Appendix C (2 of 3)
Predesign Investigation

TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300038.D				
Lims ID:	LB 280-423271/1-G				
Client ID:					
Sample Type:	LB				
Inject. Date:	30-Jul-2018 23:47:28	ALS Bottle#:	33	Worklist Smp#:	38
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	LB 280-423271/1-				
Misc. Info.:	280-0072505-038				
Operator ID:	TEM	Instrument ID:	SGC_P2		
Method:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\P2 8081 IS.m				
Limit Group:	GCSV - 8081A - IS				
Last Update:	08-Aug-2018 01:52:05	Calib Date:	30-Jul-2018 22:03:40		
Integrator:	Falcon				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300032.D				
Column 1 :	CLP1 (0.32 mm)		Det: GC ECD1A		
Column 2 :	CLP2 (0.32 mm)		Det: GC ECD2B		
Process Host:	CTX0301				
First Level Reviewer: mooret		Date:	03-Aug-2018 13:07:13		

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	16.6	83.21
$ 41 DCB Decachlorobiphenyl	20.0	18.9	94.40

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	17.6	88.14
$ 41 DCB Decachlorobiphenyl	20.0	19.6	98.13

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 280-423271/2-F

Matrix: Solid (TCLP) | Lab File ID: 07300039.D

Analysis Method: 8081B | Date Collected:

Extraction Method: 3510C | Date Extracted: 07/25/2018 11:45

Sample wt/vol: 100(mL) | Date Analyzed: 07/31/2018 00:04

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: CLP1 ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 424154 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-20-8	Endrin	0.00614		0.00050	0.000079
76-44-8	Heptachlor	0.00653		0.00050	0.000077
1024-57-3	Heptachlor epoxide	0.00638		0.00050	0.000075
58-89-9	gamma-BHC (Lindane)	0.00609		0.00050	0.000069
72-43-5	Methoxychlor	0.00676		0.0010	0.00013

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	79		28-115
2051-24-3	DCB Decachlorobiphenyl	91		34-122

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300039.D
Lims ID: LCS 280-423271/2-F
Client ID:
Sample Type: LCS
Inject. Date: 31-Jul-2018 00:04:44 ALS Bottle#: 34 Worklist Smp#: 39
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: LCS 280-423271/2
Misc. Info.: 280-0072505-039
Operator ID: TEM Instrument ID: SGC_P2

Method: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\P2 8081 IS.m
Limit Group: GCSV - 8081A - IS
Last Update: 08-Aug-2018 01:52:05 Calib Date: 30-Jul-2018 22:03:40
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300032.D

Column 1 : CLP1 (0.32 mm) Det: GC ECD1A
Column 2 : CLP2 (0.32 mm) Det: GC ECD2B
Process Host: CTX0301

First Level Reviewer: mooret Date: 01-Aug-2018 14:31:53

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	2.945	2.945	-0.001	862070430	150.0	150.0	
2	2.730	2.730	0.000	202492047	150.0	150.0	
$ 4 Tetrachloro-m-xylene							
1	3.850	3.850	0.000	106081792	20.0	15.8	
2	3.720	3.720	0.000	29880334	20.0	18.1	
						RPD = 13.70	
5 Hexachlorobenzene							
1	4.263	4.263	0.000	278191142	50.0	42.4	
2	4.200	4.200	0.000	76818281	50.0	44.5	
						RPD = 4.81	
8 alpha-BHC							
1	4.435	4.435	0.000	528829350	50.0	56.2	
2	4.346	4.346	0.000	131665503	50.0	57.9	
						RPD = 3.10	
9 gamma-BHC (Lindane)							
1	4.727	4.728	-0.001	507040723	50.0	60.9	
2	4.665	4.663	0.002	124772489	50.0	61.1	
						RPD = 0.29	
10 beta-BHC							
1	4.807	4.808	-0.001	200798579	50.0	58.7	
2	4.743	4.743	0.000	52924794	50.0	60.7	
						RPD = 3.39	
12 delta-BHC							
1	4.957	4.957	0.000	523292095	50.0	62.4	
2	4.976	4.977	-0.001	128518597	50.0	65.0	
						RPD = 4.07	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
15 Heptachlor							
1	5.129	5.129	0.000	465318263	50.0	65.3	
2	5.018	5.017	0.001	121309560	50.0	63.4	
						RPD = 2.93	
16 Aldrin							
1	5.392	5.393	-0.001	454947205	50.0	58.8	
2	5.278	5.277	0.001	115992655	50.0	60.0	
						RPD = 2.11	
21 Heptachlor epoxide							
1	5.988	5.988	0.000	420274046	50.0	63.8	
2	5.798	5.798	0.000	106992164	50.0	62.0	
						RPD = 2.80	
22 trans-Chlordane							
1	6.121	6.121	0.000	448406797	50.0	63.8	
2	5.989	5.988	0.001	114966904	50.0	63.6	
						RPD = 0.37	
23 cis-Chlordane							
1	6.262	6.262	0.000	429556009	50.0	63.5	
2	6.143	6.143	0.000	111395149	50.0	65.0	
						RPD = 2.28	
24 4,4'-DDE							
1	6.344	6.346	-0.002	431807982	50.0	65.0	
2	6.329	6.330	-0.001	114005511	50.0	62.9	
						RPD = 3.32	
25 Endosulfan I							
1	6.409	6.409	0.000	389833871	50.0	61.2	
2	6.200	6.199	0.001	103290531	50.0	63.0	
						RPD = 2.86	
27 Dieldrin							
1	6.664	6.663	0.001	462501208	50.0	65.3	
2	6.488	6.488	0.000	118572304	50.0	64.9	
						RPD = 0.65	
30 Endrin							
1	6.911	6.911	0.000	414287754	50.0	61.4	
2	6.808	6.808	0.000	108261129	50.0	62.1	
						RPD = 1.01	
32 4,4'-DDD							
1	6.980	6.981	-0.001	367985852	50.0	63.4	
2	6.944	6.946	-0.002	92988337	50.0	66.1	
						RPD = 4.24	
34 Endosulfan II							
1	7.148	7.148	0.000	370756058	50.0	62.4	
2	7.035	7.035	0.000	97560344	50.0	60.6	
						RPD = 2.97	
35 4,4'-DDT							
1	7.275	7.277	-0.002	347887173	50.0	72.4	
2	7.275	7.275	0.000	97954460	50.0	65.2	
						RPD = 10.47	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
36 Endrin aldehyde							
1	7.593	7.593	0.000	290200791	50.0	58.8	
2	7.395	7.394	0.001	77686624	50.0	60.0	
						RPD = 2.12	
37 Methoxychlor							
1	7.788	7.790	-0.002	154903573	50.0	67.6	
2	8.009	8.009	0.000	49688991	50.0	62.7	
						RPD = 7.52	
39 Endosulfan sulfate							
1	8.052	8.052	0.000	344282051	50.0	62.2	
2	7.689	7.688	0.001	91059700	50.0	62.4	
						RPD = 0.30	
40 Endrin ketone							
1	8.345	8.345	0.000	364443658	50.0	57.2	
2	8.240	8.240	0.000	98414605	50.0	57.2	
						RPD = 0.03	
$ 41 DCB Decachlorobiphenyl							
1	9.374	9.376	-0.002	88219961	20.0	18.2	
2	9.513	9.513	0.000	24877160	20.0	18.9	
						RPD = 3.96	

Reagents:

8081_IS_00008 Amount Added: 75.00 Units: uL Run Reagent

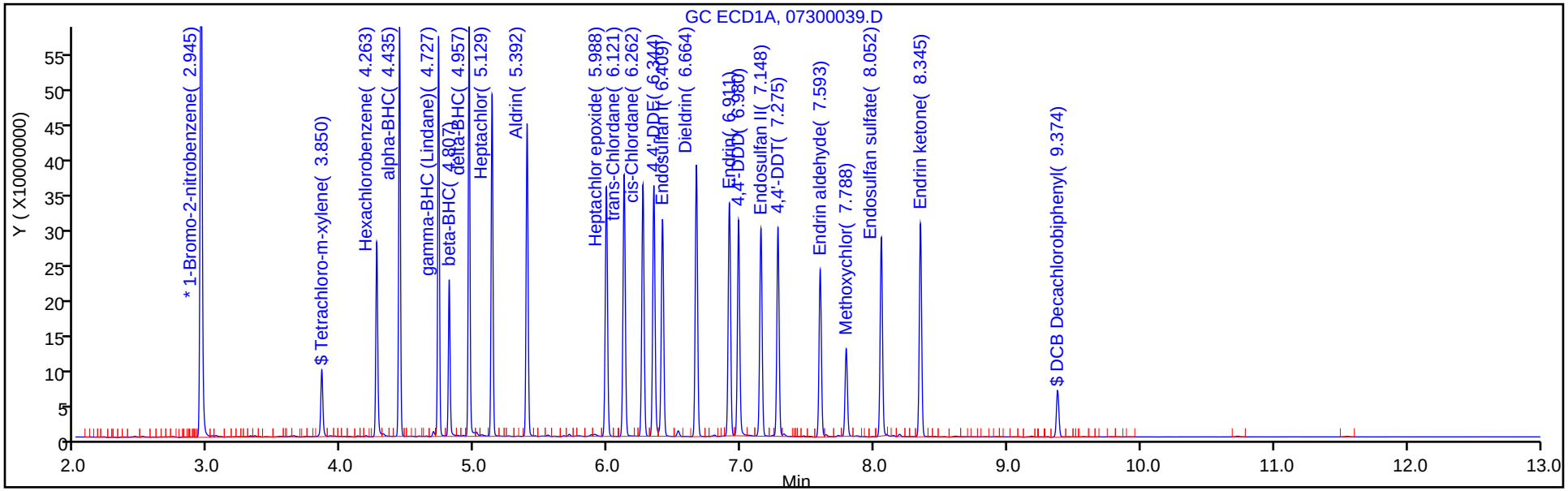
Report Date: 08-Aug-2018 01:52:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

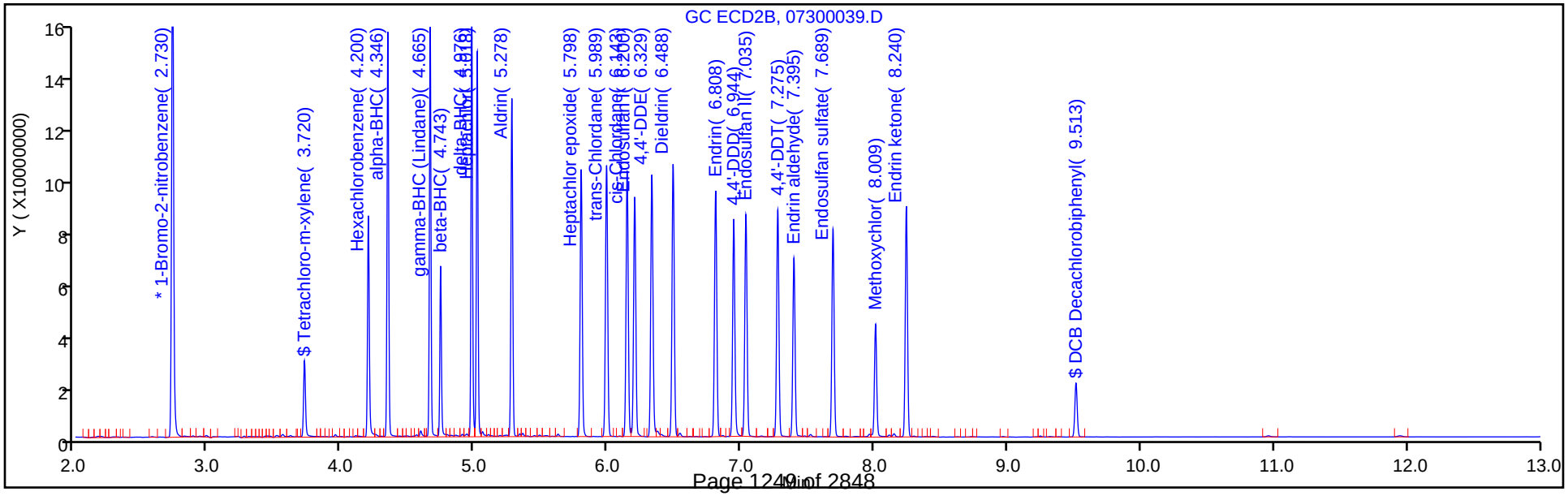
Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300039.D

Injection Date:	31-Jul-2018 00:04:44	Instrument ID:	SGC_P2	Operator ID:	TEM
Lims ID:	LCS 280-423271/2-F			Worklist Smp#:	39
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	34
Method:	P2 8081 IS	Limit Group:	GCSV - 8081A - IS		

Column: CLP1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: CLP2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300039.D				
Lims ID:	LCS 280-423271/2-F				
Client ID:					
Sample Type:	LCS				
Inject. Date:	31-Jul-2018 00:04:44	ALS Bottle#:	34	Worklist Smp#:	39
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	LCS 280-423271/2				
Misc. Info.:	280-0072505-039				
Operator ID:	TEM	Instrument ID:	SGC_P2		
Method:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\P2 8081 IS.m				
Limit Group:	GCSV - 8081A - IS				
Last Update:	08-Aug-2018 01:52:05	Calib Date:	30-Jul-2018 22:03:40		
Integrator:	Falcon				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300032.D				
Column 1 :	CLP1 (0.32 mm)		Det: GC ECD1A		
Column 2 :	CLP2 (0.32 mm)		Det: GC ECD2B		
Process Host:	CTX0301				
First Level Reviewer: mooret		Date:	01-Aug-2018 14:31:53		

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	15.8	78.96
$ 41 DCB Decachlorobiphenyl	20.0	18.2	90.97

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	18.1	90.57
$ 41 DCB Decachlorobiphenyl	20.0	18.9	94.64

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 280-423271/3-C

Matrix: Solid (TCLP) | Lab File ID: 07300040.D

Analysis Method: 8081B | Date Collected:

Extraction Method: 3510C | Date Extracted: 07/25/2018 11:45

Sample wt/vol: 100(mL) | Date Analyzed: 07/31/2018 00:21

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: CLP1 ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 424154 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
8001-35-2	Toxaphene	0.0219		0.020	0.0037

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	77		28-115
2051-24-3	DCB Decachlorobiphenyl	91		34-122

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300040.D
Lims ID: LCS 280-423271/3-C
Client ID:
Sample Type: LCS
Inject. Date: 31-Jul-2018 00:21:59 ALS Bottle#: 35 Worklist Smp#: 40
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: LCS 280-423271/3
Misc. Info.: 280-0072505-040
Operator ID: TEM Instrument ID: SGC_P2

Method: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\P2 8081 IS.m
Limit Group: GCSV - 8081A - IS
Last Update: 08-Aug-2018 01:52:05 Calib Date: 30-Jul-2018 22:03:40
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300032.D

Column 1 : CLP1 (0.32 mm) Det: GC ECD1A
Column 2 : CLP2 (0.32 mm) Det: GC ECD2B
Process Host: CTX0301

First Level Reviewer: mooret Date: 01-Aug-2018 14:32:14

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	2.947	2.945	0.002	808120653	150.0	150.0	
2	2.733	2.730	0.002	194277317	150.0	150.0	
$ 4 Tetrachloro-m-xylene							M
1	3.852	3.850	0.002	97683731	20.0	15.5	M
2	3.722	3.720	0.002	26839426	20.0	16.9	M
						RPD = 8.81	
28 Toxaphene							M
1	6.237	6.235	0.002	11676541	200.0	132.7	M
1	6.764	6.762	0.002	14536534	200.0	104.3	M
1	7.008	7.008	0.000	19642235	200.0	261.6	M
1	7.735	7.730	0.005	23815445	200.0	212.3	M
1	8.045	8.045	0.000	23071001	200.0	382.7	M
		Average of Peak Amounts =				218.7	
2	5.651	5.648	0.003	1831950	200.0	267.5	M
2	7.023	7.018	0.005	6263406	200.0	104.0	M
2	7.203	7.202	0.001	4241305	200.0	212.9	M
2	7.403	7.401	0.002	11868314	200.0	194.3	M
2	7.936	7.933	0.003	11954432	200.0	221.2	M
		Average of Peak Amounts =				200.0	
						RPD = 8.95	
$ 41 DCB Decachlorobiphenyl							M
1	9.376	9.376	0.000	82729171	20.0	18.2	M
2	9.513	9.513	0.000	24562121	20.0	19.5	
						RPD = 6.94	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

8081_IS_00008 Amount Added: 75.00 Units: uL Run Reagent

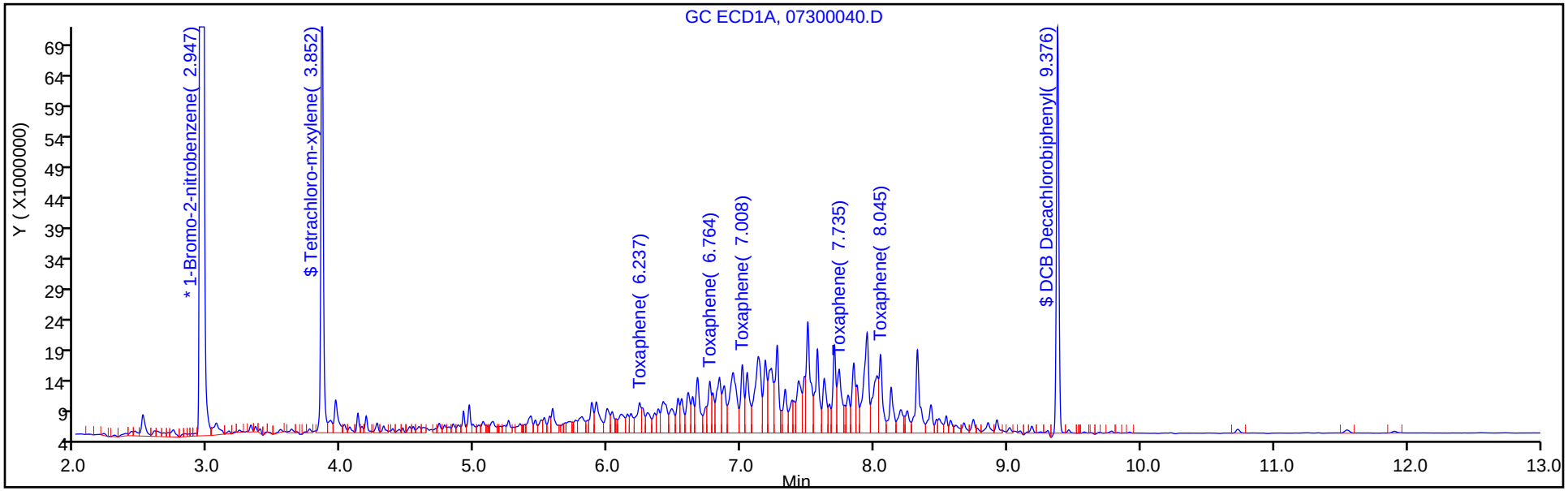
Report Date: 08-Aug-2018 01:52:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

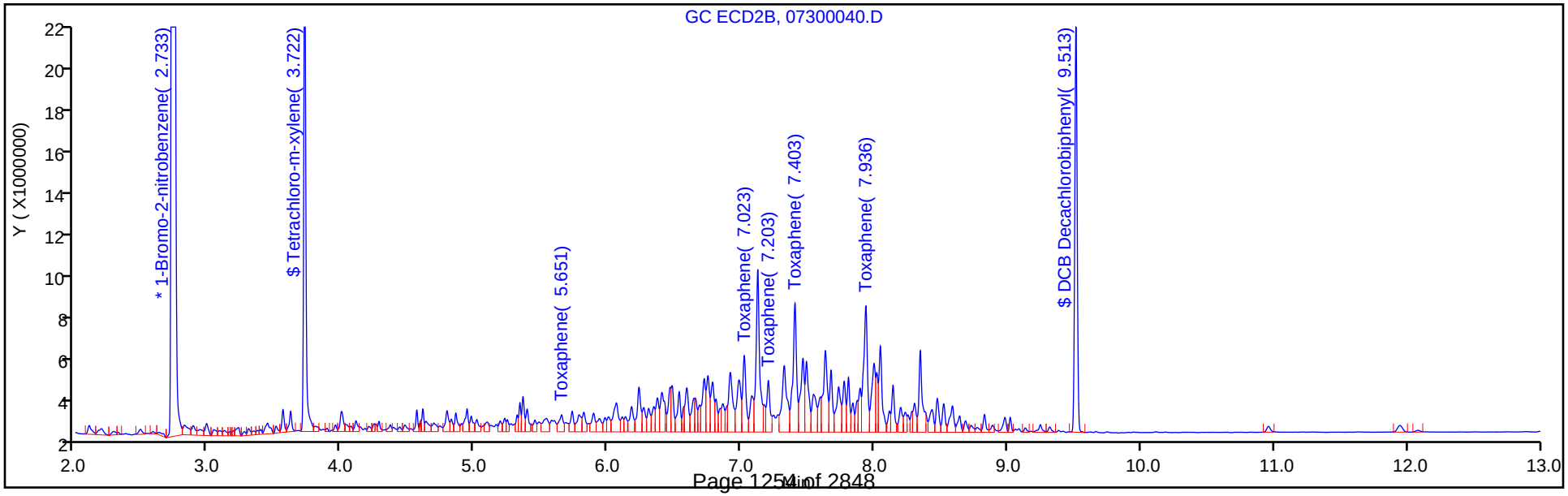
Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300040.D

Injection Date:	31-Jul-2018 00:21:59	Instrument ID:	SGC_P2	Operator ID:	TEM
Lims ID:	LCS 280-423271/3-C			Worklist Smp#:	40
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	35
Method:	P2 8081 IS	Limit Group:	GCSV - 8081A - IS		

Column: CLP1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: CLP2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300040.D				
Lims ID:	LCS 280-423271/3-C				
Client ID:					
Sample Type:	LCS				
Inject. Date:	31-Jul-2018 00:21:59	ALS Bottle#:	35	Worklist Smp#:	40
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	LCS 280-423271/3				
Misc. Info.:	280-0072505-040				
Operator ID:	TEM	Instrument ID:	SGC_P2		
Method:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\P2 8081 IS.m				
Limit Group:	GCSV - 8081A - IS				
Last Update:	08-Aug-2018 01:52:05	Calib Date:	30-Jul-2018 22:03:40		
Integrator:	Falcon				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300032.D				
Column 1 :	CLP1 (0.32 mm)		Det: GC ECD1A		
Column 2 :	CLP2 (0.32 mm)		Det: GC ECD2B		
Process Host:	CTX0301				
First Level Reviewer: mooret		Date:	01-Aug-2018 14:32:14		

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	15.5	77.50
$ 41 DCB Decachlorobiphenyl	20.0	18.2	91.00

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	16.9	84.64
$ 41 DCB Decachlorobiphenyl	20.0	19.5	97.54

Report Date: 08-Aug-2018 01:52:39 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300040.D

Injection Date: 31-Jul-2018 00:21:59 Instrument ID: SGC_P2

Lims ID: LCS 280-423271/3-C

Client ID:

Operator ID: TEM ALS Bottle#: 35 Worklist Smp#: 40

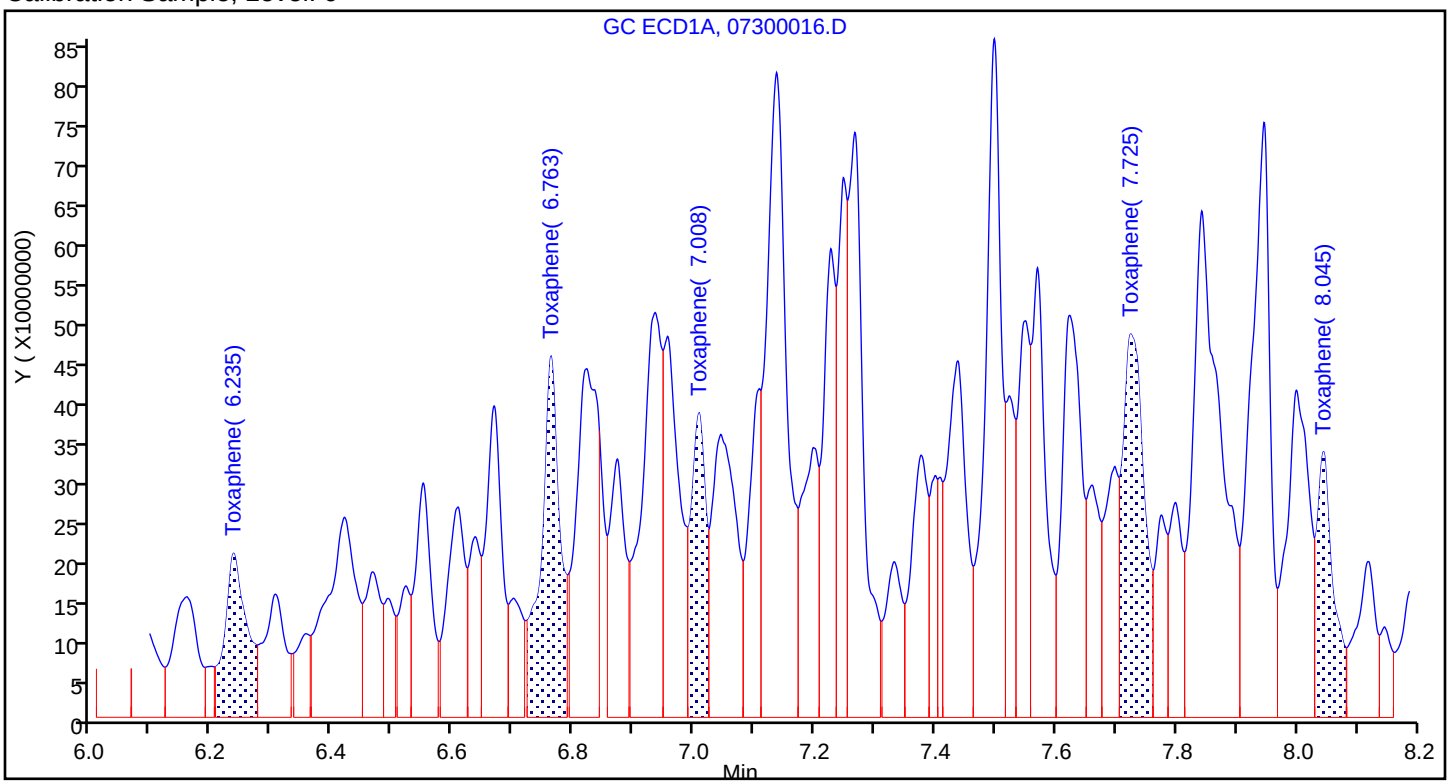
Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: P2 8081 IS Limit Group: GCSV - 8081A - IS

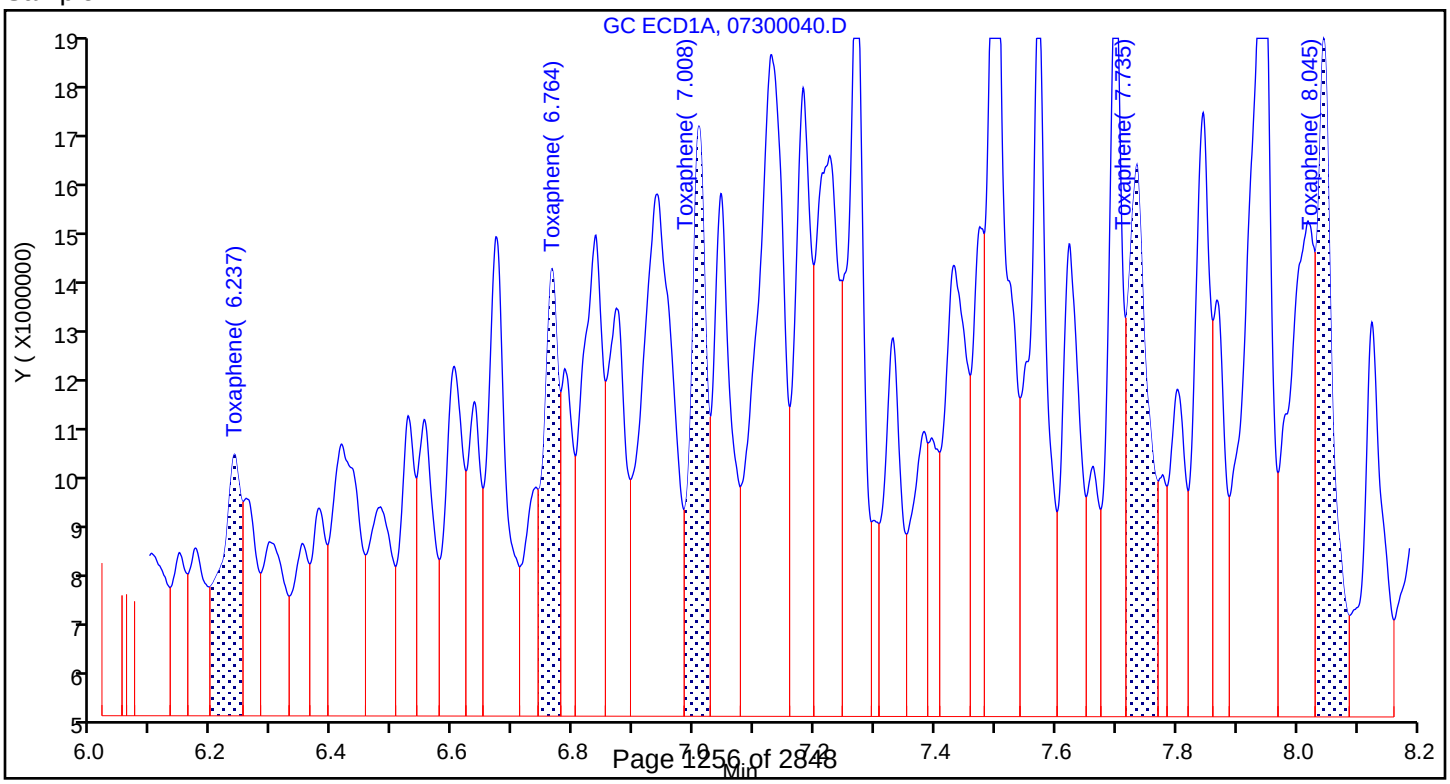
Column: CLP1 (0.32 mm) Detector GC ECD1A

28 Toxaphene, CAS: 8001-35-2

Calibration Sample, Level: 6



Sample



Report Date: 08-Aug-2018 01:52:39 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300040.D

Injection Date: 31-Jul-2018 00:21:59 Instrument ID: SGC_P2

Lims ID: LCS 280-423271/3-C

Client ID:

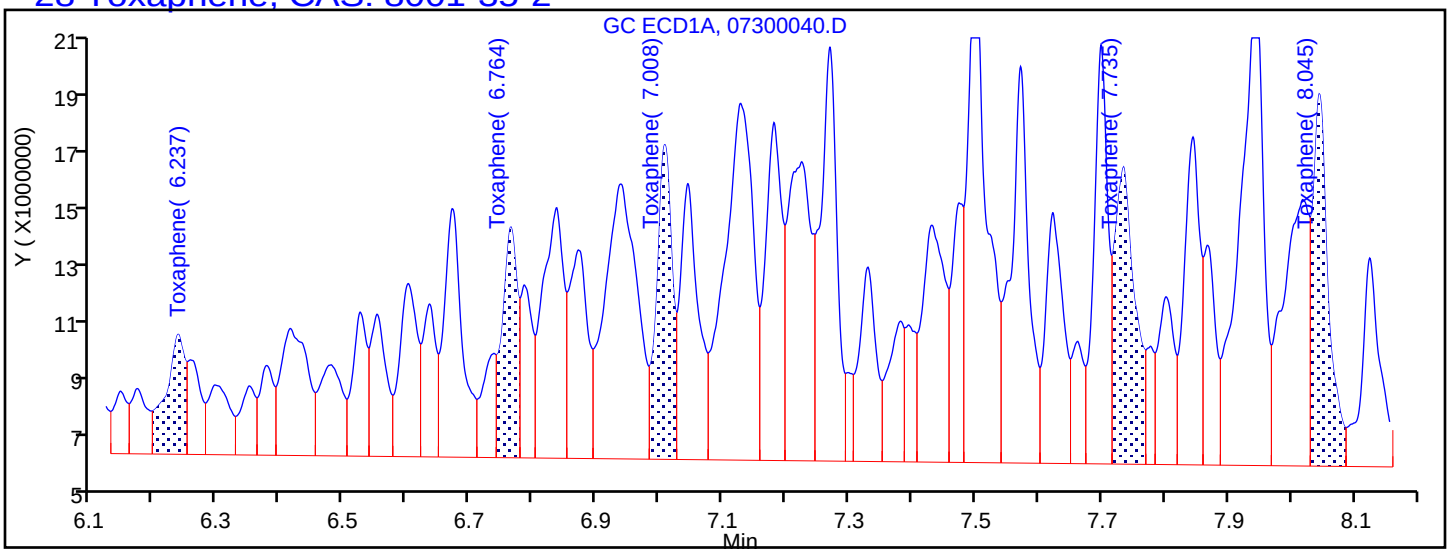
Operator ID: TEM ALS Bottle#: 35 Worklist Smp#: 40

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: P2 8081 IS Limit Group: GCSV - 8081A - IS

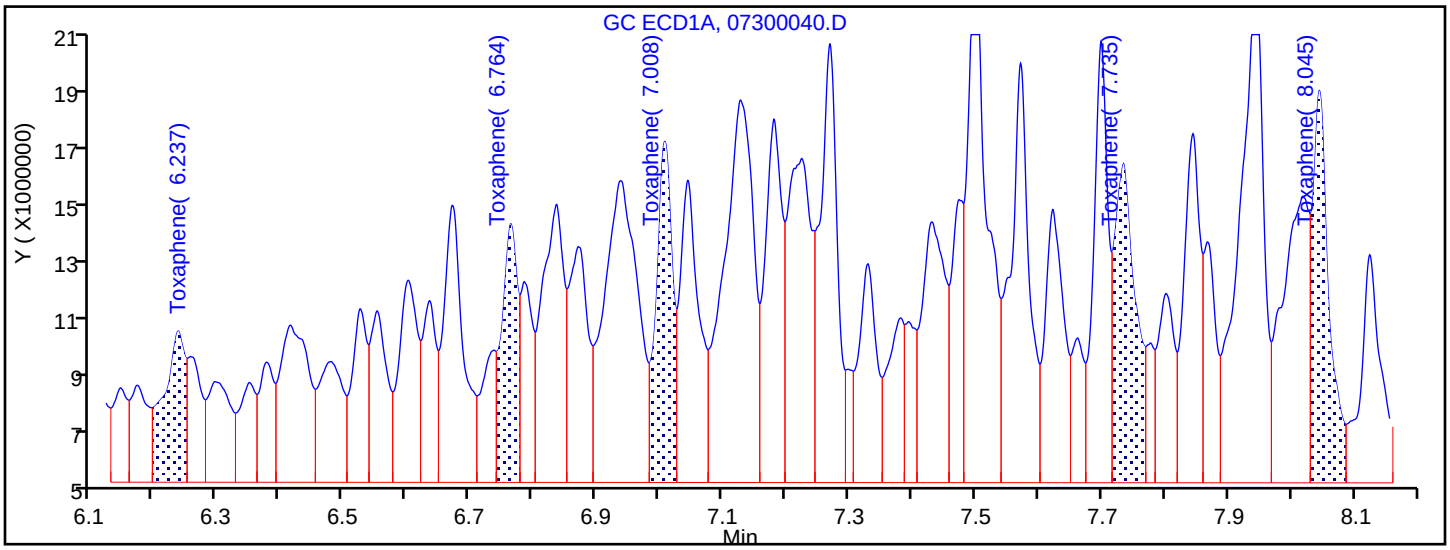
Column: CLP1 (0.32 mm) Detector GC ECD1A

28 Toxaphene, CAS: 8001-35-2



Processing Integration Results

6.237	Response = 8321969
6.764	Response = 12493989
7.008	Response = 17410622
7.735	Response = 21547092
8.045	Response = 20878242



Manual Integration Results

6.237	Response = 11676541	M
6.764	Response = 14536534	M
7.008	Response = 19642235	M
7.735	Response = 23815445	M
8.045	Response = 23071001	M

Reviewer: mooret, 08-Aug-2018 01:51:12

Audit Action: Assigned New Baseline Audit Reason: Baseline Smoothing

Manual Integration/User Assign Peak Report

TestAmerica Denver

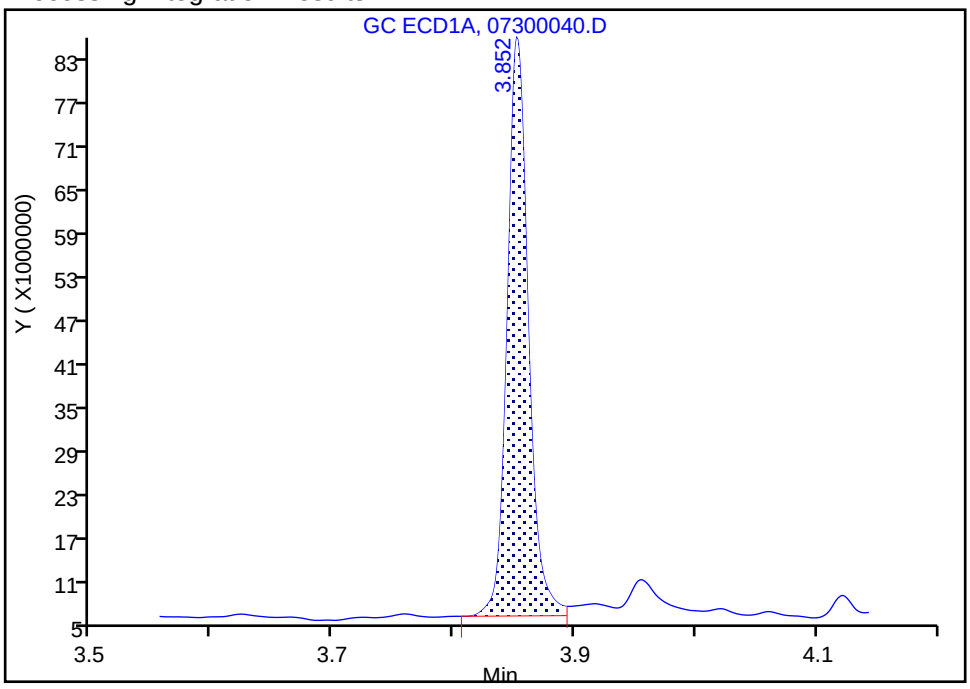
Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300040.D
Injection Date: 31-Jul-2018 00:21:59 Instrument ID: SGC_P2
Lims ID: LCS 280-423271/3-C
Client ID:
Operator ID: TEM ALS Bottle#: 35 Worklist Smp#: 40
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: P2 8081 IS Limit Group: GCSV - 8081A - IS
Column: CLP1 (0.32 mm) Detector GC ECD1A

$ 4 Tetrachloro-m-xylene, CAS: 877-09-8

Signal: 1

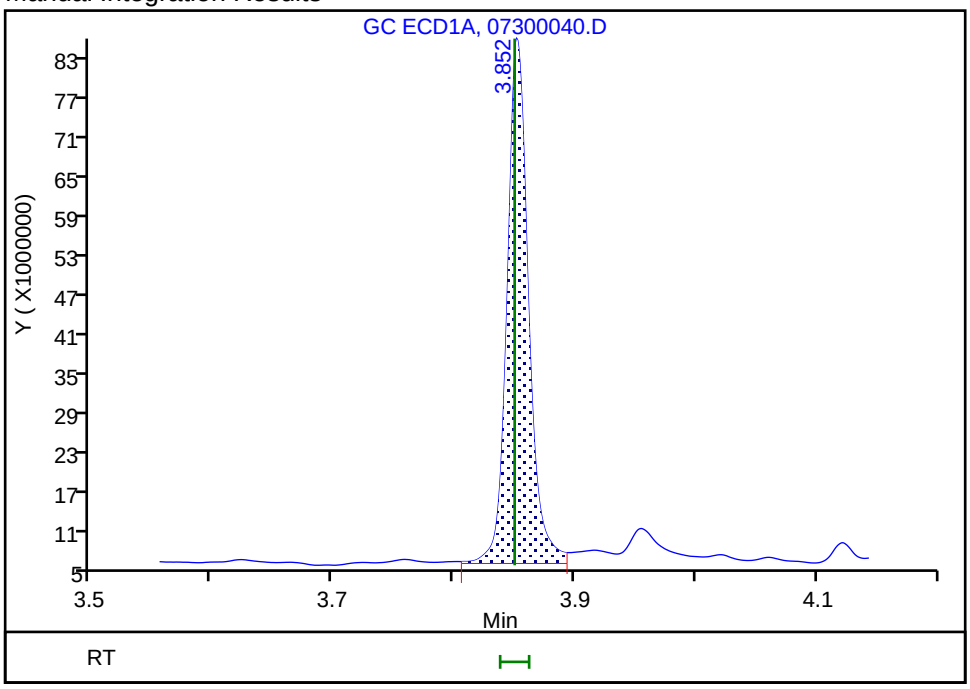
Processing Integration Results

RT: 3.85
Area: 95923660
Amount: 15.208404
Amount Units: ng/mL



Manual Integration Results

RT: 3.85
Area: 97683731
Amount: 15.499800
Amount Units: ng/mL



Reviewer: mooret, 08-Aug-2018 01:51:12
Audit Action: Assigned New Baseline Audit Reason: Baseline Smoothing

Manual Integration/User Assign Peak Report

TestAmerica Denver

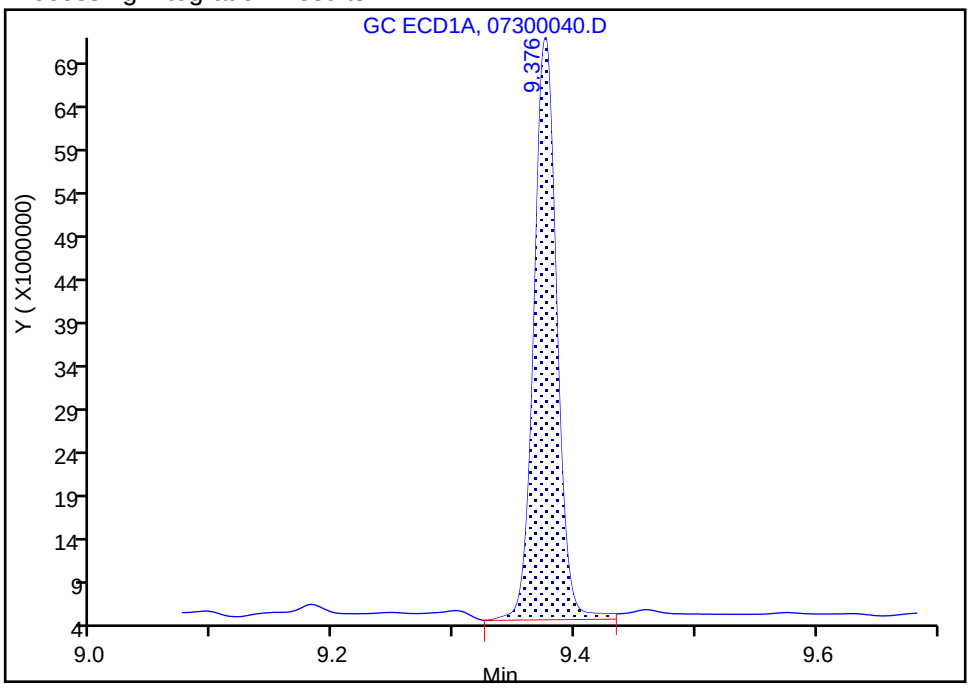
Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300040.D
Injection Date: 31-Jul-2018 00:21:59 Instrument ID: SGC_P2
Lims ID: LCS 280-423271/3-C
Client ID:
Operator ID: TEM ALS Bottle#: 35 Worklist Smp#: 40
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: P2 8081 IS Limit Group: GCSV - 8081A - IS
Column: CLP1 (0.32 mm) Detector GC ECD1A

$ 41 DCB Decachlorobiphenyl, CAS: 2051-24-3

Signal: 1

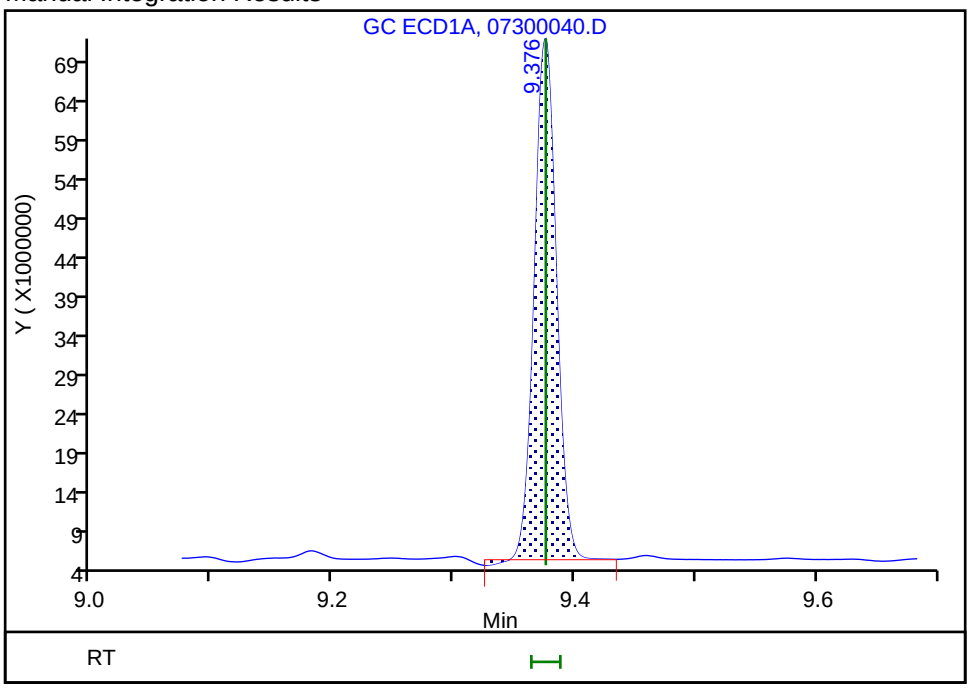
Processing Integration Results

RT: 9.38
Area: 86859804
Amount: 19.135065
Amount Units: ng/mL



Manual Integration Results

RT: 9.38
Area: 82729171
Amount: 18.200038
Amount Units: ng/mL



Reviewer: mooret, 08-Aug-2018 01:51:12
Audit Action: Assigned New Baseline Audit Reason: Baseline Smoothing

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: CRC-B22-0105 MS | Lab Sample ID: 160-29498-3 MS

Matrix: Solid (TCLP) | Lab File ID: 07300050.D

Analysis Method: 8081B | Date Collected: 07/12/2018 11:50

Extraction Method: 3510C | Date Extracted: 07/25/2018 11:45

Sample wt/vol: 100(mL) | Date Analyzed: 07/31/2018 03:14

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: CLP1 ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 424154 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-20-8	Endrin	0.00618		0.00050	0.000079
76-44-8	Heptachlor	0.00660		0.00050	0.000077
1024-57-3	Heptachlor epoxide	0.00646		0.00050	0.000075
58-89-9	gamma-BHC (Lindane)	0.00632		0.00050	0.000069
72-43-5	Methoxychlor	0.00648		0.0010	0.00013

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	86		28-115
2051-24-3	DCB Decachlorobiphenyl	91		34-122

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300050.D
Lims ID: 160-29498-A-3-L MS
Client ID:
Sample Type: MS
Inject. Date: 31-Jul-2018 03:14:56 ALS Bottle#: 45 Worklist Smp#: 50
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 160-29498-A-3-L
Misc. Info.: 280-0072505-050
Operator ID: TEM Instrument ID: SGC_P2

Method: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\P2 8081 IS.m
Limit Group: GCSV - 8081A - IS
Last Update: 08-Aug-2018 01:52:50 Calib Date: 30-Jul-2018 22:03:40
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300032.D

Column 1 : CLP1 (0.32 mm) Det: GC ECD1A
Column 2 : CLP2 (0.32 mm) Det: GC ECD2B
Process Host: CTX0301

First Level Reviewer: mooret Date: 01-Aug-2018 14:34:07

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	2.945	2.945	-0.001	816072320	150.0	150.0	
2	2.730	2.730	0.000	193186849	150.0	150.0	
$ 4 Tetrachloro-m-xylene							
1	3.851	3.850	0.001	108607943	20.0	17.1	
2	3.720	3.720	0.000	28336016	20.0	18.0	
						RPD = 4.94	
5 Hexachlorobenzene							
1	4.264	4.263	0.001	299535670	50.0	48.2	
2	4.200	4.200	0.000	78546916	50.0	47.7	
						RPD = 1.06	
8 alpha-BHC							
1	4.435	4.435	0.000	554471919	50.0	62.2	
2	4.347	4.346	0.001	132782311	50.0	61.3	
						RPD = 1.49	
9 gamma-BHC (Lindane)							
1	4.728	4.728	0.000	497339708	50.0	63.2	
2	4.664	4.663	0.001	120844650	50.0	62.1	
						RPD = 1.75	
10 beta-BHC							
1	4.808	4.808	0.000	199203256	50.0	61.6	
2	4.743	4.743	0.000	50807500	50.0	61.1	
						RPD = 0.76	
12 delta-BHC							
1	4.957	4.957	0.000	512556868	50.0	64.6	
2	4.977	4.977	0.000	120235712	50.0	63.8	
						RPD = 1.29	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
15 Heptachlor							
1	5.130	5.129	0.001	445605497	50.0	66.0	
2	5.018	5.017	0.001	117030845	50.0	64.1	
						RPD = 2.97	
16 Aldrin							
1	5.394	5.393	0.001	435307664	50.0	59.4	
2	5.278	5.277	0.001	110023015	50.0	59.7	
						RPD = 0.46	
21 Heptachlor epoxide							
1	5.989	5.988	0.001	403127190	50.0	64.6	
2	5.798	5.798	0.000	103948366	50.0	63.1	
						RPD = 2.29	
22 trans-Chlordane							
1	6.121	6.121	0.000	426057718	50.0	64.1	
2	5.989	5.988	0.001	109888405	50.0	63.7	
						RPD = 0.56	
23 cis-Chlordane							
1	6.263	6.262	0.001	405543420	50.0	63.3	
2	6.143	6.143	0.000	104571643	50.0	63.9	
						RPD = 0.92	
24 4,4'-DDE							
1	6.345	6.346	-0.001	412456545	50.0	65.6	
2	6.330	6.330	0.000	108176939	50.0	62.5	
						RPD = 4.76	
25 Endosulfan I							
1	6.410	6.409	0.001	371564637	50.0	61.6	
2	6.200	6.199	0.001	97668122	50.0	62.4	
						RPD = 1.27	
27 Dieldrin							
1	6.665	6.663	0.002	439675828	50.0	65.6	
2	6.488	6.488	0.000	113728299	50.0	65.2	
						RPD = 0.54	
30 Endrin							
1	6.912	6.911	0.001	394295371	50.0	61.8	
2	6.807	6.808	-0.001	102802882	50.0	61.8	
						RPD = 0.01	
32 4,4'-DDD							
1	6.981	6.981	0.000	342523591	50.0	62.3	
2	6.944	6.946	-0.002	87909710	50.0	65.5	
						RPD = 5.01	
34 Endosulfan II							
1	7.149	7.148	0.001	350674771	50.0	62.4	
2	7.035	7.035	0.000	94869837	50.0	61.8	
						RPD = 0.94	
35 4,4'-DDT							
1	7.278	7.277	0.001	316015835	50.0	69.5	
2	7.274	7.275	-0.001	94301218	50.0	65.8	
						RPD = 5.50	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
36 Endrin aldehyde							
1	7.594	7.593	0.001	283146443	50.0	60.6	
2	7.395	7.394	0.001	74922850	50.0	60.7	
						RPD = 0.16	
37 Methoxychlor							
1	7.790	7.790	0.000	140654696	50.0	64.8	
2	8.010	8.009	0.001	47383873	50.0	62.6	
						RPD = 3.44	
39 Endosulfan sulfate							
1	8.054	8.052	0.002	333126639	50.0	63.6	
2	7.689	7.688	0.001	86233726	50.0	62.0	
						RPD = 2.66	
40 Endrin ketone							
1	8.346	8.345	0.001	353890832	50.0	58.7	
2	8.240	8.240	0.000	94985861	50.0	57.9	
						RPD = 1.42	
$ 41 DCB Decachlorobiphenyl							
1	9.376	9.376	0.000	83182156	20.0	18.1	
2	9.514	9.513	0.001	23604893	20.0	18.8	
						RPD = 3.79	

Reagents:

8081_IS_00008 Amount Added: 75.00 Units: uL Run Reagent

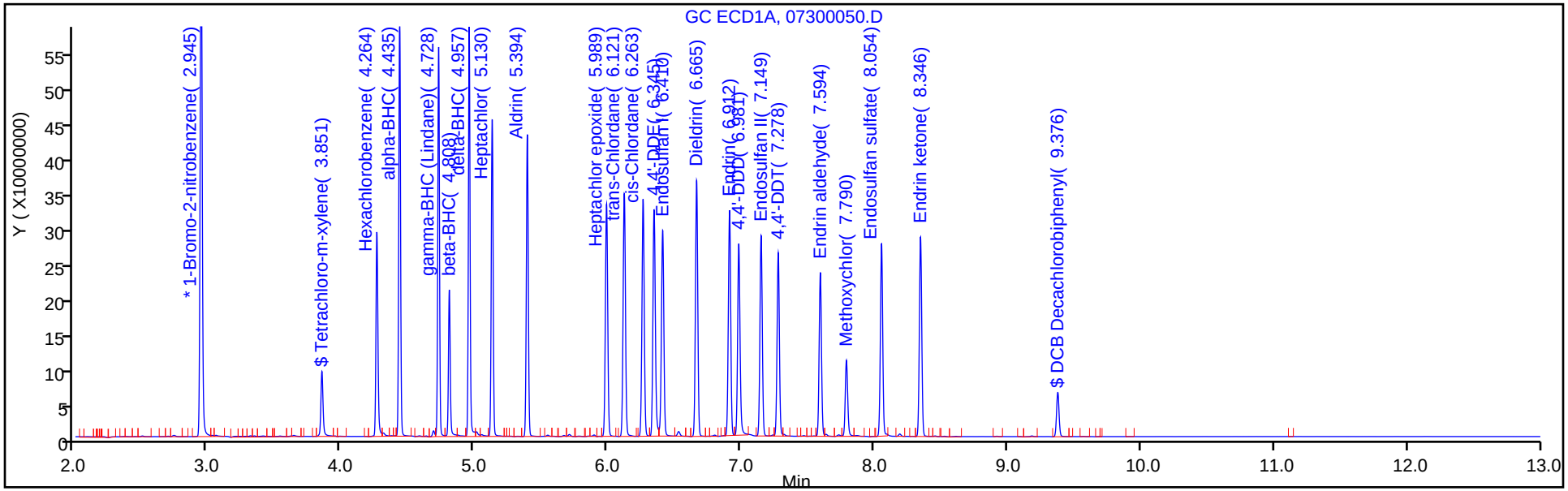
Report Date: 08-Aug-2018 01:52:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

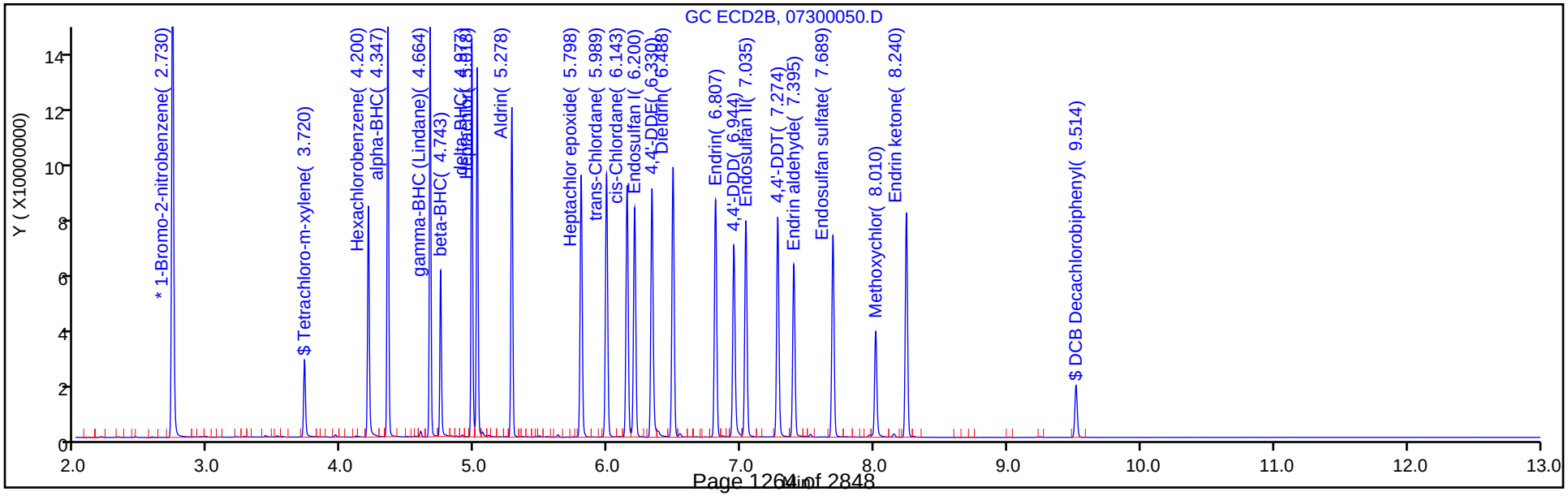
Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300050.D

Injection Date:	31-Jul-2018 03:14:56	Instrument ID:	SGC_P2	Operator ID:	TEM
Lims ID:	160-29498-A-3-L MS			Worklist Smp#:	50
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	45
Method:	P2 8081 IS	Limit Group:	GCSV - 8081A - IS		

Column: CLP1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: CLP2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300050.D				
Lims ID:	160-29498-A-3-L MS				
Client ID:					
Sample Type:	MS				
Inject. Date:	31-Jul-2018 03:14:56	ALS Bottle#:	45	Worklist Smp#:	50
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	160-29498-A-3-L				
Misc. Info.:	280-0072505-050				
Operator ID:	TEM	Instrument ID:	SGC_P2		
Method:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\P2 8081 IS.m				
Limit Group:	GCSV - 8081A - IS				
Last Update:	08-Aug-2018 01:52:50	Calib Date:	30-Jul-2018 22:03:40		
Integrator:	Falcon				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300032.D				
Column 1 :	CLP1 (0.32 mm)		Det: GC ECD1A		
Column 2 :	CLP2 (0.32 mm)		Det: GC ECD2B		
Process Host:	CTX0301				
First Level Reviewer: mooret		Date:	01-Aug-2018 14:34:07		

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	17.1	85.67
$ 41 DCB Decachlorobiphenyl	20.0	18.1	90.60

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	18.0	90.01
$ 41 DCB Decachlorobiphenyl	20.0	18.8	94.10

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: CRC-B22-0105 MSD | Lab Sample ID: 160-29498-3 MSD

Matrix: Solid (TCLP) | Lab File ID: 07300051.D

Analysis Method: 8081B | Date Collected: 07/12/2018 11:50

Extraction Method: 3510C | Date Extracted: 07/25/2018 11:45

Sample wt/vol: 100(mL) | Date Analyzed: 07/31/2018 03:32

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: CLP1 ID: 0.32(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 424154 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-20-8	Endrin	0.00622		0.00050	0.000079
76-44-8	Heptachlor	0.00680		0.00050	0.000077
1024-57-3	Heptachlor epoxide	0.00659		0.00050	0.000075
58-89-9	gamma-BHC (Lindane)	0.00650		0.00050	0.000069
72-43-5	Methoxychlor	0.00687		0.0010	0.00013

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	87		28-115
2051-24-3	DCB Decachlorobiphenyl	91		34-122

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300051.D
Lims ID: 160-29498-A-3-M MSD
Client ID:
Sample Type: MSD
Inject. Date: 31-Jul-2018 03:32:12 ALS Bottle#: 46 Worklist Smp#: 51
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 160-29498-A-3-M
Misc. Info.: 280-0072505-051
Operator ID: TEM Instrument ID: SGC_P2

Method: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\P2 8081 IS.m
Limit Group: GCSV - 8081A - IS
Last Update: 08-Aug-2018 01:52:50 Calib Date: 30-Jul-2018 22:03:40
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300032.D

Column 1 : CLP1 (0.32 mm) Det: GC ECD1A
Column 2 : CLP2 (0.32 mm) Det: GC ECD2B
Process Host: CTX0301

First Level Reviewer: mooret Date: 01-Aug-2018 14:34:21

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	2.945	2.945	0.000	830789635	150.0	150.0	
2	2.731	2.730	0.000	195920482	150.0	150.0	
$ 4 Tetrachloro-m-xylene							
1	3.851	3.850	0.001	112274053	20.0	17.4	
2	3.721	3.720	0.001	29423226	20.0	18.4	
						RPD = 5.77	
5 Hexachlorobenzene							
1	4.264	4.263	0.001	310240245	50.0	49.1	
2	4.200	4.200	0.000	81093883	50.0	48.6	
						RPD = 0.97	
8 alpha-BHC							
1	4.435	4.435	0.000	581956915	50.0	64.1	
2	4.346	4.346	0.000	138310612	50.0	62.9	
						RPD = 1.84	
9 gamma-BHC (Lindane)							
1	4.728	4.728	0.000	521104299	50.0	65.0	
2	4.664	4.663	0.001	126173388	50.0	63.9	
						RPD = 1.71	
10 beta-BHC							
1	4.808	4.808	0.000	207379832	50.0	63.0	
2	4.742	4.743	-0.001	53164608	50.0	63.1	
						RPD = 0.15	
12 delta-BHC							
1	4.958	4.957	0.001	535104240	50.0	66.3	
2	4.976	4.977	-0.001	126565123	50.0	66.2	
						RPD = 0.07	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
15 Heptachlor							
1	5.130	5.129	0.001	466793133	50.0	68.0	
2	5.017	5.017	0.000	120343978	50.0	65.0	
						RPD = 4.45	
16 Aldrin							
1	5.394	5.393	0.001	449399494	50.0	60.3	
2	5.277	5.277	0.000	113893946	50.0	60.9	
						RPD = 1.12	
21 Heptachlor epoxide							
1	5.989	5.988	0.001	418523108	50.0	65.9	
2	5.797	5.798	-0.001	107300014	50.0	64.3	
						RPD = 2.48	
22 trans-Chlordane							
1	6.122	6.121	0.001	439421860	50.0	64.9	
2	5.988	5.988	0.000	113038307	50.0	64.6	
						RPD = 0.43	
23 cis-Chlordane							
1	6.264	6.262	0.002	417154087	50.0	64.0	
2	6.142	6.143	-0.001	108451789	50.0	65.4	
						RPD = 2.14	
24 4,4'-DDE							
1	6.346	6.346	0.000	425033666	50.0	66.4	
2	6.330	6.330	0.000	111155845	50.0	63.4	
						RPD = 4.66	
25 Endosulfan I							
1	6.411	6.409	0.002	383862905	50.0	62.5	
2	6.200	6.199	0.001	100414223	50.0	63.3	
						RPD = 1.17	
27 Dieldrin							
1	6.666	6.663	0.003	453448689	50.0	66.4	
2	6.488	6.488	0.000	117136107	50.0	66.2	
						RPD = 0.28	
30 Endrin							
1	6.913	6.911	0.002	404272560	50.0	62.2	
2	6.808	6.808	0.000	106112805	50.0	62.9	
						RPD = 1.06	
32 4,4'-DDD							
1	6.982	6.981	0.001	361561628	50.0	64.6	
2	6.945	6.946	-0.001	90175035	50.0	66.2	
						RPD = 2.52	
34 Endosulfan II							
1	7.150	7.148	0.002	362690105	50.0	63.4	
2	7.035	7.035	0.000	98098627	50.0	63.0	
						RPD = 0.56	
35 4,4'-DDT							
1	7.277	7.277	0.000	335870196	50.0	72.6	
2	7.276	7.275	0.001	97006573	50.0	66.8	
						RPD = 8.32	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/mL	OnCol Amt ng/mL	Flags
36 Endrin aldehyde							
1	7.594	7.593	0.001	291273549	50.0	61.2	
2	7.396	7.394	0.002	77271008	50.0	61.7	
						RPD = 0.81	
37 Methoxychlor							
1	7.791	7.790	0.001	151806865	50.0	68.7	
2	8.010	8.009	0.001	48615614	50.0	63.4	
						RPD = 8.06	
39 Endosulfan sulfate							
1	8.053	8.052	0.001	349917626	50.0	65.7	
2	7.689	7.688	0.001	88911592	50.0	63.0	
						RPD = 4.14	
40 Endrin ketone							
1	8.346	8.345	0.001	366601681	50.0	59.8	
2	8.240	8.240	0.000	97885638	50.0	58.8	
						RPD = 1.55	
$ 41 DCB Decachlorobiphenyl							
1	9.376	9.376	0.000	85355806	20.0	18.3	
2	9.513	9.513	0.000	24238436	20.0	19.1	
						RPD = 4.29	

Reagents:

8081_IS_00008 Amount Added: 75.00 Units: uL Run Reagent

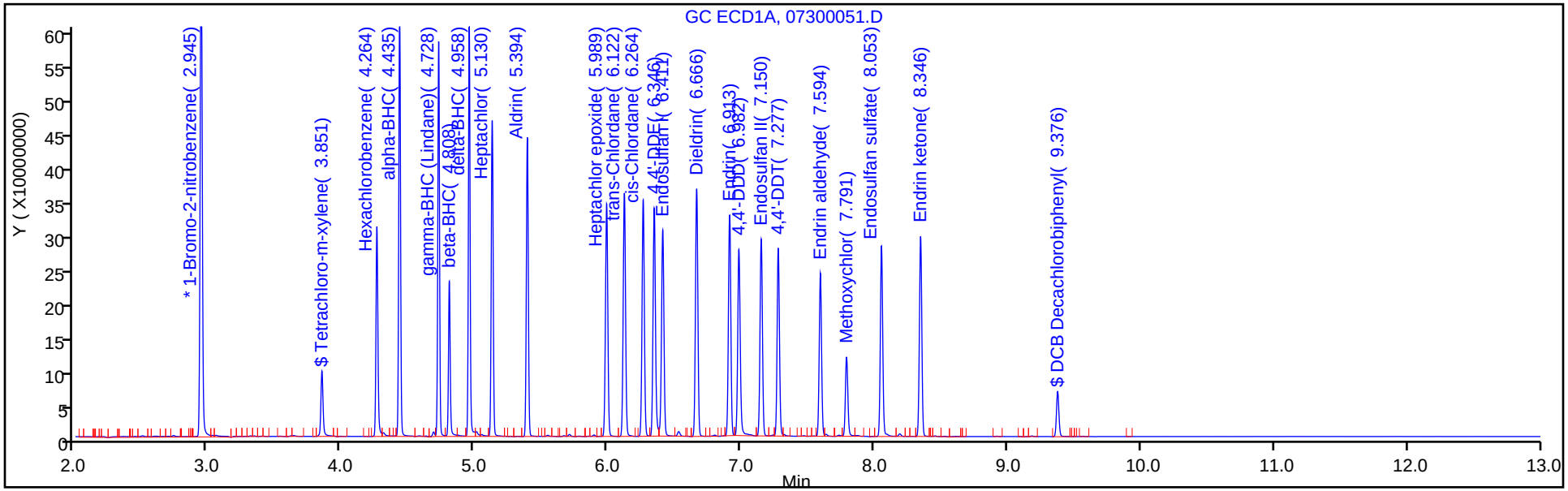
Report Date: 08-Aug-2018 01:52:53 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

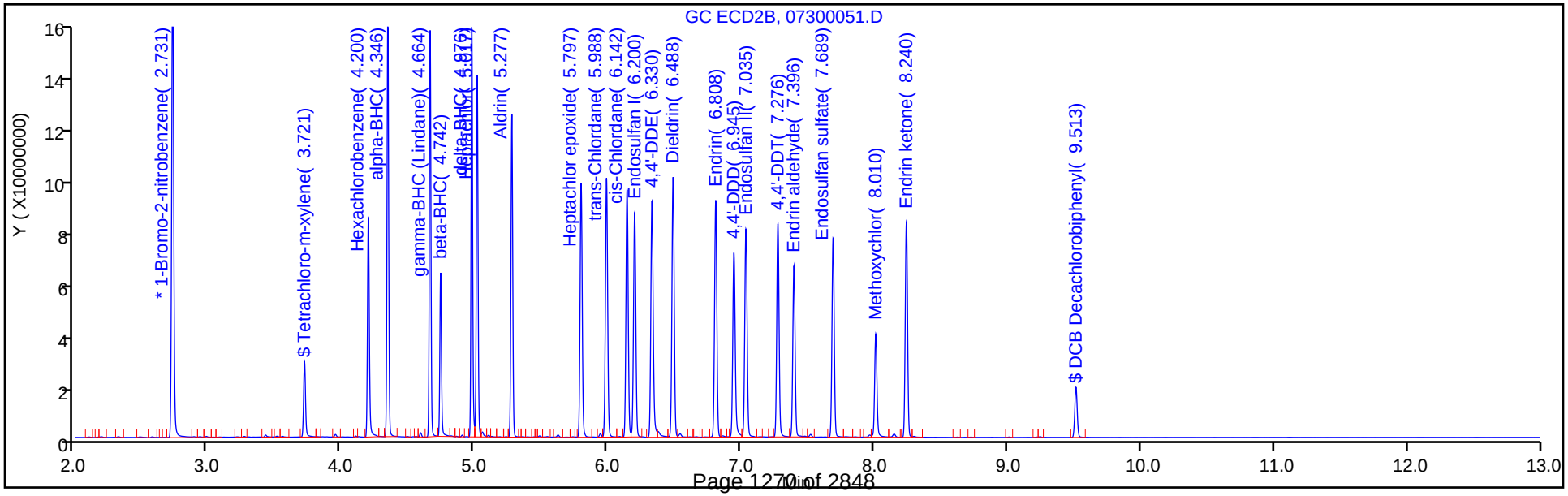
Data File: \\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300051.D

Injection Date:	31-Jul-2018 03:32:12	Instrument ID:	SGC_P2	Operator ID:	TEM
Lims ID:	160-29498-A-3-M MSD			Worklist Smp#:	51
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	46
Method:	P2 8081 IS	Limit Group:	GCSV - 8081A - IS		

Column: CLP1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



Column: CLP2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 3



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300051.D				
Lims ID:	160-29498-A-3-M MSD				
Client ID:					
Sample Type:	MSD				
Inject. Date:	31-Jul-2018 03:32:12	ALS Bottle#:	46	Worklist Smp#:	51
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	160-29498-A-3-M				
Misc. Info.:	280-0072505-051				
Operator ID:	TEM	Instrument ID:	SGC_P2		
Method:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\P2 8081 IS.m				
Limit Group:	GCSV - 8081A - IS				
Last Update:	08-Aug-2018 01:52:50	Calib Date:	30-Jul-2018 22:03:40		
Integrator:	Falcon				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_P2\20180730-72505.b\07300032.D				
Column 1 :	CLP1 (0.32 mm)		Det: GC ECD1A		
Column 2 :	CLP2 (0.32 mm)		Det: GC ECD2B		
Process Host:	CTX0301				
First Level Reviewer: mooret		Date:	01-Aug-2018 14:34:21		

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	17.4	87.04
$ 41 DCB Decachlorobiphenyl	20.0	18.3	91.34

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 4 Tetrachloro-m-xylene	20.0	18.4	92.21
$ 41 DCB Decachlorobiphenyl	20.0	19.1	95.34

PESTICIDES ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_P2 Start Date: 07/30/2018 14:32

Analysis Batch Number: 424154 End Date: 07/31/2018 03:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
PEM 280-424154/6		07/30/2018 14:32	1		CLP1 0.32(mm)
PEM 280-424154/6		07/30/2018 14:32	1		CLP2 0.32(mm)
STD7 280-424154/9 IC		07/30/2018 15:24	1		CLP1 0.32(mm)
STD7 280-424154/9 IC		07/30/2018 15:24	1		CLP2 0.32(mm)
STD6 280-424154/10 IC		07/30/2018 15:42	1		CLP1 0.32(mm)
STD6 280-424154/10 IC		07/30/2018 15:42	1		CLP2 0.32(mm)
STD5 280-424154/11 IC		07/30/2018 15:59	1		CLP1 0.32(mm)
STD5 280-424154/11 IC		07/30/2018 15:59	1		CLP2 0.32(mm)
STD4 280-424154/12 IC		07/30/2018 16:16	1		CLP1 0.32(mm)
STD4 280-424154/12 IC		07/30/2018 16:16	1		CLP2 0.32(mm)
STD3 280-424154/13 IC		07/30/2018 16:34	1		CLP1 0.32(mm)
STD3 280-424154/13 IC		07/30/2018 16:34	1		CLP2 0.32(mm)
STD2 280-424154/14 IC		07/30/2018 16:51	1		CLP1 0.32(mm)
STD2 280-424154/14 IC		07/30/2018 16:51	1		CLP2 0.32(mm)
STD1 280-424154/15 IC		07/30/2018 17:08	1		CLP1 0.32(mm)
STD1 280-424154/15 IC		07/30/2018 17:08	1		CLP2 0.32(mm)
STD6 280-424154/16 IC		07/30/2018 17:26	1	07300016.D	CLP1 0.32(mm)
STD6 280-424154/16 IC		07/30/2018 17:26	1	07300016.D	CLP2 0.32(mm)
STD5 280-424154/17 IC		07/30/2018 17:43	1	07300017.D	CLP1 0.32(mm)
STD5 280-424154/17 IC		07/30/2018 17:43	1	07300017.D	CLP2 0.32(mm)
STD4 280-424154/18 IC		07/30/2018 18:01	1	07300018.D	CLP1 0.32(mm)
STD4 280-424154/18 IC		07/30/2018 18:01	1	07300018.D	CLP2 0.32(mm)
STD3 280-424154/19 IC		07/30/2018 18:18	1	07300019.D	CLP1 0.32(mm)
STD3 280-424154/19 IC		07/30/2018 18:18	1	07300019.D	CLP2 0.32(mm)
STD2 280-424154/20 IC		07/30/2018 18:35	1	07300020.D	CLP1 0.32(mm)
STD2 280-424154/20 IC		07/30/2018 18:35	1	07300020.D	CLP2 0.32(mm)
STD1 280-424154/21 IC		07/30/2018 18:53	1	07300021.D	CLP1 0.32(mm)
STD1 280-424154/21 IC		07/30/2018 18:53	1	07300021.D	CLP2 0.32(mm)
STD5 280-424154/22 IC		07/30/2018 19:10	1	07300022.D	CLP1 0.32(mm)
STD5 280-424154/22 IC		07/30/2018 19:10	1	07300022.D	CLP2 0.32(mm)
STD4 280-424154/23 IC		07/30/2018 19:27	1	07300023.D	CLP1 0.32(mm)
STD4 280-424154/23 IC		07/30/2018 19:27	1	07300023.D	CLP2 0.32(mm)
STD3 280-424154/24 IC		07/30/2018 19:45	1	07300024.D	CLP1 0.32(mm)

PESTICIDES ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_P2 Start Date: 07/30/2018 14:32

Analysis Batch Number: 424154 End Date: 07/31/2018 03:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD3 280-424154/24 IC		07/30/2018 19:45	1	07300024.D	CLP2 0.32(mm)
STD2 280-424154/25 IC		07/30/2018 20:02	1	07300025.D	CLP1 0.32(mm)
STD2 280-424154/25 IC		07/30/2018 20:02	1	07300025.D	CLP2 0.32(mm)
STD1 280-424154/26 IC		07/30/2018 20:19	1	07300026.D	CLP1 0.32(mm)
STD1 280-424154/26 IC		07/30/2018 20:19	1	07300026.D	CLP2 0.32(mm)
STD6 280-424154/27 IC		07/30/2018 20:37	1	07300027.D	CLP1 0.32(mm)
STD6 280-424154/27 IC		07/30/2018 20:37	1	07300027.D	CLP2 0.32(mm)
STD5 280-424154/28 IC		07/30/2018 20:54	1	07300028.D	CLP1 0.32(mm)
STD5 280-424154/28 IC		07/30/2018 20:54	1	07300028.D	CLP2 0.32(mm)
STD4 280-424154/29 ICIS		07/30/2018 21:11	1	07300029.D	CLP1 0.32(mm)
STD4 280-424154/29 ICIS		07/30/2018 21:11	1	07300029.D	CLP2 0.32(mm)
STD3 280-424154/30 IC		07/30/2018 21:29	1	07300030.D	CLP1 0.32(mm)
STD3 280-424154/30 IC		07/30/2018 21:29	1	07300030.D	CLP2 0.32(mm)
STD2 280-424154/31 IC		07/30/2018 21:46	1	07300031.D	CLP1 0.32(mm)
STD2 280-424154/31 IC		07/30/2018 21:46	1	07300031.D	CLP2 0.32(mm)
STD1 280-424154/32 IC		07/30/2018 22:03	1	07300032.D	CLP1 0.32(mm)
STD1 280-424154/32 IC		07/30/2018 22:03	1	07300032.D	CLP2 0.32(mm)
ICV 280-424154/33		07/30/2018 22:21	1	07300033.D	CLP1 0.32(mm)
ICV 280-424154/33		07/30/2018 22:21	1	07300033.D	CLP2 0.32(mm)
ICV 280-424154/34		07/30/2018 22:38	1	07300034.D	CLP1 0.32(mm)
ICV 280-424154/34		07/30/2018 22:38	1	07300034.D	CLP2 0.32(mm)
ICV 280-424154/35		07/30/2018 22:55	1	07300035.D	CLP1 0.32(mm)
ICV 280-424154/35		07/30/2018 22:55	1	07300035.D	CLP2 0.32(mm)
ICV 280-424154/36		07/30/2018 23:12	1	07300036.D	CLP1 0.32(mm)
ICV 280-424154/36		07/30/2018 23:12	1	07300036.D	CLP2 0.32(mm)
PEM 280-424154/37		07/30/2018 23:30	1	07300037.D	CLP1 0.32(mm)
PEM 280-424154/37		07/30/2018 23:30	1	07300037.D	CLP2 0.32(mm)
LB 280-423271/1-G		07/30/2018 23:47	1	07300038.D	CLP1 0.32(mm)
LB 280-423271/1-G		07/30/2018 23:47	1	07300038.D	CLP2 0.32(mm)
LCS 280-423271/2-F		07/31/2018 00:04	1	07300039.D	CLP1 0.32(mm)
LCS 280-423271/2-F		07/31/2018 00:04	1	07300039.D	CLP2 0.32(mm)
LCS 280-423271/3-C		07/31/2018 00:21	1	07300040.D	CLP1 0.32(mm)
LCS 280-423271/3-C		07/31/2018 00:21	1	07300040.D	CLP2 0.32(mm)
ZZZZZ		07/31/2018 00:39	1		CLP1 0.32(mm)
ZZZZZ		07/31/2018 00:39	1		CLP2 0.32(mm)
ZZZZZ		07/31/2018 00:56	1		CLP1 0.32(mm)
ZZZZZ		07/31/2018 00:56	1		CLP2 0.32(mm)
ZZZZZ		07/31/2018 01:13	1		CLP1 0.32(mm)

PESTICIDES ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_P2 Start Date: 07/30/2018 14:32

Analysis Batch Number: 424154 End Date: 07/31/2018 03:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		07/31/2018 01:13	1		CLP2 0.32(mm)
ZZZZZ		07/31/2018 01:31	1		CLP1 0.32(mm)
ZZZZZ		07/31/2018 01:31	1		CLP2 0.32(mm)
CCV 280-424154/45		07/31/2018 01:48	1	07300045.D	CLP1 0.32(mm)
CCV 280-424154/45		07/31/2018 01:48	1	07300045.D	CLP2 0.32(mm)
CCV 280-424154/46		07/31/2018 02:05	1	07300046.D	CLP1 0.32(mm)
CCV 280-424154/46		07/31/2018 02:05	1	07300046.D	CLP2 0.32(mm)
CCV 280-424154/47		07/31/2018 02:23	1	07300047.D	CLP1 0.32(mm)
CCV 280-424154/47		07/31/2018 02:23	1	07300047.D	CLP2 0.32(mm)
CCV 280-424154/48		07/31/2018 02:40	1	07300048.D	CLP1 0.32(mm)
CCV 280-424154/48		07/31/2018 02:40	1	07300048.D	CLP2 0.32(mm)
160-29498-3		07/31/2018 02:57	1	07300049.D	CLP1 0.32(mm)
160-29498-3		07/31/2018 02:57	1	07300049.D	CLP2 0.32(mm)
160-29498-3 MS		07/31/2018 03:14	1	07300050.D	CLP1 0.32(mm)
160-29498-3 MS		07/31/2018 03:14	1	07300050.D	CLP2 0.32(mm)
160-29498-3 MSD		07/31/2018 03:32	1	07300051.D	CLP1 0.32(mm)
160-29498-3 MSD		07/31/2018 03:32	1	07300051.D	CLP2 0.32(mm)
ZZZZZ		07/31/2018 03:49	1		CLP1 0.32(mm)
ZZZZZ		07/31/2018 03:49	1		CLP2 0.32(mm)

PESTICIDES BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423271 Batch Start Date: 07/23/18 14:57 Batch Analyst: Bourgery, David F

Batch Method: 1311 Batch End Date: 07/24/18 19:17

Lab Sample ID	Client Sample ID	Method Chain	Basis	ExtractFluid	AnalysisComment				
LB 280-423271/1		1311, 3510C, 8081B		t1					
LCS 280-423271/2		1311, 3510C, 8081B		t1					
LCS 280-423271/3		1311, 3510C, 8081B		t1	TOX				
160-29498-A-3	CRC-B22-0105	1311, 3510C, 8081B	P	t1	TOX				

Batch Notes	
First End time	07/24/18 09:54
First Start time	07/23/18 14:57

Basis	Basis Description
P	TCLP

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.

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	1
1. Solid	X	X	X	X	X	X	X	X	X	X
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Sample weight, 5.0 +/- 0.1g	5.08	5.09	5.03	4.91	5.08	4.97	4.97	4.96	4.91	4.93
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	17:40	17:46	17:54	18:00	18:00	18:00	18:00	18:00	18:00	18:00
b. Stop Time for Mixing	17:45	17:51	17:59	18:05	18:05	18:05	18:05	18:05	18:05	18:05
c. pH reading after mixing	9.3	9.07	9.62	9.65	9.74	9.70	10.24	9.48	9.64	9.56
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X	X	X	X	X	X	X	X	X	X
a. HCL Lot# used	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037
b. Pipette ID	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846	311846	311846	311846	311846	311846	311846	311846	311846	311846
Termometer Correction Factor	0	0	0	0	0	0	0	0	0	0
b. Start Time	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47
c. Start Temperature (Observed)	50	50	50	50	50	50	50	50	50	50
Start Temperature (Actual)	50	50	50	50	50	50	50	50	50	50
d. Finish Time	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57
e. Finish Temperature (Observed)	51	51	51	51	51	51	51	51	51	51
Finish Temperature (Actual)	51	51	51	51	51	51	51	51	51	51
f. pH reading after heating (temperature corrected)	1.63	1.57	1.73	1.85	2.07	2.02	2.54	2.14	2.33	2.00
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N	N	N	N	N	N	N	N	N	N
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Weight of wet solids after filtration (g)	100.07	100.21	100.47	100.37	100.89	100.91	100.13	101.45	101.11	101.60
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94
6. Vol of Fluid = wet solids x 20 (mL)	2001	2004	2009	2007	2018	2018	2003	2029	2022	2032
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Leach start date and time	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15
3. Leach stop date and time	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57
4. Room temperature										
Thermometer Correction Factor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a.Temp Min (Observed) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
b.Temp Max (Observed) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
c.Temp Min (Actual) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
d.Temp Max (Actual) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
5. pH of leachate	4.99	4.97	5.21	5.28	5.35	5.43	5.74	5.72	5.96	5.44
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
A. Sample Description										
Number of phases	1									
1. Solid	X									
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Sample weight, 5.0 +/- 0.1g	4.98									
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT									
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	18:00									
b. Stop Time for Mixing	18:05									
c. pH reading after mixing	9.3									
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X									
a. HCL Lot# used	1N HCl_00037									
b. Pipette ID	TCLP#2									
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846									
Termometer Correction Factor	0									
b. Start Time	18:47									
c. Start Temperature (Observed)	50									
Start Temperature (Actual)	50	0	0	0	0	0	0	0	0	0
d. Finish Time	18:57									
e. Finish Temperature (Observed)	51									
Finish Temperature (Actual)	51	0	0	0	0	0	0	0	0	0
f. pH reading after heating (temperature corrected)	1.59									
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1									
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Weight of wet solids after filtration (g)	100.35									
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**TCLP 1**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256						
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94									
6. Vol of Fluid = wet solids x 20 (mL)	2007									
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y									
2. Leach start date and time	7/23/18 20:15									
3. Leach stop date and time	7/24/18 12:57									
4. Room temperature										
Thermometer Correction Factor	0.0									
a.Temp Min (Observed) (^oC)	23.4									
b.Temp Max (Observed) (^oC)	24.4									
c.Temp Min (Actual) (^oC)	23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d.Temp Max (Actual) (^oC)	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. pH of leachate	5.04									
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	
1. Solid	X	X	X	X	X	X	X	X	X	
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No		**N**	**N**	**N**	**N**	**N**			**N**	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Sample weight, 5.0 +/- 0.1g		4.92	5.04	4.93	4.97	5.06			5.01	
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID		TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT			TCLP BT	
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing		11:27	11:27	11:27	11:27	11:27			11:27	
b. Stop Time for Mixing		11:32	11:32	11:32	11:32	11:32			11:32	
c. pH reading after mixing		8.77	9.65	9.68	11.62	9.26			7.85	
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**		X	X	X	X	X			X	
a. HCL Lot# used		1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037			1N HCl_00037	
b. Pipette ID		TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2			TCLP#2	
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID		311846	311846	311846	311846	311846			311846	
Termometer Correction Factor		0	0	0	0	0			0	
b. Start Time		11:56	11:56	11:56	11:56	11:56			11:56	
c. Start Temperature (Observed)		50	50	50	50	50			50	
Start Temperature (Actual)	0	50	50	50	50	50	0	0	50	0
d. Finish Time		12:06	12:06	12:06	12:06	12:06			12:06	
e. Finish Temperature (Observed)		53	53	53	53	53			53	
Finish Temperature (Actual)	0	53	53	53	53	53	0	0	53	0
f. pH reading after heating (temperature corrected)		1.83	5.83	5.88	2.15	1.65			1.99	
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1		Fluid 1			Fluid 1	Fluid 1			Fluid 1	
2. If pH from C.7.f is > 5.0, use Leach Fluid #2			Fluid 2	Fluid 2						
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
E. Determination of Sample Size										
1. Particle size reduction? Yes/no		N	N	N	N	N			N	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Weight of wet solids after filtration (g)		100.02	100.23	102.23	100.76	102.32			101.95	
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	#VALUE!	TCLP 1	TCLP 2	TCLP 2	TCLP 1	TCLP 1	#VALUE!	#VALUE!	TCLP 1	#VALUE!
1. TCLP Fluid 1 Lot #	T1_00251	T1_00256	T1_00251	T1_00251	T1_00256	T1_00256			T1_00256	
2. TCLP Fluid 2 Lot #			T2_00105	T2_00105						
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid		4.94	2.89	2.89	4.94	4.94			4.94	2.89/4.94
6. Vol of Fluid = wet solids x 20 (mL)		2000	2005	2045	2015	2046			2039	
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?		Y	Y	Y	Y	Y			Y	Y
2. Leach start date and time		7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57			7/23/18 14:57	7/23/18 14:57
3. Leach stop date and time		7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54			7/24/18 9:54	7/24/18 9:54
4. Room temperature										
Thermometer Correction Factor		0.0	0.0	0.0	0.0	0.0			0.0	0.0
a.Temp Min (Observed) (^oC)		23.4	23.4	23.4	23.4	23.4			23.4	23.4
b.Temp Max (Observed) (^oC)		24.4	24.4	24.4	24.4	24.4			24.4	24.4
c.Temp Min (Actual) (^oC)	0.0	23.4	23.4	23.4	23.4	23.4	0.0	0.0	23.4	23.4
d.Temp Max (Actual) (^oC)	0.0	24.4	24.4	24.4	24.4	24.4	0.0	0.0	24.4	24.4
5. pH of leachate		5.38	5.85	5.85	6.12	5.33			5.40	2.88/4.94
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
H.Determination of Amount of Leach Fluid										
1. Balance ID	24950431				24950431	24950431		24950431		
2. ZHE vessel number	Verona				Don	EEE		Rachael		AAA
3. Weight of material added to ZHE (g)	25.00				25.19	25.07		25.14		
"X" if there was headspace in container.	X									
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)	25				25	25		25		
7. Weight of fluid to add (g)	500	0	0	0	504	501	0	503	0	0
a. TCLP Fluid 1 Lot #	T1_00255				T1_00255	T1_00255		T1_00255		T1_00255
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid	4.92				4.92	4.92		4.92		4.92
8. Percent Wet Solids (%)	100	#DIV/0!	#DIV/0!	#DIV/0!	100	100	#DIV/0!	100	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)	40				40	40		40		40
b. Reading #2 (psi)	40				40	40		40		40
2. Rotator checked to be rotating between 28 and 32 RPM?	Y				Y	Y		Y		Y
3. Leach start date & time	7/23/18 17:36				7/23/18 17:36	7/23/18 17:36		7/23/18 17:36		7/23/18 17:36
4. Leach stop date & time					7/24/18 9:54	7/24/18 9:54		7/24/18 9:54		7/24/18 9:54
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	#DIV/0!	0.0	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

LogTag ID	1000645053
User ID	TCLP (+0.0)
LogTag battery	OK
Non alert range	21.0 to 25.0 °C
Time zone	UTC -07:00, daylight time
Number of readings	728
Reading interval	10 Minutes
Number of starts	231
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	21 Hours, 50 Minutes
Reading range	23.4 to 24.4 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.94 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	21 Hours, 50 Minutes
Statistics for between the first reading and inspection mark #1:	
First reading	7/23/2018 2:55:27 PM
Last reading	7/23/2018 5:25:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.4 to 24.0 °C
Average reading	23.8 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.78 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #1 and inspection mark #2:	
First reading	7/23/2018 5:35:27 PM
Last reading	7/23/2018 8:05:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.6 to 24.1 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

Mean Kinetic Temperature	23.93 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #2 and the last reading:	
First reading	7/23/2018 8:15:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	16 Hours, 30 Minutes
Reading range	23.6 to 24.4 °C
Average reading	24.0 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.96 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	16 Hours, 30 Minutes

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	1
1. Solid	X	X	X	X	X	X	X	X	X	X
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Sample weight, 5.0 +/- 0.1g	5.08	5.09	5.03	4.91	5.08	4.97	4.97	4.96	4.91	4.93
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	17:40	17:46	17:54	18:00	18:00	18:00	18:00	18:00	18:00	18:00
b. Stop Time for Mixing	17:45	17:51	17:59	18:05	18:05	18:05	18:05	18:05	18:05	18:05
c. pH reading after mixing	9.3	9.07	9.62	9.65	9.74	9.70	10.24	9.48	9.64	9.56
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X	X	X	X	X	X	X	X	X	X
a. HCL Lot# used	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037
b. Pipette ID	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846	311846	311846	311846	311846	311846	311846	311846	311846	311846
Termometer Correction Factor	0	0	0	0	0	0	0	0	0	0
b. Start Time	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47
c. Start Temperature (Observed)	50	50	50	50	50	50	50	50	50	50
Start Temperature (Actual)	50	50	50	50	50	50	50	50	50	50
d. Finish Time	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57
e. Finish Temperature (Observed)	51	51	51	51	51	51	51	51	51	51
Finish Temperature (Actual)	51	51	51	51	51	51	51	51	51	51
f. pH reading after heating (temperature corrected)	1.63	1.57	1.73	1.85	2.07	2.02	2.54	2.14	2.33	2.00
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N	N	N	N	N	N	N	N	N	N
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Weight of wet solids after filtration (g)	100.07	100.21	100.47	100.37	100.89	100.91	100.13	101.45	101.11	101.60
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94
6. Vol of Fluid = wet solids x 20 (mL)	2001	2004	2009	2007	2018	2018	2003	2029	2022	2032
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Leach start date and time	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15
3. Leach stop date and time	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57
4. Room temperature										
Thermometer Correction Factor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a.Temp Min (Observed) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
b.Temp Max (Observed) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
c.Temp Min (Actual) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
d.Temp Max (Actual) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
5. pH of leachate	4.99	4.97	5.21	5.28	5.35	5.43	5.74	5.72	5.96	5.44
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
A. Sample Description										
Number of phases	1									
1. Solid	X									
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Sample weight, 5.0 +/- 0.1g	4.98									
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT									
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	18:00									
b. Stop Time for Mixing	18:05									
c. pH reading after mixing	9.3									
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X									
a. HCL Lot# used	1N HCl_00037									
b. Pipette ID	TCLP#2									
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846									
Termometer Correction Factor	0									
b. Start Time	18:47									
c. Start Temperature (Observed)	50									
Start Temperature (Actual)	50	0	0	0	0	0	0	0	0	0
d. Finish Time	18:57									
e. Finish Temperature (Observed)	51									
Finish Temperature (Actual)	51	0	0	0	0	0	0	0	0	0
f. pH reading after heating (temperature corrected)	1.59									
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1									
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Weight of wet solids after filtration (g)	100.35									
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**TCLP 1**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256						
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94									
6. Vol of Fluid = wet solids x 20 (mL)	2007									
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y									
2. Leach start date and time	7/23/18 20:15									
3. Leach stop date and time	7/24/18 12:57									
4. Room temperature										
Thermometer Correction Factor	0.0									
a.Temp Min (Observed) (^oC)	23.4									
b.Temp Max (Observed) (^oC)	24.4									
c.Temp Min (Actual) (^oC)	23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d.Temp Max (Actual) (^oC)	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. pH of leachate	5.04									
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	
1. Solid	X	X	X	X	X	X	X	X	X	
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No		**N**	**N**	**N**	**N**	**N**			**N**	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Sample weight, 5.0 +/- 0.1g		4.92	5.04	4.93	4.97	5.06			5.01	
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID		TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT			TCLP BT	
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing		11:27	11:27	11:27	11:27	11:27			11:27	
b. Stop Time for Mixing		11:32	11:32	11:32	11:32	11:32			11:32	
c. pH reading after mixing		8.77	9.65	9.68	11.62	9.26			7.85	
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**		X	X	X	X	X			X	
a. HCL Lot# used		1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037			1N HCl_00037	
b. Pipette ID		TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2			TCLP#2	
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID		311846	311846	311846	311846	311846			311846	
Termometer Correction Factor		0	0	0	0	0			0	
b. Start Time		11:56	11:56	11:56	11:56	11:56			11:56	
c. Start Temperature (Observed)		50	50	50	50	50			50	
Start Temperature (Actual)	0	50	50	50	50	50	0	0	50	0
d. Finish Time		12:06	12:06	12:06	12:06	12:06			12:06	
e. Finish Temperature (Observed)		53	53	53	53	53			53	
Finish Temperature (Actual)	0	53	53	53	53	53	0	0	53	0
f. pH reading after heating (temperature corrected)		1.83	5.83	5.88	2.15	1.65			1.99	
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1		Fluid 1			Fluid 1	Fluid 1			Fluid 1	
2. If pH from C.7.f is > 5.0, use Leach Fluid #2			Fluid 2	Fluid 2						
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
E. Determination of Sample Size										
1. Particle size reduction? Yes/no		N	N	N	N	N			N	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Weight of wet solids after filtration (g)		100.02	100.23	102.23	100.76	102.32			101.95	
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	#VALUE!	TCLP 1	TCLP 2	TCLP 2	TCLP 1	TCLP 1	#VALUE!	#VALUE!	TCLP 1	#VALUE!
1. TCLP Fluid 1 Lot #	T1_00251	T1_00256	T1_00251	T1_00251	T1_00256	T1_00256			T1_00256	
2. TCLP Fluid 2 Lot #			T2_00105	T2_00105						
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid		4.94	2.89	2.89	4.94	4.94			4.94	2.89/4.94
6. Vol of Fluid = wet solids x 20 (mL)		2000	2005	2045	2015	2046			2039	
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?		Y	Y	Y	Y	Y			Y	Y
2. Leach start date and time		7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57			7/23/18 14:57	7/23/18 14:57
3. Leach stop date and time		7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54			7/24/18 9:54	7/24/18 9:54
4. Room temperature										
Thermometer Correction Factor		0.0	0.0	0.0	0.0	0.0			0.0	0.0
a.Temp Min (Observed) (^oC)		23.4	23.4	23.4	23.4	23.4			23.4	23.4
b.Temp Max (Observed) (^oC)		24.4	24.4	24.4	24.4	24.4			24.4	24.4
c.Temp Min (Actual) (^oC)	0.0	23.4	23.4	23.4	23.4	23.4	0.0	0.0	23.4	23.4
d.Temp Max (Actual) (^oC)	0.0	24.4	24.4	24.4	24.4	24.4	0.0	0.0	24.4	24.4
5. pH of leachate		5.38	5.85	5.85	6.12	5.33			5.40	2.88/4.94
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
H.Determination of Amount of Leach Fluid										
1. Balance ID	24950431				24950431	24950431		24950431		
2. ZHE vessel number	Verona				Don	EEE		Rachael		AAA
3. Weight of material added to ZHE (g)	25.00				25.19	25.07		25.14		
"X" if there was headspace in container.	X									
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)	25				25	25		25		
7. Weight of fluid to add (g)	500	0	0	0	504	501	0	503	0	0
a. TCLP Fluid 1 Lot #	T1_00255				T1_00255	T1_00255		T1_00255		T1_00255
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid	4.92				4.92	4.92		4.92		4.92
8. Percent Wet Solids (%)	100	#DIV/0!	#DIV/0!	#DIV/0!	100	100	#DIV/0!	100	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)	40				40	40		40		40
b. Reading #2 (psi)	40				40	40		40		40
2. Rotator checked to be rotating between 28 and 32 RPM?	Y				Y	Y		Y		Y
3. Leach start date & time	7/23/18 17:36				7/23/18 17:36	7/23/18 17:36		7/23/18 17:36		7/23/18 17:36
4. Leach stop date & time					7/24/18 9:54	7/24/18 9:54		7/24/18 9:54		7/24/18 9:54
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	#DIV/0!	0.0	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

LogTag ID	1000645053
User ID	TCLP (+0.0)
LogTag battery	OK
Non alert range	21.0 to 25.0 °C
Time zone	UTC -07:00, daylight time
Number of readings	728
Reading interval	10 Minutes
Number of starts	231
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	21 Hours, 50 Minutes
Reading range	23.4 to 24.4 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.94 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	21 Hours, 50 Minutes
Statistics for between the first reading and inspection mark #1:	
First reading	7/23/2018 2:55:27 PM
Last reading	7/23/2018 5:25:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.4 to 24.0 °C
Average reading	23.8 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.78 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #1 and inspection mark #2:	
First reading	7/23/2018 5:35:27 PM
Last reading	7/23/2018 8:05:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.6 to 24.1 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

Mean Kinetic Temperature	23.93 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #2 and the last reading:	
First reading	7/23/2018 8:15:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	16 Hours, 30 Minutes
Reading range	23.6 to 24.4 °C
Average reading	24.0 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.96 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	16 Hours, 30 Minutes

PESTICIDES BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423606 Batch Start Date: 07/25/18 11:45 Batch Analyst: Getahun, Abaynesh A

Batch Method: 3510C Batch End Date: 07/26/18 13:01

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	ReceivedpH	8081 LCS 00433	8081/82 Surr 00103	8081Toxaphene 00031
LB 280-423271/1-A		3510C, 8081B		100 mL	10 mL	6 SU		1 mL	
LCS 280-423271/2-A		3510C, 8081B		100 mL	10 mL	6 SU	1 mL	1 mL	
LCS 280-423271/3-A		3510C, 8081B		100 mL	10 mL	6 SU		1 mL	1 mL
160-29498-A-3-A	CRC-B22-0105	3510C, 8081B	P	100 mL	10 mL	6 SU		1 mL	
160-29498-A-3-A MS	CRC-B22-0105	3510C, 8081B	P	100 mL	10 mL	6 SU	1 mL	1 mL	
160-29498-A-3-A MSD	CRC-B22-0105	3510C, 8081B	P	100 mL	10 mL	6 SU	1 mL	1 mL	

Lab Sample ID	Client Sample ID	Method Chain	Basis	AnalysisComment					
LB 280-423271/1-A		3510C, 8081B							
LCS 280-423271/2-A		3510C, 8081B		tox					
LCS 280-423271/3-A		3510C, 8081B		8081					
160-29498-A-3-A	CRC-B22-0105	3510C, 8081B	P						
160-29498-A-3-A MS	CRC-B22-0105	3510C, 8081B	P						
160-29498-A-3-A MSD	CRC-B22-0105	3510C, 8081B	P						

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.: 160-29498-1

SDG No.:

Batch Number: 423606 Batch Start Date: 07/25/18 11:45 Batch Analyst: Getahun, Abaynesh A

Batch Method: 3510C Batch End Date: 07/26/18 13:01

Batch Notes	
Acid Used for pH Adjustment ID	1:1 H2SO4_00071
Balance ID	24750399
Base Used to Adjust pH ID	10N_NaOH_00125
Batch Comment	DV-OP-0006/0007/BB8@10.00mL
Analyst ID - Concentration	KO/MF(Trainer)/AAG(Trainee)
Concentration 1 Corrected Temperature	88 Degrees C
Equipment ID - Concentration 1	B
Exchange Solvent ID	Hexane_Cycl_00051
Analyst ID - Extraction	AAG
Method/Fraction	3510C/8081/8081 DoD5
Na2SO4 ID	0000186445_00002
NaCl ID	181331
Pipette/Syringe/Dispenser ID	1n2s
Prep Solvent ID	MeCl2_Cyl_00397
Prep Solvent Volume Used	180 mL
Analyst ID - Spike Analyst	AAG
Analyst ID - Spike Witness Analyst	Reviewer:KI
Sufficient Volume for Batch QC	yes
Concentration 1 Uncorrected Temperature	89 Degrees C
Reagent Water ID	S. H2O Elga

Basis	Basis Description
P	TCLP

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.: 160-29498-1

SDG No.:

Matrix: Solid Level: Low

GC Column (1): CLP2 ID: 0.32(mm)

Client Sample ID	Lab Sample ID	TCX1 #	DCBP1 #
CRC-B21-0205	160-29498-2	84	85
	MB 280-423389/1-A	78	82
	LCS 280-423389/2-A	83	87
CRC-B21-0205 MS	160-29498-2 MS	76	78
CRC-B21-0205 MSD	160-29498-2 MSD	77	79

	QC LIMITS
TCX = Tetrachloro-m-xylene	53-128
DCBP = DCB Decachlorobiphenyl	59-130

Column to be used to flag recovery values

FORM II 8082A

FORM III
PCBS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 08031805.D

Lab ID: LCS 280-423389/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
PCB-1016	120	104	87	54-132	
PCB-1260	120	109	91	62-129	

Column to be used to flag recovery and RPD values

FORM III 8082A

FORM III
PCBS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 08031807.D

Lab ID: 160-29498-2 MS Client ID: CRC-B21-0205 MS

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC	QC LIMITS REC	#
PCB-1016	134	11 U	102	76	54-132	
PCB-1260	134	5.6 U	103	77	62-129	

Column to be used to flag recovery and RPD values

FORM III 8082A

FORM III
PCBS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 08031808.D

Lab ID: 160-29498-2 MSD Client ID: CRC-B21-0205 MSD

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
PCB-1016	136	109	80	7	36	54-132	
PCB-1260	136	111	82	8	44	62-129	

Column to be used to flag recovery and RPD values

FORM III 8082A

FORM IV
PCBS METHOD BLANK SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: MB 280-423389/1-A

Matrix: Solid Date Extracted: 07/24/2018 08:50

Lab File ID:(1) 08031804.D Lab File ID:(2) 08031804.D

Date Analyzed:(1) 08/03/2018 11:39 Date Analyzed:(2) 08/03/2018 11:39

Instrument ID:(1) SGC_P3 Instrument ID:(2) SGC_P3

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 280-423389/2-A	08/03/2018 12:01	08/03/2018 12:01
CRC-B21-0205	160-29498-2	08/03/2018 12:23	08/03/2018 12:23
CRC-B21-0205 MS	160-29498-2 MS	08/03/2018 12:45	08/03/2018 12:45
CRC-B21-0205 MSD	160-29498-2 MSD	08/03/2018 13:07	08/03/2018 13:07

FORM VIII
PCBS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Sample No.: STDL51660 280-423815/17 Date Analyzed: 07/26/2018 20:21

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm)

Lab File ID (Standard): 07261817.D Heated Purge: (Y/N) N

Calibration ID: 33202

		BNB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		3813134756	1.82				
UPPER LIMIT		7626269512	2.32				
LOWER LIMIT		1906567378	1.32				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-423815/37		4546079757	1.82				
ICV 280-423815/38		4491549810	1.82				
ICV 280-423815/39		4267203916	1.82				
ICV 280-423815/40		4451114062	1.83				
ICV 280-423815/42		4115462597	1.83				

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8082A

FORM VIII
PCBS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Sample No.: STDL51660 280-423815/17 Date Analyzed: 07/26/2018 20:21

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm)

Lab File ID (Standard): 07261817.D Heated Purge: (Y/N) N

Calibration ID: 33203

		BNB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		932481946	1.75				
UPPER LIMIT		1864963892	2.25				
LOWER LIMIT		466240973	1.25				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-423815/37		1051329672	1.75				
ICV 280-423815/38		1056154880	1.75				
ICV 280-423815/39		1016164594	1.75				
ICV 280-423815/40		1054906634	1.75				
ICV 280-423815/42		933577517	1.75				

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8082A

FORM VIII
PCBS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Sample No.: CCVIS 280-424773/3 Date Analyzed: 08/03/2018 11:18

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm)

Lab File ID (Standard): 08031803.D Heated Purge: (Y/N) N

Calibration ID: 33190

		BNB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3997970399	1.82				
UPPER LIMIT		7995940798	2.32				
LOWER LIMIT		1998985200	1.32				
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 280-423389/1-A		4144081052	1.82				
LCS 280-423389/2-A		4060115566	1.82				
160-29498-2	CRC-B21-0205	4090014666	1.82				
160-29498-2 MS	CRC-B21-0205 MS	4013017494	1.82				
160-29498-2 MSD	CRC-B21-0205 MSD	4002897214	1.82				
CCV 280-424773/18		3827789538	1.82				
CCV 280-424773/19		3914495367	1.82				

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8082A

FORM VIII
PCBS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Sample No.: CCVIS 280-424773/3 Date Analyzed: 08/03/2018 11:18

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm)

Lab File ID (Standard): 08031803.D Heated Purge: (Y/N) N

Calibration ID: 33191

		BNB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		870675925	1.75				
UPPER LIMIT		1741351850	2.25				
LOWER LIMIT		435337963	1.25				
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 280-423389/1-A		923798752	1.75				
LCS 280-423389/2-A		941439872	1.75				
160-29498-2	CRC-B21-0205	941811533	1.74				
160-29498-2 MS	CRC-B21-0205 MS	923401512	1.75				
160-29498-2 MSD	CRC-B21-0205 MSD	928265215	1.74				
CCV 280-424773/18		908389439	1.75				
CCV 280-424773/19		925137776	1.75				

BNB = 1-Bromo-2-nitrobenzene

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8082A

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Client Sample ID: CRC-B21-0205 MS Lab Sample ID: 160-29498-2 MS

Instrument ID (1): SGC_P3 Instrument ID (2): SGC_P3

Date Analyzed (1): 08/03/2018 12:45 Date Analyzed (2): 08/03/2018 12:45

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	3.66	3.41	3.91	106	102	3.3
		2	4.12	3.87	4.37	104		
		3	4.26	4.01	4.51	98.0		
		4	4.49	4.24	4.74	101		
		5	4.78	4.53	5.03	101		
	2	1	3.48	3.23	3.73	105	105	
		2	3.95	3.70	4.20	103		
		3	4.08	3.83	4.33	108		
		4	4.30	4.04	4.54	104		
		5	4.53	4.28	4.78	108		
PCB-1260	1	1	6.64	6.39	6.89	91.5	103	3.7
		2	7.11	6.86	7.36	96.5		
		3	7.64	7.39	7.89	115		
		4	8.00	7.75	8.25	107		
		5	8.51	8.26	8.76	105		
	2	1	6.00	5.75	6.25	106	99.1	
		2	6.73	6.48	6.98	95.6		
		3	7.21	6.96	7.46	111		
		4	7.64	7.40	7.90	100		
		5	8.03	7.78	8.28	82.7		

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Client Sample ID: CRC-B21-0205 MSD Lab Sample ID: 160-29498-2 MSD

Instrument ID (1): SGC_P3 Instrument ID (2): SGC_P3

Date Analyzed (1): 08/03/2018 13:07 Date Analyzed (2): 08/03/2018 13:07

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	3.66	3.41	3.91	114	109	8.7
		2	4.11	3.87	4.37	113		
		3	4.26	4.01	4.51	100		
		4	4.49	4.24	4.74	107		
		5	4.78	4.53	5.03	110		
	2	1	3.48	3.23	3.73	124	119	
		2	3.94	3.70	4.20	116		
		3	4.08	3.83	4.33	126		
		4	4.29	4.04	4.54	114		
		5	4.53	4.28	4.78	114		
PCB-1260	1	1	6.64	6.39	6.89	97.4	111	2.2
		2	7.11	6.86	7.36	105		
		3	7.63	7.39	7.89	124		
		4	8.00	7.75	8.25	116		
		5	8.51	8.26	8.76	113		
	2	1	6.00	5.75	6.25	111	109	
		2	6.72	6.48	6.98	101		
		3	7.21	6.96	7.46	121		
		4	7.64	7.40	7.90	105		
		5	8.03	7.78	8.28	105		

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 280-423389/2-A

Instrument ID (1): SGC_P3 Instrument ID (2): SGC_P3

Date Analyzed (1): 08/03/2018 12:01 Date Analyzed (2): 08/03/2018 12:01

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	3.66	3.41	3.91	108	104	3.8
		2	4.12	3.87	4.37	109		
		3	4.26	4.01	4.51	95.9		
		4	4.49	4.24	4.74	103		
		5	4.78	4.53	5.03	103		
	2	1	3.48	3.23	3.73	96.1	99.9	
		2	3.95	3.70	4.20	101		
		3	4.08	3.83	4.33	102		
		4	4.30	4.04	4.54	102		
		5	4.53	4.28	4.78	97.7		
PCB-1260	1	1	6.64	6.39	6.89	106	109	3.7
		2	7.11	6.86	7.36	100		
		3	7.64	7.39	7.89	118		
		4	8.00	7.75	8.25	113		
		5	8.51	8.26	8.76	108		
	2	1	6.00	5.75	6.25	104	105	
		2	6.72	6.48	6.98	96.0		
		3	7.21	6.96	7.46	110		
		4	7.65	7.40	7.90	111		
		5	8.03	7.78	8.28	104		

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: CRC-B21-0205 | Lab Sample ID: 160-29498-2

Matrix: Solid | Lab File ID: 08031806.D

Analysis Method: 8082A | Date Collected: 07/12/2018 11:40

Extraction Method: 3546 | Date Extracted: 07/24/2018 08:50

Sample wt/vol: 15.2(g) | Date Analyzed: 08/03/2018 12:23

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: CLP2 ID: 0.32(mm)

% Moisture: 5.8 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 424773 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
11104-28-2	PCB-1221	33	U	98	33
12674-11-2	PCB-1016	11	U	69	11
11141-16-5	PCB-1232	11	U	69	11
53469-21-9	PCB-1242	19	U	69	19
12672-29-6	PCB-1248	12	U	69	12
11097-69-1	PCB-1254	12	U	69	12
11096-82-5	PCB-1260	5.6	U	69	5.6
37324-23-5	PCB-1262	24	U	69	24
11100-14-4	PCB-1268	8.3	U	69	8.3
1336-36-3	Polychlorinated biphenyls, Total	5.6	U	69	5.6

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	84		53-128
2051-24-3	DCB Decachlorobiphenyl	85		59-130

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031806.D
Lims ID: 160-29498-B-2-A
Client ID: CRC-B21-0205
Sample Type: Client
Inject. Date: 03-Aug-2018 12:23:44 ALS Bottle#: 6 Worklist Smp#: 6
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 160-29498-B-2-A
Misc. Info.: 280-0072651-006
Operator ID: JAX Instrument ID: SGC_P3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:33:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

First Level Reviewer: jacksonto Date: 03-Aug-2018 13:25:19

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/ml	Flags
* 17 1-Bromo-2-nitrobenzene						
1	1.824	1.822	0.002	4090014666	1000.0	
2	1.744	1.746	-0.002	941811533	1000.0	
					RPD = 0.00	
$ 14 Tetrachloro-m-xylene						
1	2.748	2.749	-0.001	680816758	16.6	
2	2.778	2.776	0.002	171083010	16.7	
					RPD = 0.86	
3 PCB-1221						U
1		2.962			ND	
1		3.102				
1		3.139				
2		3.092				
2		3.219				
2		3.272				

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/ml	Flags
7	PCB-1232					U
1		3.137			ND	
1		3.481				
1		3.944				
1		4.084				
1		4.531				
2		3.271				
2		3.661				
2		4.117				
2		4.261				
2		4.784				
1	PCB-1016					U
1		3.482			ND	
1		3.946				
1		4.082				
1		4.292				
1		4.529				
2		3.659				
2		4.116				
2		4.259				
2		4.489				
2		4.782				
10	PCB-1242					U
1		3.482			ND	
1		3.946				
1		4.529				
1		5.016				
1		5.042				
2		3.659				
2		4.116				
2		4.259				
2		4.783				
2		4.919				
4	PCB-1248					U
1		3.943			ND	
1		4.296				
1		4.533				
1		5.279				
1		5.763				
2		4.116				
2		4.493				
2		4.783				
2		4.923				
2		6.093				

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/ml	Flags
9 PCB-1254						U
1		5.282			ND	
1		5.612				
1		5.762				
1		6.362				
1		6.728				
2		5.525				
2		5.945				
2		6.092				
2		6.642				
2		7.112				
12 PCB-1260						U
1		5.999			ND	
1		6.726				
1		7.212				
1		7.646				
1		8.029				
2		6.639				
2		7.106				
2		7.636				
2		8.002				
2		8.506				
5 PCB-1262						U
1		6.364			ND	
1		6.887				
1		7.214				
1		7.647				
1		8.031				
2		6.641				
2		7.241				
2		7.637				
2		8.004				
2		8.507				
13 PCB-1268						U
1		8.092			ND	
1		8.146				
1		8.416				
1		8.922				
1		9.336				
2		8.503				
2		8.566				
2		8.919				
2		9.349				
2		9.813				
$ 15 DCB Decachlorobiphenyl						
1	9.604	9.606	-0.002	727962396	15.0	
2	10.174	10.176	-0.002	147759568	17.0	
					RPD = 12.92	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ng/ml	Flags
2 PCB-5460						U
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						U
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						U
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_00012 Amount Added: 1.00 Units: mL Run Reagent

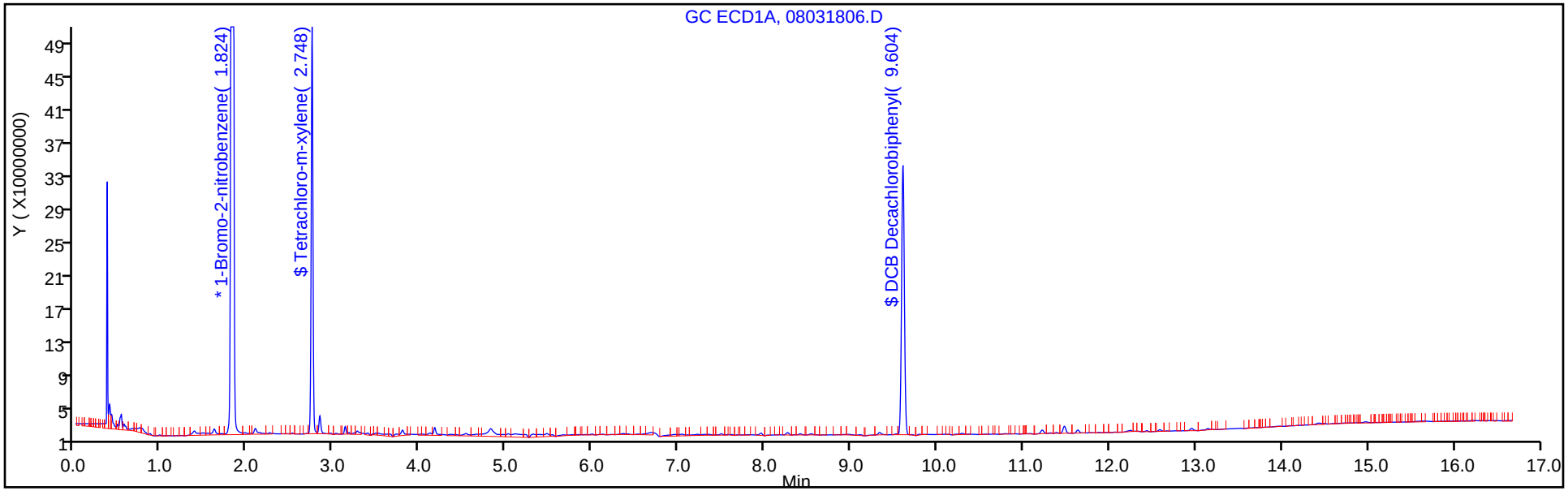
Report Date: 04-Aug-2018 07:33:41 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

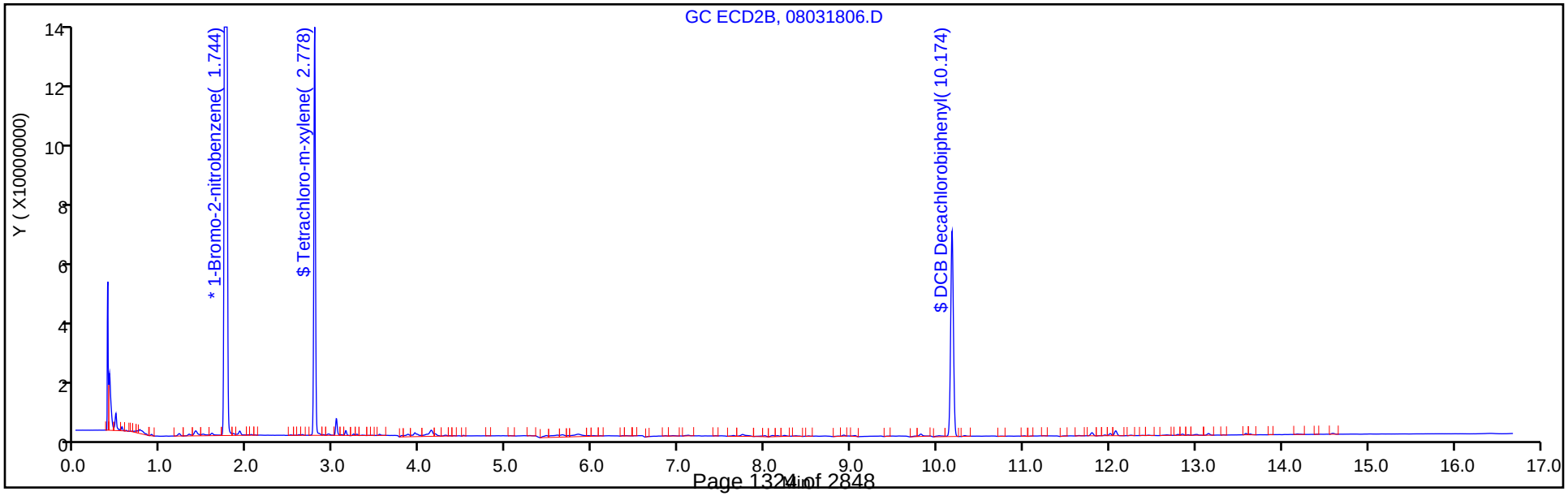
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031806.D

Injection Date:	03-Aug-2018 12:23:44	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	160-29498-B-2-A	Lab Sample ID:	280-29498-2	Worklist Smp#:	6
Client ID:	CRC-B21-0205				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	6
Method:	PCB_P3	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_P3\20180803-72651.b\08031806.D				
Lims ID:	160-29498-B-2-A				
Client ID:	CRC-B21-0205				
Sample Type:	Client				
Inject. Date:	03-Aug-2018 12:23:44	ALS Bottle#:	6	Worklist Smp#:	6
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	160-29498-B-2-A				
Misc. Info.:	280-0072651-006				
Operator ID:	JAX	Instrument ID:	SGC_P3		
Method:	\\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m				
Limit Group:	GCSV - 8082 - IS				
Last Update:	04-Aug-2018 07:33:29	Calib Date:	27-Jul-2018 02:54:25		
Integrator:	Falcon				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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:	CTX0302				
First Level Reviewer: jacksonto		Date:	03-Aug-2018 13:25:19		

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	16.6	83.03
$ 15 DCB Decachlorobiphenyl	20.0	15.0	74.86

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	16.7	83.75
$ 15 DCB Decachlorobiphenyl	20.0	17.0	85.20

FORM VI
PCBS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 14:30 Calibration End Date: 07/26/2018 16:41 Calibration ID: 33194

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL11248 280-423815/7	07261807.D
Level 2	STDL21248 280-423815/6	07261806.D
Level 3	STDL31248 280-423815/5	07261805.D
Level 4	STDL41248 280-423815/4	07261804.D
Level 5	STDL51248 280-423815/3	07261803.D
Level 6	STDL61248 280-423815/2	07261802.D
Level 7	STDL71248 280-423815/1	07261801.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-1248 Peak 1	0.5053 0.3751	0.4441 0.3732	0.3997	0.3715	0.3662	Lin1	3.4055	0.3669							1.0000		0.9900
PCB-1248 Peak 2	0.5233 0.3755	0.4597 0.3735	0.4159	0.3811	0.3684	Lin1	4.1427	0.3676							1.0000		0.9900
PCB-1248 Peak 3	0.5334 0.3742	0.4775 0.3713	0.4160	0.3778	0.3640	Lin1	4.6404	0.3644							1.0000		0.9900
PCB-1248 Peak 4	0.3740 0.2852	0.3300 0.2832	0.3087	0.2856	0.2752	Lin1	2.4274	0.2788							1.0000		0.9900
PCB-1248 Peak 5	0.2585 0.1914	0.2335 0.1913	0.2056	0.1925	0.1855	Lin1	1.8680	0.1874							1.0000		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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 14:30 Calibration End Date: 07/26/2018 16:41 Calibration ID: 33194

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL11248 280-423815/7	07261807.D
Level 2	STDL21248 280-423815/6	07261806.D
Level 3	STDL31248 280-423815/5	07261805.D
Level 4	STDL41248 280-423815/4	07261804.D
Level 5	STDL51248 280-423815/3	07261803.D
Level 6	STDL61248 280-423815/2	07261802.D
Level 7	STDL71248 280-423815/1	07261801.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	48741664 1069713029	88221840 1398539772	160461812	381558898	738052958	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 2	BNB	Lin1	50486020 1070840366	91321574 1399648158	166984160	391374857	742344885	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 3	BNB	Lin1	51456224 1067064086	94853715 1391634555	167022358	387989583	733497845	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 4	BNB	Lin1	36079565 813404598	65556937 1061421230	123932521	293311879	554610126	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 5	BNB	Lin1	24935530 545692230	46378855 716924026	82529606	197663678	373910443	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_P3\20180726-72400.b\07261801.D
Lims ID: STDL71248
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 26-Jul-2018 14:30:30 ALS Bottle#: 1 Worklist Smp#: 1
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL71248
Misc. Info.: 280-0072400-001
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:23 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.822	0.004	3747844794	1000.0	1000.0	
2	1.747	1.746	0.001	919520146	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.940	3.943	-0.003	1398539772	1000.0	1007.8	
1	4.296	4.296	0.000	1399648158	1000.0	1004.8	
1	4.533	4.533	0.000	1391634555	1000.0	1006.3	
1	5.280	5.279	0.001	1061421230	1000.0	1007.0	
1	5.763	5.763	0.000	716924026	1000.0	1010.7	
		Average of Peak Amounts =				1007.3	
2	4.117	4.116	0.001	376135153	1000.0	1013.4	
2	4.493	4.493	0.000	210088582	1000.0	1011.9	
2	4.783	4.783	0.000	288122268	1000.0	1017.4	
2	4.920	4.923	-0.003	312332435	1000.0	1013.0	
2	6.093	6.093	0.000	200204502	1000.0	1014.8	
		Average of Peak Amounts =				1014.1	
						RPD = 0.67	
S 8 Polychlorinated biphenyls, Total							
1						1007.3	
2						1014.1	
						RPD = 0.67	

Reagents:

AR_1248_L7_00016 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

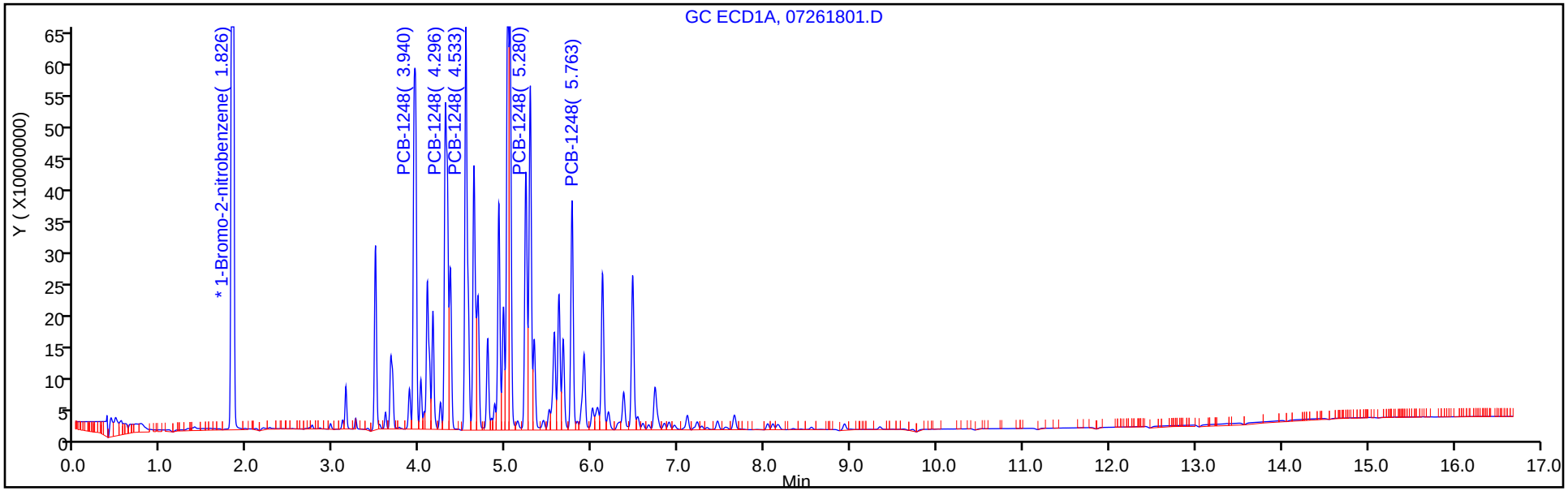
Report Date: 28-Jul-2018 08:57:24 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

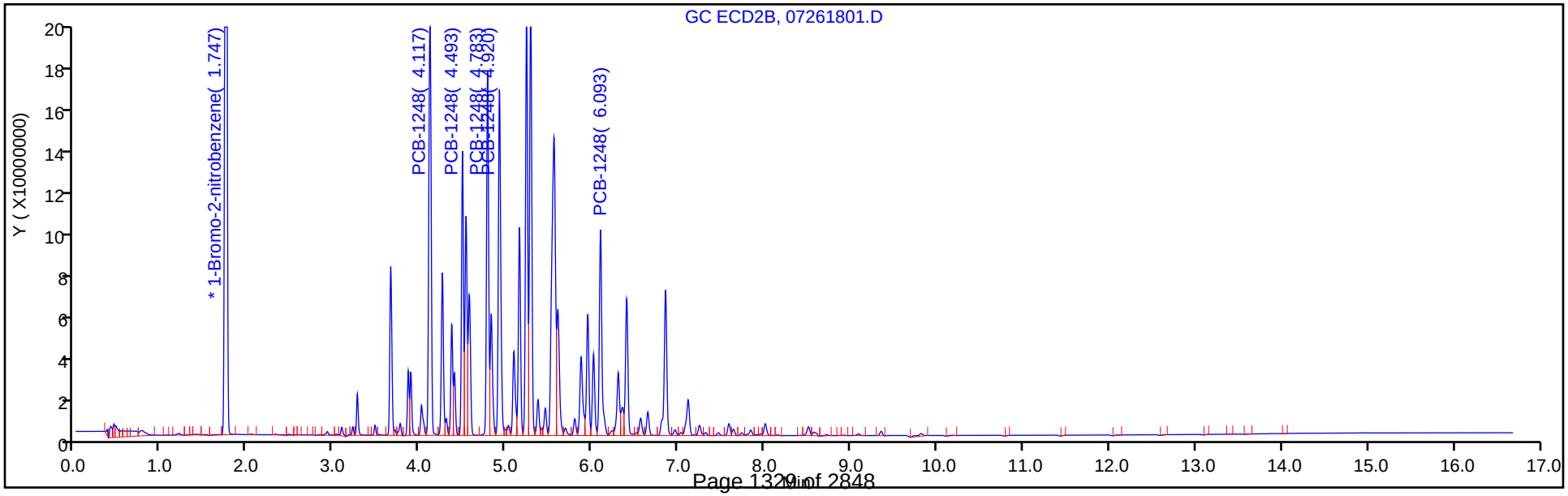
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261801.D

Injection Date:	26-Jul-2018 14:30:30	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL71248			Worklist Smp#:	1
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	1
Method:	PCB_P3	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_P3\20180726-72400.b\07261802.D
Lims ID: STDL61248
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Jul-2018 14:52:24 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL61248
Misc. Info.: 280-0072400-002
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:26 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.822	0.004	3802069986	1000.0	1000.0	
2	1.746	1.746	0.000	952740054	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.939	3.943	-0.004	1069713029	750.0	757.5	
1	4.296	4.296	0.000	1070840366	750.0	755.0	
1	4.533	4.533	0.000	1067064086	750.0	757.5	
1	5.279	5.279	0.000	813404598	750.0	758.6	
1	5.763	5.763	0.000	545692230	750.0	755.9	
		Average of Peak Amounts =				756.9	
2	4.116	4.116	0.000	291718497	750.0	756.7	
2	4.493	4.493	0.000	162930506	750.0	754.9	
2	4.783	4.783	0.000	221815473	750.0	753.0	
2	4.923	4.923	0.000	241932039	750.0	755.4	
2	6.093	6.093	0.000	153778544	750.0	749.8	
		Average of Peak Amounts =				753.9	
						RPD = 0.39	
S 8 Polychlorinated biphenyls, Total							
1						756.9	
2						753.9	
						RPD = 0.39	

Reagents:

AR_1248_L6_00018 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

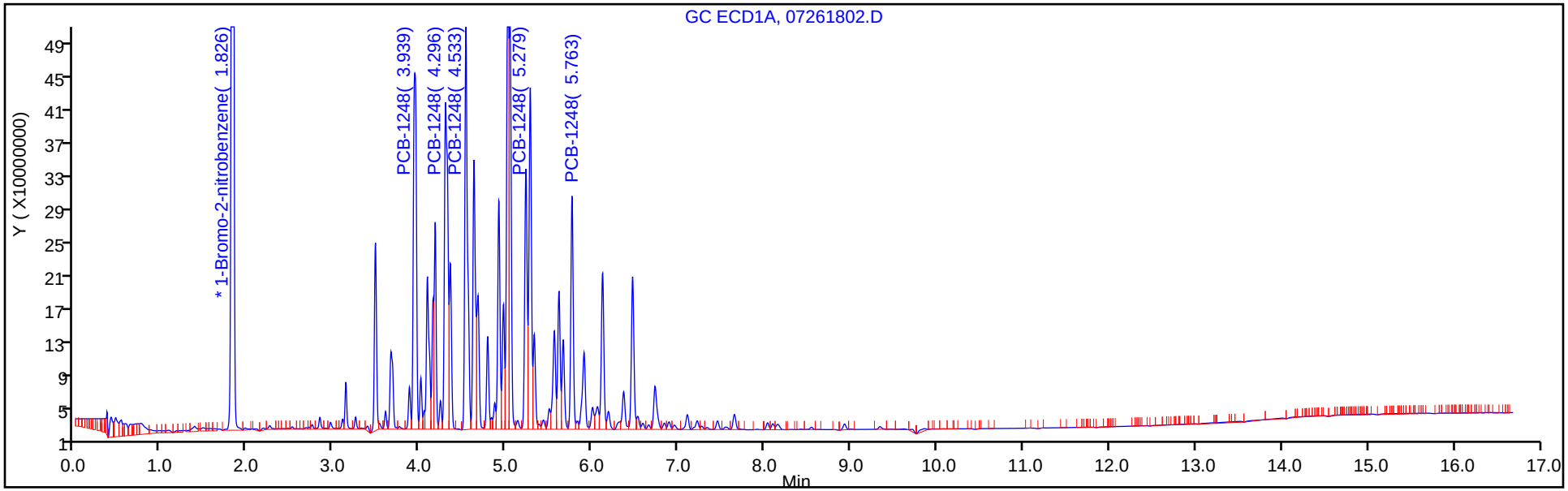
Report Date: 28-Jul-2018 08:57:27 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

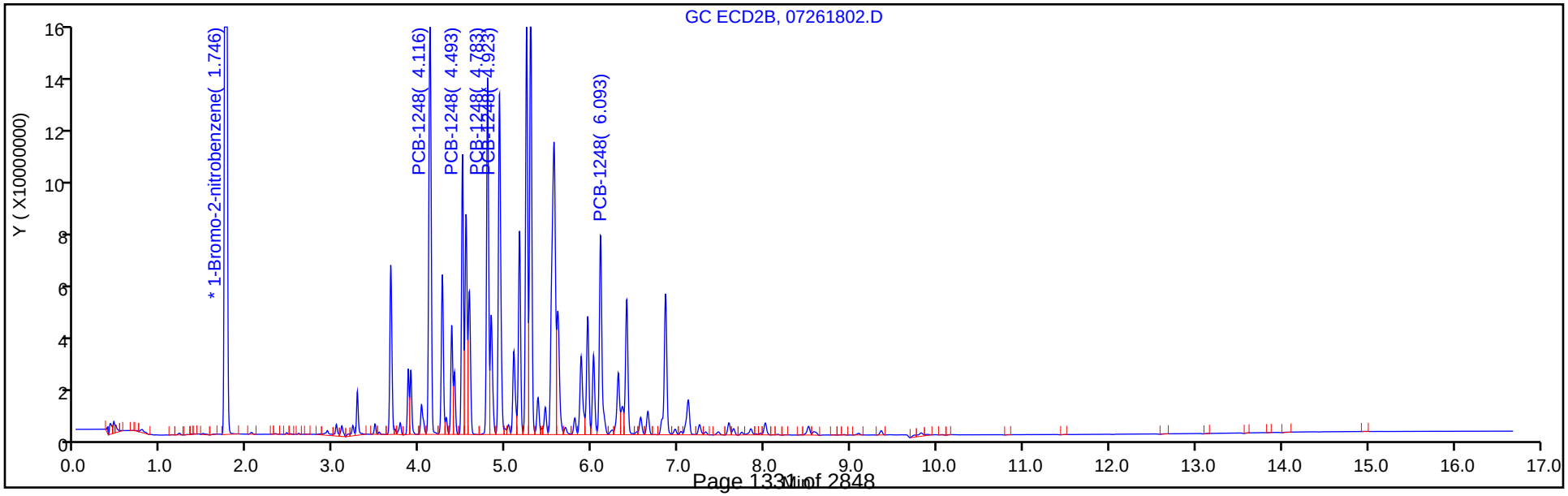
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261802.D

Injection Date:	26-Jul-2018 14:52:24	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL61248			Worklist Smp#:	2
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	2
Method:	PCB_P3	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_P3\20180726-72400.b\07261803.D
Lims ID: STDL51248
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 26-Jul-2018 15:14:18 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL51248
Misc. Info.: 280-0072400-003
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:53:07

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	1.826	1.826	0.000	4030642817	1000.0	1000.0	
2	1.749	1.749	0.000	1007527317	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.943	3.943	0.000	738052958	500.0	489.8	
1	4.296	4.296	0.000	742344885	500.0	489.8	
1	4.533	4.533	0.000	733497845	500.0	486.7	
1	5.279	5.279	0.000	554610126	500.0	484.8	
1	5.763	5.763	0.000	373910443	500.0	485.0	
		Average of Peak Amounts =				487.2	
2	4.116	4.116	0.000	199457121	500.0	486.8	
2	4.493	4.493	0.000	111690891	500.0	485.9	
2	4.783	4.783	0.000	152263931	500.0	484.7	
2	4.923	4.923	0.000	165414321	500.0	485.6	
2	6.093	6.093	0.000	106326159	500.0	486.9	
		Average of Peak Amounts =				486.0	
						RPD = 0.26	

Reagents:

AR_1248_L5_00020 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

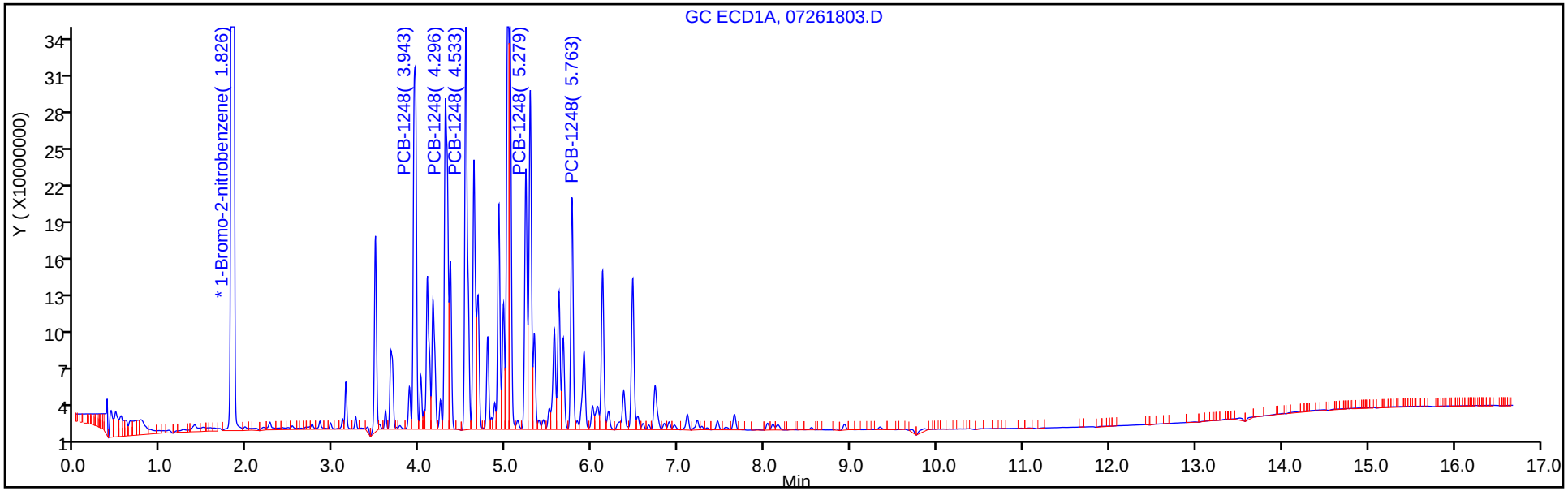
Report Date: 28-Jul-2018 08:57:30 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

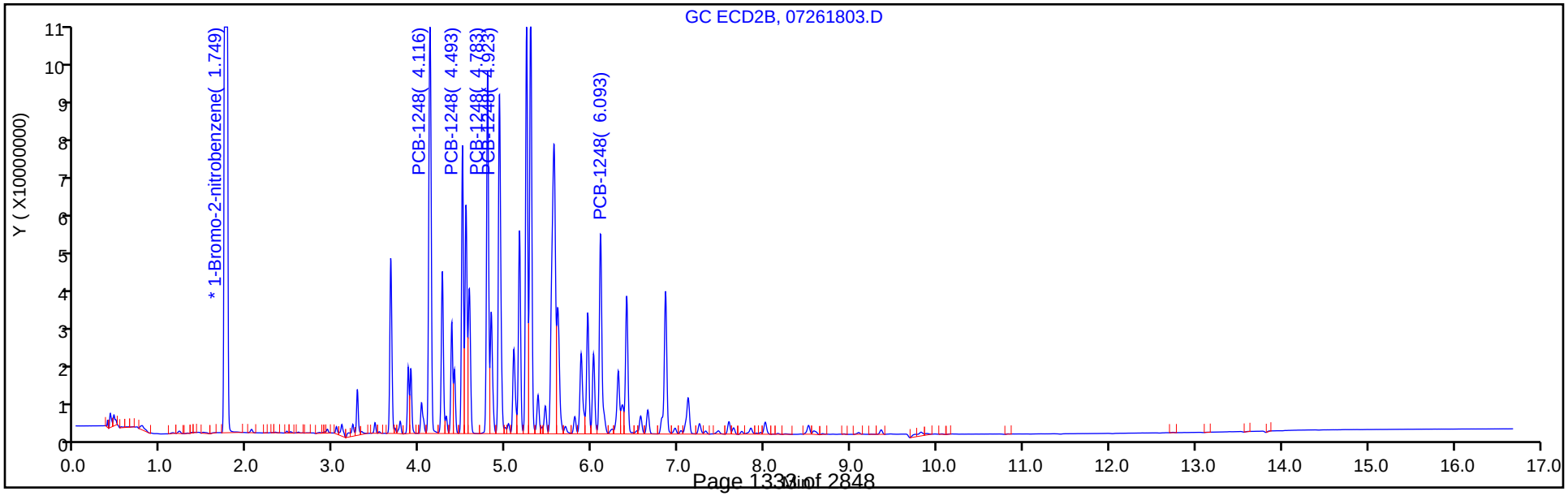
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261803.D

Injection Date:	26-Jul-2018 15:14:18	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL51248			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	3
Method:	PCB_P3	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_P3\20180726-72400.b\07261804.D
Lims ID: STDL41248
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 26-Jul-2018 15:36:13 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL41248
Misc. Info.: 280-0072400-004
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:31 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.826	0.000	4107889787	1000.0	1000.0	
2	1.749	1.749	0.000	1025850863	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.942	3.943	-0.001	381558898	250.0	243.9	
1	4.296	4.296	0.000	391374857	250.0	247.9	
1	4.532	4.533	-0.001	387989583	250.0	246.5	
1	5.279	5.279	0.000	293311879	250.0	247.4	
1	5.762	5.763	-0.001	197663678	250.0	246.8	
		Average of Peak Amounts =				246.5	
2	4.116	4.116	0.000	101770593	250.0	240.4	
2	4.492	4.493	-0.001	58113563	250.0	243.5	
2	4.782	4.783	-0.001	78999080	250.0	241.2	
2	4.919	4.923	-0.004	84923943	250.0	241.0	
2	6.092	6.093	-0.001	55689720	250.0	245.7	
		Average of Peak Amounts =				242.4	
						RPD = 1.68	
S 8 Polychlorinated biphenyls, Total							
1						246.5	
2						242.4	
						RPD = 1.68	

Reagents:

