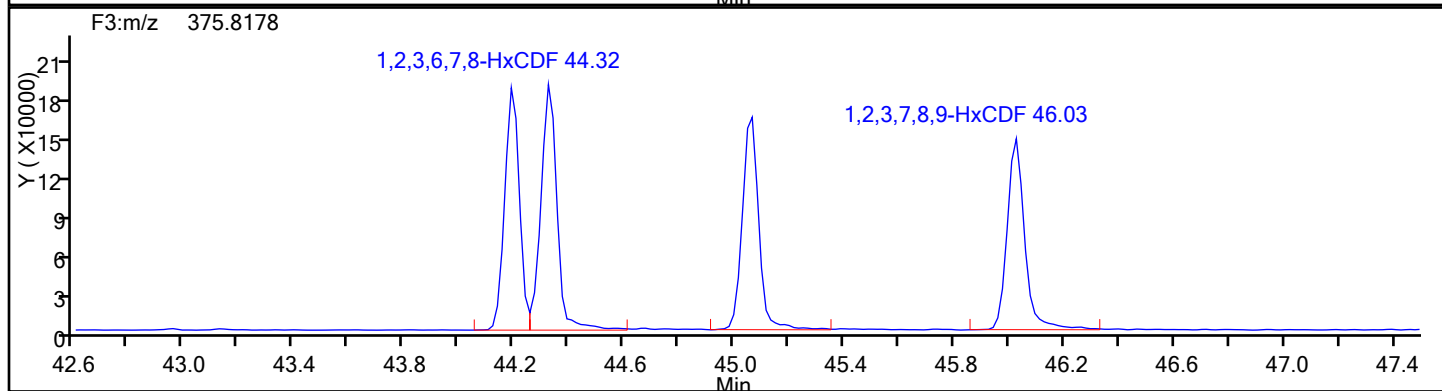
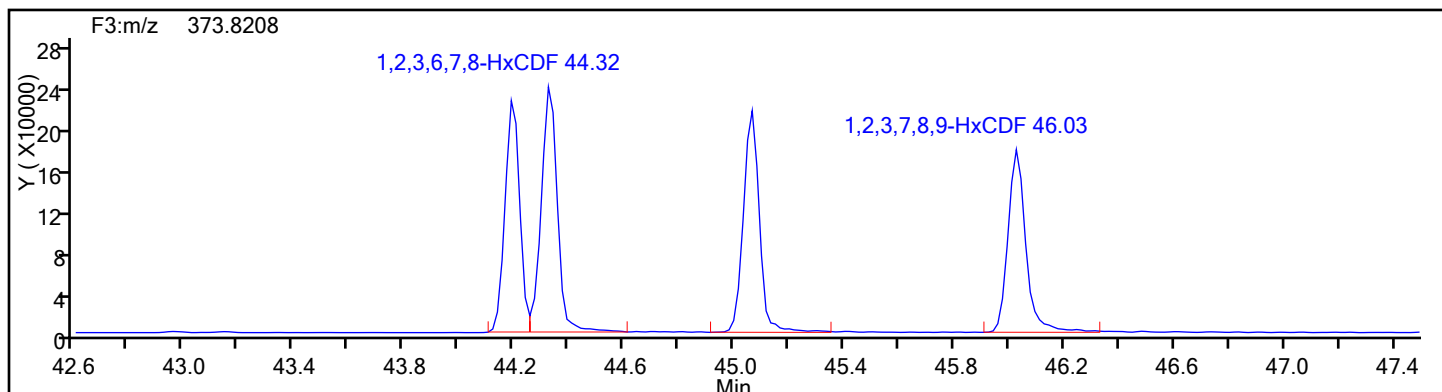
Worklist#: 7768

Sample Line#: 3

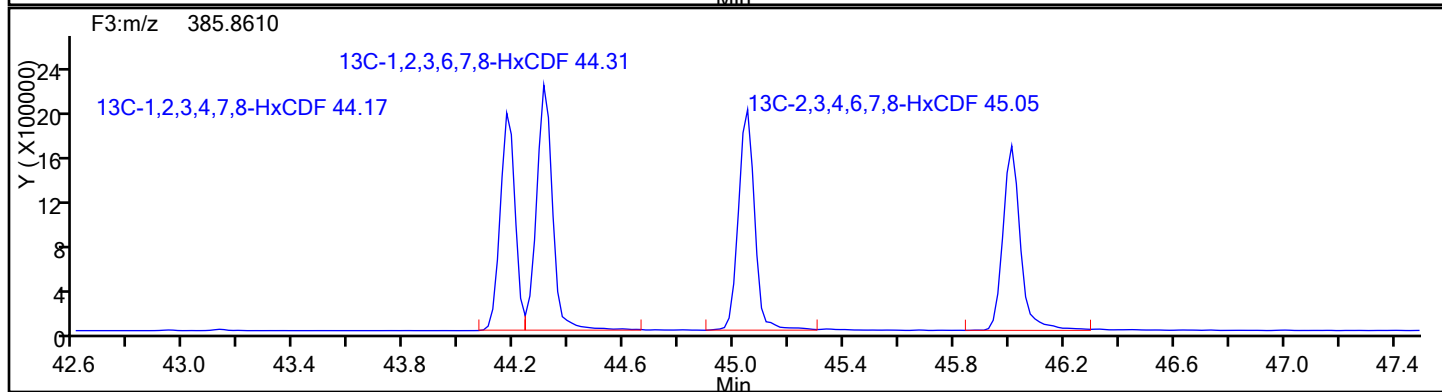
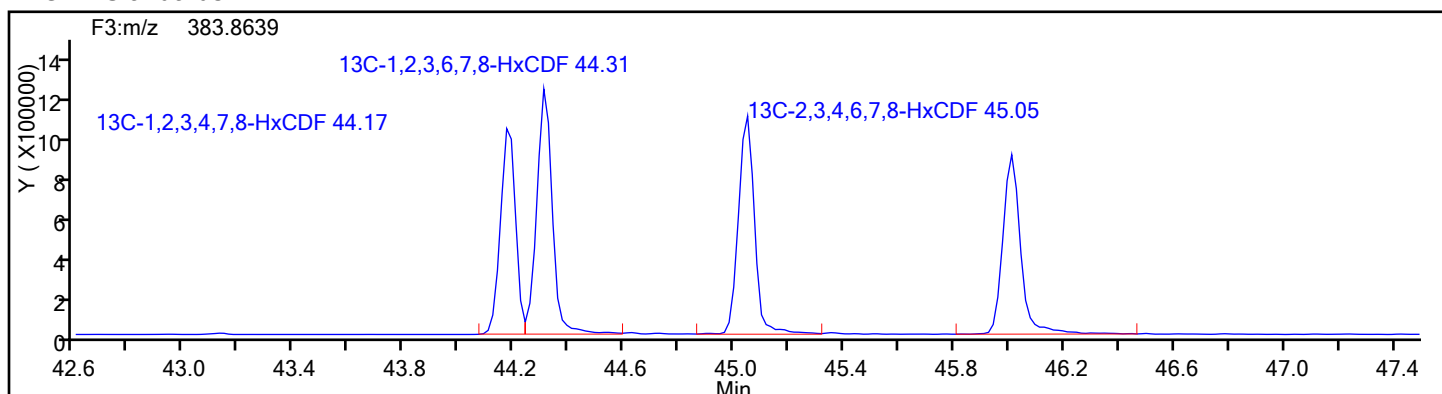
Column Type:

Column Dia:

HxCDF



HxCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

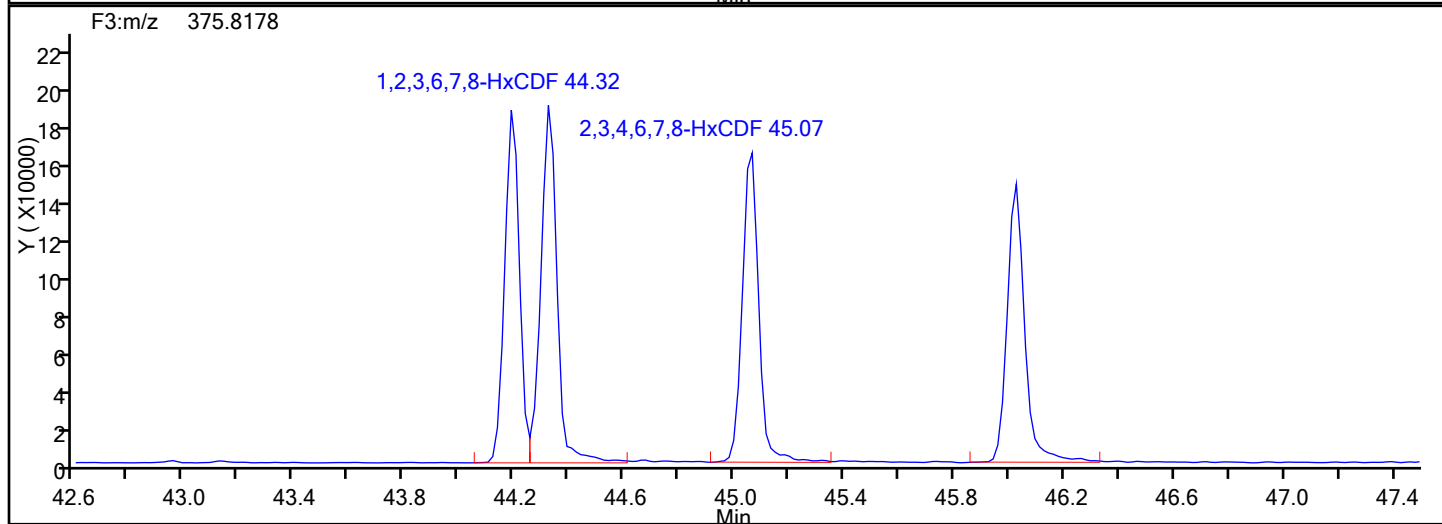
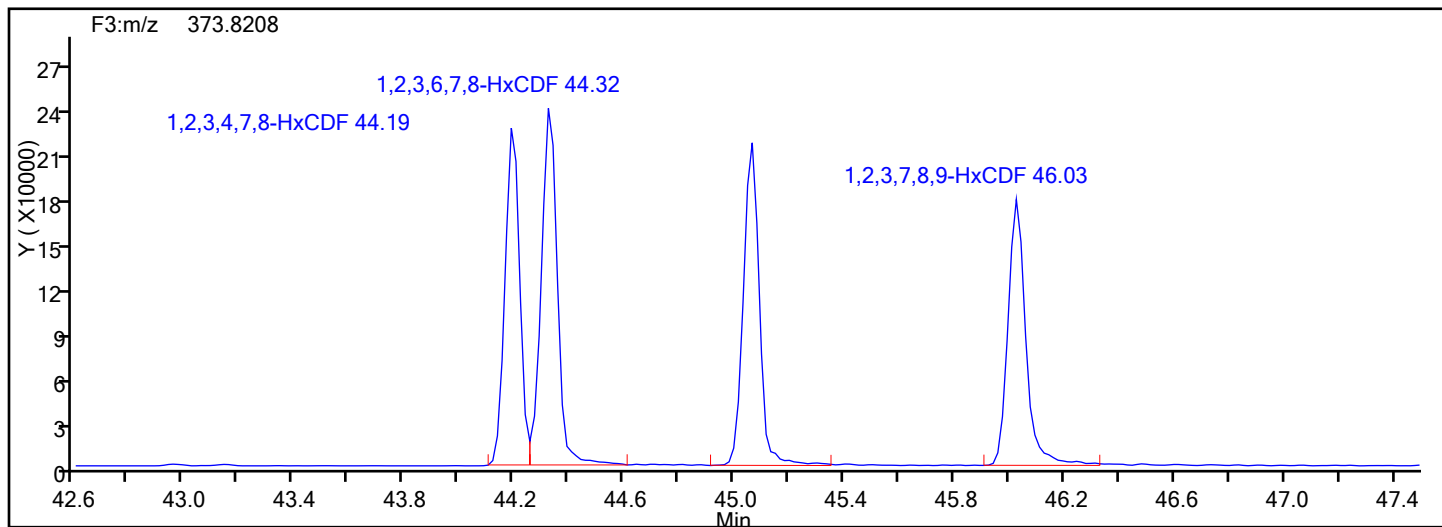
Worklist#: 7768

Sample Line#: 3

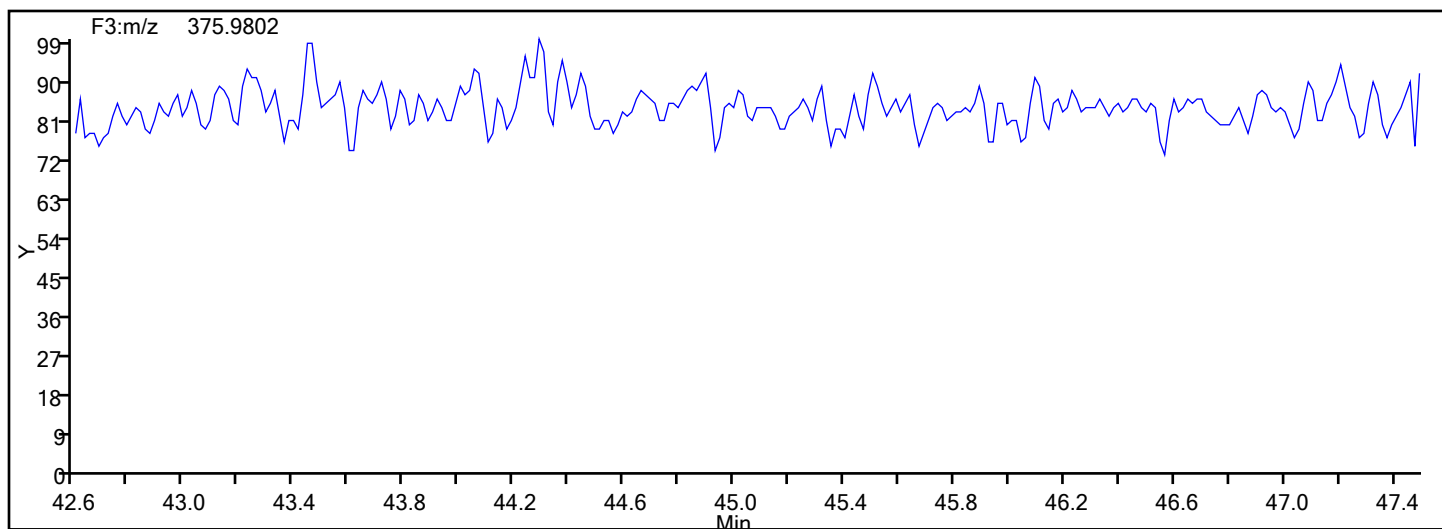
Column Type:

Column Dia:

HxCDF



HxCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

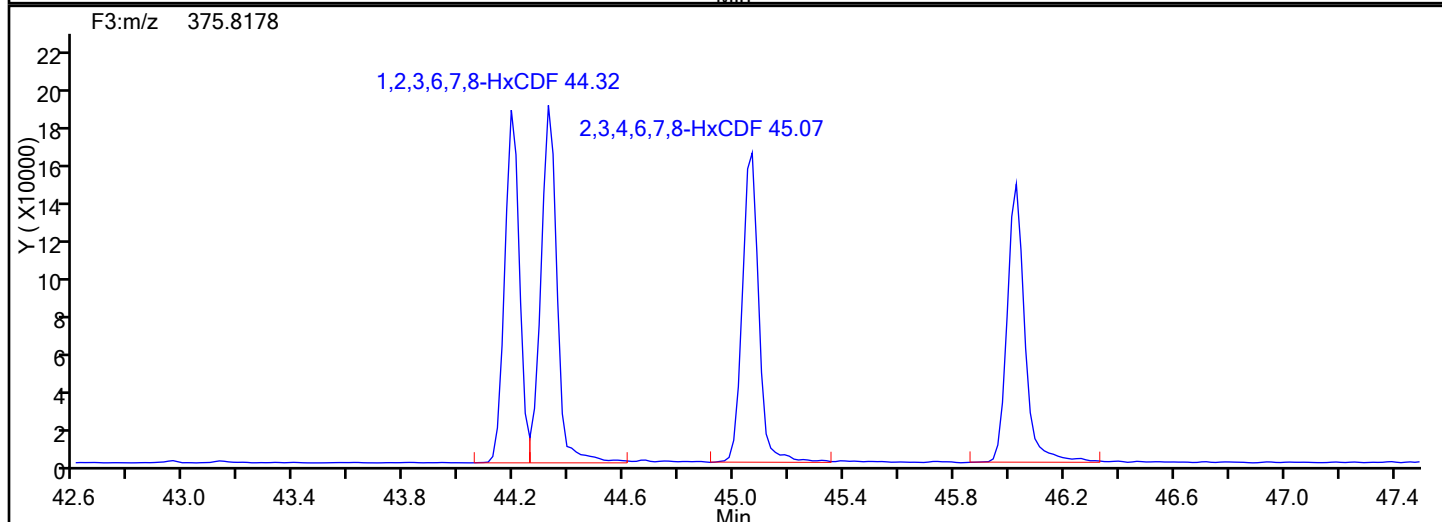
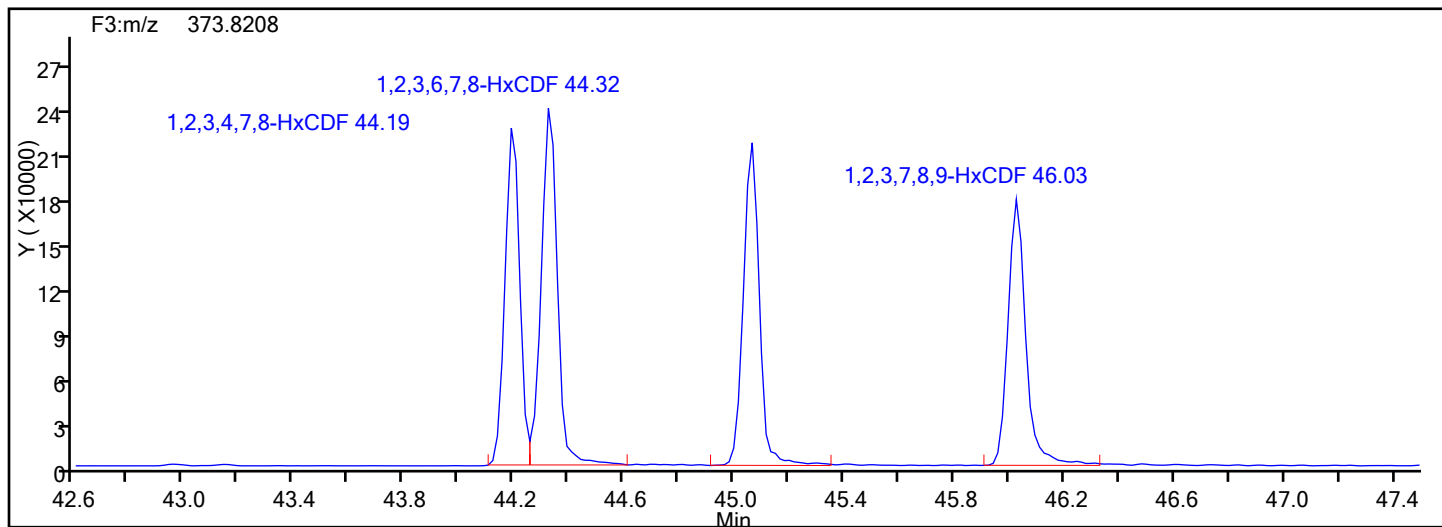
Worklist#: 7768

Sample Line#: 3

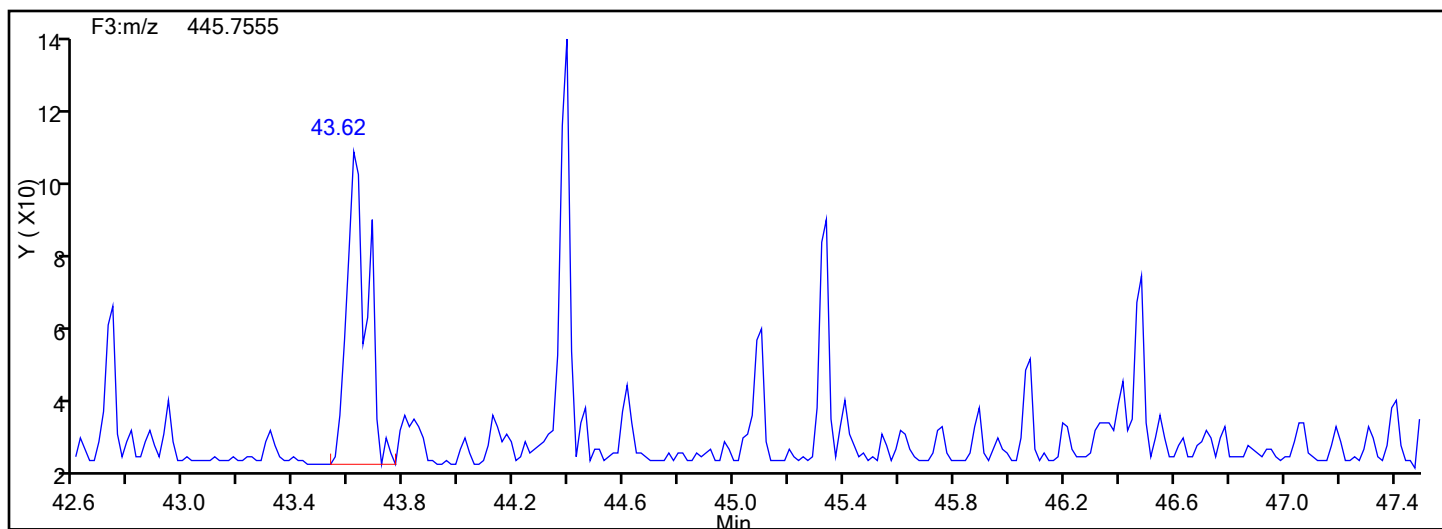
Column Type:

Column Dia:

HxCDF



HxCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

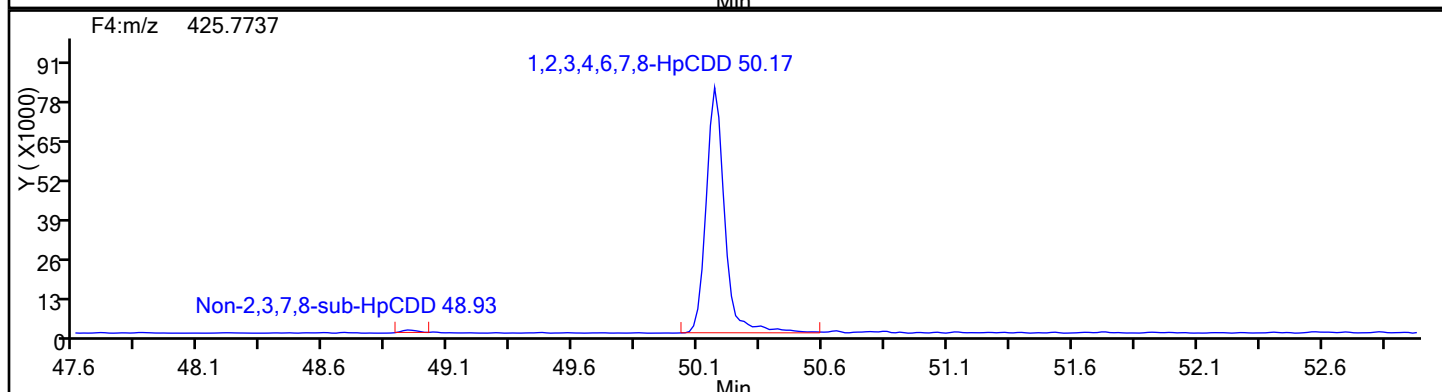
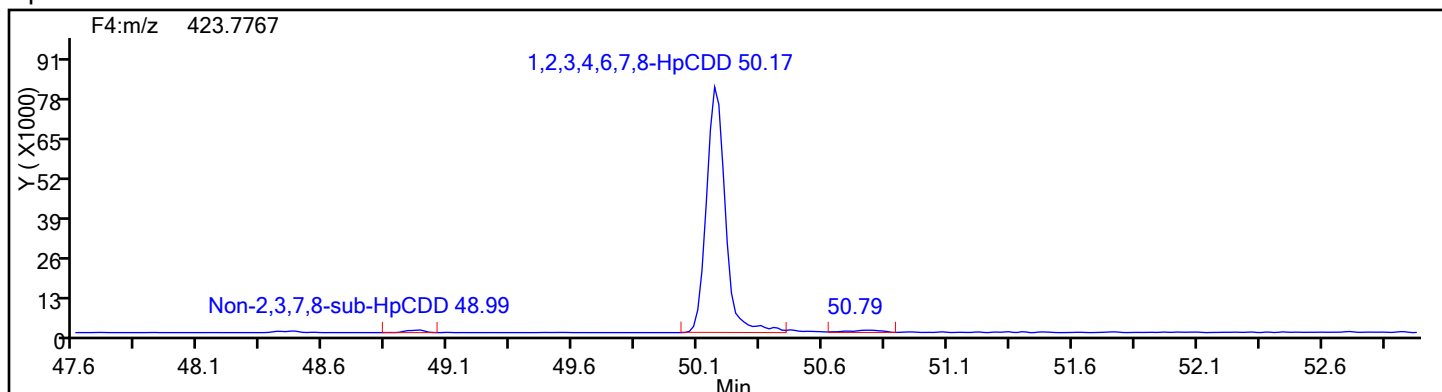
Worklist#: 7768

Sample Line#: 3

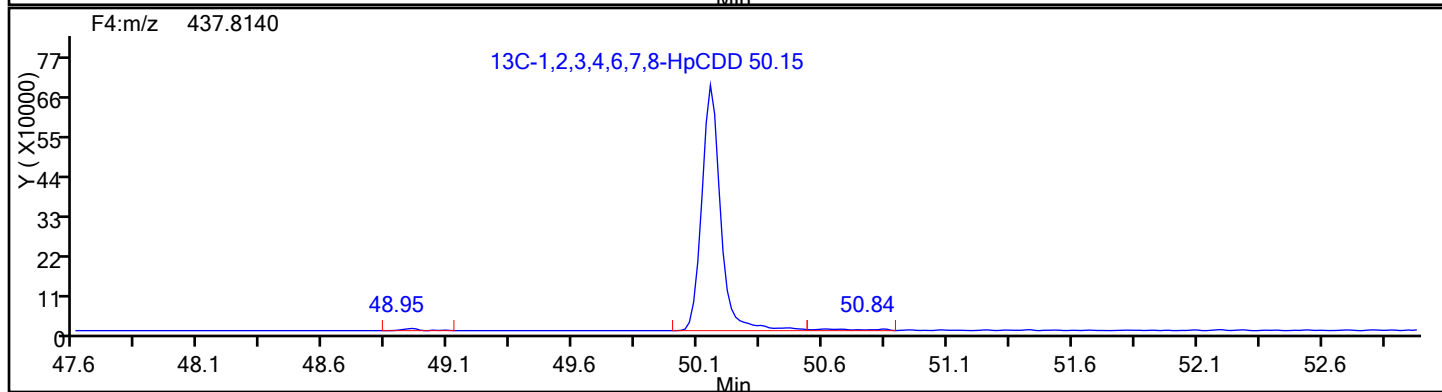
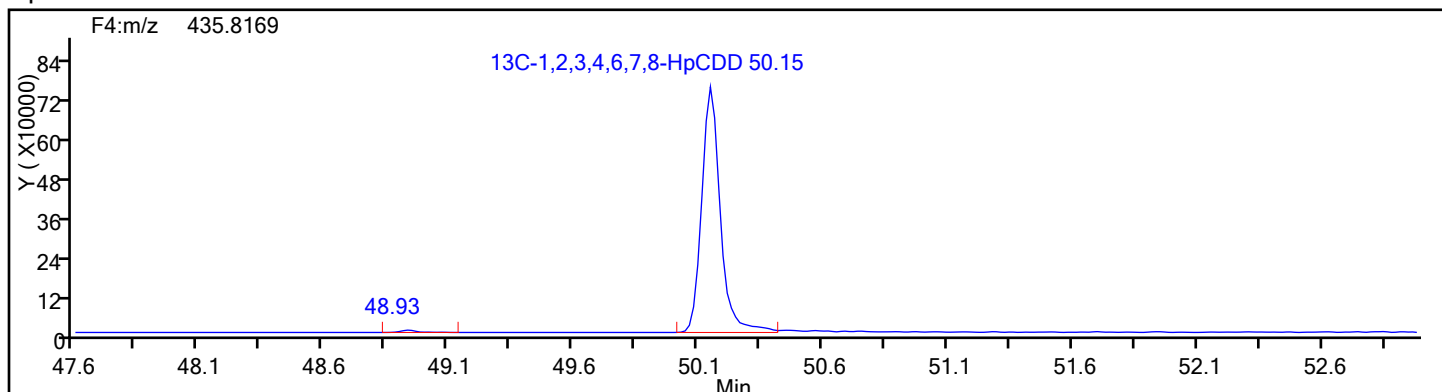
Column Type:

Column Dia:

HpCDD

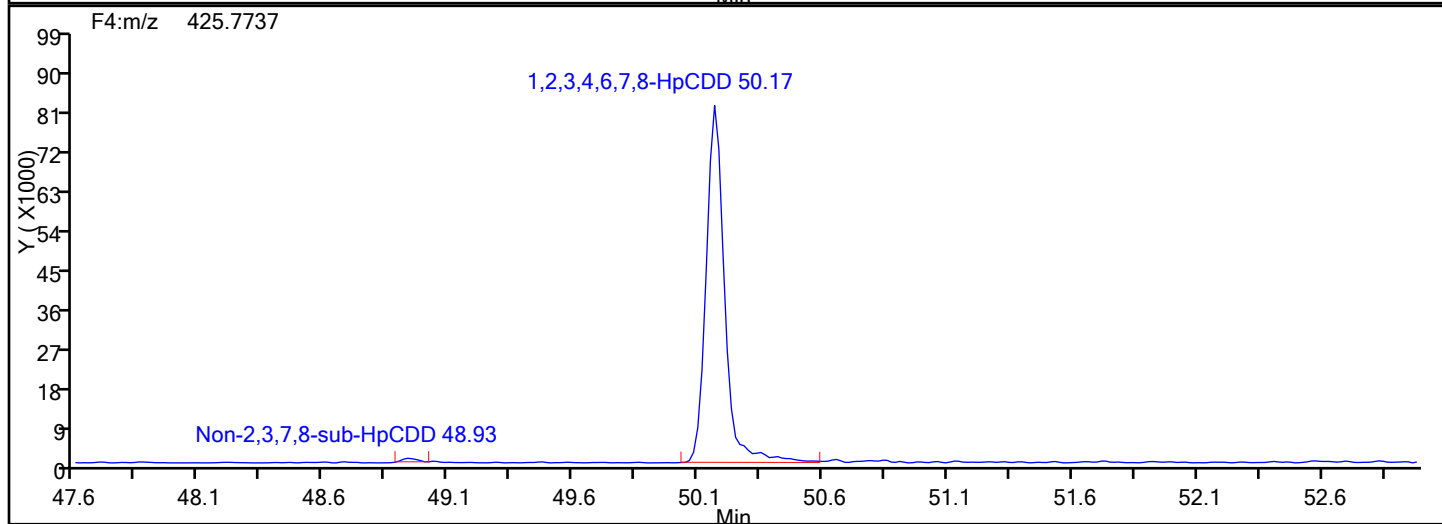
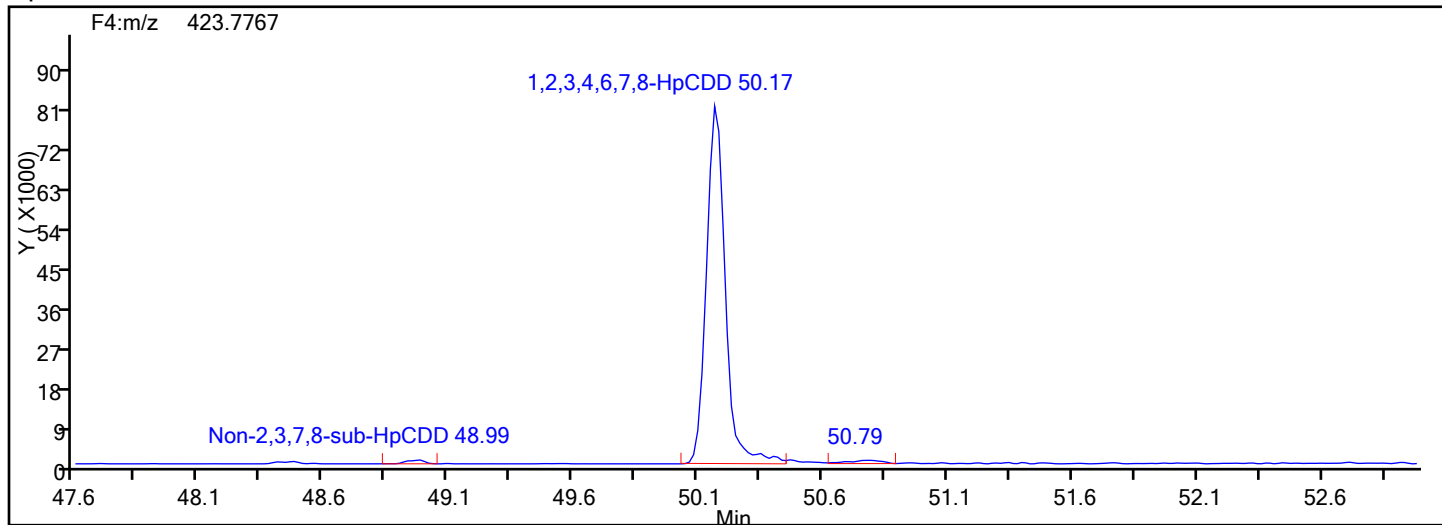


HpCDD Standards

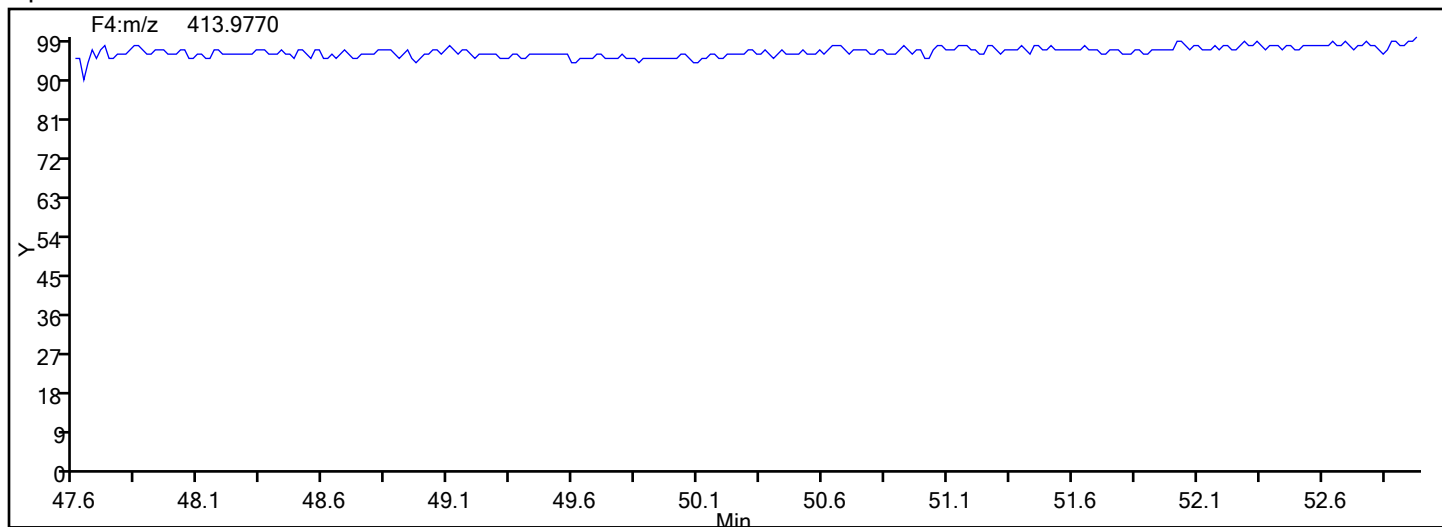


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d
Injection Date: 16-May-2014 15:26:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 3
Column Type: Column Dia:
HpCDD



HpCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

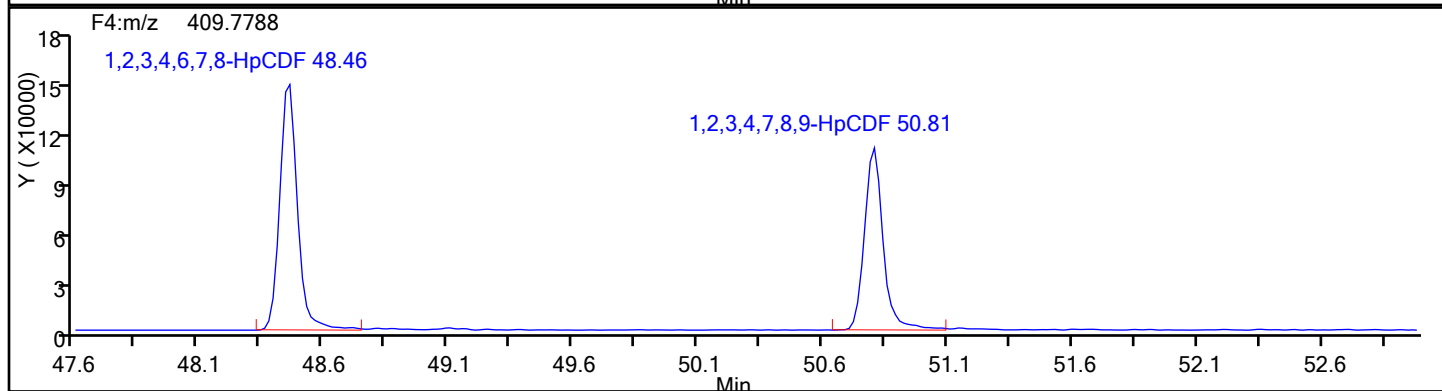
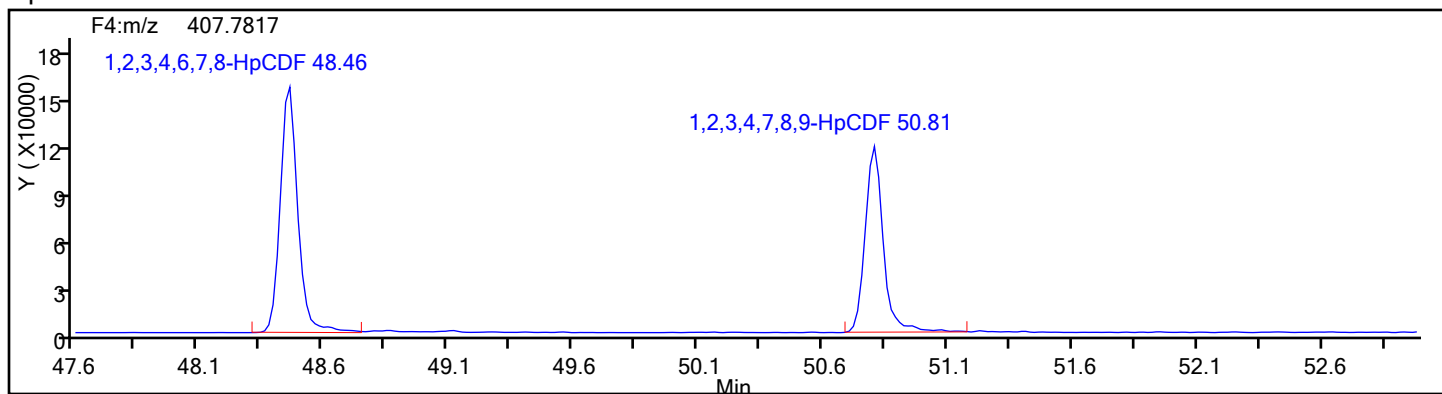
Worklist#: 7768

Sample Line#: 3

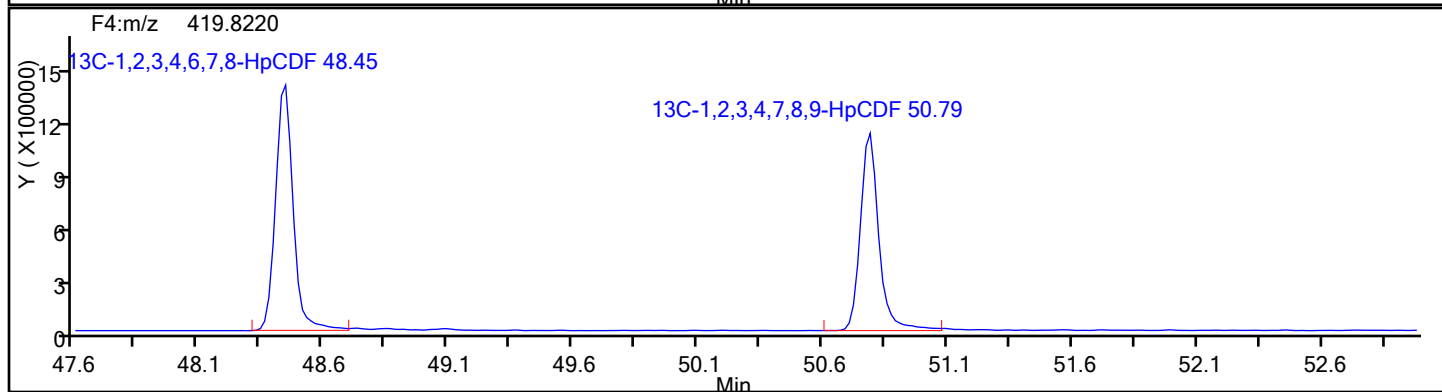
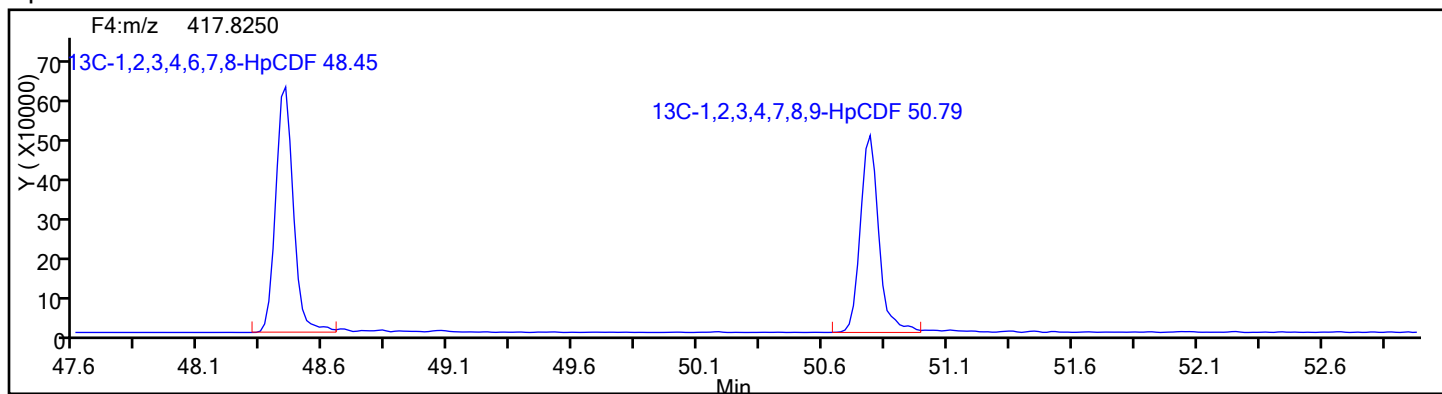
Column Type:

Column Dia:

HpCDF



HpCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

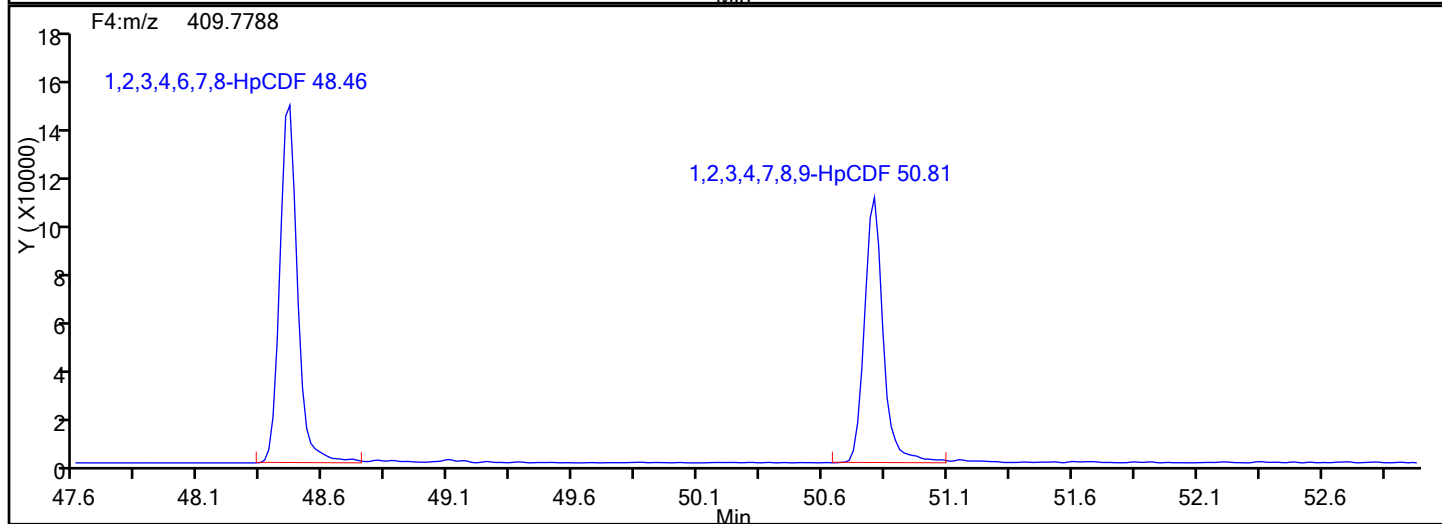
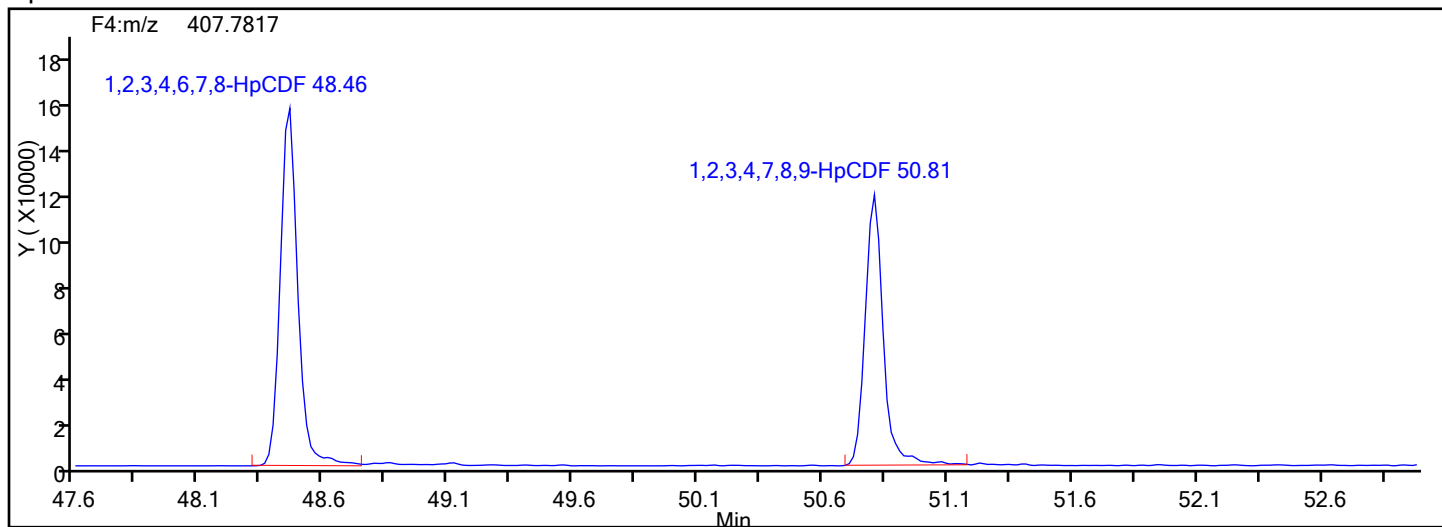
Worklist#: 7768

Sample Line#: 3

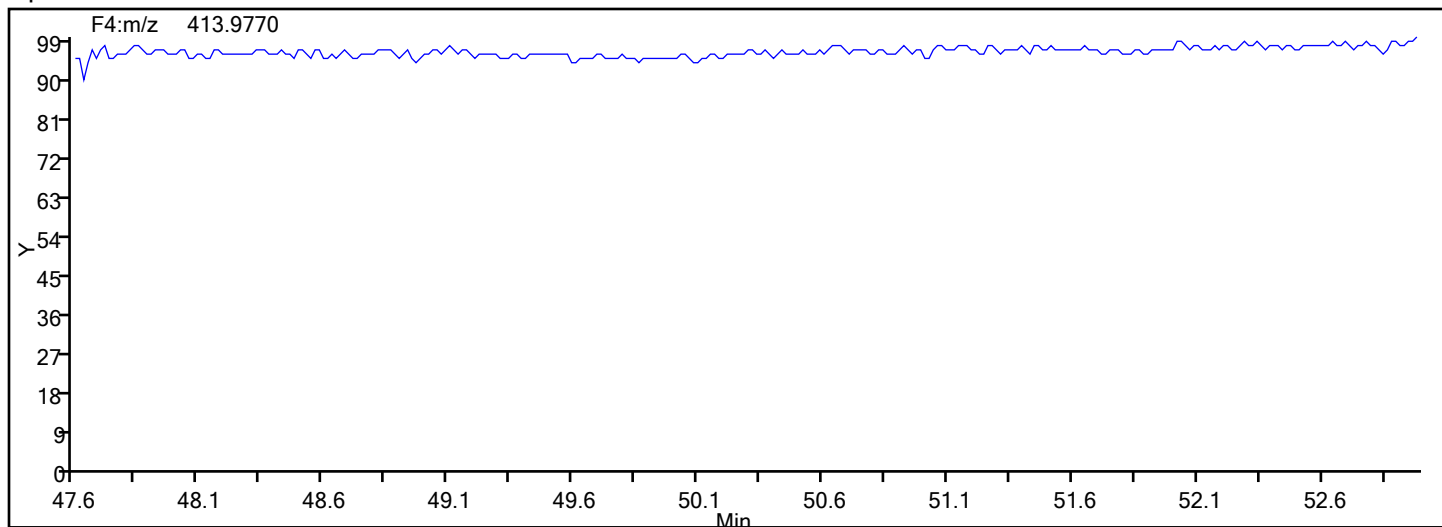
Column Type:

Column Dia:

HpCDF



HpCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

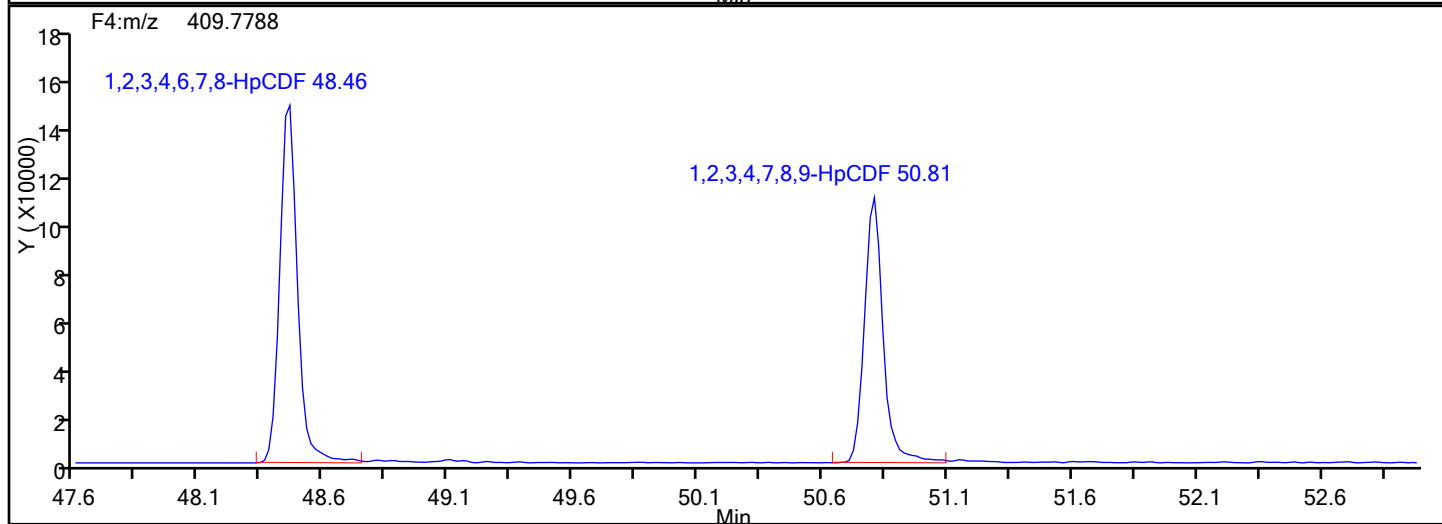
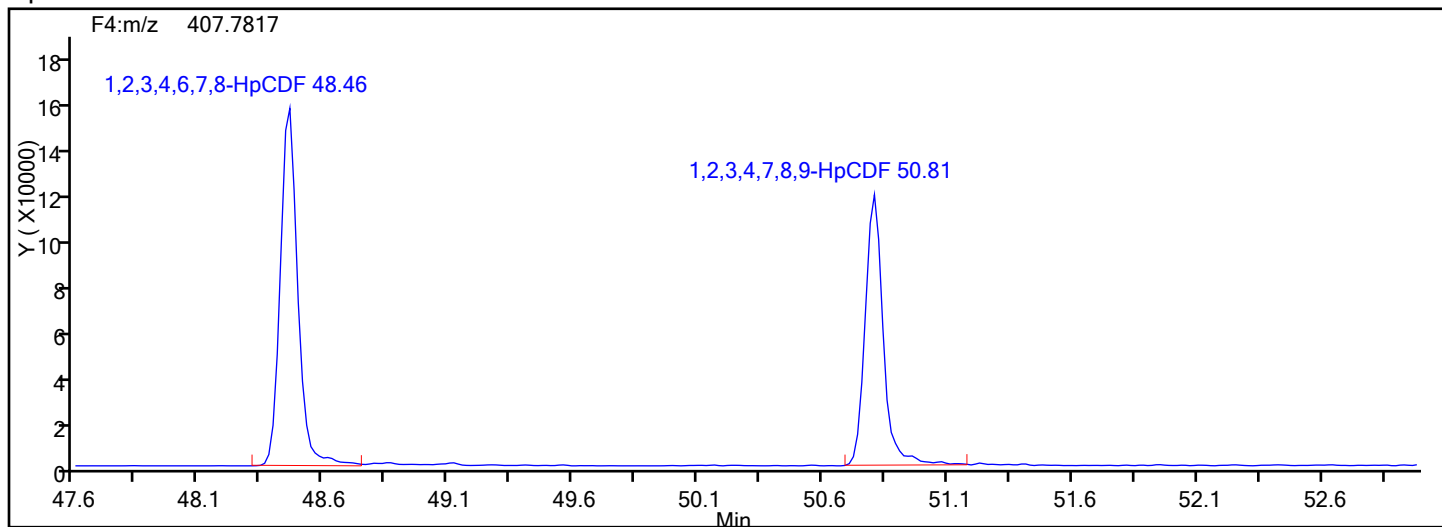
Worklist#: 7768

Sample Line#: 3

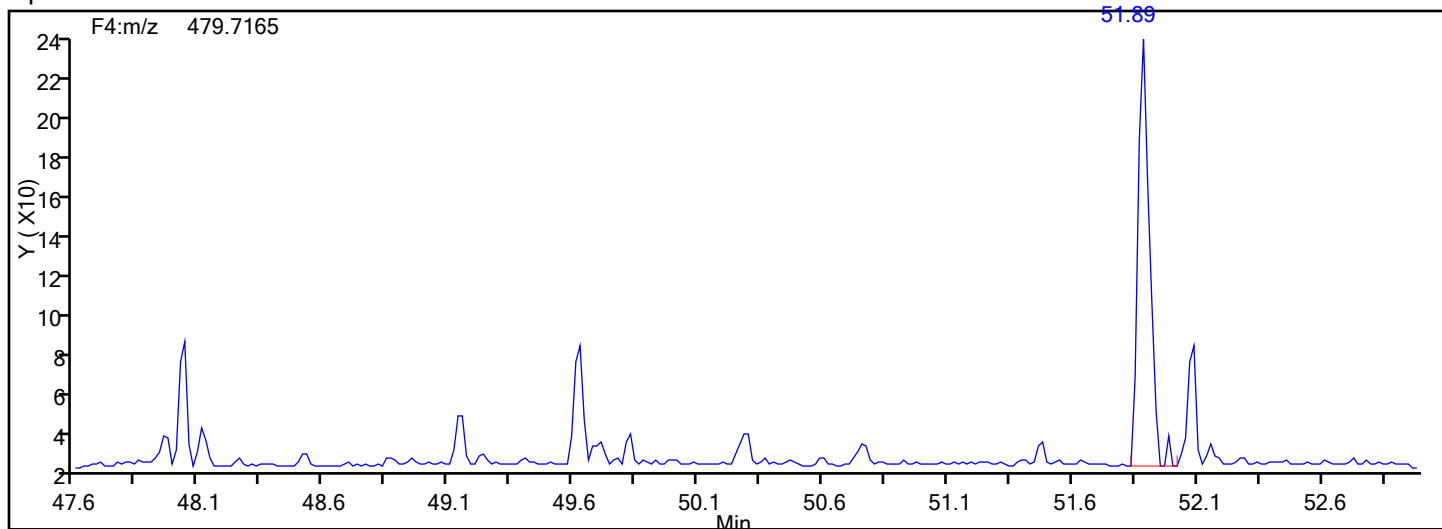
Column Type:

Column Dia:

HpCDF



HpCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

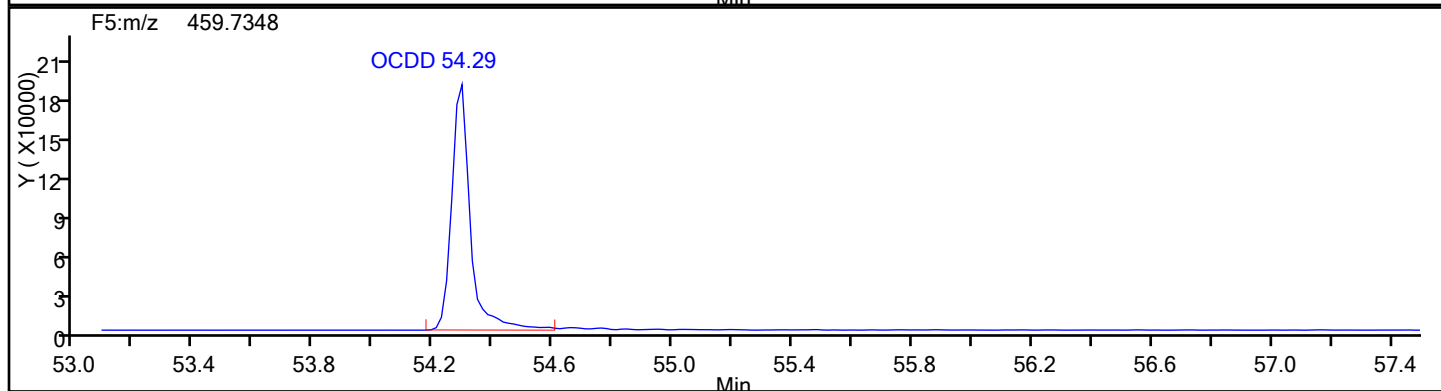
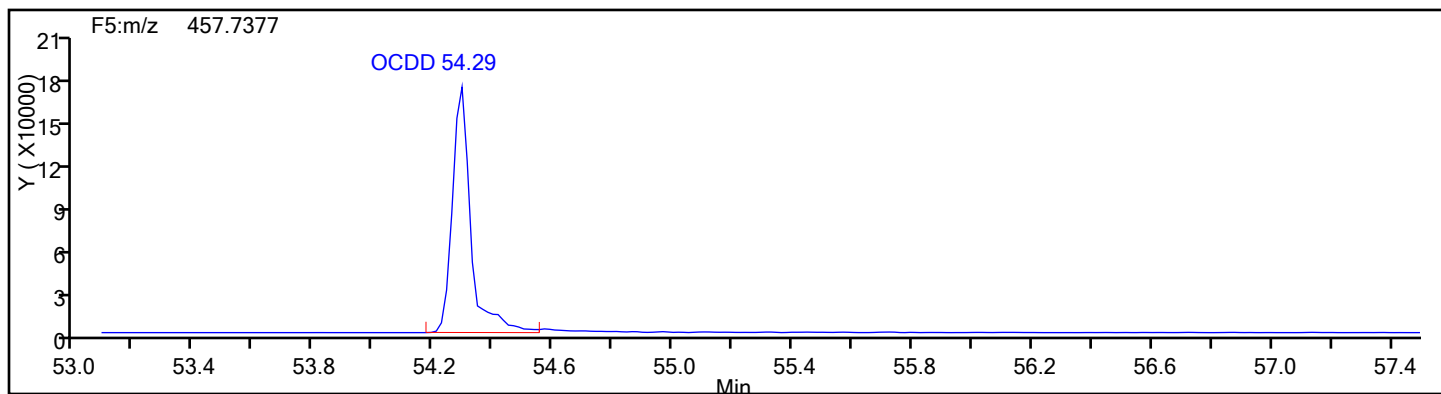
Worklist#: 7768

Sample Line#: 3

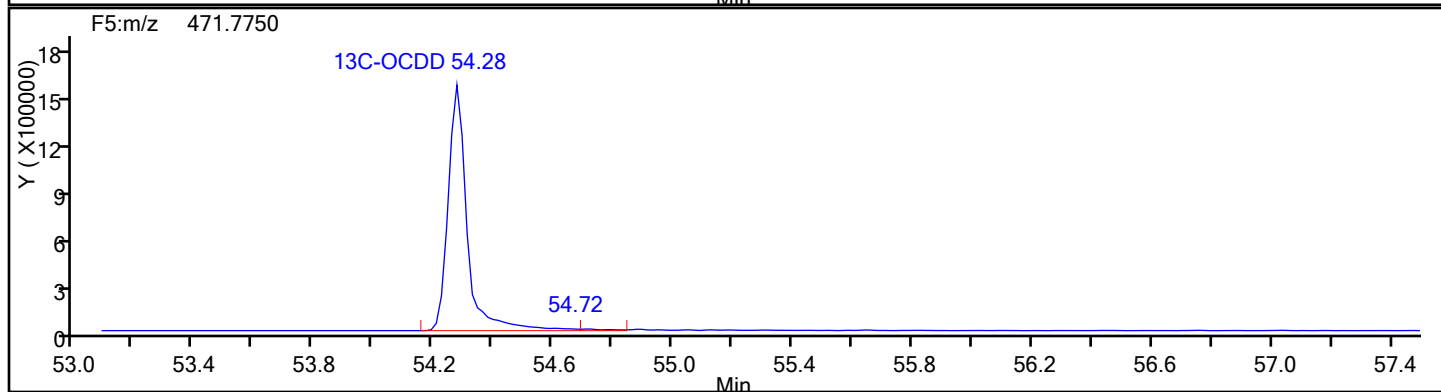
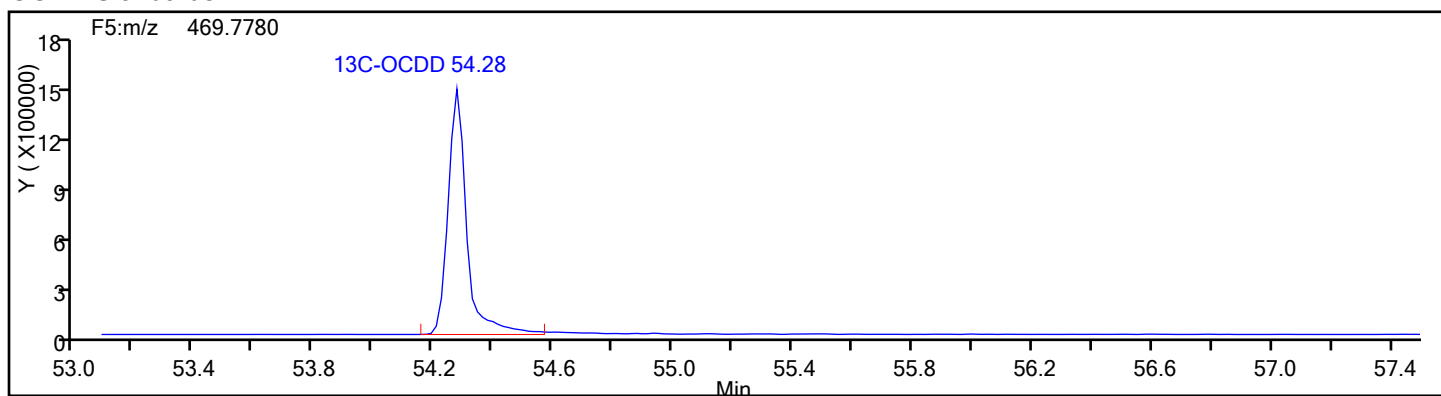
Column Type:

Column Dia:

OCDD



OCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

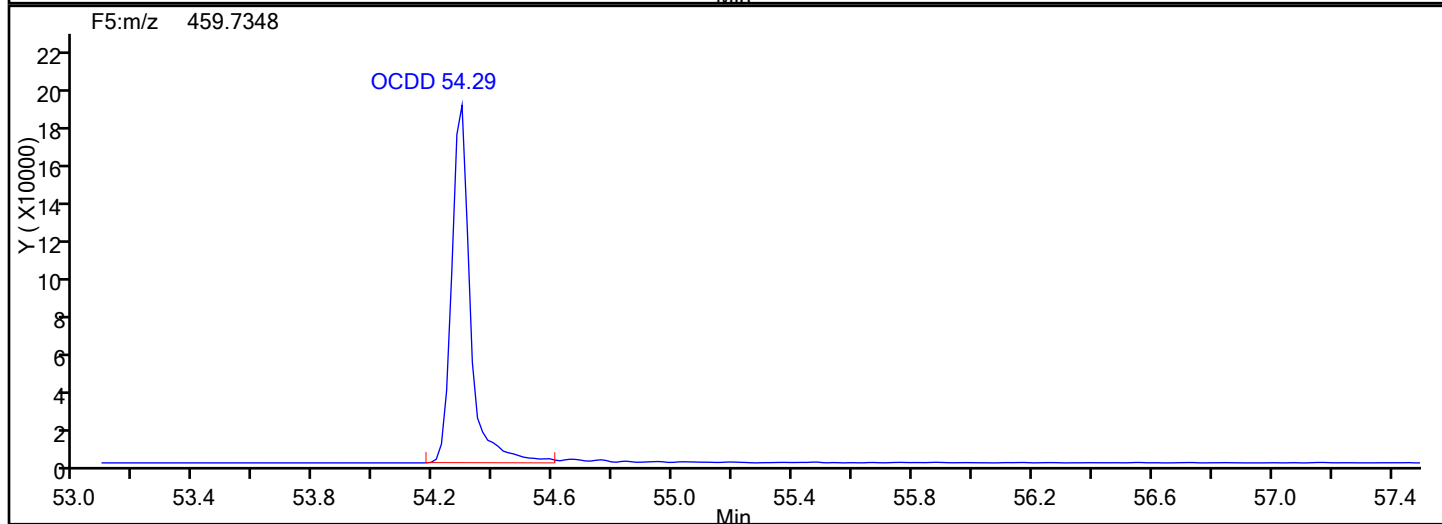
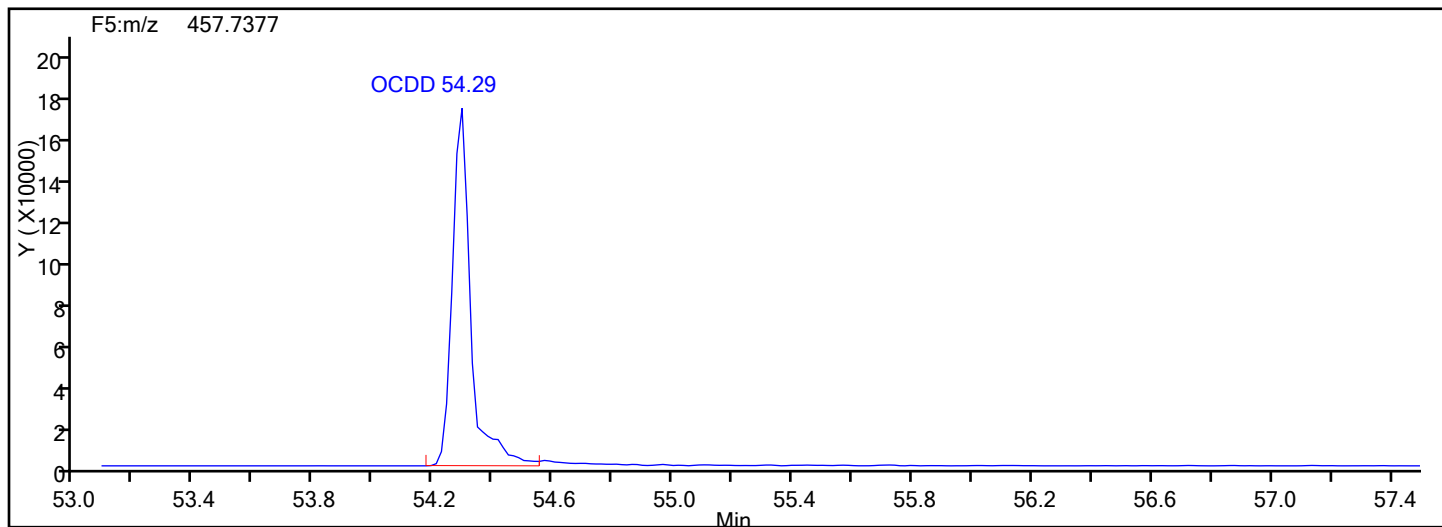
Worklist#: 7768

Sample Line#: 3

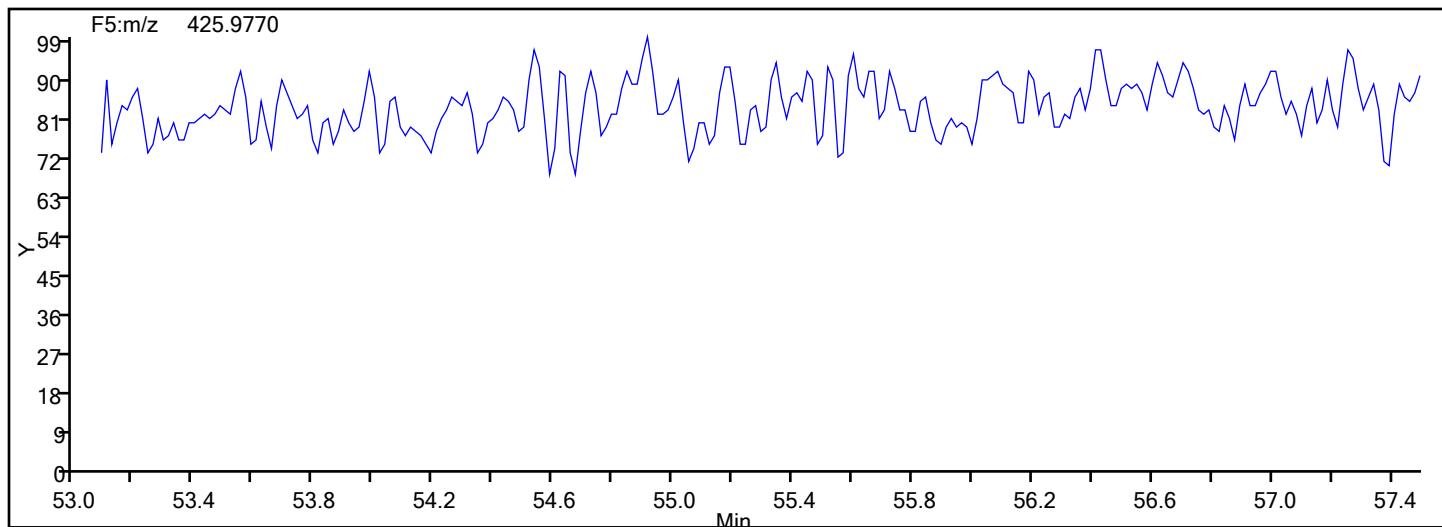
Column Type:

Column Dia:

OCDD



OCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

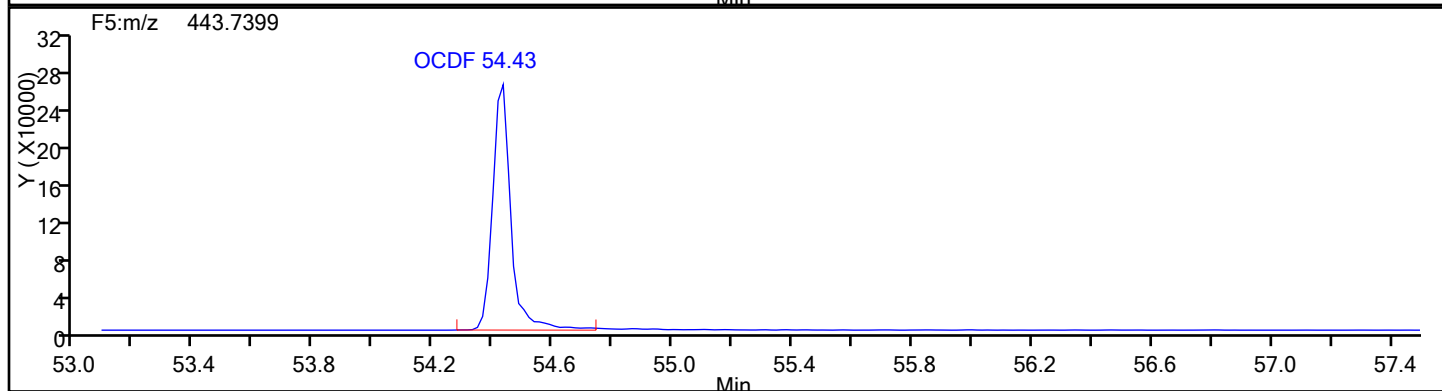
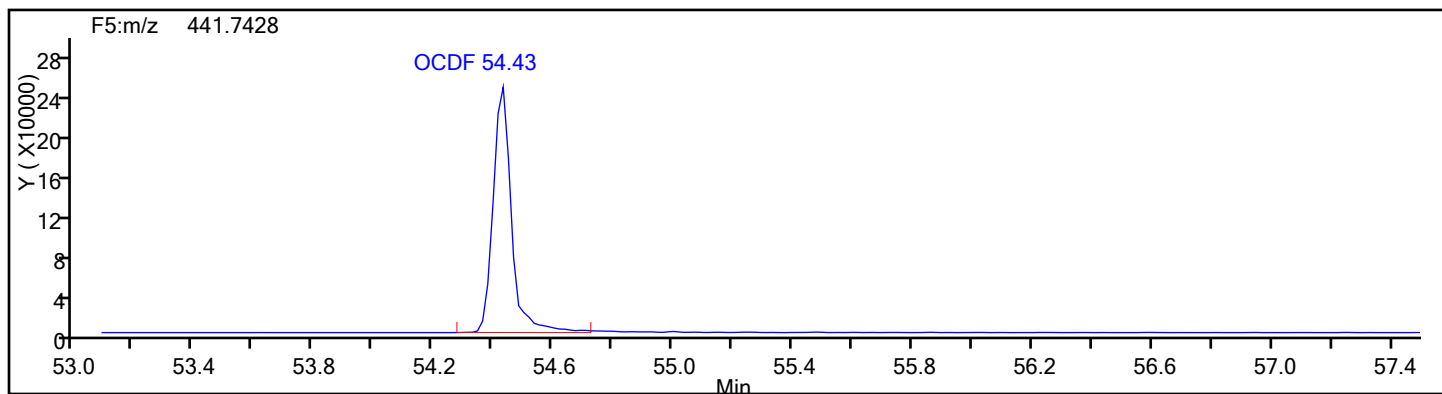
Worklist#: 7768

Sample Line#: 3

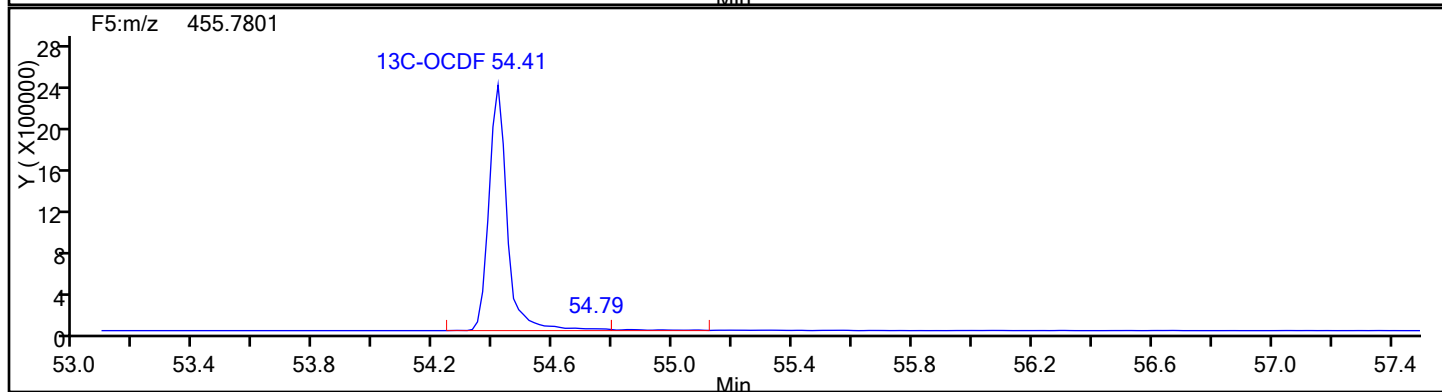
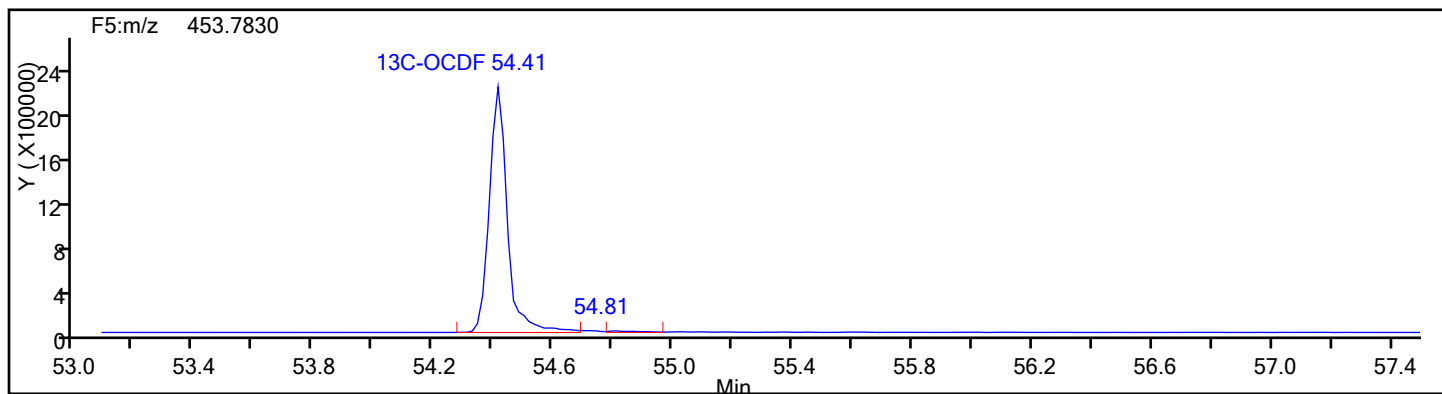
Column Type:

Column Dia:

OCDF



OCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

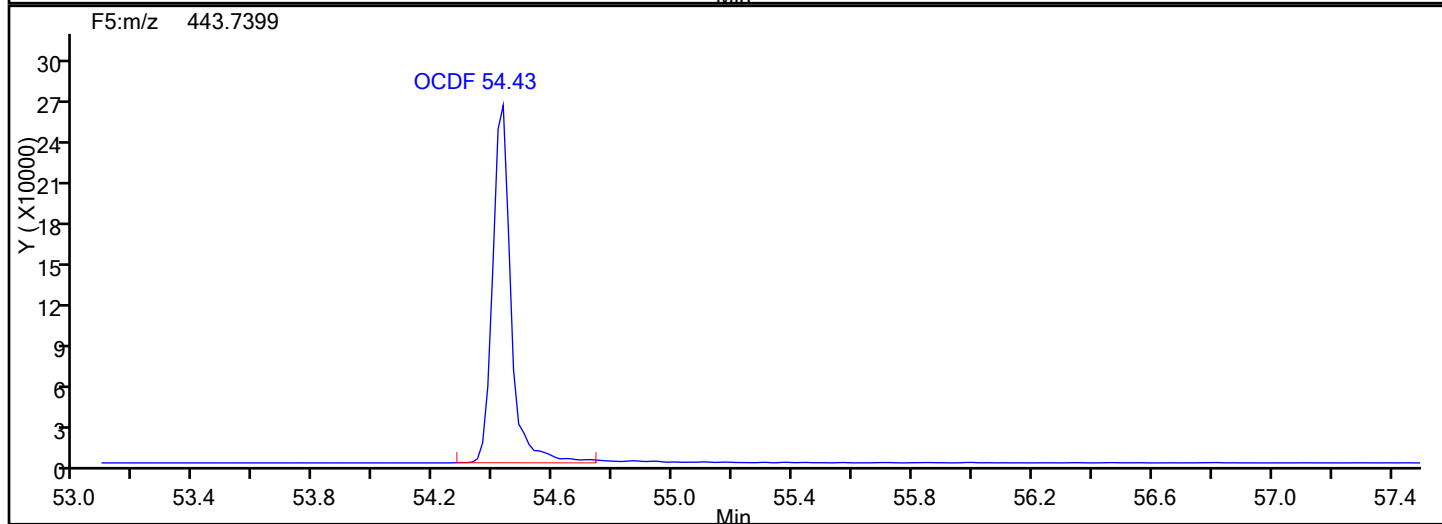
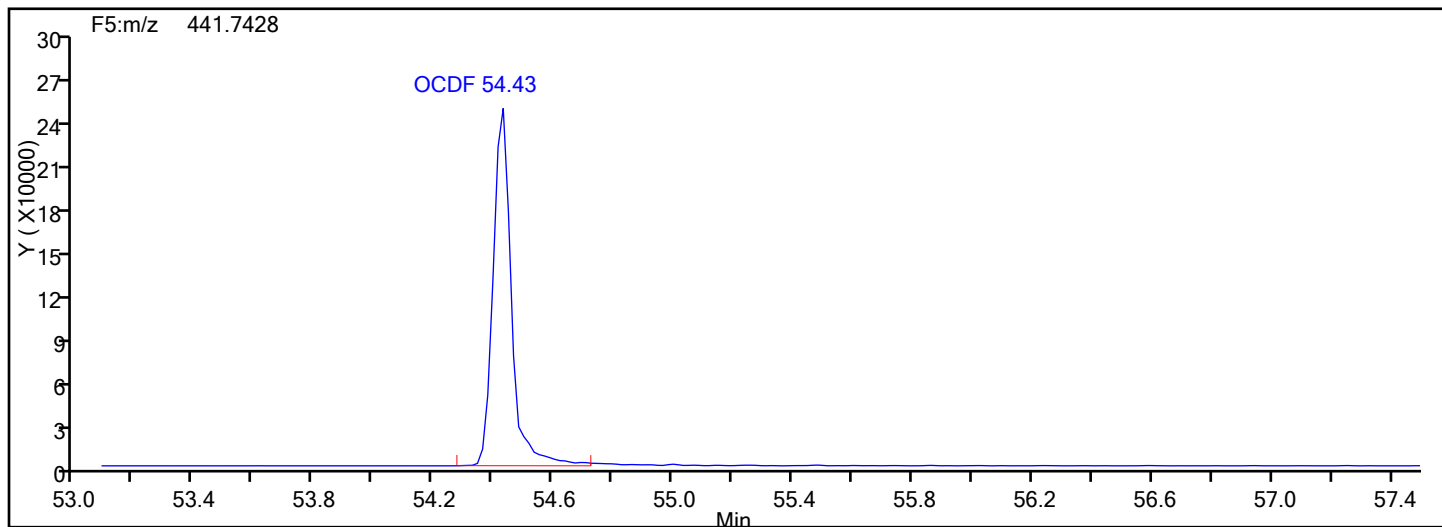
Worklist#: 7768

Sample Line#: 3

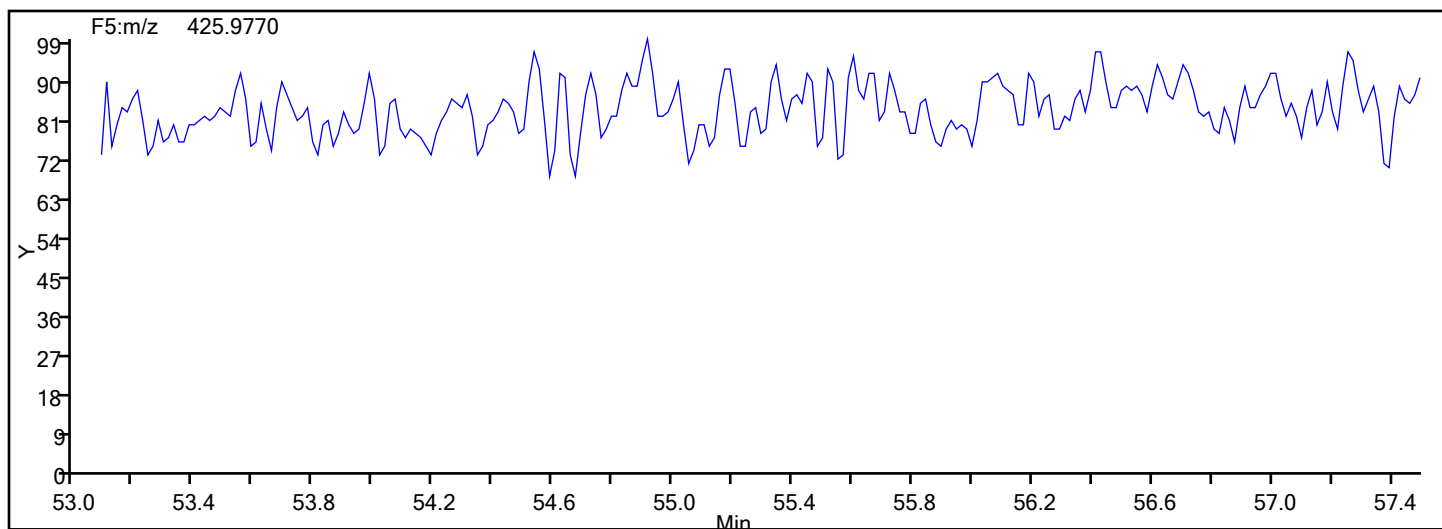
Column Type:

Column Dia:

OCDF



OCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i2.d

Injection Date: 16-May-2014 15:26:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

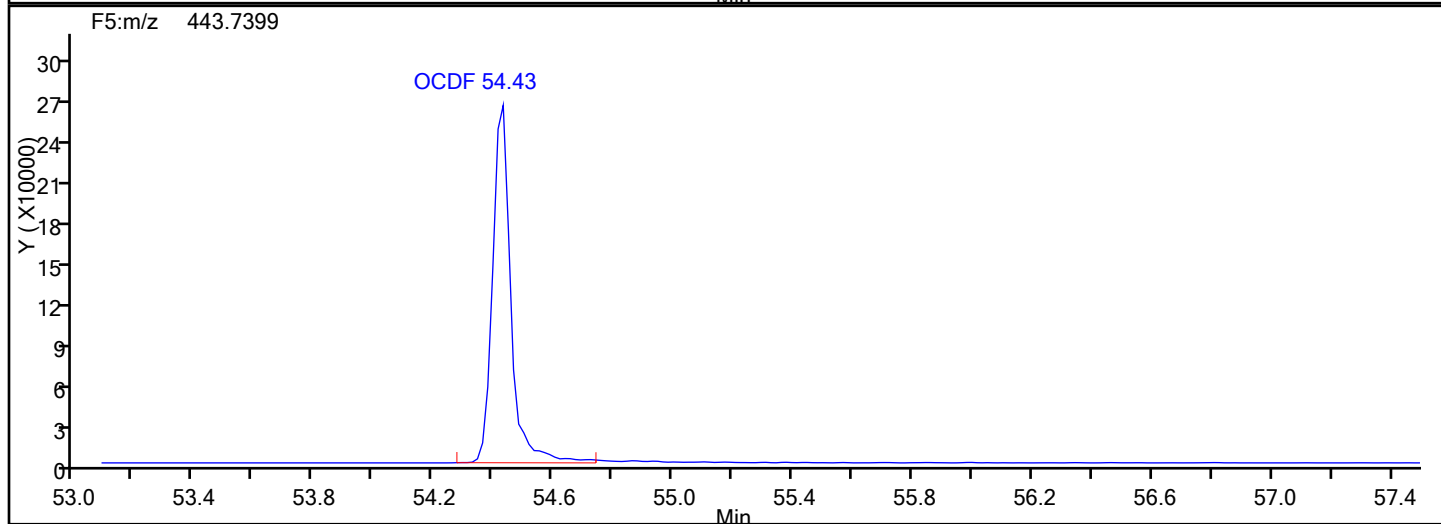
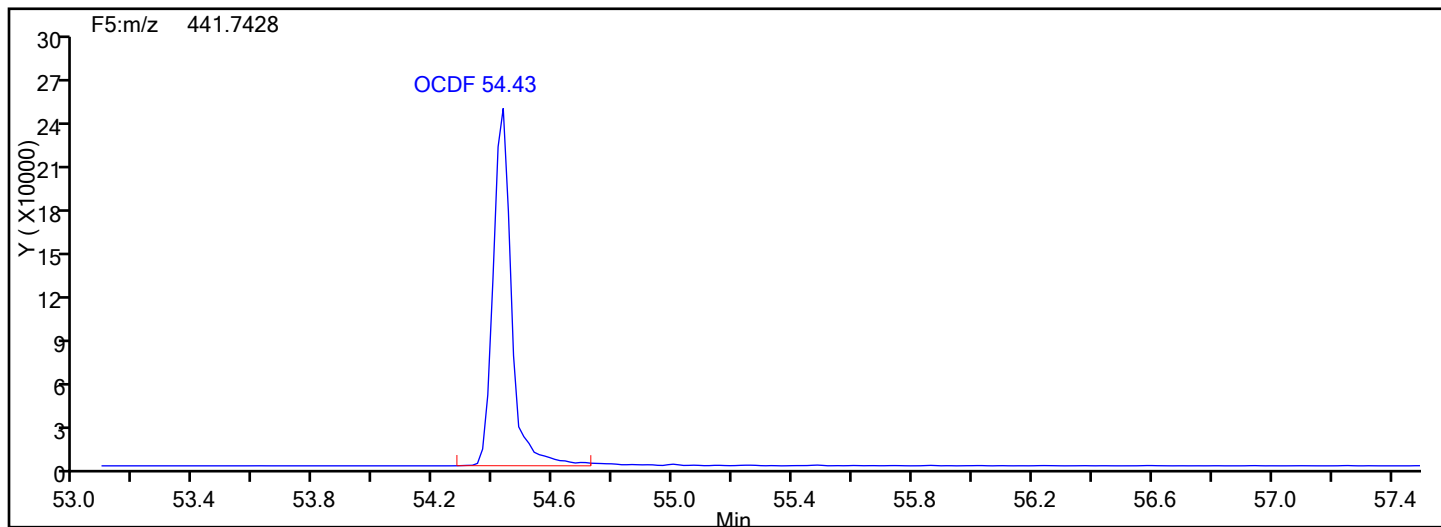
Worklist#: 7768

Sample Line#: 3

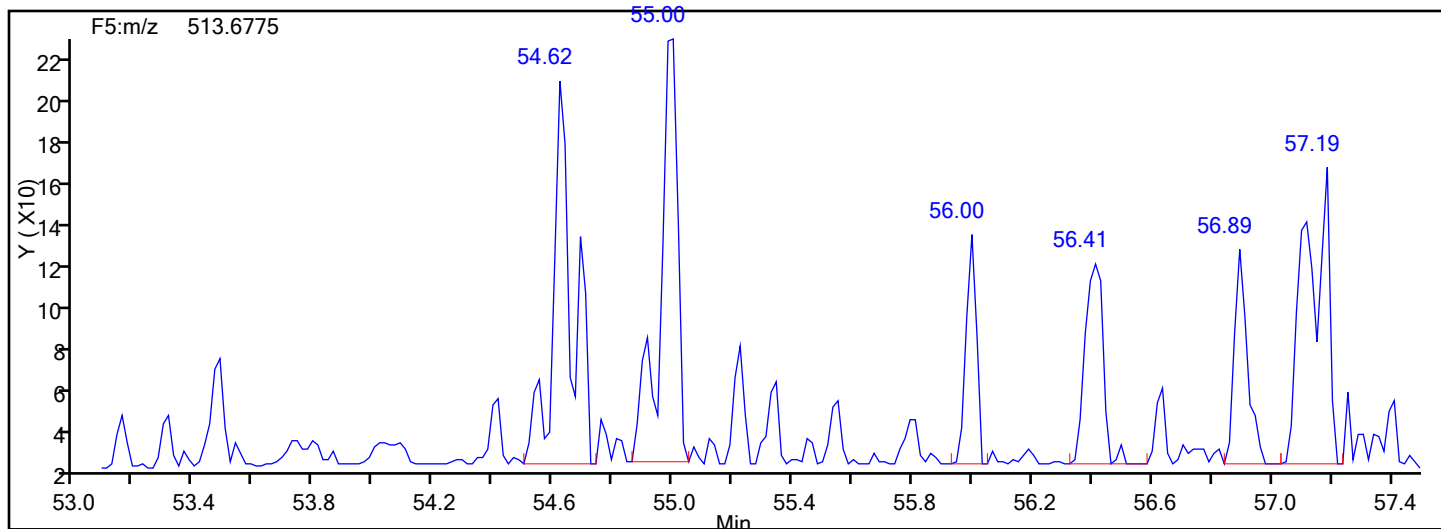
Column Type:

Column Dia:

OCDF



OCDF Interference Mass



TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 16-May-2014 16:27:00 ALS Bottle#: 0 Worklist Smp#: 4
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs3 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:10:05 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:14:19

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31.838	1103093	0.77	1.1733	9.782	9.782	0.0261	0.0261	97.82	
A Non-2,3,7,8-sub-TCDD	30.308	4111	0.77	0.0000						RQ
S Total TCDD					9.782	9.782	0.0261	0.0261		RQ
2,3,7,8-TCDF	29.760	1699244	0.79	1.0881	9.890	9.890	0.0284	0.0284	98.90	
A Non-2,3,7,8-sub-TCDF	28.995	15857	0.77	0.0000						
S Total TCDF					9.890	9.890	0.0284	0.0284		
1,2,3,7,8-PeCDD	41.015	3815716	1.56	1.0434	48.5	48.5	0.0582	0.0582	96.92	
A Non-2,3,7,8-sub-PeCDD	39.915						0.0	0.0		
S Total PeCDD					48.5	48.5	0.0582	0.0582		
1,2,3,7,8-PeCDF	39.293	6951995	1.58	1.1898	48.1	48.1	0.1888	0.1888	96.21	
2,3,4,7,8-PeCDF	40.499	6512875	1.58	1.1095	48.5	48.5	0.1814	0.1814	97.01	
A Non-2,3,7,8-sub-PeCDF	38.623						0.0	0.0		
S Total PeCDF					96.6	96.6	0.1851	0.1851		
1,2,3,4,7,8-HxCDD	45.248	4731492	1.27	1.1409	49.1	49.1	0.1073	0.1073	98.27	
1,2,3,6,7,8-HxCDD	45.366	5069185	1.26	1.1481	49.6	49.6	0.1128	0.1128	99.12	
1,2,3,7,8,9-HxCDD	45.754	5184383	1.28	1.2212	48.9	48.9	0.1031	0.1031	97.88	
A Non-2,3,7,8-sub-HxCDD	44.687						0.0	0.0		
S Total HxCDD					147.6	147.6	0.1078	0.1078		
1,2,3,4,7,8-HxCDF	44.202	7655800	1.25	1.3629	48.6	48.6	0.1512	0.1512	97.14	
1,2,3,6,7,8-HxCDF	44.337	8864531	1.21	1.2762	48.4	48.4	0.1440	0.1440	96.74	
2,3,4,6,7,8-HxCDF	45.063	7899628	1.25	1.2654	48.4	48.4	0.1570	0.1570	96.75	
1,2,3,7,8,9-HxCDF	46.024	7126497	1.26	1.2573	49.0	49.0	0.2044	0.2044	98.07	
A Non-2,3,7,8-sub-HxCDF	44.552						0.0	0.0		
S Total HxCDF					194.3	194.3	0.1642	0.1642		
1,2,3,4,6,7,8-HpCDD	50.178	4285504	1.05	1.1204	49.5	49.5	0.1647	0.1647	99.02	
A Non-2,3,7,8-sub-HpCDD	49.566						0.0	0.0		
S Total HpCDD					49.5	49.5	0.1647	0.1647		
1,2,3,4,6,7,8-HpCDF	48.458	7340131	1.05	1.4984	48.5	48.5	0.1652	0.1652	97.00	
1,2,3,4,7,8,9-HpCDF	50.819	5736971	1.07	1.3807	48.6	48.6	0.2252	0.2252	97.15	

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
A Non-2,3,7,8-sub-HpCDF	49.625						0.0	0.0		
S Total HpCDF					97.1	97.1	0.1952	0.1952		
OCDD	54.290	7672456	0.90	1.2073	99.1	99.1	0.1333	0.1333	99.09	
OCDF	54.428	10665891	0.91	1.1162	98.2	98.2	0.1095	0.1095	98.17	
D 13C-2,3,7,8-TCDD	31.788	9611208	0.81	1.0709	98.8	98.8	0.2864	0.2864	98.79	
D 13C-2,3,7,8-TCDF	29.727	15790178	0.81	1.7545	99.1	99.1	0.1594	0.1594	99.07	
D 13C-1,2,3,7,8-PeCDD	40.998	7546076	1.58	0.8743	95.0	95.0	0.3704	0.3704	95.01	
D 13C-1,2,3,7,8-PeCDF	39.276	12146075	1.57	1.3704	97.6	97.6	0.3207	0.3207	97.56	
D 13C-2,3,4,7,8-PeCDF	40.481	12102314	1.58	1.3837	96.3	96.3	0.3176	0.3176	96.28	
D 13C-1,2,3,4,7,8-HxCDD	45.231	8441043	1.24	0.8772	100.1	100.1	0.2048	0.2048	100	
D 13C-1,2,3,6,7,8-HxCDD	45.350	8908892	1.26	0.9171	101.0	101.0	0.1959	0.1959	101	
D 13C-1,2,3,4,7,8-HxCDF	44.185	11565241	0.52	1.1892	101.1	101.1	0.1596	0.1596	101	
D 13C-1,2,3,6,7,8-HxCDF	44.320	14360417	0.53	1.4625	102.1	102.1	0.1298	0.1298	102	
D 13C-2,3,4,6,7,8-HxCDF	45.046	12905207	0.55	1.3197	101.7	101.7	0.1438	0.1438	102	
D 13C-1,2,3,7,8,9-HxCDF	46.007	11559055	0.54	1.2001	100.2	100.2	0.1581	0.1581	100	
D 13C-1,2,3,4,6,7,8-HpCDD	50.161	7725803	1.10	0.8155	98.5	98.5	0.3117	0.3117	98.52	
D 13C-1,2,3,4,6,7,8-HpCDF	48.441	10100696	0.44	1.0496	100.1	100.1	0.1758	0.1758	100	
D 13C-1,2,3,4,7,8,9-HpCDF	50.786	8553669	0.45	0.8947	99.4	99.4	0.2063	0.2063	99.41	
D 13C-OCDD	54.290	12827376	0.92	0.7044	189.4	189.4	0.1987	0.1987	94.68	
D 13C-OCDF	54.428	19467909	0.91	1.0615	190.7	190.7	0.0917	0.0917	95.36	
\$ 37Cl4-2,3,7,8-TCDD	31.838	1078771		1.2266	9.682	9.682	0.0207	0.0207	96.82	
* 13C-1,2,3,4-TCDD	31.273	9084255	0.81	9.1E+04	100.0	100.0				
* 13C-1,2,3,7,8,9-HxCDD	45.737	9616646	1.27	1E+05	100.0	100.0				

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

Reagents:

61L31613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 16-May-2014 16:27:00 ALS Bottle#: 0 Worklist Smp#: 4
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs3 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:10:05 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:14:19

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,7,8-TCDD											
319.8965	31.838	31.838	0	1.002	480461	49145	43	107	1143		
321.8936	31.855	31.838	1	1.002	622632	66067	74	185	893	0.77(0.65-0.89)	
A Non-2,3,7,8-sub-TCDD											RQ
319.8965	29.744	30.308	-34		2139	497	43	107	12		
321.8936	29.727	30.308	-35		2323	402	74	185	5	0.92(0.65-0.89)	
2,3,7,8-TCDF											
303.9016	29.760	29.760	0	1.001	751447	84906	105	262	809		
305.8987	29.777	29.760	1	1.002	947797	110203	112	280	984	0.79(0.65-0.89)	
A Non-2,3,7,8-sub-TCDF											
303.9016	28.613	28.995	-23		6903	985	105	262	9		
305.8987	28.597	28.995	-24		8954	1096	112	280	10	0.77(0.65-0.89)	
1,2,3,7,8-PeCDD											
355.8546	41.015	41.015	0	1.000	2326577	552471	233	582	2371		
357.8516	41.015	41.015	0	1.000	1489139	361545	206	515	1755	1.56(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDD											
355.8546	39.915						233	582			
357.8516	39.915						206	515			
1,2,3,7,8-PeCDF											
339.8597	39.293	39.293	0	1.000	4258824	875314	1384	3460	632		
341.8567	39.293	39.293	0	1.000	2693171	549312	886	2215	620	1.58(1.32-1.78)	
2,3,4,7,8-PeCDF											
339.8597	40.499	40.499	0	1.000	3984815	919843	1384	3460	665		
341.8567	40.499	40.499	0	1.000	2528060	588273	886	2215	664	1.58(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-PeCDF											
339.8597	38.623						1384	3460			
341.8567	38.623						886	2215			
1,2,3,4,7,8-HxCDD											
389.8158	45.248	45.248	0	1.000	2647565	694895	543	1357	1280		
391.8127	45.248	45.248	0	1.000	2083927	528569	537	1342	984	1.27(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45.366	45.366	0	1.000	2830045	671380	543	1357	1236		
391.8127	45.366	45.366	0	1.000	2239140	528504	537	1342	984	1.26(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45.754	45.754	0	1.012	2909461	665096	543	1357	1225		
391.8127	45.754	45.754	0	1.012	2274922	515784	537	1342	960	1.28(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDD											
389.8158	44.687						543	1357			
391.8127	44.687						537	1342			
1,2,3,4,7,8-HxCDF											
373.8208	44.202	44.202	0	1.000	4252364	1152533	1361	3402	847		
375.8178	44.202	44.202	0	1.000	3403436	889291	1188	2970	749	1.25(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44.337	44.337	0	1.000	4852548	1177511	1361	3402	865		
375.8178	44.337	44.337	0	1.000	4011983	951434	1188	2970	801	1.21(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	45.063	45.063	0	1.000	4384591	1096858	1361	3402	806		
375.8178	45.063	45.063	0	1.000	3515037	885868	1188	2970	746	1.25(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	46.024	46.024	0	1.000	3973060	857029	1361	3402	630		
375.8178	46.024	46.024	0	1.000	3153437	697338	1188	2970	587	1.26(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDF											
373.8208	44.552						1361	3402			
375.8178	44.552						1188	2970			
1,2,3,4,6,7,8-HpCDD											
423.7767	50.178	50.178	0	1.000	2192332	417062	552	1380	756		
425.7737	50.178	50.178	0	1.000	2093172	396316	526	1315	753	1.05(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											
423.7767	49.566						552	1380			
425.7737	49.566						526	1315			
1,2,3,4,6,7,8-HpCDF											
407.7817	48.458	48.458	0	1.000	3763417	750457	1020	2550	736		
409.7788	48.458	48.458	0	1.000	3576714	728511	1018	2545	716	1.05(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50.819	50.819	0	1.001	2966508	567063	1020	2550	556		
409.7788	50.802	50.819	-1	1.000	2770463	540488	1018	2545	531	1.07(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDF											
407.7817	49.625						1020	2550			
409.7788	49.625						1018	2545			

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
OCDD											
457.7377	54.290	54.290	0	1.000	3630135	798190	388	970	2057		
459.7348	54.290	54.290	0	1.000	4042321	922514	517	1292	1784	0.90(0.76-1.02)	
OCDF											
441.7428	54.428	54.428	0	1.000	5087486	1187618	419	1047	2834		
443.7399	54.428	54.428	0	1.000	5578405	1325319	670	1675	1978	0.91(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	31.788	31.788	0	1.016	4294516	424380	700	1750	606		
333.9338	31.788	31.788	0	1.016	5316692	529219	507	1267	1044	0.81(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	29.727	29.727	0	0.951	7044515	770657	604	1510	1276		
317.9389	29.727	29.727	0	0.951	8745663	984510	496	1240	1985	0.81(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40.998	40.998	0	1.311	4626247	1112265	908	2270	1225		
369.8919	40.998	40.998	0	1.311	2919829	692726	366	915	1893	1.58(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	39.276	39.276	0	1.256	7420185	1556852	666	1665	2338		
353.8970	39.276	39.276	0	1.256	4725890	969806	1063	2657	912	1.57(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40.481	40.481	0	1.294	7402612	1733324	666	1665	2603		
353.8970	40.481	40.481	0	1.294	4699702	1085674	1063	2657	1021	1.58(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	45.231	45.231	0	0.989	4677745	1212495	788	1970	1539		
403.8529	45.231	45.231	0	0.989	3763298	992262	766	1915	1295	1.24(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45.350	45.350	0	0.992	4971028	1147081	788	1970	1456		
403.8529	45.350	45.350	0	0.992	3937864	936939	766	1915	1223	1.26(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	44.185	44.185	0	0.966	3971124	1055768	658	1645	1605		
385.8610	44.185	44.185	0	0.966	7594117	2035527	984	2460	2069	0.52(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	44.320	44.320	0	0.969	4988721	1221360	658	1645	1856		
385.8610	44.320	44.320	0	0.969	9371696	2246658	984	2460	2283	0.53(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	45.046	45.046	0	0.985	4567426	1141229	658	1645	1734		
385.8610	45.046	45.046	0	0.985	8337781	2065196	984	2460	2099	0.55(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	46.007	46.007	0	1.006	4038510	860411	658	1645	1308		
385.8610	46.007	46.007	0	1.006	7520545	1619371	984	2460	1646	0.54(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	50.161	50.161	0	1.097	4048454	764293	960	2400	796		
437.8140	50.161	50.161	0	1.097	3677349	696523	1239	3097	562	1.10(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48.441	48.441	0	1.059	3071353	632983	814	2035	778		
419.8220	48.441	48.441	0	1.059	7029343	1424811	783	1957	1820	0.44(0.51-0.37)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50.786	50.786	0	1.110	2665351	503859	814	2035	619		
419.8220	50.786	50.786	0	1.110	5888318	1134602	783	1957	1449	0.45(0.37-0.51)	
13C-OCDD											
469.7780	54.290	54.290	0	1.187	6153472	1344000	630	1575	2133		
471.7750	54.290	54.290	0	1.187	6673904	1466401	581	1452	2524	0.92(0.76-1.02)	
13C-OCDF											
453.7830	54.428	54.428	0	1.190	9258160	2101172	434	1085	4841		
455.7801	54.428	54.428	0	1.190	10209749	2351742	408	1020	5764	0.91(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31.838	31.838	0	1.018	1078771	110043	100	250	1100		
13C-1,2,3,4-TCDD											
331.9368	31.273	31.273	0		4054750	419797	700	1750	600		
333.9338	31.273	31.273	0		5029505	563740	507	1267	1112	0.81(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45.737	45.737	0		5389374	1212839	788	1970	1539		
403.8529	45.737	45.737	0		4227272	949970	766	1915	1240	1.27(1.05-1.43)	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Reagents:

61L31613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d
 Lims ID: IC L3
 Client ID:
 Inject. Date: 16-May-2014 16:27:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 3
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 4
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDD, RT: 30.308

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	319.8965 Area	319.8965 Height	321.8936 Area	321.8936 Height	Amount	Ratio	Flags
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29.744 2139 497 2323 402 0.92 Rn

Signal Totals:

2139 497 2323 402

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
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4462 899 0.92 RQ

4111 711 Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (4462 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (4111 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d
 Lims ID: IC L3
 Client ID:
 Inject. Date: 16-May-2014 16:27:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 3
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 4
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDF, RT: 28.995

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
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28.613 6903 985 8954 1096 0.77 n

Signal Totals:

6903 985 8954 1096

Total Responses:

Rx Area	Rx Height	Amount	Ratio	Flags
15857	2081		0.77	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (15857 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

n - Failed Sig-To-Noise Test

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

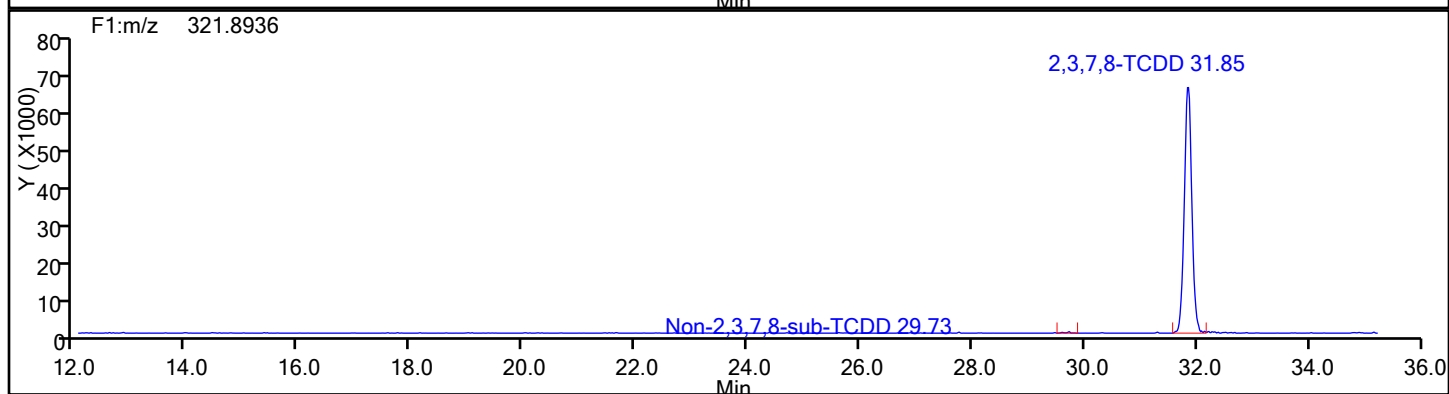
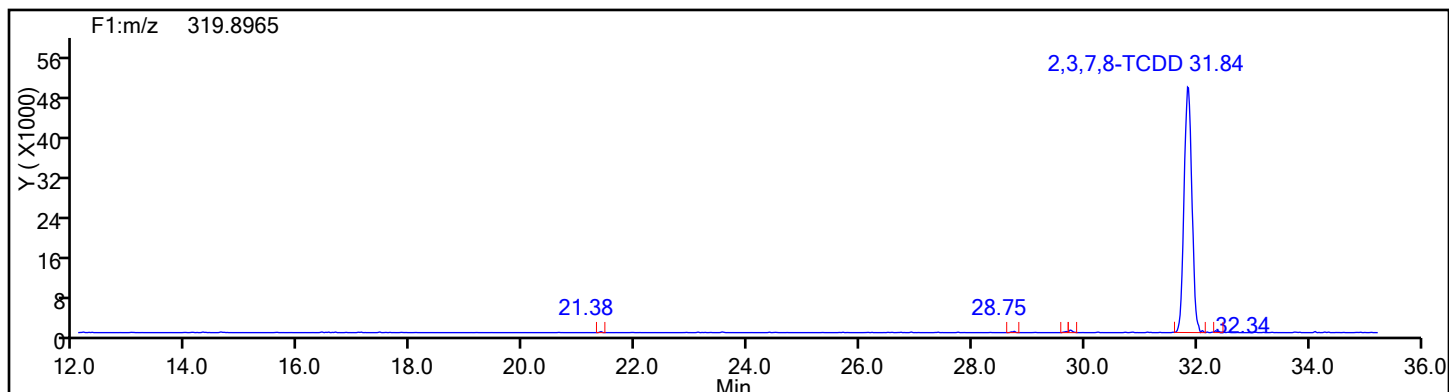
Worklist#: 7768

Sample Line#: 4

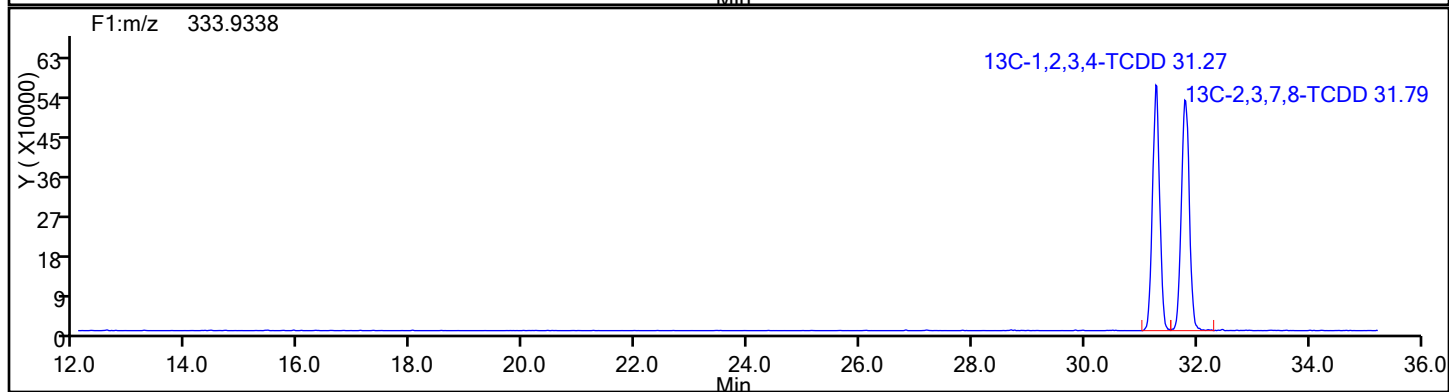
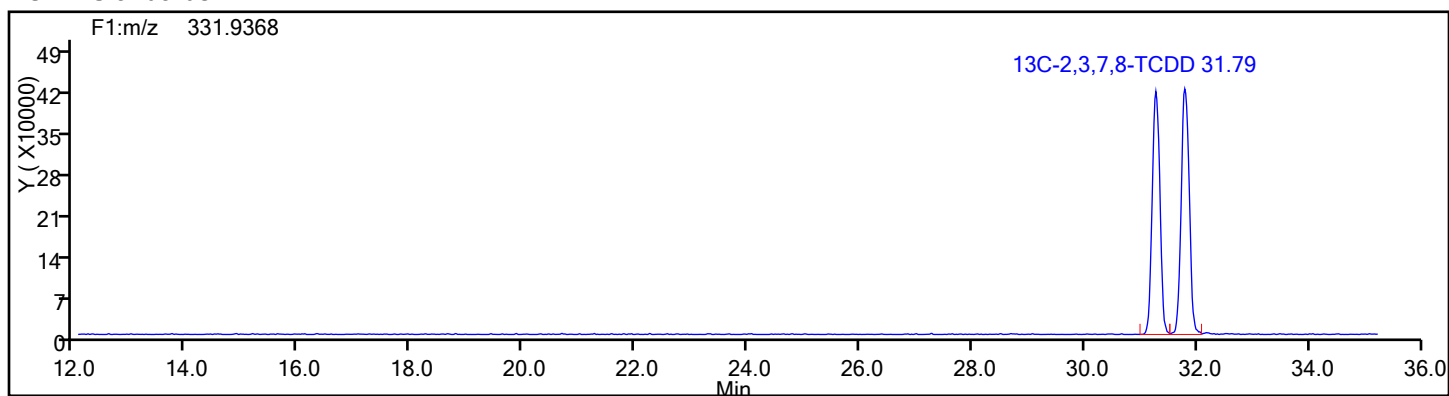
Column Type:

Column Dia:

TCDD

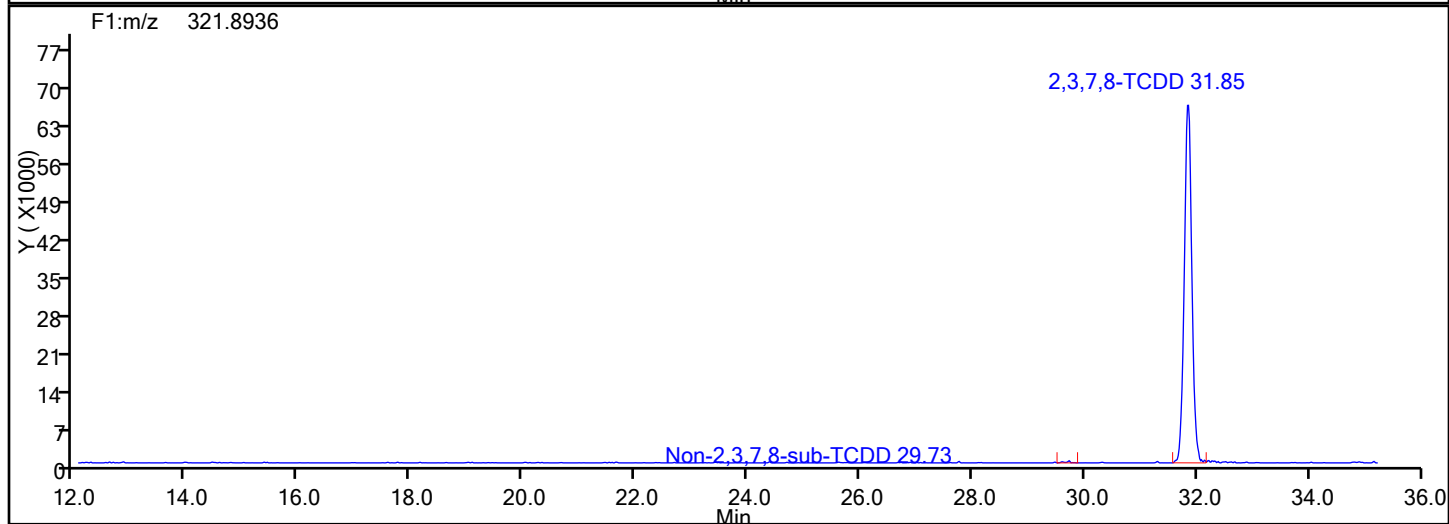
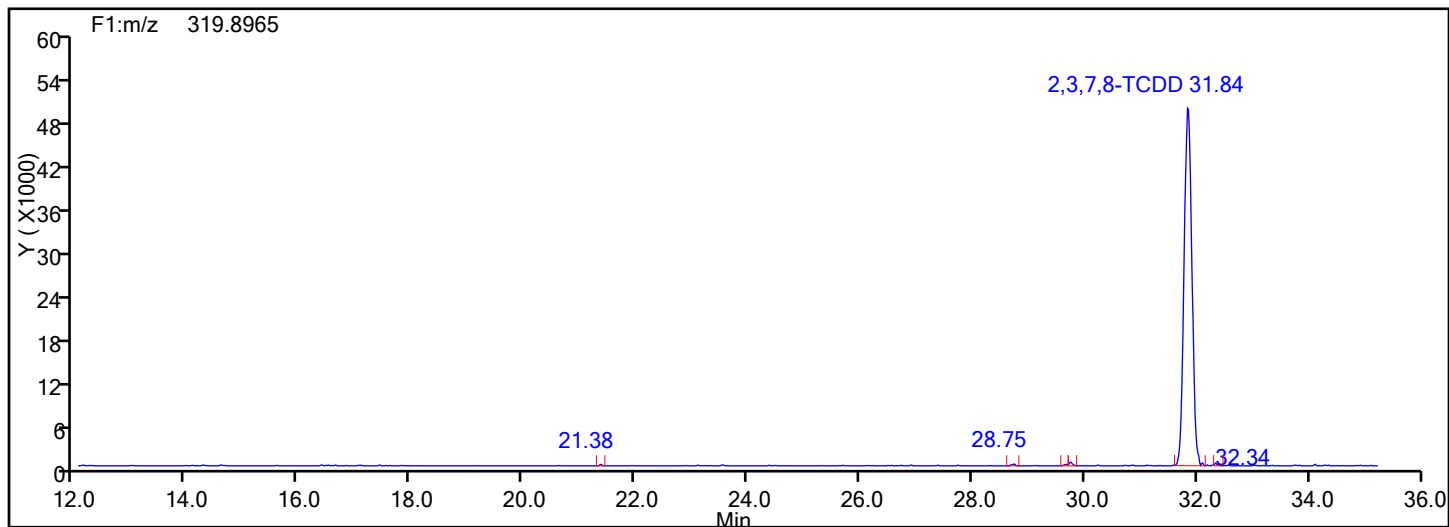


TCDD Standards

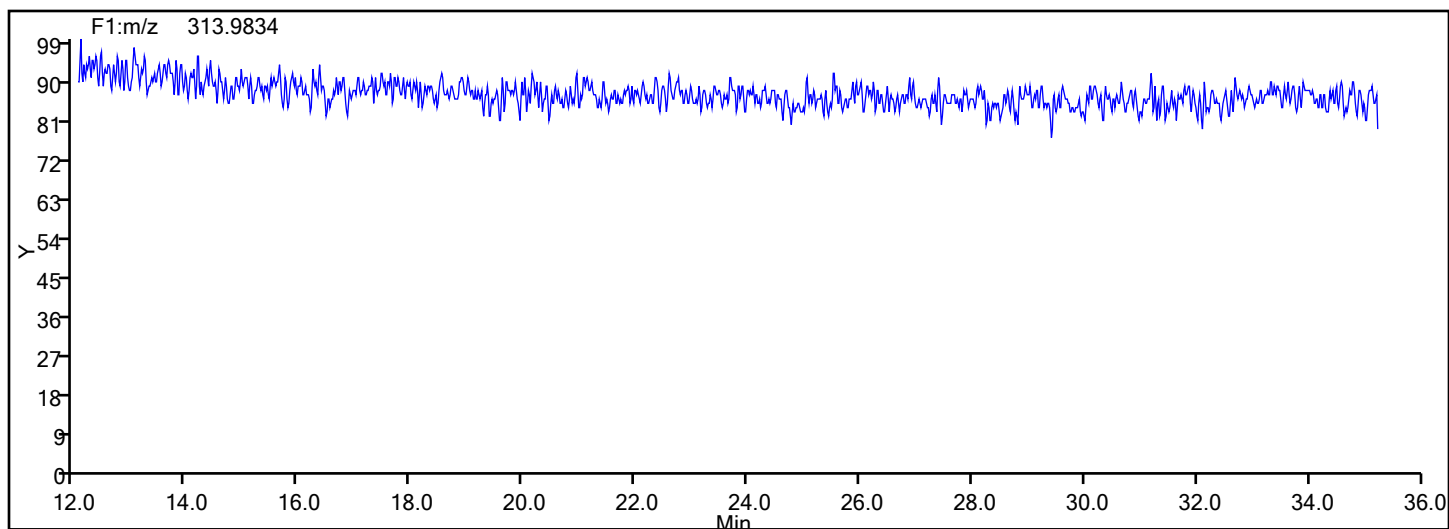


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d
Injection Date: 16-May-2014 16:27:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 4
Column Type: Column Dia:
TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

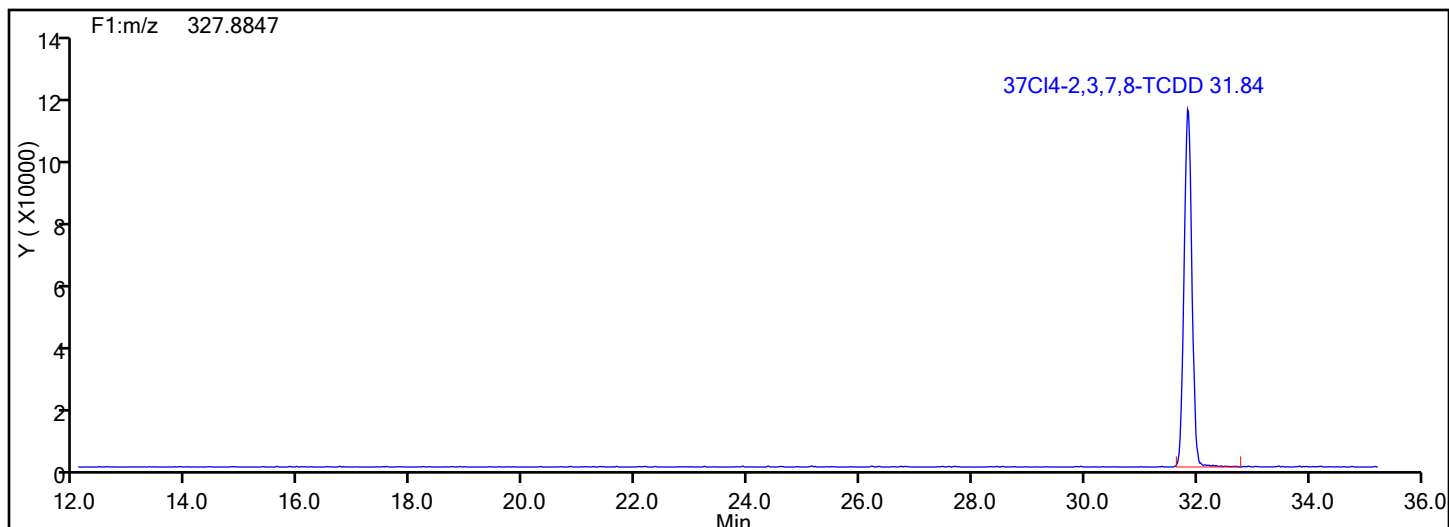
Worklist#: 7768

Sample Line#: 4

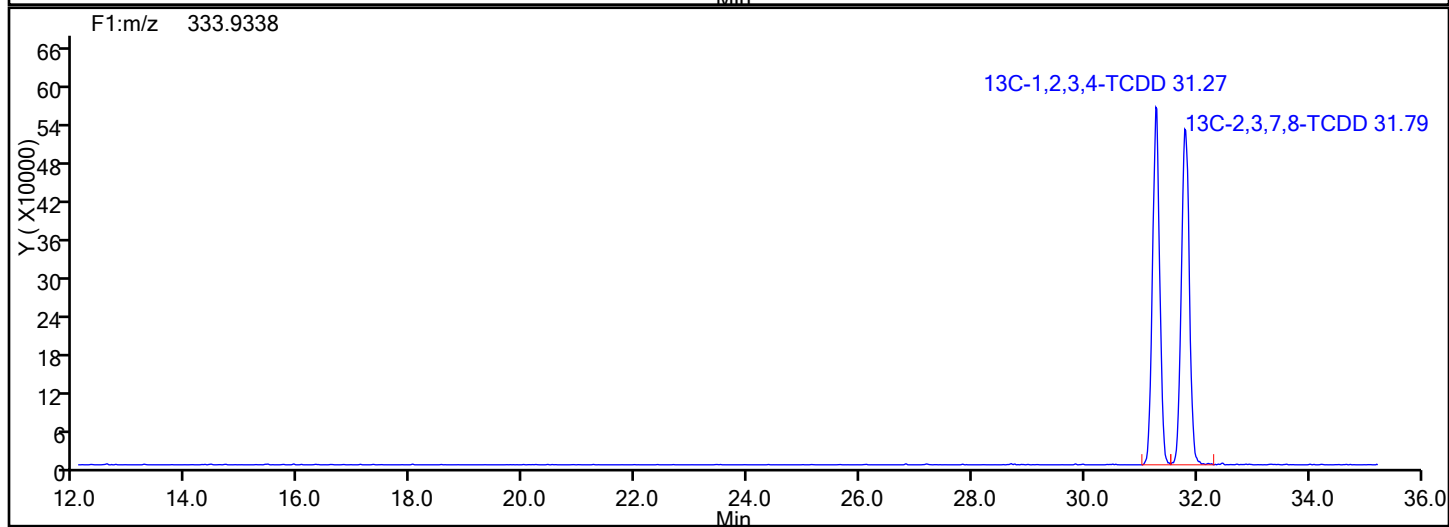
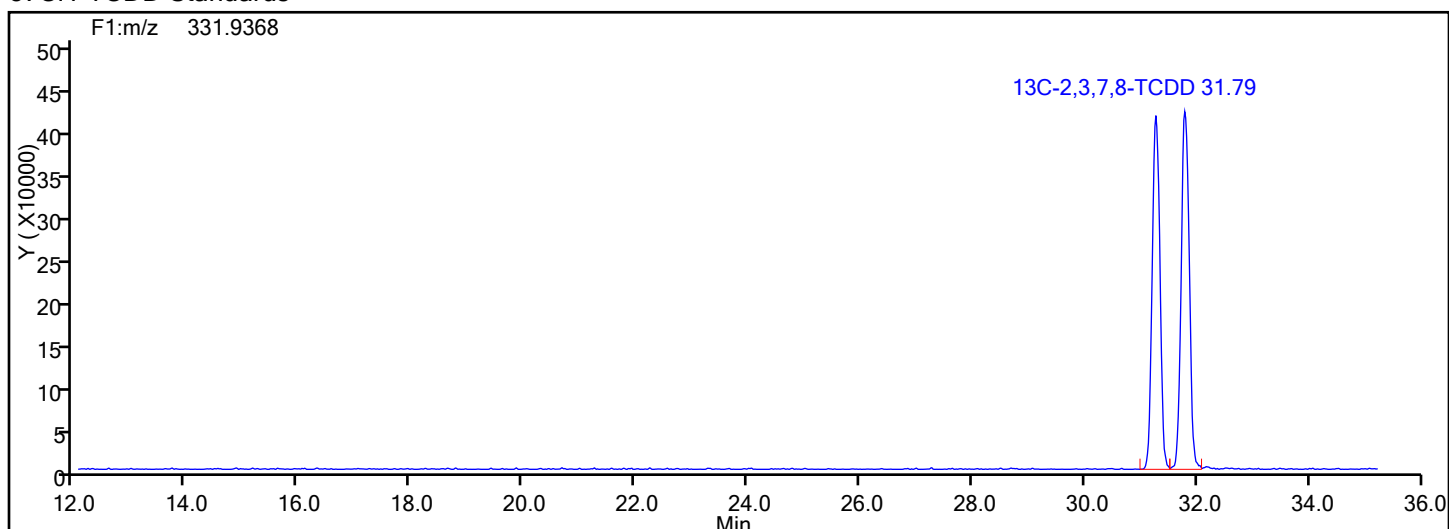
Column Type:

Column Dia:

37Cl4-TCDD



37Cl4-TCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

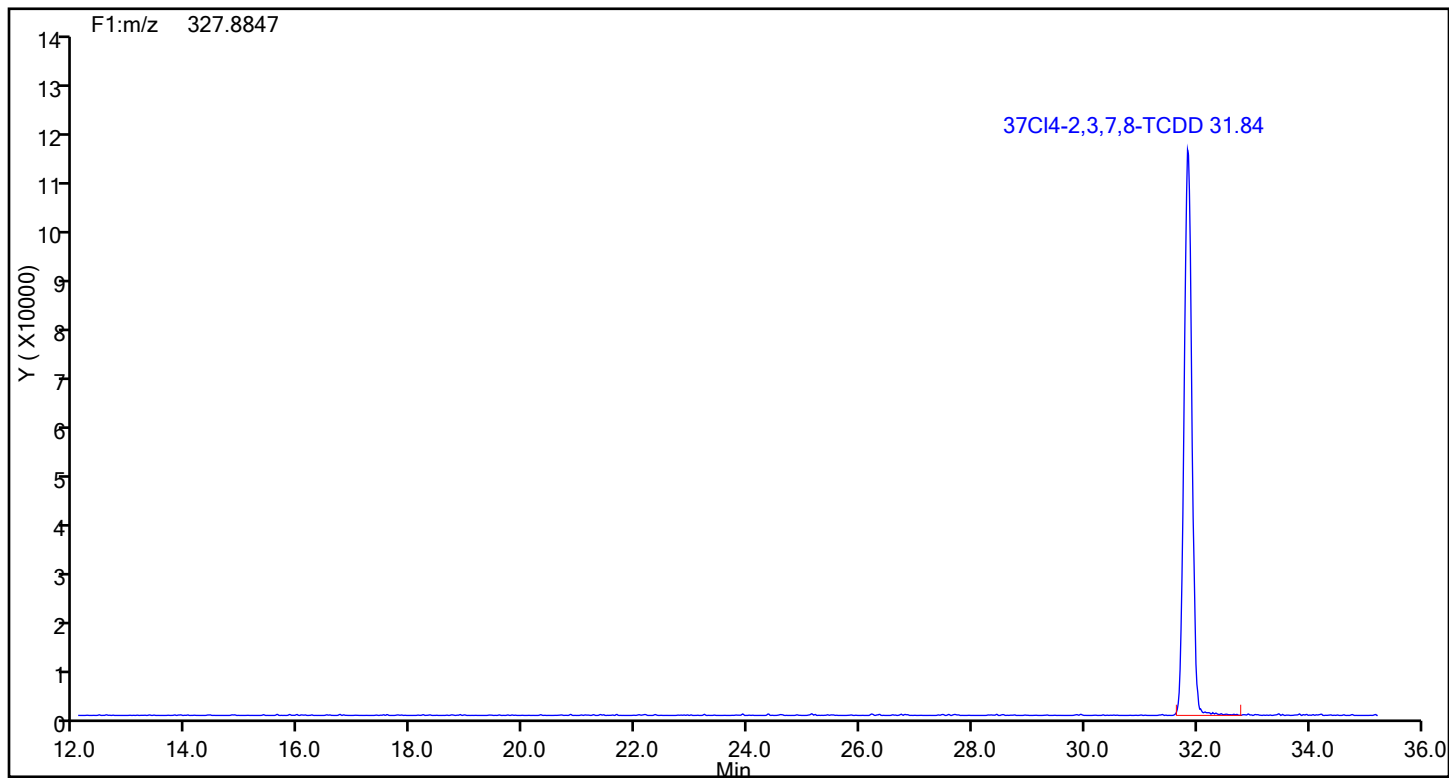
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Sample Line#: 4

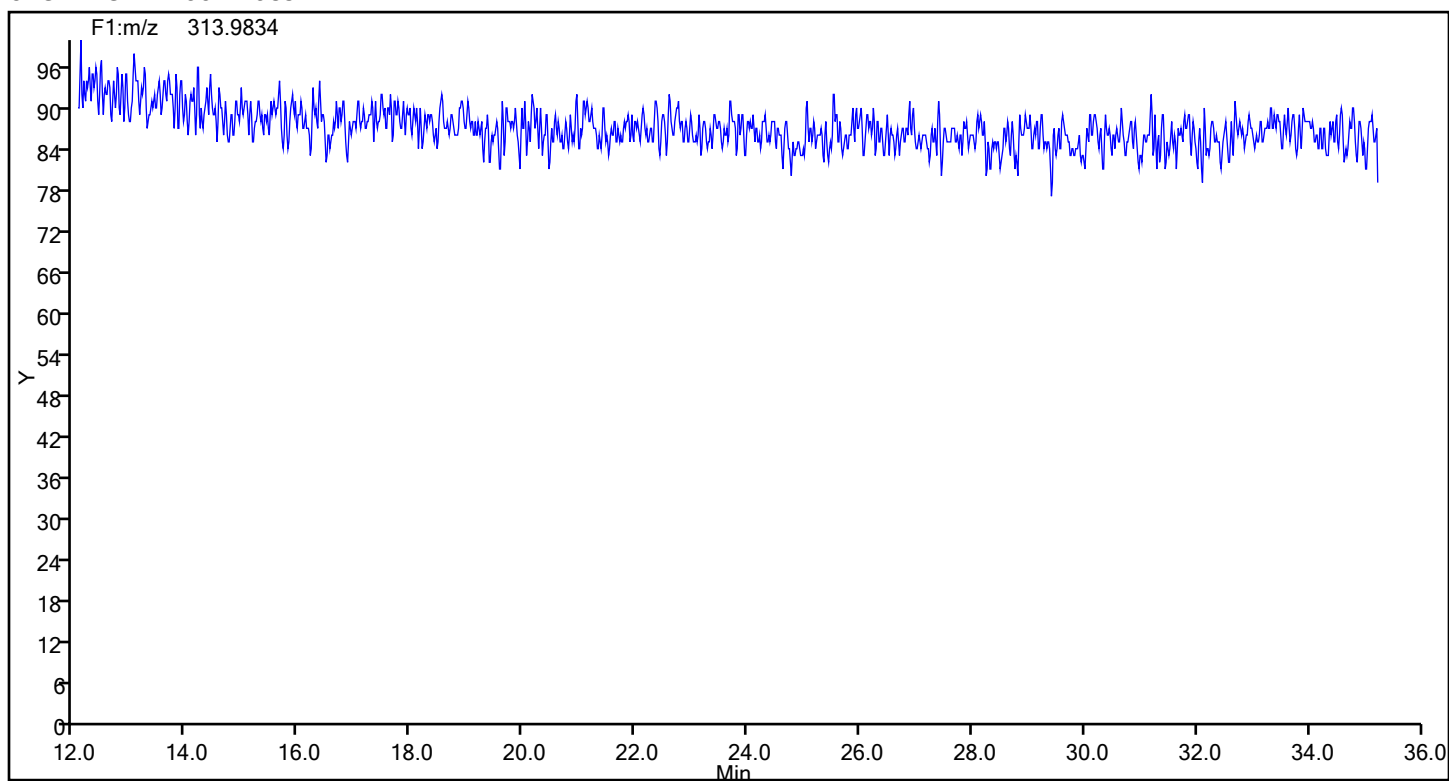
Column Type:

Column Dia:

37Cl4-TCDD



37Cl4-TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

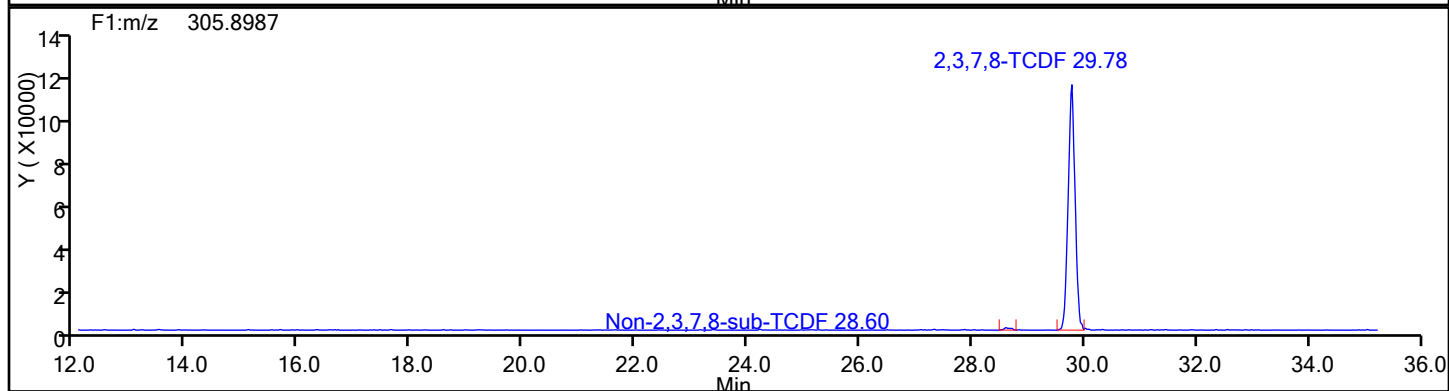
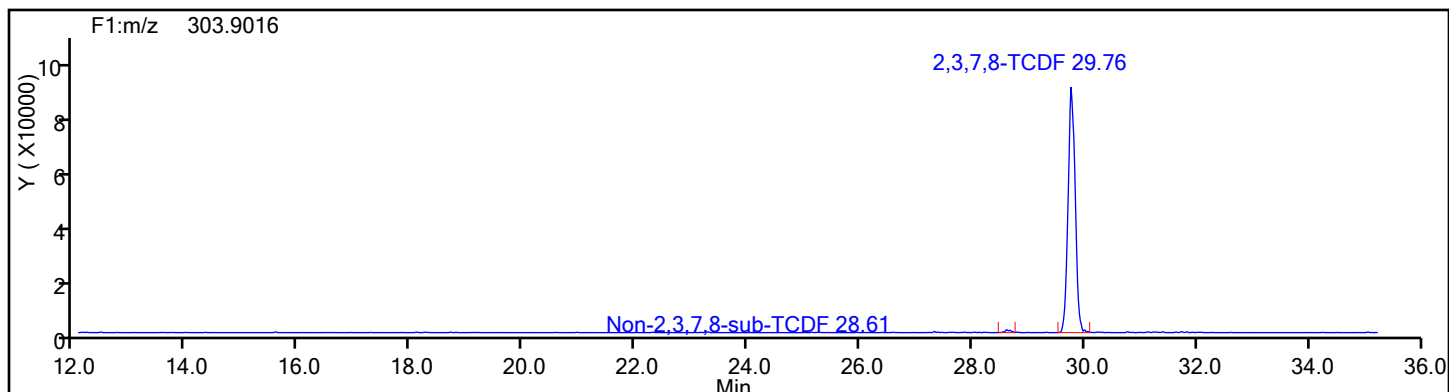
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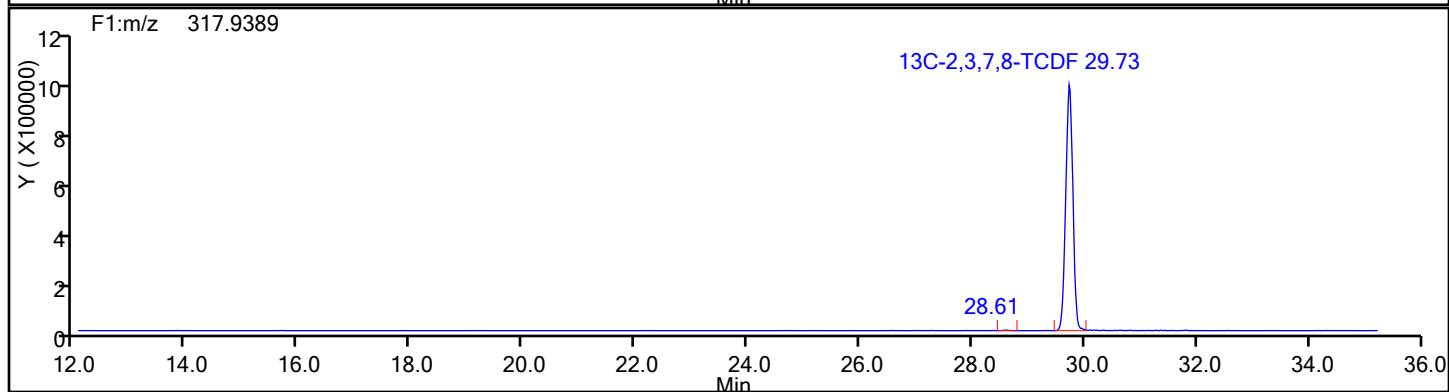
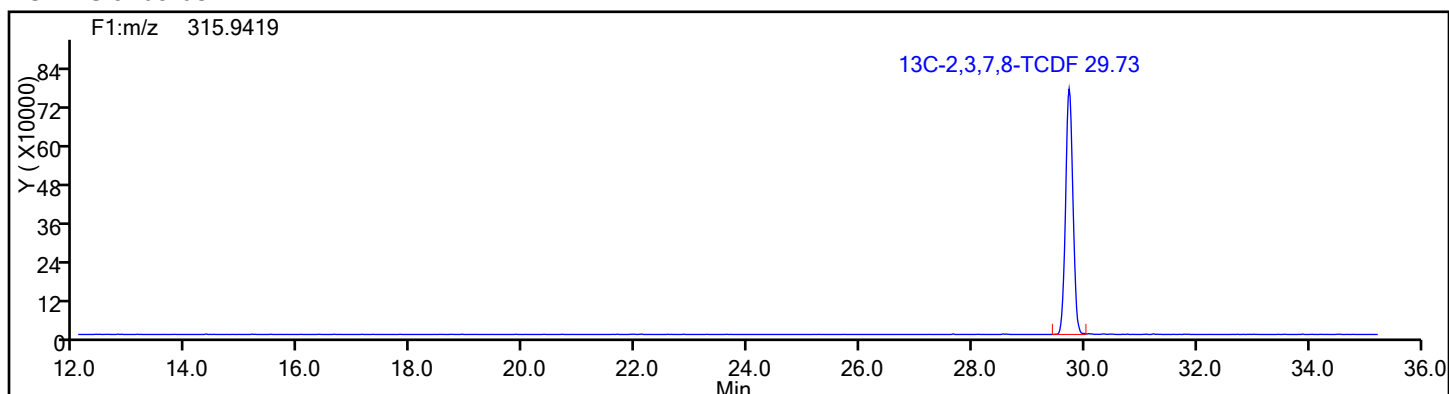
Column Type:

Column Dia:

TCDF

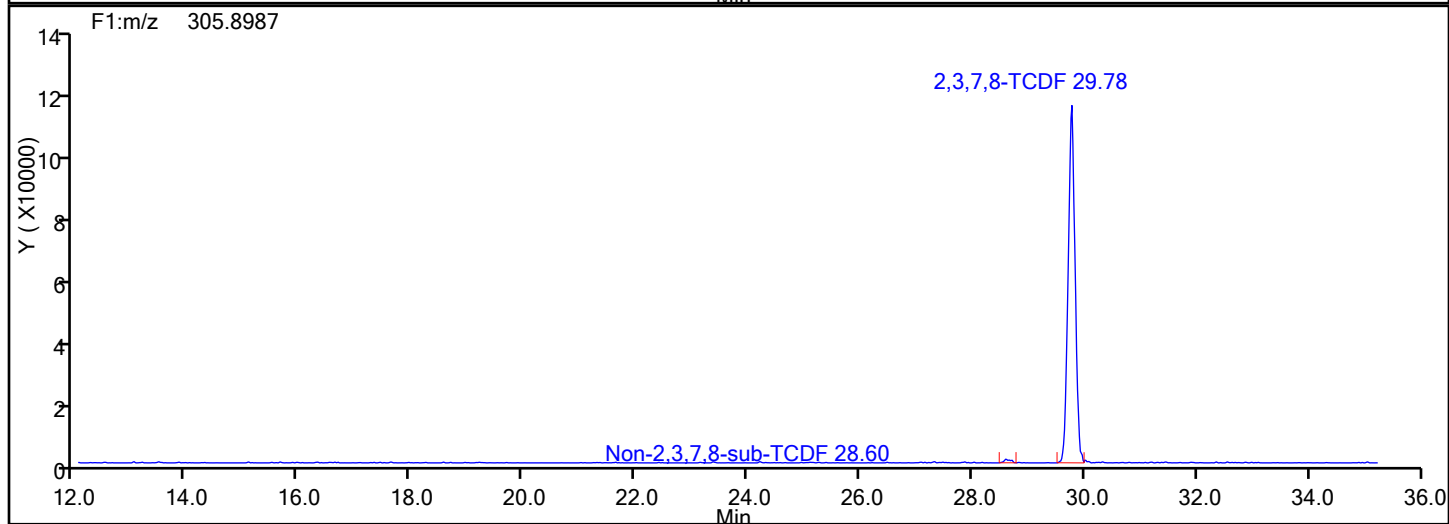
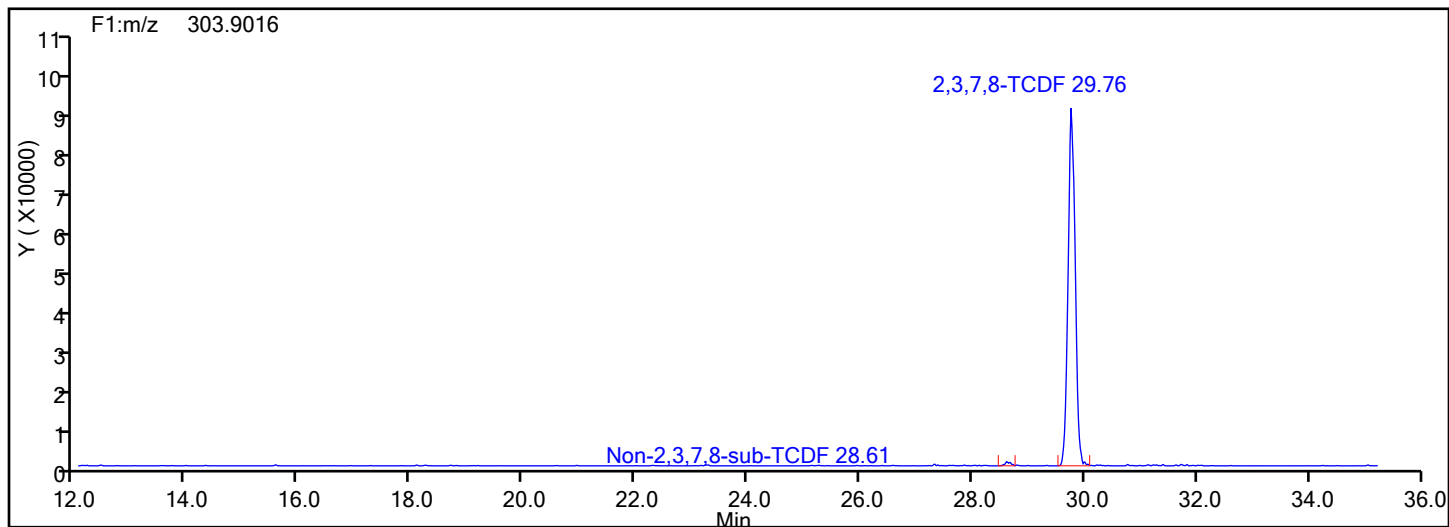


TCDF Standards

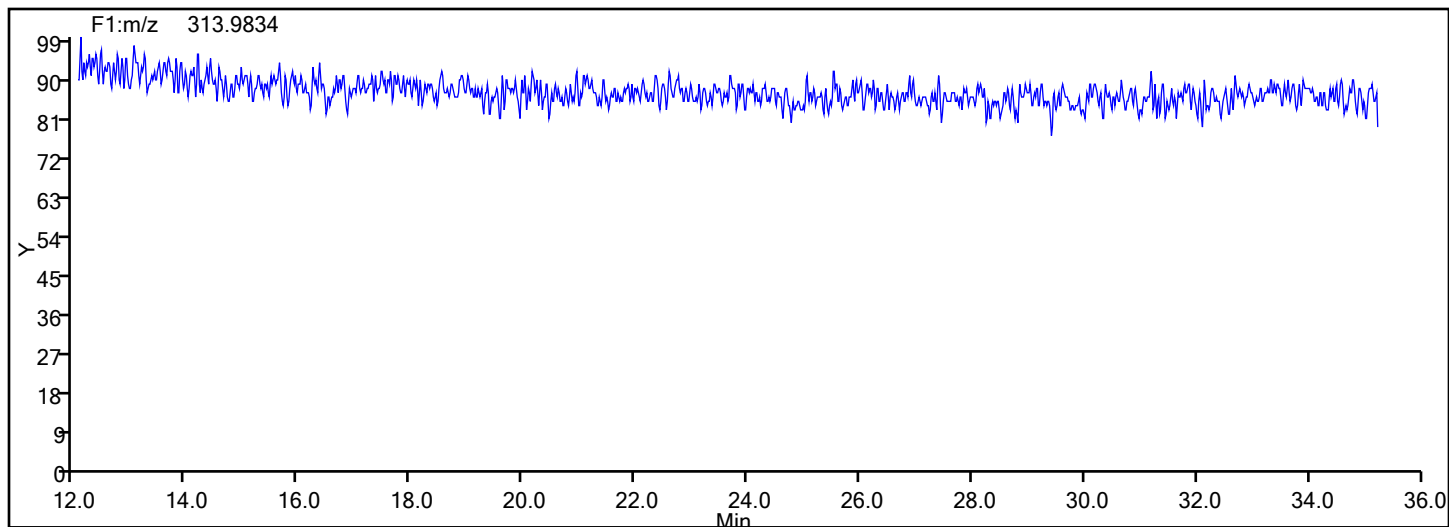


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d
Injection Date: 16-May-2014 16:27:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 4
Column Type: Column Dia:
TCDF

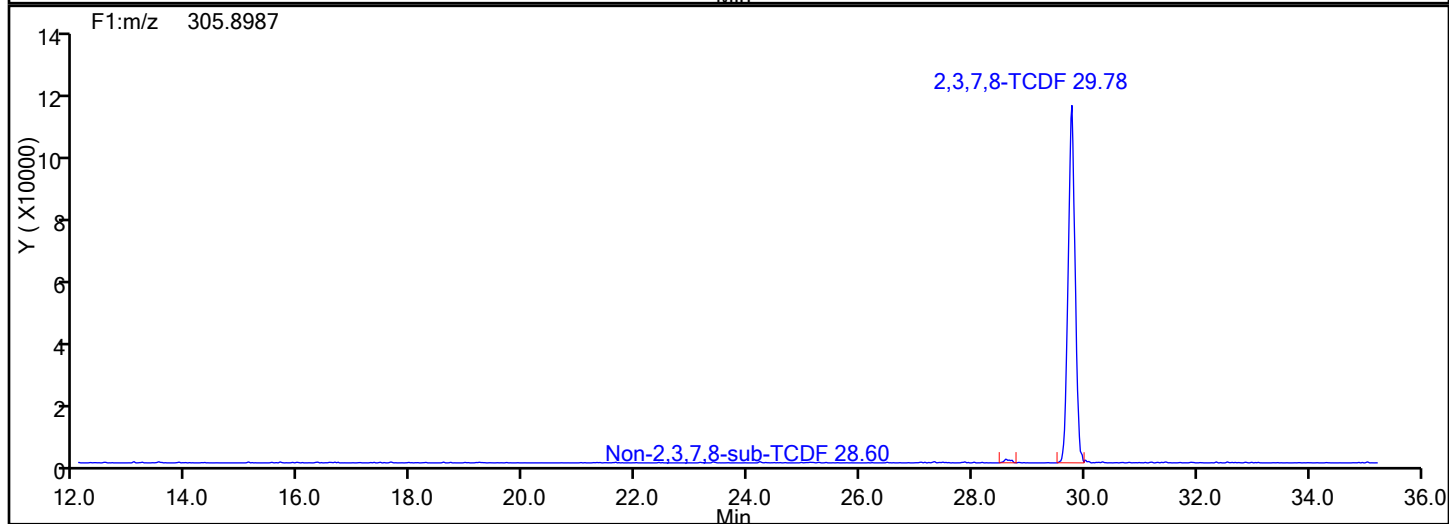
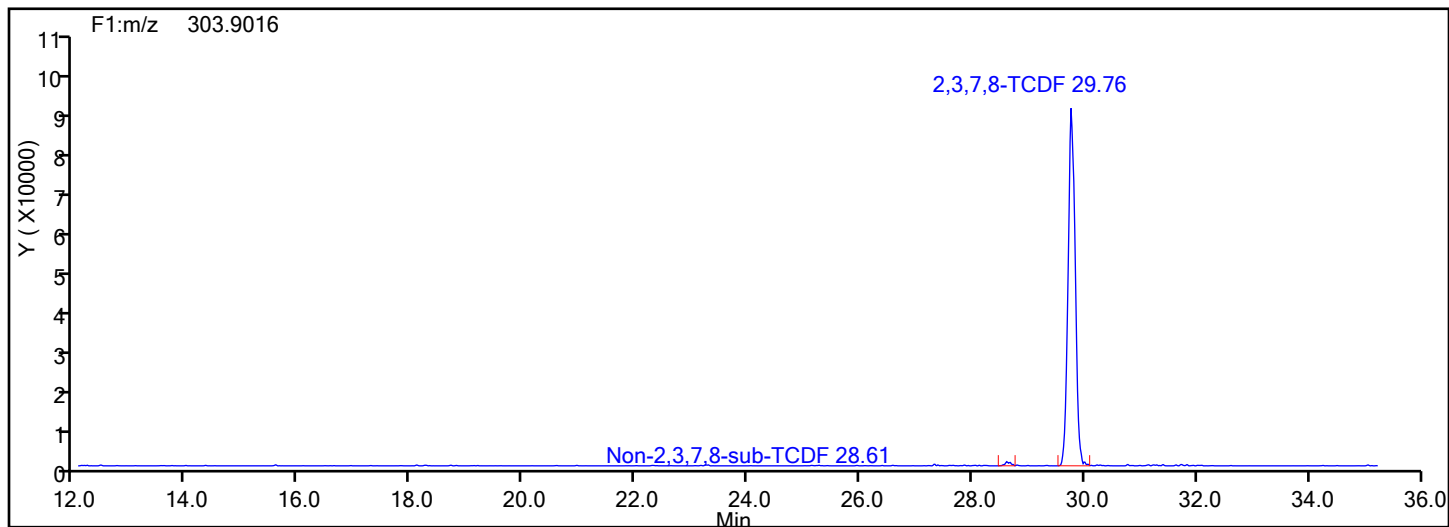


TCDF Lock Mass

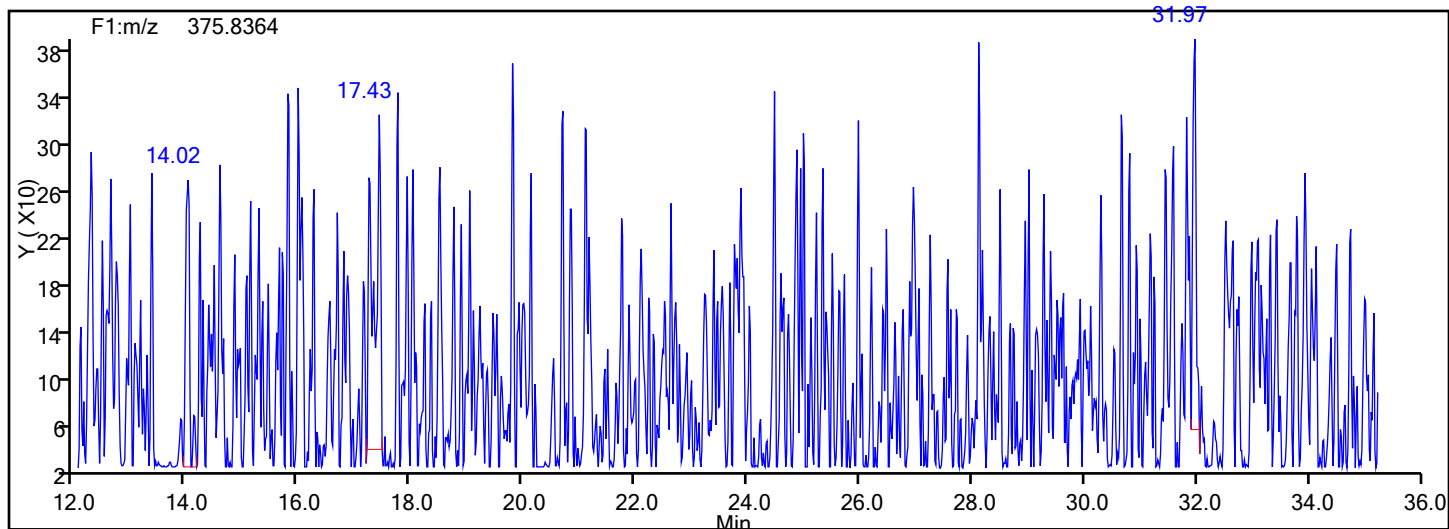


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d
Injection Date: 16-May-2014 16:27:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 4
Column Type: Column Dia:
TCDF



TCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

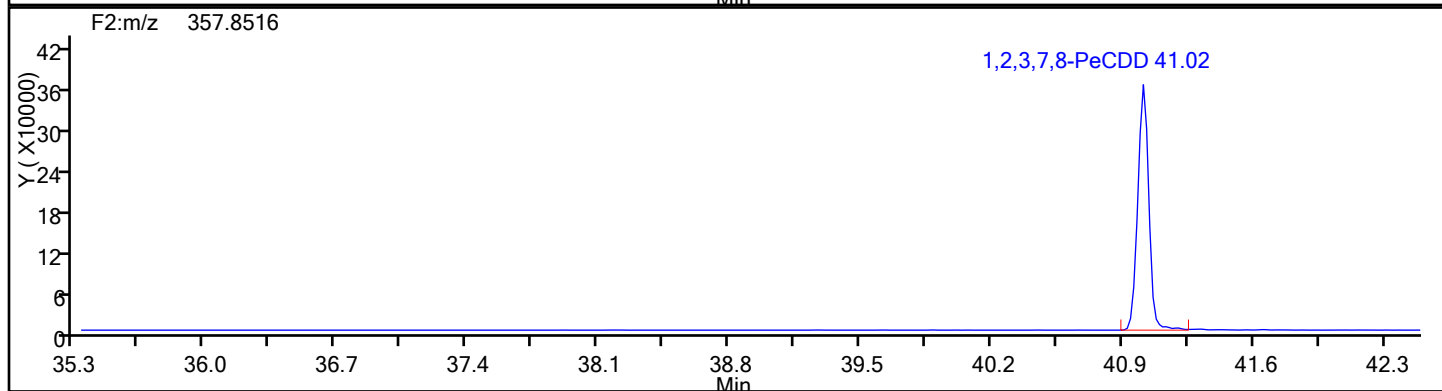
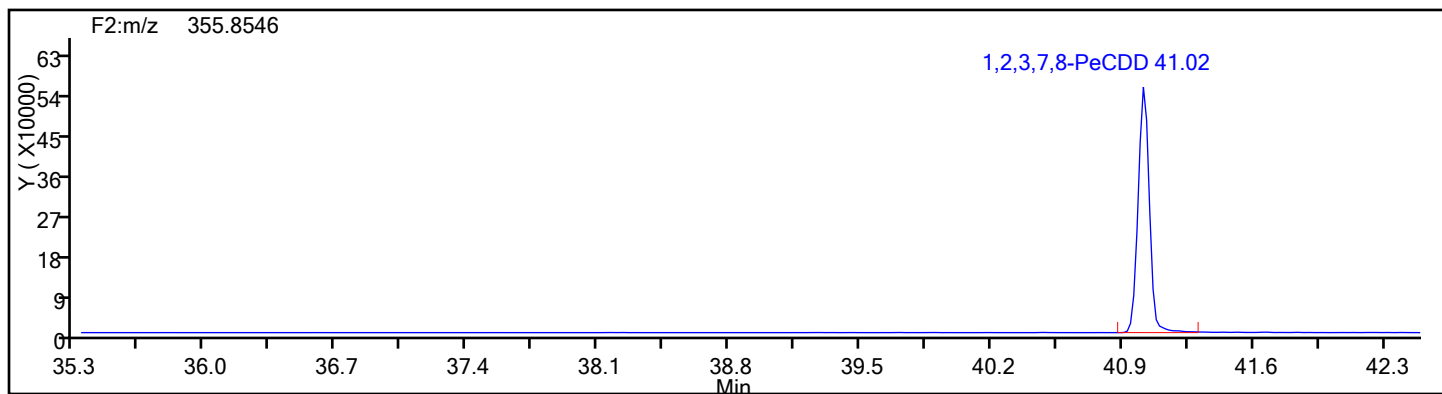
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Sample Line#: 4

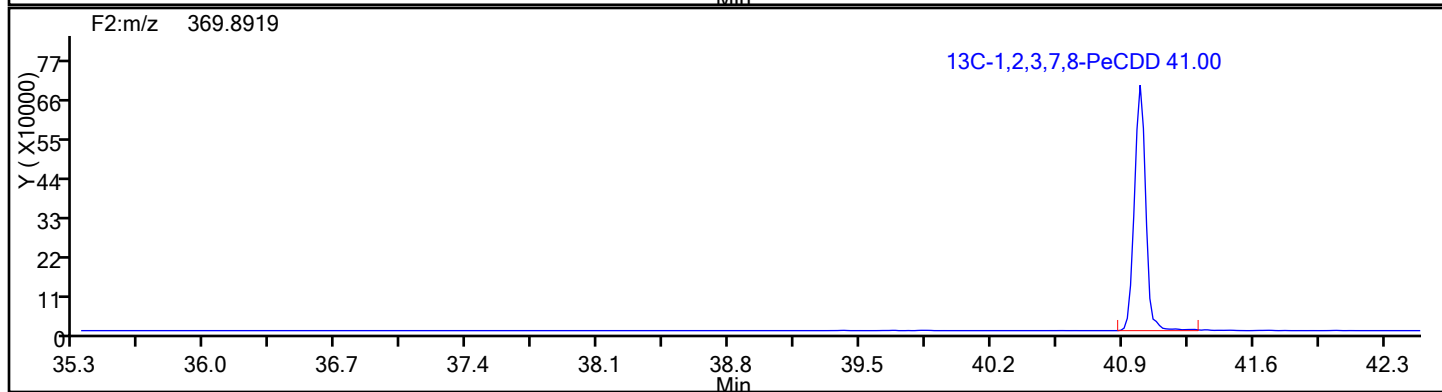
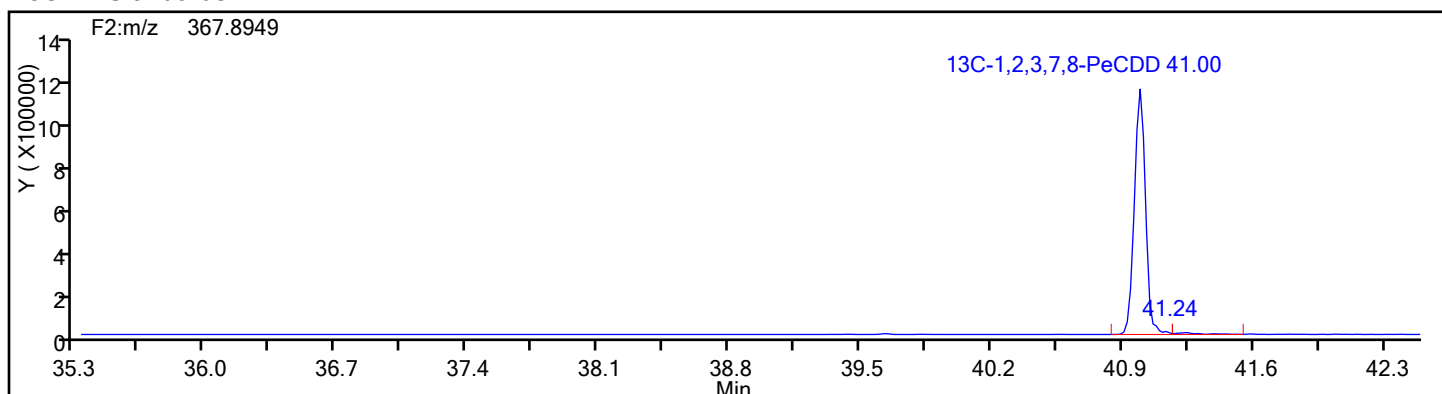
Column Type:

Column Dia:

PeCDD



PeCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

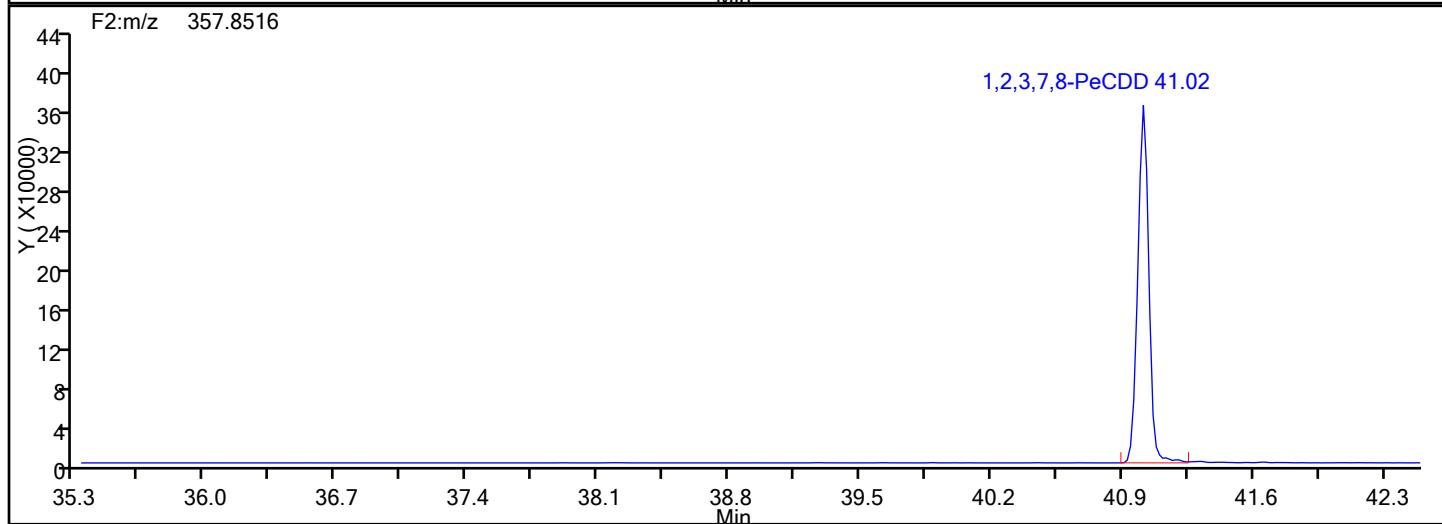
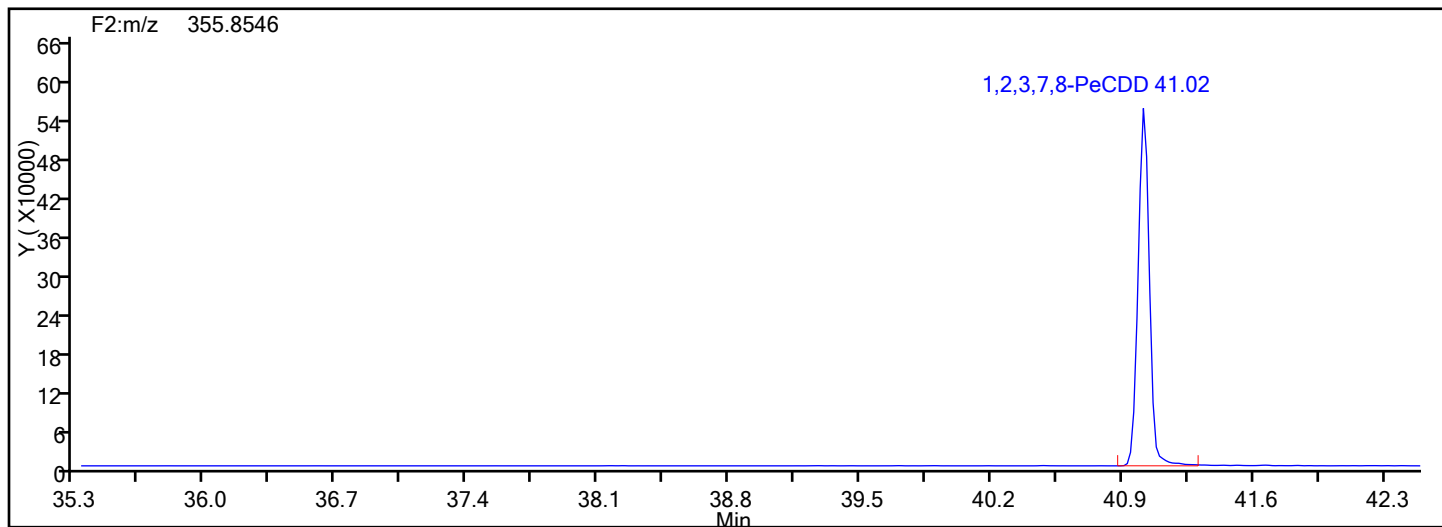
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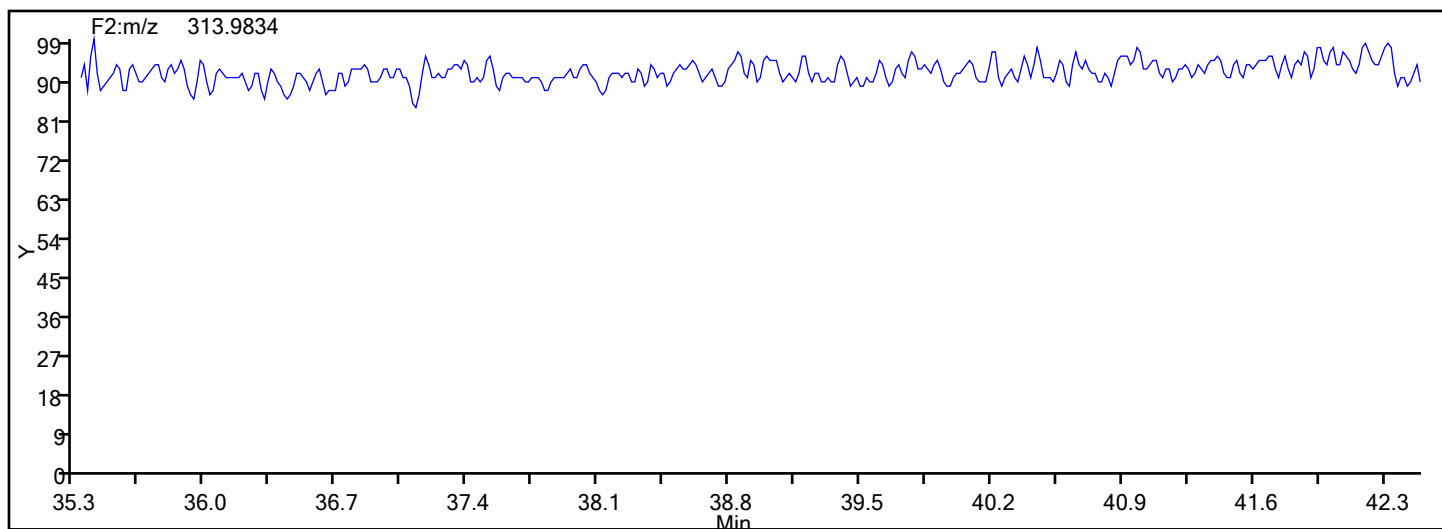
Column Type:

Column Dia:

PeCDD



PeCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

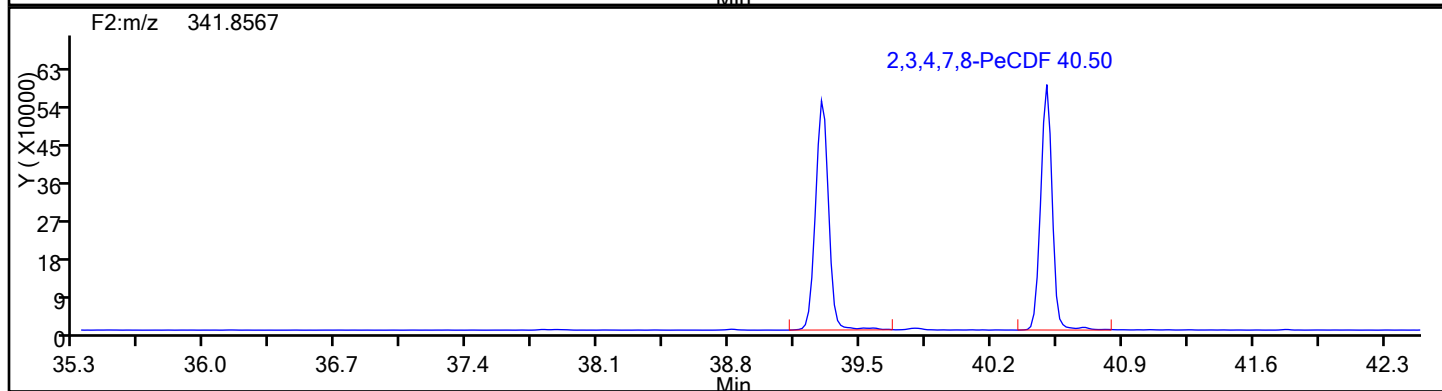
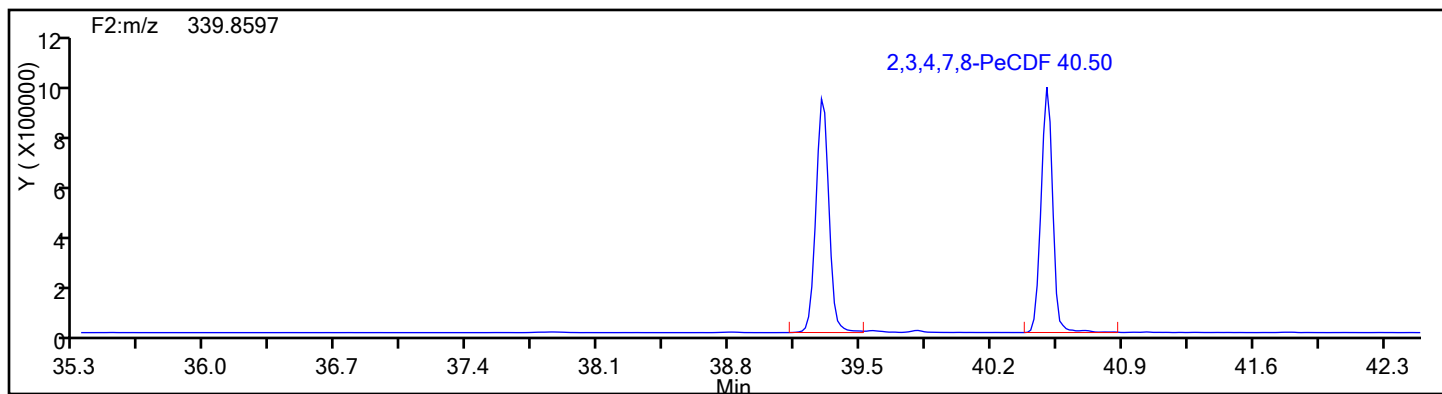
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Sample Line#: 4

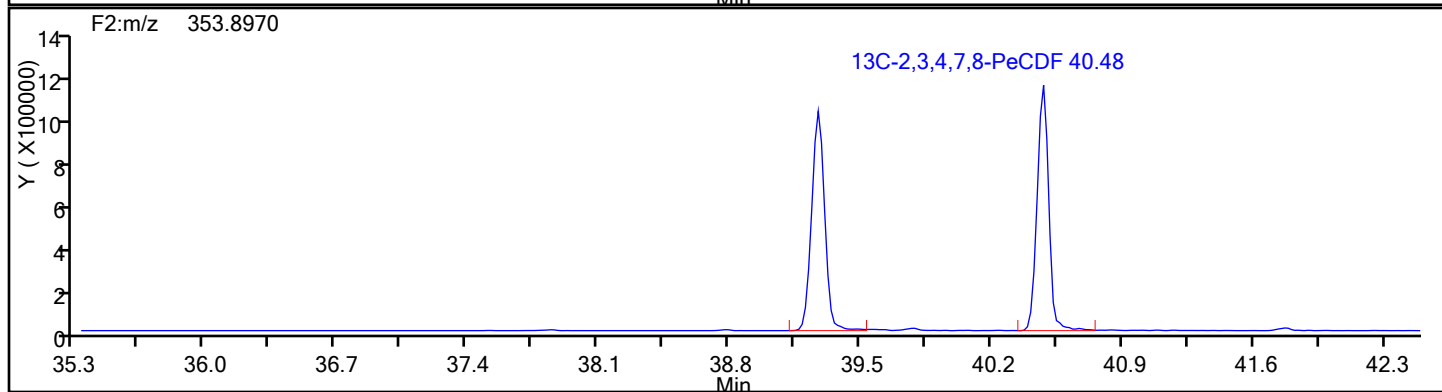
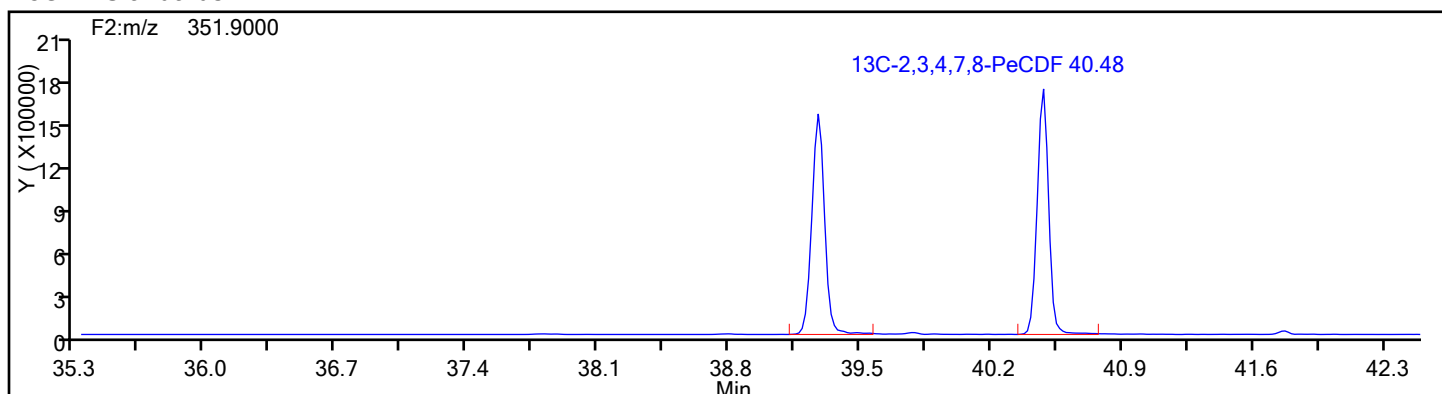
Column Type:

Column Dia:

PeCDF



PeCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

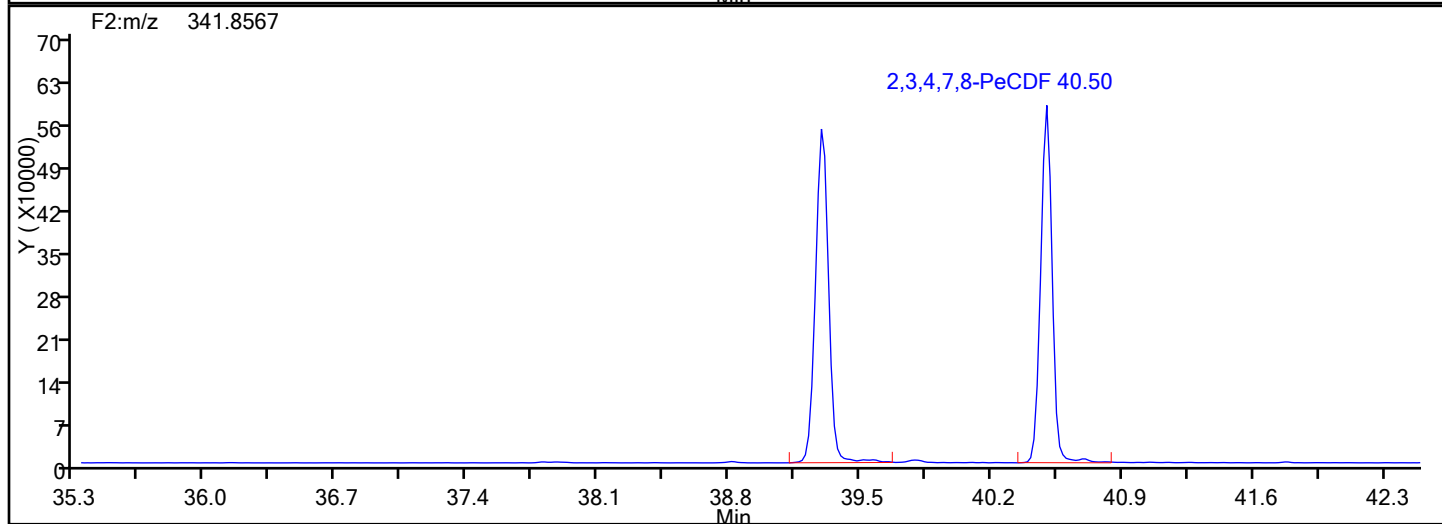
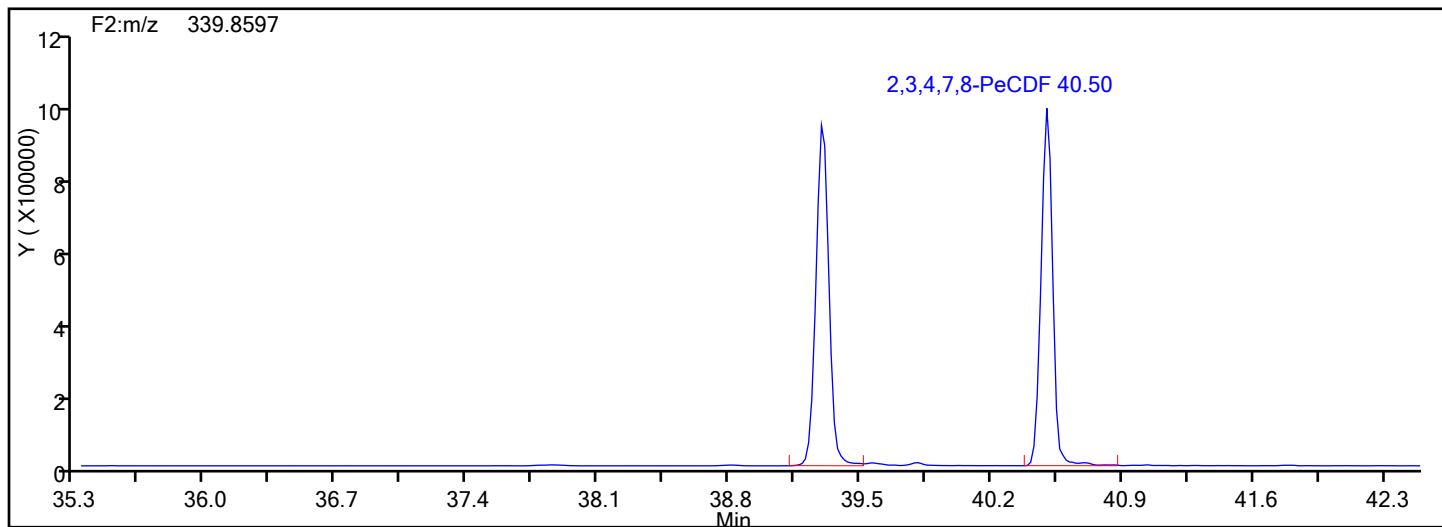
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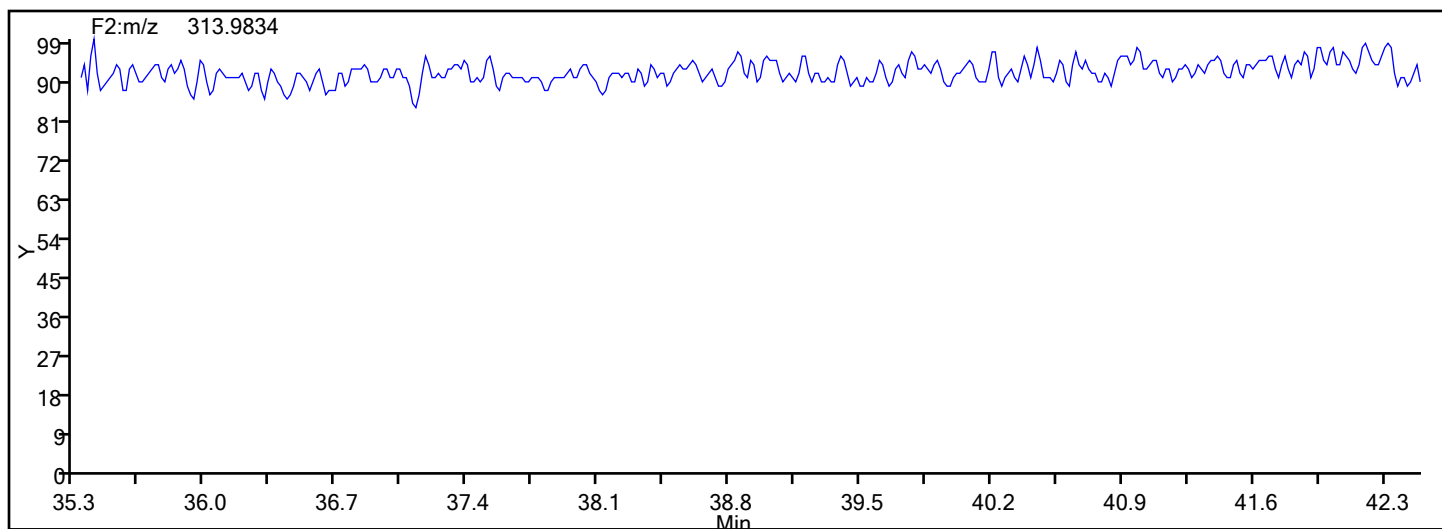
Column Type:

Column Dia:

PeCDF



PeCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

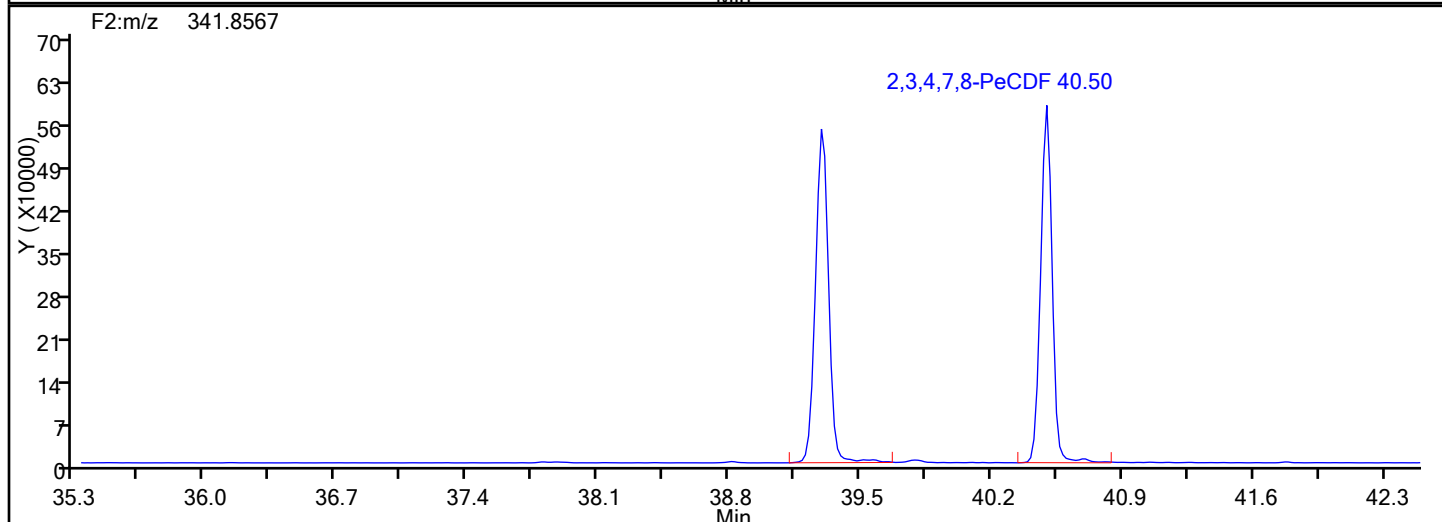
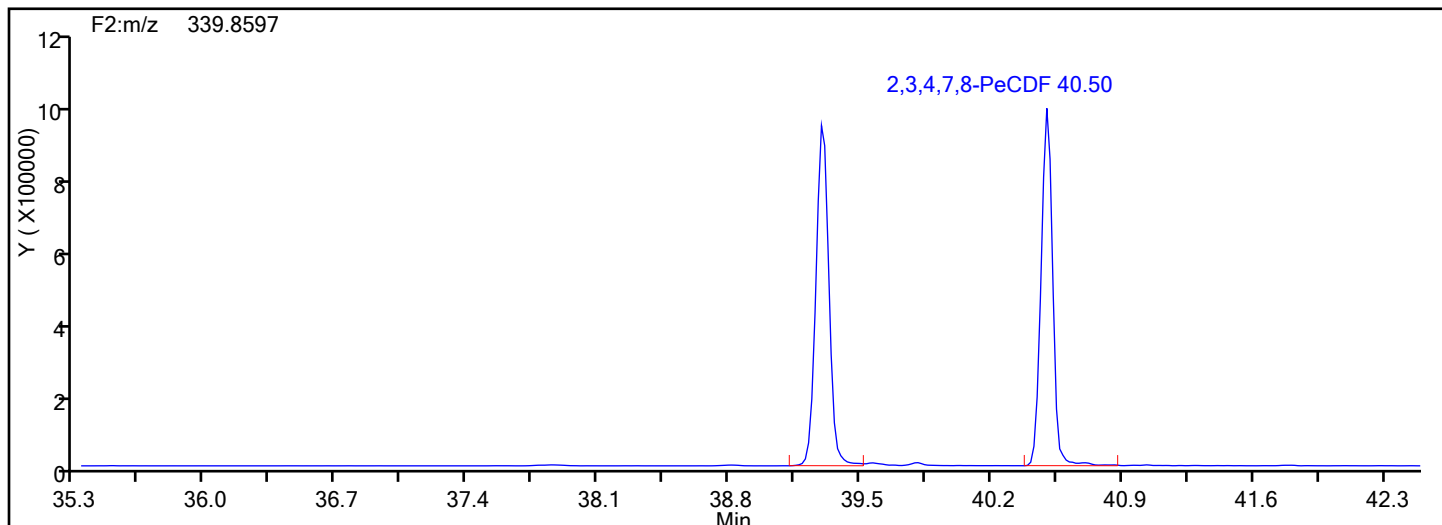
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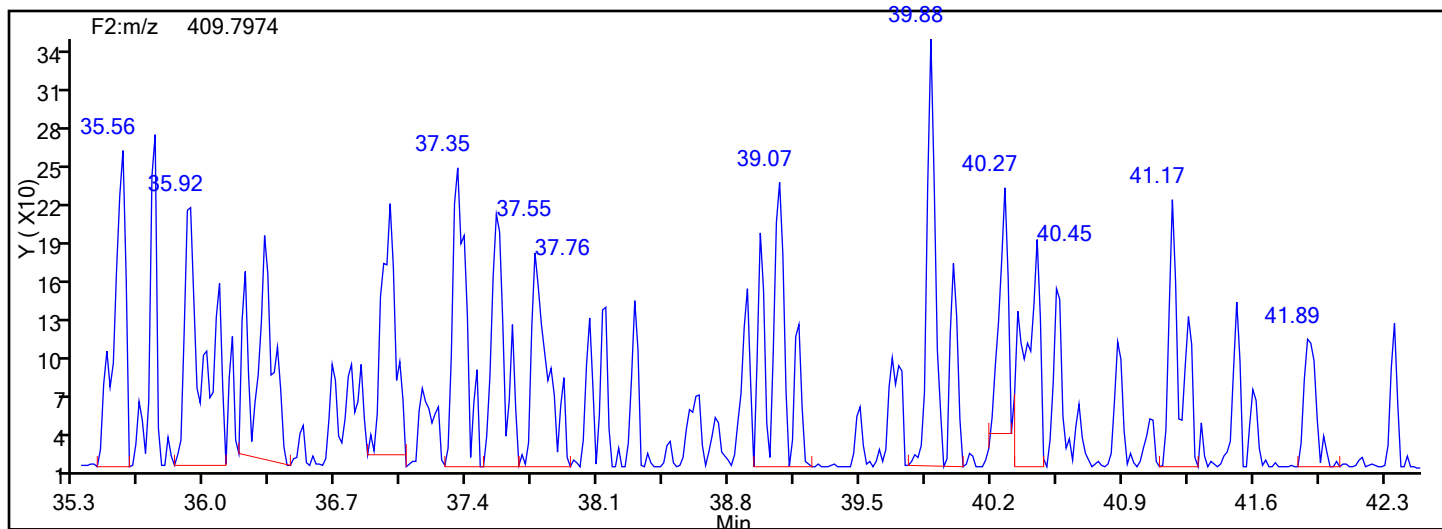
Column Type:

Column Dia:

PeCDF



PeCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

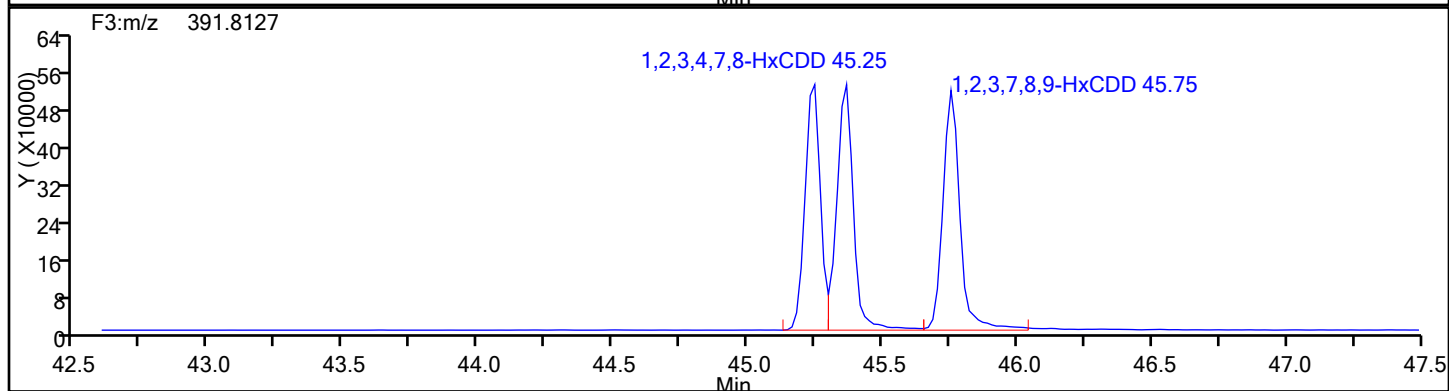
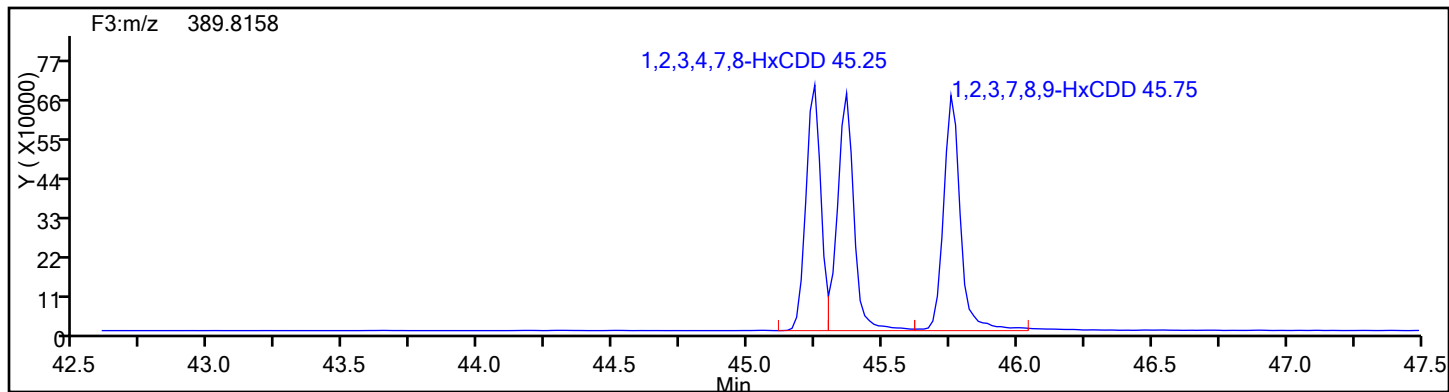
Worklist#: 7768

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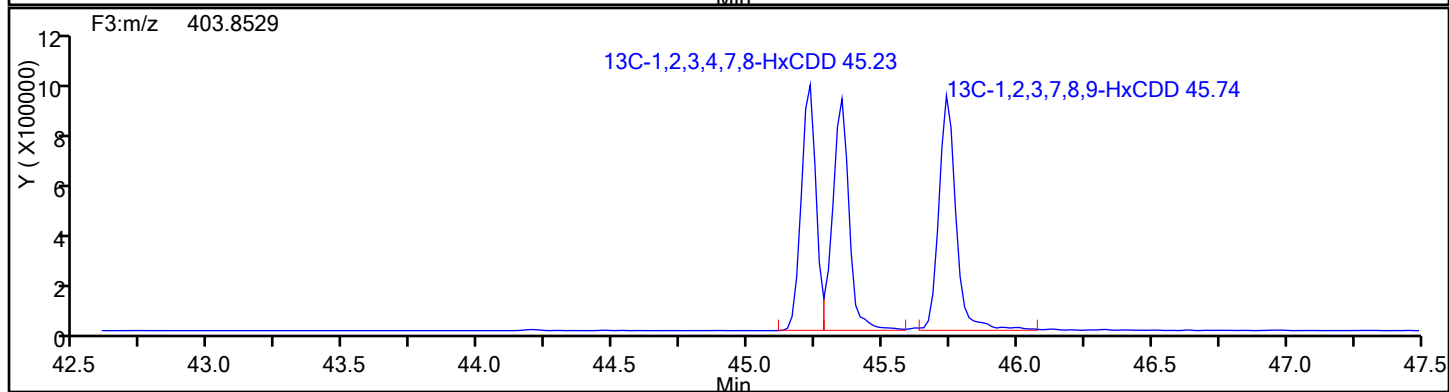
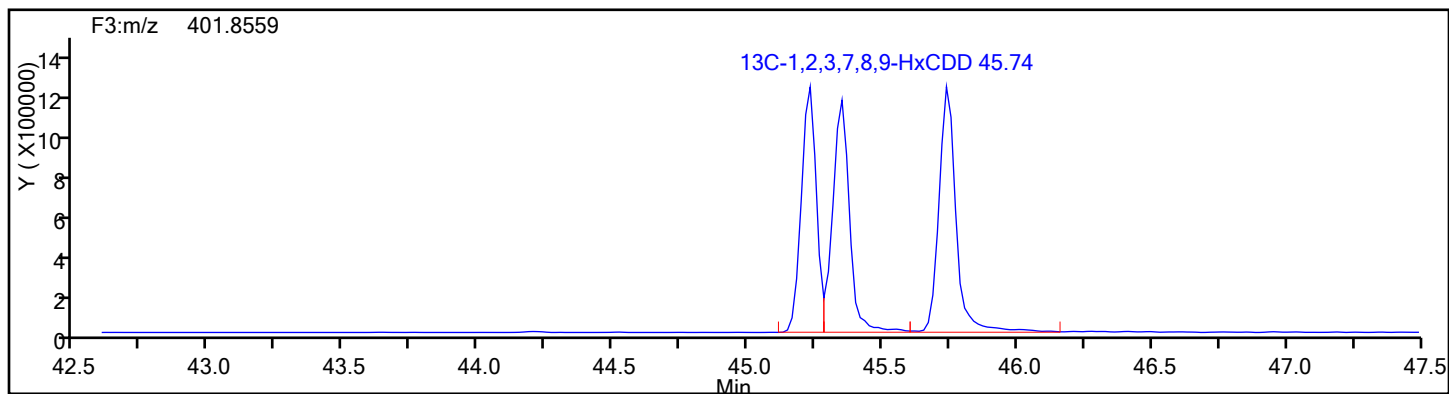
Column Type:

Column Dia:

HxCDD



HxCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

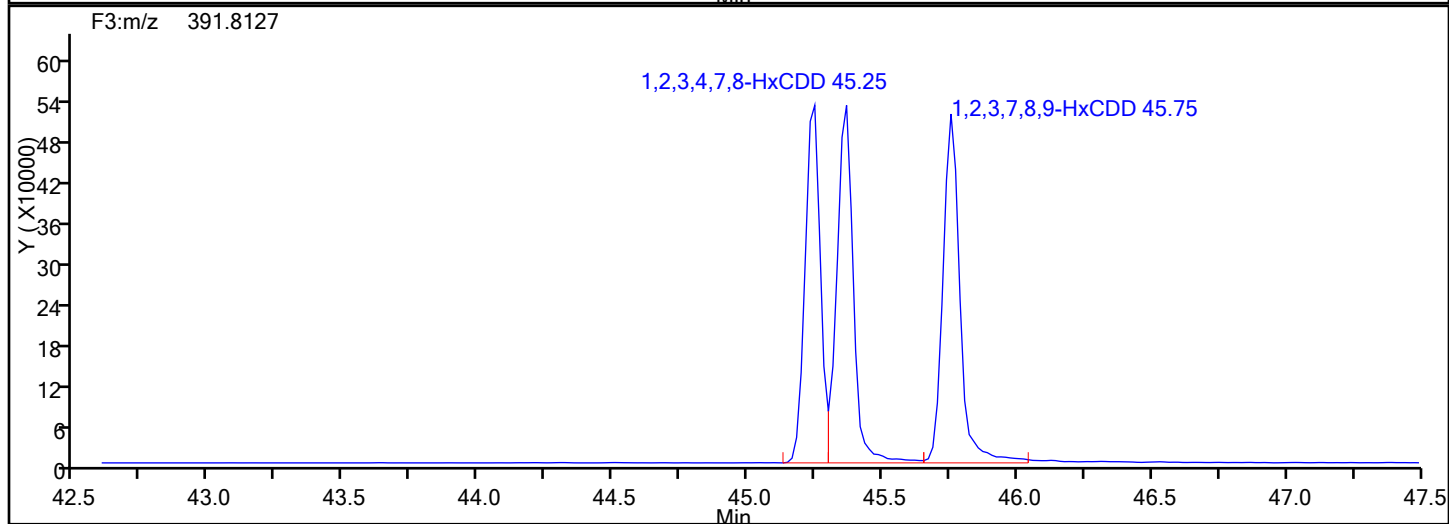
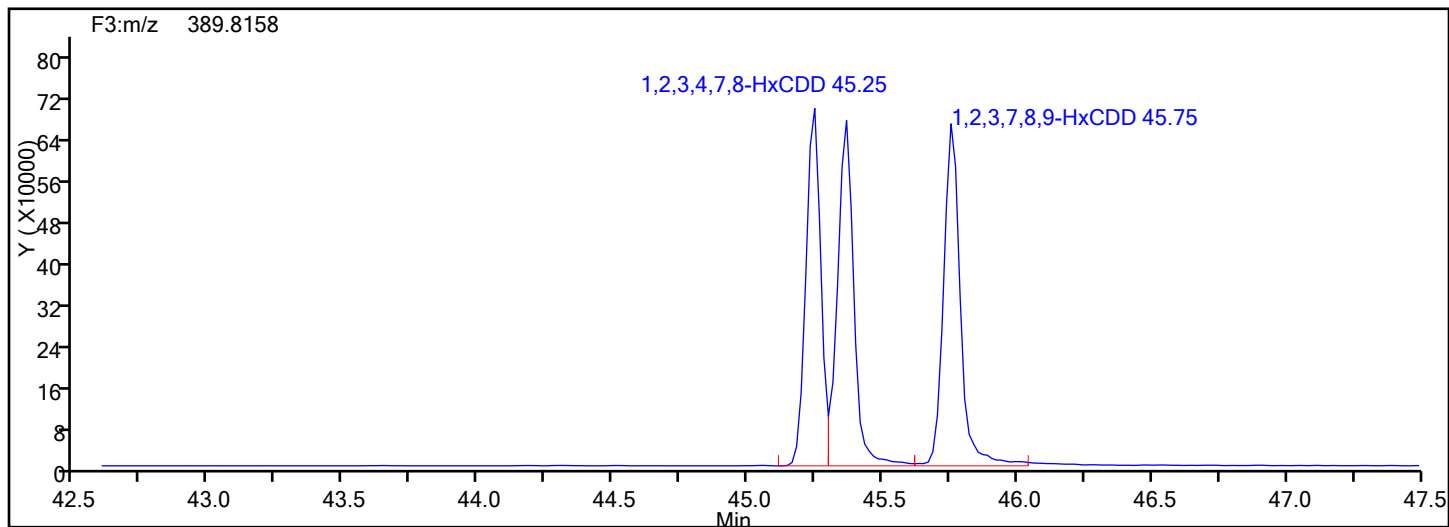
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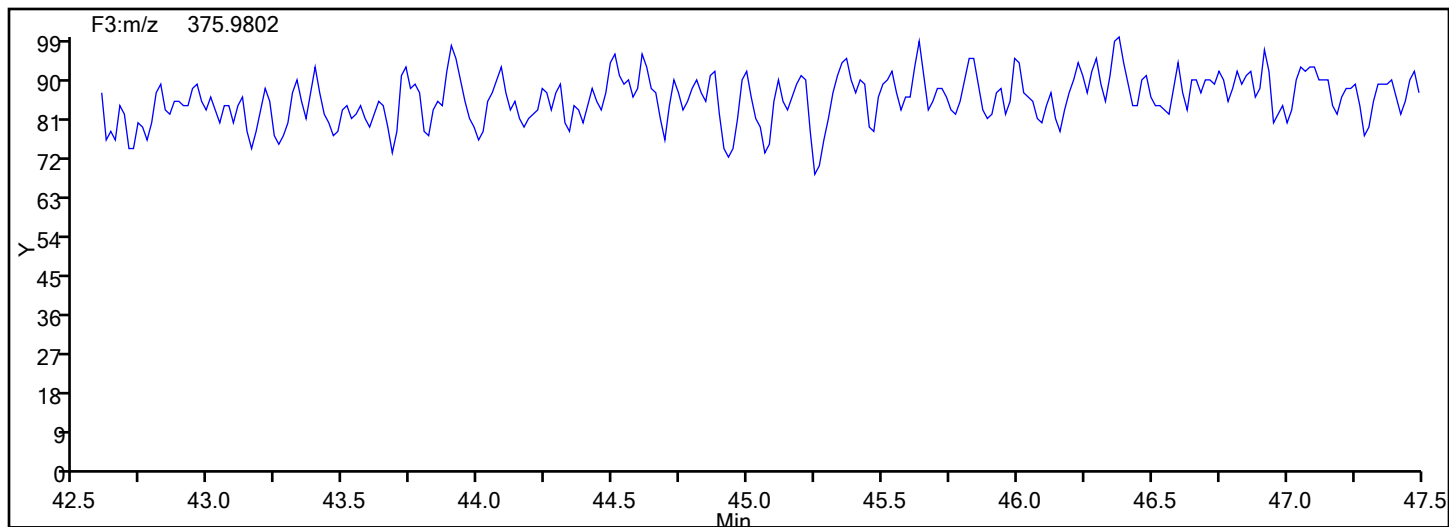
Column Type:

Column Dia:

HxCDD



HxCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

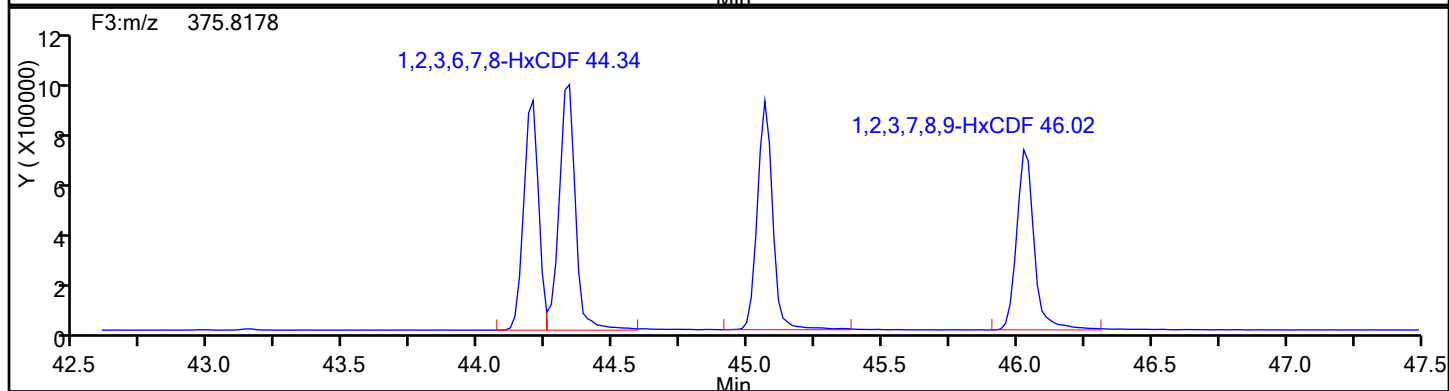
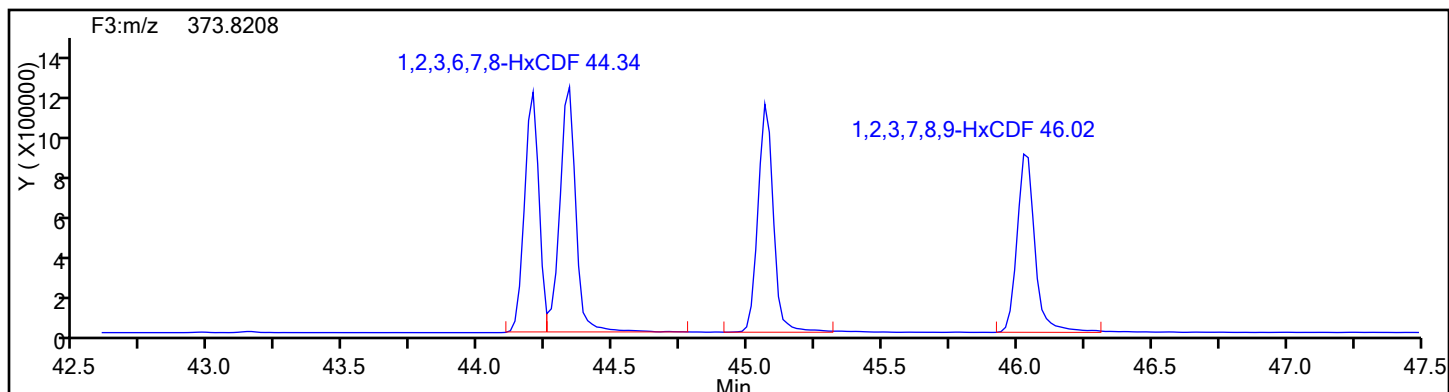
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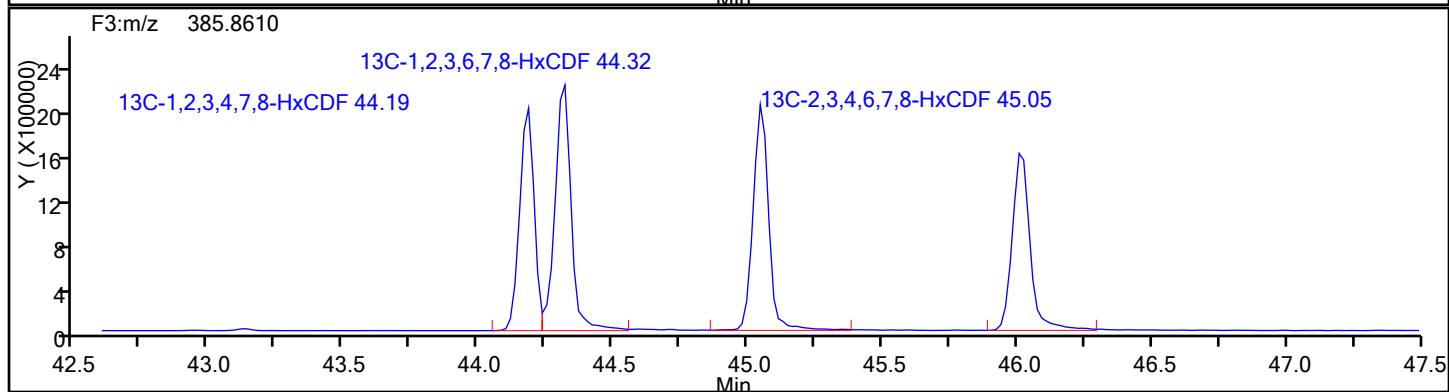
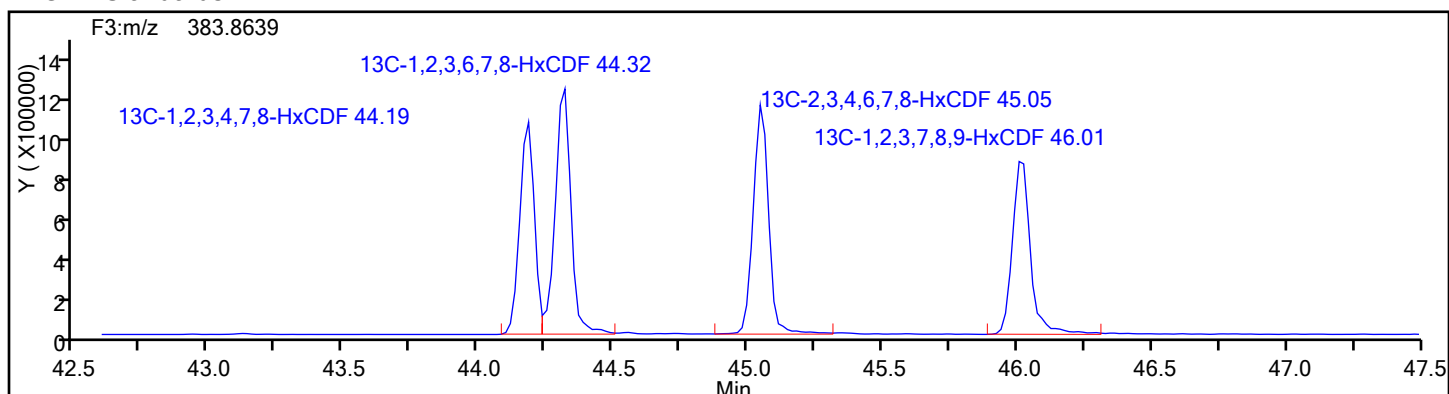
Column Type:

Column Dia:

HxCDF



HxCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

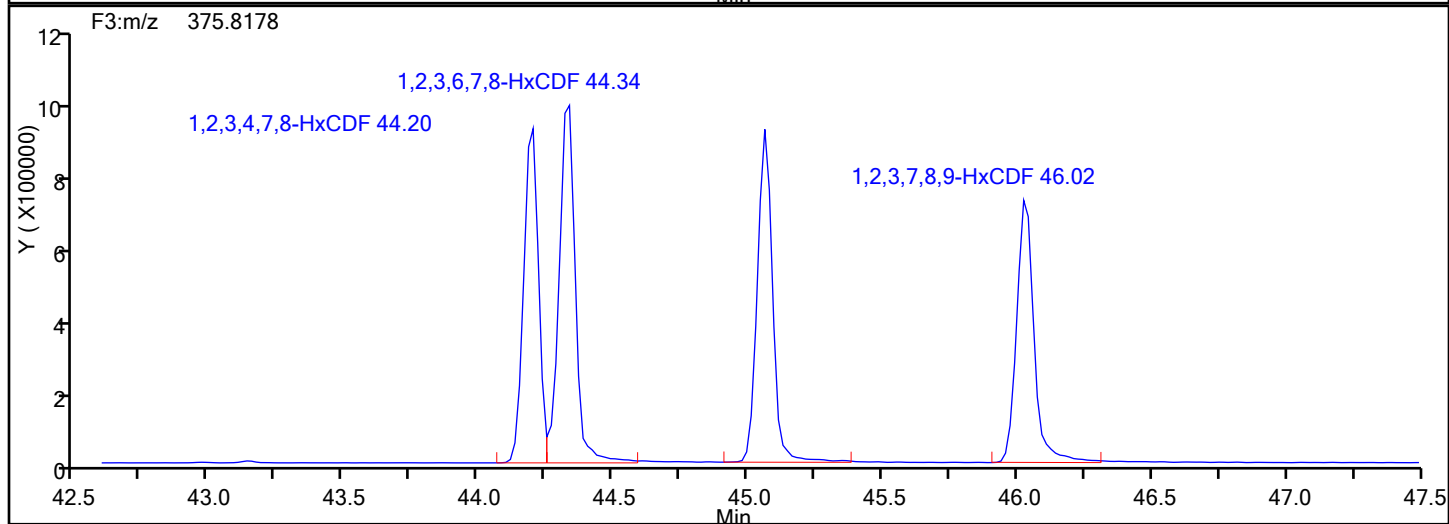
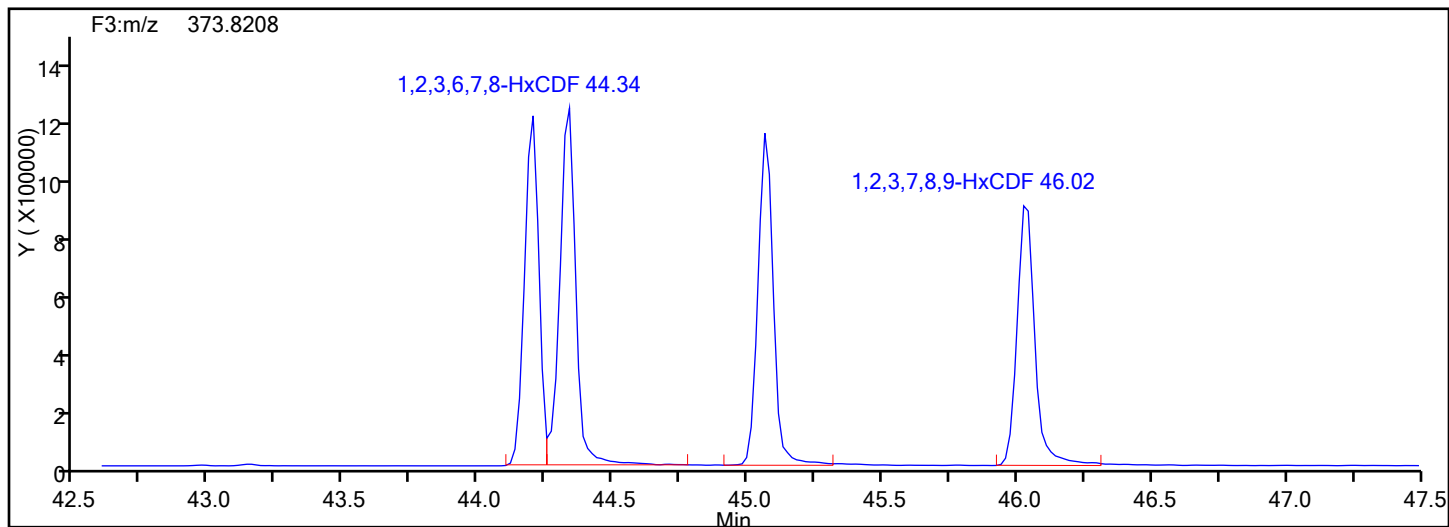
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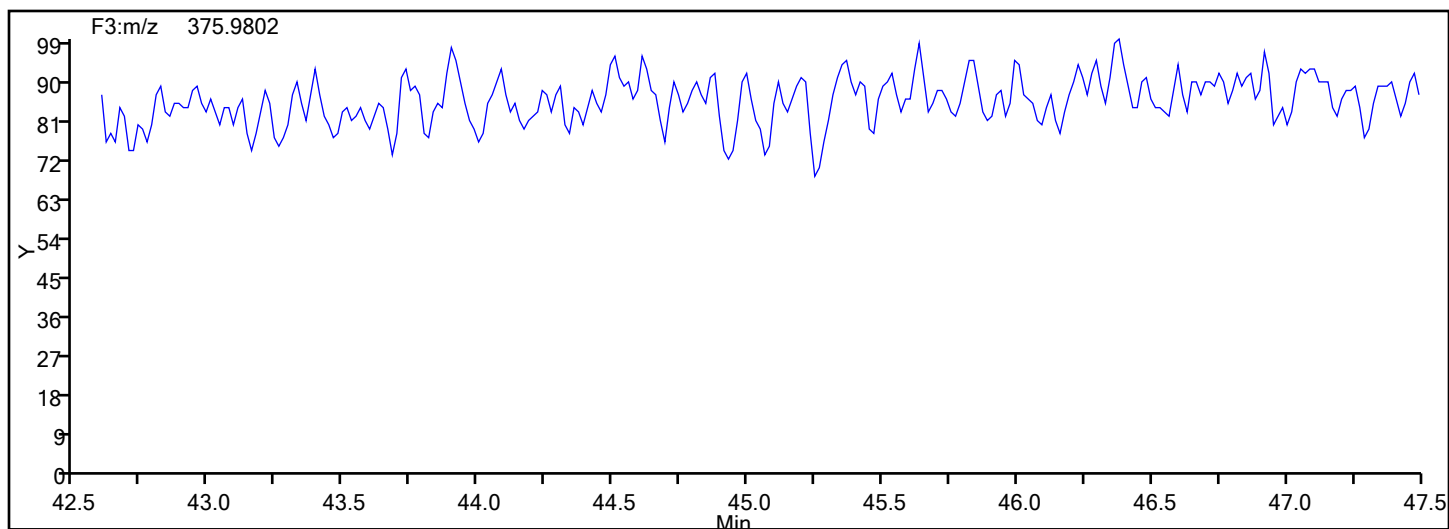
Column Type:

Column Dia:

HxCDF



HxCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

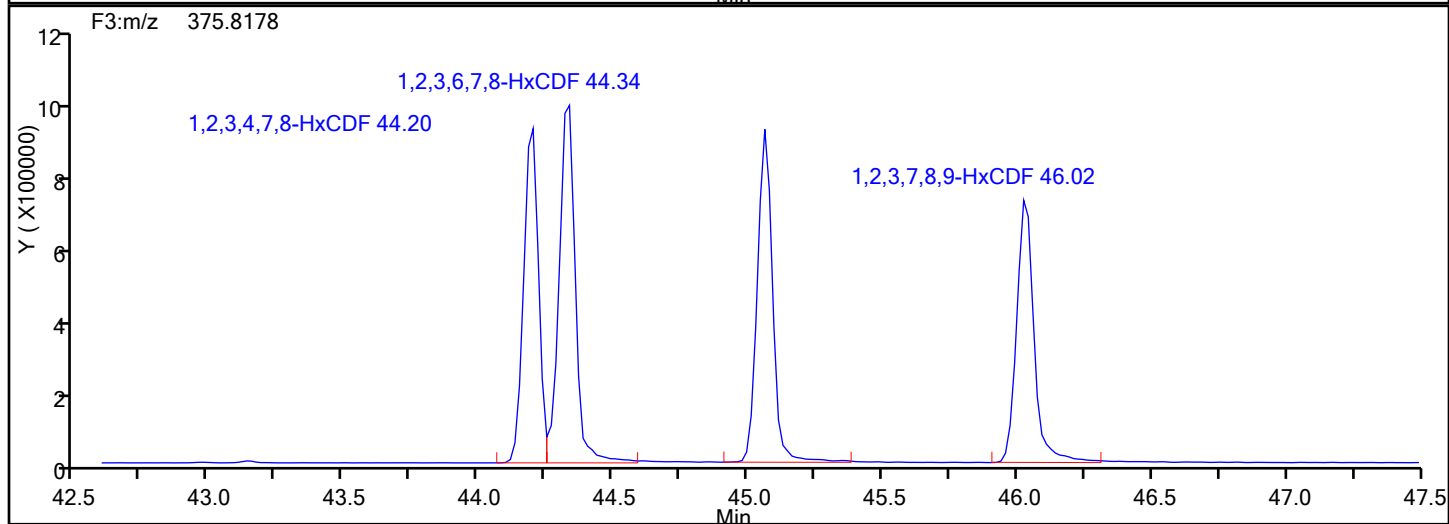
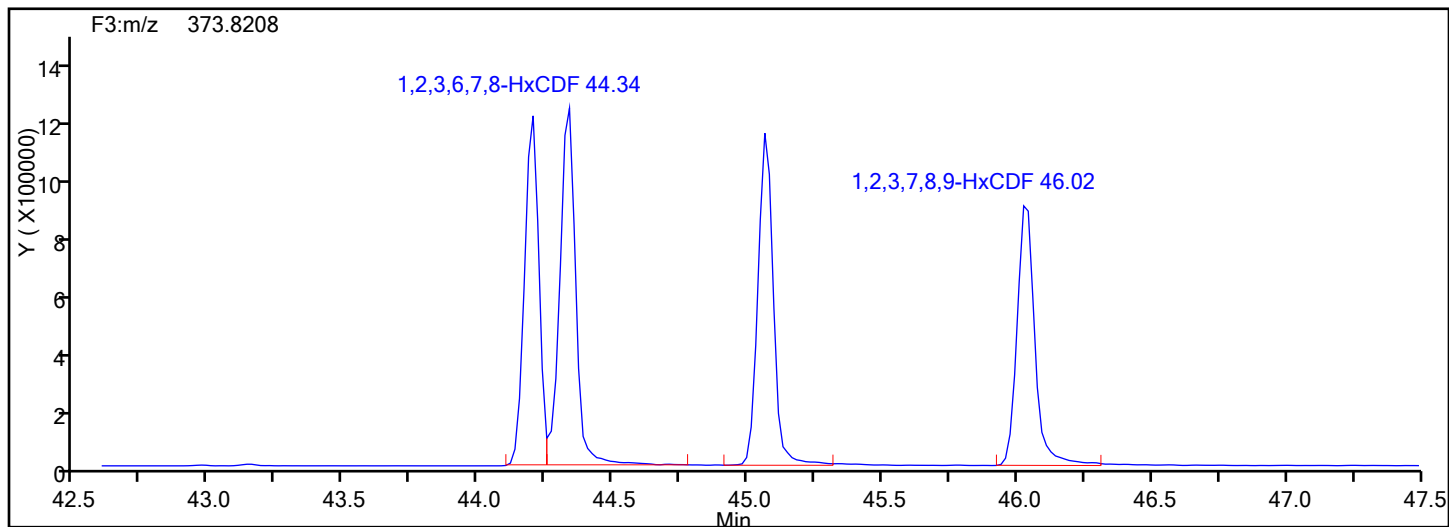
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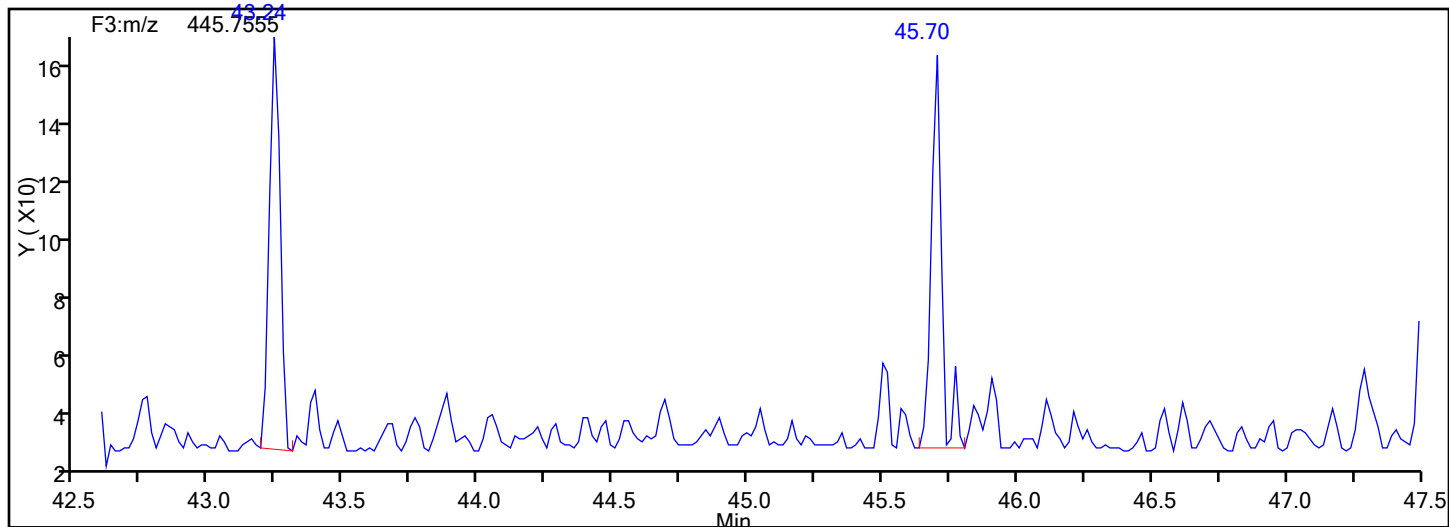
Column Type:

Column Dia:

HxCDF



HxCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

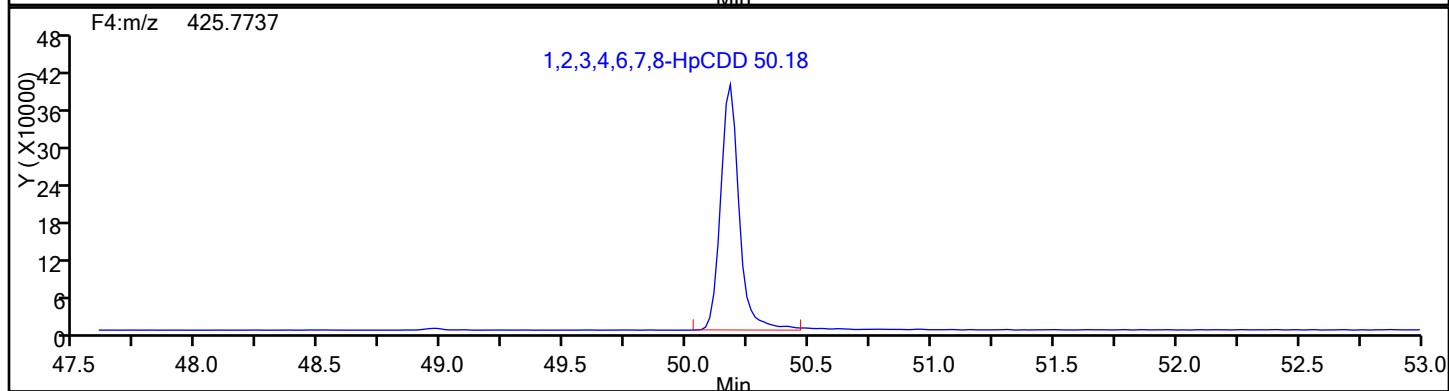
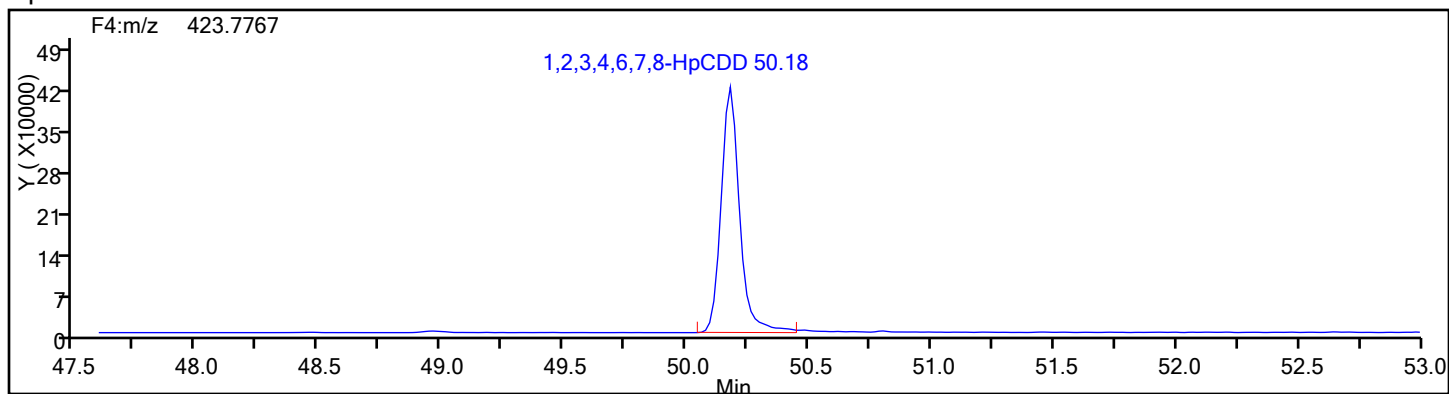
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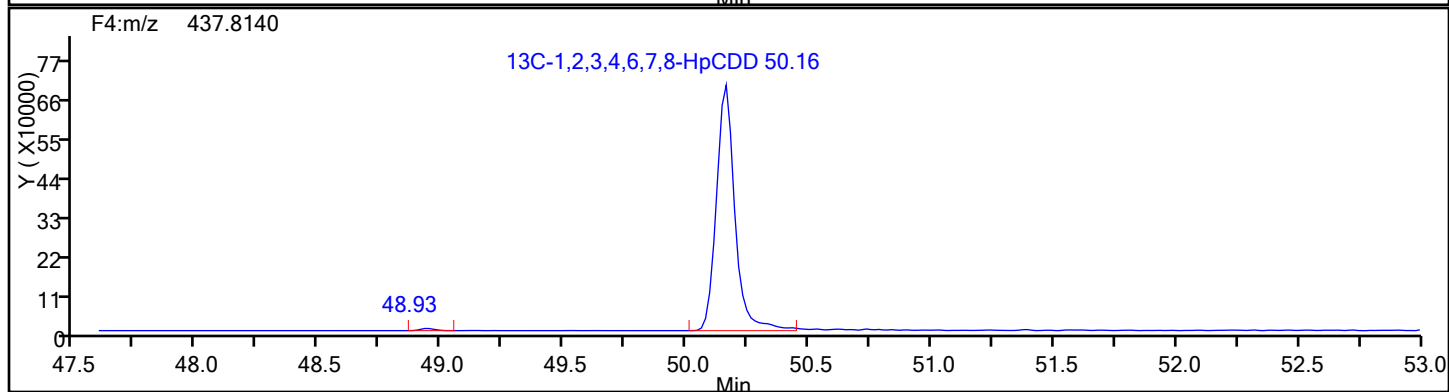
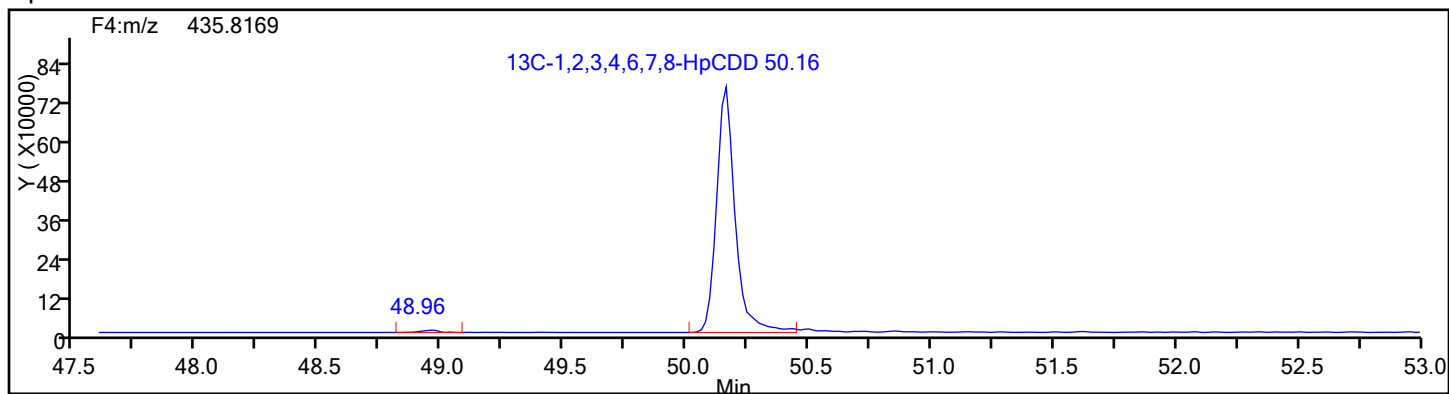
Column Type:

Column Dia:

HpCDD



HpCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

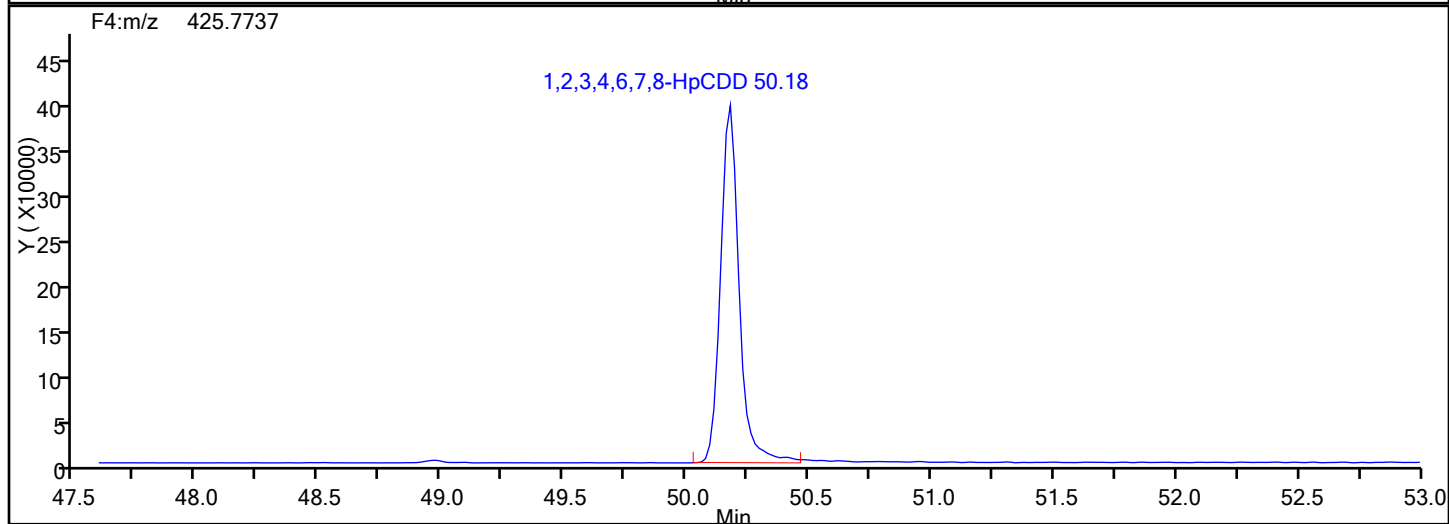
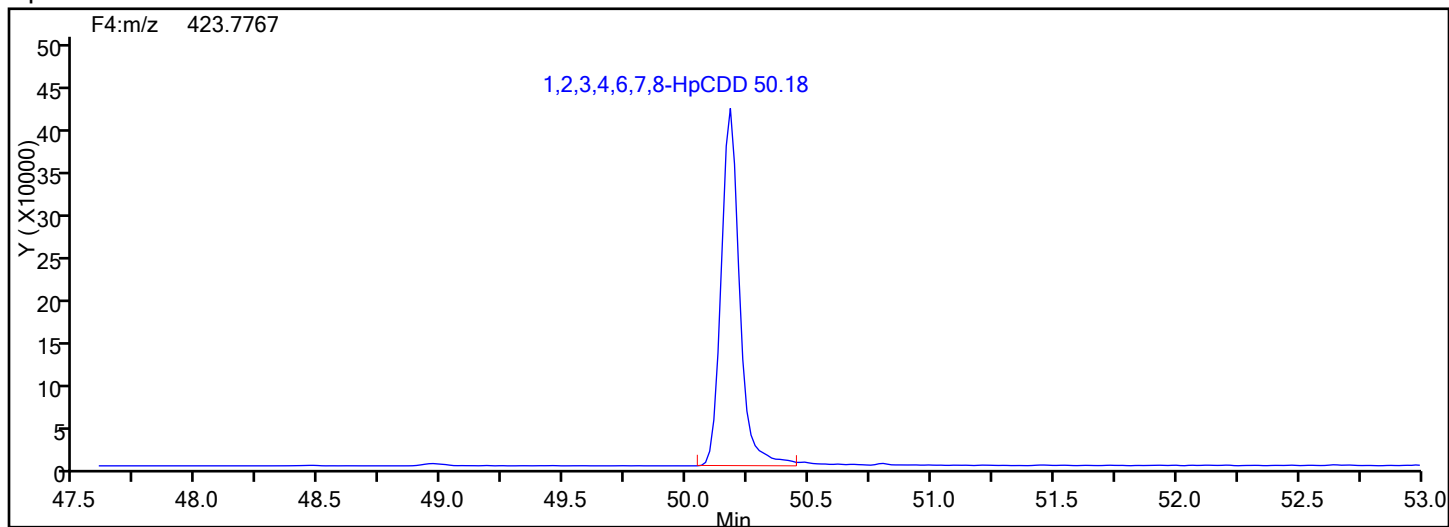
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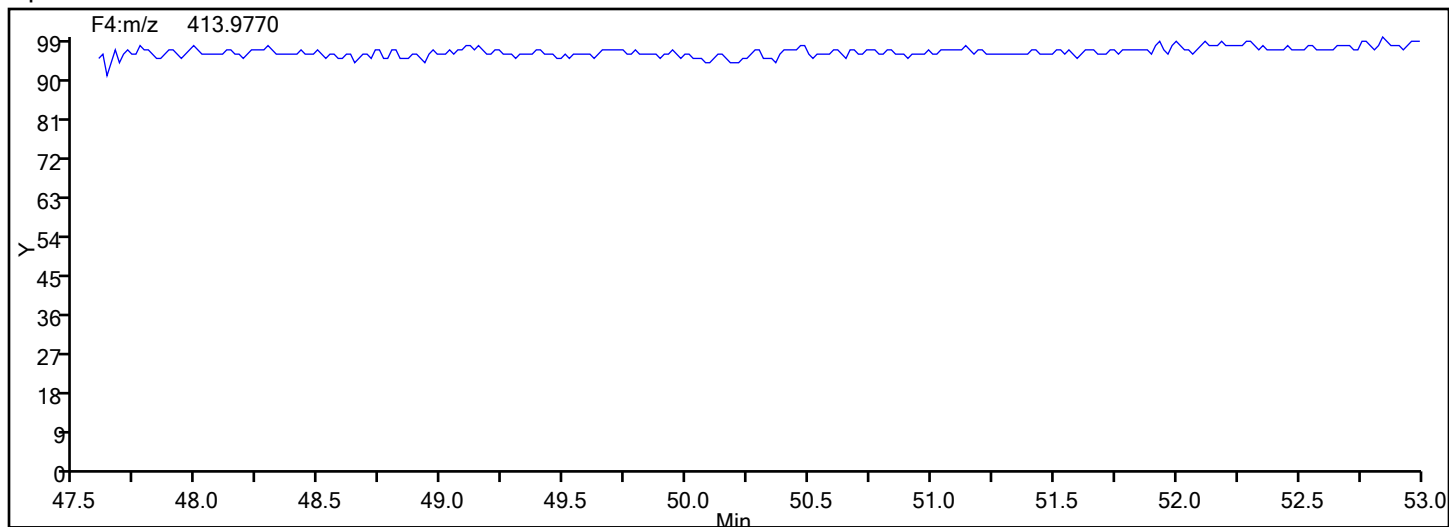
Column Type:

Column Dia:

HpCDD



HpCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

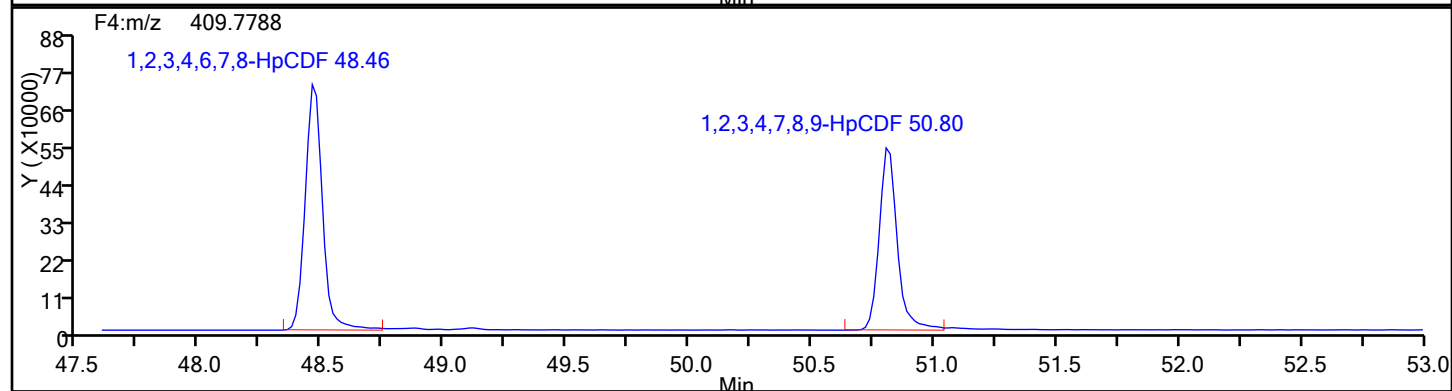
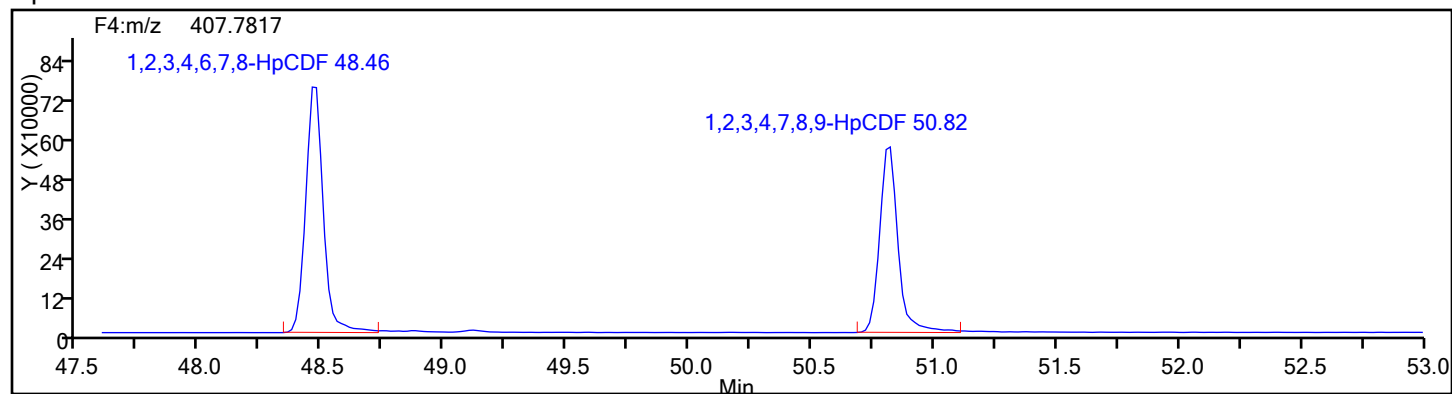
Worklist#: 7768

Sample Line#: 4

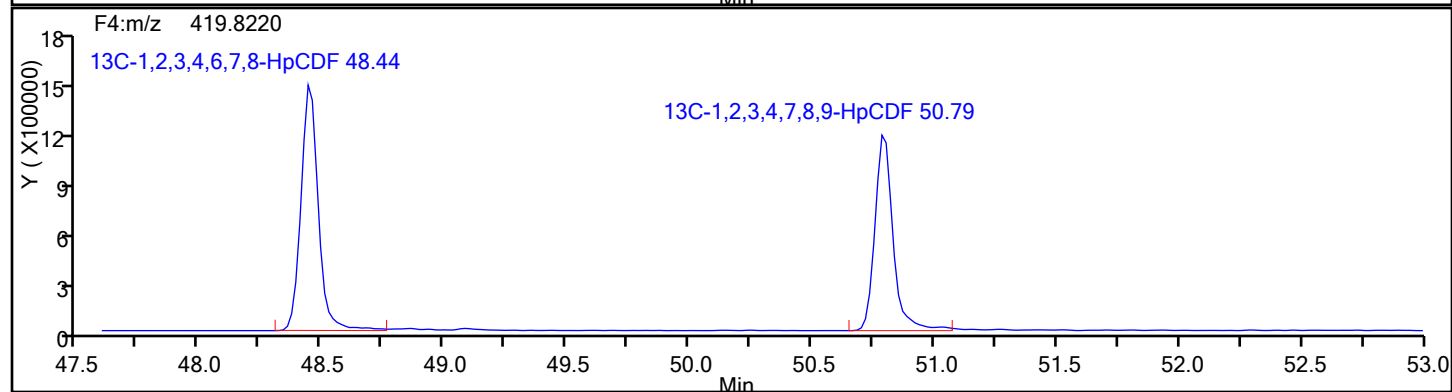
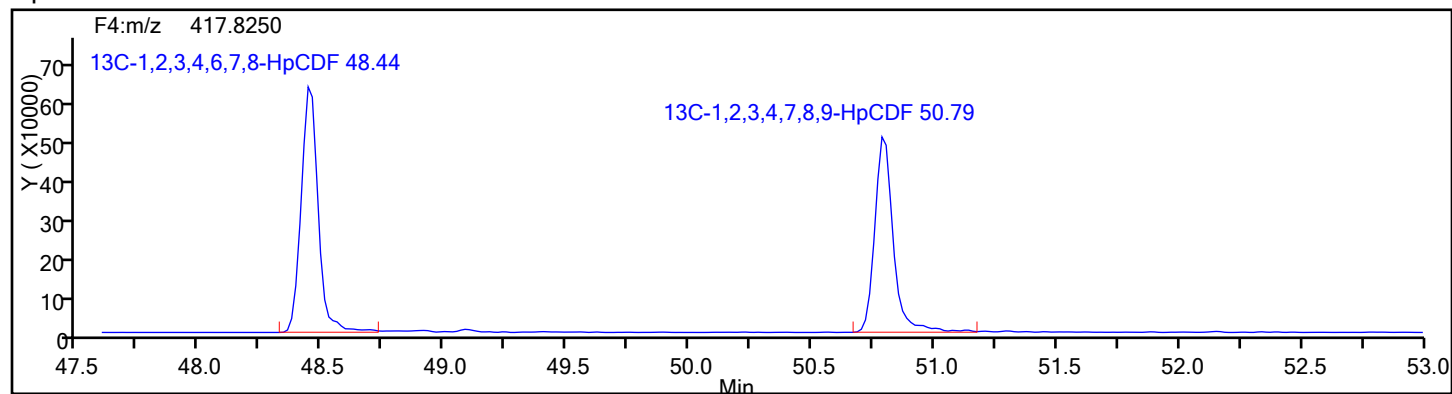
Column Type:

Column Dia:

HpCDF



HpCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

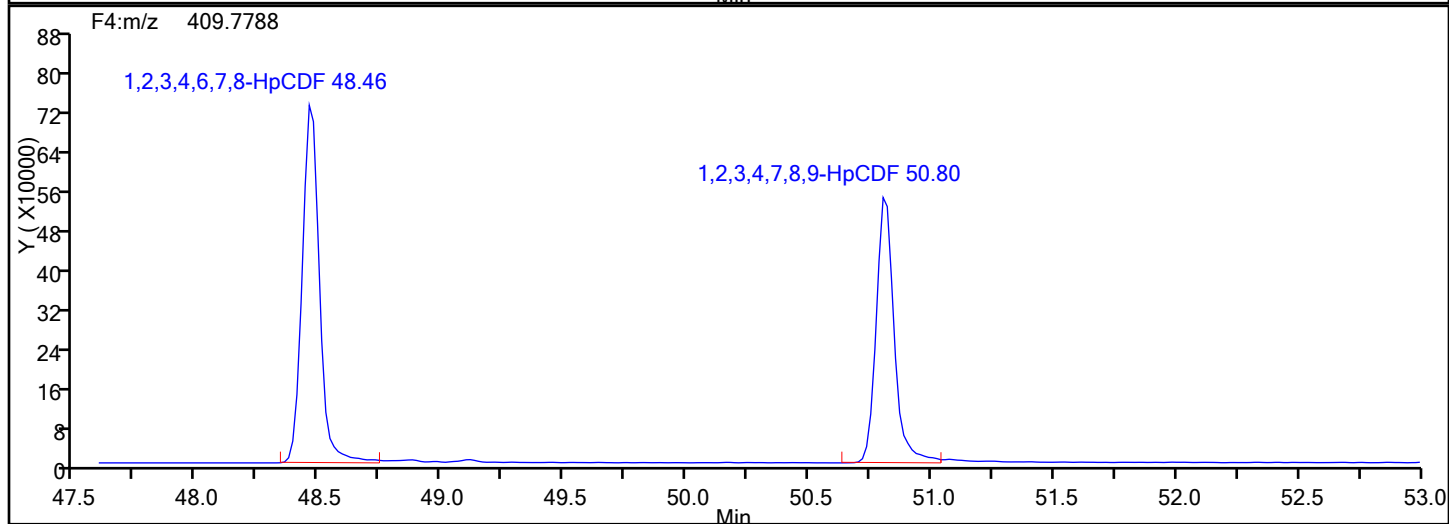
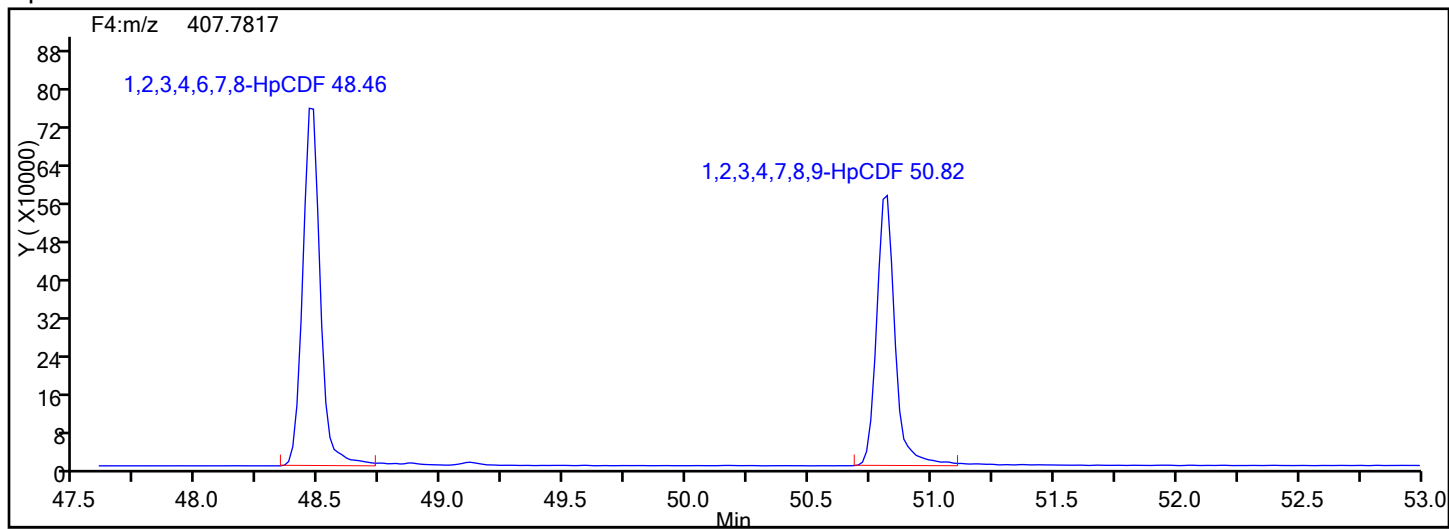
Worklist#: 7768

Sample Line#: 4

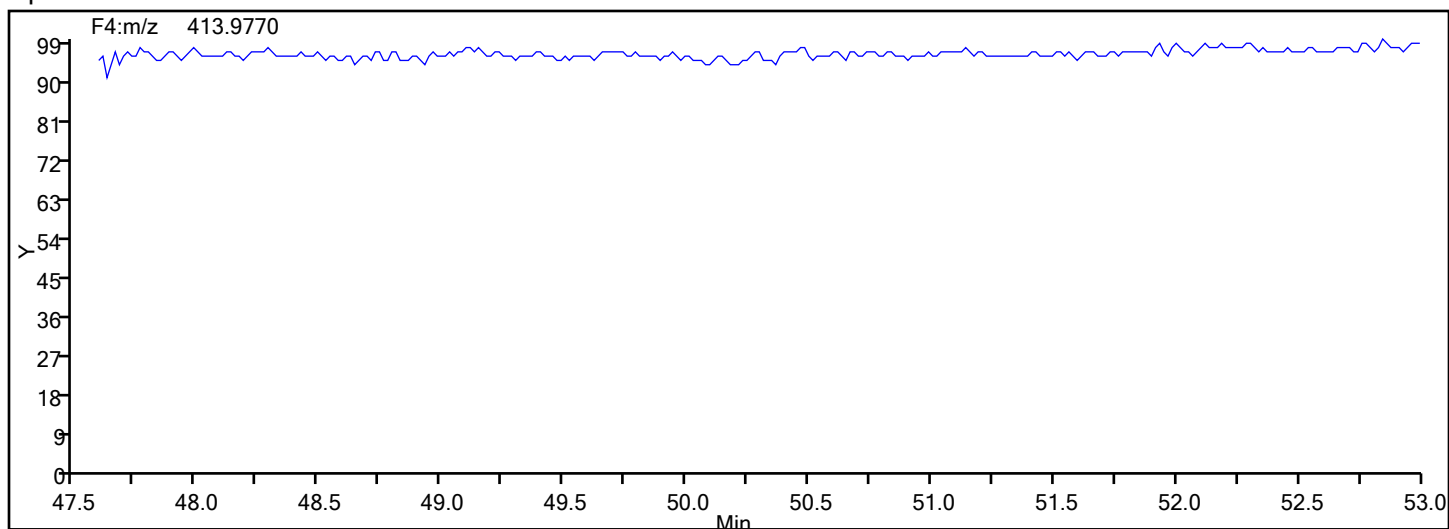
Column Type:

Column Dia:

HpCDF



HpCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

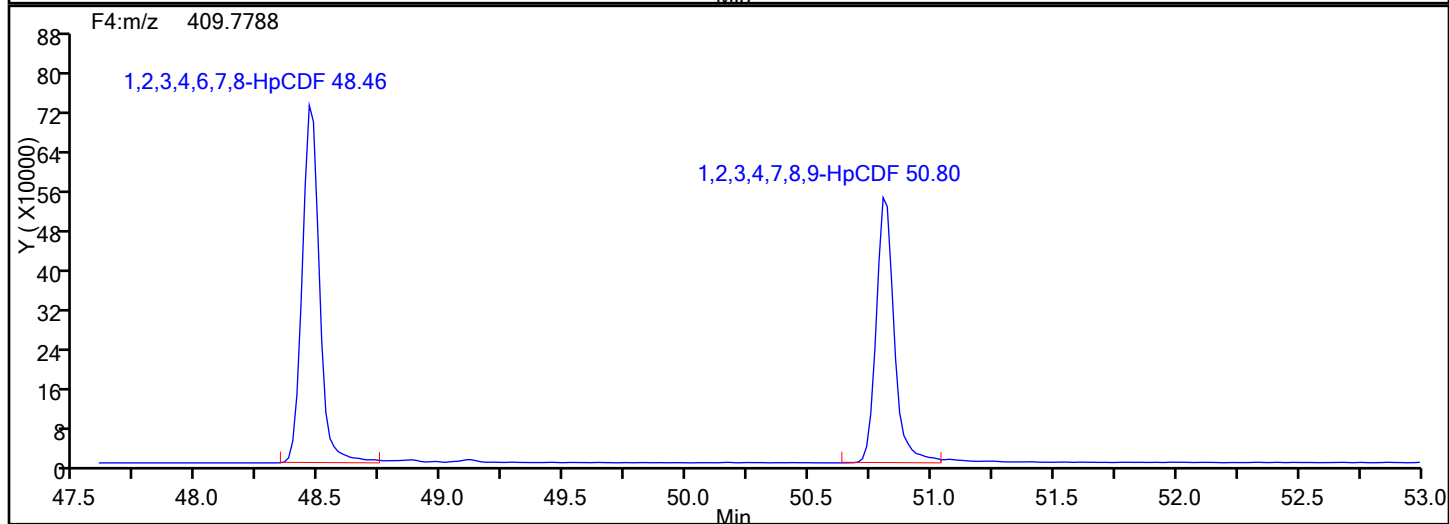
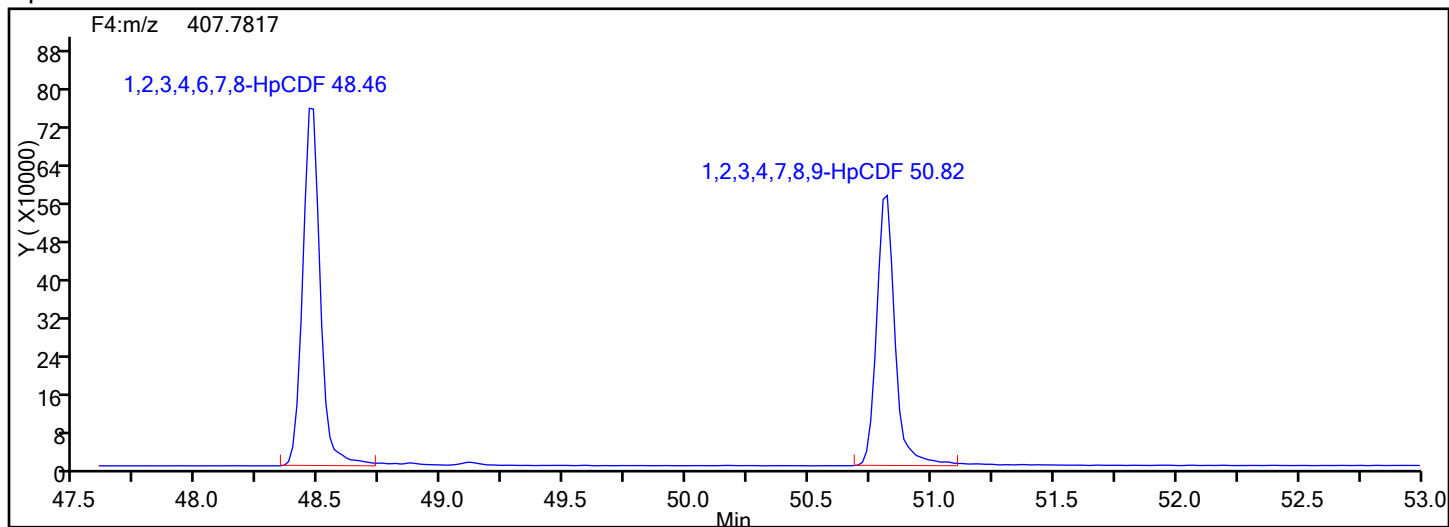
Worklist#: 7768

Sample Line#: 4

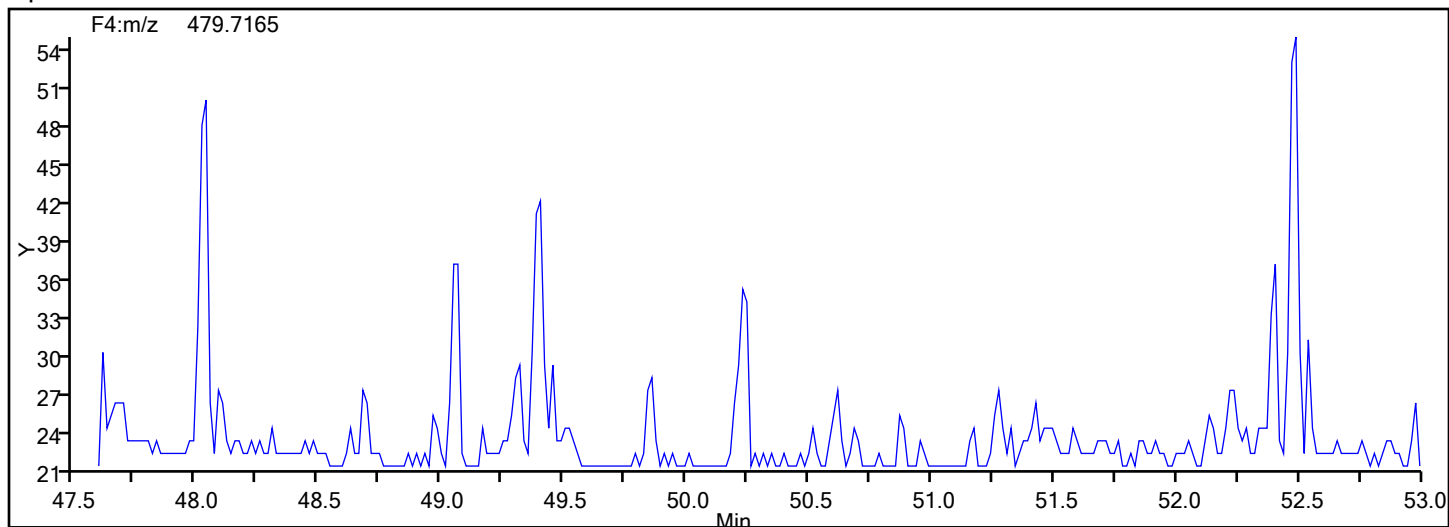
Column Type:

Column Dia:

HpCDF



HpCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

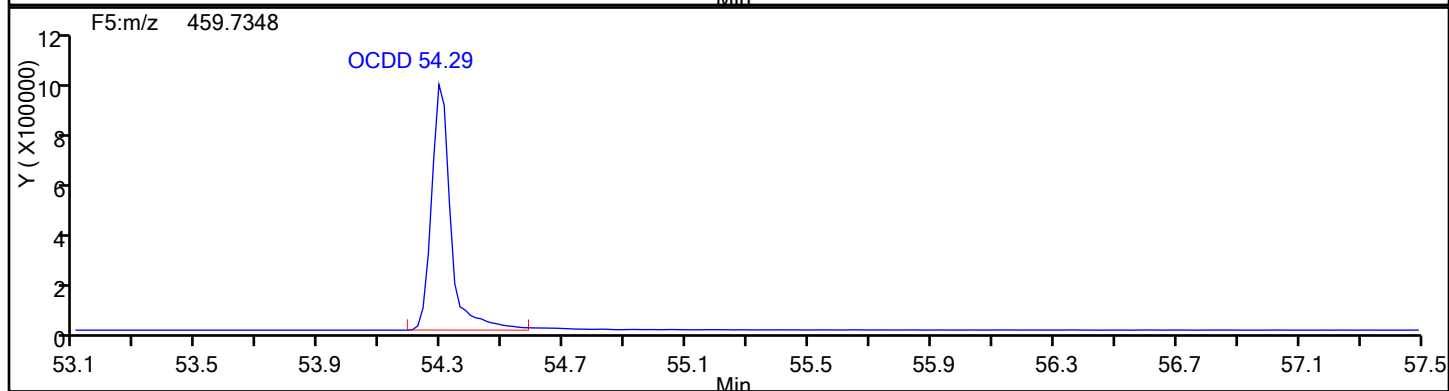
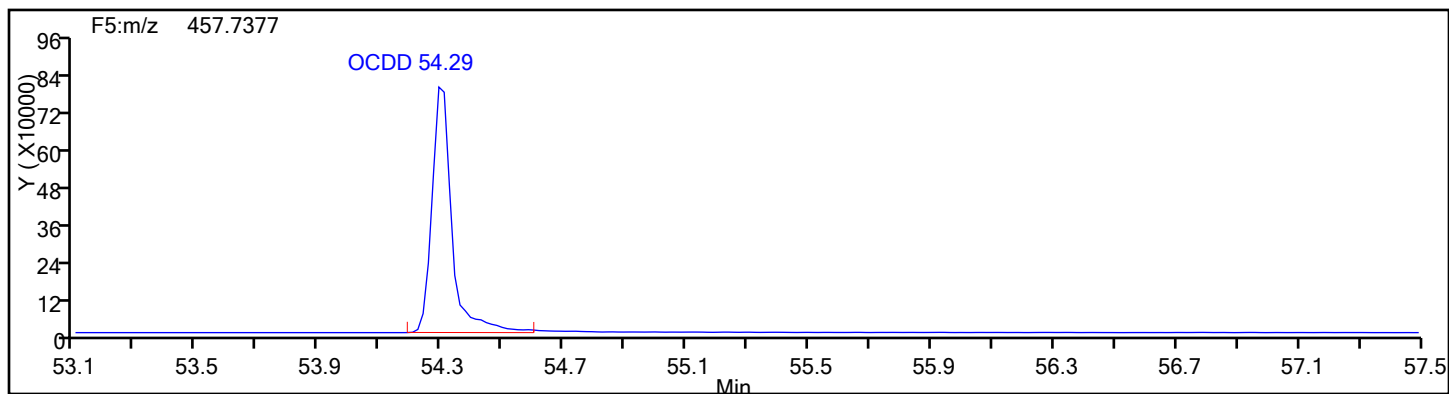
Worklist#: 7768

Sample Line#: 4

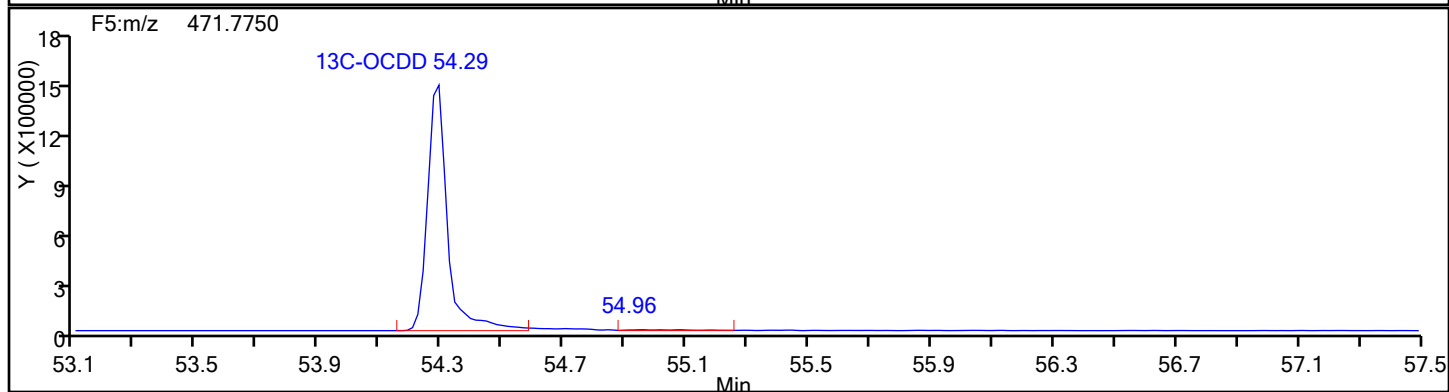
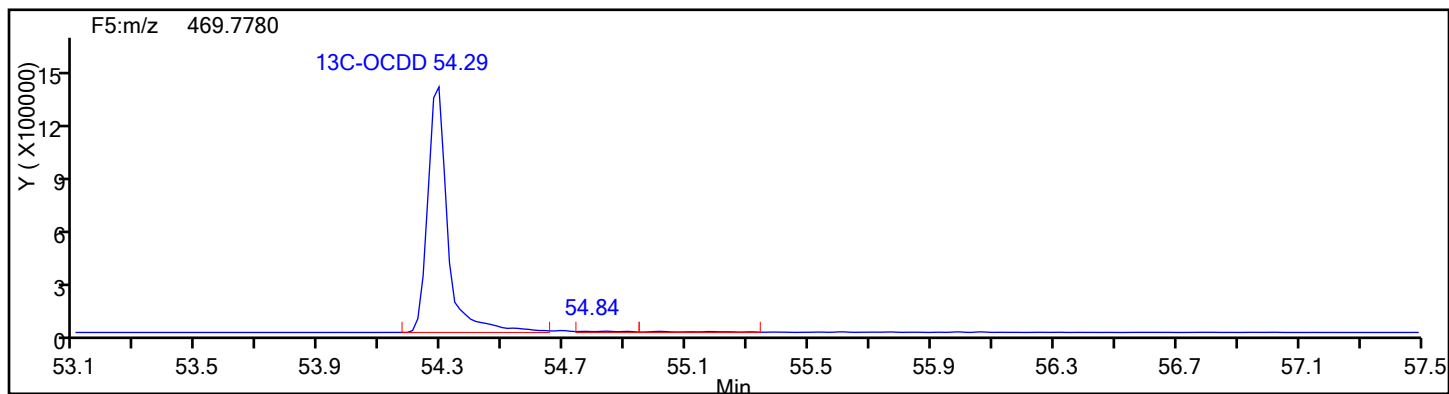
Column Type:

Column Dia:

OCDD



OCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

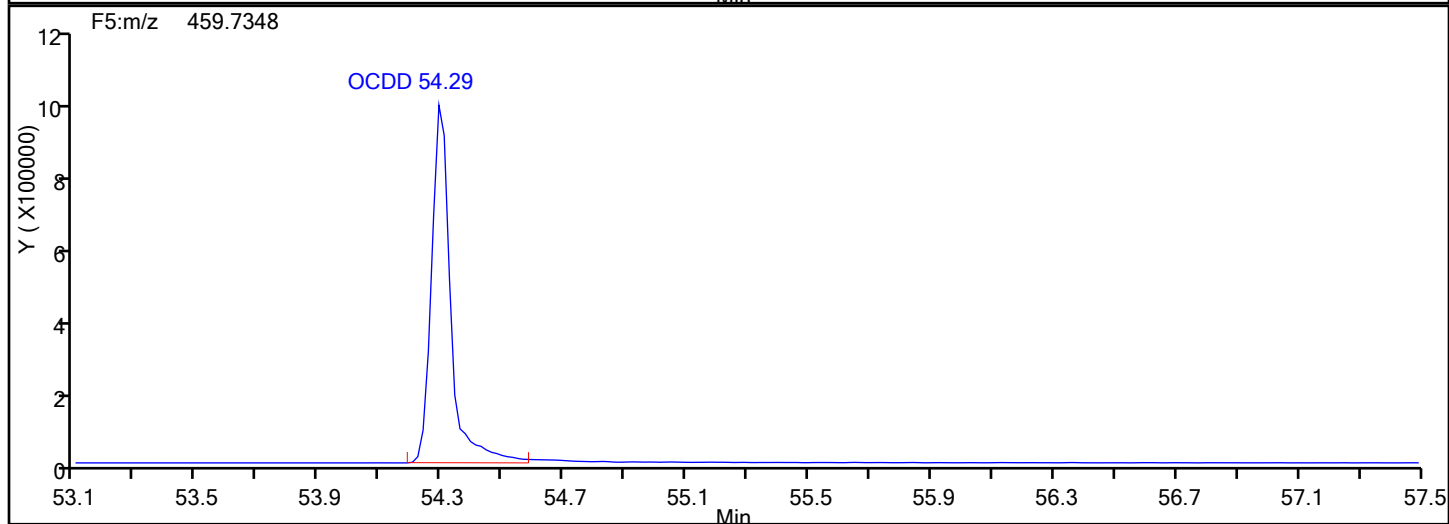
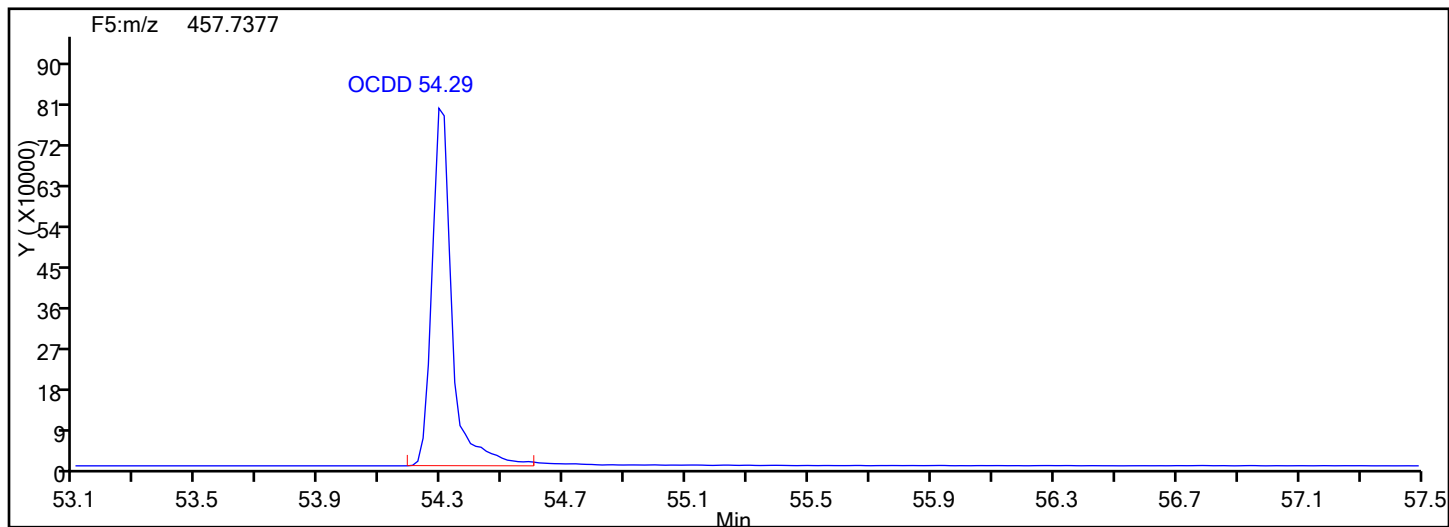
Worklist#: 7768

Sample Line#: 4

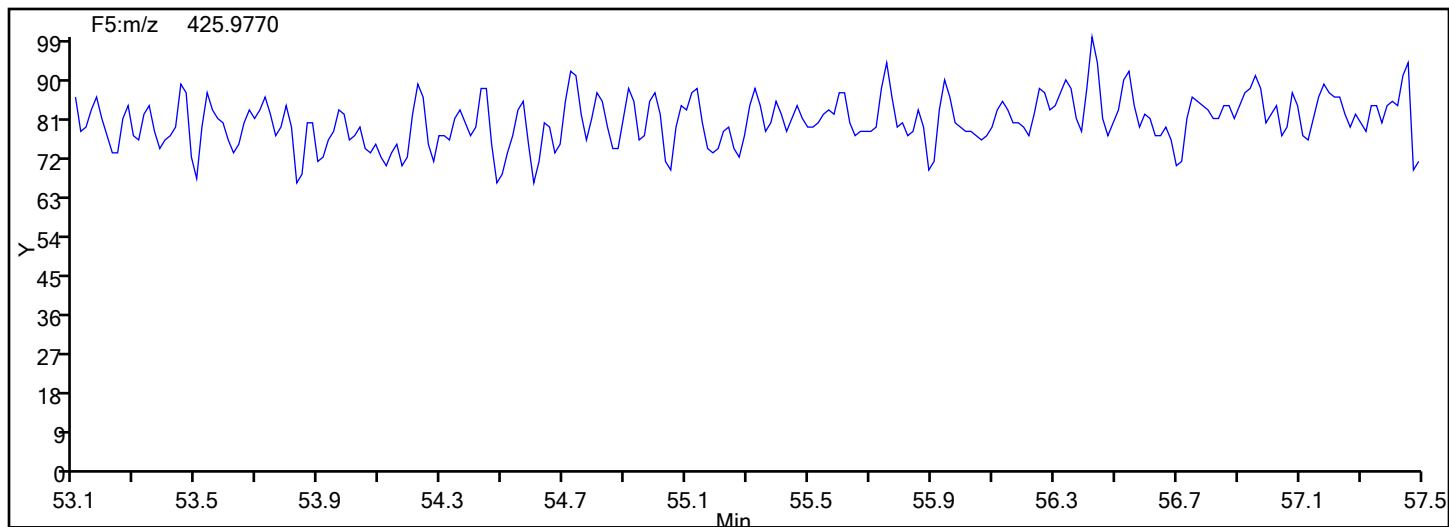
Column Type:

Column Dia:

OCDD



OCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

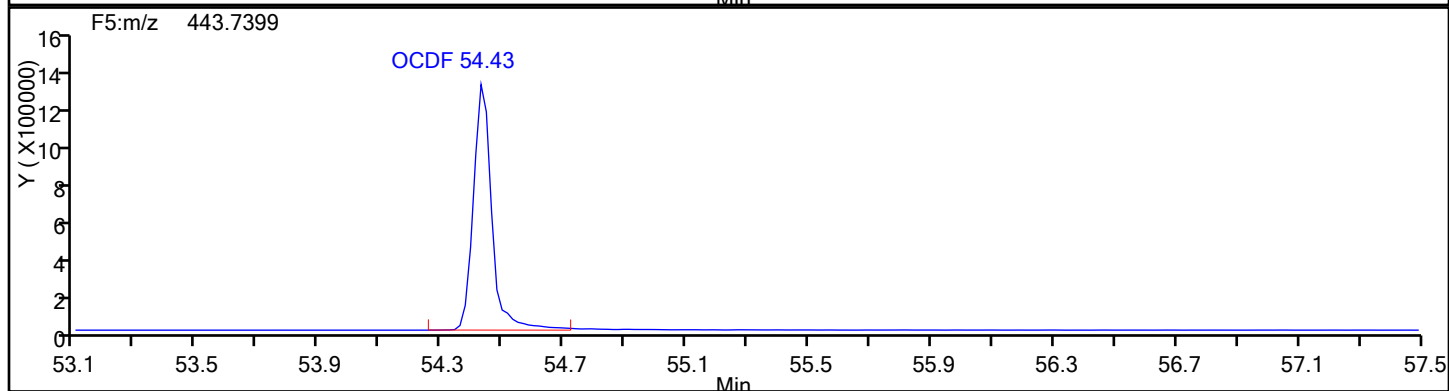
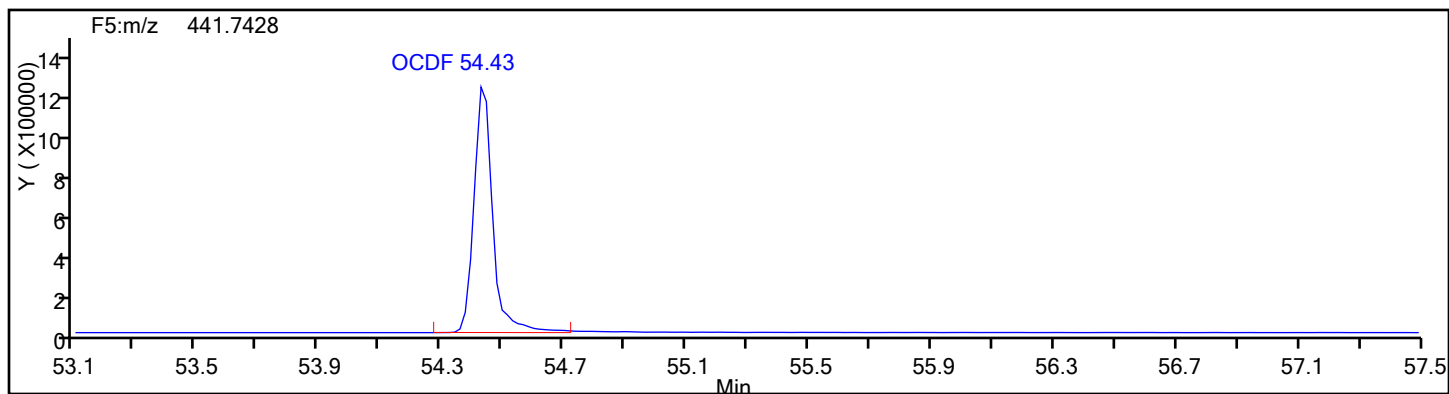
Worklist#: 7768