AR_1248_L4_00021 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

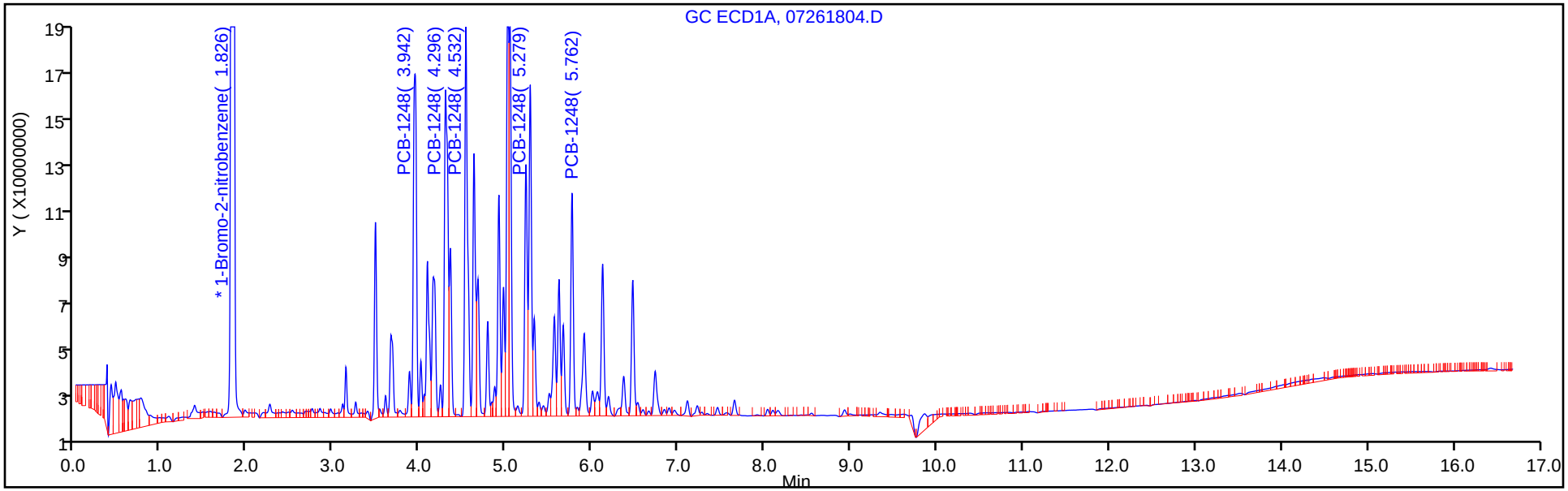
Report Date: 28-Jul-2018 08:57:32 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

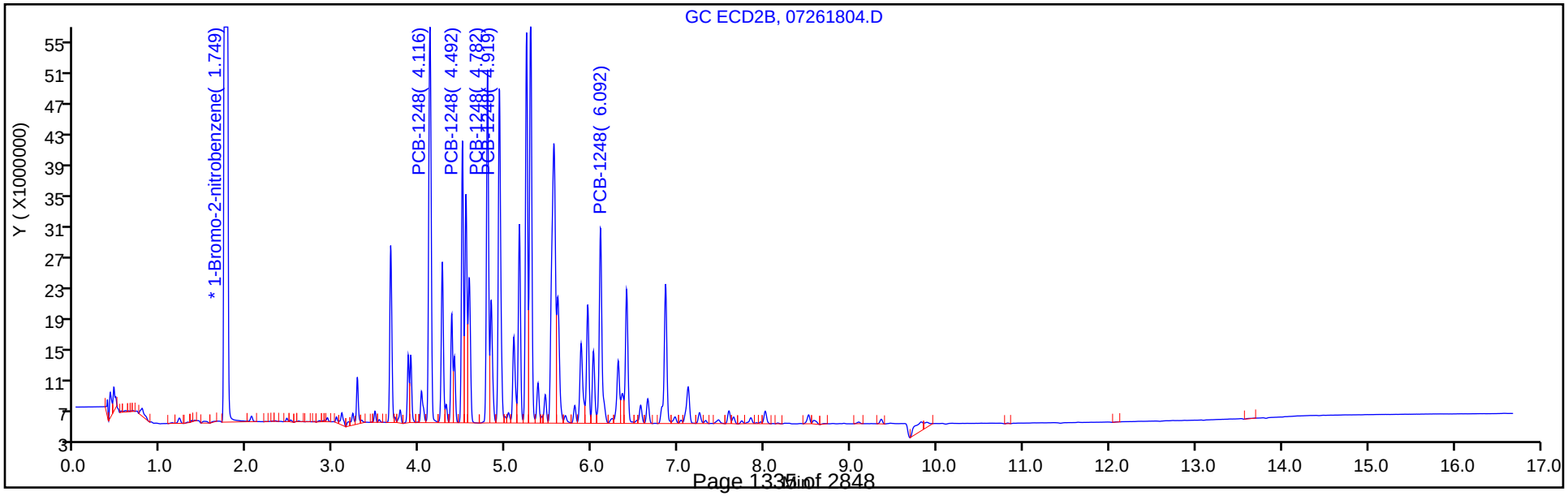
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261804.D

Injection Date:	26-Jul-2018 15:36:13	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL41248			Worklist Smp#:	4
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	4
Method:	PCB_P3	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_P3\20180726-72400.b\07261805.D
Lims ID: STDL31248
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Jul-2018 15:58:08 ALS Bottle#: 5 Worklist Smp#: 5
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL31248
Misc. Info.: 280-0072400-005
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:35 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.826	0.000	4015030166	1000.0	1000.0	
2	1.746	1.749	-0.003	1017467318	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.942	3.943	-0.001	160461812	100.0	99.6	
1	4.296	4.296	0.000	166984160	100.0	101.9	
1	4.532	4.533	-0.001	167022358	100.0	101.4	
1	5.279	5.279	0.000	123932521	100.0	102.0	
1	5.762	5.763	-0.001	82529606	100.0	99.7	
		Average of Peak Amounts =				100.9	
2	4.116	4.116	0.000	43836014	100.0	100.4	
2	4.492	4.493	-0.001	25353445	100.0	101.6	
2	4.782	4.783	-0.001	34764138	100.0	100.5	
2	4.919	4.923	-0.004	37377143	100.0	102.6	
2	6.096	6.093	0.003	23939193	100.0	101.0	
		Average of Peak Amounts =				101.2	
						RPD = 0.29	
S 8 Polychlorinated biphenyls, Total							
1						100.9	
2						101.2	
						RPD = 0.29	

Reagents:

AR_1248_L3_00020 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

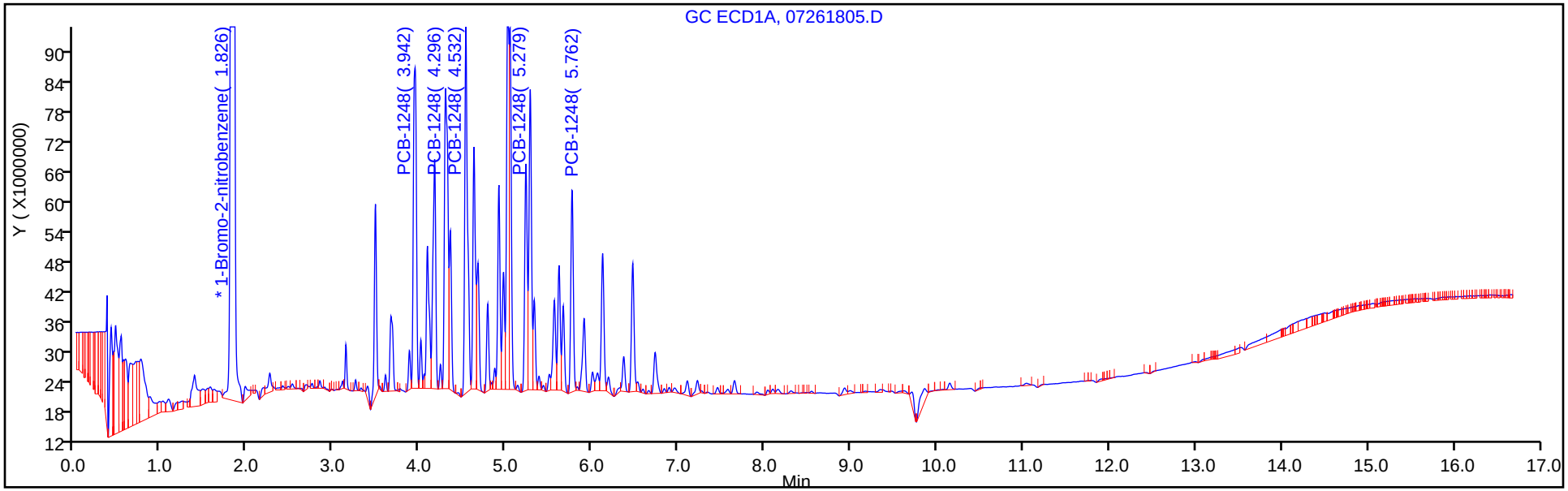
Report Date: 28-Jul-2018 08:57:35 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

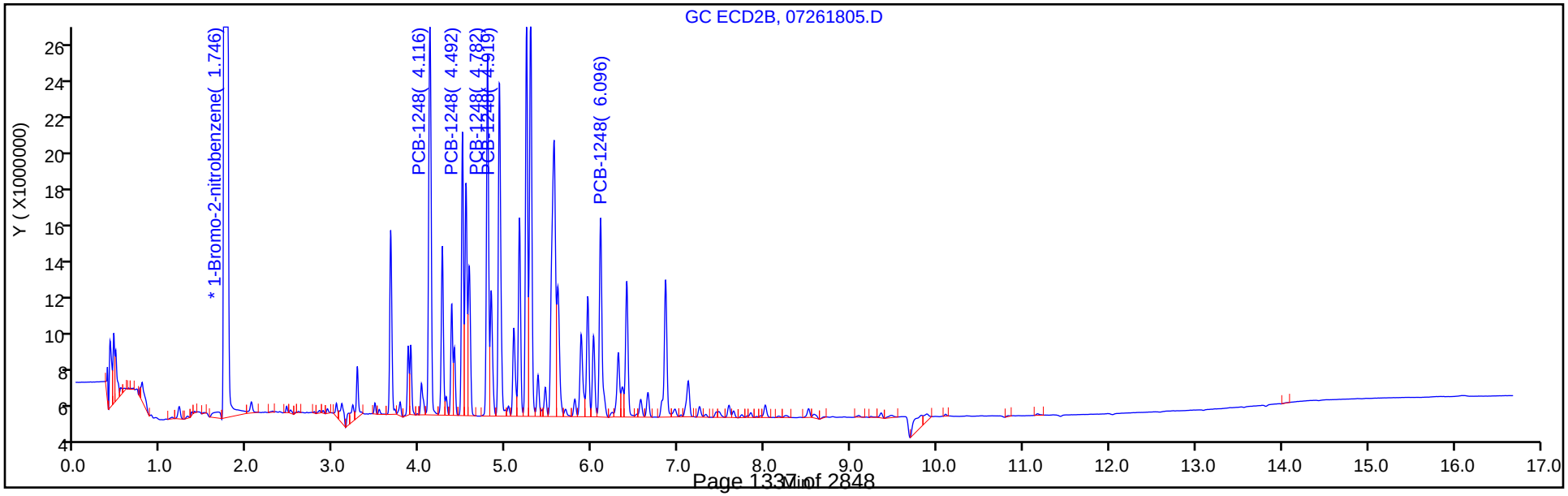
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261805.D

Injection Date:	26-Jul-2018 15:58:08	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL31248			Worklist Smp#:	5
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	5
Method:	PCB_P3	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_P3\20180726-72400.b\07261806.D
Lims ID: STDL21248
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Jul-2018 16:20:03 ALS Bottle#: 6 Worklist Smp#: 6
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL21248
Misc. Info.: 280-0072400-006
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:37 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.826	0.000	3972801839	1000.0	1000.0	
2	1.750	1.749	0.001	1015572853	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.943	3.943	0.000	88221840	50.0	51.2	
1	4.296	4.296	0.000	91321574	50.0	51.3	
1	4.533	4.533	0.000	94853715	50.0	52.8	
1	5.280	5.279	0.001	65556937	50.0	50.5	
1	5.763	5.763	0.000	46378855	50.0	52.3	
		Average of Peak Amounts =				51.6	
2	4.116	4.116	0.000	24364139	50.0	52.8	
2	4.493	4.493	0.000	14414113	50.0	53.6	
2	4.783	4.783	0.000	20407018	50.0	54.3	
2	4.920	4.923	-0.003	20808605	50.0	53.8	
2	6.093	6.093	0.000	13487869	50.0	52.8	
		Average of Peak Amounts =				53.5	
						RPD = 3.50	
S 8 Polychlorinated biphenyls, Total							
1						51.6	
2						53.5	
						RPD = 3.50	

Reagents:

AR_1248_L2_00020 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

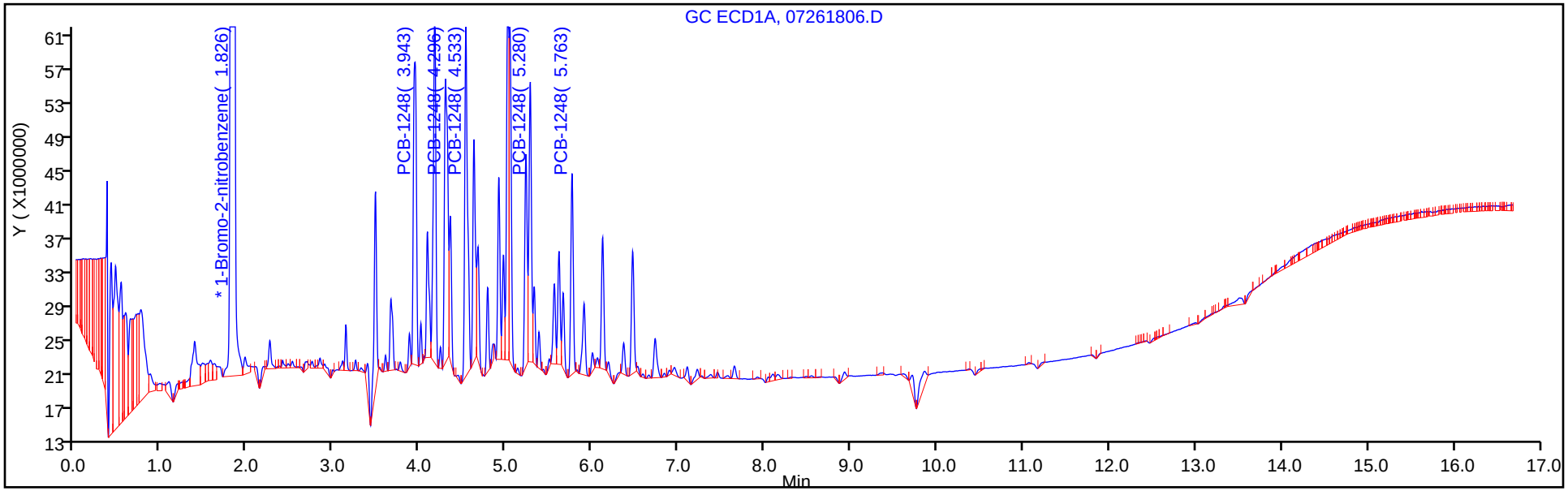
Report Date: 28-Jul-2018 08:57:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

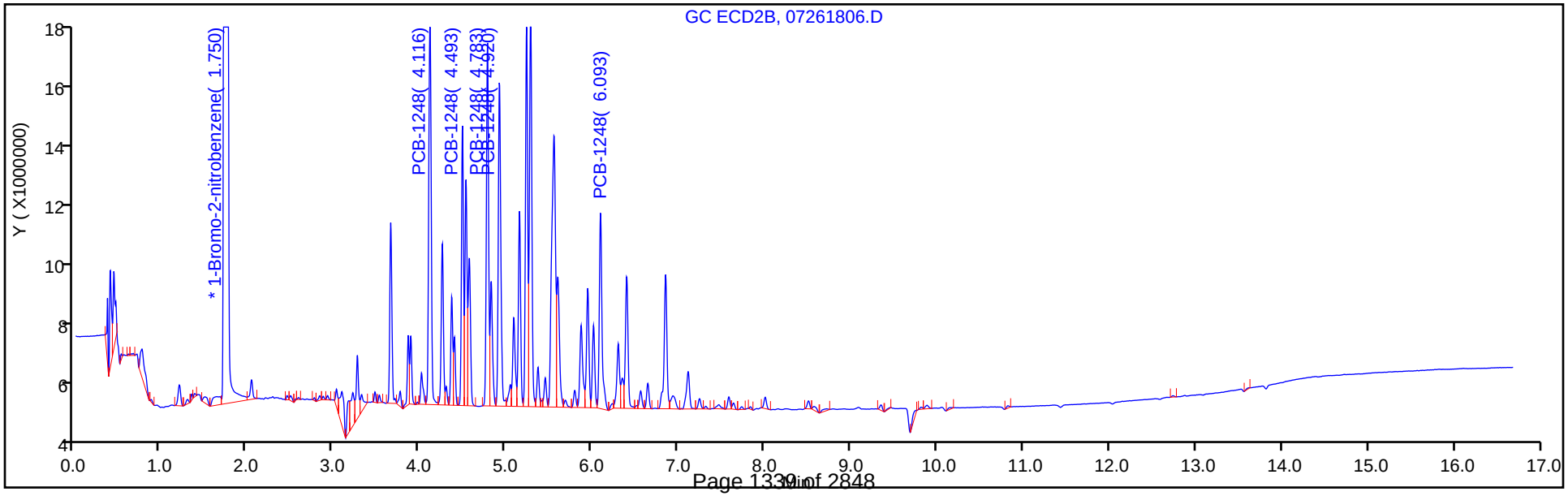
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261806.D

Injection Date:	26-Jul-2018 16:20:03	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL21248			Worklist Smp#:	6
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	6
Method:	PCB_P3	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_P3\20180726-72400.b\07261807.D
Lims ID: STDL11248
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 26-Jul-2018 16:41:59 ALS Bottle#: 7 Worklist Smp#: 7
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL11248
Misc. Info.: 280-0072400-007
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:39 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 12:41:03

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	1.826	1.826	0.000	3858753962	1000.0	1000.0	
2	1.746	1.749	-0.003	987751476	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.939	3.943	-0.004	48741664	25.0	25.1	
1	4.296	4.296	0.000	50486020	25.0	24.3	
1	4.533	4.533	0.000	51456224	25.0	23.9	
1	5.279	5.279	0.000	36079565	25.0	24.8	
1	5.766	5.763	0.003	24935530	25.0	24.5	
		Average of Peak Amounts =				24.5	
2	4.116	4.116	0.000	12543330	25.0	24.6	
2	4.493	4.493	0.000	7406962	25.0	23.7	
2	4.783	4.783	0.000	10669410	25.0	23.8	
2	4.923	4.923	0.000	10292379	25.0	23.5	
2	6.096	6.093	0.003	7097060	25.0	24.1	
		Average of Peak Amounts =				23.9	
						RPD = 2.43	
S 8 Polychlorinated biphenyls, Total							
1						24.5	
2						23.9	
						RPD = 2.43	

Reagents:

AR_1248_L1_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

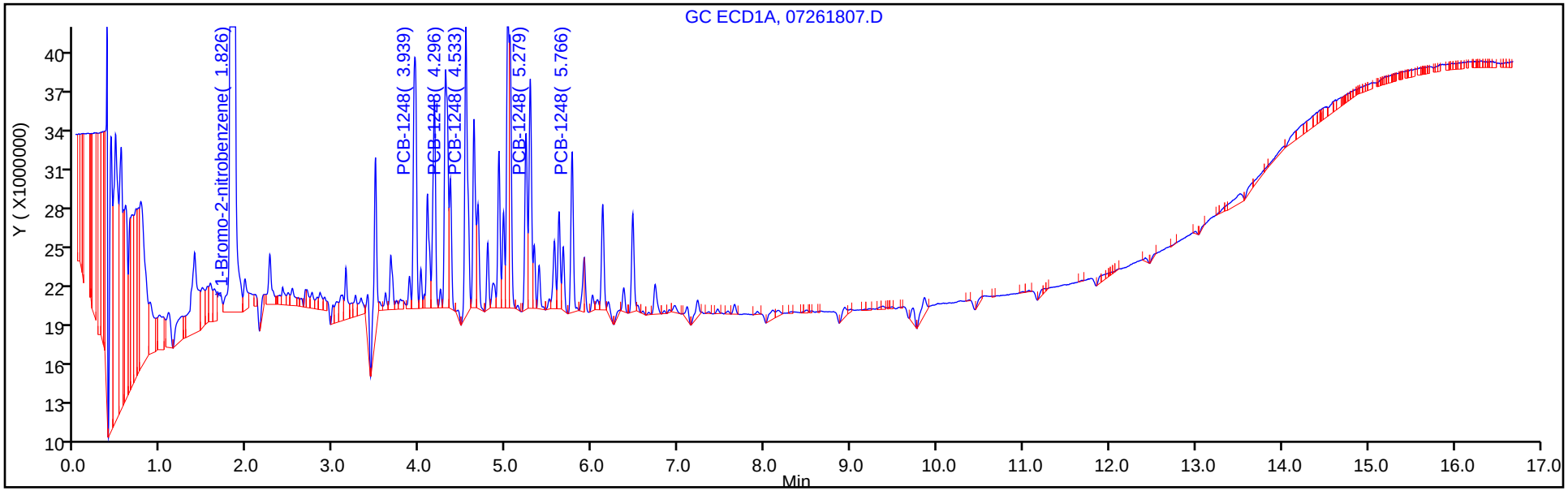
Report Date: 28-Jul-2018 08:57:40 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

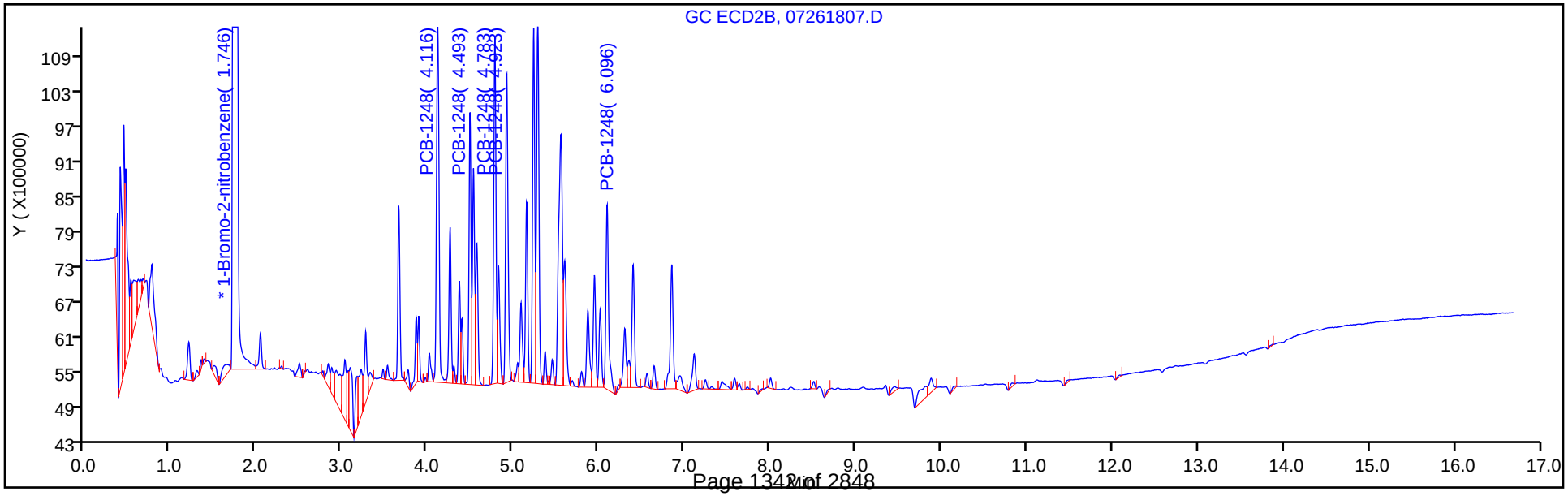
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261807.D

Injection Date:	26-Jul-2018 16:41:59	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL11248			Worklist Smp#:	7
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	7
Method:	PCB_P3	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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 14:30 Calibration End Date: 07/26/2018 16:41 Calibration ID: 33195

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL11248 280-423815/7	07261807.D
Level 2	STDL21248 280-423815/6	07261806.D
Level 3	STDL31248 280-423815/5	07261805.D
Level 4	STDL41248 280-423815/4	07261804.D
Level 5	STDL51248 280-423815/3	07261803.D
Level 6	STDL61248 280-423815/2	07261802.D
Level 7	STDL71248 280-423815/1	07261801.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-1248 Peak 1	0.5080 0.4083	0.4798 0.4091	0.4308	0.3968	0.3959	Lin1	2.8425	0.4009							0.9990		0.9900
PCB-1248 Peak 2	0.3000 0.2280	0.2839 0.2285	0.2492	0.2266	0.2217	Lin1	2.2012	0.2236							0.9990		0.9900
PCB-1248 Peak 3	0.4321 0.3104	0.4019 0.3133	0.3417	0.3080	0.3023	Lin1	3.5529	0.3045							0.9990		0.9900
PCB-1248 Peak 4	0.4168 0.3386	0.4098 0.3397	0.3674	0.3311	0.3284	Lin1	2.5837	0.3328							0.9990		0.9900
PCB-1248 Peak 5	0.2874 0.2152	0.2656 0.2177	0.2353	0.2171	0.2111	Lin1	2.0659	0.2125							1.0000		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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 14:30 Calibration End Date: 07/26/2018 16:41 Calibration ID: 33195

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL11248 280-423815/7	07261807.D
Level 2	STDL21248 280-423815/6	07261806.D
Level 3	STDL31248 280-423815/5	07261805.D
Level 4	STDL41248 280-423815/4	07261804.D
Level 5	STDL51248 280-423815/3	07261803.D
Level 6	STDL61248 280-423815/2	07261802.D
Level 7	STDL71248 280-423815/1	07261801.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	12543330 291718497	24364139 376135153	43836014	101770593	199457121	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 2	BNB	Lin1	7406962 162930506	14414113 210088582	25353445	58113563	111690891	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 3	BNB	Lin1	10669410 221815473	20407018 288122268	34764138	78999080	152263931	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 4	BNB	Lin1	10292379 241932039	20808605 312332435	37377143	84923943	165414321	25.0 750	50.0 1000	100	250	500
PCB-1248 Peak 5	BNB	Lin1	7097060 153778544	13487869 200204502	23939193	55689720	106326159	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_P3\20180726-72400.b\07261801.D
Lims ID: STDL71248
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 26-Jul-2018 14:30:30 ALS Bottle#: 1 Worklist Smp#: 1
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL71248
Misc. Info.: 280-0072400-001
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:23 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.822	0.004	3747844794	1000.0	1000.0	
2	1.747	1.746	0.001	919520146	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.940	3.943	-0.003	1398539772	1000.0	1007.8	
1	4.296	4.296	0.000	1399648158	1000.0	1004.8	
1	4.533	4.533	0.000	1391634555	1000.0	1006.3	
1	5.280	5.279	0.001	1061421230	1000.0	1007.0	
1	5.763	5.763	0.000	716924026	1000.0	1010.7	
		Average of Peak Amounts =				1007.3	
2	4.117	4.116	0.001	376135153	1000.0	1013.4	
2	4.493	4.493	0.000	210088582	1000.0	1011.9	
2	4.783	4.783	0.000	288122268	1000.0	1017.4	
2	4.920	4.923	-0.003	312332435	1000.0	1013.0	
2	6.093	6.093	0.000	200204502	1000.0	1014.8	
		Average of Peak Amounts =				1014.1	
						RPD = 0.67	
S 8 Polychlorinated biphenyls, Total							
1						1007.3	
2						1014.1	
						RPD = 0.67	

Reagents:

AR_1248_L7_00016 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

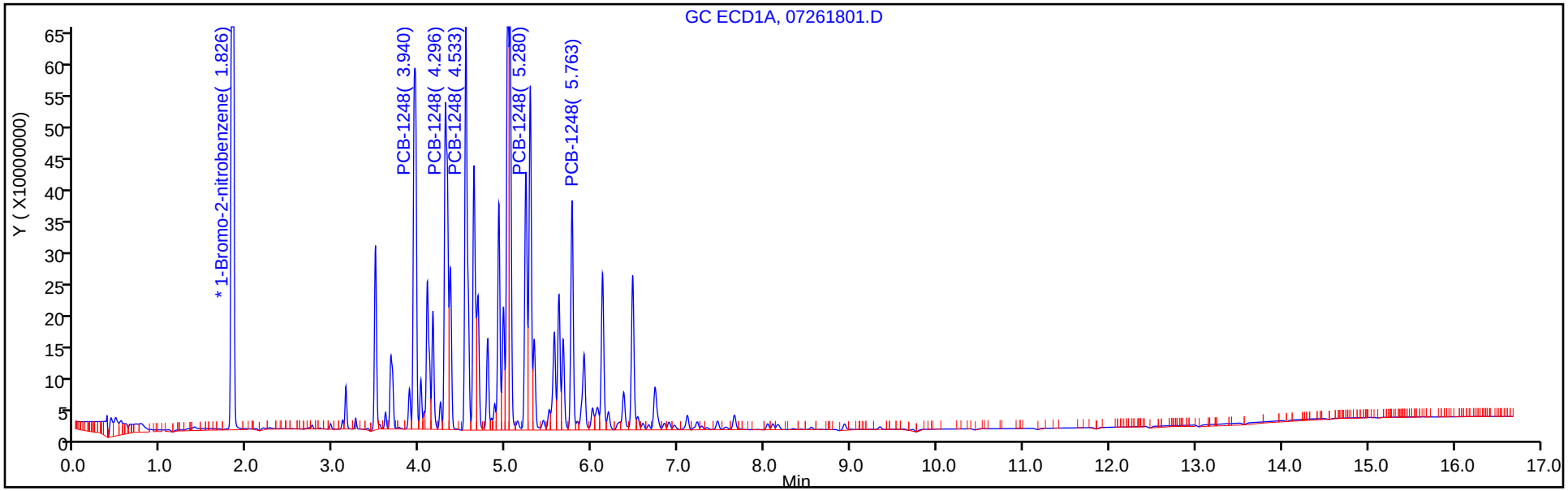
Report Date: 28-Jul-2018 08:57:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

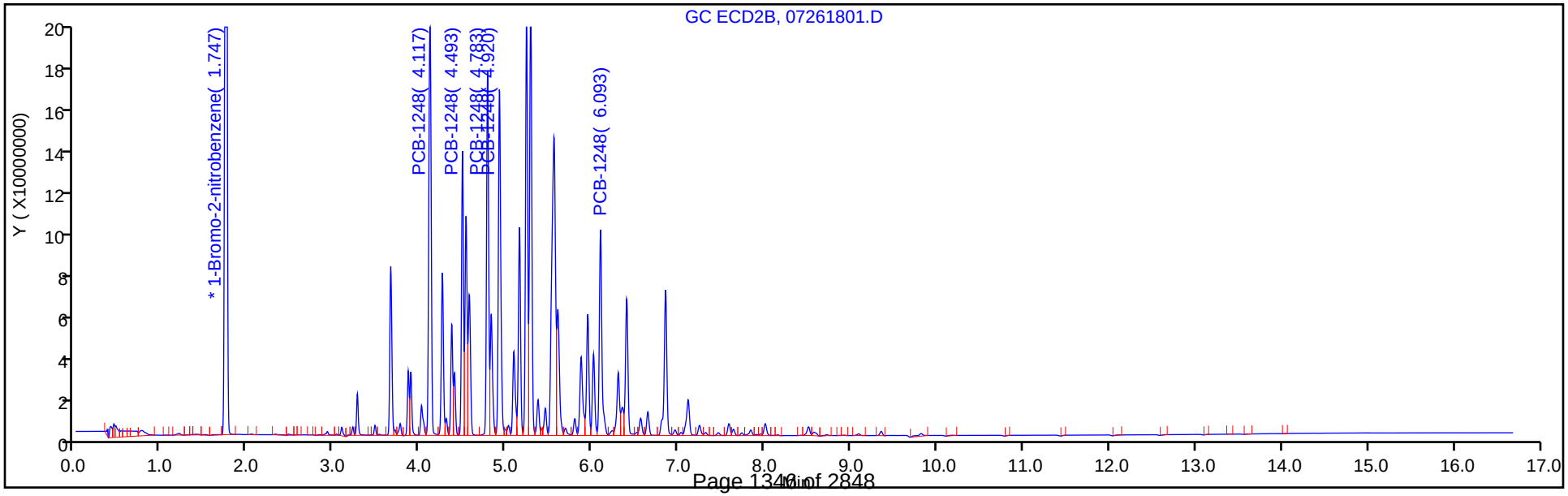
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261801.D

Injection Date:	26-Jul-2018 14:30:30	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL71248			Worklist Smp#:	1
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	1
Method:	PCB_P3	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_P3\20180726-72400.b\07261802.D
Lims ID: STDL61248
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Jul-2018 14:52:24 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL61248
Misc. Info.: 280-0072400-002
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:26 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.822	0.004	3802069986	1000.0	1000.0	
2	1.746	1.746	0.000	952740054	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.939	3.943	-0.004	1069713029	750.0	757.5	
1	4.296	4.296	0.000	1070840366	750.0	755.0	
1	4.533	4.533	0.000	1067064086	750.0	757.5	
1	5.279	5.279	0.000	813404598	750.0	758.6	
1	5.763	5.763	0.000	545692230	750.0	755.9	
		Average of Peak Amounts =				756.9	
2	4.116	4.116	0.000	291718497	750.0	756.7	
2	4.493	4.493	0.000	162930506	750.0	754.9	
2	4.783	4.783	0.000	221815473	750.0	753.0	
2	4.923	4.923	0.000	241932039	750.0	755.4	
2	6.093	6.093	0.000	153778544	750.0	749.8	
		Average of Peak Amounts =				753.9	
						RPD = 0.39	
S 8 Polychlorinated biphenyls, Total							
1						756.9	
2						753.9	
						RPD = 0.39	

Reagents:

AR_1248_L6_00018 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

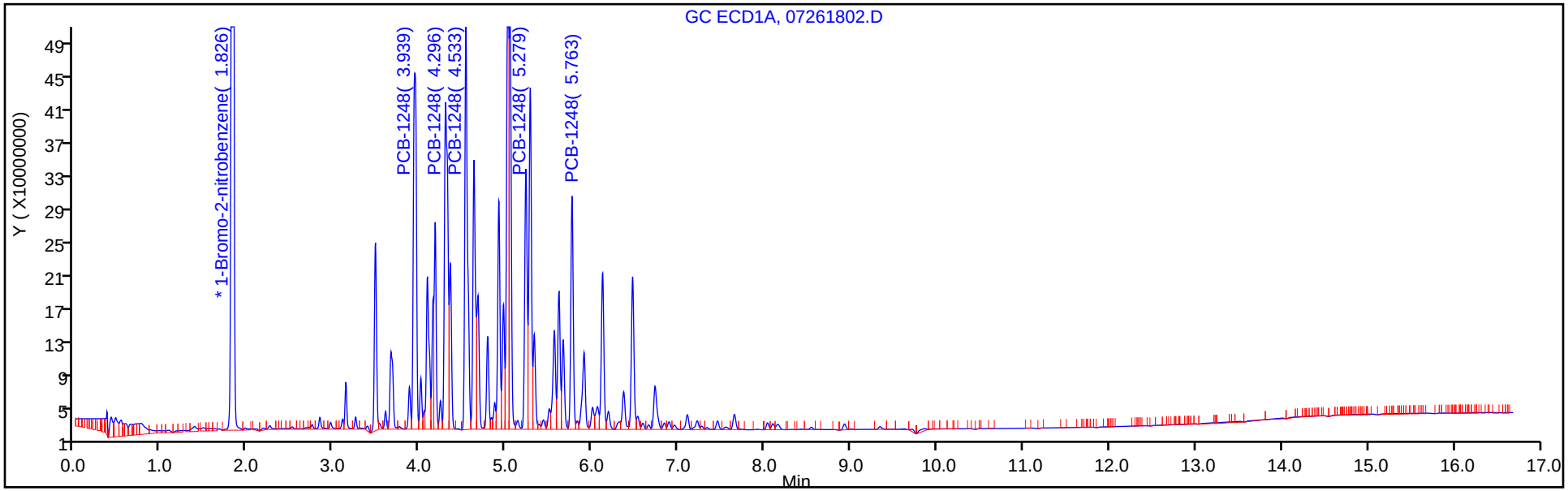
Report Date: 28-Jul-2018 08:57:27 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

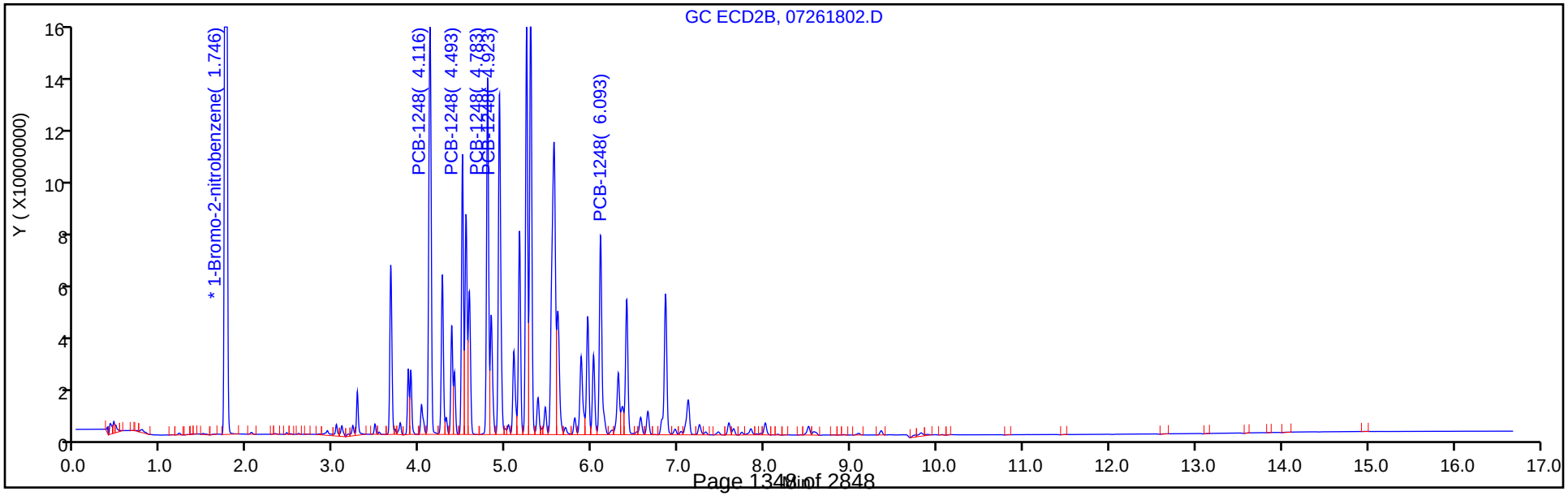
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261802.D

Injection Date:	26-Jul-2018 14:52:24	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL61248			Worklist Smp#:	2
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	2
Method:	PCB_P3	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_P3\20180726-72400.b\07261803.D
Lims ID: STDL51248
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 26-Jul-2018 15:14:18 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL51248
Misc. Info.: 280-0072400-003
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:53:07

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	1.826	1.826	0.000	4030642817	1000.0	1000.0	
2	1.749	1.749	0.000	1007527317	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.943	3.943	0.000	738052958	500.0	489.8	
1	4.296	4.296	0.000	742344885	500.0	489.8	
1	4.533	4.533	0.000	733497845	500.0	486.7	
1	5.279	5.279	0.000	554610126	500.0	484.8	
1	5.763	5.763	0.000	373910443	500.0	485.0	
		Average of Peak Amounts =				487.2	
2	4.116	4.116	0.000	199457121	500.0	486.8	
2	4.493	4.493	0.000	111690891	500.0	485.9	
2	4.783	4.783	0.000	152263931	500.0	484.7	
2	4.923	4.923	0.000	165414321	500.0	485.6	
2	6.093	6.093	0.000	106326159	500.0	486.9	
		Average of Peak Amounts =				486.0	
						RPD = 0.26	

Reagents:

AR_1248_L5_00020 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

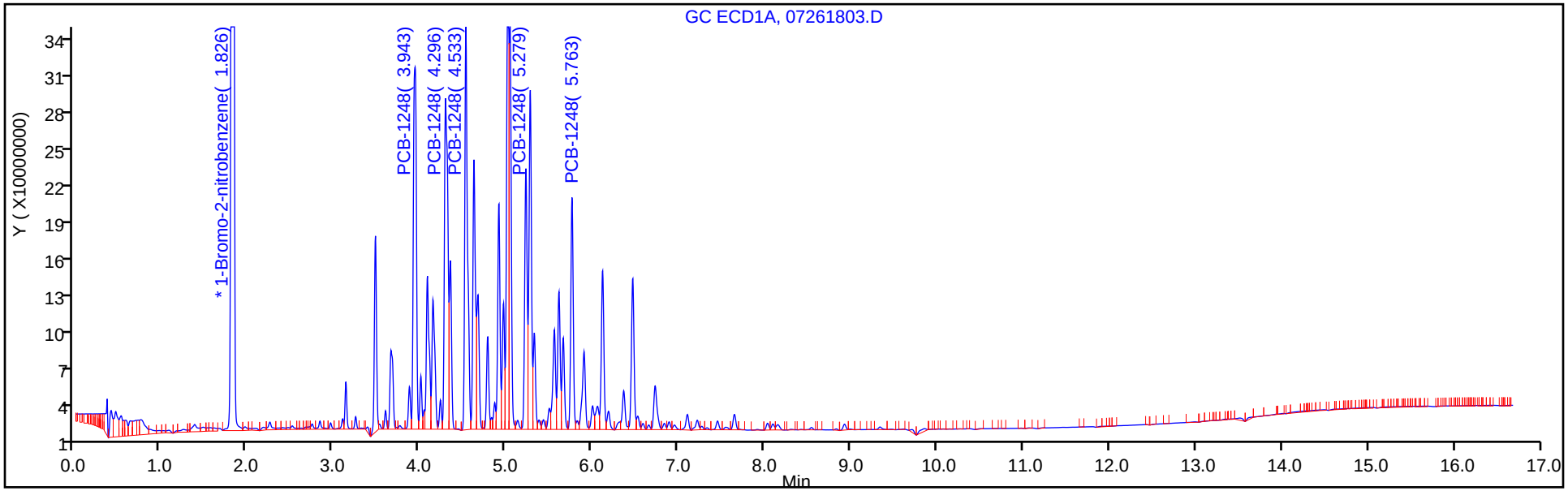
Report Date: 28-Jul-2018 08:57:30 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

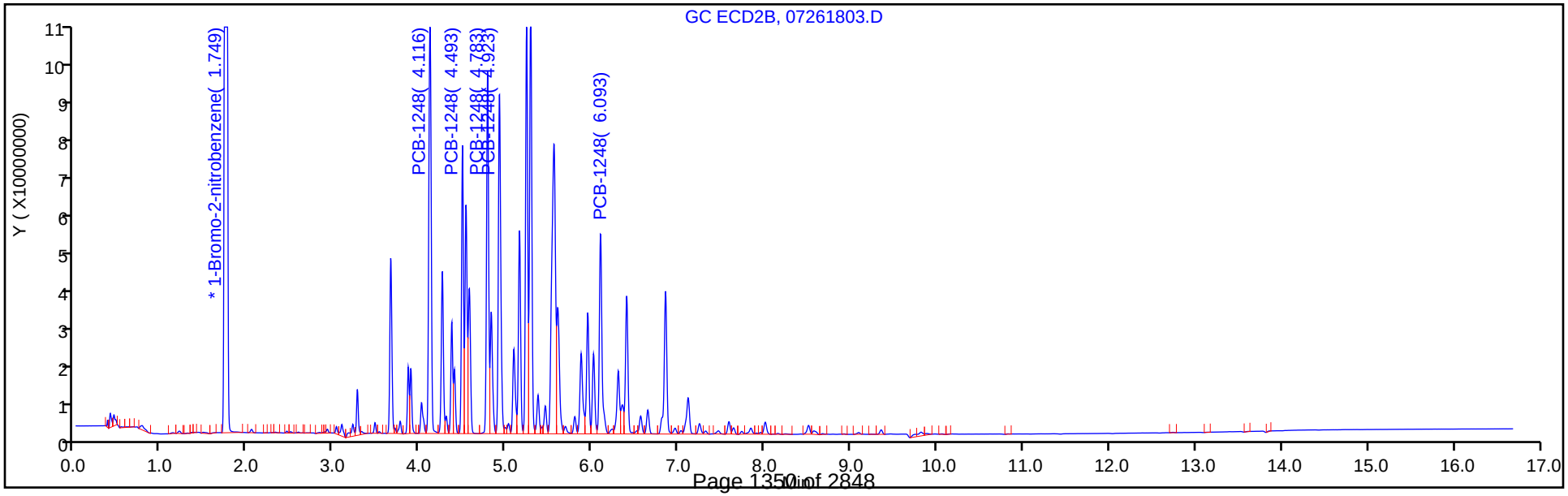
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261803.D

Injection Date:	26-Jul-2018 15:14:18	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL51248			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	3
Method:	PCB_P3	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_P3\20180726-72400.b\07261804.D
Lims ID: STDL41248
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 26-Jul-2018 15:36:13 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL41248
Misc. Info.: 280-0072400-004
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:31 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.826	0.000	4107889787	1000.0	1000.0	
2	1.749	1.749	0.000	1025850863	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.942	3.943	-0.001	381558898	250.0	243.9	
1	4.296	4.296	0.000	391374857	250.0	247.9	
1	4.532	4.533	-0.001	387989583	250.0	246.5	
1	5.279	5.279	0.000	293311879	250.0	247.4	
1	5.762	5.763	-0.001	197663678	250.0	246.8	
		Average of Peak Amounts =				246.5	
2	4.116	4.116	0.000	101770593	250.0	240.4	
2	4.492	4.493	-0.001	58113563	250.0	243.5	
2	4.782	4.783	-0.001	78999080	250.0	241.2	
2	4.919	4.923	-0.004	84923943	250.0	241.0	
2	6.092	6.093	-0.001	55689720	250.0	245.7	
		Average of Peak Amounts =				242.4	
						RPD = 1.68	
S 8 Polychlorinated biphenyls, Total							
1						246.5	
2						242.4	
						RPD = 1.68	

Reagents:

AR_1248_L4_00021 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

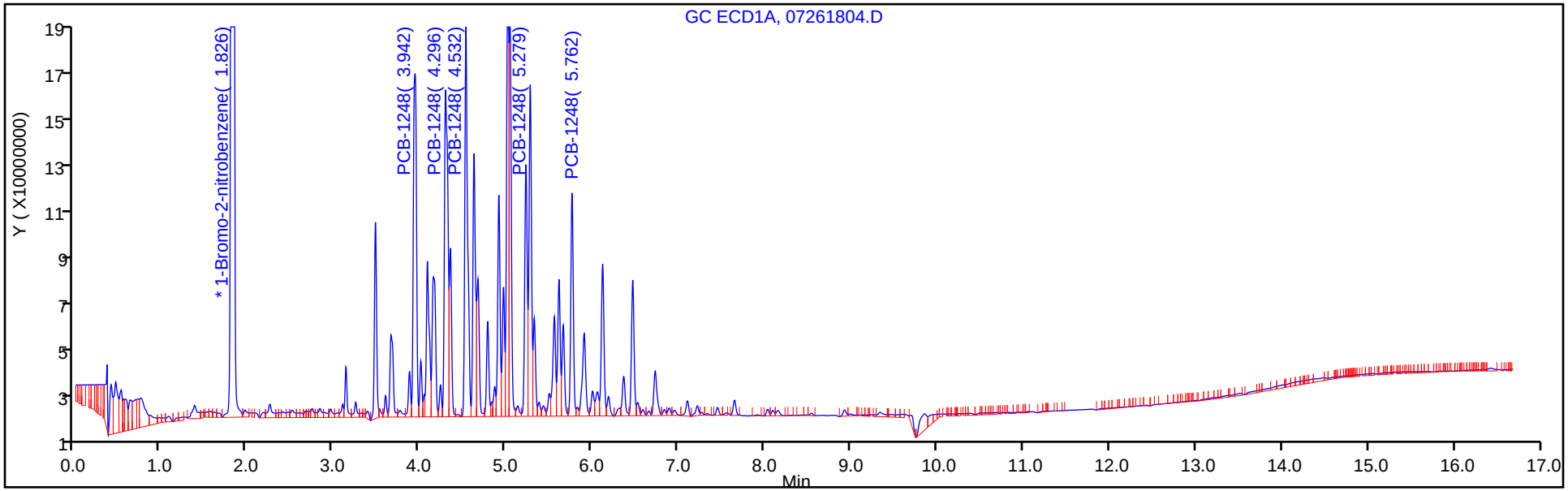
Report Date: 28-Jul-2018 08:57:32 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

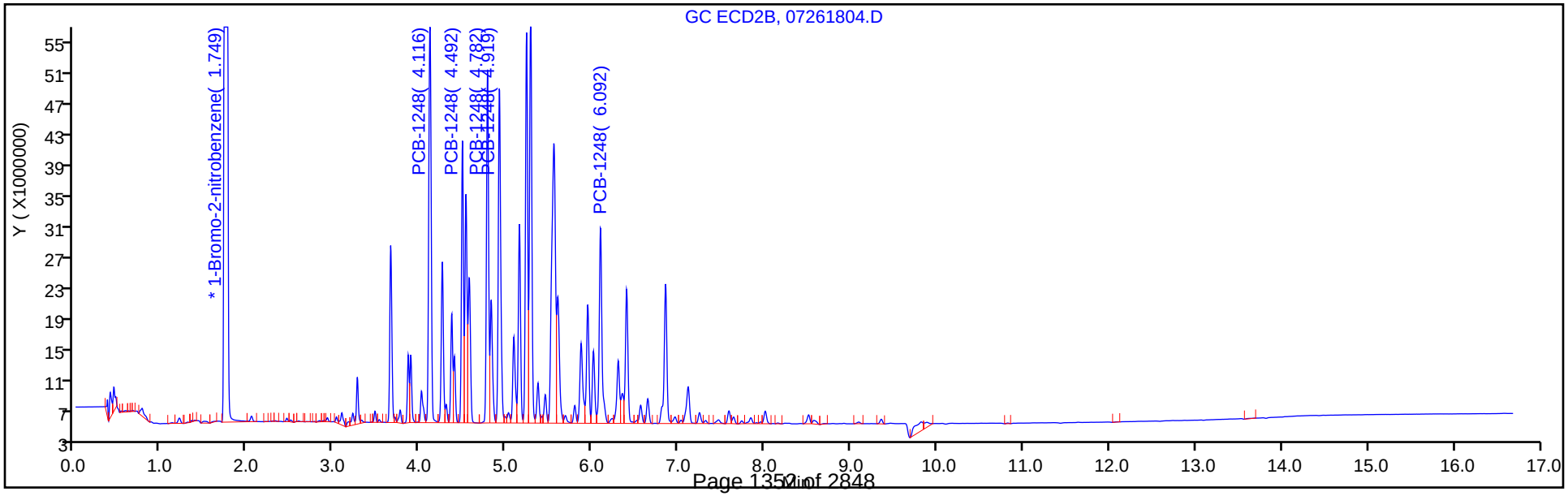
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261804.D

Injection Date:	26-Jul-2018 15:36:13	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL41248			Worklist Smp#:	4
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	4
Method:	PCB_P3	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_P3\20180726-72400.b\07261805.D
Lims ID: STDL31248
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Jul-2018 15:58:08 ALS Bottle#: 5 Worklist Smp#: 5
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL31248
Misc. Info.: 280-0072400-005
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:35 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.826	0.000	4015030166	1000.0	1000.0	
2	1.746	1.749	-0.003	1017467318	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.942	3.943	-0.001	160461812	100.0	99.6	
1	4.296	4.296	0.000	166984160	100.0	101.9	
1	4.532	4.533	-0.001	167022358	100.0	101.4	
1	5.279	5.279	0.000	123932521	100.0	102.0	
1	5.762	5.763	-0.001	82529606	100.0	99.7	
		Average of Peak Amounts =				100.9	
2	4.116	4.116	0.000	43836014	100.0	100.4	
2	4.492	4.493	-0.001	25353445	100.0	101.6	
2	4.782	4.783	-0.001	34764138	100.0	100.5	
2	4.919	4.923	-0.004	37377143	100.0	102.6	
2	6.096	6.093	0.003	23939193	100.0	101.0	
		Average of Peak Amounts =				101.2	
						RPD = 0.29	
S 8 Polychlorinated biphenyls, Total							
1						100.9	
2						101.2	
						RPD = 0.29	

Reagents:

AR_1248_L3_00020 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

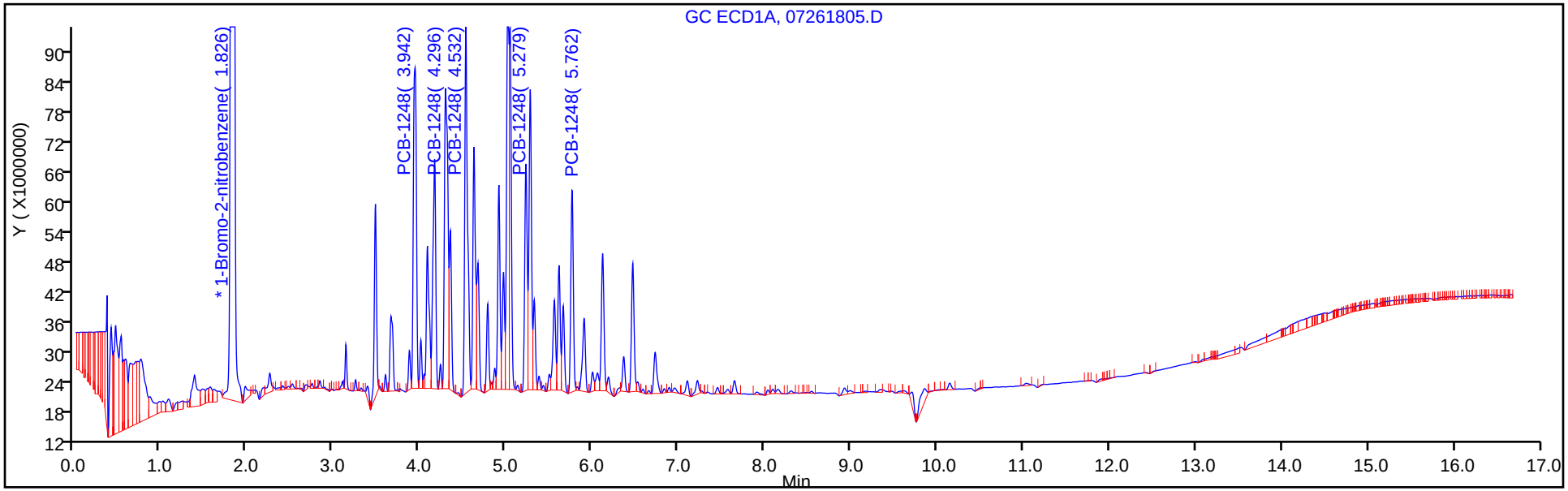
Report Date: 28-Jul-2018 08:57:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

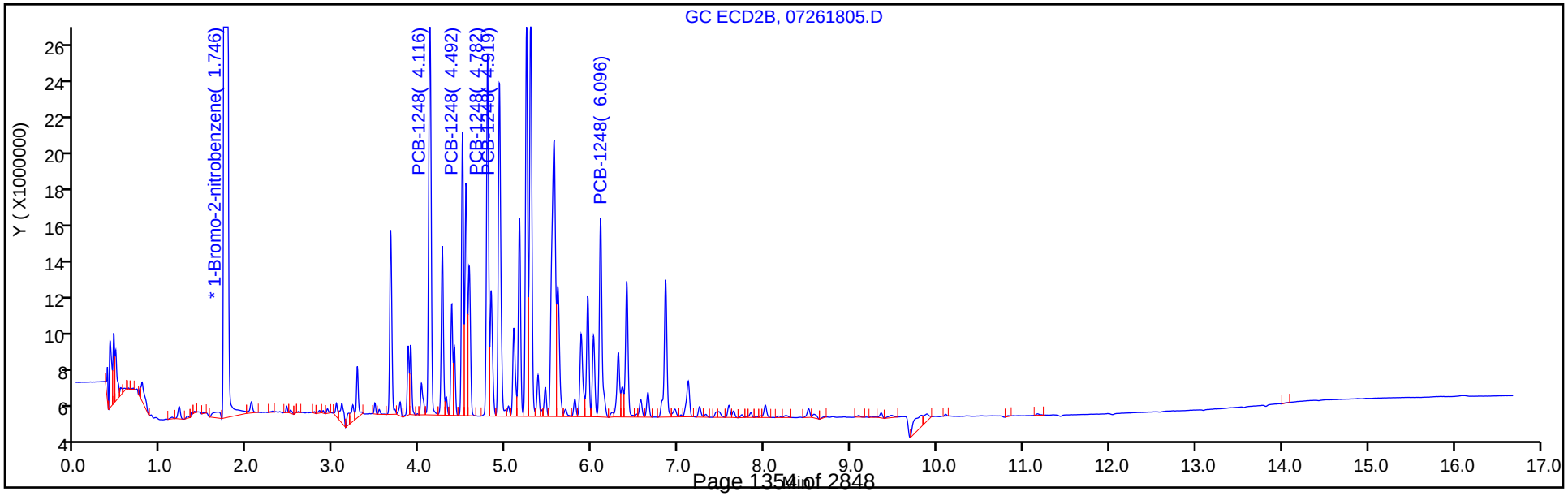
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261805.D

Injection Date:	26-Jul-2018 15:58:08	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL31248			Worklist Smp#:	5
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	5
Method:	PCB_P3	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_P3\20180726-72400.b\07261806.D
Lims ID: STDL21248
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Jul-2018 16:20:03 ALS Bottle#: 6 Worklist Smp#: 6
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL21248
Misc. Info.: 280-0072400-006
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:37 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.826	0.000	3972801839	1000.0	1000.0	
2	1.750	1.749	0.001	1015572853	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.943	3.943	0.000	88221840	50.0	51.2	
1	4.296	4.296	0.000	91321574	50.0	51.3	
1	4.533	4.533	0.000	94853715	50.0	52.8	
1	5.280	5.279	0.001	65556937	50.0	50.5	
1	5.763	5.763	0.000	46378855	50.0	52.3	
		Average of Peak Amounts =				51.6	
2	4.116	4.116	0.000	24364139	50.0	52.8	
2	4.493	4.493	0.000	14414113	50.0	53.6	
2	4.783	4.783	0.000	20407018	50.0	54.3	
2	4.920	4.923	-0.003	20808605	50.0	53.8	
2	6.093	6.093	0.000	13487869	50.0	52.8	
		Average of Peak Amounts =				53.5	
						RPD = 3.50	
S 8 Polychlorinated biphenyls, Total							
1						51.6	
2						53.5	
						RPD = 3.50	

Reagents:

AR_1248_L2_00020 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

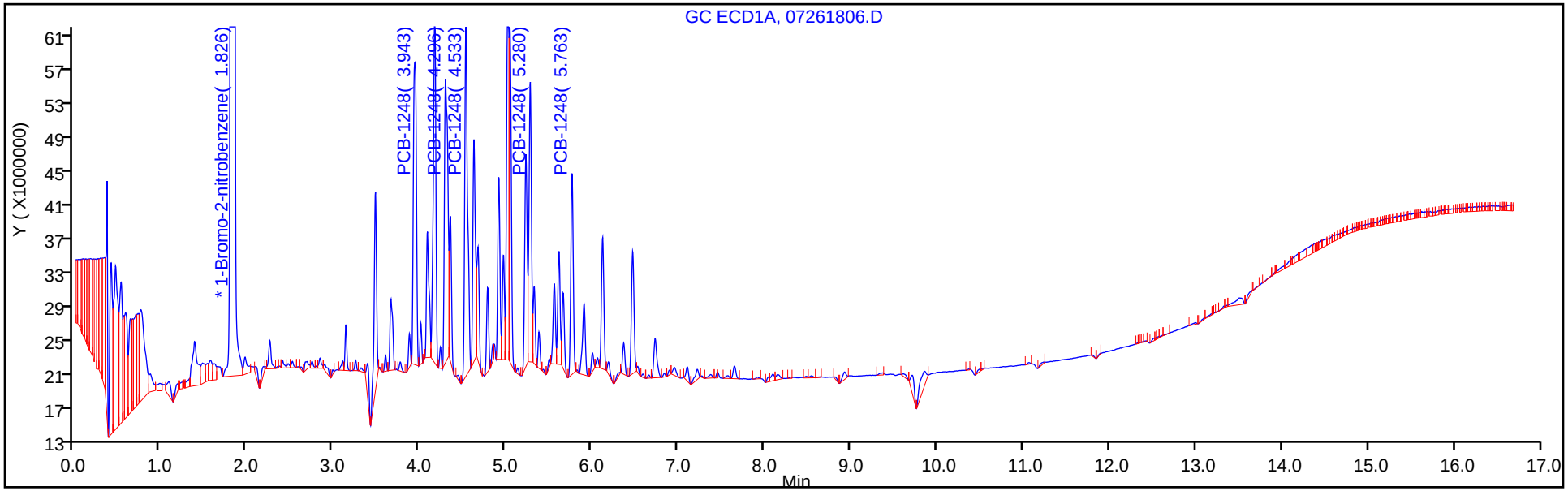
Report Date: 28-Jul-2018 08:57:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

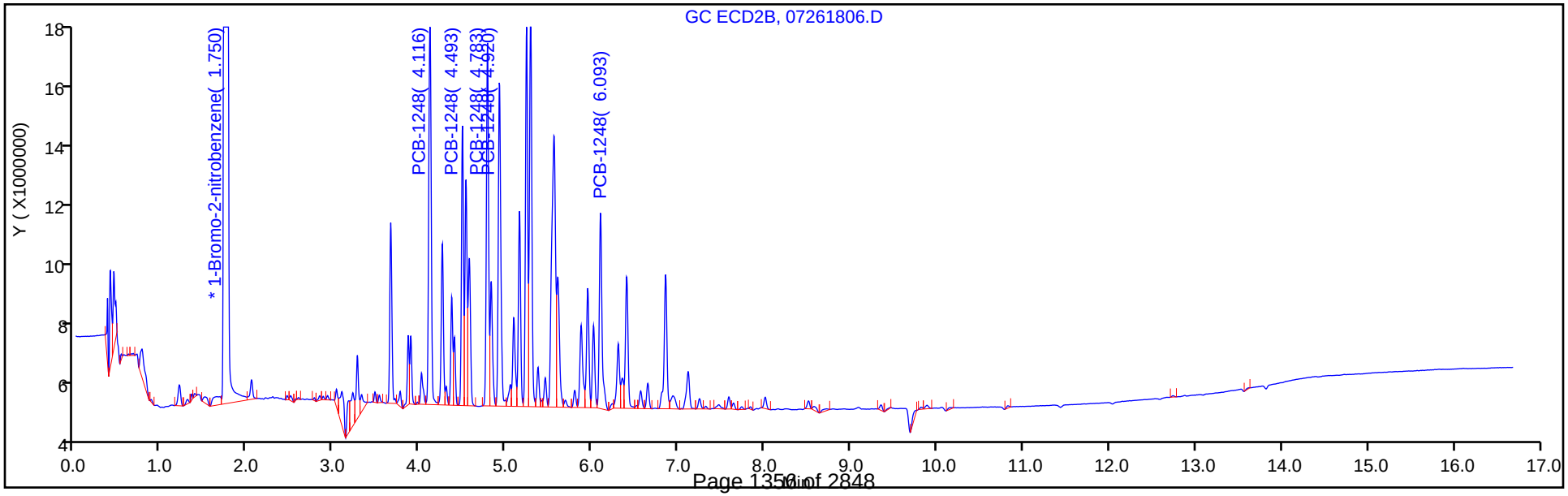
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261806.D

Injection Date:	26-Jul-2018 16:20:03	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL21248			Worklist Smp#:	6
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	6
Method:	PCB_P3	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_P3\20180726-72400.b\07261807.D
Lims ID: STDL11248
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 26-Jul-2018 16:41:59 ALS Bottle#: 7 Worklist Smp#: 7
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL11248
Misc. Info.: 280-0072400-007
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub2

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:39 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 12:41:03

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	1.826	1.826	0.000	3858753962	1000.0	1000.0	
2	1.746	1.749	-0.003	987751476	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.939	3.943	-0.004	48741664	25.0	25.1	
1	4.296	4.296	0.000	50486020	25.0	24.3	
1	4.533	4.533	0.000	51456224	25.0	23.9	
1	5.279	5.279	0.000	36079565	25.0	24.8	
1	5.766	5.763	0.003	24935530	25.0	24.5	
		Average of Peak Amounts =				24.5	
2	4.116	4.116	0.000	12543330	25.0	24.6	
2	4.493	4.493	0.000	7406962	25.0	23.7	
2	4.783	4.783	0.000	10669410	25.0	23.8	
2	4.923	4.923	0.000	10292379	25.0	23.5	
2	6.096	6.093	0.003	7097060	25.0	24.1	
		Average of Peak Amounts =				23.9	
						RPD = 2.43	
S 8 Polychlorinated biphenyls, Total							
1						24.5	
2						23.9	
						RPD = 2.43	

Reagents:

AR_1248_L1_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

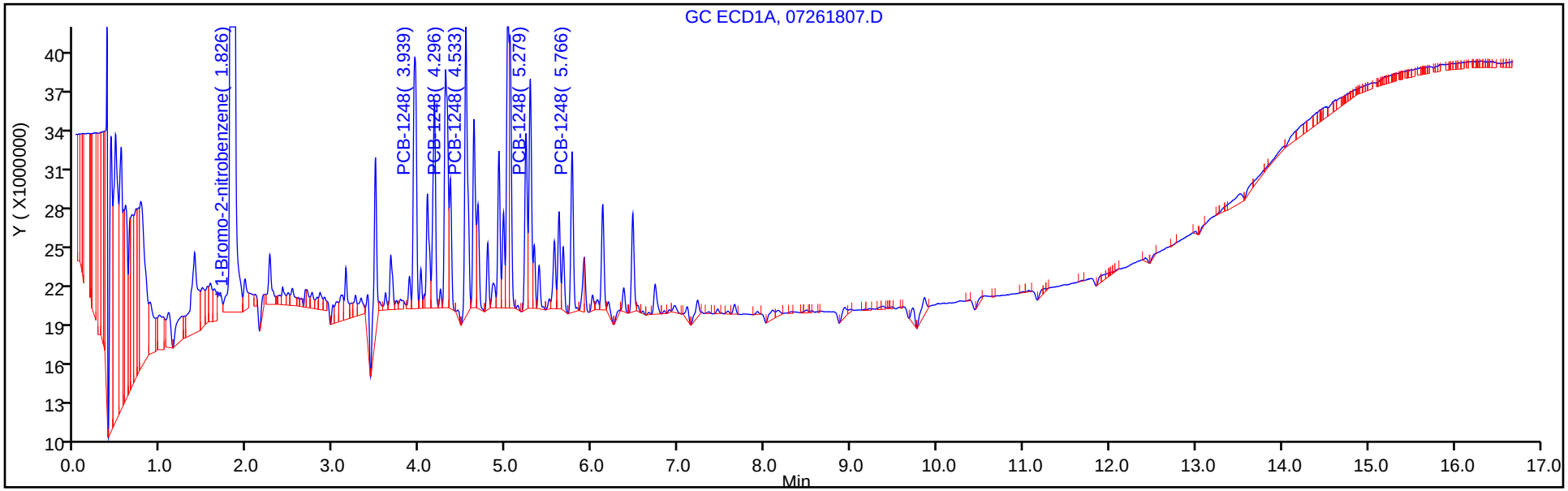
Report Date: 28-Jul-2018 08:57:40 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

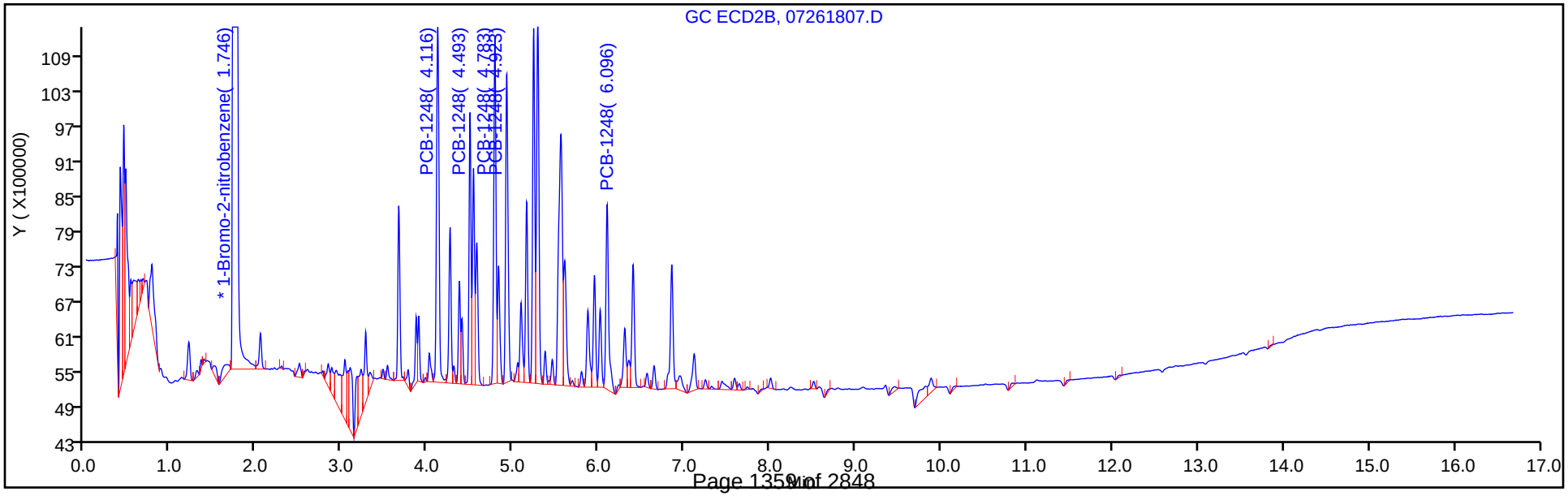
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261807.D

Injection Date:	26-Jul-2018 16:41:59	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL11248			Worklist Smp#:	7
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	7
Method:	PCB_P3	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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 17:03 Calibration End Date: 07/26/2018 19:15 Calibration ID: 33198

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL12154 280-423815/14	07261814.D
Level 2	STDL22154 280-423815/13	07261813.D
Level 3	STDL32154 280-423815/12	07261812.D
Level 4	STDL42154 280-423815/11	07261811.D
Level 5	STDL52154 280-423815/10	07261810.D
Level 6	STDL62154 280-423815/9	07261809.D
Level 7	STDL72154 280-423815/8	07261808.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	+++++ 0.0857	0.1285 0.0775	0.1019	0.1004	0.0886	Lin1	2.7013	0.0798							0.9940		0.9900
PCB-1221 Peak 2	+++++ 0.0575	0.1048 0.0570	0.0776	0.0684	0.0603	Lin1	2.5248	0.0548							0.9990		0.9900
PCB-1221 Peak 3	+++++ 0.2013	0.3345 0.2011	0.2655	0.2480	0.2180	Lin1	7.5144	0.1967							0.9970		0.9900
PCB-1254 Peak 1	0.5824 0.4061	0.5767 0.4111	0.4362	0.4393	0.4074	Lin1	5.6354	0.4025							0.9990		0.9900
PCB-1254 Peak 2	0.4606 0.3307	0.4569 0.3353	0.3568	0.3589	0.3327	Lin1	4.1992	0.3290							0.9990		0.9900
PCB-1254 Peak 3	0.7659 0.5915	0.7731 0.6059	0.6152	0.6254	0.5896	Lin1	5.4555	0.5913							0.9990		0.9900
PCB-1254 Peak 4	0.5424 0.3994	0.5413 0.4051	0.4289	0.4312	0.4017	Lin1	4.6630	0.3978							0.9990		0.9900
PCB-1254 Peak 5	0.8019 0.6201	0.8091 0.6334	0.6454	0.6547	0.6190	Lin1	5.7243	0.6193							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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 17:03 Calibration End Date: 07/26/2018 19:15 Calibration ID: 33198

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL12154 280-423815/14	07261814.D
Level 2	STDL22154 280-423815/13	07261813.D
Level 3	STDL32154 280-423815/12	07261812.D
Level 4	STDL42154 280-423815/11	07261811.D
Level 5	STDL52154 280-423815/10	07261810.D
Level 6	STDL62154 280-423815/9	07261809.D
Level 7	STDL72154 280-423815/8	07261808.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	+++++ 248708917	23711103 292066279	41152608	97141411	176374457	+++++ 750	50.0 1000	100	250	500
PCB-1221 Peak 2	BNB	Lin1	+++++ 167065128	19345080 214809521	31337662	66197390	120015483	+++++ 750	50.0 1000	100	250	500
PCB-1221 Peak 3	BNB	Lin1	+++++ 584613581	61712498 757680417	107173792	240097727	434220484	+++++ 750	50.0 1000	100	250	500
PCB-1254 Peak 1	BNB	Lin1	52975306 1179204419	106406554 1548685078	176124811	425252844	811250358	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 2	BNB	Lin1	41896653 960142986	84309193 1263159189	144038285	347457956	662653862	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 3	BNB	Lin1	69675539 1717640087	142643324 2282182979	248370990	605400484	1174214073	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 4	BNB	Lin1	49339811 1159799236	99872861 1525787142	173151350	417427148	800025258	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 5	BNB	Lin1	72943911 1800662050	149281422 2385964005	260562608	633749653	1232800716	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_P3\20180726-72400.b\07261808.D
Lims ID: STDL72154
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 26-Jul-2018 17:03:53 ALS Bottle#: 8 Worklist Smp#: 8
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL72154
Misc. Info.: 280-0072400-008
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:42 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.826	-0.001	3766883063	1000.0	1000.0	
2	1.746	1.749	-0.003	965706449	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.959	2.962	-0.003	292066279	1000.0	937.4	
1	3.102	3.102	0.000	214809521	1000.0	994.3	
1	3.139	3.139	0.000	757680417	1000.0	984.2	
		Average of Peak Amounts =				972.0	
2	3.089	3.092	-0.003	100349693	1000.0	974.5	
2	3.219	3.219	0.000	60904852	1000.0	929.6	
2	3.272	3.272	0.000	223269697	1000.0	967.8	
		Average of Peak Amounts =				957.3	
						RPD = 1.52	
9 PCB-1254							
1	5.282	5.282	0.000	1548685078	1000.0	1007.4	
1	5.612	5.612	0.000	1263159189	1000.0	1006.5	
1	5.765	5.762	0.003	2282182979	1000.0	1015.3	
1	6.362	6.362	0.000	1525787142	1000.0	1006.5	
1	6.729	6.728	0.001	2385964005	1000.0	1013.5	
		Average of Peak Amounts =				1009.8	
2	5.526	5.525	0.001	416361808	1000.0	1001.3	
2	5.946	5.945	0.001	315490545	1000.0	1005.8	
2	6.096	6.092	0.004	593748945	1000.0	1003.6	
2	6.642	6.642	0.000	247087804	1000.0	1002.5	
2	7.112	7.112	0.000	619422196	1000.0	1008.9	
		Average of Peak Amounts =				1004.5	
						RPD = 0.53	

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						1981.8	
2						1961.7	
						RPD = 1.02	

Reagents:

AR_2154_L7_00016	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

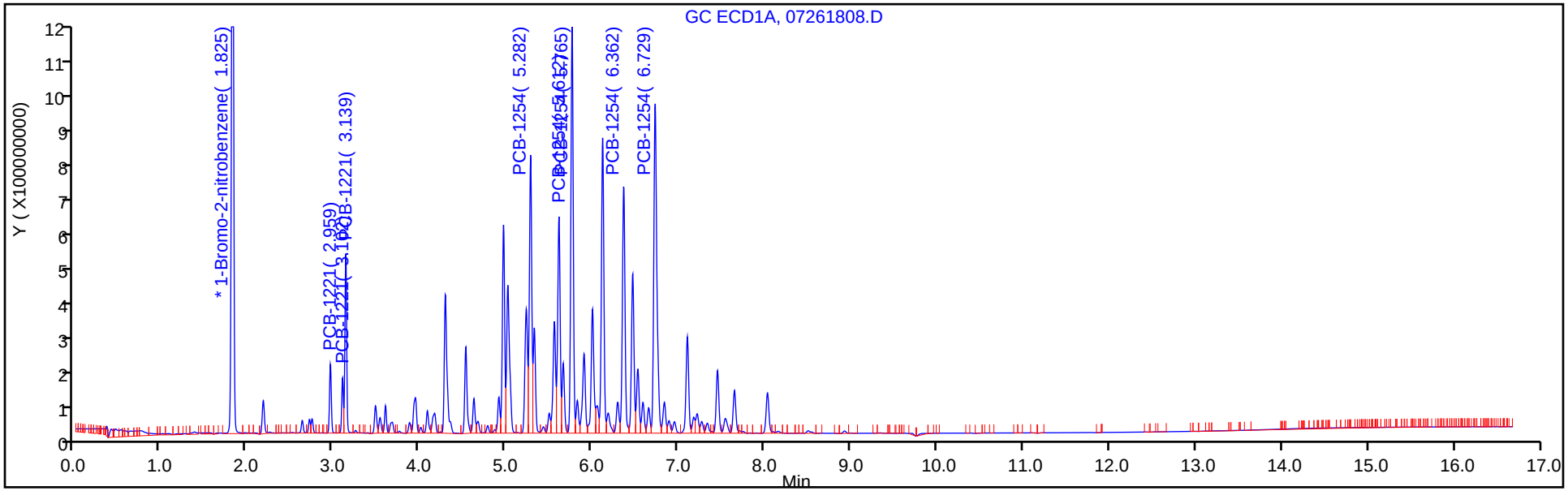
Report Date: 28-Jul-2018 08:57:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

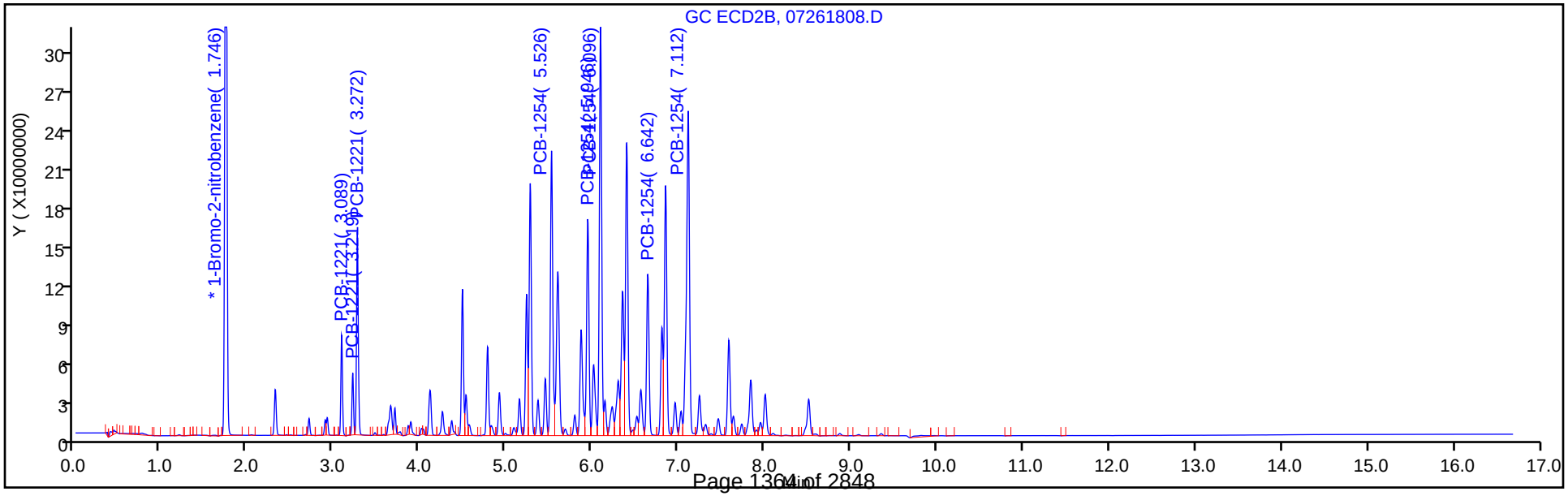
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261808.D

Injection Date:	26-Jul-2018 17:03:53	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL72154			Worklist Smp#:	8
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	8
Method:	PCB_P3	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_P3\20180726-72400.b\07261809.D
Lims ID: STDL62154
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Jul-2018 17:25:48 ALS Bottle#: 9 Worklist Smp#: 9
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL62154
Misc. Info.: 280-0072400-009
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:45 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.826	-0.001	3871662869	1000.0	1000.0	
2	1.745	1.749	-0.004	983732805	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.962	2.962	0.000	248708917	750.0	770.8	
1	3.102	3.102	0.000	167065128	750.0	741.1	
1	3.138	3.139	-0.001	584613581	750.0	729.3	
		Average of Peak Amounts =				747.1	
2	3.092	3.092	0.000	81026620	750.0	766.6	
2	3.218	3.219	-0.001	54154941	750.0	807.8	
2	3.272	3.272	0.000	182585001	750.0	771.9	
		Average of Peak Amounts =				782.1	
						RPD = 4.58	
9 PCB-1254							
1	5.282	5.282	0.000	1179204419	750.0	742.6	
1	5.612	5.612	0.000	960142986	750.0	741.0	
1	5.765	5.762	0.003	1717640087	750.0	741.0	
1	6.365	6.362	0.003	1159799236	750.0	741.3	
1	6.728	6.728	0.000	1800662050	750.0	741.7	
		Average of Peak Amounts =				741.5	
2	5.525	5.525	0.000	315875459	750.0	743.1	
2	5.945	5.945	0.000	237674095	750.0	741.8	
2	6.095	6.092	0.003	448690677	750.0	742.6	
2	6.642	6.642	0.000	186412255	750.0	739.8	
2	7.112	7.112	0.000	466264135	750.0	743.7	
		Average of Peak Amounts =				742.2	
						RPD = 0.09	

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						1488.6	
2						1524.3	
						RPD = 2.37	

Reagents:

AR_2154_L6_00018	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

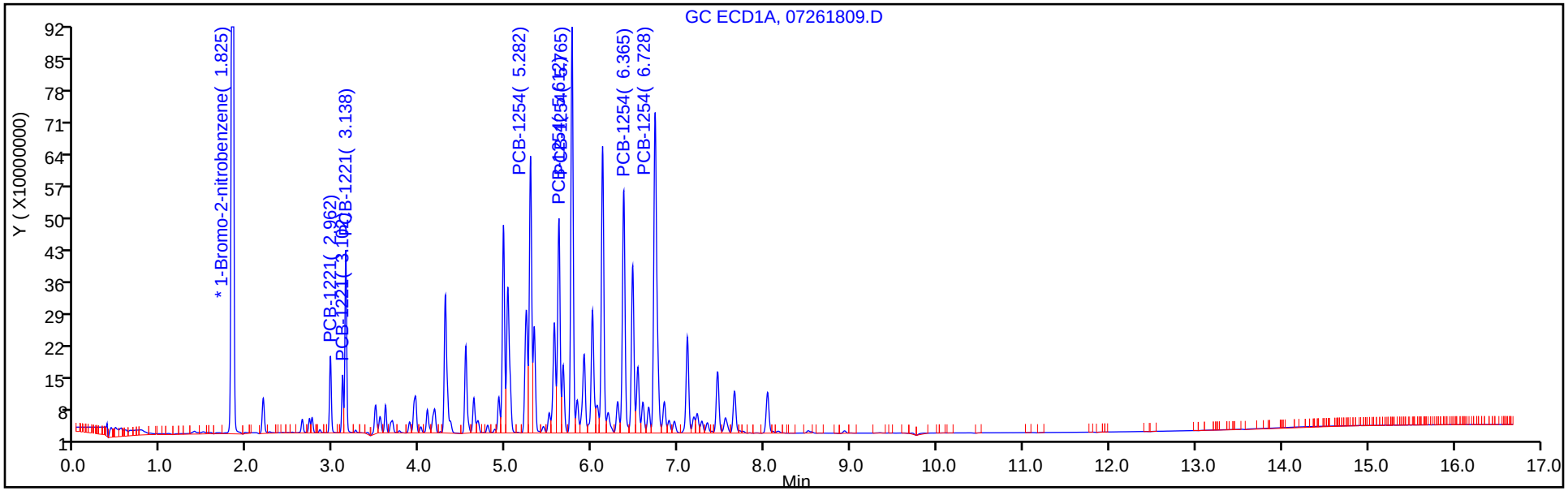
Report Date: 28-Jul-2018 08:57:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

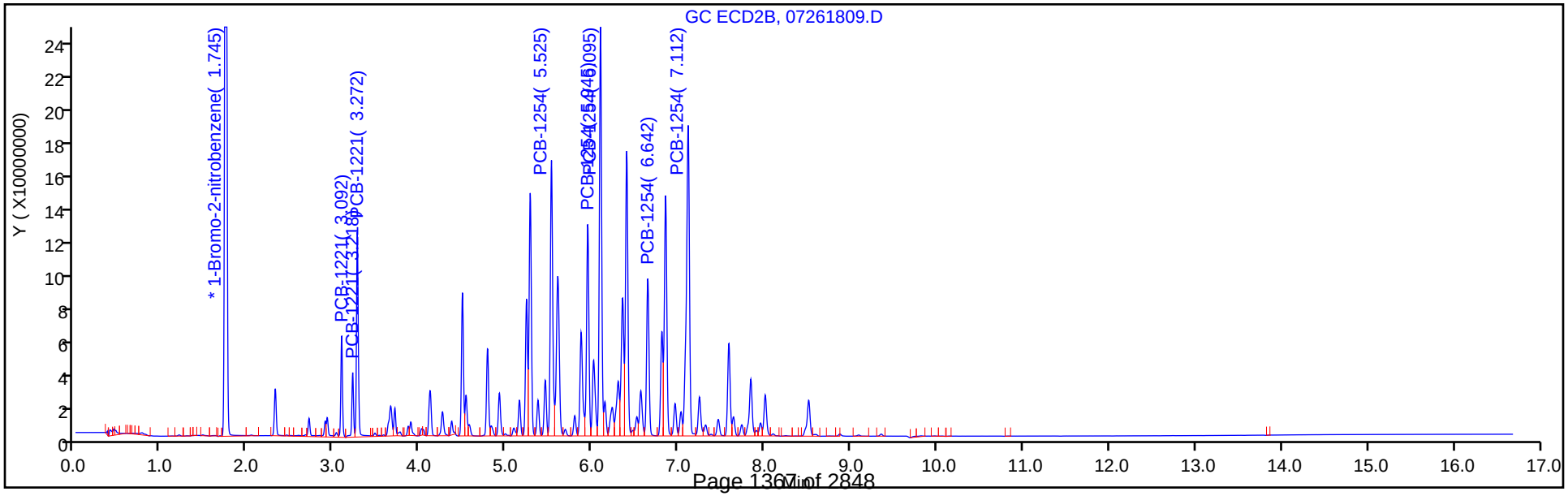
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261809.D

Injection Date:	26-Jul-2018 17:25:48	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL62154			Worklist Smp#:	9
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	9
Method:	PCB_P3	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_P3\20180726-72400.b\07261810.D
Lims ID: STDL52154
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 26-Jul-2018 17:47:43 ALS Bottle#: 10 Worklist Smp#: 10
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL52154
Misc. Info.: 280-0072400-010
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:47 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:53:29

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	1.825	1.825	0.000	3982970204	1000.0	1000.0	
2	1.745	1.745	0.000	1007590600	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.962	2.962	0.000	176374457	500.0	520.9	
1	3.102	3.102	0.000	120015483	500.0	503.6	
1	3.139	3.139	0.000	434220484	500.0	515.9	
		Average of Peak Amounts =				513.5	
2	3.092	3.092	0.000	55080697	500.0	499.5	
2	3.219	3.219	0.000	35520273	500.0	506.8	
2	3.272	3.272	0.000	123500201	500.0	501.1	
		Average of Peak Amounts =				502.4	
						RPD = 2.17	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.282	5.282	0.000	811250358	500.0	492.0	
1	5.612	5.612	0.000	662653862	500.0	492.9	
1	5.762	5.762	0.000	1174214073	500.0	489.3	
1	6.362	6.362	0.000	800025258	500.0	493.2	
1	6.728	6.728	0.000	1232800716	500.0	490.5	
		Average of Peak Amounts =				491.6	
2	5.525	5.525	0.000	217391228	500.0	495.9	
2	5.945	5.945	0.000	163018585	500.0	494.1	
2	6.092	6.092	0.000	309777395	500.0	498.2	
2	6.642	6.642	0.000	128100525	500.0	493.0	
2	7.112	7.112	0.000	318447726	500.0	493.5	
		Average of Peak Amounts =				494.9	
						RPD = 0.68	

Reagents:

AR_2154_L5_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

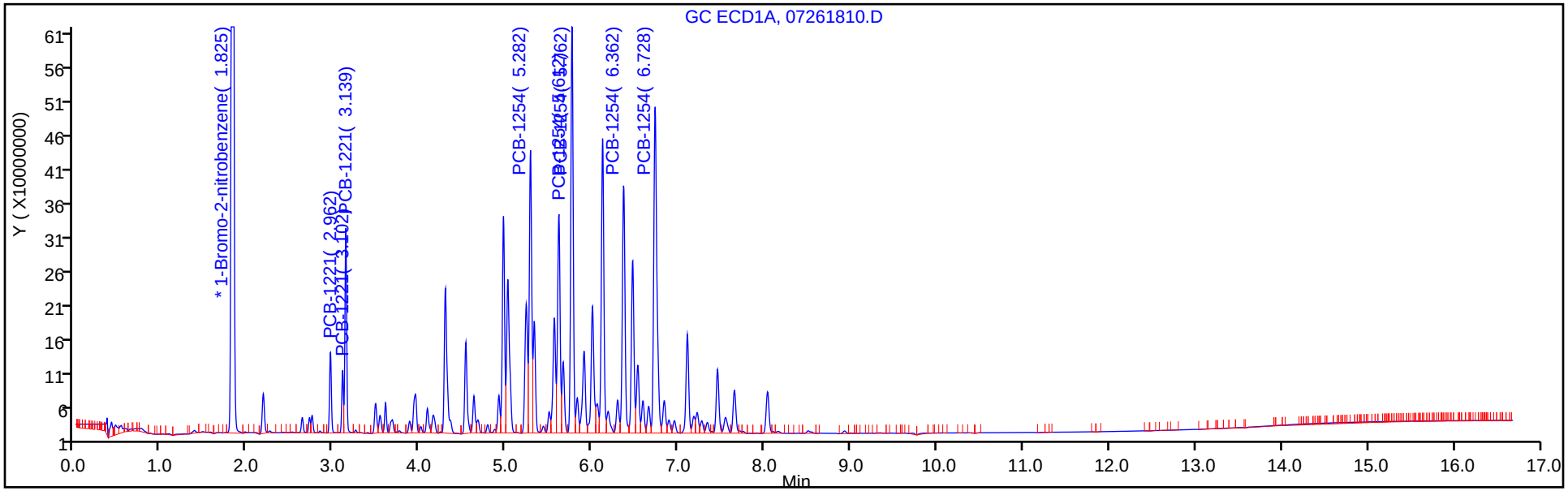
Report Date: 28-Jul-2018 08:57:48 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

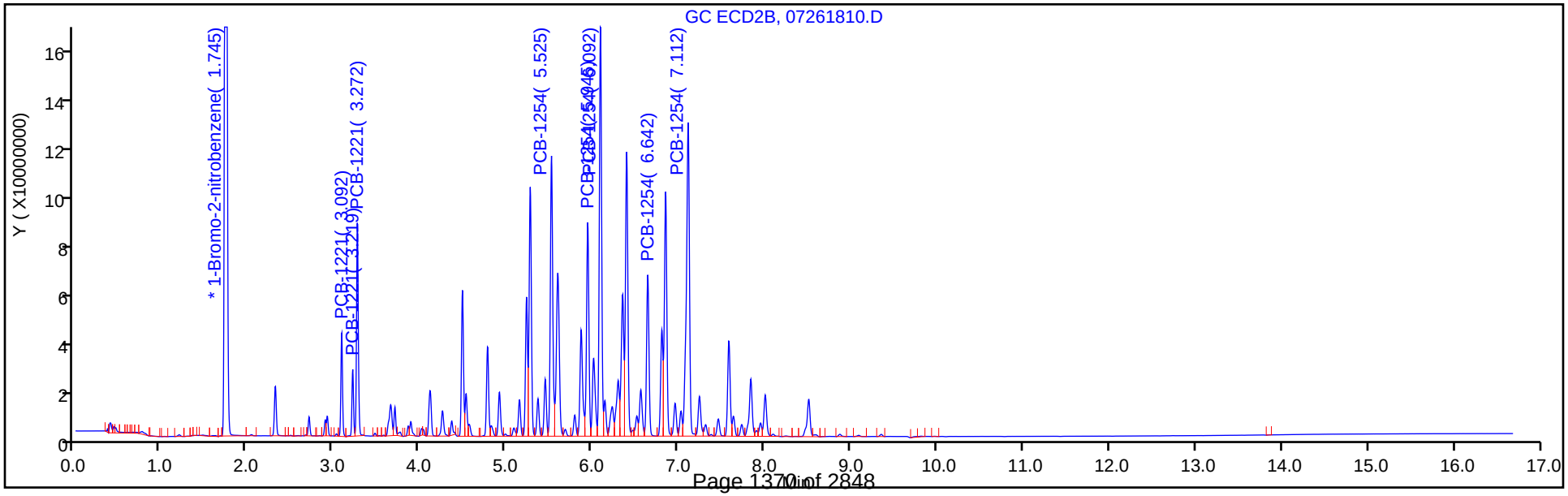
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261810.D

Injection Date:	26-Jul-2018 17:47:43	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL52154			Worklist Smp#:	10
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	10
Method:	PCB_P3	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_P3\20180726-72400.b\07261811.D
Lims ID: STDL42154
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 26-Jul-2018 18:09:38 ALS Bottle#: 11 Worklist Smp#: 11
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL42154
Misc. Info.: 280-0072400-011
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:50 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:57:51

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	1.825	1.825	0.000	3871961289	1000.0	1000.0	
2	1.746	1.745	0.001	992434657	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							M
1	2.959	2.962	-0.003	97141411	250.0	280.4	
1	3.102	3.102	0.000	66197390	250.0	265.8	
1	3.139	3.139	0.000	240097727	250.0	277.0	
		Average of Peak Amounts =				274.4	
2	3.092	3.092	0.000	29356878	250.0	257.5	M
2	3.219	3.219	0.000	18791227	250.0	258.8	M
2	3.272	3.272	0.000	67558101	250.0	266.9	M
		Average of Peak Amounts =				261.1	
						RPD = 4.99	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.282	5.282	0.000	425252844	250.0	258.8	
1	5.612	5.612	0.000	347457956	250.0	260.0	
1	5.762	5.762	0.000	605400484	250.0	255.2	
1	6.362	6.362	0.000	417427148	250.0	259.3	
1	6.729	6.728	0.001	633749653	250.0	255.0	
		Average of Peak Amounts =				257.7	
2	5.526	5.525	0.001	114176349	250.0	259.6	
2	5.946	5.945	0.001	85188473	250.0	258.4	
2	6.096	6.092	0.004	159145339	250.0	256.3	
2	6.642	6.642	0.000	68837632	250.0	264.3	
2	7.112	7.112	0.000	163768656	250.0	254.3	
		Average of Peak Amounts =				258.6	
						RPD = 0.34	
S 8 Polychlorinated biphenyls, Total							
1						532.1	
2						519.6	
						RPD = 2.37	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_2154_L4_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

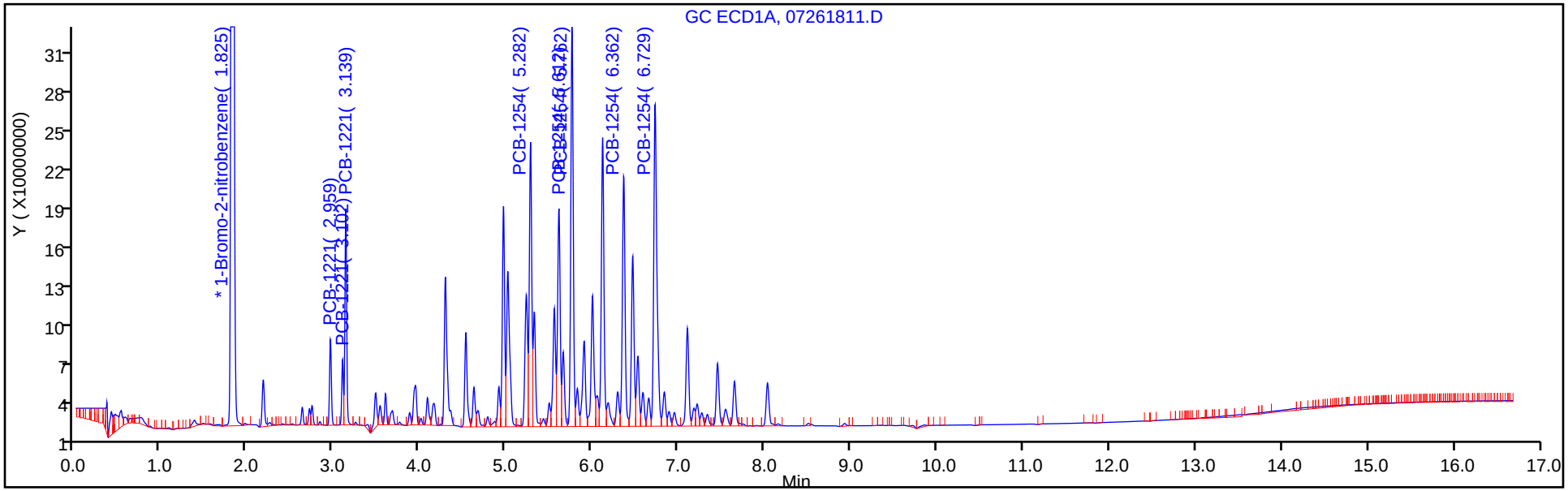
Report Date: 28-Jul-2018 08:57:51 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

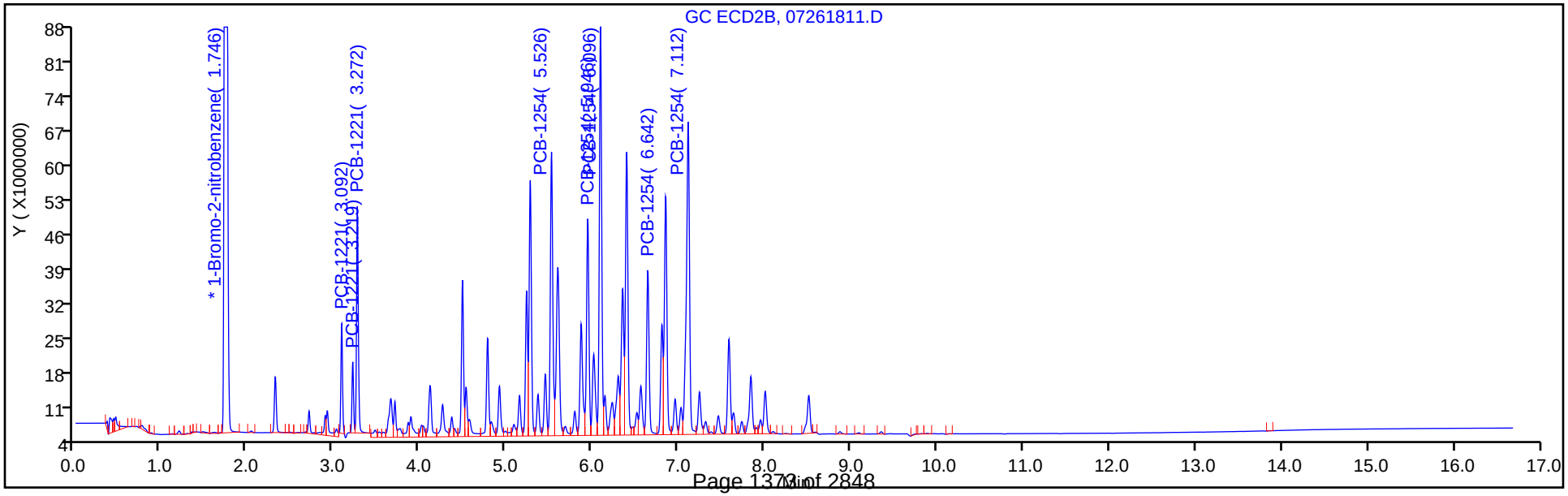
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261811.D

Injection Date:	26-Jul-2018 18:09:38	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL42154			Worklist Smp#:	11
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	11
Method:	PCB_P3	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_P3\20180726-72400.b\07261812.D
Lims ID: STDL32154
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Jul-2018 18:31:32 ALS Bottle#: 12 Worklist Smp#: 12
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL32154
Misc. Info.: 280-0072400-012
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:52 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.825	0.000	4037409336	1000.0	1000.0	
2	1.745	1.745	0.000	1022614595	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.961	2.962	-0.001	41152608	100.0	93.8	
1	3.101	3.102	-0.001	31337662	100.0	95.5	
1	3.138	3.139	-0.001	107173792	100.0	96.7	
		Average of Peak Amounts =				95.4	
2	3.091	3.092	-0.001	14232033	100.0	106.4	
2	3.218	3.219	-0.001	8648355	100.0	99.5	
2	3.271	3.272	-0.001	27840555	100.0	91.4	
		Average of Peak Amounts =				99.1	
						RPD = 3.85	
9 PCB-1254							
1	5.281	5.282	-0.001	176124811	100.0	94.4	
1	5.611	5.612	-0.001	144038285	100.0	95.7	
1	5.765	5.762	0.003	248370990	100.0	94.8	
1	6.365	6.362	0.003	173151350	100.0	96.1	
1	6.728	6.728	0.000	260562608	100.0	95.0	
		Average of Peak Amounts =				95.2	
2	5.525	5.525	0.000	46515061	100.0	96.4	
2	5.945	5.945	0.000	34235074	100.0	95.9	
2	6.095	6.092	0.003	63918934	100.0	95.4	
2	6.641	6.642	-0.001	27740502	100.0	97.1	
2	7.111	7.112	-0.001	66280307	100.0	95.5	
		Average of Peak Amounts =				96.0	
						RPD = 0.91	

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						190.6	
2						195.2	
						RPD = 2.39	

Reagents:

AR_2154_L3_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

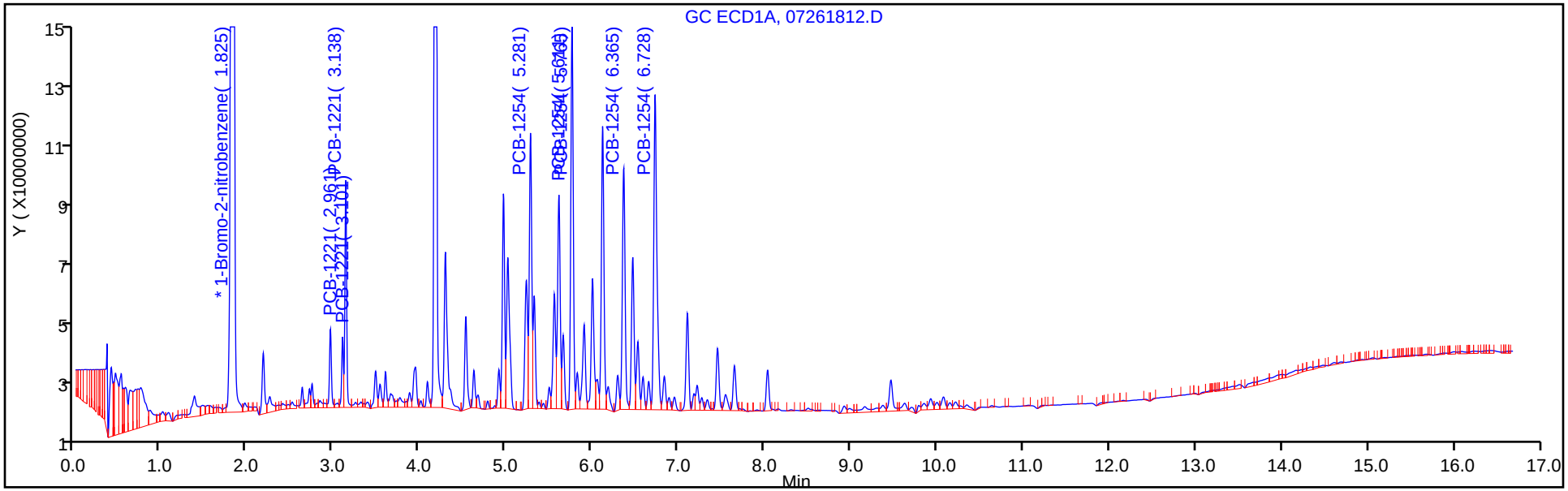
Report Date: 28-Jul-2018 08:57:53 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

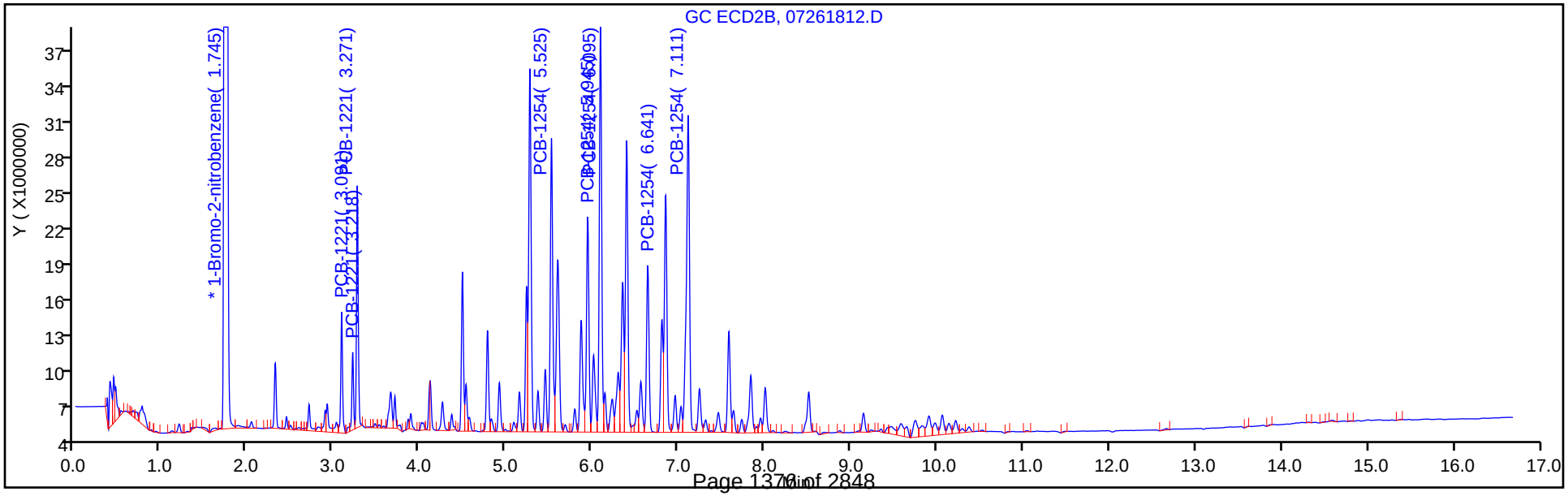
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261812.D

Injection Date:	26-Jul-2018 18:31:32	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL32154			Worklist Smp#:	12
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	12
Method:	PCB_P3	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_P3\20180726-72400.b\07261813.D
Lims ID: STDL22154
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Jul-2018 18:53:27 ALS Bottle#: 13 Worklist Smp#: 13
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL22154
Misc. Info.: 280-0072400-013
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:55 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:59:40

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	1.824	1.825	-0.001	3690187867	1000.0	1000.0	
2	1.744	1.745	-0.001	944112634	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							Ma
1	2.961	2.962	-0.001	23711103	50.0	46.6	M
1	3.101	3.102	-0.001	19345080	50.0	49.6	M
1	3.138	3.139	-0.001	61712498	50.0	46.8	M
		Average of Peak Amounts =				47.7	
2	3.091	3.092	-0.001	7179966	50.0	45.5	M
2	3.218	3.219	-0.001	4750122	50.0	47.5	M
2	3.271	3.272	-0.001	16811971	50.0	51.0	M
		Average of Peak Amounts =				48.0	
						RPD = 0.63	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.281	5.282	-0.001	106406554	50.0	57.6	
1	5.611	5.612	-0.001	84309193	50.0	56.7	
1	5.764	5.762	0.002	142643324	50.0	56.1	
1	6.364	6.362	0.002	99872861	50.0	56.3	
1	6.728	6.728	0.000	149281422	50.0	56.1	
		Average of Peak Amounts =				56.6	
2	5.524	5.525	-0.001	26987414	50.0	56.7	
2	5.944	5.945	-0.001	19699230	50.0	56.8	
2	6.094	6.092	0.002	36606192	50.0	56.3	
2	6.641	6.642	-0.001	16007589	50.0	56.8	
2	7.111	7.112	-0.001	37693122	50.0	56.1	
		Average of Peak Amounts =				56.5	
						RPD = 0.04	
S 8 Polychlorinated biphenyls, Total							
1						104.2	
2						104.5	
						RPD = 0.26	

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

Reagents:

AR_2154_L2_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

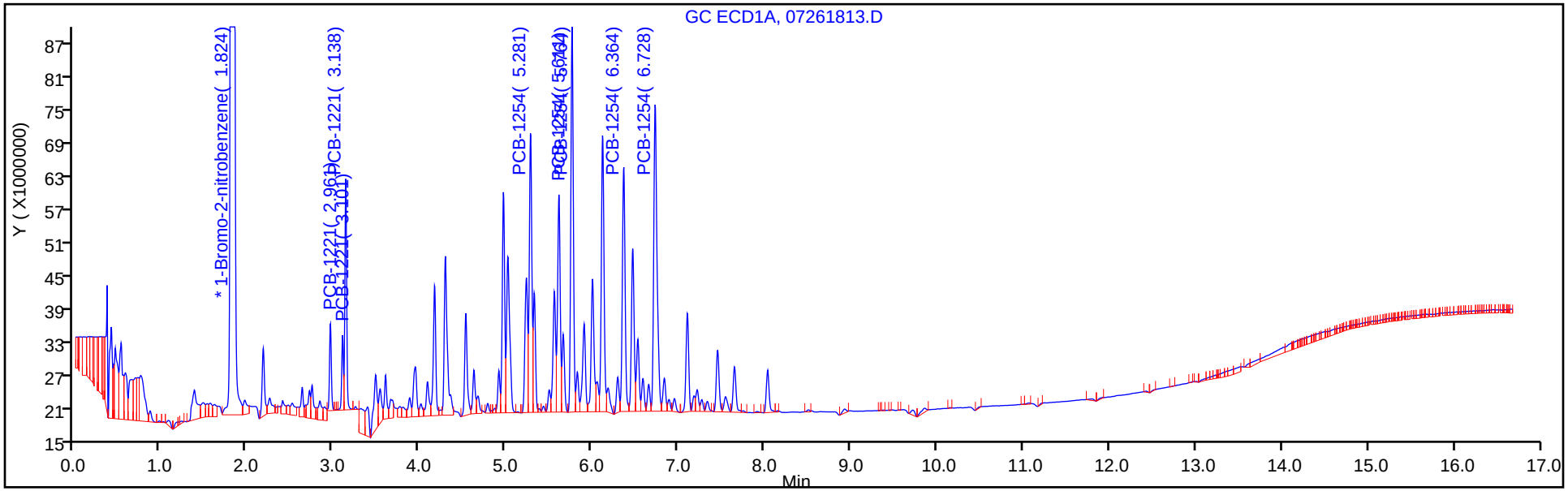
Report Date: 28-Jul-2018 08:57:56 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

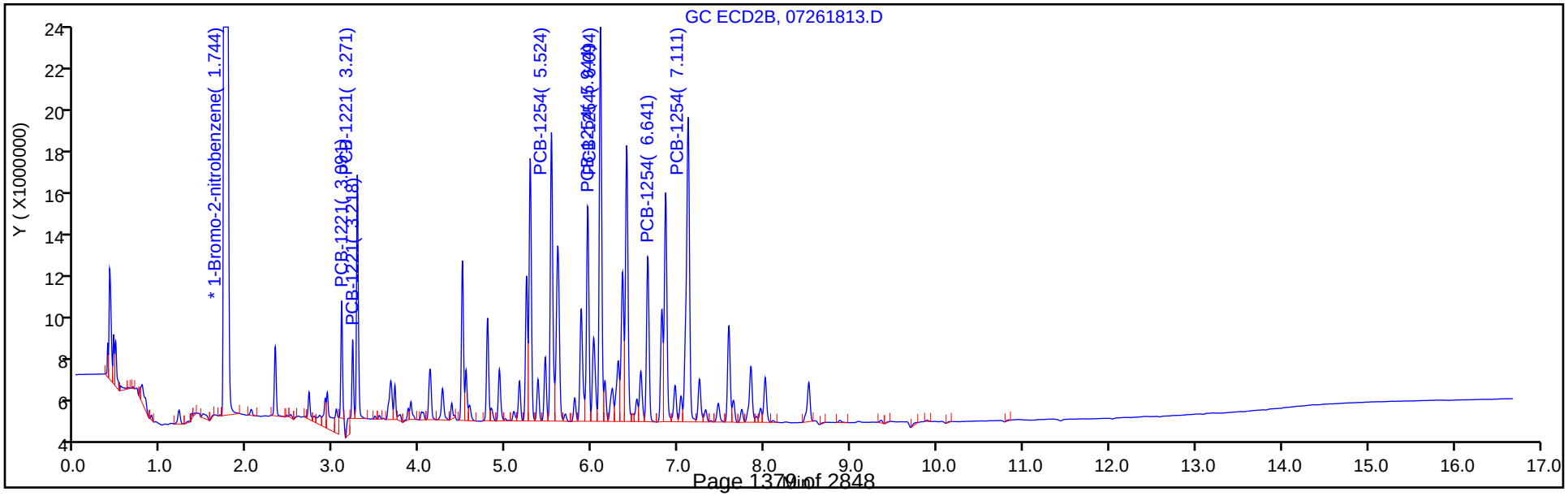
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261813.D

Injection Date:	26-Jul-2018 18:53:27	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL22154			Worklist Smp#:	13
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	13
Method:	PCB_P3	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



Report Date: 28-Jul-2018 08:57:56 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261813.D

Injection Date: 26-Jul-2018 18:53:27 Instrument ID: SGC_P3

Lims ID: STDL22154

Client ID:

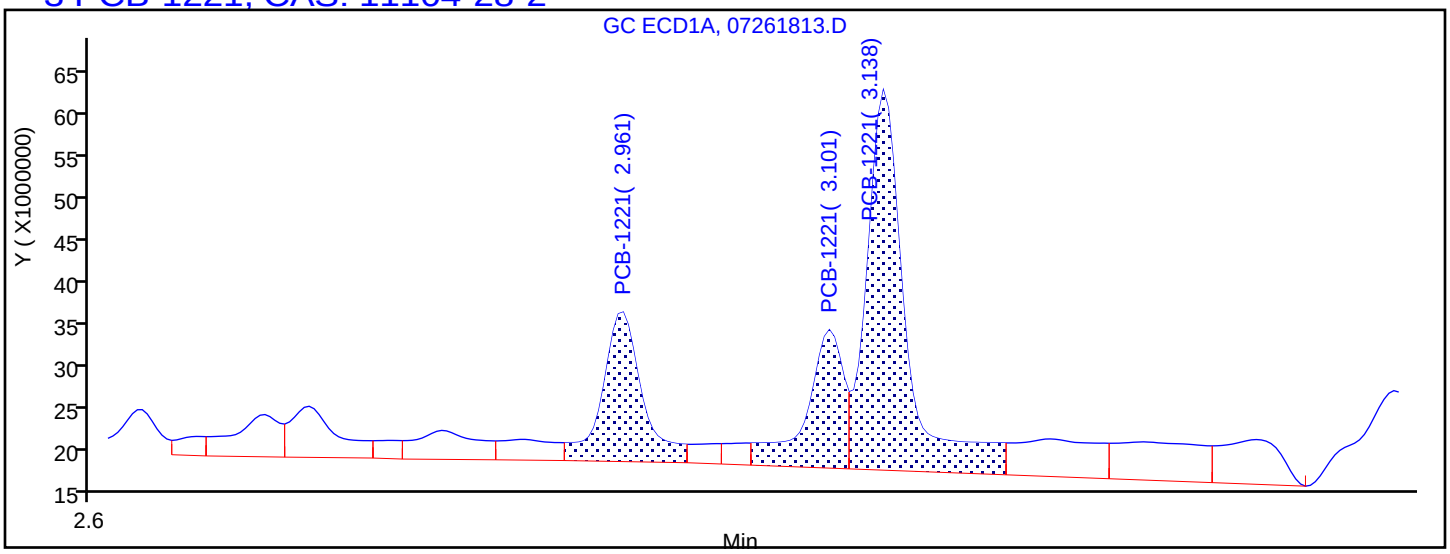
Operator ID: JAX ALS Bottle#: 13 Worklist Smp#: 13

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

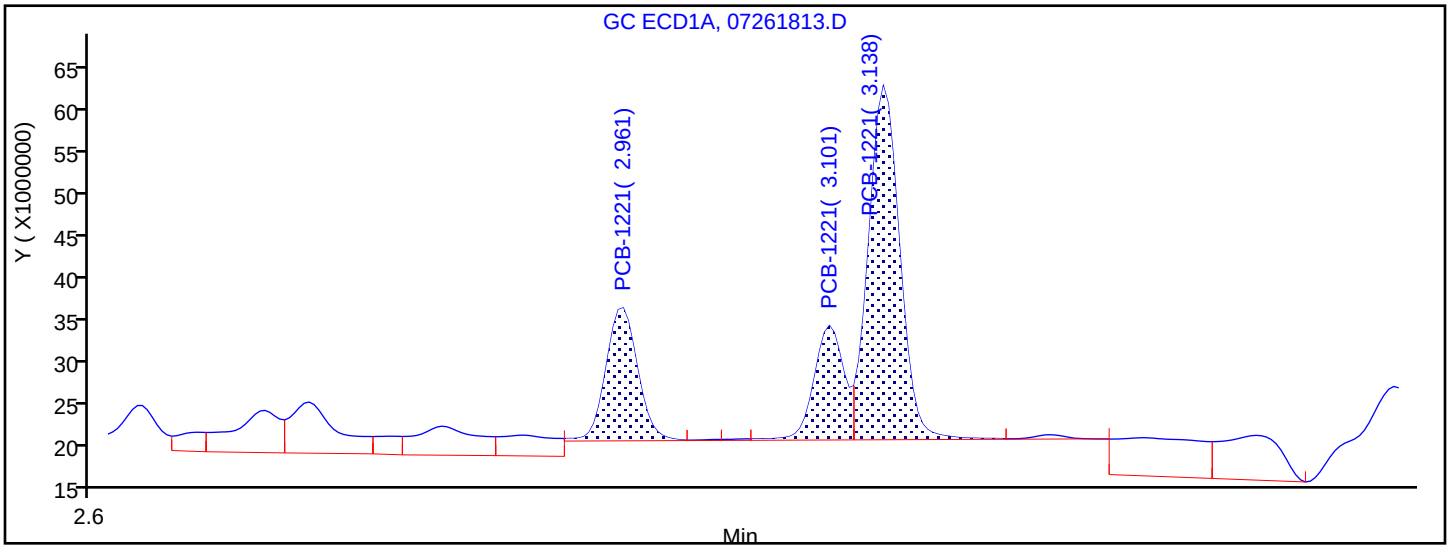
Column: CLP1 Pesticides Column 1 (0.32 mm) Detector GC ECD1A

3 PCB-1221, CAS: 11104-28-2



Processing Integration Results

2.961	Response = 33575095	
3.101	Response = 28870656	
3.138	Response = 84309670	



Manual Integration Results

2.961	Response = 23711103	M
3.101	Response = 19345080	M
3.138	Response = 61712498	M

Reviewer: jacksonto, 27-Jul-2018 06:58:51

Audit Action: Assigned New Baseline Audit Reason: Baseline Smoothing

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261814.D
Lims ID: STDL12154
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 26-Jul-2018 19:15:22 ALS Bottle#: 14 Worklist Smp#: 14
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL12154
Misc. Info.: 280-0072400-014
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:58 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:55:45

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	1.825	1.825	0.000	3638706043	1000.0	1000.0	
2	1.745	1.745	0.000	925885390	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.961	2.962	-0.001	3631772	25.0	-21.3	
1	3.101	3.102	-0.001	8950064	25.0	-1.19	
1	3.138	3.139	-0.001	31289936	25.0	5.51	
		Average of Peak Amounts =				-5.67	
2	3.091	3.092	-0.001	6225392	25.0	37.0	
2	3.218	3.219	-0.001	4567357	25.0	46.0	
2	3.271	3.272	-0.001	10551026	25.0	23.4	
		Average of Peak Amounts =				35.5	
						RPD = 276.11	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.281	5.282	-0.001	52975306	25.0	22.2	
1	5.611	5.612	-0.001	41896653	25.0	22.2	
1	5.765	5.762	0.003	69675539	25.0	23.2	
1	6.365	6.362	0.003	49339811	25.0	22.4	
1	6.728	6.728	0.000	72943911	25.0	23.1	
		Average of Peak Amounts =				22.6	
2	5.525	5.525	0.000	12763809	25.0	22.0	
2	5.945	5.945	0.000	9018440	25.0	22.2	
2	6.095	6.092	0.003	16913396	25.0	22.6	
2	6.641	6.642	-0.001	7444433	25.0	21.5	
2	7.111	7.112	-0.001	17590105	25.0	23.0	
		Average of Peak Amounts =				22.3	
						RPD = 1.55	
S 8 Polychlorinated biphenyls, Total							
1						16.9	
2						57.7	
						RPD = 109.25	

Reagents:

AR_2154_L1_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

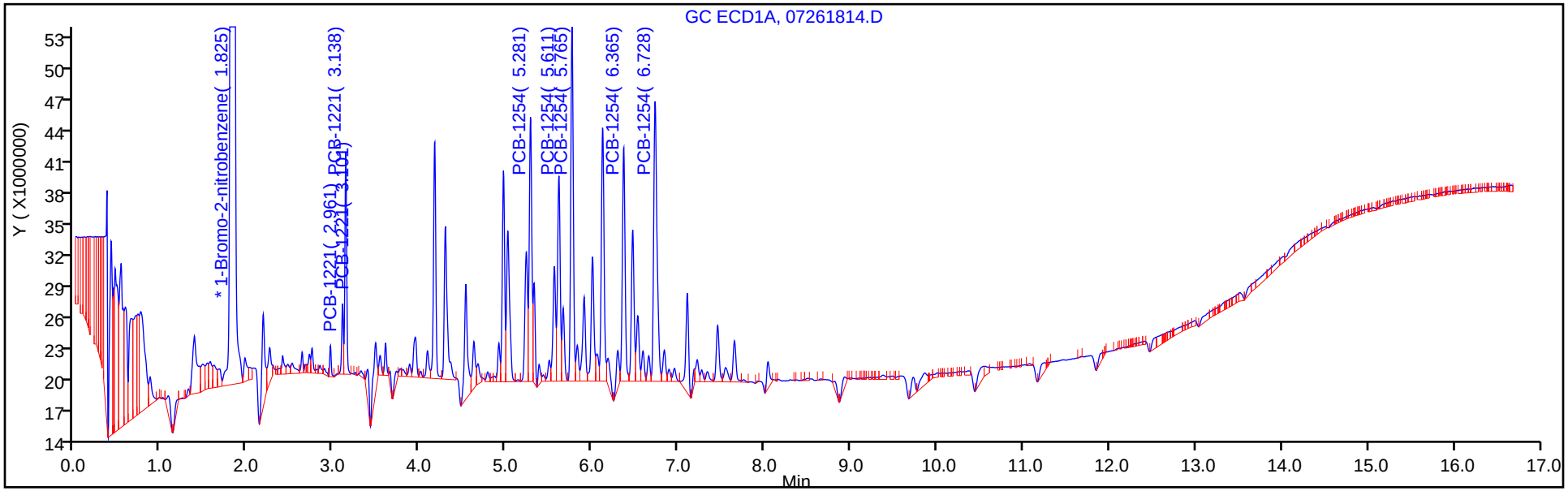
Report Date: 28-Jul-2018 08:57:59 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

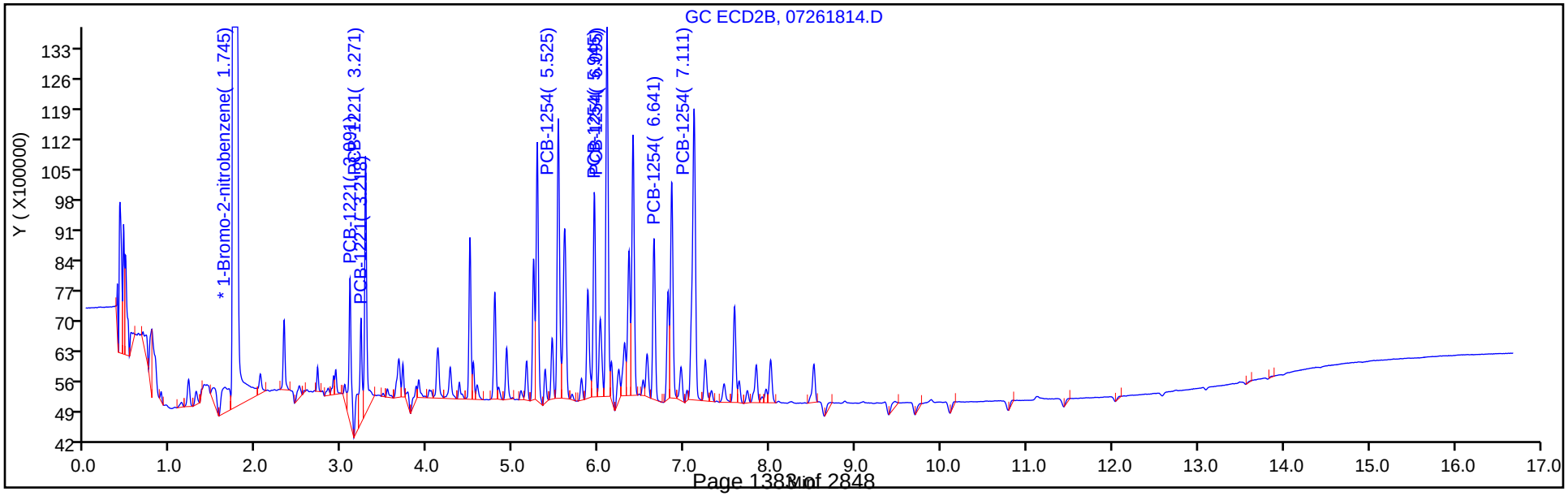
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261814.D

Injection Date:	26-Jul-2018 19:15:22	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL12154			Worklist Smp#:	14
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	14
Method:	PCB_P3	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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 17:03 Calibration End Date: 07/26/2018 19:15 Calibration ID: 33199

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL12154 280-423815/14	07261814.D
Level 2	STDL22154 280-423815/13	07261813.D
Level 3	STDL32154 280-423815/12	07261812.D
Level 4	STDL42154 280-423815/11	07261811.D
Level 5	STDL52154 280-423815/10	07261810.D
Level 6	STDL62154 280-423815/9	07261809.D
Level 7	STDL72154 280-423815/8	07261808.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	+++++ 0.1098	0.1521 0.1039	0.1392	0.1183	0.1093	Lin1	2.8859	0.1037							0.9990		0.9900
PCB-1221 Peak 2	+++++ 0.0734	0.1006 0.0631	0.0846	0.0757	0.0705	Lin1	1.9090	0.0658							0.9940		0.9900
PCB-1221 Peak 3	+++++ 0.2475	0.3561 0.2312	0.2722	0.2723	0.2451	Lin1	5.9473	0.2328							0.9980		0.9900
PCB-1254 Peak 1	0.5514 0.4281	0.5717 0.4311	0.4549	0.4602	0.4315	Lin1	4.4140	0.4262							0.9990		0.9900
PCB-1254 Peak 2	0.3896 0.3221	0.4173 0.3267	0.3348	0.3434	0.3236	Lin1	2.5766	0.3222							0.9990		0.9900
PCB-1254 Peak 3	0.7307 0.6081	0.7755 0.6148	0.6251	0.6414	0.6149	Lin1	4.5164	0.6081							0.9990		0.9900
PCB-1254 Peak 4	0.3216 0.2527	0.3391 0.2559	0.2713	0.2774	0.2543	Lin1	2.6029	0.2526							0.9990		0.9900
PCB-1254 Peak 5	0.7599 0.6320	0.7985 0.6414	0.6481	0.6601	0.6321	Lin1	4.5099	0.6313							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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 17:03 Calibration End Date: 07/26/2018 19:15 Calibration ID: 33199

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL12154 280-423815/14	07261814.D
Level 2	STDL22154 280-423815/13	07261813.D
Level 3	STDL32154 280-423815/12	07261812.D
Level 4	STDL42154 280-423815/11	07261811.D
Level 5	STDL52154 280-423815/10	07261810.D
Level 6	STDL62154 280-423815/9	07261809.D
Level 7	STDL72154 280-423815/8	07261808.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	+++++ 81026620	7179966 100349693	14232033	29356878	55080697	+++++ 750	50.0 1000	100	250	500
PCB-1221 Peak 2	BNB	Lin1	+++++ 54154941	4750122 60904852	8648355	18791227	35520273	+++++ 750	50.0 1000	100	250	500
PCB-1221 Peak 3	BNB	Lin1	+++++ 182585001	16811971 223269697	27840555	67558101	123500201	+++++ 750	50.0 1000	100	250	500
PCB-1254 Peak 1	BNB	Lin1	12763809 315875459	26987414 416361808	46515061	114176349	217391228	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 2	BNB	Lin1	9018440 237674095	19699230 315490545	34235074	85188473	163018585	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 3	BNB	Lin1	16913396 448690677	36606192 593748945	63918934	159145339	309777395	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 4	BNB	Lin1	7444433 186412255	16007589 247087804	27740502	68837632	128100525	25.0 750	50.0 1000	100	250	500
PCB-1254 Peak 5	BNB	Lin1	17590105 466264135	37693122 619422196	66280307	163768656	318447726	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_P3\20180726-72400.b\07261808.D
Lims ID: STDL72154
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 26-Jul-2018 17:03:53 ALS Bottle#: 8 Worklist Smp#: 8
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL72154
Misc. Info.: 280-0072400-008
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:42 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.826	-0.001	3766883063	1000.0	1000.0	
2	1.746	1.749	-0.003	965706449	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.959	2.962	-0.003	292066279	1000.0	937.4	
1	3.102	3.102	0.000	214809521	1000.0	994.3	
1	3.139	3.139	0.000	757680417	1000.0	984.2	
		Average of Peak Amounts =				972.0	
2	3.089	3.092	-0.003	100349693	1000.0	974.5	
2	3.219	3.219	0.000	60904852	1000.0	929.6	
2	3.272	3.272	0.000	223269697	1000.0	967.8	
		Average of Peak Amounts =				957.3	
						RPD = 1.52	
9 PCB-1254							
1	5.282	5.282	0.000	1548685078	1000.0	1007.4	
1	5.612	5.612	0.000	1263159189	1000.0	1006.5	
1	5.765	5.762	0.003	2282182979	1000.0	1015.3	
1	6.362	6.362	0.000	1525787142	1000.0	1006.5	
1	6.729	6.728	0.001	2385964005	1000.0	1013.5	
		Average of Peak Amounts =				1009.8	
2	5.526	5.525	0.001	416361808	1000.0	1001.3	
2	5.946	5.945	0.001	315490545	1000.0	1005.8	
2	6.096	6.092	0.004	593748945	1000.0	1003.6	
2	6.642	6.642	0.000	247087804	1000.0	1002.5	
2	7.112	7.112	0.000	619422196	1000.0	1008.9	
		Average of Peak Amounts =				1004.5	
						RPD = 0.53	

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						1981.8	
2						1961.7	
						RPD = 1.02	

Reagents:

AR_2154_L7_00016	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

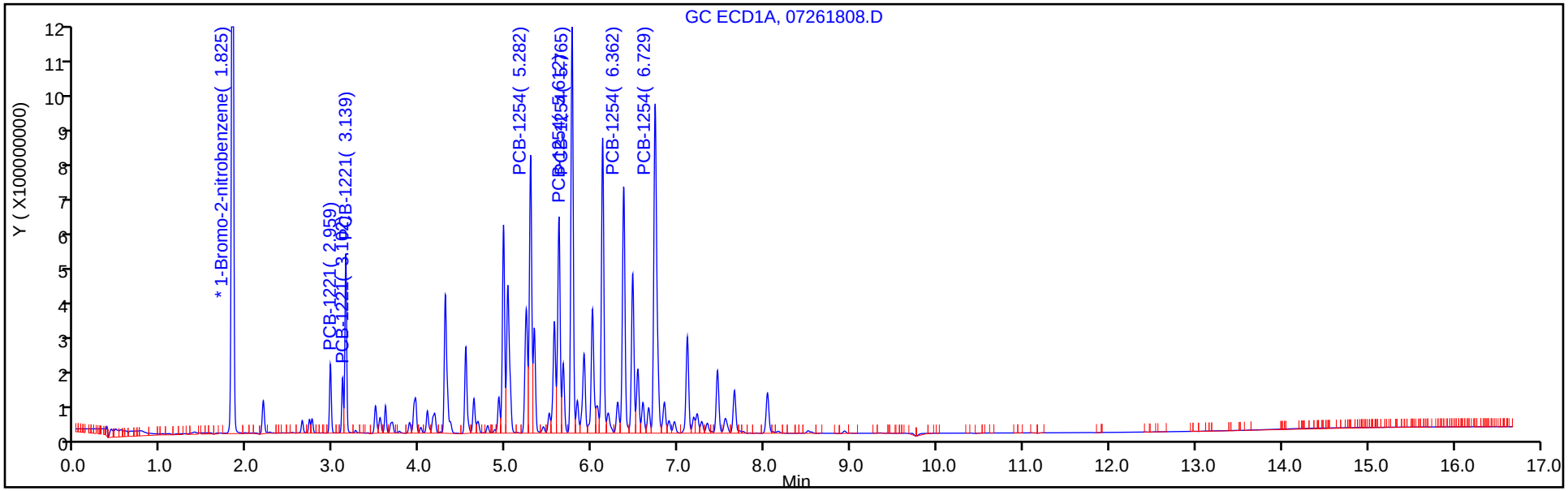
Report Date: 28-Jul-2018 08:57:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

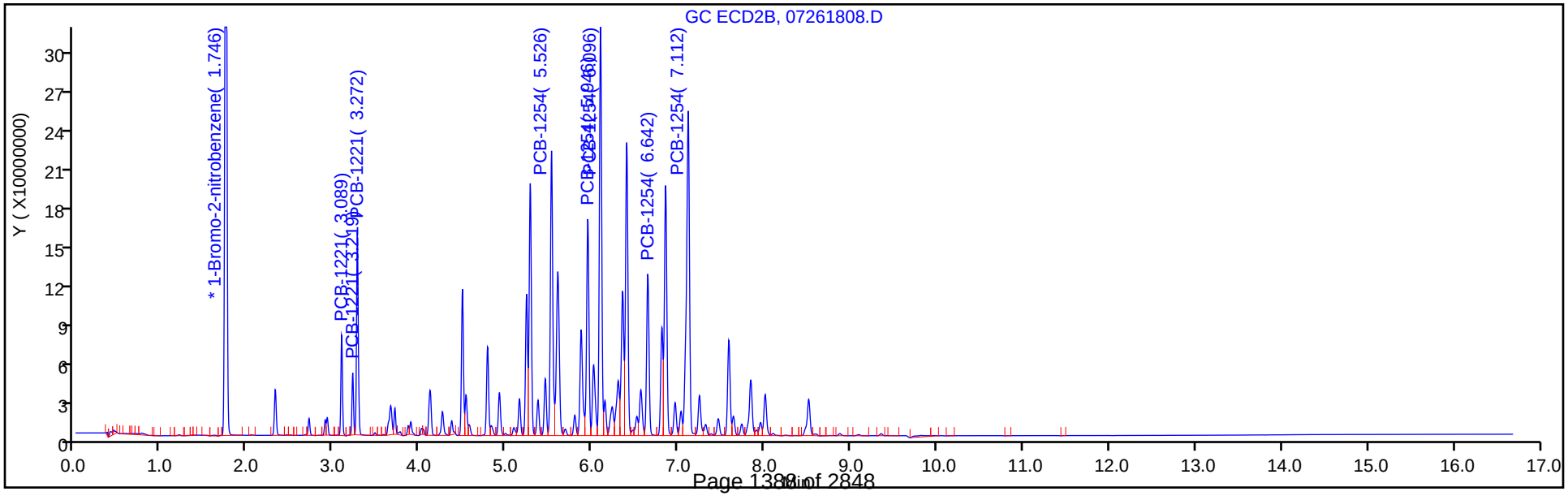
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261808.D

Injection Date:	26-Jul-2018 17:03:53	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL72154			Worklist Smp#:	8
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	8
Method:	PCB_P3	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_P3\20180726-72400.b\07261809.D
Lims ID: STDL62154
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Jul-2018 17:25:48 ALS Bottle#: 9 Worklist Smp#: 9
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL62154
Misc. Info.: 280-0072400-009
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:45 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.826	-0.001	3871662869	1000.0	1000.0	
2	1.745	1.749	-0.004	983732805	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.962	2.962	0.000	248708917	750.0	770.8	
1	3.102	3.102	0.000	167065128	750.0	741.1	
1	3.138	3.139	-0.001	584613581	750.0	729.3	
		Average of Peak Amounts =				747.1	
2	3.092	3.092	0.000	81026620	750.0	766.6	
2	3.218	3.219	-0.001	54154941	750.0	807.8	
2	3.272	3.272	0.000	182585001	750.0	771.9	
		Average of Peak Amounts =				782.1	
						RPD = 4.58	
9 PCB-1254							
1	5.282	5.282	0.000	1179204419	750.0	742.6	
1	5.612	5.612	0.000	960142986	750.0	741.0	
1	5.765	5.762	0.003	1717640087	750.0	741.0	
1	6.365	6.362	0.003	1159799236	750.0	741.3	
1	6.728	6.728	0.000	1800662050	750.0	741.7	
		Average of Peak Amounts =				741.5	
2	5.525	5.525	0.000	315875459	750.0	743.1	
2	5.945	5.945	0.000	237674095	750.0	741.8	
2	6.095	6.092	0.003	448690677	750.0	742.6	
2	6.642	6.642	0.000	186412255	750.0	739.8	
2	7.112	7.112	0.000	466264135	750.0	743.7	
		Average of Peak Amounts =				742.2	
						RPD = 0.09	

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						1488.6	
2						1524.3	
						RPD = 2.37	

Reagents:

AR_2154_L6_00018	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

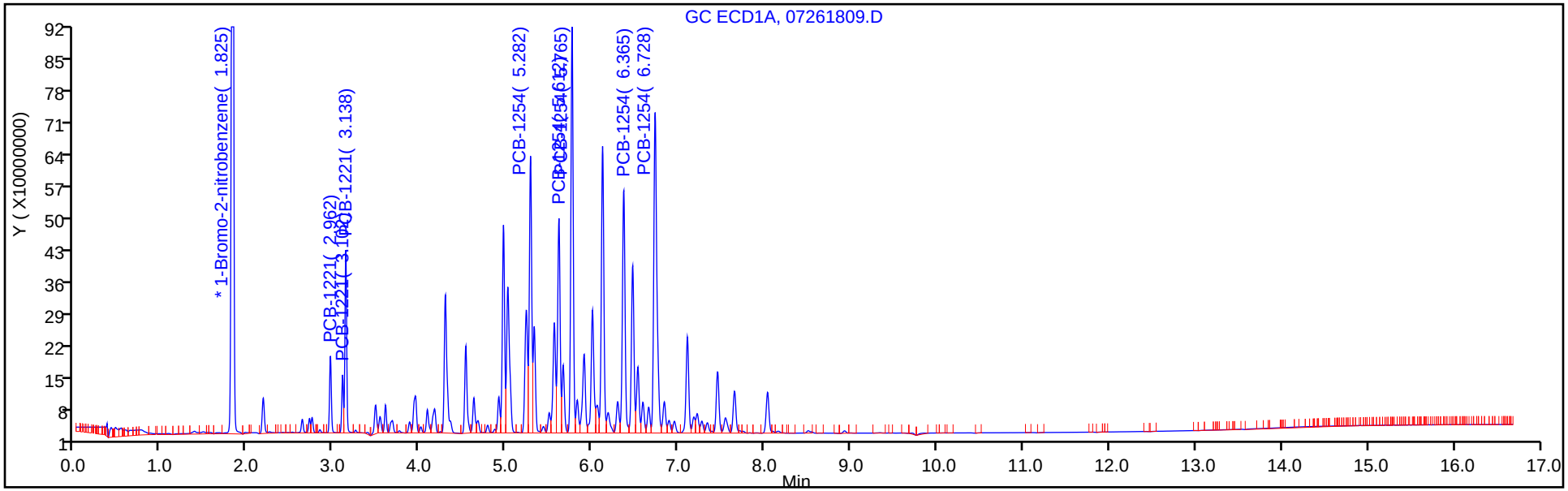
Report Date: 28-Jul-2018 08:57:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

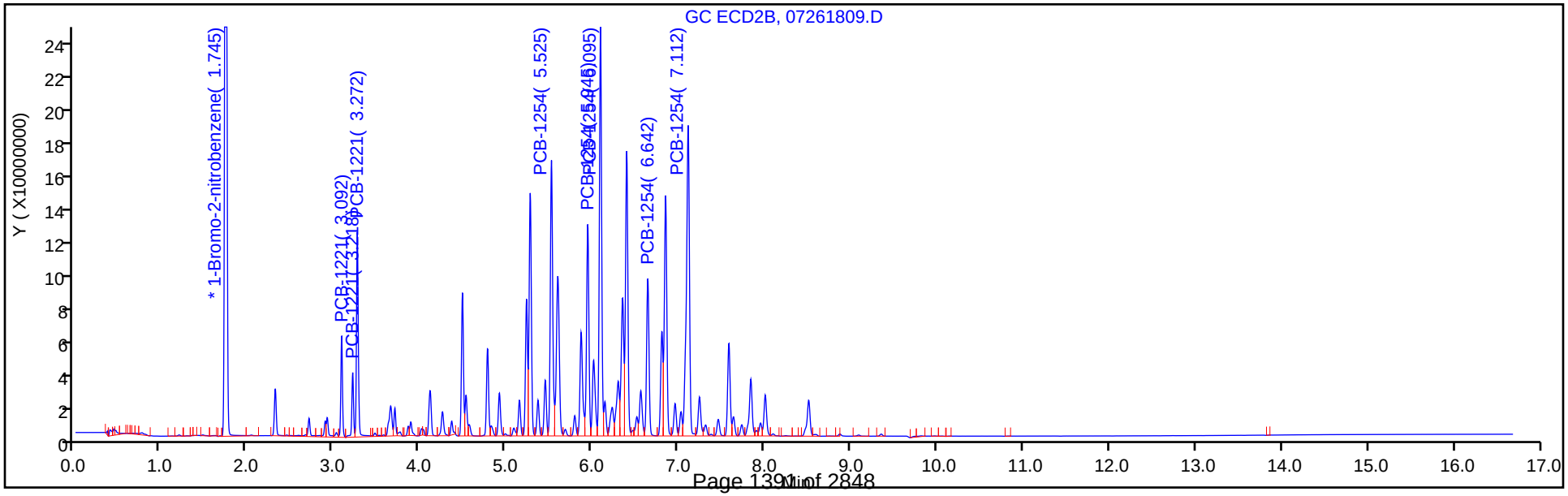
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261809.D

Injection Date:	26-Jul-2018 17:25:48	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL62154			Worklist Smp#:	9
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	9
Method:	PCB_P3	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_P3\20180726-72400.b\07261810.D
Lims ID: STDL52154
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 26-Jul-2018 17:47:43 ALS Bottle#: 10 Worklist Smp#: 10
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL52154
Misc. Info.: 280-0072400-010
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:47 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:53:29

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	1.825	1.825	0.000	3982970204	1000.0	1000.0	
2	1.745	1.745	0.000	1007590600	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.962	2.962	0.000	176374457	500.0	520.9	
1	3.102	3.102	0.000	120015483	500.0	503.6	
1	3.139	3.139	0.000	434220484	500.0	515.9	
		Average of Peak Amounts =				513.5	
2	3.092	3.092	0.000	55080697	500.0	499.5	
2	3.219	3.219	0.000	35520273	500.0	506.8	
2	3.272	3.272	0.000	123500201	500.0	501.1	
		Average of Peak Amounts =				502.4	
						RPD = 2.17	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.282	5.282	0.000	811250358	500.0	492.0	
1	5.612	5.612	0.000	662653862	500.0	492.9	
1	5.762	5.762	0.000	1174214073	500.0	489.3	
1	6.362	6.362	0.000	800025258	500.0	493.2	
1	6.728	6.728	0.000	1232800716	500.0	490.5	
		Average of Peak Amounts =				491.6	
2	5.525	5.525	0.000	217391228	500.0	495.9	
2	5.945	5.945	0.000	163018585	500.0	494.1	
2	6.092	6.092	0.000	309777395	500.0	498.2	
2	6.642	6.642	0.000	128100525	500.0	493.0	
2	7.112	7.112	0.000	318447726	500.0	493.5	
		Average of Peak Amounts =				494.9	
						RPD = 0.68	

Reagents:

AR_2154_L5_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

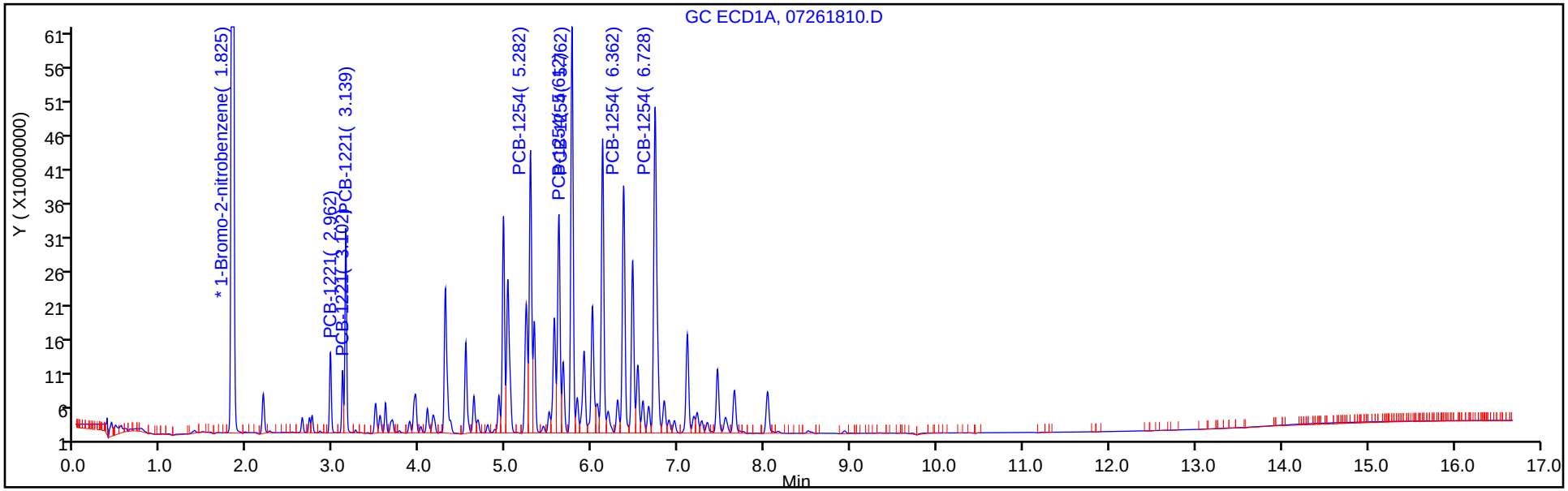
Report Date: 28-Jul-2018 08:57:48 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

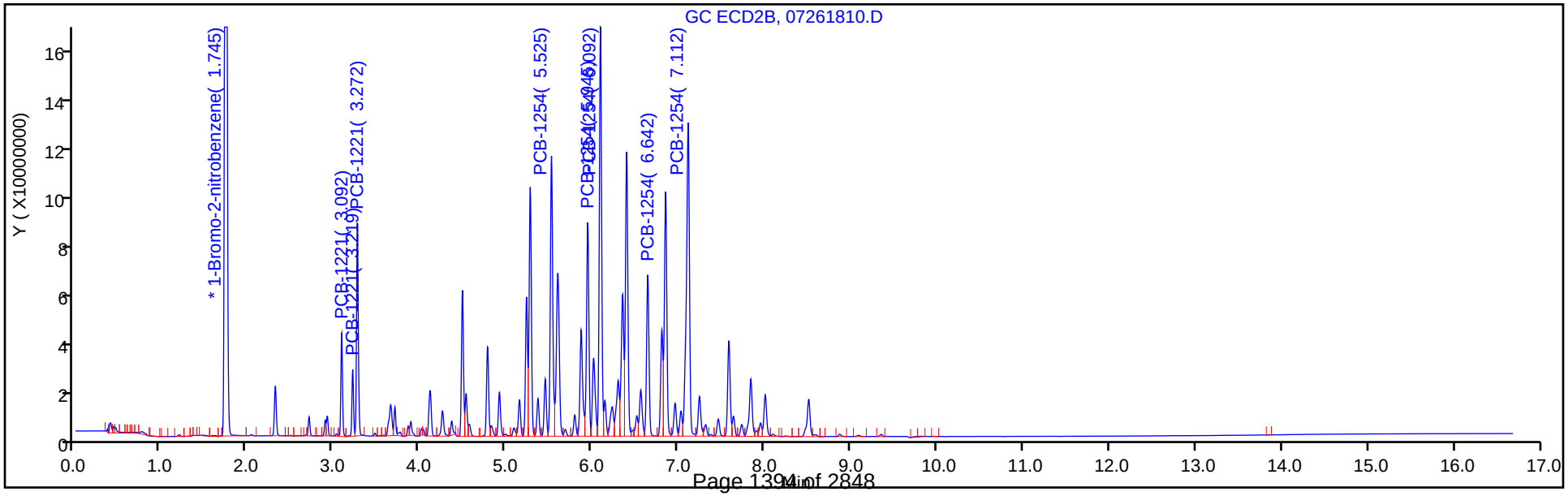
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261810.D

Injection Date:	26-Jul-2018 17:47:43	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL52154			Worklist Smp#:	10
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	10
Method:	PCB_P3	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_P3\20180726-72400.b\07261811.D
Lims ID: STDL42154
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 26-Jul-2018 18:09:38 ALS Bottle#: 11 Worklist Smp#: 11
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL42154
Misc. Info.: 280-0072400-011
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:50 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:57:51

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	1.825	1.825	0.000	3871961289	1000.0	1000.0	
2	1.746	1.745	0.001	992434657	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							M
1	2.959	2.962	-0.003	97141411	250.0	280.4	
1	3.102	3.102	0.000	66197390	250.0	265.8	
1	3.139	3.139	0.000	240097727	250.0	277.0	
		Average of Peak Amounts =				274.4	
2	3.092	3.092	0.000	29356878	250.0	257.5	M
2	3.219	3.219	0.000	18791227	250.0	258.8	M
2	3.272	3.272	0.000	67558101	250.0	266.9	M
		Average of Peak Amounts =				261.1	
						RPD = 4.99	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.282	5.282	0.000	425252844	250.0	258.8	
1	5.612	5.612	0.000	347457956	250.0	260.0	
1	5.762	5.762	0.000	605400484	250.0	255.2	
1	6.362	6.362	0.000	417427148	250.0	259.3	
1	6.729	6.728	0.001	633749653	250.0	255.0	
		Average of Peak Amounts =				257.7	
2	5.526	5.525	0.001	114176349	250.0	259.6	
2	5.946	5.945	0.001	85188473	250.0	258.4	
2	6.096	6.092	0.004	159145339	250.0	256.3	
2	6.642	6.642	0.000	68837632	250.0	264.3	
2	7.112	7.112	0.000	163768656	250.0	254.3	
		Average of Peak Amounts =				258.6	
						RPD = 0.34	
S 8 Polychlorinated biphenyls, Total							
1						532.1	
2						519.6	
						RPD = 2.37	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_2154_L4_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

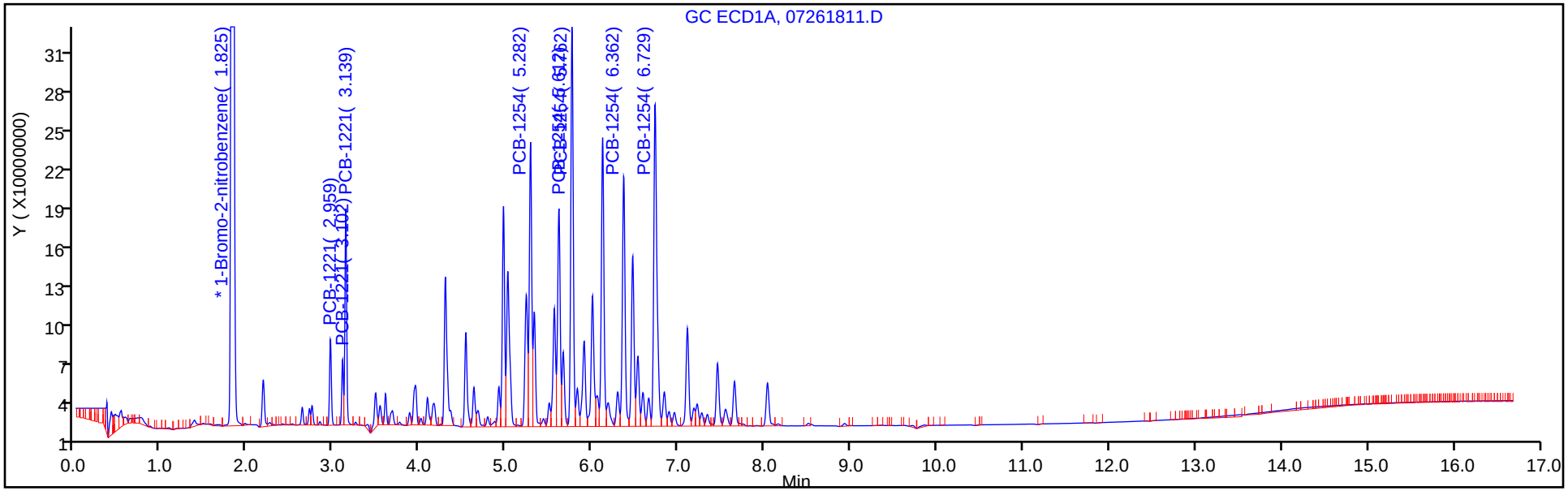
Report Date: 28-Jul-2018 08:57:51 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

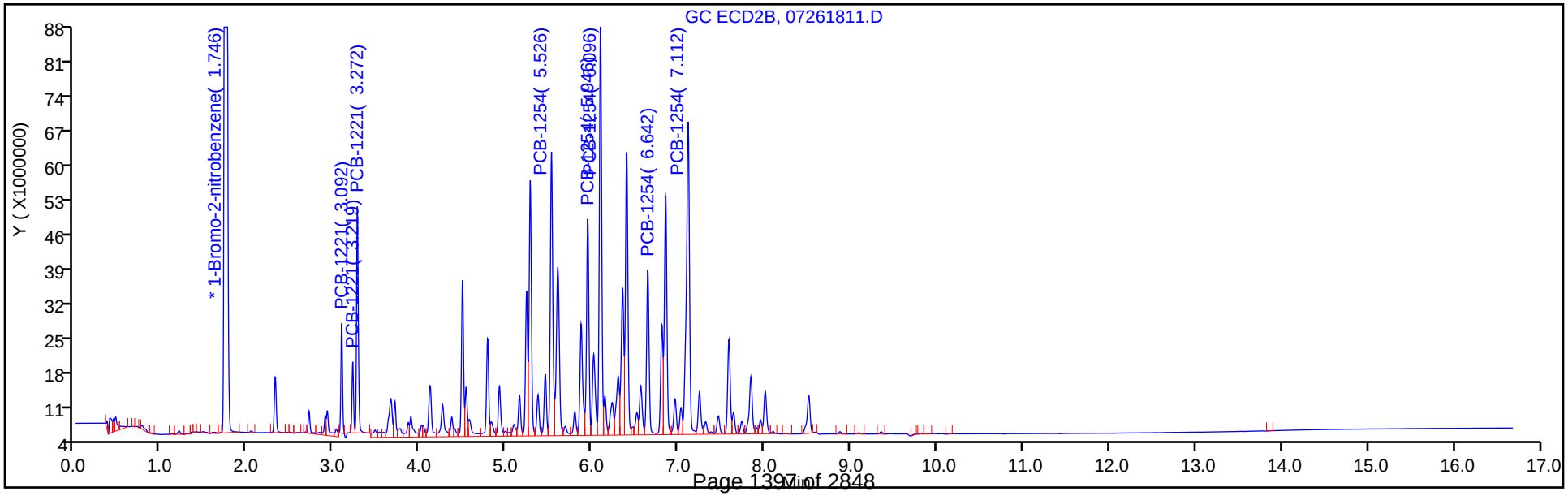
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261811.D

Injection Date:	26-Jul-2018 18:09:38	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL42154			Worklist Smp#:	11
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	11
Method:	PCB_P3	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



Report Date: 28-Jul-2018 08:57:51 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261811.D

Injection Date: 26-Jul-2018 18:09:38 Instrument ID: SGC_P3

Lims ID: STDL42154

Client ID:

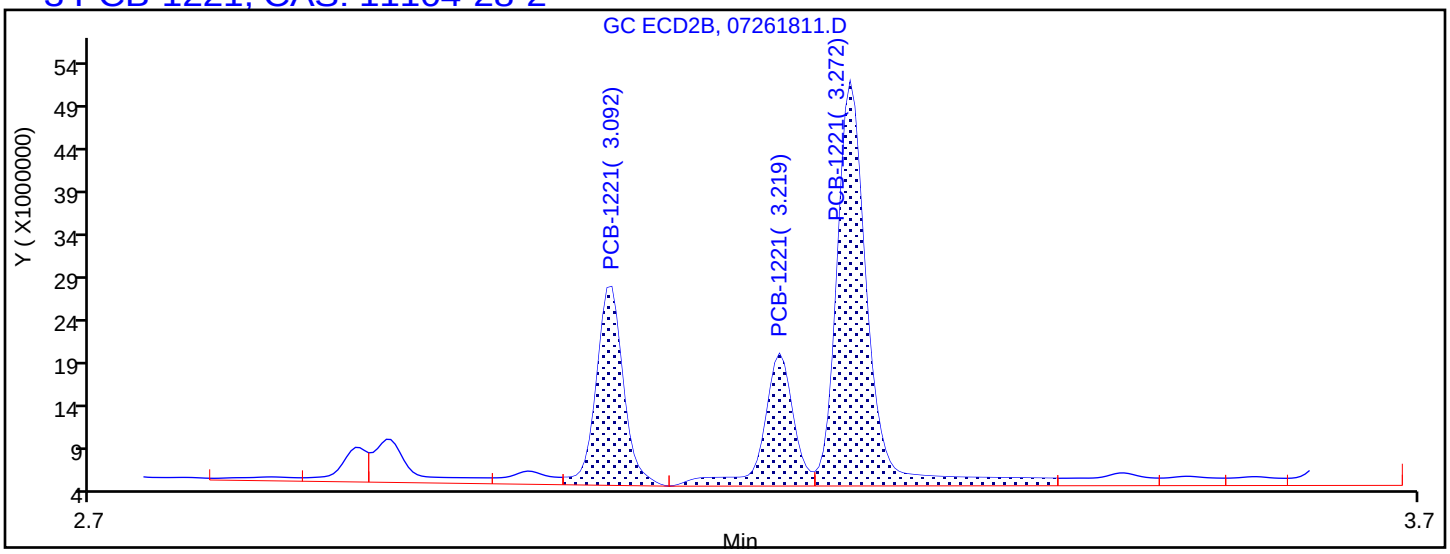
Operator ID: JAX ALS Bottle#: 11 Worklist Smp#: 11

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

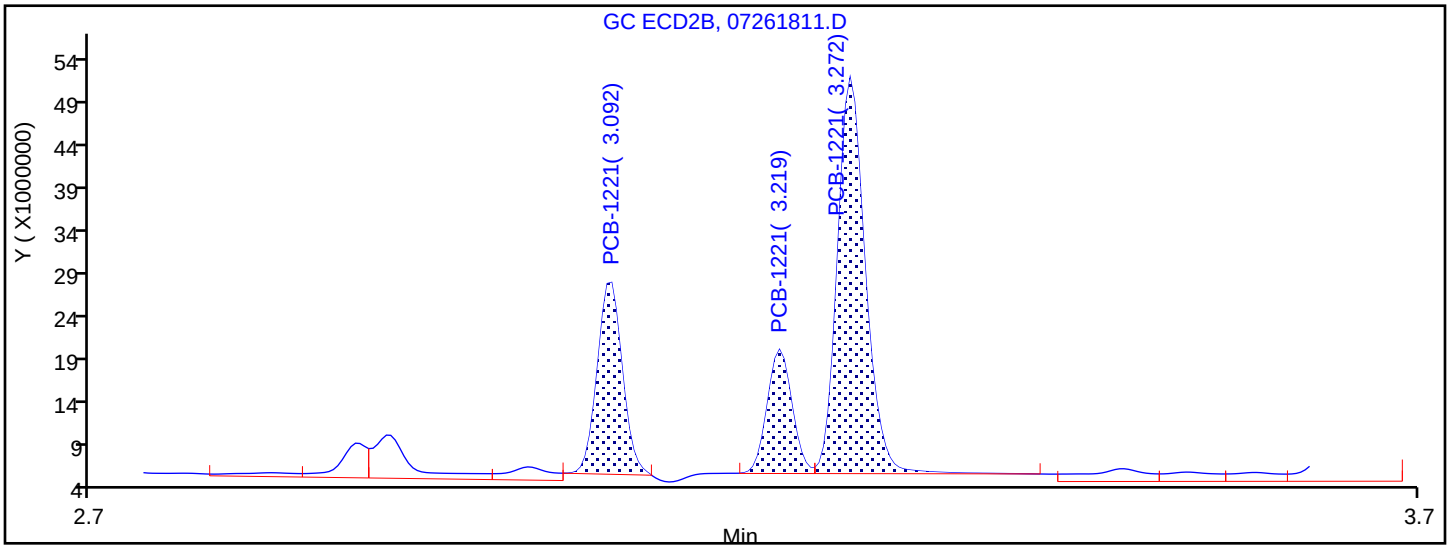
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

3 PCB-1221, CAS: 11104-28-2



Processing Integration Results

3.092	Response = 32809893	
3.219	Response = 24511655	
3.272	Response = 77715091	



Manual Integration Results

3.092	Response = 29356878	M
3.219	Response = 18791227	M
3.272	Response = 67558101	M

Reviewer: jacksonto, 27-Jul-2018 06:57:28

Audit Action: Manually Integrated Audit Reason: Instrument noise

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261812.D
Lims ID: STDL32154
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Jul-2018 18:31:32 ALS Bottle#: 12 Worklist Smp#: 12
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL32154
Misc. Info.: 280-0072400-012
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:52 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.825	0.000	4037409336	1000.0	1000.0	
2	1.745	1.745	0.000	1022614595	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.961	2.962	-0.001	41152608	100.0	93.8	
1	3.101	3.102	-0.001	31337662	100.0	95.5	
1	3.138	3.139	-0.001	107173792	100.0	96.7	
		Average of Peak Amounts =				95.4	
2	3.091	3.092	-0.001	14232033	100.0	106.4	
2	3.218	3.219	-0.001	8648355	100.0	99.5	
2	3.271	3.272	-0.001	27840555	100.0	91.4	
		Average of Peak Amounts =				99.1	
						RPD = 3.85	
9 PCB-1254							
1	5.281	5.282	-0.001	176124811	100.0	94.4	
1	5.611	5.612	-0.001	144038285	100.0	95.7	
1	5.765	5.762	0.003	248370990	100.0	94.8	
1	6.365	6.362	0.003	173151350	100.0	96.1	
1	6.728	6.728	0.000	260562608	100.0	95.0	
		Average of Peak Amounts =				95.2	
2	5.525	5.525	0.000	46515061	100.0	96.4	
2	5.945	5.945	0.000	34235074	100.0	95.9	
2	6.095	6.092	0.003	63918934	100.0	95.4	
2	6.641	6.642	-0.001	27740502	100.0	97.1	
2	7.111	7.112	-0.001	66280307	100.0	95.5	
		Average of Peak Amounts =				96.0	
						RPD = 0.91	

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						190.6	
2						195.2	
						RPD = 2.39	

Reagents:

AR_2154_L3_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

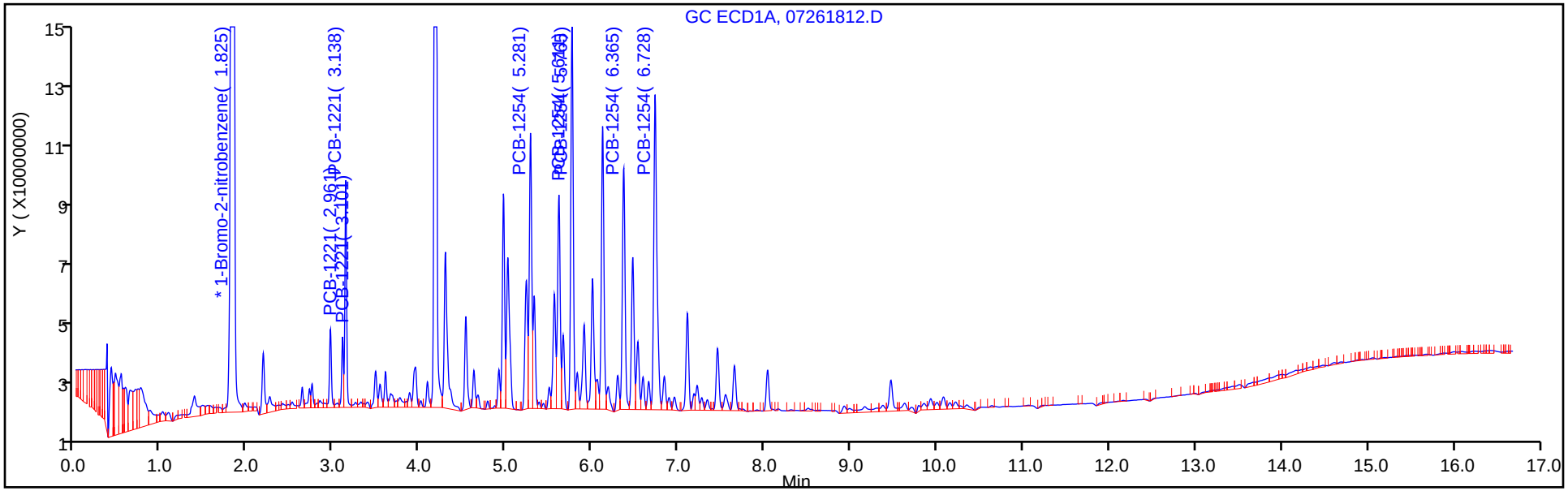
Report Date: 28-Jul-2018 08:57:53 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

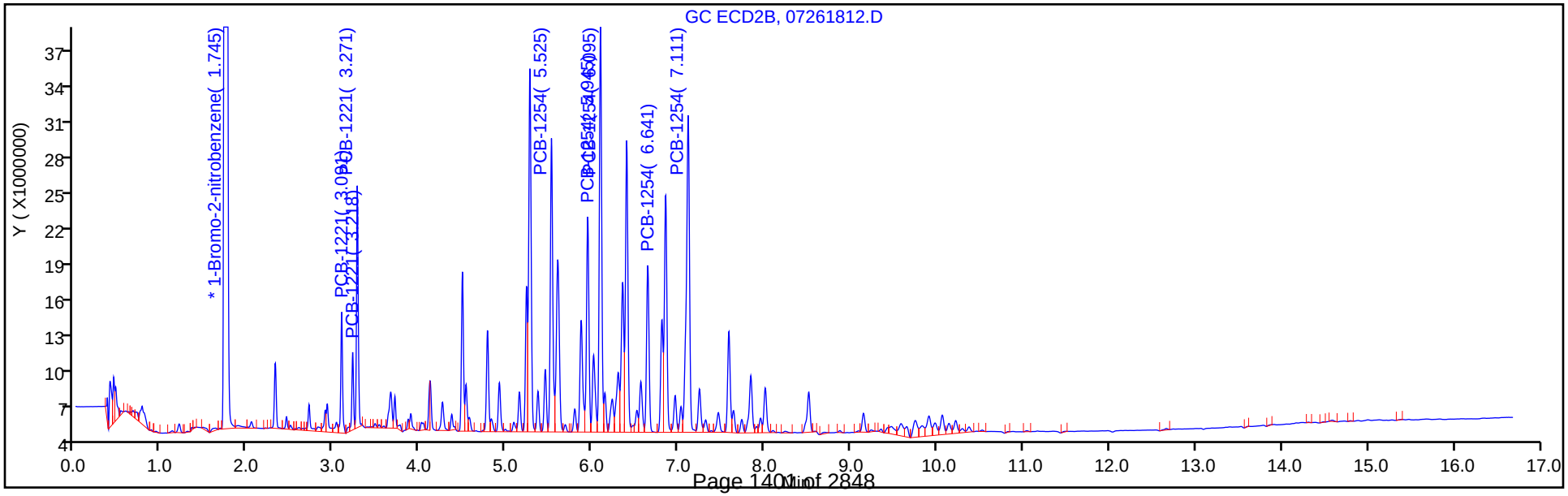
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261812.D

Injection Date:	26-Jul-2018 18:31:32	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL32154			Worklist Smp#:	12
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	12
Method:	PCB_P3	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_P3\20180726-72400.b\07261813.D
Lims ID: STDL22154
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Jul-2018 18:53:27 ALS Bottle#: 13 Worklist Smp#: 13
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL22154
Misc. Info.: 280-0072400-013
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:55 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:59:40

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	1.824	1.825	-0.001	3690187867	1000.0	1000.0	
2	1.744	1.745	-0.001	944112634	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							Ma
1	2.961	2.962	-0.001	23711103	50.0	46.6	M
1	3.101	3.102	-0.001	19345080	50.0	49.6	M
1	3.138	3.139	-0.001	61712498	50.0	46.8	M
		Average of Peak Amounts =				47.7	
2	3.091	3.092	-0.001	7179966	50.0	45.5	M
2	3.218	3.219	-0.001	4750122	50.0	47.5	M
2	3.271	3.272	-0.001	16811971	50.0	51.0	M
		Average of Peak Amounts =				48.0	
						RPD = 0.63	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.281	5.282	-0.001	106406554	50.0	57.6	
1	5.611	5.612	-0.001	84309193	50.0	56.7	
1	5.764	5.762	0.002	142643324	50.0	56.1	
1	6.364	6.362	0.002	99872861	50.0	56.3	
1	6.728	6.728	0.000	149281422	50.0	56.1	
		Average of Peak Amounts =				56.6	
2	5.524	5.525	-0.001	26987414	50.0	56.7	
2	5.944	5.945	-0.001	19699230	50.0	56.8	
2	6.094	6.092	0.002	36606192	50.0	56.3	
2	6.641	6.642	-0.001	16007589	50.0	56.8	
2	7.111	7.112	-0.001	37693122	50.0	56.1	
		Average of Peak Amounts =				56.5	
						RPD = 0.04	
S 8 Polychlorinated biphenyls, Total							
1						104.2	
2						104.5	
						RPD = 0.26	

QC Flag Legend

Review Flags

M - Manually Integrated

a - User Assigned ID

Reagents:

AR_2154_L2_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

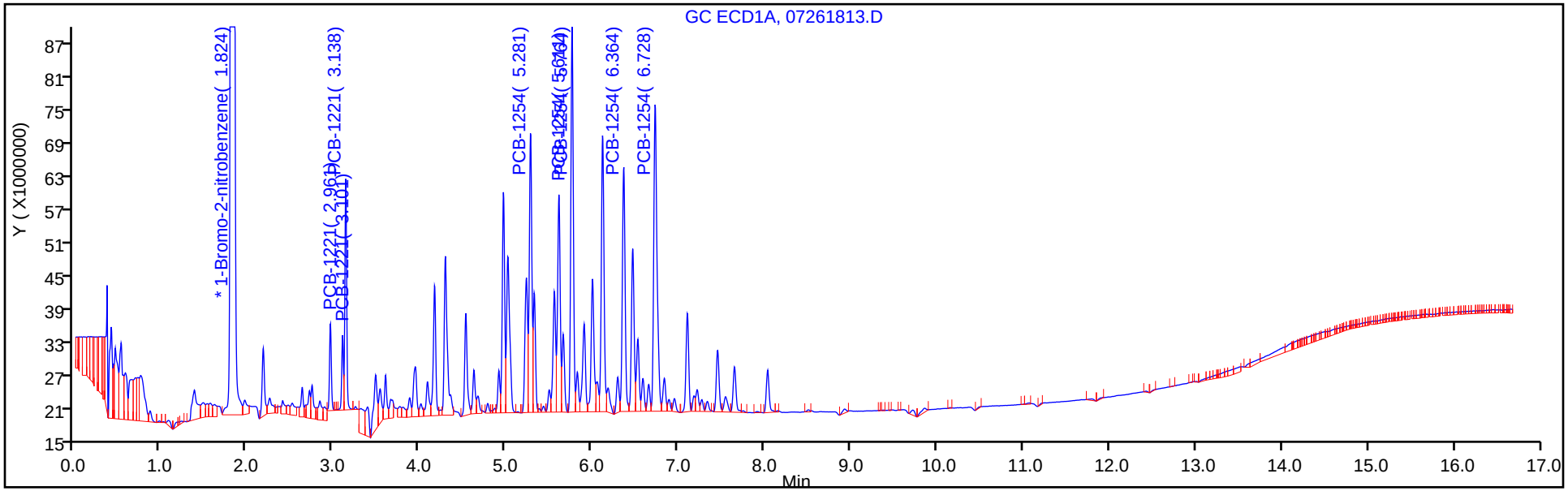
Report Date: 28-Jul-2018 08:57:56 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

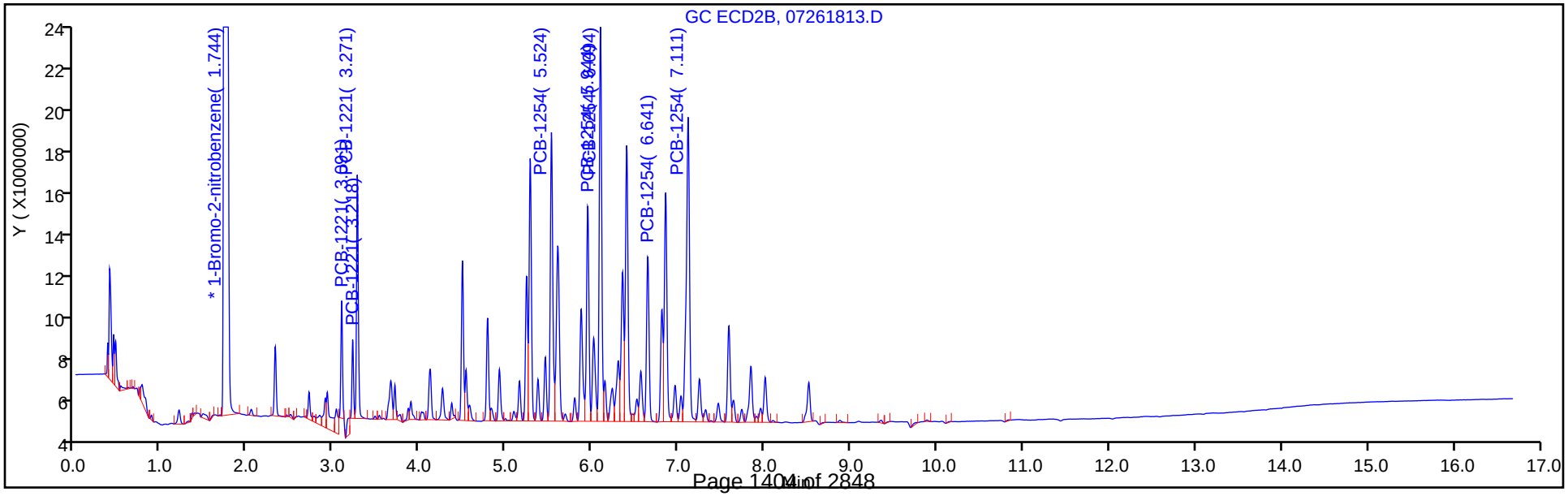
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261813.D

Injection Date:	26-Jul-2018 18:53:27	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL22154			Worklist Smp#:	13
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	13
Method:	PCB_P3	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



Report Date: 28-Jul-2018 08:57:56 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261813.D

Injection Date: 26-Jul-2018 18:53:27 Instrument ID: SGC_P3

Lims ID: STDL22154

Client ID:

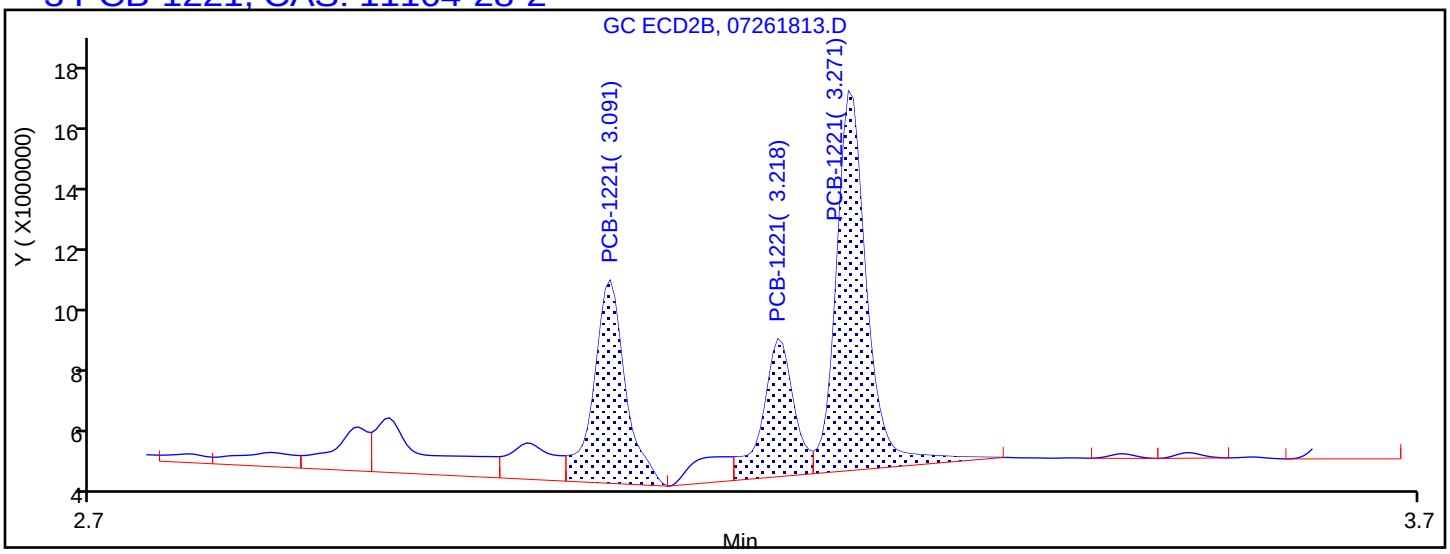
Operator ID: JAX ALS Bottle#: 13 Worklist Smp#: 13

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

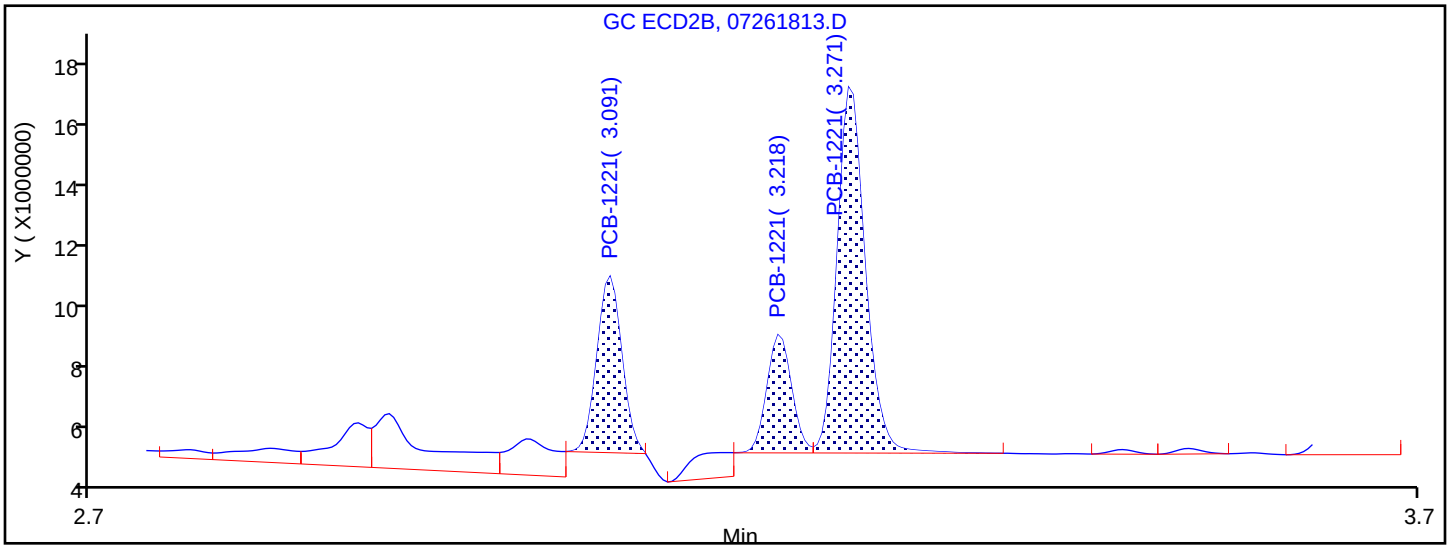
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

3 PCB-1221, CAS: 11104-28-2



Processing Integration Results

3.091	Response = 10484572	
3.218	Response = 6995935	
3.271	Response = 19020744	



Manual Integration Results

3.091	Response = 7179966	M
3.218	Response = 4750122	M
3.271	Response = 16811971	M

Reviewer: jacksonto, 27-Jul-2018 06:59:20

Audit Action: Manually Integrated Audit Reason: Baseline Smoothing

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261814.D
Lims ID: STDL12154
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 26-Jul-2018 19:15:22 ALS Bottle#: 14 Worklist Smp#: 14
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL12154
Misc. Info.: 280-0072400-014
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:57:58 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:55:45

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	1.825	1.825	0.000	3638706043	1000.0	1000.0	
2	1.745	1.745	0.000	925885390	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.961	2.962	-0.001	3631772	25.0	-21.3	
1	3.101	3.102	-0.001	8950064	25.0	-1.19	
1	3.138	3.139	-0.001	31289936	25.0	5.51	
		Average of Peak Amounts =				-5.67	
2	3.091	3.092	-0.001	6225392	25.0	37.0	
2	3.218	3.219	-0.001	4567357	25.0	46.0	
2	3.271	3.272	-0.001	10551026	25.0	23.4	
		Average of Peak Amounts =				35.5	
						RPD = 276.11	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.281	5.282	-0.001	52975306	25.0	22.2	
1	5.611	5.612	-0.001	41896653	25.0	22.2	
1	5.765	5.762	0.003	69675539	25.0	23.2	
1	6.365	6.362	0.003	49339811	25.0	22.4	
1	6.728	6.728	0.000	72943911	25.0	23.1	
		Average of Peak Amounts =				22.6	
2	5.525	5.525	0.000	12763809	25.0	22.0	
2	5.945	5.945	0.000	9018440	25.0	22.2	
2	6.095	6.092	0.003	16913396	25.0	22.6	
2	6.641	6.642	-0.001	7444433	25.0	21.5	
2	7.111	7.112	-0.001	17590105	25.0	23.0	
		Average of Peak Amounts =				22.3	
						RPD = 1.55	
S 8 Polychlorinated biphenyls, Total							
1						16.9	
2						57.7	
						RPD = 109.25	

Reagents:

AR_2154_L1_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

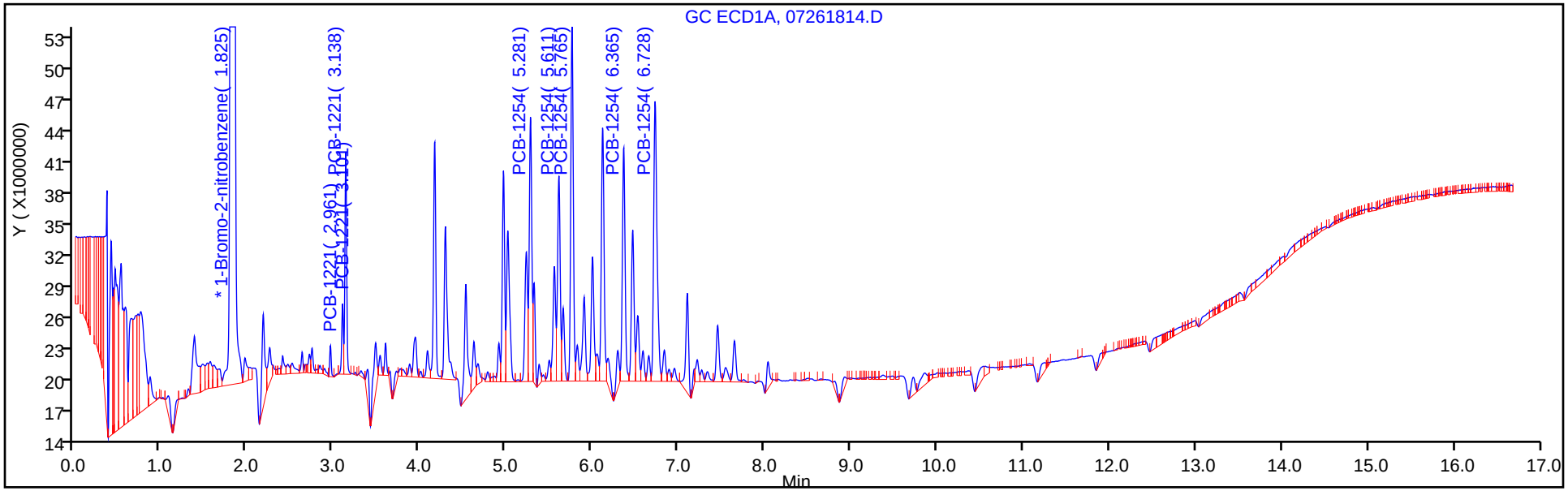
Report Date: 28-Jul-2018 08:57:59 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

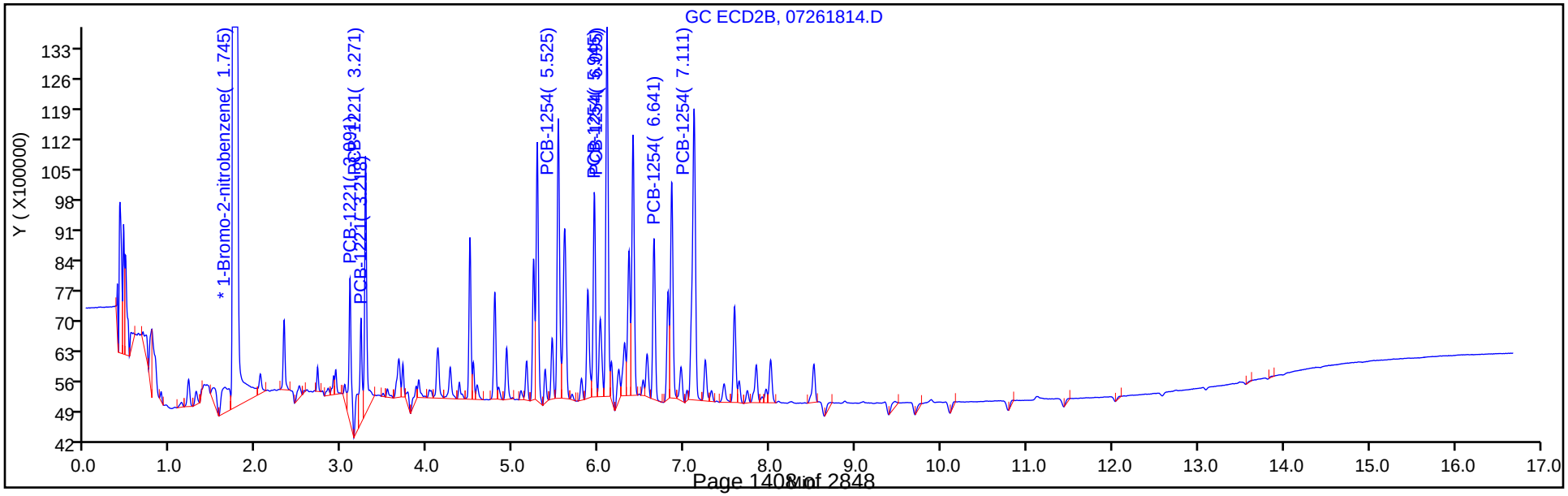
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261814.D

Injection Date:	26-Jul-2018 19:15:22	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL12154			Worklist Smp#:	14
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	14
Method:	PCB_P3	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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 19:37 Calibration End Date: 07/26/2018 21:48 Calibration ID: 33202

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL11660 280-423815/21	07261821.D
Level 2	STDL21660 280-423815/20	07261820.D
Level 3	STDL31660 280-423815/19	07261819.D
Level 4	STDL41660 280-423815/18	07261818.D
Level 5	STDL51660 280-423815/17	07261817.D
Level 6	STDL61660 280-423815/16	07261816.D
Level 7	STDL71660 280-423815/15	07261815.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	0.5141 0.3011	0.3915 0.2919	0.3552	0.3314	0.2984	Lin1	5.7287	0.2907							0.9990		0.9900
PCB-1016 Peak 2	0.8570 0.7086	0.8008 0.7160	0.7286	0.7260	0.6633	Lin1	4.0257	0.6979							0.9990		0.9900
PCB-1016 Peak 3	0.3805 0.3041	0.3452 0.3002	0.3296	0.3138	0.2975	Lin1	2.2916	0.2988							1.0000		0.9900
PCB-1016 Peak 4	0.3996 0.2993	0.3798 0.2874	0.3203	0.3083	0.2891	Lin1	3.4135	0.2881							0.9990		0.9900
PCB-1016 Peak 5	0.4243 0.3118	0.3834 0.3078	0.3377	0.3229	0.2948	Lin1	3.3670	0.3027							0.9990		0.9900
PCB-1260 Peak 1	0.5879 0.4507	0.5367 0.4490	0.4663	0.4572	0.4231	Lin1	3.7985	0.4391							0.9990		0.9900
PCB-1260 Peak 2	1.0684 0.8752	0.9685 0.8886	0.8588	0.8560	0.8143	Lin1	3.9975	0.8595							0.9980		0.9900
PCB-1260 Peak 3	0.5483 0.4177	0.5053 0.4278	0.4190	0.4141	0.3982	Lin1	3.1255	0.4122							0.9990		0.9900
PCB-1260 Peak 4	1.1042 0.9873	1.0464 1.0102	0.9296	0.9593	0.9118	Lin1	1.5762	0.9750							0.9980		0.9900
PCB-1260 Peak 5	0.6025 0.5360	0.5830 0.5435	0.5354	0.5527	0.4886	Lin1	1.8465	0.5281							0.9980		0.9900
Tetrachloro-m-xylene	12.254 9.9003	11.393 9.9279	10.201	10.120	9.9363	Lin1	3.1155	9.8360							1.0000		0.9900
DCB Decachlorobiphenyl	13.613 12.015	12.691 12.000	11.318	11.779	11.369	Lin1	1.4237	11.793							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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 19:37 Calibration End Date: 07/26/2018 21:48 Calibration ID: 33202

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL11660 280-423815/21	07261821.D
Level 2	STDL21660 280-423815/20	07261820.D
Level 3	STDL31660 280-423815/19	07261819.D
Level 4	STDL41660 280-423815/18	07261818.D
Level 5	STDL51660 280-423815/17	07261817.D
Level 6	STDL61660 280-423815/16	07261816.D
Level 7	STDL71660 280-423815/15	07261815.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	48134861 811814801	74228256 1044251582	145154311	333050298	568966573	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 2	BNB	Lin1	80233550 1910478750	151822408 2561622432	297780975	729594286	1264623351	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 3	BNB	Lin1	35625504 819973691	65437598 1074169648	134716078	315296107	567175982	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 4	BNB	Lin1	37415163 806885049	72010040 1028067726	130916793	309826275	551274462	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 5	BNB	Lin1	39723614 840763961	72691870 1101156241	138033380	324533953	562077108	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 1	BNB	Lin1	55041097 1215029433	101744987 1606461628	190578969	459488619	806746216	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 2	BNB	Lin1	100029381 2359729297	183606390 3179307131	351013434	860195550	1552544957	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 3	BNB	Lin1	51333307 1126090265	95798206 1530630540	171255673	416094858	759165679	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 4	BNB	Lin1	103383378 2661864470	198377225 3614188893	379922865	964013985	1738367628	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 5	BNB	Lin1	56407075 1445222530	110528181 1944339811	218813310	555421286	931555497	25.0 750	50.0 1000	100	250	500
Tetrachloro-m-xylene	BNB	Lin1	57366226 1334619185	107991025 1775948813	208465904	508500562	947212225	1.25 37.5	2.50 50.0	5.00	12.5	25.0
DCB Decachlorobiphenyl	BNB	Lin1	63725710 1619668224	120300629 2146588242	231293042	591837237	1083780555	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_P3\20180726-72400.b\07261815.D
Lims ID: STDL71660
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 26-Jul-2018 19:37:15 ALS Bottle#: 15 Worklist Smp#: 15
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL71660
Misc. Info.: 280-0072400-015
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:01 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.825	-0.001	3577696245	1000.0	1000.0	
2	1.745	1.745	0.000	892366330	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.750	-0.002	1775948813	50.0	50.2	
2	2.778	2.776	0.002	499038673	50.0	51.6	
						RPD = 2.88	
1 PCB-1016							
1	3.481	3.483	-0.002	1044251582	1000.0	984.4	
1	3.948	3.946	0.002	2561622432	1000.0	1020.2	
1	4.084	4.083	0.001	1074169648	1000.0	997.3	
1	4.298	4.296	0.002	1028067726	1000.0	985.7	
1	4.531	4.530	0.001	1101156241	1000.0	1005.6	
		Average of Peak Amounts =				998.6	
2	3.661	3.660	0.001	298117689	1000.0	1000.1	
2	4.118	4.116	0.002	698425367	1000.0	1014.3	
2	4.261	4.260	0.001	287670939	1000.0	1021.3	
2	4.491	4.493	-0.002	148139435	1000.0	1012.5	
2	4.781	4.783	-0.002	219931719	1000.0	1015.7	
		Average of Peak Amounts =				1012.8	
						RPD = 1.41	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.001	6.000	0.001	1606461628	1000.0	1014.1	
1	6.728	6.726	0.002	3179307131	1000.0	1029.2	
1	7.214	7.213	0.001	1530630540	1000.0	1030.3	
1	7.648	7.646	0.002	3614188893	1000.0	1034.4	
1	8.031	8.030	0.001	1944339811	1000.0	1025.5	
		Average of Peak Amounts =				1026.7	
2	6.641	6.643	-0.002	516509076	1000.0	1023.1	
2	7.111	7.110	0.001	795259591	1000.0	1026.9	
2	7.638	7.636	0.002	368841723	1000.0	1040.0	
2	8.004	8.006	-0.002	884699106	1000.0	1032.4	
2	8.508	8.510	-0.002	642556155	1000.0	1031.1	
		Average of Peak Amounts =				1030.7	
						RPD = 0.39	
$ 15 DCB Decachlorobiphenyl							
1	9.608	9.610	-0.002	2146588242	50.0	50.8	
2	10.175	10.176	-0.002	412875074	50.0	51.1	
						RPD = 0.67	
S 8 Polychlorinated biphenyls, Total							
1						2025.3	
2						2043.5	
						RPD = 0.89	

Reagents:

AR_1660_L7_00024	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

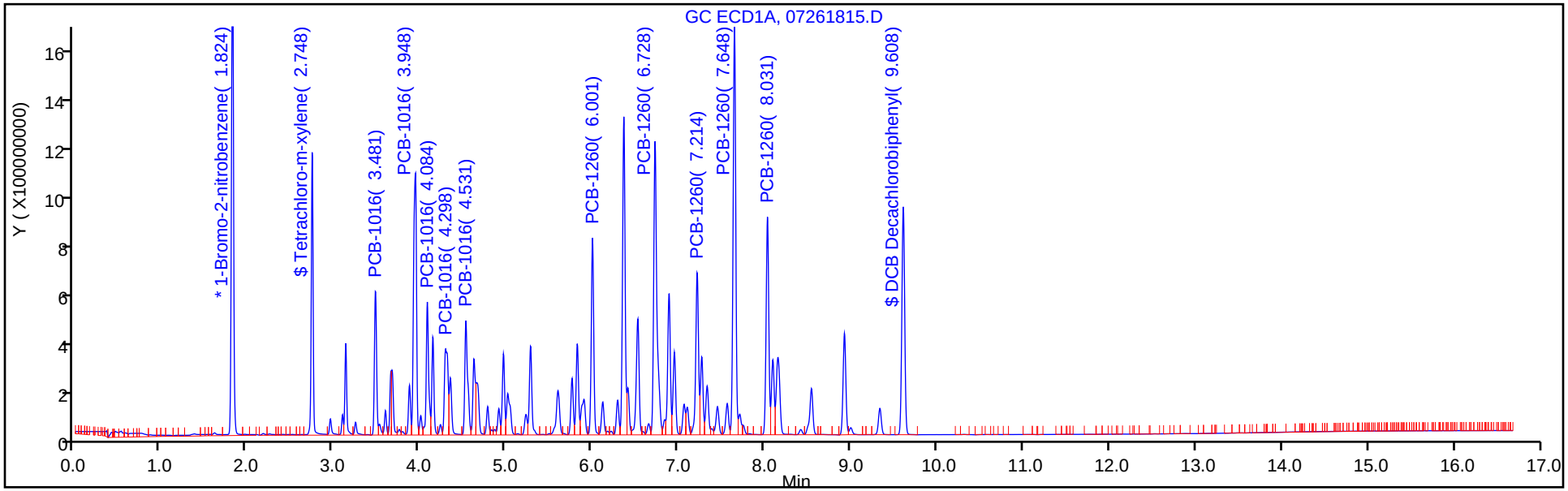
Report Date: 28-Jul-2018 08:58:02 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

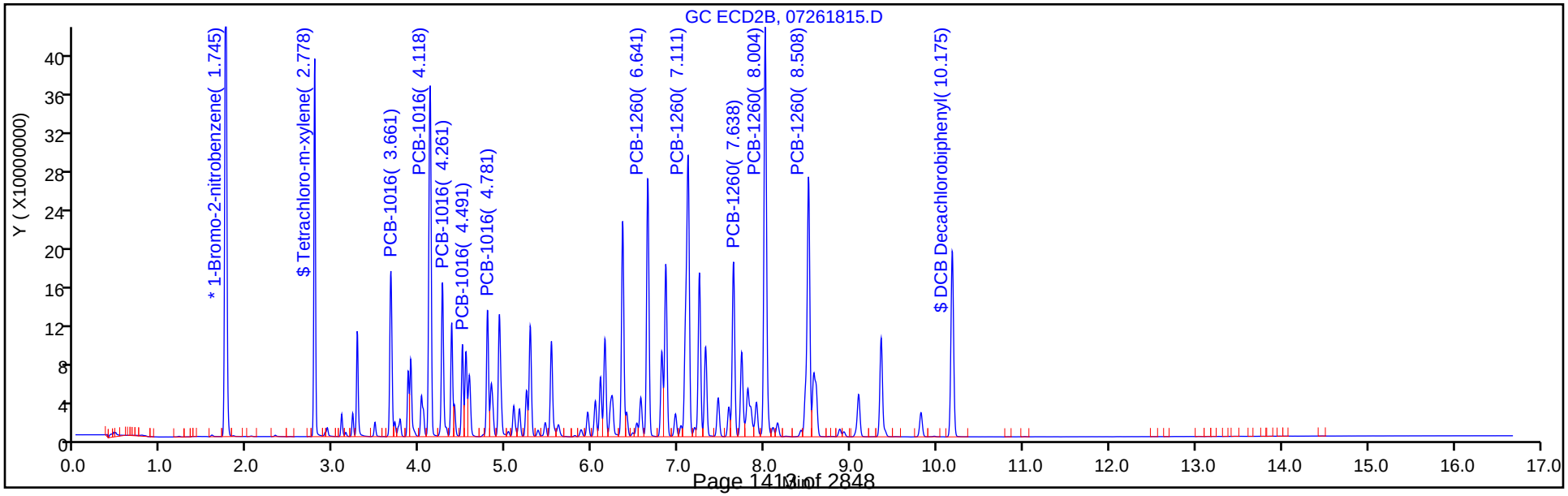
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261815.D

Injection Date:	26-Jul-2018 19:37:15	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL71660			Worklist Smp#:	15
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	15
Method:	PCB_P3	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_P3\20180726-72400.b\07261816.D
Lims ID: STDL61660
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Jul-2018 19:59:09 ALS Bottle#: 16 Worklist Smp#: 16
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL61660
Misc. Info.: 280-0072400-016
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:04 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.825	-0.001	3594822007	1000.0	1000.0	
2	1.747	1.745	0.002	904474601	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.747	2.750	-0.003	1334619185	37.5	37.4	
2	2.777	2.776	0.001	360924650	37.5	36.8	
						RPD = 1.63	
1 PCB-1016							
1	3.484	3.483	0.001	811814801	750.0	757.1	
1	3.947	3.946	0.001	1910478750	750.0	755.8	
1	4.084	4.083	0.001	819973691	750.0	755.8	
1	4.297	4.296	0.001	806885049	750.0	767.3	
1	4.531	4.530	0.001	840763961	750.0	761.5	
		Average of Peak Amounts =				759.5	
2	3.661	3.660	0.001	228555339	750.0	753.9	
2	4.117	4.116	0.001	526520070	750.0	753.2	
2	4.261	4.260	0.001	215828902	750.0	753.9	
2	4.491	4.493	-0.002	110048691	750.0	739.2	
2	4.781	4.783	-0.002	165531336	750.0	751.3	
		Average of Peak Amounts =				750.3	
						RPD = 1.22	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.001	6.000	0.001	1215029433	750.0	761.2	
1	6.727	6.726	0.001	2359729297	750.0	759.0	
1	7.214	7.213	0.001	1126090265	750.0	752.3	
1	7.647	7.646	0.001	2661864470	750.0	757.8	
1	8.031	8.030	0.001	1445222530	750.0	757.7	
		Average of Peak Amounts =				757.6	
2	6.641	6.643	-0.002	384272618	750.0	749.4	
2	7.107	7.110	-0.003	591812889	750.0	752.6	
2	7.637	7.636	0.001	274269914	750.0	761.3	
2	8.004	8.006	-0.002	654981012	750.0	753.2	
2	8.507	8.510	-0.003	473791105	750.0	748.8	
		Average of Peak Amounts =				753.1	
						RPD = 0.60	
$ 15 DCB Decachlorobiphenyl							
1	9.607	9.610	-0.003	1619668224	37.5	38.1	
2	10.174	10.176	-0.002	306393068	37.5	37.3	
						RPD = 2.09	
S 8 Polychlorinated biphenyls, Total							
1						1517.1	
2						1503.4	
						RPD = 0.91	

Reagents:

AR_1660_L6_00031	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

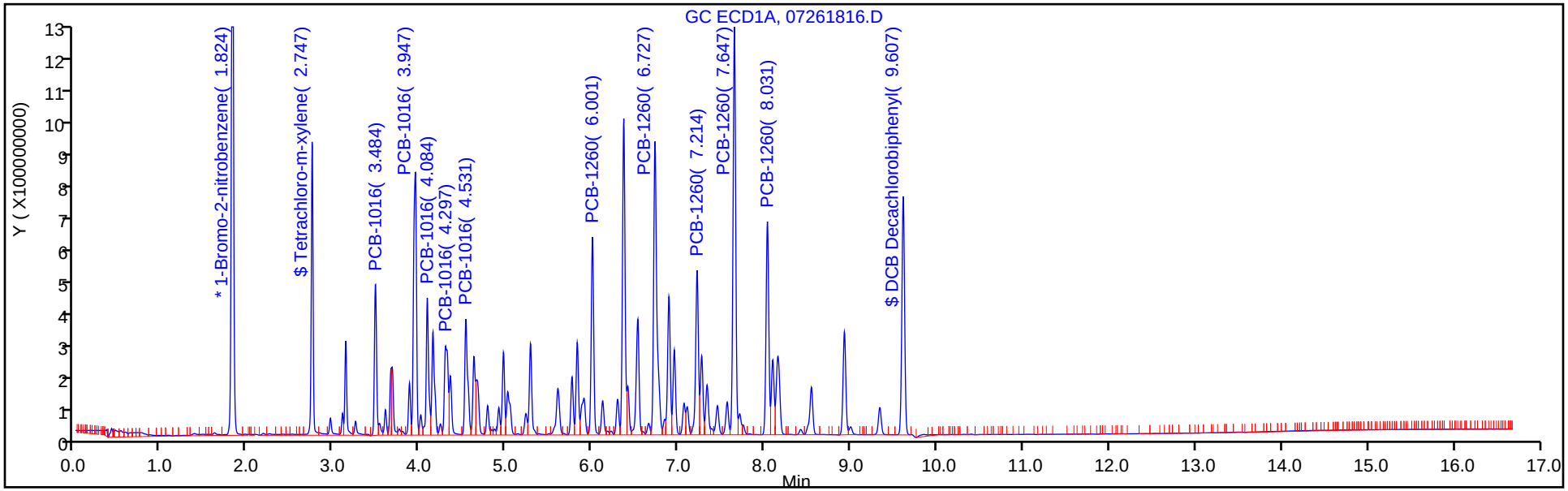
Report Date: 28-Jul-2018 08:58:05 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

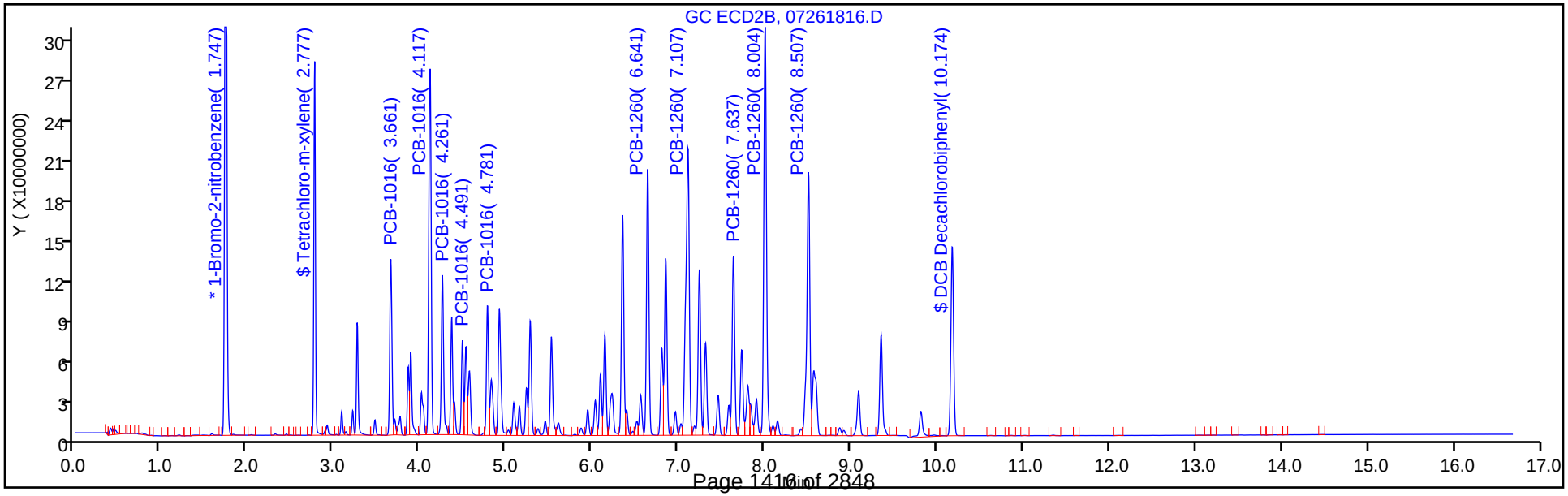
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261816.D

Injection Date:	26-Jul-2018 19:59:09	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL61660			Worklist Smp#:	16
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	16
Method:	PCB_P3	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_P3\20180726-72400.b\07261817.D
Lims ID: STDL51660
Client ID:
Sample Type: ICIS Calib Level: 5
Inject. Date: 26-Jul-2018 20:21:04 ALS Bottle#: 17 Worklist Smp#: 17
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL51660
Misc. Info.: 280-0072400-017
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:07 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:53:56

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	1.823	1.823	0.000	3813134756	1000.0	1000.0	
2	1.746	1.746	0.000	932481946	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.750	2.750	0.000	947212225	25.0	24.9	
2	2.776	2.776	0.000	245232278	25.0	24.3	
						RPD = 2.76	
1 PCB-1016							
1	3.483	3.483	0.000	568966573	500.0	493.6	
1	3.946	3.946	0.000	1264623351	500.0	469.5	
1	4.083	4.083	0.000	567175982	500.0	490.2	
1	4.296	4.296	0.000	551274462	500.0	490.0	
1	4.530	4.530	0.000	562077108	500.0	475.8	
		Average of Peak Amounts =				483.8	
2	3.660	3.660	0.000	155922488	500.0	495.3	
2	4.116	4.116	0.000	349951054	500.0	483.9	
2	4.260	4.260	0.000	140969713	500.0	474.6	
2	4.493	4.493	0.000	75860901	500.0	490.6	
2	4.783	4.783	0.000	109800199	500.0	479.4	
		Average of Peak Amounts =				484.8	
						RPD = 0.20	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.000	6.000	0.000	806746216	500.0	473.2	
1	6.726	6.726	0.000	1552544957	500.0	469.0	
1	7.213	7.213	0.000	759165679	500.0	475.4	
1	7.646	7.646	0.000	1738367628	500.0	465.9	
1	8.030	8.030	0.000	931555497	500.0	459.1	
		Average of Peak Amounts =				468.5	
2	6.643	6.643	0.000	253176955	500.0	476.7	
2	7.110	7.110	0.000	388003503	500.0	476.8	
2	7.636	7.636	0.000	174170875	500.0	466.5	
2	8.006	8.006	0.000	418648404	500.0	465.7	
2	8.510	8.510	0.000	309094679	500.0	472.1	
		Average of Peak Amounts =				471.6	
						RPD = 0.64	
$ 15 DCB Decachlorobiphenyl							
1	9.610	9.610	0.000	1083780555	25.0	24.0	
2	10.176	10.176	0.000	202898841	25.0	23.8	
						RPD = 0.75	

Reagents:

AR_1660_L5_00064	Amount Added: 1.00	Units: mL	
BNB IS_00012	Amount Added: 1.00	Units: mL	Run Reagent

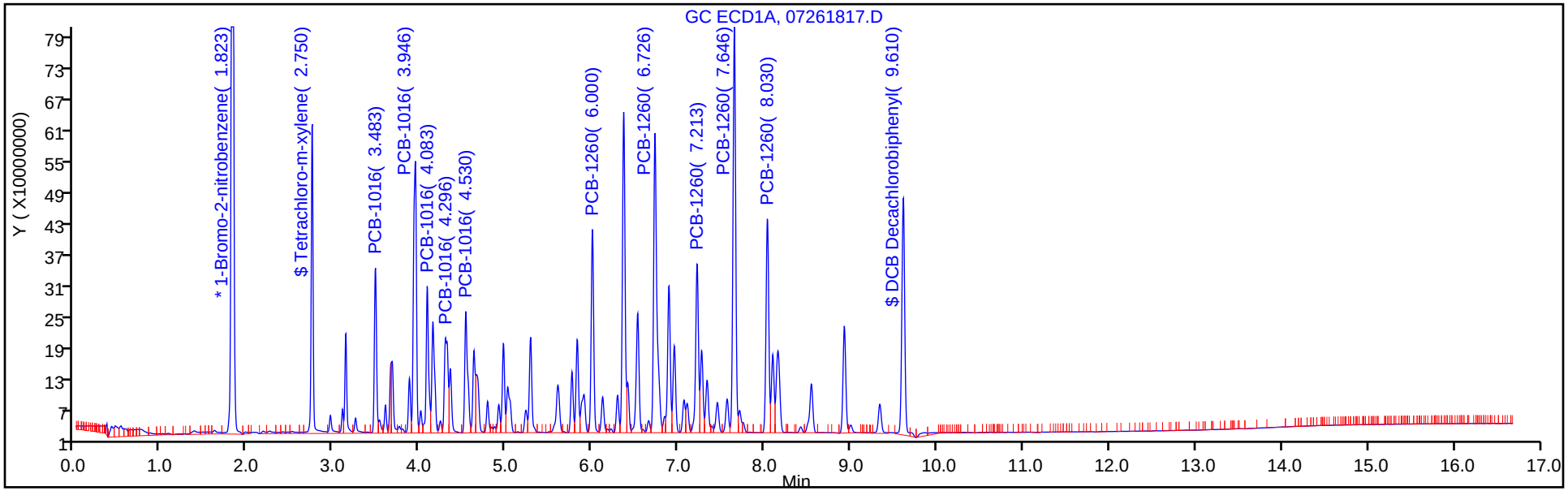
Report Date: 28-Jul-2018 08:58:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

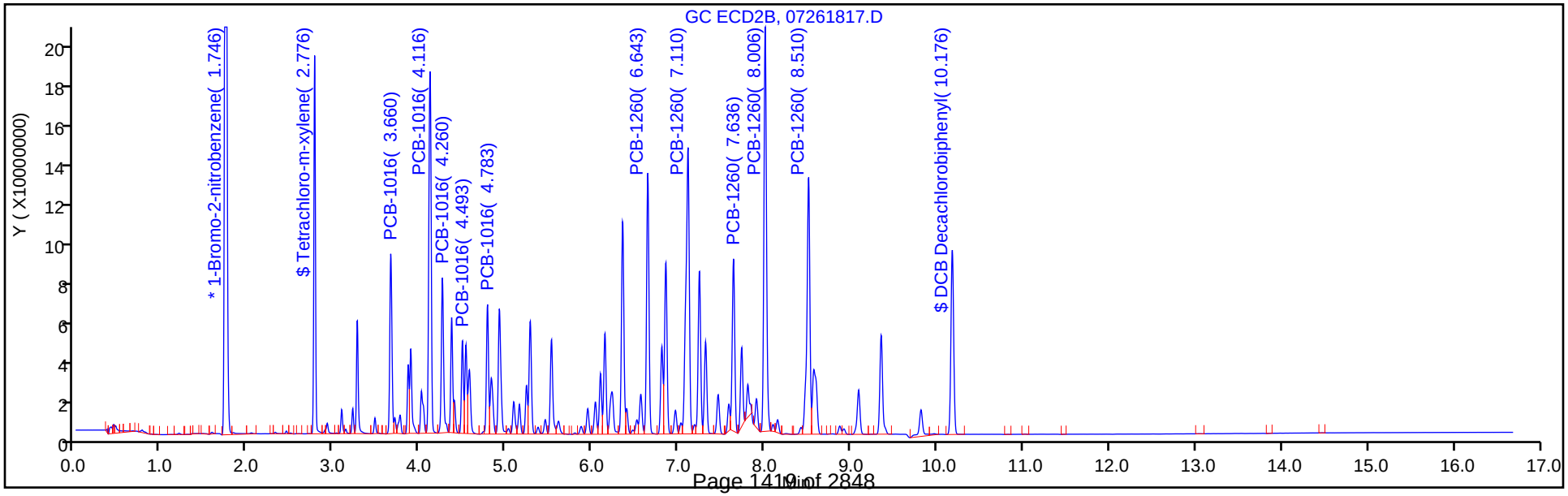
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261817.D

Injection Date:	26-Jul-2018 20:21:04	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL51660			Worklist Smp#:	17
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	17
Method:	PCB_P3	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_P3\20180726-72400.b\07261818.D
Lims ID: STDL41660
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 26-Jul-2018 20:42:57 ALS Bottle#: 18 Worklist Smp#: 18
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL41660
Misc. Info.: 280-0072400-018
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:10 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.822	1.823	-0.001	4019689096	1000.0	1000.0	
2	1.746	1.746	0.000	987518109	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.749	2.750	-0.001	508500562	12.5	12.5	
2	2.776	2.776	0.000	133184145	12.5	12.4	
						RPD = 0.92	
1 PCB-1016							
1	3.482	3.483	-0.001	333050298	250.0	265.3	
1	3.946	3.946	0.000	729594286	250.0	254.3	
1	4.086	4.083	0.003	315296107	250.0	254.9	
1	4.296	4.296	0.000	309826275	250.0	255.7	
1	4.532	4.530	0.002	324533953	250.0	255.6	
		Average of Peak Amounts =				257.2	
2	3.659	3.660	-0.001	84309581	250.0	247.7	
2	4.116	4.116	0.000	192432824	250.0	249.1	
2	4.259	4.260	-0.001	79376199	250.0	248.5	
2	4.492	4.493	-0.001	42919488	250.0	257.0	
2	4.782	4.783	-0.001	62590457	250.0	252.9	
		Average of Peak Amounts =				251.0	
						RPD = 2.41	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	5.999	6.000	-0.001	459488619	250.0	251.7	
1	6.726	6.726	0.000	860195550	250.0	244.3	
1	7.216	7.213	0.003	416094858	250.0	243.5	
1	7.646	7.646	0.000	964013985	250.0	244.3	
1	8.032	8.030	0.002	555421286	250.0	258.1	
		Average of Peak Amounts =				248.4	
2	6.642	6.643	-0.001	142063581	250.0	249.7	
2	7.109	7.110	-0.001	210404668	250.0	241.7	
2	7.636	7.636	0.000	90588084	250.0	226.0	
2	8.002	8.006	-0.004	237476638	250.0	247.9	
2	8.509	8.510	-0.001	172198618	250.0	246.0	
		Average of Peak Amounts =				242.3	
						RPD = 2.51	
$ 15 DCB Decachlorobiphenyl							
1	9.606	9.610	-0.004	591837237	12.5	12.4	
2	10.176	10.176	0.000	116982238	12.5	12.8	
						RPD = 3.15	
S 8 Polychlorinated biphenyls, Total							
1						505.6	
2						493.3	
						RPD = 2.46	

Reagents:

AR_1660_L4_00067	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

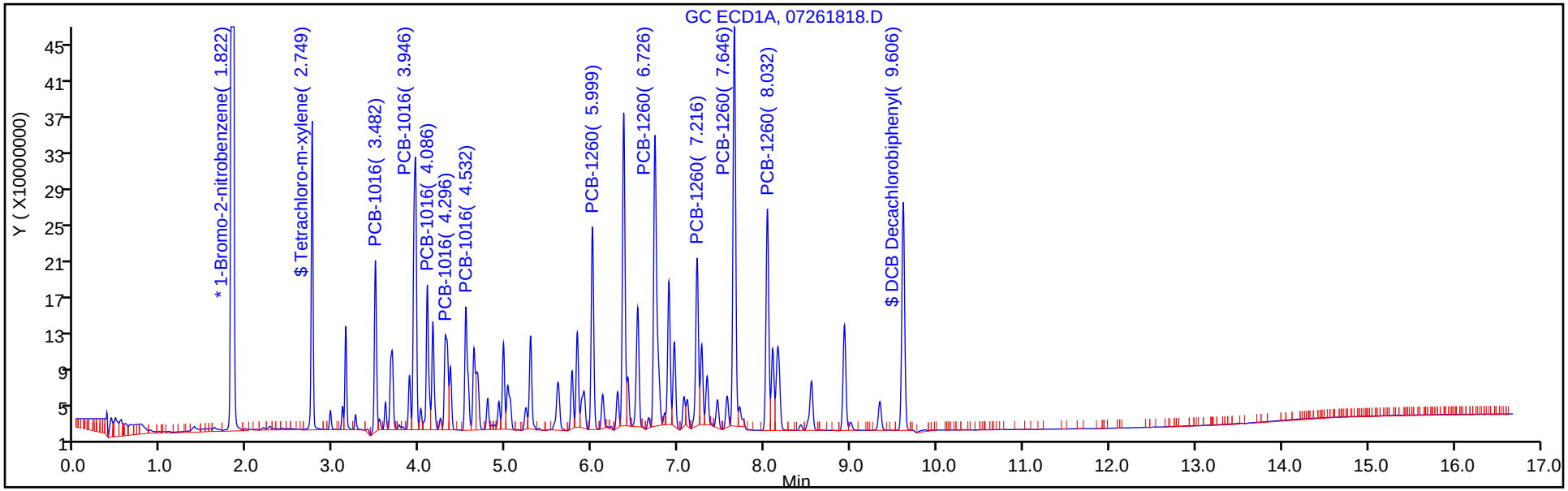
Report Date: 28-Jul-2018 08:58:11 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

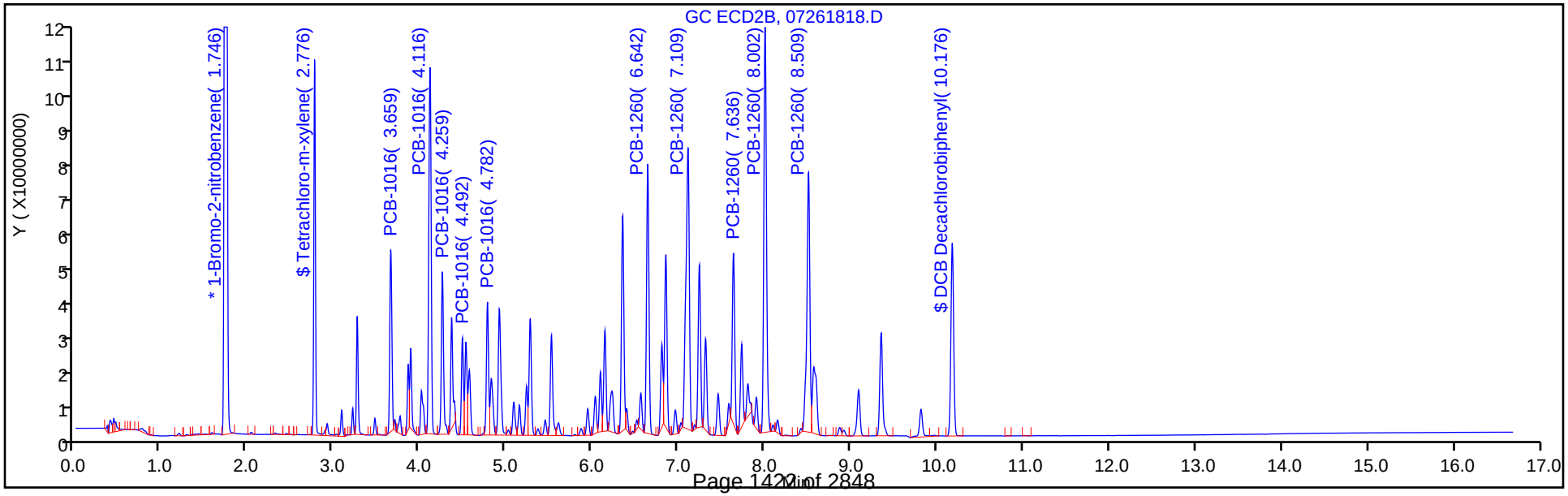
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261818.D

Injection Date:	26-Jul-2018 20:42:57	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL41660			Worklist Smp#:	18
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	18
Method:	PCB_P3	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_P3\20180726-72400.b\07261819.D
Lims ID: STDL31660
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Jul-2018 21:04:51 ALS Bottle#: 19 Worklist Smp#: 19
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL31660
Misc. Info.: 280-0072400-019
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:13 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:55:00

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	1.825	1.823	0.002	4087095985	1000.0	1000.0	
2	1.745	1.746	-0.001	986715161	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.750	-0.002	208465904	5.00	4.87	
2	2.775	2.776	-0.001	51150182	5.00	4.76	
						RPD = 2.20	
1 PCB-1016							
1	3.482	3.483	-0.001	145154311	100.0	102.5	
1	3.945	3.946	-0.001	297780975	100.0	98.6	
1	4.085	4.083	0.002	134716078	100.0	102.7	
1	4.295	4.296	-0.001	130916793	100.0	99.3	
1	4.532	4.530	0.002	138033380	100.0	100.4	
		Average of Peak Amounts =				100.7	
2	3.662	3.660	0.002	36729706	100.0	102.0	
2	4.115	4.116	-0.001	77623105	100.0	97.8	
2	4.258	4.260	-0.002	33384470	100.0	99.9	
2	4.492	4.493	-0.001	17766189	100.0	100.1	
2	4.782	4.783	-0.001	25846195	100.0	97.9	
		Average of Peak Amounts =				99.5	
						RPD = 1.18	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.002	6.000	0.002	190578969	100.0	97.6	
1	6.728	6.726	0.002	351013434	100.0	95.3	
1	7.215	7.213	0.002	171255673	100.0	94.1	
1	7.648	7.646	0.002	379922865	100.0	93.7	
1	8.032	8.030	0.002	218813310	100.0	97.9	
		Average of Peak Amounts =				95.7	
2	6.642	6.643	-0.001	58545147	100.0	99.4	
2	7.108	7.110	-0.002	88932128	100.0	99.4	
2	7.638	7.636	0.002	42150883	100.0	101.9	
2	8.005	8.006	-0.001	96086237	100.0	98.3	
2	8.508	8.510	-0.002	71582581	100.0	99.5	
		Average of Peak Amounts =				99.7	
						RPD = 4.11	
$ 15 DCB Decachlorobiphenyl							
1	9.608	9.610	-0.002	231293042	5.00	4.68	
2	10.175	10.176	-0.001	47701941	5.00	4.95	
						RPD = 5.67	
S 8 Polychlorinated biphenyls, Total							
1						196.4	
2						199.2	
						RPD = 1.44	

Reagents:

AR_1660_L3_00030	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

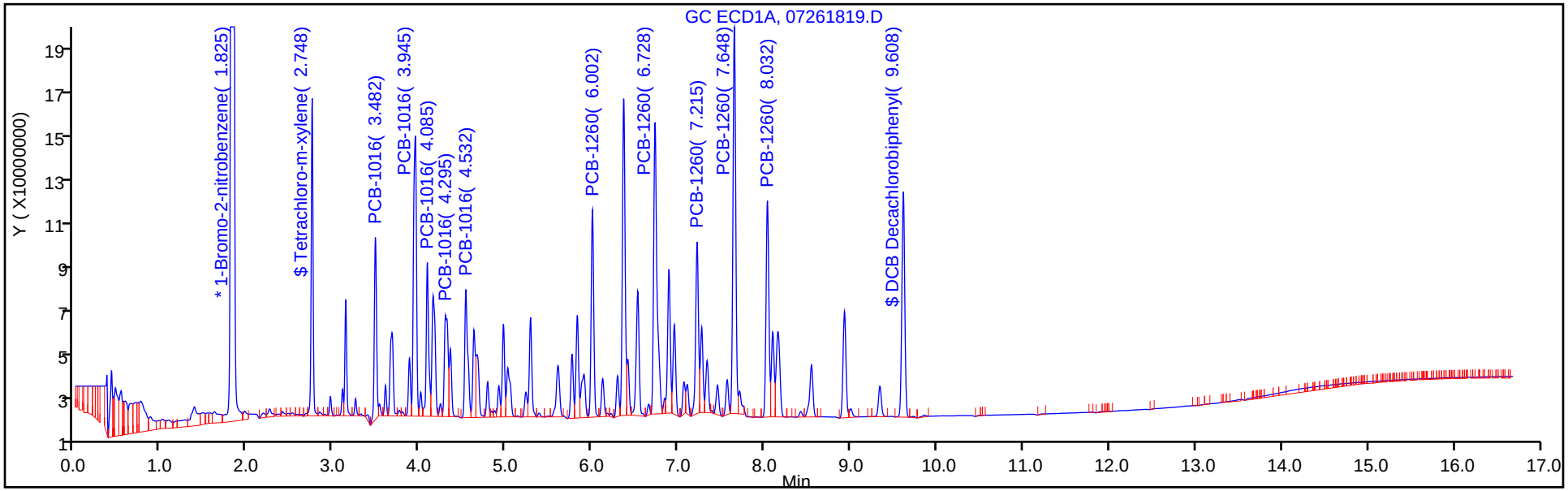
Report Date: 28-Jul-2018 08:58:14 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

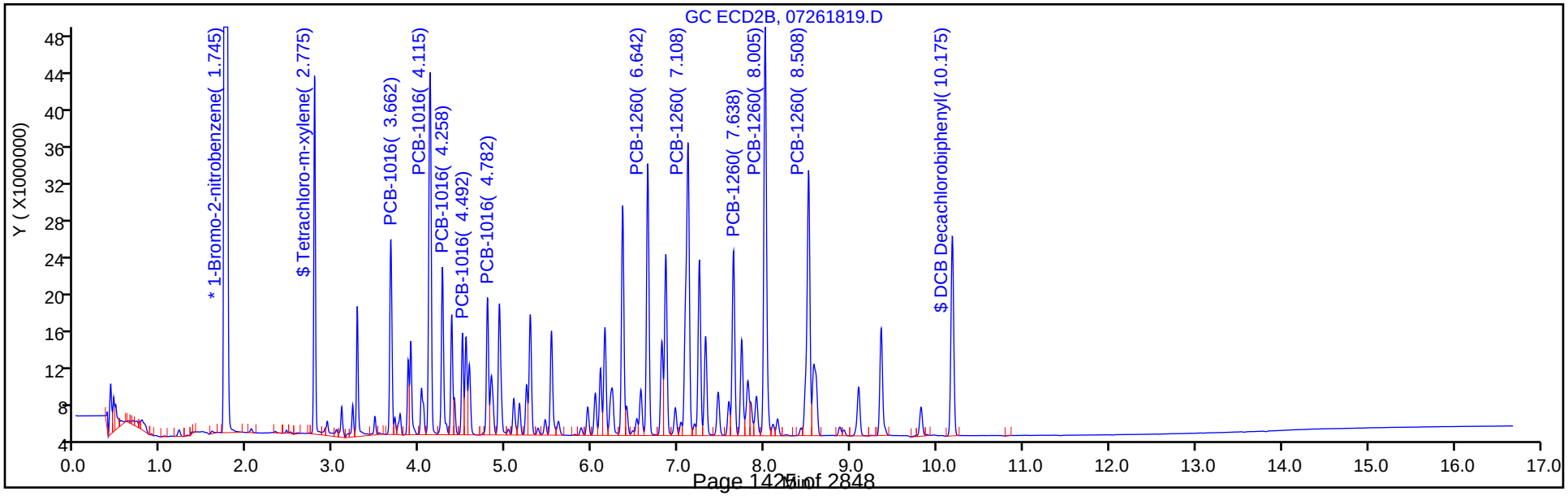
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261819.D

Injection Date:	26-Jul-2018 21:04:51	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL31660			Worklist Smp#:	19
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	19
Method:	PCB_P3	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_P3\20180726-72400.b\07261820.D
Lims ID: STDL21660
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Jul-2018 21:26:43 ALS Bottle#: 20 Worklist Smp#: 20
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL21660
Misc. Info.: 280-0072400-020
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:16 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 10:12:25

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	1.824	1.823	0.001	3791610865	1000.0	1000.0	
2	1.744	1.746	-0.002	942555682	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.747	2.750	-0.003	107991025	2.50	2.58	
2	2.778	2.776	0.002	26264346	2.50	2.55	
						RPD = 1.15	
1 PCB-1016							
1	3.481	3.483	-0.002	74228256	50.0	47.6	
1	3.944	3.946	-0.002	151822408	50.0	51.6	
1	4.084	4.083	0.001	65437598	50.0	50.1	
1	4.297	4.296	0.001	72010040	50.0	54.1	
1	4.531	4.530	0.001	72691870	50.0	52.2	
		Average of Peak Amounts =				51.1	
2	3.661	3.660	0.001	19644922	50.0	52.5	
2	4.114	4.116	-0.002	40597014	50.0	51.4	
2	4.261	4.260	0.001	17774764	50.0	52.0	
2	4.491	4.493	-0.002	9553415	50.0	51.5	
2	4.781	4.783	-0.002	14737260	50.0	53.9	
		Average of Peak Amounts =				52.3	
						RPD = 2.23	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.001	6.000	0.001	101744987	50.0	52.5	
1	6.727	6.726	0.001	183606390	50.0	51.7	
1	7.214	7.213	0.001	95798206	50.0	53.7	
1	7.647	7.646	0.001	198377225	50.0	52.0	
1	8.031	8.030	0.001	110528181	50.0	51.7	
		Average of Peak Amounts =				52.3	
2	6.641	6.643	-0.002	30712058	50.0	51.9	
2	7.111	7.110	0.001	46728182	50.0	52.4	
2	7.638	7.636	0.002	22481025	50.0	54.1	
2	8.004	8.006	-0.002	50146473	50.0	52.2	
2	8.508	8.510	-0.002	37585818	50.0	52.5	
		Average of Peak Amounts =				52.6	
						RPD = 0.59	
$ 15 DCB Decachlorobiphenyl							M
1	9.607	9.610	-0.003	120300629	2.50	2.57	M
2	10.178	10.176	0.002	26028544	2.50	2.64	
						RPD = 2.77	
S 8 Polychlorinated biphenyls, Total							
1						103.4	
2						104.9	
						RPD = 1.40	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1660_L2_00029	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

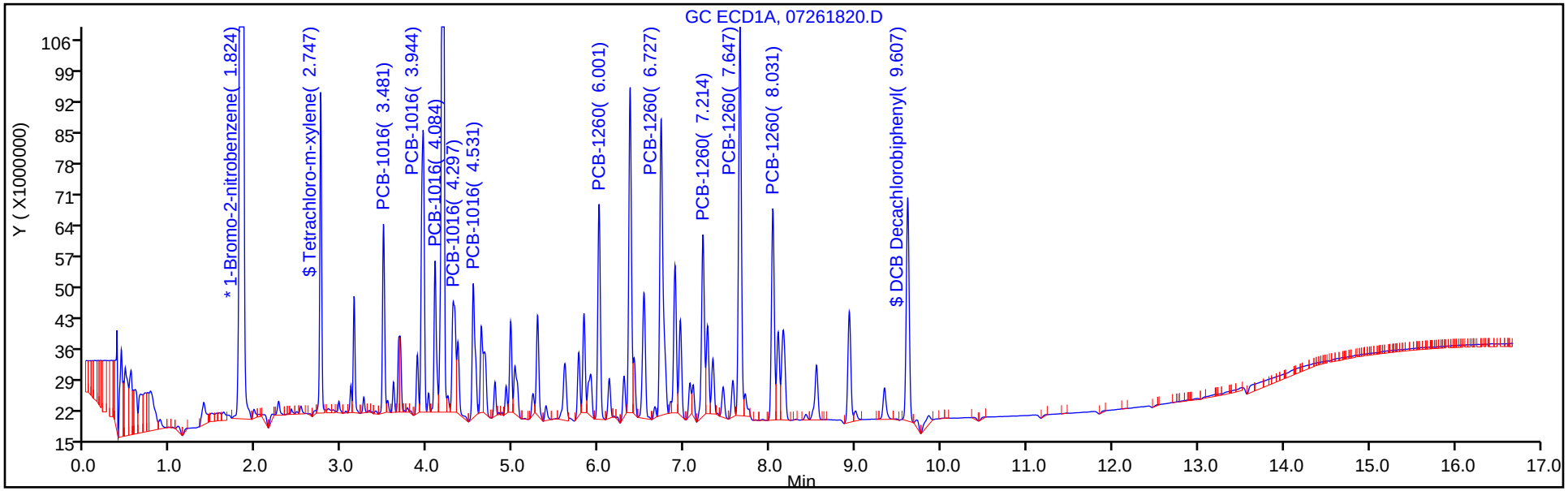
Report Date: 28-Jul-2018 08:58:17 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

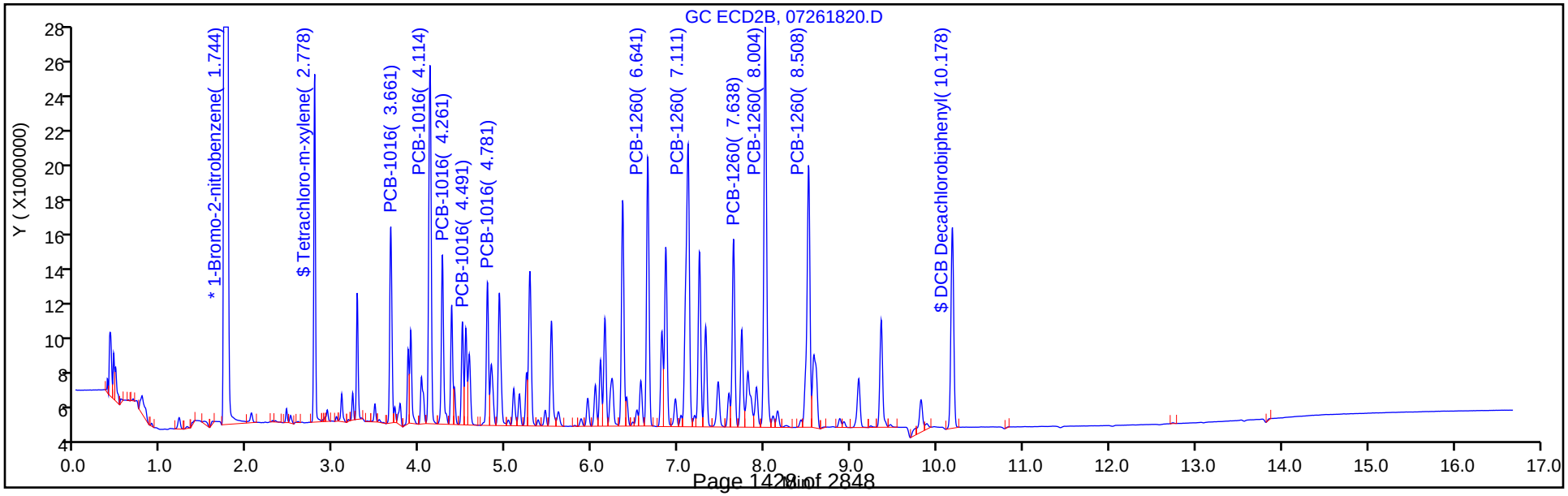
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261820.D

Injection Date:	26-Jul-2018 21:26:43	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL21660			Worklist Smp#:	20
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	20
Method:	PCB_P3	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



Manual Integration/User Assign Peak Report

TestAmerica Denver

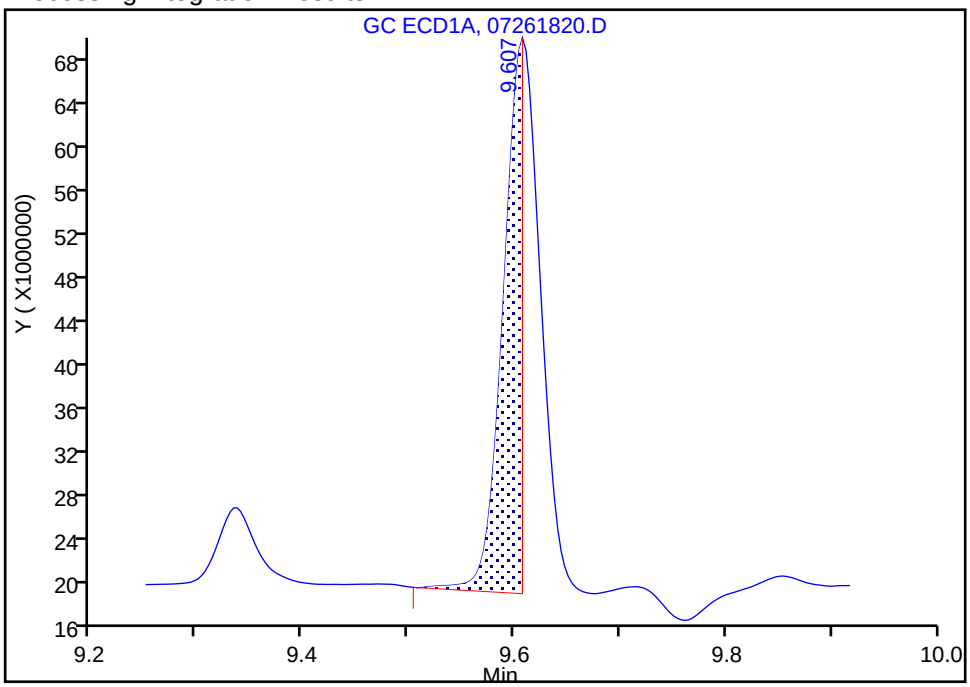
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261820.D
Injection Date: 26-Jul-2018 21:26:43 Instrument ID: SGC_P3
Lims ID: STDL21660
Client ID:
Operator ID: JAX ALS Bottle#: 20 Worklist Smp#: 20
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: PCB_P3 Limit Group: GCSV - 8082 - IS
Column: CLP1 Pesticides Column 1 (0.32 mm) Detector GC ECD1A

$ 15 DCB Decachlorobiphenyl, CAS: 2051-24-3

Signal: 1

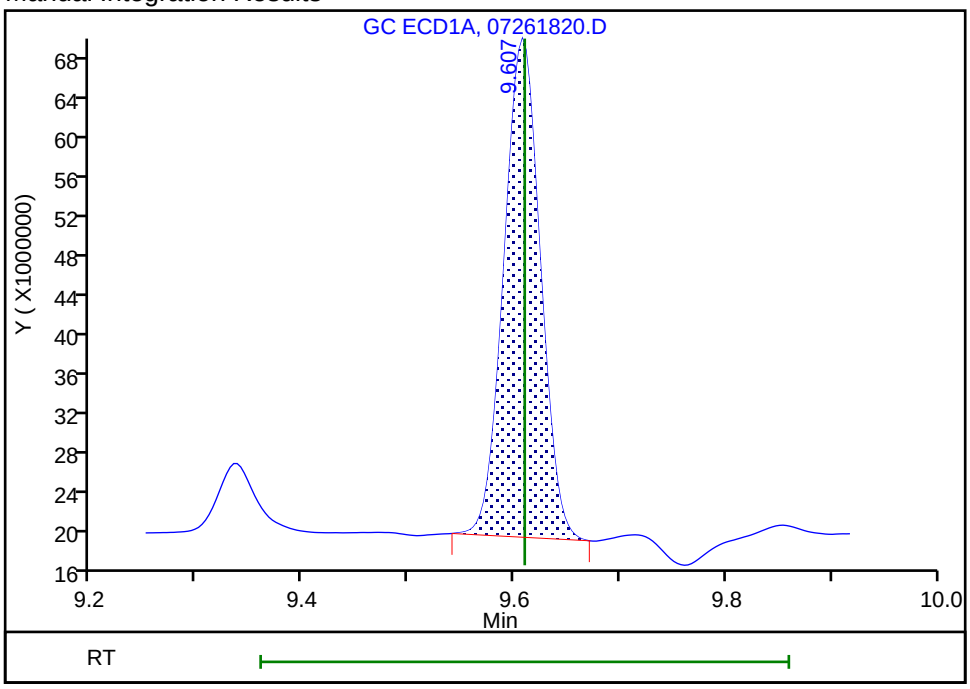
Processing Integration Results

RT: 9.61
Area: 62186478
Amount: 1.630128
Amount Units: ng/ml



Manual Integration Results

RT: 9.61
Area: 120300629
Amount: 2.569597
Amount Units: ng/ml



Reviewer: jacksonto, 27-Jul-2018 10:12:16
Audit Action: Manually Integrated Audit Reason: Split Peak

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261821.D
Lims ID: STDL11660
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 26-Jul-2018 21:48:36 ALS Bottle#: 21 Worklist Smp#: 21
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL11660
Misc. Info.: 280-0072400-021
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:19 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.823	1.823	0.000	3745042881	1000.0	1000.0	
2	1.746	1.746	0.000	917448217	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.749	2.750	-0.001	57366226	1.25	1.24	
2	2.776	2.776	0.000	13257316	1.25	1.31	
						RPD = 5.50	
1 PCB-1016							
1	3.483	3.483	0.000	48134861	25.0	24.5	
1	3.946	3.946	0.000	80233550	25.0	24.9	
1	4.083	4.083	0.000	35625504	25.0	24.2	
1	4.296	4.296	0.000	37415163	25.0	22.8	
1	4.533	4.530	0.003	39723614	25.0	23.9	
		Average of Peak Amounts =				24.1	
2	3.660	3.660	0.000	10372351	25.0	23.6	
2	4.116	4.116	0.000	21066950	25.0	25.3	
2	4.260	4.260	0.000	9462238	25.0	24.8	
2	4.493	4.493	0.000	5205325	25.0	24.0	
2	4.783	4.783	0.000	7729817	25.0	23.9	
		Average of Peak Amounts =				24.3	
						RPD = 0.97	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	5.999	6.000	-0.001	55041097	25.0	24.8	
1	6.726	6.726	0.000	100029381	25.0	26.4	
1	7.216	7.213	0.003	51333307	25.0	25.7	
1	7.646	7.646	0.000	103383378	25.0	26.7	
1	8.033	8.030	0.003	56407075	25.0	25.0	
		Average of Peak Amounts =				25.7	
2	6.643	6.643	0.000	15958520	25.0	24.9	
2	7.110	7.110	0.000	23856144	25.0	25.2	
2	7.636	7.636	0.000	11379981	25.0	25.2	
2	8.006	8.006	0.000	25230613	25.0	25.3	
2	8.510	8.510	0.000	18989802	25.0	24.9	
		Average of Peak Amounts =				25.1	
						RPD = 2.53	
$ 15 DCB Decachlorobiphenyl							
1	9.606	9.610	-0.004	63725710	1.25	1.32	
2	10.176	10.176	0.000	13498010	1.25	1.20	
						RPD = 9.28	
S 8 Polychlorinated biphenyls, Total							
1						49.8	
2						49.4	
						RPD = 0.82	

Reagents:

AR_1660_L1_00030	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

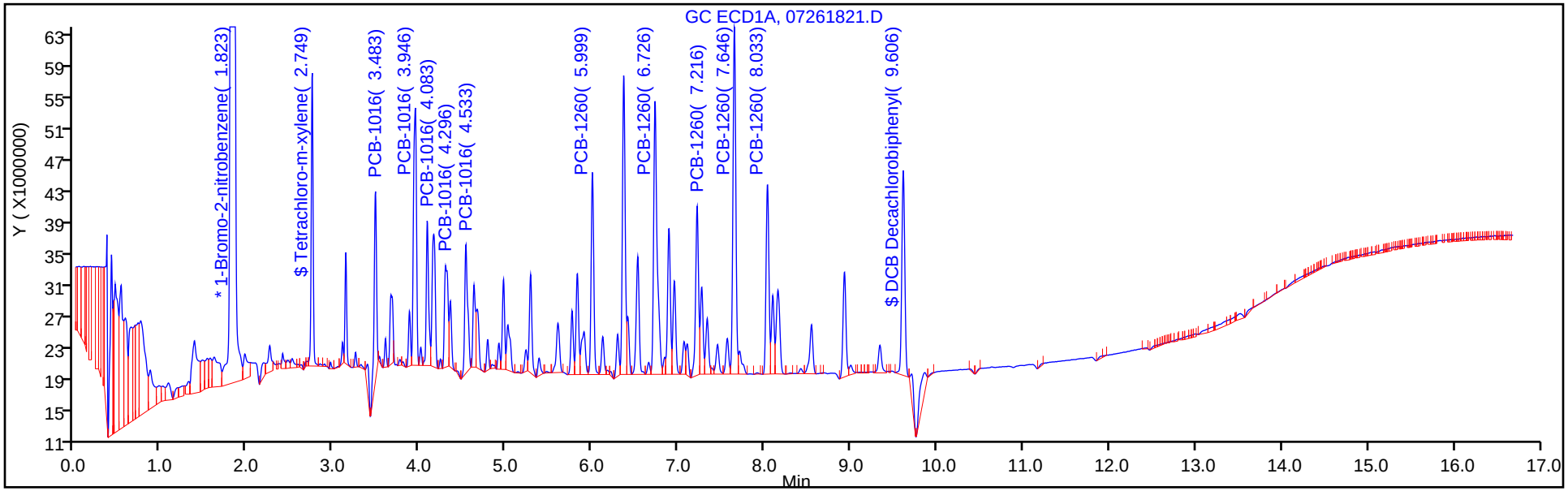
Report Date: 28-Jul-2018 08:58:19 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

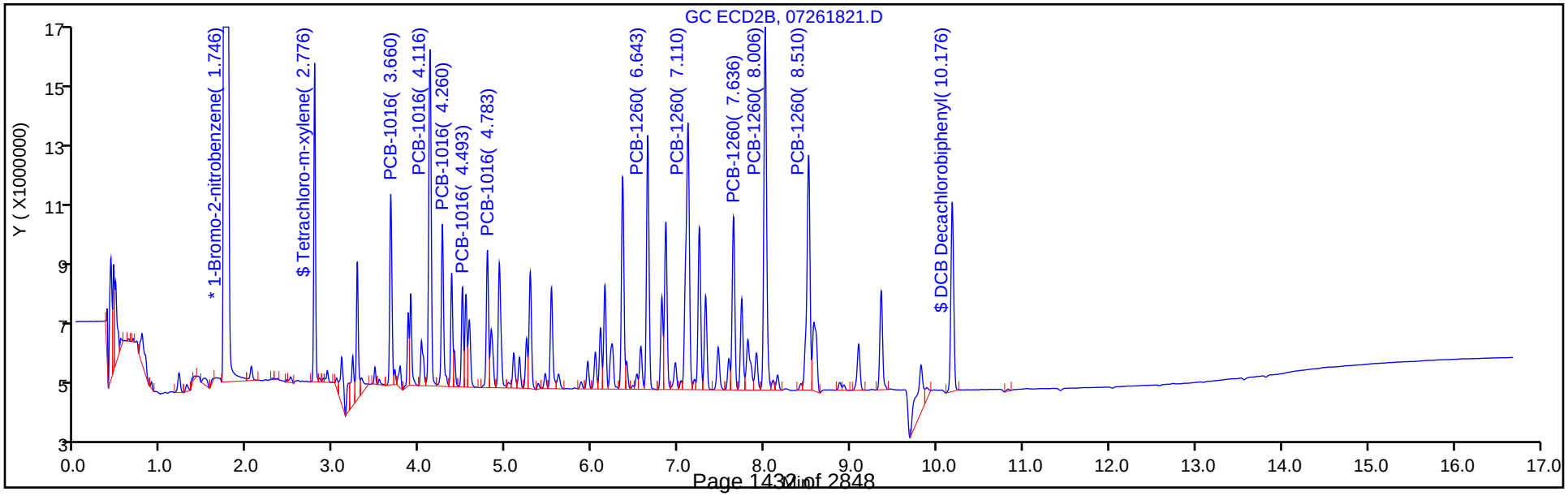
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261821.D

Injection Date:	26-Jul-2018 21:48:36	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL11660			Worklist Smp#:	21
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	21
Method:	PCB_P3	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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 19:37 Calibration End Date: 07/26/2018 21:48 Calibration ID: 33203

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL11660 280-423815/21	07261821.D
Level 2	STDL21660 280-423815/20	07261820.D
Level 3	STDL31660 280-423815/19	07261819.D
Level 4	STDL41660 280-423815/18	07261818.D
Level 5	STDL51660 280-423815/17	07261817.D
Level 6	STDL61660 280-423815/16	07261816.D
Level 7	STDL71660 280-423815/15	07261815.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	0.4522 0.3369	0.4168 0.3341	0.3722	0.3415	0.3344	Lin1	3.5034	0.3305							1.0000		0.9900
PCB-1016 Peak 2	0.9185 0.7762	0.8614 0.7827	0.7867	0.7795	0.7506	Lin1	3.5559	0.7681							1.0000		0.9900
PCB-1016 Peak 3	0.4125 0.3182	0.3772 0.3224	0.3383	0.3215	0.3024	Lin1	2.5596	0.3131							0.9990		0.9900
PCB-1016 Peak 4	0.2269 0.1622	0.2027 0.1660	0.1801	0.1738	0.1627	Lin1	1.7761	0.1622							1.0000		0.9900
PCB-1016 Peak 5	0.3370 0.2440	0.3127 0.2465	0.2619	0.2535	0.2355	Lin1	2.6962	0.2400							0.9990		0.9900
PCB-1260 Peak 1	0.6958 0.5665	0.6517 0.5788	0.5933	0.5754	0.5430	Lin1	3.4178	0.5624							0.9990		0.9900
PCB-1260 Peak 2	1.0401 0.8724	0.9915 0.8912	0.9013	0.8523	0.8322	Lin1	4.2764	0.8637							0.9990		0.9900
PCB-1260 Peak 3	0.4962 0.4043	0.4770 0.4133	0.4272	0.3669	0.3736	Lin1	2.4643	0.3951							0.9970		0.9900
PCB-1260 Peak 4	1.1000 0.9655	1.0641 0.9914	0.9738	0.9619	0.8979	Lin1	3.2523	0.9571							0.9980		0.9900
PCB-1260 Peak 5	0.8279 0.6984	0.7975 0.7201	0.7255	0.6975	0.6630	Lin1	3.3786	0.6950							0.9990		0.9900
Tetrachloro-m-xylene	11.560 10.641	11.146 11.185	10.368	10.789	10.520	Lin1	0.2549	10.830							0.9990		0.9900
DCB Decachlorobiphenyl	11.770 9.0334	11.046 9.2535	9.6688	9.4769	8.7036	Lin1	3.8950	8.9786							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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 19:37 Calibration End Date: 07/26/2018 21:48 Calibration ID: 33203

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL11660 280-423815/21	07261821.D
Level 2	STDL21660 280-423815/20	07261820.D
Level 3	STDL31660 280-423815/19	07261819.D
Level 4	STDL41660 280-423815/18	07261818.D
Level 5	STDL51660 280-423815/17	07261817.D
Level 6	STDL61660 280-423815/16	07261816.D
Level 7	STDL71660 280-423815/15	07261815.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	10372351 228555339	19644922 298117689	36729706	84309581	155922488	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 2	BNB	Lin1	21066950 526520070	40597014 698425367	77623105	192432824	349951054	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 3	BNB	Lin1	9462238 215828902	17774764 287670939	33384470	79376199	140969713	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 4	BNB	Lin1	5205325 110048691	9553415 148139435	17766189	42919488	75860901	25.0 750	50.0 1000	100	250	500
PCB-1016 Peak 5	BNB	Lin1	7729817 165531336	14737260 219931719	25846195	62590457	109800199	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 1	BNB	Lin1	15958520 384272618	30712058 516509076	58545147	142063581	253176955	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 2	BNB	Lin1	23856144 591812889	46728182 795259591	88932128	210404668	388003503	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 3	BNB	Lin1	11379981 274269914	22481025 368841723	42150883	90588084	174170875	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 4	BNB	Lin1	25230613 654981012	50146473 884699106	96086237	237476638	418648404	25.0 750	50.0 1000	100	250	500
PCB-1260 Peak 5	BNB	Lin1	18989802 473791105	37585818 642556155	71582581	172198618	309094679	25.0 750	50.0 1000	100	250	500
Tetrachloro-m-xylene	BNB	Lin1	13257316 360924650	26264346 499038673	51150182	133184145	245232278	1.25 37.5	2.50 50.0	5.00	12.5	25.0
DCB Decachlorobiphenyl	BNB	Lin1	13498010 306393068	26028544 412875074	47701941	116982238	202898841	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_P3\20180726-72400.b\07261815.D
Lims ID: STDL71660
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 26-Jul-2018 19:37:15 ALS Bottle#: 15 Worklist Smp#: 15
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL71660
Misc. Info.: 280-0072400-015
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:01 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.825	-0.001	3577696245	1000.0	1000.0	
2	1.745	1.745	0.000	892366330	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.750	-0.002	1775948813	50.0	50.2	
2	2.778	2.776	0.002	499038673	50.0	51.6	
						RPD = 2.88	
1 PCB-1016							
1	3.481	3.483	-0.002	1044251582	1000.0	984.4	
1	3.948	3.946	0.002	2561622432	1000.0	1020.2	
1	4.084	4.083	0.001	1074169648	1000.0	997.3	
1	4.298	4.296	0.002	1028067726	1000.0	985.7	
1	4.531	4.530	0.001	1101156241	1000.0	1005.6	
		Average of Peak Amounts =				998.6	
2	3.661	3.660	0.001	298117689	1000.0	1000.1	
2	4.118	4.116	0.002	698425367	1000.0	1014.3	
2	4.261	4.260	0.001	287670939	1000.0	1021.3	
2	4.491	4.493	-0.002	148139435	1000.0	1012.5	
2	4.781	4.783	-0.002	219931719	1000.0	1015.7	
		Average of Peak Amounts =				1012.8	
						RPD = 1.41	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.001	6.000	0.001	1606461628	1000.0	1014.1	
1	6.728	6.726	0.002	3179307131	1000.0	1029.2	
1	7.214	7.213	0.001	1530630540	1000.0	1030.3	
1	7.648	7.646	0.002	3614188893	1000.0	1034.4	
1	8.031	8.030	0.001	1944339811	1000.0	1025.5	
		Average of Peak Amounts =				1026.7	
2	6.641	6.643	-0.002	516509076	1000.0	1023.1	
2	7.111	7.110	0.001	795259591	1000.0	1026.9	
2	7.638	7.636	0.002	368841723	1000.0	1040.0	
2	8.004	8.006	-0.002	884699106	1000.0	1032.4	
2	8.508	8.510	-0.002	642556155	1000.0	1031.1	
		Average of Peak Amounts =				1030.7	
						RPD = 0.39	
$ 15 DCB Decachlorobiphenyl							
1	9.608	9.610	-0.002	2146588242	50.0	50.8	
2	10.175	10.176	-0.002	412875074	50.0	51.1	
						RPD = 0.67	
S 8 Polychlorinated biphenyls, Total							
1						2025.3	
2						2043.5	
						RPD = 0.89	

Reagents:

AR_1660_L7_00024	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

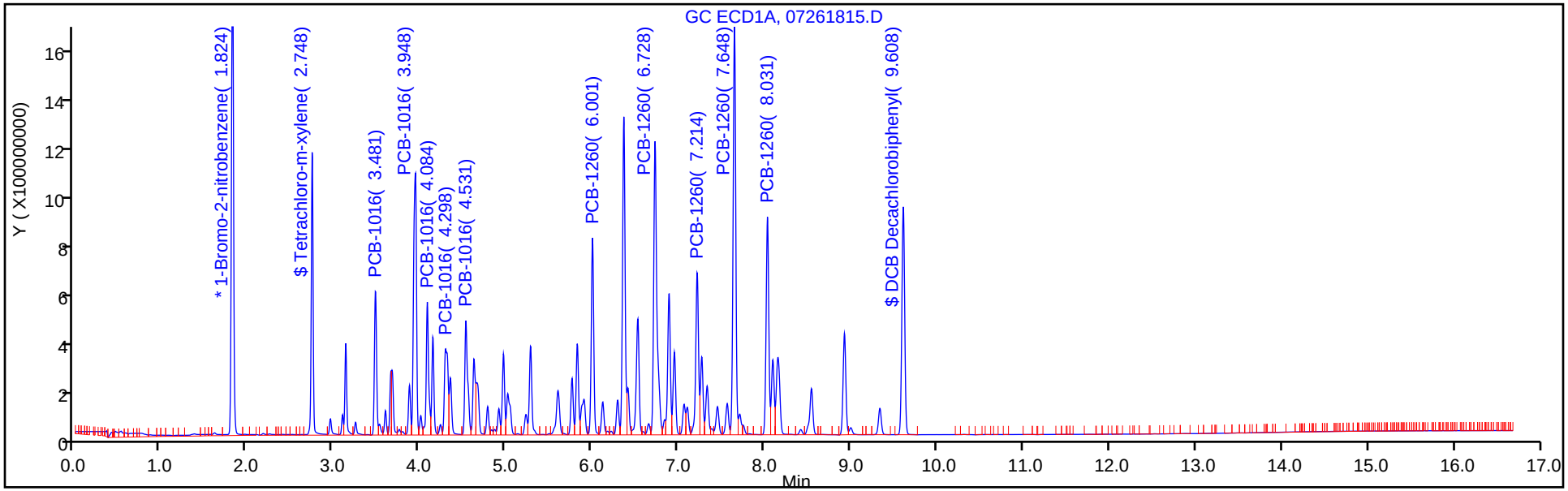
Report Date: 28-Jul-2018 08:58:02 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

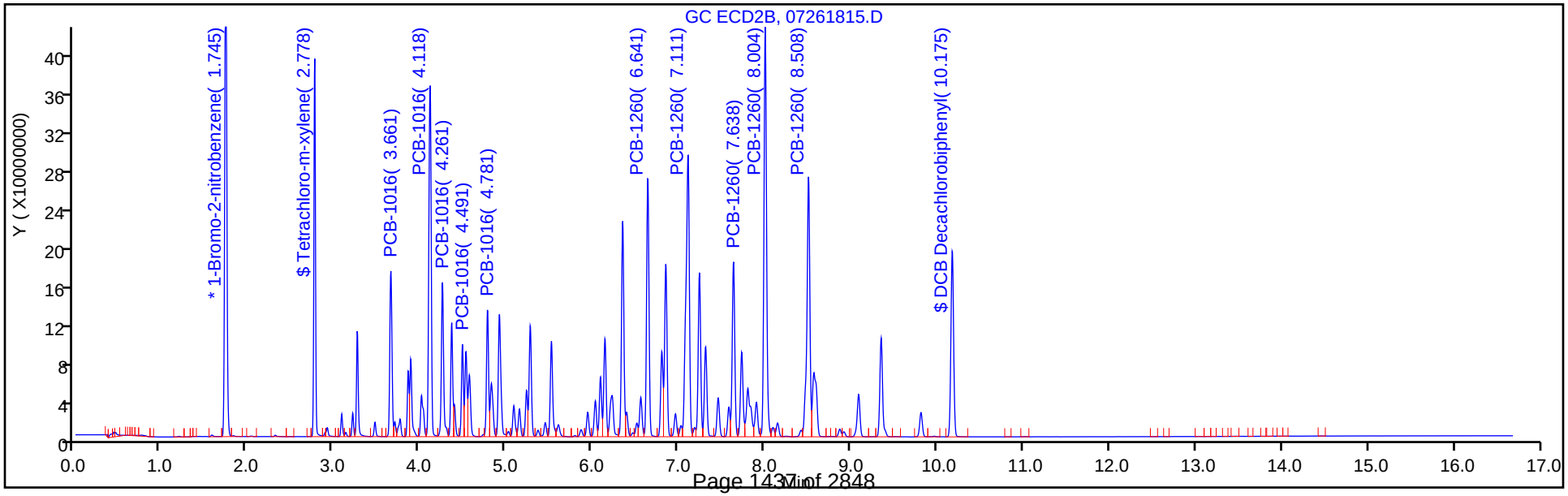
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261815.D

Injection Date:	26-Jul-2018 19:37:15	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL71660			Worklist Smp#:	15
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	15
Method:	PCB_P3	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_P3\20180726-72400.b\07261816.D
Lims ID: STDL61660
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Jul-2018 19:59:09 ALS Bottle#: 16 Worklist Smp#: 16
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL61660
Misc. Info.: 280-0072400-016
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:04 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.825	-0.001	3594822007	1000.0	1000.0	
2	1.747	1.745	0.002	904474601	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.747	2.750	-0.003	1334619185	37.5	37.4	
2	2.777	2.776	0.001	360924650	37.5	36.8	
						RPD = 1.63	
1 PCB-1016							
1	3.484	3.483	0.001	811814801	750.0	757.1	
1	3.947	3.946	0.001	1910478750	750.0	755.8	
1	4.084	4.083	0.001	819973691	750.0	755.8	
1	4.297	4.296	0.001	806885049	750.0	767.3	
1	4.531	4.530	0.001	840763961	750.0	761.5	
		Average of Peak Amounts =				759.5	
2	3.661	3.660	0.001	228555339	750.0	753.9	
2	4.117	4.116	0.001	526520070	750.0	753.2	
2	4.261	4.260	0.001	215828902	750.0	753.9	
2	4.491	4.493	-0.002	110048691	750.0	739.2	
2	4.781	4.783	-0.002	165531336	750.0	751.3	
		Average of Peak Amounts =				750.3	
						RPD = 1.22	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.001	6.000	0.001	1215029433	750.0	761.2	
1	6.727	6.726	0.001	2359729297	750.0	759.0	
1	7.214	7.213	0.001	1126090265	750.0	752.3	
1	7.647	7.646	0.001	2661864470	750.0	757.8	
1	8.031	8.030	0.001	1445222530	750.0	757.7	
		Average of Peak Amounts =				757.6	
2	6.641	6.643	-0.002	384272618	750.0	749.4	
2	7.107	7.110	-0.003	591812889	750.0	752.6	
2	7.637	7.636	0.001	274269914	750.0	761.3	
2	8.004	8.006	-0.002	654981012	750.0	753.2	
2	8.507	8.510	-0.003	473791105	750.0	748.8	
		Average of Peak Amounts =				753.1	
						RPD = 0.60	
$ 15 DCB Decachlorobiphenyl							
1	9.607	9.610	-0.003	1619668224	37.5	38.1	
2	10.174	10.176	-0.002	306393068	37.5	37.3	
						RPD = 2.09	
S 8 Polychlorinated biphenyls, Total							
1						1517.1	
2						1503.4	
						RPD = 0.91	

Reagents:

AR_1660_L6_00031	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

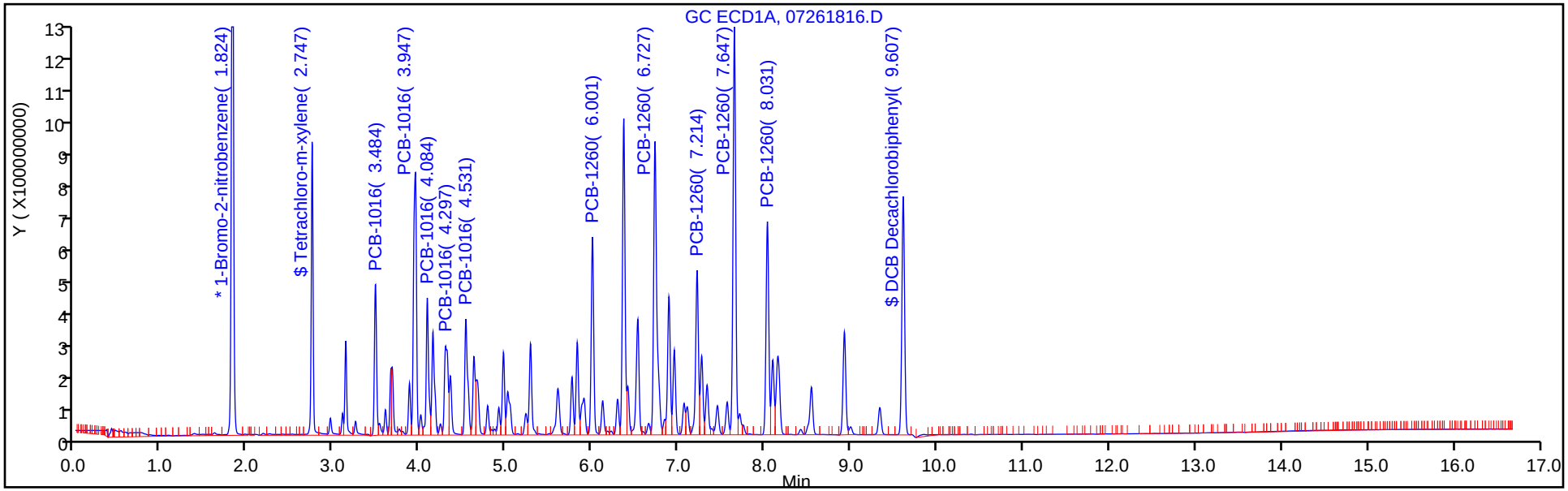
Report Date: 28-Jul-2018 08:58:05 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

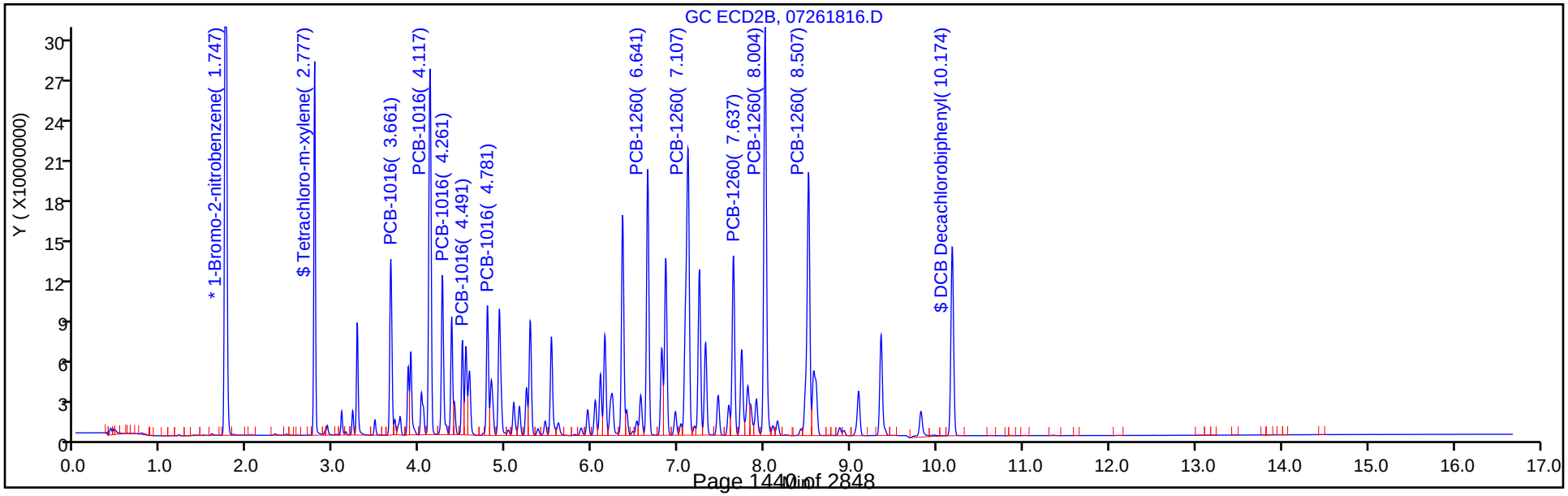
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261816.D

Injection Date:	26-Jul-2018 19:59:09	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL61660			Worklist Smp#:	16
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	16
Method:	PCB_P3	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_P3\20180726-72400.b\07261817.D
Lims ID: STDL51660
Client ID:
Sample Type: ICIS Calib Level: 5
Inject. Date: 26-Jul-2018 20:21:04 ALS Bottle#: 17 Worklist Smp#: 17
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL51660
Misc. Info.: 280-0072400-017
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:07 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:53:56

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	1.823	1.823	0.000	3813134756	1000.0	1000.0	
2	1.746	1.746	0.000	932481946	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.750	2.750	0.000	947212225	25.0	24.9	
2	2.776	2.776	0.000	245232278	25.0	24.3	
						RPD = 2.76	
1 PCB-1016							
1	3.483	3.483	0.000	568966573	500.0	493.6	
1	3.946	3.946	0.000	1264623351	500.0	469.5	
1	4.083	4.083	0.000	567175982	500.0	490.2	
1	4.296	4.296	0.000	551274462	500.0	490.0	
1	4.530	4.530	0.000	562077108	500.0	475.8	
		Average of Peak Amounts =				483.8	
2	3.660	3.660	0.000	155922488	500.0	495.3	
2	4.116	4.116	0.000	349951054	500.0	483.9	
2	4.260	4.260	0.000	140969713	500.0	474.6	
2	4.493	4.493	0.000	75860901	500.0	490.6	
2	4.783	4.783	0.000	109800199	500.0	479.4	
		Average of Peak Amounts =				484.8	
						RPD = 0.20	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.000	6.000	0.000	806746216	500.0	473.2	
1	6.726	6.726	0.000	1552544957	500.0	469.0	
1	7.213	7.213	0.000	759165679	500.0	475.4	
1	7.646	7.646	0.000	1738367628	500.0	465.9	
1	8.030	8.030	0.000	931555497	500.0	459.1	
		Average of Peak Amounts =				468.5	
2	6.643	6.643	0.000	253176955	500.0	476.7	
2	7.110	7.110	0.000	388003503	500.0	476.8	
2	7.636	7.636	0.000	174170875	500.0	466.5	
2	8.006	8.006	0.000	418648404	500.0	465.7	
2	8.510	8.510	0.000	309094679	500.0	472.1	
		Average of Peak Amounts =				471.6	
						RPD = 0.64	
$ 15 DCB Decachlorobiphenyl							
1	9.610	9.610	0.000	1083780555	25.0	24.0	
2	10.176	10.176	0.000	202898841	25.0	23.8	
						RPD = 0.75	

Reagents:

AR_1660_L5_00064	Amount Added: 1.00	Units: mL	
BNB IS_00012	Amount Added: 1.00	Units: mL	Run Reagent

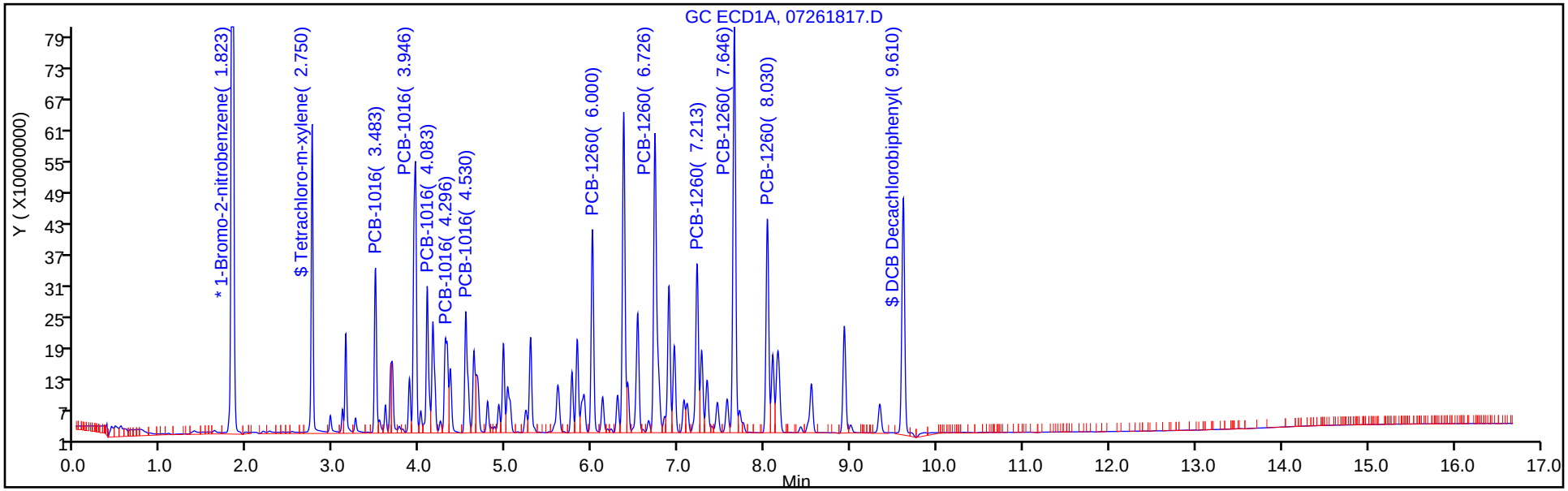
Report Date: 28-Jul-2018 08:58:09 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

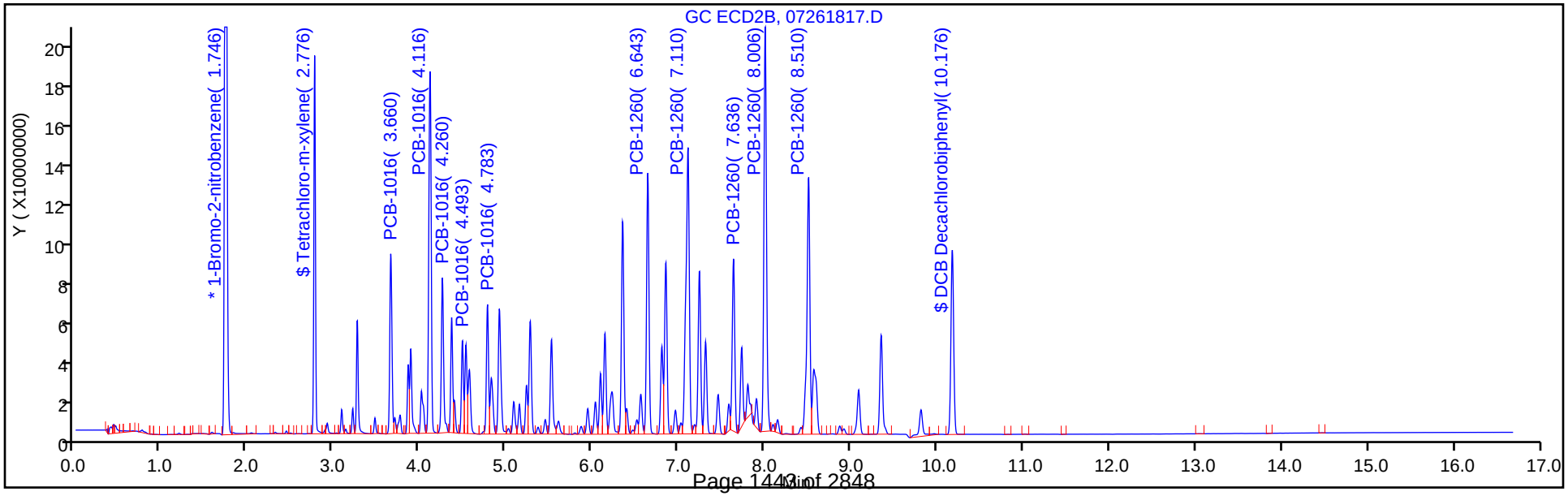
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261817.D

Injection Date:	26-Jul-2018 20:21:04	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL51660			Worklist Smp#:	17
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	17
Method:	PCB_P3	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_P3\20180726-72400.b\07261818.D
Lims ID: STDL41660
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 26-Jul-2018 20:42:57 ALS Bottle#: 18 Worklist Smp#: 18
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL41660
Misc. Info.: 280-0072400-018
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:10 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.822	1.823	-0.001	4019689096	1000.0	1000.0	
2	1.746	1.746	0.000	987518109	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.749	2.750	-0.001	508500562	12.5	12.5	
2	2.776	2.776	0.000	133184145	12.5	12.4	
						RPD = 0.92	
1 PCB-1016							
1	3.482	3.483	-0.001	333050298	250.0	265.3	
1	3.946	3.946	0.000	729594286	250.0	254.3	
1	4.086	4.083	0.003	315296107	250.0	254.9	
1	4.296	4.296	0.000	309826275	250.0	255.7	
1	4.532	4.530	0.002	324533953	250.0	255.6	
		Average of Peak Amounts =				257.2	
2	3.659	3.660	-0.001	84309581	250.0	247.7	
2	4.116	4.116	0.000	192432824	250.0	249.1	
2	4.259	4.260	-0.001	79376199	250.0	248.5	
2	4.492	4.493	-0.001	42919488	250.0	257.0	
2	4.782	4.783	-0.001	62590457	250.0	252.9	
		Average of Peak Amounts =				251.0	
						RPD = 2.41	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	5.999	6.000	-0.001	459488619	250.0	251.7	
1	6.726	6.726	0.000	860195550	250.0	244.3	
1	7.216	7.213	0.003	416094858	250.0	243.5	
1	7.646	7.646	0.000	964013985	250.0	244.3	
1	8.032	8.030	0.002	555421286	250.0	258.1	
		Average of Peak Amounts =				248.4	
2	6.642	6.643	-0.001	142063581	250.0	249.7	
2	7.109	7.110	-0.001	210404668	250.0	241.7	
2	7.636	7.636	0.000	90588084	250.0	226.0	
2	8.002	8.006	-0.004	237476638	250.0	247.9	
2	8.509	8.510	-0.001	172198618	250.0	246.0	
		Average of Peak Amounts =				242.3	
						RPD = 2.51	
$ 15 DCB Decachlorobiphenyl							
1	9.606	9.610	-0.004	591837237	12.5	12.4	
2	10.176	10.176	0.000	116982238	12.5	12.8	
						RPD = 3.15	
S 8 Polychlorinated biphenyls, Total							
1						505.6	
2						493.3	
						RPD = 2.46	

Reagents:

AR_1660_L4_00067	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

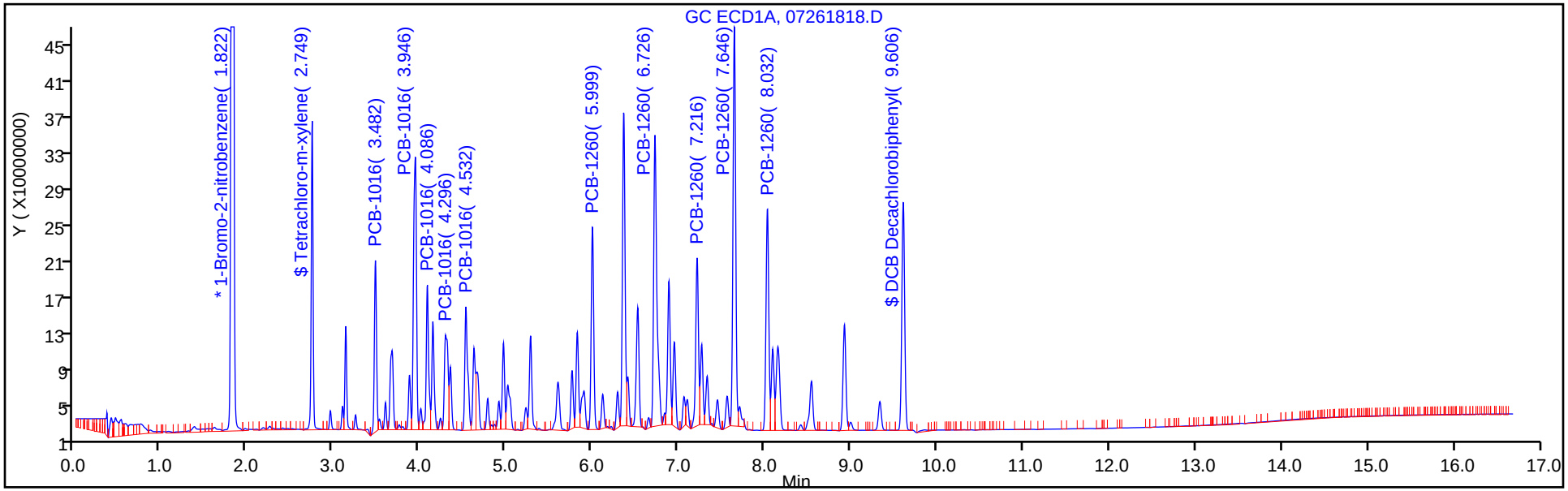
Report Date: 28-Jul-2018 08:58:12 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

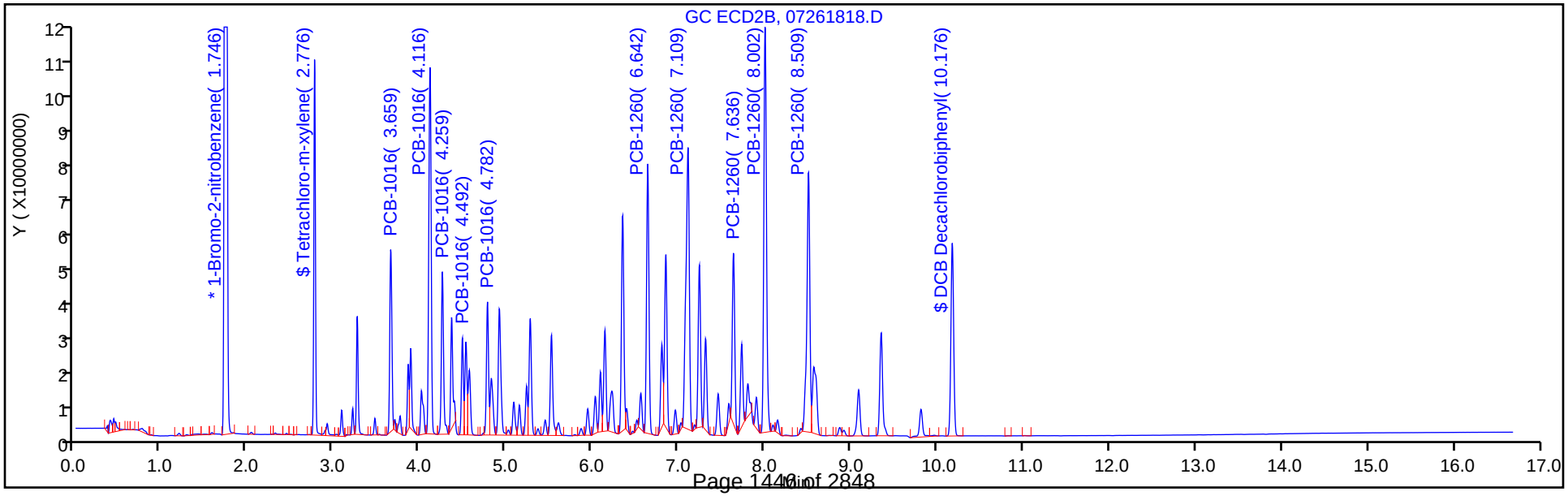
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261818.D

Injection Date:	26-Jul-2018 20:42:57	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL41660			Worklist Smp#:	18
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	18
Method:	PCB_P3	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_P3\20180726-72400.b\07261819.D
Lims ID: STDL31660
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Jul-2018 21:04:51 ALS Bottle#: 19 Worklist Smp#: 19
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL31660
Misc. Info.: 280-0072400-019
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:13 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:55:00

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	1.825	1.823	0.002	4087095985	1000.0	1000.0	
2	1.745	1.746	-0.001	986715161	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.750	-0.002	208465904	5.00	4.87	
2	2.775	2.776	-0.001	51150182	5.00	4.76	
						RPD = 2.20	
1 PCB-1016							
1	3.482	3.483	-0.001	145154311	100.0	102.5	
1	3.945	3.946	-0.001	297780975	100.0	98.6	
1	4.085	4.083	0.002	134716078	100.0	102.7	
1	4.295	4.296	-0.001	130916793	100.0	99.3	
1	4.532	4.530	0.002	138033380	100.0	100.4	
		Average of Peak Amounts =				100.7	
2	3.662	3.660	0.002	36729706	100.0	102.0	
2	4.115	4.116	-0.001	77623105	100.0	97.8	
2	4.258	4.260	-0.002	33384470	100.0	99.9	
2	4.492	4.493	-0.001	17766189	100.0	100.1	
2	4.782	4.783	-0.001	25846195	100.0	97.9	
		Average of Peak Amounts =				99.5	
						RPD = 1.18	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.002	6.000	0.002	190578969	100.0	97.6	
1	6.728	6.726	0.002	351013434	100.0	95.3	
1	7.215	7.213	0.002	171255673	100.0	94.1	
1	7.648	7.646	0.002	379922865	100.0	93.7	
1	8.032	8.030	0.002	218813310	100.0	97.9	
		Average of Peak Amounts =				95.7	
2	6.642	6.643	-0.001	58545147	100.0	99.4	
2	7.108	7.110	-0.002	88932128	100.0	99.4	
2	7.638	7.636	0.002	42150883	100.0	101.9	
2	8.005	8.006	-0.001	96086237	100.0	98.3	
2	8.508	8.510	-0.002	71582581	100.0	99.5	
		Average of Peak Amounts =				99.7	
						RPD = 4.11	
$ 15 DCB Decachlorobiphenyl							
1	9.608	9.610	-0.002	231293042	5.00	4.68	
2	10.175	10.176	-0.001	47701941	5.00	4.95	
						RPD = 5.67	
S 8 Polychlorinated biphenyls, Total							
1						196.4	
2						199.2	
						RPD = 1.44	