Sample Line#: 4

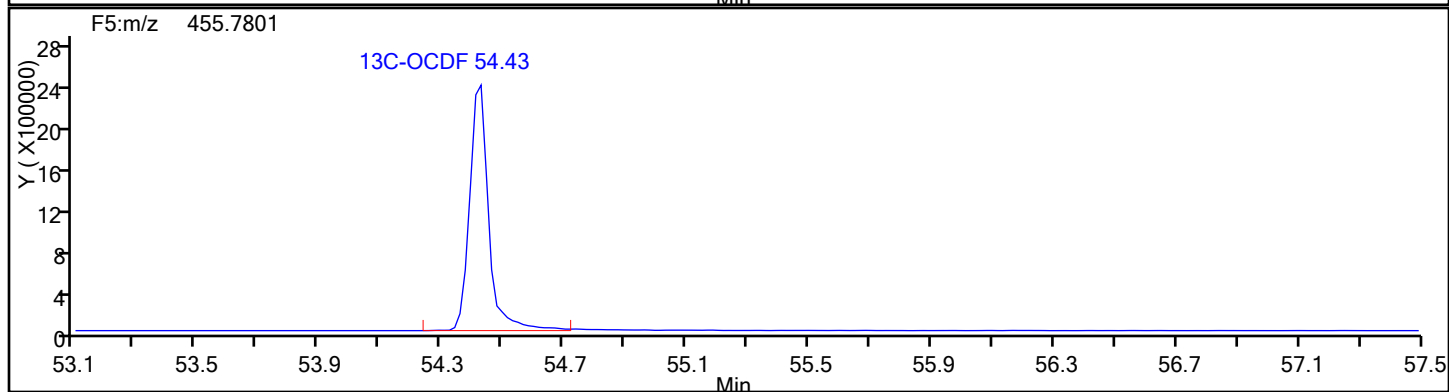
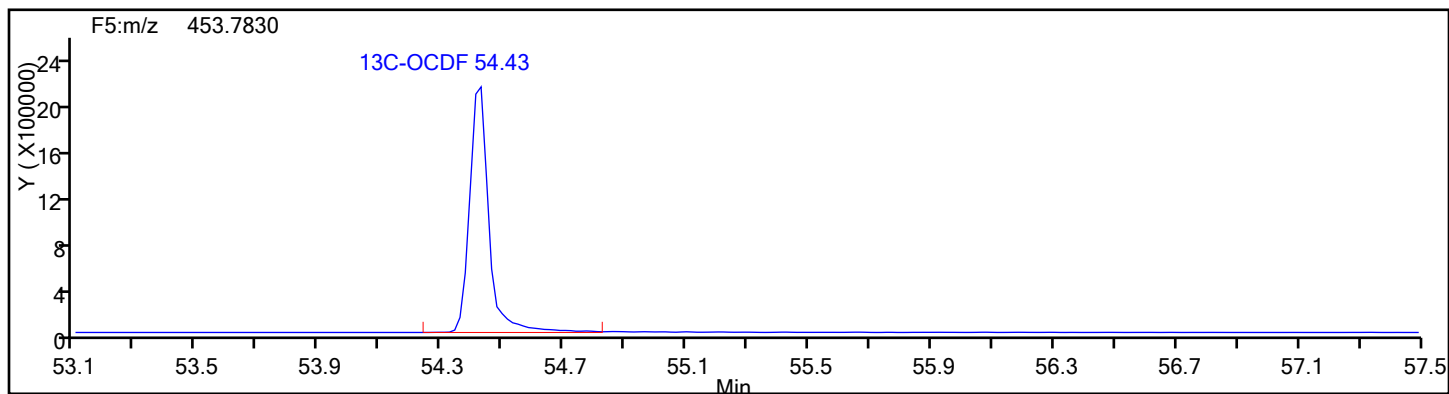
Column Type:

Column Dia:

OCDF



OCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

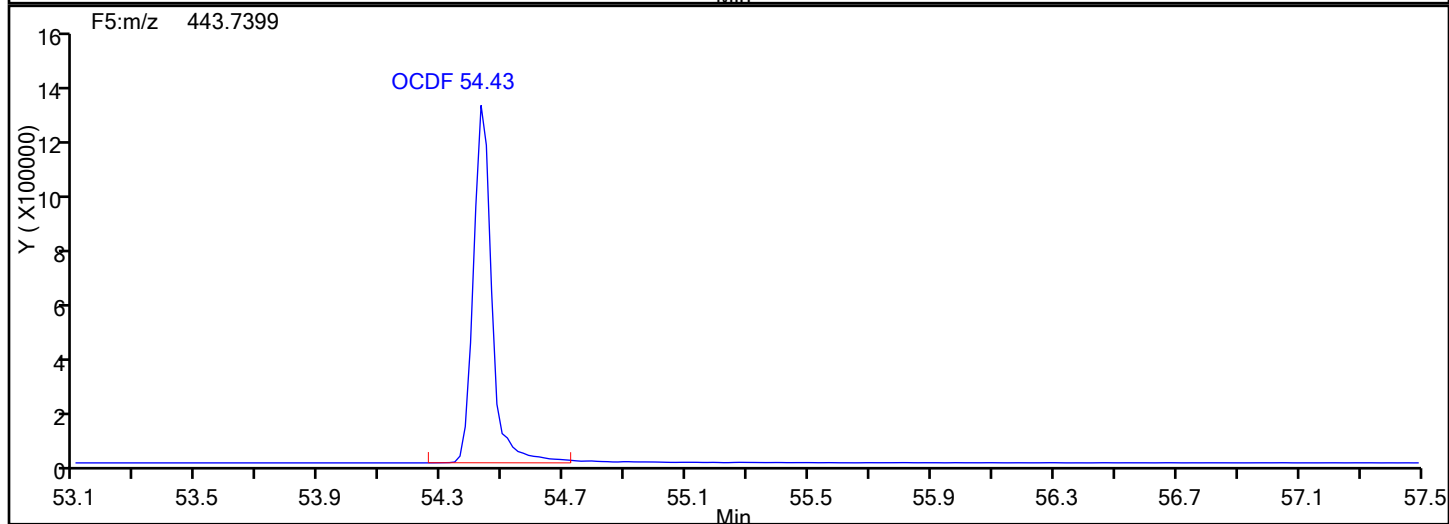
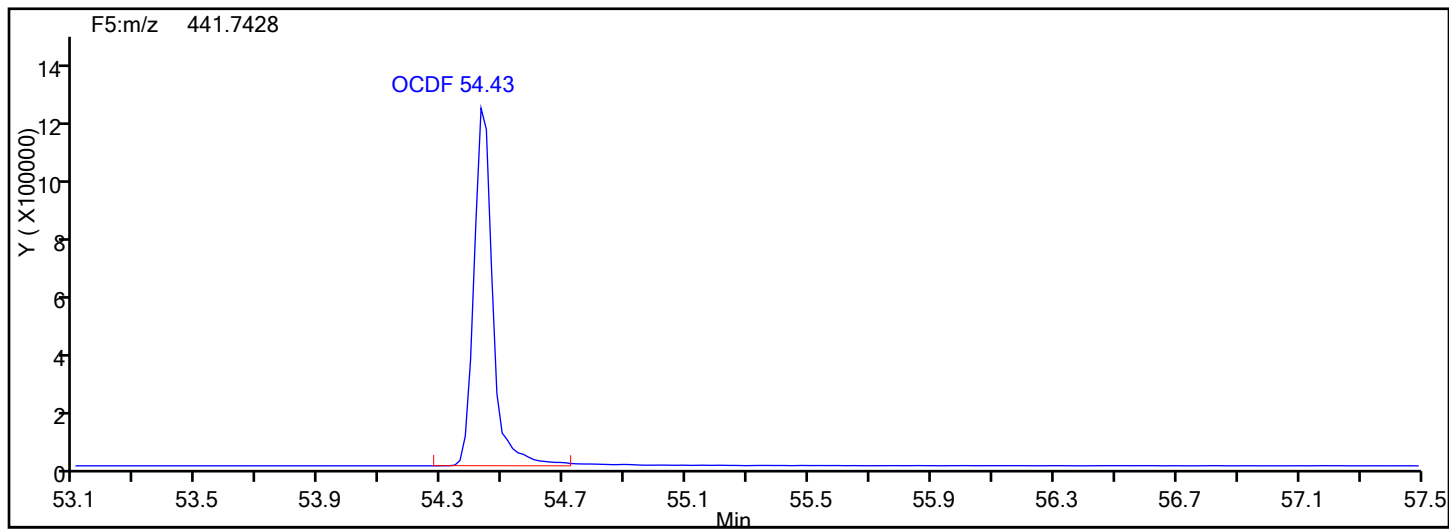
Worklist#: 7768

Sample Line#: 4

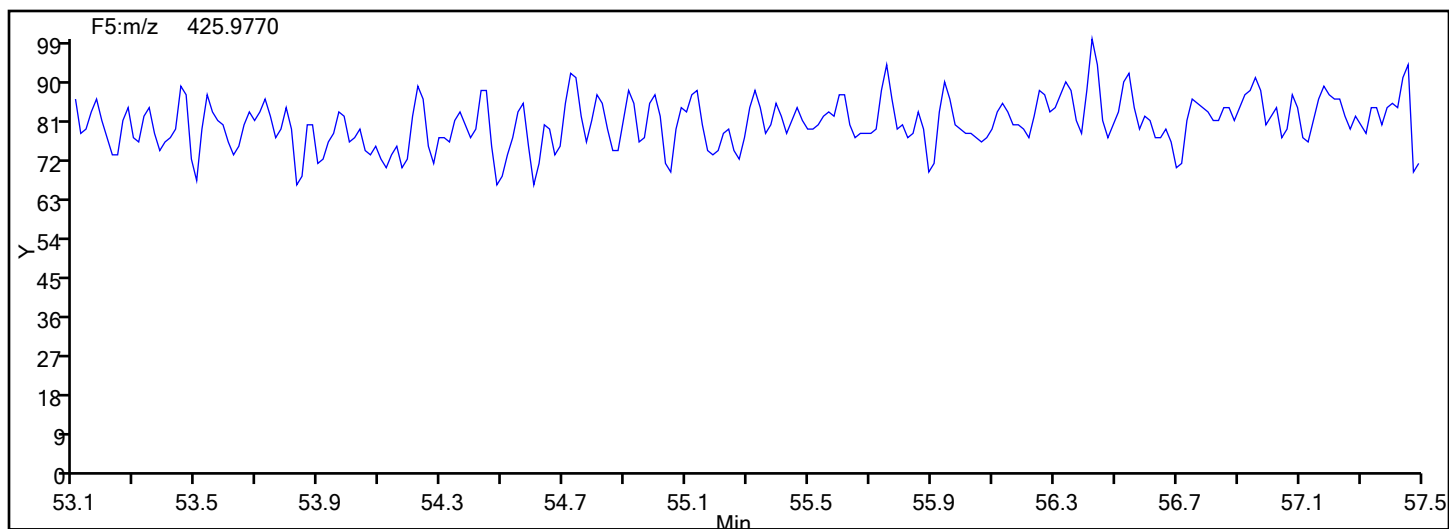
Column Type:

Column Dia:

OCDF



OCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i3.d

Injection Date: 16-May-2014 16:27:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

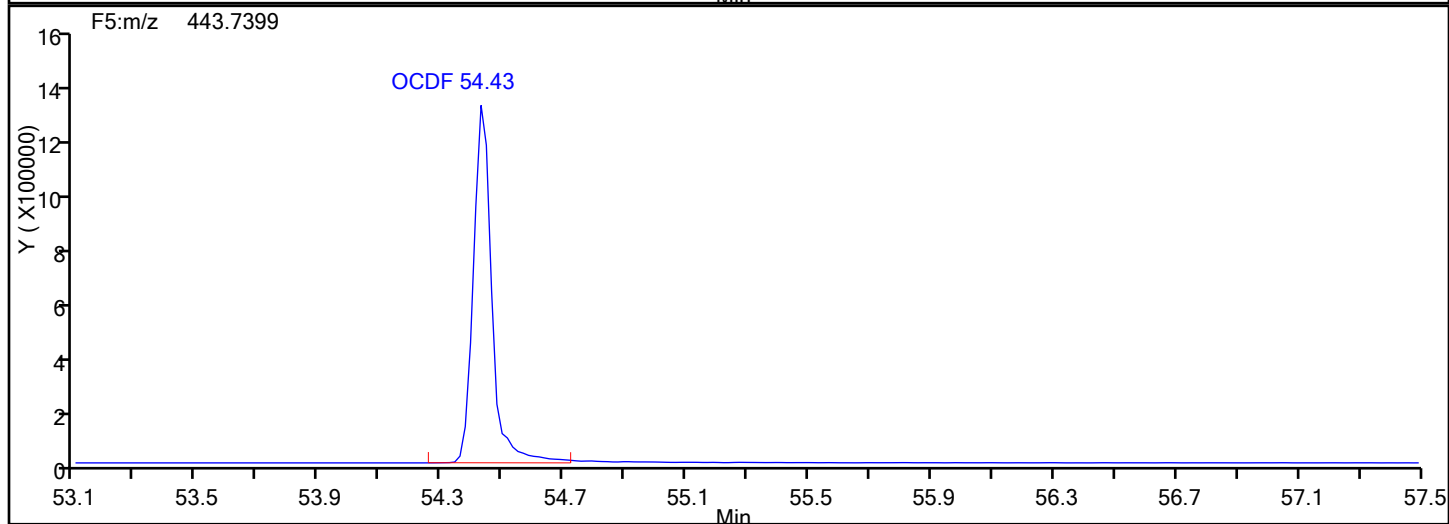
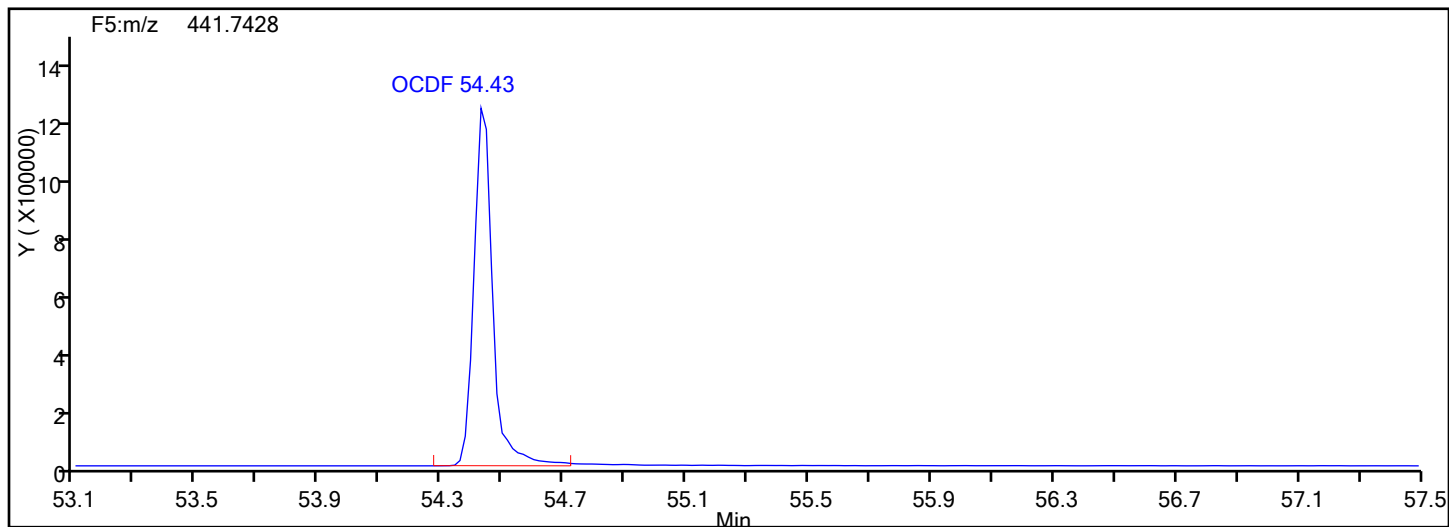
Worklist#: 7768

Sample Line#: 4

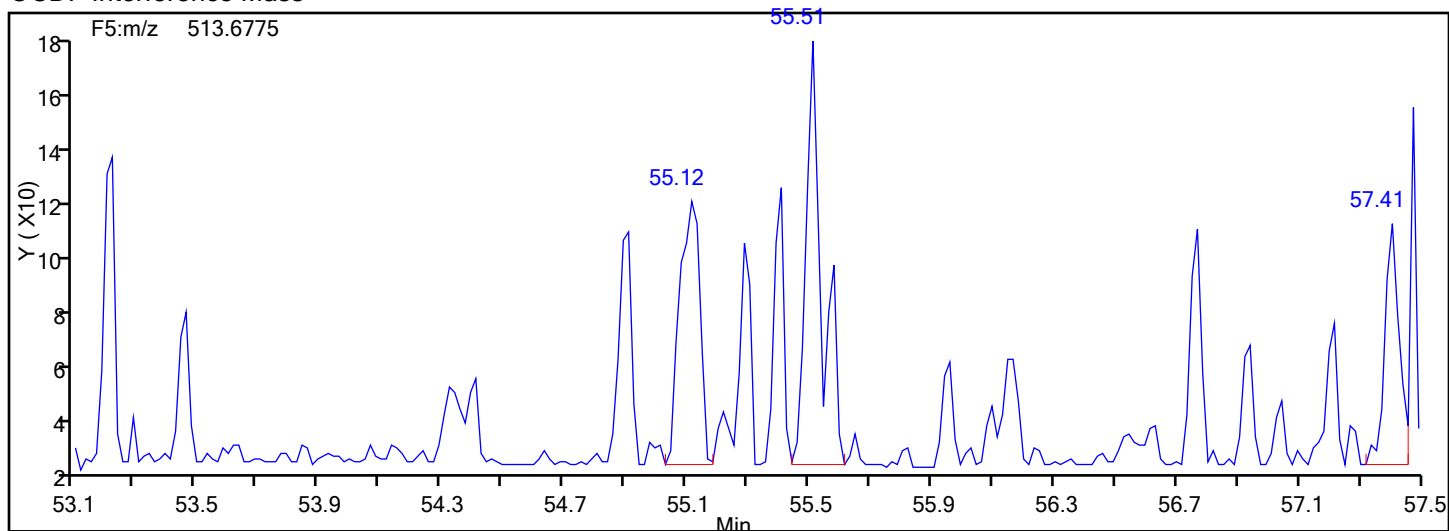
Column Type:

Column Dia:

OCDF



OCDF Interference Mass



TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d
 Lims ID: IC L4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 16-May-2014 17:29:00 ALS Bottle#: 0 Worklist Smp#: 5
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs4 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:09:34 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:15:14

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31.815	4263534	0.80	1.1733	38.6	38.6	0.0562	0.0562	96.61	
A Non-2,3,7,8-sub-TCDD	30.308						0.0	0.0		
S Total TCDD					38.6	38.6	0.0562	0.0562		
2,3,7,8-TCDF	29.738	6586510	0.79	1.0881	39.2	39.2	0.0448	0.0448	98.00	
A Non-2,3,7,8-sub-TCDF	28.995	62222	0.77	0.0000						RQ
S Total TCDF					39.2	39.2	0.0448	0.0448		RQ
1,2,3,7,8-PeCDD	40.977	15915139	1.57	1.0434	192.3	192.3	0.1041	0.1041	96.13	
A Non-2,3,7,8-sub-PeCDD	39.915						0.0	0.0		
S Total PeCDD					192.3	192.3	0.1041	0.1041		
1,2,3,7,8-PeCDF	39.255	28353659	1.58	1.1898	194.0	194.0	0.6108	0.6108	96.98	
2,3,4,7,8-PeCDF	40.461	26657615	1.59	1.1095	192.9	192.9	0.5785	0.5785	96.45	
A Non-2,3,7,8-sub-PeCDF	38.623						0.0	0.0		
S Total PeCDF					386.9	386.9	0.5947	0.5947		
1,2,3,4,7,8-HxCDD	45.212	19615008	1.24	1.1409	193.1	193.1	0.4370	0.4370	96.53	
1,2,3,6,7,8-HxCDD	45.330	20922527	1.27	1.1481	190.0	190.0	0.4327	0.4327	94.98	
1,2,3,7,8,9-HxCDD	45.718	21806109	1.26	1.2212	193.1	193.1	0.4076	0.4076	96.53	
A Non-2,3,7,8-sub-HxCDD	44.687						0.0	0.0		
S Total HxCDD					576.1	576.1	0.4258	0.4258		
1,2,3,4,7,8-HxCDF	44.166	31660907	1.24	1.3629	192.6	192.6	0.4101	0.4101	96.29	
1,2,3,6,7,8-HxCDF	44.284	36461883	1.25	1.2762	190.5	190.5	0.3742	0.3742	95.27	
2,3,4,6,7,8-HxCDF	45.026	32628769	1.25	1.2654	193.4	193.4	0.4178	0.4178	96.70	
1,2,3,7,8,9-HxCDF	45.988	30276117	1.25	1.2573	196.1	196.1	0.5112	0.5112	98.06	
A Non-2,3,7,8-sub-HxCDF	44.552						0.0	0.0		
S Total HxCDF					772.6	772.6	0.4284	0.4284		
1,2,3,4,6,7,8-HpCDD	50.141	17971175	1.06	1.1204	192.8	192.8	0.5434	0.5434	96.40	
A Non-2,3,7,8-sub-HpCDD	49.566						0.0	0.0		
S Total HpCDD					192.8	192.8	0.5434	0.5434		
1,2,3,4,6,7,8-HpCDF	48.420	30775593	1.05	1.4984	193.1	193.1	0.3986	0.3986	96.55	
1,2,3,4,7,8,9-HpCDF	50.765	24451442	1.05	1.3807	195.2	195.2	0.5424	0.5424	97.61	

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
A Non-2,3,7,8-sub-HpCDF	49.625						0.0	0.0		
S Total HpCDF					388.3	388.3	0.4705	0.4705		
OCDD	54.267	34014604	0.90	1.2073	380.8	380.8	0.3541	0.3541	95.20	
OCDF	54.388	47454024	0.92	1.1162	378.5	378.5	0.3471	0.3471	94.62	
D 13C-2,3,7,8-TCDD	31.766	9403373	0.83	1.0709	100.8	100.8	0.2750	0.2750	101	
D 13C-2,3,7,8-TCDF	29.688	15441140	0.82	1.7545	101.1	101.1	0.0968	0.0968	101	
D 13C-1,2,3,7,8-PeCDD	40.960	7933559	1.61	0.8743	104.2	104.2	0.3387	0.3387	104	
D 13C-1,2,3,7,8-PeCDF	39.238	12286310	1.60	1.3704	102.9	102.9	0.3105	0.3105	103	
D 13C-2,3,4,7,8-PeCDF	40.444	12455454	1.59	1.3837	103.4	103.4	0.3075	0.3075	103	
D 13C-1,2,3,4,7,8-HxCDD	45.195	8905352	1.28	0.8772	101.2	101.2	0.1612	0.1612	101	
D 13C-1,2,3,6,7,8-HxCDD	45.313	9593131	1.26	0.9171	104.3	104.3	0.1542	0.1542	104	
D 13C-1,2,3,4,7,8-HxCDF	44.149	12063156	0.53	1.1892	101.1	101.1	0.1383	0.1383	101	
D 13C-1,2,3,6,7,8-HxCDF	44.267	14993755	0.55	1.4625	102.2	102.2	0.1125	0.1125	102	
D 13C-2,3,4,6,7,8-HxCDF	45.009	13333182	0.53	1.3197	100.7	100.7	0.1246	0.1246	101	
D 13C-1,2,3,7,8,9-HxCDF	45.971	12277599	0.54	1.2001	102.0	102.0	0.1370	0.1370	102	
D 13C-1,2,3,4,6,7,8-HpCDD	50.124	8319073	1.10	0.8155	101.7	101.7	0.2654	0.2654	102	
D 13C-1,2,3,4,6,7,8-HpCDF	48.403	10636138	0.46	1.0496	101.0	101.0	0.1544	0.1544	101	
D 13C-1,2,3,4,7,8,9-HpCDF	50.748	9071146	0.45	0.8947	101.0	101.0	0.1811	0.1811	101	
D 13C-OCDD	54.250	14797795	0.93	0.7044	209.4	209.4	0.1227	0.1227	105	
D 13C-OCDF	54.388	22466050	0.91	1.0615	210.9	210.9	0.1026	0.1026	105	
\$ 37Cl4-2,3,7,8-TCDD	31.799	4258282		1.2266	39.9	39.9	0.0284	0.0284	99.66	
* 13C-1,2,3,4-TCDD	31.234	8708927	0.81	9.1E+04	100.0	100.0				
* 13C-1,2,3,7,8,9-HxCDD	45.701	10033553	1.25	1E+05	100.0	100.0				

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

Reagents:

61L41613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d
 Lims ID: IC L4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 16-May-2014 17:29:00 ALS Bottle#: 0 Worklist Smp#: 5
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs4 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:09:34 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:15:14

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,7,8-TCDD											
319.8965	31.815	31.838	-1	1.002	1891248	191979	134	335	1433		
321.8936	31.799	31.838	-2	1.001	2372286	242692	126	315	1926	0.80(0.65-0.89)	
A Non-2,3,7,8-sub-TCDD											
319.8965	30.308						134	335			
321.8936	30.308						126	315			
2,3,7,8-TCDF											
303.9016	29.738	29.760	-1	1.002	2915517	328500	135	337	2433		
305.8987	29.721	29.760	-2	1.001	3670993	403994	191	477	2115	0.79(0.65-0.89)	
A Non-2,3,7,8-sub-TCDF											
303.9016	28.591	28.995	-24		24843	3402	135	337	25		
305.8987	28.591	28.995	-24		28149	3247	191	477	17	0.88(0.65-0.89)	
303.9016	30.070	28.995	64		9552	855	135	337	6		
305.8987	30.137	28.995	68		5215	1125	191	477	6	1.83(0.65-0.89)	
1,2,3,7,8-PeCDD											
355.8546	40.977	41.015	-2	1.000	9711201	2312647	455	1137	5083		
357.8516	40.977	41.015	-2	1.000	6203938	1486672	371	927	4007	1.57(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDD											
355.8546	39.915						455	1137			
357.8516	39.915						371	927			
1,2,3,7,8-PeCDF											
339.8597	39.255	39.293	-2	1.000	17352103	3551979	4380	10950	811		
341.8567	39.255	39.293	-2	1.000	11001556	2244107	2922	7305	768	1.58(1.32-1.78)	
2,3,4,7,8-PeCDF											
339.8597	40.461	40.499	-2	1.000	16366381	3807031	4380	10950	869		
341.8567	40.461	40.499	-2	1.000	10291234	2372495	2922	7305	812	1.59(1.32-1.78)	

RQ

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-PeCDF											
339.8597	38.623						4380	10950			
341.8567	38.623						2922	7305			
1,2,3,4,7,8-HxCDD											
389.8158	45.212	45.248	-2	1.000	10866678	2725560	2588	6470	1053		
391.8127	45.195	45.248	-3	1.000	8748330	2182787	1821	4552	1199	1.24(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45.330	45.366	-2	1.000	11699331	2736260	2588	6470	1057		
391.8127	45.313	45.366	-3	1.000	9223196	2118323	1821	4552	1163	1.27(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45.718	45.754	-2	1.012	12176851	2829631	2588	6470	1093		
391.8127	45.718	45.754	-2	1.012	9629258	2234894	1821	4552	1227	1.26(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDD											
389.8158	44.687						2588	6470			
391.8127	44.687						1821	4552			
1,2,3,4,7,8-HxCDF											
373.8208	44.166	44.202	-2	1.000	17552228	4595549	3845	9612	1195		
375.8178	44.149	44.202	-3	1.000	14108679	3675530	3097	7742	1187	1.24(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44.284	44.337	-3	1.000	20275139	4913451	3845	9612	1278		
375.8178	44.284	44.337	-3	1.000	16186744	4031681	3097	7742	1302	1.25(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	45.026	45.063	-2	1.000	18106557	4588639	3845	9612	1193		
375.8178	45.026	45.063	-2	1.000	14522212	3646655	3097	7742	1177	1.25(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	45.988	46.024	-2	1.000	16793197	3750981	3845	9612	976		
375.8178	45.988	46.024	-2	1.000	13482920	3044426	3097	7742	983	1.25(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDF											
373.8208	44.552						3845	9612			
375.8178	44.552						3097	7742			
1,2,3,4,6,7,8-HpCDD											
423.7767	50.141	50.178	-2	1.000	9259060	1781113	2362	5905	754		
425.7737	50.141	50.178	-2	1.000	8712115	1650944	1426	3565	1158	1.06(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											
423.7767	49.566						2362	5905			
425.7737	49.566						1426	3565			
1,2,3,4,6,7,8-HpCDF											
407.7817	48.420	48.458	-2	1.000	15764262	3226313	2617	6542	1233		
409.7788	48.420	48.458	-2	1.000	15011331	3120494	2620	6550	1191	1.05(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50.765	50.819	-3	1.000	12497949	2420397	2617	6542	925		
409.7788	50.765	50.819	-3	1.000	11953493	2345175	2620	6550	895	1.05(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDF											
407.7817	49.625						2617	6542			
409.7788	49.625						2620	6550			

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
OCDD											
457.7377	54.267	54.290	-1	1.000	16128444	3708022	1051	2627	3528		
459.7348	54.250	54.290	-2	1.000	17886160	4037709	1866	4665	2164	0.90(0.76-1.02)	
OCDF											
441.7428	54.388	54.428	-2	1.000	22687472	5303694	2550	6375	2080		
443.7399	54.388	54.428	-2	1.000	24766552	5953196	1550	3875	3841	0.92(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	31.766	31.788	-1	1.017	4252514	446145	651	1627	685		
333.9338	31.766	31.788	-1	1.017	5150859	538901	440	1100	1225	0.83(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	29.688	29.727	-2	0.951	6943354	752027	320	800	2350		
317.9389	29.688	29.727	-2	0.951	8497786	921617	309	772	2983	0.82(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40.960	40.998	-2	1.311	4892053	1175097	744	1860	1579		
369.8919	40.960	40.998	-2	1.311	3041506	726434	353	882	2058	1.61(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	39.238	39.276	-2	1.256	7554923	1540416	855	2137	1802		
353.8970	39.238	39.276	-2	1.256	4731387	971377	721	1802	1347	1.60(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40.444	40.481	-2	1.295	7639963	1738288	855	2137	2033		
353.8970	40.444	40.481	-2	1.295	4815491	1105777	721	1802	1534	1.59(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	45.195	45.231	-2	0.989	4993367	1233498	758	1895	1627		
403.8529	45.195	45.231	-2	0.989	3911985	977058	541	1352	1806	1.28(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45.313	45.350	-2	0.992	5339736	1220476	758	1895	1610		
403.8529	45.313	45.350	-2	0.992	4253395	998127	541	1352	1845	1.26(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	44.149	44.185	-2	0.966	4183066	1106590	486	1215	2277		
385.8610	44.149	44.185	-2	0.966	7880090	1998317	1025	2562	1950	0.53(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	44.267	44.320	-3	0.969	5312423	1289548	486	1215	2653		
385.8610	44.267	44.320	-3	0.969	9681332	2344271	1025	2562	2287	0.55(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	45.009	45.046	-2	0.985	4594531	1144207	486	1215	2354		
385.8610	45.009	45.046	-2	0.985	8738651	2138197	1025	2562	2086	0.53(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	45.971	46.007	-2	1.006	4287134	927670	486	1215	1909		
385.8610	45.971	46.007	-2	1.006	7990465	1772222	1025	2562	1729	0.54(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	50.124	50.161	-2	1.097	4358439	814143	823	2057	989		
437.8140	50.124	50.161	-2	1.097	3960634	741361	1165	2912	636	1.10(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48.403	48.441	-2	1.059	3337014	690637	759	1897	910		
419.8220	48.403	48.441	-2	1.059	7299124	1501267	730	1825	2057	0.46(0.51-0.37)	

Signal	RT (min.)	Adj RT (min.)	¶ Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50.748	50.786	-2	1.110	2821969	553394	759	1897	729		
419.8220	50.748	50.786	-2	1.110	6249177	1194738	730	1825	1637	0.45(0.37-0.51)	
13C-OCDD											
469.7780	54.250	54.290	-2	1.187	7131779	1633617	392	980	4167		
471.7750	54.250	54.290	-2	1.187	7666016	1778388	402	1005	4424	0.93(0.76-1.02)	
13C-OCDF											
453.7830	54.388	54.428	-2	1.190	10677571	2517622	556	1390	4528		
455.7801	54.388	54.428	-2	1.190	11788479	2773637	444	1110	6247	0.91(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31.799	31.838	-2	1.018	4258282	440452	129	322	3414		
13C-1,2,3,4-TCDD											
331.9368	31.234	31.273	-2		3910026	413703	651	1627	635		
333.9338	31.234	31.273	-2		4798901	512178	440	1100	1164	0.81(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45.701	45.737	-2		5570704	1287541	758	1895	1699		
403.8529	45.701	45.737	-2		4462849	1008970	541	1352	1865	1.25(1.05-1.43)	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Reagents:

61L41613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d
 Lims ID: IC L4
 Client ID:
 Inject. Date: 16-May-2014 17:29:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 4
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 5
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDF, RT: 28.995

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
-----------------	-----	----------------------	--------------	------	--------

Invalid SimRptGroup

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
----	---------------	-----------------	---------------	-----------------	--------	-------	-------

28.591	24843	3402	28149	3247		0.88	
30.070	9552	855	5215	1125		1.83	Rn

Signal Totals:

	34395	4257	33364	4372			
--	-------	------	-------	------	--	--	--

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	67759	8629				1.03	RQ
	62222	8640					Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (67759 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (62222 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

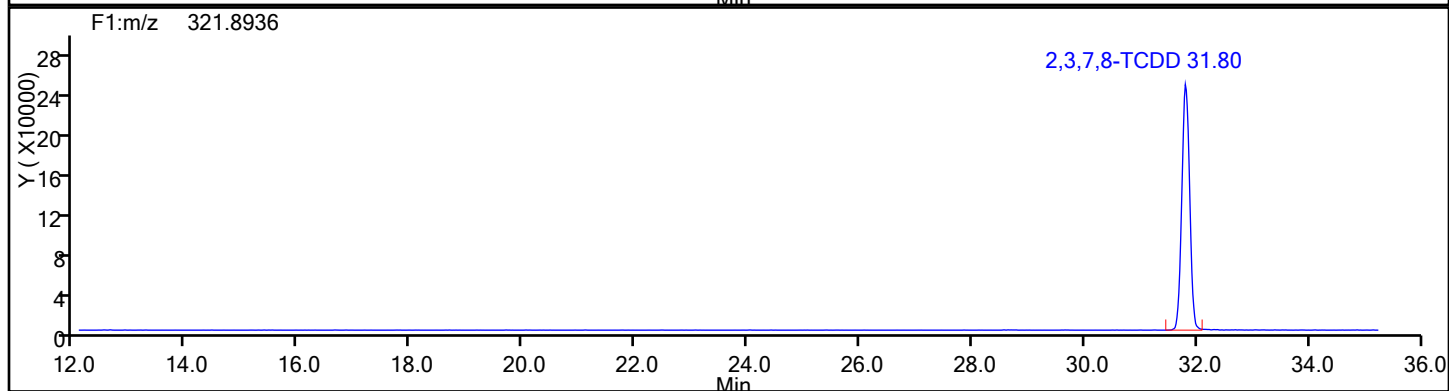
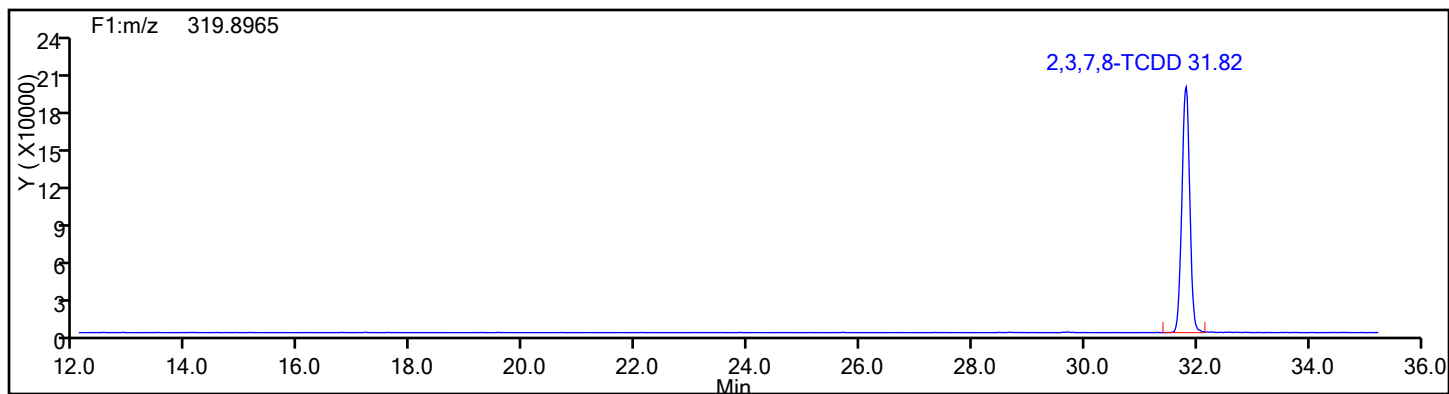
Worklist#: 7768

Sample Line#: 5

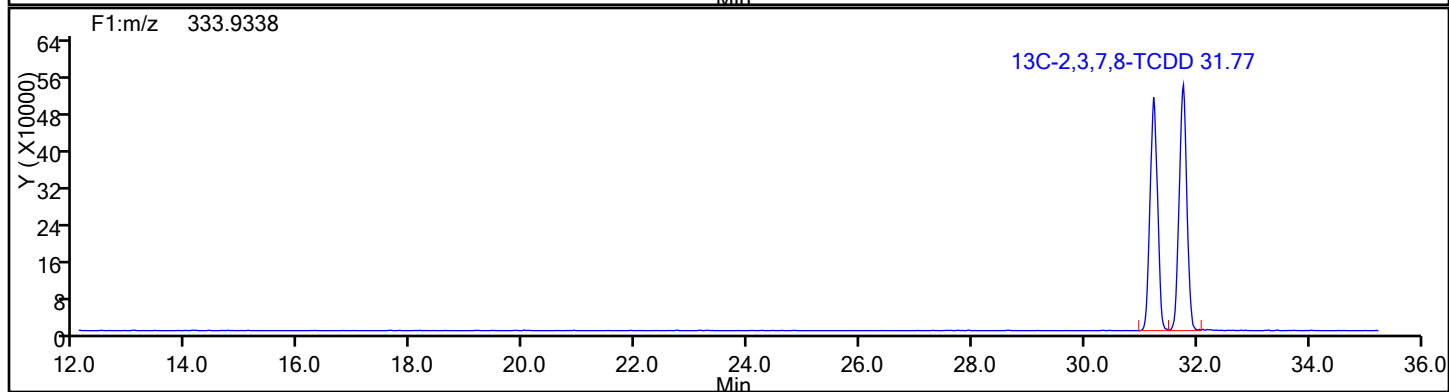
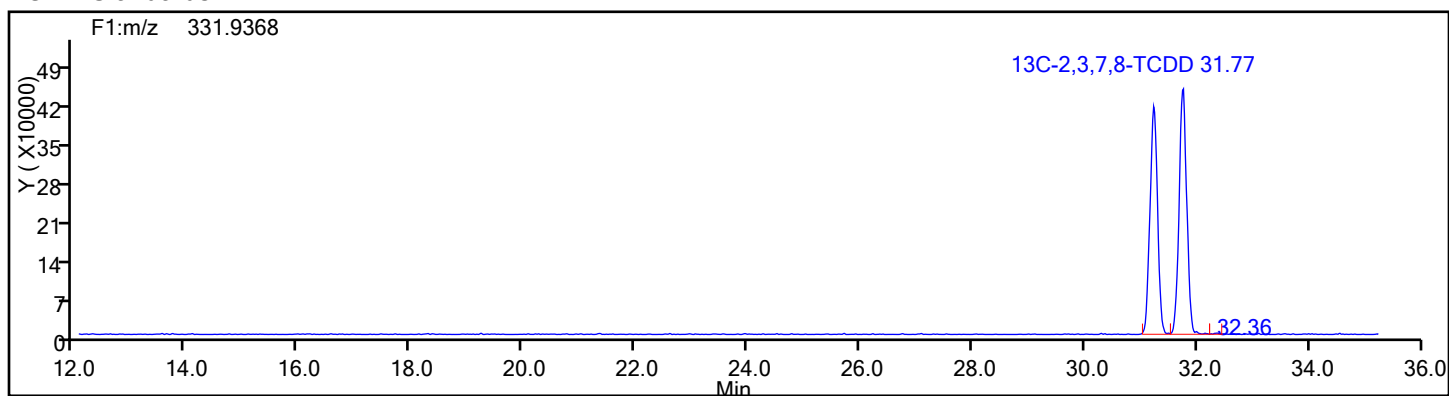
Column Type:

Column Dia:

TCDD



TCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

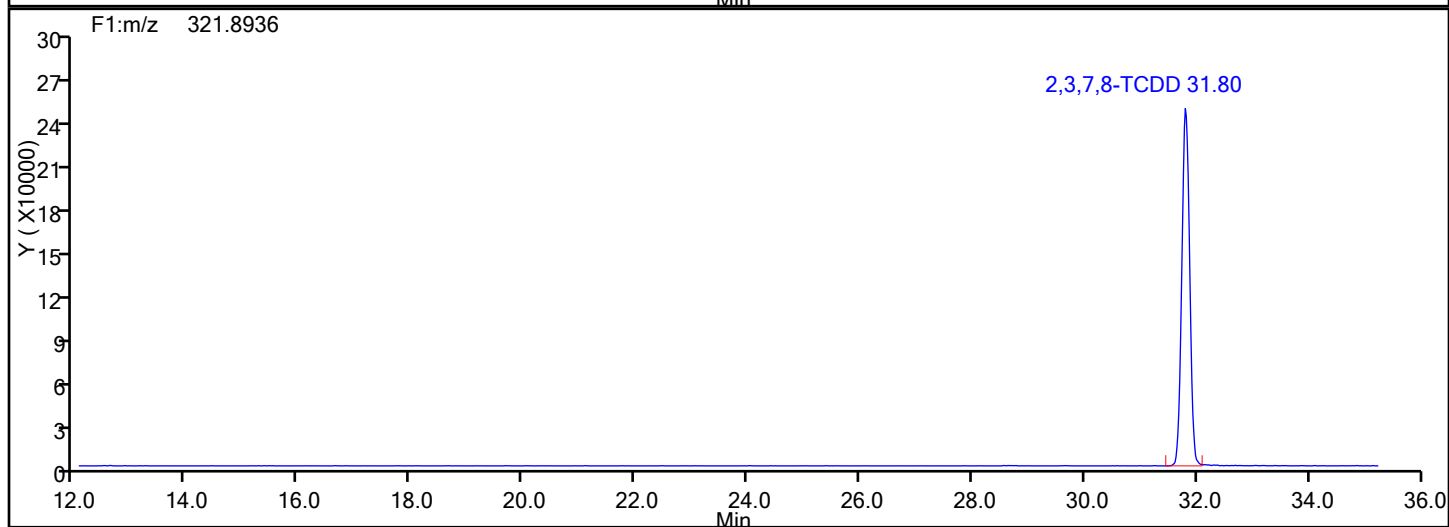
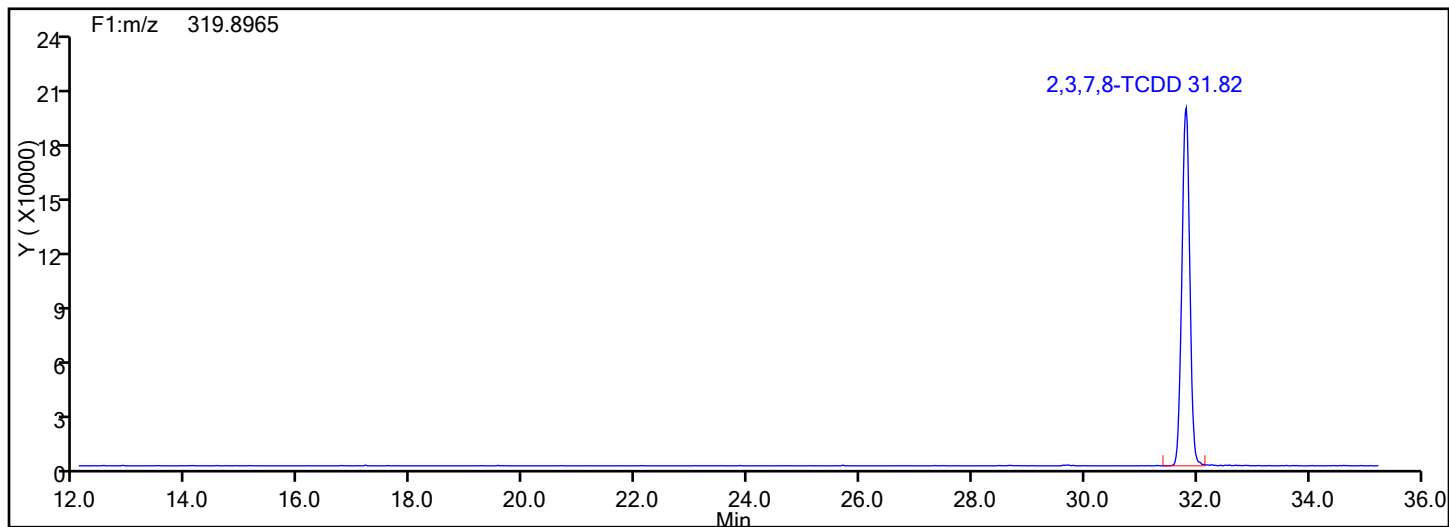
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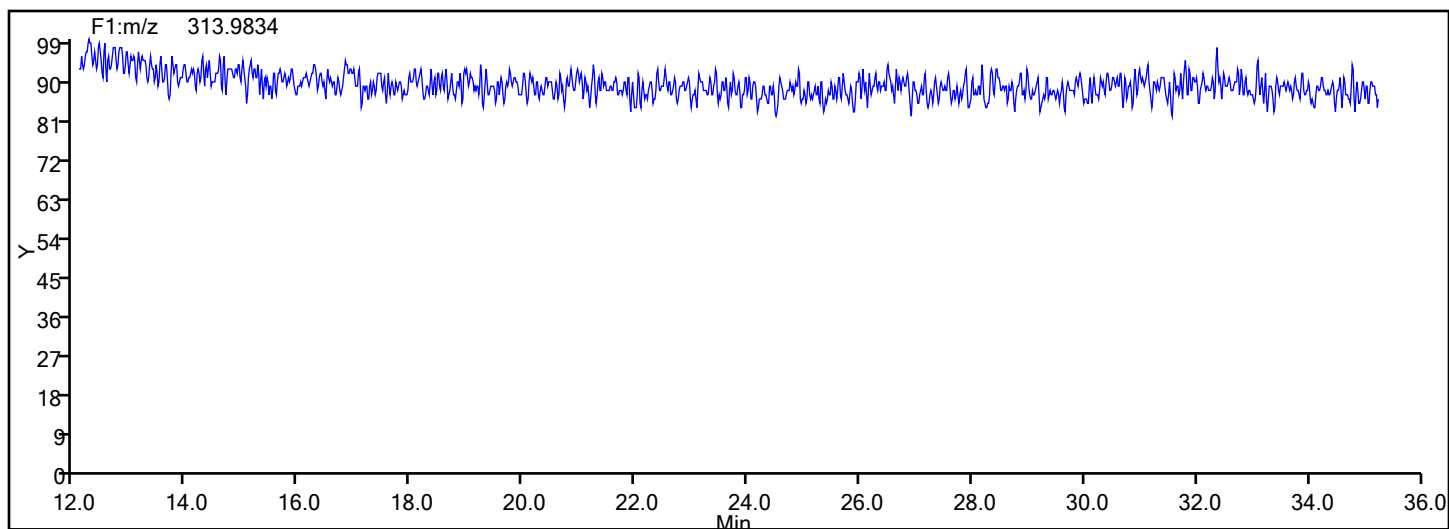
Column Type:

Column Dia:

TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

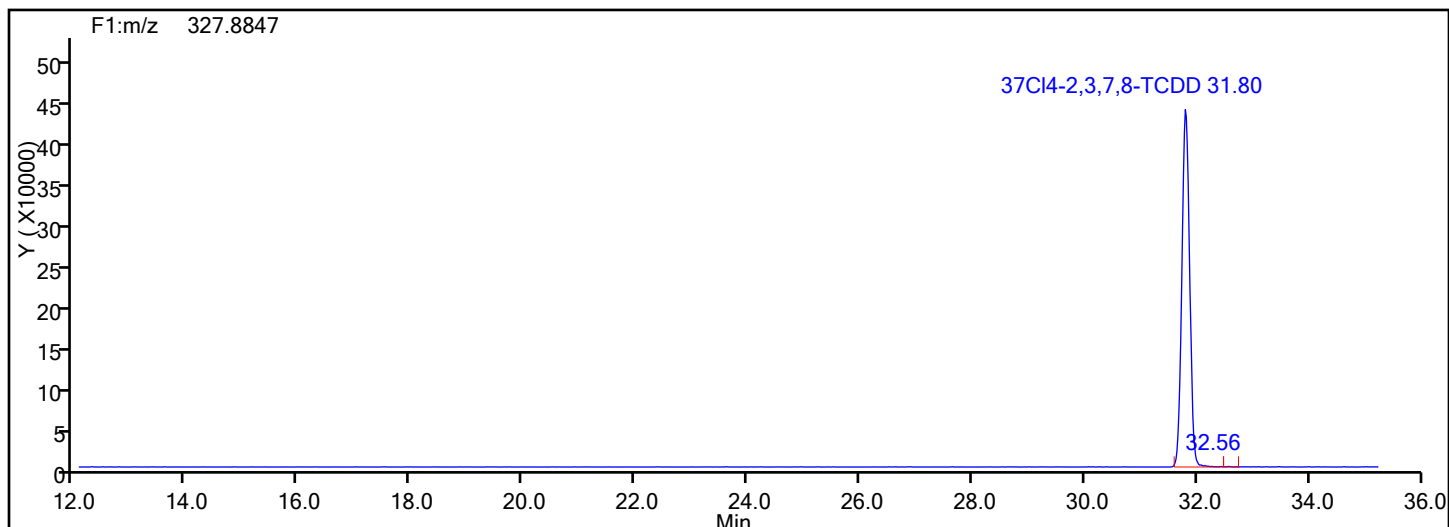
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Sample Line#: 5

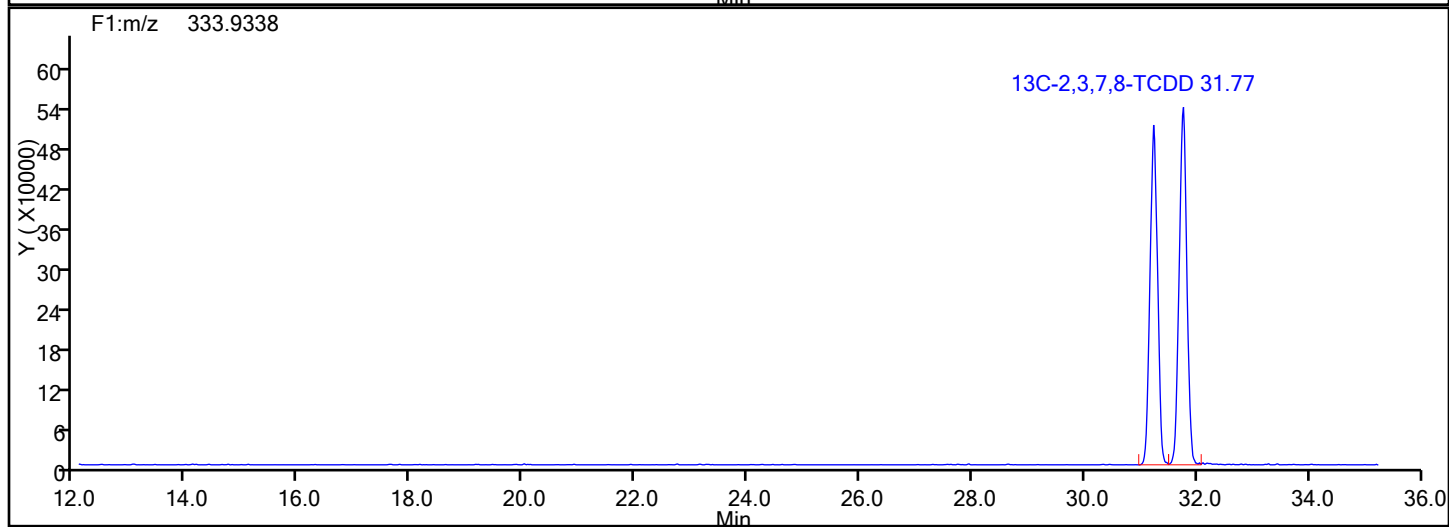
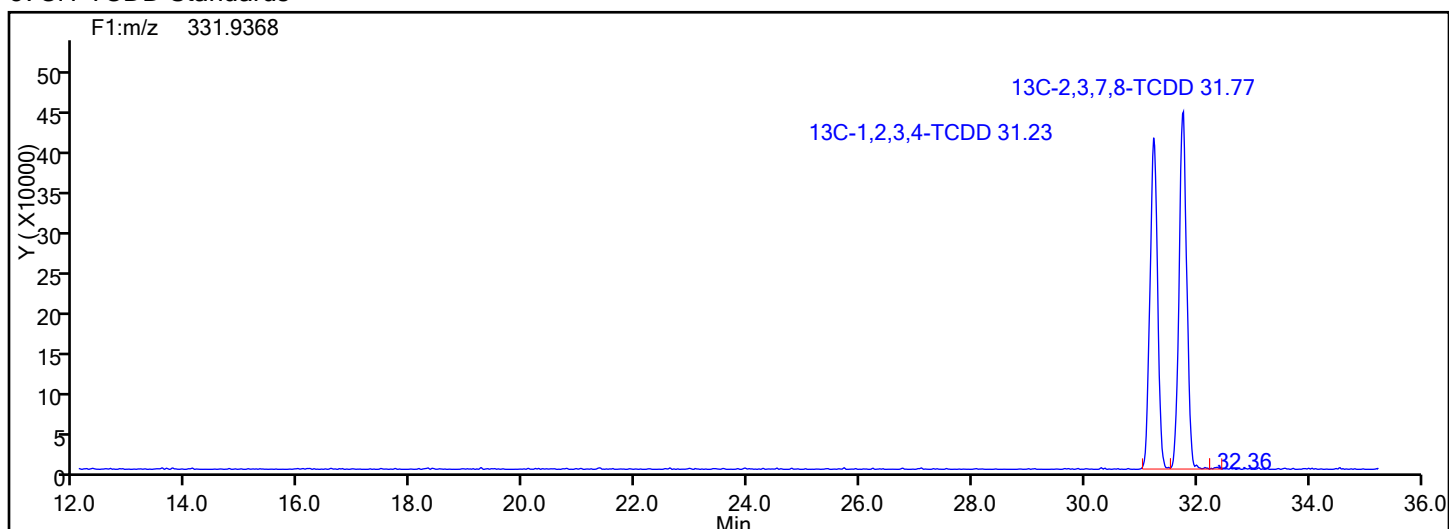
Column Type:

Column Dia:

37Cl4-TCDD

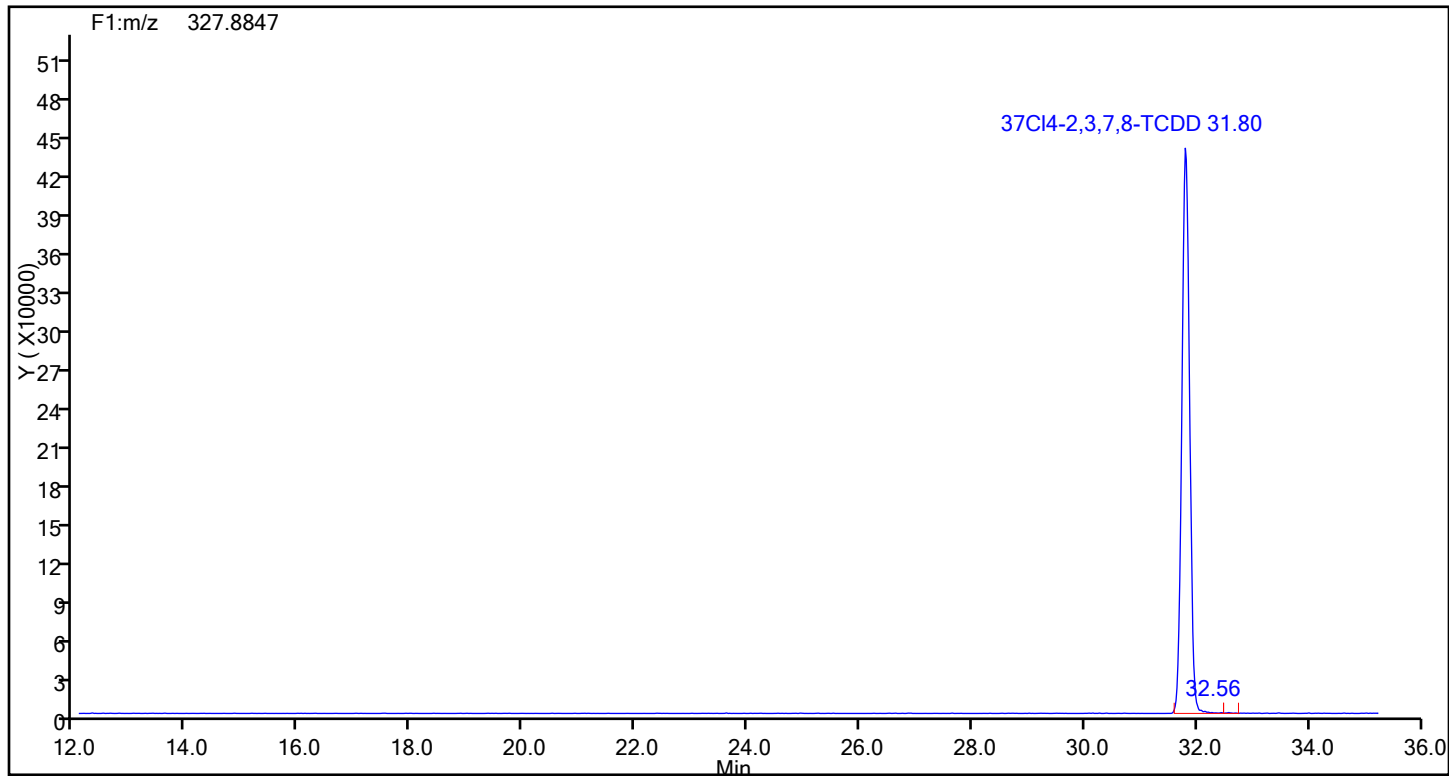


37Cl4-TCDD Standards

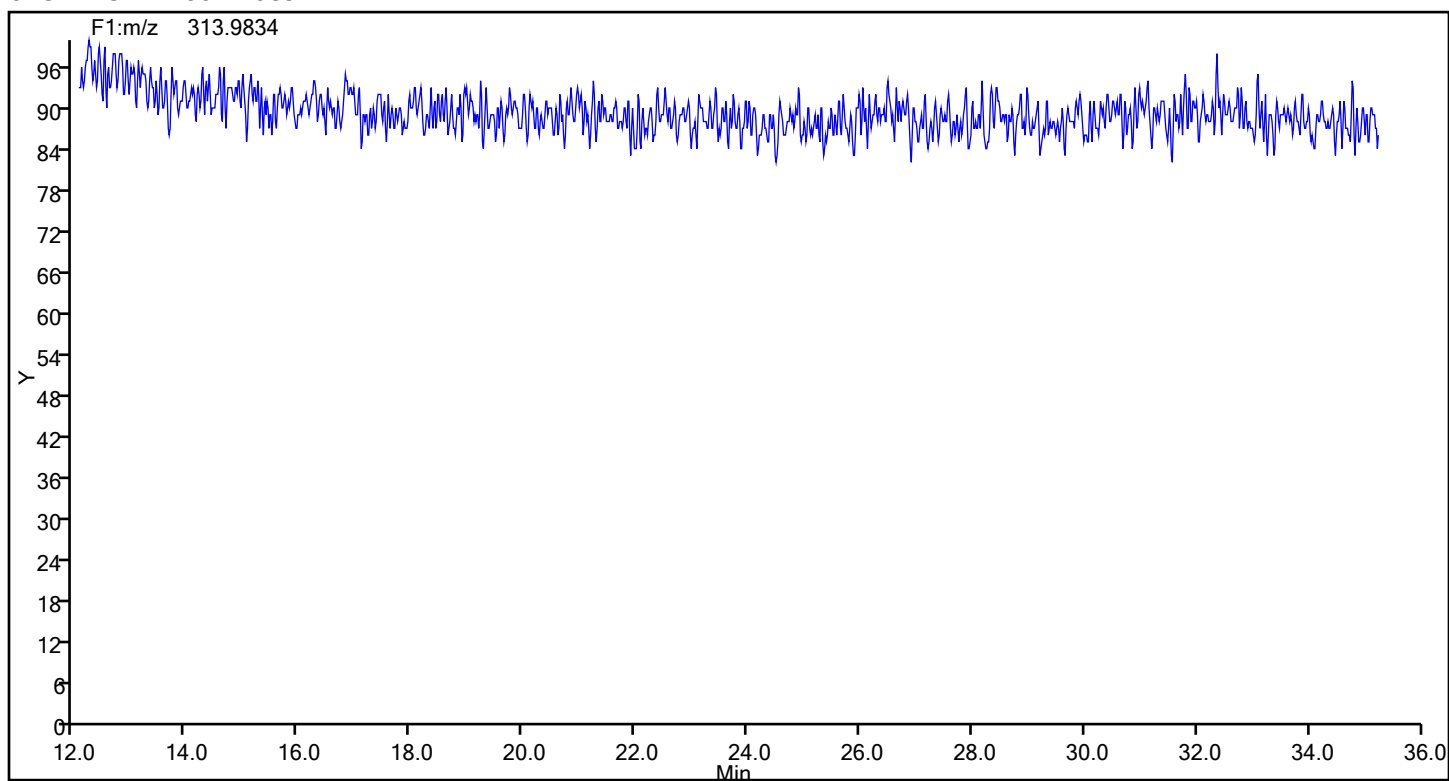


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d
Injection Date: 16-May-2014 17:29:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 5
Column Type: Column Dia:
37Cl4-TCDD



37Cl4-TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

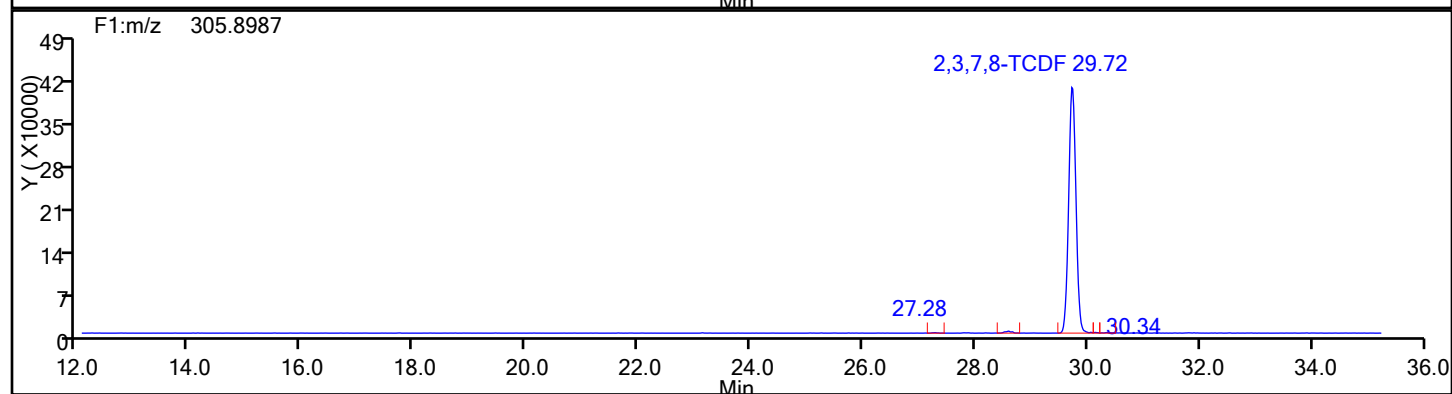
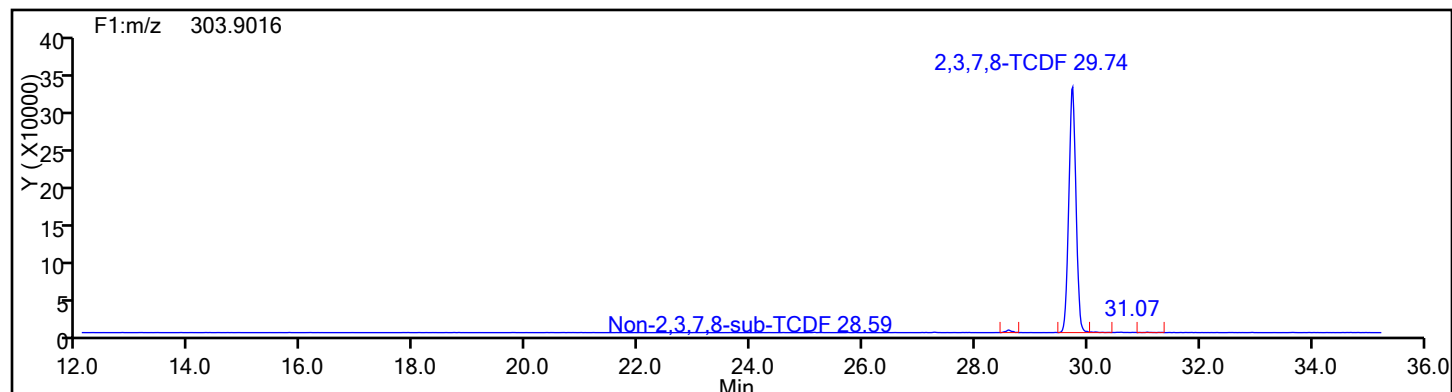
Worklist#: 7768

Sample Line#: 5

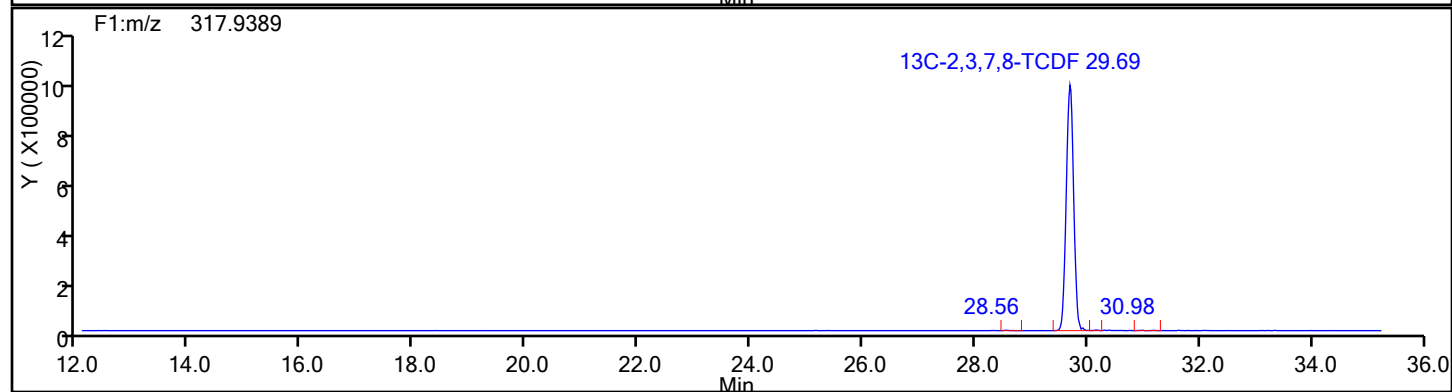
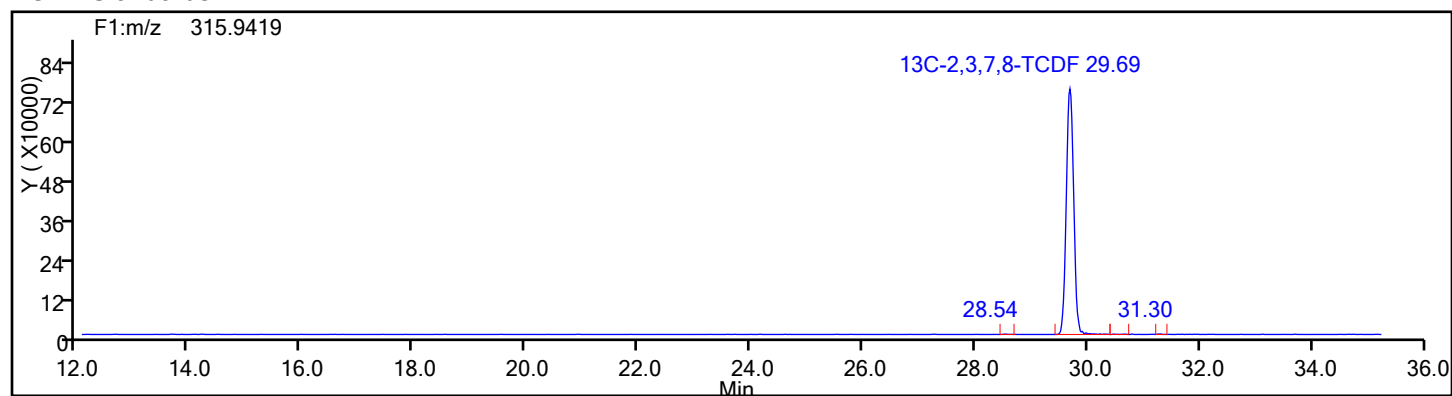
Column Type:

Column Dia:

TCDF

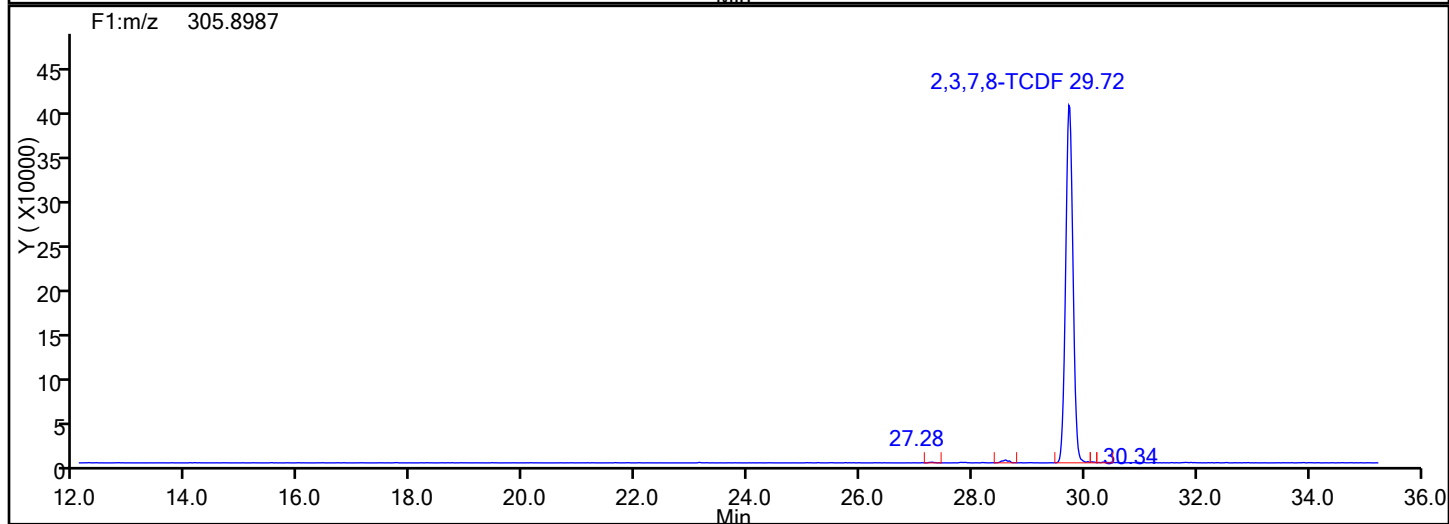
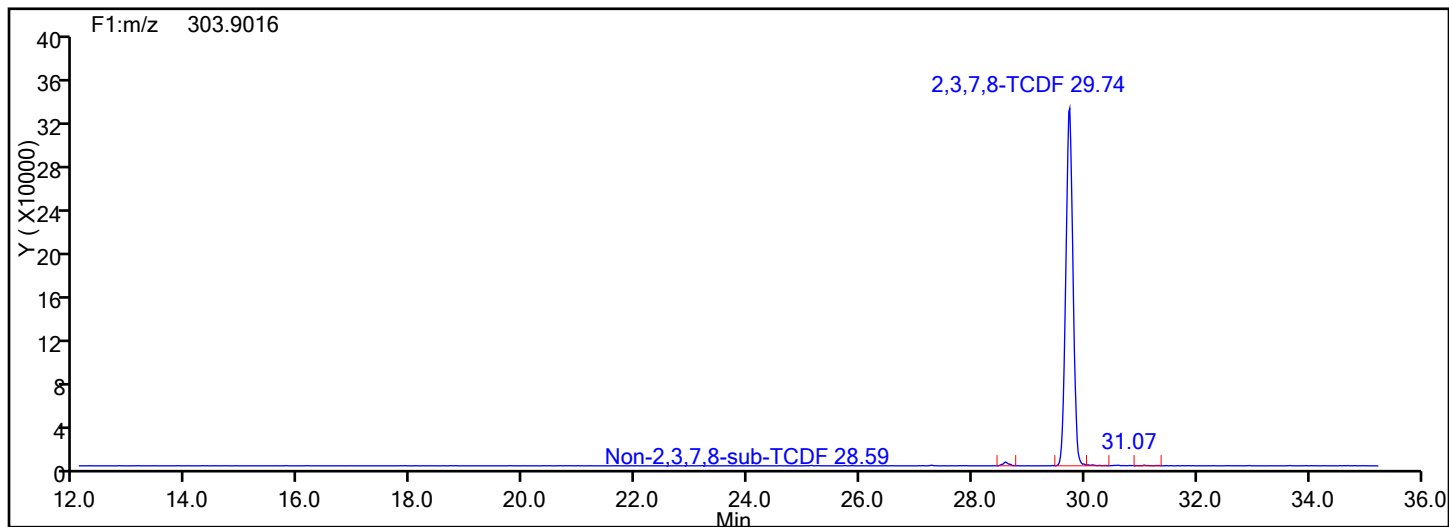


TCDF Standards

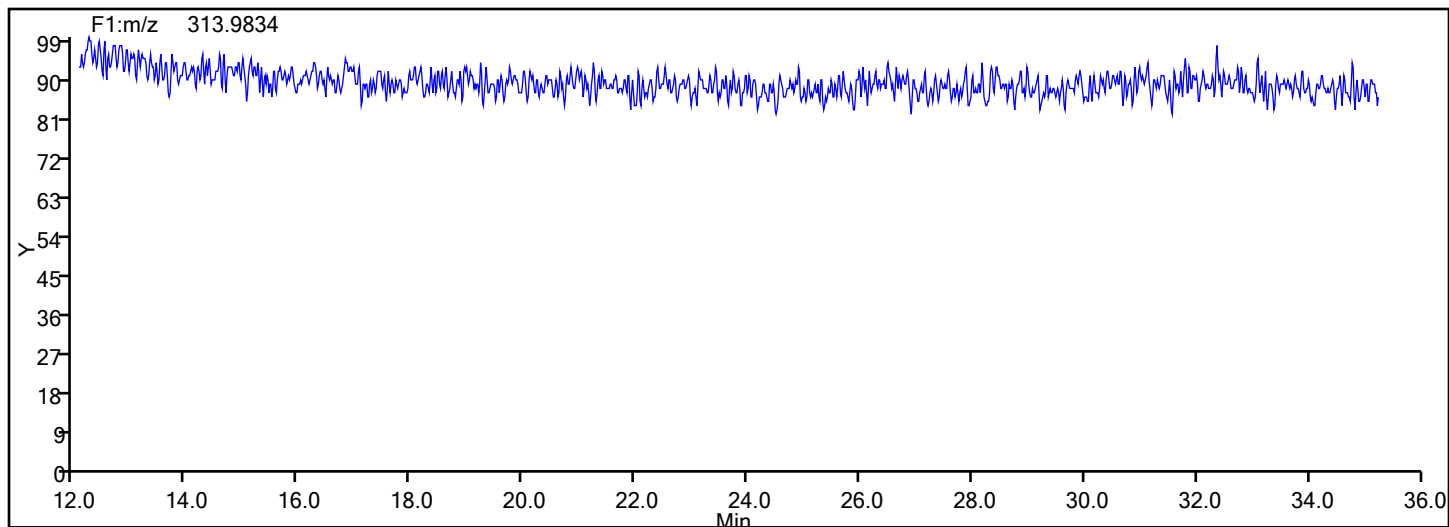


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d
Injection Date: 16-May-2014 17:29:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 5
Column Type: Column Dia:
TCDF

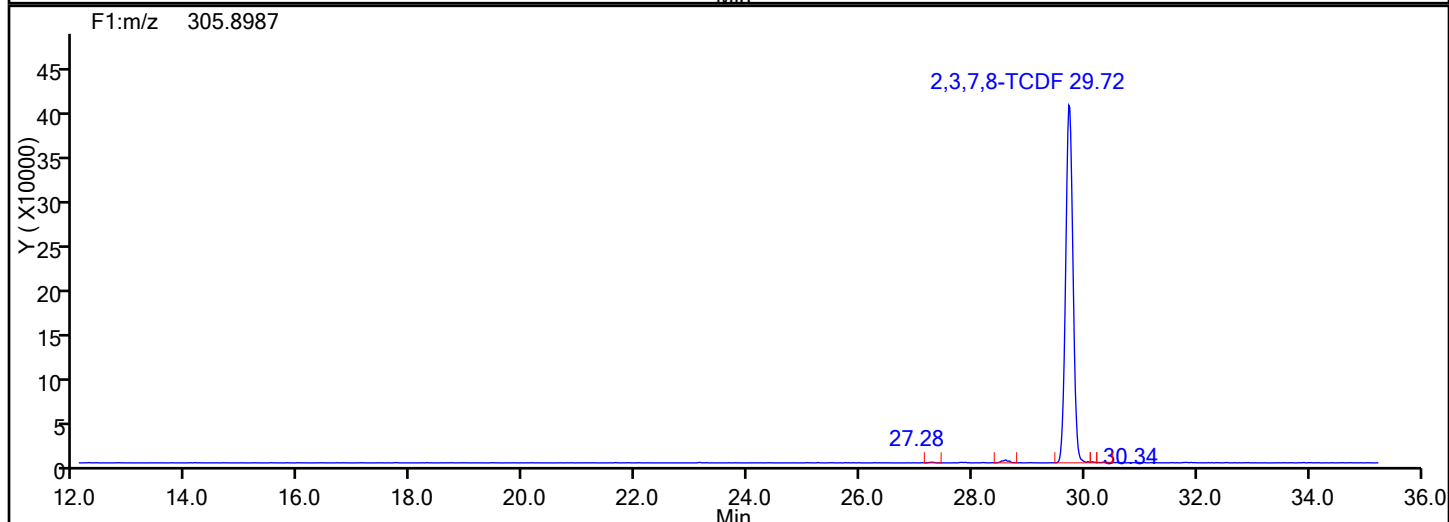
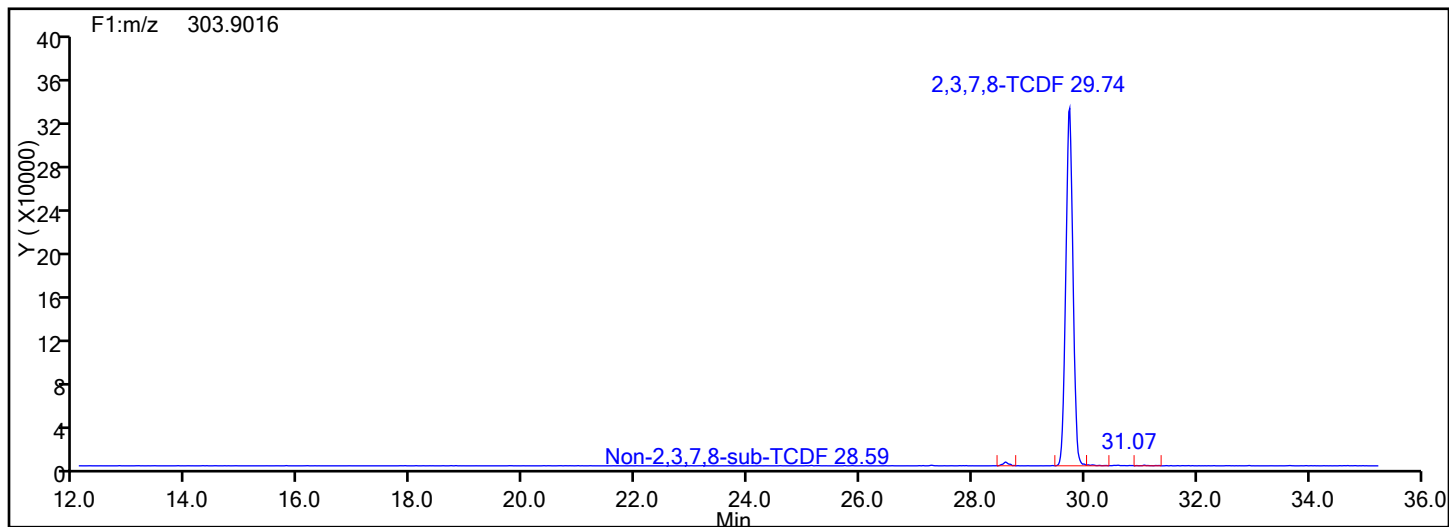


TCDF Lock Mass

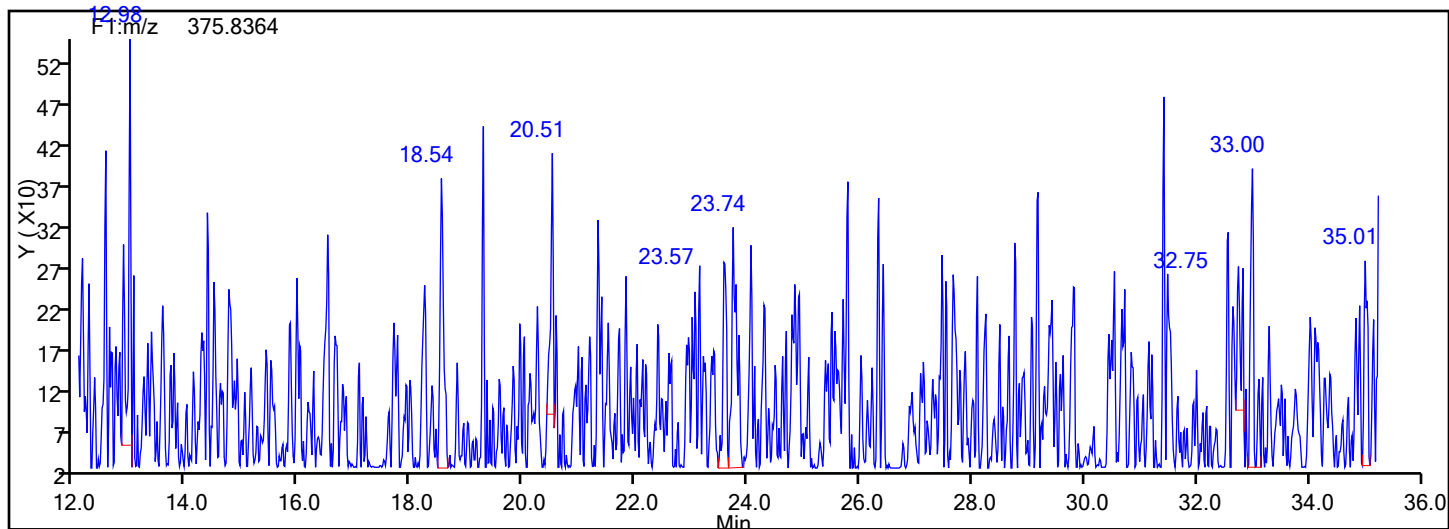


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d
Injection Date: 16-May-2014 17:29:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 5
Column Type: Column Dia:
TCDF



TCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

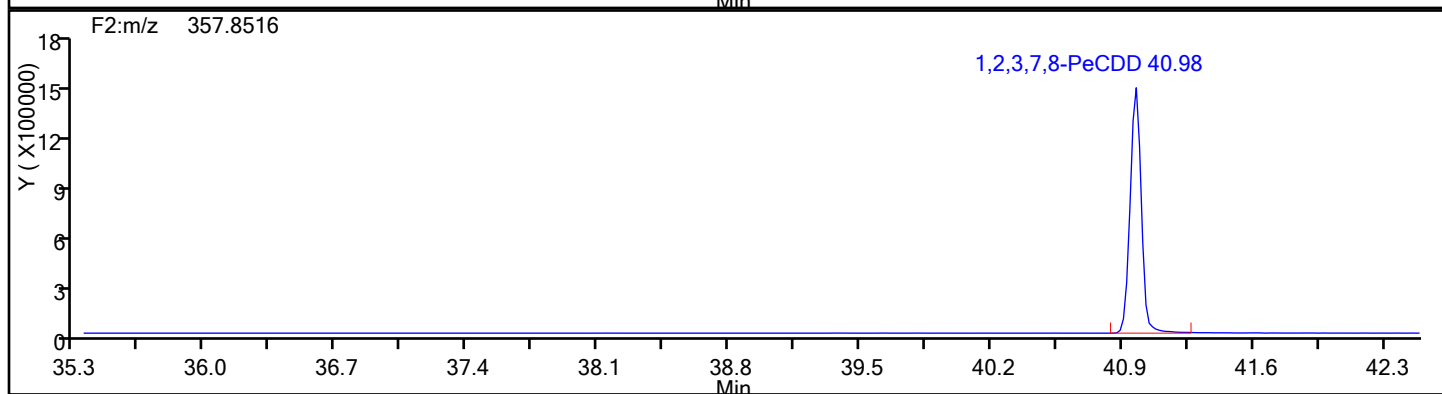
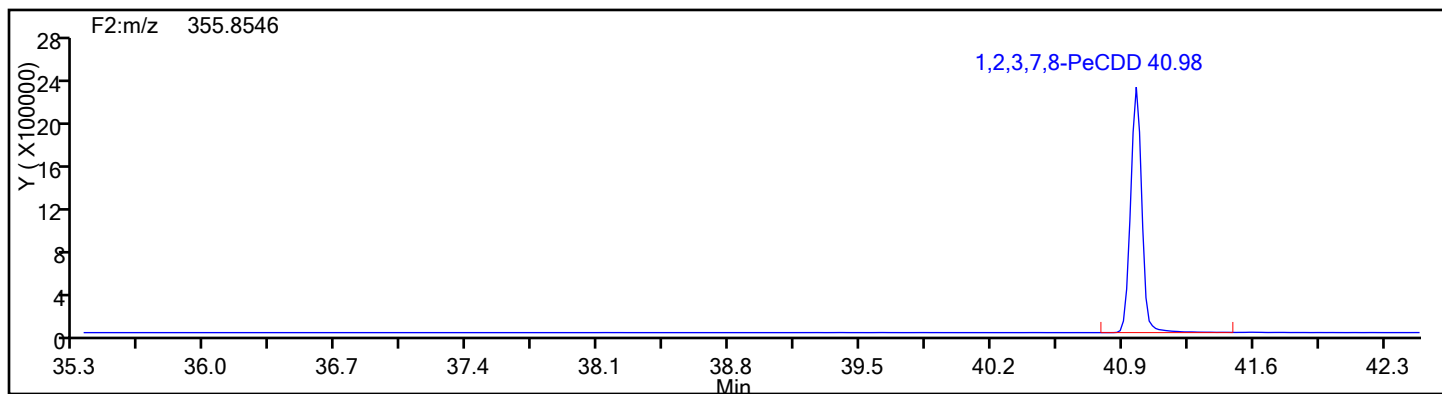
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Sample Line#: 5

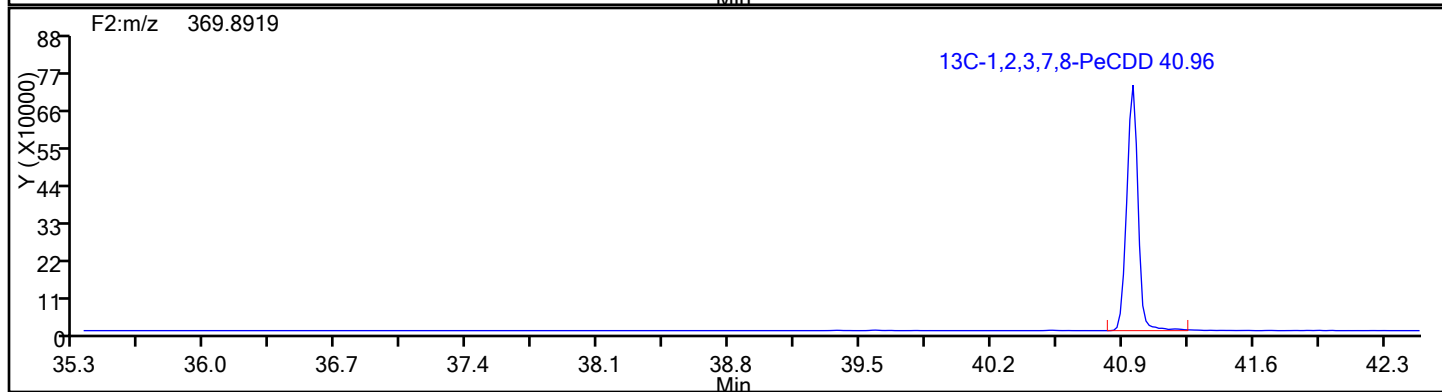
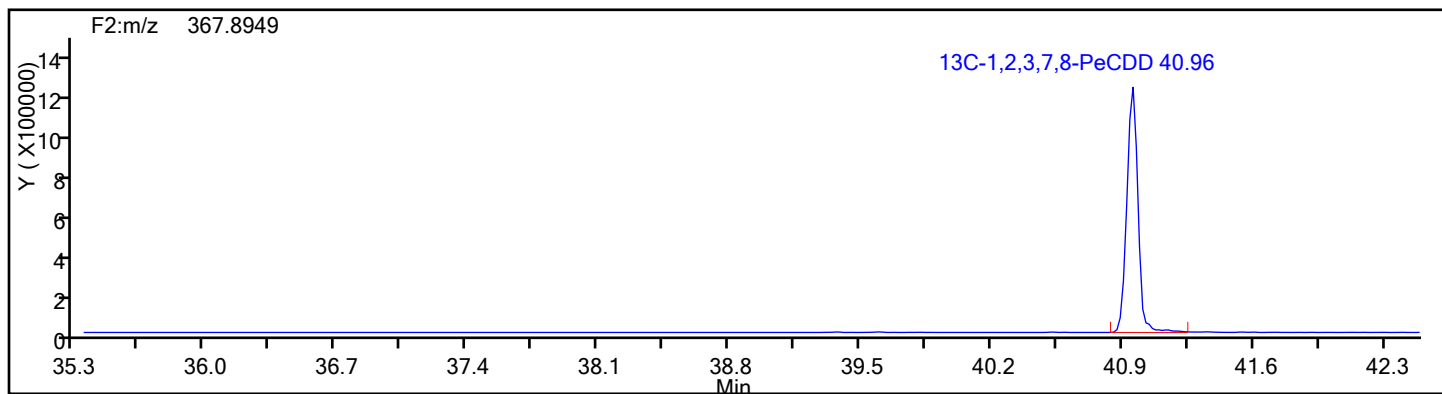
Column Type:

Column Dia:

PeCDD



PeCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

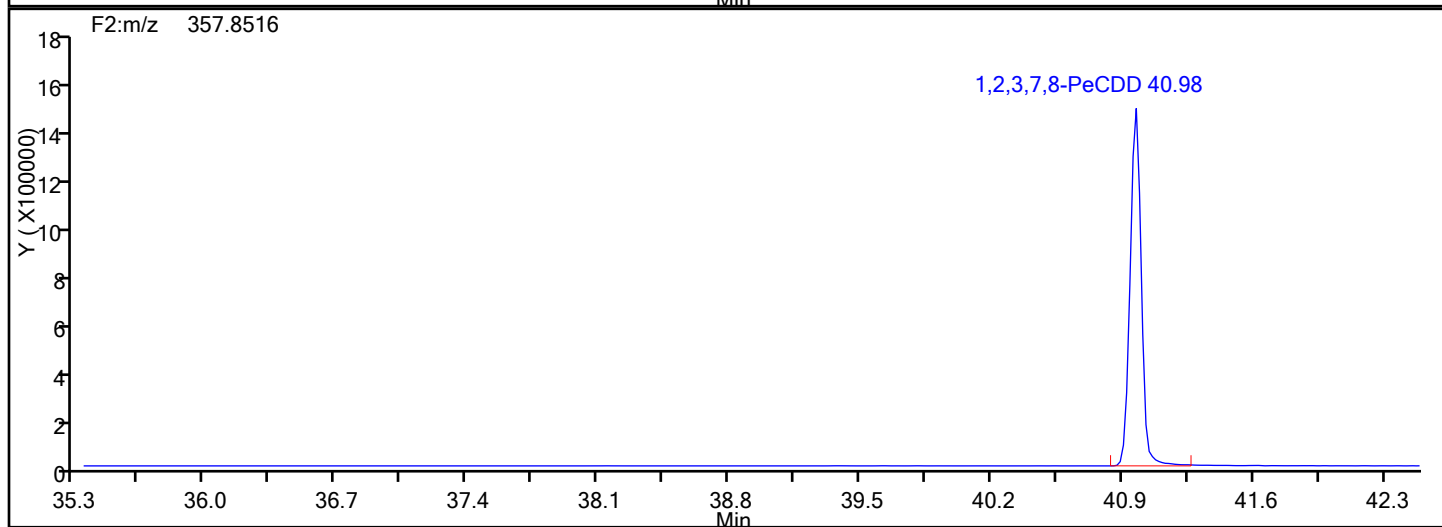
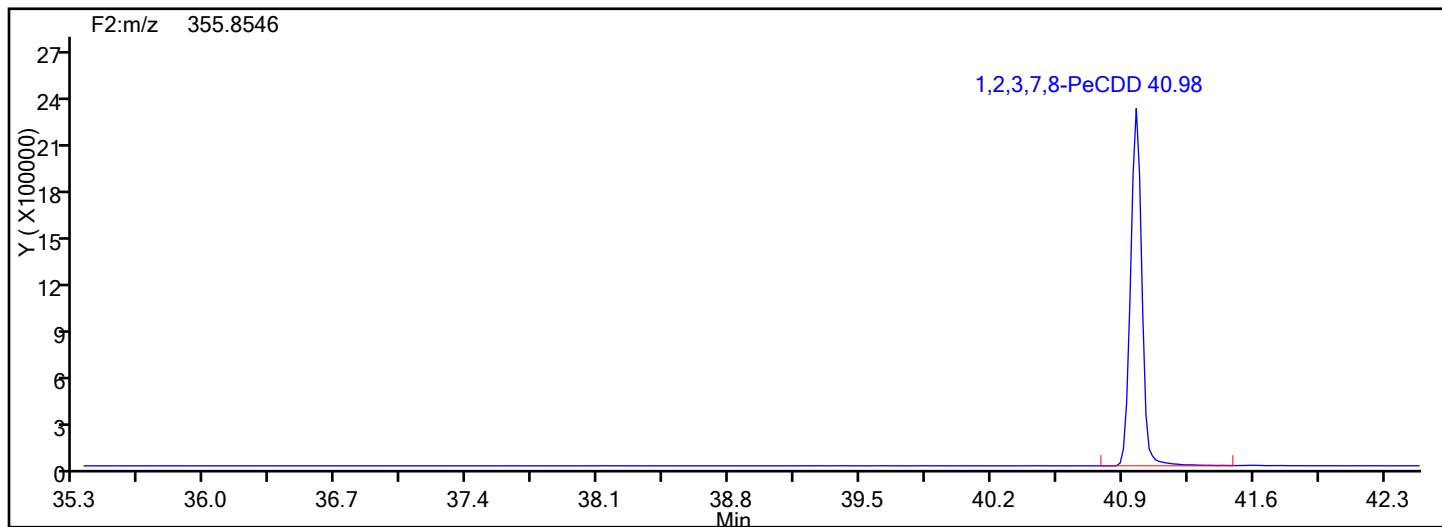
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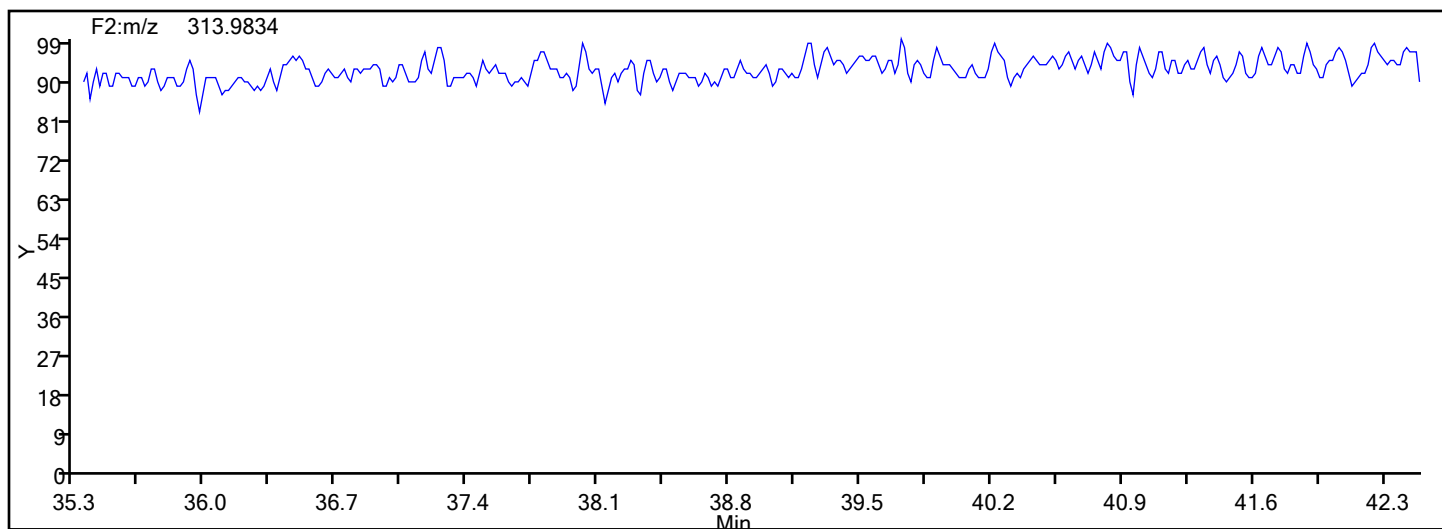
Column Type:

Column Dia:

PeCDD



PeCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

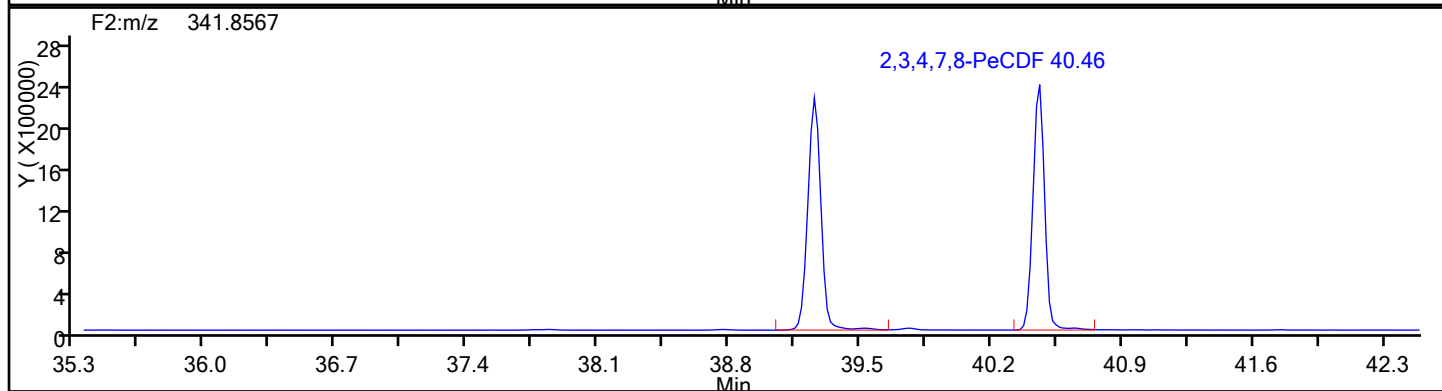
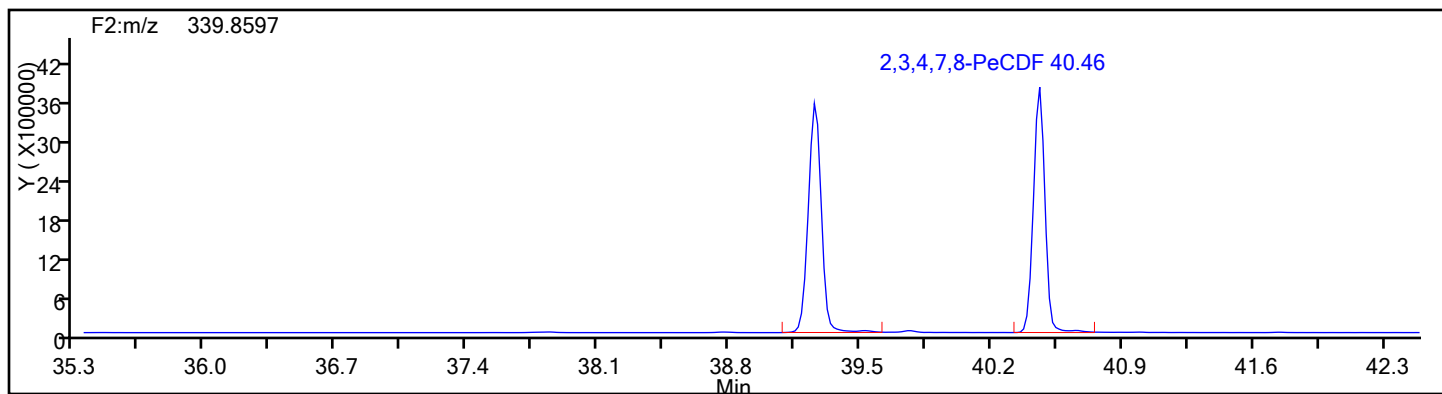
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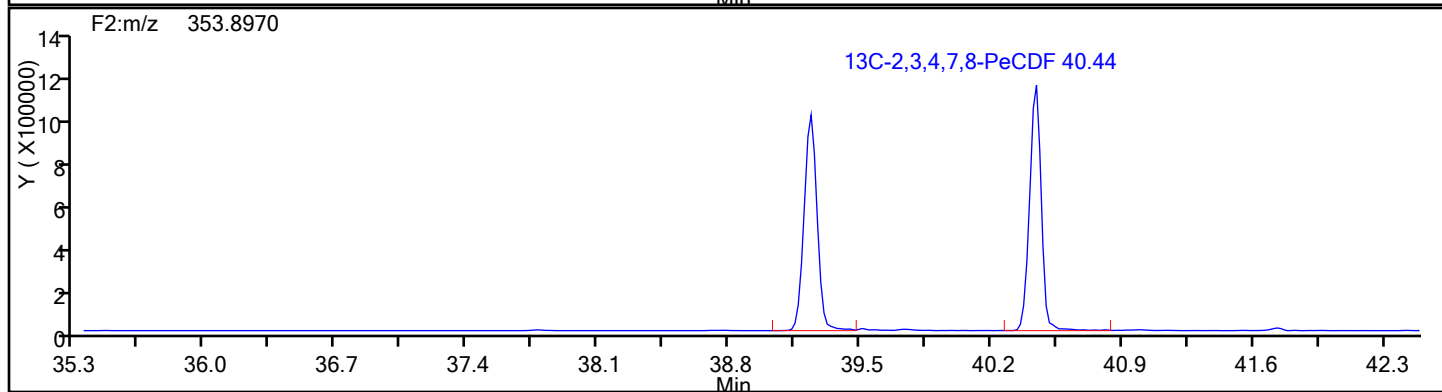
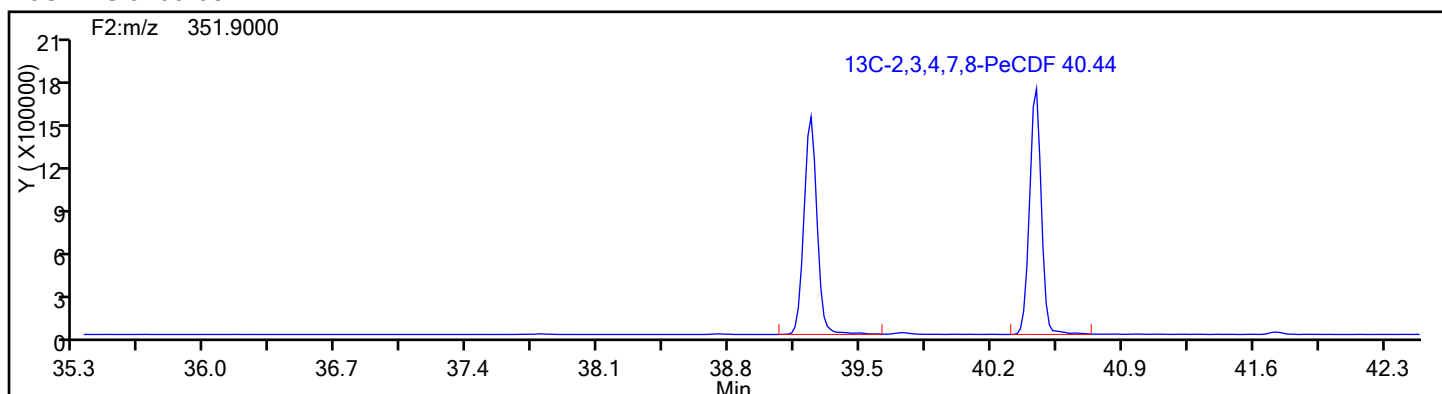
Column Type:

Column Dia:

PeCDF

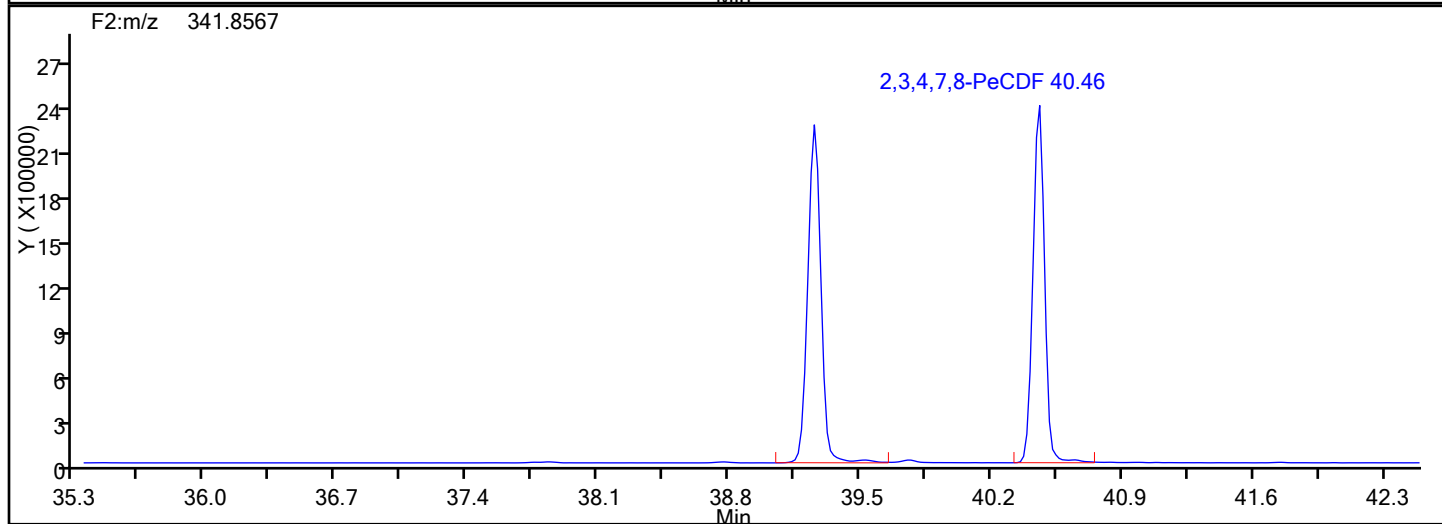
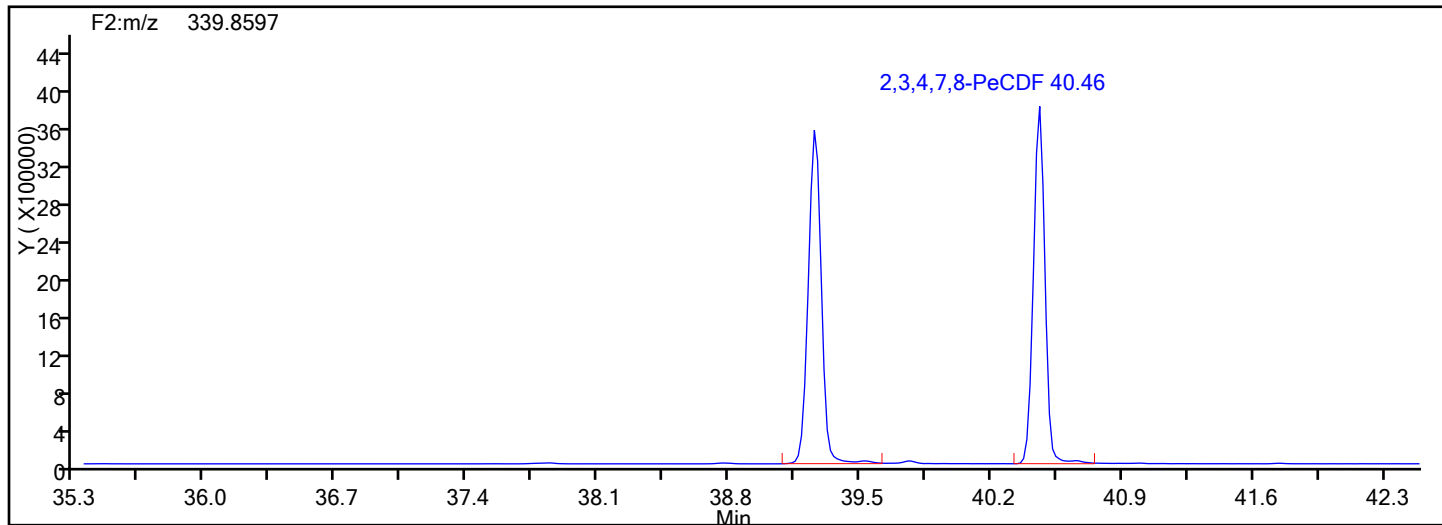


PeCDF Standards

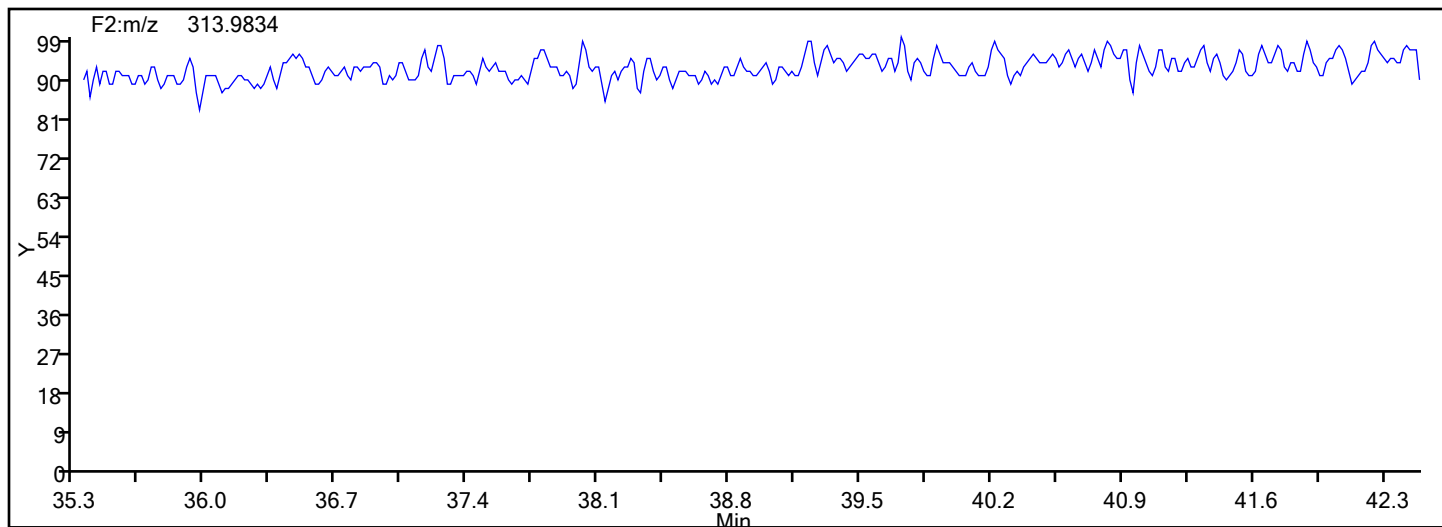


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d
Injection Date: 16-May-2014 17:29:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 5
Column Type: Column Dia:
PeCDF



PeCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

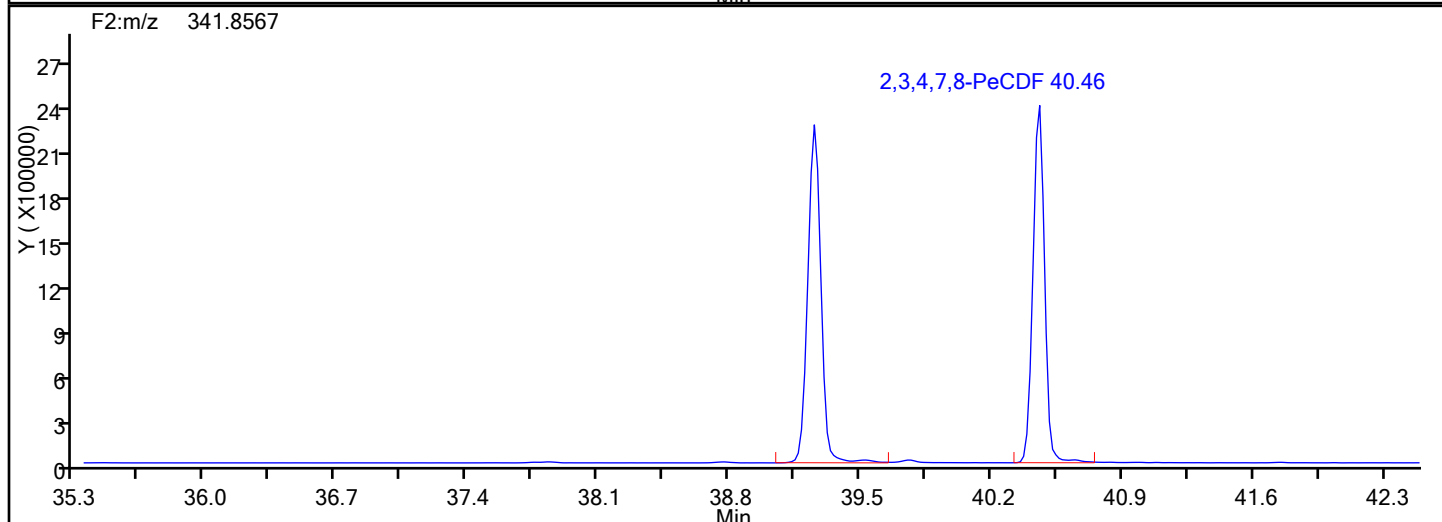
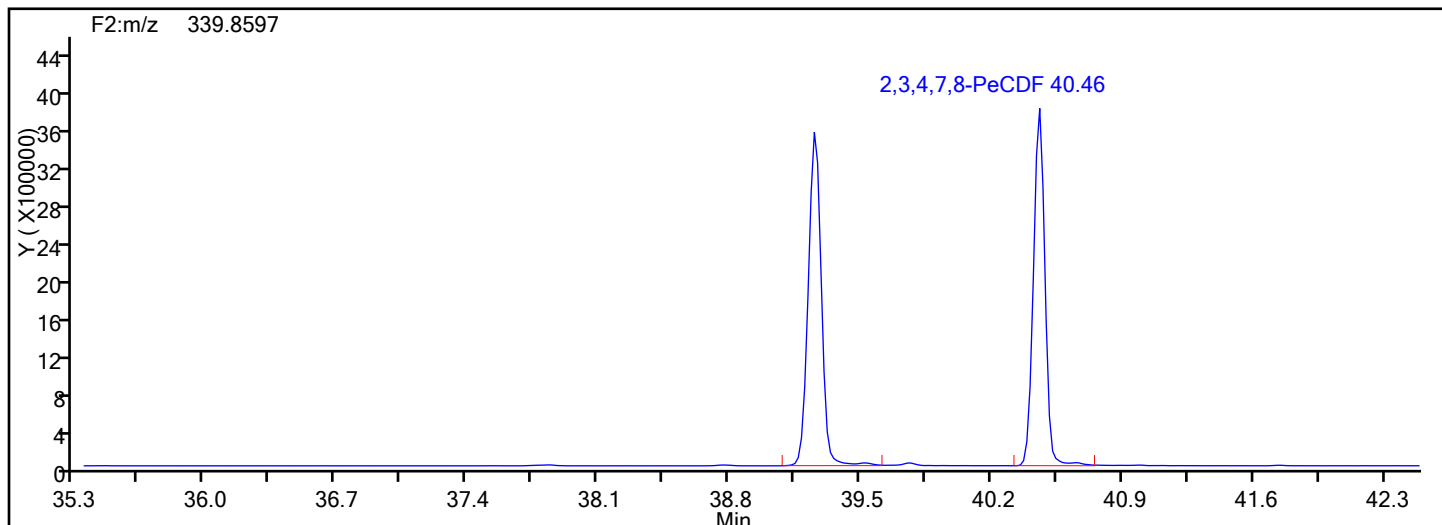
Worklist#: 7768

Sample Line#: 5

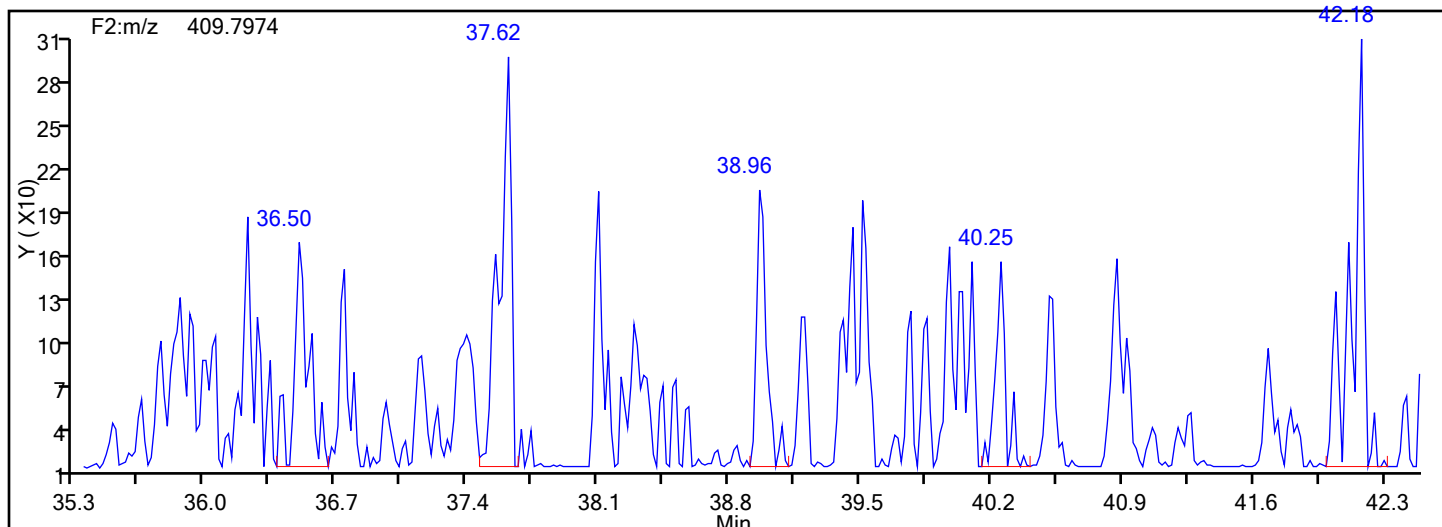
Column Type:

Column Dia:

PeCDF



PeCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

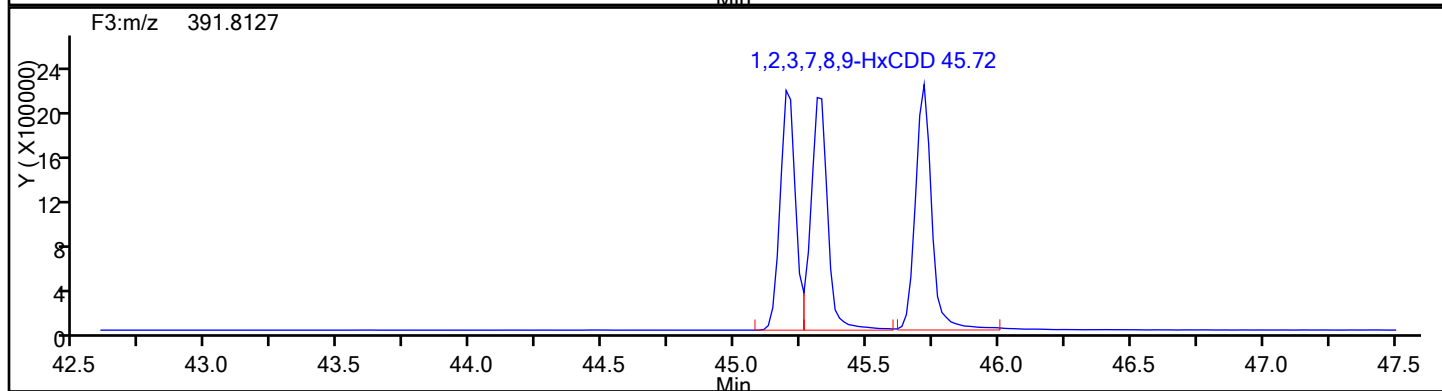
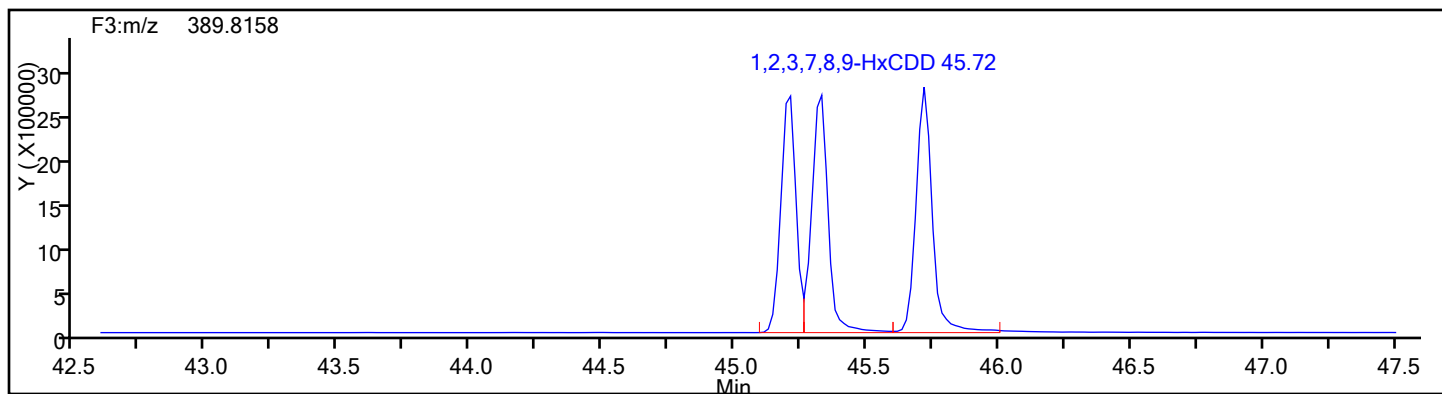
Worklist#: 7768

Sample Line#: 5

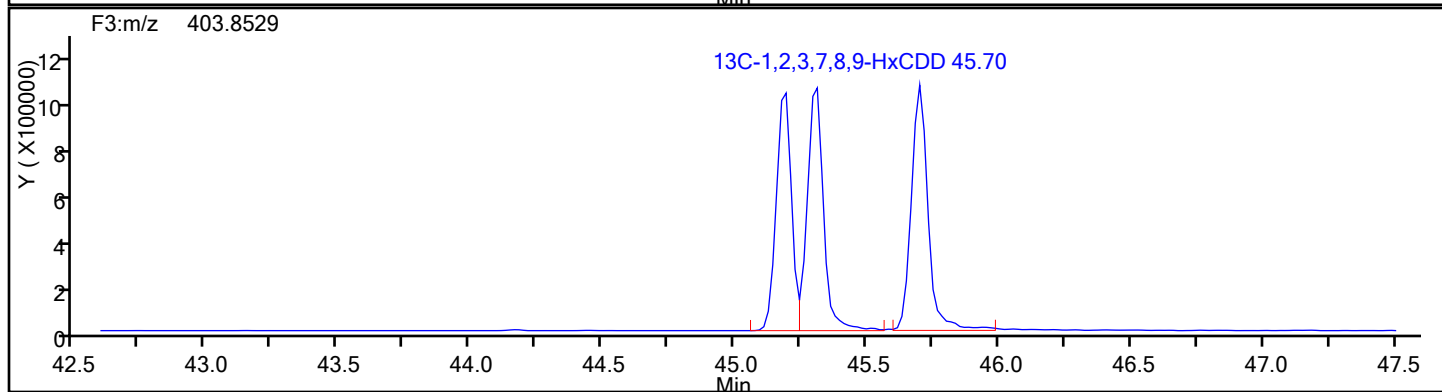
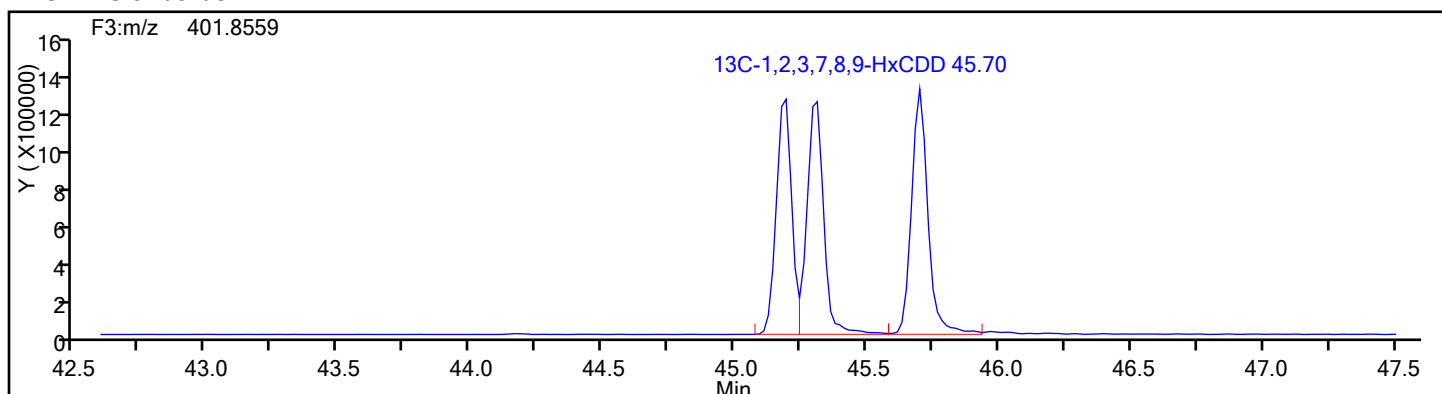
Column Type:

Column Dia:

HxCDD



HxCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

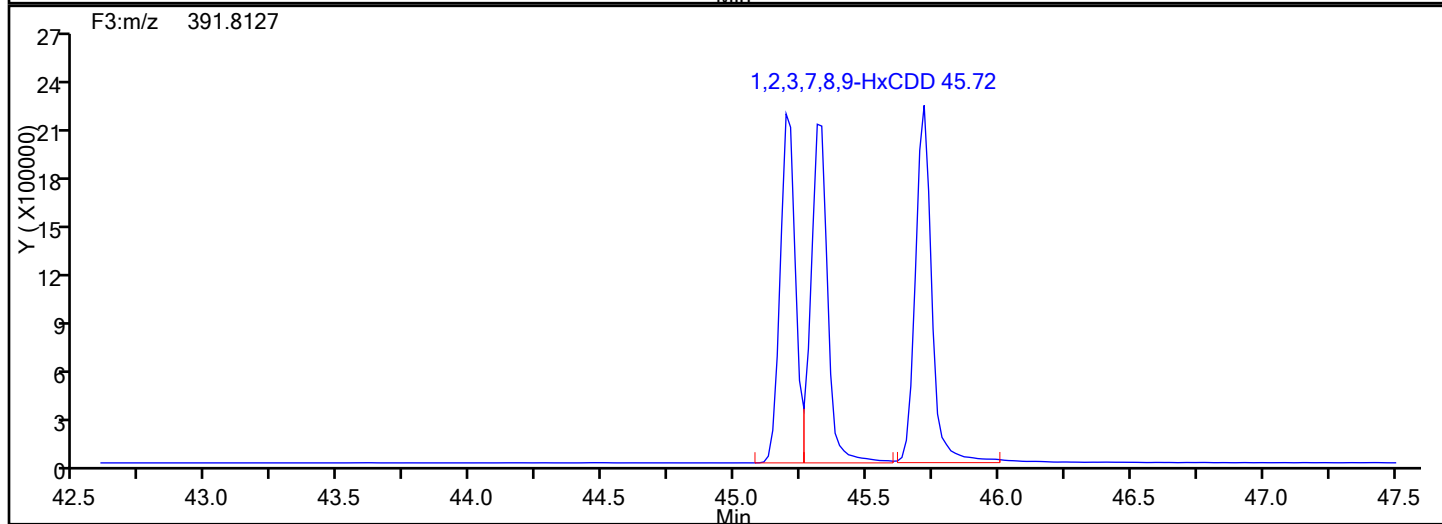
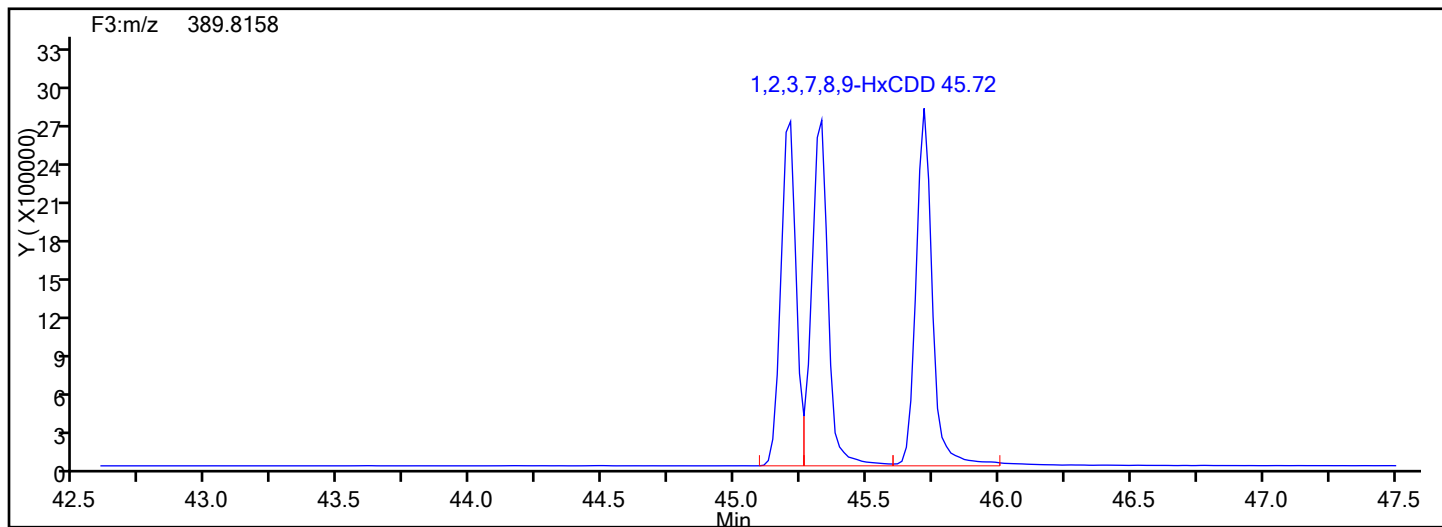
Worklist#: 7768

Sample Line#: 5

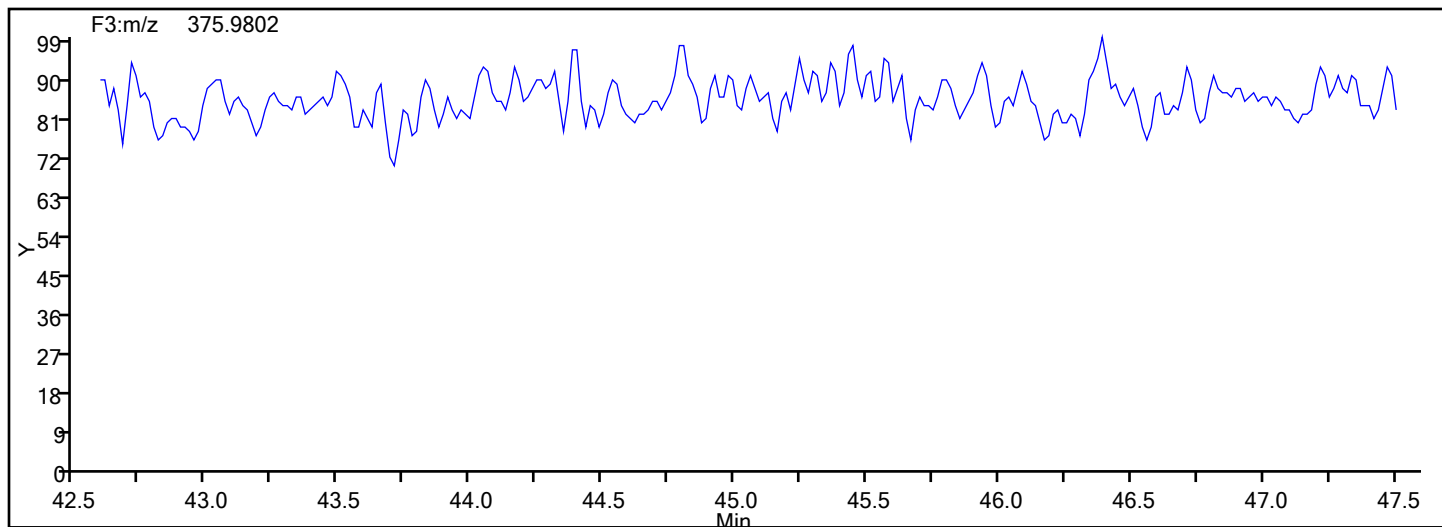
Column Type:

Column Dia:

HxCDD



HxCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

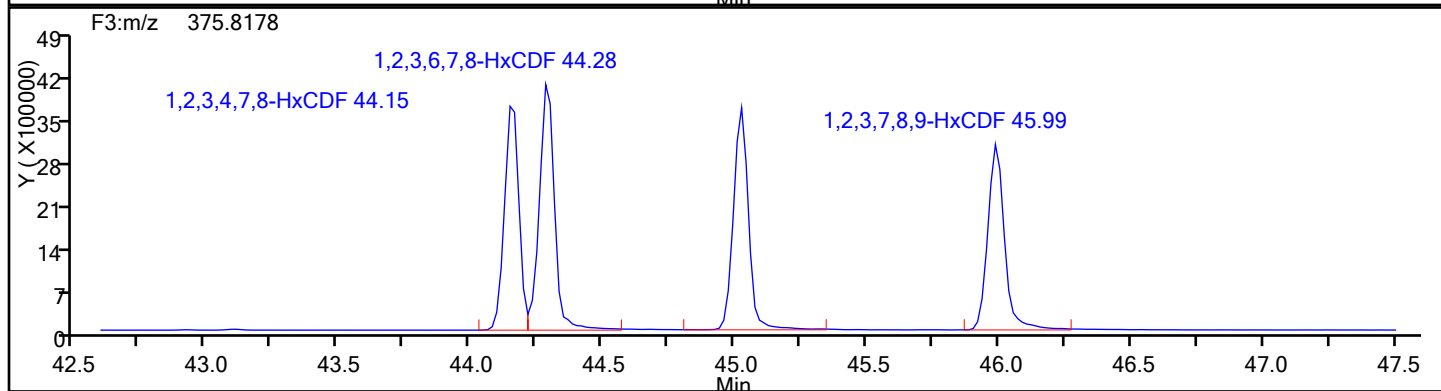
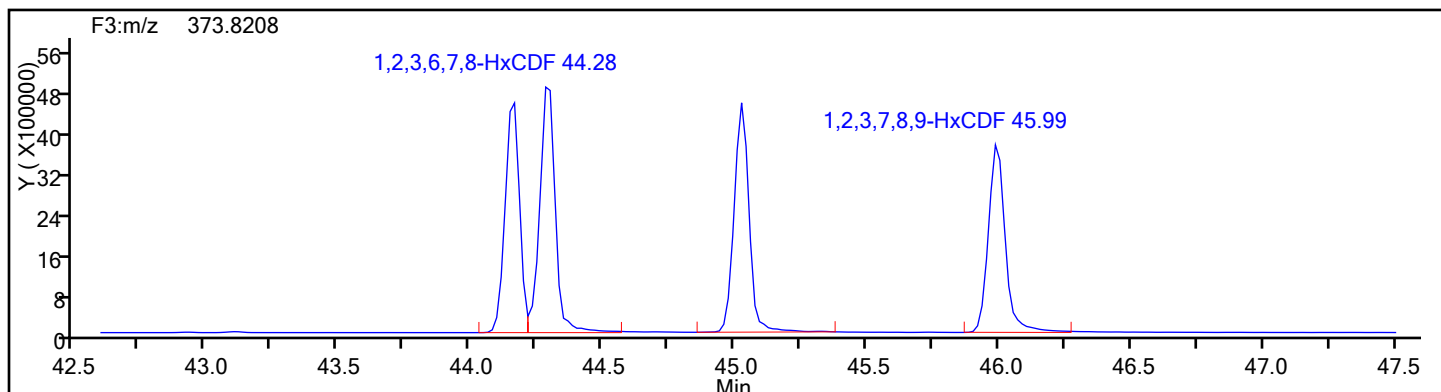
Worklist#: 7768

Sample Line#: 5

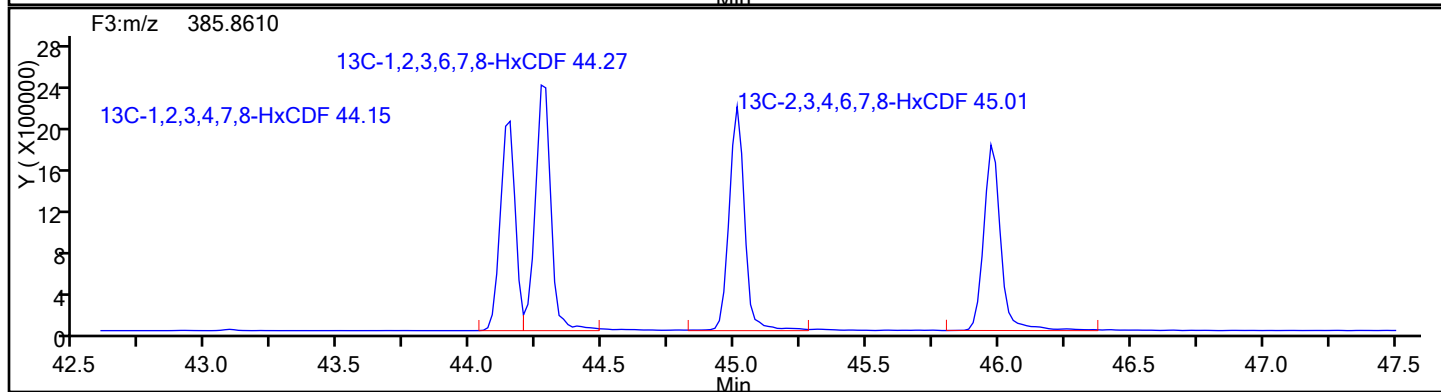
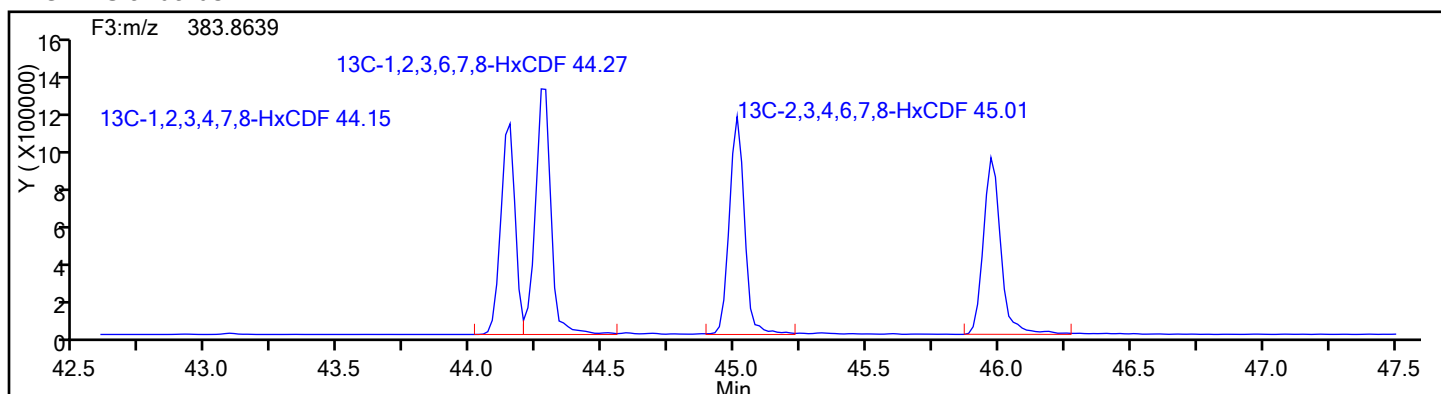
Column Type:

Column Dia:

HxCDF



HxCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

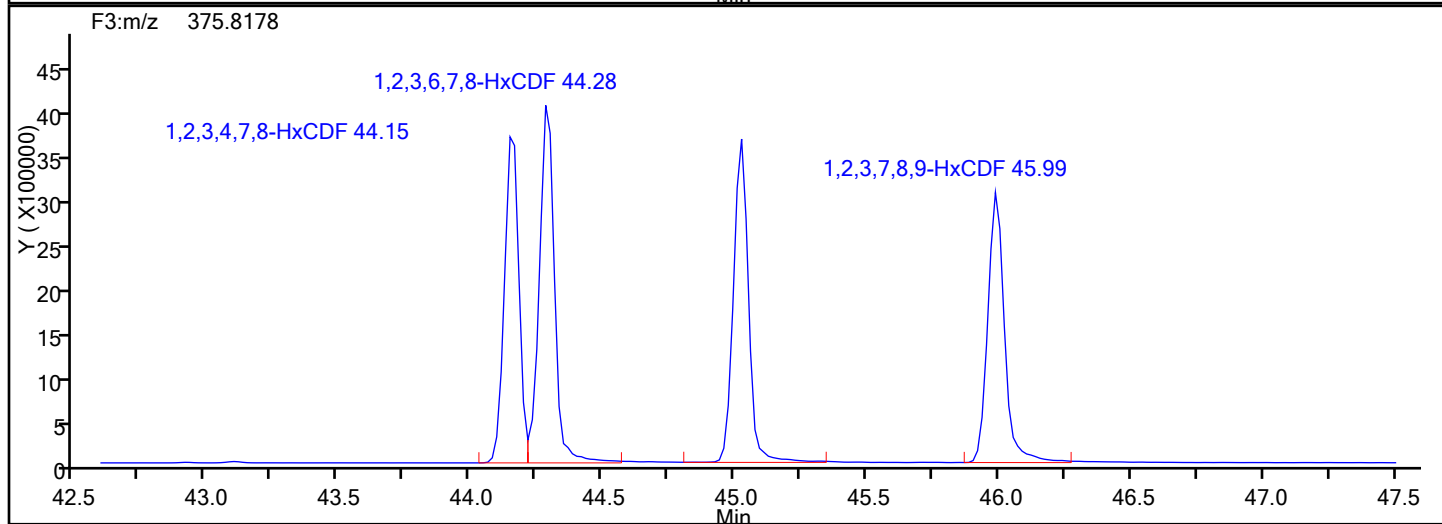
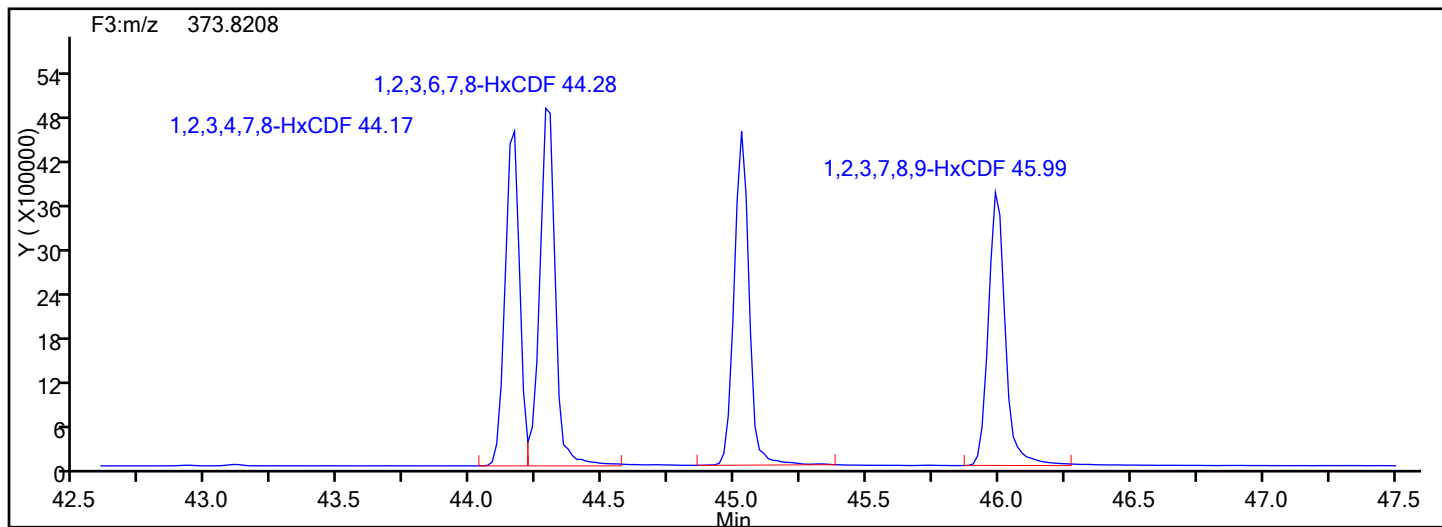
Worklist#: 7768

Sample Line#: 5

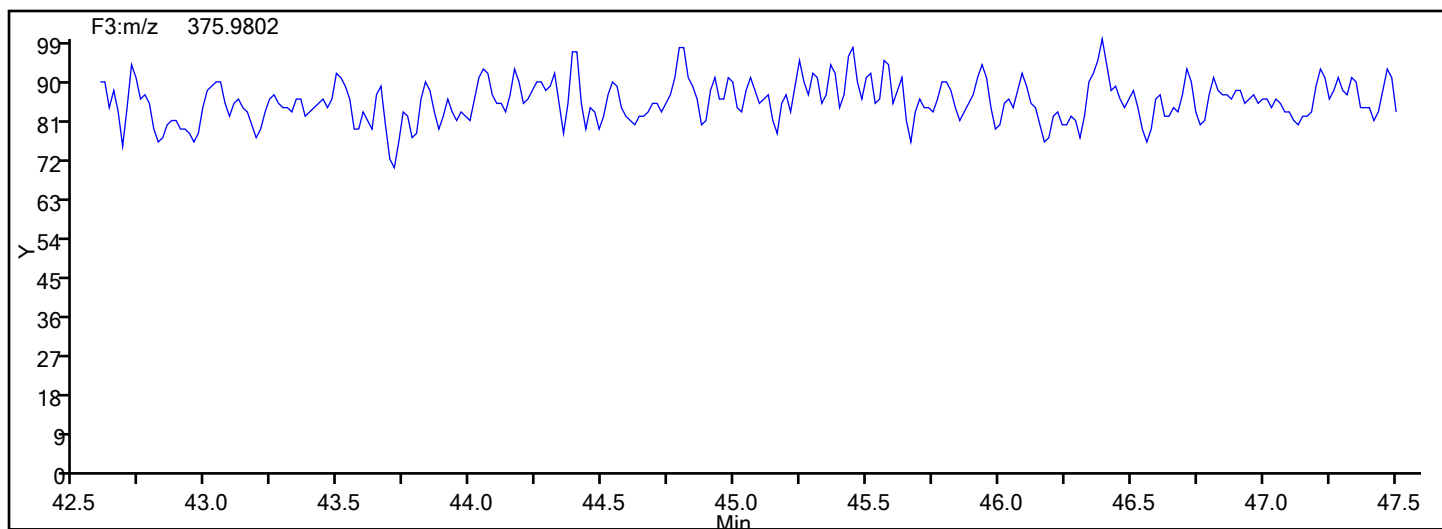
Column Type:

Column Dia:

HxCDF



HxCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

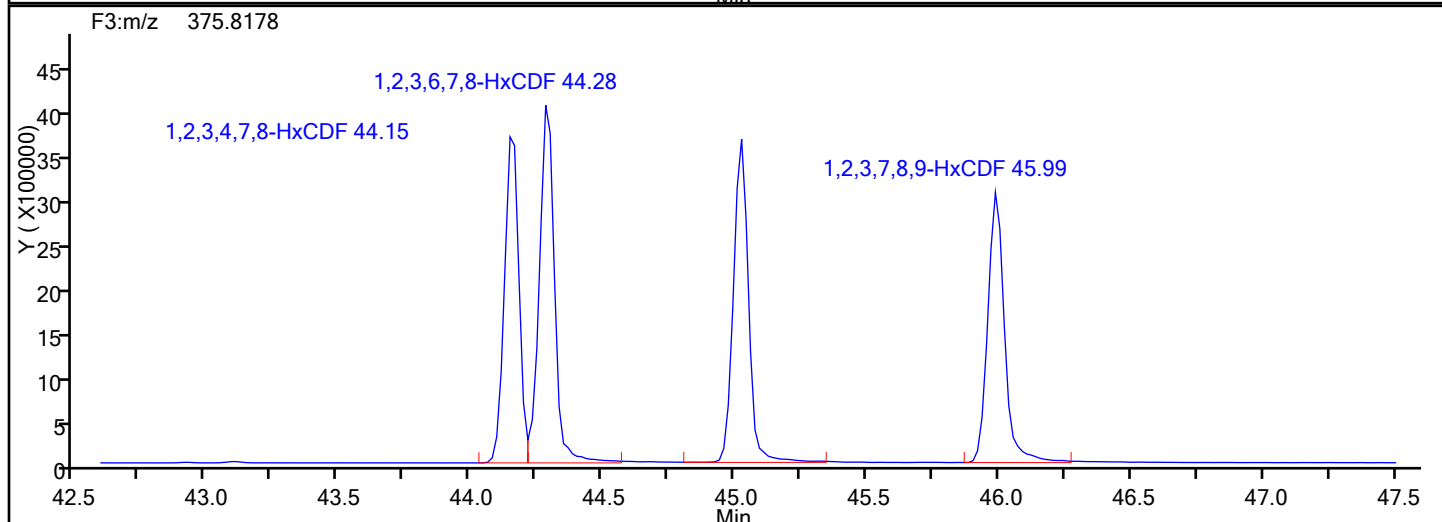
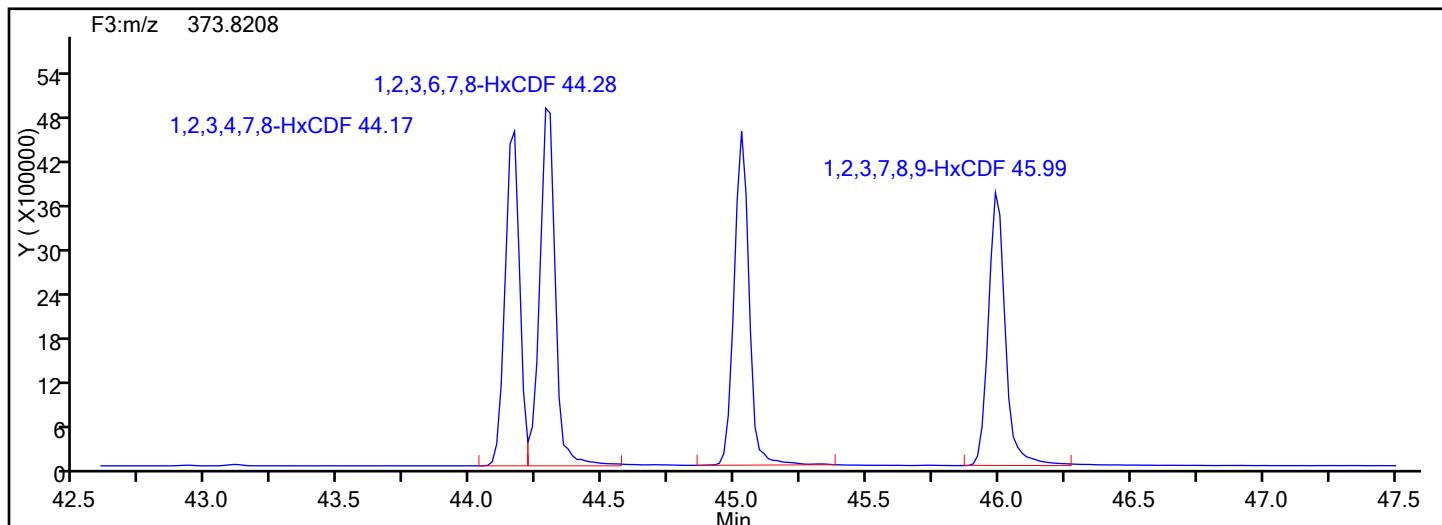
Worklist#: 7768

Sample Line#: 5

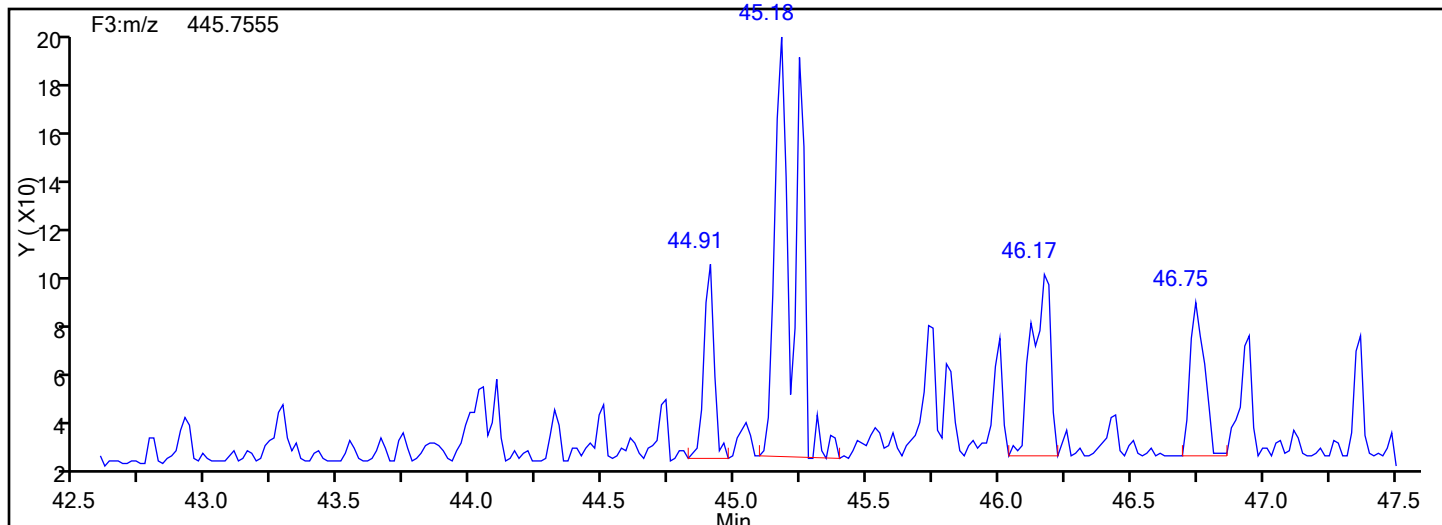
Column Type:

Column Dia:

HxCDF



HxCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

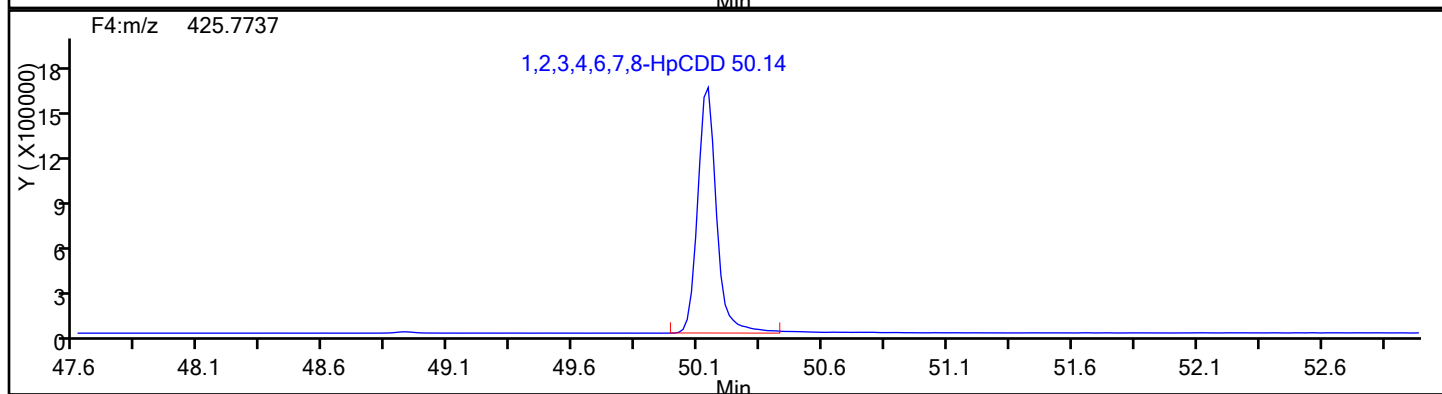
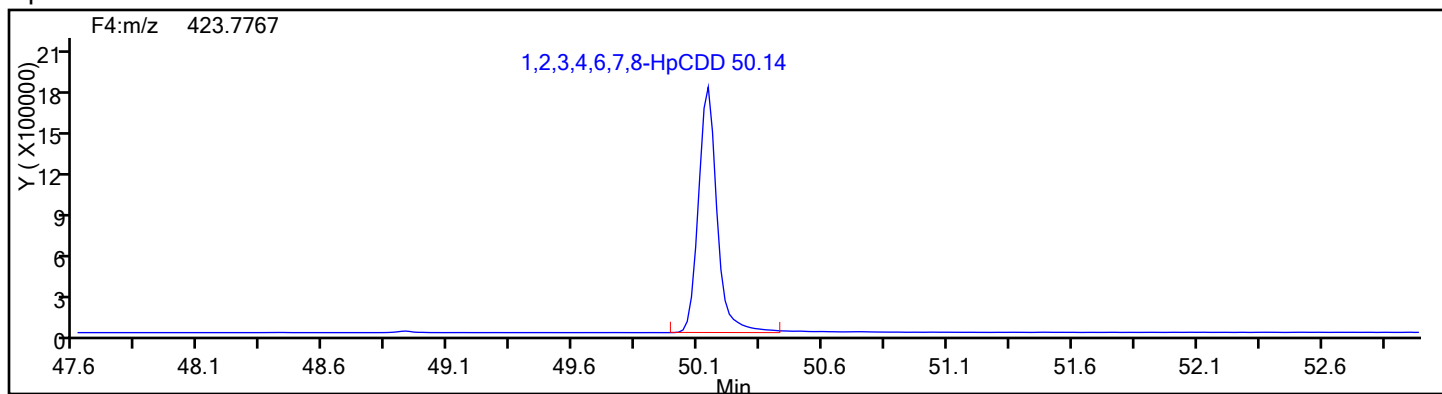
Worklist#: 7768

Sample Line#: 5

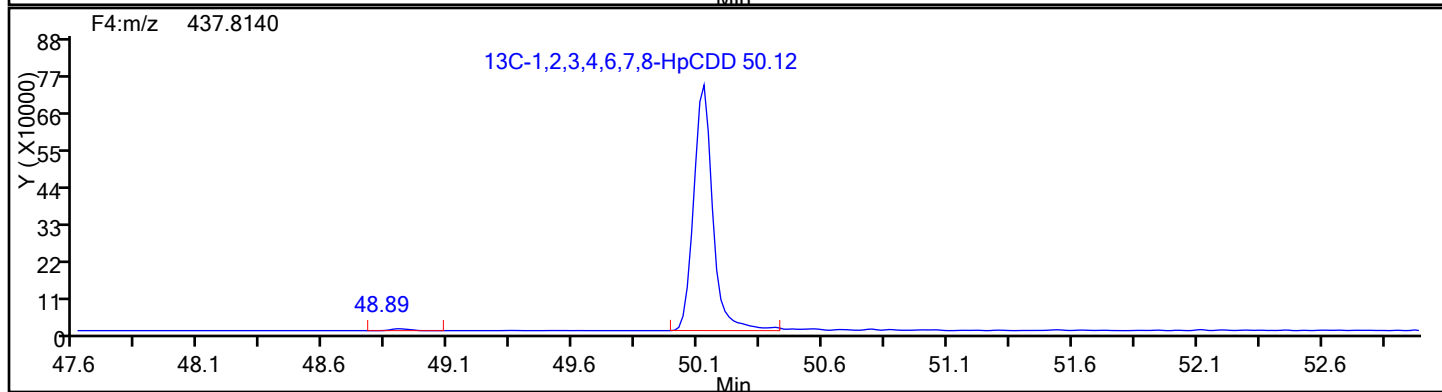
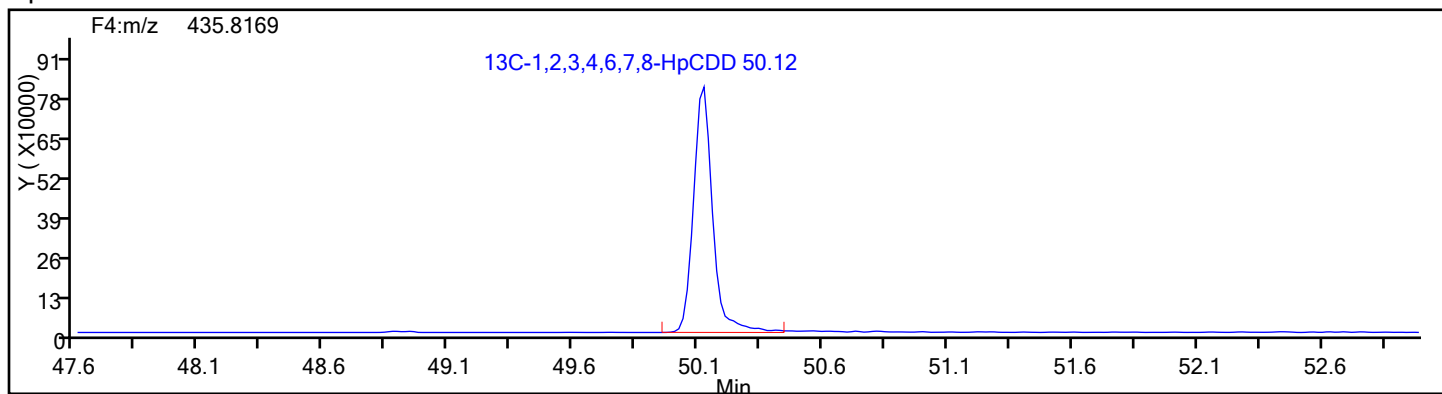
Column Type:

Column Dia:

HpCDD

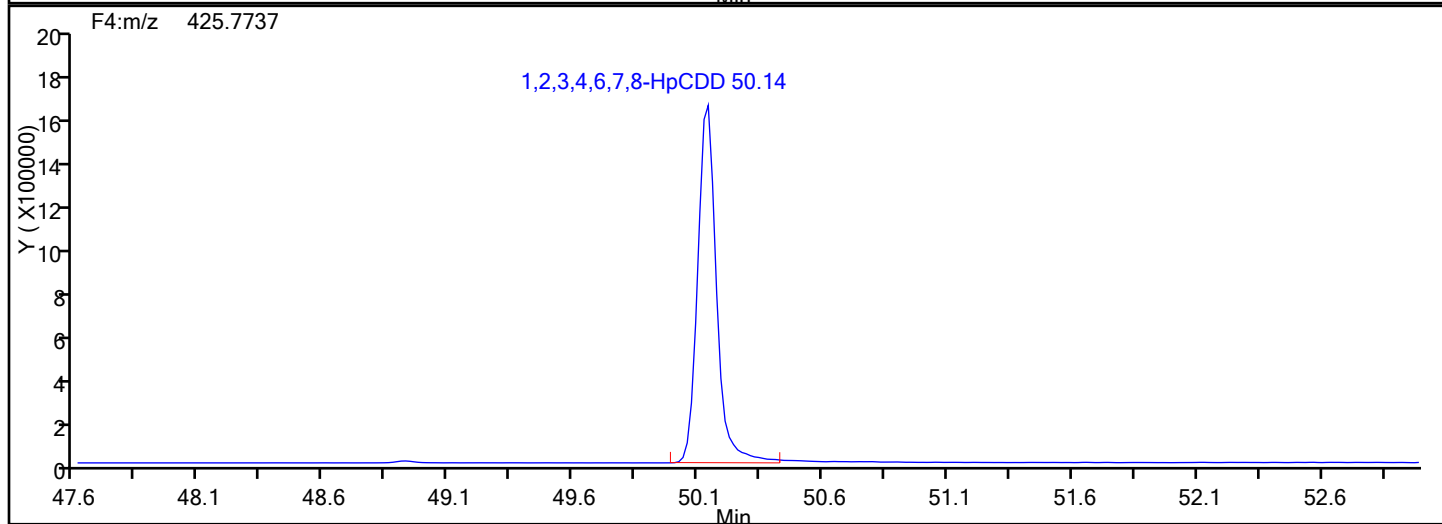
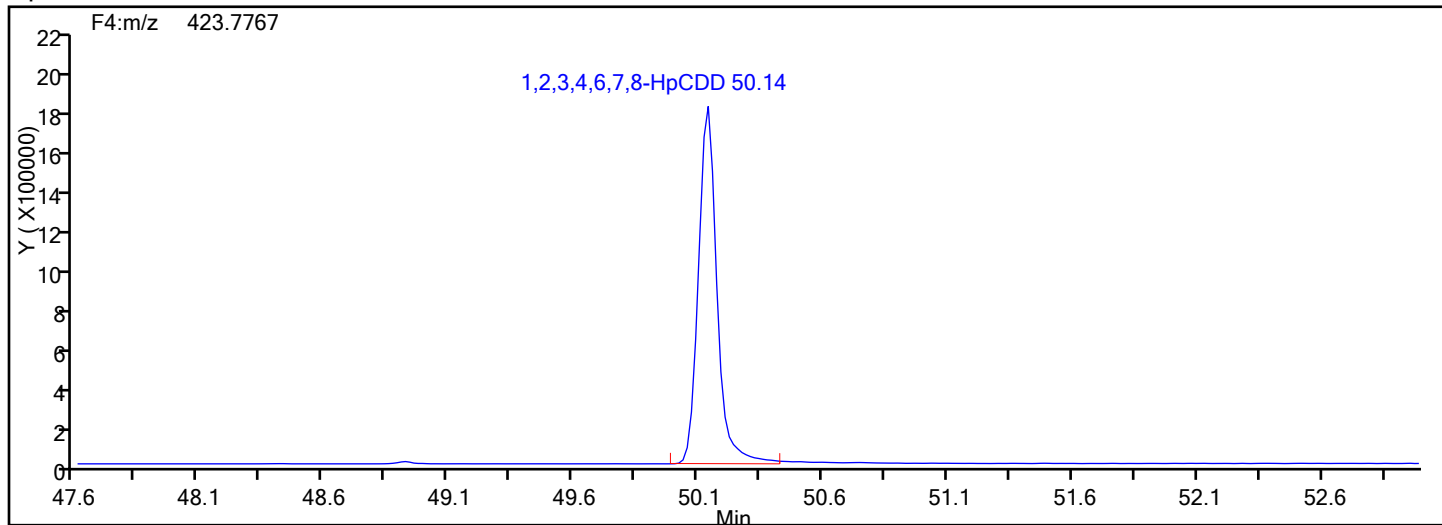


HpCDD Standards

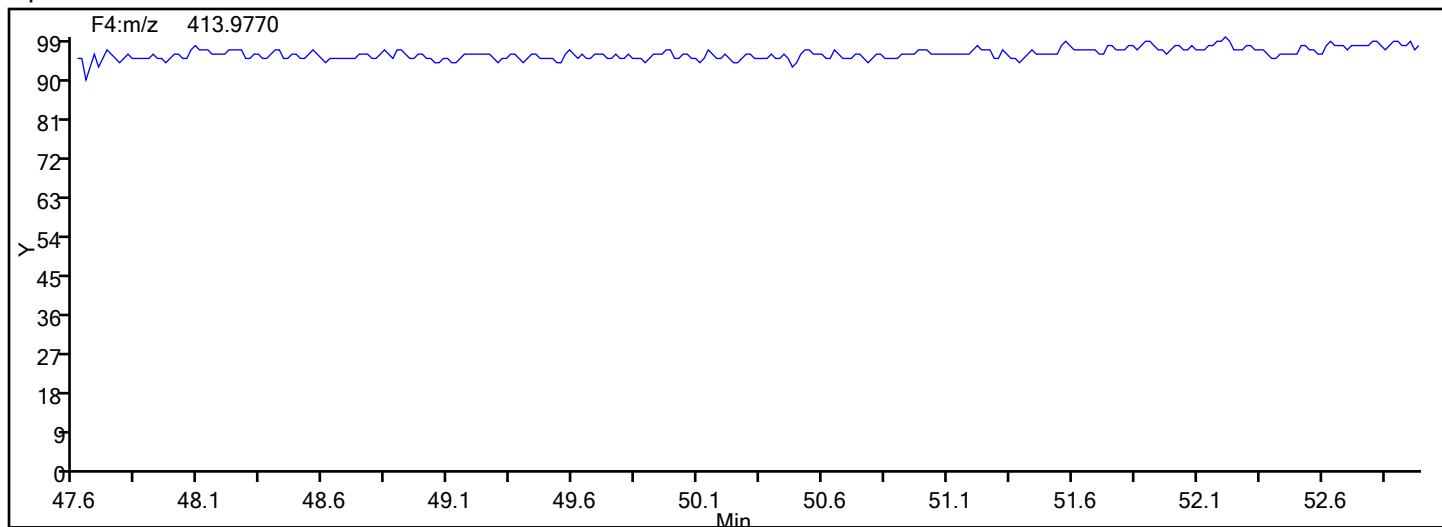


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d
Injection Date: 16-May-2014 17:29:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 5
Column Type: Column Dia:
HpCDD



HpCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

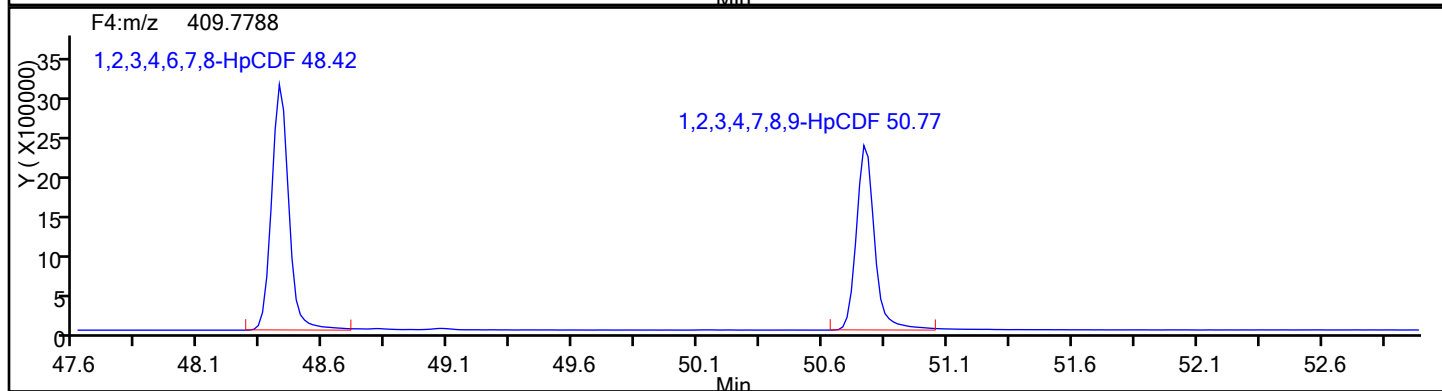
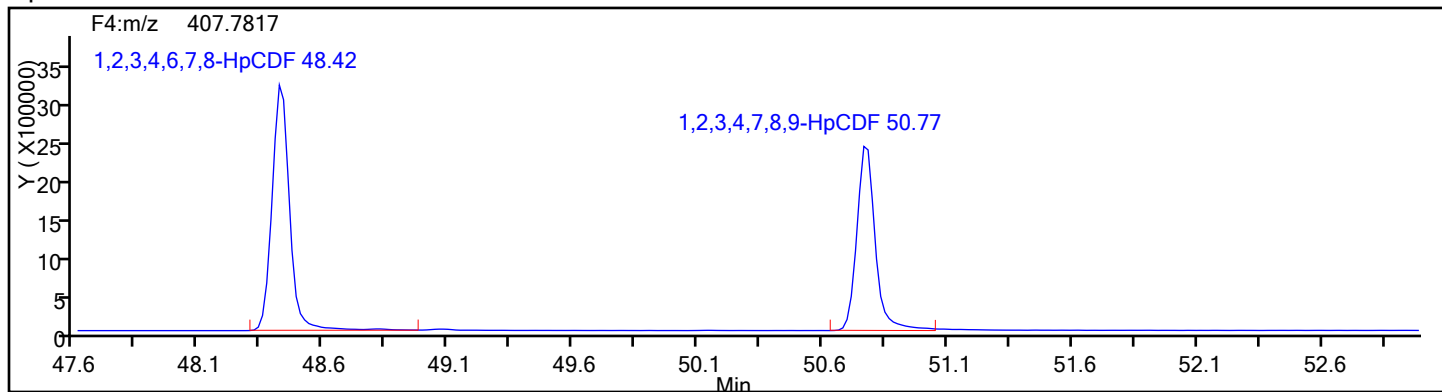
Worklist#: 7768

Sample Line#: 5

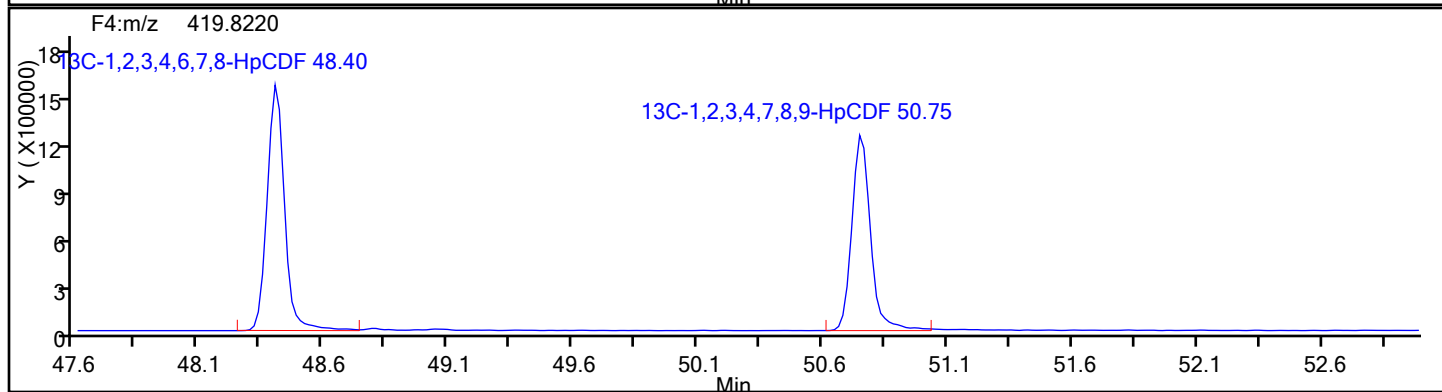
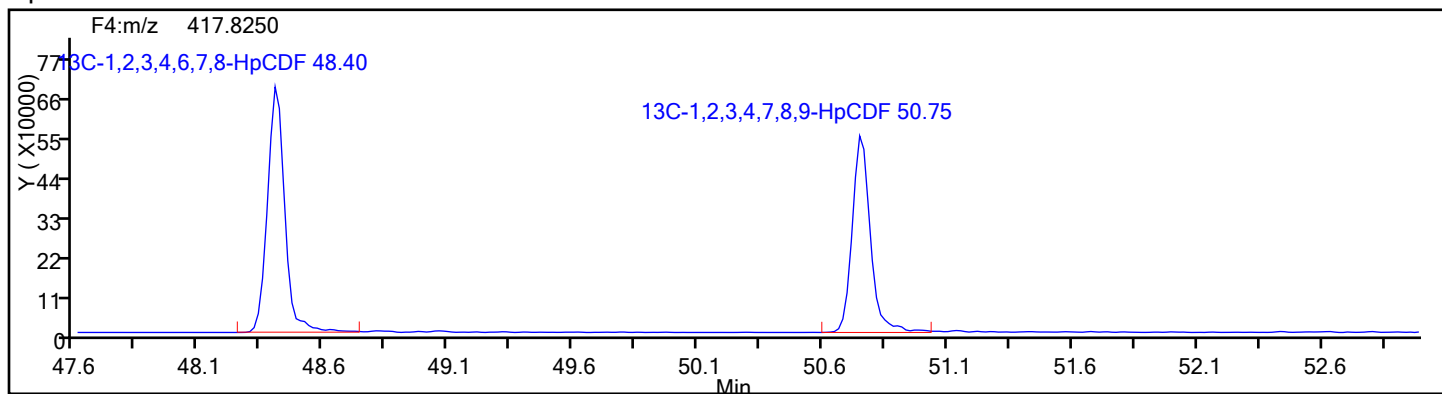
Column Type:

Column Dia:

HpCDF



HpCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

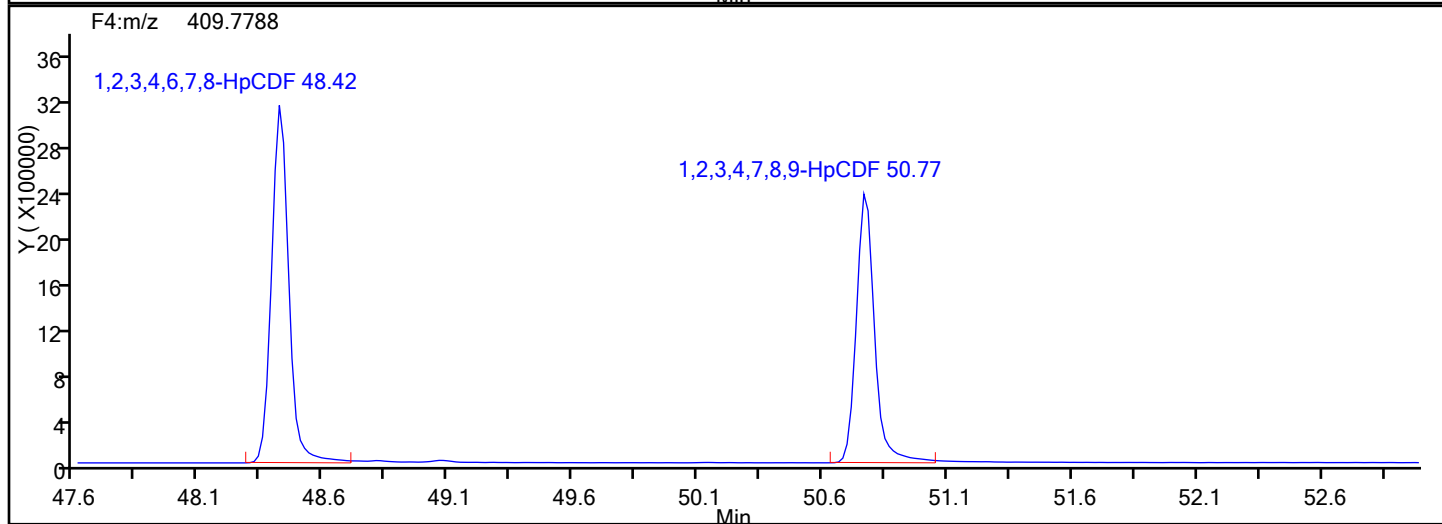
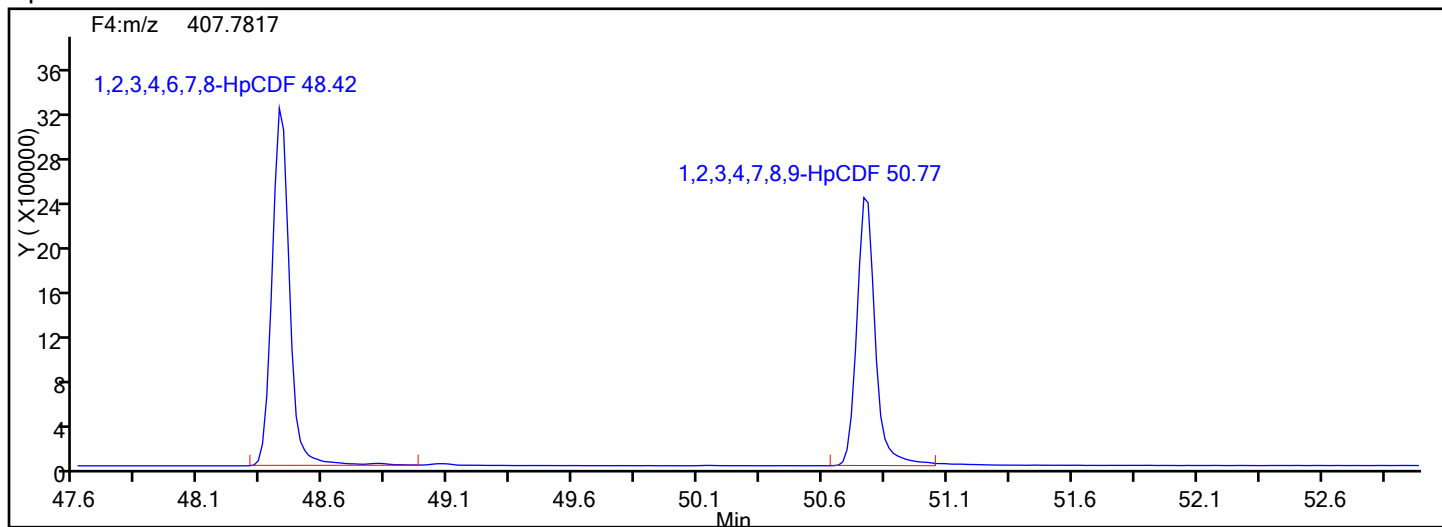
Worklist#: 7768

Sample Line#: 5

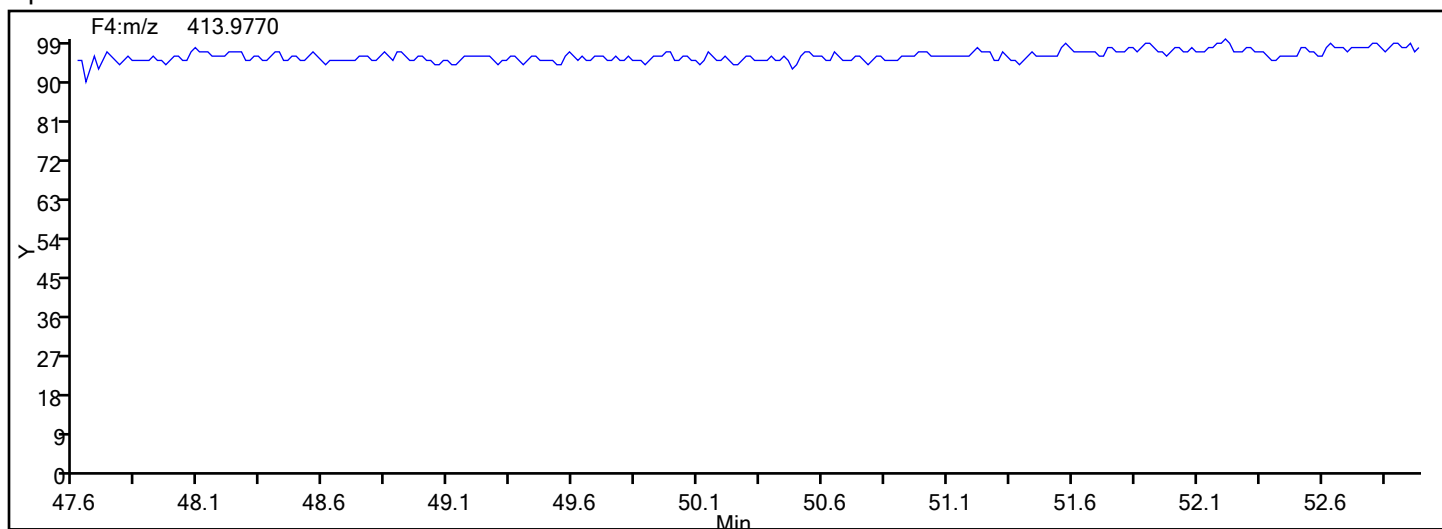
Column Type:

Column Dia:

HpCDF



HpCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

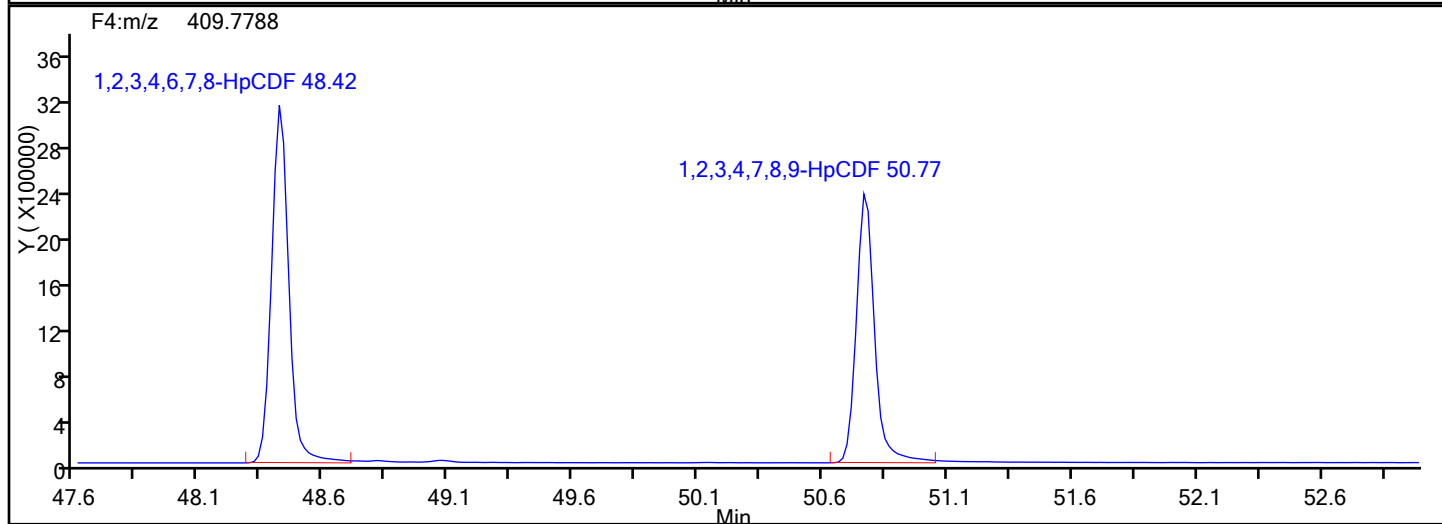
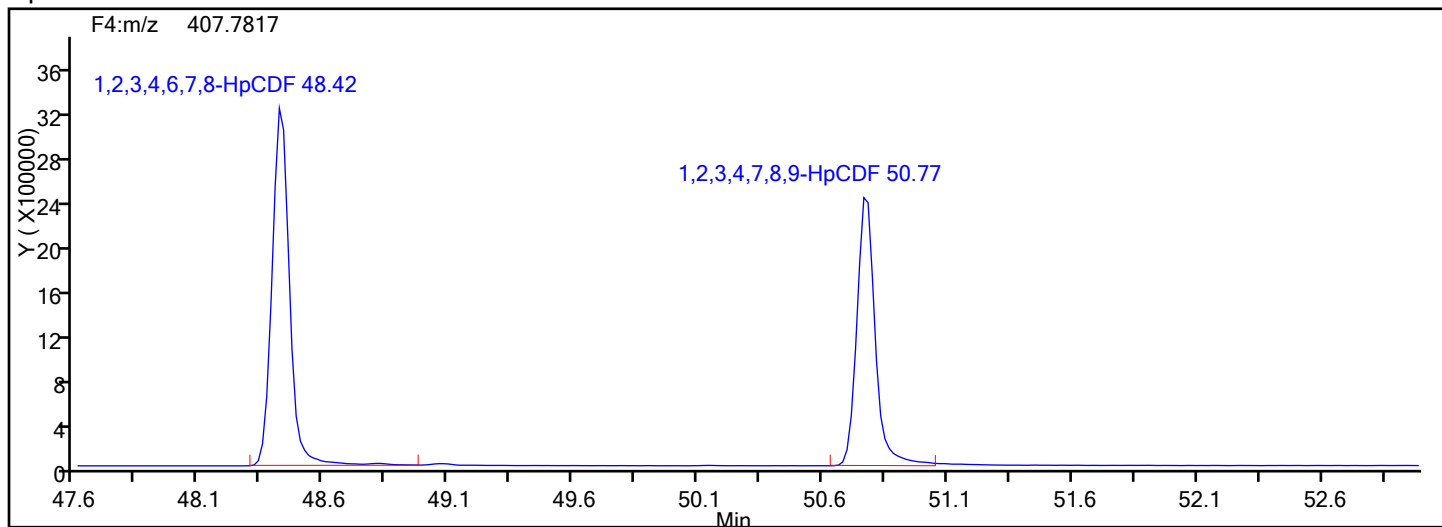
Worklist#: 7768

Sample Line#: 5

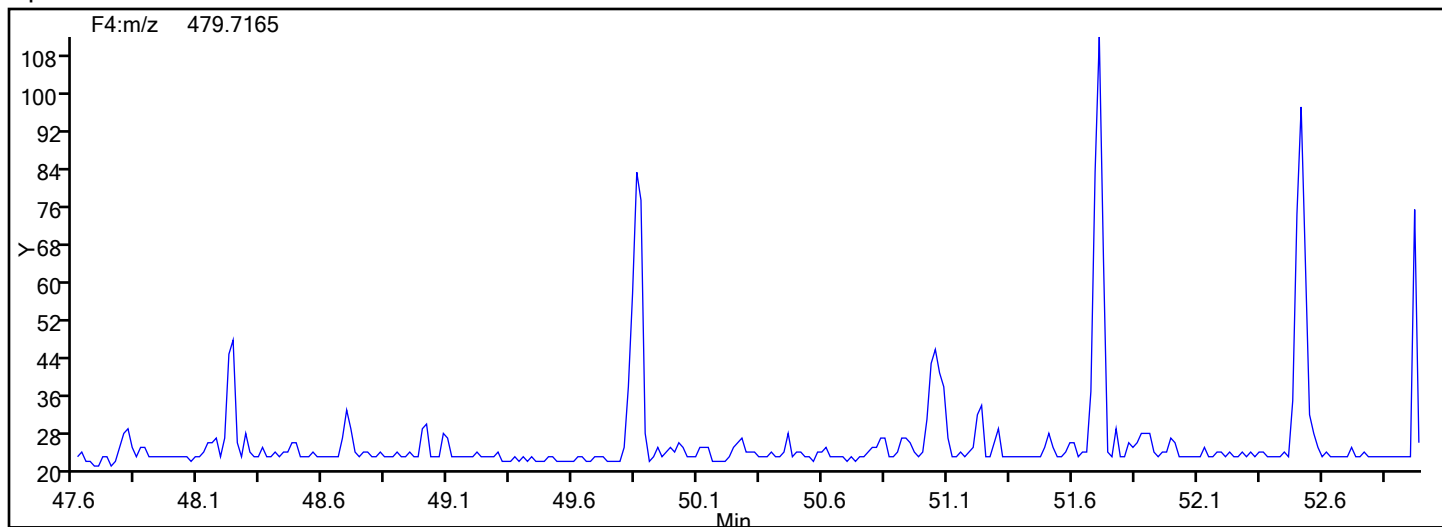
Column Type:

Column Dia:

HpCDF



HpCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

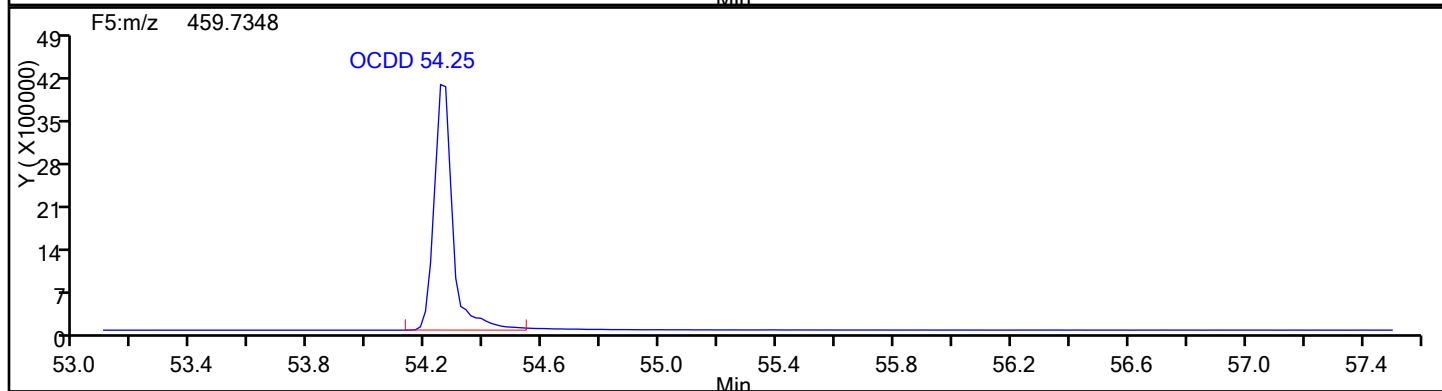
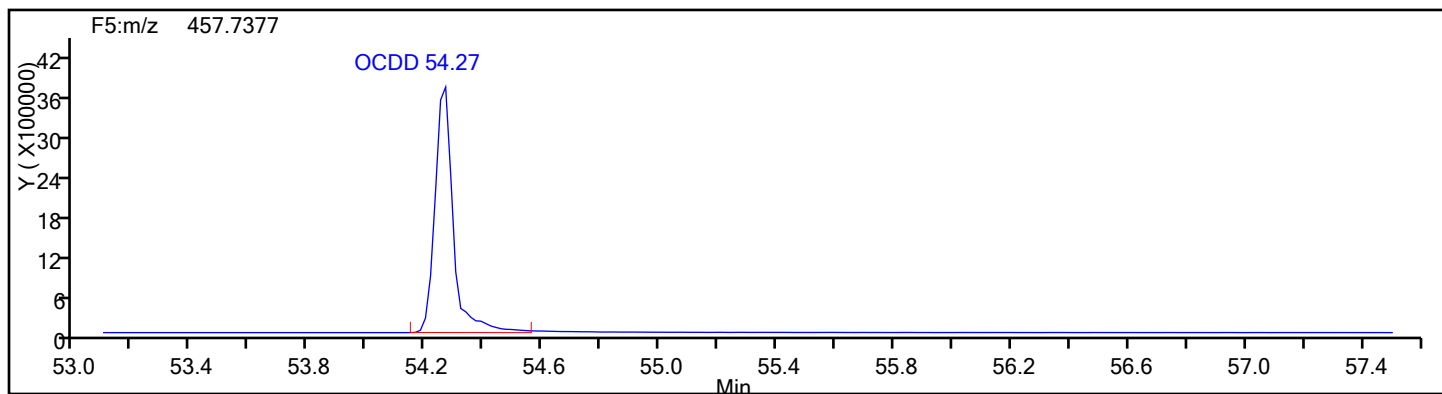
Worklist#: 7768

Sample Line#: 5

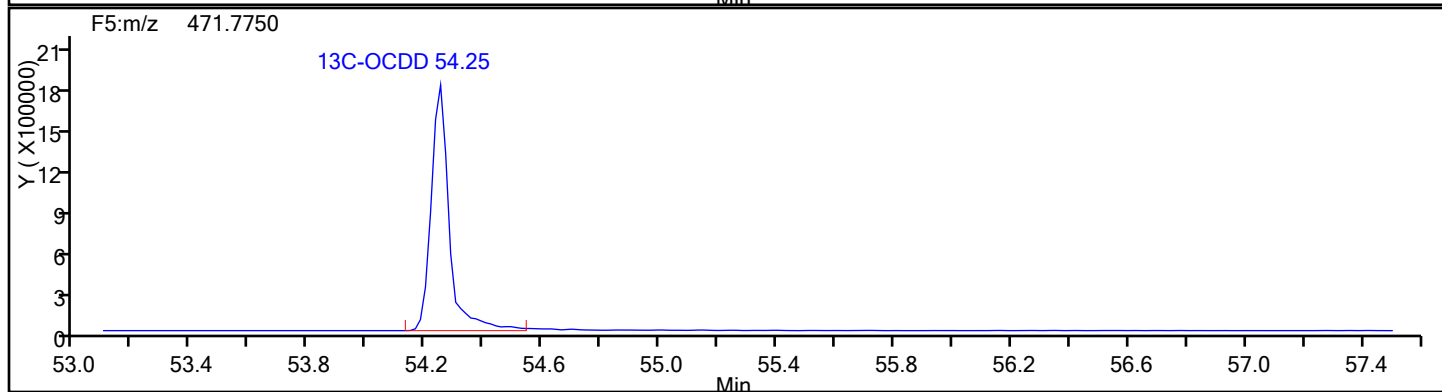
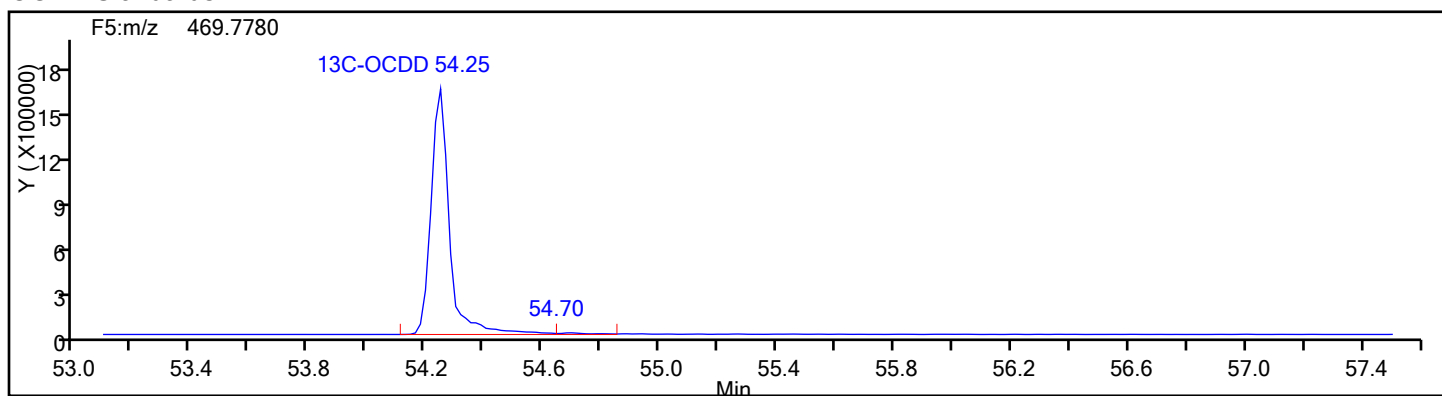
Column Type:

Column Dia:

OCDD



OCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

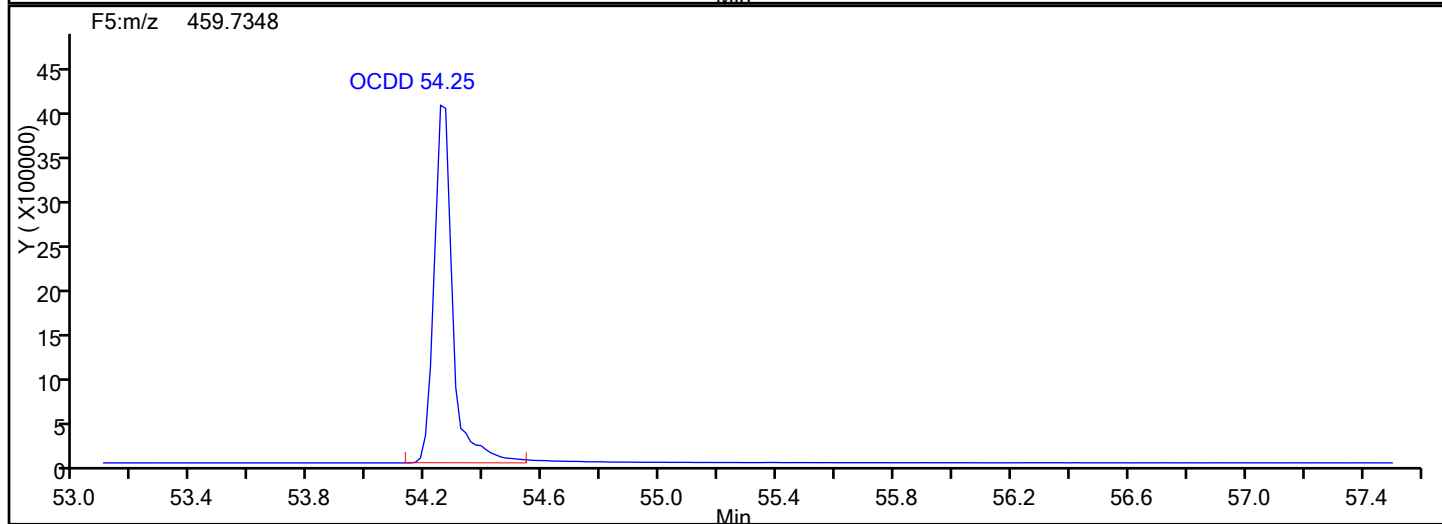
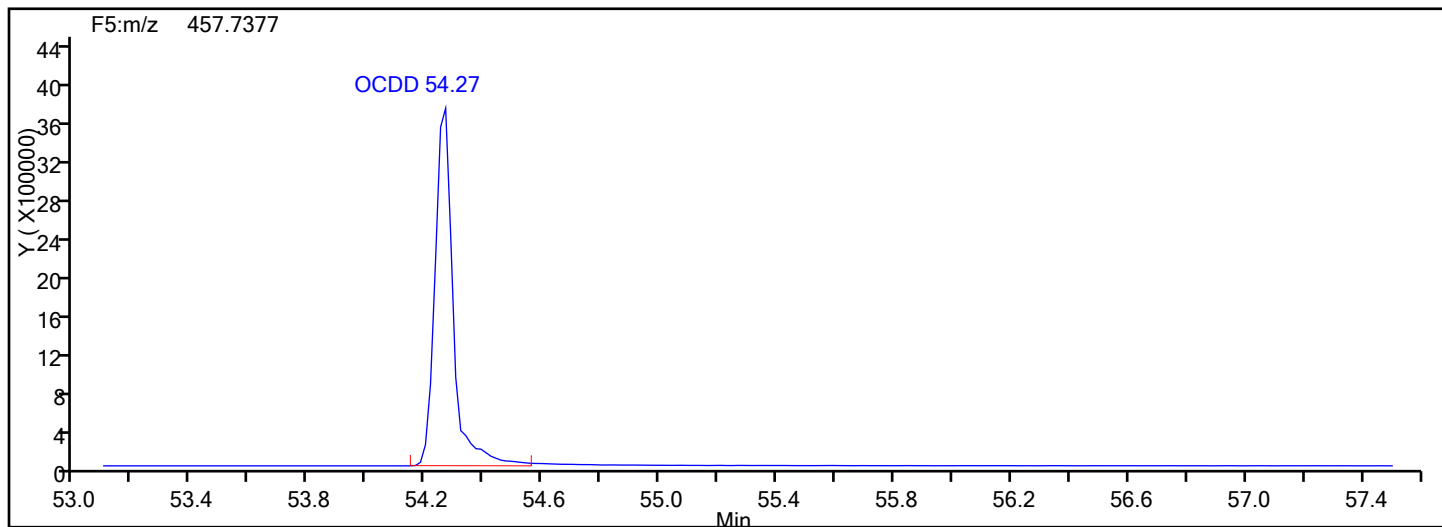
Worklist#: 7768

Sample Line#: 5

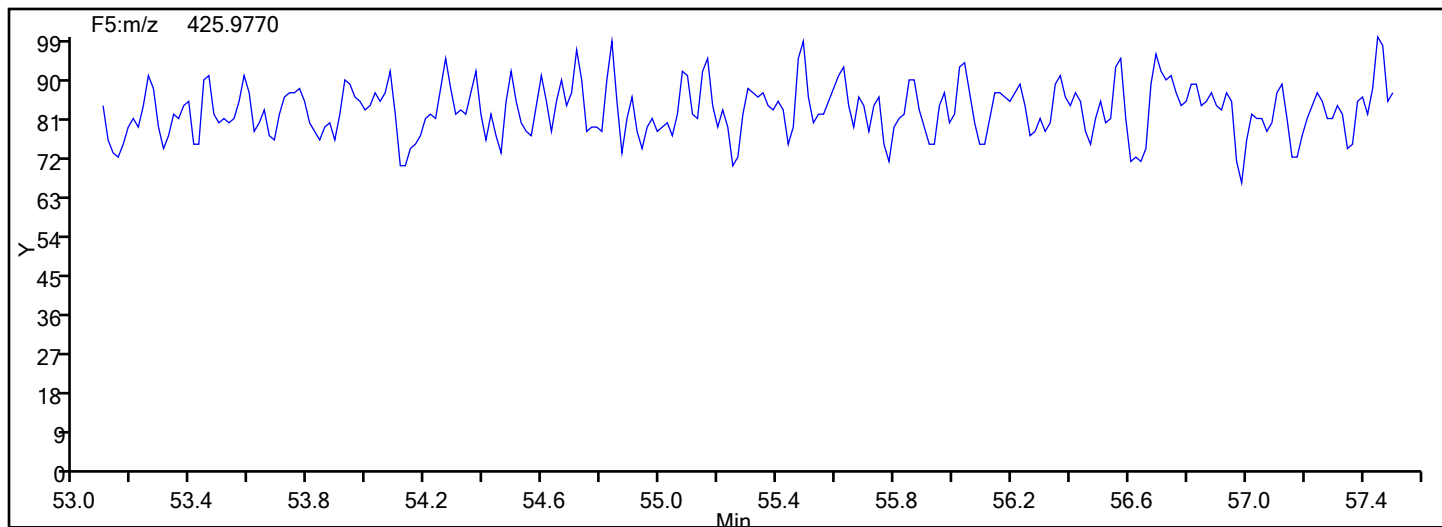
Column Type:

Column Dia:

OCDD



OCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

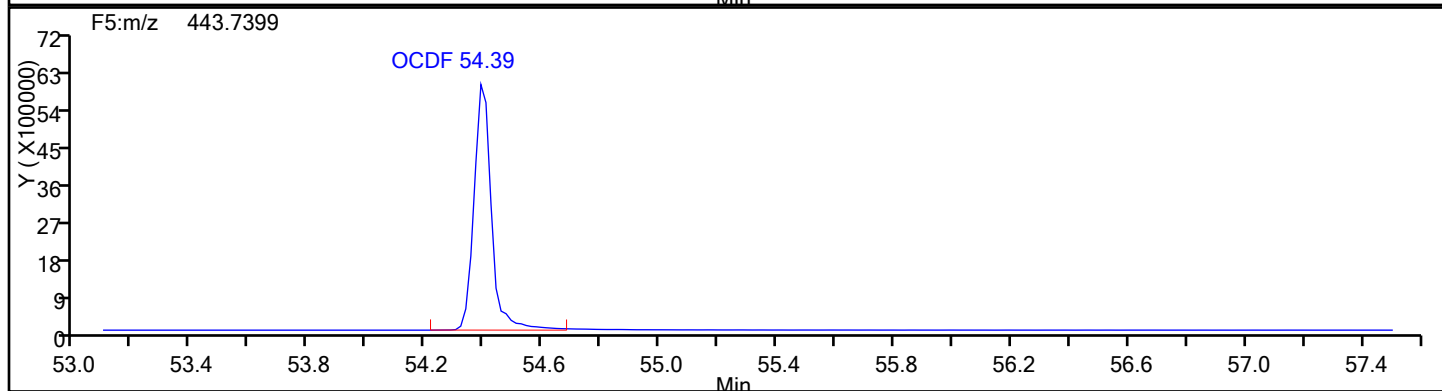
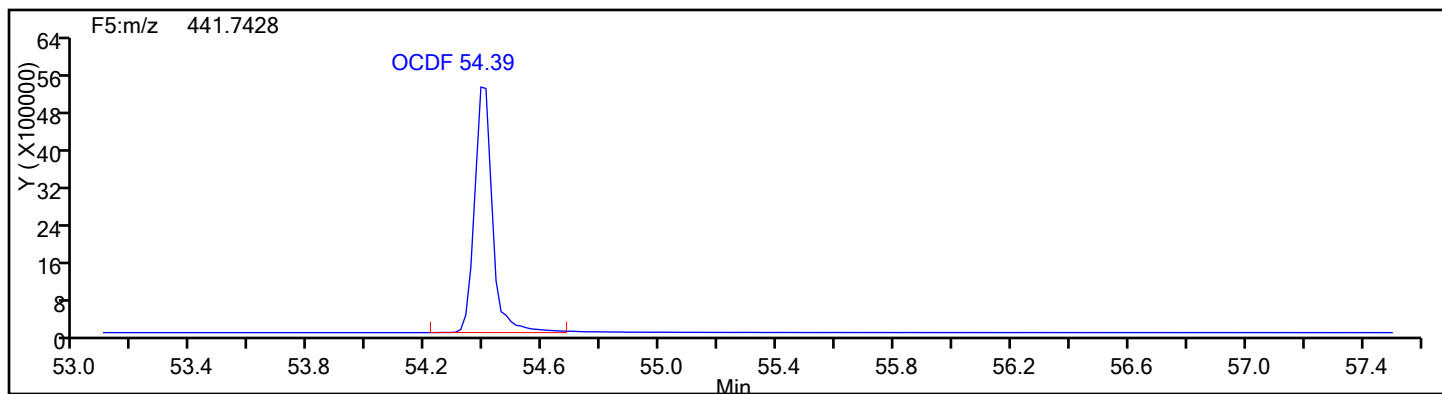
Worklist#: 7768

Sample Line#: 5

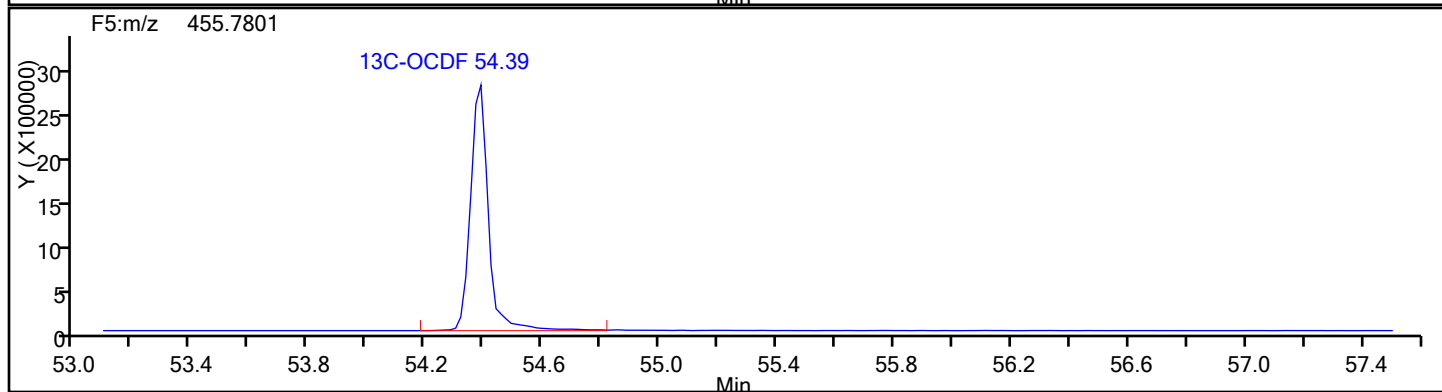
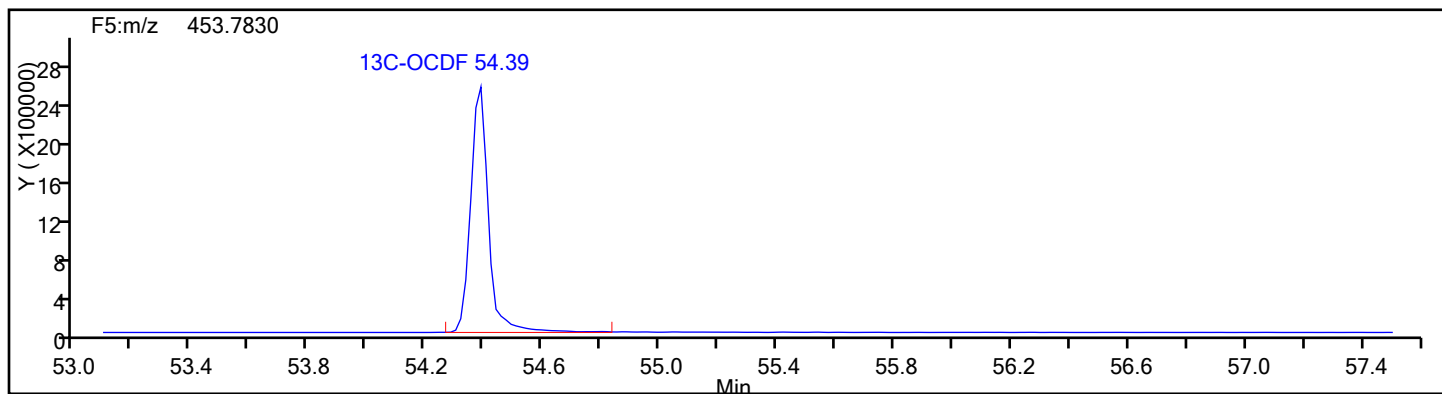
Column Type:

Column Dia:

OCDF



OCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

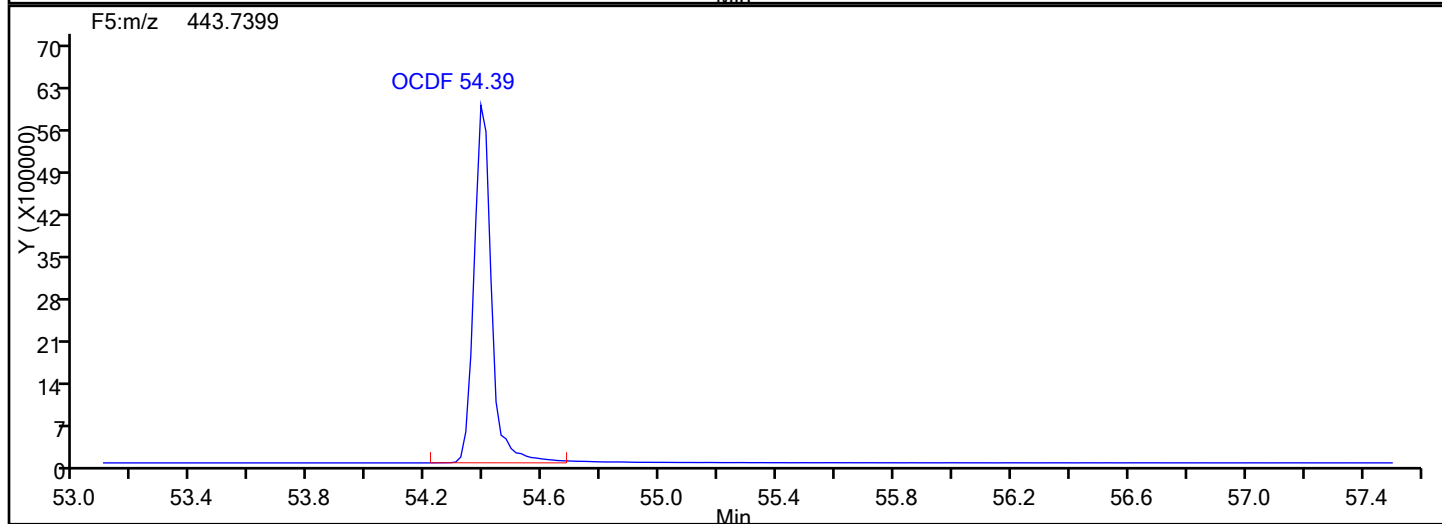
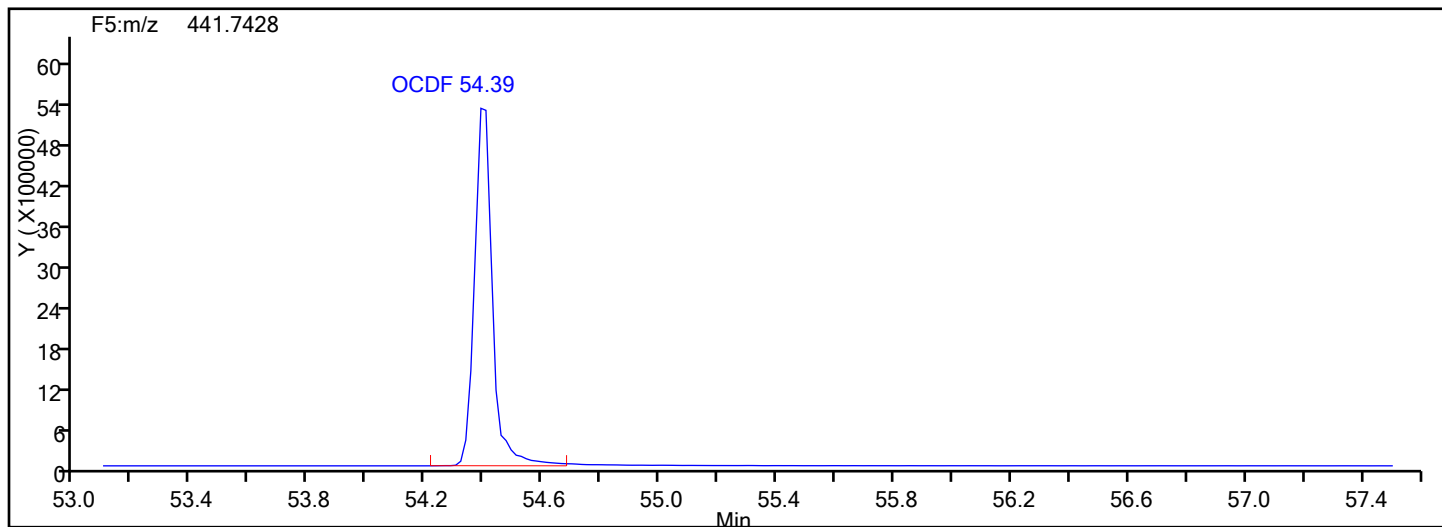
Worklist#: 7768

Sample Line#: 5

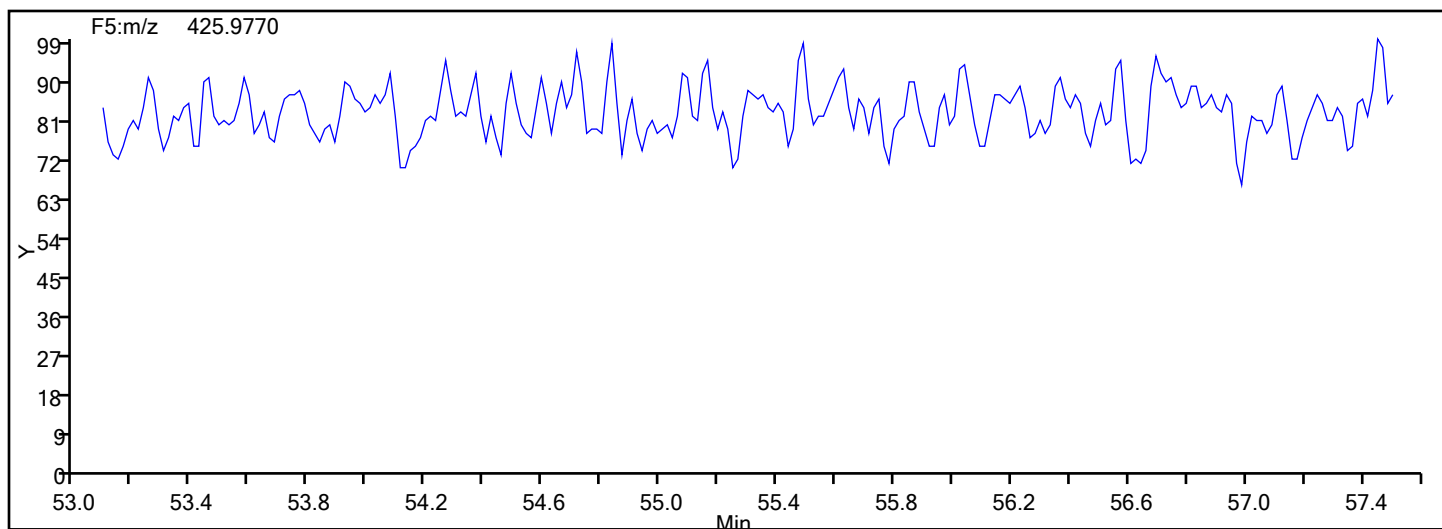
Column Type:

Column Dia:

OCDF



OCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i4.d

Injection Date: 16-May-2014 17:29:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

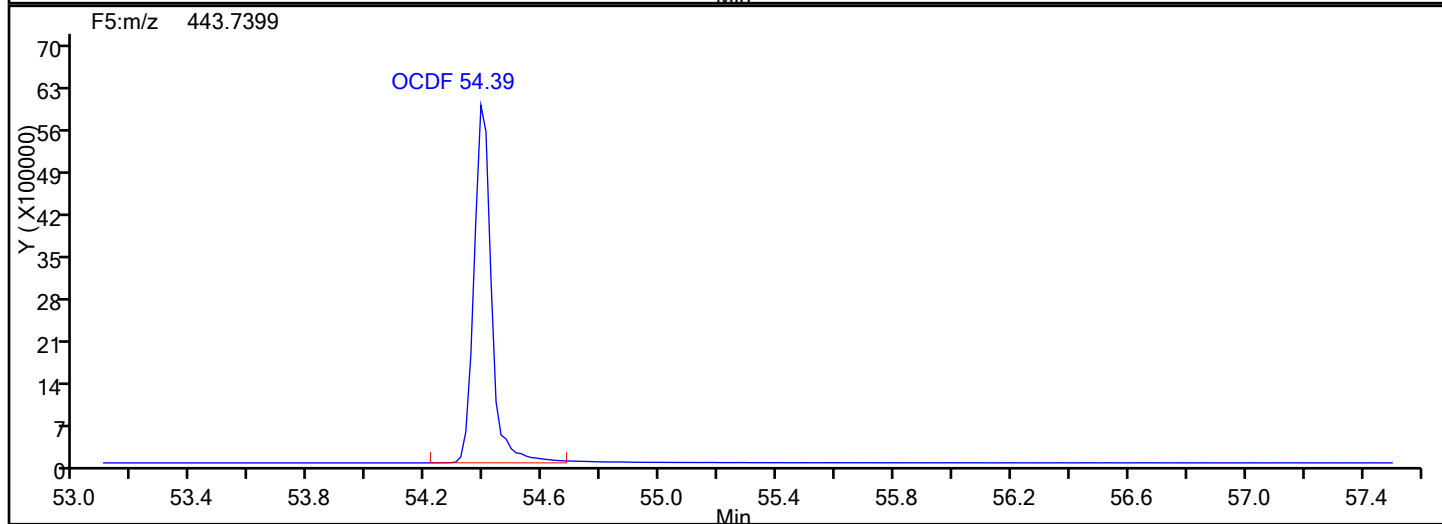
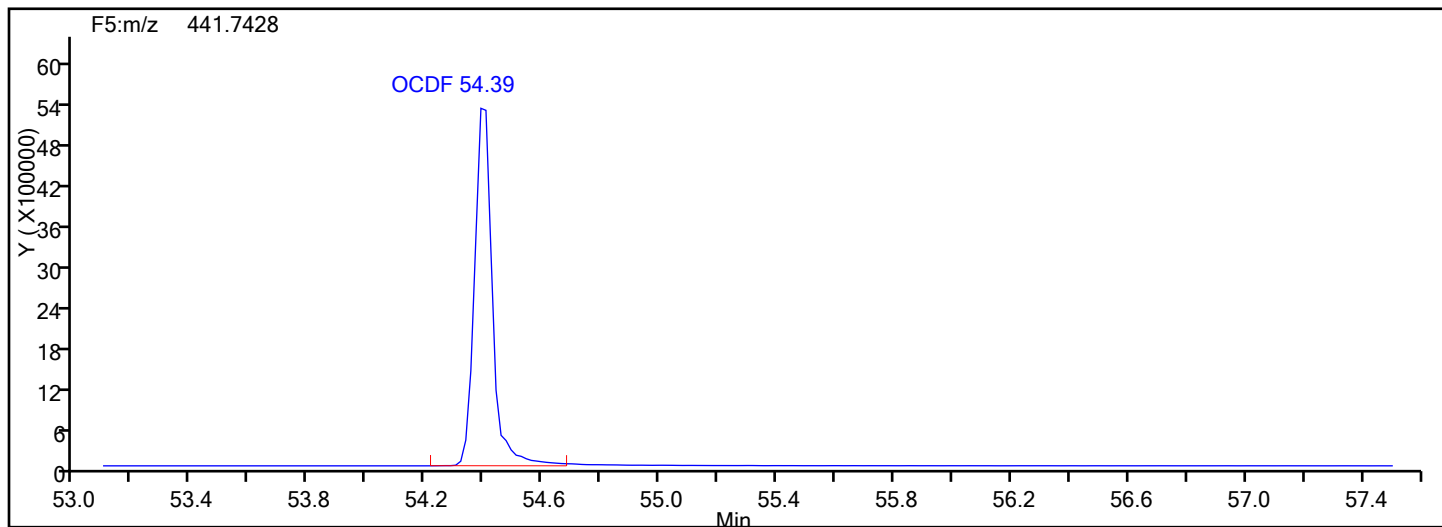
Worklist#: 7768

Sample Line#: 5

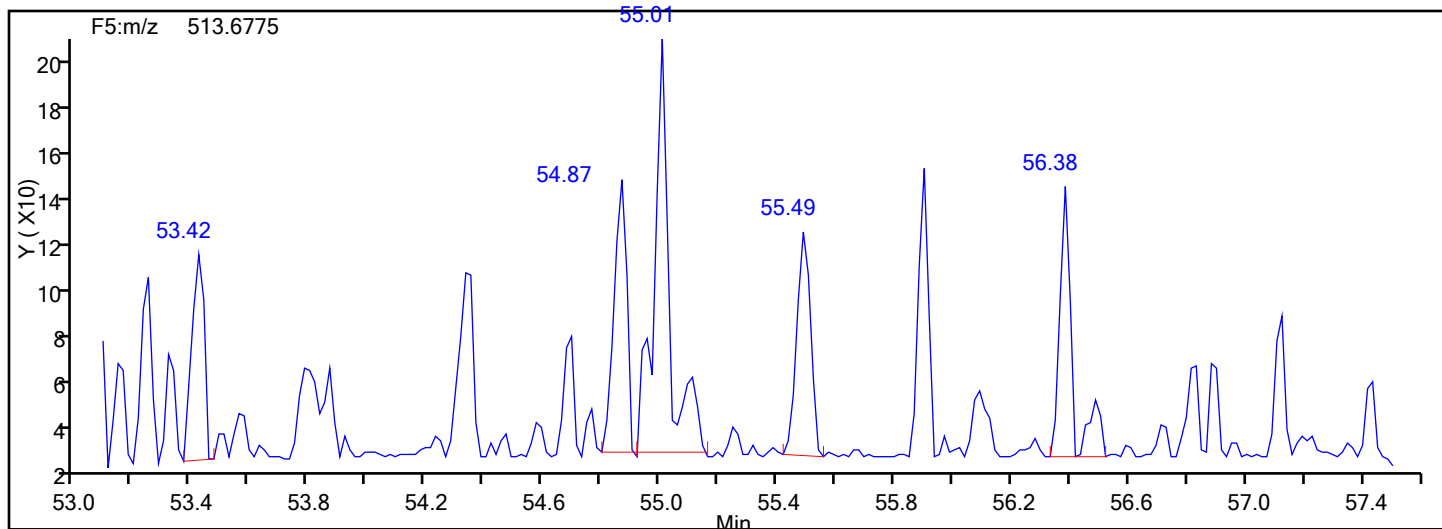
Column Type:

Column Dia:

OCDF



OCDF Interference Mass



TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 16-May-2014 18:31:00 ALS Bottle#: 0 Worklist Smp#: 6
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs5 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:09:42 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:23:41

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31.832	23916178	0.80	1.1733	196.5	196.5	0.1046	0.1046	98.23	
A Non-2,3,7,8-sub-TCDD	30.308	20556	0.87	0.0000						
S Total TCDD					196.5	196.5	0.1046	0.1046		
2,3,7,8-TCDF	29.771	35566472	0.79	1.0881	194.4	194.4	0.1061	0.1061	97.18	
A Non-2,3,7,8-sub-TCDF	28.995	285679	0.84	0.0000						
S Total TCDF					194.4	194.4	0.1061	0.1061		
1,2,3,7,8-PeCDD	41.009	97828013	1.59	1.0434	1000.1	1000.1	0.3428	0.3428	100	
A Non-2,3,7,8-sub-PeCDD	39.915						0.0	0.0		
S Total PeCDD					1000.1	1000.1	0.3428	0.3428		
1,2,3,7,8-PeCDF	39.288	172459555	1.60	1.1898	1017.5	1017.5	3.025	3.025	102	
2,3,4,7,8-PeCDF	40.493	162647050	1.60	1.1095	1026.5	1026.5	2.864	2.864	103	
A Non-2,3,7,8-sub-PeCDF	38.623						0.0	0.0		
S Total PeCDF					2043.9	2043.9	2.945	2.945		
1,2,3,4,7,8-HxCDD	45.245	125745795	1.26	1.1409	995.8	995.8	1.575	1.575	99.58	
1,2,3,6,7,8-HxCDD	45.363	129376084	1.27	1.1481	989.2	989.2	1.608	1.608	98.92	
1,2,3,7,8,9-HxCDD	45.751	139413717	1.26	1.2212	1016.6	1016.6	1.491	1.491	102	
A Non-2,3,7,8-sub-HxCDD	44.687						0.0	0.0		
S Total HxCDD					3001.6	3001.6	1.558	1.558		
1,2,3,4,7,8-HxCDF	44.199	205245281	1.25	1.3629	1028.0	1028.0	2.022	2.022	103	
1,2,3,6,7,8-HxCDF	44.334	230766405	1.25	1.2762	989.4	989.4	1.847	1.847	98.94	
2,3,4,6,7,8-HxCDF	45.059	207212834	1.25	1.2654	1013.7	1013.7	2.076	2.076	101	
1,2,3,7,8,9-HxCDF	46.038	192682603	1.26	1.2573	1002.8	1002.8	2.485	2.485	100	
A Non-2,3,7,8-sub-HxCDF	44.552						0.0	0.0		
S Total HxCDF					4033.9	4033.9	2.107	2.107		
1,2,3,4,6,7,8-HpCDD	50.192	114386892	1.05	1.1204	995.3	995.3	1.902	1.902	99.53	
A Non-2,3,7,8-sub-HpCDD	49.566						0.0	0.0		
S Total HpCDD					995.3	995.3	1.902	1.902		
1,2,3,4,6,7,8-HpCDF	48.471	196710947	1.03	1.4984	983.2	983.2	2.194	2.194	98.32	
1,2,3,4,7,8,9-HpCDF	50.816	160075574	1.04	1.3807	1006.3	1006.3	2.965	2.965	101	

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
A Non-2,3,7,8-sub-HpCDF	49.625						0.0	0.0		
S Total HpCDF					1989.5	1989.5	2.579	2.579		
OCDD	54.304	231071676	0.89	1.2073	2026.8	2026.8	0.8181	0.8181	101	
OCDF	54.442	328275681	0.90	1.1162	2062.9	2062.9	0.7552	0.7552	103	
D 13C-2,3,7,8-TCDD	31.799	10375862	0.80	1.0709	102.1	102.1	0.2605	0.2605	102	
D 13C-2,3,7,8-TCDF	29.721	16816585	0.79	1.7545	101.0	101.0	0.1119	0.1119	101	
D 13C-1,2,3,7,8-PeCDD	40.992	9374768	1.62	0.8743	113.0	113.0	0.4333	0.4333	113	
D 13C-1,2,3,7,8-PeCDF	39.271	14246063	1.59	1.3704	109.5	109.5	0.1736	0.1736	110	
D 13C-2,3,4,7,8-PeCDF	40.476	14282105	1.62	1.3837	108.8	108.8	0.1720	0.1720	109	
D 13C-1,2,3,4,7,8-HxCDD	45.228	11068991	1.26	0.8772	98.9	98.9	0.1314	0.1314	98.89	
D 13C-1,2,3,6,7,8-HxCDD	45.346	11391028	1.28	0.9171	97.3	97.3	0.1256	0.1256	97.34	
D 13C-1,2,3,4,7,8-HxCDF	44.182	14649659	0.54	1.1892	96.5	96.5	0.1158	0.1158	96.54	
D 13C-1,2,3,6,7,8-HxCDF	44.317	18275058	0.54	1.4625	97.9	97.9	0.0942	0.0942	97.93	
D 13C-2,3,4,6,7,8-HxCDF	45.042	16154097	0.53	1.3197	95.9	95.9	0.1043	0.1043	95.93	
D 13C-1,2,3,7,8,9-HxCDF	46.021	15282343	0.54	1.2001	99.8	99.8	0.1147	0.1147	99.80	
D 13C-1,2,3,4,6,7,8-HpCDD	50.175	10257853	1.05	0.8155	98.6	98.6	0.1427	0.1427	98.58	
D 13C-1,2,3,4,6,7,8-HpCDF	48.454	13352459	0.46	1.0496	99.7	99.7	0.1096	0.1096	99.70	
D 13C-1,2,3,4,7,8,9-HpCDF	50.799	11521506	0.46	0.8947	100.9	100.9	0.1286	0.1286	101	
D 13C-OCDD	54.287	18887158	0.92	0.7044	210.1	210.1	0.0872	0.0872	105	
D 13C-OCDF	54.425	28514559	0.90	1.0615	210.5	210.5	0.0642	0.0642	105	
\$ 37Cl4-2,3,7,8-TCDD	31.832	23452691		1.2266	201.5	201.5	0.0283	0.0283	101	
* 13C-1,2,3,4-TCDD	31.267	9489667	0.81	9.1E+04	100.0	100.0				
* 13C-1,2,3,7,8,9-HxCDD	45.734	12759843	1.30	1E+05	100.0	100.0				

Reagents:

61L51613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 16-May-2014 18:31:00 ALS Bottle#: 0 Worklist Smp#: 6
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:74cs5 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 12-Jan-2017 08:09:42 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: XAWRK029

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:23:41

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,7,8-TCDD											
319.8965	31.832	31.838	0	1.001	10665390	1108150	219	547	5060		
321.8936	31.849	31.838	1	1.002	13250788	1366893	303	757	4511	0.80(0.65-0.89)	
A Non-2,3,7,8-sub-TCDD											
319.8965	28.708	30.308	-96		9544	1291	219	547	6		
321.8936	28.741	30.308	-94		11012	1474	303	757	5	0.87(0.65-0.89)	
2,3,7,8-TCDF											
303.9016	29.771	29.760	1	1.002	15694011	1738934	454	1135	3830		
305.8987	29.771	29.760	1	1.002	19872461	2216741	412	1030	5380	0.79(0.65-0.89)	
A Non-2,3,7,8-sub-TCDF											
303.9016	28.625	28.995	-22		130826	15367	454	1135	34		
305.8987	28.641	28.995	-21		154853	16581	412	1030	40	0.84(0.65-0.89)	
1,2,3,7,8-PeCDD											
355.8546	41.009	41.015	0	1.000	60075873	14997294	1824	4560	8222		
357.8516	41.009	41.015	0	1.000	37752140	9486986	1446	3615	6561	1.59(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDD											
355.8546	39.915						1824	4560			
357.8516	39.915						1446	3615			
1,2,3,7,8-PeCDF											
339.8597	39.288	39.293	0	1.000	106202805	22324573	27008	67520	827		
341.8567	39.288	39.293	0	1.000	66256750	14051069	15663	39157	897	1.60(1.32-1.78)	
2,3,4,7,8-PeCDF											
339.8597	40.493	40.499	0	1.000	100191913	24210618	27008	67520	896		
341.8567	40.493	40.499	0	1.000	62455137	15041234	15663	39157	960	1.60(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-PeCDF											
339.8597	38.623						27008	67520			
341.8567	38.623						15663	39157			
1,2,3,4,7,8-HxCDD											
389.8158	45.245	45.248	0	1.000	70196193	19067753	12408	31020	1537		
391.8127	45.245	45.248	0	1.000	55549602	14654681	8468	21170	1731	1.26(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45.363	45.366	0	1.000	72331523	18520681	12408	31020	1493		
391.8127	45.363	45.366	0	1.000	57044561	14423769	8468	21170	1703	1.27(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45.751	45.754	0	1.012	77766034	18943593	12408	31020	1527		
391.8127	45.751	45.754	0	1.012	61647683	15150297	8468	21170	1789	1.26(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDD											
389.8158	44.687						12408	31020			
391.8127	44.687						8468	21170			
1,2,3,4,7,8-HxCDF											
373.8208	44.199	44.202	0	1.000	114161862	31685533	23050	57625	1375		
375.8178	44.199	44.202	0	1.000	91083419	24447023	20666	51665	1183	1.25(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44.334	44.337	0	1.000	128418736	33333661	23050	57625	1446		
375.8178	44.317	44.337	-1	1.000	102347669	26127663	20666	51665	1264	1.25(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	45.059	45.063	0	1.000	115056569	30171058	23050	57625	1309		
375.8178	45.059	45.063	0	1.000	92156265	24362204	20666	51665	1179	1.25(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	46.038	46.024	1	1.000	107301541	25727683	23050	57625	1116		
375.8178	46.021	46.024	0	1.000	85381062	19976892	20666	51665	967	1.26(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDF											
373.8208	44.552						23050	57625			
375.8178	44.552						20666	51665			
1,2,3,4,6,7,8-HpCDD											
423.7767	50.192	50.178	1	1.000	58686063	11601434	8826	22065	1314		
425.7737	50.175	50.178	0	1.000	55700829	11195120	8090	20225	1384	1.05(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											
423.7767	49.566						8826	22065			
425.7737	49.566						8090	20225			
1,2,3,4,6,7,8-HpCDF											
407.7817	48.471	48.458	1	1.000	100031303	22111953	20119	50297	1099		
409.7788	48.471	48.458	1	1.000	96679644	21209513	17872	44680	1187	1.03(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50.816	50.819	0	1.000	81724701	17482751	20119	50297	869		
409.7788	50.816	50.819	0	1.000	78350873	16747345	17872	44680	937	1.04(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDF											
407.7817	49.625						20119	50297			
409.7788	49.625						17872	44680			

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
OCDD											
457.7377	54.304	54.290	1	1.000	108733609	27926856	5675	14187	4921		
459.7348	54.304	54.290	1	1.000	122338067	31462370	3359	8397	9367	0.89(0.76-1.02)	
OCDF											
441.7428	54.442	54.428	1	1.000	155863517	41040943	7156	17890	5735		
443.7399	54.442	54.428	1	1.000	172412164	44868657	4979	12447	9012	0.90(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	31.799	31.788	1	1.017	4607334	473651	592	1480	800		
333.9338	31.782	31.788	0	1.016	5768528	589511	550	1375	1072	0.80(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	29.721	29.727	0	0.951	7427403	841116	547	1367	1538		
317.9389	29.721	29.727	0	0.951	9389182	1034816	257	642	4027	0.79(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40.992	40.998	0	1.311	5796310	1417798	1141	2852	1243		
369.8919	40.992	40.998	0	1.311	3578458	867632	410	1025	2116	1.62(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	39.271	39.276	0	1.256	8743681	1824863	607	1517	3006		
353.8970	39.271	39.276	0	1.256	5502382	1138709	367	917	3103	1.59(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40.476	40.481	0	1.295	8822327	2063105	607	1517	3399		
353.8970	40.476	40.481	0	1.295	5459778	1294562	367	917	3527	1.62(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	45.228	45.231	0	0.989	6164898	1616312	842	2105	1920		
403.8529	45.228	45.231	0	0.989	4904093	1287517	532	1330	2420	1.26(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45.346	45.350	0	0.992	6401259	1595923	842	2105	1895		
403.8529	45.346	45.350	0	0.992	4989769	1231785	532	1330	2315	1.28(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	44.182	44.185	0	0.966	5120432	1381755	832	2080	1661		
385.8610	44.182	44.185	0	0.966	9529227	2585041	810	2025	3191	0.54(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	44.317	44.320	0	0.969	6409287	1630605	832	2080	1960		
385.8610	44.317	44.320	0	0.969	11865771	3006925	810	2025	3712	0.54(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	45.042	45.046	0	0.985	5600324	1449599	832	2080	1742		
385.8610	45.042	45.046	0	0.985	10553773	2710750	810	2025	3347	0.53(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	46.021	46.007	1	1.006	5386117	1234214	832	2080	1483		
385.8610	46.021	46.007	1	1.006	9896226	2263801	810	2025	2795	0.54(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	50.175	50.161	1	1.097	5249997	1019447	2	5	509724		
437.8140	50.158	50.161	0	1.097	5007856	965323	1386	3465	696	1.05(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48.454	48.441	1	1.059	4191950	918491	651	1627	1411		
419.8220	48.454	48.441	1	1.059	9160509	1970766	721	1802	2733	0.46(0.51-0.37)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50.799	50.786	1	1.111	3608112	723202	651	1627	1111		
419.8220	50.799	50.786	1	1.111	7913394	1597054	721	1802	2215	0.46(0.37-0.51)	
13C-OCDD											
469.7780	54.287	54.290	0	1.187	9055141	2191452	401	1002	5465		
471.7750	54.287	54.290	0	1.187	9832017	2381855	332	830	7174	0.92(0.76-1.02)	
13C-OCDF											
453.7830	54.425	54.428	0	1.190	13541954	3402498	327	817	10405		
455.7801	54.425	54.428	0	1.190	14972605	3795875	485	1212	7827	0.90(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31.832	31.838	0	1.018	23452691	2454284	142	355	17284		
13C-1,2,3,4-TCDD											
331.9368	31.267	31.273	0		4245924	455340	592	1480	769		
333.9338	31.267	31.273	0		5243743	567990	550	1375	1033	0.81(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45.734	45.737	0		7200331	1668779	842	2105	1982		
403.8529	45.734	45.737	0		5559512	1312385	532	1330	2467	1.30(1.05-1.43)	

QC Flag Legend

Processing Flags

n - Failed Sig-To-Noise Test

Reagents:

61L51613OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Lims ID: IC L5
 Client ID:
 Inject. Date: 16-May-2014 18:31:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 5
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 6
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDD, RT: 30.308

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	319.8965 Area	319.8965 Height	321.8936 Area	321.8936 Height	Amount	Ratio	Flags
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28.708 9544 1291 11012 1474 0.87 n

Signal Totals:

9544 1291 11012 1474

Total Responses:

Rx Area	Rx Height	Amount	Ratio	Flags
20556	2765		0.87	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (20556 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

n - Failed Sig-To-Noise Test

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Lims ID: IC L5
 Client ID:
 Inject. Date: 16-May-2014 18:31:00 Dil. Factor: 1.0000
 Sample Type: IC, ICal Standard Calib Level: 5
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 6
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDF, RT: 28.995

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
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28.625 130826 15367 154853 16581 0.84

Signal Totals:

130826 15367 154853 16581

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	285679	31948				0.84	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (285679 * 0.0) / (0 * 0.000)

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

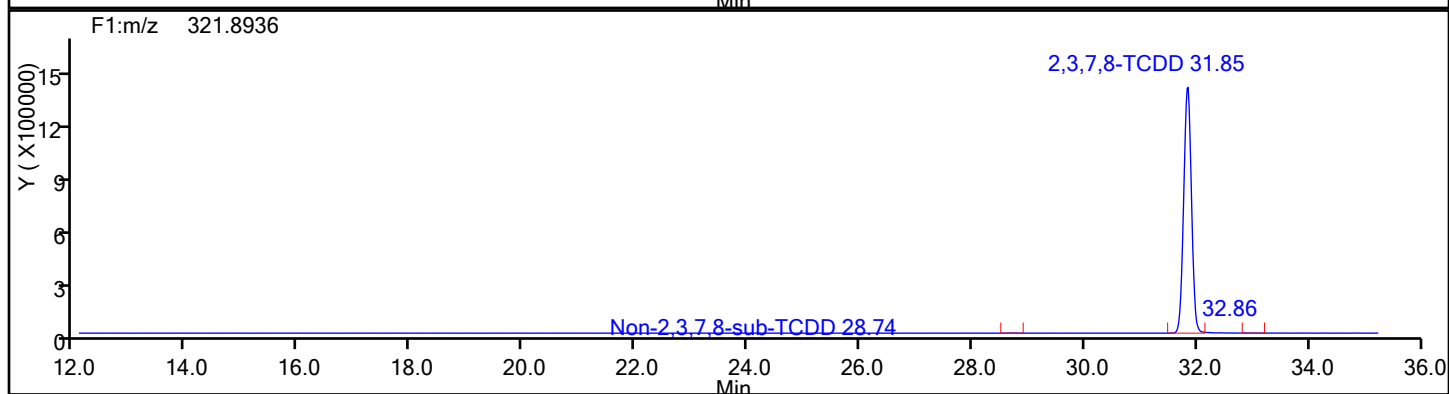
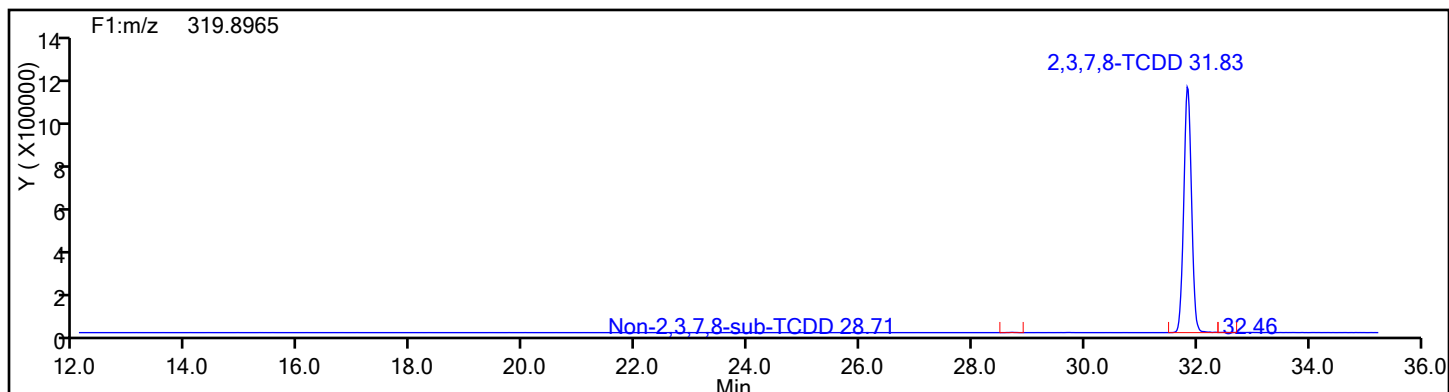
Worklist#: 7768

Sample Line#: 6

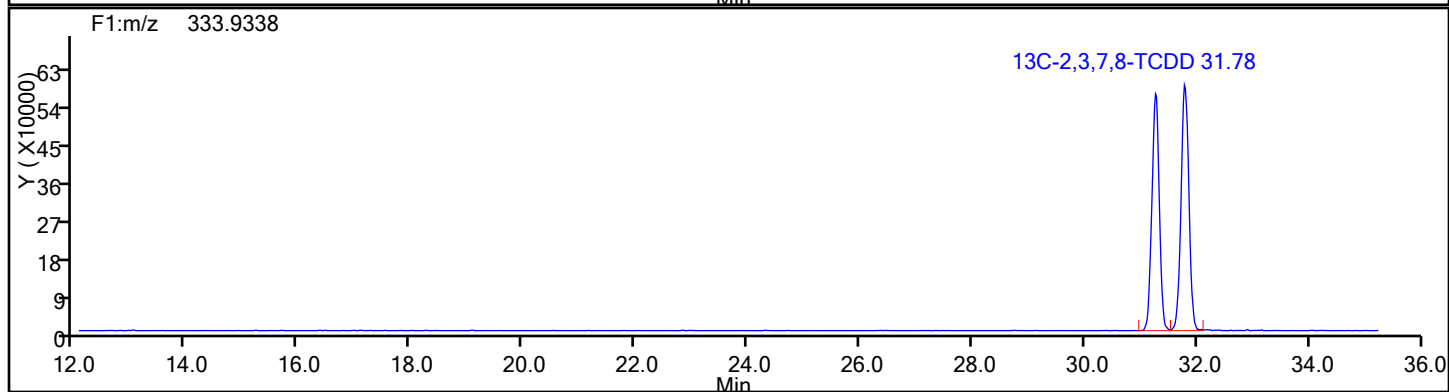
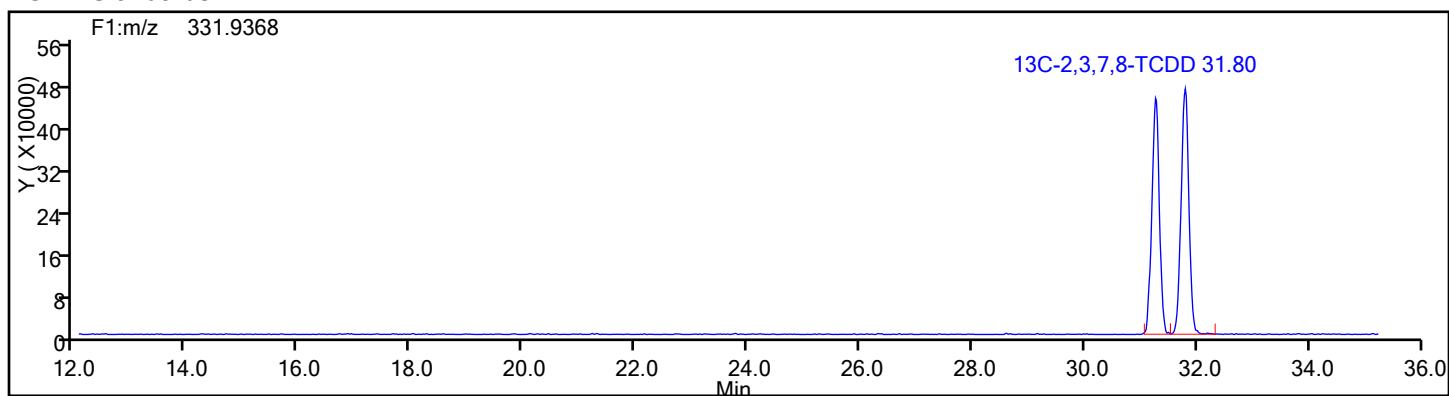
Column Type:

Column Dia:

TCDD

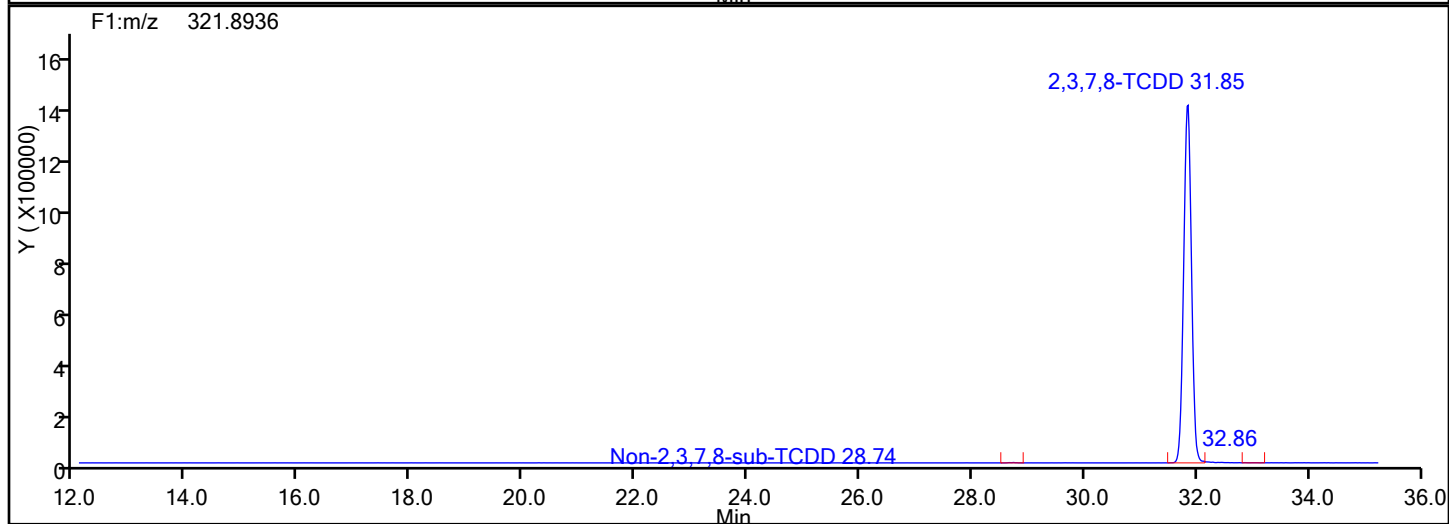
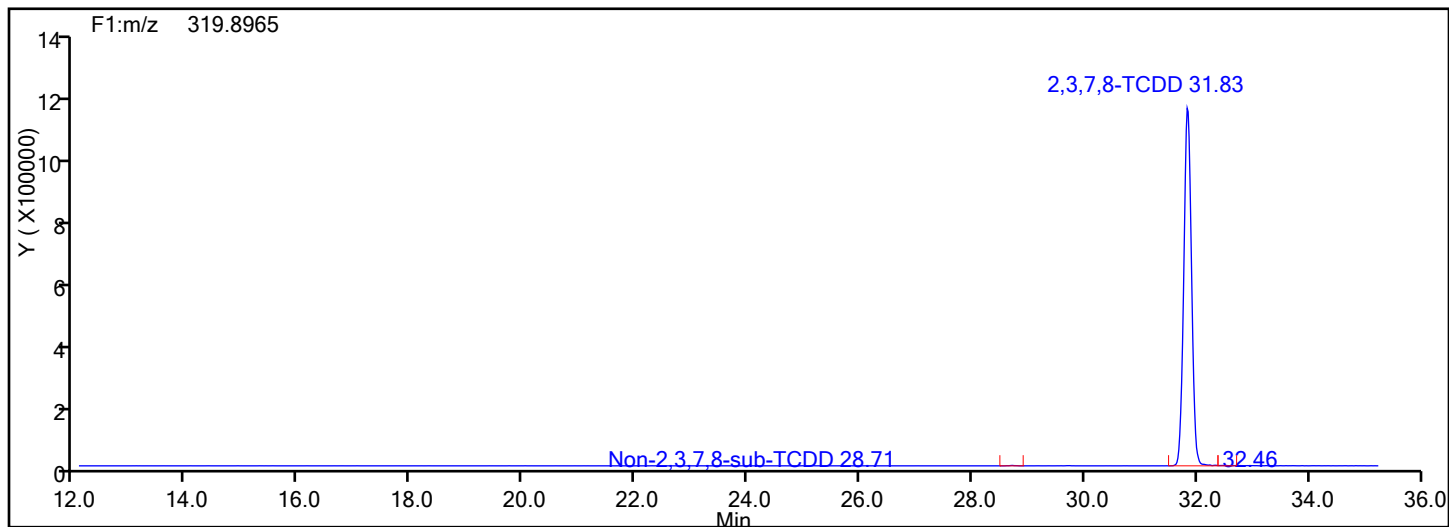


TCDD Standards

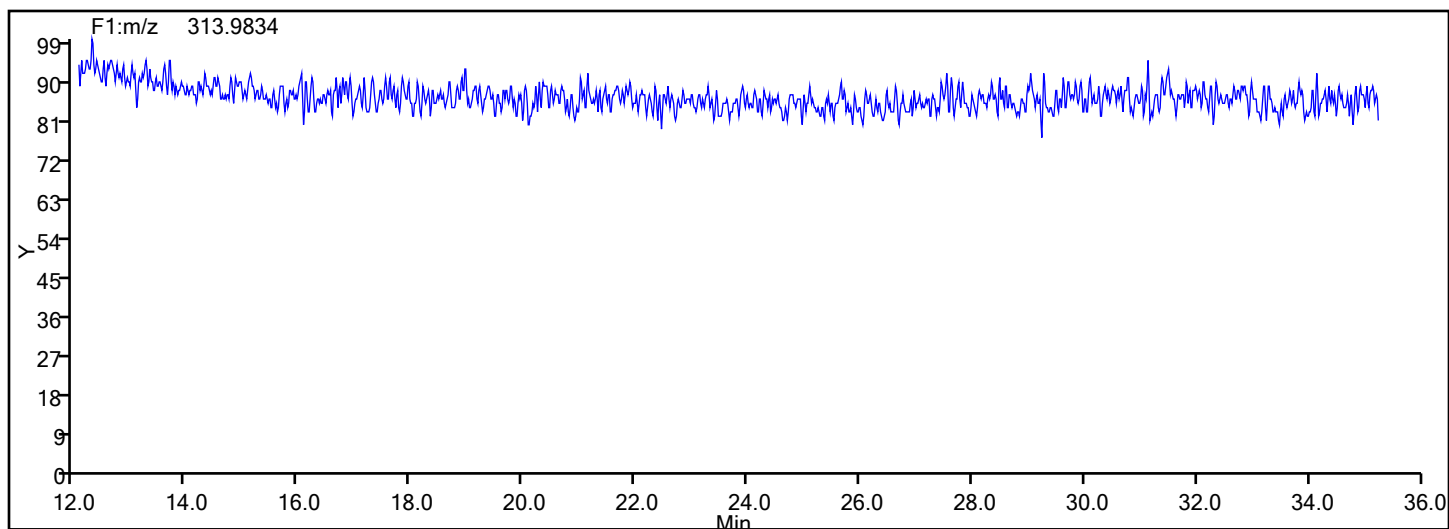


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
Injection Date: 16-May-2014 18:31:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 6
Column Type: Column Dia:
TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

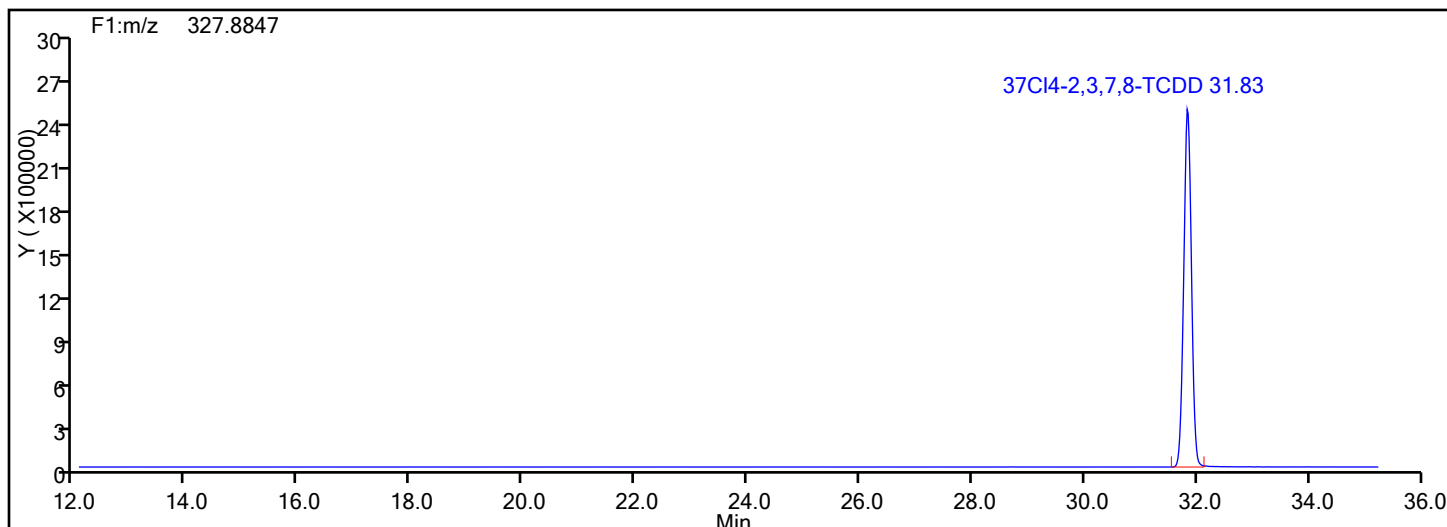
Worklist#: 7768

Sample Line#: 6

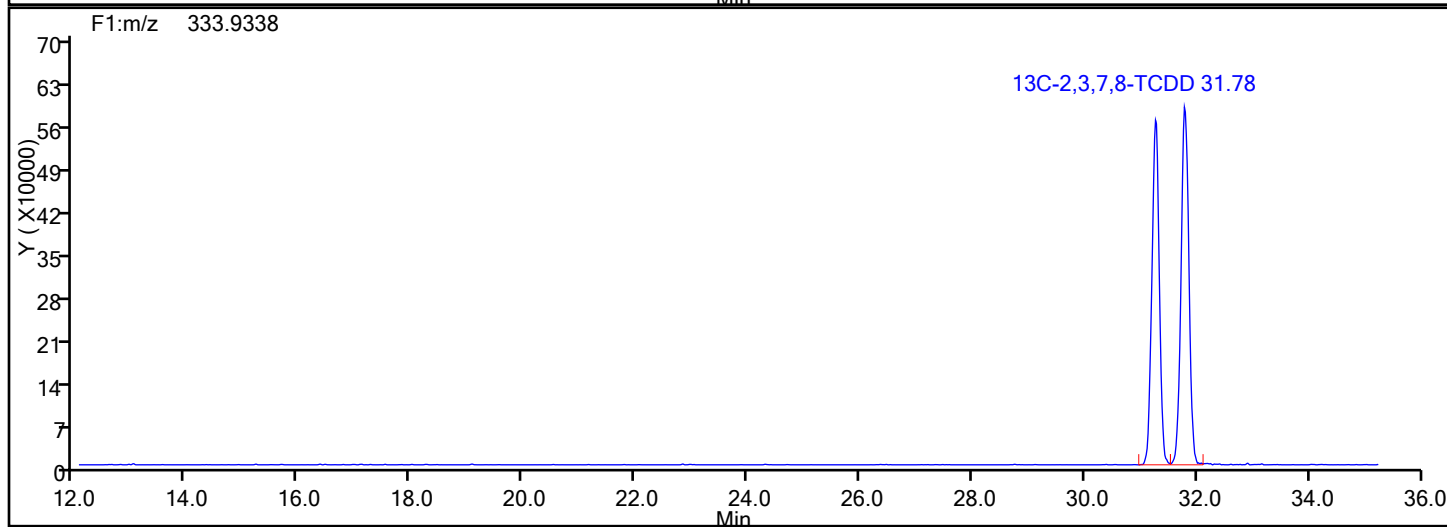
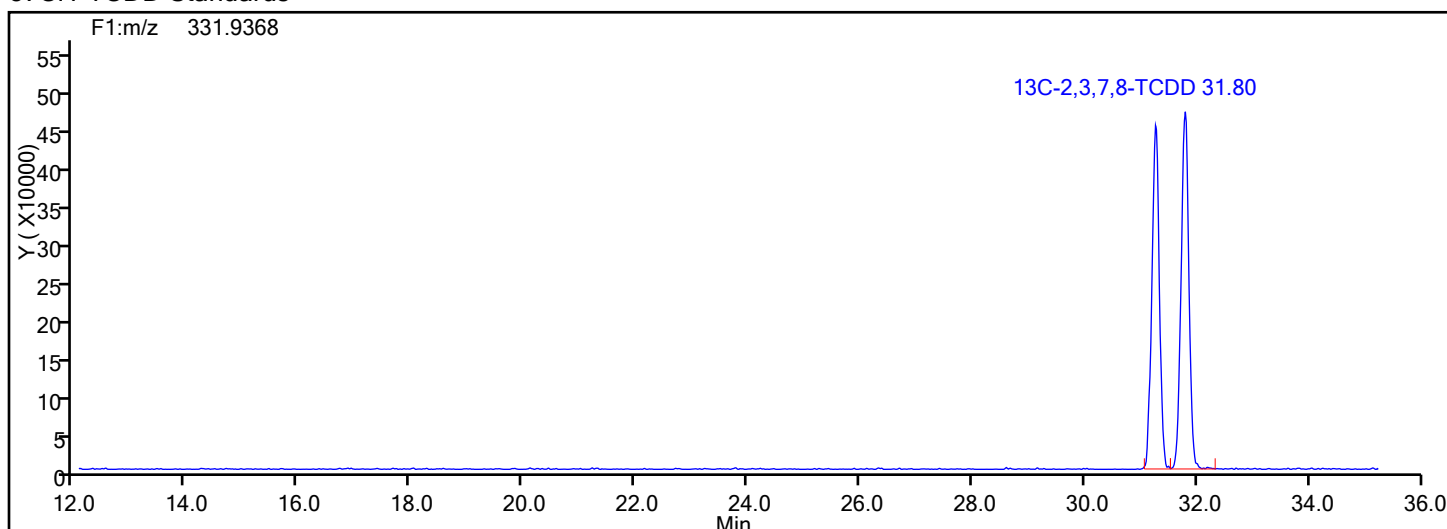
Column Type:

Column Dia:

37Cl4-TCDD

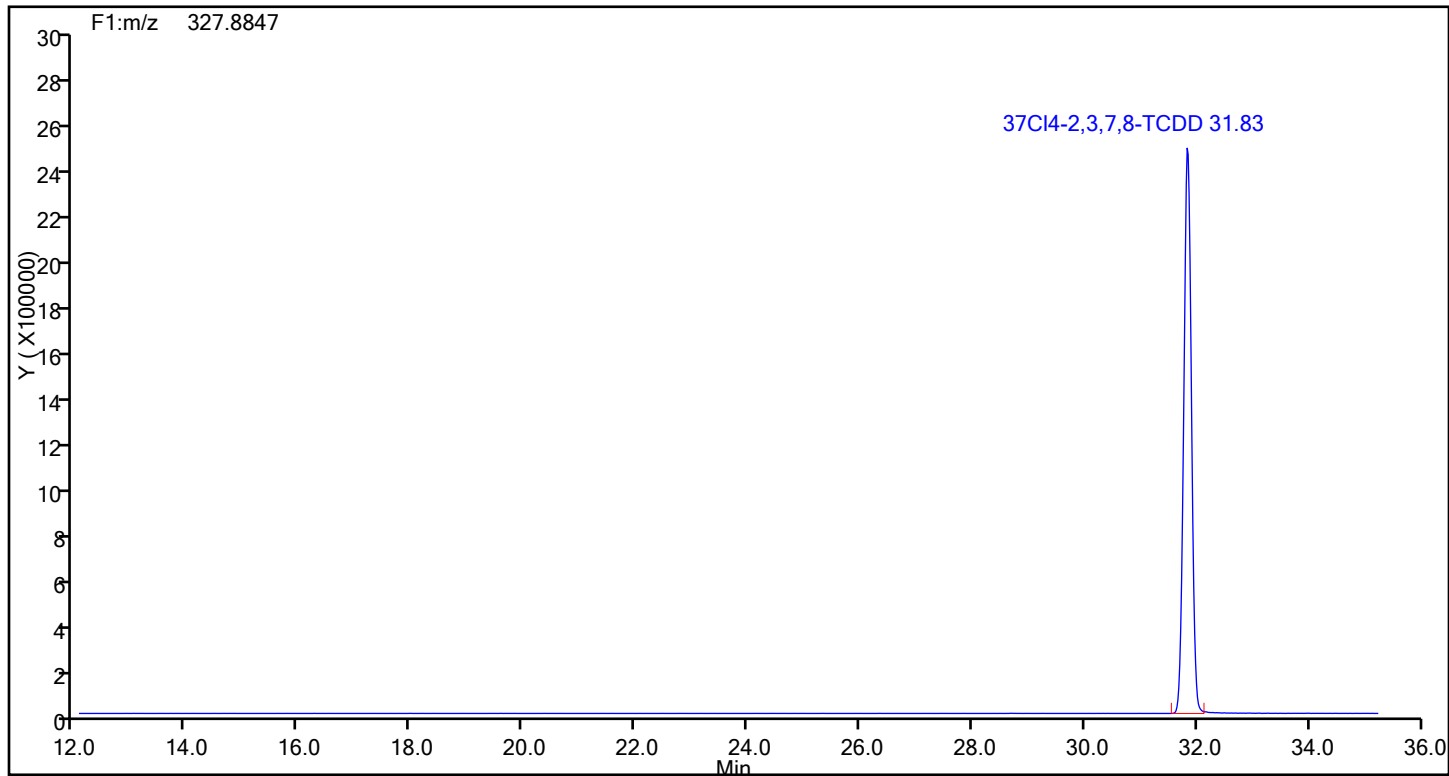


37Cl4-TCDD Standards

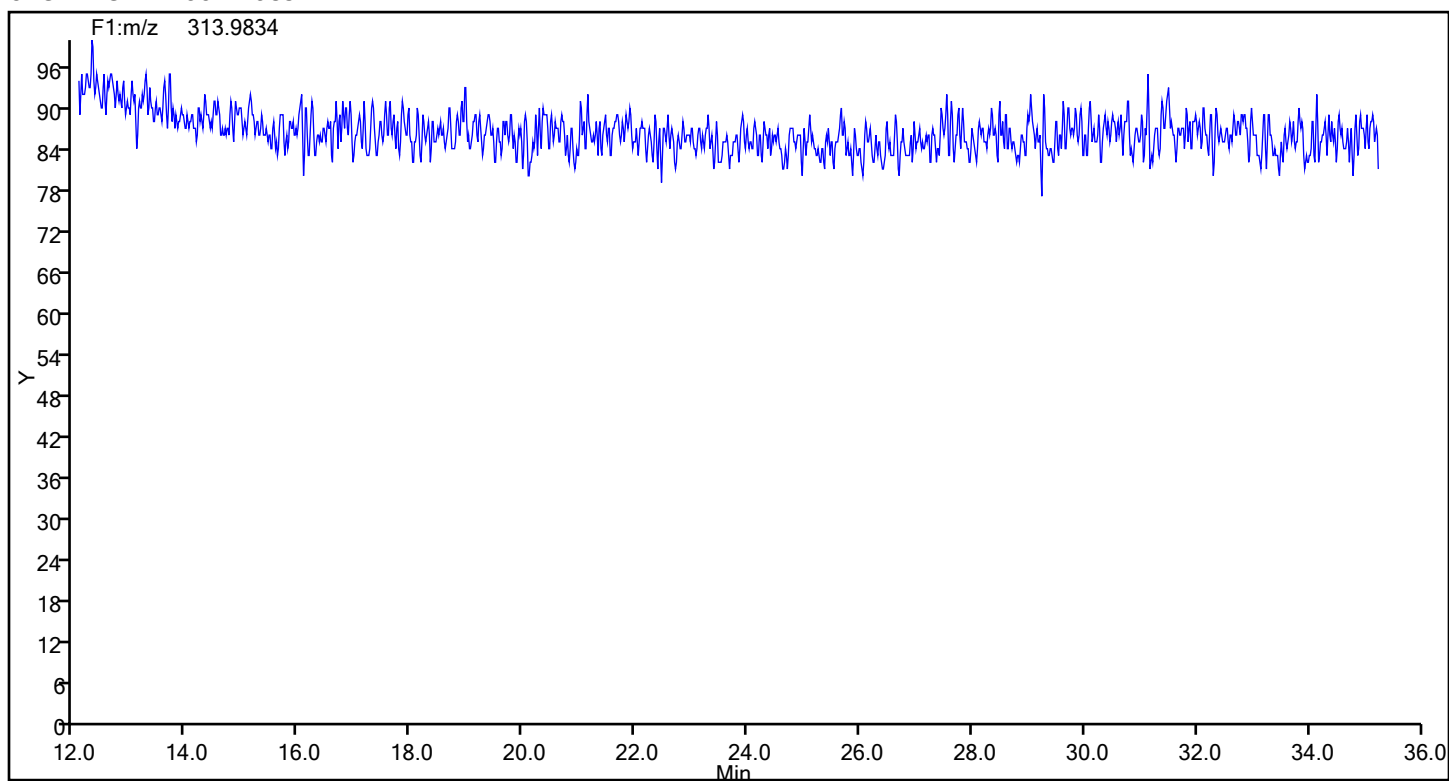


TestAmerica Knoxville

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Injection Date: 16-May-2014 18:31:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 6
Column Type: Column Dia:
37Cl4-TCDD



37Cl4-TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

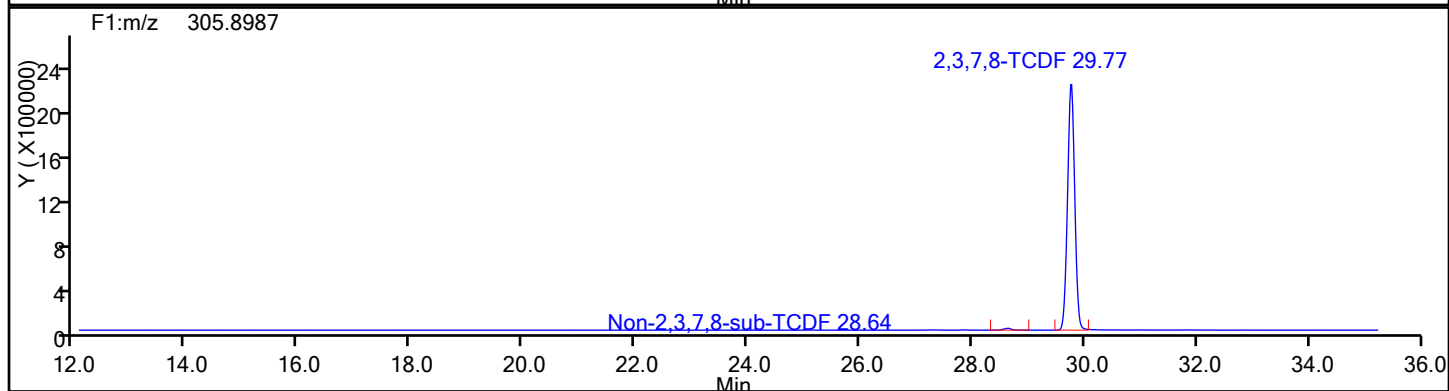
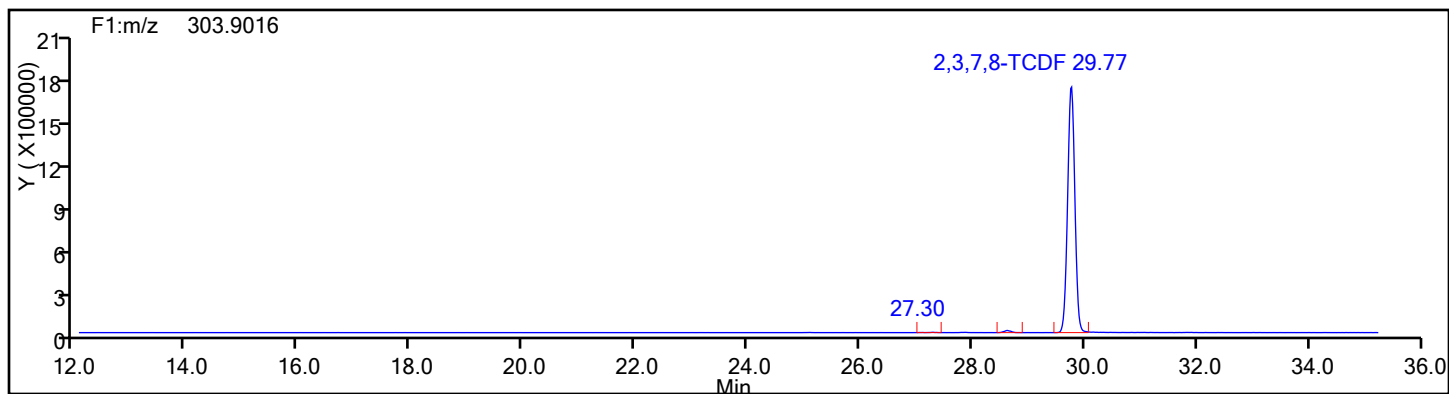
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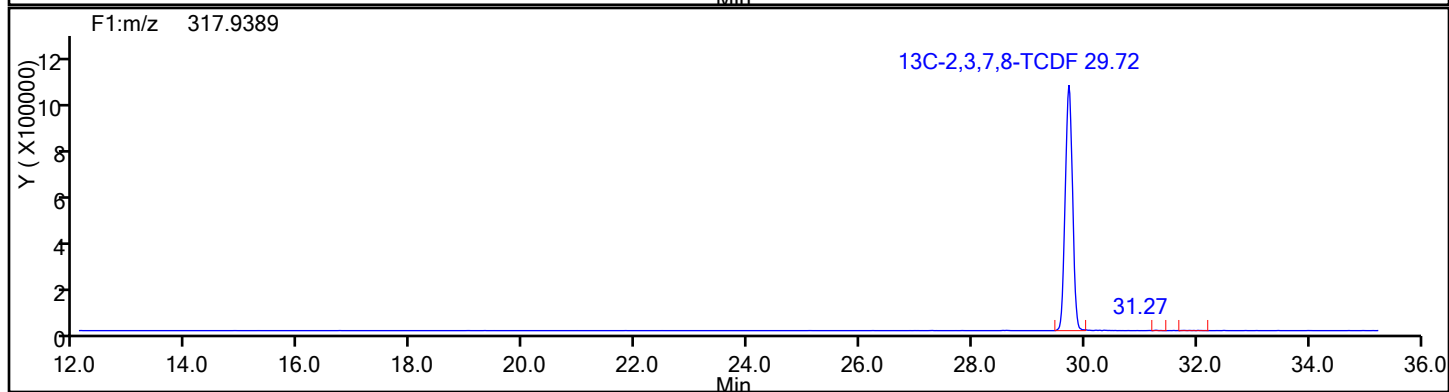
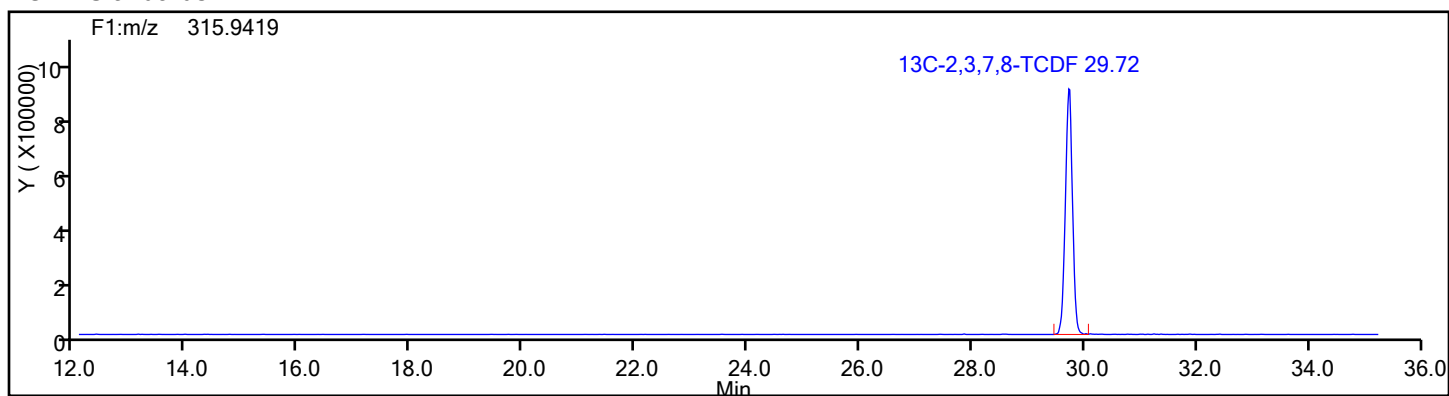
Column Type:

Column Dia:

TCDF

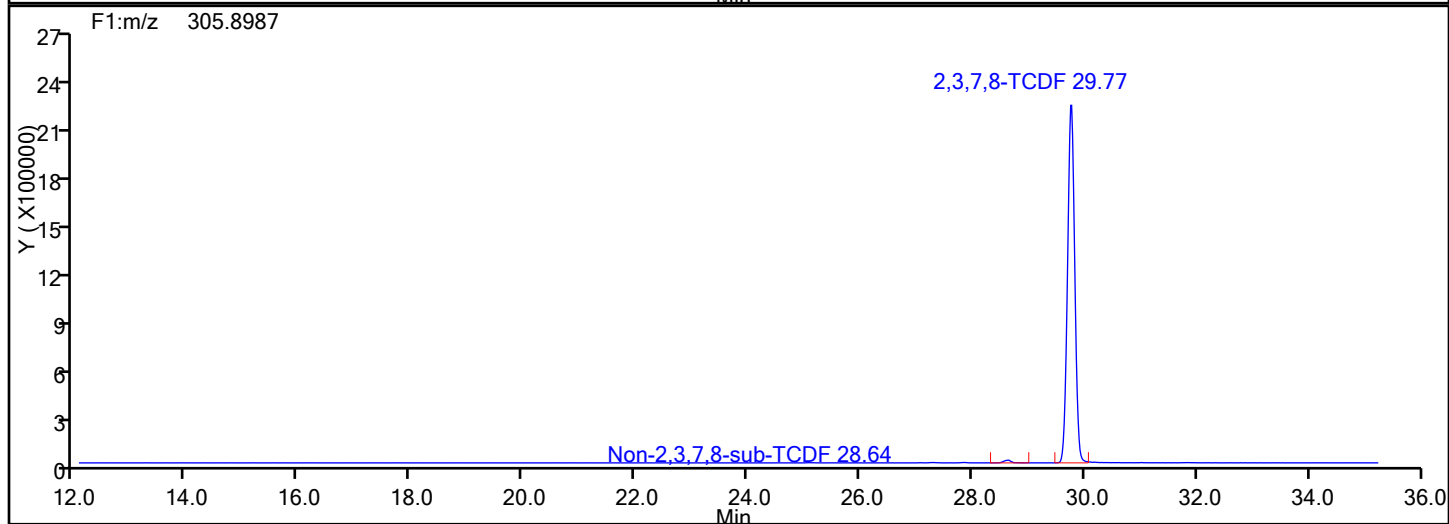
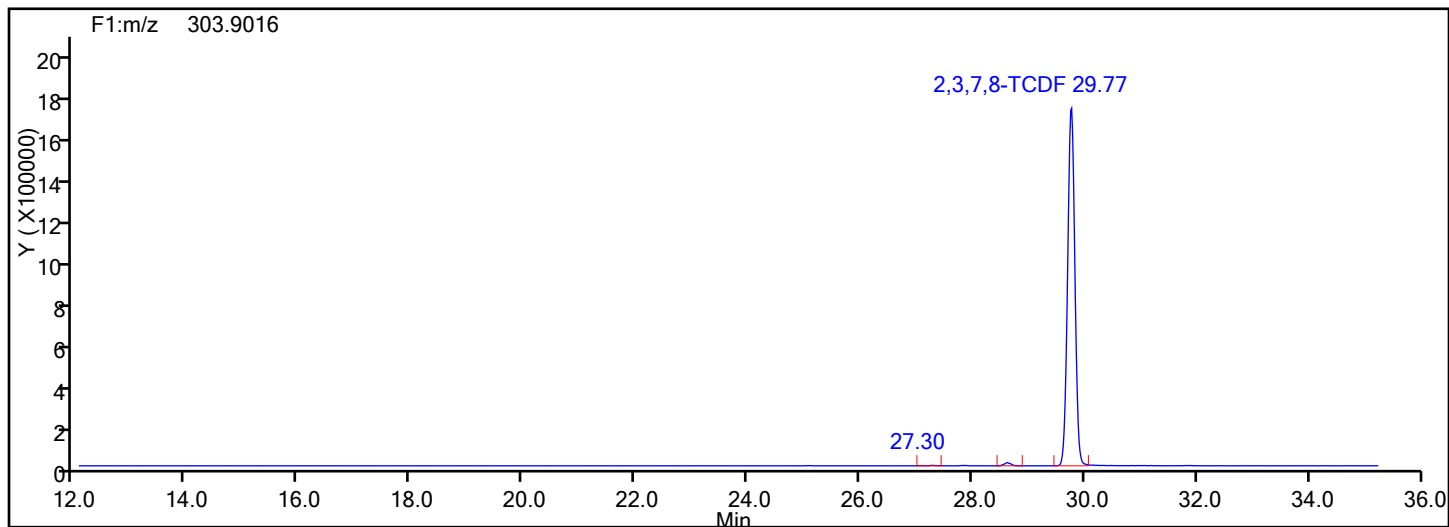


TCDF Standards

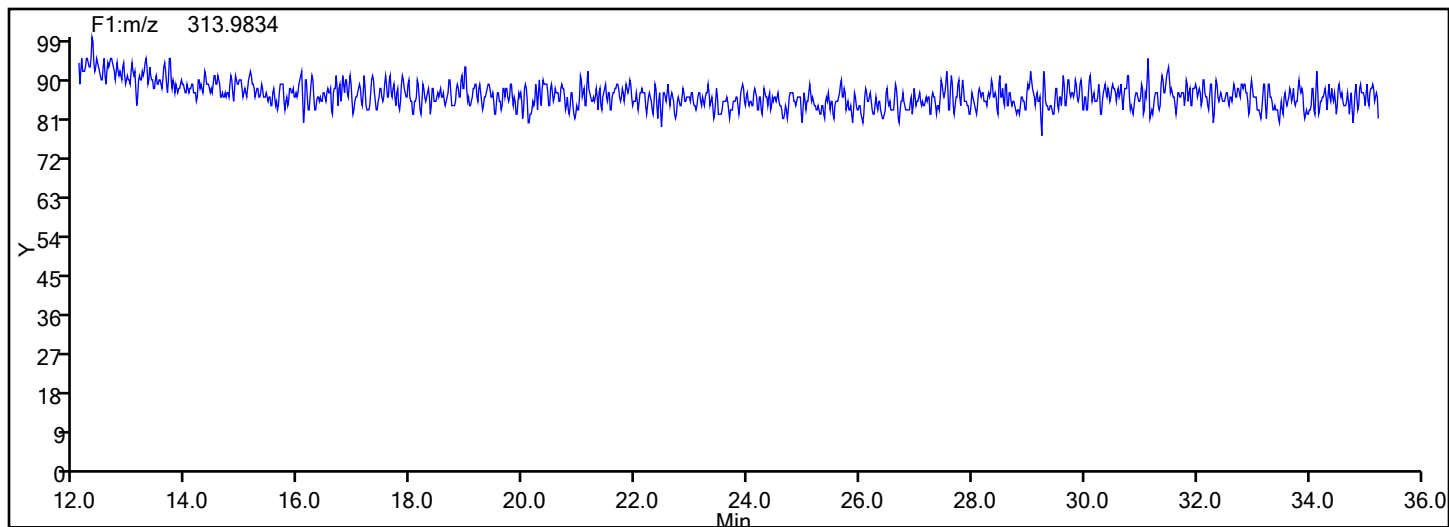


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
Injection Date: 16-May-2014 18:31:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 6
Column Type: Column Dia:
TCDF



TCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

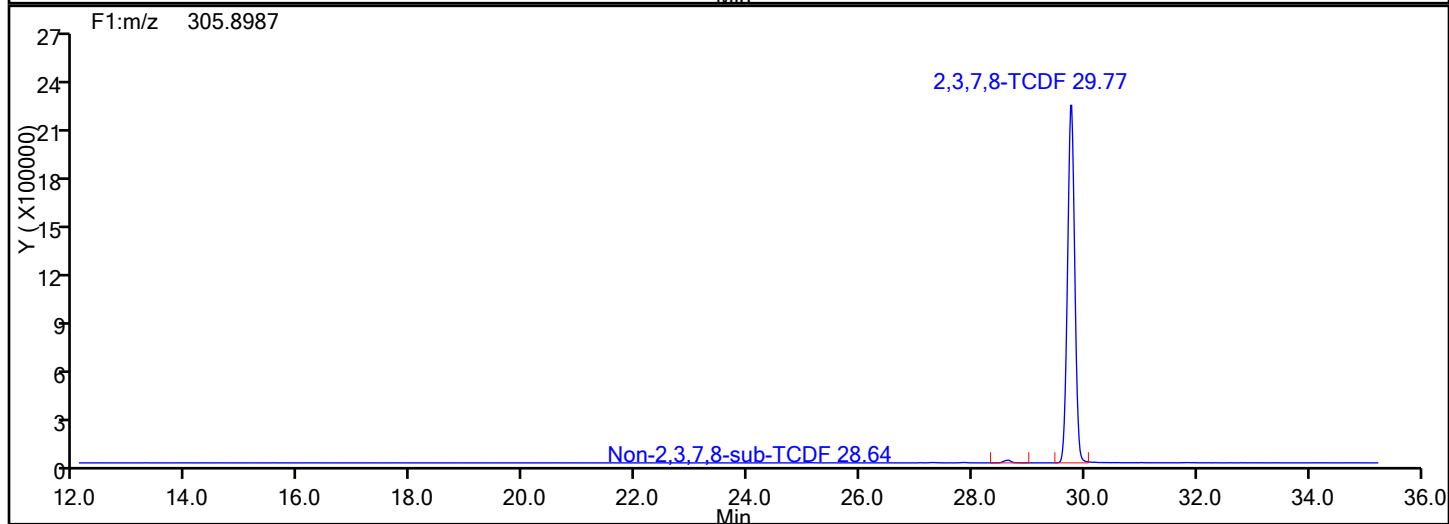
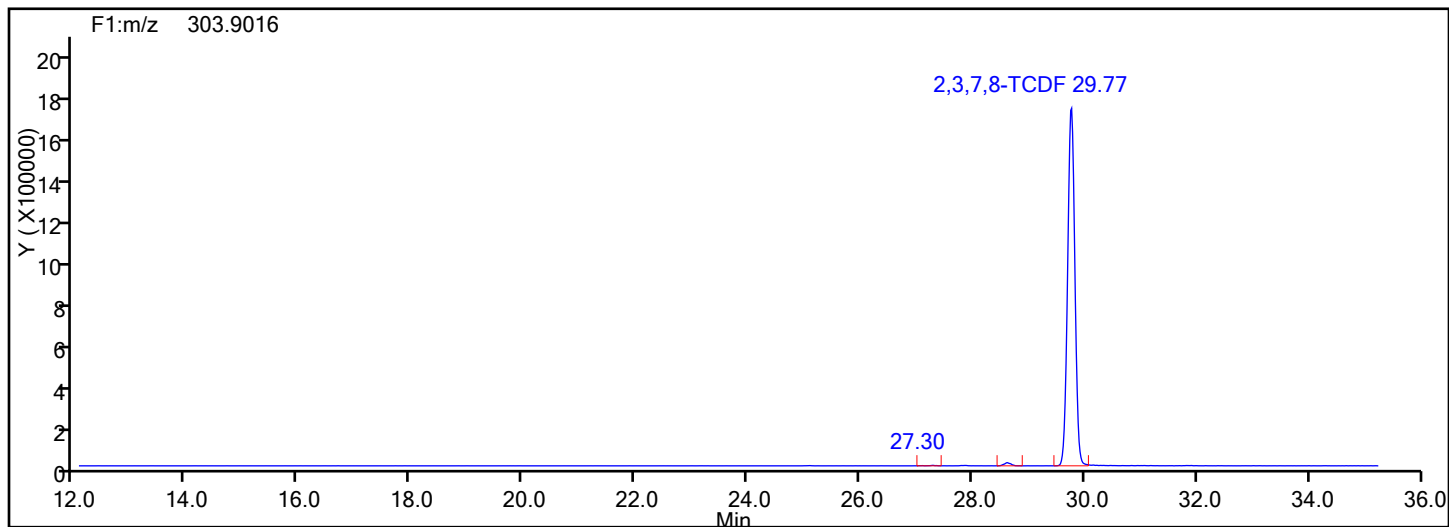
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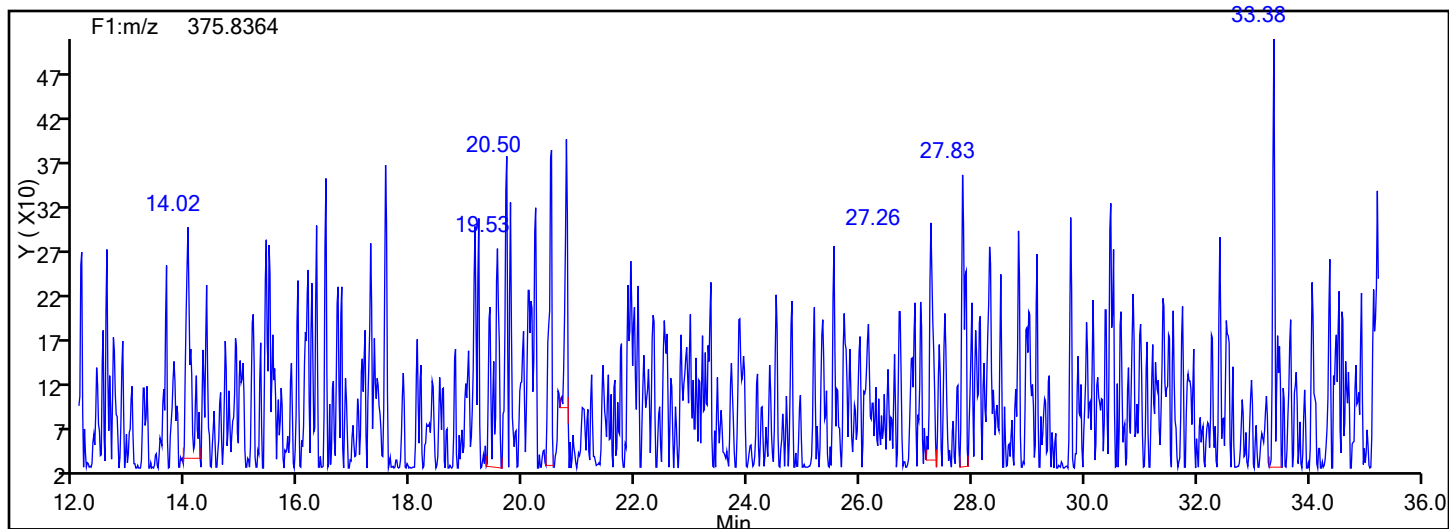
Column Type:

Column Dia:

TCDF



TCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

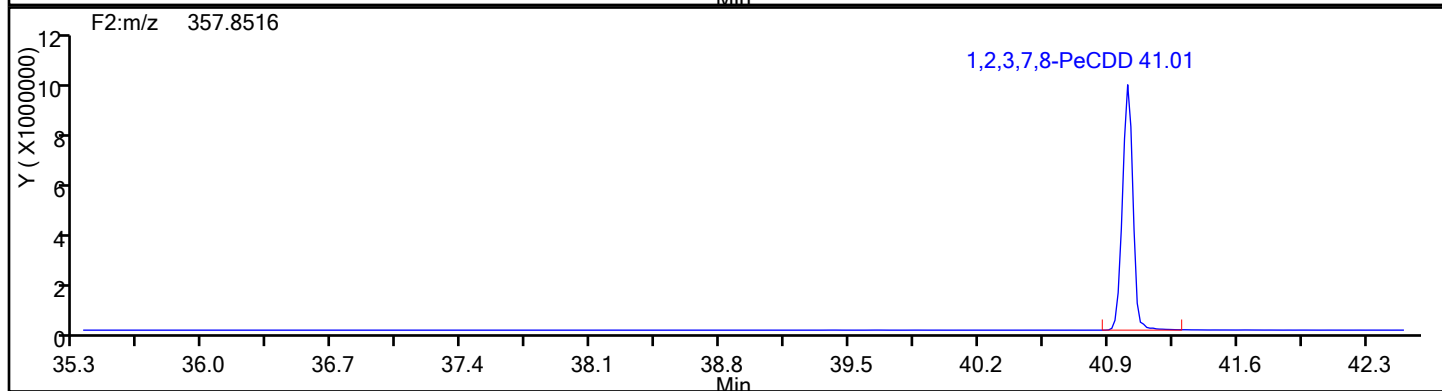
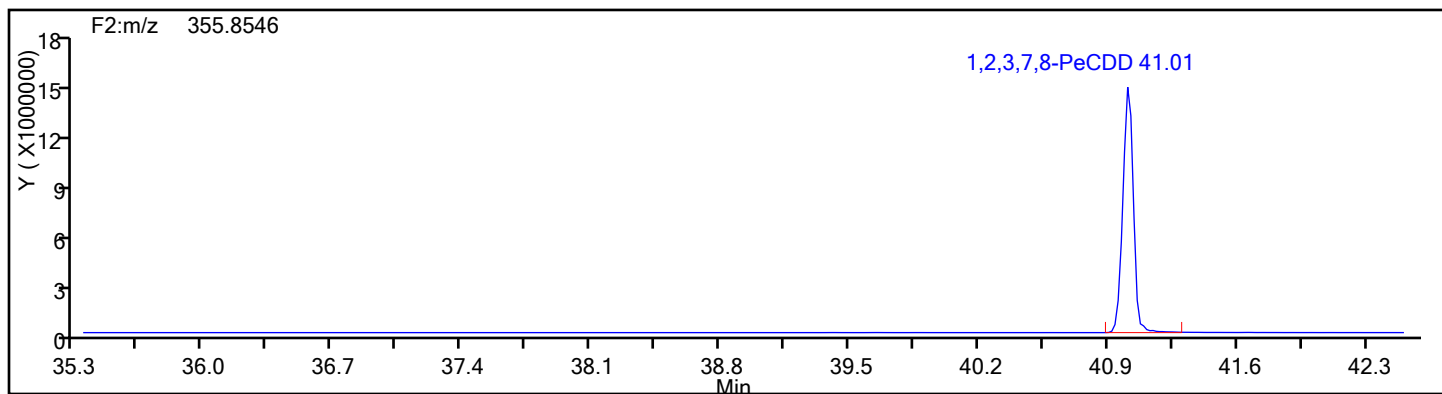
Worklist#: 7768

Sample Line#: 6

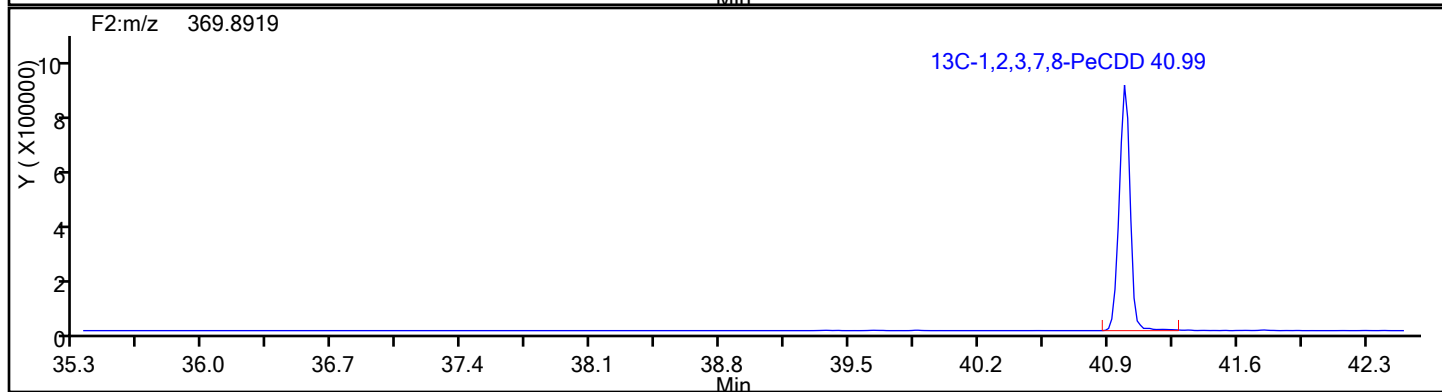
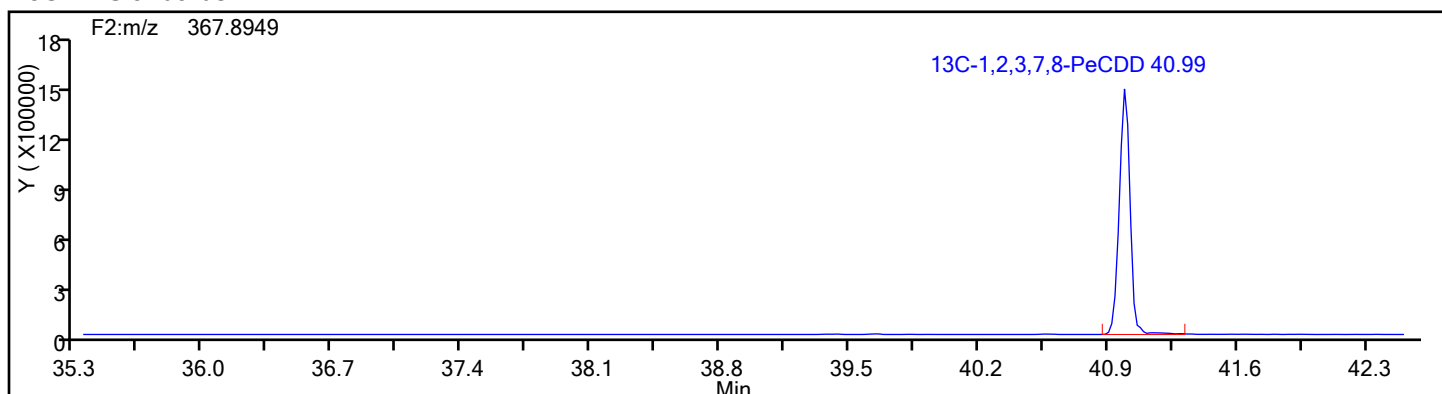
Column Type:

Column Dia:

PeCDD

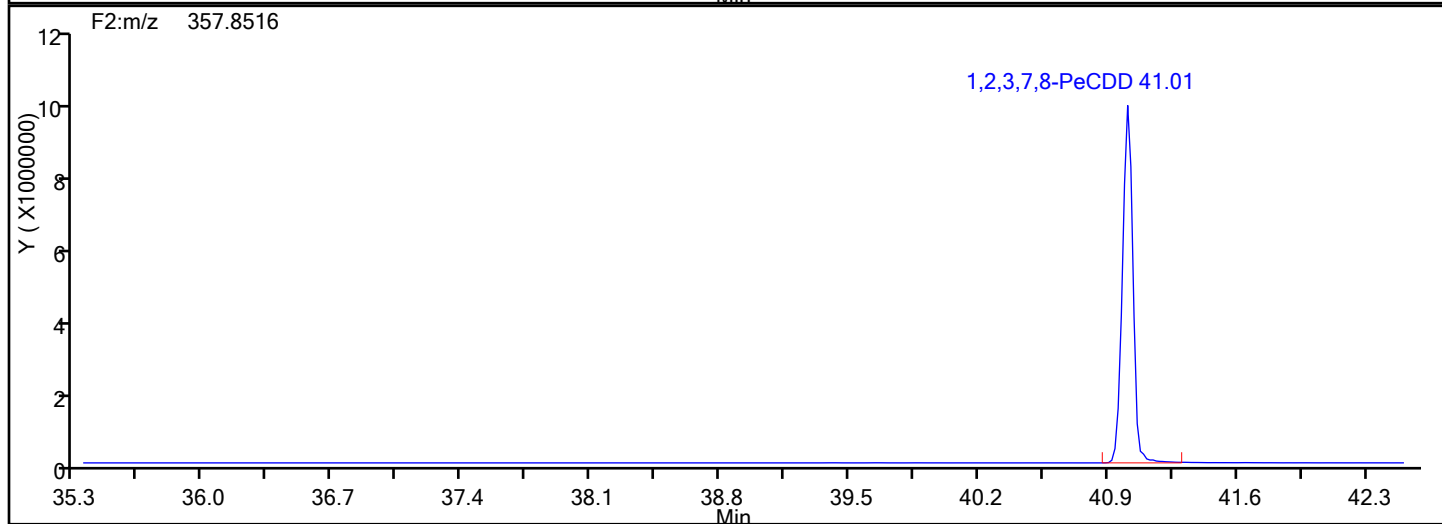
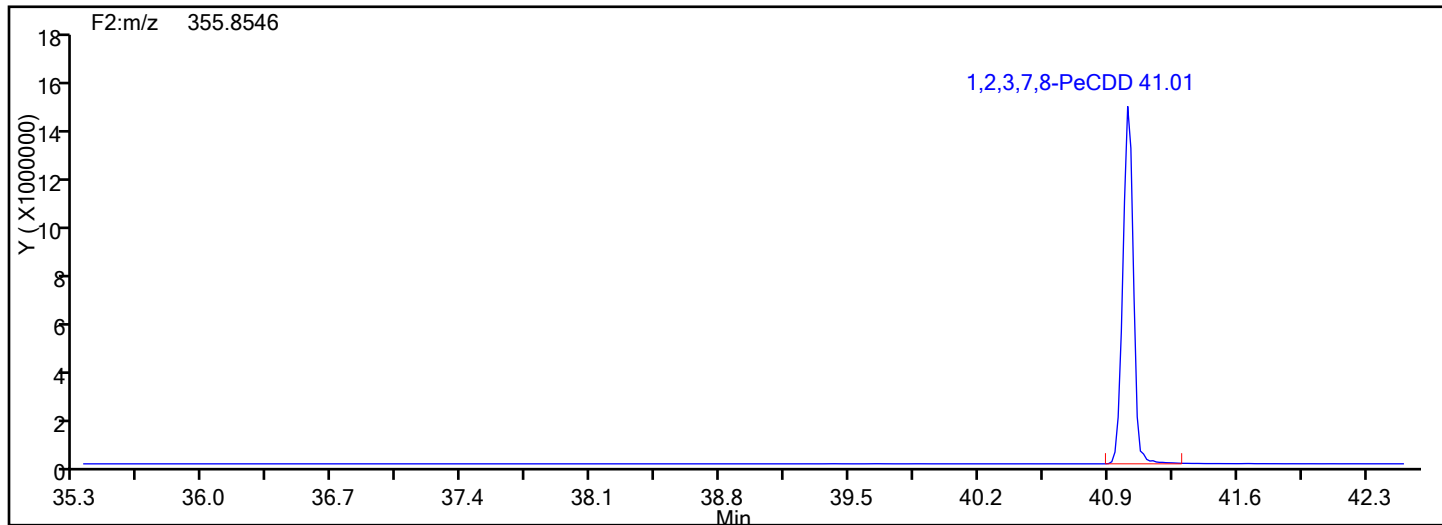


PeCDD Standards

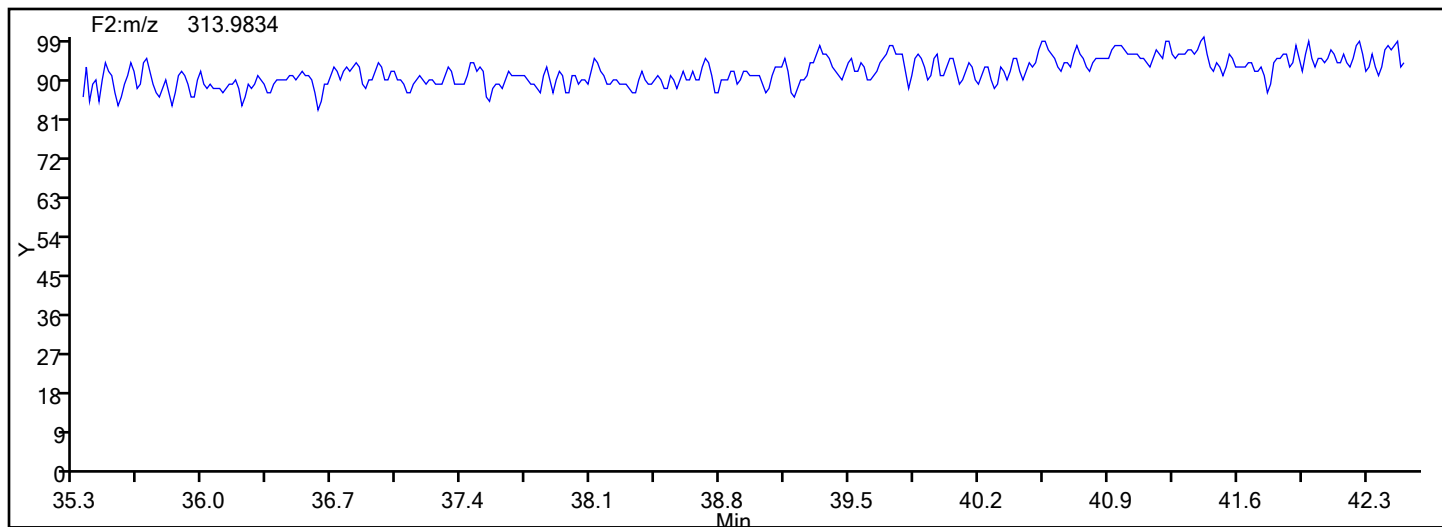


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
Injection Date: 16-May-2014 18:31:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 6
Column Type: Column Dia:
PeCDD



PeCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

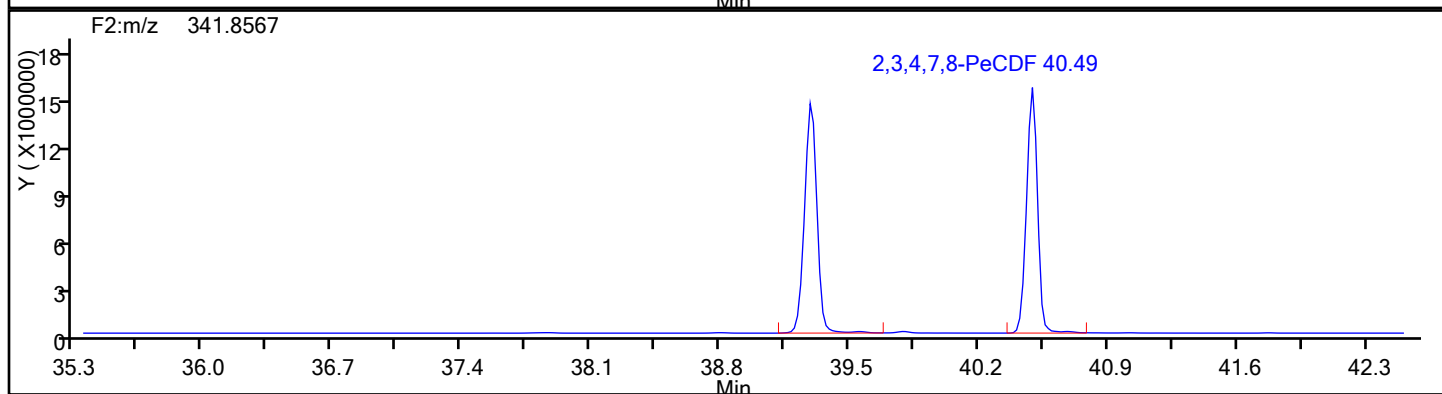
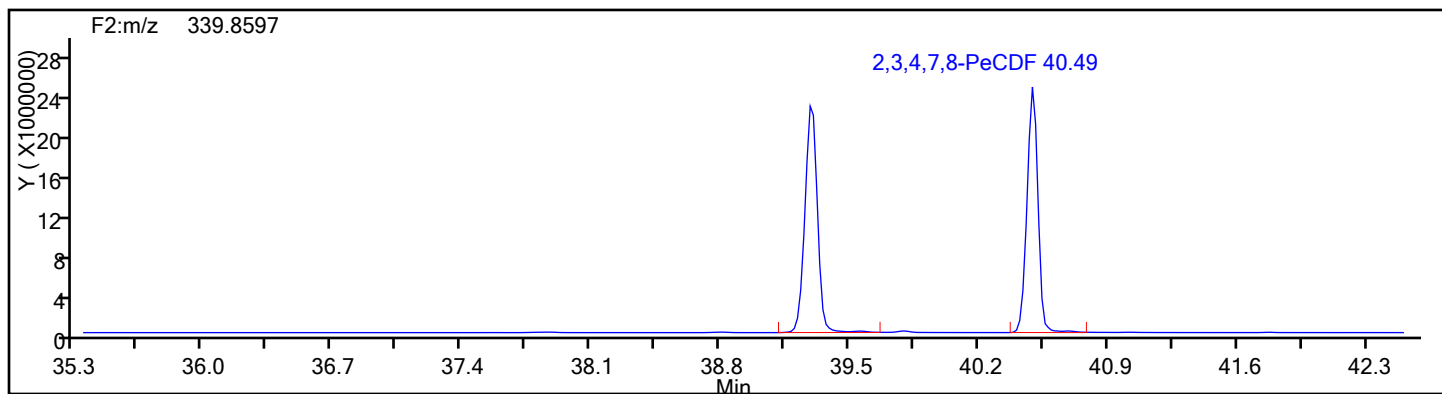
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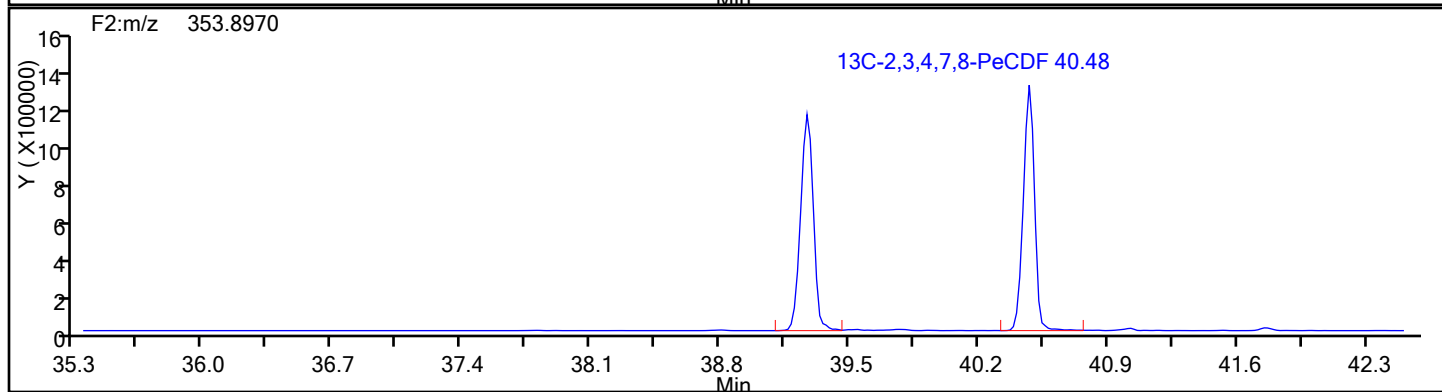
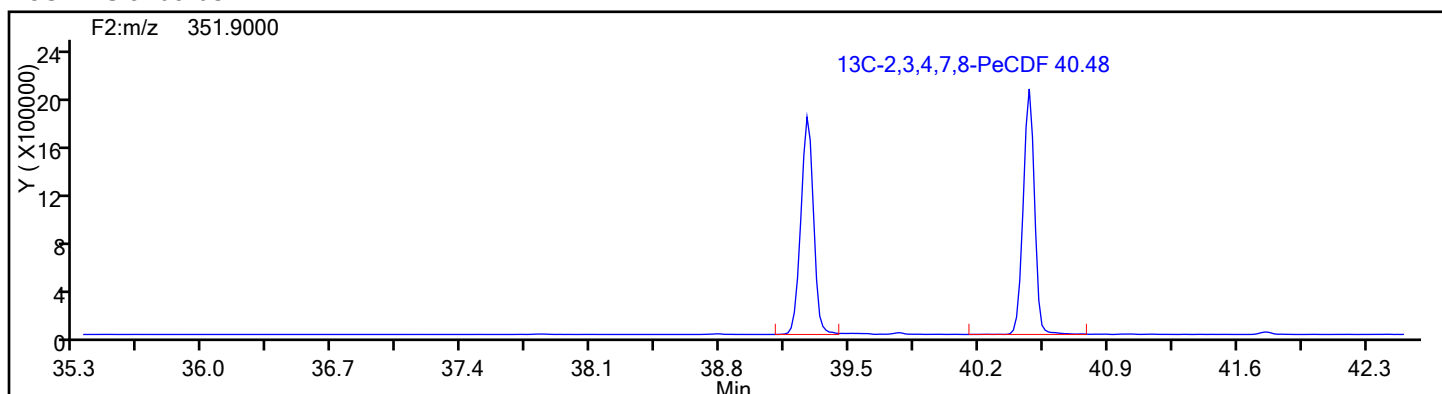
Column Type:

Column Dia:

PeCDF



PeCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

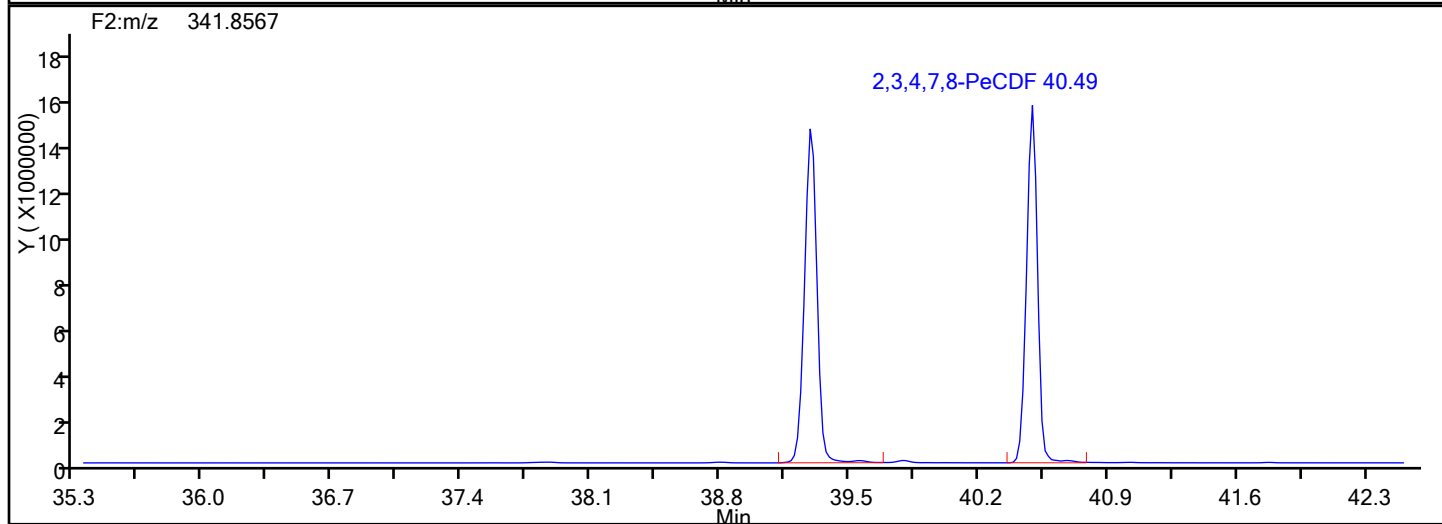
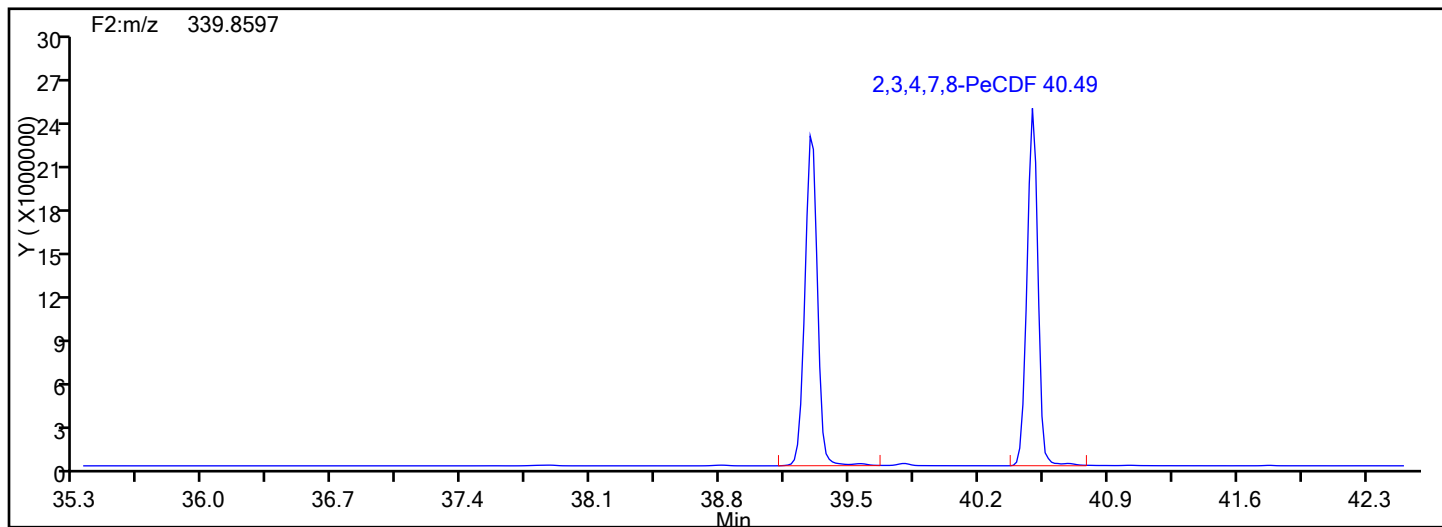
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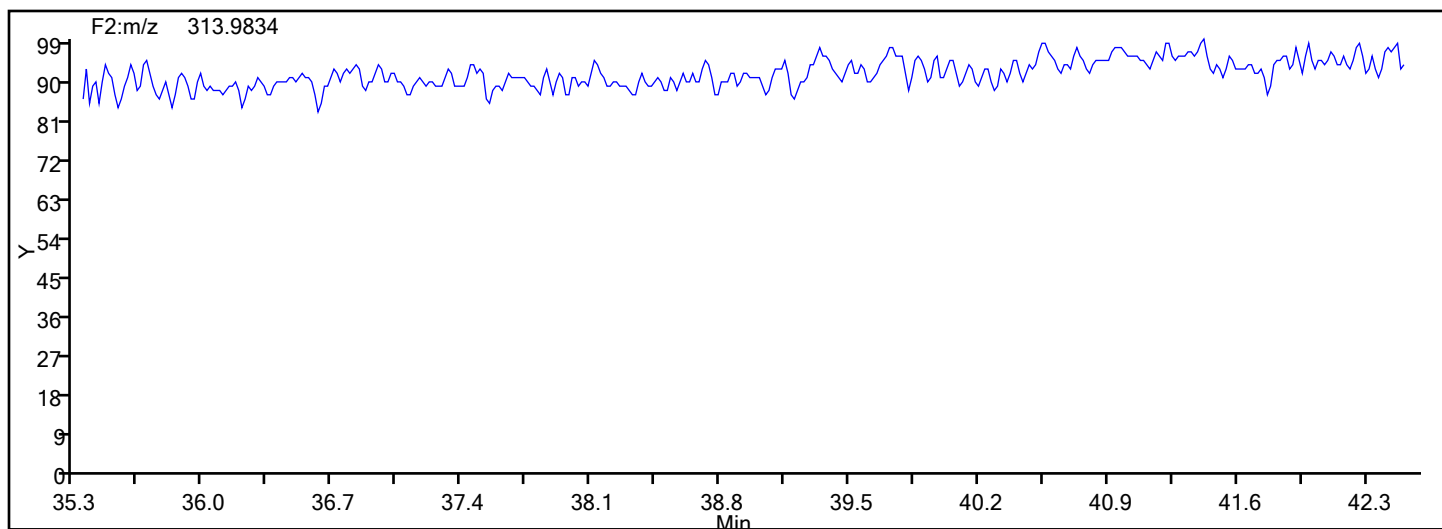
Column Type:

Column Dia:

PeCDF



PeCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

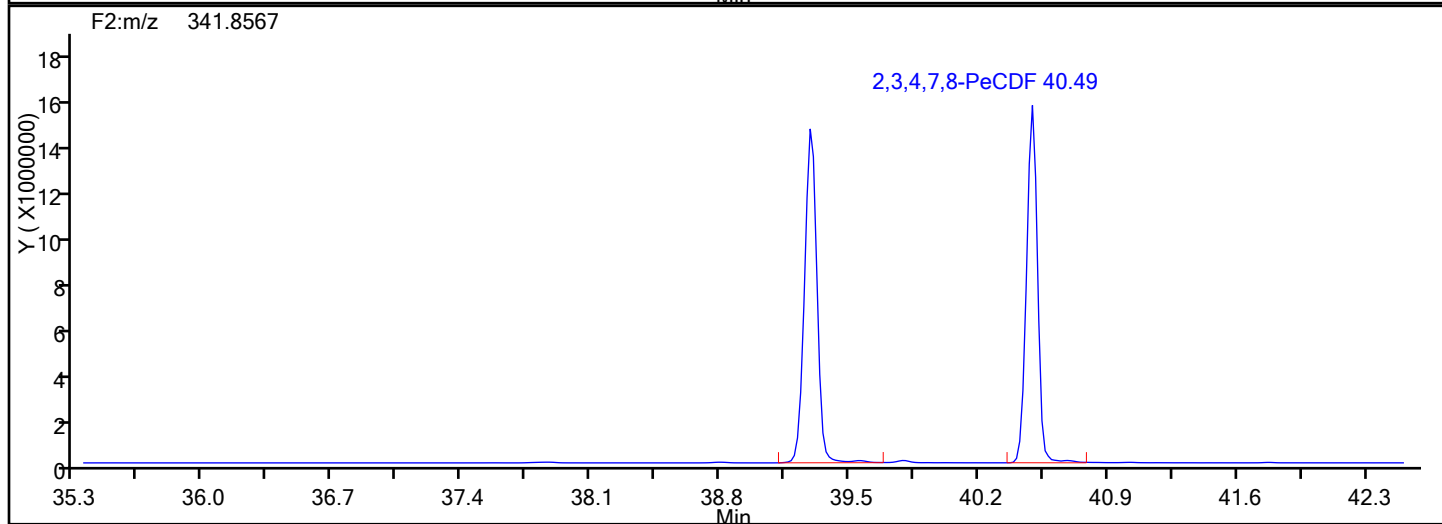
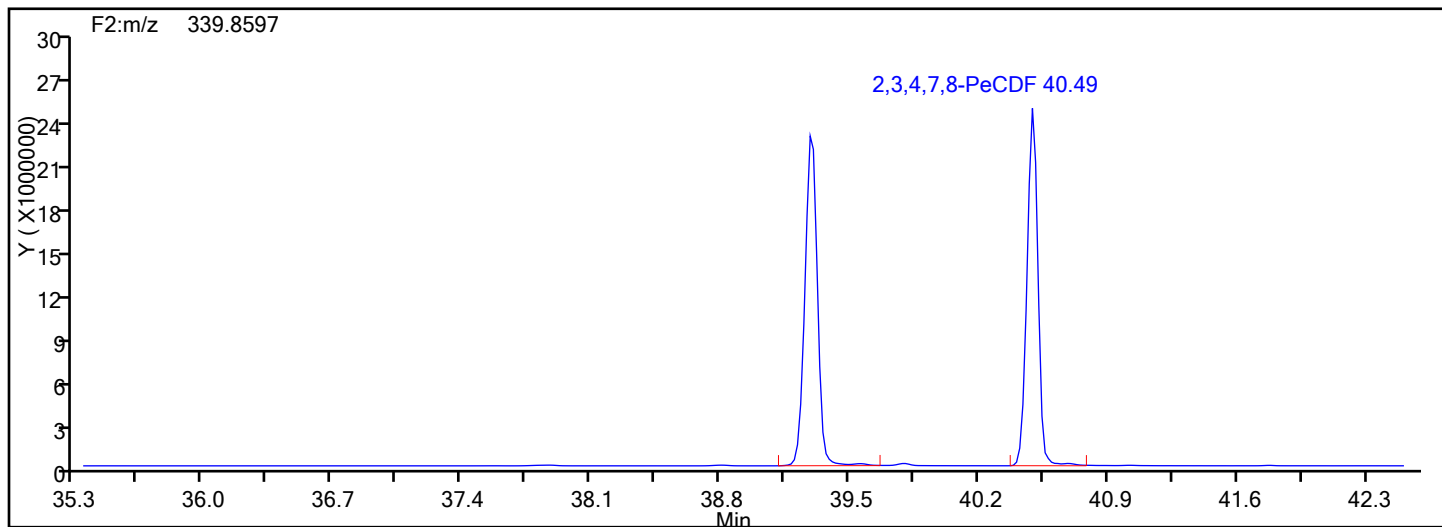
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Sample Line#: 6

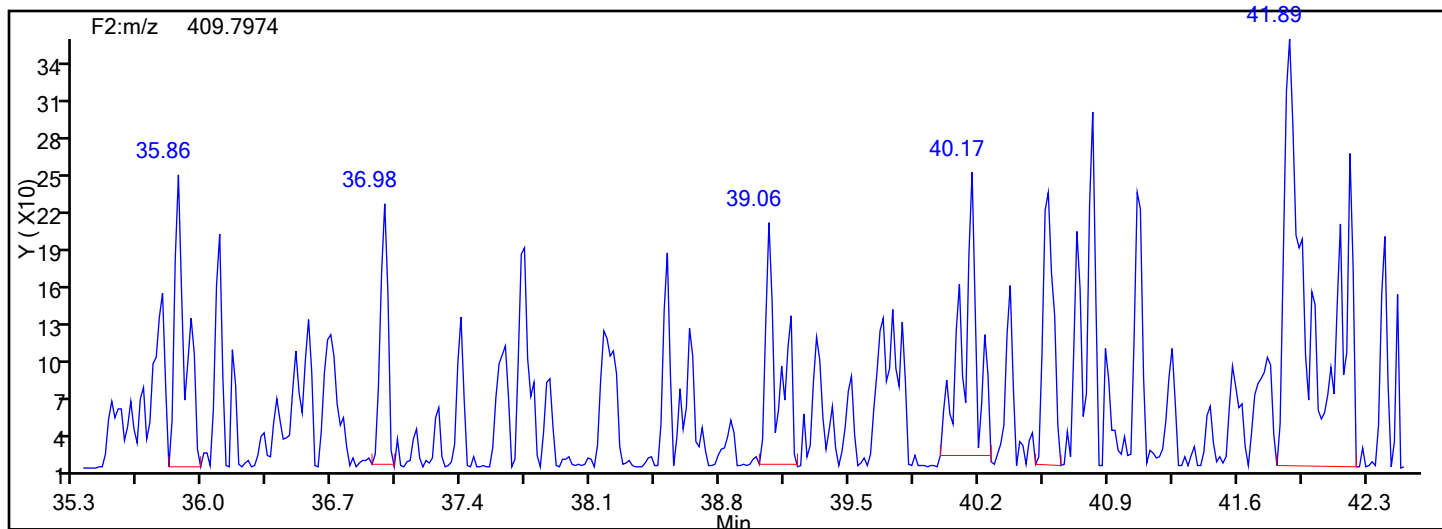
Column Type:

Column Dia:

PeCDF



PeCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

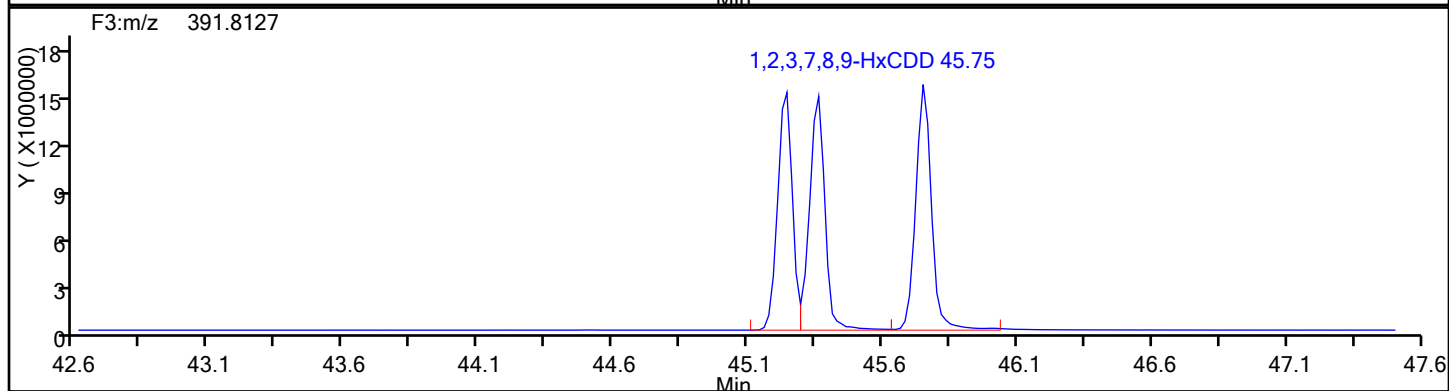
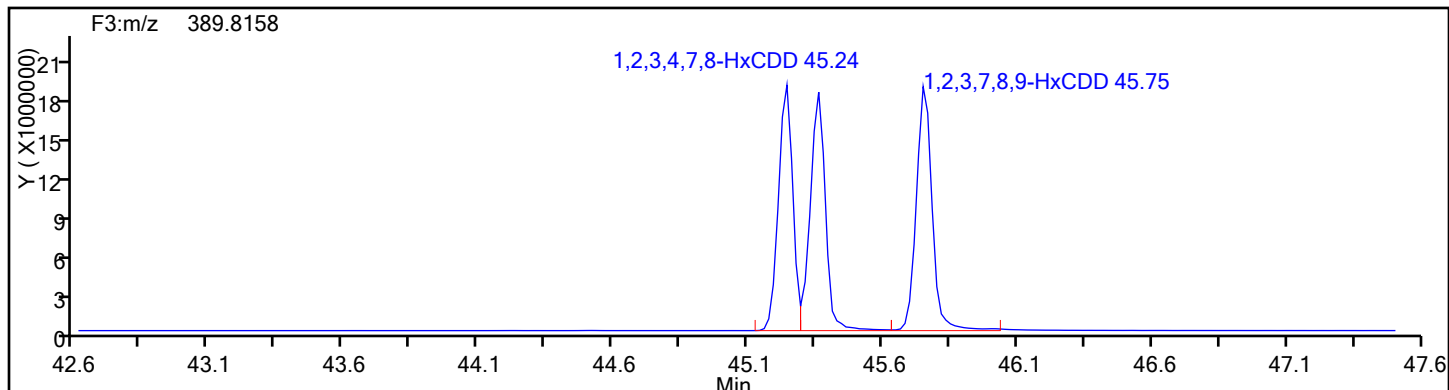
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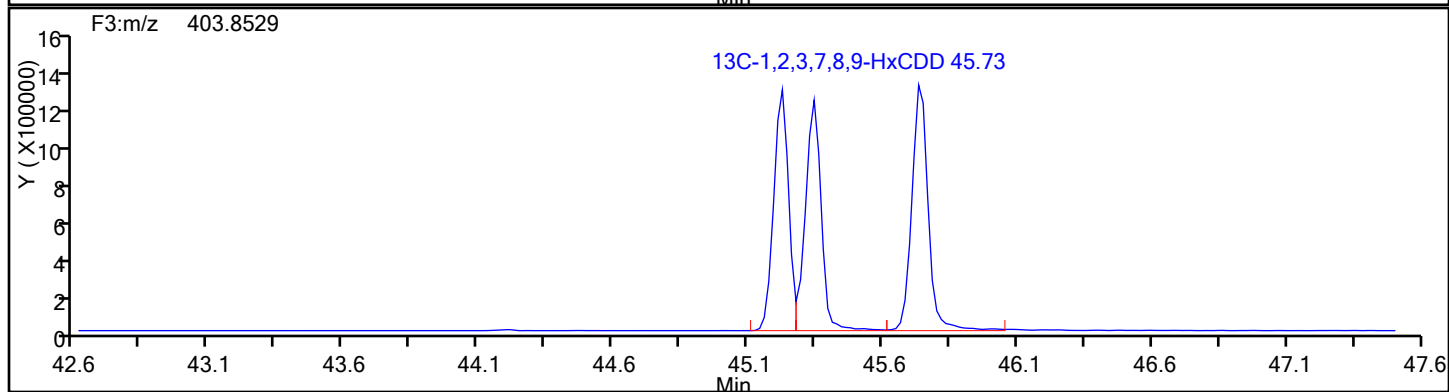
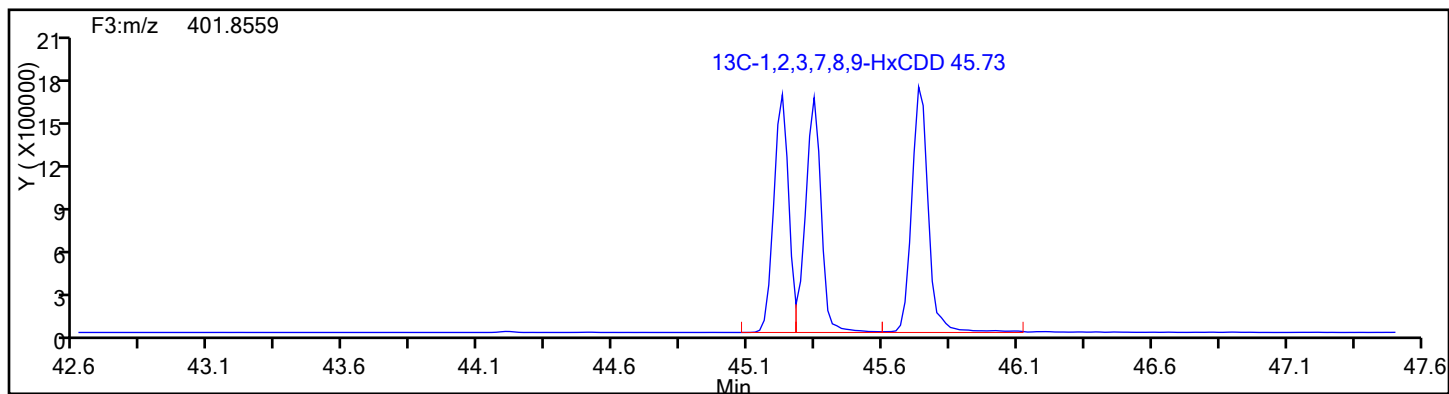
Column Type:

Column Dia:

HxCDD



HxCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

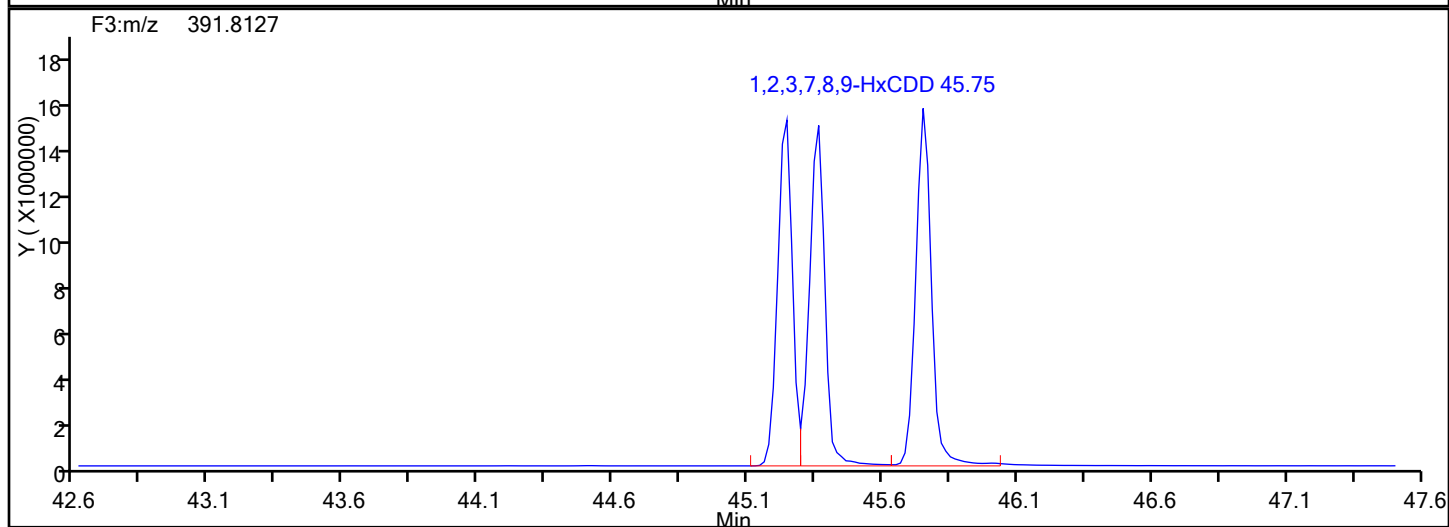
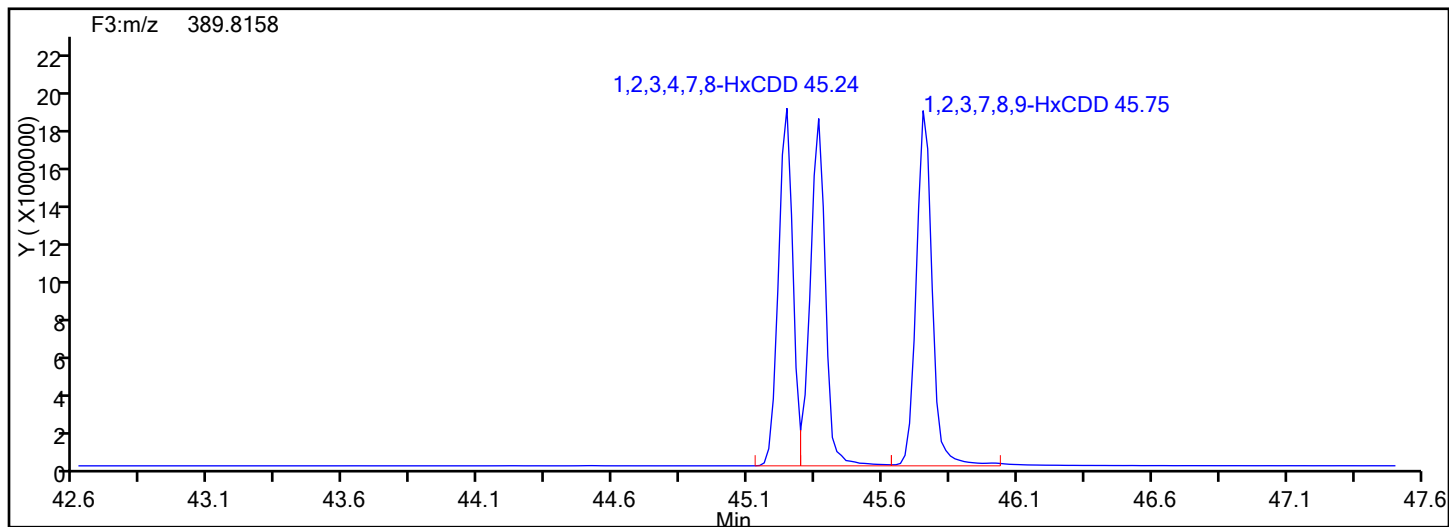
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Sample Line#: 6

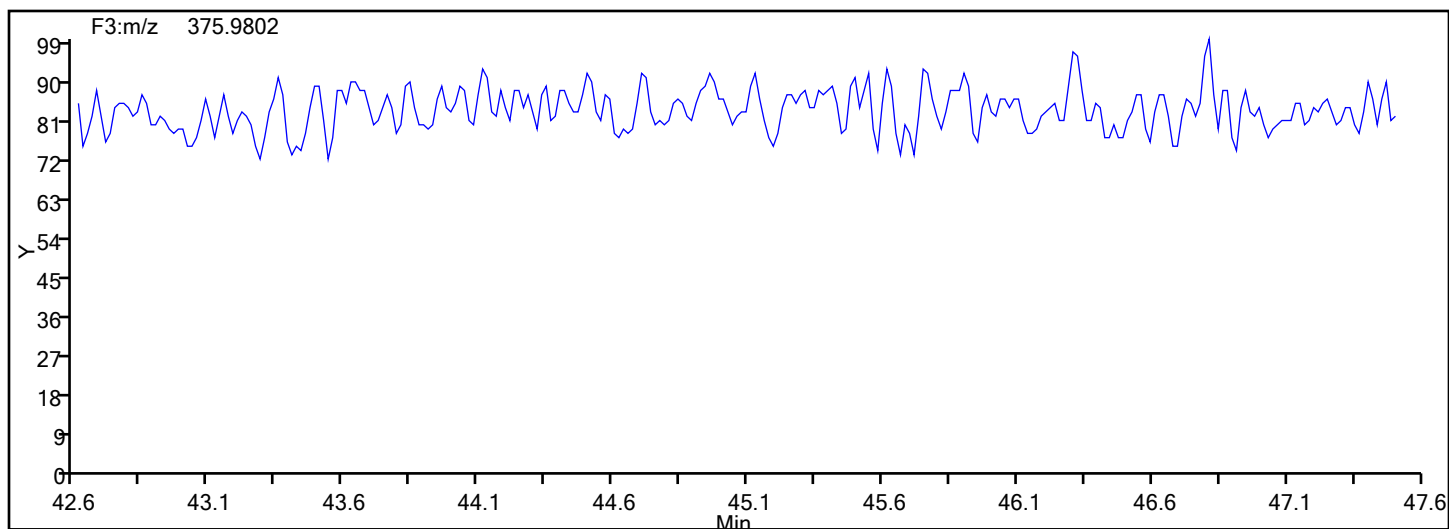
Column Type:

Column Dia:

HxCDD



HxCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

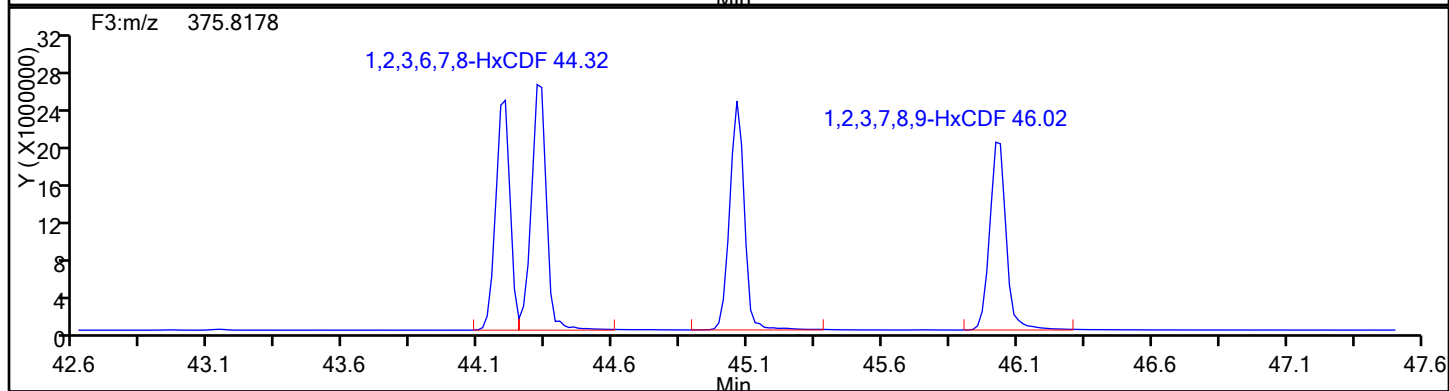
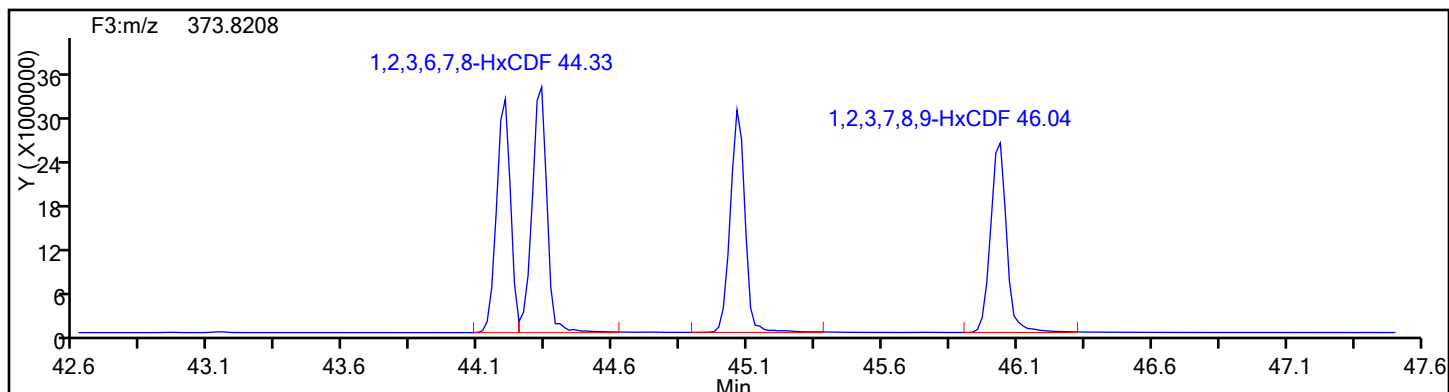
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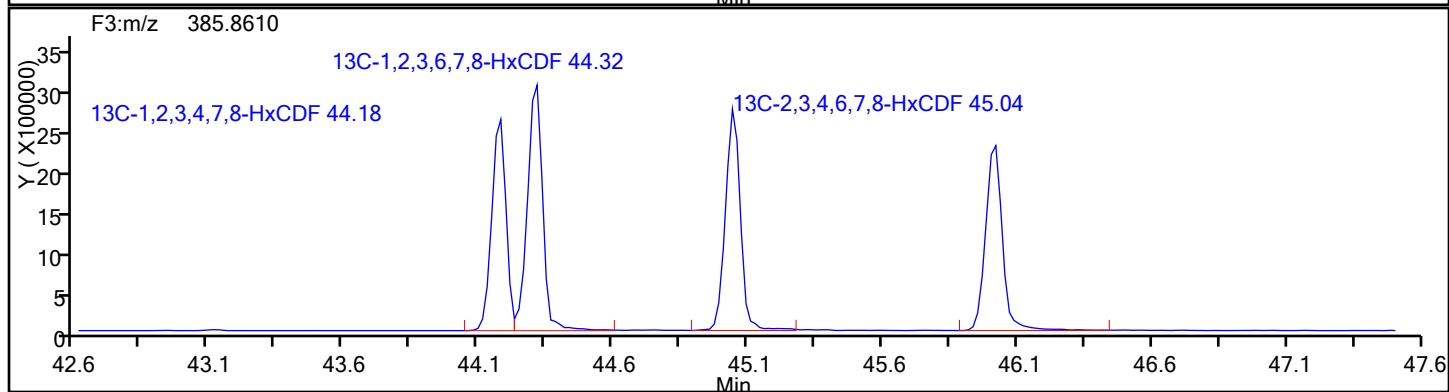
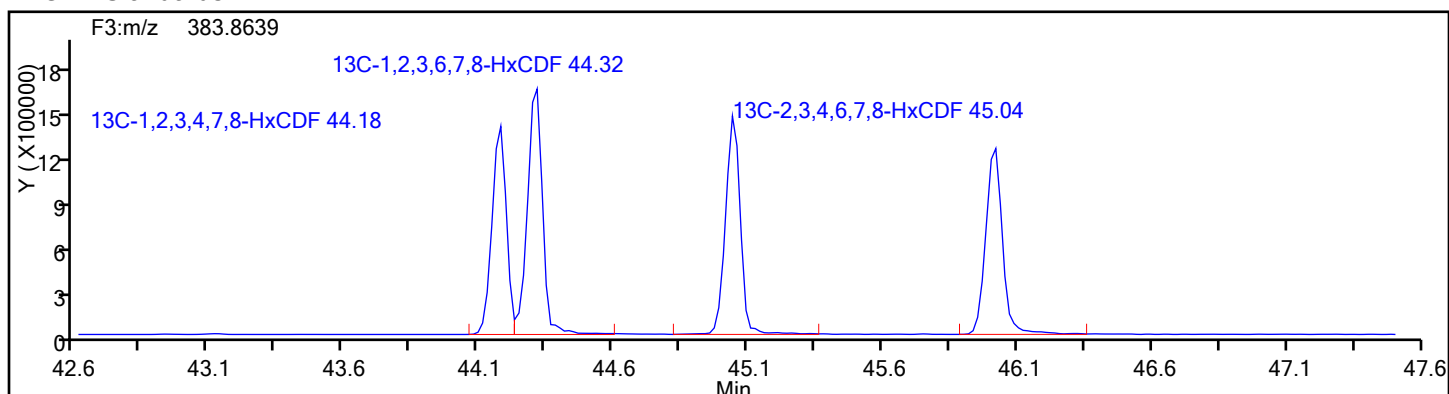
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Column Dia:

HxCDF



HxCDF Standards



TestAmerica Knoxville

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Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

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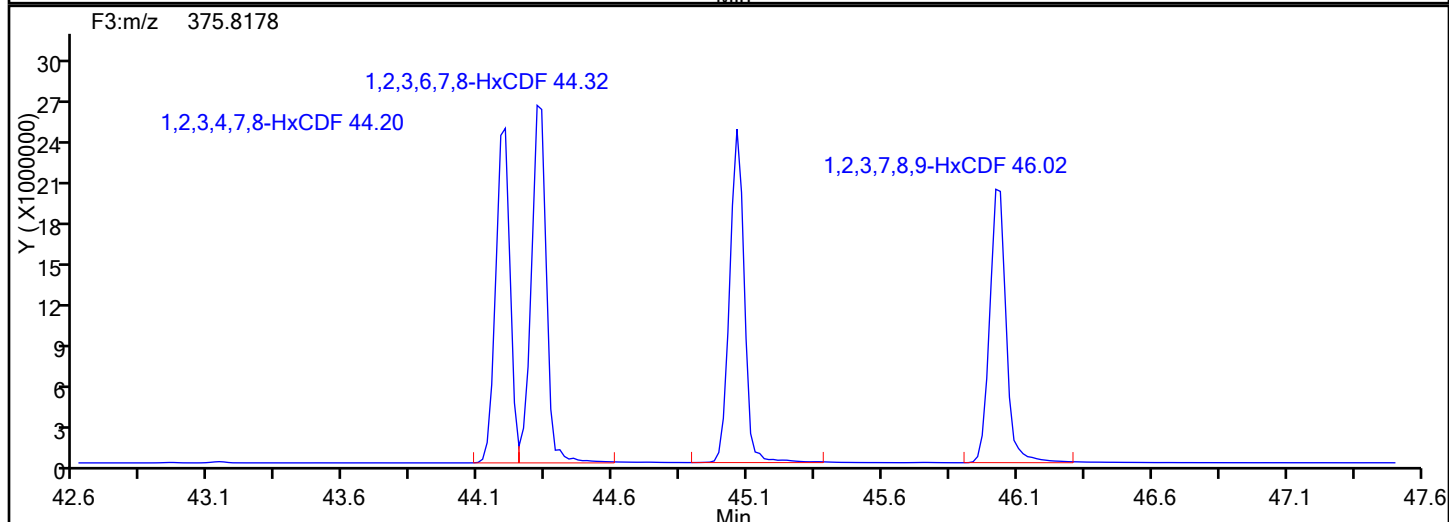
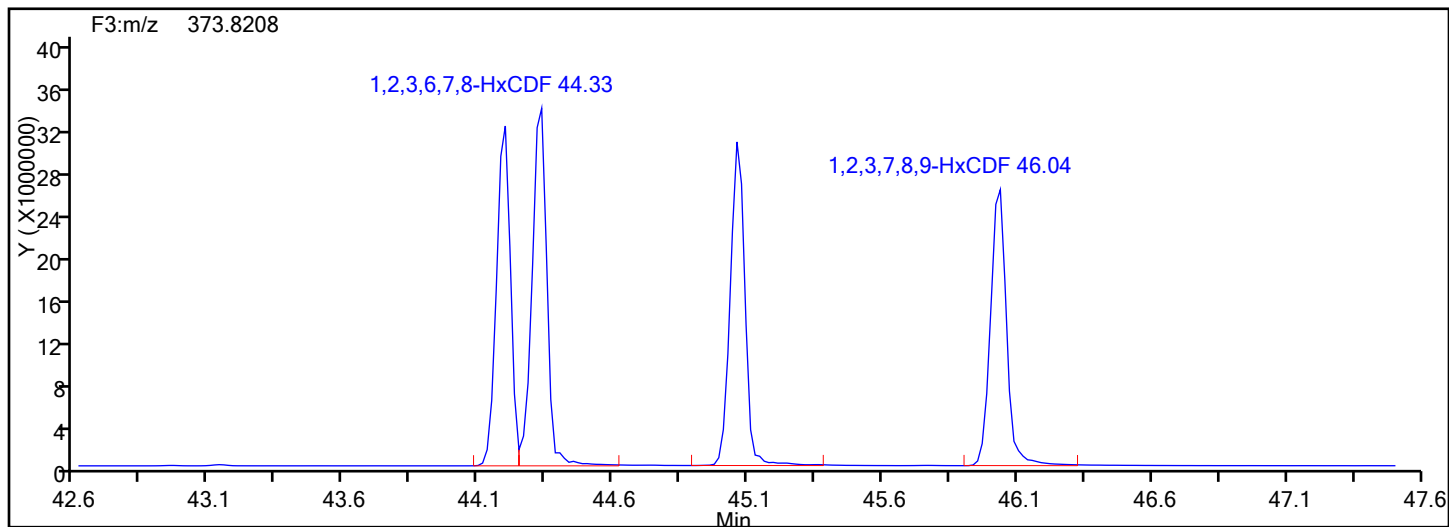
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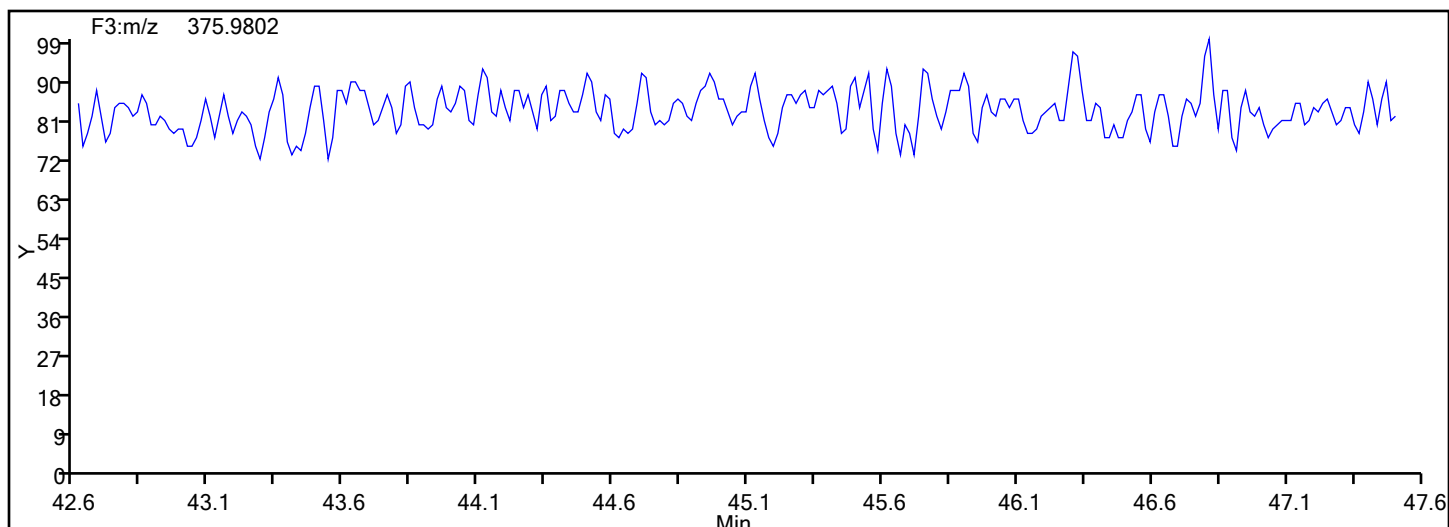
Column Type:

Column Dia:

HxCDF



HxCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

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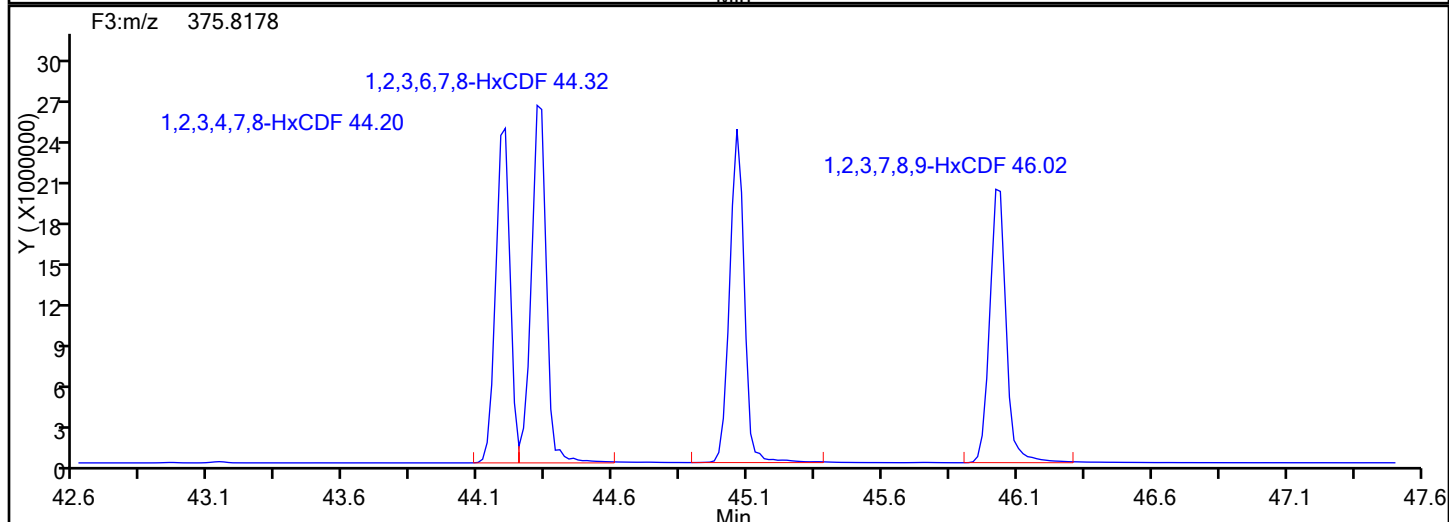
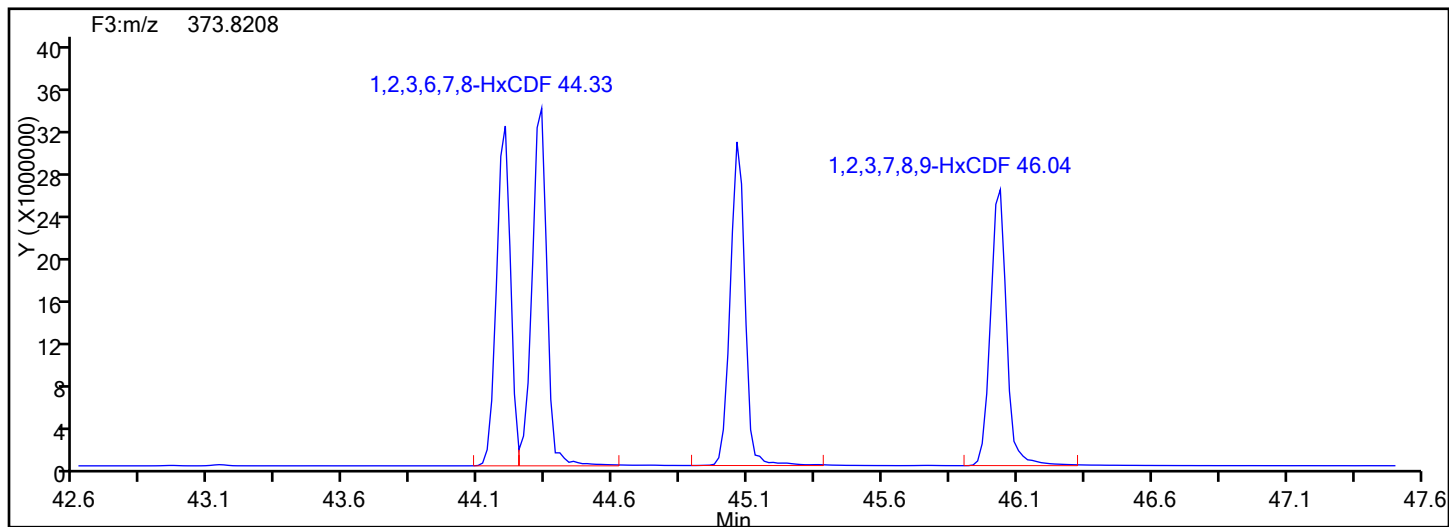
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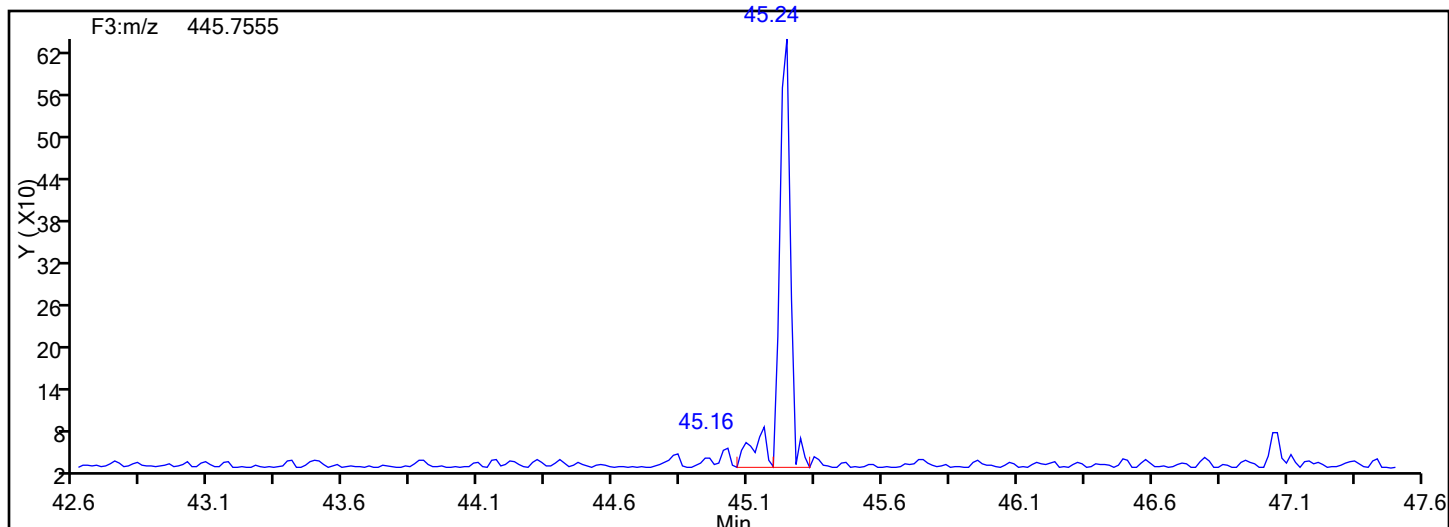
Column Type:

Column Dia:

HxCDF



HxCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

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Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

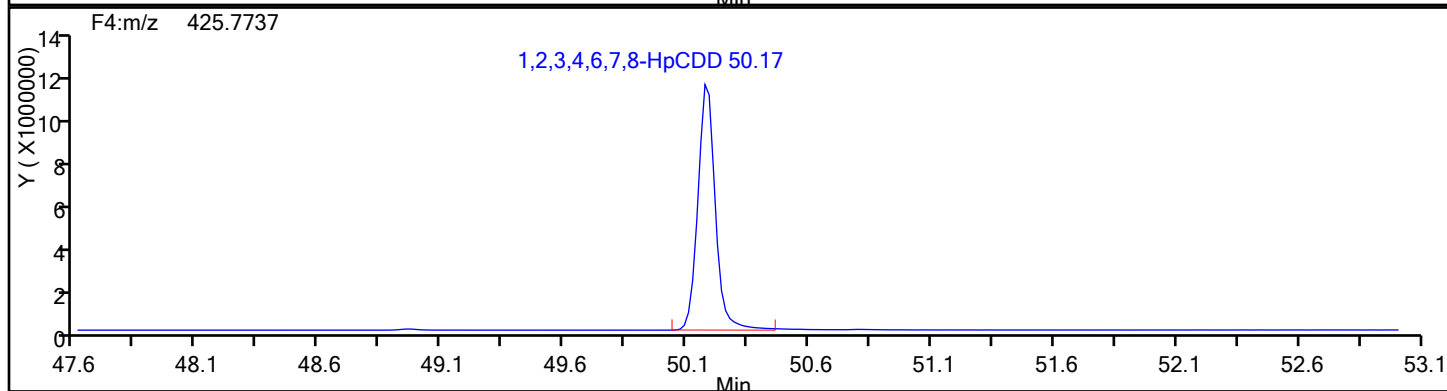
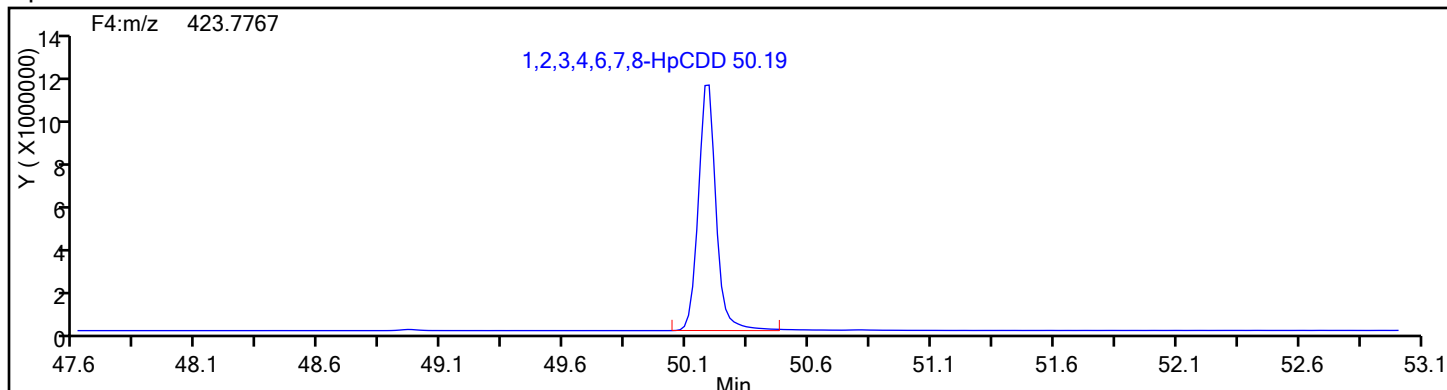
Worklist#: 7768

Sample Line#: 6

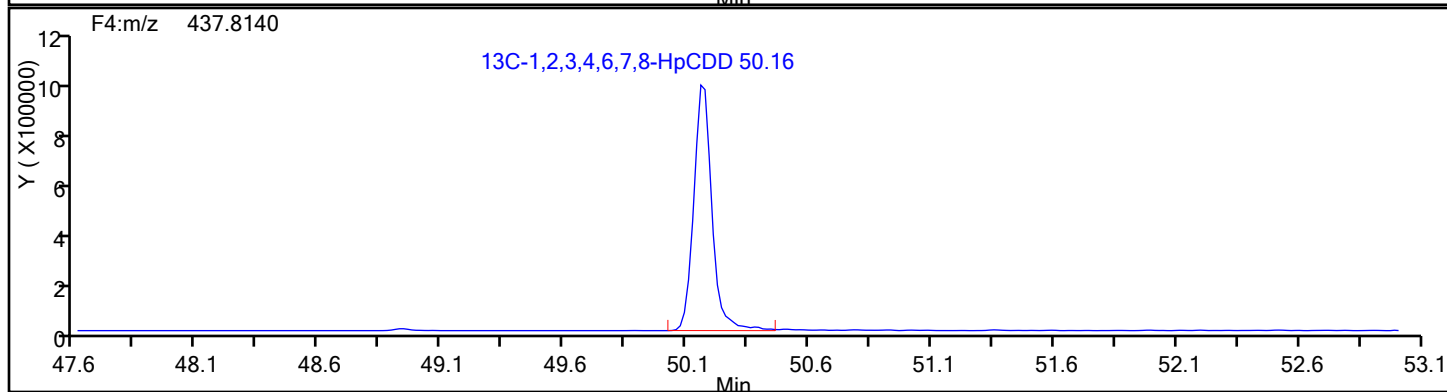
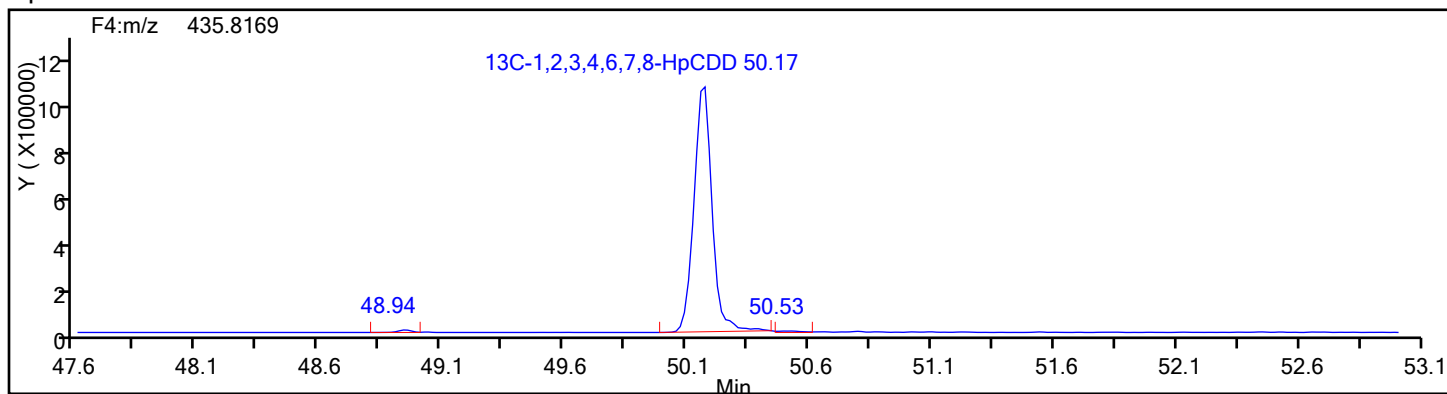
Column Type:

Column Dia:

HpCDD

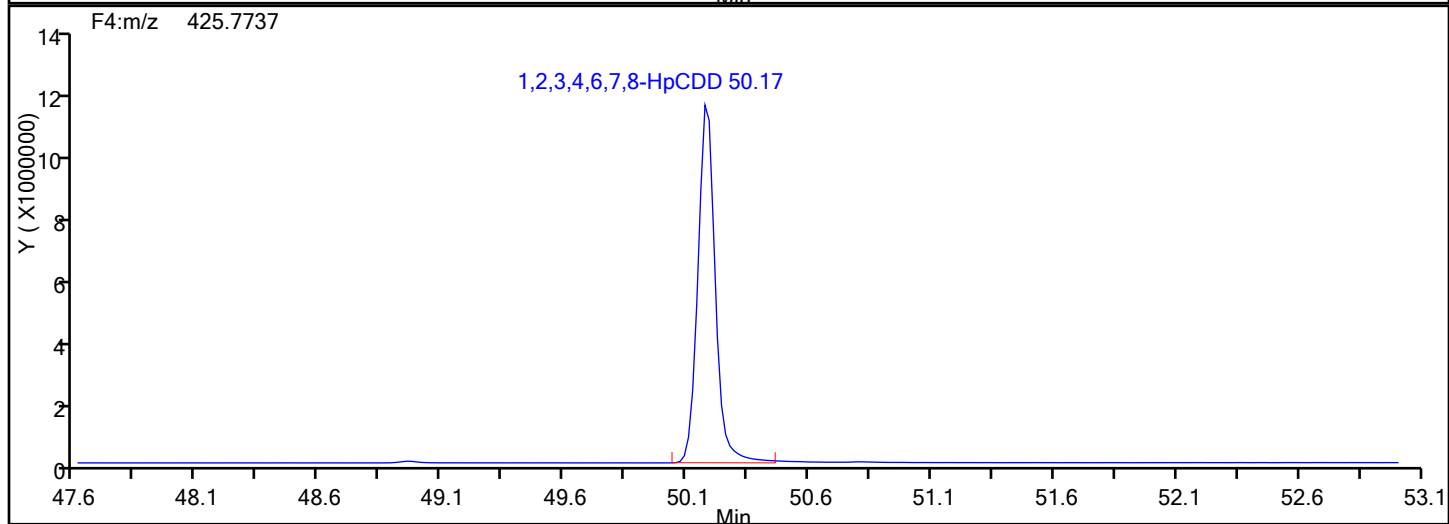
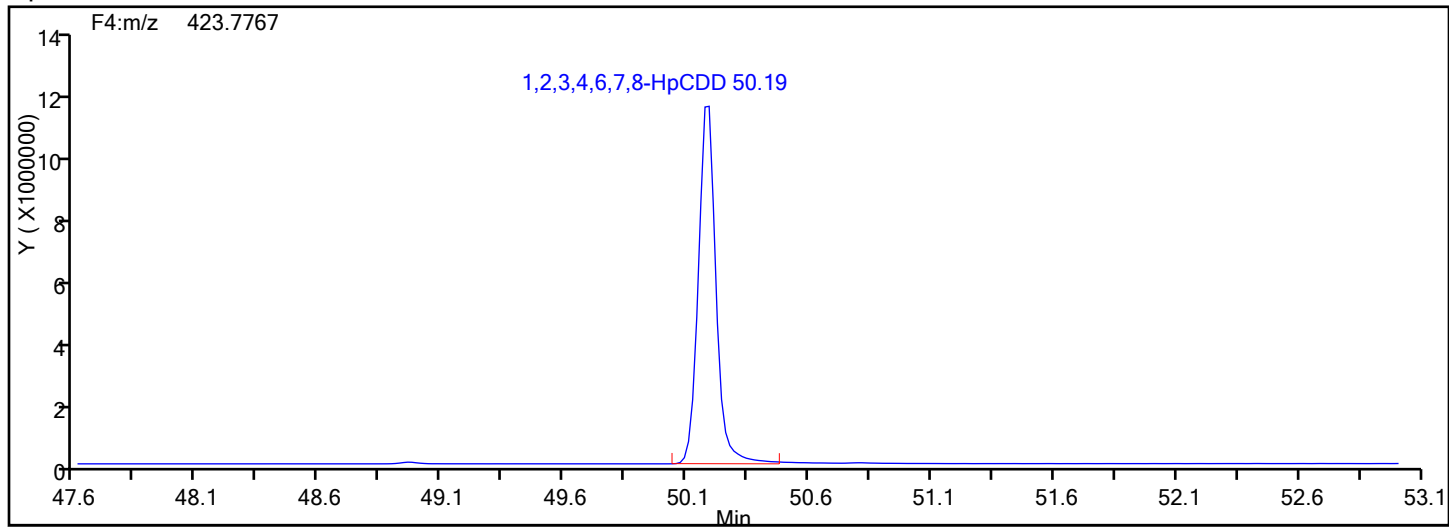


HpCDD Standards

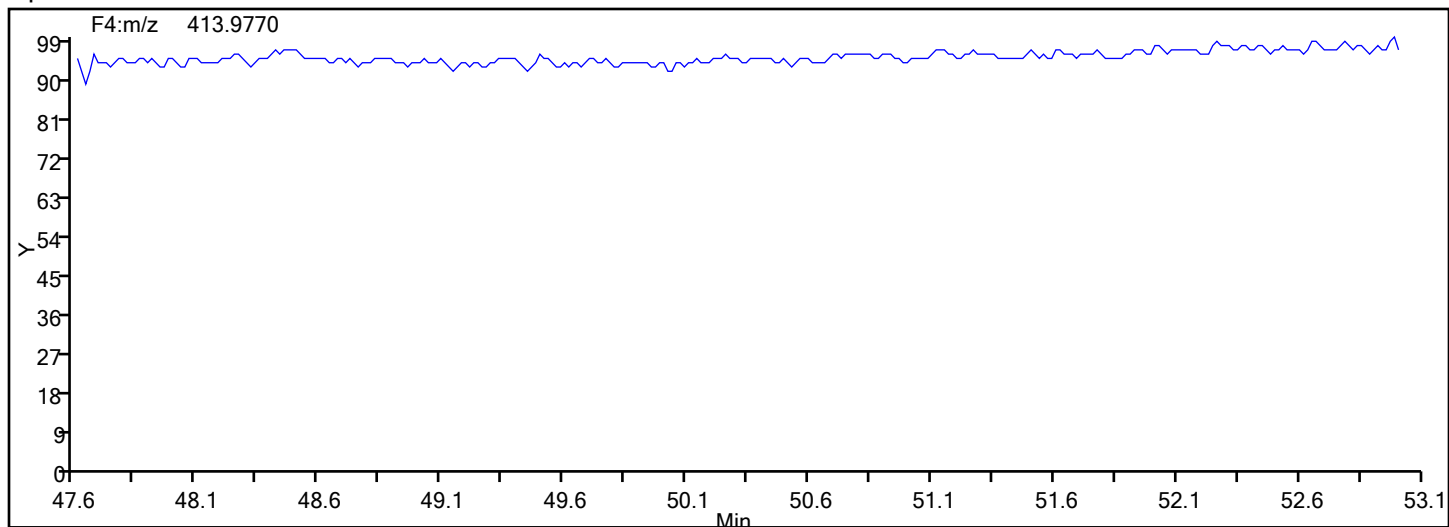


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
Injection Date: 16-May-2014 18:31:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 6
Column Type: Column Dia:
HpCDD



HpCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

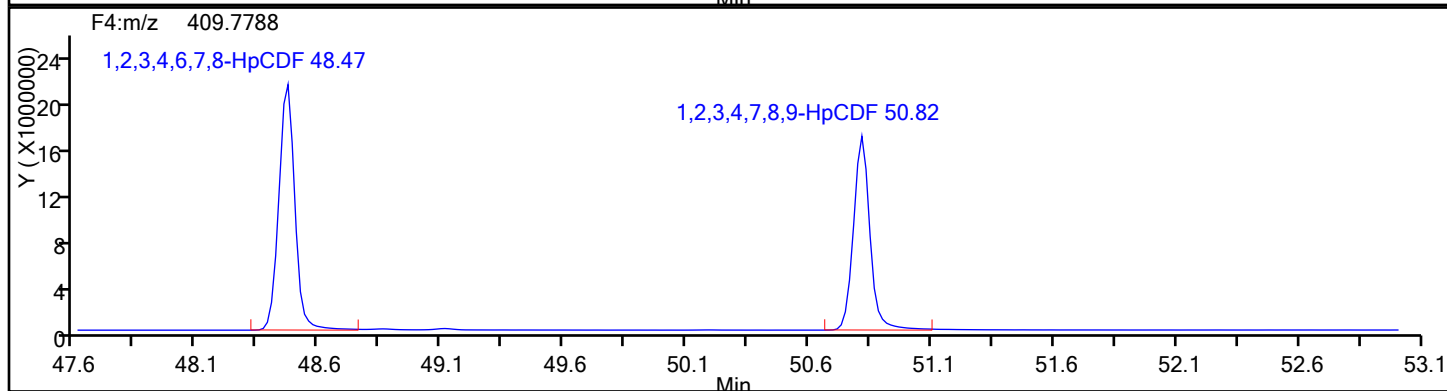
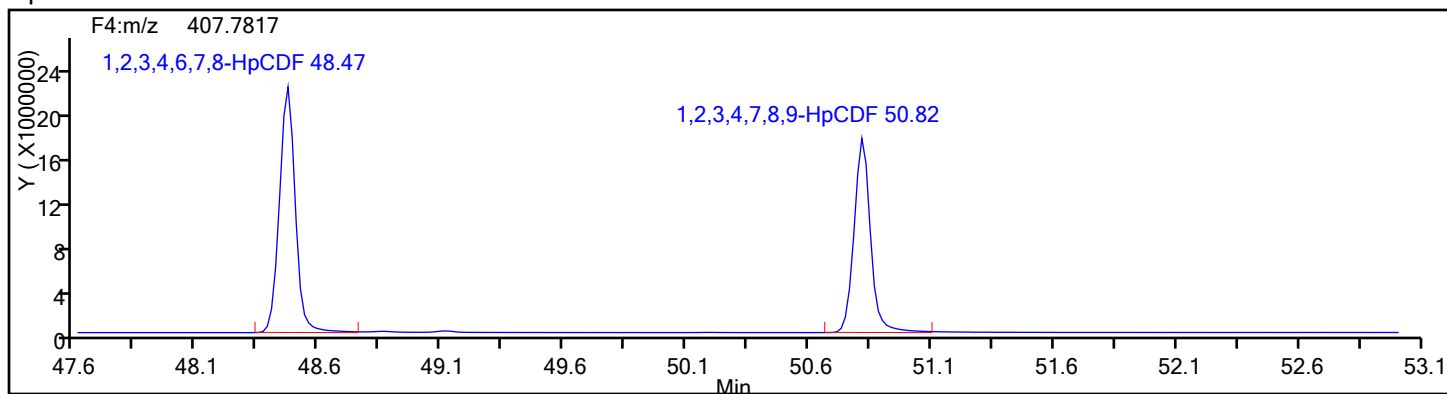
Worklist#: 7768

Sample Line#: 6

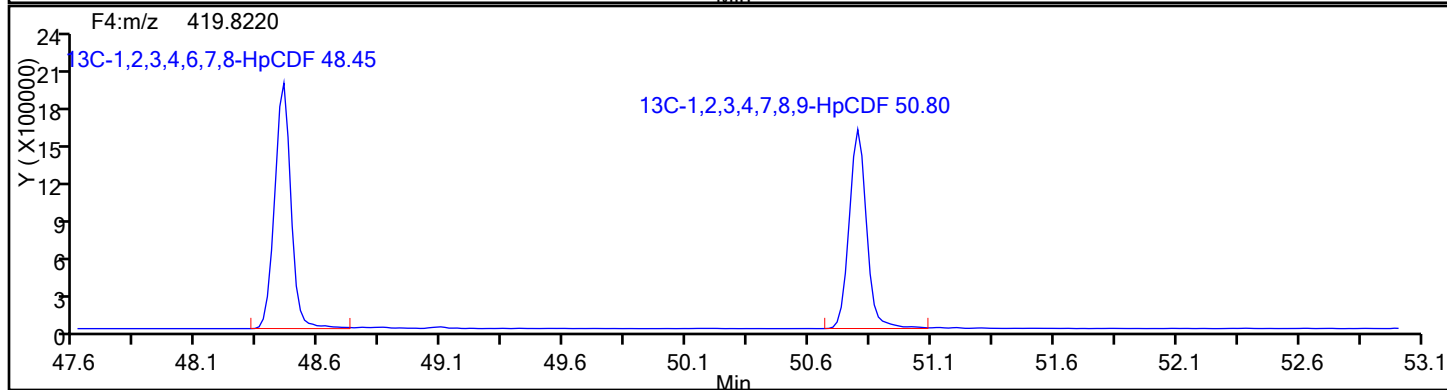
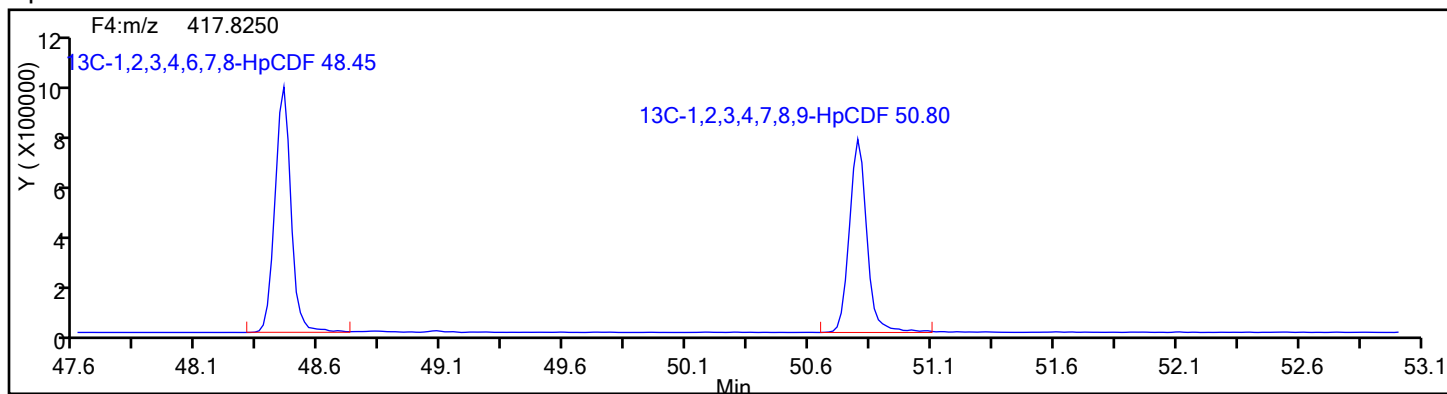
Column Type:

Column Dia:

HpCDF



HpCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

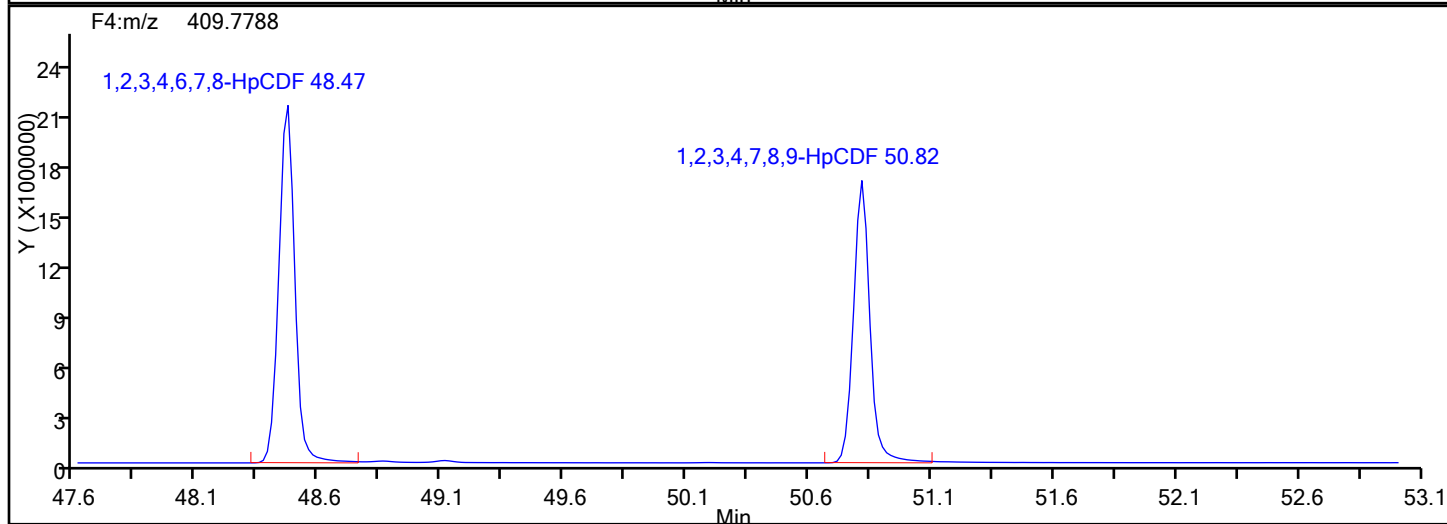
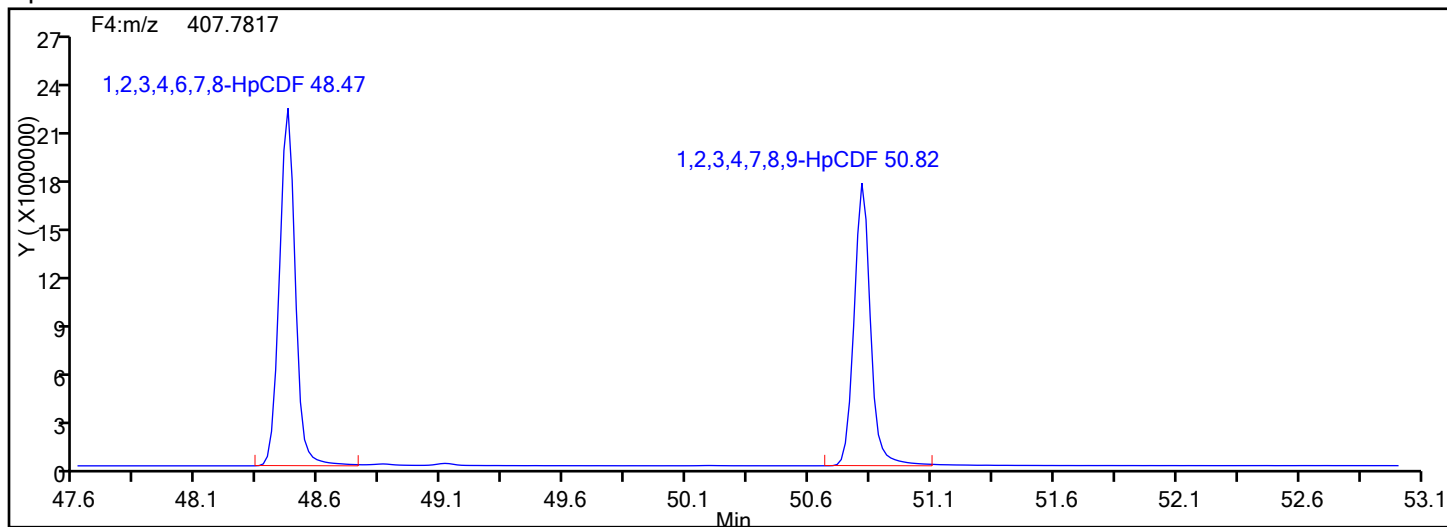
Worklist#: 7768

Sample Line#: 6

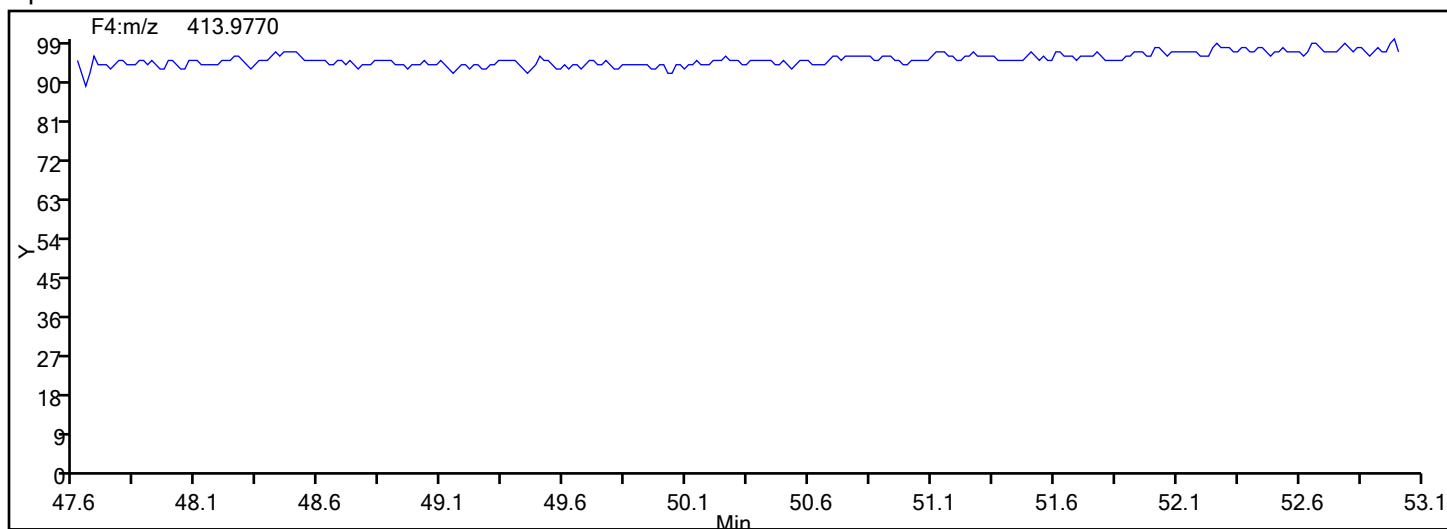
Column Type:

Column Dia:

HpCDF



HpCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

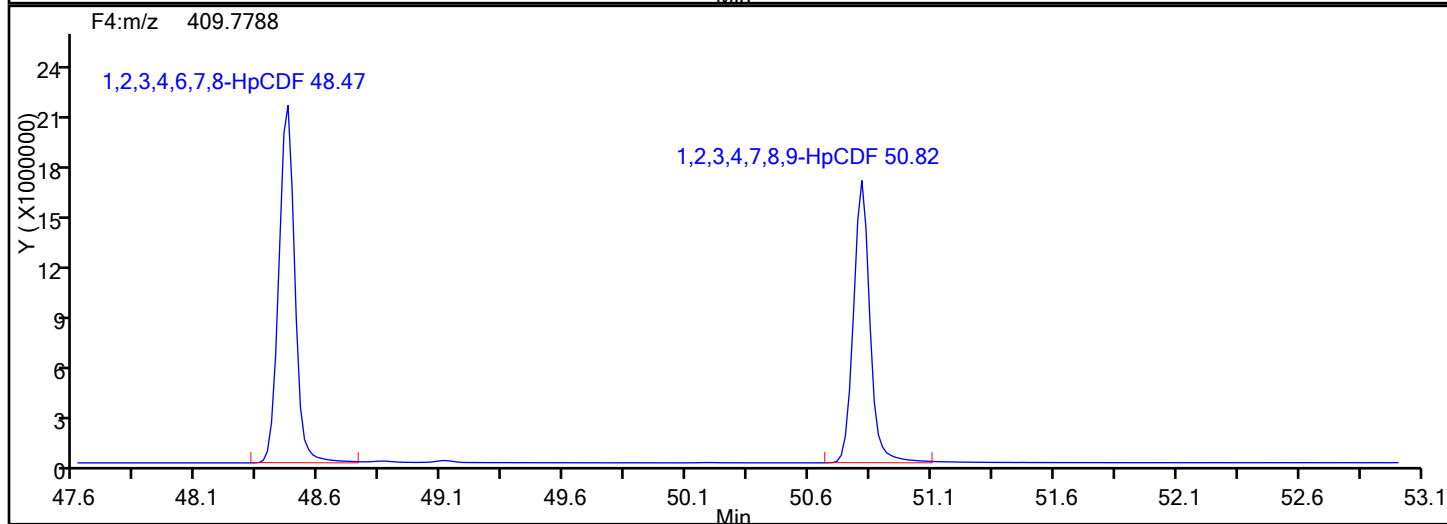
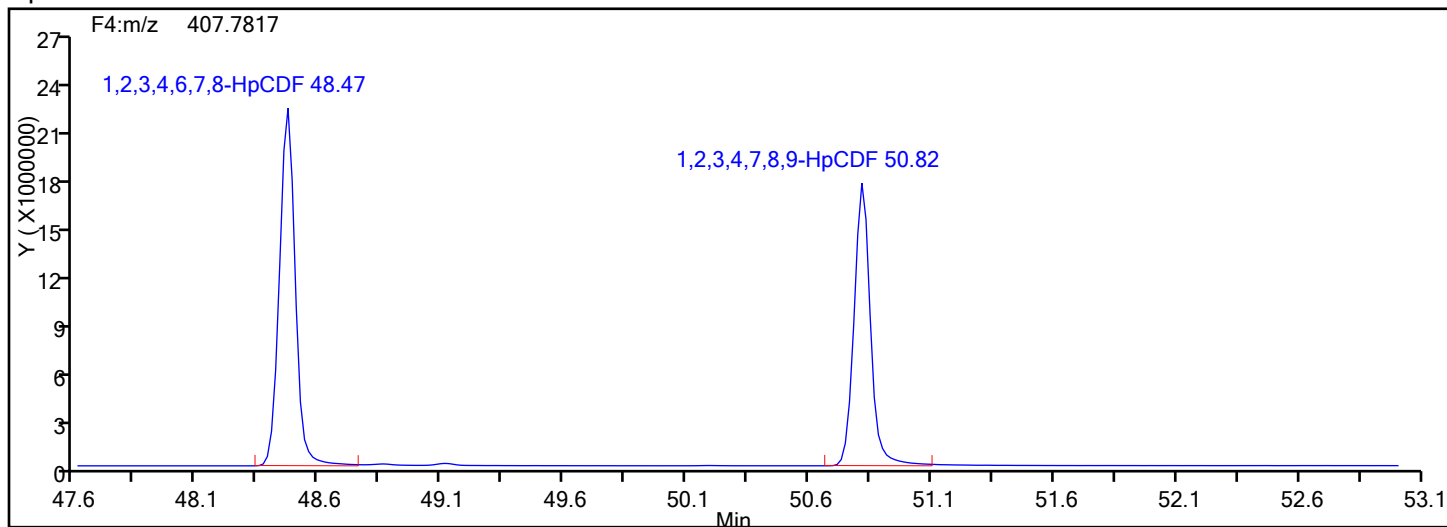
Worklist#: 7768

Sample Line#: 6

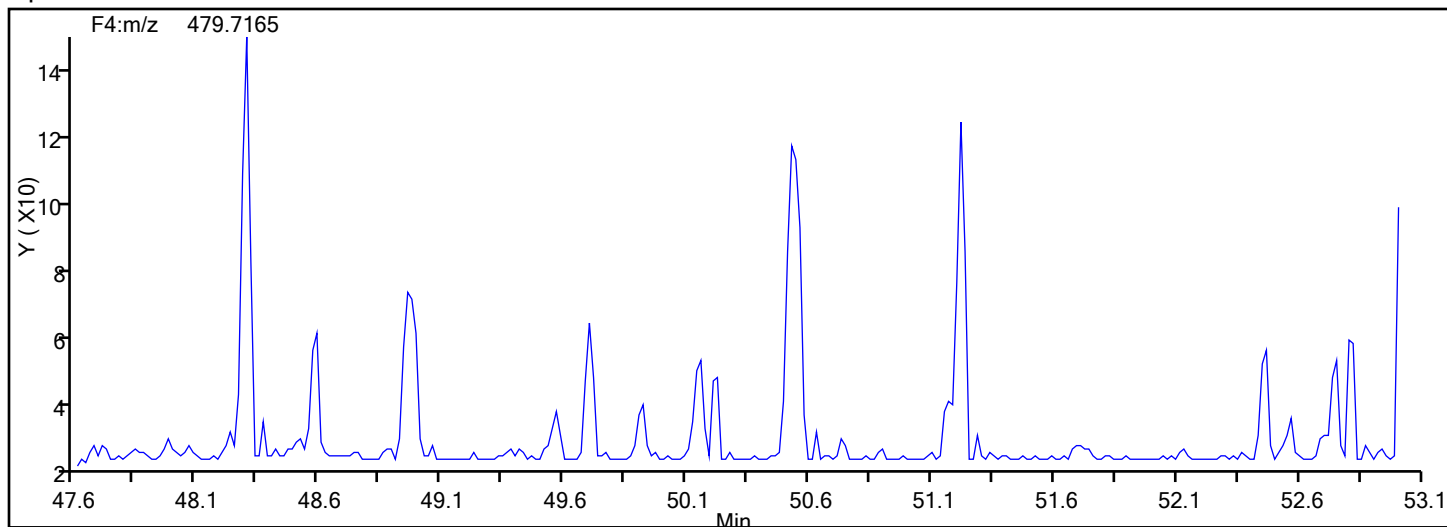
Column Type:

Column Dia:

HpCDF



HpCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

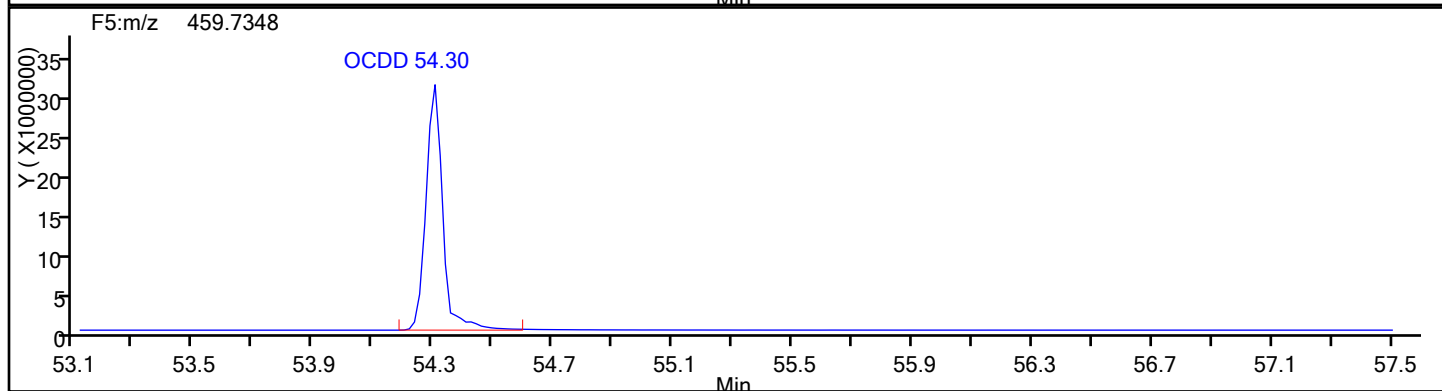
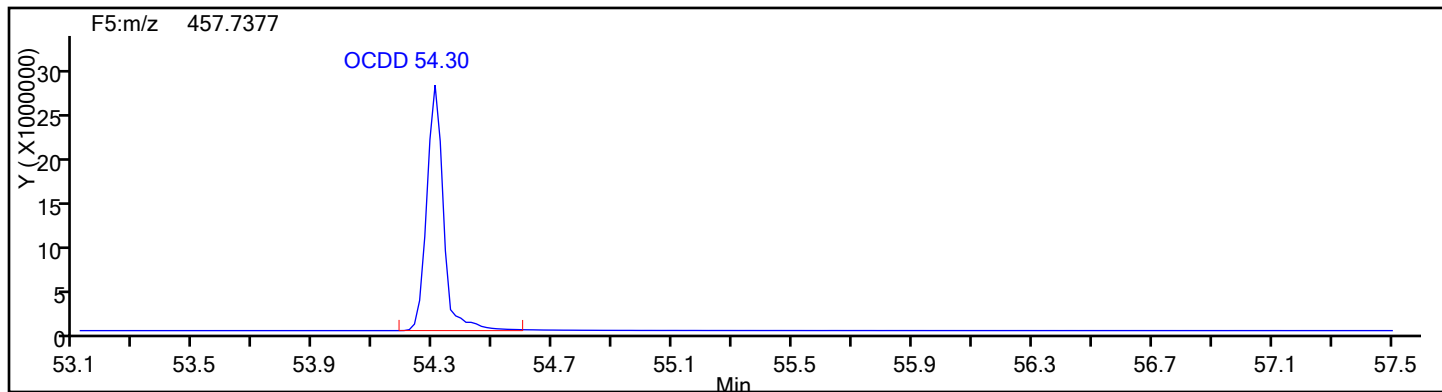
Worklist#: 7768

Sample Line#: 6

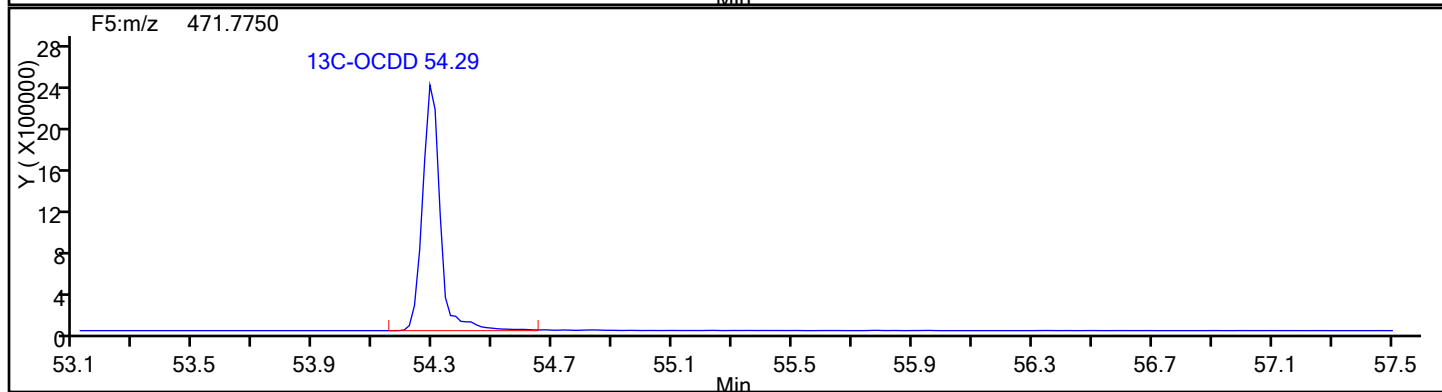
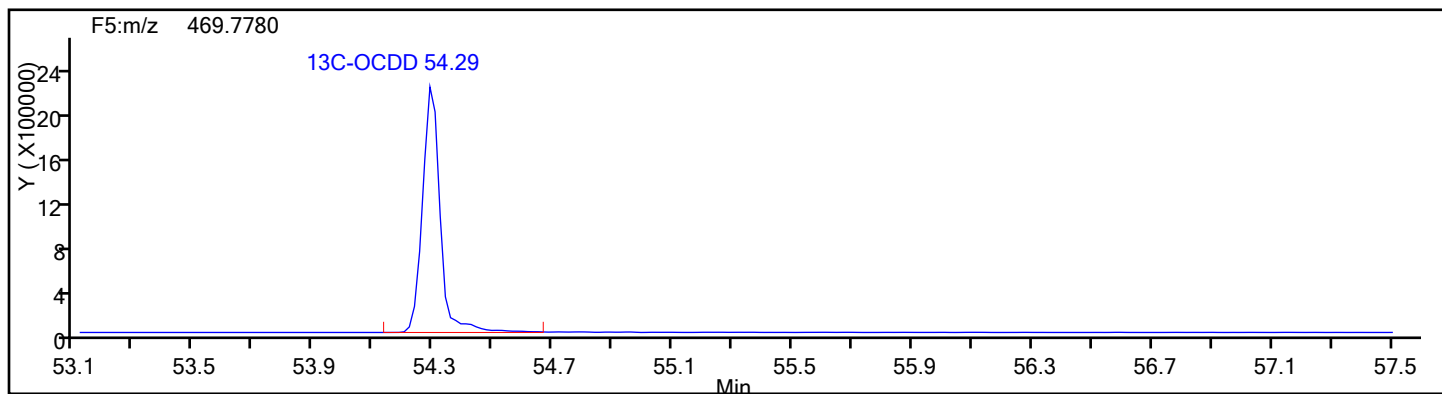
Column Type:

Column Dia:

OCDD



OCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

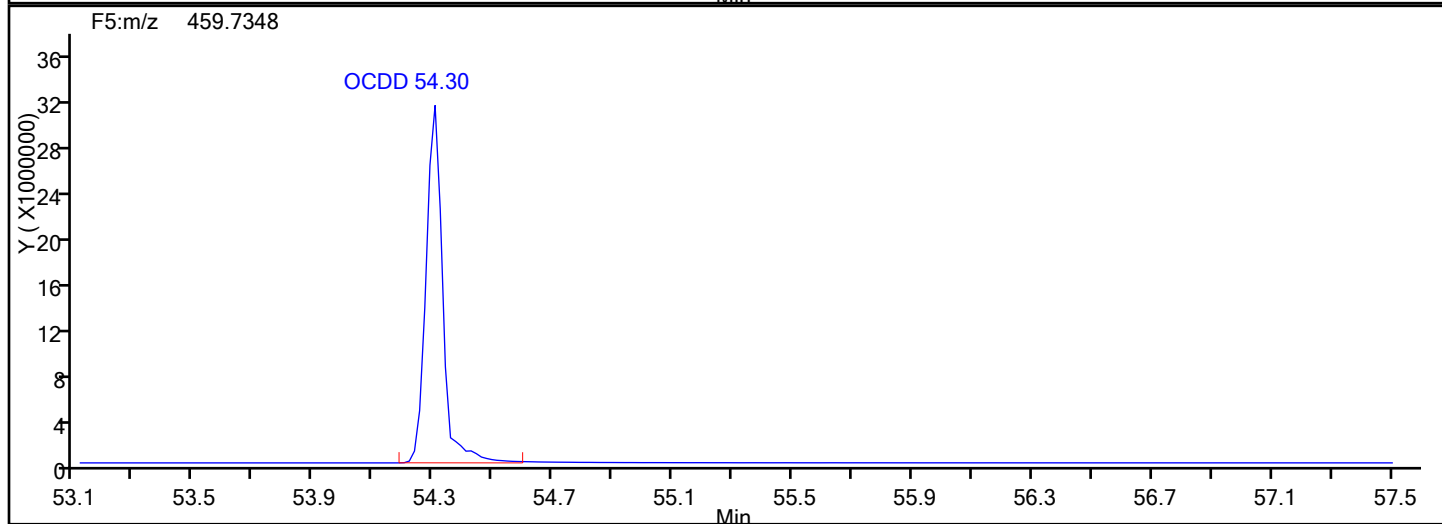
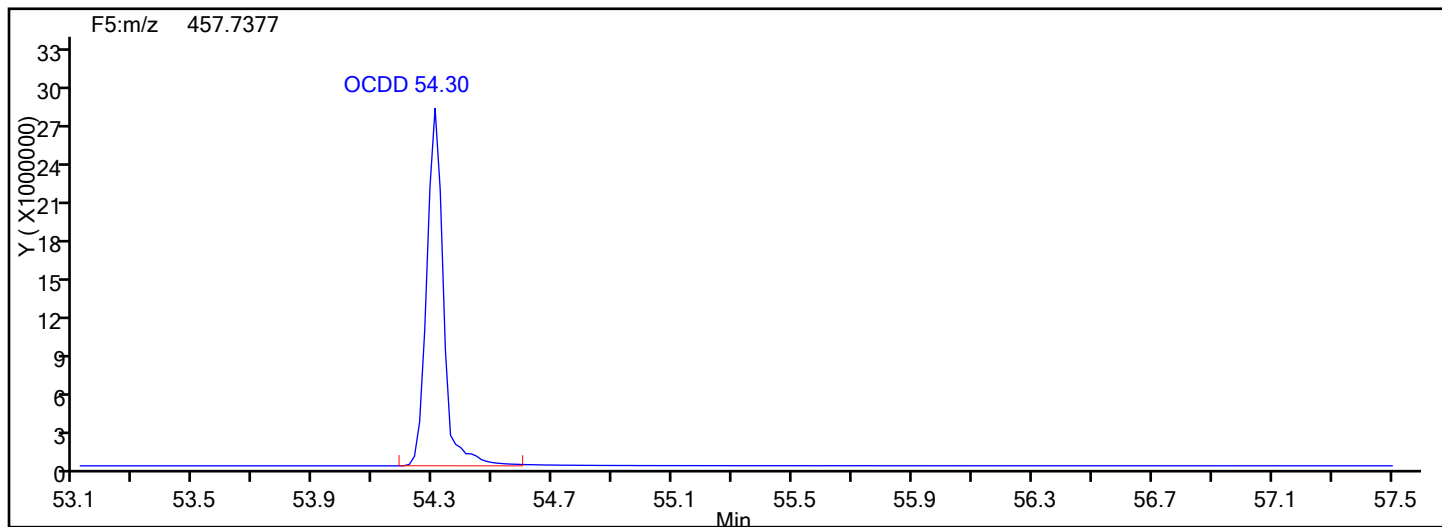
Worklist#: 7768

Sample Line#: 6

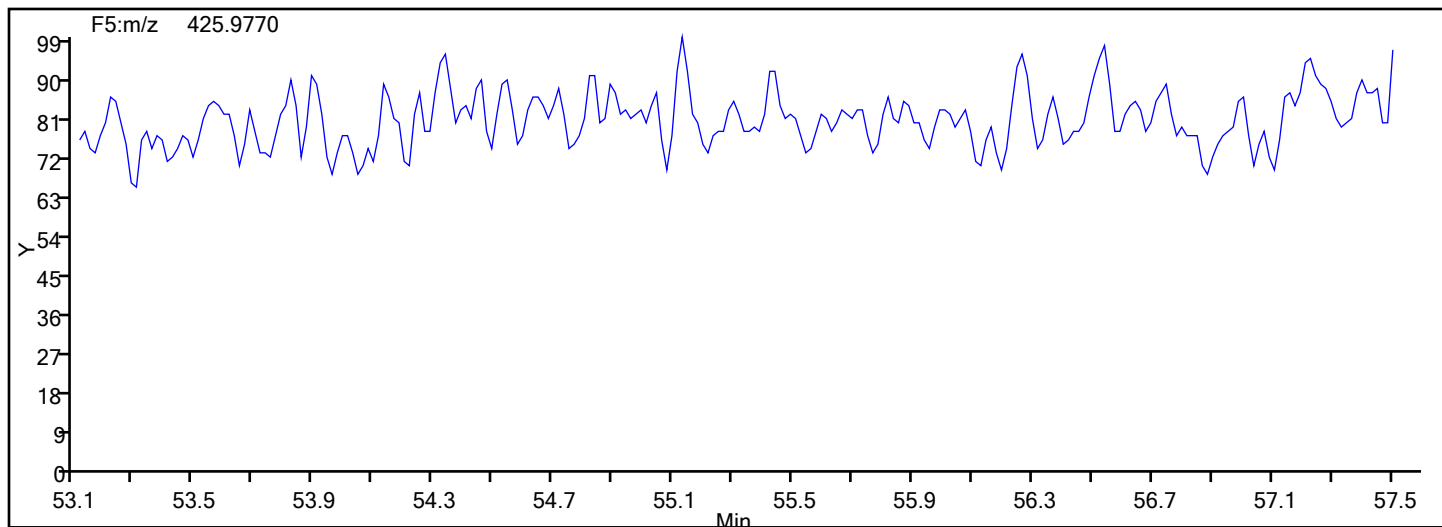
Column Type:

Column Dia:

OCDD



OCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

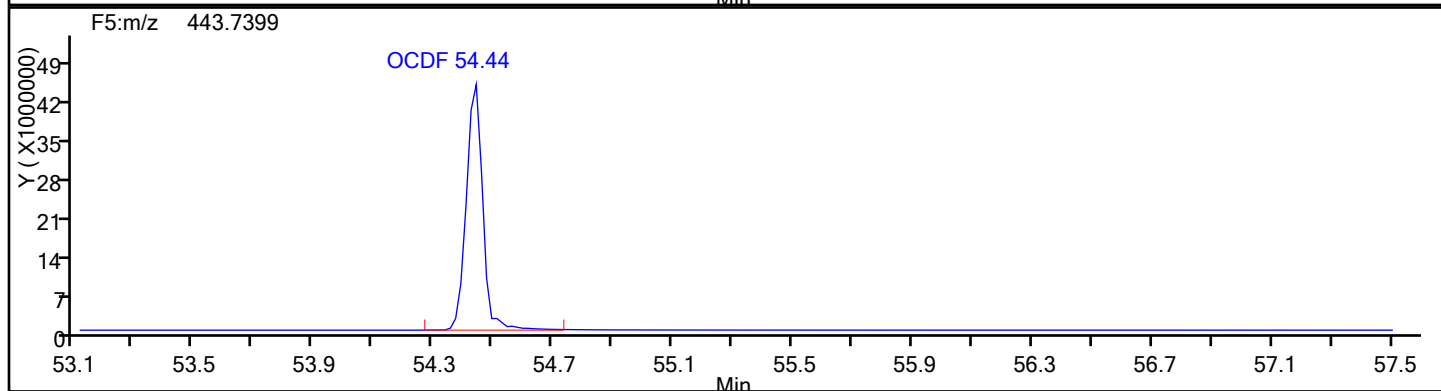
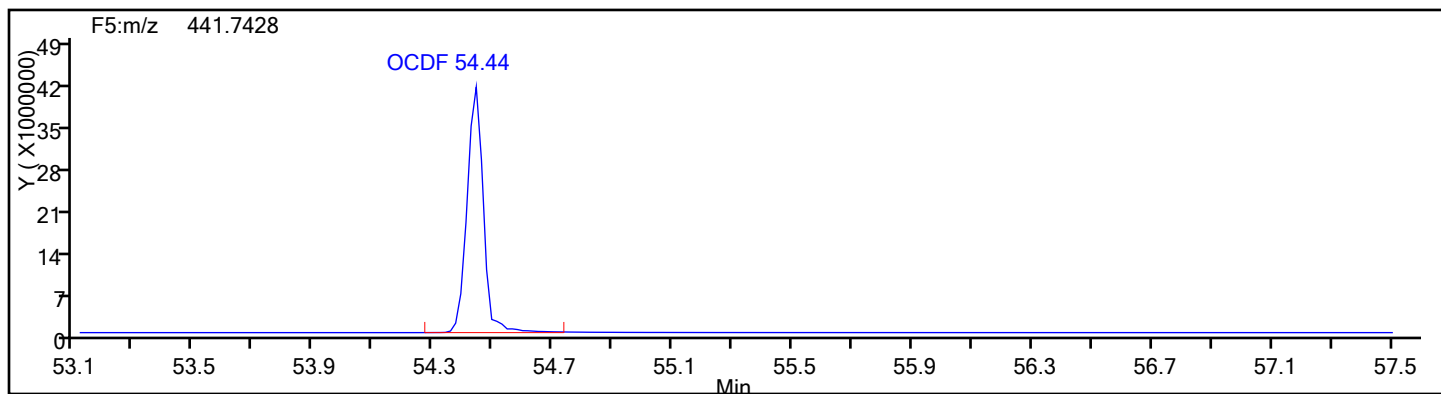
Worklist#: 7768

Sample Line#: 6

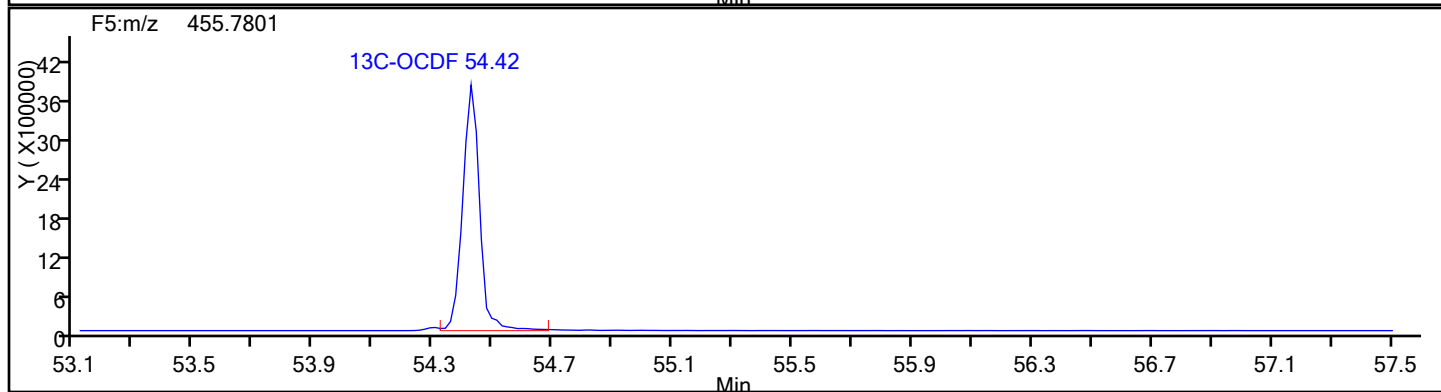
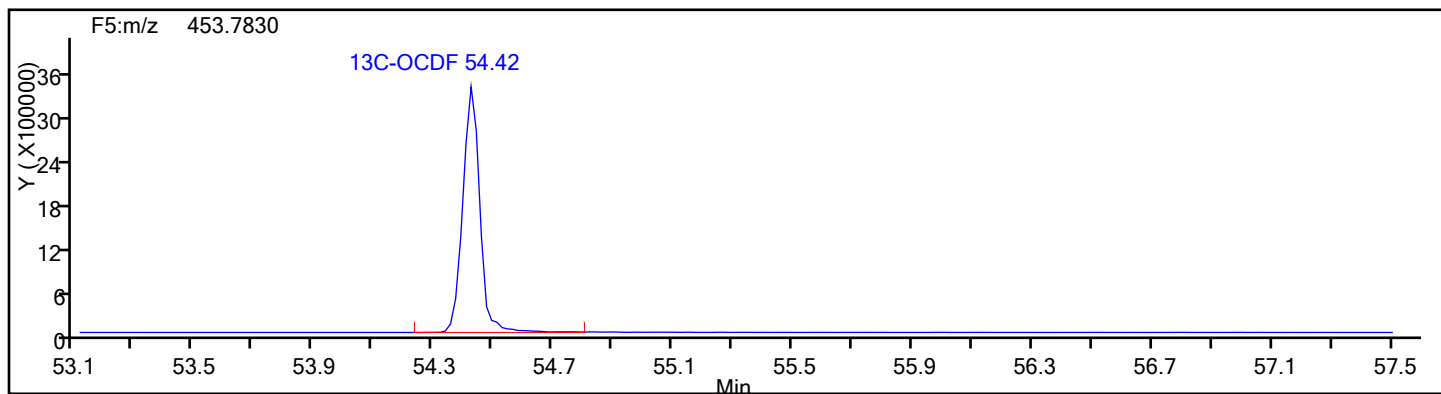
Column Type:

Column Dia:

OCDF



OCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

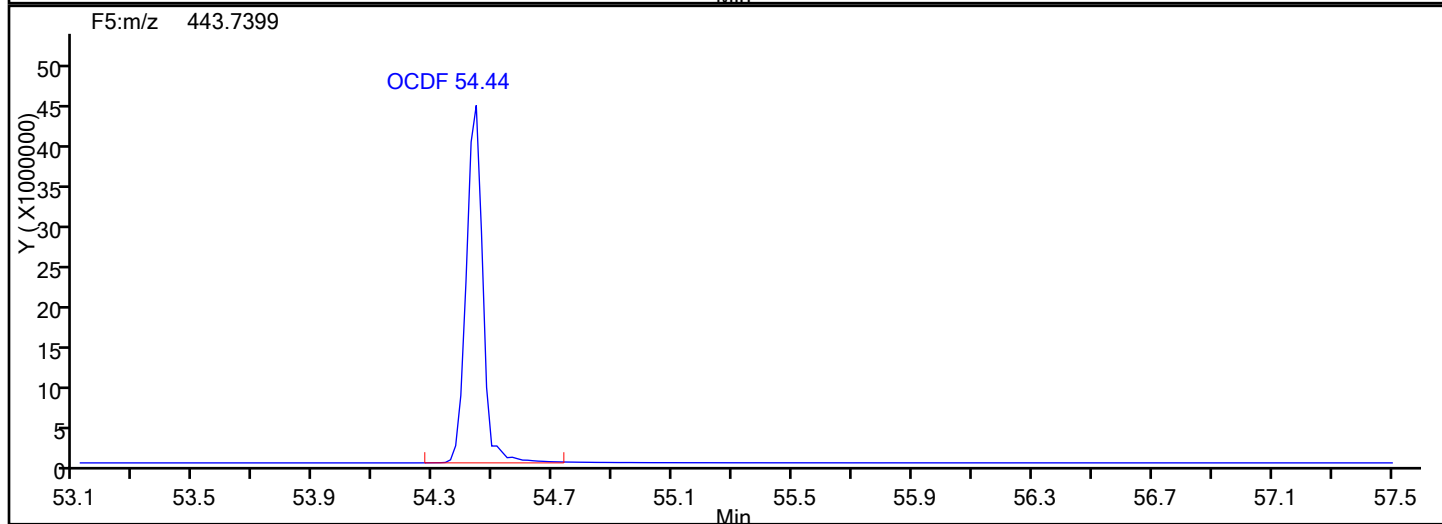
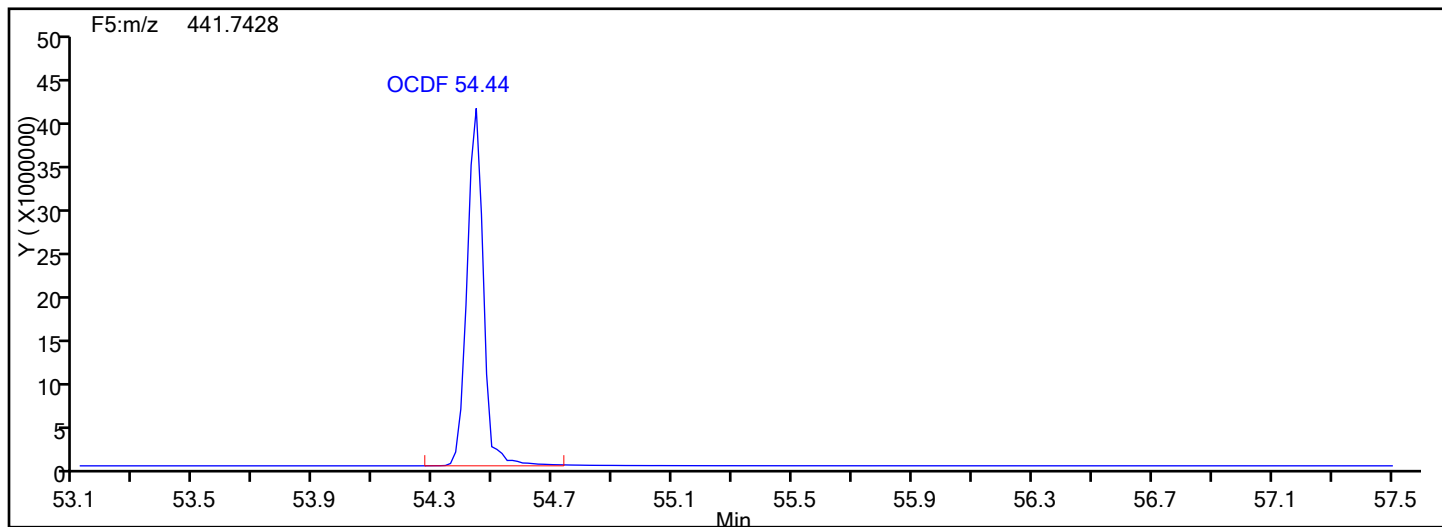
Worklist#: 7768

Sample Line#: 6

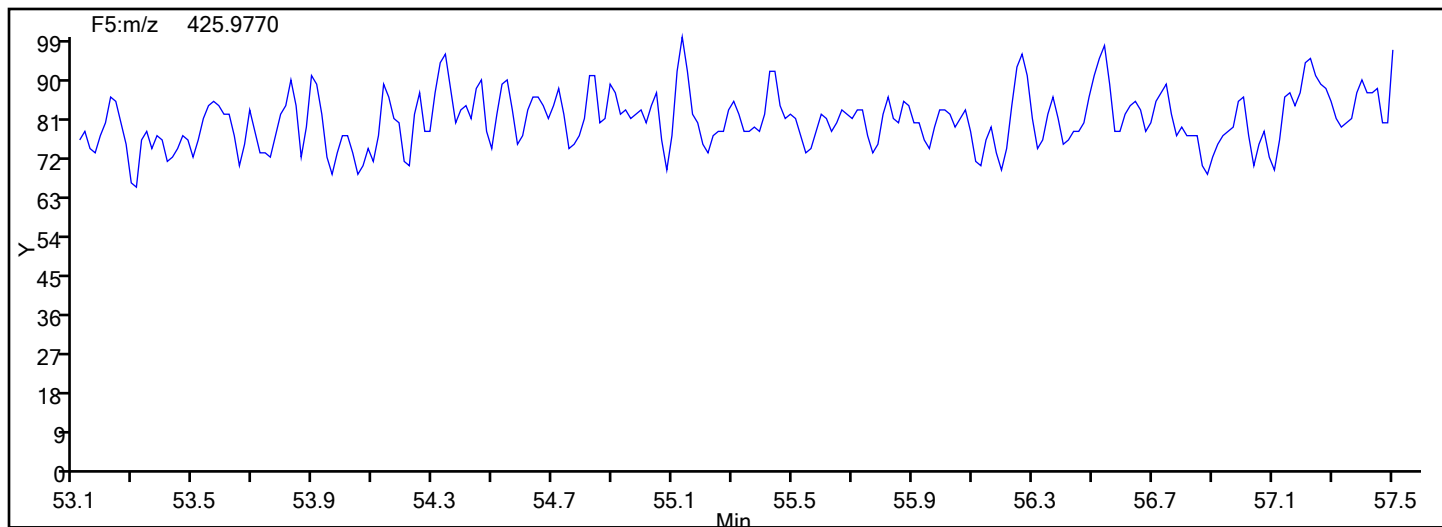
Column Type:

Column Dia:

OCDF



OCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Injection Date: 16-May-2014 18:31:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

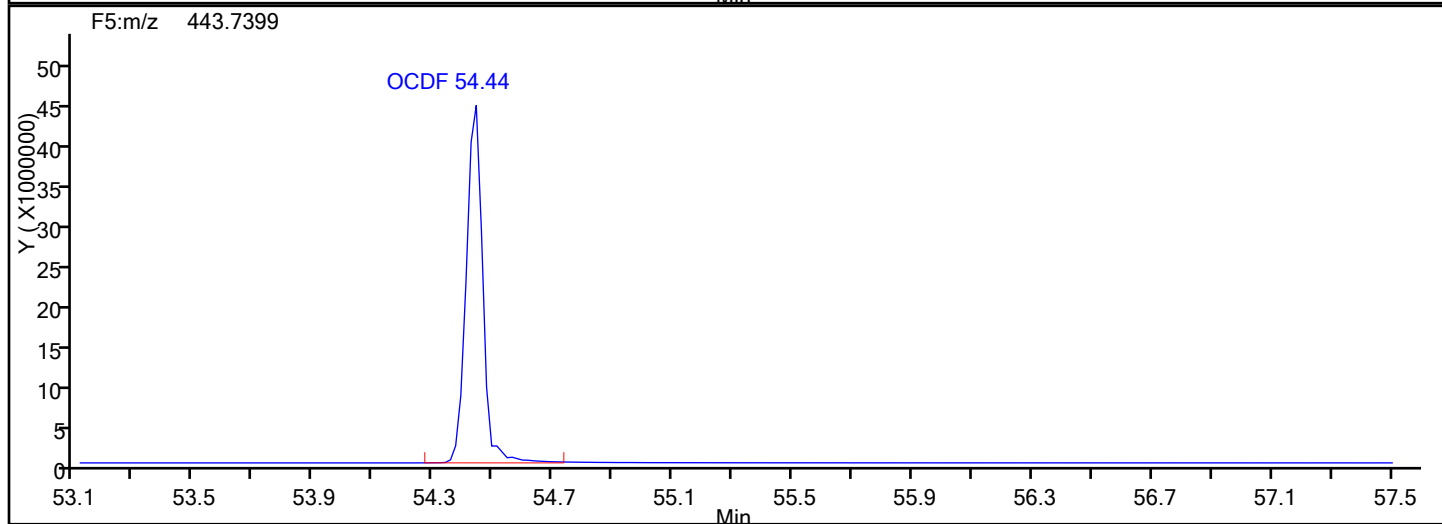
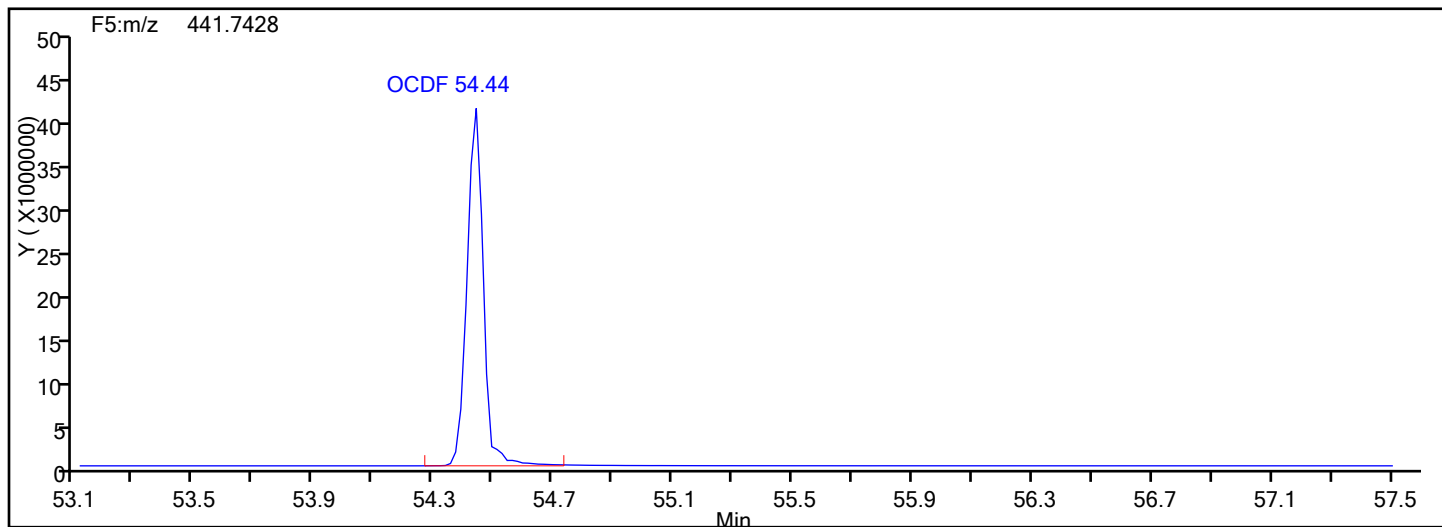
Worklist#: 7768

Sample Line#: 6

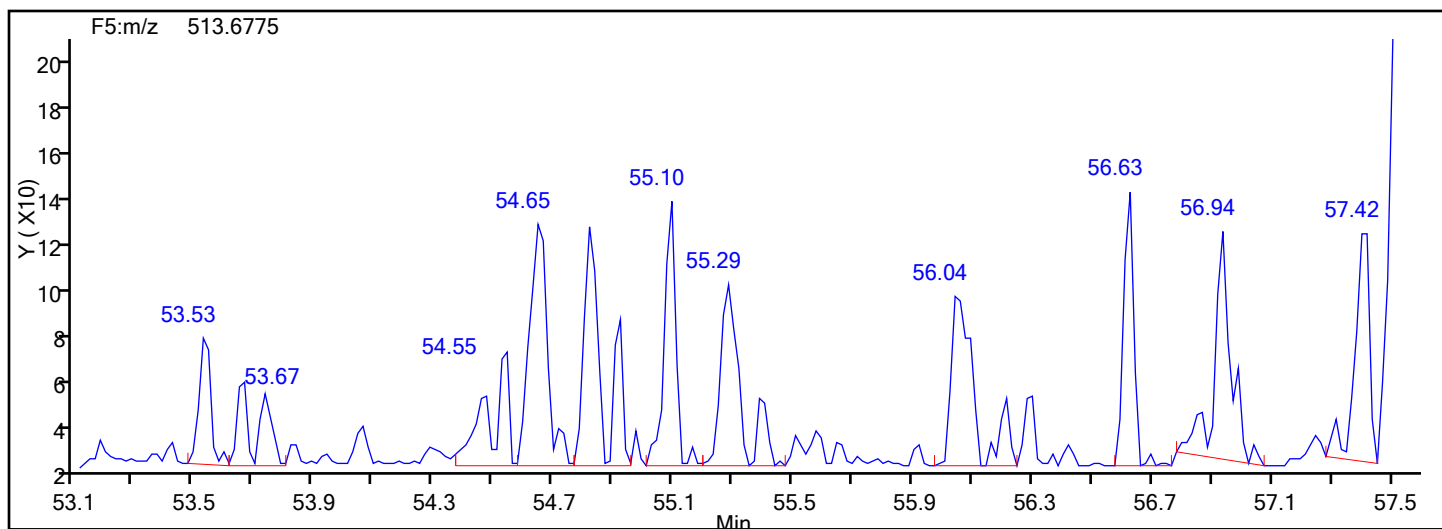
Column Type:

Column Dia:

OCDF



OCDF Interference Mass



FORM VI
RESOLUTION CHECK SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID (1): WDM 140-7768/1 Instrument ID (1): D2A

GC Column (1): RTX-5 ID: 0.32 (mm) Date Analyzed (1): 05/16/2014 10:23

ANALYTE	RT	RESOLUTION (%)
2,3,7,8-TCDD	31.85	17

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
Injection Date: 16-May-2014 10:23:00 Instrument ID: D2A
Lims ID: WDM
Client ID:
Operator ID: DavidsonM ALS Bottle#: 0 Worklist Smp#: 1
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL

2,3,7,8-TCDD

Isotopic Dilution Dioxin Method

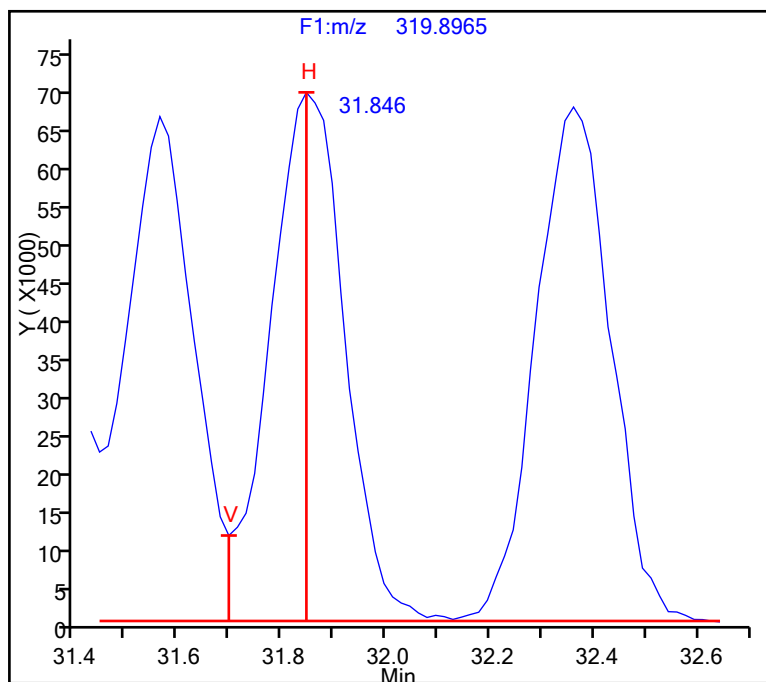
$$\%R = (V / H) * 100$$

V (Valley Height) = 11408

H (Peak Height) = 69250

$$\%R = 17 \leq 25$$

Passed



FORM VI
RESOLUTION CHECK SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1
SDG No.: _____
Lab Sample ID (1): WDMCCV 140-27191/1 Instrument ID (1): D2A
GC Column (1): RTX-5 ID: 0.32 (mm) Date Analyzed (1): 01/28/2019 01:01

ANALYTE	RT	RESOLUTION (%)
2,3,7,8-TCDD	31.00	15

TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Instrument ID: D2A
Lims ID: WDMCCV
Client ID:
Operator ID: Xcalibur_System ALS Bottle#: 0 Worklist Smp#: 1
Injection Vol: 1.0 ul Column:
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL

2,3,7,8-TCDD

Isotopic Dilution Dioxin Method

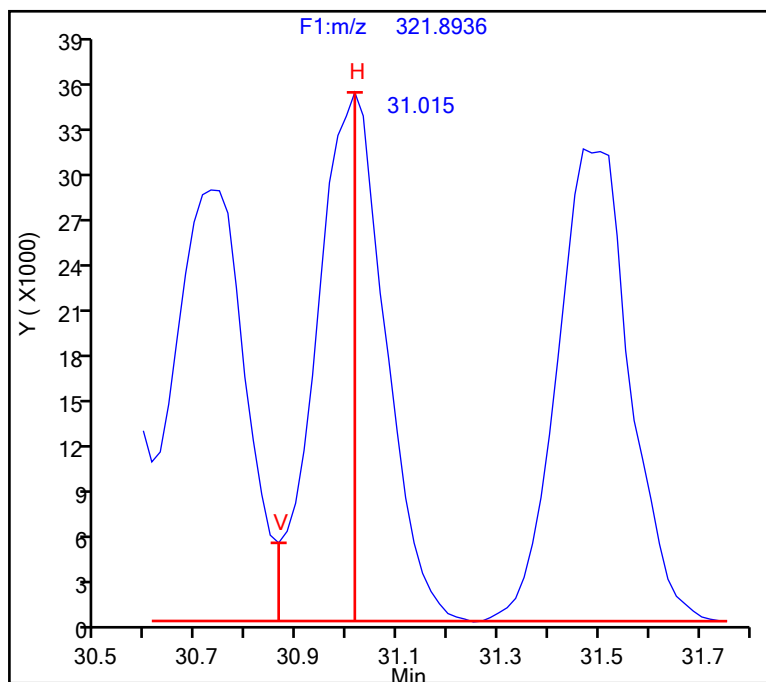
$$\%R = (V / H) * 100$$

V (Valley Height) = 5288

H (Peak Height) = 35045

$$\%R = 15 \leq 25$$

Passed



FORM VI
RESOLUTION CHECK SUMMARY

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID (1): WDMCCV 140-27242/1 Instrument ID (1): D2A

GC Column (1): RTX-5 ID: 0.32 (mm) Date Analyzed (1): 01/29/2019 09:51

ANALYTE	RT	RESOLUTION (%)
2,3,7,8-TCDD	30.97	13

TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Instrument ID: D2A
Lims ID: WDMCCV
Client ID:
Operator ID: Xcalibur_System ALS Bottle#: 0 Worklist Smp#: 1
Injection Vol: 1.0 ul Column:
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL

2,3,7,8-TCDD

Isotopic Dilution Dioxin Method

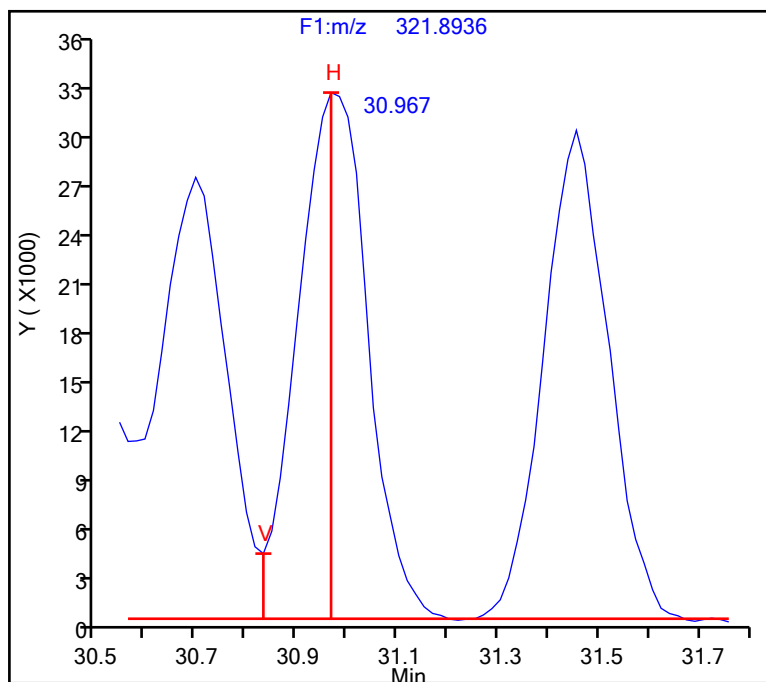
$$\%R = (V / H) * 100$$

V (Valley Height) = 4315

H (Peak Height) = 32119

$$\%R = 13 \leq 25$$

Passed



FORM VII
DIOXIN CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: ICV 140-7768/7 Calibration Date: 05/16/2014 20:36

Instrument ID: D2A Calib Start Date: 05/16/2014 14:26

GC Column: RTX-5 ID: 0.32 (mm) Calib End Date: 05/16/2014 18:31

Lab File ID: d3140516ss.d Conc. Units: pg/uL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
2,3,7,8-TCDF	AveID	1.088	1.069		9.82	10.0	-1.8	35.0
2,3,7,8-TCDD	AveID	1.173	1.088		9.27	10.0	-7.3	35.0
1,2,3,7,8-PeCDF	AveID	1.190	1.051		44.2	50.0	-11.6	35.0
2,3,4,7,8-PeCDF	AveID	1.109	1.106		49.8	50.0	-0.3	35.0
1,2,3,7,8-PeCDD	AveID	1.043	1.080		51.7	50.0	3.5	35.0
1,2,3,4,7,8-HxCDF	AveID	1.363	1.210		44.4	50.0	-11.2	35.0
1,2,3,6,7,8-HxCDF	AveID	1.276	1.178		46.1	50.0	-7.7	35.0
2,3,4,6,7,8-HxCDF	AveID	1.265	1.171		46.3	50.0	-7.5	35.0
1,2,3,4,7,8-HxCDD	AveID	1.141	1.081		47.4	50.0	-5.3	35.0
1,2,3,6,7,8-HxCDD	AveID	1.148	1.023		44.5	50.0	-10.9	35.0
1,2,3,7,8,9-HxCDD	AveID	1.221	1.075		44.0	50.0	-12.0	35.0
1,2,3,7,8,9-HxCDF	AveID	1.257	1.146		45.6	50.0	-8.9	35.0
1,2,3,4,6,7,8-HpCDF	AveID	1.498	1.371		45.7	50.0	-8.5	35.0
1,2,3,4,6,7,8-HpCDD	AveID	1.120	1.091		48.7	50.0	-2.6	35.0
1,2,3,4,7,8,9-HpCDF	AveID	1.381	1.356		49.1	50.0	-1.8	35.0
OCDD	AveID	1.207	1.096		90.7	100	-9.3	35.0
OCDF	AveID	1.116	1.302		117	100	16.7	35.0
13C-2,3,7,8-TCDF	Ave	1.755	1.954		111	100	11.4	
13C-2,3,7,8-TCDD	Ave	1.071	1.163		109	100	8.6	
13C-1,2,3,7,8-PeCDF	Ave	1.370	1.489		109	100	8.6	
13C-2,3,4,7,8-PeCDF	Ave	1.384	1.444		104	100	4.3	
13C-1,2,3,7,8-PeCDD	Ave	0.8743	0.8389		96.0	100	-4.0	
13C-1,2,3,4,7,8-HxCDF	Ave	1.189	1.260		106	100	6.0	
13C-1,2,3,6,7,8-HxCDF	Ave	1.462	1.518		104	100	3.8	
13C-2,3,4,6,7,8-HxCDF	Ave	1.320	1.402		106	100	6.2	
13C-1,2,3,4,7,8-HxCDD	Ave	0.8772	0.9166		104	100	4.5	
13C-1,2,3,6,7,8-HxCDD	Ave	0.9171	1.021		111	100	11.4	
13C-1,2,3,7,8,9-HxCDF	Ave	1.200	1.243		104	100	3.6	
13C-1,2,3,4,6,7,8-HpCDF	Ave	1.050	1.135		108	100	8.1	
13C-1,2,3,4,6,7,8-HpCDD	Ave	0.8155	0.8003		98.1	100	-1.9	
13C-1,2,3,4,7,8,9-HpCDF	Ave	0.8947	0.8904		99.5	100	-0.5	
13C-OCDD	Ave	0.7044	0.7274		207	200	3.3	
13C-OCDF	Ave	1.061	0.8403		158	200	-20.8	
37Cl4-2,3,7,8-TCDD	Ave	1.227	1.270		10.4	10.0	3.6	

TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 16-May-2014 20:36:00 ALS Bottle#: 0 Worklist Smp#: 7
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:76 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist:
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 01-Feb-2017 12:30:10 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: XAWRK012

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:32:47

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31:53	1417873	0.79	1.1733	9.273	9.273	0.0556	0.0556	92.73	
A Non-2,3,7,8-sub-TCDD	30:20	27238	0.77	0.0000						RQ
S Total TCDD					9.273	9.273	0.0556	0.0556		RQ
2,3,7,8-TCDF	29:49	2340173	0.79	1.0881	9.823	9.823	0.0298	0.0298	98.23	
A Non-2,3,7,8-sub-TCDF	28:61	61132	0.77	0.0000						RQ
S Total TCDF					9.823	9.823	0.0298	0.0298		RQ
1,2,3,7,8-PeCDD	41:03	5075088	1.55	1.0434	51.7	51.7	0.0781	0.0781	103	
A Non-2,3,7,8-sub-PeCDD	39:56						0.0	0.0		
S Total PeCDD					51.7	51.7	0.0781	0.0781		
1,2,3,7,8-PeCDF	39:20	8772190	1.60	1.1898	44.2	44.2	0.3292	0.3292	88.37	
2,3,4,7,8-PeCDF	40:31	8947470	1.58	1.1095	49.8	49.8	0.3182	0.3182	99.70	
A Non-2,3,7,8-sub-PeCDF	38:38	194618	1.55	0.0000						RQ
S Total PeCDF					94.0	94.0	0.3237	0.3237		RQ
1,2,3,4,7,8-HxCDD	45:16	6434621	1.25	1.1409	47.4	47.4	0.1781	0.1781	94.72	
1,2,3,6,7,8-HxCDD	45:23	6785615	1.25	1.1481	44.5	44.5	0.1729	0.1729	89.06	
1,2,3,7,8,9-HxCDD	45:46	6765473	1.25	1.2212	44.0	44.0	0.1645	0.1645	88.00	
A Non-2,3,7,8-sub-HxCDD	44:42	6077453	1.07	0.0000						
S Total HxCDD					135.9	135.9	0.1718	0.1718		
1,2,3,4,7,8-HxCDF	44:13	9905457	1.24	1.3629	44.4	44.4	0.1276	0.1276	88.77	
1,2,3,6,7,8-HxCDF	44:21	11612537	1.25	1.2762	46.1	46.1	0.1262	0.1262	92.27	
2,3,4,6,7,8-HxCDF	45:05	10663021	1.25	1.2654	46.3	46.3	0.1363	0.1363	92.51	
1,2,3,7,8,9-HxCDF	46:04	9252844	1.24	1.2573	45.6	45.6	0.1802	0.1802	91.12	
A Non-2,3,7,8-sub-HxCDF	44:34						0.0	0.0		
S Total HxCDF					182.3	182.3	0.1426	0.1426		
1,2,3,4,6,7,8-HpCDD	50:12	5673345	1.05	1.1204	48.7	48.7	0.2370	0.2370	97.39	
A Non-2,3,7,8-sub-HpCDD	49:35	43311	1.01	0.0000						
S Total HpCDD					48.7	48.7	0.2370	0.2370		
1,2,3,4,6,7,8-HpCDF	48:30	10105566	1.06	1.4984	45.7	45.7	0.1492	0.1492	91.47	
1,2,3,4,7,8,9-HpCDF	50:50	7845196	1.05	1.3807	49.1	49.1	0.2145	0.2145	98.23	

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
A Non-2,3,7,8-sub-HpCDF	49:39						0.0	0.0		
S Total HpCDF					94.9	94.9	0.1818	0.1818		
OCDD	54:20	10353088	0.91	1.2073	90.7	90.7	0.1168	0.1168	90.74	
OCDF	54:27	14219371	0.91	1.1162	116.7	116.7	0.1569	0.1569	117	
D 13C-2,3,7,8-TCDD	31:49	13031572	0.81	1.0709	108.6	108.6	0.2879	0.2879	109	
D 13C-2,3,7,8-TCDF	29:46	21894242	0.80	1.7545	111.4	111.4	0.3328	0.3328	111	
D 13C-1,2,3,7,8-PeCDD	40:61	9401272	1.59	0.8743	96.0	96.0	0.3372	0.3372	95.95	
D 13C-1,2,3,7,8-PeCDF	39:17	16685645	1.58	1.3704	108.6	108.6	0.5610	0.5610	109	
D 13C-2,3,4,7,8-PeCDF	40:30	16178636	1.60	1.3837	104.3	104.3	0.5556	0.5556	104	
D 13C-1,2,3,4,7,8-HxCDD	45:15	11909770	1.26	0.8772	104.5	104.5	0.1864	0.1864	104	
D 13C-1,2,3,6,7,8-HxCDD	45:22	13272005	1.28	0.9171	111.4	111.4	0.1783	0.1783	111	
D 13C-1,2,3,4,7,8-HxCDF	44:12	16374250	0.52	1.1892	106.0	106.0	0.1201	0.1201	106	
D 13C-1,2,3,6,7,8-HxCDF	44:20	19722109	0.52	1.4625	103.8	103.8	0.0977	0.0977	104	
D 13C-2,3,4,6,7,8-HxCDF	45:04	18217439	0.53	1.3197	106.2	106.2	0.1082	0.1082	106	
D 13C-1,2,3,7,8,9-HxCDF	46:03	16152585	0.52	1.2001	103.6	103.6	0.1190	0.1190	104	
D 13C-1,2,3,4,6,7,8-HpCDD	50:11	10398852	1.09	0.8155	98.1	98.1	0.0233	0.0233	98.14	
D 13C-1,2,3,4,6,7,8-HpCDF	48:28	14746195	0.45	1.0496	108.1	108.1	0.1265	0.1265	108	
D 13C-1,2,3,4,7,8,9-HpCDF	50:49	11568712	0.47	0.8947	99.5	99.5	0.1484	0.1484	99.51	
D 13C-OCDD	54:18	18901029	0.92	0.7044	206.5	206.5	0.1411	0.1411	103	
D 13C-OCDF	54:27	21836911	0.89	1.0615	158.3	158.3	0.0854	0.0854	79.17	
\$ 37Cl4-2,3,7,8-TCDD	31:53	1423356		1.2266	10.4	10.4	0.0168	0.0168	104	
* 13C-1,2,3,4-TCDD	31:18	11206563	0.82	9.1E+04	100.0	100.0				
* 13C-1,2,3,7,8,9-HxCDD	45:45	12993023	1.26	1E+05	100.0	100.0				

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

Reagents:

61CV1613OS_00005

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 16-May-2014 20:36:00 ALS Bottle#: 0 Worklist Smp#: 7
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:76 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Sublist:
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 01-Feb-2017 12:30:10 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: XAWRK012

First Level Reviewer: davidsonm

Date: 11-Jan-2017 16:32:47

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,7,8-TCDD											
319.8965	31:53	31:53	0	1.002	625068	60444	179	447	338		
321.8936	31:53	31:53	0	1.002	792805	81677	166	415	492	0.79(0.65-0.89)	
A Non-2,3,7,8-sub-TCDD											RQ
319.8965	31:36	30:20	77		14371	1924	179	447	11		
321.8936	31:38	30:20	79		15389	2519	166	415	15	0.93(0.65-0.89)	
2,3,7,8-TCDF											
303.9016	29:49	29:49	0	1.002	1031334	108919	158	395	689		
305.8987	29:49	29:49	0	1.002	1308839	141742	155	387	914	0.79(0.65-0.89)	
A Non-2,3,7,8-sub-TCDF											RQ
303.9016	27:53	28:61	-68		9888	1534	158	395	10		
305.8987	27:55	28:61	-66		12672	2036	155	387	13	0.78(0.65-0.89)	
303.9016	34:42	28:61	340		16780	2164	158	395	14		
305.8987	34:43	28:61	341		115682	4841	155	387	31	0.15(0.65-0.89)	
1,2,3,7,8-PeCDD											
355.8546	41:03	41:03	0	1.001	3087321	702702	295	737	2382		
357.8516	41:02	41:03	-1	1.000	1987767	465184	422	1055	1102	1.55(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDD											
355.8546	39:56						295	737			
357.8516	39:56						422	1055			
1,2,3,7,8-PeCDF											
339.8597	39:20	39:20	0	1.001	5404007	1115966	2501	6252	446		
341.8567	39:20	39:20	0	1.001	3368183	689033	2774	6935	248	1.60(1.32-1.78)	
2,3,4,7,8-PeCDF											
339.8597	40:31	40:31	0	1.000	5473120	1239165	2501	6252	495		
341.8567	40:31	40:31	0	1.000	3474350	799162	2774	6935	288	1.58(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-PeCDF											RQ
339.8597	39:50	38:38	71		138716	26751	2501	6252	11		
341.8567	39:50	38:38	71		76321	15381	2774	6935	6	1.82(1.32-1.78)	
1,2,3,4,7,8-HxCDD											
389.8158	45:16	45:16	0	1.000	3579248	927964	1313	3282	707		
391.8127	45:16	45:16	0	1.000	2855373	725887	1200	3000	605	1.25(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45:23	45:23	0	1.000	3774978	909011	1313	3282	692		
391.8127	45:23	45:23	0	1.000	3010637	734850	1200	3000	612	1.25(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45:46	45:46	0	1.012	3754712	862716	1313	3282	657		
391.8127	45:46	45:46	0	1.012	3010761	693378	1200	3000	578	1.25(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDD											
389.8158	44:38	44:42	-5		3139465	355478	1313	3282	271		
391.8127	44:38	44:42	-5		2937988	346912	1200	3000	289	1.07(1.05-1.43)	
1,2,3,4,7,8-HxCDF											
373.8208	44:13	44:13	0	1.000	5487400	1497391	1821	4552	822		
375.8178	44:13	44:13	0	1.000	4418057	1193324	1292	3230	924	1.24(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44:21	44:21	0	1.000	6453112	1603982	1821	4552	881		
375.8178	44:21	44:21	0	1.000	5159425	1253054	1292	3230	970	1.25(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	45:05	45:05	0	1.000	5919412	1461157	1821	4552	802		
375.8178	45:05	45:05	0	1.000	4743609	1190672	1292	3230	922	1.25(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	46:04	46:04	0	1.000	5114596	1110954	1821	4552	610		
375.8178	46:03	46:04	-1	1.000	4138248	899907	1292	3230	697	1.24(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDF											
373.8208	44:34						1821	4552			
375.8178	44:34						1292	3230			
1,2,3,4,6,7,8-HpCDD											
423.7767	50:12	50:12	0	1.000	2908005	549724	901	2252	610		
425.7737	50:12	50:12	0	1.000	2765340	524474	1173	2932	447	1.05(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											
423.7767	48:59	49:35	-36		21729	5130	901	2252	6		
425.7737	48:60	49:35	-35		21582	5123	1173	2932	4	1.01(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF											
407.7817	48:30	48:30	0	1.001	5205525	1048507	1360	3400	771		
409.7788	48:29	48:30	-1	1.000	4900041	996621	1290	3225	773	1.06(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50:50	50:50	0	1.000	4012075	797853	1360	3400	587		
409.7788	50:50	50:50	0	1.000	3833121	754937	1290	3225	585	1.05(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDF											
407.7817	49:39						1360	3400			
409.7788	49:39						1290	3225			

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
OCDD											
457.7377	54:20	54:20	0	1.000	4936199	1099344	554	1385	1984		
459.7348	54:18	54:20	-1	1.000	5416889	1240830	651	1627	1906	0.91(0.76-1.02)	
OCDF											
441.7428	54:27	54:27	0	1.000	6768152	1570191	718	1795	2187		
443.7399	54:27	54:27	0	1.000	7451219	1761771	1059	2647	1664	0.91(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	31:49	31:50	0	1.016	5815191	584676	597	1492	979		
333.9338	31:50	31:50	0	1.017	7216381	737228	843	2107	875	0.81(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	29:46	29:45	0	0.951	9740010	1056104	1458	3645	724		
317.9389	29:46	29:45	0	0.951	12154232	1352506	1269	3172	1066	0.80(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40:61	40:60	0	1.310	5770571	1350495	883	2207	1529		
369.8919	40:61	40:60	0	1.310	3630701	849050	494	1235	1719	1.59(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	39:17	39:17	0	1.255	10209440	2060178	1791	4477	1150		
353.8970	39:17	39:17	0	1.255	6476205	1306438	1800	4500	726	1.58(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40:30	40:29	0	1.294	9958166	2298930	1791	4477	1284		
353.8970	40:30	40:29	0	1.294	6220470	1436425	1800	4500	798	1.60(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	45:15	45:14	1	0.989	6640939	1716989	1276	3190	1346		
403.8529	45:15	45:14	1	0.989	5268831	1375213	660	1650	2084	1.26(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45:22	45:21	1	0.992	7448022	1763686	1276	3190	1382		
403.8529	45:22	45:21	1	0.992	5823983	1400199	660	1650	2122	1.28(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	44:12	44:11	1	0.966	5572913	1526862	563	1407	2712		
385.8610	44:12	44:11	1	0.966	10801337	2947711	1128	2820	2613	0.52(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	44:20	44:19	1	0.969	6720563	1680247	563	1407	2984		
385.8610	44:20	44:19	1	0.969	13001546	3153048	1128	2820	2795	0.52(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	45:04	45:03	0	0.985	6334059	1563970	563	1407	2778		
385.8610	45:04	45:03	0	0.985	11883380	2946859	1128	2820	2612	0.53(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	46:03	46:01	1	1.006	5526618	1177745	563	1407	2092		
385.8610	46:01	46:01	0	1.006	10625967	2256210	1128	2820	2000	0.52(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	50:11	50:09	1	1.097	5427250	1008813	153	382	6594		
437.8140	50:11	50:09	1	1.097	4971602	943619	72	180	13106	1.09(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48:28	48:27	0	1.059	4588031	915667	791	1977	1158		
419.8220	48:28	48:27	0	1.059	10158164	2048687	781	1952	2623	0.45(0.51-0.37)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50:49	50:48	1	1.111	3700112	716176	791	1977	905		
419.8220	50:49	50:48	1	1.111	7868600	1520419	781	1952	1947	0.47(0.37-0.51)	
13C-OCDD											
469.7780	54:18	54:17	1	1.187	9058974	2055731	645	1612	3187		
471.7750	54:18	54:17	1	1.187	9842055	2215791	532	1330	4165	0.92(0.76-1.02)	
13C-OCDF											
453.7830	54:27	54:26	1	1.190	10295647	2421522	579	1447	4182		
455.7801	54:27	54:26	1	1.190	11541264	2651395	494	1235	5367	0.89(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31:53	31:53	0	1.019	1423356	147302	96	240	1534		
13C-1,2,3,4-TCDD											
331.9368	31:18	31:18	0		5037847	530028	597	1492	888		
333.9338	31:18	31:18	0		6168716	637618	843	2107	756	0.82(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45:45	45:45	0		7238094	1648269	1276	3190	1292		
403.8529	45:45	45:45	0		5754929	1311453	660	1650	1987	1.26(1.05-1.43)	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Reagents:

61CV1613OS_00005

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d
Lims ID: ICV
Client ID:
Inject. Date: 16-May-2014 20:36:00 Dil. Factor: 1.0000
Sample Type: ICV, ICal Verification
Instrument ID: D2A Operator: DavidsonM
Lims Batch ID: 7768 Lims Sample ID: 7
Sublist:

Non-2,3,7,8-sub-TCDD, RT: 30.308

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	319.8965 Area	319.8965 Height	321.8936 Area	321.8936 Height	Amount	Ratio	Flags
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31:36 14371 1924 15389 2519 0.93 R

Signal Totals:
14371 1924 15389 2519

Total Responses:

Rx Area	Rx Height	Amount	Ratio	Flags
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29760 4443 0.93 RQ
27238 4458 Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (29760 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (27238 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d
 Lims ID: ICV
 Client ID:
 Inject. Date: 16-May-2014 20:36:00 Dil. Factor: 1.0000
 Sample Type: ICV, ICal Verification
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 7
 Sublist:

Non-2,3,7,8-sub-TCDF, RT: 28.995

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
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27:53 9888 1534 12672 2036 0.78 n
 34:42 16780 2164 115682 4841 0.15 R

Signal Totals:
 26668 3698 128354 6877

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
--	---------	-----------	--	--	--------	-------	-------

155022 10575 0.21 RQ
 61132 8544 Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (155022 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (61132 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d
 Lims ID: ICV
 Client ID:
 Inject. Date: 16-May-2014 20:36:00 Dil. Factor: 1.0000
 Sample Type: ICV, ICal Verification
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 7
 Sublist:

Non-2,3,7,8-sub-PeCDF, RT: 38.623

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	339.8597 Area	339.8597 Height	341.8567 Area	341.8567 Height	Amount	Ratio	Flags
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39:50 138716 26751 76321 15381 1.82 Rn

Signal Totals:
138716 26751 76321 15381

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
--	---------	-----------	--	--	--------	-------	-------

215037 42132 1.82 RQ

194618 39221 Empc Correction

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (215037 * 0.0) / (0 * 0.000)

Empc Amount: 0.0 = (194618 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

n - Failed Sig-To-Noise Test

Q - EMPC-Estimated Max. Possible Conc.

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d
 Lims ID: ICV
 Client ID:
 Inject. Date: 16-May-2014 20:36:00 Dil. Factor: 1.0000
 Sample Type: ICV, ICal Verification
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 7
 Sublist:

Non-2,3,7,8-sub-HxCDD, RT: 44.687

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
-----------------	-----	----------------------	--------------	------	--------

Invalid SimRptGroup

Sum the Uncalibrated Results

RT	389.8158 Area	389.8158 Height	391.8127 Area	391.8127 Height	Amount	Ratio	Flags
----	---------------	-----------------	---------------	-----------------	--------	-------	-------

44:38 3139465 355478 2937988 346912 1.07

Signal Totals:

3139465 355478 2937988 346912

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	6077453	702390				1.07	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (6077453 * 0.0) / (0 * 0.000)

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d
 Lims ID: ICV
 Client ID:
 Inject. Date: 16-May-2014 20:36:00 Dil. Factor: 1.0000
 Sample Type: ICV, ICal Verification
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 7
 Sublist:

Non-2,3,7,8-sub-HpCDD, RT: 49.566

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
-----------------	-----	----------------------	--------------	------	--------

Invalid SimRptGroup

Sum the Uncalibrated Results

RT	423.7767 Area	423.7767 Height	425.7737 Area	425.7737 Height	Amount	Ratio	Flags
----	---------------	-----------------	---------------	-----------------	--------	-------	-------

48:59 21729 5130 21582 5123 1.01 n

Signal Totals:

21729 5130 21582 5123

Total Responses:

Rx Area	Rx Height			Amount	Ratio	Flags
43311	10253				1.01	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (43311 * 0.0) / (0 * 0.000)

QC Flag Legend

Processing Flags

n - Failed Sig-To-Noise Test

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

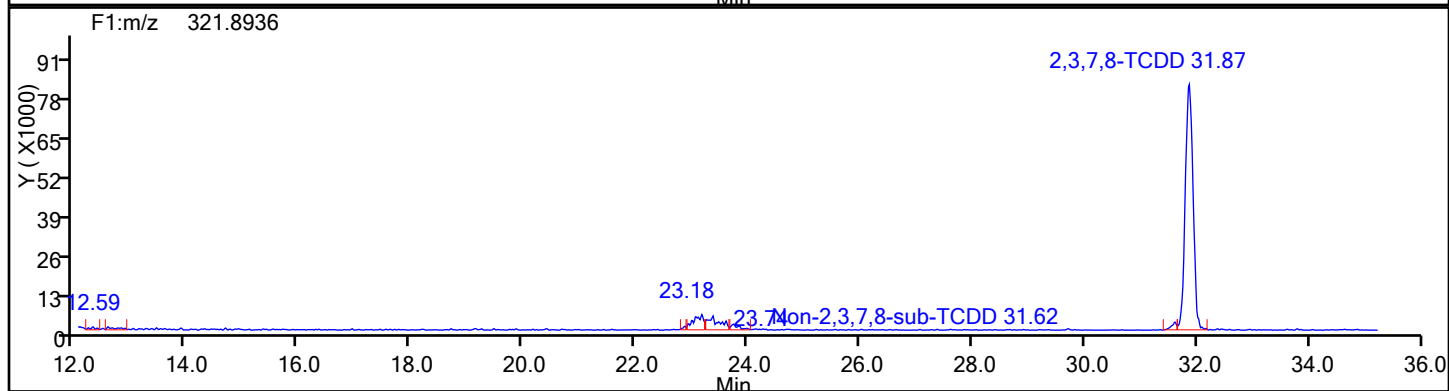
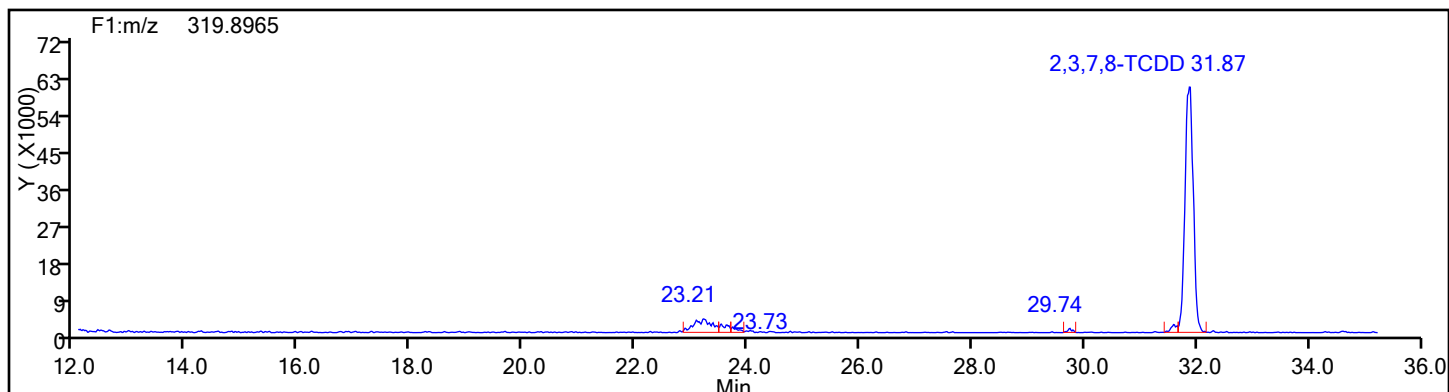
Worklist#: 7768

Sample Line#: 7

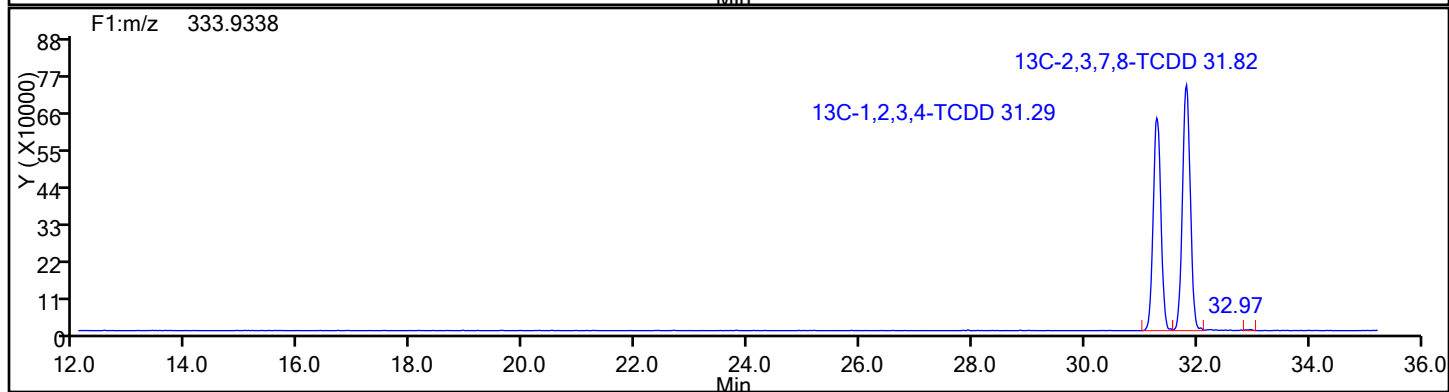
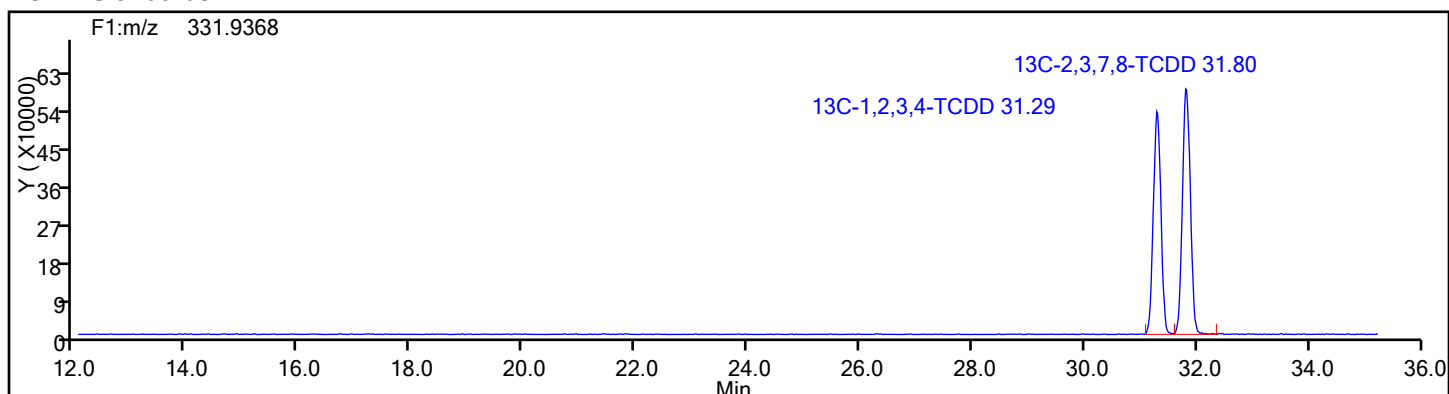
Column Type:

Column Dia:

TCDD



TCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

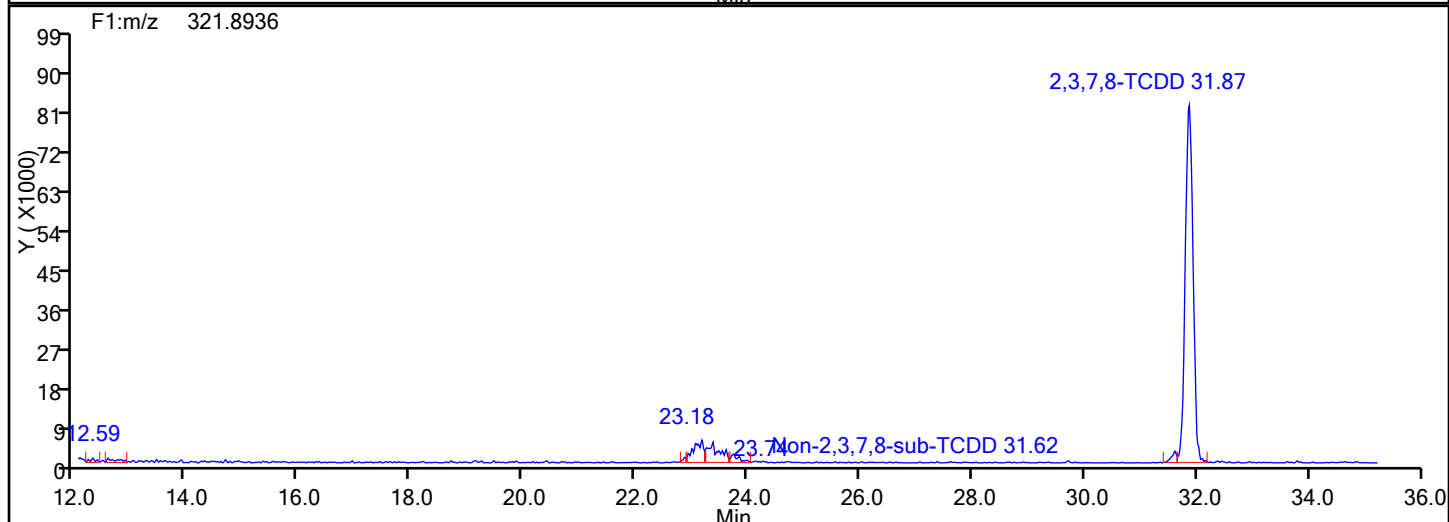
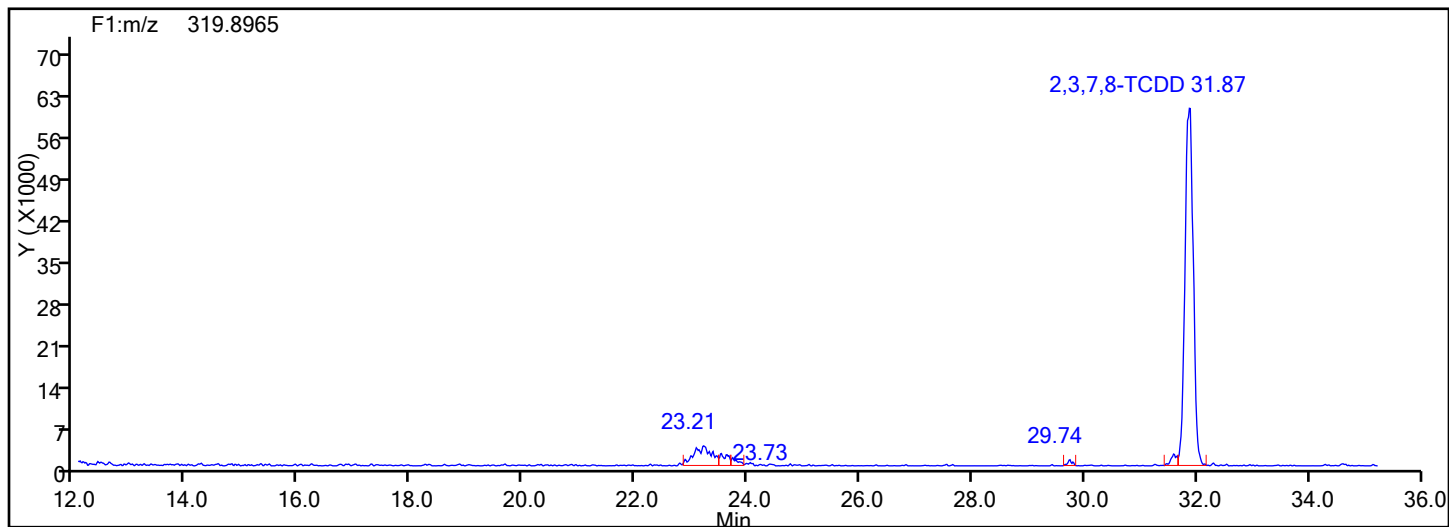
Worklist#: 7768

Sample Line#: 7

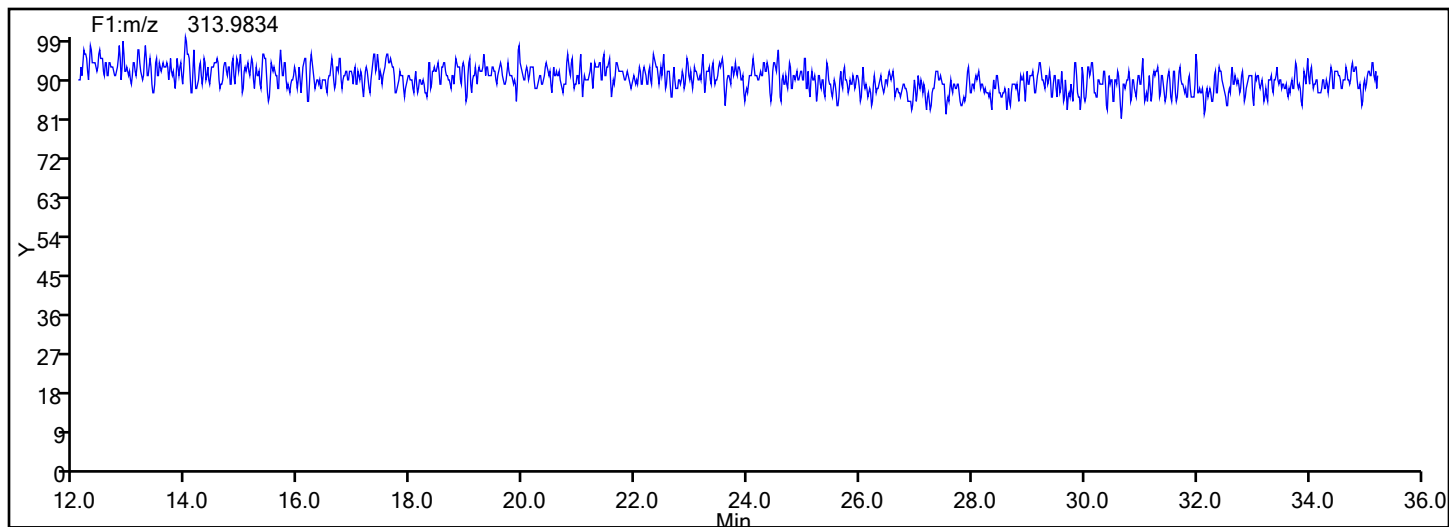
Column Type:

Column Dia:

TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

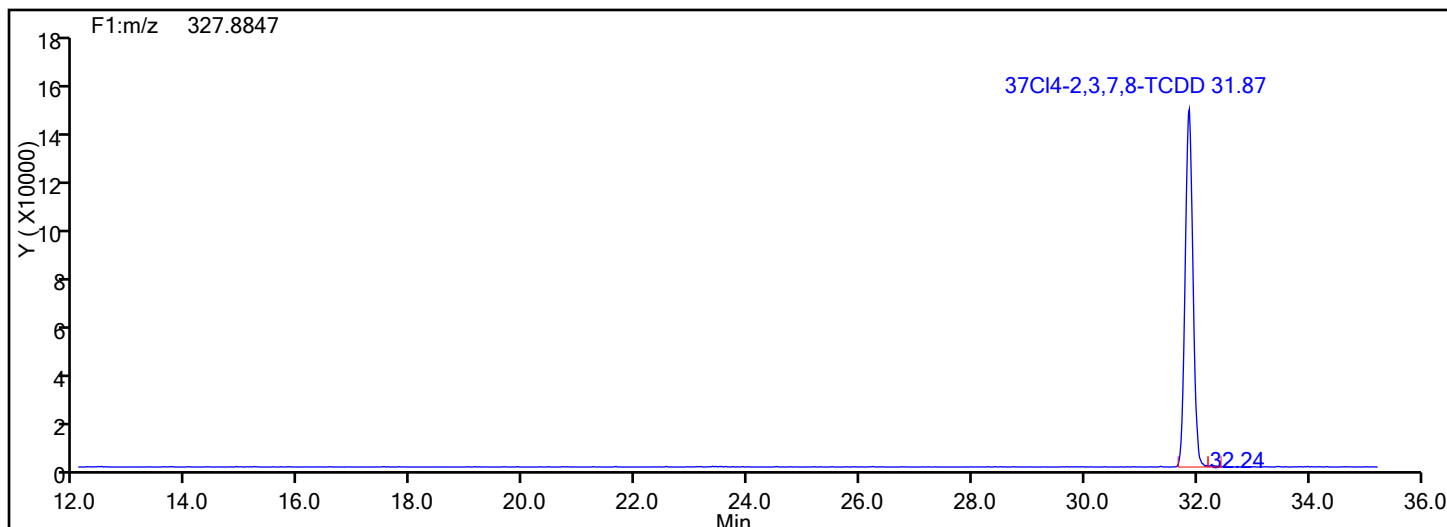
Worklist#: 7768

Sample Line#: 7

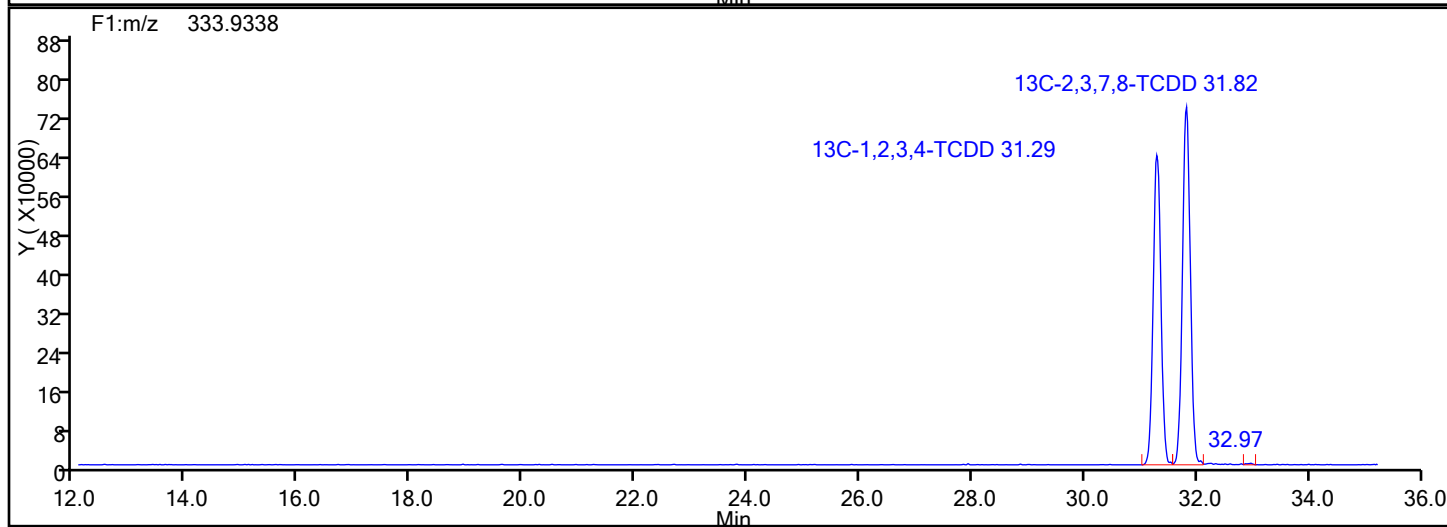
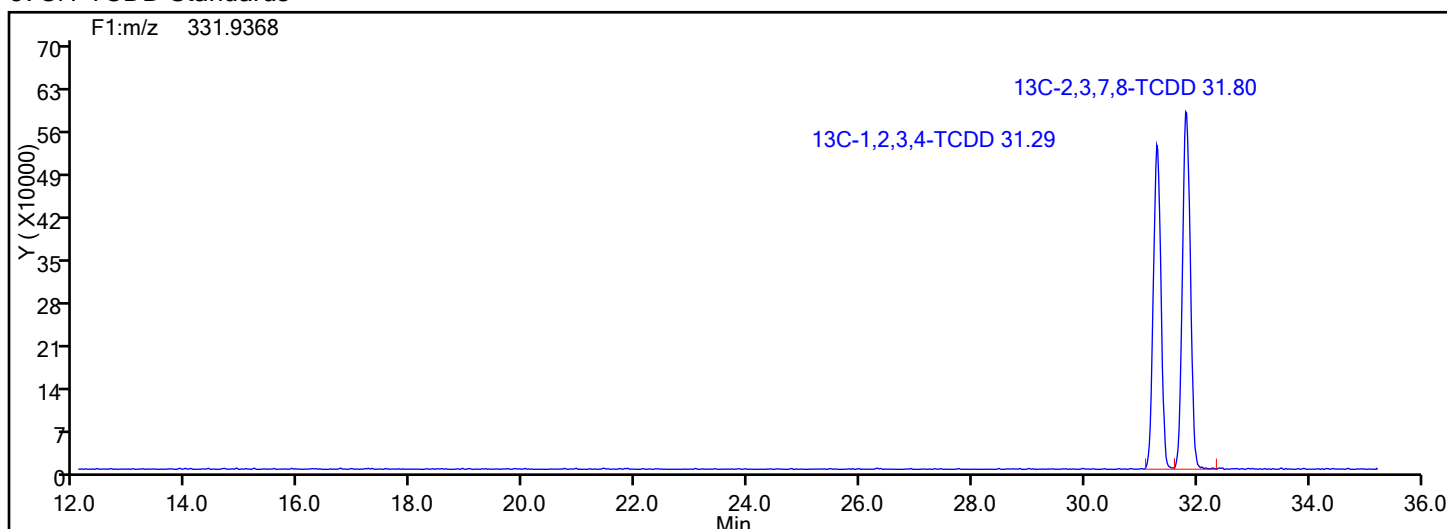
Column Type:

Column Dia:

37Cl4-TCDD



37Cl4-TCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

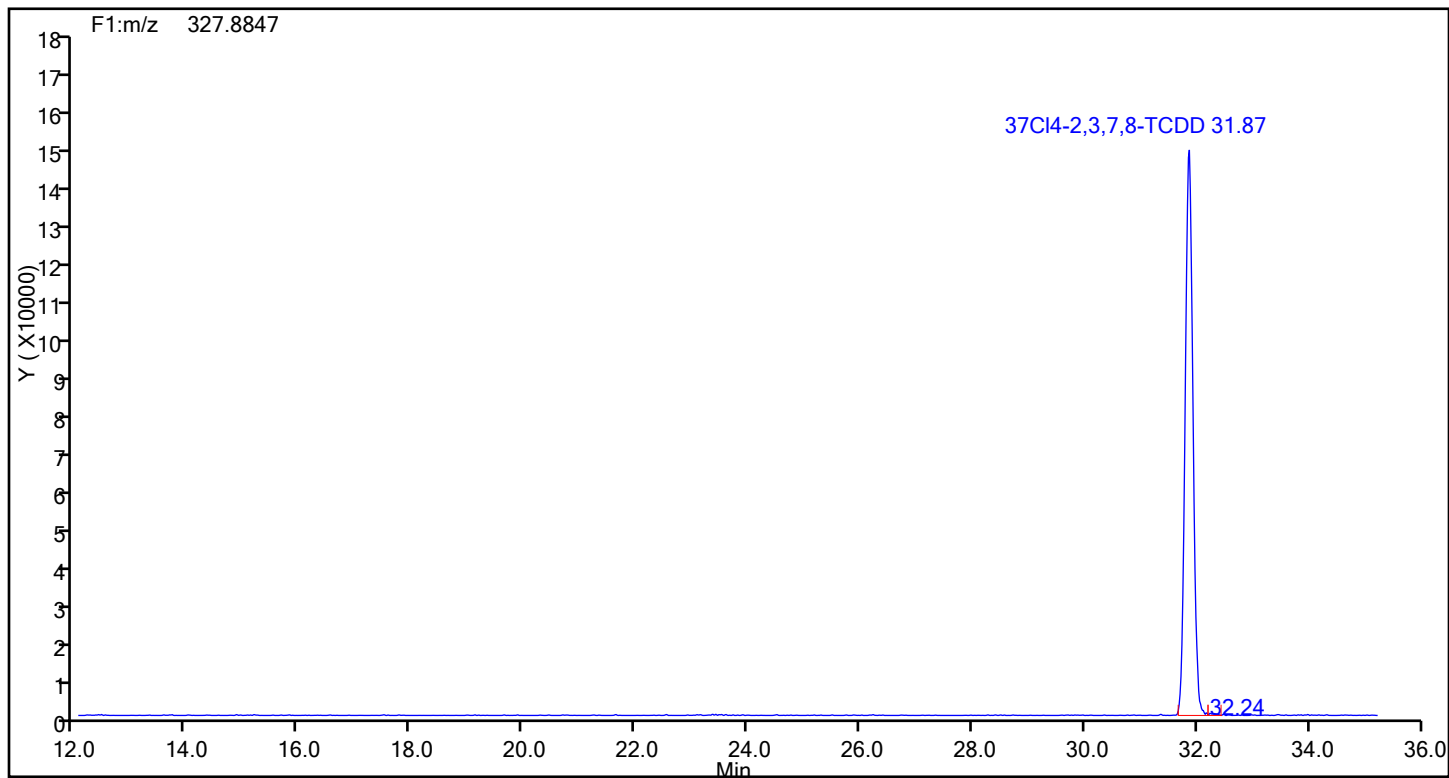
Worklist#: 7768

Sample Line#: 7

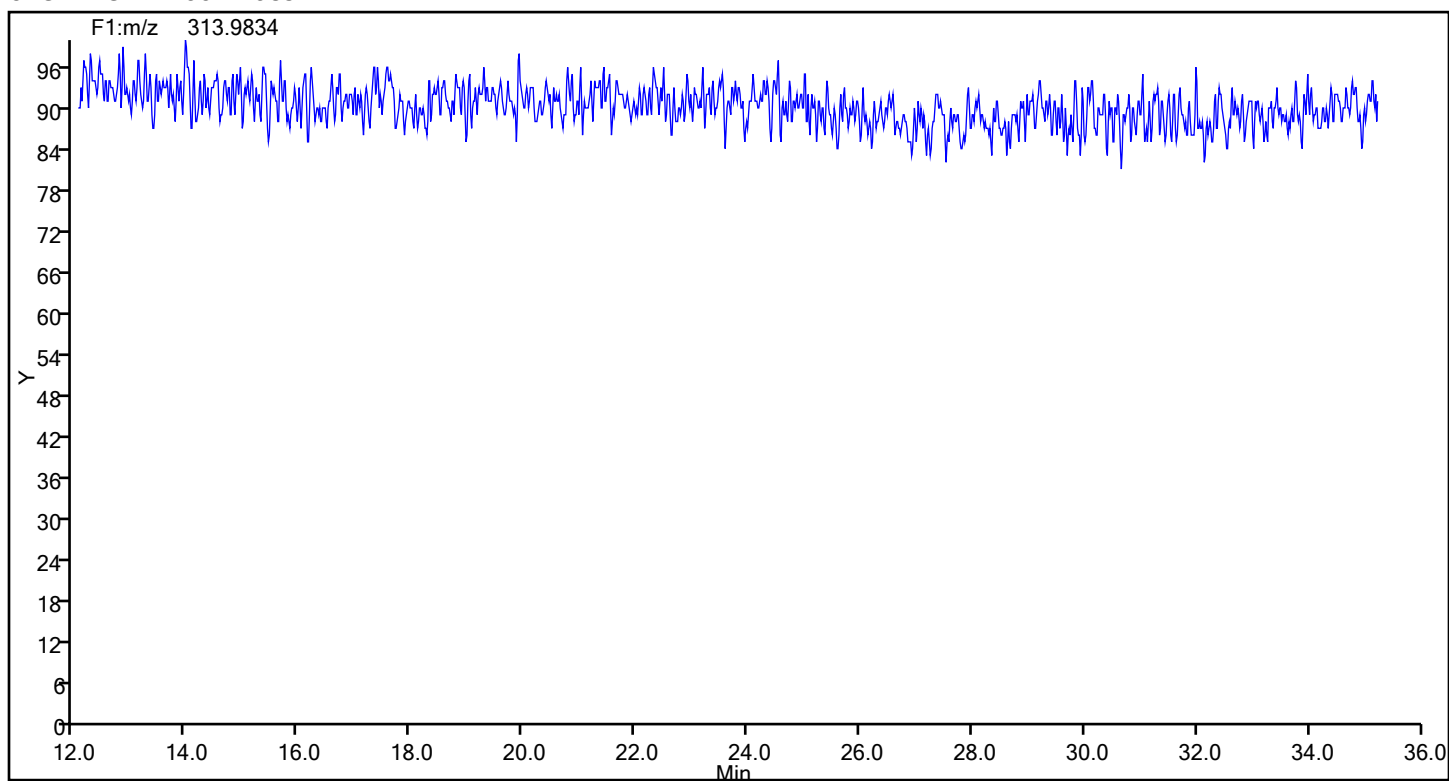
Column Type:

Column Dia:

37Cl4-TCDD



37Cl4-TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

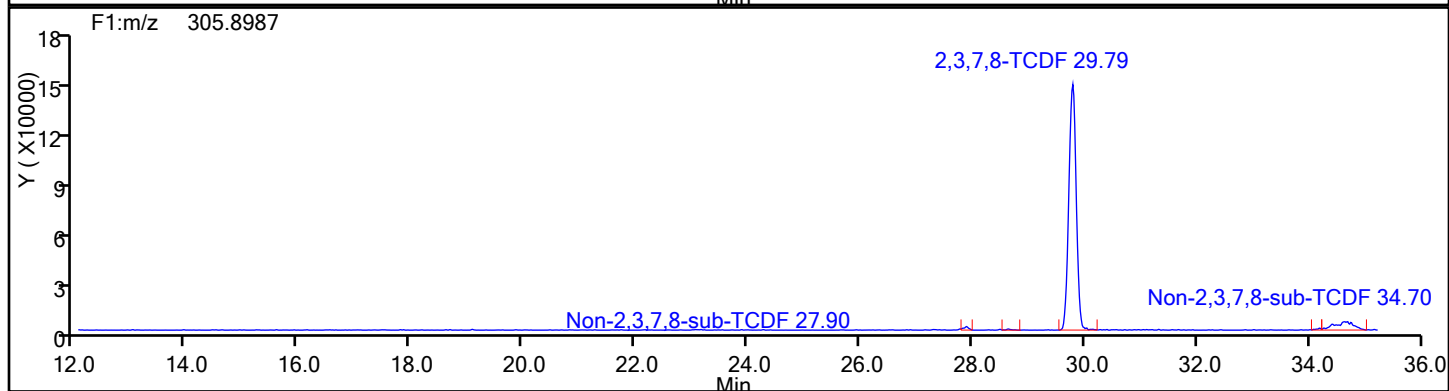
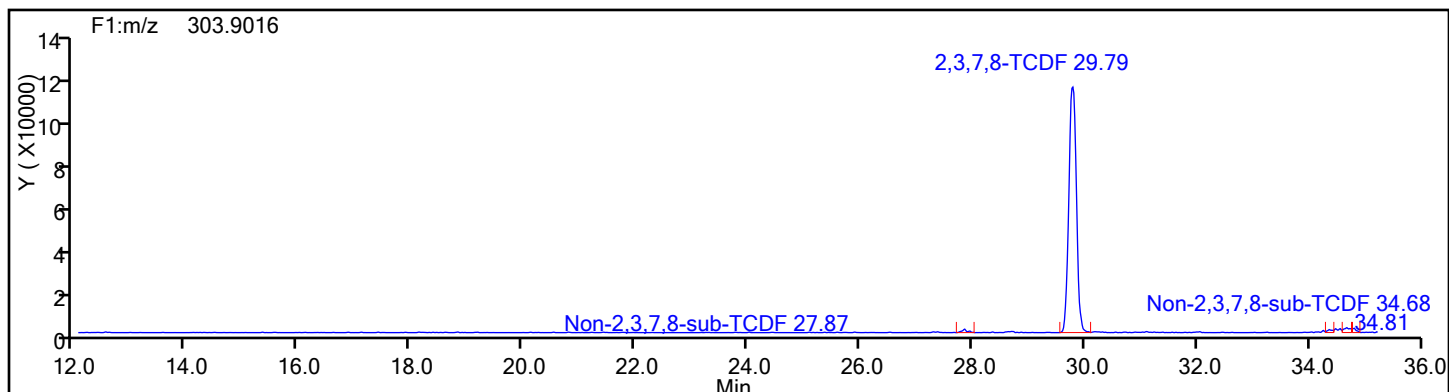
Worklist#: 7768

Sample Line#: 7

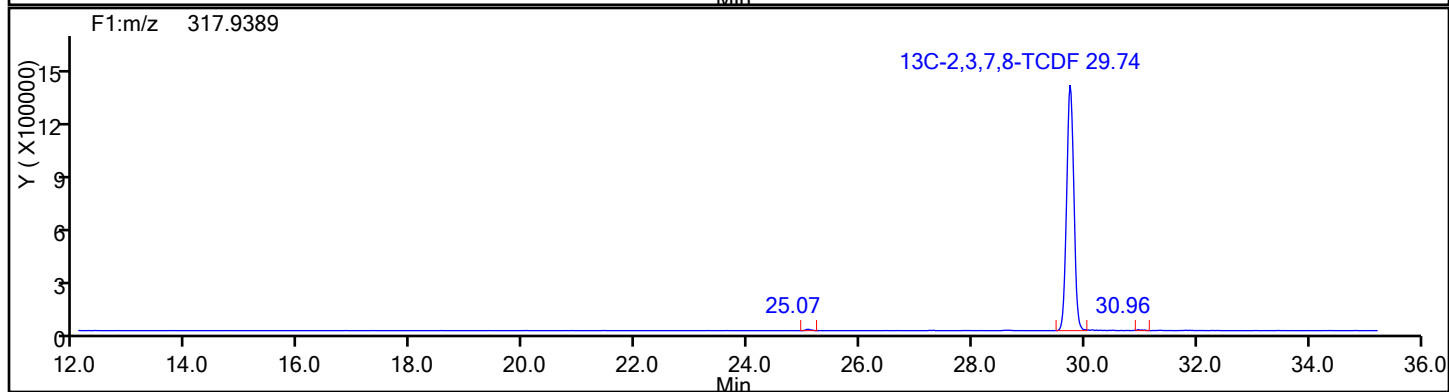
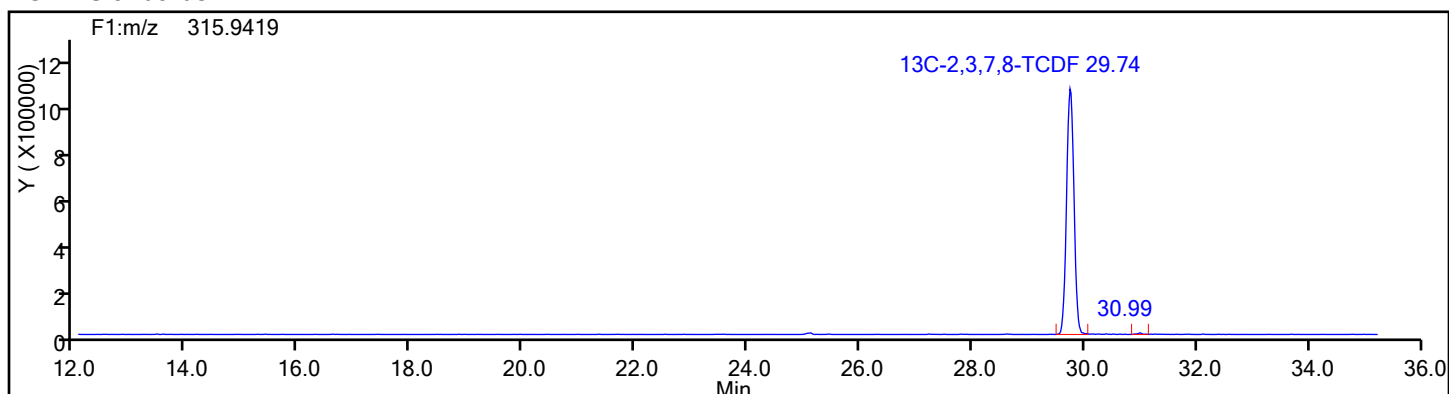
Column Type:

Column Dia:

TCDF



TCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

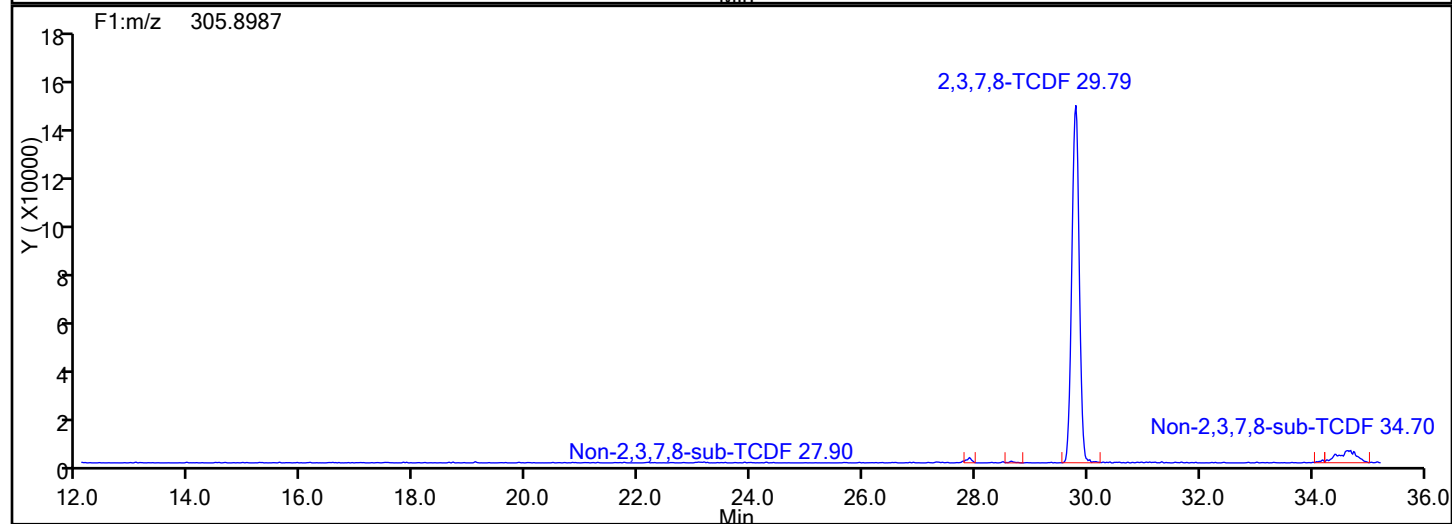
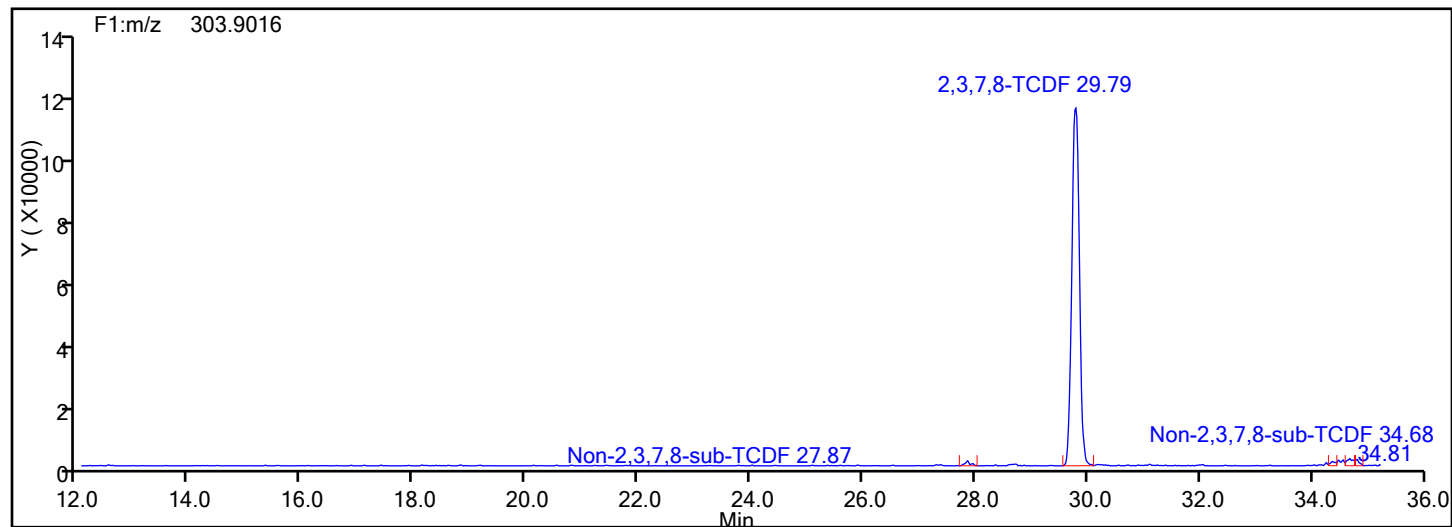
Worklist#: 7768

Sample Line#: 7

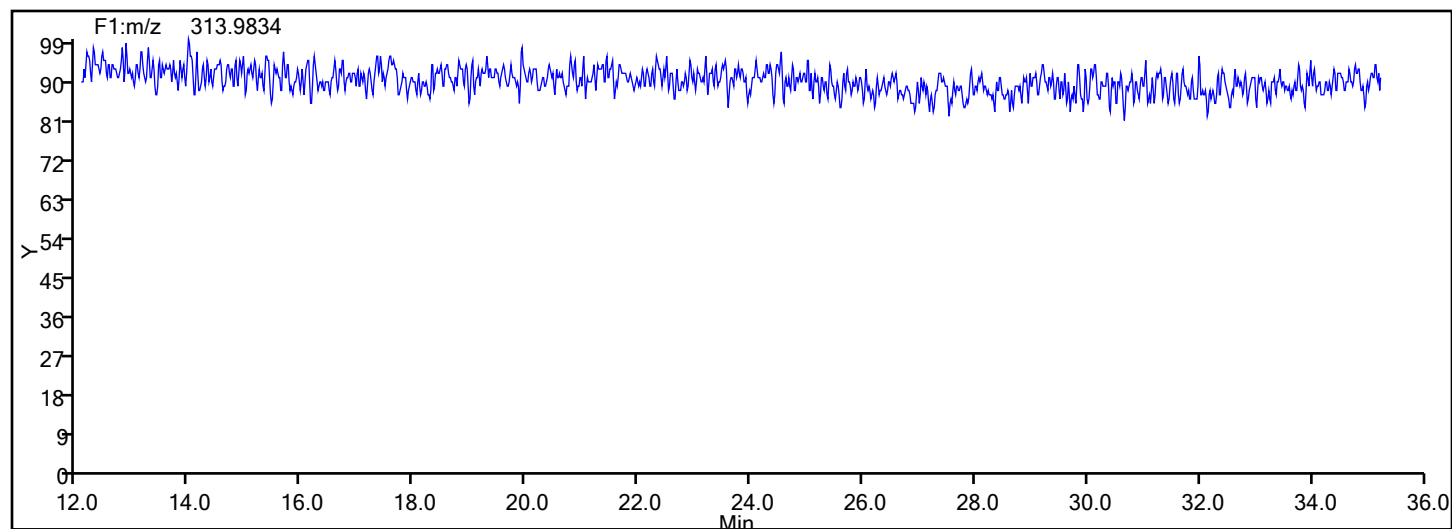
Column Type:

Column Dia:

TCDF



TCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

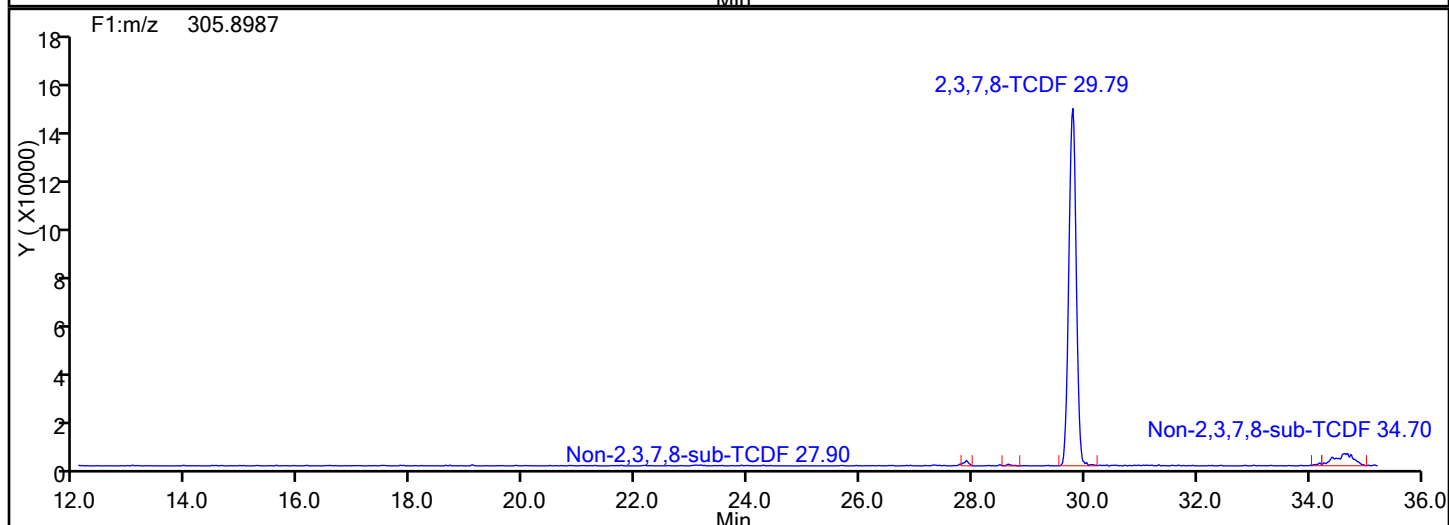
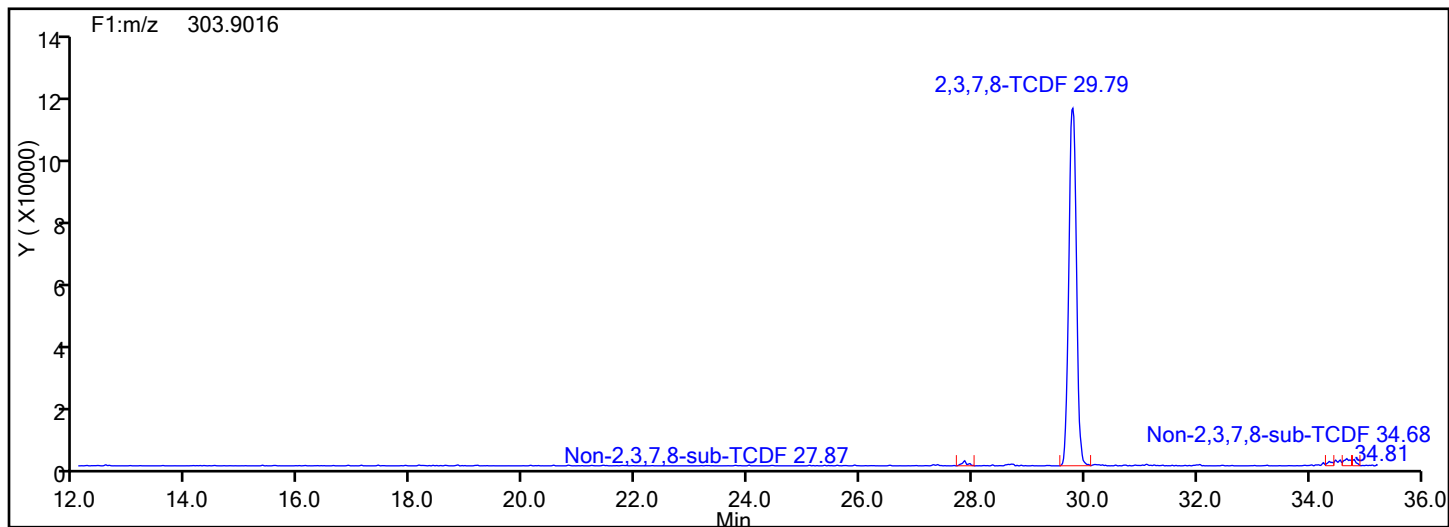
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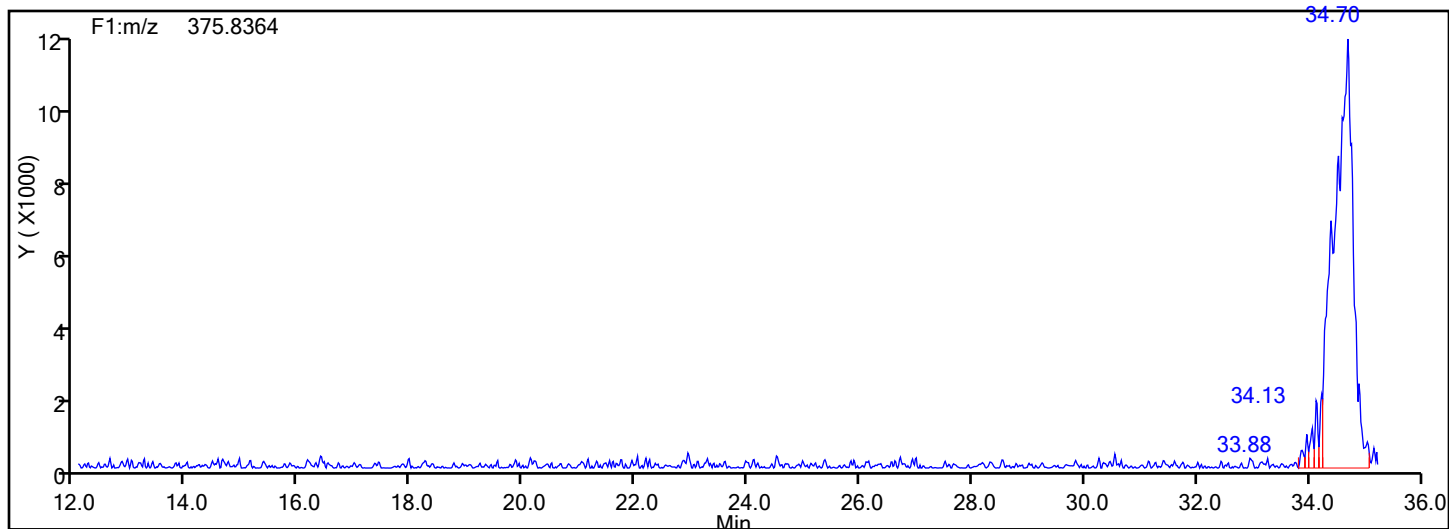
Column Type:

Column Dia:

TCDF



TCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

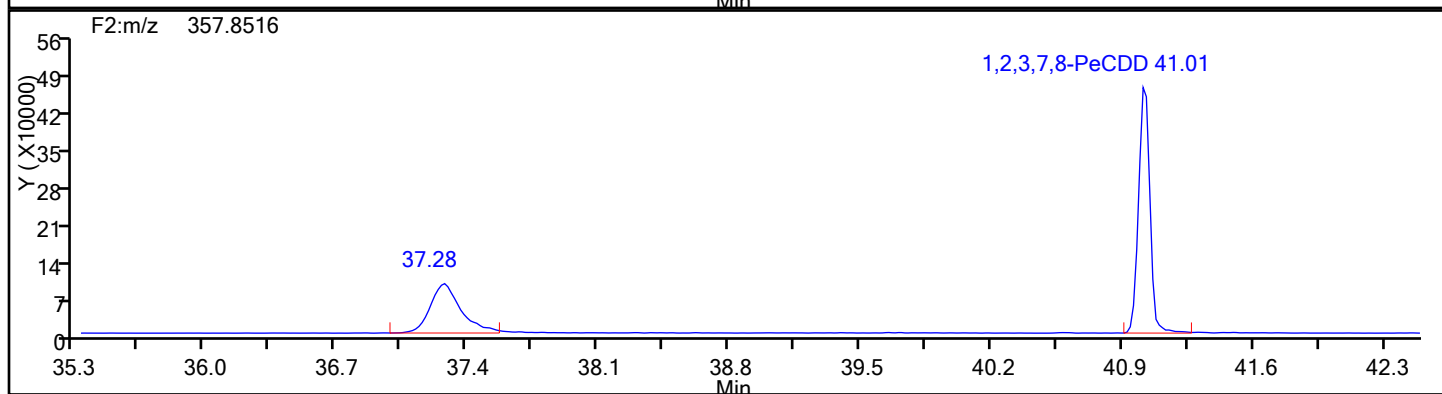
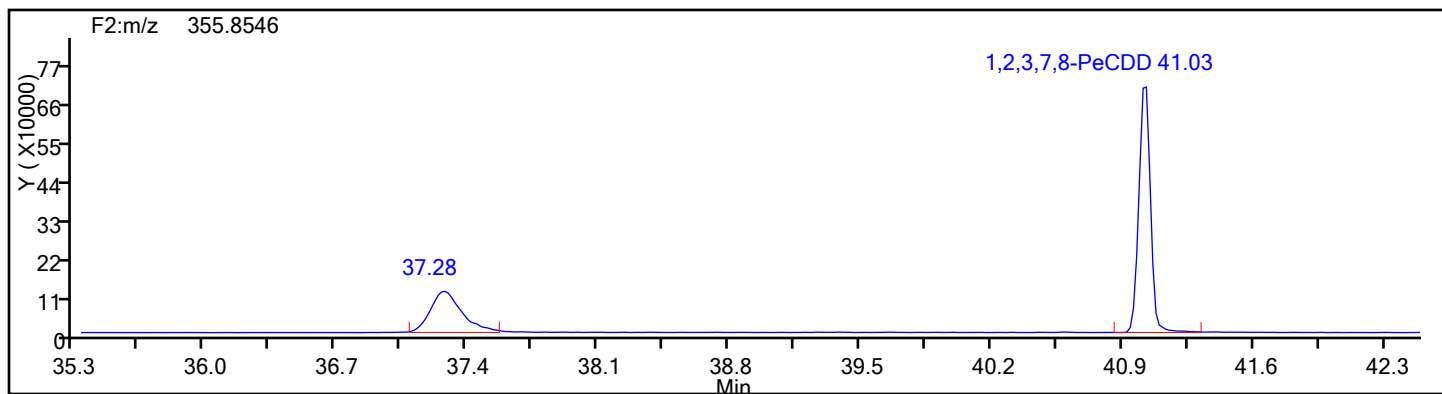
Worklist#: 7768

Sample Line#: 7

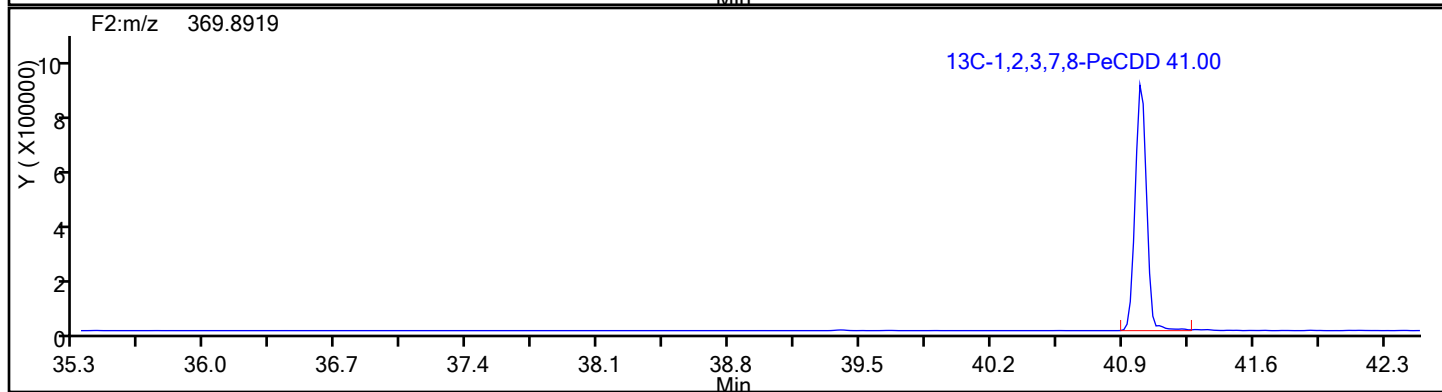
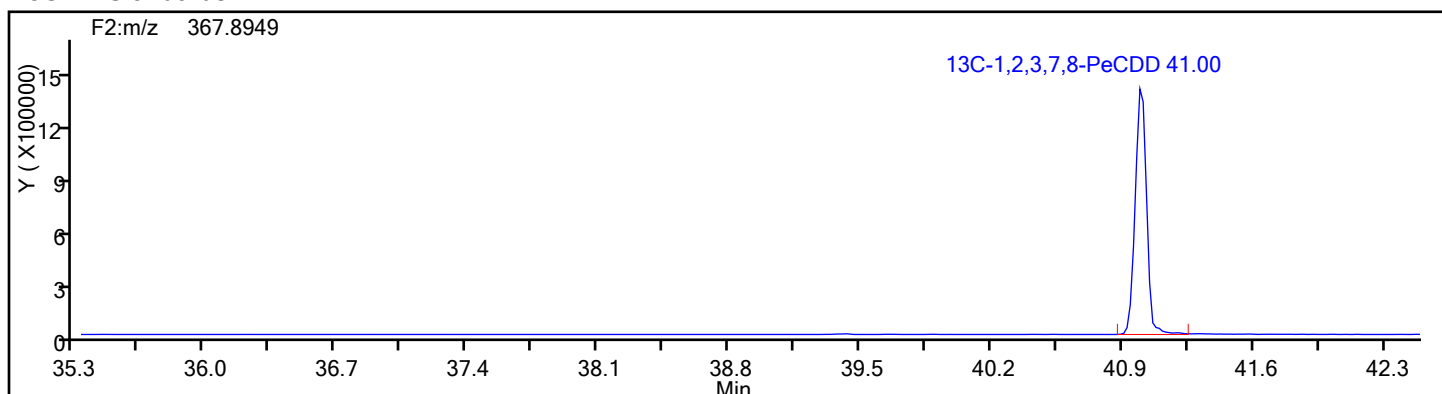
Column Type:

Column Dia:

PeCDD



PeCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

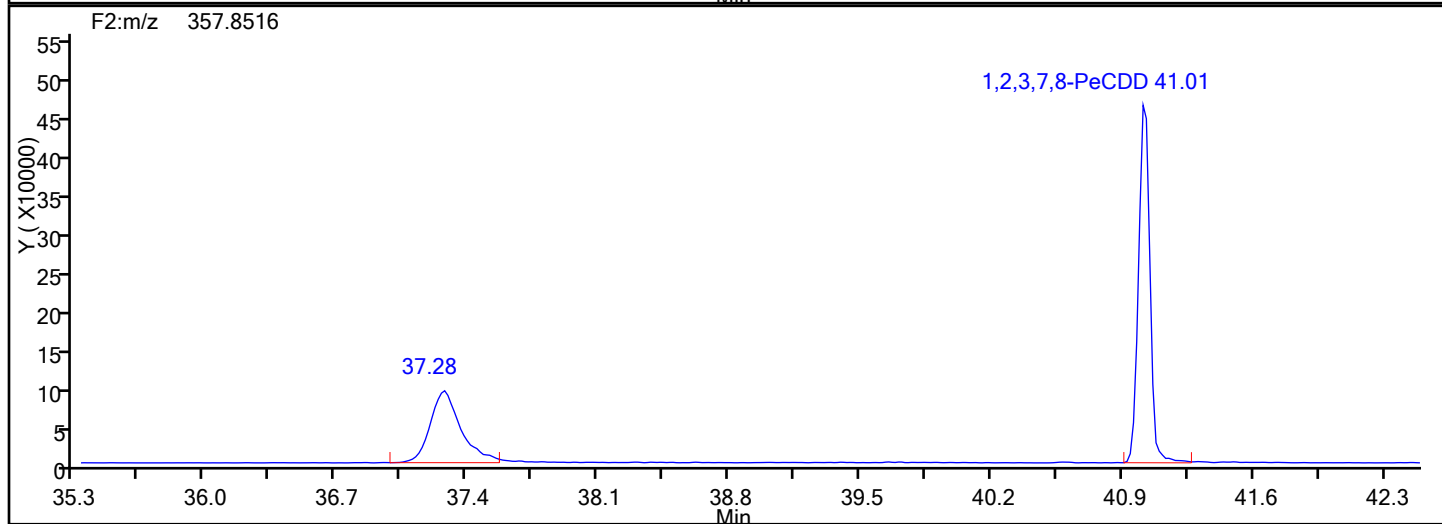
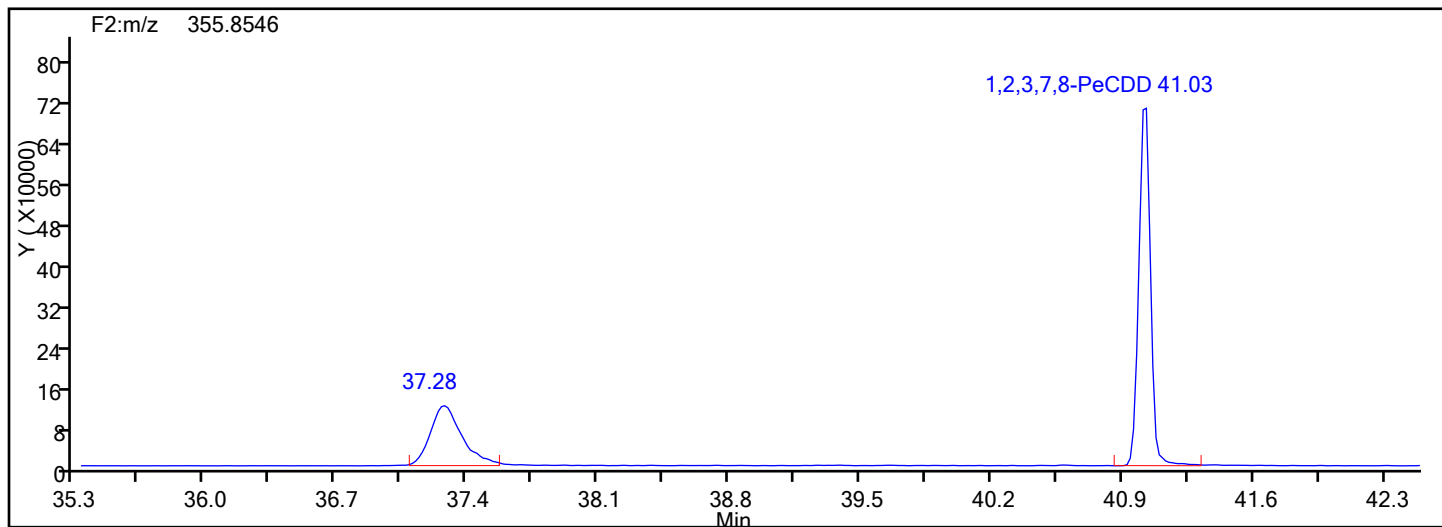
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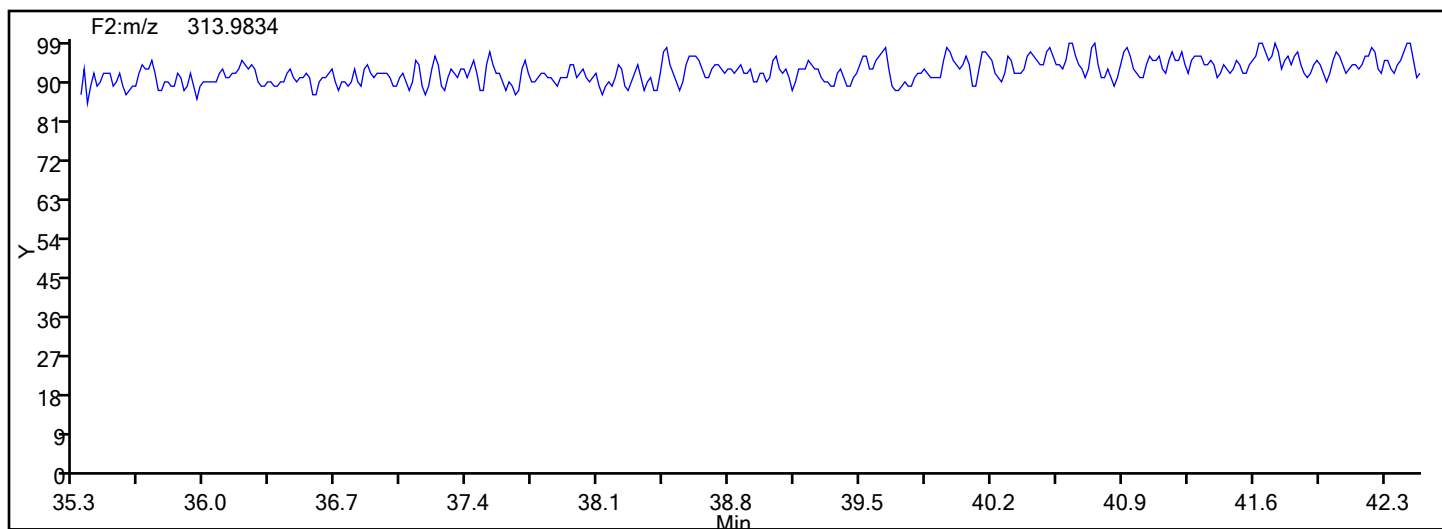
Column Type:

Column Dia:

PeCDD



PeCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

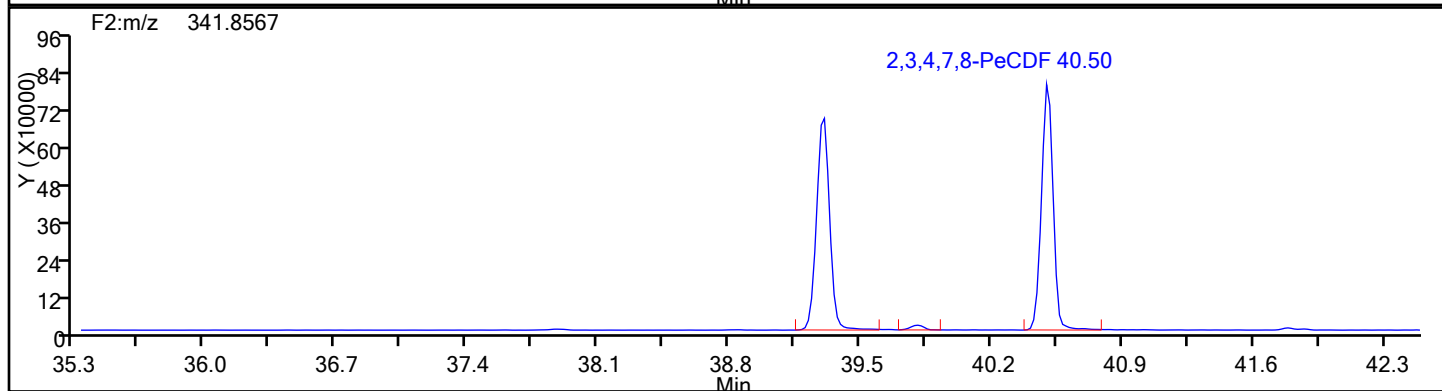
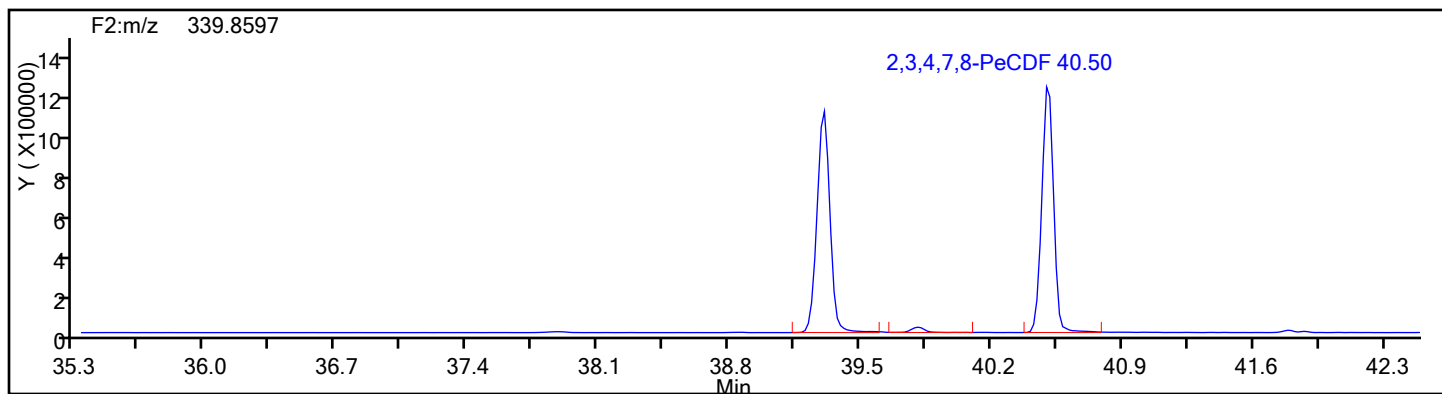
Worklist#: 7768

Sample Line#: 7

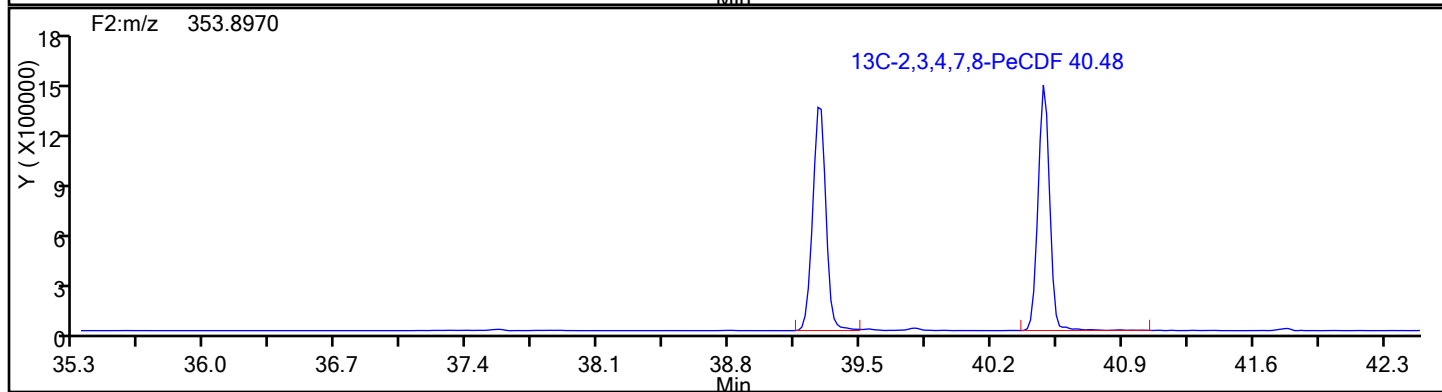
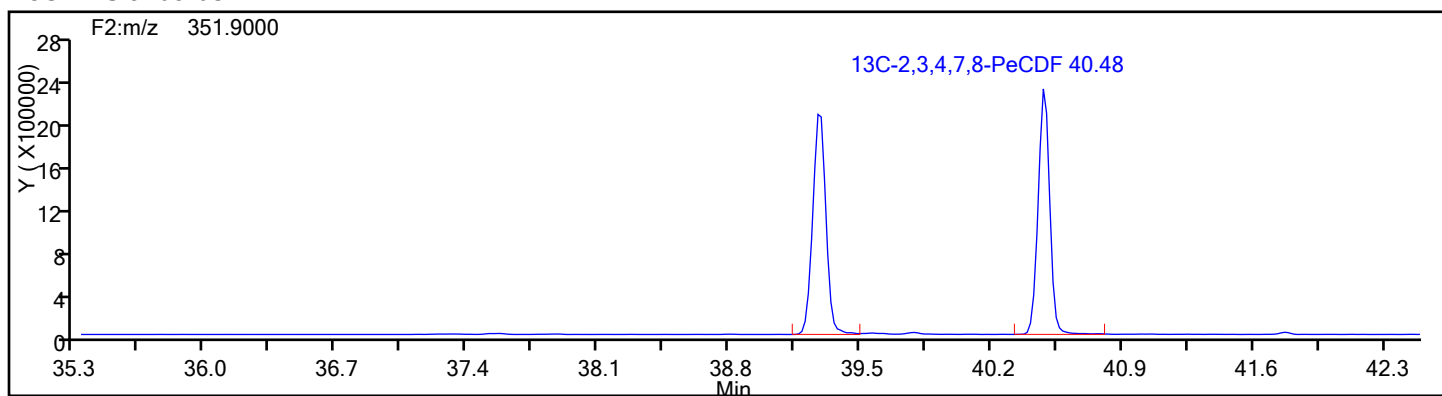
Column Type:

Column Dia:

PeCDF



PeCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

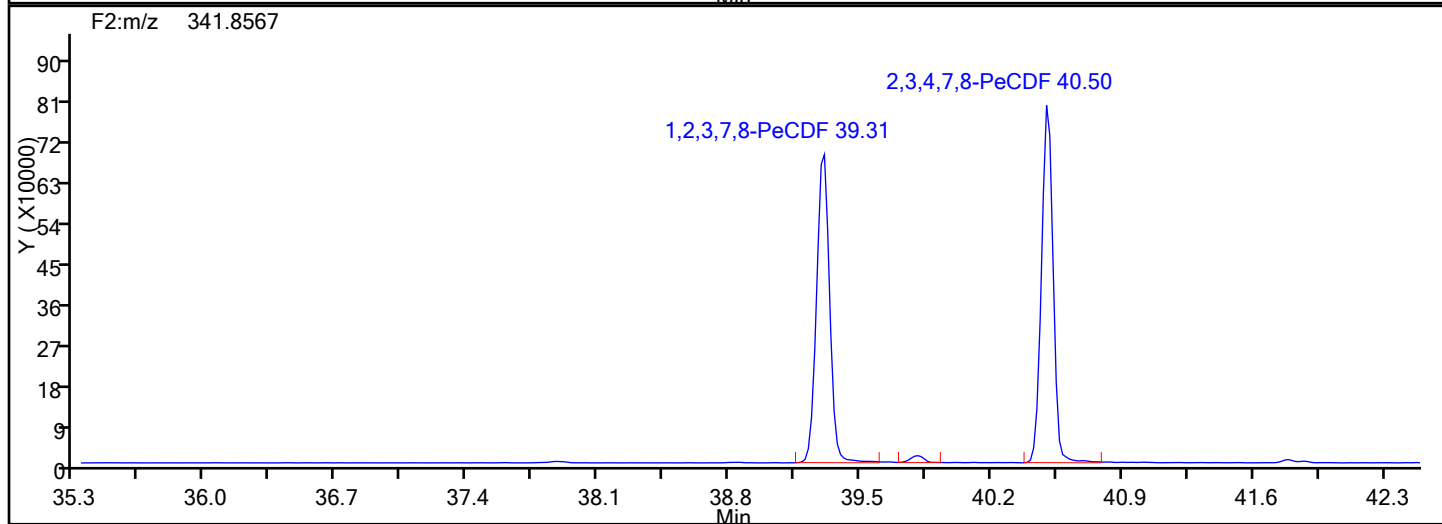
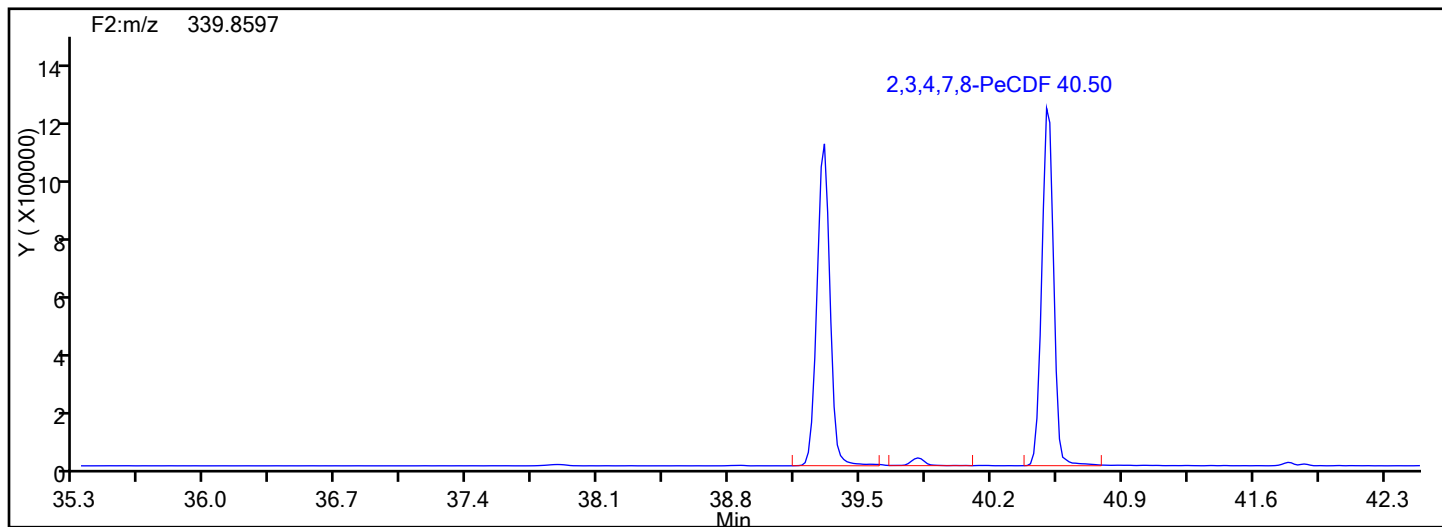
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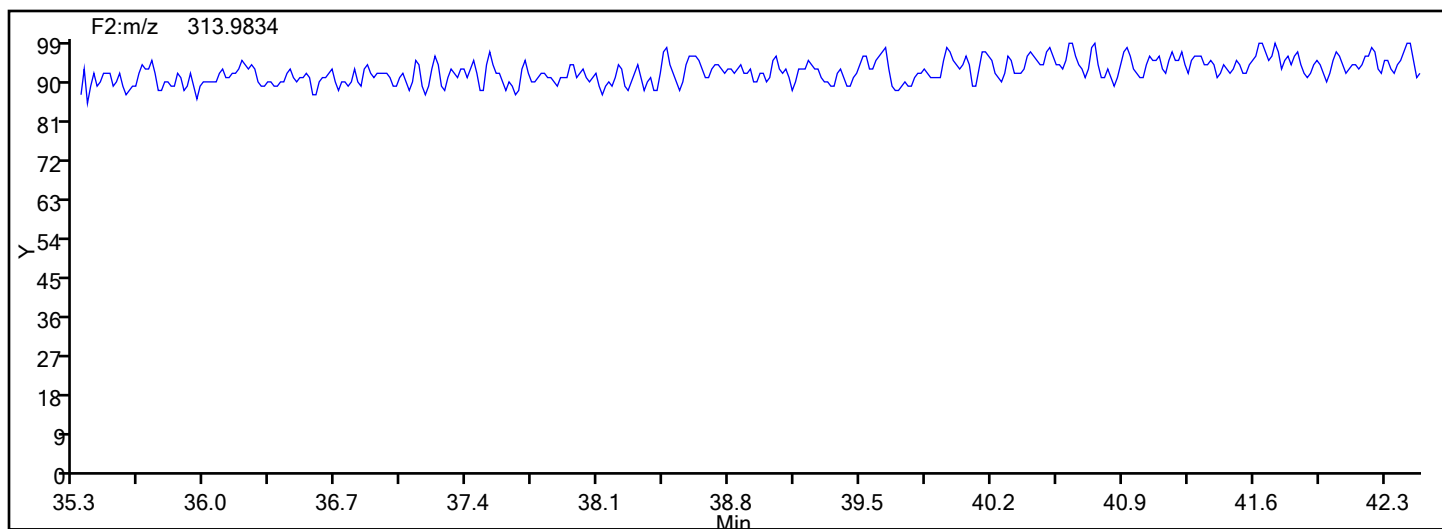
Column Type:

Column Dia:

PeCDF



PeCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

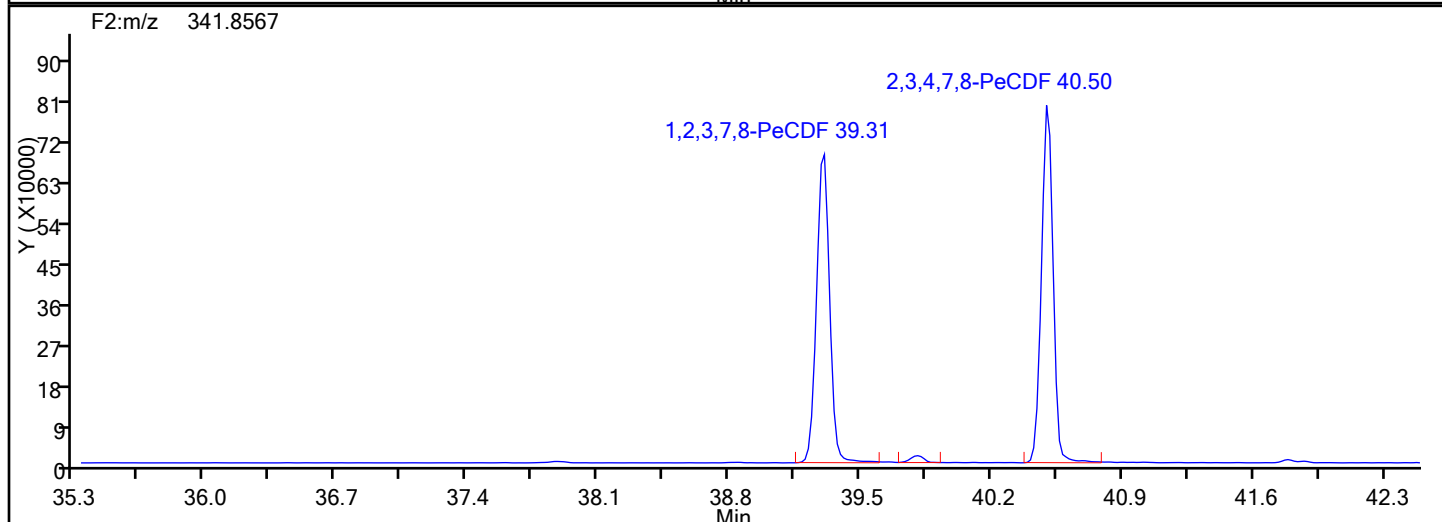
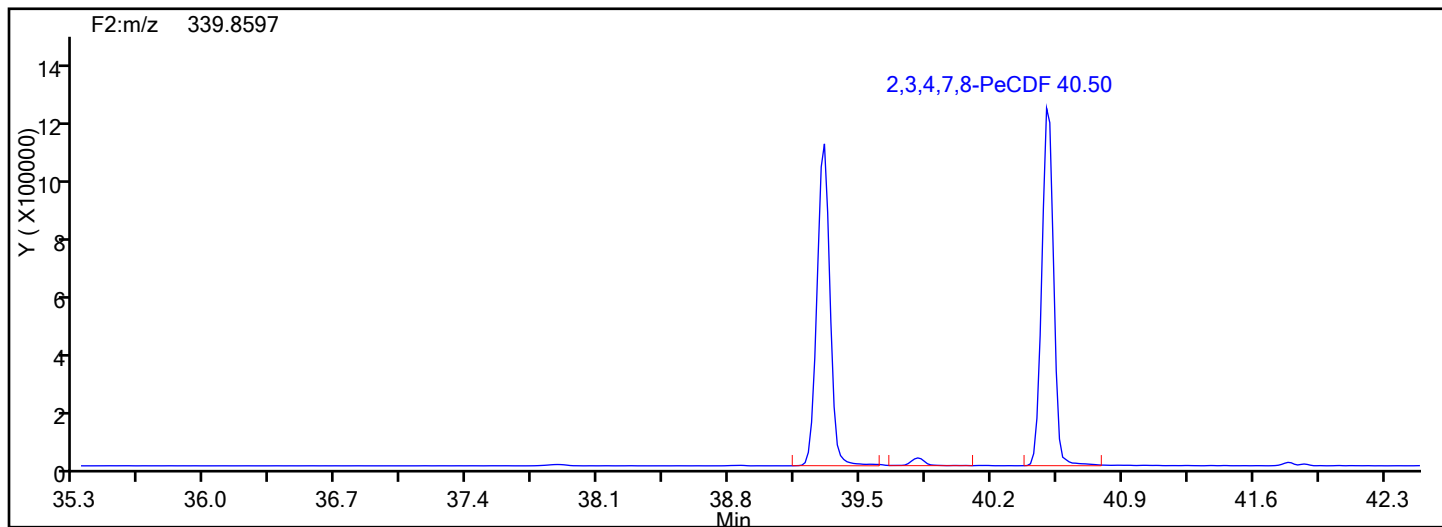
Worklist#: 7768

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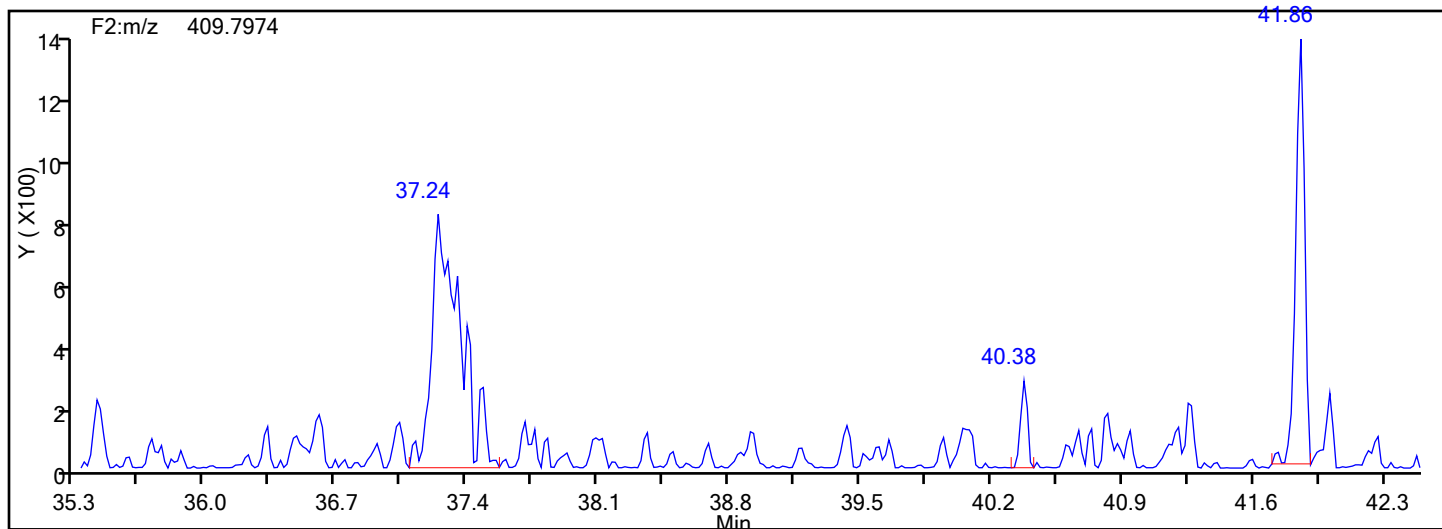
Column Type:

Column Dia:

PeCDF



PeCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

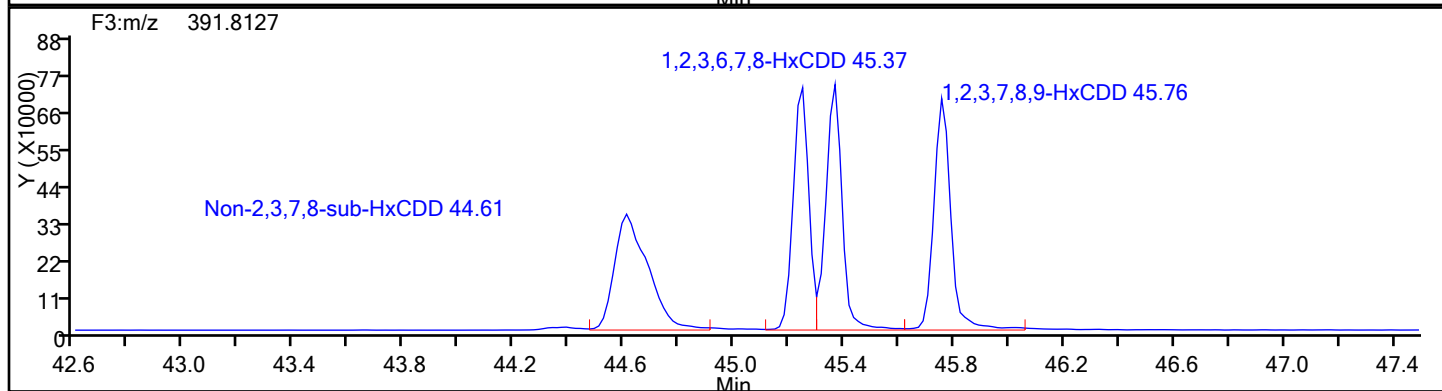
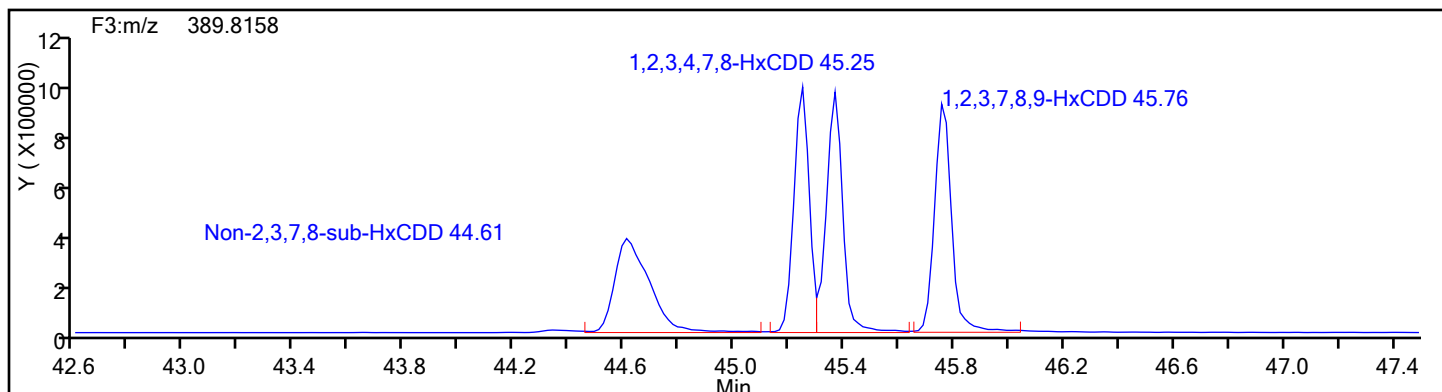
Worklist#: 7768

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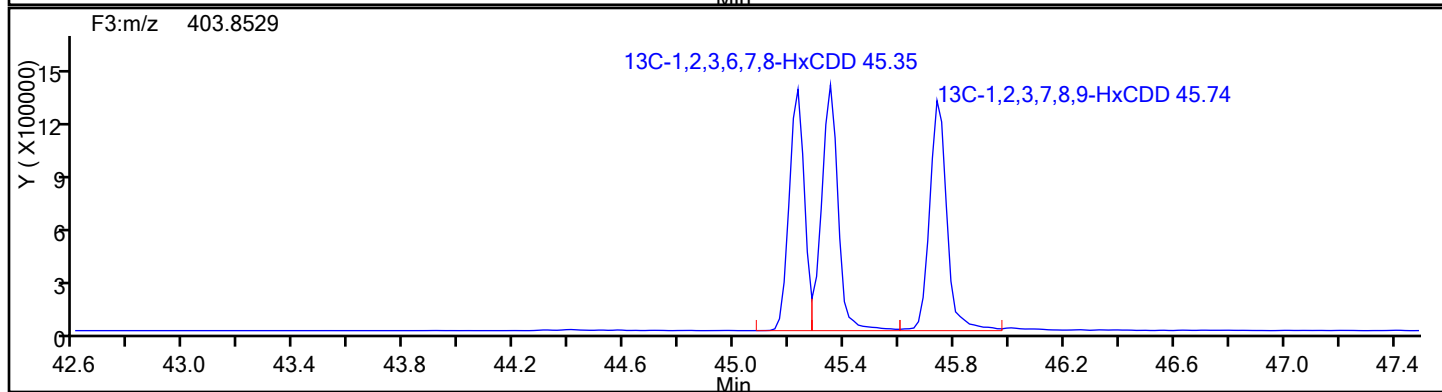
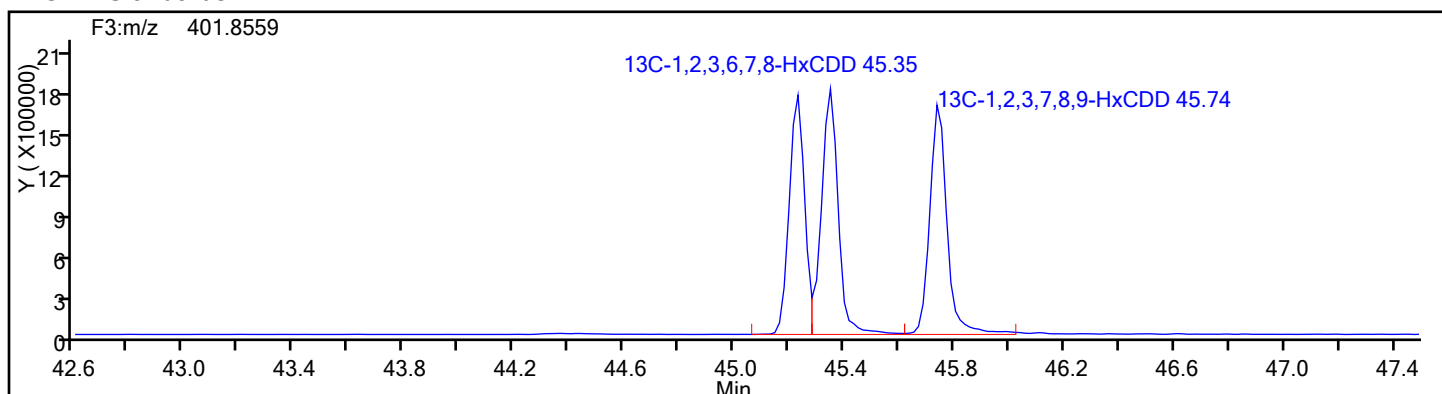
Column Type:

Column Dia:

HxCDD



HxCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

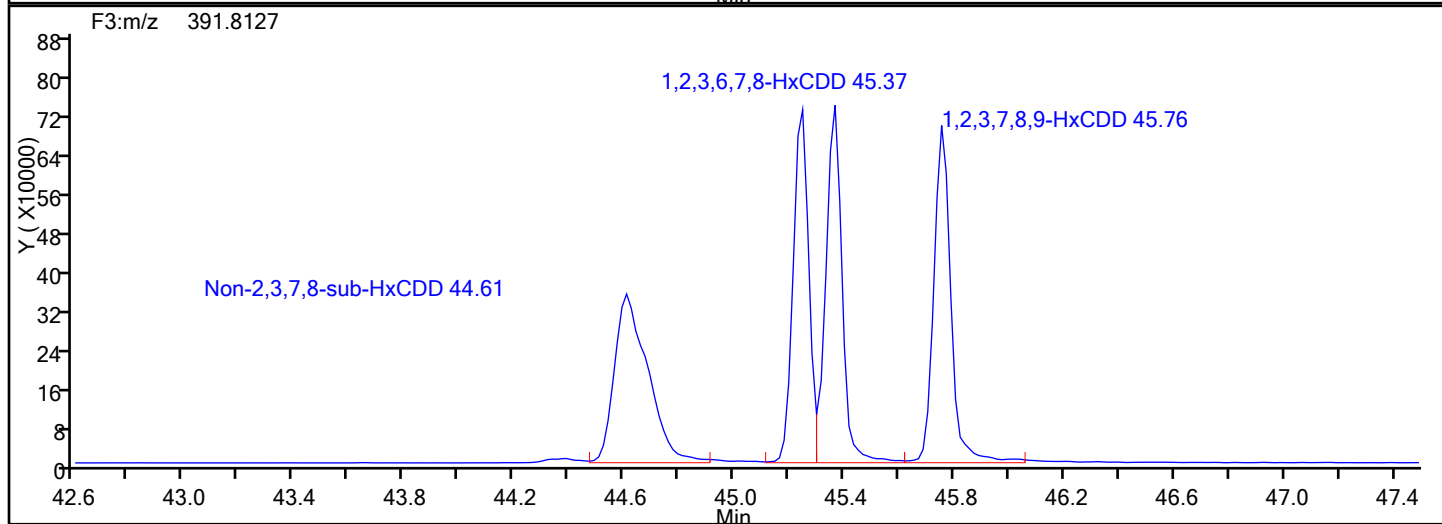
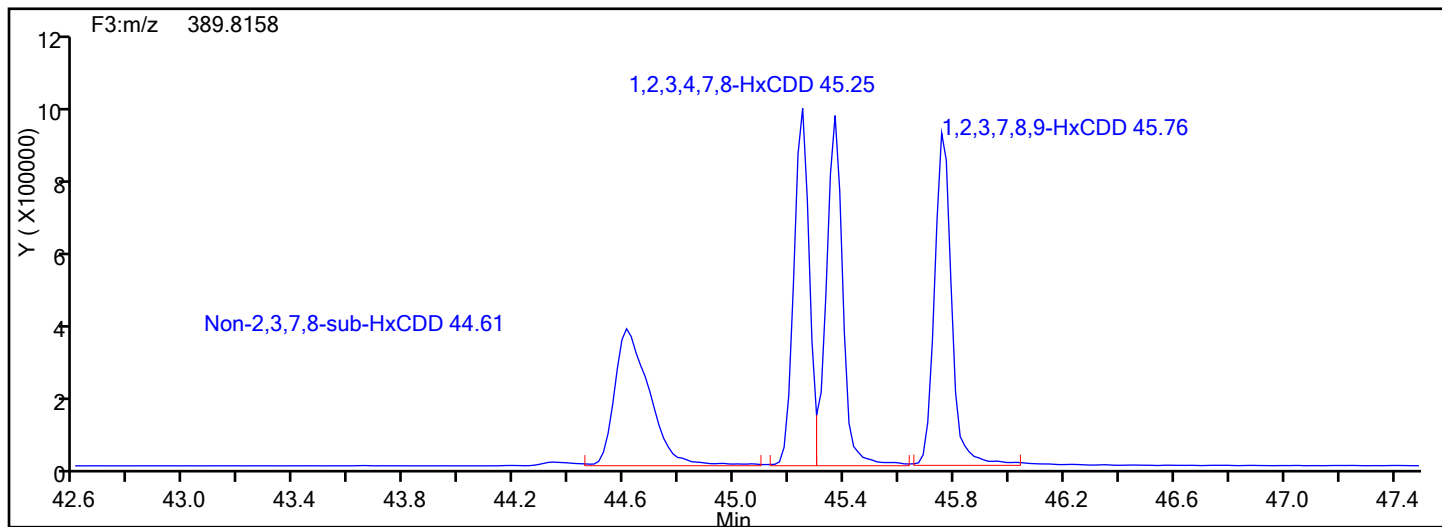
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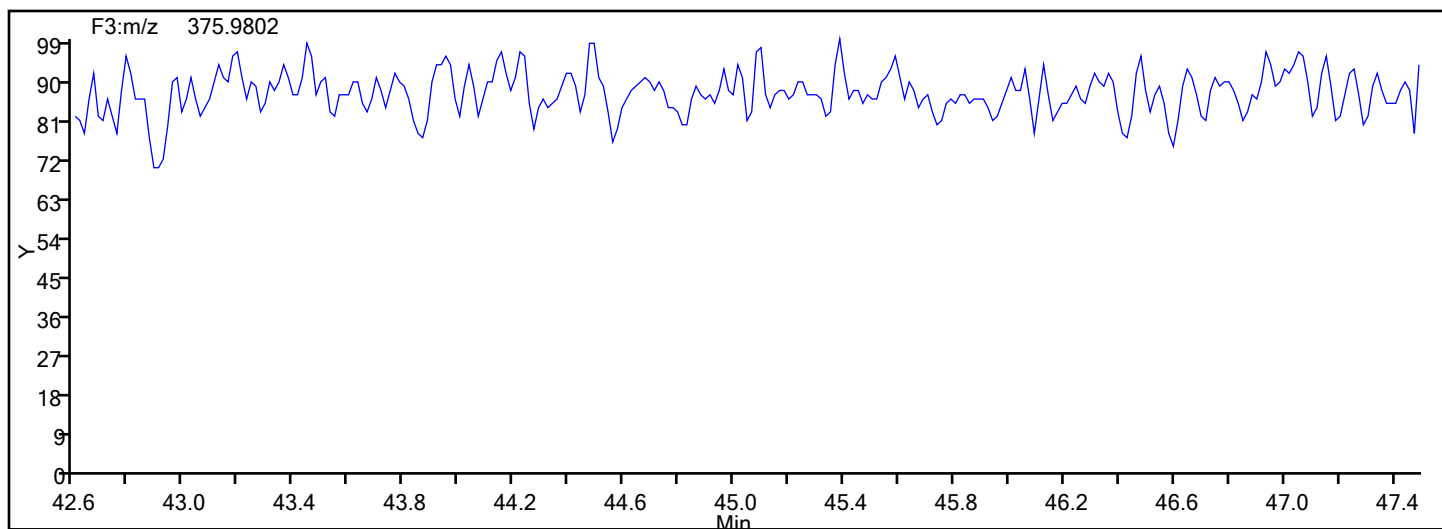
Column Type:

Column Dia:

HxCDD



HxCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

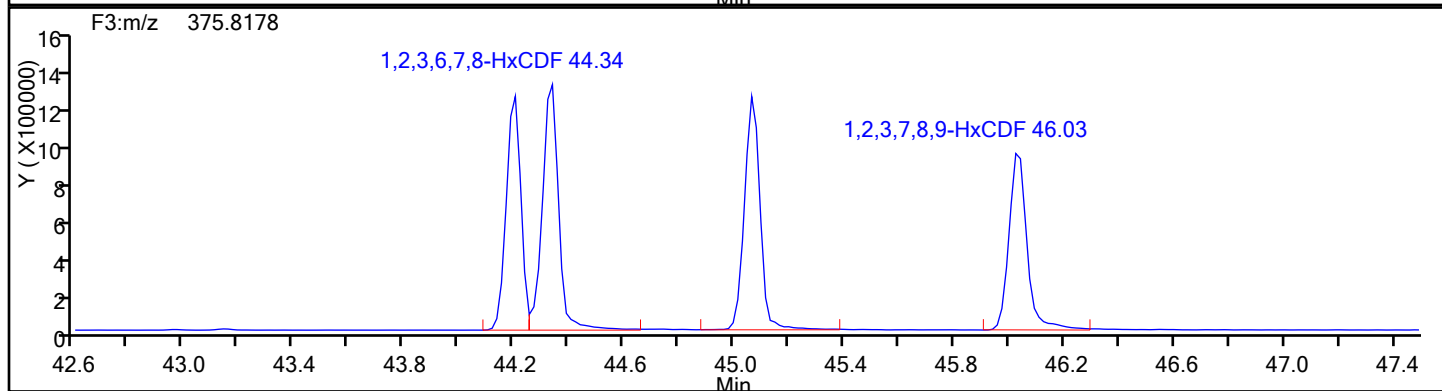
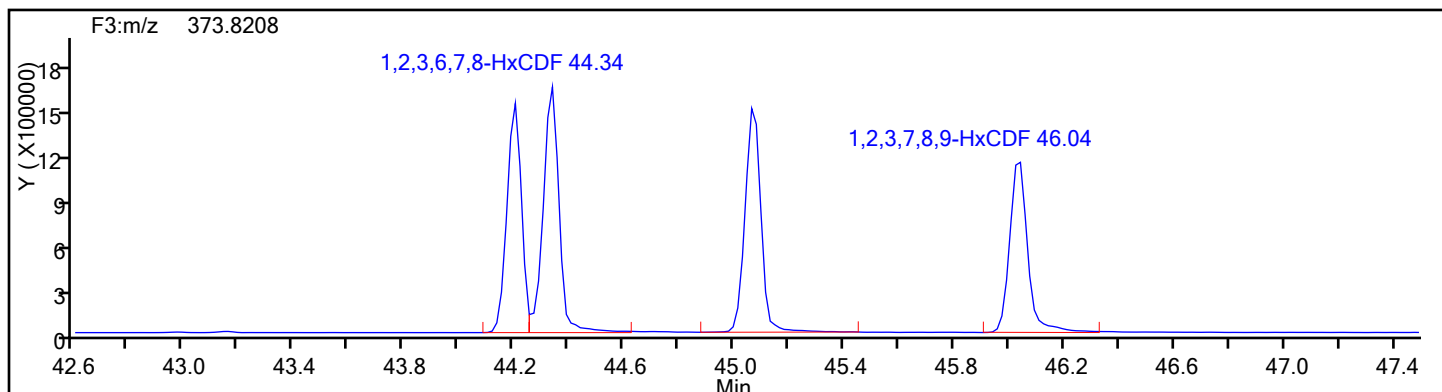
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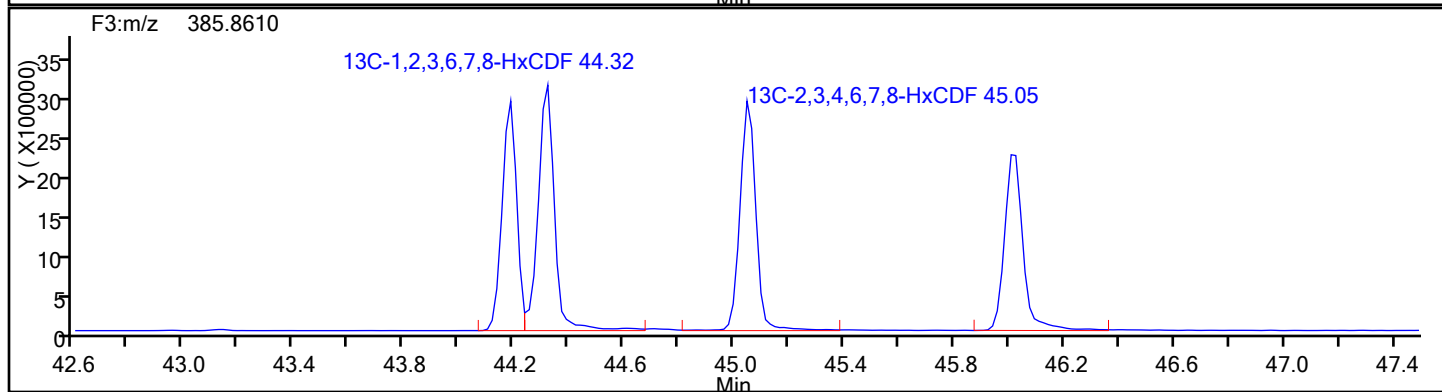
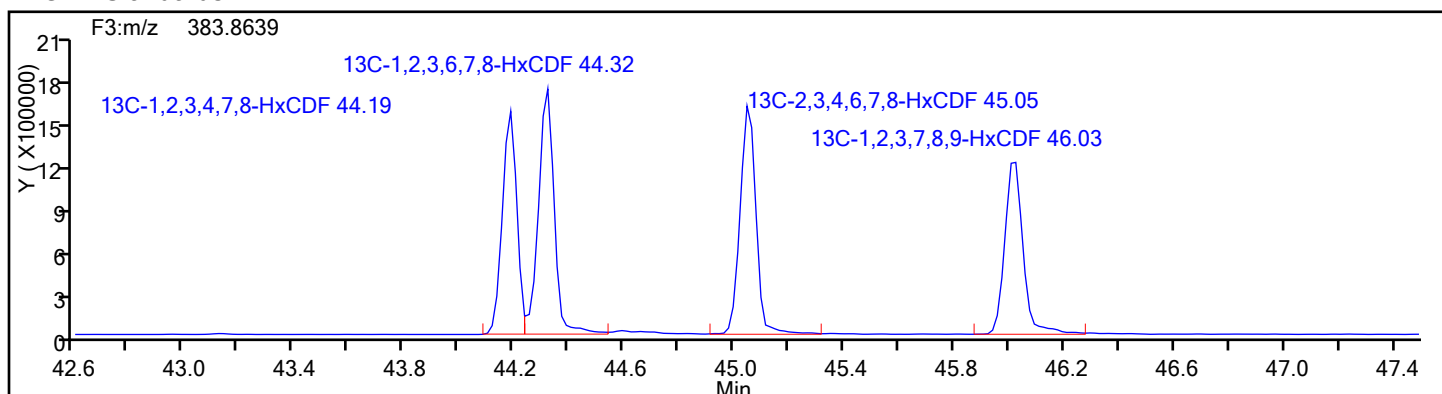
Column Type:

Column Dia:

HxCDF



HxCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

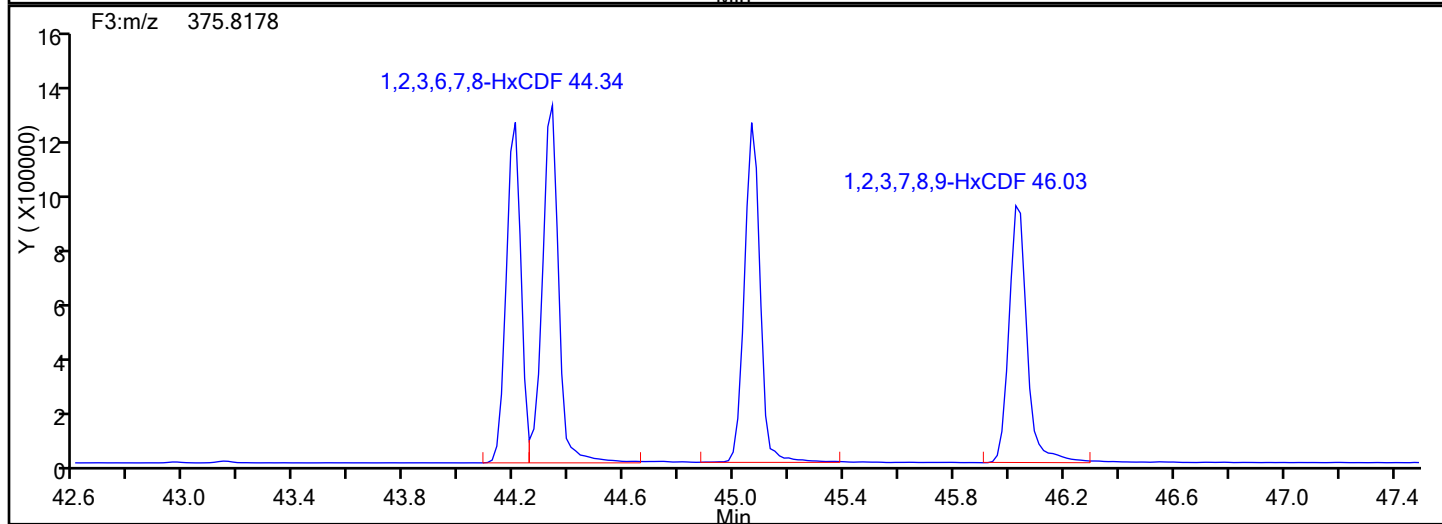
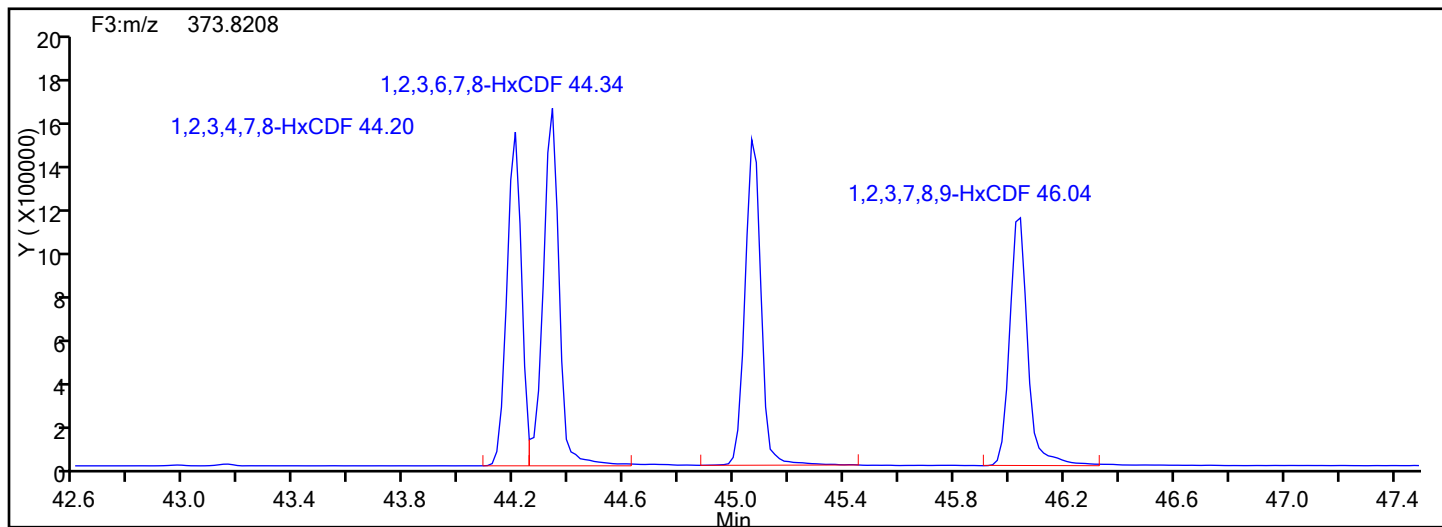
Worklist#: 7768

Sample Line#: 7

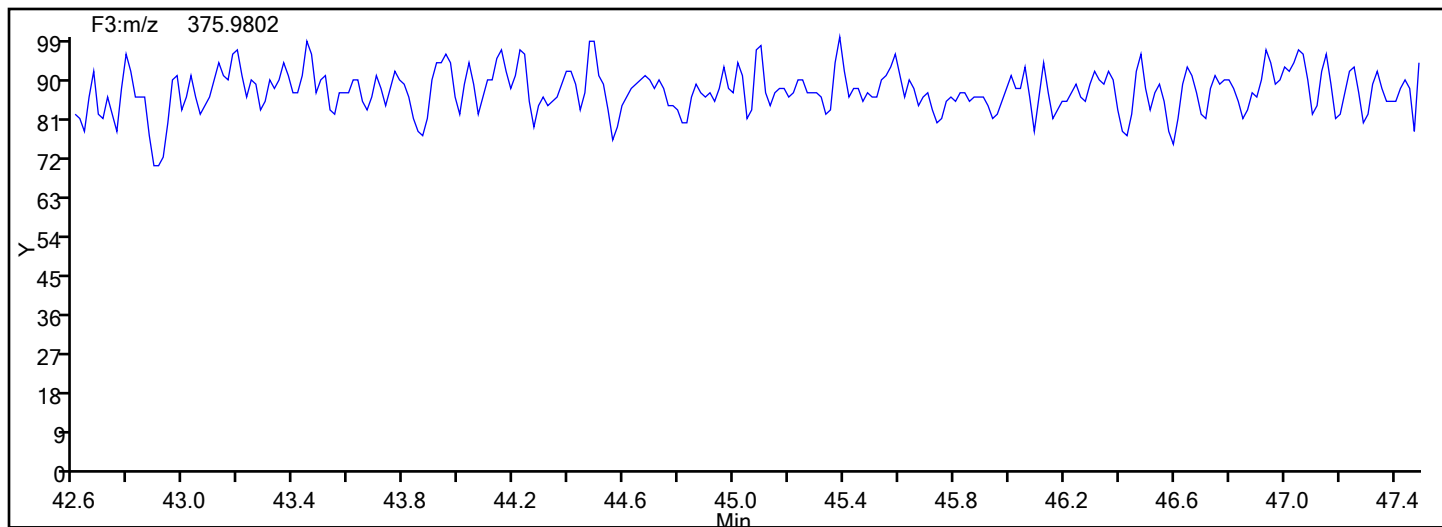
Column Type:

Column Dia:

HxCDF



HxCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

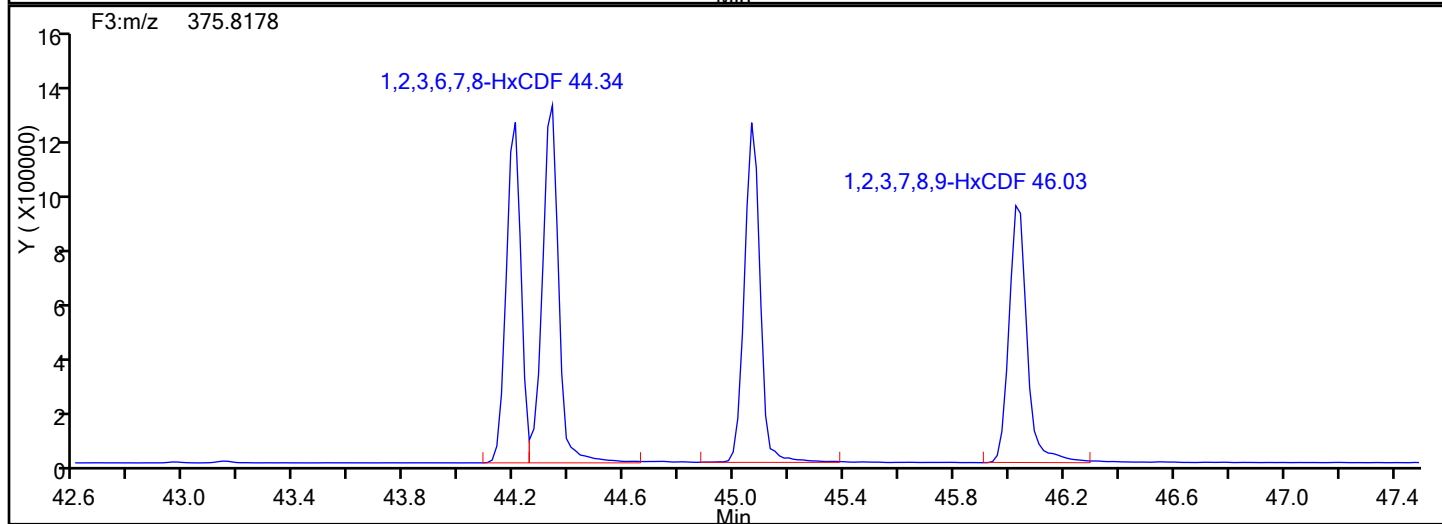
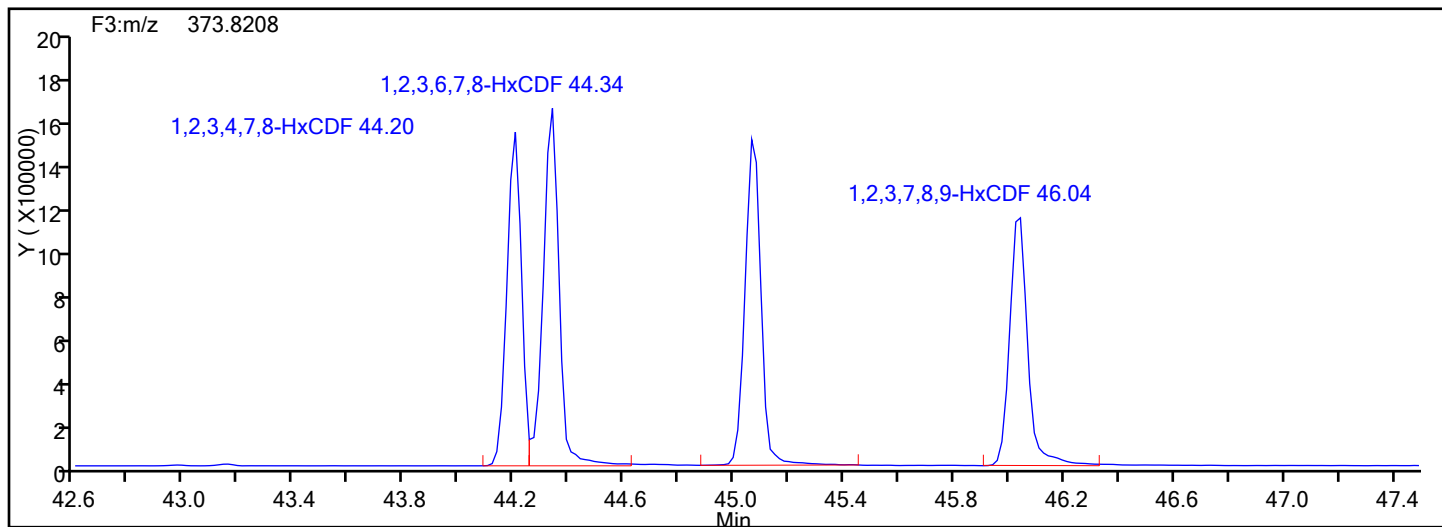
Worklist#: 7768

Sample Line#: 7

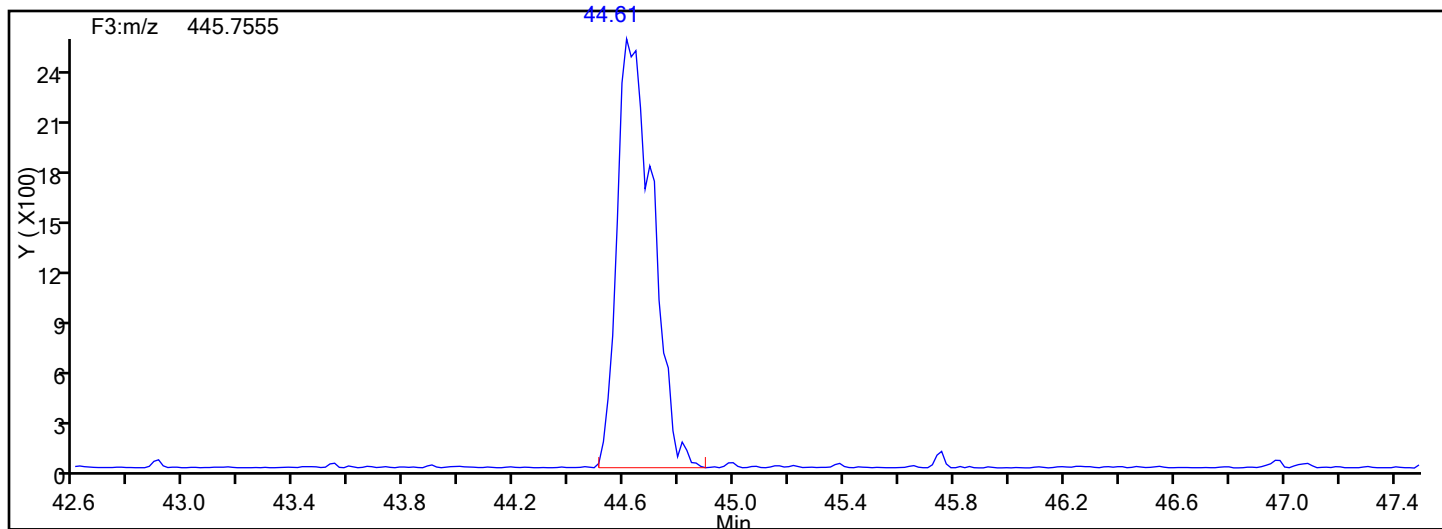
Column Type:

Column Dia:

HxCDF



HxCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

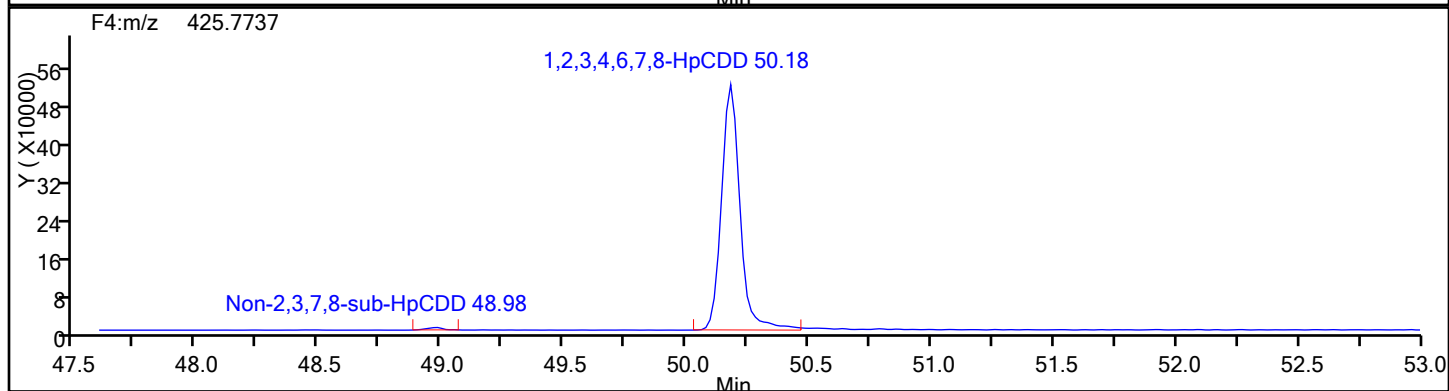
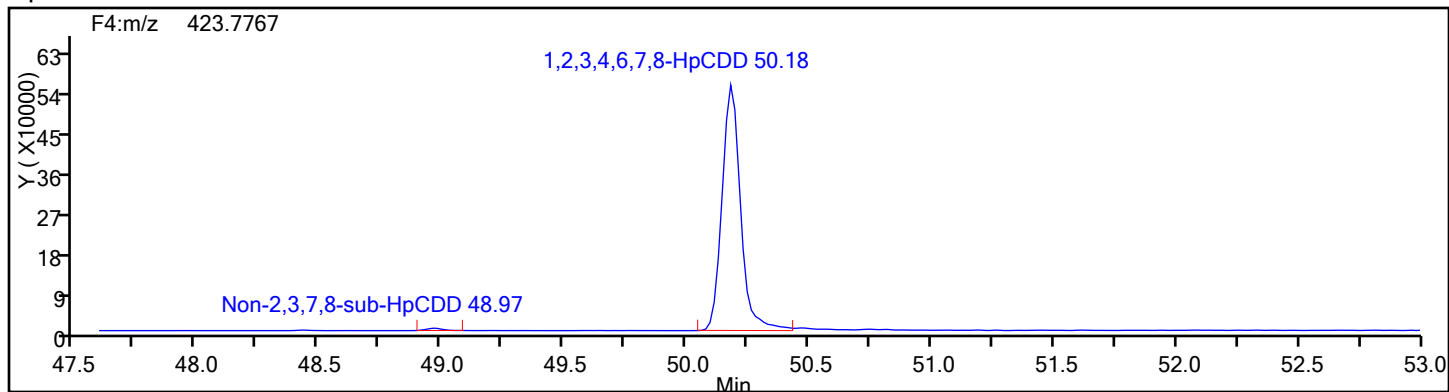
Worklist#: 7768

Sample Line#: 7

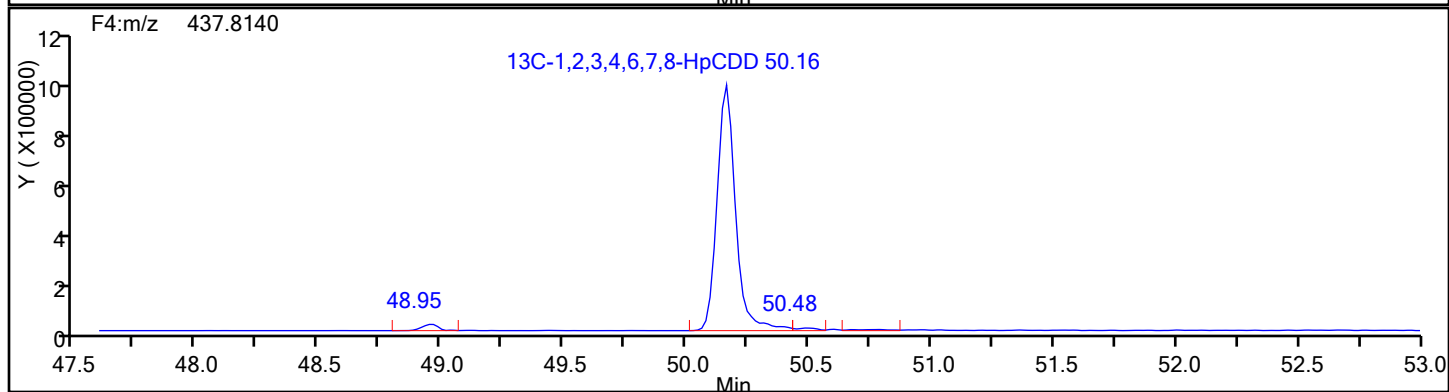
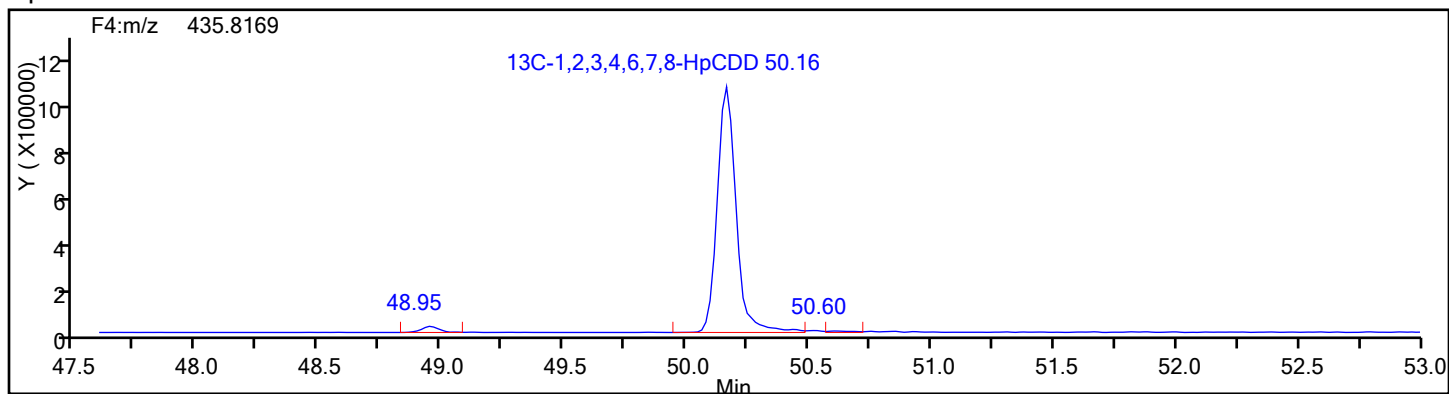
Column Type:

Column Dia:

HpCDD



HpCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

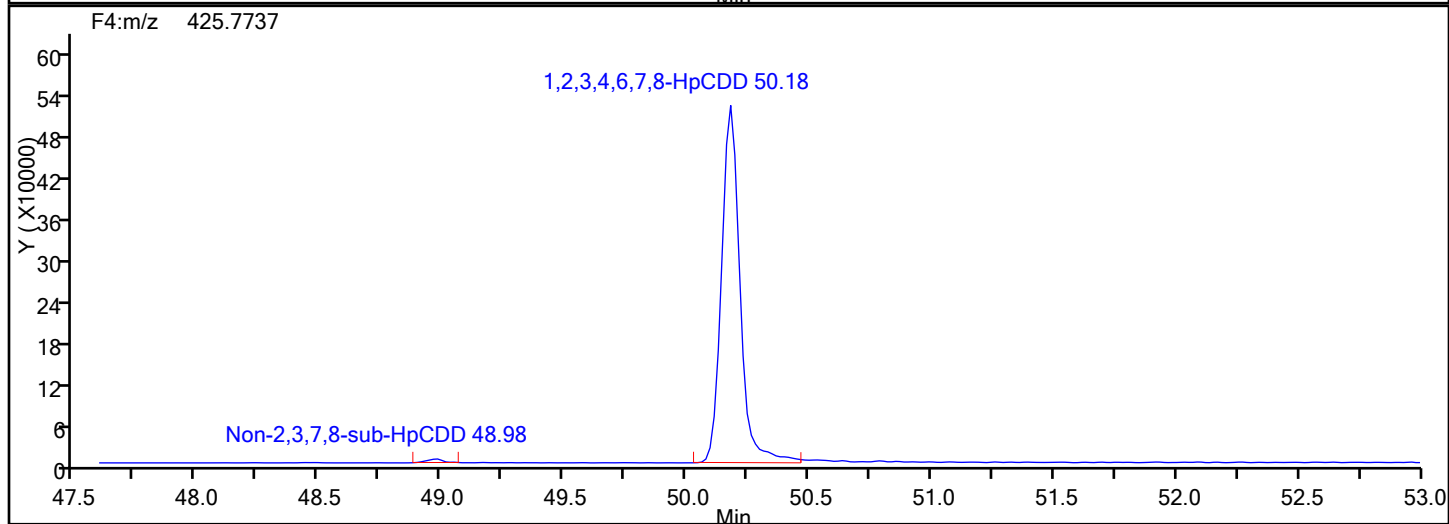
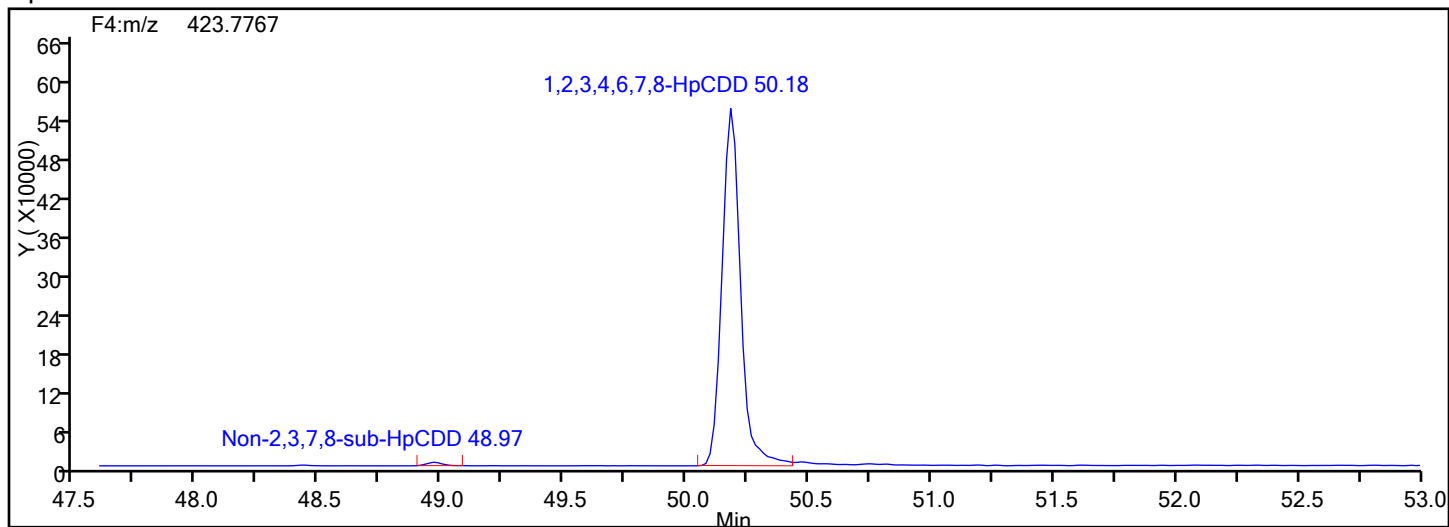
Worklist#: 7768

Sample Line#: 7

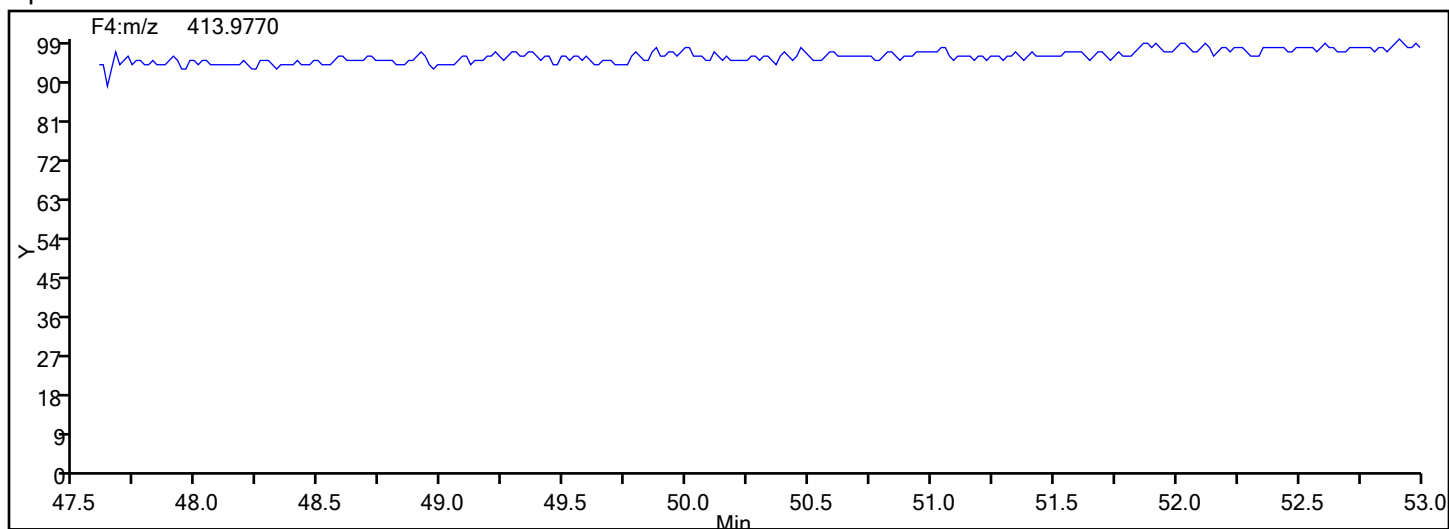
Column Type:

Column Dia:

HpCDD



HpCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

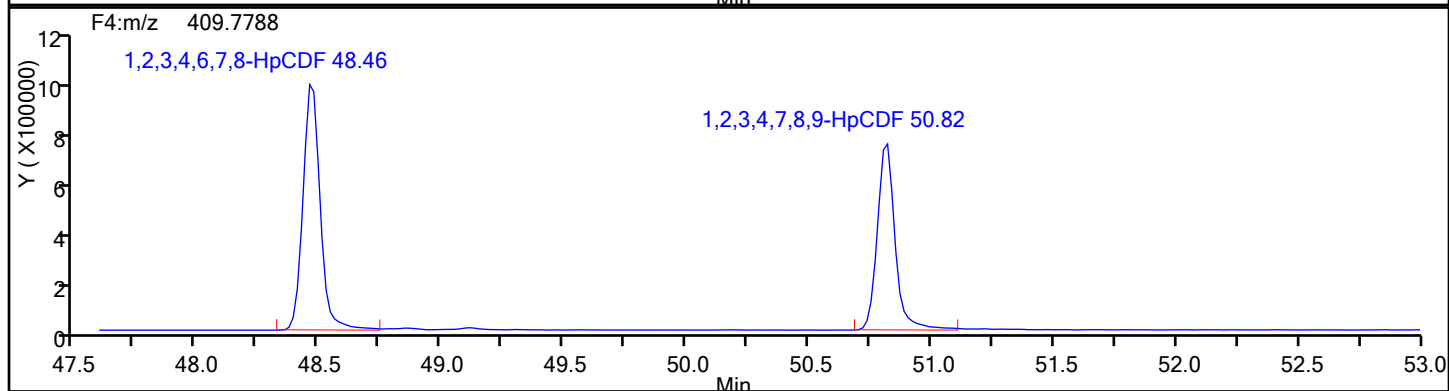
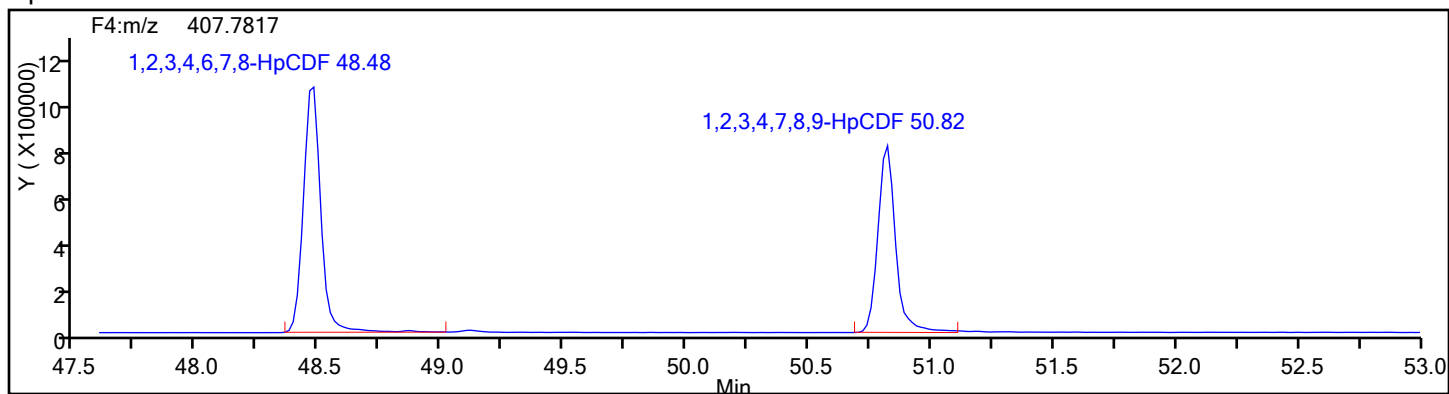
Worklist#: 7768

Sample Line#: 7

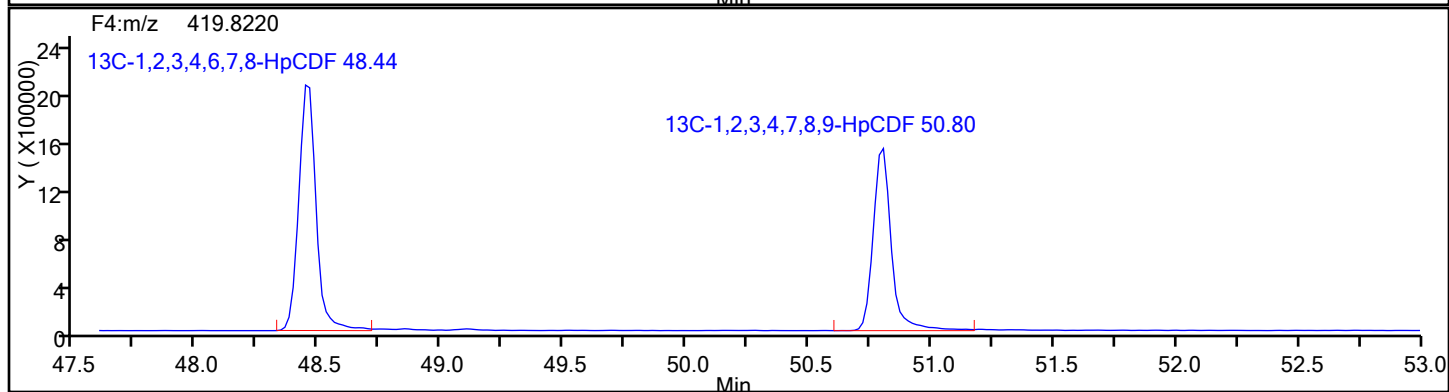
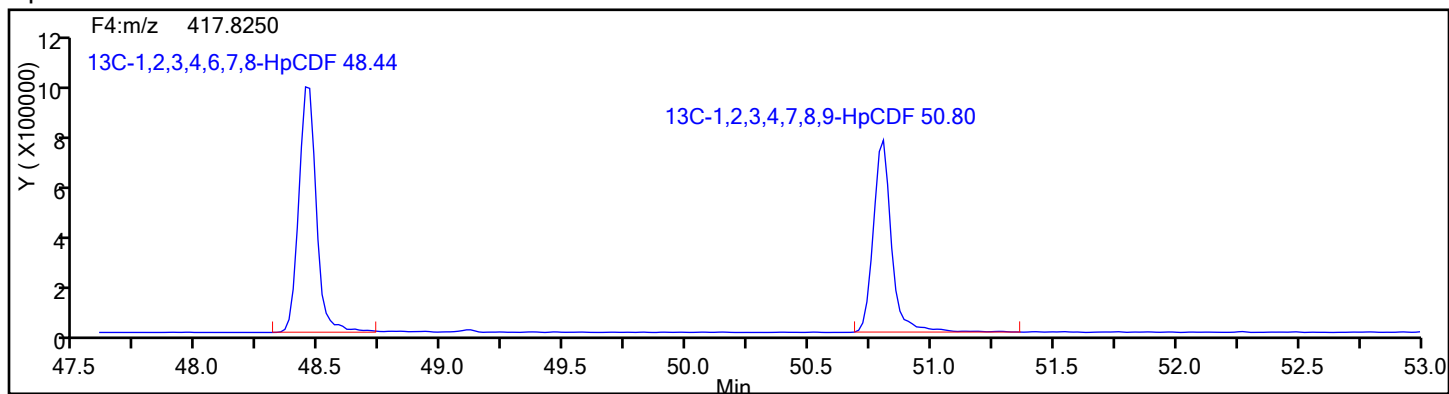
Column Type:

Column Dia:

HpCDF



HpCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

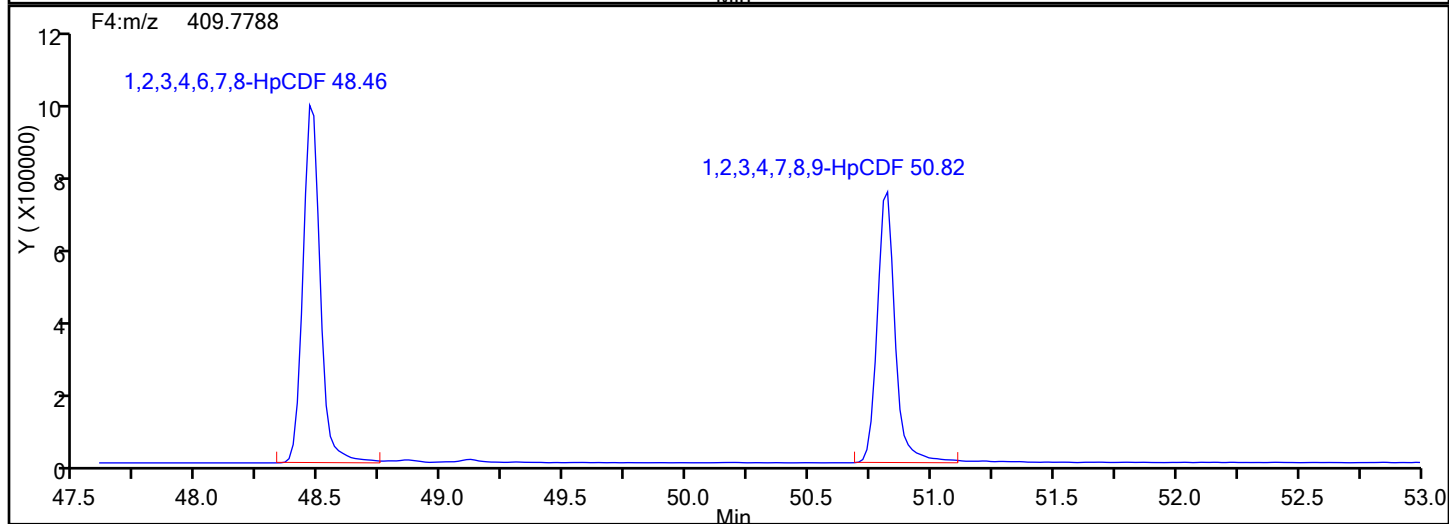
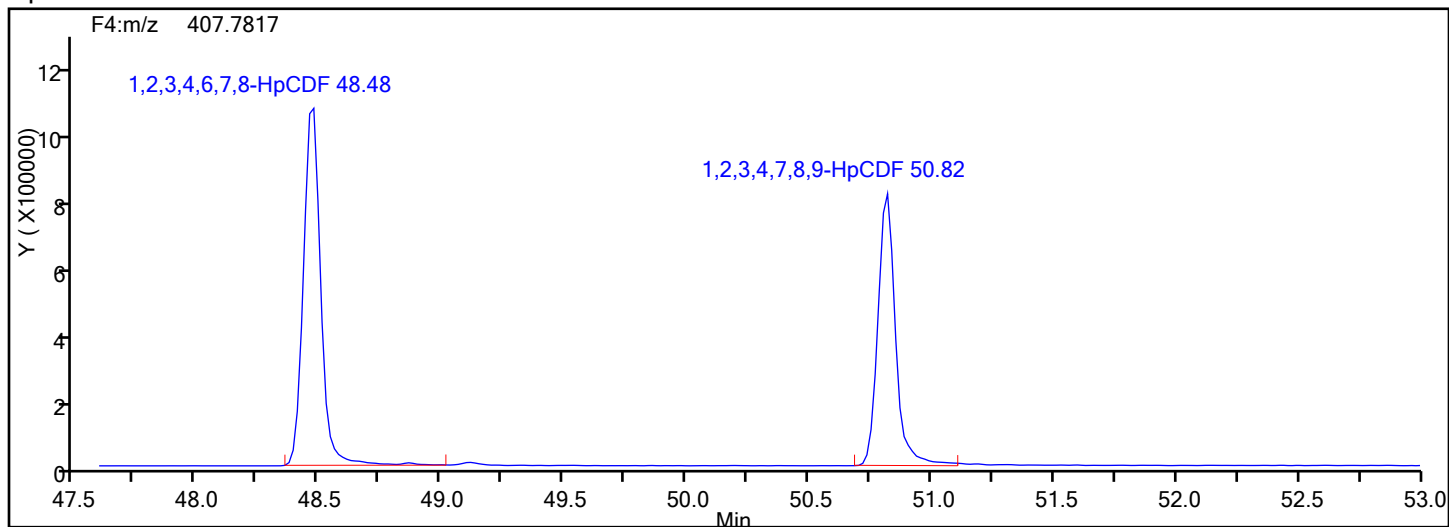
Worklist#: 7768

Sample Line#: 7

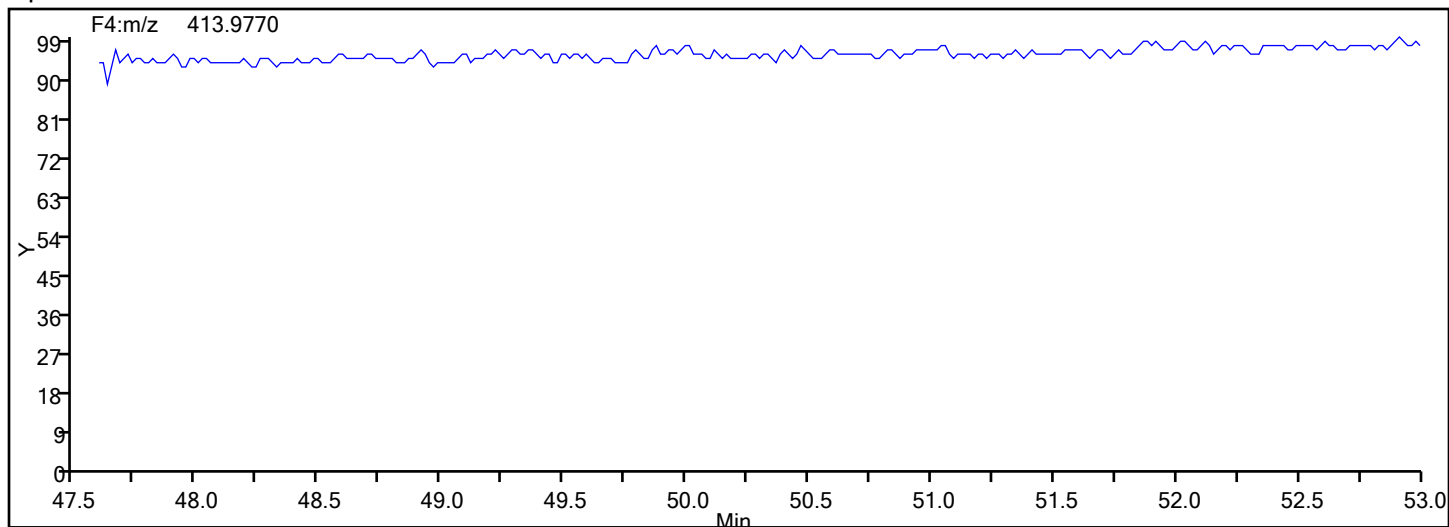
Column Type:

Column Dia:

HpCDF



HpCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

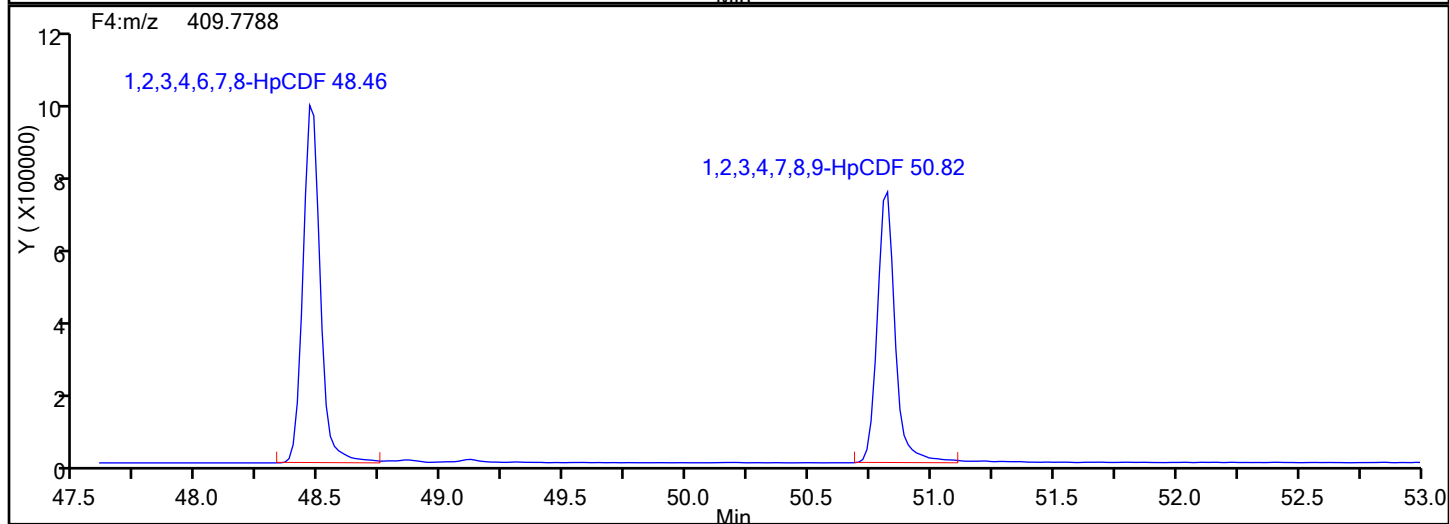
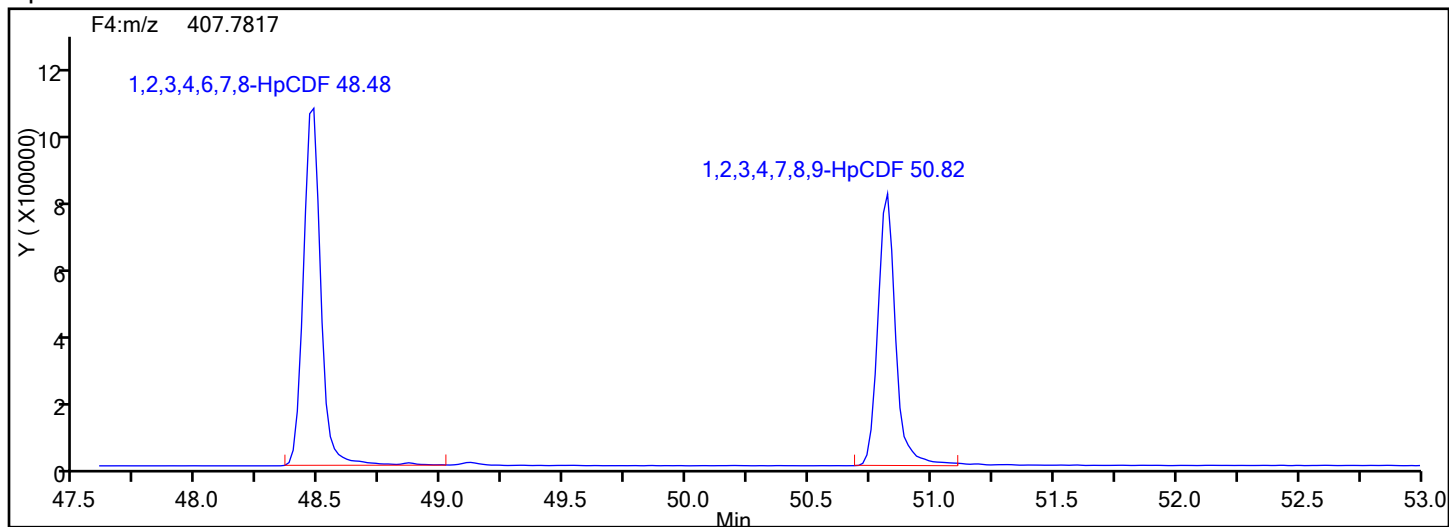
Worklist#: 7768

Sample Line#: 7

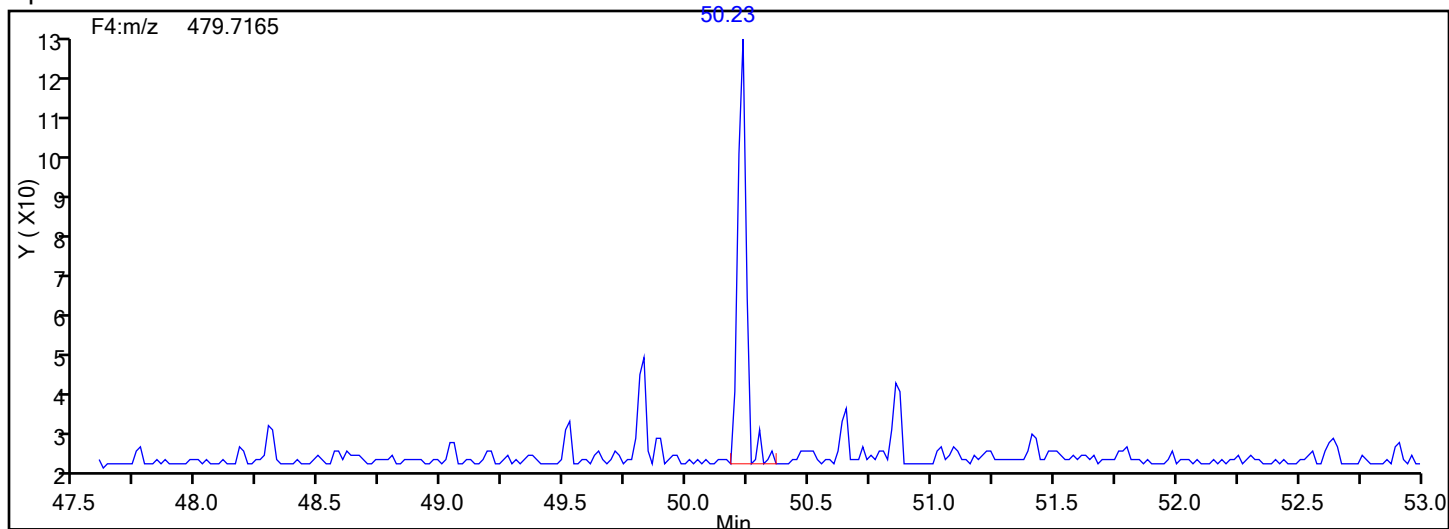
Column Type:

Column Dia:

HpCDF



HpCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

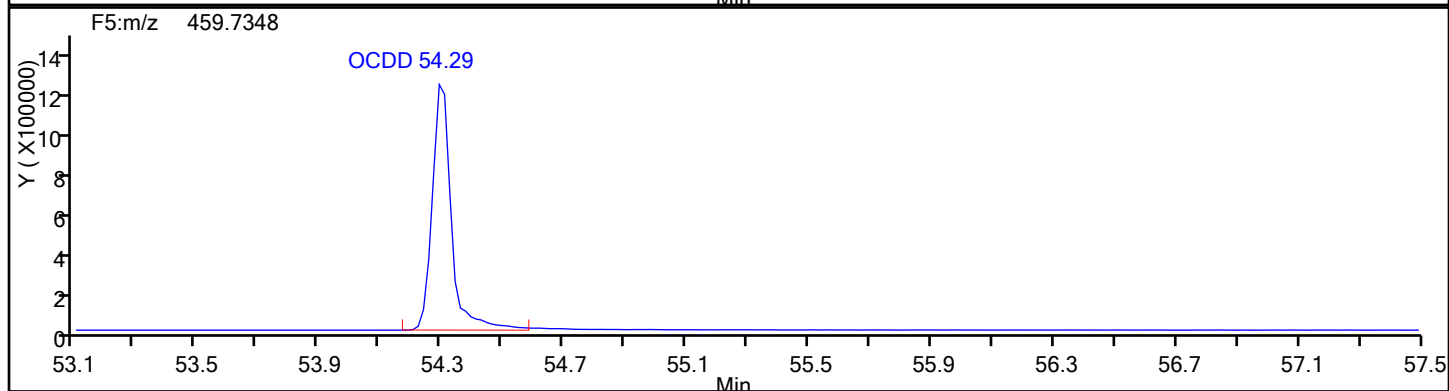
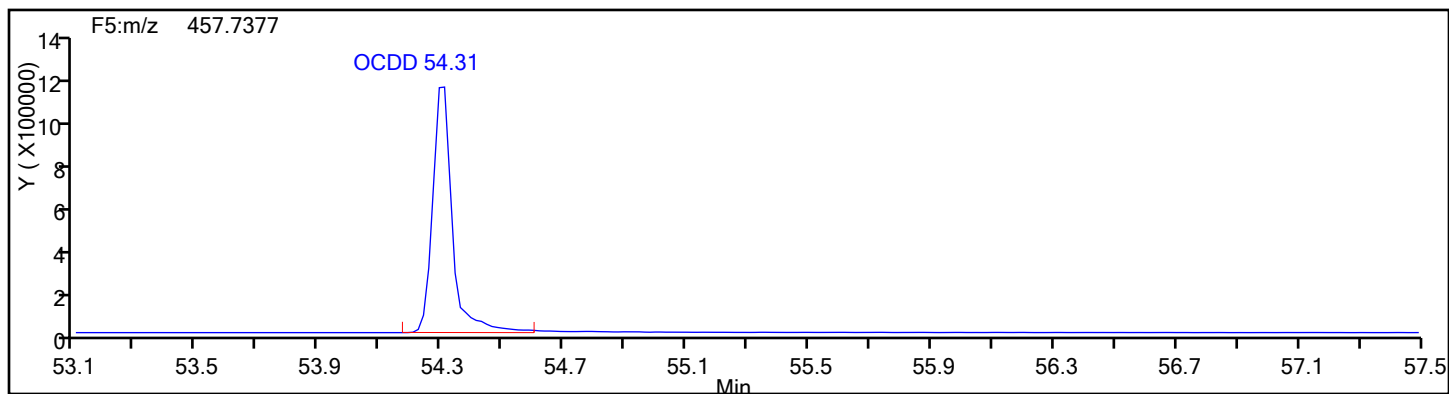
Worklist#: 7768

Sample Line#: 7

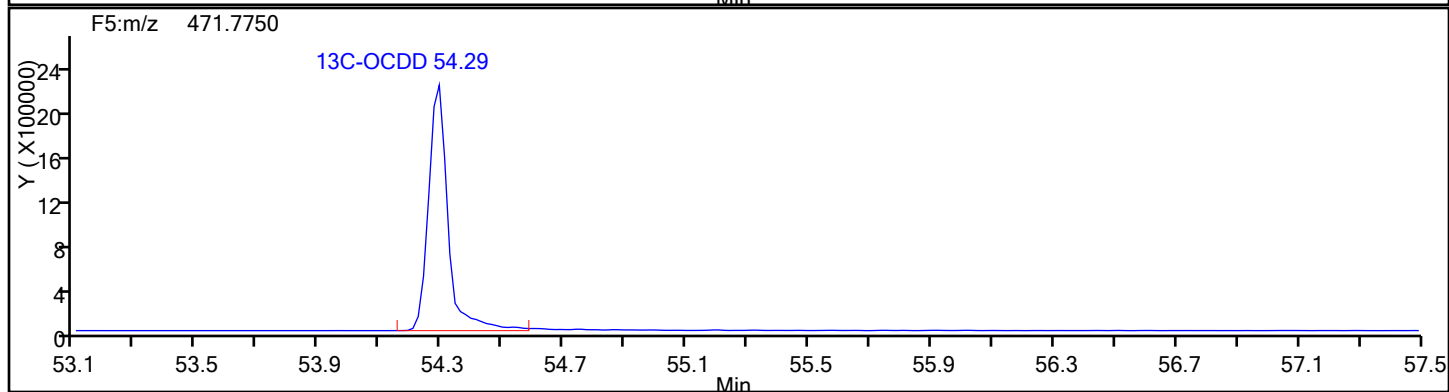
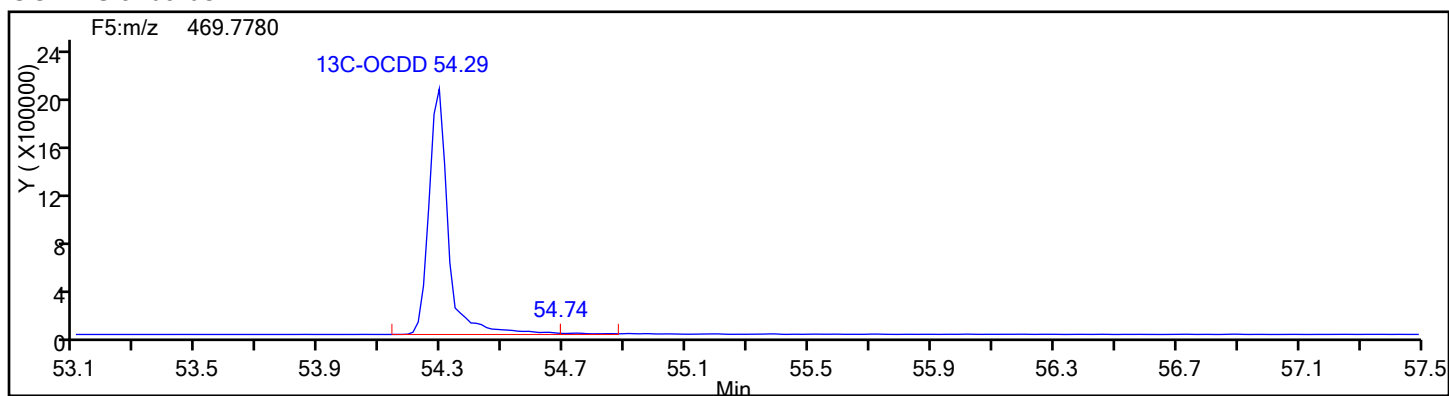
Column Type:

Column Dia:

OCDD



OCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

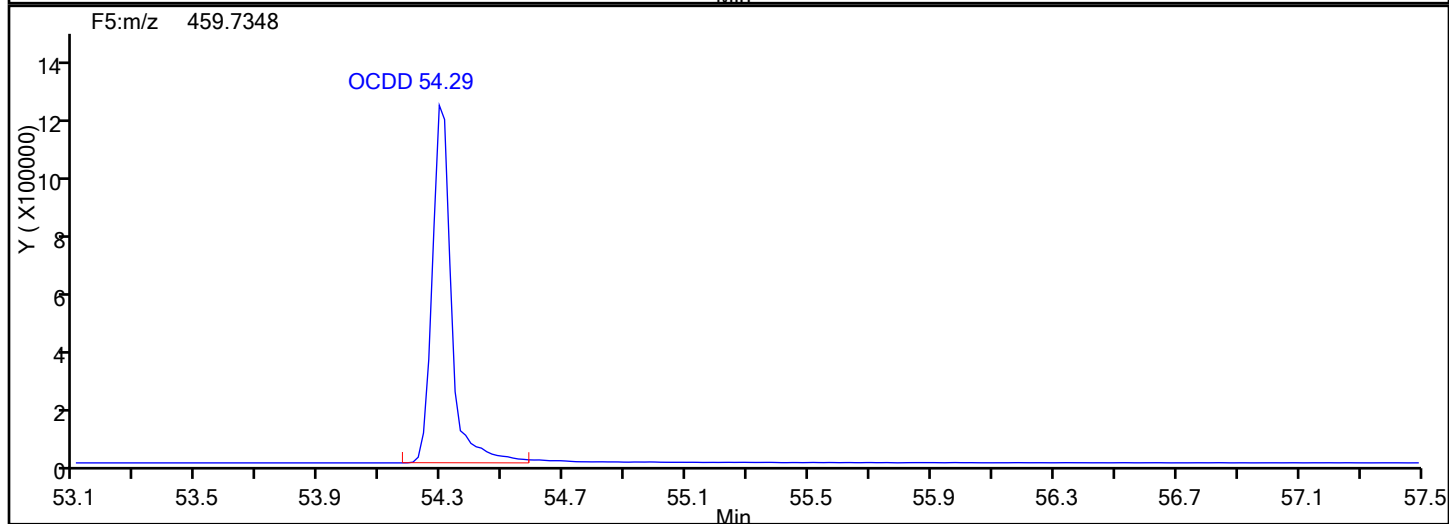
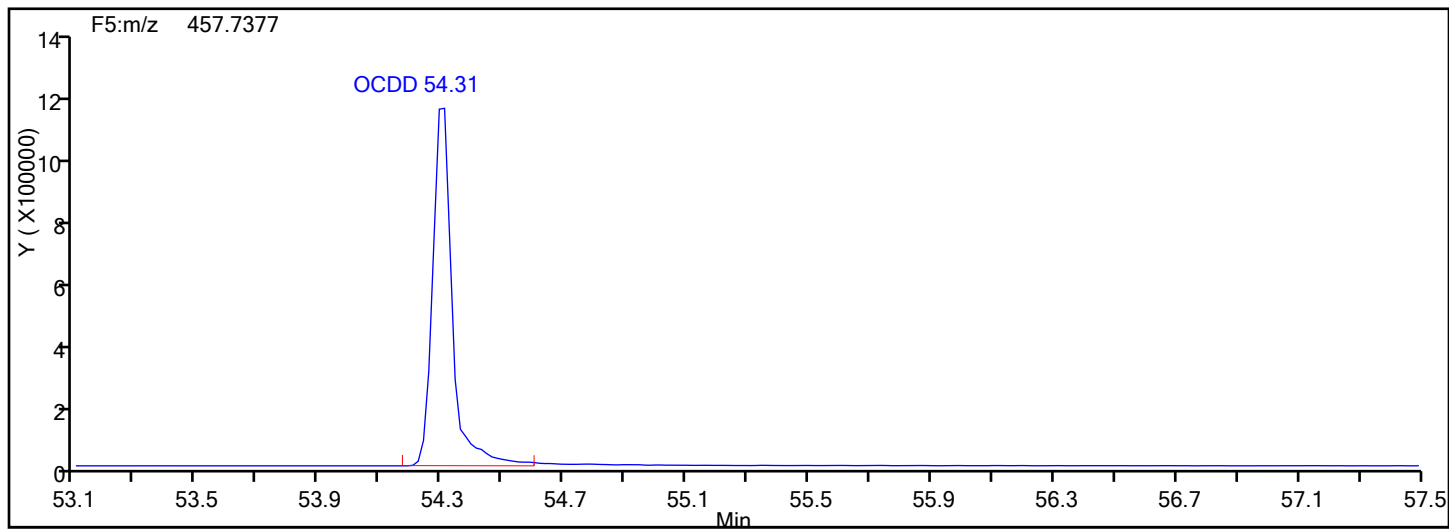
Worklist#: 7768

Sample Line#: 7

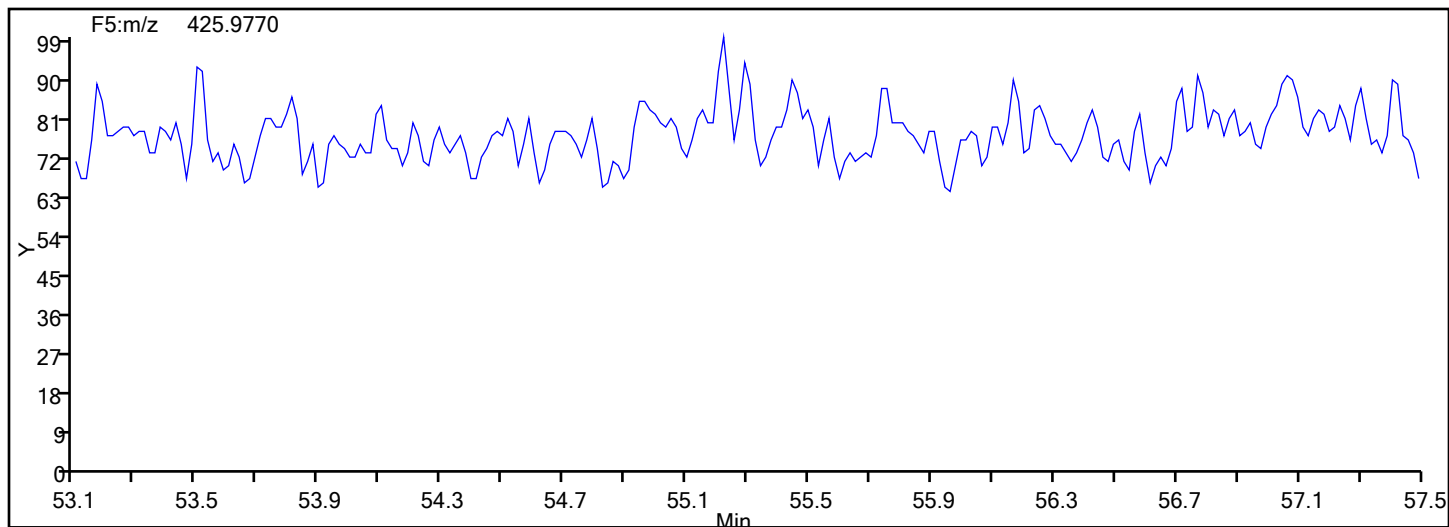
Column Type:

Column Dia:

OCDD



OCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

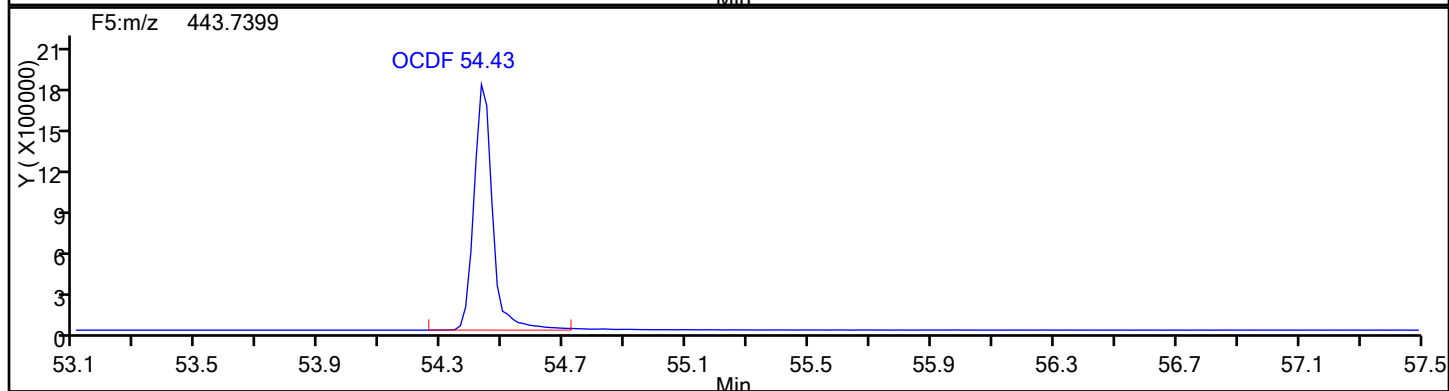
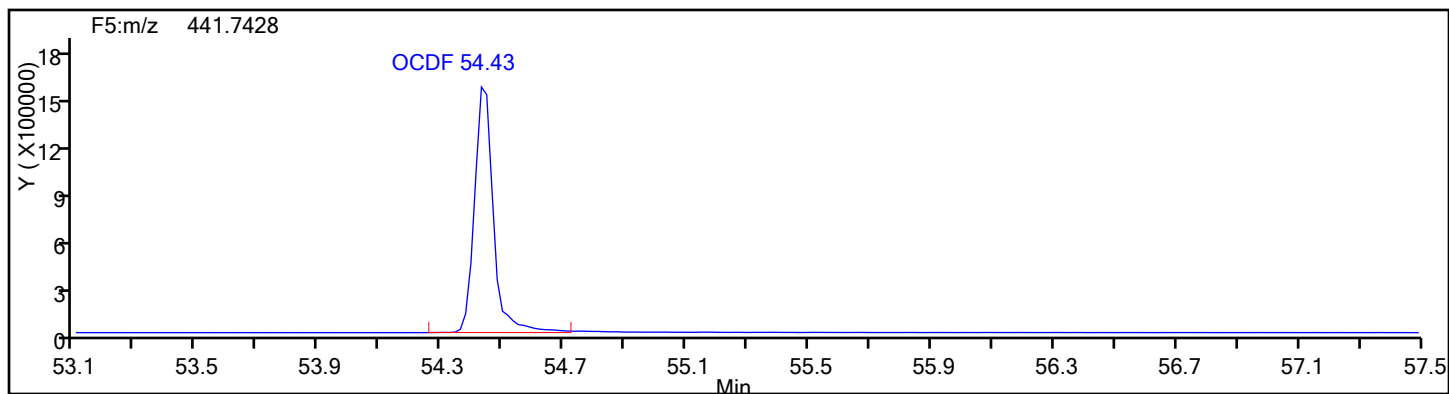
Worklist#: 7768

Sample Line#: 7

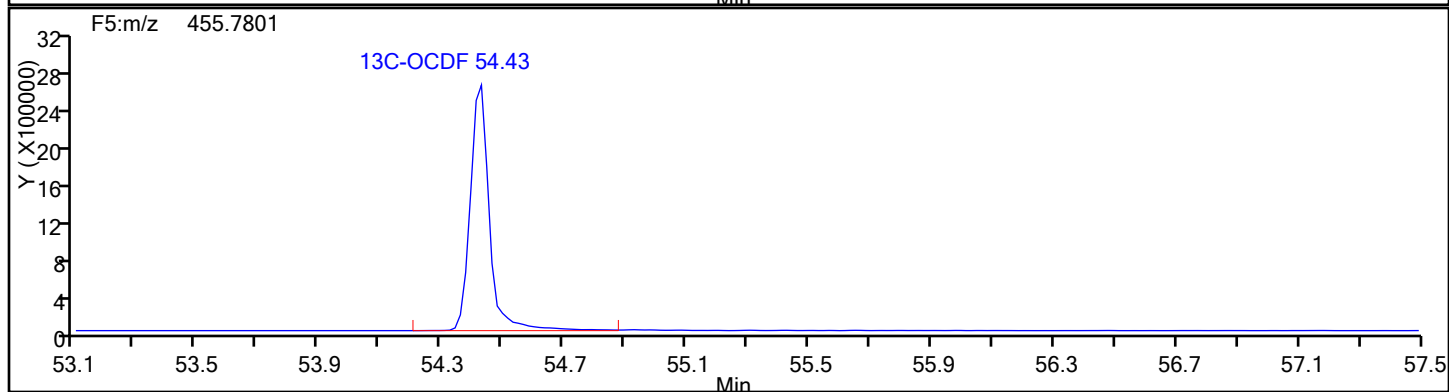
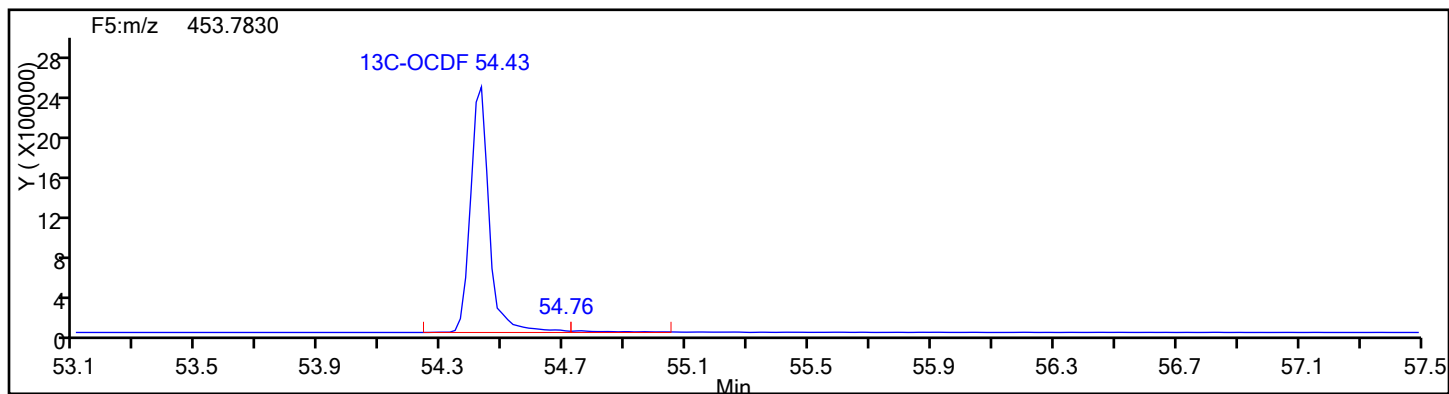
Column Type:

Column Dia:

OCDF



OCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

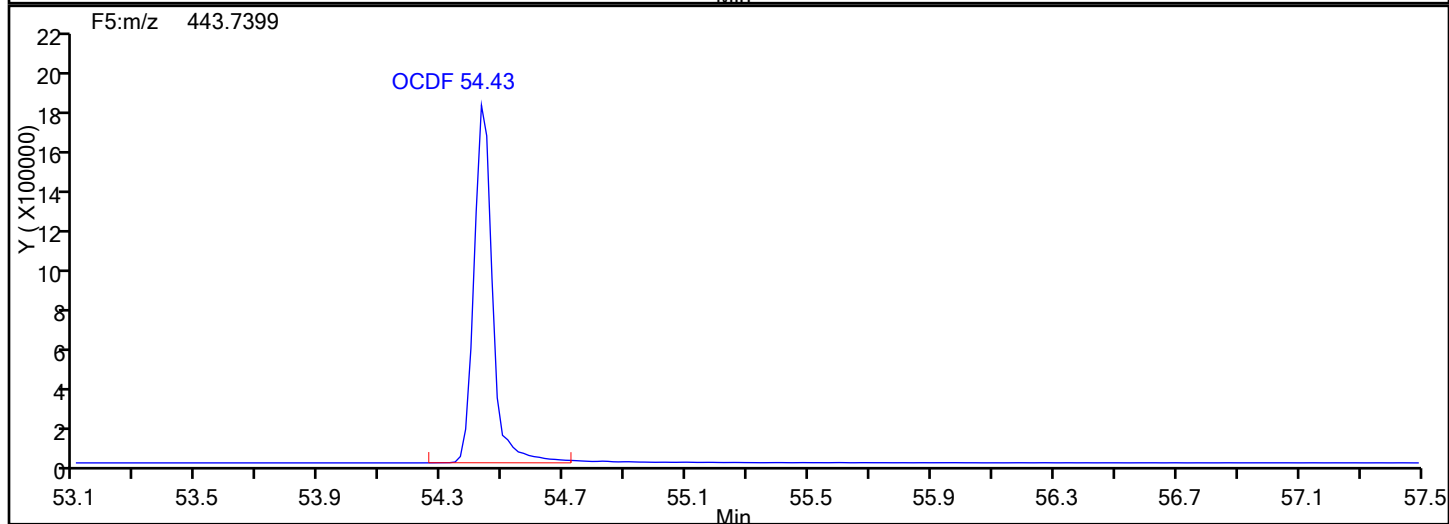
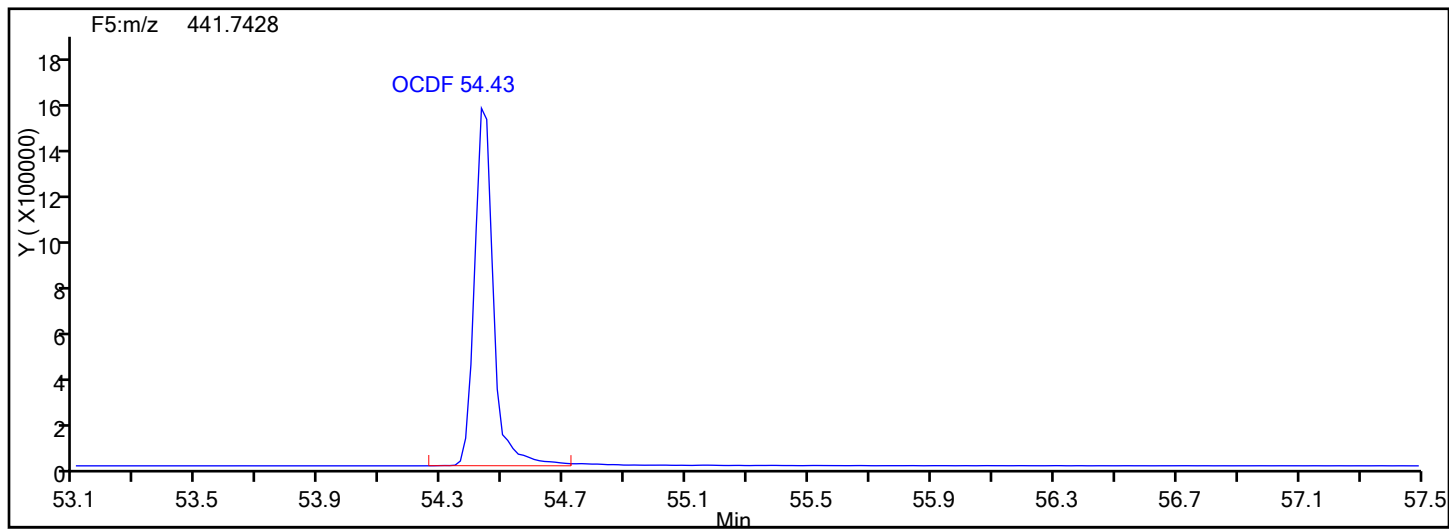
Worklist#: 7768

Sample Line#: 7

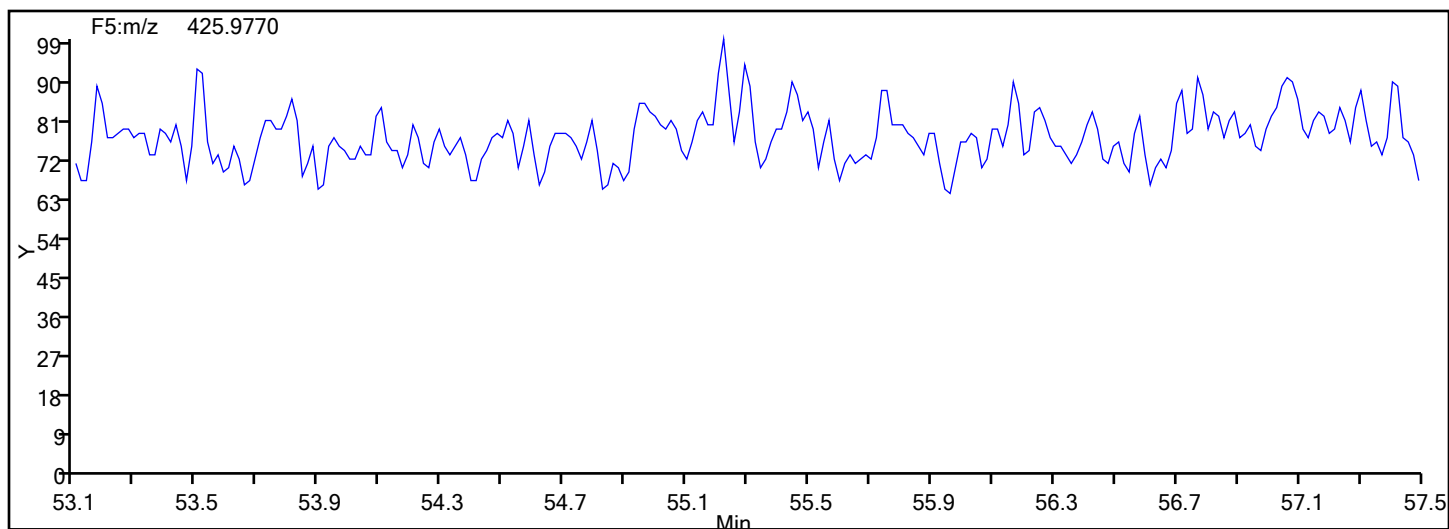
Column Type:

Column Dia:

OCDF



OCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516ss.d

Injection Date: 16-May-2014 20:36:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

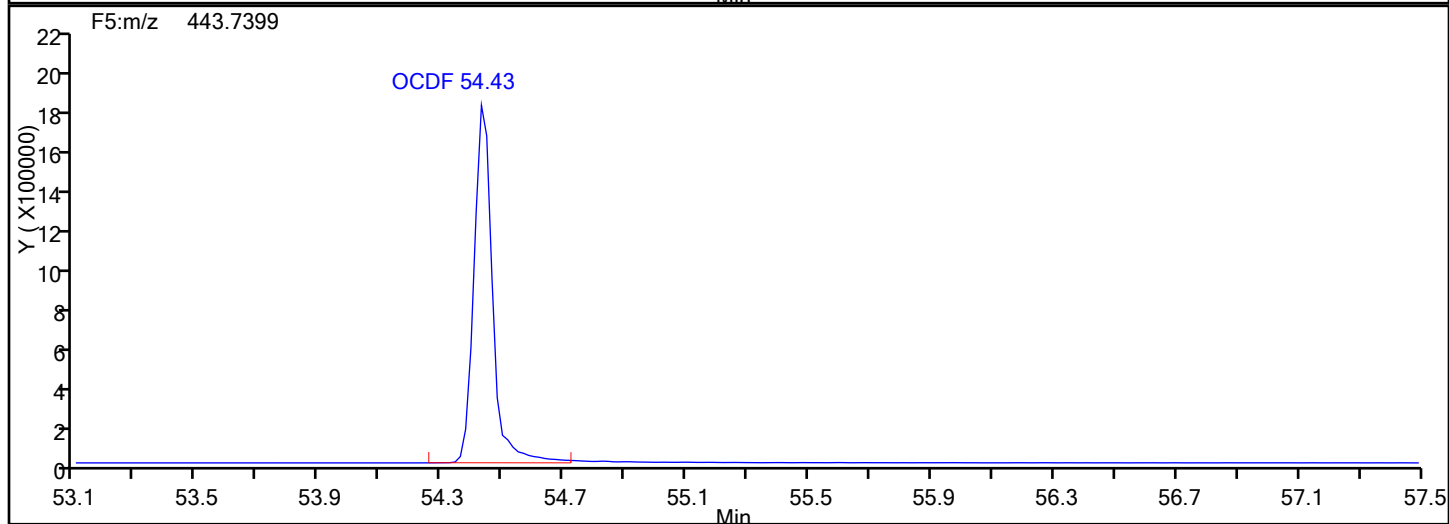
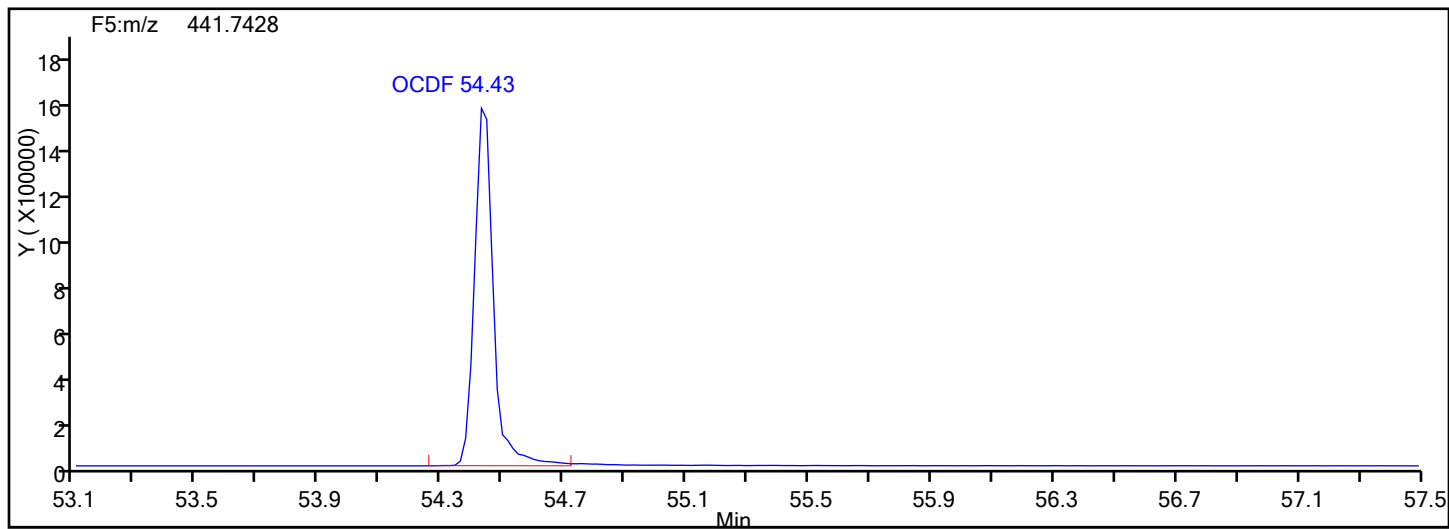
Worklist#: 7768

Sample Line#: 7

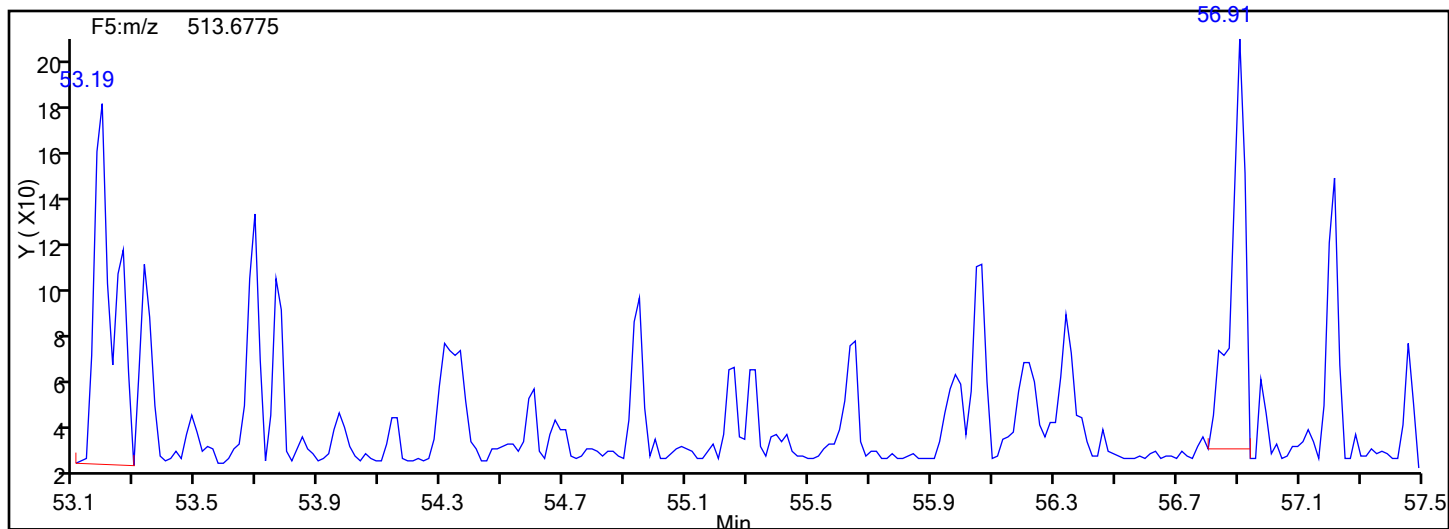
Column Type:

Column Dia:

OCDF



OCDF Interference Mass



FORM VII
DIOXIN CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: WDMCCV 140-27191/1 Calibration Date: 01/28/2019 01:01

Instrument ID: D2A Calib Start Date: 05/16/2014 14:26

GC Column: RTX-5 ID: 0.32 (mm) Calib End Date: 05/16/2014 18:31

Lab File ID: d3190128s1.d Conc. Units: pg/uL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%REC	%REC LIMITS
2,3,7,8-TCDF	AveID	1.088	1.053		9.68	10.0	97	84-120
2,3,7,8-TCDD	AveID	1.173	1.136		9.68	10.0	97	78-129
1,2,3,7,8-PeCDF	AveID	1.190	1.095		46.0	50.0	92	82-120
2,3,4,7,8-PeCDF	AveID	1.109	1.013		45.6	50.0	91	82-122
1,2,3,7,8-PeCDD	AveID	1.043	0.9775		46.8	50.0	94	78-130
1,2,3,4,7,8-HxCDF	AveID	1.363	1.331		48.8	50.0	98	90-112
1,2,3,6,7,8-HxCDF	AveID	1.276	1.235		48.4	50.0	97	88-114
2,3,4,6,7,8-HxCDF	AveID	1.265	1.240		49.0	50.0	98	88-114
1,2,3,4,7,8-HxCDD	AveID	1.141	1.142		50.1	50.0	100	78-128
1,2,3,6,7,8-HxCDD	AveID	1.148	1.107		48.2	50.0	96	78-128
1,2,3,7,8,9-HxCDD	AveID	1.221	1.233		50.5	50.0	101	82-122
1,2,3,7,8,9-HxCDF	AveID	1.257	1.189		47.3	50.0	95	90-112
1,2,3,4,6,7,8-HpCDF	AveID	1.498	1.526		50.9	50.0	102	90-110
1,2,3,4,6,7,8-HpCDD	AveID	1.120	1.122		50.1	50.0	100	86-116
1,2,3,4,7,8,9-HpCDF	AveID	1.381	1.427		51.7	50.0	103	86-116
OCDD	AveID	1.207	1.216		101	100	101	79-126
OCDF	AveID	1.116	1.174		105	100	105	63-159
13C-2,3,7,8-TCDF	Ave	1.755	1.628		92.8	100	93	71-140
13C-2,3,7,8-TCDD	Ave	1.071	1.041		97.2	100	97	82-121
13C-1,2,3,7,8-PeCDF	Ave	1.370	1.410		103	100	103	76-130
13C-2,3,4,7,8-PeCDF	Ave	1.384	1.406		102	100	102	77-130
13C-1,2,3,7,8-PeCDD	Ave	0.8743	0.997		114	100	114	62-160
13C-1,2,3,4,7,8-HxCDF	Ave	1.189	1.240		104	100	104	76-131
13C-1,2,3,6,7,8-HxCDF	Ave	1.462	1.386		94.8	100	95	70-143
13C-2,3,4,6,7,8-HxCDF	Ave	1.320	1.283		97.2	100	97	73-137
13C-1,2,3,4,7,8-HxCDD	Ave	0.8772	0.8758		99.8	100	100	85-117
13C-1,2,3,6,7,8-HxCDD	Ave	0.9171	0.8777		95.7	100	96	85-118
13C-1,2,3,7,8,9-HxCDF	Ave	1.200	1.193		99.4	100	99	74-135
13C-1,2,3,4,6,7,8-HpCDF	Ave	1.050	1.027		97.9	100	98	78-129
13C-1,2,3,4,6,7,8-HpCDD	Ave	0.8155	0.8079		99.1	100	99	72-138
13C-1,2,3,4,7,8,9-HpCDF	Ave	0.8947	0.8332		93.1	100	93	77-129
13C-OCDD	Ave	0.7044	0.6360		181	200	90	48-208
13C-OCDF	Ave	1.061	0.8188		154	200	77	48-208
37Cl4-2,3,7,8-TCDD	Ave	1.227	1.156		9.43	10.0	94	79-127

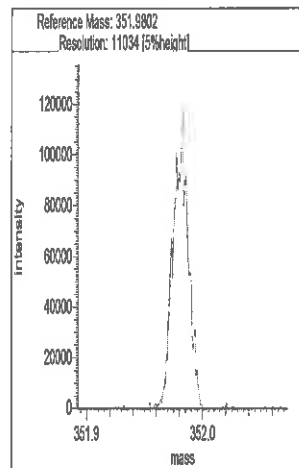
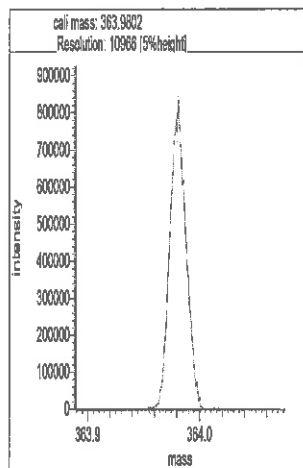
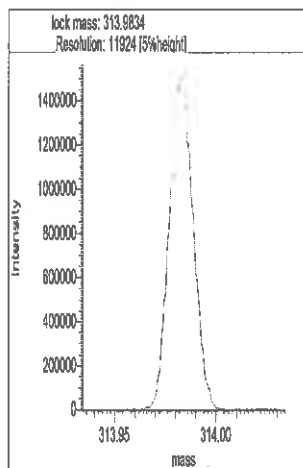
Date: 28 Jan 2019 00:47
MID Experiment: 5w_db5_fc43_singleGC_OCDF_ResCheck
Target Resolution: 10000
Resolution Warning : 9500
Resolution Error : 9000
Reference: FC43Knx.lua
Status: RESOLUTION PASSED

Segment 1

Lock mass 313.9834 [m/z] Resolution: 11924 [5%height]

Cali. mass 363.9802 [m/z] Resolution: 10966 [5%height]

Ref. mass 351.9802 [m/z] Resolution: 11034 [5%height]

Segment 2

Lock mass 313.9834 [m/z] Resolution: 11463 [5%height]

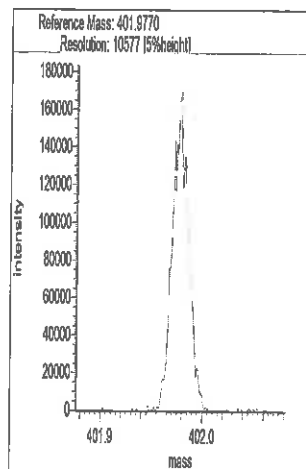
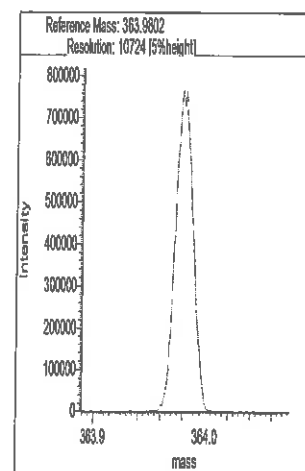
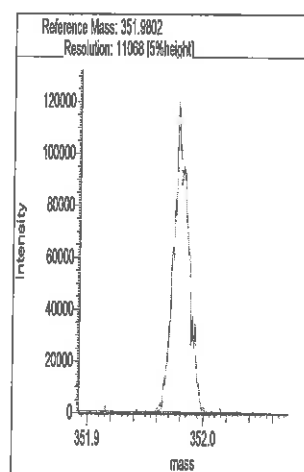
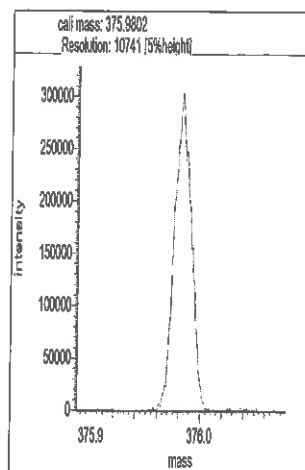
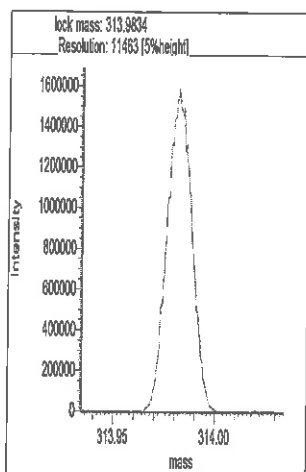
Cali. mass 375.9802 [m/z] Resolution: 10741 [5%height]

Ref. mass 351.9802 [m/z] Resolution: 11068 [5%height]

Ref. mass 363.9802 [m/z] Resolution: 10724 [5%height]

Ref. mass 401.9770 [m/z] Resolution: 10577 [5%height]

190128s1b



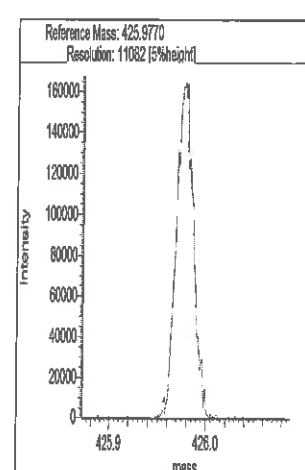
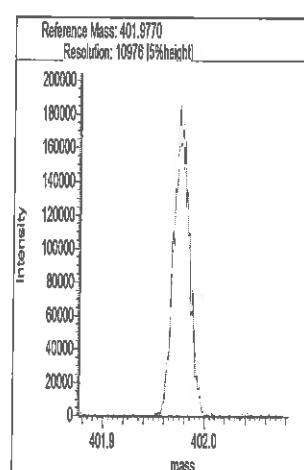
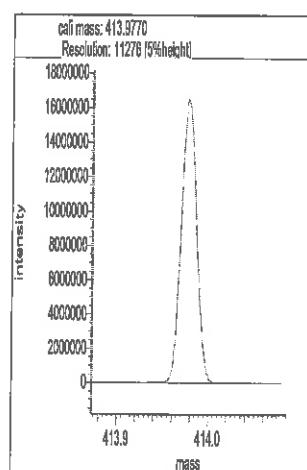
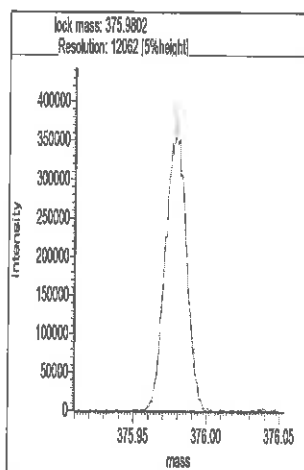
Segment 3

Lock mass 375.9802 [m/z] Resolution: 12062 [5%height]

Cali. mass 413.9770 [m/z] Resolution: 11276 [5%height]

Ref. mass 401.9770 [m/z] Resolution: 10976 [5%height]

Ref. mass 425.9770 [m/z] Resolution: 11082 [5%height]

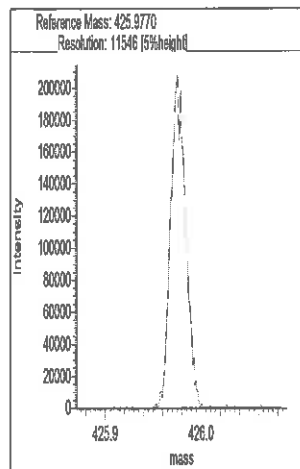
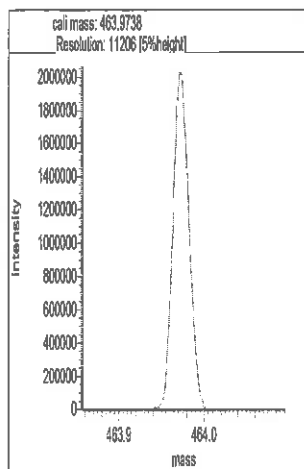
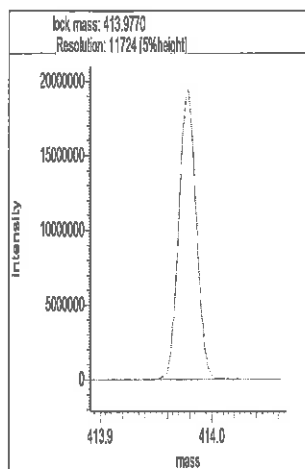


Segment 4

Lock mass 413.9770 [m/z] Resolution: 11724 [5%height]

Cali. mass 463.9738 [m/z] Resolution: 11206 [5%height]

Ref. mass 425.9770 [m/z] Resolution: 11546 [5%height]

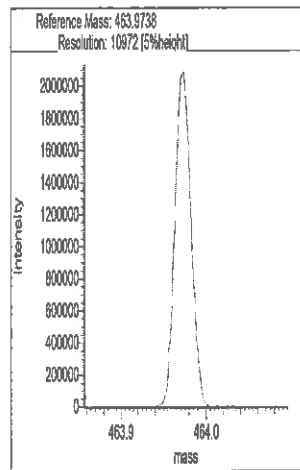
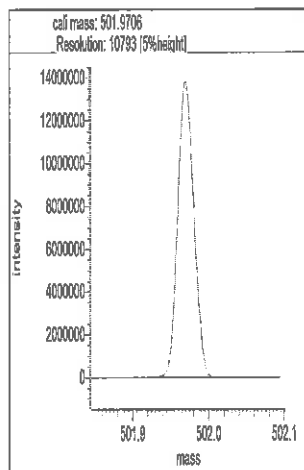
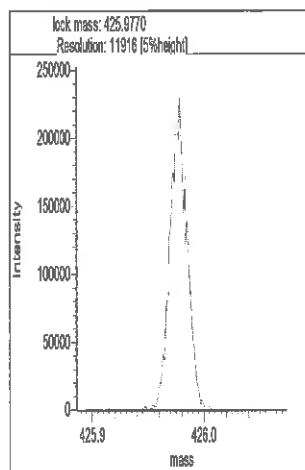


Segment 5

Lock mass 425.9770 [m/z] Resolution: 11916 [5%height]

Cali. mass 501.9706 [m/z] Resolution: 10793 [5%height]

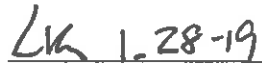
Ref. mass 463.9738 [m/z] Resolution: 10972 [5%height]



Reports

00:58:59: Peak matching procedure started
00:58:59:
00:59:00: Reference mass: 313.98336
00:59:00: Sample mass: 364.0
00:59:01:
00:59:01: Finding reference mass
00:59:02: Finding sample mass
00:59:03:
00:59:09: [1] 363.9804 amu, mean: 363.9804 SD: 0.47 mmu or: 1.30 ppm
00:59:12: [2] 363.9810 amu, mean: 363.9807 SD: 0.52 mmu or: 1.43 ppm
00:59:15: [3] 363.9814 amu, mean: 363.9809 SD: 0.55 mmu or: 1.51 ppm
00:59:18: [4] 363.9816 amu, mean: 363.9811 SD: 0.49 mmu or: 1.36 ppm
00:59:21: [5] 363.9814 amu, mean: 363.9812 SD: 0.44 mmu or: 1.22 ppm
00:59:25: [6] 363.9812 amu, mean: 363.9812 SD: 0.43 mmu or: 1.19 ppm
00:59:28: [7] 363.9816 amu, mean: 363.9812 SD: 0.40 mmu or: 1.11 ppm
00:59:31: [8] 363.9811 amu, mean: 363.9812 SD: 0.42 mmu or: 1.15 ppm
00:59:34: [9] 363.9807 amu, mean: 363.9812 SD: 0.43 mmu or: 1.19 ppm
00:59:37: [10] 363.9817 amu, mean: 363.9812
00:59:38:
00:59:38: Stop requested. Please wait for procedure to finish.
00:59:38:
00:59:40:
00:59:41: Peakmatching stopped

Signature

 1-28-19

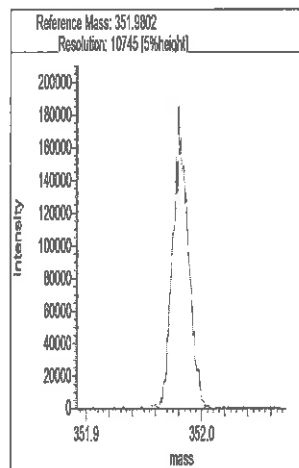
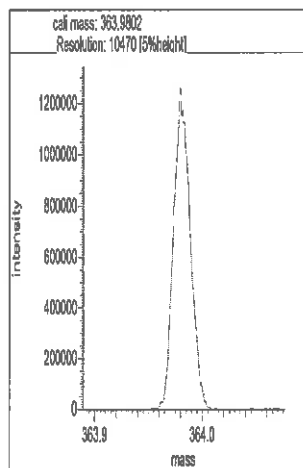
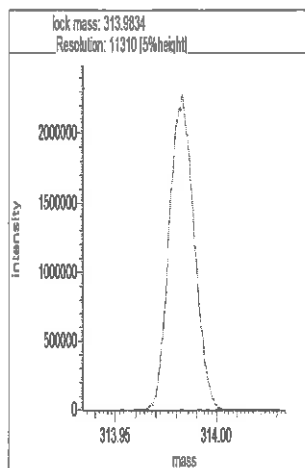
Resolution Check Report (DFS SN: 3190)

Date: 28 Jan 2019 11:40
MID Experiment: 5w_db5_fc43_singleGC_OCDF_ResCheck
Target Resolution: 10000
Resolution Warning : 9500
Resolution Error : 9000
Reference: FC43Knx.lua
Status: RESOLUTION PASSED

Segment 1

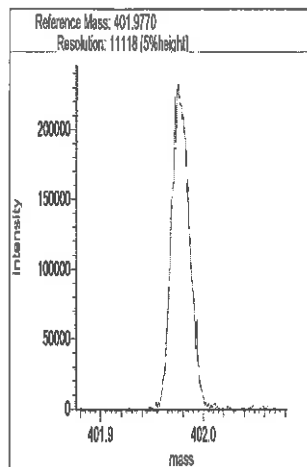
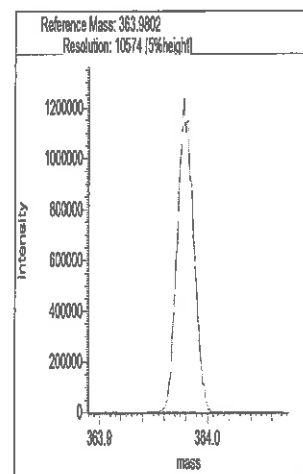
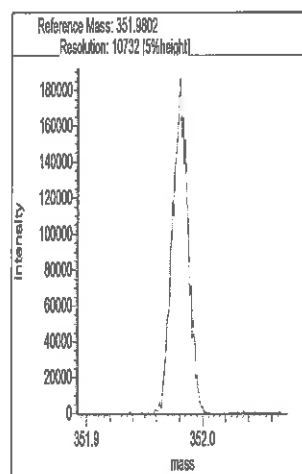
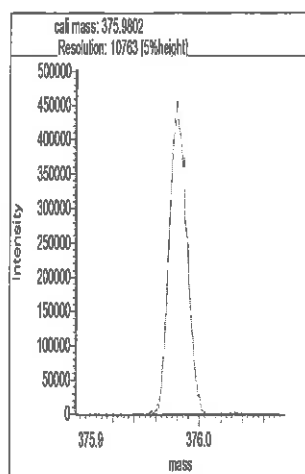
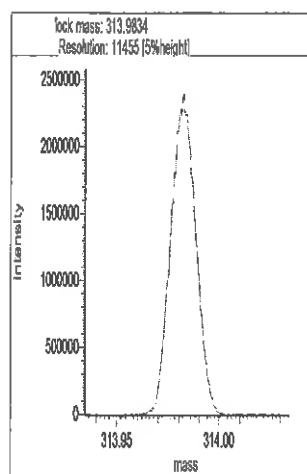
Lock mass 313.9834 [m/z] Resolution: 11310 [5%height]
Cali. mass 363.9802 [m/z] Resolution: 10470 [5%height]
Ref. mass 351.9802 [m/z] Resolution: 10745 [5%height]

-190128s2b



Segment 2

Lock mass 313.9834 [m/z] Resolution: 11455 [5%height]
Cali. mass 375.9802 [m/z] Resolution: 10763 [5%height]
Ref. mass 351.9802 [m/z] Resolution: 10732 [5%height]
Ref. mass 363.9802 [m/z] Resolution: 10574 [5%height]
Ref. mass 401.9770 [m/z] Resolution: 11118 [5%height]



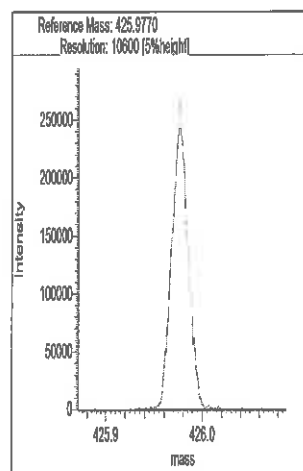
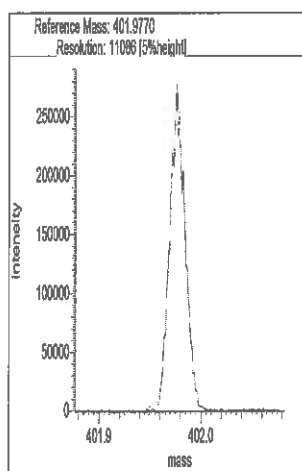
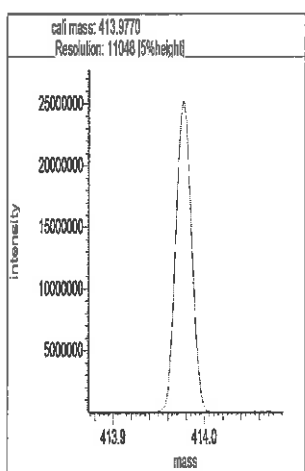
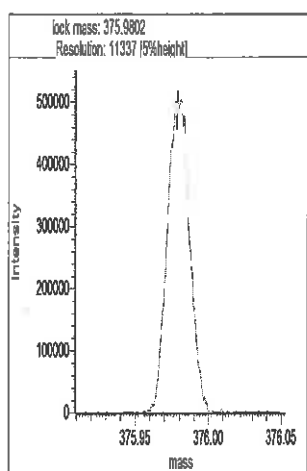
Segment 3

Lock mass 375.9802 [m/z] Resolution: 11337 [5%height]

Cali. mass 413.9770 [m/z] Resolution: 11048 [5%height]

Ref. mass 401.9770 [m/z] Resolution: 11086 [5%height]

Ref. mass 425.9770 [m/z] Resolution: 10600 [5%height]

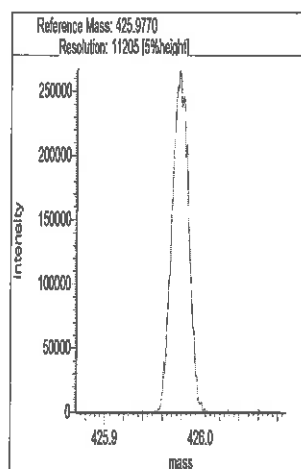
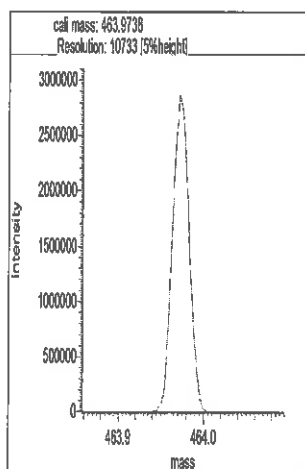
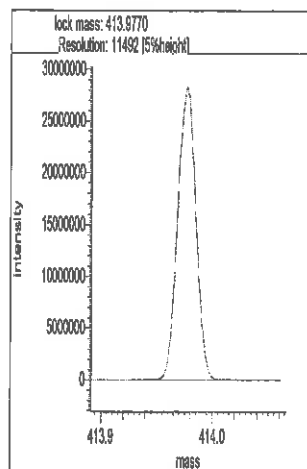


Segment 4

Lock mass 413.9770 [m/z] Resolution: 11492 [5%height]

Cali. mass 463.9738 [m/z] Resolution: 10733 [5%height]

Ref. mass 425.9770 [m/z] Resolution: 11205 [5%height]

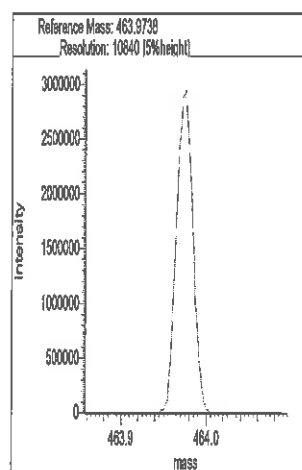
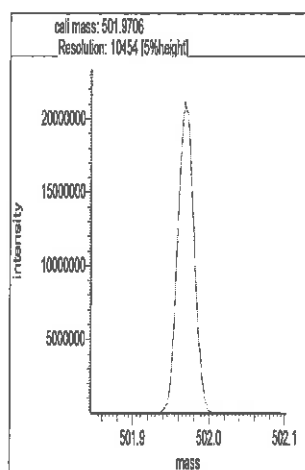
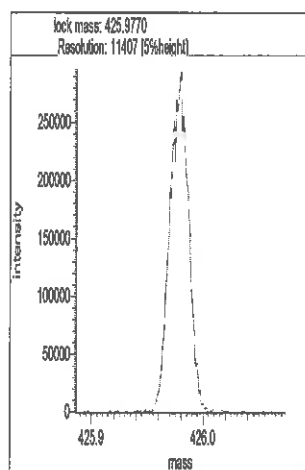


Segment 5

Lock mass 425.9770 [m/z] Resolution: 11407 [5%height]

Cali. mass 501.9706 [m/z] Resolution: 10454 [5%height]

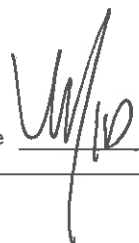
Ref. mass 463.9738 [m/z] Resolution: 10840 [5%height]



Reports

11:51:29: Peak matching procedure started
11:51:29:
11:51:30: Reference mass: 313.98336
11:51:30: Sample mass: 364.0
11:51:31:
11:51:31: Finding reference mass
11:51:32: Finding sample mass
11:51:33:
11:51:39: [1] 363.9800 amu, mean: 363.9800
11:51:42: [2] 363.9797 amu, mean: 363.9799 SD: 0.23 mmu or: 0.62 ppm
11:51:45: [3] 363.9796 amu, mean: 363.9798 SD: 0.22 mmu or: 0.60 ppm
11:51:48: [4] 363.9800 amu, mean: 363.9798 SD: 0.22 mmu or: 0.59 ppm
11:51:51: [5] 363.9803 amu, mean: 363.9799 SD: 0.28 mmu or: 0.77 ppm
11:51:55: [6] 363.9802 amu, mean: 363.9800 SD: 0.28 mmu or: 0.76 ppm
11:51:58: [7] 363.9796 amu, mean: 363.9799 SD: 0.28 mmu or: 0.77 ppm
11:52:01: [8] 363.9812 amu, mean: 363.9801 SD: 0.54 mmu or: 1.48 ppm
11:52:04: [9] 363.9800 amu, mean: 363.9801 SD: 0.51 mmu or: 1.39 ppm
11:52:07: [10] 363.9799 amu, mean: 363.9801 SD: 0.48 mmu or: 1.32 ppm
11:52:08:
11:52:08: Stop requested. Please wait for procedure to finish.
11:52:08:

Signature

 1/28/19

TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
 Lims ID: WDMCCV
 Client ID:
 Sample Type: WDMCCV
 Inject. Date: 28-Jan-2019 01:01:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010654-001
 Operator ID: Xcalibur_System Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 28-Jan-2019 02:09:05 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: CTX0314

First Level Reviewer: mcwhirterl

Date: 28-Jan-2019 02:09:05

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31:00	584233	0.75	1.1733	9.681	9.681	0.0399	0.0399	96.81	
A Non-2,3,7,8-sub-TCDD	29:38	1572295	0.79	1.1733	26.1	26.1	0.0399	9.374	0.00	
S Total TCDD					35.7	35.7	0.0399	0.0399		
2,3,7,8-TCDF	29:00	846634	0.79	1.0881	9.678	9.678	0.0202	0.0202	96.78	
A Non-2,3,7,8-sub-TCDF	28:21						0.0202	0.2354		RQU
S Total TCDF					9.678	9.678	0.0202	0.0202		
1,2,3,7,8-PeCDD	40:40	2405958	1.56	1.0434	46.8	46.8	0.007449	0.007449	93.68	Ma
A Non-2,3,7,8-sub-PeCDD	39:32						0.007449	0.6441		U
S Total PeCDD					46.8	46.8	0.007449	0.007449		
1,2,3,7,8-PeCDF	38:53	3812370	1.59	1.1898	46.0	46.0	0.0655	0.0655	92.03	
2,3,4,7,8-PeCDF	40:08	3516619	1.55	1.1095	45.6	45.6	0.0619	0.0619	91.30	
A Non-2,3,7,8-sub-PeCDF	38:08						0.0635	0.7499		U
S Total PeCDF					91.7	91.7	0.0637	0.0637		
1,2,3,4,7,8-HxCDD	44:55	2571987	1.26	1.1409	50.1	50.1	0.0164	0.0164	100	
1,2,3,6,7,8-HxCDD	45:03	2499214	1.27	1.1481	48.2	48.2	0.0167	0.0167	96.46	
1,2,3,7,8,9-HxCDD	45:26	2779903	1.28	1.2212	50.5	50.5	0.0155	0.0155	101	
A Non-2,3,7,8-sub-HxCDD	44:24						0.0162	0.0162		
S Total HxCDD					148.8	148.8	0.0162	0.0162		
1,2,3,4,7,8-HxCDF	43:54	4242125	1.25	1.3629	48.8	48.8	0.1948	0.1948	97.64	
1,2,3,6,7,8-HxCDF	44:02	4400690	1.26	1.2762	48.4	48.4	0.1902	0.1902	96.78	
2,3,4,6,7,8-HxCDF	44:45	4092188	1.26	1.2654	49.0	49.0	0.2159	0.2159	98.03	
1,2,3,7,8,9-HxCDF	45:41	3648782	1.27	1.2573	47.3	47.3	0.2556	0.2556	94.59	
A Non-2,3,7,8-sub-HxCDF	44:14						0.2115	0.2115		
S Total HxCDF					193.5	193.5	0.2141	0.2141		
1,2,3,4,6,7,8-HpCDD	49:45	2331451	1.06	1.1204	50.1	50.1	0.0464	0.0464	100	
A Non-2,3,7,8-sub-HpCDD	49:10						0.0464	0.0464		
S Total HpCDD					50.1	50.1	0.0464	0.0464		
1,2,3,4,6,7,8-HpCDF	48:04	4030518	1.04	1.4984	50.9	50.9	0.0406	0.0406	102	
1,2,3,4,7,8,9-HpCDF	50:24	3056217	1.06	1.3807	51.7	51.7	0.0613	0.0613	103	

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
A Non-2,3,7,8-sub-HpCDF	49:25						0.0491	2.143		U
S Total HpCDF					102.6	102.6	0.0509	0.0509		
OCDD	53:59	3976688	0.89	1.2073	100.7	100.7	0.0118	0.0118	101	
OCDF	54:07	4945288	0.90	1.1162	105.2	105.2	0.009773	0.009773	105	
D 13C-2,3,7,8-TCDD	30:58	5143407	0.81	1.0709	97.2	97.2	0.2178	0.2178	97.25	
D 13C-2,3,7,8-TCDF	28:58	8039168	0.80	1.7545	92.8	92.8	0.1381	0.1381	92.78	
D 13C-1,2,3,7,8-PeCDD	40:39	4922796	1.59	0.8743	114.0	114.0	0.4123	0.4123	114	
D 13C-1,2,3,7,8-PeCDF	38:51	6963696	1.59	1.3704	102.9	102.9	1.386	1.386	103	
D 13C-2,3,4,7,8-PeCDF	40:06	6943490	1.61	1.3837	101.6	101.6	1.373	1.373	102	
D 13C-1,2,3,4,7,8-HxCDD	44:54	4503767	1.26	0.8772	99.8	99.8	0.2807	0.2807	99.84	
D 13C-1,2,3,6,7,8-HxCDD	45:02	4513356	1.26	0.9171	95.7	95.7	0.2685	0.2685	95.71	
D 13C-1,2,3,4,7,8-HxCDF	43:53	6375808	0.54	1.1892	104.3	104.3	0.5667	0.5667	104	
D 13C-1,2,3,6,7,8-HxCDF	44:01	7126139	0.54	1.4625	94.8	94.8	0.4608	0.4608	94.76	
D 13C-2,3,4,6,7,8-HxCDF	44:44	6597806	0.53	1.3197	97.2	97.2	0.5107	0.5107	97.23	
D 13C-1,2,3,7,8,9-HxCDF	45:40	6136108	0.53	1.2001	99.4	99.4	0.5616	0.5616	99.43	
D 13C-1,2,3,4,6,7,8-HpCDD	49:43	4154438	1.06	0.8155	99.1	99.1	0.5629	0.5629	99.07	
D 13C-1,2,3,4,6,7,8-HpCDF	48:03	5281911	0.46	1.0496	97.9	97.9	0.8792	0.8792	97.86	
D 13C-1,2,3,4,7,8,9-HpCDF	50:23	4284350	0.46	0.8947	93.1	93.1	1.031	1.031	93.12	
D 13C-OCDD	53:58	6540759	0.88	0.7044	180.6	180.6	0.4557	0.4557	90.29	
D 13C-OCDF	54:06	8421274	0.90	1.0615	154.3	154.3	0.1777	0.1777	77.14	
\$ 37Cl4-2,3,7,8-TCDD	31:01	571062		1.2266	9.427	9.427	0.0156	0.0156	94.27	
* 13C-1,2,3,4-TCDD	30:28	4938720	0.82	9.1E+04	100.0	100.0			100	
* 13C-1,2,3,7,8,9-HxCDD	45:25	5142254	1.24	1E+05	100.0	100.0			100	
1,3,6,8-TCDF	22:40	1012063	0.82						0.00	
1,3,6,8-TCDD	25:06	557171	0.79						0.00	
1,2,8,9-TCDF	34:02	810990	0.79						0.00	
1,2,8,9-TCDD	34:10	529639	0.80						0.00	
1,3,4,6,8-PeCDF	34:49	3559553	1.57						0.00	
1,2,4,7,9-PeCDD	37:44	2209725	1.57						0.00	
1,2,3,8,9-PeCDD	41:19	2518119	1.58						0.00	
1,2,3,8,9-PeCDF	41:27	3481939	1.57						0.00	
1,2,3,4,6,8-HxCDF	42:40	4041599	1.24						0.00	
1,2,4,6,7,9-HxCDD	43:21	2868758	1.25						0.00	
1,2,3,4,8,9-HxCDF	45:49	3649266	1.30						0.00	
1,2,3,4,6,7,9-HpCDD	48:35	2518944	1.06						0.00	

QC Flag Legend

Review Flags

M - Manually Integrated

U - Marked Undetected

a - User Assigned ID

Reagents:

61WDML3OP_F/L_00052

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
 Lims ID: WDMCCV
 Client ID:
 Sample Type: WDMCCV
 Inject. Date: 28-Jan-2019 01:01:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010654-001
 Operator ID: Xcalibur_System Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 28-Jan-2019 02:09:05 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: CTX0314

First Level Reviewer: mcwhirterl

Date: 28-Jan-2019 02:09:05

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,7,8-TCDD											
319.8965	31:00	31:00	0	1.001	250059	26714	34	85	786		
321.8936	31:01	31:00	1	1.002	334174	35038	68	170	515	0.75(0.65-0.89)	
A Non-2,3,7,8-sub-TCDD											
319.8965	30:31	29:38	53	0.985	219864	24645	34	85	725		
321.8936	30:31	29:38	53	0.985	280239	31801	68	170	468	0.78(0.65-0.89)	
319.8965	30:43	29:38	65	0.992	224380	23534	34	85	692		
321.8936	30:44	29:38	66	0.992	282121	28595	68	170	421	0.80(0.65-0.89)	
319.8965	31:30	29:38	111	1.017	249987	26831	34	85	789		
321.8936	31:29	29:38	110	1.016	315704	31295	68	170	460	0.79(0.65-0.89)	
2,3,7,8-TCDF											
303.9016	29:00	29:00	0	1.001	373155	42643	41	102	1040		
305.8987	29:00	29:00	0	1.001	473479	54364	41	102	1326	0.79(0.65-0.89)	
A Non-2,3,7,8-sub-TCDF											
303.9016	25:10	28:21	-191	0.869	1822	302	41	102	7		U
	Empc Correction				1215	237	41	102	6		
305.8987	25:12	28:21	-189	0.870	1579	309	41	102	8	1.15(0.65-0.89)	
1,2,3,7,8-PeCDD											
355.8546	40:40	40:40	0	1.000	1466172	360578	18	45	20032		Ma
357.8516	40:40	40:40	0	1.000	939786	227169	19	47	11956	1.56(1.32-1.78)	M
A Non-2,3,7,8-sub-PeCDD											
355.8546	39:32	39:32	0	0.972	18990	3257	18	45			U
357.8516	39:32	39:32	0	0.972	14094	2240	19	47		1.35(1.32-1.78)	
1,2,3,7,8-PeCDF											
339.8597	38:53	38:53	0	1.000	2342774	465724	292	730	1595		
341.8567	38:53	38:53	0	1.000	1469596	293809	139	347	2114	1.59(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,4,7,8-PeCDF											
339.8597	40:08	40:08	0	1.001	2139768	477999	292	730	1637		
341.8567	40:07	40:08	-1	1.000	1376851	308200	139	347	2217	1.55(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDF											
339.8597	37:20	38:08	-47	0.961	36918	4485	292	730	15		
341.8567	37:19	38:08	-48	0.961	23027	3192	139	347	23	1.60(1.32-1.78)	U
1,2,3,4,7,8-HxCDD											
389.8158	44:55	44:55	0	1.000	1434645	371547	50	125	7431		
391.8127	44:55	44:55	0	1.000	1137342	298413	37	92	8065	1.26(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45:03	45:03	0	1.000	1398767	356646	50	125	7133		
391.8127	45:03	45:03	0	1.000	1100447	285363	37	92	7713	1.27(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45:26	45:26	0	1.012	1562645	380585	50	125	7612		
391.8127	45:26	45:26	0	1.012	1217258	294970	37	92	7972	1.28(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDD											
389.8158	44:24						50	125			
391.8127	44:24						37	92			
1,2,3,4,7,8-HxCDF											
373.8208	43:54	43:54	0	1.000	2358572	654752	1103	2757	594		
375.8178	43:54	43:54	0	1.000	1883553	527973	747	1867	707	1.25(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44:02	44:02	0	1.000	2453856	668869	1103	2757	606		
375.8178	44:02	44:02	0	1.000	1946834	522433	747	1867	699	1.26(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	44:45	44:45	0	1.000	2278951	592001	1103	2757	537		
375.8178	44:44	44:45	-1	1.000	1813237	462302	747	1867	619	1.26(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	45:41	45:41	0	1.000	2042888	498300	1103	2757	452		
375.8178	45:41	45:41	0	1.000	1605894	395681	747	1867	530	1.27(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDF											
373.8208	44:14						1103	2757			
375.8178	44:14						747	1867			
1,2,3,4,6,7,8-HpCDD											
423.7767	49:45	49:45	0	1.000	1197453	231791	102	255	2272		
425.7737	49:45	49:45	0	1.000	1133998	220998	66	165	3348	1.06(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											
423.7767	49:10						102	255			
425.7737	49:10						66	165			
1,2,3,4,6,7,8-HpCDF											
407.7817	48:04	48:04	0	1.000	2057209	446779	111	277	4025		
409.7788	48:04	48:04	0	1.000	1973309	434808	168	420	2588	1.04(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50:24	50:24	0	1.000	1571052	311184	111	277	2803		
409.7788	50:24	50:24	0	1.000	1485165	290462	168	420	1729	1.06(0.88-1.20)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-HpCDF											U
407.7817	48:27	49:25	-57	1.008	30993	6638	111	277	60		
409.7788	48:27	49:25	-57	1.008	34109	5133	168	420	31	0.91(0.88-1.20)	
OCDD											
457.7377	53:59	53:59	0	1.000	1878022	469264	25	62	18771		
459.7348	53:59	53:59	0	1.000	2098666	521064	22	55	23685	0.89(0.76-1.02)	
OCDF											
441.7428	54:07	54:07	0	1.000	2348380	582348	23	57	25319		
443.7399	54:07	54:07	0	1.000	2596908	620611	23	57	26983	0.90(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	30:58	30:58	-4	1.017	2301526	240891	290	725	831		
333.9338	30:58	30:58	-4	1.017	2841881	303198	231	577	1313	0.81(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	28:58	28:57	-3	0.951	3577824	405965	278	695	1460		
317.9389	28:58	28:57	-3	0.951	4461344	525245	263	657	1997	0.80(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40:39	40:35	-1	1.334	3019250	729455	407	1017	1792		
369.8919	40:39	40:35	-1	1.334	1903546	454274	398	995	1141	1.59(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	38:51	38:48	-2	1.275	4272927	850707	2555	6387	333		
353.8970	38:51	38:48	-2	1.275	2690769	531820	1686	4215	315	1.59(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40:06	40:03	-2	1.316	4287292	964708	2555	6387	378		
353.8970	40:06	40:03	-2	1.316	2656198	602419	1686	4215	357	1.61(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	44:54	44:55	-2	0.989	2512949	647628	567	1417	1142		
403.8529	44:54	44:55	-2	0.989	1990818	512640	685	1712	748	1.26(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45:02	45:03	-2	0.991	2515685	627914	567	1417	1107		
403.8529	45:02	45:03	-2	0.991	1997671	505047	685	1712	737	1.26(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	43:53	43:53	-1	0.966	2225773	607616	1135	2837	535		
385.8610	43:53	43:53	-1	0.966	4150035	1134380	2292	5730	495	0.54(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	44:01	44:01	-1	0.969	2492040	675704	1135	2837	595		
385.8610	44:01	44:01	-1	0.969	4634099	1229549	2292	5730	536	0.54(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	44:44	44:44	-1	0.985	2288598	589610	1135	2837	519		
385.8610	44:44	44:44	-1	0.985	4309208	1103306	2292	5730	481	0.53(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	45:40	45:41	-2	1.006	2125935	498956	1135	2837	440		
385.8610	45:40	45:41	-2	1.006	4010173	940350	2292	5730	410	0.53(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	49:43	49:44	-2	1.095	2140952	411135	1193	2982	345		
437.8140	49:43	49:44	-2	1.095	2013486	396006	1141	2852	347	1.06(0.88-1.20)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48:03	48:04	-2	1.058	1657127	359502	845	2112	425		
419.8220	48:03	48:04	-2	1.058	3624784	787283	3847	9617	205	0.46(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50:23	50:23	-1	1.109	1351074	265548	845	2112	314		
419.8220	50:23	50:23	-1	1.109	2933276	558059	3847	9617	145	0.46(0.37-0.51)	
13C-OCDD											
469.7780	53:58	53:58	-1	1.188	3060186	776040	568	1420	1366		
471.7750	53:58	53:58	-1	1.188	3480573	861249	1064	2660	809	0.88(0.76-1.02)	
13C-OCDF											
453.7830	54:06	54:06	-1	1.191	3989736	991732	457	1142	2170		
455.7801	54:06	54:06	-1	1.191	4431538	1116829	502	1255	2225	0.90(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31:01	31:01	0	1.018	571062	60091	43	107	1397		
13C-1,2,3,4-TCDD											
331.9368	30:28	30:28	0		2231852	248891	290	725	858		
333.9338	30:28	30:28	0		2706868	309221	231	577	1339	0.82(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45:25	45:25	0		2848317	695399	567	1417	1226		
403.8529	45:25	45:25	0		2293937	575733	685	1712	840	1.24(1.05-1.43)	
1,3,6,8-TCDF											
303.9016	22:40	22:40	0	0.783	456455	70425	41	102	1718		
305.8987	22:39	22:40	-1	0.782	555608	85997	41	102	2097	0.82(0.65-0.89)	
1,3,6,8-TCDD											
319.8965	25:06	25:06	0	0.810	246582	33753	34	85	993		
321.8936	25:06	25:06	0	0.810	310589	42762	68	170	629	0.79(0.65-0.89)	
1,2,8,9-TCDF											
303.9016	34:02	34:02	0	1.175	359016	39289	41	102	958		
305.8987	34:02	34:02	0	1.175	451974	47484	41	102	1158	0.79(0.65-0.89)	
1,2,8,9-TCDD											
319.8965	34:10	34:10	0	1.103	235141	24371	34	85	717		
321.8936	34:10	34:10	0	1.103	294498	33752	68	170	496	0.80(0.65-0.89)	
1,3,4,6,8-PeCDF											
339.8597	34:49	34:49	0	0.896	2172787	274910	292	730	941		
341.8567	34:48	34:49	-1	0.896	1386766	175589	139	347	1263	1.57(1.32-1.78)	
1,2,4,7,9-PeCDD											
355.8546	37:44	37:44	0	0.928	1348302	220316	18	45	12240		
357.8516	37:44	37:44	0	0.928	861423	139772	19	47	7356	1.57(1.32-1.78)	
1,2,3,8,9-PeCDD											
355.8546	41:19	41:19	0	1.017	1542134	371615	18	45	20645		
357.8516	41:19	41:19	0	1.017	975985	237390	19	47	12494	1.58(1.32-1.78)	
1,2,3,8,9-PeCDF											
339.8597	41:27	41:27	0	1.067	2128535	520106	292	730	1781		
341.8567	41:27	41:27	0	1.067	1353404	328320	139	347	2362	1.57(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
1,2,3,4,6,8-HxCDF											
373.8208	42:40	42:40	0	0.972	2237240	608009	1103	2757	551		
375.8178	42:40	42:40	0	0.972	1804359	491081	747	1867	657	1.24(1.05-1.43)	
1,2,4,6,7,9-HxCDD											
389.8158	43:21	43:21	0	0.965	1595040	425755	50	125	8515		
391.8127	43:21	43:21	0	0.965	1273718	351164	37	92	9491	1.25(1.05-1.43)	
1,2,3,4,8,9-HxCDF											
373.8208	45:49	45:49	0	1.044	2065506	485901	1103	2757	441		
375.8178	45:49	45:49	0	1.044	1583760	383305	747	1867	513	1.30(1.05-1.43)	
1,2,3,4,6,7,9-HpCDD											
423.7767	48:35	48:35	0	0.977	1293219	266584	102	255	2614		
425.7737	48:34	48:35	-1	0.977	1225725	255307	66	165	3868	1.06(0.88-1.20)	

QC Flag Legend

Review Flags

M - Manually Integrated

U - Marked Undetected

a - User Assigned ID

Reagents:

61WDML3OP_F/L_00052

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
CCV Relative RT Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
 Lims ID: WDMCCV
 Client ID:
 Sample Type: WDMCCV
 Inject. Date: 28-Jan-2019 01:01:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010654-001
 Operator ID: Xcalibur_System Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 28-Jan-2019 02:09:05 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: CTX0314

First Level Reviewer: mcwhirterl

Date: 28-Jan-2019 02:09:05

Start Cal Date: 16-May-2014 14:26:00

End Cal Date: 16-May-2014 18:31:00

Compound	T/L	ICAL RT	CCV RT	RT (secs)	RT Lmt	ICAL RRT	CCV RRT	RRT Limits
13C-1,2,3,4-TCDD		31:17	30:28	-48		1.000	1.000	0.000 - 0.000
2,3,7,8-TCDD		31:50	31:00	-50		1.001	1.001	0.999 - 1.002
37Cl4-2,3,7,8-TCDD		31:50	31:01	-49		1.018	1.018	0.989 - 1.052
13C-2,3,7,8-TCDD		31:48	30:58	-50		1.017	1.017	0.976 - 1.043
2,3,7,8-TCDF		29:47	29:00	-46		1.002	1.001	0.999 - 1.003
13C-2,3,7,8-TCDF		29:44	28:58	-45		0.951	0.951	0.923 - 1.103
1,2,3,7,8-PeCDD		41:01	40:40	-20		1.000	1.000	0.999 - 1.002
13C-1,2,3,7,8-PeCDD		41:00	40:39	-20		1.311	1.334	1.000 - 1.567
1,2,3,7,8-PeCDF		39:18	38:53	-25		1.000	1.000	0.999 - 1.002
13C-1,2,3,7,8-PeCDF		39:17	38:51	-25		1.256	1.275	1.000 - 1.425
2,3,4,7,8-PeCDF		40:30	40:08	-22		1.000	1.001	0.999 - 1.002
13C-2,3,4,7,8-PeCDF		40:29	40:06	-23		1.295	1.316	1.011 - 1.526
13C-1,2,3,7,8,9-HxCDD		45:45	45:25	-19		1.000	1.000	0.000 - 0.000
1,2,3,4,7,8-HxCDD		45:15	44:55	-19		1.000	1.000	0.999 - 1.001
13C-1,2,3,4,7,8-HxCDD		45:14	44:54	-19		0.989	0.989	0.977 - 1.000
1,2,3,6,7,8-HxCDD		45:22	45:03	-19		1.000	1.000	0.998 - 1.004
13C-1,2,3,6,7,8-HxCDD		45:21	45:02	-19		0.992	0.991	0.981 - 1.003
1,2,3,7,8,9-HxCDD		45:46	45:26	-19		1.012	1.012	1.000 - 1.019
1,2,3,4,7,8-HxCDF		44:12	43:54	-18		1.000	1.000	0.999 - 1.001
13C-1,2,3,4,7,8-HxCDF		44:11	43:53	-18		0.966	0.966	0.936 - 0.996
1,2,3,6,7,8-HxCDF		44:21	44:02	-18		1.000	1.000	0.997 - 1.005
13C-1,2,3,6,7,8-HxCDF		44:20	44:01	-18		0.969	0.969	0.949 - 0.975
2,3,4,6,7,8-HxCDF		45:04	44:45	-18		1.000	1.000	0.999 - 1.001
13C-2,3,4,6,7,8-HxCDF		45:03	44:44	-18		0.985	0.985	0.977 - 1.047

Compound	T/L	ICAL RT	CCV RT	RT (secs)	RT Lmt	ICAL RRT	CCV RRT	RRT Limits
1,2,3,7,8,9-HxCDF		46:03	45:41	-21		1.000	1.000	0.999 - 1.001
13C-1,2,3,7,8,9-HxCDF		46:02	45:40	-21		1.006	1.006	0.959 - 1.021
1,2,3,4,6,7,8-HpCDD		50:12	49:45	-27		1.000	1.000	0.999 - 1.001
13C-1,2,3,4,6,7,8-HpCDD		50:11	49:43	-27		1.097	1.095	1.086 - 1.110
1,2,3,4,6,7,8-HpCDF		48:29	48:04	-24		1.000	1.000	0.999 - 1.001
13C-1,2,3,4,6,7,8-HpCDF		48:28	48:03	-24		1.059	1.058	1.043 - 1.085
1,2,3,4,7,8,9-HpCDF		50:49	50:24	-25		1.000	1.000	0.999 - 1.001
13C-1,2,3,4,7,8,9-HpCDF		50:48	50:23	-25		1.111	1.109	1.057 - 1.151
OCDD		54:19	53:59	-19		1.000	1.000	0.999 - 1.001
13C-OCDD		54:18	53:58	-19		1.187	1.188	1.032 - 1.311
OCDF		54:27	54:07	-19		1.000	1.000	0.999 - 1.008
13C-OCDF		54:26	54:06	-19		1.190	1.191	1.091 - 1.291

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
 Lims ID: WDMCCV
 Client ID:
 Inject. Date: 28-Jan-2019 01:01:00 Dil. Factor: 1.0000
 Sample Type: WDMCCV, Combo WDM and CCV
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27191 Lims Sample ID: 1
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDD, RT: 29.626

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
2,3,7,8-TCDD	1.173	D 13C-2,3,7,8-TCDD	100.000	5143407	544089

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.173		100.000	5143407	544089

Sum the Uncalibrated Results

RT	319.8965 Area	319.8965 Height	321.8936 Area	321.8936 Height	Amount	Ratio	Flags
30:31	219864	24645	280239	31801	8.29	0.78	
30:43	224380	23534	282121	28595	8.39	0.80	
31:30	249987	26831	315704	31295	9.37	0.79	
Signal Totals:	694231	75010	878064	91691			

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	1572295	166701				0.79	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 26.054 = (1572295 * 100.000) / (5143407 * 1.173)

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
 Lims ID: WDMCCV
 Client ID:
 Inject. Date: 28-Jan-2019 01:01:00 Dil. Factor: 1.0000
 Sample Type: WDMCCV, Combo WDM and CCV
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27191 Lims Sample ID: 1
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDF, RT: 28.346

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
2,3,7,8-TCDF	1.088	D 13C-2,3,7,8-TCDF	100.000	8039168	931210

Averages:

	RRF _n		Qis	Ris Area	Ris Height
	1.088		100.000	8039168	931210

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
25:10	1822	302	1579	309	0.0389	1.15	RnQ
25:10	1215	237	1579	309	0.0319		Empc Correction
27:07	2721	374	3642	508	0.0727	0.75	n
27:53	8959	1027	13937	1798	0.2617	0.64	RQ
27:53	8959	1027	11635	1333	0.2354		Empc Correction

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Lims ID: WDMCCV
Client ID:
Inject. Date: 28-Jan-2019 01:01:00 Dil. Factor: 1.0000
Sample Type: WDMCCV, Combo WDM and CCV
Instrument ID: D2A Operator: Xcalibur_System
Lims Batch ID: 27191 Lims Sample ID: 1
Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-PeCDD, RT: 39.522

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,7,8-PeCDD	1.043	D 13C-1,2,3,7,8-PeCDD	100.000	4922796	1183729

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.043		100.000	4922796	1183729

Sum the Uncalibrated Results

RT	355.8546 Area	355.8546 Height	357.8516 Area	357.8516 Height	Amount	Ratio	Flags
40:54	18990	3257	14094	2240	0.6441	1.35	

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
 Lims ID: WDMCCV
 Client ID:
 Inject. Date: 28-Jan-2019 01:01:00 Dil. Factor: 1.0000
 Sample Type: WDMCCV, Combo WDM and CCV
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27191 Lims Sample ID: 1
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-PeCDF, RT: 38.126

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,7,8-PeCDF	1.190	D 13C-1,2,3,7,8-PeCDF	100.000	6963696	1382527
2,3,4,7,8-PeCDF	1.109	D 13C-2,3,4,7,8-PeCDF	100.000	6943490	1567127

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.150		100.000	6953593	1474827

Sum the Uncalibrated Results

RT	339.8597 Area	339.8597 Height	341.8567 Area	341.8567 Height	Amount	Ratio	Flags
37:20	36918	4485	23027	3192	0.7499	1.60	
39:25	30578	6418	19814	4297	0.6304	1.54	

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
 Lims ID: WDMCCV
 Client ID:
 Inject. Date: 28-Jan-2019 01:01:00 Dil. Factor: 1.0000
 Sample Type: WDMCCV, Combo WDM and CCV
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27191 Lims Sample ID: 1
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-HpCDF, RT: 49.404

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,4,6,7,8-HpCDF	1.498	D 13C-1,2,3,4,6,7,8-HpCDF	100.000	5281911	1146785
1,2,3,4,7,8,9-HpCDF	1.381	D 13C-1,2,3,4,7,8,9-HpCDF	100.000	4284350	823607

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.440		100.000	4783130	985196

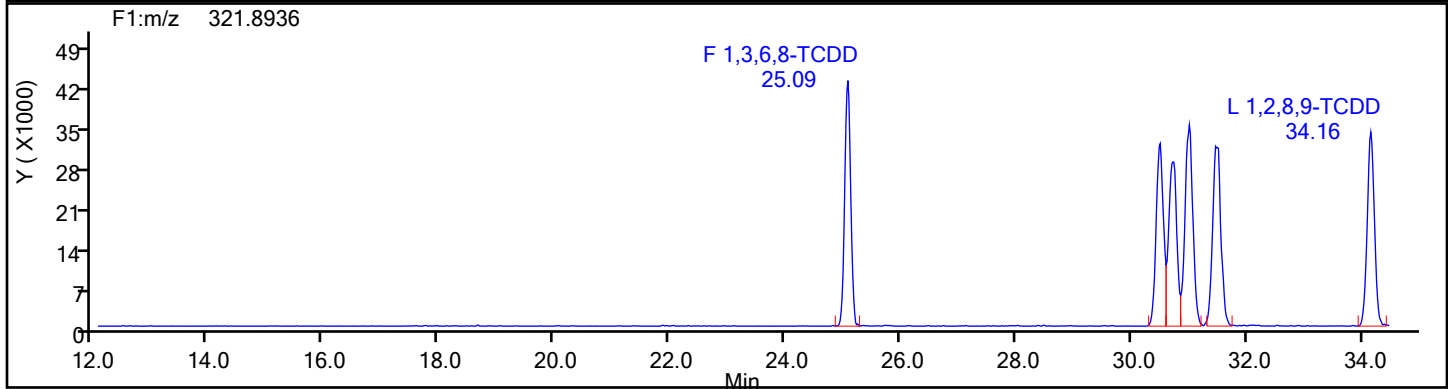
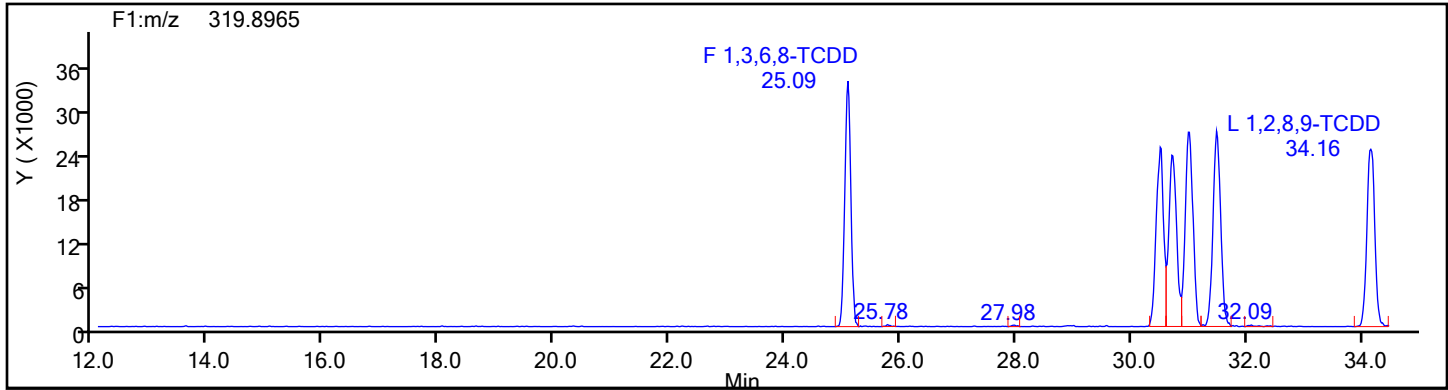
Sum the Uncalibrated Results

RT	407.7817 Area	407.7817 Height	409.7788 Area	409.7788 Height	Amount	Ratio	Flags
48:27	30993	6638	34109	5133	0.9455	0.91	
48:43	72794	15996	74783	14340	2.14	0.97	

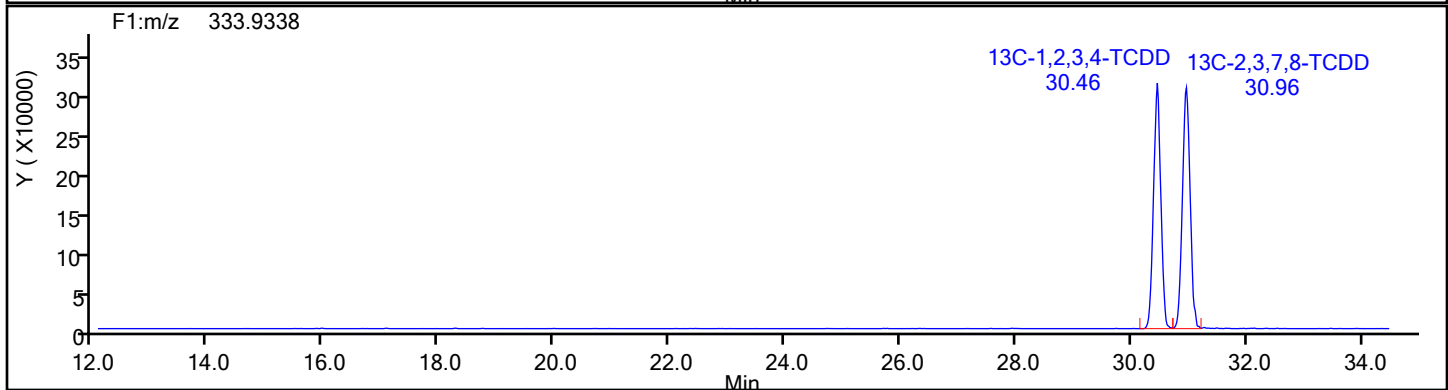
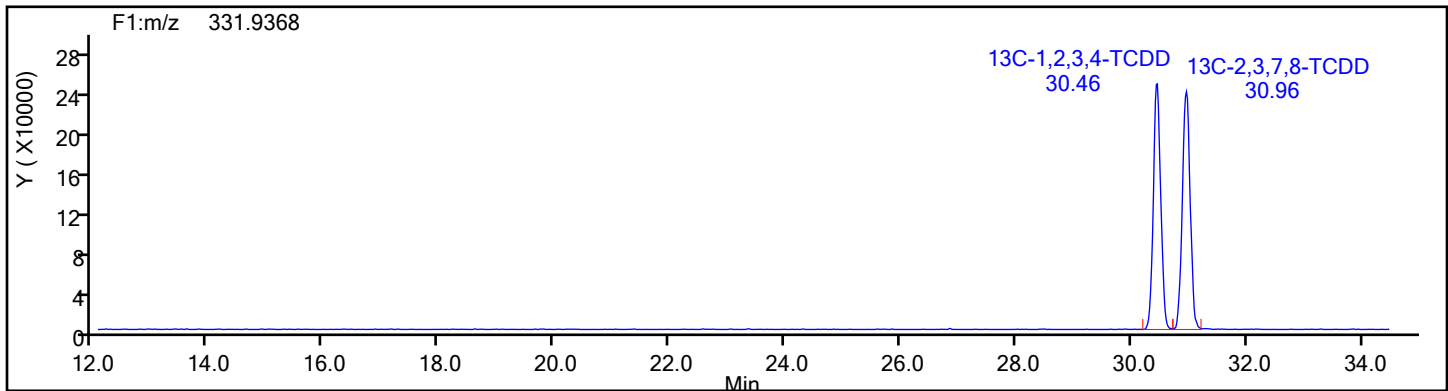
Compound is Marked ND

TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
TCDD

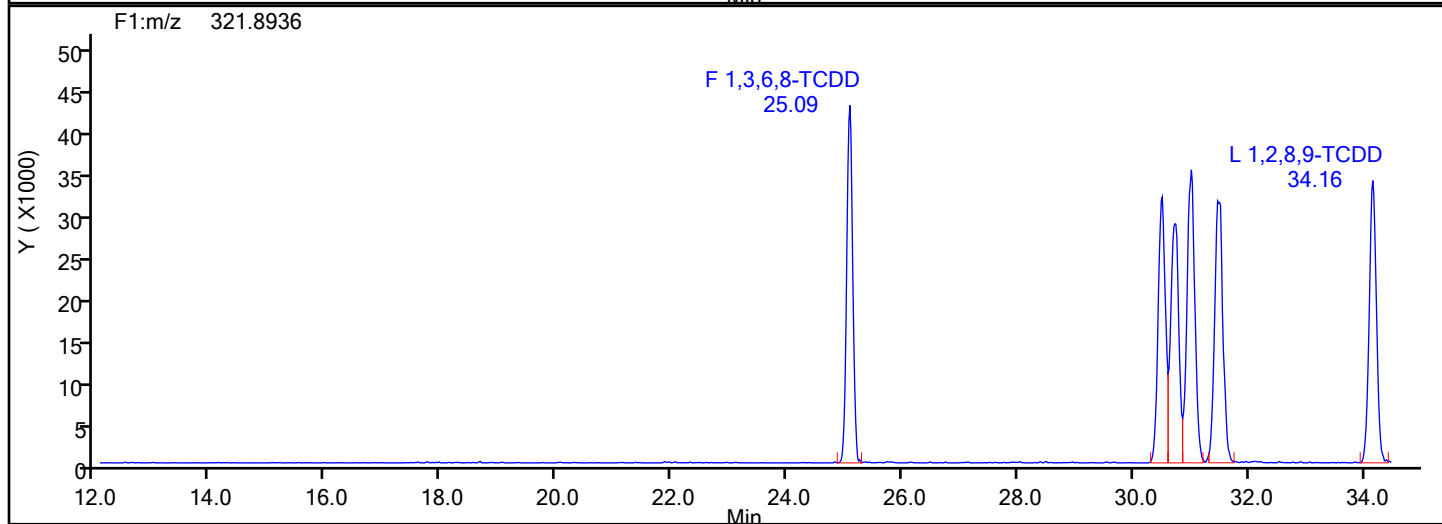
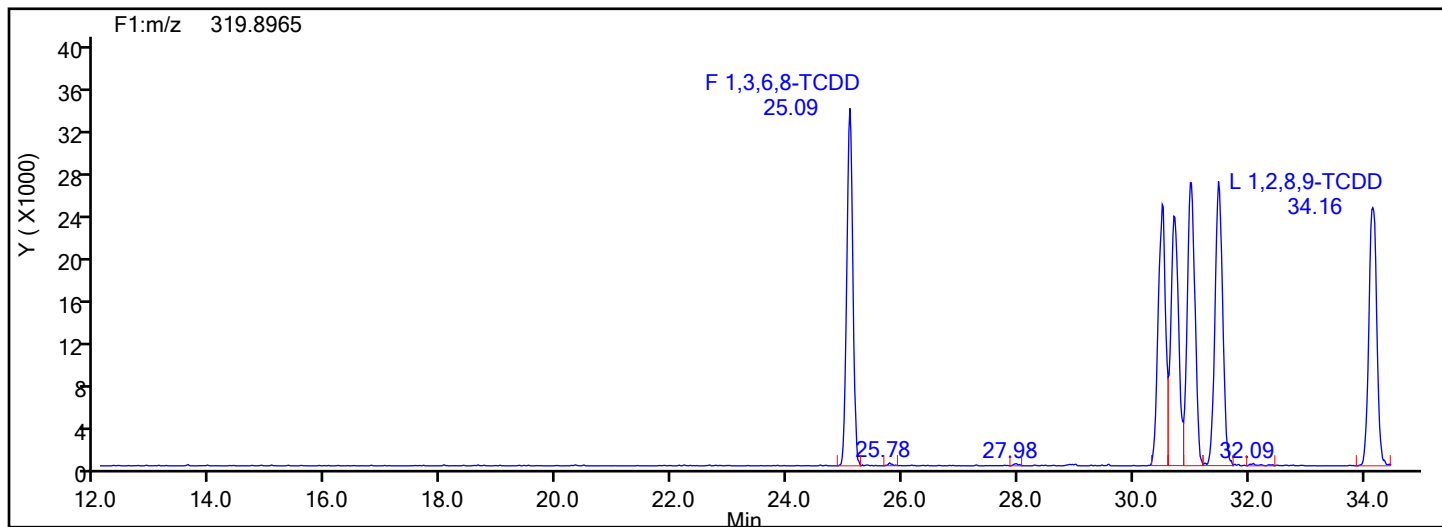


TCDD Standards

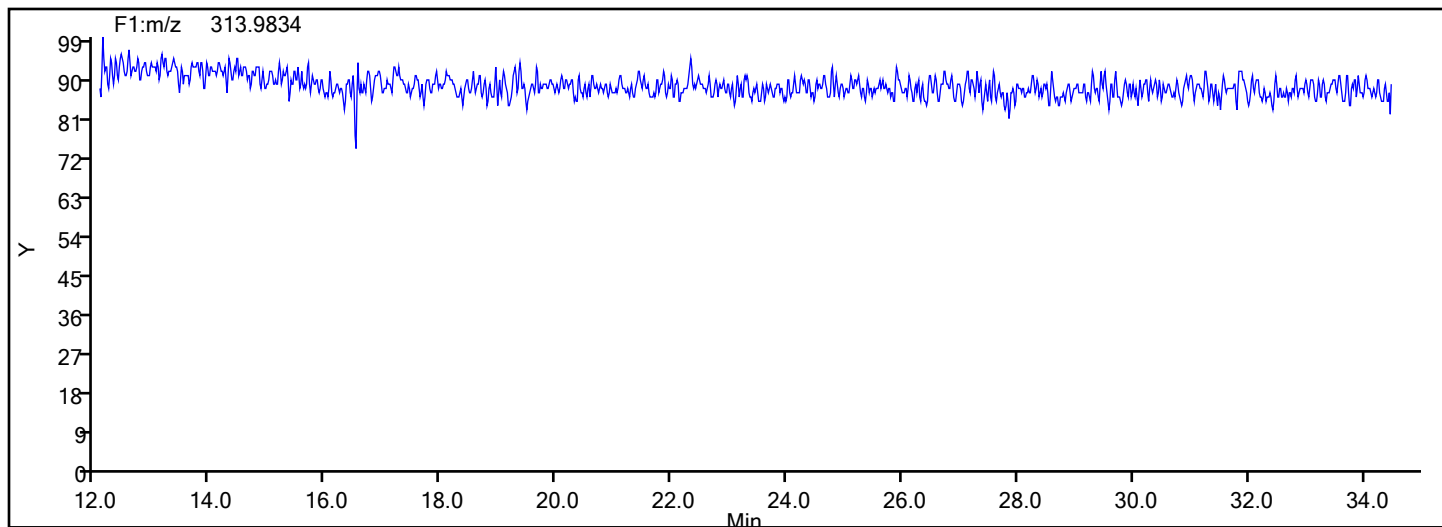


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
TCDD

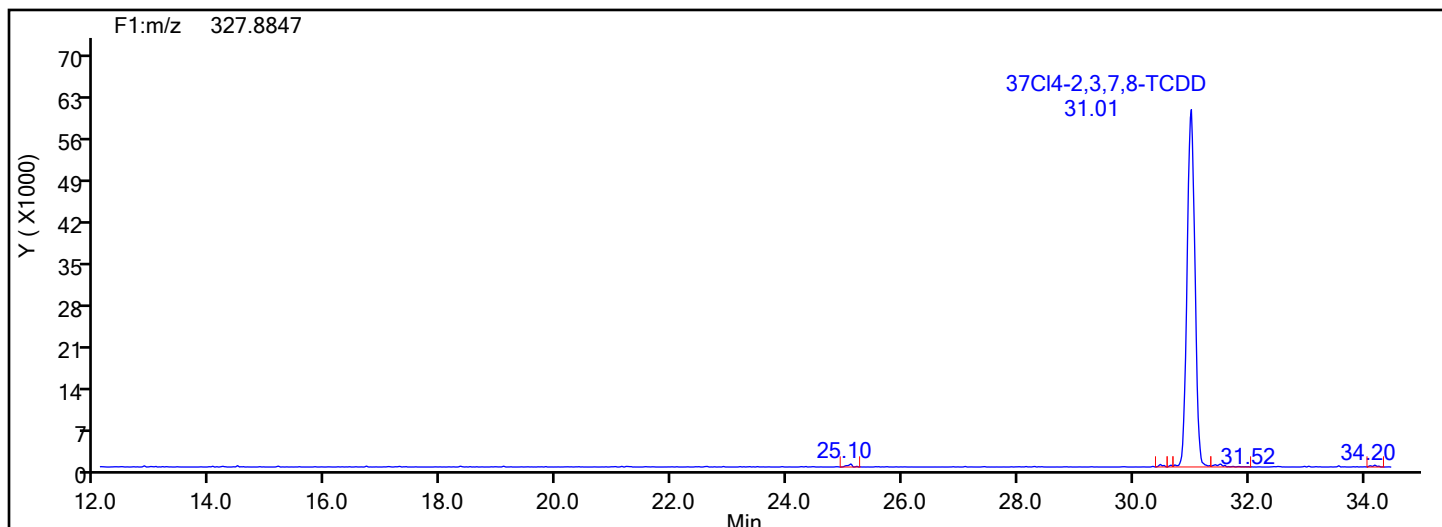


TCDD Lock Mass

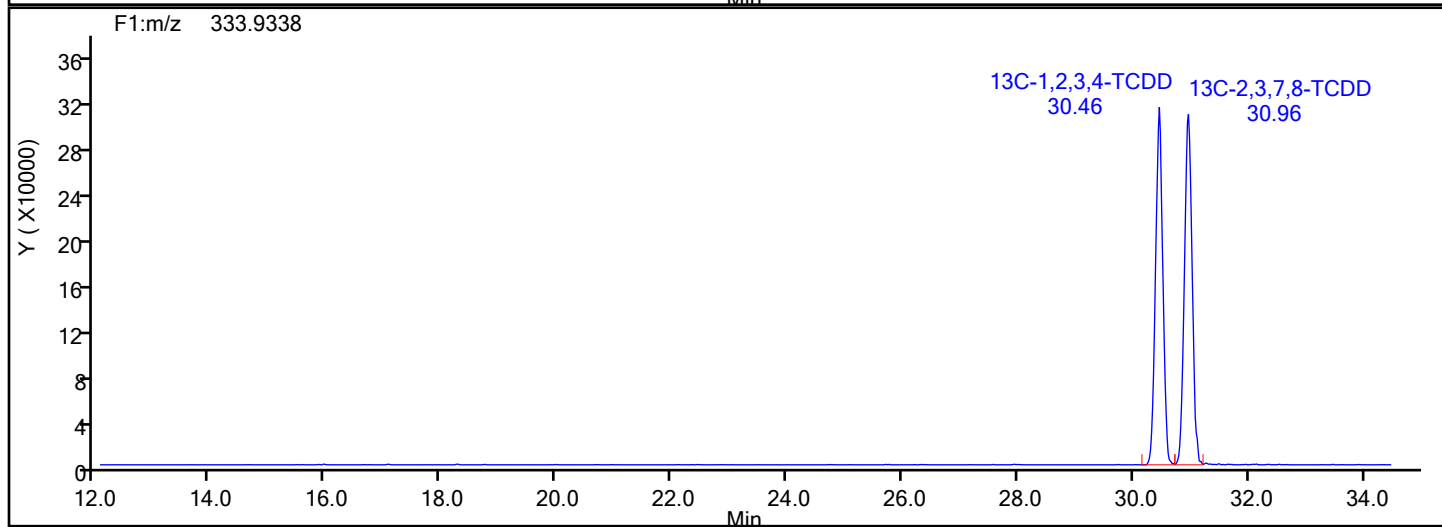
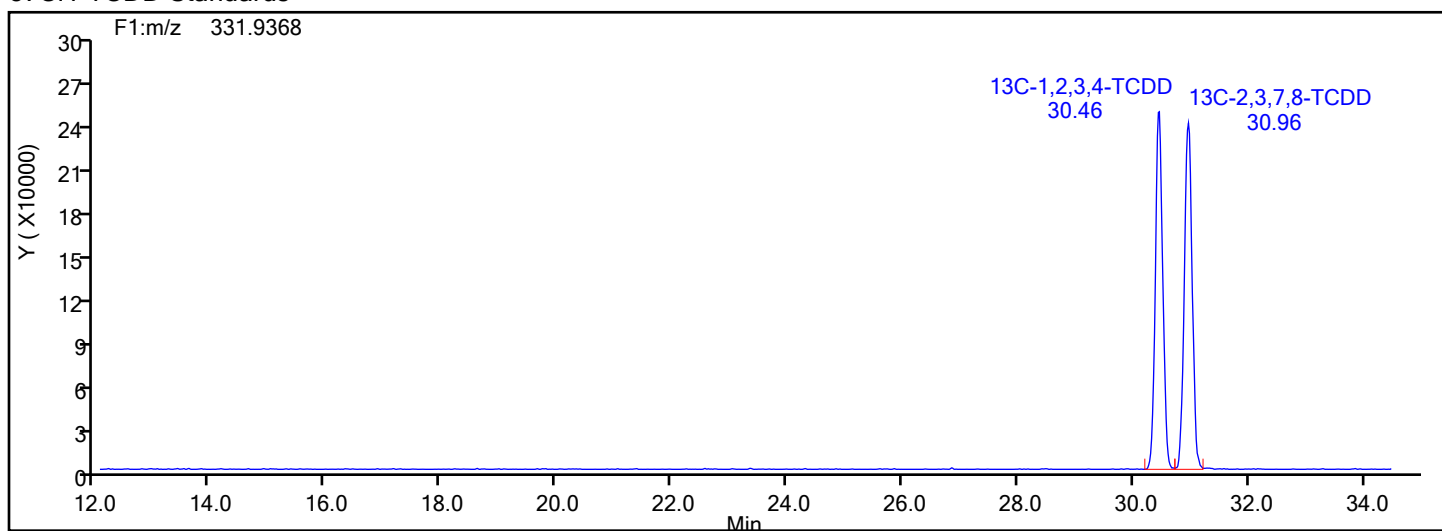


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
37Cl4-TCDD

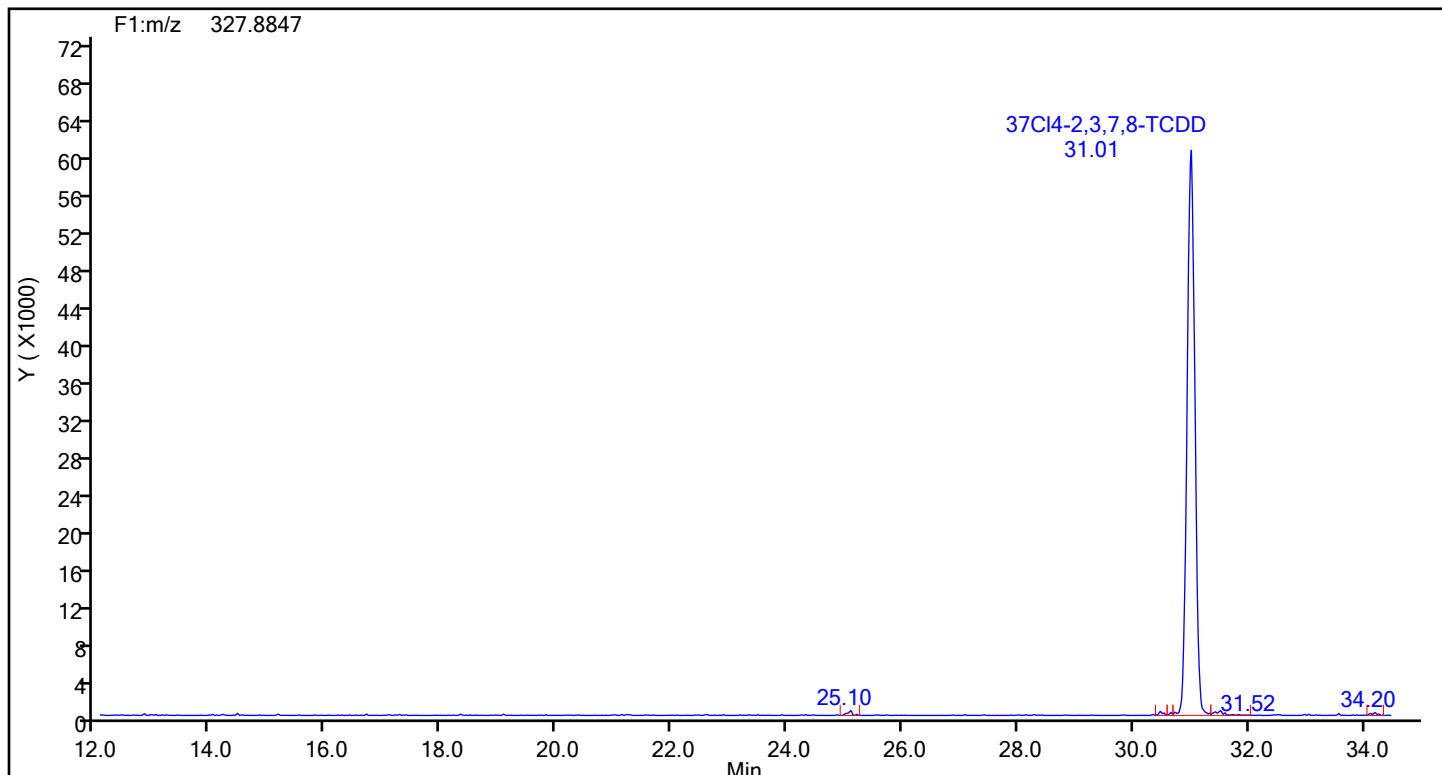


37Cl4-TCDD Standards

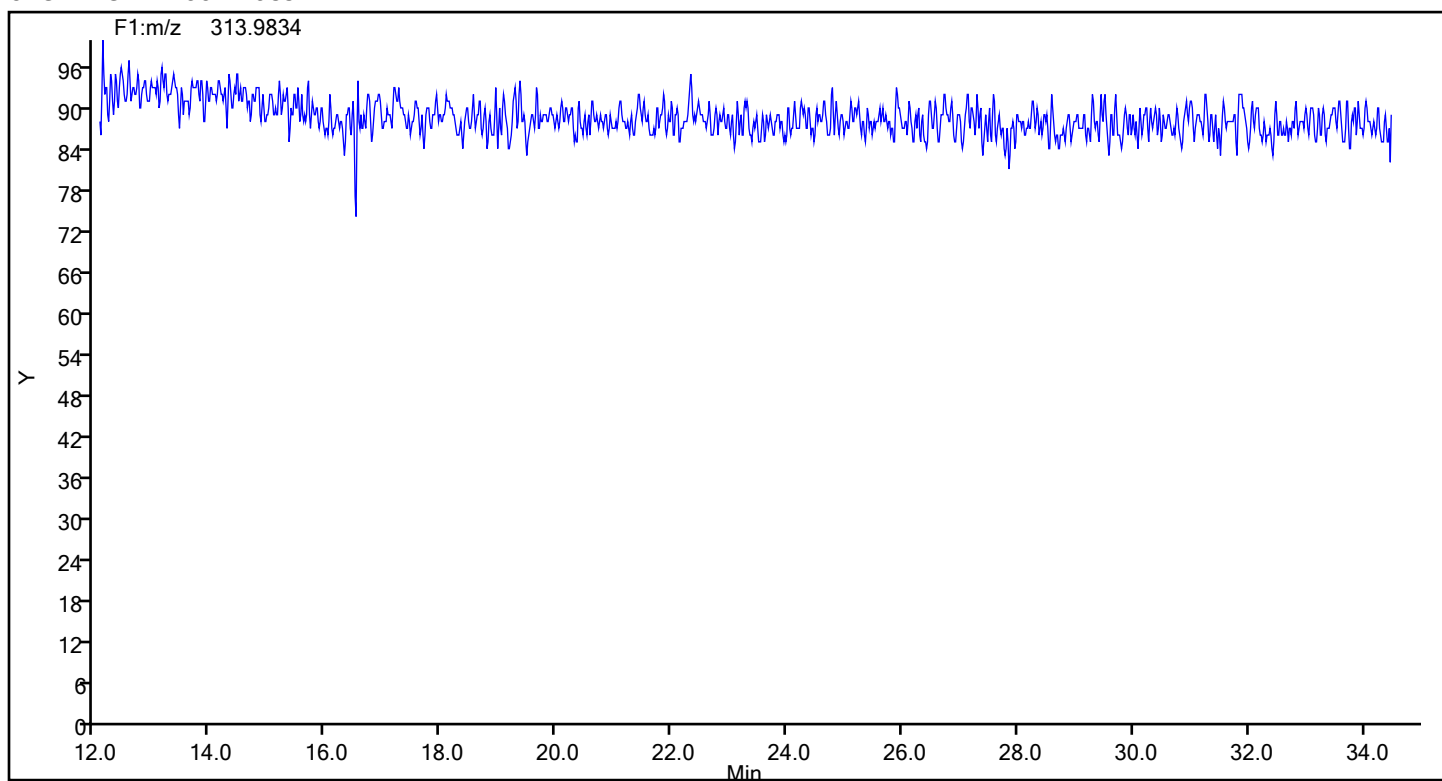


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
37Cl4-TCDD



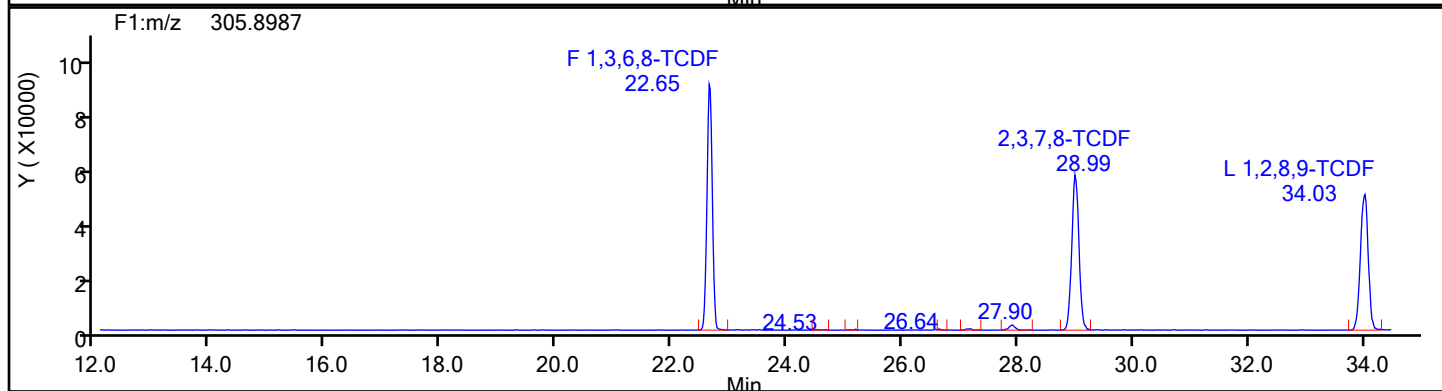
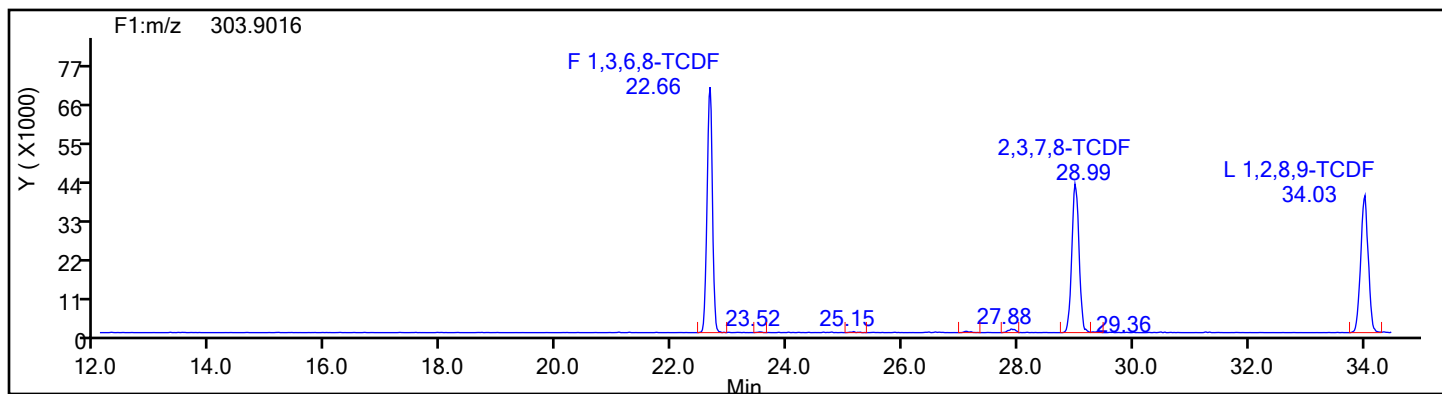
37Cl4-TCDD Lock Mass



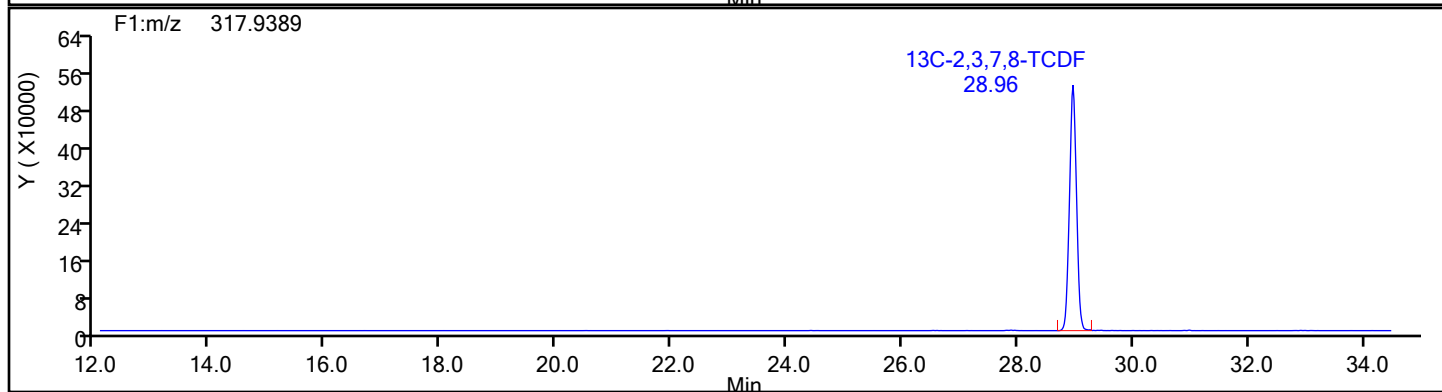
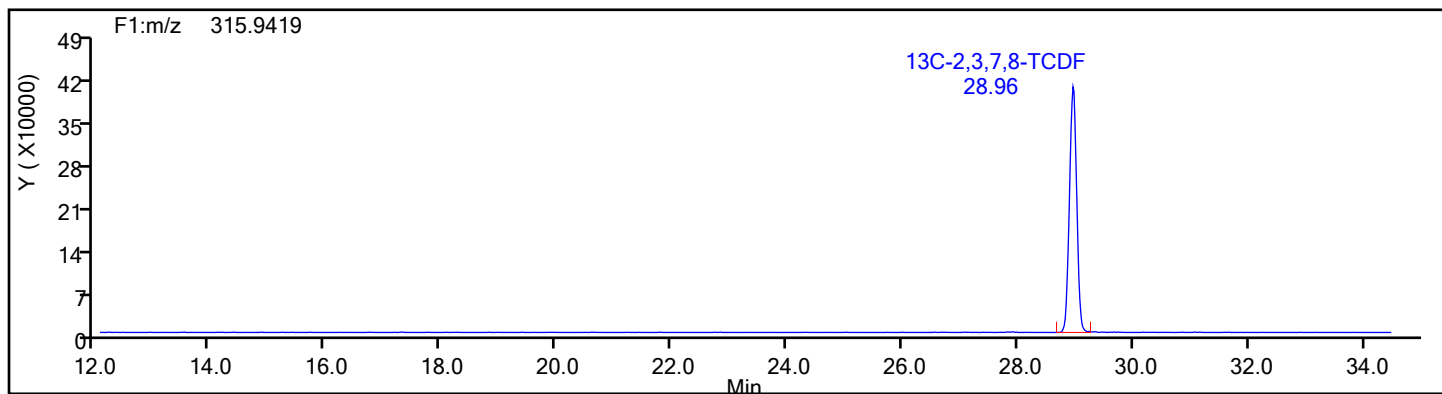
TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:

TCDF

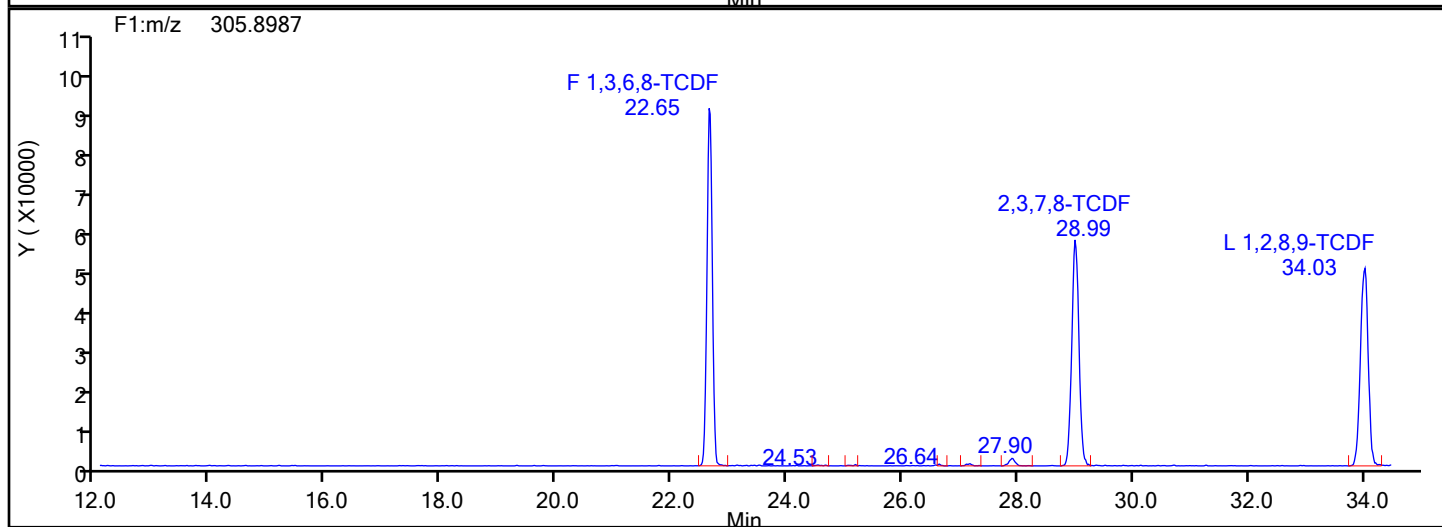
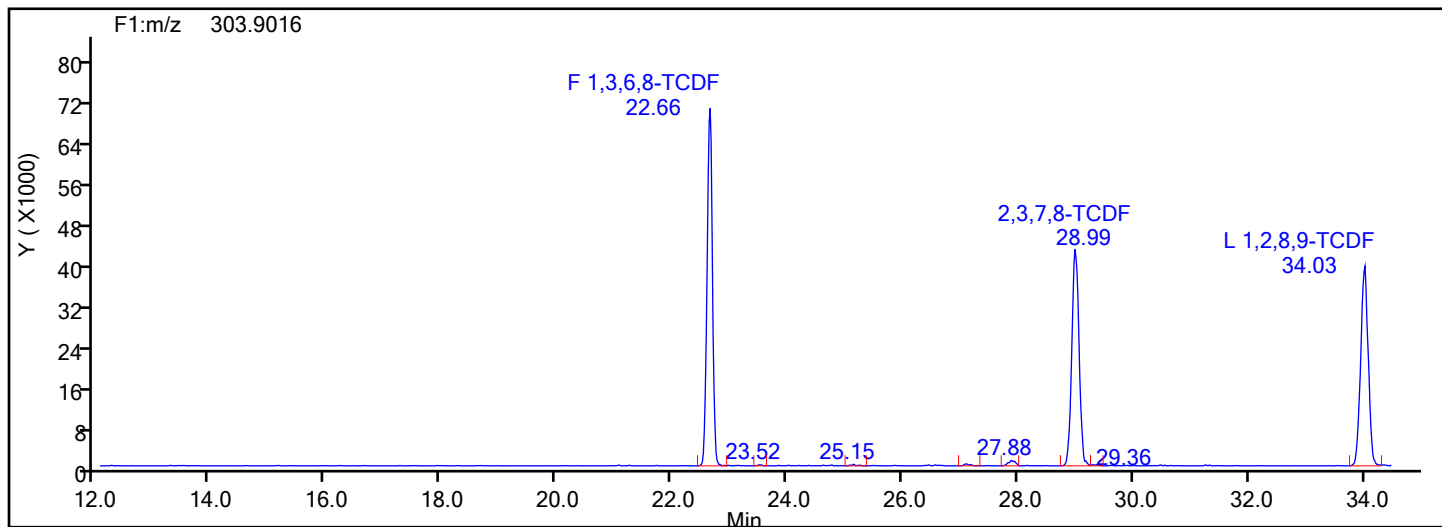


TCDF Standards

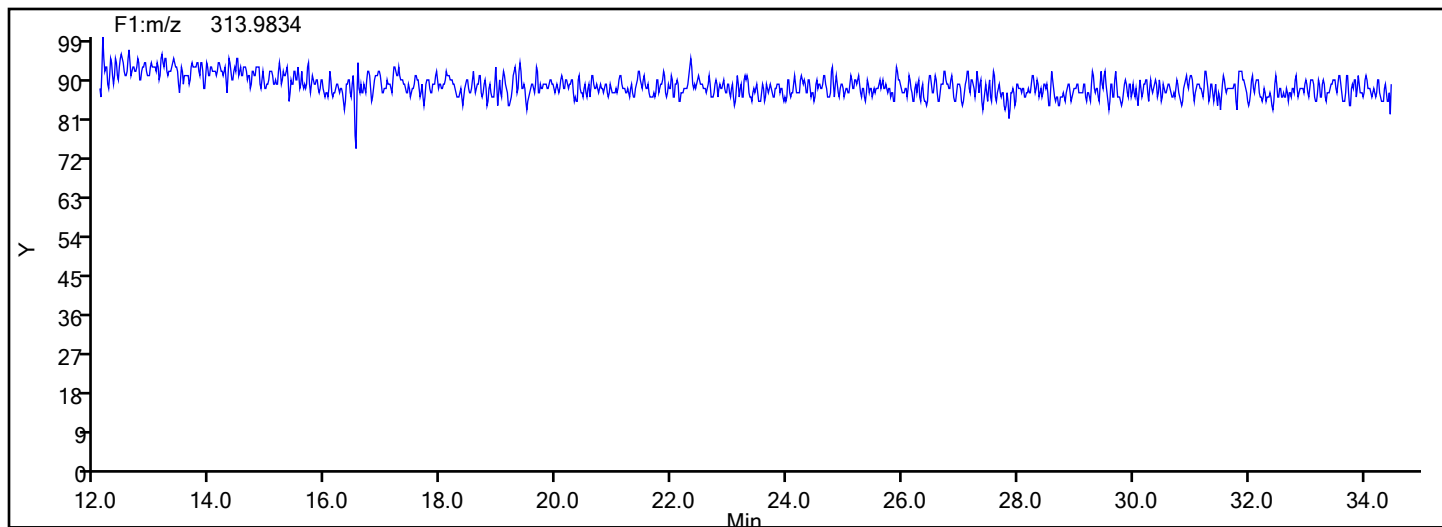


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
TCDF

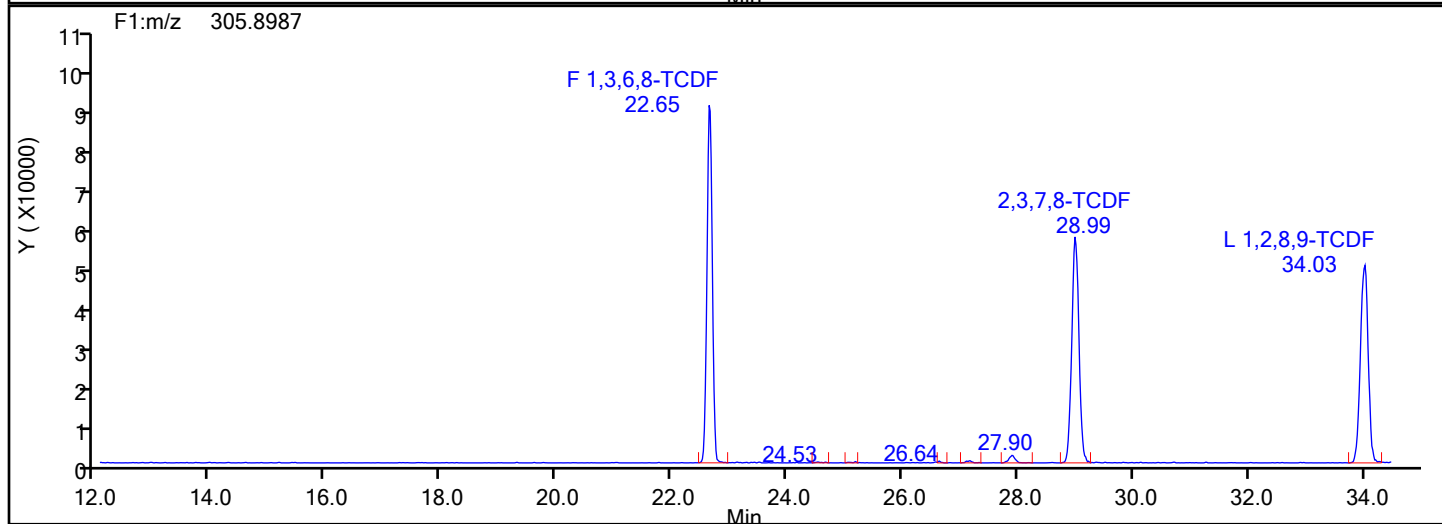
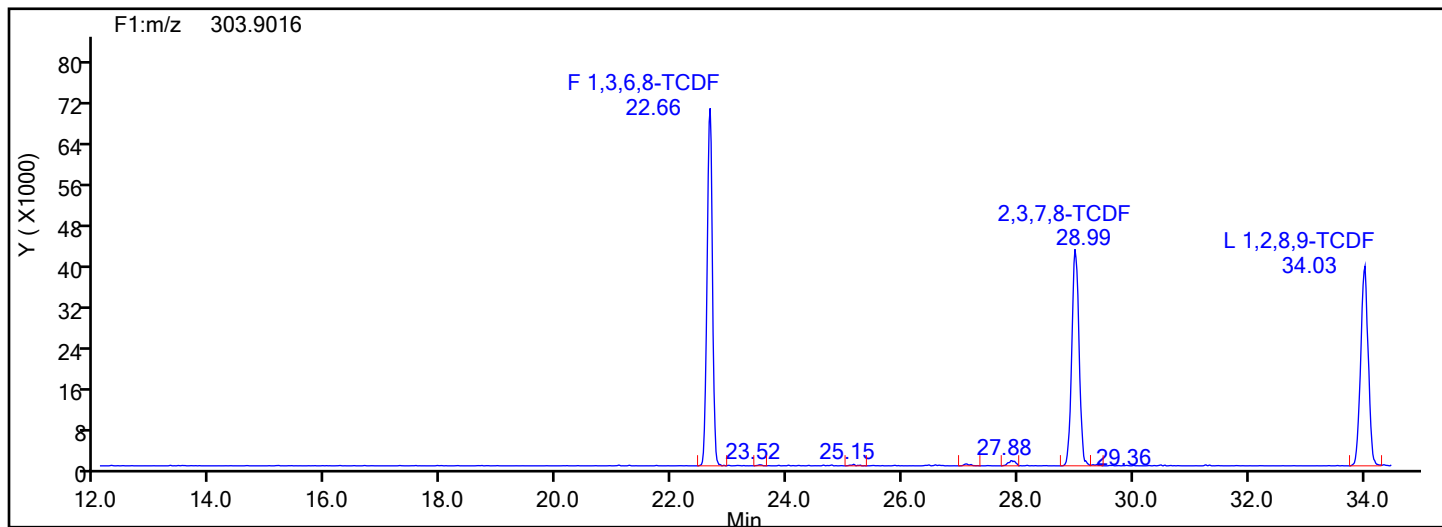


TCDF Lock Mass

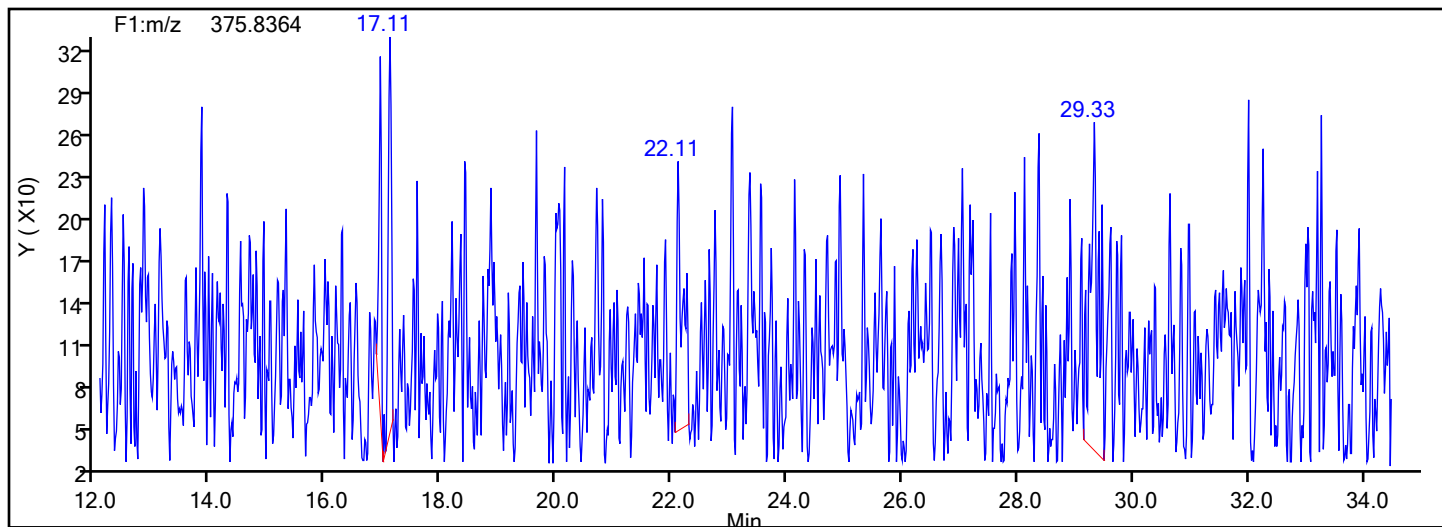


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
TCDF



TCDF Interference Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

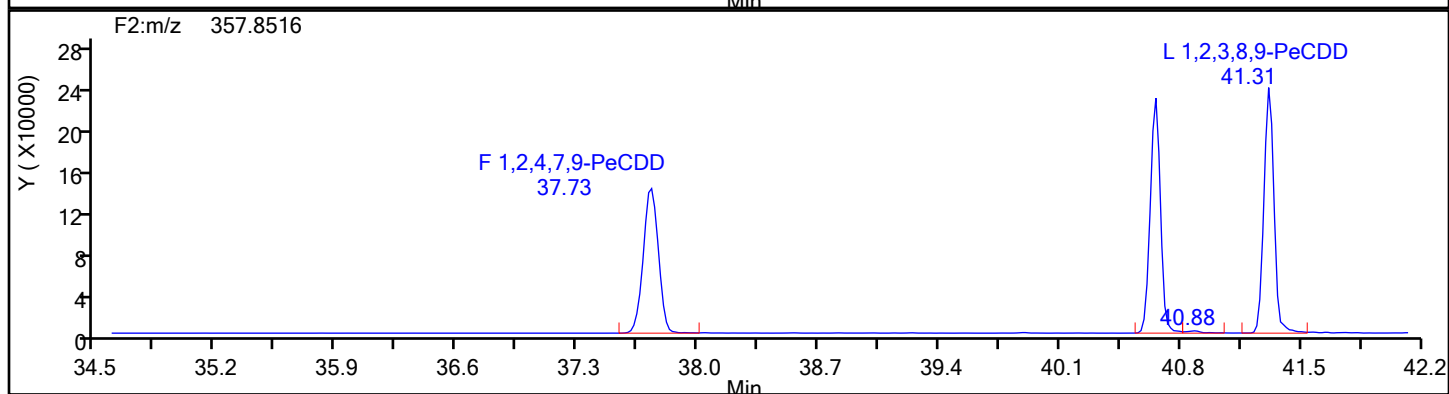
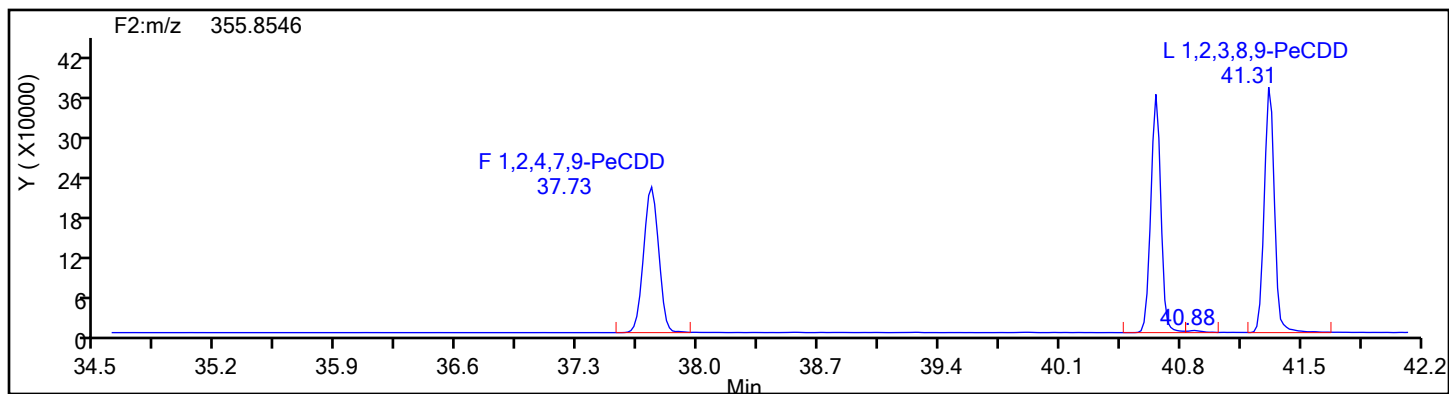
Worklist#: 27191

Sample Line#: 1

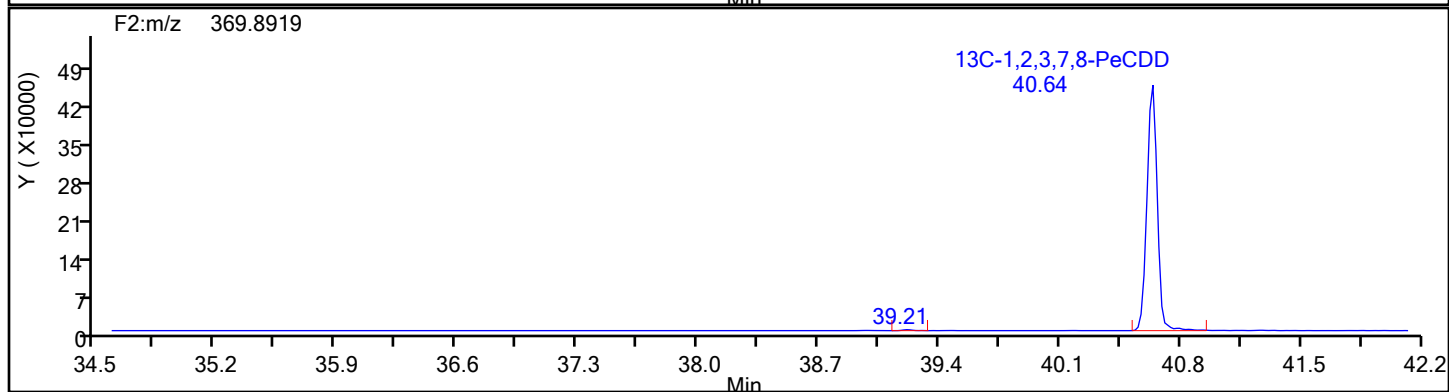
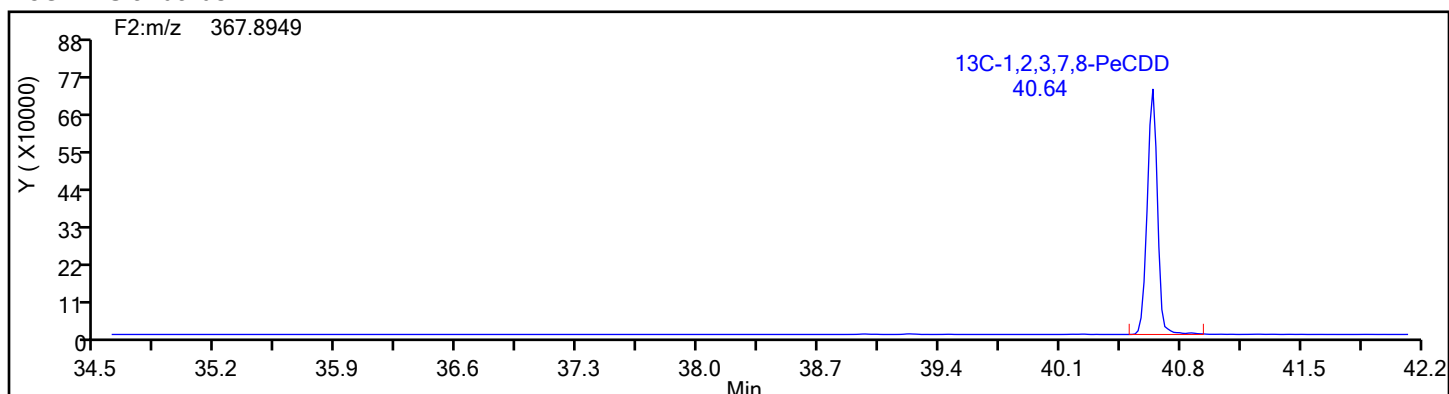
Column Type:

Column Dia:

PeCDD



PeCDD Standards



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

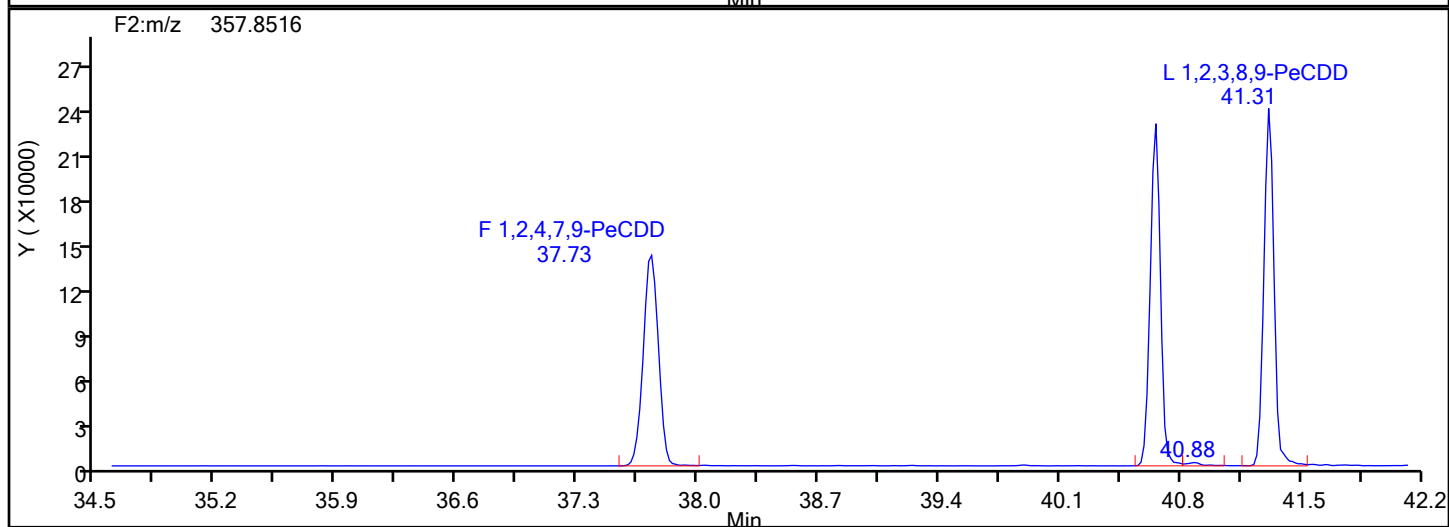
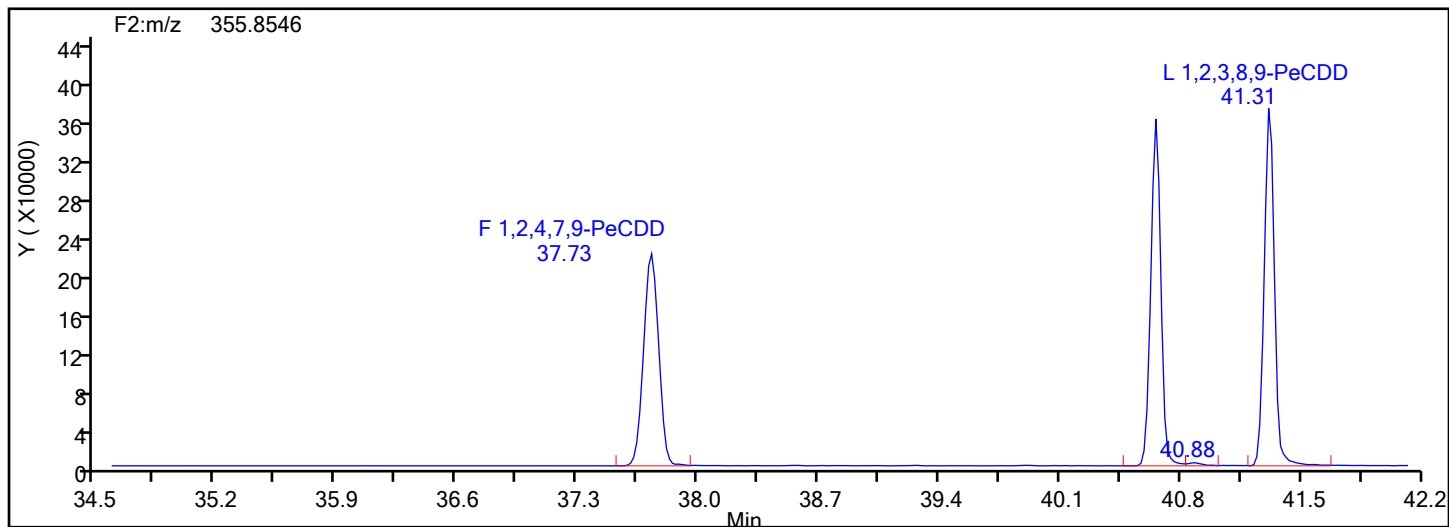
Worklist#: 27191

Sample Line#: 1

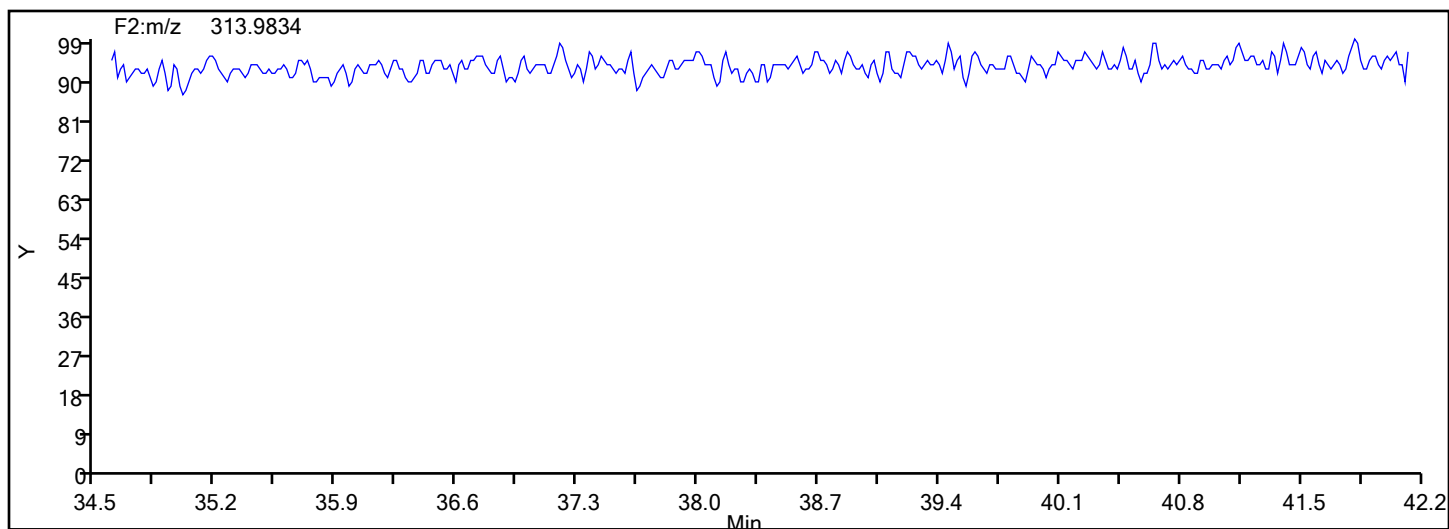
Column Type:

Column Dia:

PeCDD



PeCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Instrument ID: D2A

Lims ID: WDMCCV

Client ID:

Operator ID: Xcalibur_System

ALS Bottle#:

0

Worklist Smp#: 1

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

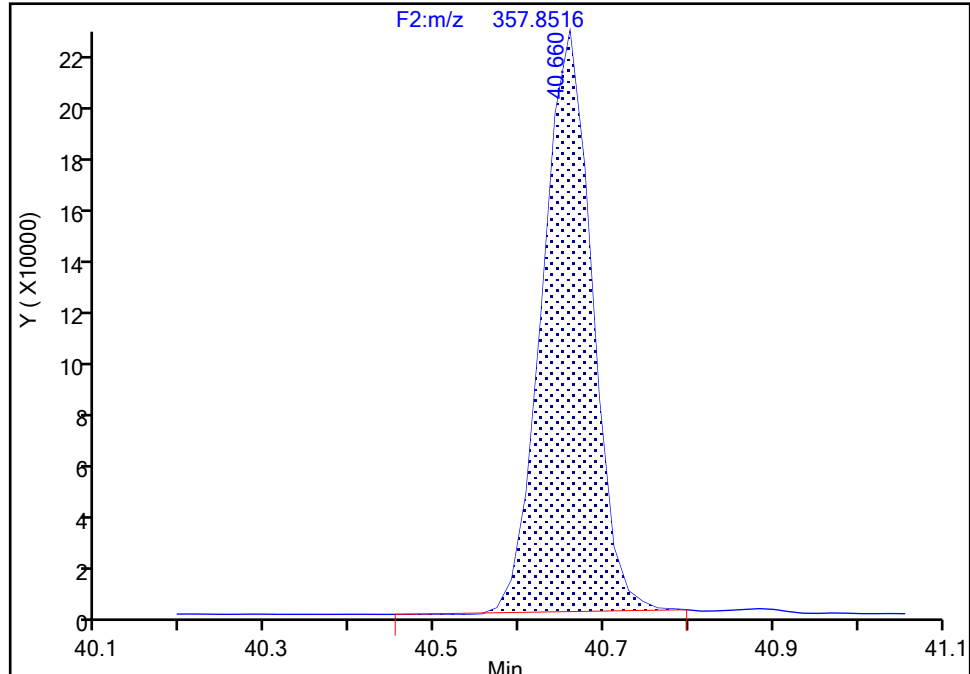
Detector F2(34.39 :42.21)

1,2,3,7,8-PeCDD, CAS: 40321-76-4

Signal: 2

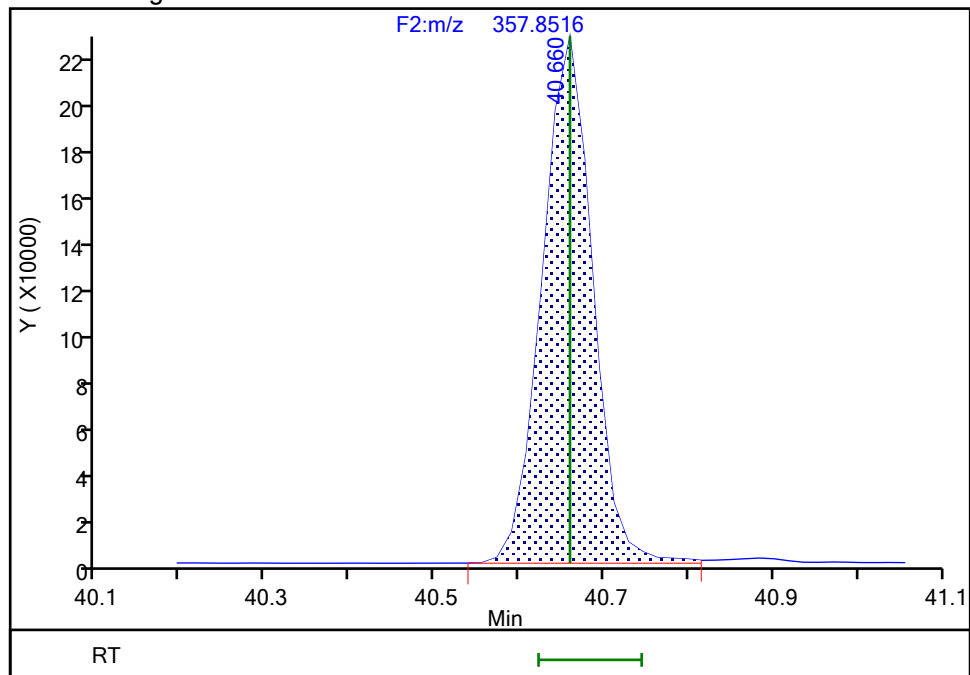
RT: 40.66
Area: 920103
Amount: 46.457415
Amount Units: pg/ul

Processing Integration Results



RT: 40.66
Area: 939786
Amount: 46.840615
Amount Units: pg/ul

Manual Integration Results



Reviewer: mcwhirterl, 28-Jan-2019 02:04:12

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Instrument ID: D2A

Lims ID: WDMCCV

Client ID:

Operator ID: Xcalibur_System

ALS Bottle#: 0

Worklist Smp#: 1

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Column:

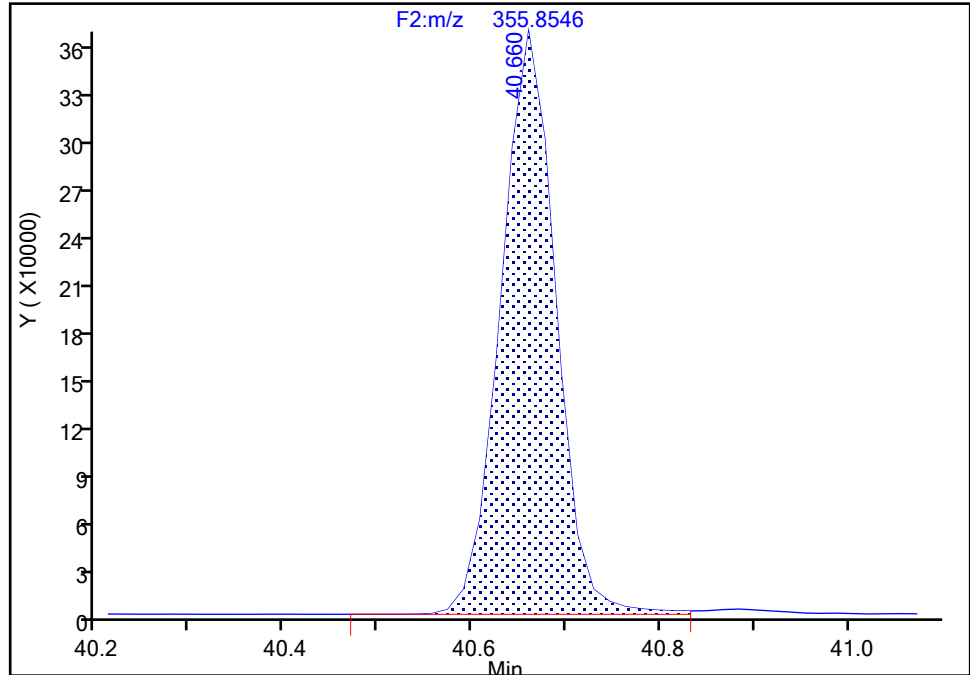
Detector F2(34.39 :42.21)

1,2,3,7,8-PeCDD, CAS: 40321-76-4

Signal: 1

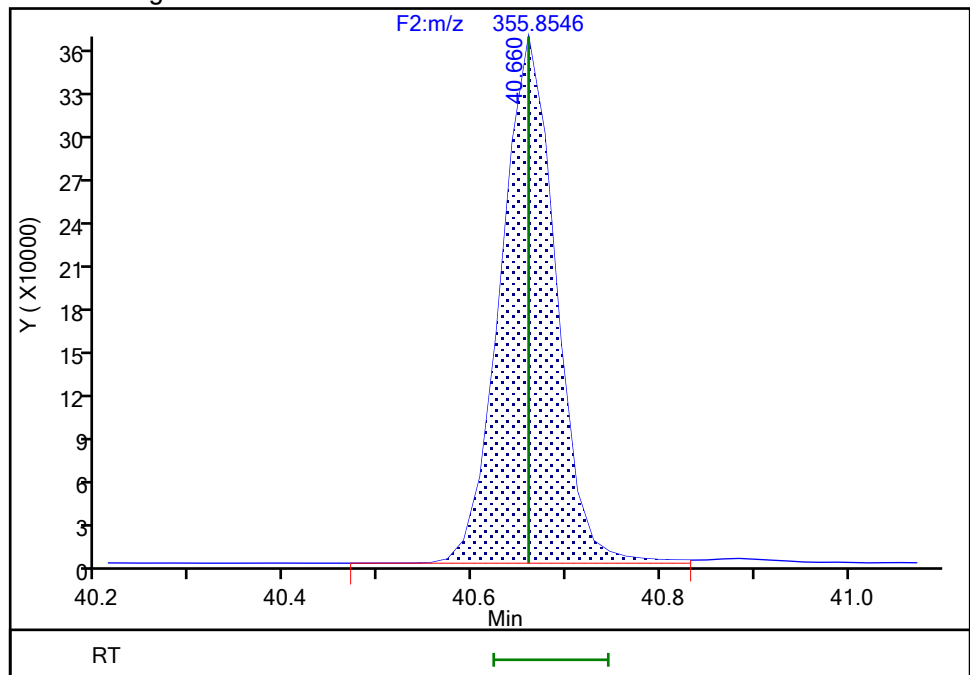
RT: 40.66
Area: 1466172
Amount: 46.457415
Amount Units: pg/ul

Processing Integration Results



RT: 40.66
Area: 1466172
Amount: 46.840615
Amount Units: pg/ul

Manual Integration Results



Reviewer: mcwhirterl, 28-Jan-2019 02:04:15

Audit Action: Manually Integrated/Assigned Compound ID Audit Reason: Baseline

TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

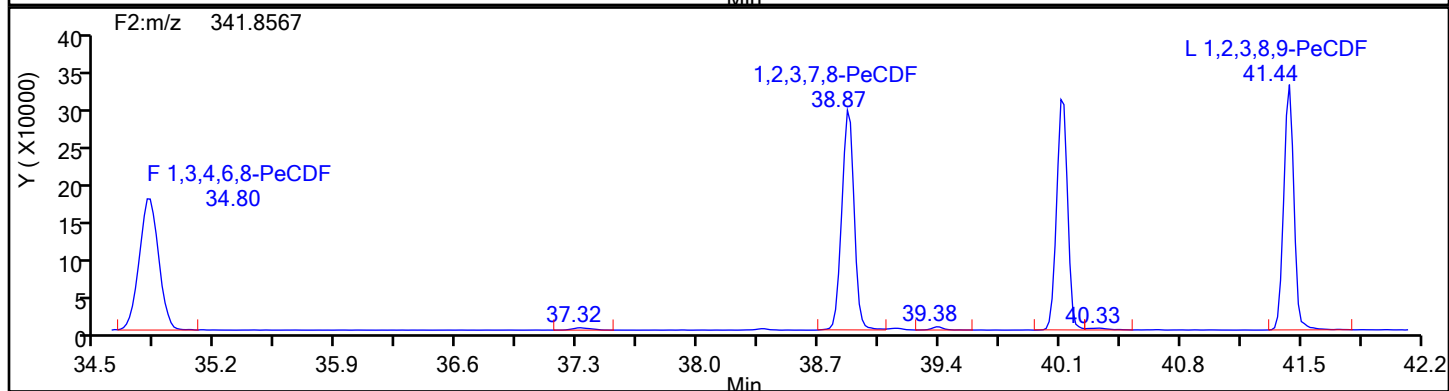
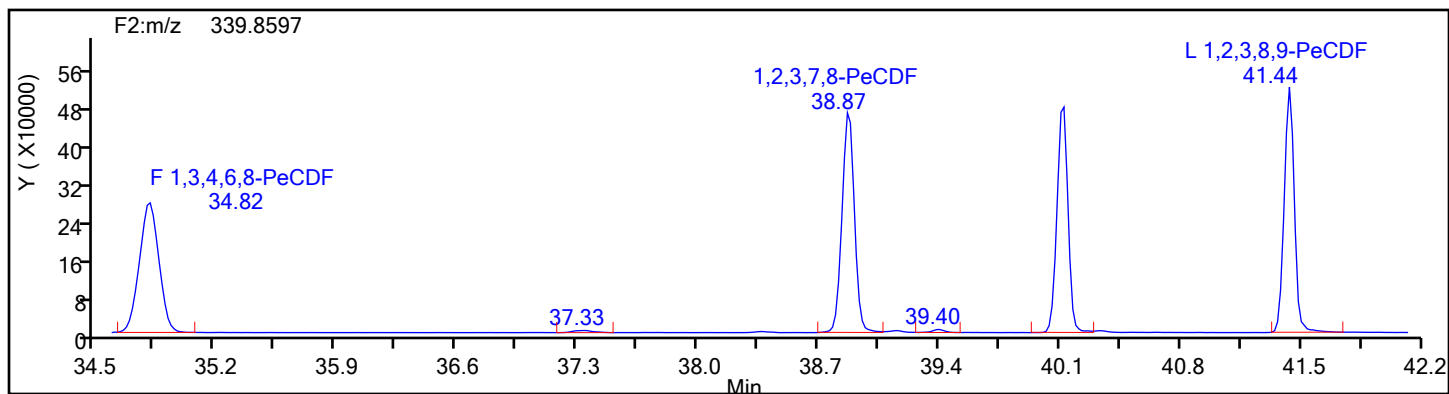
Worklist#: 27191

Sample Line#: 1

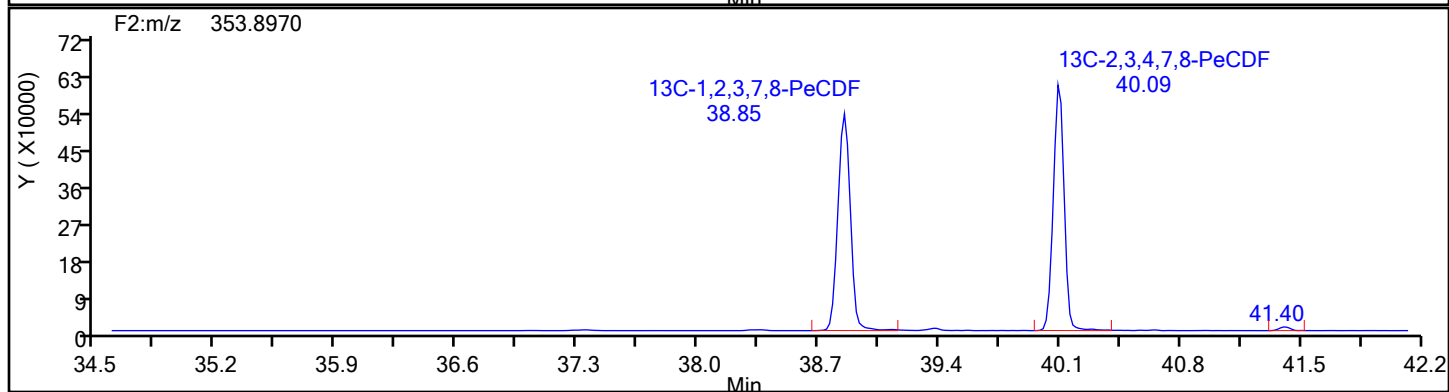
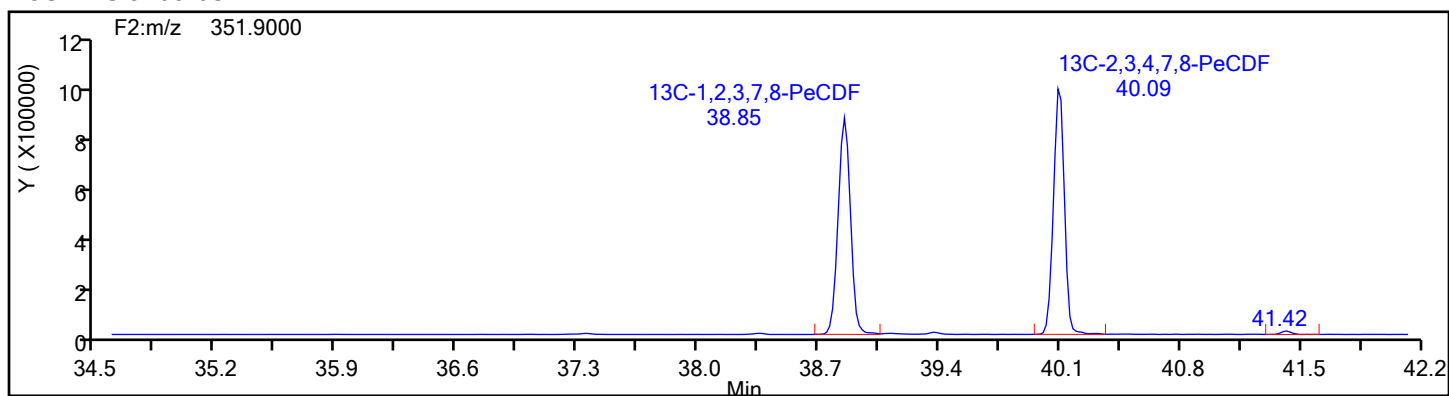
Column Type:

Column Dia:

PeCDF



PeCDF Standards



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

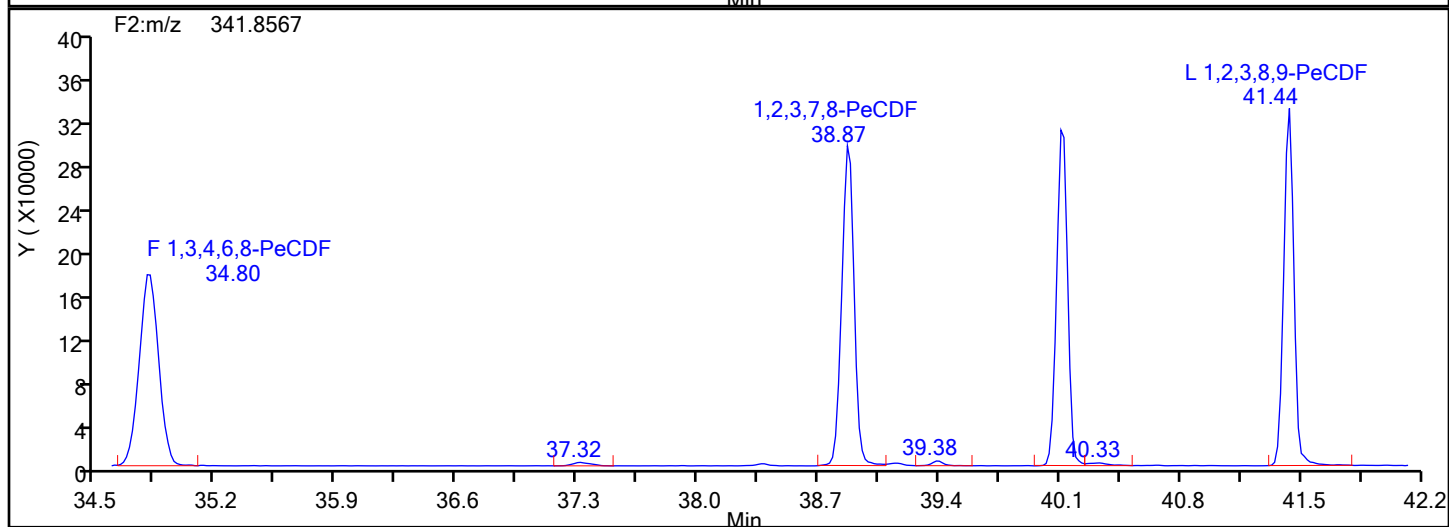
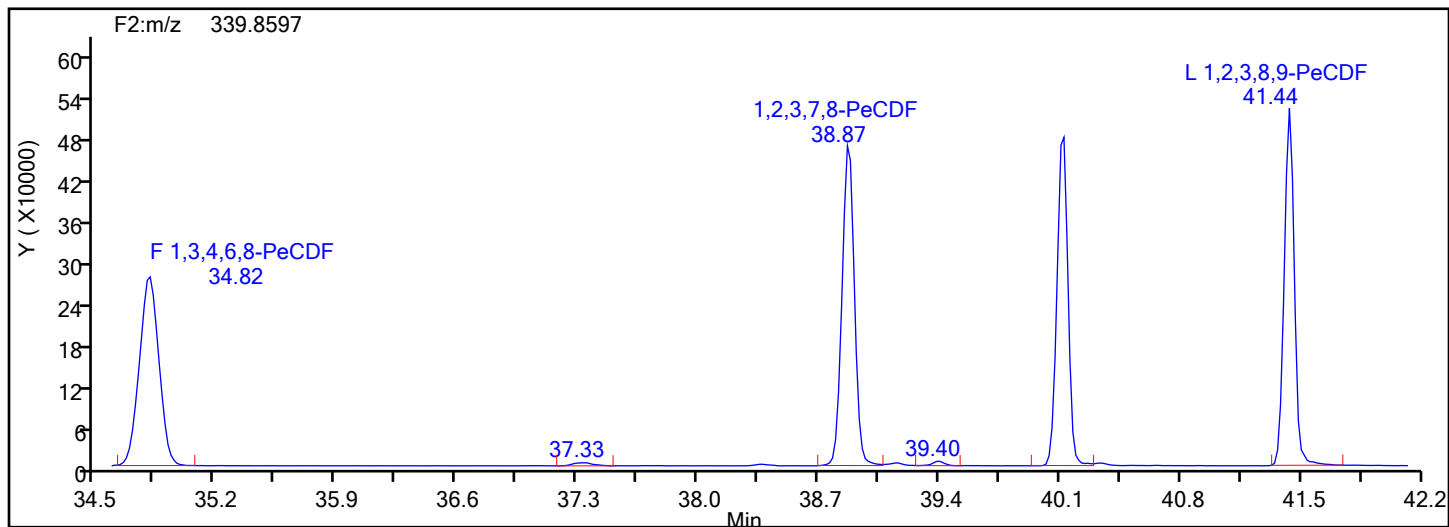
Worklist#: 27191

Sample Line#: 1

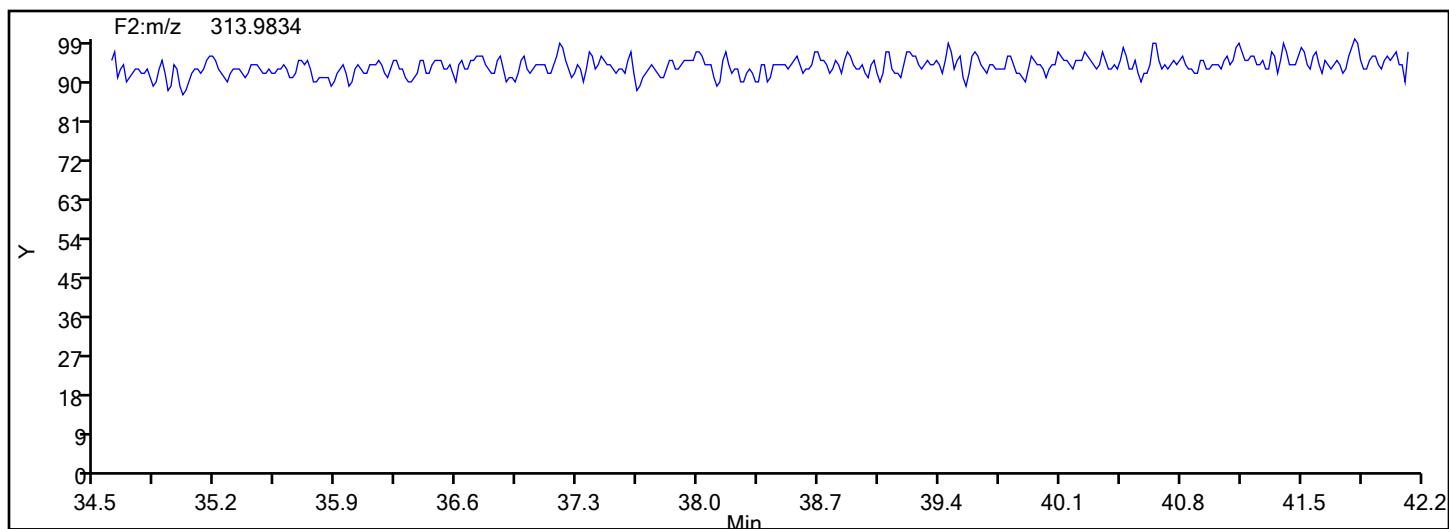
Column Type:

Column Dia:

PeCDF



PeCDF Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

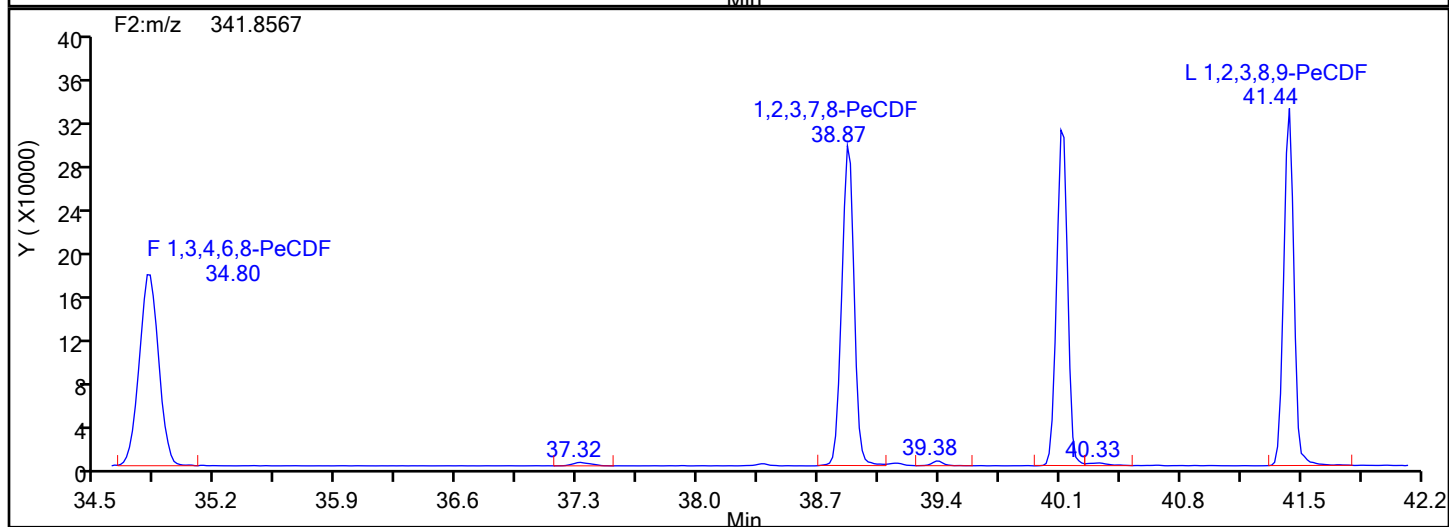
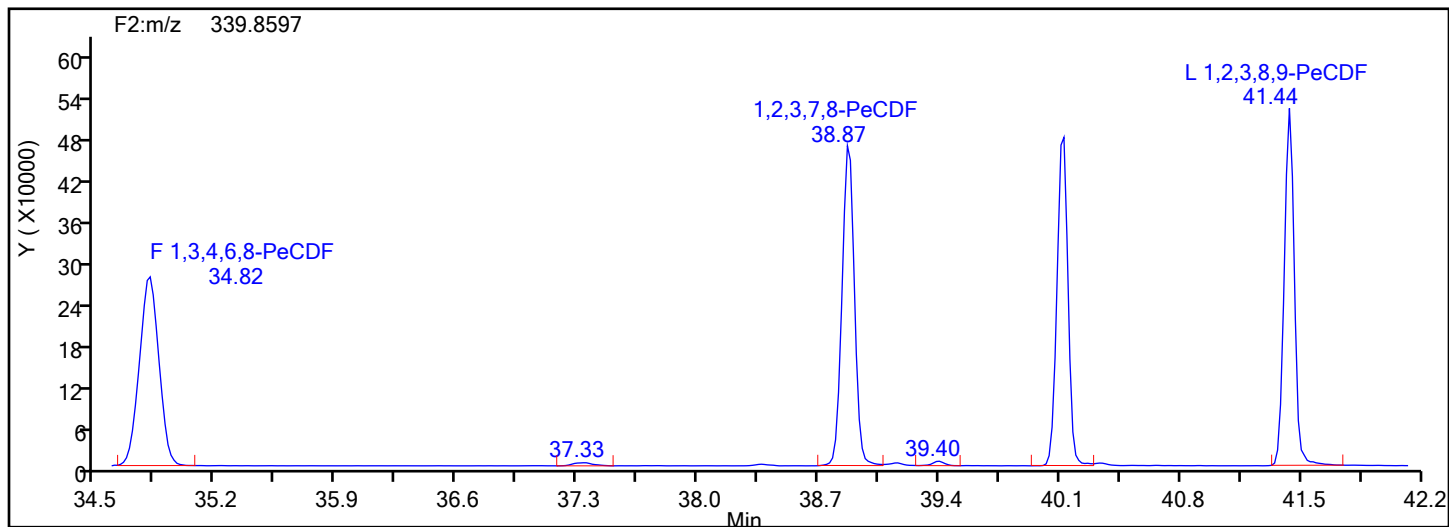
Worklist#: 27191

Sample Line#: 1

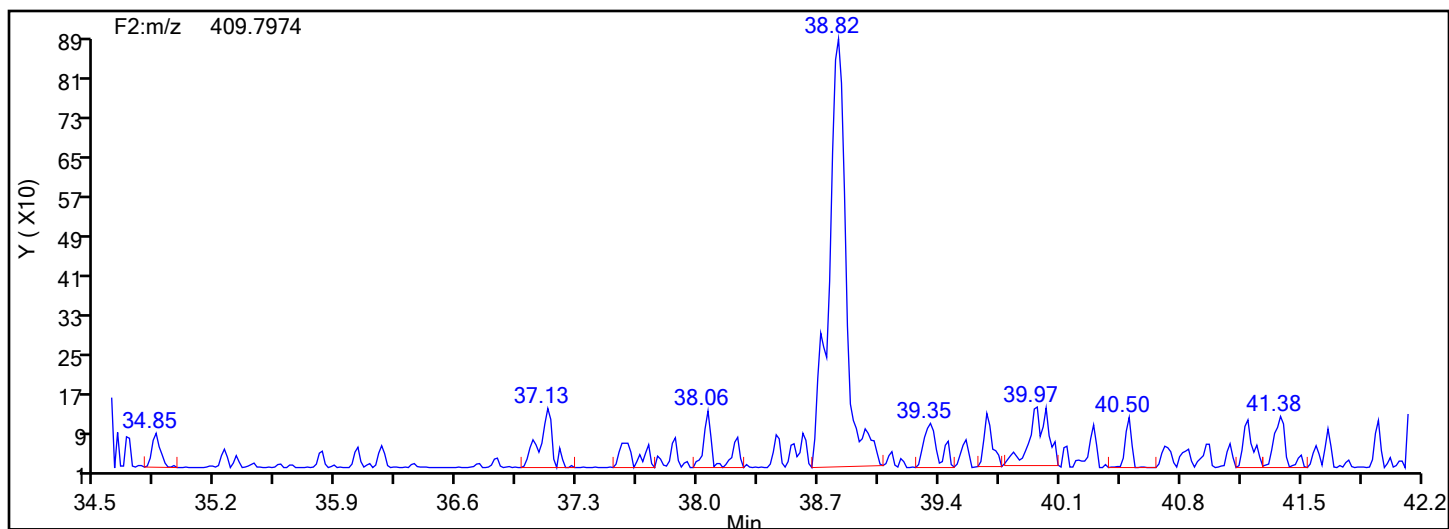
Column Type:

Column Dia:

PeCDF

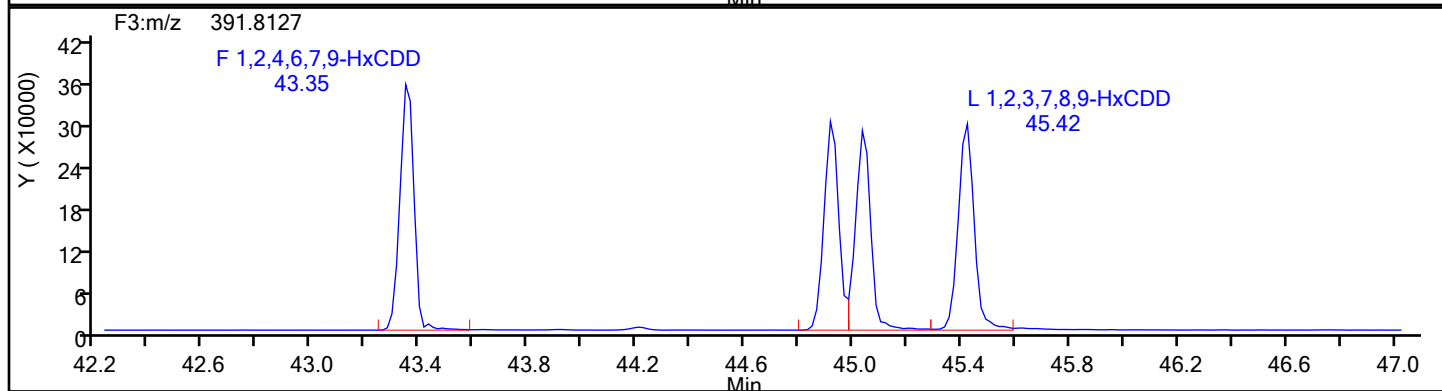
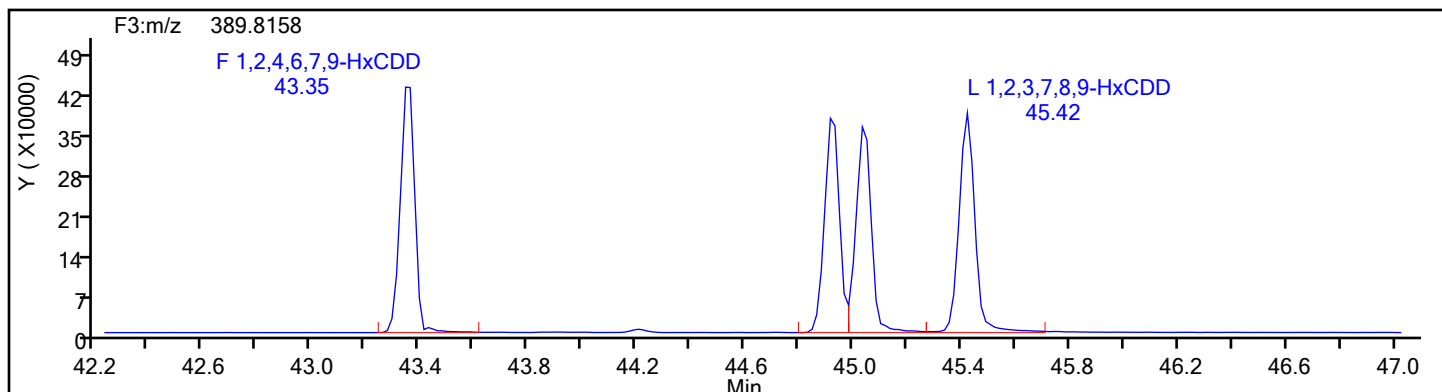


PeCDF Interference Mass

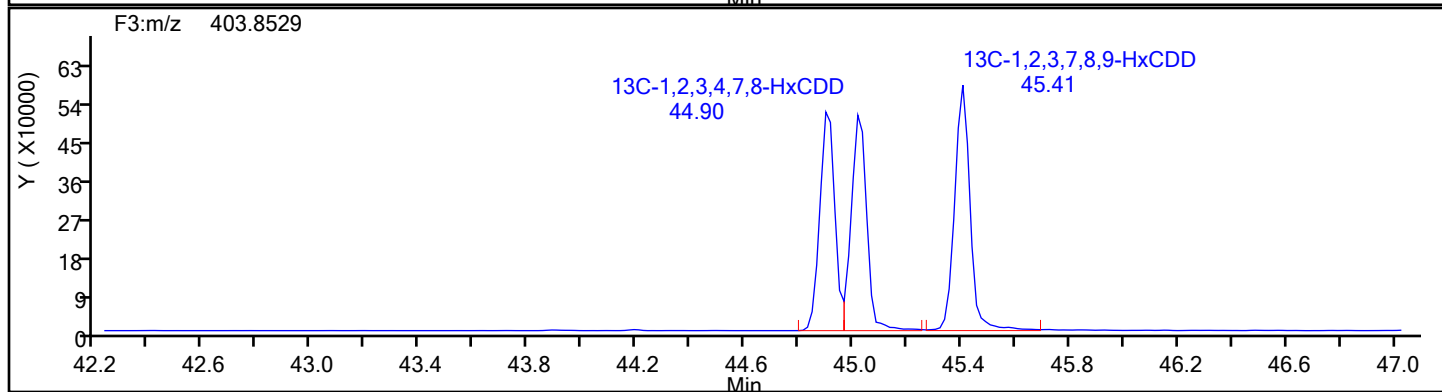
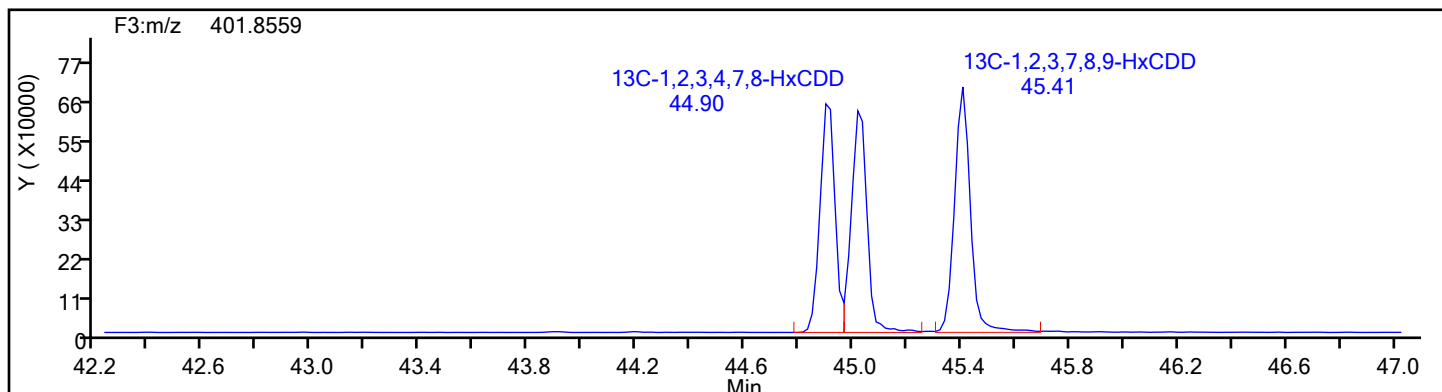


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
HxCDD

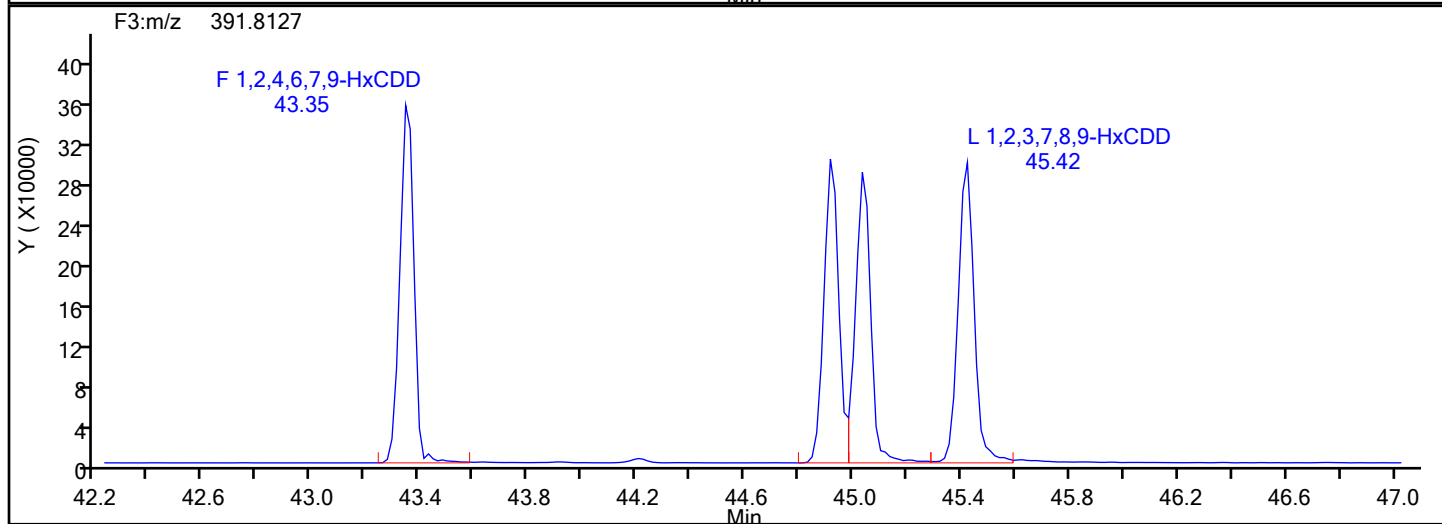
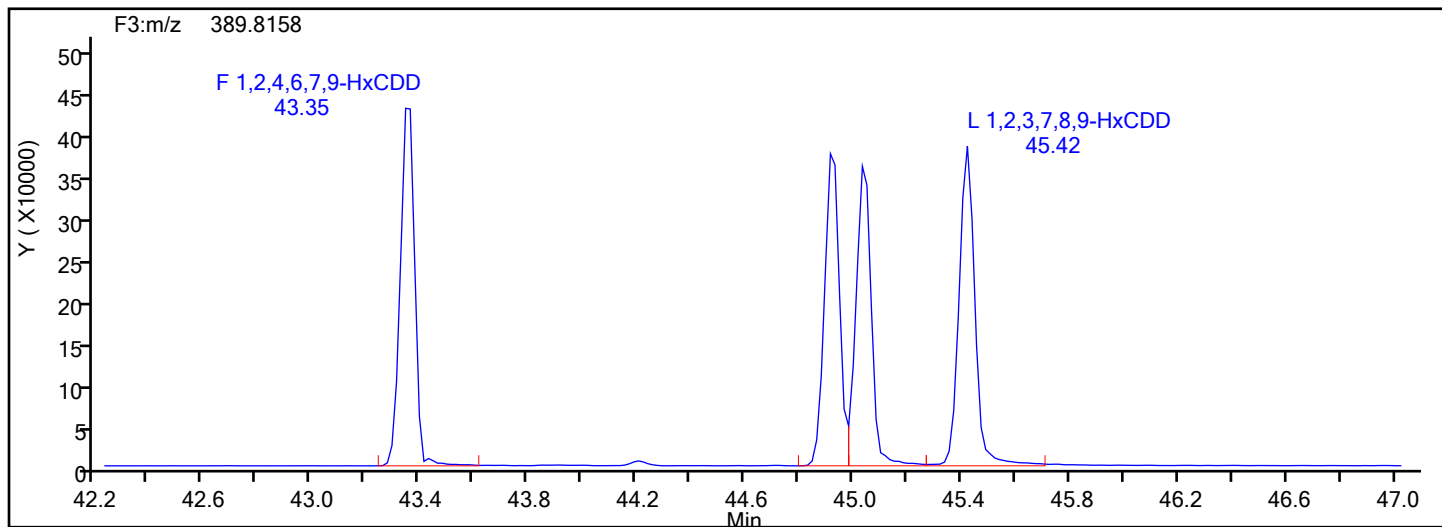


HxCDD Standards

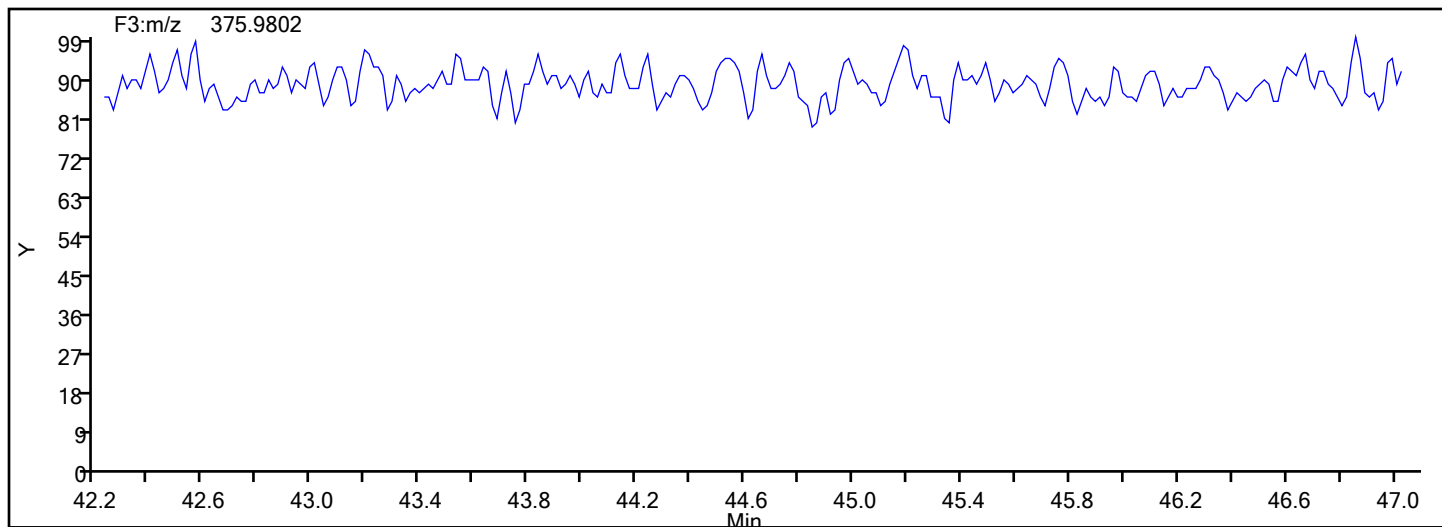


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
HxCDD



HxCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

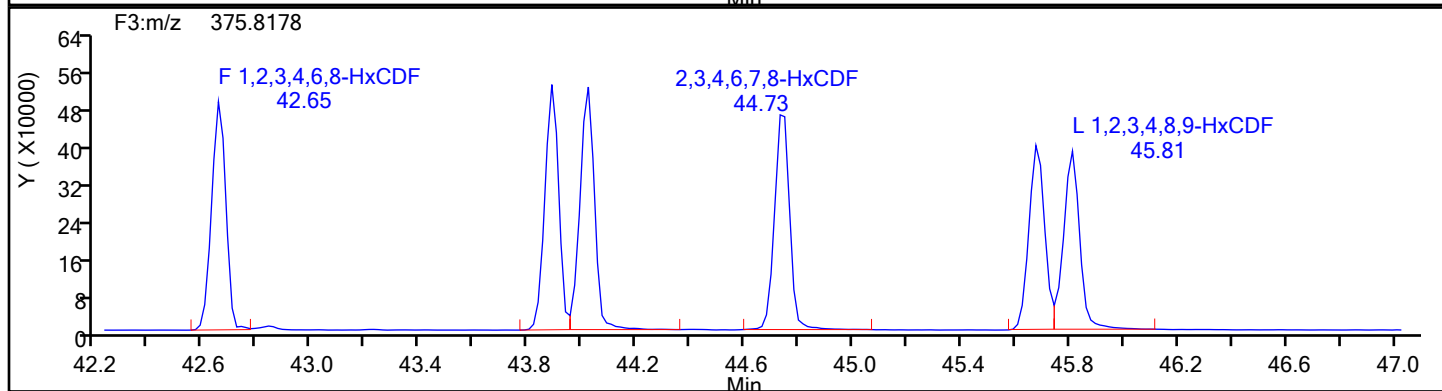
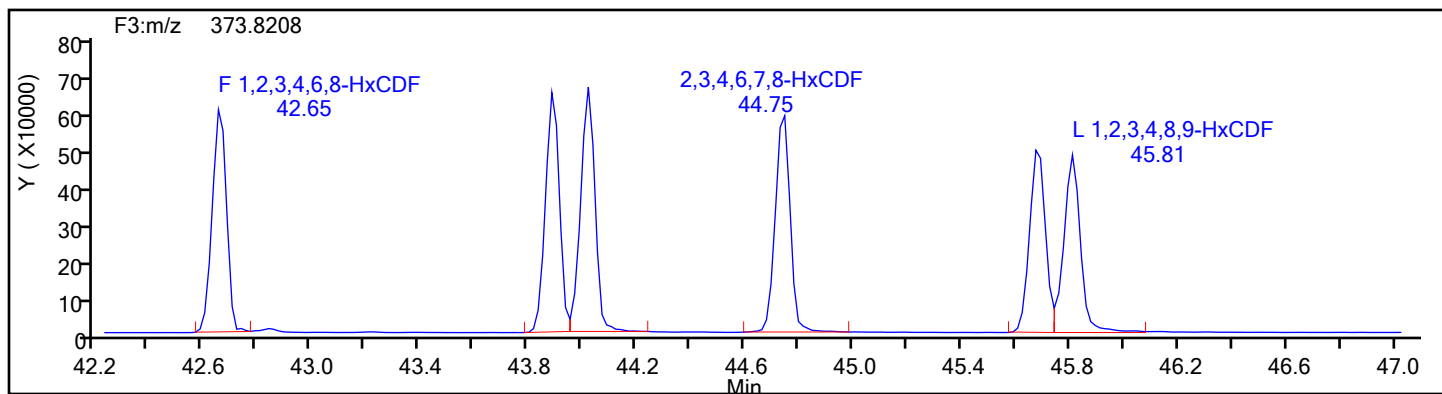
Worklist#: 27191

Sample Line#: 1

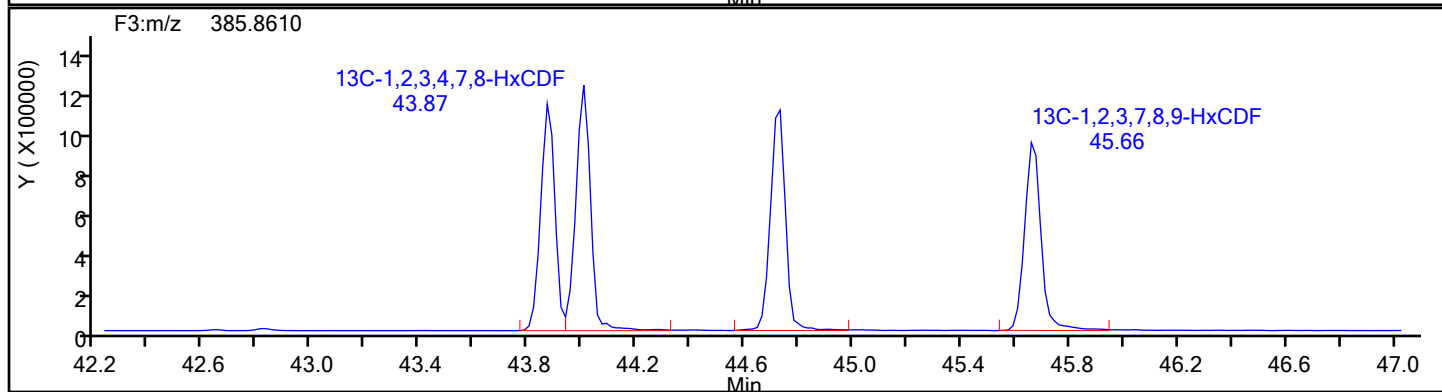
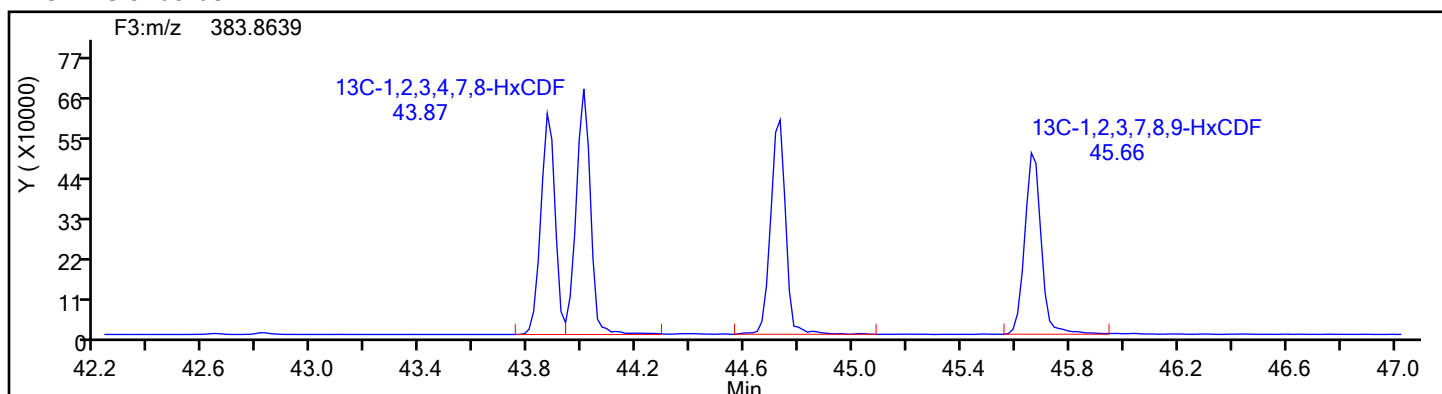
Column Type:

Column Dia:

HxCDF



HxCDF Standards



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

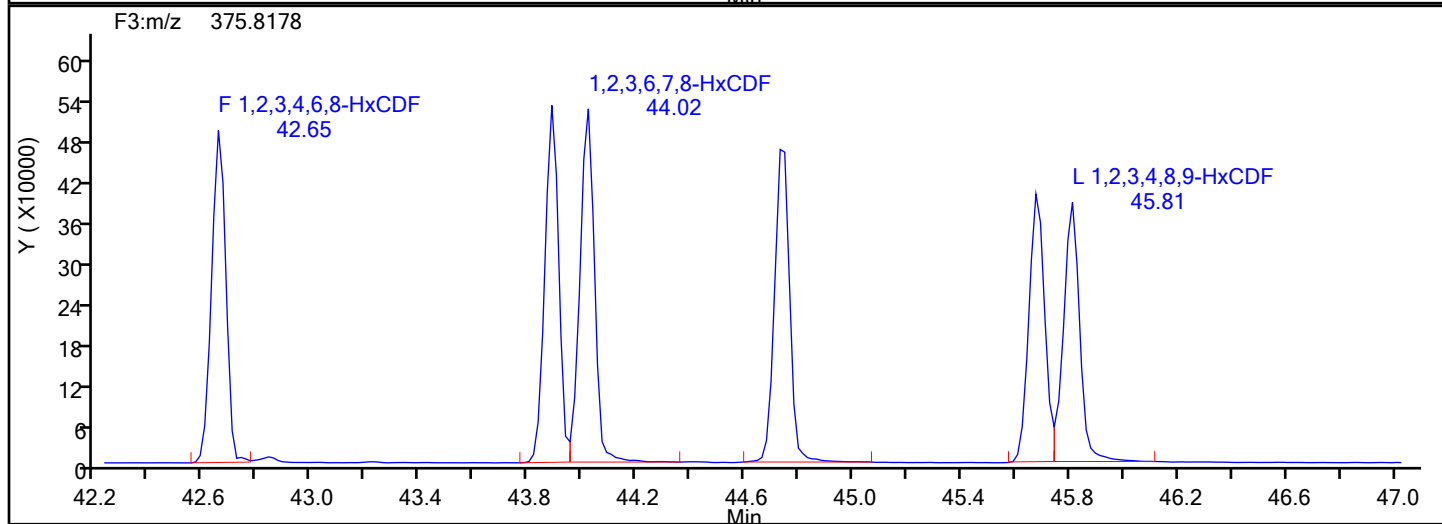
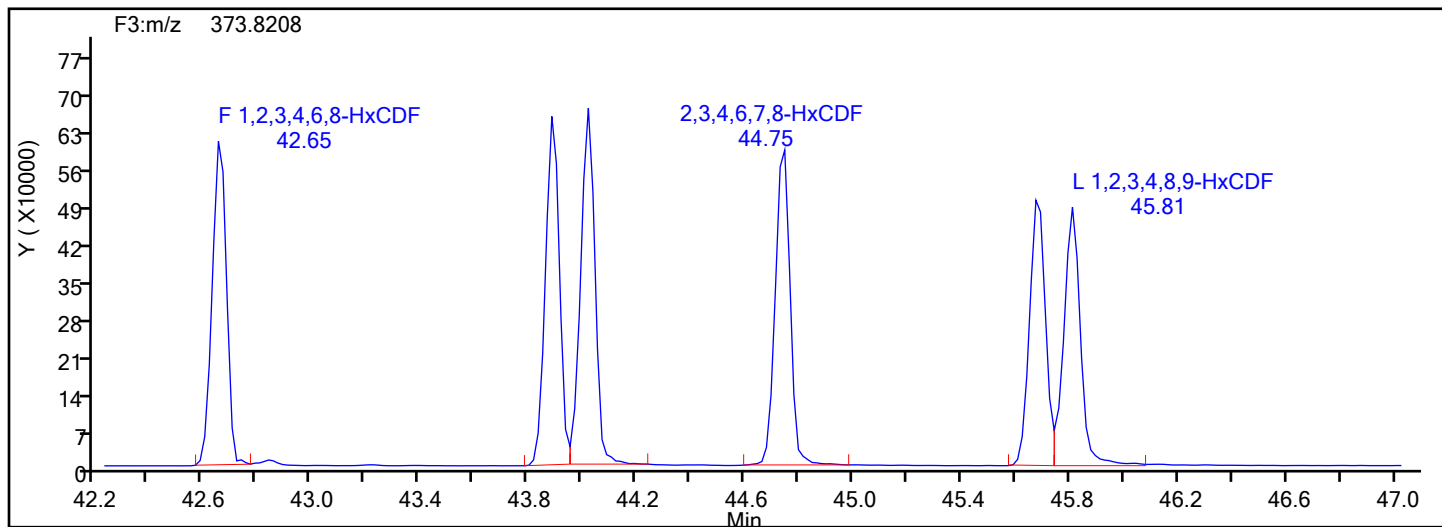
Worklist#: 27191

Sample Line#: 1

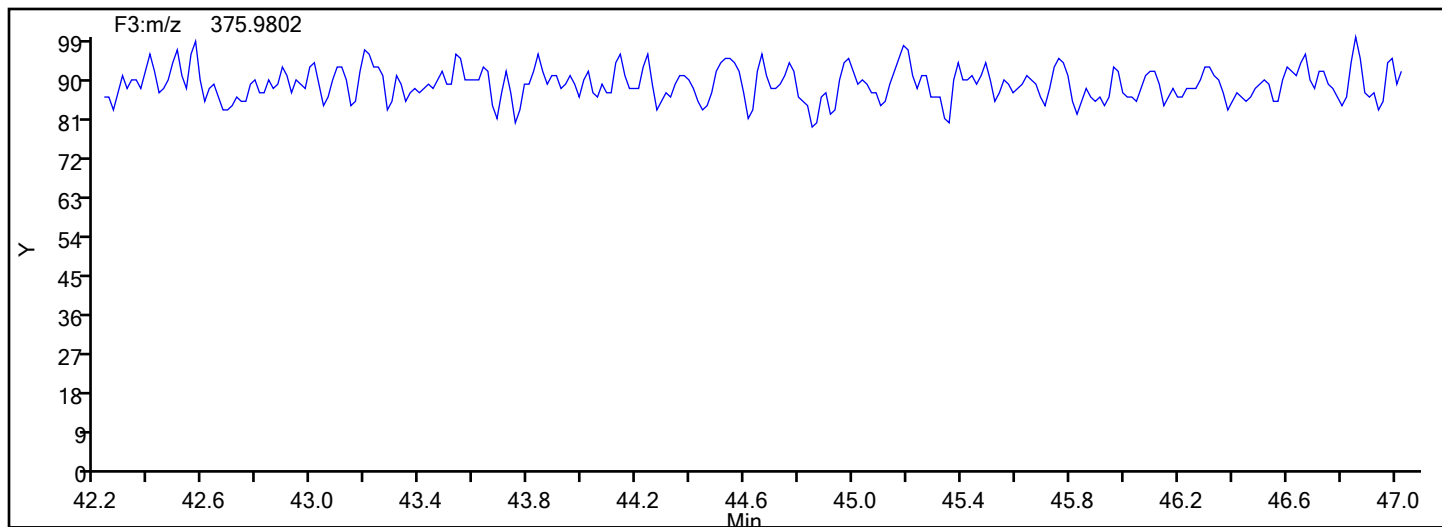
Column Type:

Column Dia:

HxCDF



HxCDF Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

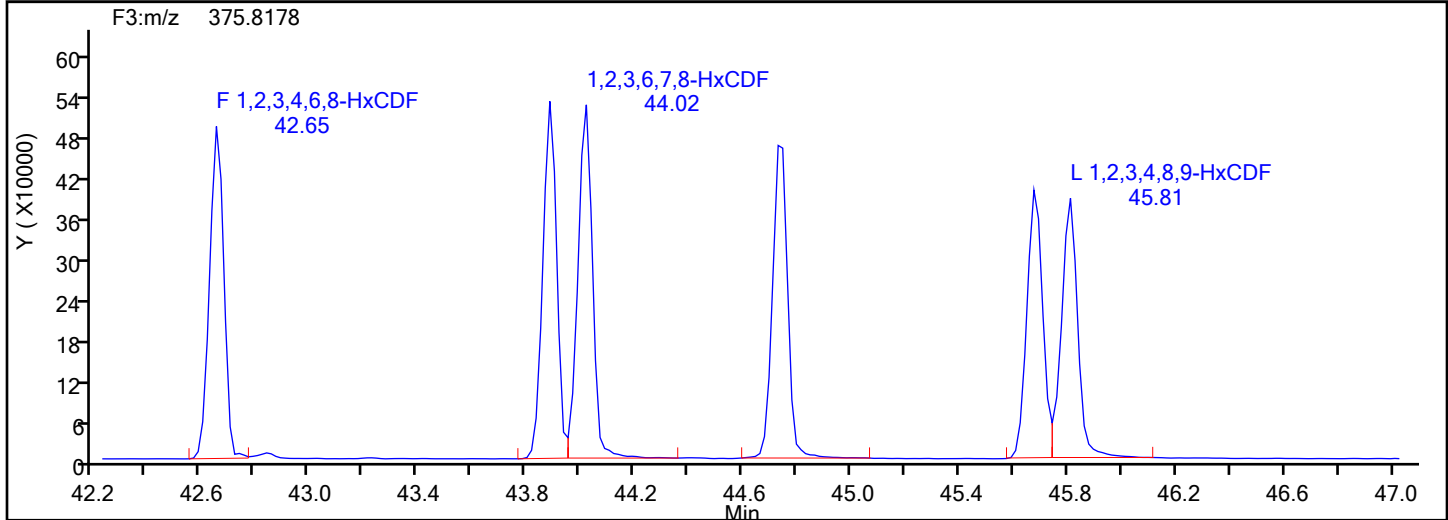
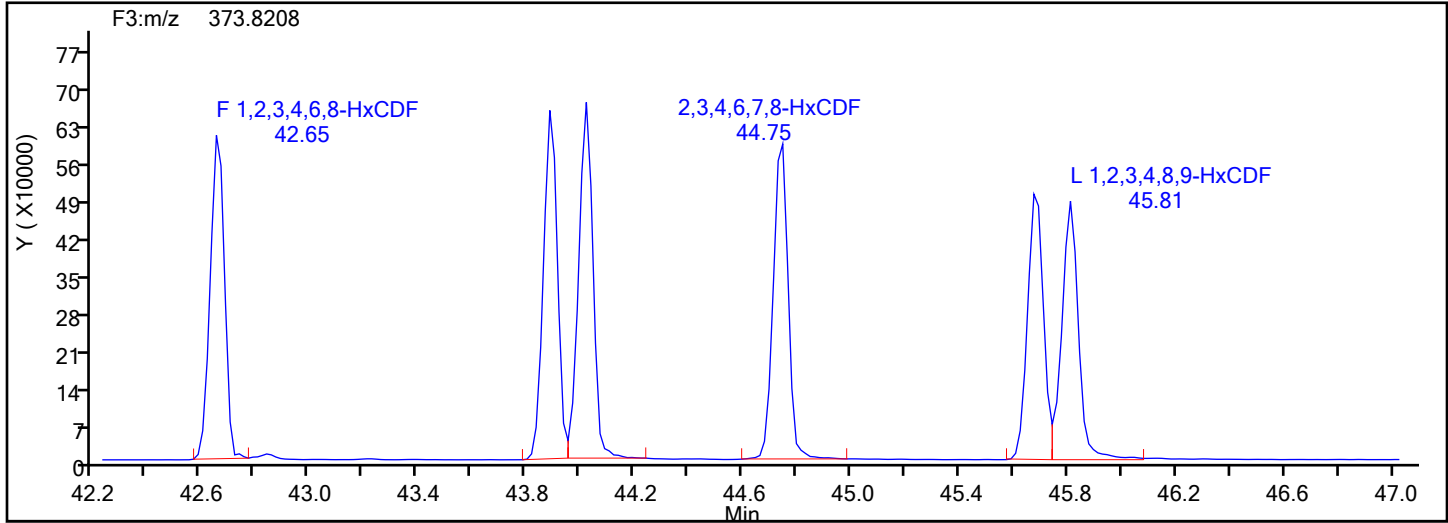
Worklist#: 27191

Sample Line#: 1

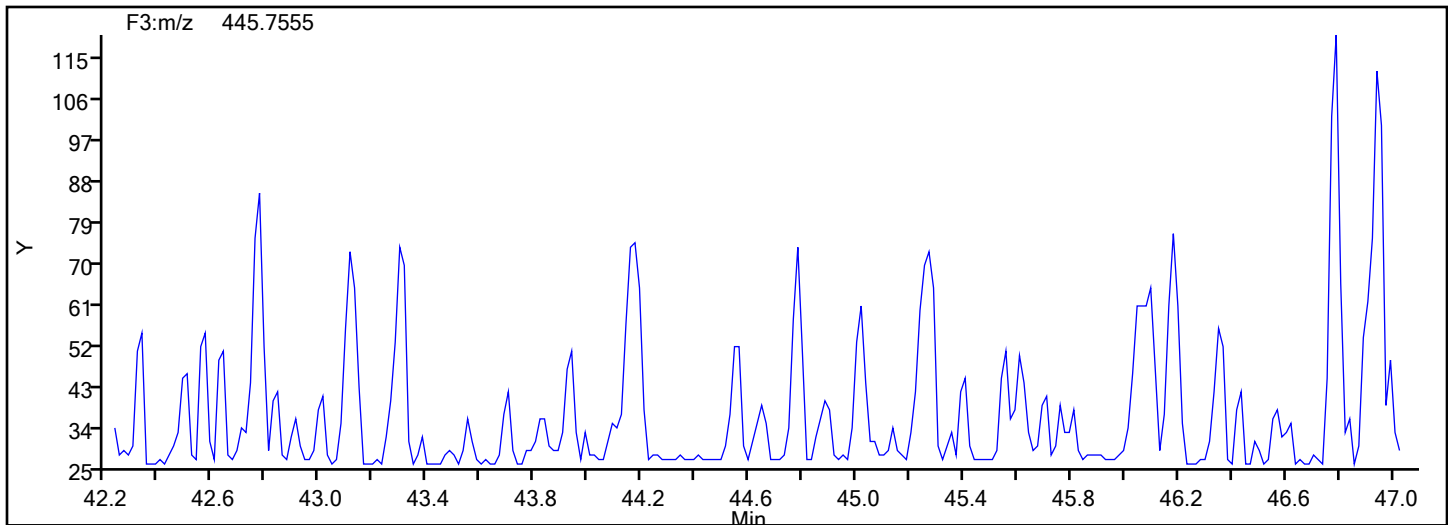
Column Type:

Column Dia:

HxCDF



HxCDF Interference Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

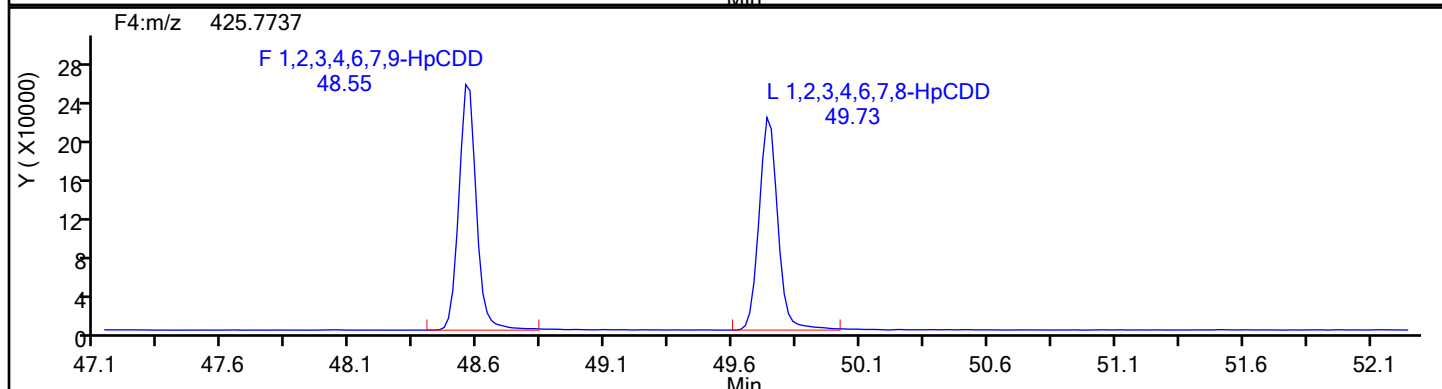
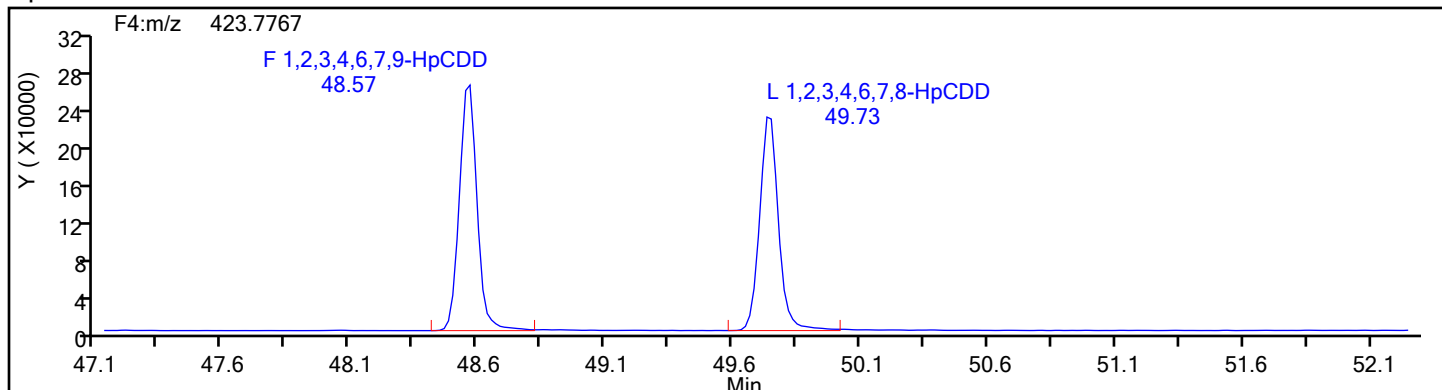
Worklist#: 27191

Sample Line#: 1

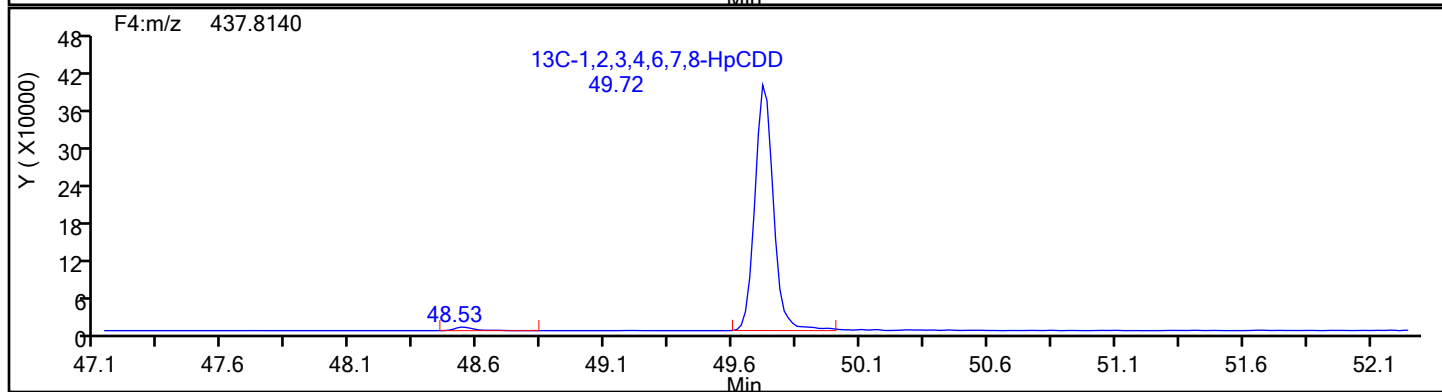
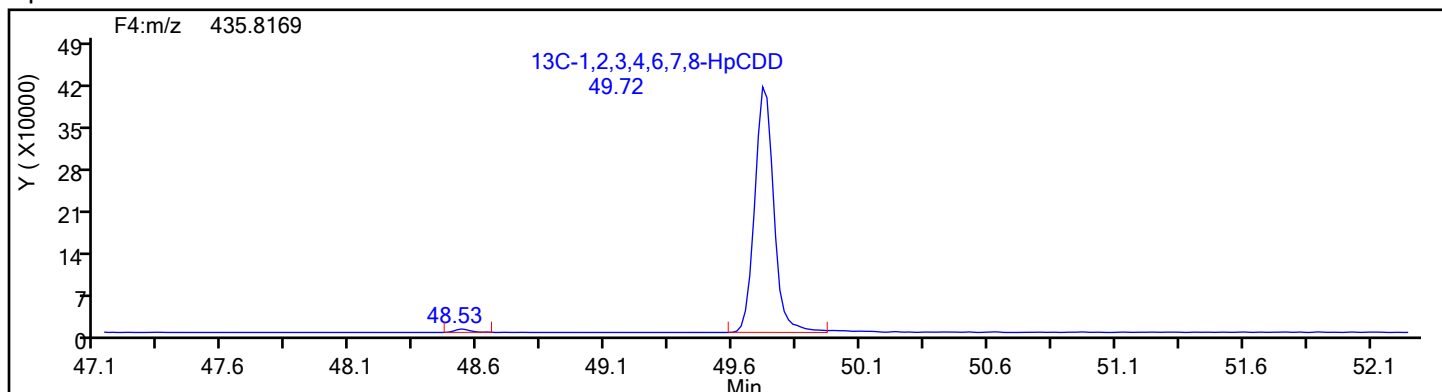
Column Type:

Column Dia:

HpCDD

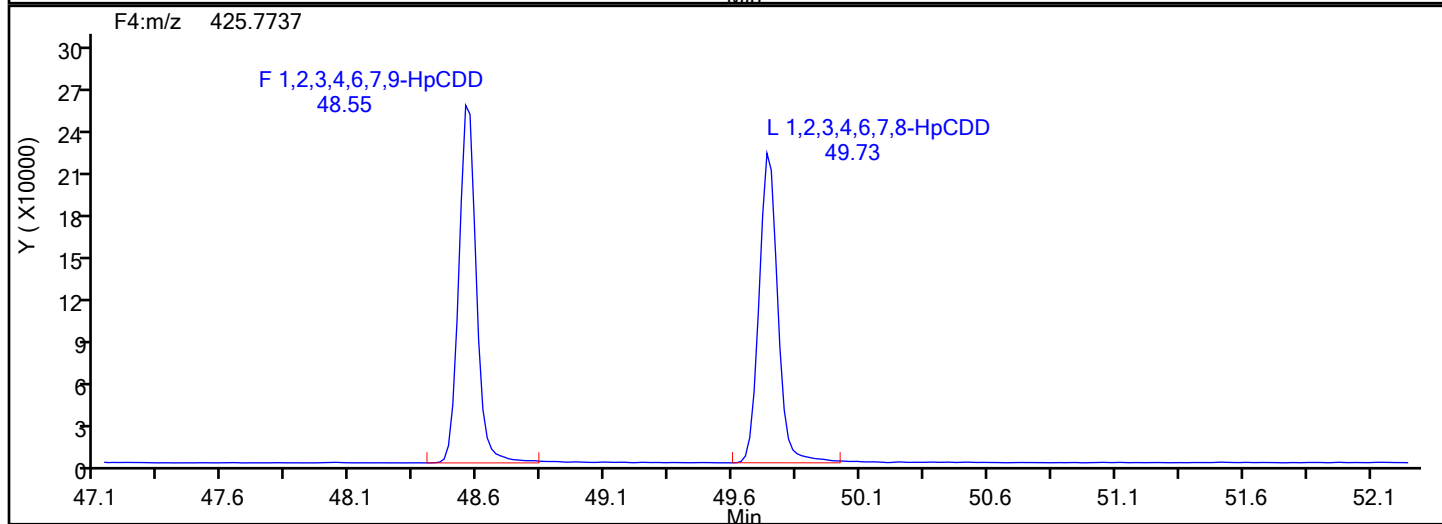
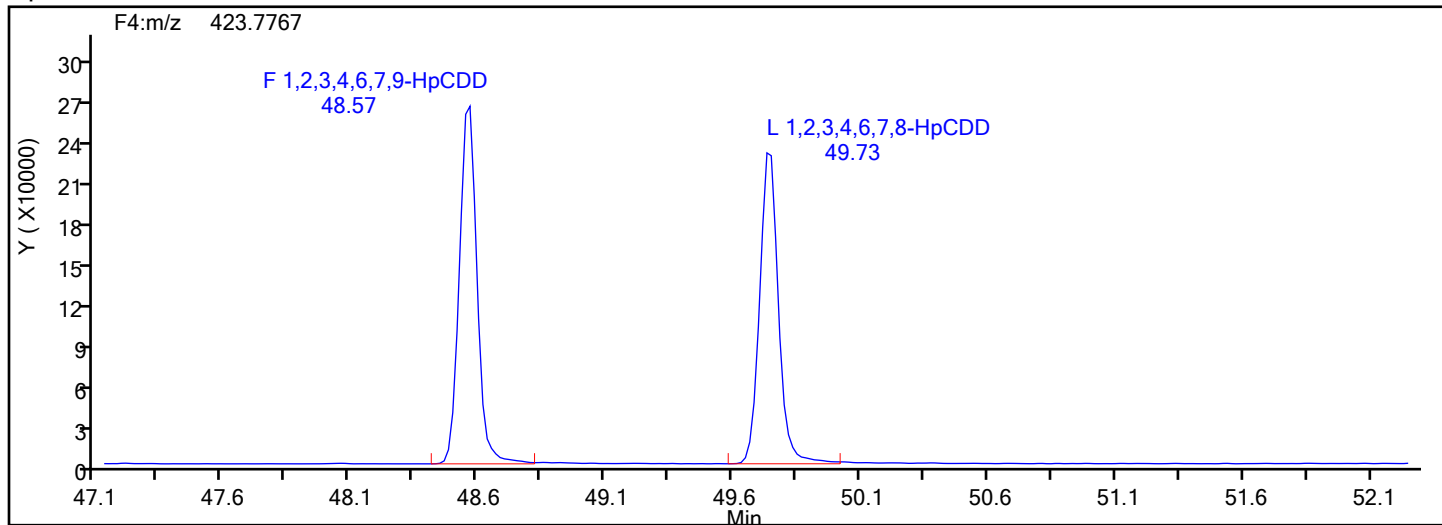