Reagents:

AR_1660_L3_00030	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

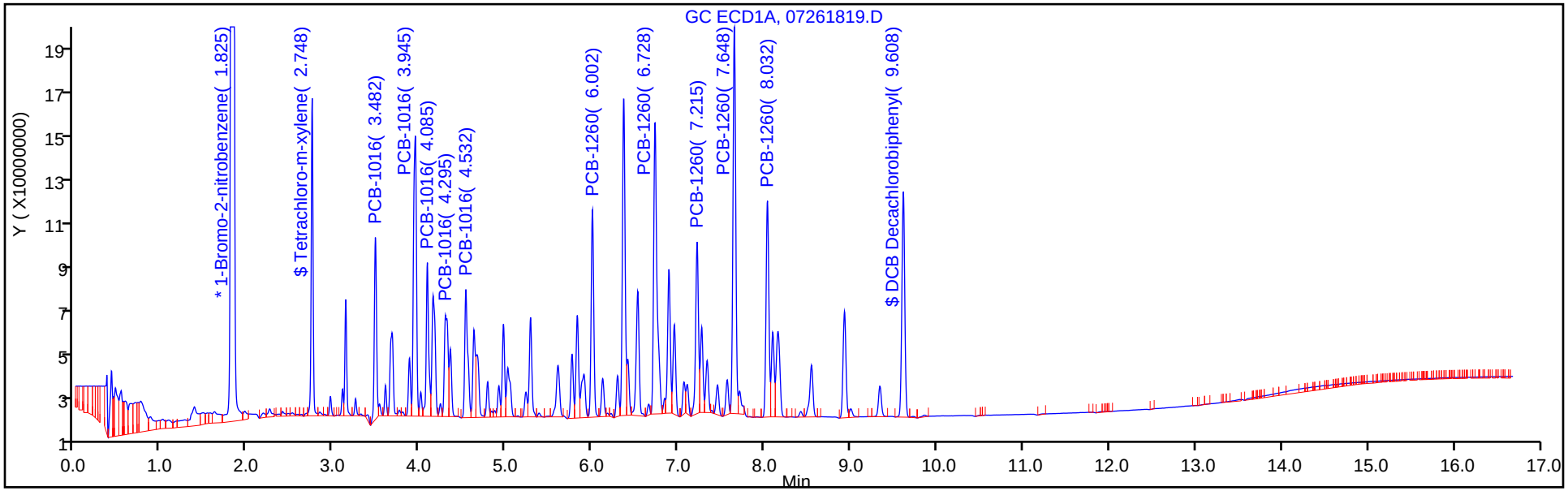
Report Date: 28-Jul-2018 08:58:14 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

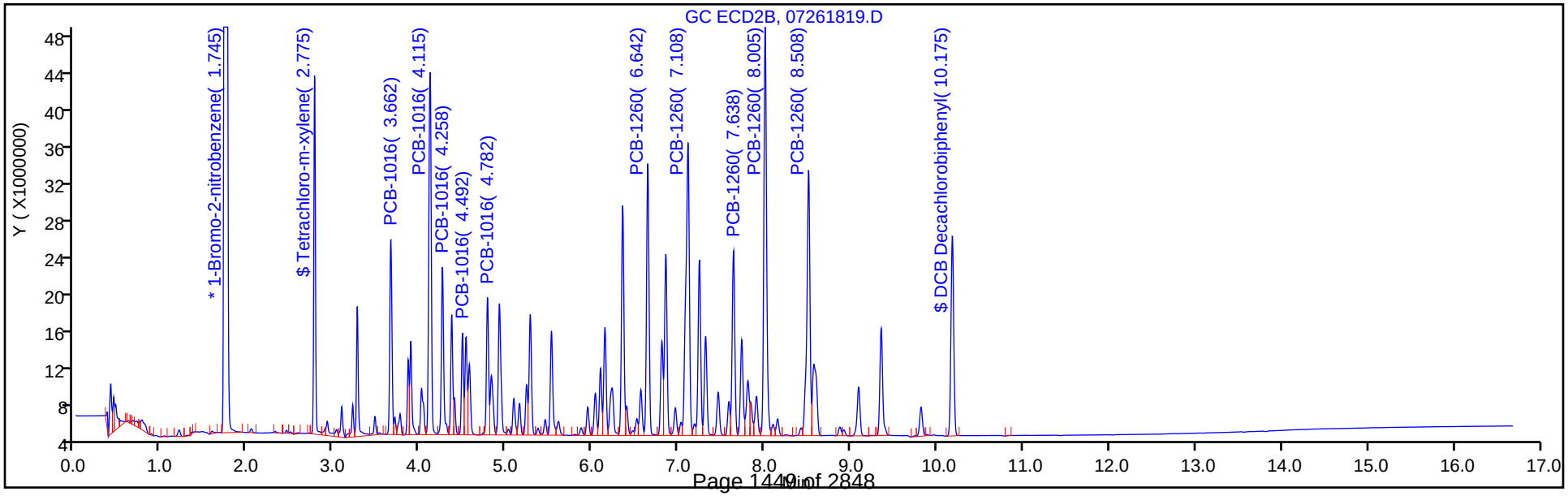
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261819.D

Injection Date:	26-Jul-2018 21:04:51	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL31660			Worklist Smp#:	19
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	19
Method:	PCB_P3	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_P3\20180726-72400.b\07261820.D
Lims ID: STDL21660
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Jul-2018 21:26:43 ALS Bottle#: 20 Worklist Smp#: 20
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL21660
Misc. Info.: 280-0072400-020
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:16 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 10:12:25

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	1.824	1.823	0.001	3791610865	1000.0	1000.0	
2	1.744	1.746	-0.002	942555682	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.747	2.750	-0.003	107991025	2.50	2.58	
2	2.778	2.776	0.002	26264346	2.50	2.55	
						RPD = 1.15	
1 PCB-1016							
1	3.481	3.483	-0.002	74228256	50.0	47.6	
1	3.944	3.946	-0.002	151822408	50.0	51.6	
1	4.084	4.083	0.001	65437598	50.0	50.1	
1	4.297	4.296	0.001	72010040	50.0	54.1	
1	4.531	4.530	0.001	72691870	50.0	52.2	
		Average of Peak Amounts =				51.1	
2	3.661	3.660	0.001	19644922	50.0	52.5	
2	4.114	4.116	-0.002	40597014	50.0	51.4	
2	4.261	4.260	0.001	17774764	50.0	52.0	
2	4.491	4.493	-0.002	9553415	50.0	51.5	
2	4.781	4.783	-0.002	14737260	50.0	53.9	
		Average of Peak Amounts =				52.3	
						RPD = 2.23	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	6.001	6.000	0.001	101744987	50.0	52.5	
1	6.727	6.726	0.001	183606390	50.0	51.7	
1	7.214	7.213	0.001	95798206	50.0	53.7	
1	7.647	7.646	0.001	198377225	50.0	52.0	
1	8.031	8.030	0.001	110528181	50.0	51.7	
		Average of Peak Amounts =				52.3	
2	6.641	6.643	-0.002	30712058	50.0	51.9	
2	7.111	7.110	0.001	46728182	50.0	52.4	
2	7.638	7.636	0.002	22481025	50.0	54.1	
2	8.004	8.006	-0.002	50146473	50.0	52.2	
2	8.508	8.510	-0.002	37585818	50.0	52.5	
		Average of Peak Amounts =				52.6	
						RPD = 0.59	
$ 15 DCB Decachlorobiphenyl							M
1	9.607	9.610	-0.003	120300629	2.50	2.57	M
2	10.178	10.176	0.002	26028544	2.50	2.64	
						RPD = 2.77	
S 8 Polychlorinated biphenyls, Total							
1						103.4	
2						104.9	
						RPD = 1.40	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1660_L2_00029	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

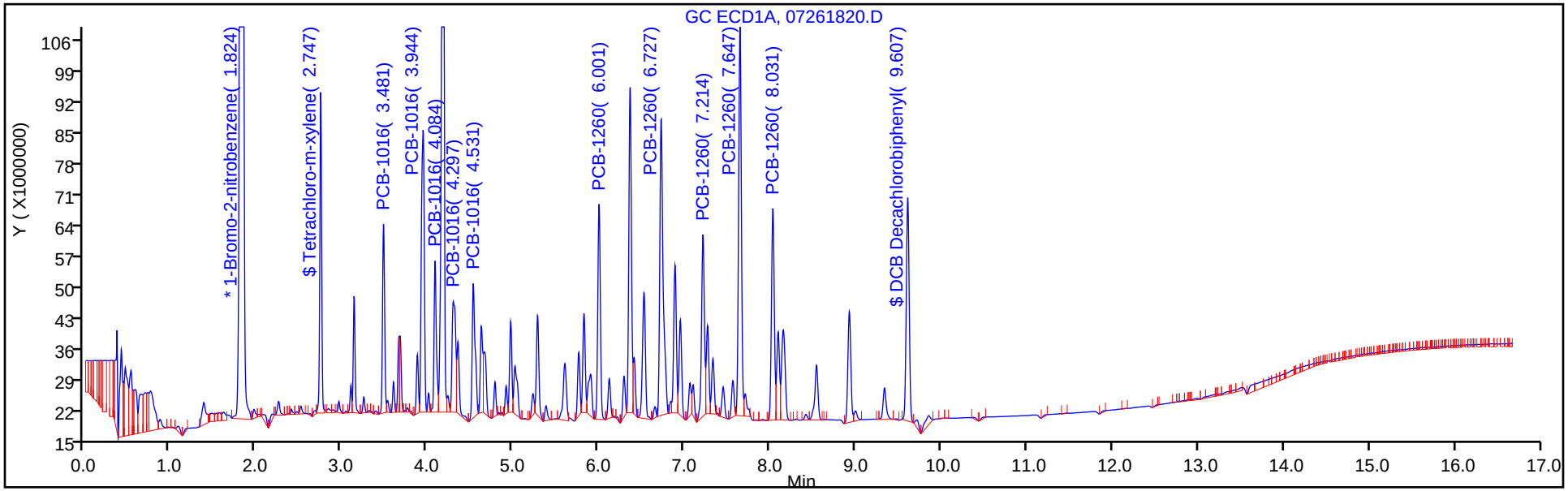
Report Date: 28-Jul-2018 08:58:17 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

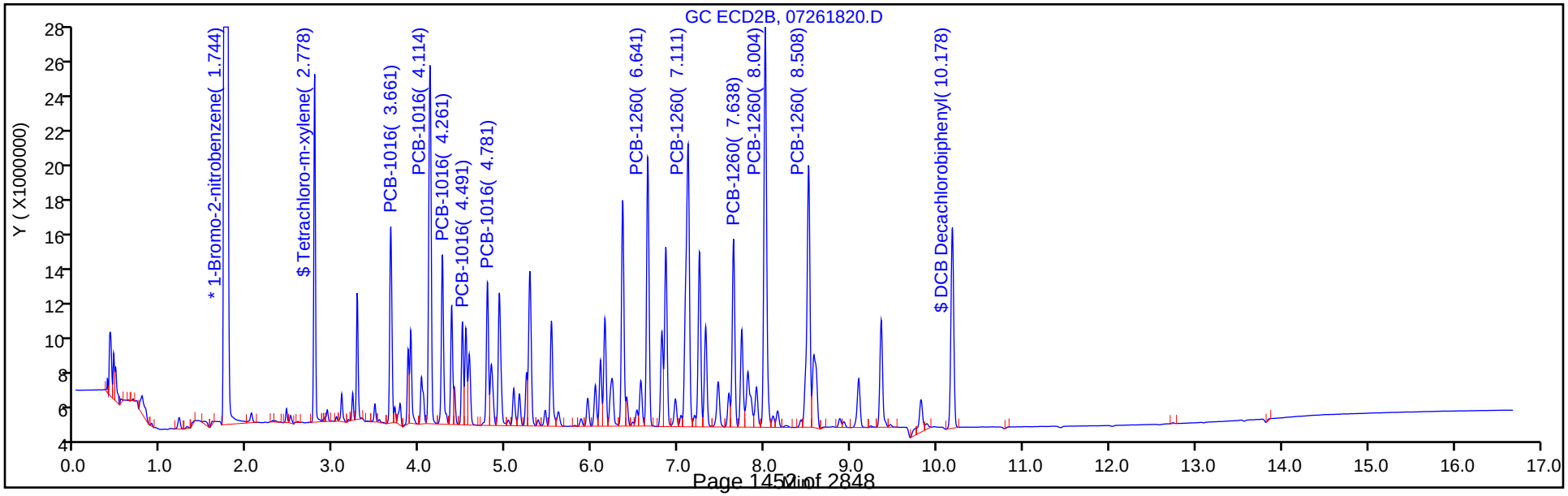
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261820.D

Injection Date:	26-Jul-2018 21:26:43	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL21660			Worklist Smp#:	20
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	20
Method:	PCB_P3	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_P3\20180726-72400.b\07261821.D
Lims ID: STDL11660
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 26-Jul-2018 21:48:36 ALS Bottle#: 21 Worklist Smp#: 21
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL11660
Misc. Info.: 280-0072400-021
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:19 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.823	1.823	0.000	3745042881	1000.0	1000.0	
2	1.746	1.746	0.000	917448217	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.749	2.750	-0.001	57366226	1.25	1.24	
2	2.776	2.776	0.000	13257316	1.25	1.31	
						RPD = 5.50	
1 PCB-1016							
1	3.483	3.483	0.000	48134861	25.0	24.5	
1	3.946	3.946	0.000	80233550	25.0	24.9	
1	4.083	4.083	0.000	35625504	25.0	24.2	
1	4.296	4.296	0.000	37415163	25.0	22.8	
1	4.533	4.530	0.003	39723614	25.0	23.9	
		Average of Peak Amounts =				24.1	
2	3.660	3.660	0.000	10372351	25.0	23.6	
2	4.116	4.116	0.000	21066950	25.0	25.3	
2	4.260	4.260	0.000	9462238	25.0	24.8	
2	4.493	4.493	0.000	5205325	25.0	24.0	
2	4.783	4.783	0.000	7729817	25.0	23.9	
		Average of Peak Amounts =				24.3	
						RPD = 0.97	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	5.999	6.000	-0.001	55041097	25.0	24.8	
1	6.726	6.726	0.000	100029381	25.0	26.4	
1	7.216	7.213	0.003	51333307	25.0	25.7	
1	7.646	7.646	0.000	103383378	25.0	26.7	
1	8.033	8.030	0.003	56407075	25.0	25.0	
		Average of Peak Amounts =				25.7	
2	6.643	6.643	0.000	15958520	25.0	24.9	
2	7.110	7.110	0.000	23856144	25.0	25.2	
2	7.636	7.636	0.000	11379981	25.0	25.2	
2	8.006	8.006	0.000	25230613	25.0	25.3	
2	8.510	8.510	0.000	18989802	25.0	24.9	
		Average of Peak Amounts =				25.1	
						RPD = 2.53	
$ 15 DCB Decachlorobiphenyl							
1	9.606	9.610	-0.004	63725710	1.25	1.32	
2	10.176	10.176	0.000	13498010	1.25	1.20	
						RPD = 9.28	
S 8 Polychlorinated biphenyls, Total							
1						49.8	
2						49.4	
						RPD = 0.82	

Reagents:

AR_1660_L1_00030	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

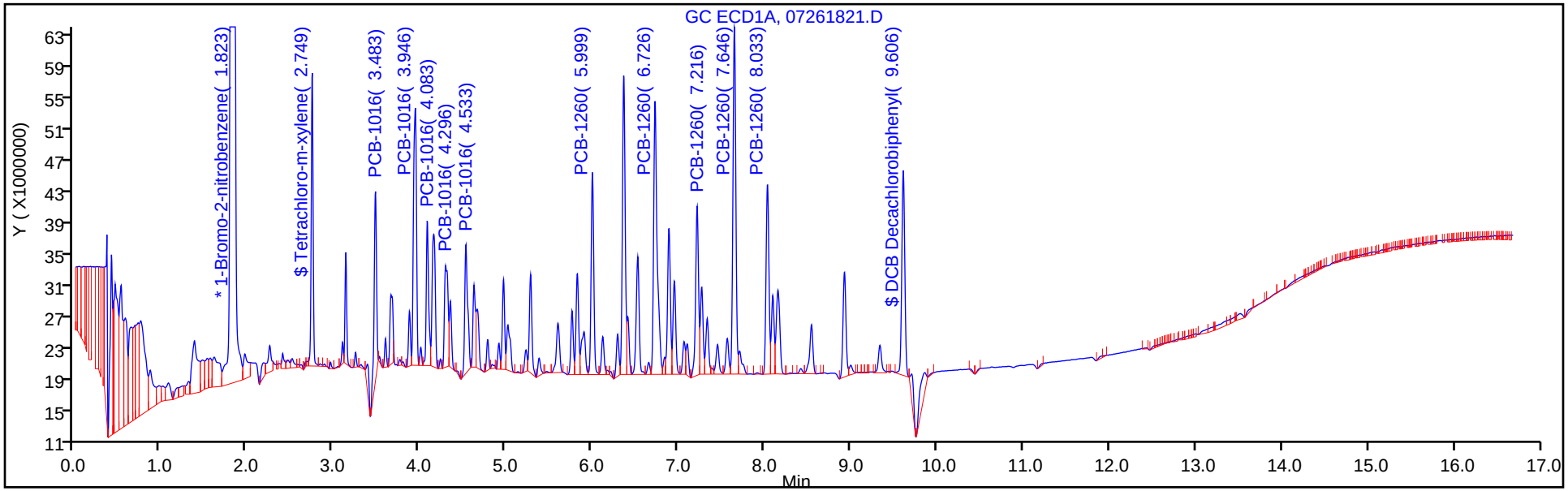
Report Date: 28-Jul-2018 08:58:20 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

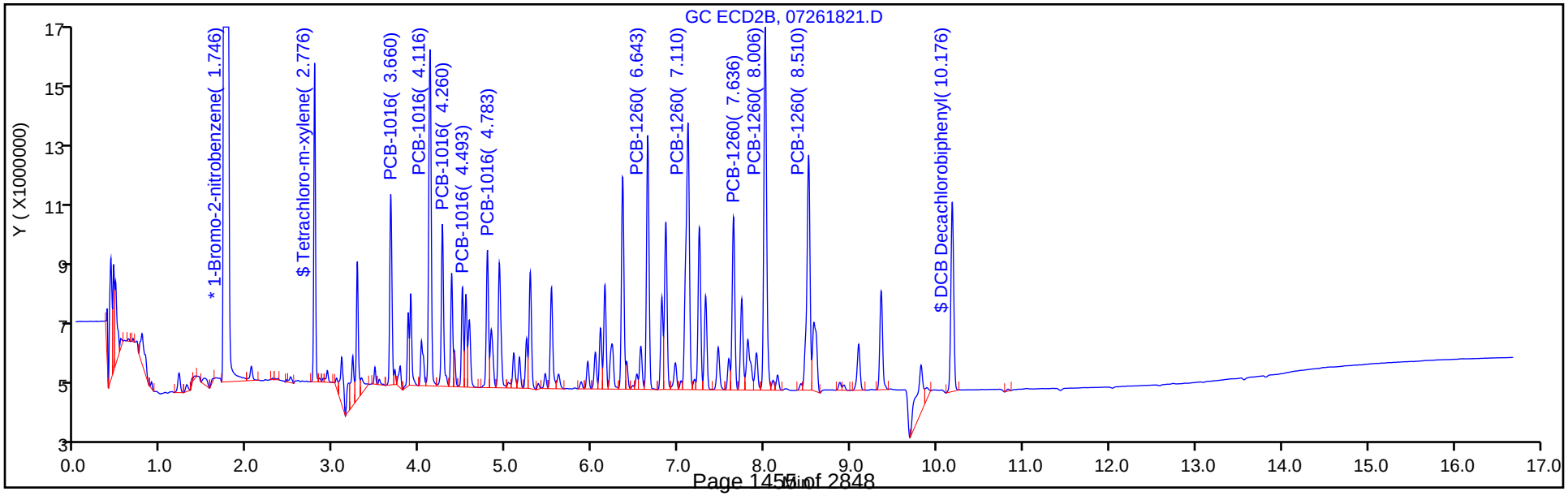
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261821.D

Injection Date:	26-Jul-2018 21:48:36	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL11660			Worklist Smp#:	21
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	21
Method:	PCB_P3	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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 22:10 Calibration End Date: 07/27/2018 00:21 Calibration ID: 33206

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL13262 280-423815/28	07261828.D
Level 2	STDL23262 280-423815/27	07261827.D
Level 3	STDL33262 280-423815/26	07261826.D
Level 4	STDL43262 280-423815/25	07261825.D
Level 5	STDL53262 280-423815/24	07261824.D
Level 6	STDL63262 280-423815/23	07261823.D
Level 7	STDL73262 280-423815/22	07261822.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	0.2827 0.1624	0.2379 0.1701	0.2137	0.1969	0.1762	Lin1	3.5194	0.1663							0.9970		0.9900
PCB-1232 Peak 2	0.3483 0.1377	0.2230 0.1432	0.1801	0.1652	0.1467	Lin1	5.0017	0.1361							0.9980		0.9900
PCB-1232 Peak 3	0.4769 0.3136	0.3935 0.3240	0.3713	0.3185	0.3193	Lin1	4.1276	0.3134							0.9990		0.9900
PCB-1232 Peak 4	0.2254 0.1328	0.1824 0.1398	0.1743	0.1537	0.1430	Lin1	2.5491	0.1360							0.9980		0.9900
PCB-1232 Peak 5	0.2460 0.1291	0.1793 0.1329	0.1699	0.1418	0.1347	Lin1	2.9912	0.1285							0.9990		0.9900
PCB-1262 Peak 1	0.6773 0.4896	0.5569 0.5092	0.5382	0.4633	0.4963	Lin1	3.7831	0.4906							0.9980		0.9900
PCB-1262 Peak 2	0.7859 0.6048	0.6612 0.6071	0.6548	0.5779	0.5927	Lin1	4.0973	0.5948							0.9990		0.9900
PCB-1262 Peak 3	0.7898 0.5820	0.6419 0.6025	0.6263	0.5455	0.5825	Lin1	3.8826	0.5809							0.9980		0.9900
PCB-1262 Peak 4	1.5509 1.2968	1.2854 1.3338	1.2806	1.1614	1.2492	Lin1	2.0602	1.2853							0.9980		0.9900
PCB-1262 Peak 5	0.5619 0.4429	0.4752 0.4470	0.4594	0.4004	0.4280	Lin1	2.2439	0.4342							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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 22:10 Calibration End Date: 07/27/2018 00:21 Calibration ID: 33206

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL13262 280-423815/28	07261828.D
Level 2	STDL23262 280-423815/27	07261827.D
Level 3	STDL33262 280-423815/26	07261826.D
Level 4	STDL43262 280-423815/25	07261825.D
Level 5	STDL53262 280-423815/24	07261824.D
Level 6	STDL63262 280-423815/23	07261823.D
Level 7	STDL73262 280-423815/22	07261822.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	26467386 479573594	44938322 611787806	85362025	203305684	340116096	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 2	BNB	Lin1	32612675 406645863	42116948 514945675	71944246	170534432	283217860	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 3	BNB	Lin1	44651866 926060753	74322474 1165612013	148308242	328782040	616372874	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 4	BNB	Lin1	21102449 392155075	34445987 502988295	69629738	158658851	276034543	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 5	BNB	Lin1	23037481 381231403	33871151 478155620	67846321	146356994	260030834	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 1	BNB	Lin1	63420882 1445803454	105189473 1831565903	214946624	478283893	957870813	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 2	BNB	Lin1	73582740 1786102797	124889835 2183705156	261507031	596590433	1143893711	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 3	BNB	Lin1	73948902 1718812555	121236749 2167188624	250145078	563101166	1124267139	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 4	BNB	Lin1	145215665 3829551180	242797260 4797921790	511439441	1198934695	2411094032	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 5	BNB	Lin1	52609134 1308050520	89755394 1607960243	183478247	413367464	826012252	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_P3\20180726-72400.b\07261822.D
Lims ID: STDL73262
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 26-Jul-2018 22:10:26 ALS Bottle#: 22 Worklist Smp#: 22
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL73262
Misc. Info.: 280-0072400-022
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:22 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.823	0.001	3597061463	1000.0	1000.0	
2	1.744	1.746	-0.002	873511782	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	611787806	1000.0	1001.4	
1	3.481	3.481	0.000	514945675	1000.0	1015.4	
1	3.944	3.944	0.000	1165612013	1000.0	1020.8	
1	4.084	4.084	0.000	502988295	1000.0	1009.7	
1	4.531	4.531	0.000	478155620	1000.0	1011.2	
		Average of Peak Amounts =				1011.7	
2	3.271	3.271	0.000	170515363	1000.0	1000.4	
2	3.661	3.661	0.000	146077335	1000.0	1001.8	
2	4.118	4.117	0.001	311088112	1000.0	1022.1	
2	4.261	4.261	0.000	132091723	1000.0	1018.1	
2	4.781	4.784	-0.003	91889822	1000.0	1010.4	
		Average of Peak Amounts =				1010.6	
						RPD = 0.11	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.364	6.364	0.000	1831565903	1000.0	1030.1	
1	6.887	6.887	0.000	2183705156	1000.0	1013.8	
1	7.214	7.214	0.000	2167188624	1000.0	1030.5	
1	7.647	7.647	0.000	4797921790	1000.0	1036.2	
1	8.031	8.031	0.000	1607960243	1000.0	1024.5	
		Average of Peak Amounts =				1027.0	
2	6.641	6.641	0.000	386293547	1000.0	1025.5	
2	7.241	7.241	0.000	545191304	1000.0	1027.2	
2	7.638	7.637	0.001	519595572	1000.0	1026.2	
2	8.004	8.004	0.000	1092546271	1000.0	1030.3	
2	8.508	8.507	0.001	777659234	1000.0	1032.3	
		Average of Peak Amounts =				1028.3	
						RPD = 0.12	
S 8 Polychlorinated biphenyls, Total							
1						2038.7	
2						2038.8	
						RPD = 0.01	

Reagents:

AR_3262_L7_00016	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

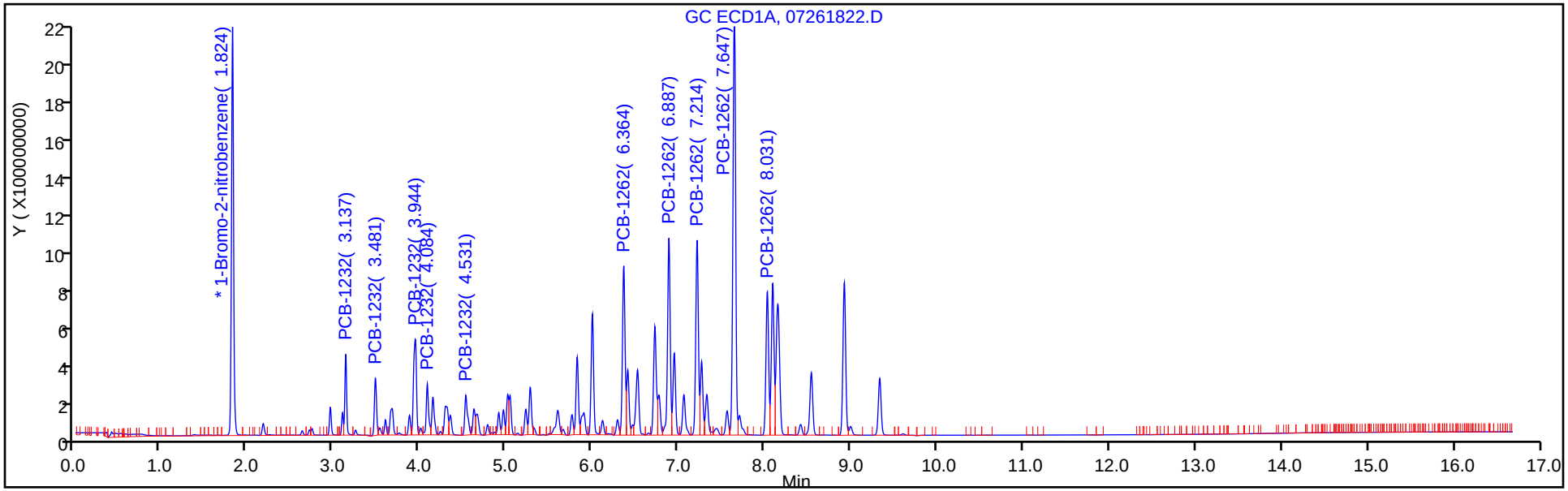
Report Date: 28-Jul-2018 08:58:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

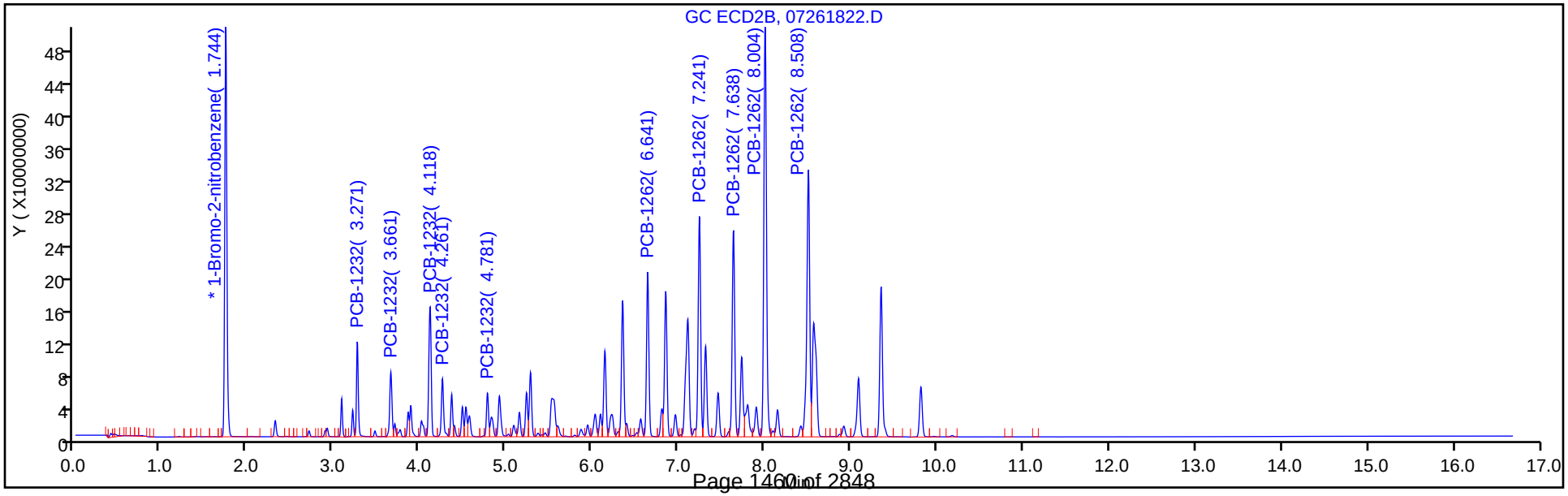
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261822.D

Injection Date:	26-Jul-2018 22:10:26	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL73262			Worklist Smp#:	22
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	22
Method:	PCB_P3	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_P3\20180726-72400.b\07261823.D
Lims ID: STDL63262
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Jul-2018 22:32:16 ALS Bottle#: 23 Worklist Smp#: 23
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL63262
Misc. Info.: 280-0072400-023
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:24 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.823	0.003	3937521174	1000.0	1000.0	
2	1.749	1.746	0.003	970442268	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.139	3.137	0.002	479573594	750.0	711.1	
1	3.482	3.481	0.001	406645863	750.0	722.3	
1	3.946	3.944	0.002	926060753	750.0	737.2	
1	4.086	4.084	0.002	392155075	750.0	713.8	
1	4.532	4.531	0.001	381231403	750.0	730.2	
		Average of Peak Amounts =				722.9	
2	3.272	3.271	0.001	136687320	750.0	713.9	
2	3.662	3.661	0.001	117078872	750.0	717.9	
2	4.116	4.117	-0.001	246868259	750.0	727.4	
2	4.259	4.261	-0.002	100670751	750.0	693.7	
2	4.782	4.784	-0.002	73340106	750.0	721.3	
		Average of Peak Amounts =				714.9	
						RPD = 1.12	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.362	6.364	-0.002	1445803454	750.0	740.7	
1	6.889	6.887	0.002	1786102797	750.0	755.8	
1	7.216	7.214	0.002	1718812555	750.0	744.8	
1	7.649	7.647	0.002	3829551180	750.0	755.1	
1	8.029	8.031	-0.002	1308050520	750.0	760.0	
		Average of Peak Amounts =				751.3	
2	6.642	6.641	0.001	310761746	750.0	740.4	
2	7.242	7.241	0.001	438927546	750.0	742.5	
2	7.639	7.637	0.002	419317280	750.0	743.6	
2	8.006	8.004	0.002	876614753	750.0	743.0	
2	8.506	8.507	-0.001	619852648	750.0	739.0	
		Average of Peak Amounts =				741.7	
						RPD = 1.28	
S 8 Polychlorinated biphenyls, Total							
1						1474.2	
2						1456.6	
						RPD = 1.20	

Reagents:

AR_3262_L6_00018	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

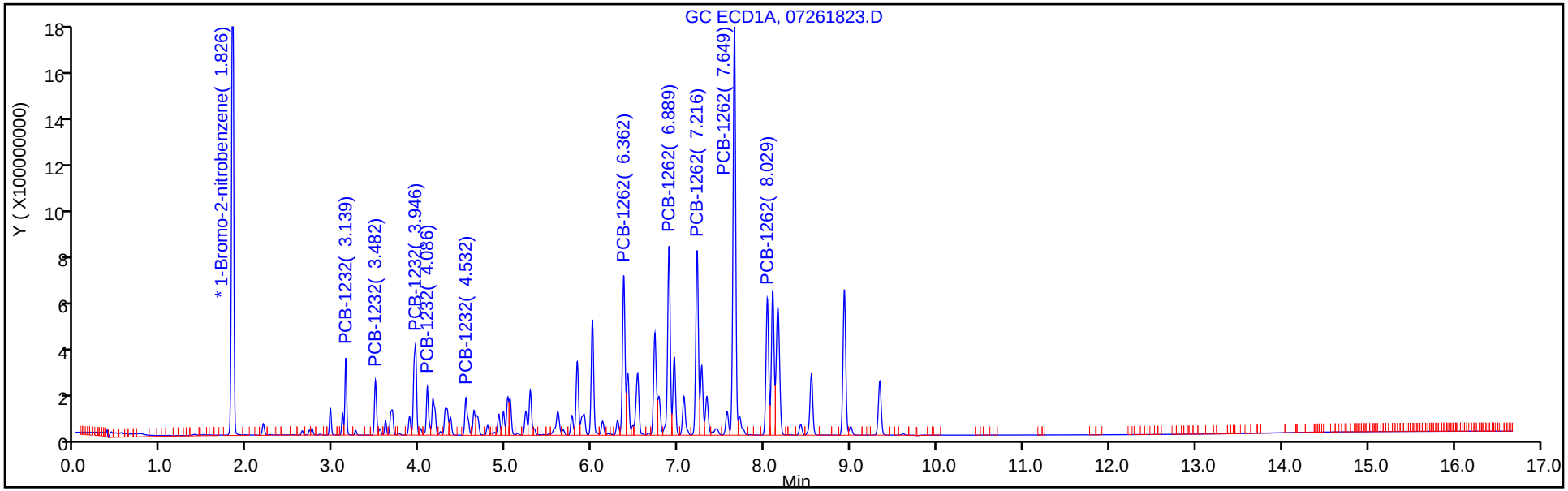
Report Date: 28-Jul-2018 08:58:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

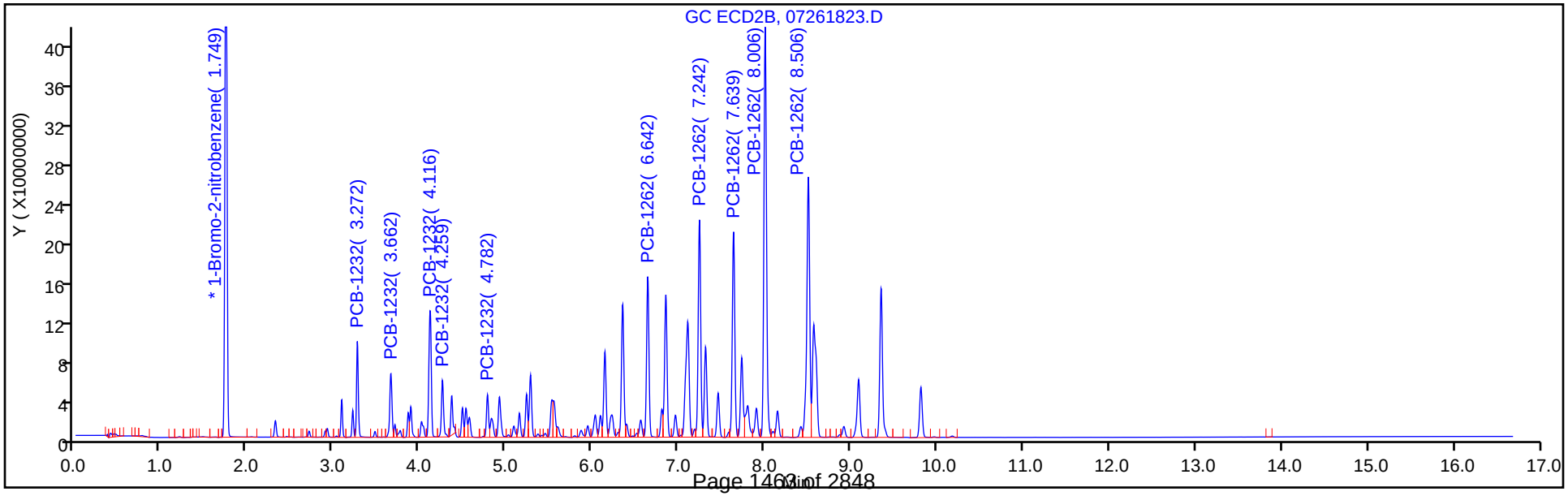
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261823.D

Injection Date:	26-Jul-2018 22:32:16	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL63262			Worklist Smp#:	23
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	23
Method:	PCB_P3	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_P3\20180726-72400.b\07261824.D
Lims ID: STDL53262
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 26-Jul-2018 22:54:06 ALS Bottle#: 24 Worklist Smp#: 24
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL53262
Misc. Info.: 280-0072400-024
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:27 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:54:42

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	1.824	1.824	0.000	3860184021	1000.0	1000.0	
2	1.747	1.747	0.000	940550760	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	340116096	500.0	508.6	
1	3.481	3.481	0.000	283217860	500.0	502.5	
1	3.944	3.944	0.000	616372874	500.0	496.3	
1	4.084	4.084	0.000	276034543	500.0	507.2	
1	4.531	4.531	0.000	260030834	500.0	501.0	
		Average of Peak Amounts =				503.1	
2	3.271	3.271	0.000	94335627	500.0	500.2	
2	3.661	3.661	0.000	80273470	500.0	502.9	
2	4.117	4.117	0.000	164142741	500.0	496.1	
2	4.261	4.261	0.000	71868290	500.0	507.0	
2	4.784	4.784	0.000	49643579	500.0	498.9	
		Average of Peak Amounts =				501.0	
						RPD = 0.42	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.364	6.364	0.000	957870813	500.0	498.0	
1	6.887	6.887	0.000	1143893711	500.0	491.3	
1	7.214	7.214	0.000	1124267139	500.0	494.7	
1	7.647	7.647	0.000	2411094032	500.0	484.4	
1	8.031	8.031	0.000	826012252	500.0	487.7	
		Average of Peak Amounts =				491.2	
2	6.641	6.641	0.000	201013380	500.0	491.5	
2	7.241	7.241	0.000	284655519	500.0	494.6	
2	7.637	7.637	0.000	271295602	500.0	494.2	
2	8.004	8.004	0.000	564740450	500.0	492.6	
2	8.507	8.507	0.000	403405101	500.0	494.4	
		Average of Peak Amounts =				493.4	
						RPD = 0.45	

Reagents:

AR_3262_L5_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

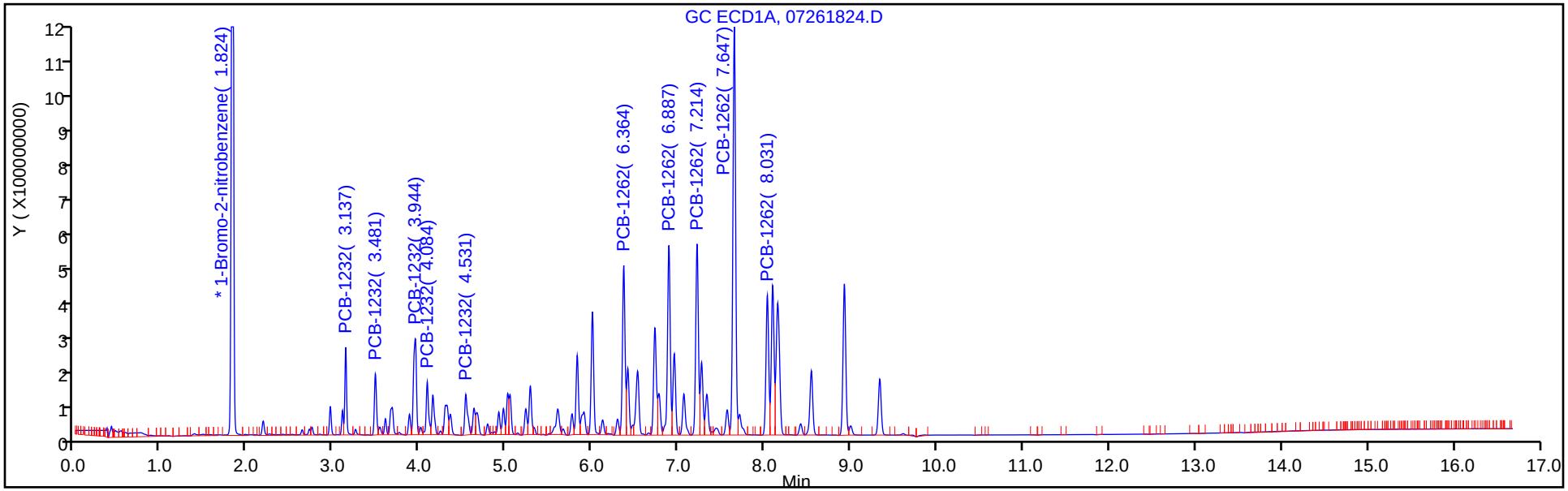
Report Date: 28-Jul-2018 08:58:28 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

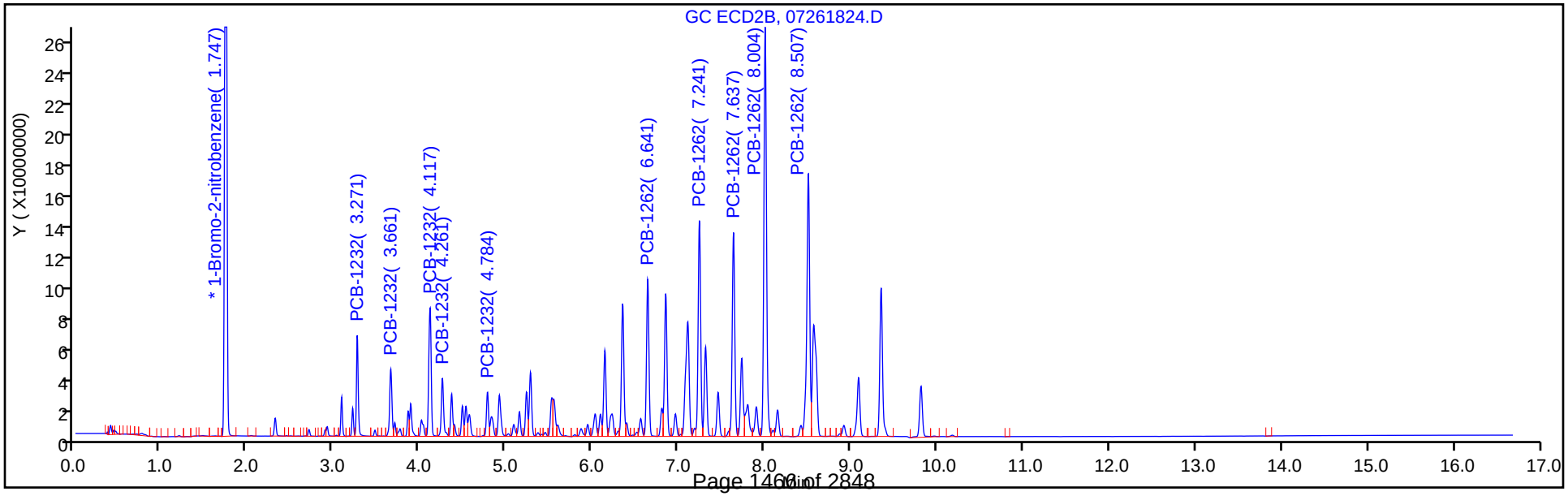
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261824.D

Injection Date:	26-Jul-2018 22:54:06	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL53262			Worklist Smp#:	24
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	24
Method:	PCB_P3	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_P3\20180726-72400.b\07261825.D
Lims ID: STDL43262
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 26-Jul-2018 23:15:57 ALS Bottle#: 25 Worklist Smp#: 25
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL43262
Misc. Info.: 280-0072400-025
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.824	0.001	4129209805	1000.0	1000.0	
2	1.745	1.747	-0.002	991438954	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.139	3.137	0.002	203305684	250.0	274.9	
1	3.482	3.481	0.001	170534432	250.0	266.8	
1	3.945	3.944	0.001	328782040	250.0	240.9	
1	4.085	4.084	0.001	158658851	250.0	263.9	
1	4.532	4.531	0.001	146356994	250.0	252.6	
		Average of Peak Amounts =				259.8	
2	3.272	3.271	0.001	60789394	250.0	294.8	
2	3.659	3.661	-0.002	47135363	250.0	272.5	
2	4.115	4.117	-0.002	89514888	250.0	252.1	
2	4.259	4.261	-0.002	42387004	250.0	277.1	
2	4.782	4.784	-0.002	28312964	250.0	262.4	
		Average of Peak Amounts =				271.8	
						RPD = 4.52	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.365	6.364	0.001	478283893	250.0	228.4	
1	6.889	6.887	0.002	596590433	250.0	236.0	
1	7.215	7.214	0.001	563101166	250.0	228.1	
1	7.649	7.647	0.002	1198934695	250.0	224.3	
1	8.032	8.031	0.001	413367464	250.0	225.4	
		Average of Peak Amounts =				228.4	
2	6.642	6.641	0.001	105728794	250.0	241.3	
2	7.242	7.241	0.001	145864695	250.0	237.0	
2	7.639	7.637	0.002	138466408	250.0	235.8	
2	8.005	8.004	0.001	284501104	250.0	233.4	
2	8.505	8.507	-0.002	202464731	250.0	232.4	
		Average of Peak Amounts =				236.0	
						RPD = 3.24	
S 8 Polychlorinated biphenyls, Total							
1						488.2	
2						507.8	
						RPD = 3.92	

Reagents:

AR_3262_L4_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

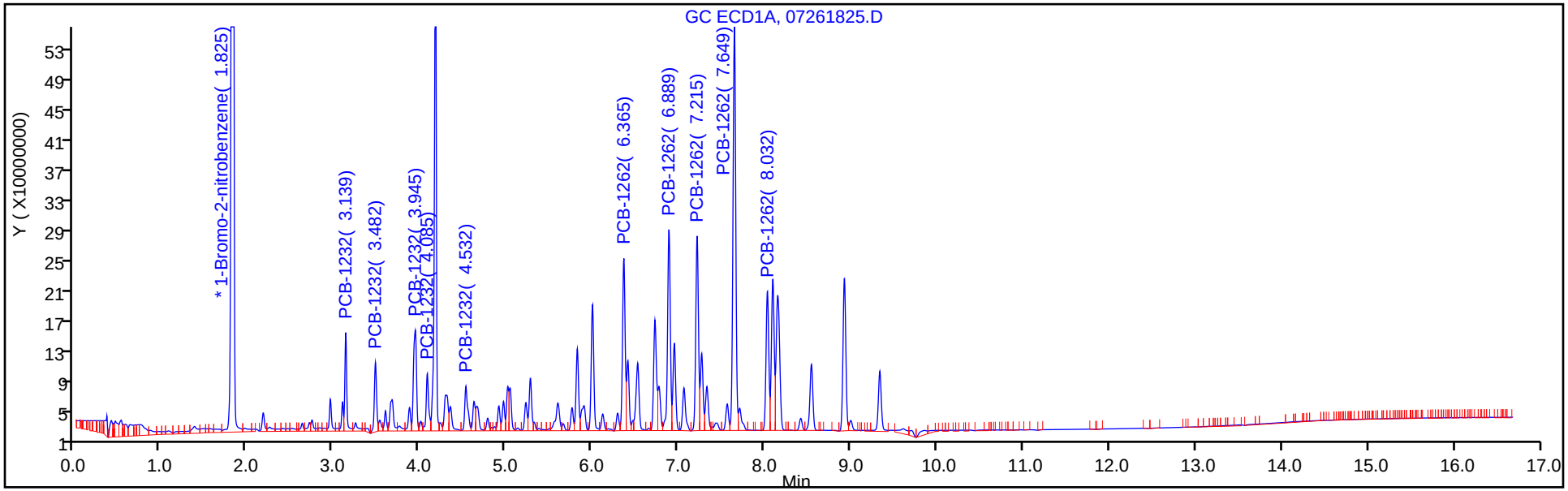
Report Date: 28-Jul-2018 08:58:31 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

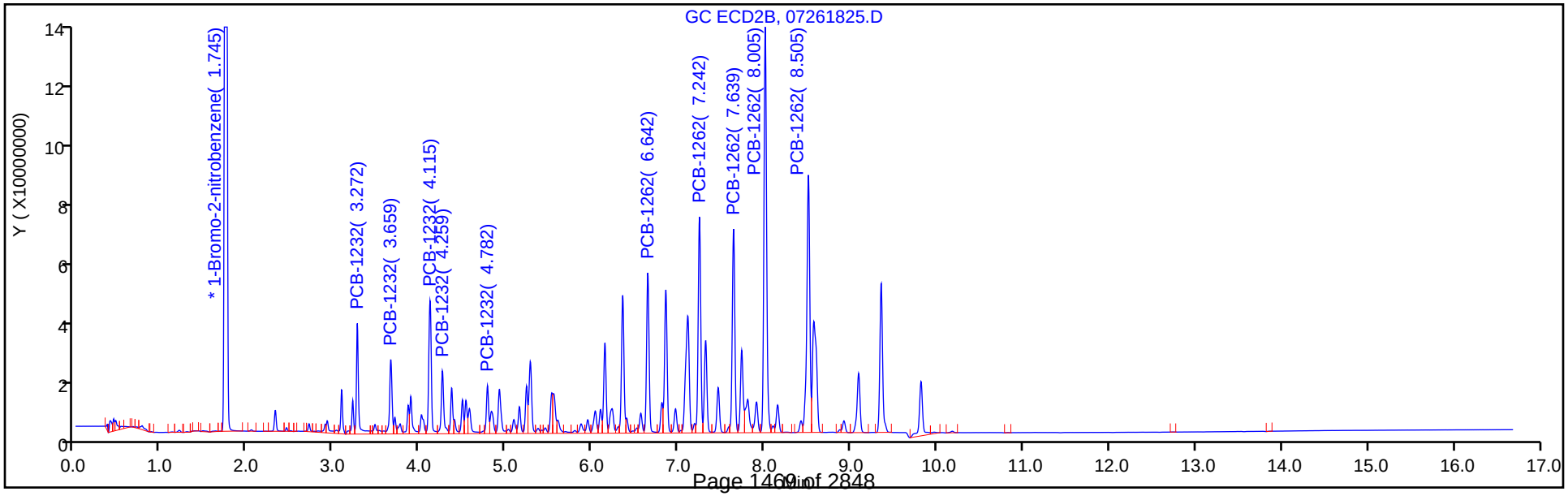
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261825.D

Injection Date:	26-Jul-2018 23:15:57	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL43262			Worklist Smp#:	25
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	25
Method:	PCB_P3	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_P3\20180726-72400.b\07261826.D
Lims ID: STDL33262
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Jul-2018 23:37:49 ALS Bottle#: 26 Worklist Smp#: 26
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL33262
Misc. Info.: 280-0072400-026
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:32 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.824	0.000	3993766615	1000.0	1000.0	
2	1.747	1.747	0.000	977743320	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	85362025	100.0	107.3	
1	3.481	3.481	0.000	71944246	100.0	95.6	
1	3.947	3.944	0.003	148308242	100.0	105.3	
1	4.084	4.084	0.000	69629738	100.0	109.5	
1	4.531	4.531	0.000	67846321	100.0	108.9	
		Average of Peak Amounts =				105.3	
2	3.274	3.271	0.003	22383714	100.0	92.4	
2	3.661	3.661	0.000	20138406	100.0	108.3	
2	4.117	4.117	0.000	37919940	100.0	102.9	
2	4.261	4.261	0.000	17504682	100.0	107.3	
2	4.784	4.784	0.000	12442281	100.0	107.9	
		Average of Peak Amounts =				103.8	
						RPD = 1.50	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.364	6.364	0.000	214946624	100.0	102.0	
1	6.887	6.887	0.000	261507031	100.0	103.2	
1	7.214	7.214	0.000	250145078	100.0	101.1	
1	7.647	7.647	0.000	511439441	100.0	98.0	
1	8.031	8.031	0.000	183478247	100.0	100.7	
		Average of Peak Amounts =				101.0	
2	6.644	6.641	0.003	45670894	100.0	101.2	
2	7.241	7.241	0.000	61410562	100.0	97.3	
2	7.637	7.637	0.000	59609505	100.0	99.2	
2	8.004	8.004	0.000	122475076	100.0	99.7	
2	8.507	8.507	0.000	89786487	100.0	101.4	
		Average of Peak Amounts =				99.8	
						RPD = 1.24	
S 8 Polychlorinated biphenyls, Total							
1						206.3	
2						203.5	
						RPD = 1.38	

Reagents:

AR_3262_L3_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

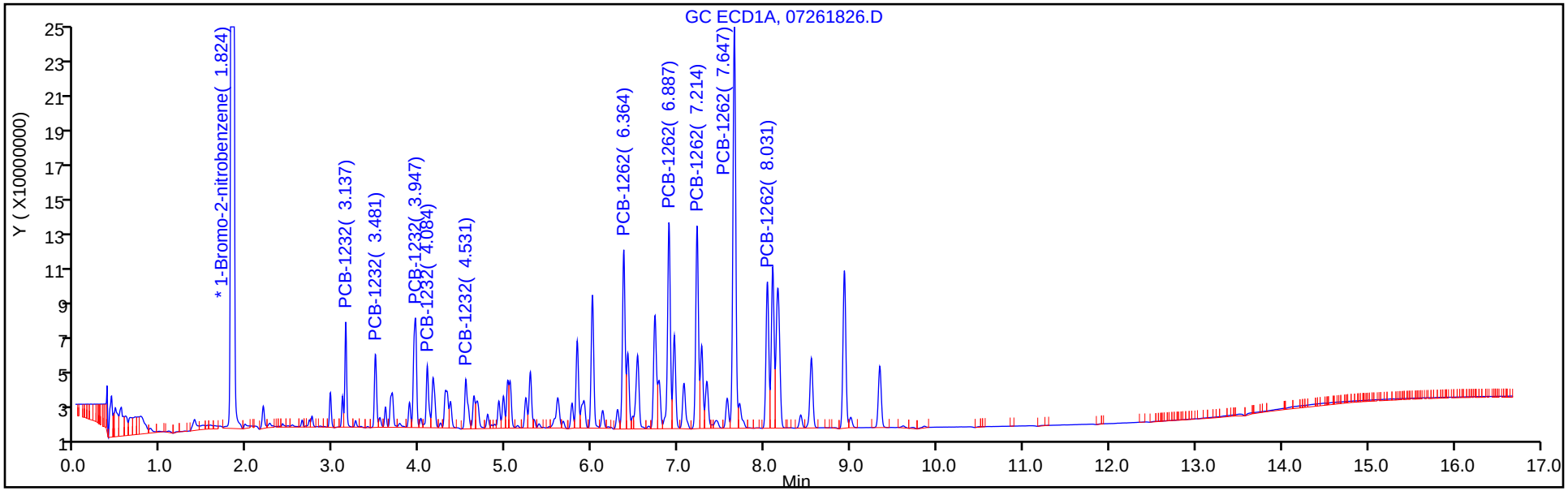
Report Date: 28-Jul-2018 08:58:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

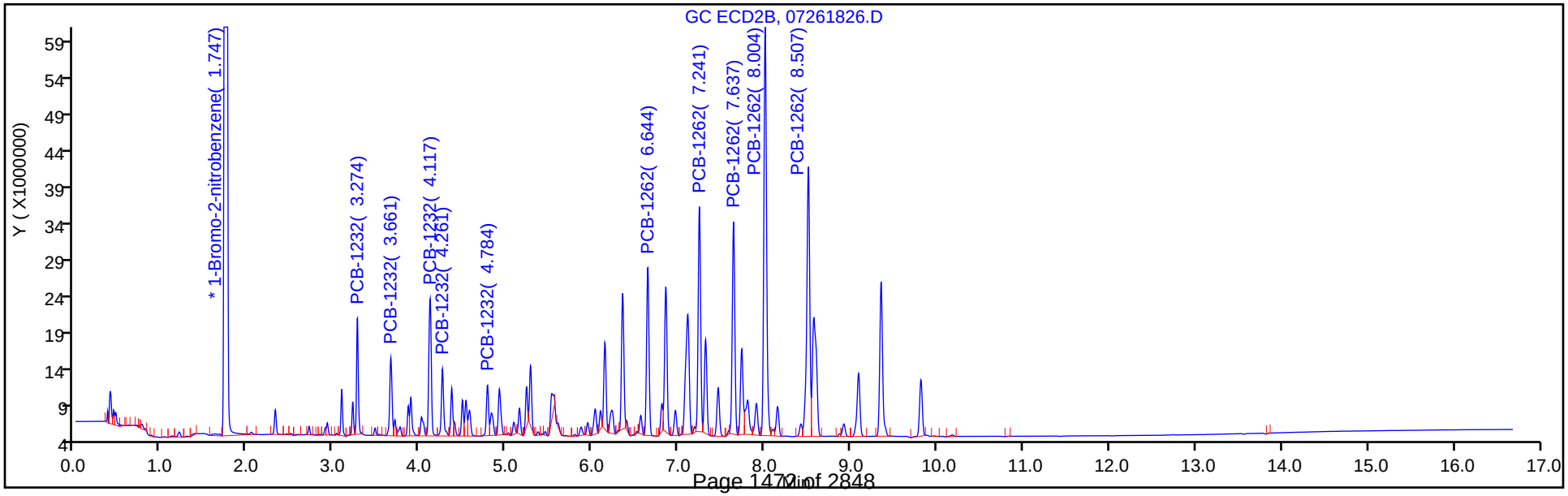
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261826.D

Injection Date:	26-Jul-2018 23:37:49	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL33262			Worklist Smp#:	26
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	26
Method:	PCB_P3	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_P3\20180726-72400.b\07261827.D
Lims ID: STDL23262
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Jul-2018 23:59:41 ALS Bottle#: 27 Worklist Smp#: 27
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL23262
Misc. Info.: 280-0072400-027
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:35 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.823	1.824	-0.001	3777655116	1000.0	1000.0	
2	1.746	1.747	-0.001	929309946	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.136	3.137	-0.001	44938322	50.0	50.4	
1	3.483	3.481	0.002	42116948	50.0	45.2	
1	3.946	3.944	0.002	74322474	50.0	49.6	
1	4.083	4.084	-0.001	34445987	50.0	48.3	
1	4.533	4.531	0.002	33871151	50.0	46.5	
		Average of Peak Amounts =				48.0	
2	3.273	3.271	0.002	13680089	50.0	49.3	
2	3.660	3.661	-0.001	10256242	50.0	50.1	
2	4.116	4.117	-0.001	18951980	50.0	49.7	
2	4.260	4.261	-0.001	8924226	50.0	50.6	
2	4.783	4.784	-0.001	6593505	50.0	53.0	
		Average of Peak Amounts =				50.5	
						RPD = 5.14	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.363	6.364	-0.001	105189473	50.0	49.0	
1	6.889	6.887	0.002	124889835	50.0	48.7	
1	7.216	7.214	0.002	121236749	50.0	48.6	
1	7.646	7.647	-0.001	242797260	50.0	48.4	
1	8.029	8.031	-0.002	89755394	50.0	49.6	
		Average of Peak Amounts =				48.9	
2	6.643	6.641	0.002	22660119	50.0	49.0	
2	7.243	7.241	0.002	31521669	50.0	49.4	
2	7.636	7.637	-0.001	29874473	50.0	49.1	
2	8.003	8.004	-0.001	59024812	50.0	48.7	
2	8.506	8.507	-0.001	43239083	50.0	48.6	
		Average of Peak Amounts =				49.0	
						RPD = 0.23	
S 8 Polychlorinated biphenyls, Total							
1						96.8	
2						99.5	
						RPD = 2.69	

Reagents:

AR_3262_L2_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

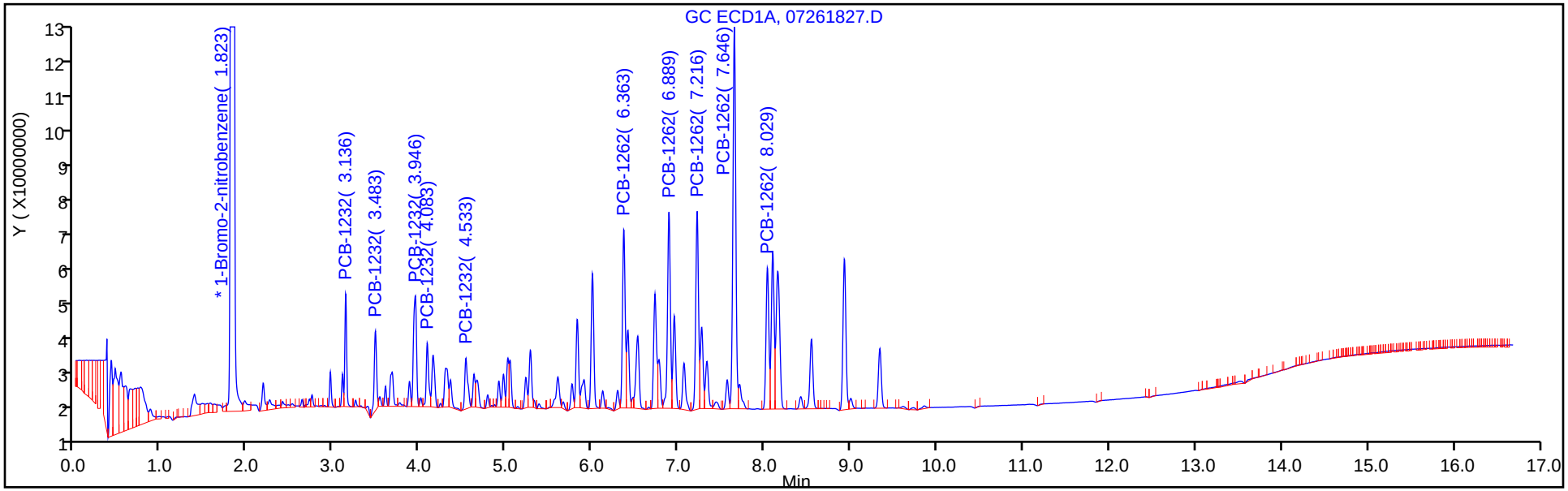
Report Date: 28-Jul-2018 08:58:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

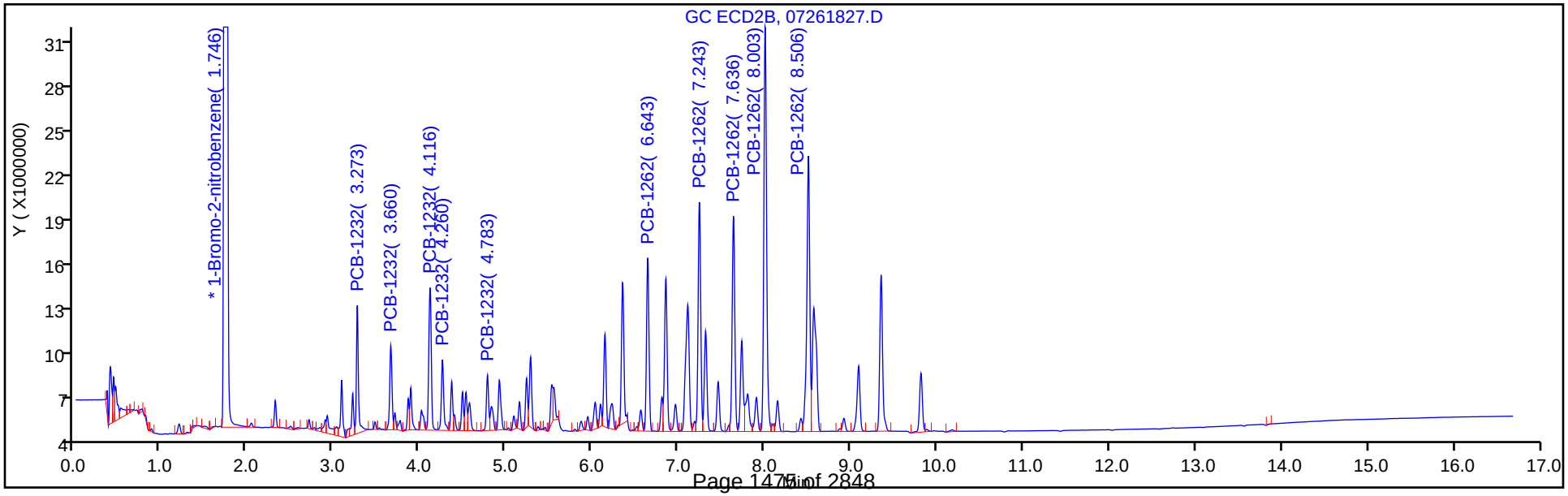
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261827.D

Injection Date:	26-Jul-2018 23:59:41	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL23262			Worklist Smp#:	27
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	27
Method:	PCB_P3	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_P3\20180726-72400.b\07261828.D
Lims ID: STDL13262
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 27-Jul-2018 00:21:31 ALS Bottle#: 28 Worklist Smp#: 28
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL13262
Misc. Info.: 280-0072400-028
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:38 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.824	0.000	3745295136	1000.0	1000.0	
2	1.748	1.747	0.001	912726429	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	26467386	25.0	21.3	
1	3.484	3.481	0.003	32612675	25.0	27.2	
1	3.947	3.944	0.003	44651866	25.0	24.9	
1	4.084	4.084	0.000	21102449	25.0	22.7	
1	4.531	4.531	0.000	23037481	25.0	24.6	
		Average of Peak Amounts =				24.1	
2	3.271	3.271	0.000	9042848	25.0	23.9	
2	3.661	3.661	0.000	5793990	25.0	21.5	
2	4.118	4.117	0.001	10720680	25.0	24.6	
2	4.261	4.261	0.000	4844577	25.0	21.2	
2	4.781	4.784	-0.003	3489069	25.0	21.0	
		Average of Peak Amounts =				22.5	
						RPD = 7.17	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.364	6.364	0.000	63420882	25.0	26.8	
1	6.887	6.887	0.000	73582740	25.0	26.1	
1	7.214	7.214	0.000	73948902	25.0	27.3	
1	7.647	7.647	0.000	145215665	25.0	28.6	
1	8.031	8.031	0.000	52609134	25.0	27.2	
		Average of Peak Amounts =				27.2	
2	6.644	6.641	0.003	13328922	25.0	26.2	
2	7.241	7.241	0.000	18666133	25.0	27.1	
2	7.638	7.637	0.001	17643903	25.0	26.9	
2	8.004	8.004	0.000	34319951	25.0	27.2	
2	8.508	8.507	0.001	25572301	25.0	27.0	
		Average of Peak Amounts =				26.9	
						RPD = 1.19	
S 8 Polychlorinated biphenyls, Total							
1						51.3	
2						49.4	
						RPD = 3.96	

Reagents:

AR_3262_L1_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

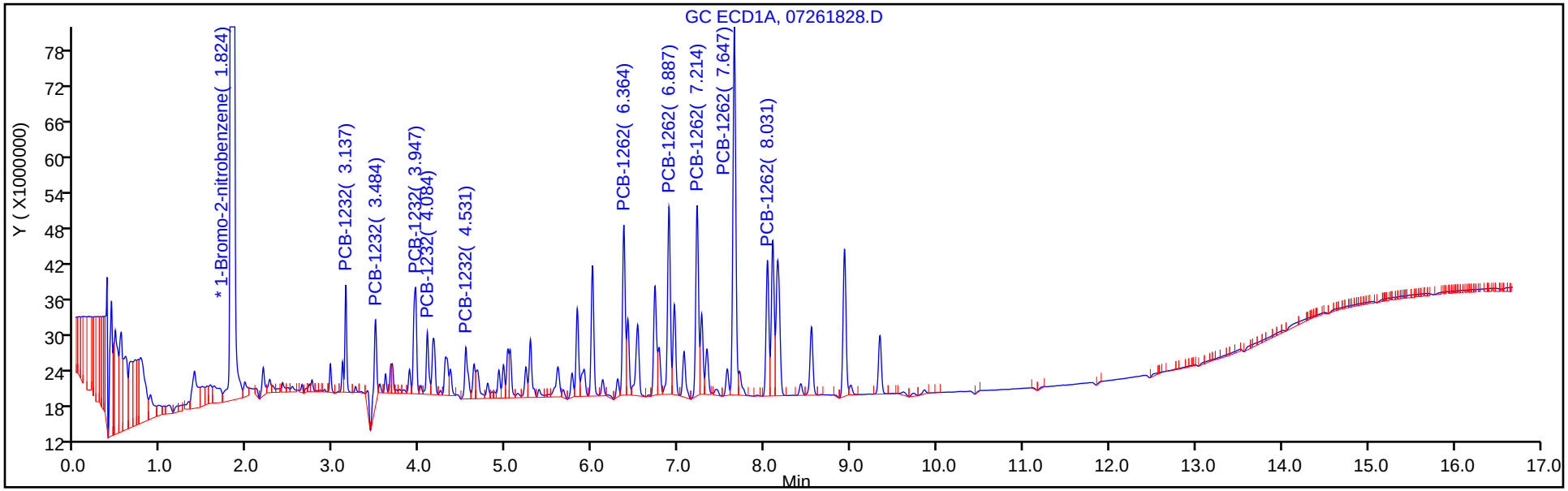
Report Date: 28-Jul-2018 08:58:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

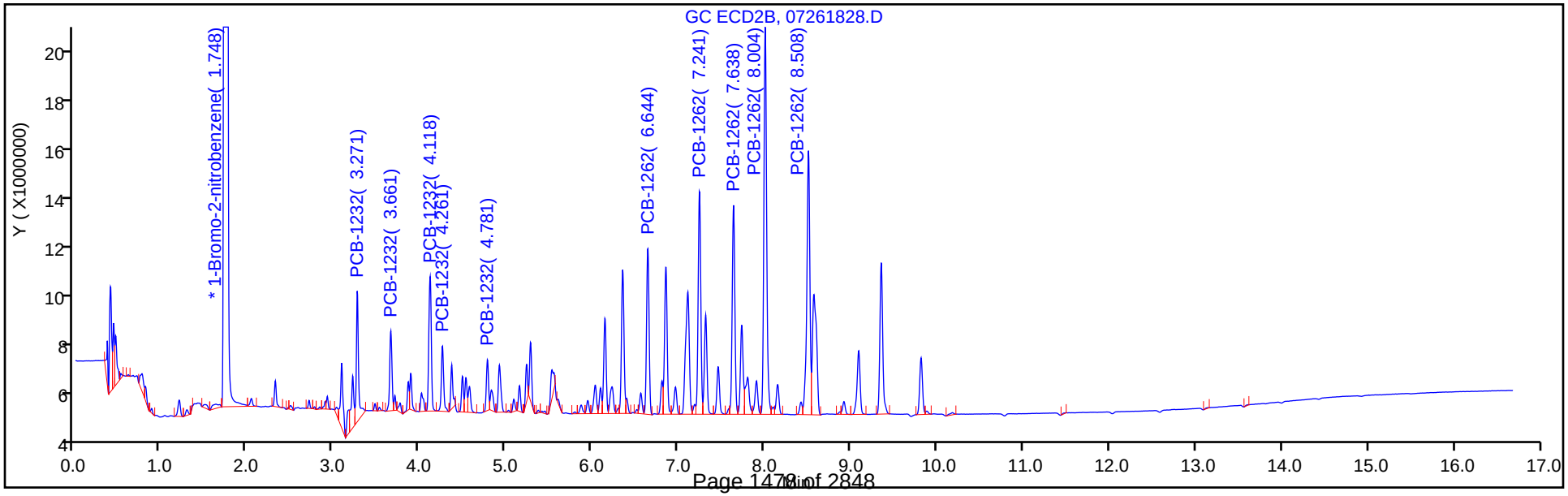
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261828.D

Injection Date:	27-Jul-2018 00:21:31	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL13262			Worklist Smp#:	28
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	28
Method:	PCB_P3	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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 22:10 Calibration End Date: 07/27/2018 00:21 Calibration ID: 33207

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL13262 280-423815/28	07261828.D
Level 2	STDL23262 280-423815/27	07261827.D
Level 3	STDL33262 280-423815/26	07261826.D
Level 4	STDL43262 280-423815/25	07261825.D
Level 5	STDL53262 280-423815/24	07261824.D
Level 6	STDL63262 280-423815/23	07261823.D
Level 7	STDL73262 280-423815/22	07261822.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	0.3963 0.1878	0.2944 0.1952	0.2289	0.2453	0.2006	Lin1	5.3626	0.1898							0.9950		0.9900
PCB-1232 Peak 2	0.2539 0.1609	0.2207 0.1672	0.2060	0.1902	0.1707	Lin1	2.8178	0.1641							0.9980		0.9900
PCB-1232 Peak 3	0.4698 0.3392	0.4079 0.3561	0.3878	0.3612	0.3490	Lin1	3.2470	0.3452							0.9990		0.9900
PCB-1232 Peak 4	0.2123 0.1383	0.1921 0.1512	0.1790	0.1710	0.1528	Lin1	2.1978	0.1464							0.9960		0.9900
PCB-1232 Peak 5	0.1529 0.1008	0.1419 0.1052	0.1273	0.1142	0.1056	Lin1	1.6672	0.1025							0.9980		0.9900
PCB-1262 Peak 1	0.5841 0.4270	0.4877 0.4422	0.4671	0.4266	0.4274	Lin1	3.4045	0.4279							0.9990		0.9900
PCB-1262 Peak 2	0.8180 0.6031	0.6784 0.6241	0.6281	0.5885	0.6053	Lin1	4.0832	0.6037							0.9990		0.9900
PCB-1262 Peak 3	0.7732 0.5761	0.6429 0.5948	0.6097	0.5586	0.5769	Lin1	3.8412	0.5759							0.9990		0.9900
PCB-1262 Peak 4	1.5041 1.2044	1.2703 1.2508	1.2526	1.1478	1.2009	Lin1	4.6572	1.2094							0.9990		0.9900
PCB-1262 Peak 5	1.1207 0.8516	0.9306 0.8903	0.9183	0.8169	0.8578	Lin1	4.8802	0.8577							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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/26/2018 22:10 Calibration End Date: 07/27/2018 00:21 Calibration ID: 33207

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL13262 280-423815/28	07261828.D
Level 2	STDL23262 280-423815/27	07261827.D
Level 3	STDL33262 280-423815/26	07261826.D
Level 4	STDL43262 280-423815/25	07261825.D
Level 5	STDL53262 280-423815/24	07261824.D
Level 6	STDL63262 280-423815/23	07261823.D
Level 7	STDL73262 280-423815/22	07261822.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	9042848 136687320	13680089 170515363	22383714	60789394	94335627	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 2	BNB	Lin1	5793990 117078872	10256242 146077335	20138406	47135363	80273470	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 3	BNB	Lin1	10720680 246868259	18951980 311088112	37919940	89514888	164142741	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 4	BNB	Lin1	4844577 100670751	8924226 132091723	17504682	42387004	71868290	25.0 750	50.0 1000	100	250	500
PCB-1232 Peak 5	BNB	Lin1	3489069 73340106	6593505 91889822	12442281	28312964	49643579	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 1	BNB	Lin1	13328922 310761746	22660119 386293547	45670894	105728794	201013380	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 2	BNB	Lin1	18666133 438927546	31521669 545191304	61410562	145864695	284655519	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 3	BNB	Lin1	17643903 419317280	29874473 519595572	59609505	138466408	271295602	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 4	BNB	Lin1	34319951 876614753	59024812 1092546271	122475076	284501104	564740450	25.0 750	50.0 1000	100	250	500
PCB-1262 Peak 5	BNB	Lin1	25572301 619852648	43239083 777659234	89786487	202464731	403405101	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_P3\20180726-72400.b\07261822.D
Lims ID: STDL73262
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 26-Jul-2018 22:10:26 ALS Bottle#: 22 Worklist Smp#: 22
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL73262
Misc. Info.: 280-0072400-022
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:22 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.823	0.001	3597061463	1000.0	1000.0	
2	1.744	1.746	-0.002	873511782	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	611787806	1000.0	1001.4	
1	3.481	3.481	0.000	514945675	1000.0	1015.4	
1	3.944	3.944	0.000	1165612013	1000.0	1020.8	
1	4.084	4.084	0.000	502988295	1000.0	1009.7	
1	4.531	4.531	0.000	478155620	1000.0	1011.2	
		Average of Peak Amounts =				1011.7	
2	3.271	3.271	0.000	170515363	1000.0	1000.4	
2	3.661	3.661	0.000	146077335	1000.0	1001.8	
2	4.118	4.117	0.001	311088112	1000.0	1022.1	
2	4.261	4.261	0.000	132091723	1000.0	1018.1	
2	4.781	4.784	-0.003	91889822	1000.0	1010.4	
		Average of Peak Amounts =				1010.6	
						RPD = 0.11	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.364	6.364	0.000	1831565903	1000.0	1030.1	
1	6.887	6.887	0.000	2183705156	1000.0	1013.8	
1	7.214	7.214	0.000	2167188624	1000.0	1030.5	
1	7.647	7.647	0.000	4797921790	1000.0	1036.2	
1	8.031	8.031	0.000	1607960243	1000.0	1024.5	
		Average of Peak Amounts =				1027.0	
2	6.641	6.641	0.000	386293547	1000.0	1025.5	
2	7.241	7.241	0.000	545191304	1000.0	1027.2	
2	7.638	7.637	0.001	519595572	1000.0	1026.2	
2	8.004	8.004	0.000	1092546271	1000.0	1030.3	
2	8.508	8.507	0.001	777659234	1000.0	1032.3	
		Average of Peak Amounts =				1028.3	
						RPD = 0.12	
S 8 Polychlorinated biphenyls, Total							
1						2038.7	
2						2038.8	
						RPD = 0.01	

Reagents:

AR_3262_L7_00016	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

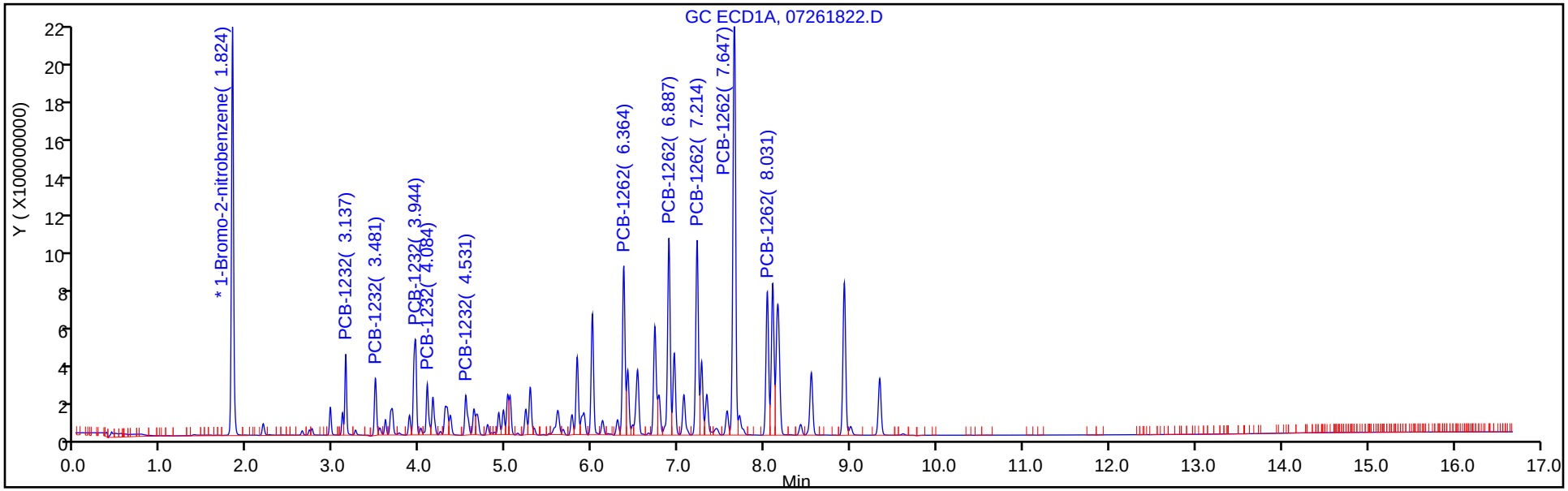
Report Date: 28-Jul-2018 08:58:23 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

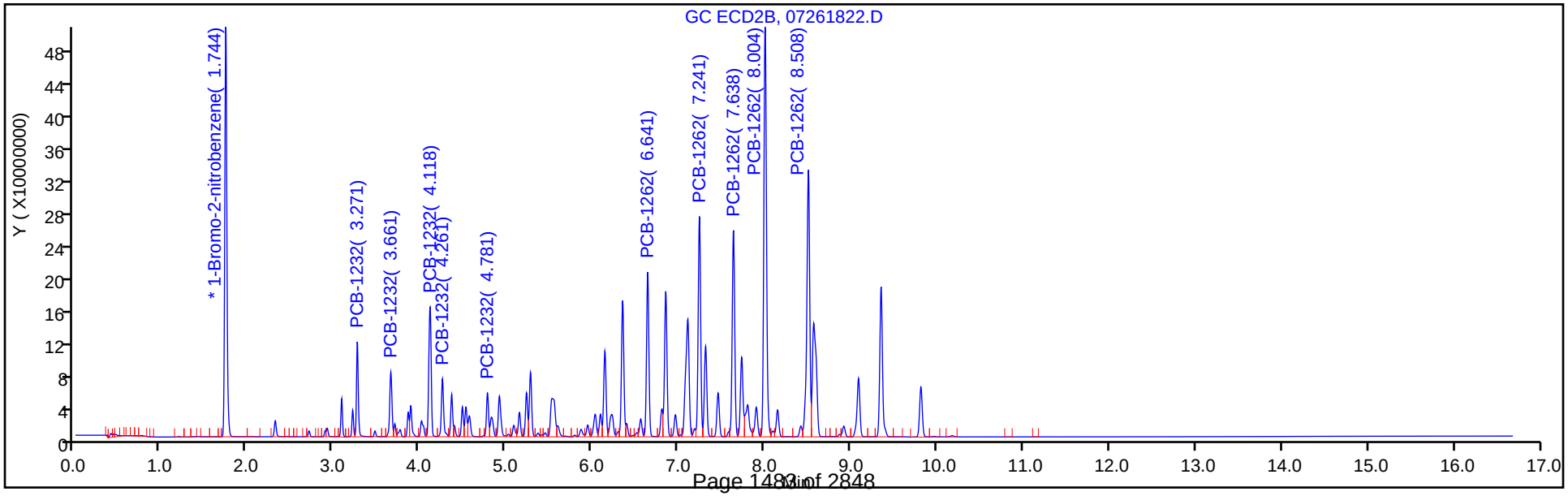
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261822.D

Injection Date:	26-Jul-2018 22:10:26	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL73262			Worklist Smp#:	22
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	22
Method:	PCB_P3	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_P3\20180726-72400.b\07261823.D
Lims ID: STDL63262
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Jul-2018 22:32:16 ALS Bottle#: 23 Worklist Smp#: 23
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL63262
Misc. Info.: 280-0072400-023
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:24 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.823	0.003	3937521174	1000.0	1000.0	
2	1.749	1.746	0.003	970442268	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.139	3.137	0.002	479573594	750.0	711.1	
1	3.482	3.481	0.001	406645863	750.0	722.3	
1	3.946	3.944	0.002	926060753	750.0	737.2	
1	4.086	4.084	0.002	392155075	750.0	713.8	
1	4.532	4.531	0.001	381231403	750.0	730.2	
		Average of Peak Amounts =				722.9	
2	3.272	3.271	0.001	136687320	750.0	713.9	
2	3.662	3.661	0.001	117078872	750.0	717.9	
2	4.116	4.117	-0.001	246868259	750.0	727.4	
2	4.259	4.261	-0.002	100670751	750.0	693.7	
2	4.782	4.784	-0.002	73340106	750.0	721.3	
		Average of Peak Amounts =				714.9	
						RPD = 1.12	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.362	6.364	-0.002	1445803454	750.0	740.7	
1	6.889	6.887	0.002	1786102797	750.0	755.8	
1	7.216	7.214	0.002	1718812555	750.0	744.8	
1	7.649	7.647	0.002	3829551180	750.0	755.1	
1	8.029	8.031	-0.002	1308050520	750.0	760.0	
		Average of Peak Amounts =				751.3	
2	6.642	6.641	0.001	310761746	750.0	740.4	
2	7.242	7.241	0.001	438927546	750.0	742.5	
2	7.639	7.637	0.002	419317280	750.0	743.6	
2	8.006	8.004	0.002	876614753	750.0	743.0	
2	8.506	8.507	-0.001	619852648	750.0	739.0	
		Average of Peak Amounts =				741.7	
						RPD = 1.28	
S 8 Polychlorinated biphenyls, Total							
1						1474.2	
2						1456.6	
						RPD = 1.20	

Reagents:

AR_3262_L6_00018	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

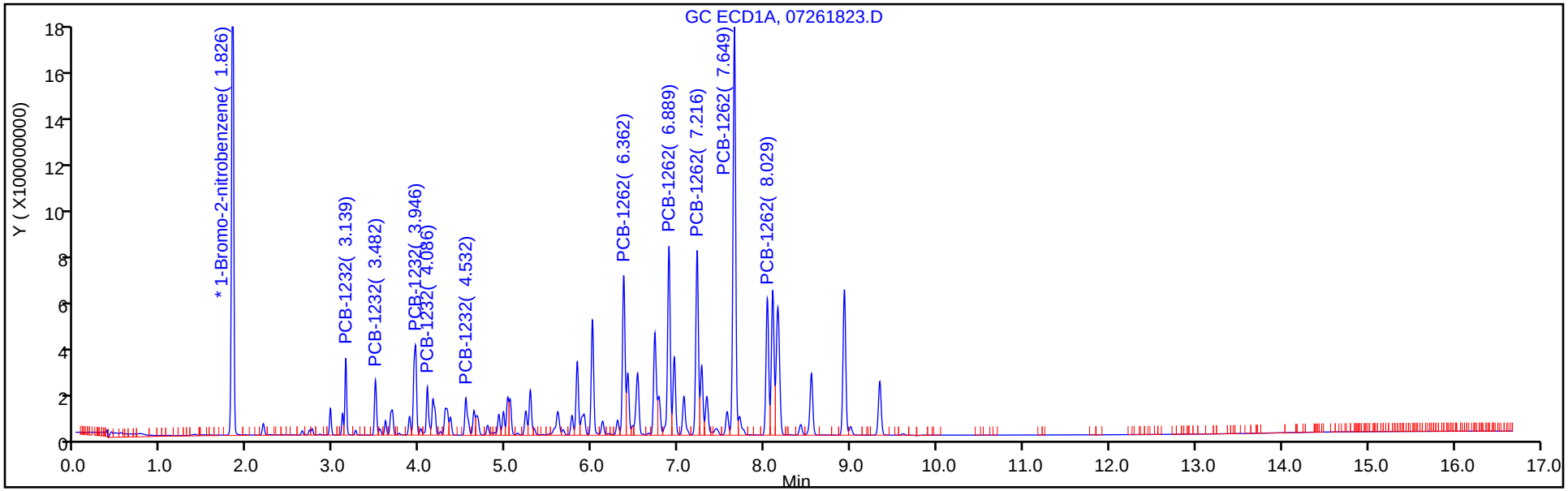
Report Date: 28-Jul-2018 08:58:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

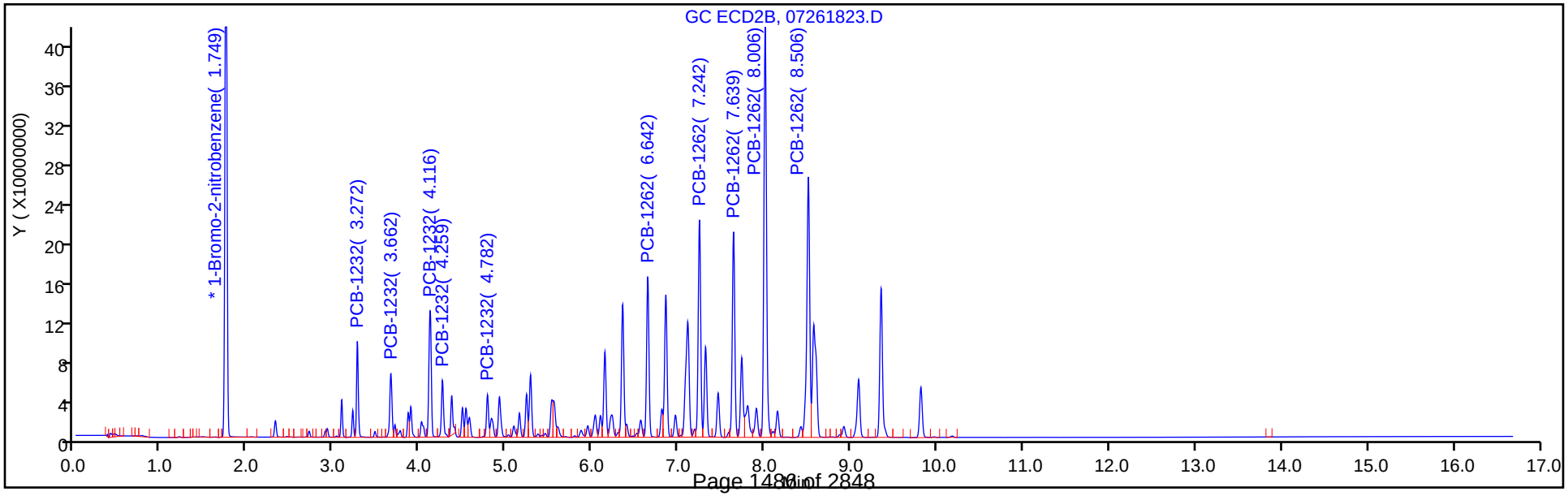
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261823.D

Injection Date:	26-Jul-2018 22:32:16	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL63262			Worklist Smp#:	23
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	23
Method:	PCB_P3	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_P3\20180726-72400.b\07261824.D
Lims ID: STDL53262
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 26-Jul-2018 22:54:06 ALS Bottle#: 24 Worklist Smp#: 24
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL53262
Misc. Info.: 280-0072400-024
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:27 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:54:42

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	1.824	1.824	0.000	3860184021	1000.0	1000.0	
2	1.747	1.747	0.000	940550760	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	340116096	500.0	508.6	
1	3.481	3.481	0.000	283217860	500.0	502.5	
1	3.944	3.944	0.000	616372874	500.0	496.3	
1	4.084	4.084	0.000	276034543	500.0	507.2	
1	4.531	4.531	0.000	260030834	500.0	501.0	
		Average of Peak Amounts =				503.1	
2	3.271	3.271	0.000	94335627	500.0	500.2	
2	3.661	3.661	0.000	80273470	500.0	502.9	
2	4.117	4.117	0.000	164142741	500.0	496.1	
2	4.261	4.261	0.000	71868290	500.0	507.0	
2	4.784	4.784	0.000	49643579	500.0	498.9	
		Average of Peak Amounts =				501.0	
						RPD = 0.42	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.364	6.364	0.000	957870813	500.0	498.0	
1	6.887	6.887	0.000	1143893711	500.0	491.3	
1	7.214	7.214	0.000	1124267139	500.0	494.7	
1	7.647	7.647	0.000	2411094032	500.0	484.4	
1	8.031	8.031	0.000	826012252	500.0	487.7	
		Average of Peak Amounts =				491.2	
2	6.641	6.641	0.000	201013380	500.0	491.5	
2	7.241	7.241	0.000	284655519	500.0	494.6	
2	7.637	7.637	0.000	271295602	500.0	494.2	
2	8.004	8.004	0.000	564740450	500.0	492.6	
2	8.507	8.507	0.000	403405101	500.0	494.4	
		Average of Peak Amounts =				493.4	
						RPD = 0.45	

Reagents:

AR_3262_L5_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

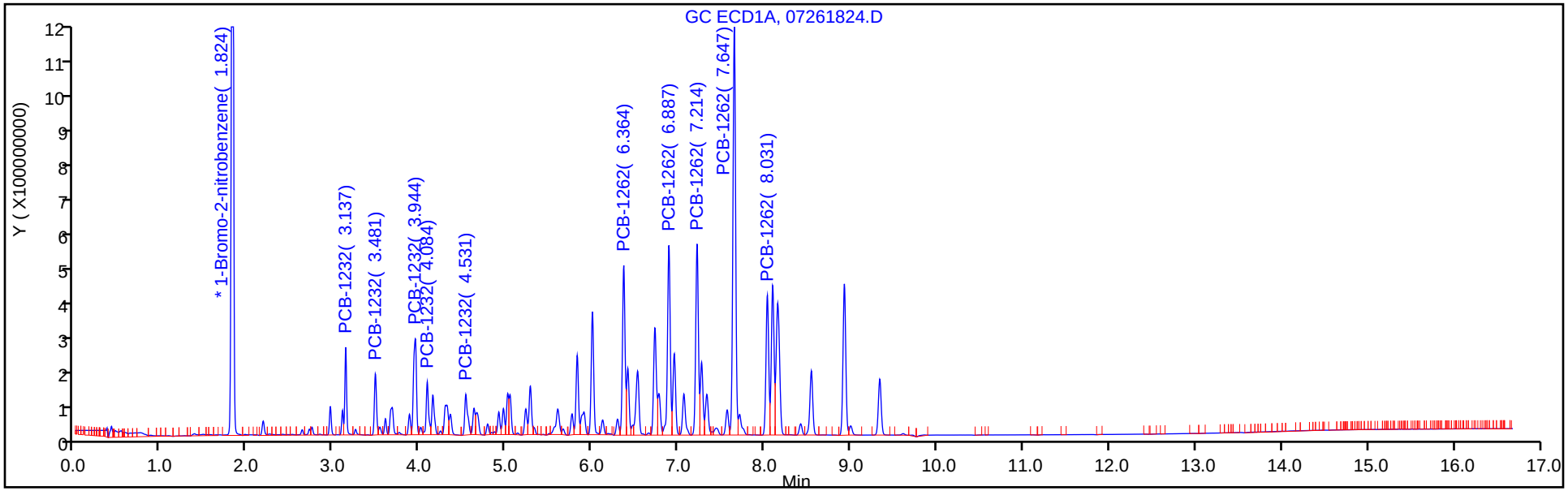
Report Date: 28-Jul-2018 08:58:28 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

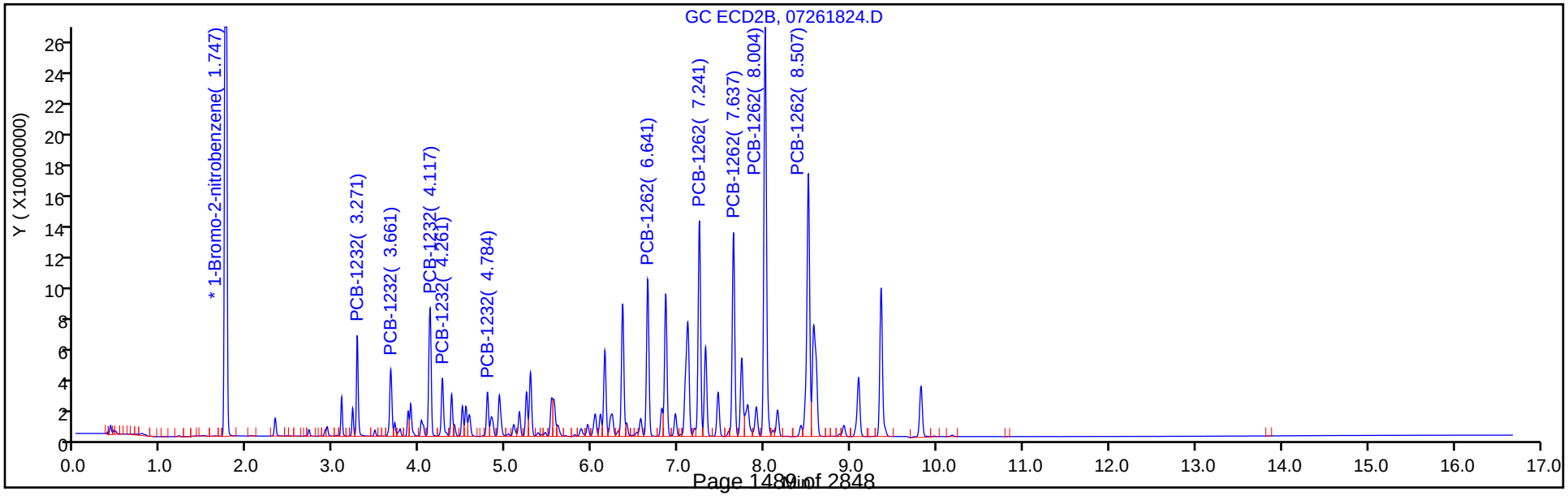
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261824.D

Injection Date:	26-Jul-2018 22:54:06	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL53262			Worklist Smp#:	24
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	24
Method:	PCB_P3	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_P3\20180726-72400.b\07261825.D
Lims ID: STDL43262
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 26-Jul-2018 23:15:57 ALS Bottle#: 25 Worklist Smp#: 25
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL43262
Misc. Info.: 280-0072400-025
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.824	0.001	4129209805	1000.0	1000.0	
2	1.745	1.747	-0.002	991438954	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.139	3.137	0.002	203305684	250.0	274.9	
1	3.482	3.481	0.001	170534432	250.0	266.8	
1	3.945	3.944	0.001	328782040	250.0	240.9	
1	4.085	4.084	0.001	158658851	250.0	263.9	
1	4.532	4.531	0.001	146356994	250.0	252.6	
		Average of Peak Amounts =				259.8	
2	3.272	3.271	0.001	60789394	250.0	294.8	
2	3.659	3.661	-0.002	47135363	250.0	272.5	
2	4.115	4.117	-0.002	89514888	250.0	252.1	
2	4.259	4.261	-0.002	42387004	250.0	277.1	
2	4.782	4.784	-0.002	28312964	250.0	262.4	
		Average of Peak Amounts =				271.8	
						RPD = 4.52	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.365	6.364	0.001	478283893	250.0	228.4	
1	6.889	6.887	0.002	596590433	250.0	236.0	
1	7.215	7.214	0.001	563101166	250.0	228.1	
1	7.649	7.647	0.002	1198934695	250.0	224.3	
1	8.032	8.031	0.001	413367464	250.0	225.4	
		Average of Peak Amounts =				228.4	
2	6.642	6.641	0.001	105728794	250.0	241.3	
2	7.242	7.241	0.001	145864695	250.0	237.0	
2	7.639	7.637	0.002	138466408	250.0	235.8	
2	8.005	8.004	0.001	284501104	250.0	233.4	
2	8.505	8.507	-0.002	202464731	250.0	232.4	
		Average of Peak Amounts =				236.0	
						RPD = 3.24	
S 8 Polychlorinated biphenyls, Total							
1						488.2	
2						507.8	
						RPD = 3.92	

Reagents:

AR_3262_L4_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

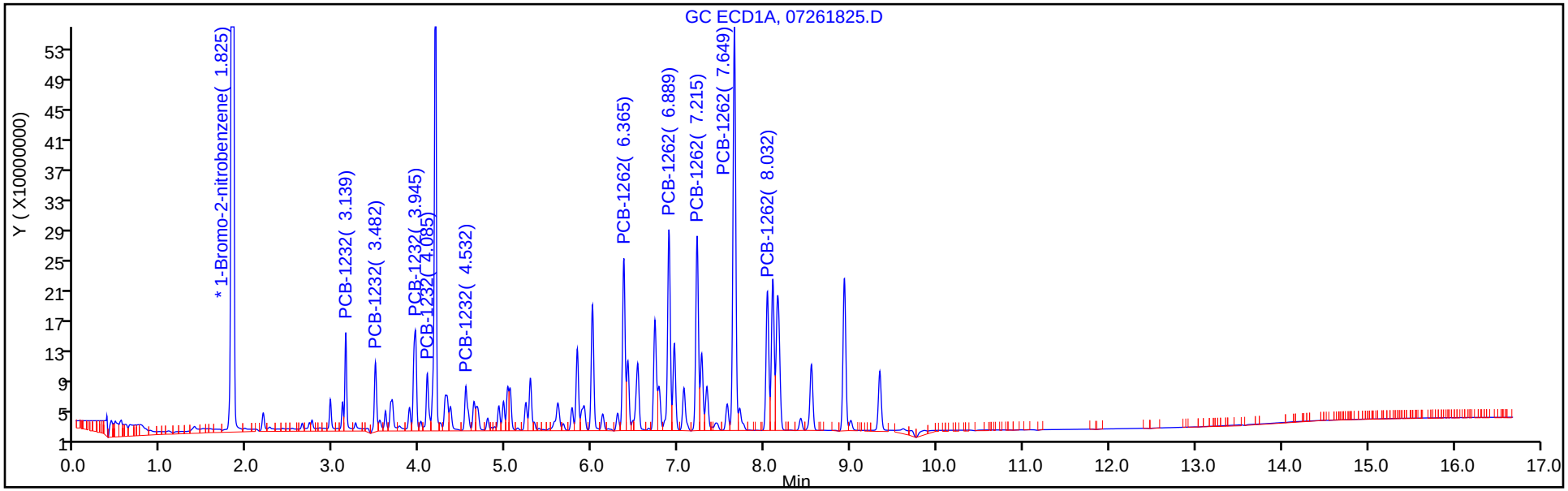
Report Date: 28-Jul-2018 08:58:31 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

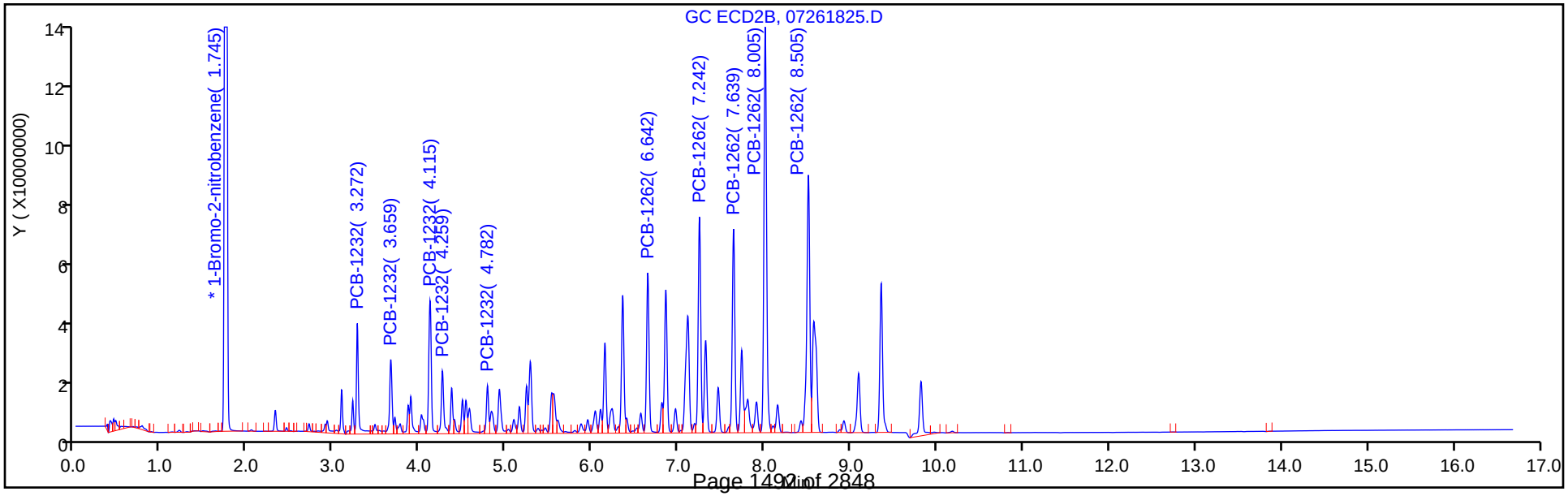
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261825.D

Injection Date:	26-Jul-2018 23:15:57	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL43262			Worklist Smp#:	25
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	25
Method:	PCB_P3	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_P3\20180726-72400.b\07261826.D
Lims ID: STDL33262
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Jul-2018 23:37:49 ALS Bottle#: 26 Worklist Smp#: 26
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL33262
Misc. Info.: 280-0072400-026
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:32 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.824	0.000	3993766615	1000.0	1000.0	
2	1.747	1.747	0.000	977743320	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	85362025	100.0	107.3	
1	3.481	3.481	0.000	71944246	100.0	95.6	
1	3.947	3.944	0.003	148308242	100.0	105.3	
1	4.084	4.084	0.000	69629738	100.0	109.5	
1	4.531	4.531	0.000	67846321	100.0	108.9	
		Average of Peak Amounts =				105.3	
2	3.274	3.271	0.003	22383714	100.0	92.4	
2	3.661	3.661	0.000	20138406	100.0	108.3	
2	4.117	4.117	0.000	37919940	100.0	102.9	
2	4.261	4.261	0.000	17504682	100.0	107.3	
2	4.784	4.784	0.000	12442281	100.0	107.9	
		Average of Peak Amounts =				103.8	
						RPD = 1.50	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.364	6.364	0.000	214946624	100.0	102.0	
1	6.887	6.887	0.000	261507031	100.0	103.2	
1	7.214	7.214	0.000	250145078	100.0	101.1	
1	7.647	7.647	0.000	511439441	100.0	98.0	
1	8.031	8.031	0.000	183478247	100.0	100.7	
		Average of Peak Amounts =				101.0	
2	6.644	6.641	0.003	45670894	100.0	101.2	
2	7.241	7.241	0.000	61410562	100.0	97.3	
2	7.637	7.637	0.000	59609505	100.0	99.2	
2	8.004	8.004	0.000	122475076	100.0	99.7	
2	8.507	8.507	0.000	89786487	100.0	101.4	
		Average of Peak Amounts =				99.8	
						RPD = 1.24	
S 8 Polychlorinated biphenyls, Total							
1						206.3	
2						203.5	
						RPD = 1.38	

Reagents:

AR_3262_L3_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

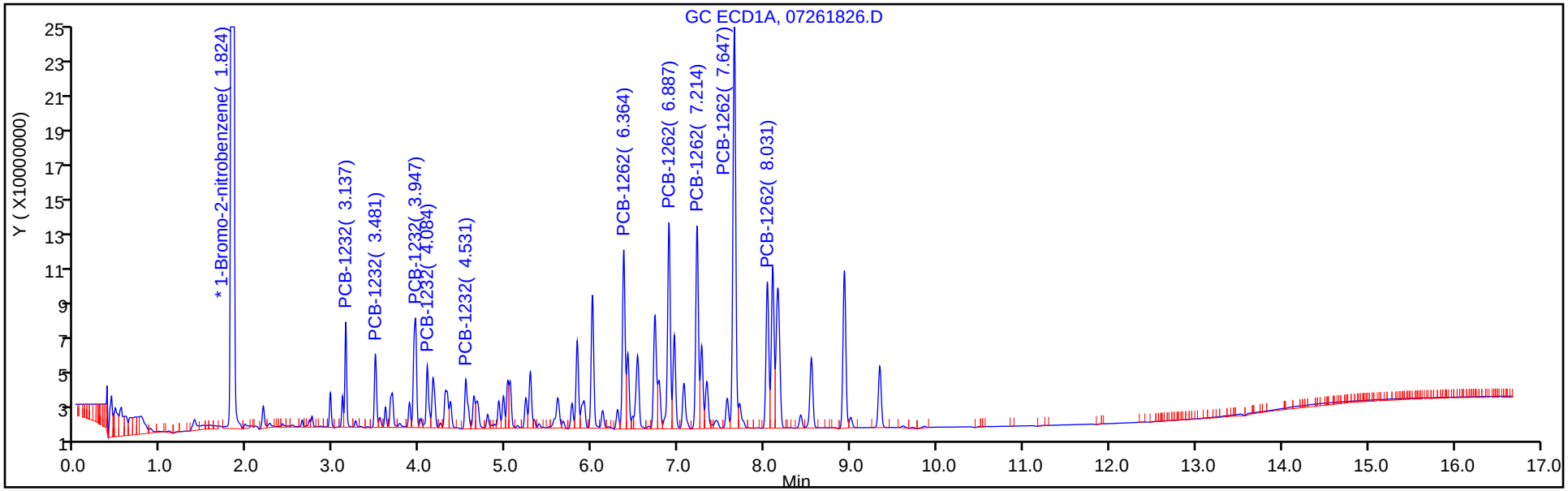
Report Date: 28-Jul-2018 08:58:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

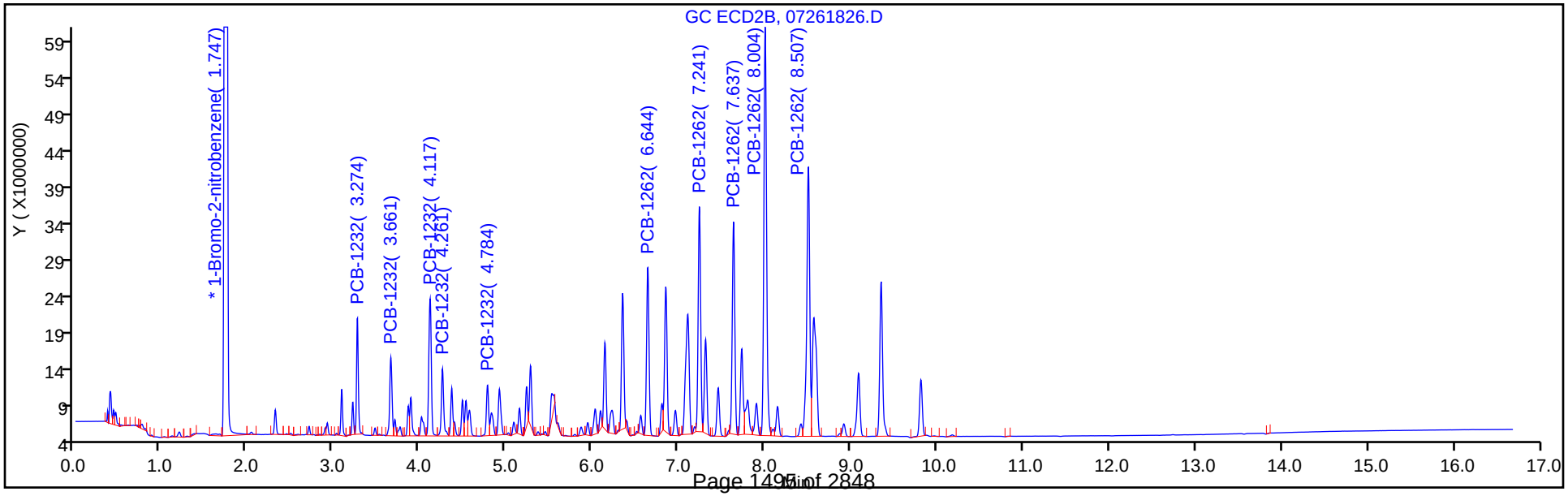
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261826.D

Injection Date:	26-Jul-2018 23:37:49	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL33262			Worklist Smp#:	26
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	26
Method:	PCB_P3	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_P3\20180726-72400.b\07261827.D
Lims ID: STDL23262
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Jul-2018 23:59:41 ALS Bottle#: 27 Worklist Smp#: 27
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL23262
Misc. Info.: 280-0072400-027
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:35 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.823	1.824	-0.001	3777655116	1000.0	1000.0	
2	1.746	1.747	-0.001	929309946	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.136	3.137	-0.001	44938322	50.0	50.4	
1	3.483	3.481	0.002	42116948	50.0	45.2	
1	3.946	3.944	0.002	74322474	50.0	49.6	
1	4.083	4.084	-0.001	34445987	50.0	48.3	
1	4.533	4.531	0.002	33871151	50.0	46.5	
		Average of Peak Amounts =				48.0	
2	3.273	3.271	0.002	13680089	50.0	49.3	
2	3.660	3.661	-0.001	10256242	50.0	50.1	
2	4.116	4.117	-0.001	18951980	50.0	49.7	
2	4.260	4.261	-0.001	8924226	50.0	50.6	
2	4.783	4.784	-0.001	6593505	50.0	53.0	
		Average of Peak Amounts =				50.5	
						RPD = 5.14	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.363	6.364	-0.001	105189473	50.0	49.0	
1	6.889	6.887	0.002	124889835	50.0	48.7	
1	7.216	7.214	0.002	121236749	50.0	48.6	
1	7.646	7.647	-0.001	242797260	50.0	48.4	
1	8.029	8.031	-0.002	89755394	50.0	49.6	
		Average of Peak Amounts =				48.9	
2	6.643	6.641	0.002	22660119	50.0	49.0	
2	7.243	7.241	0.002	31521669	50.0	49.4	
2	7.636	7.637	-0.001	29874473	50.0	49.1	
2	8.003	8.004	-0.001	59024812	50.0	48.7	
2	8.506	8.507	-0.001	43239083	50.0	48.6	
		Average of Peak Amounts =				49.0	
						RPD = 0.23	
S 8 Polychlorinated biphenyls, Total							
1						96.8	
2						99.5	
						RPD = 2.69	

Reagents:

AR_3262_L2_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

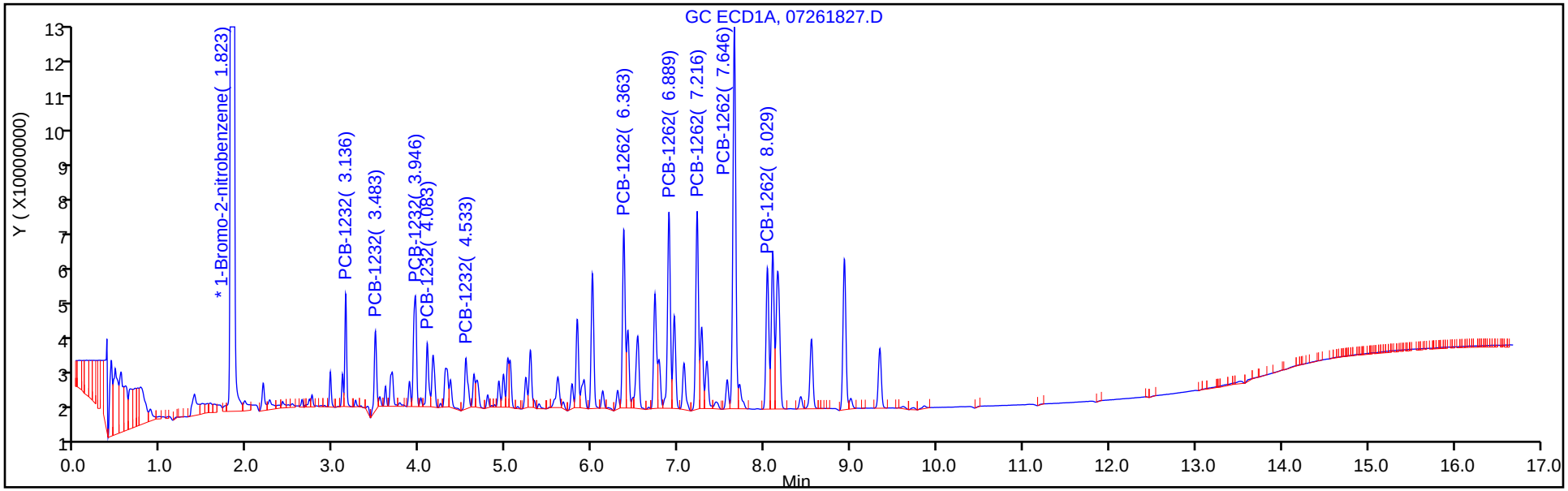
Report Date: 28-Jul-2018 08:58:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

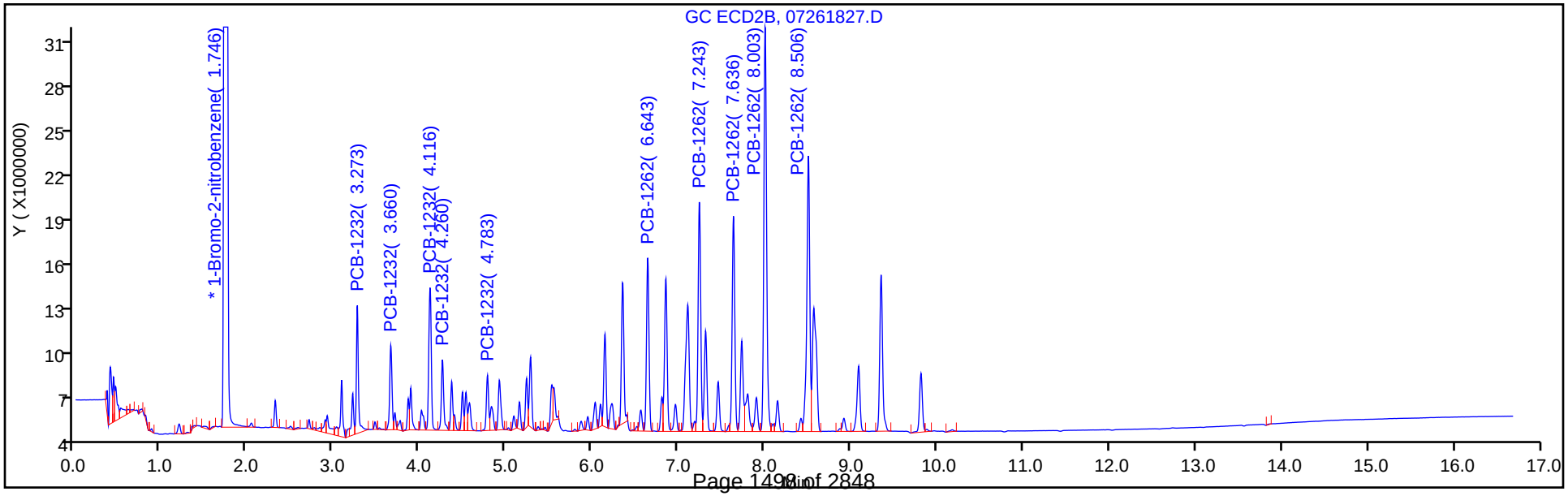
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261827.D

Injection Date:	26-Jul-2018 23:59:41	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL23262			Worklist Smp#:	27
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	27
Method:	PCB_P3	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_P3\20180726-72400.b\07261828.D
Lims ID: STDL13262
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 27-Jul-2018 00:21:31 ALS Bottle#: 28 Worklist Smp#: 28
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL13262
Misc. Info.: 280-0072400-028
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub4

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:38 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.824	1.824	0.000	3745295136	1000.0	1000.0	
2	1.748	1.747	0.001	912726429	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	26467386	25.0	21.3	
1	3.484	3.481	0.003	32612675	25.0	27.2	
1	3.947	3.944	0.003	44651866	25.0	24.9	
1	4.084	4.084	0.000	21102449	25.0	22.7	
1	4.531	4.531	0.000	23037481	25.0	24.6	
		Average of Peak Amounts =				24.1	
2	3.271	3.271	0.000	9042848	25.0	23.9	
2	3.661	3.661	0.000	5793990	25.0	21.5	
2	4.118	4.117	0.001	10720680	25.0	24.6	
2	4.261	4.261	0.000	4844577	25.0	21.2	
2	4.781	4.784	-0.003	3489069	25.0	21.0	
		Average of Peak Amounts =				22.5	
						RPD = 7.17	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.364	6.364	0.000	63420882	25.0	26.8	
1	6.887	6.887	0.000	73582740	25.0	26.1	
1	7.214	7.214	0.000	73948902	25.0	27.3	
1	7.647	7.647	0.000	145215665	25.0	28.6	
1	8.031	8.031	0.000	52609134	25.0	27.2	
		Average of Peak Amounts =				27.2	
2	6.644	6.641	0.003	13328922	25.0	26.2	
2	7.241	7.241	0.000	18666133	25.0	27.1	
2	7.638	7.637	0.001	17643903	25.0	26.9	
2	8.004	8.004	0.000	34319951	25.0	27.2	
2	8.508	8.507	0.001	25572301	25.0	27.0	
		Average of Peak Amounts =				26.9	
						RPD = 1.19	
S 8 Polychlorinated biphenyls, Total							
1						51.3	
2						49.4	
						RPD = 3.96	

Reagents:

AR_3262_L1_00021	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

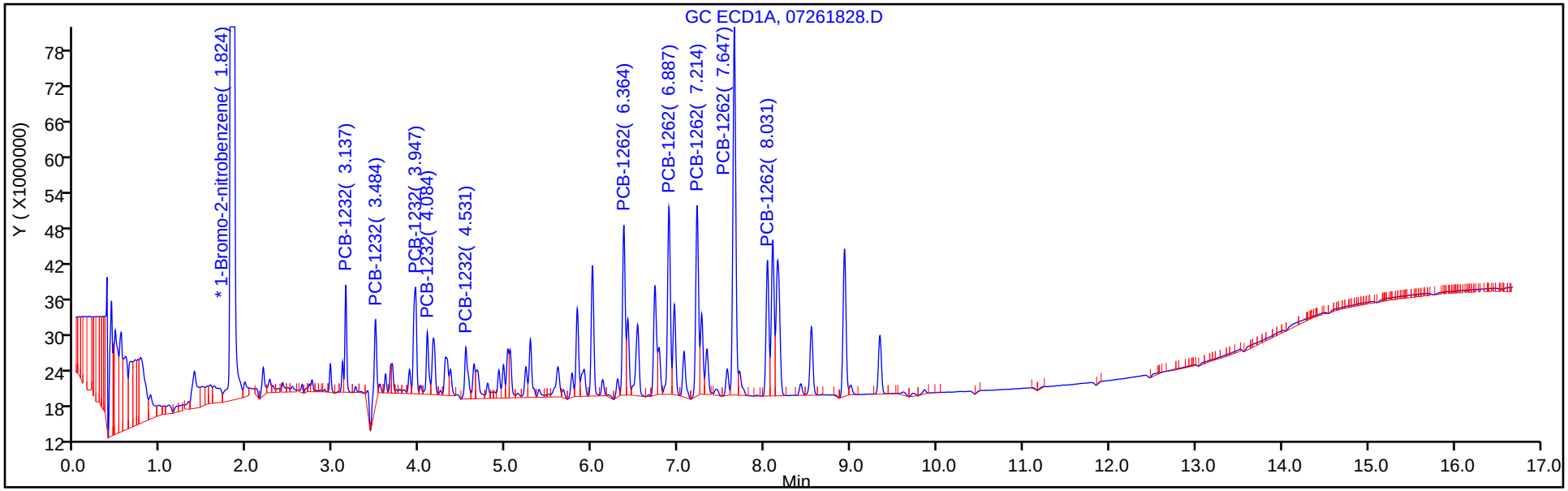
Report Date: 28-Jul-2018 08:58:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

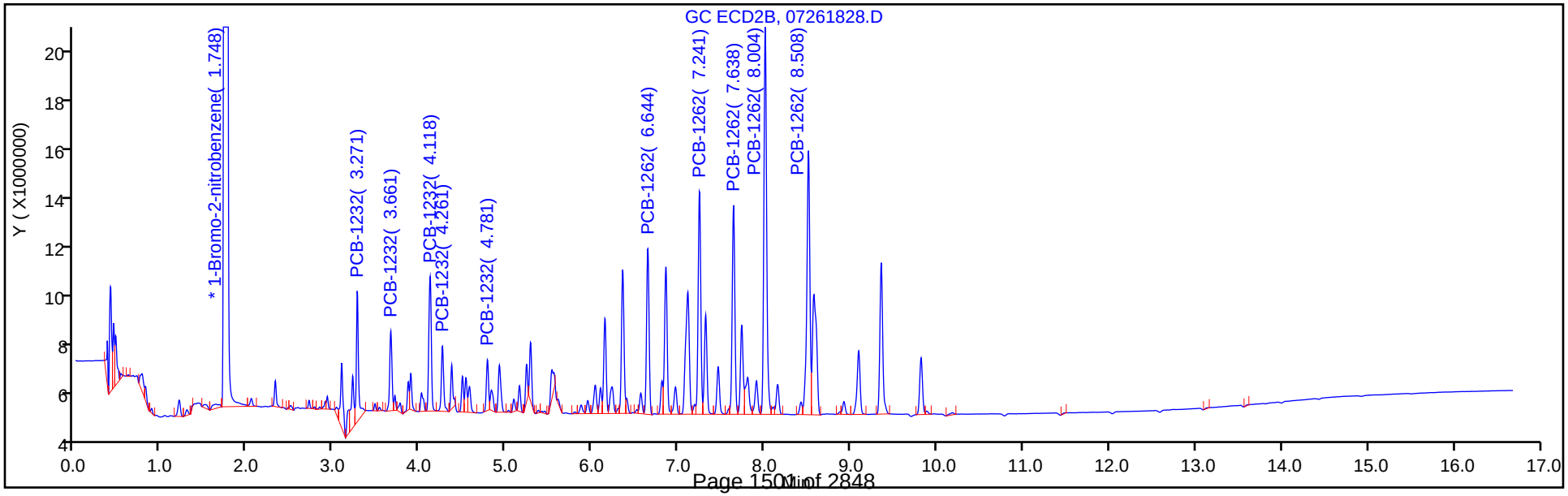
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261828.D

Injection Date:	27-Jul-2018 00:21:31	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL13262			Worklist Smp#:	28
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	28
Method:	PCB_P3	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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/27/2018 00:43 Calibration End Date: 07/27/2018 02:54 Calibration ID: 33190

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL14268 280-423815/35	07261835.D
Level 2	STDL24268 280-423815/34	07261834.D
Level 3	STDL34268 280-423815/33	07261833.D
Level 4	STDL44268 280-423815/32	07261832.D
Level 5	STDL54268 280-423815/31	07261831.D
Level 6	STDL64268 280-423815/30	07261830.D
Level 7	STDL74268 280-423815/29	07261829.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	0.4232 0.2614	0.3240 +++++	0.2962	0.2588	0.2401	Lin1	4.2560	0.2458							0.9970		0.9900
PCB-1242 Peak 2	0.7244 0.6118	0.6343 +++++	0.6003	0.5543	0.5360	Lin1	2.9998	0.5715							0.9950		0.9900
PCB-1242 Peak 3	0.4355 0.2693	0.3071 +++++	0.2892	0.2459	0.2412	Lin1	3.8517	0.2484							0.9940		0.9900
PCB-1242 Peak 4	0.2629 0.2107	0.2105 +++++	0.2116	0.1887	0.1769	Lin1	1.2972	0.1935							0.9910		0.9900
PCB-1242 Peak 5	0.2843 0.2037	0.2095 +++++	0.2069	0.1873	0.1874	Lin1	1.6377	0.1921							0.9960		0.9900
PCB-1268 Peak 1	1.5853 1.5488	1.4181 +++++	1.2960	1.2758	1.3002	Ave		1.4040				9.7		20.0			
PCB-1268 Peak 2	1.4700 1.4789	1.3809 +++++	1.2593	1.2479	1.2158	Ave		1.3421				8.7		20.0			
PCB-1268 Peak 3	1.2854 1.2695	1.1965 +++++	1.0920	1.0789	1.0769	Ave		1.1665				8.3		20.0			
PCB-1268 Peak 4	0.6720 0.5591	0.5862 +++++	0.5300	0.4999	0.4888	Ave		0.5560				12.1		20.0			
PCB-1268 Peak 5	4.2809 5.6341	4.1949 +++++	3.9874	4.2608	4.5568	Ave		4.4858				13.2		20.0			

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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/27/2018 00:43 Calibration End Date: 07/27/2018 02:54 Calibration ID: 33190

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL14268 280-423815/35	07261835.D
Level 2	STDL24268 280-423815/34	07261834.D
Level 3	STDL34268 280-423815/33	07261833.D
Level 4	STDL44268 280-423815/32	07261832.D
Level 5	STDL54268 280-423815/31	07261831.D
Level 6	STDL64268 280-423815/30	07261830.D
Level 7	STDL74268 280-423815/29	07261829.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	40841335 753305844	67214262 +++++	120512933	267503307	487124854	25.0 750	50.0 +++++	100	250	500
PCB-1242 Peak 2	BNB	Lin1	69909700 1763285715	131575938 +++++	244191872	572805873	1087280185	25.0 750	50.0 +++++	100	250	500
PCB-1242 Peak 3	BNB	Lin1	42035171 776078077	63713198 +++++	117664760	254133135	489211525	25.0 750	50.0 +++++	100	250	500
PCB-1242 Peak 4	BNB	Lin1	25375393 607154990	43655261 +++++	86071990	194967792	358785141	25.0 750	50.0 +++++	100	250	500
PCB-1242 Peak 5	BNB	Lin1	27438135 586948235	43460363 +++++	84157687	193581499	380162307	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 1	BNB	Ave	152999650 4463887127	294165209 +++++	527232636	1318437558	2637523666	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 2	BNB	Ave	141874823 4262360376	286439104 +++++	512295496	1289625546	2466293328	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 3	BNB	Ave	124055667 3658806043	248200681 +++++	444227497	1115013664	2184437787	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 4	BNB	Ave	64853393 1611355444	121593208 +++++	215594506	516658524	991595660	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 5	BNB	Ave	413156079 6238377787	870184056 +++++	1622112145	4403308683	9243731153	25.0 750	50.0 +++++	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_P3\20180726-72400.b\07261829.D
Lims ID: STDL74268
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 27-Jul-2018 00:43:23 ALS Bottle#: 29 Worklist Smp#: 29
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL74268
Misc. Info.: 280-0072400-029
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:40 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:04:59

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	1.822	1.824	-0.002	3794904621	1000.0	1000.0	
2	1.746	1.747	-0.001	905392232	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.482	3.482	0.000	155662800	1000.0	149.6	
1	3.946	3.946	0.000	263625376	1000.0	116.3	
1	4.529	4.529	0.000	486969010	1000.0	501.1	
1	5.019	5.016	0.003	1048377344	1000.0	1421.2	
1	0.000	5.042	-5.042	0	1000.0	0	
		Average of Peak Amounts =				547.0	
2	3.659	3.659	0.000	56728763	1000.0	214.7	
2	4.116	4.116	0.000	66610319	1000.0	113.5	
2	4.259	4.259	0.000	39914045	1000.0	164.0	
2	4.782	4.783	-0.001	113944017	1000.0	621.7	
2	4.919	4.919	0.000	61889406	1000.0	280.6	
		Average of Peak Amounts =				278.9	
						RPD = 64.93	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.089	8.092	-0.003	9389902	1000.0	1.76	
1	8.152	8.146	0.006	15423414	1000.0	3.03	
1	8.419	8.416	0.003	329743	1000.0	0.0745	
1	8.926	8.922	0.004	19994602	1000.0	9.48	
1	9.336	9.336	0.000	4884776	1000.0	0.2869	
		Average of Peak Amounts =				2.93	
2	8.509	8.503	0.006	69320757	1000.0	56.1	
2	8.592	8.566	0.026	4413043	1000.0	1.29	
2	8.869	8.919	-0.050	3820745	1000.0	2.01	
2	9.349	9.349	0.000	3551327	1000.0	5.86	
2	9.816	9.813	0.003	5331146	1000.0	1.52	
		Average of Peak Amounts =				13.3	
						RPD = 128.08	
S 8 Polychlorinated biphenyls, Total							
1						550.0	
2						292.2	
						RPD = 61.20	

Reagents:

AR_4268_L7_00015	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

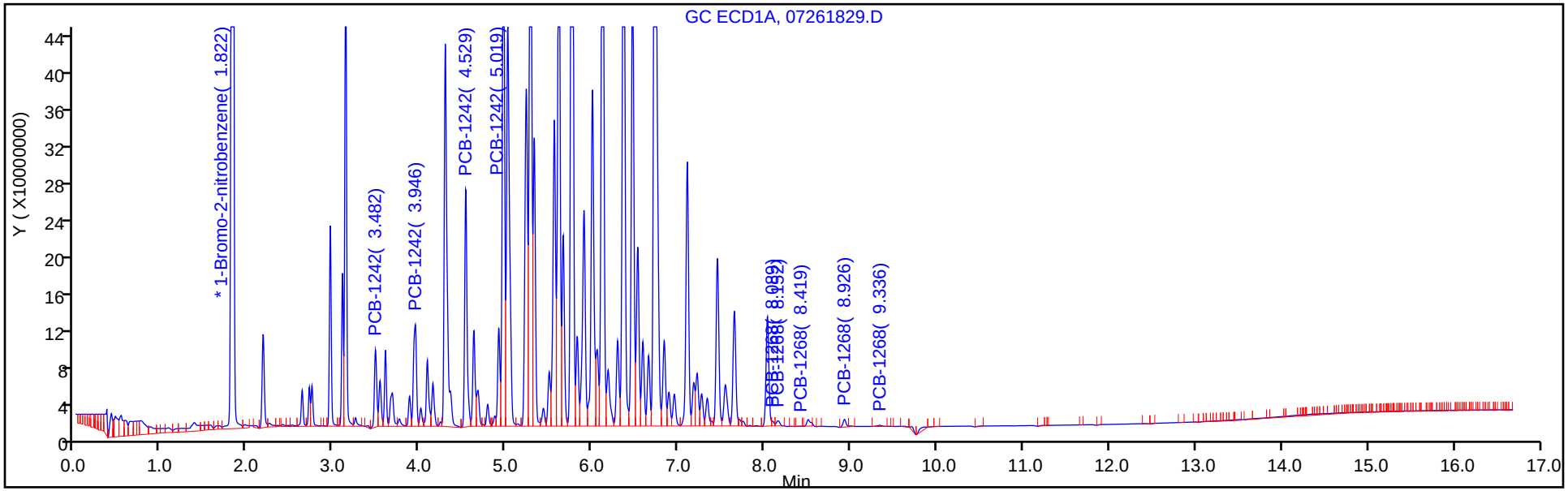
Report Date: 28-Jul-2018 08:58:41 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

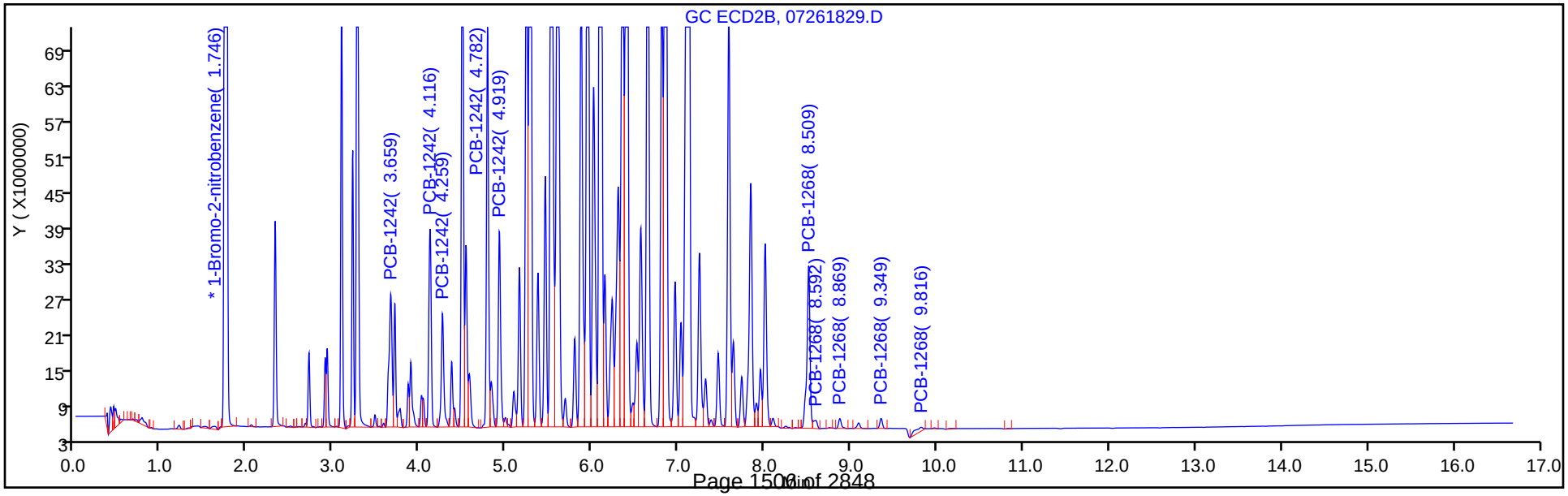
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261829.D

Injection Date:	27-Jul-2018 00:43:23	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL74268			Worklist Smp#:	29
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	29
Method:	PCB_P3	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_P3\20180726-72400.b\07261830.D
Lims ID: STDL64268
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 27-Jul-2018 01:05:14 ALS Bottle#: 30 Worklist Smp#: 30
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL64268
Misc. Info.: 280-0072400-030
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:43 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:06:58

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	1.825	1.824	0.001	3842855436	1000.0	1000.0	
2	1.745	1.747	-0.002	926369053	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.481	3.482	-0.001	753305844	750.0	780.3	
1	3.945	3.946	-0.001	1763285715	750.0	797.6	
1	4.531	4.529	0.002	776078077	750.0	797.5	
1	5.018	5.016	0.002	607154990	750.0	809.9	
1	5.045	5.042	0.003	586948235	750.0	786.7	
		Average of Peak Amounts =				794.4	
2	3.662	3.659	0.003	204721874	750.0	778.7	
2	4.118	4.116	0.002	464071122	750.0	791.7	
2	4.258	4.259	-0.001	191149538	750.0	790.5	
2	4.782	4.783	-0.001	148260988	750.0	793.0	
2	4.922	4.919	0.003	175841689	750.0	790.5	
		Average of Peak Amounts =				788.9	
						RPD = 0.70	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.091	8.092	-0.001	4463887127	750.0	827.3	
1	8.148	8.146	0.002	4262360376	750.0	826.4	
1	8.418	8.416	0.002	3658806043	750.0	816.2	
1	8.925	8.922	0.003	1611355444	750.0	754.2	
1	9.345	9.336	0.009	16238377787	750.0	942.0	
		Average of Peak Amounts =				833.2	
2	8.505	8.503	0.002	989479047	750.0	799.9	
2	8.568	8.566	0.002	907876939	750.0	794.5	
2	8.918	8.919	-0.001	768819502	750.0	794.9	
2	9.352	9.349	0.003	354672250	750.0	797.5	
2	9.815	9.813	0.002	2549179598	750.0	798.4	
		Average of Peak Amounts =				797.0	
						RPD = 4.44	
S 8 Polychlorinated biphenyls, Total							
1						1627.6	
2						1585.9	
						RPD = 2.60	

Reagents:

AR_4268_L6_00017	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

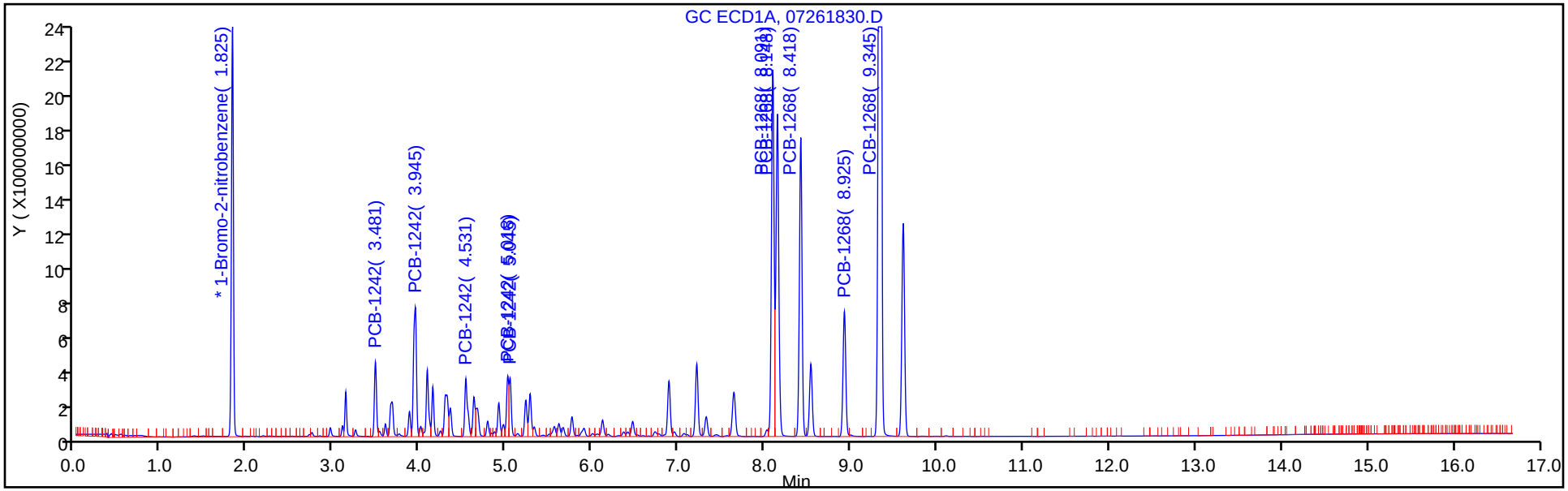
Report Date: 28-Jul-2018 08:58:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