HpCDD Standards

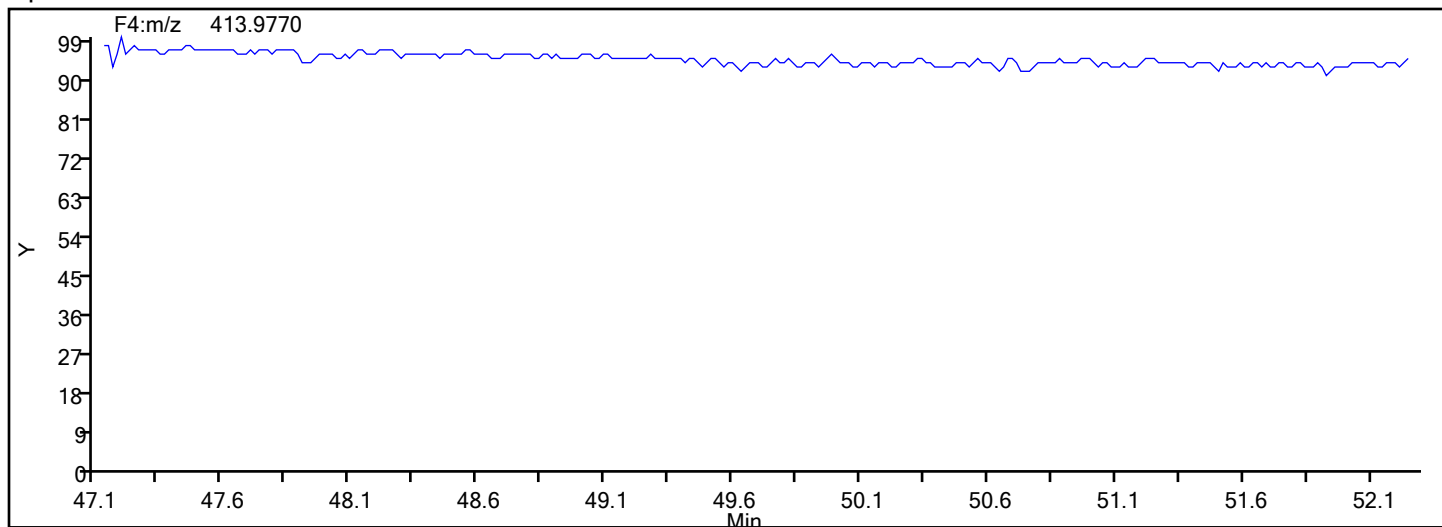


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
HpCDD



HpCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

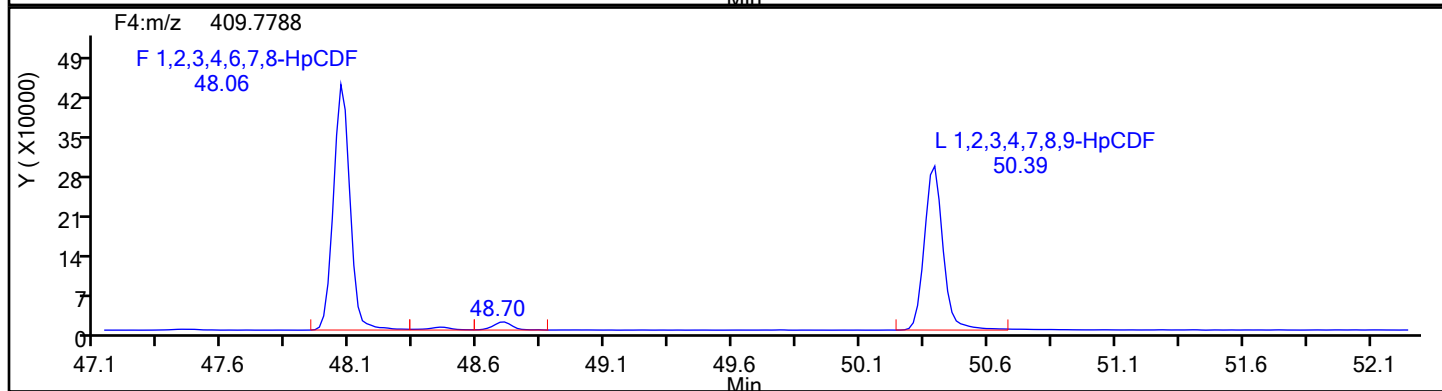
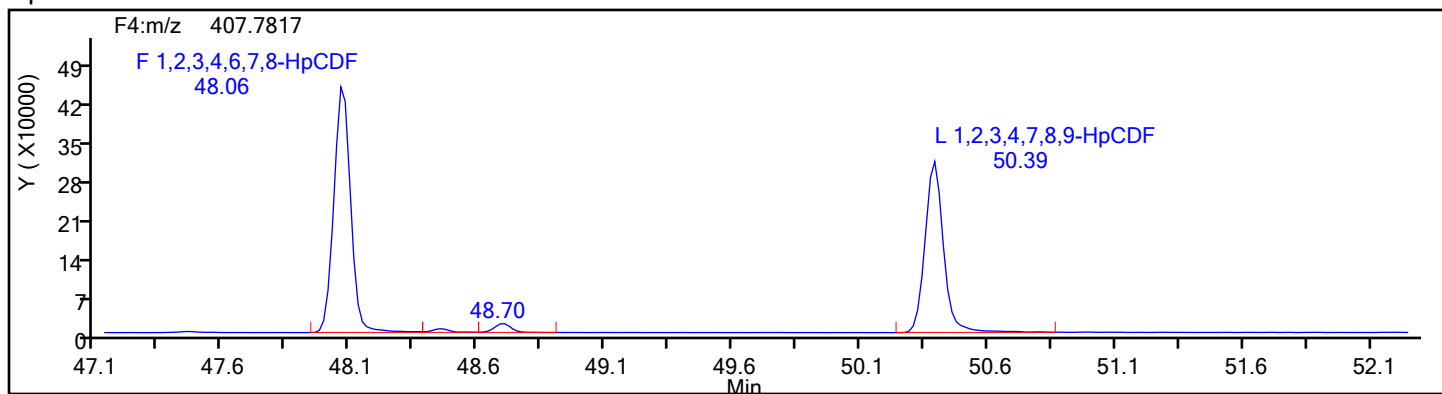
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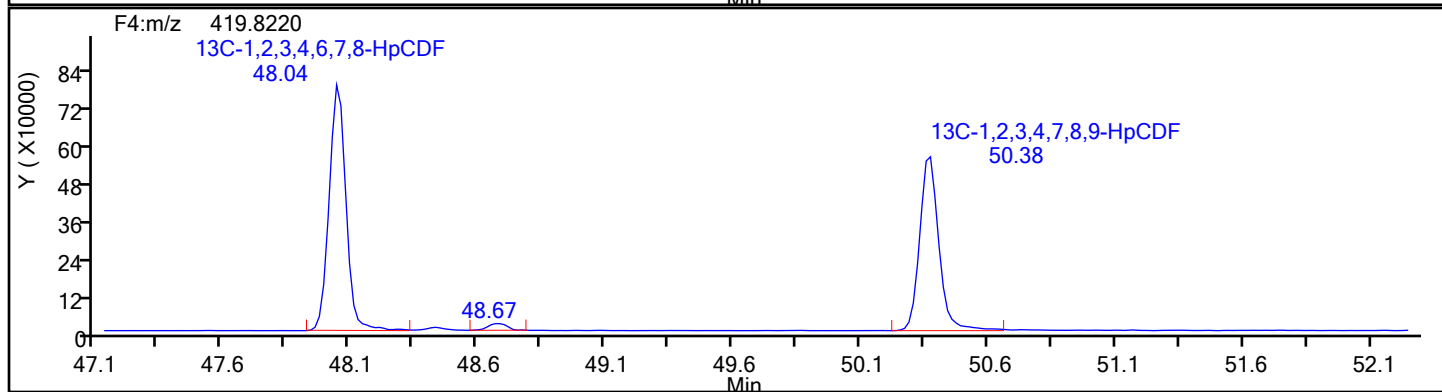
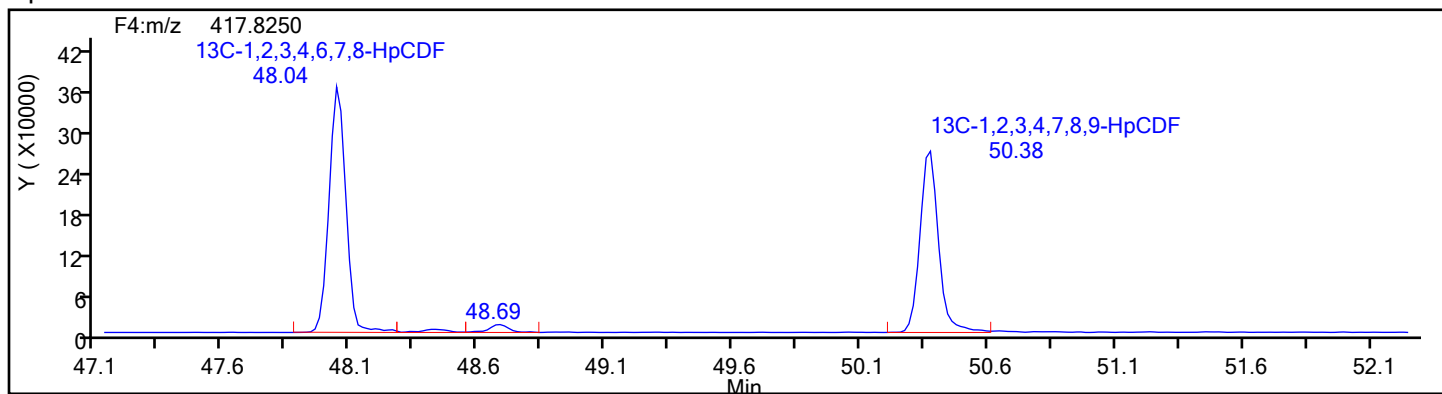
Column Type:

Column Dia:

HpCDF

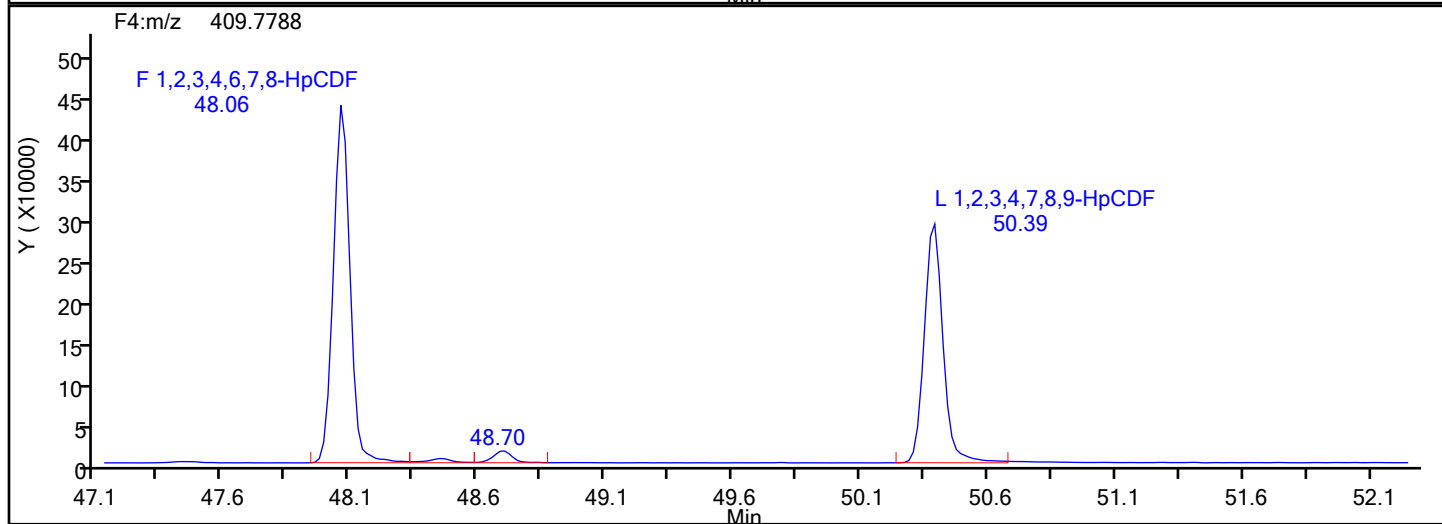
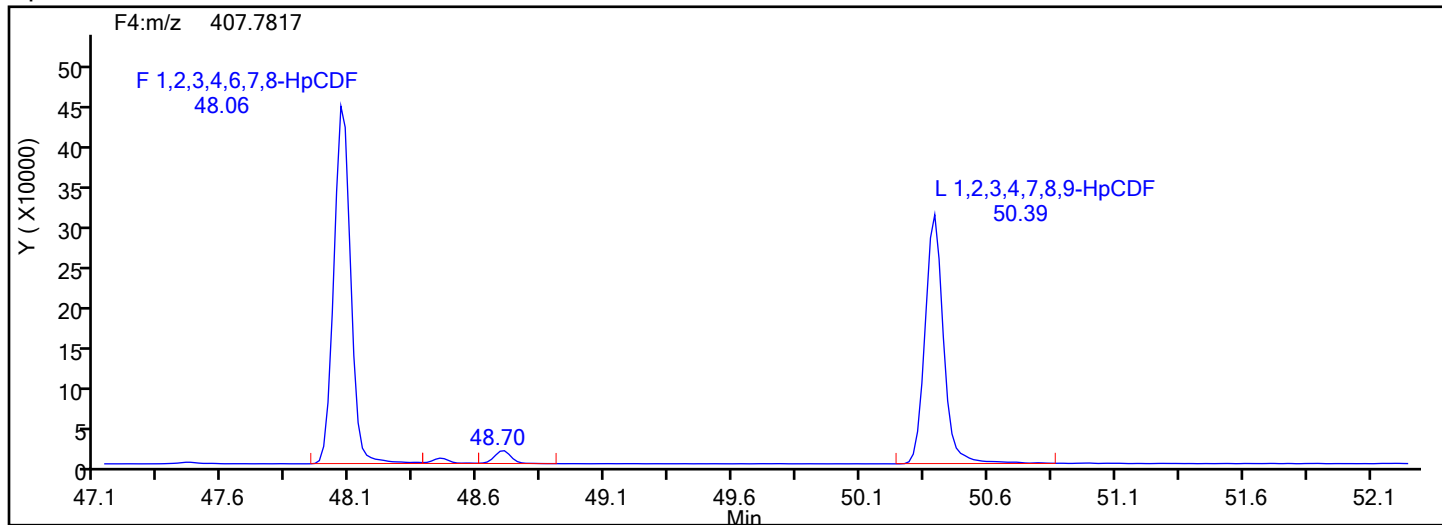


HpCDF Standards

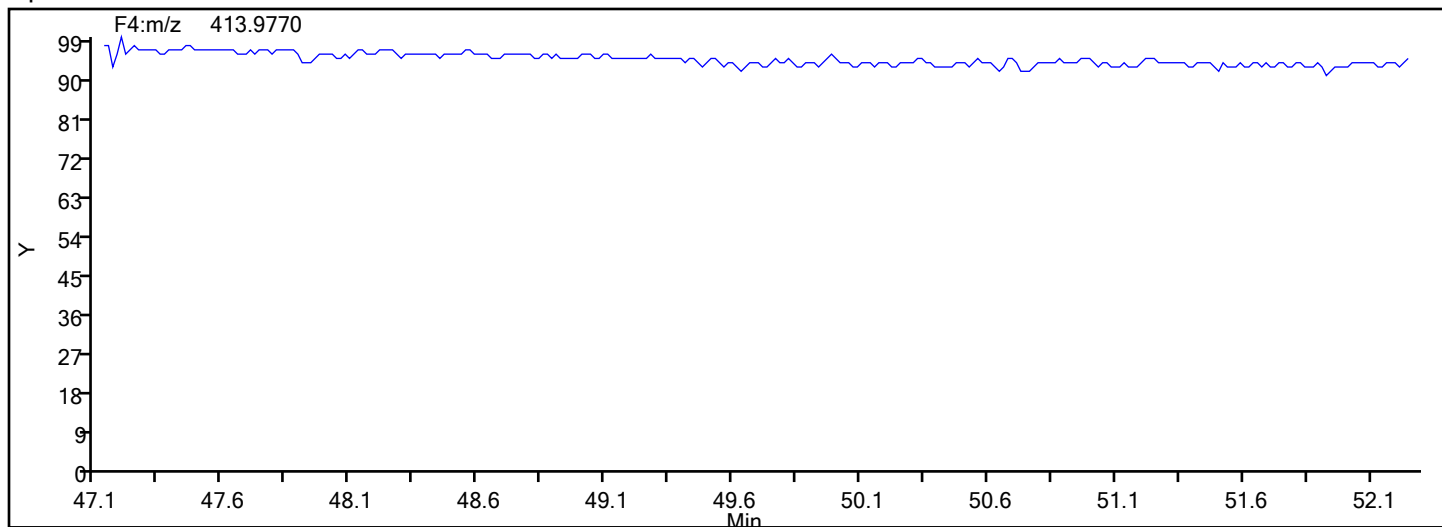


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
HpCDF



HpCDF Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

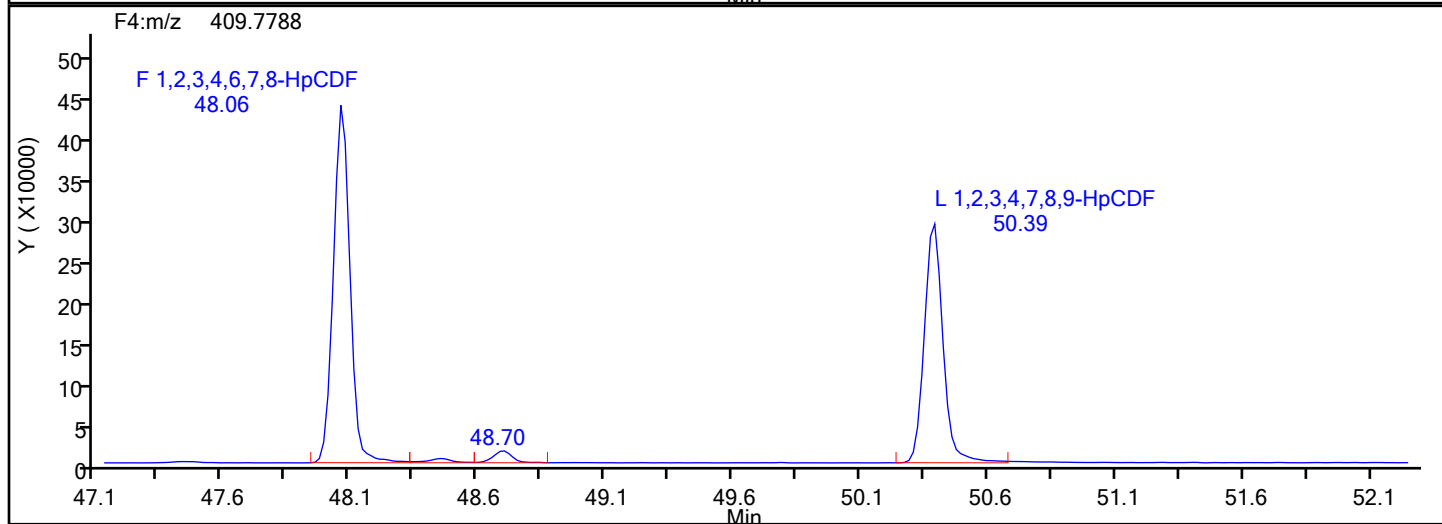
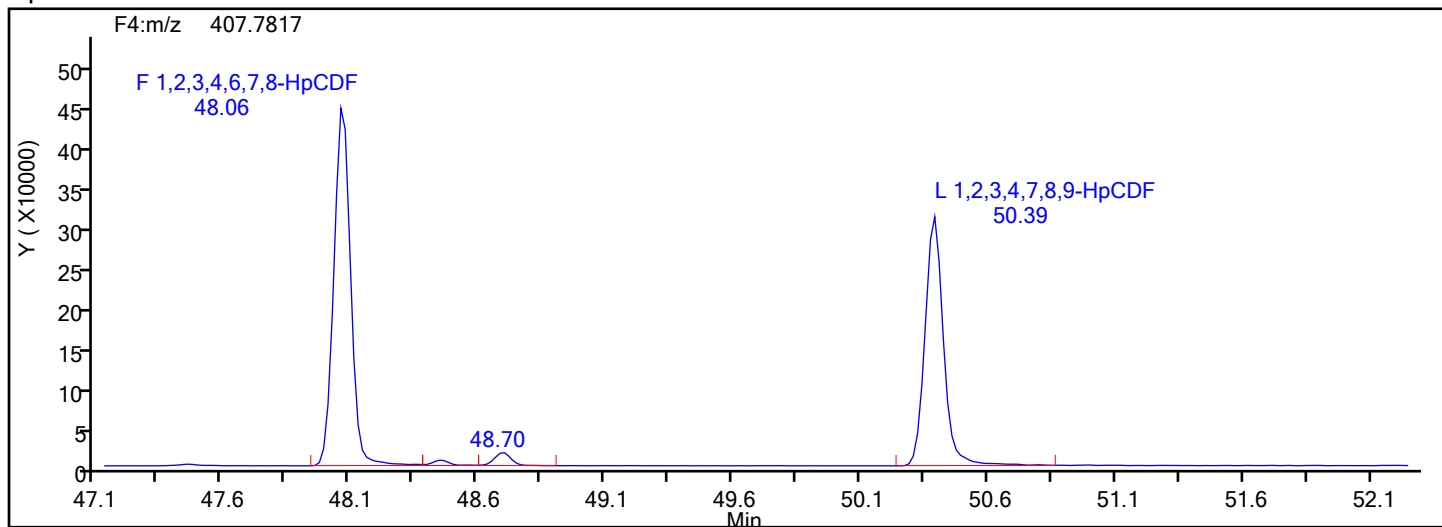
Worklist#: 27191

Sample Line#: 1

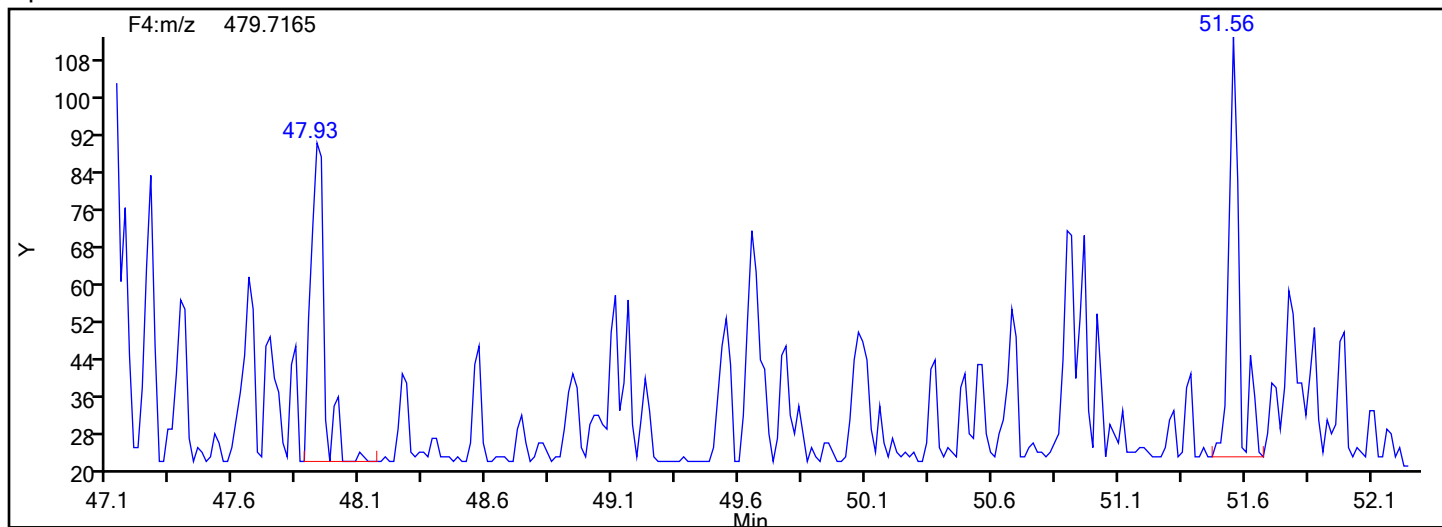
Column Type:

Column Dia:

HpCDF

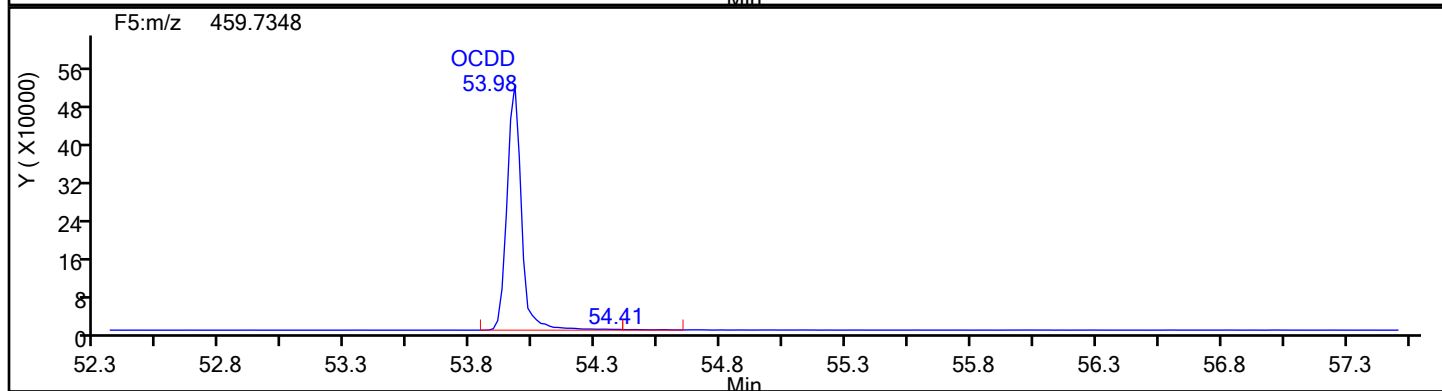
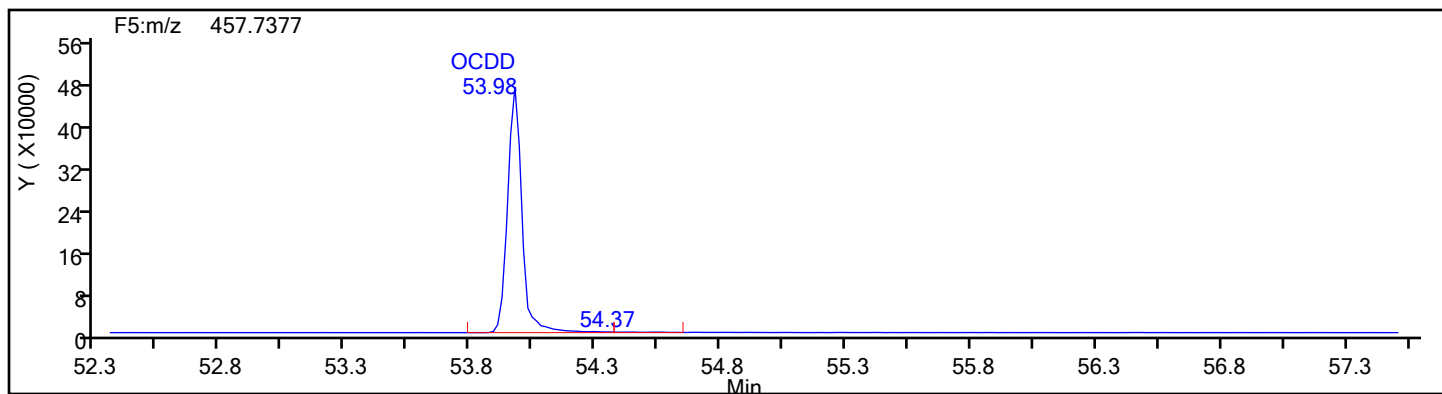


HpCDF Interference Mass

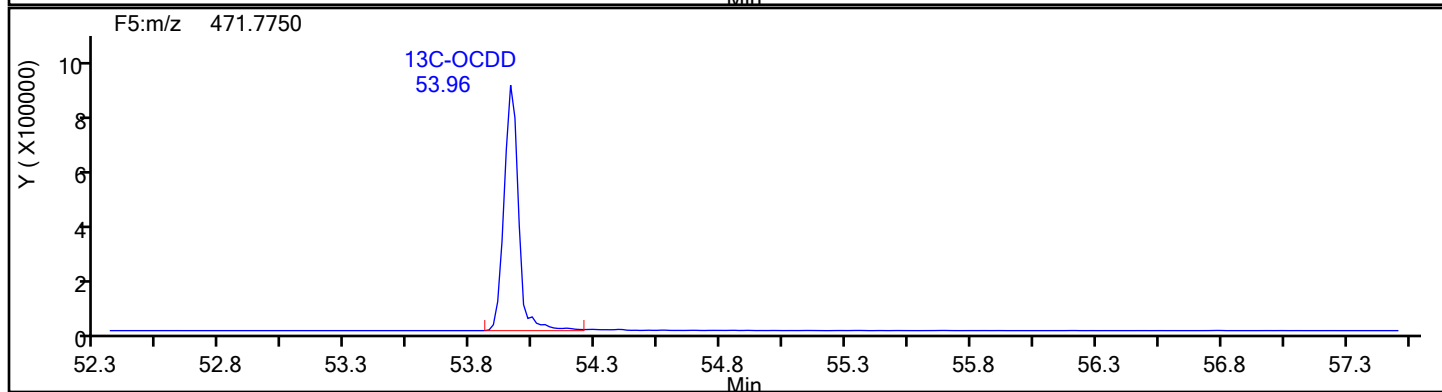
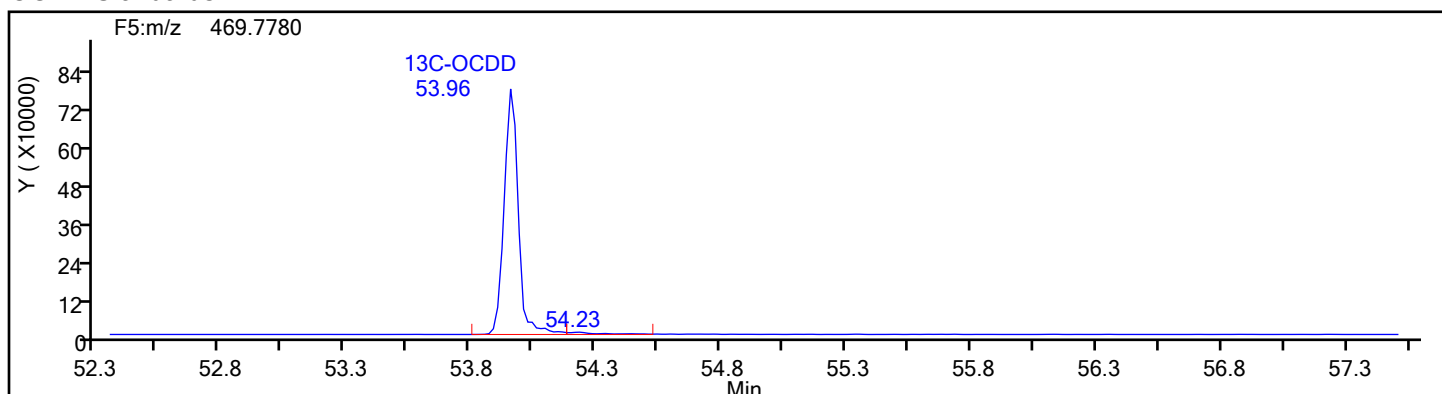


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d
Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
OCDD

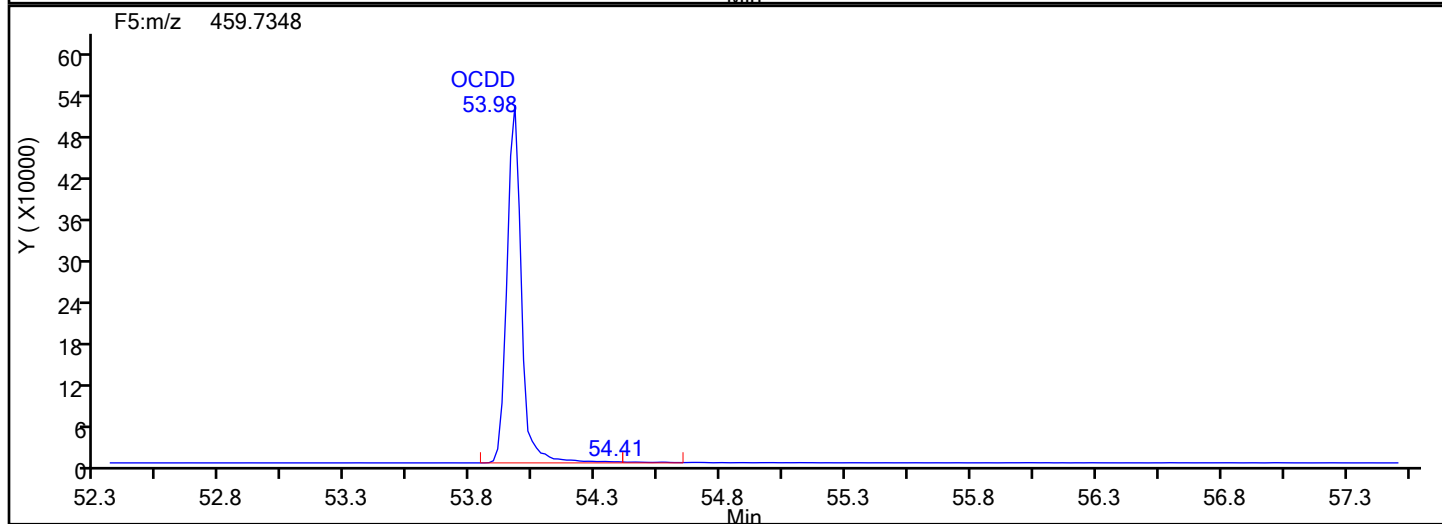
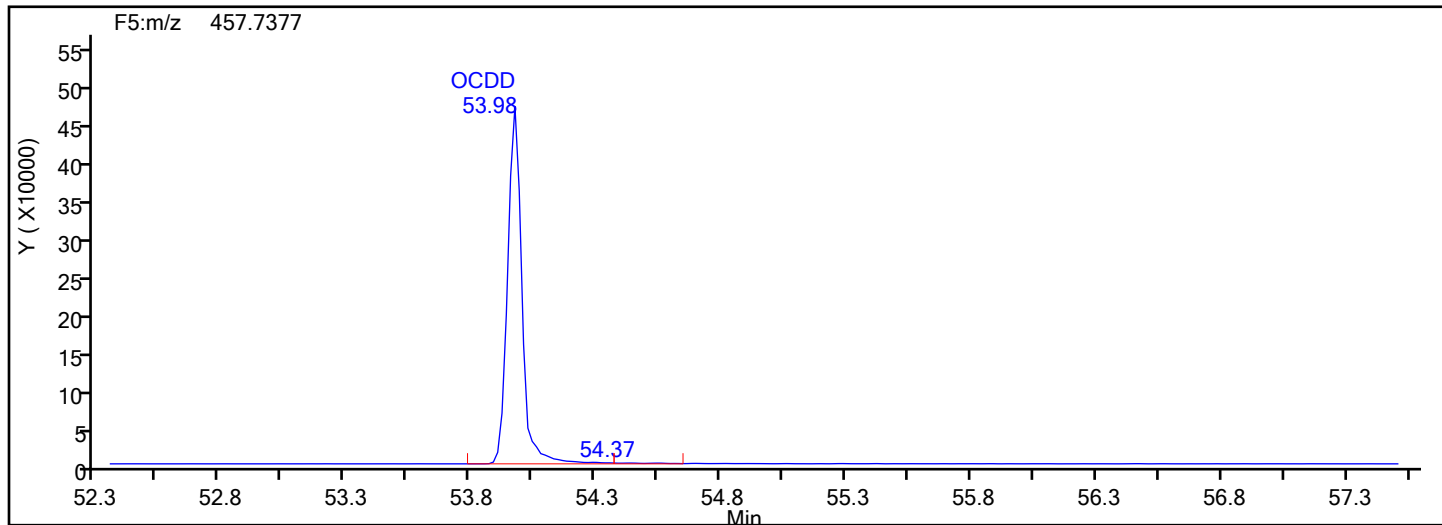


OCDD Standards

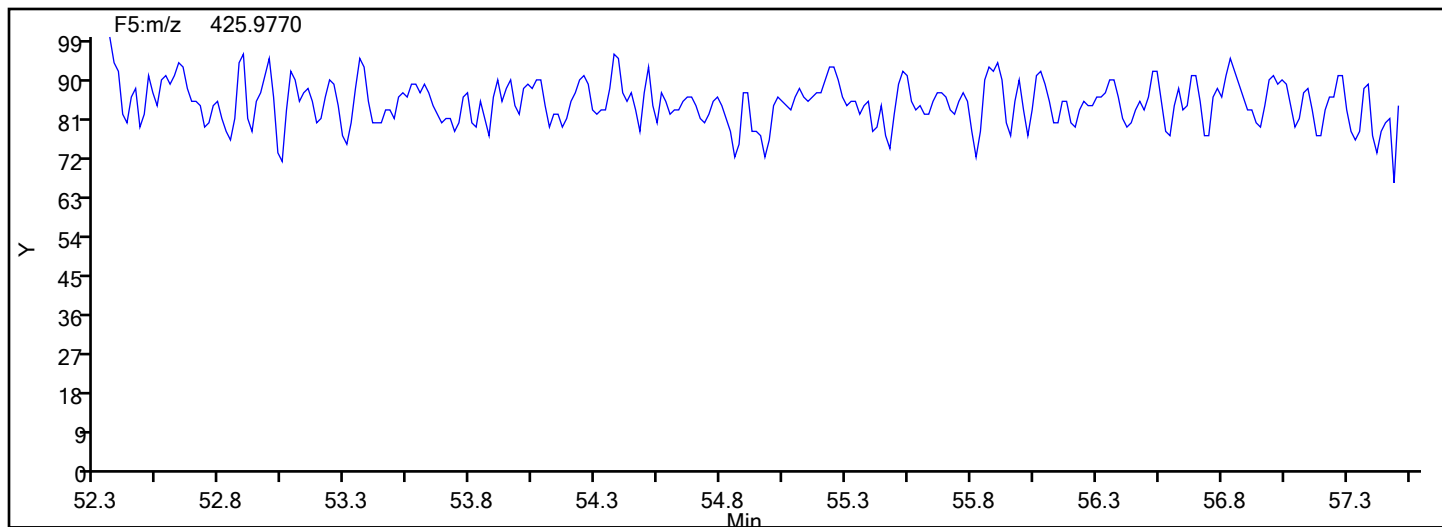


TestAmerica Knoxville

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Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
OCDD



OCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

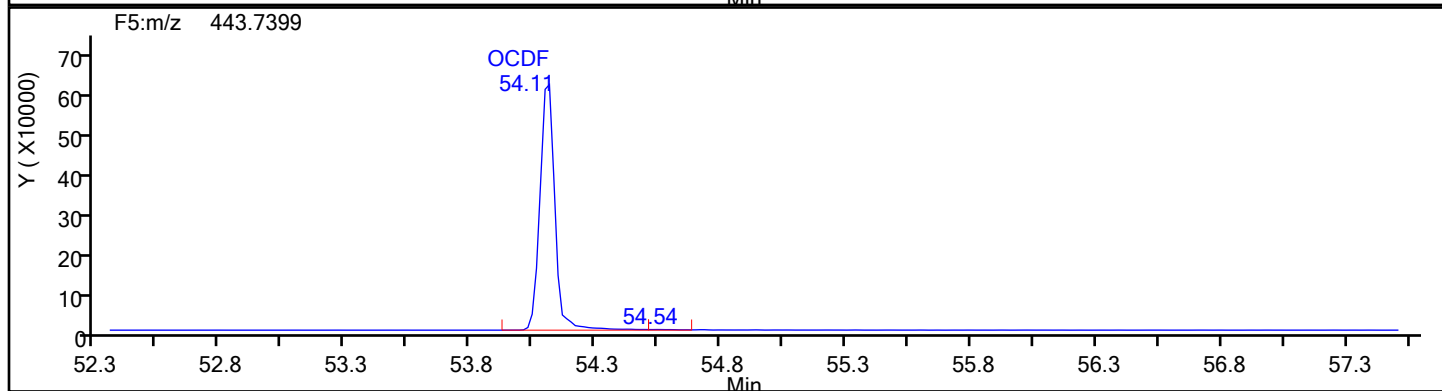
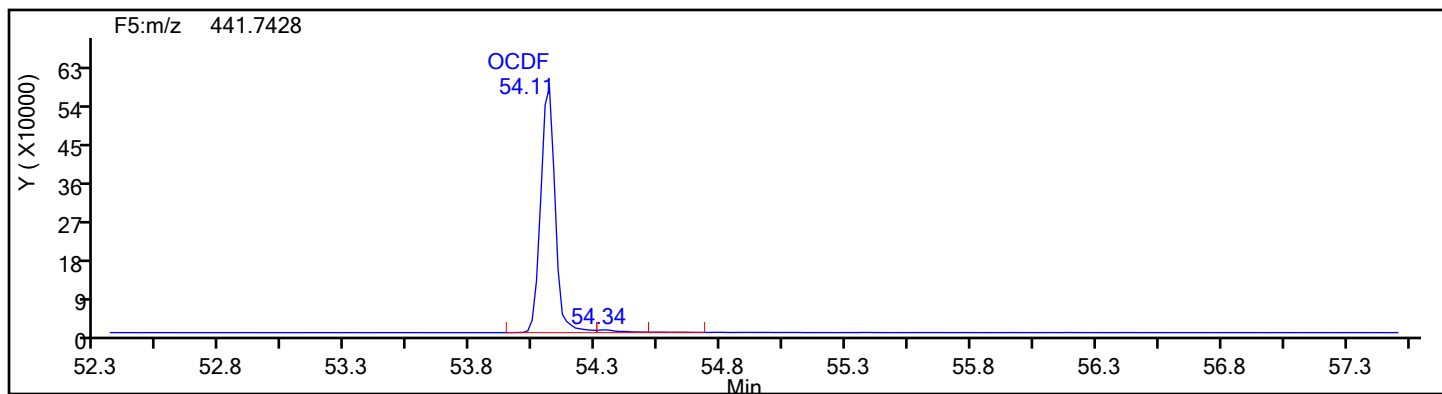
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Sample Line#: 1

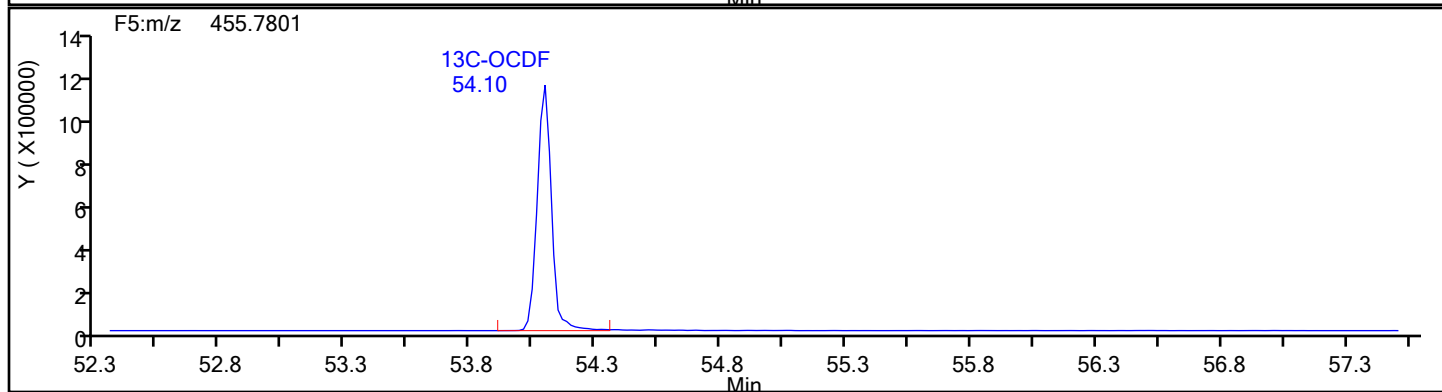
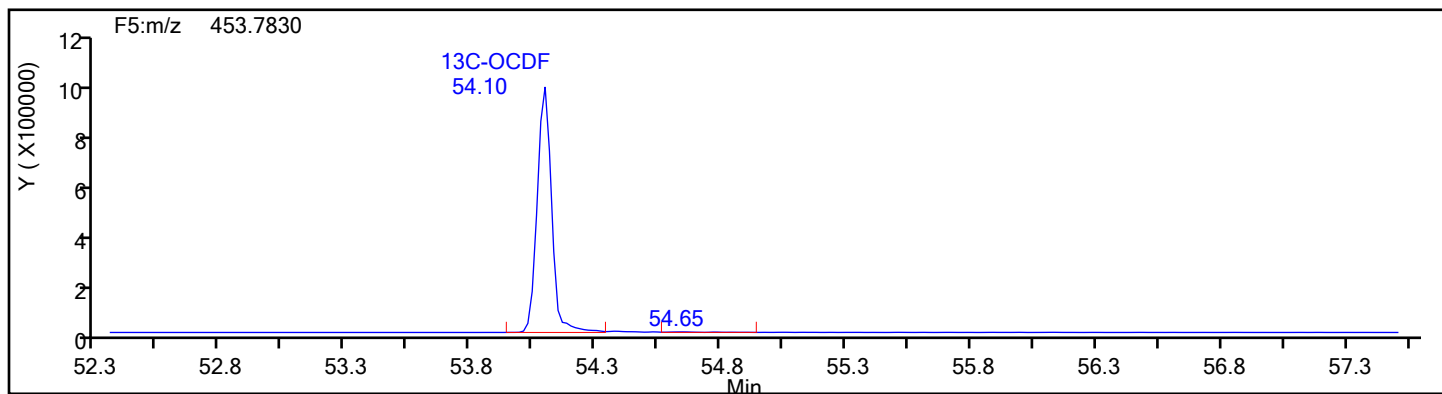
Column Type:

Column Dia:

OCDF

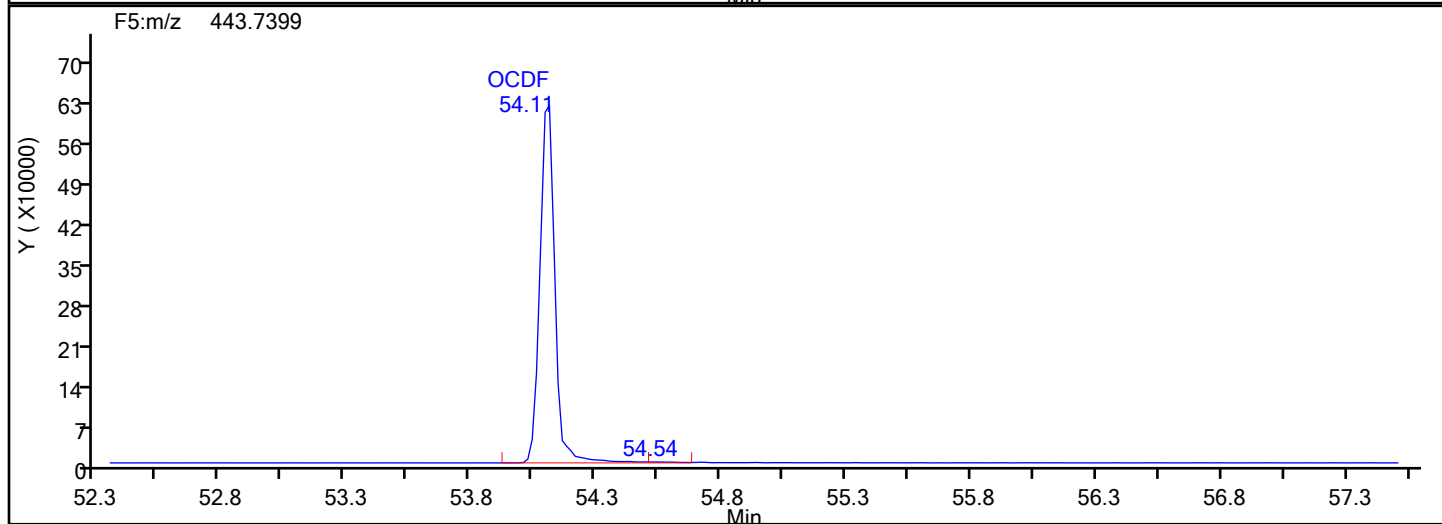
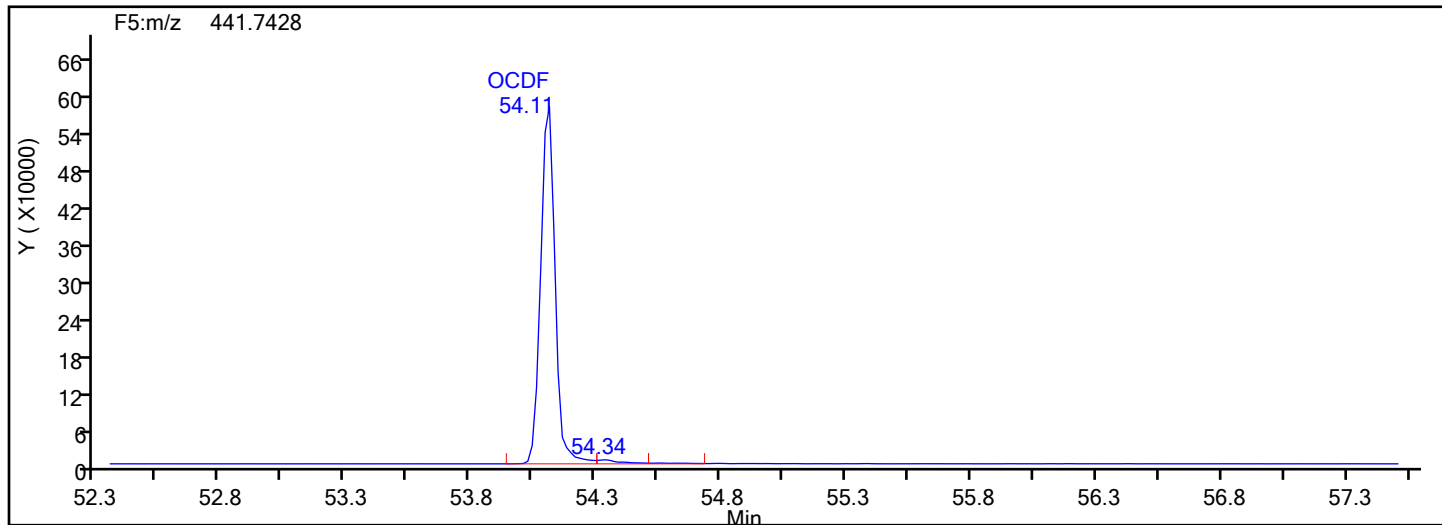


OCDF Standards

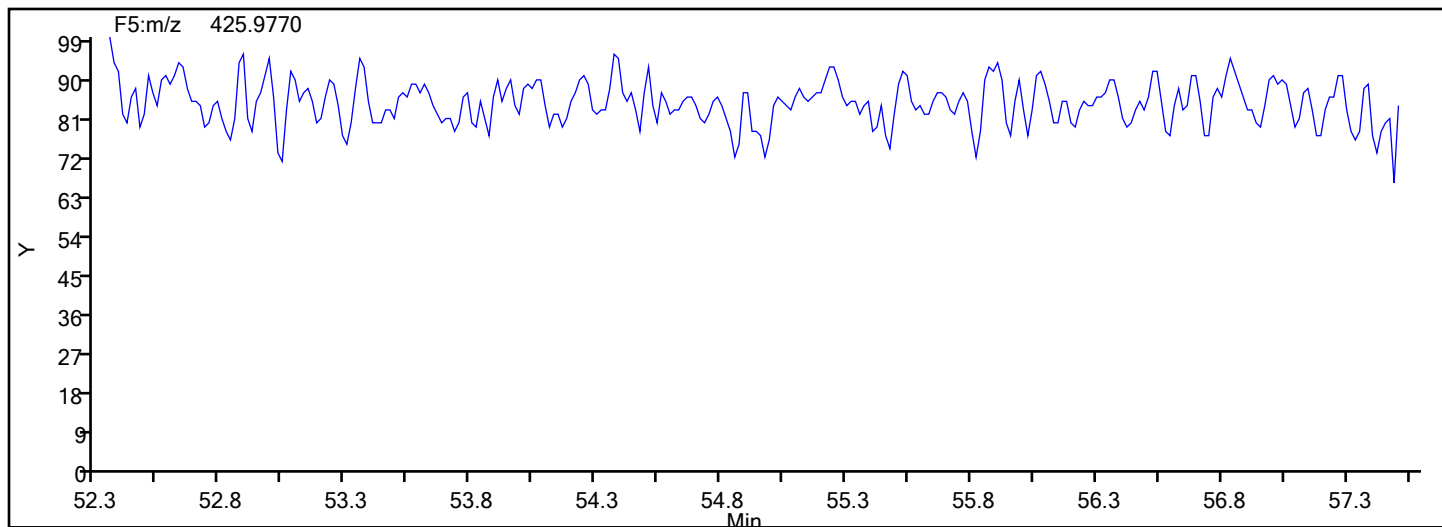


TestAmerica Knoxville

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Injection Date: 28-Jan-2019 01:01:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 1
Column Type: Column Dia:
OCDF



OCDF Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\d3190128s1.d

Injection Date: 28-Jan-2019 01:01:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

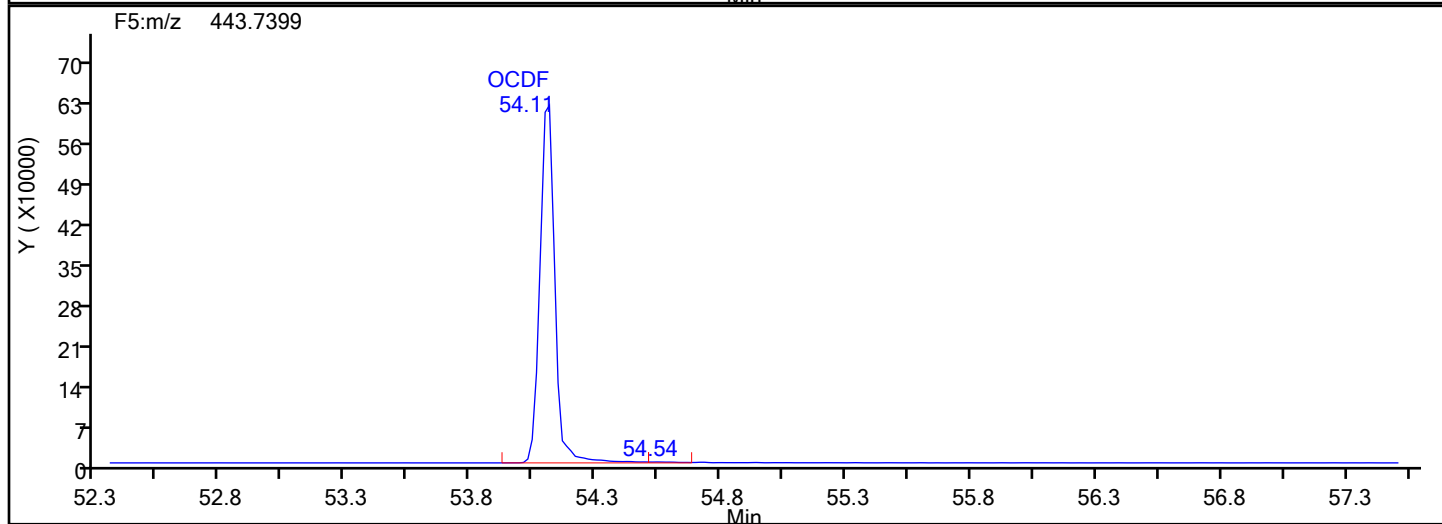
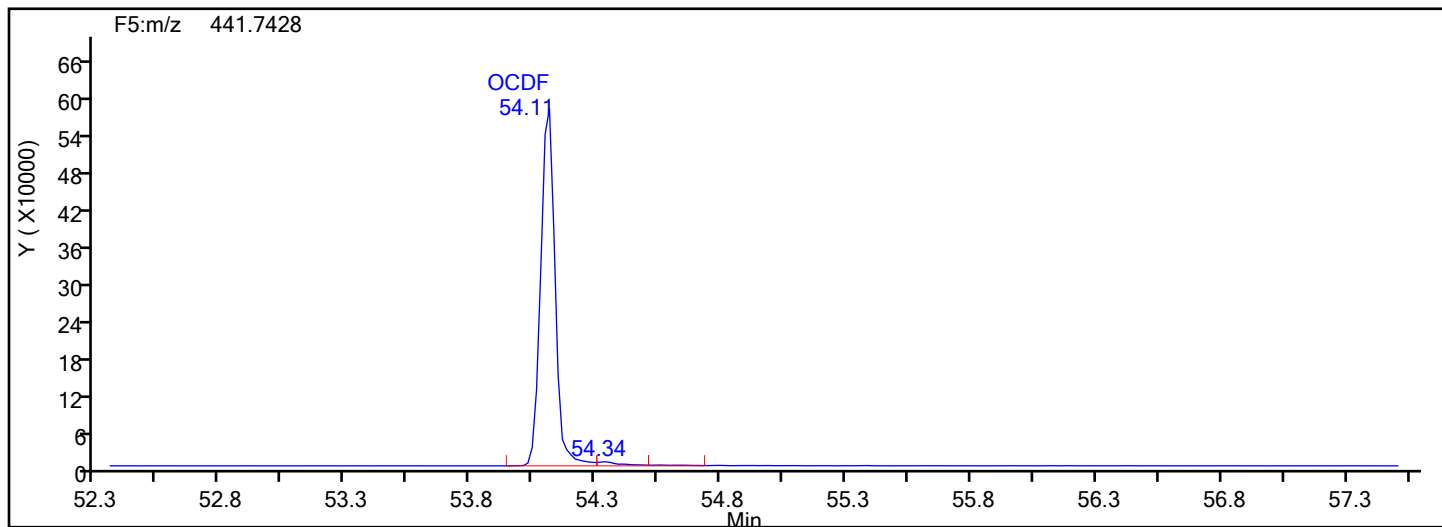
Worklist#: 27191

Sample Line#: 1

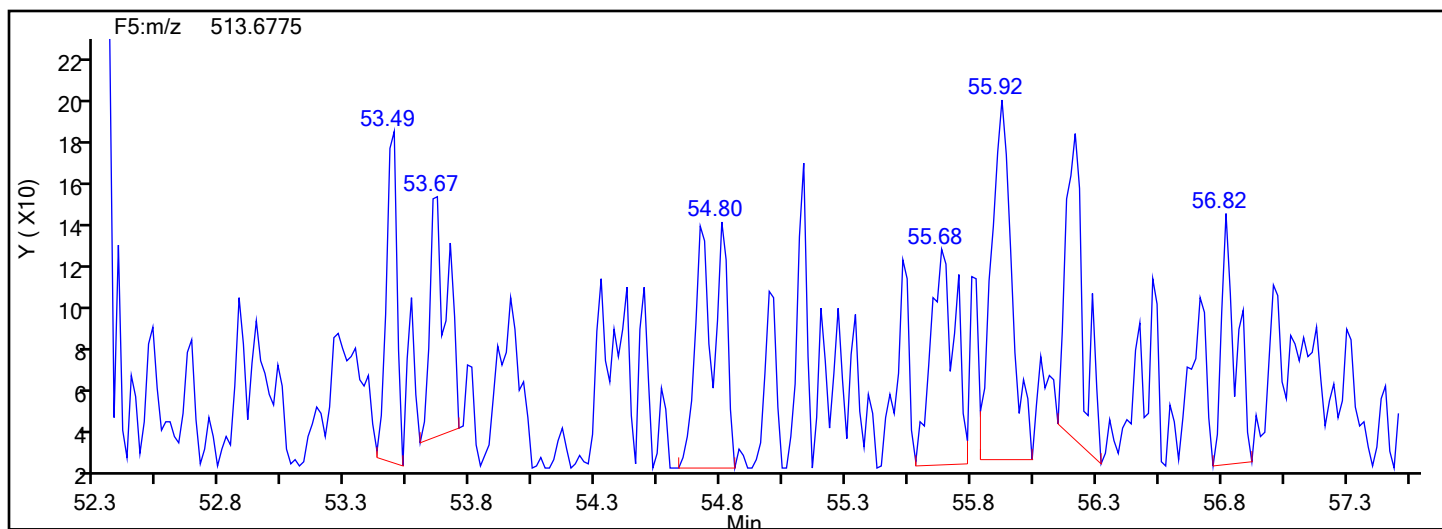
Column Type:

Column Dia:

OCDF



OCDF Interference Mass



FORM VII
DIOXIN CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Lab Sample ID: WDMCCV 140-27242/1 Calibration Date: 01/29/2019 09:51

Instrument ID: D2A Calib Start Date: 05/16/2014 14:26

GC Column: RTX-5 ID: 0.32 (mm) Calib End Date: 05/16/2014 18:31

Lab File ID: d3190129s2.d Conc. Units: pg/uL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%REC	%REC LIMITS
2,3,7,8-TCDF	AveID	1.088	1.081		9.93	10.0	99	84-120
2,3,7,8-TCDD	AveID	1.173	1.159		9.88	10.0	99	78-129
1,2,3,7,8-PeCDF	AveID	1.190	1.121		47.1	50.0	94	82-120
2,3,4,7,8-PeCDF	AveID	1.109	1.078		48.6	50.0	97	82-122
1,2,3,7,8-PeCDD	AveID	1.043	1.008		48.3	50.0	97	78-130
1,2,3,4,7,8-HxCDF	AveID	1.363	1.389		51.0	50.0	102	90-112
1,2,3,6,7,8-HxCDF	AveID	1.276	1.217		47.7	50.0	95	88-114
2,3,4,6,7,8-HxCDF	AveID	1.265	1.261		49.8	50.0	100	88-114
1,2,3,4,7,8-HxCDD	AveID	1.141	1.103		48.4	50.0	97	78-128
1,2,3,6,7,8-HxCDD	AveID	1.148	1.117		48.7	50.0	97	78-128
1,2,3,7,8,9-HxCDD	AveID	1.221	1.167		47.8	50.0	96	82-122
1,2,3,7,8,9-HxCDF	AveID	1.257	1.166		46.4	50.0	93	90-112
1,2,3,4,6,7,8-HpCDF	AveID	1.498	1.478		49.3	50.0	99	90-110
1,2,3,4,6,7,8-HpCDD	AveID	1.120	1.143		51.0	50.0	102	86-116
1,2,3,4,7,8,9-HpCDF	AveID	1.381	1.412		51.1	50.0	102	86-116
OCDD	AveID	1.207	1.207		100	100	100	79-126
OCDF	AveID	1.116	1.140		102	100	102	63-159
13C-2,3,7,8-TCDF	Ave	1.755	1.728		98.5	100	99	71-140
13C-2,3,7,8-TCDD	Ave	1.071	1.056		98.6	100	99	82-121
13C-1,2,3,7,8-PeCDF	Ave	1.370	1.322		96.5	100	96	76-130
13C-2,3,4,7,8-PeCDF	Ave	1.384	1.296		93.7	100	94	77-130
13C-1,2,3,7,8-PeCDD	Ave	0.8743	0.8649		98.9	100	99	62-160
13C-1,2,3,4,7,8-HxCDF	Ave	1.189	1.206		101	100	101	76-131
13C-1,2,3,6,7,8-HxCDF	Ave	1.462	1.523		104	100	104	70-143
13C-2,3,4,6,7,8-HxCDF	Ave	1.320	1.326		100	100	100	73-137
13C-1,2,3,4,7,8-HxCDD	Ave	0.8772	0.8640		98.5	100	98	85-117
13C-1,2,3,6,7,8-HxCDD	Ave	0.9171	0.9760		106	100	106	85-118
13C-1,2,3,7,8,9-HxCDF	Ave	1.200	1.182		98.5	100	99	74-135
13C-1,2,3,4,6,7,8-HpCDF	Ave	1.050	1.076		103	100	103	78-129
13C-1,2,3,4,6,7,8-HpCDD	Ave	0.8155	0.8364		103	100	103	72-138
13C-1,2,3,4,7,8,9-HpCDF	Ave	0.8947	0.8912		99.6	100	100	77-129
13C-OCDD	Ave	0.7044	0.7023		199	200	100	48-208
13C-OCDF	Ave	1.061	0.9799		185	200	92	48-208
37Cl4-2,3,7,8-TCDD	Ave	1.227	1.146		9.35	10.0	93	79-127

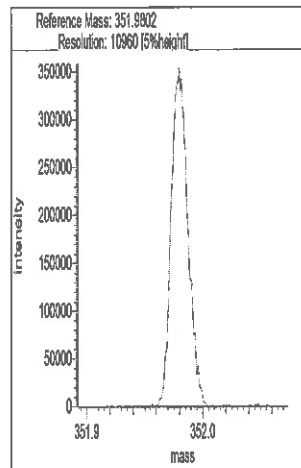
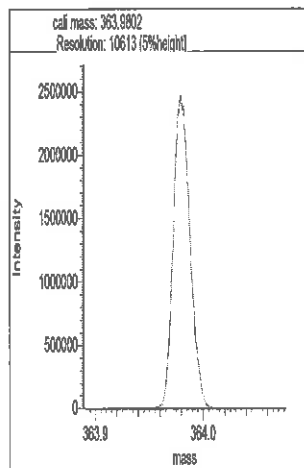
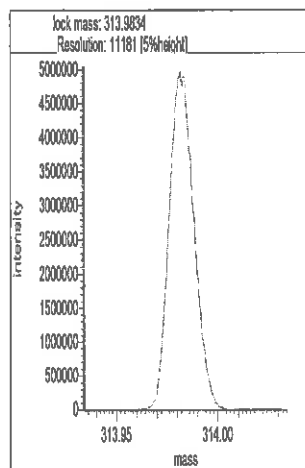
Resolution Check Report (DFS SN: 3190)

Date: 29 Jan 2019 09:38
MID Experiment: 5w_db5_fc43_singleGC_OCDF_ResCheck
Target Resolution: 10000
Resolution Warning : 9500
Resolution Error : 9000
Reference: FC43Knx.lua
Status: RESOLUTION PASSED

Segment 1

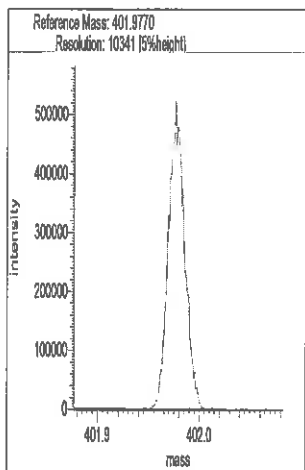
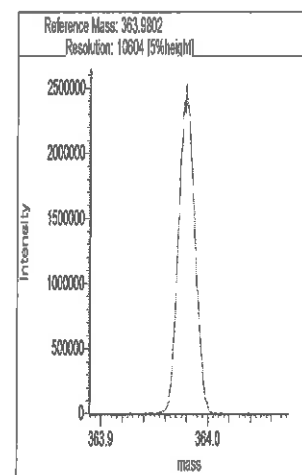
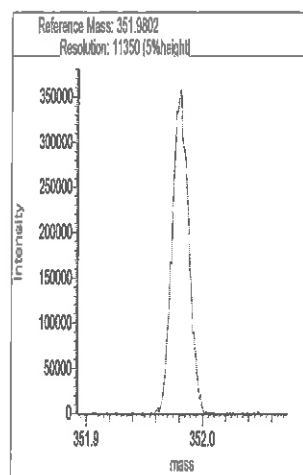
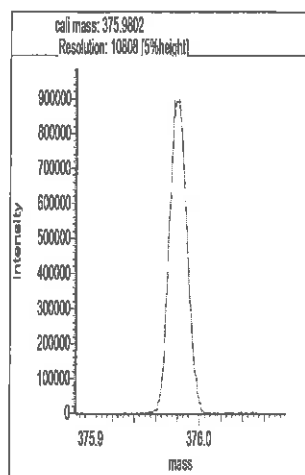
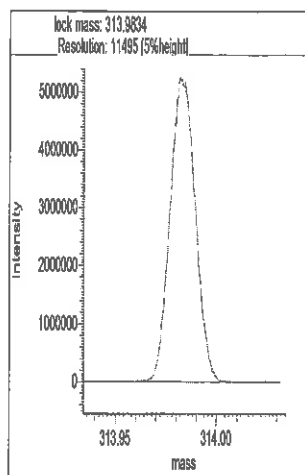
Lock mass 313.9834 [m/z] Resolution: 11181 [5%height]
Cali. mass 363.9802 [m/z] Resolution: 10613 [5%height]
Ref. mass 351.9802 [m/z] Resolution: 10960 [5%height]

190129s2a



Segment 2

Lock mass 313.9834 [m/z] Resolution: 11495 [5%height]
Cali. mass 375.9802 [m/z] Resolution: 10808 [5%height]
Ref. mass 351.9802 [m/z] Resolution: 11350 [5%height]
Ref. mass 363.9802 [m/z] Resolution: 10604 [5%height]
Ref. mass 401.9770 [m/z] Resolution: 10341 [5%height]



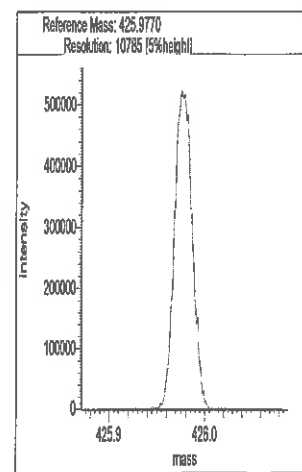
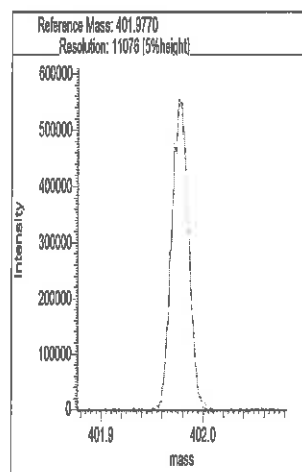
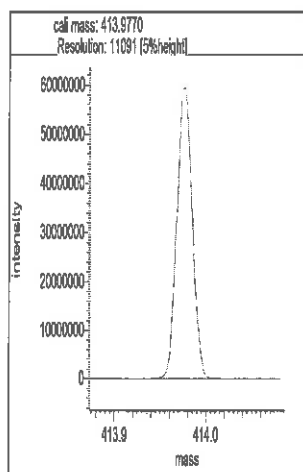
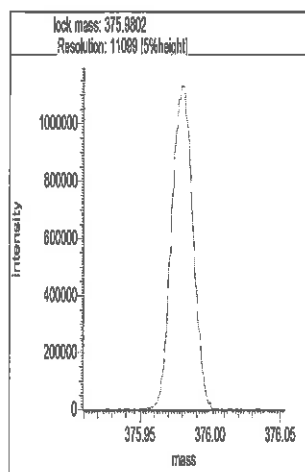
Segment 3

Lock mass 375.9802 [m/z] Resolution: 11099 [5%height]

Cali. mass 413.9770 [m/z] Resolution: 11091 [5%height]

Ref. mass 401.9770 [m/z] Resolution: 11076 [5%height]

Ref. mass 425.9770 [m/z] Resolution: 10785 [5%height]

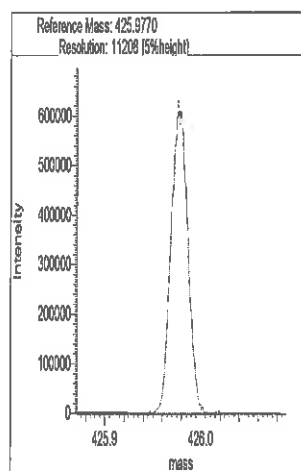
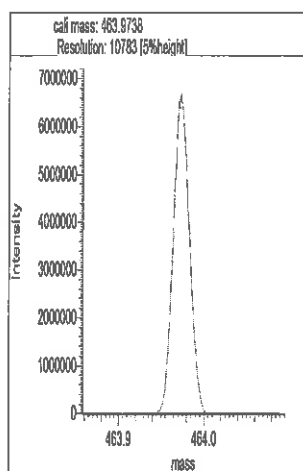
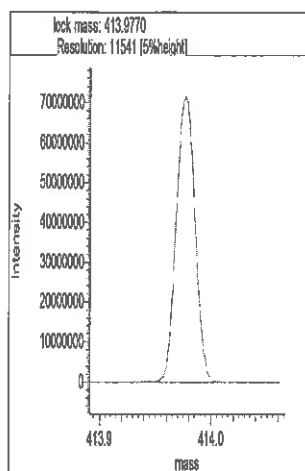


Segment 4

Lock mass 413.9770 [m/z] Resolution: 11541 [5%height]

Cali. mass 463.9738 [m/z] Resolution: 10783 [5%height]

Ref. mass 425.9770 [m/z] Resolution: 11208 [5%height]

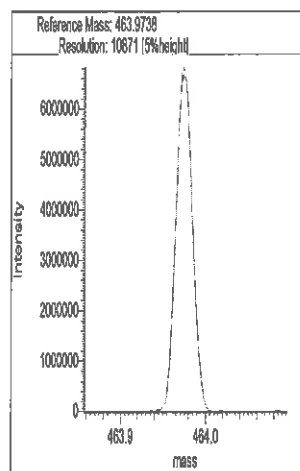
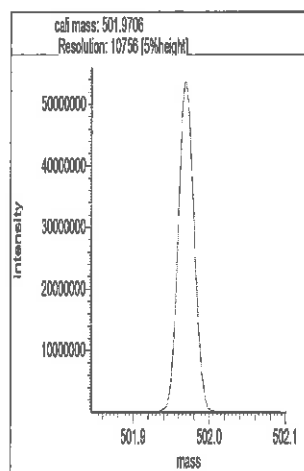
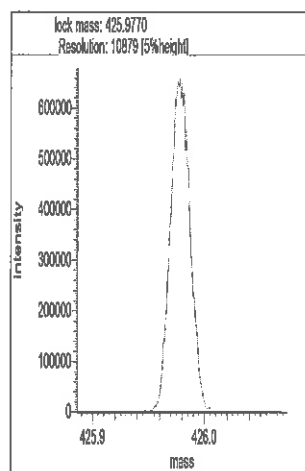


Segment 5

Lock mass 425.9770 [m/z] Resolution: 10879 [5%height]

Cali. mass 501.9706 [m/z] Resolution: 10756 [5%height]

Ref. mass 463.9738 [m/z] Resolution: 10871 [5%height]



Reports

09:50:09: Peak matching procedure started
09:50:10:
09:50:10: Reference mass: 313.98336
09:50:11: Sample mass: 364.0
09:50:11:
09:50:12: Finding reference mass
09:50:12: Finding sample mass
09:50:13:
09:50:18: [1] 363.9796 amu, mean: 363.9796
09:50:22: [2] 363.9799 amu, mean: 363.9798 SD: 0.21 mmu or: 0.58 ppm
09:50:25: [3] 363.9805 amu, mean: 363.9800 SD: 0.44 mmu or: 1.20 ppm
09:50:28: [4] 363.9796 amu, mean: 363.9799 SD: 0.42 mmu or: 1.17 ppm
09:50:31: [5] 363.9797 amu, mean: 363.9799 SD: 0.38 mmu or: 1.04 ppm
09:50:34: [6] 363.9797 amu, mean: 363.9798 SD: 0.35 mmu or: 0.96 ppm
09:50:38: [7] 363.9791 amu, mean: 363.9797 SD: 0.43 mmu or: 1.17 ppm
09:50:41: [8] 363.9801 amu, mean: 363.9798 SD: 0.42 mmu or: 1.15 ppm
09:50:44: [9] 363.9798 amu, mean: 363.9798 SD: 0.39 mmu or: 1.08 ppm
09:50:47: [10] 363.9803 amu, mean: 363.9798 SD: 0.41 mmu or: 1.13 ppm
09:50:48:
09:50:48: Stop requested. Please wait for procedure to finish.
09:50:48:
09:50:50:

Signature

 1-29-19

Resolution Check Report (DFS SN: 3190)

Date: 29 Jan 2019 21:25
MID Experiment: 5w_db5_fc43_singleGC_OCDF_ResCheck
Target Resolution: 10000
Resolution Warning : 9500
Resolution Error : 9000
Reference: FC43Knx.lua
Status: RESOLUTION PASSED

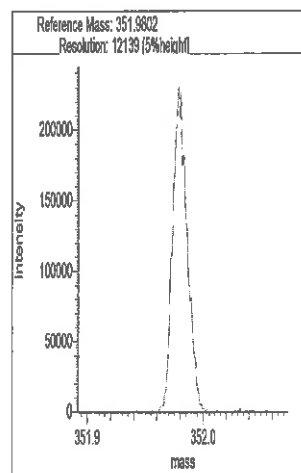
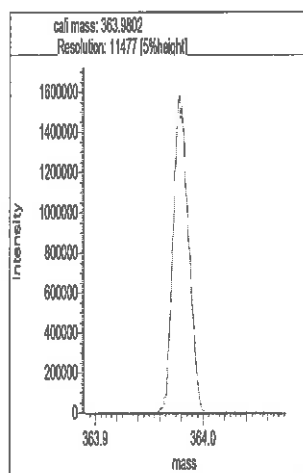
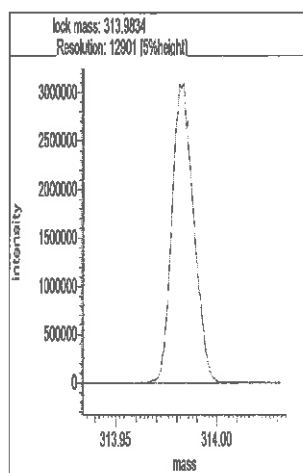
-190129s3a

Segment 1

Lock mass 313.9834 [m/z] Resolution: 12901 [5%height]

Cali. mass 363.9802 [m/z] Resolution: 11477 [5%height]

Ref. mass 351.9802 [m/z] Resolution: 12139 [5%height]



Segment 2

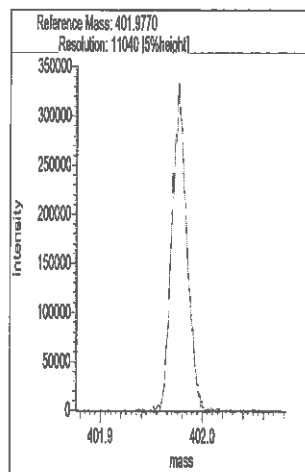
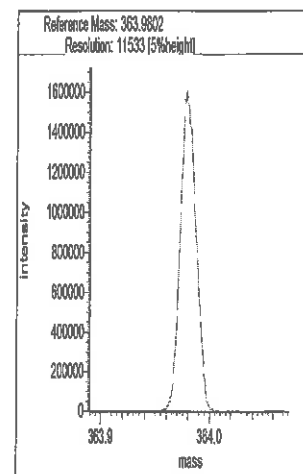
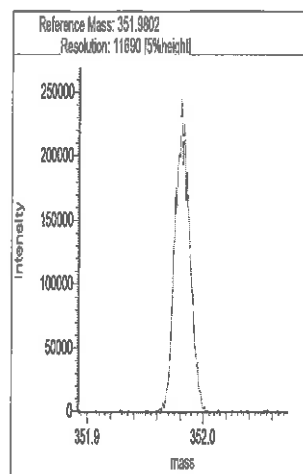
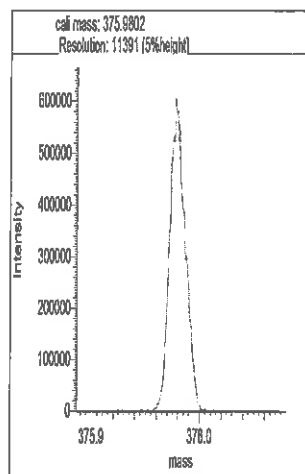
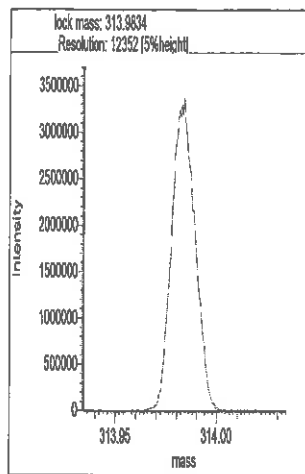
Lock mass 313.9834 [m/z] Resolution: 12352 [5%height]

Cali. mass 375.9802 [m/z] Resolution: 11391 [5%height]

Ref. mass 351.9802 [m/z] Resolution: 11690 [5%height]

Ref. mass 363.9802 [m/z] Resolution: 11533 [5%height]

Ref. mass 401.9770 [m/z] Resolution: 11040 [5%height]



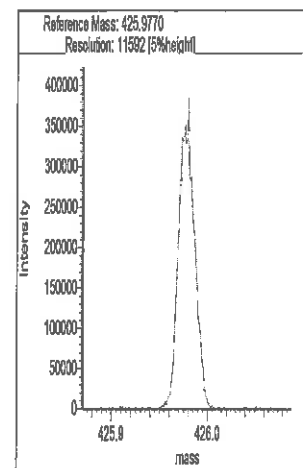
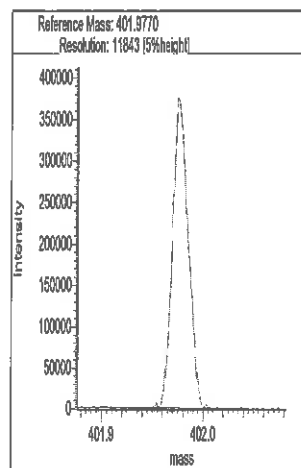
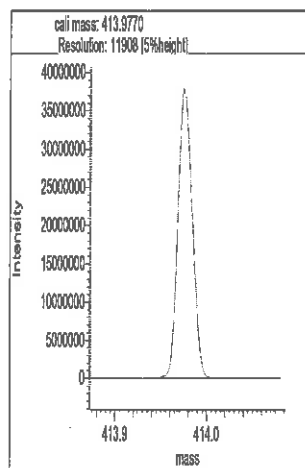
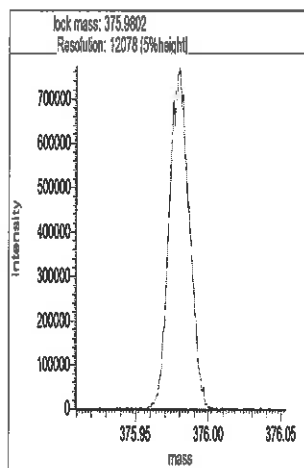
Segment 3

Lock mass 375.9802 [m/z] Resolution: 12078 [5%height]

Cali. mass 413.9770 [m/z] Resolution: 11908 [5%height]

Ref. mass 401.9770 [m/z] Resolution: 11843 [5%height]

Ref. mass 425.9770 [m/z] Resolution: 11592 [5%height]

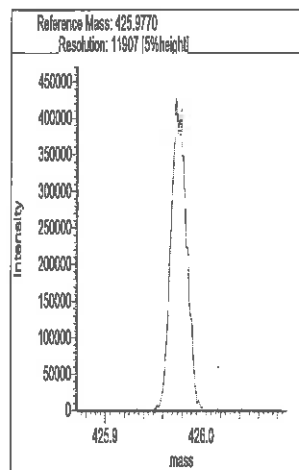
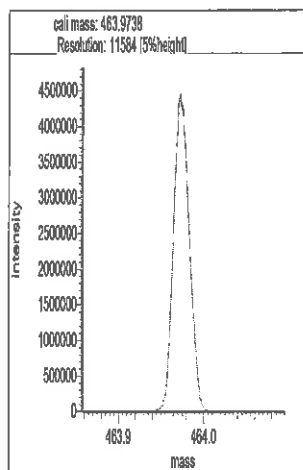
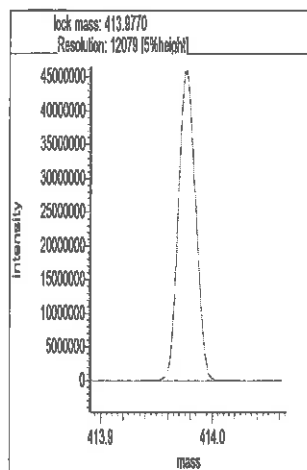


Segment 4

Lock mass 413.9770 [m/z] Resolution: 12079 [5%height]

Cali. mass 463.9738 [m/z] Resolution: 11584 [5%height]

Ref. mass 425.9770 [m/z] Resolution: 11907 [5%height]

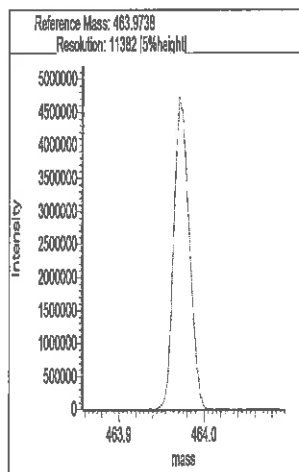
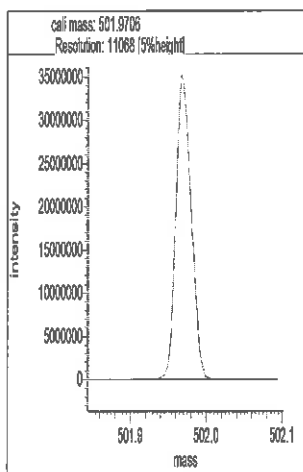
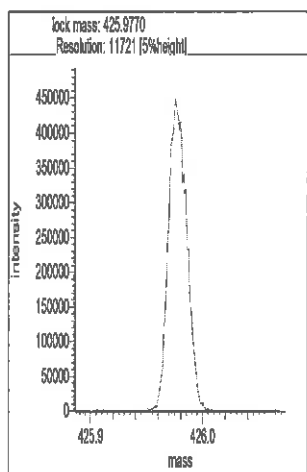


Segment 5

Lock mass 425.9770 [m/z] Resolution: 11721 [5%height]

Cali. mass 501.9706 [m/z] Resolution: 11068 [5%height]

Ref. mass 463.9738 [m/z] Resolution: 11382 [5%height]



Reports
21:37:29: Peak matching procedure started
21:37:29:
21:37:30: Reference mass: 313.98336
21:37:30: Sample mass: 364.0
21:37:31:
21:37:31: Finding reference mass
21:37:32: Finding sample mass
21:37:32:
21:37:38: [1] 363.9784 amu, mean: 363.9784
21:37:42: [2] 363.9784 amu, mean: 363.9784 SD: 0.01 mmu or: 0.02 ppm
21:37:45: [3] 363.9788 amu, mean: 363.9785 SD: 0.22 mmu or: 0.59 ppm
21:37:48: [4] 363.9790 amu, mean: 363.9787 SD: 0.30 mmu or: 0.82 ppm
21:37:51: [5] 363.9793 amu, mean: 363.9788 SD: 0.39 mmu or: 1.08 ppm
21:37:54: [6] 363.9786 amu, mean: 363.9788 SD: 0.36 mmu or: 0.98 ppm
21:37:57: [7] 363.9792 amu, mean: 363.9788 SD: 0.37 mmu or: 1.01 ppm
21:38:00: [8] 363.9786 amu, mean: 363.9788 SD: 0.35 mmu or: 0.96 ppm
21:38:04: [9] 363.9797 amu, mean: 363.9789 SD: 0.45 mmu or: 1.24 ppm
21:38:07: [10] 363.9787 amu, mean: 363.9789 SD: 0.43 mmu or: 1.19 ppm
21:38:07: Stop requested. Please wait for procedure to finish.
21:38:07:
21:38:10: Peakmatching stopped

Signature

PMP 1-29-19

TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
 Lims ID: WDMCCV
 Client ID:
 Sample Type: WDMCCV
 Inject. Date: 29-Jan-2019 09:51:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010667-001
 Operator ID: Xcalibur_System Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 29-Jan-2019 10:59:26 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: CTX1017

First Level Reviewer: davidsonm

Date: 29-Jan-2019 10:59:26

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	30:59	557314	0.77	1.1733	9.877	9.877	0.0245	0.0245	98.77	
A Non-2,3,7,8-sub-TCDD	29:36	1431875	0.81	1.1733	25.4	25.4	0.0245	8.919	0.00	
S Total TCDD					35.3	35.3	0.0245	0.0245		
2,3,7,8-TCDF	28:58	850434	0.79	1.0881	9.931	9.931	0.0277	0.0277	99.31	
A Non-2,3,7,8-sub-TCDF	28:18						0.0277	0.1539		RQU
S Total TCDF					9.931	9.931	0.0277	0.0277		
1,2,3,7,8-PeCDD	40:38	1985514	1.65	1.0434	48.3	48.3	0.008430	0.008430	96.64	
A Non-2,3,7,8-sub-PeCDD	39:30						0.008430	0.008430		
S Total PeCDD					48.3	48.3	0.008430	0.008430		
1,2,3,7,8-PeCDF	38:50	3372974	1.57	1.1898	47.1	47.1	0.0709	0.0709	94.19	
2,3,4,7,8-PeCDF	40:05	3181936	1.61	1.1095	48.6	48.6	0.0681	0.0681	97.17	
A Non-2,3,7,8-sub-PeCDF	38:06						0.0693	0.6270		U
S Total PeCDF					95.7	95.7	0.0695	0.0695		
1,2,3,4,7,8-HxCDD	44:54	2193526	1.26	1.1409	48.4	48.4	0.0547	0.0547	96.72	
1,2,3,6,7,8-HxCDD	45:01	2509242	1.27	1.1481	48.7	48.7	0.0546	0.0546	97.31	
1,2,3,7,8,9-HxCDD	45:23	2470250	1.25	1.2212	47.8	47.8	0.0512	0.0512	95.56	
A Non-2,3,7,8-sub-HxCDD	44:21						0.0535	0.0535		
S Total HxCDD					144.8	144.8	0.0535	0.0535		
1,2,3,4,7,8-HxCDF	43:52	3854956	1.30	1.3629	51.0	51.0	0.1272	0.1272	102	
1,2,3,6,7,8-HxCDF	44:00	4266393	1.25	1.2762	47.7	47.7	0.1235	0.1235	95.39	
2,3,4,6,7,8-HxCDF	44:42	3847003	1.24	1.2654	49.8	49.8	0.1418	0.1418	99.67	
1,2,3,7,8,9-HxCDF	45:39	3171178	1.33	1.2573	46.4	46.4	0.1771	0.1771	92.71	
A Non-2,3,7,8-sub-HxCDF	44:13						0.1397	0.1397		
S Total HxCDF					194.9	194.9	0.1424	0.1424		
1,2,3,4,6,7,8-HpCDD	49:43	2199939	1.04	1.1204	51.0	51.0	0.0469	0.0469	102	
A Non-2,3,7,8-sub-HpCDD	49:07						0.0469	1.484		U
S Total HpCDD					51.0	51.0	0.0469	0.0469		
1,2,3,4,6,7,8-HpCDF	48:02	3659799	1.05	1.4984	49.3	49.3	0.0574	0.0574	98.65	
1,2,3,4,7,8,9-HpCDF	50:21	2895359	1.07	1.3807	51.1	51.1	0.0847	0.0847	102	

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
A Non-2,3,7,8-sub-HpCDF	49:20						0.0688	0.7304		RQU
S Total HpCDF					100.5	100.5	0.0711	0.0711		
OCDD	53:56	3900997	0.89	1.2073	100.0	100.0	0.0099	0.0099	99.97	
OCDF	54:04	5139674	0.90	1.1162	102.1	102.1	0.0299	0.0299	102	
D 13C-2,3,7,8-TCDD	30:56	4809408	0.79	1.0709	98.6	98.6	0.1781	0.1781	98.63	
D 13C-2,3,7,8-TCDF	28:56	7870034	0.83	1.7545	98.5	98.5	0.1800	0.1800	98.52	
D 13C-1,2,3,7,8-PeCDD	40:37	3938120	1.59	0.8743	98.9	98.9	0.5914	0.5914	98.93	
D 13C-1,2,3,7,8-PeCDF	38:49	6019713	1.59	1.3704	96.5	96.5	0.9627	0.9627	96.47	
D 13C-2,3,4,7,8-PeCDF	40:04	5902887	1.59	1.3837	93.7	93.7	0.9534	0.9534	93.69	
D 13C-1,2,3,4,7,8-HxCDD	44:53	3975943	1.27	0.8772	98.5	98.5	0.1421	0.1421	98.49	
D 13C-1,2,3,6,7,8-HxCDD	45:00	4491678	1.28	0.9171	106.4	106.4	0.1359	0.1359	106	
D 13C-1,2,3,4,7,8-HxCDF	43:51	5549472	0.53	1.1892	101.4	101.4	0.4457	0.4457	101	
D 13C-1,2,3,6,7,8-HxCDF	43:59	7008893	0.54	1.4625	104.1	104.1	0.3624	0.3624	104	
D 13C-2,3,4,6,7,8-HxCDF	44:41	6100466	0.54	1.3197	100.4	100.4	0.4016	0.4016	100	
D 13C-1,2,3,7,8,9-HxCDF	45:38	5440953	0.53	1.2001	98.5	98.5	0.4416	0.4416	98.51	
D 13C-1,2,3,4,6,7,8-HpCDD	49:42	3849221	1.06	0.8155	102.6	102.6	0.3765	0.3765	103	
D 13C-1,2,3,4,6,7,8-HpCDF	48:01	4951834	0.47	1.0496	102.5	102.5	0.5957	0.5957	103	
D 13C-1,2,3,4,7,8,9-HpCDF	50:20	4101369	0.45	0.8947	99.6	99.6	0.6988	0.6988	99.61	
D 13C-OCDD	53:56	6464354	0.90	0.7044	199.4	199.4	0.4276	0.4276	99.71	
D 13C-OCDF	54:03	9019076	0.89	1.0615	184.6	184.6	0.3670	0.3670	92.32	
\$ 37Cl4-2,3,7,8-TCDD	31:00	522000		1.2266	9.347	9.347	0.0502	0.0502	93.47	
* 13C-1,2,3,4-TCDD	30:26	4553149	0.82	9.1E+04	100.0	100.0			100	
* 13C-1,2,3,7,8,9-HxCDD	45:22	4602063	1.26	1E+05	100.0	100.0			100	
1,3,6,8-TCDF	22:37	988266	0.83						0.00	
1,3,6,8-TCDD	25:04	524425	0.76						0.00	
1,2,8,9-TCDF	33:59	797443	0.81						0.00	
1,2,8,9-TCDD	34:09	477848	0.78						0.00	
1,3,4,6,8-PeCDF	34:47	3351705	1.56						0.00	
1,2,4,7,9-PeCDD	37:42	1936222	1.57						0.00	
1,2,3,8,9-PeCDD	41:17	1968087	1.55						0.00	
1,2,3,8,9-PeCDF	41:25	3007104	1.56						0.00	
1,2,3,4,6,8-HxCDF	42:38	3828867	1.30						0.00	
1,2,4,6,7,9-HxCDD	43:19	2687614	1.25						0.00	
1,2,3,4,8,9-HxCDF	45:47	3403275	1.26						0.00	
1,2,3,4,6,7,9-HpCDD	48:32	2291327	1.06						0.00	

QC Flag Legend

Review Flags

U - Marked Undetected

Reagents:

61WDML3OP_F/L_00052

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
 Lims ID: WDMCCV
 Client ID:
 Sample Type: WDMCCV
 Inject. Date: 29-Jan-2019 09:51:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010667-001
 Operator ID: Xcalibur_System Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 29-Jan-2019 10:59:26 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: CTX1017

First Level Reviewer: davidsonm

Date: 29-Jan-2019 10:59:26

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
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2,3,7,8-TCDD

319.8965	30:59	30:59	0	1.002	241713	25111	26	65	966		
321.8936	30:59	30:59	0	1.002	315601	32116	32	80	1004	0.77(0.65-0.89)	

A Non-2,3,7,8-sub-TCDD

319.8965	30:28	29:36	52	0.985	210200	23219	26	65	893		
321.8936	30:30	29:36	54	0.986	256124	27972	32	80	874	0.82(0.65-0.89)	
319.8965	30:41	29:36	65	0.992	200814	20714	26	65	797		
321.8936	30:42	29:36	66	0.993	261427	27007	32	80	844	0.77(0.65-0.89)	
319.8965	31:28	29:36	111	1.017	227852	24675	26	65	949		
321.8936	31:28	29:36	111	1.017	275458	29841	32	80	933	0.83(0.65-0.89)	

2,3,7,8-TCDF

303.9016	28:58	28:58	0	1.001	374789	41741	45	112	928		
305.8987	28:58	28:58	0	1.001	475645	55981	62	155	903	0.79(0.65-0.89)	

A Non-2,3,7,8-sub-TCDF

303.9016	27:10	28:18	-68	0.939	1943	305	45	112	7		
305.8987	27:03	28:18	-75	0.935	2889	288	62	155	5	0.67(0.65-0.89)	

1,2,3,7,8-PeCDD

355.8546	40:38	40:38	0	1.000	1236167	283520	21	52	13501		
357.8516	40:38	40:38	0	1.000	749347	178877	11	27	16262	1.65(1.32-1.78)	

A Non-2,3,7,8-sub-PeCDD

355.8546	39:30						21	52			
357.8516	39:30						11	27			

1,2,3,7,8-PeCDF

339.8597	38:50	38:50	0	1.000	2061518	412068	225	562	1831		
341.8567	38:50	38:50	0	1.000	1311456	262764	172	430	1528	1.57(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,4,7,8-PeCDF											
339.8597	40:05	40:05	0	1.000	1962287	430457	225	562	1913		
341.8567	40:05	40:05	0	1.000	1219649	276493	172	430	1608	1.61(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDF											
339.8597	37:17	38:06	-49	0.960	25478	3598	225	562	16		U
341.8567	37:16	38:06	-50	0.960	17491	2637	172	430	15	1.46(1.32-1.78)	
1,2,3,4,7,8-HxCDD											
389.8158	44:54	44:54	0	1.000	1223310	332299	140	350	2374		
391.8127	44:54	44:54	0	1.000	970216	262460	123	307	2134	1.26(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45:01	45:01	0	1.000	1404554	330590	140	350	2361		
391.8127	45:01	45:01	0	1.000	1104688	261017	123	307	2122	1.27(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45:23	45:23	0	1.011	1370377	286031	140	350	2043		
391.8127	45:23	45:23	0	1.011	1099873	233882	123	307	1901	1.25(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDD											
389.8158	44:21						140	350			
391.8127	44:21						123	307			
1,2,3,4,7,8-HxCDF											
373.8208	43:52	43:52	0	1.000	2177739	579380	489	1222	1185		
375.8178	43:52	43:52	0	1.000	1677217	456978	569	1422	803	1.30(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44:00	44:00	0	1.000	2367170	589140	489	1222	1205		
375.8178	44:00	44:00	0	1.000	1899223	454057	569	1422	798	1.25(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	44:42	44:42	0	1.000	2129906	527009	489	1222	1078		
375.8178	44:42	44:42	0	1.000	1717097	425188	569	1422	747	1.24(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	45:39	45:39	0	1.000	1809567	438218	489	1222	896		
375.8178	45:39	45:39	0	1.000	1361611	345545	569	1422	607	1.33(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDF											
373.8208	44:13						489	1222			
375.8178	44:13						569	1422			
1,2,3,4,6,7,8-HpCDD											
423.7767	49:43	49:43	0	1.000	1122072	207242	71	177	2919		
425.7737	49:43	49:43	0	1.000	1077867	193810	80	200	2423	1.04(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											
423.7767	49:07	49:07	0	0.988	31904	1808	71	177			U
425.7737	49:07	49:07	0	0.988	32083	1586	80	200		0.99(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF											
407.7817	48:02	48:02	0	1.000	1877875	384224	164	410	2343		
409.7788	48:02	48:02	0	1.000	1781924	365387	194	485	1883	1.05(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50:21	50:21	0	1.000	1497240	275790	164	410	1682		
409.7788	50:21	50:21	0	1.000	1398119	260965	194	485	1345	1.07(0.88-1.20)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-HpCDF											U
407.7817	48:26	49:20	-55	1.008	21261	3477	164	410	21		
409.7788	48:25	49:20	-56	1.008	20074	2834	194	485	15	1.06(0.88-1.20)	
OCDD											
457.7377	53:56	53:56	0	1.000	1832342	407317	15	37	27154		
459.7348	53:56	53:56	0	1.000	2068655	459209	19	47	24169	0.89(0.76-1.02)	
OCDF											
441.7428	54:04	54:04	0	1.000	2441217	576415	55	137	10480		
443.7399	54:04	54:04	0	1.000	2698457	634182	79	197	8028	0.90(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	30:56	30:56	-5	1.016	2129998	224335	221	552	1015		
333.9338	30:57	30:56	-4	1.017	2679410	280050	157	392	1784	0.79(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	28:56	28:55	-3	0.951	3576916	405477	319	797	1271		
317.9389	28:55	28:55	-4	0.950	4293118	481624	307	767	1569	0.83(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40:37	40:33	-1	1.335	2418493	554961	672	1680	826		
369.8919	40:37	40:33	-1	1.335	1519627	354563	353	882	1004	1.59(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	38:49	38:46	-2	1.276	3699655	729805	1641	4102	445		
353.8970	38:49	38:46	-2	1.276	2320058	446361	974	2435	458	1.59(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40:04	40:01	-2	1.316	3624611	800003	1641	4102	488		
353.8970	40:04	40:01	-2	1.316	2278276	513685	974	2435	527	1.59(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	44:53	44:52	-1	0.989	2220797	588580	242	605	2432		
403.8529	44:53	44:52	-1	0.989	1755146	464289	249	622	1865	1.27(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45:00	44:59	-1	0.992	2525029	588418	242	605	2431		
403.8529	45:00	44:59	-1	0.992	1966649	459517	249	622	1845	1.28(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	43:51	43:50	-1	0.966	1920078	524248	1095	2737	479		
385.8610	43:51	43:50	-1	0.966	3629394	1001935	992	2480	1010	0.53(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	43:59	43:58	-1	0.969	2465907	588457	1095	2737	537		
385.8610	43:59	43:58	-1	0.969	4542986	1089930	992	2480	1099	0.54(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	44:41	44:41	-2	0.985	2129041	505059	1095	2737	461		
385.8610	44:41	44:41	-2	0.985	3971425	969298	992	2480	977	0.54(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	45:38	45:38	-2	1.006	1893326	418755	1095	2737	382		
385.8610	45:38	45:38	-2	1.006	3547627	769093	992	2480	775	0.53(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	49:42	49:41	-2	1.095	1976228	375224	432	1080	869		
437.8140	49:42	49:41	-2	1.095	1872993	341505	777	1942	440	1.06(0.88-1.20)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48:01	48:00	-1	1.059	1580608	338263	956	2390	354		
419.8220	48:01	48:00	-1	1.059	3371226	702997	1506	3765	467	0.47(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50:20	50:20	-2	1.110	1267002	237450	956	2390	248		
419.8220	50:20	50:20	-2	1.110	2834367	527527	1506	3765	350	0.45(0.37-0.51)	
13C-OCDD											
469.7780	53:56	53:55	-1	1.189	3064285	668707	493	1232	1356		
471.7750	53:56	53:55	-1	1.189	3400069	746711	693	1732	1078	0.90(0.76-1.02)	
13C-OCDF											
453.7830	54:03	54:03	-2	1.192	4237996	940642	917	2292	1026		
455.7801	54:03	54:03	-2	1.192	4781080	1069120	617	1542	1733	0.89(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31:00	31:00	0	1.018	522000	55985	122	305	459		
13C-1,2,3,4-TCDD											
331.9368	30:26	30:26	0		2053536	217920	221	552	986		
333.9338	30:26	30:26	0		2499613	277589	157	392	1768	0.82(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45:22	45:22	0		2561864	541468	242	605	2237		
403.8529	45:22	45:22	0		2040199	442901	249	622	1779	1.26(1.05-1.43)	
1,3,6,8-TCDF											
303.9016	22:37	22:37	0	0.782	447922	67866	45	112	1508		
305.8987	22:37	22:37	0	0.782	540344	80484	62	155	1298	0.83(0.65-0.89)	
1,3,6,8-TCDD											
319.8965	25:04	25:04	0	0.810	226714	29964	26	65	1152		
321.8936	25:04	25:04	0	0.810	297711	40744	32	80	1273	0.76(0.65-0.89)	
1,2,8,9-TCDF											
303.9016	33:59	33:59	0	1.175	355804	38643	45	112	859		
305.8987	33:58	33:59	-1	1.174	441639	46379	62	155	748	0.81(0.65-0.89)	
1,2,8,9-TCDD											
319.8965	34:09	34:09	0	1.104	210029	22664	26	65	872		
321.8936	34:08	34:09	-1	1.104	267819	30280	32	80	946	0.78(0.65-0.89)	
1,3,4,6,8-PeCDF											
339.8597	34:47	34:47	0	0.896	2041704	256185	225	562	1139		
341.8567	34:46	34:47	-1	0.896	1310001	166885	172	430	970	1.56(1.32-1.78)	
1,2,4,7,9-PeCDD											
355.8546	37:42	37:42	0	0.928	1183094	188787	21	52	8990		
357.8516	37:42	37:42	0	0.928	753128	120859	11	27	10987	1.57(1.32-1.78)	
1,2,3,8,9-PeCDD											
355.8546	41:17	41:17	0	1.017	1196146	273377	21	52	13018		
357.8516	41:17	41:17	0	1.017	771941	178539	11	27	16231	1.55(1.32-1.78)	
1,2,3,8,9-PeCDF											
339.8597	41:25	41:25	0	1.067	1831389	420850	225	562	1870		
341.8567	41:25	41:25	0	1.067	1175715	266723	172	430	1551	1.56(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
1,2,3,4,6,8-HxCDF											
373.8208	42:38	42:38	0	0.972	2162417	569373	489	1222	1164		
375.8178	42:38	42:38	0	0.972	1666450	432719	569	1422	760	1.30(1.05-1.43)	
1,2,4,6,7,9-HxCDD											
389.8158	43:19	43:19	0	0.965	1494515	403748	140	350	2884		
391.8127	43:19	43:19	0	0.965	1193099	320091	123	307	2602	1.25(1.05-1.43)	
1,2,3,4,8,9-HxCDF											
373.8208	45:47	45:47	0	1.044	1896893	402005	489	1222	822		
375.8178	45:46	45:47	-1	1.044	1506382	317188	569	1422	557	1.26(1.05-1.43)	
1,2,3,4,6,7,9-HpCDD											
423.7767	48:32	48:32	0	0.977	1176721	231796	71	177	3265		
425.7737	48:32	48:32	0	0.977	1114606	218587	80	200	2732	1.06(0.88-1.20)	

QC Flag Legend

Review Flags

U - Marked Undetected

Reagents:

61WDML3OP_F/L_00052

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
CCV Relative RT Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
 Lims ID: WDMCCV
 Client ID:
 Sample Type: WDMCCV
 Inject. Date: 29-Jan-2019 09:51:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010667-001
 Operator ID: Xcalibur_System Instrument ID: D2A
 Sublist: chrom-D2A_Dioxin*sub1
 Method: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 29-Jan-2019 10:59:26 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)

Process Host: CTX1017

First Level Reviewer: davidsonm

Date: 29-Jan-2019 10:59:26

Start Cal Date: 16-May-2014 14:26:00

End Cal Date: 16-May-2014 18:31:00

Compound	T/L	ICAL RT	CCV RT	RT (secs)	RT Lmt	ICAL RRT	CCV RRT	RRT Limits
13C-1,2,3,4-TCDD		31:17	30:26	-50		1.000	1.000	0.000 - 0.000
2,3,7,8-TCDD		31:50	30:59	-51		1.001	1.002	0.999 - 1.002
37Cl4-2,3,7,8-TCDD		31:50	31:00	-50		1.018	1.018	0.989 - 1.052
13C-2,3,7,8-TCDD		31:48	30:56	-52		1.017	1.016	0.976 - 1.043
2,3,7,8-TCDF		29:47	28:58	-48		1.002	1.001	0.999 - 1.003
13C-2,3,7,8-TCDF		29:44	28:56	-47		0.951	0.951	0.923 - 1.103
13C-1,2,3,7,8-PeCDD		41:00	40:37	-23		1.311	1.335	1.000 - 1.567
1,2,3,7,8-PeCDD		41:01	40:38	-23		1.000	1.000	0.999 - 1.002
1,2,3,7,8-PeCDF		39:18	38:50	-27		1.000	1.000	0.999 - 1.002
13C-1,2,3,7,8-PeCDF		39:17	38:49	-27		1.256	1.276	1.000 - 1.425
2,3,4,7,8-PeCDF		40:30	40:05	-25		1.000	1.000	0.999 - 1.002
13C-2,3,4,7,8-PeCDF		40:29	40:04	-25		1.295	1.316	1.011 - 1.526
13C-1,2,3,7,8,9-HxCDD		45:45	45:22	-22		1.000	1.000	0.000 - 0.000
13C-1,2,3,4,7,8-HxCDD		45:14	44:53	-21		0.989	0.989	0.977 - 1.000
1,2,3,4,7,8-HxCDD		45:15	44:54	-21		1.000	1.000	0.999 - 1.001
13C-1,2,3,6,7,8-HxCDD		45:21	45:00	-21		0.992	0.992	0.981 - 1.003
1,2,3,6,7,8-HxCDD		45:22	45:01	-21		1.000	1.000	0.998 - 1.004
1,2,3,7,8,9-HxCDD		45:46	45:23	-22		1.012	1.011	1.000 - 1.019
13C-1,2,3,4,7,8-HxCDF		44:11	43:51	-20		0.966	0.966	0.936 - 0.996
1,2,3,4,7,8-HxCDF		44:12	43:52	-20		1.000	1.000	0.999 - 1.001
13C-1,2,3,6,7,8-HxCDF		44:20	43:59	-20		0.969	0.969	0.949 - 0.975
1,2,3,6,7,8-HxCDF		44:21	44:00	-20		1.000	1.000	0.997 - 1.005
2,3,4,6,7,8-HxCDF		45:04	44:42	-21		1.000	1.000	0.999 - 1.001
13C-2,3,4,6,7,8-HxCDF		45:03	44:41	-21		0.985	0.985	0.977 - 1.047

Compound	T/L	ICAL RT	CCV RT	RT (secs)	RT Lmt	ICAL RRT	CCV RRT	RRT Limits
1,2,3,7,8,9-HxCDF		46:03	45:39	-23		1.000	1.000	0.999 - 1.001
13C-1,2,3,7,8,9-HxCDF		46:02	45:38	-23		1.006	1.006	0.959 - 1.021
1,2,3,4,6,7,8-HpCDD		50:12	49:43	-29		1.000	1.000	0.999 - 1.001
13C-1,2,3,4,6,7,8-HpCDD		50:11	49:42	-29		1.097	1.095	1.086 - 1.110
13C-1,2,3,4,6,7,8-HpCDF		48:28	48:01	-26		1.059	1.059	1.043 - 1.085
1,2,3,4,6,7,8-HpCDF		48:29	48:02	-26		1.000	1.000	0.999 - 1.001
1,2,3,4,7,8,9-HpCDF		50:49	50:21	-28		1.000	1.000	0.999 - 1.001
13C-1,2,3,4,7,8,9-HpCDF		50:48	50:20	-28		1.111	1.110	1.057 - 1.151
OCDD		54:19	53:56	-22		1.000	1.000	0.999 - 1.001
13C-OCDD		54:18	53:56	-21		1.187	1.189	1.032 - 1.311
OCDF		54:27	54:04	-22		1.000	1.000	0.999 - 1.008
13C-OCDF		54:26	54:03	-22		1.190	1.192	1.091 - 1.291

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
 Lims ID: WDMCCV
 Client ID:
 Inject. Date: 29-Jan-2019 09:51:00 Dil. Factor: 1.0000
 Sample Type: WDMCCV, Combo WDM and CCV
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 1
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDD, RT: 29.595

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
2,3,7,8-TCDD	1.173	D 13C-2,3,7,8-TCDD	100.000	4809408	504385

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.173		100.000	4809408	504385

Sum the Uncalibrated Results

RT	319.8965 Area	319.8965 Height	321.8936 Area	321.8936 Height	Amount	Ratio	Flags
30:28	210200	23219	256124	27972	8.26	0.82	
30:41	200814	20714	261427	27007	8.19	0.77	
31:28	227852	24675	275458	29841	8.92	0.83	
Signal Totals:	638866	68608	793009	84820			

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	1431875	153428				0.81	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 25.375 = (1431875 * 100.000) / (4809408 * 1.173)

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
 Lims ID: WDMCCV
 Client ID:
 Inject. Date: 29-Jan-2019 09:51:00 Dil. Factor: 1.0000
 Sample Type: WDMCCV, Combo WDM and CCV
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 1
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-TCDF, RT: 28.298

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
2,3,7,8-TCDF	1.088	D 13C-2,3,7,8-TCDF	100.000	7870034	887101

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.088		100.000	7870034	887101

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
27:10	1943	305	2889	288	0.0564	0.67	n
27:52	5735	702	9420	1269	0.1770	0.61	RQ
27:52	5735	702	7448	911	0.1539		Empc Correction

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
 Lims ID: WDMCCV
 Client ID:
 Inject. Date: 29-Jan-2019 09:51:00 Dil. Factor: 1.0000
 Sample Type: WDMCCV, Combo WDM and CCV
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 1
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-PeCDF, RT: 38.091

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,7,8-PeCDF	1.190	D 13C-1,2,3,7,8-PeCDF	100.000	6019713	1176166
2,3,4,7,8-PeCDF	1.109	D 13C-2,3,4,7,8-PeCDF	100.000	5902887	1313688

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.150		100.000	5961300	1244927

Sum the Uncalibrated Results

RT	339.8597 Area	339.8597 Height	341.8567 Area	341.8567 Height	Amount	Ratio	Flags
37:17	25478	3598	17491	2637	0.6270	1.46	

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Lims ID: WDMCCV
Client ID:
Inject. Date: 29-Jan-2019 09:51:00 Dil. Factor: 1.0000
Sample Type: WDMCCV, Combo WDM and CCV
Instrument ID: D2A Operator: Xcalibur_System
Lims Batch ID: 27242 Lims Sample ID: 1
Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-HpCDD, RT: 49.112

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,4,6,7,8-HpCDD	1.120	D 13C-1,2,3,4,6,7,8-HpCDD	100.000	3849221	716729

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.120		100.000	3849221	716729

Sum the Uncalibrated Results

RT	423.7767 Area	423.7767 Height	425.7737 Area	425.7737 Height	Amount	Ratio	Flags
50:04	31904	1808	32083	1586	1.48	0.99	

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
 Lims ID: WDMCCV
 Client ID:
 Inject. Date: 29-Jan-2019 09:51:00 Dil. Factor: 1.0000
 Sample Type: WDMCCV, Combo WDM and CCV
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27242 Lims Sample ID: 1
 Sublist: chrom-D2A_Dioxin*sub1

Non-2,3,7,8-sub-HpCDF, RT: 49.331

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,4,6,7,8-HpCDF	1.498	D 13C-1,2,3,4,6,7,8-HpCDF	100.000	4951834	1041260
1,2,3,4,7,8,9-HpCDF	1.381	D 13C-1,2,3,4,7,8,9-HpCDF	100.000	4101369	764977

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.440		100.000	4526601	903118

Sum the Uncalibrated Results

RT	407.7817 Area	407.7817 Height	409.7788 Area	409.7788 Height	Amount	Ratio	Flags
48:26	21261	3477	20074	2834	0.6343	1.06	
48:40	30956	5016	23330	4620	0.8331	1.33	RQ
48:40	24263	4804	23330	4620	0.7304		Empc Correction

Compound is Marked ND

TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

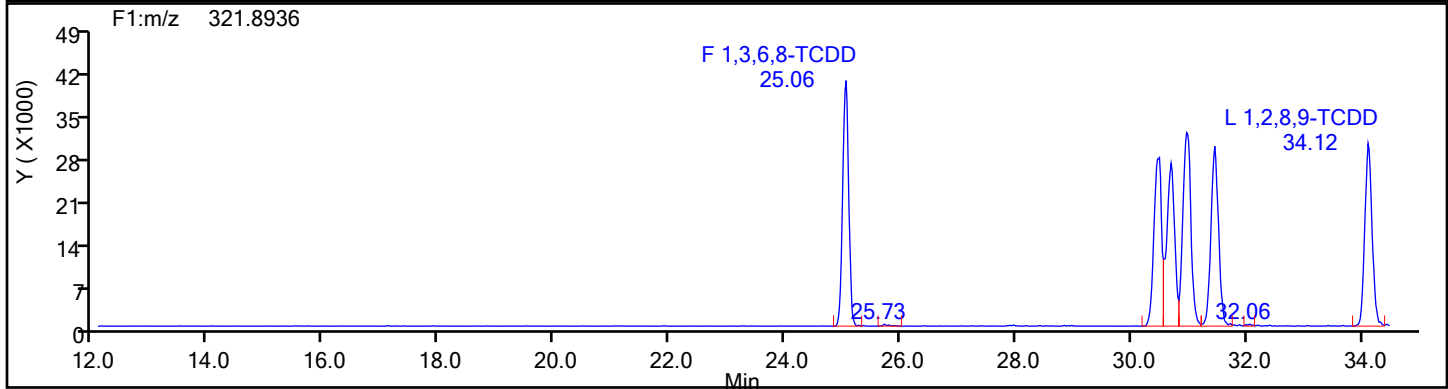
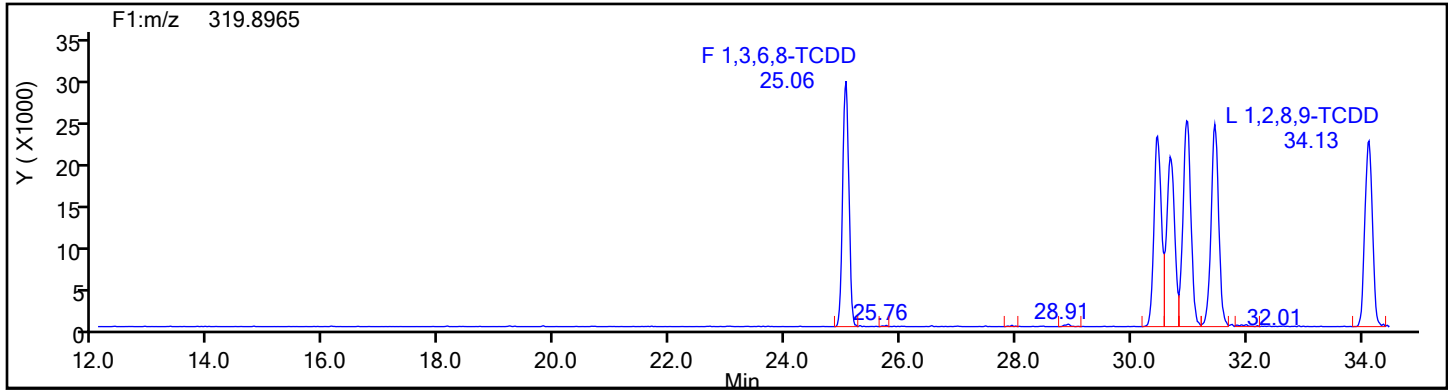
Worklist#: 27242

Sample Line#: 1

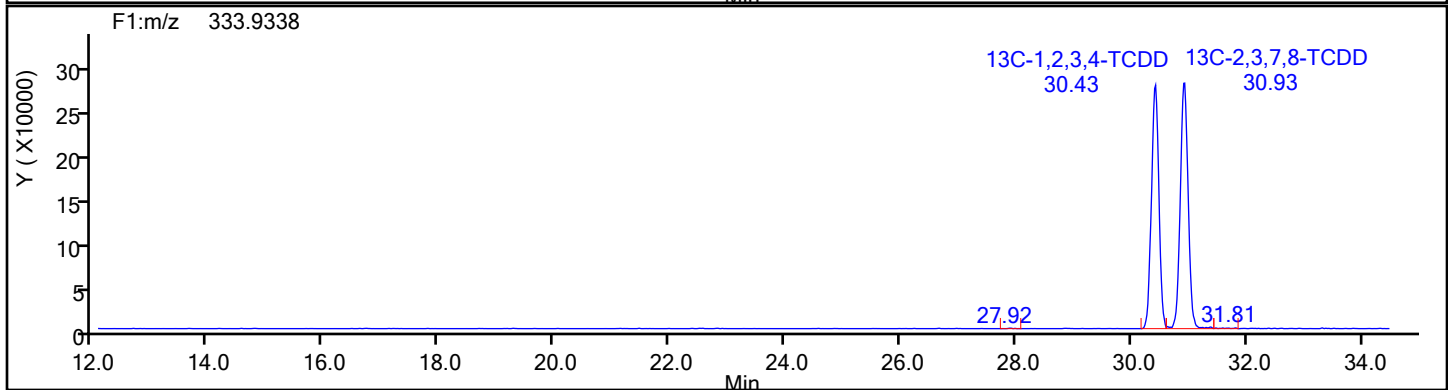
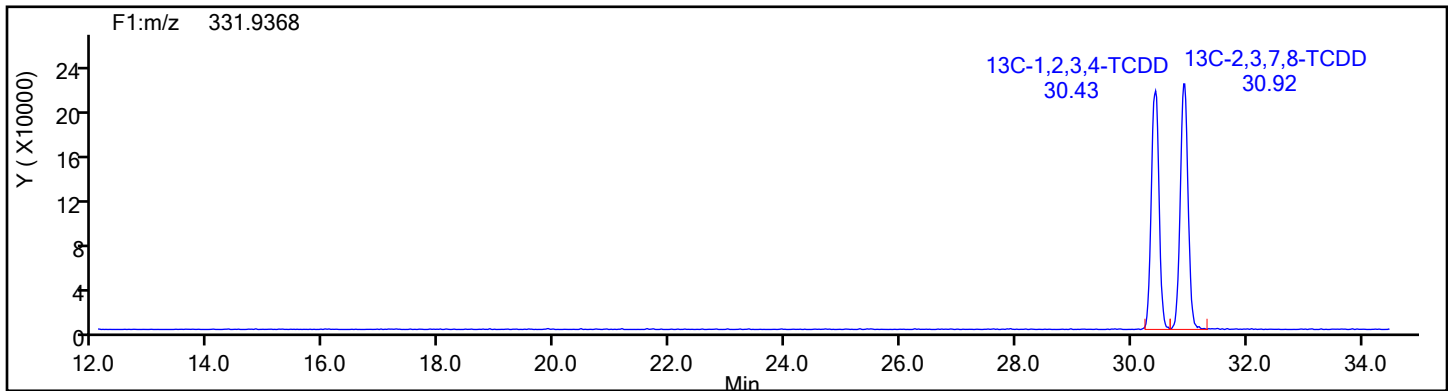
Column Type:

Column Dia:

TCDD



TCDD Standards



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

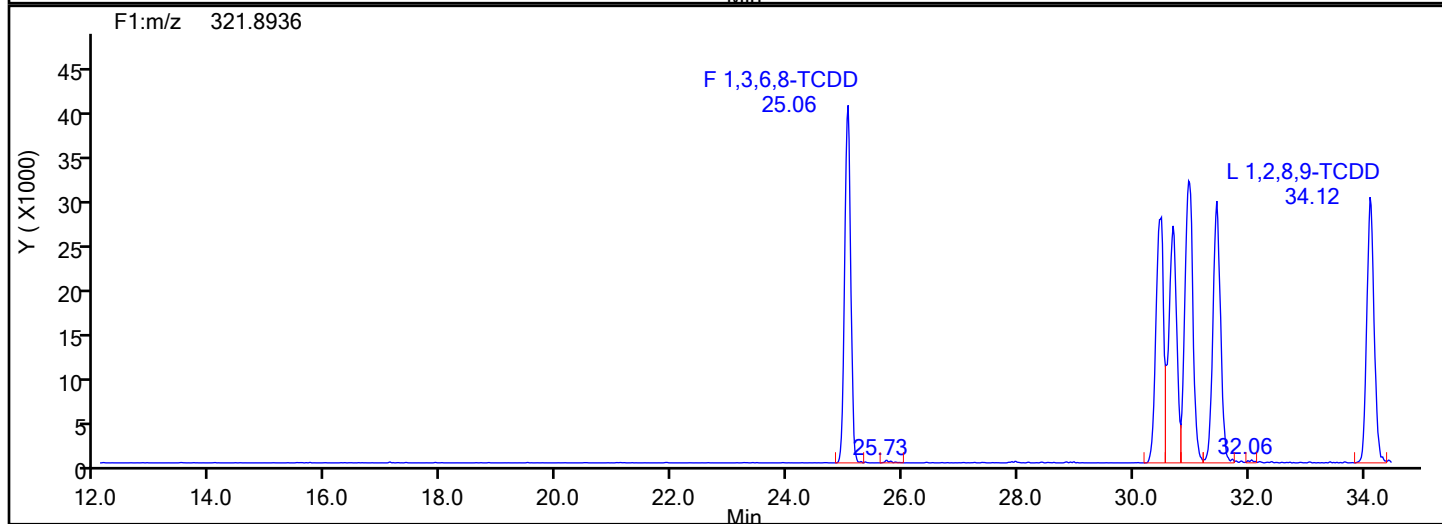
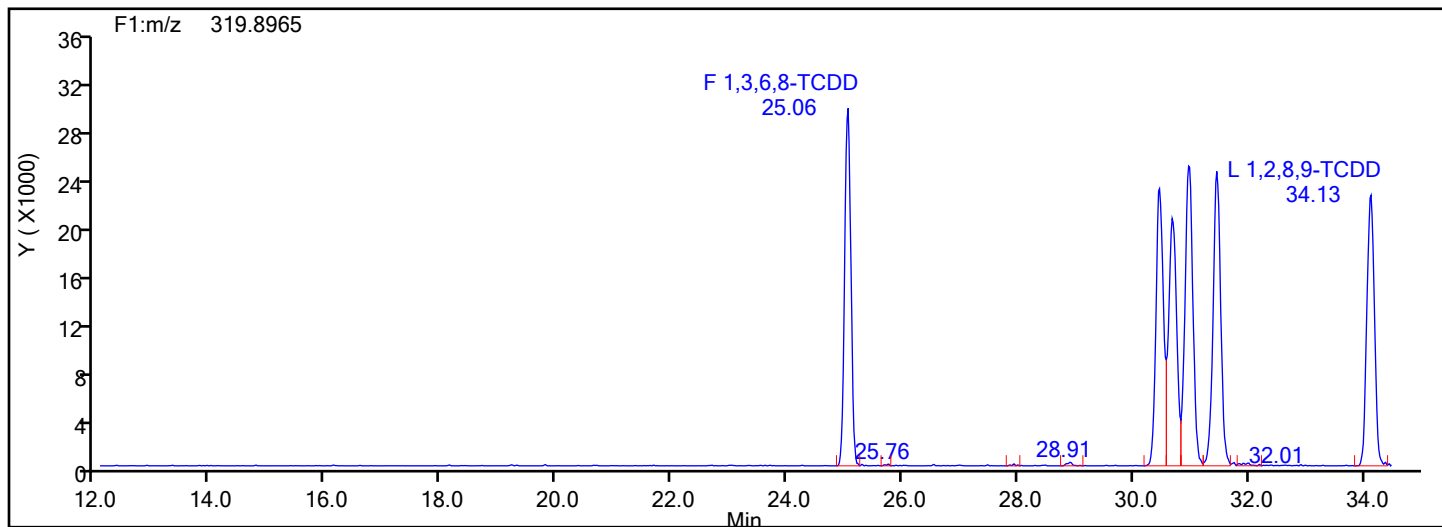
Worklist#: 27242

Sample Line#: 1

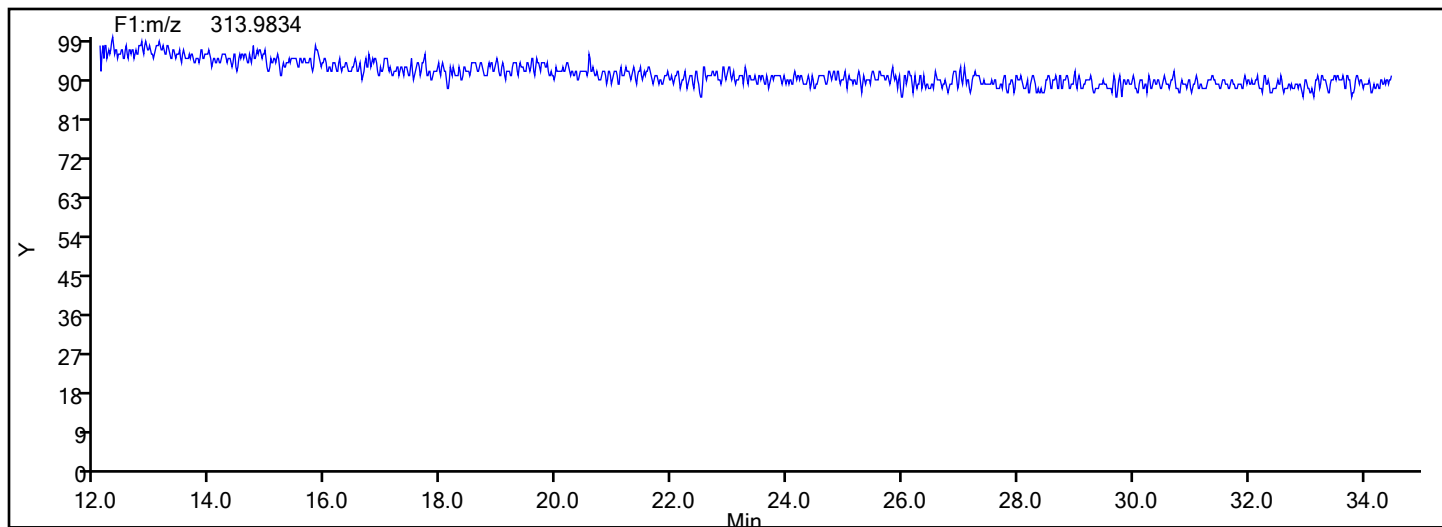
Column Type:

Column Dia:

TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

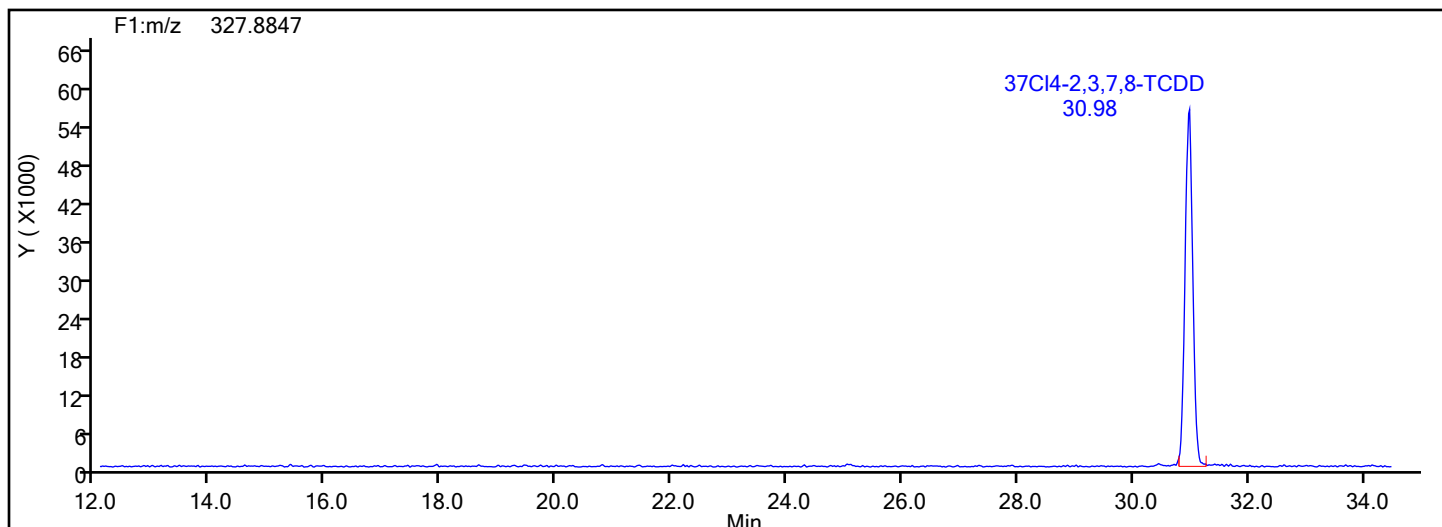
Worklist#: 27242

Sample Line#: 1

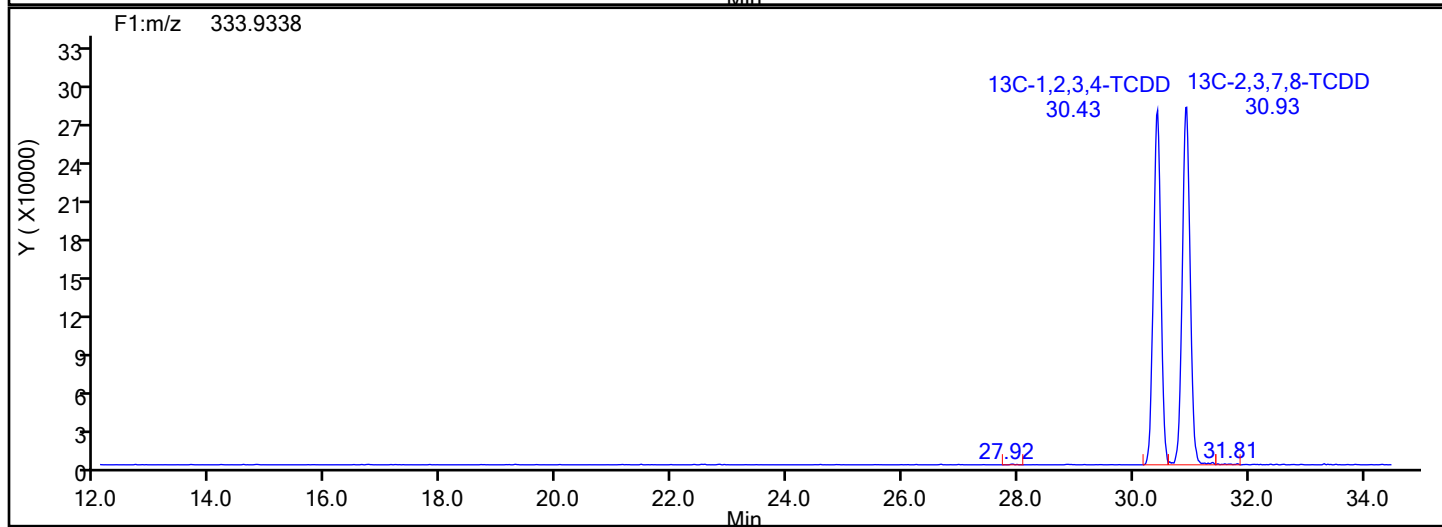
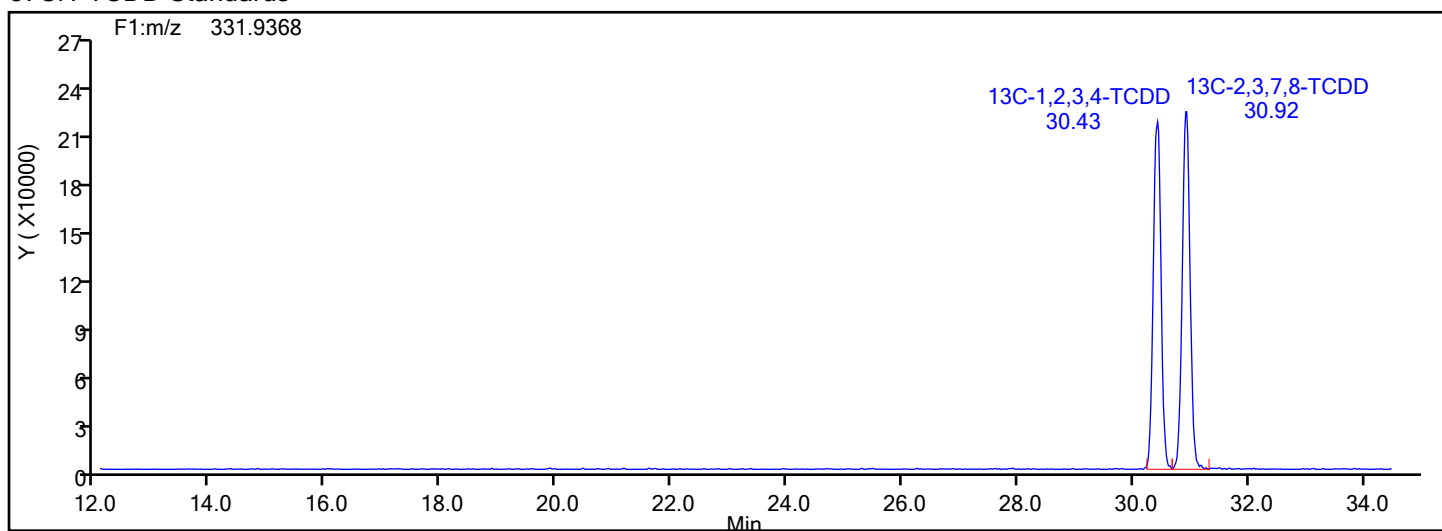
Column Type:

Column Dia:

37Cl4-TCDD

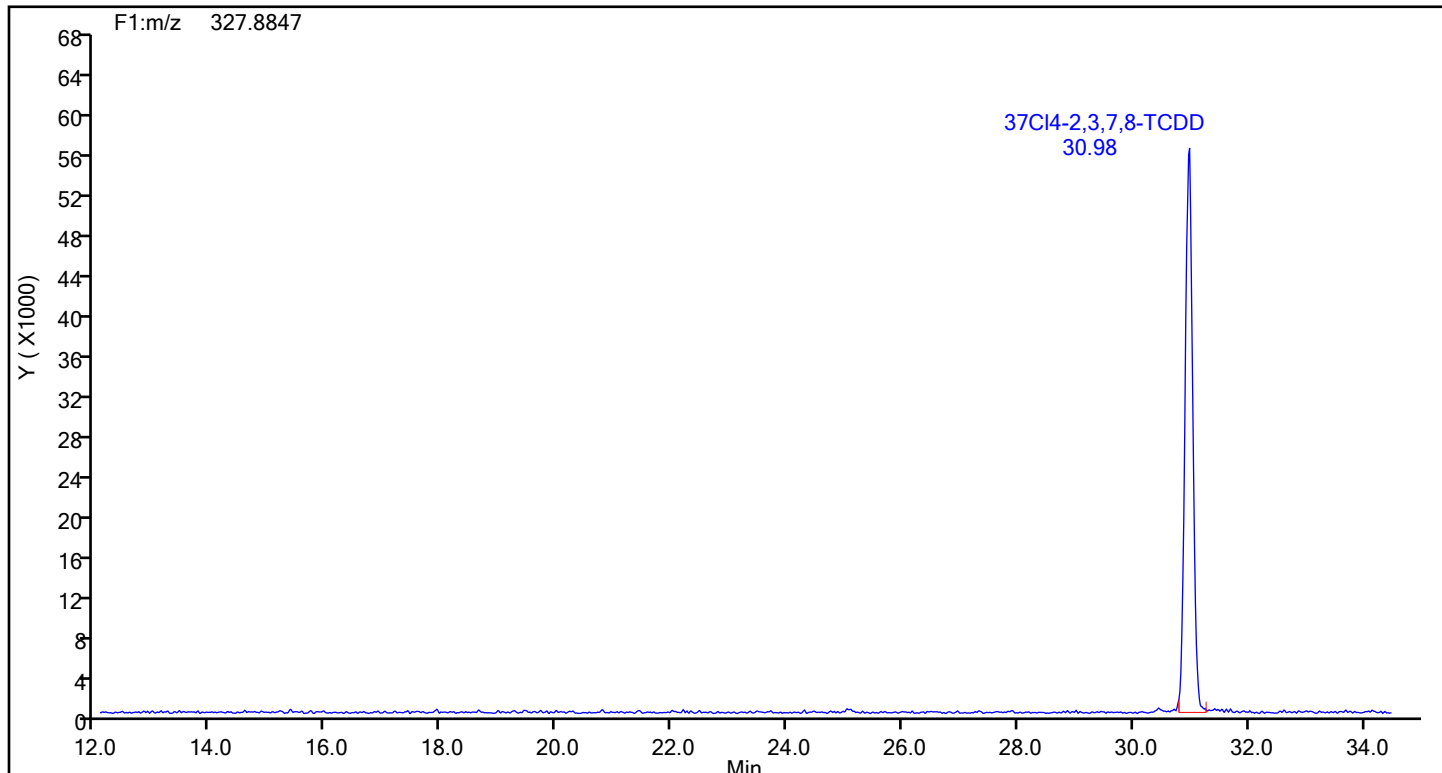


37Cl4-TCDD Standards

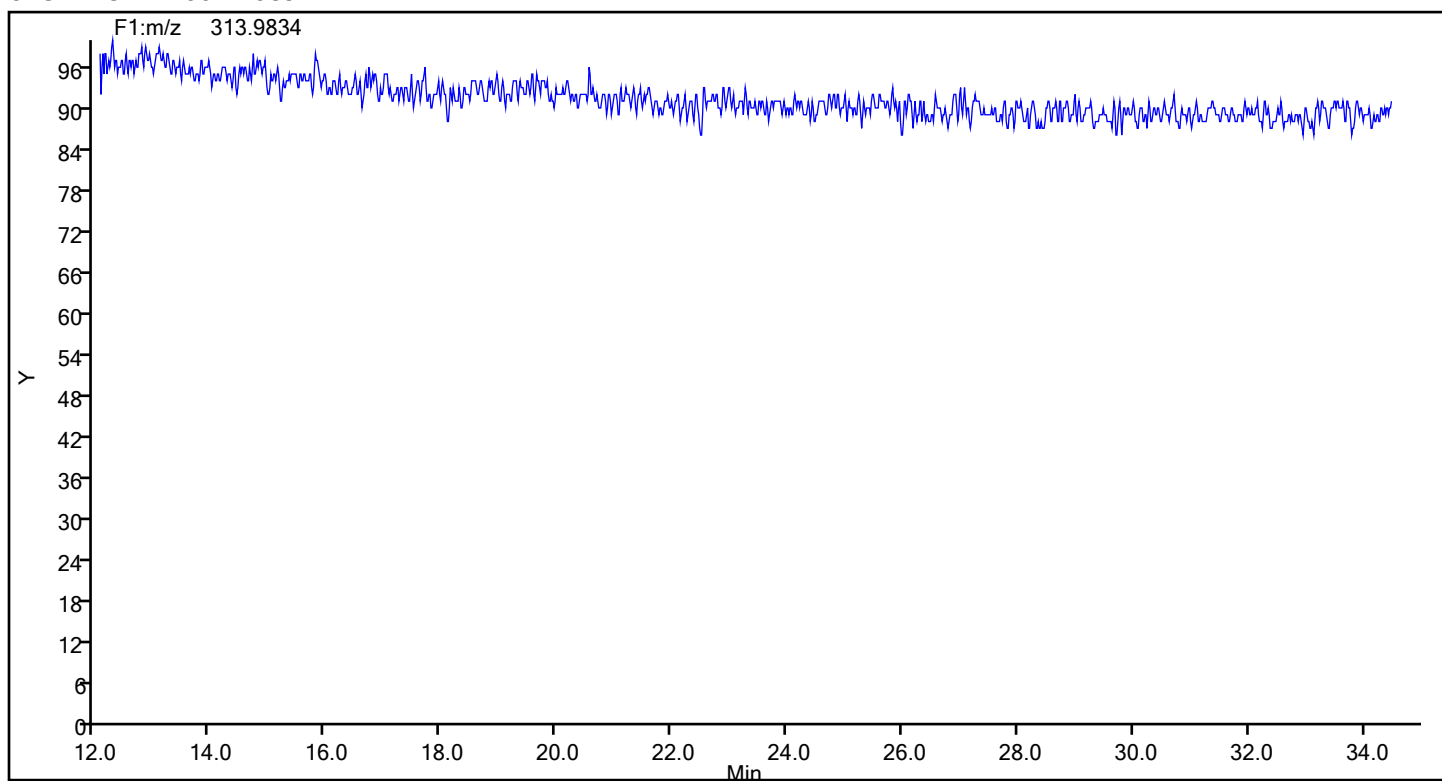


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27242 Sample Line#: 1
Column Type: Column Dia:
37Cl4-TCDD

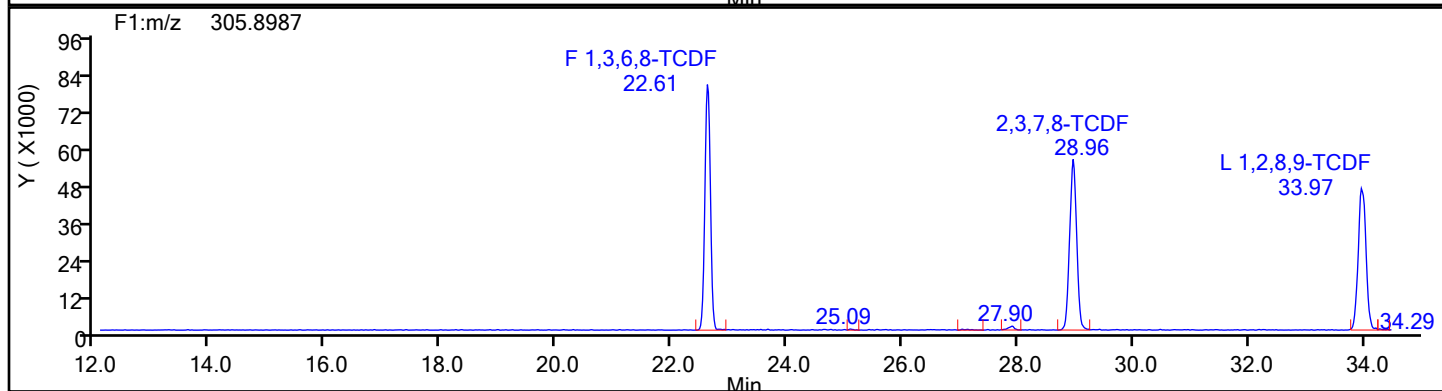
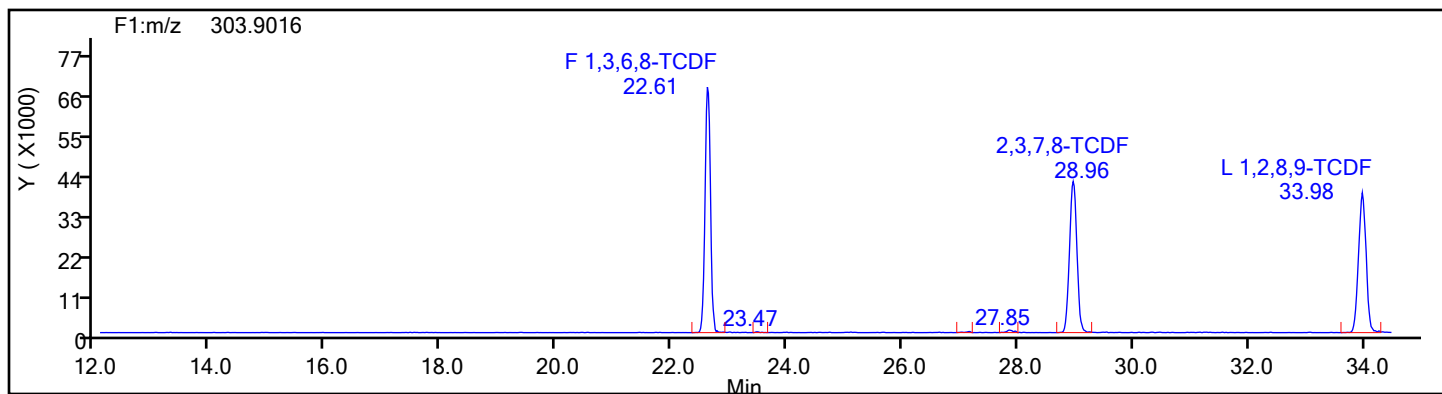


37Cl4-TCDD Lock Mass

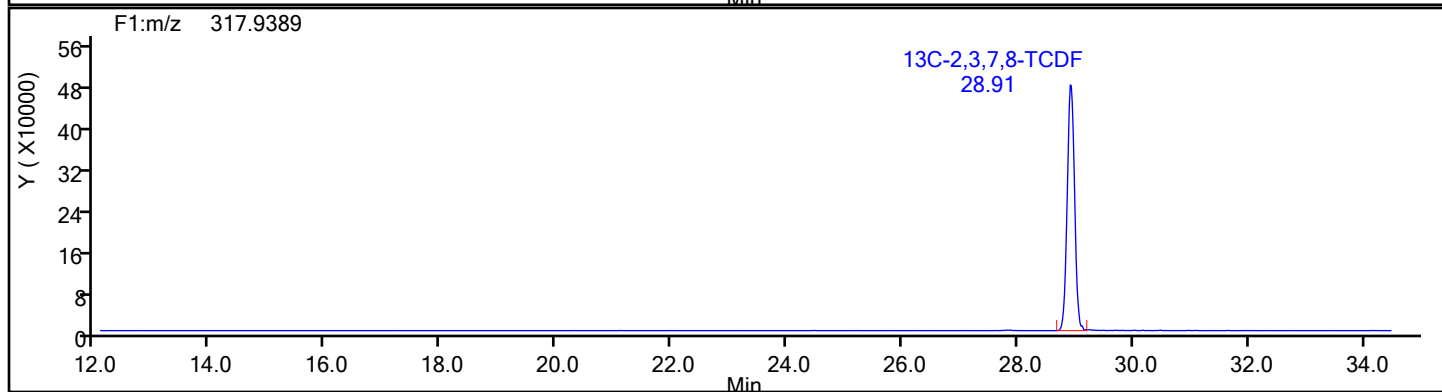
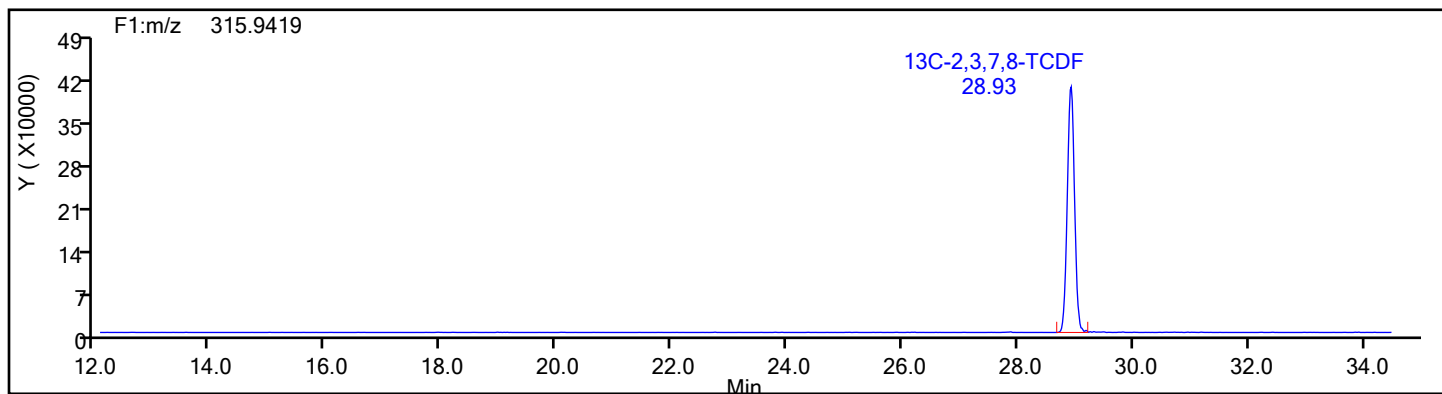


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27242 Sample Line#: 1
Column Type: Column Dia:
TCDF

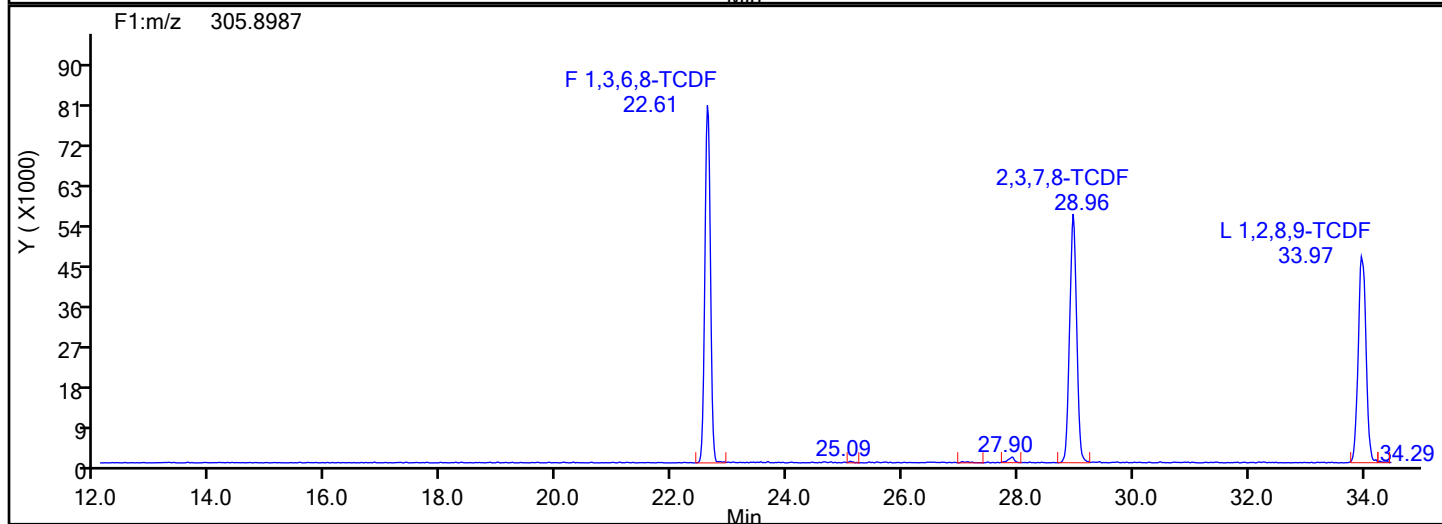
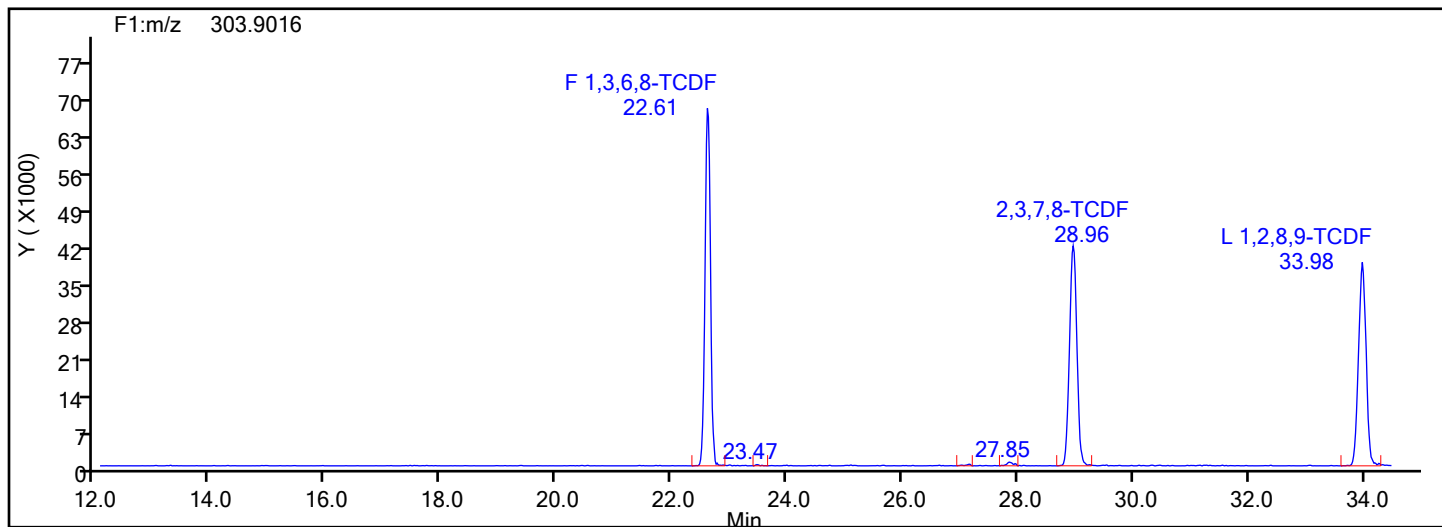


TCDF Standards

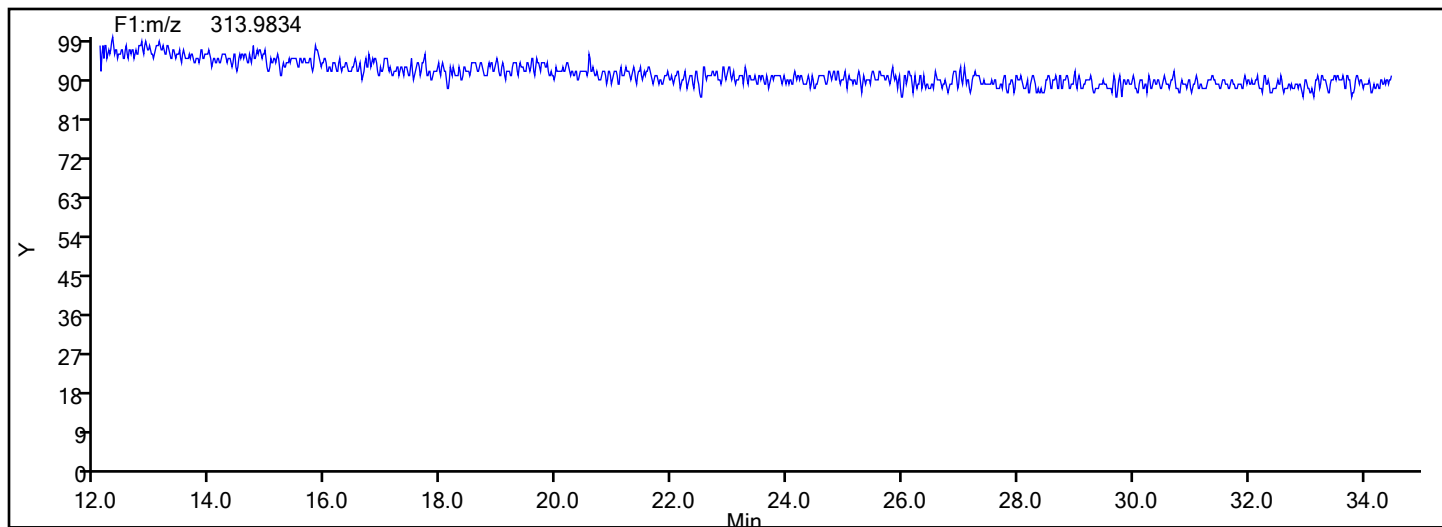


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27242 Sample Line#: 1
Column Type: Column Dia:
TCDF



TCDF Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

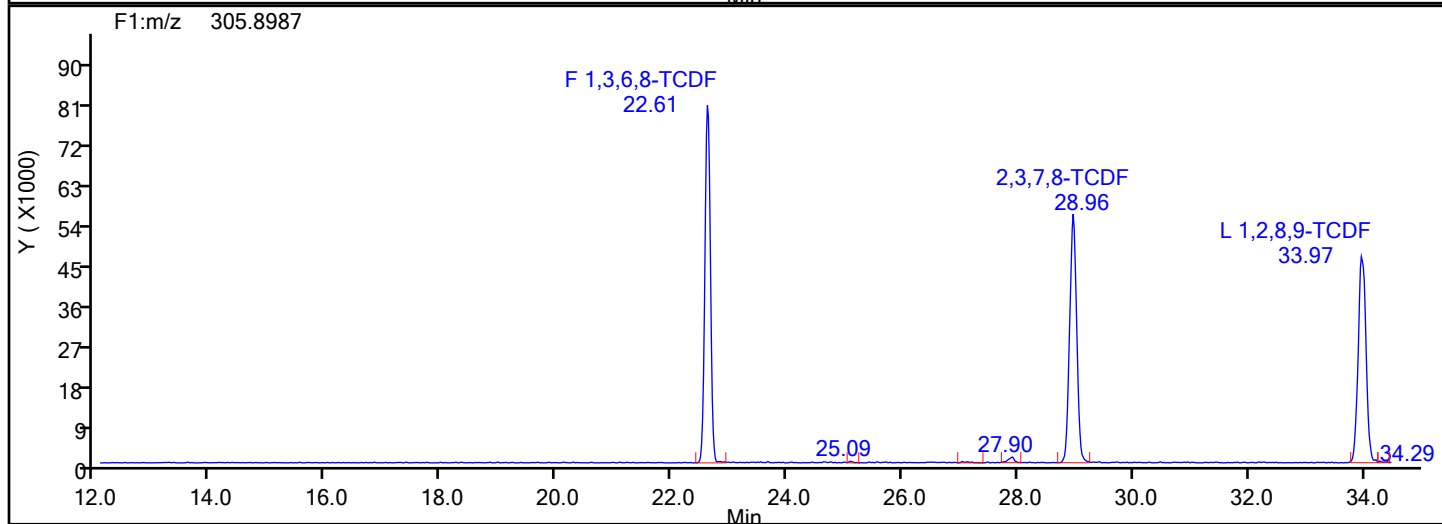
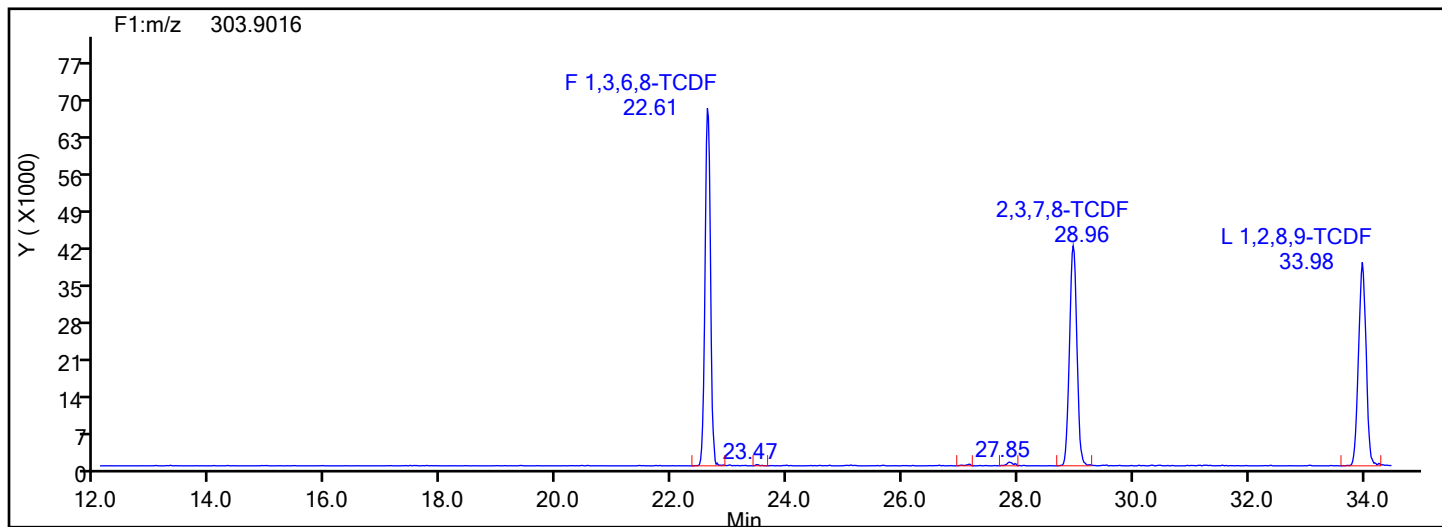
Worklist#: 27242

Sample Line#: 1

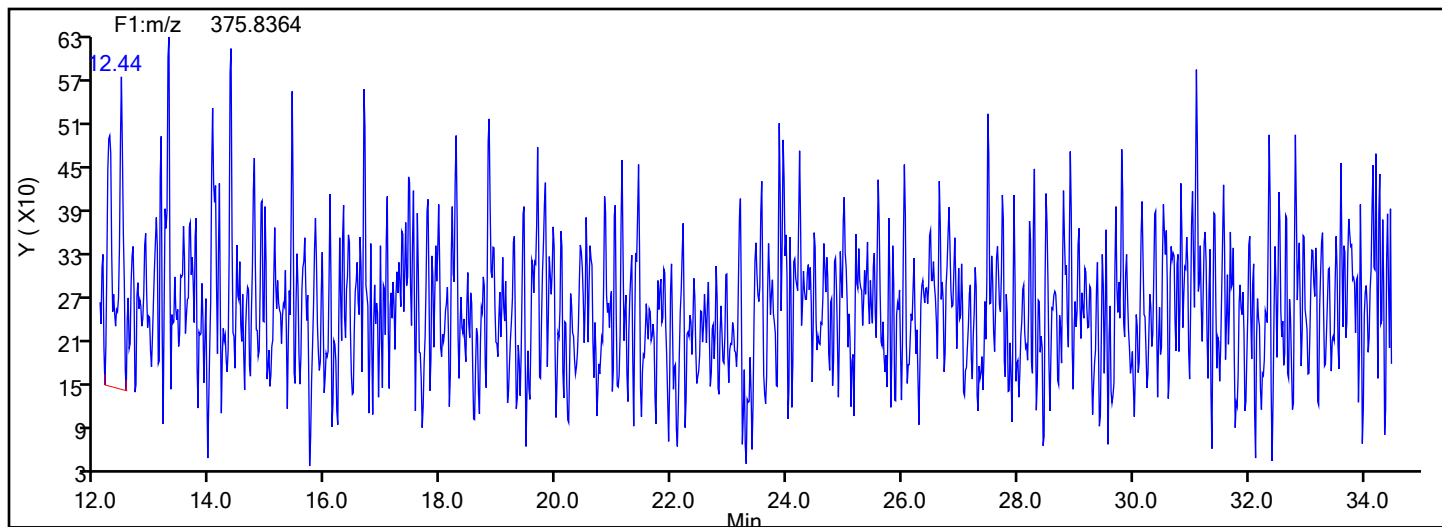
Column Type:

Column Dia:

TCDF

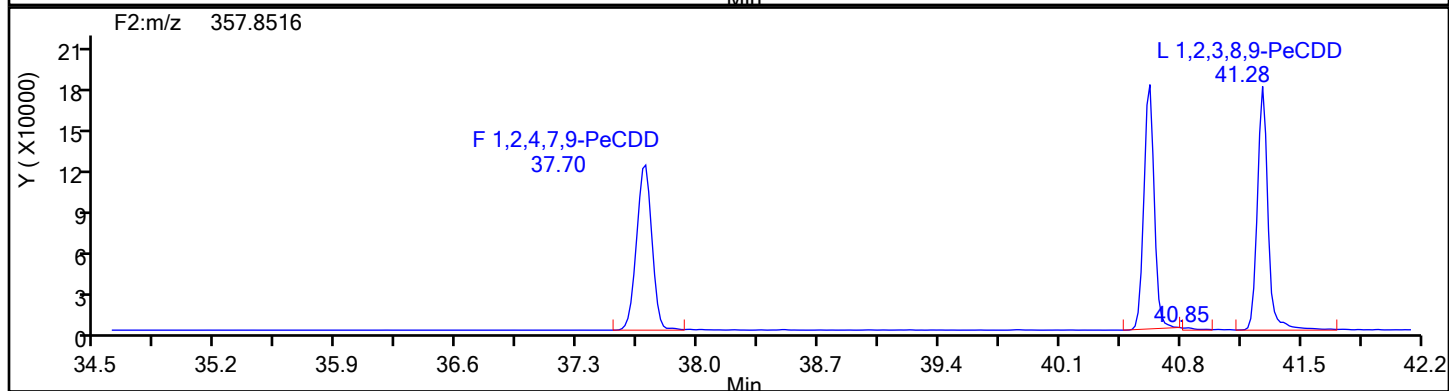
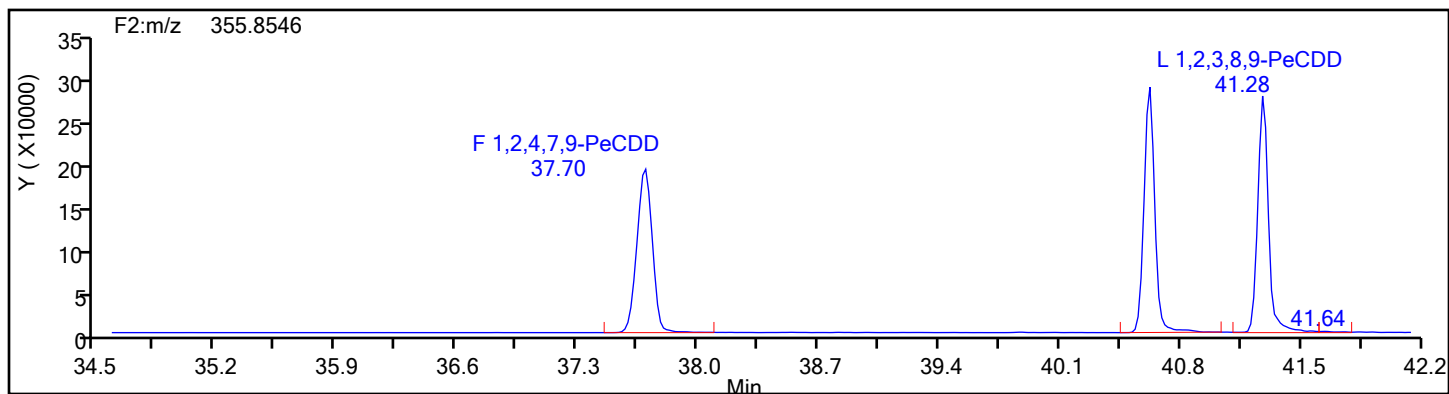


TCDF Interference Mass

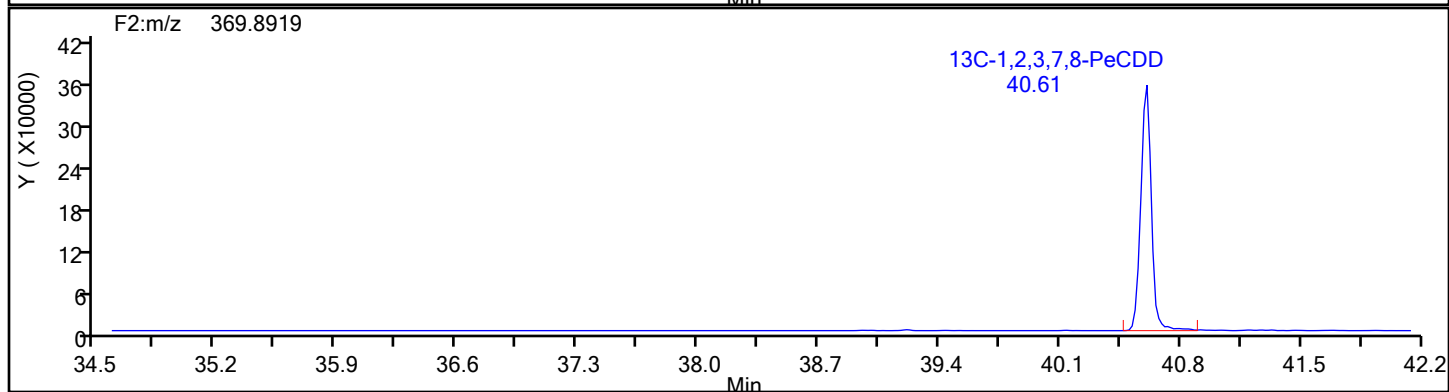
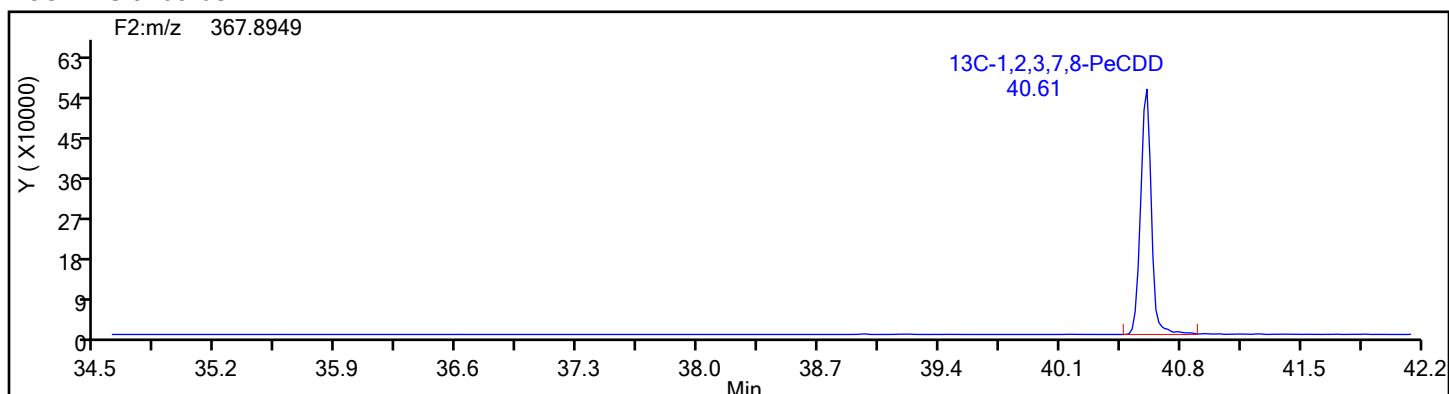


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27242 Sample Line#: 1
Column Type: Column Dia:
PeCDD

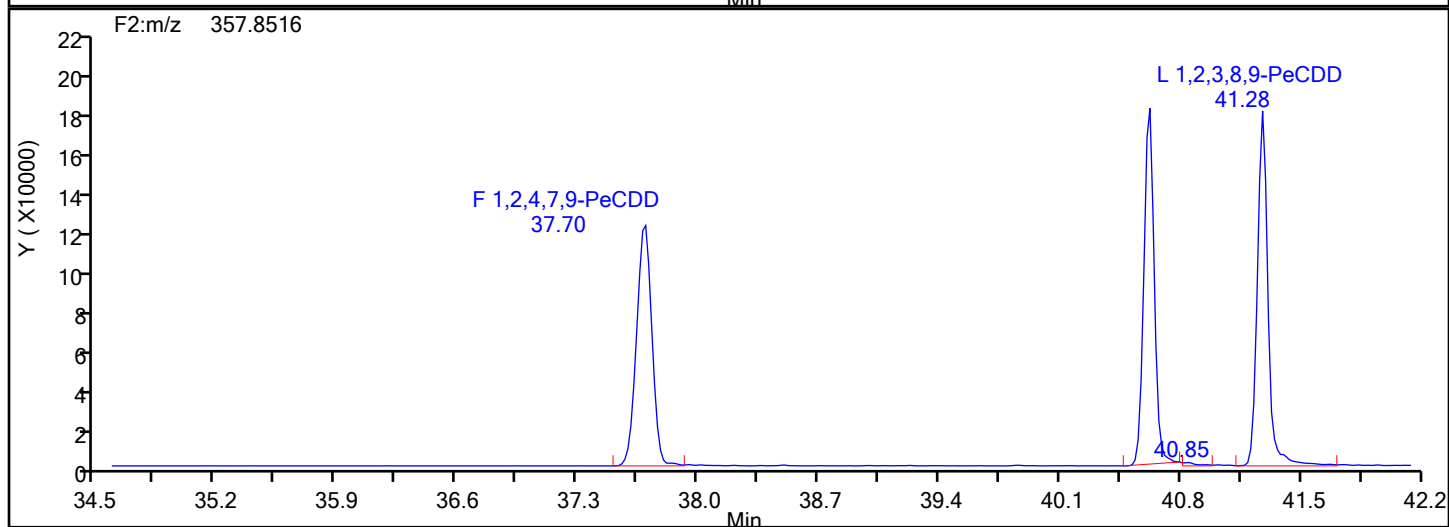
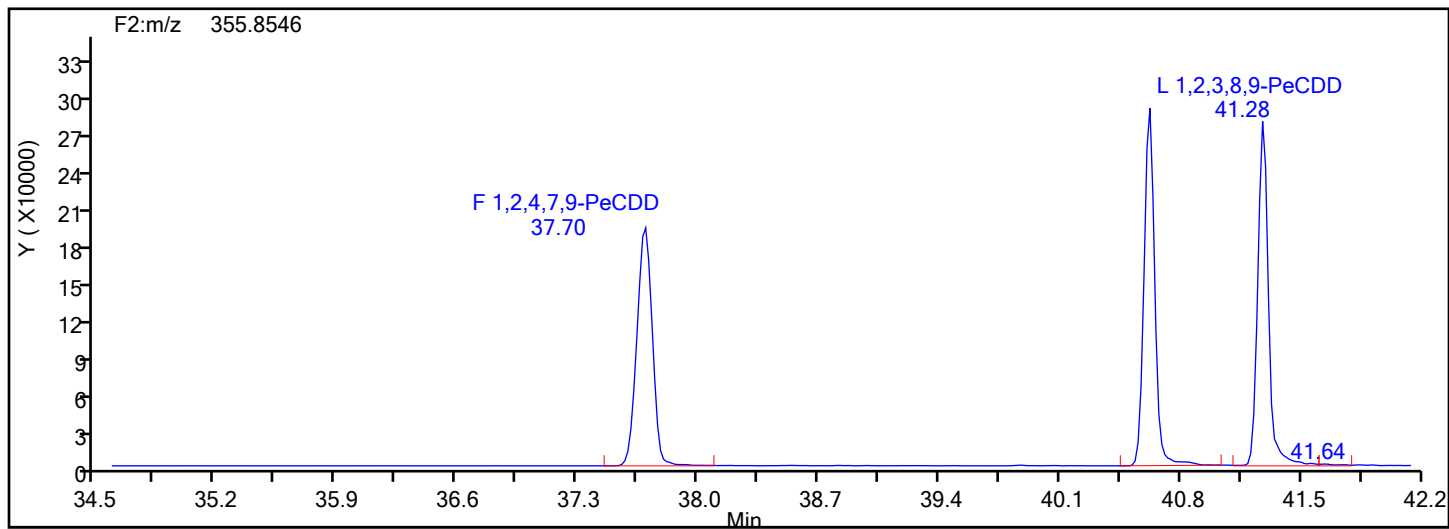


PeCDD Standards

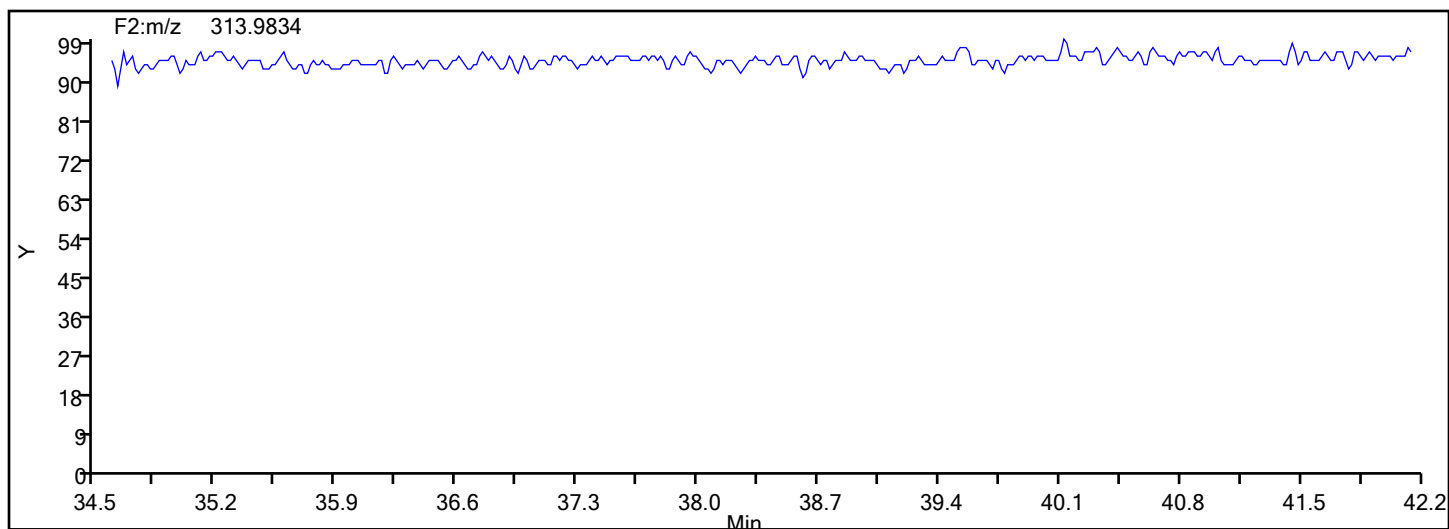


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27242 Sample Line#: 1
Column Type: Column Dia:
PeCDD



PeCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

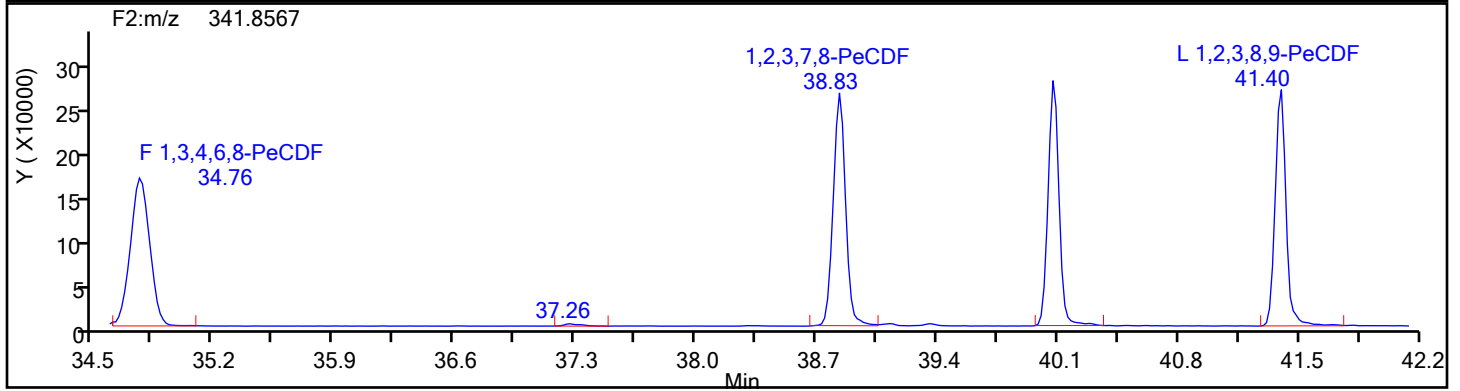
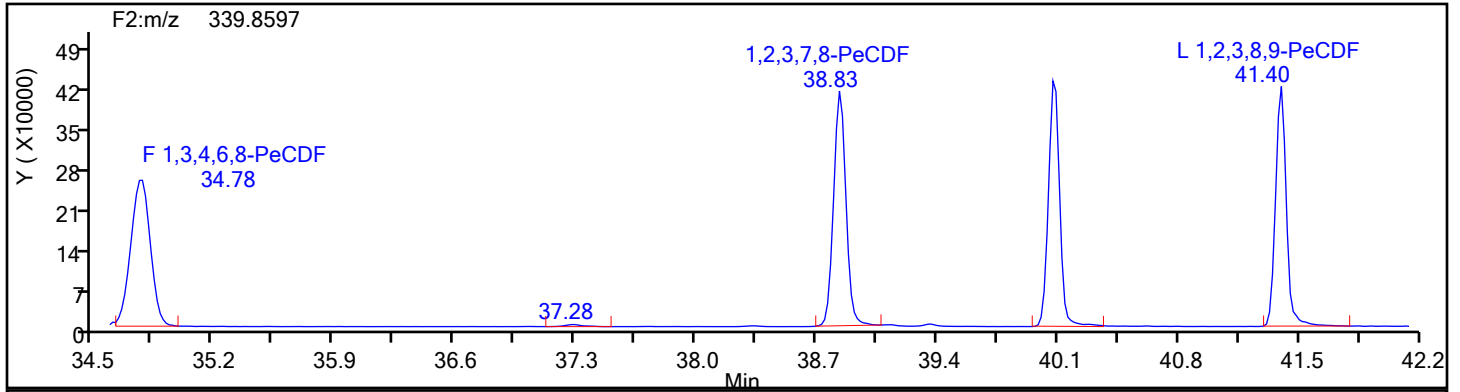
Worklist#: 27242

Sample Line#: 1

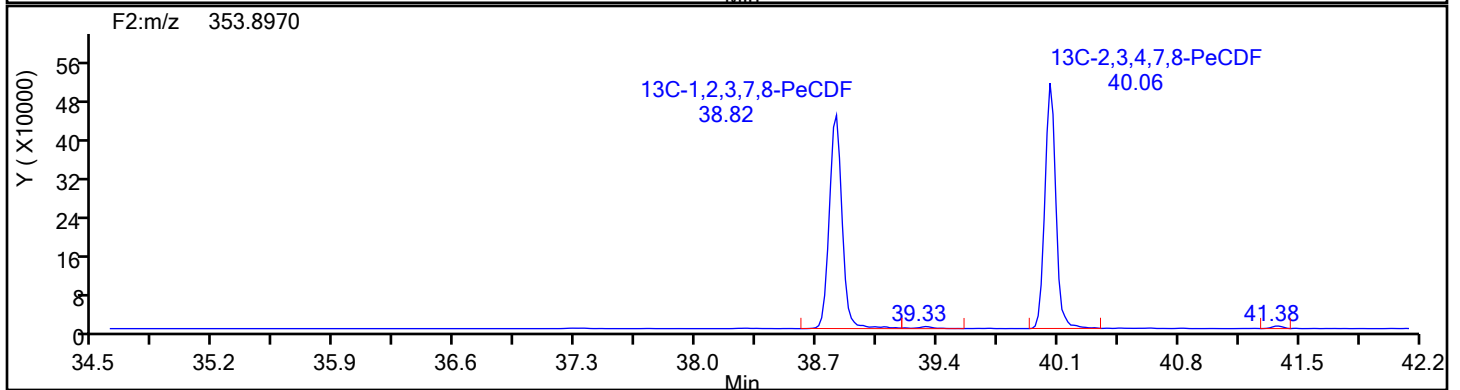
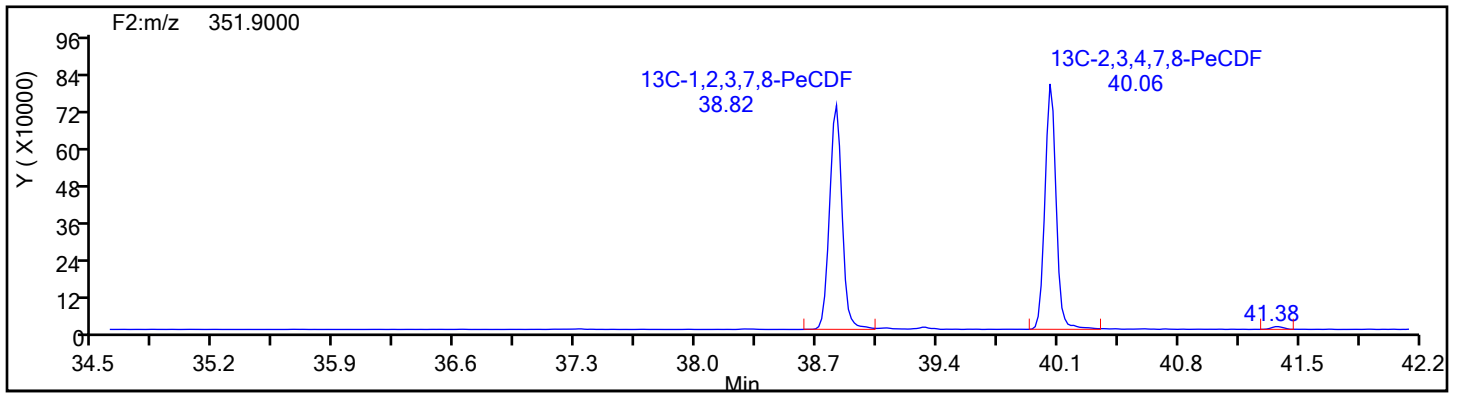
Column Type:

Column Dia:

PeCDF



PeCDF Standards



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

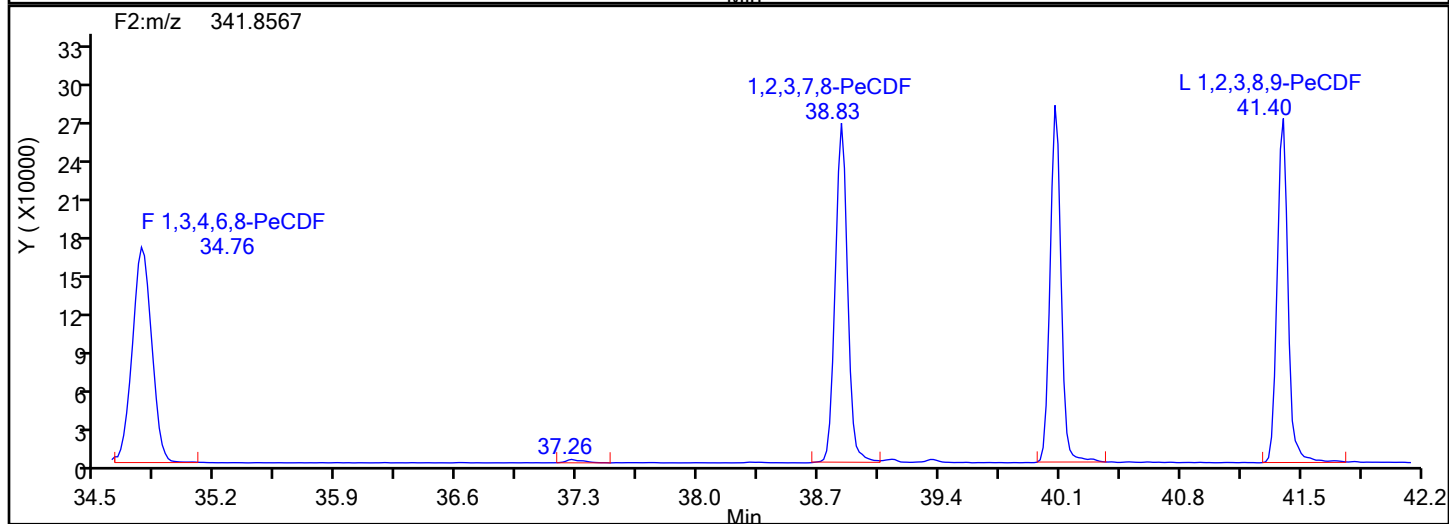
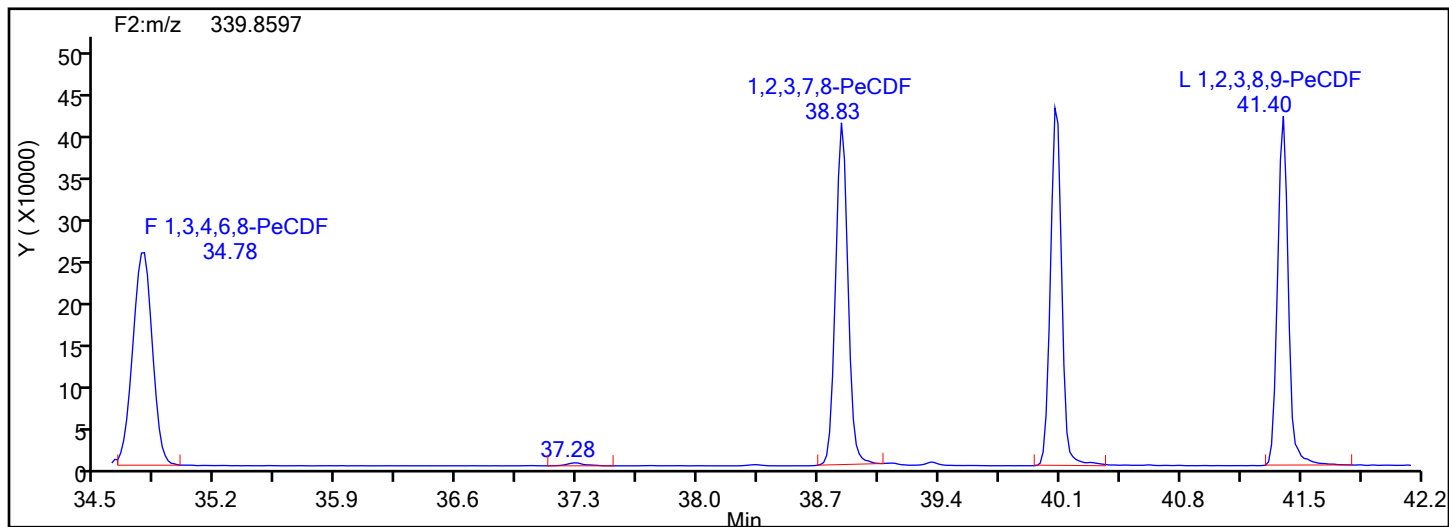
Worklist#: 27242

Sample Line#: 1

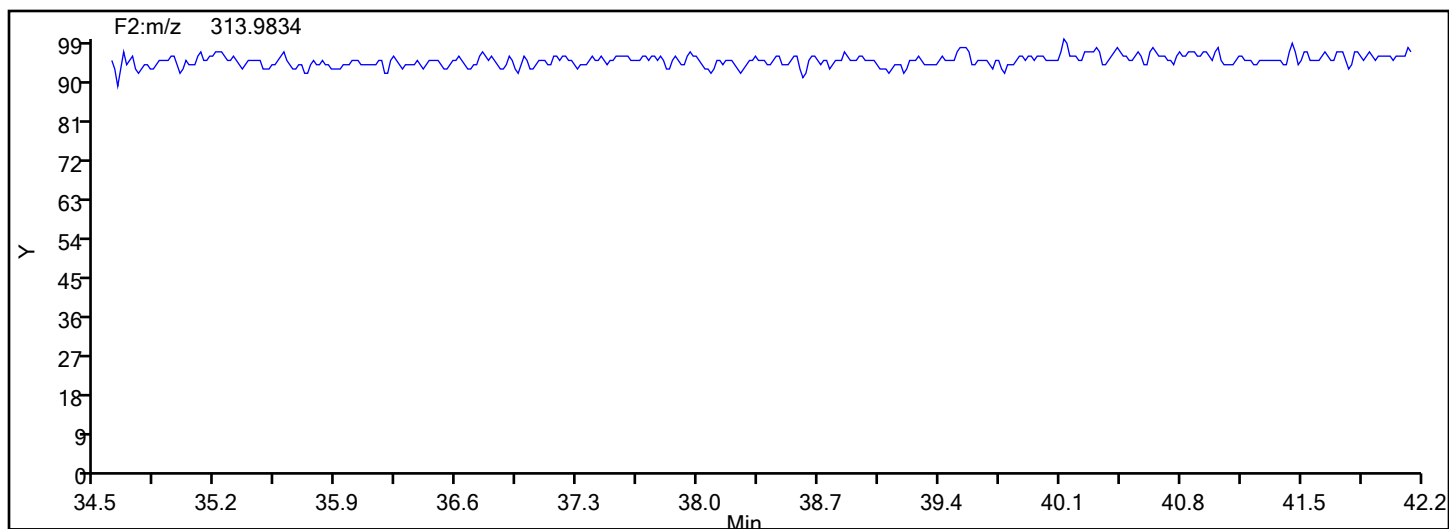
Column Type:

Column Dia:

PeCDF



PeCDF Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

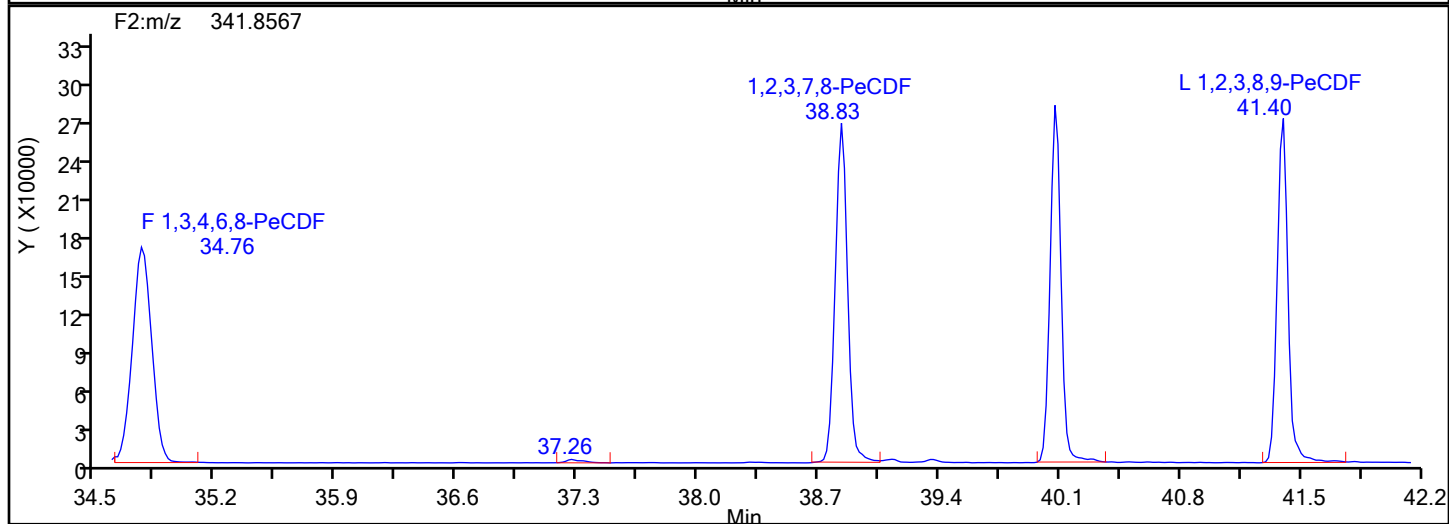
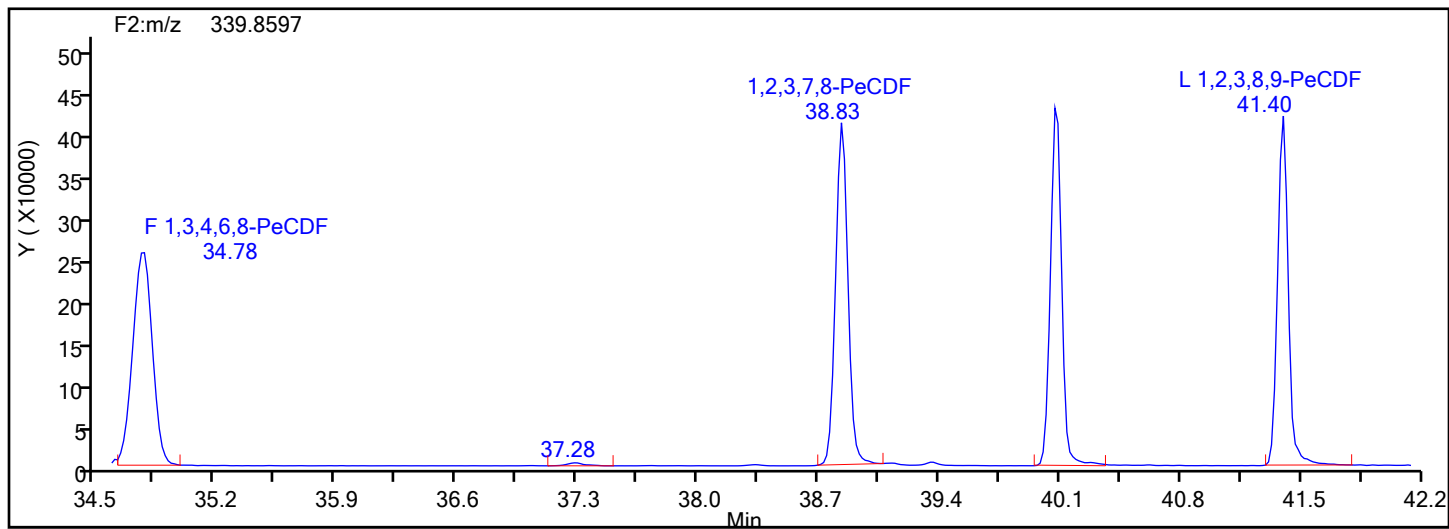
Worklist#: 27242

Sample Line#: 1

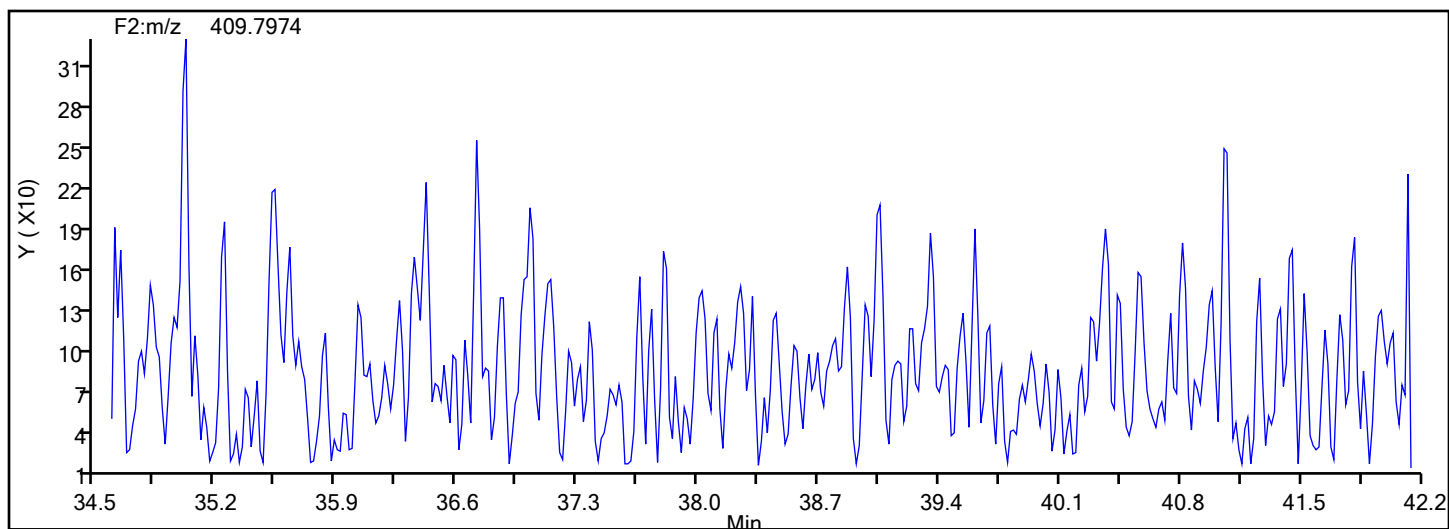
Column Type:

Column Dia:

PeCDF



PeCDF Interference Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

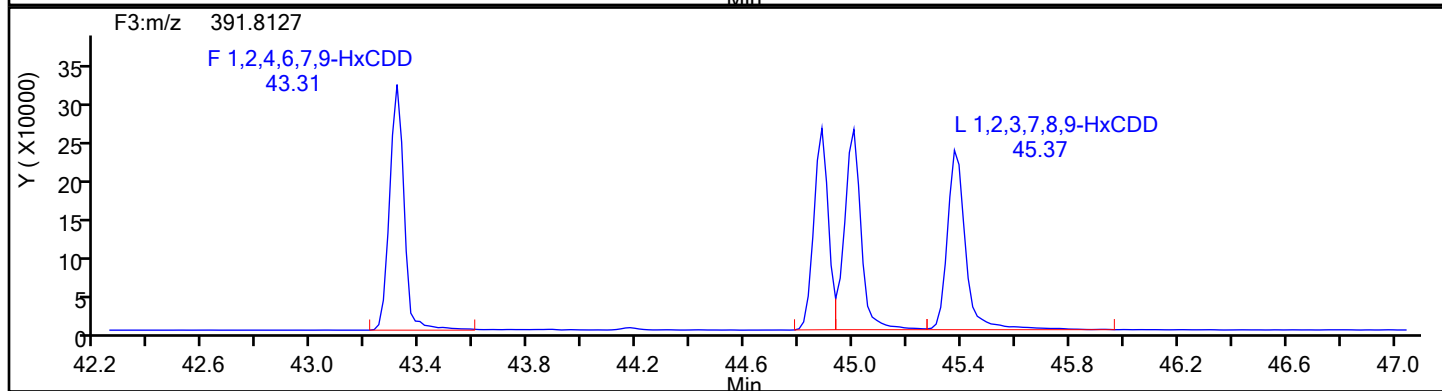
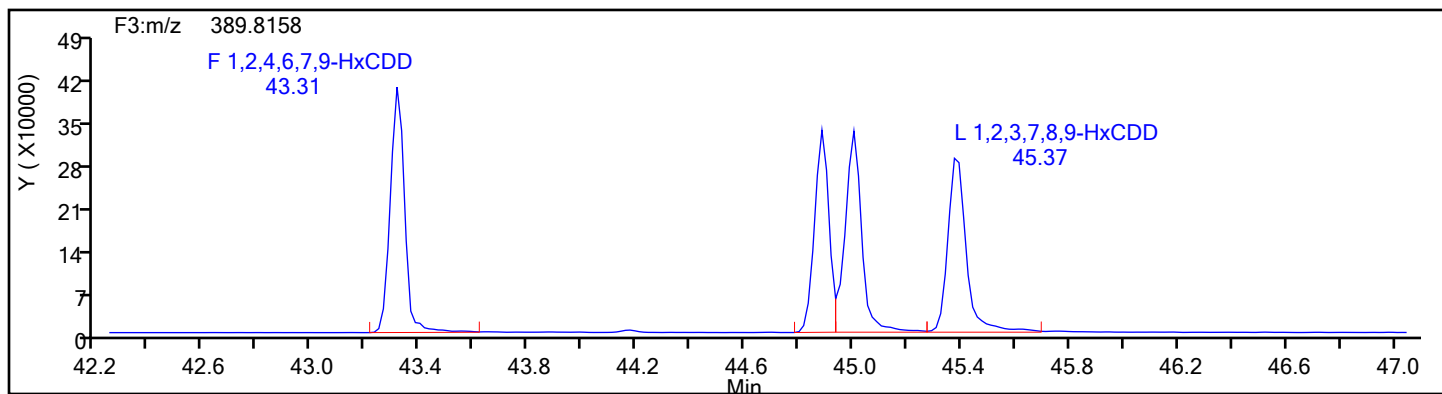
Worklist#: 27242

Sample Line#: 1

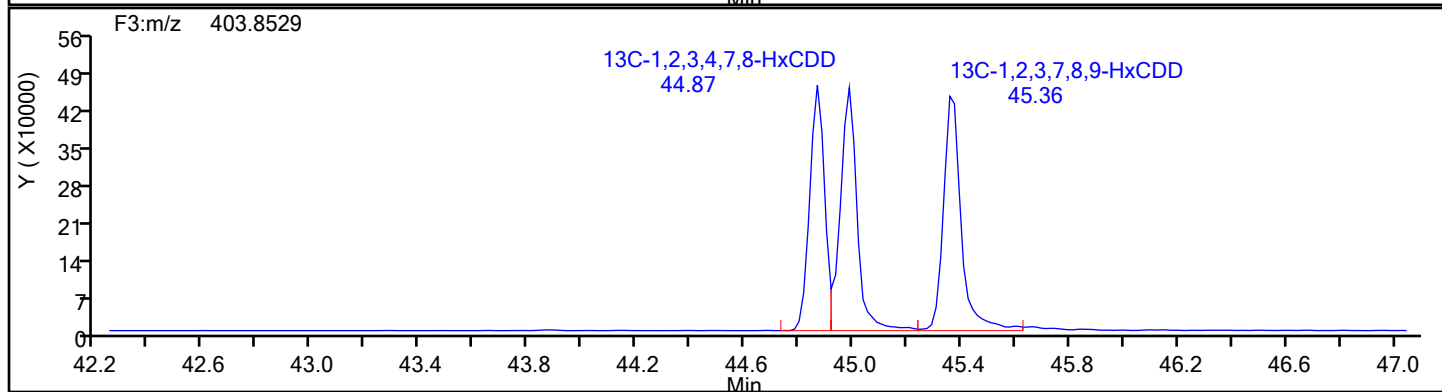
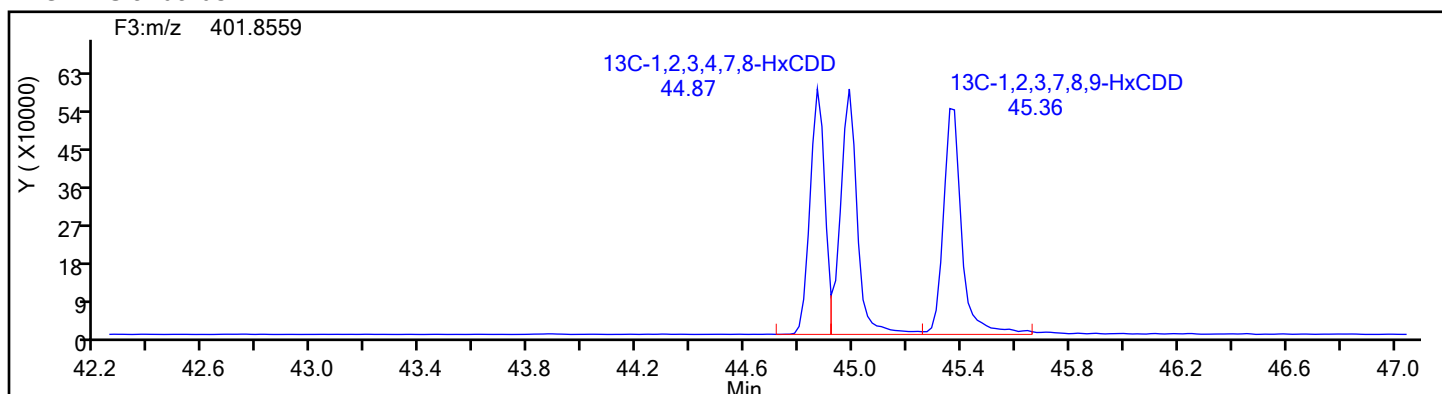
Column Type:

Column Dia:

HxCDD

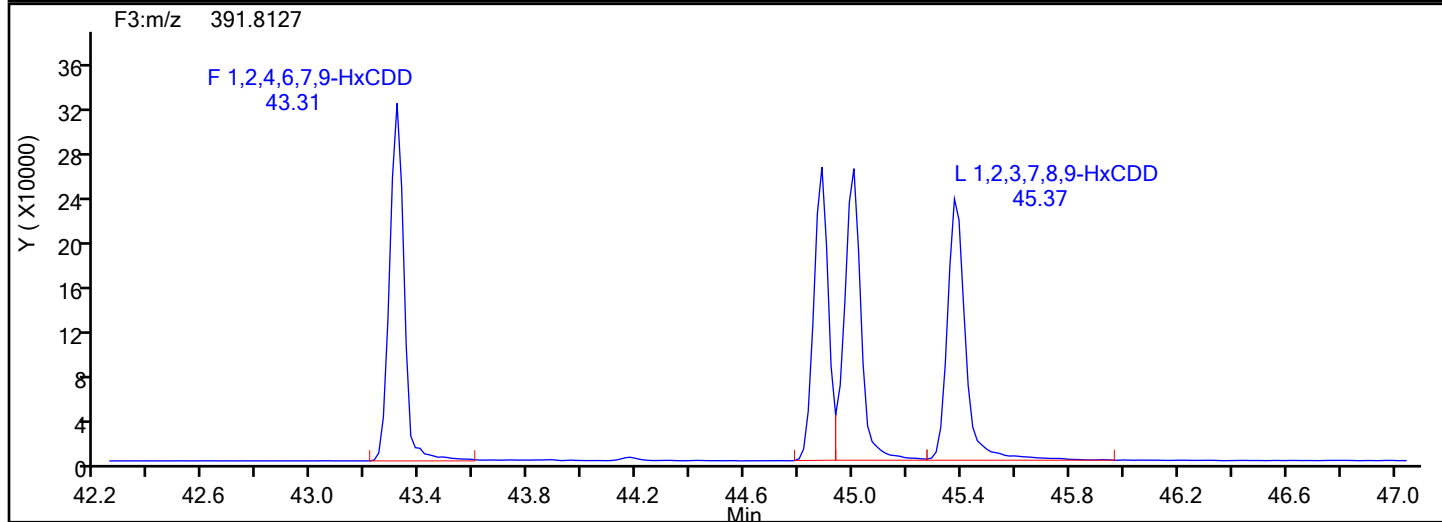
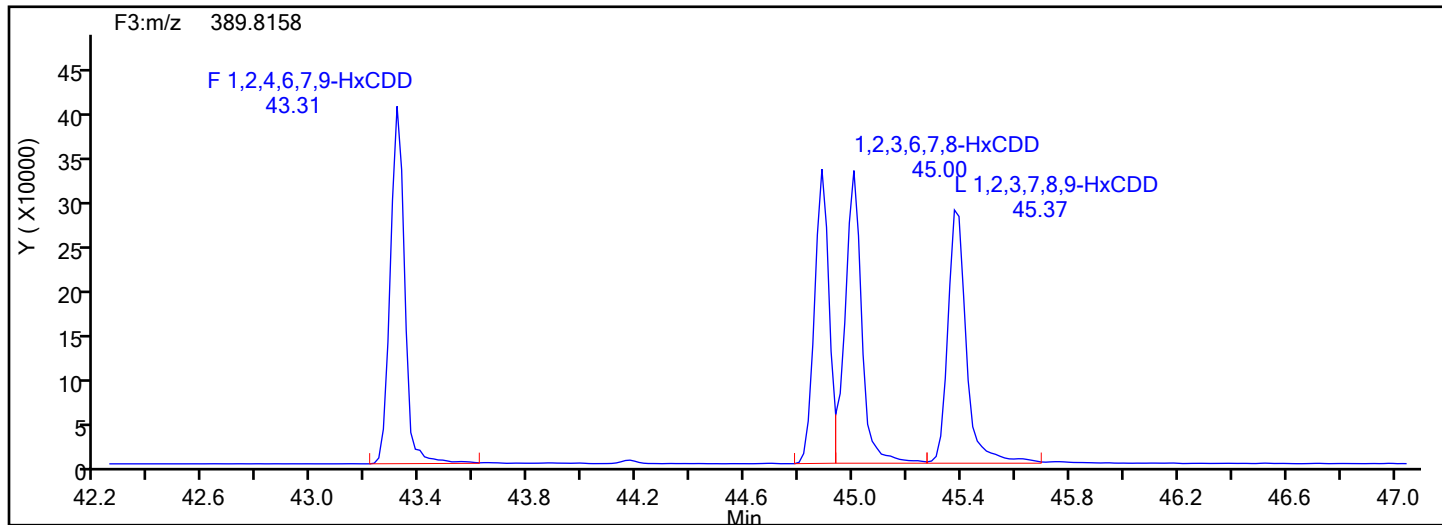


HxCDD Standards

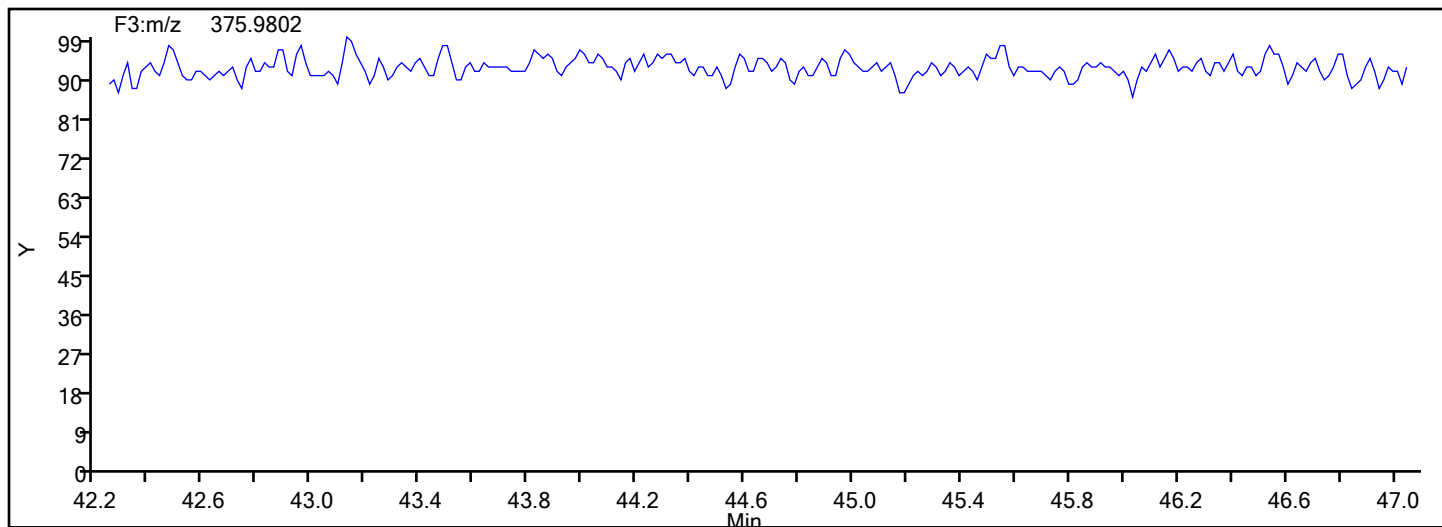


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27242 Sample Line#: 1
Column Type: Column Dia:
HxCDD



HxCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

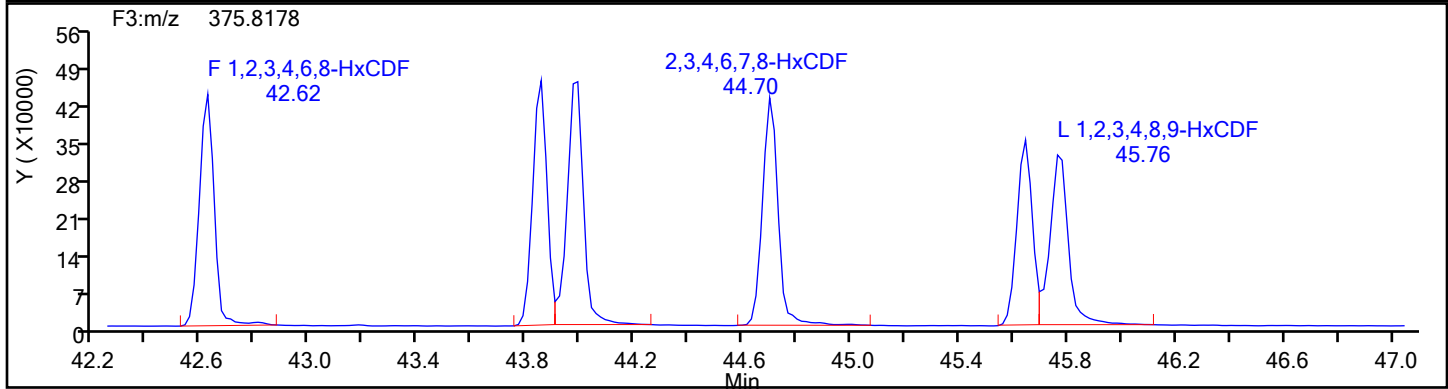
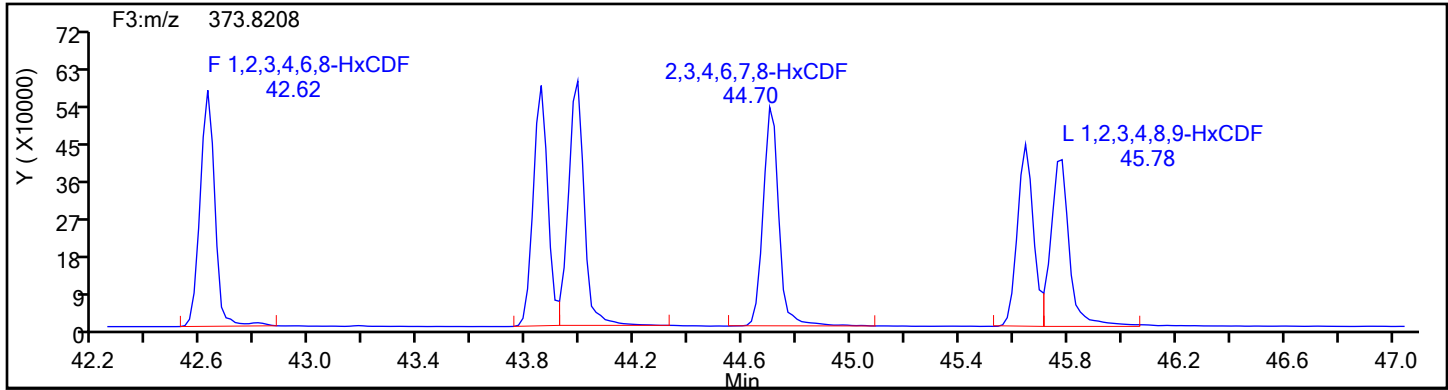
Worklist#: 27242

Sample Line#: 1

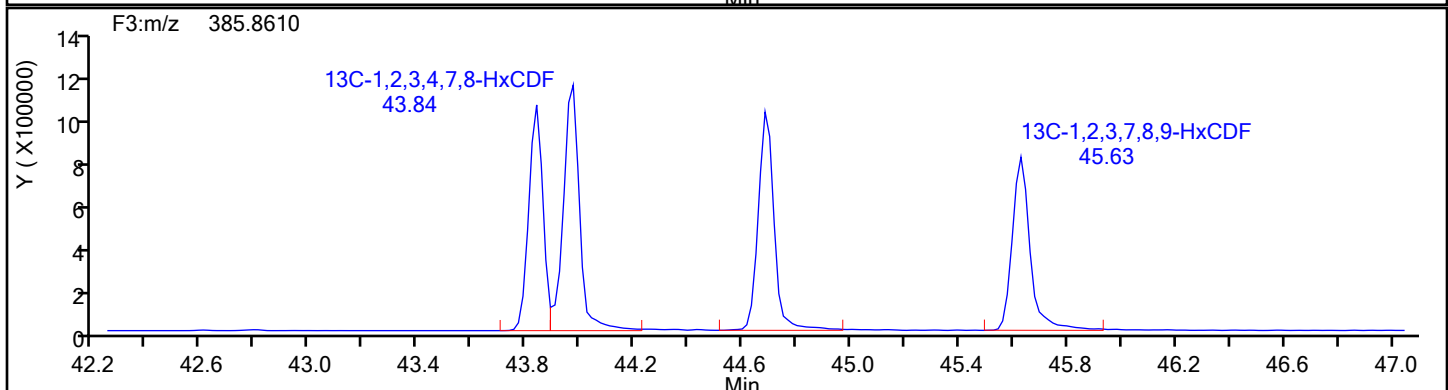
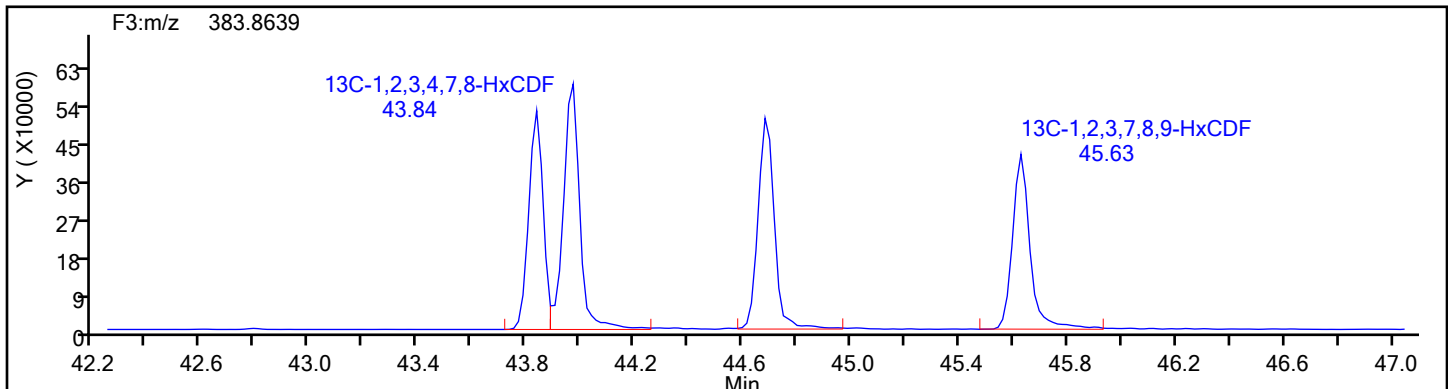
Column Type:

Column Dia:

HxCDF



HxCDF Standards



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

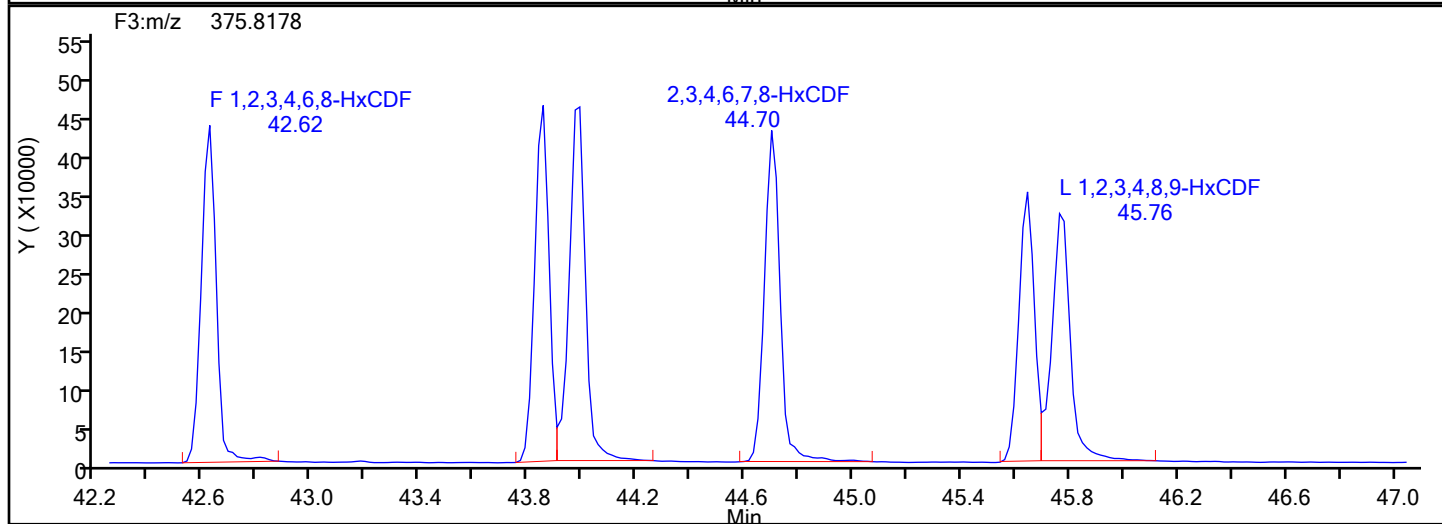
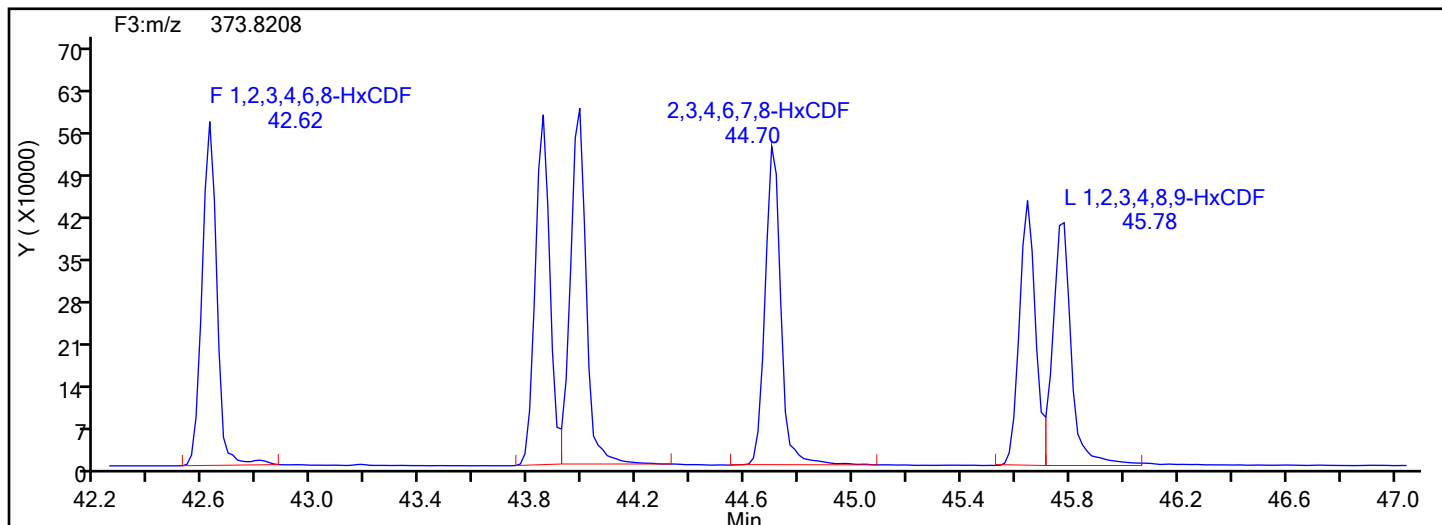
Worklist#: 27242

Sample Line#: 1

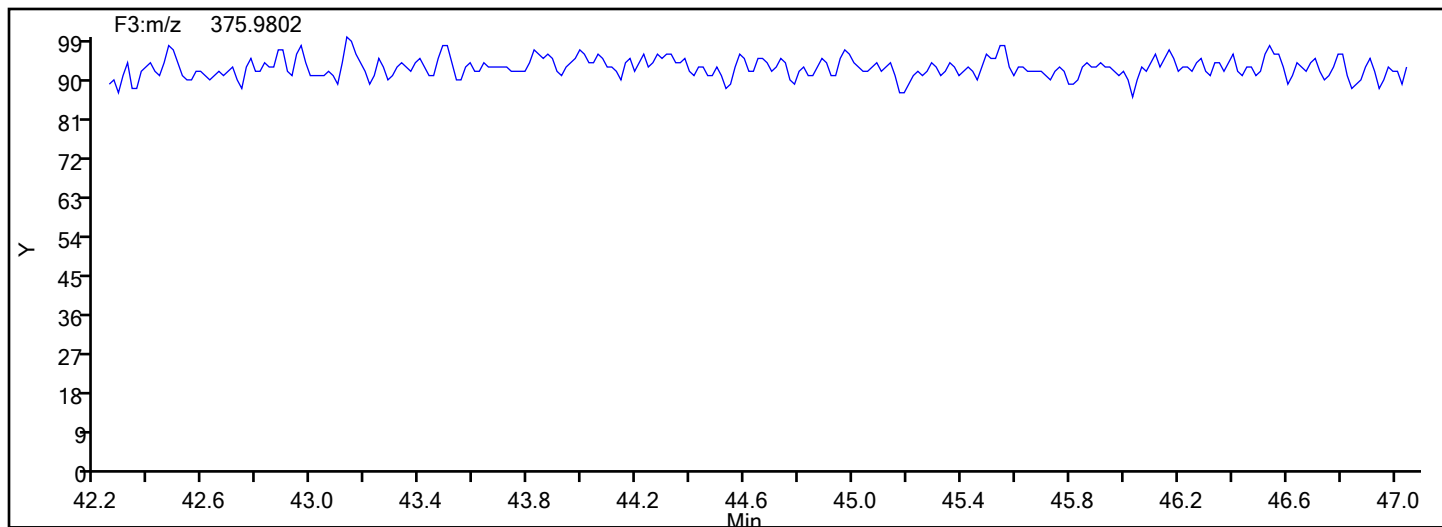
Column Type:

Column Dia:

HxCDF



HxCDF Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

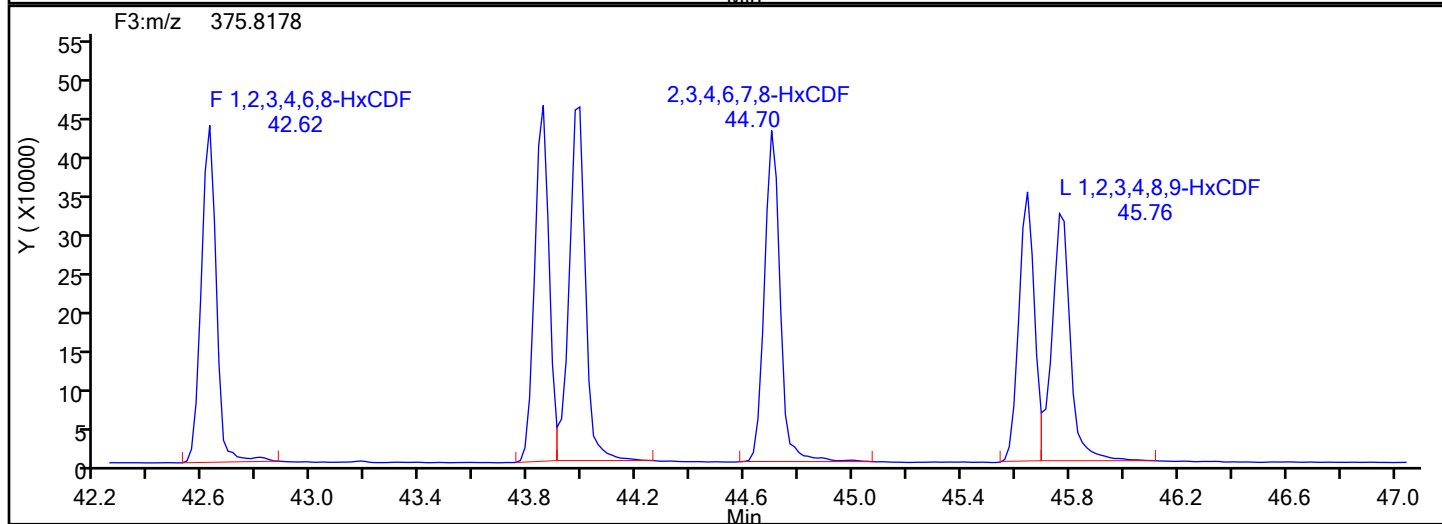
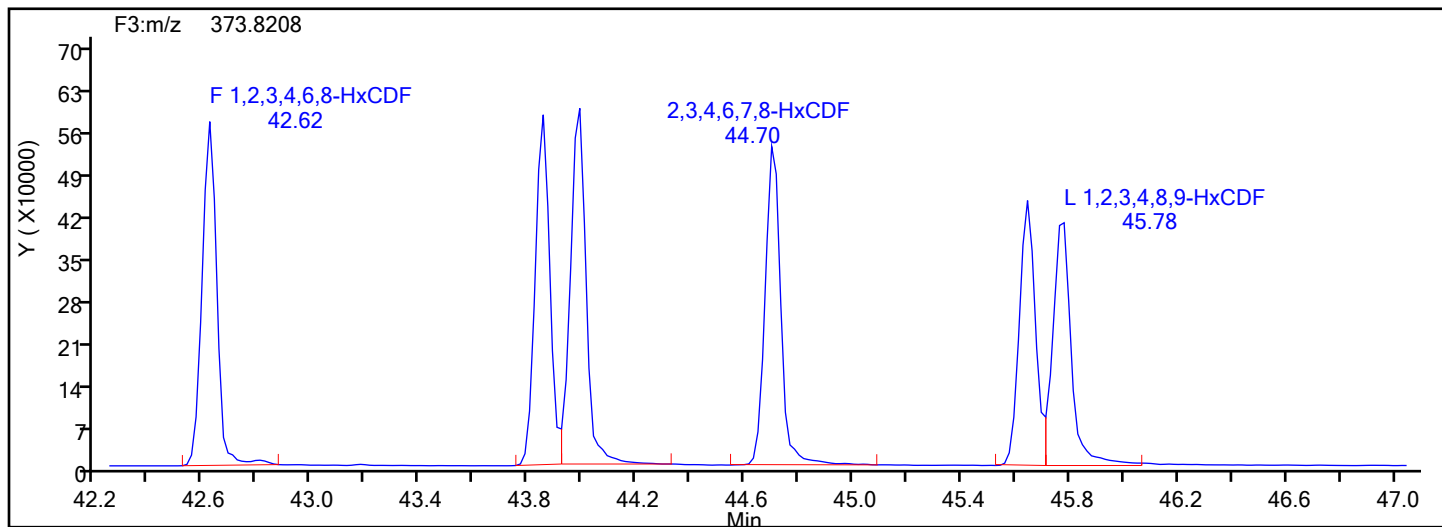
Worklist#: 27242

Sample Line#: 1

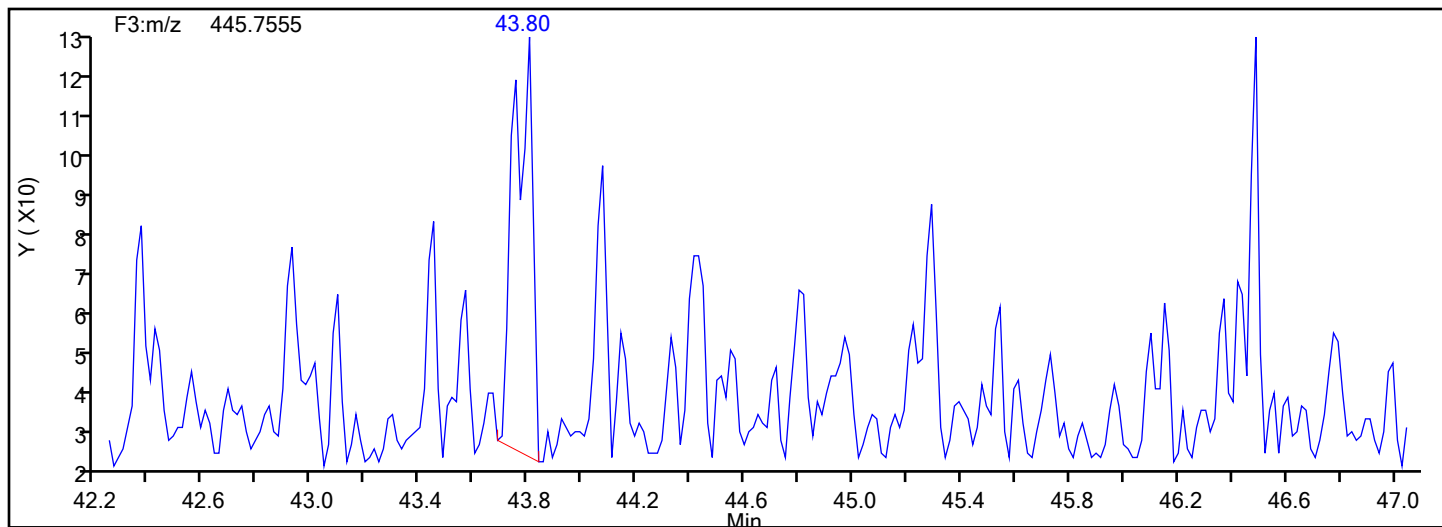
Column Type:

Column Dia:

HxCDF



HxCDF Interference Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

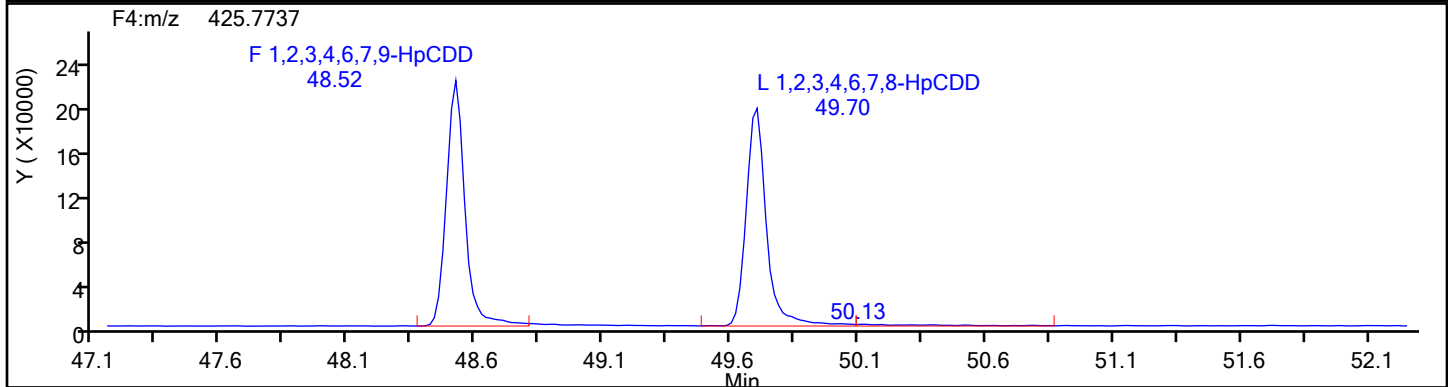
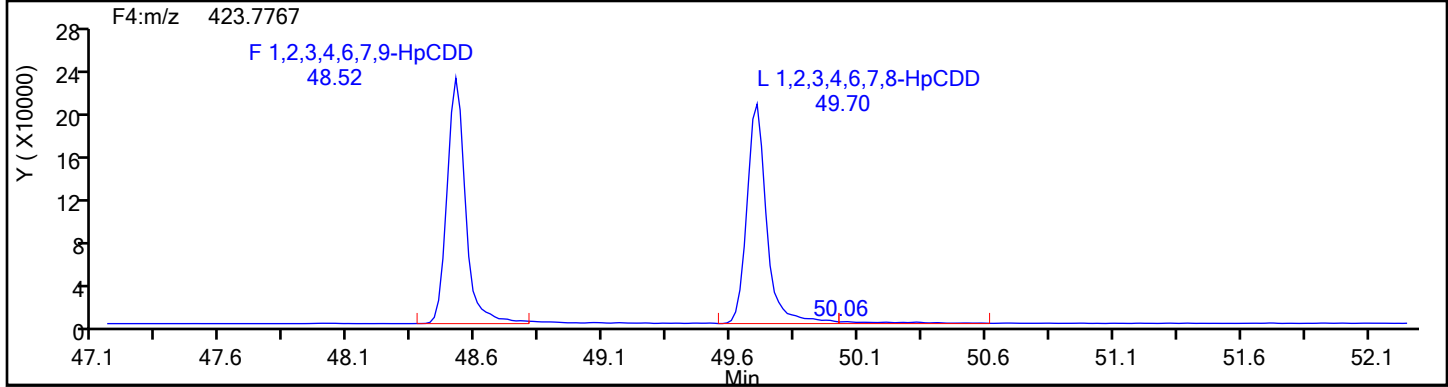
Worklist#: 27242

Sample Line#: 1

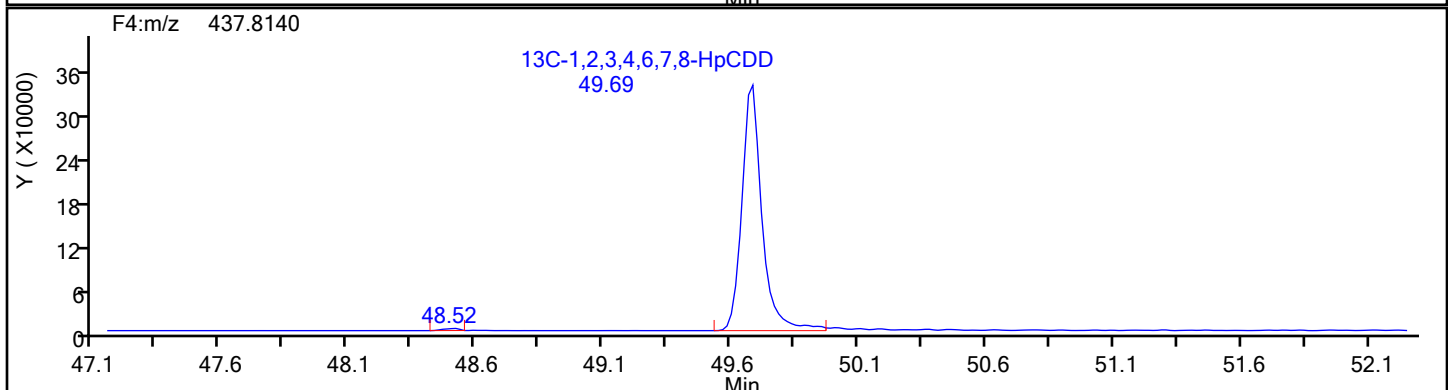
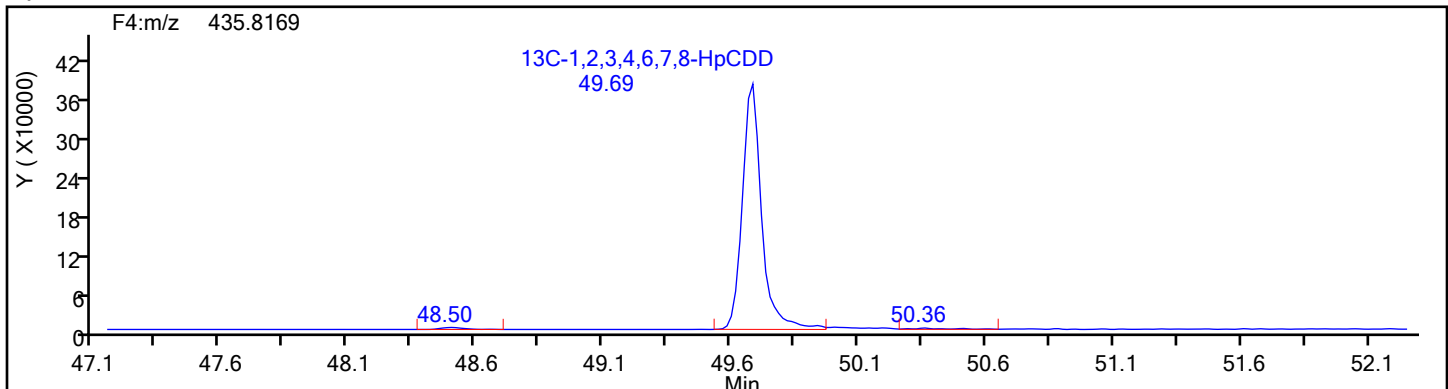
Column Type:

Column Dia:

HpCDD



HpCDD Standards



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

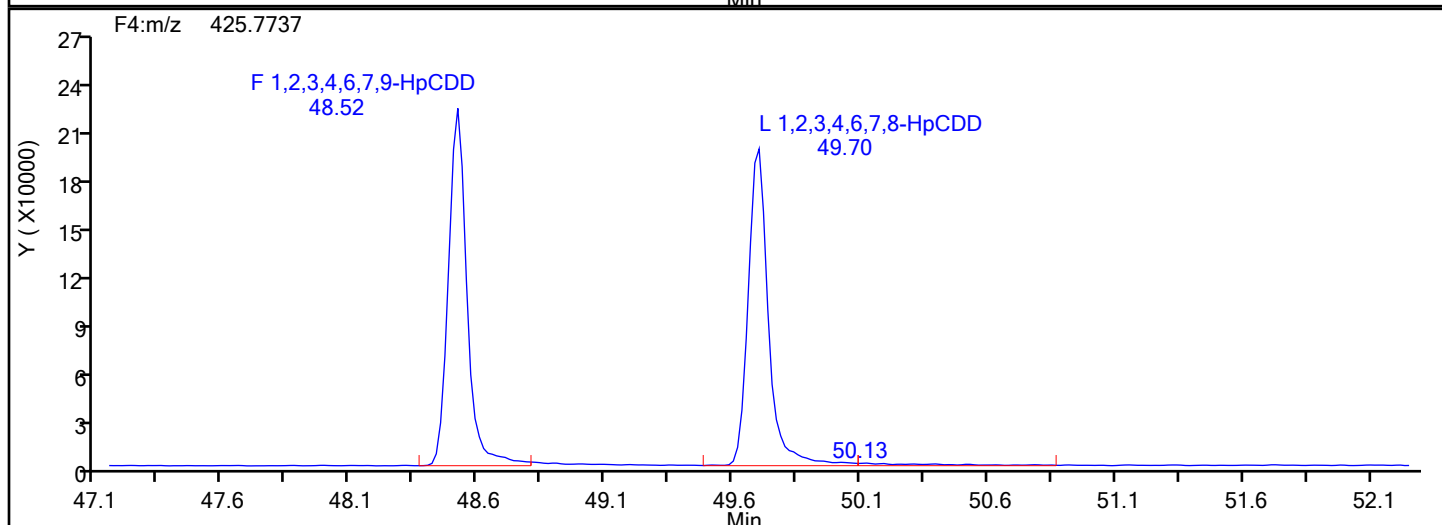
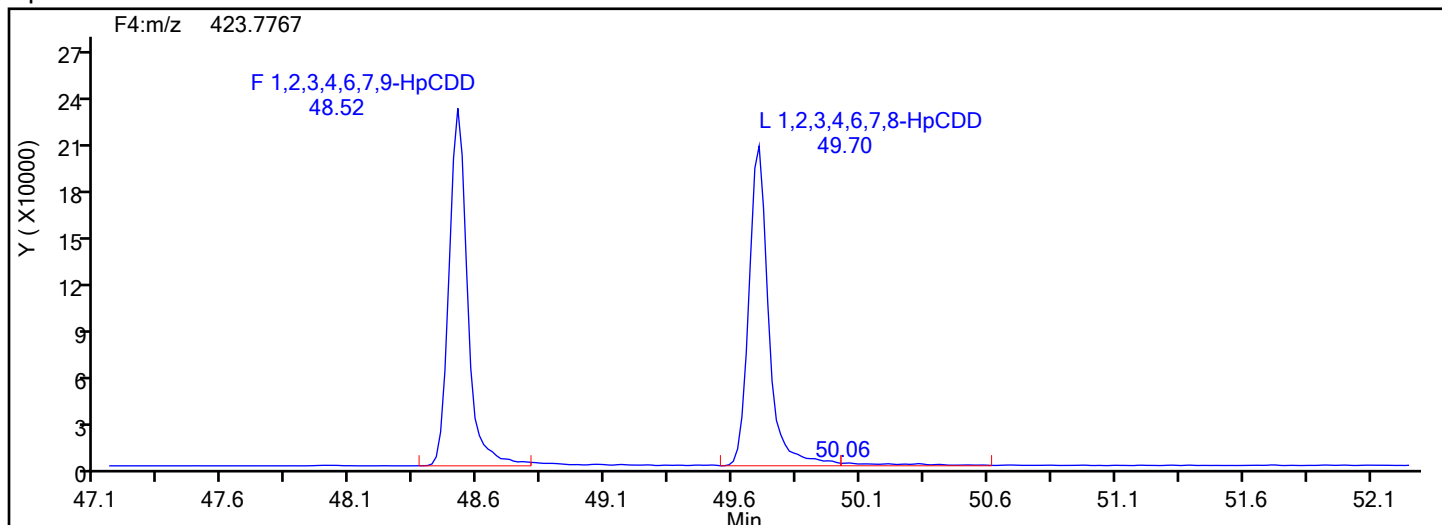
Worklist#: 27242

Sample Line#: 1

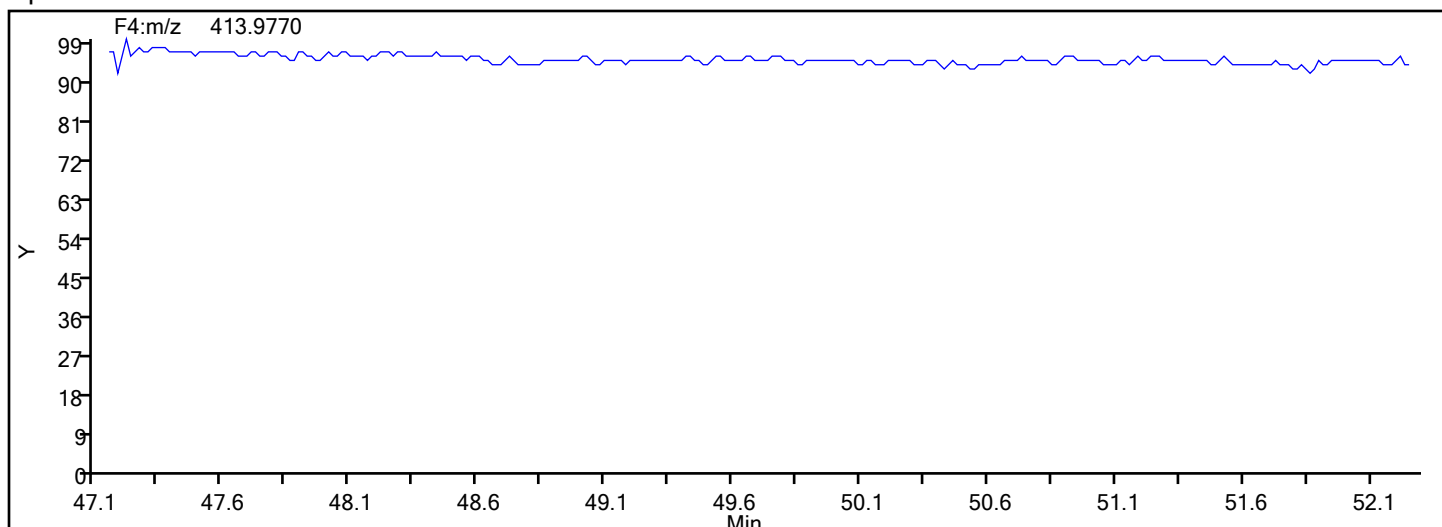
Column Type:

Column Dia:

HpCDD



HpCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

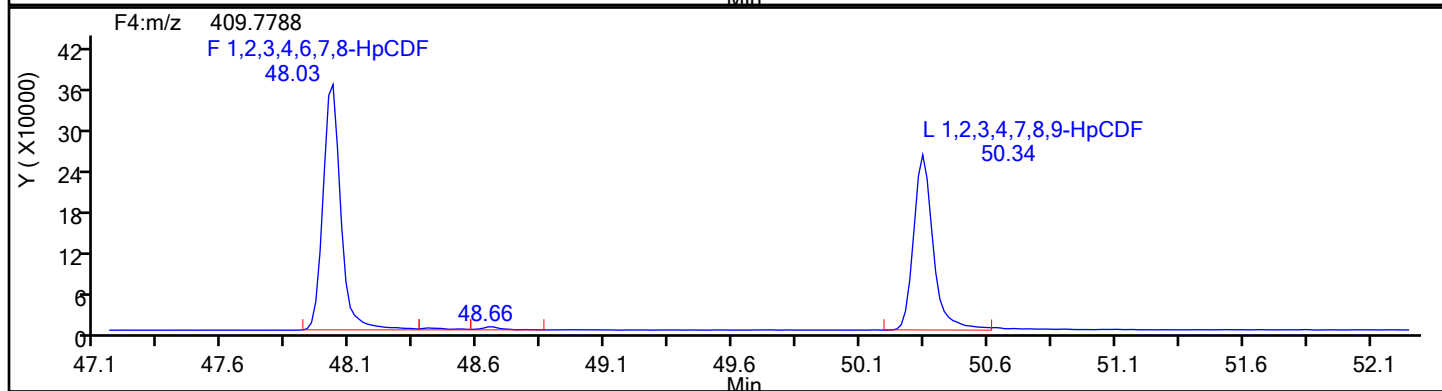
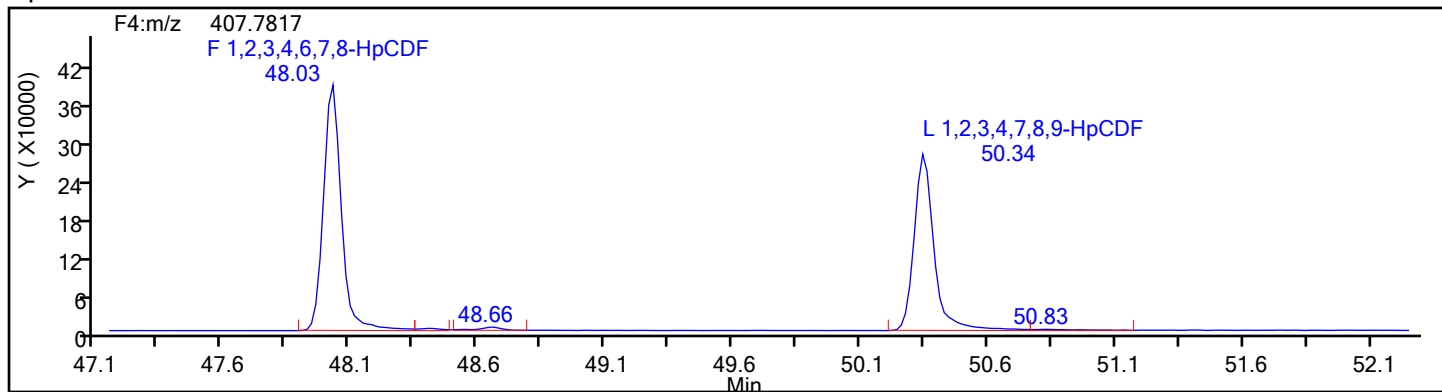
Worklist#: 27242

Sample Line#: 1

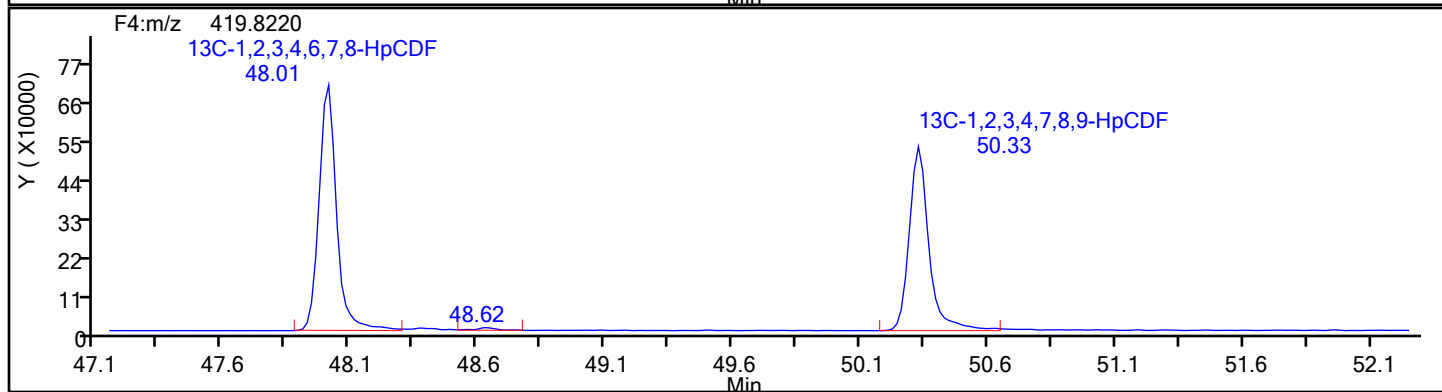
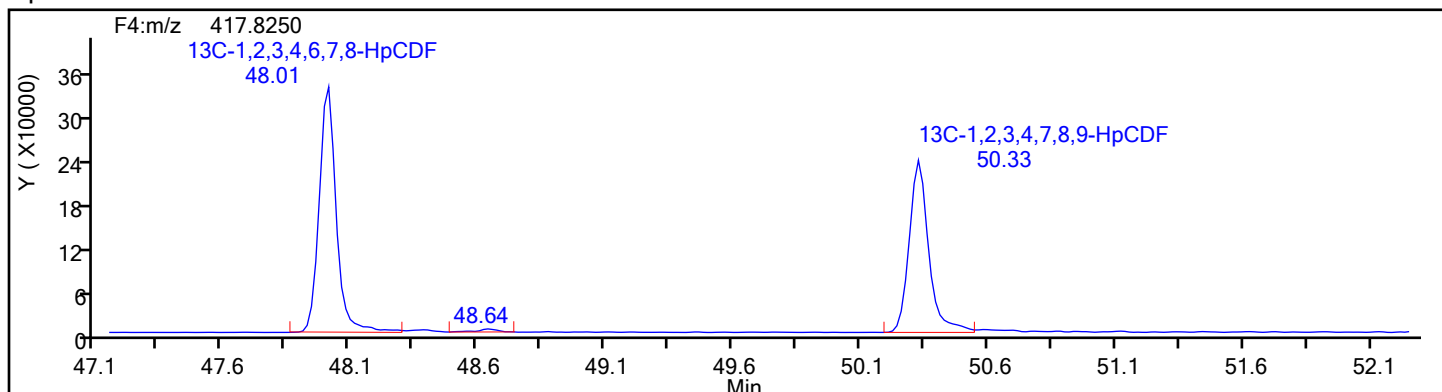
Column Type:

Column Dia:

HpCDF

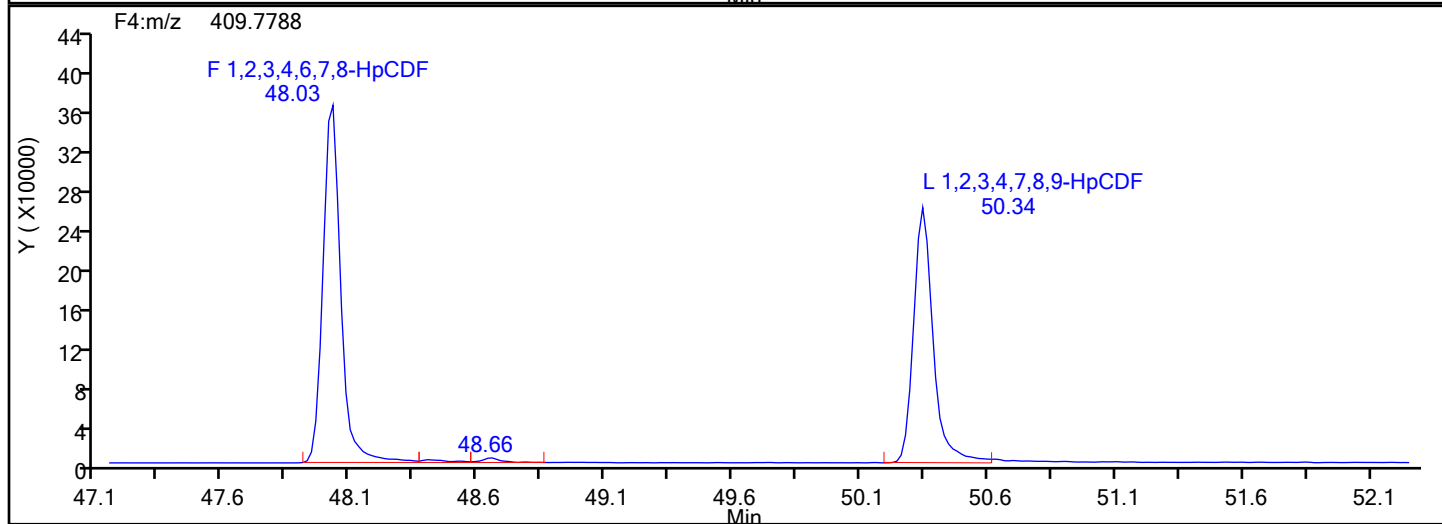
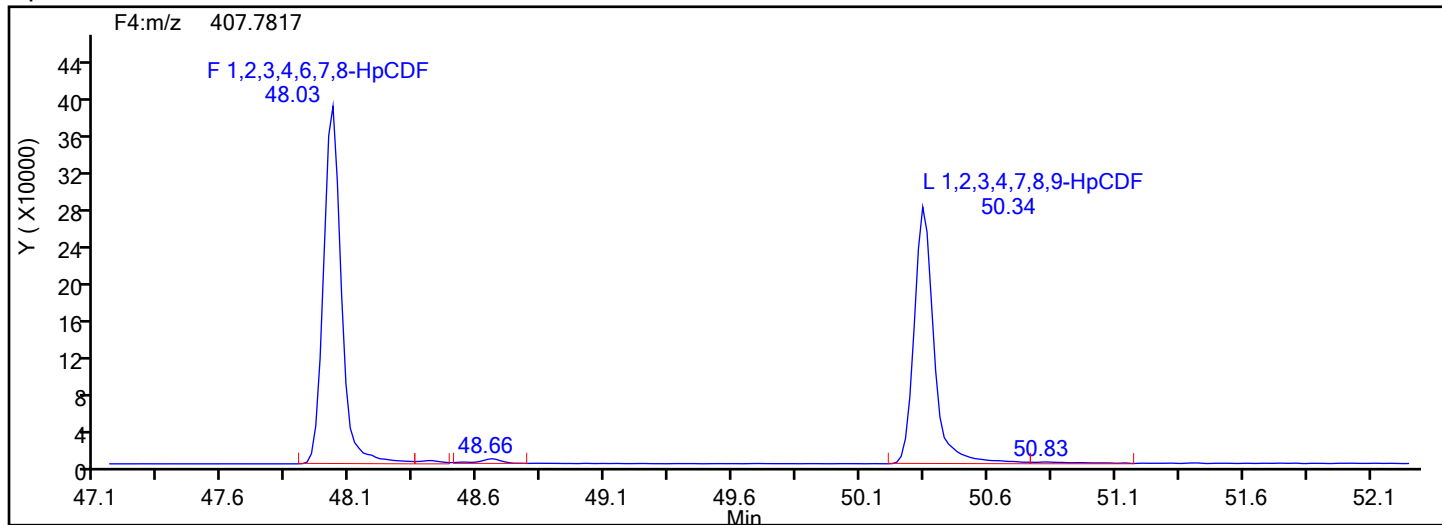


HpCDF Standards

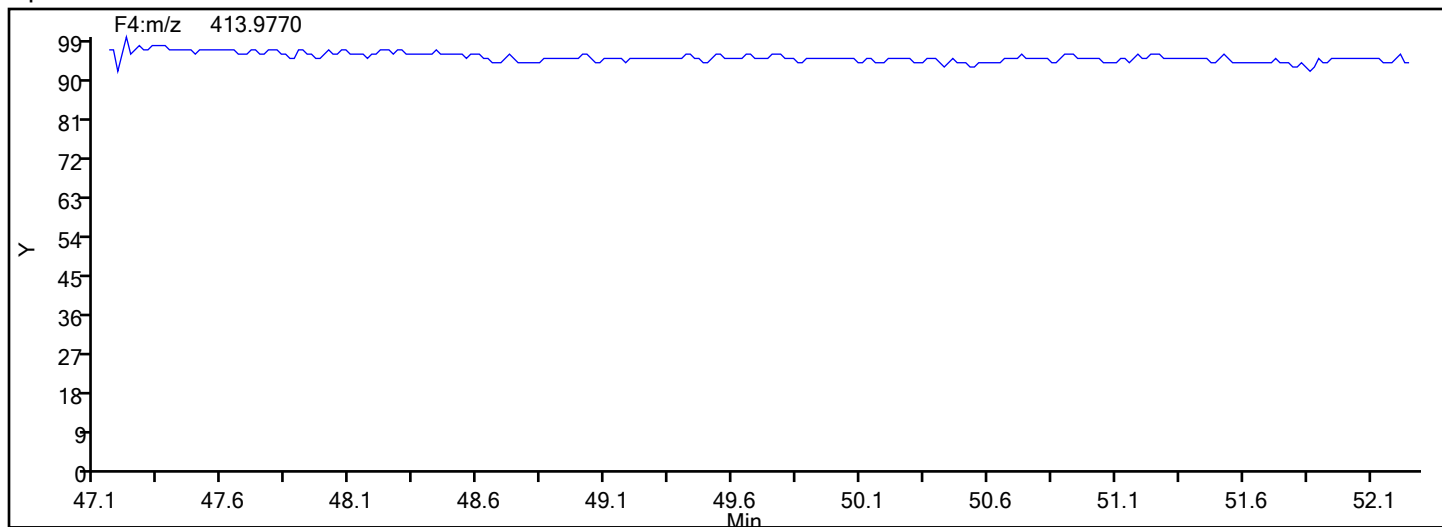


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27242 Sample Line#: 1
Column Type: Column Dia:
HpCDF



HpCDF Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

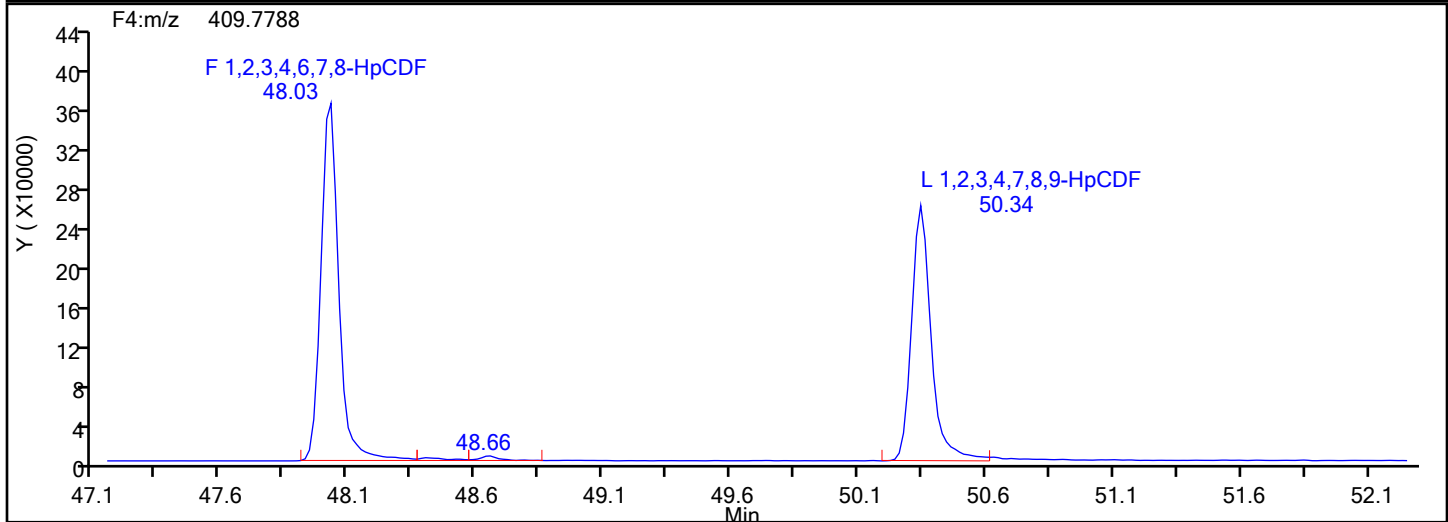
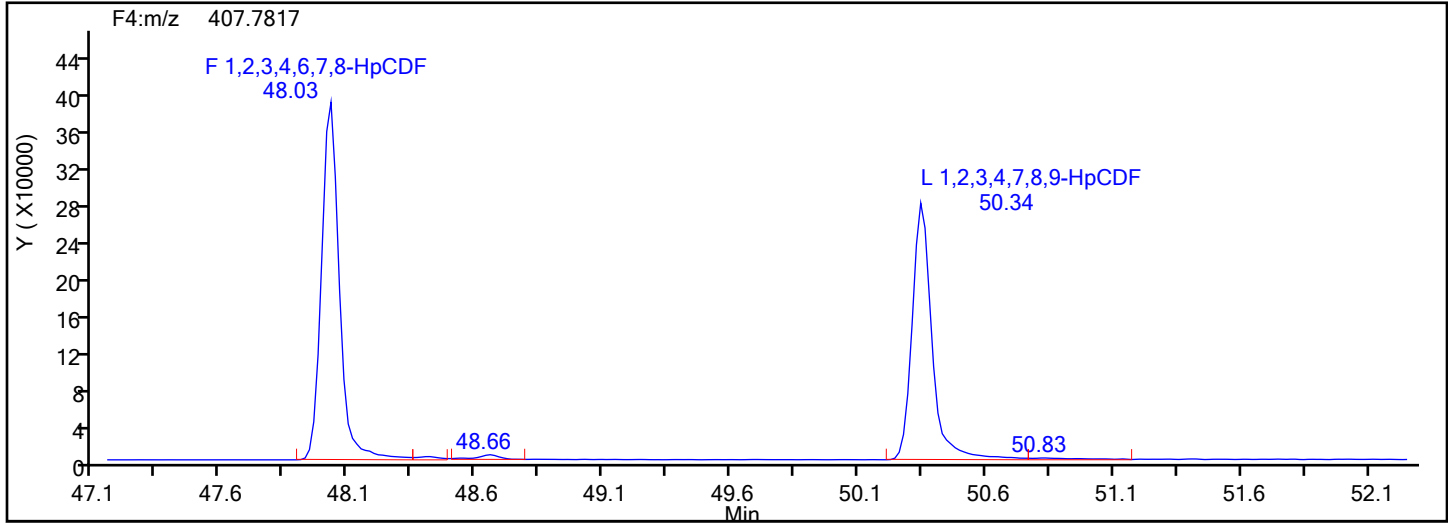
Worklist#: 27242

Sample Line#: 1

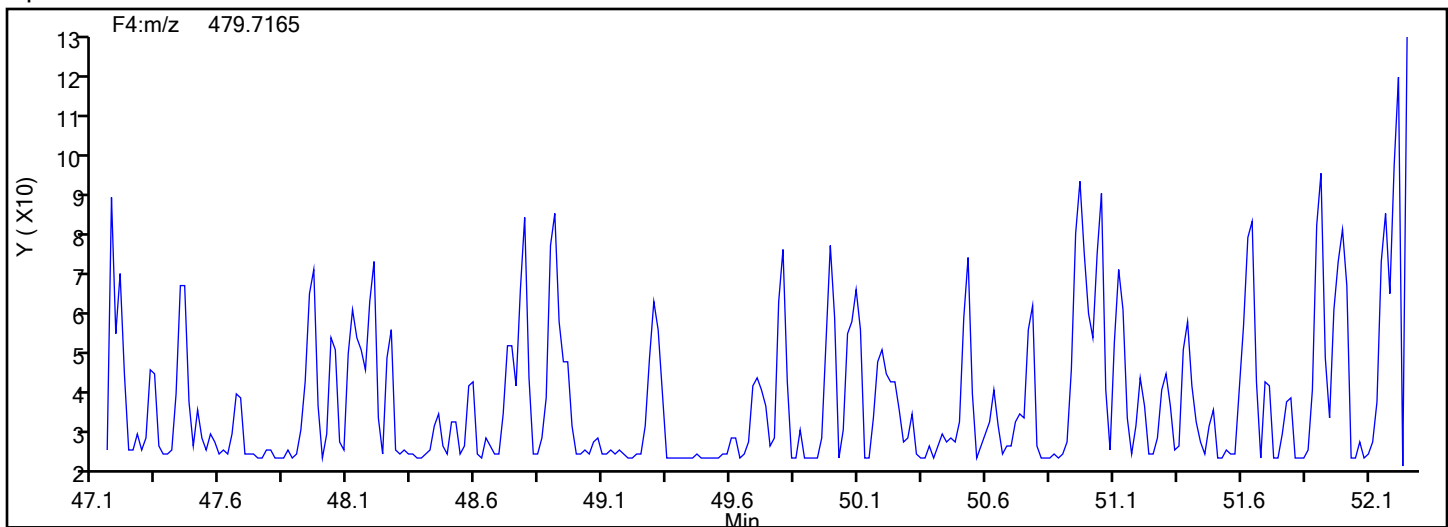
Column Type:

Column Dia:

HpCDF

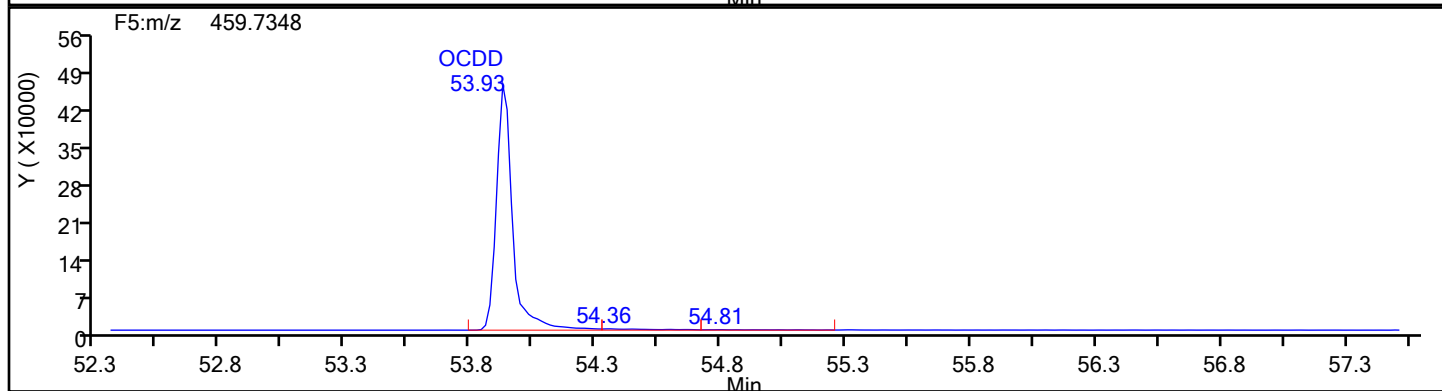
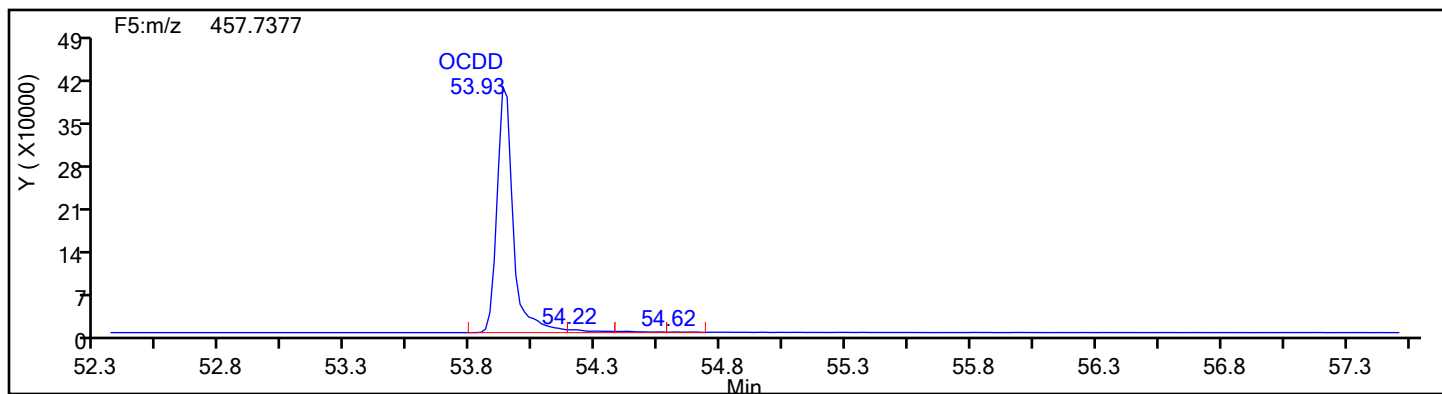


HpCDF Interference Mass

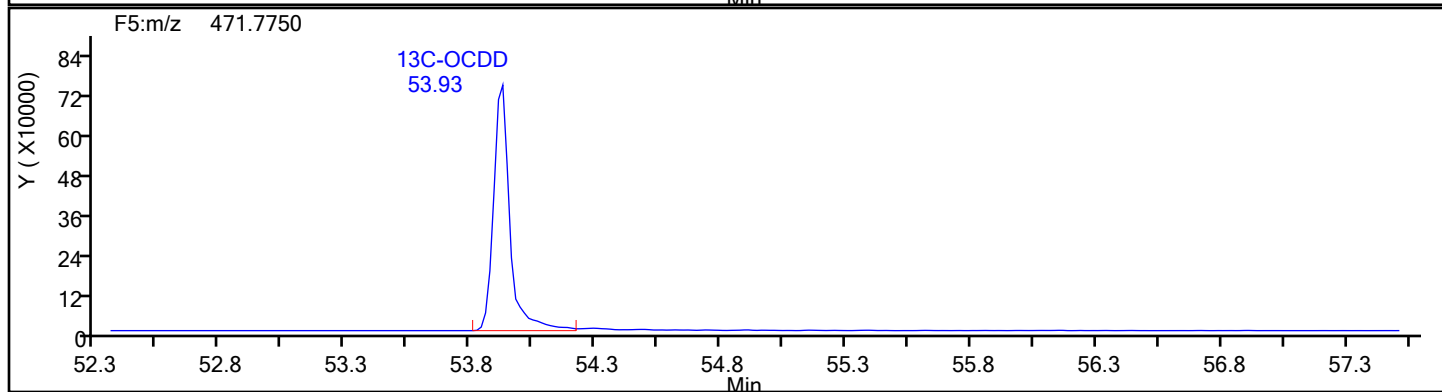
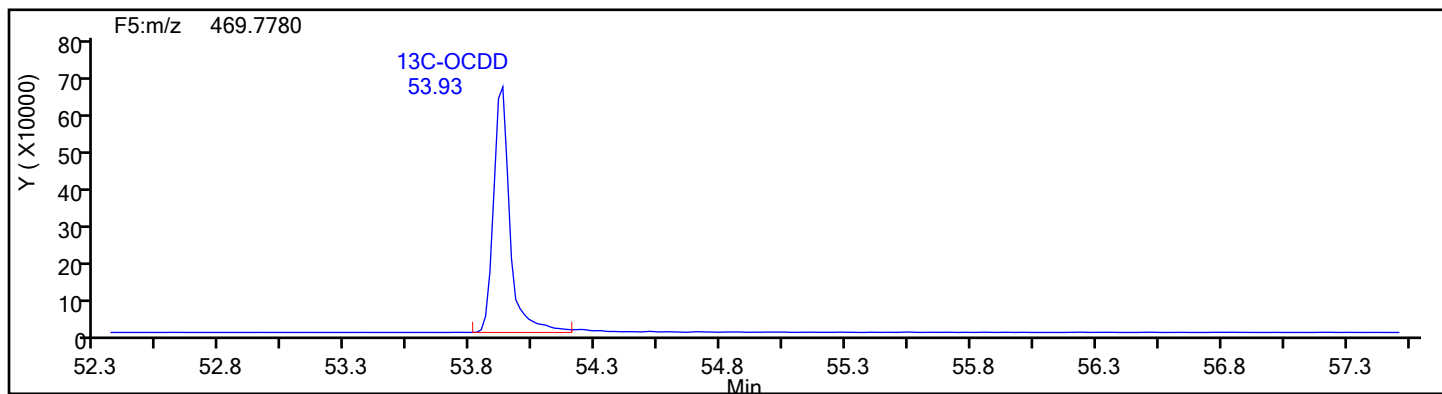


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27242 Sample Line#: 1
Column Type: Column Dia:
OCDD

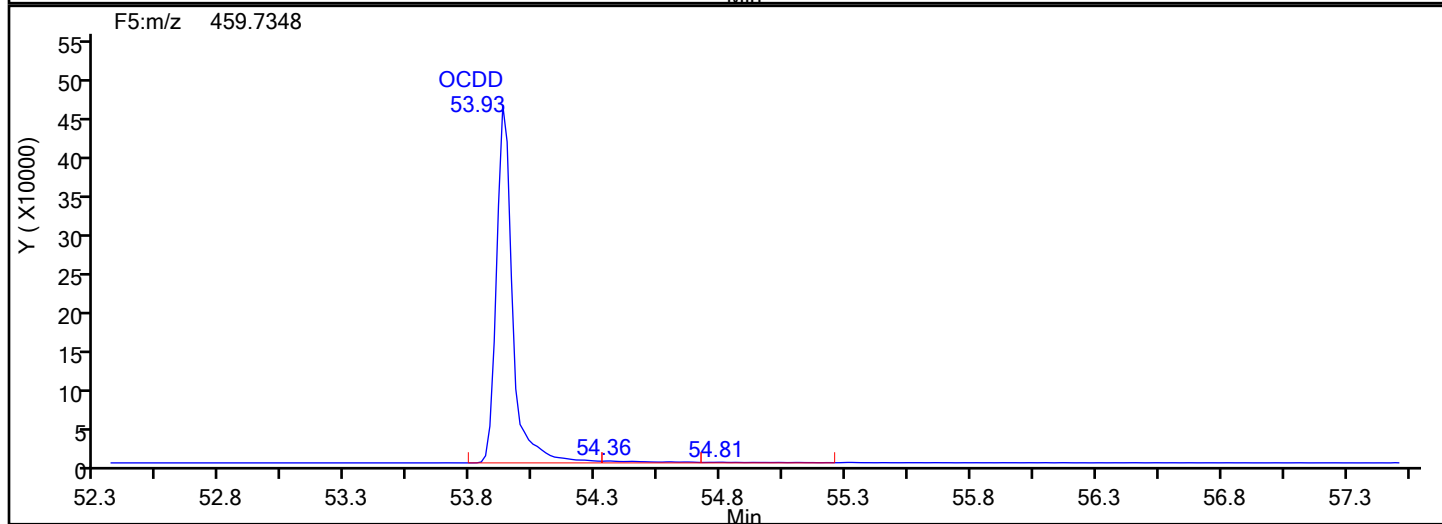
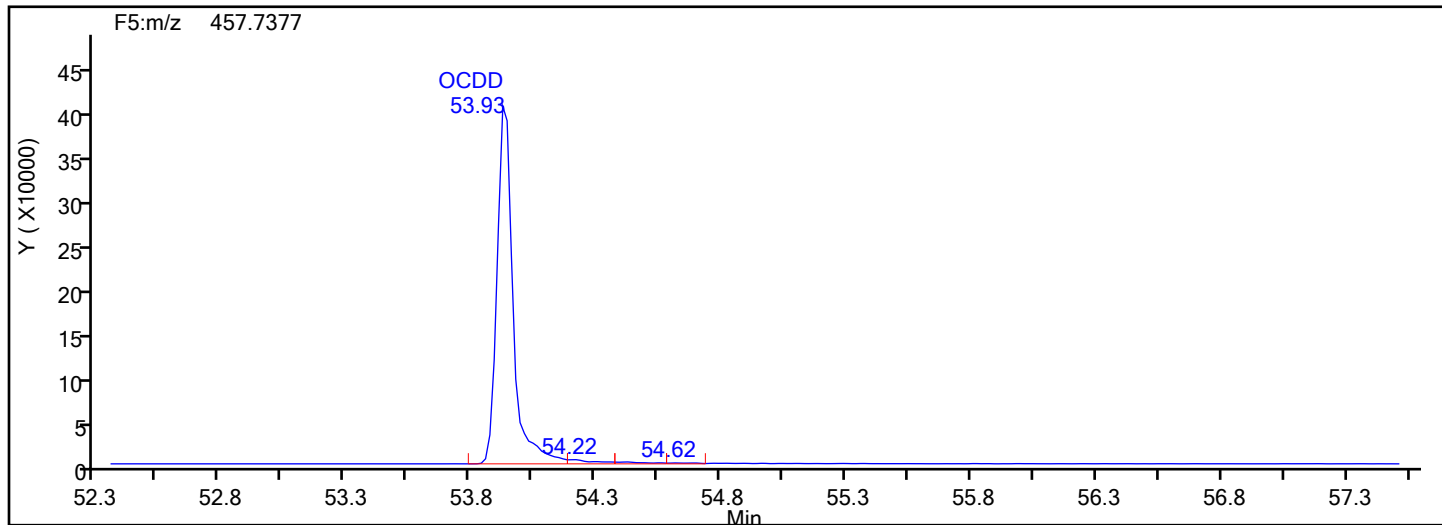


OCDD Standards

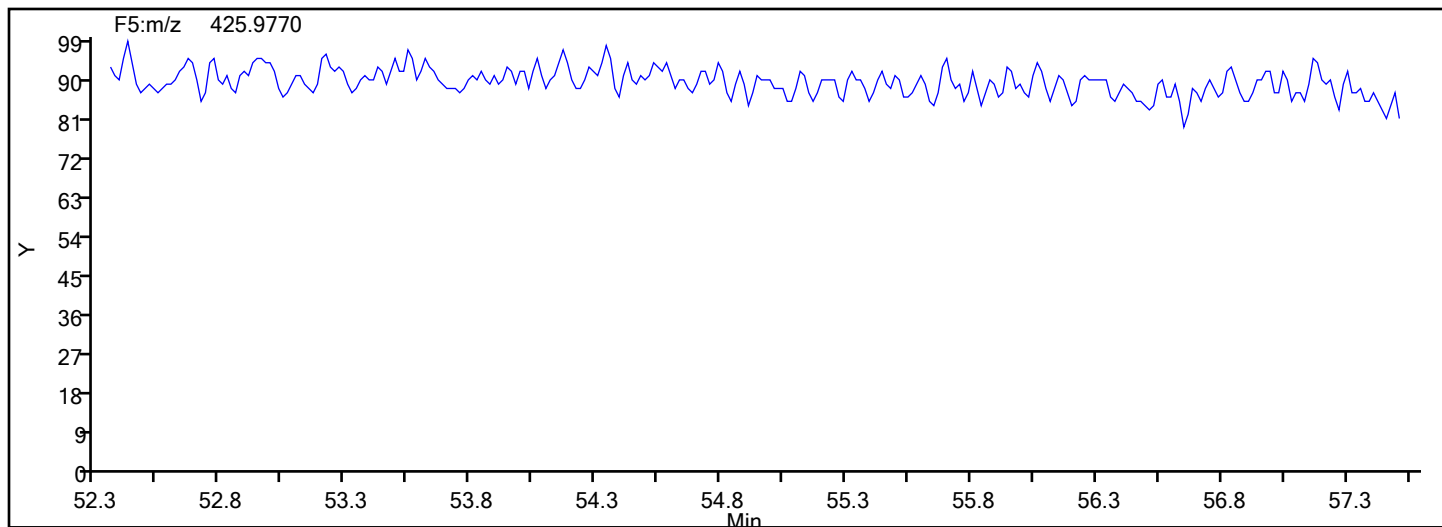


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d
Injection Date: 29-Jan-2019 09:51:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27242 Sample Line#: 1
Column Type: Column Dia:
OCDD



OCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

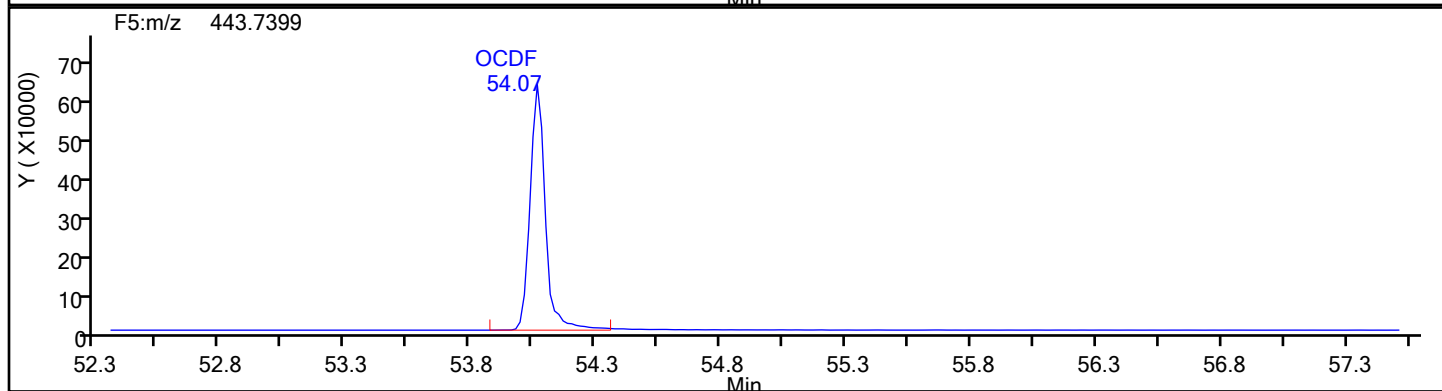
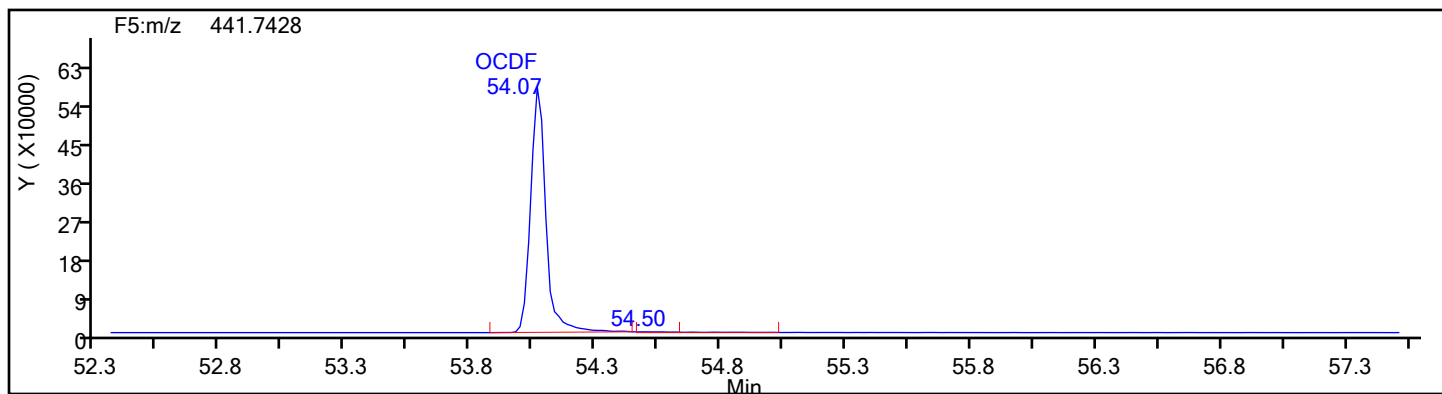
Worklist#: 27242

Sample Line#: 1

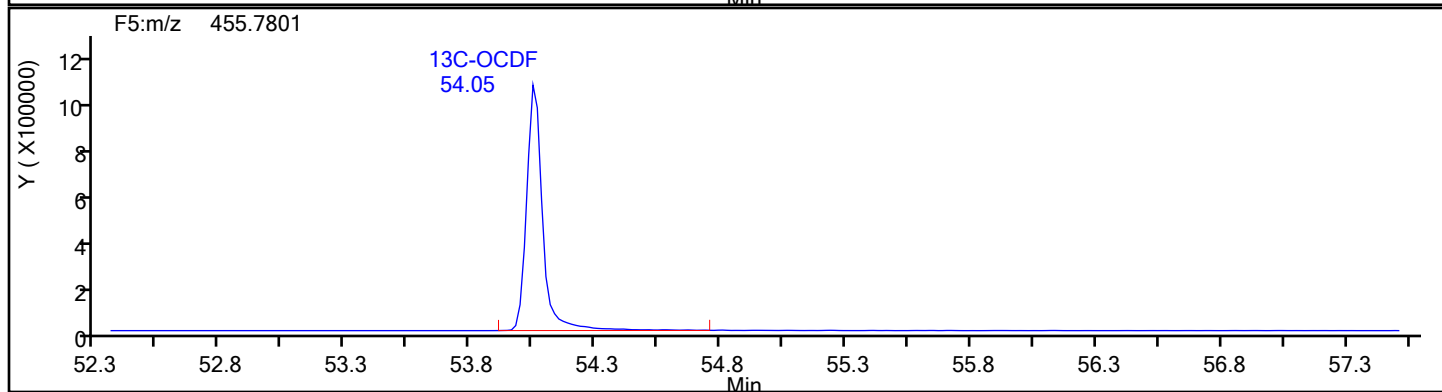
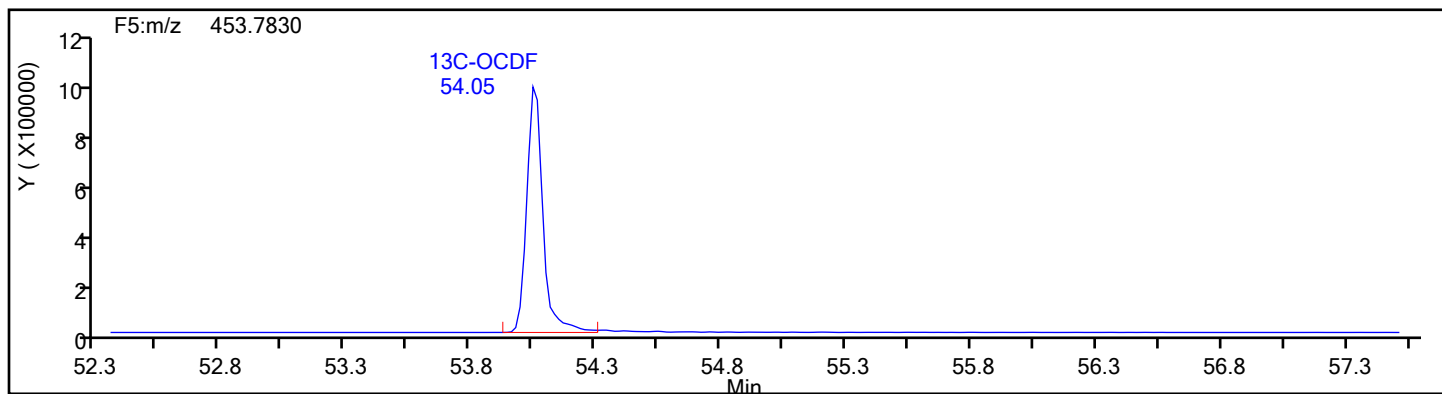
Column Type:

Column Dia:

OCDF



OCDF Standards



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

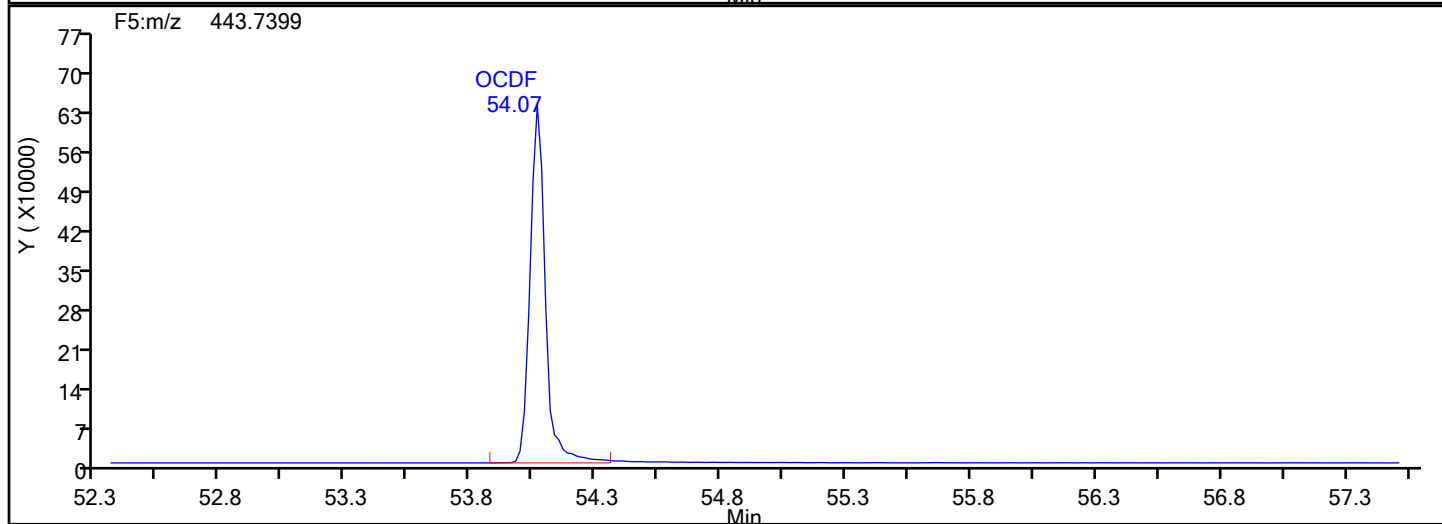
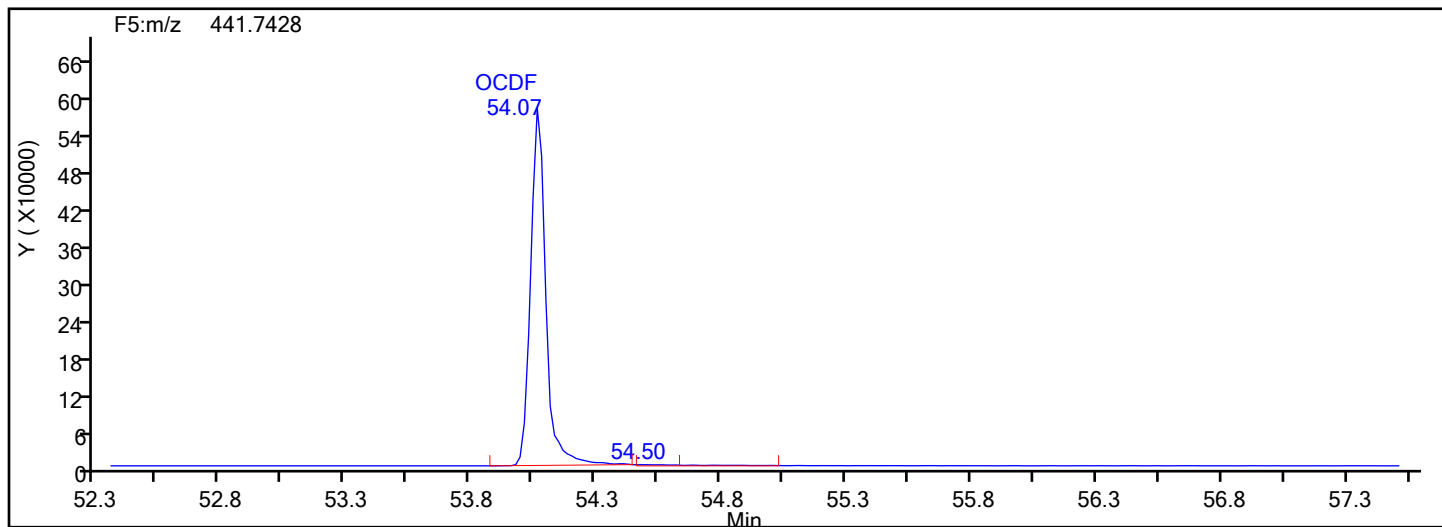
Worklist#: 27242

Sample Line#: 1

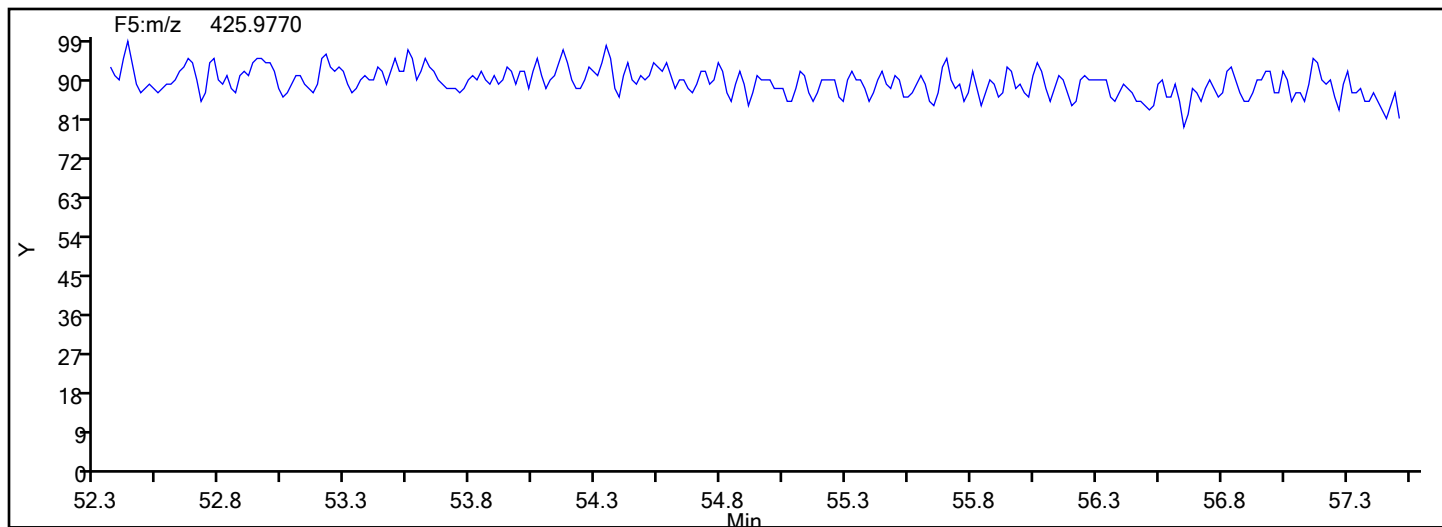
Column Type:

Column Dia:

OCDF



OCDF Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190129-10667.b\d3190129s2.d

Injection Date: 29-Jan-2019 09:51:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

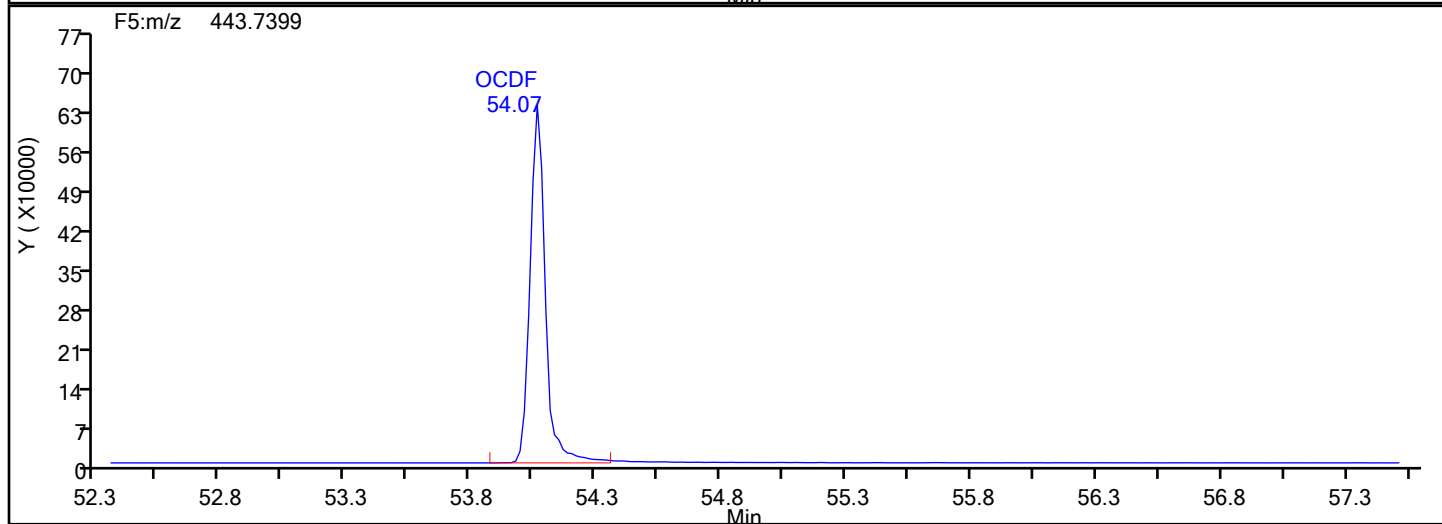
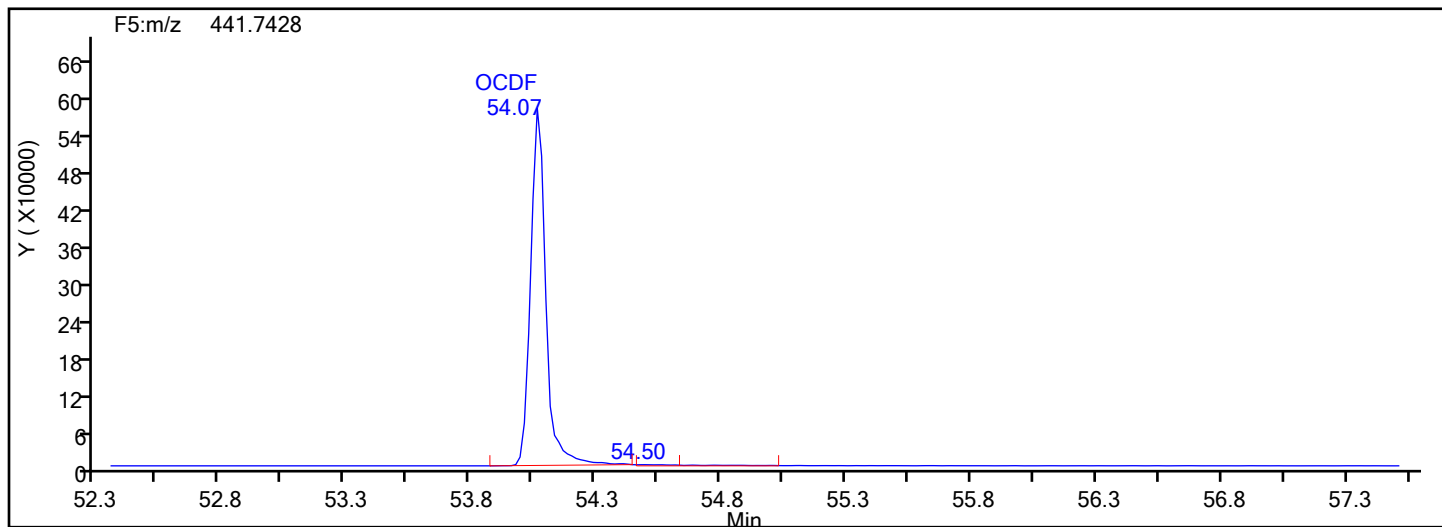
Worklist#: 27242

Sample Line#: 1

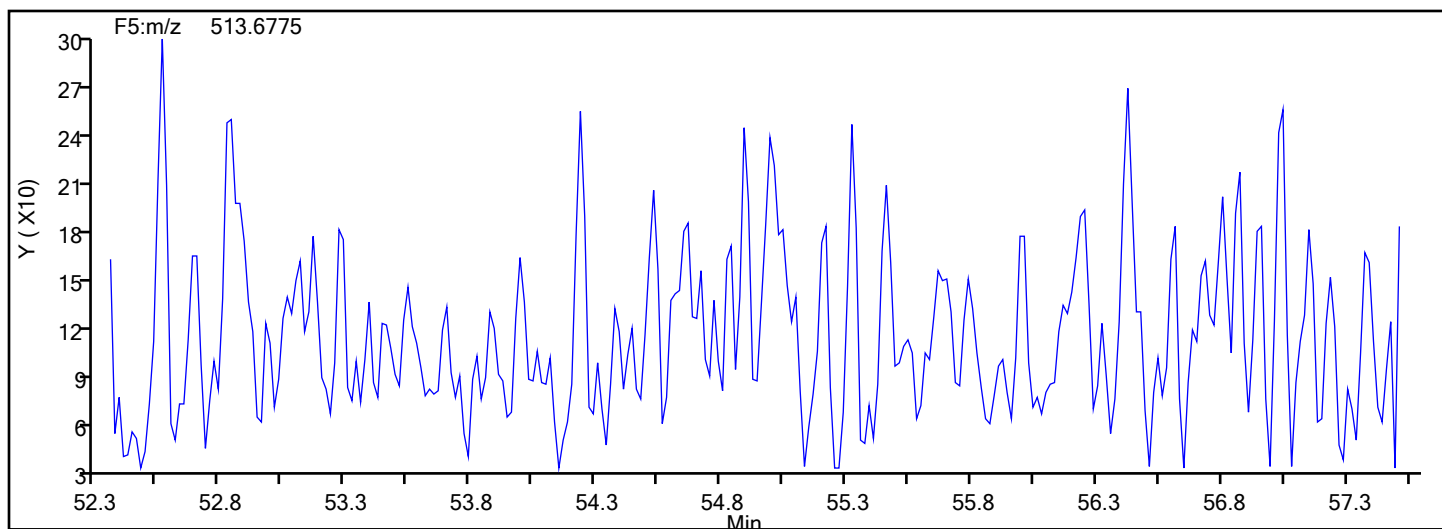
Column Type:

Column Dia:

OCDF



OCDF Interference Mass



TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
 Lims ID: WDM
 Client ID:
 Sample Type: WDM
 Inject. Date: 16-May-2014 10:23:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:83 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 01-Feb-2017 12:19:14 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d

Column 1 : Det: F1(12.07 :34.29)
 Process Host: XAWRK012

First Level Reviewer: gilmorem

Date: 01-Feb-2017 12:19:14

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31:52	1589129	0.78	1.1733	9.827	9.827	0.0525	0.0525		
A Non-2,3,7,8-sub-TCDD	30:20	4299654	0.80	0.0000						
S Total TCDD					9.827	9.827	0.0525	0.0525		
2,3,7,8-TCDF	29:47	2357482	0.78	1.0881	9.693	9.693	0.0581	0.0581		
A Non-2,3,7,8-sub-TCDF	28:61	41764	0.80	0.0000						
S Total TCDF					9.693	9.693	0.0581	0.0581		
1,2,3,7,8-PeCDD	41:01	5982819	1.58	1.0434	50.2	50.2	0.1352	0.1352		
A Non-2,3,7,8-sub-PeCDD	39:56						0.0	0.0		
S Total PeCDD					50.2	50.2	0.1352	0.1352		
1,2,3,7,8-PeCDF	39:18	10286787	1.60	1.1898	49.3	49.3	0.2156	0.2156		
2,3,4,7,8-PeCDF	40:30	9924708	1.58	1.1095	49.7	49.7	0.2037	0.2037		
A Non-2,3,7,8-sub-PeCDF	38:38						0.0	0.0		
S Total PeCDF					99.0	99.0	0.2097	0.2097		
1,2,3,4,7,8-HxCDD	45:15	7476089	1.26	1.1409	50.4	50.4	0.2657	0.2657		
1,2,3,6,7,8-HxCDD	45:22	7598331	1.25	1.1481	49.5	49.5	0.2727	0.2727		
1,2,3,7,8,9-HxCDD	45:46	8317943	1.24	1.2212	51.7	51.7	0.2523	0.2523		
A Non-2,3,7,8-sub-HxCDD	44:42						0.0	0.0		
S Total HxCDD					151.6	151.6	0.2636	0.2636		
1,2,3,4,7,8-HxCDF	44:12	12537626	1.24	1.3629	49.0	49.0	0.2654	0.2654		
1,2,3,6,7,8-HxCDF	44:20	13426640	1.24	1.2762	48.9	48.9	0.2599	0.2599		
2,3,4,6,7,8-HxCDF	45:04	12110442	1.25	1.2654	48.2	48.2	0.2974	0.2974		
1,2,3,7,8,9-HxCDF	46:02	10527214	1.25	1.2573	47.6	47.6	0.3663	0.3663		
A Non-2,3,7,8-sub-HxCDF	44:34						0.0	0.0		
S Total HxCDF					193.7	193.7	0.2972	0.2972		
1,2,3,4,6,7,8-HpCDD	50:11	6801187	1.06	1.1204	48.9	48.9	0.1169	0.1169		
A Non-2,3,7,8-sub-HpCDD	49:35						0.0	0.0		
S Total HpCDD					48.9	48.9	0.1169	0.1169		
1,2,3,4,6,7,8-HpCDF	48:28	11064927	1.04	1.4984	48.4	48.4	0.2343	0.2343		
1,2,3,4,7,8,9-HpCDF	50:49	9279563	1.05	1.3807	49.9	49.9	0.3032	0.3032		
A Non-2,3,7,8-sub-HpCDF	49:39						0.0	0.0		

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
S Total HpCDF					98.3	98.3	0.2688	0.2688		
OCDD	54:18	12317564	0.91	1.2073	102.2	102.2	0.1313	0.1313		
OCDF	54:27	16322450	0.91	1.1162	98.1	98.1	0.1132	0.1132		
D 13C-2,3,7,8-TCDD	31:50	13782525	0.80	1.0709	101.6	101.6	0.2722	0.2722	102	
D 13C-2,3,7,8-TCDF	29:45	22350977	0.78	1.7545	100.6	100.6	0.1848	0.1848	101	
D 13C-1,2,3,7,8-PeCDD	40:60	11420019	1.63	0.8743	103.2	103.2	0.3838	0.3838	103	
D 13C-1,2,3,7,8-PeCDF	39:17	17536794	1.60	1.3704	101.1	101.1	0.1989	0.1989	101	
D 13C-2,3,4,7,8-PeCDF	40:29	18008915	1.61	1.3837	102.8	102.8	0.1970	0.1970	103	
D 13C-1,2,3,4,7,8-HxCDD	45:14	12997422	1.27	0.8772	99.2	99.2	0.2024	0.2024	99.22	
D 13C-1,2,3,6,7,8-HxCDD	45:21	13368313	1.27	0.9171	97.6	97.6	0.1936	0.1936	97.61	
D 13C-1,2,3,4,7,8-HxCDF	44:11	18777500	0.52	1.1892	105.7	105.7	0.1461	0.1461	106	
D 13C-1,2,3,6,7,8-HxCDF	44:19	21493519	0.53	1.4625	98.4	98.4	0.1188	0.1188	98.42	
D 13C-2,3,4,6,7,8-HxCDF	45:03	19873130	0.53	1.3197	100.8	100.8	0.1317	0.1317	101	
D 13C-1,2,3,7,8,9-HxCDF	46:01	17573709	0.54	1.2001	98.1	98.1	0.1448	0.1448	98.06	
D 13C-1,2,3,4,6,7,8-HpCDD	50:09	12409981	1.07	0.8155	101.9	101.9	0.3650	0.3650	102	
D 13C-1,2,3,4,6,7,8-HpCDF	48:27	15245672	0.46	1.0496	97.3	97.3	0.1531	0.1531	97.26	
D 13C-1,2,3,4,7,8,9-HpCDF	50:48	13475063	0.45	0.8947	100.9	100.9	0.1796	0.1796	101	
D 13C-OCDD	54:17	19967001	0.92	0.7044	189.8	189.8	0.0935	0.0935	94.91	
D 13C-OCDF	54:26	29828160	0.89	1.0615	188.2	188.2	0.1211	0.1211	94.09	
\$ 37Cl4-2,3,7,8-TCDD	31:53	1540857		1.2266	9.922	9.922	0.0141	0.0141	99.22	
* 13C-1,2,3,4-TCDD	31:18	12661775	0.79	9.1E+04	100.0	100.0				
* 13C-1,2,3,7,8,9-HxCDD	45:45	14933512	1.23	1E+05	100.0	100.0				
1,3,6,8-TCDF	23:12	2705807	0.78							
1,3,6,8-TCDD	25:43	1493428	0.79							
1,2,8,9-TCDF	34:49	2207414	0.79							
1,2,8,9-TCDD	34:56	1027901	1.53							R
1,3,4,6,8-PeCDF	35:30	9418858	1.58							
1,2,4,7,9-PeCDD	38:12	5769231	1.58							
1,2,3,8,9-PeCDD	41:40	6403188	1.58							
1,2,3,8,9-PeCDF	41:47	9220677	1.58							
1,2,3,4,6,8-HxCDF	42:58	11593665	1.24							
1,2,4,6,7,9-HxCDD	43:38	8590777	1.29							
1,2,3,4,8,9-HxCDF	46:10	10545581	1.26							
1,2,3,4,6,7,9-HpCDD	48:59	7139183	1.04							

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

61WDML3OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
 Lims ID: WDM
 Client ID:
 Sample Type: WDM
 Inject. Date: 16-May-2014 10:23:00 ALS Bottle#: 0 Worklist Smp#: 1
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: WO=4104:83 Meth=F8o Dil=1
 Misc. Info.: Inst=d2a/1182082 Batch=20140516i Ccal=D3140515S2
 Operator ID: DavidsonM Instrument ID: D2A
 Method: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 01-Feb-2017 12:19:14 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: XAWRK012

First Level Reviewer: gilmorem

Date: 01-Feb-2017 12:19:14

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,7,8-TCDD											
319.8965	31:52	31:52	0	1.001	696529	69222	209	522	331		
321.8936	31:53	31:52	1	1.002	892600	89318	140	350	638	0.78(0.65-0.89)	
A Non-2,3,7,8-sub-TCDD											
319.8965	31:21	30:20	61		634630	64877	209	522	310		
321.8936	31:21	30:20	61		795249	85115	140	350	608	0.80(0.65-0.89)	
319.8965	31:35	30:20	75		596138	66085	209	522	316		
321.8936	31:35	30:20	75		756200	78976	140	350	564	0.79(0.65-0.89)	
319.8965	32:23	30:20	123		679460	67333	209	522	322		
321.8936	32:22	30:20	122		837977	80267	140	350	573	0.81(0.65-0.89)	
2,3,7,8-TCDF											
303.9016	29:47	29:47	0	1.001	1030383	110691	179	447	618		
305.8987	29:47	29:47	0	1.001	1327099	145355	450	1125	323	0.78(0.65-0.89)	
A Non-2,3,7,8-sub-TCDF											
303.9016	28:39	28:61	-21		18518	2522	179	447	14		
305.8987	28:40	28:61	-20		23246	3134	450	1125	7	0.80(0.65-0.89)	
1,2,3,7,8-PeCDD											
355.8546	41:01	41:01	0	1.000	3663513	865905	1136	2840	762		
357.8516	41:01	41:01	0	1.000	2319306	553569	374	935	1480	1.58(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDD											
355.8546	39:56						1136	2840			
357.8516	39:56						374	935			
1,2,3,7,8-PeCDF											
339.8597	39:18	39:18	0	1.000	6334583	1305396	2242	5605	582		
341.8567	39:18	39:18	0	1.000	3952204	823049	1407	3517	585	1.60(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,4,7,8-PeCDF											
339.8597	40:30	40:30	0	1.000	6077933	1398614	2242	5605	624		
341.8567	40:30	40:30	0	1.000	3846775	876157	1407	3517	623	1.58(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDF											
339.8597	38:38						2242	5605			
341.8567	38:38						1407	3517			
1,2,3,4,7,8-HxCDD											
389.8158	45:15	45:15	0	1.000	4166912	1065660	2295	5737	464		
391.8127	45:15	45:15	0	1.000	3309177	841026	1727	4317	487	1.26(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45:22	45:22	0	1.000	4226872	1011650	2295	5737	441		
391.8127	45:22	45:22	0	1.000	3371459	826469	1727	4317	479	1.25(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45:46	45:46	0	1.012	4607847	1053576	2295	5737	459		
391.8127	45:46	45:46	0	1.012	3710096	840399	1727	4317	487	1.24(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDD											
389.8158	44:42						2295	5737			
391.8127	44:42						1727	4317			
1,2,3,4,7,8-HxCDF											
373.8208	44:12	44:12	0	1.000	6951531	1877297	4021	10052	467		
375.8178	44:12	44:12	0	1.000	5586095	1516685	3318	8295	457	1.24(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44:20	44:20	0	1.000	7444736	1903851	4021	10052	473		
375.8178	44:20	44:20	0	1.000	5981904	1556381	3318	8295	469	1.24(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	45:04	45:04	0	1.000	6729390	1682827	4021	10052	419		
375.8178	45:04	45:04	0	1.000	5381052	1311981	3318	8295	395	1.25(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	46:02	46:02	0	1.000	5854129	1415565	4021	10052	352		
375.8178	46:02	46:02	0	1.000	4673085	1123767	3318	8295	339	1.25(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDF											
373.8208	44:34						4021	10052			
375.8178	44:34						3318	8295			
1,2,3,4,6,7,8-HpCDD											
423.7767	50:11	50:11	0	1.001	3502420	651977	546	1365	1194		
425.7737	50:10	50:11	-1	1.000	3298767	623072	664	1660	938	1.06(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											
423.7767	49:35						546	1365			
425.7737	49:35						664	1660			
1,2,3,4,6,7,8-HpCDF											
407.7817	48:28	48:28	0	1.000	5628277	1194618	2211	5527	540		
409.7788	48:28	48:28	0	1.000	5436650	1152269	2265	5662	509	1.04(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50:49	50:49	0	1.000	4761486	943596	2211	5527	427		
409.7788	50:49	50:49	0	1.000	4518077	912841	2265	5662	403	1.05(0.88-1.20)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-HpCDF											
407.7817	49:39						2211	5527			
409.7788	49:39						2265	5662			
OCDD											
457.7377	54:18	54:18	0	1.000	5864993	1424854	961	2402	1483		
459.7348	54:18	54:18	0	1.000	6452571	1540991	550	1375	2802	0.91(0.76-1.02)	
OCDF											
441.7428	54:27	54:27	0	1.000	7783500	1914344	949	2372	2017		
443.7399	54:27	54:27	0	1.000	8538950	2069182	921	2302	2247	0.91(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	31:50	31:50	0	1.017	6142060	623396	1089	2722	572		
333.9338	31:49	31:50	-1	1.016	7640465	793194	501	1252	1583	0.80(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	29:45	29:45	0	0.951	9828273	1091149	1288	3220	847		
317.9389	29:45	29:45	0	0.951	12522704	1394107	480	1200	2904	0.78(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40:60	40:60	0	1.310	7072990	1653783	1563	3907	1058		
369.8919	40:60	40:60	0	1.310	4347029	1022227	267	667	3829	1.63(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	39:17	39:17	0	1.255	10799529	2182297	1003	2507	2176		
353.8970	39:17	39:17	0	1.255	6737265	1373259	484	1210	2837	1.60(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40:29	40:29	0	1.294	11096035	2464519	1003	2507	2457		
353.8970	40:29	40:29	0	1.294	6912880	1570847	484	1210	3246	1.61(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	45:14	45:14	0	0.989	7273389	1861481	749	1872	2485		
403.8529	45:14	45:14	0	0.989	5724033	1455179	1658	4145	878	1.27(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45:21	45:21	0	0.991	7479523	1801159	749	1872	2405		
403.8529	45:21	45:21	0	0.991	5888790	1410042	1658	4145	850	1.27(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	44:11	44:11	0	0.966	6451490	1760136	773	1932	2277		
385.8610	44:11	44:11	0	0.966	12326010	3312655	1583	3957	2093	0.52(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	44:19	44:19	0	0.969	7484164	1929971	773	1932	2497		
385.8610	44:19	44:19	0	0.969	14009355	3601488	1583	3957	2275	0.53(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	45:03	45:03	0	0.985	6852361	1683655	773	1932	2178		
385.8610	45:03	45:03	0	0.985	13020769	3192337	1583	3957	2017	0.53(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	46:01	46:01	0	1.006	6155940	1404414	773	1932	1817		
385.8610	46:01	46:01	0	1.006	11417769	2578908	1583	3957	1629	0.54(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	50:09	50:09	0	1.096	6418552	1192690	2111	5277	565		
437.8140	50:09	50:09	0	1.096	5991429	1116969	1925	4812	580	1.07(0.88-1.20)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48:27	48:27	0	1.059	4814800	1019155	755	1887	1350		
419.8220	48:27	48:27	0	1.059	10430872	2168312	1424	3560	1523	0.46(0.51-0.37)	
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50:48	50:48	0	1.110	4198433	838216	755	1887	1110		
419.8220	50:48	50:48	0	1.110	9276630	1834729	1424	3560	1288	0.45(0.37-0.51)	
13C-OCDD											
469.7780	54:17	54:17	0	1.187	9561386	2241485	518	1295	4327		
471.7750	54:17	54:17	0	1.187	10405615	2525718	375	937	6735	0.92(0.76-1.02)	
13C-OCDF											
453.7830	54:26	54:26	0	1.190	14032219	3509504	579	1447	6061		
455.7801	54:26	54:26	0	1.190	15795941	3888947	1164	2910	3341	0.89(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31:53	31:53	0	1.019	1540857	163270	94	235	1737		
13C-1,2,3,4-TCDD											
331.9368	31:18	31:18	0		5600787	604972	1089	2722	556		
333.9338	31:18	31:18	0		7060988	758389	501	1252	1514	0.79(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45:45	45:45	0		8233327	1900497	749	1872	2537		
403.8529	45:45	45:45	0		6700185	1489143	1658	4145	898	1.23(1.05-1.43)	
1,3,6,8-TCDF											
303.9016	23:12	23:12	0		1188062	179703	179	447	1004		
305.8987	23:12	23:12	0		1517745	224499	450	1125	499	0.78(0.65-0.89)	
1,3,6,8-TCDD											
319.8965	25:43	25:43	0		659431	89773	209	522	430		
321.8936	25:43	25:43	0		833997	110819	140	350	792	0.79(0.65-0.89)	
1,2,8,9-TCDF											
303.9016	34:49	34:49	0		976870	119878	179	447	670		
305.8987	34:49	34:49	0		1230544	148928	450	1125	331	0.79(0.65-0.89)	
1,2,8,9-TCDD											
319.8965	34:56	34:56	0		621667	77237	209	522			
321.8936	34:56	34:56	0		406234	99648	140	350		1.53(0.65-0.89)	R
1,3,4,6,8-PeCDF											
339.8597	35:30	35:30	0		5766695	802508	2242	5605	358		
341.8567	35:30	35:30	0		3652163	508637	1407	3517	362	1.58(1.32-1.78)	
1,2,4,7,9-PeCDD											
355.8546	38:12	38:12	0		3532025	602440	1136	2840	530		
357.8516	38:12	38:12	0		2237206	374750	374	935	1002	1.58(1.32-1.78)	
1,2,3,8,9-PeCDD											
355.8546	41:40	41:40	0		3922341	906446	1136	2840	798		
357.8516	41:40	41:40	0		2480847	587482	374	935	1571	1.58(1.32-1.78)	
1,2,3,8,9-PeCDF											
339.8597	41:47	41:47	0		5640415	1328106	2242	5605	592		
341.8567	41:47	41:47	0		3580262	862011	1407	3517	613	1.58(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
1,2,3,4,6,8-HxCDF											
373.8208	42:58	42:58	0		6408064	1762377	4021	10052	438		
375.8178	42:58	42:58	0		5185601	1395659	3318	8295	421	1.24(1.05-1.43)	
1,2,4,6,7,9-HxCDD											
389.8158	43:38	43:38	0		4834597	1263198	2295	5737	550		
391.8127	43:38	43:38	0		3756180	1000999	1727	4317	580	1.29(1.05-1.43)	
1,2,3,4,8,9-HxCDF											
373.8208	46:10	46:10	0		5877002	1308455	4021	10052	325		
375.8178	46:10	46:10	0		4668579	1034589	3318	8295	312	1.26(1.05-1.43)	
1,2,3,4,6,7,9-HpCDD											
423.7767	48:59	48:59	0		3636651	724215	546	1365	1326		
425.7737	48:59	48:59	0		3502532	696931	664	1660	1050	1.04(0.88-1.20)	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

61WDML3OP_00001

Amount Added: 20.00

Units: uL

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
 Lims ID: WDM
 Client ID:
 Inject. Date: 16-May-2014 10:23:00 Dil. Factor: 1.0000
 Sample Type: WDM, Window Defining Mix
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 1

Non-2,3,7,8-sub-TCDD, RT: 30.308

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	319.8965 Area	319.8965 Height	321.8936 Area	321.8936 Height	Amount	Ratio	Flags
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31:21	634630	64877	795249	85115		0.80	
31:35	596138	66085	756200	78976		0.79	
32:23	679460	67333	837977	80267		0.81	

Signal Totals:

1910228	198295	2389426	244358
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Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	4299654	442653				0.80	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (4299654 * 0.0) / (0 * 0.000)

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
 Lims ID: WDM
 Client ID:
 Inject. Date: 16-May-2014 10:23:00 Dil. Factor: 1.0000
 Sample Type: WDM, Window Defining Mix
 Instrument ID: D2A Operator: DavidsonM
 Lims Batch ID: 7768 Lims Sample ID: 1

Non-2,3,7,8-sub-TCDF, RT: 28.995

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
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Invalid SimRptGroup

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
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28:39 18518 2522 23246 3134 0.80

Signal Totals:

18518 2522 23246 3134

Total Responses:

	Rx Area	Rx Height			Amount	Ratio	Flags
	41764	5656				0.80	

On-Column Amount = (Rx * Qis) / (Ris * RRFn)

Quant By: Area

Amount: 0.0 = (41764 * 0.0) / (0 * 0.000)

TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

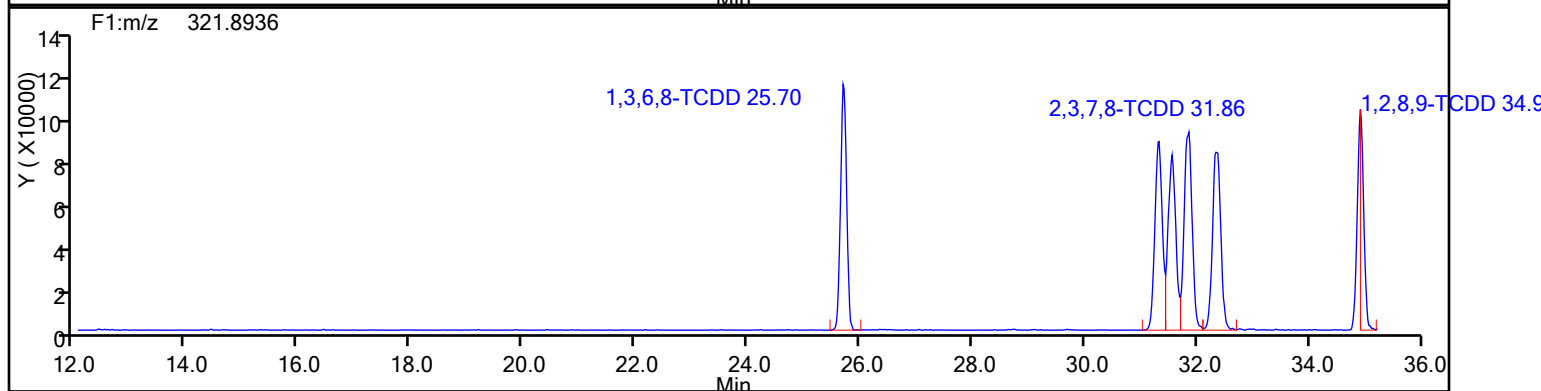
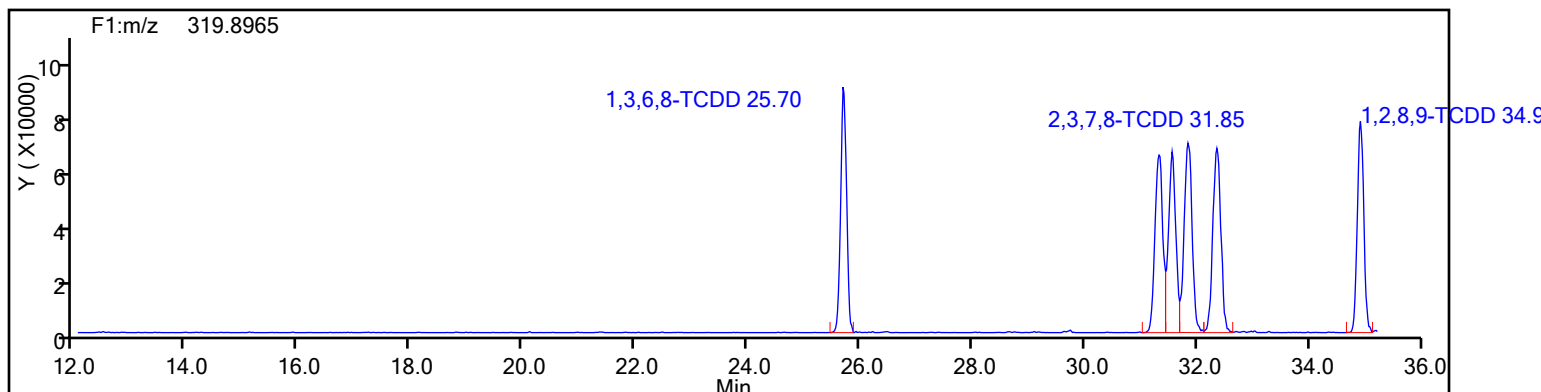
Worklist#: 7768

Sample Line#: 1

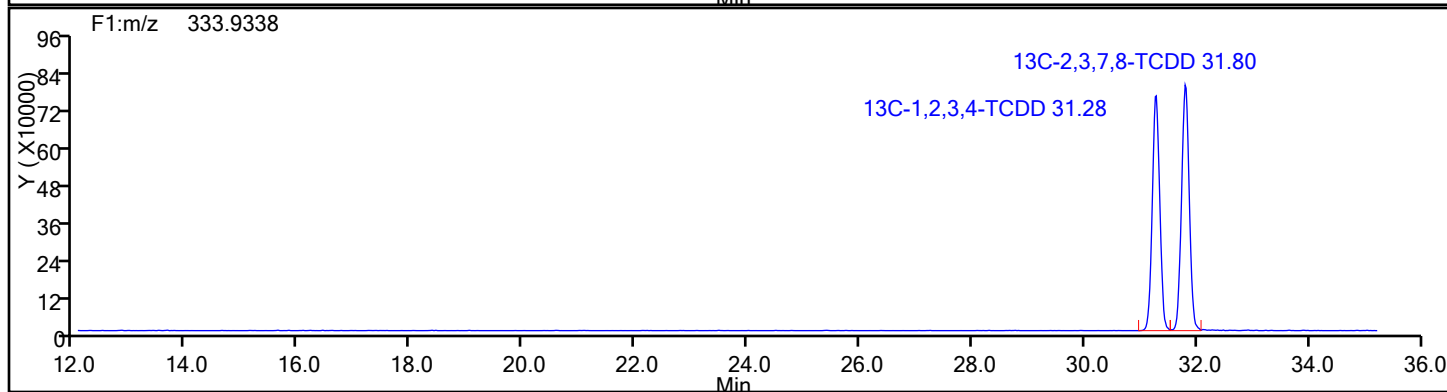
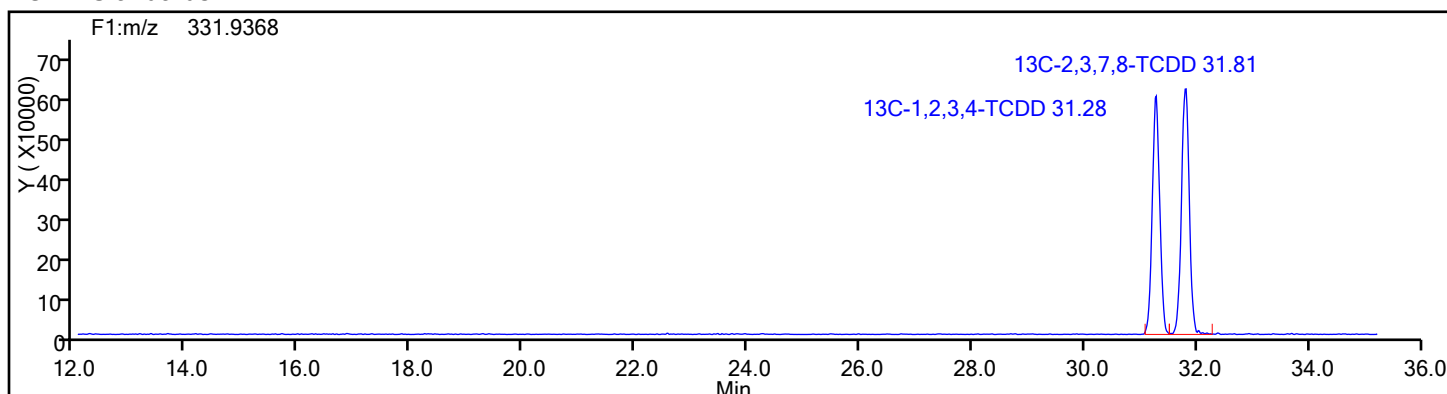
Column Type:

Column Dia:

TCDD

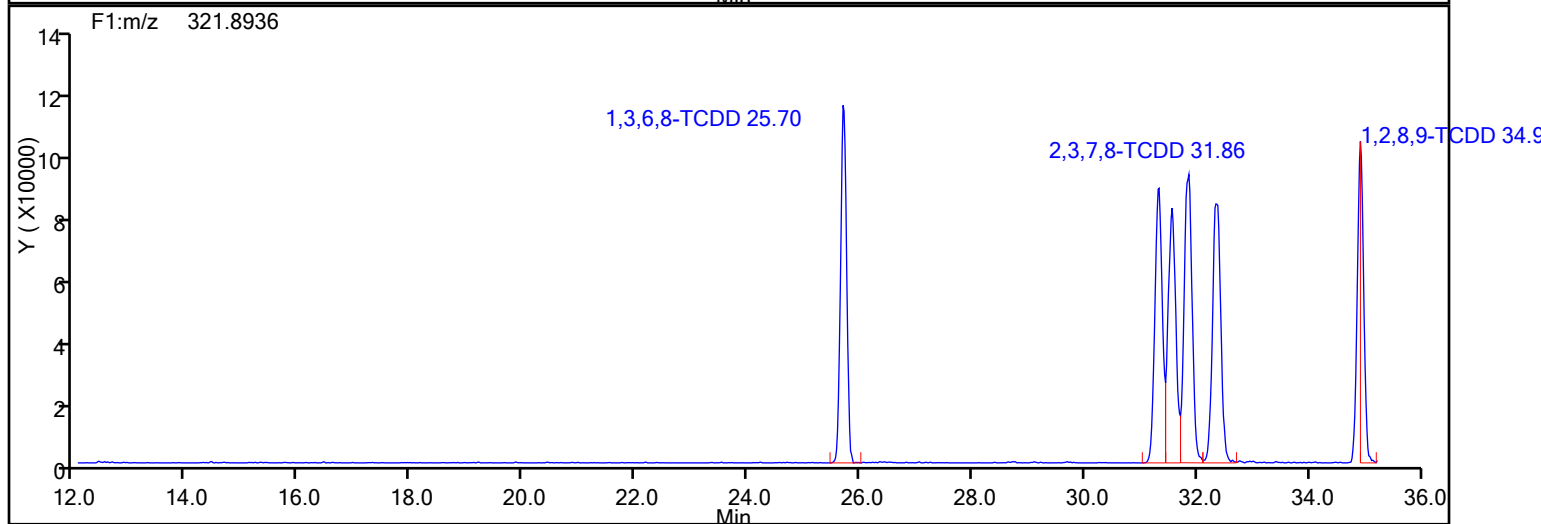
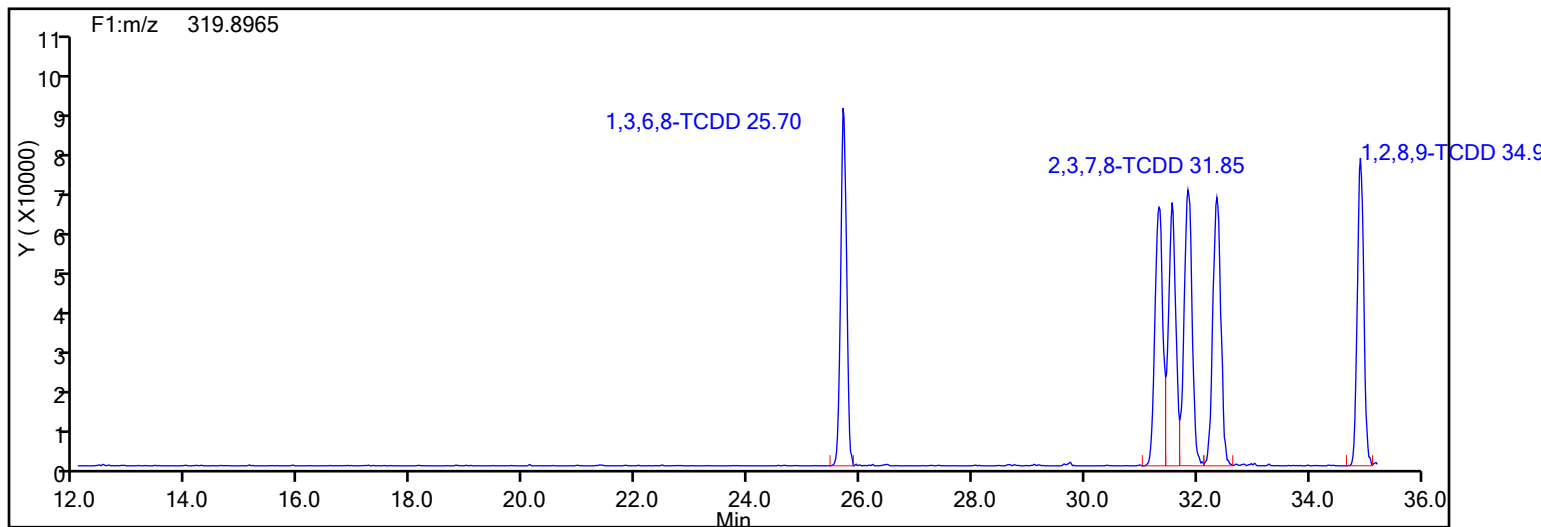


TCDD Standards

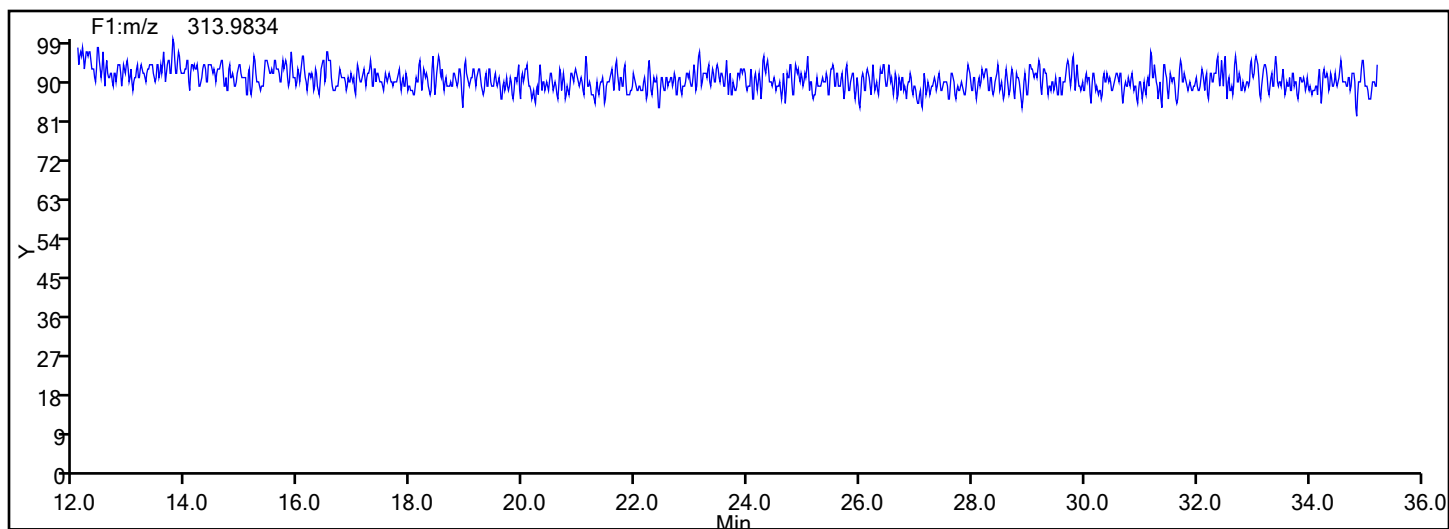


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
Injection Date: 16-May-2014 10:23:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 1
Column Type: Column Dia:
TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

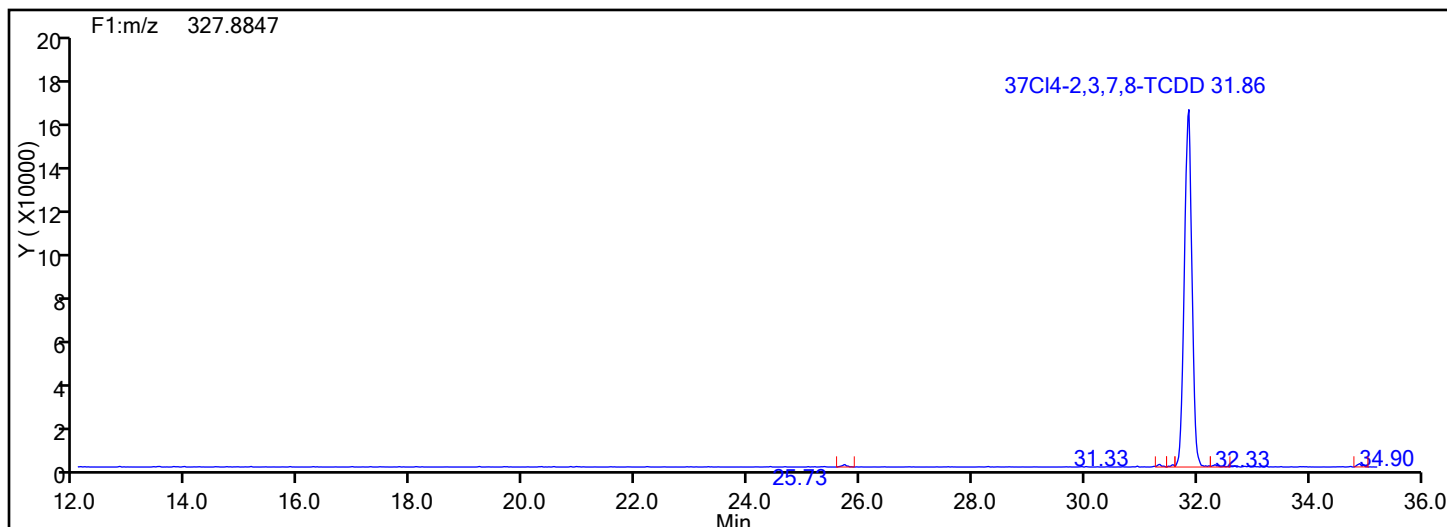
Worklist#: 7768

Sample Line#: 1

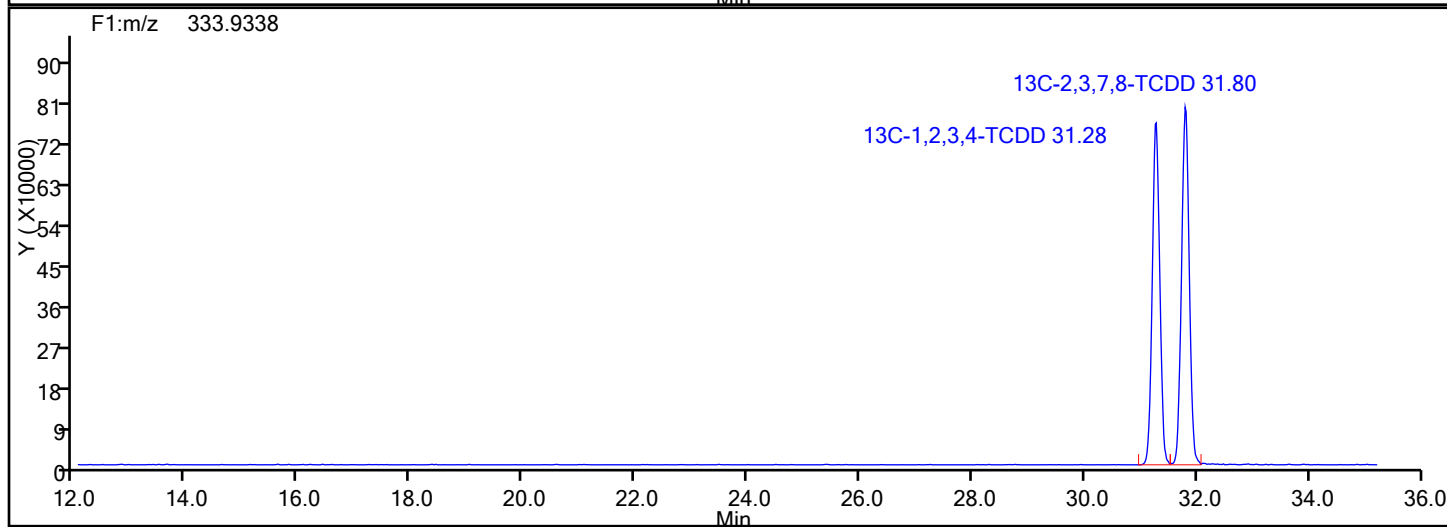
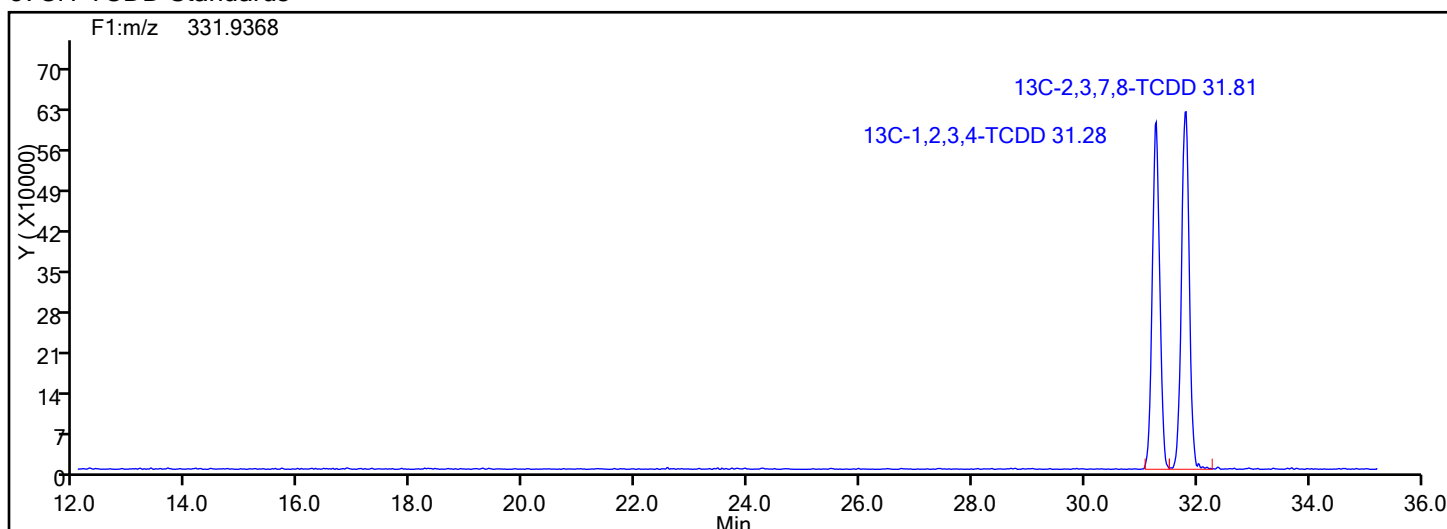
Column Type:

Column Dia:

37Cl4-TCDD

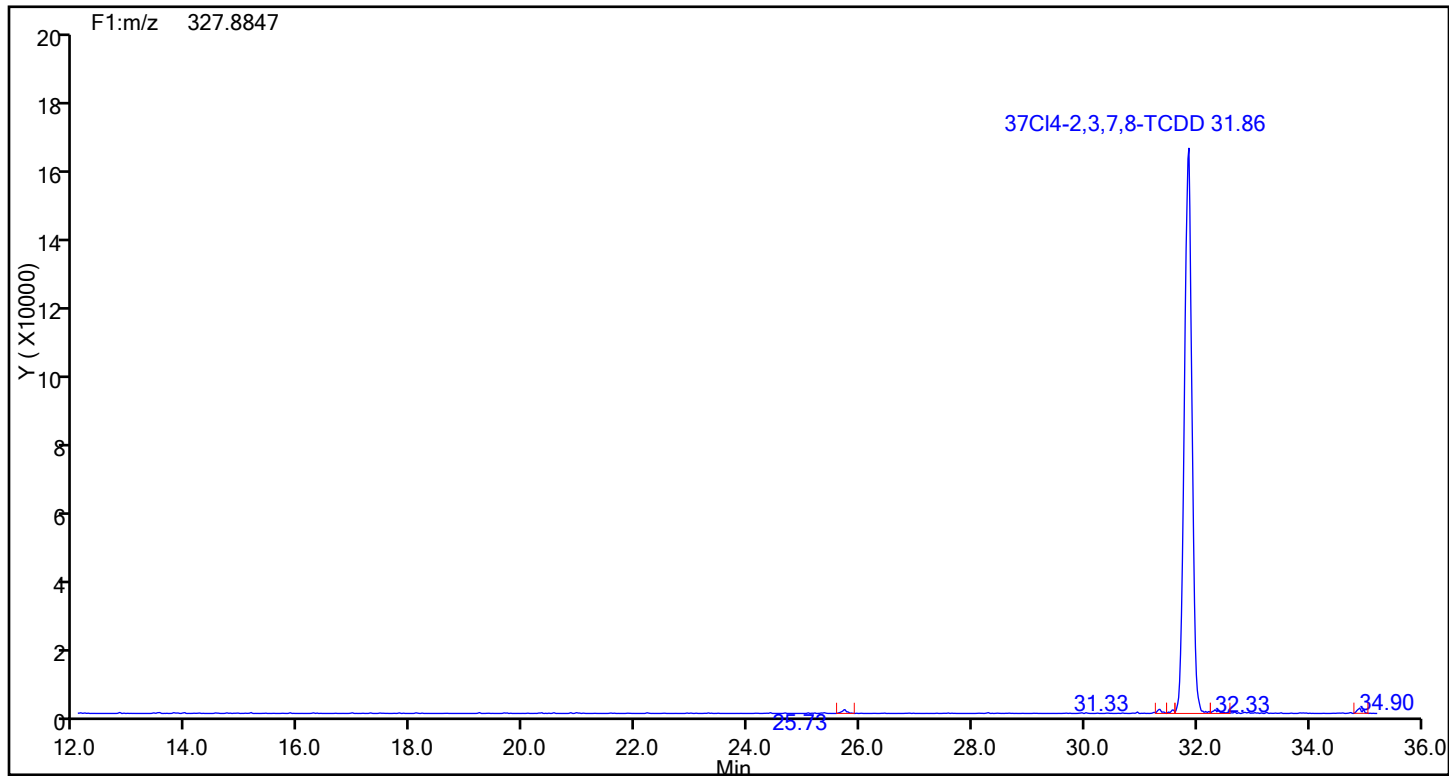


37Cl4-TCDD Standards

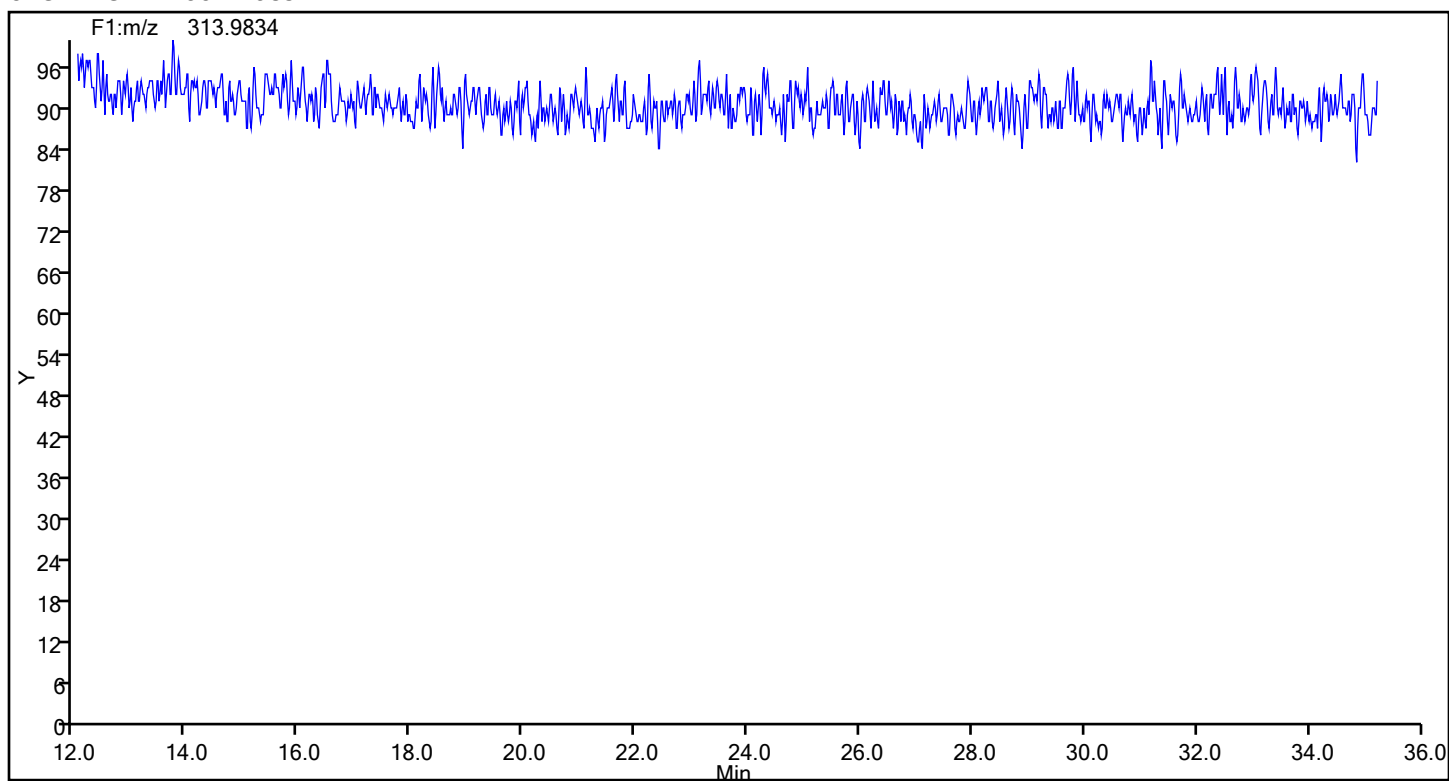


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
Injection Date: 16-May-2014 10:23:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 1
Column Type: Column Dia:
37Cl4-TCDD



37Cl4-TCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

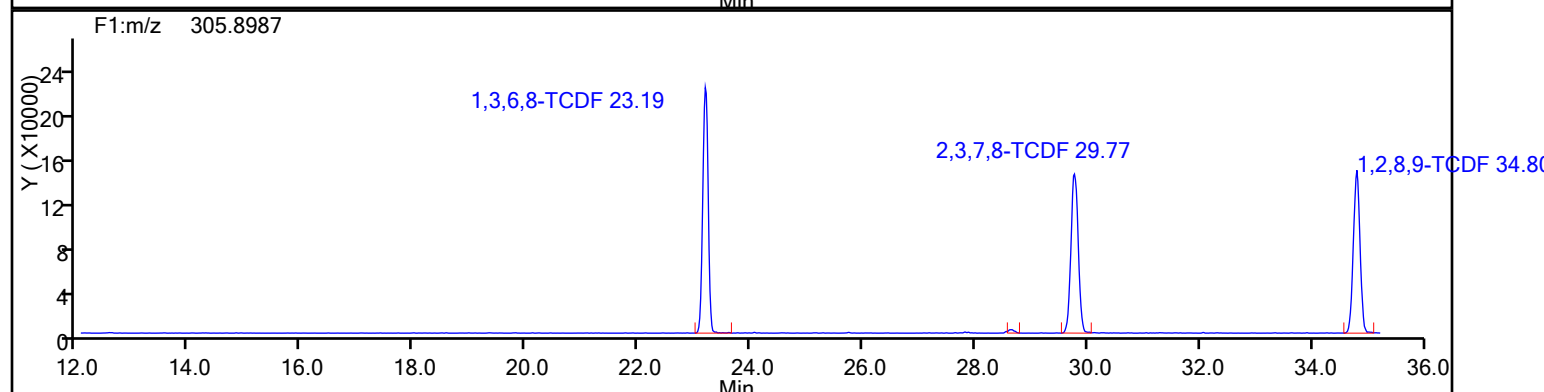
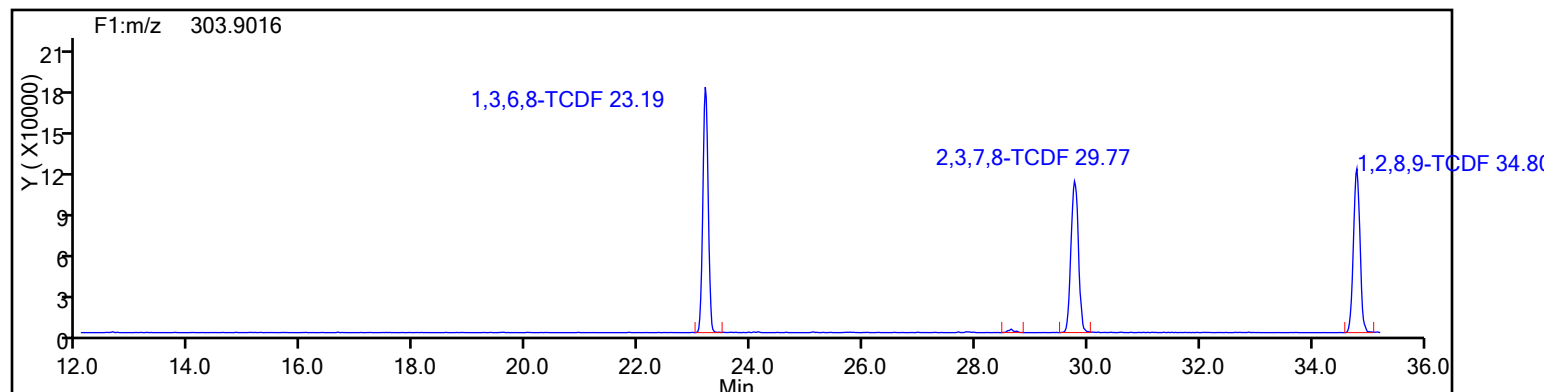
Worklist#: 7768

Sample Line#: 1

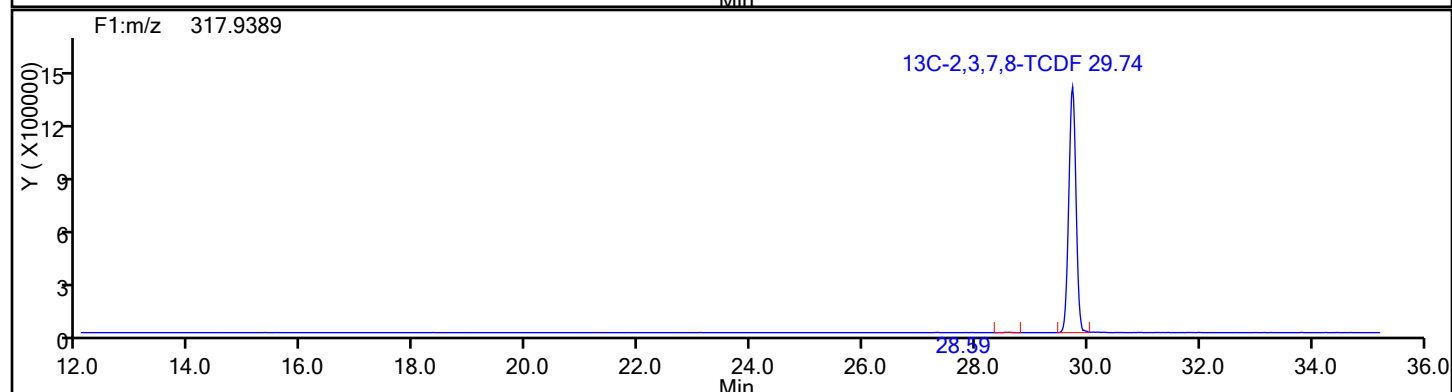
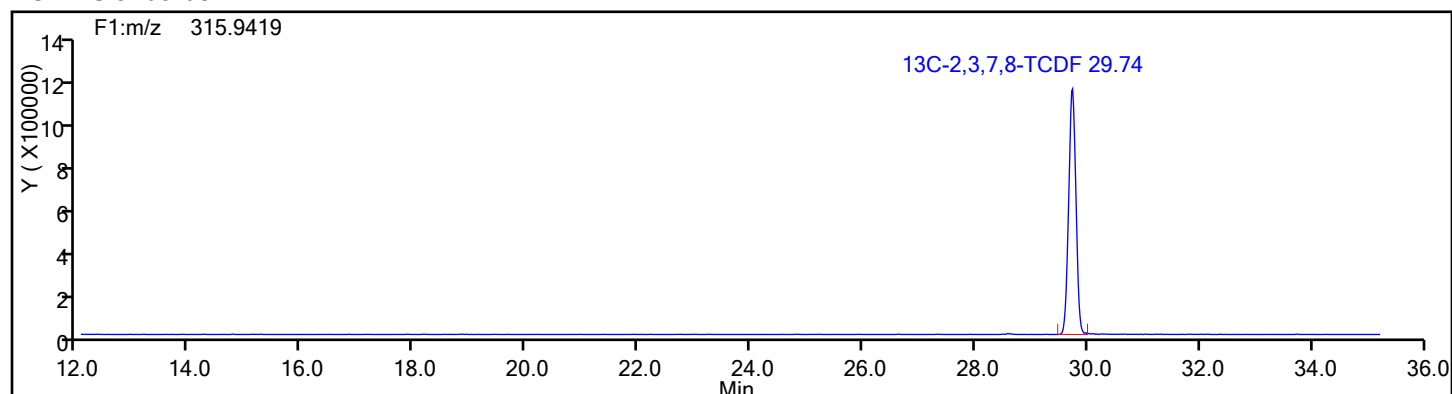
Column Type:

Column Dia:

TCDF

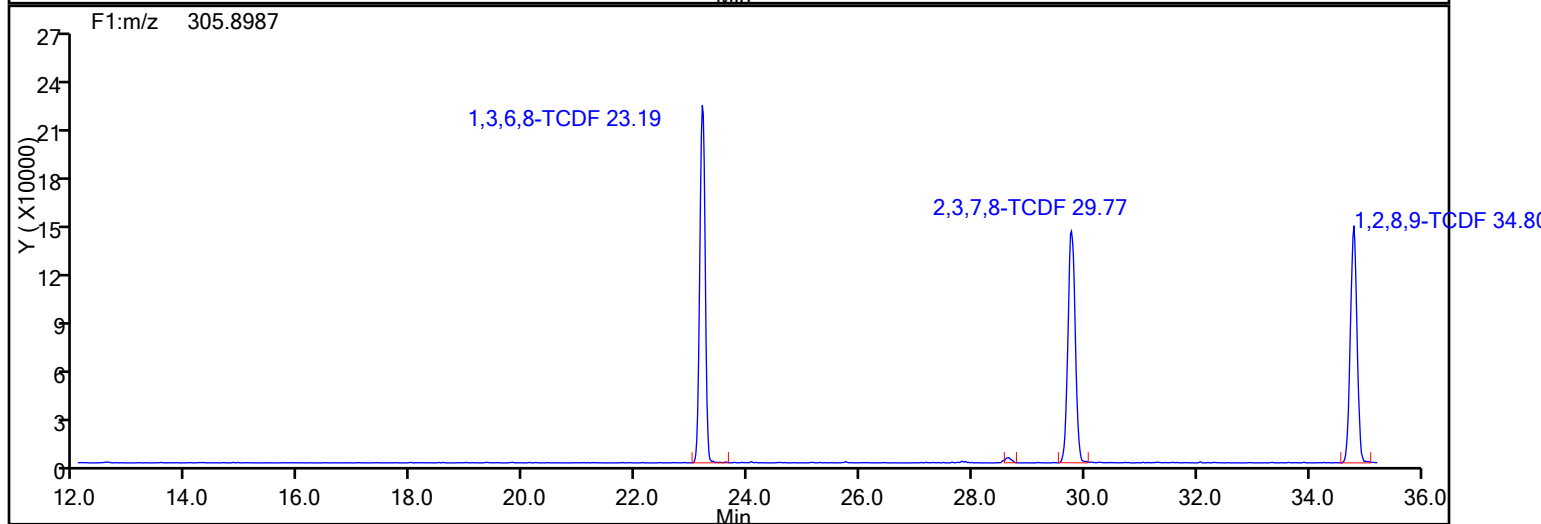
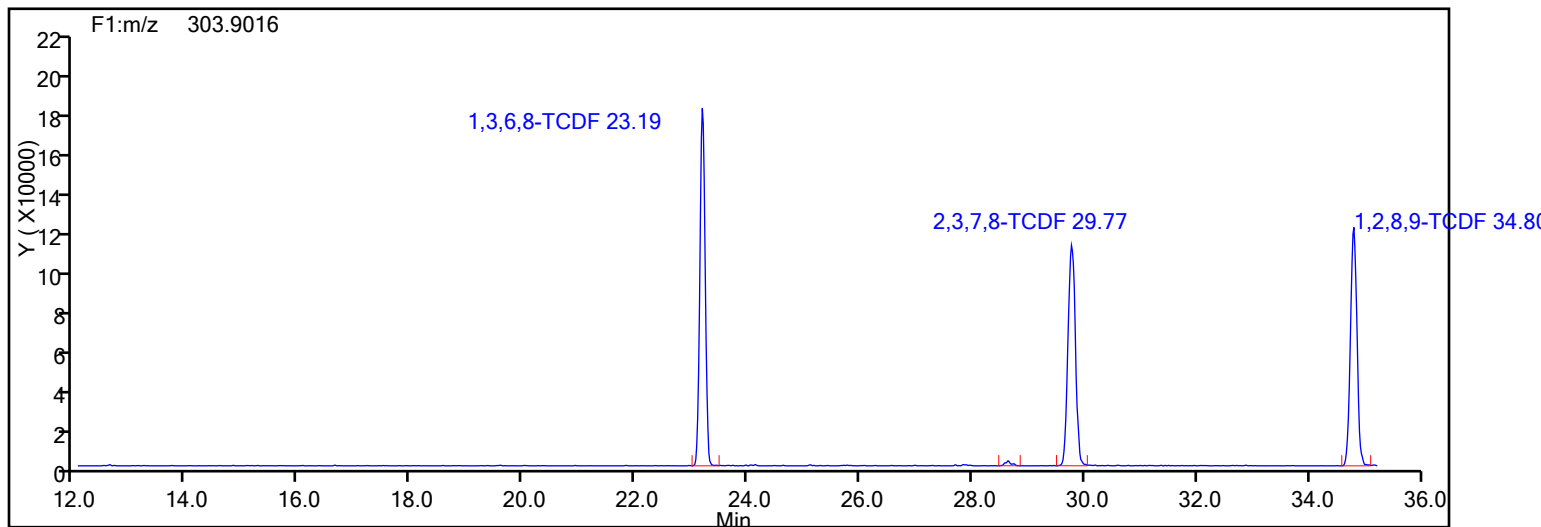


TCDF Standards

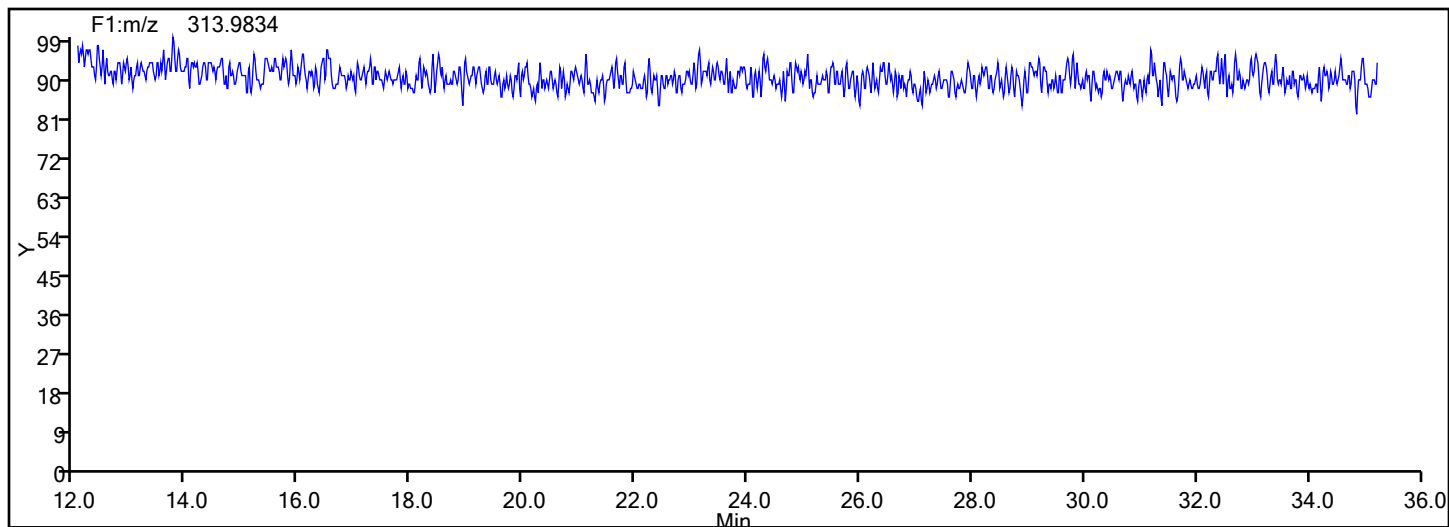


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
Injection Date: 16-May-2014 10:23:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 1
Column Type: Column Dia:
TCDF

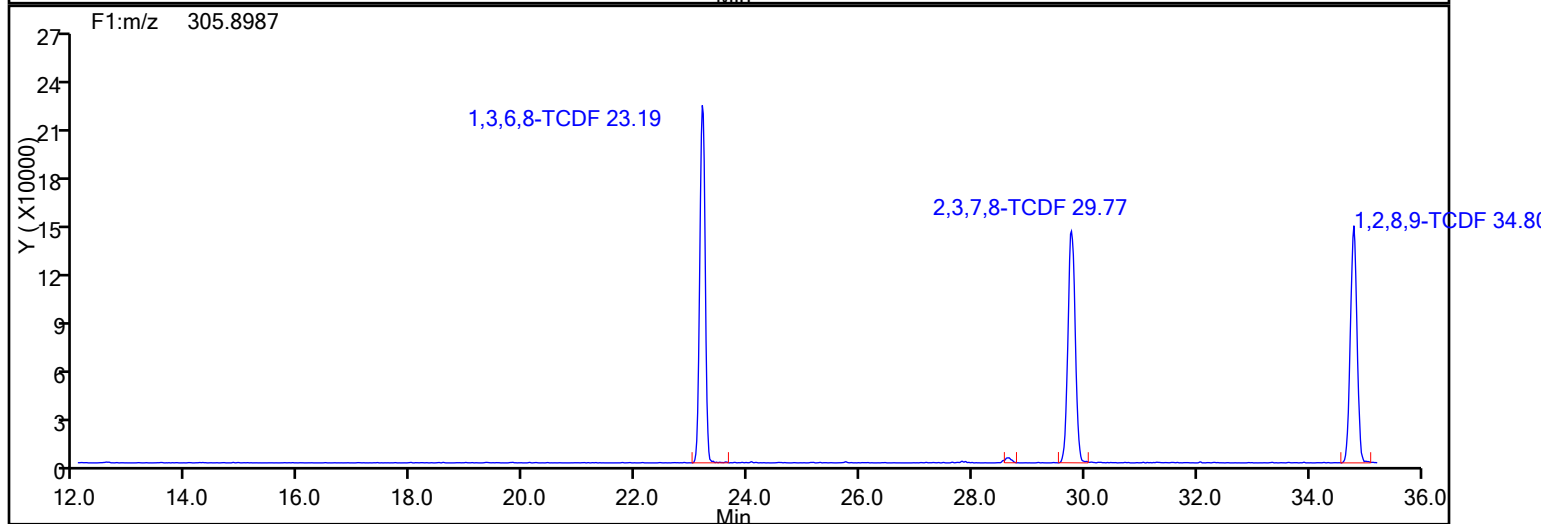
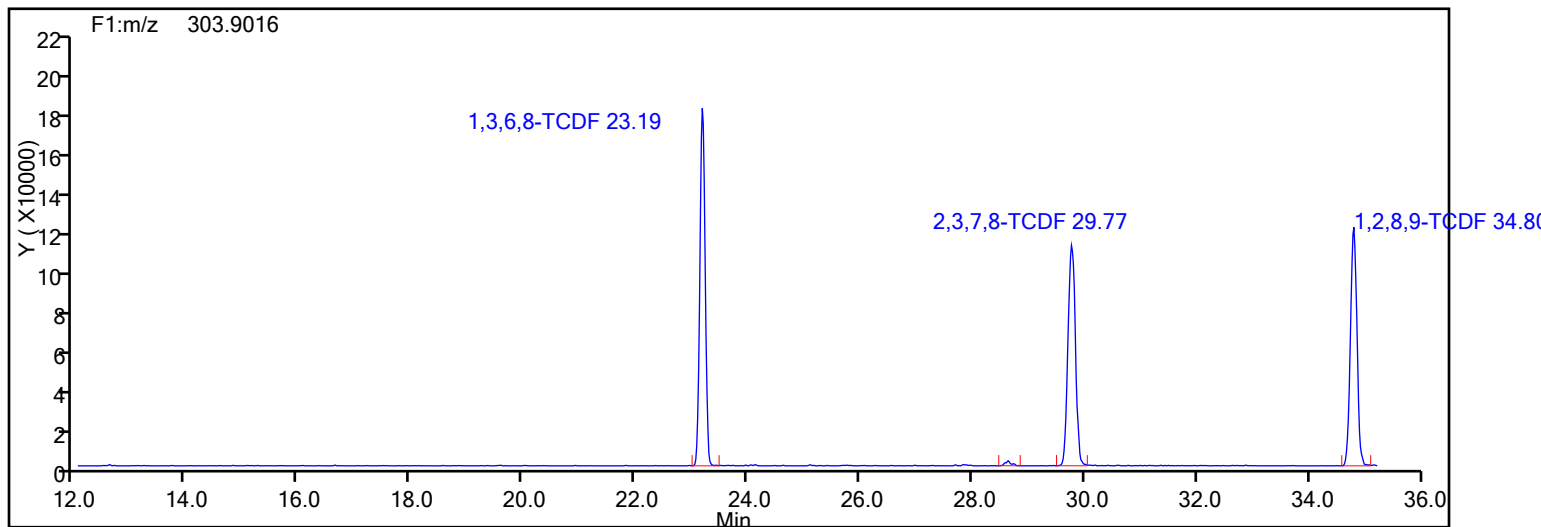


TCDF Lock Mass

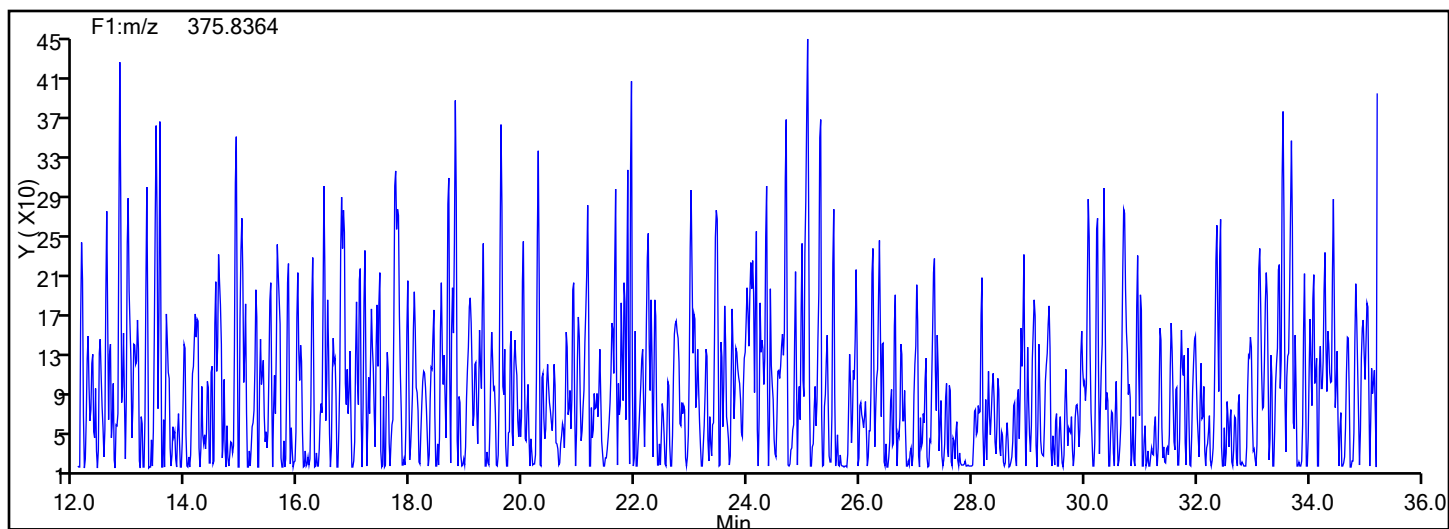


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
Injection Date: 16-May-2014 10:23:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 1
Column Type: Column Dia:
TCDF



TCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

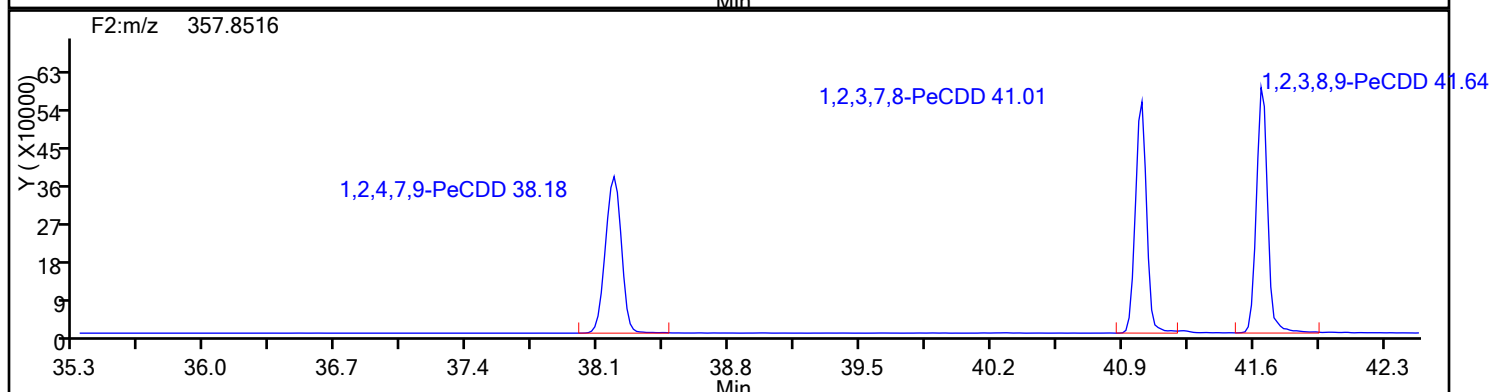
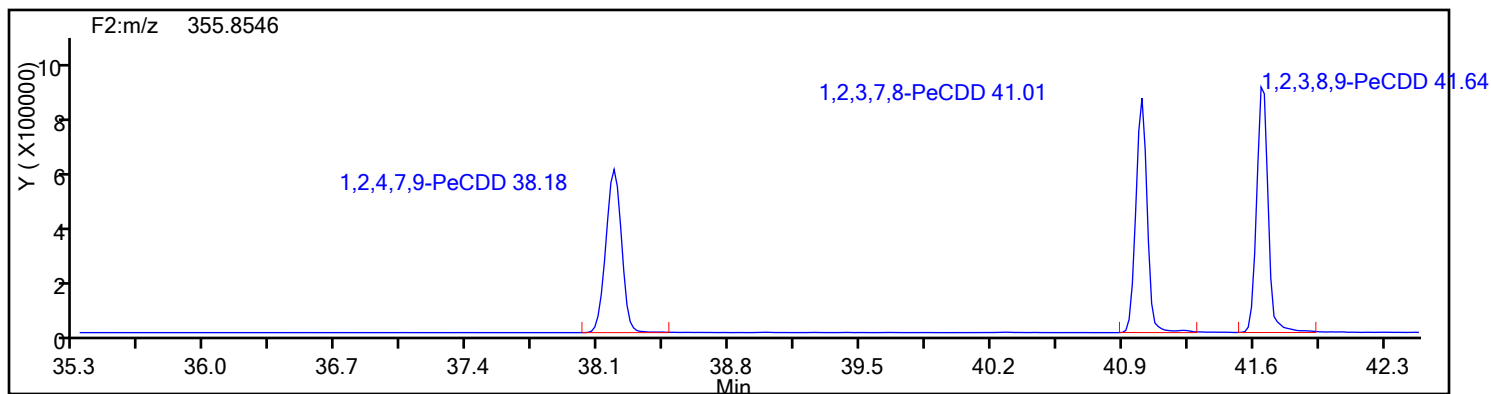
Worklist#: 7768

Sample Line#: 1

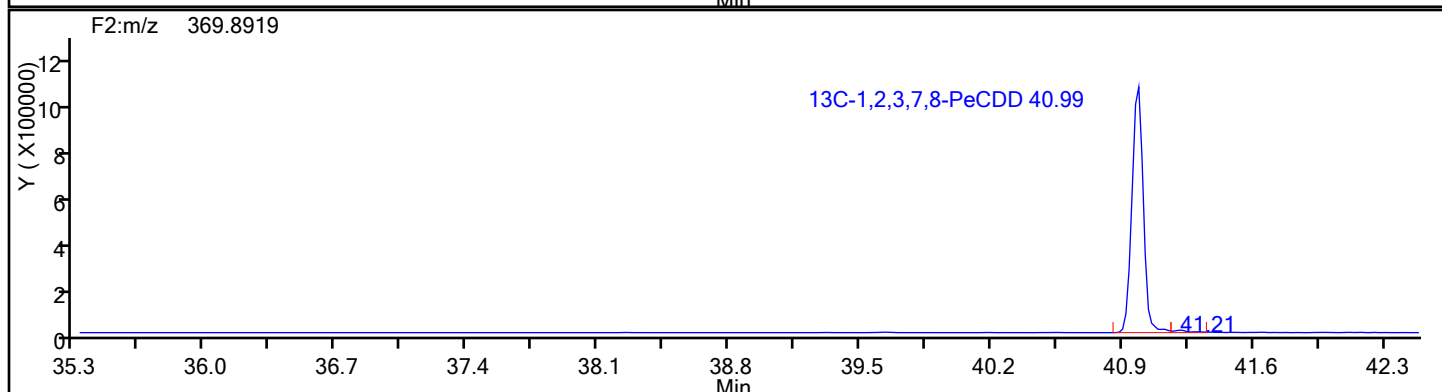
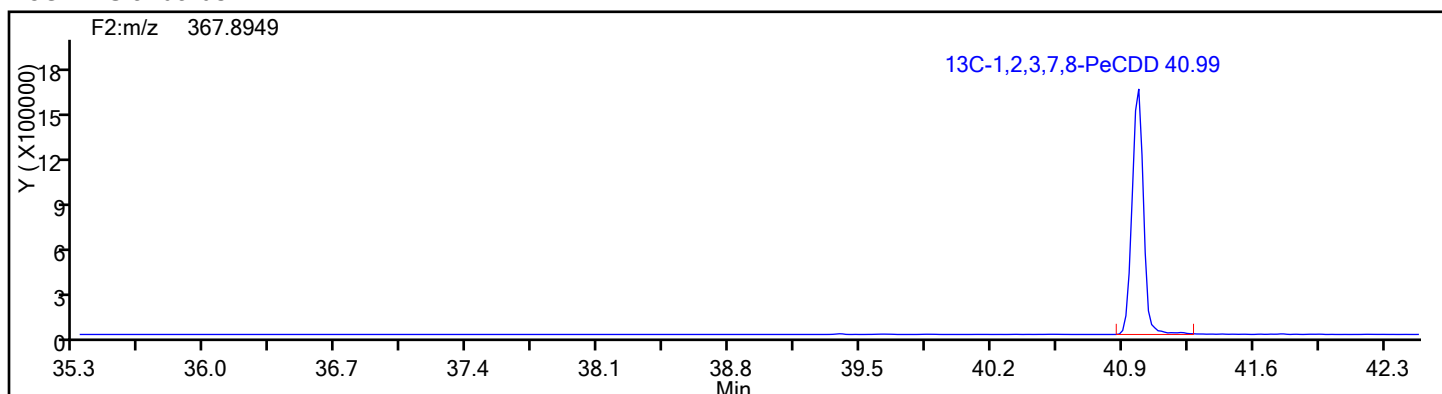
Column Type:

Column Dia:

PeCDD



PeCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

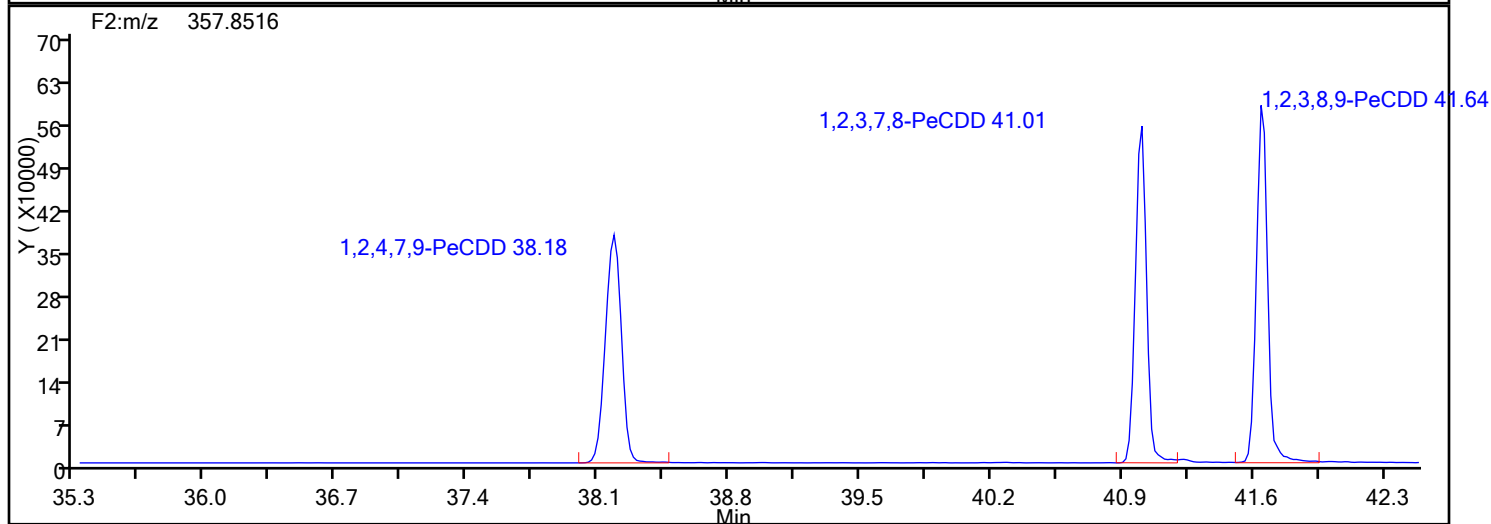
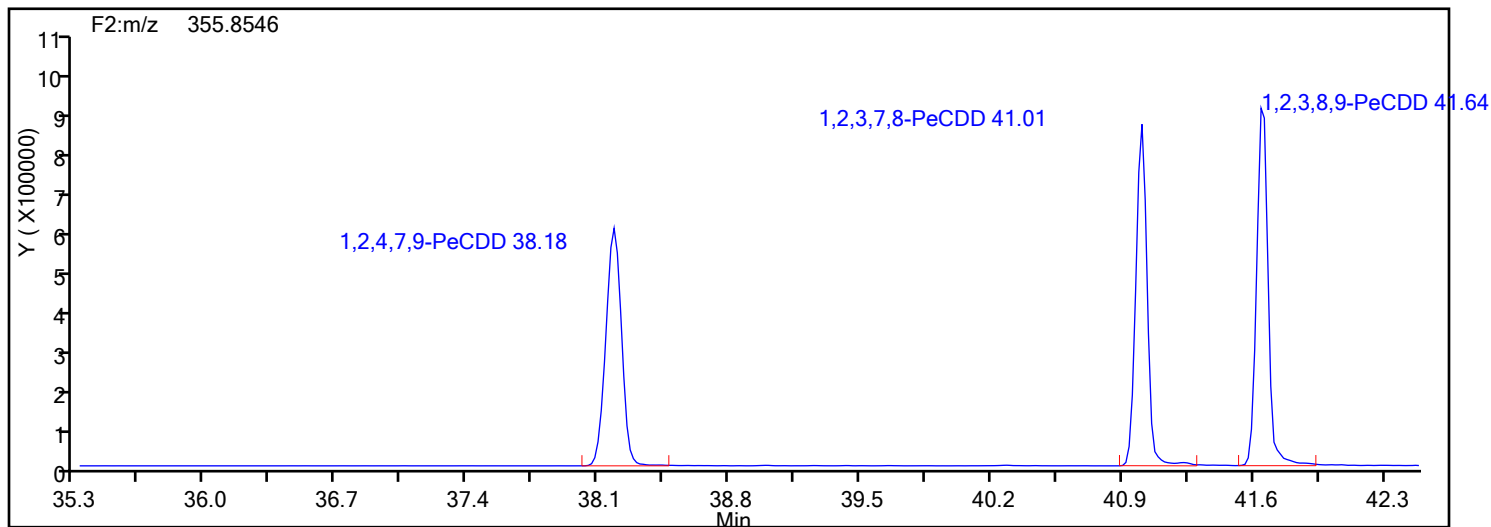
Worklist#: 7768

Sample Line#: 1

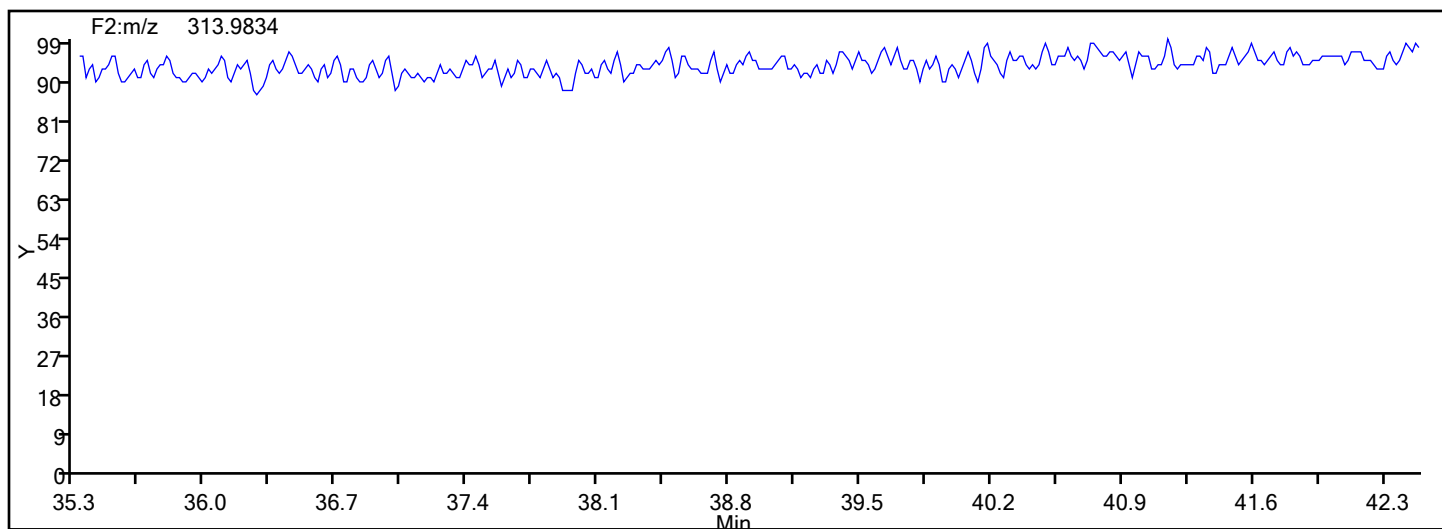
Column Type:

Column Dia:

PeCDD



PeCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

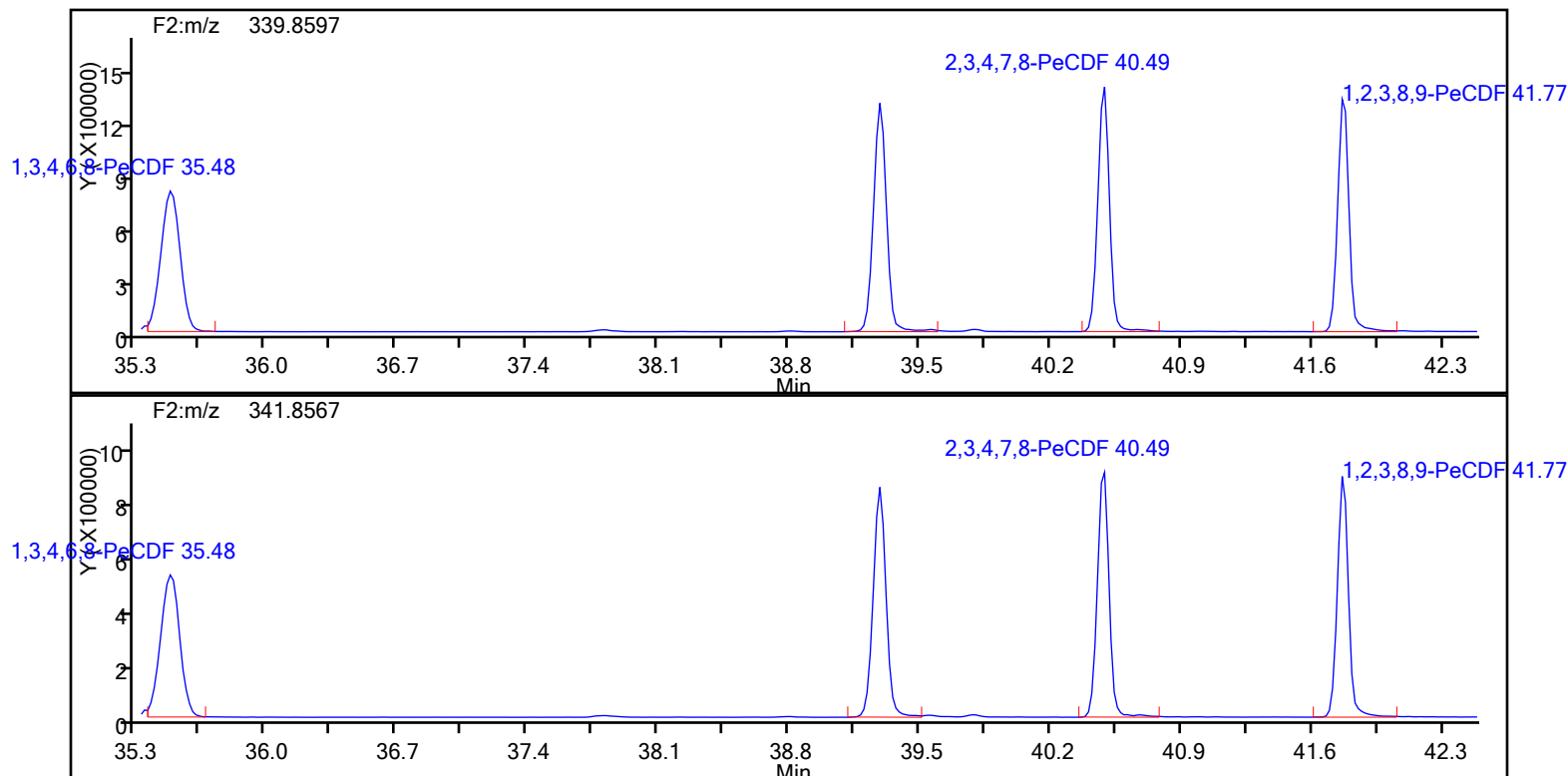
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Sample Line#: 1

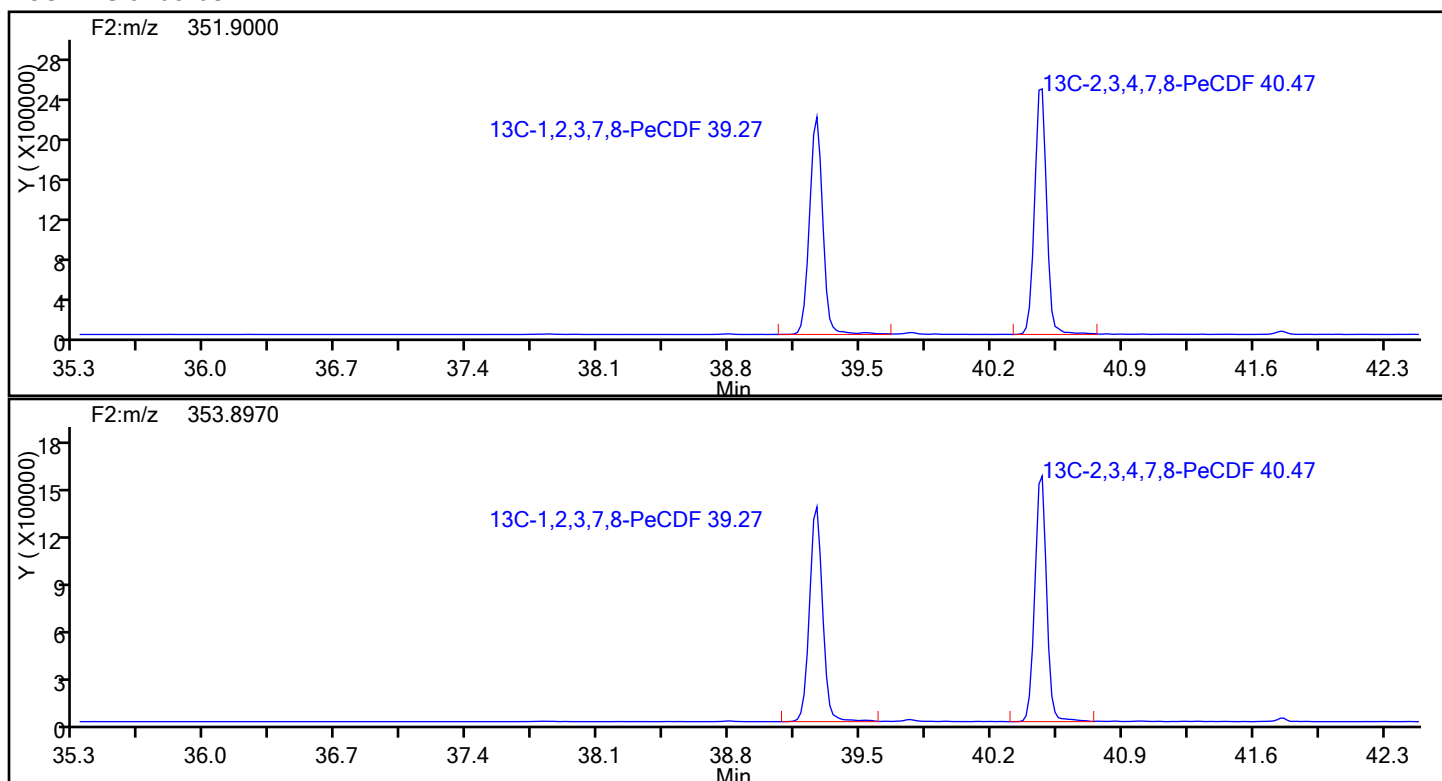
Column Type:

Column Dia:

PeCDF



PeCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

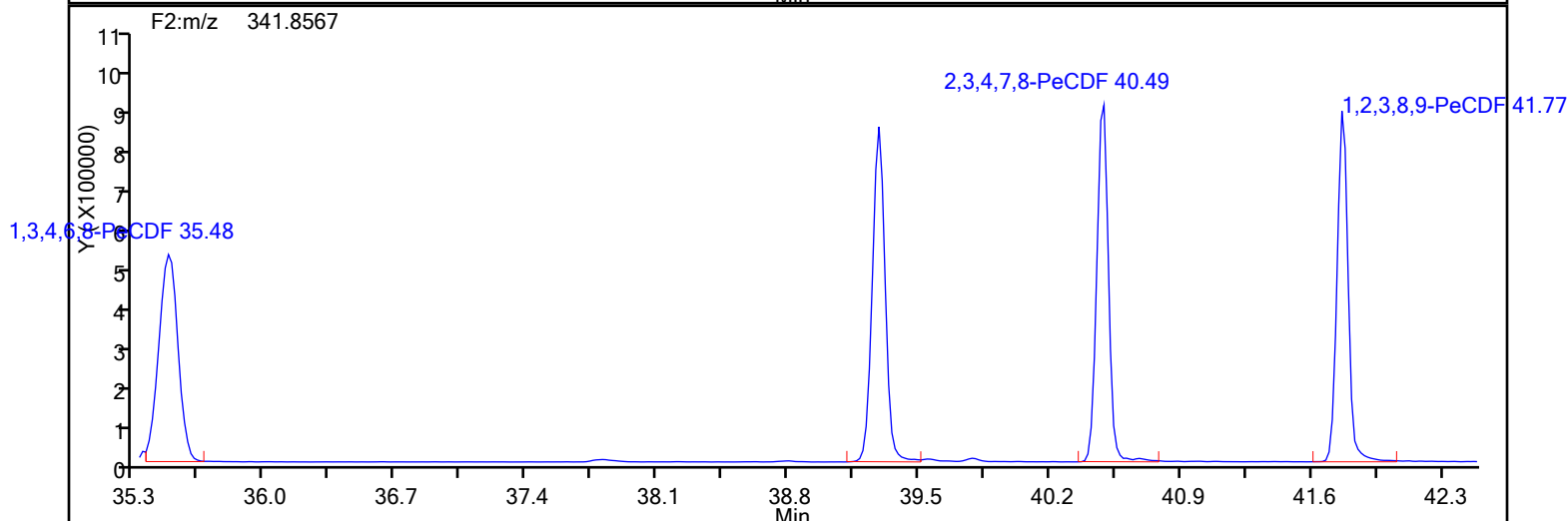
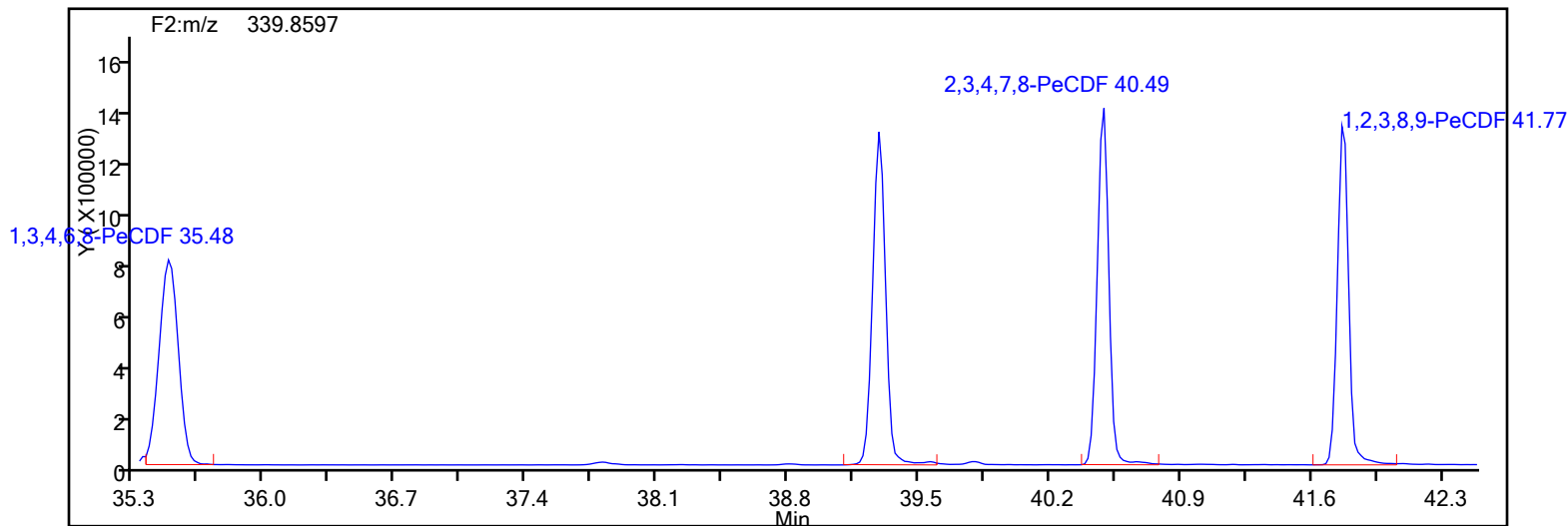
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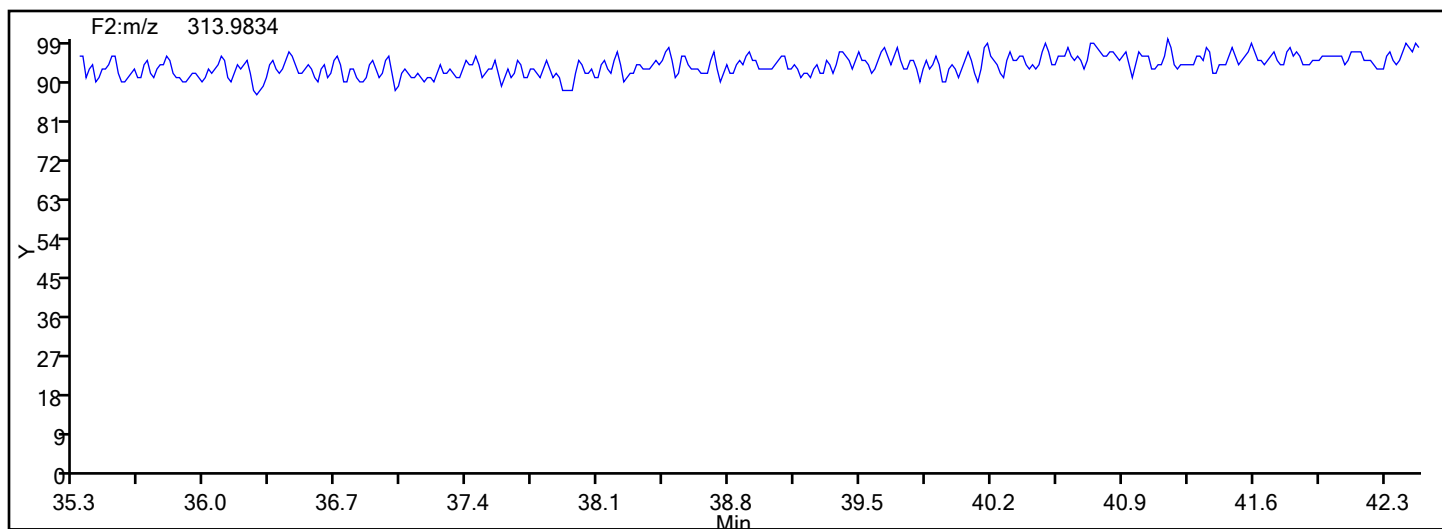
Column Type:

Column Dia:

PeCDF



PeCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

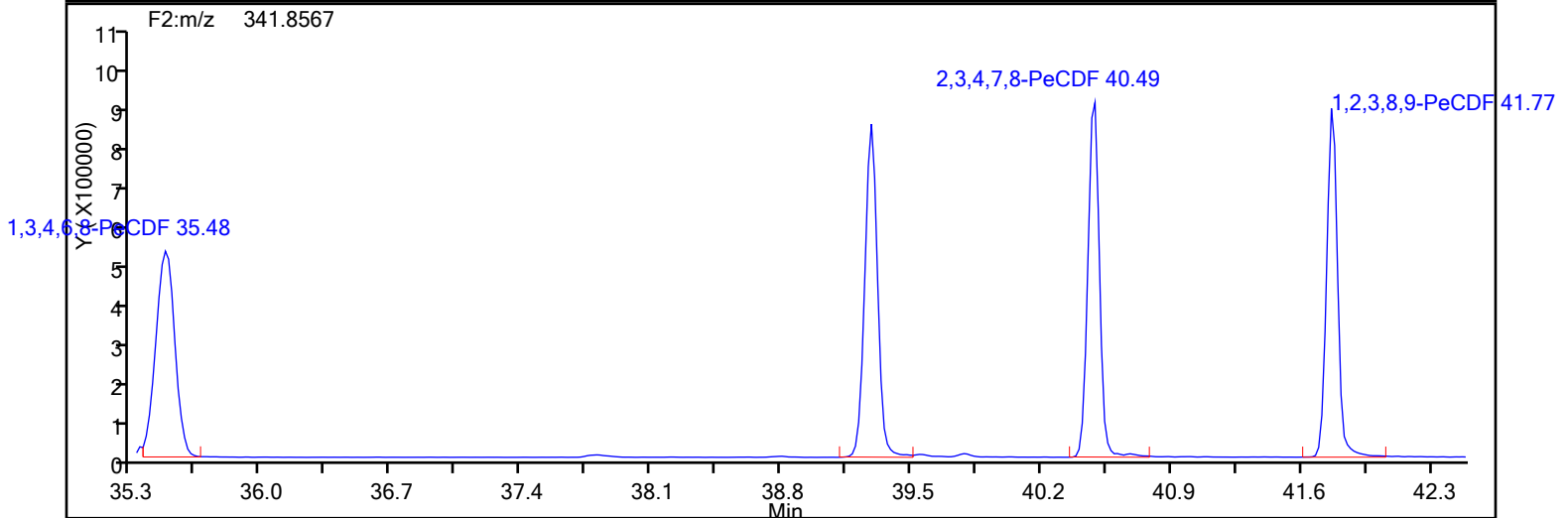
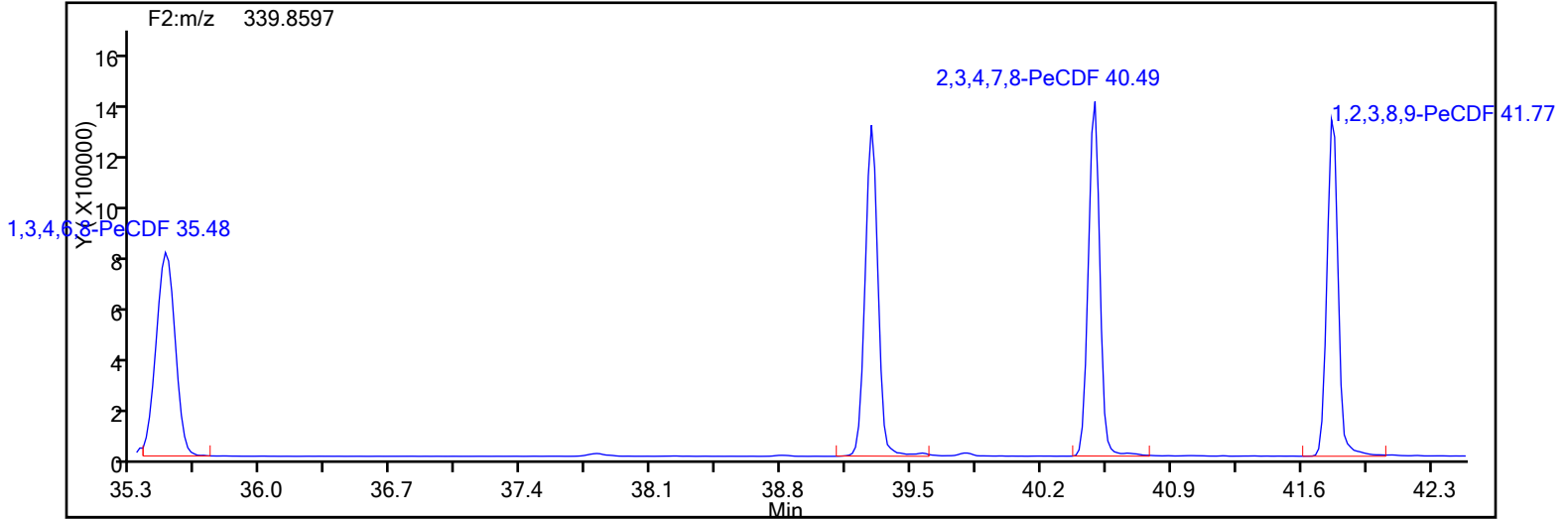
Worklist#: 7768

Sample Line#: 1

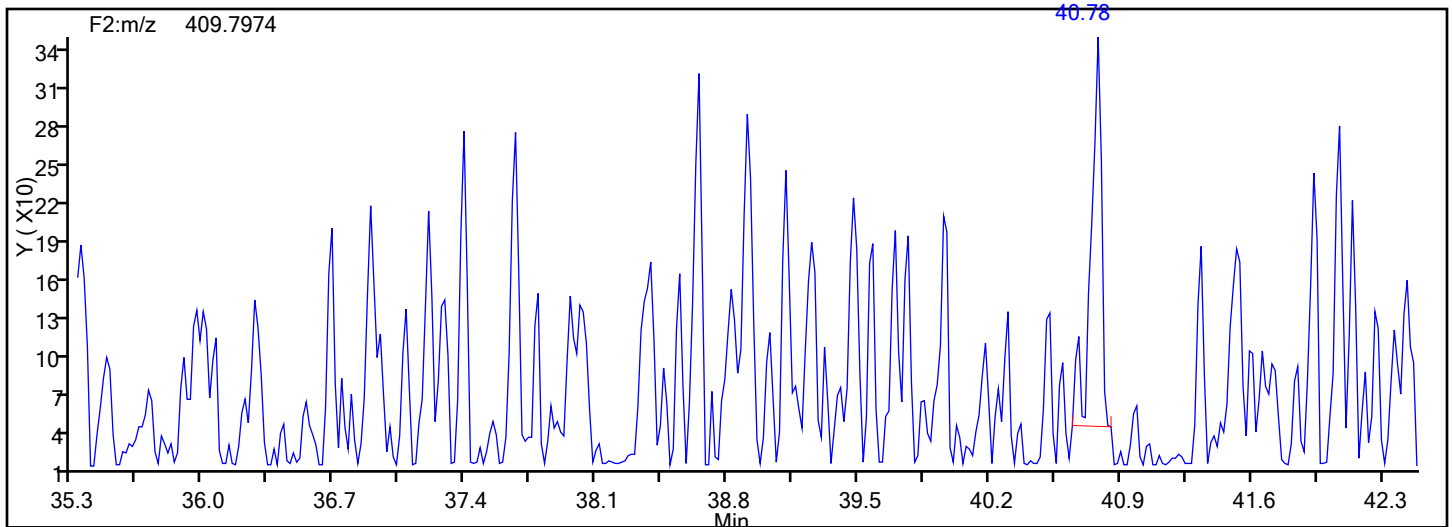
Column Type:

Column Dia:

PeCDF



PeCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

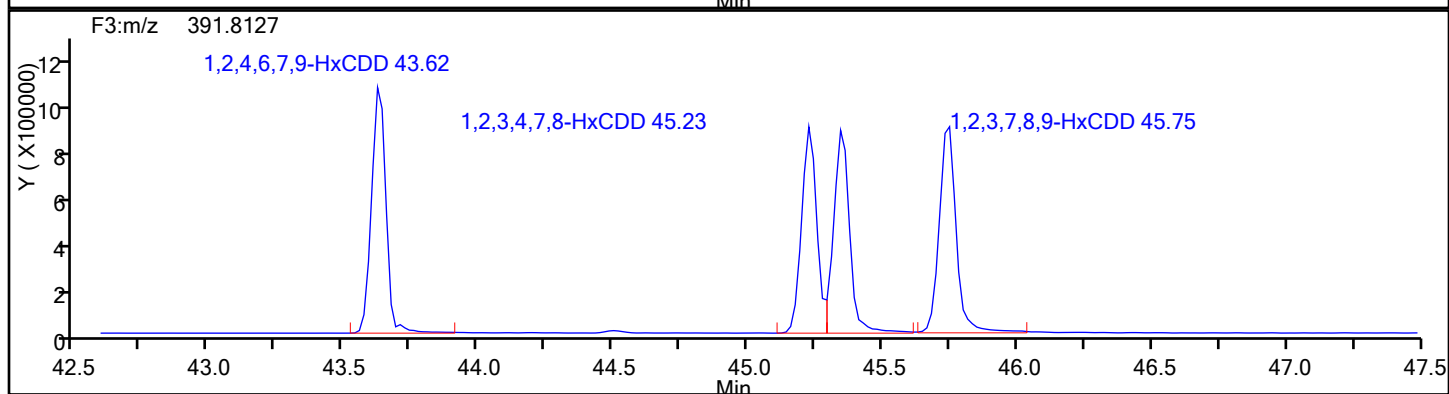
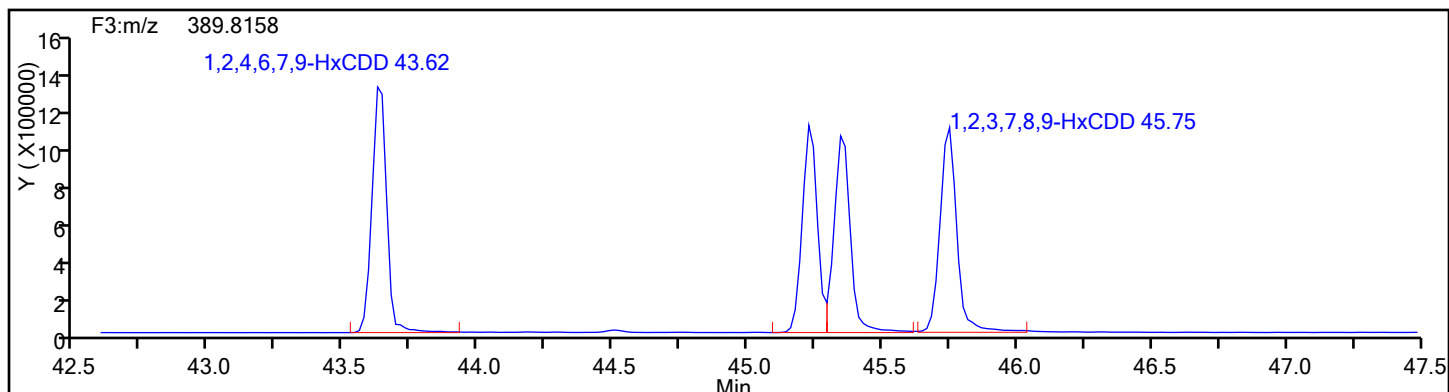
Worklist#: 7768

Sample Line#: 1

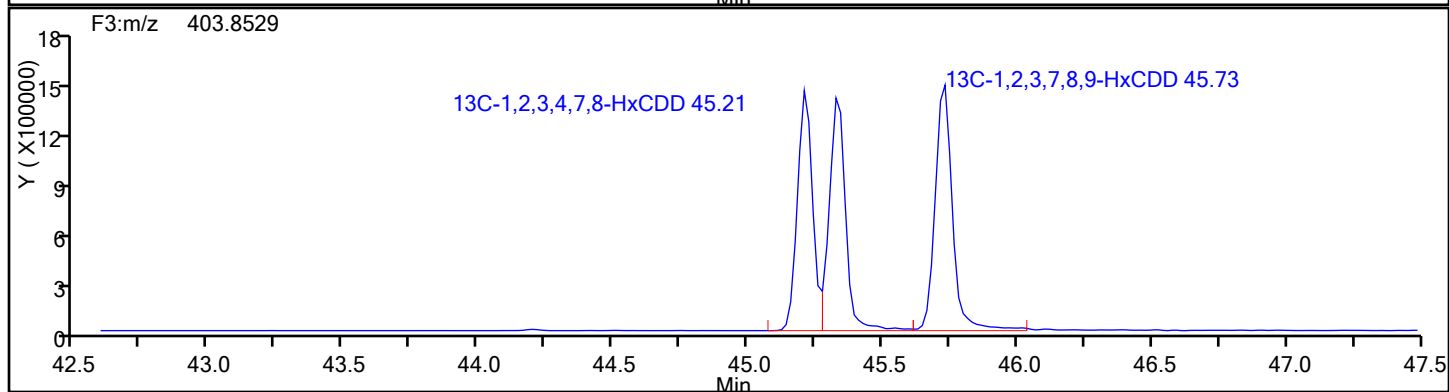
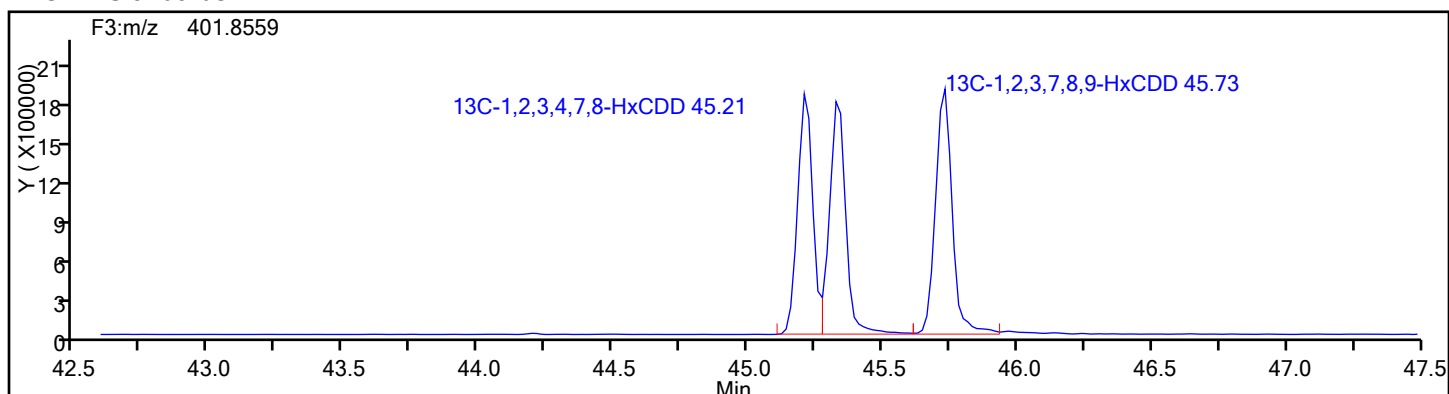
Column Type:

Column Dia:

HxCDD



HxCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

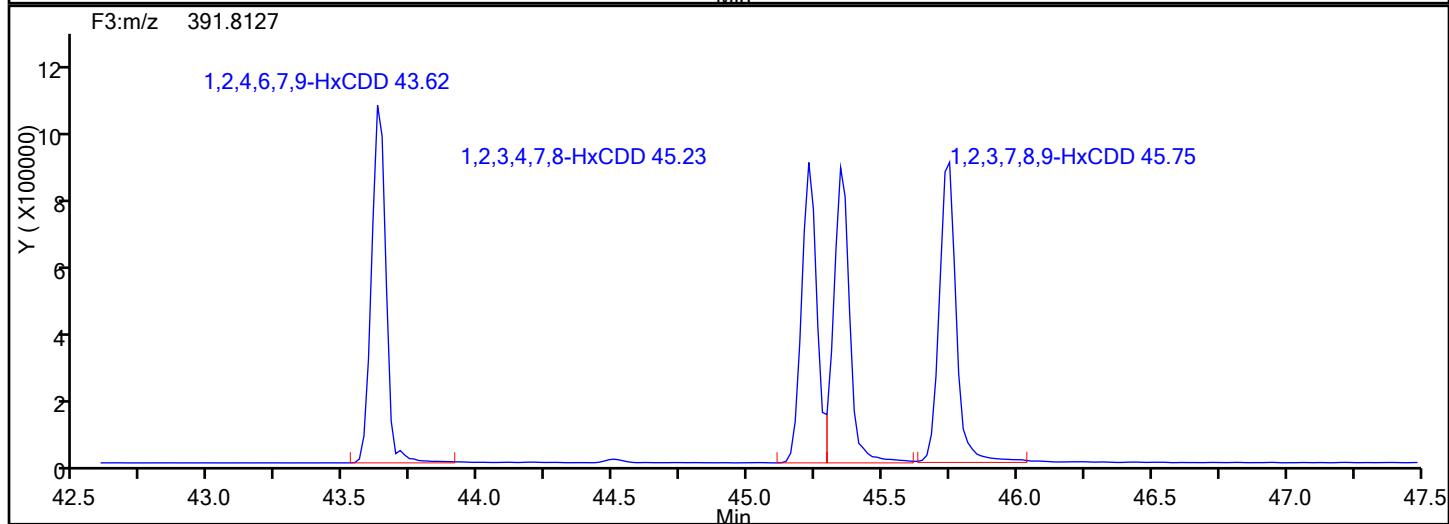
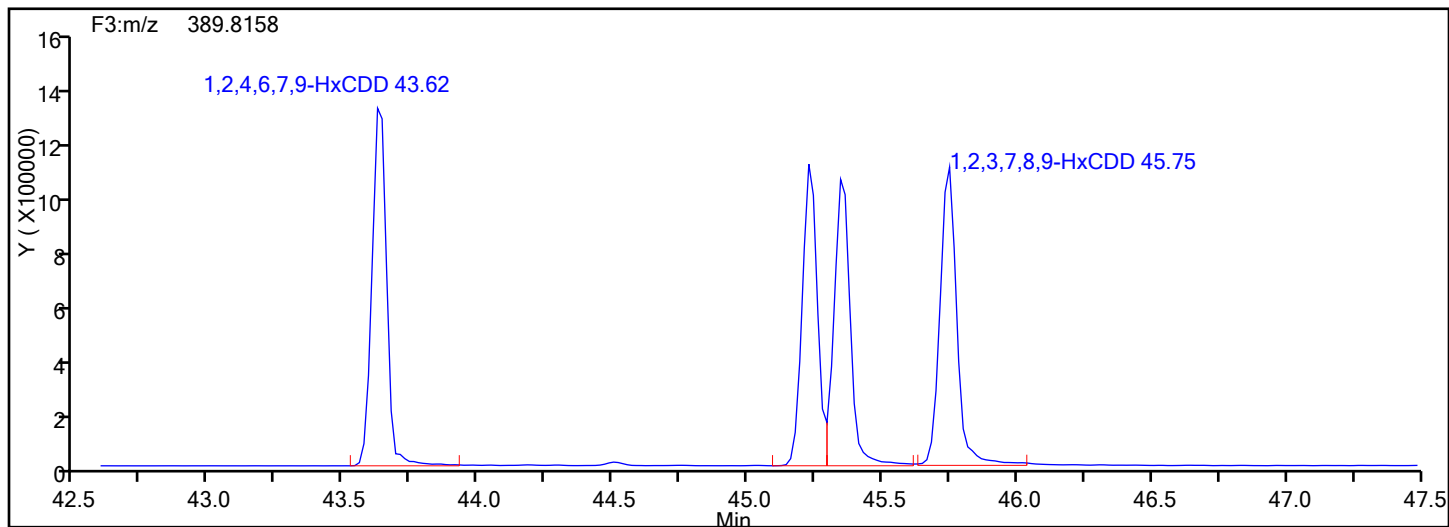
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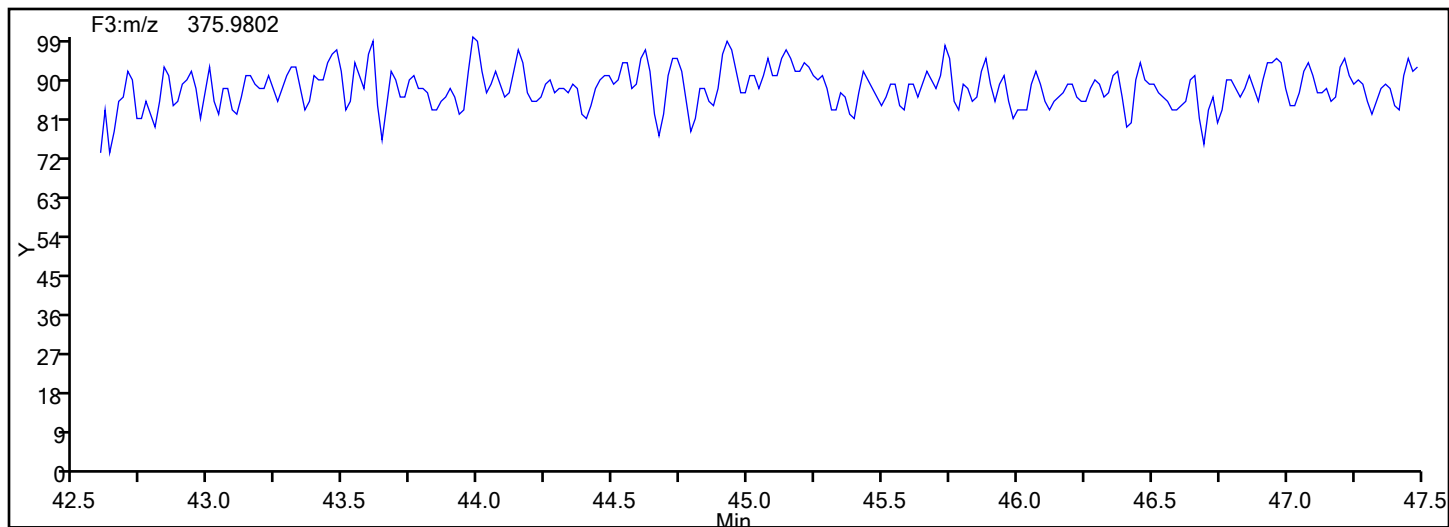
Column Type:

Column Dia:

HxCDD



HxCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

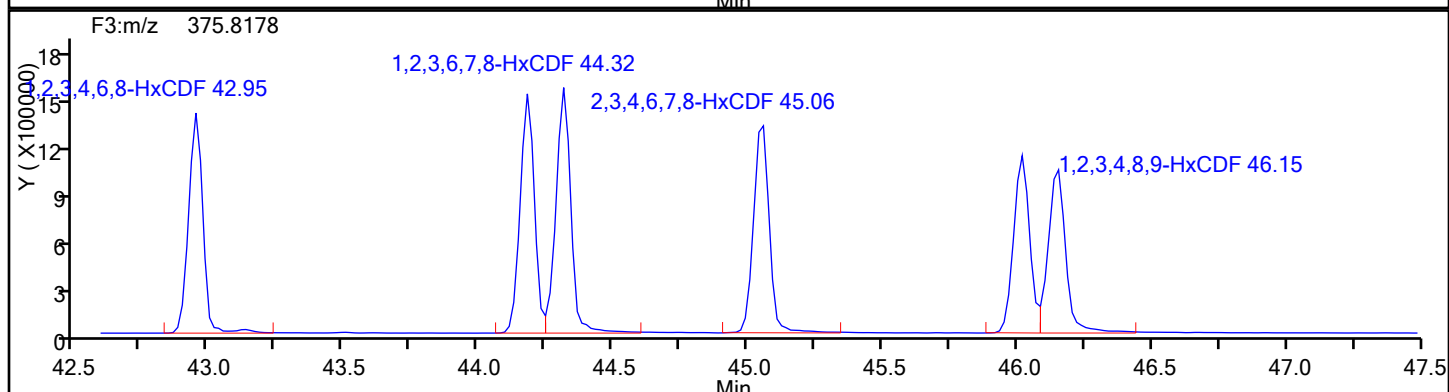
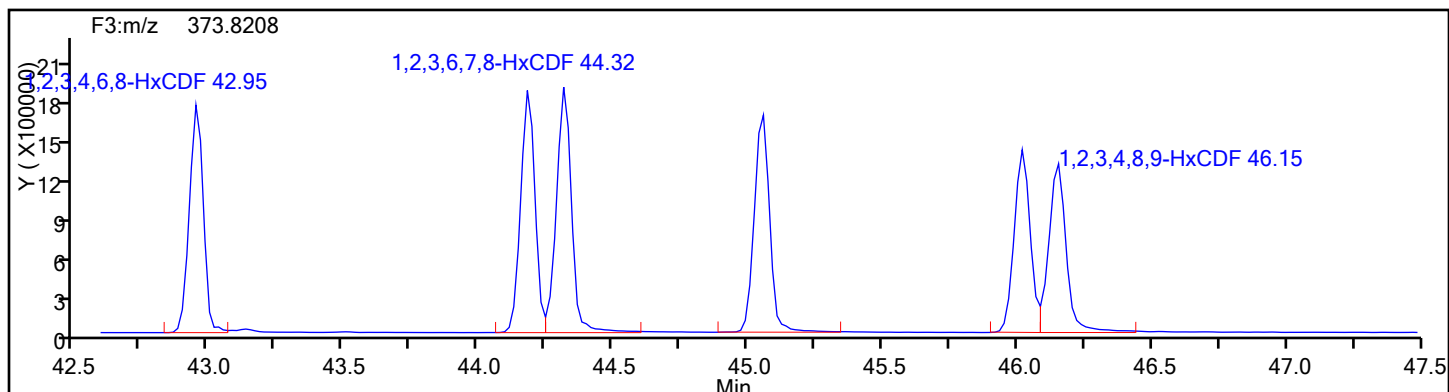
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Sample Line#: 1

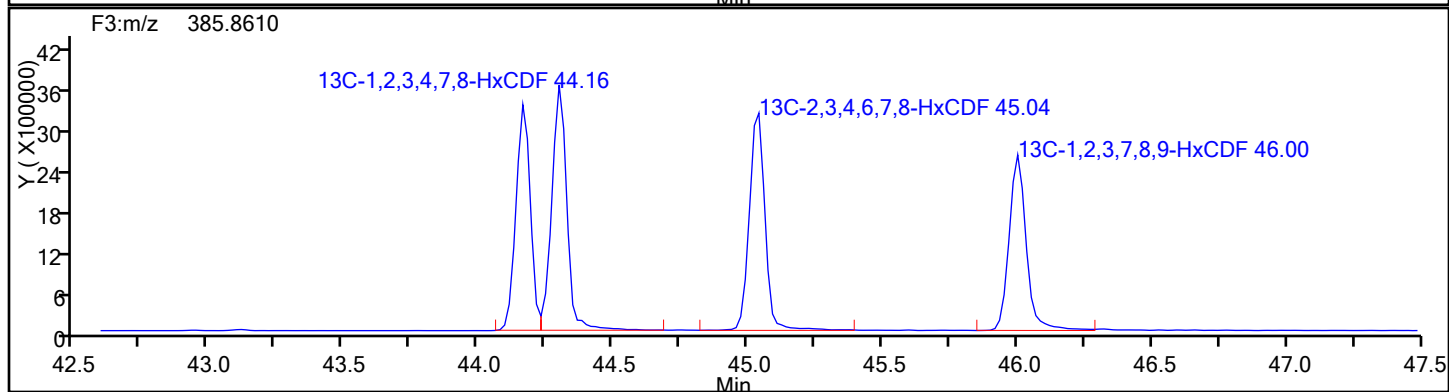
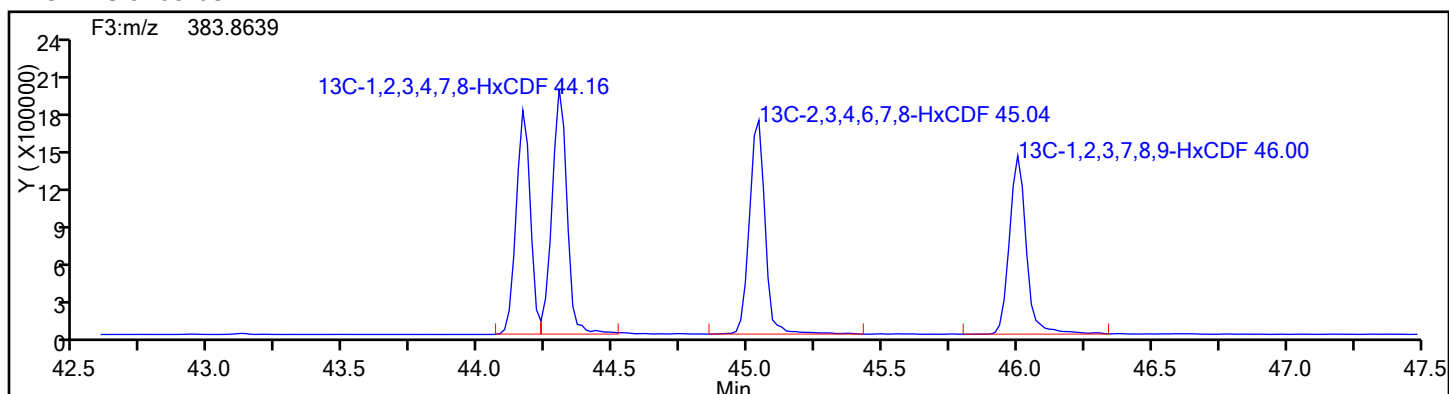
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Column Dia:

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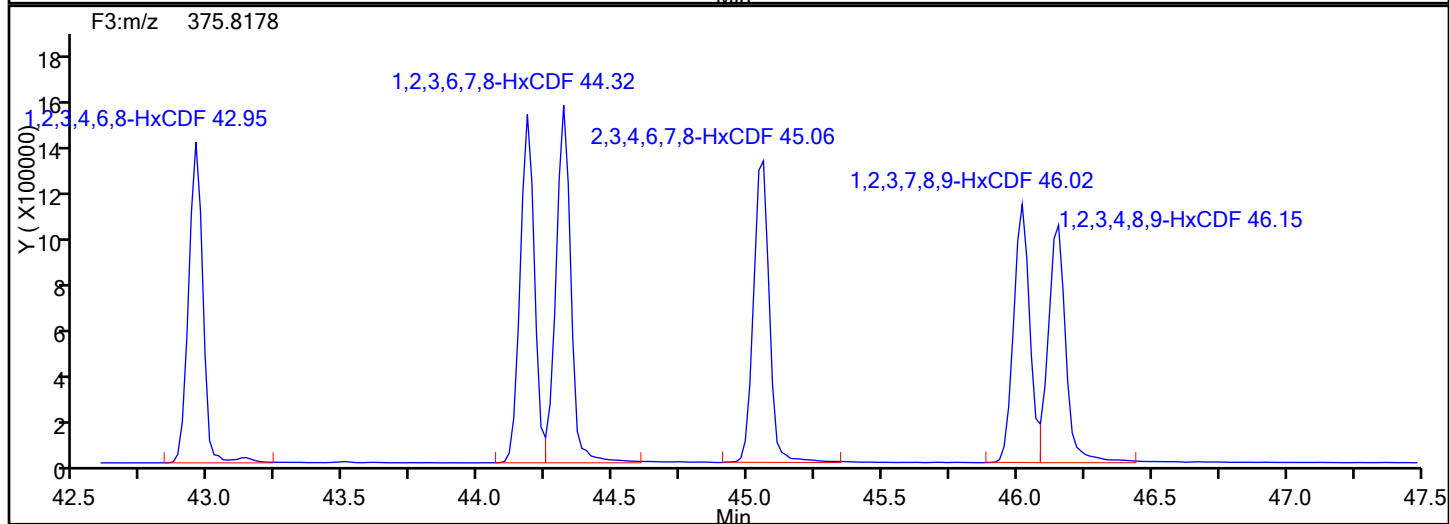
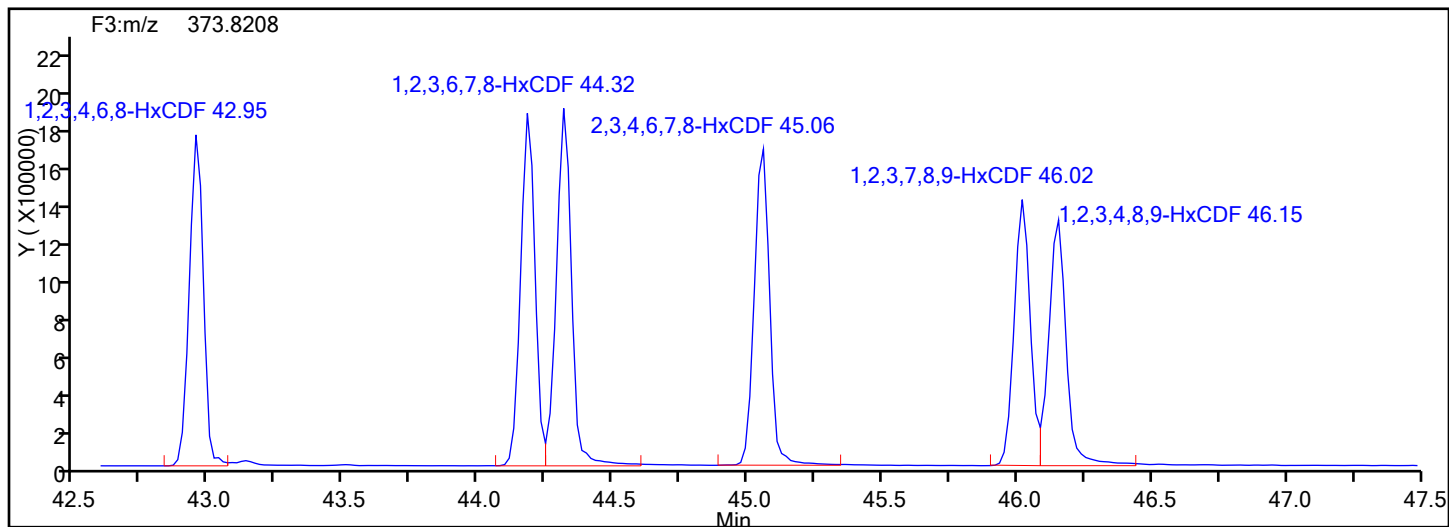


HxCDF Standards

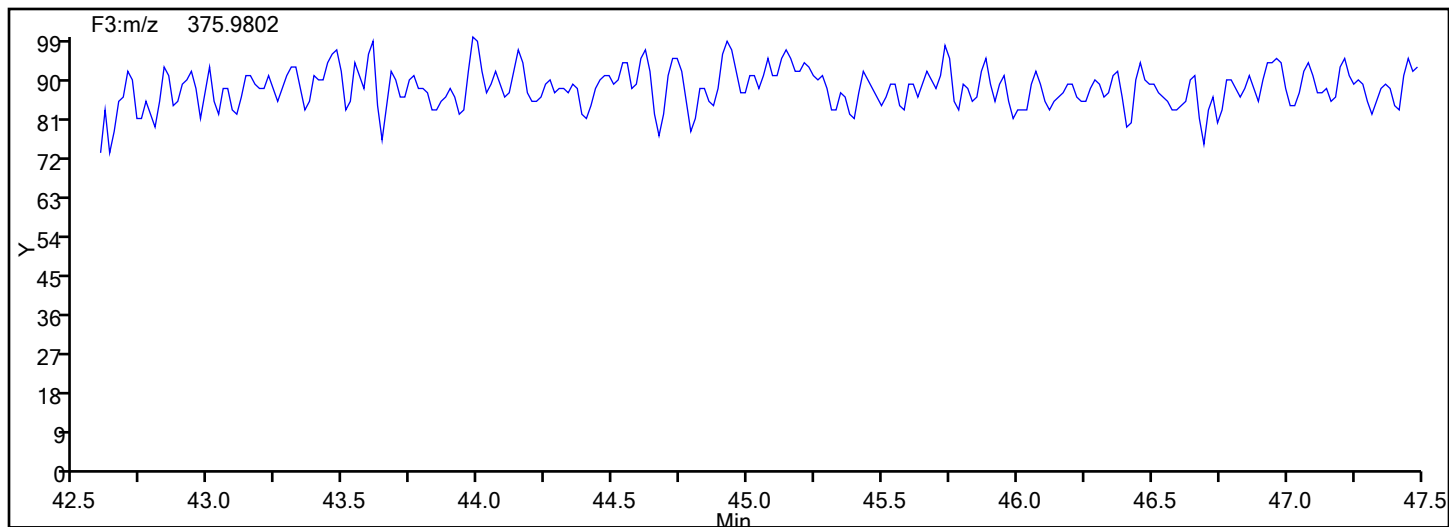


TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d
Injection Date: 16-May-2014 10:23:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: DavidsonM
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 7768 Sample Line#: 1
Column Type: Column Dia:
HxCDF



HxCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

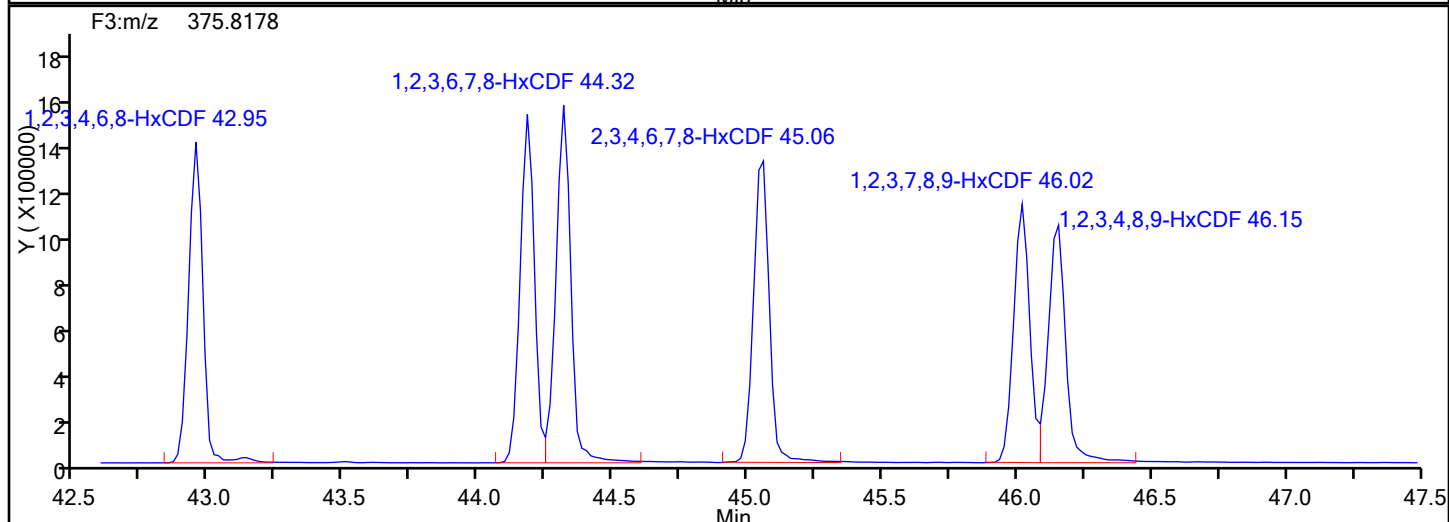
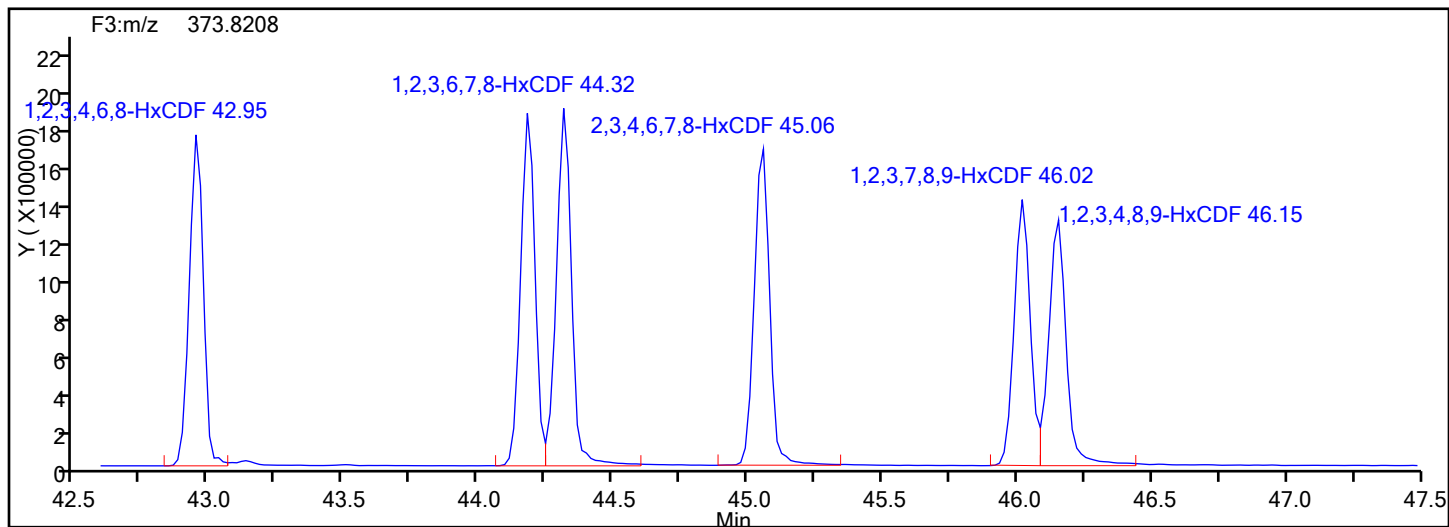
Worklist#: 7768

Sample Line#: 1

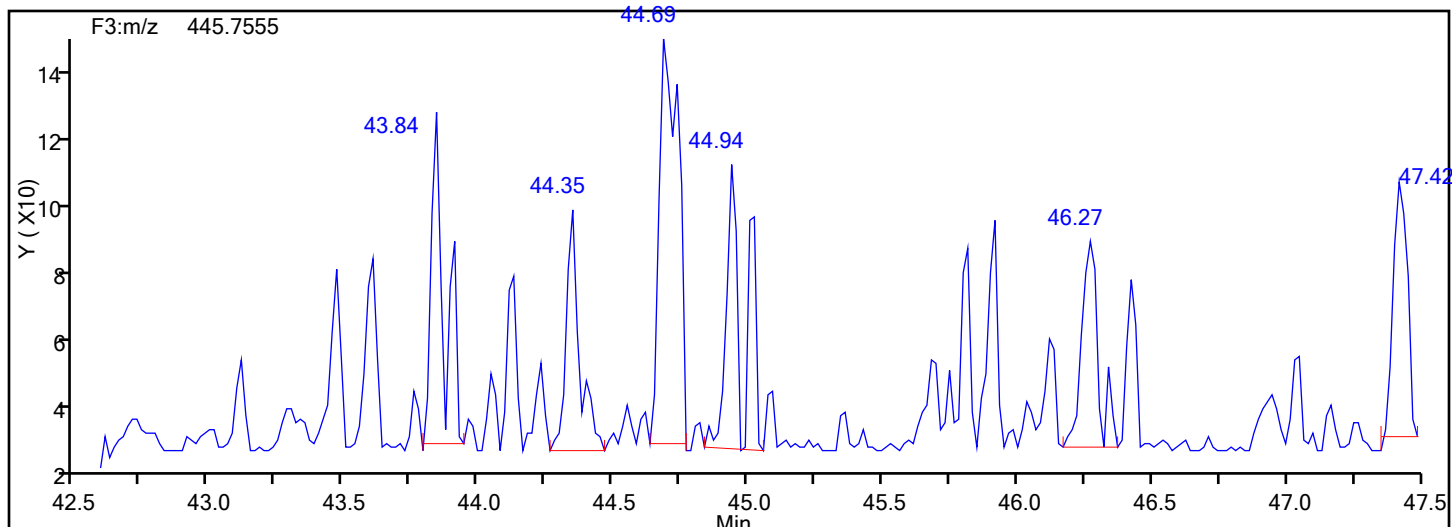
Column Type:

Column Dia:

HxCDF



HxCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

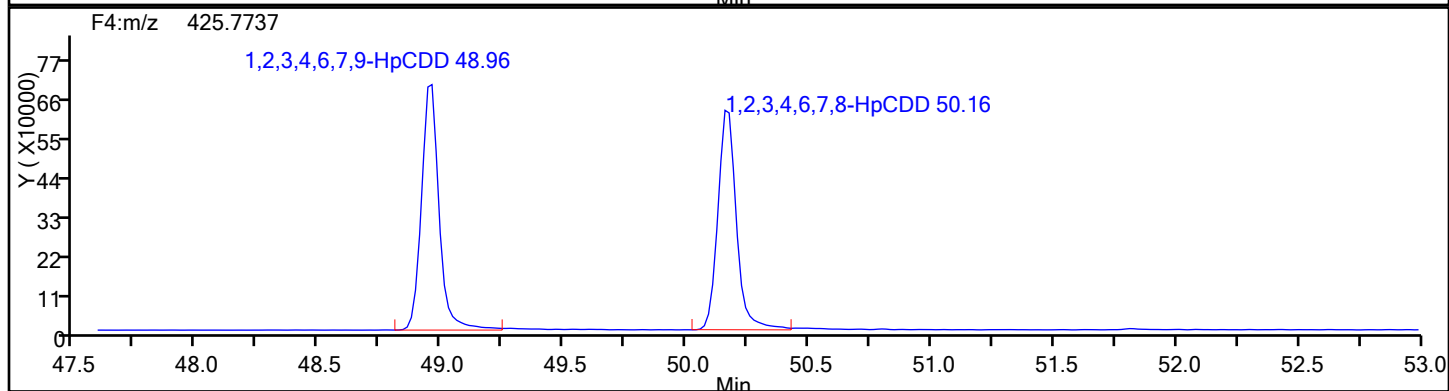
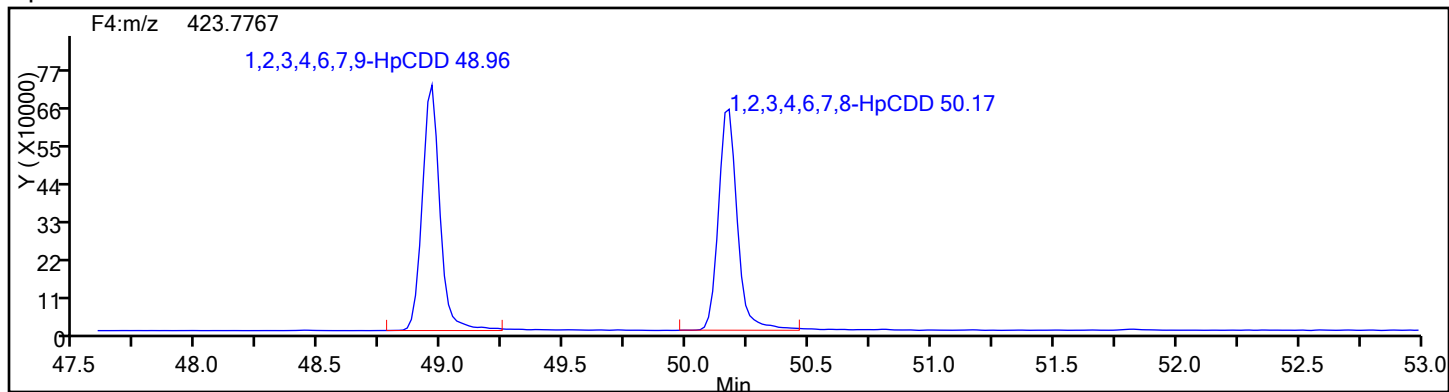
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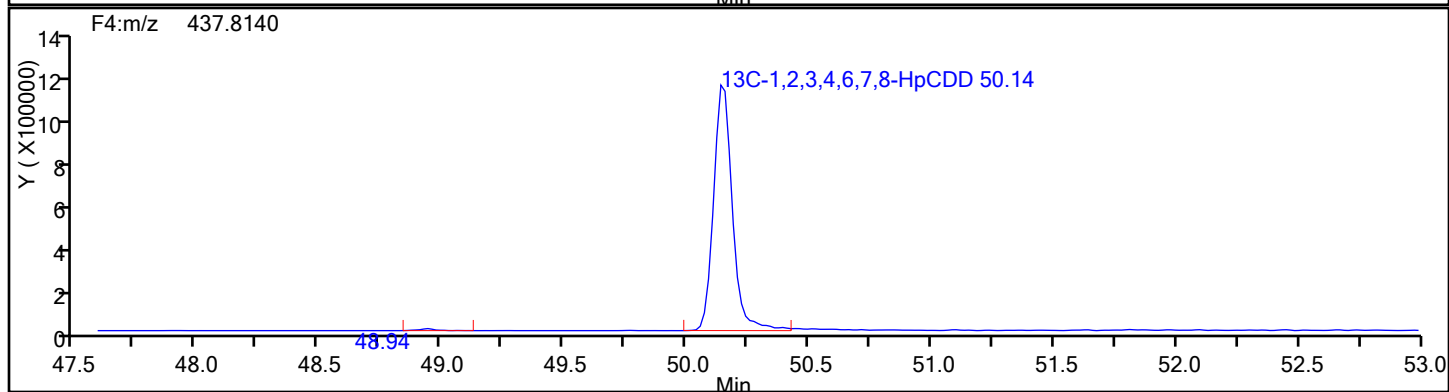
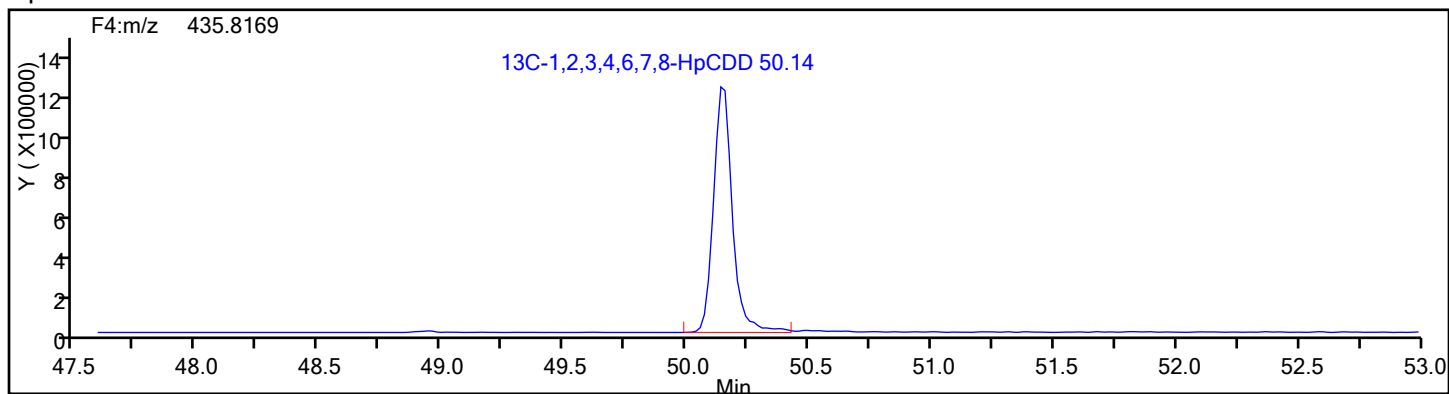
Column Type:

Column Dia:

HpCDD



HpCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

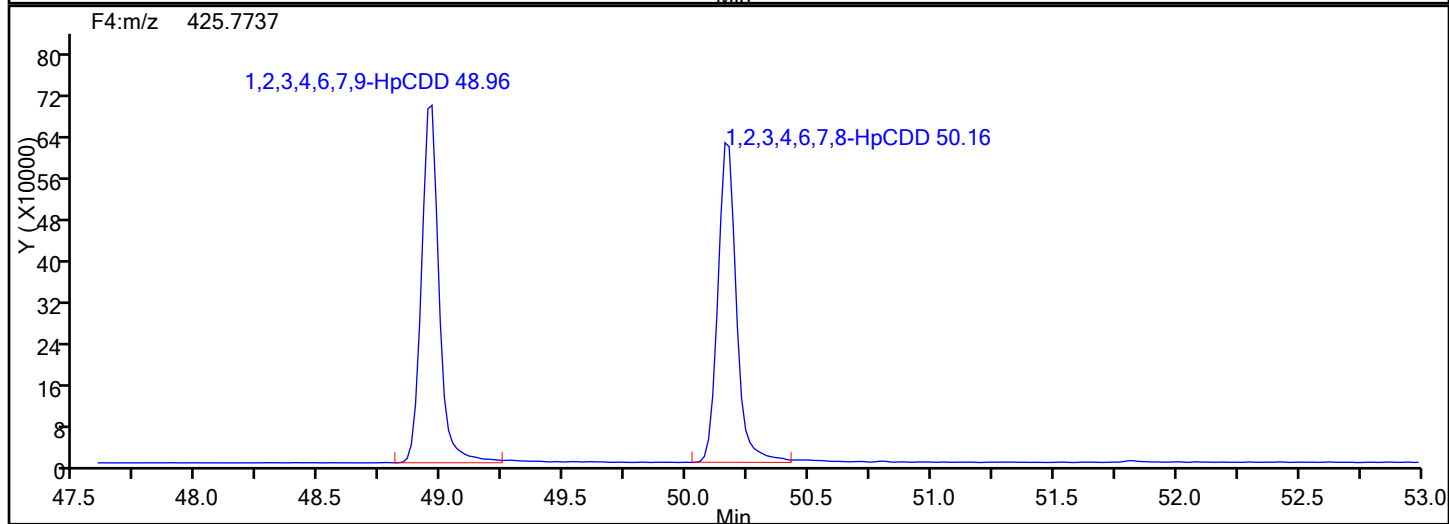
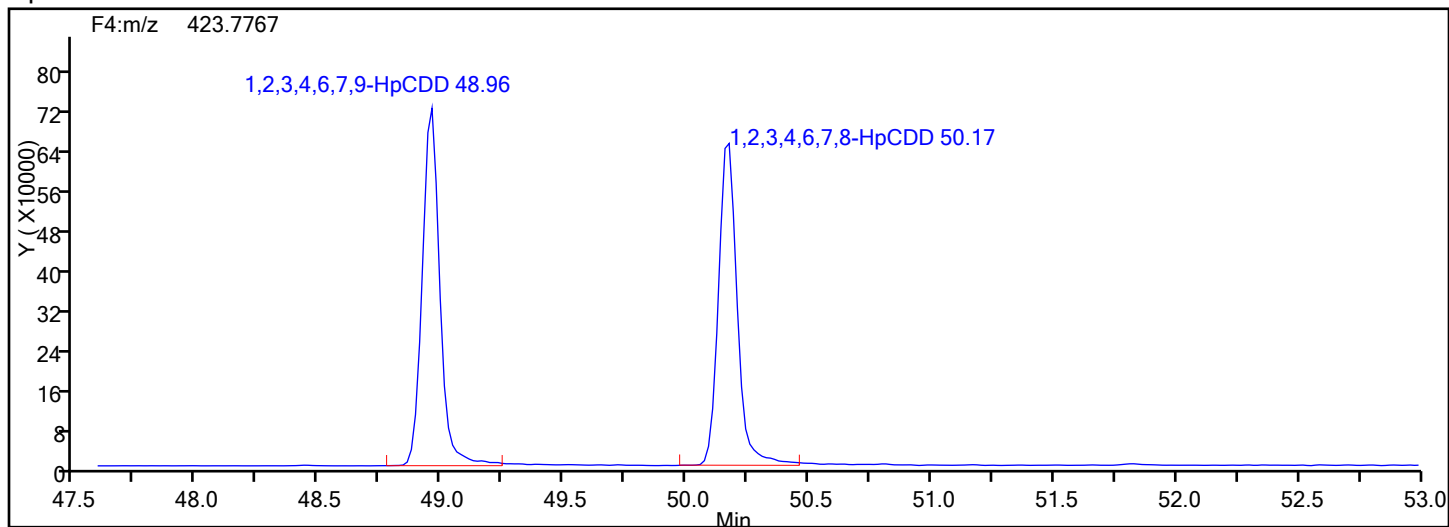
Worklist#: 7768

Sample Line#: 1

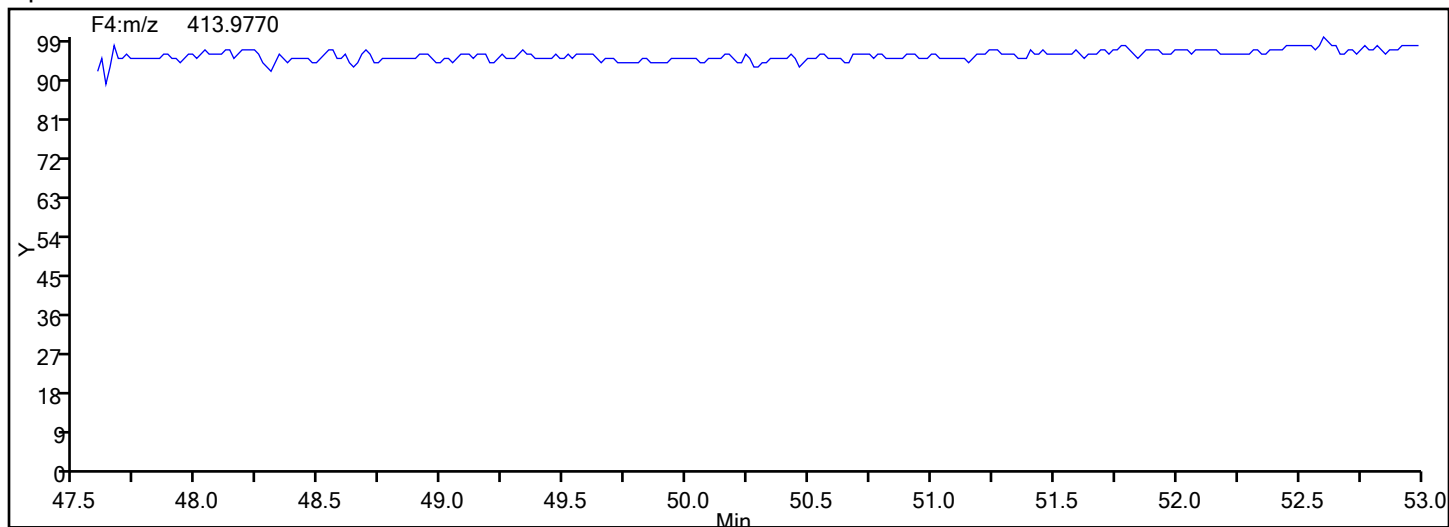
Column Type:

Column Dia:

HpCDD



HpCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

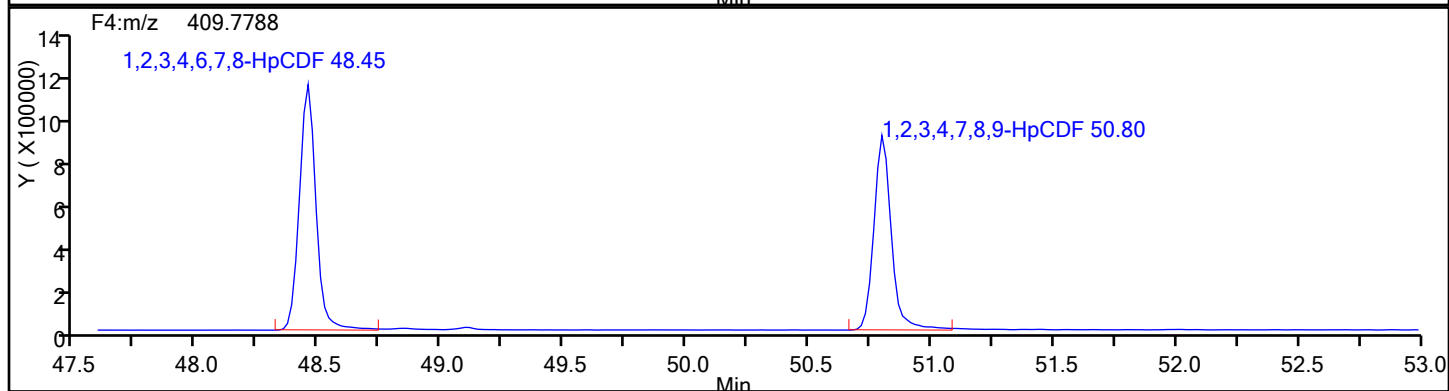
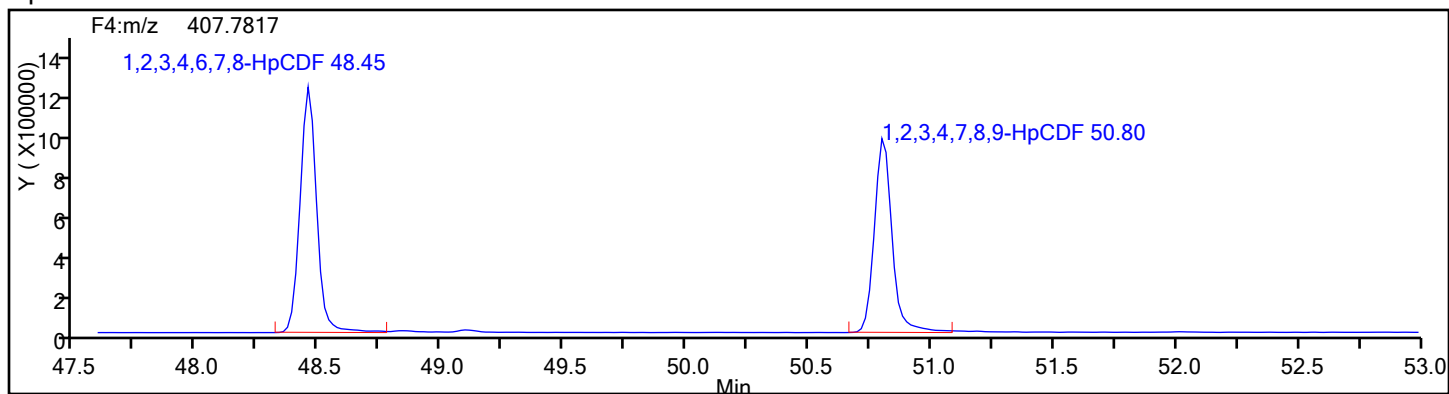
Worklist#: 7768

Sample Line#: 1

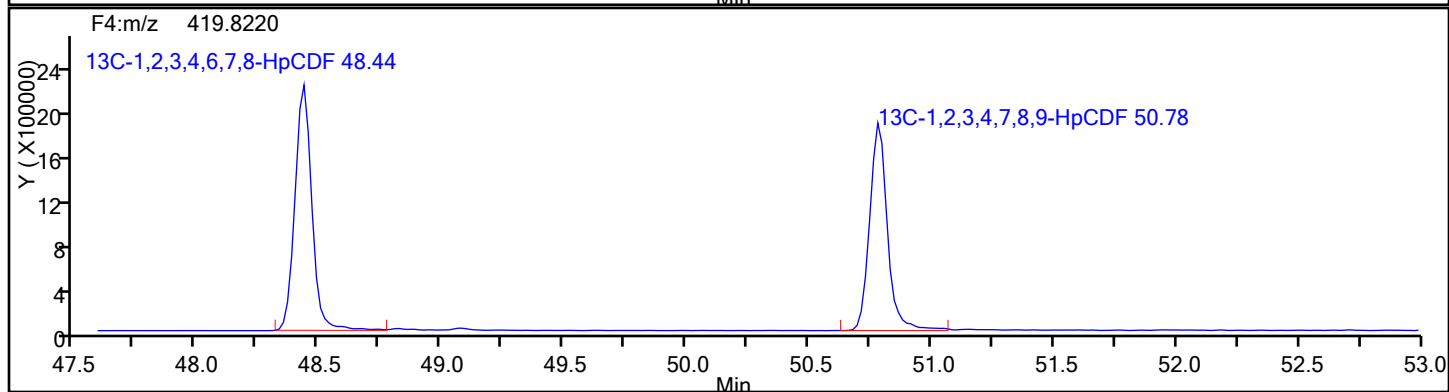
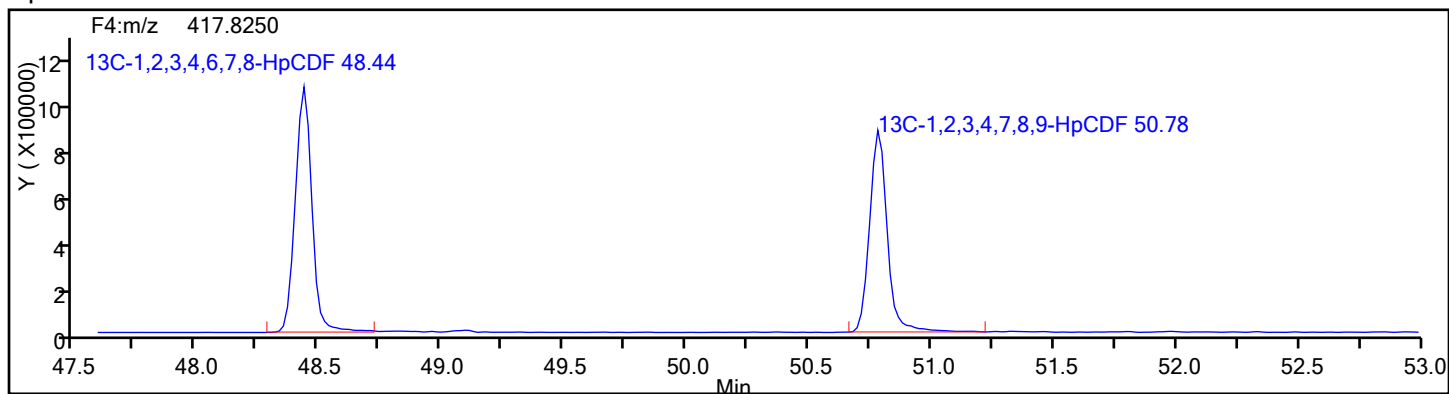
Column Type:

Column Dia:

HpCDF



HpCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

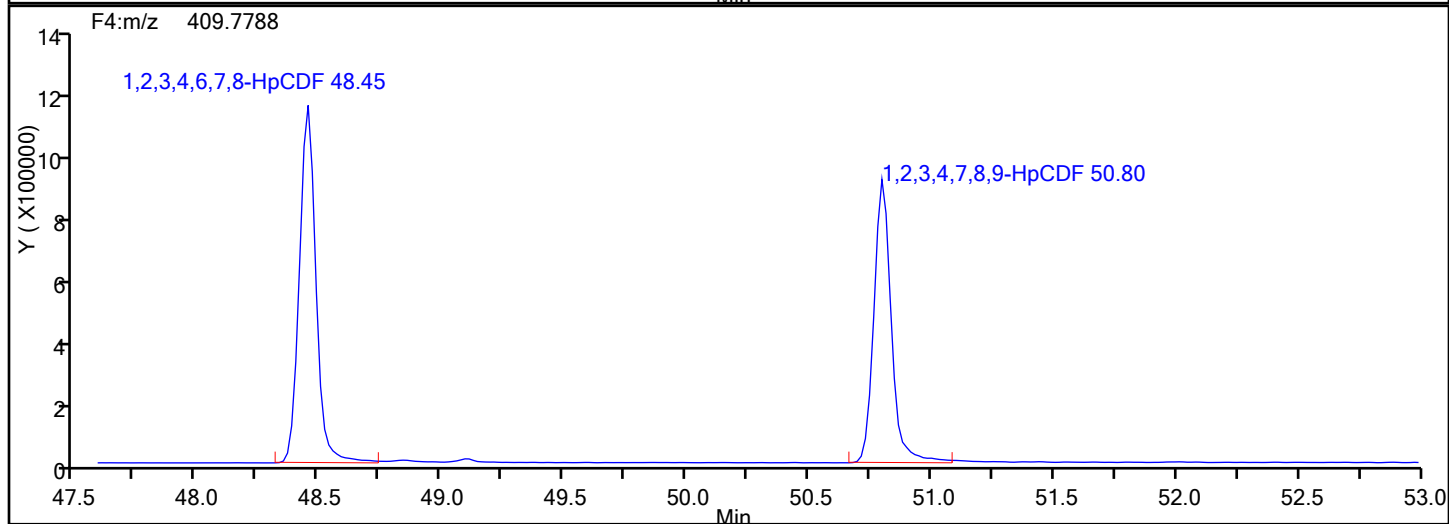
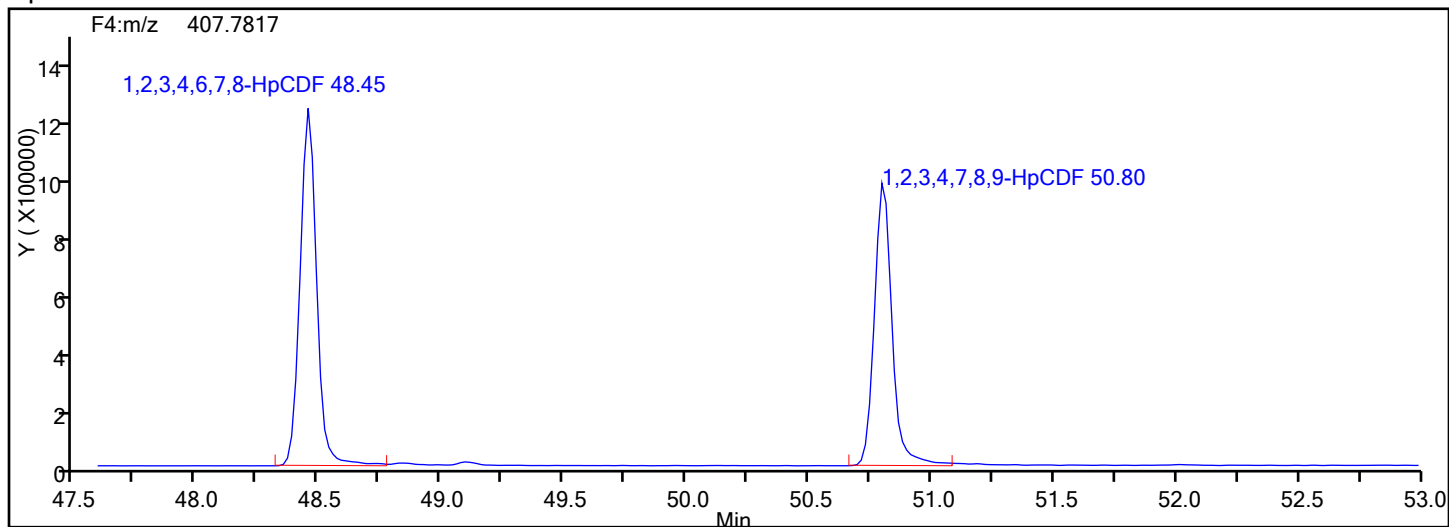
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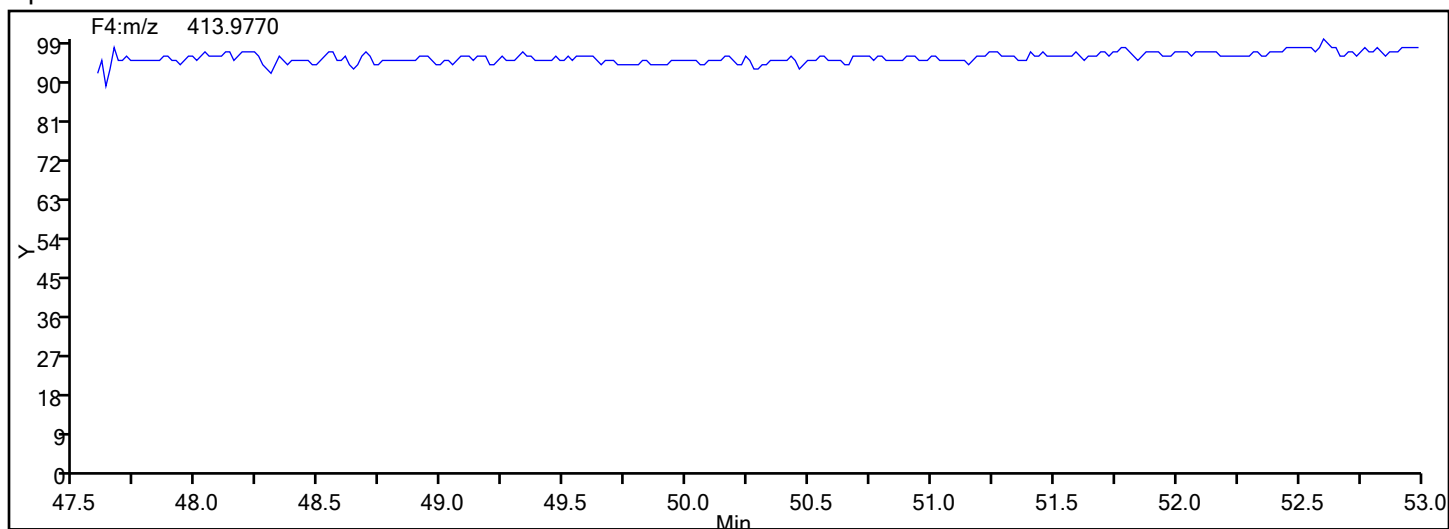
Column Type:

Column Dia:

HpCDF



HpCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

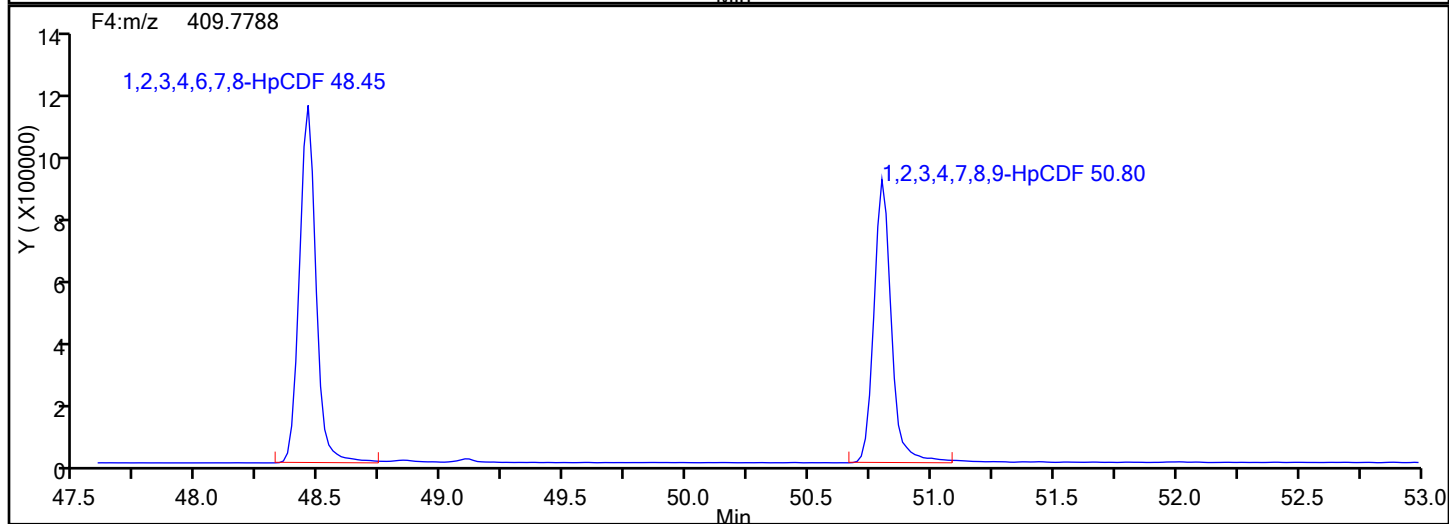
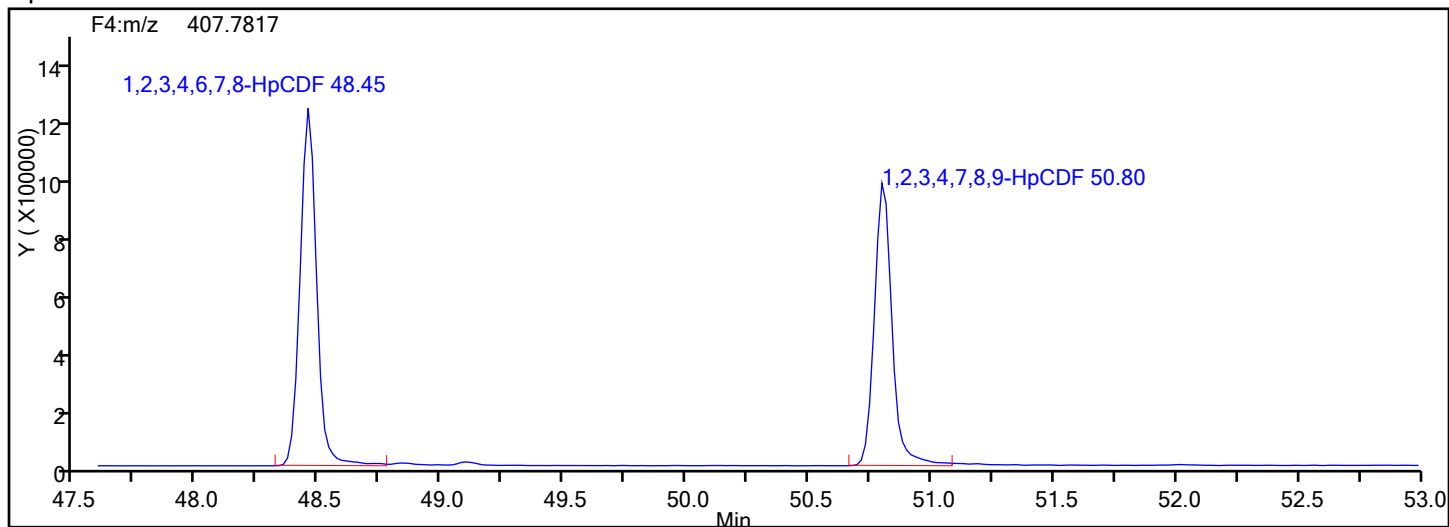
Worklist#: 7768

Sample Line#: 1

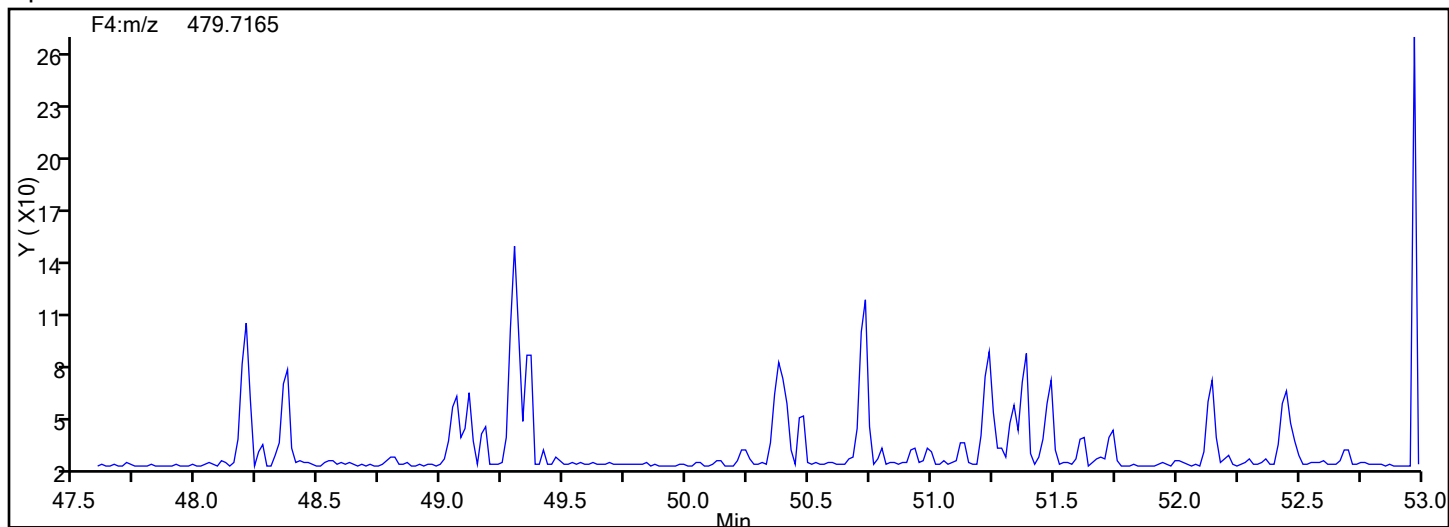
Column Type:

Column Dia:

HpCDF



HpCDF Interference Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

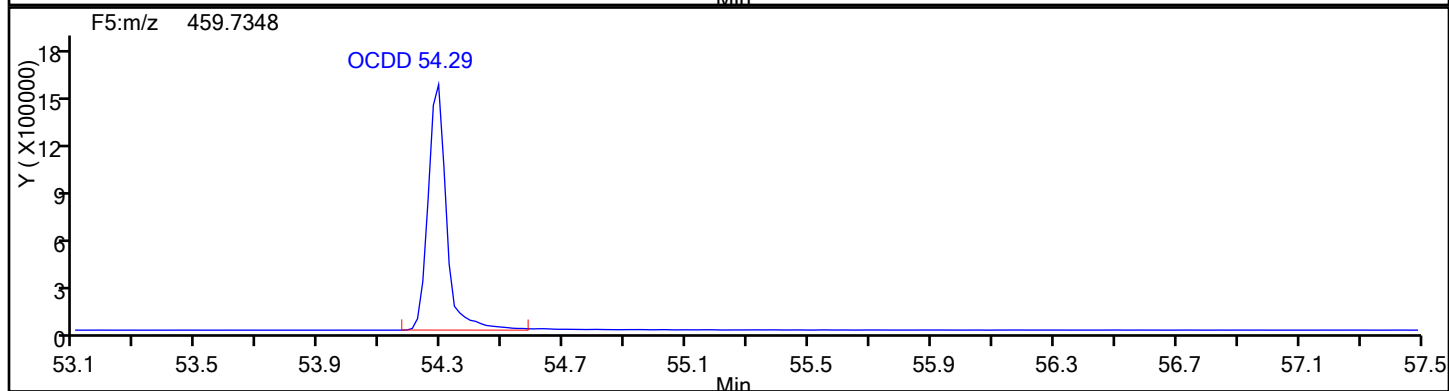
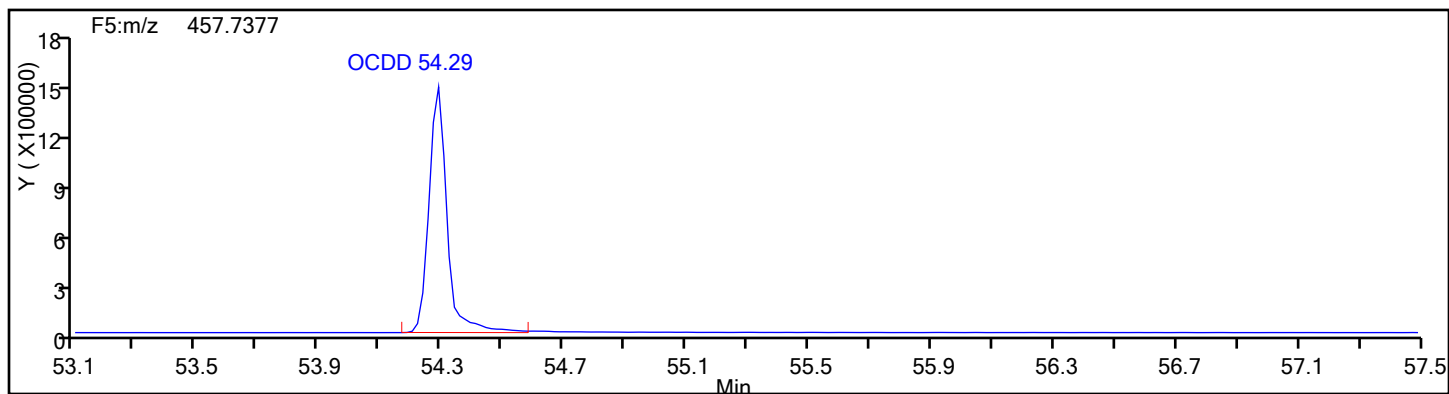
Worklist#: 7768

Sample Line#: 1

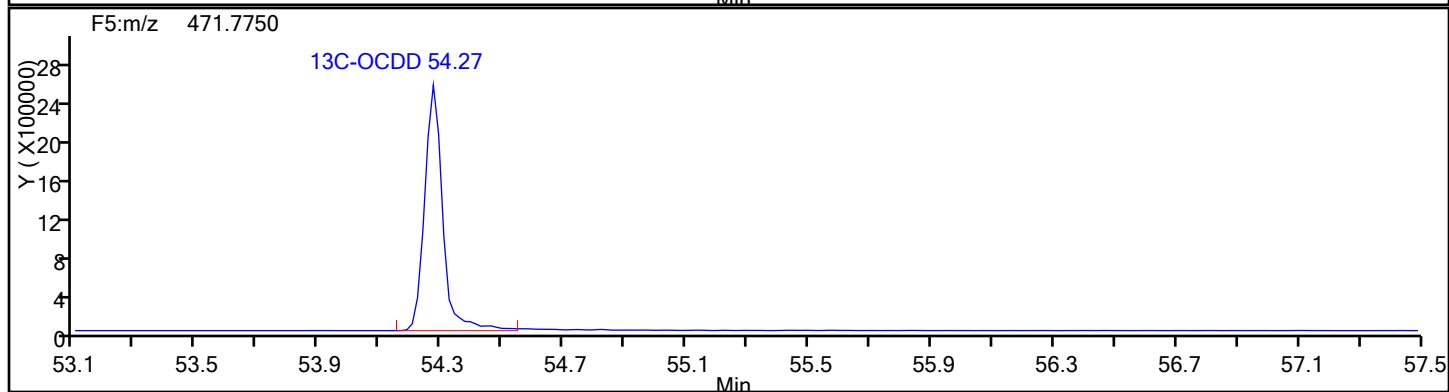
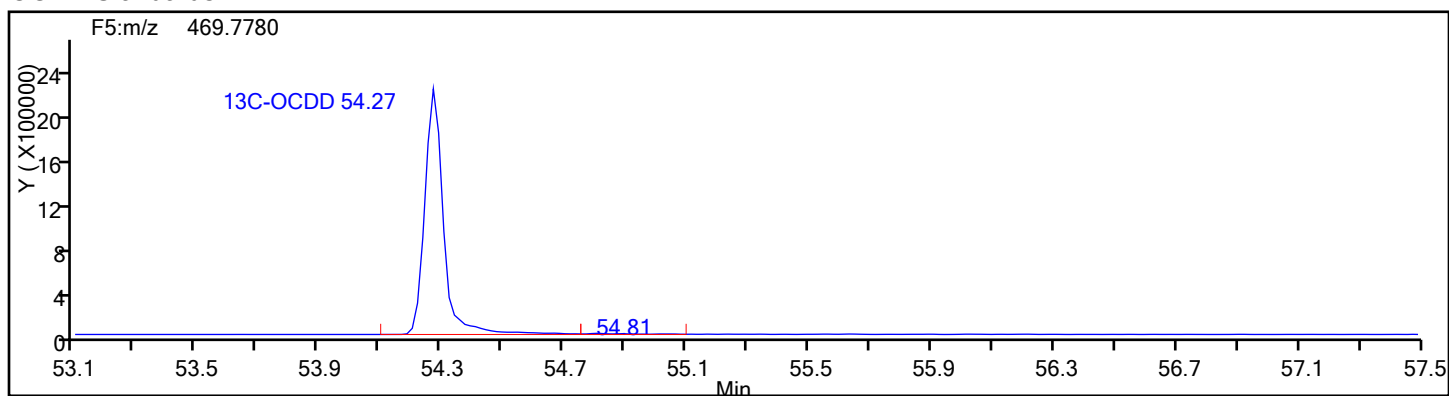
Column Type:

Column Dia:

OCDD



OCDD Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

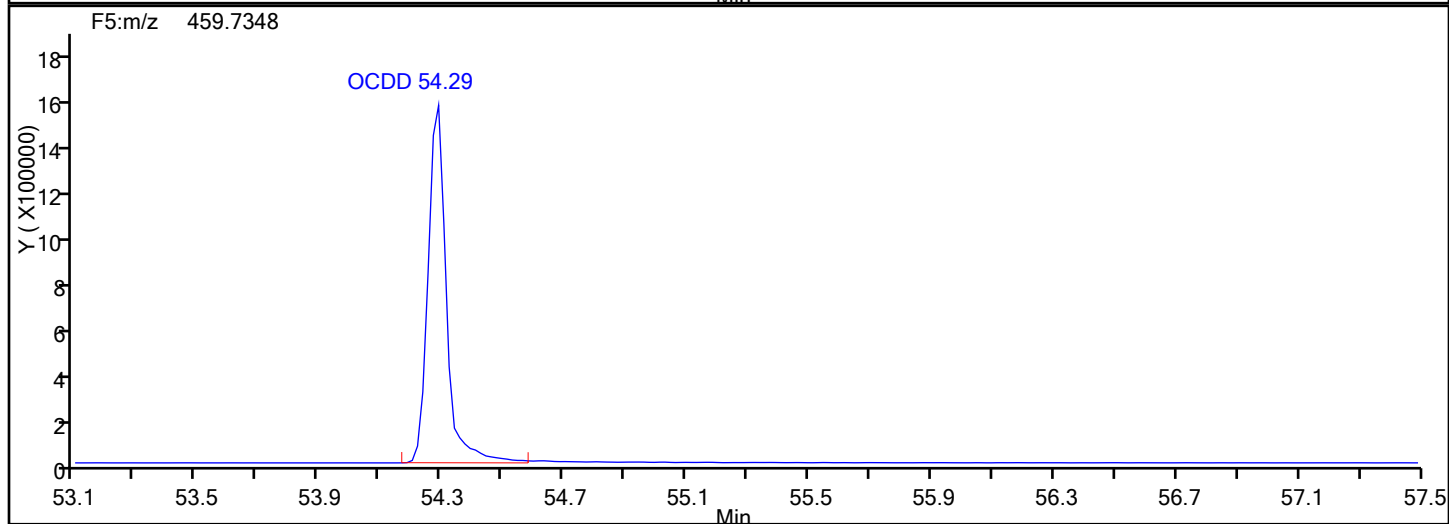
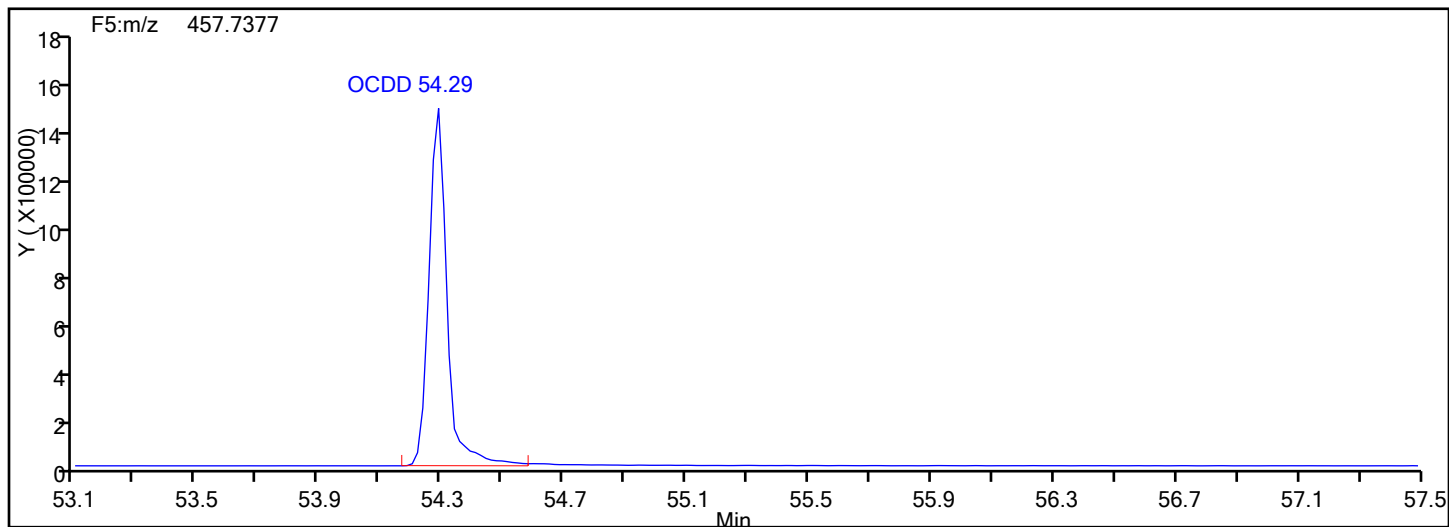
Worklist#: 7768

Sample Line#: 1

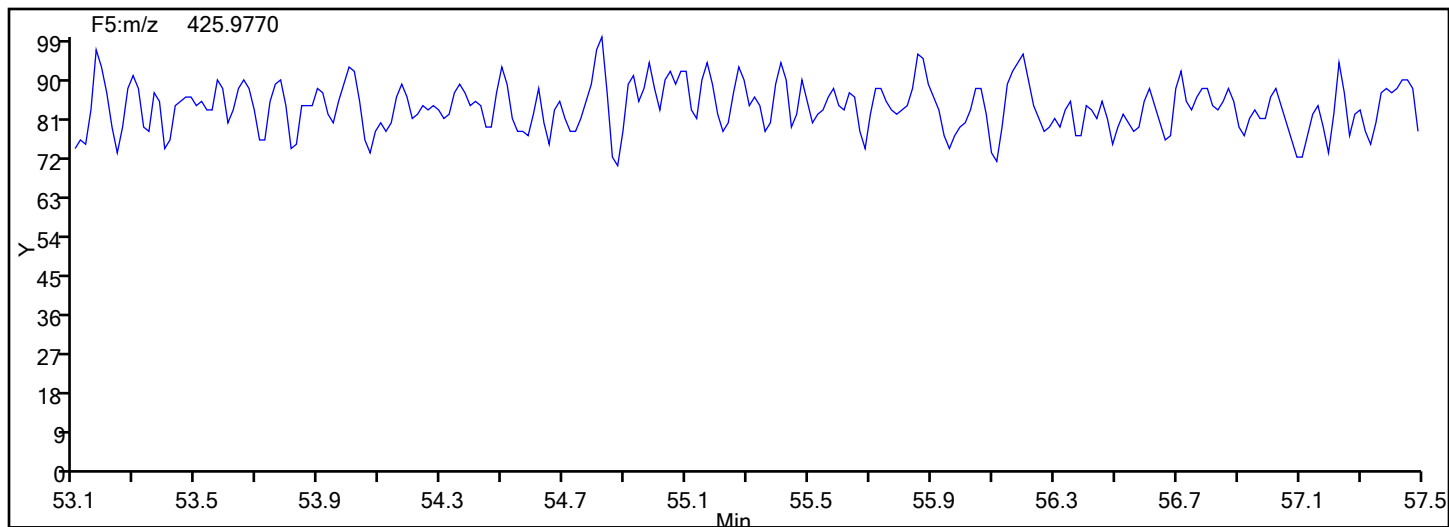
Column Type:

Column Dia:

OCDD



OCDD Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

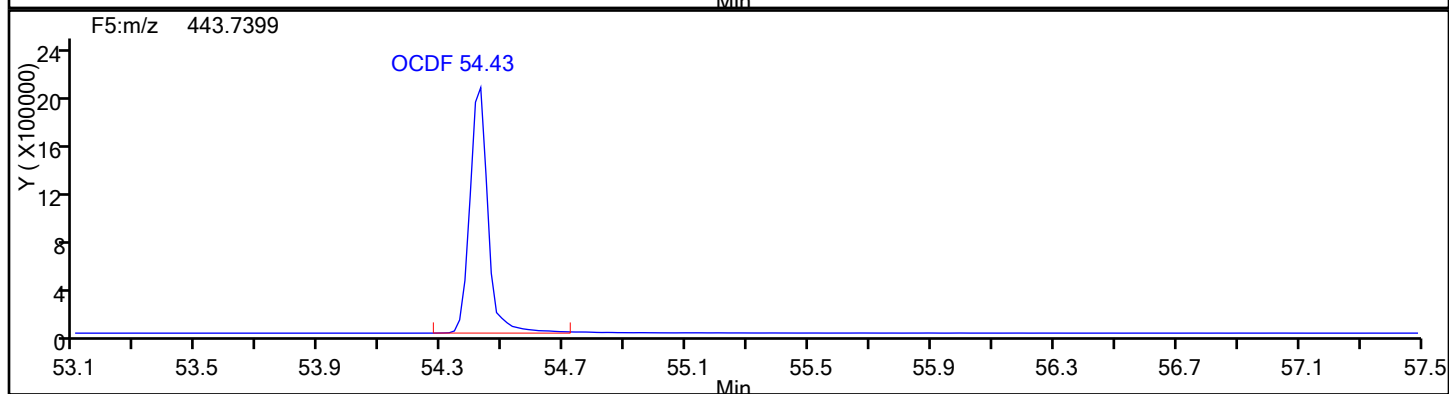
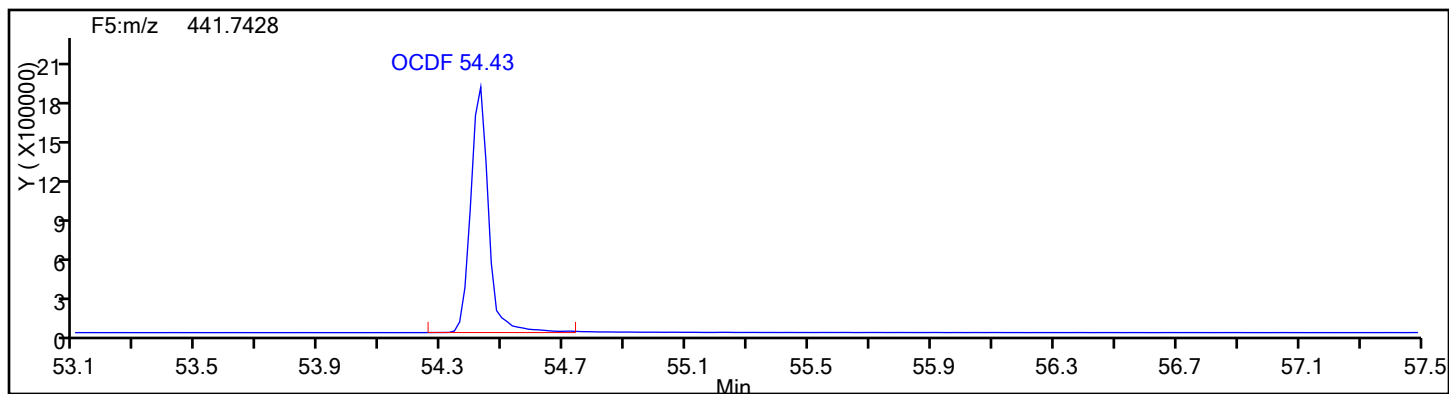
Worklist#: 7768

Sample Line#: 1

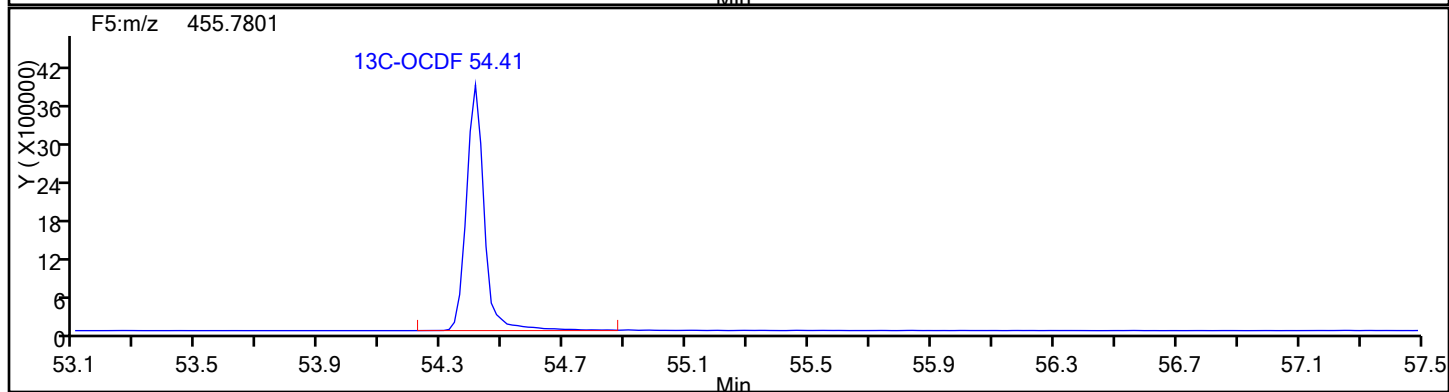
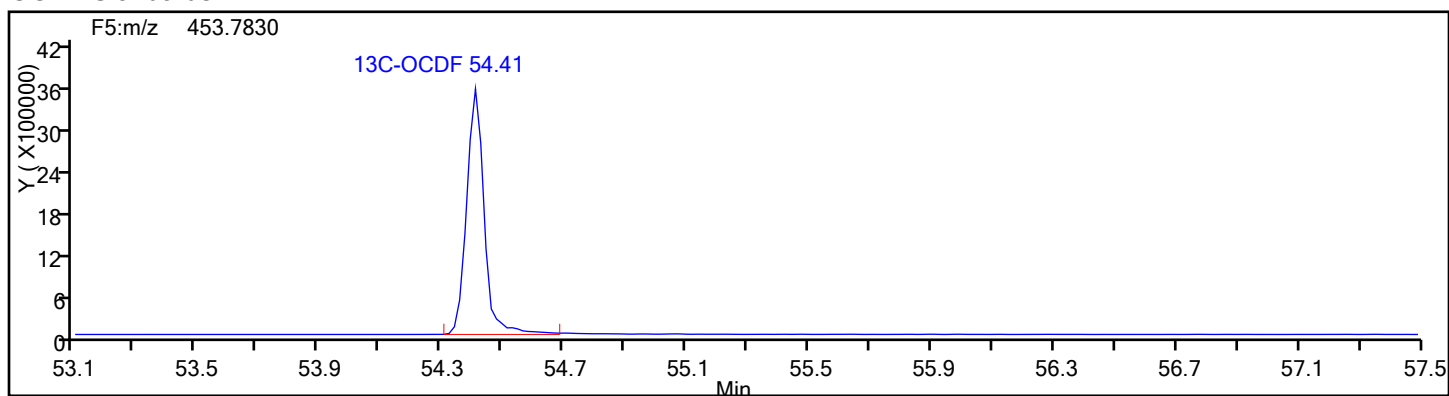
Column Type:

Column Dia:

OCDF



OCDF Standards



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

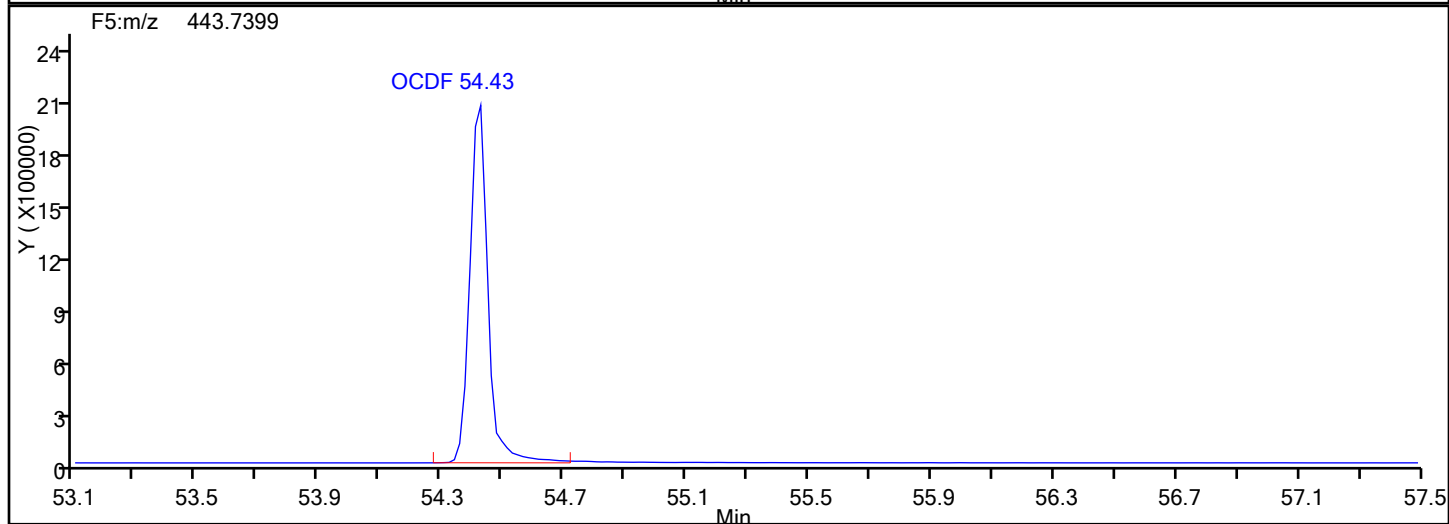
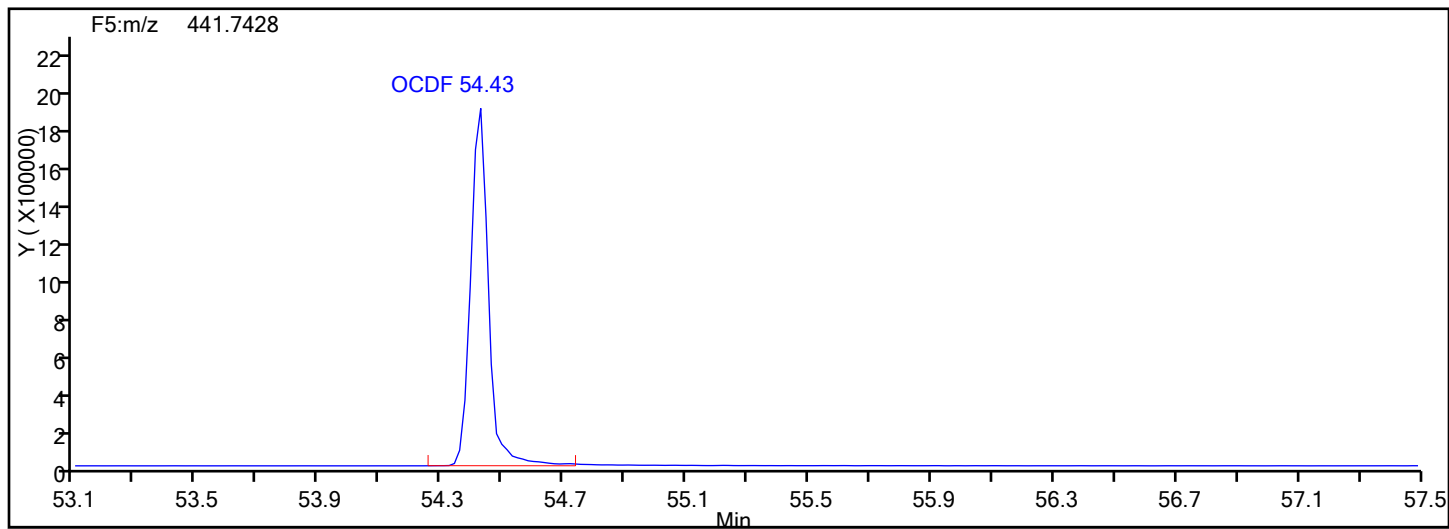
Worklist#: 7768

Sample Line#: 1

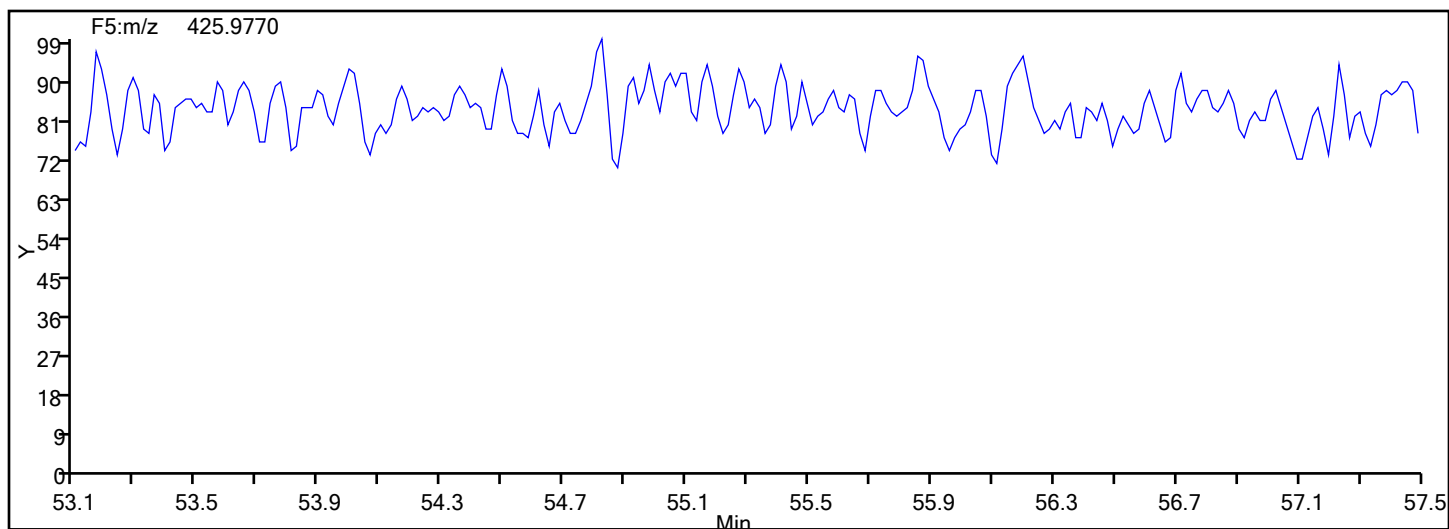
Column Type:

Column Dia:

OCDF



OCDF Lock Mass



TestAmerica Knoxville

Data File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516w1.d

Injection Date: 16-May-2014 10:23:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: DavidsonM

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

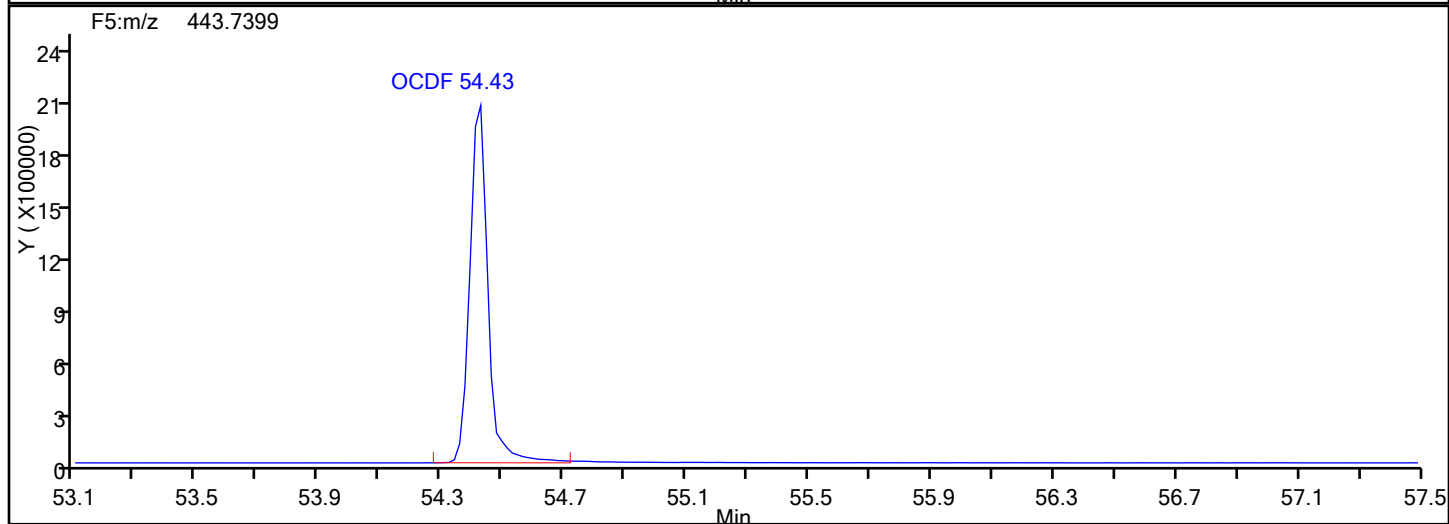
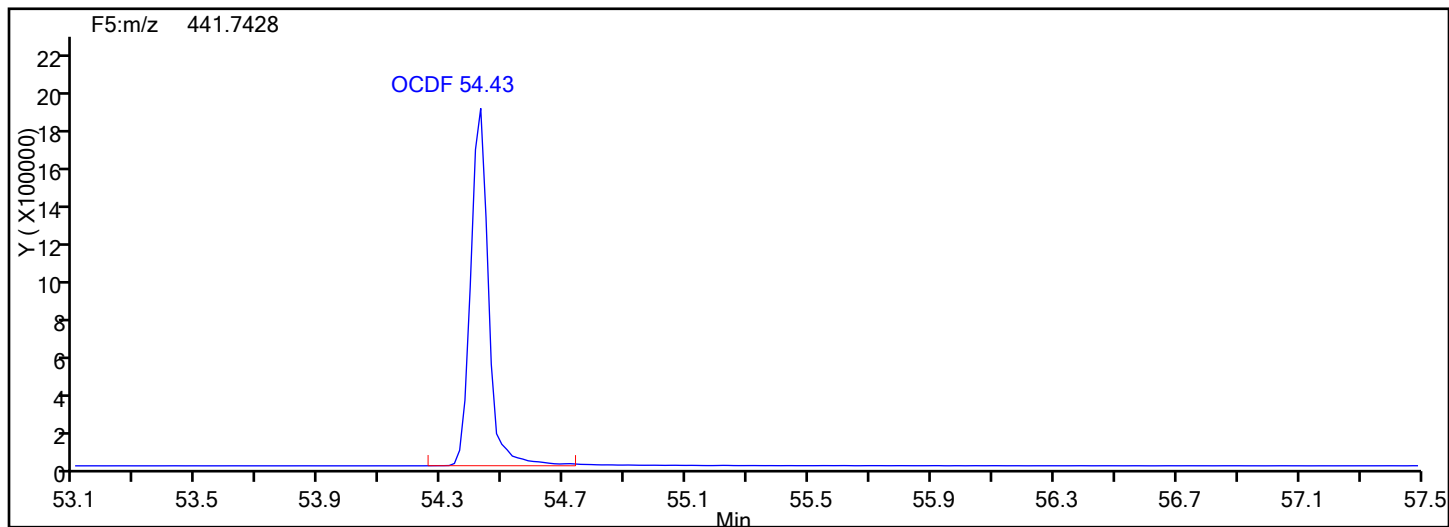
Worklist#: 7768

Sample Line#: 1

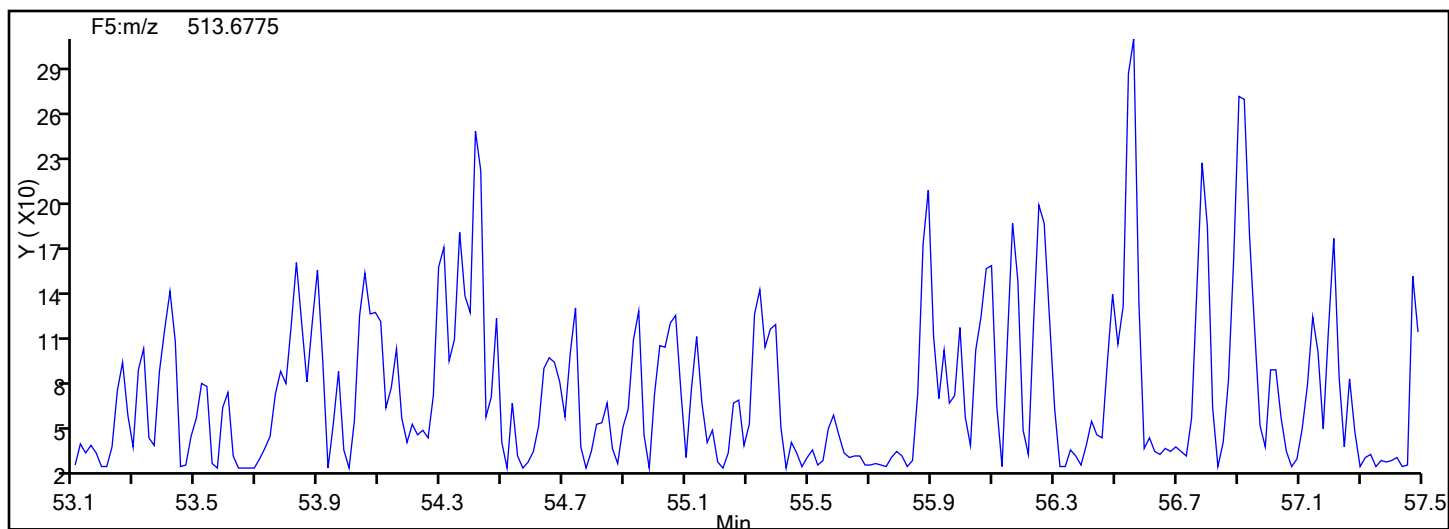
Column Type:

Column Dia:

OCDF



OCDF Interference Mass



FORM I
DIOXIN ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 140-27087/10-A
 Matrix: Water Lab File ID: MB140-270884-Aa.d
 Analysis Method: 1613B Date Collected: _____
 Extract. Method: HRMS-Sepf Date Extracted: 01/22/2019 13:19
 Sample wt/vol: 1000 (mL) Date Analyzed: 01/28/2019 03:56
 Con. Extract Vol.: 20 (uL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 27191 Units: pg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	EDL
1746-01-6	2,3,7,8-TCDD	0.44	U	10	0.44

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
76523-40-5	13C-2,3,7,8-TCDD	84		25-164

CAS NO.	SURROGATE	%REC	Q	LIMITS
85508-50-5	37C14-2,3,7,8-TCDD	97		35-197

TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\MB140-270884-Aa.d
 Lims ID: MB 140-27087/10-A
 Client ID:
 Sample Type: MB
 Inject. Date: 28-Jan-2019 03:56:00 ALS Bottle#: 0 Worklist Smp#: 9
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010654-008
 Operator ID: Xcalibur_System Instrument ID: D2A
 Method: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 28-Jan-2019 08:40:18 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: CTX1016

First Level Reviewer: davidsonm

Date: 28-Jan-2019 08:40:18

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31:00						0.0220	0.0220		
A Non-2,3,7,8-sub-TCDD	29:38						0.0220	0.0220		
S Total TCDD							0.0220	0.0220		
2,3,7,8-TCDF	29:00						0.0100	0.0100		
A Non-2,3,7,8-sub-TCDF	28:21						0.0100	0.0100		
S Total TCDF							0.0100	0.0100		
1,2,3,7,8-PeCDD	40:40						0.0145	0.0145		
A Non-2,3,7,8-sub-PeCDD	39:32						0.0145	0.0145		
S Total PeCDD							0.0145	0.0145		
1,2,3,7,8-PeCDF	38:53						0.0167	0.0167		
2,3,4,7,8-PeCDF	40:08						0.0161	0.0161		
A Non-2,3,7,8-sub-PeCDF	38:08						0.0164	0.0164		
S Total PeCDF							0.0167	0.0167		
1,2,3,4,7,8-HxCDD	44:55						0.0110	0.0110		
1,2,3,6,7,8-HxCDD	45:03						0.0116	0.0116		
1,2,3,7,8,9-HxCDD	45:39						0.0106	0.0106		RQU
A Non-2,3,7,8-sub-HxCDD	44:24						0.0110	0.0110		
S Total HxCDD							0.0116	0.0116		
1,2,3,4,7,8-HxCDF	43:54						0.0132	0.0132		
1,2,3,6,7,8-HxCDF	44:02						0.0111	0.0111		
2,3,4,6,7,8-HxCDF	44:45						0.0119	0.0119		
1,2,3,7,8,9-HxCDF	45:41						0.0133	0.0133		
A Non-2,3,7,8-sub-HxCDF	44:14						0.0123	0.0123		
S Total HxCDF							0.0133	0.0133		
1,2,3,4,6,7,8-HpCDD	49:43	2163	0.99	1.1204	0.0570	0.0570	0.0262	0.0262		M
A Non-2,3,7,8-sub-HpCDD	49:10						0.0262	0.0262		
S Total HpCDD					0.0570	0.0570	0.0262	0.0262		
1,2,3,4,6,7,8-HpCDF	48:03	6669	0.91	1.4984	0.1076	0.1076	0.009569	0.009569		
1,2,3,4,7,8,9-HpCDF	50:24						0.0138	0.0138		
A Non-2,3,7,8-sub-HpCDF	49:25						0.0114	0.0114		
S Total HpCDF					0.1076	0.1076	0.0117	0.0117		

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
OCDD	53:57	11754	0.89	1.2073	0.4029	0.3638	0.0131	0.0131		RQM
OCDF	54:05	14840	0.79	1.1162	0.3684	0.3684	0.009294	0.009294		M
D 13C-2,3,7,8-TCDD	30:58	2199831	0.81	1.0709	41.9	41.9	0.1814	0.1814	83.72	
D 13C-2,3,7,8-TCDF	28:57	3540412	0.77	1.7545	41.1	41.1	0.3934	0.3934	82.24	
D 13C-1,2,3,7,8-PeCDD	40:37	2022240	1.62	0.8743	47.1	47.1	0.4557	0.4557	94.27	
D 13C-1,2,3,7,8-PeCDF	38:49	2974765	1.61	1.3704	44.2	44.2	0.4478	0.4478	88.47	
D 13C-2,3,4,7,8-PeCDF	40:05	2878665	1.60	1.3837	42.4	42.4	0.4435	0.4435	84.79	
D 13C-1,2,3,4,7,8-HxCDD	44:53	1815773	1.25	0.8772	39.6	39.6	0.0882	0.0882	79.22	
D 13C-1,2,3,6,7,8-HxCDD	45:01	1899667	1.22	0.9171	39.6	39.6	0.0843	0.0843	79.28	
D 13C-1,2,3,4,7,8-HxCDF	43:52	2341109	0.51	1.1892	37.7	37.7	0.1554	0.1554	75.34	
D 13C-1,2,3,6,7,8-HxCDF	43:59	2913824	0.53	1.4625	38.1	38.1	0.1264	0.1264	76.25	
D 13C-2,3,4,6,7,8-HxCDF	44:42	2735940	0.51	1.3197	39.7	39.7	0.1401	0.1401	79.34	
D 13C-1,2,3,7,8,9-HxCDF	45:39	2835218	0.53	1.2001	45.2	45.2	0.1540	0.1540	90.41	
D 13C-1,2,3,4,6,7,8-HpCDD	49:42	1693727	1.05	0.8155	39.7	39.7	0.1367	0.1367	79.49	
D 13C-1,2,3,4,6,7,8-HpCDF	48:02	2068177	0.48	1.0496	37.7	37.7	0.1960	0.1960	75.41	
D 13C-1,2,3,4,7,8,9-HpCDF	50:21	1769001	0.46	0.8947	37.8	37.8	0.2300	0.2300	75.67	
D 13C-OCDD	53:56	2676074	0.89	0.7044	72.7	72.7	0.1918	0.1918	72.70	
D 13C-OCDF	54:04	3608613	0.92	1.0615	65.1	65.1	0.1745	0.1745	65.06	
\$ 37Cl4-2,3,7,8-TCDD	31:00	583570		1.2266	9.696	9.696	0.0254	0.0254	96.96	
* 13C-1,2,3,4-TCDD	30:27	4907043	0.80	9.1E+04	100.0	100.0				
* 13C-1,2,3,7,8,9-HxCDD	45:23	5225805	1.28	1E+05	100.0	100.0				

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

Review Flags

M - Manually Integrated

U - Marked Undetected

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\MB140-270884-Aa.d
 Lims ID: MB 140-27087/10-A
 Client ID:
 Sample Type: MB
 Inject. Date: 28-Jan-2019 03:56:00 ALS Bottle#: 0 Worklist Smp#: 9
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010654-008
 Operator ID: Xcalibur_System Instrument ID: D2A
 Method: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 28-Jan-2019 08:40:18 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: CTX1016

First Level Reviewer: davidsonm

Date: 28-Jan-2019 08:40:18

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
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2,3,7,8-TCDD

319.8965	30:56						20	50			
321.8936	30:56						28	70			

A Non-2,3,7,8-sub-TCDD

319.8965	29:38						20	50			
321.8936	29:38						28	70			

2,3,7,8-TCDF

303.9016	28:56						17	42			
305.8987	28:56						18	45			

A Non-2,3,7,8-sub-TCDF

303.9016	28:21						17	42			
305.8987	28:21						18	45			

1,2,3,7,8-PeCDD

355.8546	40:37						20	50			
357.8516	40:37						36	90			

A Non-2,3,7,8-sub-PeCDD

355.8546	39:32						20	50			
357.8516	39:32						36	90			

1,2,3,7,8-PeCDF

339.8597	38:48						43	107			
341.8567	38:48						50	125			

2,3,4,7,8-PeCDF

339.8597	40:05						43	107			
341.8567	40:05						50	125			

A Non-2,3,7,8-sub-PeCDF

339.8597	38:08						43	107			
341.8567	38:08						50	125			

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
1,2,3,4,7,8-HxCDD											
389.8158	44:52						28	70			
391.8127	44:52						20	50			
1,2,3,6,7,8-HxCDD											
389.8158	45:01						28	70			
391.8127	45:01						20	50			
1,2,3,7,8,9-HxCDD											
389.8158	45:25						28	70			RQU
391.8127	45:25						20	50			
A Non-2,3,7,8-sub-HxCDD											
389.8158	44:24						28	70			
391.8127	44:24						20	50			
1,2,3,4,7,8-HxCDF											
373.8208	43:51						33	82			
375.8178	43:51						54	135			
1,2,3,6,7,8-HxCDF											
373.8208	43:59						33	82			
375.8178	43:59						54	135			
2,3,4,6,7,8-HxCDF											
373.8208	44:45						33	82			
375.8178	44:45						54	135			
1,2,3,7,8,9-HxCDF											
373.8208	45:38						33	82			
375.8178	45:38						54	135			
A Non-2,3,7,8-sub-HxCDF											
373.8208	44:14						33	82			
375.8178	44:14						54	135			
1,2,3,4,6,7,8-HpCDD											
423.7767	49:43	49:43	-1	1.000	1074	292	22	55	13		M
425.7737	49:44	49:43	0	1.001	1089	254	57	142	4	0.99(0.88-1.20)	M
A Non-2,3,7,8-sub-HpCDD											
423.7767	49:10						22	55			
425.7737	49:10						57	142			
1,2,3,4,6,7,8-HpCDF											
407.7817	48:03	48:03	-1	1.000	3184	725	35	87	21		
409.7788	48:02	48:03	-2	1.000	3485	535	16	40	33	0.91(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50:21						35	87			
409.7788	50:21						16	40			
A Non-2,3,7,8-sub-HpCDF											
407.7817	49:25						35	87			
409.7788	49:25						16	40			
OCDD											
457.7377	53:57	53:57	-2	1.000	5535	1392	22	55	63		RQM
459.7348	53:57	53:57	-2	1.000	7483	1785	21	52	85	0.74(0.76-1.02)	M
Empc Correction					6219	1564	21	52	74		

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
OCDF											M
441.7428	54:05	54:05	-2	1.000	6546	1913	18	45	106		M
443.7399	54:04	54:05	-3	1.000	8294	1866	19	47	98	0.79(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	30:58	31:04	-4	1.017	982831	105393	236	590	447		
333.9338	30:57	31:04	-5	1.017	1217000	127277	175	437	727	0.81(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	28:57	29:03	-4	0.951	1542736	171026	882	2205	194		
317.9389	28:57	29:03	-4	0.951	1997676	227778	578	1445	394	0.77(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40:37	40:43	-3	1.334	1249419	284949	512	1280	557		
369.8919	40:37	40:43	-3	1.334	772821	177511	331	827	536	1.62(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	38:49	38:56	-4	1.275	1833942	361265	805	2012	449		
353.8970	38:50	38:56	-3	1.276	1140823	221115	493	1232	449	1.61(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40:05	40:11	-3	1.316	1772465	402831	805	2012	500		
353.8970	40:05	40:11	-3	1.316	1106200	247039	493	1232	501	1.60(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	44:53	44:57	-3	0.989	1007862	264979	241	602	1099		
403.8529	44:53	44:57	-3	0.989	807911	212137	126	315	1684	1.25(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45:01	45:04	-3	0.992	1044198	246028	241	602	1021		
403.8529	45:01	45:04	-3	0.992	855469	205363	126	315	1630	1.22(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	43:52	43:54	-2	0.967	793209	203687	413	1032	493		
385.8610	43:51	43:54	-3	0.966	1547900	401296	464	1160	865	0.51(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	43:59	44:02	-3	0.969	1011905	263513	413	1032	638		
385.8610	43:59	44:02	-3	0.969	1901919	501487	464	1160	1081	0.53(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	44:42	44:46	-3	0.985	928945	243985	413	1032	591		
385.8610	44:42	44:46	-3	0.985	1806995	478993	464	1160	1032	0.51(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	45:39	45:43	-3	1.006	985406	232598	413	1032	563		
385.8610	45:39	45:43	-3	1.006	1849812	415942	464	1160	896	0.53(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	49:42	49:46	-3	1.095	867937	170583	297	742	574		
437.8140	49:42	49:46	-3	1.095	825790	165073	232	580	712	1.05(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48:02	48:06	-3	1.059	668493	142763	347	867	411		
419.8220	48:02	48:06	-3	1.059	1399684	300104	629	1572	477	0.48(0.37-0.51)	
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50:21	50:25	-3	1.110	560102	105233	347	867	303		
419.8220	50:22	50:25	-2	1.110	1208899	228977	629	1572	364	0.46(0.37-0.51)	

Signal	RT (min.)	Adj RT (min.)	¶ Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-OCDD											
469.7780	53:56	54:00	-3	1.189	1263264	322949	338	845	955		
471.7750	53:56	54:00	-3	1.189	1412810	355065	303	757	1172	0.89(0.76-1.02)	
13C-OCDF											
453.7830	54:04	54:08	-3	1.192	1732924	428256	291	727	1472		
455.7801	54:04	54:08	-3	1.192	1875689	458604	588	1470	780	0.92(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31:00	31:03	-1	1.018	583570	61927	66	165	938		
13C-1,2,3,4-TCDD											
331.9368	30:27	30:28	-1		2184796	236582	236	590	1002		
333.9338	30:27	30:28	-1		2722247	292211	175	437	1670	0.80(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45:23	45:25	-2		2932470	667953	241	602	2772		
403.8529	45:23	45:25	-2		2293335	517874	126	315	4110	1.28(1.05-1.43)	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Q - EMPC-Estimated Max. Possible Conc.