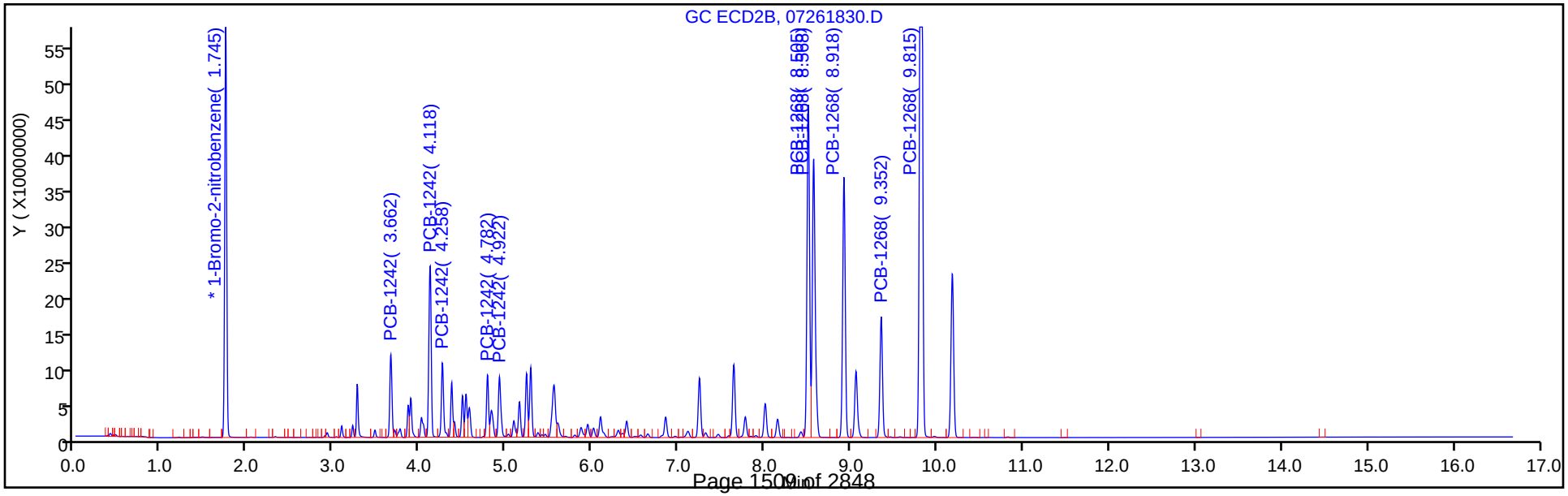
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261830.D

Injection Date:	27-Jul-2018 01:05:14	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL64268			Worklist Smp#:	30
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	30
Method:	PCB_P3	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_P3\20180726-72400.b\07261831.D
Lims ID: STDL54268
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 27-Jul-2018 01:27:05 ALS Bottle#: 31 Worklist Smp#: 31
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL54268
Misc. Info.: 280-0072400-031
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:45 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:56:26

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	1.822	1.822	0.000	4057088253	1000.0	1000.0	
2	1.746	1.746	0.000	971955590	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.482	3.482	0.000	487124854	500.0	471.2	
1	3.946	3.946	0.000	1087280185	500.0	463.7	
1	4.529	4.529	0.000	489211525	500.0	469.9	
1	5.016	5.016	0.000	358785141	500.0	450.4	
1	5.042	5.042	0.000	380162307	500.0	479.3	
		Average of Peak Amounts =				466.9	
2	3.659	3.659	0.000	131887733	500.0	474.9	
2	4.116	4.116	0.000	289111105	500.0	468.8	
2	4.259	4.259	0.000	118580118	500.0	464.8	
2	4.783	4.783	0.000	91502274	500.0	462.8	
2	4.919	4.919	0.000	109052703	500.0	464.7	
		Average of Peak Amounts =				467.2	
						RPD = 0.06	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.092	8.092	0.000	2637523666	500.0	463.0	
1	8.146	8.146	0.000	2466293328	500.0	452.9	
1	8.416	8.416	0.000	2184437787	500.0	461.6	
1	8.922	8.922	0.000	991595660	500.0	439.6	
1	9.336	9.336	0.000	9243731153	500.0	507.9	
		Average of Peak Amounts =				465.0	
2	8.503	8.503	0.000	607376783	500.0	467.4	
2	8.566	8.566	0.000	560639572	500.0	466.5	
2	8.919	8.919	0.000	477692426	500.0	469.9	
2	9.349	9.349	0.000	218153864	500.0	466.6	
2	9.813	9.813	0.000	1566311259	500.0	467.5	
		Average of Peak Amounts =				467.6	
						RPD = 0.55	

Reagents:

AR_4268_L5_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

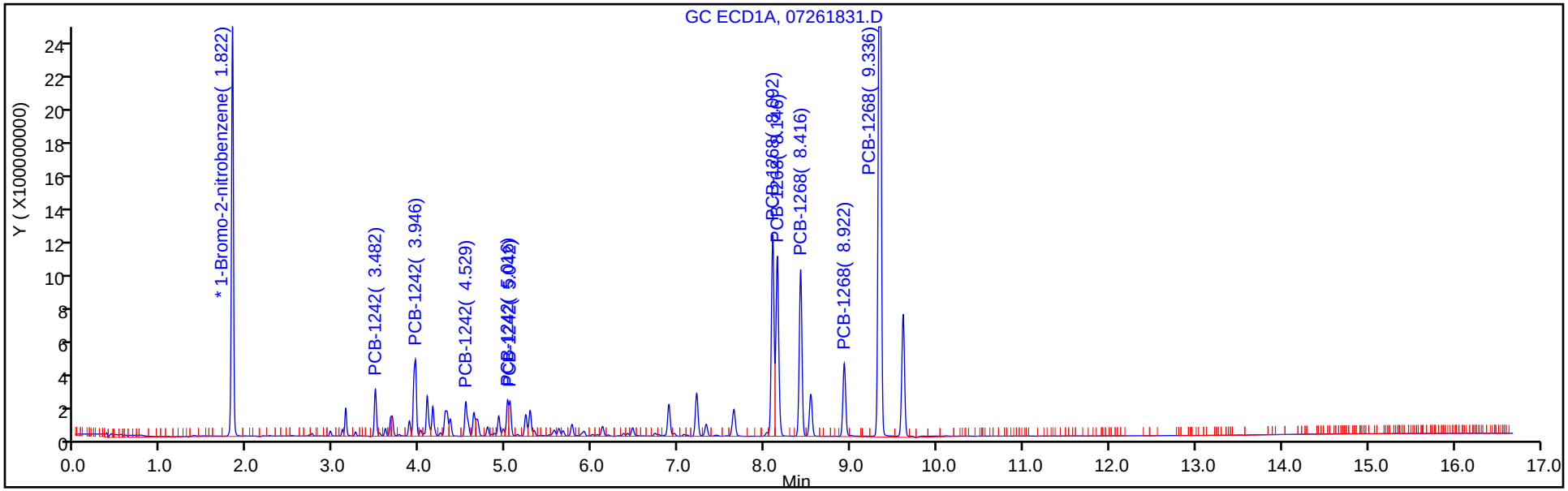
Report Date: 28-Jul-2018 08:58:46 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

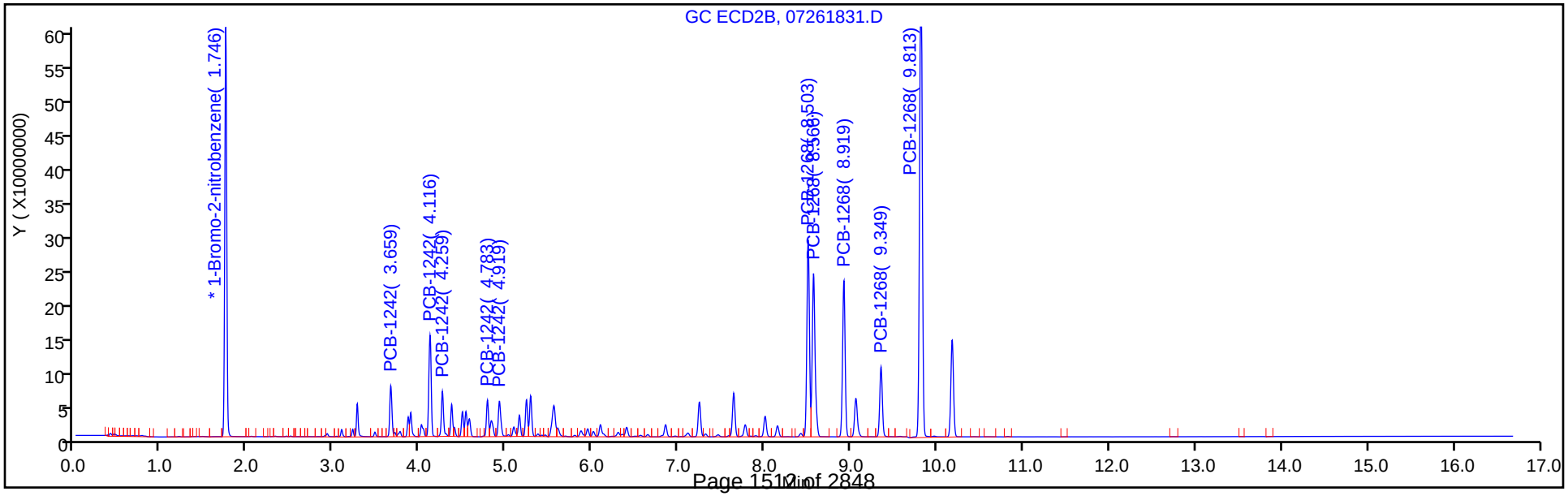
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261831.D

Injection Date:	27-Jul-2018 01:27:05	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL54268			Worklist Smp#:	31
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	31
Method:	PCB_P3	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_P3\20180726-72400.b\07261832.D
Lims ID: STDL44268
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 27-Jul-2018 01:48:54 ALS Bottle#: 32 Worklist Smp#: 32
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL44268
Misc. Info.: 280-0072400-032
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:48 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 12:34:19

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	1.824	1.822	0.002	4133806380	1000.0	1000.0	
2	1.748	1.746	0.002	993035645	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.481	3.482	-0.001	267503307	250.0	246.0	
1	3.944	3.946	-0.002	572805873	250.0	237.2	
1	4.531	4.529	0.002	254133135	250.0	232.0	
1	5.017	5.016	0.001	194967792	250.0	237.1	
1	5.044	5.042	0.002	193581499	250.0	235.3	
		Average of Peak Amounts =				237.5	
2	3.661	3.659	0.002	69810890	250.0	241.9	
2	4.114	4.116	-0.002	151419133	250.0	238.7	
2	4.258	4.259	-0.001	63664693	250.0	241.3	
2	4.781	4.783	-0.002	49730284	250.0	242.0	
2	4.921	4.919	0.002	58732190	250.0	241.9	
		Average of Peak Amounts =				241.2	
						RPD = 1.54	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.091	8.092	-0.001	1318437558	250.0	227.2	
1	8.147	8.146	0.001	1289625546	250.0	232.4	
1	8.417	8.416	0.001	1115013664	250.0	231.2	
1	8.924	8.922	0.002	516658524	250.0	224.8	
1	9.337	9.336	0.001	4403308683	250.0	237.5	
		Average of Peak Amounts =				230.6	
2	8.504	8.503	0.001	310775473	250.0	233.4	
2	8.568	8.566	0.002	294540678	250.0	238.6	
2	8.918	8.919	-0.001	245535704	250.0	235.4	
2	9.351	9.349	0.002	112544617	250.0	234.4	
2	9.814	9.813	0.001	801467144	250.0	234.0	
		Average of Peak Amounts =				235.2	
						RPD = 1.95	
S 8 Polychlorinated biphenyls, Total							
1						468.1	
2						476.4	
						RPD = 1.74	

Reagents:

AR_4268_L4_00022	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

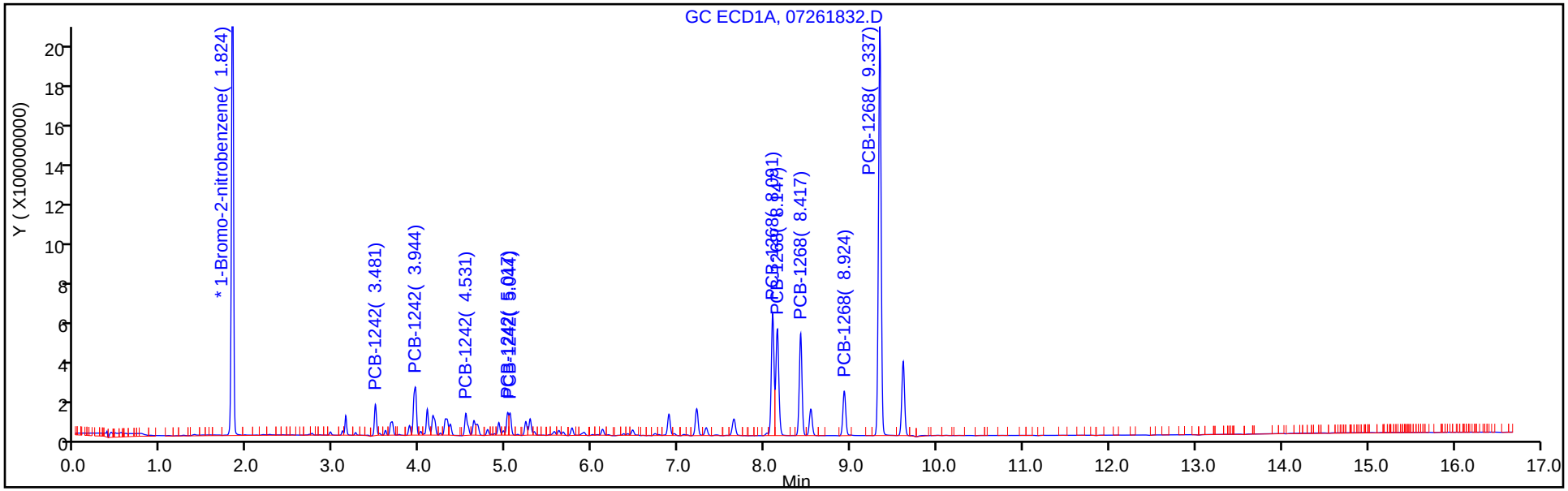
Report Date: 28-Jul-2018 08:58:49 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

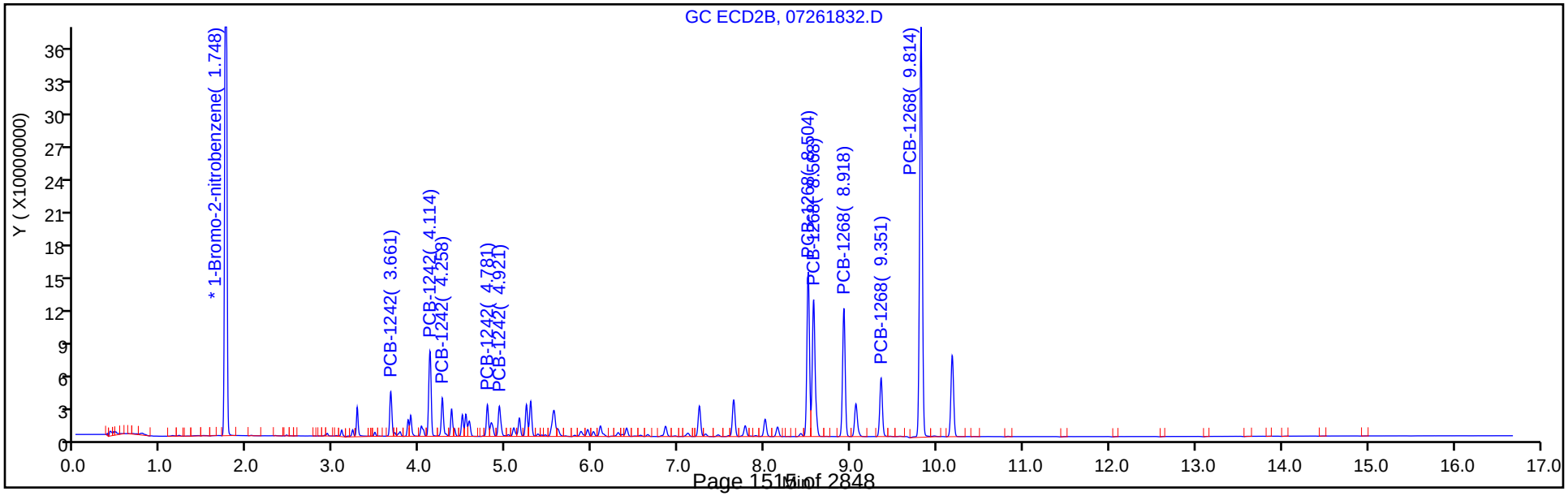
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261832.D

Injection Date:	27-Jul-2018 01:48:54	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL44268			Worklist Smp#:	32
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	32
Method:	PCB_P3	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_P3\20180726-72400.b\07261833.D
Lims ID: STDL34268
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 27-Jul-2018 02:10:45 ALS Bottle#: 33 Worklist Smp#: 33
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL34268
Misc. Info.: 280-0072400-033
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:51 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.822	0.003	4068051096	1000.0	1000.0	
2	1.745	1.746	-0.001	974172605	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.482	3.482	0.000	120512933	100.0	103.2	
1	3.945	3.946	-0.001	244191872	100.0	99.8	
1	4.532	4.529	0.003	117664760	100.0	100.9	
1	5.018	5.016	0.002	86071990	100.0	102.7	
1	5.045	5.042	0.003	84157687	100.0	99.2	
		Average of Peak Amounts =				101.2	
2	3.659	3.659	0.000	30104274	100.0	101.6	
2	4.115	4.116	-0.001	62244598	100.0	98.2	
2	4.259	4.259	0.000	27275391	100.0	101.8	
2	4.782	4.783	-0.001	21084577	100.0	99.6	
2	4.922	4.919	0.003	24707591	100.0	100.1	
		Average of Peak Amounts =				100.3	
						RPD = 0.89	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.092	8.092	0.000	527232636	100.0	92.3	
1	8.145	8.146	-0.001	512295496	100.0	93.8	
1	8.415	8.416	-0.001	444227497	100.0	93.6	
1	8.922	8.922	0.000	215594506	100.0	95.3	
1	9.335	9.336	-0.001	1622112145	100.0	88.9	
		Average of Peak Amounts =				92.8	
2	8.505	8.503	0.002	125857483	100.0	95.5	
2	8.569	8.566	0.003	119648436	100.0	97.2	
2	8.919	8.919	0.000	99950049	100.0	96.5	
2	9.352	9.349	0.003	46697296	100.0	97.8	
2	9.812	9.813	-0.001	322500660	100.0	95.9	
		Average of Peak Amounts =				96.6	
						RPD = 4.01	
S 8 Polychlorinated biphenyls, Total							
1						193.9	
2						196.8	
						RPD = 1.48	

Reagents:

AR_4268_L3_00019	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

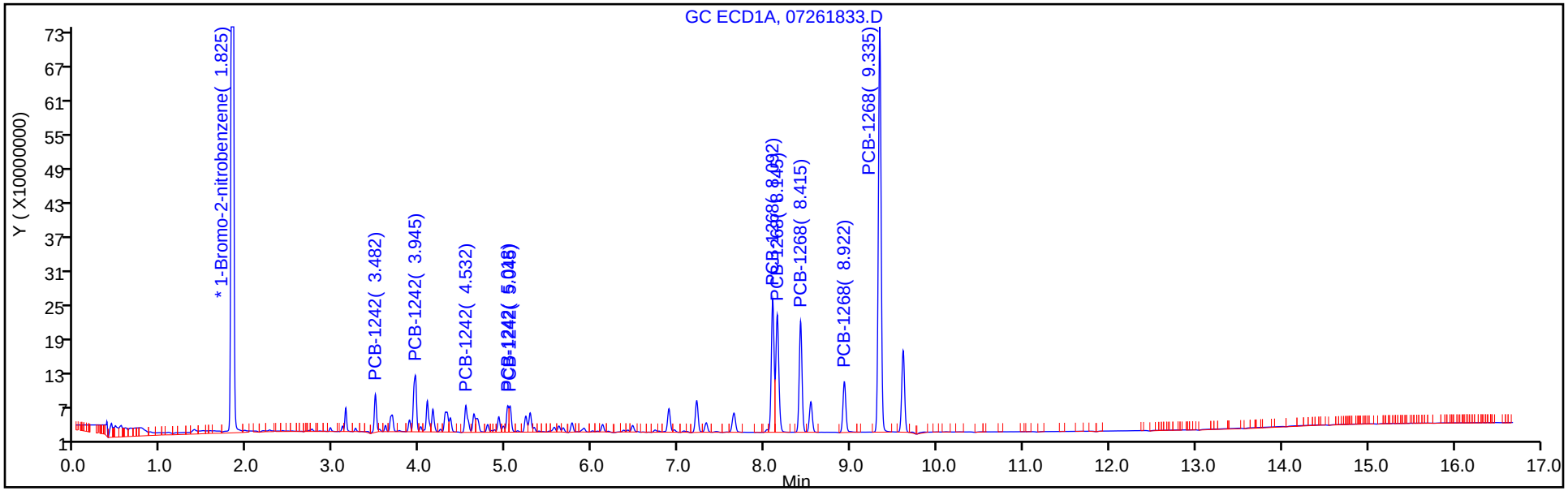
Report Date: 28-Jul-2018 08:58:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

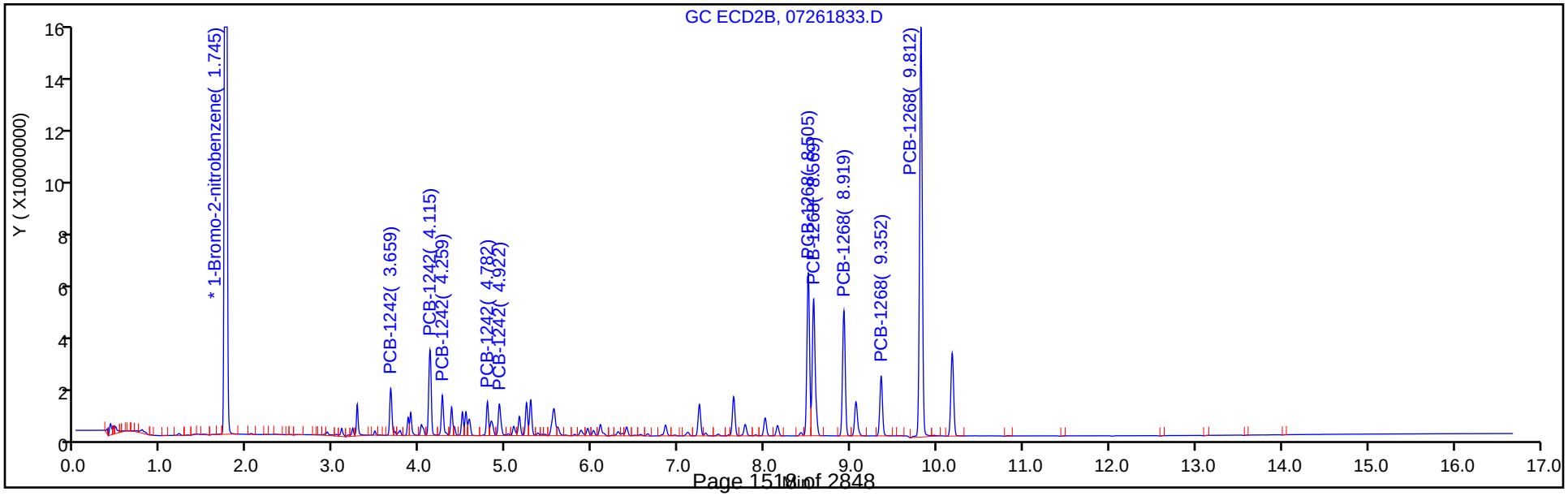
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261833.D

Injection Date:	27-Jul-2018 02:10:45	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL34268			Worklist Smp#:	33
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	33
Method:	PCB_P3	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_P3\20180726-72400.b\07261834.D
Lims ID: STDL24268
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 27-Jul-2018 02:32:34 ALS Bottle#: 34 Worklist Smp#: 34
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL24268
Misc. Info.: 280-0072400-034
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:54 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.822	0.004	4148732630	1000.0	1000.0	
2	1.746	1.746	0.000	982495300	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.483	3.482	0.001	67214262	50.0	48.6	
1	3.946	3.946	0.000	131575938	50.0	50.2	
1	4.533	4.529	0.004	63713198	50.0	46.3	
1	5.019	5.016	0.003	43655261	50.0	47.7	
1	5.043	5.042	0.001	43460363	50.0	46.0	
		Average of Peak Amounts =				47.8	
2	3.659	3.659	0.000	17339538	50.0	54.4	
2	4.116	4.116	0.000	33962344	50.0	51.6	
2	4.259	4.259	0.000	14672846	50.0	51.4	
2	4.783	4.783	0.000	12050818	50.0	52.6	
2	4.919	4.919	0.000	13934067	50.0	53.2	
		Average of Peak Amounts =				52.6	
						RPD = 9.68	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.093	8.092	0.001	294165209	50.0	50.5	
1	8.146	8.146	0.000	286439104	50.0	51.4	
1	8.416	8.416	0.000	248200681	50.0	51.3	
1	8.926	8.922	0.004	121593208	50.0	52.7	
1	9.336	9.336	0.000	870184056	50.0	46.8	
		Average of Peak Amounts =				50.5	
2	8.506	8.503	0.003	69843721	50.0	51.9	
2	8.566	8.566	0.000	66325610	50.0	52.2	
2	8.919	8.919	0.000	55381720	50.0	52.1	
2	9.349	9.349	0.000	26016252	50.0	53.0	
2	9.813	9.813	0.000	180808335	50.0	53.2	
		Average of Peak Amounts =				52.5	
						RPD = 3.79	
S 8 Polychlorinated biphenyls, Total							
1						98.3	
2						105.1	
						RPD = 6.70	

Reagents:

AR_4268_L2_00019	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

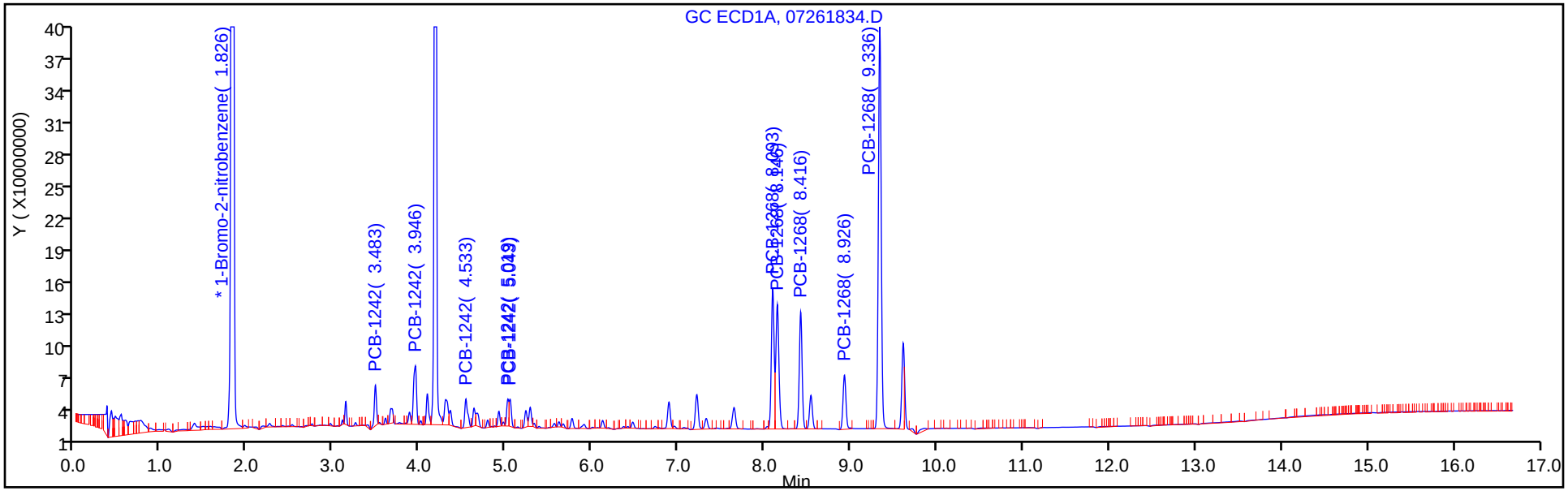
Report Date: 28-Jul-2018 08:58:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

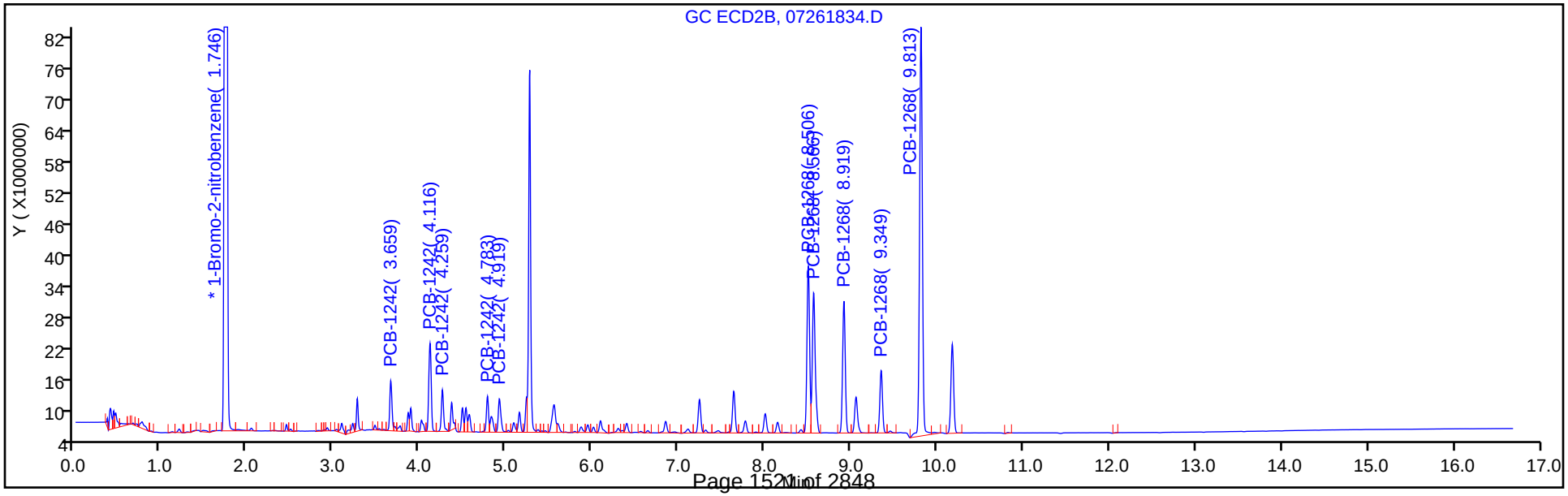
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261834.D

Injection Date:	27-Jul-2018 02:32:34	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL24268			Worklist Smp#:	34
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	34
Method:	PCB_P3	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_P3\20180726-72400.b\07261835.D
Lims ID: STDL14268
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 27-Jul-2018 02:54:25 ALS Bottle#: 35 Worklist Smp#: 35
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL14268
Misc. Info.: 280-0072400-035
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:56 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 28-Jul-2018 07:58:21

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	1.825	1.822	0.003	3860476206	1000.0	1000.0	
2	1.745	1.746	-0.001	937405836	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.481	3.482	-0.001	40841335	25.0	25.7	
1	3.945	3.946	-0.001	69909700	25.0	26.4	
1	4.531	4.529	0.002	42035171	25.0	28.3	
1	5.018	5.016	0.002	25375393	25.0	27.3	
1	5.045	5.042	0.003	27438135	25.0	28.5	
		Average of Peak Amounts =				27.2	
2	3.661	3.659	0.002	8403452	25.0	23.5	
2	4.115	4.116	-0.001	17241655	25.0	25.9	
2	4.258	4.259	-0.001	7626456	25.0	25.1	
2	4.781	4.783	-0.002	6344220	25.0	25.0	
2	4.921	4.919	0.002	6917258	25.0	24.6	
		Average of Peak Amounts =				24.8	
						RPD = 9.23	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.091	8.092	-0.001	152999650	25.0	28.2	
1	8.145	8.146	-0.001	141874823	25.0	27.4	
1	8.418	8.416	0.002	124055667	25.0	27.5	
1	8.925	8.922	0.003	64853393	25.0	30.2	
1	9.335	9.336	-0.001	413156079	25.0	23.9	
		Average of Peak Amounts =				27.4	
2	8.505	8.503	0.002	35177787	25.0	26.8	
2	8.568	8.566	0.002	32941651	25.0	25.9	
2	8.918	8.919	-0.001	27677944	25.0	26.3	
2	9.351	9.349	0.002	12581884	25.0	25.7	
2	9.815	9.813	0.002	84685682	25.0	26.0	
		Average of Peak Amounts =				26.1	
						RPD = 4.86	
S 8 Polychlorinated biphenyls, Total							
1						54.7	
2						51.0	
						RPD = 7.02	

Reagents:

AR_4268_L1_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

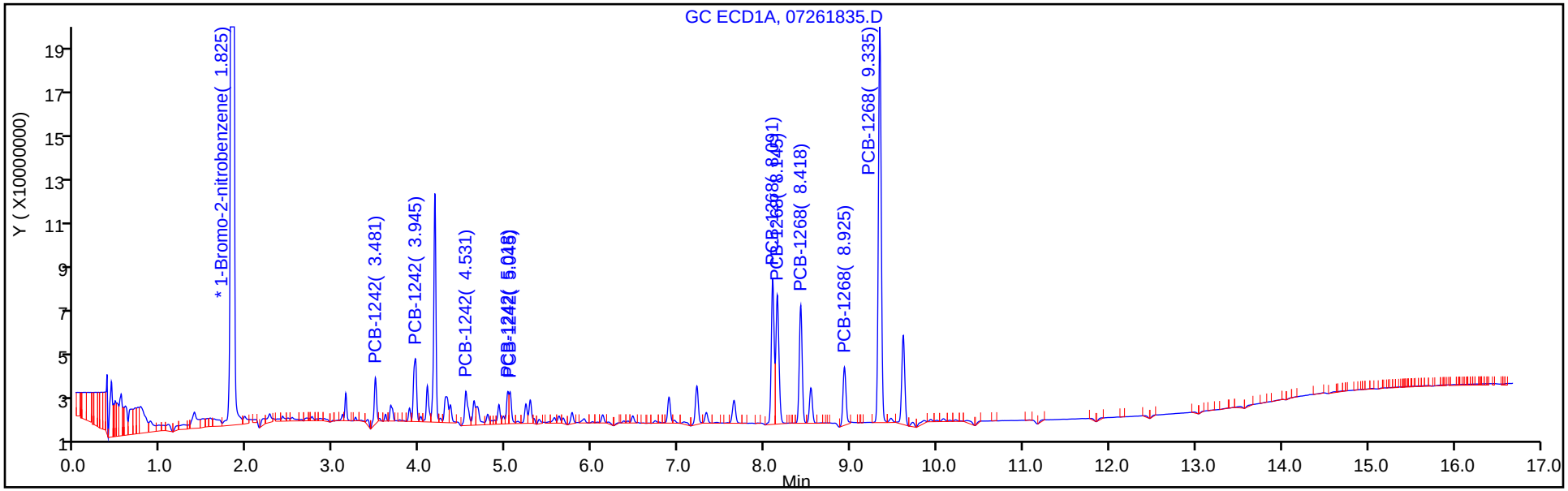
Report Date: 28-Jul-2018 08:58:57 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

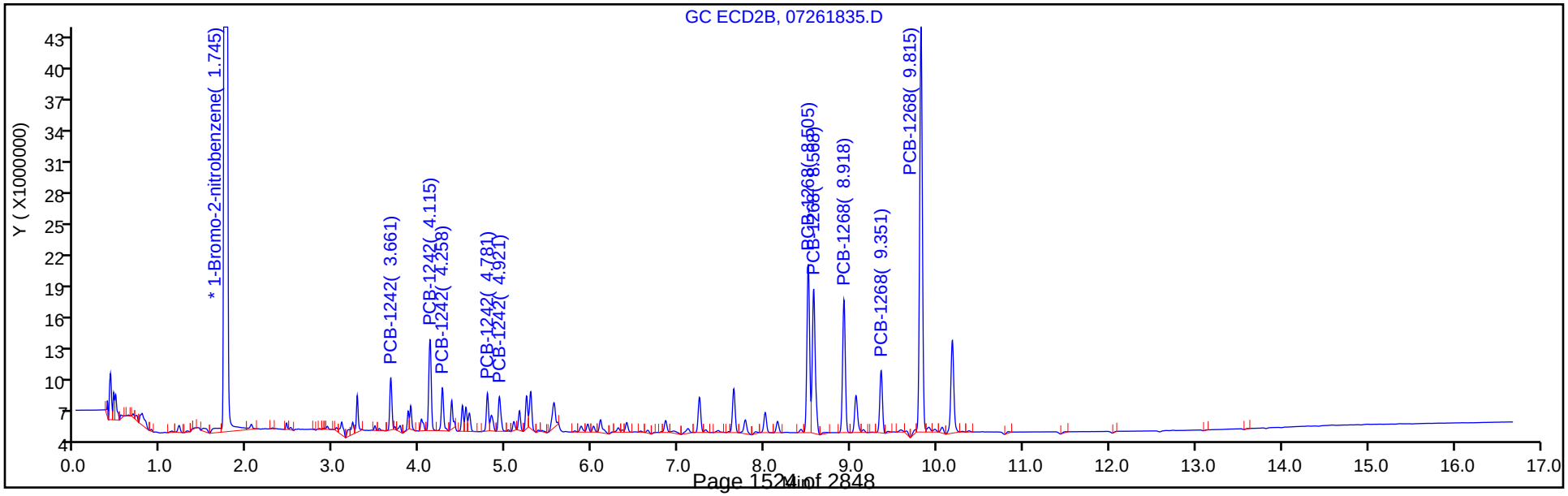
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.D

Injection Date:	27-Jul-2018 02:54:25	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL14268			Worklist Smp#:	35
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	35
Method:	PCB_P3	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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/27/2018 00:43 Calibration End Date: 07/27/2018 02:54 Calibration ID: 33191

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL14268 280-423815/35	07261835.D
Level 2	STDL24268 280-423815/34	07261834.D
Level 3	STDL34268 280-423815/33	07261833.D
Level 4	STDL44268 280-423815/32	07261832.D
Level 5	STDL54268 280-423815/31	07261831.D
Level 6	STDL64268 280-423815/30	07261830.D
Level 7	STDL74268 280-423815/29	07261829.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	0.3586 0.2947	0.3530 +++++	0.3090	0.2812	0.2714	Lin1	2.3691	0.2808							0.9970		0.9900
PCB-1242 Peak 2	0.7357 0.6679	0.6913 +++++	0.6389	0.6099	0.5949	Lin1	2.0420	0.6301							0.9960		0.9900
PCB-1242 Peak 3	0.3254 0.2751	0.2987 +++++	0.2800	0.2564	0.2440	Lin1	1.6283	0.2590							0.9960		0.9900
PCB-1242 Peak 4	0.2707 0.2134	0.2453 +++++	0.2164	0.2003	0.1883	Lin1	1.7700	0.1996							0.9950		0.9900
PCB-1242 Peak 5	0.2952 0.2531	0.2836 +++++	0.2536	0.2366	0.2244	Lin1	1.5169	0.2382							0.9960		0.9900
PCB-1268 Peak 1	1.5011 1.4242	1.4218 +++++	1.2919	1.2518	1.2498	Lin1	1.8464	1.3330							0.9940		0.9900
PCB-1268 Peak 2	1.4057 1.3067	1.3501 +++++	1.2282	1.1864	1.1536	Lin1	3.2927	1.2294							0.9950		0.9900
PCB-1268 Peak 3	1.1810 1.1066	1.1274 +++++	1.0260	0.9890	0.9830	Lin1	2.1253	1.0414							0.9950		0.9900
PCB-1268 Peak 4	0.5369 0.5105	0.5296 +++++	0.4794	0.4533	0.4489	Lin1	1.1191	0.4787							0.9950		0.9900
PCB-1268 Peak 5	3.6136 3.6691	3.6806 +++++	3.3105	3.2284	3.2230	Lin1	0.6388	3.4460							0.9950		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.: 160-29498-1 Analy Batch No.: 423815

SDG No.:

Instrument ID: SGC_P3 GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 07/27/2018 00:43 Calibration End Date: 07/27/2018 02:54 Calibration ID: 33191

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STDL14268 280-423815/35	07261835.D
Level 2	STDL24268 280-423815/34	07261834.D
Level 3	STDL34268 280-423815/33	07261833.D
Level 4	STDL44268 280-423815/32	07261832.D
Level 5	STDL54268 280-423815/31	07261831.D
Level 6	STDL64268 280-423815/30	07261830.D
Level 7	STDL74268 280-423815/29	07261829.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	8403452 204721874	17339538 +++++	30104274	69810890	131887733	25.0 750	50.0 +++++	100	250	500
PCB-1242 Peak 2	BNB	Lin1	17241655 464071122	33962344 +++++	62244598	151419133	289111105	25.0 750	50.0 +++++	100	250	500
PCB-1242 Peak 3	BNB	Lin1	7626456 191149538	14672846 +++++	27275391	63664693	118580118	25.0 750	50.0 +++++	100	250	500
PCB-1242 Peak 4	BNB	Lin1	6344220 148260988	12050818 +++++	21084577	49730284	91502274	25.0 750	50.0 +++++	100	250	500
PCB-1242 Peak 5	BNB	Lin1	6917258 175841689	13934067 +++++	24707591	58732190	109052703	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 1	BNB	Lin1	35177787 989479047	69843721 +++++	125857483	310775473	607376783	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 2	BNB	Lin1	32941651 907876939	66325610 +++++	119648436	294540678	560639572	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 3	BNB	Lin1	27677944 768819502	55381720 +++++	99950049	245535704	477692426	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 4	BNB	Lin1	12581884 354672250	26016252 +++++	46697296	112544617	218153864	25.0 750	50.0 +++++	100	250	500
PCB-1268 Peak 5	BNB	Lin1	84685682 2549179598	180808335 +++++	322500660	801467144	1566311259	25.0 750	50.0 +++++	100	250	500

Curve Type Legend:
Lin1 = Linear 1/conc ISTD

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261829.D
Lims ID: STDL74268
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 27-Jul-2018 00:43:23 ALS Bottle#: 29 Worklist Smp#: 29
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL74268
Misc. Info.: 280-0072400-029
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:40 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:04:59

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	1.822	1.824	-0.002	3794904621	1000.0	1000.0	
2	1.746	1.747	-0.001	905392232	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.482	3.482	0.000	155662800	1000.0	149.6	
1	3.946	3.946	0.000	263625376	1000.0	116.3	
1	4.529	4.529	0.000	486969010	1000.0	501.1	
1	5.019	5.016	0.003	1048377344	1000.0	1421.2	
1	0.000	5.042	-5.042	0	1000.0	0	
		Average of Peak Amounts =				547.0	
2	3.659	3.659	0.000	56728763	1000.0	214.7	
2	4.116	4.116	0.000	66610319	1000.0	113.5	
2	4.259	4.259	0.000	39914045	1000.0	164.0	
2	4.782	4.783	-0.001	113944017	1000.0	621.7	
2	4.919	4.919	0.000	61889406	1000.0	280.6	
		Average of Peak Amounts =				278.9	
						RPD = 64.93	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.089	8.092	-0.003	9389902	1000.0	1.76	
1	8.152	8.146	0.006	15423414	1000.0	3.03	
1	8.419	8.416	0.003	329743	1000.0	0.0745	
1	8.926	8.922	0.004	19994602	1000.0	9.48	
1	9.336	9.336	0.000	4884776	1000.0	0.2869	
		Average of Peak Amounts =				2.93	
2	8.509	8.503	0.006	69320757	1000.0	56.1	
2	8.592	8.566	0.026	4413043	1000.0	1.29	
2	8.869	8.919	-0.050	3820745	1000.0	2.01	
2	9.349	9.349	0.000	3551327	1000.0	5.86	
2	9.816	9.813	0.003	5331146	1000.0	1.52	
		Average of Peak Amounts =				13.3	
						RPD = 128.08	
S 8 Polychlorinated biphenyls, Total							
1						550.0	
2						292.2	
						RPD = 61.20	

Reagents:

AR_4268_L7_00015	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

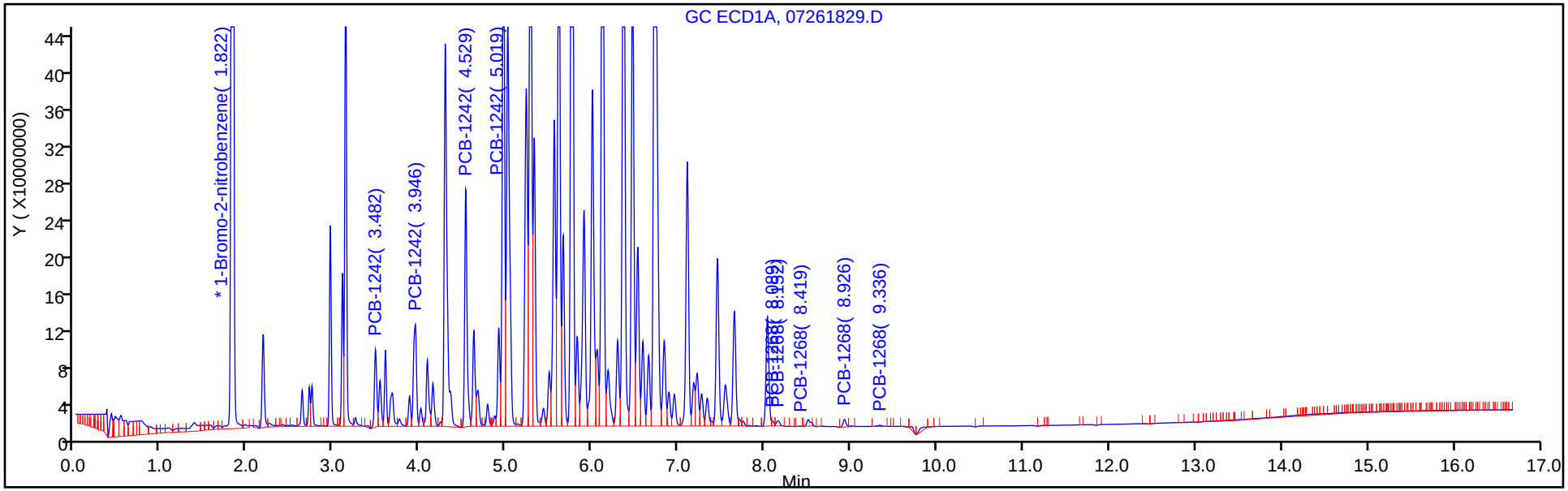
Report Date: 28-Jul-2018 08:58:41 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

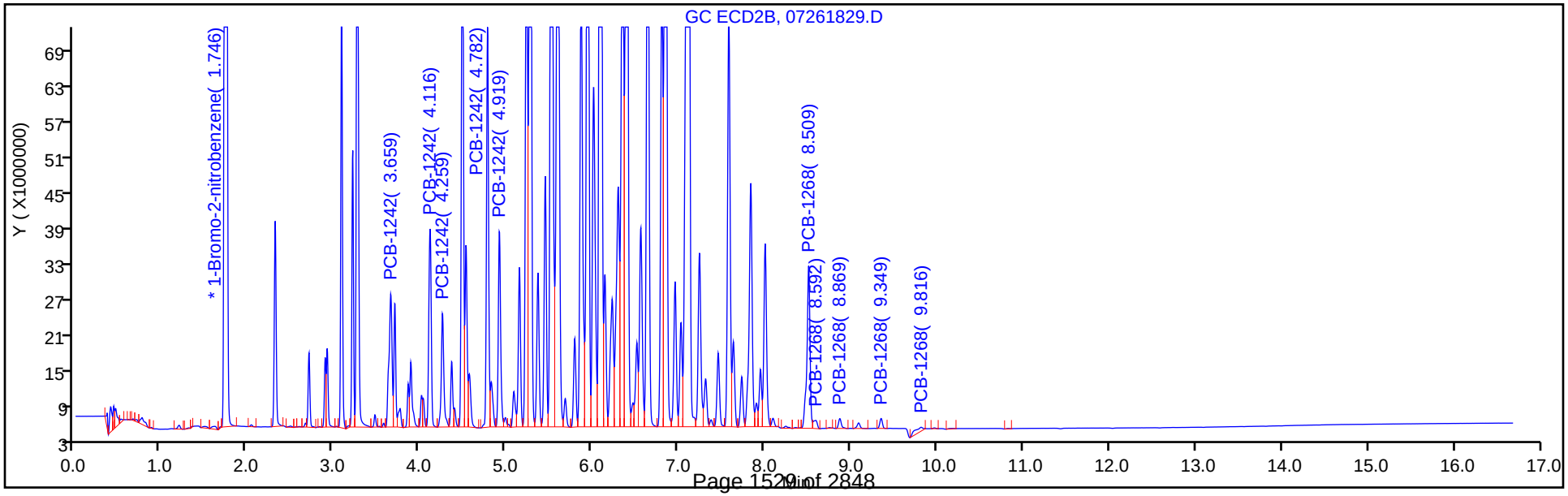
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261829.D

Injection Date:	27-Jul-2018 00:43:23	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL74268			Worklist Smp#:	29
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	29
Method:	PCB_P3	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_P3\20180726-72400.b\07261830.D
Lims ID: STDL64268
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 27-Jul-2018 01:05:14 ALS Bottle#: 30 Worklist Smp#: 30
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL64268
Misc. Info.: 280-0072400-030
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:43 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:06:58

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	1.825	1.824	0.001	3842855436	1000.0	1000.0	
2	1.745	1.747	-0.002	926369053	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.481	3.482	-0.001	753305844	750.0	780.3	
1	3.945	3.946	-0.001	1763285715	750.0	797.6	
1	4.531	4.529	0.002	776078077	750.0	797.5	
1	5.018	5.016	0.002	607154990	750.0	809.9	
1	5.045	5.042	0.003	586948235	750.0	786.7	
		Average of Peak Amounts =				794.4	
2	3.662	3.659	0.003	204721874	750.0	778.7	
2	4.118	4.116	0.002	464071122	750.0	791.7	
2	4.258	4.259	-0.001	191149538	750.0	790.5	
2	4.782	4.783	-0.001	148260988	750.0	793.0	
2	4.922	4.919	0.003	175841689	750.0	790.5	
		Average of Peak Amounts =				788.9	
						RPD = 0.70	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.091	8.092	-0.001	4463887127	750.0	827.3	
1	8.148	8.146	0.002	4262360376	750.0	826.4	
1	8.418	8.416	0.002	3658806043	750.0	816.2	
1	8.925	8.922	0.003	1611355444	750.0	754.2	
1	9.345	9.336	0.009	16238377787	750.0	942.0	
		Average of Peak Amounts =				833.2	
2	8.505	8.503	0.002	989479047	750.0	799.9	
2	8.568	8.566	0.002	907876939	750.0	794.5	
2	8.918	8.919	-0.001	768819502	750.0	794.9	
2	9.352	9.349	0.003	354672250	750.0	797.5	
2	9.815	9.813	0.002	2549179598	750.0	798.4	
		Average of Peak Amounts =				797.0	
						RPD = 4.44	
S 8 Polychlorinated biphenyls, Total							
1						1627.6	
2						1585.9	
						RPD = 2.60	

Reagents:

AR_4268_L6_00017	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

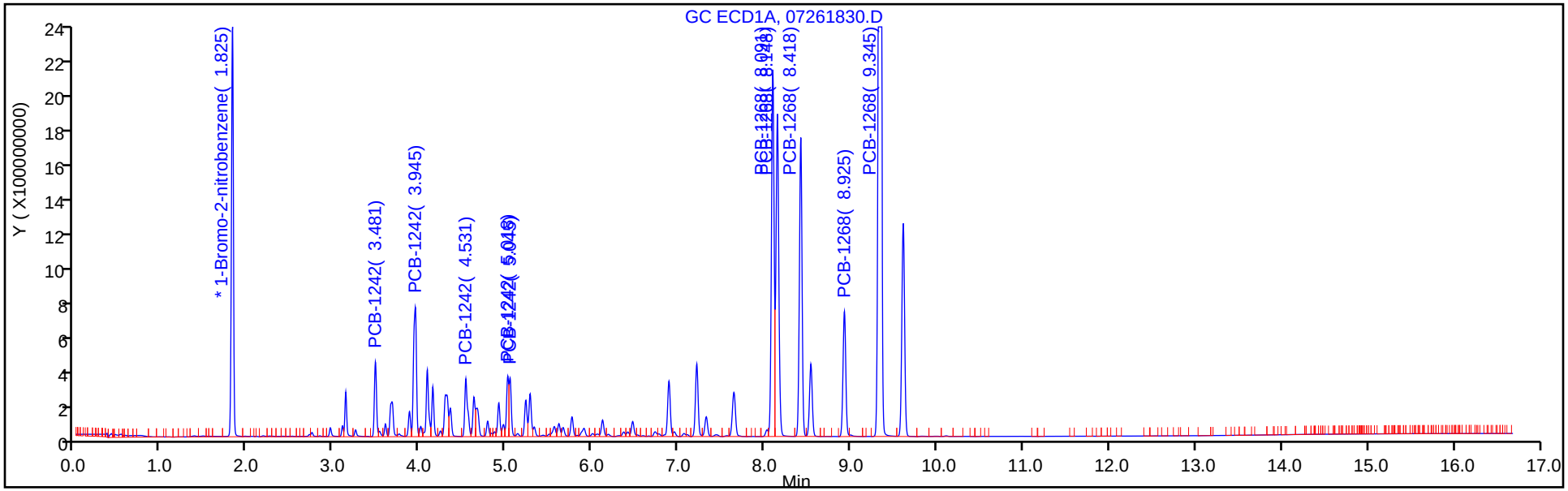
Report Date: 28-Jul-2018 08:58:44 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

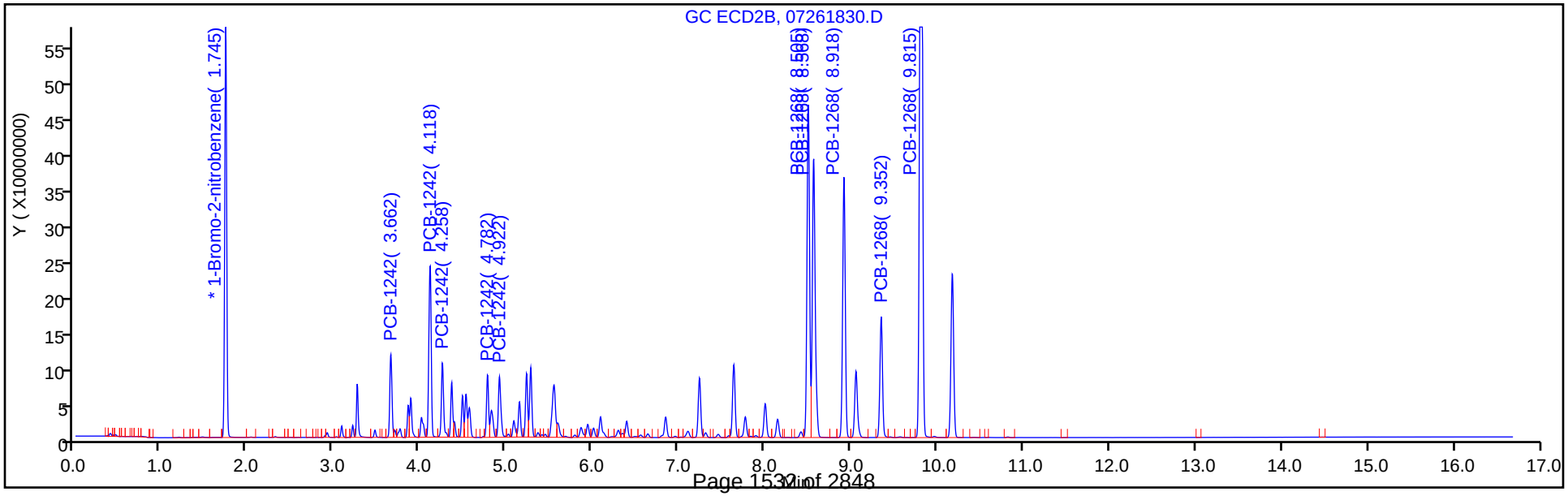
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261830.D

Injection Date:	27-Jul-2018 01:05:14	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL64268			Worklist Smp#:	30
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	30
Method:	PCB_P3	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_P3\20180726-72400.b\07261831.D
Lims ID: STDL54268
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 27-Jul-2018 01:27:05 ALS Bottle#: 31 Worklist Smp#: 31
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL54268
Misc. Info.: 280-0072400-031
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:45 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 06:56:26

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	1.822	1.822	0.000	4057088253	1000.0	1000.0	
2	1.746	1.746	0.000	971955590	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.482	3.482	0.000	487124854	500.0	471.2	
1	3.946	3.946	0.000	1087280185	500.0	463.7	
1	4.529	4.529	0.000	489211525	500.0	469.9	
1	5.016	5.016	0.000	358785141	500.0	450.4	
1	5.042	5.042	0.000	380162307	500.0	479.3	
		Average of Peak Amounts =				466.9	
2	3.659	3.659	0.000	131887733	500.0	474.9	
2	4.116	4.116	0.000	289111105	500.0	468.8	
2	4.259	4.259	0.000	118580118	500.0	464.8	
2	4.783	4.783	0.000	91502274	500.0	462.8	
2	4.919	4.919	0.000	109052703	500.0	464.7	
		Average of Peak Amounts =				467.2	
						RPD = 0.06	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.092	8.092	0.000	2637523666	500.0	463.0	
1	8.146	8.146	0.000	2466293328	500.0	452.9	
1	8.416	8.416	0.000	2184437787	500.0	461.6	
1	8.922	8.922	0.000	991595660	500.0	439.6	
1	9.336	9.336	0.000	9243731153	500.0	507.9	
		Average of Peak Amounts =				465.0	
2	8.503	8.503	0.000	607376783	500.0	467.4	
2	8.566	8.566	0.000	560639572	500.0	466.5	
2	8.919	8.919	0.000	477692426	500.0	469.9	
2	9.349	9.349	0.000	218153864	500.0	466.6	
2	9.813	9.813	0.000	1566311259	500.0	467.5	
		Average of Peak Amounts =				467.6	
						RPD = 0.55	

Reagents:

AR_4268_L5_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

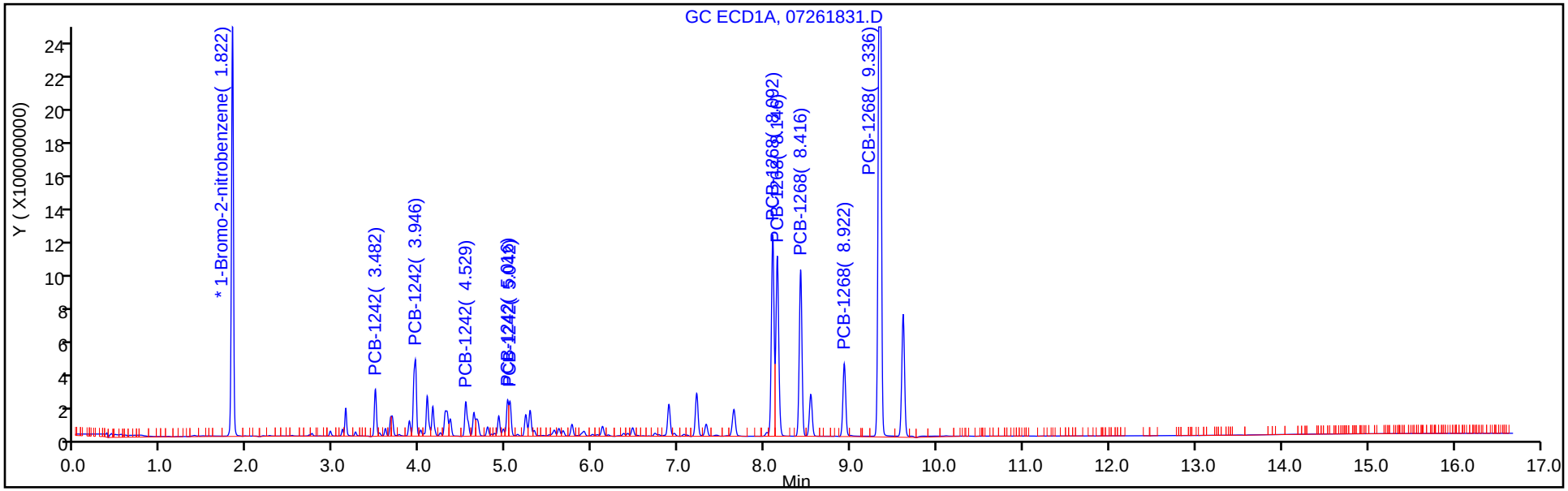
Report Date: 28-Jul-2018 08:58:46 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

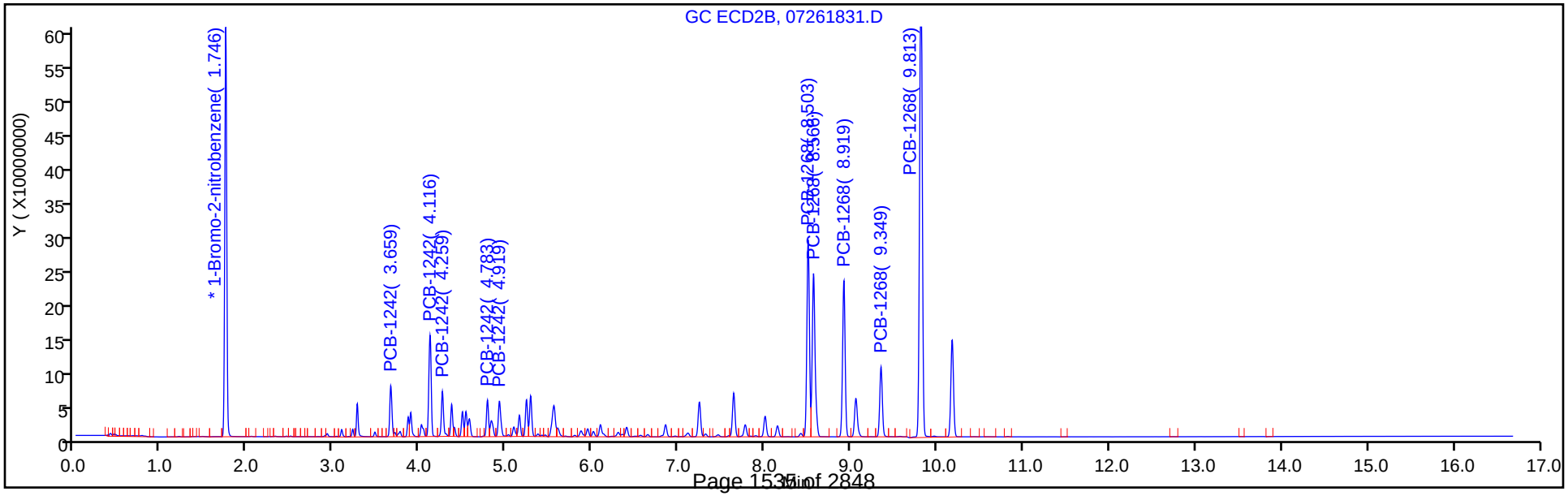
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261831.D

Injection Date:	27-Jul-2018 01:27:05	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL54268			Worklist Smp#:	31
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	31
Method:	PCB_P3	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_P3\20180726-72400.b\07261832.D
Lims ID: STDL44268
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 27-Jul-2018 01:48:54 ALS Bottle#: 32 Worklist Smp#: 32
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL44268
Misc. Info.: 280-0072400-032
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:48 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 27-Jul-2018 12:34:19

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	1.824	1.822	0.002	4133806380	1000.0	1000.0	
2	1.748	1.746	0.002	993035645	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.481	3.482	-0.001	267503307	250.0	246.0	
1	3.944	3.946	-0.002	572805873	250.0	237.2	
1	4.531	4.529	0.002	254133135	250.0	232.0	
1	5.017	5.016	0.001	194967792	250.0	237.1	
1	5.044	5.042	0.002	193581499	250.0	235.3	
		Average of Peak Amounts =				237.5	
2	3.661	3.659	0.002	69810890	250.0	241.9	
2	4.114	4.116	-0.002	151419133	250.0	238.7	
2	4.258	4.259	-0.001	63664693	250.0	241.3	
2	4.781	4.783	-0.002	49730284	250.0	242.0	
2	4.921	4.919	0.002	58732190	250.0	241.9	
		Average of Peak Amounts =				241.2	
						RPD = 1.54	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.091	8.092	-0.001	1318437558	250.0	227.2	
1	8.147	8.146	0.001	1289625546	250.0	232.4	
1	8.417	8.416	0.001	1115013664	250.0	231.2	
1	8.924	8.922	0.002	516658524	250.0	224.8	
1	9.337	9.336	0.001	4403308683	250.0	237.5	
		Average of Peak Amounts =				230.6	
2	8.504	8.503	0.001	310775473	250.0	233.4	
2	8.568	8.566	0.002	294540678	250.0	238.6	
2	8.918	8.919	-0.001	245535704	250.0	235.4	
2	9.351	9.349	0.002	112544617	250.0	234.4	
2	9.814	9.813	0.001	801467144	250.0	234.0	
		Average of Peak Amounts =				235.2	
						RPD = 1.95	
S 8 Polychlorinated biphenyls, Total							
1						468.1	
2						476.4	
						RPD = 1.74	

Reagents:

AR_4268_L4_00022	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

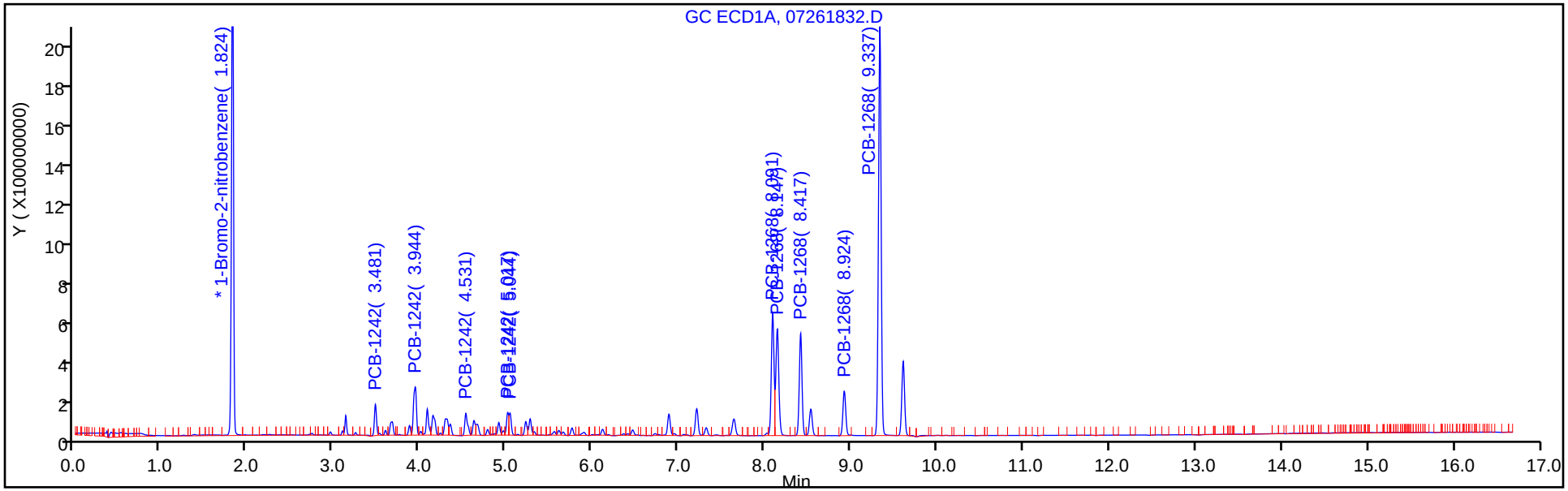
Report Date: 28-Jul-2018 08:58:49 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

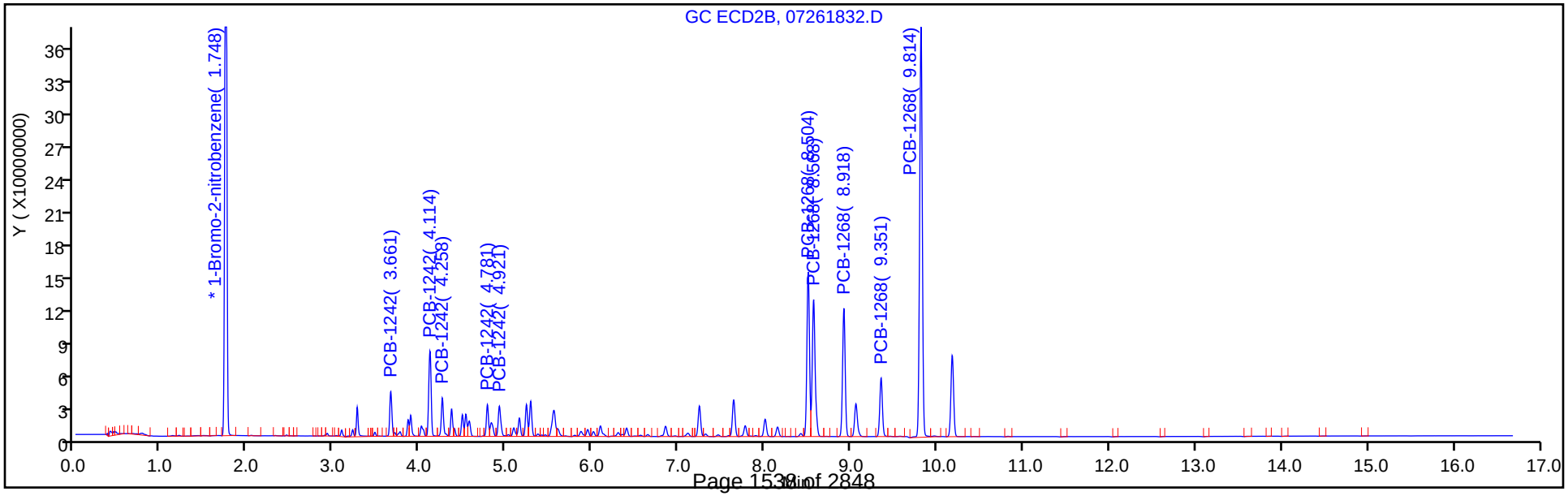
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261832.D

Injection Date:	27-Jul-2018 01:48:54	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL44268			Worklist Smp#:	32
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	32
Method:	PCB_P3	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_P3\20180726-72400.b\07261833.D
Lims ID: STDL34268
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 27-Jul-2018 02:10:45 ALS Bottle#: 33 Worklist Smp#: 33
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL34268
Misc. Info.: 280-0072400-033
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:51 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.825	1.822	0.003	4068051096	1000.0	1000.0	
2	1.745	1.746	-0.001	974172605	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.482	3.482	0.000	120512933	100.0	103.2	
1	3.945	3.946	-0.001	244191872	100.0	99.8	
1	4.532	4.529	0.003	117664760	100.0	100.9	
1	5.018	5.016	0.002	86071990	100.0	102.7	
1	5.045	5.042	0.003	84157687	100.0	99.2	
		Average of Peak Amounts =				101.2	
2	3.659	3.659	0.000	30104274	100.0	101.6	
2	4.115	4.116	-0.001	62244598	100.0	98.2	
2	4.259	4.259	0.000	27275391	100.0	101.8	
2	4.782	4.783	-0.001	21084577	100.0	99.6	
2	4.922	4.919	0.003	24707591	100.0	100.1	
		Average of Peak Amounts =				100.3	
						RPD = 0.89	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.092	8.092	0.000	527232636	100.0	92.3	
1	8.145	8.146	-0.001	512295496	100.0	93.8	
1	8.415	8.416	-0.001	444227497	100.0	93.6	
1	8.922	8.922	0.000	215594506	100.0	95.3	
1	9.335	9.336	-0.001	1622112145	100.0	88.9	
		Average of Peak Amounts =				92.8	
2	8.505	8.503	0.002	125857483	100.0	95.5	
2	8.569	8.566	0.003	119648436	100.0	97.2	
2	8.919	8.919	0.000	99950049	100.0	96.5	
2	9.352	9.349	0.003	46697296	100.0	97.8	
2	9.812	9.813	-0.001	322500660	100.0	95.9	
		Average of Peak Amounts =				96.6	
						RPD = 4.01	
S 8 Polychlorinated biphenyls, Total							
1						193.9	
2						196.8	
						RPD = 1.48	

Reagents:

AR_4268_L3_00019	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

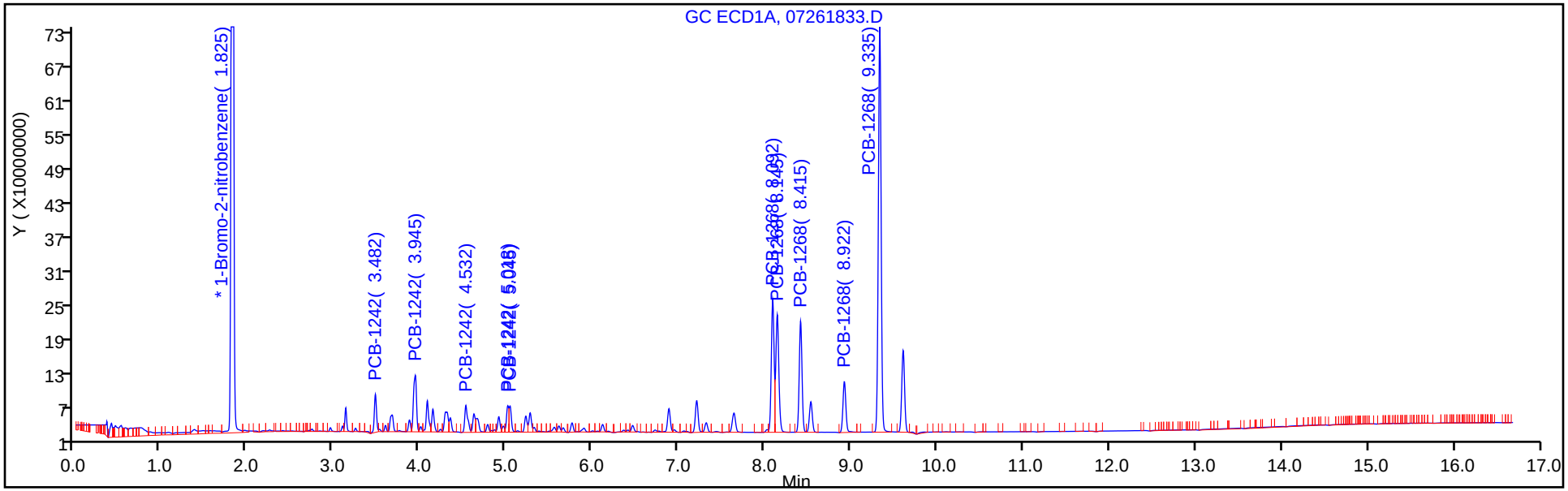
Report Date: 28-Jul-2018 08:58:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

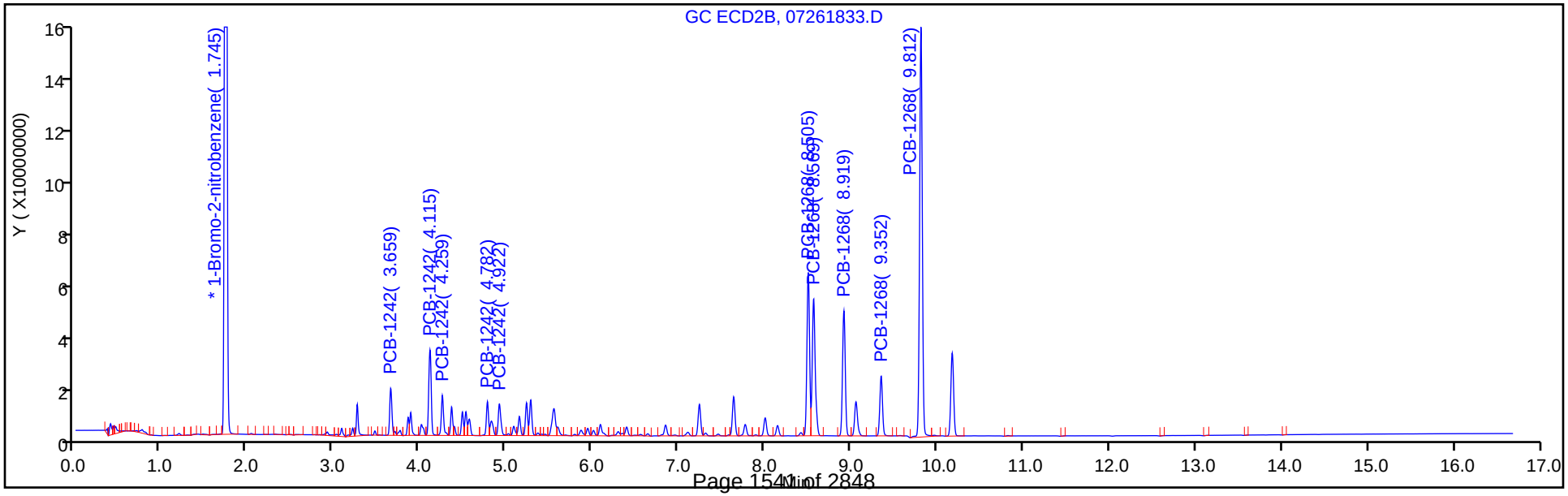
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261833.D

Injection Date:	27-Jul-2018 02:10:45	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL34268			Worklist Smp#:	33
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	33
Method:	PCB_P3	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_P3\20180726-72400.b\07261834.D
Lims ID: STDL24268
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 27-Jul-2018 02:32:34 ALS Bottle#: 34 Worklist Smp#: 34
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL24268
Misc. Info.: 280-0072400-034
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:54 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

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	1.826	1.822	0.004	4148732630	1000.0	1000.0	
2	1.746	1.746	0.000	982495300	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.483	3.482	0.001	67214262	50.0	48.6	
1	3.946	3.946	0.000	131575938	50.0	50.2	
1	4.533	4.529	0.004	63713198	50.0	46.3	
1	5.019	5.016	0.003	43655261	50.0	47.7	
1	5.043	5.042	0.001	43460363	50.0	46.0	
		Average of Peak Amounts =				47.8	
2	3.659	3.659	0.000	17339538	50.0	54.4	
2	4.116	4.116	0.000	33962344	50.0	51.6	
2	4.259	4.259	0.000	14672846	50.0	51.4	
2	4.783	4.783	0.000	12050818	50.0	52.6	
2	4.919	4.919	0.000	13934067	50.0	53.2	
		Average of Peak Amounts =				52.6	
						RPD = 9.68	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.093	8.092	0.001	294165209	50.0	50.5	
1	8.146	8.146	0.000	286439104	50.0	51.4	
1	8.416	8.416	0.000	248200681	50.0	51.3	
1	8.926	8.922	0.004	121593208	50.0	52.7	
1	9.336	9.336	0.000	870184056	50.0	46.8	
		Average of Peak Amounts =				50.5	
2	8.506	8.503	0.003	69843721	50.0	51.9	
2	8.566	8.566	0.000	66325610	50.0	52.2	
2	8.919	8.919	0.000	55381720	50.0	52.1	
2	9.349	9.349	0.000	26016252	50.0	53.0	
2	9.813	9.813	0.000	180808335	50.0	53.2	
		Average of Peak Amounts =				52.5	
						RPD = 3.79	
S 8 Polychlorinated biphenyls, Total							
1						98.3	
2						105.1	
						RPD = 6.70	

Reagents:

AR_4268_L2_00019	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

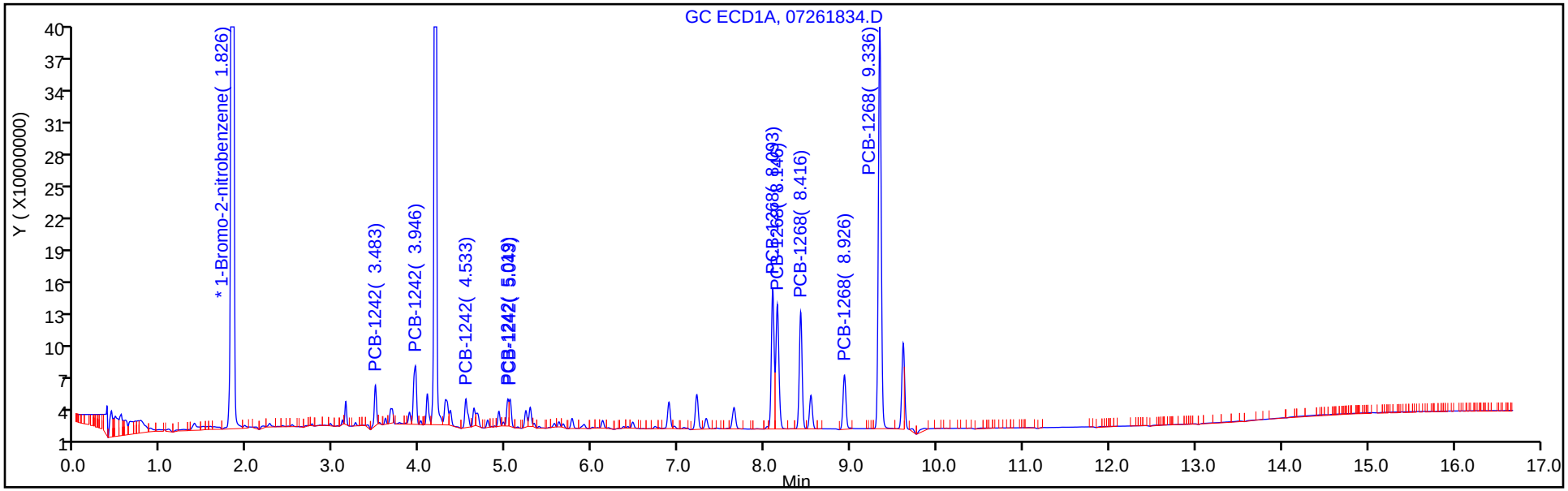
Report Date: 28-Jul-2018 08:58:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

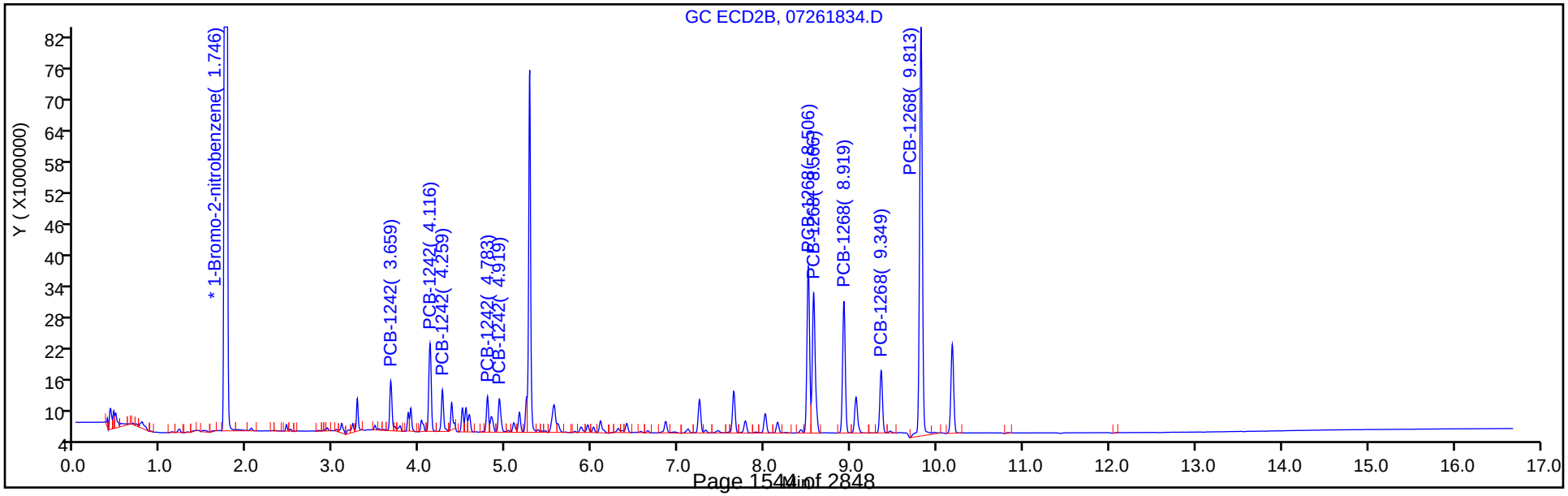
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261834.D

Injection Date:	27-Jul-2018 02:32:34	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL24268			Worklist Smp#:	34
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	34
Method:	PCB_P3	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_P3\20180726-72400.b\07261835.D
Lims ID: STDL14268
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 27-Jul-2018 02:54:25 ALS Bottle#: 35 Worklist Smp#: 35
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STDL14268
Misc. Info.: 280-0072400-035
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub5

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 28-Jul-2018 08:58:56 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0316

First Level Reviewer: jacksonto Date: 28-Jul-2018 07:58:21

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	1.825	1.822	0.003	3860476206	1000.0	1000.0	
2	1.745	1.746	-0.001	937405836	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.481	3.482	-0.001	40841335	25.0	25.7	
1	3.945	3.946	-0.001	69909700	25.0	26.4	
1	4.531	4.529	0.002	42035171	25.0	28.3	
1	5.018	5.016	0.002	25375393	25.0	27.3	
1	5.045	5.042	0.003	27438135	25.0	28.5	
		Average of Peak Amounts =				27.2	
2	3.661	3.659	0.002	8403452	25.0	23.5	
2	4.115	4.116	-0.001	17241655	25.0	25.9	
2	4.258	4.259	-0.001	7626456	25.0	25.1	
2	4.781	4.783	-0.002	6344220	25.0	25.0	
2	4.921	4.919	0.002	6917258	25.0	24.6	
		Average of Peak Amounts =				24.8	
						RPD = 9.23	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.091	8.092	-0.001	152999650	25.0	28.2	
1	8.145	8.146	-0.001	141874823	25.0	27.4	
1	8.418	8.416	0.002	124055667	25.0	27.5	
1	8.925	8.922	0.003	64853393	25.0	30.2	
1	9.335	9.336	-0.001	413156079	25.0	23.9	
		Average of Peak Amounts =				27.4	
2	8.505	8.503	0.002	35177787	25.0	26.8	
2	8.568	8.566	0.002	32941651	25.0	25.9	
2	8.918	8.919	-0.001	27677944	25.0	26.3	
2	9.351	9.349	0.002	12581884	25.0	25.7	
2	9.815	9.813	0.002	84685682	25.0	26.0	
		Average of Peak Amounts =				26.1	
						RPD = 4.86	
S 8 Polychlorinated biphenyls, Total							
1						54.7	
2						51.0	
						RPD = 7.02	

Reagents:

AR_4268_L1_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

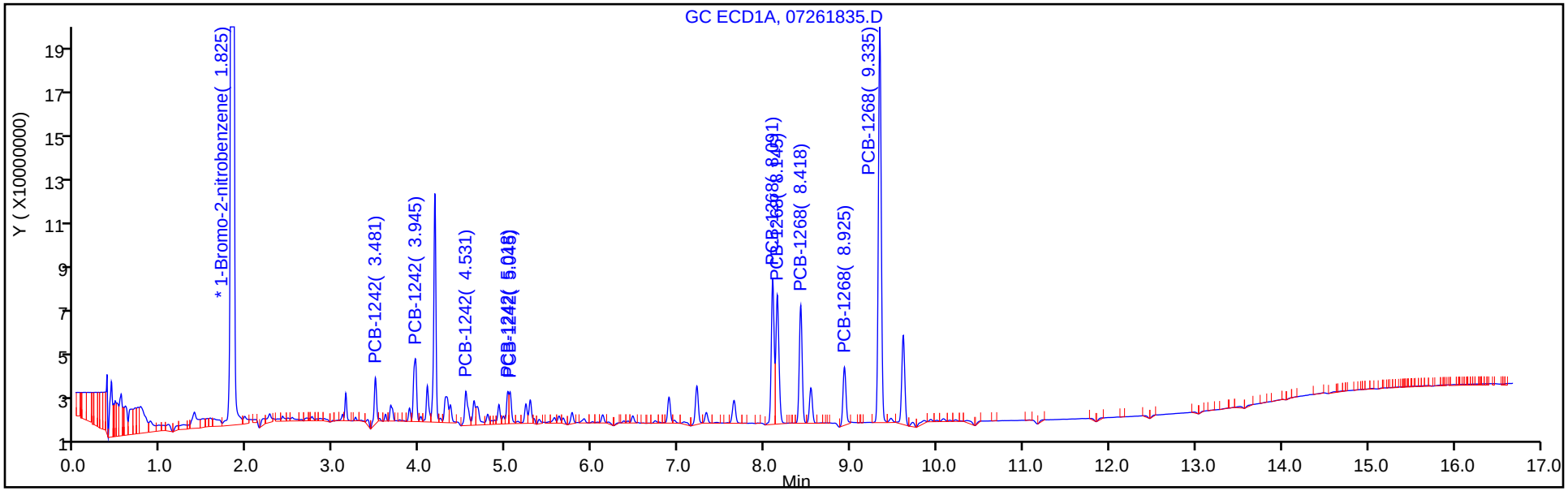
Report Date: 28-Jul-2018 08:58:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

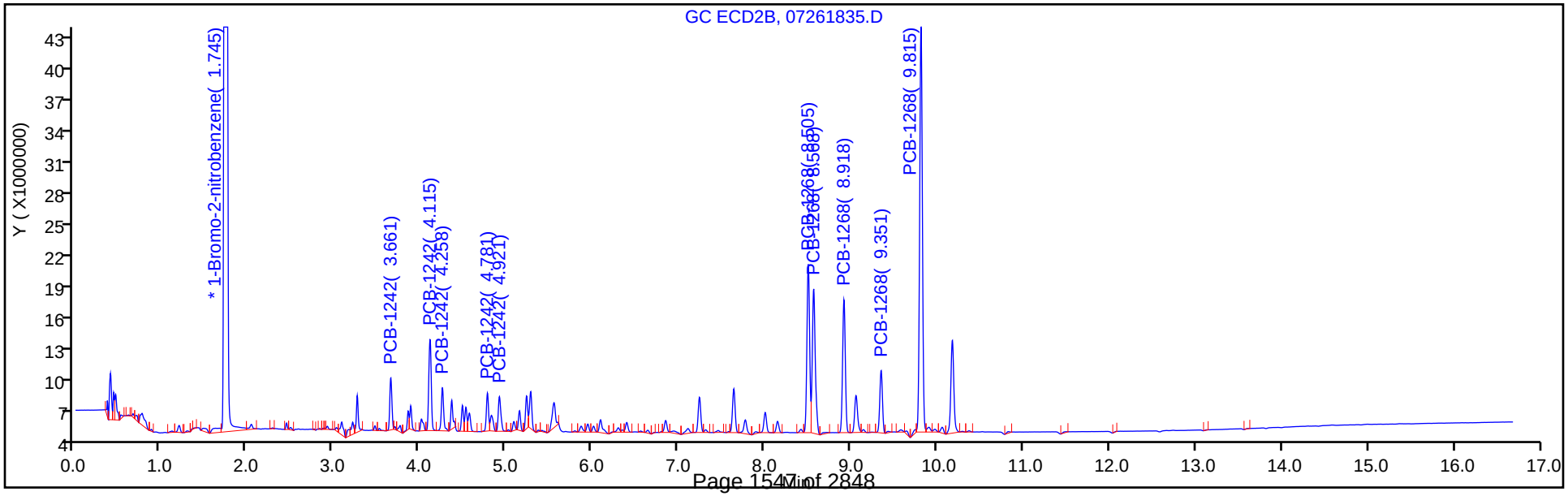
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.D

Injection Date:	27-Jul-2018 02:54:25	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	STDL14268			Worklist Smp#:	35
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	35
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/37 Calibration Date: 07/27/2018 03:38

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 17:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 19:15

Lab File ID: 07261837.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1221 Peak 1	Lin1		0.0961		0.267	0.250	6.8	20.0
PCB-1221 Peak 2	Lin1		0.0655		0.253	0.250	1.0	20.0
PCB-1221 Peak 3	Lin1		0.2219		0.244	0.250	-2.5	20.0
PCB-1254 Peak 1	Lin1		0.4191		0.246	0.250	-1.5	20.0
PCB-1254 Peak 2	Lin1		0.3341		0.241	0.250	-3.5	20.0
PCB-1254 Peak 3	Lin1		0.5845		0.238	0.250	-4.8	20.0
PCB-1254 Peak 4	Lin1		0.4016		0.241	0.250	-3.7	20.0
PCB-1254 Peak 5	Lin1		0.6145		0.239	0.250	-4.5	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/37 Calibration Date: 07/27/2018 03:38

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 17:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 19:15

Lab File ID: 07261837.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1221 Peak 1	2.96	2.71	3.21
PCB-1221 Peak 2	3.10	2.85	3.35
PCB-1221 Peak 3	3.14	2.89	3.39
PCB-1254 Peak 1	5.28	5.03	5.53
PCB-1254 Peak 2	5.61	5.36	5.86
PCB-1254 Peak 3	5.76	5.51	6.01
PCB-1254 Peak 4	6.36	6.11	6.61
PCB-1254 Peak 5	6.73	6.48	6.98

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261837.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 03:38:05 ALS Bottle#: 37 Worklist Smp#: 37
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-037
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 27-Jul-2018 12:42:28 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0306

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:13:36

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	1.824	1.822	0.002	4546079757	1000.0	1000.0	
2	1.747	1.746	0.001	1051329672	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							M
1	2.960	2.962	-0.002	109163806	250.0	267.0	
1	3.100	3.102	-0.002	74420962	250.0	252.6	
1	3.137	3.139	-0.002	252235666	250.0	243.8	
		Average of Peak Amounts =				254.5	
2	3.090	3.092	-0.002	30024247	250.0	247.6	M
2	3.217	3.219	-0.002	18756668	250.0	242.2	M
2	3.270	3.272	-0.002	68292112	250.0	253.5	M
		Average of Peak Amounts =				247.8	
						RPD = 2.66	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.280	5.282	-0.002	476292076	250.0	246.3	
1	5.610	5.612	-0.002	379759372	250.0	241.1	
1	5.764	5.762	0.002	664260070	250.0	237.9	
1	6.360	6.362	-0.002	456424721	250.0	240.7	
1	6.727	6.728	-0.001	698364013	250.0	238.8	
		Average of Peak Amounts =				241.0	
2	5.524	5.525	-0.001	118120530	250.0	253.3	
2	5.947	5.945	0.002	88715311	250.0	253.9	
2	6.094	6.092	0.002	165022784	250.0	250.7	
2	6.640	6.642	-0.002	68785629	250.0	248.7	
2	7.110	7.112	-0.002	172200431	250.0	252.3	
		Average of Peak Amounts =				251.8	
						RPD = 4.39	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_2154_ICV_00013	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

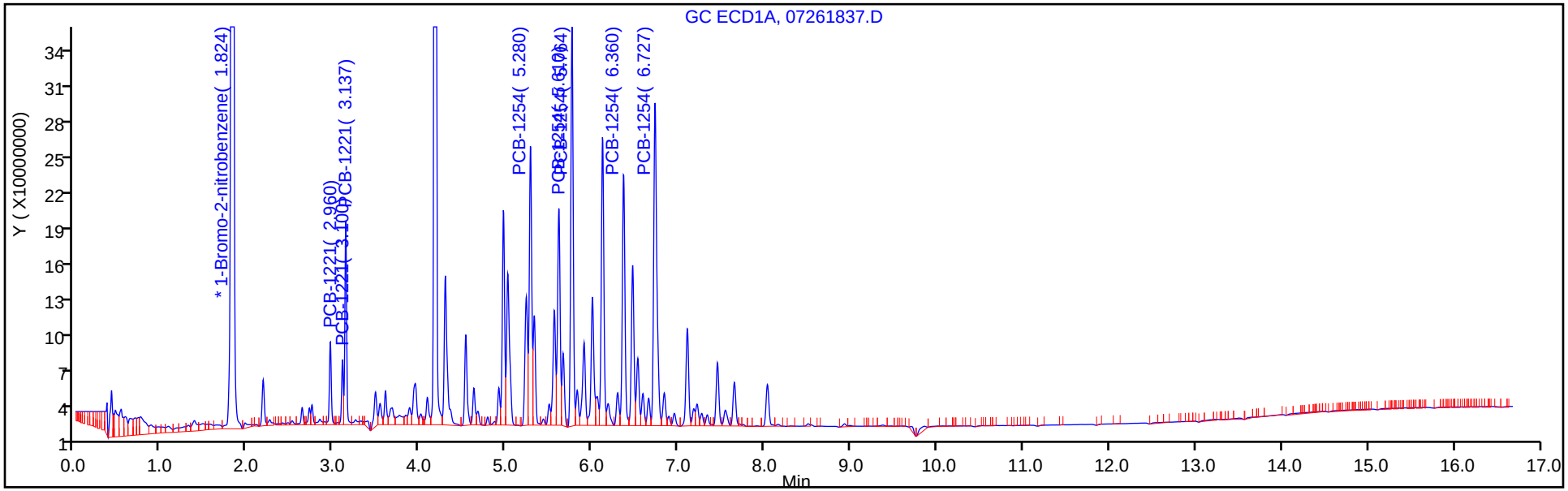
Report Date: 27-Jul-2018 12:45:52 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

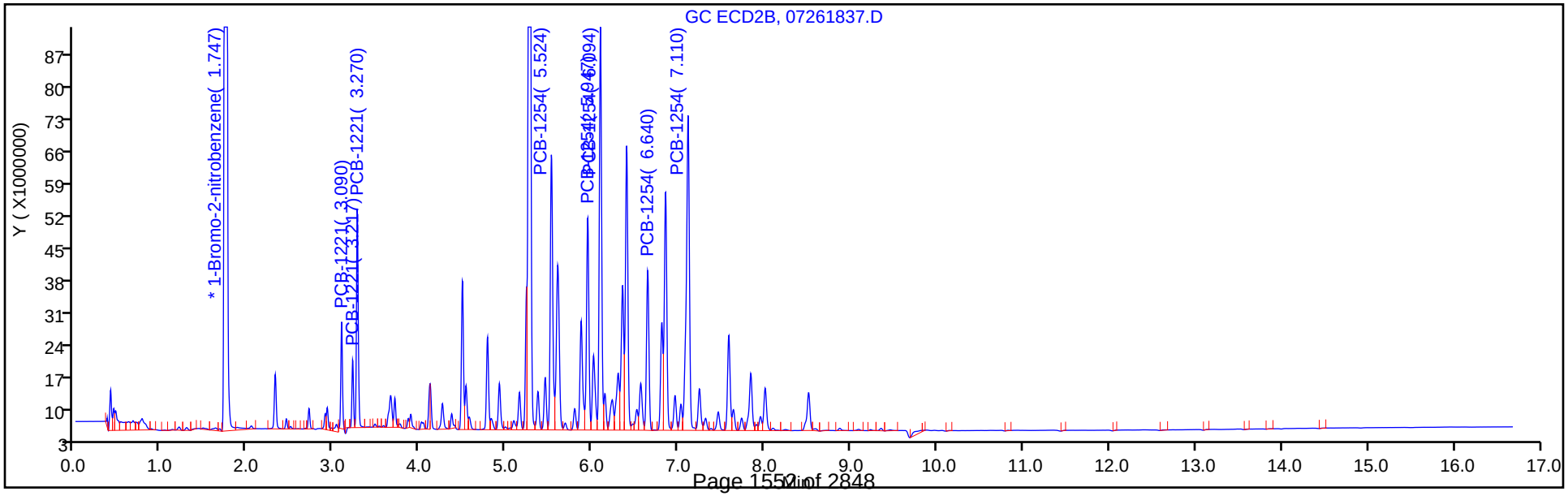
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261837.D

Injection Date:	27-Jul-2018 03:38:05	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	37
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	37
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/37 Calibration Date: 07/27/2018 03:38

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 17:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 19:15

Lab File ID: 07261837.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1221 Peak 1	Lin1		0.1142		0.248	0.250	-0.9	20.0
PCB-1221 Peak 2	Lin1		0.0714		0.242	0.250	-3.1	20.0
PCB-1221 Peak 3	Lin1		0.2598		0.254	0.250	1.4	20.0
PCB-1254 Peak 1	Lin1		0.4494		0.253	0.250	1.3	20.0
PCB-1254 Peak 2	Lin1		0.3375		0.254	0.250	1.6	20.0
PCB-1254 Peak 3	Lin1		0.6279		0.251	0.250	0.3	20.0
PCB-1254 Peak 4	Lin1		0.2617		0.249	0.250	-0.5	20.0
PCB-1254 Peak 5	Lin1		0.6552		0.252	0.250	0.9	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/37 Calibration Date: 07/27/2018 03:38

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 17:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 19:15

Lab File ID: 07261837.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1221 Peak 1	3.09	2.84	3.34
PCB-1221 Peak 2	3.22	2.97	3.47
PCB-1221 Peak 3	3.27	3.02	3.52
PCB-1254 Peak 1	5.52	5.28	5.78
PCB-1254 Peak 2	5.95	5.70	6.20
PCB-1254 Peak 3	6.09	5.84	6.34
PCB-1254 Peak 4	6.64	6.39	6.89
PCB-1254 Peak 5	7.11	6.86	7.36

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261837.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 03:38:05 ALS Bottle#: 37 Worklist Smp#: 37
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-037
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 27-Jul-2018 12:42:28 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0306

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:13:36

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	1.824	1.822	0.002	4546079757	1000.0	1000.0	
2	1.747	1.746	0.001	1051329672	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							M
1	2.960	2.962	-0.002	109163806	250.0	267.0	
1	3.100	3.102	-0.002	74420962	250.0	252.6	
1	3.137	3.139	-0.002	252235666	250.0	243.8	
		Average of Peak Amounts =				254.5	
2	3.090	3.092	-0.002	30024247	250.0	247.6	M
2	3.217	3.219	-0.002	18756668	250.0	242.2	M
2	3.270	3.272	-0.002	68292112	250.0	253.5	M
		Average of Peak Amounts =				247.8	
						RPD = 2.66	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							
1	5.280	5.282	-0.002	476292076	250.0	246.3	
1	5.610	5.612	-0.002	379759372	250.0	241.1	
1	5.764	5.762	0.002	664260070	250.0	237.9	
1	6.360	6.362	-0.002	456424721	250.0	240.7	
1	6.727	6.728	-0.001	698364013	250.0	238.8	
		Average of Peak Amounts =				241.0	
2	5.524	5.525	-0.001	118120530	250.0	253.3	
2	5.947	5.945	0.002	88715311	250.0	253.9	
2	6.094	6.092	0.002	165022784	250.0	250.7	
2	6.640	6.642	-0.002	68785629	250.0	248.7	
2	7.110	7.112	-0.002	172200431	250.0	252.3	
		Average of Peak Amounts =				251.8	
						RPD = 4.39	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_2154_ICV_00013	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

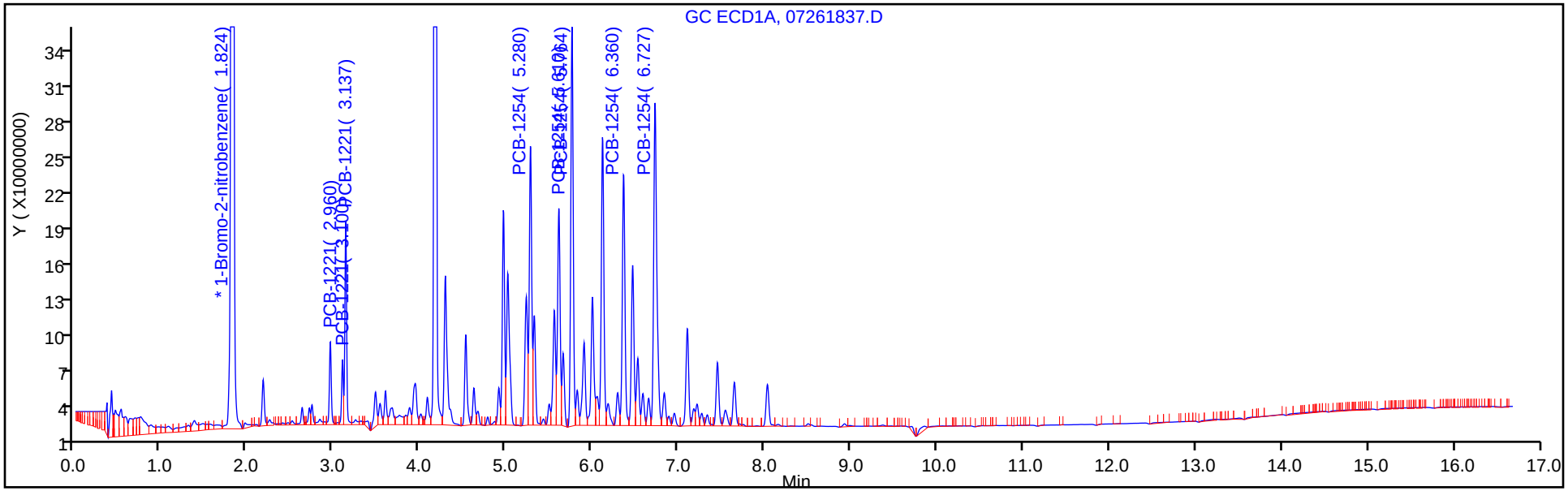
Report Date: 27-Jul-2018 12:45:53 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

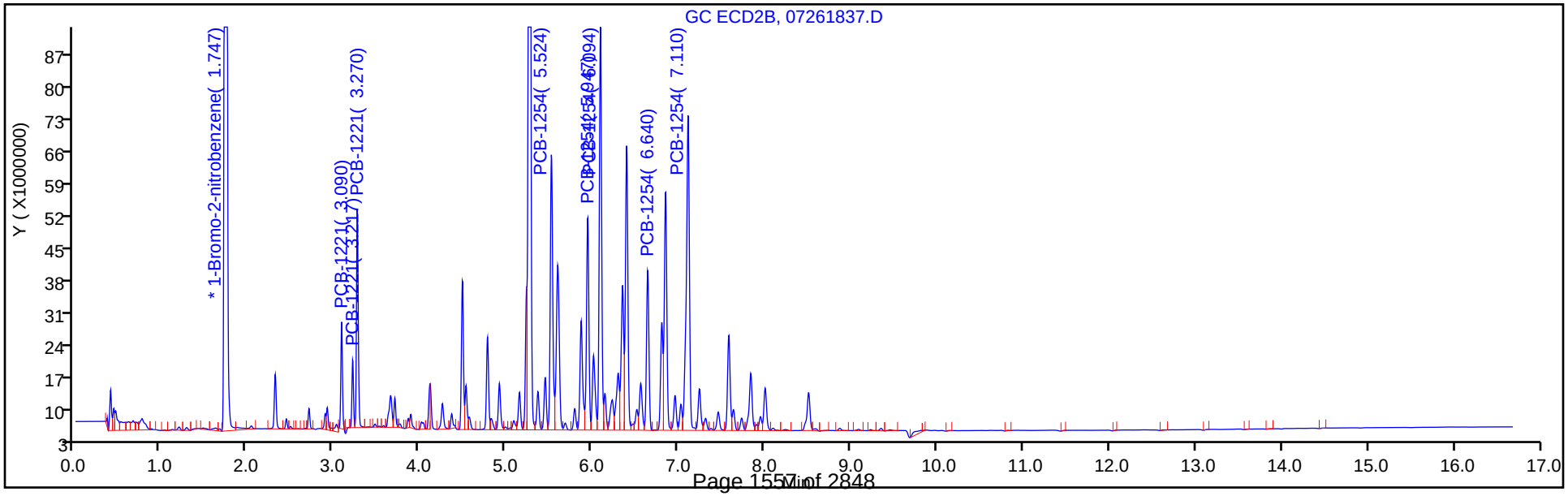
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261837.D

Injection Date:	27-Jul-2018 03:38:05	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	37
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	37
Method:	PCB_P3	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



Report Date: 27-Jul-2018 12:45:53 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261837.D

Injection Date: 27-Jul-2018 03:38:05 Instrument ID: SGC_P3

Lims ID: ICV

Client ID:

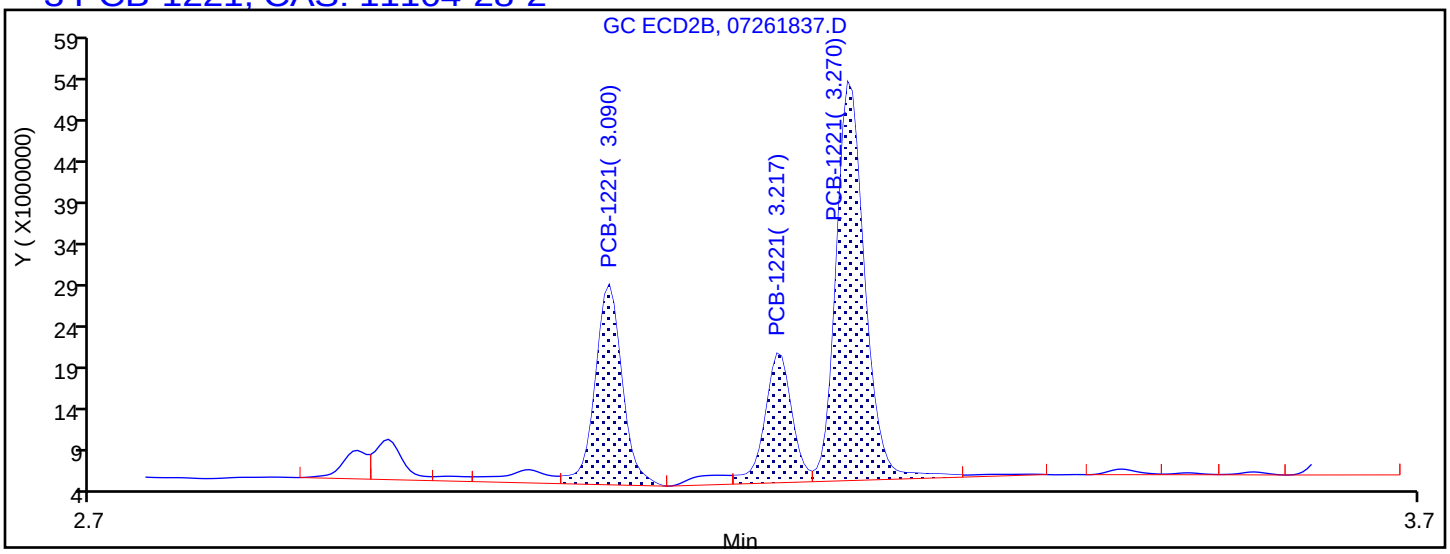
Operator ID: JAX ALS Bottle#: 37 Worklist Smp#: 37

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

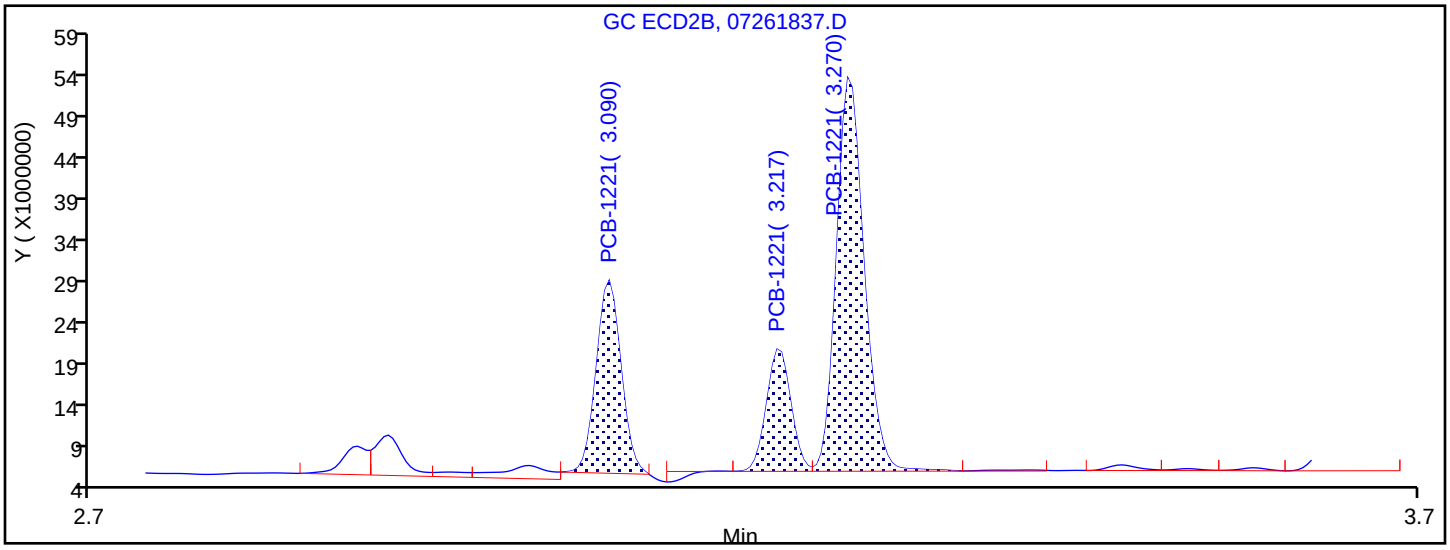
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

3 PCB-1221, CAS: 11104-28-2



Processing Integration Results

3.090	Response = 33807958	
3.217	Response = 21943229	
3.270	Response = 71577501	



Manual Integration Results

3.090	Response = 30024247	M
3.217	Response = 18756668	M
3.270	Response = 68292112	M

Reviewer: jacksonto, 27-Jul-2018 07:13:19

Audit Action: Manually Integrated Audit Reason: Instrument noise

FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/38 Calibration Date: 07/27/2018 03:59

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 07261838.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin1		0.3158		0.252	0.250	0.8	20.0
PCB-1016 Peak 2	Lin1		0.6473		0.226	0.250	-9.5	20.0
PCB-1016 Peak 3	Lin1		0.2901		0.235	0.250	-6.0	20.0
PCB-1016 Peak 4	Lin1		0.2899		0.240	0.250	-4.1	20.0
PCB-1016 Peak 5	Lin1		0.3004		0.237	0.250	-5.2	20.0
PCB-1260 Peak 1	Lin1		0.4319		0.237	0.250	-5.1	20.0
PCB-1260 Peak 2	Lin1		0.8402		0.240	0.250	-4.1	20.0
PCB-1260 Peak 3	Lin1		0.4173		0.246	0.250	-1.8	20.0
PCB-1260 Peak 4	Lin1		0.9373		0.239	0.250	-4.5	20.0
PCB-1260 Peak 5	Lin1		0.5184		0.242	0.250	-3.2	20.0
Tetrachloro-m-xylene	Lin1		9.680		0.0120	0.0125	-4.1	20.0
DCB Decachlorobiphenyl	Lin1		11.38		0.0119	0.0125	-4.5	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/38 Calibration Date: 07/27/2018 03:59

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 07261838.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.48	3.23	3.73
PCB-1016 Peak 2	3.94	3.70	4.20
PCB-1016 Peak 3	4.08	3.83	4.33
PCB-1016 Peak 4	4.29	4.05	4.55
PCB-1016 Peak 5	4.53	4.28	4.78
PCB-1260 Peak 1	6.00	5.75	6.25
PCB-1260 Peak 2	6.72	6.48	6.98
PCB-1260 Peak 3	7.21	6.96	7.46
PCB-1260 Peak 4	7.65	7.40	7.90
PCB-1260 Peak 5	8.03	7.78	8.28
Tetrachloro-m-xylene	2.75	2.50	3.00
DCB Decachlorobiphenyl	9.61	9.36	9.86

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261838.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 03:59:55 ALS Bottle#: 38 Worklist Smp#: 38
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-038
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 27-Jul-2018 12:42:28 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0306

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:14:24

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	1.824	1.822	0.002	4491549810	1000.0	1000.0	
2	1.745	1.746	-0.001	1056154880	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.750	-0.002	543476042	12.5	12.0	
2	2.775	2.776	-0.001	132662823	12.5	11.6	
						RPD = 3.48	
1 PCB-1016							M
1	3.481	3.483	-0.002	354646056	250.0	251.9	
1	3.944	3.946	-0.002	726885232	250.0	226.1	
1	4.084	4.083	0.001	325720494	250.0	235.1	
1	4.294	4.296	-0.002	325567227	250.0	239.8	
1	4.531	4.530	0.001	337323891	250.0	237.0	M
		Average of Peak Amounts =				238.0	
2	3.658	3.660	-0.002	91525231	250.0	251.6	
2	4.115	4.116	-0.001	203326354	250.0	246.0	
2	4.258	4.260	-0.002	83849867	250.0	245.4	
2	4.491	4.493	-0.002	44350978	250.0	248.0	
2	4.781	4.783	-0.002	64907129	250.0	244.8	
		Average of Peak Amounts =				247.1	
						RPD = 3.78	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							M
1	6.001	6.000	0.001	484981446	250.0	237.3	M
1	6.724	6.726	-0.002	943425216	250.0	239.7	M
1	7.214	7.213	0.001	468606599	250.0	245.5	M
1	7.648	7.646	0.002	1052477749	250.0	238.7	M
1	8.031	8.030	0.001	582136195	250.0	241.9	
		Average of Peak Amounts =				240.6	
2	6.641	6.643	-0.002	150111200	250.0	246.6	
2	7.108	7.110	-0.002	232131740	250.0	249.5	
2	7.635	7.636	-0.001	107945173	250.0	252.5	
2	8.005	8.006	-0.001	255718081	250.0	249.6	
2	8.508	8.510	-0.002	184731073	250.0	246.8	
		Average of Peak Amounts =				249.0	
						RPD = 3.42	
$ 15 DCB Decachlorobiphenyl							
1	9.608	9.610	-0.002	638656530	12.5	11.9	
2	10.175	10.176	-0.001	121265030	12.5	12.4	
						RPD = 3.44	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1660_ICV_00013	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

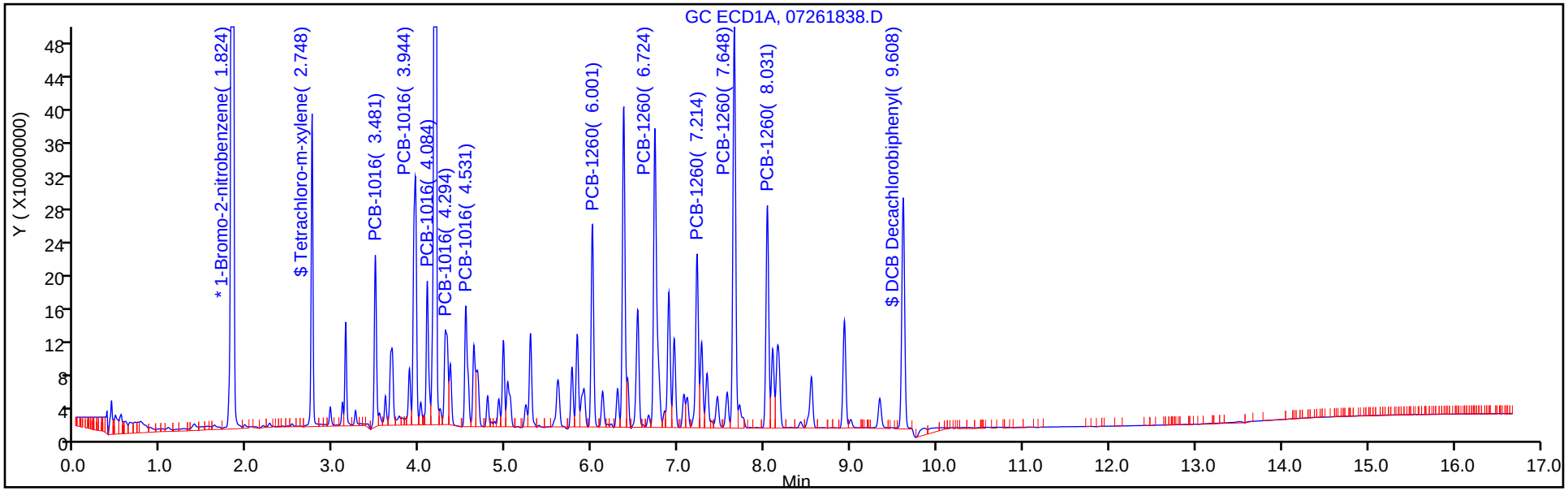
Report Date: 27-Jul-2018 12:46:05 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

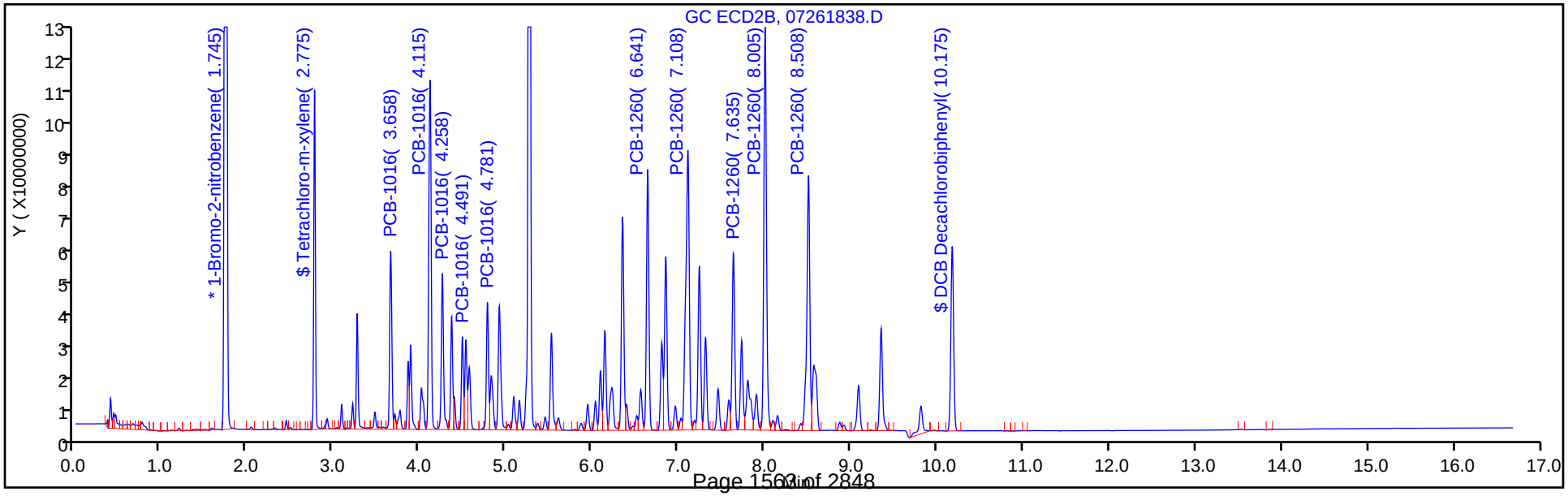
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261838.D

Injection Date:	27-Jul-2018 03:59:55	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	38
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	38
Method:	PCB_P3	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



Report Date: 27-Jul-2018 12:46:07 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261838.D

Injection Date: 27-Jul-2018 03:59:55 Instrument ID: SGC_P3

Lims ID: ICV

Client ID:

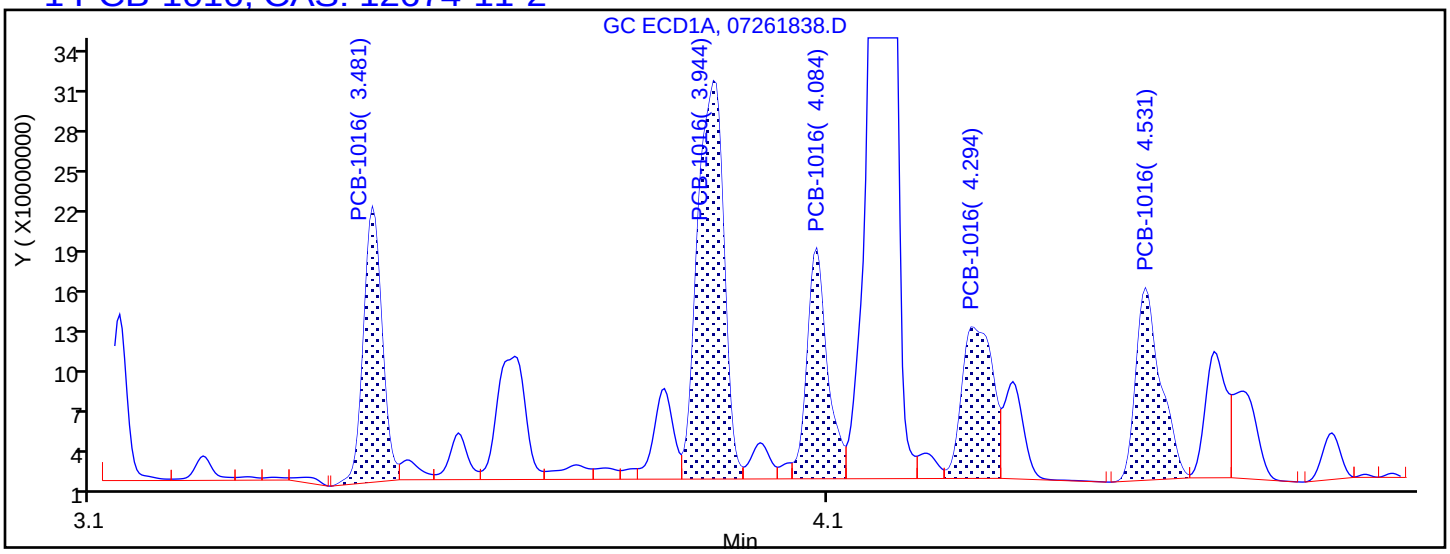
Operator ID: JAX ALS Bottle#: 38 Worklist Smp#: 38

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

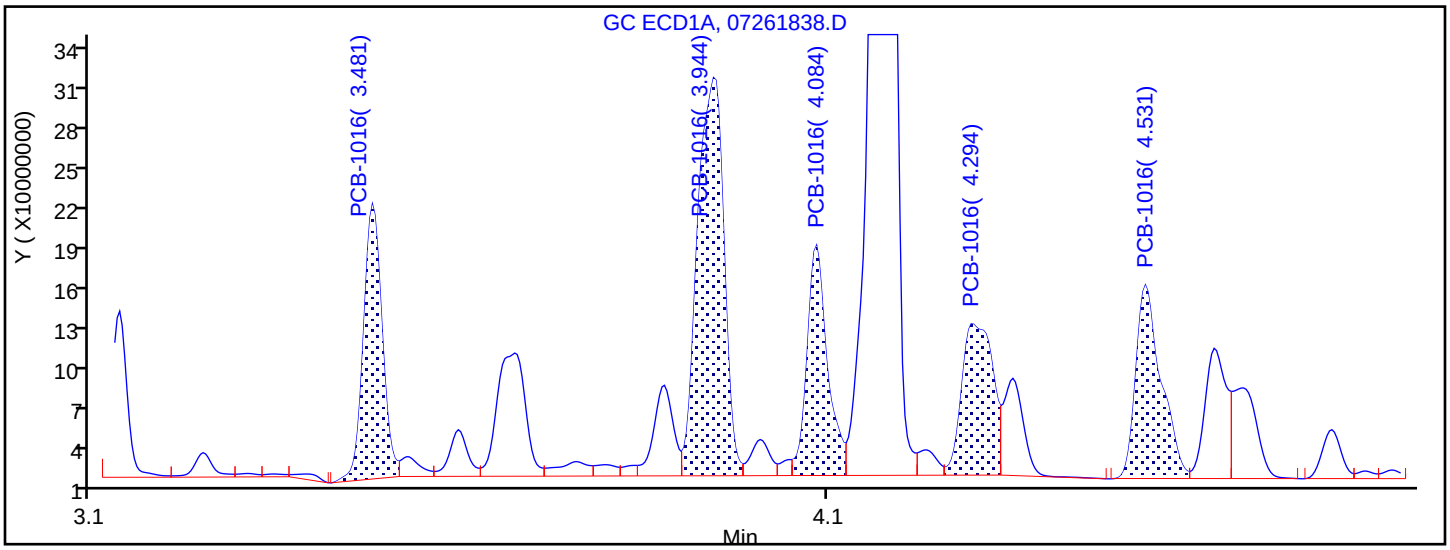
Column: CLP1 Pesticides Column 1 (0.32 mm) Detector GC ECD1A

1 PCB-1016, CAS: 12674-11-2



Processing Integration Results

3.481	Response = 354646056
3.944	Response = 726885232
4.084	Response = 325720494
4.294	Response = 325567227
4.531	Response = 328848771



Manual Integration Results

3.481	Response = 354646056	
3.944	Response = 726885232	
4.084	Response = 325720494	
4.294	Response = 325567227	
4.531	Response = 337323891	M

Reviewer: jacksonto, 27-Jul-2018 07:14:15

Audit Action: Assigned New Baseline Audit Reason: Baseline Smoothing

Report Date: 27-Jul-2018 12:46:07 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261838.D

Injection Date: 27-Jul-2018 03:59:55 Instrument ID: SGC_P3

Lims ID: ICV

Client ID:

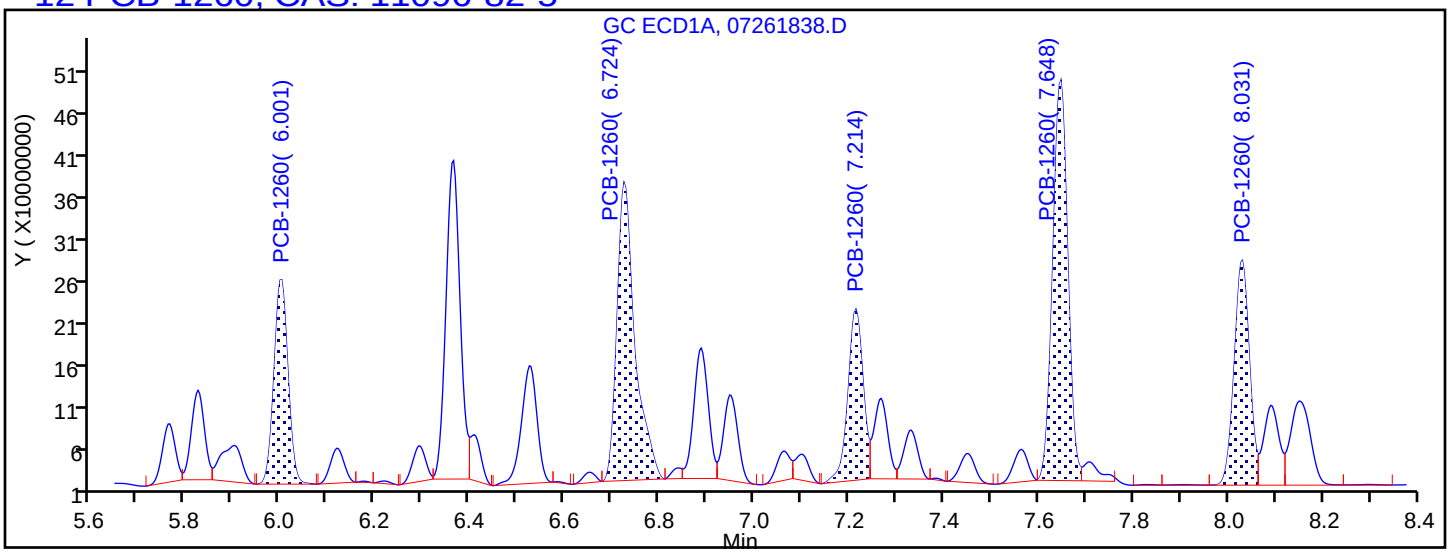
Operator ID: JAX ALS Bottle#: 38 Worklist Smp#: 38

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

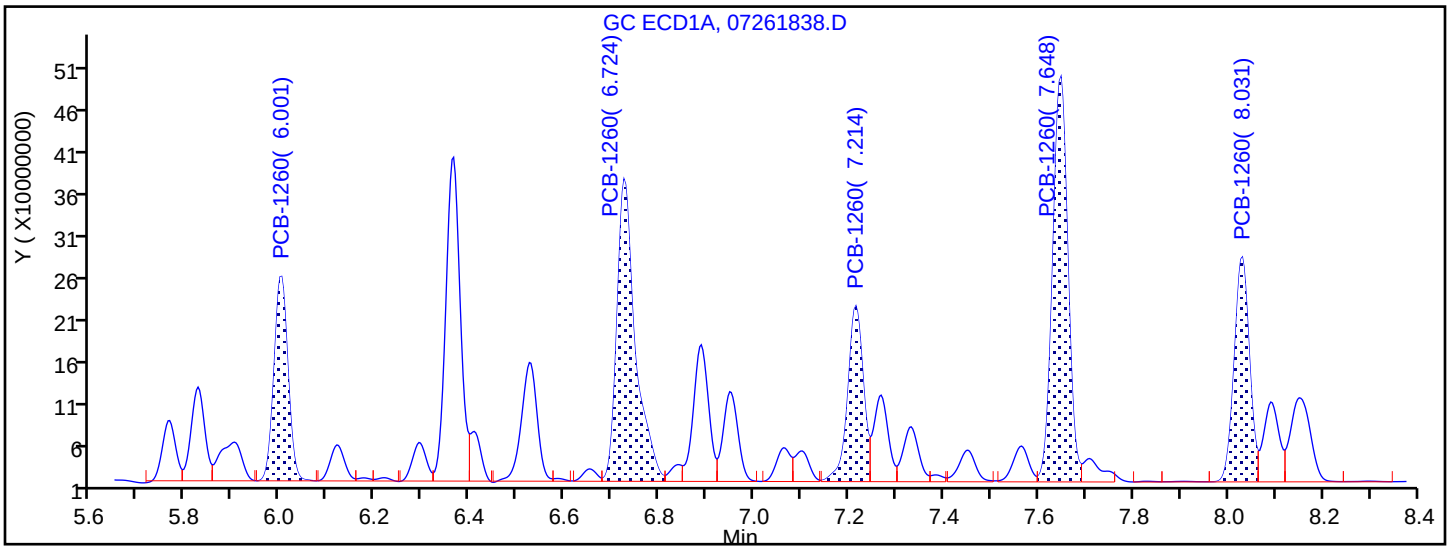
Column: CLP1 Pesticides Column 1 (0.32 mm) Detector GC ECD1A

12 PCB-1260, CAS: 11096-82-5



Processing Integration Results

6.001	Response = 484902178
6.724	Response = 902193204
7.214	Response = 441996866
7.648	Response = 1022024680
8.031	Response = 582136195



Manual Integration Results

6.001	Response = 484981446	M
6.724	Response = 943425216	M
7.214	Response = 468606599	M
7.648	Response = 1052477749	M
8.031	Response = 582136195	

Reviewer: jacksonto, 27-Jul-2018 07:14:13

Audit Action: Assigned New Baseline Audit Reason: Baseline Smoothing

FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/38 Calibration Date: 07/27/2018 03:59

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 07261838.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin1		0.3466		0.252	0.250	0.6	20.0
PCB-1016 Peak 2	Lin1		0.7701		0.246	0.250	-1.6	20.0
PCB-1016 Peak 3	Lin1		0.3176		0.245	0.250	-1.9	20.0
PCB-1016 Peak 4	Lin1		0.1680		0.248	0.250	-0.8	20.0
PCB-1016 Peak 5	Lin1		0.2458		0.245	0.250	-2.1	20.0
PCB-1260 Peak 1	Lin1		0.5685		0.247	0.250	-1.3	20.0
PCB-1260 Peak 2	Lin1		0.8792		0.250	0.250	-0.2	20.0
PCB-1260 Peak 3	Lin1		0.4088		0.252	0.250	1.0	20.0
PCB-1260 Peak 4	Lin1		0.9685		0.250	0.250	-0.2	20.0
PCB-1260 Peak 5	Lin1		0.6996		0.247	0.250	-1.3	20.0
Tetrachloro-m-xylene	Lin1		10.05		0.0116	0.0125	-7.4	20.0
DCB Decachlorobiphenyl	Lin1		9.185		0.0124	0.0125	-1.2	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/38 Calibration Date: 07/27/2018 03:59

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 07261838.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.66	3.41	3.91
PCB-1016 Peak 2	4.12	3.87	4.37
PCB-1016 Peak 3	4.26	4.01	4.51
PCB-1016 Peak 4	4.49	4.24	4.74
PCB-1016 Peak 5	4.78	4.53	5.03
PCB-1260 Peak 1	6.64	6.39	6.89
PCB-1260 Peak 2	7.11	6.86	7.36
PCB-1260 Peak 3	7.64	7.39	7.89
PCB-1260 Peak 4	8.01	7.76	8.26
PCB-1260 Peak 5	8.51	8.26	8.76
Tetrachloro-m-xylene	2.78	2.53	3.03
DCB Decachlorobiphenyl	10.18	9.93	10.43

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261838.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 03:59:55 ALS Bottle#: 38 Worklist Smp#: 38
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-038
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 27-Jul-2018 12:42:28 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0306

First Level Reviewer: jacksonto Date: 27-Jul-2018 07:14:24

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	1.824	1.822	0.002	4491549810	1000.0	1000.0	
2	1.745	1.746	-0.001	1056154880	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.750	-0.002	543476042	12.5	12.0	
2	2.775	2.776	-0.001	132662823	12.5	11.6	
						RPD = 3.48	
1 PCB-1016							M
1	3.481	3.483	-0.002	354646056	250.0	251.9	
1	3.944	3.946	-0.002	726885232	250.0	226.1	
1	4.084	4.083	0.001	325720494	250.0	235.1	
1	4.294	4.296	-0.002	325567227	250.0	239.8	
1	4.531	4.530	0.001	337323891	250.0	237.0	M
		Average of Peak Amounts =				238.0	
2	3.658	3.660	-0.002	91525231	250.0	251.6	
2	4.115	4.116	-0.001	203326354	250.0	246.0	
2	4.258	4.260	-0.002	83849867	250.0	245.4	
2	4.491	4.493	-0.002	44350978	250.0	248.0	
2	4.781	4.783	-0.002	64907129	250.0	244.8	
		Average of Peak Amounts =				247.1	
						RPD = 3.78	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							M
1	6.001	6.000	0.001	484981446	250.0	237.3	M
1	6.724	6.726	-0.002	943425216	250.0	239.7	M
1	7.214	7.213	0.001	468606599	250.0	245.5	M
1	7.648	7.646	0.002	1052477749	250.0	238.7	M
1	8.031	8.030	0.001	582136195	250.0	241.9	
		Average of Peak Amounts =				240.6	
2	6.641	6.643	-0.002	150111200	250.0	246.6	
2	7.108	7.110	-0.002	232131740	250.0	249.5	
2	7.635	7.636	-0.001	107945173	250.0	252.5	
2	8.005	8.006	-0.001	255718081	250.0	249.6	
2	8.508	8.510	-0.002	184731073	250.0	246.8	
		Average of Peak Amounts =				249.0	
						RPD = 3.42	
$ 15 DCB Decachlorobiphenyl							
1	9.608	9.610	-0.002	638656530	12.5	11.9	
2	10.175	10.176	-0.001	121265030	12.5	12.4	
						RPD = 3.44	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

AR_1660_ICV_00013	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

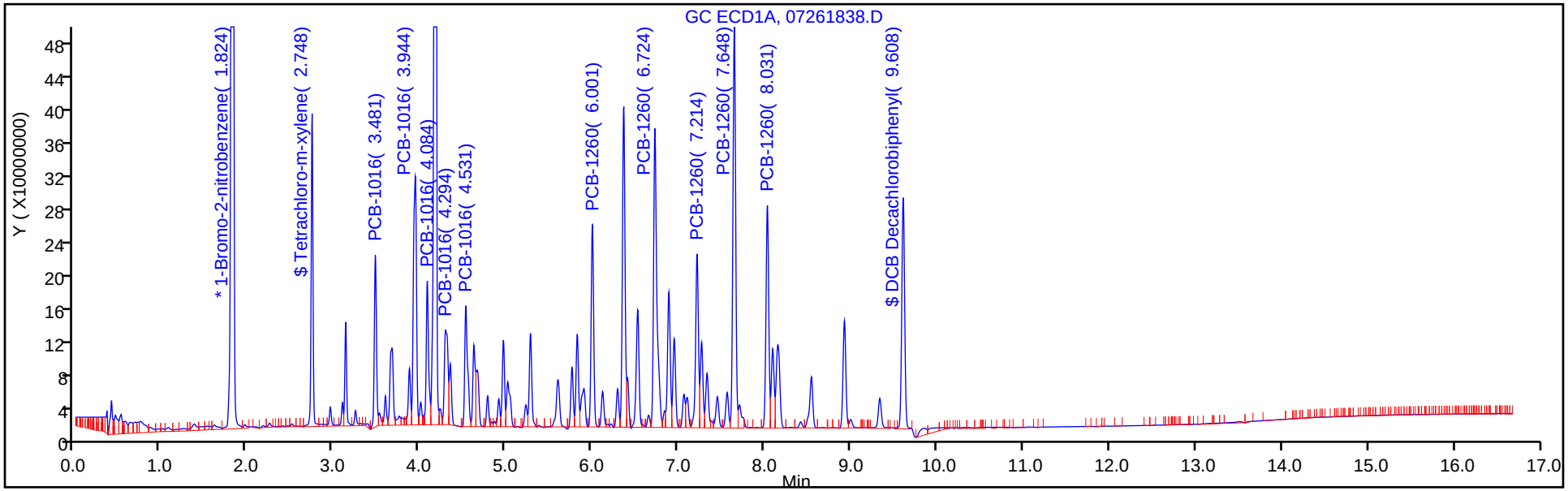
Report Date: 27-Jul-2018 12:46:07 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

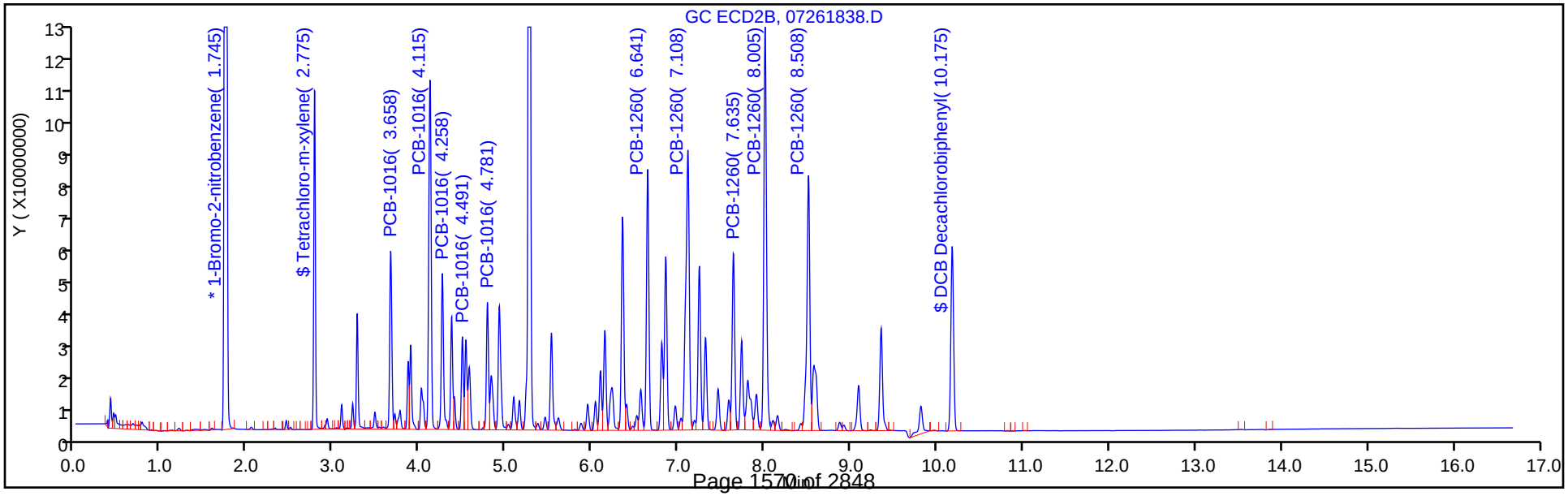
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261838.D

Injection Date:	27-Jul-2018 03:59:55	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	38
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	38
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/39 Calibration Date: 07/27/2018 04:21

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 22:10

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/27/2018 00:21

Lab File ID: 07261839.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1232 Peak 1	Lin1		0.1696		0.234	0.250	-6.5	20.0
PCB-1232 Peak 2	Lin1		0.1492		0.237	0.250	-5.1	20.0
PCB-1232 Peak 3	Lin1		0.3125		0.236	0.250	-5.5	20.0
PCB-1232 Peak 4	Lin1		0.1405		0.240	0.250	-4.1	20.0
PCB-1232 Peak 5	Lin1		0.1381		0.245	0.250	-1.8	20.0
PCB-1262 Peak 1	Lin1		0.4716		0.233	0.250	-7.0	20.0
PCB-1262 Peak 2	Lin1		0.5373		0.219	0.250	-12.4	20.0
PCB-1262 Peak 3	Lin1		0.5553		0.232	0.250	-7.1	20.0
PCB-1262 Peak 4	Lin1		1.173		0.227	0.250	-9.3	20.0
PCB-1262 Peak 5	Lin1		0.3973		0.224	0.250	-10.6	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/39 Calibration Date: 07/27/2018 04:21

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 22:10

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/27/2018 00:21

Lab File ID: 07261839.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1232 Peak 1	3.14	2.89	3.39
PCB-1232 Peak 2	3.48	3.23	3.73
PCB-1232 Peak 3	3.95	3.69	4.19
PCB-1232 Peak 4	4.08	3.83	4.33
PCB-1232 Peak 5	4.53	4.28	4.78
PCB-1262 Peak 1	6.36	6.11	6.61
PCB-1262 Peak 2	6.89	6.64	7.14
PCB-1262 Peak 3	7.22	6.96	7.46
PCB-1262 Peak 4	7.65	7.40	7.90
PCB-1262 Peak 5	8.03	7.78	8.28

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261839.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 04:21:45 ALS Bottle#: 39 Worklist Smp#: 39
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-039
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 27-Jul-2018 12:42:28 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0306

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	1.823	1.822	0.001	4267203916	1000.0	1000.0	
2	1.747	1.746	0.001	1016164594	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	180871029	250.0	233.7	
1	3.483	3.481	0.002	159120882	250.0	237.3	
1	3.947	3.944	0.003	333405726	250.0	236.1	
1	4.083	4.084	-0.001	149917501	250.0	239.6	
1	4.533	4.531	0.002	147348702	250.0	245.5	
		Average of Peak Amounts =				238.4	
2	3.273	3.271	0.002	51511524	250.0	238.9	
2	3.660	3.661	-0.001	41686979	250.0	232.8	
2	4.117	4.117	0.000	84930374	250.0	232.7	
2	4.260	4.261	-0.001	36309649	250.0	229.1	
2	4.783	4.784	-0.001	26305078	250.0	236.4	
		Average of Peak Amounts =				234.0	
						RPD = 1.90	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.363	6.364	-0.001	503110029	250.0	232.6	
1	6.887	6.887	0.000	573221578	250.0	219.0	
1	7.217	7.214	0.003	592358057	250.0	232.3	
1	7.647	7.647	0.000	1251717188	250.0	226.6	
1	8.030	8.031	-0.001	423816443	250.0	223.6	
		Average of Peak Amounts =				226.8	
2	6.643	6.641	0.002	105232495	250.0	234.0	
2	7.240	7.241	-0.001	149884280	250.0	237.6	
2	7.637	7.637	0.000	142548602	250.0	236.9	
2	8.003	8.004	-0.001	293803608	250.0	235.2	
2	8.507	8.507	0.000	209000783	250.0	234.1	
		Average of Peak Amounts =				235.6	
						RPD = 3.79	

Reagents:

AR_3262_ICV_00013	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

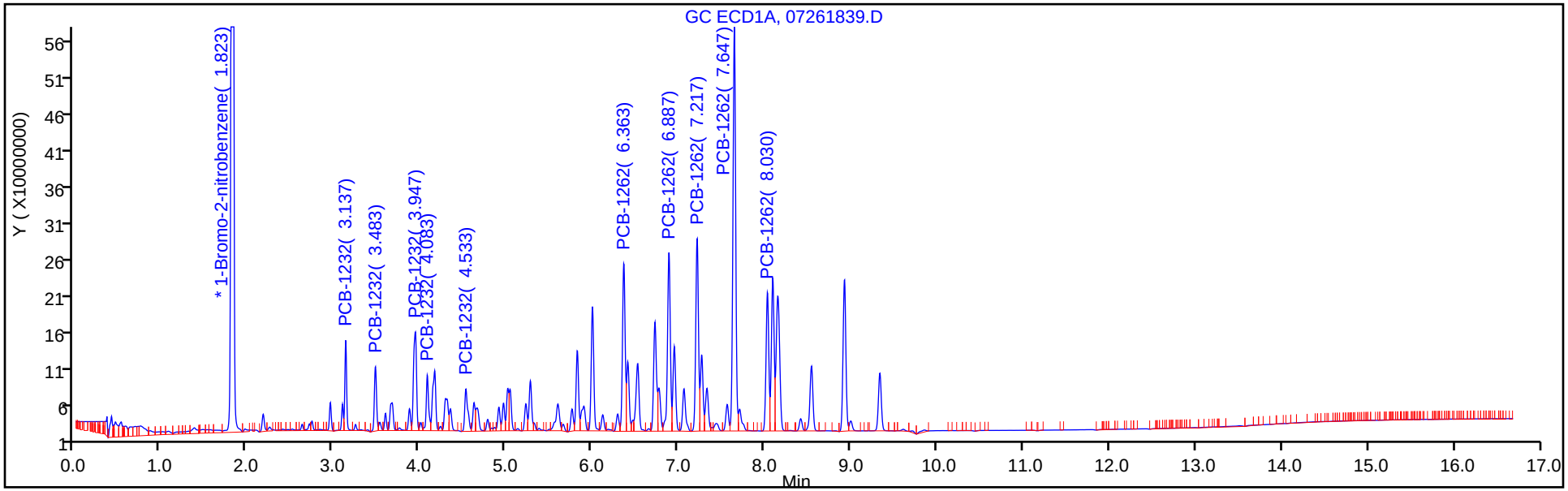
Report Date: 27-Jul-2018 12:46:16 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

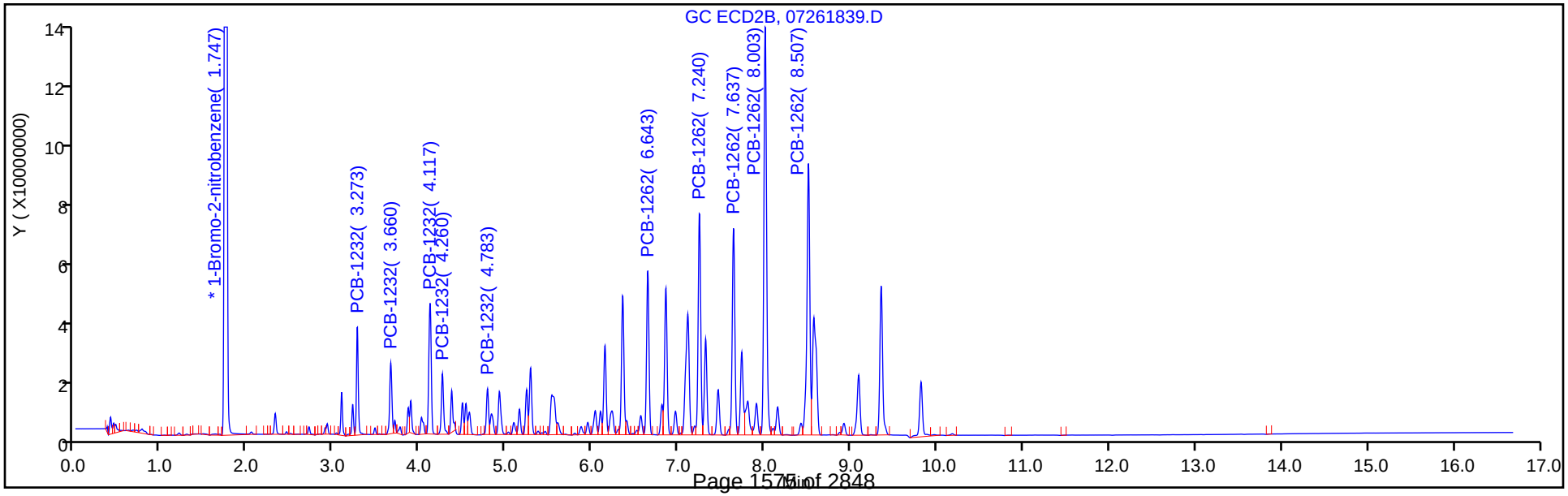
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261839.D

Injection Date:	27-Jul-2018 04:21:45	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	39
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	39
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/39 Calibration Date: 07/27/2018 04:21

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 22:10

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/27/2018 00:21

Lab File ID: 07261839.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1232 Peak 1	Lin1		0.2028		0.239	0.250	-4.5	20.0
PCB-1232 Peak 2	Lin1		0.1641		0.233	0.250	-6.9	20.0
PCB-1232 Peak 3	Lin1		0.3343		0.233	0.250	-6.9	20.0
PCB-1232 Peak 4	Lin1		0.1429		0.229	0.250	-8.4	20.0
PCB-1232 Peak 5	Lin1		0.1036		0.236	0.250	-5.4	20.0
PCB-1262 Peak 1	Lin1		0.4142		0.234	0.250	-6.4	20.0
PCB-1262 Peak 2	Lin1		0.5900		0.238	0.250	-5.0	20.0
PCB-1262 Peak 3	Lin1		0.5611		0.237	0.250	-5.2	20.0
PCB-1262 Peak 4	Lin1		1.157		0.235	0.250	-5.9	20.0
PCB-1262 Peak 5	Lin1		0.8227		0.234	0.250	-6.4	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/39 Calibration Date: 07/27/2018 04:21

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 22:10

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/27/2018 00:21

Lab File ID: 07261839.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1232 Peak 1	3.27	3.02	3.52
PCB-1232 Peak 2	3.66	3.41	3.91
PCB-1232 Peak 3	4.12	3.87	4.37
PCB-1232 Peak 4	4.26	4.01	4.51
PCB-1232 Peak 5	4.78	4.53	5.03
PCB-1262 Peak 1	6.64	6.39	6.89
PCB-1262 Peak 2	7.24	6.99	7.49
PCB-1262 Peak 3	7.64	7.39	7.89
PCB-1262 Peak 4	8.00	7.75	8.25
PCB-1262 Peak 5	8.51	8.26	8.76

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261839.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 04:21:45 ALS Bottle#: 39 Worklist Smp#: 39
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-039
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 27-Jul-2018 12:42:28 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0306

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	1.823	1.822	0.001	4267203916	1000.0	1000.0	
2	1.747	1.746	0.001	1016164594	1000.0	1000.0	
						RPD = 0.00	
7 PCB-1232							
1	3.137	3.137	0.000	180871029	250.0	233.7	
1	3.483	3.481	0.002	159120882	250.0	237.3	
1	3.947	3.944	0.003	333405726	250.0	236.1	
1	4.083	4.084	-0.001	149917501	250.0	239.6	
1	4.533	4.531	0.002	147348702	250.0	245.5	
		Average of Peak Amounts =				238.4	
2	3.273	3.271	0.002	51511524	250.0	238.9	
2	3.660	3.661	-0.001	41686979	250.0	232.8	
2	4.117	4.117	0.000	84930374	250.0	232.7	
2	4.260	4.261	-0.001	36309649	250.0	229.1	
2	4.783	4.784	-0.001	26305078	250.0	236.4	
		Average of Peak Amounts =				234.0	
						RPD = 1.90	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
5 PCB-1262							
1	6.363	6.364	-0.001	503110029	250.0	232.6	
1	6.887	6.887	0.000	573221578	250.0	219.0	
1	7.217	7.214	0.003	592358057	250.0	232.3	
1	7.647	7.647	0.000	1251717188	250.0	226.6	
1	8.030	8.031	-0.001	423816443	250.0	223.6	
		Average of Peak Amounts =				226.8	
2	6.643	6.641	0.002	105232495	250.0	234.0	
2	7.240	7.241	-0.001	149884280	250.0	237.6	
2	7.637	7.637	0.000	142548602	250.0	236.9	
2	8.003	8.004	-0.001	293803608	250.0	235.2	
2	8.507	8.507	0.000	209000783	250.0	234.1	
		Average of Peak Amounts =				235.6	
						RPD = 3.79	

Reagents:

AR_3262_ICV_00013	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

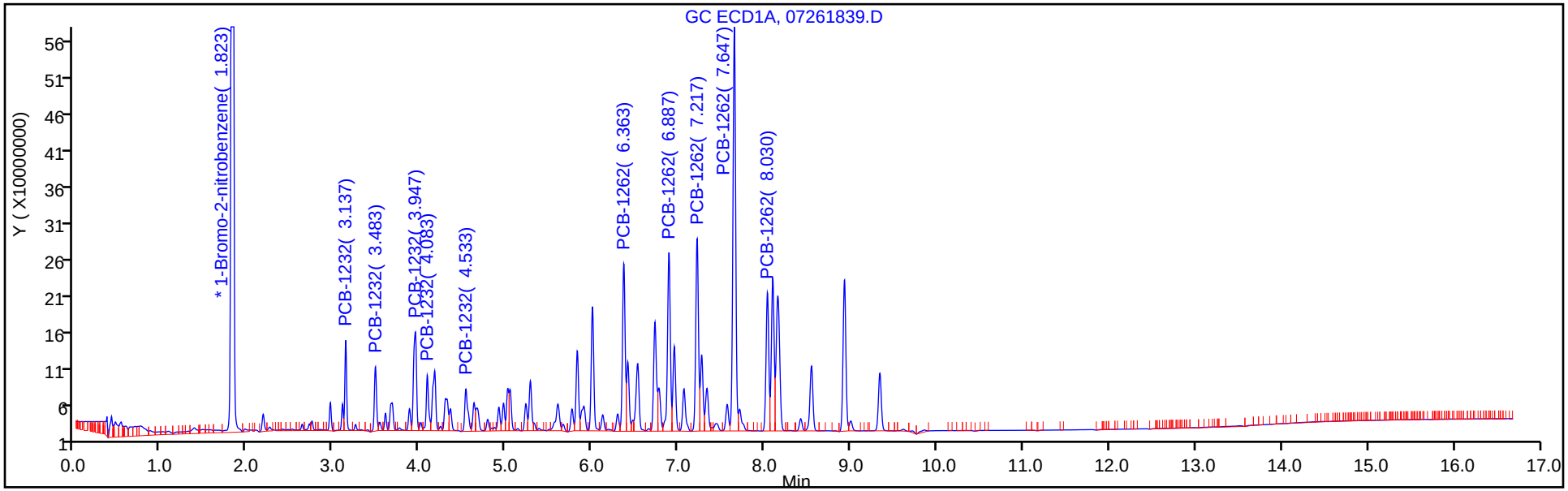
Report Date: 27-Jul-2018 12:46:18 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

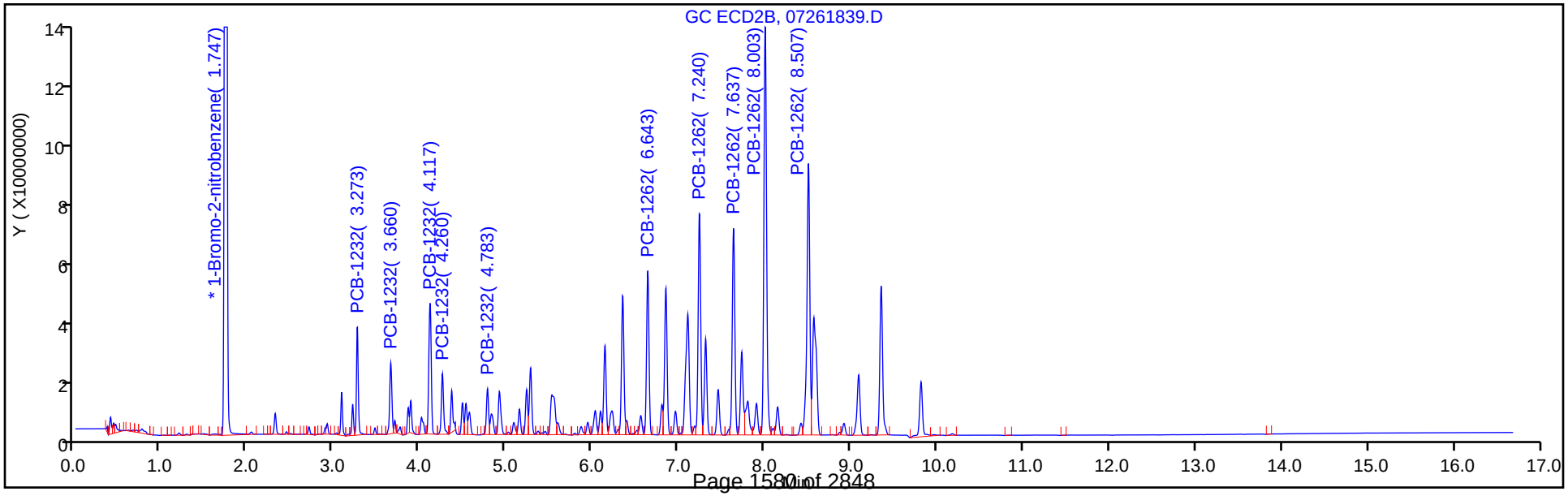
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261839.D

Injection Date:	27-Jul-2018 04:21:45	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	39
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	39
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/40 Calibration Date: 07/27/2018 04:43

Instrument ID: SGC_P3 Calib Start Date: 07/27/2018 00:43

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/27/2018 02:54

Lab File ID: 07261840.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1242 Peak 1	Lin1		0.2576		0.245	0.250	-2.1	20.0
PCB-1242 Peak 2	Lin1		0.5410		0.231	0.250	-7.4	20.0
PCB-1242 Peak 3	Lin1		0.2486		0.235	0.250	-6.1	20.0
PCB-1242 Peak 4	Lin1		0.1856		0.233	0.250	-6.8	20.0
PCB-1242 Peak 5	Lin1		0.1825		0.239	0.250	-4.2	20.0
PCB-1268 Peak 1	Ave	1.404	1.276		0.360	0.250	-9.1	20.0
PCB-1268 Peak 2	Ave	1.342	1.167		0.360	0.250	-13.0	20.0
PCB-1268 Peak 3	Ave	1.167	1.048		0.360	0.250	-10.2	20.0
PCB-1268 Peak 4	Ave	0.5560	0.4821		0.360	0.250	-13.3	20.0
PCB-1268 Peak 5	Ave	4.486	4.162		0.360	0.250	-7.2	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/40 Calibration Date: 07/27/2018 04:43

Instrument ID: SGC_P3 Calib Start Date: 07/27/2018 00:43

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/27/2018 02:54

Lab File ID: 07261840.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1242 Peak 1	3.48	3.23	3.73
PCB-1242 Peak 2	3.95	3.70	4.20
PCB-1242 Peak 3	4.53	4.28	4.78
PCB-1242 Peak 4	5.02	4.77	5.27
PCB-1242 Peak 5	5.05	4.79	5.29
PCB-1268 Peak 1	8.10	7.84	8.34
PCB-1268 Peak 2	8.15	7.90	8.40
PCB-1268 Peak 3	8.42	8.17	8.67
PCB-1268 Peak 4	8.93	8.67	9.17
PCB-1268 Peak 5	9.34	9.09	9.59

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261840.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 04:43:35 ALS Bottle#: 40 Worklist Smp#: 40
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-040
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 27-Jul-2018 12:42:28 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0306

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	1.825	1.822	0.003	4451114062	1000.0	1000.0	
2	1.745	1.746	-0.001	1054906634	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.481	3.482	-0.001	286596291	250.0	244.7	
1	3.945	3.946	-0.001	602047707	250.0	231.4	
1	4.531	4.529	0.002	276618471	250.0	234.7	
1	5.018	5.016	0.002	206515683	250.0	233.1	
1	5.045	5.042	0.003	203108909	250.0	239.4	
		Average of Peak Amounts =				236.7	
2	3.661	3.659	0.002	72792376	250.0	237.3	
2	4.118	4.116	0.002	157980545	250.0	234.4	
2	4.258	4.259	-0.001	65819140	250.0	234.7	
2	4.781	4.783	-0.002	51490642	250.0	235.7	
2	4.921	4.919	0.002	60495772	250.0	234.4	
		Average of Peak Amounts =				235.3	
						RPD = 0.58	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.095	8.092	0.003	1420248071	250.0	227.3	
1	8.145	8.146	-0.001	1298747608	250.0	217.4	
1	8.418	8.416	0.002	1165678964	250.0	224.5	
1	8.925	8.922	0.003	536448450	250.0	216.8	
1	9.338	9.336	0.002	4631580500	250.0	232.0	
		Average of Peak Amounts =				223.6	
2	8.505	8.503	0.002	330217786	250.0	233.5	
2	8.568	8.566	0.002	303691486	250.0	231.5	
2	8.918	8.919	-0.001	258451082	250.0	233.2	
2	9.351	9.349	0.002	116374600	250.0	228.1	
2	9.811	9.813	-0.002	841499239	250.0	231.3	
		Average of Peak Amounts =				231.5	
						RPD = 3.49	

Reagents:

AR_4268_ICV_00013	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

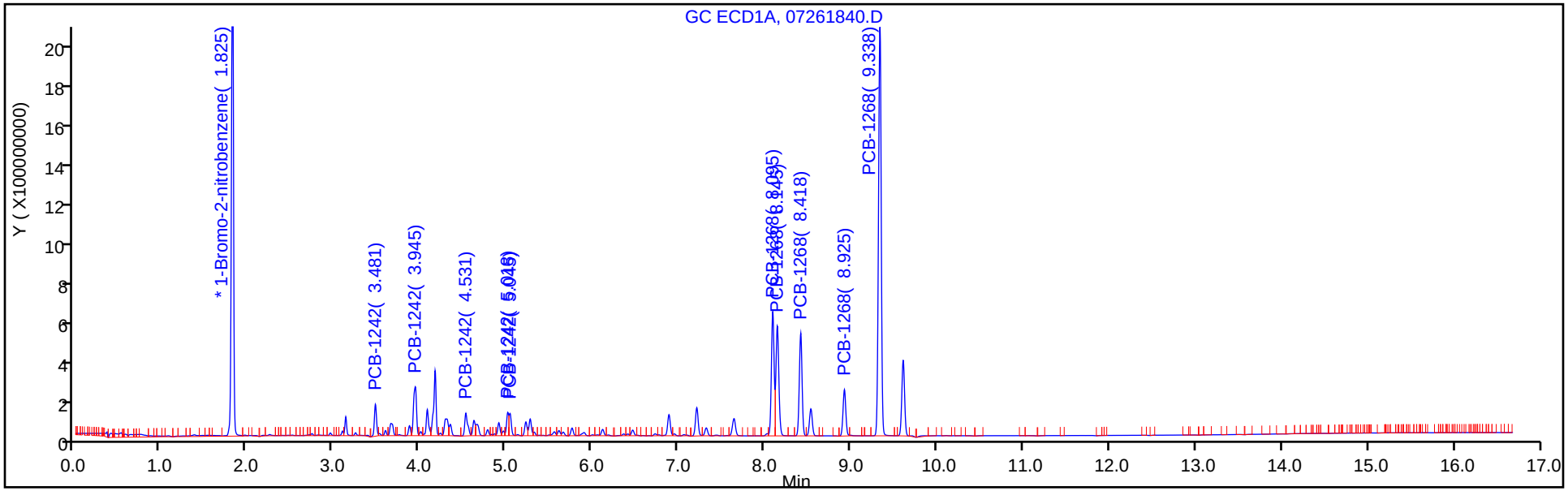
Report Date: 27-Jul-2018 12:46:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

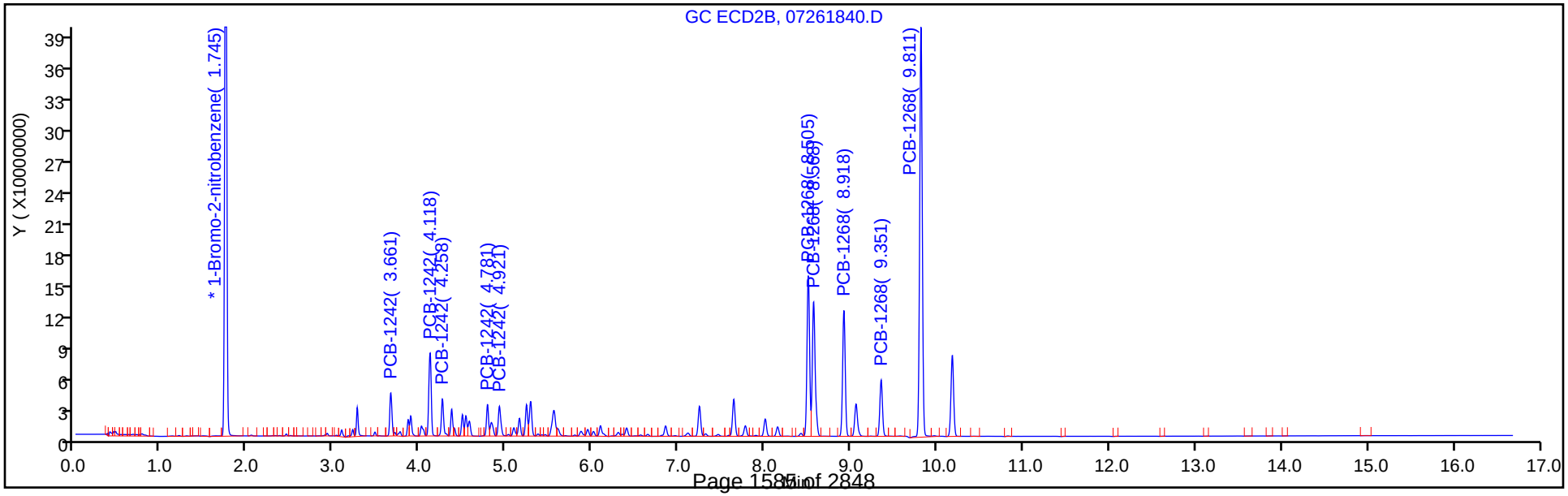
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261840.D

Injection Date:	27-Jul-2018 04:43:35	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	40
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	40
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/40 Calibration Date: 07/27/2018 04:43

Instrument ID: SGC_P3 Calib Start Date: 07/27/2018 00:43

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/27/2018 02:54

Lab File ID: 07261840.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1242 Peak 1	Lin1		0.2760		0.237	0.250	-5.1	20.0
PCB-1242 Peak 2	Lin1		0.5990		0.234	0.250	-6.2	20.0
PCB-1242 Peak 3	Lin1		0.2496		0.235	0.250	-6.1	20.0
PCB-1242 Peak 4	Lin1		0.1952		0.236	0.250	-5.7	20.0
PCB-1242 Peak 5	Lin1		0.2294		0.234	0.250	-6.2	20.0
PCB-1268 Peak 1	Lin1		1.252		0.360	0.250	-6.6	20.0
PCB-1268 Peak 2	Lin1		1.152		0.360	0.250	-7.4	20.0
PCB-1268 Peak 3	Lin1		0.9800		0.360	0.250	-6.7	20.0
PCB-1268 Peak 4	Lin1		0.4413		0.360	0.250	-8.7	20.0
PCB-1268 Peak 5	Lin1		3.191		0.360	0.250	-7.5	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/40 Calibration Date: 07/27/2018 04:43

Instrument ID: SGC_P3 Calib Start Date: 07/27/2018 00:43

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/27/2018 02:54

Lab File ID: 07261840.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1242 Peak 1	3.66	3.41	3.91
PCB-1242 Peak 2	4.12	3.87	4.37
PCB-1242 Peak 3	4.26	4.01	4.51
PCB-1242 Peak 4	4.78	4.53	5.03
PCB-1242 Peak 5	4.92	4.67	5.17
PCB-1268 Peak 1	8.51	8.25	8.75
PCB-1268 Peak 2	8.57	8.32	8.82
PCB-1268 Peak 3	8.92	8.67	9.17
PCB-1268 Peak 4	9.35	9.10	9.60
PCB-1268 Peak 5	9.81	9.56	10.06

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261840.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 04:43:35 ALS Bottle#: 40 Worklist Smp#: 40
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-040
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 27-Jul-2018 12:42:28 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0306

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	1.825	1.822	0.003	4451114062	1000.0	1000.0	
2	1.745	1.746	-0.001	1054906634	1000.0	1000.0	
						RPD = 0.00	
10 PCB-1242							
1	3.481	3.482	-0.001	286596291	250.0	244.7	
1	3.945	3.946	-0.001	602047707	250.0	231.4	
1	4.531	4.529	0.002	276618471	250.0	234.7	
1	5.018	5.016	0.002	206515683	250.0	233.1	
1	5.045	5.042	0.003	203108909	250.0	239.4	
		Average of Peak Amounts =				236.7	
2	3.661	3.659	0.002	72792376	250.0	237.3	
2	4.118	4.116	0.002	157980545	250.0	234.4	
2	4.258	4.259	-0.001	65819140	250.0	234.7	
2	4.781	4.783	-0.002	51490642	250.0	235.7	
2	4.921	4.919	0.002	60495772	250.0	234.4	
		Average of Peak Amounts =				235.3	
						RPD = 0.58	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
13 PCB-1268							
1	8.095	8.092	0.003	1420248071	250.0	227.3	
1	8.145	8.146	-0.001	1298747608	250.0	217.4	
1	8.418	8.416	0.002	1165678964	250.0	224.5	
1	8.925	8.922	0.003	536448450	250.0	216.8	
1	9.338	9.336	0.002	4631580500	250.0	232.0	
		Average of Peak Amounts =				223.6	
2	8.505	8.503	0.002	330217786	250.0	233.5	
2	8.568	8.566	0.002	303691486	250.0	231.5	
2	8.918	8.919	-0.001	258451082	250.0	233.2	
2	9.351	9.349	0.002	116374600	250.0	228.1	
2	9.811	9.813	-0.002	841499239	250.0	231.3	
		Average of Peak Amounts =				231.5	
						RPD = 3.49	

Reagents:

AR_4268_ICV_00013	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

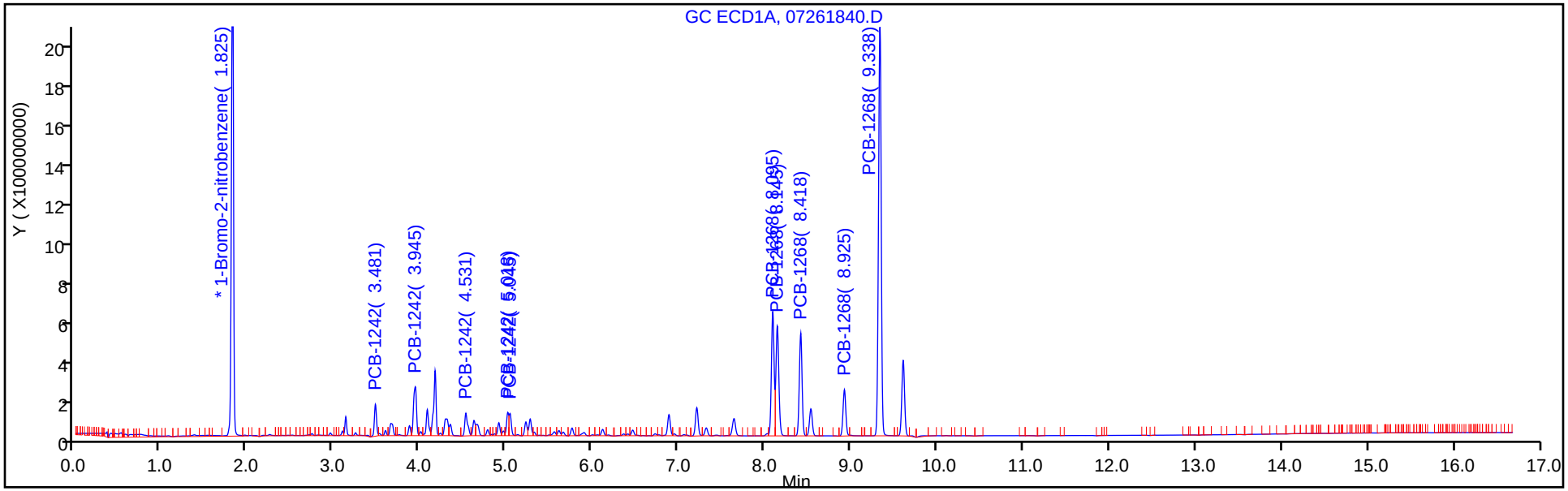
Report Date: 27-Jul-2018 12:46:28 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

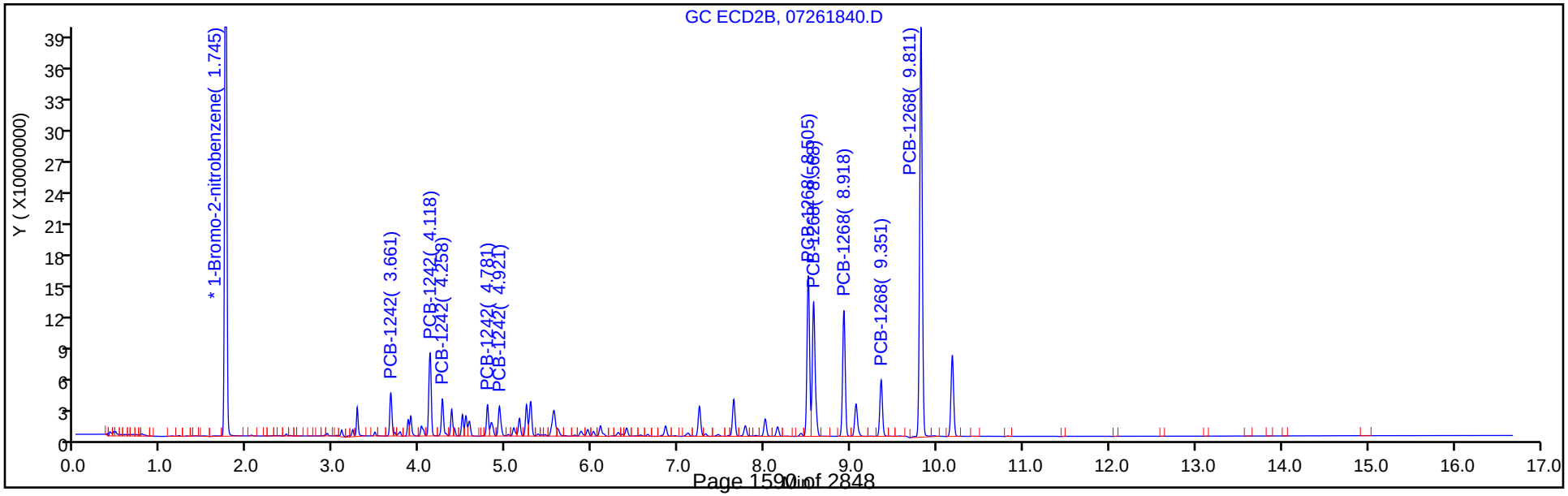
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261840.D

Injection Date:	27-Jul-2018 04:43:35	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	40
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	40
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/42 Calibration Date: 07/27/2018 08:31

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 14:30

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 16:41

Lab File ID: 07261842.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1248 Peak 1	Lin1		0.3988		0.262	0.250	5.0	20.0
PCB-1248 Peak 2	Lin1		0.4032		0.263	0.250	5.2	20.0
PCB-1248 Peak 3	Lin1		0.4065		0.266	0.250	6.5	20.0
PCB-1248 Peak 4	Lin1		0.3028		0.263	0.250	5.1	20.0
PCB-1248 Peak 5	Lin1		0.2055		0.264	0.250	5.7	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/42 Calibration Date: 07/27/2018 08:31

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 14:30

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 16:41

Lab File ID: 07261842.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1248 Peak 1	3.94	3.69	4.19
PCB-1248 Peak 2	4.30	4.05	4.55
PCB-1248 Peak 3	4.53	4.28	4.78
PCB-1248 Peak 4	5.28	5.03	5.53
PCB-1248 Peak 5	5.77	5.51	6.01

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261842.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 08:31:38 ALS Bottle#: 42 Worklist Smp#: 42
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-042
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 30-Jul-2018 07:20:11 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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	1.826	1.822	0.004	4115462597	1000.0	1000.0	
2	1.750	1.746	0.004	933577517	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.943	3.943	0.000	410282216	250.0	262.4	
1	4.296	4.296	0.000	414788665	250.0	262.9	
1	4.533	4.533	0.000	418243215	250.0	266.2	
1	5.279	5.279	0.000	311498101	250.0	262.7	
1	5.766	5.763	0.003	211465532	250.0	264.2	
		Average of Peak Amounts =				263.7	
2	4.116	4.116	0.000	98640633	250.0	256.5	
2	4.493	4.493	0.000	56845471	250.0	262.4	
2	4.783	4.783	0.000	77187345	250.0	259.9	
2	4.920	4.923	-0.003	82933125	250.0	259.2	
2	6.093	6.093	0.000	54594663	250.0	265.5	
		Average of Peak Amounts =				260.7	
						RPD = 1.15	

Reagents:

AR_1248_ICV_00013 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

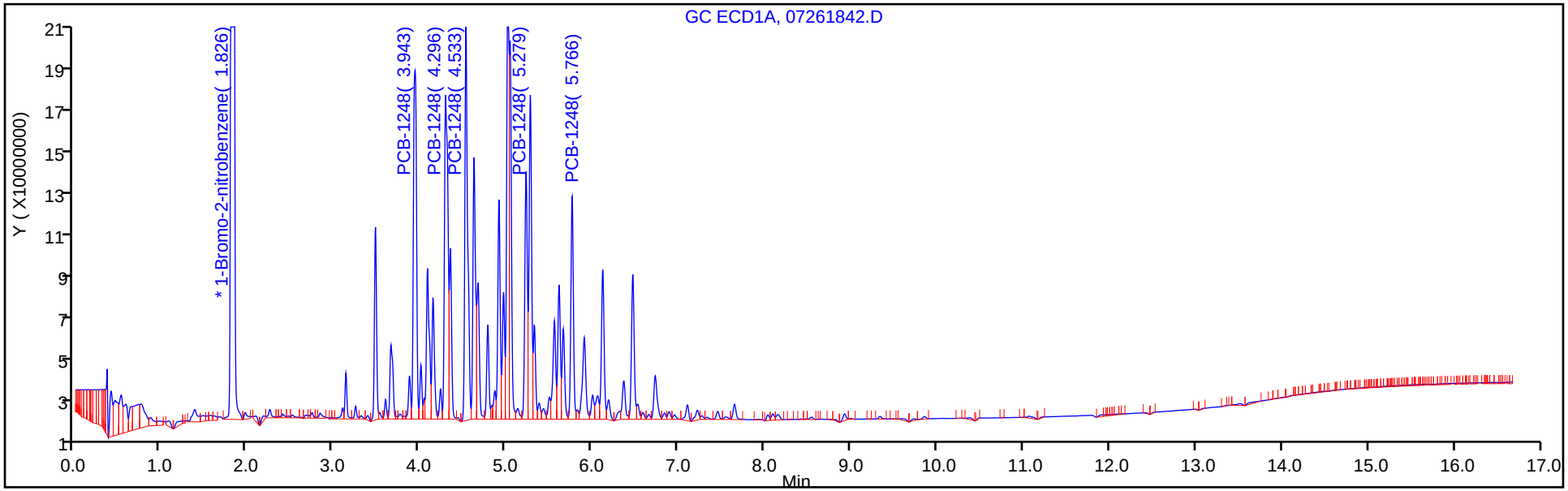
Report Date: 31-Jul-2018 14:24:33 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

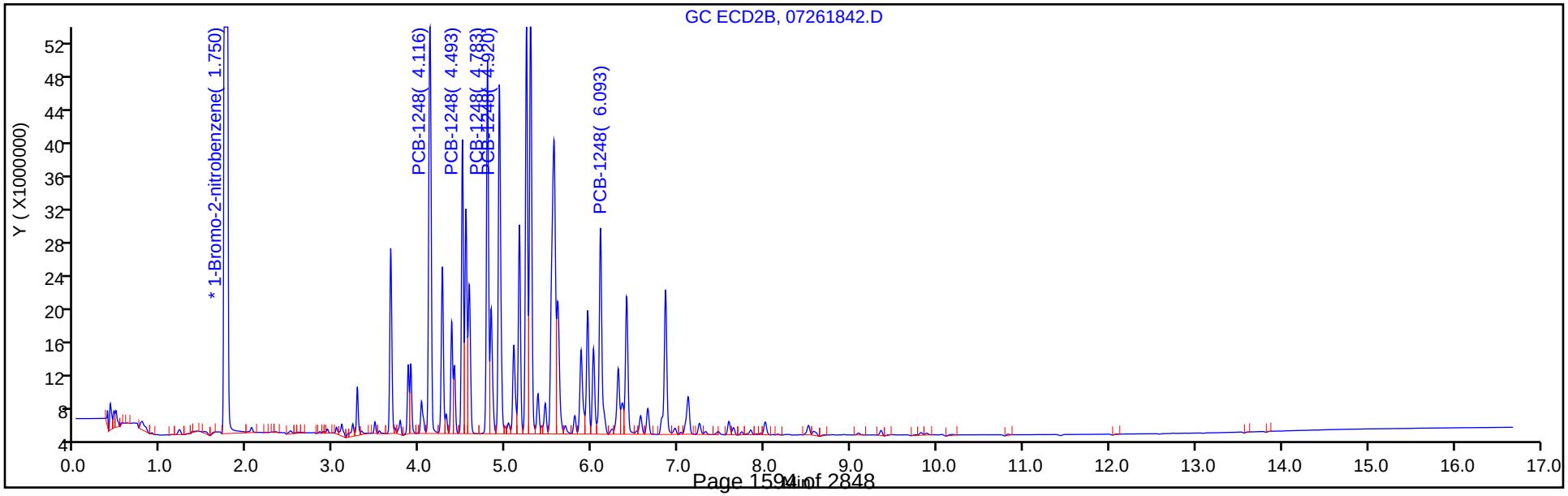
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261842.D

Injection Date:	27-Jul-2018 08:31:38	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	42
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	42
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/42 Calibration Date: 07/27/2018 08:31

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 14:30

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 16:41

Lab File ID: 07261842.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1248 Peak 1	Lin1		0.4226		0.256	0.250	2.6	20.0
PCB-1248 Peak 2	Lin1		0.2436		0.262	0.250	5.0	20.0
PCB-1248 Peak 3	Lin1		0.3307		0.260	0.250	3.9	20.0
PCB-1248 Peak 4	Lin1		0.3553		0.259	0.250	3.7	20.0
PCB-1248 Peak 5	Lin1		0.2339		0.265	0.250	6.2	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-423815/42 Calibration Date: 07/27/2018 08:31

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 14:30

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 16:41

Lab File ID: 07261842.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1248 Peak 1	4.12	3.87	4.37
PCB-1248 Peak 2	4.49	4.24	4.74
PCB-1248 Peak 3	4.78	4.53	5.03
PCB-1248 Peak 4	4.92	4.67	5.17
PCB-1248 Peak 5	6.09	5.84	6.34

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261842.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-Jul-2018 08:31:38 ALS Bottle#: 42 Worklist Smp#: 42
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072400-042
Operator ID: JAX Instrument ID: SGC_P3
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 30-Jul-2018 07:20:11 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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	1.826	1.822	0.004	4115462597	1000.0	1000.0	
2	1.750	1.746	0.004	933577517	1000.0	1000.0	
						RPD = 0.00	
4 PCB-1248							
1	3.943	3.943	0.000	410282216	250.0	262.4	
1	4.296	4.296	0.000	414788665	250.0	262.9	
1	4.533	4.533	0.000	418243215	250.0	266.2	
1	5.279	5.279	0.000	311498101	250.0	262.7	
1	5.766	5.763	0.003	211465532	250.0	264.2	
		Average of Peak Amounts =				263.7	
2	4.116	4.116	0.000	98640633	250.0	256.5	
2	4.493	4.493	0.000	56845471	250.0	262.4	
2	4.783	4.783	0.000	77187345	250.0	259.9	
2	4.920	4.923	-0.003	82933125	250.0	259.2	
2	6.093	6.093	0.000	54594663	250.0	265.5	
		Average of Peak Amounts =				260.7	
						RPD = 1.15	

Reagents:

AR_1248_ICV_00013 Amount Added: 1.00 Units: mL
BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

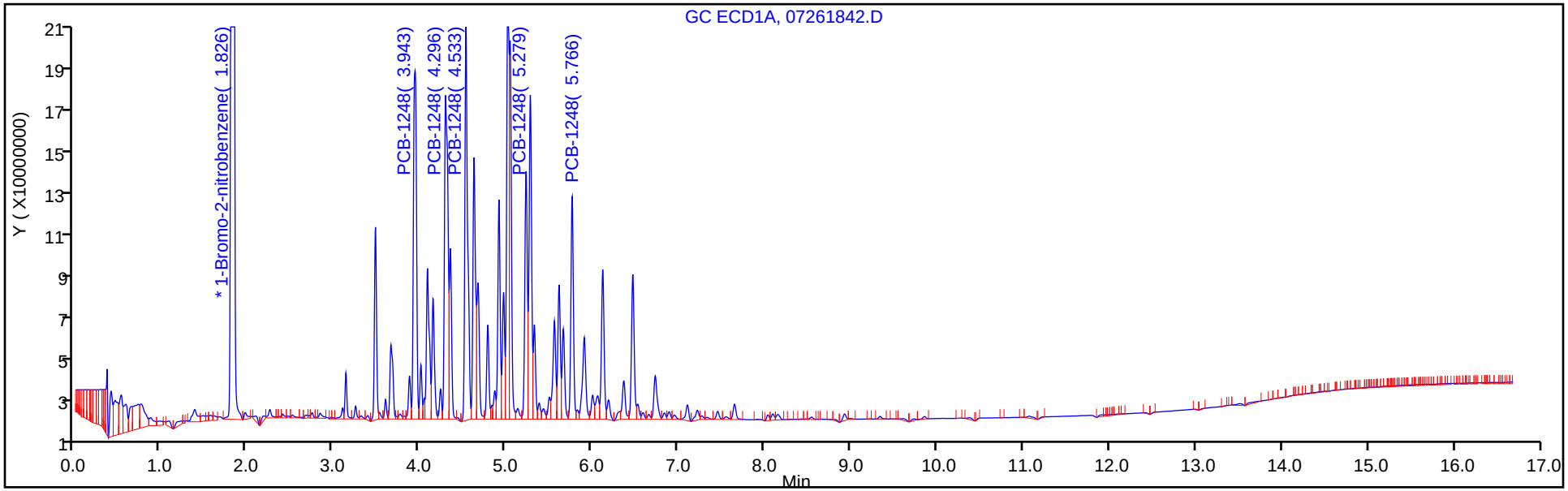
Report Date: 31-Jul-2018 14:24:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

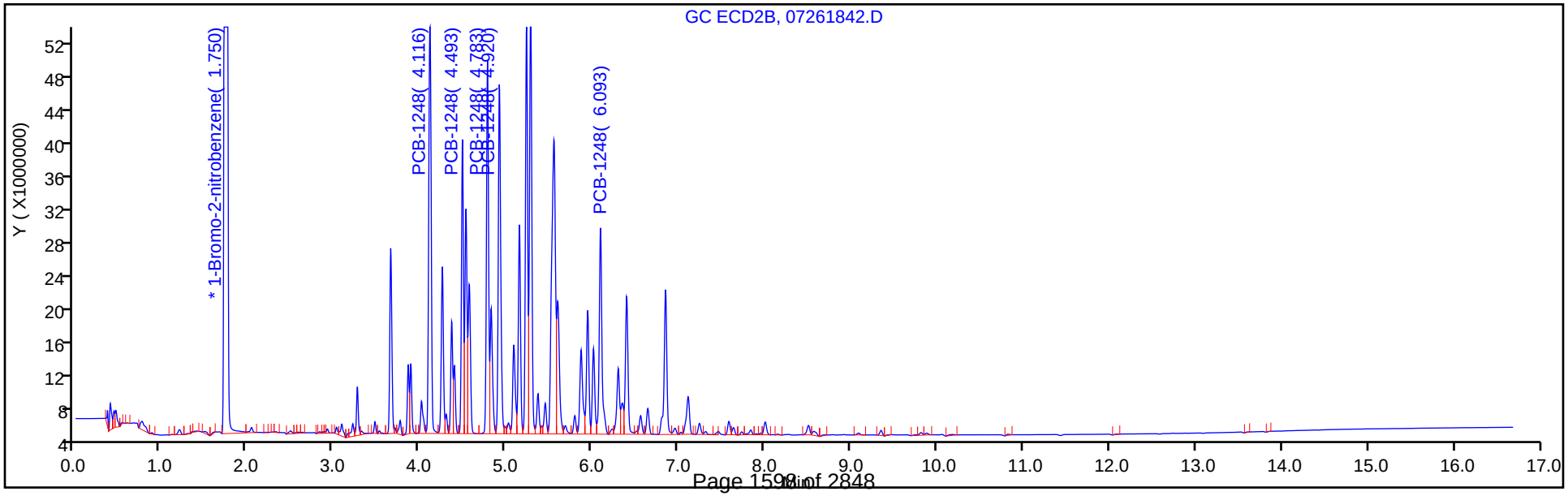
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261842.D

Injection Date:	27-Jul-2018 08:31:38	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	ICV			Worklist Smp#:	42
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	42
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: CCVIS 280-424773/3 Calibration Date: 08/03/2018 11:18

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 08031803.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin1		0.3123		0.517	0.500	3.5	20.0
PCB-1016 Peak 2	Lin1		0.7275		0.515	0.500	3.1	20.0
PCB-1016 Peak 3	Lin1		0.3082		0.508	0.500	1.6	20.0
PCB-1016 Peak 4	Lin1		0.2986		0.506	0.500	1.3	20.0
PCB-1016 Peak 5	Lin1		0.3180		0.514	0.500	2.8	20.0
PCB-1260 Peak 1	Lin1		0.4749		0.532	0.500	6.4	20.0
PCB-1260 Peak 2	Lin1		0.9299		0.536	0.500	7.3	20.0
PCB-1260 Peak 3	Lin1		0.4474		0.535	0.500	7.0	20.0
PCB-1260 Peak 4	Lin1		1.044		0.534	0.500	6.8	20.0
PCB-1260 Peak 5	Lin1		0.5244		0.493	0.500	-1.4	20.0
Tetrachloro-m-xylene	Lin1		10.14		0.0255	0.0250	1.9	20.0
DCB Decachlorobiphenyl	Lin1		12.40		0.0262	0.0250	4.7	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCVIS 280-424773/3 Calibration Date: 08/03/2018 11:18

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 08031803.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.48	3.23	3.73
PCB-1016 Peak 2	3.95	3.70	4.20
PCB-1016 Peak 3	4.08	3.83	4.33
PCB-1016 Peak 4	4.29	4.04	4.54
PCB-1016 Peak 5	4.53	4.28	4.78
PCB-1260 Peak 1	6.00	5.75	6.25
PCB-1260 Peak 2	6.73	6.48	6.98
PCB-1260 Peak 3	7.21	6.96	7.46
PCB-1260 Peak 4	7.65	7.40	7.90
PCB-1260 Peak 5	8.03	7.78	8.28
Tetrachloro-m-xylene	2.75	2.50	3.00
DCB Decachlorobiphenyl	9.61	9.36	9.86

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031803.D
Lims ID: CCVIS
Client ID:
Sample Type: CCVIS
Inject. Date: 03-Aug-2018 11:18:02 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCVIS
Misc. Info.: 280-0072651-003
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:33:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

First Level Reviewer: jacksonto Date: 03-Aug-2018 12:02:20

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	1.822	1.822	0.000	3997970399	1000.0	1000.0	
2	1.746	1.746	0.000	870675925	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.749	2.749	0.000	1013803428	25.0	25.5	
2	2.776	2.776	0.000	244492615	25.0	25.9	
						RPD = 1.72	
1 PCB-1016							
1	3.482	3.482	0.000	624271899	500.0	517.4	
1	3.946	3.946	0.000	1454262823	500.0	515.5	
1	4.082	4.082	0.000	616158784	500.0	508.2	
1	4.292	4.292	0.000	596957181	500.0	506.5	
1	4.529	4.529	0.000	635665019	500.0	514.1	
		Average of Peak Amounts =				512.3	
2	3.659	3.659	0.000	153768345	500.0	523.7	
2	4.116	4.116	0.000	352017684	500.0	521.7	
2	4.259	4.259	0.000	144891303	500.0	523.3	
2	4.489	4.489	0.000	75211698	500.0	521.6	
2	4.782	4.782	0.000	110542627	500.0	517.8	
		Average of Peak Amounts =				521.6	
						RPD = 1.80	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							M
1	5.999	5.999	0.000	949344630	500.0	532.2	
1	6.726	6.726	0.000	1858830507	500.0	536.3	
1	7.212	7.212	0.000	894288303	500.0	535.1	
1	7.646	7.646	0.000	2087296240	500.0	533.8	
1	8.029	8.029	0.000	1048324183	500.0	493.0	
		Average of Peak Amounts =				526.1	
2	6.639	6.639	0.000	268175370	500.0	541.6	M
2	7.106	7.106	0.000	409456759	500.0	539.5	M
2	7.636	7.636	0.000	190799881	500.0	548.5	M
2	8.002	8.002	0.000	453235755	500.0	540.5	M
2	8.506	8.506	0.000	327782217	500.0	536.8	M
		Average of Peak Amounts =				541.4	
						RPD = 2.87	
$ 15 DCB Decachlorobiphenyl							
1	9.606	9.606	0.000	1239832961	25.0	26.2	
2	10.176	10.176	0.000	210858898	25.0	26.5	
						RPD = 1.38	
19 1260 Res 1							
1	8.029	8.029	0.000	1048324183	NR	NR	
16 1260 Res 2							
1	8.089	8.089	0.000	406806564	NR	NR	
18 1260 Res 3							
1	8.149	8.149	0.000	551561514	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Review Flags

M - Manually Integrated

Reagents:

AR_1660_L5_00064	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

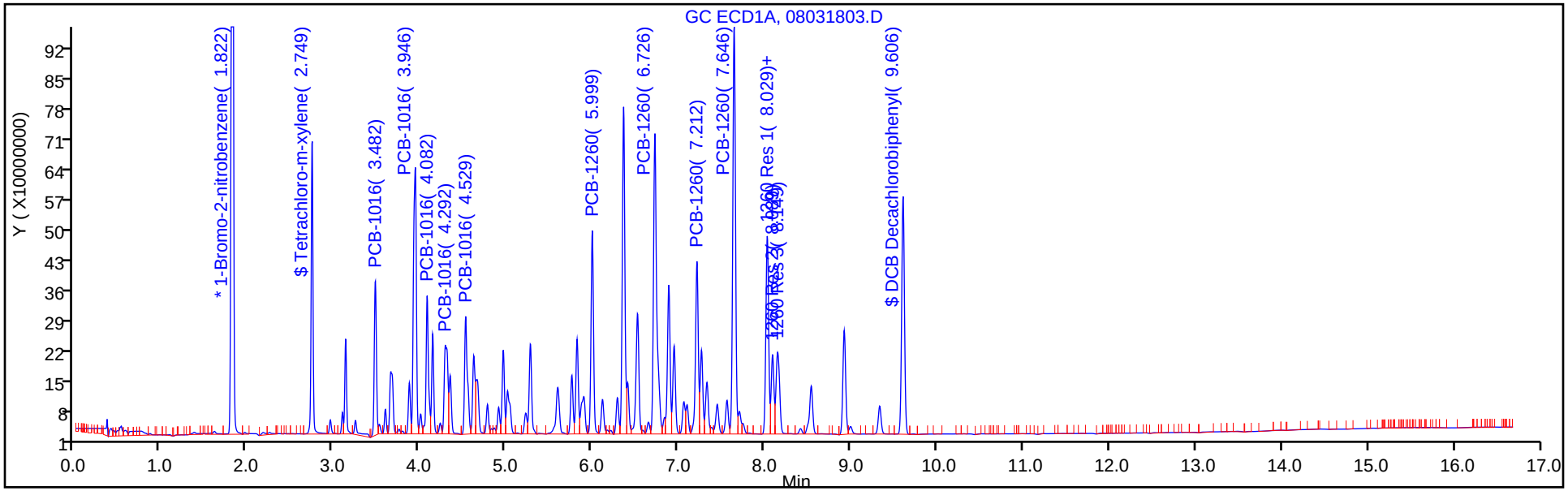
Report Date: 04-Aug-2018 07:33:31 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

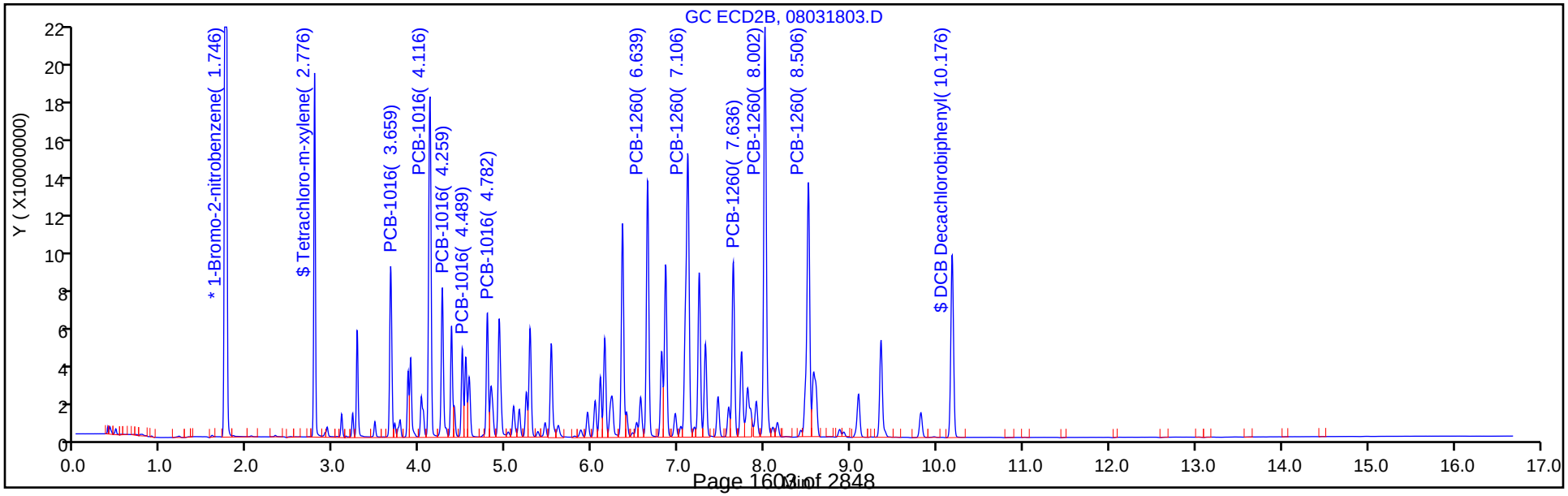
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031803.D

Injection Date:	03-Aug-2018 11:18:02	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	CCVIS			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	3
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: CCVIS 280-424773/3 Calibration Date: 08/03/2018 11:18

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 08031803.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin1		0.3532		0.524	0.500	4.7	20.0
PCB-1016 Peak 2	Lin1		0.8086		0.522	0.500	4.3	20.0
PCB-1016 Peak 3	Lin1		0.3328		0.523	0.500	4.7	20.0
PCB-1016 Peak 4	Lin1		0.1728		0.522	0.500	4.3	20.0
PCB-1016 Peak 5	Lin1		0.2539		0.518	0.500	3.6	20.0
PCB-1260 Peak 1	Lin1		0.6160		0.542	0.500	8.3	20.0
PCB-1260 Peak 2	Lin1		0.9406		0.540	0.500	7.9	20.0
PCB-1260 Peak 3	Lin1		0.4383		0.548	0.500	9.7	20.0
PCB-1260 Peak 4	Lin1		1.041		0.540	0.500	8.1	20.0
PCB-1260 Peak 5	Lin1		0.7529		0.537	0.500	7.4	20.0
Tetrachloro-m-xylene	Lin1		11.23		0.0259	0.0250	3.6	20.0
DCB Decachlorobiphenyl	Lin1		9.687		0.0265	0.0250	6.2	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCVIS 280-424773/3 Calibration Date: 08/03/2018 11:18

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 08031803.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.66	3.41	3.91
PCB-1016 Peak 2	4.12	3.87	4.37
PCB-1016 Peak 3	4.26	4.01	4.51
PCB-1016 Peak 4	4.49	4.24	4.74
PCB-1016 Peak 5	4.78	4.53	5.03
PCB-1260 Peak 1	6.64	6.39	6.89
PCB-1260 Peak 2	7.11	6.86	7.36
PCB-1260 Peak 3	7.64	7.39	7.89
PCB-1260 Peak 4	8.00	7.75	8.25
PCB-1260 Peak 5	8.51	8.26	8.76
Tetrachloro-m-xylene	2.78	2.53	3.03
DCB Decachlorobiphenyl	10.18	9.93	10.43

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031803.D
Lims ID: CCVIS
Client ID:
Sample Type: CCVIS
Inject. Date: 03-Aug-2018 11:18:02 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCVIS
Misc. Info.: 280-0072651-003
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:33:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

First Level Reviewer: jacksonto Date: 03-Aug-2018 12:02:20

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	1.822	1.822	0.000	3997970399	1000.0	1000.0	
2	1.746	1.746	0.000	870675925	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.749	2.749	0.000	1013803428	25.0	25.5	
2	2.776	2.776	0.000	244492615	25.0	25.9	
						RPD = 1.72	
1 PCB-1016							
1	3.482	3.482	0.000	624271899	500.0	517.4	
1	3.946	3.946	0.000	1454262823	500.0	515.5	
1	4.082	4.082	0.000	616158784	500.0	508.2	
1	4.292	4.292	0.000	596957181	500.0	506.5	
1	4.529	4.529	0.000	635665019	500.0	514.1	
		Average of Peak Amounts =				512.3	
2	3.659	3.659	0.000	153768345	500.0	523.7	
2	4.116	4.116	0.000	352017684	500.0	521.7	
2	4.259	4.259	0.000	144891303	500.0	523.3	
2	4.489	4.489	0.000	75211698	500.0	521.6	
2	4.782	4.782	0.000	110542627	500.0	517.8	
		Average of Peak Amounts =				521.6	
						RPD = 1.80	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							M
1	5.999	5.999	0.000	949344630	500.0	532.2	
1	6.726	6.726	0.000	1858830507	500.0	536.3	
1	7.212	7.212	0.000	894288303	500.0	535.1	
1	7.646	7.646	0.000	2087296240	500.0	533.8	
1	8.029	8.029	0.000	1048324183	500.0	493.0	
		Average of Peak Amounts =				526.1	
2	6.639	6.639	0.000	268175370	500.0	541.6	M
2	7.106	7.106	0.000	409456759	500.0	539.5	M
2	7.636	7.636	0.000	190799881	500.0	548.5	M
2	8.002	8.002	0.000	453235755	500.0	540.5	M
2	8.506	8.506	0.000	327782217	500.0	536.8	M
		Average of Peak Amounts =				541.4	
						RPD = 2.87	
$ 15 DCB Decachlorobiphenyl							
1	9.606	9.606	0.000	1239832961	25.0	26.2	
2	10.176	10.176	0.000	210858898	25.0	26.5	
						RPD = 1.38	
19 1260 Res 1							
1	8.029	8.029	0.000	1048324183	NR	NR	
16 1260 Res 2							
1	8.089	8.089	0.000	406806564	NR	NR	
18 1260 Res 3							
1	8.149	8.149	0.000	551561514	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Review Flags

M - Manually Integrated

Reagents:

AR_1660_L5_00064	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

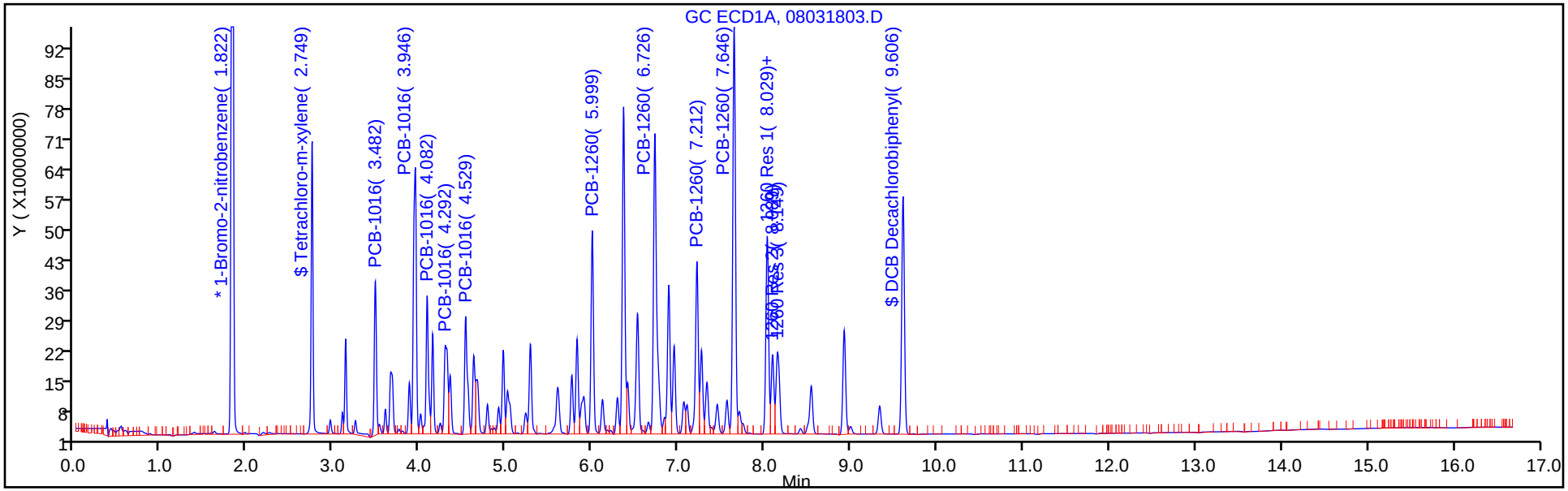
Report Date: 04-Aug-2018 07:33:33 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

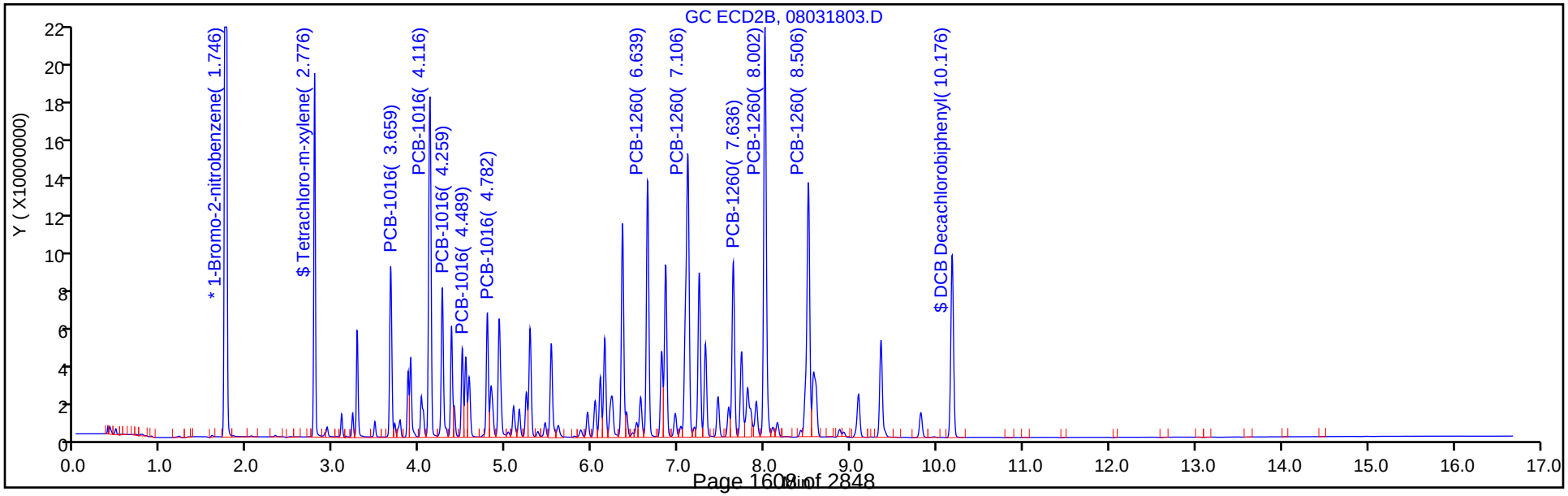
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031803.D

Injection Date:	03-Aug-2018 11:18:02	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	CCVIS			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	3
Method:	PCB_P3	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



Report Date: 04-Aug-2018 07:33:33 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031803.D

Injection Date: 03-Aug-2018 11:18:02 Instrument ID: SGC_P3

Lims ID: CCVIS

Client ID:

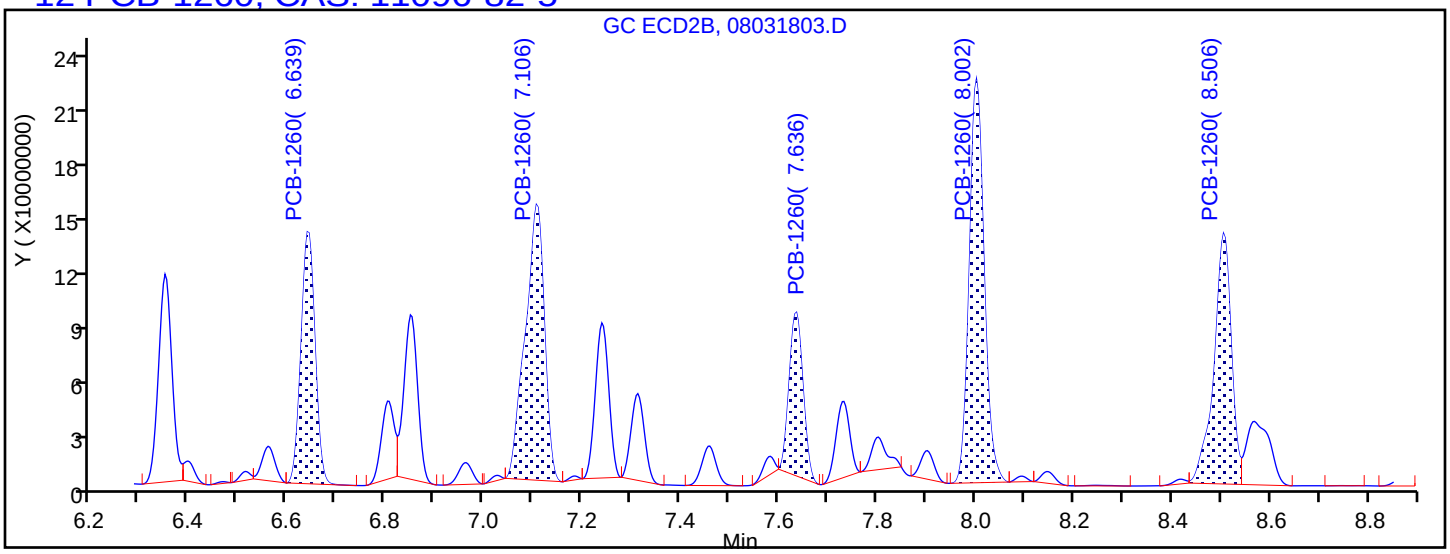
Operator ID: JAX ALS Bottle#: 3 Worklist Smp#: 3

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

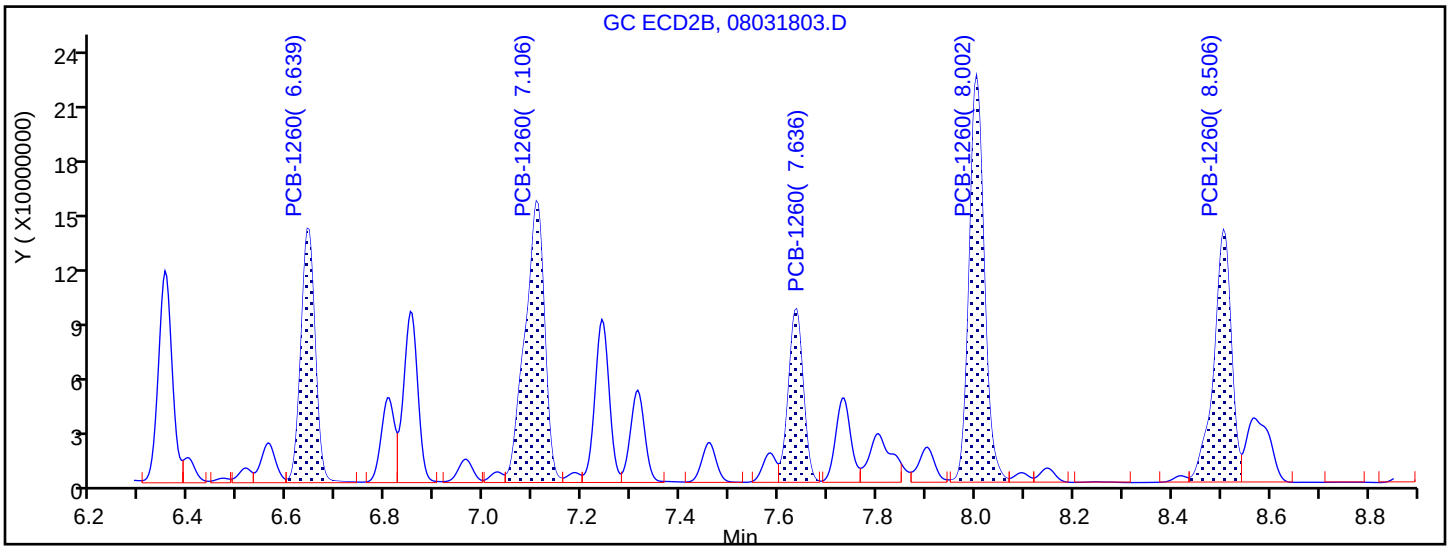
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

12 PCB-1260, CAS: 11096-82-5



Processing Integration Results

6.639	Response = 259679731
7.106	Response = 387687116
7.636	Response = 167501368
8.002	Response = 442053032
8.506	Response = 322068495



Manual Integration Results

6.639	Response = 268175370	M
7.106	Response = 409456759	M
7.636	Response = 190799881	M
8.002	Response = 453235755	M
8.506	Response = 327782217	M

Reviewer: jacksonto, 03-Aug-2018 12:01:54

Audit Action: Assigned New Baseline Audit Reason: Baseline Smoothing

FORM VII
PCBS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-424773/18 Calibration Date: 08/03/2018 16:46

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 17:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 19:15

Lab File ID: 08031818.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1221 Peak 1	Lin1		0.0889		0.523	0.500	4.5	20.0
PCB-1221 Peak 2	Lin1		0.0654		0.551	0.500	10.1	20.0
PCB-1221 Peak 3	Lin1		0.2237		0.530	0.500	6.1	20.0
PCB-1254 Peak 1	Lin1		0.4267		0.516	0.500	3.2	20.0
PCB-1254 Peak 2	Lin1		0.3493		0.518	0.500	3.6	20.0
PCB-1254 Peak 3	Lin1		0.6118		0.508	0.500	1.6	20.0
PCB-1254 Peak 4	Lin1		0.4208		0.517	0.500	3.4	20.0
PCB-1254 Peak 5	Lin1		0.6491		0.515	0.500	3.0	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-424773/18 Calibration Date: 08/03/2018 16:46

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 17:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 19:15

Lab File ID: 08031818.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1221 Peak 1	2.96	2.71	3.21
PCB-1221 Peak 2	3.10	2.85	3.35
PCB-1221 Peak 3	3.14	2.89	3.39
PCB-1254 Peak 1	5.28	5.03	5.53
PCB-1254 Peak 2	5.61	5.36	5.86
PCB-1254 Peak 3	5.76	5.51	6.01
PCB-1254 Peak 4	6.36	6.11	6.61
PCB-1254 Peak 5	6.73	6.48	6.98

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031818.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 03-Aug-2018 16:46:23 ALS Bottle#: 18 Worklist Smp#: 18
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCV 2154
Misc. Info.: 280-0072651-018
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 06-Aug-2018 11:11:09 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

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	1.822	1.822	0.000	3827789538	1000.0	1000.0	
2	1.745	1.746	-0.001	908389439	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.958	2.962	-0.004	170051438	500.0	522.7	
1	3.098	3.102	-0.004	125182189	500.0	550.6	
1	3.135	3.139	-0.004	428091895	500.0	530.3	
		Average of Peak Amounts =				534.5	
2	3.089	3.092	-0.003	53770341	500.0	543.1	
2	3.219	3.219	0.000	35568489	500.0	566.2	
2	3.272	3.272	0.000	118851327	500.0	536.6	
		Average of Peak Amounts =				548.6	
						RPD = 2.61	
9 PCB-1254							
1	5.278	5.282	-0.004	816641340	500.0	516.0	
1	5.608	5.612	-0.004	668443696	500.0	518.0	
1	5.758	5.762	-0.004	1170920919	500.0	508.1	
1	6.358	6.362	-0.004	805317626	500.0	517.1	
1	6.725	6.728	-0.003	1242381491	500.0	514.8	
		Average of Peak Amounts =				514.8	
2	5.522	5.525	-0.003	205386867	500.0	520.2	
2	5.942	5.945	-0.003	153754850	500.0	517.3	
2	6.092	6.092	0.000	292412609	500.0	521.9	
2	6.639	6.642	-0.003	121728909	500.0	520.2	
2	7.109	7.112	-0.003	300949095	500.0	517.7	
		Average of Peak Amounts =				519.4	
						RPD = 0.89	

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						1049.3	
2						1068.1	
						RPD = 1.77	

Reagents:

AR_2154_L5_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

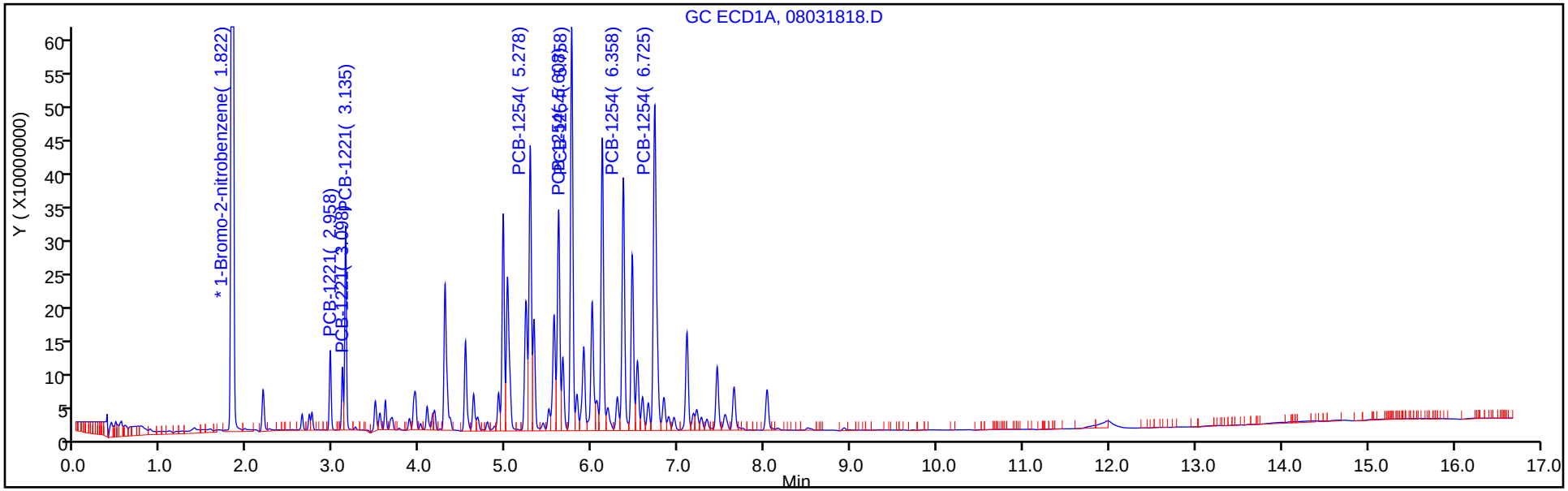
Report Date: 06-Aug-2018 11:11:10 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

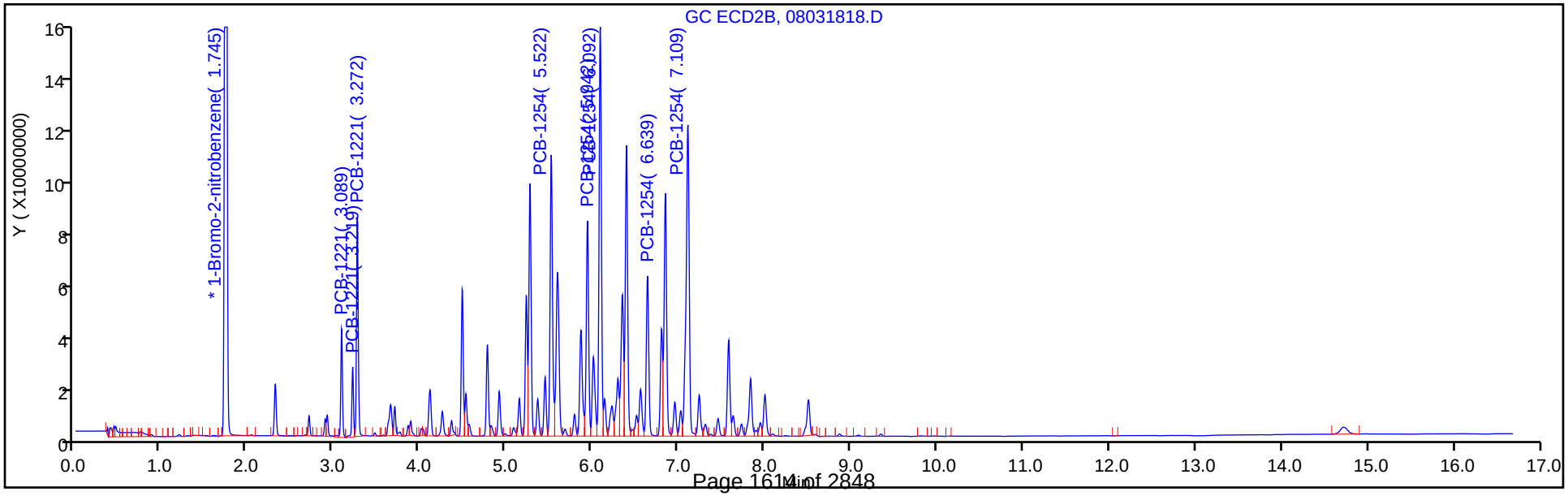
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031818.D

Injection Date:	03-Aug-2018 16:46:23	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	CCV			Worklist Smp#:	18
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	18
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-424773/18 Calibration Date: 08/03/2018 16:46

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 17:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 19:15

Lab File ID: 08031818.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1221 Peak 1	Lin1		0.1184		0.543	0.500	8.6	20.0
PCB-1221 Peak 2	Lin1		0.0783		0.566	0.500	13.2	20.0
PCB-1221 Peak 3	Lin1		0.2617		0.537	0.500	7.3	20.0
PCB-1254 Peak 1	Lin1		0.4522		0.520	0.500	4.0	20.0
PCB-1254 Peak 2	Lin1		0.3385		0.517	0.500	3.5	20.0
PCB-1254 Peak 3	Lin1		0.6438		0.522	0.500	4.4	20.0
PCB-1254 Peak 4	Lin1		0.2680		0.520	0.500	4.0	20.0
PCB-1254 Peak 5	Lin1		0.6626		0.518	0.500	3.5	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-424773/18 Calibration Date: 08/03/2018 16:46

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 17:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 19:15

Lab File ID: 08031818.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1221 Peak 1	3.09	2.84	3.34
PCB-1221 Peak 2	3.22	2.97	3.47
PCB-1221 Peak 3	3.27	3.02	3.52
PCB-1254 Peak 1	5.52	5.28	5.78
PCB-1254 Peak 2	5.94	5.70	6.20
PCB-1254 Peak 3	6.09	5.84	6.34
PCB-1254 Peak 4	6.64	6.39	6.89
PCB-1254 Peak 5	7.11	6.86	7.36

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031818.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 03-Aug-2018 16:46:23 ALS Bottle#: 18 Worklist Smp#: 18
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCV 2154
Misc. Info.: 280-0072651-018
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 06-Aug-2018 11:11:09 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

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	1.822	1.822	0.000	3827789538	1000.0	1000.0	
2	1.745	1.746	-0.001	908389439	1000.0	1000.0	
						RPD = 0.00	
3 PCB-1221							
1	2.958	2.962	-0.004	170051438	500.0	522.7	
1	3.098	3.102	-0.004	125182189	500.0	550.6	
1	3.135	3.139	-0.004	428091895	500.0	530.3	
		Average of Peak Amounts =				534.5	
2	3.089	3.092	-0.003	53770341	500.0	543.1	
2	3.219	3.219	0.000	35568489	500.0	566.2	
2	3.272	3.272	0.000	118851327	500.0	536.6	
		Average of Peak Amounts =				548.6	
						RPD = 2.61	
9 PCB-1254							
1	5.278	5.282	-0.004	816641340	500.0	516.0	
1	5.608	5.612	-0.004	668443696	500.0	518.0	
1	5.758	5.762	-0.004	1170920919	500.0	508.1	
1	6.358	6.362	-0.004	805317626	500.0	517.1	
1	6.725	6.728	-0.003	1242381491	500.0	514.8	
		Average of Peak Amounts =				514.8	
2	5.522	5.525	-0.003	205386867	500.0	520.2	
2	5.942	5.945	-0.003	153754850	500.0	517.3	
2	6.092	6.092	0.000	292412609	500.0	521.9	
2	6.639	6.642	-0.003	121728909	500.0	520.2	
2	7.109	7.112	-0.003	300949095	500.0	517.7	
		Average of Peak Amounts =				519.4	
						RPD = 0.89	

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						1049.3	
2						1068.1	
						RPD = 1.77	

Reagents:

AR_2154_L5_00020	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

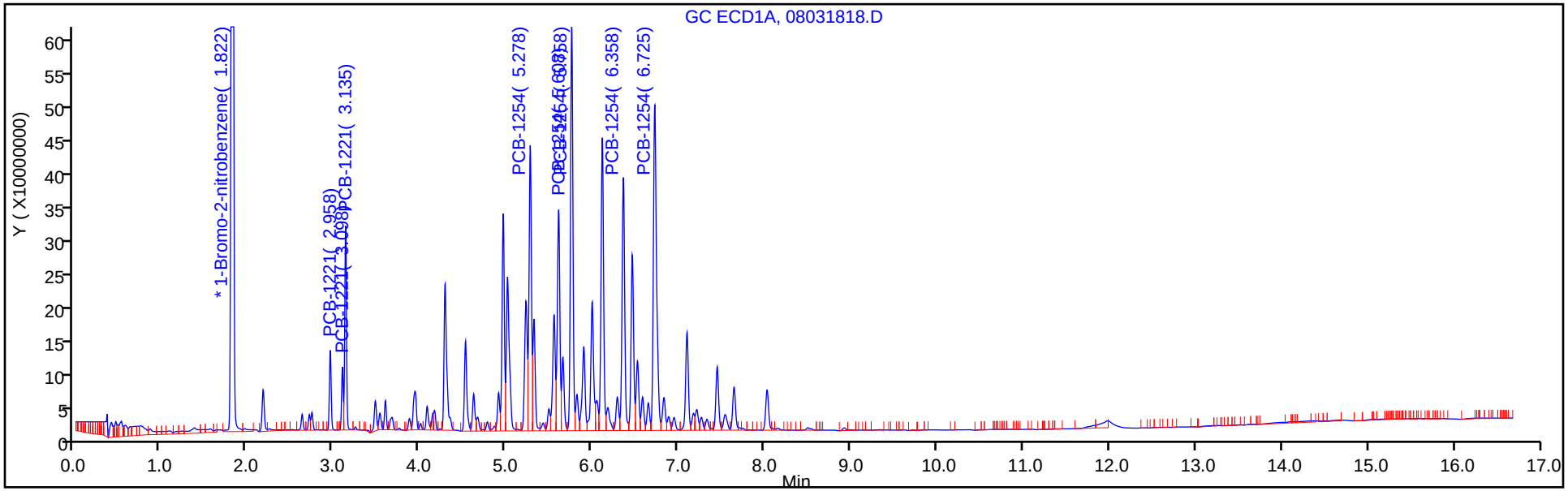
Report Date: 06-Aug-2018 11:11:10 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

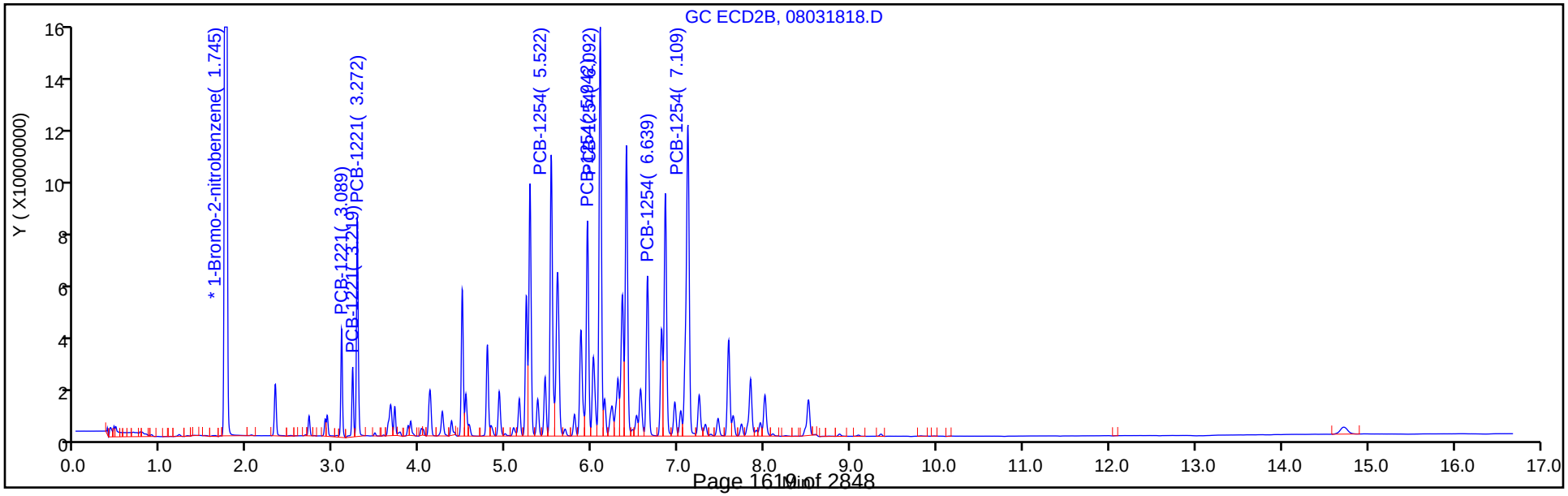
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031818.D

Injection Date:	03-Aug-2018 16:46:23	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	CCV			Worklist Smp#:	18
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	18
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-424773/19 Calibration Date: 08/03/2018 17:08

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 08031819.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin1		0.3150		0.522	0.500	4.4	20.0
PCB-1016 Peak 2	Lin1		0.7335		0.520	0.500	3.9	20.0
PCB-1016 Peak 3	Lin1		0.3129		0.516	0.500	3.2	20.0
PCB-1016 Peak 4	Lin1		0.2996		0.508	0.500	1.6	20.0
PCB-1016 Peak 5	Lin1		0.3196		0.517	0.500	3.3	20.0
PCB-1260 Peak 1	Lin1		0.4760		0.533	0.500	6.7	20.0
PCB-1260 Peak 2	Lin1		0.9353		0.539	0.500	7.9	20.0
PCB-1260 Peak 3	Lin1		0.4511		0.540	0.500	7.9	20.0
PCB-1260 Peak 4	Lin1		1.052		0.538	0.500	7.5	20.0
PCB-1260 Peak 5	Lin1		0.5724		0.538	0.500	7.7	20.0
Tetrachloro-m-xylene	Lin1		10.10		0.0254	0.0250	1.5	20.0
DCB Decachlorobiphenyl	Lin1		12.48		0.0263	0.0250	5.3	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-424773/19 Calibration Date: 08/03/2018 17:08

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 08031819.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.48	3.23	3.73
PCB-1016 Peak 2	3.95	3.70	4.20
PCB-1016 Peak 3	4.08	3.83	4.33
PCB-1016 Peak 4	4.29	4.04	4.54
PCB-1016 Peak 5	4.53	4.28	4.78
PCB-1260 Peak 1	6.00	5.75	6.25
PCB-1260 Peak 2	6.73	6.48	6.98
PCB-1260 Peak 3	7.21	6.96	7.46
PCB-1260 Peak 4	7.65	7.40	7.90
PCB-1260 Peak 5	8.03	7.78	8.28
Tetrachloro-m-xylene	2.75	2.50	3.00
DCB Decachlorobiphenyl	9.61	9.36	9.86

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031819.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 03-Aug-2018 17:08:17 ALS Bottle#: 19 Worklist Smp#: 19
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCV
Misc. Info.: 280-0072651-019
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:34:13 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

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	1.821	1.822	-0.001	3914495367	1000.0	1000.0	
2	1.745	1.746	-0.001	925137776	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.749	-0.001	988837170	25.0	25.4	
2	2.775	2.776	-0.001	258315773	25.0	25.8	
						RPD = 1.54	
1 PCB-1016							
1	3.481	3.482	-0.001	616620444	500.0	522.2	
1	3.945	3.946	-0.001	1435553127	500.0	519.7	
1	4.081	4.082	-0.001	612450193	500.0	516.0	
1	4.291	4.292	-0.001	586358177	500.0	508.1	
1	4.528	4.529	-0.001	625469928	500.0	516.7	
		Average of Peak Amounts =				516.5	
2	3.658	3.659	-0.001	161857126	500.0	518.7	
2	4.115	4.116	-0.001	367691480	500.0	512.8	
2	4.258	4.259	-0.001	148424463	500.0	504.2	
2	4.492	4.489	0.003	80360019	500.0	524.6	
2	4.782	4.782	0.000	115443143	500.0	508.7	
		Average of Peak Amounts =				513.8	
						RPD = 0.54	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	5.998	5.999	-0.001	931736024	500.0	533.5	
1	6.725	6.726	-0.001	1830602846	500.0	539.4	
1	7.211	7.212	-0.001	883000257	500.0	539.6	
1	7.645	7.646	-0.001	2058248293	500.0	537.6	
1	8.028	8.029	-0.001	1120389632	500.0	538.4	
		Average of Peak Amounts =				537.7	
2	6.638	6.639	-0.001	281786209	500.0	535.5	
2	7.105	7.106	-0.001	433414857	500.0	537.5	
2	7.635	7.636	-0.001	194296287	500.0	525.4	
2	8.002	8.002	0.000	467438991	500.0	524.5	
2	8.505	8.506	-0.001	348333638	500.0	536.9	
		Average of Peak Amounts =				531.9	
						RPD = 1.08	
$ 15 DCB Decachlorobiphenyl							
1	9.605	9.606	-0.001	1220951115	25.0	26.3	
2	10.172	10.176	-0.004	221654549	25.0	26.3	
						RPD = 0.29	
S 8 Polychlorinated biphenyls, Total							
1						1054.3	
2						1045.7	
						RPD = 0.81	
19 1260 Res 1							
1	8.028	8.029	-0.001	1120389632	NR	NR	
16 1260 Res 2							
1	8.088	8.089	-0.001	395703690	NR	NR	
18 1260 Res 3							
1	8.148	8.149	-0.001	547275071	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

AR_1660_L5_00064	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

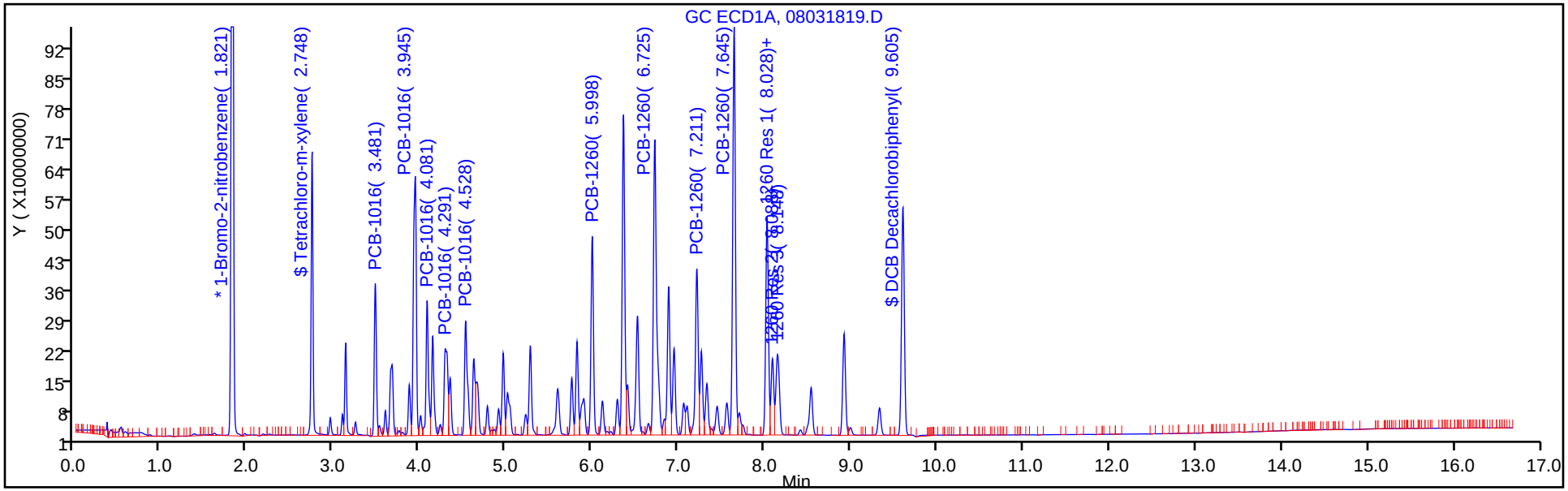
Report Date: 04-Aug-2018 07:34:13 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

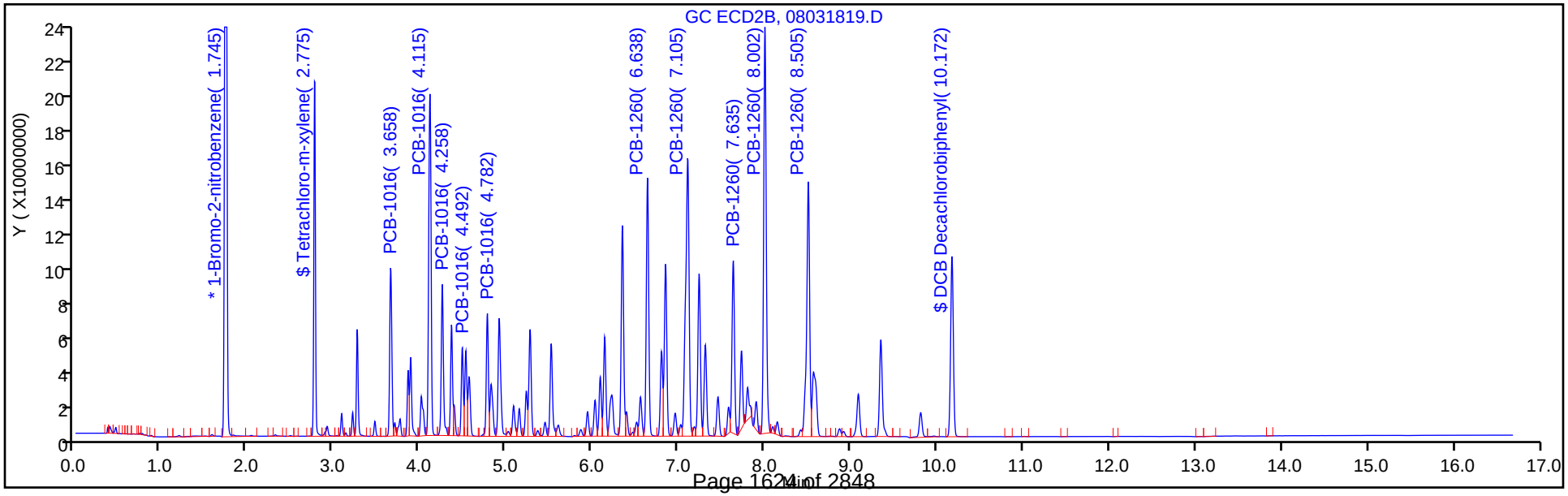
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031819.D

Injection Date:	03-Aug-2018 17:08:17	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	CCV			Worklist Smp#:	19
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	19
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-424773/19 Calibration Date: 08/03/2018 17:08

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 08031819.D Conc. Units: ug/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-1016 Peak 1	Lin1		0.3499		0.519	0.500	3.7	20.0
PCB-1016 Peak 2	Lin1		0.7949		0.513	0.500	2.6	20.0
PCB-1016 Peak 3	Lin1		0.3209		0.504	0.500	0.8	20.0
PCB-1016 Peak 4	Lin1		0.1737		0.525	0.500	4.9	20.0
PCB-1016 Peak 5	Lin1		0.2496		0.509	0.500	1.7	20.0
PCB-1260 Peak 1	Lin1		0.6092		0.536	0.500	7.1	20.0
PCB-1260 Peak 2	Lin1		0.9370		0.537	0.500	7.5	20.0
PCB-1260 Peak 3	Lin1		0.4200		0.525	0.500	5.1	20.0
PCB-1260 Peak 4	Lin1		1.011		0.524	0.500	4.9	20.0
PCB-1260 Peak 5	Lin1		0.7530		0.537	0.500	7.4	20.0
Tetrachloro-m-xylene	Lin1		11.17		0.0258	0.0250	3.0	20.0
DCB Decachlorobiphenyl	Lin1		9.584		0.0263	0.0250	5.0	20.0

FORM VII
PCBS CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-424773/19 Calibration Date: 08/03/2018 17:08

Instrument ID: SGC_P3 Calib Start Date: 07/26/2018 19:37

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 07/26/2018 21:48

Lab File ID: 08031819.D

Analyte	RT	RT WINDOW	
		FROM	TO
PCB-1016 Peak 1	3.66	3.41	3.91
PCB-1016 Peak 2	4.12	3.87	4.37
PCB-1016 Peak 3	4.26	4.01	4.51
PCB-1016 Peak 4	4.49	4.24	4.74
PCB-1016 Peak 5	4.78	4.53	5.03
PCB-1260 Peak 1	6.64	6.39	6.89
PCB-1260 Peak 2	7.11	6.86	7.36
PCB-1260 Peak 3	7.64	7.39	7.89
PCB-1260 Peak 4	8.00	7.75	8.25
PCB-1260 Peak 5	8.51	8.26	8.76
Tetrachloro-m-xylene	2.78	2.53	3.03
DCB Decachlorobiphenyl	10.17	9.93	10.43

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031819.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 03-Aug-2018 17:08:17 ALS Bottle#: 19 Worklist Smp#: 19
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCV
Misc. Info.: 280-0072651-019
Operator ID: JAX Instrument ID: SGC_P3
Sublist: chrom-PCB_P3*sub1

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:34:13 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

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	1.821	1.822	-0.001	3914495367	1000.0	1000.0	
2	1.745	1.746	-0.001	925137776	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.749	-0.001	988837170	25.0	25.4	
2	2.775	2.776	-0.001	258315773	25.0	25.8	
						RPD = 1.54	
1 PCB-1016							
1	3.481	3.482	-0.001	616620444	500.0	522.2	
1	3.945	3.946	-0.001	1435553127	500.0	519.7	
1	4.081	4.082	-0.001	612450193	500.0	516.0	
1	4.291	4.292	-0.001	586358177	500.0	508.1	
1	4.528	4.529	-0.001	625469928	500.0	516.7	
		Average of Peak Amounts =				516.5	
2	3.658	3.659	-0.001	161857126	500.0	518.7	
2	4.115	4.116	-0.001	367691480	500.0	512.8	
2	4.258	4.259	-0.001	148424463	500.0	504.2	
2	4.492	4.489	0.003	80360019	500.0	524.6	
2	4.782	4.782	0.000	115443143	500.0	508.7	
		Average of Peak Amounts =				513.8	
						RPD = 0.54	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	5.998	5.999	-0.001	931736024	500.0	533.5	
1	6.725	6.726	-0.001	1830602846	500.0	539.4	
1	7.211	7.212	-0.001	883000257	500.0	539.6	
1	7.645	7.646	-0.001	2058248293	500.0	537.6	
1	8.028	8.029	-0.001	1120389632	500.0	538.4	
		Average of Peak Amounts =				537.7	
2	6.638	6.639	-0.001	281786209	500.0	535.5	
2	7.105	7.106	-0.001	433414857	500.0	537.5	
2	7.635	7.636	-0.001	194296287	500.0	525.4	
2	8.002	8.002	0.000	467438991	500.0	524.5	
2	8.505	8.506	-0.001	348333638	500.0	536.9	
		Average of Peak Amounts =				531.9	
						RPD = 1.08	
$ 15 DCB Decachlorobiphenyl							
1	9.605	9.606	-0.001	1220951115	25.0	26.3	
2	10.172	10.176	-0.004	221654549	25.0	26.3	
						RPD = 0.29	
S 8 Polychlorinated biphenyls, Total							
1						1054.3	
2						1045.7	
						RPD = 0.81	
19 1260 Res 1							
1	8.028	8.029	-0.001	1120389632	NR	NR	
16 1260 Res 2							
1	8.088	8.089	-0.001	395703690	NR	NR	
18 1260 Res 3							
1	8.148	8.149	-0.001	547275071	NR	NR	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Reagents:

AR_1660_L5_00064	Amount Added:	1.00	Units: mL	
BNB IS_00012	Amount Added:	1.00	Units: mL	Run Reagent

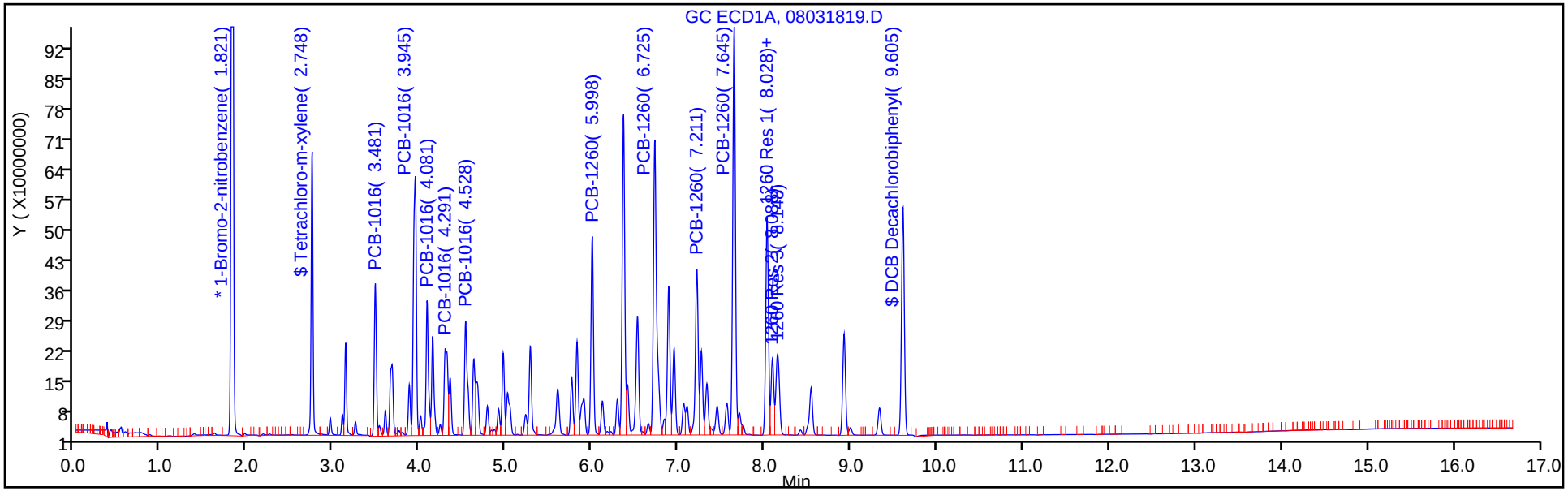
Report Date: 04-Aug-2018 07:34:14 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

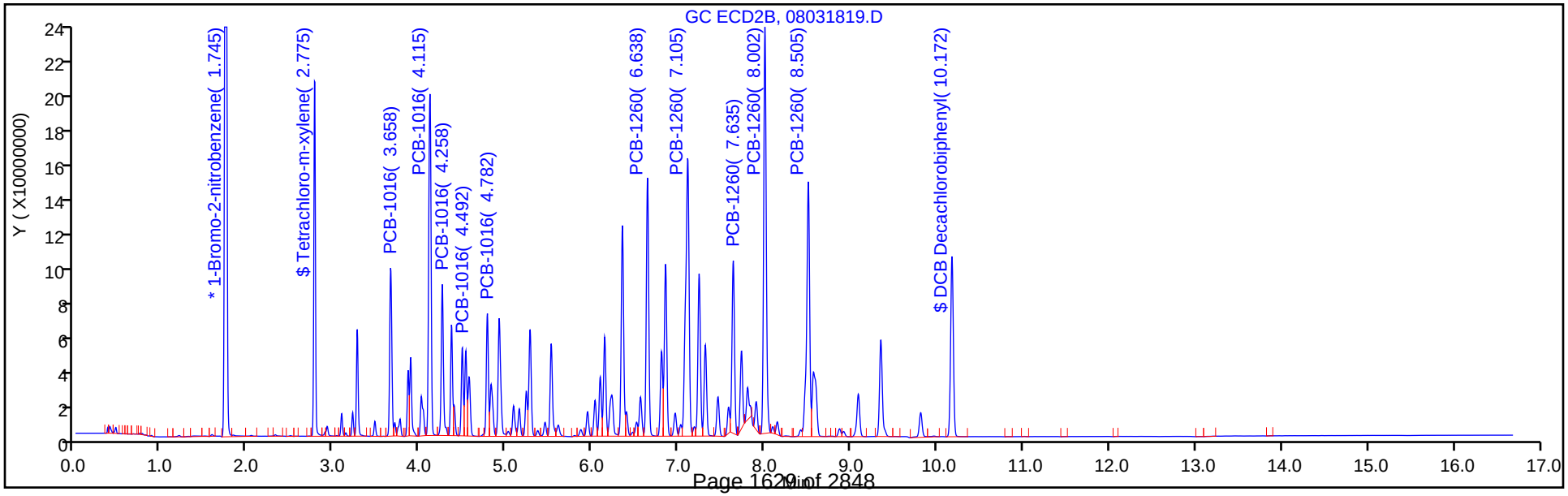
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031819.D

Injection Date:	03-Aug-2018 17:08:17	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	CCV			Worklist Smp#:	19
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	19
Method:	PCB_P3	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.: 160-29498-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 280-423389/1-A

Matrix: Solid | Lab File ID: 08031804.D

Analysis Method: 8082A | Date Collected:

Extraction Method: 3546 | Date Extracted: 07/24/2018 08:50

Sample wt/vol: 16.2(g) | Date Analyzed: 08/03/2018 11:39

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.: 424773 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
11104-28-2	PCB-1221	29	U	87	29
12674-11-2	PCB-1016	9.4	U	61	9.4
11141-16-5	PCB-1232	9.4	U	61	9.4
53469-21-9	PCB-1242	17	U	61	17
12672-29-6	PCB-1248	10	U	61	10
11097-69-1	PCB-1254	10	U	61	10
11096-82-5	PCB-1260	4.9	U	61	4.9
37324-23-5	PCB-1262	21	U	61	21
11100-14-4	PCB-1268	7.3	U	61	7.3
1336-36-3	Polychlorinated biphenyls, Total	4.9	U	61	4.9

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	78		53-128
2051-24-3	DCB Decachlorobiphenyl	82		59-130

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031804.D
Lims ID: MB 280-423389/1-A
Client ID:
Sample Type: MB
Inject. Date: 03-Aug-2018 11:39:56 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: MB 280-423389/1-
Misc. Info.: 280-0072651-004
Operator ID: JAX Instrument ID: SGC_P3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:33:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

First Level Reviewer: jacksonto Date: 03-Aug-2018 12:02:32

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	1.821	1.822	-0.001	4144081052	1000.0	1000.0	
2	1.745	1.746	-0.001	923798752	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.749	-0.001	673687378	20.0	16.2	
2	2.775	2.776	-0.001	156279578	20.0	15.6	
						RPD = 3.86	
3 PCB-1221							U
1		2.962				ND	
1		3.102					
1		3.139					
2		3.092					
2		3.219					
2		3.272					

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
7	PCB-1232						U
1		3.137				ND	
1		3.481					
1		3.944					
1		4.084					
1		4.531					
2		3.271					
2		3.661					
2		4.117					
2		4.261					
2		4.784					
1	PCB-1016						U
1		3.482				ND	
1		3.946					
1		4.082					
1		4.292					
1		4.529					
2		3.659					
2		4.116					
2		4.259					
2		4.489					
2		4.782					
10	PCB-1242						U
1		3.482				ND	
1		3.946					
1		4.529					
1		5.016					
1		5.042					
2		3.659					
2		4.116					
2		4.259					
2		4.783					
2		4.919					
4	PCB-1248						U
1		3.943				ND	
1		4.296					
1		4.533					
1		5.279					
1		5.763					
2		4.116					
2		4.493					
2		4.783					
2		4.923					
2		6.093					

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
9 PCB-1254							U
1		5.282				ND	
1		5.612					
1		5.762					
1		6.362					
1		6.728					
2		5.525					
2		5.945					
2		6.092					
2		6.642					
2		7.112					
12 PCB-1260							U
1		5.999				ND	
1		6.726					
1		7.212					
1		7.646					
1		8.029					
2		6.639					
2		7.106					
2		7.636					
2		8.002					
2		8.506					
5 PCB-1262							U
1		6.364				ND	
1		6.887					
1		7.214					
1		7.647					
1		8.031					
2		6.641					
2		7.241					
2		7.637					
2		8.004					
2		8.507					
13 PCB-1268							U
1		8.092				ND	
1		8.146					
1		8.416					
1		8.922					
1		9.336					
2		8.503					
2		8.566					
2		8.919					
2		9.349					
2		9.813					
$ 15 DCB Decachlorobiphenyl							
1	9.605	9.606	-0.001	823786659	20.0	16.7	
2	10.175	10.176	-0.001	139178799	20.0	16.3	
						RPD = 2.35	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
2 PCB-5460							U
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							U
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							U
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_00012 Amount Added: 1.00 Units: mL Run Reagent

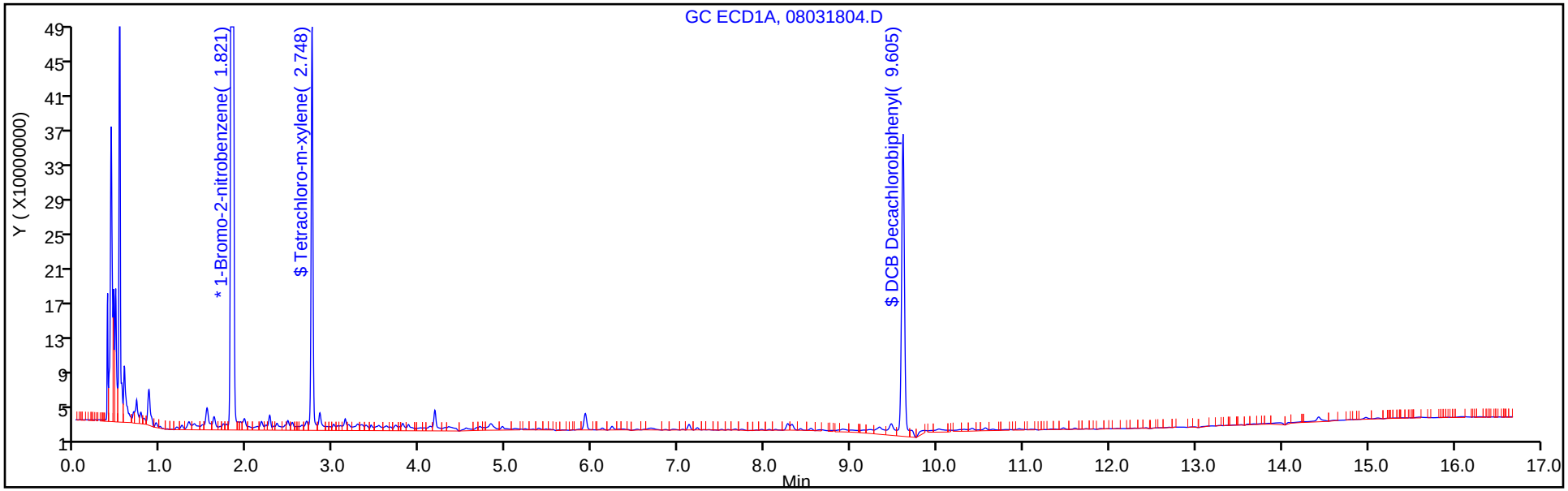
Report Date: 04-Aug-2018 07:33:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

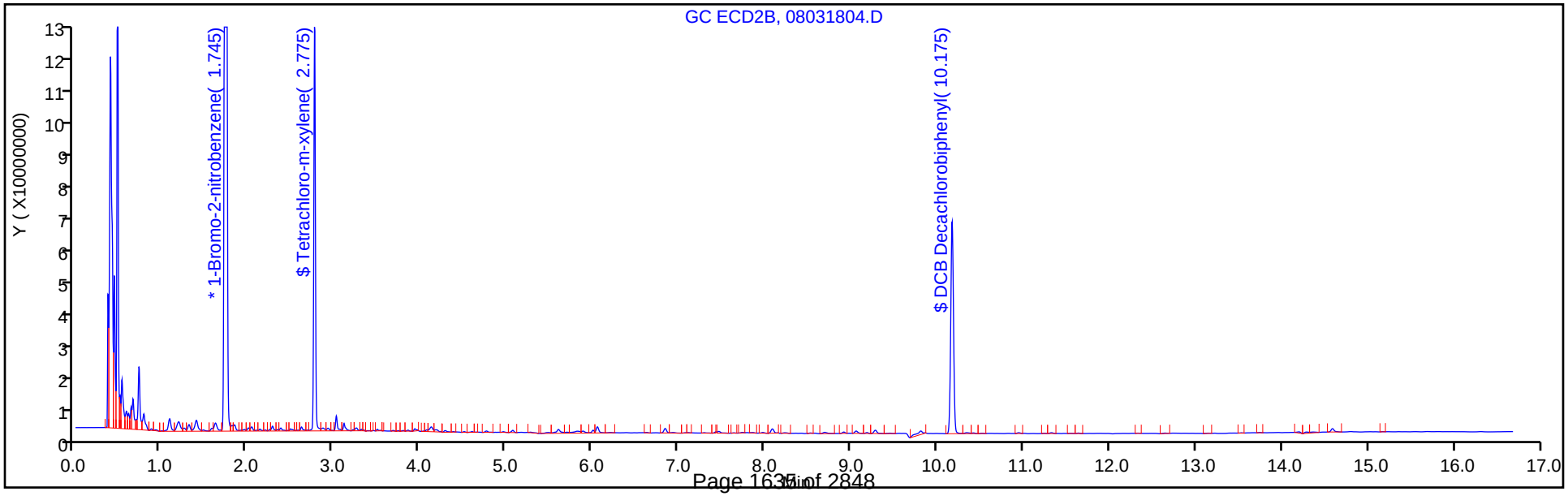
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031804.D

Injection Date:	03-Aug-2018 11:39:56	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	MB 280-423389/1-A			Worklist Smp#:	4
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	4
Method:	PCB_P3	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_P3\20180803-72651.b\08031804.D
Lims ID: MB 280-423389/1-A
Client ID:
Sample Type: MB
Inject. Date: 03-Aug-2018 11:39:56 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: MB 280-423389/1-
Misc. Info.: 280-0072651-004
Operator ID: JAX Instrument ID: SGC_P3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:33:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

First Level Reviewer: jacksonto Date: 03-Aug-2018 12:02:32

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	16.2	81.05
$ 15 DCB Decachlorobiphenyl	20.0	16.7	83.67

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	15.6	77.99
$ 15 DCB Decachlorobiphenyl	20.0	16.3	81.73

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 280-423389/2-A

Matrix: Solid | Lab File ID: 08031805.D

Analysis Method: 8082A | Date Collected:

Extraction Method: 3546 | Date Extracted: 07/24/2018 08:50

Sample wt/vol: 16.7(g) | Date Analyzed: 08/03/2018 12:01

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.: 424773 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	104		59	9.2
11096-82-5	PCB-1260	109		59	4.8

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	83		53-128
2051-24-3	DCB Decachlorobiphenyl	87		59-130

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031805.D
Lims ID: LCS 280-423389/2-A
Client ID:
Sample Type: LCS
Inject. Date: 03-Aug-2018 12:01:50 ALS Bottle#: 5 Worklist Smp#: 5
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: LCS 280-423389/2
Misc. Info.: 280-0072651-005
Operator ID: JAX Instrument ID: SGC_P3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:33:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

First Level Reviewer: jacksonto Date: 03-Aug-2018 13:25:11

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	1.821	1.822	-0.001	4060115566	1000.0	1000.0	
2	1.745	1.746	-0.001	941439872	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.749	-0.001	663264345	20.0	16.3	
2	2.775	2.776	-0.001	169798234	20.0	16.6	
						RPD = 2.06	
1 PCB-1016							
1	3.481	3.482	-0.001	212653659	200.0	160.5	
1	3.945	3.946	-0.001	495962822	200.0	169.3	
1	4.081	4.082	-0.001	216393350	200.0	170.7	
1	4.295	4.292	0.003	213750359	200.0	170.9	
1	4.528	4.529	-0.001	214273754	200.0	163.2	
		Average of Peak Amounts =				166.9	
2	3.658	3.659	-0.001	59463912	200.0	180.5	
2	4.115	4.116	-0.001	135023707	200.0	182.1	
2	4.258	4.259	-0.001	49634553	200.0	160.2	
2	4.488	4.489	-0.001	27938418	200.0	172.0	
2	4.781	4.782	-0.001	41406694	200.0	172.0	
		Average of Peak Amounts =				173.4	
						RPD = 3.79	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	5.998	5.999	-0.001	324631818	200.0	173.5	
1	6.721	6.726	-0.005	575689507	200.0	160.3	
1	7.211	7.212	-0.001	320161745	200.0	183.7	
1	7.645	7.646	-0.001	738732534	200.0	185.0	
1	8.028	8.029	-0.001	380822688	200.0	174.1	
		Average of Peak Amounts =				175.3	
2	6.638	6.639	-0.001	96604116	200.0	176.4	
2	7.105	7.106	-0.001	139216126	200.0	166.3	
2	7.635	7.636	-0.001	75544093	200.0	196.9	
2	8.001	8.002	-0.001	173604234	200.0	189.3	
2	8.505	8.506	-0.001	121541670	200.0	180.9	
		Average of Peak Amounts =				181.9	
						RPD = 3.71	
$ 15 DCB Decachlorobiphenyl							
1	9.605	9.606	-0.001	885503720	20.0	18.4	
2	10.175	10.176	-0.001	149931221	20.0	17.3	
						RPD = 5.99	

Reagents:

BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

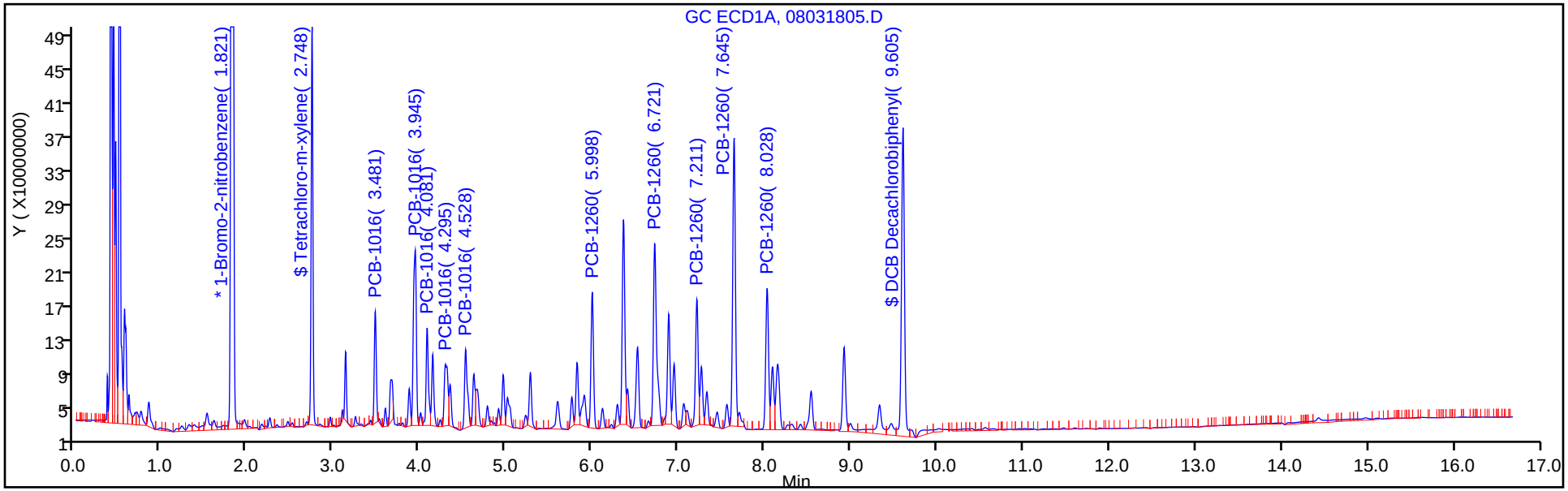
Report Date: 04-Aug-2018 07:33:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

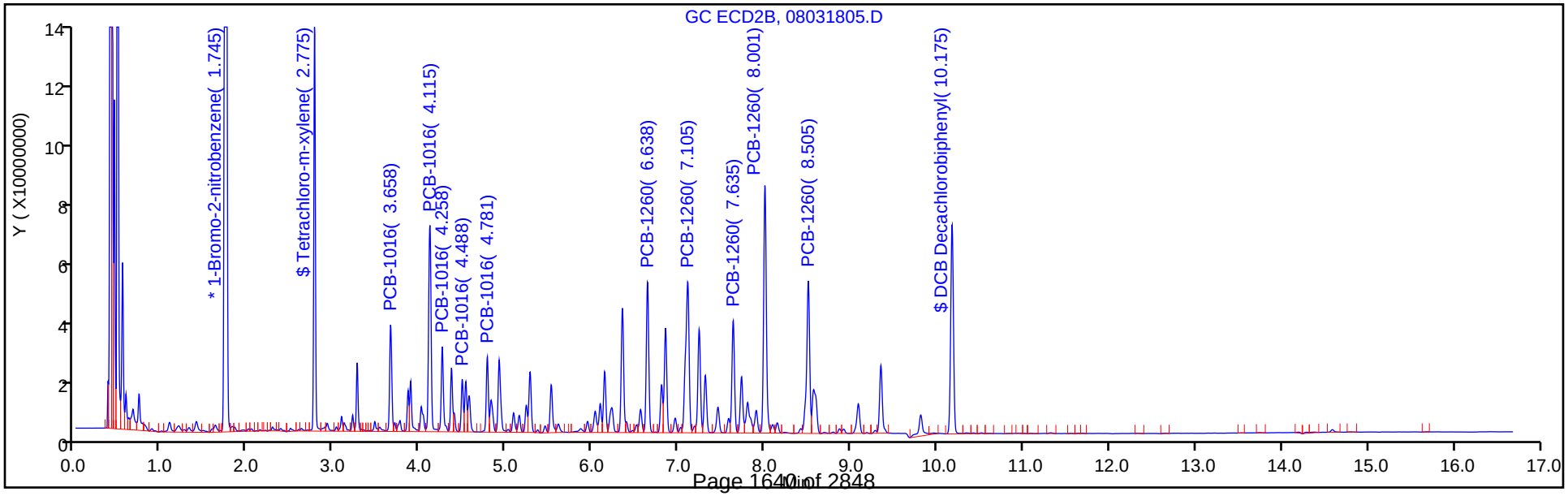
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031805.D

Injection Date:	03-Aug-2018 12:01:50	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	LCS 280-423389/2-A			Worklist Smp#:	5
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	5
Method:	PCB_P3	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_P3\20180803-72651.b\08031805.D				
Lims ID:	LCS 280-423389/2-A				
Client ID:					
Sample Type:	LCS				
Inject. Date:	03-Aug-2018 12:01:50	ALS Bottle#:	5	Worklist Smp#:	5
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	LCS 280-423389/2				
Misc. Info.:	280-0072651-005				
Operator ID:	JAX	Instrument ID:	SGC_P3		
Method:	\\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m				
Limit Group:	GCSV - 8082 - IS				
Last Update:	04-Aug-2018 07:33:29	Calib Date:	27-Jul-2018 02:54:25		
Integrator:	Falcon				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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:	CTX0302				
First Level Reviewer: jacksonto		Date:	03-Aug-2018 13:25:11		

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	16.3	81.46
$ 15 DCB Decachlorobiphenyl	20.0	18.4	91.86

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	16.6	83.15
$ 15 DCB Decachlorobiphenyl	20.0	17.3	86.52

Report Date: 04-Aug-2018 07:33:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031805.D

Injection Date: 03-Aug-2018 12:01:50 Instrument ID: SGC_P3

Lims ID: LCS 280-423389/2-A

Client ID:

Operator ID: JAX ALS Bottle#: 5 Worklist Smp#: 5

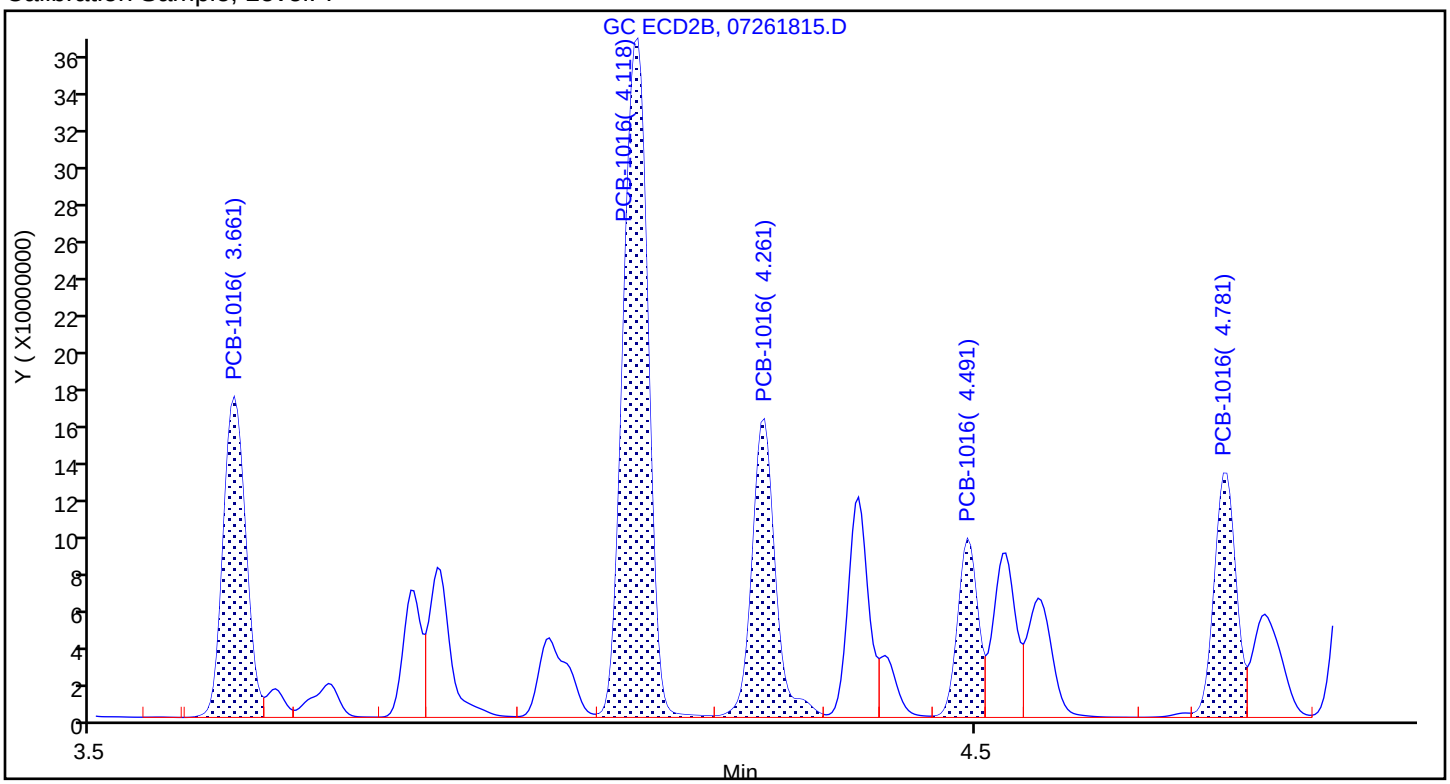
Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

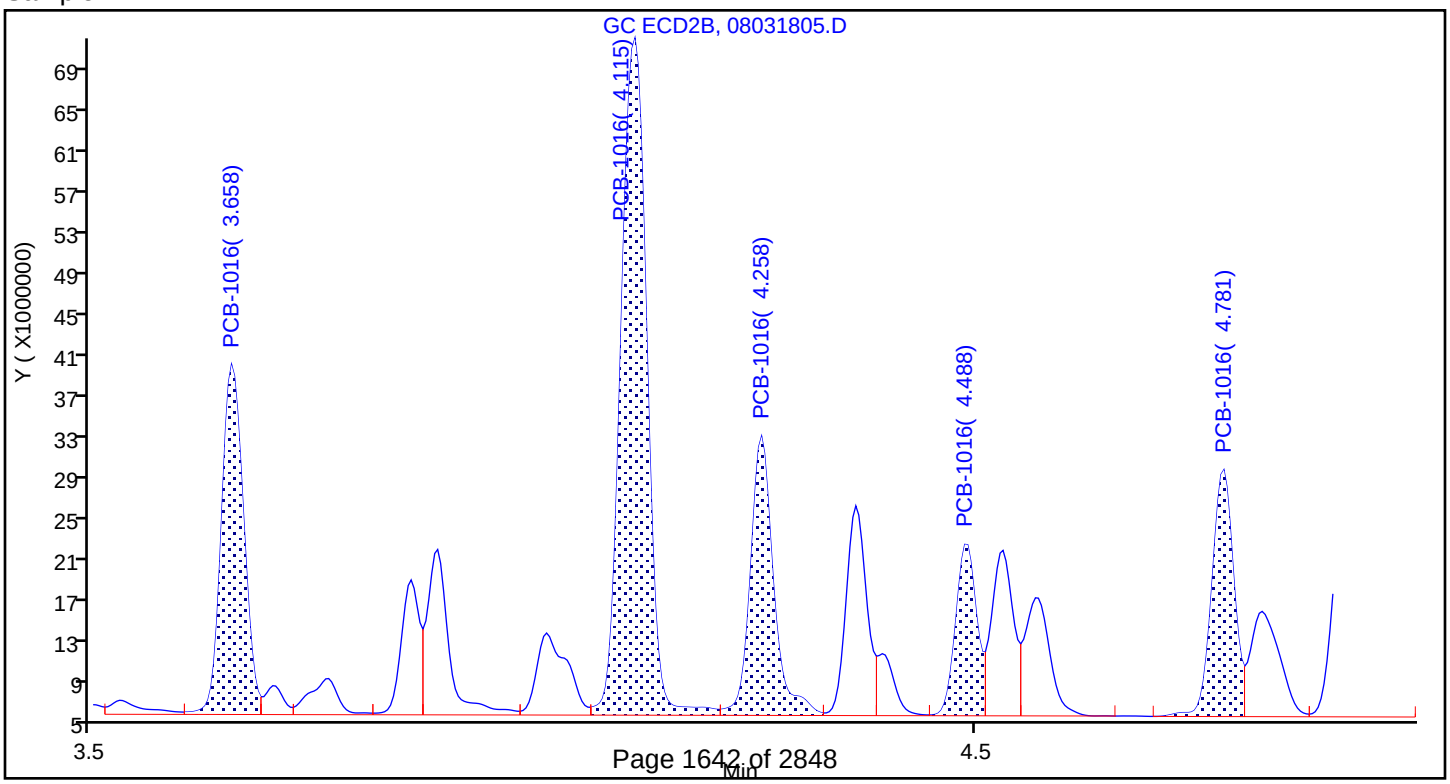
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

1 PCB-1016, CAS: 12674-11-2

Calibration Sample, Level: 7



Sample



Report Date: 04-Aug-2018 07:33:39 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031805.D

Injection Date: 03-Aug-2018 12:01:50 Instrument ID: SGC_P3

Lims ID: LCS 280-423389/2-A

Client ID:

Operator ID: JAX ALS Bottle#: 5 Worklist Smp#: 5

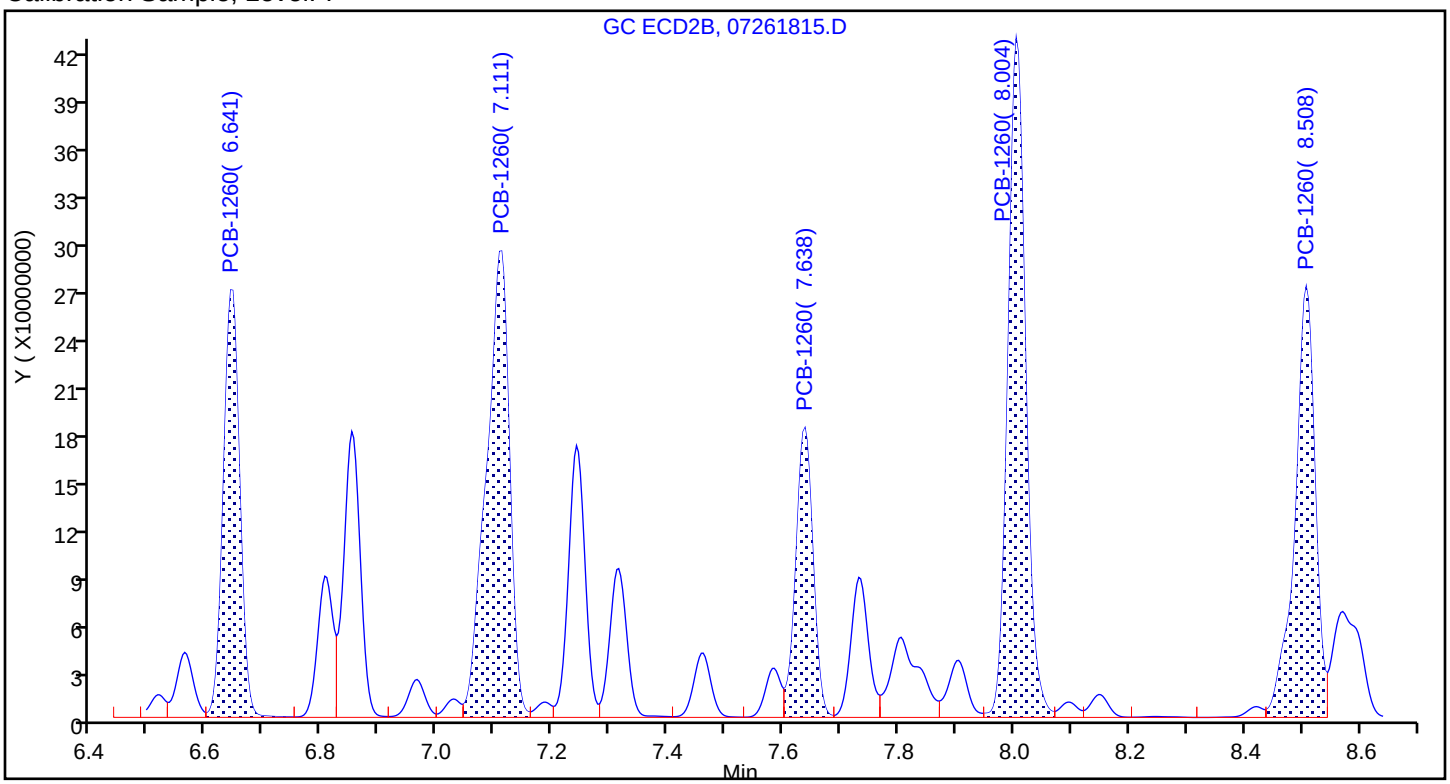
Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

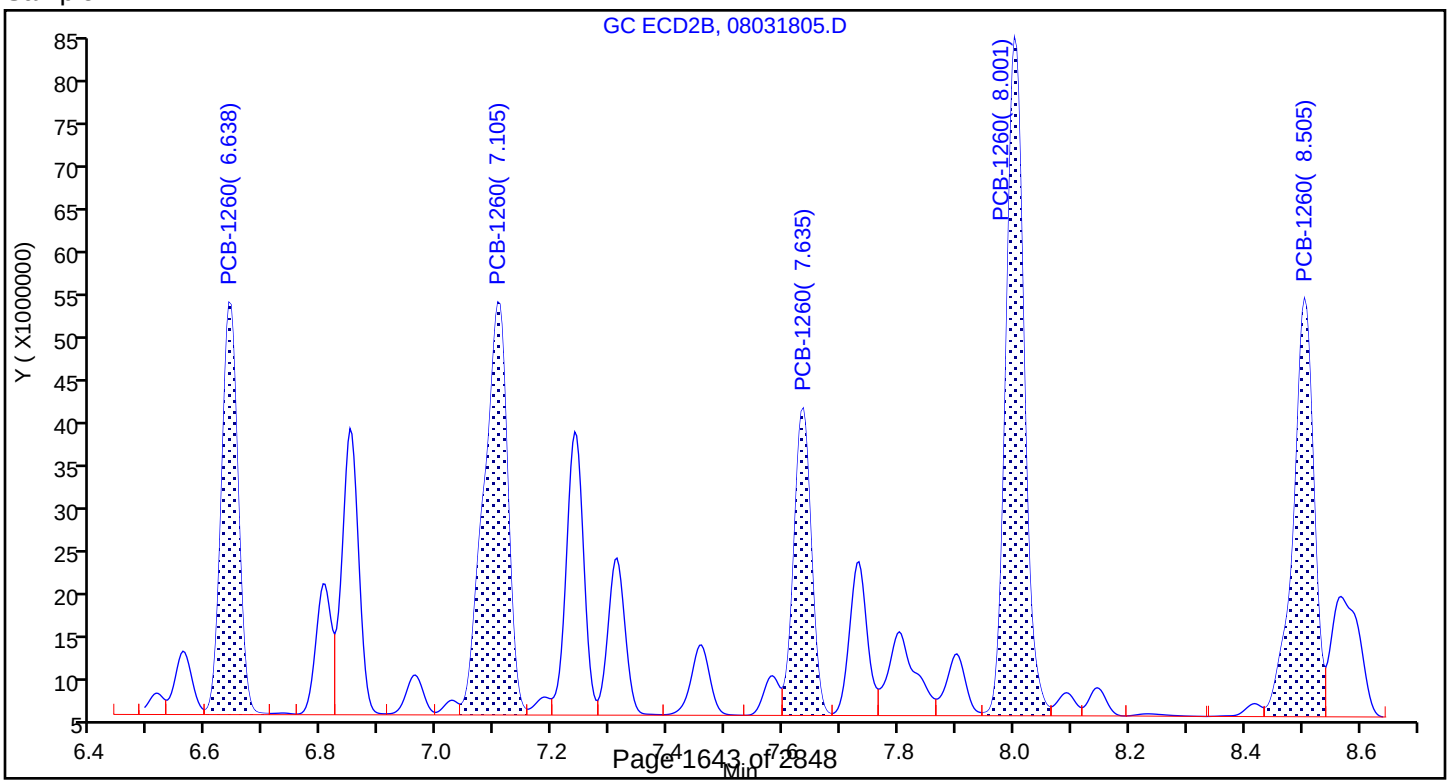
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

12 PCB-1260, CAS: 11096-82-5

Calibration Sample, Level: 7



Sample



FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: CRC-B21-0205 MS | Lab Sample ID: 160-29498-2 MS