Review Flags

M - Manually Integrated

U - Marked Undetected

TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\MB140-270884-Aa.d

Injection Date: 28-Jan-2019 03:56:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

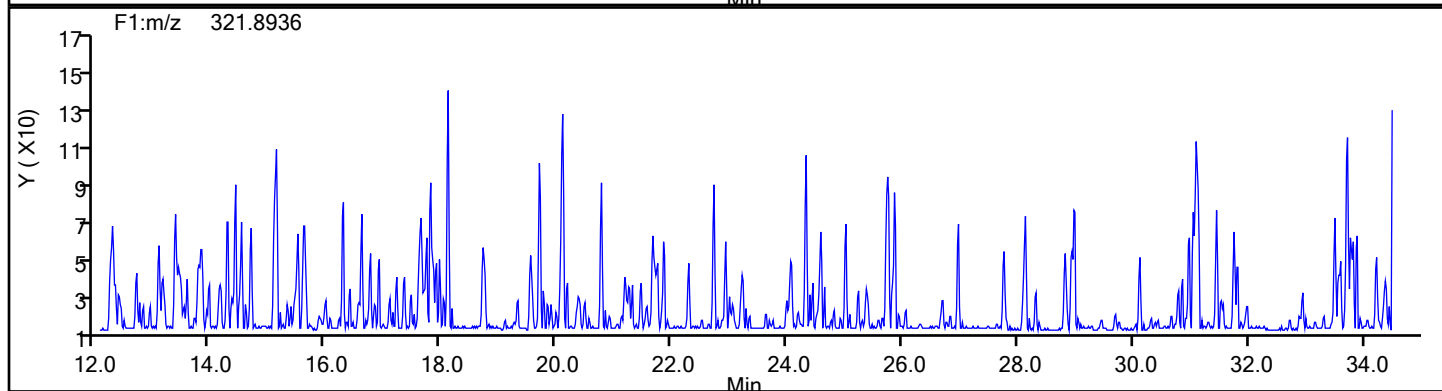
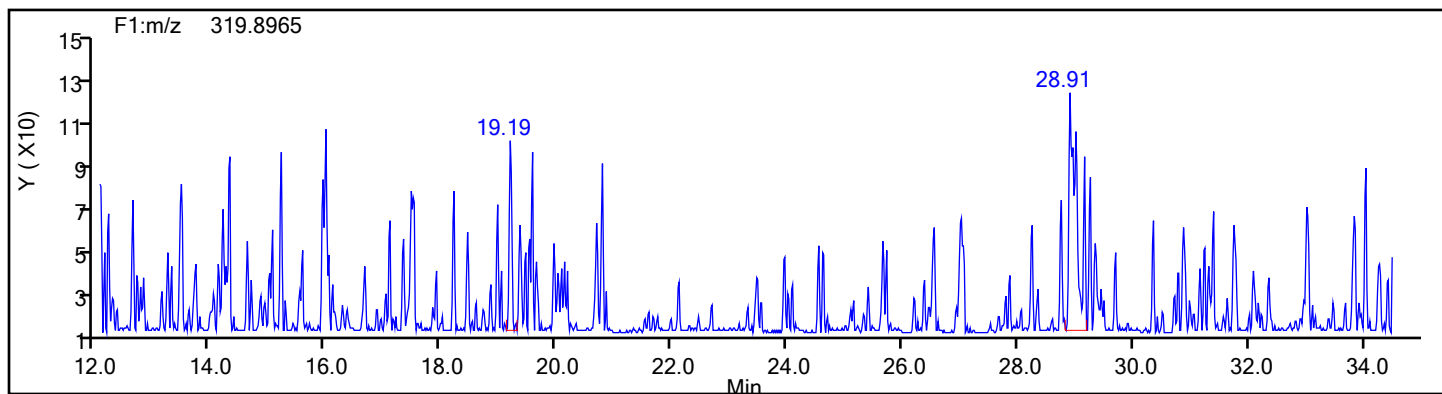
Worklist#: 27191

Sample Line#: 9

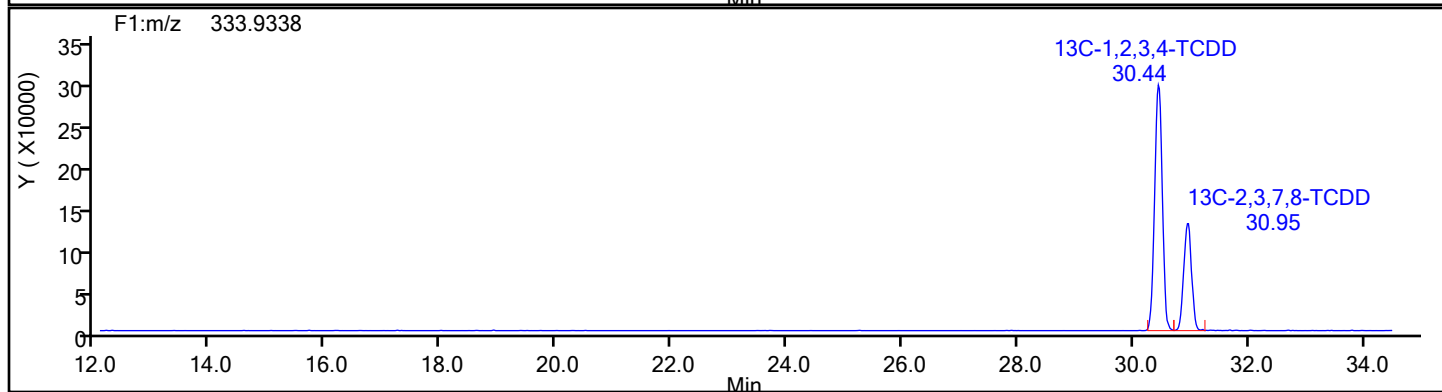
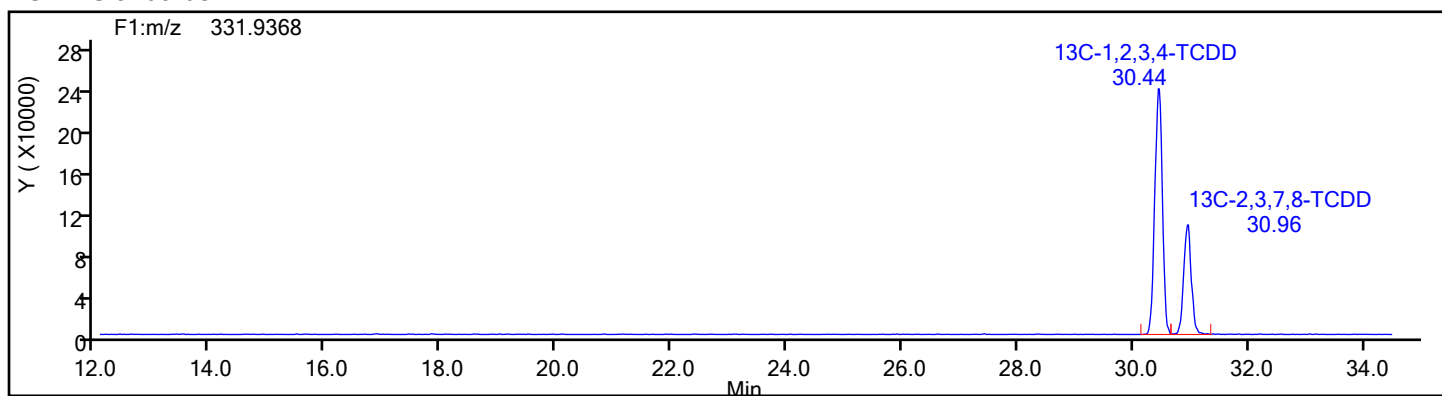
Column Type:

Column Dia:

TCDD

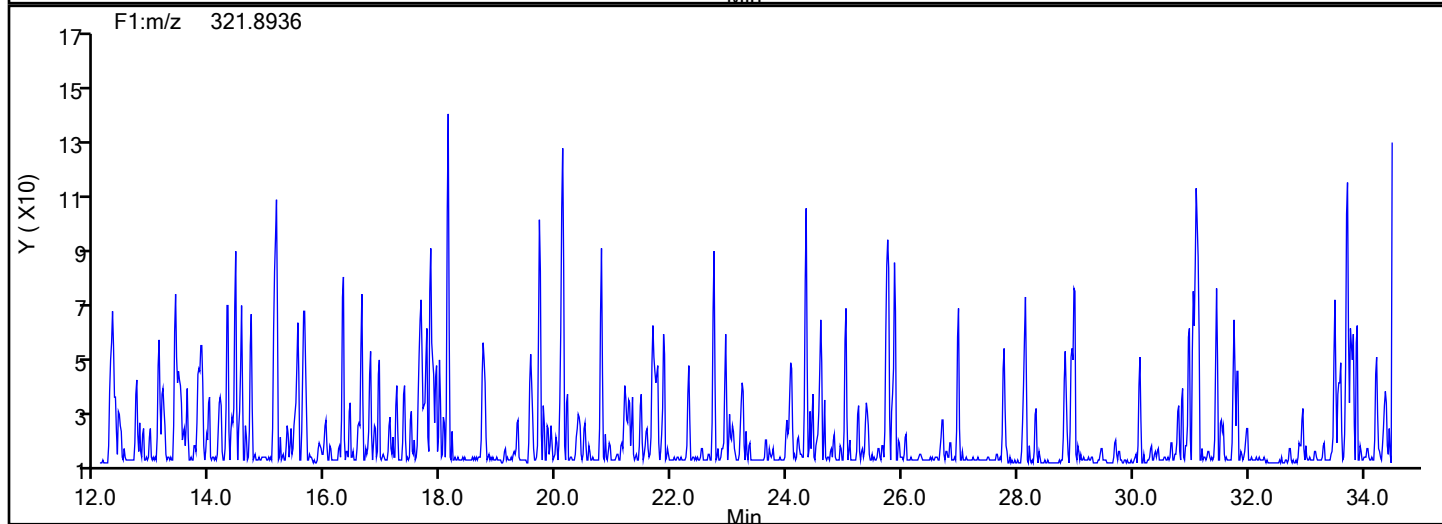
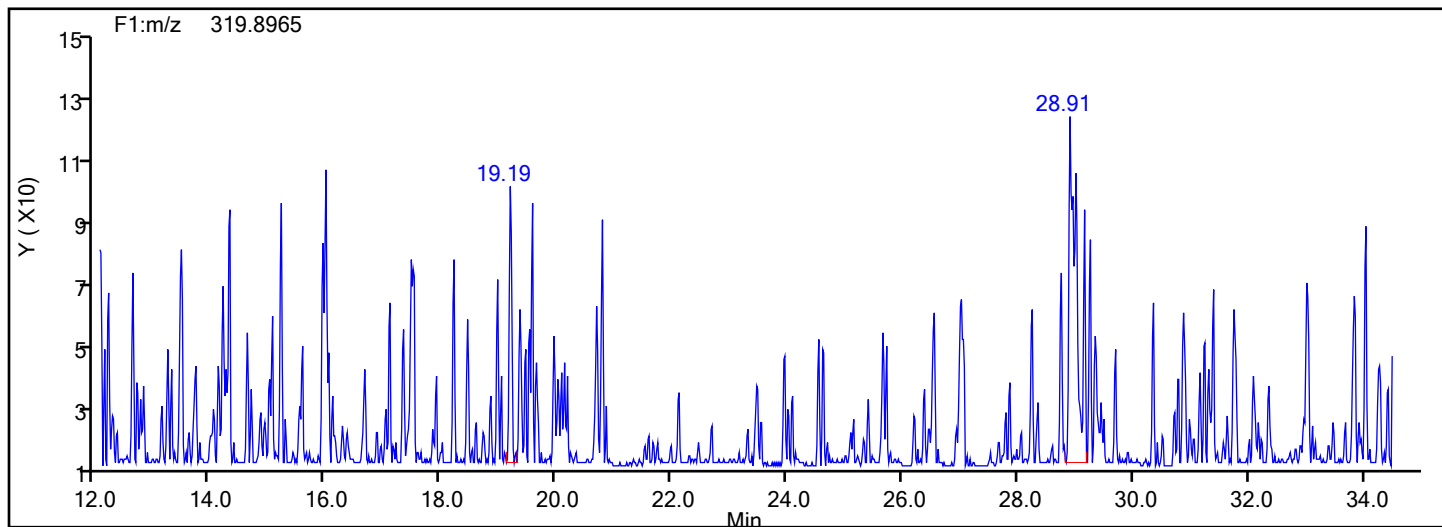


TCDD Standards

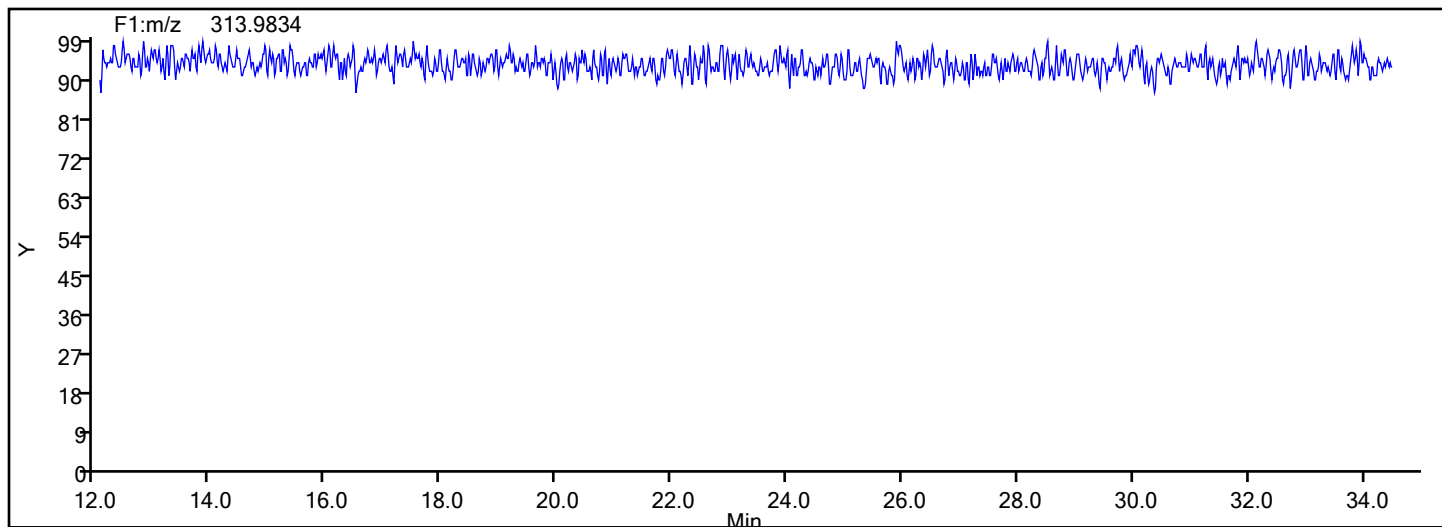


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\MB140-270884-Aa.d
Injection Date: 28-Jan-2019 03:56:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 9
Column Type: Column Dia:
TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\MB140-270884-Aa.d

Injection Date: 28-Jan-2019 03:56:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

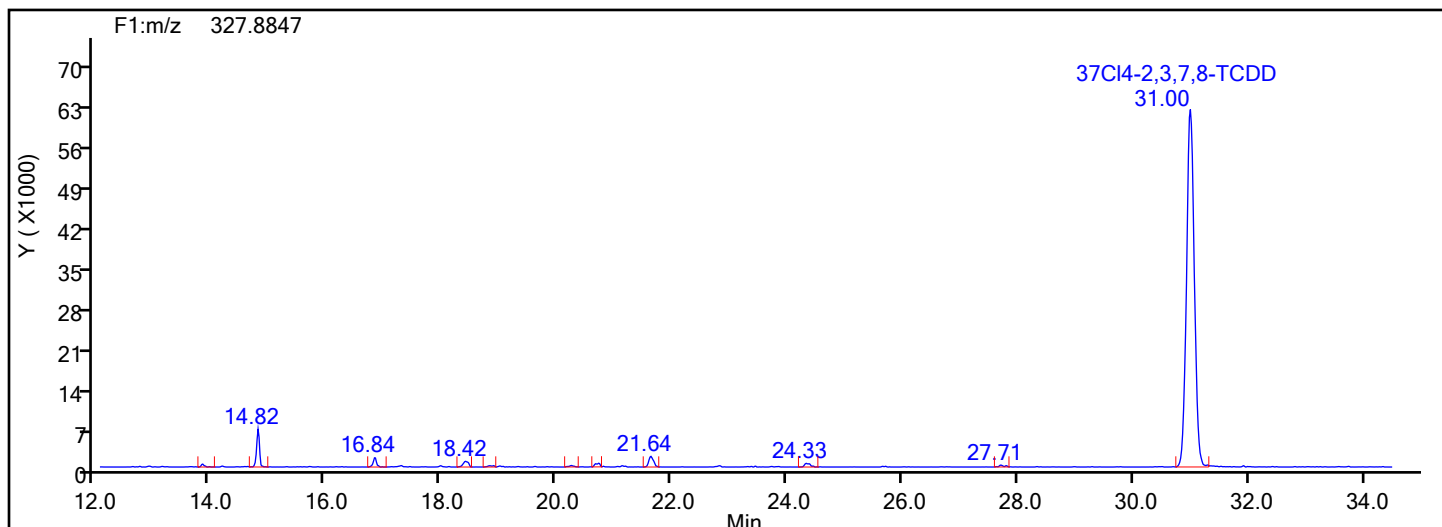
Worklist#: 27191

Sample Line#: 9

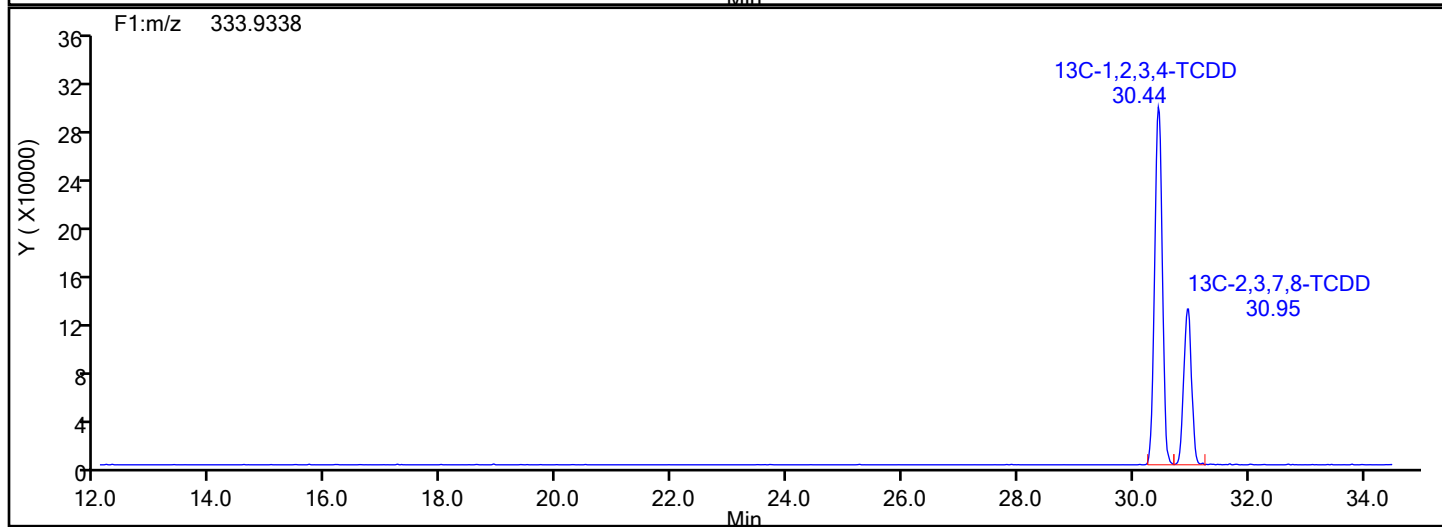
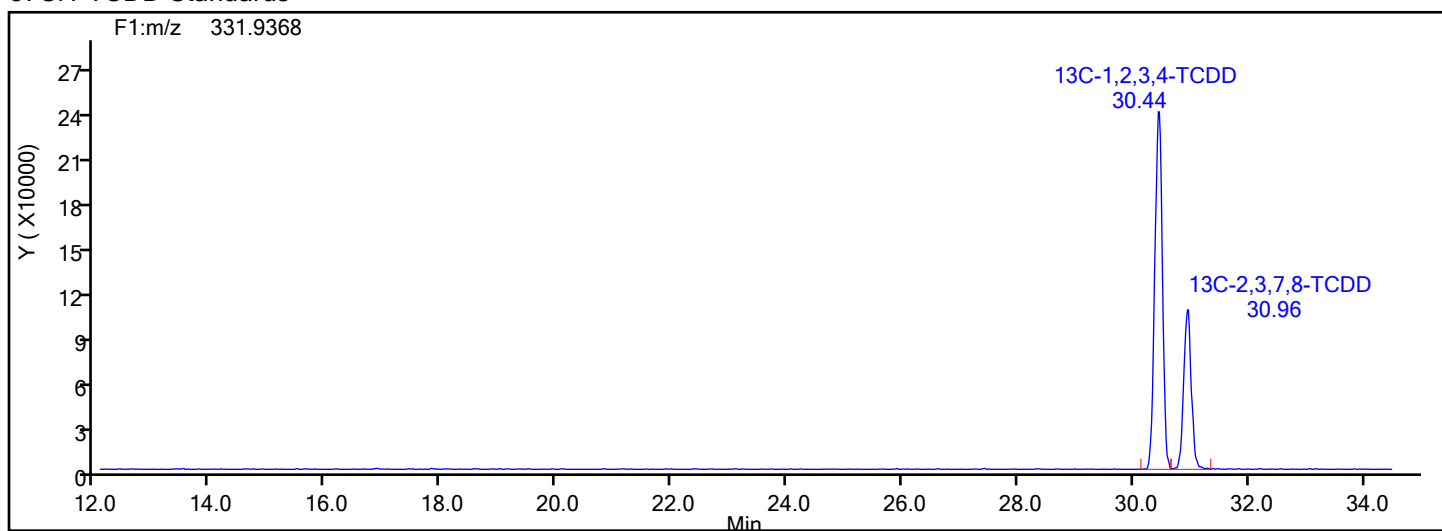
Column Type:

Column Dia:

37Cl4-TCDD

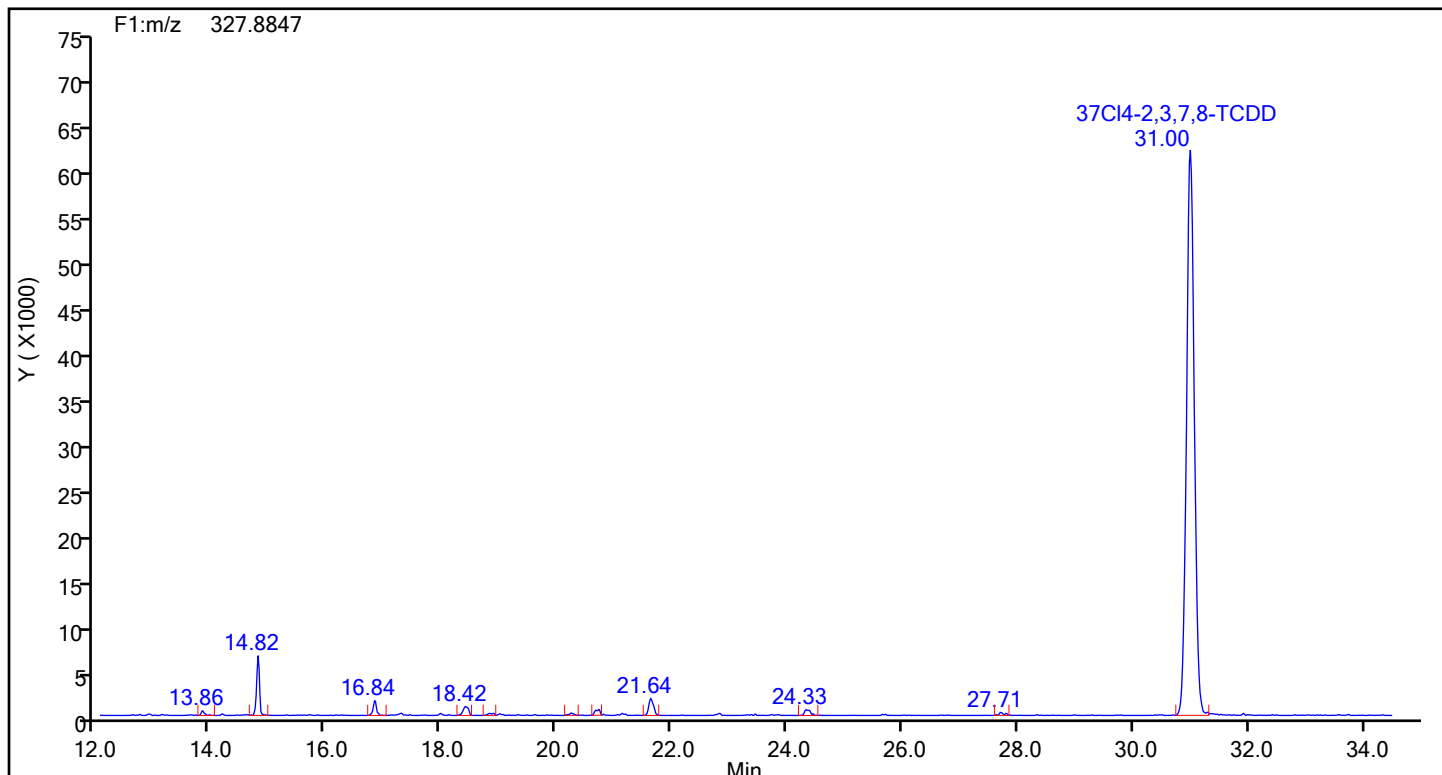


37Cl4-TCDD Standards

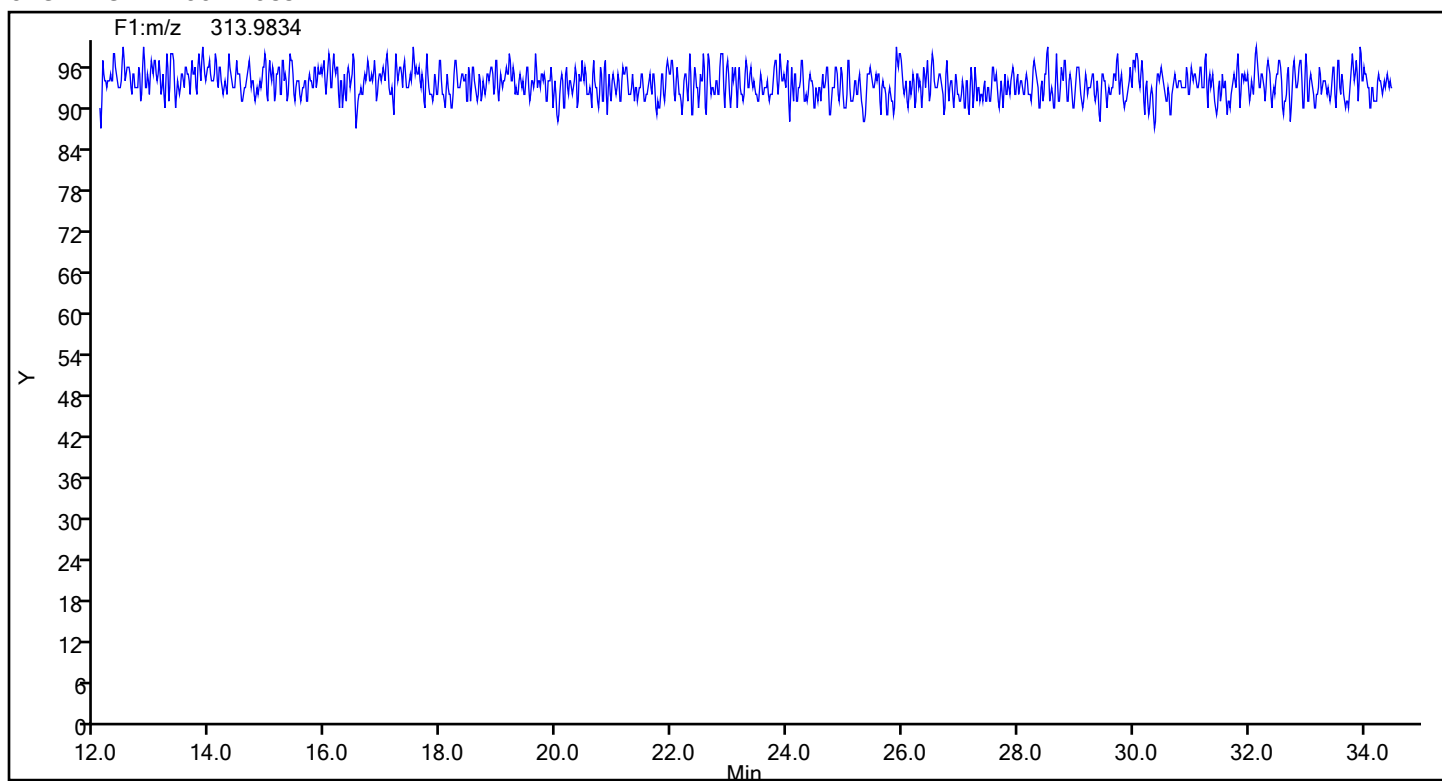


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\MB140-270884-Aa.d
Injection Date: 28-Jan-2019 03:56:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 9
Column Type: Column Dia:
37Cl4-TCDD



37Cl4-TCDD Lock Mass



FORM I
DIOXIN ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 140-27087/11-A
 Matrix: Water Lab File ID: LCS140-270885-Aa.d
 Analysis Method: 1613B Date Collected: _____
 Extract. Method: HRMS-Sepf Date Extracted: 01/22/2019 13:19
 Sample wt/vol: 1000 (mL) Date Analyzed: 01/28/2019 02:07
 Con. Extract Vol.: 20 (uL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 27191 Units: pg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	EDL
1746-01-6	2,3,7,8-TCDD	183		10	0.63

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
76523-40-5	13C-2,3,7,8-TCDD	83		20-175

CAS NO.	SURROGATE	%REC	Q	LIMITS
85508-50-5	37C14-2,3,7,8-TCDD	100		31-191

TestAmerica Knoxville
Target Compound Quantitation Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
 Lims ID: LCS 140-27087/11-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 28-Jan-2019 02:07:00 ALS Bottle#: 0 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010654-002
 Operator ID: Xcalibur_System Instrument ID: D2A
 Method: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 28-Jan-2019 08:25:45 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: CTX1016

First Level Reviewer: davidsonm

Date: 28-Jan-2019 08:25:58

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
2,3,7,8-TCDD	31:02	292976	0.82	1.1733	9.159	9.159	0.0315	0.0315	91.59	
A Non-2,3,7,8-sub-TCDD	29:38						0.0315	0.0315		
S Total TCDD					9.159	9.159	0.0315	0.0315		
2,3,7,8-TCDF	29:03	442467	0.82	1.0881	9.215	9.215	0.0199	0.0199	92.15	
A Non-2,3,7,8-sub-TCDF	28:21						0.0199	0.0539		RQU
S Total TCDF					9.215	9.215	0.0199	0.0199		
1,2,3,7,8-PeCDD	40:41	1169083	1.55	1.0434	45.4	45.4	0.0253	0.0253	90.87	
A Non-2,3,7,8-sub-PeCDD	39:32						0.0253	0.4573		U
S Total PeCDD					45.4	45.4	0.0253	0.0253		
1,2,3,7,8-PeCDF	38:54	1815768	1.59	1.1898	41.3	41.3	0.1688	0.1688	82.65	
2,3,4,7,8-PeCDF	40:09	1792752	1.57	1.1095	44.5	44.5	0.1692	0.1692	88.97	
A Non-2,3,7,8-sub-PeCDF	38:08						0.1688	0.3551		U
S Total PeCDF					85.8	85.8	0.1690	0.1690		
1,2,3,4,7,8-HxCDD	44:57	1310518	1.25	1.1409	47.9	47.9	0.0186	0.0186	95.84	
1,2,3,6,7,8-HxCDD	45:03	1335396	1.28	1.1481	46.6	46.6	0.0178	0.0178	93.19	
1,2,3,7,8,9-HxCDD	45:26	1450400	1.23	1.2212	48.5	48.5	0.0170	0.0170	97.09	
A Non-2,3,7,8-sub-HxCDD	44:24						0.0178	0.8628		U
S Total HxCDD					143.1	143.1	0.0178	0.0178		
1,2,3,4,7,8-HxCDF	43:54	2130035	1.26	1.3629	47.5	47.5	0.1191	0.1191	95.03	
1,2,3,6,7,8-HxCDF	44:02	2303692	1.28	1.2762	47.2	47.2	0.1116	0.1116	94.39	
2,3,4,6,7,8-HxCDF	44:46	2052255	1.26	1.2654	46.5	46.5	0.1298	0.1298	92.93	
1,2,3,7,8,9-HxCDF	45:42	1923788	1.27	1.2573	48.2	48.2	0.1569	0.1569	96.31	
A Non-2,3,7,8-sub-HxCDF	44:14						0.1274	0.1274		
S Total HxCDF					189.3	189.3	0.1293	0.1293		
1,2,3,4,6,7,8-HpCDD	49:46	1184409	1.05	1.1204	46.6	46.6	0.0252	0.0252	93.19	
A Non-2,3,7,8-sub-HpCDD	49:10						0.0252	2.021		U
S Total HpCDD					46.6	46.6	0.0252	0.0252		
1,2,3,4,6,7,8-HpCDF	48:05	2089052	1.06	1.4984	49.5	49.5	0.0461	0.0461	99.07	
1,2,3,4,7,8,9-HpCDF	50:25	1639071	1.05	1.3807	50.4	50.4	0.0636	0.0636	101	
A Non-2,3,7,8-sub-HpCDF	49:25						0.0537	0.6761		U
S Total HpCDF					99.9	99.9	0.0548	0.0548		

Compound	RT (min.)	Area	Ratio	Ical RRF	Amount pg/ul	EMPC pg/ul	Noise EDL	Final EDL	%Rec	Flags
OCDD	54:00	1980378	0.89	1.2073	92.2	92.2	0.0174	0.0174	92.24	
OCDF	54:07	2499700	0.92	1.1162	90.8	90.8	0.0212	0.0212	90.80	
D 13C-2,3,7,8-TCDD	31:01	1363155	0.75	1.0709	41.3	41.3	0.2256	0.2256	82.62	
D 13C-2,3,7,8-TCDF	29:00	2206419	0.82	1.7545	40.8	40.8	0.2535	0.2535	81.63	
D 13C-1,2,3,7,8-PeCDD	40:40	1232965	1.54	0.8743	45.8	45.8	0.3504	0.3504	91.54	
D 13C-1,2,3,7,8-PeCDF	38:52	1846440	1.60	1.3704	43.7	43.7	0.4944	0.4944	87.46	
D 13C-2,3,4,7,8-PeCDF	40:08	1816105	1.52	1.3837	42.6	42.6	0.4896	0.4896	85.19	
D 13C-1,2,3,4,7,8-HxCDD	44:56	1198560	1.32	0.8772	45.3	45.3	0.1259	0.1259	90.67	
D 13C-1,2,3,6,7,8-HxCDD	45:02	1248154	1.34	0.9171	45.2	45.2	0.1204	0.1204	90.32	
D 13C-1,2,3,4,7,8-HxCDF	43:53	1644652	0.54	1.1892	45.9	45.9	0.2327	0.2327	91.78	
D 13C-1,2,3,6,7,8-HxCDF	44:01	1912291	0.55	1.4625	43.4	43.4	0.1892	0.1892	86.77	
D 13C-2,3,4,6,7,8-HxCDF	44:45	1745163	0.52	1.3197	43.9	43.9	0.2097	0.2097	87.76	
D 13C-1,2,3,7,8,9-HxCDF	45:41	1588674	0.53	1.2001	43.9	43.9	0.2305	0.2305	87.85	
D 13C-1,2,3,4,6,7,8-HpCDD	49:44	1134396	1.06	0.8155	46.2	46.2	0.3047	0.3047	92.31	
D 13C-1,2,3,4,6,7,8-HpCDF	48:04	1407355	0.47	1.0496	44.5	44.5	0.3740	0.3740	88.98	
D 13C-1,2,3,4,7,8,9-HpCDF	50:24	1178613	0.48	0.8947	43.7	43.7	0.4388	0.4388	87.42	
D 13C-OCDD	53:59	1778395	0.89	0.7044	83.8	83.8	0.2916	0.2916	83.77	
D 13C-OCDF	54:07	2466426	0.91	1.0615	77.1	77.1	0.1725	0.1725	77.10	
\$ 37Cl4-2,3,7,8-TCDD	31:03	376540		1.2266	9.964	9.964	0.0552	0.0552	99.64	
* 13C-1,2,3,4-TCDD	30:30	3081107	0.81	9.1E+04	100.0	100.0			100	
* 13C-1,2,3,7,8,9-HxCDD	45:25	3013760	1.26	1E+05	100.0	100.0			100	

QC Flag Legend

Review Flags

U - Marked Undetected

TestAmerica Knoxville
Target Compound Quantitation Worksheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
 Lims ID: LCS 140-27087/11-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 28-Jan-2019 02:07:00 ALS Bottle#: 0 Worklist Smp#: 3
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info:
 Misc. Info.: 140-0010654-002
 Operator ID: Xcalibur_System Instrument ID: D2A
 Method: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\D2A_Dioxin.m
 Limit Group: HR - 1613B - ICAL
 Last Update: 28-Jan-2019 08:25:45 Calib Date: 16-May-2014 18:31:00
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Knoxville\ChromData\D2A\20170111-3817.b\d3140516i5.d
 Column 1 : Det: F1(12.07 :34.29)
 Process Host: CTX1016

First Level Reviewer: davidsonm

Date: 28-Jan-2019 08:25:58

Signal	RT (min.)	Adj RT (min.)	⌈ Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
2,3,7,8-TCDD											
319.8965	31:02	30:59	2	1.001	132063	14278	18	45	793		
321.8936	31:04	30:59	4	1.002	160913	16645	23	57	724	0.82(0.65-0.89)	
A Non-2,3,7,8-sub-TCDD											
319.8965	29:38						18	45			
321.8936	29:38						23	57			
2,3,7,8-TCDF											
303.9016	29:03	28:59	3	1.002	199001	23078	18	45	1282		
305.8987	29:03	28:59	3	1.002	243466	28381	25	62	1135	0.82(0.65-0.89)	
A Non-2,3,7,8-sub-TCDF											
303.9016	22:43	28:21	-338	0.783	571	134	18	45	7		U
	Empc Correction				481	110	18	45	6		
305.8987	22:42	28:21	-339	0.783	625	143	25	62	6	0.91(0.65-0.89)	
1,2,3,7,8-PeCDD											
355.8546	40:41	40:40	1	1.000	710808	168355	15	37	11224		
357.8516	40:41	40:40	1	1.000	458275	107731	45	112	2394	1.55(1.32-1.78)	
A Non-2,3,7,8-sub-PeCDD											
355.8546	37:45	39:32	-107	0.928	2894	435	15	37	29		U
357.8516	37:46	39:32	-106	0.929	2005	416	45	112	9	1.44(1.32-1.78)	
1,2,3,7,8-PeCDF											
339.8597	38:54	38:51	2	1.001	1115975	221746	357	892	621		
341.8567	38:53	38:51	1	1.000	699793	135431	239	597	567	1.59(1.32-1.78)	
2,3,4,7,8-PeCDF											
339.8597	40:09	40:07	1	1.000	1094458	243070	357	892	681		
341.8567	40:09	40:07	1	1.000	698294	154310	239	597	646	1.57(1.32-1.78)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
A Non-2,3,7,8-sub-PeCDF											U
339.8597	38:08	38:08	0	0.981	8607	1498	357	892			
341.8567	38:08	38:08	0	0.981	6346	1438	239	597		1.36(1.32-1.78)	
1,2,3,4,7,8-HxCDD											
389.8158	44:57	44:55	2	1.000	729072	180846	38	95	4759		
391.8127	44:56	44:55	1	1.000	581446	148715	12	30	12393	1.25(1.05-1.43)	
1,2,3,6,7,8-HxCDD											
389.8158	45:03	45:01	1	1.000	749778	183319	38	95	4824		
391.8127	45:03	45:01	1	1.000	585618	146074	12	30	12173	1.28(1.05-1.43)	
1,2,3,7,8,9-HxCDD											
389.8158	45:26	45:25	1	1.011	800031	191672	38	95	5044		
391.8127	45:26	45:25	1	1.011	650369	152463	12	30	12705	1.23(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDD											U
389.8158	43:22	44:24	-62	0.963	13578	3840	38	95	101		
391.8127	43:22	44:24	-62	0.963	11123	3122	12	30	260	1.22(1.05-1.43)	
1,2,3,4,7,8-HxCDF											
373.8208	43:54	43:53	1	1.000	1187148	321923	329	822	978		
375.8178	43:54	43:53	1	1.000	942887	255986	243	607	1053	1.26(1.05-1.43)	
1,2,3,6,7,8-HxCDF											
373.8208	44:02	44:01	1	1.000	1292980	335197	329	822	1019		
375.8178	44:02	44:01	1	1.000	1010712	264793	243	607	1090	1.28(1.05-1.43)	
2,3,4,6,7,8-HxCDF											
373.8208	44:46	44:45	1	1.000	1142352	293829	329	822	893		
375.8178	44:46	44:45	1	1.000	909903	227014	243	607	934	1.26(1.05-1.43)	
1,2,3,7,8,9-HxCDF											
373.8208	45:42	45:39	1	1.000	1075319	236291	329	822	718		
375.8178	45:42	45:39	1	1.000	848469	193537	243	607	796	1.27(1.05-1.43)	
A Non-2,3,7,8-sub-HxCDF											
373.8208	44:14						329	822			
375.8178	44:14						243	607			
1,2,3,4,6,7,8-HpCDD											
423.7767	49:46	49:43	2	1.001	606661	114341	19	47	6018		
425.7737	49:45	49:43	1	1.000	577748	109730	30	75	3658	1.05(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDD											U
423.7767	48:35	49:10	-34	0.977	24476	5174	19	47	272		
425.7737	48:35	49:10	-34	0.977	26909	5171	30	75	172	0.91(0.88-1.20)	
1,2,3,4,6,7,8-HpCDF											
407.7817	48:05	48:03	1	1.000	1073212	227842	117	292	1947		
409.7788	48:05	48:03	1	1.000	1015840	222430	50	125	4449	1.06(0.88-1.20)	
1,2,3,4,7,8,9-HpCDF											
407.7817	50:25	50:23	1	1.000	841051	165944	117	292	1418		
409.7788	50:25	50:23	1	1.000	798020	161325	50	125	3227	1.05(0.88-1.20)	
A Non-2,3,7,8-sub-HpCDF											U
407.7817	48:43	49:25	-41	1.014	12235	2390	117	292	20		
409.7788	48:43	49:25	-41	1.014	12932	2517	50	125	50	0.95(0.88-1.20)	

Signal	RT (min.)	Adj RT (min.)	Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
OCDD											
457.7377	54:00	53:58	1	1.000	932380	222619	24	60	9276		
459.7348	53:59	53:58	0	1.000	1047998	242464	13	32	18651	0.89(0.76-1.02)	
OCDF											
441.7428	54:07	54:07	0	1.000	1197796	289187	30	75	9640		
443.7399	54:07	54:07	0	1.000	1301904	321324	26	65	12359	0.92(0.76-1.02)	
13C-2,3,7,8-TCDD											
331.9368	31:01	31:04	-2	1.017	584158	60485	206	515	294		
333.9338	31:00	31:04	-3	1.017	778997	77570	122	305	636	0.75(0.65-0.89)	
13C-2,3,7,8-TCDF											
315.9419	29:00	29:03	-2	0.951	995209	112401	323	807	348		
317.9389	29:00	29:03	-2	0.951	1211210	134243	281	702	478	0.82(0.65-0.89)	
13C-1,2,3,7,8-PeCDD											
367.8949	40:40	40:43	-1	1.333	748096	176037	260	650	677		
369.8919	40:40	40:43	-1	1.333	484869	108468	156	390	695	1.54(1.32-1.78)	
13C-1,2,3,7,8-PeCDF											
351.9000	38:52	38:56	-2	1.275	1137359	229255	596	1490	385		
353.8970	38:52	38:56	-2	1.275	709081	141768	324	810	438	1.60(1.32-1.78)	
13C-2,3,4,7,8-PeCDF											
351.9000	40:08	40:11	-1	1.316	1096322	238624	596	1490	400		
353.8970	40:08	40:11	-1	1.316	719783	158231	324	810	488	1.52(1.32-1.78)	
13C-1,2,3,4,7,8-HxCDD											
401.8559	44:56	44:57	-1	0.989	682605	165246	226	565	731		
403.8529	44:55	44:57	-2	0.989	515955	129477	95	237	1363	1.32(1.05-1.43)	
13C-1,2,3,6,7,8-HxCDD											
401.8559	45:02	45:04	-2	0.991	714521	176865	226	565	783		
403.8529	45:02	45:04	-2	0.991	533633	129472	95	237	1363	1.34(1.05-1.43)	
13C-1,2,3,4,7,8-HxCDF											
383.8639	43:53	43:54	-1	0.966	574070	148939	489	1222	305		
385.8610	43:53	43:54	-1	0.966	1070582	291650	315	787	926	0.54(0.43-0.59)	
13C-1,2,3,6,7,8-HxCDF											
383.8639	44:01	44:02	-1	0.969	675545	179777	489	1222	368		
385.8610	44:01	44:02	-1	0.969	1236746	322095	315	787	1023	0.55(0.43-0.59)	
13C-2,3,4,6,7,8-HxCDF											
383.8639	44:45	44:46	-1	0.985	596765	150500	489	1222	308		
385.8610	44:45	44:46	-1	0.985	1148398	284746	315	787	904	0.52(0.43-0.59)	
13C-1,2,3,7,8,9-HxCDF											
383.8639	45:41	45:43	-2	1.006	549790	123261	489	1222	252		
385.8610	45:41	45:43	-2	1.006	1038884	239288	315	787	760	0.53(0.43-0.59)	
13C-1,2,3,4,6,7,8-HpCDD											
435.8169	49:44	49:46	-2	1.095	583639	109567	190	475	577		
437.8140	49:45	49:46	-1	1.095	550757	106685	532	1330	201	1.06(0.88-1.20)	
13C-1,2,3,4,6,7,8-HpCDF											
417.8250	48:04	48:06	-2	1.058	448754	99807	420	1050	238		
419.8220	48:04	48:06	-2	1.058	958601	201893	721	1802	280	0.47(0.37-0.51)	

Signal	RT (min.)	Adj RT (min.)	¶ Sec.	REL RT	Area	Height	Avg Noise	EDL Height	S/N	Ratio(Limits)	Flags
13C-1,2,3,4,7,8,9-HpCDF											
417.8250	50:24	50:25	-1	1.109	380466	77437	420	1050	184		
419.8220	50:24	50:25	-1	1.109	798147	160154	721	1802	222	0.48(0.37-0.51)	
13C-OCDD											
469.7780	53:59	54:00	-1	1.188	839650	208241	212	530	982		
471.7750	53:59	54:00	-1	1.188	938745	228611	385	962	594	0.89(0.76-1.02)	
13C-OCDF											
453.7830	54:07	54:08	-1	1.191	1178142	287973	163	407	1767		
455.7801	54:07	54:08	-1	1.191	1288284	303895	369	922	824	0.91(0.76-1.02)	
37Cl4-2,3,7,8-TCDD											
327.8847	31:03	31:03	2	1.018	376540	38457	92	230	418		
13C-1,2,3,4-TCDD											
331.9368	30:30	30:28	2		1375101	155684	206	515	756		
333.9338	30:30	30:28	2		1706006	183776	122	305	1506	0.81(0.65-0.89)	
13C-1,2,3,7,8,9-HxCDD											
401.8559	45:25	45:25	1		1678194	406780	226	565	1800		
403.8529	45:25	45:25	1		1335566	319675	95	237	3365	1.26(1.05-1.43)	

QC Flag Legend

Review Flags

U - Marked Undetected

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
 Lims ID: LCS 140-27087/11-A
 Client ID:
 Inject. Date: 28-Jan-2019 02:07:00 Dil. Factor: 1.0000
 Sample Type: LCS, Lab Control Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27191 Lims Sample ID: 3

Non-2,3,7,8-sub-TCDF, RT: 28.346

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
2,3,7,8-TCDF	1.088	D 13C-2,3,7,8-TCDF	50.000	2206419	246644

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.088		50.000	2206419	246644

Sum the Uncalibrated Results

RT	303.9016 Area	303.9016 Height	305.8987 Area	305.8987 Height	Amount	Ratio	Flags
22:43	571	134	625	143	0.0249	0.91	RQ
22:43	481	110	625	143	0.0230		Empc Correction
27:55	1125	215	1844	285	0.0618	0.61	RQ
27:55	1125	215	1461	279	0.0539		Empc Correction
34:05	927	138	893	117	0.0379	1.04	RQ
34:05	687	90	893	117	0.0329		Empc Correction

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
Lims ID: LCS 140-27087/11-A
Client ID:
Inject. Date: 28-Jan-2019 02:07:00 Dil. Factor: 1.0000
Sample Type: LCS, Lab Control Sample
Instrument ID: D2A Operator: Xcalibur_System
Lims Batch ID: 27191 Lims Sample ID: 3

Non-2,3,7,8-sub-PeCDD, RT: 39.522

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,7,8-PeCDD	1.043	D 13C-1,2,3,7,8-PeCDD	50.000	1232965	284505

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.043		50.000	1232965	284505

Sum the Uncalibrated Results

RT	355.8546 Area	355.8546 Height	357.8516 Area	357.8516 Height	Amount	Ratio	Flags
37:45	2894	435	2005	416	0.1904	1.44	
41:20	6930	1011	4837	821	0.4573	1.43	

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
 Lims ID: LCS 140-27087/11-A
 Client ID:
 Inject. Date: 28-Jan-2019 02:07:00 Dil. Factor: 1.0000
 Sample Type: LCS, Lab Control Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27191 Lims Sample ID: 3

Non-2,3,7,8-sub-PeCDF, RT: 38.126

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,7,8-PeCDF	1.190	D 13C-1,2,3,7,8-PeCDF	50.000	1846440	371023
2,3,4,7,8-PeCDF	1.109	D 13C-2,3,4,7,8-PeCDF	50.000	1816105	396855

Averages:

	RRF _n		Qis	Ris Area	Ris Height
	1.150		50.000	1831272	383939

Sum the Uncalibrated Results

RT	339.8597 Area	339.8597 Height	341.8567 Area	341.8567 Height	Amount	Ratio	Flags
39:26	8607	1498	6346	1438	0.3551	1.36	

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
 Lims ID: LCS 140-27087/11-A
 Client ID:
 Inject. Date: 28-Jan-2019 02:07:00 Dil. Factor: 1.0000
 Sample Type: LCS, Lab Control Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27191 Lims Sample ID: 3

Non-2,3,7,8-sub-HxCDD, RT: 44.384

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,4,7,8-HxCDD	1.141	D 13C-1,2,3,4,7,8-HxCDD	50.000	1198560	294723
1,2,3,6,7,8-HxCDD	1.148	D 13C-1,2,3,6,7,8-HxCDD	50.000	1248154	306337
1,2,3,7,8,9-HxCDD	1.221				

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.170		50.000	1223357	300530

Sum the Uncalibrated Results

RT	389.8158 Area	389.8158 Height	391.8127 Area	391.8127 Height	Amount	Ratio	Flags
43:22	13578	3840	11123	3122	0.8628	1.22	

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
Lims ID: LCS 140-27087/11-A
Client ID:
Inject. Date: 28-Jan-2019 02:07:00 Dil. Factor: 1.0000
Sample Type: LCS, Lab Control Sample
Instrument ID: D2A Operator: Xcalibur_System
Lims Batch ID: 27191 Lims Sample ID: 3

Non-2,3,7,8-sub-HpCDD, RT: 49.151

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,4,6,7,8-HpCDD	1.120	D 13C-1,2,3,4,6,7,8-HpCDD	50.000	1134396	216252

Averages:

	RRFn		Qis	Ris Area	Ris Height
	1.120		50.000	1134396	216252

Sum the Uncalibrated Results

RT	423.7767 Area	423.7767 Height	425.7737 Area	425.7737 Height	Amount	Ratio	Flags
48:35	24476	5174	26909	5171	2.02	0.91	

Compound is Marked ND

TestAmerica Knoxville
AreaSum WorkSheet Report

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
 Lims ID: LCS 140-27087/11-A
 Client ID:
 Inject. Date: 28-Jan-2019 02:07:00 Dil. Factor: 1.0000
 Sample Type: LCS, Lab Control Sample
 Instrument ID: D2A Operator: Xcalibur_System
 Lims Batch ID: 27191 Lims Sample ID: 3

Non-2,3,7,8-sub-HpCDF, RT: 49.404

Initial Calibration RRF

IsoDil Std Amount Added and Responses

Target Compound	RRF	Iso Dil Std Compound	Amount pg/ul	Area	Height
1,2,3,4,6,7,8-HpCDF	1.498	D 13C-1,2,3,4,6,7,8-HpCDF	50.000	1407355	301700
1,2,3,4,7,8,9-HpCDF	1.381	D 13C-1,2,3,4,7,8,9-HpCDF	50.000	1178613	237591

Averages:

	RRF _n		Qis	Ris Area	Ris Height
	1.440		50.000	1292984	269645

Sum the Uncalibrated Results

RT	407.7817 Area	407.7817 Height	409.7788 Area	409.7788 Height	Amount	Ratio	Flags
48:43	12235	2390	12932	2517	0.6761	0.95	

Compound is Marked ND

TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d

Injection Date: 28-Jan-2019 02:07:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

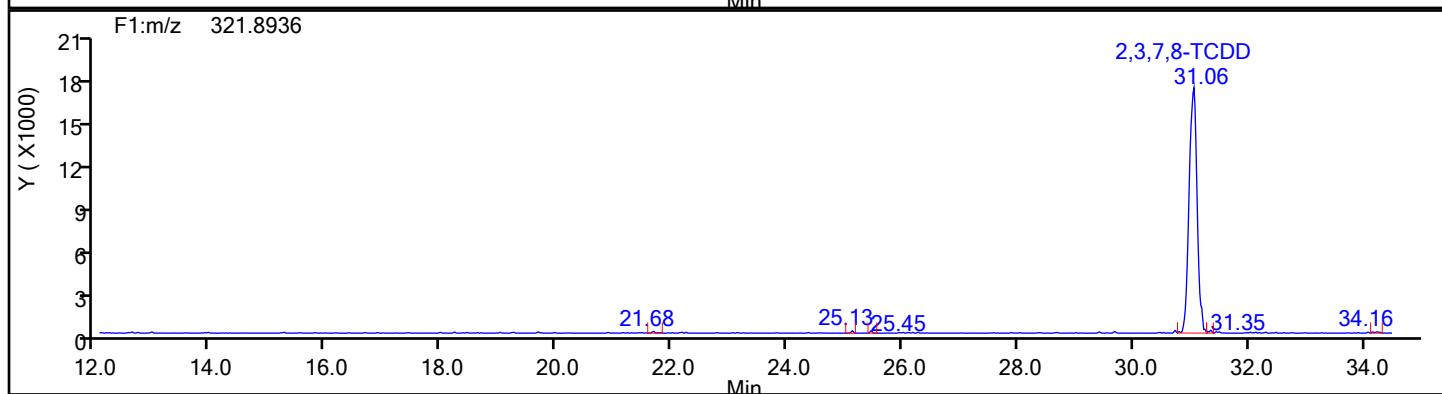
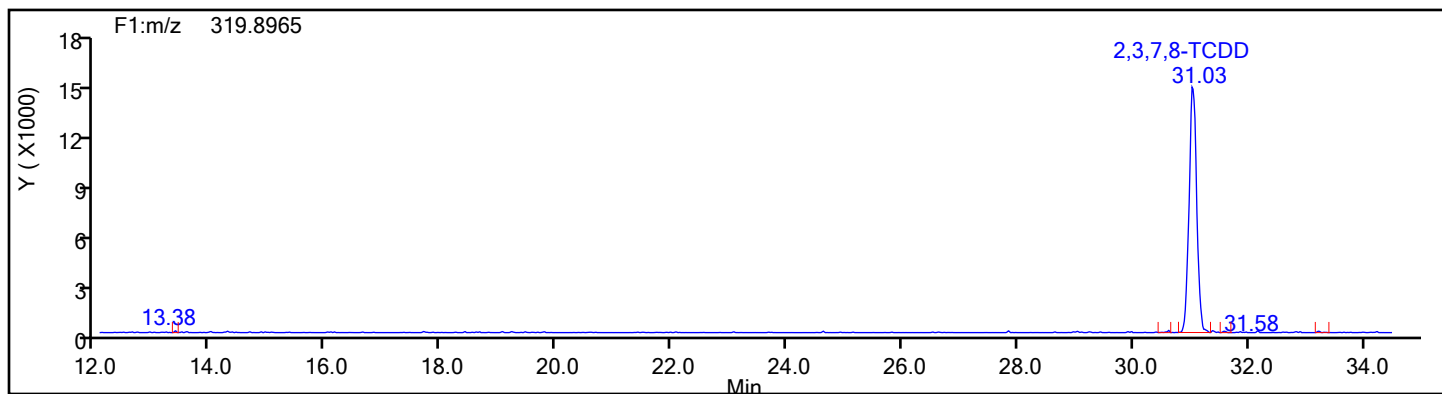
Worklist#: 27191

Sample Line#: 3

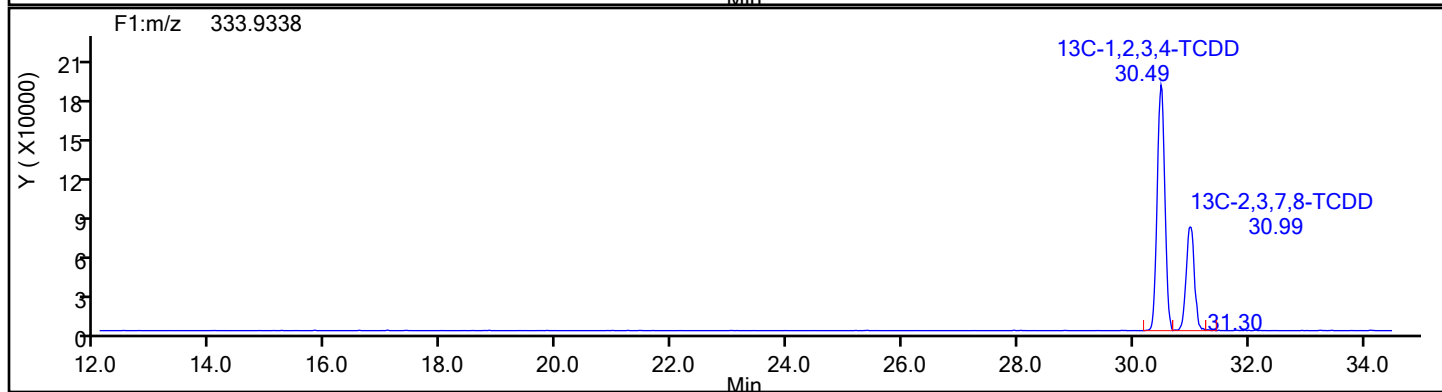
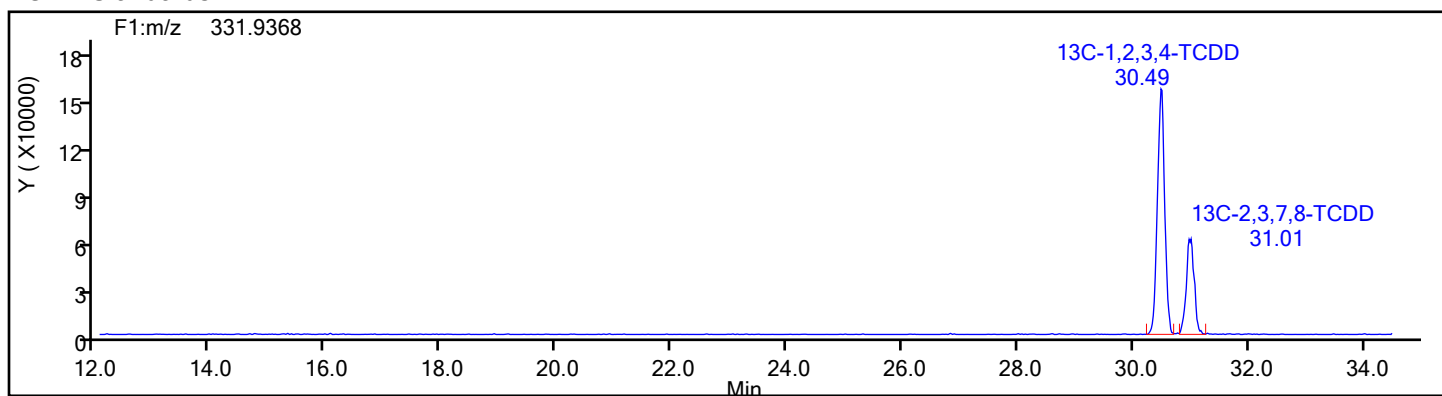
Column Type:

Column Dia:

TCDD

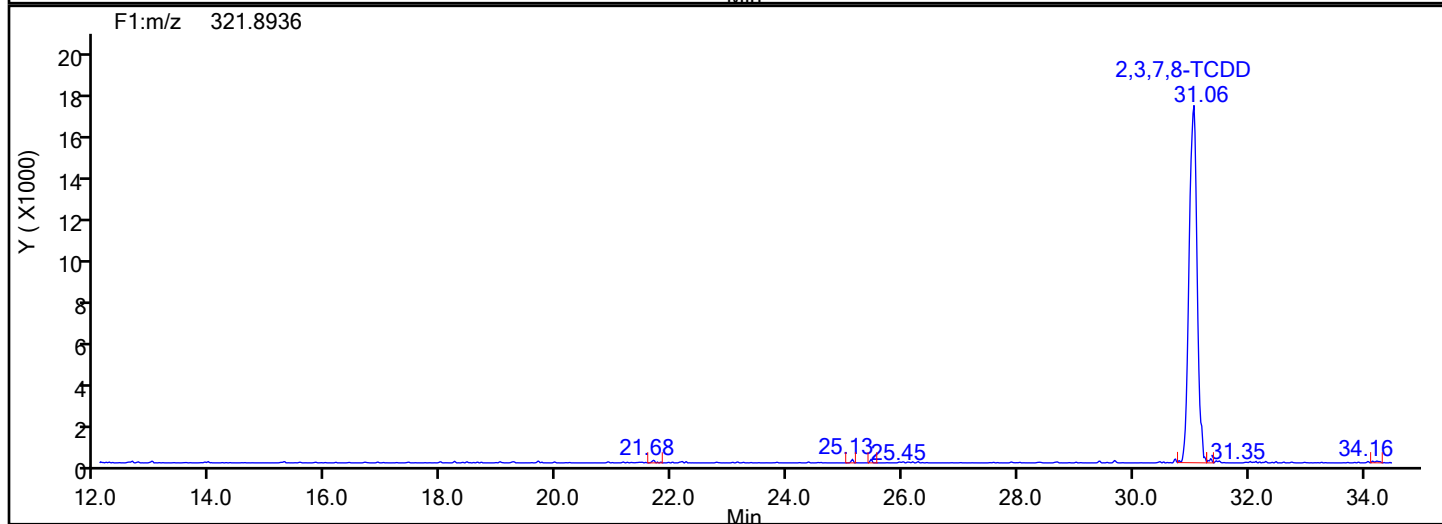
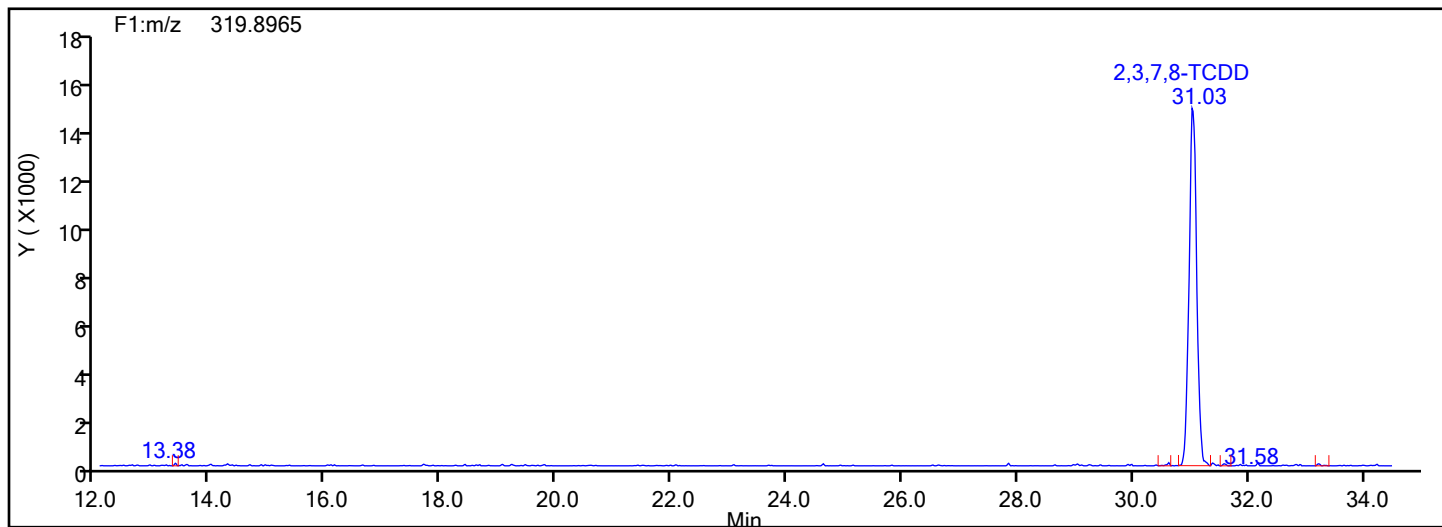


TCDD Standards

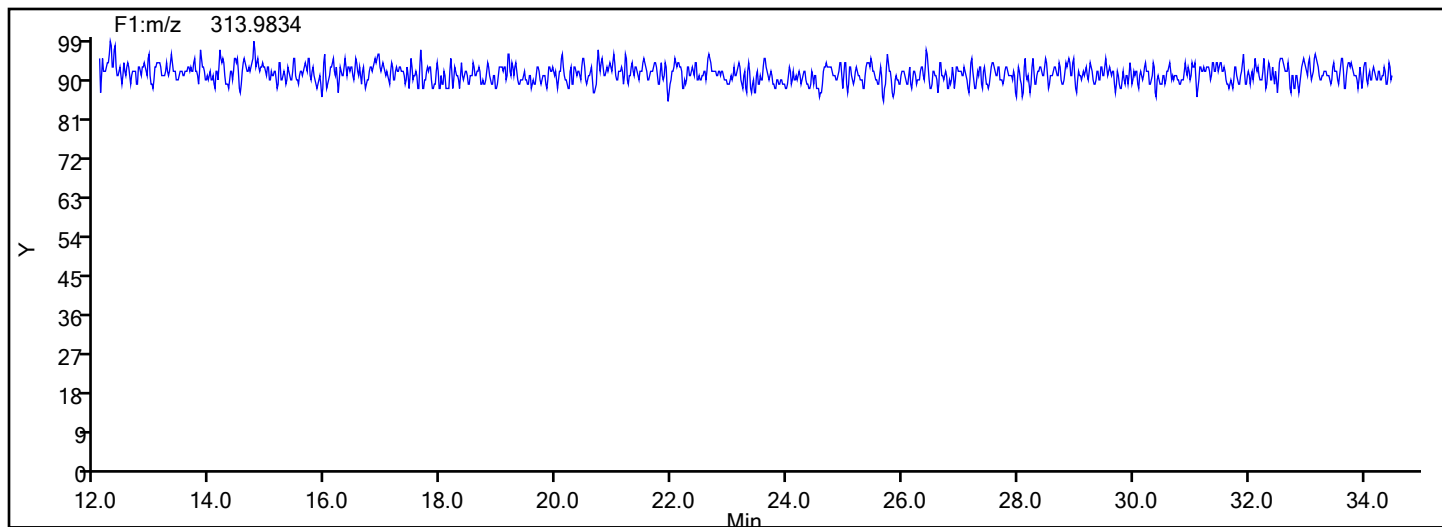


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
Injection Date: 28-Jan-2019 02:07:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 3
Column Type: Column Dia:
TCDD



TCDD Lock Mass



TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d

Injection Date: 28-Jan-2019 02:07:00

Injection Vol: 1.0 ul

Instrument ID: D2A

Operator ID: Xcalibur_System

Method: D2A_Dioxin

Limit Group: HR - 1613B - ICAL

Client ID:

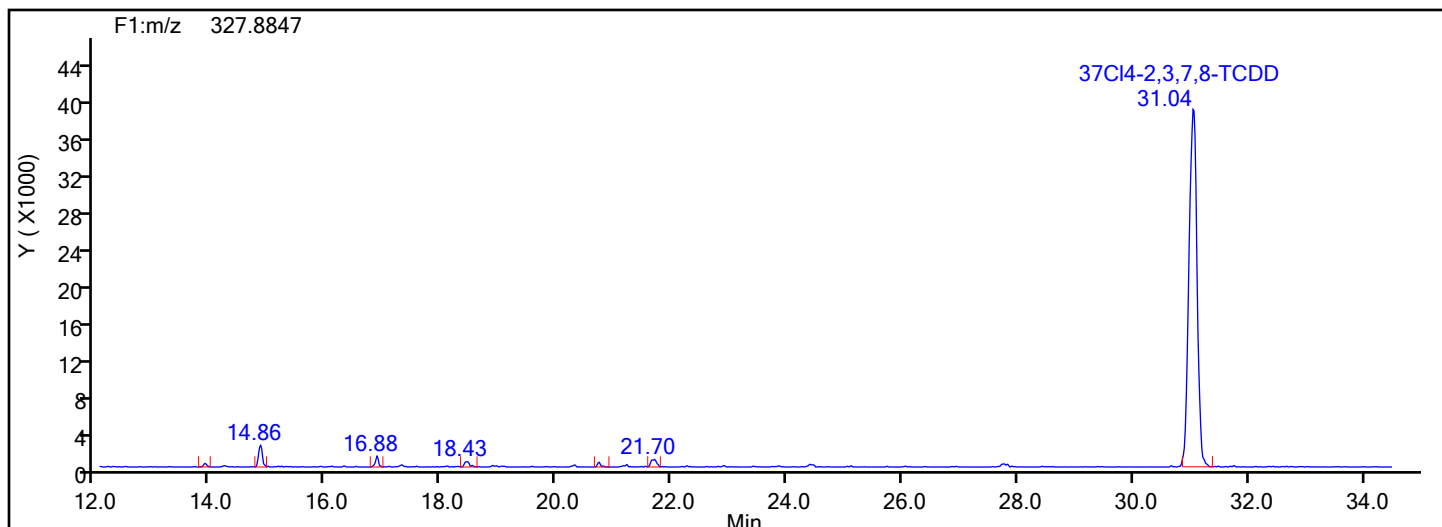
Worklist#: 27191

Sample Line#: 3

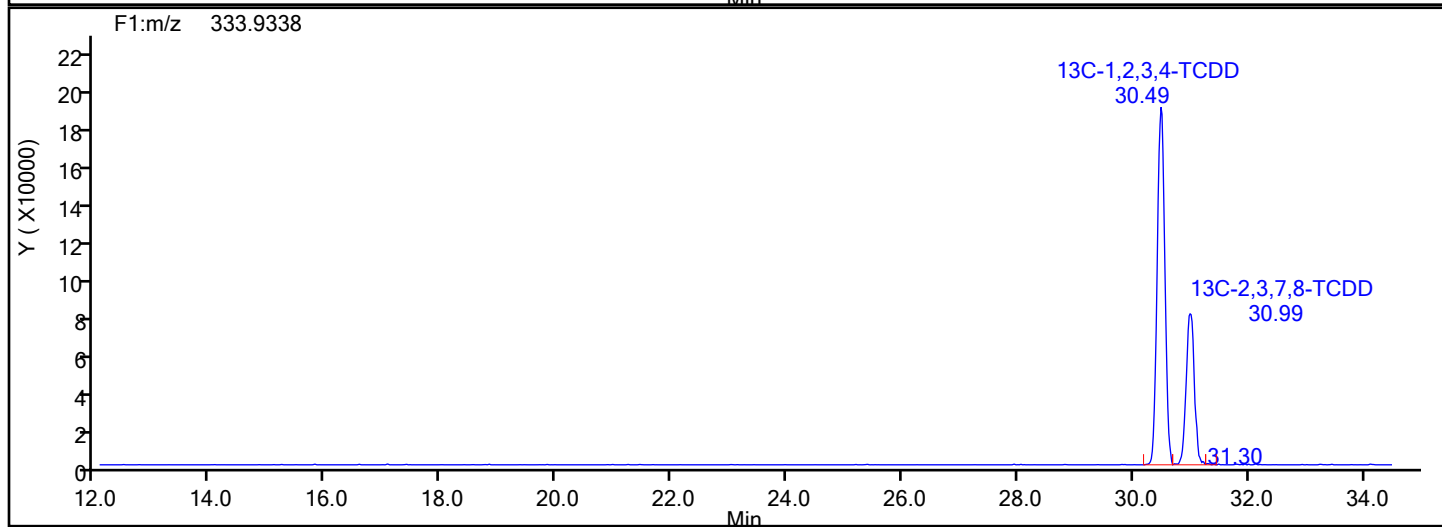
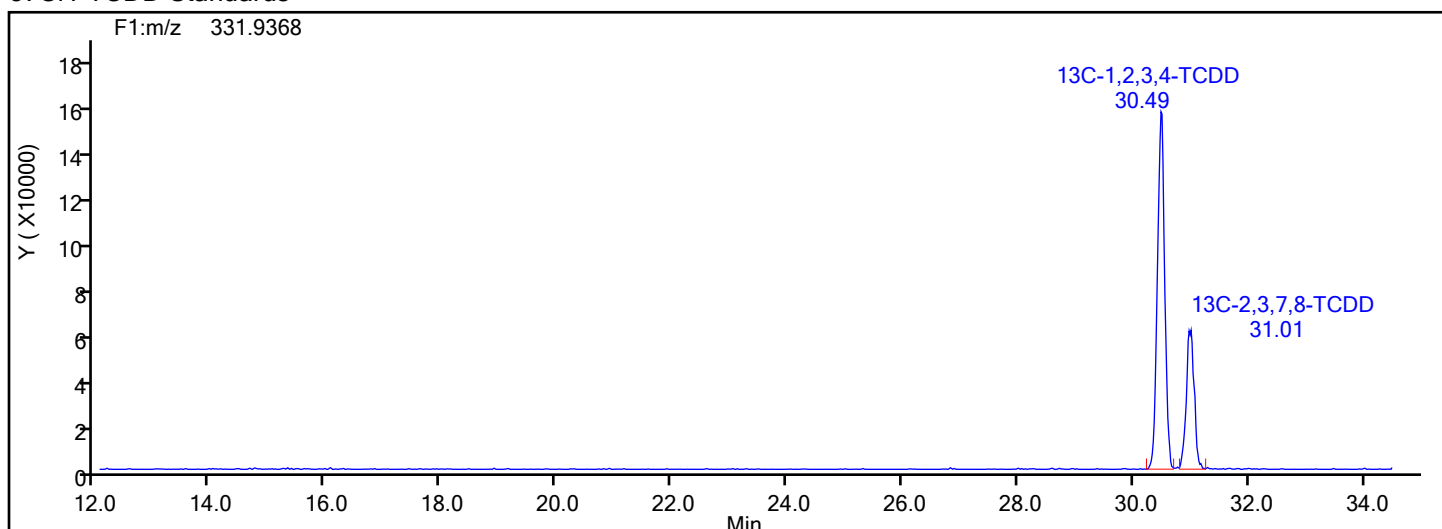
Column Type:

Column Dia:

37Cl4-TCDD

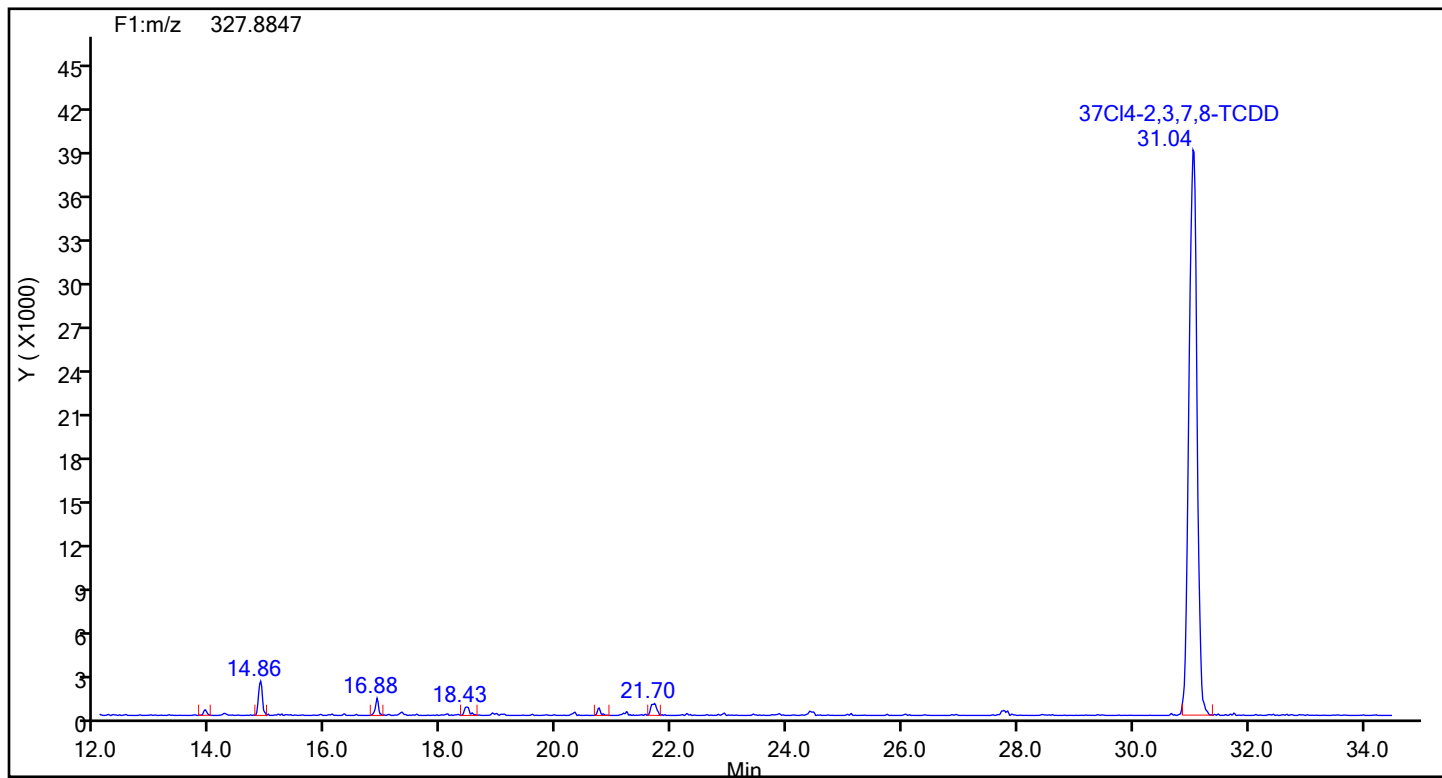


37Cl4-TCDD Standards

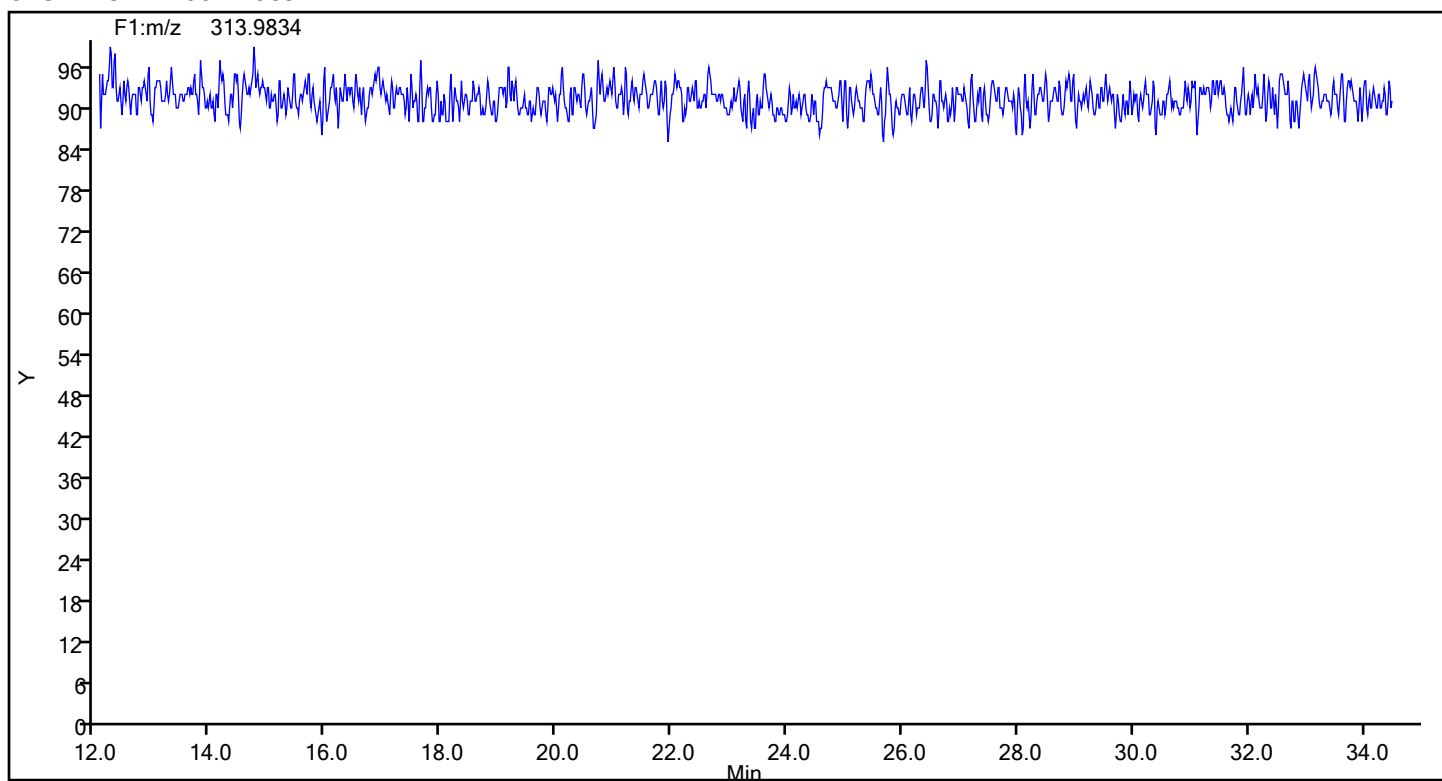


TestAmerica Knoxville

Data File: \\chromna\Knoxville\ChromData\D2A\20190127-10654.b\LCS140-270885-Aa.d
Injection Date: 28-Jan-2019 02:07:00 Injection Vol: 1.0 ul
Instrument ID: D2A Operator ID: Xcalibur_System
Method: D2A_Dioxin Limit Group: HR - 1613B - ICAL
Client ID:
Worklist#: 27191 Sample Line#: 3
Column Type: Column Dia:
37Cl4-TCDD



37Cl4-TCDD Lock Mass



DIOXIN ANALYSIS RUN LOG

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Instrument ID: D2A Start Date: 05/16/2014 10:23Analysis Batch Number: 7768 End Date: 05/16/2014 20:36

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
WDM 140-7768/1		05/16/2014 10:23	1	d3140516w1.d	RTX-5 0.32 (mm)
IC 140-7768/2		05/16/2014 14:26	1	d3140516i1.d	RTX-5 0.32 (mm)
IC 140-7768/3		05/16/2014 15:26	1	d3140516i2.d	RTX-5 0.32 (mm)
IC 140-7768/4		05/16/2014 16:27	1	d3140516i3.d	RTX-5 0.32 (mm)
IC 140-7768/5		05/16/2014 17:29	1	d3140516i4.d	RTX-5 0.32 (mm)
IC 140-7768/6		05/16/2014 18:31	1	d3140516i5.d	RTX-5 0.32 (mm)
ICV 140-7768/7		05/16/2014 20:36	1	d3140516ss.d	RTX-5 0.32 (mm)

TestAmerica Knoxville Dioxin GC/MS Initial Calibration Data Review / Narrative Checklist
Method: 1613B - KNOX-ID-0004-R12

Mass Res. / Date/Time: 5-16-14 / 10:01 Inst: D2A Win Filename: d314051601 Col Per Filename: d314051601

CS05 Filename	CS11 Filename	CS2 Filename	CS3 Filename	CS4 Filename	CS5 Filename
d314051616	d314051611	d314051602	d314051603	d314051614	d314051615

Review Items	N/A	Yes	No	If No, why is data reportable?	2nd Level
1. Was the mass resolution documented before beginning the initial calibration?		✓			/
2. Was the instrument resolution >10,000 (<100 ppm) on PFK m/z 304.9824 and m/z 380.9760 (MAT) and > 10,000 on FC43 m/z 313.9838, 351.9802 and 363.9807? FC43 m/z 313.9838, 351.9802 and 375.9802? FC43 m/z 375.9802, 401.9770 and 413.9770? FC43 m/z 413.9775, 425.9770 and 463.9738? FC43 m/z 425.9775, 463.9743 and 501.9706? (DFS)		✓			/
3. Was the measured exact mass of m/z 380.9760 (PFK) or m/z 363.9807 (FC43) within 5 ppm at reduced accelerating voltage?		✓			/
4. Was the Window Defining Mixture analyzed and the MID switchpoints set to encompass the retention time windows of each congener group?		✓			/
5. Was the Column Performance solution analyzed and the %Valley ≤25 for separation between 2378-TCDD/F and the closest eluting non-2378 isomer on their respective columns?		✓			/
6. Were the five calibration standard solutions, at the concentrations specified in Table 5 of the SOP, analyzed (6 point calibration used for microwave extractions)?		✓			/
7. Was date/time of analysis verified between analysis header and logbook as correct?		✓			/
8. Were the response factors calculated for each labeled standard and unlabeled native analyte using the SOP specified reference compound (Table 3), quantitation ions (Table 21) and formula (Section 10.2.7)?		✓			/
9. Is the retention time of ¹³ C ₁₂ -1,2,3,4-TCDD >25.0 minutes on the DB/Rtx-5 column (15.0 minutes on the DB/Rtx-225 column)?		✓			/
10. Are the relative retention times of all PCDDs/PCDFs and all labeled compounds within the limits specified in Table 3?		✓			/
11. Are %RSD ≤20% for all unlabeled native analytes except 1,2,3,7,8,9-HxCDD and OCDF?		✓			/
12. Are %RSD ≤35% for 1,2,3,7,8,9-HxCDD and OCDF and all labeled internal standards?		✓			/
13. Are all S/N ratios ≥10 for the GC signals in each EICP (extracted ion chromatographic profile) including internal standards?		✓			/
14. Are the ion abundance ratios for all labeled and unlabeled analytes within the control limits specified in Table 22 of the SOP?		✓			/
15. Was the second source ICV standard analyzed according to Sec 10.2.9 of the SOP?		✓			/
16. If manual integrations were performed, are they clearly identified, initialed and dated?	✓				/
17. Were before/after chromatograms reviewed to determine whether the software and manual integrations were appropriate?		✓			/
18. Were manual integrations documented properly?	✓				/
19. If criteria were not met, was a NCM generated, approved by supervisor, and copy included in folder?	✓				/
20. Does the ICAL folder contain complete data in the following order: Data review checklist, a complete run log, Avg. %RSD summary, Ratio summary, Calculation summary, PFK/FC43 resolution/peak match documentation; Total RIC, EICP's and manual integration - for window and all standards, in order from low to high standard, ICV Summary Table, Calculation Summary, and chromatograms?		✓			/

Analyst: <i>W/S Danville</i>	Date: 5/19/14	2nd Level Reviewer: <i>KF</i>	Date: 5/19/14
Comments:		Comments:	

ID023R15doc, 041913

TestAmerica Knoxville Dioxin GC/MS Initial Calibration Data Review / Narrative Checklist
Method: 8290/8290A - KNOX-ID-0004-R12

Mass Res. ✓ Date/Time:	5/16/14 10:01	Inst:	D2A	Win Filename:	d3140516w1	Col Port Filename:	d3140516w1
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CS05 Filename	CS1 Filename	CS2 Filename	CS3 Filename	CS4 Filename	CS5 Filename
d3140516i6	d3140516i1	d3140516i2	d3140516i3	d3140516i4	d3140516i5

Review Items	N/A	Yes	No	If No, why is data reportable?	2nd Level
1. Was the mass resolution documented before beginning the initial calibration?		✓			✓
2. Was the instrument resolution >10,000 (<100 ppm) on PFK m/z 304.9824 and m/z 380.9760 (MAT) and > 10,000 on FC43 m/z 313.9838, 351.9802 and 363.9807? FC43 m/z 313.9838, 351.9802 and 375.9802? FC43 m/z 375.9802, 401.9770 and 413.9770? FC43 m/z 413.9775, 425.9770 and 463.9738? FC43 m/z 425.9775, 463.9743 and 501.9706? (DFS)		✓			✓
3. Was the measured exact mass of m/z 380.9760 (PFK) or 363.9807 (FC43) within 5 ppm at reduced accelerating voltage?		✓			✓
4. Was the Window Defining Mixture analyzed and the MID switchpoints set to encompass the retention time windows of each congener group?		✓			✓
5. Was the Column Performance solution analyzed and the %Valley ≤25 for separation between 2378-TCDD/F and the closest eluting non-2378 isomer on their respective columns?		✓			✓
6. Were the five calibration standard solutions, at the concentrations specified in Table 5 of the SOP, analyzed (6 point calibration used for microwave extractions)?		✓			✓
7. Was date/time of analysis verified between analysis header and logbook as correct?		✓			✓
8. Were the response factors calculated for each labeled standard and unlabeled native analyte using the SOP specified reference compound (Table 3), quantitation ions (Table 21), and formula (Section 10.2.7)?		✓			✓
9. Are the relative retention times of all PCDDs/PCDFs and all labeled compounds within the limits specified in Table 3?		✓			✓
10. Are %RSD ≤20% for all unlabeled native analytes?		✓			✓
11. 8290, are %RSD ≤30% for all labeled internal standards?		✓			✓
12. 8090A, are %RSD ≤20% for all labeled internal standards?		✓			✓
13. Are all S/N ratios ≥10 for the GC signals in each EICP (extracted ion chromatographic profile) including internal standards?		✓			✓
14. Are the ion abundance ratios for all labeled and unlabeled analytes within the control limits specified in Table 22 of the SOP?		✓			✓
15. Was the second source ICV standard analyzed according to Sec 10.2.9 of the SOP?		✓			✓
16. If manual integrations were performed, are they clearly identified, initialed and dated?	✓				✓
17. Were before/after chromatograms reviewed to determine whether the software and manual integrations were appropriate?		✓			✓
18. Were manual integrations documented properly?	✓				✓
19. If criteria were not met, was a NCM generated, approved by supervisor, and copy included in folder?	✓				✓
20. Does the ICAL folder contain complete data in the following order? Data review checklist, a complete runlog, Avg. %RSD summary, Ratio summary, Calculation summary, PFK/FC43 resolution/peak match documentation, Total RIC, EICP's and manual integration - for window and all standards, in order from low to high standard, ICV Summary Table, Calculation Summary, and chromatograms?		✓			✓

Analyst:	<i>W/S Daudt</i>	Date:	5/19/14	2nd Level Reviewer:	<i>Ku</i>	Date:	5/19/14
Comments:				Comments:			

ID022R18.doc, 042213

TestAmerica Knoxville Dioxin GC/MS Initial Calibration Data Review / Narrative Checklist
Method: 8290/8290A - KNOX-ID-0004-R14

Mass Res. ✓ Date/Time: 5/16/14 10:01	Inst: D2A	Win Filename: d3140516w1	Col Perf Filename: d3140516w1
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CS0.5 Filename: d3140516i6	CS1 Filename: d3140516i1	CS2 Filename: d3140516i2	CS3 Filename: d3140516i3	CS4 Filename: d3140516i4	CS5 Filename: d3140516i5
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Review Items	N/A	Yes	No	If No, why is data reportable?	2nd Level
1. Was the mass resolution documented before beginning the initial calibration?		✓			✓
2. Was the instrument resolution >10,000 (<100 ppm) on PFK m/z 304.9824 and m/z 380.9760 (MAT) and > 10,000 on PC43 m/z 313.9838, 351.9802 and 363.9807? PC43 m/z 313.9838, 351.9802 and 375.9802? PC43 m/z 375.9802, 401.9770 and 413.9770? PC43 m/z 413.9775, 425.9770 and 463.9738? PC43 m/z 425.9775, 463.9743 and 501.9706? (DFS)		✓			✓
3. Was the measured exact mass of m/z 380.9760 (PFK) or 363.9807 (PC43) within 5 ppm at reduced accelerating voltage?		✓			✓
4. Was the Window Defining Mixture analyzed and the MID switchpoints set to encompass the retention time windows of each congener group?		✓			✓
5. Was the Column Performance solution analyzed and the %Valley ≤25 for separation between 2378-TCDD/F and the closest eluting non-2378 isomer on their respective columns?		✓			✓
6. Was DoD Performance check criteria met? Identification of all first and last eluters of the eight homologue retention time windows and documentation by labeling (F/L) on the chromatogram Absolute retention times for switching from one homologous series to the next ≥ 10 seconds for all components of the mixture.		✓			✓
7. Were the five calibration standard solutions, at the concentrations specified in Table 5 of the SOP, analyzed (6 point calibration used for microwave extractions)?		✓			✓
8. Was date/time of analysis verified between analysis header and logbook as correct?		✓			✓
9. Were the response factors calculated for each labeled standard and unlabeled native analyte using the SOP specified reference compound (Table 3), quantitation ions (Table 21), and formula (Section 10.2.7)?		✓			✓
10. Are the relative retention times of all PCDDs/PCDFs and all labeled compounds within the limits specified in Table 3?		✓			✓
11. Are %RSD ≤20% for all unlabeled native analytes?		✓			✓
12. 8290, are %RSD ≤30% for all labeled internal standards?		✓			✓
13. 8090A, are %RSD ≤20% for all labeled internal standards?		✓			✓
14. Are all S/N ratios ≥10 for the GC signals in each EICP (extracted ion chromatographic profile) including internal standards?		✓			✓
15. Are the ion abundance ratios for all labeled and unlabeled analytes within the control limits specified in Table 22 of the SOP?		✓			✓
16. Was the second source ICV standard analyzed according to Sec 10.2.9 of the SOP?		✓			✓
17. Was DoD ICV Criteria met? (For unlabeled standards, RF within ± 20% D of RF established in the ICAL. For labeled standards, RF within ± 30% D of the mean RF established in ICAL.		✓			✓
1. If manual integrations were performed, are they clearly identified, initialed and dated?	✓				✓
2. Were before/after chromatograms reviewed to determine whether the software and manual integrations were appropriate?		✓			✓
3. Were manual integrations documented properly?	✓				✓
18. If criteria were not met, was a NCM generated, approved by supervisor, and copy included in folder?	✓				✓
19. Does the ICAL folder contain complete data in the following order? Data review checklist, a complete runlog, Avg. %RSD summary, Ratio summary, Calculation summary, PFK/PC43 resolution/peak match documentation; Total RIC, EICPs and manual integration - for window and all standards, in order from low to high standard, ICV Summary Table, Calculation Summary, and chromatograms?		✓			✓

Analyst: <i>MSDanna</i>	Date: 11/18/14	2nd Level Reviewer: <i>Kep</i>	Date: 11/18/14
Comments:		Comments:	

ID022R20.doc, 111314

DIOXIN ANALYSIS RUN LOG

Lab Name: TestAmerica KnoxvilleJob No.: 160-32649-1

SDG No.: _____

Instrument ID: D2AStart Date: 01/28/2019 01:01Analysis Batch Number: 27191End Date: 01/28/2019 09:03

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
WDMCCV 140-27191/1		01/28/2019 01:01	1	d3190128s1.d	RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 02:07	1		RTX-5 0.32 (mm)
LCS 140-27087/11-A		01/28/2019 02:07	1	LCS140-270885-A a.d	RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 03:06	1		RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 03:18	1		RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 03:31	1		RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 03:43	1		RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 03:56	1		RTX-5 0.32 (mm)
MB 140-27087/10-A		01/28/2019 03:56	1	MB140-270884-Aa .d	RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 04:58	3		RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 05:59	3		RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 07:00	3		RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 08:02	3		RTX-5 0.32 (mm)
ZZZZZ		01/28/2019 09:03	3		RTX-5 0.32 (mm)

TestAmerica Knoxville Dioxin GC/MS Continuing Calibration Review / Narrative Checklist
Method: X8290 X8290A Y1613B - KNOX-ID-0004-R19

Start Mass Res. ✓:	<u>00:47</u>	Start Ver Filename:	<u>d319012851</u>	Inst/Date:	<u>D2A</u>
End Mass Res. ✓:	<u>11:40</u>	Win/CPS Filename:	<u>↓</u>	ICAL Event # (s):	<u>825, 827, 828</u>
WL#:	<u>10654</u>	End Ver Filename:	<u>d319012852</u>	Job # (s):	<u>See Comments</u>
AD Batch # (s):	<u>27191, 27192, 27193</u>				

Review Items	N/A	Yes	No	If No, why is data reportable?	2nd ✓
1. Was the mass resolution documented at both the beginning and end of the 12 hour shift and is data verified as within the 12 hour clock? Was the continuing calibration performed at the beginning of the shift (all methods) and ending of the shift (8290/8290A)?		✓			✓
2. Was the Instrument resolution >10,000 (<100 ppm) on either PFK or FC43 for the masses listed in SOP section 10.2.3?		✓			✓
3. Was the measured exact mass within 5 ppm at reduced accelerating voltage for masses listed in the SOP section 10.2.4?		✓			✓
4. Was the Window Defining Mixture analyzed and the MID switchpoints set to encompass the retention time windows of each congener group?		✓			✓
5. Was the Column Performance solution analyzed and the %Valley ≤25 for separation between 2378-TCDD/F and the closest eluting non-2378 isomer on their respective columns?		✓			✓
6. Was DoD Performance check criteria met?		✓			✓
7. Were the response factors calculated for each labeled standard and unlabeled native analyte using the SOP specified reference compound (Table 3), quantitation ions (Table 21), and formula (Section 10.2.7)?		✓			✓
8. Are the measured RRFs and/or concentrations for each compound within the specified control limits in Table 7 for all PCDDs/PCDFs?		✓		☐ CCV-Capping, RR Confirms (NCM# _____) ☐ CCV-Capping-Detects (8290/8290A) (NCM# _____) ☐ CCV-Capping-IDA (8290/8290A) (NCM# _____)	✓
9. Are the relative retention times of all PCDDs/PCDFs and all labeled compounds within the limits specified in Table 3 (1613B)?		✓			✓
10. Is the retention time of C ¹³ -1,2,3,4-TCDD >25 minutes on the Rtx-5 column and/or >15.0 min on the DB-225?		✓			✓
11. Are all S/N ratios ≥10 for the GC signals in each EICP (extracted ion chromatographic profile) including IDA's?		✓			✓
12. Are the ion abundance ratios for all labeled and unlabeled analytes within the control limits specified in Table 22 of the SOP?		✓			✓
13. Were all reagents used for calibration verified as correct in the reagent tab?		✓			✓
14. If manual integrations were performed, are the analyst name, reason, and date noted in the AD II batches? Are before and after graphics uploaded to AD II?		✓			✓
15. Were all graphics checked after upload to AD II? Was the mass res check scanned and attached to the corresponding CCV?		✓			✓
16. If criteria were not met, was a NCM generated?	✓				✓
17. Do the AD II batches contain a completed checklist for this work list?		✓			✓

Analyst: <u>LM</u>	Date: <u>1-28-19</u>
Comments:	
<u>240-106601, 280-119105, 280-119173, 280-118993, 460-173660,</u>	
<u>240-107020, 160-32649, 240-106949, 680-163005,</u>	
2nd Level Reviewer: <u>U/M</u>	Date: <u>1-28-19</u>
Comments:	

TestAmerica Knoxville Dioxin Batch Data Review Checklist
Method: 78290 78290A 71613B - KNOX-ID-0004-R19

WL #: 10654
 ADII Batch #(s): 27191, 27192, 27193
 Job #(s): See Comments

Review Items	N/A	Yes	No	Why is data reportable?	2nd ✓
1. Was the correct ICAL used for quantitation? (Check ICAL event number in every sample and CCV.)		✓		ICAL Event # <u>825, 827, 828</u>	✓
2. Has a Continuing Calibration Checklist been completed for each work list?		✓			✓
3. Were all special project requirements met (checked in backlog report and in AD II under notes)?		✓			✓
4. DoD requirements met?		✓		☐ NCM#140-11724: Add to Case Narrative if Manual Integrations Performed ☐ Narrate reasons for multiple analyses of samples <u># 10-14 - complex Dilution</u> ☒ Dilution-Respike IDA. (NCM# <u>140-16151</u>)	✓
5. Were the prep factors and dilution factors verified in AD II?		✓			✓
6. Is date/time of analysis correct and within the 12 hour clock?		✓			✓
7. Sample analyses done within preparation and analytical HT? (Check for H-flag in sample result in AD II.)		✓		☐ Holding Time-Initial Analysis (NCM# _____) ☐ Holding Time-Reanalysis (NCM# _____)	✓
8. Are IDA ratios within limits specified in Table 22 of the SOP?			✓	☒ Abundance ratio outside limit (NCM# <u>140-16153</u>)	✓
9. Are IDAs and cleanup standards within QC limits specified in Table 13?		✓		☐ IDA-Low-S/N 10:1 (NCM# _____) ☐ IDA-High-Isotope Dilution (NCM# _____)	✓
10. Were reported PCDD/Fs which did not meet the criteria below properly calculated and reported as EMPCs? • RT of 2378 isomers within SOP Table 3 limits. • RT of non-2378 isomers within established first/last windows. • Both native ions maximized within ±2 seconds. • Ion abundance ratios within the control limits specified in Table 22 (not adjusted for 8290A). • No corresponding peak at PCDFE mass (dpe tab checked and flag added in peak review). • Ion suppression tab checked and flags added in peak review if needed. • Co-elution (CI) flags added manually in AD II if needed.		✓		<u>#19, #21</u> ←	✓
11. Were all 2378-TCDF hits greater than or equal to the ML turned to acceptable on the primary column and confirmed on the DB-225 confirmation column?		✓		Were all of the samples marked as acceptable for TCDF analyzed on a DB-225 column and the lower result reported?	✓
12. Are non-detects that are G-qualified narrated?		✓		☒ (NCM# <u>140-16152</u>)	✓
13. Are positive results > ML within calibration range?		✓		☐ ICAL-Range Exceed; No Sat. (NCM# _____) ☐ non-2378's or OCDD/F (NCM# _____)	✓
14. Are all manual integrations documented with analyst name, reason, and date noted in AD II?		✓			✓
15. Were all graphics uploaded into AD II?		✓			✓
16. Final report acceptable (1. Job Data Review was checked and all CCVs, QC, and samples are turned to 2nd Level, 2. The narrative was checked in Supervisor Desktop for all deviations and grammar errors, and 3. All QC links were verified and at least one sample from every job is linked to the ICAL)?		✓			✓
17. LCS/LCSD done per prep batch and all analytes within limits?		✓		☐ LCS/LCSD-Insuff. Sample (NCM# _____) ☐ LCS/LCSD-%R High (NCM# _____)	✓
18. Method blank done per prep batch, method/instrument blank analyzed with each sequence and analytes present in the method blank < ML or within specific program requirements?		✓		☐ Method Blank-Report, 10X (NCM# _____) ☐ Method Blank-Report, ND (NCM# _____) ☐ Method Blank-Insuff. Sample (NCM# _____)	✓
1st Level Reviewed by: <u>[Signature]</u>				Date: <u>1/28/19</u>	
Comments: <u>240-106601, 280-119105, 280-119173, 280-118993, 460-173660, 240-107020, 160-32649, 240-106949, 680-163005</u>					
2nd Level Reviewed by: <u>[Signature]</u>				Date: <u>1/28/19</u>	
Comments: <u>① 240-106601-A-18, A-22, A-24</u>					

DIOXIN ANALYSIS RUN LOG

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Instrument ID: D2A Start Date: 01/29/2019 09:51Analysis Batch Number: 27242 End Date: 01/29/2019 14:46

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
WDMCCV 140-27242/1		01/29/2019 09:51	1	d3190129s2.d	RTX-5 0.32 (mm)
ZZZZZ		01/29/2019 10:52	1		RTX-5 0.32 (mm)
ZZZZZ		01/29/2019 11:04	1		RTX-5 0.32 (mm)
ZZZZZ		01/29/2019 11:17	1		RTX-5 0.32 (mm)
ZZZZZ		01/29/2019 11:29	1		RTX-5 0.32 (mm)
ZZZZZ		01/29/2019 11:42	1		RTX-5 0.32 (mm)
160-32649-1		01/29/2019 12:43	1	160-32649-n-1-a .d	RTX-5 0.32 (mm)
ZZZZZ		01/29/2019 13:45	1		RTX-5 0.32 (mm)
ZZZZZ		01/29/2019 14:46	1		RTX-5 0.32 (mm)

TestAmerica Knoxville Dioxin GC/MS Continuing Calibration Review / Narrative Checklist

Method: ~~X~~8290 ~~X~~8290A ~~X~~1613B - KNOX-ID-0004-R19

Start Mass Res. ✓:	09:38	Start Ver Filename:	d319012982	Inst/Date:	D2A / 1-29-19
End Mass Res. ✓:	21:25	Win/CPS Filename:	L	ICAL Event #s):	827, 825
WL#:	10667	End Ver Filename:	d319012983	Job # (s):	See below
AD Batch #s):	27241, 27242	PMP 1-29-19			

Review Items	N/A	Yes	No	If No, why is data reportable?	2nd ✓
1. Was the mass resolution documented at both the beginning and end of the 12 hour shift and is data verified as within the 12 hour clock? Was the continuing calibration performed at the beginning of the shift (all methods) and ending of the shift (8290/8290A)?		✓			✓
2. Was the instrument resolution >10,000 (<100 ppm) on either PFK or FC43 for the masses listed in SOP section 10.2.3?		✓			✓
3. Was the measured exact mass within 5 ppm at reduced accelerating voltage for masses listed in the SOP section 10.2.4?		✓			✓
4. Was the Window Defining Mixture analyzed and the MID switchpoints set to encompass the retention time windows of each congener group?		✓			✓
5. Was the Column Performance solution analyzed and the %Valley ≤25 for separation between 2378-TCDD/F and the closest eluting non-2378 isomer on their respective columns?		✓			✓
6. Was DoD Performance check criteria met?	✓				✓
7. Were the response factors calculated for each labeled standard and unlabeled native analyte using the SOP specified reference compound (Table 3), quantitation ions (Table 21), and formula (Section 10.2.7)?		✓			✓
8. Are the measured RRFs and/or concentrations for each compound within the specified control limits in Table 7 for all PCDDs/PCDFs?		✓		☐ CCV-Capping, RR Confirms (NCM# _____) ☐ CCV-Capping-Detects (8290/8290A) (NCM# _____) ☐ CCV-Capping-IDA (8290/8290A) (NCM# _____)	✓
9. Are the relative retention times of all PCDDs/PCDFs and all labeled compounds within the limits specified in Table 3 (1613B)?		✓			✓
10. Is the retention time of C ¹³ -1,2,3,4-TCDD >25 minutes on the Rtx-5 column and/or >15.0 min on the DB-225?		✓			✓
11. Are all S/N ratios ≥10 for the GC signals in each EICP (extracted ion chromatographic profile) including IDA's?		✓			✓
12. Are the ion abundance ratios for all labeled and unlabeled analytes within the control limits specified in Table 22 of the SOP?		✓			✓
13. Were all reagents used for calibration verified as correct in the reagent tab?		✓			✓
14. If manual integrations were performed, are the analyst name, reason, and date noted in the AD II batches? Are before and after graphics uploaded to AD II?	✓				✓
15. Were all graphics checked after upload to AD II? Was the mass res check scanned and attached to the corresponding CCV?		✓			✓
16. If criteria were not met, was a NCM generated?	✓				✓
17. Do the AD II batches contain a completed checklist for this work list?		✓			✓

Analyst:	W/S/D	Date:	1/29/19
Comments:	160-32649, 240-107020, 240-106949, 440-229699		
2nd Level Reviewer:	PMP	Date:	1-29-19
Comments:			

TestAmerica Knoxville Dioxin Batch Data Review Checklist

Method: ~~8290~~ ~~8290A~~ ~~1613B~~ - KNOX-ID-0004-R19

WL #:

10667

ADII Batch #(s):

27241, 27242

Job #(s):

160-32649, 240-107020,

240-106949, 440-229699

Review Items	N/A	Yes	No	Why is data reportable?	2nd ✓
1. Was the correct ICAL used for quantitation? (Check ICAL event number in every sample and CCV.)		✓		ICAL Event # 827, 825	✓
2. Has a Continuing Calibration Checklist been completed for each work list?		✓			✓
3. Were all special project requirements met (checked in backlog report and in AD II under notes)?		✓			✓
4. DoD requirements met?	✓			☐ NCM#140-11724: Add to Case Narrative if Manual Integrations Performed ☐ Narrate reasons for multiple analyses of samples	✓
5. Were the prep factors and dilution factors verified in AD II?		✓		☐ Dilution-Respike IDA. (NCM#)	✓
6. Is date/time of analysis correct and within the 12 hour clock?		✓			✓
7. Sample analyses done within preparation and analytical HT? (Check for H-flag in sample result in AD II.)		✓		☐ Holding Time-Initial Analysis (NCM#) ☐ Holding Time-Reanalysis (NCM#)	✓
8. Are IDA ratios within limits specified in Table 22 of the SOP?		✓		☐ Abundance ratio outside limit (NCM#)	✓
9. Are IDAs and cleanup standards within QC limits specified in Table 13?		✓		☐ IDA-Low-S/N 10:1 (NCM#) ☐ IDA-High-Isotope Dilution (NCM#)	✓
10. Were reported PCDD/Fs which did not meet the criteria below properly calculated and reported as EMPCs? • RT of 2378 isomers within SOP Table 3 limits. • RT of non-2378 isomers within established first/last windows. • Both native ions maximized within ±2 seconds. • Ion abundance ratios within the control limits specified in Table 22 (not adjusted for 8290A). • No corresponding peak at PCDPE mass (dpe tab checked and flag added in peak review). • Ion suppression tab checked and flags added in peak review if needed. • Co-elution (CI) flags added manually in AD II if needed.		✓			✓
11. Were all 2378-TCDF hits greater than or equal to the ML turned to acceptable on the primary column and confirmed on the DB-225 confirmation column?	✓			Were all of the samples marked as acceptable for TCDF analyzed on a DB-225 column and the lower result reported?	✓
12. Are non-detects that are G-qualified narrated?	✓			☐ (NCM#)	✓
13. Are positive results > ML within calibration range?		✓		☐ ICAL-Range Exceed; No Sat. (NCM#) ☐ non-2378's or OCDD/F (NCM#)	✓
14. Are all manual integrations documented with analyst name, reason, and date noted in AD II?		✓			✓
15. Were all graphics uploaded into AD II?		✓			✓
16. Final report acceptable (1. Job Data Review was checked and all CCVs, QC, and samples are turned to 2 nd Level, 2. The narrative was checked in Supervisor Desktop for all deviations and grammar errors, and 3. All QC links were verified and at least one sample from every job is linked to the ICAL)?		✓			✓
17. LCS/LCSD done per prep batch and all analytes within limits?	✓			☐ LCS/LCSD-Insuff. Sample (NCM#) ☐ LCS/LCSD-%R High (NCM#)	✓
18. Method blank done per prep batch, method/instrument blank analyzed with each sequence and analytes present in the method blank < ML or within specific program requirements?		✓		☐ Method Blank-Report, 10X (NCM#) ☐ Method Blank-Report, ND (NCM#) ☐ Method Blank-Insuff. Sample (NCM#)	✓

1st Level Reviewed by: *WJF ID PMP*

Date: 1-29-19

Comments:

2nd Level Reviewed by: *PMP 4/5 P*

Date: 1-29-19 / 1-30-19

Comments:

DIOXIN BATCH WORKSHEET

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Batch Number: 27087 Batch Start Date: 01/22/19 13:19 Batch Analyst: Ahmed, Syed MBatch Method: HRMS-Sepf Batch End Date: 01/24/19 13:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	10CSDFCL37CUP 00034	10IDDFC13WRKP 00051
160-32649-N-1	CRC-MW-1-011519	HRMS-Sepf, 1613B	T	1690.1 g	736.7 g	953.4 mL	20 uL	1 mL	1 mL
MB 140-27087/10		HRMS-Sepf, 1613B				1000 mL	20 uL	1 mL	1 mL
LCS 140-27087/11		HRMS-Sepf, 1613B				1000 mL	20 uL	1 mL	1 mL

Lab Sample ID	Client Sample ID	Method Chain	Basis	10RSDFWRKP 00028	10SPDFNATSPKP 00023	AnalysisComment			
160-32649-N-1	CRC-MW-1-011519	HRMS-Sepf, 1613B	T	20 uL		Sample filtered, filter extracted.			
MB 140-27087/10		HRMS-Sepf, 1613B		20 uL		Sample filtered, filter extracted.			
LCS 140-27087/11		HRMS-Sepf, 1613B		20 uL	1 mL				

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

DIOXIN BATCH WORKSHEET

Lab Name: TestAmerica Knoxville Job No.: 160-32649-1

SDG No.: _____

Batch Number: 27087 Batch Start Date: 01/22/19 13:19 Batch Analyst: Ahmed, Syed MBatch Method: HRMS-Sepf Batch End Date: 01/24/19 13:00

Batch Notes	
65% DCM:Hexane ID	201267
95% Hexane: MeCl ID	197363
Acid Silica ID	186795
Alumina ID	187909
Balance ID	d3
Batch Comment	qc shared with #27088
Dual Column C/U Analyst	sa
Dual Column C/U Date	01/23/2019
Deactivated Silica ID	186771
Hexane ID	183501
MeCL2 ID	184949
Na2SO4 ID	169785
Analyst ID - IDA Reagent Drop	sa
Analyst ID - IDA Reagent Drop Witness	lm
Analyst ID - IS Reagent Drop	es
Analyst ID - IS Reagent Drop Witness	es
Analyst ID - SU Reagent Drop	sa
Analyst ID - SU Reagent Drop Witness	sa
Analyst ID - TA Reagent Drop	sa
Analyst ID - TA Reagent Drop Witness	lm
Soxhlet End Date and Time	01/23/2019 07:00
Soxhlet Start Date and Time	01/22/2019 13:30
Tetradecane ID	129538
Toluene ID	171178

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Split Batch # NA

TestAmerica Knoxville Extraction Sheet
1613B/8290/8290A Aqueous by Separatory Funnel Extraction - KNOX-OP-0001

Batch Number: 27087

TALS Prep Method: ☐ 1613_P_Sep → 1613B

☐ 8290_P_Sep

Delivered: _____
Initials/Date/Time

Received: _____
Initials/Date/Time

☒ SHARED BATCH: 8290_P_Sep & 1613_P_Sep → 1613B

Lab Sample ID	Note in TALS if visible solids are present. (≤1%, >1%)	Note in TALS if sample is filtered. Soxhlet	Add sample to sep funnel.	Add 1.0/2.0 ng/mL IS (IDA) to all samples & QC. Record in TALS.	Add 0.2/1.0/2.0 ng/mL native spike (TA) to LCS, MS, MSD. Record in TALS.	Perform sep funnel extraction with methylene chloride.	Concentrate sep funnel extract.	Solvent exchange to appropriate volume of hexane.	Conc filter extract. Add 100 µL tetradecane to 40 mL vial.	Exchange filter extract to appropriate volume of hexane. Combine filter extract and sep funnel extract.	Add 0.2 ng/mL cleanup std (SU) to all 1613B extracts. Record in TALS.	Acid/Base wash extracts if needed.	Concentrate to ~2 to 4 mL on N-EVAP for dual column cleanup.	Perform silica gel/alumina column cleanup.	Concentrate to ~2 mL on N-EVAP for carbon cleanup.	Perform carbon cleanup. Add 100 µL nonane to 40 mL vial.	Concentrate to 50 µL on N-EVAP. Adjust volume to 5 mL MeCl ₂ .	Perform GPC cleanup.	Concentrate/solvent exchange to hexane to appropriate volume.	Concentrate to <1 mL.	Add 100 ng/mL recovery std (IS) to mini-vial. Record in TALS. Transfer extract to	Conc to final volume in nonane. Record final volume in TALS.
280-118993-C-2																						
280-118993-A-2 DU																						
280-118993-A-3																						
460-173660-J-1																						
280-107020-E-1																						
160-32649-N-1																						
240-106949-H-1																						
680-163005-B-20																						
680-163005-A-21																						
MB 140-27087/10																						
LCS 140-27087/11																						

Shipping and Receiving Documents

Chain of Custody Record

Client Information		Lab PM: Lambert-Sykes, Chenise Y		Carrier Tracking No(s):		COC No: 160-7516-3843.1	
Client Contact: Ms. Kristine Schnoes		Phone: <i>160-7516-3843.1</i>		E-Mail: chenise.lambert-sykes@testamericainc.com		Page: Page 1 of 1	
Company: Tetra Tech, Inc.		Address: 1 South Wacker Dr., Suite 3700		City: Chicago		State, Zip: IL, 60606	
Phone:		PO #: <i>16007994</i>		Pay by Credit Card		WO #:	
Email: kris.schnoes@tetratech.com		Project #: <i>16007994</i>		Former Carnotite Site - MW-1 Sampling		Site:	
Due Date Requested:		TAT Requested (days):		Sample Date: <i>1/15/19</i>		Sample Time: <i>1230</i>	
Sample Identification		Sample Type (C=comp, G=grab): <i>G</i>		Matrix (W=water, S=solid, O=waste/soil, BT=tissue, Ash): <i>Water</i>		Preservation Code:	
<i>QRC-MW-1-011519</i>							
							
160-32649 Chain of Custody							
Possible Hazard Identification		☐ Non-Hazard		☐ Flammable		☐ Skin Irritant	
Deliverable Requested: I, II, III, IV, Other (specify)		☐ Poison B		☐ Unknown		☐ Radiological	
Empty Kit Relinquished by: <i>[Signature]</i>		Date: <i>1/15/19</i>		Time: <i>1700</i>		Company: <i>[Signature]</i>	
Relinquished by: <i>[Signature]</i>		Date/Time: <i>1/15/19 1700</i>		Date/Time: <i>01/16/19 0910</i>		Company: <i>[Signature]</i>	
Relinquished by:		Date/Time:		Date/Time:		Company:	
Custody Seal Intact: <i>726004+005</i>		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:			
Δ Yes Δ No							

TestAmerica St. Louis

13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record



estAmerica

HE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab) Client Contact: 13715 Rider Trail North Earth City, MO 63045 Phone (314) 298-8566 Fax (314) 298-8757		Lab PM: Lambert-Sykes, Chenise Y E-Mail: chenise.lambert-sykes@testamericainc.com State of Origin: Illinois	
Shipping/Receiving Company: TestAmerica Laboratories, Inc. Address: 5815 Middlebrook Pike, City: Knoxville State, Zip: TN, 37921 Phone: 865-291-3000(Tel) 865-584-4315(Fax) Email:		Job #: 160-32649-1 Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
Due Date Requested: 2/4/2019 TAT Requested (days):		Analysis Requested:	
PO #: 16007994 WO #:		Field Filtered Sample (Yes or No) ☒ 1613B/1613B_P_Sep TCDD Only	
Project Name: Former Carnotite Site - MW-1 Sampling Site:		Perform MS/MSD (Yes or No) ☒	
Sample Date: 1/15/19 Sample Time: 12:30 Central Sample Type (C=Comp, G=grab): Matrix (W=Water, S=solid, O=soil, BT=Tissue, A=Air):		Total Number of Containers: 3	
Sample Identification - Client ID (Lab ID): CRC-MW-1-011519 (160-32649-1)		Special Instructions/Note:	
RT: 0.8°C CT: 0.8°C, 1 cooler RC-NB, pH=6 Custody seal intact LK#7048 6528 2823 RW 1/17/19		Special Instructions/Note:	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.			
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4			
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For Months			
Special Instructions/QC Requirements:			
Empty Kit Relinquished by: Date:			
Relinquished by: L. McElroy Date/Time: 01/16/19 1730 Company:		Relinquished by: Date/Time: 01/17/19 0930 Company: TA-K	
Relinquished by: Date/Time:		Relinquished by: Date/Time:	
Relinquished by: Date/Time:		Relinquished by: Date/Time:	
Custody Seals Intact:		Cooler Temperature(s) °C and Other Remarks:	
Δ Yes Δ No		Ver: 09/20/2016	

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			☐ Containers, Broken	
2. Were ambient air containers received intact?			/	☐ Checked in lab	
3. The coolers/containers custody seal if present, is it intact?	/			☐ Yes ☐ NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C) Thermometer ID: <u>5668</u> Correction factor: <u>±0.0</u>	/			☐ Cooler Out of Temp, Client Contacted, Proceed/Cancel ☐ Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	/			☐ Containers, Broken	
6. Were samples received in appropriate containers?	/			☐ Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			☐ COC & Samples Do Not Match ☐ COC Incorrect/Incomplete ☐ COC Not Received	
8. Were all of the samples listed on the COC received?	/			☐ Sample Received, Not on COC ☐ Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			☐ COC; No Date/Time; Client Contacted	
10. Was the sampler identified on the COC?	/		/	☐ Sampler Not Listed on COC	
11. Is the client and project name/# identified?	/			☐ COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/			☐ COC No tests on COC	
13. Is the matrix of the samples noted?	/			☐ COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/			☐ COC Incorrect/Incomplete	
15. Were samples received within holding time?	/			☐ Holding Time - Receipt	
16. Were samples received with correct chemical preservative (excluding Encore)?			/	☐ pH Adjusted, pH Included (See box 16A) ☐ Incorrect Preservative	
17. Were VOA samples received without headspace?			/	☐ Headspace (VOA only)	
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: <u>794 2020/04</u>	/			☐ Residual Chlorine	
19. For 1613B water samples is pH<9?	/			☐ If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?			/	☐ Project missing info	
Project #: _____ PM Instructions: _____					
Sample Receiving Associate: <u>[Signature]</u> Date: <u>11/17/19</u>					

Chain of Custody Record



Client Information (Sub Contract Lab)		Carrier Tracking No(s): 160-160892.1		COC No: 160-160892.1	
Lab PM: Lambert-Sykes, Chenise Y		State of Origin: Illinois		Page: Page 1 of 1	
Phone: chenise.lambert-sykes@testamericainc.com		Accreditations Required (See note): NELAP - Louisiana		Job #: 160-32649-1	
Company: TestAmerica Laboratories, Inc.		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)			
Due Date Requested: 2/1/2019		Analysis Requested			
TAT Requested (days):		Total Number of Containers			
PO #:		8082A/3510C_PCB_1YR (MOD) Standard 8082A list			
WO #:		8081B/3510C (MOD) Standard 8081B list			
Project #:		8270D/3510C HSL list (full list spike)			
SSOW #:		8260B/5030B (MOD) HSL Analyte list (CLP) full spike			
Sample Date		Perform MS/MSD (Yes or No)			
Sample Time		Field Filtered Sample (Yes or No)			
Sample ID (Lab ID)		Preservation Code:			
CRC-MW-1-011519 (160-32649-1)		Matrix (W=water, S=solid, O=oil, BT=Tissue, A=Air) Sample Type (C=Comp, G=grab) 12:30 Central Water			
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months					
Special Instructions/Note:					
Special Instructions/Note: 160-32649 Chain of Custody					
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months					
Special Instructions/Note:					
Special Instructions/Note: 160-32649 Chain of Custody					
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months					
Special Instructions/Note:					
Special Instructions/Note: 160-32649 Chain of Custody					
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months					
Special Instructions/Note:					
Special Instructions/Note: 160-32649 Chain of Custody					
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months					
Special Instructions/Note:					
Special Instructions/Note: 160-32649 Chain of Custody					
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months					
Special Instructions/Note:					
Special Instructions/Note: 160-32649 Chain of Custody					
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months					
Special Instructions/Note:					
Special Instructions/Note: 160-32649 Chain of Custody					
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months					
Special Instructions/Note:					
Special Instructions/Note: 160-32649 Chain of Custody					
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4					

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 160-32649-1

Login Number: 32649

List Source: TestAmerica St. Louis

List Number: 1

Creator: McKinney, Gerrod E

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.2°C; 3.6°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 160-32649-1

Login Number: 32649
List Number: 3
Creator: Lujan, Jacob P

List Source: TestAmerica Denver
List Creation: 01/17/19 05:51 PM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix J
Hydrogeologic Assessment Report



January 14, 2019

Ms. Abby Mazza
City of Chicago
Department of Fleet and Facility Management
30 North LaSalle, Suite 300
Chicago, Illinois 60606

**Subject: Hydrogeologic Assessment
Former Carnotite Reduction Company Site
434 East 26th Street
Chicago, Illinois**

Dear Ms. Mazza:

Tetra Tech, Inc. (Tetra Tech) performed a hydrogeologic assessment at the former Carnotite site in December 2018. The assessment was performed as part of the pre-design investigation to support the remedial design. The following includes a summary of work performed and conclusions regarding the hydrogeology at the site.

Hydraulic Conductivity: Tetra Tech collected hydraulic conductivity data to assess the flow rates necessary to dewater the excavation area and to maintain control of any seepage. Slug testing was performed for calculation of the groundwater flow rate, which will be used to determine the numbers and capacity of pumps needed to control the groundwater flow into the excavation. This information will also determine the capacity of treatment equipment needed for pre-treatment of the groundwater prior to discharge to the Metropolitan Water Reclamation District of Greater Chicago.

On December 12, 2018, Tetra Tech performed rising-head (slug out) tests in three groundwater monitoring wells at the site (ASC-2A, ASC-5, and MW-1) to determine the hydraulic conductivity (k) at the site and evaluate the potential groundwater extraction and discharge rates at the site.

The rising-head slug test involves withdrawing a known volume of water from a well and monitoring the resulting change in water level over time. The slug used for the tests was a disposable bailer that was 3 feet long and 1.75 inches in outer diameter; therefore, the volume of water expected to be removed was approximately 0.375 gallon.

The three monitoring wells tested have 10-foot-long screens that cross the water table. The rising-head tests are most effective for wells screened across the water table (Butler 2014).

Before conducting the tests in each well, the pressure transducer was set approximately 1 foot above the bottom of the well and was set to record water level readings on a logarithmic scale. A slug was then instantaneously removed (time zero) and water level readings were automatically recorded during water level recovery. Another test was performed after the water level recovered to approximately 90 percent or more of the static level. Three slug tests were completed at each well and the water removed was containerized and stored onsite for treatment and disposal at a later date.

Tetra Tech Inc.

1 S. Wacker Drive, 37th Floor, Chicago, IL 60606
Tel 312-201-7700 Fax 312-938-0118 www.tetrattech.com



After the tests were completed, the pressure transducer data were saved and later imported into the Super Slug 3.1 software (Starpoint Software, Inc. 2008) for interpretation. The displacement-versus-time data for individual wells were interpreted using Bouwer and Rice methods (1976 and 1989). The Super Slug printouts containing the details of slug test interpretations and calculated average hydraulic conductivities are enclosed. The average calculated hydraulic conductivities for individual wells are listed below:

- ASC-2A – 4.59×10^{-3} centimeters per second (cm/sec)
- ASC-5 – 7.17×10^{-3} cm/sec
- MW-1 – 1.69×10^{-3} cm/sec

The overall average hydraulic conductivity determined from the assessment is 3.11×10^{-3} cm/sec.

Surveying: Prior to slug testing on December 12, 2018, the depth to water was obtained at groundwater monitoring wells ASC-2A, ASC-4, ASC-5, and MW-1. The depth to water ranged from 8.25 to 11.76 feet below ground surface. On December 20, 2018, these wells were surveyed by an Illinois-licensed professional surveyor for ground surface and top-of-casing elevations. The depth to water and survey data were used to determine groundwater elevations at the site and to establish the groundwater flow direction to the east-northeast. A groundwater flow map and survey and groundwater elevation data obtained are also enclosed.

References:

Bouwer, H. 1989. The Bouwer and Rice slug test--an update, Ground Water, vol. 27, No. 3, pp. 304-309.

Bouwer, H. and R.C. Rice. 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells. Water Resources Research, vol. 12, no. 3, pp. 423-428.

Butler, J.J. 2014. Slug Tests in Wells Screened Across the Water Table: Some Additional Considerations. Groundwater. Volume 52, Number 2. Pages 311 through 316.

Starpoint Software, Inc. 2008. SuperSlug: Aquifer Slug Test Analysis Software for Microsoft Windows. Version 3.2.

If you have any questions, please call me at (312) 201-7480.

Sincerely,

A handwritten signature in cursive script that reads 'Kristine H. Schnoes'.

Kristine Schnoes
Project Manager

Enclosures (3)

ENCLOSURE 1

**SLUG TEST INTERPRETATIONS AND CALCULATED HYDRAULIC
CONDUCTIVITIES**

Carnotite Slug Test Summary

Slug Test ID	Graphical k	Arithmetic k	Geometric k	Sensitivity Analysis k
ASC-2A-1	6.14E-04	3.87E-04	3.36E-04	4.73E-04
ASC-2A-2	7.32E-04	3.72E-04	NA	5.64E-04
ASC-2A-3	6.11E-04	3.42E-04	2.83E-04	4.80E-04
Averages	6.52E-04	3.67E-04	3.10E-04	5.06E-04
Overall ASC-2A Average		4.59E-04		
ASC-5-1	NA	9.63E-03	NA	1.57E-02
ASC-5-2	7.64E-04	7.48E-03	5.25E-03	1.08E-02
ASC-5-3	4.86E-04	9.82E-03	6.14E-03	1.37E-02
Averages	6.25E-04	8.98E-03	5.69E-03	1.34E-02
Overall ASC-5 Average		7.17E-03		
MW-1-1	1.49E-03	2.13E-03	1.98E-03	2.44E-03
MW-1-2	1.15E-03	1.51E-03	1.37E-03	1.89E-03
MW-1-3	1.26E-03	1.61E-03	1.48E-03	1.97E-03
Averages	1.30E-03	1.75E-03	1.61E-03	2.10E-03
Overall MW-1 Average		1.69E-03		

Graphical k Average 8.60E-04
Aritmetic k Average 3.70E-03
Geometric k Average 2.54E-03
Sensitivity Analysis k Average 5.33E-03

Overall Average 3.11E-03

Notes:

All values presented as centimeters per second

ID = Identification
k = Hydraulic conductivity
NA = Not applicable; data obtained unable to produce k because of water oscillations

Bouwer and Rice Automatic Parameter Estimation

Carnotite

Location: Chicago, IL
 Test Date: December 12, 2018
 Client: City of Chicago, 2FM
 Import File: C:\Users\Dave\Desktop\asc-2A-1.txt

Well Label: ASC-2A - Test 1
 Aquifer Thickness: 20. feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 2.125 Inches
 Gravel Pack Porosity: 30. %
 Corrected Casing Radius: 1.433 Inches
 Bouwer and Rice Parameter A: 2.953
 Bouwer and Rice Parameter B: 0.6265
 Radius of Influence of Test: 2.423 feet

Trial	Adjusted Time (Seconds)	Head (feet)	Head Ratio	Hyd. Con. (cm/sec)	Flow to Well (Meters3/Day)
2	0.	1.177	1.	--	
3	0.25	1.167	0.9915	2.271e-003	5.109
4	0.5	1.171	0.9949	6.801e-004	1.535
5	0.75	1.165	0.9898	9.091e-004	2.042
6	1.	1.167	0.9915	5.677e-004	1.277
7	1.25	1.162	0.9873	6.827e-004	1.529
8	1.613	1.166	0.9907	3.873e-004	0.8707
9	1.75	1.164	0.989	4.223e-004	0.9476
10	2.	1.166	0.9907	3.124e-004	0.7022
11	2.25	1.161	0.9864	4.047e-004	0.9059
12	2.5	1.164	0.989	2.956e-004	0.6633
13	2.75	1.165	0.9898	2.479e-004	0.5569
14	3.	1.161	0.9864	3.036e-004	0.6795
15	3.25	1.16	0.9856	2.978e-004	0.6661
16	3.5	1.163	0.9881	2.275e-004	0.51
17	3.75	1.158	0.9839	2.887e-004	0.6447
18	4.	1.164	0.989	1.847e-004	0.4146
19	4.25	1.158	0.9839	2.548e-004	0.5688
20	4.5	1.16	0.9856	2.151e-004	0.4811
21	4.75	1.16	0.9856	2.038e-004	0.4558
22	5.	1.157	0.983	2.281e-004	0.5087
23	5.25	1.159	0.9847	1.953e-004	0.4364
24	5.5	1.156	0.9822	2.178e-004	0.4854
25	5.75	1.154	0.9805	2.284e-004	0.5081
26	6.11	1.156	0.9822	1.96e-004	0.4369
27	6.47	1.151	0.9779	2.297e-004	0.5097
28	6.89	1.153	0.9796	1.989e-004	0.4422
29	7.309	1.153	0.9796	1.875e-004	0.4169
30	7.729	1.151	0.9779	1.923e-004	0.4267
31	8.21	1.154	0.9805	1.599e-004	0.3558
32	8.749	1.149	0.9762	1.831e-004	0.4056
33	9.229	1.143	0.9711	2.113e-004	0.4657
34	9.829	1.149	0.9762	1.63e-004	0.361
35	10.43	1.146	0.9737	1.703e-004	0.3762
36	11.03	1.144	0.972	1.716e-004	0.3784
37	11.69	1.148	0.9754	1.42e-004	0.3143

38	12.41	1.141	0.9694	1.665e-004	0.3664
39	13.19	1.136	0.9652	1.788e-004	0.3917
40	13.97	1.135	0.9643	1.731e-004	0.3787
41	14.81	1.133	0.9626	1.712e-004	0.3739
42	15.71	1.131	0.9609	1.688e-004	0.3682
43	16.67	1.119	0.9507	2.017e-004	0.4351
44	17.63	1.116	0.9482	2.008e-004	0.4321
45	18.71	1.107	0.9405	2.18e-004	0.4654
46	19.85	1.104	0.938	2.146e-004	0.4568
47	21.05	1.087	0.9235	2.514e-004	0.5269
48	22.31	1.073	0.9116	2.759e-004	0.5708
49	23.63	1.064	0.904	2.842e-004	0.583
50	25.07	1.054	0.8955	2.929e-004	0.5953
51	26.57	1.034	0.8785	3.244e-004	0.6466
52	28.13	1.027	0.8726	3.224e-004	0.6384
53	29.81	1.007	0.8556	3.482e-004	0.676
54	31.61	0.996	0.8462	3.515e-004	0.6749
55	33.47	0.979	0.8318	3.662e-004	0.6911
56	35.51	0.962	0.8173	3.779e-004	0.701
57	37.61	0.943	0.8012	3.921e-004	0.7129
58	39.83	0.921	0.7825	4.097e-004	0.7275
59	42.23	0.904	0.7681	4.158e-004	0.7246
60	44.75	0.881	0.7485	4.307e-004	0.7315
61	47.39	0.858	0.729	4.438e-004	0.7342
62	50.21	0.841	0.7145	4.454e-004	0.7222
63	53.21	0.816	0.6933	4.58e-004	0.7206
64	56.39	0.792	0.6729	4.674e-004	0.7137
65	59.75	0.768	0.6525	4.754e-004	0.7039
66	63.35	0.742	0.6304	4.846e-004	0.6932
67	66.95	0.724	0.6151	4.829e-004	0.6741
68	71.15	0.701	0.5956	4.846e-004	0.6549
69	75.35	0.686	0.5828	4.767e-004	0.6305
70	79.55	0.668	0.5675	4.738e-004	0.6101
71	84.35	0.652	0.554	4.659e-004	0.5857
72	89.75	0.627	0.5327	4.669e-004	0.5644
73	94.55	0.603	0.5123	4.706e-004	0.5471
74	100.5	0.588	0.4996	4.592e-004	0.5206
75	106.5	0.557	0.4732	4.672e-004	0.5017
76	112.5	0.531	0.4511	4.705e-004	0.4817
77	119.1	0.503	0.4274	4.747e-004	0.4604
78	126.3	0.476	0.4044	4.767e-004	0.4375
79	134.1	0.449	0.3815	4.78e-004	0.4138
80	141.9	0.422	0.3585	4.808e-004	0.3912
81	150.3	0.382	0.3246	4.98e-004	0.3668
82	159.3	0.349	0.2965	5.076e-004	0.3415
83	168.9	0.334	0.2838	4.96e-004	0.3194
84	178.5	0.273	0.2319	5.445e-004	0.2866
85	189.3	0.236	0.2005	5.646e-004	0.2569
86	200.7	0.19	0.1614	6.044e-004	0.2214
87	212.7	0.149	0.1266	6.464e-004	0.1857
88	225.3	0.102	8.666e-002	7.221e-004	0.142
89	238.5	4.8e-002	4.078e-002	8.924e-004	8.258e-002

Arithmetic Means:

Hydraulic Conductivity
Transmissivity

3.868e-004 cm/sec
2.037 meters²/day

Geometric Means:

Hydraulic Conductivity	3.363e-004 cm/sec
Transmissivity	1.771 meters ² /day

Sensitivity Analysis:

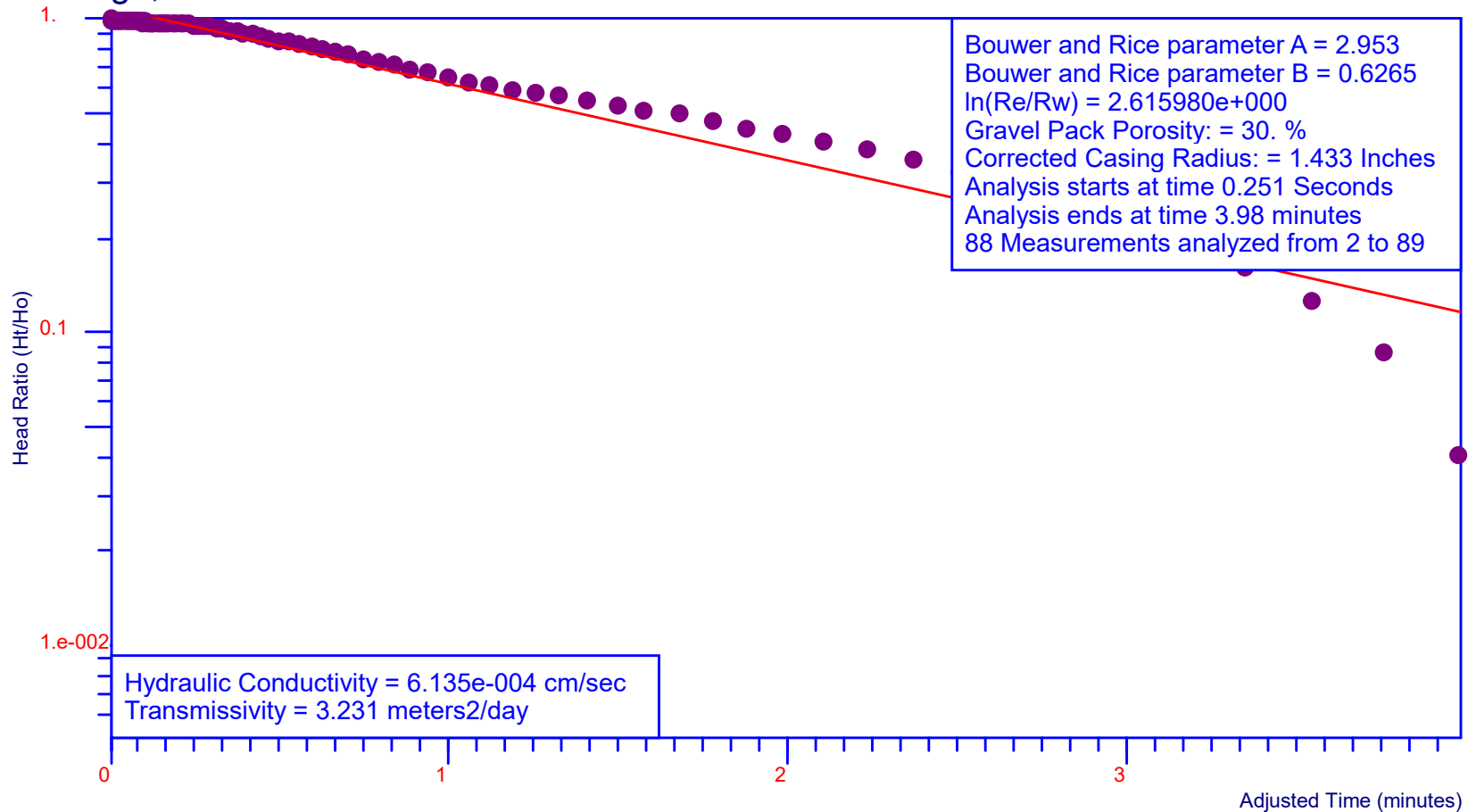
Hydraulic Conductivity	4.726e-004 cm/sec
Transmissivity	2.489 meters ² /day

Carnotite December 12, 2018

Bouwer and Rice Graph

Chicago, IL

ASC-2A - Test 1



Client:: City of Chicago, 2FM
Analysis by Starpoint Software

H_o is 1.177 feet at 0.251 Seconds

Bouwer and Rice Automatic Parameter Estimation

Carnotite

Location: Chicago, IL
 Test Date: December 12, 2018
 Client: City of Chicago, 2FM
 Import File: C:\Users\Dave\Desktop\asc-2A-2.txt

Well Label: ASC-2A - Test 2
 Aquifer Thickness: 20. feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 2.125 Inches
 Gravel Pack Porosity: 30. %
 Corrected Casing Radius: 1.433 Inches
 Bouwer and Rice Parameter A: 2.953
 Bouwer and Rice Parameter B: 0.6265
 Radius of Influence of Test: 2.423 feet

Trial	Adjusted Time (Seconds)	Head (feet)	Head Ratio	Hyd. Con. (cm/sec)	Flow to Well (Meters3/Day)
2	0.	1.025	1.	--	
3	0.25	1.023	0.998	5.198e-004	1.025
4	0.5	1.022	0.9971	3.9e-004	0.7685
5	1.005	1.021	0.9961	2.589e-004	0.5095
6	1.128	1.022	0.9971	1.729e-004	0.3407
7	1.251	1.025	1.	--	
8	1.5	1.015	0.9902	4.349e-004	0.851
9	1.75	1.019	0.9941	2.232e-004	0.4385
10	2.	1.017	0.9922	2.607e-004	0.5111
11	2.25	1.019	0.9941	1.736e-004	0.3411
12	2.5	1.017	0.9922	2.085e-004	0.4089
13	2.75	1.025	1.	--	
14	3.	1.019	0.9941	1.302e-004	0.2558
15	3.25	1.016	0.9912	1.805e-004	0.3537
16	3.5	1.017	0.9922	1.489e-004	0.2921
17	3.75	1.015	0.9902	1.739e-004	0.3404
18	4.	1.017	0.9922	1.303e-004	0.2555
19	4.25	1.016	0.9912	1.381e-004	0.2704
20	4.5	1.017	0.9922	1.158e-004	0.2272
21	4.75	1.012	0.9873	1.788e-004	0.3488
22	5.	1.014	0.9893	1.436e-004	0.2807
23	5.25	1.009	0.9844	1.994e-004	0.3879
24	5.5	1.012	0.9873	1.544e-004	0.3013
25	5.75	1.012	0.9873	1.477e-004	0.2882
26	6.11	1.011	0.9863	1.498e-004	0.2919
27	6.47	1.014	0.9893	1.11e-004	0.2169
28	6.89	1.01	0.9854	1.424e-004	0.2772
29	7.31	1.008	0.9834	1.522e-004	0.2958
30	7.73	0.999	0.9746	2.211e-004	0.4259
31	8.21	1.008	0.9834	1.355e-004	0.2634
32	8.75	1.006	0.9815	1.423e-004	0.2759
33	9.23	1.	0.9756	1.78e-004	0.3432
34	9.83	0.999	0.9746	1.739e-004	0.3349
35	10.43	1.	0.9756	1.575e-004	0.3037
36	11.03	0.992	0.9678	1.974e-004	0.3775
37	11.69	0.996	0.9717	1.633e-004	0.3137

38	12.41	0.993	0.9688	1.701e-004	0.3256
39	13.19	0.985	0.961	2.008e-004	0.3813
40	13.97	0.98	0.9561	2.138e-004	0.404
41	14.81	0.97	0.9463	2.478e-004	0.4634
42	15.71	0.968	0.9444	2.423e-004	0.4523
43	16.67	0.956	0.9327	2.782e-004	0.5127
44	17.63	0.957	0.9337	2.591e-004	0.478
45	18.71	0.939	0.9161	3.116e-004	0.5642
46	19.85	0.927	0.9044	3.368e-004	0.602
47	21.05	0.923	0.9005	3.313e-004	0.5896
48	22.31	0.909	0.8868	3.582e-004	0.6277
49	23.63	0.897	0.8751	3.756e-004	0.6495
50	25.07	0.882	0.8605	3.988e-004	0.6781
51	26.57	0.869	0.8478	4.134e-004	0.6927
52	28.13	0.847	0.8263	4.512e-004	0.7368
53	29.81	0.834	0.8137	4.603e-004	0.7401
54	31.61	0.82	0.8	4.697e-004	0.7425
55	33.47	0.799	0.7795	4.952e-004	0.7628
56	35.51	0.785	0.7659	4.998e-004	0.7565
57	37.61	0.762	0.7434	5.245e-004	0.7706
58	39.83	0.744	0.7259	5.352e-004	0.7677
59	42.23	0.729	0.7112	5.369e-004	0.7546
60	44.75	0.704	0.6868	5.585e-004	0.7581
61	47.39	0.68	0.6634	5.761e-004	0.7553
62	50.21	0.661	0.6449	5.813e-004	0.7408
63	53.21	0.642	0.6263	5.85e-004	0.7241
64	56.39	0.63	0.6146	5.743e-004	0.6975
65	59.75	0.609	0.5941	5.797e-004	0.6807
66	63.35	0.597	0.5824	5.677e-004	0.6534
67	66.95	0.578	0.5639	5.693e-004	0.6344
68	71.15	0.563	0.5493	5.603e-004	0.6082
69	75.35	0.546	0.5327	5.561e-004	0.5854
70	79.55	0.523	0.5102	5.628e-004	0.5675
71	84.35	0.499	0.4868	5.678e-004	0.5463
72	89.75	0.477	0.4654	5.671e-004	0.5215
73	94.55	0.461	0.4498	5.623e-004	0.4998
74	100.5	0.438	0.4273	5.626e-004	0.4751
75	106.6	0.415	0.4049	5.646e-004	0.4517
76	112.6	0.382	0.3727	5.835e-004	0.4297
77	119.1	0.354	0.3454	5.937e-004	0.4052
78	126.3	0.332	0.3239	5.936e-004	0.38
79	134.1	0.294	0.2868	6.194e-004	0.3511
80	141.9	0.266	0.2595	6.323e-004	0.3243
81	150.3	0.241	0.2351	6.406e-004	0.2977
82	159.3	0.222	0.2166	6.387e-004	0.2734
83	168.9	0.201	0.1961	6.416e-004	0.2486
84	178.5	0.125	0.122	7.841e-004	0.189
85	189.3	8.7e-002	8.488e-002	8.667e-004	0.1454
86	200.8	4.2e-002	4.098e-002	1.059e-003	8.574e-002

Arithmetic Means:

Hydraulic Conductivity 3.722e-004 cm/sec
Transmissivity 1.961 meters²/day

Geometric Means:

Hydraulic Conductivity 0. cm/sec
Transmissivity 0. meters²/day

Sensitivity Analysis:

Hydraulic Conductivity

5.643e-004 cm/sec

Transmissivity

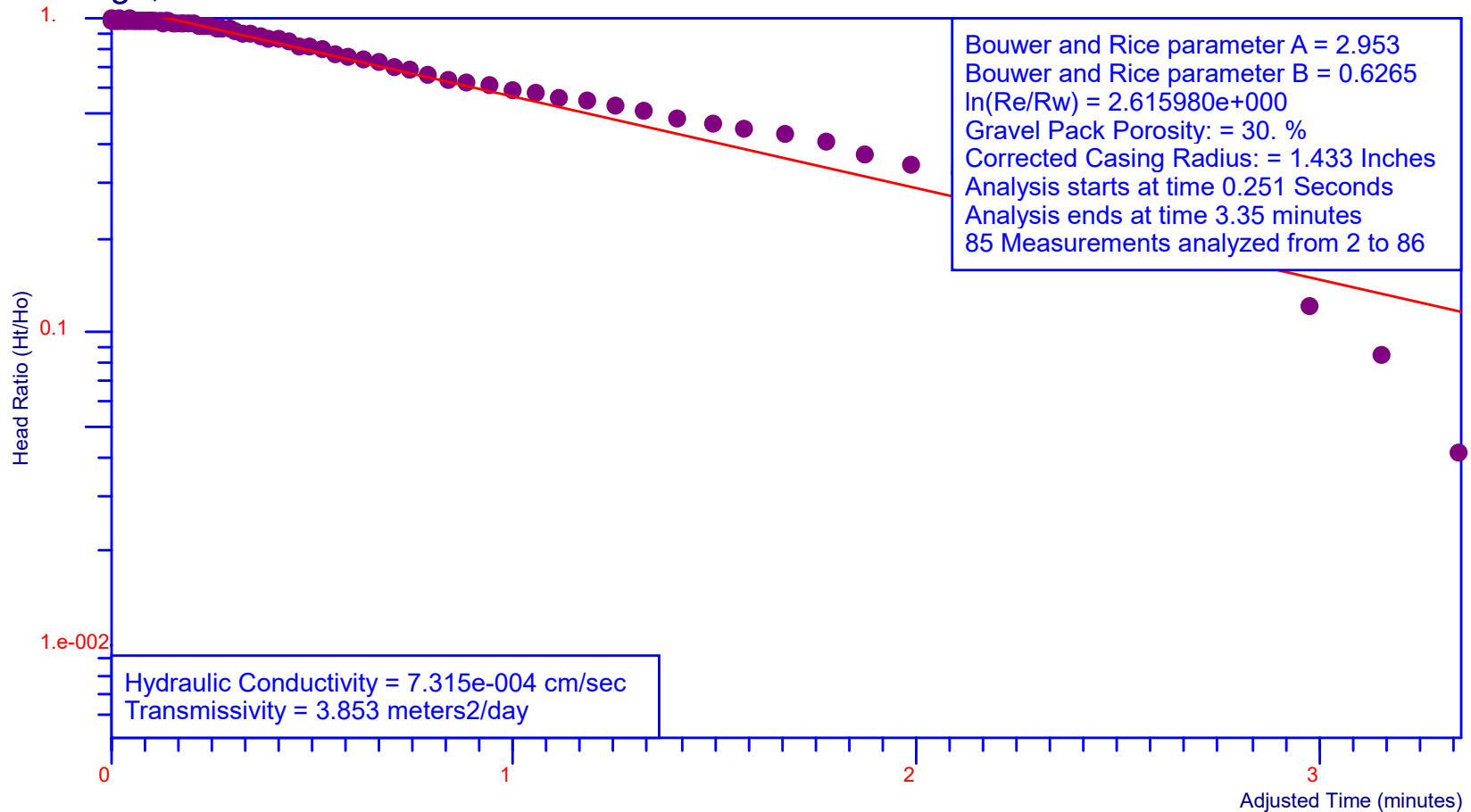
2.972 meters²/day

Carnotite December 12, 2018

Bouwer and Rice Graph

Chicago, IL

ASC-2A - Test 2



Client:: City of Chicago, 2FM
Analysis by Starpoint Software

H_o is 1.025 feet at 0.251 Seconds

Bouwer and Rice Automatic Parameter Estimation

Carnotite

Location: Chicago, IL
 Test Date: December 12, 2018
 Client: City of Chicago, 2FM
 Import File: C:\Users\Dave\Desktop\asc-2A-3.txt

Well Label: ASC-2A - Test 3
 Aquifer Thickness: 20. feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 2.125 Inches
 Gravel Pack Porosity: 30. %
 Corrected Casing Radius: 1.433 Inches
 Bouwer and Rice Parameter A: 2.953
 Bouwer and Rice Parameter B: 0.6265
 Radius of Influence of Test: 2.423 feet

Trial	Adjusted Time (Seconds)	Head (feet)	Head Ratio	Hyd. Con. (cm/sec)	Flow to Well (Meters3/Day)
7	0.	1.058	1.	--	
8	0.25	1.056	0.9981	5.036e-004	1.025
9	0.5	1.047	0.9896	1.391e-003	2.807
10	0.75	1.053	0.9953	4.202e-004	0.8531
11	1.	1.055	0.9972	1.889e-004	0.3843
12	1.25	1.052	0.9943	3.027e-004	0.614
13	1.5	1.051	0.9934	2.944e-004	0.5966
14	1.75	1.054	0.9962	1.44e-004	0.2926
15	2.	1.049	0.9915	2.842e-004	0.5748
16	2.25	1.047	0.9896	3.091e-004	0.6239
17	2.5	1.05	0.9924	2.02e-004	0.4089
18	2.75	1.049	0.9915	2.067e-004	0.418
19	3.	1.055	0.9972	6.298e-005	0.1281
20	3.25	1.052	0.9943	1.164e-004	0.2361
21	3.5	1.053	0.9953	9.005e-005	0.1828
22	3.75	1.051	0.9934	1.178e-004	0.2387
23	4.	1.049	0.9915	1.421e-004	0.2874
24	4.25	1.049	0.9915	1.337e-004	0.2705
25	4.5	1.054	0.9962	5.6e-005	0.1138
26	4.86	1.051	0.9934	9.088e-005	0.1841
27	5.22	1.045	0.9877	1.576e-004	0.3175
28	5.64	1.048	0.9905	1.12e-004	0.2264
29	6.06	1.048	0.9905	1.043e-004	0.2107
30	6.48	1.044	0.9868	1.368e-004	0.2753
31	6.96	1.042	0.9849	1.457e-004	0.2926
32	7.5	1.041	0.9839	1.437e-004	0.2884
33	7.98	1.04	0.983	1.431e-004	0.2869
34	8.58	1.039	0.982	1.405e-004	0.2815
35	9.18	1.037	0.9802	1.453e-004	0.2905
36	9.78	1.037	0.9802	1.364e-004	0.2727
37	10.44	1.037	0.9802	1.278e-004	0.2554
38	11.16	1.033	0.9764	1.426e-004	0.2839
39	11.94	1.034	0.9773	1.279e-004	0.2549
40	12.72	1.024	0.9679	1.709e-004	0.3373
41	13.56	1.019	0.9631	1.843e-004	0.362
42	14.46	1.019	0.9631	1.728e-004	0.3395

43	15.42	1.012	0.9565	1.918e-004	0.3742
44	16.38	1.004	0.949	2.128e-004	0.4119
45	17.46	0.997	0.9423	2.263e-004	0.435
46	18.6	0.993	0.9386	2.268e-004	0.4342
47	19.8	0.981	0.9272	2.539e-004	0.4802
48	21.06	0.977	0.9234	2.516e-004	0.474
49	22.38	0.962	0.9093	2.828e-004	0.5245
50	23.82	0.953	0.9008	2.919e-004	0.5364
51	25.32	0.937	0.8856	3.191e-004	0.5765
52	26.88	0.93	0.879	3.192e-004	0.5723
53	28.56	0.913	0.8629	3.434e-004	0.6044
54	30.36	0.904	0.8544	3.447e-004	0.6008
55	32.22	0.883	0.8346	3.734e-004	0.6356
56	34.26	0.866	0.8185	3.889e-004	0.6493
57	36.36	0.848	0.8015	4.049e-004	0.6619
58	38.58	0.831	0.7854	4.165e-004	0.6673
59	40.98	0.815	0.7703	4.237e-004	0.6657
60	43.5	0.792	0.7486	4.429e-004	0.6763
61	46.14	0.77	0.7278	4.582e-004	0.6802
62	48.96	0.751	0.7098	4.657e-004	0.6744
63	51.96	0.735	0.6947	4.664e-004	0.661
64	55.14	0.712	0.673	4.779e-004	0.656
65	58.5	0.686	0.6484	4.928e-004	0.6517
66	62.1	0.676	0.6389	4.799e-004	0.6255
67	65.7	0.65	0.6144	4.934e-004	0.6183
68	69.9	0.638	0.603	4.814e-004	0.5922
69	74.1	0.616	0.5822	4.857e-004	0.5768
70	78.3	0.604	0.5709	4.763e-004	0.5547
71	83.1	0.585	0.5529	4.744e-004	0.5351
72	88.5	0.566	0.535	4.703e-004	0.5132
73	93.3	0.544	0.5142	4.744e-004	0.4975
74	99.3	0.516	0.4877	4.811e-004	0.4786
75	105.3	0.496	0.4688	4.787e-004	0.4577
76	111.3	0.478	0.4518	4.75e-004	0.4377
77	117.9	0.453	0.4282	4.787e-004	0.4181
78	125.1	0.428	0.4045	4.813e-004	0.3972
79	132.9	0.4	0.3781	4.869e-004	0.3755
80	140.7	0.371	0.3507	4.955e-004	0.3545
81	149.1	0.342	0.3233	5.039e-004	0.3323
82	158.1	0.315	0.2977	5.099e-004	0.3096
83	167.7	0.282	0.2665	5.246e-004	0.2852
84	177.3	0.244	0.2306	5.505e-004	0.259
85	188.1	0.208	0.1966	5.754e-004	0.2307
86	199.5	0.186	0.1758	5.798e-004	0.2079
87	211.5	0.166	0.1569	5.826e-004	0.1865
88	224.1	9.2e-002	8.696e-002	7.251e-004	0.1286
89	237.3	4.7e-002	4.442e-002	8.731e-004	7.911e-002

Arithmetic Means:

Hydraulic Conductivity 3.422e-004 cm/sec
Transmissivity 1.802 meters²/day

Geometric Means:

Hydraulic Conductivity 2.832e-004 cm/sec
Transmissivity 1.491 meters²/day

Sensitivity Analysis:

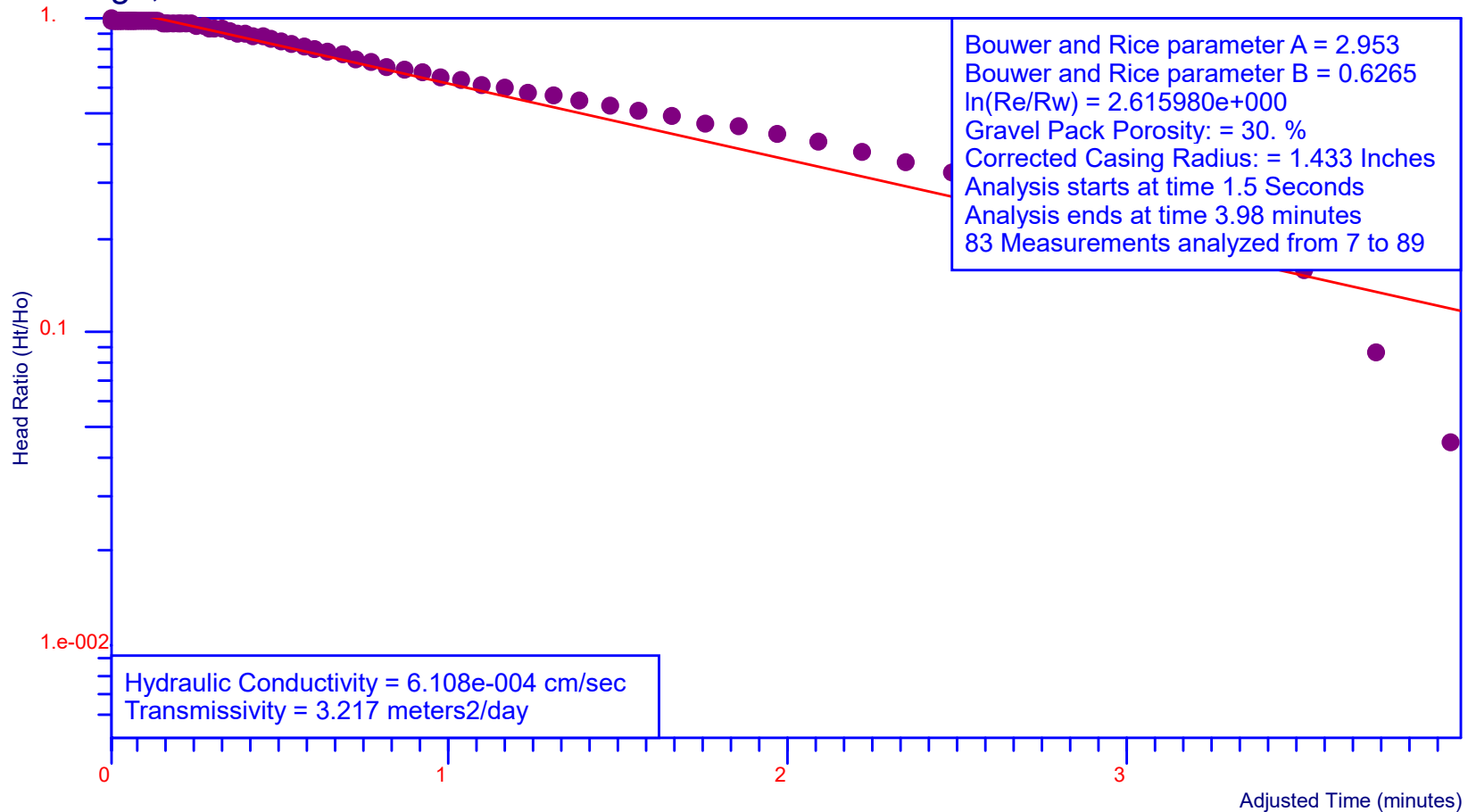
Hydraulic Conductivity	4.798e-004 cm/sec
Transmissivity	2.527 meters ² /day

Carnotite December 12, 2018

Bouwer and Rice Graph

Chicago, IL

ASC-2A - Test 3



Client:: City of Chicago, 2FM
Analysis by Starpoint Software

Bouwer and Rice Automatic Parameter Estimation

Carnotite

Location: Chicago, IL
 Test Date: December 12, 2018
 Client: City of Chicago, 2FM
 Import File: C:\Users\Dave\Desktop\asc-5-1.txt

Well Label: ASC-5 - Test 1
 Aquifer Thickness: 20. feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 2.125 Inches
 Gravel Pack Porosity: 30. %
 Corrected Casing Radius: 1.433 Inches
 Bouwer and Rice Parameter A: 3.148
 Bouwer and Rice Parameter B: 0.6634
 Radius of Influence of Test: 2.489 feet

Trial	Adjusted Time (Seconds)	Head (feet)	Head Ratio	Hyd. Con. (cm/sec)	Flow to Well (Meters3/Day)
2	0.	8.8e-002	1.	--	
3	0.304	8.8e-002	1.	--	
4	0.5	6.3e-002	0.7159	3.965e-002	4.766
5	0.75	5.4e-002	0.6136	3.862e-002	3.98
6	1.	5.9e-002	0.6705	2.371e-002	2.67
7	1.25	5.2e-002	0.5909	2.496e-002	2.477
8	1.5	4.9e-002	0.5568	2.315e-002	2.165
9	1.75	4.9e-002	0.5568	1.985e-002	1.856
10	2.	3.9e-002	0.4432	2.413e-002	1.796
11	2.25	3.9e-002	0.4432	2.145e-002	1.597
12	2.5	4.e-002	0.4545	1.871e-002	1.428
13	2.75	3.4e-002	0.3864	2.051e-002	1.331
14	3.	3.5e-002	0.3977	1.823e-002	1.217
15	3.25	3.6e-002	0.4091	1.631e-002	1.121
16	3.5	2.6e-002	0.2955	2.066e-002	1.025
17	3.75	3.e-002	0.3409	1.702e-002	0.9744
18	4.	3.3e-002	0.375	1.454e-002	0.9159
19	4.25	3.2e-002	0.3636	1.412e-002	0.8621
20	4.5	2.5e-002	0.2841	1.659e-002	0.7913
21	4.75	2.4e-002	0.2727	1.622e-002	0.743
22	5.	2.1e-002	0.2386	1.7e-002	0.6811
23	5.25	3.e-002	0.3409	1.216e-002	0.696
24	5.5	2.2e-002	0.25	1.495e-002	0.6276
25	5.75	2.5e-002	0.2841	1.298e-002	0.6193
26	6.111	2.3e-002	0.2614	1.302e-002	0.5716
27	6.471	2.e-002	0.2273	1.358e-002	0.5183
28	6.891	1.8e-002	0.2045	1.366e-002	0.4692
29	7.31	1.6e-002	0.1818	1.383e-002	0.4223
30	7.73	1.7e-002	0.1932	1.262e-002	0.4092
31	8.211	1.7e-002	0.1932	1.188e-002	0.3853
32	8.75	1.7e-002	0.1932	1.115e-002	0.3615
33	9.23	2.1e-002	0.2386	9.208e-003	0.369
34	9.83	1.4e-002	0.1591	1.109e-002	0.2963
35	10.43	1.3e-002	0.1477	1.087e-002	0.2698
36	11.03	1.1e-002	0.125	1.118e-002	0.2347
37	11.69	1.5e-002	0.1705	8.977e-003	0.257

38	12.41	1.7e-002	0.1932	7.858e-003	0.2549
39	13.19	1.3e-002	0.1477	8.6e-003	0.2133
40	13.97	1.3e-002	0.1477	8.12e-003	0.2014
41	14.81	1.4e-002	0.1591	7.362e-003	0.1967
42	15.71	1.1e-002	0.125	7.851e-003	0.1648
43	16.67	1.e-002	0.1136	7.738e-003	0.1477
44	17.63	3.e-003	3.409e-002	1.137e-002	6.507e-002
45	18.71	1.1e-002	0.125	6.592e-003	0.1384
46	19.85	7.e-003	7.955e-002	7.564e-003	0.101
47	21.05	1.1e-002	0.125	5.859e-003	0.123
48	22.31	7.e-003	7.955e-002	6.73e-003	8.99e-002
49	23.63	9.e-003	0.1023	5.723e-003	9.829e-002
50	25.07	1.e-002	0.1136	5.145e-003	9.818e-002
51	26.57	1.1e-002	0.125	4.642e-003	9.744e-002
52	28.13	8.e-003	9.091e-002	5.056e-003	7.719e-002
53	29.81	1.6e-002	0.1818	3.392e-003	0.1036
54	31.61	1.5e-002	0.1705	3.32e-003	9.503e-002
55	33.47	1.1e-002	0.125	3.685e-003	7.735e-002
56	35.51	8.e-003	9.091e-002	4.005e-003	6.114e-002
57	37.61	7.e-003	7.955e-002	3.992e-003	5.333e-002
58	39.86	1.1e-002	0.125	3.094e-003	6.495e-002
59	42.23	1.3e-002	0.1477	2.686e-003	6.663e-002
60	44.75	1.3e-002	0.1477	2.535e-003	6.288e-002
61	47.39	1.1e-002	0.125	2.603e-003	5.463e-002
62	50.21	1.3e-002	0.1477	2.259e-003	5.604e-002
63	53.21	1.1e-002	0.125	2.318e-003	4.866e-002
64	56.39	6.e-003	6.818e-002	2.825e-003	3.234e-002
65	59.75	8.e-003	9.091e-002	2.38e-003	3.634e-002
66	63.35	1.e-002	0.1136	2.036e-003	3.886e-002
67	66.95	1.6e-002	0.1818	1.51e-003	4.611e-002
68	71.15	1.2e-002	0.1364	1.661e-003	3.803e-002
69	75.35	1.2e-002	0.1364	1.568e-003	3.591e-002
70	79.55	1.3e-002	0.1477	1.426e-003	3.537e-002
71	84.35	1.e-002	0.1136	1.529e-003	2.918e-002
72	89.75	1.1e-002	0.125	1.374e-003	2.885e-002
73	94.55	1.4e-002	0.1591	1.153e-003	3.081e-002
74	100.5	1.3e-002	0.1477	1.128e-003	2.798e-002
75	106.5	1.1e-002	0.125	1.158e-003	2.43e-002
76	112.5	9.e-003	0.1023	1.202e-003	2.064e-002
77	119.2	1.4e-002	0.1591	9.151e-004	2.445e-002
78	126.3	8.e-003	9.091e-002	1.126e-003	1.718e-002
79	188.4	1.4e-002	0.1591	5.787e-004	1.546e-002
80	196.2	6.e-003	6.818e-002	8.119e-004	9.295e-003

Arithmetic Means:

Hydraulic Conductivity 9.629e-003 cm/sec
Transmissivity 50.72 meters2/day

Geometric Means:

Hydraulic Conductivity 0. cm/sec
Transmissivity 0. meters2/day

Sensitivity Analysis:

Hydraulic Conductivity 1.573e-002 cm/sec
Transmissivity 82.83 meters2/day

Bouwer and Rice Automatic Parameter Estimation

Carnotite

Location: Chicago, IL
 Test Date: December 12, 2018
 Client: City of Chicago, 2FM
 Import File: C:\Users\Dave\Desktop\asc-5-2.txt

Well Label: ASC-5 - Test 2
 Aquifer Thickness: 20. feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 2.125 Inches
 Gravel Pack Porosity: 30. %
 Corrected Casing Radius: 1.433 Inches
 Bouwer and Rice Parameter A: 3.148
 Bouwer and Rice Parameter B: 0.6634
 Radius of Influence of Test: 2.489 feet

Trial	Adjusted Time (Seconds)	Head (feet)	Head Ratio	Hyd. Con. (cm/sec)	Flow to Well (Meters3/Day)
2	0.	3.4e-002	1.	--	
3	0.25	3.1e-002	0.9118	2.192e-002	1.296
4	0.509	3.2e-002	0.9412	7.065e-003	0.4314
5	0.75	3.1e-002	0.9118	7.305e-003	0.4321
6	1.	2.9e-002	0.8529	9.435e-003	0.5221
7	1.25	2.7e-002	0.7941	1.094e-002	0.5636
8	1.5	2.9e-002	0.8529	6.29e-003	0.3481
9	1.75	2.4e-002	0.7059	1.181e-002	0.5407
10	2.	2.2e-002	0.6471	1.291e-002	0.542
11	2.25	2.2e-002	0.6471	1.148e-002	0.4818
12	2.5	1.7e-002	0.5	1.645e-002	0.5335
13	2.75	2.e-002	0.5882	1.144e-002	0.4368
14	3.	1.6e-002	0.4706	1.49e-002	0.455
15	3.25	1.9e-002	0.5588	1.062e-002	0.3851
16	3.5	1.4e-002	0.4118	1.504e-002	0.4017
17	3.75	1.e-002	0.2941	1.936e-002	0.3694
18	4.	1.5e-002	0.4412	1.213e-002	0.3473
19	4.25	1.7e-002	0.5	9.674e-003	0.3138
20	4.5	1.2e-002	0.3529	1.373e-002	0.3143
21	4.75	1.4e-002	0.4118	1.108e-002	0.296
22	5.	1.6e-002	0.4706	8.942e-003	0.273
23	5.25	7.e-003	0.2059	1.786e-002	0.2385
24	5.5	1.2e-002	0.3529	1.123e-002	0.2572
25	5.75	1.e-002	0.2941	1.262e-002	0.2409
26	6.11	9.e-003	0.2647	1.29e-002	0.2216
27	6.47	9.e-003	0.2647	1.218e-002	0.2093
28	6.89	9.e-003	0.2647	1.144e-002	0.1965
29	7.31	1.e-002	0.2941	9.93e-003	0.1895
30	7.73	1.4e-002	0.4118	6.808e-003	0.1819
31	8.21	8.e-003	0.2353	1.045e-002	0.1596
32	8.75	1.2e-002	0.3529	7.06e-003	0.1617
33	9.23	7.e-003	0.2059	1.016e-002	0.1357
34	9.83	4.e-003	0.1176	1.291e-002	9.856e-002
35	10.43	0.	0.	--	
36	11.03	7.e-003	0.2059	8.499e-003	0.1135
37	11.69	6.e-003	0.1765	8.801e-003	0.1008

38	12.41	8.e-003	0.2353	6.916e-003	0.1056
39	13.19	6.e-003	0.1765	7.8e-003	8.931e-002
40	13.97	7.e-003	0.2059	6.71e-003	8.963e-002
41	14.81	2.e-003	5.882e-002	1.135e-002	4.331e-002
42	15.71	6.e-003	0.1765	6.549e-003	7.498e-002
43	16.67	1.e-002	0.2941	4.354e-003	8.309e-002
44	17.63	8.e-003	0.2353	4.868e-003	7.431e-002
45	18.71	4.e-003	0.1176	6.784e-003	5.178e-002
46	19.85	4.e-003	0.1176	6.395e-003	4.881e-002
47	21.05	6.e-003	0.1765	4.888e-003	5.596e-002
48	22.31	3.e-003	8.824e-002	6.454e-003	3.695e-002
49	23.63	6.e-003	0.1765	4.354e-003	4.985e-002
50	25.07	2.e-003	5.882e-002	6.703e-003	2.558e-002
51	26.57	7.e-003	0.2059	3.528e-003	4.713e-002
52	28.13	1.1e-002	0.3235	2.379e-003	4.995e-002
53	29.81	1.e-002	0.2941	2.435e-003	4.646e-002
54	31.61	5.e-003	0.1471	3.597e-003	3.432e-002
55	33.47	1.1e-002	0.3235	2.e-003	4.198e-002
56	35.51	9.e-003	0.2647	2.22e-003	3.813e-002
57	37.61	1.1e-002	0.3235	1.78e-003	3.736e-002
58	39.83	1.3e-002	0.3824	1.432e-003	3.552e-002
59	42.23	8.e-003	0.2353	2.032e-003	3.102e-002
60	44.75	1.1e-002	0.3235	1.496e-003	3.14e-002
61	47.39	9.e-003	0.2647	1.664e-003	2.857e-002
62	50.21	1.3e-002	0.3824	1.136e-003	2.817e-002
63	53.21	1.e-002	0.2941	1.364e-003	2.603e-002
64	56.39	1.4e-002	0.4118	9.333e-004	2.493e-002
65	59.75	1.7e-002	0.5	6.881e-004	2.232e-002
66	63.35	1.5e-002	0.4412	7.662e-004	2.193e-002
67	66.95	1.1e-002	0.3235	9.998e-004	2.099e-002
68	71.15	1.4e-002	0.4118	7.397e-004	1.976e-002
69	75.35	1.5e-002	0.4412	6.442e-004	1.844e-002
70	79.55	2.e-003	5.882e-002	2.113e-003	8.062e-003
71	84.35	1.2e-002	0.3529	7.323e-004	1.677e-002
72	89.75	-5.e-003	-0.1471	--	
73	94.55	1.e-003	2.941e-002	2.212e-003	4.221e-003

Arithmetic Means:

Hydraulic Conductivity	7.484e-003 cm/sec
Transmissivity	39.42 meters ² /day

Geometric Means:

Hydraulic Conductivity	5.247e-003 cm/sec
Transmissivity	27.64 meters ² /day

Sensitivity Analysis:

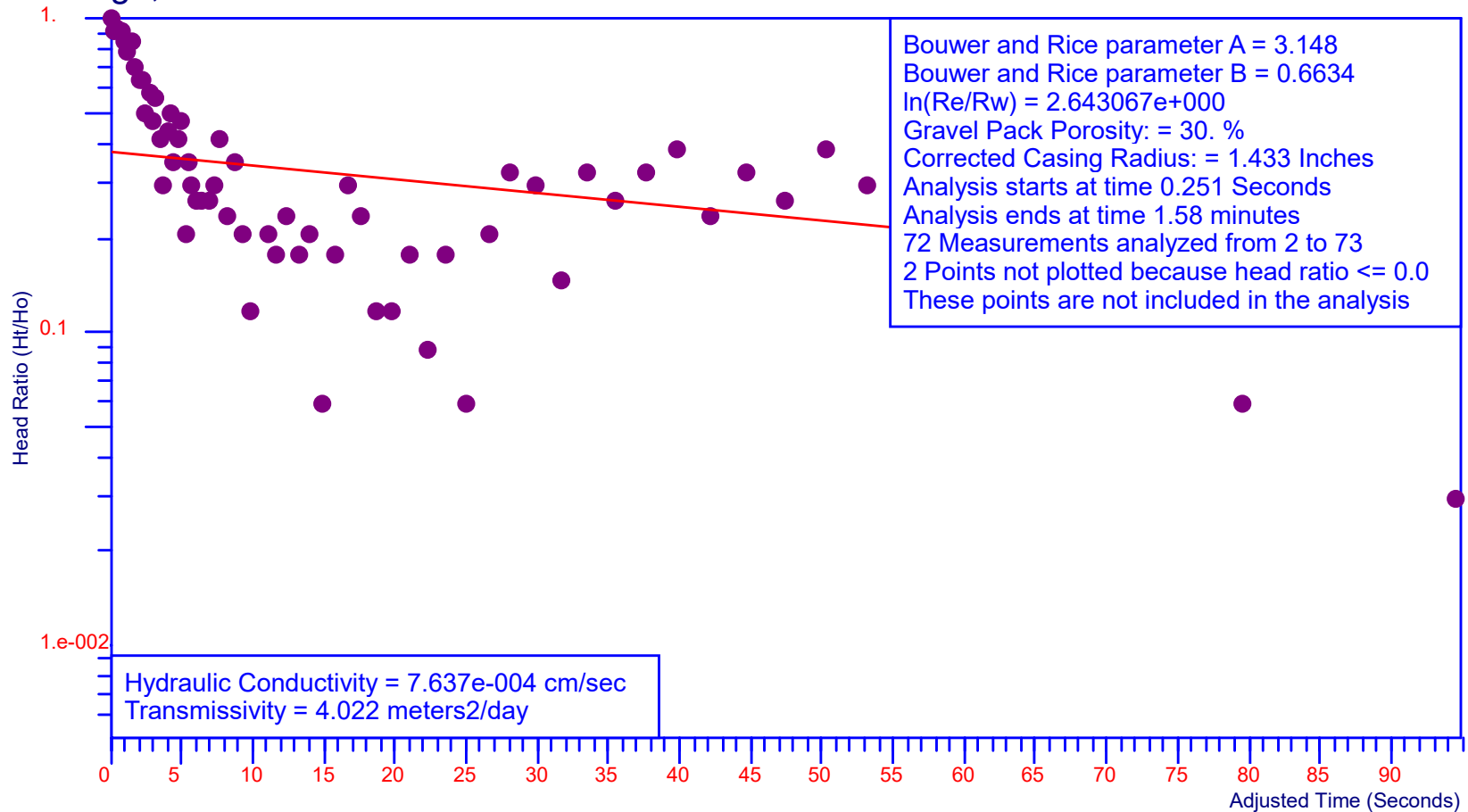
Hydraulic Conductivity	1.075e-002 cm/sec
Transmissivity	56.61 meters ² /day

Carnotite December 12, 2018

Bouwer and Rice Graph

Chicago, IL

ASC-5 - Test 2



Client:: City of Chicago, 2FM
Analysis by Starpoint Software

H_o is $3.4e-002$ feet at 0.251 Seconds

Bouwer and Rice Automatic Parameter Estimation

Carnotite

Location: Chicago, IL
 Test Date: December 12, 2018
 Client: City of Chicago, 2FM
 Import File: C:\Users\Dave\Desktop\asc-5-3.txt

Well Label: ASC-5 - Test 3
 Aquifer Thickness: 20. feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 2.125 Inches
 Gravel Pack Porosity: 30. %
 Corrected Casing Radius: 1.433 Inches
 Bouwer and Rice Parameter A: 3.148
 Bouwer and Rice Parameter B: 0.6634
 Radius of Influence of Test: 2.489 feet

Trial	Adjusted Time (Seconds)	Head (feet)	Head Ratio	Hyd. Con. (cm/sec)	Flow to Well (Meters3/Day)
2	0.	3.1e-002	1.	--	
3	0.25	2.6e-002	0.8387	4.173e-002	2.07
4	0.5	2.6e-002	0.8387	2.087e-002	1.035
5	0.903	2.3e-002	0.7419	1.961e-002	0.8605
6	1.026	1.5e-002	0.4839	4.197e-002	1.201
7	1.25	2.4e-002	0.7742	1.214e-002	0.5562
8	1.5	1.4e-002	0.4516	3.143e-002	0.8397
9	1.75	2.e-002	0.6452	1.485e-002	0.5669
10	2.	1.8e-002	0.5806	1.612e-002	0.5538
11	2.25	1.9e-002	0.6129	1.291e-002	0.4679
12	2.5	1.6e-002	0.5161	1.569e-002	0.4791
13	2.75	1.5e-002	0.4839	1.566e-002	0.4482
14	3.	1.3e-002	0.4194	1.718e-002	0.4262
15	3.25	1.5e-002	0.4839	1.325e-002	0.3792
16	3.5	1.8e-002	0.5806	9.213e-003	0.3164
17	3.75	1.2e-002	0.3871	1.501e-002	0.3437
18	4.	1.3e-002	0.4194	1.289e-002	0.3197
19	4.25	1.1e-002	0.3548	1.446e-002	0.3035
20	4.5	1.1e-002	0.3548	1.366e-002	0.2867
21	4.75	7.e-003	0.2258	1.858e-002	0.2482
22	5.	8.e-003	0.2581	1.607e-002	0.2453
23	5.25	7.e-003	0.2258	1.681e-002	0.2246
24	5.5	1.7e-002	0.5484	6.479e-003	0.2102
25	5.75	-4.e-003	-0.129	--	
26	6.109	8.e-003	0.2581	1.315e-002	0.2008
27	6.47	6.e-003	0.1935	1.506e-002	0.1724
28	6.89	8.e-003	0.2581	1.166e-002	0.178
29	7.31	1.1e-002	0.3548	8.407e-003	0.1765
30	7.729	2.e-003	6.452e-002	2.103e-002	8.027e-002
31	8.21	7.e-003	0.2258	1.075e-002	0.1436
32	8.75	6.e-003	0.1935	1.113e-002	0.1275
33	9.229	1.1e-002	0.3548	6.659e-003	0.1398
34	9.83	2.e-003	6.452e-002	1.654e-002	6.312e-002
35	10.43	9.e-003	0.2903	7.033e-003	0.1208
36	11.03	1.4e-002	0.4516	4.275e-003	0.1142
37	11.69	4.e-003	0.129	1.039e-002	7.931e-002

38	12.41	1.e-003	3.226e-002	1.641e-002	3.132e-002
39	13.19	3.e-003	9.677e-002	1.05e-002	6.012e-002
40	13.97	1.e-003	3.226e-002	1.458e-002	2.782e-002
41	14.81	5.e-003	0.1613	7.308e-003	6.972e-002
42	15.71	6.e-003	0.1935	6.201e-003	7.099e-002
43	16.67	2.e-003	6.452e-002	9.753e-003	3.722e-002
44	17.63	4.e-003	0.129	6.89e-003	5.259e-002
45	18.71	-3.e-003	-9.677e-002	--	
46	19.85	1.e-003	3.226e-002	1.026e-002	1.958e-002
47	21.05	1.e-003	3.226e-002	9.676e-003	1.846e-002
48	22.31	1.e-003	3.226e-002	9.13e-003	1.742e-002
49	23.63	4.e-003	0.129	5.14e-003	3.923e-002
50	25.07	3.e-003	9.677e-002	5.526e-003	3.163e-002
51	26.57	1.1e-002	0.3548	2.313e-003	4.855e-002
52	28.13	-2.e-003	-6.452e-002	--	
53	29.81	3.e-003	9.677e-002	4.647e-003	2.66e-002
54	31.61	9.e-003	0.2903	2.321e-003	3.986e-002
55	33.47	-5.e-003	-0.1613	--	
56	35.51	7.e-003	0.2258	2.486e-003	3.32e-002
57	37.61	6.e-003	0.1935	2.59e-003	2.965e-002
58	39.83	6.e-003	0.1935	2.446e-003	2.8e-002
59	42.23	4.e-003	0.129	2.876e-003	2.195e-002
60	44.75	5.e-003	0.1613	2.418e-003	2.307e-002
61	47.39	5.e-003	0.1613	2.284e-003	2.179e-002
62	50.21	5.e-003	0.1613	2.155e-003	2.056e-002
63	53.21	5.e-003	0.1613	2.034e-003	1.941e-002
64	56.39	7.e-003	0.2258	1.565e-003	2.091e-002
65	59.75	7.e-003	0.2258	1.477e-003	1.973e-002
66	63.35	7.e-003	0.2258	1.393e-003	1.861e-002
67	66.95	8.e-003	0.2581	1.2e-003	1.832e-002
68	71.15	9.e-003	0.2903	1.031e-003	1.771e-002
69	75.35	1.2e-002	0.3871	7.471e-004	1.711e-002
70	79.55	7.e-003	0.2258	1.11e-003	1.482e-002
71	84.35	4.e-003	0.129	1.44e-003	1.099e-002
72	89.75	0.	0.	--	
73	94.55	8.e-003	0.2581	8.498e-004	1.297e-002
74	100.5	6.e-003	0.1935	9.688e-004	1.109e-002
75	106.5	5.e-003	0.1613	1.016e-003	9.691e-003
76	112.5	8.e-003	0.2581	7.139e-004	1.09e-002
77	119.1	4.e-003	0.129	1.019e-003	7.781e-003

Arithmetic Means:

Hydraulic Conductivity 9.816e-003 cm/sec
Transmissivity 51.7 meters2/day

Geometric Means:

Hydraulic Conductivity 6.136e-003 cm/sec
Transmissivity 32.32 meters2/day

Sensitivity Analysis:

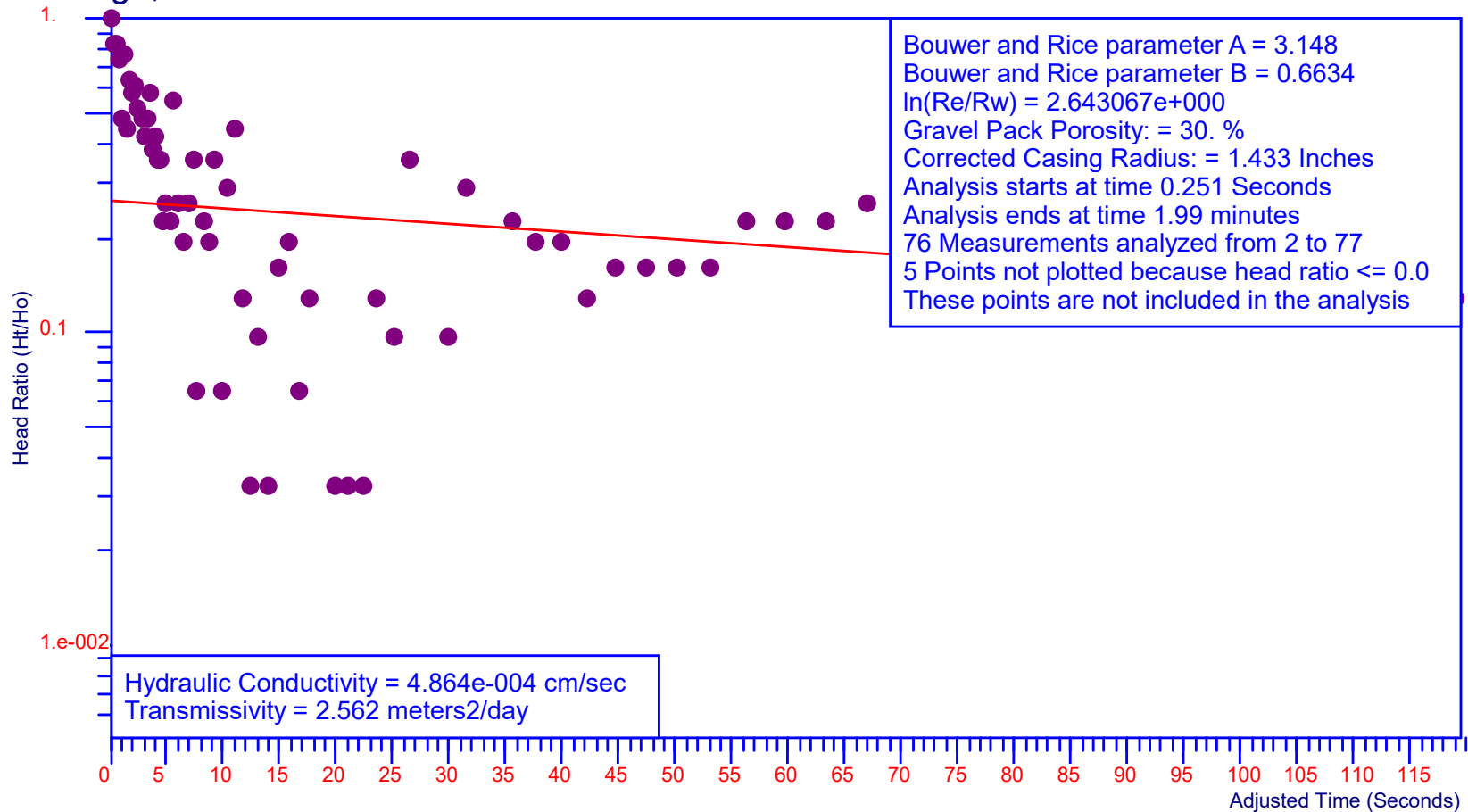
Hydraulic Conductivity 1.367e-002 cm/sec
Transmissivity 71.99 meters2/day

Carnotite December 12, 2018

Bouwer and Rice Graph

Chicago, IL

ASC-5 - Test 3



Client:: City of Chicago, 2FM
Analysis by Starpoint Software

H_o is $3.1e-002$ feet at 0.251 Seconds

Bouwer and Rice Automatic Parameter Estimation

Carnotite

Location: Chicago, IL
 Test Date: December 12, 2018
 Client: City of Chicago, 2FM
 Import File: C:\Users\Dave\Desktop\MW-1-1.txt

Well Label: MW-1 - Test 1
 Aquifer Thickness: 20. feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 2.125 Inches
 Gravel Pack Porosity: 30. %
 Corrected Casing Radius: 1.433 Inches
 Bouwer and Rice Parameter A: 3.2
 Bouwer and Rice Parameter B: 0.6681
 Radius of Influence of Test: 2.681 feet

Trial	Adjusted Time (Seconds)	Head (feet)	Head Ratio	Hyd. Con. (cm/sec)	Flow to Well (Meters3/Day)
2	0.	1.619	1.	--	
3	0.496	1.613	0.9963	4.423e-004	1.324
4	0.619	1.608	0.9932	6.508e-004	1.942
5	0.749	1.599	0.9876	9.807e-004	2.91
6	0.999	1.591	0.9827	1.032e-003	3.047
7	1.31	1.584	0.9784	9.859e-004	2.898
8	1.499	1.579	0.9753	9.862e-004	2.89
9	1.749	1.56	0.9636	1.254e-003	3.631
10	1.999	1.556	0.9611	1.173e-003	3.388
11	2.249	1.538	0.95	1.349e-003	3.85
12	2.499	1.524	0.9413	1.43e-003	4.045
13	2.749	1.509	0.9321	1.513e-003	4.236
14	2.999	1.493	0.9222	1.596e-003	4.424
15	3.249	1.474	0.9104	1.707e-003	4.669
16	3.499	1.458	0.9006	1.769e-003	4.787
17	3.749	1.433	0.8851	1.924e-003	5.116
18	3.999	1.412	0.8721	2.022e-003	5.298
19	4.249	1.387	0.8567	2.151e-003	5.537
20	4.499	1.363	0.8419	2.261e-003	5.719
21	4.749	1.34	0.8277	2.354e-003	5.853
22	4.999	1.312	0.8104	2.485e-003	6.052
23	5.249	1.279	0.79	2.654e-003	6.3
24	5.499	1.255	0.7752	2.737e-003	6.375
25	5.749	1.228	0.7585	2.841e-003	6.476
26	6.109	1.193	0.7369	2.954e-003	6.54
27	6.469	1.17	0.7227	2.967e-003	6.443
28	6.89	1.138	0.7029	3.024e-003	6.386
29	7.309	1.108	0.6844	3.066e-003	6.305
30	7.729	1.075	0.664	3.131e-003	6.246
31	8.21	1.043	0.6442	3.165e-003	6.127
32	8.749	1.013	0.6257	3.167e-003	5.954
33	9.229	0.989	0.6109	3.156e-003	5.793
34	9.829	0.953	0.5886	3.186e-003	5.635
35	10.43	0.928	0.5732	3.153e-003	5.431
36	11.03	0.897	0.554	3.164e-003	5.267
37	11.69	0.869	0.5368	3.146e-003	5.073

38	12.41	0.836	0.5164	3.147e-003	4.884
39	13.19	0.812	0.5015	3.092e-003	4.66
40	13.97	0.785	0.4849	3.062e-003	4.461
41	14.81	0.762	0.4707	3.007e-003	4.253
42	15.71	0.732	0.4521	2.986e-003	4.057
43	16.67	0.703	0.4342	2.957e-003	3.859
44	17.63	0.68	0.42	2.908e-003	3.67
45	18.71	0.661	0.4083	2.829e-003	3.471
46	19.85	0.643	0.3972	2.749e-003	3.281
47	21.05	0.619	0.3823	2.699e-003	3.101
48	22.31	0.596	0.3681	2.647e-003	2.928
49	23.63	0.574	0.3545	2.593e-003	2.763
50	25.07	0.552	0.341	2.536e-003	2.599
51	26.57	0.538	0.3323	2.45e-003	2.447
52	28.13	0.522	0.3224	2.378e-003	2.304
53	29.81	0.497	0.307	2.341e-003	2.16
54	31.61	0.479	0.2959	2.277e-003	2.024
55	33.47	0.465	0.2872	2.203e-003	1.901
56	35.51	0.45	0.2779	2.131e-003	1.78
57	37.61	0.443	0.2736	2.036e-003	1.674
58	39.83	0.426	0.2631	1.981e-003	1.566
59	42.23	0.413	0.2551	1.912e-003	1.465
60	44.75	0.399	0.2464	1.85e-003	1.37
61	47.39	0.385	0.2378	1.791e-003	1.28
62	50.21	0.373	0.2304	1.728e-003	1.196
63	53.21	0.356	0.2199	1.682e-003	1.111
64	56.39	0.344	0.2125	1.623e-003	1.036
65	59.75	0.328	0.2026	1.579e-003	0.9612
66	63.35	0.31	0.1915	1.542e-003	0.8872
67	66.95	0.3	0.1853	1.488e-003	0.8285
68	71.15	0.277	0.1711	1.466e-003	0.7539
69	75.35	0.26	0.1606	1.434e-003	0.6921
70	79.55	0.232	0.1433	1.443e-003	0.6214
71	84.35	0.214	0.1322	1.418e-003	0.5631
72	89.75	0.172	0.1062	1.476e-003	0.4713
73	94.55	0.159	9.821e-002	1.45e-003	0.428
74	100.5	0.127	7.844e-002	1.496e-003	0.3526
75	106.5	0.11	6.794e-002	1.491e-003	0.3045
76	112.5	0.148	9.141e-002	1.256e-003	0.345
77	119.1	9.2e-002	5.683e-002	1.422e-003	0.2429
78	126.4	3.5e-002	2.162e-002	1.793e-003	0.1165

Arithmetic Means:

Hydraulic Conductivity 2.131e-003 cm/sec
Transmissivity 11.22 meters²/day

Geometric Means:

Hydraulic Conductivity 1.982e-003 cm/sec
Transmissivity 10.44 meters²/day

Sensitivity Analysis:

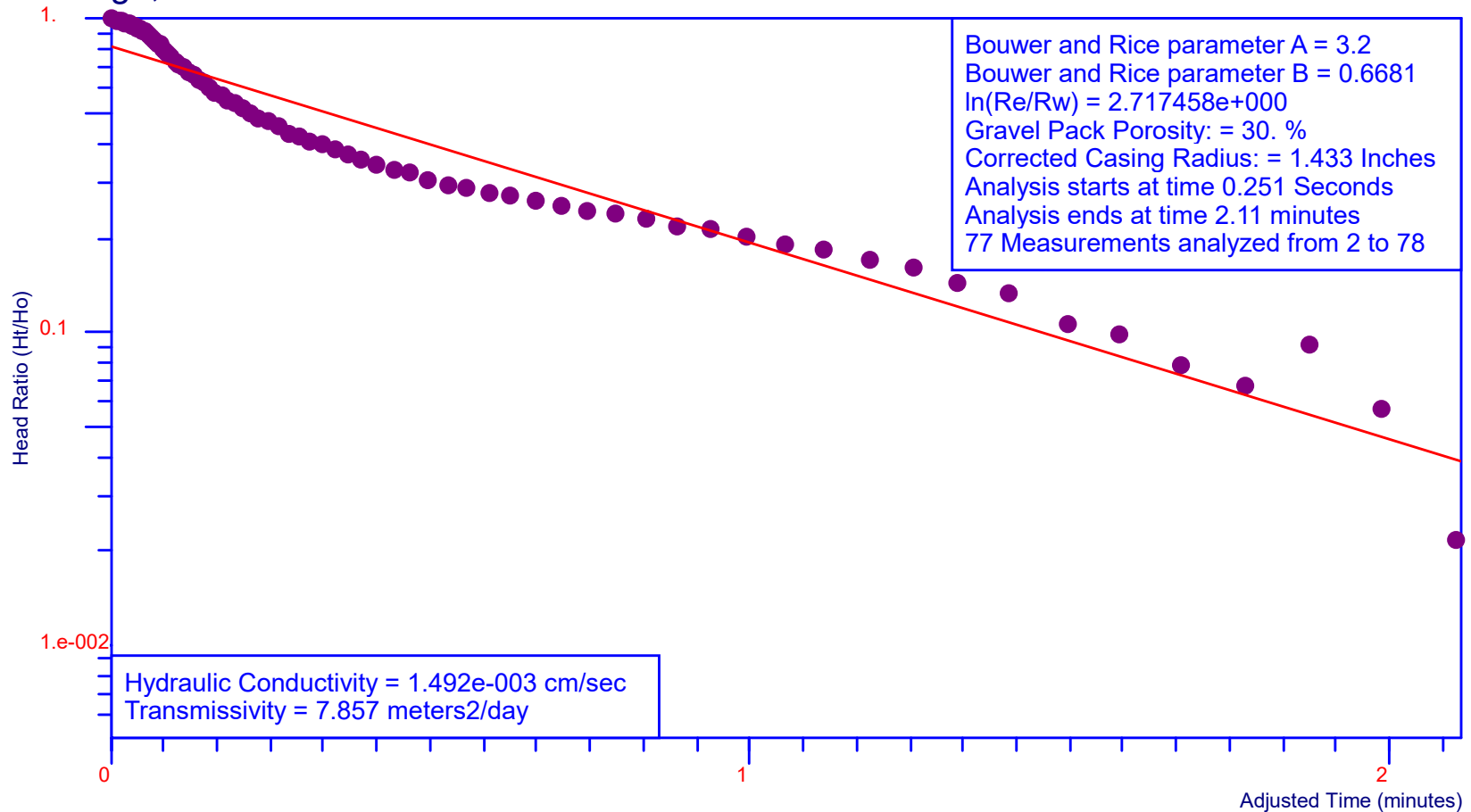
Hydraulic Conductivity 2.444e-003 cm/sec
Transmissivity 12.87 meters²/day

Carnotite December 12, 2018

Bouwer and Rice Graph

Chicago, IL

MW-1 - Test 1



Client:: City of Chicago, 2FM
Analysis by Starpoint Software

H_o is 1.619 feet at 0.251 Seconds

Bouwer and Rice Automatic Parameter Estimation

Carnotite

Location: Chicago, IL
 Test Date: December 12, 2018
 Client: City of Chicago, 2FM
 Import File: C:\Users\Dave\Desktop\MW-1-2.txt

Well Label: MW-1 - Test 2
 Aquifer Thickness: 20. feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 2.125 Inches
 Gravel Pack Porosity: 30. %
 Corrected Casing Radius: 1.433 Inches
 Bouwer and Rice Parameter A: 3.2
 Bouwer and Rice Parameter B: 0.6681
 Radius of Influence of Test: 2.681 feet

Trial	Adjusted Time (Seconds)	Head (feet)	Head Ratio	Hyd. Con. (cm/sec)	Flow to Well (Meters3/Day)
2	0.	1.616	1.	--	
3	0.471	1.607	0.9944	7.007e-004	2.09
4	0.593	1.606	0.9938	6.186e-004	1.844
5	0.75	1.608	0.995	3.91e-004	1.167
6	1.	1.599	0.9895	6.249e-004	1.855
7	1.336	1.596	0.9876	5.508e-004	1.632
8	1.5	1.597	0.9882	4.659e-004	1.381
9	1.75	1.592	0.9851	5.053e-004	1.493
10	2.	1.588	0.9827	5.164e-004	1.522
11	2.25	1.581	0.9783	5.751e-004	1.687
12	2.5	1.576	0.9752	5.924e-004	1.733
13	2.75	1.568	0.9703	6.479e-004	1.886
14	3.	1.557	0.9635	7.326e-004	2.117
15	3.25	1.551	0.9598	7.465e-004	2.149
16	3.5	1.538	0.9517	8.353e-004	2.384
17	3.75	1.53	0.9468	8.618e-004	2.447
18	4.	1.51	0.9344	1.002e-003	2.809
19	4.25	1.5	0.9282	1.036e-003	2.883
20	4.5	1.484	0.9183	1.119e-003	3.082
21	4.75	1.463	0.9053	1.237e-003	3.36
22	5.	1.446	0.8948	1.314e-003	3.526
23	5.25	1.424	0.8812	1.424e-003	3.763
24	5.5	1.41	0.8725	1.465e-003	3.834
25	5.75	1.381	0.8546	1.615e-003	4.139
26	6.11	1.355	0.8385	1.704e-003	4.284
27	6.47	1.33	0.823	1.779e-003	4.391
28	6.89	1.305	0.8075	1.833e-003	4.44
29	7.31	1.275	0.789	1.916e-003	4.534
30	7.73	1.249	0.7729	1.969e-003	4.565
31	8.21	1.215	0.7519	2.053e-003	4.629
32	8.75	1.182	0.7314	2.112e-003	4.633
33	9.23	1.159	0.7172	2.128e-003	4.578
34	9.83	1.122	0.6943	2.193e-003	4.567
35	10.43	1.095	0.6776	2.205e-003	4.481
36	11.03	1.063	0.6578	2.244e-003	4.427
37	11.69	1.037	0.6417	2.243e-003	4.316

38	12.41	0.996	0.6163	2.304e-003	4.26
39	13.19	0.97	0.6002	2.287e-003	4.117
40	13.97	0.942	0.5829	2.283e-003	3.991
41	14.81	0.901	0.5575	2.331e-003	3.898
42	15.71	0.872	0.5396	2.321e-003	3.756
43	16.67	0.839	0.5192	2.324e-003	3.618
44	17.63	0.812	0.5025	2.307e-003	3.477
45	18.71	0.785	0.4858	2.28e-003	3.322
46	19.85	0.76	0.4703	2.246e-003	3.168
47	21.05	0.725	0.4486	2.25e-003	3.028
48	22.31	0.701	0.4338	2.212e-003	2.878
49	23.63	0.666	0.4121	2.217e-003	2.74
50	25.07	0.644	0.3985	2.169e-003	2.592
51	26.57	0.62	0.3837	2.131e-003	2.452
52	28.13	0.592	0.3663	2.11e-003	2.318
53	29.81	0.574	0.3552	2.052e-003	2.186
54	31.61	0.549	0.3397	2.018e-003	2.057
55	33.47	0.522	0.323	1.995e-003	1.933
56	35.51	0.498	0.3082	1.959e-003	1.811
57	37.61	0.477	0.2952	1.917e-003	1.697
58	39.83	0.458	0.2834	1.871e-003	1.59
59	42.23	0.441	0.2729	1.817e-003	1.487
60	44.75	0.416	0.2574	1.792e-003	1.384
61	47.39	0.404	0.25	1.729e-003	1.296
62	50.21	0.384	0.2376	1.691e-003	1.205
63	53.21	0.371	0.2296	1.634e-003	1.125
64	56.39	0.36	0.2228	1.574e-003	1.051
65	59.75	0.346	0.2141	1.524e-003	0.9789
66	63.35	0.329	0.2036	1.485e-003	0.9066
67	66.95	0.316	0.1955	1.44e-003	0.8448
68	71.15	0.31	0.1918	1.371e-003	0.789
69	75.35	0.281	0.1739	1.372e-003	0.7155
70	79.55	0.282	0.1745	1.297e-003	0.6788
71	84.35	0.261	0.1615	1.277e-003	0.6187
72	89.75	0.247	0.1528	1.237e-003	0.5669
73	94.55	0.232	0.1436	1.213e-003	0.5223
74	100.6	0.218	0.1349	1.177e-003	0.4763
75	106.5	0.203	0.1256	1.151e-003	0.4335
76	112.6	0.189	0.117	1.127e-003	0.3952
77	119.1	0.174	0.1077	1.105e-003	0.357
78	126.3	0.144	8.911e-002	1.131e-003	0.3022
79	134.1	0.137	8.478e-002	1.087e-003	0.2764
80	141.9	0.127	7.859e-002	1.059e-003	0.2496
81	150.3	0.107	6.621e-002	1.067e-003	0.2119
82	159.3	9.8e-002	6.064e-002	1.039e-003	0.189
83	168.9	7.7e-002	4.765e-002	1.065e-003	0.1522
84	178.5	5.9e-002	3.651e-002	1.096e-003	0.12
85	189.3	2.4e-002	1.485e-002	1.314e-003	5.852e-002

Arithmetic Means:

Hydraulic Conductivity 1.511e-003 cm/sec
Transmissivity 7.958 meters²/day

Geometric Means:

Hydraulic Conductivity 1.374e-003 cm/sec
Transmissivity 7.238 meters²/day

Sensitivity Analysis:

Hydraulic Conductivity

1.886e-003 cm/sec

Transmissivity

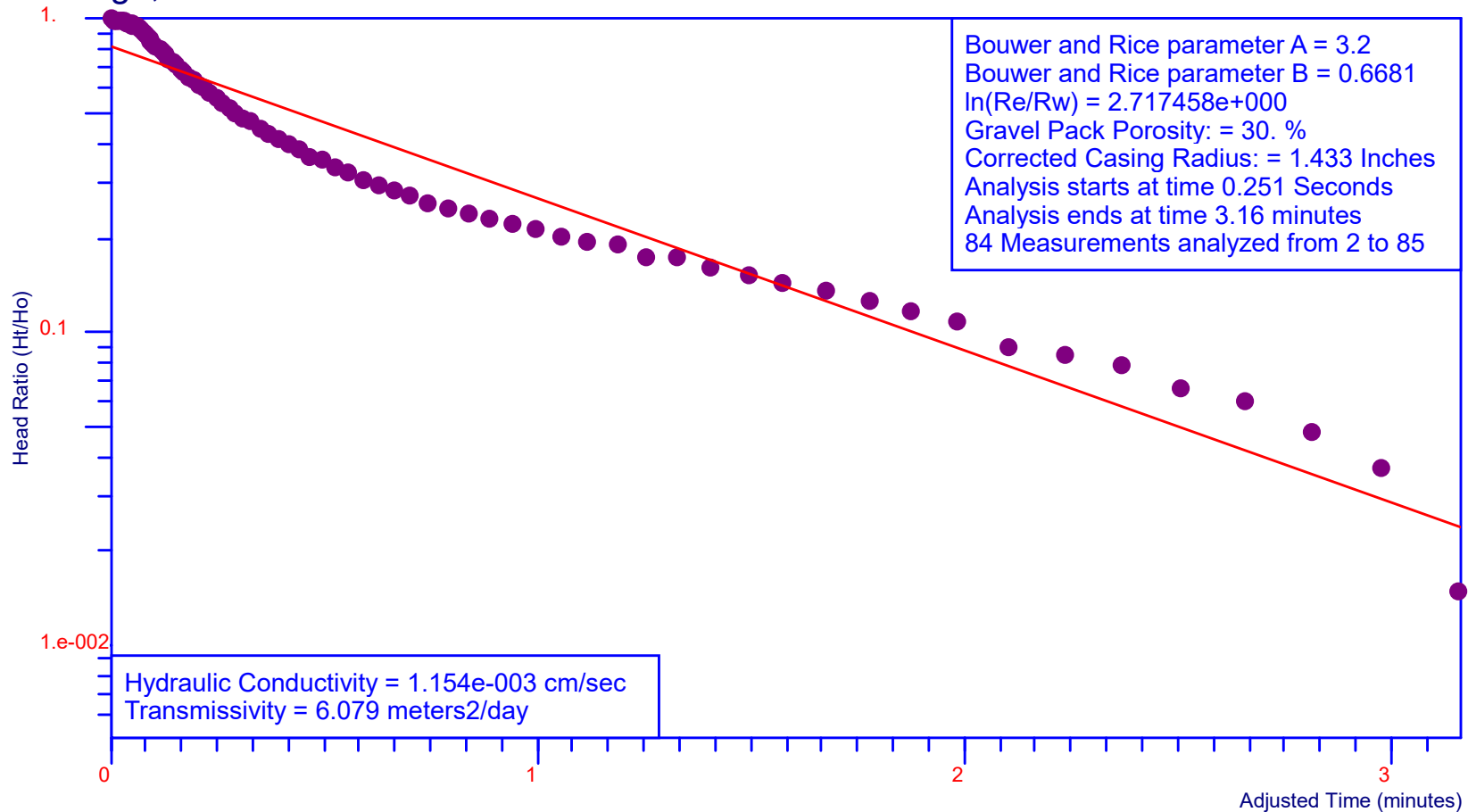
9.933 meters²/day

Carnotite December 12, 2018

Bouwer and Rice Graph

Chicago, IL

MW-1 - Test 2



Client:: City of Chicago, 2FM
Analysis by Starpoint Software

H_o is 1.616 feet at 0.251 Seconds

Bouwer and Rice Automatic Parameter Estimation

Carnotite

Location: Chicago, IL
 Test Date: December 12, 2018
 Client: City of Chicago, 2FM
 Import File: C:\Users\Dave\Desktop\MW-1-3.txt

Well Label: MW-1 - Test 3
 Aquifer Thickness: 20. feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 2.125 Inches
 Gravel Pack Porosity: 30. %
 Corrected Casing Radius: 1.433 Inches
 Bouwer and Rice Parameter A: 3.2
 Bouwer and Rice Parameter B: 0.6681
 Radius of Influence of Test: 2.681 feet

Trial	Adjusted Time (Seconds)	Head (feet)	Head Ratio	Hyd. Con. (cm/sec)	Flow to Well (Meters3/Day)
3	0.	1.612	1.	--	
4	0.25	1.597	0.9907	2.21e-003	6.55
5	0.5	1.604	0.995	5.88e-004	1.75
6	0.75	1.604	0.995	3.92e-004	1.167
7	1.	1.596	0.9901	5.895e-004	1.746
8	1.25	1.593	0.9882	5.605e-004	1.657
9	1.5	1.585	0.9833	6.654e-004	1.958
10	1.75	1.584	0.9826	5.917e-004	1.739
11	2.	1.578	0.9789	6.299e-004	1.845
12	2.25	1.573	0.9758	6.432e-004	1.878
13	2.5	1.567	0.9721	6.692e-004	1.946
14	2.75	1.557	0.9659	7.46e-004	2.156
15	3.	1.545	0.9584	8.362e-004	2.398
16	3.25	1.536	0.9529	8.781e-004	2.503
17	3.5	1.525	0.946	9.367e-004	2.651
18	3.75	1.514	0.9392	9.884e-004	2.777
19	4.	1.494	0.9268	1.123e-003	3.114
20	4.25	1.47	0.9119	1.282e-003	3.498
21	4.5	1.457	0.9038	1.328e-003	3.59
22	4.75	1.433	0.889	1.464e-003	3.895
23	5.	1.421	0.8815	1.491e-003	3.931
24	5.25	1.398	0.8672	1.603e-003	4.16
25	5.5	1.368	0.8486	1.763e-003	4.477
26	5.86	1.345	0.8344	1.826e-003	4.558
27	6.22	1.321	0.8195	1.891e-003	4.637
28	6.64	1.297	0.8046	1.935e-003	4.658
29	7.06	1.263	0.7835	2.042e-003	4.787
30	7.48	1.242	0.7705	2.06e-003	4.748
31	7.96	1.21	0.7506	2.13e-003	4.782
32	8.5	1.182	0.7333	2.157e-003	4.732
33	8.98	1.152	0.7146	2.211e-003	4.727
34	9.58	1.117	0.6929	2.263e-003	4.691
35	10.18	1.086	0.6737	2.293e-003	4.621
36	10.78	1.056	0.6551	2.319e-003	4.544
37	11.44	1.016	0.6303	2.384e-003	4.496
38	12.16	0.991	0.6148	2.364e-003	4.349

39	12.94	0.96	0.5955	2.367e-003	4.217
40	13.72	0.926	0.5744	2.388e-003	4.103
41	14.56	0.894	0.5546	2.393e-003	3.97
42	15.46	0.856	0.531	2.419e-003	3.844
43	16.42	0.83	0.5149	2.389e-003	3.68
44	17.38	0.801	0.4969	2.378e-003	3.535
45	18.46	0.771	0.4783	2.361e-003	3.378
46	19.6	0.743	0.4609	2.335e-003	3.22
47	20.8	0.717	0.4448	2.302e-003	3.063
48	22.06	0.688	0.4268	2.281e-003	2.912
49	23.38	0.657	0.4076	2.269e-003	2.766
50	24.82	0.626	0.3883	2.252e-003	2.616
51	26.32	0.606	0.3759	2.197e-003	2.471
52	27.88	0.586	0.3635	2.145e-003	2.333
53	29.56	0.557	0.3455	2.124e-003	2.196
54	31.36	0.535	0.3319	2.078e-003	2.064
55	33.22	0.509	0.3158	2.051e-003	1.937
56	35.26	0.487	0.3021	2.006e-003	1.813
57	37.36	0.459	0.2847	1.987e-003	1.693
58	39.58	0.444	0.2754	1.925e-003	1.586
59	41.98	0.418	0.2593	1.9e-003	1.474
60	44.5	0.404	0.2506	1.838e-003	1.378
61	47.14	0.381	0.2364	1.808e-003	1.279
62	49.96	0.372	0.2308	1.734e-003	1.197
63	52.96	0.356	0.2208	1.685e-003	1.113
64	56.14	0.34	0.2109	1.638e-003	1.034
65	59.5	0.328	0.2035	1.581e-003	0.9626
66	63.1	0.323	0.2004	1.505e-003	0.9025
67	66.7	0.302	0.1873	1.484e-003	0.8317
68	70.9	0.287	0.178	1.438e-003	0.7662
69	75.1	0.271	0.1681	1.403e-003	0.7057
70	79.3	0.264	0.1638	1.348e-003	0.6606
71	84.1	0.245	0.152	1.324e-003	0.6019
72	89.5	0.234	0.1452	1.274e-003	0.5534
73	94.3	0.217	0.1346	1.257e-003	0.5061
74	100.3	0.2	0.1241	1.23e-003	0.4564
75	106.3	0.185	0.1148	1.203e-003	0.4132
76	112.3	0.172	0.1067	1.178e-003	0.3759
77	118.9	0.152	9.429e-002	1.174e-003	0.3311
78	126.1	0.146	9.057e-002	1.125e-003	0.305
79	133.9	0.117	7.258e-002	1.158e-003	0.2514
80	141.7	0.104	6.452e-002	1.143e-003	0.2206
81	150.1	8.7e-002	5.397e-002	1.149e-003	0.1856
82	159.1	7.e-002	4.342e-002	1.165e-003	0.1514
83	168.7	4.8e-002	2.978e-002	1.231e-003	0.1097
84	178.3	3.1e-002	1.923e-002	1.31e-003	7.534e-002
85	189.1	1.4e-002	8.685e-003	1.483e-003	3.854e-002

Arithmetic Means:

Hydraulic Conductivity 1.613e-003 cm/sec
Transmissivity 8.496 meters2/day

Geometric Means:

Hydraulic Conductivity 1.484e-003 cm/sec
Transmissivity 7.815 meters2/day

Sensitivity Analysis:

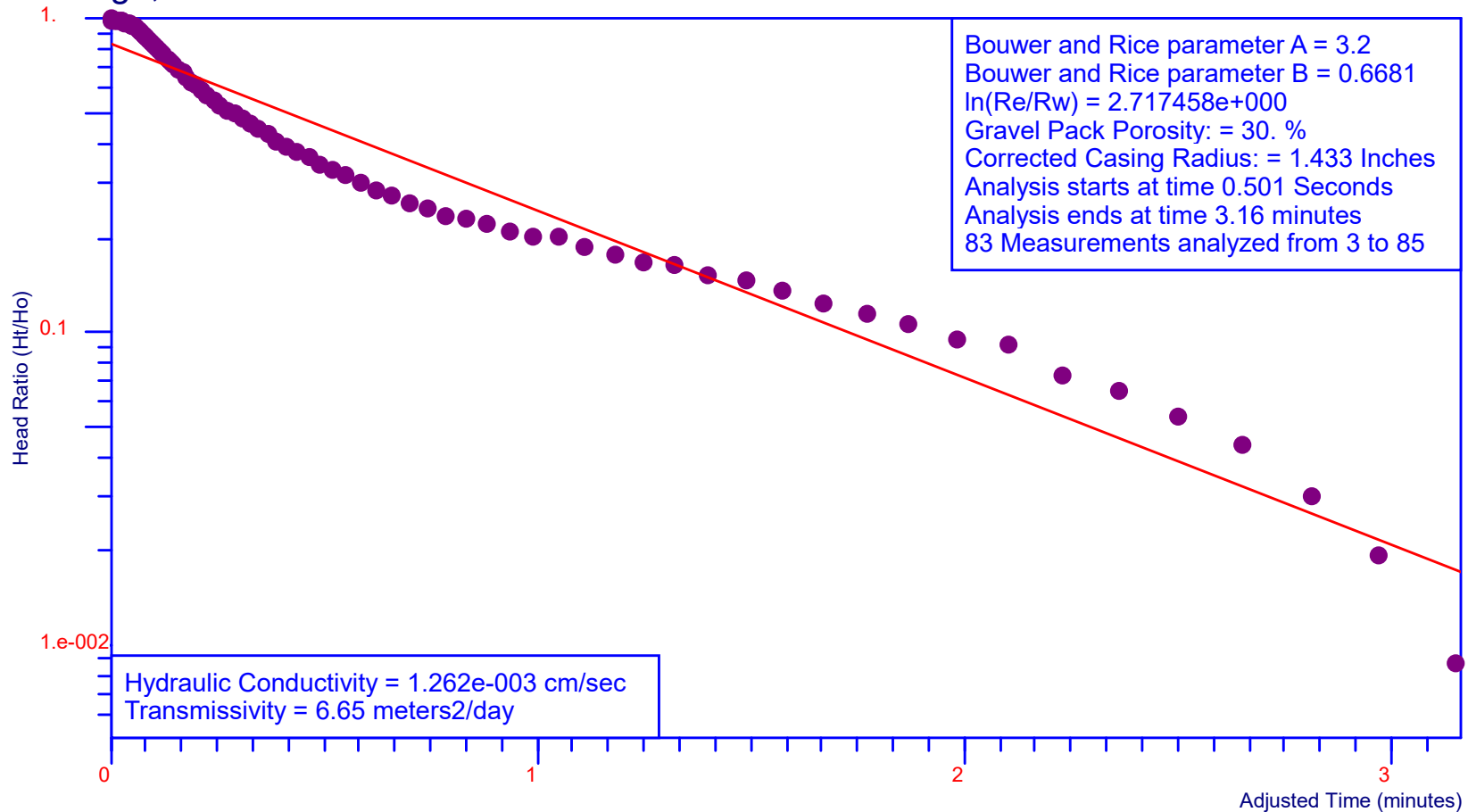
Hydraulic Conductivity	1.971e-003 cm/sec
Transmissivity	10.38 meters ² /day

Carnotite December 12, 2018

Bouwer and Rice Graph

Chicago, IL

MW-1 - Test 3



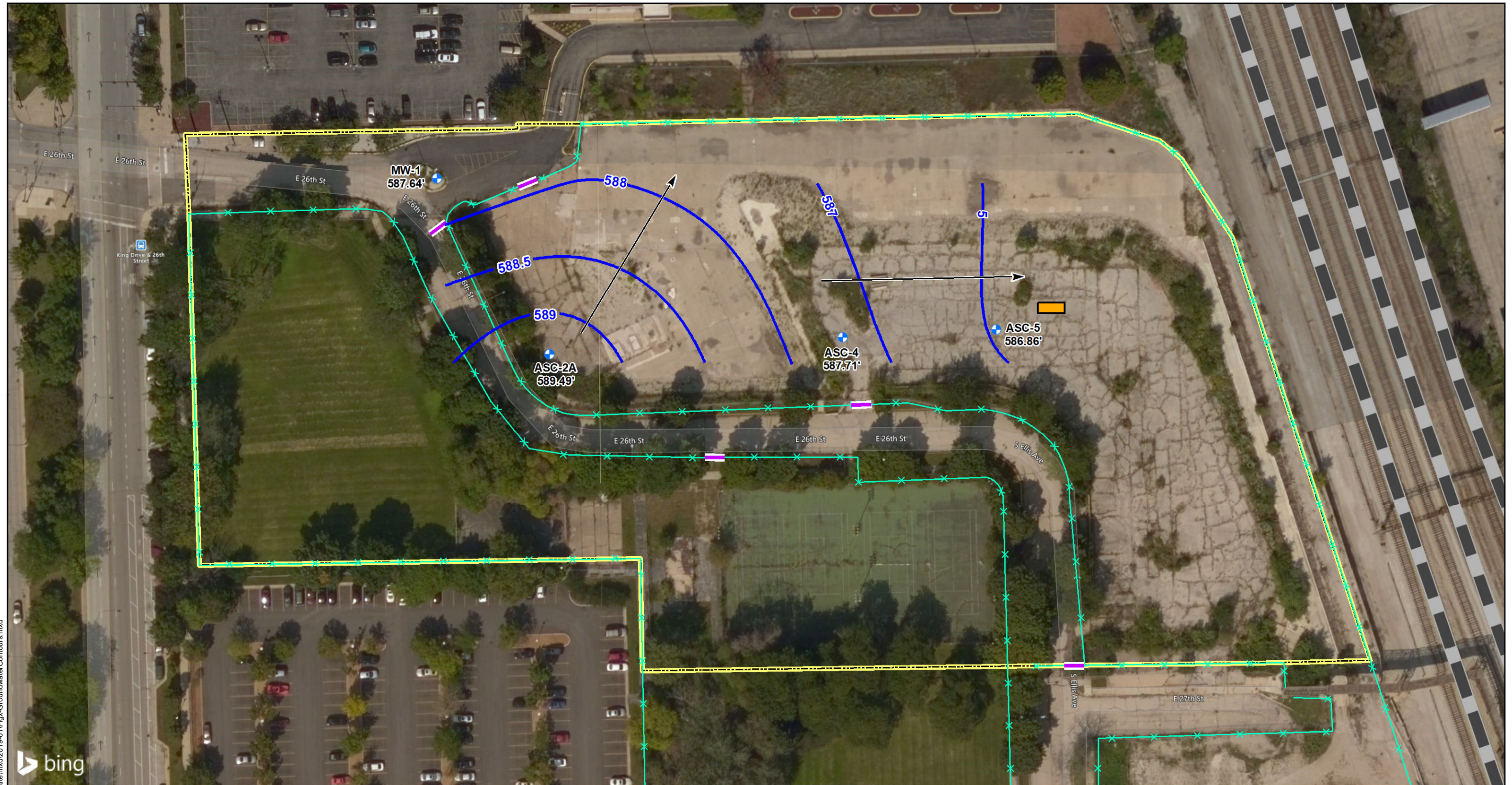
Client:: City of Chicago, 2FM
Analysis by Starpoint Software

H_o is 1.612 feet at 0.501 Seconds

ENCLOSURE 2

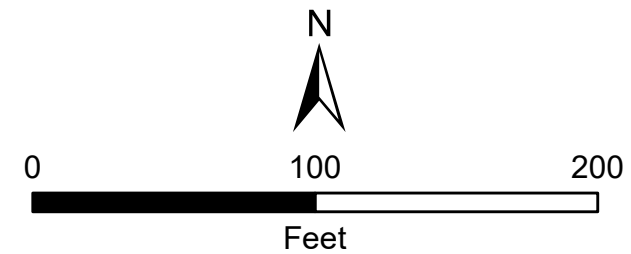
GROUNDWATER FLOW MAP

1/7/2019 G:\S\3284 Chicago 2FM01004 Carnotite\mxd\2019-01-1\Figx-GroundwaterContours.mxd



Legend

- Monitoring Well Location
- Groundwater Elevation Contour - 0.5 feet interval
- Groundwater Flow Direction
- Fence
- Gate
- Cargo Storage Container
- Radioactive Facility License Boundary



FORMER CARNOTITE REDUCTION
COMPANY SITE
434 E. 26th STREET
CHICAGO, ILLINOIS

FIGURE
GROUNDWATER FLOW MAP



ENCLOSURE 3

SURVEY AND GROUNDWATER ELEVATION DATA

Carnotite Survey and Groundwater Elevation Data

WELL	NORTHING	EASTING	ELEVATION	LOCATION	DEPTH TO WATER (12/12/18)	GROUNDWATER ELEVATION
ASC-5	1887043.555	1180024.734	598.62	TOP OF PVC	11.76	586.86
	1887043.843	1180024.759	598.91	RIM		
	1887044.040	1180024.732	598.9	SHOT ON PVMT		
ASC-4	1887034.404	1179889.904	598.76	TOP OF PVC	11.05	587.71
	1887034.656	1179889.889	599.19	RIM		
	1887034.952	1179889.819	599.2	SHOT ON PVMT		
ASC-2A	1887019.188	1179674.301	597.74	TOP OF PVC	8.25	589.49
	1887019.448	1179674.285	598.18	RIM		
	1887019.995	1179674.123	598.1	SHOT ON PVMT		
MW-1	1887153.387	1179596.593	597.28	TOP OF PVC	9.64	587.64
	1887153.615	1179596.479	597.66	RIM		
	1887153.818	1179596.471	597.7	GROUND		

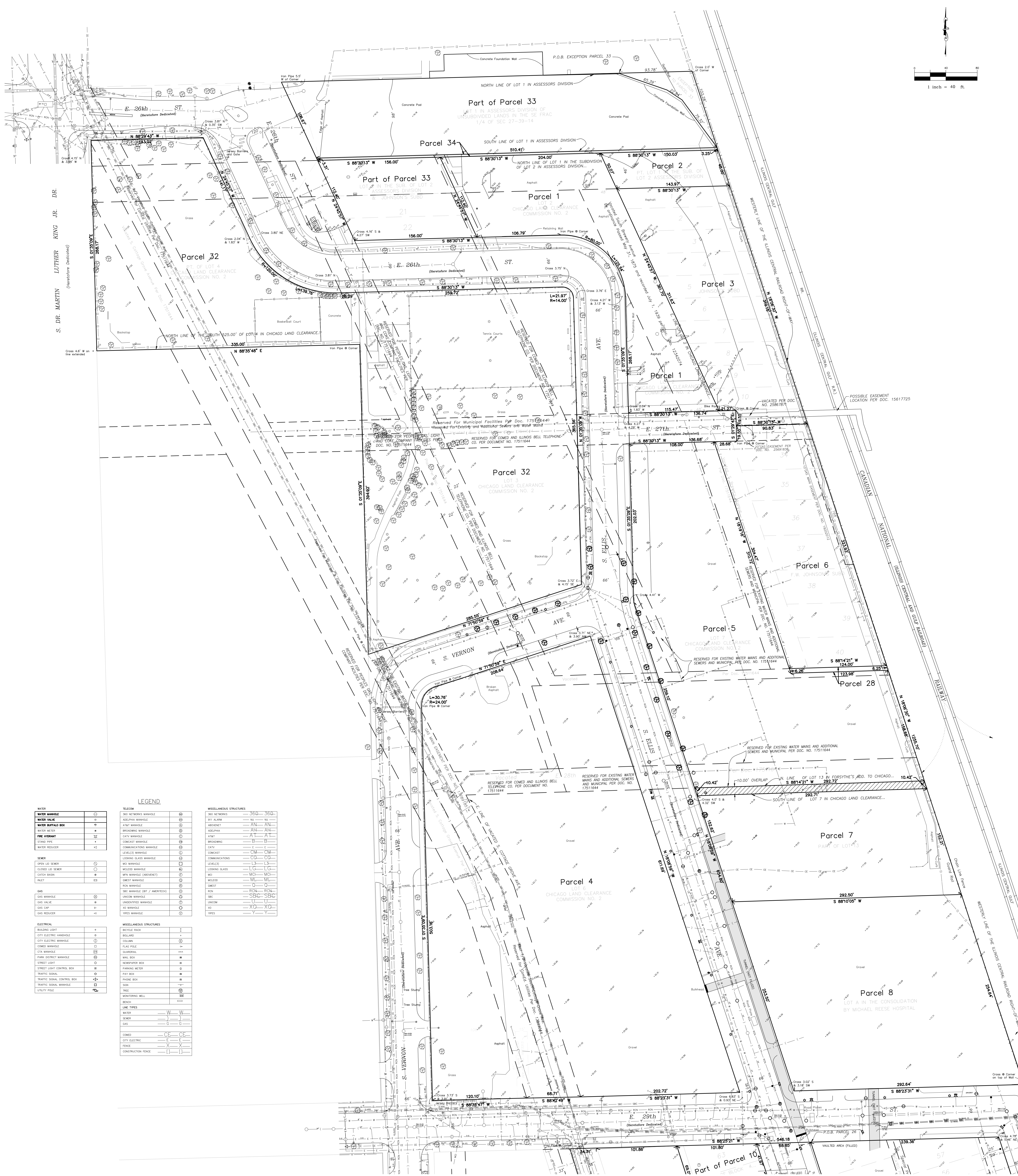
HORIZONTAL DATUM IS ILLINOIS STATE PLANE EAST, NAD83 (2011)

VERTICAL DATUM IS NAVD88 (FEET)

Appendix K

Surveys

ALTA / ACSM LAND TITLE SURVEY



LEGEND	
WATER	WATER MANHOLE
	WATER VALVE
	WATER BUFFALO BOX
	WATER METER
	FIRE HYDRANT
	STORM PIPE
	WATER REDUCER
SEWER	OPEN UP SEWER
	CLOSED UP SEWER
	SEWER MANHOLE
	SEWER VALVE
	SEWER BOX
	SEWER REDUCER
GAS	GAS MANHOLE
	GAS VALVE
	GAS BOX
	GAS REDUCER
ELECTRICAL	BUILDING LIGHT
	CITY ELECTRIC MANHOLE
	CITY ELECTRIC VALVE
	COMM. MANHOLE
	ST. MANHOLE
	PARK DISTRICT MANHOLE
	STREET LIGHT
	STREET LIGHT CONTROL BOX
	TRAFFIC SIGNAL
	TRAFFIC SIGNAL CONTROL BOX
TELECOM	300 TELEPHONE MANHOLE
	ADSL MANHOLE
	ADSL VALVE
	ADSL BOX
	CATV MANHOLE
	COMCAST MANHOLE
	COMCAST VALVE
	LEVELLED MANHOLE
	LOOKING GLASS MANHOLE
	MILLED MANHOLE
MISCELLANEOUS STRUCTURES	360 TELEPHONE
	360 TELEPHONE
	360 TELEPHONE
	360 TELEPHONE
	360 TELEPHONE
	360 TELEPHONE
	360 TELEPHONE
	360 TELEPHONE
	360 TELEPHONE
	360 TELEPHONE

SITE ADDRESS: E. 31ST STREET CHICAGO, ILLINOIS		OWNERS/DEVELOPER: CITY OF CHICAGO		ENGINEER: hbk ENGINEERING 621 WEST VAN BUREN STREET, SUITE 100 CHICAGO, ILLINOIS 60607 STATE OF ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION LICENSE NO. 184-002808		SHEET TITLE: ALTA / ACSM LAND TITLE SURVEY MICHAEL REESE HOSPITAL SITE CHICAGO, ILLINOIS	
REVISIONS		PROJECT NUMBER: 08-265		DRAWN BY: TEH		SHEET:	
No. DATE DESCRIPTION BY		CHECKED BY: TEH		APPROVED BY: TEH		1	
1		DATE DRAWN: 04/13/2012		SCALE: 1"=40'		1 OF 3	
2							
3							
4							
5							
6							
7							

1. ALL DIMENSIONS ARE GIVEN IN FEET AND DECIMAL PARTS THEREOF.
2. BEARINGS BASED ON ILLINOIS STATE PLANE COORDINATES, EAST ZONE, NAD83(2011), GPS DERIVED.
3. VERTICAL DATUM IS BASED ON NAVD88 VALUES CONVERTED TO CITY OF CHICAGO DATUM BY A DIFFERENCE OF -579.16'.
4. ONLY THOSE BUILDING LINE SETBACKS AND EASEMENTS WHICH ARE SHOWN ON THE RECORDED PLAT OF THIS SURVEY ARE SHOWN, UNLESS OTHERWISE INDICATED, REFER TO THE DEED, TITLE INSURANCE POLICY AND LOCAL ORDINANCES FOR OTHER RESTRICTIONS WHICH MAY OR MAY NOT EXIST.
5. COMPARE DEED DESCRIPTION AND SITE CONDITIONS WITH THE DATA GIVEN ON THIS PLAT AND REPORT ANY DISCREPANCIES TO THE SURVEYOR AT ONCE.
6. NO DIMENSIONS SHALL BE DERIVED FROM SCALE MEASUREMENT.
7. DISTANCES ALONG CURVES ARE ARC DISTANCES UNLESS OTHERWISE NOTED.
8. THIS SURVEY WAS PERFORMED ON THE GROUND AND COMPLETED 8/20/18.
9. ON THIS IMPROVEMENT, THERE IS THAT NO VISUAL EVIDENCE OF ANY ABOVE GROUND AT TIME OF SURVEY AND THROUGH A NORMAL SEARCH AND WALK THROUGH OF THE SITE ARE SHOWN ON THE FACE OF THIS PLAT. LAWN SPRINKLER SYSTEMS, IF ANY, ARE NOT SHOWN ON THIS SURVEY.
10. SURFACE INDICATIONS OF UTILITIES ON THE SURVEYED PARCEL HAVE BEEN SHOWN. UNDERGROUND AND OFFSITE OBSERVATIONS HAVE NOT BEEN MADE TO DETERMINE THE EXTENT OF UTILITIES SERVING OR EXISTING ON THE PROPERTY. PUBLIC AND/OR PRIVATE RECORDS HAVE NOT BEEN SEARCHED TO PROVIDE ADDITIONAL INFORMATION. OVERHEAD WIRES, IF ANY, ARE EXISTING AND THEIR POLES HAVE BEEN SHOWN. HOWEVER, THEIR FUNCTION AND DIMENSIONS HAVE NOT BEEN NOTED.
11. REGARDING THE ACTUAL PRESENCE OR ABSENCE OF ANY SERVICE OR UTILITY LINE, CONTROLLED UNDERGROUND EXPLORATORY EFFORT TOGETHER WITH DIGGER IS RECOMMENDED TO DETERMINE THE FULL EXTENT OF UNDERGROUND SERVICE AND UTILITY LINES. CONTACT DIGGER AT 312-744-7000.



THIS PROFESSIONAL SERVICE CONFORMS TO THE CURRENT ILLINOIS MINIMUM STANDARDS FOR TOPOGRAPHIC SURVEYS.

Excellence, Dedication, Innovation

Appendix L

Health and Safety and Radiation Protection Plan

This Example HASP and RPP has been developed as an example and is for informational purposes only. The remediation contractor selected by the City of Chicago, Department of Assets, Information and Services will be required to develop and provide a copy of a separate site-specific HASP and RPP covering all activities included in the contractor's scope of work.

**EXAMPLE HEALTH AND SAFETY
AND RADIATION PROTECTION PLAN
FOR SITE REMEDIATION**

**Former Carnotite Reduction Company Site
434 E. 26th Street
Chicago, IL 60616**

Prepared by



**Tetra Tech, Inc.
1 South Wacker Drive, 37th Floor
Chicago, IL 60606**

Prepared for



**City of Chicago,
Department of Assets, Information and Services
30 North LaSalle, Suite 300
Chicago, IL 60602**

June 2020

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ATTACHMENT

ATSDR TOXFAQS

ACRONYMS AND ABBREVIATIONS

AIS	City of Chicago Department of Fleet and Facility Management
μCi/mL	MicroCuries per milliliter
ACGIH	American Conference of Governmental Industrial Hygienists
AECOM	AECOM Technical Services, Inc.
AHA	Activity hazard analysis
ALARA	As low as reasonably achievable
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	Below ground surface
CARC	Potential occupational carcinogen
Carnotite	Carnotite Reduction Company
CFR	<i>Code of Federal Regulations</i>
cpm	Counts per minute
cps	Counts per second
CPR	Cardiopulmonary resuscitation
DAC	Derived air concentrations
dBA	Decibels on an A-weighted scale
DCN	Document control number
dpm/100cm ²	Disintegrations per minute per 100 square centimeters
DOE	City of Chicago Department of Environment
DOT	U.S. Department of Transportation
EDI	Environmental Design International, Inc.
EPA	U.S. Environmental Protection Agency
ESA	Environmental site assessment
FSP	Field sampling plan
GPS	Global Positioning System
HASP	Health and safety plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBK	HBK Engineering, LLC
HEPA	High-efficiency particulate air
HSR	Health and Safety Representative
IAC	<i>Illinois Administrative Code</i>
IDW	Investigation-derived waste
IEMA	Illinois Emergency Management Agency
IDLH	Immediately dangerous to life or health
IDPH	Illinois Department of Public Health
mg/kg	Milligrams per kilogram
mg/m ³	Milligrams per cubic meter
micro-rem/hr	Micro rems per hour
mrad/hr	Micro roentgens per hour
mrem	Millirem

MSL	Mean sea level
N/A	Not applicable
NaI	Sodium iodide
NIOSH	National Institute for Occupational Safety and Health
OSFM	Office of the Illinois State Fire Marshal
OSHA	Occupational Safety and Health Administration
OSL	Optically stimulated luminescence
PAH	Polycyclic aromatic hydrocarbon
PBC	Chicago Public Building Commission
PCB	Polychlorinated biphenyl
pCi/g	picoCuries per gram
pCi/L	picoCuries per liter
PEL	Permissible exposure limit
PID	Photoionization detector
PM	Project Manager
PPE	Personal protective equipment
ppm	Parts per million
Prairie Shores	Prairie Shores Apartments
QAPP	Quality assurance project plan
RaSO ₄	Radium sulfate
REC	Recognized environmental condition
REL	Recommended exposure limit
rem	Roentgen equivalent man
RPP	Radiation protection plan
RSO	Radiation Safety Officer
SDS	Safety data sheet
SSC	Site Safety Coordinator
SVOC	Semivolatile organic compound
SWP	Safe work practice
SOP	Standard operating procedure
TACO	Tiered Approach to Cleanup Objectives
TEDE	Total effective dose equivalent
Tetra Tech	Tetra Tech, Inc.
TLV	Threshold limit value
TWA	Time-weighted average
VOC	Volatile organic compound

REVIEWS AND APPROVALS

**Health and Safety and Radiation Protection Plan for Remediation Activities
Former Carnotite Reduction Company Site
Chicago, Cook County, Illinois**

We the undersigned have read and approve of the health and safety guidelines presented in this health and safety and radiation protection plan (HASP/RPP) for on-site work activities at the former Carnotite Reduction Company (Carnotite) Site.

Name	Signature	Date
_____ City of Chicago Department of Assets, Information and Services Project Manager	_____	_____
_____ Engineer Health and Safety Representative	_____	_____
_____ Engineer Project Manager	_____	_____
_____ Radiation Safety Officer	_____	_____

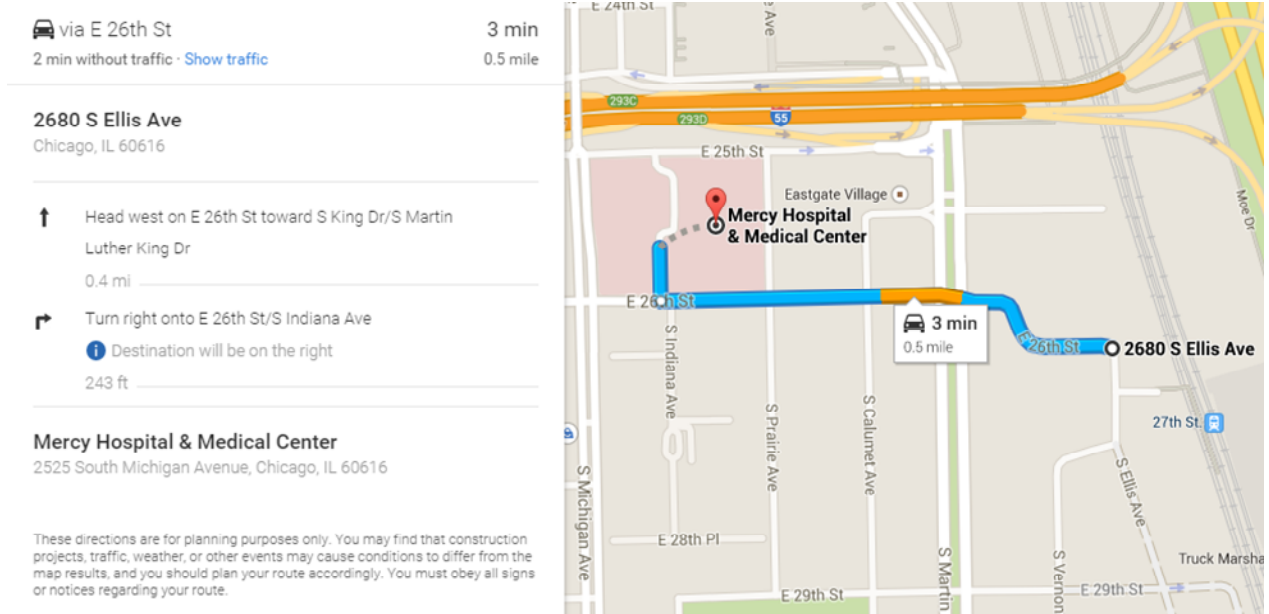
This statement certifies that the type, risk level, and severity of hazards for the project have been assessed and appropriate personal protective equipment (PPE) for site personnel have been selected in accordance with Occupational Safety and Health Administration (OSHA) regulations at Title 29 of the *Code of Federal Regulations* (CFR), Part 1910.132.

EMERGENCY INFORMATION

POST THIS PAGE ON SITE EMERGENCY CONTACTS AND ROUTE TO HOSPITAL

Emergency Contact	Telephone No.
InfoTrac Chemical Monitoring System	(800) 535-5053
Fire Department	911 or (312) 745-3705
Police Department	911 or (312) 746-6000
City of Chicago Department of Assets, Information and Services: Project Manager: Abby Mazza	(312) 744-3161
Engineer: Human Resource Development: Health and Safety Representative: Office Health and Safety Coordinator: Project Manager: Site Safety Coordinator:	
Radiation Safety Officer:	
Subcontractors:	
Medical Emergency	
Hospital Name:	Mercy Hospital & Medical Center
Hospital Address:	2525 S Michigan Ave Chicago, IL 60616
Hospital Telephone No.:	(312) 567-2000
Emergency –	(312) 567-2000
General –	(312) 567-2000
Ambulance Telephone No.:	911
Route to Hospital: (see next page hospital route map)	

EMERGENCY INFORMATION
POST THIS PAGE ON SITE
HOSPITAL ROUTE MAP TO MERCY HOSPITAL & MEDICAL CENTER



1.0 INTRODUCTION

This example health and safety and radiation protection plan (HASP/RPP) provides typical health and safety and radiation protection requirements for tasks conducted by the Engineer during remediation activities at the former Carnotite Reduction Company (Carnotite) Site (the site), in Chicago, Cook County, Illinois. This example HASP/RPP also clarifies the roles and responsibilities of the Engineer and remediation contractor. The City of Chicago Department of Assets, Information and Services (AIS) is conducting remediation of the Carnotite site. As AIS's representative, the Engineer will direct and oversee site remediation activities under the Illinois Environmental Management Agency (IEMA) radioactive facility license for the site. Soil excavation, transportation, and disposal and water management and treatment activities, as well as other construction-related site activities specified in the bid documents, will be conducted by a remediation contractor, which will be procured by AIS. This example HASP/RPP is focused on the assessment of the types, risk levels, and severity of hazards for the Engineer project tasks. However, prior to beginning on-site remediation activities, the Engineer must prepare a site-specific HASP/RPP, including relevant safe work practices (SWP), job/activity hazard analyses, standard operating procedures (SOP), documentation of employee training and qualifications, and relevant forms, such as daily tailgate safety meeting, daily site log, signature page indicating review and understanding of personnel involved, etc.. The remediation contractor will also be required to prepare a site-specific HASP/RPP for project tasks to be conducted by the remediation contractor and any associated subcontractors. If subcontractor tasks are not included in the remediation contractors HASP/RPP, the subcontractors must also submit site-specific HASPs or HASP/RPP(s), as appropriate, encompassing the subcontractor's specific onsite activities. All plans must be submitted for AIS and IEMA review prior to conducting on-site remediation activities.

The Engineer and the Engineer's Radiation Safety Officer (RSO) will complete several tasks in implementing the HASP/RPP and other associated plans, such as the field sampling plan (FSP) and quality assurance project plan (QAPP). These tasks include the following:

- Maintain compliance with the site's IEMA Radioactive Material License and all applicable regulations.
- Provide and document site-specific radiation safety training of key on-site personnel, including remediation contractor and their subcontractor personnel, prior to initiation of remediation activities.
- Oversee and document excavation work and progress.
- Conduct on-site soil radiation screening to guide soil excavation activities, facilitate segregation of clean material, and reduce volume of soil requiring off-site disposal.
- Direct soil blending activities based on soil concentrations, if necessary.

- Collect soil samples to document concentrations of radium-226 (Ra-226), total uranium, and thorium-230 (Th-230) in soil, not including waste characterization sampling necessary for waste profiling.
- Collect post-treatment system effluent water samples prior to discharge to the Metropolitan Water Reclamation District of Greater Chicago to verify compliance with applicable standards.
- Conduct work area respirable particulate dust monitoring.
- Conduct work area high-volume air sampling to evaluate potential occupational exposures to airborne radium, uranium, and thorium during excavation. Low-volume personal air sampling for worst-case individuals, as directed.
- Conduct site perimeter low-volume air sampling to monitor airborne effluents and evaluate potential airborne radium, uranium, and thorium exposures to the public. The perimeter air sampling procedures are discussed in detail in the FSP.
- Implement a site external dosimetry program and provide external dosimetry for Engineer staff and their subcontractor personnel.
- Conduct and supervise surveys of equipment and materials for release for unrestricted use. This includes advising remediation contractor on decontamination requirements and post-decontamination evaluation.
- Maintain site controls to prevent cross contamination and offsite releases of radiological contamination. This includes maintaining boundaries and the implementation of clean areas, contamination reduction zones, and exclusion zones.
- Conduct site access control surveys to eliminate potential cross contamination, such as work area surveys, clean area surveys, and contamination reduction zone surveys.
- Conduct and supervise surface contamination surveys of all personnel.
- Conduct wipe sampling of vehicles and equipment prior to demobilization from the site.
- Conduct work area gamma dose rate surveys.
- Conduct perimeter passive gamma radiation monitoring by use of dosimeters with optically stimulated luminescence (OSL) technology. The perimeter air monitoring procedures are discussed in detail in the FSP.
- Conduct perimeter passive radon monitoring. The perimeter air monitoring procedures are discussed in detail in the FSP.
- Collect verification soil samples.
- Collect construction debris and soil disposal criteria samples to identify appropriate non-radiological disposal options.
- Conduct the final status radiation surveys of remediated areas.
- Verification of analytical data generated by subcontracted laboratories

The remediation contractor shall designate their own RSO in addition to being responsible for implementing a site-specific HASP/RPP encompassing tasks for their personnel and subcontractors. The remediation contractor's RSO shall be responsible for the following tasks:

- Conduct work area air sampling to evaluate potential internal uranium, thorium, and radium exposures for remediation contractor's and subcontractor's personnel.
- Provide external dosimetry and any necessary personnel-related sampling or air monitoring for the remediation contractor's and subcontractor's personnel.
- Conduct surface contamination and exposure rate surveys of contaminated soil trucks leaving the site in order to comply with U.S. Department of Transportation regulations and waste disposal site acceptance criteria.
- Conduct decontamination of equipment and materials as necessary.
- Conduct surveys of equipment and materials prior to approval for release for unrestricted use by the Engineer's RSO.
- Conduct clean area radiological surveys in remediation contractor's support zone workspaces.
- Comply with all aspects of the site access control program.

This document addresses items specified under OSHA regulations at 29 CFR, Part 1910.120 (b), "Final Rule." The site-specific HASP/RPP will be available to all personnel who could be exposed to hazardous on-site conditions.

The purpose of this example HASP/RPP is to present typical Engineer health and safety and radiation protection requirements for site remediation activities and designate protocols to be followed during Engineer activities at the site. This example HASP/RPP also discusses the different task responsibilities for the Engineer's and remediation contractor's separate RSOs. All personnel on site, including the Engineer and their subcontractor employees and site visitors, must be informed of site emergency response procedures and any potential fire, explosion, health, or safety hazards associated with on-site activities. This example HASP/RPP summarizes potential hazards and specifies protective measures planned for Engineer site activities.

This plan must be reviewed and approved by the Engineer's Health and Safety Representative (HSR) or a designee, and the Engineer's Project Manager (PM) (see the Reviews and Approvals form after the cover page in this document). The Compliance Agreement form must be signed by all Engineer and associated subcontractor personnel before they enter the site. Protocols established in this HASP/RPP are based on available site data, on-site conditions, as well as health and safety hazards known or anticipated at the site. This plan is intended solely for use during proposed activities described in the corresponding site-specific work plan. Specifications in this HASP/RPP are subject to review and revision based on actual conditions encountered in the field during site activities. Significant revisions to this plan must be approved by the Engineer's PM and the Engineer's HSR.

2.0 HEALTH AND SAFETY PERSONNEL AND PLAN ENFORCEMENT

This section describes responsibilities of project personnel, summarizes requirements for subcontractors and visitors who want to enter the site, discusses different task responsibilities for the Engineer's and removal contractor's separate RSOs, and discusses HASP/RPP enforcement.

2.1 PROJECT PERSONNEL

The following personnel and organizations are associated with planned activities at the site. The organizational structure will be reviewed and updated as necessary during the course of the project.

Name/Title	Responsibility	Telephone No.
Client Representatives		
Abby Mazza	AIS PM	(312) 744-3161
Illinois Emergency Management Agency (IEMA) Representatives		
Kelly Horn	IEMA Lead PM	(217) 558-5135
Kelly Grahm	IEMA PM	(630) 293-8242
Radiation Safety Officer		
Engineer Personnel		
Engineer Subcontractor Personnel		

The Engineer's RSO, PM, Field Team Leader, Site Safety Coordinator (SSC), and HSR, as well as the RSO, will be responsible for implementation and enforcement of the provisions of this HASP/RPP. Their duties and expectations of the Engineer's employees are described in the following sections.

2.1.1 Radiation Safety Officer

The Engineer's RSO is responsible for ensuring that all work performed at the site complies with the conditions of the site's IEMA Radioactive Materials License and all applicable radiation safety regulations. The Engineer's RSO is responsible for continually evaluating site working conditions to ensure that all radiological exposures to both site personnel and individual members of the public are kept As Low as Reasonably Achievable (ALARA). The Engineer's RSO is also responsible for the promotion of a positive nuclear safety culture at the site, where a collective commitment by leaders and individuals emphasize safety over competing goals to ensure the protection of personnel, public, and the environment. Duties of the Engineer's RSO include the following:

- Providing and documenting site-specific radiation safety training to key on-site personnel, including remediation contractor and their subcontractor personnel, prior to initiation of remediation activities.
- Assisting the Engineer in overseeing excavation work.
- Conducting on-site soil radiation screening to guide soil excavation activities, facilitate segregation of clean material, and reduce volume of soil requiring off-site disposal.
- Implementing site air monitoring program to evaluate potential occupational exposures from airborne radiological particulates, including conducting work area high-volume air sampling for radium, uranium, and thorium during excavation. Additionally, conducting low-volume personal air sampling for individuals, as needed.
- Implementing the air monitoring program to also evaluate potential public exposures from airborne radiological particulates. Including conducting perimeter passive gamma radiation monitoring by use of dosimeters with optically stimulated luminescence (OSL) technology. Also, conducting perimeter passive radon monitoring. The perimeter air monitoring procedures are discussed in detail in the FSP.
- Conduct site perimeter low-volume air sampling to monitor airborne effluents and evaluate potential airborne radium, uranium, and thorium exposures to the public. The perimeter air sampling procedures are discussed in detail in the FSP.
- Implementing a site external dosimetry program and providing external dosimetry for Engineer staff and their subcontractor personnel.
- Maintaining site controls to prevent cross contamination and offsite releases of radiological contamination. This includes maintaining boundaries and the implementation of clean areas, contamination reduction zones, and exclusion zones.
- Conducting site access control surveys to eliminate potential cross contamination, such as work area surveys, clean area surveys, and contamination reduction zone surveys.
- Conducting and supervising surface contamination surveys of all personnel.
- Conducting and supervising surveys of equipment and materials for release for unrestricted use. This includes advising remediation contractor on decontamination requirements and post-decontamination evaluation.
- Conduct work area gamma dose rate surveys.
- Conducting the final status radiation surveys of remediated areas.
- Advise Field Team Leader and PM of site radiological hazards and advise on corrective actions which may include upgrading or downgrading PPE, engineering controls, or procedural changes.

2.1.2 Project Manager and Field Team Leader

The Engineer's PM has ultimate responsibility for ensuring implementation of the requirements set forth in this HASP/RPP. Some of this responsibility may be achieved through delegation to site-dedicated

personnel who report directly to the PM. The PM will regularly confer with site personnel regarding health and safety compliance.

The Engineer's Field Team Leader will have the day-to-day responsibility for ensuring implementation of the HASP/RPP while overseeing and directing field activities. Engineer subcontractor compliance with the HASP/RPP will be monitored by the Field Team Leader. The Field Team Leader will report directly to the PM any health and safety-related issues.

2.1.3 Health and Safety Representative

The Engineer's HSR is responsible for administration of the Engineer's company health and safety program. The HSR will advise the PM and site personnel regarding project-specific health and safety issues. The Engineer's PM will establish a liaison between officers and representatives of AIS and the HSR on matters relating to health and safety.

2.1.4 Site Safety Coordinator

SSCs are assigned by the PM and approved by the HSR to oversee health and safety of project activities. If qualified by experience and training, the SSC may also serve as the "competent person" as required by federal or state health and safety regulations (i.e. for excavations, asbestos, fall protection, and scaffolding). The HSR has the right and responsibility to review the scope of work and site hazards to ensure that the SSC selected is adequately trained and experienced to manage site safety. The SSC is responsible for the following:

- Being on site during all work activities or designating a qualified alternate SSC in his or her absence.
- Overseeing health and safety issues for the Engineer's employees, subcontractors, and visitors.
- Implementing hazard communication, respiratory protection, personal protective equipment (PPE), and other associated safety and health programs.
- Implementing the site-specific HASP/RPP.
- Verifying that on-site personnel read and understand site health and safety documents, such as HASPs, project-specific safety data sheets (SDS), and activity hazard analyses (AHA).
- Verifying that the HASP/RPP accurately reflects **all** site hazards and is revised or amended as new tasks are assigned or new hazards are recognized.
- Verifying on-site personnel have all necessary training, medical clearance, and respirator fit tests as specified by the HASP/RPP.

- Advising the PM and/or client of any field practices or conditions that may endanger the health and safety of field personnel, subcontractors, or visitors.
- Recommending corrective actions for any conditions that may endanger the health and safety of field personnel, subcontractors, or visitors.
- Selecting, inspecting, maintaining, and enforcing proper use, cleaning, and maintenance of protective clothing and equipment.
- Monitoring on-site hazards and conditions.
- Maintaining visual or verbal communication with all site workers.
- Stopping work if any worker feels that a work site condition, practice, or operation causes or presents a hazard that can reasonably be expected to result in immediate death, serious physical harm, or severe damage to the environment.
- Working closely with the PM to determine appropriate corrective action and/or prompt resolution to all hazards.
- Conducting daily health and safety briefings for site personnel and initial site training for new personnel.
- Establishing and maintaining work zones and control points by overseeing control of entry and exit at site access points. Recording names and job assignments of all personnel who enter and exit the site.
- Arranging for work area and personal or ambient hazard monitoring (for occupational exposure assessments related to inhalation, noise, heat/cold stress, and other potential exposure hazards).
- Ensuring that all monitoring equipment used on site has been properly calibrated and is operated in accordance with manufacturer's recommendations and approved sampling methodologies.
- Creating and maintaining records of employee exposure and monitoring results for all on-site personnel.
- Determining need for additional safety equipment (such as respirators or fall protection equipment), depending on planned tasks and site-specific conditions.
- Monitoring workers for signs of occupational health exposures, such as chemical exposure, heat stress, and fatigue.
- Conducting scheduled and unscheduled field site safety audits.
- Coordinating and supervising emergency response and providing emergency first aid and cardiopulmonary resuscitation (CPR) to team members, if required.
- Reporting all occupational illness, injuries, incidents, and near-misses to the HSR and PM immediately after stabilization of the incident.
- Assisting in preparing reports of illnesses, injuries, motor vehicle accidents, or property damage.

2.1.5 Engineer's Employees

Other employees of the Engineer may be present at the site during environmental monitoring and sample collection activities. The Engineer's employees will read and sign a site-specific HASP and RPP compliance agreement. The Engineer's employees are expected to fully participate in implementing the

site HASP/RPP by obtaining necessary training, attending site safety meetings, always wearing designated PPE, complying with site safety and health rules, and advising the Engineer's SSC of health and safety concerns at the site. Additionally, all Engineer employees have the following rights and responsibilities:

- Engineer employees are expected to report safety hazards they face while performing their work and are responsible for doing so. As such, employee reports of safety hazards shall be viewed as positive interactions and ***no employee of the Engineer will retaliate against any other employee who reports a safety hazard.***
- Engineer employees have the right to refuse to perform work involving significant safety hazards they feel have not been addressed.
- Every Engineer employee has the right to stop work if he or she feels any work site condition, practice, or operation causes or presents a hazard that can reasonably be expected to result in immediate death, serious physical harm, or severe damage to the environment.

2.1.6 Remediation Contractor Personnel

Remediation contractor personnel directly contracted by AIS at the site will be required to submit a separate site-specific HASP/RPP. Any subcontractors of the remediation contractor will comply with the remediation contractor's HASP/RPP or supplement the site-specific HASP/RPP with a separate HASP or HASP/RPP, as appropriate, encompassing the subcontractor's specific onsite activities. The remediation contractor and associated subcontractor HASP/RPP must meet all applicable OSHA and radiation requirements. Remediation contractor and associated subcontractor personnel must comply with all applicable 29 CFR Part 1910.120 training and IEMA requirements in Title 32 of the Illinois Administrative Code, including all relevant training, fit testing, and medical surveillance requirements, as specified in the remediation contractor's site-specific HASP/RPP and associated task hazard analysis. The remediation contractor and associated subcontractor personnel are responsible for providing PPE required by their HASP/RPP for their personnel and are directly responsible for the health and safety of their employees.

2.1.7 Excavation Competent Person (Remediation Contractor)

The remediation contractor will provide a competent person for trenching and excavation activities in accordance with 29 CFR §1926.651. Responsibilities of the competent person include:

- Perform daily inspection of protection equipment, trench conditions, and adjacent areas.
- Conduct inspections prior to start of work and as needed throughout the shift.
- Conduct inspections after every rainstorm or other occurrence that could increase hazard.

- Remove employees from hazardous conditions and make all changes necessary to ensure their safety.
- Categorize soil conditions and conduct visual and manual tests as a preliminary effort.
- Determine the appropriate protection system to be used.
- Obtain appropriate permits and supply necessary notices when needed (such as Confined Space Permit or Hot Work Permit).
- Maintain on-site records in relation to all excavation and trenching activities, including inspections.

All activities will be conducted in accordance with the requirements of 29 CFR §1926.651, as well as specific excavation requirements identified in the remediation contractor's HASP/RPP. Furthermore, inspections conducted by the subcontractor competent person will be documented on a remediation contractor-supplied form or document; this documentation will be maintained throughout the project.

2.1.8 Visitors

All site visitors will be required to read the Engineer's and remediation contractor's HASP/RPP and sign the Engineer's HASP/RPP Compliance Agreement form. Visitors will be expected to comply with relevant OSHA requirements. The RSO may also provide visitors with site-specific radiological training, as required. Visitors will also be expected to provide their own PPE required by the HASP/RPP. Visitors who have not met OSHA and radiological training, medical surveillance, and PPE requirements are not permitted to enter areas where exposure to radiation hazards or hazardous materials is possible.

2.2 HASP AND RPP ENFORCEMENT

HASP/RPP enforcement on the site will be rigorous. Violators of the HASP/RPPs will be verbally notified on first violation, and the violation will be recorded by the Engineer's SSC in a field logbook. On second violation, the violator will be notified in writing, and the Engineer's PM and the violator's supervisor will be notified. A third violation will result in a written notification and eviction of the violator from the site. The written notification will be sent to human resources development and the HSR.

Personnel will be encouraged to report to the SSC any conditions or practices that they consider detrimental to their health or safety, or those they believe are in violation of applicable health and safety standards. These reports may be transmitted orally or in writing. Personnel who believe that an imminent danger threatens human health or the environment are encouraged to stop work and bring the matter to the immediate attention of the SSC for resolution.

At least one copy of this HASP/RPP will be available to all site personnel at all times. The remediation contractor shall also make at least one copy of their HASP/RPP available to all site personnel at all times. Remediation contractor and associated subcontractor HASP/RPP(s) enforcement is the responsibility of the remediation contractor.

The daily tailgate safety meetings will encompass relevant safety topics for the day's scope of work. The Engineer's SSC will discuss minor changes in HASP/RPP procedures at the beginning of each work day at the daily tailgate safety meeting. The daily tailgate safety meeting will be led by the Engineer's SSC and RSO in close coordination with AIS's remediation contractor's competent person and RSO. Significant plan revisions must be reviewed and approved by the Engineer's HSR, and discussed with the PM.

3.0 SITE BACKGROUND

From about 1916 to 1921, Carnotite operated an elemental radium separation and refining facility in Chicago at 2600 S. Inglehart Place, a street that no longer exists (HBK Engineering, LLC [HBK] 2012). Carnotite was near what is now 434 E. 26th Street, Chicago, Illinois. This property later became part of the land occupied by the former Michael Reese Hospital. In 1979, the State of Illinois Department of Health, Division of Radiological Health, in cooperation with the U.S. Environmental Protection Agency (EPA), conducted a radiological surface survey of part of the Michael Reese property and identified several areas of elevated radioactivity. State personnel concluded that the contamination did not pose an immediate health hazard, but should be considered prior to any future construction. In September 2008, the owner of Michael Reese filed a petition for bankruptcy protection in the U.S. Bankruptcy Court for the Northern District of Illinois. Anticipating selection of Chicago as host of the 2016 Olympic Games, the City of Chicago purchased the 37-acre former Michael Reese property in June 2009. The City planned to develop the property as the site of the Olympic Village. In August 2009, IEMA conducted a gamma surface survey, observed readings of gamma activity, and recommended to the City of Chicago further investigation of gamma activity prior to invasive construction work (AECOM Technical Services, Inc. [AECOM] 2011a). In December 2009, EPA conducted a surface gamma survey at the site and confirmed presence of elevated surficial gamma activity (EPA 2009). In June 2012, subsurface investigations confirmed the presence of elevated levels of radium and uranium in subsurface soil (AECOM 2012a). In October 2013, at the City of Chicago's request, the IEMA Division of Nuclear Safety became the lead regulatory agency for the site (former Michael Reese Site) (AIS 2013); pursuant to this determination, AIS obtained radioactive material storage license IL-02467-01 from IEMA in 2015. AIS received the most recent license amendment on October 1, 2018 (IEMA 2018).

3.1 SITE DESCRIPTION

The site is at 434 East 26th Street on the northern portion of the former Michael Reese Hospital campus in Chicago, Cook County, Illinois (Figure 1). The site is currently owned by the City of Chicago. The site boundary is defined in the proposed radioactive material license, based on property boundaries to the north, east, southwest, and west. The southernmost site boundary is defined by reference to results of former investigations that did not identify radioactive contamination above background levels south of the current boundary (AECOM 2013, 2014). The 7-acre site is bordered north by Advocate Health Center, east by the Metra South Shore rail line, south by vacant property and residential property, and west by Dr. Martin Luther King, Jr. (King) Drive and residential property across King Drive (Figure 1). Radium, uranium, and thorium contamination is present within the central and western portions of the site,

believed to have resulted from Carnotite's refining operations in the early 1900s. Based on results of previous investigations at the site, including surficial gamma surveys, down-hole gamma logging, and analyses of soil samples, the estimated extent of radiological contamination is limited to the central and western portions of the site (see Figures 2 and 3). Most impacted material is limited to the top 5 feet below ground surface (bgs). However, contamination extends to 14 feet bgs within one area in the northwest portion of the site (AECOM 2012a).

The site is 0.25 miles west of Lake Michigan and 1.20 miles southeast of the Chicago River (see Figure 1). Most of the western portion of the site is vegetated and consists of an open field (formerly a baseball field) with some trees. The southern central portion of the site is paved and consists of a former basketball court and tennis courts. The eastern and northern portions of the site consist of a concrete slab and asphalt parking lot remaining from former Michael Reese Hospital campus Building No. 1. The site is split into northwestern and southeastern sections by East 26th Street and South Ellis Avenue. East 26th Street enters the site on the east side of the intersection of South King Drive near the northwestern corner of the site. East 26th Street then travels southeast through the site, eventually becoming South Ellis Avenue. South Ellis Avenue exits the south-central portion of the site and extends south to the intersection of South Ellis Avenue and 27th Street (see Figure 2). A fence surrounds both the northeastern and southwestern portions of the site.

Borings advanced by AECOM during a subsurface investigation indicated three distinct soil/fill types underlying the Carnotite site. The first type was demolition debris apparently used to fill historical foundations that predate construction of Michael Reese Hospital. This demolition material consisted of sand, gravel, and concrete with traces of brick and cinders. The second type, brown to black fill soil, ranged from a fine to medium sand to silty clay and contained minor amounts of gravel and cinders. The third soil type, a native tan to brown fine sand, was encountered in a majority of the borings. The native sand was typically encountered at a depth of 4 to 6 feet bgs but was slightly deeper where historical foundations were present. An exception to this was in the vicinity of the tennis courts where native sand was not encountered within the first 12 feet, the maximum depth of the borings. Subsequent investigation of other areas of the former Michael Reese Hospital complex, mostly outside the Carnotite site boundary, found the same three soil or fill types at similar depths (AECOM 2012a and 2014).

Regional geology generally consists of unconsolidated glacial deposits about 50 feet thick overlying Silurian bedrock. The site is underlain by the Chicago Lake Plain sediments and the Wadsworth Till Member—a clayey gray till. The Wadsworth Till Member is a glacial till and a part of the Wedron Formation. In the Chicago area, undisturbed Chicago Lake Plain sediments are primarily fine-grained silt

and clay. At the site, urban fill and lake-bottom sand was observed to approximately 30 feet bgs. Clay was observed between 25 and 30 feet bgs (CH2MHILL 2008).

Four major groundwater aquifers are recognized in northeastern Illinois: the Pleistocene glacial drift (shallow) aquifer, Silurian dolomite aquifer, Cambro-Ordovician aquifer, and Cambrian Mt. Simon sandstone aquifer. Historical site information indicates that shallow groundwater generally flows northeast toward Lake Michigan. Unless disturbed or breached, the native clay underlying the shallow fill and sandy lake deposits forms an effective aquitard that inhibits significant vertical migration of shallow groundwater into the clay. Monitoring well water levels measured during May 5 to 7, 2008, indicate an easterly flow direction toward Lake Michigan in the shallow groundwater. Saturated conditions in the Phase II borings were generally encountered between 6 and 12 feet bgs across the site, indicating presence of a continuous groundwater unit within the sandy geologic material (CH2MHILL 2008).

Well records from the Illinois State Geological Survey indicate 28 groundwater wells registered within a 1-mile radius of the site. Most of these wells are screened in Silurian bedrock from 70 to 1,937 feet bgs (EDI 2009). However, these wells are believed to be inactive because the City of Chicago Department of Water Management supplies drinking water from Lake Michigan to the City of Chicago. Also, City of Chicago municipal code Chapter 11-8 prohibits installation of new potable supply wells.

Natural surface drainage patterns at the site have been altered by construction and demolition activities. Ground surface elevations range from 591 feet above mean sea level (MSL) near the southeast corner of the site to 600 feet above MSL near the center of the site. Overland flow is minimal due to relatively flat topography. Flooding is not expected at the site, as the site is not within 100-year or 500-year floodplains (EDI 2009).

3.2 SITE HISTORY

From about 1916 to 1921, Carnotite operated an elemental radium separation and refining facility at the site. Based on a 1911 Sanborn map, Conrad Seipp Brewing Company occupied the Carnotite site area prior to Carnotite operations (EDI 2008). The time period of Carnotite's operation is not covered by available historic records; therefore, the Carnotite site was not identified during previous Phase I and II ESAs (EDI 2008 and 2009; CH2MHILL 2008).

During the time period of Carnotite operations, uranium ore called carnotite was likely the primary raw material from which radium was extracted and concentrated. Although the carnotite ore was relatively rich in uranium, concentrations of radium were only in the milligrams per kilogram (mg/kg) range (i.e.,

parts per million [ppm]). Thus, large amounts of ore were required to produce relatively small amounts of radium. Most radium production sites in the early 1900s produced only a few grams of radium each year. However, production of a few grams would have required hundreds of tons of uranium ore. The separation methods used to isolate radium also separated and concentrated uranium from the origin ore during the radium recovery process. Based on historical U.S. Patent Office documents, Carnotite radium recovery operations included rotating the carnotite ore in drums or barrels, followed by treatment with an aqueous solution of sulfuric and hydrochloric acids. Addition of sulfuric acid facilitated formation of barium and radium sulfates, which remained insoluble during the treatment process, thereby facilitating the radium concentration process. The mixture was dried and baked at 250 degrees Celsius to drive off the water. The resultant “green slime” was further treated with a dilute solution of hydrofluoric acid and water to further concentrate the radium sulfate. An estimated 20 pounds of material containing radium, which was further refined, was produced from 1 ton of carnotite ore (U.S. Patent Office 1916 and 1919). Because radium was the primary focus, the extracted uranium would likely have become a waste. As a result, radionuclides of concern include both radium and uranium.

3.3 FORMER SITE INVESTIGATIONS

Previous Phase I and Phase II environmental site assessments (ESA) documented non-radiological contamination at the site; however, the focus of the current environmental monitoring addressed by this HASP/RPP is the evaluation of existing concentrations of radionuclides in air and groundwater to demonstrate that public doses do not exceed standards in 32 *Illinois Administrative Code* (IAC) 340.310. Previous radiological site investigations discussed below have documented elevated gamma readings in surface and subsurface soil, as well as elevated levels of radium and uranium in subsurface soil. Previous investigations have also delineated the extent of contamination at the site.

Phase I and II ESAs

On August 8, 2008, Environmental Design International, Inc. (EDI) submitted a Phase I Environmental Site Assessment (ESA) Update Report to CH2M HILL regarding the facility described as the Michael Reese Hospital and Medical Center, which included the site. This assessment revealed evidence of recognized environmental conditions (REC) in connection with the former Michael Reese Hospital facility. EDI also identified data gaps in historical information regarding the facility, particularly during the period of 1912 through 1949, and during the 1950s, 1960s, and early 1970s (EDI 2008).

On August 8, 2008, CH2M HILL prepared a Phase II ESA Report regarding the facility described as the Michael Reese Hospital site, which included the site. Fieldwork occurred in two phases—from May 5 to 14 (Phase IIa), and from June 12 to 13, 2008 (Phase IIb). A total of 127 soil samples and 53 groundwater

samples were collected for laboratory analysis during the two field efforts. Broad spectrum chemical analyses of the soil and groundwater samples occurred for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides, polychlorinated biphenyls (PCB), and metals. Approximately 58 percent of the soil samples collected at the site and nearby areas contained contaminant concentration(s) exceeding one or more Tiered Approach to Cleanup Objectives (TACO) Tier 1 residential criteria. An evaluation of the groundwater data acquired at the site documented TACO Tier 1, Class I groundwater criteria exceedances by concentrations of lead, arsenic, chromium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(123-cd)pyrene, and chloroform. Approximately 75 percent of the groundwater samples collected at the site contained contaminant concentration(s) exceeding one or more TACO Tier 1 residential criteria, principally lead concentrations (C2HM HILL 2008).

On June 26, 2009, EDI submitted a Phase I ESA Update Report regarding the facility described as the Michael Reese Hospital and Medical Center, which included the site. The updated Phase I ESA Report included addition of RECs per conclusions and results from the Phase II ESA completed by C2HM HILL on August 8, 2008. The report also included information obtained from the Office of the Illinois State Fire Marshal (OSFM) indicating an issued a notice of violation to the facility regarding eight USTs associated with the facility (EDI 2009).

Radiological Site Investigations

IEMA visited the former Michael Reese Hospital to close out radiological licenses at the former hospital and to scan the former hospital buildings. Through a record review, IEMA discovered a letter regarding a 1979 gamma survey related to the former Carnotite site. On August 12, 2009, IEMA conducted a gamma surface survey of the site area. On August 18, 2009, in a letter to the City of Chicago Department of Environment (DOE), IEMA indicated that the observed gamma readings did not pose an immediate health risk, but recommended additional characterization prior to invasive construction activities at the site (AECOM 2011a and 2014).

On December 11, 2009, EPA conducted a gamma surface survey of the site and confirmed presence of elevated surficial gamma activity. EPA provided DOE an aerial image depicting a color-coded data point overlay of the surface gamma readings, but gamma reading values were not provided (EPA 2009).

DOE evaluated historical documents to assess development of the site that took place during the early 1900s. DOE determined that Carnotite had operated on site from about 1916 until 1921. It was purchased by Tungsten Products Company (Boulder, Colorado) when it went out of business in 1920. Tungsten Products Company had recently merged with the Radium Company of Colorado. Information

on Tungsten Products or the Radium Company after 1926 could not be found. On March 14, 1979, the IDPH, Division of Radiological Health (a predecessor organization to IEMA), in cooperation with EPA, surveyed the area of what was thought to be the site. Most of the site at that time was part of the Michael Reese Medical Center. Radiation levels were found relatively low, and because of the depth of the radioactive material and the geographical location, IDPH determined that no immediate health hazard was apparent (IDPH 1979).

On January 26, 2011, AECOM completed an interior radiological survey of Building No. 1 and provided a letter report to the Chicago Public Building Commission (PBC) titled “Interior Radiological Survey Results for Building No. 1 – Former Carnotite Reduction Company Investigation.” The investigation area consisted of a large building within the northeast portion of the site (Building No. 1) that was part of the former Michael Reese Hospital complex. AECOM had conducted the gamma surface survey using Ludlum Model 2221 meters and unshielded 2- x 2-inch sodium iodide (NaI) probes (Model 44-10). Field instrumentation background for the interior slab of approximately 5,150 cpm was established based on six readings taken within the building and away from the exterior walls. Maximum readings from the floor slab survey grids ranged from 4,800 to 9,300 cpm. The southwest corner of the building was not surveyed because debris/conditions limited access. In addition to the main building area, the concrete slab within the covered walkway extending south from the southeast corner of the building was also surveyed on December 13, 2010. Gamma readings did not indicate elevated conditions, and results (grid maximums) ranged from 6,100 to 7,200 cpm. Thus, the interior floor surveys did not indicate elevated gamma readings that could indicate presence of radiologically-impacted soil beneath the concrete slabs. Based on the survey results, AECOM determined that a radiological exposure issue for the public and/or construction workers did not exist, as long as the pavement would remain appreciably intact and soil beneath the slab would not be exposed. The recommendation was based on identification of several projects where known radiological impacts had existed beneath paved surfaces in public areas (i.e., parking lots), but EPA had allowed continued use of the areas as long as the paved surface would be maintained (AECOM 2011a).

On February 8, 2011, AECOM completed a radiological surface gamma survey and provided a letter report to the PBC titled “Radiological Surface Gamma Survey Results – Former Carnotite Reduction Company Investigation.” The investigation area included grassed and paved surfaces, as well as Building No. 1 that was part of the former Michael Reese Hospital complex but based on its year of construction (1948), was not associated with Carnotite. The surface gamma survey utilized an unshielded Ludlum 2221 meter-scaler with a 2- x 2-inch NaI probe. Surface readings were recorded continuously and logged at a minimum of every 2 seconds along with Global Positioning System (GPS) coordinates as the

operator traversed the investigation area. The individual traverses were spaced approximately 3 feet apart and generally parallel to the boundaries of the screening area. The field instrumentation surface gamma background value was calculated to be approximately 4,050 cpm for paved surfaces and 6,815 cpm for soil or grassed areas. Because cleanup criteria and an equivalent field instrumentation threshold had not been established for the site, elevated gamma readings were defined as readings exceeding twice background. Based on the benchmark of twice the paved background value (8,100 cpm), a significant portion of the investigation area (predominantly the southern and eastern portions) had surface gamma readings not indicative of radiologically-impacted material. The surface gamma survey encountered elevated gamma readings in the northwest portion of the investigation area adjacent to and likely beneath East 26th Street (see Figure 3). Peak gamma responses exceeded 90,000 cpm within an area west of the former Building No. 1 and near the East 26th Street curb line. The results indicated that the paved road surface was likely providing significant shielding, and the radiologically-impacted soil likely extended into or was contiguous beneath the street. The areas of elevated gamma response were generally consistent with results of previous smaller scale surface gamma studies by IEMA and EPA (AECOM 2011b).

In June 2012, EPA conducted a radiological surface gamma survey of the site and of properties in the vicinity of the site (readings were in counts per second [cps]). Three figures were provided—aerial images of the site and the area in the vicinity of the site. The figures included color-coded point data overlays of the surface gamma readings. The highest total gamma cps survey readings were encountered along 26th Street, particularly in the northwest portion of the site and at the northern edge of the tennis courts (EPA 2012).

On June 11, 2012, AECOM completed a down-hole gamma survey of the site and submitted a final report titled “Subsurface Gamma Screening Results (Final) – Former Carnotite Reduction Company” to the PBC. The down-hole surveys utilized a Ludlum 2221 rater-scaler with a 0.5- by 1-inch NaI probe Model 4462 that was equipped with a 1-inch lead end-cap. The purpose of the lead end-cap was to shield gamma radiation from below the probe so that the readings as much as possible reflected the gamma radiation encountered laterally from the probe. A Geoprobe rig was utilized to advance the boreholes and collect samples for radioisotope analyses. A total of 215 borings were advanced, down-hole logged, and position-located by use of GPS instrumentation. Down-hole gamma readings ranged from <1,000 cpm to over 230,000 cpm. In general, the native sand was encountered at about 6 feet bgs, but at greater depths where historical foundations were present. A total of 58 soil samples were selected for gamma spectroscopy analysis. A balance of clean and impacted surface samples (0 to 2 feet bgs) were selected, as well as a group of subsurface samples that had exhibited a range of gamma counts. In the 58 samples

analyzed at the laboratory via gamma spectroscopy, total uranium activity ranged from non-detect to 3,670 picocuries per gram (pCi/g), and total radium activity ranged from 0.85 to 1,181 pCi/g (AECOM 2012a).

On October 22, 2012, AECOM completed a radiological surface surveillance for demolition operations of Building No. 1, and provided a letter report to the PBC titled “Radiological Surface Surveillance of Demolition Operations for Building No. 1 – Former Carnotite Reduction Company Investigation.” AECOM applied the same methods described in the “Radiological Surface Gamma Survey Results – Former Carnotite Reduction Company Investigation” letter report to conduct ground surface gamma surveys. Field gamma measurements reported during radiological surveying prior to and during demolition of Building No. 1 did not exceed the respective “twice-background” threshold limits previously cited, and ranged from 7,800 to 13,700 cpm unshielded. Thus, no presence of radiologically-contaminated material was indicated (AECOM 2012b).

On October 31, 2012, AECOM completed a surface gamma survey and provided a letter report to the PBC titled “Draft-Radiological Surface Gamma Survey Results - Former Michael Reese Hospital site.” The September 2012 investigation area included South Vernon and South Ellis Avenues north of East 29th Street, as well as a flat, grass-covered area west of South Ellis Avenue, which is south of the site. AECOM applied the same methods described in the “Radiological Surface Gamma Survey Results – Former Carnotite Reduction Company Investigation” letter report to conduct ground surface gamma surveys. Results of the September 2012 survey within the paved areas did not indicate gamma readings greater than twice background for paved areas. Gamma readings within the vegetated or soil covered surfaces were all less than 13,000 cpm—substantially less than twice the background value for these surfaces. Thus, gamma readings taken during the September 2012 survey did not indicate results indicative of surface or near-surface radiological contamination (AECOM 2012c).

On February 1, 2013, Prairie Shores Apartments (Prairie Shores) submitted a letter to IEMA regarding radiological surveys of the apartment buildings and grounds. Prairie Shores is south-southwest of the site. At Prairie Shores, Radiation Safety Services, Inc. (RSSI) had conducted short- and long-term radon monitoring utilizing alpha track radon monitors, surface radiation surveys by use of a Ludlum Model 44-10 side-shielded probes connected to Ludlum 193 alarming rate meters, and dose rate surveys utilizing Health Physics Instrument Model 1010 tissue-equivalent dose-rate meters. Short-term radon monitoring indicated radon measurements from <0.3 to 1.7 pCi/L (picocuries per liter). Long-term radon monitoring indicated radon measurements from 0.8 to 2.9 pCi/L. Surface radium survey readings did not exceed 2,000 cpm except for a range from 6,000 to 8,000 cpm within a localized area adjacent to the base of a

freestanding brick wall at the east edge of the parking lot east of Vernon Avenue and opposite Prairie Shores Building 3. Background dose rate at Prairie Shores was measured at approximately 0.006 micro roentgens per hour (mrad/hr). Dose rates exceeded background only at the east and west base of the brick wall (ranging from 0.014 to 0.026 mrad/hr), with surface radium survey readings of 6,000 to 8,000 cpm. Dose rates ranged from 0.008 to 0.014 mrad/hr at three other locations, including a green space between the west side of Prairie Shores building and King Drive, a localized area on unpaved land north of Prairie Shores Building 5 parking lot, and two localized areas of the paved circular drive north of Prairie Shores Building 4. Based on results of the evaluation and health-based standards applied by IEMA, Prairie Shores concluded that no actionable public health risk existed on the Prairie Shores property as a result of radiological contamination associated with the site. Prairie Shores requested a review of the evaluation results by IEMA to confirm absence of actionable public health risk, to determine if IEMA would recommend remediation of two discrete areas of contamination, and if IEMA would consider release of the Prairie Shores property for unrestricted use (Prairie Shores 2013).

On March 4, 2013, IEMA responded to the Prairie Shores “Prairie Shores Apartments – Radiological Investigations” letter report. IEMA concurred with the methodology utilized by RSSI to conduct the cursory site investigation. IEMA suggested both near surface and subsurface soil sampling investigations, combined with down-hole gamma surveys, to fully characterize and delineate lateral and vertical extents of possibly present contamination. IEMA recommended analyses of samples for total radium and total uranium. IEMA stated that without data further characterizing the Prairie Shores property, a public health risk related to possibly present radiological contamination at the Prairie Shores property could not be confirmed or refuted (IEMA 2013).

On May 23, 2013, EPA submitted a letter to the City of Chicago Department of Law, Aviation, Environmental, Regulatory & Contracts Division that conveyed a cost estimate for cleanup of the site to the City of Chicago. EPA had prepared a rough draft, order of magnitude cost estimate for cleanup of certain environmental contamination on the property. EPA based the estimate on cleanup of likely contaminants of concern including arsenic, lead, radium, and uranium, and respective cleanup criteria of 13.1 ppm, 400 ppm, 7.1 pCi/g, and 20 pCi/g. EPA also incorporated boring data acquired by AECOM, and assumed GPS identification of elevated areas, programmable heavy equipment using GPS readings to direct work, and transport of radioactively contaminated material to properly licensed disposal facilities in compliance with EPA off-site policies. Without an exact volume of contaminated soils determined, EPA’s preliminary estimate indicated a cost of approximately \$23 million to conduct cleanup work (EPA 2013).

On June 28, 2013, AECOM submitted a letter report to AIS titled “Radiological Surface Gamma and Dose Rate Survey Results – Former Michael Reese Hospital Site.” At the time of the report, the former Michael Reese Hospital facility, which included the site, was covered primarily by vegetation/soil, gravel/crushed concrete surfaces, and paved surfaces (streets and sidewalks). In April 2013, AIS authorized AECOM to conduct a similar surface gamma survey east of S. Vernon and S. Ellis Avenues, north of E. 29th Street, south of E.27th Street, and west of the Metra rail corridor. AECOM applied the same methods described in the “Radiological Surface Gamma Survey Results – Former Carnotite Reduction Company Investigation” letter report to conduct ground surface gamma surveys. The twice background value for the paved areas slightly exceeded 10,068 cpm. Results from both the September 2012 and April 2013 surveys of the paved areas did not indicate gamma readings greater than twice background for paved areas. Gamma readings from the vegetated or soil-covered surfaces were less than 13,000 cpm and substantially less than twice the background value for these surfaces. Thus, gamma readings taken during the September 2012 and April 2013 surveys did not indicate presence of surface or near-surface radiological contamination. A primary goal of the September 2012 and April 2013 surface surveys was to determine if radiological contamination was present that could represent a potential human health exposure issue. Survey results did not indicate presence of radiological contamination at or in the near surface soil of the investigation area. Therefore, no radiological concern with surface soil in the survey areas was indicated. Limitations of Ludlum instrumentation surveys, especially shielding effects, restrict the surface gamma screening technique to the upper 1.5 feet of soil and 1 foot or less of paved areas. Thus, conclusions regarding absence of radiological contamination should not be extrapolated to soil beneath pavement or to depths exceeding 1.5 feet below unpaved surfaces. Dose rates were measured by use of a Bicron MicroRem. Dose rate results within areas outside of the area of known contamination ranged from 3 to 7 micro rems per hour (micro-rem/hr) at the surface, and appeared to be at background level for the areas. These areas include the former park and playground area, and the former building and parking lot areas north of E. 29th Street. Within the area of known contamination, the dose rates measured at the surface ranged from 3 to 55 micro-rem/hr, with an average of 13 micro-rem/hr. The relatively small areas with the highest measured dose rates were consistent with areas of high levels of surface gamma activity indicated in data acquired during the original December 2010 and January 2011 surface surveys. Because the areas with highest dose rates were small, AECOM determined that exceedance of the Nuclear Regulatory Commission’s (NRC) annual dose limit was not a realistic expectation (AECOM 2013).

On December 4, 2013, IDPH provided a Letter Health Consultation regarding the site. The health consultation indicated that public dose rates for commuters traversing accessible portions of the site were not expected to exceed acceptable dose limits (IDPH 2013).

On May 22, 2014, AECOM submitted a report to AIS titled “Subsurface Gamma Screening Report – Former Michael Reese Hospital Campus.” As previous surface and subsurface studies focused on the delineation of radiological contamination near the northern boundary of the former Michael Reese Hospital campus, the purpose of the investigations discussed in this report was to collect data to substantiate that radiological contamination was not present on other portions of the former campus. The subsurface investigation included down-hole gamma surveys at 29 soil borings. The investigation also included collection and analysis of select soil samples from several of the soil borings. The 29 borings were advanced at locations predetermined by AIS. Two of the borings, B-27 and B-29, were advanced at locations within the current radioactive material license area, near the eastern boundary of the area. AECOM applied a method for the down-hole gamma survey and soil sample collection similar to that described in the “Subsurface Gamma Screening Results (Final) – Former Carnotite Reduction Company” report. Down-hole gamma survey measurements were taken from each of the 29 soil borings. Down-hole gamma readings from the fill soil ranged from 260 to 2,078 cpm—less than twice the field instrument background value of 2,500 cpm. Therefore, no elevated subsurface gamma readings indicative of potential radiological contamination were encountered at the 29 boring locations. Fill soil samples were collected from select borings and submitted for gamma spectroscopy. The samples were selected to represent a range of gamma readings encountered, as well as spatial distribution across the investigation area. While cleanup criteria had not been established for the site, review of the gamma results indicated that none of the 10 samples had total radium or uranium activities that would be inconsistent with background soil conditions or likely to be considered as indicative of contamination related to Carnotite operations (AECOM 2014).

In October 2016, Tetra Tech prepared a dose assessment report for uranium soil cleanup objective determination. The dose assessment report’s primary purposes were to establish a uranium soil cleanup objective consistent with standards in 32 IAC 340.310 and to determine if additional groundwater sampling was needed at the Carnotite site. A uranium soil cleanup objective of 187 pCi/g was calculated based on a set of soil-based exposure pathways assuming a conservative residential scenario and using the Residual Radioactivity (RESRAD)-ONSITE modeling program. Subsequently, the RESRAD-OFFSITE modeling program was used to evaluate whether soil at the Carnotite site may adversely impact receptors exposed via surface water from Lake Michigan, about 0.25 mile east and downgradient of the Carnotite site. Based on a total uranium soil concentration of 3,670 pCi/g (the maximum detected concentration of total uranium in site soil), the maximum dose to receptors potentially exposed via ingestion of surface water and fish tissue from Lake Michigan downgradient of the Carnotite site was established at 5.859E-07 mrem/yr. This dose is well below the allowable annual dose of 25 mrem/yr. Finally, the RESRAD-OFFSITE modeling program was used to evaluate hypothetical use of groundwater as drinking water and

resulting dose estimates. Based on a total uranium soil concentration of 3,670 pCi/g, the maximum dose is 6E-01 mrem/yr for a drinking water well located at the Carnotite site boundary; again, well below the allowable annual dose (Tetra Tech 2016a).

On April 3, 2017, Tetra Tech collected two soil samples for remediation planning. The soil samples were collected from areas along 26th Street known to be contaminated. One sample was collected from 2.5 feet bgs and another from the surface. Ra-226 was detected from 57.9 to 592 pCi/g, Th-230 was detected from 106 to 445 pCi/g, and total uranium was detected from 36.5 to 48 pCi/g (Tetra Tech 2017a).

In July 2018, Tetra Tech conducted a pre-design investigation to further delineate Ra-226, Th-230, and total uranium contamination in soil; confirm depth to a confining clay layer for evaluating shoring requirements; and acquire groundwater data for design of dewatering and pre-treatment systems. Existing groundwater monitoring wells were sampled; a new groundwater monitoring well (MW-1) was installed and sampled; and 18 investigative, seven background, and three waste characterization soil borings were advanced. Also, XRF screening was conducted for select soil samples. Of 65 investigative soil samples collected within 0 and 30 feet bgs, nine contained Ra-226, total uranium, or Th-230 above site-specific soil remediation criteria at depths between 0 and 6 feet bgs. These exceedances were detected only within previously identified contaminated areas. No Ra-226, total uranium, or Th-230 soil concentrations exceeded soil remediation criteria outside of the horizontal or vertical footprint of the established contamination area. In addition, no soil remediation criteria were exceeded in the 33 soil samples collected below the water table. No borings could be installed west of the plume area along 26th Street and east of Martin Luther King Drive due to access issues and the presence of utilities. However, the extent of contamination in these areas was defined during the 2012 subsurface investigation. In 2012, no contamination was detected above site-specific concentrations of concern in soil analytical or gamma screening results collected west of the contaminated area. Also, the results indicate that uranium and thorium are not likely present outside the previously delineated areas of contamination.

XRF data collected during the investigation were compared with laboratory results. XRF and laboratory analytical results were similar for uranium concentrations detected by the XRF analyzer above 50 ppm. For total uranium concentrations near the XRF detection limit range of 15 to 25 ppm, the difference between XRF and laboratory analytical results was greater but remained within the acceptable range of difference between soil duplicate samples. However, the total uranium COC at depths less than 5 meters is 22 pCi/g, which is less than or within the XRF detection range. Therefore, total uranium concentrations near the COC may not be detected by the XRF. Accurate determination of Th-230 concentrations in soil by use of field screening with an XRF was found to be impractical because XRF

results were not consistent with analytical results. Other study objectives achieved included: (1) confirmation of the depth to clay at 31 to 33 feet bgs; (2) establishment of Th-230 background concentration of 0.842 pCi/g and, as a result, a tTh-230 remediation objective of 5.8 pCi/g; (3) acquisition of groundwater analytical results for wastewater treatment design and discharge purposes; and (4) confirmation that groundwater analytical results do not exceed site-specific groundwater remediation criteria (Tetra Tech 2018a).

In December 2018, GSG Consultants, Inc. (GSG) conducted a geotechnical investigation in the north contaminated area where deep excavation to 14 to 15 feet bgs is planned during site remediation activities. Three soil borings were advanced at the northwest, east, and southwest boundary of the expected deep excavation area to explore the subsurface conditions, to determine engineering properties of the subsurface soil, and develop sheet piling design and construction recommendations.

Representative soil samples were tested for moisture content, Atterberg Limits, and dry unit weight. Soil borings were advanced to between 61 and 71 feet bgs. In the borings, fill material was observed from the surface to between 3.5 and 6.5 feet bgs. Beneath the fill, loose to medium dense sand was observed to depths of between 26 and 31 feet bgs. Clay and silty clay was encountered below the sand to boring depths of between 61 and 63.5 feet bgs. Two borings were terminated at 61 and 61.5 feet upon encountering auger refusal on hard silty clay soils. The third boring noted dense to very dense silt with traces of clay and limestone fragments between 63.5 and 71 feet bgs. Groundwater was encountered at depths ranging from 8.5 to 18.5 feet bgs (GSG 2019a). GSG also determined minimum excavation slope requirements for the site remediation activities based on the results of the geotechnical investigation. The following side slopes were recommended (GSG 2019b):

- For excavations up to 15 feet bgs - 2.5H:1V
- For excavations 7.5 feet bgs or less - 2H:1V
- For excavations 5 feet bgs or less - 1.5H:1V

In December 2018, Tetra Tech conducted a hydrogeologic assessment at the site. The assessment was performed to support the remedial design. Slug tests and surveying of existing monitoring wells ASC-2A, ASC-5, and MW-1 were conducted to determine groundwater flow rate. Groundwater flow rate was used to facilitate design of excavation dewatering and groundwater treatment remediation activities. Hydraulic conductivity in the on-site wells ranged from 1.69×10^{-3} centimeters per second (cm/sec) in MW-1 to 7.17×10^{-3} cm/sec in ASC-5 (Tetra Tech 2019a).

In January 2019, Tetra Tech conducted a soil boring investigation to determine the maximum depth of contamination located beneath the northern portion of 26th Street and along the north property boundary.

The maximum depth of contamination above site-specific soil remediation criteria was determined to be 14 feet bgs. Total uranium was detected in soil up to 41 pCi/g and to depths of up to 14 feet. Ra-226 was detected in soil up to 26.9 pCi/g and Th-230 was detected up to 89 pCi/g, both within previous maximum depth ranges of 7 feet bgs or less. Soil boring logs confirmed subsurface conditions consistent with previous investigations. In March 2019, Tetra Tech advanced a hand boring to confirm the eastern extent of surficial Th-230 contamination along the northern portion of 26th Street. Ra-226, total uranium, or Th-230 were not detected at concentrations above the site-specific soil remediation criteria (Tetra Tech 2019b).

In July 2019, at the request of the City's Department of Water Management, AIS conducted a sewer investigation in planned excavation areas to determine if any unknown connections to the combined sewers exist prior to removal of the sewers during remediation activities. During the investigation, the sewers were cleaned by hydro-jetting, if possible, and televised. Two previously unknown sewer connections to the north 26th Street sewer from the adjacent property to the north were discovered. In addition, the sewer along north 26th Street was observed to be in poor condition in some locations (Tetra Tech 2019c).

In summary, investigations at the site since 2009 have identified the presence of gamma activity. A subsurface investigation in June 2012 confirmed the presence of elevated levels of radium and uranium in subsurface soil. Soil sampling in 2017 and the pre-design investigation in 2018 confirmed the presence of Th-230. The 2018 pre-design investigation also delineated the extent of Ra-226, total uranium and Th-230 soil contamination. The City (AIS) was required to obtain a radioactive facility license with the IEMA because of the discovery of radionuclide contamination associated with the former Carnotite site and the need to address the contamination in accordance with state and federal requirements. IEMA is the lead regulatory agency that oversees the proper management and remediation of radionuclide-contaminated sites in Illinois.

3.4 PLANNED ACTIVITIES

The Engineer and RSO field activities to occur during site remediation activities at the site are provided in the Introduction, Section 1.0, of this HASP/RPP.

Additional details regarding implementation of these tasks appear in other site-related documents such as the field sampling plan.

4.0 SITE-SPECIFIC HAZARD EVALUATION

Field activities and physical features of the site may expose field personnel to a variety of hazards. This section provides information on potential hazards related to site activities and the nature of hazardous materials. Potential radiological, chemical, and physical hazards related to site activities are discussed below.

4.1 SUMMARY OF EXISTING RADIOLOGICAL CONDITIONS

Based on historical information regarding uranium contamination throughout the site and isotopic uranium analysis of on-site soil, most uranium at the site likely is primarily in the form of natural uranium (U-nat). U-nat consists of three major isotopes, uranium-238 (U-238), uranium-235 (U-235), and uranium-234 (U-234). Although U-nat is composed primarily of U-238 (99.3 percent), the radioactivity percentage of each U-nat isotope is as follows: 48.9 percent U-238, 48.9 percent U-234, and 2.2 percent U-235. The nature and extent of radiological contamination at the site are discussed in Section 3.3 above. The maximum total uranium concentration detected in on-site soil was 3,670 pCi/g. Th-230 is a long-lived decay product of uranium-234 and has been detected up to 445 pCi/g in on-site soil.

Based on historical information regarding radium contamination throughout the site, most radium at the site likely is in the form of relatively insoluble radium sulfate (RaSO_4). Radium contamination throughout the site likely is primarily in the form of Ra-226. Radium-228 has not been detected above background concentrations at the site. The nature and extent of radiological contamination at the site are discussed in Section 3.3 above. The maximum Ra-226 concentration detected in on-site soil was 1,124 pCi/g.

The on-site surface soil sample with greatest concentration of uranium and radium also contained 75 pCi/g of thorium-234, 89 pCi/g of protactinium-234, 257 pCi/g of lead-214, 233 pCi/g of bismuth-214, 3.53 pCi/g of actinium-228, 6.38 pCi/g of bismuth-212, and 2.91 pCi/g of thallium-208.

Ra-226 is formed from the radioactive decay of uranium-238 and thorium-230. Ra-226 undergoes radioactive decay via alpha emission, and has a half-life of approximately 1,600 years (see Table 4-1 below). Radon-222 is a daughter product of Ra-226. Members of the radon decay chain transmute via alpha or beta emission, and in some cases emit gamma radiation.

Uranium is a naturally occurring element. In its natural state, crystal uranium occurs as a component of several minerals, such as carnotite, uraninite, and pitchblend, but is not found in the metallic state. U-238 undergoes radioactive decay via alpha and gamma emissions, and has a half-life of approximately 4,468,000,000 years (see Table 4-1). U-234 undergoes radioactive decay via alpha and gamma emissions, and has a half-life of

approximately 245,500 years (see Table 4-1). U-235 undergoes radioactive decay via alpha and gamma emissions, and has a half-life of approximately 703,800,000 years (see Table 4-1).

**TABLE 4-1
RADIOACTIVE DECAY SERIES
CARNOTITE SITE**

Symbol	Element	Radiation	Half-Life	Decay Product
U-238	Uranium-238	Alpha	4,468,000,000 years	Th-234
Th-234	Thorium-234	Beta	24.1 days	Pa-234
Pa-234	Protactinium-234	Beta	1.17 minutes	U-234
U-234	Uranium-234	Alpha	245,500 years	Th-230
Th-230	Thorium-230	Alpha	80,000 years	Ra-226
Ra-226	Radium-226	Alpha	1,600 years	Rn-222
Rn-222	Radon-222	Alpha	3.82 days	Po-218
Po-218	Polonium-218	Alpha	3.05 minutes	Pb-214
Pb-214	Lead-214	Beta	27 minutes	Bi-214
Bi-214	Bismuth-214	Beta	19.7 minutes	Po-214
Po-214	Polonium-214	Alpha	1 microsecond	Pb-210
Pb-210	Lead-210	Beta	22.3 years	Bi-210
Bi-210	Bismuth-210	Beta	5.01 days	Po-210
Po-210	Polonium-210	Alpha	138.4 days	Pb-206
Pb-206	Lead-206	None	stable	(none)

4.2 WORKER/PUBLIC RADIATION DOSE LIMITS

Site investigation activities may pose increased potential for worker and public exposures to disturbed radioactive materials via a variety of potential exposure pathways. These pathways include inhalation of suspended particulates and/or radon progeny, direct exposure to gamma emitting radioactive material, and ingestion or inhalation of removable contamination. The HASP/RPP is implemented by application of selected components, including dose limits, of the radiological protection framework presented within Title 32 of IAC. Use of these dose limits (subject to administrative reductions and monitoring/radiological protection actions) will ensure that worker doses are documented, and that public and worker doses are maintained at levels As Low as Reasonably Achievable (ALARA).

The ALARA concept serves as the basis for a sound health physics program. On-going evaluation of site procedures is an important aspect of the ALARA program. Radioactive materials license conditions and applicable regulations dictate the maximum limits for levels of contamination, airborne particulates, and personnel dose. However, an effective ALARA program sets administrative goals that are more restrictive in order to reduce exposures and force an evaluation of procedures and other site controls, if needed.

The ALARA policy will be implemented as part of the site HASP/RPP via site safety meetings, training, planning, issuance of and compliance with SWPs, implementation of radiation control measures, establishment of administrative control limits, and use of PPE. Implementation of the policy requires active participation of all on-site personnel and anyone entering the site, especially all personnel conducting work within established exclusion zones. Engineering controls will be the preferred means of reducing exposures, although administrative control or personal protective clothing and equipment may also be used.

Specific information on potential radiological hazards at the site is in Table 4-2, including exposure limits, anticipated exposure routes, and toxic characteristics. Table 4-3 lists radiation dose limits per year and the project-administered radiation dose limits.

TABLE 4-2
POTENTIAL RADIOLOGICAL HAZARDS
CARNOTITE SITE

Radiological Contaminant	Exposure Limits	Exposure Routes	Toxic Characteristics⁽¹⁾
Radium-226	See Table 4-3	Inhalation of suspended particulates and radon progeny, direct exposure to gamma-emitting radium sources, and ingestion or inhalation of removable alpha contamination	Long-term exposure to low levels of radium increases risk of developing several types of diseases. Inhaled or ingested radium increases risk of developing lymphoma, bone cancer, and diseases that affect formation of blood, such as leukemia and aplastic anemia. These effects usually take years to develop. External exposure to radium's gamma radiation increases risk of cancer to varying degrees in all tissues and organs.
Thorium-230	See Table 4-3	Inhalation of suspended particulates, direct exposure to gamma-emitting sources, and ingestion or inhalation of removable alpha contamination	Inhaled or ingested thorium may cause an increased risk of developing lung or bone cancer.
Uranium (nat)	See Table 4-3	Inhalation of suspended particulates, direct exposure to gamma-emitting sources, and ingestion or inhalation of removable alpha contamination	Intakes of uranium exceeding EPA standards can lead to increased cancer risk, liver damage, or both. Long-term chronic intakes of uranium isotopes in food, water, or air can lead to internal irradiation and/or chemical toxicity.

Source:

⁽¹⁾ U.S. Environmental Protection Agency (EPA). 2019. Radiation Protection Website. On-line address: <https://www.epa.gov/radiation/radionuclides> Accessed on June 25, 2019.

TABLE 4-3
ENVIRONMENTAL MONITORING DOSE LIMITS FOR WORKERS AND PUBLIC
CARNOTITE SITE

Dose Target	32 IAC Part 340	Project Administrative Limits⁽¹⁾
Worker Whole Body TEDE ⁽²⁾	5 rem/year	External Dose 0.125 rem/quarter (0.500 rem/year) Internal Dose 0.125 rem/quarter (0.500 rem/year)
Worker Lens of Eye	15 rem/year	0.375 rem/quarter (1.5 rem/year) ⁽³⁾
Worker Individual Organ	50 rem/year	1.25 rem/quarter (5 rem/year)
Worker Skin or Extremity	50 rem/year	1.25 rem/quarter (5 rem/year) ⁽³⁾
Public Whole Body TEDE ⁽²⁾	0.1 rem/year	0.1 rem/year

Notes:

⁽¹⁾ Project administrative limits are ALARA goals and 10% of annual limits based on 32 IAC 340.520. These are presented on a quarterly basis because data will be acquired quarterly.

⁽²⁾ TEDE is calculated as the sum of the external dose equivalent and the committed effective dose equivalent.

⁽³⁾ It is anticipated that lens of eye and skin/extremity doses will be negligible; therefore, no formal monitoring protocols are specified. Should field conditions warrant, additional monitoring will occur.

IAC *Illinois Administrative Code*
mrem Millirem
rem Roentgen equivalent man
TEDE Total effective dose equivalent

4.3 CHEMICAL HAZARDS

Previous investigations have identified 10 non-radiological contaminants of potential concern at the Carnotite site: arsenic, benzo(a)anthracene, benzo (b)fluoranthene, benzo(a)pyrene, carbazole, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, lead, mercury, and naphthalene. Arsenic was detected in soil at concentrations up to 60 mg/kg. Benzo(a)anthracene was detected in soil up to 56.2 mg/kg. Benzo (b)fluoranthene was detected in soil up to 65.3 mg/kg. Benzo(a)pyrene was detected in soil up to 81.6 mg/kg. Carbazole was detected in soil up to 4.59 mg/kg. Dibenz(a,h)anthracene was detected in soil up to 6.84 mg/kg. Indeno(1,2,3-cd)pyrene was detected in soil up to 127 mg/kg. Lead was detected in soil up to 7,400 mg/kg. Mercury was detected in soil up to 1.7 mg/kg. Naphthalene was detected in soil up to 148 mg/kg. The Engineer will limit exposure to these potential chemical hazards by implementation of engineering controls such as suppression, and administrative controls such as limitation of access to areas of contamination. Site action levels for particulate monitoring in air should be inclusive and sufficiently protective for these chemical hazards as well as the radiological hazards on-site.

Also, the Engineer will limit exposure to chemical hazards by requiring use of appropriate PPE such as Tyvek[®] coveralls, gloves, and overboots. See Section 6.1 for PPE requirements. Specific information on potential chemical hazards at the site appears in Table 4-4, including exposure limits, anticipated exposure routes, and toxic characteristics. SDSs included with this HASP/RPP summarize health and safety information regarding

hazardous materials that will be brought to the site, such as laboratory reagents, decontamination solutions, and sample preservatives.

Additionally, Agency for Toxic Substances and Disease Registry (ATSDR) fact sheets are included for arsenic, lead, mercury, naphthalene, polycyclic aromatic hydrocarbons (PAH) (i.e., benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, carbazole, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene), radium, and uranium.

- Arsenic ATSDR fact sheet
- Lead ATSDR fact sheet
- Mercury ATSDR fact sheet
- Naphthalene ATSDR fact sheet
- PAH ATSDR fact sheet
- Radium ATSDR fact sheet
- Thorium ATSDR fact sheet
- Uranium ATSDR fact sheet.

All site personnel will be informed of hazards associated with the contaminants of concern and any chemicals necessary to complete the project. Additionally, SDSs will be included as needed and provided with the HASP/RPP or brought to the site.

TABLE 4-4
POTENTIAL CHEMICAL HAZARDS
CARNOTITE SITE

Chemical	Matrix	Highest Observed Concentration	Exposure Limits and IDLH Level	Exposure Routes	Symptoms of Exposure
Arsenic	Soil	60 mg/kg	PEL = TWA 0.01 mg/m ³ REL = CARC = 0.002 mg/m ³ [15-minute] TLV = TWA 0.01 mg/m ³ IDLH = CARC; 5.0 mg/m ³	Inhalation, ingestion, skin and/or eye contact	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, potential occupational carcinogen
Lead	Soil	7,400 mg/kg	PEL = TWA 0.05 mg/m ³ REL = CARC = 0.05 mg/m ³ TLV = TWA 0.05 mg/m ³ IDLH = 100 mg/m ³	Inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension
Mercury	Soil	1.7 mg/kg	PEL = TWA 0.1 mg/m ³ REL = CARC = 0.1 mg/m ³ TLV = TWA 0.05 mg/m ³ IDLH = 10 mg/m ³	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria
Naphthalene	Soil	148 mg/kg	PEL = TWA 10 ppm or 50 mg/m ³ REL TLV = TWA 10 ppm or 50 mg/m ³ IDLH = 250 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage
PAHs (as Coal Tar Pitch Volatiles)	Soil	127 mg/kg of Indeno(1,2,3-cd)pyrene	PEL = TWA 0.2 mg/m ³ REL = CARC = TWA 0.1 mg/m ³ TLV = TWA 0.2 mg/m ³ IDLH = 80 mg/m ³ PEL = TWA 100 ppm (Naphtha [coal tar])	Inhalation, skin absorption, ingestion, skin and/or eye contact	Headache, nausea, vomiting, diaphoresis, respiratory and dermal irritation; chronic bronchitis, chronic cough irritation, bronchogenic cancer, dermatitis, cutaneous photosensitization, pilosebaceous reactions, leukoplakia, buccal-pharyngeal cancer, cancer of the lip, lymphoma, hematuria, kidney and bladder cancers

Sources:

National Institute for Occupational Safety and Health (NIOSH). 2016. *Pocket Guide to Chemical Hazards*. July.

American Conference of Governmental Industrial Hygienists (ACGIH). 2018. "Threshold Limit Values and Biological Exposure Indices for 2018."

Notes:

C 15-minute Ceiling exposure
CARC Potential occupational carcinogen
IDLH Immediately dangerous to life or health
mg/m³ Milligrams per cubic meter
mg/kg Milligrams per kilogram
PEL Permissible exposure limit
REL Recommended exposure limit
TLV Threshold limit value
TWA Time-weighted average

4.4 PHYSICAL HAZARDS

Physical hazards associated with site activities present a potential threat to on-site personnel. Dangers are posed by, but not limited to, heavy equipment, open excavations, utility and power lines, slippery surfaces, unseen obstacles, noise, heat, cold, and poor illumination.

Injuries resulting from physical hazards can be avoided by applying SWP and exercising caution when working with machinery. Specific SWPs applicable to the site are listed in Section 9.5. To ensure a safe workplace, the SSC will conduct and document regular safety inspections, and will ensure that all of the Engineer's workers and visitors are informed of any potential physical hazards related to the site.

Physical hazards that have been identified at this site include the following:

- Exposure to radiological hazard from radium, uranium, and thorium
- Slips, trips, and falls
- Heavy machinery
- Open excavations
- Truck traffic
- Airborne dust and flying debris
- High noise
-
- Weather extremes including heat and cold stress
- Heavy lifting

4.5 BIOLOGICAL HAZARDS

The site is within a minimally wooded and mostly open area. Encountering biological hazards, primarily biting and stinging insects, is possible during work activities.

Table 4-5 presents a hazard analysis that encompasses chemical, physical, and biological hazards, including required controls regarding drilling to occur at the site.

4.6 ACTIVITY HAZARD ASSESSMENT

Multiple work tasks will be undertaken during the site remediation activities. These work tasks will require participation of various project staff and subcontractors, and may involve varying potential for exposure to chemical, physical, biological, and radiological hazards at the site. Table 4-5 includes descriptions of primary monitoring and investigation work tasks and their associated chemical, physical,

biological, and radiological hazards. Also included are mitigation measures to reduce or control impacts of the chemical, physical, biological, and radiological hazards. Many radiological hazard mitigation measures are actions described in the radiological safe work practices to be developed by the Engineer. Other actions are developed based on task-specific circumstances. Table 4-5 presents a hazard analysis that encompasses chemical, physical, biological, and radiological hazards at the site.

TABLE 4-5
RADIOLOGICAL, CHEMICAL, PHYSICAL, AND BIOLOGICAL HAZARD ANALYSIS
CARNOTITE SITE

Task	Potential Hazard	Controls	Initial Level of Protection	Upgraded Level of Protection
Soil Excavation	Radiological hazards: radium-226, uranium-234, 235, 238, and thorium-230 in soil. Exposure through respirable particulates in air or direct contact; Potential worker and equipment contact and contamination during excavation activities; Inadvertent spread of radium-226, uranium-234, 235, 238, and thorium-230 contamination to site and environments. Exposure to chemicals listed in Table 4-4 through respirable particulates in air or direct contact; Underground utilities; Open excavations and / or trenches; Heavy equipment; High noise; Heat and/or cold stress; Sun exposure; Uneven, muddy, or rugged terrain; General slips, trips, and falls; Heavy lifting; Biohazards, including poisonous plants and biting and stinging insects	Monitor airborne dust and initiate dust control in accordance with this HASP/RPP, Use appropriate safe work practices for field work, HAZWOPER, and Trenching and Excavation Safety, Fall protection practices, Heat and/or cold stress, Sun exposure, Safe lifting practices; Working near heavy equipment, Hearing Conservation Program, Biohazards, and Respirator cleaning and use of air purifying respirators. Radiation Worker Training Requirements, Work Area Gamma Exposure Rate Surveys, Portable Radiation Equipment Function Check and Operation, Surveys for Surface Contamination and Release of Equipment for Unrestricted Use, Personnel Frisking Surveys, and Decontamination of Personnel and Equipment.	Level D ensemble: Clothing: work uniform or coveralls, safety glasses. Respirator: N/A Gloves: Leather work or nitrile as needed Boots: leather steel toe/steel shank Other: hardhat, high-visibility vest, ear plugs (near heavy equipment or in high noise areas), sunscreen, and insect repellant, as needed	Level C ensemble: Respirator: full-face air purifying respirator with appropriate P100 cartridge Tyvek QC or SL as needed to avoid contamination If personnel do not have a respirator, personnel must leave area until H&S concern subsides

TABLE 4-5 (CONTINUED)
RADIOLOGICAL, CHEMICAL, PHYSICAL, BIOLOGICAL, AND RADIOLOGICAL HAZARD ANALYSIS

Task	Potential Hazard	Controls	Initial Level of Protection	Upgraded Level of Protection
Radiological screening of soil and soil sampling	Radiological hazards: radium-226, uranium-234, 235, 238, and thorium-230 in soil. Exposure through respirable particulates in air or direct contact; Potential worker and equipment contact and contamination during screening activities; Inadvertent spread of radium-226, uranium-234, 235, 238, and thorium-230 contamination to site and environments; Exposure to chemicals listed in Table 4-4 through respirable particulates in air or direct contact; Underground utilities; Open excavations and / or trenches; Heavy equipment; High noise; Heat or cold stress; Sun exposure; Uneven, muddy, or rugged terrain; General slips, trips, and falls; Heavy lifting; Biohazards, including poisonous plants and biting and stinging insects	Monitor airborne dust and initiate dust control in accordance with this HASP/RPP, Use appropriate safe work practices for field work, HAZWOPER, and Trenching and Excavation Safety. The remediation contractor will conduct an aboveground and underground utility clearance before mobilization. The remediation contractor will provide a Competent Person to oversee all excavation in accordance with 29 CFR §1926.651, including inspection requirements. NO PERSON will enter an open excavation without appropriate excavation sloping or earth retention system in place. Fall protection practices, Heat and/or cold stress, Sun exposure, Safe lifting practices; Working near heavy equipment, Hearing Conservation Program, Biohazards, and Respirator cleaning and use of air purifying respirators. Radiation Worker Training Requirements, Portable Radiation Equipment Function Check and Operation, Personnel Frisking Surveys, and Decontamination of Personnel and Equipment.	Level D ensemble: Clothing: work uniform or coveralls, safety glasses. Eye and Face: Safety glasses Respirator: N/A Gloves: Leather work or nitrile as needed Boots: leather steel toe/steel shank Other: hardhat, high-visibility vest, ear plugs (near heavy equipment or in high noise areas), sunscreen, and insect repellent, as needed	Level C ensemble: Respirator: full-face air purifying respirator with appropriate P100 cartridge Tyvek QC or SL as needed to avoid contamination If personnel do not have a respirator, personnel must leave area until H&S concern subsides

TABLE 4-5 (CONTINUED)
RADIOLOGICAL, CHEMICAL, PHYSICAL, BIOLOGICAL, AND RADIOLOGICAL HAZARD ANALYSIS

Task	Potential Hazard	Controls	Initial Level of Protection	Upgraded Level of Protection
Air Monitoring	Radiological hazards: Airborne radium-226, uranium-234, 235, 238, and thorium-230. Exposure through respirable particulates in air; Potential worker and equipment contact and contamination during sampling activities; Inadvertent spread of radium-226, uranium-234, 235, 238, and thorium-230 contamination to site and environments; Off-site distribution of airborne contamination; Exposure to chemicals listed in Table 4-4 through respirable particulates in air; Heat or cold stress; Sun exposure; Uneven, muddy, or rugged terrain; General slips, trips, and falls; Heavy lifting; Biohazards, including poisonous plants and biting and stinging insects	Monitor airborne dust and initiate dust control in accordance with this HASP/RPP, Use appropriate safe work practices for field work, HAZWOPER, Fall protection practices, Heat and/or cold stress, Sun exposure, Safe lifting practices; Biohazards, and Respirator cleaning and use of air purifying respirators. Radiation Worker Training Requirements, Work Area Gamma Exposure Rate Surveys, Portable Radiation Equipment Function Check and Operation, Surveys for Surface Contamination and Release of Equipment for Unrestricted Use, Personnel Frisking Surveys, and Decontamination of Personnel and Equipment.	Level D ensemble: Clothing: work uniform or coveralls, safety glasses. Eye and Face: Safety glasses Respirator: N/A Gloves: Leather work or nitrile as needed Boots: leather steel toe/steel shank with boot covers or chemical-resistant boots with boot covers Other: hardhat, high-visibility vest, ear plugs (near drilling equipment or in high noise areas), sunscreen, and insect repellent, as needed	Level C ensemble: Respirator: full-face air purifying respirator with appropriate P100 cartridge Boots: leather steel toe/steel shank with boot covers Tyvek QC or SL as needed to avoid contamination If personnel do not have a respirator, personnel must leave area until health and safety concern subsides

TABLE 4-5 (CONTINUED)
RADIOLOGICAL, CHEMICAL, PHYSICAL, BIOLOGICAL, AND RADIOLOGICAL HAZARD ANALYSIS

Task	Potential Hazard	Controls	Initial Level of Protection	Upgraded Level of Protection
Water Sampling	Radiological hazards: radium-226, uranium-234, 235, 238, and thorium-230. Exposure through respirable particulates in air or direct contact; Potential worker and equipment contact and contamination during sampling activities; Inadvertent spread of radium-226, uranium-234, 235, 238, and thorium-230 contamination to site and environments; Off-site distribution of airborne contamination; Exposure to chemicals listed in Table 4-4 through respirable particulates in air or direct contact; Heat or cold stress; Sun exposure; Uneven, muddy, or rugged terrain; General slips, trips, and falls; Heavy lifting; Biohazards, including poisonous plants and biting and stinging insects	Monitor airborne dust and initiate dust control in accordance with this HASP/RPP, Use appropriate safe work practices for field work, HAZWOPER, Fall protection practices, Heat and/or cold stress, Sun exposure, Safe lifting practices, Biohazards, and Respirator cleaning and use of air purifying respirators. Radiation Worker Training Requirements, Work Area Gamma Exposure Rate Surveys, Portable Radiation Equipment Function Check and Operation, Surveys for Surface Contamination and Release of Equipment for Unrestricted Use, Personnel Frisking Surveys, and Decontamination of Personnel and Equipment.	Level D ensemble: Clothing: work uniform or coveralls, safety glasses. Respirator: N/A Gloves: Leather work or nitrile as needed Boots: leather steel toe/steel shank with boot covers or chemical-resistant boots with boot covers Other: hardhat, high-visibility vest, ear plugs (near drilling equipment or in high noise areas), sunscreen, and insect repellent, as needed	Level C ensemble: Respirator: full-face air purifying respirator with appropriate P100 cartridge Boots: leather steel toe/steel shank with boot covers Tyvek QC or SL as needed to avoid contamination If personnel do not have a respirator, personnel must leave area until health and safety concern subsides

Notes:

HAZWOPER Hazardous Waste Operations and Emergency Response
N/A Not applicable

5.0 TRAINING REQUIREMENTS

All on-site personnel who may be exposed to hazardous conditions, including Engineer and their subcontractor personnel and site visitors who will participate in on-site activities, will be required to meet training requirements outlined in 29 CFR Part 1910.120, “Hazardous Waste Operations and Emergency Response.” All Engineer personnel and visitors who could encounter or handle contaminated soil or groundwater at the site will be required to review this HASP/RPP and sign the Compliance Agreement form, and the Engineer’s site workers and direct subcontractors will be required to sign a Daily Tailgate Safety Meeting form.