Matrix: Solid | Lab File ID: 08031807.D

Analysis Method: 8082A | Date Collected: 07/12/2018 11:40

Extraction Method: 3546 | Date Extracted: 07/24/2018 08:50

Sample wt/vol: 15.8(g) | Date Analyzed: 08/03/2018 12:45

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: CLP2 ID: 0.32(mm)

% Moisture: 5.8 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 424773 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	102		67	10
11096-82-5	PCB-1260	103		67	5.3

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	76		53-128
2051-24-3	DCB Decachlorobiphenyl	78		59-130

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031807.D
Lims ID: 160-29498-B-2-B MS
Client ID:
Sample Type: MS
Inject. Date: 03-Aug-2018 12:45:39 ALS Bottle#: 7 Worklist Smp#: 7
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 160-29498-B-2-B
Misc. Info.: 280-0072651-007
Operator ID: JAX Instrument ID: SGC_P3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:33:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

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	1.821	1.822	-0.001	4013017494	1000.0	1000.0	
2	1.745	1.746	-0.001	923401512	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.748	2.749	-0.001	604773979	20.0	15.0	
2	2.775	2.776	-0.001	151439418	20.0	15.1	
						RPD = 0.76	
1 PCB-1016							
1	3.481	3.482	-0.001	204460331	200.0	155.6	
1	3.945	3.946	-0.001	445539594	200.0	153.3	
1	4.081	4.082	-0.001	201754705	200.0	160.6	
1	4.295	4.292	0.003	192411192	200.0	154.6	
1	4.528	4.529	-0.001	208615790	200.0	160.6	
		Average of Peak Amounts =				156.9	
2	3.658	3.659	-0.001	51380529	200.0	157.7	
2	4.115	4.116	-0.001	113541219	200.0	155.4	
2	4.258	4.259	-0.001	44548925	200.0	145.9	
2	4.491	4.489	0.002	24154778	200.0	150.3	
2	4.781	4.782	-0.001	35685974	200.0	149.8	
		Average of Peak Amounts =				151.8	
						RPD = 3.30	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	5.998	5.999	-0.001	293437192	200.0	157.9	
1	6.725	6.726	-0.001	506665139	200.0	142.2	
1	7.211	7.212	-0.001	285777334	200.0	165.2	
1	7.641	7.646	-0.005	590317811	200.0	149.2	
1	8.028	8.029	-0.001	268301946	200.0	123.1	
		Average of Peak Amounts =				147.5	
2	6.641	6.639	0.002	73897940	200.0	136.2	
2	7.108	7.106	0.002	118528524	200.0	143.7	
2	7.635	7.636	-0.001	64584811	200.0	170.8	
2	8.001	8.002	-0.001	143590964	200.0	159.1	
2	8.505	8.506	-0.001	103271420	200.0	156.0	
		Average of Peak Amounts =				153.2	
						RPD = 3.75	
$ 15 DCB Decachlorobiphenyl							
1	9.605	9.606	-0.001	669009553	20.0	14.0	
2	10.175	10.176	-0.001	132196655	20.0	15.5	
						RPD = 10.13	

Reagents:

BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

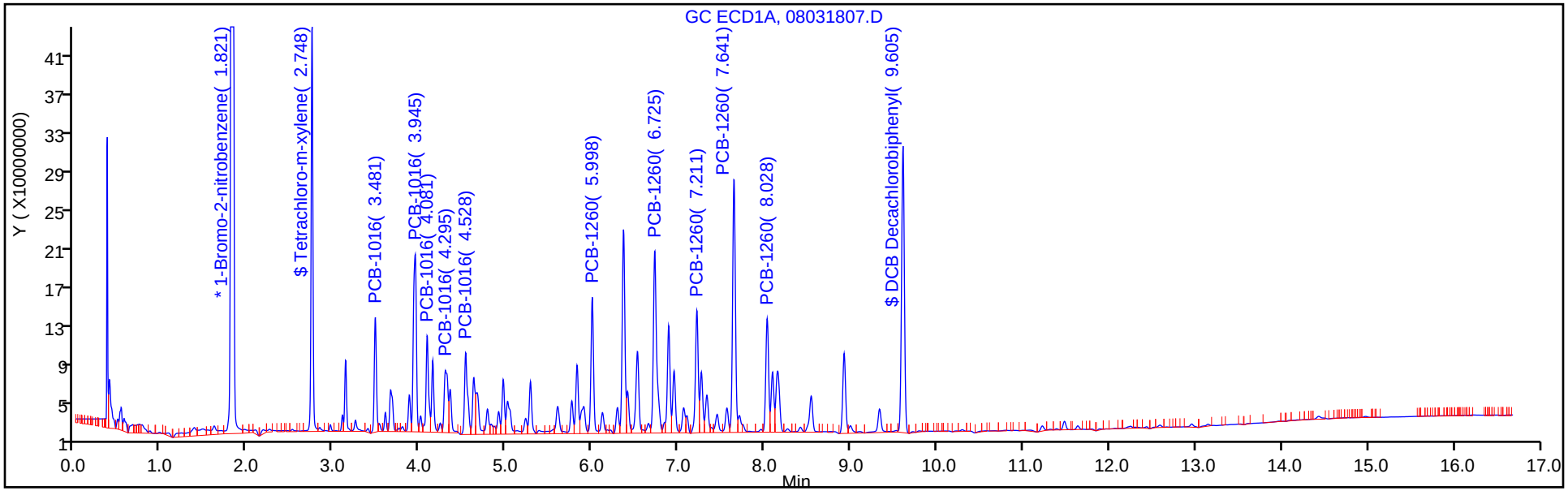
Report Date: 04-Aug-2018 07:33:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

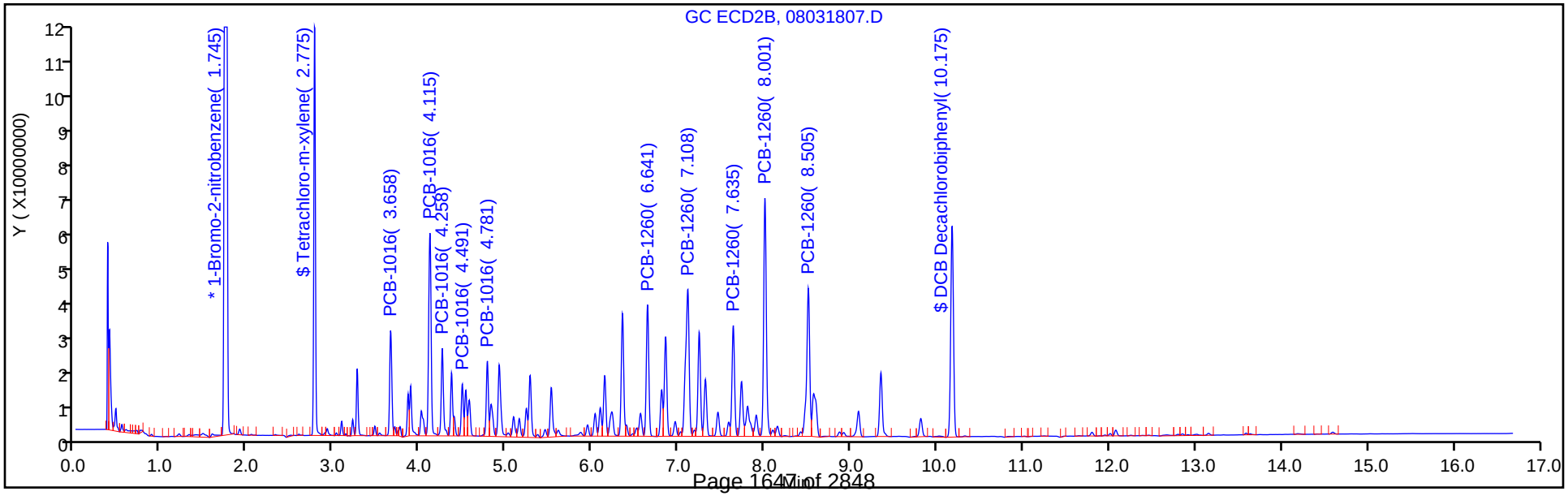
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031807.D

Injection Date:	03-Aug-2018 12:45:39	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	160-29498-B-2-B MS			Worklist Smp#:	7
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	7
Method:	PCB_P3	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_P3\20180803-72651.b\08031807.D				
Lims ID:	160-29498-B-2-B MS				
Client ID:					
Sample Type:	MS				
Inject. Date:	03-Aug-2018 12:45:39	ALS Bottle#:	7	Worklist Smp#:	7
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	160-29498-B-2-B				
Misc. Info.:	280-0072651-007				
Operator ID:	JAX	Instrument ID:	SGC_P3		
Method:	\\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m				
Limit Group:	GCSV - 8082 - IS				
Last Update:	04-Aug-2018 07:33:29	Calib Date:	27-Jul-2018 02:54:25		
Integrator:	Falcon				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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:	CTX0302				

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	15.0	75.02
$ 15 DCB Decachlorobiphenyl	20.0	14.0	70.08

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	15.1	75.60
$ 15 DCB Decachlorobiphenyl	20.0	15.5	77.56

Report Date: 04-Aug-2018 07:33:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031807.D

Injection Date: 03-Aug-2018 12:45:39 Instrument ID: SGC_P3

Lims ID: 160-29498-B-2-B MS

Client ID:

Operator ID: JAX ALS Bottle#: 7 Worklist Smp#: 7

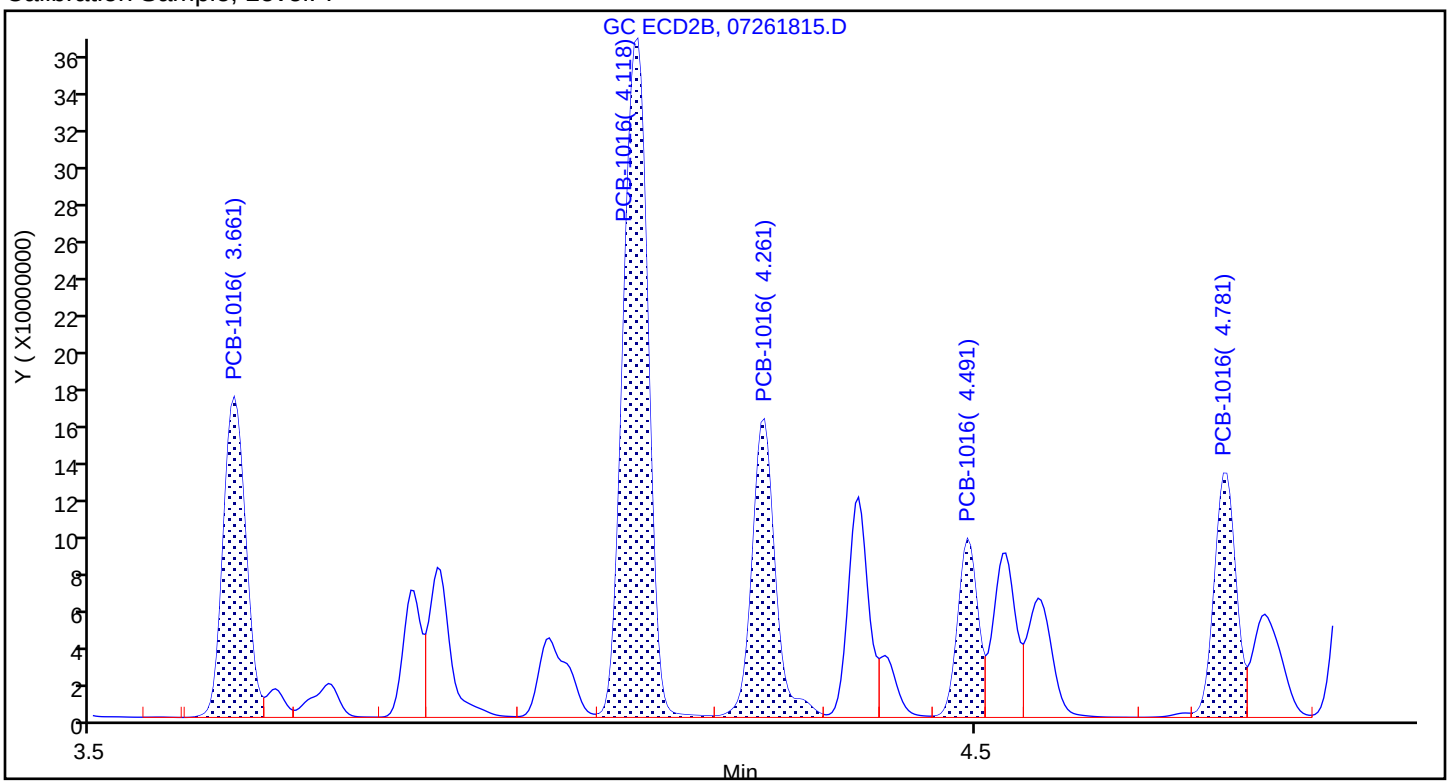
Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

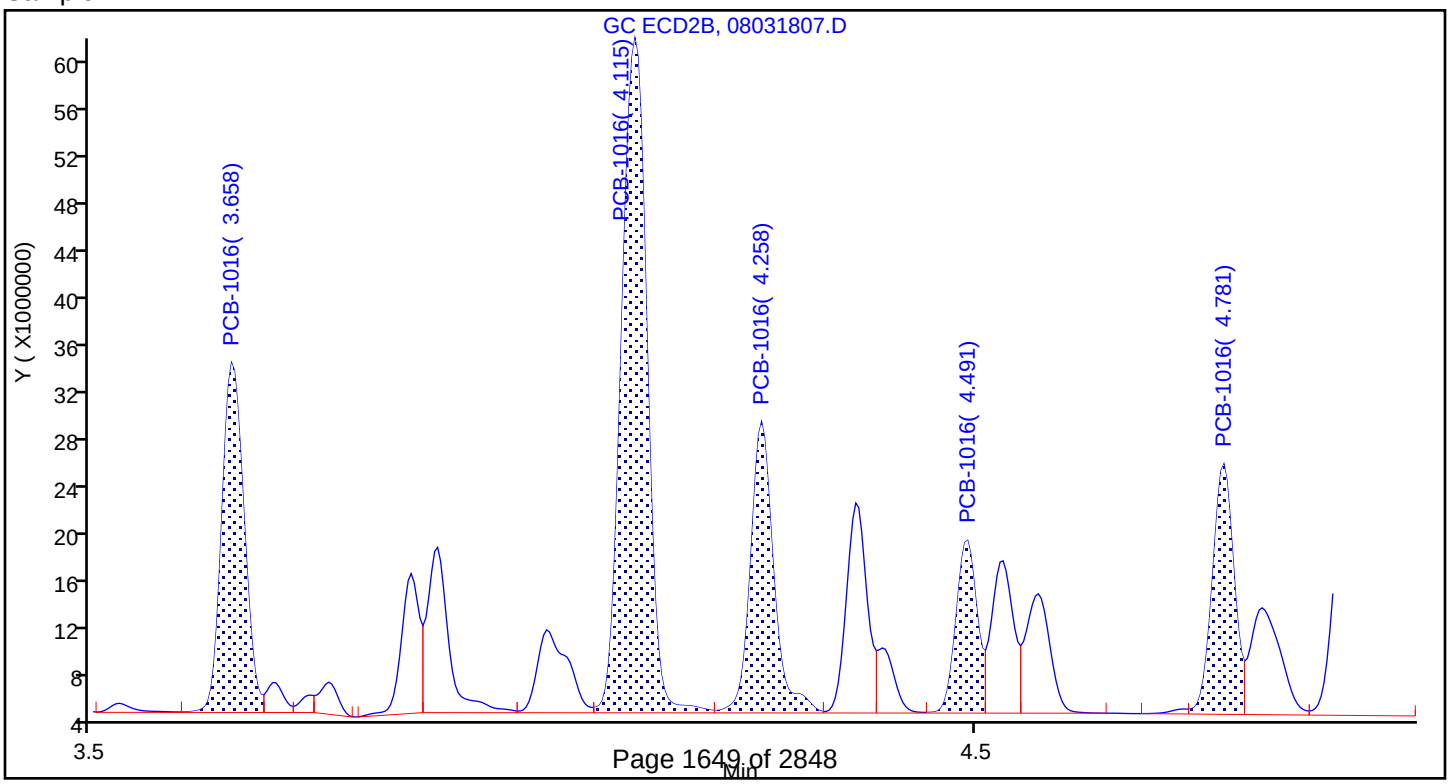
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

1 PCB-1016, CAS: 12674-11-2

Calibration Sample, Level: 7



Sample



Report Date: 04-Aug-2018 07:33:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031807.D

Injection Date: 03-Aug-2018 12:45:39 Instrument ID: SGC_P3

Lims ID: 160-29498-B-2-B MS

Client ID:

Operator ID: JAX ALS Bottle#: 7 Worklist Smp#: 7

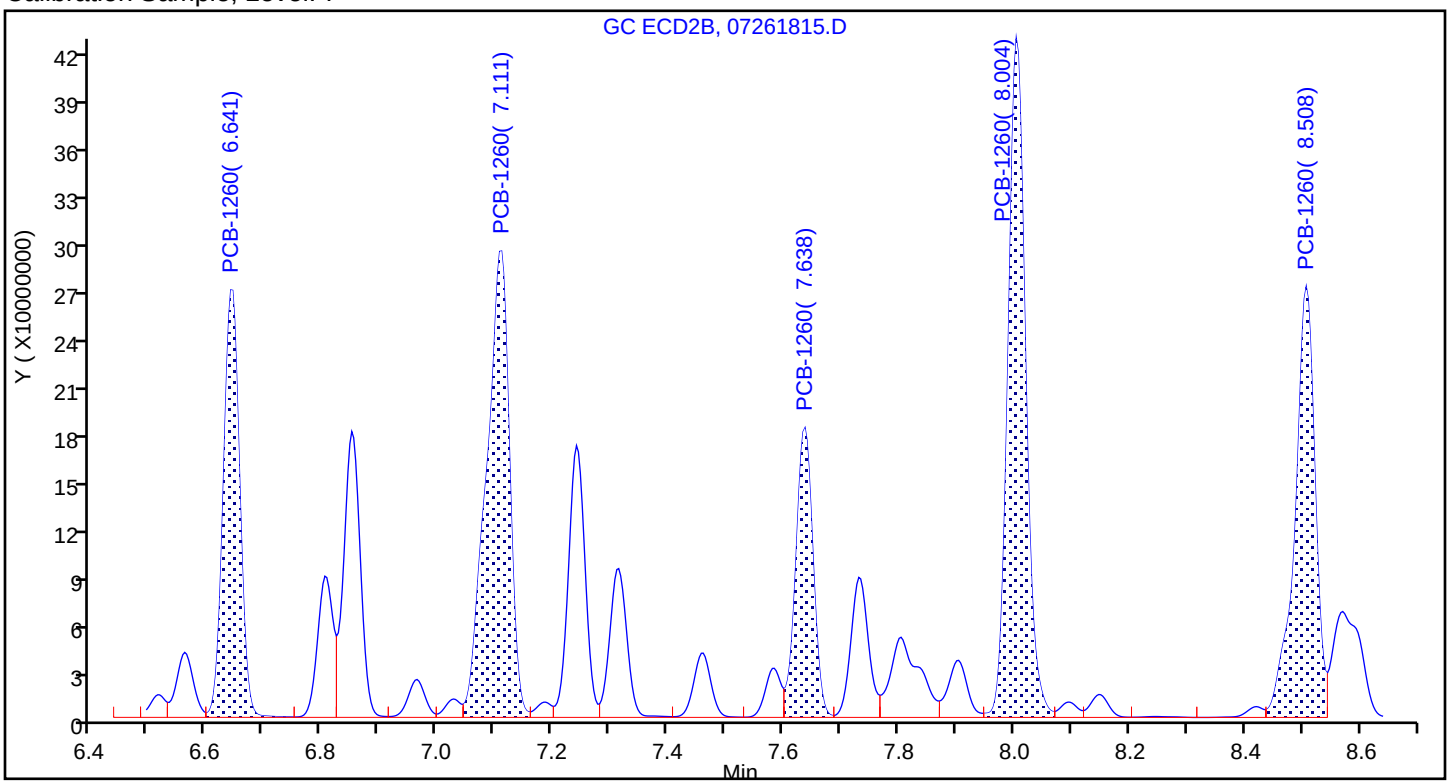
Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

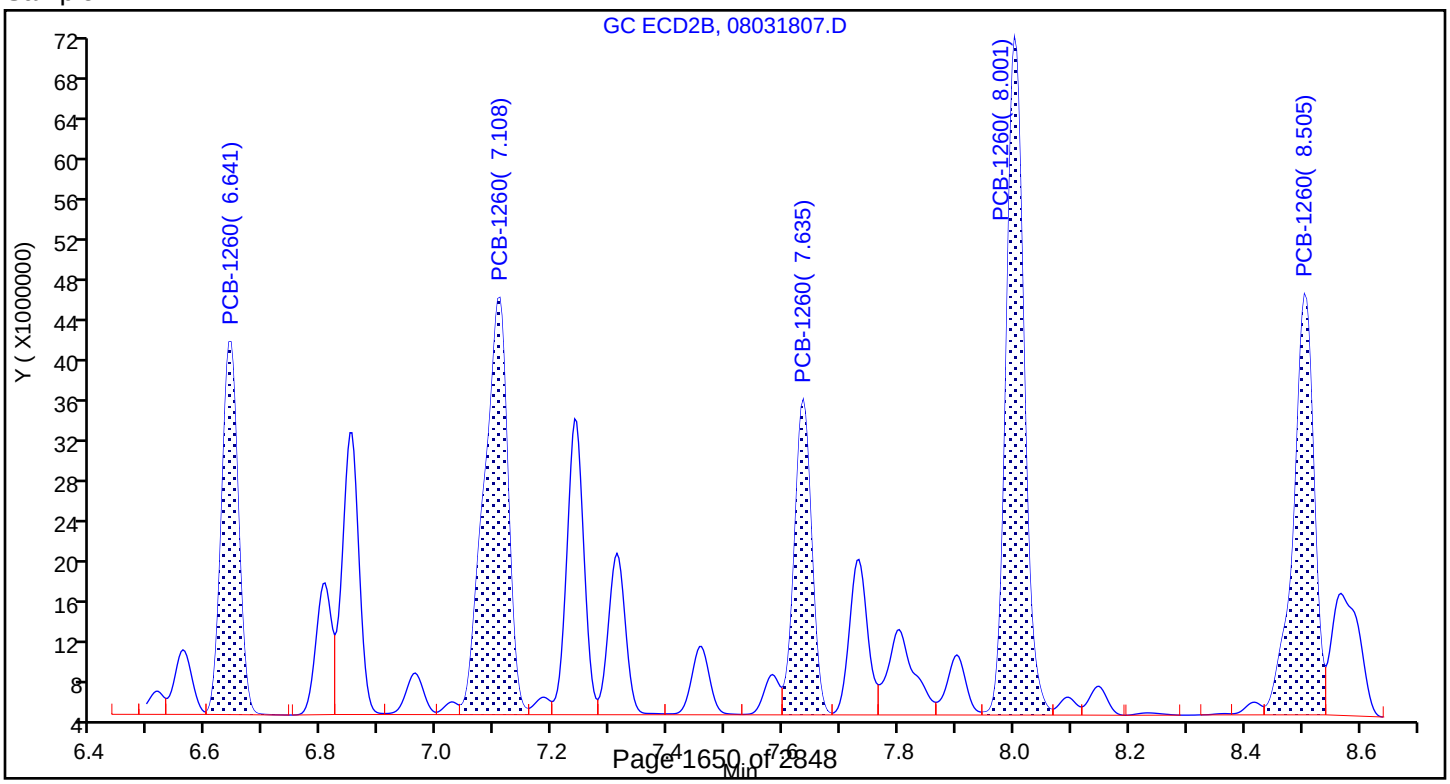
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

12 PCB-1260, CAS: 11096-82-5

Calibration Sample, Level: 7



Sample



FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: CRC-B21-0205 MSD | Lab Sample ID: 160-29498-2 MSD

Matrix: Solid | Lab File ID: 08031808.D

Analysis Method: 8082A | Date Collected: 07/12/2018 11:40

Extraction Method: 3546 | Date Extracted: 07/24/2018 08:50

Sample wt/vol: 15.6(g) | Date Analyzed: 08/03/2018 13:07

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: CLP2 ID: 0.32(mm)

% Moisture: 5.8 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 424773 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	109		67	10
11096-82-5	PCB-1260	111		67	5.4

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	77		53-128
2051-24-3	DCB Decachlorobiphenyl	79		59-130

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031808.D
Lims ID: 160-29498-B-2-C MSD
Client ID:
Sample Type: MSD
Inject. Date: 03-Aug-2018 13:07:33 ALS Bottle#: 8 Worklist Smp#: 8
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 160-29498-B-2-C
Misc. Info.: 280-0072651-008
Operator ID: JAX Instrument ID: SGC_P3

Method: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m
Limit Group: GCSV - 8082 - IS
Last Update: 04-Aug-2018 07:33:29 Calib Date: 27-Jul-2018 02:54:25
Integrator: Falcon
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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: CTX0302

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	1.823	1.822	0.001	4002897214	1000.0	1000.0	
2	1.744	1.746	-0.002	928265215	1000.0	1000.0	
						RPD = 0.00	
$ 14 Tetrachloro-m-xylene							
1	2.747	2.749	-0.002	616625426	20.0	15.3	
2	2.777	2.776	0.001	155755919	20.0	15.5	
						RPD = 0.81	
1 PCB-1016							
1	3.480	3.482	-0.002	234259225	200.0	181.6	
1	3.943	3.946	-0.003	493221696	200.0	170.8	
1	4.080	4.082	-0.002	230850632	200.0	185.4	
1	4.293	4.292	0.001	207287405	200.0	167.9	
1	4.527	4.529	-0.002	217058421	200.0	168.0	
		Average of Peak Amounts =				174.7	
2	3.657	3.659	-0.002	54786265	200.0	168.0	
2	4.114	4.116	-0.002	122070691	200.0	166.6	
2	4.257	4.259	-0.002	45146637	200.0	147.1	
2	4.490	4.489	0.001	25257273	200.0	156.8	
2	4.780	4.782	-0.002	38631142	200.0	162.2	
		Average of Peak Amounts =				160.1	
						RPD = 8.72	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ng/ml	OnCol Amt ng/ml	Flags
12 PCB-1260							
1	5.997	5.999	-0.002	302379296	200.0	163.4	
1	6.723	6.726	-0.003	526224798	200.0	148.3	
1	7.213	7.212	0.001	305546551	200.0	177.6	
1	7.643	7.646	-0.003	609097042	200.0	154.4	
1	8.027	8.029	-0.002	332156879	200.0	153.6	
		Average of Peak Amounts =				159.5	
2	6.640	6.639	0.001	77910262	200.0	143.2	
2	7.107	7.106	0.001	127094232	200.0	153.6	
2	7.634	7.636	-0.002	69215679	200.0	182.5	
2	8.004	8.002	0.002	153933367	200.0	169.9	
2	8.507	8.506	0.001	110369374	200.0	166.2	
		Average of Peak Amounts =				163.1	
						RPD = 2.23	
$ 15 DCB Decachlorobiphenyl							
1	9.603	9.606	-0.003	663494490	20.0	13.9	
2	10.174	10.176	-0.002	134519326	20.0	15.7	
						RPD = 11.96	

Reagents:

BNB IS_00012 Amount Added: 1.00 Units: mL Run Reagent

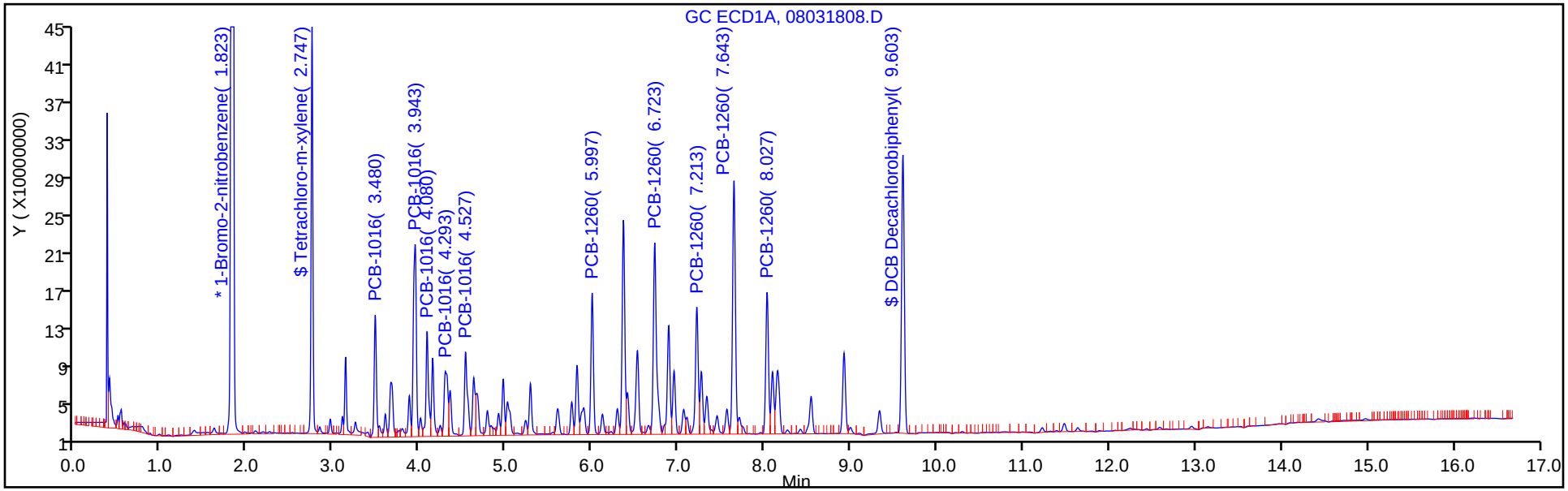
Report Date: 04-Aug-2018 07:33:46 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

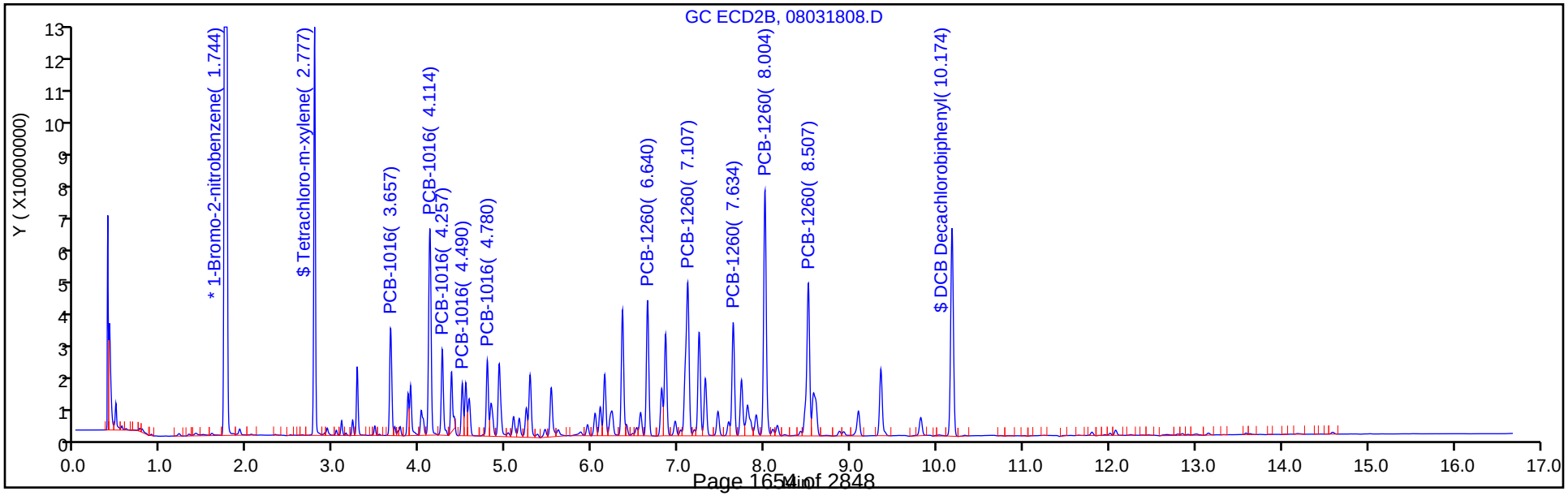
Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031808.D

Injection Date:	03-Aug-2018 13:07:33	Instrument ID:	SGC_P3	Operator ID:	JAX
Lims ID:	160-29498-B-2-C MSD			Worklist Smp#:	8
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	8
Method:	PCB_P3	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_P3\20180803-72651.b\08031808.D				
Lims ID:	160-29498-B-2-C MSD				
Client ID:					
Sample Type:	MSD				
Inject. Date:	03-Aug-2018 13:07:33	ALS Bottle#:	8	Worklist Smp#:	8
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	160-29498-B-2-C				
Misc. Info.:	280-0072651-008				
Operator ID:	JAX	Instrument ID:	SGC_P3		
Method:	\\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\PCB_P3.m				
Limit Group:	GCSV - 8082 - IS				
Last Update:	04-Aug-2018 07:33:29	Calib Date:	27-Jul-2018 02:54:25		
Integrator:	Falcon				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_P3\20180726-72400.b\07261835.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:	CTX0302				

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	15.3	76.72
$ 15 DCB Decachlorobiphenyl	20.0	13.9	69.67

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 14 Tetrachloro-m-xylene	20.0	15.5	77.35
$ 15 DCB Decachlorobiphenyl	20.0	15.7	78.53

Report Date: 04-Aug-2018 07:33:46 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031808.D

Injection Date: 03-Aug-2018 13:07:33 Instrument ID: SGC_P3

Lims ID: 160-29498-B-2-C MSD

Client ID:

Operator ID: JAX ALS Bottle#: 8 Worklist Smp#: 8

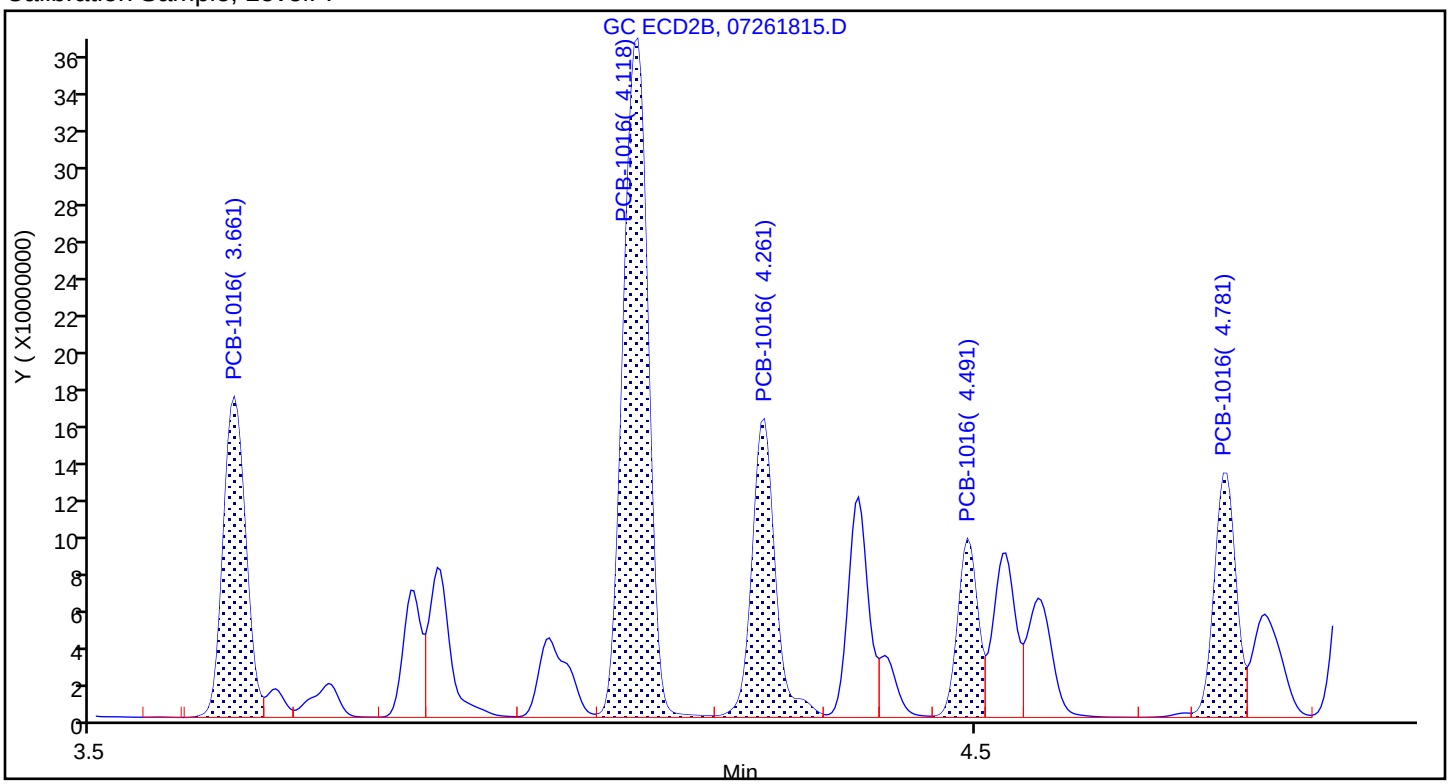
Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

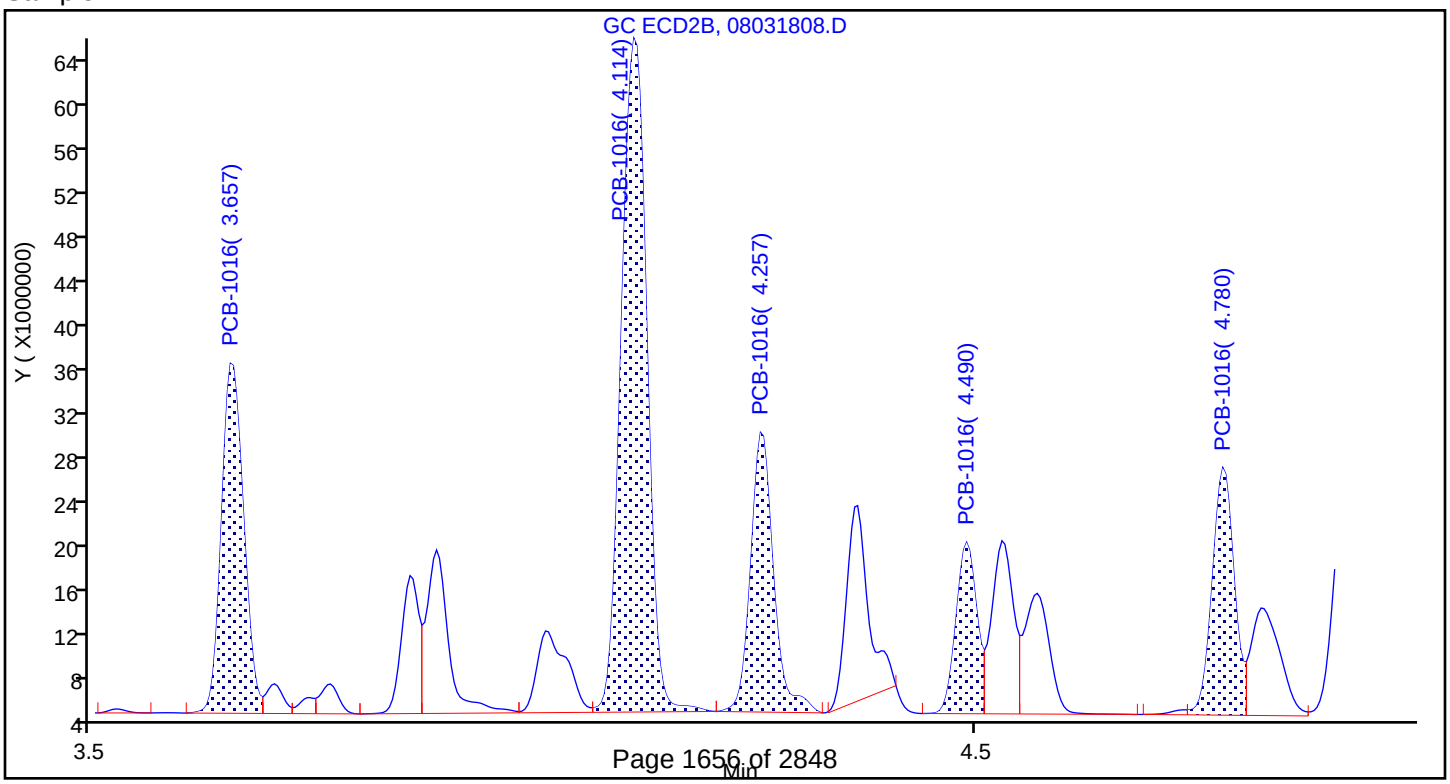
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

1 PCB-1016, CAS: 12674-11-2

Calibration Sample, Level: 7



Sample



Report Date: 04-Aug-2018 07:33:46 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

Data File: \\ChromNA\Denver\ChromData\SGC_P3\20180803-72651.b\08031808.D

Injection Date: 03-Aug-2018 13:07:33 Instrument ID: SGC_P3

Lims ID: 160-29498-B-2-C MSD

Client ID:

Operator ID: JAX ALS Bottle#: 8 Worklist Smp#: 8

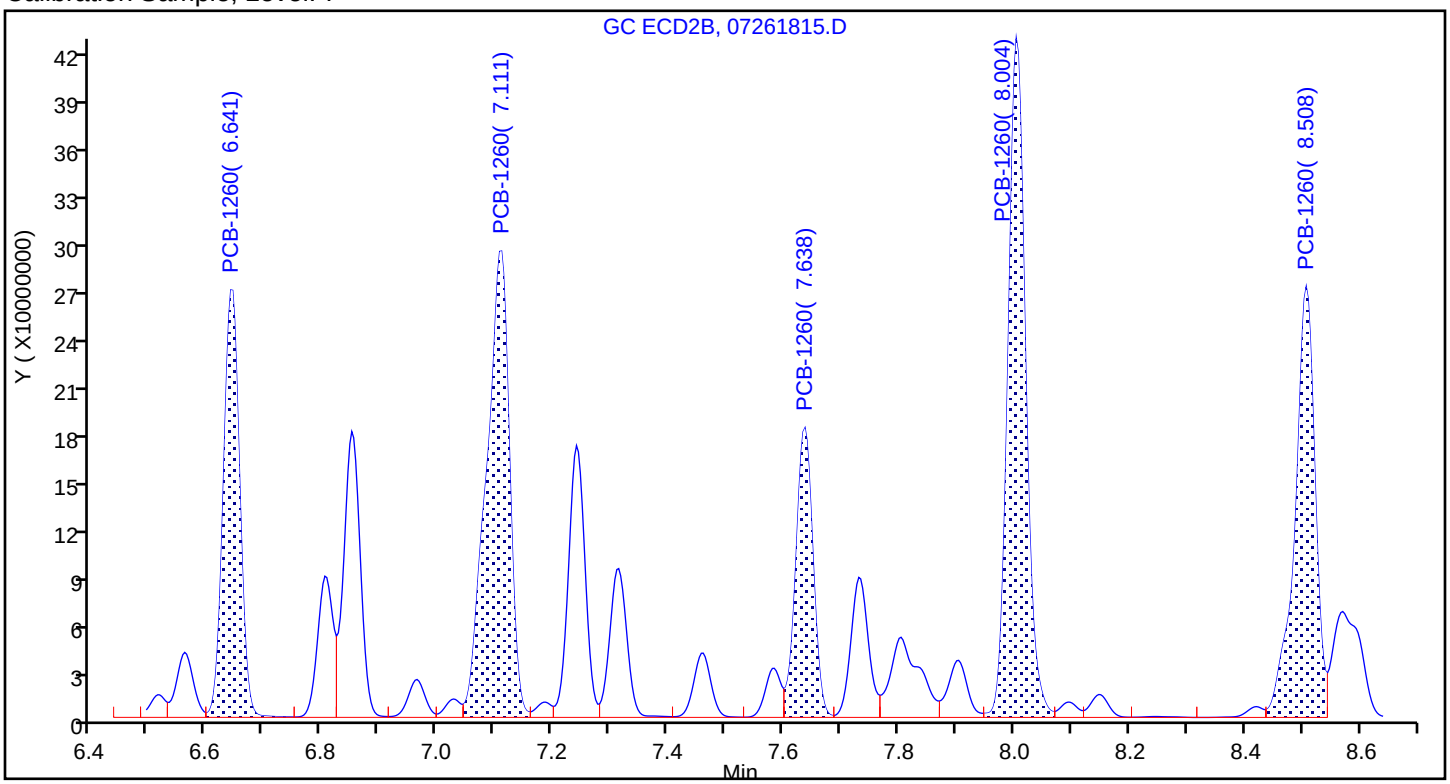
Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: PCB_P3 Limit Group: GCSV - 8082 - IS

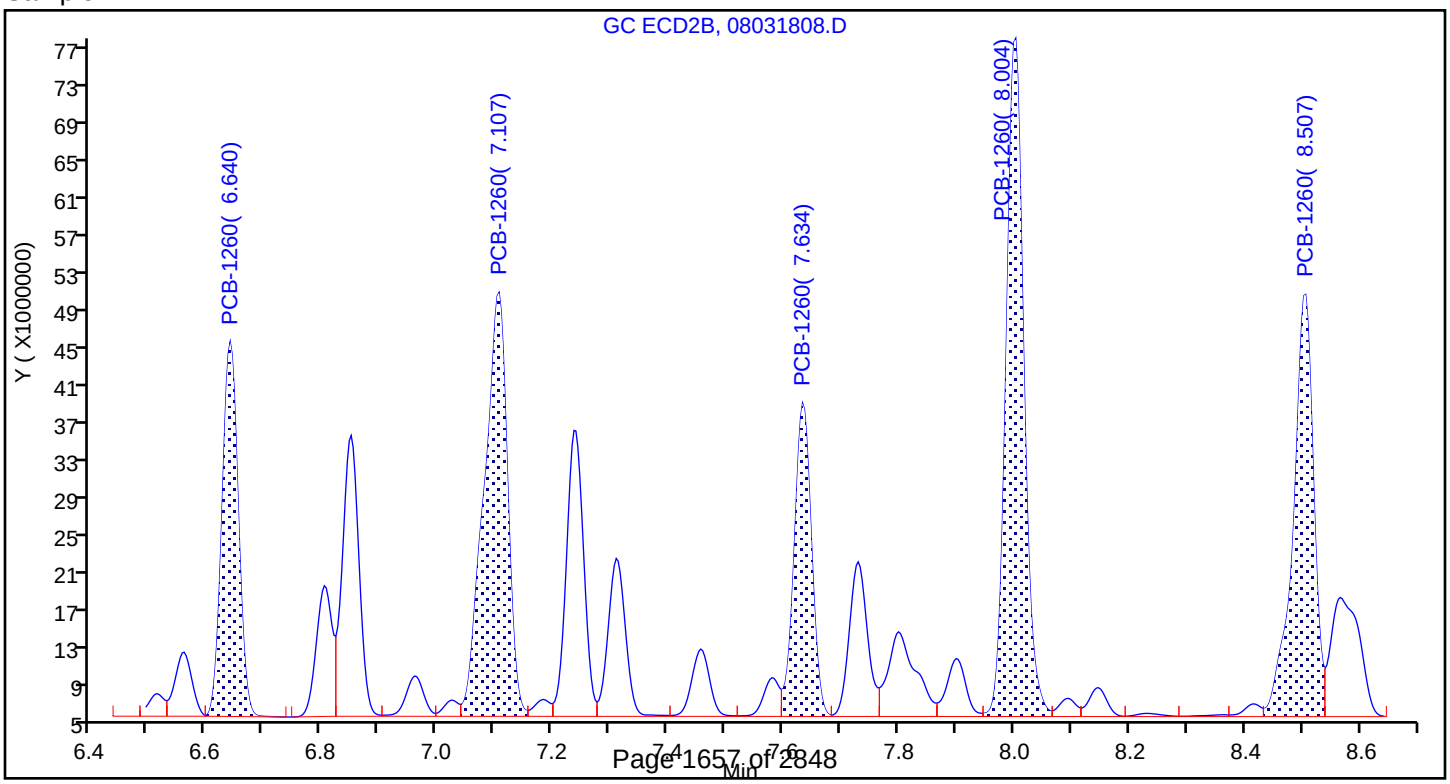
Column: CLP2 Pesticides Column 2 (0.32 mm) Detector GC ECD2B

12 PCB-1260, CAS: 11096-82-5

Calibration Sample, Level: 7



Sample



PCBS ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_P3 Start Date: 07/26/2018 14:30

Analysis Batch Number: 423815 End Date: 07/27/2018 08:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STDL71248 280-423815/1 IC		07/26/2018 14:30	1	07261801.D	CLP1 0.32(mm)
STDL71248 280-423815/1 IC		07/26/2018 14:30	1	07261801.D	CLP2 0.32(mm)
STDL61248 280-423815/2 IC		07/26/2018 14:52	1	07261802.D	CLP1 0.32(mm)
STDL61248 280-423815/2 IC		07/26/2018 14:52	1	07261802.D	CLP2 0.32(mm)
STDL51248 280-423815/3 IC		07/26/2018 15:14	1	07261803.D	CLP1 0.32(mm)
STDL51248 280-423815/3 IC		07/26/2018 15:14	1	07261803.D	CLP2 0.32(mm)
STDL41248 280-423815/4 IC		07/26/2018 15:36	1	07261804.D	CLP1 0.32(mm)
STDL41248 280-423815/4 IC		07/26/2018 15:36	1	07261804.D	CLP2 0.32(mm)
STDL31248 280-423815/5 IC		07/26/2018 15:58	1	07261805.D	CLP1 0.32(mm)
STDL31248 280-423815/5 IC		07/26/2018 15:58	1	07261805.D	CLP2 0.32(mm)
STDL21248 280-423815/6 IC		07/26/2018 16:20	1	07261806.D	CLP1 0.32(mm)
STDL21248 280-423815/6 IC		07/26/2018 16:20	1	07261806.D	CLP2 0.32(mm)
STDL11248 280-423815/7 IC		07/26/2018 16:41	1	07261807.D	CLP1 0.32(mm)
STDL11248 280-423815/7 IC		07/26/2018 16:41	1	07261807.D	CLP2 0.32(mm)
STDL72154 280-423815/8 IC		07/26/2018 17:03	1	07261808.D	CLP1 0.32(mm)
STDL72154 280-423815/8 IC		07/26/2018 17:03	1	07261808.D	CLP2 0.32(mm)
STDL62154 280-423815/9 IC		07/26/2018 17:25	1	07261809.D	CLP1 0.32(mm)
STDL62154 280-423815/9 IC		07/26/2018 17:25	1	07261809.D	CLP2 0.32(mm)
STDL52154 280-423815/10 IC		07/26/2018 17:47	1	07261810.D	CLP1 0.32(mm)
STDL52154 280-423815/10 IC		07/26/2018 17:47	1	07261810.D	CLP2 0.32(mm)
STDL42154 280-423815/11 IC		07/26/2018 18:09	1	07261811.D	CLP1 0.32(mm)
STDL42154 280-423815/11 IC		07/26/2018 18:09	1	07261811.D	CLP2 0.32(mm)
STDL32154 280-423815/12 IC		07/26/2018 18:31	1	07261812.D	CLP1 0.32(mm)
STDL32154 280-423815/12 IC		07/26/2018 18:31	1	07261812.D	CLP2 0.32(mm)
STDL22154 280-423815/13 IC		07/26/2018 18:53	1	07261813.D	CLP1 0.32(mm)
STDL22154 280-423815/13 IC		07/26/2018 18:53	1	07261813.D	CLP2 0.32(mm)
STDL12154 280-423815/14 IC		07/26/2018 19:15	1	07261814.D	CLP1 0.32(mm)
STDL12154 280-423815/14 IC		07/26/2018 19:15	1	07261814.D	CLP2 0.32(mm)
STDL71660 280-423815/15 IC		07/26/2018 19:37	1	07261815.D	CLP1 0.32(mm)
STDL71660 280-423815/15 IC		07/26/2018 19:37	1	07261815.D	CLP2 0.32(mm)
STDL61660 280-423815/16 IC		07/26/2018 19:59	1	07261816.D	CLP1 0.32(mm)

PCBS ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_P3 Start Date: 07/26/2018 14:30

Analysis Batch Number: 423815 End Date: 07/27/2018 08:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STDL61660 280-423815/16 IC		07/26/2018 19:59	1	07261816.D	CLP2 0.32(mm)
STDL51660 280-423815/17 ICIS		07/26/2018 20:21	1	07261817.D	CLP1 0.32(mm)
STDL51660 280-423815/17 ICIS		07/26/2018 20:21	1	07261817.D	CLP2 0.32(mm)
STDL41660 280-423815/18 IC		07/26/2018 20:42	1	07261818.D	CLP1 0.32(mm)
STDL41660 280-423815/18 IC		07/26/2018 20:42	1	07261818.D	CLP2 0.32(mm)
STDL31660 280-423815/19 IC		07/26/2018 21:04	1	07261819.D	CLP1 0.32(mm)
STDL31660 280-423815/19 IC		07/26/2018 21:04	1	07261819.D	CLP2 0.32(mm)
STDL21660 280-423815/20 IC		07/26/2018 21:26	1	07261820.D	CLP1 0.32(mm)
STDL21660 280-423815/20 IC		07/26/2018 21:26	1	07261820.D	CLP2 0.32(mm)
STDL11660 280-423815/21 IC		07/26/2018 21:48	1	07261821.D	CLP1 0.32(mm)
STDL11660 280-423815/21 IC		07/26/2018 21:48	1	07261821.D	CLP2 0.32(mm)
STDL73262 280-423815/22 IC		07/26/2018 22:10	1	07261822.D	CLP1 0.32(mm)
STDL73262 280-423815/22 IC		07/26/2018 22:10	1	07261822.D	CLP2 0.32(mm)
STDL63262 280-423815/23 IC		07/26/2018 22:32	1	07261823.D	CLP1 0.32(mm)
STDL63262 280-423815/23 IC		07/26/2018 22:32	1	07261823.D	CLP2 0.32(mm)
STDL53262 280-423815/24 IC		07/26/2018 22:54	1	07261824.D	CLP1 0.32(mm)
STDL53262 280-423815/24 IC		07/26/2018 22:54	1	07261824.D	CLP2 0.32(mm)
STDL43262 280-423815/25 IC		07/26/2018 23:15	1	07261825.D	CLP1 0.32(mm)
STDL43262 280-423815/25 IC		07/26/2018 23:15	1	07261825.D	CLP2 0.32(mm)
STDL33262 280-423815/26 IC		07/26/2018 23:37	1	07261826.D	CLP1 0.32(mm)
STDL33262 280-423815/26 IC		07/26/2018 23:37	1	07261826.D	CLP2 0.32(mm)
STDL23262 280-423815/27 IC		07/26/2018 23:59	1	07261827.D	CLP1 0.32(mm)
STDL23262 280-423815/27 IC		07/26/2018 23:59	1	07261827.D	CLP2 0.32(mm)
STDL13262 280-423815/28 IC		07/27/2018 00:21	1	07261828.D	CLP1 0.32(mm)
STDL13262 280-423815/28 IC		07/27/2018 00:21	1	07261828.D	CLP2 0.32(mm)
STDL74268 280-423815/29 IC		07/27/2018 00:43	1	07261829.D	CLP1 0.32(mm)
STDL74268 280-423815/29 IC		07/27/2018 00:43	1	07261829.D	CLP2 0.32(mm)
STDL64268 280-423815/30 IC		07/27/2018 01:05	1	07261830.D	CLP1 0.32(mm)
STDL64268 280-423815/30 IC		07/27/2018 01:05	1	07261830.D	CLP2 0.32(mm)
STDL54268 280-423815/31 IC		07/27/2018 01:27	1	07261831.D	CLP1 0.32(mm)
STDL54268 280-423815/31 IC		07/27/2018 01:27	1	07261831.D	CLP2 0.32(mm)

PCBS ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_P3 Start Date: 07/26/2018 14:30

Analysis Batch Number: 423815 End Date: 07/27/2018 08:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STDL44268 280-423815/32 IC		07/27/2018 01:48	1	07261832.D	CLP1 0.32(mm)
STDL44268 280-423815/32 IC		07/27/2018 01:48	1	07261832.D	CLP2 0.32(mm)
STDL34268 280-423815/33 IC		07/27/2018 02:10	1	07261833.D	CLP1 0.32(mm)
STDL34268 280-423815/33 IC		07/27/2018 02:10	1	07261833.D	CLP2 0.32(mm)
STDL24268 280-423815/34 IC		07/27/2018 02:32	1	07261834.D	CLP1 0.32(mm)
STDL24268 280-423815/34 IC		07/27/2018 02:32	1	07261834.D	CLP2 0.32(mm)
STDL14268 280-423815/35 IC		07/27/2018 02:54	1	07261835.D	CLP1 0.32(mm)
STDL14268 280-423815/35 IC		07/27/2018 02:54	1	07261835.D	CLP2 0.32(mm)
ICV 280-423815/37		07/27/2018 03:38	1	07261837.D	CLP1 0.32(mm)
ICV 280-423815/37		07/27/2018 03:38	1	07261837.D	CLP2 0.32(mm)
ICV 280-423815/38		07/27/2018 03:59	1	07261838.D	CLP1 0.32(mm)
ICV 280-423815/38		07/27/2018 03:59	1	07261838.D	CLP2 0.32(mm)
ICV 280-423815/39		07/27/2018 04:21	1	07261839.D	CLP1 0.32(mm)
ICV 280-423815/39		07/27/2018 04:21	1	07261839.D	CLP2 0.32(mm)
ICV 280-423815/40		07/27/2018 04:43	1	07261840.D	CLP1 0.32(mm)
ICV 280-423815/40		07/27/2018 04:43	1	07261840.D	CLP2 0.32(mm)
ICV 280-423815/42		07/27/2018 08:31	1	07261842.D	CLP1 0.32(mm)
ICV 280-423815/42		07/27/2018 08:31	1	07261842.D	CLP2 0.32(mm)

PCBS ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_P3 Start Date: 08/03/2018 11:18

Analysis Batch Number: 424773 End Date: 08/03/2018 23:42

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVIS 280-424773/3		08/03/2018 11:18	1	08031803.D	CLP1 0.32(mm)
CCVIS 280-424773/3		08/03/2018 11:18	1	08031803.D	CLP2 0.32(mm)
MB 280-423389/1-A		08/03/2018 11:39	1	08031804.D	CLP1 0.32(mm)
MB 280-423389/1-A		08/03/2018 11:39	1	08031804.D	CLP2 0.32(mm)
LCS 280-423389/2-A		08/03/2018 12:01	1	08031805.D	CLP1 0.32(mm)
LCS 280-423389/2-A		08/03/2018 12:01	1	08031805.D	CLP2 0.32(mm)
160-29498-2		08/03/2018 12:23	1	08031806.D	CLP1 0.32(mm)
160-29498-2		08/03/2018 12:23	1	08031806.D	CLP2 0.32(mm)
160-29498-2 MS		08/03/2018 12:45	1	08031807.D	CLP1 0.32(mm)
160-29498-2 MS		08/03/2018 12:45	1	08031807.D	CLP2 0.32(mm)
160-29498-2 MSD		08/03/2018 13:07	1	08031808.D	CLP1 0.32(mm)
160-29498-2 MSD		08/03/2018 13:07	1	08031808.D	CLP2 0.32(mm)
ZZZZZ		08/03/2018 13:29	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 13:29	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 13:51	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 13:51	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 14:13	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 14:13	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 14:35	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 14:35	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 14:57	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 14:57	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 15:18	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 15:18	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 15:40	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 15:40	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 16:02	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 16:02	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 16:24	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 16:24	1		CLP2 0.32(mm)
CCV 280-424773/18		08/03/2018 16:46	1	08031818.D	CLP1 0.32(mm)
CCV 280-424773/18		08/03/2018 16:46	1	08031818.D	CLP2 0.32(mm)
CCV 280-424773/19		08/03/2018 17:08	1	08031819.D	CLP1 0.32(mm)
CCV 280-424773/19		08/03/2018 17:08	1	08031819.D	CLP2 0.32(mm)
ZZZZZ		08/03/2018 17:30	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 17:30	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 17:52	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 17:52	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 18:13	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 18:13	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 18:35	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 18:35	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 18:57	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 18:57	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 19:19	1		CLP1 0.32(mm)

PCBS ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_P3 Start Date: 08/03/2018 11:18

Analysis Batch Number: 424773 End Date: 08/03/2018 23:42

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		08/03/2018 19:19	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 19:41	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 19:41	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 20:03	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 20:03	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 20:25	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 20:25	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 21:30	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 21:30	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 21:52	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 21:52	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 22:14	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 22:14	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 22:36	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 22:36	1		CLP2 0.32(mm)
ZZZZZ		08/03/2018 22:58	1		CLP1 0.32(mm)
ZZZZZ		08/03/2018 22:58	1		CLP2 0.32(mm)
CCV 280-424773/37		08/03/2018 23:42	1		CLP1 0.32(mm)
CCV 280-424773/37		08/03/2018 23:42	1		CLP2 0.32(mm)

PCBS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423389 Batch Start Date: 07/24/18 11:07 Batch Analyst: Cox, Daniel W

Batch Method: 3546 Batch End Date: 07/24/18 20:36

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	8081/82 Surr 00103	8082 LCS 00048	AnalysisComment	
MB 280-423389/1		3546, 8082A		16.2 g	10 mL	1 mL			
LCS 280-423389/2		3546, 8082A		16.7 g	10 mL	1 mL	1 mL	8082 LCS	
160-29498-B-2	CRC-B21-0205	3546, 8082A	T	15.2 g	10 mL	1 mL			
160-29498-B-2 MS	CRC-B21-0205	3546, 8082A	T	15.8 g	10 mL	1 mL	1 mL	8082 LCS	
160-29498-B-2 MSD	CRC-B21-0205	3546, 8082A	T	15.6 g	10 mL	1 mL	1 mL	8082 LCS	

Batch Notes	
Balance ID	24750402
Batch Comment	DV-OP-0015/0007 / B B8 set @ 10.00mL R2D2@2mL
Blank Matrix ID	175085
Analyst ID - Concentration	MM/AP
Concentration 1 Corrected Temperature	88/88 Degrees C
Analyst ID - Clean Up	AP
Equipment ID - Concentration 1	A/B
Exchange Solvent ID	Hexane_Cycl_00051
Analyst ID - Extraction	DC/JM
Florisil ID	FlorisilSol_00152
Florisil Solution Reagent ID	Phenomenex Prod Lot:S18-002991
Method/Fraction	3546/8081/82
Microwave Oven ID	MARS
Microwave Program ID	Start time: 1140 End:1210
Na2SO4 ID	0000200264_0005
Pipette/Syringe/Dispenser ID	L
Prep Solvent ID	MeCl2_Cycl_00397/Acetone_000223
Analyst ID - Spike Analyst	JM
Analyst ID - Spike Witness Analyst	Reviewer:JZ
Sufficient Volume for Batch QC	Yes
Concentration 1 Uncorrected Temperature	89/90 Degrees C

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.: 160-29498-1

SDG No.:

Batch Number: 423389 Batch Start Date: 07/24/18 11:07 Batch Analyst: Cox, Daniel W

Batch Method: 3546 Batch End Date: 07/24/18 20:36

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 8151A

Herbicides (GC) by Method 8151A

FORM II
HERBICIDES SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid (TCLP) Level: Low

GC Column (2): CLP2 ID: 0.32(mm)

Client Sample ID	Lab Sample ID	DCPAA2 #
CRC-B22-0105	160-29498-3	33
	LB 280-423271/1-D	39
	LCS 280-423271/2-D	36
	280-112289-A-1-E MS	38
	280-112289-A-1-F MSD	45

	QC LIMITS
DCPAA = 2,4-Dichlorophenylacetic acid	10-131

Column to be used to flag recovery values

FORM II 8151A

FORM III
HERBICIDES LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid (TCLP) Level: Low Lab File ID: 08080033.D

Lab ID: LCS 280-423271/2-D Client ID:

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC	QC LIMITS REC	#
2,4-D	0.0500	0.0239 J	48	13-115	
Silvex (2,4,5-TP)	0.0500	0.0274	55	10-158	
2,4,5-T	0.0500	0.0282	56	10-122	

Column to be used to flag recovery and RPD values

FORM III 8151A

FORM III
HERBICIDES MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid (TCLP) Level: Low Lab File ID: 08080038.D

Lab ID: 280-112289-A-1-E MS Client ID:

COMPOUND	SPIKE ADDED (mg/L)	SAMPLE CONCENTRATION (mg/L)	MS CONCENTRATION (mg/L)	MS % REC	QC LIMITS REC	#
2,4-D	0.0500	0.0021 U	0.0279 J	56	13-115	
Silvex (2,4,5-TP)	0.0500	0.0017 U	0.0331	66	10-158	
2,4,5-T	0.0500	0.0019 U	0.0344	69	10-122	

Column to be used to flag recovery and RPD values

FORM III 8151A

FORM III
HERBICIDES MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid (TCLP) Level: Low Lab File ID: 08080039.D

Lab ID: 280-112289-A-1-F MSD Client ID:

COMPOUND	SPIKE ADDED (mg/L)	MSD CONCENTRATION (mg/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
2,4-D	0.0500	0.0340 J	68	20	30	13-115	
Silvex (2,4,5-TP)	0.0500	0.0362	72	9	30	10-158	
2,4,5-T	0.0500	0.0380	76	10	30	10-122	

Column to be used to flag recovery and RPD values

FORM III 8151A

FORM VIII
HERBICIDES ANALYTICAL SEQUENCE

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Sample No.: STD4 280-425303/6 Date Analyzed: 08/08/2018 10:50

Instrument ID: SGC_M GC Column: CLP1 ID: 0.32(mm)

Lab File ID (Standard): 08080006.D Heated Purge: (Y/N) N

Calibration ID: 33326

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				DCPAA RT #		
INITIAL CALIBRATION SURROGATE				5.32		
UPPER LIMIT				5.35		
LOWER LIMIT				5.29		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
STD4 280-425303/6 ICRT		08/08/2018 10:50	08080006.D	5.32		
ICV 280-425303/10		08/08/2018 11:58	08080010.D	5.32		

DCPAA = 2,4-Dichlorophenylacetic acid

DCPAA RT Limit = ± 0.03 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8151A

FORM VIII
HERBICIDES ANALYTICAL SEQUENCE

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Sample No.: STD4 280-425303/6 Date Analyzed: 08/08/2018 10:50

Instrument ID: SGC_M GC Column: CLP2 ID: 0.32(mm)

Lab File ID (Standard): 08080006.D Heated Purge: (Y/N) N

Calibration ID: 33327

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				DCPAA		
				RT #		
INITIAL CALIBRATION SURROGATE				5.07		
UPPER LIMIT				5.10		
LOWER LIMIT				5.04		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
STD4 280-425303/6 ICRT		08/08/2018 10:50	08080006.D	5.07		
ICV 280-425303/10		08/08/2018 11:58	08080010.D	5.06		

DCPAA = 2,4-Dichlorophenylacetic acid

DCPAA RT Limit = ± 0.03 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8151A

FORM VIII
HERBICIDES ANALYTICAL SEQUENCE

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Sample No.: CCVRT 280-425378/3 Date Analyzed: 08/08/2018 16:52

Instrument ID: SGC_M GC Column: CLP1 ID: 0.32(mm)

Lab File ID (Standard): 08080003.D Heated Purge: (Y/N) N

Calibration ID: 33326

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				DCPAA RT #		
CONTINUING CALIBRATION SURROGATE				5.32		
UPPER LIMIT				5.35		
LOWER LIMIT				5.29		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
CCVRT 280-425378/3		08/08/2018 16:52	08080003.D	5.32		
CCV 280-425378/31		08/09/2018 00:26	08080031.D	5.32		
CCV 280-425378/40		08/09/2018 02:48	08080040.D	5.32		

DCPAA = 2,4-Dichlorophenylacetic acid

DCPAA RT Limit = ± 0.03 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8151A

FORM VIII
HERBICIDES ANALYTICAL SEQUENCE

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Sample No.: CCVRT 280-425378/3 Date Analyzed: 08/08/2018 16:52

Instrument ID: SGC_M GC Column: CLP2 ID: 0.32(mm)

Lab File ID (Standard): 08080003.D Heated Purge: (Y/N) N

Calibration ID: 33327

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				DCPAA RT #		
CONTINUING CALIBRATION SURROGATE				5.06		
UPPER LIMIT				5.09		
LOWER LIMIT				5.03		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
CCVRT 280-425378/3		08/08/2018 16:52	08080003.D	5.06		
CCV 280-425378/31		08/09/2018 00:26	08080031.D	5.06		
LB 280-423271/1-D		08/09/2018 00:42	08080032.D	5.06		
LCS 280-423271/2-D		08/09/2018 00:58	08080033.D	5.06		
160-29498-3	CRC-B22-0105	08/09/2018 01:13	08080034.D	5.06		
280-112289-A-1-E MS		08/09/2018 02:16	08080038.D	5.06		
280-112289-A-1-F MSD		08/09/2018 02:32	08080039.D	5.06		
CCV 280-425378/40		08/09/2018 02:48	08080040.D	5.06		

DCPAA = 2,4-Dichlorophenylacetic acid

DCPAA RT Limit = ± 0.03 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8151A

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 280-423271/2-D

Instrument ID (1): SGC_M Instrument ID (2): SGC_M

Date Analyzed (1): 08/09/2018 00:58 Date Analyzed (2): 08/09/2018 00:58

GC Column (1): CLP1 ID: 0.32(mm) GC Column (2): CLP2 ID: 0.32(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
2,4-D	1		6.21	6.18	6.24	0.0334		33.3
	2		5.99	5.96	6.02	0.0239		
Silvex (2,4,5-TP)	1		6.73	6.70	6.76	0.0313		13.3
	2		6.50	6.47	6.53	0.0274		
2,4,5-T	1		6.83	6.80	6.86	0.0328		14.8
	2		6.70	6.67	6.73	0.0282		

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Client Sample ID: Lab Sample ID: 280-112289-A-1-E MS

Instrument ID (1): SGC_M Instrument ID (2): SGC_M

Date Analyzed (1): 08/09/2018 02:16 Date Analyzed (2): 08/09/2018 02:16

GC Column (1): CLP1 ID: 0.32(mm) GC Column (2): CLP2 ID: 0.32(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
2,4-D	1		6.21	6.18	6.24	0.0387		32.4
	2		5.99	5.96	6.02	0.0279		
Silvex (2,4,5-TP)	1		6.73	6.70	6.76	0.0378		13.4
	2		6.49	6.47	6.53	0.0331		
2,4,5-T	1		6.83	6.80	6.86	0.0399		14.7
	2		6.70	6.67	6.73	0.0344		

FORM X
IDENTIFICATION SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Client Sample ID: Lab Sample ID: 280-112289-A-1-F MSD

Instrument ID (1): SGC_M Instrument ID (2): SGC_M

Date Analyzed (1): 08/09/2018 02:32 Date Analyzed (2): 08/09/2018 02:32

GC Column (1): CLP1 ID: 0.32(mm) GC Column (2): CLP2 ID: 0.32(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
2,4-D	1		6.21	6.18	6.24	0.0431		23.6
	2		5.99	5.96	6.02	0.0340		
Silvex (2,4,5-TP)	1		6.73	6.70	6.76	0.0402		10.6
	2		6.49	6.47	6.53	0.0362		
2,4,5-T	1		6.83	6.80	6.86	0.0415		8.9
	2		6.70	6.67	6.73	0.0380		

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: CRC-B22-0105 | Lab Sample ID: 160-29498-3

Matrix: Solid (TCLP) | Lab File ID: 08080034.D

Analysis Method: 8151A | Date Collected: 07/12/2018 11:50

Extraction Method: 8151A | Date Extracted: 07/25/2018 09:20

Sample wt/vol: 100(mL) | Date Analyzed: 08/09/2018 01:13

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.: 425378 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	0.0021	U	0.040	0.0021
93-72-1	Silvex (2,4,5-TP)	0.0017	U	0.010	0.0017

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	33		10-131

TestAmerica Denver
Target Compound Quantitation Report

Data File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080034.D				
Lims ID:	160-29498-A-3-D				
Client ID:	CRC-B22-0105				
Sample Type:	Client				
Inject. Date:	09-Aug-2018 01:13:53	ALS Bottle#:	34	Worklist Smp#:	34
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	160-29498-A-3-D				
Misc. Info.:	280-0072814-034				
Operator ID:	TEM	Instrument ID:	SGC_M		
Method:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m				
Limit Group:	GCSV - 8151				
Method Label:	8151A: Herbicides: DV-GC-0022				
Last Update:	10-Aug-2018 12:25:37	Calib Date:	08-Aug-2018 11:41:27		
Integrator:	Falcon				
Quant Method:	External Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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:	CTX0307				

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	OnCol Amt ug/ml	Flags
$ 3 2,4-Dichlorophenylacetic acid						
1	5.321	5.323	-0.002	29810926	0.2048	
2	5.061	5.062	-0.001	37925161	0.1625	
					RPD = 23.01	
8 2,4-D						
1	6.210	6.213	-0.003	1938176	0.000149	
2	6.013	5.994	0.019	2466476	-0.006938	
					RPD = -208.80	
LOD = 0.001000						
9 Silvex (2,4,5-TP)						
1		6.728			ND	
2		6.498				
10 2,4,5-T						
1	6.833	6.834	-0.001	6210730	0.002334	
2	6.701	6.704	-0.003	5240331	-0.001156	
					RPD = 592.03	

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

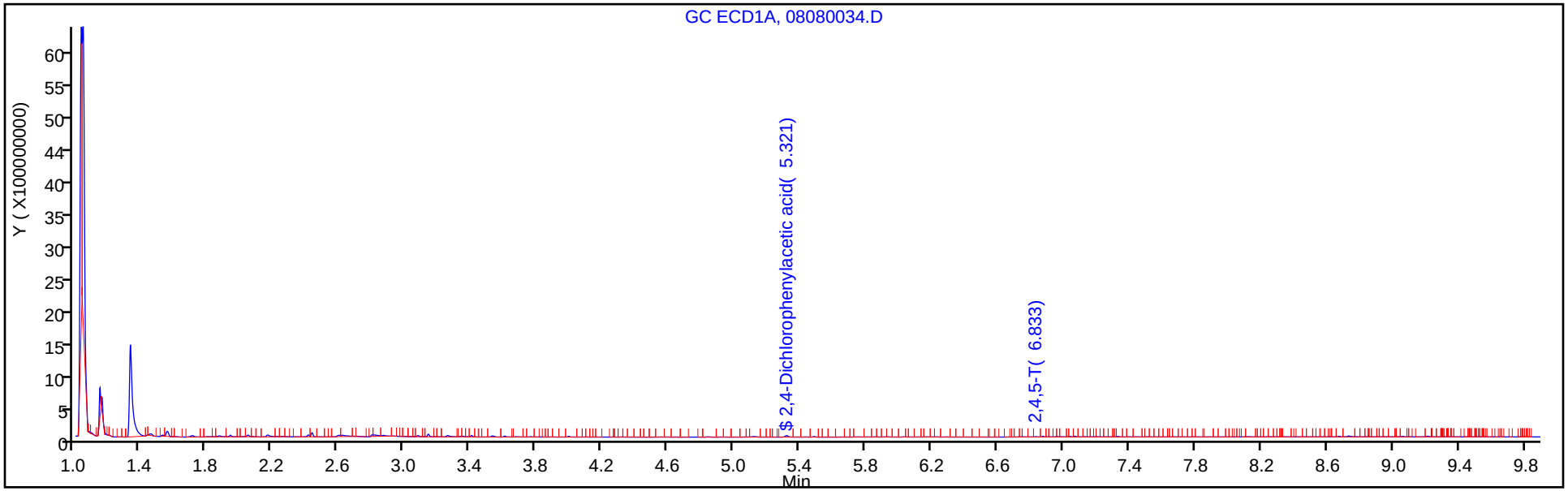
Report Date: 10-Aug-2018 13:23:01 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

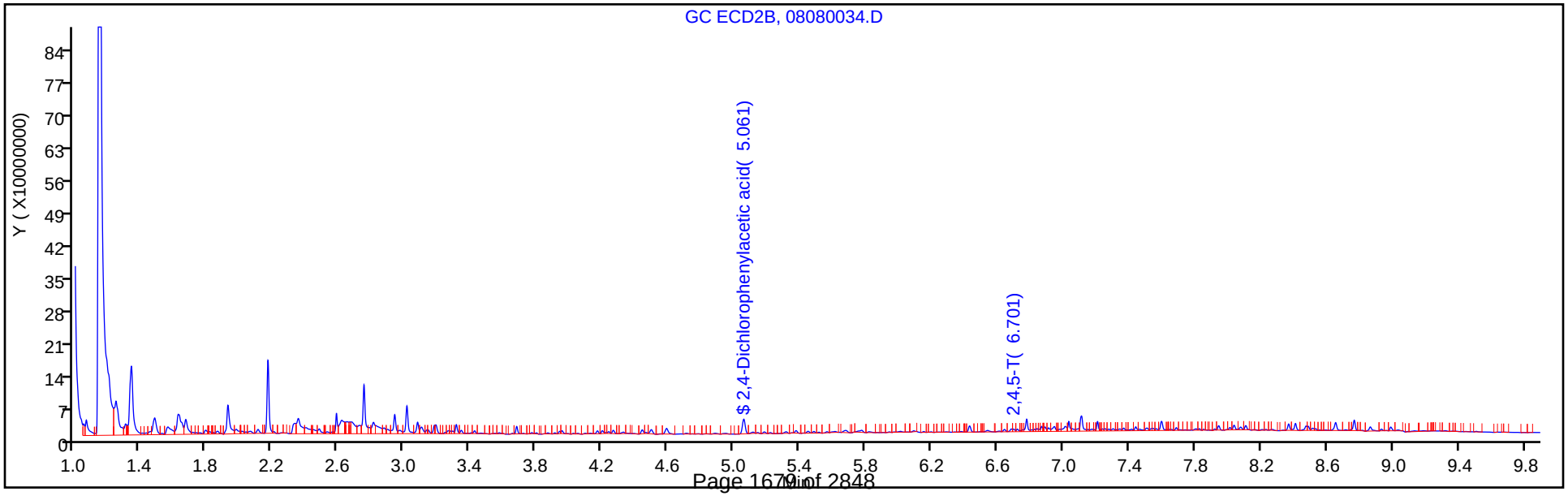
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080034.D

Injection Date:	09-Aug-2018 01:13:53	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	160-29498-A-3-D	Lab Sample ID:	280-29498-3	Worklist Smp#:	34
Client ID:	CRC-B22-0105				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	34
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080034.D				
Lims ID:	160-29498-A-3-D				
Client ID:	CRC-B22-0105				
Sample Type:	Client				
Inject. Date:	09-Aug-2018 01:13:53	ALS Bottle#:	34	Worklist Smp#:	34
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	160-29498-A-3-D				
Misc. Info.:	280-0072814-034				
Operator ID:	TEM	Instrument ID:	SGC_M		
Method:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m				
Limit Group:	GCSV - 8151				
Method Label:	8151A: Herbicides: DV-GC-0022				
Last Update:	10-Aug-2018 12:25:37	Calib Date:	08-Aug-2018 11:41:27		
Integrator:	Falcon				
Quant Method:	External Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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:	CTX0307				

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.2048	40.96

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.1625	32.50

FORM VI
HERBICIDES BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1 Analy Batch No.: 425303

SDG No.:

Instrument ID: SGC_M GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/08/2018 10:03 Calibration End Date: 08/08/2018 11:41 Calibration ID: 33326

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-425303/9	08080009.D
Level 2	STD2 280-425303/8	08080008.D
Level 3	STD3 280-425303/7	08080007.D
Level 4	STD4 280-425303/6	08080006.D
Level 5	STD5 280-425303/5	08080005.D
Level 6	STD6 280-425303/4	08080004.D
Level 7	STD7 280-425303/3	08080003.D

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Dalapon	1.618	1.618	1.618	1.619	1.617	1.620	1.621				1.587 - 1.647	1.619
Dicamba	5.484	5.484	5.482	5.483	5.482	5.484	5.486				5.454 - 5.514	5.484
MCPP	5.653	5.652	5.651	5.653	5.654	5.656	5.660				5.623 - 5.683	5.654
MCPA	5.774	5.773	5.772	5.774	5.774	5.778	5.782				5.744 - 5.804	5.775
Dichlorprop	6.054	6.053	6.051	6.052	6.051	6.053	6.053				6.023 - 6.083	6.052
2,4-D	6.214	6.213	6.211	6.211	6.211	6.213	6.213				6.182 - 6.242	6.212
Pentachlorophenol	6.380	6.380	6.379	6.379	6.380	6.382	6.384				6.281 - 6.481	6.381
Silvex (2,4,5-TP)	6.727	6.727	6.726	6.726	6.726	6.728	6.728				6.697 - 6.757	6.727
2,4,5-T	6.834	6.834	6.833	6.834	6.834	6.834	6.836				6.804 - 6.864	6.834
2,4-DB	6.999	6.999	6.998	6.998	6.998	6.998	6.999				6.968 - 7.028	6.998
Picloram	7.287	7.287	7.287	7.287	7.287	7.288	7.289				7.257 - 7.317	7.287
Dinoseb	7.345	7.345	7.345	7.344	7.344	7.345	7.346				7.315 - 7.375	7.345
2,4-Dichlorophenylacetic acid	5.323	5.323	5.321	5.321	5.320	5.322	5.323				5.292 - 5.352	5.322

FORM VI
HERBICIDES BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-29498-1 Analy Batch No.: 425303

SDG No.:

Instrument ID: SGC_M GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/08/2018 10:03 Calibration End Date: 08/08/2018 11:41 Calibration ID: 33326

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-425303/9	08080009.D
Level 2	STD2 280-425303/8	08080008.D
Level 3	STD3 280-425303/7	08080007.D
Level 4	STD4 280-425303/6	08080006.D
Level 5	STD5 280-425303/5	08080005.D
Level 6	STD6 280-425303/4	08080004.D
Level 7	STD7 280-425303/3	08080003.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 7	LVL 4		B	M1	M2								
Dalapon	218174982 178670007	207699674 191946549	197800121 175490318	200432871	Lin2	1616035.94	185842516							0.9970		0.9900
Dicamba	628263808 481602261	576707243 515200796	541499963 475042848	547519067	Lin2	6470867.39	500159443							0.9970		0.9900
MCPP	919631 558871	779530 589059	693829 525982	658594	Lin2	1735079.66	572947.507							0.9920		0.9900
MCPA	1533906 906854	1222721 948221	1113102 833317	1094523	Lin2	2953634.74	918888.828							0.9910		0.9900
Dichlorprop	162420731 121416125	146085265 129942612	139606815 117903744	140926547	Lin2	1809763.44	126366896							0.9950		0.9900
2,4-D	188556673 143087898	172995097 155470273	164779998 140731361	167226617	Lin2	1915688.52	150533162							0.9950		0.9900
Pentachlorophenol	2033607981 1608904348	1870642901 1787232263	1779235930 1664302236	1845557723	Lin2	15859708.2	1706344058							0.9970		0.9900
Silvex (2,4,5-TP)	726507771 559035297	663704417 627880099	625672175 578197498	651861894	Lin2	6379783.94	596398290							0.9970		0.9900
2,4,5-T	699732170 557263122	646382285 634885608	617606747 580535750	654836904	Lin2	4811342.57	599441222							0.9960		0.9900
2,4-DB	123264007 92270683	114706408 106029437	109737400 95360114	113309440	Lin2	1137892.81	101174266							0.9930		0.9900
Picloram	976286763 795115938	928886636 945321553	893966044 850007844	954977188	Lin2	4712322.58	878705250							0.9950		0.9900
Dinoseb	295177867 341546649	350257155 412428242	363551946 381833074	403382281	Ave		364025316				11.0		20.0			
2,4-Dichlorophenylacetic acid	181923082 130749728	162507220 137597906	150456849 123175828	150815280	Lin2	2372459.86	133992473							0.9950		0.9900

Note: The M1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
HERBICIDES BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-29498-1 Analy Batch No.: 425303

SDG No.:

Instrument ID: SGC_M GC Column: CLP1 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/08/2018 10:03 Calibration End Date: 08/08/2018 11:41 Calibration ID: 33326

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-425303/9	08080009.D
Level 2	STD2 280-425303/8	08080008.D
Level 3	STD3 280-425303/7	08080007.D
Level 4	STD4 280-425303/6	08080006.D
Level 5	STD5 280-425303/5	08080005.D
Level 6	STD6 280-425303/4	08080004.D
Level 7	STD7 280-425303/3	08080003.D

ANALYTE	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
Dalapon	Lin2	9876236 173778808	18804090 317760319	44769585	90730950	121319168	0.0453 0.905	0.0905 1.81	0.226	0.453	0.679
Dicamba	Lin2	29818971 489054356	54743935 901868847	128504710	259866237	342870710	0.0475 0.949	0.0949 1.90	0.237	0.475	0.712
MCPP	Lin2	4333952 55521303	7347396 99152098	16349072	31037634	39506986	4.71 94.3	9.43 189	23.6	47.1	70.7
MCPA	Lin2	7208087 89117073	11491551 156636006	26153275	51433477	63921882	4.70 94.0	9.40 188	23.5	47.0	70.5
Dichlorprop	Lin2	7740566 123854801	13924117 224759907	33266559	67162069	86795835	0.0477 0.953	0.0953 1.91	0.238	0.477	0.715
2,4-D	Lin2	8864992 146188698	16266729 264659398	38735658	78621594	100909163	0.0470 0.940	0.0940 1.88	0.235	0.470	0.705
Pentachlorophenol	Lin2	97079361 1706360003	178599631 3177985119	424681376	881023118	1152076070	0.0477 0.955	0.0955 1.91	0.239	0.477	0.716
Silvex (2,4,5-TP)	Lin2	34872373 602764895	63715624 1110139196	150161322	312893709	402505414	0.0480 0.960	0.0960 1.92	0.240	0.480	0.720
2,4,5-T	Lin2	33496179 607839481	61884640 1111609855	147824175	313470426	400142785	0.0479 0.957	0.0957 1.91	0.239	0.479	0.718
2,4-DB	Lin2	5862128 100849899	10910300 181403545	26094182	53887137	65822445	0.0476 0.951	0.0951 1.90	0.238	0.476	0.713
Picloram	Lin2	46134431 893423400	87789076 1606684826	211221827	451274470	563598055	0.0473 0.945	0.0945 1.89	0.236	0.473	0.709
Dinoseb	Ave	14083674 393559650	33423289 728728421	86729861	192463771	244440667	0.0477 0.954	0.0954 1.91	0.239	0.477	0.716
2,4-Dichlorophenylacetic acid	Lin2	8441231 127690857	15080670 228614337	34905989	69978290	91001811	0.0464 0.928	0.0928 1.86	0.232	0.464	0.696

Curve Type Legend:

Ave = Average
Lin2 = Linear 1/conc^2

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080003.D
Lims ID: STD7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 08-Aug-2018 10:03:43 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD7
Misc. Info.: 280-0072797-003
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:20 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:19:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.621	1.617	0.004	317760319	1.81	1.70	
2	1.385	1.379	0.006	515724629	1.81	1.71	
						RPD = 0.35	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.323	5.322	0.001	228614337	1.86	1.69	
2	5.065	5.063	0.002	345246756	1.86	1.48	
						RPD = 13.19	
4 Dicamba							
1	5.486	5.484	0.002	901868847	1.90	1.79	
2	5.222	5.220	0.002	1299031353	1.90	1.77	
						RPD = 1.00	
5 MCPP							
1	5.660	5.653	0.007	99152098	188.5	170.0	
2	5.343	5.334	0.009	166300598	188.5	188.7	
						RPD = 10.39	
6 MCPA							
1	5.782	5.774	0.008	156636006	188.0	167.2	
2	5.536	5.526	0.010	232098793	188.0	188.0	
						RPD = 11.66	
7 Dichlorprop							
1	6.053	6.053	0.000	224759907	1.91	1.76	
2	5.778	5.777	0.001	333212792	1.91	1.73	
						RPD = 1.72	
8 2,4-D							
1	6.213	6.212	0.001	264659398	1.88	1.75	
2	5.996	5.994	0.002	418946367	1.88	1.88	
						RPD = 7.35	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.384	6.381	0.003	3177985119	1.91	1.85	
2	6.246	6.243	0.003	4222529236	1.91	1.72	
9 Silvex (2,4,5-TP)							
1	6.728	6.727	0.001	1110139196	1.92	1.85	
2	6.500	6.498	0.002	1642223181	1.92	1.74	
						RPD = 6.09	
10 2,4,5-T							
1	6.836	6.834	0.002	1111609855	1.91	1.85	
2	6.706	6.704	0.002	1696455416	1.91	1.75	
						RPD = 5.24	
11 2,4-DB							
1	6.999	6.998	0.001	181403545	1.90	1.78	
2	6.881	6.882	-0.001	273681225	1.90	1.90	
						RPD = 6.25	
12 Picloram							
1	7.289	7.287	0.002	1606684826	1.89	1.82	
2	7.261	7.259	0.002	2332032553	1.89	1.76	
						RPD = 3.49	
13 Dinoseb							
1	7.346	7.345	0.001	728728421	1.91	2.00	
2	6.975	6.973	0.002	1191868441	1.91	1.85	
						RPD = 7.71	

Reagents:

8151ICALL7_00061 Amount Added: 1.00 Units: mL

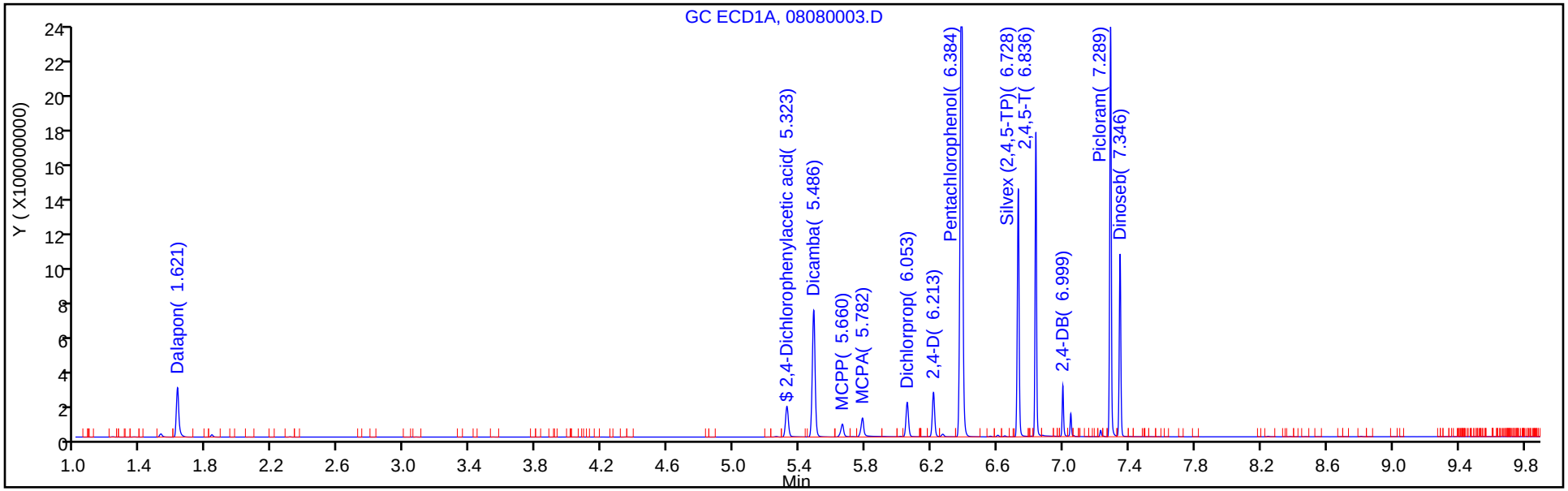
Report Date: 09-Aug-2018 01:29:21 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

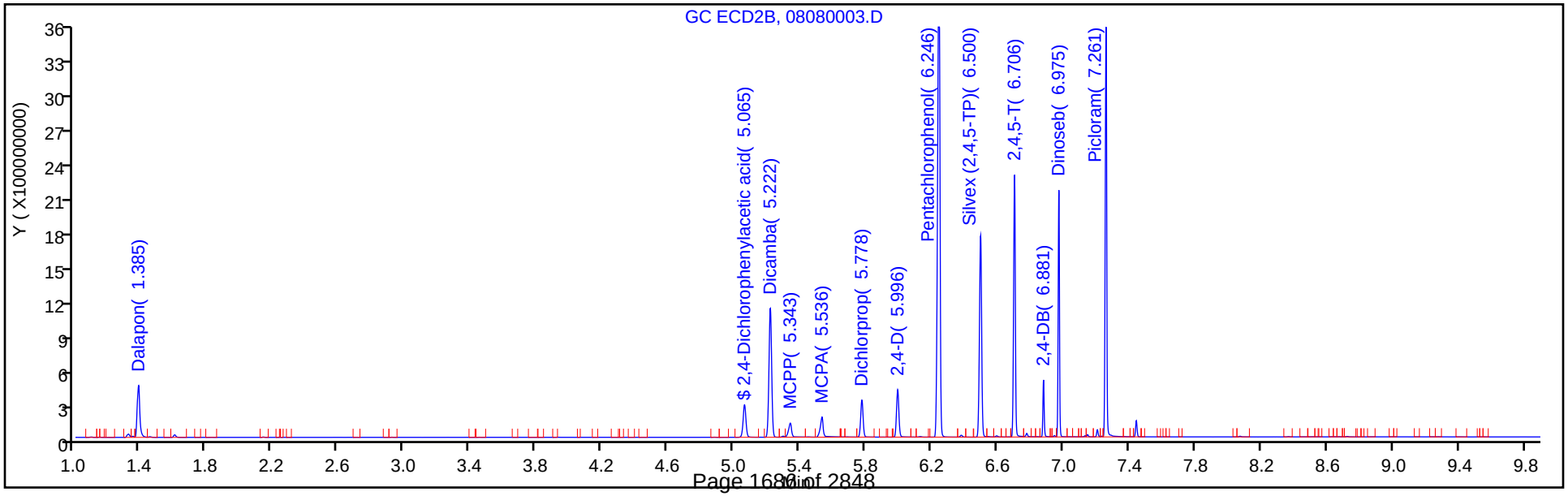
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080003.D

Injection Date:	08-Aug-2018 10:03:43	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD7			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	3
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080004.D
Lims ID: STD6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 08-Aug-2018 10:19:22 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD6
Misc. Info.: 280-0072797-004
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:22 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:21:49

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.620	1.617	0.003	173778808	0.9054	0.9264	
2	1.385	1.379	0.006	279484202	0.9054	0.9201	
						RPD = 0.68	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.322	5.322	0.000	127690857	0.9280	0.9353	
2	5.065	5.063	0.002	192231839	0.9280	0.8238	
						RPD = 12.68	
4 Dicamba							
1	5.484	5.484	0.000	489054356	0.9493	0.9649	
2	5.222	5.220	0.002	711722545	0.9493	0.9643	
						RPD = 0.06	
5 MCPP							
1	5.656	5.653	0.003	55521303	94.3	93.9	
2	5.339	5.334	0.005	98517033	94.3	95.5	
						RPD = 1.76	
6 MCPA							
1	5.778	5.774	0.004	89117073	94.0	93.8	
2	5.531	5.526	0.005	136577833	94.0	96.2	
						RPD = 2.56	
7 Dichlorprop							
1	6.053	6.053	0.000	123854801	0.9532	0.9658	
2	5.778	5.777	0.001	187233012	0.9532	0.9670	
						RPD = 0.12	
8 2,4-D							
1	6.213	6.212	0.001	146188698	0.9403	0.9584	
2	5.995	5.994	0.001	237972083	0.9403	0.9725	
						RPD = 1.46	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.382	6.381	0.001	1706360003	0.9548	0.99	
2	6.245	6.243	0.002	2405218536	0.9548	0.9771	
9 Silvex (2,4,5-TP)							
1	6.728	6.727	0.001	602764895	0.9600	1.00	
2	6.500	6.498	0.002	934041009	0.9600	0.9861	
						RPD = 1.40	
10 2,4,5-T							
1	6.834	6.834	0.000	607839481	0.9574	1.01	
2	6.706	6.704	0.002	970525615	0.9574	1.00	
						RPD = 0.64	
11 2,4-DB							
1	6.998	6.998	0.000	100849899	0.9512	0.9855	
2	6.882	6.882	0.000	154697606	0.9512	1.01	
						RPD = 2.69	
12 Picloram							
1	7.288	7.287	0.001	893423400	0.9451	1.01	
2	7.261	7.259	0.002	1339192412	0.9451	1.01	
						RPD = 0.21	
13 Dinoseb							
1	7.345	7.345	0.000	393559650	0.9543	1.08	
2	6.975	6.973	0.002	664542886	0.9543	1.04	
						RPD = 3.88	

Reagents:

8151ICALL6_00064 Amount Added: 1.00 Units: mL

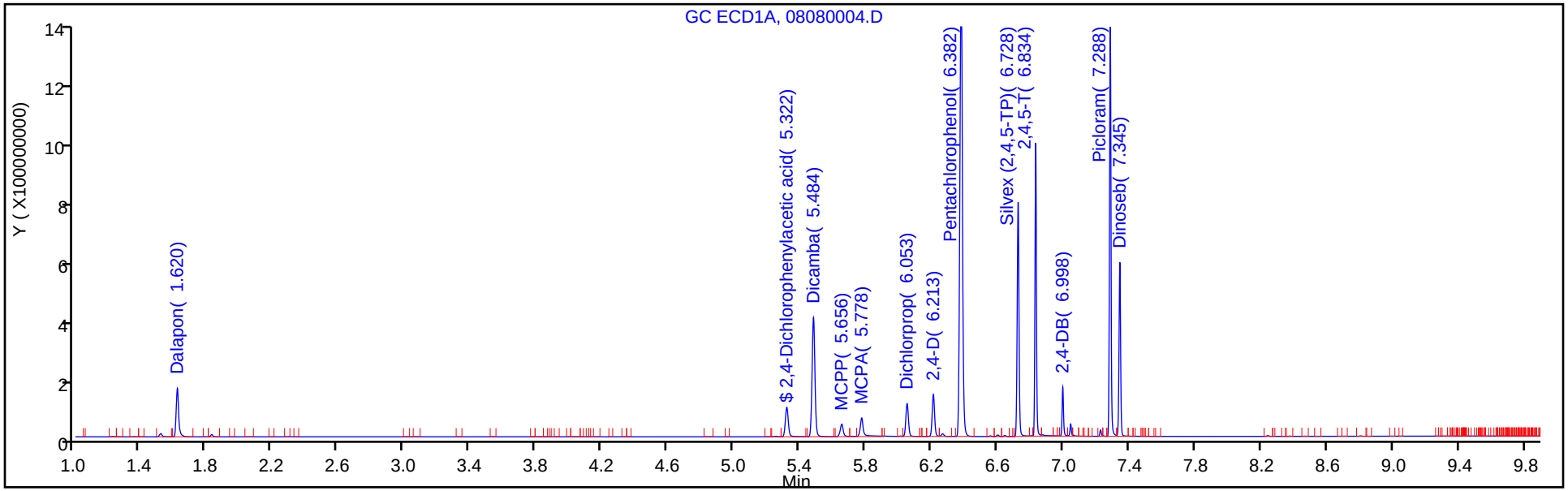
Report Date: 09-Aug-2018 01:29:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

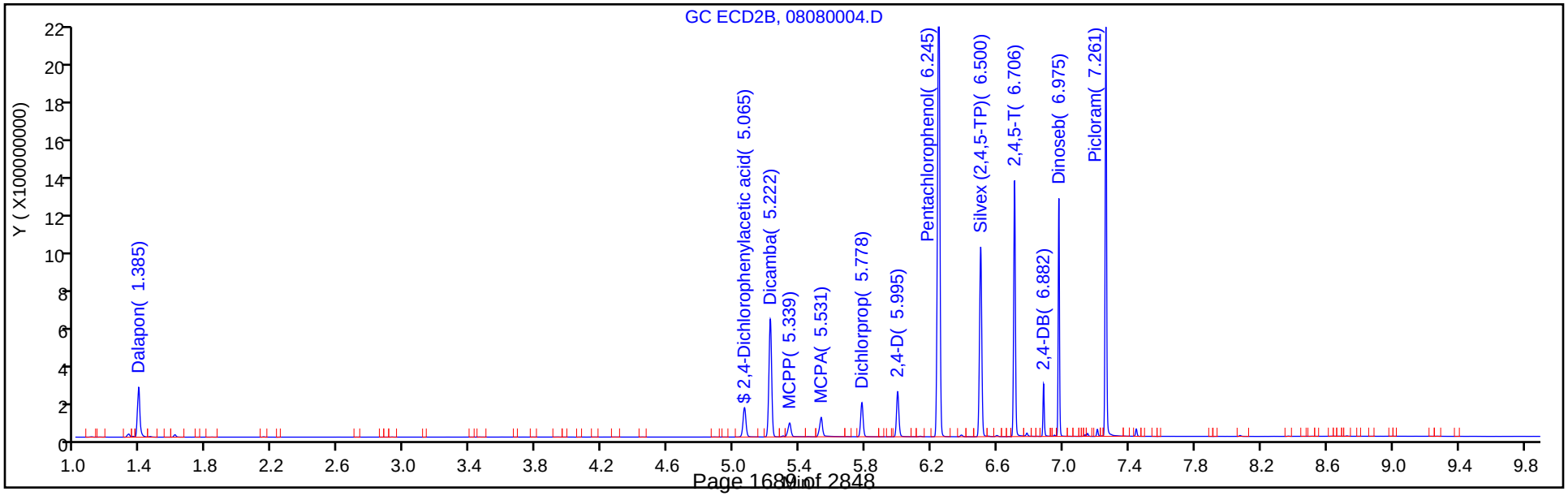
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080004.D

Injection Date:	08-Aug-2018 10:19:22	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD6			Worklist Smp#:	4
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	4
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080005.D
Lims ID: STD5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 08-Aug-2018 10:35:01 ALS Bottle#: 5 Worklist Smp#: 5
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD5
Misc. Info.: 280-0072797-005
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:23 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:18:38

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.617	1.617	0.000	121319168	0.6790	0.6441	
2	1.384	1.379	0.005	198166874	0.6790	0.6493	
						RPD = 0.80	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.320	5.322	-0.002	91001811	0.6960	0.6615	
2	5.065	5.063	0.002	135939868	0.6960	0.5825	
						RPD = 12.69	
4 Dicamba							
1	5.482	5.484	-0.002	342870710	0.7119	0.6726	
2	5.221	5.220	0.001	496960539	0.7119	0.6687	
						RPD = 0.57	
5 MCPP							
1	5.654	5.653	0.001	39506986	70.7	65.9	
2	5.337	5.334	0.003	73315129	70.7	66.4	
						RPD = 0.75	
6 MCPA							
1	5.774	5.774	0.000	63921882	70.5	66.3	
2	5.529	5.526	0.003	100131555	70.5	65.8	
						RPD = 0.88	
7 Dichlorprop							
1	6.051	6.053	-0.002	86795835	0.7149	0.6725	
2	5.778	5.777	0.001	129849800	0.7149	0.6654	
						RPD = 1.06	
8 2,4-D							
1	6.211	6.212	-0.001	100909163	0.7052	0.6576	
2	5.995	5.994	0.001	164538186	0.7052	0.6480	
						RPD = 1.47	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.380	6.381	-0.001	1152076070	0.7161	0.6659	
2	6.245	6.243	0.002	1662130029	0.7161	0.6725	
9 Silvex (2,4,5-TP)							
1	6.726	6.727	-0.001	402505414	0.7200	0.6642	
2	6.500	6.498	0.002	632398746	0.7200	0.6644	
						RPD = 0.03	
10 2,4,5-T							
1	6.834	6.834	0.000	400142785	0.7181	0.6595	
2	6.705	6.704	0.001	648273354	0.7181	0.6655	
						RPD = 0.90	
11 2,4-DB							
1	6.998	6.998	0.000	65822445	0.7134	0.6393	
2	6.882	6.882	0.000	99919640	0.7134	0.6326	
						RPD = 1.06	
12 Picloram							
1	7.287	7.287	0.000	563598055	0.7088	0.6360	
2	7.260	7.259	0.001	870038471	0.7088	0.6543	
						RPD = 2.83	
13 Dinoseb							
1	7.344	7.345	-0.001	244440667	0.7157	0.6715	
2	6.974	6.973	0.001	415921233	0.7157	0.6566	
						RPD = 2.24	

Reagents:

8151ICALL5_00061 Amount Added: 1.00 Units: mL

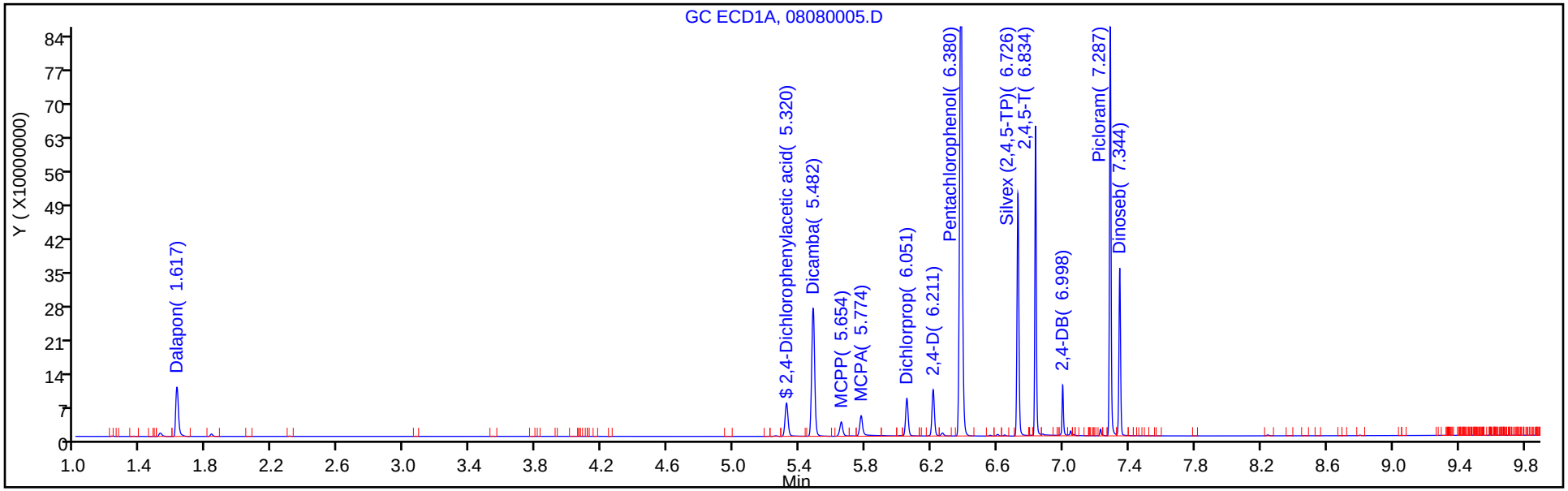
Report Date: 09-Aug-2018 01:29:23 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

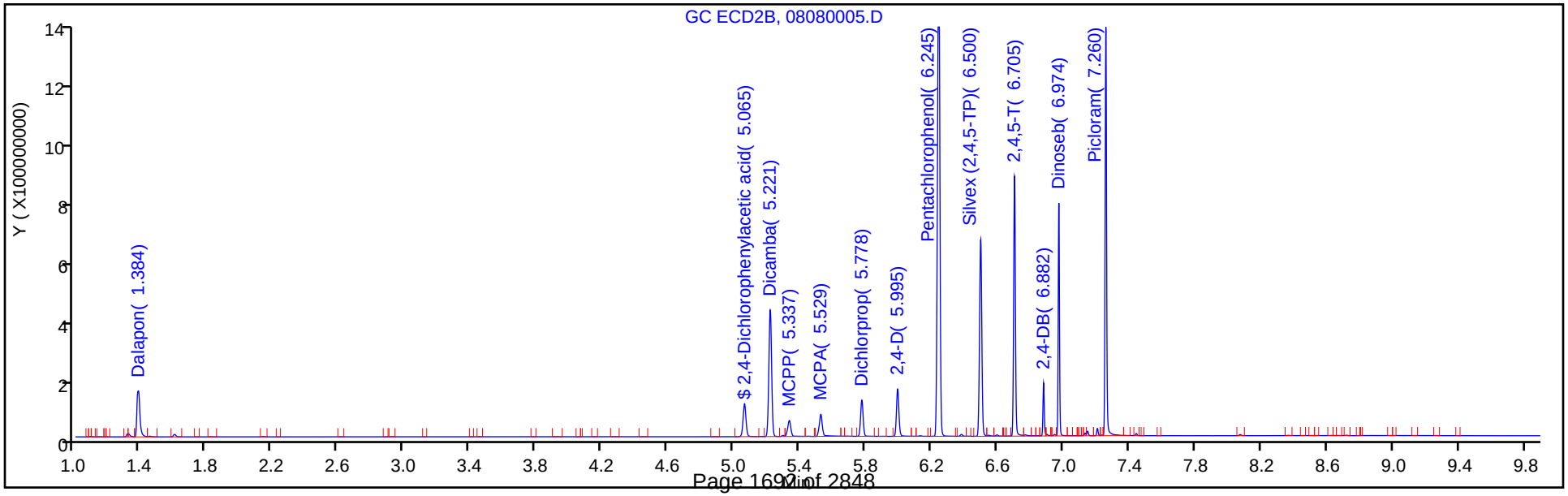
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080005.D

Injection Date:	08-Aug-2018 10:35:01	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD5			Worklist Smp#:	5
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	5
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080006.D
Lims ID: STD4
Client ID:
Sample Type: ICRT Calib Level: 4
Inject. Date: 08-Aug-2018 10:50:41 ALS Bottle#: 6 Worklist Smp#: 6
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD4
Misc. Info.: 280-0072797-006
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:23 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:17:44

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.619	1.619	0.000	90730950	0.4527	0.4795	
2	1.384	1.384	0.000	146872546	0.4527	0.4784	
						RPD = 0.24	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.321	5.321	0.000	69978290	0.4640	0.5045	
2	5.066	5.066	0.000	105251012	0.4640	0.4510	
						RPD = 11.20	
4 Dicamba							
1	5.483	5.483	0.000	259866237	0.4746	0.5066	
2	5.222	5.222	0.000	379560072	0.4746	0.5072	
						RPD = 0.11	
5 MCPP							
1	5.653	5.653	0.000	31037634	47.1	51.1	
2	5.337	5.337	0.000	57672749	47.1	49.4	
						RPD = 3.53	
6 MCPA							
1	5.774	5.774	0.000	51433477	47.0	52.8	
2	5.529	5.529	0.000	78500532	47.0	48.6	
						RPD = 8.24	
7 Dichlorprop							
1	6.052	6.052	0.000	67162069	0.4766	0.5172	
2	5.778	5.778	0.000	102116188	0.4766	0.5197	
						RPD = 0.48	
8 2,4-D							
1	6.211	6.211	0.000	78621594	0.4702	0.5096	
2	5.996	5.996	0.000	129223808	0.4702	0.4987	
						RPD = 2.15	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.379	6.379	0.000	881023118	0.4774	0.5070	
2	6.245	6.245	0.000	1290240384	0.4774	0.5201	
9 Silvex (2,4,5-TP)							
1	6.726	6.726	0.000	312893709	0.4800	0.5139	
2	6.499	6.499	0.000	497595756	0.4800	0.5207	
						RPD = 1.30	
10 2,4,5-T							
1	6.834	6.834	0.000	313470426	0.4787	0.5149	
2	6.706	6.706	0.000	513159291	0.4787	0.5254	
						RPD = 2.02	
11 2,4-DB							
1	6.998	6.998	0.000	53887137	0.4756	0.5214	
2	6.882	6.882	0.000	80729498	0.4756	0.5030	
						RPD = 3.59	
12 Picloram							
1	7.287	7.287	0.000	451274470	0.4726	0.5082	
2	7.260	7.260	0.000	703441877	0.4726	0.5282	
						RPD = 3.86	
13 Dinoseb							
1	7.344	7.344	0.000	192463771	0.4771	0.5287	
2	6.974	6.974	0.000	325556199	0.4771	0.5172	
						RPD = 2.19	

Reagents:

8151ICALL4_00130 Amount Added: 1.00 Units: mL

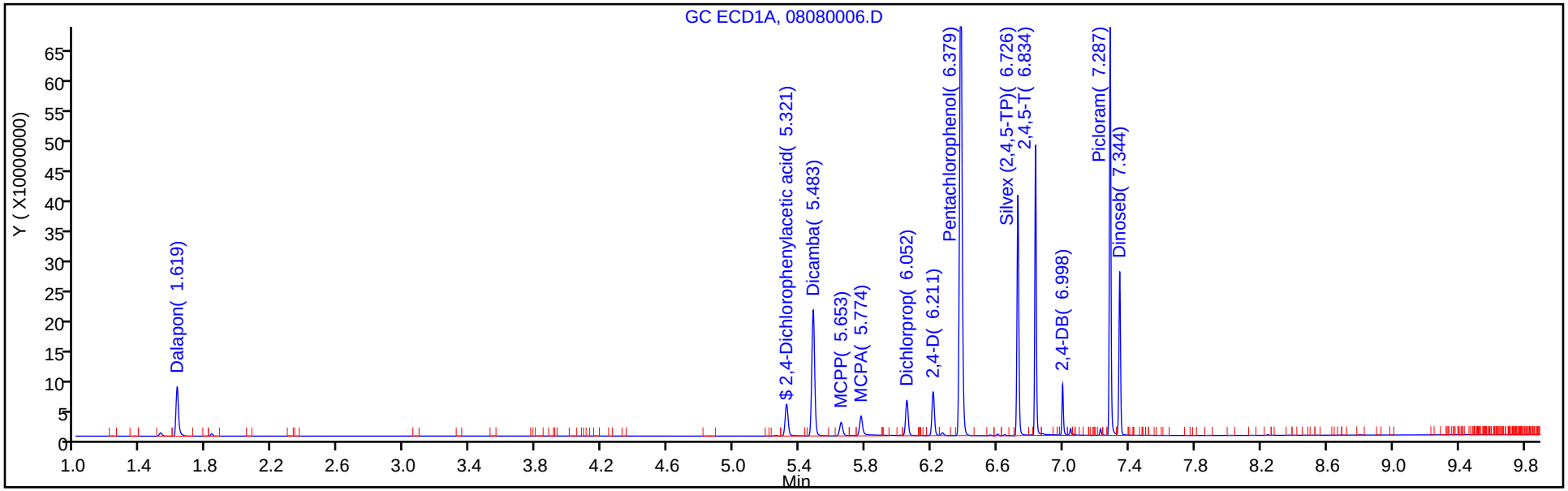
Report Date: 09-Aug-2018 01:29:24 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

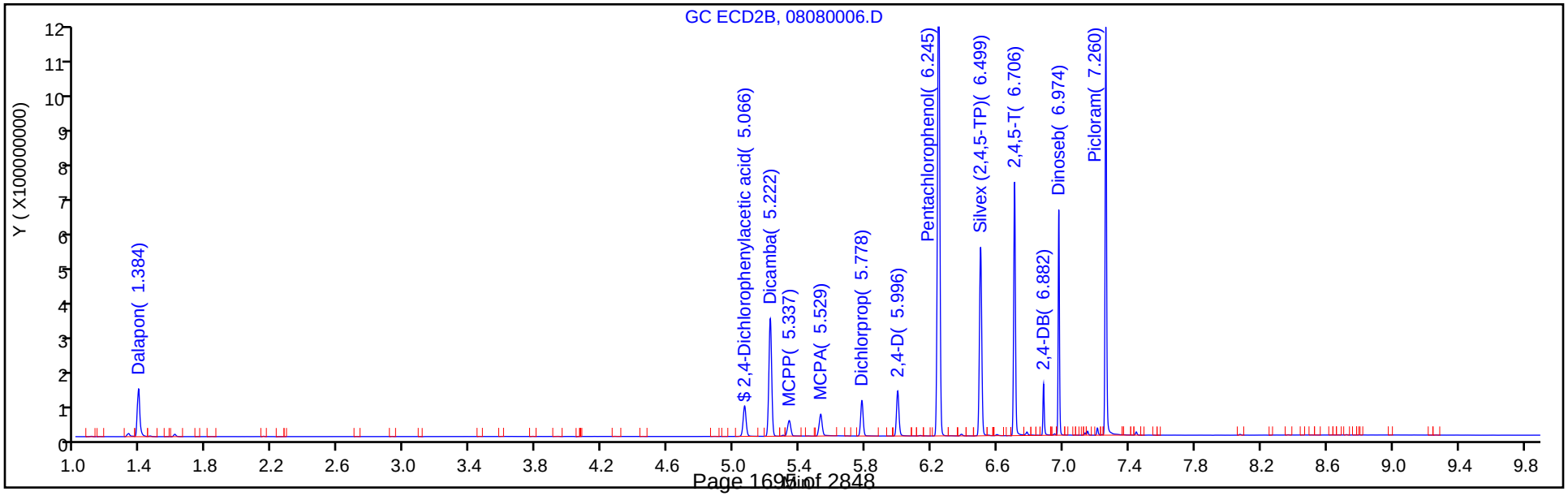
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080006.D

Injection Date:	08-Aug-2018 10:50:41	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD4			Worklist Smp#:	6
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	6
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080007.D
Lims ID: STD3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 08-Aug-2018 11:07:33 ALS Bottle#: 7 Worklist Smp#: 7
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD3
Misc. Info.: 280-0072797-007
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:24 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:54:54

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.618	1.619	-0.001	44769585	0.2263	0.2322	
2	1.382	1.384	-0.002	73069873	0.2263	0.2325	
						RPD = 0.15	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.321	5.321	0.000	34905989	0.2320	0.2428	
2	5.064	5.066	-0.002	53885382	0.2320	0.2309	
						RPD = 5.02	
4 Dicamba							
1	5.482	5.483	-0.001	128504710	0.2373	0.2440	
2	5.220	5.222	-0.002	188893478	0.2373	0.2448	
						RPD = 0.34	
5 MCPP							
1	5.651	5.653	-0.002	16349072	23.6	25.5	
2	5.333	5.337	-0.004	35305806	23.6	26.1	
						RPD = 2.43	
6 MCPA							
1	5.772	5.774	-0.002	26153275	23.5	25.2	
2	5.524	5.529	-0.005	49079036	23.5	26.1	
						RPD = 3.38	
7 Dichlorprop							
1	6.051	6.052	-0.001	33266559	0.2383	0.2489	
2	5.776	5.778	-0.002	51328072	0.2383	0.2527	
						RPD = 1.52	
8 2,4-D							
1	6.211	6.211	0.000	38735658	0.2351	0.2446	
2	5.994	5.996	-0.002	64835200	0.2351	0.2364	
						RPD = 3.42	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.379	6.379	0.000	424681376	0.2387	0.2396	
2	6.242	6.245	-0.003	629461122	0.2387	0.2492	
9 Silvex (2,4,5-TP)							
1	6.726	6.726	0.000	150161322	0.2400	0.2411	
2	6.497	6.499	-0.002	241304118	0.2400	0.2474	
						RPD = 2.57	
10 2,4,5-T							
1	6.833	6.834	-0.001	147824175	0.2394	0.2386	
2	6.704	6.706	-0.002	245337273	0.2394	0.2478	
						RPD = 3.78	
11 2,4-DB							
1	6.998	6.998	0.000	26094182	0.2378	0.2467	
2	6.881	6.882	-0.001	37951372	0.2378	0.2202	
						RPD = 11.36	
12 Picloram							
1	7.287	7.287	0.000	211221827	0.2363	0.2350	
2	7.260	7.260	0.000	320766126	0.2363	0.2387	
						RPD = 1.53	
13 Dinoseb							
1	7.345	7.344	0.001	86729861	0.2386	0.2383	
2	6.973	6.974	-0.001	138827132	0.2386	0.2293	
						RPD = 3.84	

Reagents:

8151ICALL3_00062 Amount Added: 1.00 Units: mL

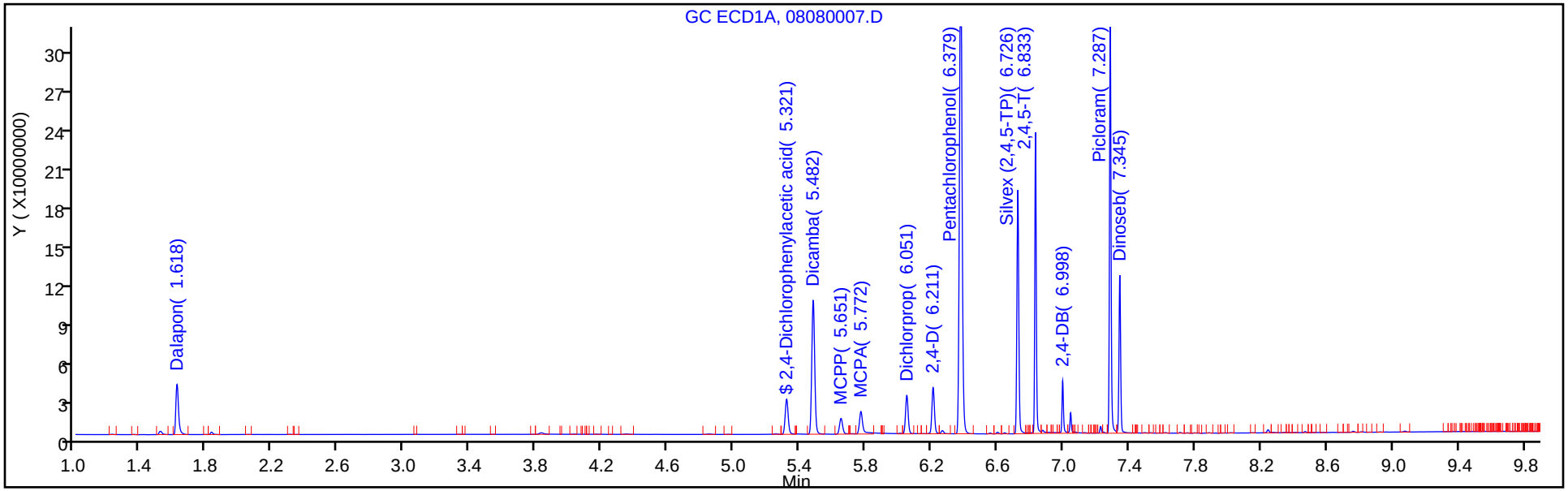
Report Date: 09-Aug-2018 01:29:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

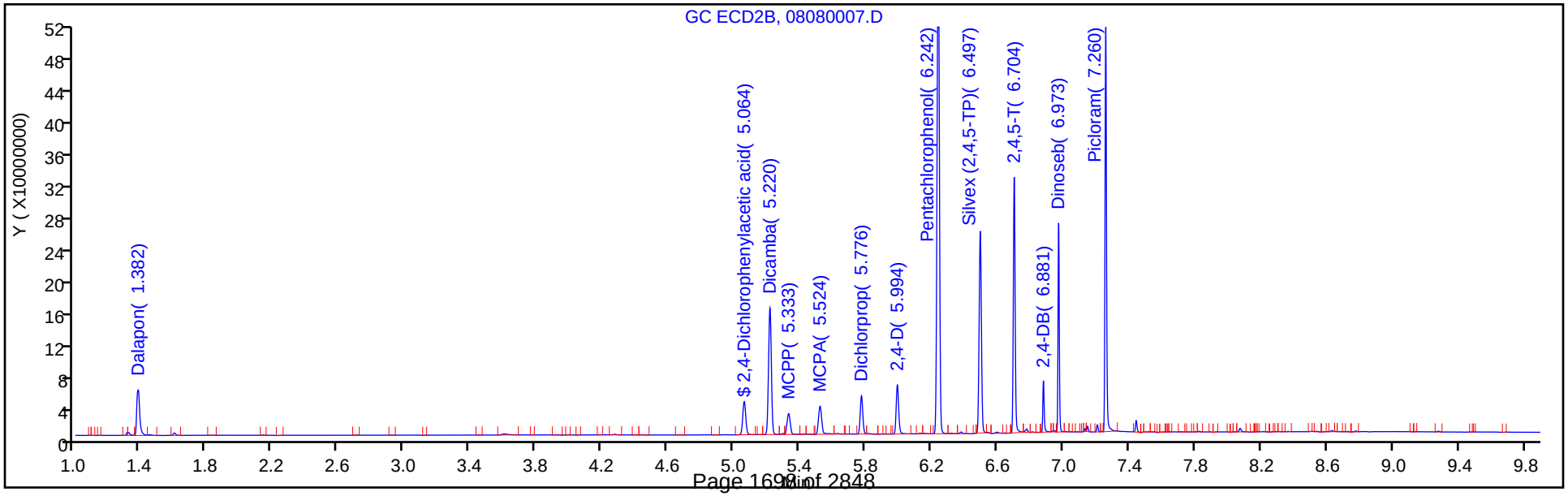
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080007.D

Injection Date:	08-Aug-2018 11:07:33	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD3			Worklist Smp#:	7
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	7
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080008.D
Lims ID: STD2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 08-Aug-2018 11:24:30 ALS Bottle#: 8 Worklist Smp#: 8
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD2
Misc. Info.: 280-0072797-008
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:25 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:55:29

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.618	1.619	-0.001	18804090	0.0905	0.0925	
2	1.382	1.384	-0.002	30877974	0.0905	0.0920	
						RPD = 0.53	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.323	5.321	0.002	15080670	0.0928	0.0948	
2	5.066	5.066	0.000	23594788	0.0928	0.1011	
						RPD = 6.40	
4 Dicamba							
1	5.484	5.483	0.001	54743935	0.0949	0.0965	
2	5.221	5.222	-0.001	82628015	0.0949	0.0986	
						RPD = 2.13	
5 MCPP							
1	5.652	5.653	-0.001	7347396	9.43	9.80	
2	5.335	5.337	-0.002	18484319	9.43	9.44	
						RPD = 3.70	
6 MCPA							
1	5.773	5.774	-0.001	11491551	9.40	9.29	
2	5.525	5.529	-0.004	26539187	9.40	9.54	
						RPD = 2.59	
7 Dichlorprop							
1	6.053	6.052	0.001	13924117	0.0953	0.0959	
2	5.778	5.778	0.000	21696071	0.0953	0.0970	
						RPD = 1.19	
8 2,4-D							
1	6.213	6.211	0.002	16266729	0.0940	0.0953	
2	5.996	5.996	0.000	29938127	0.0940	0.0990	
						RPD = 3.78	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.380	6.379	0.000	178599631	0.0955	0.0954	
2	6.244	6.245	-0.001	261322018	0.0955	0.0983	
9 Silvex (2,4,5-TP)							
1	6.727	6.726	0.001	63715624	0.0960	0.0961	
2	6.499	6.499	0.000	105894186	0.0960	0.1030	
						RPD = 6.86	
10 2,4,5-T							
1	6.834	6.834	0.000	61884640	0.0957	0.0952	
2	6.705	6.706	-0.001	97475937	0.0957	0.0945	
						RPD = 0.78	
11 2,4-DB							
1	6.999	6.998	0.001	10910300	0.0951	0.0966	
2	6.882	6.882	0.000	21619795	0.0951	0.1143	
						RPD = 16.75	
12 Picloram							
1	7.287	7.287	0.000	87789076	0.0945	0.0945	
2	7.260	7.260	0.000	120299432	0.0945	0.0870	
						RPD = 8.36	
13 Dinoseb							
1	7.345	7.344	0.001	33423289	0.0954	0.0918	
2	6.974	6.974	0.000	50599641	0.0954	0.0932	
						RPD = 1.51	

Reagents:

8151ICALL2_00069 Amount Added: 1.00 Units: mL

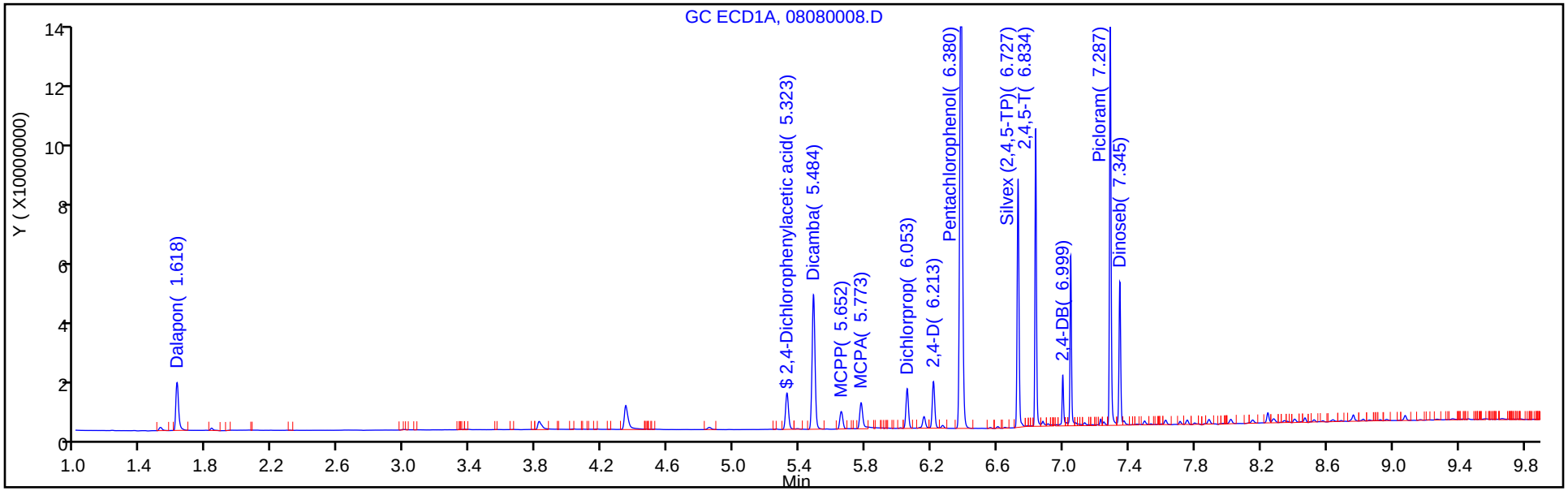
Report Date: 09-Aug-2018 01:29:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

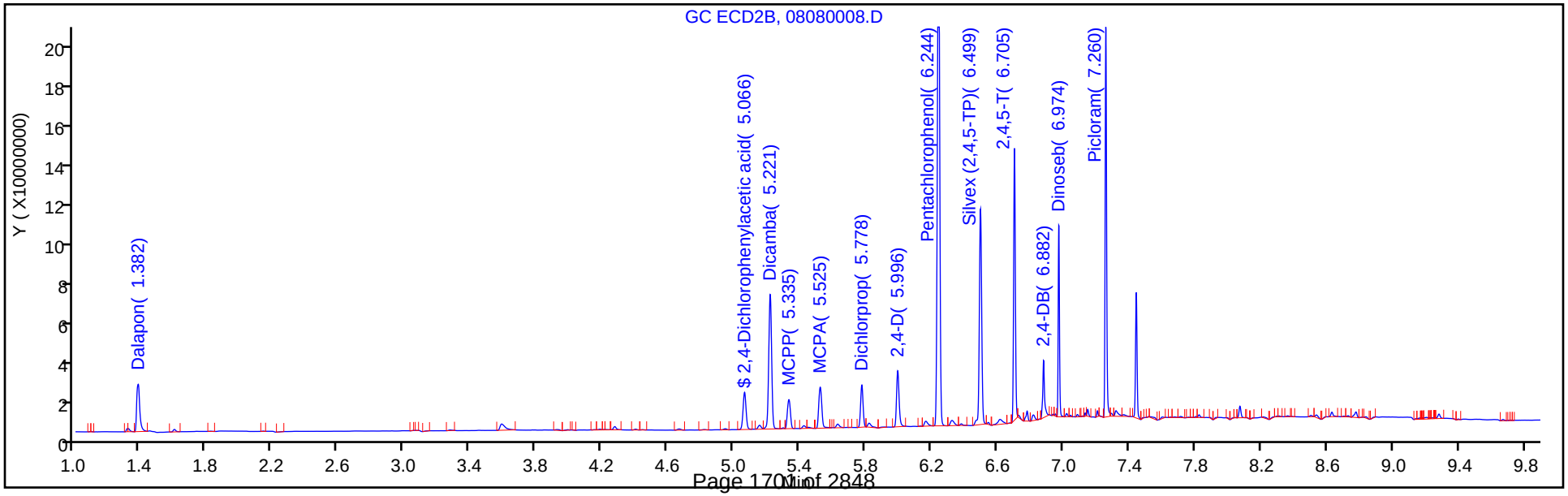
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080008.D

Injection Date:	08-Aug-2018 11:24:30	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD2			Worklist Smp#:	8
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	8
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.D
Lims ID: STD1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 08-Aug-2018 11:41:27 ALS Bottle#: 9 Worklist Smp#: 9
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD1
Misc. Info.: 280-0072797-009
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:26 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:57:27

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.618	1.619	-0.001	9876236	0.0453	0.0444	
2	1.379	1.384	-0.005	16634606	0.0453	0.0446	
						RPD = 0.24	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.323	5.321	0.002	8441231	0.0464	0.0453	
2	5.064	5.066	-0.002	13192413	0.0464	0.0565	
						RPD = 22.08	
4 Dicamba							
1	5.484	5.483	0.001	29818971	0.0475	0.0467	
2	5.219	5.222	-0.003	44516848	0.0475	0.0462	
						RPD = 1.14	
5 MCPP							
1	5.653	5.653	0.000	4333952	4.71	4.54	
2	5.333	5.337	-0.004	11577563	4.71	2.76	
						RPD = 48.70	
6 MCPA							
1	5.774	5.774	0.000	7208087	4.70	4.63	
2	5.524	5.529	-0.005	17320028	4.70	2.90	
						RPD = 46.00	
7 Dichlorprop							
1	6.054	6.052	0.002	7740566	0.0477	0.0469	
2	5.777	5.778	-0.001	12087337	0.0477	0.0465	
						RPD = 0.89	
8 2,4-D							
1	6.214	6.211	0.003	8864992	0.0470	0.0462	
2	5.995	5.996	-0.001	14562776	0.0470	0.0395	
						RPD = 15.61	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.380	6.379	0.001	97079361	0.0477	0.0476	
2	6.244	6.245	-0.002	134946851	0.0477	0.0465	
9 Silvex (2,4,5-TP)							
1	6.727	6.726	0.001	34872373	0.0480	0.0478	
2	6.499	6.499	0.000	52335796	0.0480	0.0459	
						RPD = 4.11	
10 2,4,5-T							
1	6.834	6.834	0.000	33496179	0.0479	0.0479	
2	6.705	6.706	-0.001	52282980	0.0479	0.0476	
						RPD = 0.50	
11 2,4-DB							
1	6.999	6.998	0.001	5862128	0.0476	0.0467	
2	6.882	6.882	0.000	10759379	0.0476	0.0444	
						RPD = 4.97	
12 Picloram							
1	7.287	7.287	0.000	46134431	0.0473	0.0471	
2	7.259	7.260	-0.001	69688067	0.0473	0.0487	
						RPD = 3.16	
13 Dinoseb							
1	7.345	7.344	0.001	14083674	0.0477	0.0387	
2	6.974	6.974	0.000	21082281	0.0477	0.0477	
						RPD = 20.85	

Reagents:

8151ICALL1_00067 Amount Added: 1.00 Units: mL

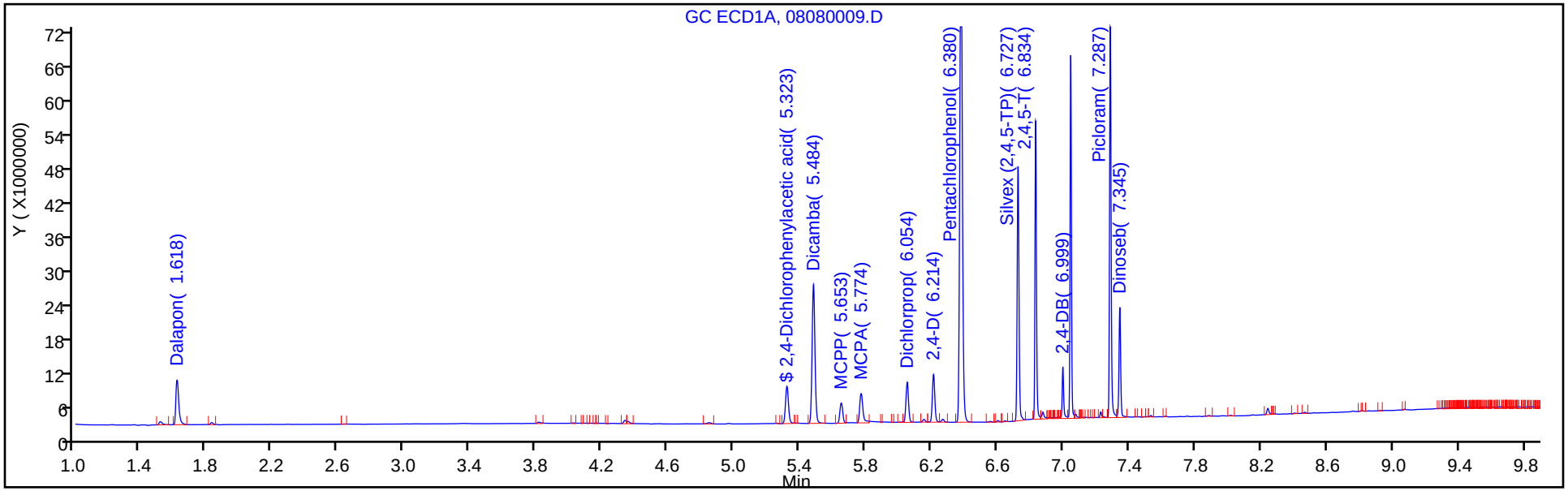
Report Date: 09-Aug-2018 01:29:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

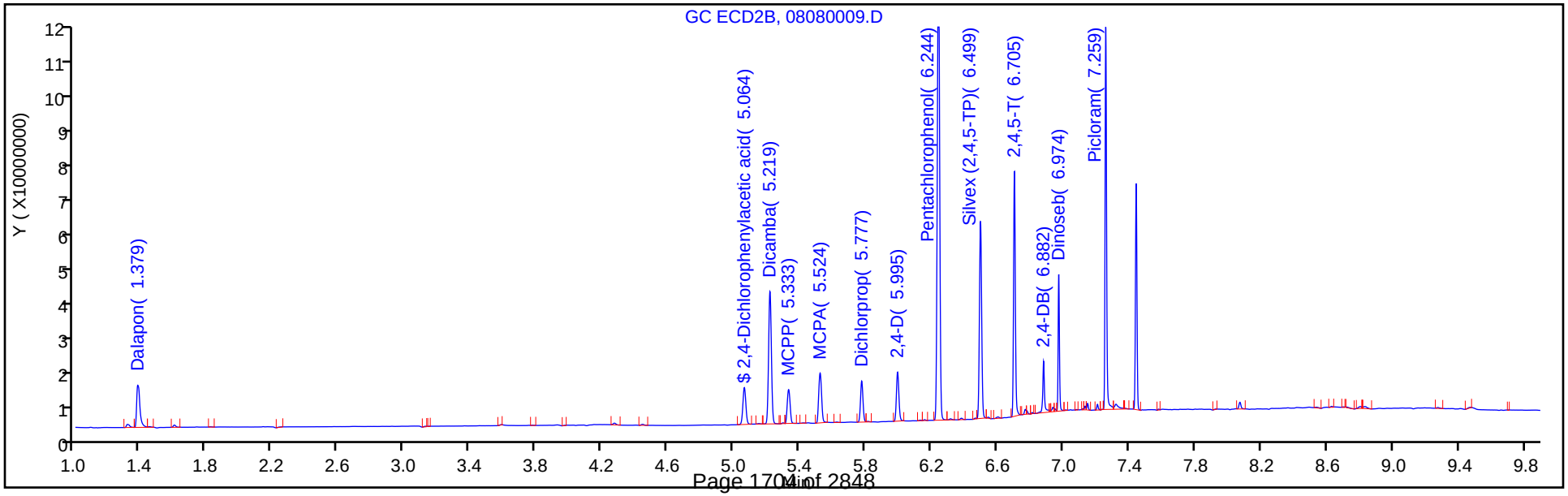
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.D

Injection Date:	08-Aug-2018 11:41:27	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD1			Worklist Smp#:	9
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	9
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM VI
HERBICIDES BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1 Analy Batch No.: 425303

SDG No.:

Instrument ID: SGC_M GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/08/2018 10:03 Calibration End Date: 08/08/2018 11:41 Calibration ID: 33327

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-425303/9	08080009.D
Level 2	STD2 280-425303/8	08080008.D
Level 3	STD3 280-425303/7	08080007.D
Level 4	STD4 280-425303/6	08080006.D
Level 5	STD5 280-425303/5	08080005.D
Level 6	STD6 280-425303/4	08080004.D
Level 7	STD7 280-425303/3	08080003.D

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Dalapon	1.379	1.382	1.382	1.384	1.384	1.385	1.385				1.349 - 1.409	1.383
Dicamba	5.219	5.221	5.220	5.222	5.221	5.222	5.222				5.190 - 5.250	5.221
MCPP	5.333	5.335	5.333	5.337	5.337	5.339	5.343				5.304 - 5.364	5.337
MCPA	5.524	5.525	5.524	5.529	5.529	5.531	5.536				5.496 - 5.556	5.528
Dichlorprop	5.777	5.778	5.776	5.778	5.778	5.778	5.778				5.747 - 5.807	5.778
2,4-D	5.995	5.996	5.994	5.996	5.995	5.995	5.996				5.964 - 6.024	5.995
Pentachlorophenol	6.244	6.244	6.242	6.245	6.245	6.245	6.246				6.143 - 6.343	6.244
Silvex (2,4,5-TP)	6.499	6.499	6.497	6.499	6.500	6.500	6.500				6.468 - 6.528	6.499
2,4,5-T	6.705	6.705	6.704	6.706	6.705	6.706	6.706				6.674 - 6.734	6.705
2,4-DB	6.882	6.882	6.881	6.882	6.882	6.882	6.881				6.852 - 6.912	6.882
Dinoseb	6.974	6.974	6.973	6.974	6.974	6.975	6.975				6.943 - 7.003	6.974
Picloram	7.259	7.260	7.260	7.260	7.260	7.261	7.261				7.229 - 7.289	7.260
2,4-Dichlorophenylacetic acid	5.064	5.066	5.064	5.066	5.065	5.065	+++++				5.033 - 5.093	5.065

FORM VI
HERBICIDES BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 160-29498-1 Analy Batch No.: 425303

SDG No.:

Instrument ID: SGC_M GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/08/2018 10:03 Calibration End Date: 08/08/2018 11:41 Calibration ID: 33327

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-425303/9	08080009.D
Level 2	STD2 280-425303/8	08080008.D
Level 3	STD3 280-425303/7	08080007.D
Level 4	STD4 280-425303/6	08080006.D
Level 5	STD5 280-425303/5	08080005.D
Level 6	STD6 280-425303/4	08080004.D
Level 7	STD7 280-425303/3	08080003.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 7	LVL 4		B	M1	M2								
Dalapon	367473485 291845694	341061181 308702935	322835911 284820583	324454732	Lin2	3259080.97	300200314							0.9980		0.9900
Dicamba	937937277 698039560	870455781 749773553	795969357 684240902	799705182	Lin2	10976755.2	726724022							0.9960		0.9900
MCPP	2456668 1037126	1961114 1045227	1498323 882192	1223770	Qua	8695461.82	1047579.70	-1124.7847						0.9980		0.9900
MCPA	3685763 1420557	2823816 1453212	2088838 1234786	1670519	Qua	13258102.5	1405089.03	-1280.9832						0.9980		0.9900
Dichlorprop	253629271 181643043	227624938 196436040	215403964 174795568	214270971	Lin2	3236271.16	190278759							0.9940		0.9900
2,4-D	309747442 233313036	318389099 253081020	275806445 222772715	274856552	Qua	4280446.16	261290613	-21594851						0.9980		0.9900
Pentachlorophenol	2826852076 2321208036	2737072721 2519212921	2637176735 2211327173	2702781637	Lin2	21636960.5	2439367626							0.9940		0.9900
Silvex (2,4,5-TP)	1090329083 878331592	1103064438 972959384	1005433825 855324573	1036657825	Lin2	9337602.86	937768817							0.9930		0.9900
2,4,5-T	1092186756 902824809	1018131784 1013709646	1025014719 885970031	1071985149	Lin2	6354906.85	964579997							0.9940		0.9900
2,4-DB	226239373 140068535	227301635 162642702	159602048 143868593	169751349	Qua	3809756.34	156756729	-7626415.6						0.9950		0.9900
Dinoseb	441860749 581149221	530255604 696403339	581931913 624505340	682328947	Lin1	-9845804.7	648444496							0.9940		0.9900
Picloram	1474723669 1227437620	1272875167 1416984882	1357596555 1233749102	1488608353	Lin2	5390348.99	1321498660							0.9910		0.9900
2,4-Dichlorophenylacetic acid	284319246 195315902	254254181 207146378	232264578 +++++	226834078	Ave		233355727				13.8		20.0			