Before on-site activities begin, the Engineer’s RSO will present a briefing specifically on radiation hazards associated with the site for all personnel who participate in on-site activities. This includes the Engineer’s personnel, Engineer’s subcontracted personnel, the remediation contractor’s personnel, and the remediation subcontractor’s personnel. The following topics will be addressed during the radiation safety training:

- Basic Radiation Physics
- Sources of Radiation
- ALARA Principle (Time, Distance, Shielding)
- Radiation Units and Quantities
- Radiation Biology
- Personnel Monitoring
- Air and Soil Monitoring
- Working Safely Around Radiation
- Site Control Zones
- Applicable Regulations and Instructions to Workers.

In addition to the Engineer’s RSO training, the Engineer’s SSC will present a briefing for all personnel who will participate in on-site activities. The following topics will be addressed during the pre-work briefing:

- Names of the SSC and the designated alternate
- Site history
- Work tasks
- Hazardous chemicals that may be encountered on site
- Physical hazards that may be encountered on site

- PPE, including type or types of respiratory protection to be used for work tasks
- Training requirements
- Environmental surveillance (air monitoring) equipment use and maintenance
- Action levels and situations requiring upgrade or downgrade of level of protection
- Site control measures, including site communications, control zones, and SWPs
- Decontamination procedures
- Emergency communication signals and codes
- Environmental accident emergency procedures (in case contamination spreads outside the exclusion zone)
- Personnel exposure and accident emergency procedures (in case of falls, exposure to hazardous substances, and other hazardous situations)
- Fire and explosion emergency procedures
- Emergency telephone numbers
- Emergency routes.

Worker training requirements specific to the radiation concern are discussed further in the Engineer's radiation SWPs. Any other health and safety-related issues that may arise before on-site activities begin will also be discussed during the pre-work briefing.

Additionally, the remediation contractor personnel serving as the trenching and excavation competent person will have training and experience necessary to fulfill the requirements of that position in accordance with 29 CFR §1926.651.

The daily tailgate safety meetings will encompass relevant safety topics for the day's scope of work. The daily tailgate safety meeting will be led by the Engineer's SSC and RSO in close coordination with AIS's remediation contractor's competent person and RSO. Issues that arise during implementation of on-site activities will be addressed during tailgate safety meetings to be held daily before the workday or shift begins, and will be documented in the Daily Tailgate Safety Meeting form. Any minor changes in procedures or site-specific health and safety-related matters will be addressed during these meetings. Significant plan revisions or procedure changes must be reviewed and approved by the Engineer's HSR, and discussed with the PM. Following approval these changes will be relayed to Engineer's and their subcontractor personnel by the Engineer's SSC.

6.0 PERSONAL PROTECTION REQUIREMENTS

The levels of personal protection to be used for Engineer work tasks at the site have been selected based on known or anticipated physical hazards; types and concentrations of contaminants that may be encountered on site; and contaminant properties, toxicity, exposure routes, and matrixes. The following sections describe protective equipment and clothing; reassessment of protection levels; limitations of protective clothing; and respirator selection, use, and maintenance.

6.1 PROTECTIVE EQUIPMENT AND CLOTHING

Engineer personnel will wear protective equipment when (1) site activities involve known or suspected atmospheric contamination; (2) site activities may generate vapors, gases, or particulates; or (3) direct contact with hazardous materials may occur. Based on the anticipated hazard level, personnel will initially perform field tasks in Level D protection. If site conditions or results of air monitoring during on-site activities warrant a higher level of protection, all field personnel will withdraw from the site, immediately notify the Engineer's SSC, and wait for further instructions. Descriptions of equipment and clothing required for Level D and Level C protection are as follows:

- Level D
 - Coveralls or work clothes, if applicable
 - Class II or better, high-visibility safety vests
 - Outer gloves (neoprene, nitrile, or other), if applicable
 - Disposable inner gloves (such as latex or vinyl)(optional)
 - Boots with steel-toe protection and steel shanks
 - Disposable boot covers or chemical-resistant outer boots
 - Safety glasses or goggles
 - Hard hat (face shield optional)
 - Hearing protection (for areas with a noise level exceeding 85 decibels on the A-weighted scale)
- Level C
 - Coveralls or work clothes, if applicable
 - Chemical-resistant clothing (such as Tyvek® or Saranex® coveralls)
 - Class II or better, high-visibility safety vests
 - Outer gloves (neoprene, nitrile, or other), if applicable
 - Disposable inner gloves (latex or vinyl)
 - Boots with steel-toe protection and steel shanks
 - Disposable boot covers or chemical-resistant outer boots

- Full- or half-face, air-purifying respirator with National Institute for Occupational Safety and Health (NIOSH)-approved cartridges to protect against organic vapors, dust, fumes, and mists
- Safety glasses or goggles (with a half-face respirator only)
- Hard hat (face shield optional)
- Hearing protection (for areas with a noise level exceeding 85 decibels on the A-weighted scale)

6.2 REASSESSMENT OF PROTECTION LEVELS

PPE levels may be downgraded based on a change in site conditions or investigation findings, and only after approval by the Engineer's HSR. When a significant change in site conditions occurs, hazards will be reassessed. Some indicators of need for reassessment are as follows:

- Commencement of a new work phase, such as the start of a significantly different activity or work that begins on a different portion of the site.
- A change in job tasks during a work phase.
- A change of season or weather.
- Temperature extremes or individual medical considerations limiting effectiveness of PPE.
- Discovery of contaminants other than those previously identified.
- A change in ambient levels of airborne contaminants (see the radiological monitoring action levels listed in Table 8-1).
- A change in work scope that affects the degree of contact with contaminated media.

6.3 LIMITATIONS OF PROTECTIVE CLOTHING

PPE clothing ensembles designated for use during site activities have been selected to provide protection against contaminants at known or anticipated on-site concentrations and physical states. However, no protective garment, glove, or boot is entirely chemical-resistant; nor does any protective clothing provide protection against all types of chemicals. Permeation of a given chemical through PPE depends on the contaminant concentration, environmental conditions, physical condition of the protective garment, and resistance of the garment to the specific contaminant. Chemical permeation may continue even after the source of contamination has been removed from the garment.

All site personnel will follow the procedures below to achieve optimum performance from PPE:

- When chemical-protective coveralls become contaminated, don a new, clean garment after each rest break or at the beginning of each shift.
- Inspect all clothing, gloves, and boots both before and during use for the following:

- Imperfect seams
- Non-uniform coatings
- Tears or cracks
- Poorly functioning closures
- Inspect reusable garments, boots, and gloves both before and during use for visible signs of chemical permeation, such as the following:
 - Swelling
 - Discoloration
 - Stiffness
 - Brittleness
 - Cracks
 - Any sign of puncture
 - Any sign of abrasion.

Reusable gloves, boots, or coveralls exhibiting any of the characteristics listed above must be discarded. Reusable PPE will be decontaminated in accordance with procedures described in Section 10.0, and will be neatly stored in the support zone away from work zones.

6.4 RESPIRATOR SELECTION, USE, AND MAINTENANCE

The Engineer and their subcontractor personnel will be informed of proper use, maintenance, and limitations of respirators during annual health and safety refresher training and the pre-work briefing. Any on-site personnel who will use a tight-fitting respirator must pass a qualitative fit test for the respirator that follows the fit testing protocol provided in Appendix A to the OSHA respirator standard and applicable IEMA requirements (29 CFR Part 1910.134 and 32 IAC 340.730). Fit testing must be repeated annually or when a new type of respirator is used.

Respirator selection is based on assessment of the nature and extent of hazardous atmospheres anticipated during field activities. This assessment includes a reasonable estimate of employee exposure to respiratory hazards and identification of each contaminant's anticipated chemical form and physical state.

Each site-specific HASP/RPP must include a Respiratory Hazard Assessment to determine appropriate respiratory protection. Approved respirators for protection against particulate contaminants can include the following:

- An atmosphere supplying respirator

- A respirator equipped with a filter certified by NIOSH under 32 CFR Part 11 or 42 CFR Part 84 as a P100 filter (formerly known as a high-efficiency particulate air [HEPA] filter).

For any tasks performed in Level C PPE, a full-face, air-purifying respirator equipped with NIOSH-approved cartridges or filters will be selected to protect against radiological hazards, vapors, gases, and aerosols. Air-purifying respirators will be used only in conjunction with real-time, breathing-space air monitoring, which must comply with the action levels listed in Table 8-1. Air-purifying respirators will be used only when they can provide protection against the substances encountered on site. Details regarding the use, cleaning, and maintenance of respirators are to be described in relevant safe work procedures included in each site-specific HASP/RPP.

7.0 MEDICAL SURVEILLANCE

The following sections describe the Engineer's medical surveillance program, including health monitoring requirements, site-specific medical monitoring, and medical support and follow-up requirements. Procedures documented in these sections will be followed for all Engineer activities at the site. Additional requirements are specified in the Engineer's *Health and Safety Manual*.

7.1 HEALTH MONITORING REQUIREMENTS

All Engineer and their subcontractor personnel involved in on-site activities at the site must participate in a health monitoring program as required by 29 CFR Part 1910.120(f). Under this program, the Engineer's personnel receive baseline and annual or biennial physical examinations consisting of the following:

- Complete medical and work history
- Physical examination
- Vision screening
- Audiometric screening
- Pulmonary function test
- Resting electrocardiogram
- Chest X-ray (required once every 3 years)
- Blood chemistry, including hematology and serum
- Urinalysis.

For each Engineer employee, the Engineer receives a copy of the examining physician's written opinion after post-examination laboratory tests have been completed; the Engineer's employee also receives a copy of the written opinion. This opinion includes the following information (in accordance with 29 CFR Part 1910.120[f][7]):

- Results of the medical examination and tests.
- The physician's opinion as to whether the employee has any medical conditions that would place the employee at an increased risk of health impairment from work involving hazardous waste operations or during an emergency response.
- The physician's recommended limitations, if any, on the employee's assigned work; special emphasis is placed on fitness for duty, including the ability to wear any required PPE under conditions expected on site (for example, temperature extremes).
- A statement that the employee has been informed by the physician of the medical examination results and of any medical conditions that require further examination or treatment.

Engineer personnel working at the site will also be subject to medical surveillance requirements.

All personnel on-site must have health monitoring programs conducted by their respective employer designated clinics in compliance with 29 CFR §1910.120(f). Any frequent visitor or observer at the site will be required to provide records in compliance with 29 CFR Part 1910.120(f) before he or she can enter the site.

Infrequent visitors or observers will be briefed on radiation hazards and other health hazards as well as site specific procedures. The Engineer will verify any visitors or observers have appropriate PPE prior to entering the site. Infrequent visitors or observers will be escorted the entire duration that they are in the exclusion zone by the Engineer's RSO or the Engineer's RSO's designee.

7.2 SITE-SPECIFIC MEDICAL MONITORING

Before Engineer personnel and their subcontractors who will wear respirators can enter the Exclusion Zone or contamination reduction zone (CRZ) at the site, they must undergo a qualitative respirator fit test (see Section 9.0, Site Control).

7.3 MEDICAL SUPPORT AND FOLLOW-UP REQUIREMENTS

As a follow-up to an injury requiring care beyond basic first aid or to possible exposure above established radiation exposure limits, all Engineer employees are entitled to and encouraged to seek medical attention and physical testing. Such injuries and exposures must be reported to the Engineer's SSC and HSR. Depending on the type of injury or exposure, follow-up testing, if required, must be performed within 24 to 48 hours of the incident. The Engineer's medical consultant will be responsible to advise regarding the type of test required to accurately monitor for exposure effects. An incident report must be completed by the Engineer's PM in the event of an accident, illness, or injury. A copy of this must be forwarded to the Engineer's HSR for use in determining the recordability of the incident and for inclusion in the Engineer's medical surveillance records.

8.0 ENVIRONMENTAL MONITORING AND SAMPLING

Environmental monitoring or sampling will occur to assess personnel exposure levels, as well as site or ambient conditions, and to determine appropriate levels of PPE for work tasks. Perimeter air monitoring will also be conducted by the Engineer and Engineer's RSO but those procedures are discussed in the FSP.

The following sections discuss initial and background air monitoring, personal monitoring, ambient air monitoring, monitoring parameters and devices, use and maintenance of survey equipment, thermal stress monitoring, and noise monitoring. Site-specific air monitoring requirements and action levels are listed in Table 8-1. Engineer SWPs and SOPs will be provided in the site-specific HASP/RPP, which will be prepared before remediation activities begin.

8.1 INITIAL AND BACKGROUND AIR MONITORING

Before a work task begins, initial and background air monitoring of the work area for Ra-226, uranium, and Th-230 will be completed at the site. Procedures for initial and background air monitoring are described in the FSP. This will be conducted by the Engineer and Engineer's RSO. The remediation contractor or remediation contractor's RSO may conduct initial and background air monitoring as appropriate.

Operations at the site may result in variable background levels of airborne compounds. Airborne compounds may be released from vehicles, blowing dust, material transfers, and so on. These sources can complicate evaluation of contaminant emissions during project tasks. Therefore, several upwind and pre-work measurements will be taken to assess contributions to airborne contamination by other potential sources. Additional information on initial and background air monitoring appears in the appropriate Engineer radiation SWP.

8.2 PERSONAL MONITORING

Employees working closest to a source of contamination have the highest likelihood of exposure to airborne contaminant concentrations that may exceed established exposure limits. Therefore, selective monitoring of the workers closest to a source of contaminant generation may be conducted during site activities. Personal monitoring will occur in the breathing zone, and, if a worker is wearing respiratory protective equipment, outside the face piece.

The Engineer and remediation contractor will conduct personal monitoring for their respective personnel separately.

8.3 AMBIENT AIR MONITORING

Most tasks will require monitoring of the general work area or ambient site conditions. Ambient monitoring will generally be conducted by use of direct-reading survey instrumentation, compound-specific instruments, or detector tubes. High-volume air particulate sampling will also be conducted in the work area by the Engineer's RSO.

Initial ambient air monitoring will be performed at the site. Periodic ambient air monitoring will also occur at the frequency listed in radiation SWP addressing air monitoring.

Dust monitoring will be conducted by the Engineer and occur at the excavation area by use of continuous, real-time, direct-read particulate monitors primarily for respirable dust particulates or Particulate Matter of 4 micrometers and smaller (PM₄). The aerosol monitors will run continuously each day during excavation activities, will be able to be moved throughout the site, and placed on adjustable tripods to breathing zone height. Site action levels for airborne particulate have been calculated based on levels of total and specific metals and Ra-226, uranium, and Th-230 in the soil. If site action levels are exceeded, work will be stopped, and dust suppression engineering controls, including wetting soil with water to immobilize dust, will be initiated.

8.4 MONITORING PARAMETERS AND DEVICES

The following sections describe use and limitations of instruments utilized to monitor for organic vapors, radiation, combustible atmospheres, percent oxygen, and particulates. Site-specific air monitoring requirements are discussed in the appropriate Engineer radiation SWP regarding air monitoring. Radiological monitoring devices are addressed in Engineer radiation SWPs addressing the functionality of portable radiation equipment.

All monitors will be calibrated in accordance with manufacturer recommendations prior to start of the project. Calibration requirements for radiological equipment are in radiation SWP regarding portable radiation equipment functionality, along with an instrument function check form to record calibration results.

8.4.1 Organic Vapors

PAHs have been identified at the site within subsurface soil samples. Air monitoring for organic vapors will be conducted during underground storage tank removal activities and may be conducted whenever subsurface activities occur, if odors are observed. Air monitoring for organic vapors will be conducted utilizing a photoionization detector (PID) such as a MiniRAE 3000 or similar. NIOSH-approved full-face respirator with organic vapor cartridges will be worn whenever total airborne hydrocarbon or VOC vapor levels in the breathing zone of field personnel reach or exceed a 15- minute average site specific action level of 11 ppm in summer and 25 ppm in winter. If total airborne hydrocarbons or VOC vapors in the breathing zone exceed an action level of 100 ppm (the OSHA PEL for Naptha [coal tar]), work will be suspended, personnel will be directed to move a safe distance from the source, and the operating unit health and safety manager or designee will be consulted in accordance with General Safe Work Practices for Oil and Petroleum Distillate Fuel Products.

8.4.2 Radiation

Ra-226, uranium, and Th-230 have been identified as the primary contaminants at the site. Table 8-1 lists radiation monitoring, action levels, and required steps if action levels are exceeded.

8.4.2.1 External Dosimetry

Based on previous site characterization data and current conditions, at no areas of the site surface are dose limits to individual members of the public specified in 32 IAC 340.310 likely exceeded. During intrusive activities that may bring subsurface contamination to the surface, the work area will be surveyed for gamma activity. These direct measurements, along with previous data and associated calculations, will be used to ensure that potential radiation exposure to site personnel does not exceed 10 percent of the annual limits set forth in 32 IAC 340.210.

All personnel will be required to wear radiation exposure monitoring devices while working onsite. Policy for implementation of the exposure monitoring device (external dosimeter) will be developed by the Engineer's RSO for the Engineer's and subcontractor's personnel. The remediation contractor's designated RSO will be responsible for providing external dosimetry for the remediation contractor's and subcontractor's personnel.

TABLE 8-1
RADIOLOGICAL MONITORING ACTION LEVELS

Monitoring Activity	RSO Responsible for Implementation	Action Level	Required Action	Section
External gamma exposure rate monitoring	Engineer's RSO and remediation contractor's RSO for respective personnel	> 2.0 mrem per hour in any work area continuously occupied for more than 1 hour from 32 IAC 340.310	Reevaluate staging of personnel, identify source of elevated exposure rates	8.4.2.1
Work area and personal air particulate sampling ⁽¹⁾	Engineer's RSO and remediation contractor's RSO for respective personnel	Ra-226 Conc. > 3.00 E-11 µCi/mL; U-nat Conc. > 2.00E-12 µCi/mL; and Th-230 Conc. > 3.00 E-13µCi/mL from 32 IAC 340.230, which references 10 CFR 20 Appendix B	Implement engineered control measures or upgrade respiratory protection (Level C)	8.4.2.2 and 8.4.5
Monitoring of equipment leaving radiologically controlled area	Remediation contractor RSO with approval and oversight of the Engineer's RSO	Total Fixed Alpha > 1000 dpm/100 cm ² and Removable Alpha > 33 dpm/100 cm ² from 32 IAC 340 Appendix A	Implement equipment decontamination procedures and resurvey	10.2
Monitoring of personnel leaving radiologically controlled area	Engineer's RSO and remediation contractor's RSO for respective personnel	Measurable contamination above background	Implement personnel decontamination procedures and resurvey	10.1

Notes:

Radon action level includes radon progeny contribution.

CFR	<i>Code of Federal Regulations</i>
dpm/100cm ²	Disintegrations per minute per 100 square centimeters
IAC	<i>Illinois Administrative Code</i>
µCi/mL	MicroCuries per milliliter
mrem	Millirem

⁽¹⁾ The work area and personal air particulate sampling action levels are 10% of the occupational values listed in 10 CFR 20, Appendix B, Table 1.

Work area gamma surveys shall be conducted per the appropriate radiation SWP by use of Bicron MicroRem or similar piece of equipment as prescribed by the relevant radiation SWP during activities posing potential encounter with radiological contamination. Results of these surveys shall be used to demonstrate compliance with 32 IAC 340.520(a). The Engineer's PM and RSO shall also evaluate environmental monitoring results to determine if a change to this approach is warranted.

8.4.2.2 Internal Dosimetry

Based on previous site characterization data and planned environmental monitoring activities, no personnel are likely to receive, in 1 year, an intake exceeding 10 percent of the applicable annual limit on intake in Table 1, columns 1 and 2 of Appendix B to 10 CFR 20, which would trigger need for occupational radiological air monitoring in compliance with 32 IAC 340.520(b). However, the Engineer's RSO will still implement and conduct work area high-volume air sampling to evaluate potential occupational exposures to airborne radium, uranium, and thorium during excavation. This will be conducted as a best practice and out of an abundance of caution to ensure the safety of on-site personnel. Low-volume personal air sampling for individuals may also be utilized, as needed.

8.4.3 Combustible Atmospheres

Because of the nature of the work at the site, at no areas where the Engineer's employees are expected to be exposed to combustible atmospheres; thus, no air monitoring for combustible atmospheres will occur.

8.4.4 Percent Oxygen

Because of the nature of the work at the site, no areas exist where the Engineer's employees are expected to be exposed to oxygen-deficient atmospheres; thus, no air monitoring for percent oxygen will occur.

8.4.5 Particulates

Aerosols are a group of airborne materials that include particulates, fumes, mists, and smoke. Particulates are the primary aerosol of concern at the site. Particulate migration will be managed by implementation of a comprehensive dust control program, which includes dust suppression by wetting soil with water to immobilize dust.

8.4.5.1 Work Area Monitoring

Also, particulate concentrations at the work or excavation area will be measured by use of a TSI Incorporated desktop aerosol monitor DustTrak DRX model 8533 or similar with environmental enclosures`. Based on industrial hygiene calculations, the Engineer's action dust action level for the site

has been established at 0.75 milligrams per cubic meter (mg/m³) 15 percent of the OSHA permissible exposure limit for Particulates Not Otherwise Regulated). This dust action level calculation is provided as an example which was determined to be sufficiently protective for all airborne hazards on-site. AIS's remediation contractor will need to conduct their own industrial hygiene calculations to be provided with their site-specific HASP/RPP.

If the dust action level is reached, work will stop and dust control procedures will be implemented by AIS's remediation contractor. The Engineer and the Engineer's RSO designees will have work stoppage authority if action levels are reached or dust control procedures are deemed inadequate based on the site goal of zero visible dust.

The primary assessment of radiological exposure for personnel will be radiological work area monitoring by continuous high-volume work area sampling. This will be conducted during remediation activities to ensure no exposure to levels of radium, uranium, and thorium during excavation exceeding derived air concentrations (DACs) of Radionuclides for occupational exposure based upon those specified under NRC regulations 10 CFR, Part 20 Appendix B. Work area air samplers will be stationed adjacent to the area being excavated daily, with a minimum of one upwind and one downwind location. Additional locations may be added based on-site activities that involve the handling of potentially contaminated soils. Air samples will be collected continuously during all operations that involve disturbance of potentially contaminated soils. Samples will be collected with Staplex Model TFIA High Volume Air Samplers utilizing Staplex Model TFA810 ashless paper filters, or equivalent. Sampling media (air sample filters) will be collected and replaced daily at the conclusion of each workday and analyzed onsite for gross alpha. Air samples will be analyzed the next day and, if "day after" results exceed background, again after 4 days to allow short-lived daughter products to decay.

8.4.5.2 Personal Air Monitoring

Engineer and their subcontractor personnel radiological air monitoring with low volume personal air monitors (PAM) will be conducted as deemed necessary by the Engineer or Engineer's RSO based upon continuous high-volume work area sample results. If deemed necessary, selected workers participating in site activities that involve excavation, movement, or loading of potentially contaminated soils within a radiological exclusion zone will wear a PAM to evaluate the air quality in the worker's breathing zone. The Engineer's RSO or SSC may require that additional personnel wear PAMs if those workers could encounter airborne particulates during site operations. The Engineer's RSO or SSC may reduce the level of personnel air monitoring required if analysis demonstrates that on-site airborne radioactivity is significantly below the action level. Samples will be collected over the entire time a worker is inside the

exclusion zone, and the cumulative time will be recorded. Flow rate through air samples must remain between 2 and 4 liters per minute. Samples will be collected by use of Zefon Model 739 MCE Filter Cartridges – 37 millimeter x 0.8 micron membrane filters. Air sample filters will be collected and replaced daily, and submitted to the on-site field laboratory for analysis. Samples analyzed from the PAMs will be used to measure potential contributions to worker's dose from airborne radionuclides.

Table 8-1 above describes particulate monitoring activity, action levels, and required steps if action levels are exceeded. Particulate sampling procedures to be applied at the site are discussed in the FSP and presented in the radiation SWP addressing air monitoring.

8.5 USE AND MAINTENANCE OF SURVEY EQUIPMENT

All personnel using field survey equipment must have training in operation, limitations, and maintenance of that equipment. Maintenance and daily operational checks will accord with manufacturer recommendations, will be performed by individuals familiar with the devices, and at a minimum, will occur daily directly before and after use of these devices on site. Repairs, maintenance, and internal or electronic calibration of these devices will be recorded in an equipment maintenance logbook or in the equipment log sheet found in the appropriate radiation SWPs. The equipment maintenance logbook for each instrument will be kept in that instrument's case. Rented equipment will be repaired and maintained by the rental company. Results of routine calibration will be recorded on the equipment log sheets in the appropriate radiation SWPs. Procedures to conduct an operational checks of radiation equipment such as the Bicron MicroREM, and Ludlum Model 3 are also specified in the radiation SWPs regarding the operations and functionality of portable equipment.

Air monitoring equipment will be calibrated before work begins. If air monitoring with PAMs is deemed necessary, each PAM will be flow tested daily by use a flow calibration device (Buck™ primary flow calibrator or equivalent). Only basic maintenance (such as changing batteries) will be performed by on-site personnel. Any additional maintenance or repairs will be conducted by a trained service technician.

8.6 THERMAL STRESS MONITORING

Heat stress and cold stress are common and serious threats at hazardous waste sites. Engineer SWPs describe both heat and cold stress, and include monitoring methods appropriate for the season and location of work.

8.7 NOISE MONITORING

Most high noise levels at a work site are caused by equipment such as drill rigs or sources associated with the work site, such as equipment and vehicles. When noise levels at the site are suspected to equal or exceed an 8-hour time-weighted average (TWA) of 85 decibels on an A-weighted scale (85 dBA) in slow response mode, the Engineer's SSC will evaluate the work area to characterize the noise source and exposure levels. A sound level meter may be used for the evaluation, but a noise dosimeter is recommended for documenting full-shift noise exposures for Engineer personnel and their subcontractors. If neither instrument is available, the SSC may use a simple rule-of-thumb test to determine whether noise levels exceed 85 dBA. The test requires the SSC to determine how loud he or she must speak to be heard at an arm's length from another person. If the SSC must raise his or her voice to be heard, the average noise level likely exceeds 85 dBA.

Hearing protection must be worn if Engineer employees are exposed to noise levels that exceed the action level of 85 dBA. The protectors will be ear plugs or muffs that must provide sufficient attenuation to limit noise exposure to less than 85 dBA. The SSC will supervise use of hearing protectors by Engineer personnel and their subcontractors at the work site as necessary.

9.0 SITE CONTROL

Site control is an essential component in HASP/RPP implementation. The following sections discuss the Engineer's measures and procedures for site control, such as on-site communications, site control zones, site access control, site safety inspections, and SWPs.

9.1 ON-SITE COMMUNICATIONS

Successful communication between field teams and personnel in the support zone is essential. In non-combustible atmospheres, the following communication systems will be available during site activities:

- Cellular telephones
- Compressed air horn.

Texting within the exclusion zone by all on-site personnel will be limited to texts regarding remediation activities and only as necessary. Any used gloves shall be replaced prior to texting and any texting should be done in a safe area away from moving equipment. This is both for awareness of moving equipment and for radiation contamination safety. In the event that a cell phone comes in contact with contaminated soil it should be surveyed out of the exclusion zone following outlined procedures for equipment and decontaminated as appropriate as discussed in Section 10.2.

The following hand signals will be used by Engineer site personnel in emergency situations, in combustible atmospheres, or when verbal communication is difficult:

Signal	Definition
Hands clutching throat	Out of air or cannot breathe
Hands on top of head	Need assistance
Thumbs up	Okay, I am all right, or I understand
Thumbs down	No or negative
Arms waving upright	Send backup support
Gripping partner's wrist	Exit area immediately

9.2 SITE CONTROL ZONES

On-site work areas will be divided into an exclusion zone, a CRZ, and a support zone to control spread of contamination and employee exposures to chemical and physical hazards. These on-site work areas or zones will be defined by the Engineer's RSO in coordination with the Engineer and the remediation contractor.

Access to the exclusion zone and CRZ will be restricted to authorized personnel. Any visitors to these areas must present proper identification and be authorized to be on site, and must meet training requirements for the site, including site-specific training. The Engineer's SSC and RSO will identify work areas that visitors or personnel are authorized to enter and will enforce site control measures.

The following sections describe the exclusion zone, the CRZ, and the support zone, as well as procedures to be followed within each. Locations of the site control zones may be adjusted in the field.

9.2.1 Zone 1: Exclusion Zone

An exclusion zone includes areas where contamination is either known or likely to be present or could cause harm to personnel because of work activity. The perimeter of the exclusion zone and an appropriate radius around work task areas will be demarcated by a physical barrier, such as barricade tape or traffic cones, to restrict access. A daily roster with the date of each person's entrance into the exclusion zone; the person's name, signature, and organization; and the time of entry and exit will be kept for all personnel working in the zone. Visitors will not be permitted to enter the exclusion zone without proper qualifications, equipment, and the Engineer's SSC and RSO authorization. Work tasks that require establishment of an exclusion zone include the following:

- Excavation activities
- On-site soil radiation screening
- Verification soil sampling
- Radiological waste transportation sampling

9.2.2 Zone 2: Contamination Reduction Zone

A formally established CRZ is required for the site. The CRZ will contain facilities to decontaminate personnel and portable equipment. Personnel and equipment decontamination procedures are described in Section 10.0. Visitors will not be permitted to enter the CRZ without proper qualifications and the Engineer's SSC and RSO authorization.

9.2.3 Zone 3: Support Zone

The support zone shall consist of any uncontaminated and nonhazardous part of the site. The support zone shall be situated in an area generally upwind of any exclusion zone. Site visitors not meeting training, medical surveillance, and PPE requirements must stay in the support zone.

9.3 SITE ACCESS CONTROL

Site access is restricted by a chain link fence. Accessibility to the remainder of the site is restricted by a chain-link fence. The site will be inaccessible to the public during excavation, and all heavy equipment will be kept inside the work zone of the site. Security personnel will be provided by the remediation contractor during non-work hours.

9.4 SITE SAFETY INSPECTIONS

Periodic site safety inspections will be conducted by the Engineer's SSC and RSO to ensure safe work areas and compliance with this HASP/RPP. Results of the formal site safety inspections will be recorded on a Field Audit Checklist.

9.5 SAFE WORK PRACTICES AND RADIATION SAFE WORK PRACTICES

Following is a list of various SWPs and health and safety programs developed by the Engineer that are applicable to the site and will be included with the Engineer's site-specific HASP/RPP:

- Hearing Conservation Program
- Hot Work Practices
- Haulage and Earth Moving
- Lead Protection Program
- General Safe Work Practices
- General Safe Work Practices HAZWOPER
- Safe Drilling Practices
- Special Site Hazards
- Safe Electrical Work Practices
- Fall Protection Practices
- Portable Ladder Safety
- Drum and Container Handling Practices
- Flammable Hazards and Ignition Sources
- Spill and Discharge Control Practices
- Heat Stress
- Cold Stress
- Biohazards
- Safe Lifting Procedures
- Oil and Petroleum Distillate Fuel Product Hazards
- Prevention of Sun Exposure
- Respirator Cleaning Practices
- Safe Use Practices for Use of Respirators
- Respirator Qualitative Fit Testing Procedures

Following is a list of site-specific radiation SWPs developed by the Engineer's RSO that are applicable to the site and will be included with the Engineer's site-specific HASP/RPP:

- Radiation Worker Training Requirements
- Site Access Control
- External Dosimetry
- Work Area Gamma Exposure Rate Surveys
- Clean Area Surveys
- Waste Management
- Internal Dose Calculations
- Portable Radiation Equipment Function Check
- Gamma Radiological Screening Surveys
- Air Monitoring
- Surveys for Surface Contamination and Release of Equipment for Unrestricted Use
- Personnel Frisking Surveys
- Decontamination of Personnel and Equipment
- Operation of the Ludlum 2929 Alpha/ Beta System

10.0 DECONTAMINATION

Decontamination is the process of removing or neutralizing contaminants on personnel or equipment. When properly conducted, decontamination procedures protect workers from contaminants that may have accumulated on PPE, tools, and other equipment. Proper decontamination also prevents transport of potentially harmful materials to uncontaminated areas. AIS's remediation contractor's RSO will be required to develop decontamination procedures for personnel and equipment, which must be included in the remediation contractor's site-specific HASP and RPP. The following personnel and equipment decontamination procedures are provided as examples.

10.1 PERSONNEL DECONTAMINATION

Personnel decontamination procedures will follow guidance in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH and others 1985), the applicable radiation SWP and, if wet decontamination techniques are conducted, the Engineer's applicable SOPs. Before personnel leave the site, each person whose work activities involve potential contact with contamination will be screened in accordance with the radiation SWP regarding personnel and equipment decontamination. If contamination is found, personnel and PPE will be decontaminated using dry decontamination techniques and, if necessary, with potable water or a mixture of detergent and water. Liquid and solid wastes generated during decontamination will be collected and disposed of with other contaminated waste. Decontamination of personnel will follow the procedures defined in the aforementioned decontamination radiation SWP and, if applicable, the Engineer's general equipment decontamination SOP.

Used, disposable PPE, including respirator cartridges, will be collected in sealable containers and will be disposed of in accordance with procedures described in the FSP. Personnel decontamination procedures may be modified as necessary while on site. Compliance with site decontamination procedures for all personnel will be enforced by the Engineer's SSC and RSO.

10.2 EQUIPMENT DECONTAMINATION

Decontamination of all sampling and field monitoring equipment used during site activities will be required. Decontamination of sampling and monitoring equipment will follow the procedures defined in the previously mentioned radiation SWP regarding surveys for surface contamination and, if wet decontamination techniques are conducted, the Engineer's applicable SOP. Compliance with site decontamination procedures for all equipment will be enforced by the Engineer's SSC and RSO. Before

equipment is approved to be released for unrestricted use, each item will be screened in accordance with the applicable radiation SWP. The Engineer's RSO is the only personnel on-site with the authority to approve the release of any equipment for unrestricted use.

10.2.1 Sampling Equipment

Decontamination of sampling equipment, such as spoons and bowls, will be required. Non-disposable equipment will be decontaminated in accordance with radiation SWP detailing decontamination of personnel and equipment and, if wet decontamination techniques are conducted, the Engineer's SOP regarding general decontamination.

10.3 OTHER FIELD MONITORING EQUIPMENT

Any other equipment used in the exclusion or contamination reduction zone will be decontaminated following the procedures outlined in radiation SWP detailing decontamination of personnel and equipment and, if wet decontamination techniques are conducted, the Engineer's SOP regarding general decontamination.

11.0 EMERGENCY RESPONSE PLANNING

This section describes emergency response planning procedures to be implemented for the site consistent with local, state, and federal disaster and emergency management plans, and designed to comply with applicable provisions of 29 CFR §1910.38. The following sections discuss pre-emergency planning, personnel roles and lines of authority, emergency recognition and prevention, evacuation routes and procedures, emergency contacts and notifications, hospital route directions, emergency medical treatment procedures, protective equipment failure, fire or explosion, weather-related emergencies, spills or leaks, emergency equipment and facilities, and reporting.

11.1 PRE-EMERGENCY PLANNING

Before operations begin on site, the Field Team Leader will perform a dry run to the hospital listed in this HASP/RPP to ensure the route is correct. Additionally, the PM or Field Team Leader will determine whether the hospital has capability of managing radiologically-contaminated patients.

During the pre-work briefing and daily tailgate safety meetings, all on-site employees will be trained in and reminded of the provisions of Section 11.0, site communication systems, and site evacuation routes. The emergency response provisions will be reviewed on a regular basis by the Engineer's SSC, and will be revised, if necessary, to ensure that they are adequate and consistent with prevailing site conditions.

11.2 PERSONNEL ROLES AND LINES OF AUTHORITY

The Engineer's SSC has primary responsibility for responding to and correcting emergencies, and for taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may include evacuation of personnel from the site area. The SSC is also responsible for ensuring that corrective measures have been implemented, appropriate authorities have been notified, and follow-up reports have been completed.

In addition to internally required emergency communications, in the event of an emergency pertaining to work at the site, the Engineer's PM will communicate directly with Abby Mazza, AIS Project Manager, (312) 744-3161 in the case of emergency.

The remediation contractor and individual subcontractors are required to cooperate with the SSC, within the parameters of their scopes of work.

Engineer personnel and their subcontractors are required to report all injuries, illnesses, spills, fires, and property damage to the SSC. The SSC must be notified of any on-site emergencies, and is responsible for ensuring that the appropriate emergency procedures described in this section are followed. As a courtesy, the local fire or emergency response department can be supplied with a copy of the HASP/RPP before site work begins.

11.3 EMERGENCY RECOGNITION AND PREVENTION

Table 4-2 lists potential on-site radiological hazards. On-site personnel will be made familiar with this information and with techniques of hazard recognition through pre-work training and site-specific briefings.

11.4 EVACUATION ROUTES AND PROCEDURES

In the event of an emergency that necessitates evacuation of a work task area or the site, the Engineer's SSC will contact all nearby personnel using the on-site communications discussed in Section 9.1 to advise the personnel of the emergency. The personnel will proceed along site roads to a safe distance upwind from the hazard source. The personnel will remain in that area until the SSC or an authorized individual provides further instructions.

11.5 EMERGENCY CONTACTS AND NOTIFICATIONS

The emergency information before the introduction of this HASP/RPP includes names and telephone numbers of emergency contact personnel. ***THIS PAGE MUST BE POSTED ON SITE OR MUST BE READILY AVAILABLE AT ALL TIMES IN THE SUPPORT ZONE.*** In the event of a medical emergency, personnel will notify the appropriate emergency organization and will take direction from the Engineer's SSC. In the event of a fire, explosion, or spill at the site, the SSC will notify the appropriate emergency contact, as well as follow the proper internal notification procedures

11.6 HOSPITAL ROUTE DIRECTIONS

Before any site activities begin, the Engineer and remediation contractor personnel will conduct a pre-emergency hospital run to familiarize themselves with the route to the local hospital. A map showing the hospital route is provided at the beginning of this HASP/RPP.

11.7 EMERGENCY MEDICAL TREATMENT PROCEDURES

A person who becomes ill or injured during work tasks may require decontamination. If the illness or injury is minor, any decontamination necessary will be completed and first aid should be administered before the patient is transported. If the patient's condition is serious, partial decontamination will be completed (such as complete disrobing of the person and redressing of the person in clean coveralls or wrapping in a blanket). First aid should be administered until an ambulance or paramedics arrive. All injuries and illnesses must be reported immediately to the Engineer's PM and HSR.

Any person transported to a clinic or hospital for radiological exposure treatment will be accompanied by information on the radiological hazard to which he or she has been exposed to at the site, if possible. Table 4-2 lists this information.

11.8 PROTECTIVE EQUIPMENT FAILURE

If any worker in the exclusion zone experiences a failure of protective equipment (either engineering controls or PPE) that affects his or her personal protection, the worker and all coworkers will immediately leave the exclusion zone. Re-entry to the site zone will not be permitted until (1) the protective equipment has been repaired or replaced, (2) the cause of the equipment failure has been determined, and (3) the equipment failure is no longer considered a threat.

11.9 FIRE OR EXPLOSION

In the event of a fire or explosion on site, the local fire department will be immediately summoned. The Engineer's SSC or a site representative will advise the fire department of the location and nature of any hazardous materials involved. Appropriate provisions of Section 11.0 will be implemented by site personnel.

11.10 INFECTIOUS DISEASE

Site work and site work procedures may be impacted by infectious disease or pandemics. General contingency procedures will be in place which could be implemented in the event remediation activities are on-going during a pandemic, such as social distancing, providing masks to personnel, providing additional hand sanitizer, providing additional hand washing stations, etc. Additional information on working while addressing and attempting to prevent the spread of infectious disease is presented in the applicable SWP.

11.11 WEATHER-RELATED EMERGENCIES

Site work will not be conducted during severe weather conditions, including high-speed winds or lightning. In the event of severe weather, field personnel will stop work, secure and lower all equipment (for example, drill rig), and seek shelter.

Thermal stress caused by excessive heat or cold may occur as a result of extreme temperatures, workload, or the PPE used. Heat and cold stress treatment will be administered as described in relevant safe work practices.

11.12 SPILLS OR LEAKS

In the event of a severe spill or a leak, site personnel will conduct the following procedures:

- Evacuate the affected area and relocate personnel to an upwind location.
- Inform the Engineer's SSC or Field Team Leader.
- Locate the source of the spill or leak, and stop the flow if safe to do so.
- Begin containment and recovery of spilled or leaked materials.
- Notify appropriate local, state, and federal agencies.

Additional information on spill and leak control is presented in the applicable SWP.

11.13 EMERGENCY EQUIPMENT AND FACILITIES

The following emergency equipment will be available on site:

- First aid kit (located in support zone)
- Eye wash (portable) (located in support zone)
- Mobile telephone
- Sorbent material
- Drums
- Monitoring stations.

11.14 REPORTING

All emergency situations require follow-up and reporting. An employee involved in an incident will immediately report the incident to the local Engineer Office HSR, Regional Safety Officer, or Engineer's

HSR via phone. The Engineer's Incident Report (Form IR) must be completed by the Engineer's PM and submitted to the Engineer's HSR within 24 hours of an emergency. The report must include proposed actions to prevent similar incidents from occurring. The HSR must be fully informed of the corrective action process so that he may implement applicable elements of the process at other sites.

12.0 EMERGENCY RESPONSE AND CONTINGENCIES INVOLVING RADIOLOGICAL CONTAMINATION

The following sections address provisions for a contaminated worker, life-threatening emergencies, minor first aid cases, and first aid and CPR.

12.1 PROVISIONS FOR A CONTAMINATED WORKER

If a worker does not have an emergency-related accident or illness, he or she will be checked for contamination and decontaminated if necessary before leaving the site. If the worker does have need for emergency care, he or she will proceed directly through the CRZ to the proper facilities. The hospital route and emergency phone numbers are provided on page viii.

12.2 LIFE-THREATENING EMERGENCIES

In the case of a life-threatening emergency, implement first aid procedures and immediately dial (911) for emergency medical assistance. Take measures to prevent any further damage or injury. Notify appropriate individuals as soon as possible. Procedures to follow during medical emergencies are in Section 11.7.

12.3 MINOR FIRST AID CASES

All Engineer personnel are expected to be responsible for reporting ANY unsafe conditions, behaviors or incidents -- including injuries, illnesses, fires, spills/releases, property damages and near-misses -- they face or encounter while performing their work. According to the Engineer's reporting procedures, for non-emergency incidents the Engineer's personnel should:

- Notify Incident Intervention
- Notify your Office, Project or Safety Manager via phone immediately.
- Complete an "Engineer Incident Report" (Form IR) within 24 hours and send it to your Safety Manager. If an injury or illness has occurred, the Form IR-A must also be completed.
- Additional reports may be necessary.

Minor first aid cases may be treated on site by personnel trained in first aid using approved first aid kits. After treatment from on-site personnel, the treated person will report to his/her immediate supervisor or the RSO.

12.4 FIRST AID AND CARDIOPULMONARY RESUSCITATION

The Engineer will supply a minimum of one employee trained and certified in first aid and CPR on site at any time that work occurs.

13.0 DISPOSAL OF INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) is waste generated during remediation activities or during previous investigation activities at the site that is suspected or known to be radiologically-contaminated. IDW may include sample media and wastewater generated during decontamination procedures. Wastewater or sample media generated during decontamination may be containerized in U.S. Department of Transportation (DOT)-approved 55-gallon drums staged within a secured area of the site pending transport to an approved off-site facility for disposal waste. Wastewater alternatively could be managed with on-site groundwater from the excavation area to be processed through AIS's remediation contractor's on-site water treatment system.

IDW will also include disposable PPE and disposable supplies such as sample tubing. The Engineer and Engineer's RSO will assume spent PPE and disposable supplies used in the exclusion zone exceeds the surface contamination release criteria in 32 IAC 340 Appendix A. This assumption is out of an abundance of caution and in an effort to save time surveying and characterizing all PPE used within the exclusion zone. This waste will be containerized and staged on the site to await off-site transportation or shipped with radiologically-contaminated soil for disposal as radiological waste.

General refuse is only waste material generated on the site that has not come into contact with contaminated environmental media. General refuse will primarily be from the support zone and may include cardboard, plastic, paper, ice bags, plastic bottles, and other uncontaminated refuse. Some general refuse may be collected in the CRZ such as plastic packaging from disposable boot covers for site visitors, cardboard, ice bags, plastic bottles, and other uncontaminated refuse. General refuse generated during removal activities will be disposed of in an on-site or an off-site dumpster or other trash receptacle.

14.0 REFERENCES

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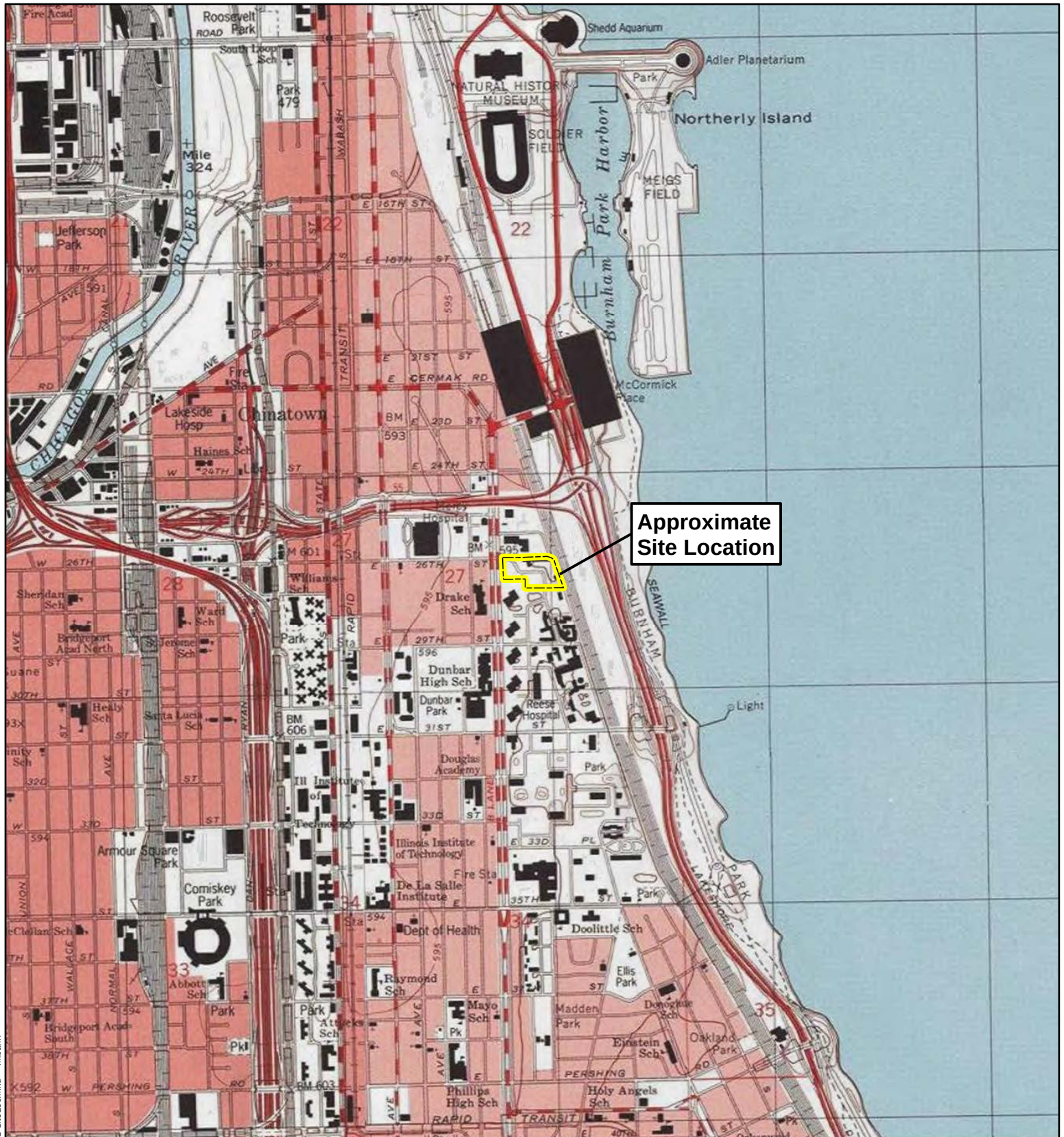
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FIGURES

FIGURE 1 SITE LOCATION MAP

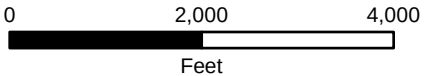
FIGURE 2 SOIL ANALYTICAL RESULTS ABOVE REMEDIATION CRITERIA

FIGURE 3 GAMMA RADIATION SURFACE SURVEY RESULTS, DECEMBER 2010 AND
JANUARY 2011



Approximate
Site Location

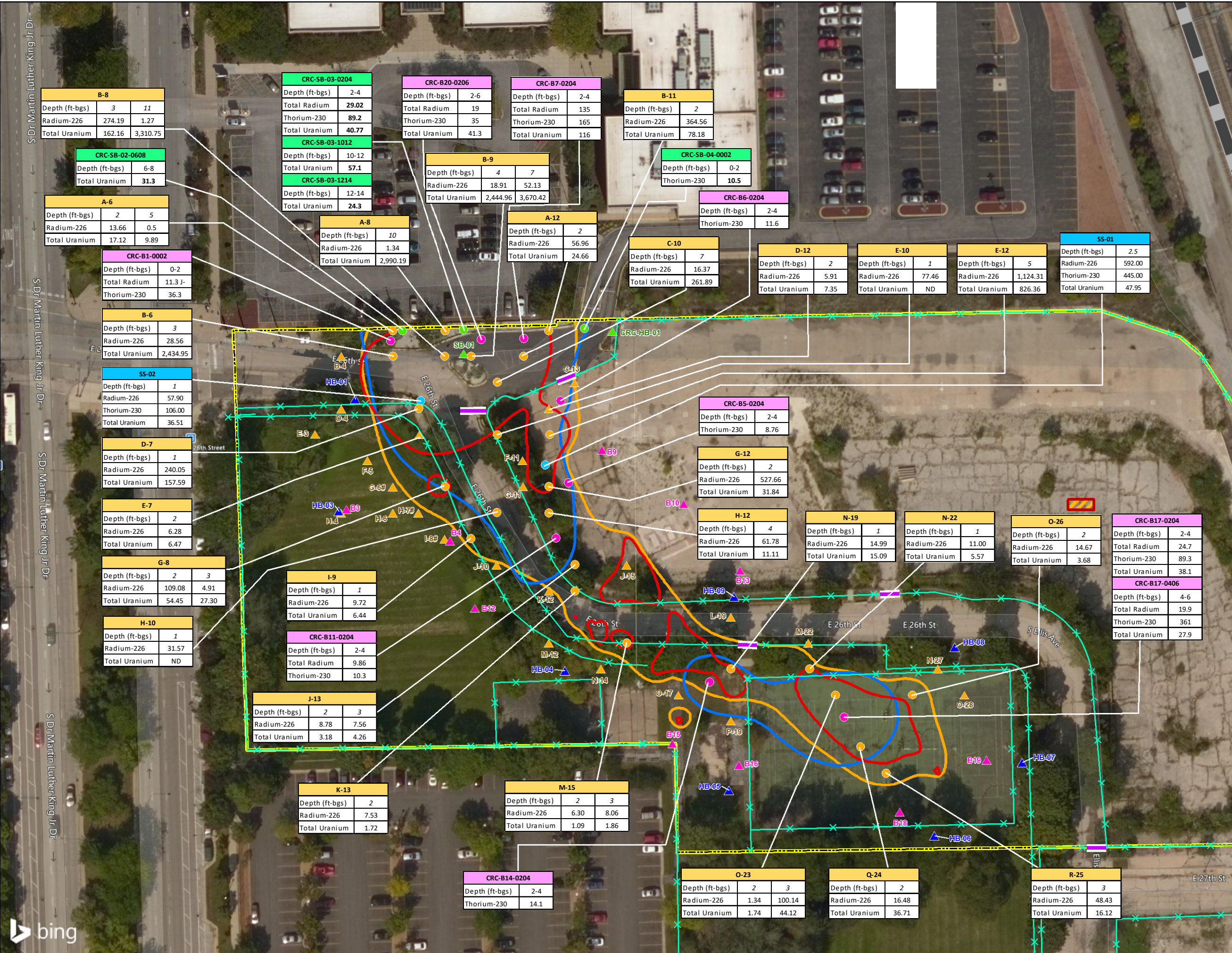
REFERENCE MAP



FORMER CARNOTITE REDUCTION
COMPANY SITE
434 E. 26th STREET
CHICAGO, ILLINOIS

FIGURE 1
SITE LOCATION MAP

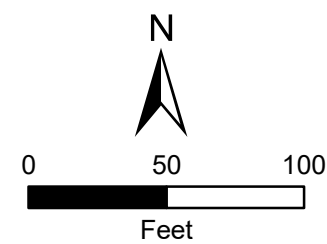




Legend

- ▲ Hand Boring Location - 2020
Concentration below soil remediation criteria
- Soil Sample Location – 2019
- ▲ Soil Sample Location – 2019
Concentration below soil remediation criteria
- Soil Sample Location – 2012
- ▲ Soil Sample Location – 2012
Concentration below soil remediation criteria
- Soil Sample Location – 2017
- Soil Sample Location – 2018
- ▲ Soil Sample Location – 2018
Concentration below soil remediation criteria
- ✕ Fence
- Gate
- Total uranium in soil above 22 pCi/g
above 5 meters bgs
- Thorium-230 in soil above 5.5 pCi/g
- Radium-226 in soil above 5.9 pCi/g
- ▨ Cargo Storage Container
- ▭ Radioactive Facility License Boundary

All results presented in units of pCi/g
ft-bgs = feet-below ground surface
pCi/g = picoCuries per gram

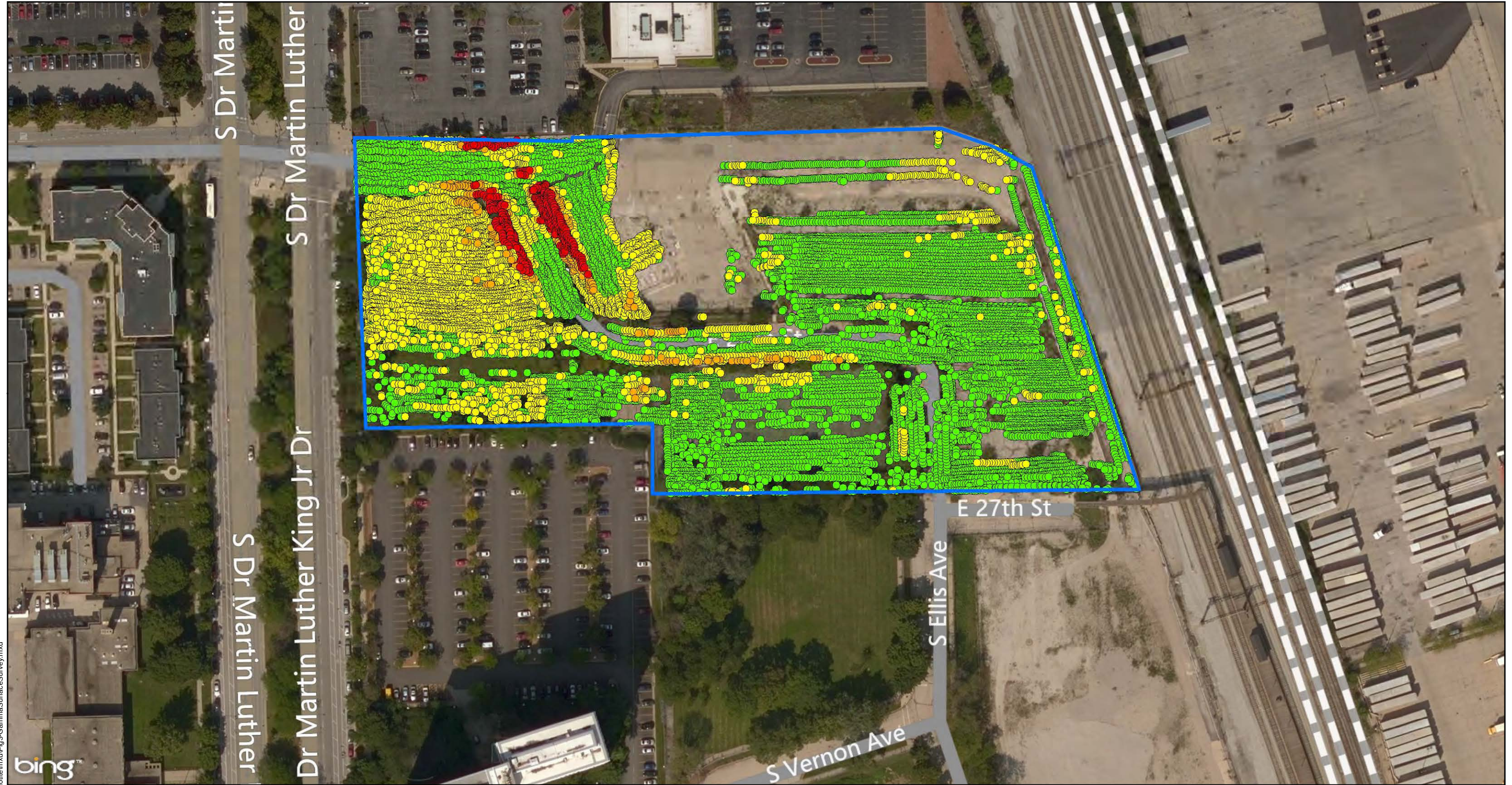


FORMER CARNOTITE REDUCTION
COMPANY SITE
434 E. 26th STREET
CHICAGO, ILLINOIS

FIGURE 2
SOIL ANALYTICAL RESULTS ABOVE
REMEDIATION CRITERIA

TETRA TECH

5/26/2015 G:\S\3284 Chicago 2\FM01004 Carnotite\mxd\Fig 3-GammaSurfaceSurvey.mxd



Legend

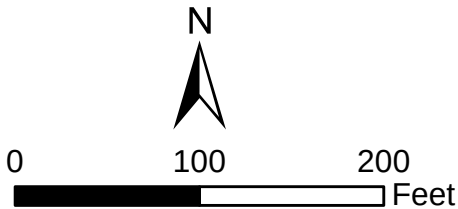
Gamma Surface Surveys (December 2010 & January 2011)
counts per minute (cpm)

- <8,100
- 8,101 - 13,600
- 13,601 - 20,000
- >20,000

Radioactive Facility License Boundary

Note: During the 2012 Subsurface Gamma Screening Investigation, elevated gamma readings were defined as twice the site-specific background values for paved (8,100 cpm) and unpaved (13,600 cpm) surfaces (AECOM 2012)

Source: AECOM 2012



FORMER CARNOTITE REDUCTION
COMPANY SITE
434 E. 26th STREET
CHICAGO, ILLINOIS

FIGURE 3
GAMMA RADIATION SURFACE
SURVEY RESULTS
DECEMBER 2010 AND JANUARY 2011



ATTACHMENT

ATSDR TOXFAQS

- Arsenic Toxicological Fact Sheet
 - Lead Toxicological Fact Sheet
 - Mercury Toxicological Fact Sheet
 - Naphthalene Toxicological Fact Sheet
 - PAH Toxicological Fact Sheet
 - Radium Toxicological Fact Sheet
 - Thorium Toxicological Fact Sheet
 - Uranium Toxicological Fact Sheet
-

This fact sheet answers the most frequently asked health questions (FAQs) about arsenic. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts. Arsenic has been found in at least 1,149 of the 1,684 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenate (CCA) is used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. Organic arsenic compounds are used as pesticides, primarily on cotton fields and orchards.

What happens to arsenic when it enters the environment?

- Arsenic occurs naturally in soil and minerals and may enter the air, water, and land from wind-blown dust and may get into water from runoff and leaching.
- Arsenic cannot be destroyed in the environment. It can only change its form.
- Rain and snow remove arsenic dust particles from the air.
- Many common arsenic compounds can dissolve in water. Most of the arsenic in water will ultimately end up in soil or sediment.
- Fish and shellfish can accumulate arsenic; most of this arsenic is in an organic form called arsenobetaine that is much less harmful.

How might I be exposed to arsenic?

- Ingesting small amounts present in your food and water or breathing air containing arsenic.
- Breathing sawdust or burning smoke from wood treated with arsenic.
- Living in areas with unusually high natural levels of arsenic in rock.
- Working in a job that involves arsenic production or use, such as copper or lead smelting, wood treating, or pesticide application.

How can arsenic affect my health?

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs.

Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso.

Skin contact with inorganic arsenic may cause redness and swelling.

Almost nothing is known regarding health effects of organic arsenic compounds in humans. Studies in animals show that some simple organic arsenic

Arsenic

CAS # 7440-38-2

compounds are less toxic than inorganic forms. Ingestion of methyl and dimethyl compounds can cause diarrhea and damage to the kidneys.

How likely is arsenic to cause cancer?

Several studies have shown that ingestion of inorganic arsenic can increase the risk of skin cancer and cancer in the liver, bladder, and lungs. Inhalation of inorganic arsenic can cause increased risk of lung cancer. The Department of Health and Human Services (DHHS) and the EPA have determined that inorganic arsenic is a known human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic arsenic is carcinogenic to humans.

How can arsenic affect children?

There is some evidence that long-term exposure to arsenic in children may result in lower IQ scores. There is also some evidence that exposure to arsenic in the womb and early childhood may increase mortality in young adults.

There is some evidence that inhaled or ingested arsenic can injure pregnant women or their unborn babies, although the studies are not definitive. Studies in animals show that large doses of arsenic that cause illness in pregnant females, can also cause low birth weight, fetal malformations, and even fetal death. Arsenic can cross the placenta and has been found in fetal tissues. Arsenic is found at low levels in breast milk.

How can families reduce the risks of exposure to arsenic?

- If you use arsenic-treated wood in home projects, you should wear dust masks, gloves, and protective clothing to decrease exposure to sawdust.
- If you live in an area with high levels of arsenic in water or soil, you should use cleaner sources of water and limit contact with soil.

- If you work in a job that may expose you to arsenic, be aware that you may carry arsenic home on your clothing, skin, hair, or tools. Be sure to shower and change clothes before going home.

Is there a medical test to determine whether I've been exposed to arsenic?

There are tests available to measure arsenic in your blood, urine, hair, and fingernails. The urine test is the most reliable test for arsenic exposure within the last few days. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. These tests can determine if you have been exposed to above-average levels of arsenic. They cannot predict whether the arsenic levels in your body will affect your health.

Has the federal government made recommendations to protect human health?

The EPA has set limits on the amount of arsenic that industrial sources can release to the environment and has restricted or cancelled many of the uses of arsenic in pesticides. EPA has set a limit of 0.01 parts per million (ppm) for arsenic in drinking water.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit (PEL) of 10 micrograms of arsenic per cubic meter of workplace air (10 µg/m³) for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Arsenic (Update). Atlanta, GA: U.S. Department of Health and Human Services. Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,272 of the 1,684 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years. The use of lead as an additive to gasoline was banned in 1996 in the United States.

What happens to lead when it enters the environment?

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When lead is released to the air, it may travel long distances before settling to the ground.
- Once lead falls onto soil, it usually sticks to soil particles.
- Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

How might I be exposed to lead?

- Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.
- Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.
- Working in a job where lead is used or engaging in certain hobbies in which lead is used, such as making stained glass.

- Using health-care products or folk remedies that contain lead.

How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high-levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services (DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

Lead

CAS # 7439-92-1

How can lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

How can families reduce the risks of exposure to lead?

- Avoid exposure to sources of lead.
- Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint.
- If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.
- Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children.
- If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

Is there a medical test to determine whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure

to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter ($\mu\text{g}/\text{dL}$). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3–6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/or if they have a brother, sister, or playmate who has had lead poisoning. CDC has updated its recommendations on children's blood lead levels. Experts now use an upper reference level value of 97.5% of the population distribution for children's blood lead. In 2012-2015, the value to identify children with blood lead levels that are much higher than most children have, is 5 micrograms per deciliter ($\mu\text{g}/\text{dL}$). EPA limits lead in drinking water to 15 μg per liter.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for lead (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

This fact sheet answers the most frequently asked health questions (FAQs) about mercury. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to mercury occurs from breathing contaminated air, ingesting contaminated water and food, and having dental and medical treatments. Mercury, at high levels, may damage the brain, kidneys, and developing fetus. This chemical has been found in at least 714 of 1,467 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is mercury?

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas.

Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make.

Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, some dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

What happens to mercury when it enters the environment?

- Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity.
- Methylmercury may be formed in water and soil by small organisms called bacteria.

- Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

How might I be exposed to mercury?

- Eating fish or shellfish contaminated with methylmercury.
- Breathing vapors in air from spills, incinerators, and industries that burn mercury-containing fossil fuels.
- Release of mercury from dental work and medical treatments.
- Breathing contaminated workplace air or skin contact during use in the workplace.
- Practicing rituals that include mercury.

How can mercury affect my health?

The nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems.

Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation.

Mercury

CAS # 7439-97-6

How likely is mercury to cause cancer?

There are inadequate human cancer data available for all forms of mercury. Mercuric chloride has caused increases in several types of tumors in rats and mice, and methylmercury has caused kidney tumors in male mice. The EPA has determined that mercuric chloride and methylmercury are possible human carcinogens.

How can mercury affect children?

Very young children are more sensitive to mercury than adults. Mercury in the mother's body passes to the fetus and may accumulate there, possibly causing damage to the developing nervous system. It can also pass to a nursing infant through breast milk. However, the benefits of breast feeding may be greater than the possible adverse effects of mercury in breast milk.

Mercury's harmful effects that may affect the fetus include brain damage, mental retardation, incoordination, blindness, seizures, and inability to speak. Children poisoned by mercury may develop problems of their nervous and digestive systems, and kidney damage.

How can families reduce the risk of exposure to mercury?

Carefully handle and dispose of products that contain mercury, such as thermometers or fluorescent light bulbs. Do not vacuum up spilled mercury, because it will vaporize and increase exposure. If a large amount of mercury has been spilled, contact your health department. Teach children not to play with shiny, silver liquids.

Properly dispose of older medicines that contain mercury. Keep all mercury-containing medicines away from children.

Pregnant women and children should keep away from rooms where liquid mercury has been used.

Learn about wildlife and fish advisories in your area from your public health or natural resources department.

Is there a medical test to determine whether I've been exposed to mercury?

Tests are available to measure mercury levels in the body. Blood or urine samples are used to test for exposure to metallic mercury and to inorganic forms of mercury. Mercury in whole blood or in scalp hair is measured to determine exposure to methylmercury. Your doctor can take samples and send them to a testing laboratory.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 2 parts of mercury per billion parts of drinking water (2 ppb).

The Food and Drug Administration (FDA) has set a maximum permissible level of 1 part of methylmercury in a million parts of seafood (1 ppm).

The Occupational Safety and Health Administration (OSHA) has set limits of 0.1 milligram of organic mercury per cubic meter of workplace air (0.1 mg/m^3) and 0.05 mg/m^3 of metallic mercury vapor for 8-hour shifts and 40-hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

This fact sheet answers the most frequently asked health questions (FAQs) about naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because these substances may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene happens mostly from breathing air contaminated from the burning of wood, tobacco, or fossil fuels, industrial discharges, or moth repellents. Exposure to large amounts of naphthalene may damage or destroy some of your red blood cells. Naphthalene has caused cancer in animals. Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene have been found in at least 687, 36, and 412, respectively, of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

What are naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

Naphthalene is a white solid that evaporates easily. Fuels such as petroleum and coal contain naphthalene. It is also called white tar, and tar camphor, and has been used in mothballs and moth flakes. Burning tobacco or wood produces naphthalene. It has a strong, but not unpleasant smell. The major commercial use of naphthalene is in the manufacture of polyvinyl chloride (PVC) plastics. Its major consumer use is in moth repellents and toilet deodorant blocks.

1-Methylnaphthalene and 2-methylnaphthalene are naphthalene-related compounds. 1-Methylnaphthalene is a clear liquid and 2-methylnaphthalene is a solid; both can be smelled in air and in water at very low concentrations.

1-Methylnaphthalene and 2-methylnaphthalene are used to make other chemicals such as dyes and resins. 2-Methylnaphthalene is also used to make vitamin K.

What happens to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene when they enter the environment?

- ☐ Naphthalene enters the environment from industrial and domestic sources, and from accidental spills.
- ☐ Naphthalene can dissolve in water to a limited degree and may be present in drinking water from wells close to hazardous waste sites and landfills.
- ☐ Naphthalene can become weakly attached to soil or pass through soil into underground water.
- ☐ In air, moisture and sunlight break it down within 1 day. In water, bacteria break it down or it evaporates into the air.
- ☐ Naphthalene does not accumulate in the flesh of animals or fish that you might eat.

- ☐ 1-Methylnaphthalene and 2-methylnaphthalene are expected to act like naphthalene in air, water, or soil because they have similar chemical and physical properties.

How might I be exposed to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

- ☐ Breathing low levels in outdoor air.
- ☐ Breathing air contaminated from industrial discharges or smoke from burning wood, tobacco, or fossil fuels.
- ☐ Using or making moth repellents, coal tar products, dyes or inks could expose you to these chemicals in the air.
- ☐ Drinking water from contaminated wells.
- ☐ Touching fabrics that are treated with moth repellents containing naphthalene.
- ☐ Exposure to naphthalene, 1-methylnaphthalene and 2-methylnaphthalene from eating foods or drinking beverages is unlikely.

How can naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene affect my health?

Exposure to large amounts of naphthalene may damage or destroy some of your red blood cells. This could cause you to have too few red blood cells until your body replaces the destroyed cells. This condition is called hemolytic anemia. Some symptoms of hemolytic anemia are fatigue, lack of appetite, restlessness, and pale skin. Exposure to large amounts of naphthalene may also cause nausea, vomiting, diarrhea, blood in the urine, and a yellow color to the skin. Animals sometimes develop cloudiness in their eyes after swallowing high amounts of naphthalene. It is not clear whether this also develops in people. Rats and mice that breathed naphthalene vapors daily for a lifetime developed irritation and inflammation of their nose and lungs. It is unclear if naphthalene

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causes reproductive effects in animals; most evidence says it does not.

There are no studies of humans exposed to 1-methylnaphthalene or 2-methylnaphthalene.

Mice fed food containing 1-methylnaphthalene and 2-methylnaphthalene for most of their lives had part of their lungs filled with an abnormal material.

How likely are naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene to cause cancer?

There is no direct evidence in humans that naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene cause cancer. However, cancer from naphthalene exposure has been seen in animal studies. Some female mice that breathed naphthalene vapors daily for a lifetime developed lung tumors. Some male and female rats exposed to naphthalene in a similar manner also developed nose tumors.

Based on the results from animal studies, the Department of Health and Human Services (DHHS) concluded that naphthalene is reasonably anticipated to be a human carcinogen. The International Agency for Research on Cancer (IARC) concluded that naphthalene is possibly carcinogenic to humans. The EPA determined that naphthalene is a possible human carcinogen (Group C) and that the data are inadequate to assess the human carcinogenic potential of 2-methylnaphthalene.

How can naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene affect children?

Hospitals have reported many cases of hemolytic anemia in children, including newborns and infants, who either ate naphthalene mothballs or deodorants cakes or who were in close contact with clothing or blankets stored in naphthalene mothballs. Naphthalene can move from a pregnant woman's blood to the unborn baby's blood. Naphthalene has been detected in some samples of breast milk from the general U.S. population, but not at levels that are expected to be of concern.

There is no information on whether naphthalene has affected development in humans. No developmental abnormalities were observed in the offspring from rats, mice, and rabbits fed naphthalene during pregnancy.

We do not have any information on possible health effects of 1-methylnaphthalene or 2-methylnaphthalene on children.

How can families reduce the risks of exposure to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

❑ Families can reduce the risks of exposure to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene by avoiding smoking tobacco, generating smoke during cooking, or using

fireplaces or heating appliances in their homes.

❑ If families use naphthalene-containing moth repellents, the material should be enclosed in containers that prevent vapors from escaping, and kept out of the reach from children.

❑ Blankets and clothing stored with naphthalene moth repellents should be aired outdoors to remove naphthalene odors and washed before they are used.

❑ Families should inform themselves of the contents of air deodorizers that are used in their homes and refrain from using deodorizers with naphthalene.

Is there a medical test to determine whether I've been exposed to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

Tests are available that measure levels of these chemicals and their breakdown products in samples of urine, feces, blood, maternal milk, or body fat. These tests are not routinely available in a doctor's office because they require special equipment, but samples can be sent to special testing laboratories. These tests cannot determine exactly how much naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene you were exposed to or predict whether harmful effects will occur. If the samples are collected within a day or two of exposure, then the tests can show if you were exposed to a large or small amount of naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene.

Has the federal government made recommendations to protect human health?

The EPA recommends that children not drink water with over 0.5 parts per million (0.5 ppm) naphthalene for more than 10 days or over 0.4 ppm for any longer than 7 years. Adults should not drink water with more than 1 ppm for more than 7 years. For water consumed over a lifetime (70 years), the EPA suggests that it contain no more than 0.1 ppm naphthalene.

The Occupational Safety and Health Administration (OSHA) set a limit of 10 ppm for the level of naphthalene in workplace air during an 8-hour workday, 40-hour workweek. The National Institute for Occupational Safety and Health (NIOSH) considers more than 500 ppm of naphthalene in air to be immediately dangerous to life or health. This is the exposure level of a chemical that is likely to impair a worker's ability to leave a contaminate area and therefore, results in permanent health problems or death.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



Polycyclic Aromatic Hydrocarbons (PAHs) - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl'i-sī'klīk ār'ə-măt'īk hī'drə-kar'bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.

- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.
- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

Polycyclic Aromatic Hydrocarbons

How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

This fact sheet answers the most frequently asked health questions (FAQs) about radium. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Radium is a radioactive substance formed from the breakdown of uranium and thorium. Exposure to high levels results in an increased risk of bone, liver, and breast cancer. This chemical has been found in at least 18 of the 1,177 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is radium?

(Pronounced rā'dē-əm)

Radium is a naturally occurring silvery-white radioactive metal that can exist in several forms called isotopes. Radium is formed when uranium and thorium break down in the environment. Uranium and thorium are found in small amounts in most rocks and soil. Two of the main radium isotopes found in the environment are radium-226 and radium-228.

Radium undergoes radioactive decay. It divides into two parts—one part is called radiation and the other part is called a daughter. The daughter, like radium, is not stable, and it also divides into radiation and another daughter. The dividing of daughters continues until a stable, nonradioactive daughter is formed. During the decay process, alpha, beta, and gamma radiation are released. Alpha particles can travel only a short distance and cannot travel through your skin. Beta particles can penetrate through your skin, but they cannot go all the way through your body. Gamma radiation can go all the way through your body.

Radium has been used as a radiation source for treating cancer, in radiography of metals, and combined with other

metals as a neutron source for research and radiation instrument calibration. Until the 1960s, radium was a component of the luminous paints used for watch and clock dials, instrument panels in airplanes, military instruments, and compasses.

What happens to radium when it enters the environment?

- ☐ Radium is constantly being produced by the radioactive decay of uranium and thorium.
- ☐ Radium is present at very low levels in rocks and soil and may strongly attach to those materials.
- ☐ Radium may also be found in air.
- ☐ High concentrations are found in water in some areas of the country.
- ☐ Uranium mining results in higher levels of radium in water near uranium mines.
- ☐ Radium in the soil may be absorbed by plants.
- ☐ It may concentrate in fish and other aquatic organisms.

How might I be exposed to radium?

- ☐ Everyone is exposed to low levels of radium in the air, water, and food.

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- ☐ Higher levels may be found in the air near industries that burn coal or other fuels.
- ☐ It may be found at higher levels in drinking water from wells.
- ☐ Miners, particularly miners of uranium and hard rock, are exposed to higher levels of radium.
- ☐ It may also be found at radioactive waste disposal sites.

How can radium affect my health?

Radium has been shown to cause effects on the blood (anemia) and eyes (cataracts). It also has been shown to affect the teeth, causing an increase in broken teeth and cavities. Patients who were injected with radium in Germany, from 1946 to 1950, for the treatment of certain diseases including tuberculosis were significantly shorter as adults than people who were not treated.

How likely is radium to cause cancer?

Exposure to high levels of radium results in an increased incidence of bone, liver, and breast cancer. The EPA and the National Academy of Sciences, Committee on Biological Effects of Ionizing Radiation, has stated that radium is a known human carcinogen.

Is there a medical test to show whether I've been exposed to radium?

Urine tests can determine if you have been exposed to radium. Another test measures the amount of radon (a breakdown product of radium) in exhaled air. Both types of tests require special equipment and cannot be done in a doctor's office. These tests cannot tell how much radium you were exposed to, nor can they be used to predict whether you will develop harmful health effects.

Has the federal government made recommendations to protect human health?

The EPA has set a drinking water limit of 5 picocuries per liter (5 pCi/L) for radium-226 and radium-228 (combined).

The EPA has set a soil concentration limit for radium-226 in uranium and thorium mill tailings of 5 picocuries per gram (5 pCi/g) in the first 15 centimeters of soil and 15 pCi/g in deeper soil.

The federal recommendations have been updated as of July 1999.

Glossary

Anemia: A decreased ability of the blood to transport oxygen.

Carcinogen: A substance that can cause cancer.

CAS: Chemical Abstracts Service.

National Priorities List: A list of the nation's worst hazardous waste sites.

Picocurie (pCi): A unit used to measure the quantity of radioactive material.

rem: A unit used to measure radiation dose.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological profile for radium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html> ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



Thorium - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about thorium. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Thorium is a radioactive substance that occurs naturally in the environment. Thorium does not appear to cause cancer, except when intentionally injected intravenously. This chemical has been found in at least 16 of the 1,177 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is thorium?

Pronounced (thô'-rē-m) Thorium is a naturally occurring, radioactive substance. In the environment, thorium exists in combination with other minerals, such as silica. Small amounts of thorium are present in all rocks, soil, water, plants, and animals. Soil contains an average of about 6 parts of thorium per million parts of soil (6 ppm). More than 99% of natural thorium exists in the form of thorium-232. It breaks down into two parts—a small part called “alpha” radiation and a large part called the decay product. The decay product is also not stable and continues to break down through a series of decay products until a stable product is formed. During these decay processes, radioactive substances are produced. These include radium and radon. These substances give off radiation, including alpha and beta particles, and gamma radiation. Some rocks in underground mines contain thorium in a more concentrated form. After these rocks are mined, thorium is usually concentrated and changed into thorium dioxide or other chemical forms. After most of the thorium is removed, the rocks are called “depleted” ore or tailings. Thorium is used to make ceramics, gas lantern mantles, and metals used in the aerospace industry and in nuclear reactions. Thorium can also be used as a fuel for generating nuclear energy. Thorium-227 (a form of thorium that comes from the decay of uranium) has been proposed to treat skeletal pain associated with cancers so as to improve the quality of life. Measuring the ratio of two radioactive forms of thorium have been used to determine if ivory from African elephant tusks was poached since 1976 when a European Union law went into effect.

What happens to thorium when it enters the environment?

- Thorium is a natural part of the environment.
- Thorium changes extremely slowly into other radioactive substances.
- It takes about 14 billion years for half of the thorium-232 to change into new forms.
- As rocks are broken up by wind and water, the thorium and all other components of the rocks become part of the soil.
- Thorium in soil can be washed into rivers and lakes.
- Windblown dust and volcanic eruptions are natural sources of thorium in the air.
- Burning coal may release small amounts of thorium into the air.
- Mining thorium or making products that contain it may also release thorium into the environment.

How might I be exposed to thorium?

- Just by being alive, everyone is exposed to small amounts of thorium in air, water, and food.
- by breathing air near facilities where uranium, phosphate, or tin ore is processed.
- by living in homes built on soil with high levels of thorium.
- by working in the uranium, thorium, tin, and phosphate mining, and gas mantle production industries.
- by living near radioactive waste disposal sites where thorium can enter the environment.

Thorium

How likely is thorium to affect my health?

Studies on thorium workers have shown that breathing dust containing thorium and other substances may damage the lung many years after being exposed. Sufficiently high exposure may also change the genetic material of those body cells where the thorium is deposited. However, thorium is not known to cause birth defects or to affect the ability to have children. One study showed that working in a thorium plant increased the chance of death in males but decreased the chance of death in females. Increasing the amount of thorium in your environment could increase your exposure to radium and radon. Health effects from those substances and other radioactive materials are the subjects of separate toxicological profiles prepared by ATSDR.

Thorium was once thought to cause cancer in mine and mill workers, but it was later concluded that thorium likely had no significant impact on their cancer risk. Cancers in those workers were likely due to their cigarette smoking and inhaling silica dust. Exposure to thorium has produced lung tumors in animals. Thorium is mildly radioactive (has a very long half-life) so health effects from exposure may be partly from the chemical itself and partly from the radiation it emits. The International Agency for Research on Cancer (IARC) has not found sufficient evidence to classify thorium in mines and mills as carcinogenic.

IARC and the National Toxicology Program (NTP) have determined that medical thorium (a colloid form used until 1955) did cause cancer. People who had large amounts of thorium injected into their blood for special medical x-ray tests had more than the usual number of cancers, particularly of the liver, gall bladder, and leukemia. Also, medical thorium has been found to cause liver cirrhosis and chromosome damage. When improperly injected, medical thorium caused cancer, fibrosis, nerve damage, pain, and blood vessel changes in those areas where thorium had leaked out of the blood vessel. NTP also considers that thorium dioxide can cause cancer if it is injected into the body, as in a medical procedure.

Is there a medical test to show whether I've been exposed to thorium?

Special tests that measure the level of radioactivity from thorium in your urine and feces, and radon gas in the air you exhale can determine if you have been exposed to high levels of thorium. These tests are only useful if done within several days to a week after exposure. The tests cannot tell you if your health will be affected by the exposure. They require special equipment and are probably not available at your local clinic or hospital.

Has the federal government made recommendations to protect human health?

The EPA has set a drinking water limit of 15 picocuries per liter of water (15 pCi/L) for gross alpha particle activity and 4 millirems per year for beta particles and photon activity (for example, gamma radiation and x-rays). These values apply to all radioactive materials and are not specific only to thorium.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological Profile for Thorium. Atlanta, GA: U.S. Department of Health and Human Services.

Agency for Toxic Substances and Disease Registry (ATSDR). 2014. Addendum to the Toxicological Profile for Thorium. Atlanta, GA: U.S. Department of Health and Human Services.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Natural & Depleted Uranium - ToxFAQs™

CAS # 7440-61-1

This fact sheet answers the most frequently asked health questions (FAQs) about natural and depleted uranium. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Natural uranium is a naturally occurring chemical substance that is mildly radioactive. Depleted uranium is an adjusted mixture of natural uranium isotopes that is less radioactive. Everyone is exposed to low amounts of uranium through food, water, and air. Exposure to high levels of natural or depleted uranium can cause kidney disease. Uranium has been found in at least 67 of 1,699 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is uranium?

Uranium is a naturally occurring radioactive element. It is naturally present in nearly all rocks, soils, and air; can be redistributed in the environment through wind and water erosion; and more can be released into the environment through volcanic eruptions. Natural uranium is a mixture of three isotopes: ^{234}U , ^{235}U , and ^{238}U . The most common isotope is ^{238}U ; it makes up over 99% of natural uranium. All three isotopes behave the same chemically, but they have different radioactive properties. The half-lives of uranium isotopes (the amount of time needed for half of the isotope to give off its radiation and change into a different element) is very long. The least radioactive isotope is ^{238}U with a half life of 4.5 billion years. Depleted uranium is a mixture of the same three uranium isotopes except that it has very little ^{234}U and ^{235}U . It is less radioactive than natural uranium. Enriched uranium is another mixture of isotopes that has more ^{234}U and ^{235}U than natural uranium. Enriched uranium is more radioactive than natural uranium.

Uranium is almost as hard as steel and much denser than lead. Natural uranium is used to make enriched uranium; depleted uranium is the leftover product. Enriched uranium is used to make fuel for nuclear power plants. Depleted uranium is used as a counterbalance on helicopters rotors and airplane control surfaces, as a shield to protect against ionizing radiation, as a component of munitions to help them penetrate enemy armored vehicles, and as armor in some parts of military vehicles.

What happens to uranium when it enters the environment?

- Natural and depleted uranium that exist in the dust in the air settle onto water, land, and plants. Uranium deposited on land can be reincorporated into soil, washed into surface water, or stick to plant roots. Uranium in air, surface water, or groundwater can be transported large distances.

How might I be exposed to uranium?

- Food and drinking water are the primary sources of intake for the general public. Very low levels of uranium are found in the air.
- Root crops such as potatoes, parsnips, turnips, and sweet potatoes contribute the highest amounts of uranium to the diet. Because uranium in soil can stick to these vegetables, the concentrations in these foods are directly related to the concentrations of uranium in the soil where the foods are grown.
- In most areas of the United States, low levels of uranium are found in the drinking water. Higher levels may be found in areas with elevated levels of naturally occurring uranium in rocks and soil.
- People may be exposed to higher levels of uranium if they live near uranium mining, processing, and manufacturing facilities. People may also be exposed if they live near areas where depleted uranium weapons are used.

How can uranium enter and leave my body?

Most of the uranium you breathe or ingest is not absorbed and leaves the body in the feces. Absorbed uranium is deposited throughout the body. The highest levels are found in the bones, liver, and kidneys; 66% of the uranium in the body is found in your bones. It can remain in the bones for a long time; the half-life of uranium in bones is 70–200 days. Most of the uranium that is not in bones leaves the body in the urine in 1–2 weeks.

How can uranium affect my health?

Natural uranium and depleted uranium have the identical chemical effect on your body. Kidney damage has been seen in humans and animals after inhaling or ingesting

Natural and Depleted Uranium

CAS # 7440-61-1

uranium compounds. However, kidney damage has not been consistently found in soldiers who have had uranium metal fragments in their bodies for several years. Ingesting water-soluble uranium compounds will result in kidney effects at lower doses than following exposure to insoluble uranium compounds.

Studies in animals have shown that inhalation exposure to insoluble uranium compounds can result in lung damage. In male rats and mice, exposure to uranium has been shown to decrease fertility. Uranium compounds on the skin caused skin irritation and mild skin damage in animals.

Health effects of natural and depleted uranium are due to chemical effects and not to radiation.

How likely is uranium to cause cancer?

Neither the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC) nor the EPA have classified natural uranium or depleted uranium with respect to carcinogenicity.

How can uranium affect children?

The health effects seen in children from exposure to toxic levels of uranium are expected to be similar to the effects seen in adults.

Exposure of animals to high levels of uranium during pregnancy, which caused toxicity in the mothers, has induced early deaths and birth defects in the young. It is not clear if this can happen in the absence of effects on the mother. We do not know whether uranium can cause birth defects in people. There are some studies that suggest that exposure to depleted uranium increased the frequency of birth defects, but the studies are deficient to allow valid conclusions.

How can families reduce the risk of exposure to uranium?

- Avoid eating root vegetables grown in soils with high levels of uranium. Consider washing fruits and vegetables grown in that soil and discard the outside portion of root vegetables.

- Consider having your water tested if you suspect that your drinking water might have elevated levels of uranium; if elevated levels are found, consider using bottled water.

Is there a medical test to determine whether I've been exposed to uranium?

Natural uranium is in your normal diet, so there will always be some level of uranium in all parts of your body. If depleted uranium is present, it adds to the total uranium level. Uranium can be measured in blood, urine, hair, and body tissues. Most tests are for total uranium; however, expensive tests are available to estimate the amounts of both natural and depleted uranium that are present.

Has the federal government made recommendations to protect human health?

The government has made recommendations for uranium which apply to natural and depleted uranium combined.

The EPA established a maximum drinking water contaminant level of 0.03 mg/L.

The Occupational Safety and Health Administration (OSHA) has limited workers' exposure in air to an average of 0.05 mg U/m³ for soluble uranium and 0.25 mg U/m³ for insoluble uranium over an 8-hour workday.

The National Institute for Occupational Safety and Health (NIOSH) recommends workers exposure be limited to 0.05 mg U/m³ of air for soluble uranium and 0.2 mg U/m³ for insoluble uranium averaged over a 10-hour workday and recommends that exposure to soluble uranium not exceed 0.6 mg U/m³ for more than 15 minutes.

The Nuclear Regulatory Commission (NRC) has established air concentration limits for uranium and its individual isotopes that apply to occupational exposure and releases from facilities.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2013. Toxicological Profile for Uranium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Appendix M
Radioactive Material License

OFFICIAL USE ONLY – SECURITY RELATED INFORMATION

STATE OF ILLINOIS
ILLINOIS EMERGENCY MANAGEMENT AGENCY
BUREAU OF RADIATION SAFETY
1035 OUTER PARK DRIVE
SPRINGFIELD, IL 62704
(217) 785-9947

RADIOACTIVE MATERIAL LICENSE

Pursuant to the Illinois Radiation Protection Act and the rules and regulations in 32 Illinois Administrative Code promulgated thereunder, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess and transfer radioactive material(s) listed herein; and to use such radioactive material(s) for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Agency now or hereafter in effect and to any conditions specified in the license.

City of Chicago Department of Assets and Information and Services (AIS) 30 North LaSalle St., Suite 300 Chicago, IL 60602	<u>LICENSEE</u> IL- 02467-01	<u>LICENSE NUMBER</u> January 31, 2021	<u>EXPIRATION DATE</u>
	<u>AMENDMENT NUMBER</u> 4		

Attention: Abby Mazza P.E.
Environmental Engineer III

In accordance with application dated 5-13-2015 and letters with attachments dated 5-28-2015 and 6-18-2015, License Number IL-02467-01 is established.

ITEM	RADIONUCLIDE	MAXIMUM ACTIVITY*		MAXIMUM POSSESSION	
		CHEMICAL and/or PHYSICAL FORM	PER SOURCE	LIMIT	
A.	Radium, Uranium, Thorium, and their daughters	As contamination from previous operations		Only the quantity present at the site	
B.	Radium, Uranium, Thorium and their daughters	As Environmental (air, soil, water) and wipe samples	Any	Any	

Agency Note: Manufacturers/Distributors must verify authenticity of license and maximum possession limits with the Illinois Emergency Management Agency, Bureau of Radiation Safety prior to shipment of radioactive material to this licensee.

AUTHORIZED USE:

- A. Except as specifically provided otherwise by the license, the licensee shall possess and use radioactive material described in all schedules of this license in accordance with statements, representations and procedures contained in, referenced in, or enclosed with the documents listed below for Site Decommissioning Plan and associated implementing documents.**
- B. For collection, possession, storage and transfer of samples incidental to site environmental monitoring and characterization act**

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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CONDITIONS

1. Radioactive material listed in License Schedule Items A. and B. shall be stored only on the licensee's property at 434 East 26th Street, Chicago, Illinois, known as the Former Carnotite Reduction Company site and further described in accordance with statements, representations and procedures listed in other conditions of this license.
2. Radioactive material shall be used by, or under the supervision of the Radiation Safety Officer Glen Huber, CHP or individuals who have been trained in accordance with application dated May 13, 2015. The licensee shall maintain training records of all designated users.
3. License Responsibilities
 - A. The Radiation Safety Officer for this license is Glenn Huber, as designated by the Agent for the City of Chicago.
 - B. The Agent for the City of Chicago is Kimberly Worthington, P.E., Deputy Commissioner.
 - C. The Contact for the City of Chicago is Abby Mazza, P.E., Environmental Engineer III.
4. The Radiation Safety Officer may delegate certain duties to specified individuals provided that:
 - A. The licensee maintain, for a period of 5 years, records of all individuals designated by the Radiation Safety Officer to perform duties or meet regulatory requirements that would otherwise be required as a duty of the Radiation Safety Officer. These records shall include:
 1. The name of the individual;
 2. A list of all duties the Radiation Safety Officer's designee is authorized to perform;
 3. The date upon which the designation became effective;
 4. The signature of the Radiation Safety Officer's designee; and
 5. The signature of the Radiation Safety Officer.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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- B. The Radiation Safety Officer shall review records generated by designees and the performance of designees quarterly. In addition, the licensee shall maintain for Agency inspection for a period of 5 years, records of the quarterly reviews of records generated by designees and quarterly reviews of designee's performance. These records shall include:
1. The date of the review;
 2. The records being reviewed and the name of the designee being reviewed;
 3. A list of all duties performed by the designee;
 4. The results of the Radiation Safety Officer's review and any corrective measures taken, if applicable, based on the review; and
 5. The signature of the Radiation Safety Officer.
5. Radioactive material authorized for use in License Schedule Item A shall be used in accordance with the following conditions:
- A. **The licensee shall not commence decommissioning activities until authorized in writing by the Agency.**
 - B. The installation of utilities to support environmental monitoring
 - C. The installation of groundwater monitoring wells
 - D. The maintenance of existing installed utilities
 - E. Any other activities as approved by the Agency with prior approval via memo or email.
6. The licensee has developed a plan and procedure for utility emergencies in impacted areas and shall continue to keep the Agency informed of significant activities in the vicinity of the site.
7. The licensee shall control entry to the licensed area, with the exception of the pedestrian/public right-of-way areas along 26th and 27th Street as shown on Figure 2 of the HASP, Rev 0, until the areas are released for unrestricted use. Items and surface contamination shall be decontaminated in

* μCi-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μg-microgram; kg-kilogram

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accordance with 32 Ill. Adm. Code 340. Appendix A. Failure to meet the stipulations of this Condition may result in termination of this authorization.

8. An environmental monitoring program, shall be implemented as soon as practicable after the issuance of this license. **Portions of this program were previously temporarily suspended. Those portions shall resume 30 days prior to initiation of invasive remedial decommissioning activities, including site mobilization. The environmental monitoring program shall consist of the following:**
 - A. Particulate sampling shall be performed as follows: 4 locations as specified in the May 13, 2015 application and further described in the May 28, 2015 Environmental Monitoring Plan. The method of collection shall be continuous. The frequency of filter change shall be weekly. Analysis shall be as outlined in the Environmental Monitoring Plan. These shall be reported in units of microcurie per milliliter (μCi/ml). A background location for this program was requested via letter on October 31, 2017.
 - B. Radon sampling shall be performed as follows: 10 locations as specified in the May 13, 2015 application and as described in the May 28, 2015 Environmental Monitoring Plan. The method of collection shall be continuous. The frequency of collection shall be quarterly. Sample analysis shall be quarterly by location.
 - C. Direct gamma radiation monitoring shall be performed as follows: 10 locations as specified in the May 13, 2015 application and as described in the May 28, 2015 Environmental Monitoring Plan. The method of collection shall be continuous. The frequency of collection shall be quarterly. Sample analysis shall be quarterly by location. During the quarterly collection, dose rate information shall be collected at each of these locations as requested. A background location for this program was requested via letter on October 31, 2017.
 - D. Water monitoring shall be performed as follows: Groundwater monitoring shall be conducted initially at 3 existing well locations. Additional locations may be added based on results. The frequency of collection shall be quarterly and the analysis shall be quarterly by location and as outlined in the Environmental Monitoring Plan. A background location for this program was requested via letter on October 31, 2017.
 - E. The Licensee shall conduct an evaluation of existing storm sewers and drainage systems and select two locations for storm sewer water sampling; said sampling will be conducted at the same time and frequency as groundwater sampling. Initially, sediments should also be collected from these same locations for a total of 4 quarters. **For the purposes of**

* μCi-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μg-microgram; kg-kilogram

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decommissioning, storm sewer and sediment sampling will only performed when requested by the Agency. A background location for this program was requested via letter on October 31, 2017.

- F. The Environmental Monitoring Program will generate quarterly data reports based on analytical results. These results should be shared with the Agency. An annual report of these compiled results and an analysis of trends should be submitted to the Agency within 120 days of the end of the 4th quarter.

The annual environmental monitoring report specified above, shall contain a section that includes the Annual Public Dose Evaluation as required by 32 Ill. Adm. Code 340.320.

9. The installation, initiation and implementation of the Environmental Monitoring Program shall comply with the Quality Assurance program.
10. The licensee shall use appropriately calibrated survey instruments for performing exposure rate surveys in accordance with 32 Ill. Adm. Code 332(b)(2). The gamma radiation shall be measured at a distance of 100 cm from the surface. For purposes of the survey, the background gamma radiation level is defined as 10 μ R/hr $\pm$ 4 μ R/hr.
11. For the purpose of radionuclide determinations in air samples from the Former Carnotite Reduction Site, any laboratory employed for this purpose shall use instrumentation and methodologies with lower limits of detection at or below 10% of the regulatory limits for the radiological parameters for which environmental air particulate samples are analyzed. Results indicating that a parameter is not detected shall be reported as "less than" the value of the corresponding lower limit of detection
12. The licensee shall ensure that background counts and operational efficiency checks are performed on radiation detection instrumentation used on the site. The background count and counting efficiency shall be performed daily or, if not used daily, prior to each use. The licensee shall calibrate the systems initially, at intervals not to exceed 12 months, and after each repair of the instrument. Counting efficiencies shall be determined using appropriate standards which are traceable to the National Institute of Standards and Technology (NIST). Records shall be maintained to document the system calibration, background determinations, and counting efficiency determinations.

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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13. Each radiation survey instrument calibration certificate shall include an appropriate scale correction factor each time the exposure rate indicated by the radiation survey instrument differs from the true exposure rate by more than plus or minus ten percent.
14. The licensee shall remove from service any radiation survey instrument which exhibits reference check source readings deviating by more than plus or minus 20 percent from the reference check source reading taken immediately after calibration.
15. Operating and emergency procedures submitted with the licensee's application dated May 13, 2015 shall be followed.
16. This license does not exempt the licensee from compliance with state and or federal laws and rules governing the treatment of water.
17. All radioactive material must be disposed in accordance with 32 Ill. Adm. Code 340 and other applicable state and federal regulations
18. **Reserved**
19. Soil Remediation Criteria
 - a. For the purpose of the activities authorized by this amendment, the concentration of residual radium (radium 226) in dry soil, after removal of soil or other materials that are being relocated, shall not exceed 5 picocuries per gram (5 pCi/g) above background. Concentrations of radium in such residual soils shall be averaged over areas of 100 square meters and averaged over layers of 15 centimeters thickness. The soil concentration of 5 pCi/g is deemed necessary to ensure that the licensee will meet the requirements of 32 Ill. Adm. Code, sections 340.110(b) and 330.325 to maintain doses to the public and releases to the general environment as low as is reasonably achievable (ALARA). A case by case demonstration that particular circumstances do not require cleanup to the above-stated goal will be considered.
 - b. For the purpose of the activities authorized by this amendment, the concentration of total residual uranium in dry soil, after removal of soil or other materials that are being relocated, shall not exceed 20 picocuries per gram (20 pCi/g) above background to a depth of 5 meters and 50 picocuries per gram (50 pCi/g) for all other depths. Concentrations of uranium in such residual soils shall be averaged over areas of 100 square meters and averaged over layers of 15 centimeters thickness. The soil concentration of 20 pCi/g to a depth of 5 meters and 50 pCi/g for all other depths is deemed necessary to ensure that the licensee will meet the requirements of 32 Ill. Adm. Code, sections 340.110(b) and 330.325 to maintain doses to the public and

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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releases to the general environment as low as is reasonably achievable (ALARA). A case by case demonstration that particular circumstances do not require cleanup to the above-stated goal will be considered.

- c. For the purpose of the activities authorized by this amendment, the concentration of residual thorium (Th-230) in dry soil, after removal of soil or other materials that are being relocated, shall not exceed 5 picocuries per gram (5 pCi/g) above background. Concentrations of thorium in such residual soils shall be averaged over areas of 100 square meters and averaged over layers of 15 centimeters thickness. The soil concentration of 5 pCi/g is deemed necessary to ensure that the licensee will meet the requirements of 32 Ill. Adm. Code, sections 340.110(b) and 330.325 to maintain doses to the public and releases to the general environment as low as is reasonably achievable (ALARA). A case by case demonstration that particular circumstances do not require cleanup to the above-stated goal will be considered.
- d. Background concentrations for the aforementioned radionuclides shall be determined either via utilization of established local background concentrations from other projects, or via an approved background sampling activity.

- 20. The RSO shall order all outdoor contaminated waste handling operations (e.g., excavation or loading of trucks) to cease in the event of adverse weather (e.g., sustained winds exceeding 20 miles/hour averaged over a 10 minute period or rainfall exceeding 0.25 inch/hour). In addition, any time visible dust is observed at the Site, the RSO shall take actions within 20 minutes to stop the generation of visible dust.**
- 21. The licensee shall provide two (2) copies of the dust control plan and QA/QC plan required for each contractor in the contract specifications to IEMA prior to commencement of decommissioning activities.**
- 22. The licensee shall ensure, for the purposes of dust control, that each truck hauling contaminated soil has either: a soil moisture content that is sufficient to prevent visible dust generation; the soil on the top of the load is wet before transporting it; or the contents are covered. In addition, all outdoor, stockpiled, contaminated material at the Site shall be covered with geomembranes, or other approved alternate cover material.**
- 23. All above grade, outdoor, stockpiles and associated exposed faces of contaminated materials shall be fully covered with geomembranes or approved alternate cover material, when activities using the materials are completed for the day.**

* μCi-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μg-microgram; kg-kilogram

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24. The licensee shall perform occupational air monitoring while engaged in the following activities: when digging in contaminated soil, managing contaminated material stockpiles, and loading waste for shipment.
25. Interfaces between clean backfill and contaminated material (which is to be excavated at a later date, if any) shall be identified and synthetic or natural barriers shall be placed at these interfaces to prevent contamination of clean backfill material.
26. Radiological analysis of water discharged off site from any water treatment system shall be performed as described in the Decommissioning Plan and associated implementing procedures
27. All accessible areas of *clean areas* shall be surveyed for contamination on at least a weekly frequency. If contamination in excess of the limits specified in 32 Ill. Adm. Code 340 Appendix A is detected, the licensee shall decontaminate the area to the specified limits.
28. Except as specifically provided otherwise by the license, the licensee shall possess and use radioactive material described in all schedules of this license in accordance with statements, representations and procedures contained in, referenced in, or enclosed with the documents listed below. The regulations contained in 32 Ill. Adm. Code: Chapter II, Subchapters b and d shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations. The most recent statements, representations and procedures listed below shall govern if they conflict with previously submitted documents.
- A. Application, with attachments, dated May 13, 2015.
 - B. Letter with attachments dated May 28, 2015, Environmental Monitoring Plan Submittal
 - C. Letter with attachment dated June 18, 2015, HASP/RPP and QAPP Submittal
 - D. Letter dated March 3, 2017 regarding temporary suspension of Environmental Monitoring Program
 - E. Letter dated October 31, 2017 with the Agency review of the Public Dose Evaluation and request for background locations for all environmental sampling system and the collection of dose rate data at TLD locations.
 - F. **Letter transmitting Draft Remediation Plans, Specifications, and Drawings, August 9, 2019.**

* μ Ci-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μ g-microgram; kg-kilogram

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- G. Letter transmitting the City of Chicago's (City) Decommissioning Plan, Revision 4, Former Carnotite Reduction Company Site, 434 East 26th Street, Chicago, Illinois, 60616 submitted by the City on April 30, 2020, and Agency approval letter sent on May 13, 2020.**

KFG:KH

* μCi-microcurie; mCi-millicurie; Ci-Curie; MBq-Megabecquerel; GBq-Gigabecquerel; TBq-Terabecquerel; g-gram; μg-microgram; kg-kilogram

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Appendix N

Electrical Permit

ELECTRICAL WIRING PERMIT

BUILDING PERMIT APP. NO.



CITY OF CHICAGO
DEPARTMENT OF BUILDINGS
BUREAU OF ELECTRICAL INSPECTION
PERMIT TO DO ELECTRICAL WORK

Run Date: 08/31/2015

PERMIT FEE WAIVED

PERMIT NO. 100609058

Priority EL01	Date Issued 08/25/2015	ADDRESS 434 E 26TH ST		ROOM 0	FLOOR 1
CONTRACTOR NAME D N D ELECTRIC, INC.			REG. NO. ECC93196	CONTRACTOR PHONE (630)585-0933	
CONTACT NAME D N D ELECTRIC, INC.			CONTACT PHONE (630)585-0933	BUILDING PERMIT APP ELECT	
TYPE OF				VIOLATION ICN. NO.	0
TYPE OF CONSTRUCTION		ELONLY		NO PERMIT TICKET NO.	
REQ. F/A: N		REQ. EM: N		REQ. MAINT: N	
HIGH RISE: N		PARKING LOT: N		SWM N	
EXIT LIGHTING: N		PLAN REVIEW NO.		TOTAL ELEC FEE \$ 200.00	

DESCRIPTION OF WORK: INSTALLATION OF TEMPORARY WOOD POLES AND AERIAL CABLE, TO POWERING AIR MONITORS, FOR THE CARNOTITE REDUCTION COMPANY SITE PROJECT.

	NUMBER OF		OUTLETS ON EXISTING	
	1-PHASE	3-PHASE	LIGHT.	RECEP.
15 AMP	0	0	0	0
20 AMP	4	0	LIGHT TYPE	
OVER 20 AMP	0	0		

Power and Equipment		
Power Equip Type	# of Units	Total HPVA

Services				
SVC TYPE	# Of SVCS	VOLTS/ PH/W	AMPS	EL Htng(KW)
TEMP SVC	1	120-1-3	60	0

COMMUNICATION / DATA / LOW VOLTAGE SYSTEMS	
Data/Com/LV Type	# of Units

NOTICE TO ELECTRICAL CONTRACTOR:

This permit does not authorize the installation or alteration of any electrical equipment other than that listed hereon.

The issuance of this permit shall not be construed to authorize the installation or alteration of any electrical equipment not in conformity with the Chicago Electrical Code or the Ordinances of the City of Chicago.

It is unlawful to do any wiring without a permit

Judith Frydland
Commissioner
Department of Buildings

D N D ELECTRIC, INC.
 2255 CHURCH RD
 AURORA IL 60502

Appendix O
Geotechnical Evaluation and Excavation Plan Report



623 Cooper Court • Schaumburg, IL 60173

Tel: 630.994.2600 • Fax: 312.733.5612

July 30, 2019

Ms. Kristine Schnoes
Environmental Scientist
Tetra Tech, Inc.
1 South Wacker Drive, Suite 3700
Chicago, IL

**Re: Geotechnical Engineering Services
Former Carnotite Reduction Company Site – Excavation Plan
Chicago, Illinois**

Dear Ms. Schnoes,

GSG Consultants, Inc. (GSG) is pleased to provide Geotechnical Engineering Services for the Former Carnotite Reduction Company Site in Chicago, Illinois. The site investigation completed for the Sheet Pile Wall Design Geotechnical Investigation Report (January 25, 2019) for the proposed site was completed by GSG in January 2019.

The proposed Excavation Plans for soil removal at the site were completed per City of Chicago OUC requirements showing excavations with minimum slopes of 1.5H:1V for all excavations. Tetra Tech requested GSG evaluate and analyze the potential for slope excavations at this site, in order to minimize the excavations on site.

Engineering Analysis

GSG reviewed the geotechnical design reports, and proposed construction drawings in order to provide geotechnical analysis and recommendations for slope stability calculations in accordance with City of Chicago OUC requirements.

GSG used Slide 8.0 to analyze the stability based on the anticipated grading and the soils encountered while drilling. Slide 8.0 is a comprehensive slope stability analysis software used to evaluate the proposed excavation slopes for the project based on the limit equilibrium method. The analysis was evaluated using the Simplified Bishop Method– long term (drained) failure envelopes. The analyses for the excavation slopes was performed for Cross Sections A-A, C-C,

and D-D for differing anticipated depths of the excavations. The results of the slope models are provided in Attachments 1 through 3.

Attachments 1 through 3 contains a copy of the hand calculations for the global slope stability analysis of the excavations based on recommended slopes and soil conditions in accordance with OSHA requirements. The hand analysis was completed using the Method of Slices to confirm the analysis completed using the Slide software.

Conclusions

Based on the analyses completed, it is recommended that the slope excavations for excavations of up to 15 feet (Section A-A, B-B) may be completed at a 2.5H:1V side slope. The long term analysis resulted in global factor of safety of **1.7** using the simplified Bishop Method which was confirmed with hand calculations utilizing the Ordinary Method of Slices.

For excavations 7.5 feet (Section D-D) or less in depth, a side slope of 2H:1V may be completed. The long term analysis resulted in a global factor of safety of **1.7** using the simplified Bishop Method and confirmed with hand calculations utilizing the Ordinary Method of Slices.

For excavations 5 feet (Section C-C) or less in depth, a side slope of 1.5H:1V may be completed. The long term analysis resulted in a global factor of safety of **1.7** using the simplified Bishop Method and confirmed with hand calculations utilizing the Ordinary Method of Slices.

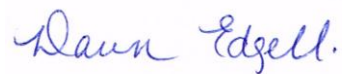
GSG appreciates the opportunity to submit this proposal for your consideration. We are looking forward to working with you on this project. Should you have any questions regarding our proposal, please call us at (312) 733-6262.

Sincerely,

GSG CONSULTANTS, INC.



Matthew J. Chipko, P.E.
Project Engineer



Dawn Edgell, P.E.
Sr. Project Engineer



Former Carnotite Reduction Company Site – Excavation Slope Stability

Chicago, Illinois

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Attachment 1 –Slope Stability Exhibits - 15-foot Excavations – Section A-A – Exhibits and Hand Calculations

Attachment 2 –Slope Stability Exhibits - 5-foot Excavations – Section C-C – Exhibits and Hand Calculations

Attachment 3 –Slope Stability Exhibits – 7.5-foot Excavations – Section D-D – Exhibits and Hand Calculations

Attachment 4 - References



Attachment 1

Slope Stability Exhibits
15-Foot Excavations
Section A-A

Exhibits and Hand Calculations



Problem Statement:

Estimate the allowable factor of safety for global stability for utility excavation – Section A-A – from GSG Excavation Plan for OUC. Calculation is for the long-term drained condition and is based on the soil conditions present at the site, which generally consist of OSHA Type C soils that require a minimum excavation slope of 1.5H:1V, however, for the excavations on this site in the area of Section A-A less than 15 feet, can be considered with a 2.5H:1V slopes.

Approach and References:

1. Ordinary Method of Slices – see attached exhibit
2. Excavation Plan & Cross Sections

Definitions:

B = Width of slice

H = Average height of slice

A = Area of slice

α = Angle of failure surface

W = Weight of slice

σ_w = Average pore pressure of slice

U = Normal component of pore pressure

N' = Effective normal force

c = drained shear strength or cohesion

γ = total unit weight

ϕ = drained friction angle

Assumed Soil Parameters – Drained Condition:

Depth (ft)	Soil Description	c (psf)	γ (pcf)	ϕ (degrees)
0-6	Black Sand Fill	c1 = 0	$\gamma_1 = 125$	30
6-19	Loose to Med. Dense, Br/Gr Sand	c2 = 0	$\gamma_2 = 122$	34
19-33	Loose to Med. Dense, Gr Sand	c3 = 0	$\gamma_3 = 119$	32

Given:

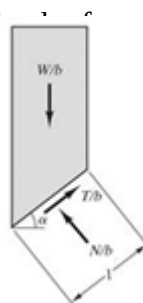
Depth of long term water table = 19 feet (below max c' variations)

Maximum excavation depth – 15 feet

Slide slopes (max per OSHA soil type) – 2.5H:1V

- Effective Stress Analysis (ESA)

$$FS = \frac{\sum \{c'l + [(W/b) \cos \alpha - ul] \tan \phi'\}}{\sum [(W/b) \sin \alpha]}$$





Calculations: Example of driving and resistance forces for Slice 1

Slices 1 through 10 include the resisting forces contributed through the soil adjacent to the failure surface friction angle and cohesive forces for all slices

Slice 1 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 1A: } B \text{ (ft)} = 3.5 \text{ ft}$$

$$H \text{ (ft)} = 0.75 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = (0.75 \text{ ft} * 3.5 \text{ ft}) / 2 = 1.31 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -31.6 \text{ degrees}$$

$$\text{Sin}(-31.6 \text{ deg}) = -0.52$$

$$\text{Cos}(-31.6 \text{ deg}) = 0.85$$

$$\text{Sec}(-31.6 \text{ deg}) = 1.18$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (1.31 \text{ ft}^2 * 125 \text{ pcf}) = 164.1 \text{ lb/ft}$$

$$W * \sin(\alpha) = 164.1 \text{ lb/ft} * -0.52 = 85.3 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 164.1 \text{ lb/ft} * 0.85 = 139.5 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (164.1 \text{ lb/ft} * 0.85) - 0 \text{ lb/ft} = 139.5 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 139.5 \text{ lb/ft} * 0.58 = 79.5 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 3.5 * 1.18 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 2

Slice 2 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 2A: } B \text{ (ft)} = 3.5 \text{ ft}$$

$$H \text{ (ft)} = 1.30 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(1.3 \text{ ft} + 0.75 \text{ ft}) / 2] * 3.5 \text{ ft} = 3.59 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -29.4 \text{ degrees}$$

$$\text{Sin}(-29.4 \text{ deg}) = -0.52$$

$$\text{Cos}(-29.4 \text{ deg}) = 0.87$$

$$\text{Sec}(-29.4 \text{ deg}) = 1.15$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (3.59 \text{ ft}^2 * 125 \text{ pcf}) = 448.4 \text{ lb/ft}$$

$$W * \sin(\alpha) = 448.4 \text{ lb/ft} * -0.52 = 219.7 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 448.4 \text{ lb/ft} * 0.87 = 390.1 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (448.4 \text{ lb/ft} * 0.87) - 0 \text{ lb/ft} = 390.1 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 390.1 \text{ lb/ft} * 0.58 = 222.4 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 3.5 * 1.15 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 3

Slice 3 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 3A: } B \text{ (ft)} = 3.25 \text{ ft}$$

$$H \text{ (ft)} = 1.7 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(1.7 \text{ ft} + 1.3 \text{ ft}) / 2] * 3.25 \text{ ft} = 4.88 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -27.4 \text{ degrees}$$

$$\text{Sin}(-27.4 \text{ deg}) = -0.46$$

$$\text{Cos}(-27.4 \text{ deg}) = 0.89$$

$$\text{Sec}(-27.4 \text{ deg}) = 1.12$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (4.88 \text{ ft}^2 * 125 \text{ pcf}) = 609.4 \text{ lb/ft}$$

$$W * \sin(\alpha) = 609.4 \text{ lb/ft} * -0.46 = 280.3 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 609.4 \text{ lb/ft} * 0.89 = 542.3 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (609.4 \text{ lb/ft} * 0.89) - 0 \text{ lb/ft} = 542.3 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 542.3 \text{ lb/ft} * 0.58 = 309.1 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 3.25 * 1.12 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 4

Slice 4 exists in one (1) soil type that will be designated as follows: 4A) Black sand fill and 4B) Brown and Gray Sand

Slice 4A: B (ft) = 3.75 ft

H (ft) = 1.7 ft

$A_1 \text{ (ft}^2\text{)} = [(1.7 \text{ ft} + 1.7 \text{ ft}) / 2] * 3.75 \text{ ft} = 3.19 \text{ ft}^2$

Slice 4B: B (ft) = 3.75 ft

H (ft) = 1.80 ft

$A_1 \text{ (ft}^2\text{)} = (1.8 \text{ ft} * 3.75 \text{ ft}) / 2 = 3.38 \text{ ft}^2$

Alpha (α) = -25.1 degrees

Sin(-25.1 deg) = -0.42

Cos(-25.1 deg) = 0.91

Sec(-25.1 deg) = 1.10

$W \text{ (lb/ft)} = A_1 \gamma_1 + A_2 \gamma_2 = (3.19 \text{ ft}^2 * 125 \text{ pcf}) + (3.38 \text{ ft}^2 * 122 \text{ pcf}) = 810.2 \text{ lb/ft}$

$W * \sin(\alpha) = 810.2 \text{ lb/ft} * -0.42 = 340.3 \text{ lb/ft}$ (driving)

$W * \cos(\alpha) = 810.2 \text{ lb/ft} * 0.91 = 737.3 \text{ lb/ft}$

$N' = (W * \cos(\alpha)) - U = (810.2 \text{ lb/ft} * 0.91) - 0 \text{ lb/ft} = 737.3 \text{ lb/ft}$

$\tan(\varphi) = \tan(34 \text{ deg}) = 0.67$

$N' * \tan(\varphi) = 737.3 \text{ lb/ft} * 0.67 = 494 \text{ lb/ft}$ (resisting)

$c * B * \sec(\alpha) = 0 \text{ psf} * 3.75 * 1.10 = 0 \text{ lb/ft}$ (resisting)



Calculations: Example of driving and resistance forces for Slice 5

Slice 5 exists in one (1) soil type that will be designated as follows: 5A) Br/gr sand

$$\text{Slice 5A: } B \text{ (ft)} = 3.75 \text{ ft}$$

$$H \text{ (ft)} = 2.0 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(2.0 \text{ ft} + 1.7 \text{ ft}) / 2] * 3.75 \text{ ft} = 7.13 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -22.8 \text{ degrees}$$

$$\text{Sin}(-22.8 \text{ deg}) = -0.39$$

$$\text{Cos}(-22.8 \text{ deg}) = 0.92$$

$$\text{Sec}(-22.8 \text{ deg}) = 1.09$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (7.13 \text{ ft}^2 * 122 \text{ pcf}) = 869.3 \text{ lb/ft}$$

$$W * \sin(\alpha) = 869.3 \text{ lb/ft} * -0.39 = 339 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 869.3 \text{ lb/ft} * 0.92 = 799.7 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (869.3 \text{ lb/ft} * 0.92) - 0 \text{ lb/ft} = 799.7 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(34 \text{ deg}) = 0.67$$

$$N' * \tan(\varphi) = 799.7 \text{ lb/ft} * 0.67 = 535.8 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 3.75 * 1.09 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 6

Slice 5 exists in one (1) soil type that will be designated as follows: 6A) Br/gr sand

$$\text{Slice 6A: } B \text{ (ft)} = 3.75 \text{ ft}$$

$$H \text{ (ft)} = 1.9 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(1.9 \text{ ft} + 2.0 \text{ ft}) / 2] * 3.75 \text{ ft} = 7.31 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -20.6 \text{ degrees}$$

$$\text{Sin}(-20.6 \text{ deg}) = -0.35$$

$$\text{Cos}(-20.6 \text{ deg}) = 0.94$$

$$\text{Sec}(-20.6 \text{ deg}) = 1.06$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (7.31 \text{ ft}^2 * 122 \text{ pcf}) = 892.1 \text{ lb/ft}$$

$$W * \sin(\alpha) = 892.1 \text{ lb/ft} * -0.35 = 312.2 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 892.1 \text{ lb/ft} * 0.94 = 838.6 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (892.1 \text{ lb/ft} * 0.94) - 0 \text{ lb/ft} = 838.6 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(34 \text{ deg}) = 0.67$$

$$N' * \tan(\varphi) = 838.6 \text{ lb/ft} * 0.67 = 561.9 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 3.75 * 1.06 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 7

Slice 7 exists in one (1) soil type that will be designated as follows: 7A) Br/gr sand

$$\text{Slice 7A: } B \text{ (ft)} = 3.75 \text{ ft}$$

$$H \text{ (ft)} = 1.7 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(1.7 \text{ ft} + 1.9 \text{ ft}) / 2] * 3.75 \text{ ft} = 6.75 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -18.4 \text{ degrees}$$

$$\text{Sin}(-18.4 \text{ deg}) = -0.32$$

$$\text{Cos}(-18.4 \text{ deg}) = 0.95$$

$$\text{Sec}(-18.4 \text{ deg}) = 1.05$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (6.75 \text{ ft}^2 * 122 \text{ pcf}) = 823.5 \text{ lb/ft}$$

$$W * \sin(\alpha) = 823.5 \text{ lb/ft} * -0.32 = 263.5 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 823.5 \text{ lb/ft} * 0.95 = 782.3 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (823.5 \text{ lb/ft} * 0.95) - 0 \text{ lb/ft} = 782.3 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(34 \text{ deg}) = 0.67$$

$$N' * \tan(\varphi) = 782.3 \text{ lb/ft} * 0.67 = 524.2 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 3.75 * 1.05 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 8

Slice 8 exists in one (1) soil type that will be designated as follows: 8A) Br/gr sand

$$\text{Slice 8A: } B \text{ (ft)} = 3.5 \text{ ft}$$

$$H \text{ (ft)} = 1.3 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(1.3 \text{ ft} + 1.7 \text{ ft}) / 2] * 3.5 \text{ ft} = 5.25 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -16.2 \text{ degrees}$$

$$\text{Sin}(-16.2 \text{ deg}) = -0.28$$

$$\text{Cos}(-16.2 \text{ deg}) = 0.96$$

$$\text{Sec}(-16.2 \text{ deg}) = 1.04$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (5.25 \text{ ft}^2 * 122 \text{ pcf}) = 640.5 \text{ lb/ft}$$

$$W * \sin(\alpha) = 640.5 \text{ lb/ft} * -0.28 = 179.3 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 640.5 \text{ lb/ft} * 0.96 = 614.9 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (640.5 \text{ lb/ft} * 0.96) - 0 \text{ lb/ft} = 614.9 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(34 \text{ deg}) = 0.67$$

$$N' * \tan(\varphi) = 614.9 \text{ lb/ft} * 0.67 = 414.4 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 3.5 * 1.04 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 9

Slice 9 exists in one (1) soil type that will be designated as follows: 9A) Br/gr sand

$$\text{Slice 9A: } B \text{ (ft)} = 4.0 \text{ ft}$$

$$H \text{ (ft)} = 0.7 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(0.7 \text{ ft} + 1.3 \text{ ft}) / 2] * 4.0 \text{ ft} = 4.0 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -14.1 \text{ degrees}$$

$$\text{Sin}(-14.1 \text{ deg}) = -0.24$$

$$\text{Cos}(-14.1 \text{ deg}) = 0.97$$

$$\text{Sec}(-14.1 \text{ deg}) = 1.03$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (4 \text{ ft}^2 * 122 \text{ pcf}) = 488 \text{ lb/ft}$$

$$W * \sin(\alpha) = 488 \text{ lb/ft} * -0.24 = 117.1 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 488 \text{ lb/ft} * 0.97 = 473.4 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (488 \text{ lb/ft} * 0.97) - 0 \text{ lb/ft} = 473.4 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(34 \text{ deg}) = 0.67$$

$$N' * \tan(\varphi) = 473.4 \text{ lb/ft} * 0.67 = 317.2 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 4.0 * 1.03 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 10

Slice 10 exists in one (1) soil type that will be designated as follows: 1A) Br/Gr Sand

$$\text{Slice 10A: } B \text{ (ft)} = 3.75 \text{ ft}$$

$$H \text{ (ft)} = 0.7 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = (0.7 \text{ ft} * 3.75 \text{ ft}) / 2 = 1.31 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -1.9 \text{ degrees}$$

$$\text{Sin}(-1.9 \text{ deg}) = -0.03$$

$$\text{Cos}(-1.9 \text{ deg}) = 1.0$$

$$\text{Sec}(-1.9 \text{ deg}) = 1.0$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (1.31 \text{ ft}^2 * 122 \text{ pcf}) = 160.1 \text{ lb/ft}$$

$$W * \sin(\alpha) = 160.1 \text{ lb/ft} * -0.03 = 4.8 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 160.1 \text{ lb/ft} * 1.0 = 160.1 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (160.1 \text{ lb/ft} * 1.0) - 0 \text{ lb/ft} = 160.1 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(34 \text{ deg}) = 0.67$$

$$N' * \tan(\varphi) = 160.1 \text{ lb/ft} * 0.67 = 107.3 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 3.75 * 1.0 = 0 \text{ lb/ft (resisting)}$$



Total sum of resisting forces:

Summation of resisting forces due to friction angle forces

$$= 79.5 + 222.4 + 309.1 + 494 + 535.8 + 561.9 + 524.2 + 414.4 + 317.2 + 107.3 = 3565.7 \text{ lb/ft}$$

Summation of resisting forces due to cohesion forces

$$= 0 \text{ lb/ft}$$

$$\text{Summation of all resisting forces} = 3565.7 \text{ lb/ft} + 0 \text{ lb/ft} = 3565.7 \text{ lb/ft}$$

Total sum of driving forces:

Total driving forces

$$= 85.3 + 219.7 + 280.3 + 340.3 + 339 + 312.2 + 263.5 + 179.3 + 117.1 + 4.8 = 2141.7 \text{ lb/ft}$$

Results:

$$\text{Factor of Safety} = \frac{\text{sum of resisting forces}}{\text{Sum of driving forces}} = \frac{3565.7}{2141.7} = 1.70$$

Driving Forces are equal to the summation of the weights of slices 1 through 10

Resistance Forces are equal to the summation of the shear forces (i.e. cohesion/friction) along the failure surface

See attached spreadsheet for complete list of slice calculations and attached Slope 7.0 model of global stability analyses. Based on hand calculation, the factor of safety against failure is 1.7, consistent with the Slope 7.0 software.

Conclusion:

The above factor of safety, which was computed by using the method of slices for a 2.5H:1V slope at Section A-A for excavations 15 feet or less, is consistent with the factors of safety computed via Slope 7.0 which utilized the Simplified Bishop and Janbu methods. The computer models calculated factor of safety values for this scenario of 1.5 (Bishop), which satisfy the minimum design factor of safety for slope stability of 1.5.



OSHA Excavation Slopes:

The contractor will be responsible to provide a safe excavation during the construction activities of the project. All excavations should be conducted in accordance with applicable federal, state, and local safety regulations, including, but not limited to the Occupational Safety and Health Administration (OSHA) excavation safety standards. In accordance with OSHA Regulation 29 CFR 1926 Subpart P Appendix B, the maximum allowable slopes for excavations less than 20 feet should be completed per the OSHA Excavation Slopes shown in Table 1. Excavations made in layered soil systems shall use the maximum allowable slope for each layer as prescribed in the OSHA Regulation. Excavations greater than 20 feet deep should be designed by a registered professional engineer; any shoring or bracing systems should be designed by a licensed structural engineer.

Table 1 – OSHA Excavation Slopes

Soil or Rock Type	Maximum Allowable Slope (H:V) for less than 20 feet
Stable Rock	Vertical (90°)
Type A ¹	¾:1 (53 °)
Type B ²	1:1 (45 °)
Type C ³	1 ½:1 (34 °)

¹ Type A Soils are cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) or greater.

² Type B Soils are cohesive soils with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf, and includes angular gravel.

³ Type C Soils are cohesive soils with an unconfined compressive strength of 0.5 tsf or less, as well as cohesionless soils.

Excavation stability and soil pressures on temporary shoring are dependent on soil conditions, depth of excavations, installation procedures, and the magnitude of any surcharge loads on the ground surface adjacent to the excavation. Surcharge loads from the excavated materials, construction equipment, and vehicles should be included in the design of the excavation system. Excavation near existing structures and underground utilities should be performed with extreme care to avoid undermining existing structures.

Long Term Circular Failure - slope 2.5H:1V

Resisting Forces	3565.66	(= 188.36+8956.6+4487.7)
Driving Forces	-2141.6731	
Factor of Safety	-1.70	

Slide Analysis Information

Carnotite Open Cut- 15 ft Excavation

Project Summary

Slide Modeler Version: 8.026
Compute Time: 00h:00m:00.484s

General Settings

Units of Measurement: Imperial Units
Time Units: days
Permeability Units: feet/second
Data Output: Standard
Failure Direction: Left to Right

Analysis Options

Slices Type: Vertical

Analysis Methods Used

Bishop simplified
Janbu simplified

Number of slices: 10
Tolerance: 0.005
Maximum number of iterations: 50
Check $m_{\alpha} < 0.2$: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight [lbs/ft³]: 62.4
Use negative pore pressure cutoff: Yes
Maximum negative pore pressure [psf]: 0
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Circular
 Search Method: Grid Search
 Radius Increment: 10
 Composite Surfaces: Disabled
 Reverse Curvature: Invalid Surfaces
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined
 Minimum Area: Not Defined
 Minimum Weight: Not Defined

Seismic Loading

Advanced seismic analysis: No
 Staged pseudostatic analysis: No

Materials

Property	BL Sand FILL	BR/GR Sand	GR Sand	V Soft to M Stiff GR Clay DRAINED	Med Stiff to V Stiff Gray Clay DRAINED
Color					
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	122	120	80	80
Cohesion [psf]	0	0	0	0	75
Friction Angle [°]	30	34	32	21	25
Water Surface	None	None	Water Table	Water Table	Water Table
Hu Value			1	0	1
Ru Value	0	0			

Global Minimums

Method: bishop simplified

FS	1.663420
Center:	19.507, 685.769
Radius:	104.547
Left Slip Surface Endpoint:	-36.965, 597.786
Right Slip Surface Endpoint:	-0.277, 583.111
Resisting Moment:	386719 lb-ft
Driving Moment:	232484 lb-ft
Total Slice Area:	49.2133 ft2
Surface Horizontal Width:	36.6881 ft
Surface Average Height:	1.3414 ft

Method: janbu simplified

FS	1.646190
Center:	19.507, 685.769
Radius:	104.547
Left Slip Surface Endpoint:	-36.965, 597.786
Right Slip Surface Endpoint:	-0.277, 583.111
Resisting Horizontal Force:	3424.3 lb
Driving Horizontal Force:	2080.14 lb
Total Slice Area:	49.2133 ft2
Surface Horizontal Width:	36.6881 ft
Surface Average Height:	1.3414 ft

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 25662
 Number of Invalid Surfaces: 2949

Error Codes:

Error Code -107 reported for 203 surfaces
 Error Code -108 reported for 1951 surfaces
 Error Code -109 reported for 7 surfaces
 Error Code -118 reported for 788 surfaces

Method: janbu simplified

Number of Valid Surfaces: 25601
 Number of Invalid Surfaces: 3010

Error Codes:

Error Code -107 reported for 203 surfaces
 Error Code -108 reported for 2011 surfaces
 Error Code -109 reported for 7 surfaces
 Error Code -111 reported for 1 surface
 Error Code -118 reported for 788 surfaces

Error Codes

The following errors were encountered during the computation:

- 107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
- 108 = Total driving moment or total driving force < 0.1 . This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
- 109 = Soiltype for slice base not located. This error should occur very rarely, if at all. It may occur if a very low number of slices is combined with certain soil geometries, such that the midpoint of a slice base is actually outside the soil region, even though the slip surface is wholly within the soil region.
- 111 = safety factor equation did not converge
- 118 = Surface does not pass through the search focus

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.66342

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	3.41314	156.627	-31.5965	BL Sand FILL	0	30	13.1274	21.8364	37.8217	0	37.8217	45.8966	45.8966
2	3.41314	432.688	-29.4245	BL Sand FILL	0	30	36.8023	61.2176	106.032	0	106.032	126.79	126.79
3	3.41314	636.651	-27.2981	BL Sand FILL	0	30	54.9139	91.3448	158.214	0	158.214	186.555	186.555
4	3.77838	849.425	-25.1022	BR/GR Sand	0	34	76.6181	127.448	188.95	0	188.95	224.844	224.844
5	3.77838	916.95	-22.8353	BR/GR Sand	0	34	84.066	139.837	207.316	0	207.316	242.715	242.715
6	3.77838	914.283	-20.6057	BR/GR Sand	0	34	85.1505	141.641	209.991	0	209.991	242.006	242.006
7	3.77838	834.865	-18.4082	BR/GR Sand	0	34	78.9524	131.331	194.706	0	194.706	220.982	220.982
8	3.77838	681.659	-16.2386	BR/GR Sand	0	34	65.4345	108.845	161.369	0	161.369	180.428	180.428
9	3.77838	457.244	-14.0926	BR/GR Sand	0	34	44.5412	74.0908	109.844	0	109.844	121.026	121.026
10	3.77838	163.764	-11.9667	BR/GR Sand	0	34	16.1853	26.923	39.9149	0	39.9149	43.3454	43.3454

Global Minimum Query (janbu simplified) - Safety Factor: 1.64619

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	3.41314	156.627	-31.5965	BL Sand FILL	0	30	13.2384	21.7929	37.7463	0	37.7463	45.8895	45.8895
2	3.41314	432.688	-29.4245	BL Sand FILL	0	30	37.1184	61.104	105.835	0	105.835	126.771	126.771
3	3.41314	636.651	-27.2981	BL Sand FILL	0	30	55.3931	91.1875	157.942	0	157.942	186.53	186.53
4	3.77838	849.425	-25.1022	BR/GR Sand	0	34	77.2803	127.218	188.608	0	188.608	224.812	224.812
5	3.77838	916.95	-22.8353	BR/GR Sand	0	34	84.8049	139.605	206.974	0	206.974	242.684	242.684
6	3.77838	914.283	-20.6057	BR/GR Sand	0	34	85.9123	141.428	209.676	0	209.676	241.978	241.978
7	3.77838	834.865	-18.4082	BR/GR Sand	0	34	79.6706	131.153	194.443	0	194.443	220.959	220.959
8	3.77838	681.659	-16.2386	BR/GR Sand	0	34	66.0404	108.715	161.176	0	161.176	180.411	180.411
9	3.77838	457.244	-14.0926	BR/GR Sand	0	34	44.9602	74.0131	109.729	0	109.729	121.016	121.016
10	3.77838	163.764	-11.9667	BR/GR Sand	0	34	16.34	26.8988	39.8792	0	39.8792	43.3424	43.3424

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.66342

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Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	-36.9653	597.786	0	0	0
2	-33.5522	595.687	34.641	0	0
3	-30.1391	593.762	113.268	0	0
4	-26.7259	592	204.704	0	0
5	-22.9475	590.23	249.932	0	0
6	-19.1691	588.639	262.431	0	0
7	-15.3908	587.218	239.309	0	0
8	-11.6124	585.961	186.109	0	0
9	-7.834	584.86	116.679	0	0
10	-4.05562	583.912	52.7285	0	0
11	-0.277242	583.111	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.64619

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	-36.9653	597.786	0	0	0
2	-33.5522	595.687	34.0642	0	0
3	-30.1391	593.762	111.122	0	0
4	-26.7259	592	200.276	0	0
5	-22.9475	590.23	242.141	0	0
6	-19.1691	588.639	251.019	0	0
7	-15.3908	587.218	224.284	0	0
8	-11.6124	585.961	167.774	0	0
9	-7.834	584.86	95.6232	0	0
10	-4.05562	583.912	29.8311	0	0
11	-0.277242	583.111	0	0	0

Entity Information

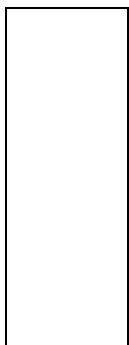
Water Table

X	Y
-90	579
200	579

Focus Search Window

X	Y
-12.5523	583.179
-12.5523	574.952
13.5607	574.952
13.5607	583

External Boundary



X	Y
-90	538
200	538
200	550
200	565
200	579
200	592
200	598
137.5	598
122.5	592
100	583
0	583
-22.5	592
-37.5	598
-90	598
-90	592
-90	579
-90	565
-90	550

Material Boundary

X	Y
-90	592
-22.5	592

Material Boundary

X	Y
122.5	592
200	592

Material Boundary

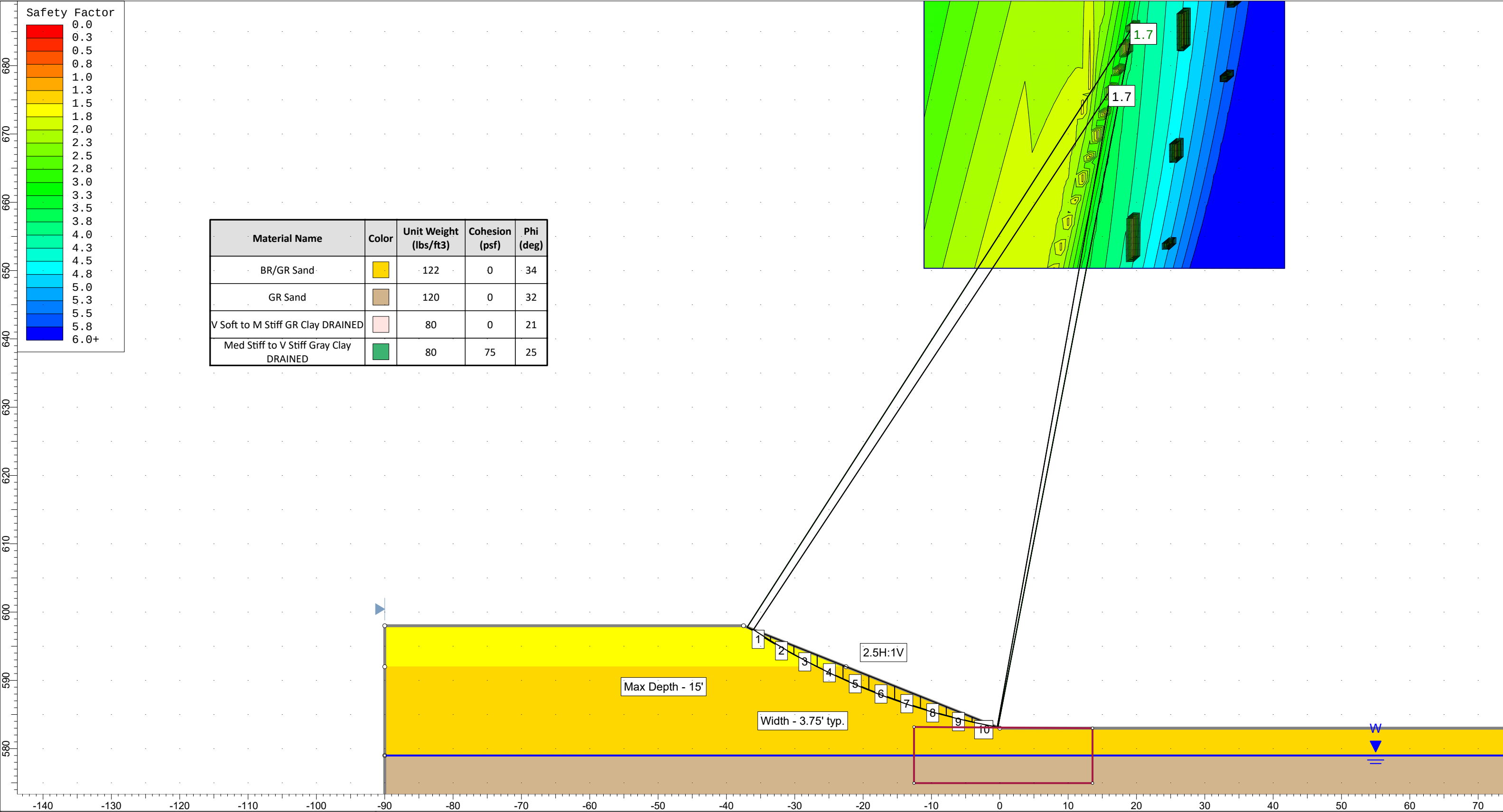
X	Y
-90	579
200	579

Material Boundary

X	Y
-90	565
200	565

Material Boundary

X	Y
-90	550
200	550



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
BR/GR Sand	■	122	0	34
GR Sand	■	120	0	32
V Soft to M Stiff GR Clay DRAINED	■	80	0	21
Med Stiff to V Stiff Gray Clay DRAINED	■	80	75	25

Attachment 2

Slope Stability Exhibits
5-Foot Excavations
Section C-C

Exhibits and Hand Calculations



Problem Statement:

Estimate the allowable factor of safety for global stability for utility excavation – Section C-C – from GSG Excavation Plan for OUC. Calculation is for the long-term drained condition and is based on the soil conditions present at the site, which generally consist of OSHA Type C soils that require a minimum excavation slope of 1.5H:1V.

Approach and References:

1. Ordinary Method of Slices – see attached exhibit
2. Excavation Plan & Cross Sections

Definitions:

B = Width of slice

H = Average height of slice

A = Area of slice

α = Angle of failure surface

W = Weight of slice

σ_w = Average pore pressure of slice

U = Normal component of pore pressure

N' = Effective normal force

c = drained shear strength or cohesion

γ = total unit weight

ϕ = drained friction angle

Assumed Soil Parameters – Drained Condition:

Depth (ft)	Soil Description	c (psf)	γ (pcf)	ϕ (degrees)
0-6	Black Sand Fill	c1 = 0	γ_1 = 125	30
6-19	Loose to Med. Dense, Br/Gr Sand	c2 = 0	γ_2 = 122	34
19-33	Loose to Med. Dense, Gr Sand	c3 = 0	γ_3 = 119	32

Given:

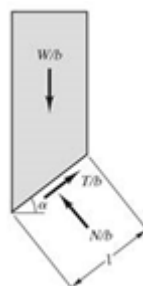
Depth of long term water table = 119 feet (below max depth of excavations)

Maximum excavation depth – 5 feet

Slide slopes (max per OSHA soil type) – 1.5H:1V

- Effective Stress Analysis (ESA)

$$FS = \frac{\sum \{c'l + [(W/b) \cos \alpha - ul] \tan \phi'\}}{\sum [(W/b) \sin \alpha]}$$





Calculations: Example of driving and resistance forces for Slice 1

Slices 1 through 10 include the resisting forces contributed through the soil adjacent to the failure surface friction angle and cohesive forces for all slices

Slice 1 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 1A: } B \text{ (ft)} = 1.5 \text{ ft}$$

$$H \text{ (ft)} = 1.6 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = (1.5 \text{ ft} * 1.6 \text{ ft}) / 2 = 1.2 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -43.4 \text{ degrees}$$

$$\sin(-43.4 \text{ deg}) = -0.69$$

$$\cos(-43.4 \text{ deg}) = 0.73$$

$$\sec(-43.4 \text{ deg}) = 1.37$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (1.2 \text{ ft}^2 * 125 \text{ pcf}) = 150 \text{ lb/ft}$$

$$W * \sin(\alpha) = 150 \text{ lb/ft} * -0.69 = 103.5 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 150 \text{ lb/ft} * 0.73 = 109.5 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (150 \text{ lb/ft} * 0.73) - 0 \text{ lb/ft} = 109.5 \text{ lb/ft}$$

$$\tan(\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 109.5 \text{ lb/ft} * 0.58 = 62.4 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.5 * 1.37 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 2

Slice 2 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 1A: } B \text{ (ft)} = 1.75 \text{ ft}$$

$$H \text{ (ft)} = 2.8 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(1.6 \text{ ft} + 2.8 \text{ ft}) / 2] * 1.75 \text{ ft} = 3.85 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -36.1 \text{ degrees}$$

$$\text{Sin}(-36.1 \text{ deg}) = -0.59$$

$$\text{Cos}(-36.1 \text{ deg}) = 0.81$$

$$\text{Sec}(-36.1 \text{ deg}) = 1.23$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (3.85 \text{ ft}^2 * 125 \text{ pcf}) = 481.3 \text{ lb/ft}$$

$$W * \sin(\alpha) = 481.3 \text{ lb/ft} * -0.59 = 283.9 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 481.3 \text{ lb/ft} * 0.81 = 389.8 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (481.3 \text{ lb/ft} * 0.81) - 0 \text{ lb/ft} = 389.9 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 389.9 \text{ lb/ft} * 0.58 = 222.2 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.75 * 1.23 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 3

Slice 3 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 1A: } B \text{ (ft)} = 1.75 \text{ ft}$$

$$H \text{ (ft)} = 3.7 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(2.8 \text{ ft} + 3.7 \text{ ft}) / 2] * 1.75 \text{ ft} = 5.69 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -29.5 \text{ degrees}$$

$$\sin(-29.5 \text{ deg}) = -0.49$$

$$\cos(-29.5 \text{ deg}) = 0.87$$

$$\sec(-29.5 \text{ deg}) = 1.15$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (5.69 \text{ ft}^2 * 125 \text{ pcf}) = 710.9 \text{ lb/ft}$$

$$W * \sin(\alpha) = 710.9 \text{ lb/ft} * -0.49 = 348.4 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 710.9 \text{ lb/ft} * 0.87 = 618.5 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (618.5 \text{ lb/ft} * 0.87) - 0 \text{ lb/ft} = 618.5 \text{ lb/ft}$$

$$\tan(\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 618.5 \text{ lb/ft} * 0.58 = 352.6 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.75 * 1.15 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 4

Slice 4 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 4A: } B \text{ (ft)} = 1.5 \text{ ft}$$

$$H \text{ (ft)} = 4.1 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(3.7 \text{ ft} + 4.1 \text{ ft}) / 2] * 1.5 \text{ ft} = 5.85 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -23.3 \text{ degrees}$$

$$\text{Sin}(-23.3 \text{ deg}) = -0.4$$

$$\text{Cos}(-23.3 \text{ deg}) = 0.92$$

$$\text{Sec}(-23.3 \text{ deg}) = 1.09$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (5.85 \text{ ft}^2 * 125 \text{ pcf}) = 731.3 \text{ lb/ft}$$

$$W * \sin(\alpha) = 731.3 \text{ lb/ft} * -0.4 = 292.5 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 731.3 \text{ lb/ft} * 0.92 = 672.8 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (672.8 \text{ lb/ft} * 0.92) - 0 \text{ lb/ft} = 672.8 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 672.8 \text{ lb/ft} * 0.58 = 390.2 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.5 * 1.09 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 5

Slice 5 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 5A: } B \text{ (ft)} = 1.5 \text{ ft}$$

$$H \text{ (ft)} = 3.5 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(4.1 \text{ ft} + 3.5 \text{ ft}) / 2] * 1.5 \text{ ft} = 5.7 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -17.4 \text{ degrees}$$

$$\sin(-17.4 \text{ deg}) = -0.3$$

$$\cos(-17.4 \text{ deg}) = 0.95$$

$$\sec(-17.4 \text{ deg}) = 1.05$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (5.7 \text{ ft}^2 * 125 \text{ pcf}) = 712.5 \text{ lb/ft}$$

$$W * \sin(\alpha) = 712.5 \text{ lb/ft} * -0.3 = 213.8 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 712.5 \text{ lb/ft} * 0.95 = 676.9 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (712.5 \text{ lb/ft} * 0.95) - 0 \text{ lb/ft} = 676.9 \text{ lb/ft}$$

$$\tan(\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 676.9 \text{ lb/ft} * 0.58 = 406.1 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.5 * 1.05 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 6

Slice 6 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 6A: } B \text{ (ft)} = 1.75 \text{ ft}$$

$$H \text{ (ft)} = 2.75 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(2.75 \text{ ft} + 3.5 \text{ ft}) / 2] * 1.75 \text{ ft} = 5.47 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -11.7 \text{ degrees}$$

$$\text{Sin}(-11.7 \text{ deg}) = -0.2$$

$$\text{Cos}(-11.7 \text{ deg}) = 0.98$$

$$\text{Sec}(-11.7 \text{ deg}) = 1.02$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (5.47 \text{ ft}^2 * 125 \text{ pcf}) = 683.6 \text{ lb/ft}$$

$$W * \sin(\alpha) = 683.6 \text{ lb/ft} * -0.2 = 136.7 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 683.6 \text{ lb/ft} * 0.98 = 669.9 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (669.9 \text{ lb/ft} * 0.98) - 0 \text{ lb/ft} = 669.9 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 669.9 \text{ lb/ft} * 0.58 = 402 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.75 * 1.02 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 7

Slice 7 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 1A: } B \text{ (ft)} = 1.5 \text{ ft}$$

$$H \text{ (ft)} = 1.8 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(3.5 \text{ ft} + 1.8 \text{ ft}) / 2] * 1.5 \text{ ft} = 3.41 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -6.1 \text{ degrees}$$

$$\text{Sin}(-6.1 \text{ deg}) = -0.11$$

$$\text{Cos}(-6.1 \text{ deg}) = 0.99$$

$$\text{Sec}(-6.1 \text{ deg}) = 1.01$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (3.41 \text{ ft}^2 * 125 \text{ pcf}) = 426.6 \text{ lb/ft}$$

$$W * \sin(\alpha) = 426.6 \text{ lb/ft} * -0.11 = 46.9 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 426.6 \text{ lb/ft} * 0.99 = 422.3 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (426.6 \text{ lb/ft} * 0.99) - 0 \text{ lb/ft} = 422.3 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 422.3 \text{ lb/ft} * 0.58 = 253.4 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.5 * 1.01 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 8

Slice 8 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 8A: } B \text{ (ft)} = 1.75 \text{ ft}$$

$$H \text{ (ft)} = 0.75 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(1.8 \text{ ft} + 0.75 \text{ ft}) / 2] * 1.75 \text{ ft} = 2.23 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -0.5 \text{ degrees}$$

$$\text{Sin}(-0.5 \text{ deg}) = -0.01$$

$$\text{Cos}(-0.5 \text{ deg}) = 1.0$$

$$\text{Sec}(-0.5 \text{ deg}) = 1.0$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (2.23 \text{ ft}^2 * 125 \text{ pcf}) = 278.9 \text{ lb/ft}$$

$$W * \sin(\alpha) = 278.9 \text{ lb/ft} * -0.01 = 2.8 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 278.9 \text{ lb/ft} * 1 = 278.9 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (278.9 \text{ lb/ft} * 1) - 0 \text{ lb/ft} = 278.9 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 278.9 \text{ lb/ft} * 0.58 = 167.3 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.75 * 1.0 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 9

Slice 9 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

Slice 9A: B (ft) = 1.75 ft

H (ft) = 0.30 ft

$A_1 \text{ (ft}^2\text{)} = (1.75 \text{ ft} * 0.3 \text{ ft}) / 2 = 0.26 \text{ ft}^2$

Slice 9B: B (ft) = 1.75 ft

H (ft) = 0.3 ft

$A_2 \text{ (ft}^2\text{)} = [(0.31 \text{ ft} + 0.3 \text{ ft}) / 2] * 1.75 \text{ ft} = 0.53 \text{ ft}^2$

Alpha (α) = 5.0 degrees

Sin(5.0 deg) = 0.09

Cos(5.0 deg) = 1.0

Sec(5.0 deg) = 1.02

$W \text{ (lb/ft)} = A_1 \gamma_1 + A_2 \gamma_2 = (0.26 \text{ ft}^2 * 125 \text{ pcf}) + (0.53 \text{ ft}^2 * 125 \text{ pcf}) = 99.4 \text{ lb/ft}$

$W * \sin(\alpha) = 99.4 \text{ lb/ft} * 0.09 = 8.9 \text{ lb/ft}$ (driving)

$W * \cos(\alpha) = 99.4 \text{ lb/ft} * 1.0 = 99.4 \text{ lb/ft}$

$N' = (W * \cos(\alpha)) - U = (99.4 \text{ lb/ft} * 1.0) - 0 \text{ lb/ft} = 99.4 \text{ lb/ft}$

Tan (φ) = tan(30 deg) = 0.58

$N' * \tan(\varphi) = 99.4 \text{ lb/ft} * 0.58 = 59.7 \text{ lb/ft}$ (resisting)

$c * B * \sec(\alpha) = 0 \text{ psf} * 1.75 * 1.02 = 0 \text{ lb/ft}$ (resisting)



Calculations: Example of driving and resistance forces for Slice 10

Slice 10 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 10A: } B \text{ (ft)} = 1.5 \text{ ft}$$

$$H \text{ (ft)} = 0.3 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = (1.5 \text{ ft} * 0.3 \text{ ft}) / 2 = 0.23 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = 10.6 \text{ degrees}$$

$$\text{Sin}(10.6 \text{ deg}) = 0.18$$

$$\text{Cos}(10.6 \text{ deg}) = 0.98$$

$$\text{Sec}(10.6 \text{ deg}) = 1.02$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (0.23 \text{ ft}^2 * 125 \text{ pcf}) = 28.1 \text{ lb/ft}$$

$$W * \sin(\alpha) = 28.1 \text{ lb/ft} * 0.18 = 8.9 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 28.1 \text{ lb/ft} * 0.98 = 27.56 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (28.1 \text{ lb/ft} * 0.98) - 0 \text{ lb/ft} = 27.56 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 27.56 \text{ lb/ft} * 0.58 = 16.5 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.5 * 1.02 = 0 \text{ lb/ft (resisting)}$$



Total sum of resisting forces:

Summation of resisting forces due to friction angle forces

$$= 62.4 + 222.2 + 352.6 + 403.7 + 406.1 + 402 + 253.4 + 167.3 + 59.7 + 16.5 = 2,345.8 \text{ lb/ft}$$

Summation of resisting forces due to cohesion forces

$$= 0 \text{ lb/ft}$$

$$\text{Summation of all resisting forces} = 2,345.8 \text{ lb/ft} + -14.01 \text{ lb/ft} = 2331.79 \text{ lb/ft}$$

Total sum of driving forces:

Total driving forces

$$= 103.5 + 283.9 + 348.4 + 292.5 + 213.8 + 136.7 + 46.9 + 2.8 = 1428.5 \text{ lb/ft}$$

Results:

$$\text{Factor of Safety} = \frac{\text{sum of resisting forces}}{\text{Sum of driving forces}} = \frac{2331.79}{1428.5} = 1.70$$

Driving Forces are equal to the summation of the weights of slices 1 through 10

Resistance Forces are equal to the summation of the shear forces (i.e. cohesion/friction) along the failure surface

See attached spreadsheet for complete list of slice calculations and attached Slope 7.0 model of global stability analyses. Based on hand calculation, the factor of safety against failure is 1.66, consistent with the Slope 7.0 software.

Conclusion:

The above factor of safety, which was computed by using the method of slices for a 1.5H:1V slope at Section C-C for excavations 5 feet or less, is consistent with the factors of safety computed via Slope 7.0 which utilized the Simplified Bishop and Janbu methods. The computer models calculated factor of safety values for this scenario of 1.5 (Bishop), which satisfy the minimum design factor of safety for slope stability of 1.5.



OSHA Excavation Slopes:

The contractor will be responsible to provide a safe excavation during the construction activities of the project. All excavations should be conducted in accordance with applicable federal, state, and local safety regulations, including, but not limited to the Occupational Safety and Health Administration (OSHA) excavation safety standards. In accordance with OSHA Regulation 29 CFR 1926 Subpart P Appendix B, the maximum allowable slopes for excavations less than 20 feet should be completed per the OSHA Excavation Slopes shown in Table 1. Excavations made in layered soil systems shall use the maximum allowable slope for each layer as prescribed in the OSHA Regulation. Excavations greater than 20 feet deep should be designed by a registered professional engineer; any shoring or bracing systems should be designed by a licensed structural engineer.

Table 1 – OSHA Excavation Slopes

Soil or Rock Type	Maximum Allowable Slope (H:V) for less than 20 feet
Stable Rock	Vertical (90°)
Type A ¹	¾:1 (53 °)
Type B ²	1:1 (45 °)
Type C ³	1 ½:1 (34 °)

¹ Type A Soils are cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) or greater.

² Type B Soils are cohesive soils with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf, and includes angular gravel.

³ Type C Soils are cohesive soils with an unconfined compressive strength of 0.5 tsf or less, as well as cohesionless soils.

Excavation stability and soil pressures on temporary shoring are dependent on soil conditions, depth of excavations, installation procedures, and the magnitude of any surcharge loads on the ground surface adjacent to the excavation. Surcharge loads from the excavated materials, construction equipment, and vehicles should be included in the design of the excavation system. Excavation near existing structures and underground utilities should be performed with extreme care to avoid undermining existing structures.

Construction Excavation - Slope Stability Calculation - 5' Excavation
Long Term Circular Failure - slope 2H:1V
Former Carnotite Reduction Company Site - Soil Removal

Slice	Width, B (ft)	Height, H per soil type (ft)	Area, A (sq.ft)	Alpha, α (degrees)	Sin (alpha)	Cos (alpha)	Sec (alpha)	Weight of slice, W (lbs/ft)	Average Pore Pressure, σ_w (lbs/sq.ft)	Normal component of pore pressure, U (lbs/ft)	W*sin(alpha) (lbs/ft)	W*cos(alpha) (lbs/ft)	Effective Normal force, N' = {W*cos(alpha) - U}	tan (phi) (degrees)	N'*tan (phi) (lbs/ft)	Cohesion*B*sec(alpha) (lbs/ft)
9A	1.75	0.30	0.26													
9B	1.75	0.30	0.53	5.0	0.09	1.00	1.00	99.4		0.0	8.9	99.42	99.4	0.6	59.7	0.0
10A	1.50	0.30	0.23	10.6	0.18	0.98	1.02	28.1		0.0	5.1	27.56	27.6	0.6	16.5	0.0
							Total moving forces in the direction of resisting forces =				-14.01					
1A	1.50	1.60	1.20	-43.4	-0.69	0.73	1.37	150.0		0.0	-103.5	109.5	109.5	0.6	62.4	0.0
2A	1.75	2.80	3.85	-36.1	-0.59	0.81	1.23	481.3		0.0	-283.9	389.8	389.8	0.6	222.2	0.0
3A	1.75	3.70	5.69	-29.5	-0.49	0.87	1.15	710.9		0.0	-348.4	618.5	618.5	0.6	352.6	0.0
4A	1.50	4.10	5.85	-23.3	-0.40	0.92	1.09	731.3		0.0	-292.5	672.8	672.8	0.6	403.7	0.0
5A	1.50	3.50	5.70	-17.4	-0.30	0.95	1.05	712.5		0.0	-213.8	676.9	676.9	0.6	406.1	0.0
6A	1.75	2.75	5.47	-11.7	-0.20	0.98	1.02	683.6		0.0	-136.7	669.9	669.9	0.6	402.0	0.0
7A	1.50	1.80	3.41	-6.1	-0.11	0.99	1.01	426.6		0.0	-46.9	422.3	422.3	0.6	253.4	0.0
8A	1.75	0.75	2.23	-0.5	-0.01	1.00	1.00	278.9		0.0	-2.8	278.9	278.9	0.6	167.3	0.0
							Total moving forces opposing the resisting forces =				-1428.5		Total resisting forces =		2345.8	0.0

Resisting Forces

Driving Forces

Factor of Safety

2331.79 (= 188.36+8956.6+4487.7)

-1428.4766

-1.70

Slide Analysis Information

Carnotite Open Cut- 5 ft Excavation

Project Summary

Slide Modeler Version: 8.024

General Settings

Units of Measurement: Imperial Units
 Time Units: days
 Permeability Units: feet/second
 Data Output: Standard
 Failure Direction: Left to Right

Analysis Options

Slices Type: Vertical

Analysis Methods Used

Bishop simplified
 Janbu simplified

Number of slices: 10
 Tolerance: 0.005
 Maximum number of iterations: 50
 Check malpha < 0.2: Yes
 Initial trial value of FS: 1
 Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
 Pore Fluid Unit Weight [lbs/ft3]: 62.4
 Use negative pore pressure cutoff: Yes
 Maximum negative pore pressure [psf]: 0
 Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
 Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Circular
 Search Method: Grid Search
 Radius Increment: 10
 Composite Surfaces: Disabled
 Reverse Curvature: Invalid Surfaces
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined
 Minimum Area: Not Defined
 Minimum Weight: Not Defined

Seismic Loading

Advanced seismic analysis: No
 Staged pseudostatic analysis: No

Materials

Property	BL Sand FILL	BR/GR Sand	GR Sand	Med Stiff to V Stiff Gray Clay DRAINED
Color				
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	122	120	80
Cohesion [psf]	0	0	0	75
Friction Angle [°]	30	34	32	25
Water Surface	None	None	Water Table	Water Table
Hu Value			1	1
Ru Value	0	0		

Global Minimums

Method: bishop simplified

FS	1.713370
Center:	-1.107, 609.585
Radius:	17.053
Left Slip Surface Endpoint:	-13.620, 598.000
Right Slip Surface Endpoint:	2.860, 593.000
Resisting Moment:	41756.4 lb-ft
Driving Moment:	24370.9 lb-ft
Total Slice Area:	35.0349 ft2
Surface Horizontal Width:	16.4798 ft
Surface Average Height:	2.12594 ft

Method: janbu simplified

FS	1.567250
Center:	-3.217, 601.408
Radius:	9.293
Left Slip Surface Endpoint:	-11.863, 598.000
Right Slip Surface Endpoint:	0.742, 593.000
Resisting Horizontal Force:	2299.72 lb
Driving Horizontal Force:	1467.35 lb
Total Slice Area:	36.1929 ft2
Surface Horizontal Width:	12.6044 ft
Surface Average Height:	2.87144 ft

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 26719
 Number of Invalid Surfaces: 1892

Error Codes:

Error Code -107 reported for 207 surfaces
 Error Code -108 reported for 1058 surfaces
 Error Code -109 reported for 1 surface
 Error Code -112 reported for 521 surfaces
 Error Code -118 reported for 105 surfaces

Method: janbu simplified

Number of Valid Surfaces: 26452
 Number of Invalid Surfaces: 2159

Error Codes:

Error Code -107 reported for 207 surfaces
 Error Code -108 reported for 1201 surfaces
 Error Code -109 reported for 1 surface
 Error Code -111 reported for 154 surfaces
 Error Code -112 reported for 491 surfaces
 Error Code -118 reported for 105 surfaces

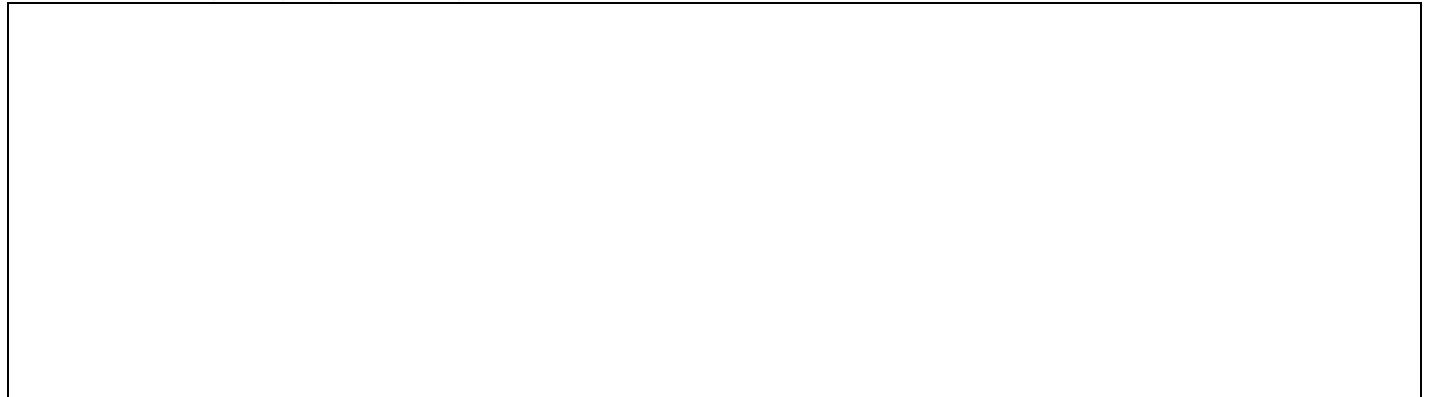
Error Codes

The following errors were encountered during the computation:

- 107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
- 108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
- 109 = Soiltype for slice base not located. This error should occur very rarely, if at all. It may occur if a very low number of slices is combined with certain soil geometries, such that the midpoint of a slice base is actually outside the soil region, even though the slip surface is wholly within the soil region.
- 111 = safety factor equation did not converge
- 112 = The coefficient $M\text{-}\alpha = \cos(\alpha)(1 + \tan(\alpha)\tan(\phi)/F) < 0.2$ for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
- 118 = Surface does not pass through the search focus

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.71337



Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.64798	160.475	-43.3929	BL Sand FILL	0	30	24.8881	42.6425	73.8589	0	73.8589	97.3885	97.3885
2	1.64798	444.95	-36.1496	BL Sand FILL	0	30	73.0158	125.103	216.684	0	216.684	270.025	270.025
3	1.64798	665.123	-29.5353	BL Sand FILL	0	30	114.207	195.678	338.924	0	338.924	403.632	403.632
4	1.64798	825.24	-23.3352	BL Sand FILL	0	30	147.333	252.436	437.233	0	437.233	500.792	500.792
5	1.64798	783.019	-17.4159	BL Sand FILL	0	30	144.808	248.109	429.738	0	429.738	475.162	475.162
6	1.64798	645.049	-11.6849	BL Sand FILL	0	30	123.307	211.27	365.93	0	365.93	391.432	391.432
7	1.64798	471.889	-6.07143	BL Sand FILL	0	30	93.1521	159.604	276.442	0	276.442	286.35	286.35
8	1.64798	265.155	-0.51652	BL Sand FILL	0	30	54.0531	92.6129	160.41	0	160.41	160.898	160.898
9	1.64798	86.6034	5.03349	BL Sand FILL	0	30	18.2495	31.2681	54.1579	0	54.1579	52.5506	52.5506
10	1.64798	31.8633	10.6318	BL Sand FILL	0	30	6.95495	11.9164	20.6397	0	20.6397	19.3342	19.3342

Global Minimum Query (janbu simplified) - Safety Factor: 1.56725

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.26044	175.915	-60.5576	BL Sand FILL	0	30	31.1024	48.7452	84.4293	0	84.4293	139.532	139.532
2	1.26044	458.045	-46.9285	BL Sand FILL	0	30	96.0128	150.476	260.632	0	260.632	363.335	363.335
3	1.26044	637.457	-36.3964	BL Sand FILL	0	30	146.499	229.6	397.678	0	397.678	505.672	505.672
4	1.26044	742.459	-27.191	BL Sand FILL	0	30	182.446	285.938	495.259	0	495.259	588.987	588.987
5	1.26044	708.8	-18.7125	BL Sand FILL	0	30	184.163	288.63	499.922	0	499.922	562.302	562.302
6	1.26044	628.712	-10.6498	BL Sand FILL	0	30	171.84	269.316	466.468	0	466.468	498.782	498.782
7	1.26044	519.847	-2.79976	BL Sand FILL	0	30	149.243	233.901	405.129	0	405.129	412.427	412.427
8	1.26044	383.628	4.99683	BL Sand FILL	0	30	115.855	181.574	314.495	0	314.495	304.366	304.366
9	1.26044	219.831	12.8895	BL Sand FILL	0	30	70.1675	109.97	190.474	0	190.474	174.417	174.417
10	1.26044	49.4235	21.0456	BL Sand FILL	0	30	16.8322	26.3802	45.6919	0	45.6919	39.2152	39.2152

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.71337

--	--	--	--	--	--	--	--	--	--	--	--	--	--

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	-13.62	598	0	0	0
2	-11.972	596.442	74.0799	0	0
3	-10.324	595.238	214.681	0	0
4	-8.67604	594.304	343.027	0	0
5	-7.02807	593.593	411.189	0	0
6	-5.38009	593.076	394.82	0	0
7	-3.73211	592.736	316.434	0	0
8	-2.08414	592.56	211.456	0	0
9	-0.436162	592.545	124.806	0	0
10	1.21181	592.691	86.8849	0	0
11	2.85979	593	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.56725

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	-11.8628	598	0	0	0
2	-10.6024	595.767	149.308	0	0
3	-9.34196	594.419	379.618	0	0
4	-8.08152	593.49	564.356	0	0
5	-6.82107	592.842	654.943	0	0
6	-5.56063	592.415	636.108	0	0
7	-4.30018	592.178	529.939	0	0
8	-3.03974	592.116	366.681	0	0
9	-1.7793	592.227	185.902	0	0
10	-0.518852	592.515	42.4642	0	0
11	0.741591	593	0	0	0

Entity Information

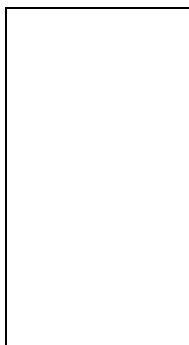
Water Table

X	Y
-90	579
170	579

Focus Search Window

X	Y
-14.59	593
-14.59	584.773
11.523	584.773
11.523	593

External Boundary



X	Y
-90	538
170	538
170	550
170	565
170	579
170	592
170	598
107.5	598
100	593
2.22045e-16	593
-7.5	598
-90	598
-90	592
-90	579
-90	565
-90	550

Material Boundary

X	Y
-90	579
170	579

Material Boundary

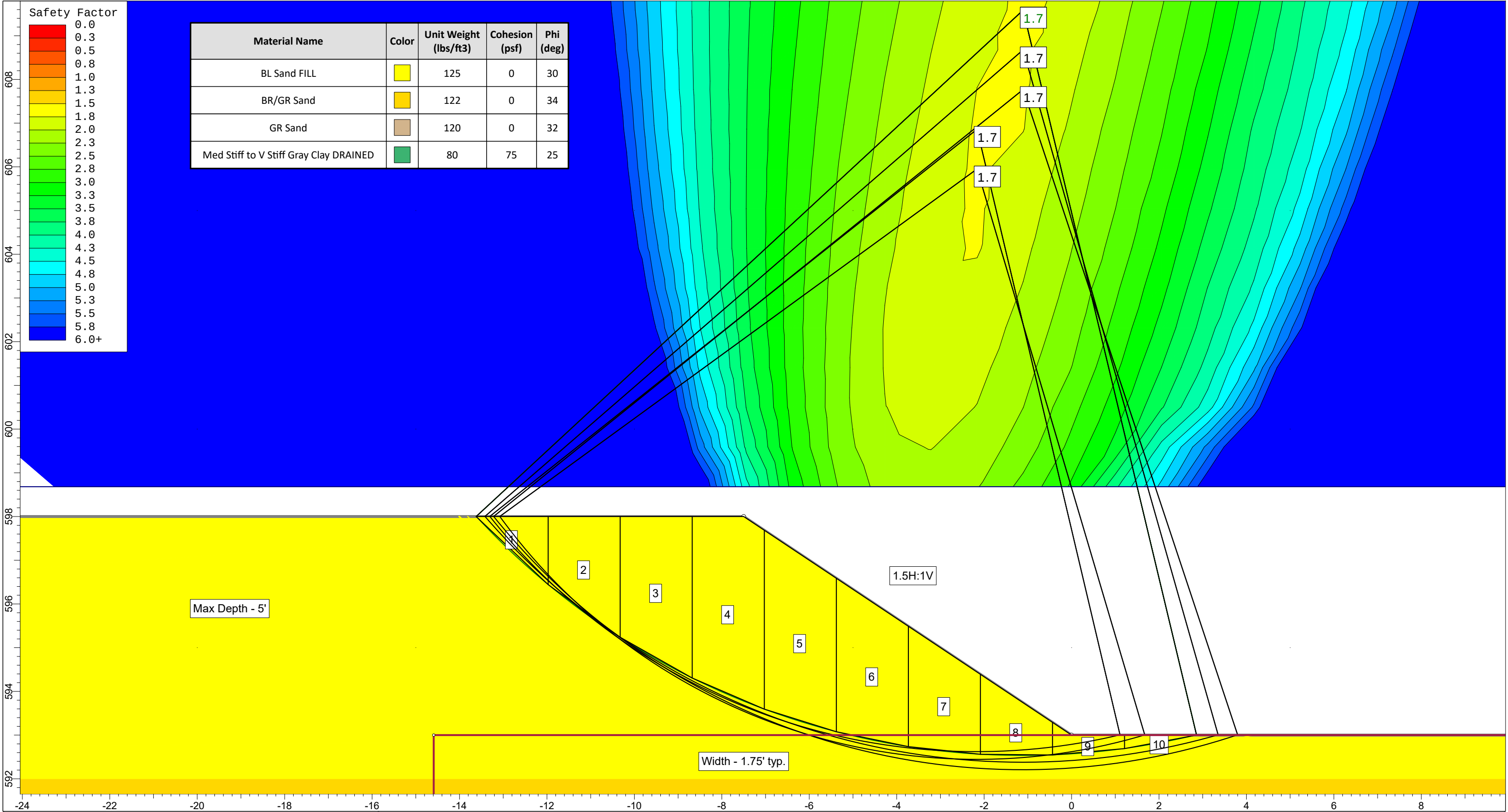
X	Y
-90	565
170	565

Material Boundary

X	Y
-90	550
170	550

Material Boundary

X	Y
-90	592
170	592



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
BL Sand FILL		125	0	30
BR/GR Sand		122	0	34
GR Sand		120	0	32
Med Stiff to V Stiff Gray Clay DRAINED		80	75	25

Attachment 3

Slope Stability Exhibits
7.5-Foot Excavations
Section D-D

Exhibits and Hand Calculations



Problem Statement:

Estimate the allowable factor of safety for global stability for utility excavation – Section D-D – from GSG Excavation Plan for OUC. Calculation is for the long-term drained condition and is based on the soil conditions present at the site, which generally consist of OSHA Type C soils that require a minimum excavation slope of 1.5H:1V, however, for the excavations in the area of Section D-D, less than 7.5 feet, can be considered with a 2H:1V slopes.

Approach and References:

1. Ordinary Method of Slices – see attached exhibit
2. Excavation Plan & Cross Sections

Definitions:

B = Width of slice

H = Average height of slice

A = Area of slice

α = Angle of failure surface

W = Weight of slice

σ_w = Average pore pressure of slice

U = Normal component of pore pressure

N' = Effective normal force

c = drained shear strength or cohesion

γ = total unit weight

ϕ = drained friction angle

Assumed Soil Parameters – Drained Condition:

Depth (ft)	Soil Description	c (psf)	γ (pcf)	ϕ (degrees)
0-6	Black Sand Fill	c1 = 0	$\gamma_1 = 125$	30
6-19	Loose to Med. Dense, Br/Gr Sand	c2 = 0	$\gamma_2 = 122$	34
19-33	Loose to Med. Dense, Gr Sand	c3 = 0	$\gamma_3 = 119$	32

Given:

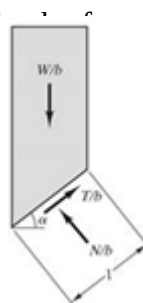
Depth of long term water table = 19 feet (below max c

Maximum excavation depth – 7.5 feet

Slide slopes (max per OSHA soil type) – 2H:1V

- Effective Stress Analysis (ESA)

$$FS = \frac{\sum \{c'l + [(W/b) \cos \alpha - ul] \tan \phi'\}}{\sum [(W/b) \sin \alpha]}$$





Calculations: Example of driving and resistance forces for Slice 1

Slices 1 through 10 include the resisting forces contributed through the soil adjacent to the failure surface friction angle and cohesive forces for all slices

Slice 1 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 1A: } B \text{ (ft)} = 2.25 \text{ ft}$$

$$H \text{ (ft)} = 1.7 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = (1.7 \text{ ft} * 2.25 \text{ ft}) / 2 = 1.91 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -37.9 \text{ degrees}$$

$$\text{Sin}(-37.9 \text{ deg}) = -0.61$$

$$\text{Cos}(-37.9 \text{ deg}) = 0.79$$

$$\text{Sec}(-37.9 \text{ deg}) = 1.27$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (1.91 \text{ ft}^2 * 125 \text{ pcf}) = 239.1 \text{ lb/ft}$$

$$W * \sin(\alpha) = 239.1 \text{ lb/ft} * -0.61 = 145.8 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 239.1 \text{ lb/ft} * 0.79 = 188.9 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (239.1 \text{ lb/ft} * 0.79) - 0 \text{ lb/ft} = 188.9 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 188.9 \text{ lb/ft} * 0.58 = 107.6 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 2.25 * 1.27 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 2

Slice 2 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 2A: } B \text{ (ft)} = 2.0 \text{ ft}$$

$$H \text{ (ft)} = 3.1 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(3.1 \text{ ft} + 1.7 \text{ ft}) / 2] * 2 \text{ ft} = 4.8 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -33.1 \text{ degrees}$$

$$\text{Sin}(-33.1 \text{ deg}) = -0.55$$

$$\text{Cos}(-33.1 \text{ deg}) = 0.84$$

$$\text{Sec}(-33.1 \text{ deg}) = 1.19$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (4.8 \text{ ft}^2 * 125 \text{ pcf}) = 600 \text{ lb/ft}$$

$$W * \sin(\alpha) = 600 \text{ lb/ft} * -0.55 = 330 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 600 \text{ lb/ft} * 0.84 = 504 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (600 \text{ lb/ft} * 0.84) - 0 \text{ lb/ft} = 504 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 504 \text{ lb/ft} * 0.58 = 287.3 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 2 * 1.19 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 3

Slice 3 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 3A: } B \text{ (ft)} = 2.0 \text{ ft}$$

$$H \text{ (ft)} = 3.6 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(3.6 \text{ ft} + 3.1 \text{ ft}) / 2] * 2 \text{ ft} = 6.7 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -28.5 \text{ degrees}$$

$$\text{Sin}(-28.5 \text{ deg}) = -0.48$$

$$\text{Cos}(-28.5 \text{ deg}) = 0.88$$

$$\text{Sec}(-28.5 \text{ deg}) = 1.14$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (6.7 \text{ ft}^2 * 125 \text{ pcf}) = 837.5 \text{ lb/ft}$$

$$W * \sin(\alpha) = 837.5 \text{ lb/ft} * -0.48 = 402 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 837.5 \text{ lb/ft} * 0.88 = 737 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (837.5 \text{ lb/ft} * 0.88) - 0 \text{ lb/ft} = 737 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 737 \text{ lb/ft} * 0.58 = 420.1 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 2.0 * 1.14 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 4

Slice 4 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 4A: } B \text{ (ft)} = 2.5 \text{ ft}$$

$$H \text{ (ft)} = 3.5 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(3.5 \text{ ft} + 3.6 \text{ ft}) / 2] * 2.5 \text{ ft} = 8.88 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -24.1 \text{ degrees}$$

$$\text{Sin}(-24.1 \text{ deg}) = -0.41$$

$$\text{Cos}(-24.1 \text{ deg}) = 0.91$$

$$\text{Sec}(-24.1 \text{ deg}) = 1.10$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (8.88 \text{ ft}^2 * 125 \text{ pcf}) = 1109.4 \text{ lb/ft}$$

$$W * \sin(\alpha) = 1109.4 \text{ lb/ft} * -0.41 = 454.8 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 1109.4 \text{ lb/ft} * 0.91 = 1009.5 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (1109.4 \text{ lb/ft} * 0.91) - 0 \text{ lb/ft} = 1009.5 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 1009.5 \text{ lb/ft} * 0.58 = 605.7 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 2.5 * 1.10 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 5

Slice 5 exists in one (1) soil type that will be designated as follows: 1A) Black sand fill

$$\text{Slice 5A: } B \text{ (ft)} = 2 \text{ ft}$$

$$H \text{ (ft)} = 3.2 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = [(3.2 \text{ ft} + 3.5 \text{ ft}) / 2] * 2 \text{ ft} = 6.7 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -19.9 \text{ degrees}$$

$$\sin(-19.9 \text{ deg}) = -0.34$$

$$\cos(-19.9 \text{ deg}) = 0.94$$

$$\sec(-19.9 \text{ deg}) = 1.06$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (6.7 \text{ ft}^2 * 125 \text{ pcf}) = 837.5 \text{ lb/ft}$$

$$W * \sin(\alpha) = 837.5 \text{ lb/ft} * -0.34 = 284.8 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 837.5 \text{ lb/ft} * 0.94 = 787.3 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (837.5 \text{ lb/ft} * 0.94) - 0 \text{ lb/ft} = 787.3 \text{ lb/ft}$$

$$\tan(\varphi) = \tan(30 \text{ deg}) = 0.58$$

$$N' * \tan(\varphi) = 787.3 \text{ lb/ft} * 0.58 = 456.5 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 2 * 1.06 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 6

Slice 6 exists in one (1) soil type that will be designated as follows: 6A) Black sand fill and 6B) Brown and Gray Sand

Slice 6A: B (ft) = 2 ft

H (ft) = 2.2 ft

$$A_1 \text{ (ft}^2\text{)} = [(2.2 \text{ ft} + 3.2 \text{ ft}) / 2] * 2 \text{ ft} = 6.7 \text{ ft}^2$$

Slice 6B: B (ft) = 2 ft

H (ft) = 0.6 ft

$$A_1 \text{ (ft}^2\text{)} = (2 \text{ ft} * 0.6 \text{ ft}) / 2 = 0.6 \text{ ft}^2$$

Alpha (α) = -15.9 degrees

$$\sin(-15.9 \text{ deg}) = -0.27$$

$$\cos(-15.9 \text{ deg}) = 0.96$$

$$\sec(-15.9 \text{ deg}) = 1.04$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 + A_2 \gamma_2 = (6.7 \text{ ft}^2 * 125 \text{ pcf}) + (0.6 \text{ ft}^2 * 122 \text{ pcf}) = 748.2 \text{ lb/ft}$$

$$W * \sin(\alpha) = 748.2 \text{ lb/ft} * -0.27 = 202 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 748.2 \text{ lb/ft} * 0.96 = 718.3 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (748.2 \text{ lb/ft} * 0.96) - 0 \text{ lb/ft} = 748.2 \text{ lb/ft}$$

$$\tan(\varphi) = \tan(34 \text{ deg}) = 0.67$$

$$N' * \tan(\varphi) = 748.2 \text{ lb/ft} * 0.67 = 481.2 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 2 * 1.04 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 7

Slice 7 exists in one (1) soil type that will be designated as follows: 7A) Black sand fill and 7B) Brown and Gray Sand

Slice 7A: B (ft) = 2 ft

H (ft) = 1.2 ft

$$A_1 \text{ (ft}^2\text{)} = [(1.2 \text{ ft} + 2.2 \text{ ft}) / 2] * 2 \text{ ft} = 3.4 \text{ ft}^2$$

Slice 7B: B (ft) = 2 ft

H (ft) = 1 ft

$$A_1 \text{ (ft}^2\text{)} = [(1 \text{ ft} + 0.6 \text{ ft}) / 2] * 2 \text{ ft} = 1.6 \text{ ft}^2$$

Alpha (α) = -12.1 degrees

Sin(-12.1 deg) = -0.21

Cos(-12.1 deg) = 0.98

Sec(-12.1 deg) = 1.02

$$W \text{ (lb/ft)} = A_1 \gamma_1 + A_2 \gamma_2 = (3.4 \text{ ft}^2 * 125 \text{ pcf}) + (1.6 \text{ ft}^2 * 122 \text{ pcf}) = 620.2 \text{ lb/ft}$$

$$W * \sin(\alpha) = 620.2 \text{ lb/ft} * -0.21 = 130.2 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 620.2 \text{ lb/ft} * 0.98 = 607.8 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (620.2 \text{ lb/ft} * 0.98) - 0 \text{ lb/ft} = 607.8 \text{ lb/ft}$$

$$\tan(\varphi) = \tan(34 \text{ deg}) = 0.67$$

$$N' * \tan(\varphi) = 607.8 \text{ lb/ft} * 0.67 = 407.2 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 2 * 1.02 = 0 \text{ lb/ft (resisting)}$$



Calculations: Example of driving and resistance forces for Slice 8

Slice 8 exists in one (1) soil type that will be designated as follows: 8A) Black sand fill and 8B) Brown and Gray Sand

Slice 8A: B (ft) = 2 ft

H (ft) = 0.23 ft

$A_1 \text{ (ft}^2\text{)} = [(0.23 \text{ ft} + 1.2 \text{ ft}) / 2] * 2 \text{ ft} = 1.43 \text{ ft}^2$

Slice 8B: B (ft) = 2 ft

H (ft) = 1.3 ft

$A_1 \text{ (ft}^2\text{)} = [(1.3 \text{ ft} + 1 \text{ ft}) / 2] * 2 \text{ ft} = 2.3 \text{ ft}^2$

Alpha (α) = -8.4 degrees

Sin(-8.4 deg) = -0.15

Cos(-8.4 deg) = 0.99

Sec(-8.4 deg) = 1.01

$W \text{ (lb/ft)} = A_1 \gamma_1 + A_2 \gamma_2 = (1.43 \text{ ft}^2 * 125 \text{ pcf}) + (2.3 \text{ ft}^2 * 122 \text{ pcf}) = 459.4 \text{ lb/ft}$

$W * \sin(\alpha) = 459.4 \text{ lb/ft} * -0.15 = 68.9 \text{ lb/ft}$ (driving)

$W * \cos(\alpha) = 459.4 \text{ lb/ft} * 0.99 = 454.8 \text{ lb/ft}$

$N' = (W * \cos(\alpha)) - U = (459.4 \text{ lb/ft} * 0.99) - 0 \text{ lb/ft} = 459.4 \text{ lb/ft}$

Tan (ϕ) = tan(34 deg) = 0.67

$N' * \tan(\phi) = 459.4 \text{ lb/ft} * 0.67 = 306.5 \text{ lb/ft}$ (resisting)

$c * B * \sec(\alpha) = 0 \text{ psf} * 2 * 1.01 = 0 \text{ lb/ft}$ (resisting)



Calculations: Example of driving and resistance forces for Slice 9

Slice 9 exists in one (1) soil type that will be designated as follows: 9A) Black sand fill and 9B) Brown and Gray Sand

Slice 9A: B (ft) = 2 ft

H (ft) = 0.2 ft

$A_1 \text{ (ft}^2\text{)} = [(0.2 \text{ ft} + 0.23 \text{ ft}) / 2] * 2 \text{ ft} = 0.2 \text{ ft}^2$

Slice 9B: B (ft) = 2 ft

H (ft) = 1.5 ft

$A_1 \text{ (ft}^2\text{)} = [(1.5 \text{ ft} + 1.3 \text{ ft}) / 2] * 2 \text{ ft} = 2.8 \text{ ft}^2$

Alpha (α) = -4.8 degrees

Sin(-4.8 deg) = -0.08

Cos(-4.8 deg) = 1.0

Sec(-4.8 deg) = 1.0

$W \text{ (lb/ft)} = A_1 \gamma_1 + A_2 \gamma_2 = (0.2 \text{ ft}^2 * 125 \text{ pcf}) + (2.8 \text{ ft}^2 * 122 \text{ pcf}) = 366.6 \text{ lb/ft}$

$W * \sin(\alpha) = 366.6 \text{ lb/ft} * -0.08 = 29.3 \text{ lb/ft}$ (driving)

$W * \cos(\alpha) = 366.6 \text{ lb/ft} * 1.0 = 366.6 \text{ lb/ft}$

$N' = (W * \cos(\alpha)) - U = (366.6 \text{ lb/ft} * 1.0) - 0 \text{ lb/ft} = 366.6 \text{ lb/ft}$

$\tan(\varphi) = \tan(34 \text{ deg}) = 0.67$

$N' * \tan(\varphi) = 366.6 \text{ lb/ft} * 0.67 = 245.6 \text{ lb/ft}$ (resisting)

$c * B * \sec(\alpha) = 0 \text{ psf} * 2 * 1.0 = 0 \text{ lb/ft}$ (resisting)



Calculations: Example of driving and resistance forces for Slice 10

Slice 10 exists in one (1) soil type that will be designated as follows: 1A) Br/Gr Sand

$$\text{Slice 10A: } B \text{ (ft)} = 1.5 \text{ ft}$$

$$H \text{ (ft)} = 1.5 \text{ ft}$$

$$A_1 \text{ (ft}^2\text{)} = (1.5 \text{ ft} * 1.5 \text{ ft}) / 2 = 1.13 \text{ ft}^2$$

$$\text{Alpha } (\alpha) = -1.1 \text{ degrees}$$

$$\text{Sin}(-1.1 \text{ deg}) = -0.02$$

$$\text{Cos}(-1.1 \text{ deg}) = 1.0$$

$$\text{Sec}(-1.1 \text{ deg}) = 1.0$$

$$W \text{ (lb/ft)} = A_1 \gamma_1 = (1.13 \text{ ft}^2 * 122 \text{ pcf}) = 137.3 \text{ lb/ft}$$

$$W * \sin(\alpha) = 137.3 \text{ lb/ft} * 0.02 = 2.7 \text{ lb/ft (driving)}$$

$$W * \cos(\alpha) = 137.3 \text{ lb/ft} * 1.0 = 137.3 \text{ lb/ft}$$

$$N' = (W * \cos(\alpha)) - U = (137.3 \text{ lb/ft} * 1.0) - 0 \text{ lb/ft} = 137.3 \text{ lb/ft}$$

$$\text{Tan } (\varphi) = \tan(34 \text{ deg}) = 0.67$$

$$N' * \tan(\varphi) = 137.3 \text{ lb/ft} * 0.67 = 92 \text{ lb/ft (resisting)}$$

$$c * B * \sec(\alpha) = 0 \text{ psf} * 1.5 * 1.0 = 0 \text{ lb/ft (resisting)}$$



Total sum of resisting forces:

Summation of resisting forces due to friction angle forces

$$= 107.6 + 287.3 + 420.1 + 605.7 + 472.4 + 481.2 + 407.2 + 306.5 + 245.6 + 92 = 3425.6 \text{ lb/ft}$$

Summation of resisting forces due to cohesion forces

$$= 0 \text{ lb/ft}$$

$$\text{Summation of all resisting forces} = 3425.6 \text{ lb/ft} + 0 \text{ lb/ft} = 3425.6 \text{ lb/ft}$$

Total sum of driving forces:

Total driving forces

$$= 145.8 + 330 + 402 + 454.8 + 284.8 + 202 + 130.2 + 68.9 + 29.3 + 2.7 = 2050.7 \text{ lb/ft}$$

Results:

$$\text{Factor of Safety} = \frac{\text{sum of resisting forces}}{\text{Sum of driving forces}} = \frac{3425.6}{2050.7} = 1.70$$

Driving Forces are equal to the summation of the weights of slices 1 through 10

Resistance Forces are equal to the summation of the shear forces (i.e. cohesion/friction) along the failure surface

See attached spreadsheet for complete list of slice calculations and attached Slope 7.0 model of global stability analyses. Based on hand calculation, the factor of safety against failure is 1.7, consistent with the Slope 7.0 software.

Conclusion:

The above factor of safety, which was computed by using the method of slices for a 1.5H:1V slope at Section D-D for excavations 7.5 feet or less, is consistent with the factors of safety computed via Slope 7.0 which utilized the Simplified Bishop and Janbu methods. The computer models calculated factor of safety values for this scenario of 1.5 (Bishop), which satisfy the minimum design factor of safety for slope stability of 1.5.



OSHA Excavation Slopes:

The contractor will be responsible to provide a safe excavation during the construction activities of the project. All excavations should be conducted in accordance with applicable federal, state, and local safety regulations, including, but not limited to the Occupational Safety and Health Administration (OSHA) excavation safety standards. In accordance with OSHA Regulation 29 CFR 1926 Subpart P Appendix B, the maximum allowable slopes for excavations less than 20 feet should be completed per the OSHA Excavation Slopes shown in Table 1. Excavations made in layered soil systems shall use the maximum allowable slope for each layer as prescribed in the OSHA Regulation. Excavations greater than 20 feet deep should be designed by a registered professional engineer; any shoring or bracing systems should be designed by a licensed structural engineer.

Table 1 – OSHA Excavation Slopes

Soil or Rock Type	Maximum Allowable Slope (H:V) for less than 20 feet
Stable Rock	Vertical (90°)
Type A ¹	¾:1 (53 °)
Type B ²	1:1 (45 °)
Type C ³	1 ½:1 (34 °)

¹ Type A Soils are cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) or greater.

² Type B Soils are cohesive soils with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf, and includes angular gravel.

³ Type C Soils are cohesive soils with an unconfined compressive strength of 0.5 tsf or less, as well as cohesionless soils.

Excavation stability and soil pressures on temporary shoring are dependent on soil conditions, depth of excavations, installation procedures, and the magnitude of any surcharge loads on the ground surface adjacent to the excavation. Surcharge loads from the excavated materials, construction equipment, and vehicles should be included in the design of the excavation system. Excavation near existing structures and underground utilities should be performed with extreme care to avoid undermining existing structures.

Long Term Circular Failure - slope 2H:1V

Resisting Forces	3425.64	(= 188.36+8956.6+4487.7)
Driving Forces	-2050.6534	
Factor of Safety	-1.70	

Slide Analysis Information

Carnotite Open Cut- 7.5 ft Excavation

Project Summary

Slide Modeler Version: 8.024
 Compute Time: 00h:00m:00.504s

General Settings

Units of Measurement: Imperial Units
 Time Units: days
 Permeability Units: feet/second
 Data Output: Standard
 Failure Direction: Left to Right

Analysis Options

Slices Type: Vertical

Analysis Methods Used

Bishop simplified
 Janbu simplified

Number of slices: 10
 Tolerance: 0.005
 Maximum number of iterations: 50
 Check $m\alpha < 0.2$: Yes
 Initial trial value of FS: 1
 Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
 Pore Fluid Unit Weight [lbs/ft³]: 62.4
 Use negative pore pressure cutoff: Yes
 Maximum negative pore pressure [psf]: 0
 Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
 Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Circular
 Search Method: Grid Search
 Radius Increment: 10
 Composite Surfaces: Disabled
 Reverse Curvature: Invalid Surfaces
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined
 Minimum Area: Not Defined
 Minimum Weight: Not Defined

Seismic Loading

Advanced seismic analysis: No
 Staged pseudostatic analysis: No

Materials

Property	BL Sand FILL	BR/GR Sand	GR Sand	V Soft to M Stiff GR Clay DRAINED	Med Stiff to V Stiff Gray Clay DRAINED
Color					
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	125	122	120	80	80
Cohesion [psf]	0	0	0	0	75
Friction Angle [°]	30	34	32	21	25
Water Surface	None	None	Water Table	Water Table	Water Table
Hu Value			1	0	1
Ru Value	0	0			

Global Minimums

Method: bishop simplified

FS	1.650690
Center:	0.149, 621.935
Radius:	31.437
Left Slip Surface Endpoint:	-20.233, 598.000
Right Slip Surface Endpoint:	0.537, 590.500
Resisting Moment:	107357 lb-ft
Driving Moment:	65037.4 lb-ft
Total Slice Area:	46.974 ft2
Surface Horizontal Width:	20.7699 ft
Surface Average Height:	2.26164 ft

Method: janbu simplified

FS	1.530130
Center:	-4.072, 603.763
Radius:	13.846
Left Slip Surface Endpoint:	-16.661, 598.000
Right Slip Surface Endpoint:	-0.037, 590.518
Resisting Horizontal Force:	3325.7 lb
Driving Horizontal Force:	2173.47 lb
Total Slice Area:	48.3831 ft2
Surface Horizontal Width:	16.6245 ft
Surface Average Height:	2.91034 ft

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 26958

Number of Invalid Surfaces: 1653

Error Codes:

Error Code -107 reported for 26 surfaces

Error Code -108 reported for 363 surfaces

Error Code -109 reported for 1 surface

Error Code -112 reported for 462 surfaces

Error Code -114 reported for 739 surfaces

Error Code -118 reported for 62 surfaces

Method: janbu simplified

Number of Valid Surfaces: 27012

Number of Invalid Surfaces: 1599

Error Codes:

Error Code -107 reported for 26 surfaces

Error Code -108 reported for 426 surfaces

Error Code -109 reported for 1 surface

Error Code -111 reported for 30 surfaces

Error Code -112 reported for 315 surfaces

Error Code -114 reported for 739 surfaces

Error Code -118 reported for 62 surfaces

Error Codes

The following errors were encountered during the computation:

-107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.

-108 = Total driving moment or total driving force < 0.1 . This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-109 = Soiltype for slice base not located. This error should occur very rarely, if at all. It may occur if a very low number of slices is combined with certain soil geometries, such that the midpoint of a slice base is actually outside the soil region, even though the slip surface is wholly within the soil region.

-111 = safety factor equation did not converge

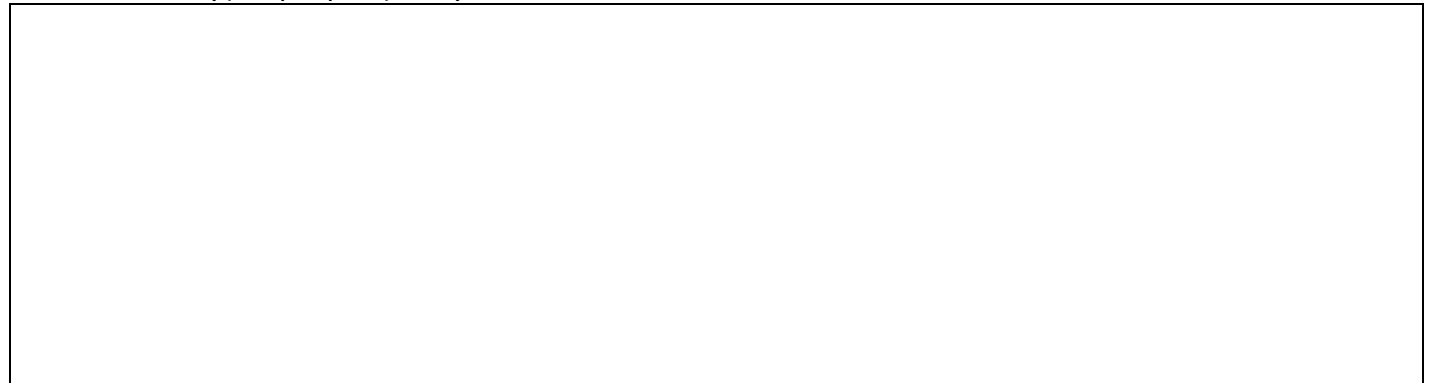
-112 = The coefficient $M\text{-}\alpha = \cos(\alpha)(1 + \tan(\alpha)\tan(\phi))/F < 0.2$ for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-114 = Surface with Reverse Curvature.

-118 = Surface does not pass through the search focus

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.65069



Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	2.15592	226.351	-37.9249	BL Sand FILL	0	30	28.8611	47.6407	82.5163	0	82.5163	105.004	105.004
2	2.15592	641.989	-33.088	BL Sand FILL	0	30	84.8312	140.03	242.538	0	242.538	297.814	297.814
3	2.15592	941.405	-28.5062	BL Sand FILL	0	30	128.36	211.882	366.991	0	366.991	436.702	436.702
4	2.15592	965.243	-24.117	BL Sand FILL	0	30	135.406	223.513	387.136	0	387.136	447.754	447.754
5	2.15592	909.806	-19.8744	BL Sand FILL	0	30	131.043	216.311	374.662	0	374.662	422.032	422.032
6	1.99805	750.468	-15.8914	BR/GR Sand	0	34	137.493	226.959	336.48	0	336.48	375.624	375.624
7	1.99805	622.649	-12.1353	BR/GR Sand	0	34	117.059	193.228	286.473	0	286.473	311.644	311.644
8	1.99805	461.598	-8.43159	BR/GR Sand	0	34	89.0131	146.933	217.838	0	217.838	231.032	231.032
9	1.99805	270.251	-4.76324	BR/GR Sand	0	34	53.4503	88.2298	130.806	0	130.806	135.26	135.26
10	1.99805	60.7422	-1.11444	BR/GR Sand	0	34	12.3245	20.3439	30.1611	0	30.1611	30.4008	30.4008

Global Minimum Query (janbu simplified) - Safety Factor: 1.53013

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.76207	315.406	-58.4235	BL Sand FILL	0	30	41.897	64.1079	111.038	0	111.038	179.203	179.203
2	1.76207	725.48	-46.1713	BL Sand FILL	0	30	111.611	170.78	295.8	0	295.8	412.071	412.071
3	1.76207	876.478	-36.3667	BL Sand FILL	0	30	146.972	224.886	389.515	0	389.515	497.74	497.74
4	1.61976	851.084	-28.0345	BR/GR Sand	0	34	187.698	287.202	425.795	0	425.795	525.74	525.74
5	1.61976	832.644	-20.6509	BR/GR Sand	0	34	194.404	297.463	441.007	0	441.007	514.276	514.276
6	1.61976	767.752	-13.6165	BR/GR Sand	0	34	188.84	288.95	428.386	0	428.386	474.129	474.129
7	1.61976	661.595	-6.78902	BR/GR Sand	0	34	171.101	261.807	388.145	0	388.145	408.514	408.514
8	1.61976	516.835	-	BR/GR Sand	0	34	140.593	215.126	318.938	0	318.938	319.082	319.082
9	1.61976	335.658	0.0586105	BR/GR Sand	0	34	96.299	147.35	218.456	0	218.456	207.193	207.193
10	1.61976	118.431	6.67097	BR/GR Sand	0	34	36.0315	55.1329	81.7376	0	81.7376	73.0899	73.0899

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.65069

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Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	-20.233	598	0	0	0
2	-18.0771	596.32	76.4302	0	0
3	-15.9212	594.915	234.367	0	0
4	-13.7653	593.744	387.503	0	0
5	-11.6094	592.779	469.404	0	0
6	-9.45344	592	479.049	0	0
7	-7.45539	591.431	395.902	0	0
8	-5.45734	591.002	285.233	0	0
9	-3.45928	590.705	172.006	0	0
10	-1.46123	590.539	87.0532	0	0
11	0.536818	590.5	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.53013

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	-16.6613	598	0	0	0
2	-14.8992	595.133	244.726	0	0
3	-13.1372	593.298	591.633	0	0
4	-11.3751	592	838.847	0	0
5	-9.75534	591.138	902.985	0	0
6	-8.13558	590.527	858.27	0	0
7	-6.51582	590.135	721.398	0	0
8	-4.89606	589.942	519.938	0	0
9	-3.2763	589.94	293.427	0	0
10	-1.65654	590.13	96.5311	0	0
11	-0.0367785	590.518	0	0	0

Entity Information

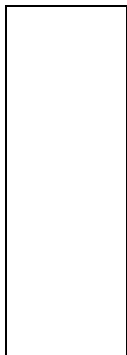
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170	579

Focus Search Window

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External Boundary



X	Y
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170	538
170	550
170	565
170	579
170	592
170	598
115	598
103	592
100	590.5
0	590.5
-3	592
-15	598
-90	598
-90	592
-90	579
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-90	550

Material Boundary

X	Y
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-3	592

Material Boundary

X	Y
103	592
170	592

Material Boundary

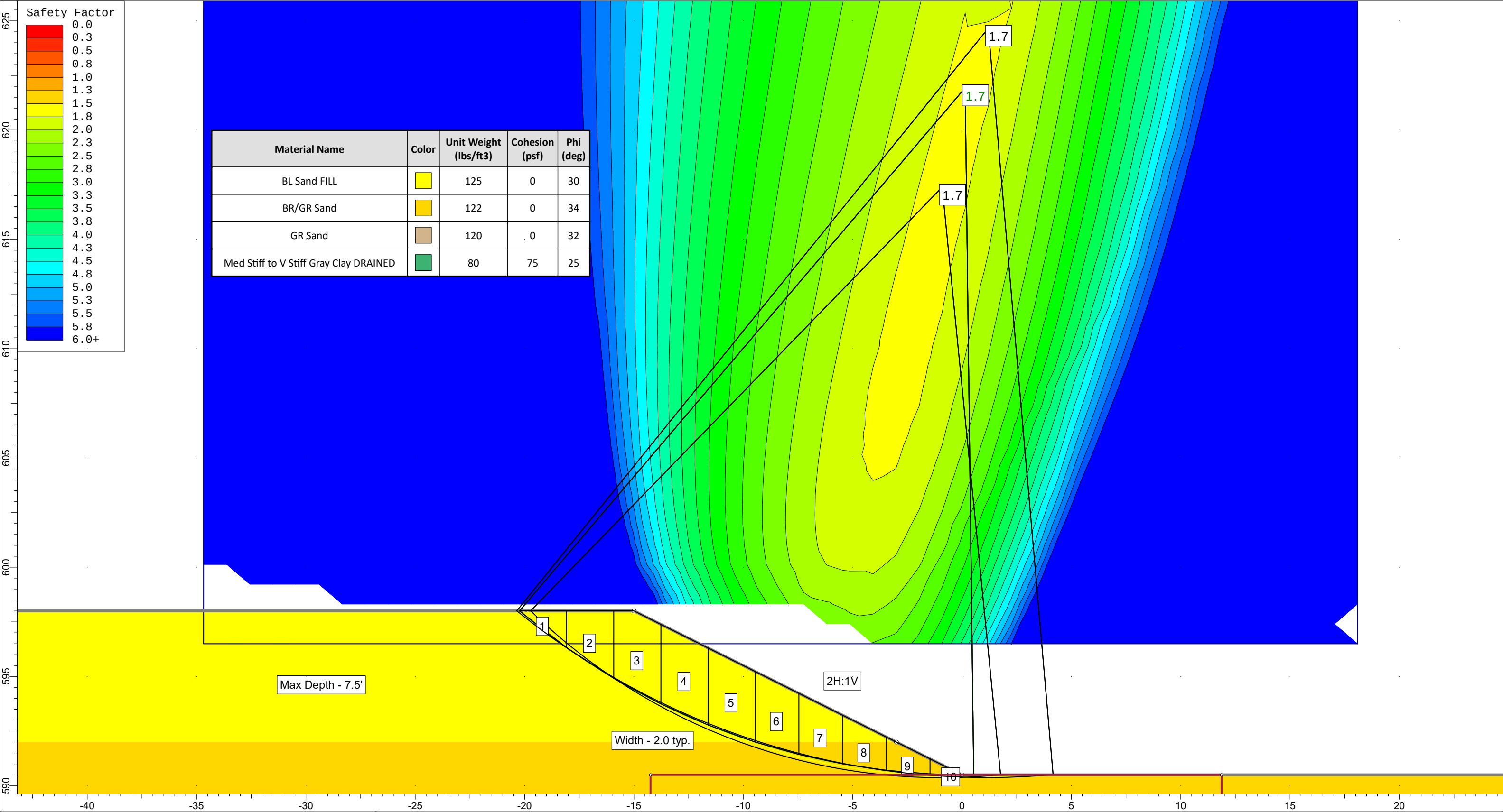
X	Y
-90	579
170	579

Material Boundary

X	Y
-90	565
170	565

Material Boundary

X	Y
-90	550
170	550



Attachment 4

References

ENGINEERING PROPERTIES OF SOIL AND ROCK

IOWA DOT

Engineering Properties of Soil and Rock

Design Manual

Chapter 200

Geotechnical Design

Originally Issued: 01-15-14

Revised: 05-19-15

This section provides guidance on selecting soil and rock engineering properties for use in geotechnical design. Properties selected for design should be based on the results of field testing, laboratory testing, or back analysis of existing conditions. In addition, local experience, correlations to local geologic formations, and relevant published data should also be considered in the final selection of design parameters.

The geotechnical designer should assess the variability of the engineering properties to determine if the observed variability is a result of laboratory testing variability or subsurface variations across the site. The geotechnical designer is responsible for selecting the geotechnical engineering properties that are appropriate for the analyses required for design of the project.

Geotechnical design parameters should be established for each of the geologic strata identified at a project site. A geologic stratum, consisting of either soil or rock material, is characterized as having the same geologic depositional history and stress history, and generally has similarities throughout the stratum in terms of density, source material, etc.

Quick Tips:

- The geotechnical designer is responsible for determination of geotechnical parameters.
- Selection of soil/rock engineering properties requires that the designer understand the loading conditions and soil/rock behavior.

Soil Strata

Soil is a nonhomogeneous, porous material for which engineering behavior is greatly influenced by density, source material, stress history, and hydrogeology. Some engineering properties (e.g., undrained shear strength in normally consolidated clays) may vary as a predictable function of a stratum dimension (e.g., depth below the top of the stratum). Where the engineering property varies within a soil stratum, the engineer should develop the design parameters taking this variation into account. This may result in multiple values within the stratum.

Rock Strata

Determination of design parameters for rock should take into consideration the in-situ rock properties (condition of the rock mass), which are generally controlled by the discontinuities within the rock mass and not the properties of the intact material. A combination of laboratory testing on small samples, empirical analysis, field observations, and engineering judgment should be employed to determine the engineering properties of rock masses, with appropriate emphasis placed on visual observations and quantitative descriptions of the rock mass.

Influence of Existing and Future Conditions on Soil and Rock Properties

Soil properties are not intrinsic to the soil type, but vary with the influence of stress, groundwater, and other environmental conditions. Thus, it is important to determine the existing conditions, as well as how conditions may change over the life of the project. For example, construction of a new embankment places new surcharge loads on the underlying soil profile. As the stress increases due to loading, the engineering properties of the underlying soil strata may also change. For example, normally consolidated

clays can gain strength with increases in effective stress. On the other hand, over-consolidated clays or weak rock may lose strength with time when exposed in cuts. The geotechnical engineer is responsible for choosing design parameters representative of existing and future conditions.

Determination of Soil and Rock Properties

Subsurface soil or rock properties are generally determined using empirical correlations related to the testing that is performed during the field exploration program (e.g. Standard Penetration Test (SPT)) outlined in Section [200C-1](#) and/or the laboratory testing as outlined in Section [200D-1](#). The laboratory testing program generally consists of index tests (classification) to obtain general information or to use with correlations to estimate design properties, and performance tests (strength and compressibility) to directly measure specific engineering properties.

The observational method or back analysis can be used to determine engineering properties of soil or rock in cases where slope failures occur, or where embankment settlement or excessive settlement of existing structures have been observed. For instance, with landslides or slope failures, the geotechnical engineer determines the geometry of the failure and then selects the soil/rock parameters, aided by correlations with index tests (if available) or experience, that result in a factor of safety approaching 1.0. For embankment or structure settlement, the engineering properties of the soils can sometimes be determined from laboratory tests outside and inside the zone of stress influence resulting from the loading, and then correlating these properties for the magnitude of the known loads. As with slope stability analysis, the pre-existing and final geometry of the subsurface soil must be adequately known, including the history of the groundwater levels.

For the detailed measurement and interpretation of soil and rock properties, follow the guidelines provided in Section [200D-1](#) and FHWA-IF-02-034, [Evaluation of Soil and Rock Properties](#), Geotechnical Engineering Circular No. 5 (Sabatini, et al., 2002), except as specifically indicated herein.

Engineering Properties of Soil

The selection of soil properties for design and analysis by the geotechnical engineer requires that the designer has a good understanding of the loading conditions and the soil behavior, has high quality soil sampling and testing, and has local geotechnical experience with the various geologic formations. This section provides guidance in the selection of engineering properties for cohesive soils (clays and highly plastic silts) and cohesionless soils (sands and non-plastic silts) for use in geotechnical design.

Unit Weight

The total (wet) unit weight of soils, see Table 1, can be estimated from typical values, or measurements of mass and volume can be performed on Shelby tube samples or California or Modified California rings. Moisture content can provide the necessary data for calculating the dry unit weight of the materials.

Table 1: Typical unit weight values for soils in their natural state (after Peck, Hanson, and Thornburn, 1974).

soil description	dry unit weight (pcf)	wet unit weight (pcf)
uniform sand (loose)	90	118
uniform sand (dense)	109	130
well-graded sand (loose)	99	124
well-graded sand (dense)	116	135
windblown silt (loose)	85	116
glacial till	132	145
soft glacial clay	76	110
stiff glacial clay	106	129
soft slightly organic clay	58	98
soft very organic clay	43	89

Shear Strength

The shear strength of a soil can be evaluated by one of the following methods:

- Geotechnical laboratory testing.
- Correlations with in-situ field testing results.
- Correlations based on index parameters.

The laboratory test that is selected and used to evaluate the shear strength of a soil should be the method that is best suited to model the loading condition (undrained total stress or drained effective stress) and the soil response. Shear strength laboratory testing methods are described in Section [200D-1](#). The selection of peak, fully softened, or residual shear strength for design analyses should be based on review of the expected or tolerable displacements of the soil.

Undrained Cohesive: The short term, end of construction design of the project should be based on undrained (total) shear strength parameters. The undrained shear strength (S_u) of cohesive soils (clay and highly plastic silts) can be measured using unconfined compression (UC) tests, unconsolidated undrained (UU) triaxial tests, or consolidated undrained (CU) triaxial tests of undisturbed samples. Typically, the total internal friction angle (ϕ) is negligible and assumed to be zero ($\phi = 0$) in cohesive materials. However, if required for the analyses, the undrained (total) friction angle (ϕ) and cohesion components of the shear strength can be determined using appropriate laboratory testing methods.

The undrained shear strength (S_u) of cohesive soils may also be correlated to results of in-situ testing such as Standard Penetration Test (SPT), Cone Penetrometer Test (CPT), Flat Plate Penetrometer Test (CPT), Flat Plate Dilatometer Test (DMT), or Vane Shear Test (VST). For example, undrained shear strength (S_u) can be correlated to the N_{60} value obtained from the Standard Penetration Test (SPT). The undrained shear strength (S_u) can be estimated for low plasticity clays ($PI \leq 10$) and medium to high plasticity clays ($11 \leq PI \leq 40$) using the relationship developed by McGregor and Duncan, 1986, see Figure 1.

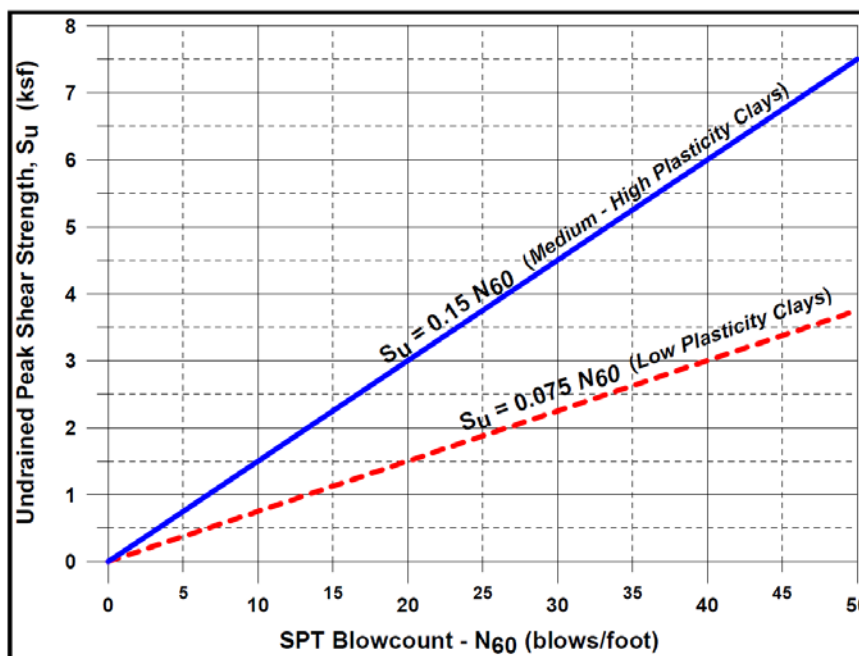


Figure 1: Undrained Shear Strength – SPT Relationship (McGregor and Duncan, 1986).

Drained Cohesive: The long-term design of the project's geotechnical components should be based on drained (effective) strength parameters. The use of peak or residual effective shear strength should be based on the expected or tolerable soil displacements. For normally-consolidated cohesive soils, the cohesive intercept (apparent cohesion) should be zero. For over-consolidated cohesive materials, such as many glacial tills, the cohesive intercept can be non-zero and may be established by consolidated undrained triaxial (CU) testing. The relationship between the peak/residual friction angle and the plasticity index as reported in NAVFAC DM7.1 generally works well for estimating the shear strength, see Figure 2.

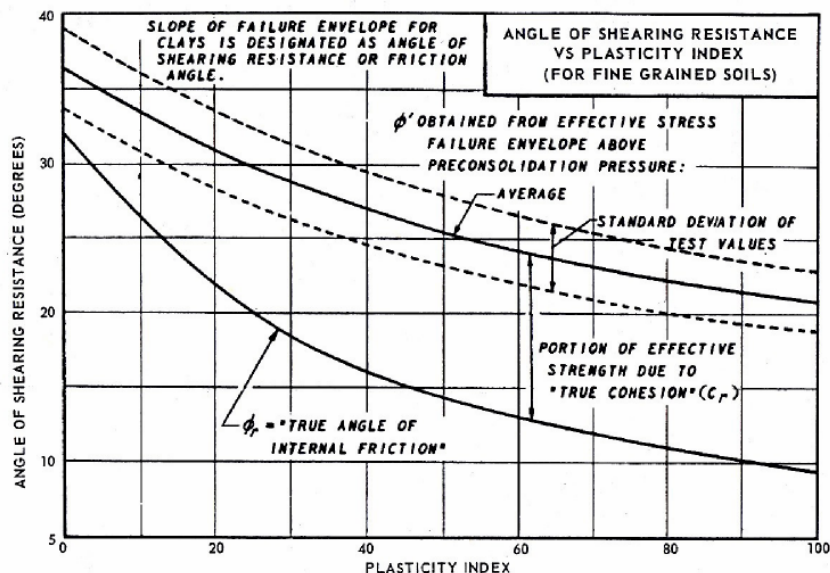


Figure 2: Correlation between residual shear strength of over-consolidated clays and plasticity index (after NAVFAC, 1971).

Drained Cohesionless: The drained friction angle (ϕ') of granular deposits may be evaluated by correlation to the results of a Standard Penetration Test. The drained friction angle (ϕ') of granular deposits may also be determined based on the relationships provided in Table 2. Table 2 is based on data for relatively clean sands, thus, sands with a significant amount of clay/silt-sized material will fall in the lower portion of the range. The reported values of effective friction angle (ϕ'), based on SPT N60 values, should be reduced by 5° for clayey sands and should be increased by 5° for gravelly sands. Engineering judgment should be used in selecting a specific value.

Table 2: Relationship among relative density, SPT N value, and internal friction angle of cohesionless soils (after Meyerhof, 1956).

state of packing	relative density (%)	standard penetration resistance, N (blows/ft)	friction angle, ϕ' (°)
very loose	<20	<4	<30
loose	20-40	4-10	30-35
compact	40-60	10-30	35-40
dense	60-80	30-50	40-45
very dense	>80	>50	>45

Note: $N = 15 + (N' - 15)/2$ for $N' > 15$ in saturated very fine or silty sand, where N' = measured blow count and N = blow count corrected for dynamic pore pressure effects during the SPT.

Compressibility

Compressibility characteristics of the soils can be determined using laboratory testing or correlations to field/in-situ testing and index properties. Compressibility of soils is typically divided into two primary categories: 1) elastic settlement and 2) time-dependent settlement. Elastic settlements typically dominate in the cohesionless soils, while time-dependent settlements dominate in cohesive soils.

Cohesionless Soils: Obtaining high quality samples for laboratory testing can be extremely difficult in cohesionless soils. Therefore, indirect methods (correlations) of measuring the elastic parameters are used to develop compressibility parameters (elastic modulus, Poisson's ratio, etc.), see Sabatini et al. (2002). Where evaluation of elastic settlement is critical to the design of the foundation or selection of the foundation type, in-situ methods such as Cone Penetrometer (CPT), Pressuremeter (PMT), or Dilatometer (DMT) should be considered for evaluating the elastic modulus of the soil strata. Typical elastic modulus values of predominately granular materials are shown in Table 3.

Table 3: Typical elastic modulus values for granular soil (modified after Sabatini, 2002).

soil type	range of equivalent elastic modulus ksf / (kPa)
fine sand - loose - medium dense - dense	160 to 240 / (8,000 to 12,000) 240 to 400 / (12,000 to 20,000) 400 to 600 / (20,000 to 30,000)
sand - loose - medium dense - dense	200 to 600 / (10,000 to 30,000) 600 to 1,000 / (30,000 to 50,000) 1,000 to 1,600 / (50,000 to 80,000)
gravel - loose - medium dense - dense	600 to 1,600 / (30,000 to 80,000) 1,600 to 2,000 / (80,000 to 100,000) 2,000 to 4,000 / (100,000 to 200,000)

Note: 1ksf $\approx$ 50kpa.

Cohesive Soils: To determine the amount of consolidation settlement (primary and secondary) in cohesive soils, the following soil parameters are required: compression index (C_c), recompression index (C_r), secondary compression (C_α) index, consolidation coefficient (C_v), and the preconsolidation pressure (σ'_p). Compressibility parameters of cohesive soils can be determined from the results of one-dimensional consolidation tests. For preliminary analyses or where accurate prediction of settlement is not critical, values can be obtained from published correlations. If correlations for prediction of settlement are used, their applicability to the specific geologic strata under consideration should be evaluated. Refer to Sabatini et al. (2002) for discussion of the various available correlations of which some are outlined below.

Compression Index (C_c): Primary consolidation occurs as the pore pressures generated during loading dissipate. The amount of primary consolidation will be related to the compressibility characteristics of the soil, and can be determined from a one-dimensional consolidation test. In lieu of one-dimensional consolidation test data, the compression index can be estimated using a correlation established by Terzaghi and Peck (1967), which is valid for inorganic clays with sensitivity up to 4 and a LL less than 100.

$$C_c = 0.009 \times (LL - 10) \quad (\text{Equation 200E-1}_1)$$

where:

LL = Liquid Limit (%).

Recompression Index (C_r): The Recompression Index (C_r) can be determined from the one-dimensional consolidation test data or estimated using empirical correlations that relate it to the C_c values, in that the C_r value is approximately 10 to 20 percent of the C_c value (Ladd, 1973).

Secondary Compression Index (C_α): Secondary compression occurs after the completion of elastic and primary consolidation settlements, and should be included in the estimate of total settlement. The Secondary Compression Index (C_α) is best determined from consolidation testing; however, Figure 3 can be used for preliminary estimates of secondary compression settlement.

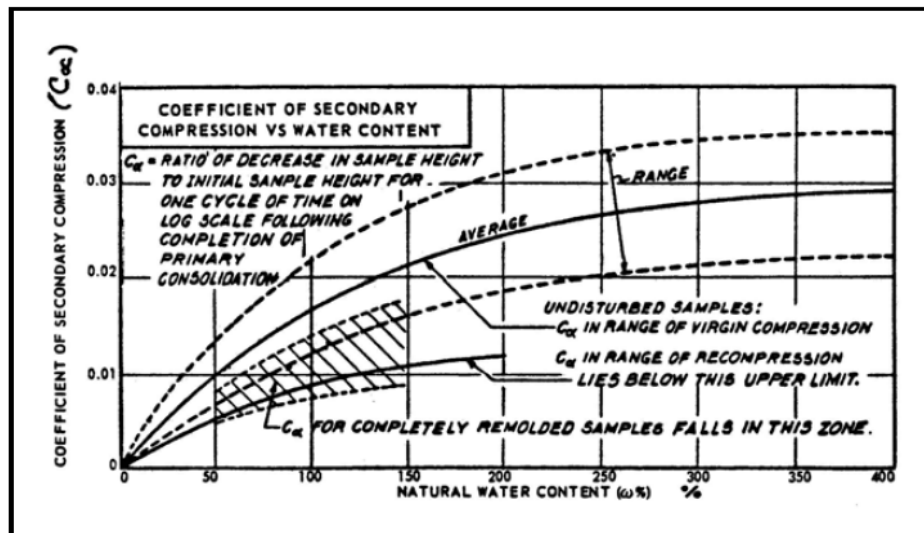


Figure 3: Secondary Compression Index Chart (NAVFAC DM-7.1).

Consolidation Coefficient (C_v): The rate of consolidation is directly related to the permeability of the soil and can be determined from a one-dimensional consolidation test. If laboratory test data is not available, an estimate of the Consolidation Coefficient (C_v) can be determined using Atterberg Limit test results and Figure 4.

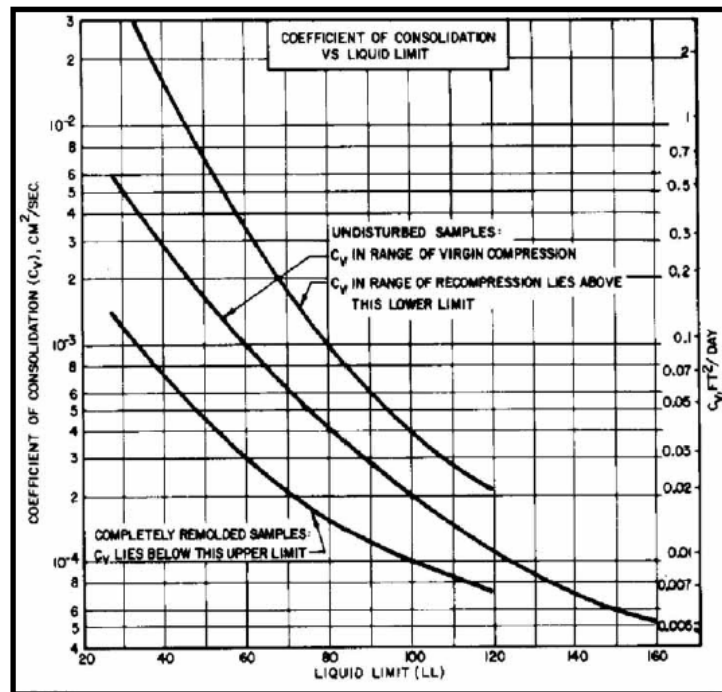


Figure 4: Consolidation Coefficient and Liquid Limit Relationship (NAVFAC DM-7.1)

Preconsolidation Pressure (σ'_p): The effective preconsolidation stress (σ'_p) in soils is used to determine whether to use the Compression and/or Recompression Index. The effective preconsolidation stress (σ'_p) is the maximum past pressure that a soil has been exposed to since deposition. If one-dimensional consolidation test data is not available, the effective preconsolidation stress (σ'_p) can be estimated using a correlation to shear strength (S_u) and Plasticity Index (PI) (NAVFAC DM-7.1).

$$\sigma' = \frac{S_u}{(0.11 + 0.0037PI)} \quad \text{Equation 200E-1}_2$$

Engineering Properties of Rock

Engineering properties of rock are generally controlled by the discontinuities within the rock mass rather than the properties of the intact material. Therefore, engineering properties for rock must account for the properties of the intact pieces and for the properties of the rock mass as a whole, specifically considering the discontinuities within the rock mass. Rock properties can be divided into two categories: 1) intact rock properties and 2) in-situ rock mass properties.

Intact Rock Properties

Intact rock properties are measured from laboratory tests on samples obtained from coring or field mapping of exposures. Intact rock engineering properties obtained from laboratory tests can include specific gravity, unit weight, compressive strength, tensile strength, elastic modulus, Poisson's ratio and shear strength. Typical property values for different rock types can be found in Goodman (1989), Sabatini, et al. (2002), or AASHTO (2012).

Rock Mass (In-situ) Properties

Rock mass properties are determined by visual examination of rock cores and geologic mapping of discontinuities within the in-situ rock mass. For the majority of projects performed by the Soils Design Section, the rock mass properties are estimated using correlations to the rock type, recovery and rock quality designation (RQD). Recovery is defined as the length of core obtained expressed as a percentage of the total length cored. Rock Quality Designation (RQD) is defined as the total length of core pieces, 4 inches or greater in length, expressed as a percentage of the total length cored. Rock

Quality Designation (RQD) provides an indication of the integrity of the rock mass and relative extent of seams and bedding planes.

Other methods such as the rock mass rating (RMR) system or geologic strength index (GSI) may also be used to assess the design properties such as shear strength and elastic modulus for the rock mass. These alternate methodologies and correlations for determining rock mass properties are described in Sabatini, et al. (2002), Hoek, et al. (2002), and AASHTO (2012).

Properties of Predominant Geologic Units in Iowa

Loess

Loess is a windblown (eolian) soil consisting predominantly of silt-sized particles, and may contain minor amounts of sand and clay. Loess deposits range from almost 300 feet in the Loess Hills of western Iowa to less than 10 feet in south-central Iowa. Loess is typically not found in Iowa floodplain regions; however, loess-derived alluvium is present. Loess-derived alluvium has significantly different engineering properties compared to virgin loess. Loess generally has an increasing clay content as the distance increases easterly from the Missouri River (or other source). The clay component of loess (along with calcium carbonate in certain deposits) has been attributed to the cohesion that allows loess to stand vertical. However, upon wetting, the loess can collapse, resulting in excessive settlements. Claypan, a clay-rich loess, may be present underlying the topsoil in southeast Iowa (and sometimes in south-central Iowa) on the broad loess-capped upland flat areas. Claypan materials are unsuitable for use in roadway projects.

For engineering purposes, loess can generally be classified into three categories based on grain size: clayey loess, silty loess, and sandy loess. Table 4 presents typical engineering properties of Iowa loess.

Table 4: Typical engineering properties of Iowa loess.

material	soil type (USCS/AASHTO classification)	undrained		drained		dry unit weight (pcf)
		angle of internal friction (degrees)	cohesion (psf)	angle of internal friction (degrees)	cohesion (psf)	
claypan (loess derived) LL = 30 to 80 PI = 10 to 40	CL, CH A-4, A-5 , A-6 and A-7	8 to 12	50 to 600	15 to 25	0 to 200	75 to 95
clayey loess LL = 30 to 50 PI = 10 to 25	CL A-4, A-5 , A-6 and A-7	8 to 11	50 to 300	20 to 25	50 to 100	75 to 95
silty loess LL = 20 to 30 PI = 0 to 10	CL, CL-ML, ML A-4, A-5 , A-6 and A-7	11 to 14	50 to 150	22 to 28	0 to 50	70 to 90
sandy loess LL = nonplastic PI = nonplastic	ML A-3	13 to 16	0	26 to 32	0	70 to 90

Glacial Deposits

Glacial deposits consist of all material deposited or transported by a glacier or a glacier's meltwater stream and are found throughout Iowa. Glacial deposits that may be encountered within Iowa include: 1) the Des Moines Lobe, which consists of the most recent glacial deposits (Wisconsin age) and extends south to the site of modern-day Des Moines; 2) Illinoian glacial deposits that are found

only in southeast Iowa; and 3) Pre-Illinoian glacial deposits that are found throughout the state (generally buried beneath loess or alluvium or sporadically exposed in northeast Iowa). See Figure 5.

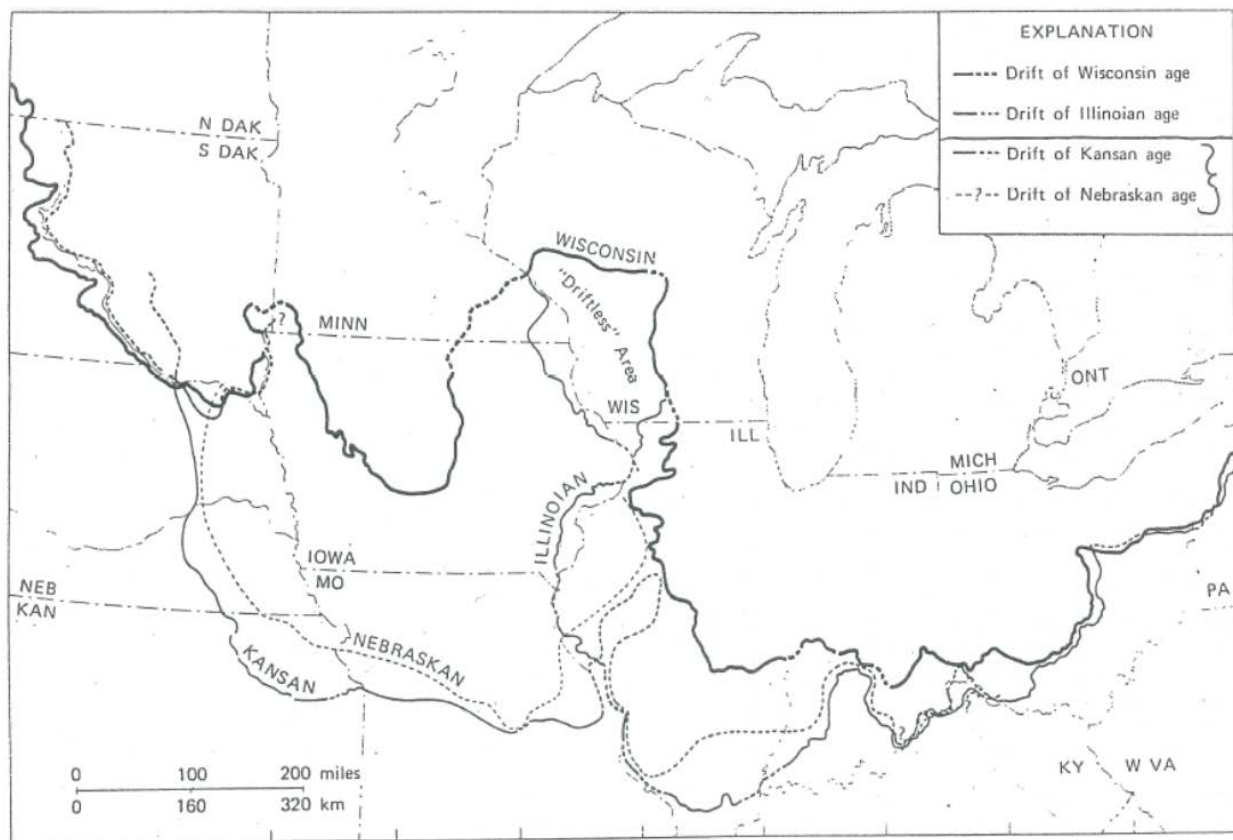


Figure 5: Limits of four glacial stages in Central North America (Prior 1976).

Glacial Till: Glacial till is predominately cohesive and consists of non-stratified deposits of clay, silt, sand, and gravel with cobbles and occasional boulders. In many instances in Iowa, typical glacial till is composed of roughly one third clay, one third silt, and one third sand with a few percentages of gravel. Sand and sand/gravel seams are common in many glacial till deposits. Boulders are common in these deposits and can range from a foot or two in diameter to the size of a bus. Glacial till has a relatively low permeability because of the fines content and the density. However, artesian conditions may be encountered within the water-bearing sand/gravel lenses in the glacial till.

Glacial Outwash: Glacial outwash is a partly-sorted mixture of clay, silt, sand, and gravel. Glacial outwash is predominately granular and consists of clayey/silty sands, fine sands, or clayey/silty gravels. Glacial outwash properties are similar to glacial till; however, glacial outwash tends to be predominately granular and consists of clayey/silty sands, fine sands or clayey/silty gravels. Glacial outwash is quite frequently stratified, mixed and non-uniform. Glacial outwash materials generally have a relatively high permeability, are water bearing, may have artesian conditions, and are susceptible to caving in open excavations or drilled holes.

Gumbotil: Gumbotil is a highly weathered soil that developed from glacial till during interglacial periods. Gumbotil is predominately found in the southern portion of the state. Gumbotil is frequently distinguished from the dark gray and brown glacial till by its light gray color and minimal sand content. Freshly excavated exposures are typically very hard, but will swell and soften rapidly upon exposure to moisture. Gumbotil is unsuitable for use in roadway projects.

Table 5 outlines the typical engineering properties of Glacial Till, Glacial Outwash, and Gumbotil. Engineering judgment and laboratory testing should be used in the evaluation and assignment of engineering properties.

Table 5: Typical engineering properties of glacial deposits.

material	soil type (USCS classification)	undrained		drained		dry unit weight (pcf)
		angle of internal friction (degrees)	cohesion (psf)	angle of internal friction (degrees)	cohesion (psf)	
Glacial Till	CL, CH, CL-ML A-4, A-5, A-6 and A-7	10 to 15	100 to 1500	20 to 30	50 to 500	110 to 120
Gumbotil	CL, CH A-4, A-5, A-6 and A-7	8 to 11	100 to 1000	16 to 22	50 to 500	90 to 115
Glacial Outwash	GW, GP, GW-GM, GP-GM, SW, SW-SM, SP, SC, SM A-1, A-3, A-3	25 to 34	0 to 50	28 to 38	0	90 to 110

Alluvium: Alluvium is all material deposited by streams. Alluvial soils are typically composed of clayey over-bank deposits underlain by silts, sandy silts, clayey silts, and silty sands. These soils generally have no continuity in their layering at shallow depths across a given site due to the complex process of erosion and deposition by flowing water and the varying depositional processes. However, continuity of soil layering does usually increase with depth in larger streams and rivers. Near surface soils normally consist of a combination of deposits deposited by slack water during flooding and tend to be finer-grained cohesive and moderately cohesive materials. Below the more cohesive blanket of surface and near surface alluvial soils, the deeper alluvial soils generally become less cohesive and grade from sandy silts and silty sands to medium to coarse sands, which become coarser grained and more dense with depth. Locally, clay filled abandoned channels and other features are often present and may contain isolated zones of clay and other cohesive soils.

The engineering properties of alluvial soils can vary significantly, so characterization of these materials through laboratory testing is preferred. Preliminary engineering properties for the cohesive and non-cohesive materials can be estimated using the correlations presented earlier in this section.

Bedrock

The bedrock in Iowa generally consists of sedimentary limestone, dolomite, shale, and sandstone. Thin layers of coal and gypsum are also found. With the exception of Sioux Quartzite exposed in far northwestern Iowa and the Manson Impact Structure in Calhoun and Pocahontas County, metamorphic and igneous rocks are found deeply buried beneath sedimentary rock and unconsolidated surficial deposits. The bedrock generally dips to the southwest at 2 degrees. The engineering properties of rock vary, so characterization of these materials through laboratory testing is preferred. Preliminary engineering properties for the bedrock can be estimated using the referenced publications presented earlier in this section.

Properties of Engineered Materials

Compacted soils are used to construct roadway embankments and bridge approaches. Selection of soil parameters for compacted soils should be based on laboratory testing or conservatively estimated from past test data and field correlations. Table 6 provides a guideline for engineering property selection on engineered fills based on the Soils Design Section's experience with soil materials typically found in Iowa.

The engineering properties are based primarily on classification, gradation, and compaction requirements, with consideration of the geologic source of the fill material. For suitable materials, where the material types vary, additional laboratory testing will be required to evaluate the range of engineering properties to be considered. For existing and new cohesive highway embankments, the Soils Design Section's standard of practice has been to assume a cohesion of 600 psf and a 12 degree friction angle for shear strength parameters; however, engineering judgment and project specific considerations must also be used in all instances.

Table 6: Typical engineering properties of engineered materials.

material	Iowa DOT standard specification	soil type (AASHTO/USCS classification)	friction angle (degrees)	cohesion (psf)	total unit weight (pcf)
suitable materials	2102.02.A	AASHTO T-99 Proctor Density of 95 pcf or greater, and AASHTO M 145 Group index less than 30 Liquid Limit (LL) < 50	Perform lab testing	Perform lab testing	Perform lab testing
select soils (cohesive)	2102.02.D.1.a	A-6 or A-7-6 soils of glacial origin (excluding Gumbotil and Palesols) Must have a AASHTO T-99 proctor density of 110 pcf or greater. Must have 45% or less silt content. Must have a plasticity index (PI) > 10	20 to 30	50 to 600	120 to 135
select soils (granular)	2102.02.D.1.b	A-1, A-2, or A-3 (0) / GW, GP, GW-GM, GP-GM, SW, SW-SM, SP Must have a AASHTO T-99 proctor density of 110 pcf or greater. Must have a combined silt and clay content of 15% or less (finer than 0.074 mm or #200 sieve). Must have a plasticity index (PI) of 3 or less	30 to 45	0	125 to 135

Final Property Selection

Engineering judgment and project specific considerations, combined with parametric analyses as needed, should always be used in selection of engineering properties. Previous experience with geologic units and other laboratory and field data should also be considered in the evaluation. The geotechnical engineer must recognize the variability of materials, and the influence of the uncertainty on the design level of safety. If the impact of this uncertainty is likely to be significant, parametric analyses should be conducted, or more data could be obtained to help reduce the uncertainty. The selection of engineering properties to be used for design is outlined in Sabatini, et al. (2002).

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Chronology of Changes to Design Manual Section:

200E-001 Engineering Properties of Soil and Rock

5/19/2015	Revised Correction in Glacial Till on page 9: glacial till is composed of one third clay, one third silt, and one third sand with a few percentages of clay.
1/15/2014	NEW New

**CORRELATION BETWEEN DRAINED SHEAR STRENGTH AND PLASTICITY
INDEX OF UNDISTURBED OVERCONSOLIDATED CLAY**

SORENSEN, K.K

Correlation between drained shear strength and plasticity index of undisturbed overconsolidated clays

Corrélation entre la résistance au cisaillement des sols drainés et l'indice de plasticité des argiles surconsolidées non perturbées

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ABSTRACT: A number of triaxial compression tests have been performed by The Danish Geotechnical Institute over the past decades on undisturbed overconsolidated Danish clays; ranging from clay till of low plasticity to extremely high plasticity marine Tertiary clays. The test results confirm that the drained peak angle of shearing resistance can be related to the plasticity index, though a large scatter is generally seen. Based on the results and a review of published data a conservative relationship between drained peak angle of shearing resistance and plasticity index for undisturbed overconsolidated clays is proposed. The proposed relationship and the interrelation to the effective cohesion are discussed.

RÉSUMÉ: De nombreux essais de compression triaxiale ont été effectués par l'Institut danois de géotechnique au cours des dernières décennies sur les argiles danoises surconsolidées non perturbées, allant des argiles morainiques ayant une plasticité faible à des argiles marines tertiaires ayant une plasticité extrêmement élevée. Les résultats des essais confirment que l'angle de résistance maximale au cisaillement des sols drainés peut être lié à l'indice de plasticité si une forte dispersion est généralement observée. Sur la base de ces résultats et à partir d'un ensemble de données déjà publiées, une relation conservatrice entre l'angle de résistance maximale au cisaillement des sols drainés et l'indice de plasticité pour les argiles surconsolidées non perturbées est proposée. La relation proposée et les liens à une cohésion effective sont discutés.

KEYWORDS: Plasticity index, Drained shear strength, Laboratory testing, Overconsolidated clay

1 INTRODUCTION

Empirical correlations are widely used in geotechnical engineering practice as a tool to estimate the engineering properties of soils. Useful correlations exist between the index properties obtained from simple routine testing and the strength and deformations properties of cohesive soils among others. For practical purposes the results of routine index tests and correlations can be used as a first approximation of the soil parameters for use in preliminary design of geotechnical structures, and later as a mean to validate the results of laboratory tests. Results from several index tests obtained for a given site can be used to assess the variation in the properties of the soil mass.

This study is aiming to provide a conservative correlation between the effective peak angle of shearing resistance and plasticity index I_p for natural undisturbed overconsolidated Danish clays based on the results from a large database of triaxial compression tests performed by The Danish Geotechnical Institute (GEO) over the past decades.

1.1 Stress-strain behavior and effective strength of overconsolidated clays

In contrast to normally consolidated (NC) clays highly overconsolidated (OC) natural clays typically show a distinct strain softening behavior in drained triaxial compression, which can be related to the breakdown of interparticle bonding and the dilatant behavior of the compact clay structure (Burland 1990). With further shearing in the post peak region OC clays (as well as NC clays) may experience an additional reduction in strength due to the alignment of the platy clay particles on the failure plane (residual state). The stress-strain behavior of OC clays compared to NC clays is illustrated in Figure 1a.

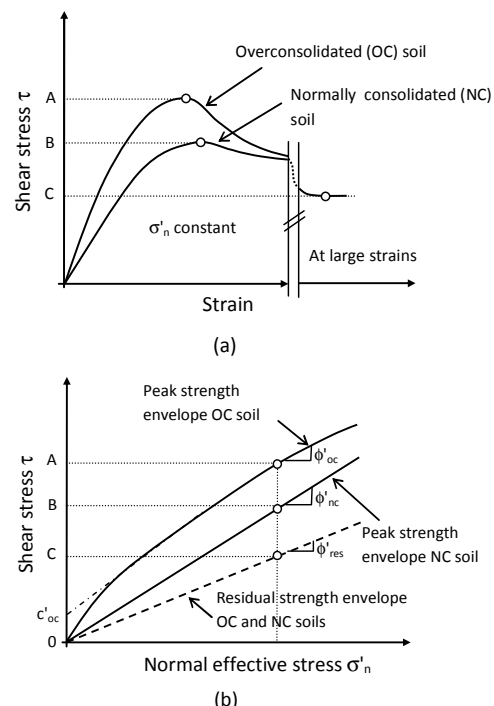


Figure 1. Peak and residual shear strength for normally consolidated and overconsolidated soils (a) Typical stress-strain curves (b) Failure envelopes showing the associated angle of shearing resistance, ϕ'

Stiff fissured overconsolidated clays may fail along preexisting fissures in which case the strength is governed by the fissure strength. Skempton (1957) found the fissure strength to correspond to the fully softened strength i.e. shear strength of the reconstituted normally consolidated soil, which is less than

the peak strength of the OC clay, but greater than the residual strength.

It is generally accepted that the effective strength of uncemented saturated clays is frictional and the strength envelope is nonlinear. Hence the strength envelope will pass through origin, and so the true cohesive intercept $c'=0$ kPa (Burland 1990). However, over the typical range of stress levels met in practice (~50-400kPa) the effective peak strength for NC and OC clays can be approximated by a linear relationship between effective normal stress at failure σ'_f and shear strength τ_f using the Mohr-Coulomb strength equation:

$$\tau_f = \sigma'_f \tan(\phi') + c' \quad (1)$$

where ϕ' and c' respectively are the tangent drained angle of shearing resistance and the apparent cohesive intercept, as illustrated in Figure 1b. For OC clays $c'_{oc} > 0$ kPa and for NC clays $c'_{nc} \approx 0$ kPa. While the angles of shearing resistance for OC and NC clays are typically found not to differ much.

Generally the frictional resistance to shearing, as expressed by ϕ' , can be expected to decrease as the content of platy clay minerals increase in the soil mass. With increasing content of platy clay particles both the liquid limit w_L and the plasticity index I_p will increase, and hence a correlation between ϕ' and w_L or I_p can be expected.

1.2 Existing relationships between effective shear strength and plasticity index

Several studies have been reported in the literature with regards to the correlation between the effective angle of shearing resistance ϕ'_{peak} and plasticity index I_p (Brooker and Ireland 1965, Ladd et al. 1977, Stark and Eid 1997, Terzaghi et al. 1996 among others). These studies are however mainly focused on normally consolidated reconstituted or undisturbed natural clays, while only little has been reported for overconsolidated undisturbed clays.

Figure 2 shows collected data from the literature in a plot of ϕ'_{nc} vs. I_p (single log plot) for primarily NC clays (I_p range 5-240%). ϕ'_{nc} generally represent a peak secant value with the assumption that c'_{nc} is zero. A very significant scattering of the data points is seen, e.g. at $I_p=20\%$ the value of ϕ'_{nc} is found to vary between approximately 25deg. and 35deg. However, despite the significant scatter a trend of reducing ϕ'_{nc} with increasing I_p is seen, and the data furthermore suggest the existence of a lower bound value for ϕ'_{nc} at given value of I_p .

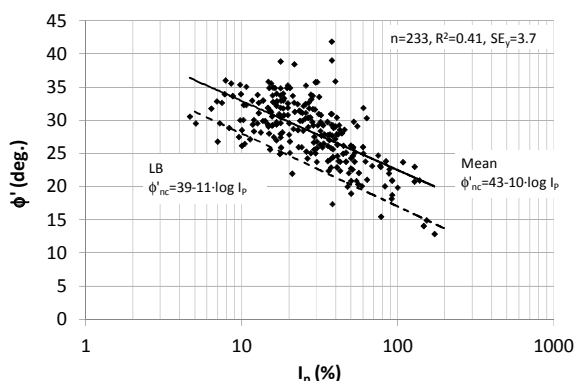


Figure 2. ϕ'_{nc} vs. I_p for primarily normally consolidated reconstituted and undisturbed clays after Ladd et al. 1977 (with data from Kenney 1959 and Bjerrum and Simons 1960), Terzaghi et al. 1996 and Brooker and Ireland 1965.

The shaded area in Figure 2 represents the range of results reported by Stark and Eid 1997 from a large series of ring shear tests on 24 different reconstituted normally consolidated natural soils ($I_p=8-244\%$, Clay-size fraction $CF=10-88\%$, normal effective stress $\sigma'_n=50-400$). Based on the data, relationships

between ϕ'_{nc} and I_p were proposed which were dependent on clay-size fraction and normal effective stress, as seen in Figure 3. By taking account of clay-size fraction and stress level Stark and Eid showed a significantly reduced scatter around the mean trend lines. A downward shift in the trend lines were observed with increasing stress levels and increasing clay-size fraction. The findings by Stark and Eid suggests that the observed scatter in the reported data found in the literature, as shown in Figure 2, to a large extent can be explained by variations in stress level due to a non-linear strength envelope and additionally clay-size fraction, as both soil mineralogy and clay-size fraction are not accounted for solely by the variation in the index properties.

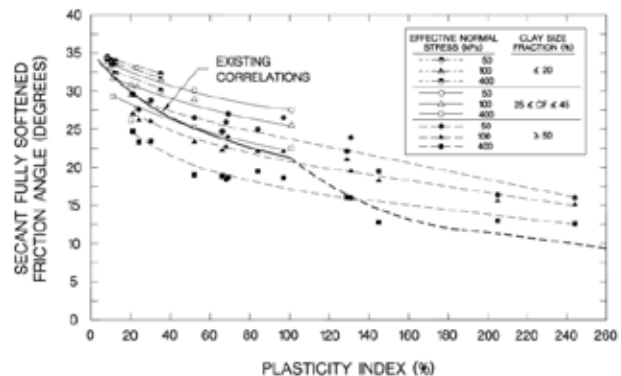


Figure 3. ϕ'_{nc} vs. I_p for reconstituted normally consolidated soils as a function of clay-size fraction and normal effective stress (Stark and Eid 1997)

Based on the literature data a cautious lower bound (LB) estimate of the relationship between ϕ'_{nc} and I_p for NC clays can be derived together with a best estimate from the best-fit regression line through the data, as indicated in Figure 2 and given below.

$$\text{Cautious LB estimate: } \phi'_{nc} = 39 - 11 \cdot \log I_p \text{ (deg.)} \quad (2)$$

$$\text{Best estimate: } \phi'_{nc} = 43 - 10 \cdot \log I_p \text{ (deg.)} \quad (3)$$

The lower bound estimate, which correspond roughly to the 5% fractile, also approximately match the lower bound of the range of results reported by Stark and Eid for clay-size fractions above 50% and a stress level of 400kPa. Hence for clay-size fractions below 50% and stress levels below 400kPa the effective angle of shearing resistance ϕ'_{nc} can be expected to be significantly greater than estimated from eq. 2 (up to approximately 12deg. for $CF < 20\%$ and $\sigma'_n = 50$ kPa, as seen from Figure 3).

2 SOIL DESCRIPTION AND TEST PROCEDURES

A number of triaxial compression tests have been performed by GEO on various undisturbed overconsolidated clays over the past decades. Test data have been collected from older tests (> 30 years) and more recent test series as listed in Table 1.

2.1 Soil description

The tested soils range from very low plasticity clay tills to extremely high plasticity Eocene clays. The recent tests include a test series in connection to the 1992 Great Belt bridge (GB) ground investigation, which provides a significant amount of test data for very low plasticity clay till. While the newly completed 2011 Fehmarnbelt (Fixed Link) (FB) ground investigation contribute significantly to the understanding of the strength behavior of very high to extremely high plasticity Eocene and Paleocene marine clays from the Røsnes, Ølst and Holmehus clay formations. The majority of the investigated clays from the Fehmarnbelt (Fixed Link) ground investigation have been assessed to be situated within glacial folded strata. A

series of recent tests in connection to a ground investigation at Esbjerg Harbour (EB) highlights the strength properties of Mica clay – a Miocene marine clay of high plasticity.

The additional old test data covers glacial clay till, a few glacial/late glacial meltwater and late glacial marine clays and furthermore a wide range of Tertiary (Palaeogene) marine clays of late Miocene age to Palaeocene age: Mica clay, Septarian clay, Søvind marl, Lillebælt clay, Røsnes clay, Ølst clay, Tarras clay and Holmehus clay.

The majority of the very high plasticity Palaeogene clays from the listed test series are found to be fissured in nature.

Figure 4 shows the outline of the index properties of the tested clays in Casagrandes classification chart. The classification parameters have generally been determined in accordance with BS 1377:Part 2:1990 using the Casagrande method to determine the liquid limit. The data points for the different soils generally fall close around straight lines and above the A-line corresponding to clays of very low ($4\% < I_p < 7\%$) to extremely high plasticity ($I_p > 100\%$).

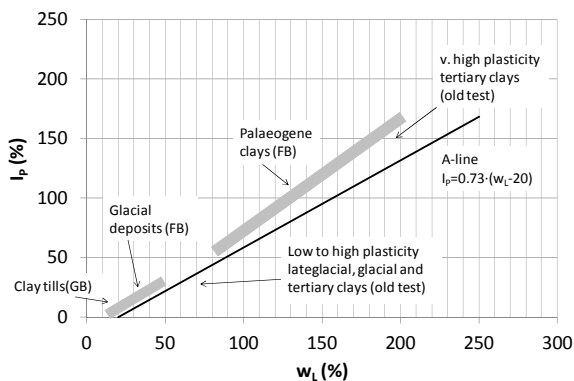


Figure 4. Outline of index properties of the tested clays shown in Casagrandes classification chart I_p vs. w_L .

The classification parameters incl. clay-size fraction (CF) and natural water content w_n for the tested clays are also listed in Table 1 alongside test types and number of tests (n). For the consistent test series (GB, FB and EB) the mean values of the classification parameters are listed and the standard deviations are shown in brackets. A more detailed description of the Palaeogene clays incl. mineralogy is given by Fehmarnbelt (Fixed Link) 2011.

2.2 Test procedures

The recent triaxial compression tests have generally been performed on nominally undisturbed specimens with a diameter of approximately 70mm and a height to diameter ratio of 1. Smooth end platens have been used. Samples have been extracted by means of a push-in Shelby-tube sampler (called A-tube in Denmark) with an inner diameter of 70mm.

Samples are saturated using backpressure and typically preloaded to reduce the effects of possible sample disturbance and bedding effects. The preloading are in most cases performed under anisotropic K_0 conditions. After the preloading and unloading of the sample, the specimen is sheared in either drained or undrained compression to failure. Multiple tests are carried out, consisting of preloading, unloading to a new and higher stress level followed by a drained or undrained compression test (these steps are repeated 2 or more times).

The applied rate of straining during shearing is chosen according to the soil type to ensure slow enough rates to achieve full equalization of pore water pressures in the specimen. For the high plasticity clays this means that the applied strain rate is around 0.02-0.05%/hr, while a strain rate of approximately 0.1-0.7%/hr has been used for specimens of clay till.

For specimens of very high plasticity clay care is generally taken during all test stages to avoid that the effective stress reduces below the in-situ stresses to prevent swelling, which

may lead to destructuration of the micro-structure (Leroueil and Vaughan 1990).

Older triaxial compression tests have in contrast typically been performed with a height to diameter ratio of 2:1 and a diameter of approximately 36 mm. Samples were usually extracted using a 42mm inner diameter sampler. Preloading was in some cases carried out under isotropic conditions and in some cases omitted. Saturation was in most cases carried out without the application of backpressure and compression was performed with the pore water pressure kept equal to zero. Hence, undrained compression was achieved by adjusting the cell pressure during testing to obtain constant volume displacement.

The applied rate of straining during the compression stage was generally higher than what would be recommended today to ensure full equalization of pore water pressures within the samples of especially high plasticity clays. Hence, the actual effective stresses at the failure state are somewhat uncertain because the pore water pressure is unknown. Nevertheless, the old triaxial tests constitute a very comprehensive database of strength parameters for low to high plasticity clays, which can be compared to the recent and presumably more reliable tests results.

Table 1. Overview of classification parameters and larger series of triaxial compression tests on undisturbed overconsolidated clays performed by GEO.

Project	Soil type	$w_n^{\#}$ [%]	$w_L^{\#}$ [%]	$I_p^{\#}$ [%]	$CF^{\#}$ [%]	Test types	n
GB (1992)	Clay till	11 (2)	16 (2)	6 (2)	-	MCAU _{u=0} and CAU	45
	Upper till	9 (-)	19 (1)	7 (1)	26 (9)	CAU and CAD	5
	Chalk till	9 (-)	20 (1)	6 (0)	23 (-)	CAU and CAD	5
	Lower till	13 (5)	28 (4)	16 (3)	24 (3)	CAU and CAD	8
	Røsnes	35 (4)	147 (28)	117 (27)	70 (7)	CAU and CAD	48
FB (2011)	Ølst	45 (11)	140 (25)	106 (23)	51 (15)	CAU and CAD	5
	Holmehus	42 (6)	133 (23)	98 (25)	61 (7)	CAU and CAD	5
	Palaeogene clays	37 (6)	145 (27)	114 (27)	67 (9)	CAU and CAD	58
	Mica clays	28 (3)	58 (9)	36 (8)	-	MCAU, MCAD, MCIU	10
Other recent test	Tertiary clays	-	-	19-85	-	MCAD CAU CU	8
GEO old test (> 30 yrs)	(Late) Glacial & Tertiary clays	-	-	5-151	-	CAU _{u=0} CAD _{u=0} CU _{u=0} CD _{u=0}	108

[#] mean values with the standard deviation shown in brackets

An overview of the number of tests (n) and test types are given in Table 1. The following abbreviations are used:

- CAU/CAD Anisotropically (K_0) Consolidated. Undrained/Drained compression.
- MCAU/MCAD Anisotropically (K_0) Consolidated. Undrained/Drained compression. Multiple test on the sample.
- CU/CD Isotropically Consolidated Undrained /Drained compression.
- u=0 denominates older test procedures with no backpressure and pore water pressure kept at zero kPa.

The drained strength parameters; angle of shearing resistance ϕ' and effective cohesion c' can be derived from the results of two or more compression tests (either using multiple testing on the same sample or sets of two or more compression tests on samples with similar properties). Alternatively, the strength parameters can be interpreted from the undrained compression effective stress path, since the effective stress path for overconsolidated clays will tend to climb the strength envelope as the soil dilates and the pore water pressures decrease.

Generally, test interpretation may be difficult in cases where the specimen experiences destructuration during testing or if the sample is fissured.

3 DRAINED SHEAR STRENGTH AND PLASTICITY INDEX

3.1 Drained peak angle of shearing resistance

Figure 5 shows the relationship between the drained peak angle of shearing resistance ϕ'_{oc} and the plasticity index I_p (single log plot) as derived from triaxial compression tests performed by GEO on the various overconsolidated undisturbed clays shown in Table 1.

ϕ'_{oc} has generally been derived as a tangent value, to minimize the otherwise high influence of stress level resulting from the initially curved failure envelope. Hence, both values of ϕ'_{oc} and c'_{oc} are obtained from the tests. Results from the older tests (> 30 years, open points) are shown separately from the more recent tests (closed points).

The shaded area and dashed lines respectively represents results of the series of triaxial compression tests on palaeogene clays and glacial till deposits (Lower and Upper till) performed in connection to the Fehmarnbelt (Fixed Link) 2011 ground investigation. The spans shown in the I_p and ϕ'_{oc} values represent mean values ± 1 standard deviation.

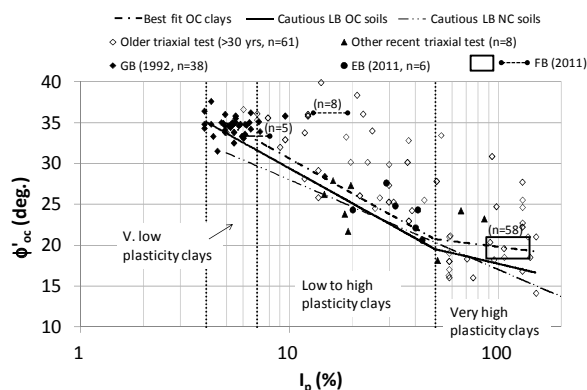


Figure 5. Relationship between peak angle of shearing resistance ϕ'_{oc} and plasticity index I_p for overconsolidated undisturbed clays

A large scatter in the data and a trend of reducing ϕ'_{oc} with increasing I_p is generally seen similarly to what was observed for NC clays in figure 2.

It is observed that the old triaxial test results generally show a much larger spread than the results of the presumably more reliable recent triaxial tests. Furthermore, the new test data tend to be found in the lower half of the range of results from the old tests. This indicates that ϕ'_{oc} is likely to be overestimated by the old tests. The use of high strain rates and the lack of full saturation in the old undrained $CU_{u=0}$ triaxial compression tests are likely to have lead to some uncertainties in the actual effective stress state at failure. This may explain some of the observed differences between the results from the old and more recent triaxial compression tests.

As for NC clays some of the scatter may arise as a result of variations in clay-size fraction, since this is not accounted for solely by the variations in I_p . Variations in stress level on the

other hand should have less of an influence, since a tangent value of ϕ'_{oc} is derived from a failure envelope which is approximately linear within the typical stress range (100-600kPa), as seen in Figures 8-10. As mentioned previously, difficulties in test interpretation and influence of fissures and destructuration may have influenced some of the results.

Based on previous experience and much of the old data shown in Figure 5 within the I_p range of 6%-106%, GEO (Knudsen 1981) has since the early 80's suggested using the following correlation to get a cautious lower bound estimate of ϕ'_{oc} on the basis of a mean value of I_p :

$$\phi'_{oc} = 45 - 15 \cdot \log I_p \quad (\text{deg.}) \quad (4)$$

In the light of the more recent test data, which extends the I_p range, especially in the high I_p end, to 4%-151%, it is suggested that the lower bound values of ϕ'_{oc} should be slightly less than previously predicted by eq. 3 for very low I_p clays and somewhat higher for high plasticity clays ($I_p > 50\%$). Hence, it is suggested to use the following revised cautious lower bound (LB) estimate of the relationship between ϕ'_{oc} and the plasticity index I_p as given by eq. 5 and 6, and shown in Figure 5 (solid line):

Cautious LB estimate:

$$4 < I_p < 50 \quad \phi'_{oc} = 44 - 14 \cdot \log I_p \quad (\text{deg.}) \quad (5)$$

$$50 \leq I_p < 150 \quad \phi'_{oc} = 30 - 6 \cdot \log I_p \quad (\text{deg.}) \quad (6)$$

For an I_p value of 100%, which is typical for e.g. Røsnes clay, this means that the lower bound estimate increases from a peak value of 15 deg. using eq. 4 to 18 deg. using eq. 6.

The estimate given by the best-fit regression line through the recent test data is shown in Figure 5 (chain dotted line) and is given by:

Best estimate:

$$4 < I_p < 50 \quad \phi'_{oc} = 45 - 14 \cdot \log I_p \quad (\text{deg.}) \quad (7)$$

$$50 \leq I_p < 150 \quad \phi'_{oc} = 26 - 3 \cdot \log I_p \quad (\text{deg.}) \quad (8)$$

Eq. 5-8. are believed to be applicable to most overconsolidated natural clays with clay-size fractions below 80%. For soils with clay-size fractions higher than 80% the above relationships should be used with caution until its validity is confirmed by additional tests.

It should be noted that some cases may dictate a mobilized angle of shearing resistance which is lower than the above estimated peak values, e.g. when progressive failure is considered in connection to slope stability analysis in high plasticity clays (Skempton 1977, Burland 1990).

The lower bound estimate for NC clays is shown in Figure 5 (dash-double-dot line) for comparison. It is observed that the lower bound estimates for NC and OC clays do not deviate much.

3.2 Effective cohesion

Figure 6 shows the relationship between the cohesive intercept of the strength envelope c'_{oc} and the plasticity index I_p (single log plot). Data from recent tests and older tests (>30 years) are separated. Two sets of c'_{oc} values have been plotted: the derived values from the tests and estimated values of c'_{oc} . The derived values have been interpreted from the tests results and are paired with the ϕ'_{oc} values shown in Figure 5. While the estimated value of c'_{oc} is found from each failure point (σ'_f , τ_f) by subtracting the stress dependent "frictional" strength contribution $\sigma'_f \tan(\phi'_{oc})$ from the shear strength τ_f . This can also be expressed in terms of mean effective stress $s'_f = 1/2(\sigma'_1 + \sigma'_3)$ and shear stress $t_f = 1/2(\sigma'_1 - \sigma'_3)$ from the following equation.

$$c'_{oc,est} = \frac{t_f - s'_f \cdot \sin \phi'_{oc,est}}{\cos \phi'_{oc,est}} \quad (9)$$

where $\phi'_{oc,est}$ is the the lower bound estimate of the angle of shearing resistance, as given by eq. 5. and 6. on the basis of I_p . The estimated c'_{oc} may show negative values in cases where the estimation of ϕ'_{oc} is too high.

The intercept of the strength envelope is very sensitive to the interpretation of the test results, and factors like destructuration or influence of fissures may have great impact on the failure points and hence the value of c'_{oc} . The scatter in the data points will therefore be very significant, much more so than what was observed for ϕ'_{oc} in figures 2 and 5. Despite the scatter a weak trend of reducing lower bound value of c'_{oc} with increasing I_p is seen for I_p greater than 7%. Part of the data from the old tests has been excluded since it is not certain if the meltwater and late glacial marine deposits are heavily overconsolidated (overconsolidation ratio OCR>4).

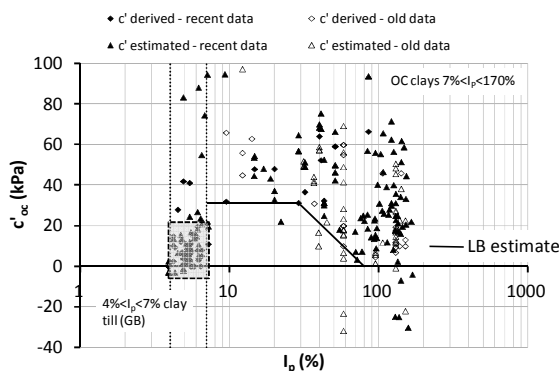


Figure 6. Relationship between effective cohesion c'_{oc} and plasticity index I_p for overconsolidated undisturbed clays

The test results from the Great Belt bridge ground investigation (GB) on very low I_p ($4\% < I_p < 7\%$) clay till are seen to deviate significantly from the general trend by showing relatively low c'_{oc} values; typically between 0 and 15 kPa. This is true for both the derived and estimated values of c'_{oc} . One or several factors might explain this, among others: a) Some of the tested clays are possibly ablation tills that are deposited in a nearly normally consolidated state. b) The clay till may have been subject to postdepositional geological processes (e.g. subsequent passing of ice sheets, meltwater, heave etc.), which may have disturbed the structure and erased the effects of overconsolidation. c) Generally, the tested clay tills have a high content of silt, sand and gravel, and the soils can therefore be characterized as transitional soils, which in terms of strength may behave more like a frictional soil ($c'_{oc} \approx 0$ kPa) than clay. This is further supported by the fact that the I_p value is likely to be overestimated, as particles larger than 0.425 mm have been removed prior to classification in accordance with BS1377:part 2:1990. An estimated 20-40% of the soil particles have been removed. Hence sand till or gravel till may in most cases be a more representative classification for the tested till deposits.

The low c'_{oc} values observed at very high I_p values above 60% are likely to be a result of fissures and/or sample destructuration. Destructuration may result from large straining events during sampling, sample preparation, testing or geological history. The Palaeogene clays from the Fehmarnbelt (Fixed Link) project mostly belong to an upper stratum which is folded by glacier. Hence, the measured strengths are likely to be influenced by varying degrees of destructuration caused by glacial disturbance of the otherwise intact clay layers.

The significant variation in the c'_{oc} values seen in Figures 6 and 7 also seem to indicate this. For heavily overconsolidated clays with $7\% < I_p < 80\%$ the test data indicate a cautious lower bound estimate of the relationship between c'_{oc} and the plasticity index, I_p as shown on Figure 6 (solid line) and given by the following equations depending on the value of I_p :

Cautious lower bound estimate:

$$7\% < I_p < 30\% \quad c'_{oc} = 30 \quad (\text{kPa}) \quad (10)$$

$$30\% \leq I_p < 80\% \quad c'_{oc} = 48 - 0.6 \cdot I_p \quad (\text{kPa}) \quad (11)$$

$$I_p > 80\% \quad c'_{oc} = 0 \quad (\text{kPa}) \quad (12)$$

While the drained angle of shearing resistance ϕ'_{oc} is more naturally linked to soil mineralogy composition, as expressed partly by the I_p value, the apparent effective cohesion is more naturally linked to the soil structure and dilative tendencies. As the I_p value is determined from reconstituted state it does not take account of soil structure. Hence, the above relationship between c'_{oc} and I_p may not be the most appropriate to use.

As suggested in the previous Danish code of practice for foundations (Danish Standard DS 415) it may be expected that the value of c'_{oc} is better related to the undrained shear strength c_u rather than I_p . Both c_u and c'_{oc} are influenced by soil structure and dilation, but as the stress level is likely to have a greater impact on c_u than c'_{oc} , the relationship will not be unique. Based on a comparison of the drained and undrained bearing capacity in connection to plate loading tests on clay till (Jacobsen 1970), the previous Danish code of practice for foundations suggests the following cautious estimate of c'_{oc} on the basis of c_u :

$$c'_{oc} = 0.1 \cdot c_u \quad (\text{kPa}) \quad (13)$$

Figure 7 shows the relationship between c'_{oc} and c_u based on data from the performed tests. As before both derived values from the tests and estimated values of c'_{oc} are shown. As expected the observed scatter is very significant, but there is a tendency of increasing values of c'_{oc} with increasing values of c_u . Both recent and older data appear to verify that the relationship between c'_{oc} and c_u given by eq. 13 can be used as a cautious lower bound estimate with an upper limit of $c'_{oc} = 30$ kPa for all heavily overconsolidated clays except very low I_p clay till. For very low I_p clay till the effective cohesion c'_{oc} is in the majority of cases found to be lower than given by eq. 13, as shown by the shaded area in Figure 7. Hence, in agreement with observations from Figure 6 it is suggested to use $c'_{oc} = 0$ kPa for very low I_p ($4\% < I_p < 7\%$) clay till/transitional soils independently of c_u , unless specific triaxial test data is available to suggest otherwise. $c'_{oc} = 0$ kPa should also be assumed for fissured high plasticity clays in cases where the overall mobilized strength may be governed by the fissure strength.

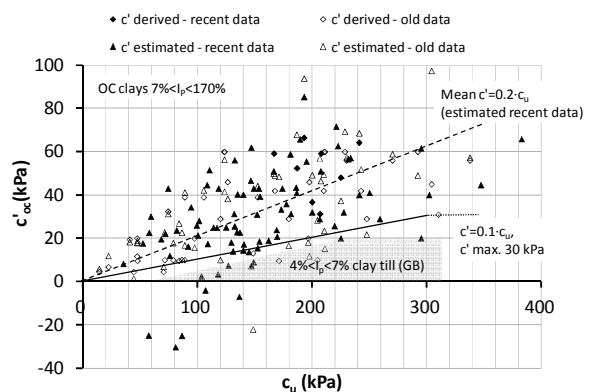


Figure 7. Relationship between effective cohesion c'_{oc} and undrained shear strength c_u for overconsolidated undisturbed clays

Generally it is suggested to estimate c'_{oc} on the basis of eq. 13 for clays with I_p values between 7% and 150%. It should however be noted that if both ϕ'_{oc} and c'_{oc} are estimated cautiously using the above correlations then the estimated combined strength may in some cases be too conservative. On the other hand, the combined strength found from the proposed correlations may overestimate the strength at low effective

stresses (<50 kPa) as the failure envelope curves towards origin (see Figure 1b).

4 VALIDATION OF THE PROPOSED RELATIONSHIPS

The test results from the three test series from the Great Belt (GB), Fehmarnbelt (Fixed Link) (FB) and Esbjerg Harbour (EB) ground investigations are shown in Figures 8-10. The figures show the failure points for each shear stage for all the tested specimens in a plot of shear stress t against mean effective stress s' . For each test series the best-fit line through the data points is shown, and for comparison the cautiously estimated effective strength envelope is also shown (dashed line). The estimated strength envelope is based on the estimated angle of shearing resistance ϕ'_{oc} found from eq. 5-6 on the basis of the mean value of I_p for the tested clays, and the effective cohesion c'_{oc} determined from eq. 13. c_u has been assumed equal to the mean shear stress t_{fm} at failure, as derived from the best-fit regression line through the failure points.

It is observed that the estimated strength envelope in all cases provides a cautious estimate of the strength of the tested clays within the given stress intervals.

5 CONCLUSION

Simple correlations between the plasticity index and the drained peak strength parameters in terms of ϕ'_{oc} and c'_{oc} have been proposed on the basis of a comprehensive database of triaxial compression tests on undisturbed overconsolidated Danish clays of very low to extremely high plasticity. The proposed correlations gives cautious lower bound values of the drained strength parameters, which can be used as a first approximation for use in preliminary design of geotechnical structures. Furthermore, the correlations can be used to evaluate the results of laboratory effective strength tests, and as a mean to assess how well these results represent the entire soil mass at a given site when viewed in connection to the variations of the index properties in the soil mass.

The authors however believe that the proposed correlations should only be used in cases where time and cost constraints do not allow for actual effective strength tests to be carried out. In most other cases the use of effective strength tests will provide a much more reliable and cost effective estimate of the strength properties of the soil in question.

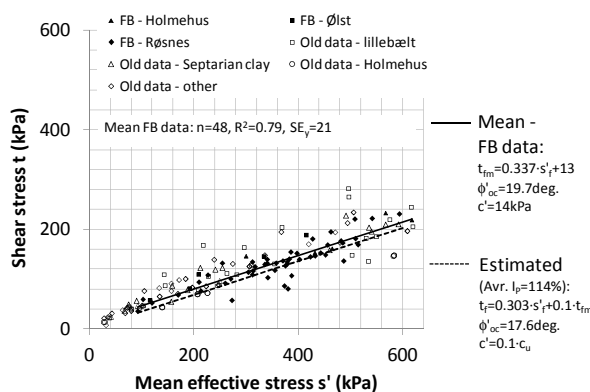


Figure 8. Failure points for high plasticity clays (50%< I_p <170%) shown in a t,s' plot

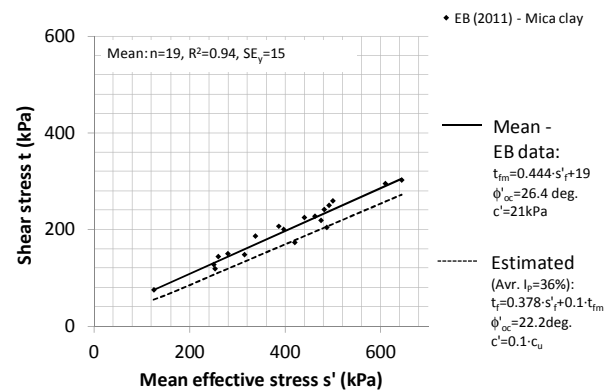


Figure 9. Failure points for mica clay (20< I_p <43%) shown in a t,s' plot

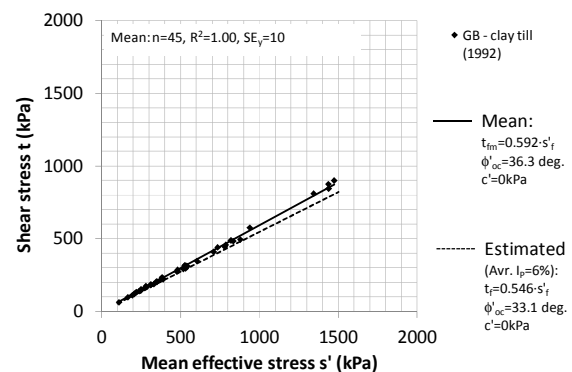


Figure 10. Failure points for clay till (4< I_p <7%) shown in a t,s' plot

6 ACKNOWLEDGEMENTS

The authors would like to acknowledge the support and work done by B. Knudsen (previously The Danish Geotechnical Institute) on the subject.

Data have been made available by Femern A/S (www.femern.com), but findings and conclusions expressed in this paper do not necessarily reflect the views of Femern A/S.

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FOUNDATION ANALYSIS AND DESIGN

JOESPH E. BOWLES, P.E., S.E.

TABLE 2-6
Representative values for angle of internal friction ϕ

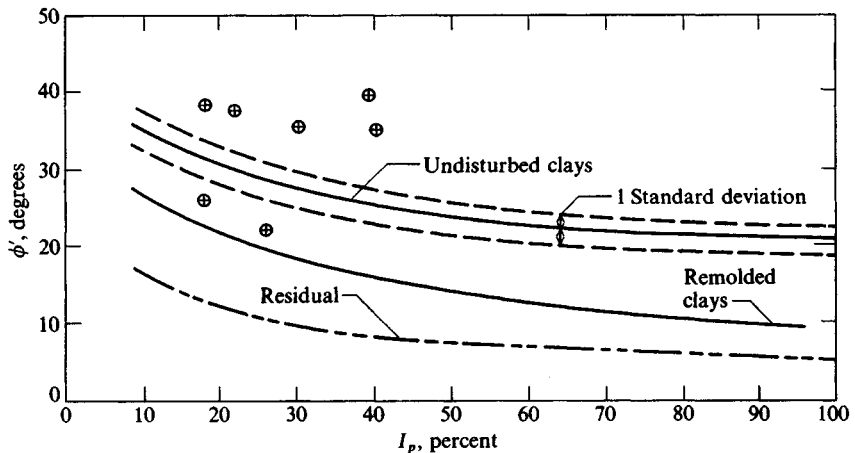
Soil	Type of test*		
	Unconsolidated-undrained, U	Consolidated-undrained, CU	Consolidated-drained, CD
Gravel			
Medium size	40–55°		40–55°
Sandy	35–50°		35–50°
Sand			
Loose dry	28–34°		
Loose saturated	28–34°		
Dense dry	35–46°		43–50°
Dense saturated	1–2° less than dense dry		43–50°
Silt or silty sand			
Loose	20–22°		27–30°
Dense	25–30°		30–35°
Clay	0° if saturated	3–20°	20–42°

*See a laboratory manual on soil testing for a complete description of these tests, e.g., Bowles (1992).

Notes:

1. Use larger values as γ increases.
2. Use larger values for more angular particles.
3. Use larger values for well-graded sand and gravel mixtures (GW, SW).
4. Average values for gravels, 35–38°; sands, 32–34°.

Figure 2-35 Correlation between ϕ' and plasticity index I_p for normally consolidated (including marine) clays. Approximately 80 percent of data falls within one standard deviation. Only a few extreme scatter values are shown [Data from several sources: Ladd et al. (1977), Bjerrum and Simons (1960), Kanja and Wolie (1977), Olsen et al. (1986).]



2007 PAVEMENT DESIGN MANUAL
MINNESOTA DOT

Typical values of c and Φ are shown in Table 3-2.10.

Table 3-2.10. Typical cohesion and angle of internal friction values.

Mn/DOT Triangular Textural Classification	c Cohesion, kPa (psf)		Φ Angle of Internal Friction (degrees)
	Compacted	Saturated	
Gravel	0	0	> 37
Sand	0	0	37 – 38
	50 – 75	10- 20	
Loamy Sand	(1,000 - 1,500)	(200 – 400)	31 – 34
	50 – 75	10 - 20	
Sandy Loam	(1,000 - 1,500)	(200 – 400)	31 – 34
	60 – 90	10 - 20	
Loam	(1,300 - 1,800)	(200 – 400)	28 – 32
	60 – 90	10 - 20	
Silt Loam	(1,300 - 1,800)	(200 – 400)	25 – 32
	50 – 75	10 – 20	
Sandy Clay Loam	(1,000 - 1,500)	(200 – 400)	31 – 34
	60 – 105	10 -20	
Clay Loam	(1,300 - 2,200)	(200 – 400)	18 – 32
	60 – 105	10 - 20	
Silty Clay Loam	(1,300 - 2,200)	(200 – 400)	18 – 32
	50 – 75	10 - 20	
Sandy Clay	(1,000 - 1,500)	(200 – 400)	31 – 34
	90 – 105	10 -20	
Silty Clay	(1,800 - 2,200)	(200 – 400)	18 – 32
	90 – 105	10 - 20	
Clay	(1,800 - 2,200)	(200 – 400)	18 - 28

While these values can be used in pavement design, they are generally more applicable to slope stability and bearing capacity calculations. Therefore, these are most often used by the Foundations Unit, rather than at the District level.

The method of determining each of the above strength values is presented in Section 4-2.06.05.

4. Dynamic Cone Penetrometer (DCP). This test is a field procedure that can be used to determine the in-situ strength properties of base and subgrade soils. The DCP is currently used for quality assurance testing by Mn/DOT.
5. Elastic Modulus of Subgrade Reaction (k-value). The k-value is used as a primary input in concrete pavement design thickness models, and can only be measured using a field test on top of the subgrade. There is no direct laboratory procedure for determining the k-value.

The k-value can be estimated using any of the following methods:

- 1) Plate bearing tests on subgrade. A 762mm (30 in.) diameter plate is loaded to a given pressure at a specified rate and the resulting deflection is measured.

Appendix P

Sewer Investigation

To: Abby Mazza, City of Chicago Department of Fleet and Facility Management (2FM)

Cc: Carol Nissen, Tetra Tech, Inc. (Tetra Tech)

From: Kris Schnoes, Tetra Tech

Date: October 7, 2019

Subject: Summary of Sewer Cleanout and Investigation
Former Carnotite Reduction Company Site (Carnotite)
434 E. 26th Street
Chicago, IL

On July 31 and August 1, 2019, 2FM conducted sewer cleanout and investigation activities at the Carnotite site as required by the City of Chicago Department of Sewers prior to removal of sewers during remediation activities. 2FM conducted the sewer investigation in planned excavation areas to determine if any unknown connections to the combined sewers exist. Prior to televising the sewer, SET Environmental, Inc. (SET) cleaned the sewers by hydro-jetting and collected the sewer water and sludge in one 25-cubic yard vacuum box and five 300-gallon totes. The vacuum box and totes remained onsite for waste characterization prior to disposal. Once sewer cleanout was complete, Michel's Pipe Service conducted sewer televising activities. Tetra Tech was present during portions of the sewer cleanout and investigation. Also, Stan A. Huber Consultants, Inc. conducted radiation screening of the work areas and equipment during cleanout and investigation activities and screened all equipment in contact with potentially contaminated sewer water and sludge for free release after decontamination of the equipment was conducted, as necessary.

The sewer cleanout and investigation began in the south portion of the future remediation area, along 26th Street as it bends from a north-south orientation to an east-west orientation near the tennis courts. The investigation then continued to the north portion of the future remediation area, along 26th Street east of Martin Luther King Drive. The following information was documented during sewer televising activities:

- In the south area, the 12-inch vitrified clay pipe (VCP) sewer south of 26th Street was completely blocked with roots and debris.
- In the south area, the 12-inch VCP sewer north of 26th Street was inspected.
- In the north area, the 26th Street sewer was observed to be 12-inch diameter VCP east of the vegetated circular center median in 26th Street and 18-inch diameter VCP west of the vegetated median. A portion of the sewer pipe is corrugated metal pipe approximately 7 feet east of Martin Luther King Drive.
- In the north area, two previously unknown sewer connections to the north 26th Street sewer from the adjacent property to the north were discovered. One 10-inch VCP sewer drains the southwest parking lot located on the property north of the site. One 8-inch VCP sewer appears to connect to a combined sewer from the building located on the north property as well as drain storm water from the grass area located east of the existing driveway entering the north property from 26th Street.
- The 12-inch VCP sewer along north 26th Street was observed to be in poor condition in some locations, including a collapsed section in the eastern portion of 26th Street located about 90 feet west-southwest of the driveway entering the north property from 26th Street.

Hand drawn field maps prepared by Michel's are attached. Michel's report also included video and photos of the inspected sewer pipes.



Field Condition Map

Date: 08/01/19

Customer: CITY OF CHICAGO

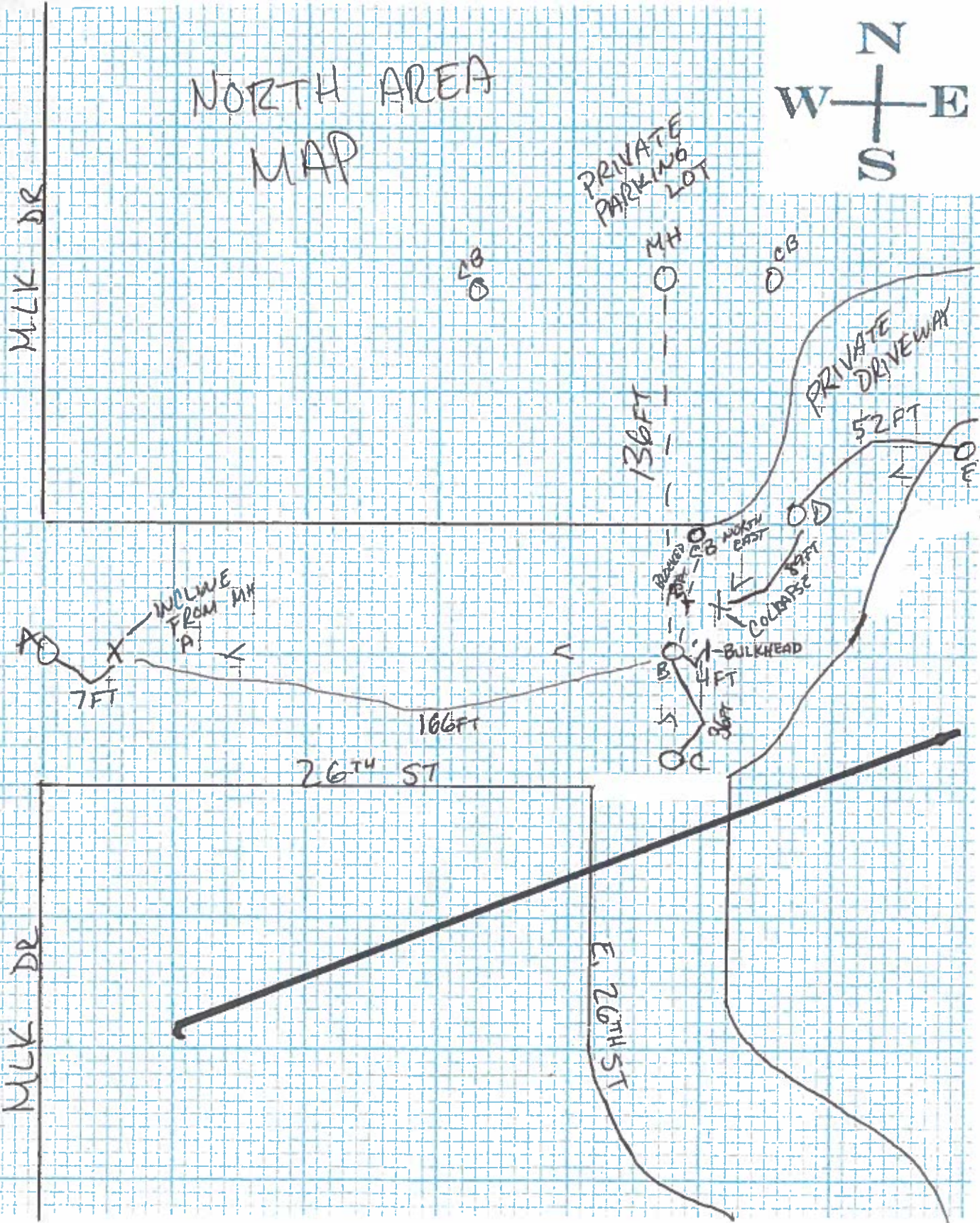
Work Order Number: 190363

Job Number:

Street Location: E. 26TH ST.

Truck Number: 90031

Operator: M. SEDLACEK





Field Condition Map

Date: 08/01/19

Customer: CITY OF CHICAGO

Work Order Number: 190303

Job Number:

Street Location: E. 26TH ST

Truck Number: 90031

Operator: M. SEDLACEK