Note: The M1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
HERBICIDES BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-29498-1 Analy Batch No.: 425303

SDG No.:

Instrument ID: SGC_M GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/08/2018 10:03 Calibration End Date: 08/08/2018 11:41 Calibration ID: 33327

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD1 280-425303/9	08080009.D
Level 2	STD2 280-425303/8	08080008.D
Level 3	STD3 280-425303/7	08080007.D
Level 4	STD4 280-425303/6	08080006.D
Level 5	STD5 280-425303/5	08080005.D
Level 6	STD6 280-425303/4	08080004.D
Level 7	STD7 280-425303/3	08080003.D

ANALYTE	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
Dalapon	Lin2	16634606 279484202	30877974 515724629	73069873	146872546	198166874	0.0453 0.905	0.0905 1.81	0.226	0.453	0.679
Dicamba	Lin2	44516848 711722545	82628015 1299031353	188893478	379560072	496960539	0.0475 0.949	0.0949 1.90	0.237	0.475	0.712
MCPP	Qua	11577563 98517033	18484319 166300598	35305806	57672749	73315129	4.71 94.3	9.43 189	23.6	47.1	70.7
MCPA	Qua	17320028 136577833	26539187 232098793	49079036	78500532	100131555	4.70 94.0	9.40 188	23.5	47.0	70.5
Dichlorprop	Lin2	12087337 187233012	21696071 333212792	51328072	102116188	129849800	0.0477 0.953	0.0953 1.91	0.238	0.477	0.715
2,4-D	Qua	14562776 237972083	29938127 418946367	64835200	129223808	164538186	0.0470 0.940	0.0940 1.88	0.235	0.470	0.705
Pentachlorophenol	Lin2	134946851 2405218536	261322018 4222529236	629461122	1290240384	1662130029	0.0477 0.955	0.0955 1.91	0.239	0.477	0.716
Silvex (2,4,5-TP)	Lin2	52335796 934041009	105894186 1642223181	241304118	497595756	632398746	0.0480 0.960	0.0960 1.92	0.240	0.480	0.720
2,4,5-T	Lin2	52282980 970525615	97475937 1696455416	245337273	513159291	648273354	0.0479 0.957	0.0957 1.91	0.239	0.479	0.718
2,4-DB	Qua	10759379 154697606	21619795 273681225	37951372	80729498	99919640	0.0476 0.951	0.0951 1.90	0.238	0.476	0.713
Dinoseb	Lin1	21082281 664542886	50599641 1191868441	138827132	325556199	415921233	0.0477 0.954	0.0954 1.91	0.239	0.477	0.716
Picloram	Lin2	69688067 1339192412	120299432 2332032553	320766126	703441877	870038471	0.0473 0.945	0.0945 1.89	0.236	0.473	0.709
2,4-Dichlorophenylacetic acid	Ave	13192413 192231839	23594788 +++++	53885382	105251012	135939868	0.0464 0.928	0.0928 +++++	0.232	0.464	0.696

FORM VI
HERBICIDES BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 160-29498-1 Analy Batch No.: 425303

SDG No.:

Instrument ID: SGC_M GC Column: CLP2 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/08/2018 10:03 Calibration End Date: 08/08/2018 11:41 Calibration ID: 33327

Curve Type Legend:

Ave = Average
Lin1 = Linear 1/conc
Lin2 = Linear 1/conc^2
Qua = Quadratic

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080003.D
Lims ID: STD7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 08-Aug-2018 10:03:43 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD7
Misc. Info.: 280-0072797-003
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:20 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:19:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.621	1.617	0.004	317760319	1.81	1.70	
2	1.385	1.379	0.006	515724629	1.81	1.71	
						RPD = 0.35	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.323	5.322	0.001	228614337	1.86	1.69	
2	5.065	5.063	0.002	345246756	1.86	1.48	
						RPD = 13.19	
4 Dicamba							
1	5.486	5.484	0.002	901868847	1.90	1.79	
2	5.222	5.220	0.002	1299031353	1.90	1.77	
						RPD = 1.00	
5 MCPP							
1	5.660	5.653	0.007	99152098	188.5	170.0	
2	5.343	5.334	0.009	166300598	188.5	188.7	
						RPD = 10.39	
6 MCPA							
1	5.782	5.774	0.008	156636006	188.0	167.2	
2	5.536	5.526	0.010	232098793	188.0	188.0	
						RPD = 11.66	
7 Dichlorprop							
1	6.053	6.053	0.000	224759907	1.91	1.76	
2	5.778	5.777	0.001	333212792	1.91	1.73	
						RPD = 1.72	
8 2,4-D							
1	6.213	6.212	0.001	264659398	1.88	1.75	
2	5.996	5.994	0.002	418946367	1.88	1.88	
						RPD = 7.35	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.384	6.381	0.003	3177985119	1.91	1.85	
2	6.246	6.243	0.003	4222529236	1.91	1.72	
9 Silvex (2,4,5-TP)							
1	6.728	6.727	0.001	1110139196	1.92	1.85	
2	6.500	6.498	0.002	1642223181	1.92	1.74	
						RPD = 6.09	
10 2,4,5-T							
1	6.836	6.834	0.002	1111609855	1.91	1.85	
2	6.706	6.704	0.002	1696455416	1.91	1.75	
						RPD = 5.24	
11 2,4-DB							
1	6.999	6.998	0.001	181403545	1.90	1.78	
2	6.881	6.882	-0.001	273681225	1.90	1.90	
						RPD = 6.25	
12 Picloram							
1	7.289	7.287	0.002	1606684826	1.89	1.82	
2	7.261	7.259	0.002	2332032553	1.89	1.76	
						RPD = 3.49	
13 Dinoseb							
1	7.346	7.345	0.001	728728421	1.91	2.00	
2	6.975	6.973	0.002	1191868441	1.91	1.85	
						RPD = 7.71	

Reagents:

8151ICALL7_00061 Amount Added: 1.00 Units: mL

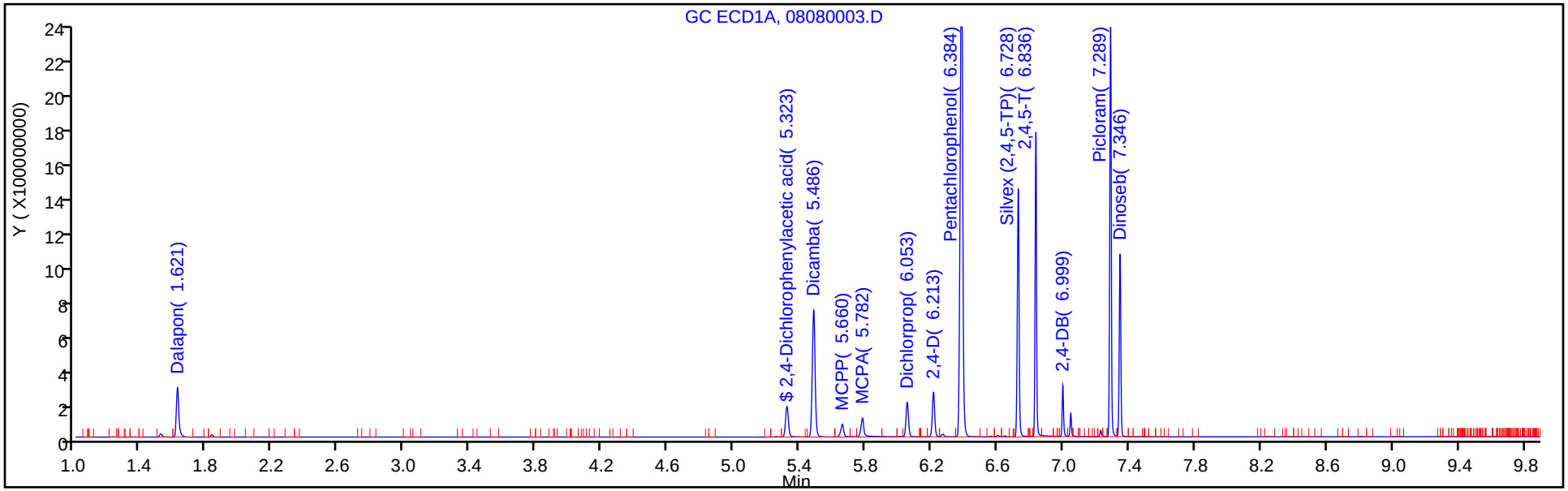
Report Date: 09-Aug-2018 01:29:21 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

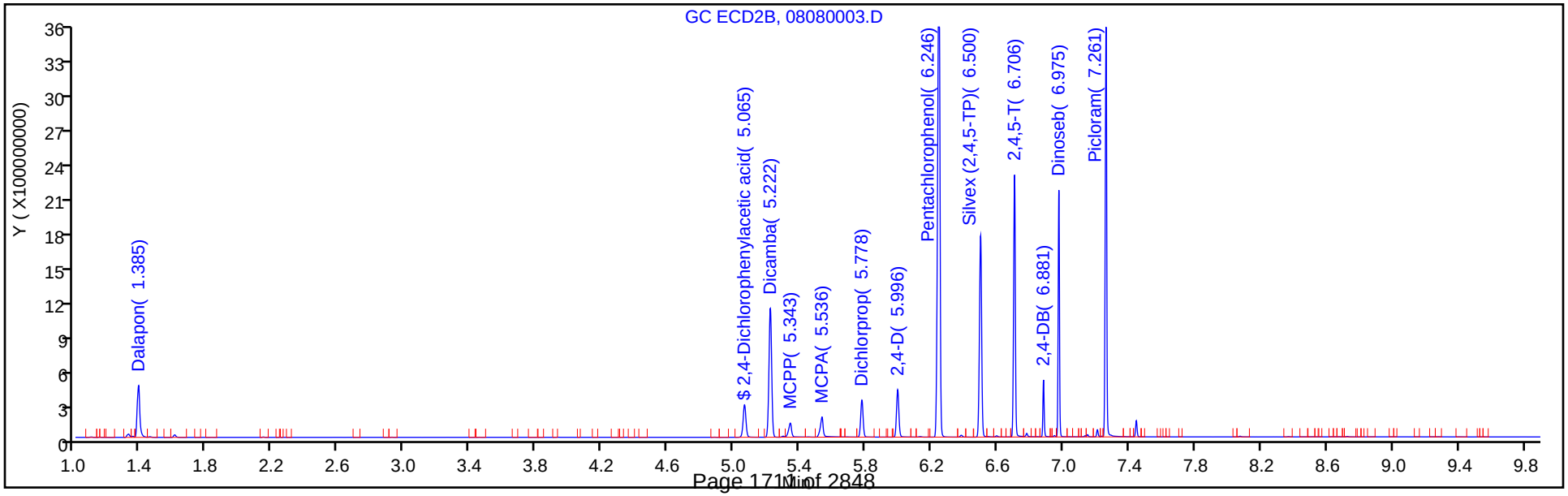
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080003.D

Injection Date:	08-Aug-2018 10:03:43	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD7			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	3
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080004.D
Lims ID: STD6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 08-Aug-2018 10:19:22 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD6
Misc. Info.: 280-0072797-004
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:22 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:21:49

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.620	1.617	0.003	173778808	0.9054	0.9264	
2	1.385	1.379	0.006	279484202	0.9054	0.9201	
						RPD = 0.68	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.322	5.322	0.000	127690857	0.9280	0.9353	
2	5.065	5.063	0.002	192231839	0.9280	0.8238	
						RPD = 12.68	
4 Dicamba							
1	5.484	5.484	0.000	489054356	0.9493	0.9649	
2	5.222	5.220	0.002	711722545	0.9493	0.9643	
						RPD = 0.06	
5 MCPP							
1	5.656	5.653	0.003	55521303	94.3	93.9	
2	5.339	5.334	0.005	98517033	94.3	95.5	
						RPD = 1.76	
6 MCPA							
1	5.778	5.774	0.004	89117073	94.0	93.8	
2	5.531	5.526	0.005	136577833	94.0	96.2	
						RPD = 2.56	
7 Dichlorprop							
1	6.053	6.053	0.000	123854801	0.9532	0.9658	
2	5.778	5.777	0.001	187233012	0.9532	0.9670	
						RPD = 0.12	
8 2,4-D							
1	6.213	6.212	0.001	146188698	0.9403	0.9584	
2	5.995	5.994	0.001	237972083	0.9403	0.9725	
						RPD = 1.46	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.382	6.381	0.001	1706360003	0.9548	0.99	
2	6.245	6.243	0.002	2405218536	0.9548	0.9771	
9 Silvex (2,4,5-TP)							
1	6.728	6.727	0.001	602764895	0.9600	1.00	
2	6.500	6.498	0.002	934041009	0.9600	0.9861	
						RPD = 1.40	
10 2,4,5-T							
1	6.834	6.834	0.000	607839481	0.9574	1.01	
2	6.706	6.704	0.002	970525615	0.9574	1.00	
						RPD = 0.64	
11 2,4-DB							
1	6.998	6.998	0.000	100849899	0.9512	0.9855	
2	6.882	6.882	0.000	154697606	0.9512	1.01	
						RPD = 2.69	
12 Picloram							
1	7.288	7.287	0.001	893423400	0.9451	1.01	
2	7.261	7.259	0.002	1339192412	0.9451	1.01	
						RPD = 0.21	
13 Dinoseb							
1	7.345	7.345	0.000	393559650	0.9543	1.08	
2	6.975	6.973	0.002	664542886	0.9543	1.04	
						RPD = 3.88	

Reagents:

8151ICALL6_00064 Amount Added: 1.00 Units: mL

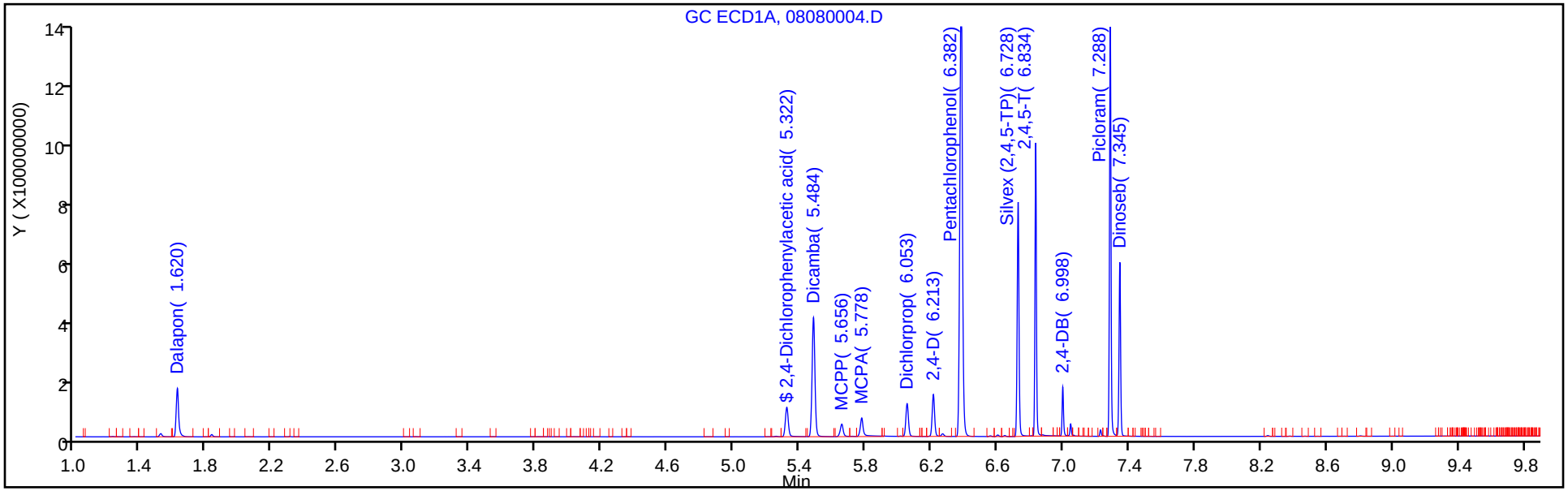
Report Date: 09-Aug-2018 01:29:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

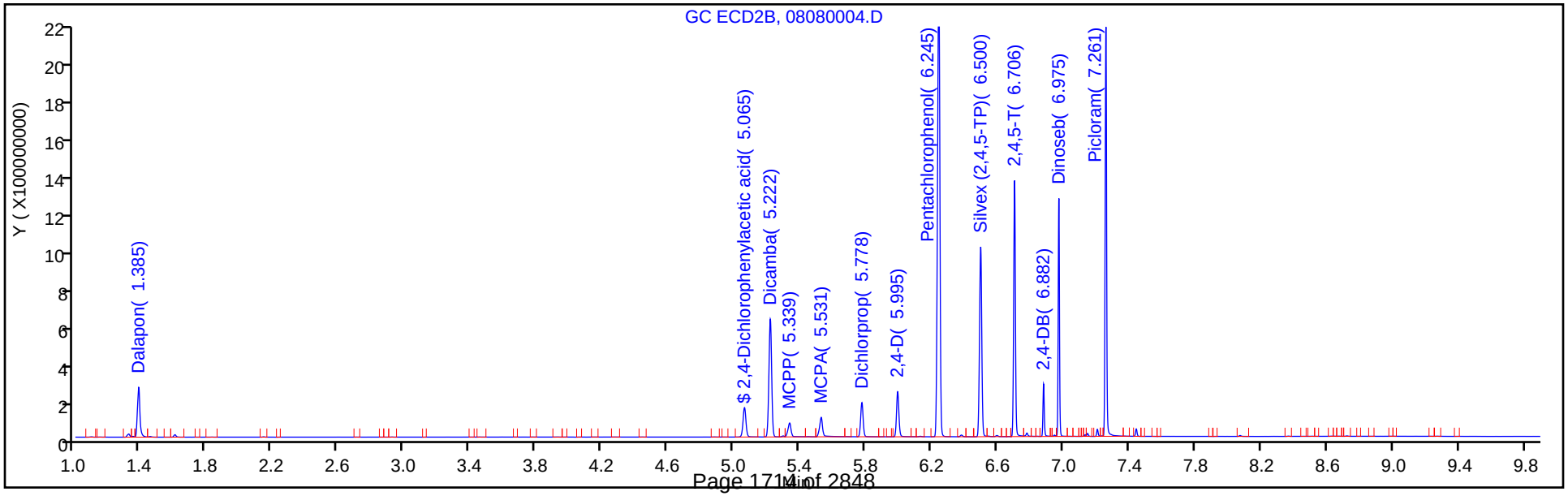
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080004.D

Injection Date:	08-Aug-2018 10:19:22	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD6			Worklist Smp#:	4
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	4
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080005.D
Lims ID: STD5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 08-Aug-2018 10:35:01 ALS Bottle#: 5 Worklist Smp#: 5
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD5
Misc. Info.: 280-0072797-005
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:23 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:18:38

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.617	1.617	0.000	121319168	0.6790	0.6441	
2	1.384	1.379	0.005	198166874	0.6790	0.6493	
						RPD = 0.80	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.320	5.322	-0.002	91001811	0.6960	0.6615	
2	5.065	5.063	0.002	135939868	0.6960	0.5825	
						RPD = 12.69	
4 Dicamba							
1	5.482	5.484	-0.002	342870710	0.7119	0.6726	
2	5.221	5.220	0.001	496960539	0.7119	0.6687	
						RPD = 0.57	
5 MCPP							
1	5.654	5.653	0.001	39506986	70.7	65.9	
2	5.337	5.334	0.003	73315129	70.7	66.4	
						RPD = 0.75	
6 MCPA							
1	5.774	5.774	0.000	63921882	70.5	66.3	
2	5.529	5.526	0.003	100131555	70.5	65.8	
						RPD = 0.88	
7 Dichlorprop							
1	6.051	6.053	-0.002	86795835	0.7149	0.6725	
2	5.778	5.777	0.001	129849800	0.7149	0.6654	
						RPD = 1.06	
8 2,4-D							
1	6.211	6.212	-0.001	100909163	0.7052	0.6576	
2	5.995	5.994	0.001	164538186	0.7052	0.6480	
						RPD = 1.47	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.380	6.381	-0.001	1152076070	0.7161	0.6659	
2	6.245	6.243	0.002	1662130029	0.7161	0.6725	
9 Silvex (2,4,5-TP)							
1	6.726	6.727	-0.001	402505414	0.7200	0.6642	
2	6.500	6.498	0.002	632398746	0.7200	0.6644	
						RPD = 0.03	
10 2,4,5-T							
1	6.834	6.834	0.000	400142785	0.7181	0.6595	
2	6.705	6.704	0.001	648273354	0.7181	0.6655	
						RPD = 0.90	
11 2,4-DB							
1	6.998	6.998	0.000	65822445	0.7134	0.6393	
2	6.882	6.882	0.000	99919640	0.7134	0.6326	
						RPD = 1.06	
12 Picloram							
1	7.287	7.287	0.000	563598055	0.7088	0.6360	
2	7.260	7.259	0.001	870038471	0.7088	0.6543	
						RPD = 2.83	
13 Dinoseb							
1	7.344	7.345	-0.001	244440667	0.7157	0.6715	
2	6.974	6.973	0.001	415921233	0.7157	0.6566	
						RPD = 2.24	

Reagents:

8151ICALL5_00061 Amount Added: 1.00 Units: mL

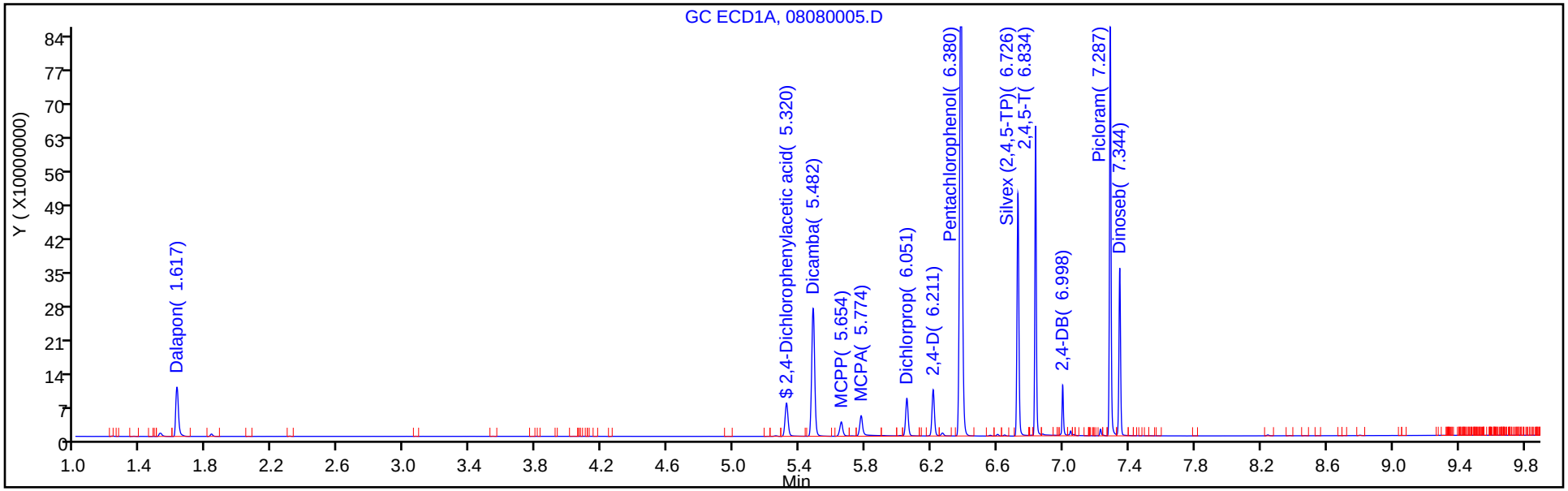
Report Date: 09-Aug-2018 01:29:23 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

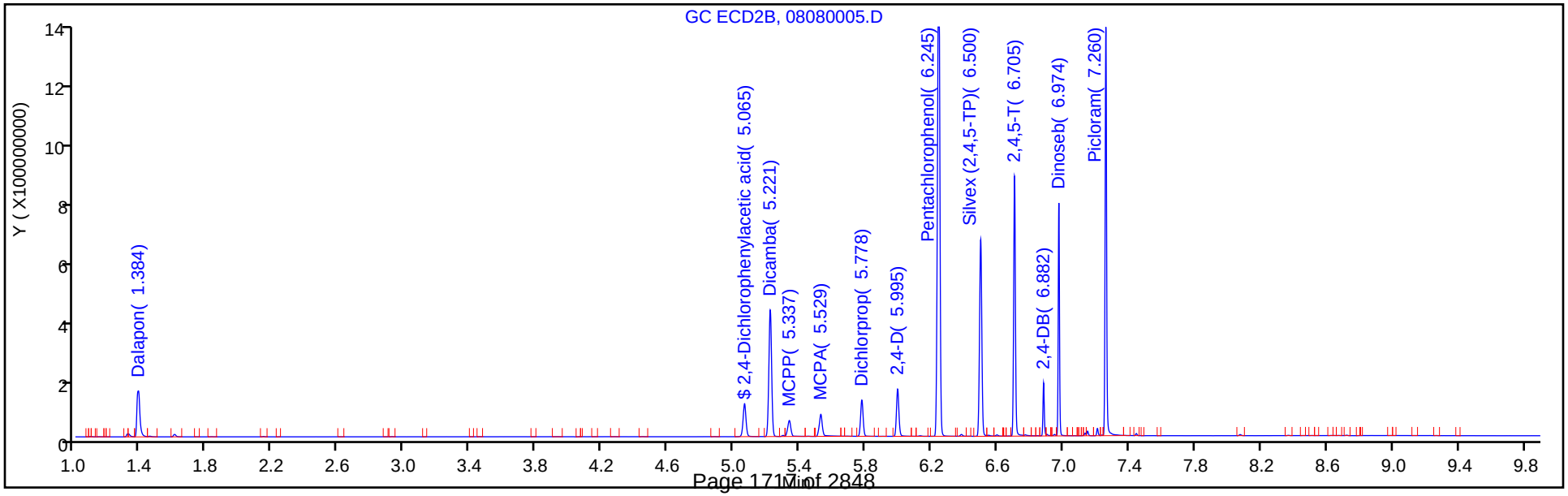
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080005.D

Injection Date:	08-Aug-2018 10:35:01	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD5			Worklist Smp#:	5
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	5
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080006.D
Lims ID: STD4
Client ID:
Sample Type: ICRT Calib Level: 4
Inject. Date: 08-Aug-2018 10:50:41 ALS Bottle#: 6 Worklist Smp#: 6
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD4
Misc. Info.: 280-0072797-006
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:23 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:17:44

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.619	1.619	0.000	90730950	0.4527	0.4795	
2	1.384	1.384	0.000	146872546	0.4527	0.4784	
						RPD = 0.24	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.321	5.321	0.000	69978290	0.4640	0.5045	
2	5.066	5.066	0.000	105251012	0.4640	0.4510	
						RPD = 11.20	
4 Dicamba							
1	5.483	5.483	0.000	259866237	0.4746	0.5066	
2	5.222	5.222	0.000	379560072	0.4746	0.5072	
						RPD = 0.11	
5 MCPP							
1	5.653	5.653	0.000	31037634	47.1	51.1	
2	5.337	5.337	0.000	57672749	47.1	49.4	
						RPD = 3.53	
6 MCPA							
1	5.774	5.774	0.000	51433477	47.0	52.8	
2	5.529	5.529	0.000	78500532	47.0	48.6	
						RPD = 8.24	
7 Dichlorprop							
1	6.052	6.052	0.000	67162069	0.4766	0.5172	
2	5.778	5.778	0.000	102116188	0.4766	0.5197	
						RPD = 0.48	
8 2,4-D							
1	6.211	6.211	0.000	78621594	0.4702	0.5096	
2	5.996	5.996	0.000	129223808	0.4702	0.4987	
						RPD = 2.15	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.379	6.379	0.000	881023118	0.4774	0.5070	
2	6.245	6.245	0.000	1290240384	0.4774	0.5201	
9 Silvex (2,4,5-TP)							
1	6.726	6.726	0.000	312893709	0.4800	0.5139	
2	6.499	6.499	0.000	497595756	0.4800	0.5207	
						RPD = 1.30	
10 2,4,5-T							
1	6.834	6.834	0.000	313470426	0.4787	0.5149	
2	6.706	6.706	0.000	513159291	0.4787	0.5254	
						RPD = 2.02	
11 2,4-DB							
1	6.998	6.998	0.000	53887137	0.4756	0.5214	
2	6.882	6.882	0.000	80729498	0.4756	0.5030	
						RPD = 3.59	
12 Picloram							
1	7.287	7.287	0.000	451274470	0.4726	0.5082	
2	7.260	7.260	0.000	703441877	0.4726	0.5282	
						RPD = 3.86	
13 Dinoseb							
1	7.344	7.344	0.000	192463771	0.4771	0.5287	
2	6.974	6.974	0.000	325556199	0.4771	0.5172	
						RPD = 2.19	

Reagents:

8151ICALL4_00130 Amount Added: 1.00 Units: mL

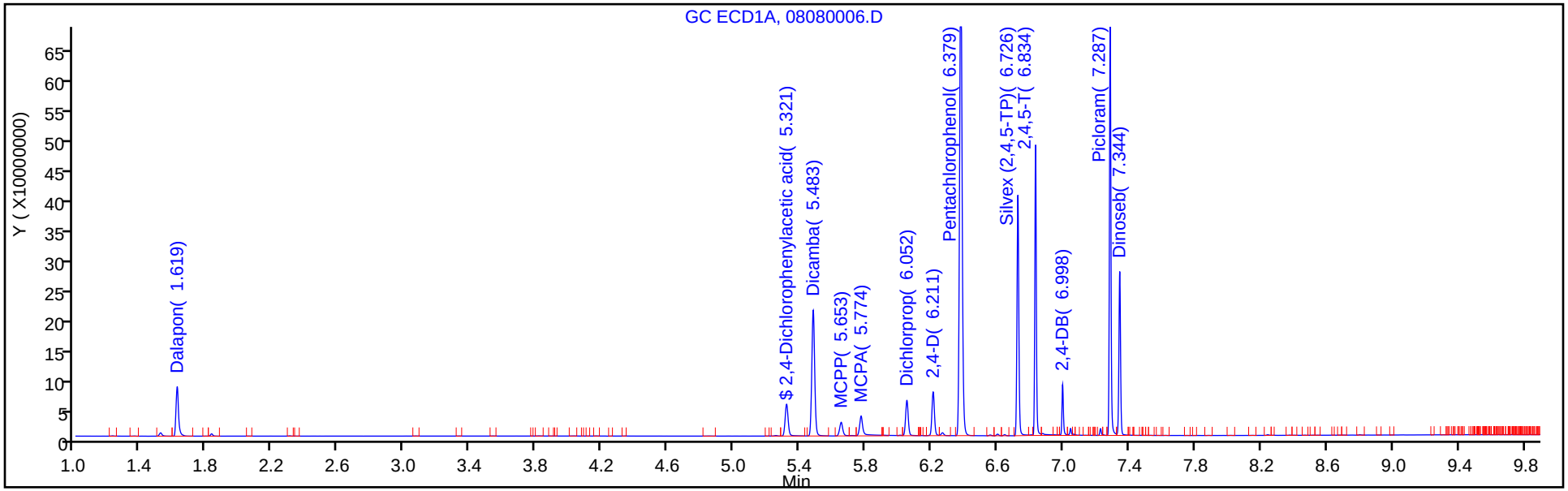
Report Date: 09-Aug-2018 01:29:24 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

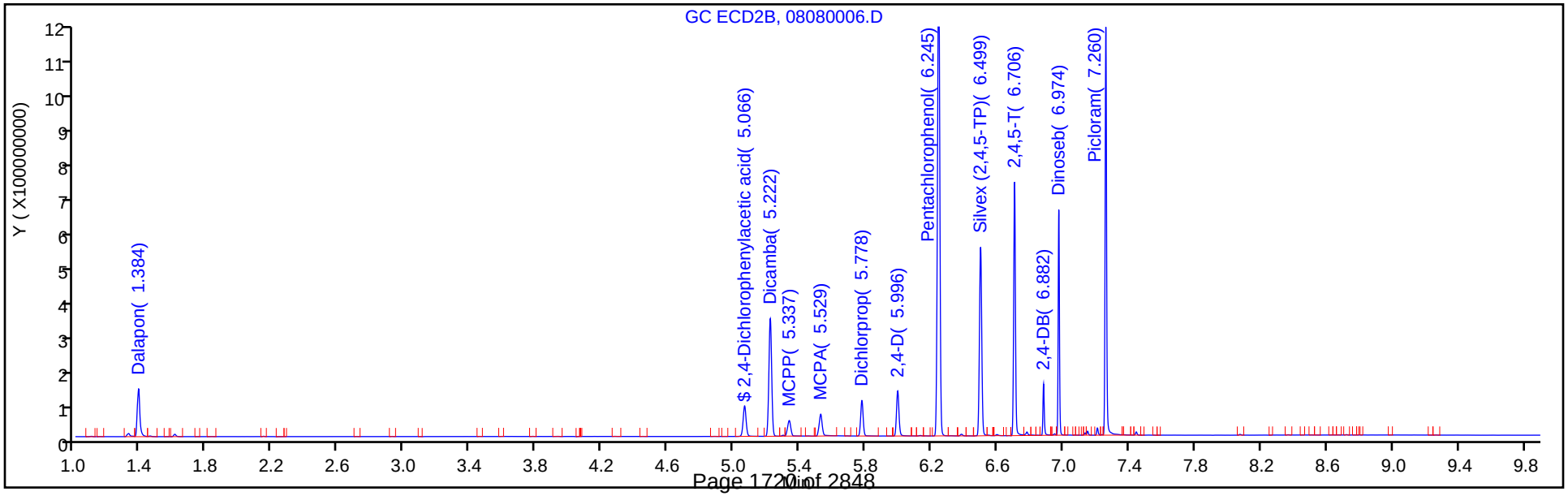
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080006.D

Injection Date:	08-Aug-2018 10:50:41	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD4			Worklist Smp#:	6
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	6
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080007.D
Lims ID: STD3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 08-Aug-2018 11:07:33 ALS Bottle#: 7 Worklist Smp#: 7
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD3
Misc. Info.: 280-0072797-007
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:24 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:54:54

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.618	1.619	-0.001	44769585	0.2263	0.2322	
2	1.382	1.384	-0.002	73069873	0.2263	0.2325	
						RPD = 0.15	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.321	5.321	0.000	34905989	0.2320	0.2428	
2	5.064	5.066	-0.002	53885382	0.2320	0.2309	
						RPD = 5.02	
4 Dicamba							
1	5.482	5.483	-0.001	128504710	0.2373	0.2440	
2	5.220	5.222	-0.002	188893478	0.2373	0.2448	
						RPD = 0.34	
5 MCPP							
1	5.651	5.653	-0.002	16349072	23.6	25.5	
2	5.333	5.337	-0.004	35305806	23.6	26.1	
						RPD = 2.43	
6 MCPA							
1	5.772	5.774	-0.002	26153275	23.5	25.2	
2	5.524	5.529	-0.005	49079036	23.5	26.1	
						RPD = 3.38	
7 Dichlorprop							
1	6.051	6.052	-0.001	33266559	0.2383	0.2489	
2	5.776	5.778	-0.002	51328072	0.2383	0.2527	
						RPD = 1.52	
8 2,4-D							
1	6.211	6.211	0.000	38735658	0.2351	0.2446	
2	5.994	5.996	-0.002	64835200	0.2351	0.2364	
						RPD = 3.42	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.379	6.379	0.000	424681376	0.2387	0.2396	
2	6.242	6.245	-0.003	629461122	0.2387	0.2492	
9 Silvex (2,4,5-TP)							
1	6.726	6.726	0.000	150161322	0.2400	0.2411	
2	6.497	6.499	-0.002	241304118	0.2400	0.2474	
						RPD = 2.57	
10 2,4,5-T							
1	6.833	6.834	-0.001	147824175	0.2394	0.2386	
2	6.704	6.706	-0.002	245337273	0.2394	0.2478	
						RPD = 3.78	
11 2,4-DB							
1	6.998	6.998	0.000	26094182	0.2378	0.2467	
2	6.881	6.882	-0.001	37951372	0.2378	0.2202	
						RPD = 11.36	
12 Picloram							
1	7.287	7.287	0.000	211221827	0.2363	0.2350	
2	7.260	7.260	0.000	320766126	0.2363	0.2387	
						RPD = 1.53	
13 Dinoseb							
1	7.345	7.344	0.001	86729861	0.2386	0.2383	
2	6.973	6.974	-0.001	138827132	0.2386	0.2293	
						RPD = 3.84	

Reagents:

8151ICALL3_00062 Amount Added: 1.00 Units: mL

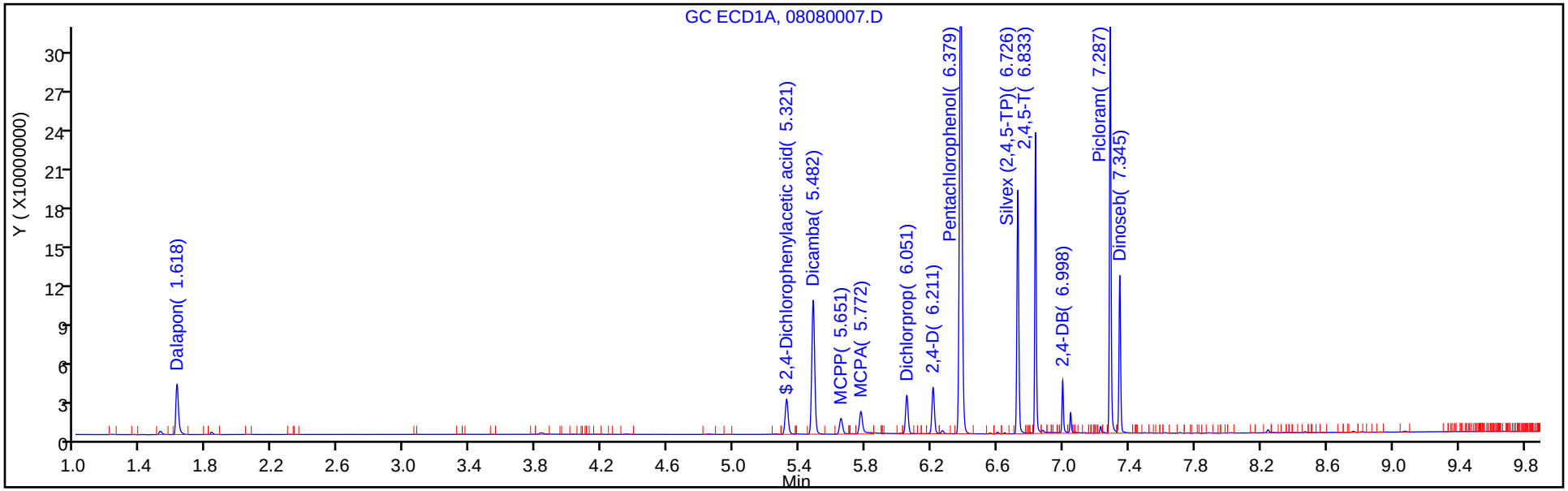
Report Date: 09-Aug-2018 01:29:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

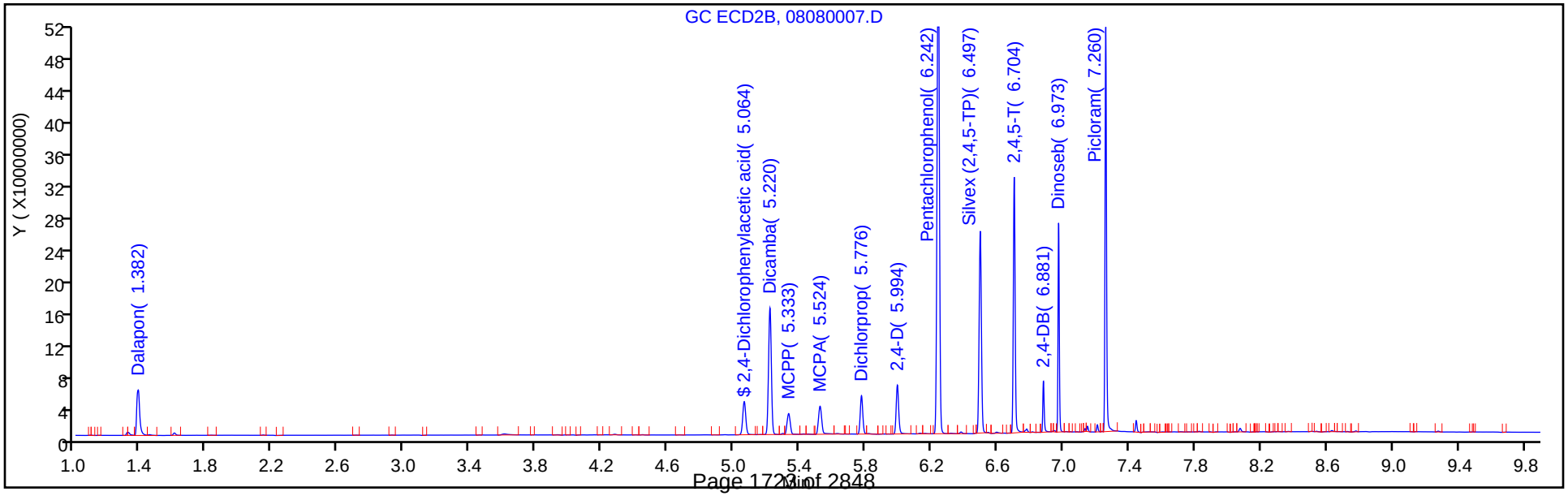
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080007.D

Injection Date:	08-Aug-2018 11:07:33	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD3			Worklist Smp#:	7
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	7
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080008.D
Lims ID: STD2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 08-Aug-2018 11:24:30 ALS Bottle#: 8 Worklist Smp#: 8
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD2
Misc. Info.: 280-0072797-008
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:25 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:55:29

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.618	1.619	-0.001	18804090	0.0905	0.0925	
2	1.382	1.384	-0.002	30877974	0.0905	0.0920	
						RPD = 0.53	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.323	5.321	0.002	15080670	0.0928	0.0948	
2	5.066	5.066	0.000	23594788	0.0928	0.1011	
						RPD = 6.40	
4 Dicamba							
1	5.484	5.483	0.001	54743935	0.0949	0.0965	
2	5.221	5.222	-0.001	82628015	0.0949	0.0986	
						RPD = 2.13	
5 MCPP							
1	5.652	5.653	-0.001	7347396	9.43	9.80	
2	5.335	5.337	-0.002	18484319	9.43	9.44	
						RPD = 3.70	
6 MCPA							
1	5.773	5.774	-0.001	11491551	9.40	9.29	
2	5.525	5.529	-0.004	26539187	9.40	9.54	
						RPD = 2.59	
7 Dichlorprop							
1	6.053	6.052	0.001	13924117	0.0953	0.0959	
2	5.778	5.778	0.000	21696071	0.0953	0.0970	
						RPD = 1.19	
8 2,4-D							
1	6.213	6.211	0.002	16266729	0.0940	0.0953	
2	5.996	5.996	0.000	29938127	0.0940	0.0990	
						RPD = 3.78	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.380	6.379	0.000	178599631	0.0955	0.0954	
2	6.244	6.245	-0.001	261322018	0.0955	0.0983	
9 Silvex (2,4,5-TP)							
1	6.727	6.726	0.001	63715624	0.0960	0.0961	
2	6.499	6.499	0.000	105894186	0.0960	0.1030	
						RPD = 6.86	
10 2,4,5-T							
1	6.834	6.834	0.000	61884640	0.0957	0.0952	
2	6.705	6.706	-0.001	97475937	0.0957	0.0945	
						RPD = 0.78	
11 2,4-DB							
1	6.999	6.998	0.001	10910300	0.0951	0.0966	
2	6.882	6.882	0.000	21619795	0.0951	0.1143	
						RPD = 16.75	
12 Picloram							
1	7.287	7.287	0.000	87789076	0.0945	0.0945	
2	7.260	7.260	0.000	120299432	0.0945	0.0870	
						RPD = 8.36	
13 Dinoseb							
1	7.345	7.344	0.001	33423289	0.0954	0.0918	
2	6.974	6.974	0.000	50599641	0.0954	0.0932	
						RPD = 1.51	

Reagents:

8151ICALL2_00069 Amount Added: 1.00 Units: mL

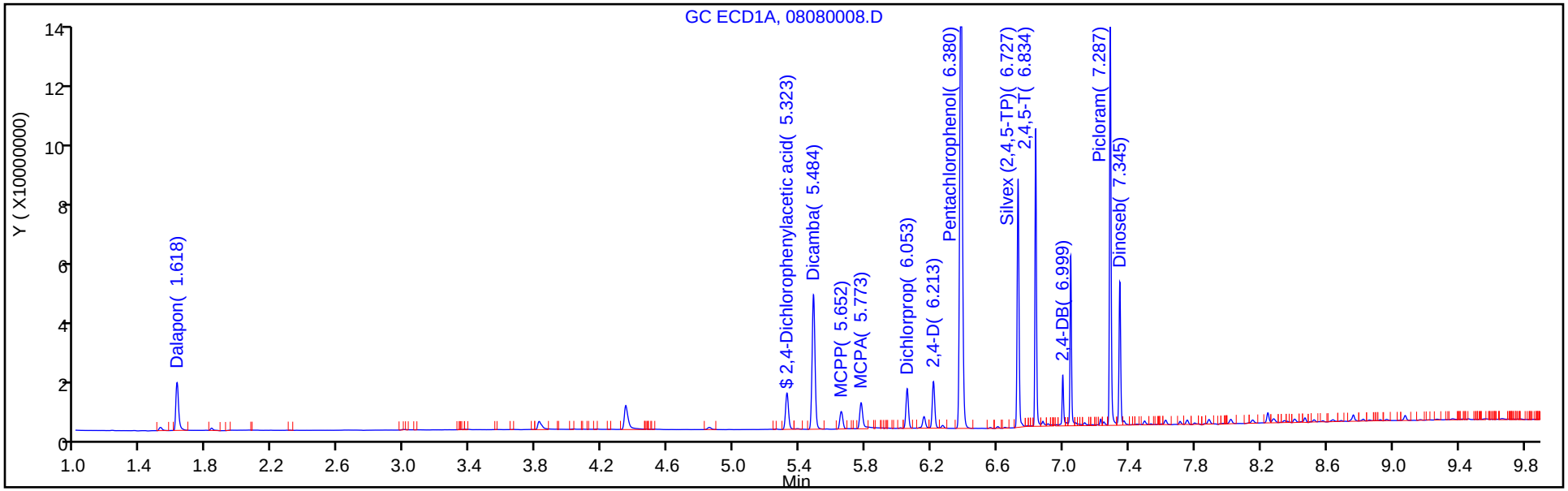
Report Date: 09-Aug-2018 01:29:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

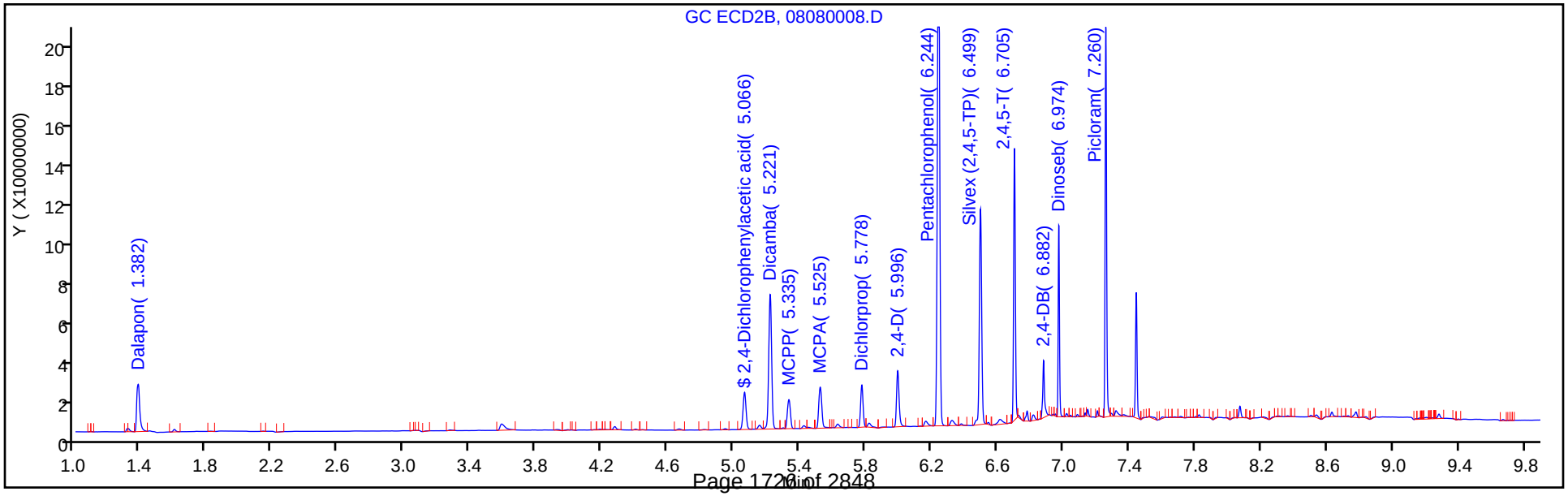
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080008.D

Injection Date:	08-Aug-2018 11:24:30	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD2			Worklist Smp#:	8
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	8
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.D
Lims ID: STD1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 08-Aug-2018 11:41:27 ALS Bottle#: 9 Worklist Smp#: 9
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: STD1
Misc. Info.: 280-0072797-009
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:26 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mardickc Date: 08-Aug-2018 11:57:27

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.618	1.619	-0.001	9876236	0.0453	0.0444	
2	1.379	1.384	-0.005	16634606	0.0453	0.0446	
						RPD = 0.24	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.323	5.321	0.002	8441231	0.0464	0.0453	
2	5.064	5.066	-0.002	13192413	0.0464	0.0565	
						RPD = 22.08	
4 Dicamba							
1	5.484	5.483	0.001	29818971	0.0475	0.0467	
2	5.219	5.222	-0.003	44516848	0.0475	0.0462	
						RPD = 1.14	
5 MCPP							
1	5.653	5.653	0.000	4333952	4.71	4.54	
2	5.333	5.337	-0.004	11577563	4.71	2.76	
						RPD = 48.70	
6 MCPA							
1	5.774	5.774	0.000	7208087	4.70	4.63	
2	5.524	5.529	-0.005	17320028	4.70	2.90	
						RPD = 46.00	
7 Dichlorprop							
1	6.054	6.052	0.002	7740566	0.0477	0.0469	
2	5.777	5.778	-0.001	12087337	0.0477	0.0465	
						RPD = 0.89	
8 2,4-D							
1	6.214	6.211	0.003	8864992	0.0470	0.0462	
2	5.995	5.996	-0.001	14562776	0.0470	0.0395	
						RPD = 15.61	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.380	6.379	0.001	97079361	0.0477	0.0476	
2	6.244	6.245	-0.002	134946851	0.0477	0.0465	
9 Silvex (2,4,5-TP)							
1	6.727	6.726	0.001	34872373	0.0480	0.0478	
2	6.499	6.499	0.000	52335796	0.0480	0.0459	
						RPD = 4.11	
10 2,4,5-T							
1	6.834	6.834	0.000	33496179	0.0479	0.0479	
2	6.705	6.706	-0.001	52282980	0.0479	0.0476	
						RPD = 0.50	
11 2,4-DB							
1	6.999	6.998	0.001	5862128	0.0476	0.0467	
2	6.882	6.882	0.000	10759379	0.0476	0.0444	
						RPD = 4.97	
12 Picloram							
1	7.287	7.287	0.000	46134431	0.0473	0.0471	
2	7.259	7.260	-0.001	69688067	0.0473	0.0487	
						RPD = 3.16	
13 Dinoseb							
1	7.345	7.344	0.001	14083674	0.0477	0.0387	
2	6.974	6.974	0.000	21082281	0.0477	0.0477	
						RPD = 20.85	

Reagents:

8151ICALL1_00067 Amount Added: 1.00 Units: mL

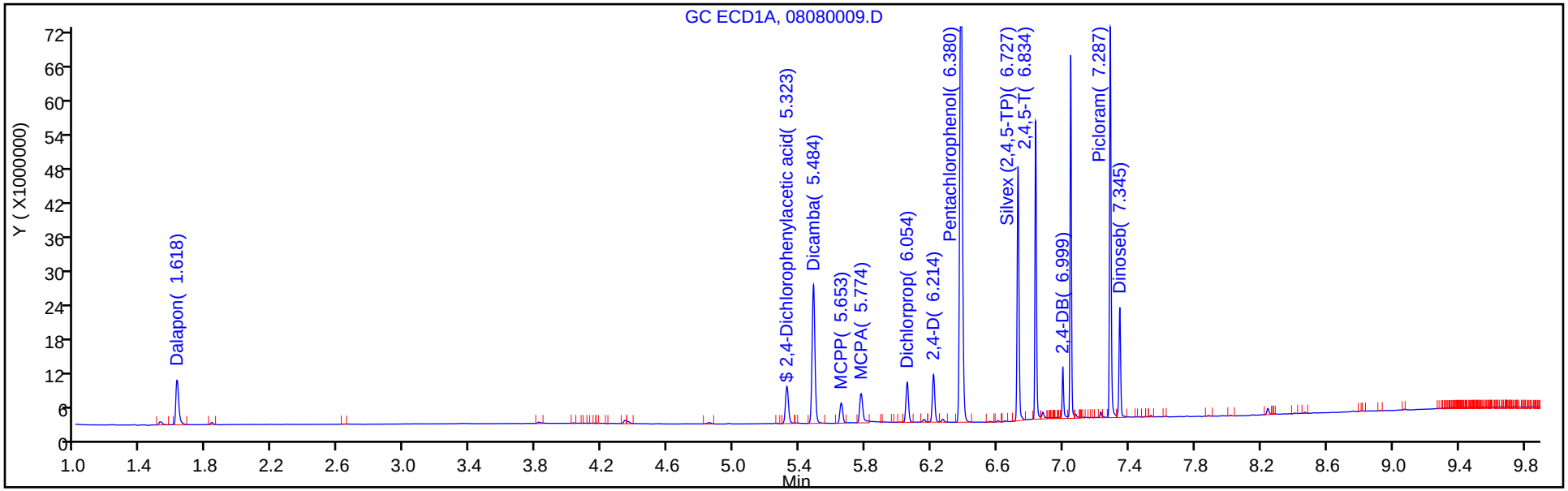
Report Date: 09-Aug-2018 01:29:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

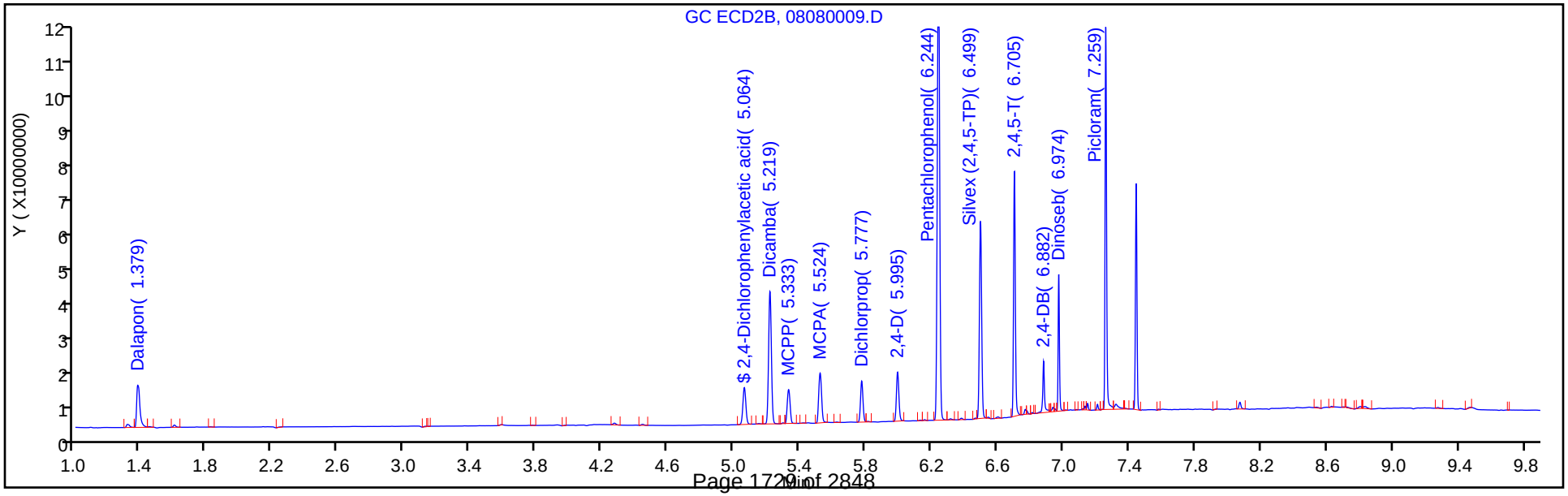
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.D

Injection Date:	08-Aug-2018 11:41:27	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	STD1			Worklist Smp#:	9
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	9
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM VII
HERBICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-425303/10 Calibration Date: 08/08/2018 11:58

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080010.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dalapon	Lin2		197276442		354	341	3.6	15.0
Dicamba	Lin2		527161170		359	353	1.7	15.0
MCPP	Lin2		633221		35900	35200	1.9	15.0
MCPA	Lin2		947574		32900	35000	-6.0	15.0
Dichlorprop	Lin2		130062209		350	354	-1.1	15.0
2,4-D	Lin2		167386652		379	353	7.6	15.0
Silvex (2,4,5-TP)	Lin2		647004776		376	356	5.5	15.0
2,4,5-T	Lin2		628140296		364	355	2.5	15.0
2,4-DB	Lin2		99607507		338	355	-4.7	15.0
Picloram	Lin2		902587783		363	358	1.2	15.0
Dinoseb	Ave	364025316	286797474		279	354	-21.2*	15.0
2,4-Dichlorophenylacetic acid	Lin2		154732701		384	348	10.4	15.0

FORM VII
HERBICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-425303/10 Calibration Date: 08/08/2018 11:58

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080010.D

Analyte	RT	RT WINDOW	
		FROM	TO
Dalapon	1.62	1.59	1.65
Dicamba	5.48	5.45	5.51
MCPP	5.65	5.62	5.68
MCPA	5.77	5.74	5.80
Dichlorprop	6.05	6.02	6.08
2,4-D	6.21	6.18	6.24
Silvex (2,4,5-TP)	6.73	6.70	6.76
2,4,5-T	6.83	6.80	6.86
2,4-DB	7.00	6.97	7.03
Picloram	7.29	7.26	7.32
Dinoseb	7.35	7.32	7.38
2,4-Dichlorophenylacetic acid	5.32	5.29	5.35

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080010.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 08-Aug-2018 11:58:24 ALS Bottle#: 10 Worklist Smp#: 10
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072797-010
Operator ID: TEM Instrument ID: SGC_M
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:27 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mooret Date: 09-Aug-2018 01:04:07

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.617	1.617	0.000	67364973	0.3415	0.3538	
2	1.379	1.379	0.000	108765310	0.3415	0.3515	
						RPD = 0.66	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.322	5.322	0.000	53846980	0.3480	0.3842	
2	5.063	5.063	0.000	87172653	0.3480	0.3736	
						RPD = 2.80	
4 Dicamba							
1	5.484	5.484	0.000	185883618	0.3526	0.3587	
2	5.220	5.220	0.000	271079958	0.3526	0.3579	
						RPD = 0.22	
5 MCPP							
1	5.653	5.653	0.000	22287797	35.2	35.9	
2	5.334	5.334	0.000	47841027	35.2	39.0	
						RPD = 8.36	
6 MCPA							
1	5.774	5.774	0.000	33210105	35.0	32.9	
2	5.526	5.526	0.000	63945997	35.0	37.3	
						RPD = 12.58	
7 Dichlorprop							
1	6.053	6.053	0.000	46027390	0.3539	0.3499	
2	5.777	5.777	0.000	70176330	0.3539	0.3518	
						RPD = 0.54	
8 2,4-D							
1	6.212	6.212	0.000	59022626	0.3526	0.3794	
2	5.994	5.994	0.000	96307170	0.3526	0.3631	
						RPD = 4.38	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.381	6.381	0.000	638442026	0.3563	0.3649	
2	6.243	6.243	0.000	936431785	0.3563	0.3750	
9 Silvex (2,4,5-TP)							
1	6.727	6.727	0.000	230616765	0.3564	0.3760	
2	6.498	6.498	0.000	364973974	0.3564	0.3792	
						RPD = 0.86	
10 2,4,5-T							
1	6.834	6.834	0.000	223280320	0.3555	0.3645	
2	6.704	6.704	0.000	347192735	0.3555	0.3534	
						RPD = 3.09	
11 2,4-DB							
1	6.998	6.998	0.000	35361910	0.3550	0.3383	
2	6.882	6.882	0.000	56703218	0.3550	0.3432	
						RPD = 1.43	
12 Picloram							
1	7.287	7.287	0.000	323273097	0.3582	0.3625	
2	7.259	7.259	0.000	471320133	0.3582	0.3526	
						RPD = 2.78	
13 Dinoseb							
1	7.345	7.345	0.000	101612345	0.3543	0.2791	
2	6.973	6.973	0.000	162422623	0.3543	0.2657	
						RPD = 4.95	

Reagents:

8151ICV_00018 Amount Added: 1.00 Units: mL

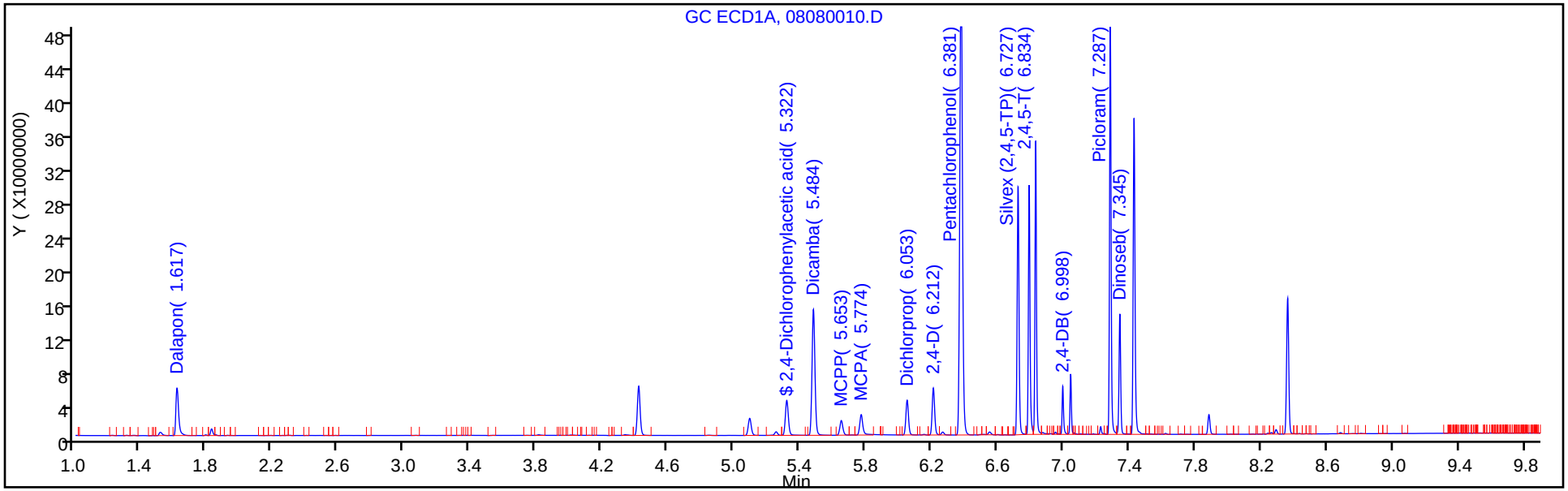
Report Date: 09-Aug-2018 01:29:27 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

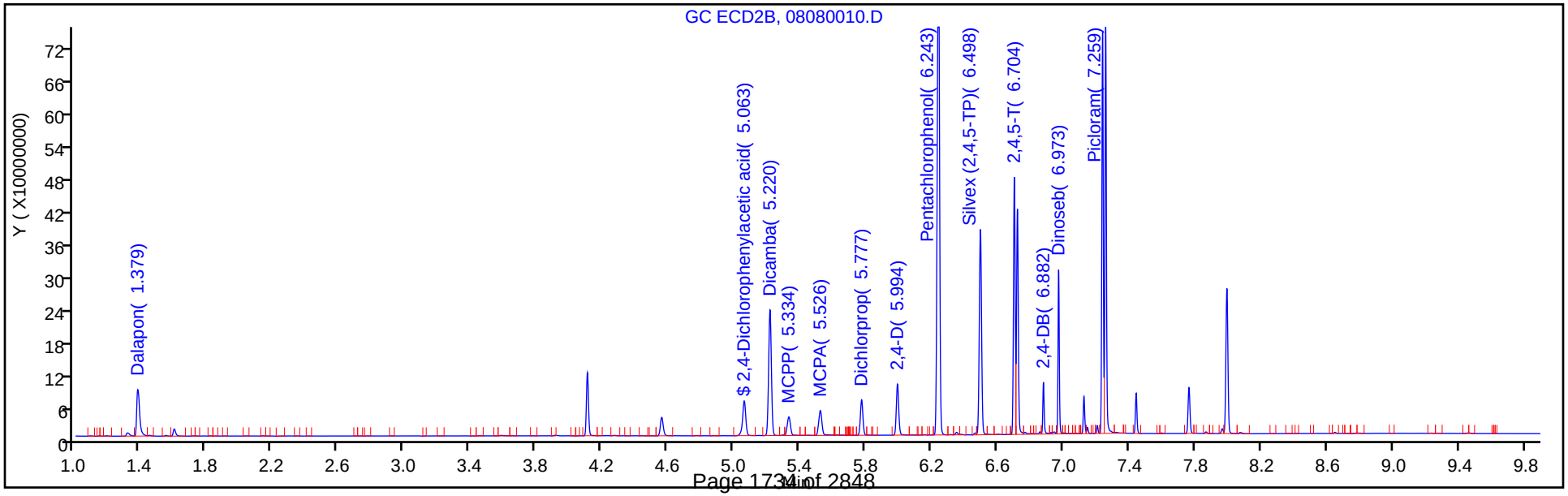
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080010.D

Injection Date:	08-Aug-2018 11:58:24	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	ICV			Worklist Smp#:	10
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	10
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM VII
HERBICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-425303/10 Calibration Date: 08/08/2018 11:58

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080010.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dalapon	Lin2		318516172		351	341	2.9	15.0
Dicamba	Lin2		768775803		358	353	1.5	15.0
MCPP	Qua		1359217		39000	35200	10.8	15.0
MCPA	Qua		1824552		37300	35000	6.6	15.0
Dichlorprop	Lin2		198301240		352	354	-0.6	15.0
2,4-D	Qua		273124662		363	353	3.0	15.0
Silvex (2,4,5-TP)	Lin2		1023949427		379	356	6.4	15.0
2,4,5-T	Lin2		976735197		353	355	-0.6	15.0
2,4-DB	Qua		159721751		343	355	-3.3	15.0
Dinoseb	Lin1		458432467		266	354	-25.0*	15.0
Picloram	Lin2		1315939366		353	358	-1.6	15.0
2,4-Dichlorophenylacetic acid	Ave	233355727	250496129		374	348	7.3	15.0

FORM VII
HERBICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICV 280-425303/10 Calibration Date: 08/08/2018 11:58

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080010.D

Analyte	RT	RT WINDOW	
		FROM	TO
Dalapon	1.38	1.35	1.41
Dicamba	5.22	5.19	5.25
MCPP	5.33	5.30	5.36
MCPA	5.53	5.50	5.56
Dichlorprop	5.78	5.75	5.81
2,4-D	5.99	5.96	6.02
Silvex (2,4,5-TP)	6.50	6.47	6.53
2,4,5-T	6.70	6.67	6.73
2,4-DB	6.88	6.85	6.91
Dinoseb	6.97	6.94	7.00
Picloram	7.26	7.23	7.29
2,4-Dichlorophenylacetic acid	5.06	5.03	5.09

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080010.D
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 08-Aug-2018 11:58:24 ALS Bottle#: 10 Worklist Smp#: 10
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: 280-0072797-010
Operator ID: TEM Instrument ID: SGC_M
Sublist:

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:29:27 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mooret Date: 09-Aug-2018 01:04:07

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.617	1.617	0.000	67364973	0.3415	0.3538	
2	1.379	1.379	0.000	108765310	0.3415	0.3515	
						RPD = 0.66	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.322	5.322	0.000	53846980	0.3480	0.3842	
2	5.063	5.063	0.000	87172653	0.3480	0.3736	
						RPD = 2.80	
4 Dicamba							
1	5.484	5.484	0.000	185883618	0.3526	0.3587	
2	5.220	5.220	0.000	271079958	0.3526	0.3579	
						RPD = 0.22	
5 MCPP							
1	5.653	5.653	0.000	22287797	35.2	35.9	
2	5.334	5.334	0.000	47841027	35.2	39.0	
						RPD = 8.36	
6 MCPA							
1	5.774	5.774	0.000	33210105	35.0	32.9	
2	5.526	5.526	0.000	63945997	35.0	37.3	
						RPD = 12.58	
7 Dichlorprop							
1	6.053	6.053	0.000	46027390	0.3539	0.3499	
2	5.777	5.777	0.000	70176330	0.3539	0.3518	
						RPD = 0.54	
8 2,4-D							
1	6.212	6.212	0.000	59022626	0.3526	0.3794	
2	5.994	5.994	0.000	96307170	0.3526	0.3631	
						RPD = 4.38	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.381	6.381	0.000	638442026	0.3563	0.3649	
2	6.243	6.243	0.000	936431785	0.3563	0.3750	
9 Silvex (2,4,5-TP)							
1	6.727	6.727	0.000	230616765	0.3564	0.3760	
2	6.498	6.498	0.000	364973974	0.3564	0.3792	
						RPD = 0.86	
10 2,4,5-T							
1	6.834	6.834	0.000	223280320	0.3555	0.3645	
2	6.704	6.704	0.000	347192735	0.3555	0.3534	
						RPD = 3.09	
11 2,4-DB							
1	6.998	6.998	0.000	35361910	0.3550	0.3383	
2	6.882	6.882	0.000	56703218	0.3550	0.3432	
						RPD = 1.43	
12 Picloram							
1	7.287	7.287	0.000	323273097	0.3582	0.3625	
2	7.259	7.259	0.000	471320133	0.3582	0.3526	
						RPD = 2.78	
13 Dinoseb							
1	7.345	7.345	0.000	101612345	0.3543	0.2791	
2	6.973	6.973	0.000	162422623	0.3543	0.2657	
						RPD = 4.95	

Reagents:

8151ICV_00018 Amount Added: 1.00 Units: mL

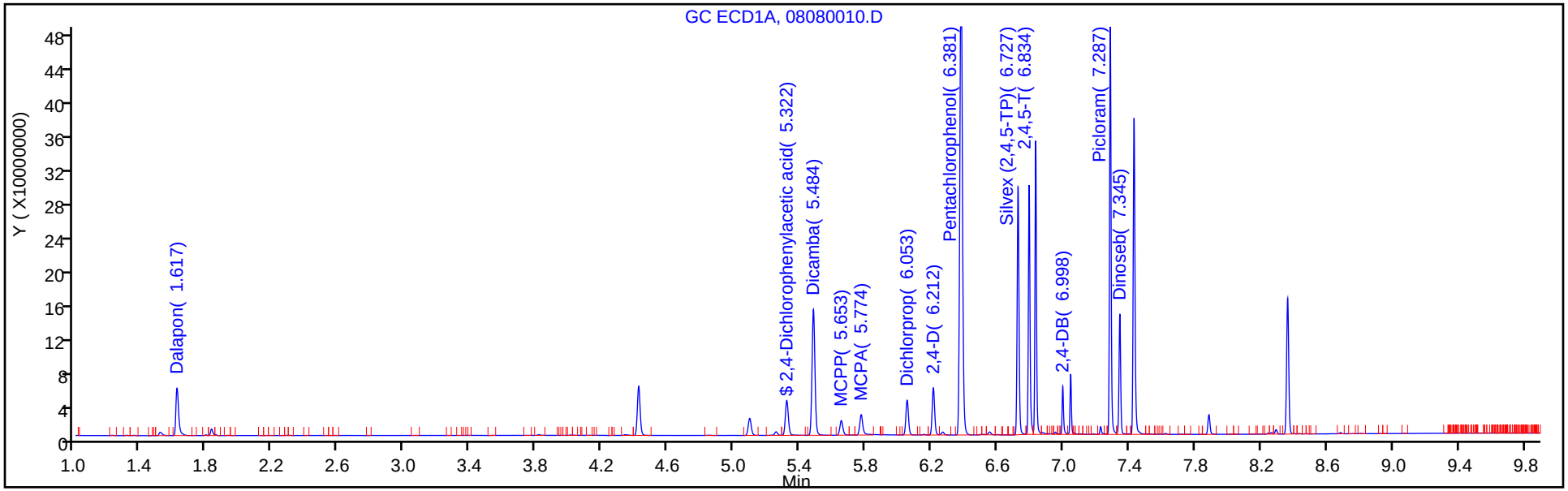
Report Date: 09-Aug-2018 01:29:27 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

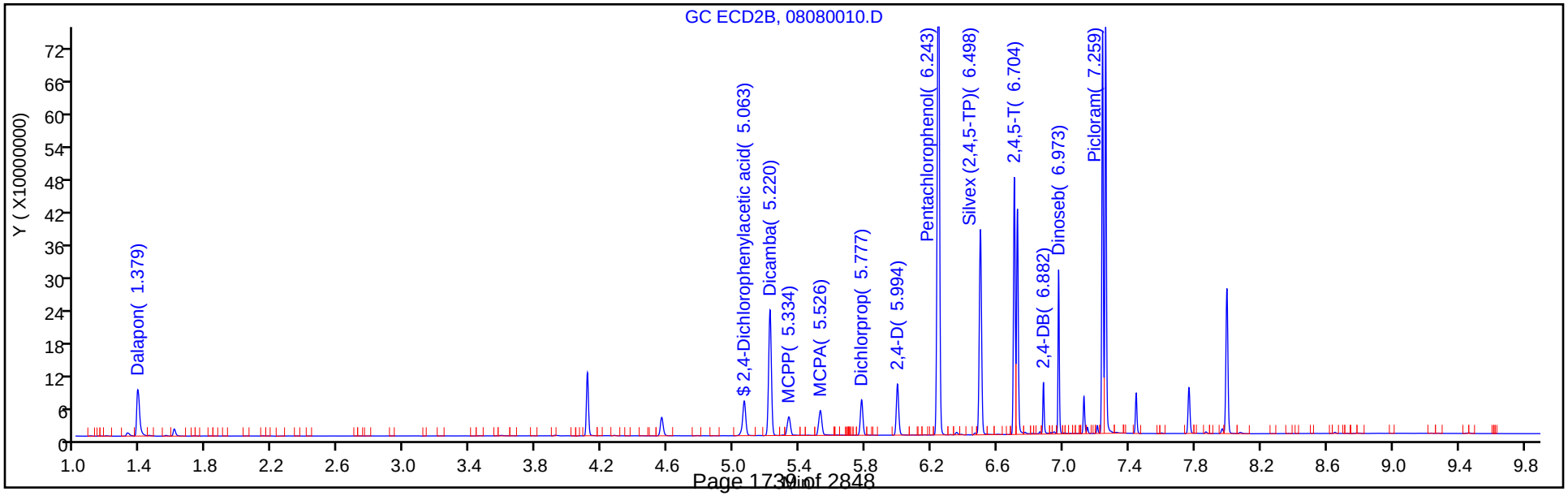
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080010.D

Injection Date:	08-Aug-2018 11:58:24	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	ICV			Worklist Smp#:	10
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	10
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM VII
HERBICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCVRT 280-425378/3 Calibration Date: 08/08/2018 16:52

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080003.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dalapon	Lin2		186755418		446	453	-1.4	15.0
Dicamba	Lin2		541988351		501	475	5.6	15.0
MCPP	Lin2		641134		49700	47100	5.5	15.0
MCPA	Lin2		895132		42600	47000	-9.4	15.0
Dichlorprop	Lin2		140267826		515	477	8.0	15.0
2,4-D	Lin2		166255442		507	470	7.7	15.0
Silvex (2,4,5-TP)	Lin2		652565354		515	480	7.2	15.0
2,4,5-T	Lin2		640515078		503	479	5.2	15.0
2,4-DB	Lin2		108138359		497	476	4.5	15.0
Picloram	Lin2		894912545		476	473	0.7	15.0
Dinoseb	Ave	364025316	261296905		342	477	-28.2*	15.0
2,4-Dichlorophenylacetic acid	Lin2		149278625		499	464	7.6	15.0

FORM VII
HERBICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCVRT 280-425378/3 Calibration Date: 08/08/2018 16:52

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080003.D

Analyte	RT	RT WINDOW	
		FROM	TO
Dalapon	1.62	1.59	1.65
Dicamba	5.48	5.45	5.51
MCPP	5.65	5.62	5.68
MCPA	5.78	5.75	5.81
Dichlorprop	6.05	6.02	6.08
2,4-D	6.21	6.18	6.24
Silvex (2,4,5-TP)	6.73	6.70	6.76
2,4,5-T	6.83	6.80	6.86
2,4-DB	7.00	6.97	7.03
Picloram	7.29	7.26	7.32
Dinoseb	7.35	7.32	7.38
2,4-Dichlorophenylacetic acid	5.32	5.29	5.35

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080003.D
Lims ID: CCVRT
Client ID:
Sample Type: CCVRT
Inject. Date: 08-Aug-2018 16:52:48 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCVRT
Misc. Info.: 280-0072814-003
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:31:28 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mooret Date: 09-Aug-2018 01:31:10

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.617	1.617	0.000	84539509	0.4527	0.4462	
2	1.379	1.379	0.000	135245764	0.4527	0.4397	
						RPD = 1.48	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.323	5.323	0.000	69265282	0.4640	0.4992	
2	5.062	5.062	0.000	102130637	0.4640	0.4377	
						RPD = 13.14	
4 Dicamba							
1	5.484	5.484	0.000	257241221	0.4746	0.5014	
2	5.219	5.219	0.000	368595455	0.4746	0.4921	
						RPD = 1.87	
5 MCPP							
1	5.654	5.654	0.000	30214773	47.1	49.7	
2	5.334	5.334	0.000	56968699	47.1	48.6	
						RPD = 2.21	
6 MCPA							
1	5.775	5.775	0.000	42063751	47.0	42.6	
2	5.525	5.525	0.000	75391666	47.0	46.2	
						RPD = 8.12	
7 Dichlorprop							
1	6.053	6.053	0.000	66848139	0.4766	0.5147	
2	5.775	5.775	0.000	97995913	0.4766	0.4980	
						RPD = 3.29	
8 2,4-D							
1	6.213	6.213	0.000	78164996	0.4702	0.5065	
2	5.994	5.994	0.000	122001350	0.4702	0.4687	
						RPD = 7.76	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.381	6.381	0.000	843588218	0.4774	0.4851	
2	6.242	6.242	0.000	1216881107	0.4774	0.4900	
9 Silvex (2,4,5-TP)							
1	6.728	6.728	0.000	313231370	0.4800	0.5145	
2	6.498	6.498	0.000	471457707	0.4800	0.4928	
						RPD = 4.31	
10 2,4,5-T							
1	6.834	6.834	0.000	306614568	0.4787	0.5035	
2	6.704	6.704	0.000	471573036	0.4787	0.4823	
						RPD = 4.30	
11 2,4-DB							
1	6.999	6.999	0.000	51427900	0.4756	0.4971	
2	6.881	6.881	0.000	73795425	0.4756	0.4566	
						RPD = 8.49	
12 Picloram							
1	7.288	7.288	0.000	422890923	0.4726	0.4759	
2	7.259	7.259	0.000	621511993	0.4726	0.4662	
						RPD = 2.05	
13 Dinoseb							
1	7.346	7.346	0.000	124671286	0.4771	0.3425	
2	6.974	6.974	0.000	192161773	0.4771	0.3115	
						RPD = 9.47	

Reagents:

8151ICALL4_00129 Amount Added: 1.00 Units: mL

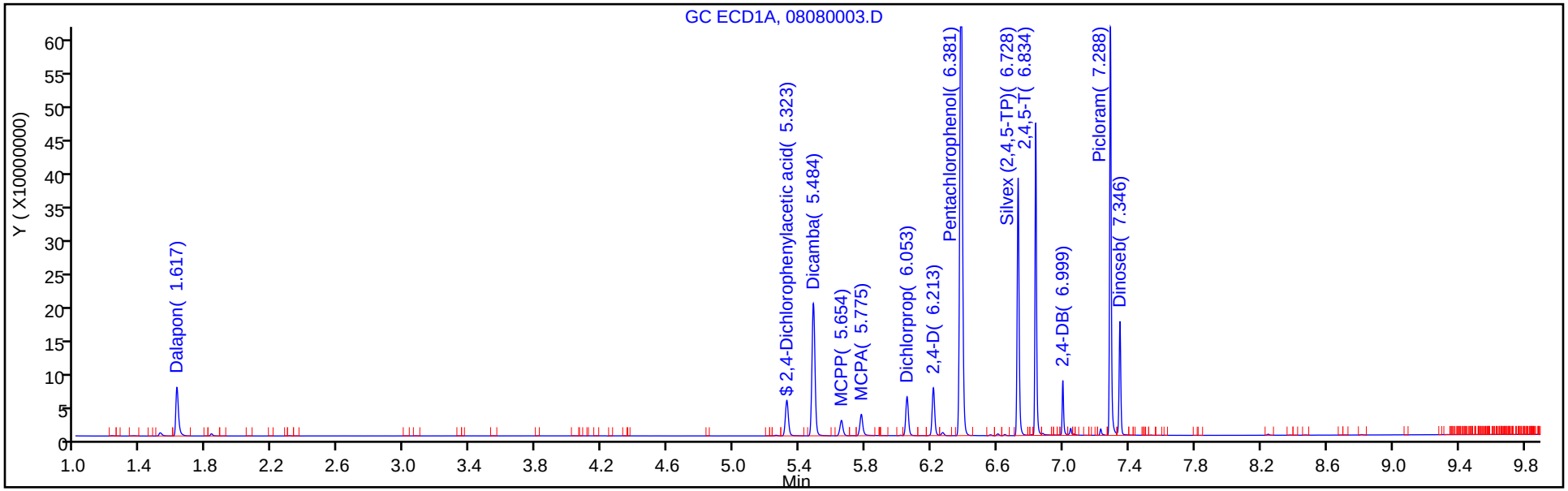
Report Date: 09-Aug-2018 01:31:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

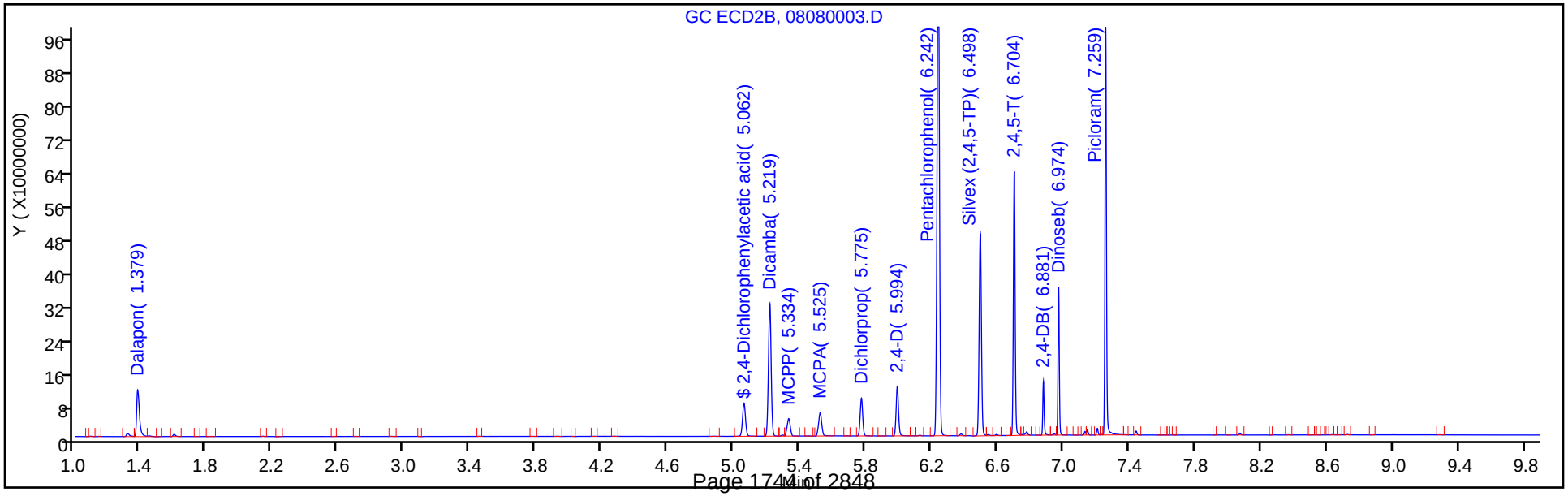
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080003.D

Injection Date:	08-Aug-2018 16:52:48	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	CCVRT			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	3
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM VII
HERBICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCVRT 280-425378/3 Calibration Date: 08/08/2018 16:52

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080003.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dalapon	Lin2		298770120		440	453	-2.9	15.0
Dicamba	Lin2		776603540		492	475	3.7	15.0
MCPP	Qua		1208831		48600	47100	3.2	15.0
MCPA	Qua		1604361		46200	47000	-1.8	15.0
Dichlorprop	Lin2		205625375		498	477	4.5	15.0
2,4-D	Qua		259494523		469	470	-0.3	15.0
Silvex (2,4,5-TP)	Lin2		982203556		493	480	2.7	15.0
2,4,5-T	Lin2		985111836		482	479	0.8	15.0
2,4-DB	Qua		155170951		457	476	-4.0	15.0
Dinoseb	Lin1		402749328		312	477	-34.7*	15.0
Picloram	Lin2		1315230120		466	473	-1.3	15.0
2,4-Dichlorophenylacetic acid	Ave	233355727	220109131		438	464	-5.7	15.0

FORM VII
HERBICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCVRT 280-425378/3 Calibration Date: 08/08/2018 16:52

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080003.D

Analyte	RT	RT WINDOW	
		FROM	TO
Dalapon	1.38	1.35	1.41
Dicamba	5.22	5.19	5.25
MCPP	5.33	5.30	5.36
MCPA	5.53	5.50	5.56
Dichlorprop	5.78	5.75	5.81
2,4-D	5.99	5.96	6.02
Silvex (2,4,5-TP)	6.50	6.47	6.53
2,4,5-T	6.70	6.67	6.73
2,4-DB	6.88	6.85	6.91
Dinoseb	6.97	6.94	7.00
Picloram	7.26	7.23	7.29
2,4-Dichlorophenylacetic acid	5.06	5.03	5.09

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080003.D
Lims ID: CCVRT
Client ID:
Sample Type: CCVRT
Inject. Date: 08-Aug-2018 16:52:48 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCVRT
Misc. Info.: 280-0072814-003
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 01:31:28 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mooret Date: 09-Aug-2018 01:31:10

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.617	1.617	0.000	84539509	0.4527	0.4462	
2	1.379	1.379	0.000	135245764	0.4527	0.4397	
						RPD = 1.48	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.323	5.323	0.000	69265282	0.4640	0.4992	
2	5.062	5.062	0.000	102130637	0.4640	0.4377	
						RPD = 13.14	
4 Dicamba							
1	5.484	5.484	0.000	257241221	0.4746	0.5014	
2	5.219	5.219	0.000	368595455	0.4746	0.4921	
						RPD = 1.87	
5 MCPP							
1	5.654	5.654	0.000	30214773	47.1	49.7	
2	5.334	5.334	0.000	56968699	47.1	48.6	
						RPD = 2.21	
6 MCPA							
1	5.775	5.775	0.000	42063751	47.0	42.6	
2	5.525	5.525	0.000	75391666	47.0	46.2	
						RPD = 8.12	
7 Dichlorprop							
1	6.053	6.053	0.000	66848139	0.4766	0.5147	
2	5.775	5.775	0.000	97995913	0.4766	0.4980	
						RPD = 3.29	
8 2,4-D							
1	6.213	6.213	0.000	78164996	0.4702	0.5065	
2	5.994	5.994	0.000	122001350	0.4702	0.4687	
						RPD = 7.76	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.381	6.381	0.000	843588218	0.4774	0.4851	
2	6.242	6.242	0.000	1216881107	0.4774	0.4900	
9 Silvex (2,4,5-TP)							
1	6.728	6.728	0.000	313231370	0.4800	0.5145	
2	6.498	6.498	0.000	471457707	0.4800	0.4928	
						RPD = 4.31	
10 2,4,5-T							
1	6.834	6.834	0.000	306614568	0.4787	0.5035	
2	6.704	6.704	0.000	471573036	0.4787	0.4823	
						RPD = 4.30	
11 2,4-DB							
1	6.999	6.999	0.000	51427900	0.4756	0.4971	
2	6.881	6.881	0.000	73795425	0.4756	0.4566	
						RPD = 8.49	
12 Picloram							
1	7.288	7.288	0.000	422890923	0.4726	0.4759	
2	7.259	7.259	0.000	621511993	0.4726	0.4662	
						RPD = 2.05	
13 Dinoseb							
1	7.346	7.346	0.000	124671286	0.4771	0.3425	
2	6.974	6.974	0.000	192161773	0.4771	0.3115	
						RPD = 9.47	

Reagents:

8151ICALL4_00129 Amount Added: 1.00 Units: mL

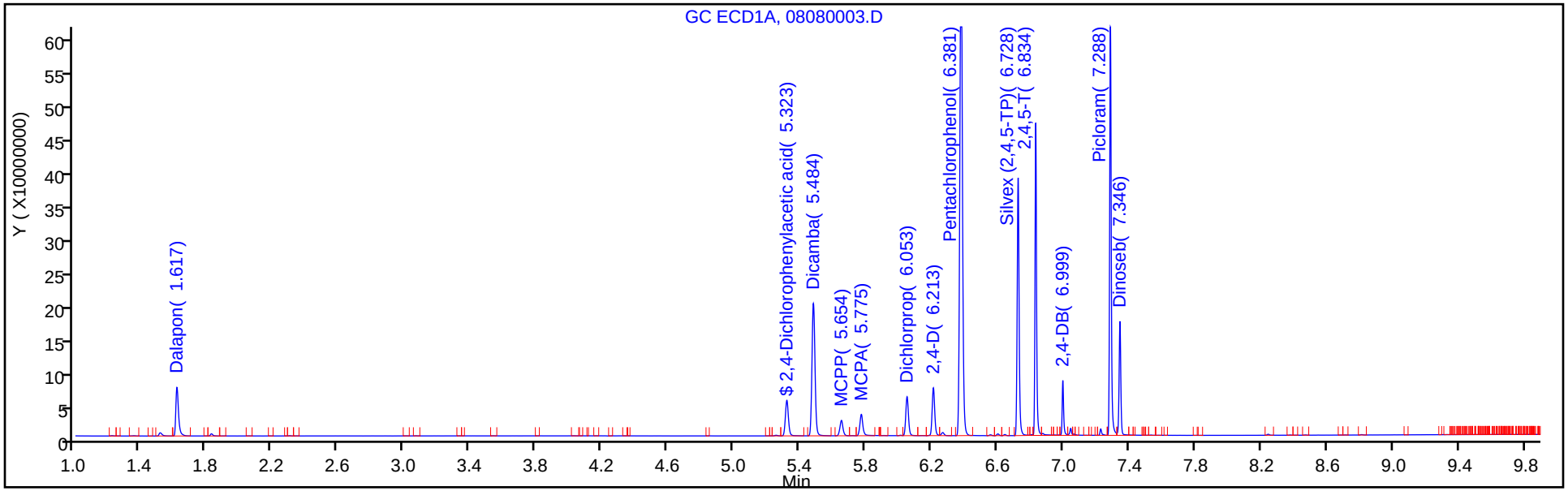
Report Date: 09-Aug-2018 01:31:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

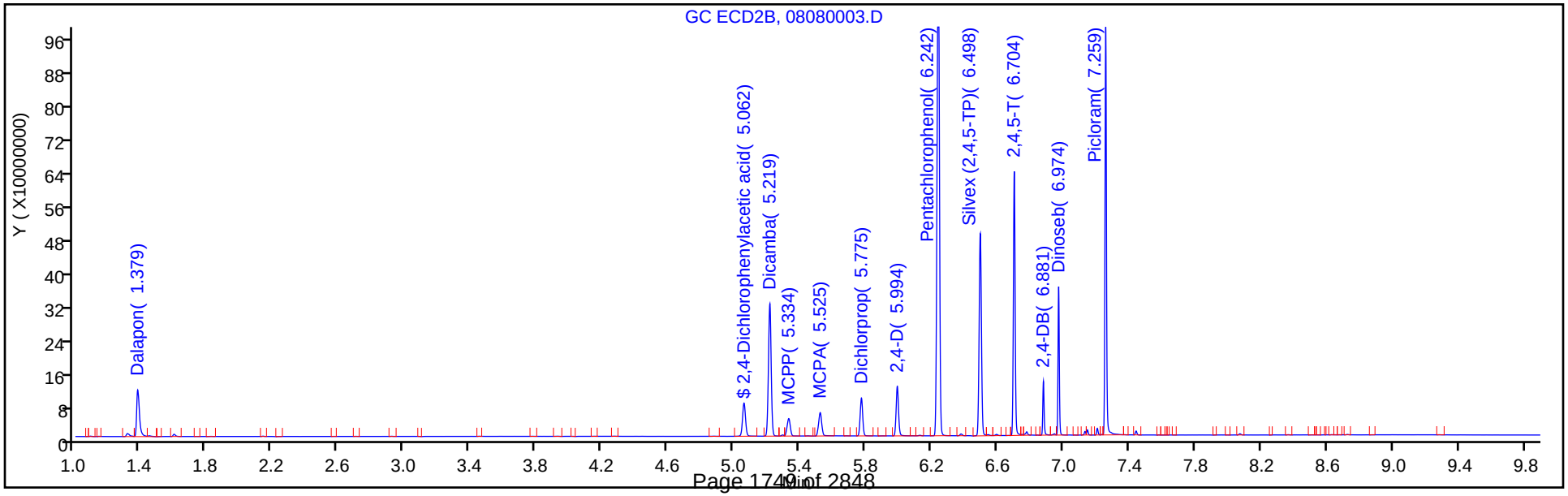
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080003.D

Injection Date:	08-Aug-2018 16:52:48	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	CCVRT			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	3
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM VII
HERBICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-425378/31 Calibration Date: 08/09/2018 00:26

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080031.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dalapon	Lin2		194745952		466	453	2.9	15.0
Dicamba	Lin2		523774066		484	475	2.0	15.0
MCPP	Lin2		612426		47300	47100	0.5	15.0
MCPA	Lin2		836399		39600	47000	-15.8*	15.0
Dichlorprop	Lin2		137825064		505	477	6.1	15.0
2,4-D	Lin2		166935295		509	470	8.2	15.0
Silvex (2,4,5-TP)	Lin2		655885673		517	480	7.7	15.0
2,4,5-T	Lin2		656545256		516	479	7.8	15.0
2,4-DB	Lin2		108993126		501	476	5.4	15.0
Picloram	Lin2		935540284		498	473	5.3	15.0
Dinoseb	Ave	364025316	288916362		379	477	-20.6*	15.0
2,4-Dichlorophenylacetic acid	Lin2		144727894		483	464	4.2	15.0

FORM VII
HERBICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-425378/31 Calibration Date: 08/09/2018 00:26

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080031.D

Analyte	RT	RT WINDOW	
		FROM	TO
Dalapon	1.62	1.59	1.65
Dicamba	5.48	5.45	5.51
MCPP	5.65	5.62	5.68
MCPA	5.77	5.75	5.81
Dichlorprop	6.05	6.02	6.08
2,4-D	6.21	6.18	6.24
Silvex (2,4,5-TP)	6.73	6.70	6.76
2,4,5-T	6.83	6.80	6.86
2,4-DB	7.00	6.97	7.03
Picloram	7.29	7.26	7.32
Dinoseb	7.35	7.32	7.38
2,4-Dichlorophenylacetic acid	5.32	5.29	5.35

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080031.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 09-Aug-2018 00:26:54 ALS Bottle#: 31 Worklist Smp#: 31
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCV
Misc. Info.: 280-0072814-031
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 10-Aug-2018 12:25:37 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mooret Date: 10-Aug-2018 12:25:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.617	1.617	0.000	88156624	0.4527	0.4657	
2	1.379	1.379	0.000	138457470	0.4527	0.4504	
						RPD = 3.34	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.320	5.323	-0.003	67153743	0.4640	0.4835	
2	5.060	5.062	-0.002	98520452	0.4640	0.4222	
						RPD = 13.53	
4 Dicamba							
1	5.483	5.484	-0.001	248596266	0.4746	0.4841	
2	5.217	5.219	-0.002	353689068	0.4746	0.4716	
						RPD = 2.62	
5 MCPP							
1	5.653	5.654	-0.001	28861839	47.1	47.3	
2	5.331	5.334	-0.003	50387313	47.1	41.7	
						RPD = 12.77	
6 MCPA							
1	5.773	5.775	-0.002	39303797	47.0	39.6	
2	5.523	5.525	-0.002	66598802	47.0	39.4	
						RPD = 0.46	
7 Dichlorprop							
1	6.052	6.053	-0.001	65683980	0.4766	0.5055	
2	5.774	5.775	-0.001	93227588	0.4766	0.4729	
						RPD = 6.65	
8 2,4-D							
1	6.212	6.213	-0.001	78484629	0.4702	0.5087	
2	5.991	5.994	-0.003	117970243	0.4702	0.4520	
						RPD = 11.80	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.380	6.381	-0.001	830138415	0.4774	0.4772	
2	6.240	6.242	-0.002	1194383186	0.4774	0.4808	
9 Silvex (2,4,5-TP)							
1	6.726	6.728	-0.002	314825123	0.4800	0.5172	
2	6.495	6.498	-0.003	465182872	0.4800	0.4861	
						RPD = 6.20	
10 2,4,5-T							
1	6.834	6.834	0.000	314288214	0.4787	0.5163	
2	6.702	6.704	-0.002	472321043	0.4787	0.4831	
						RPD = 6.64	
11 2,4-DB							
1	6.999	6.999	0.000	51834406	0.4756	0.5011	
2	6.880	6.881	-0.001	74341807	0.4756	0.4603	
						RPD = 8.49	
12 Picloram							
1	7.287	7.288	-0.001	442089561	0.4726	0.4978	
2	7.258	7.259	-0.001	624642960	0.4726	0.4686	
						RPD = 6.03	
13 Dinoseb							
1	7.345	7.346	-0.001	137849219	0.4771	0.3787	
2	6.972	6.974	-0.002	213593979	0.4771	0.3446	
						RPD = 9.43	

Reagents:

8151ICALL4_00129 Amount Added: 1.00 Units: mL

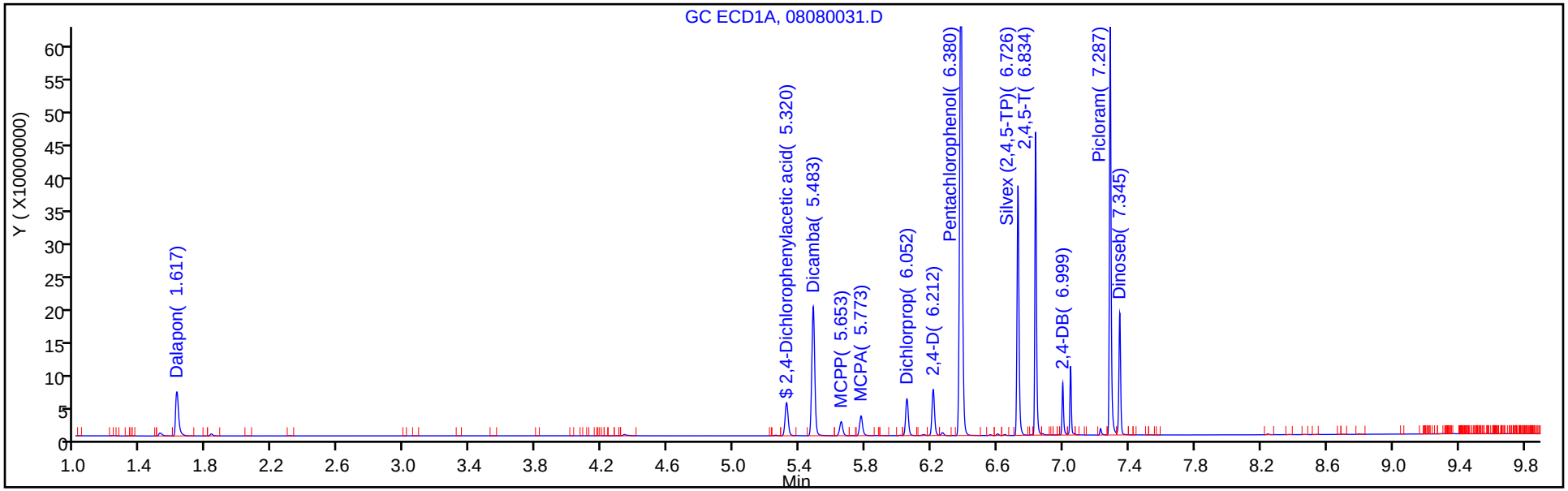
Report Date: 10-Aug-2018 12:25:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

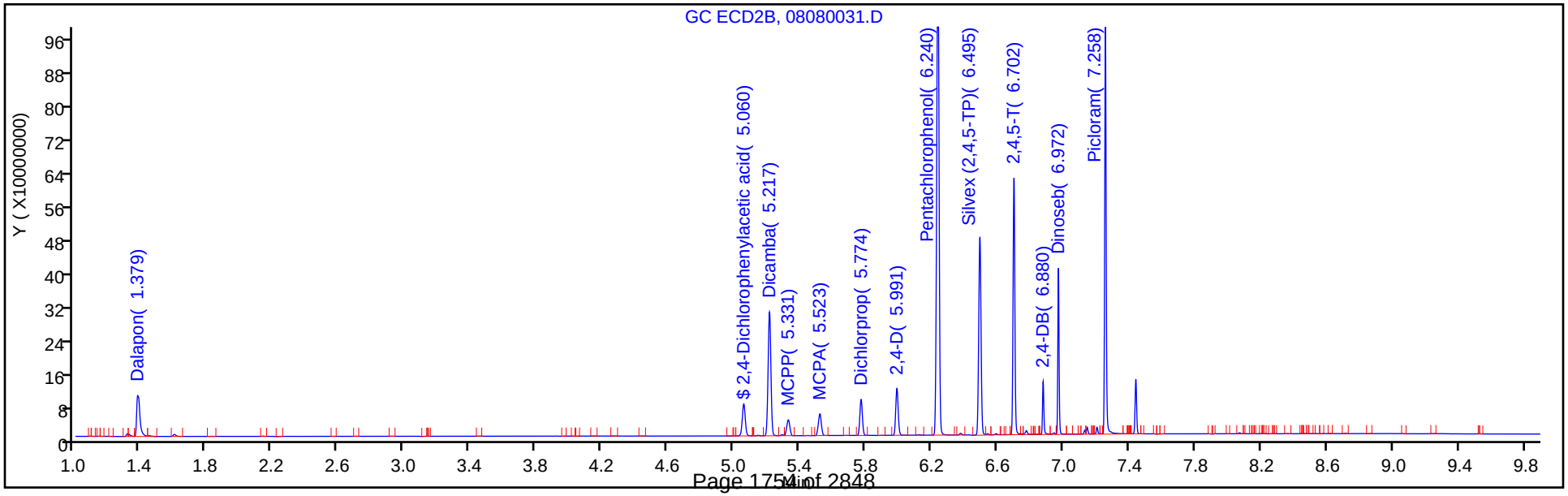
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080031.D

Injection Date:	09-Aug-2018 00:26:54	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	CCV			Worklist Smp#:	31
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	31
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM VII
HERBICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-425378/31 Calibration Date: 08/09/2018 00:26

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080031.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dalapon	Lin2		305865069		450	453	-0.5	15.0
Dicamba	Lin2		745196878		472	475	-0.6	15.0
MCPP	Qua		1069179		41700	47100	-11.6	15.0
MCPA	Qua		1417246		39400	47000	-16.2*	15.0
Dichlorprop	Lin2		195619972		473	477	-0.8	15.0
2,4-D	Qua		250920436		452	470	-3.9	15.0
Silvex (2,4,5-TP)	Lin2		969130983		486	480	1.3	15.0
2,4,5-T	Lin2		986674416		483	479	0.9	15.0
2,4-DB	Qua		156319838		460	476	-3.2	15.0
Dinoseb	Lin1		447668806		345	477	-27.8*	15.0
Picloram	Lin2		1321855804		469	473	-0.8	15.0
2,4-Dichlorophenylacetic acid	Ave	233355727	212328560		422	464	-9.0	15.0

FORM VII
HERBICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-425378/31 Calibration Date: 08/09/2018 00:26

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080031.D

Analyte	RT	RT WINDOW	
		FROM	TO
Dalapon	1.38	1.35	1.41
Dicamba	5.22	5.19	5.25
MCPP	5.33	5.30	5.36
MCPA	5.52	5.50	5.56
Dichlorprop	5.77	5.75	5.81
2,4-D	5.99	5.96	6.02
Silvex (2,4,5-TP)	6.50	6.47	6.53
2,4,5-T	6.70	6.67	6.73
2,4-DB	6.88	6.85	6.91
Dinoseb	6.97	6.94	7.00
Picloram	7.26	7.23	7.29
2,4-Dichlorophenylacetic acid	5.06	5.03	5.09

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080031.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 09-Aug-2018 00:26:54 ALS Bottle#: 31 Worklist Smp#: 31
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCV
Misc. Info.: 280-0072814-031
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 10-Aug-2018 12:25:37 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mooret Date: 10-Aug-2018 12:25:01

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.617	1.617	0.000	88156624	0.4527	0.4657	
2	1.379	1.379	0.000	138457470	0.4527	0.4504	
						RPD = 3.34	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.320	5.323	-0.003	67153743	0.4640	0.4835	
2	5.060	5.062	-0.002	98520452	0.4640	0.4222	
						RPD = 13.53	
4 Dicamba							
1	5.483	5.484	-0.001	248596266	0.4746	0.4841	
2	5.217	5.219	-0.002	353689068	0.4746	0.4716	
						RPD = 2.62	
5 MCPP							
1	5.653	5.654	-0.001	28861839	47.1	47.3	
2	5.331	5.334	-0.003	50387313	47.1	41.7	
						RPD = 12.77	
6 MCPA							
1	5.773	5.775	-0.002	39303797	47.0	39.6	
2	5.523	5.525	-0.002	66598802	47.0	39.4	
						RPD = 0.46	
7 Dichlorprop							
1	6.052	6.053	-0.001	65683980	0.4766	0.5055	
2	5.774	5.775	-0.001	93227588	0.4766	0.4729	
						RPD = 6.65	
8 2,4-D							
1	6.212	6.213	-0.001	78484629	0.4702	0.5087	
2	5.991	5.994	-0.003	117970243	0.4702	0.4520	
						RPD = 11.80	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.380	6.381	-0.001	830138415	0.4774	0.4772	
2	6.240	6.242	-0.002	1194383186	0.4774	0.4808	
9 Silvex (2,4,5-TP)							
1	6.726	6.728	-0.002	314825123	0.4800	0.5172	
2	6.495	6.498	-0.003	465182872	0.4800	0.4861	
						RPD = 6.20	
10 2,4,5-T							
1	6.834	6.834	0.000	314288214	0.4787	0.5163	
2	6.702	6.704	-0.002	472321043	0.4787	0.4831	
						RPD = 6.64	
11 2,4-DB							
1	6.999	6.999	0.000	51834406	0.4756	0.5011	
2	6.880	6.881	-0.001	74341807	0.4756	0.4603	
						RPD = 8.49	
12 Picloram							
1	7.287	7.288	-0.001	442089561	0.4726	0.4978	
2	7.258	7.259	-0.001	624642960	0.4726	0.4686	
						RPD = 6.03	
13 Dinoseb							
1	7.345	7.346	-0.001	137849219	0.4771	0.3787	
2	6.972	6.974	-0.002	213593979	0.4771	0.3446	
						RPD = 9.43	

Reagents:

8151ICALL4_00129 Amount Added: 1.00 Units: mL

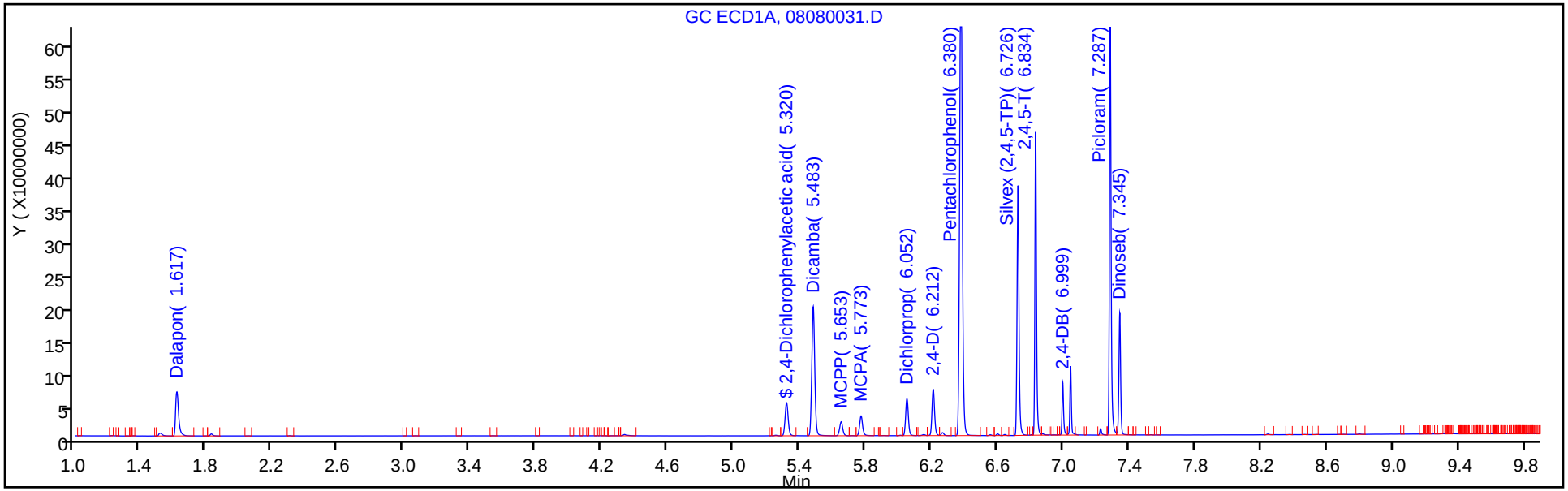
Report Date: 10-Aug-2018 12:25:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

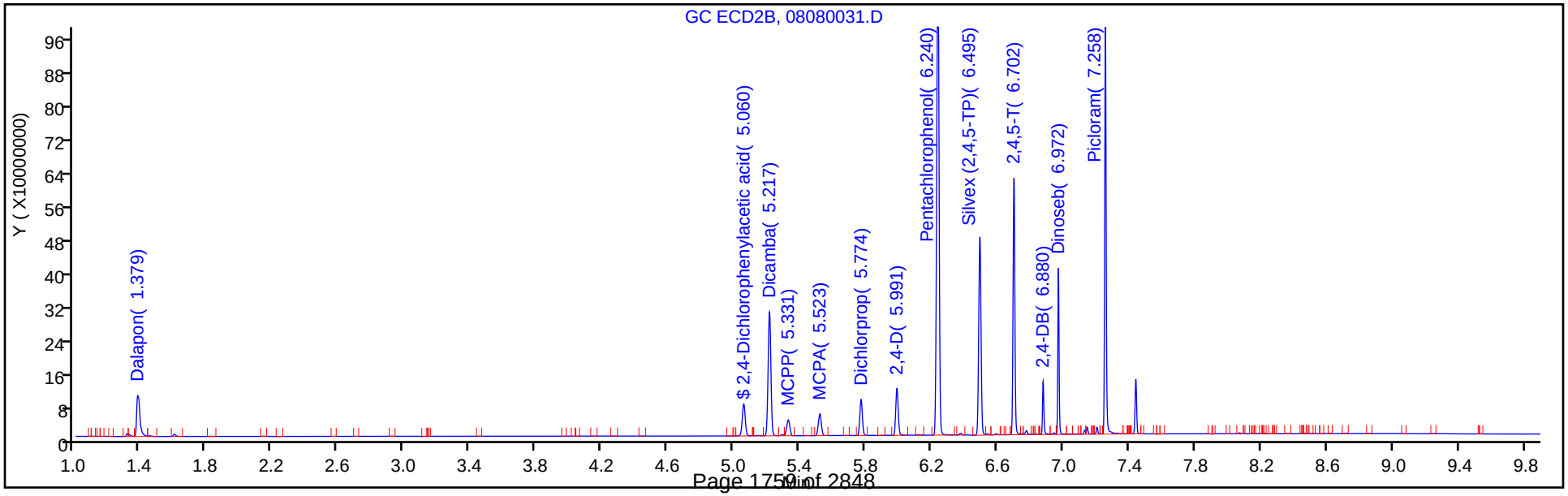
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080031.D

Injection Date:	09-Aug-2018 00:26:54	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	CCV			Worklist Smp#:	31
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	31
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM VII
HERBICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-425378/40 Calibration Date: 08/09/2018 02:48

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080040.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dalapon	Lin2		201030017		481	453	6.3	15.0
Dicamba	Lin2		547225471		506	475	6.7	15.0
MCPP	Lin2		645814		50100	47100	6.3	15.0
MCPA	Lin2		872435		41400	47000	-11.9	15.0
Dichlorprop	Lin2		146661835		539	477	13.1	15.0
2,4-D	Lin2		179263909		547	470	16.4*	15.0
Silvex (2,4,5-TP)	Lin2		712075748		562	480	17.2*	15.0
2,4,5-T	Lin2		718810466		566	479	18.2*	15.0
2,4-DB	Lin2		118657150		547	476	14.9	15.0
Picloram	Lin2		1064070048		567	473	20.0*	15.0
Dinoseb	Ave	364025316	401792972		527	477	10.4	15.0
2,4-Dichlorophenylacetic acid	Lin2		151118606		506	464	9.0	15.0

FORM VII
HERBICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-425378/40 Calibration Date: 08/09/2018 02:48

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP1 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080040.D

Analyte	RT	RT WINDOW	
		FROM	TO
Dalapon	1.62	1.59	1.65
Dicamba	5.48	5.45	5.51
MCPP	5.65	5.62	5.68
MCPA	5.77	5.75	5.81
Dichlorprop	6.05	6.02	6.08
2,4-D	6.21	6.18	6.24
Silvex (2,4,5-TP)	6.73	6.70	6.76
2,4,5-T	6.83	6.80	6.86
2,4-DB	7.00	6.97	7.03
Picloram	7.29	7.26	7.32
Dinoseb	7.34	7.32	7.38
2,4-Dichlorophenylacetic acid	5.32	5.29	5.35

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080040.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 09-Aug-2018 02:48:12 ALS Bottle#: 40 Worklist Smp#: 40
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCV
Misc. Info.: 280-0072814-040
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 08:35:39 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0308

First Level Reviewer: mardickc Date: 09-Aug-2018 08:35:39

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.619	1.617	0.002	91001263	0.4527	0.4810	
2	1.384	1.379	0.005	143230822	0.4527	0.4663	
						RPD = 3.11	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.321	5.323	-0.002	70119033	0.4640	0.5056	
2	5.060	5.062	-0.002	101629749	0.4640	0.4355	
						RPD = 14.89	
4 Dicamba							
1	5.482	5.484	-0.002	259726889	0.4746	0.5064	
2	5.217	5.219	-0.002	368709367	0.4746	0.4923	
						RPD = 2.82	
5 MCPP							
1	5.652	5.654	-0.002	30435342	47.1	50.1	
2	5.333	5.334	-0.001	53823299	47.1	45.3	
						RPD = 10.09	
6 MCPA							
1	5.773	5.775	-0.002	40997206	47.0	41.4	
2	5.523	5.525	-0.002	71187055	47.0	42.9	
						RPD = 3.57	
7 Dichlorprop							
1	6.051	6.053	-0.002	69895364	0.4766	0.5388	
2	5.773	5.775	-0.002	98995844	0.4766	0.5033	
						RPD = 6.82	
8 2,4-D							
1	6.211	6.213	-0.002	84280927	0.4702	0.5472	
2	5.990	5.994	-0.004	126003720	0.4702	0.4853	
						RPD = 11.98	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.379	6.381	-0.002	910164824	0.4774	0.5241	
2	6.239	6.242	-0.003	1282537807	0.4774	0.5169	
9 Silvex (2,4,5-TP)							
1	6.726	6.728	-0.002	341796359	0.4800	0.5624	
2	6.494	6.498	-0.004	497353195	0.4800	0.5204	
						RPD = 7.76	
10 2,4,5-T							
1	6.833	6.834	-0.001	344094570	0.4787	0.5660	
2	6.701	6.704	-0.003	510207651	0.4787	0.5224	
						RPD = 8.02	
11 2,4-DB							
1	6.998	6.999	-0.001	56430374	0.4756	0.5465	
2	6.879	6.881	-0.002	81101444	0.4756	0.5055	
						RPD = 7.80	
12 Picloram							
1	7.287	7.288	-0.001	502826301	0.4726	0.5669	
2	7.258	7.259	-0.001	699516945	0.4726	0.5253	
						RPD = 7.62	
13 Dinoseb							
1	7.344	7.346	-0.002	191705472	0.4771	0.5266	
2	6.972	6.974	-0.002	293887948	0.4771	0.4684	
						RPD = 11.70	

Reagents:

8151ICALL4_00129 Amount Added: 1.00 Units: mL

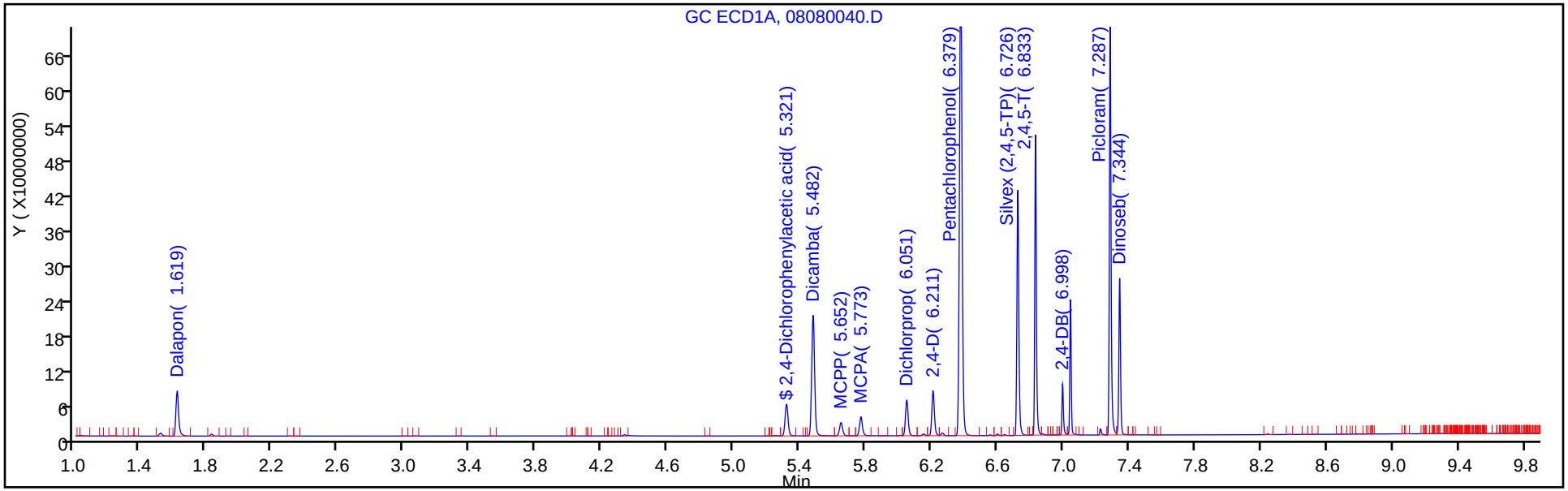
Report Date: 09-Aug-2018 08:35:40 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

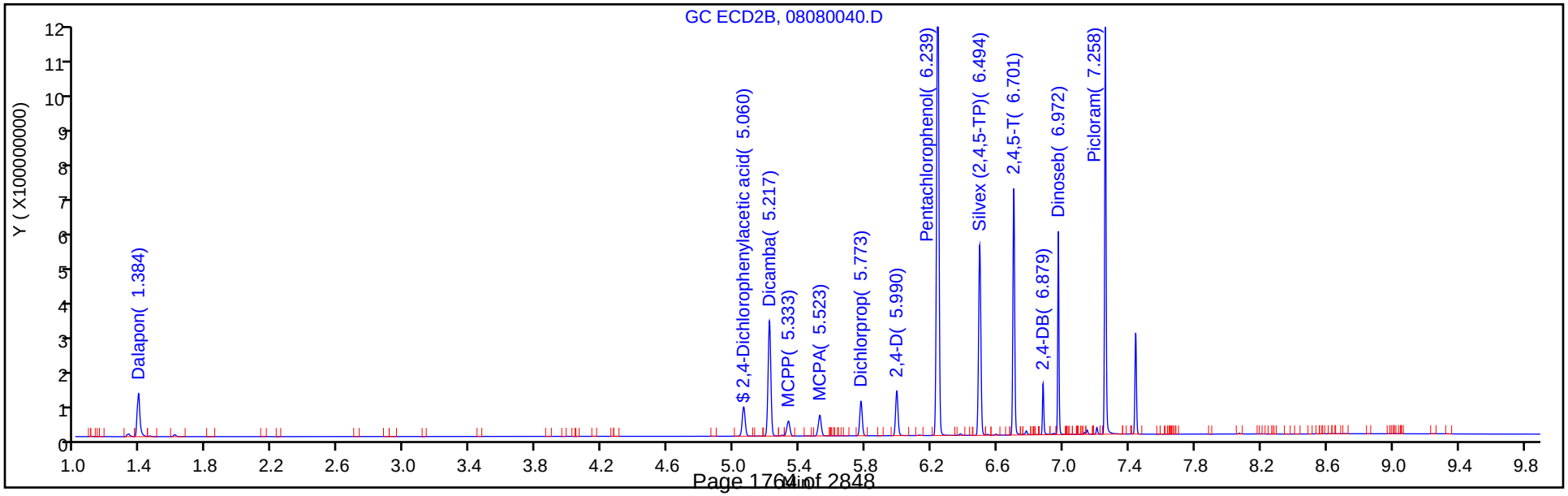
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080040.D

Injection Date:	09-Aug-2018 02:48:12	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	CCV			Worklist Smp#:	40
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	40
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM VII
HERBICIDES CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-425378/40 Calibration Date: 08/09/2018 02:48

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080040.D Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dalapon	Lin2		316409835		466	453	3.0	15.0
Dicamba	Lin2		776843544		492	475	3.7	15.0
MCPP	Qua		1142088		45300	47100	-3.9	15.0
MCPA	Qua		1514886		42900	47000	-8.7	15.0
Dichlorprop	Lin2		207723536		503	477	5.6	15.0
2,4-D	Qua		268007487		485	470	3.2	15.0
Silvex (2,4,5-TP)	Lin2		1036152490		520	480	8.4	15.0
2,4,5-T	Lin2		1065819200		522	479	9.1	15.0
2,4-DB	Qua		170533447		505	476	6.3	15.0
Dinoseb	Lin1		615955877		468	477	-1.8	15.0
Picloram	Lin2		1480302497		525	473	11.2	15.0
2,4-Dichlorophenylacetic acid	Ave	233355727	219029631		436	464	-6.1	15.0

FORM VII
HERBICIDES CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: CCV 280-425378/40 Calibration Date: 08/09/2018 02:48

Instrument ID: SGC_M Calib Start Date: 08/08/2018 10:03

GC Column: CLP2 ID: 0.32(mm) Calib End Date: 08/08/2018 11:41

Lab File ID: 08080040.D

Analyte	RT	RT WINDOW	
		FROM	TO
Dalapon	1.38	1.35	1.41
Dicamba	5.22	5.19	5.25
MCPP	5.33	5.30	5.36
MCPA	5.52	5.50	5.56
Dichlorprop	5.77	5.75	5.81
2,4-D	5.99	5.96	6.02
Silvex (2,4,5-TP)	6.49	6.47	6.53
2,4,5-T	6.70	6.67	6.73
2,4-DB	6.88	6.85	6.91
Dinoseb	6.97	6.94	7.00
Picloram	7.26	7.23	7.29
2,4-Dichlorophenylacetic acid	5.06	5.03	5.09

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080040.D
Lims ID: CCV
Client ID:
Sample Type: CCV
Inject. Date: 09-Aug-2018 02:48:12 ALS Bottle#: 40 Worklist Smp#: 40
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: CCV
Misc. Info.: 280-0072814-040
Operator ID: TEM Instrument ID: SGC_M
Sublist: chrom-8151_615*sub8

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 09-Aug-2018 08:35:39 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0308

First Level Reviewer: mardickc Date: 09-Aug-2018 08:35:39

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.619	1.617	0.002	91001263	0.4527	0.4810	
2	1.384	1.379	0.005	143230822	0.4527	0.4663	
						RPD = 3.11	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.321	5.323	-0.002	70119033	0.4640	0.5056	
2	5.060	5.062	-0.002	101629749	0.4640	0.4355	
						RPD = 14.89	
4 Dicamba							
1	5.482	5.484	-0.002	259726889	0.4746	0.5064	
2	5.217	5.219	-0.002	368709367	0.4746	0.4923	
						RPD = 2.82	
5 MCPP							
1	5.652	5.654	-0.002	30435342	47.1	50.1	
2	5.333	5.334	-0.001	53823299	47.1	45.3	
						RPD = 10.09	
6 MCPA							
1	5.773	5.775	-0.002	40997206	47.0	41.4	
2	5.523	5.525	-0.002	71187055	47.0	42.9	
						RPD = 3.57	
7 Dichlorprop							
1	6.051	6.053	-0.002	69895364	0.4766	0.5388	
2	5.773	5.775	-0.002	98995844	0.4766	0.5033	
						RPD = 6.82	
8 2,4-D							
1	6.211	6.213	-0.002	84280927	0.4702	0.5472	
2	5.990	5.994	-0.004	126003720	0.4702	0.4853	
						RPD = 11.98	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
14 Pentachlorophenol							
1	6.379	6.381	-0.002	910164824	0.4774	0.5241	
2	6.239	6.242	-0.003	1282537807	0.4774	0.5169	
9 Silvex (2,4,5-TP)							
1	6.726	6.728	-0.002	341796359	0.4800	0.5624	
2	6.494	6.498	-0.004	497353195	0.4800	0.5204	
						RPD = 7.76	
10 2,4,5-T							
1	6.833	6.834	-0.001	344094570	0.4787	0.5660	
2	6.701	6.704	-0.003	510207651	0.4787	0.5224	
						RPD = 8.02	
11 2,4-DB							
1	6.998	6.999	-0.001	56430374	0.4756	0.5465	
2	6.879	6.881	-0.002	81101444	0.4756	0.5055	
						RPD = 7.80	
12 Picloram							
1	7.287	7.288	-0.001	502826301	0.4726	0.5669	
2	7.258	7.259	-0.001	699516945	0.4726	0.5253	
						RPD = 7.62	
13 Dinoseb							
1	7.344	7.346	-0.002	191705472	0.4771	0.5266	
2	6.972	6.974	-0.002	293887948	0.4771	0.4684	
						RPD = 11.70	

Reagents:

8151ICALL4_00129 Amount Added: 1.00 Units: mL

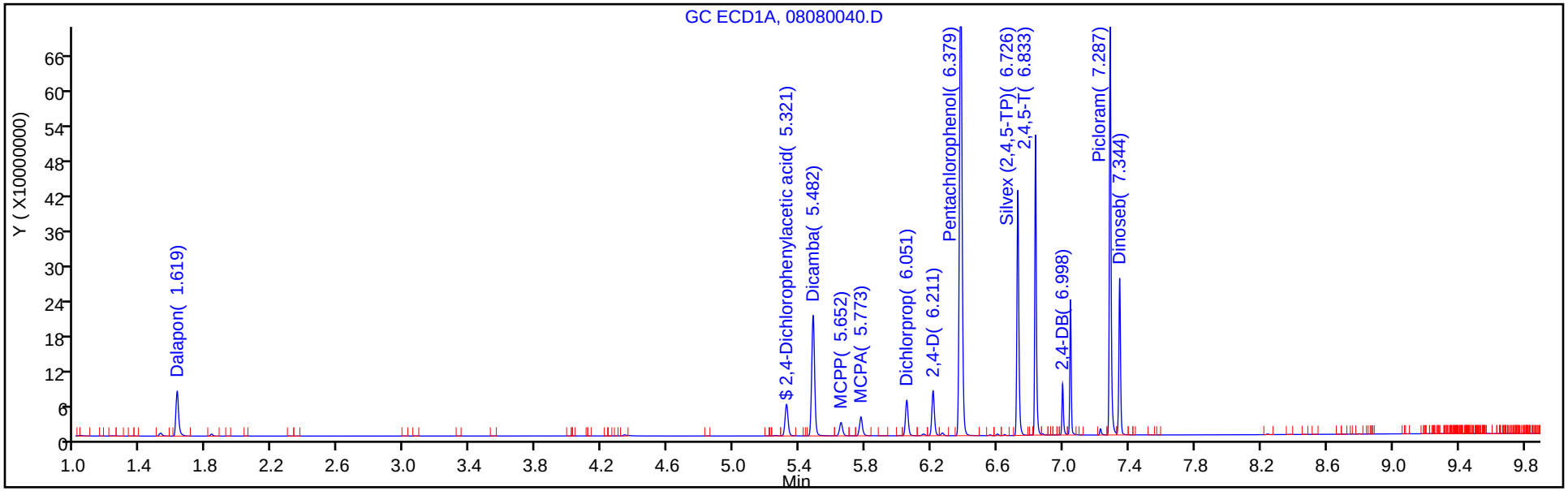
Report Date: 09-Aug-2018 08:35:40 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

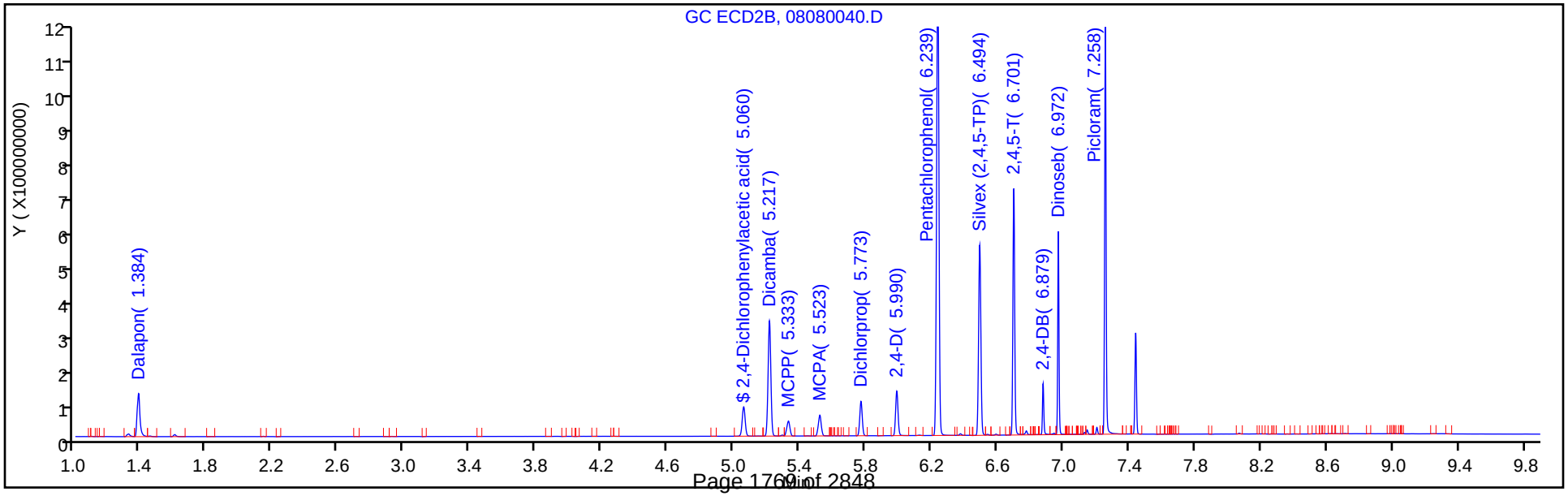
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080040.D

Injection Date:	09-Aug-2018 02:48:12	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	CCV			Worklist Smp#:	40
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	40
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: | Lab Sample ID: LB 280-423271/1-D

Matrix: Solid (TCLP) | Lab File ID: 08080032.D

Analysis Method: 8151A | Date Collected:

Extraction Method: 8151A | Date Extracted: 07/25/2018 09:20

Sample wt/vol: 100(mL) | Date Analyzed: 08/09/2018 00:42

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.: 425378 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	0.0021	U	0.040	0.0021
93-72-1	Silvex (2,4,5-TP)	0.0017	U	0.010	0.0017

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	39		10-131

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080032.D
Lims ID: LB 280-423271/1-D
Client ID:
Sample Type: LB
Inject. Date: 09-Aug-2018 00:42:32 ALS Bottle#: 32 Worklist Smp#: 32
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: LB 280-423271/1-
Misc. Info.: 280-0072814-032
Operator ID: TEM Instrument ID: SGC_M

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 10-Aug-2018 12:25:37 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
1 2,4-DBDinoseb							
1		-0.060				ND	
2		-0.060					
2 Dalapon							
1	1.616	1.617	-0.001	620331		-0.005358	
2	1.405	1.379	0.026	92527		-0.0105	
						RPD = -65.26	
LOD = 0.001000							
$ 3 2,4-Dichlorophenylacetic acid							
1	5.320	5.323	-0.003	37078587	0.5000	0.2590	
2	5.060	5.062	-0.002	45270572	0.5000	0.1940	
						RPD = 28.70	
4 Dicamba							
1	5.488	5.484	0.004	10177935		0.007412	
2	5.223	5.219	0.004	2762632		-0.0113	
						RPD = -961.91	
5 MCPP							
1	5.655	5.654	0.001	1980678		0.4287	
2	5.317	5.334	-0.017	3796544		-4.65	
						RPD = -240.59	
6 MCPA							
1	5.773	5.775	-0.002	2426358		-0.5738	
2	5.517	5.525	-0.008	302233		-9.14	
						RPD = -176.38	
LOD = 0.001000							
7 Dichlorprop							
1	6.049	6.053	-0.004	1027630		-0.006189	
2	5.776	5.775	0.001	3151125		-0.000447	
						RPD = -173.03	
LOD = 0.001000							

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
8 2,4-D							
1	6.210	6.213	-0.003	1508202		-0.002707	
2	5.974	5.994	-0.020	160140		-0.0157	
						RPD = -141.33	
LOD = 0.001000							
14 Pentachlorophenol							
1	6.368	6.381	-0.013	1010244		-0.008703	
2	6.249	6.242	0.007	388452		-0.008711	
9 Silvex (2,4,5-TP)							
1		6.728				ND	
2		6.498					
10 2,4,5-T							
1	6.833	6.834	-0.001	2672239		-0.003568	
2	6.686	6.704	-0.018	7434078		0.001119	
						RPD = -382.68	
11 2,4-DB							
1	6.997	6.999	-0.002	6232980		0.0504	
2	6.890	6.881	0.009	8782842		0.0318	
						RPD = 45.26	
12 Picloram							
1		7.288				ND	
2		7.259					
13 Dinoseb							
1	7.334	7.346	-0.012	3303913		0.009076	
2	6.965	6.974	-0.009	1565741		0.0176	
						RPD = 63.90	

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

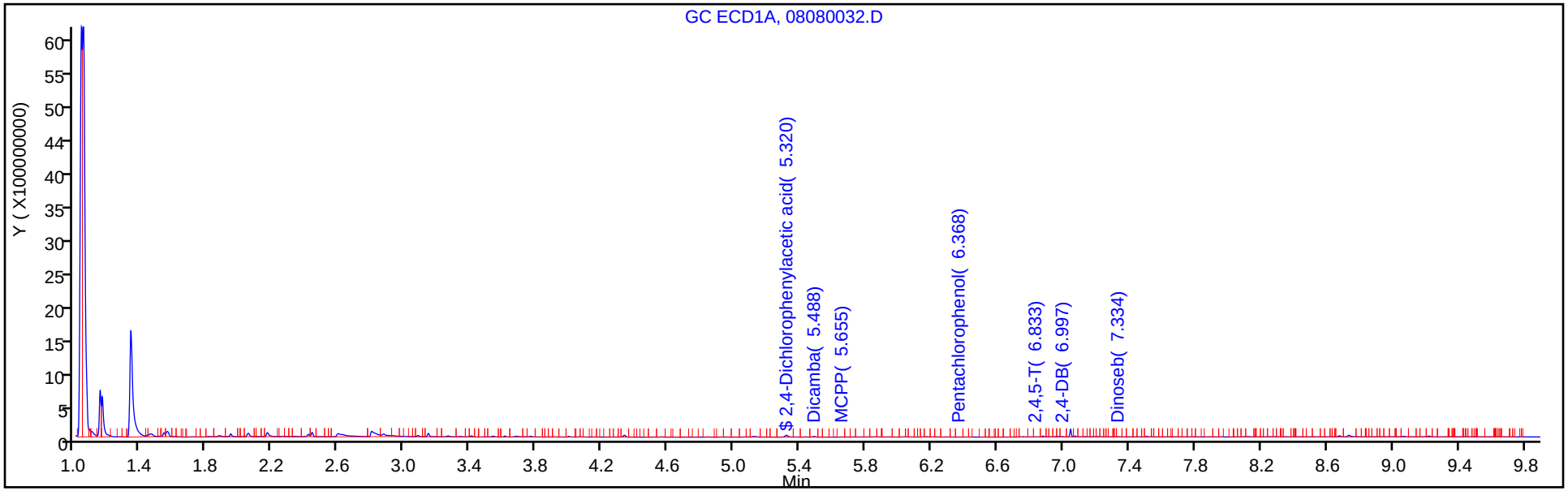
Report Date: 10-Aug-2018 12:25:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

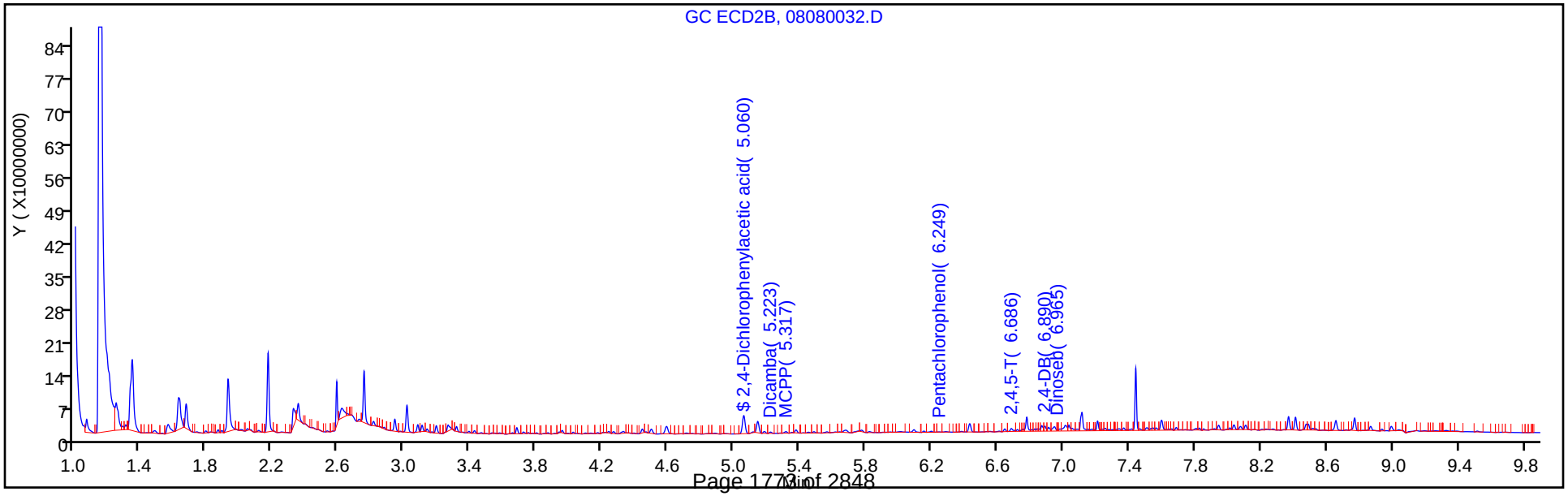
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080032.D

Injection Date:	09-Aug-2018 00:42:32	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	LB 280-423271/1-D			Worklist Smp#:	32
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	32
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080032.D				
Lims ID:	LB 280-423271/1-D				
Client ID:					
Sample Type:	LB				
Inject. Date:	09-Aug-2018 00:42:32	ALS Bottle#:	32	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	LB 280-423271/1-				
Misc. Info.:	280-0072814-032				
Operator ID:	TEM	Instrument ID:	SGC_M		
Method:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m				
Limit Group:	GCSV - 8151				
Method Label:	8151A: Herbicides: DV-GC-0022				
Last Update:	10-Aug-2018 12:25:37	Calib Date:	08-Aug-2018 11:41:27		
Integrator:	Falcon				
Quant Method:	External Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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:	CTX0307				

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.2590	51.80

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.1940	38.80

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 280-423271/2-D

Matrix: Solid (TCLP) | Lab File ID: 08080033.D

Analysis Method: 8151A | Date Collected:

Extraction Method: 8151A | Date Extracted: 07/25/2018 09:20

Sample wt/vol: 100(mL) | Date Analyzed: 08/09/2018 00:58

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.: 425378 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	0.0239	J	0.040	0.0021
93-72-1	Silvex (2,4,5-TP)	0.0274		0.010	0.0017

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	36		10-131

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080033.D
Lims ID: LCS 280-423271/2-D
Client ID:
Sample Type: LCS
Inject. Date: 09-Aug-2018 00:58:13 ALS Bottle#: 33 Worklist Smp#: 33
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: LCS 280-423271/2
Misc. Info.: 280-0072814-033
Operator ID: TEM Instrument ID: SGC_M

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 10-Aug-2018 12:25:37 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

First Level Reviewer: mooret Date: 10-Aug-2018 12:25:06

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
2 Dalapon							
1	1.625	1.617	0.008	61523036	0.5000	0.3224	
2	1.381	1.379	0.002	39188852	0.5000	0.1197	
						RPD = 91.70	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.320	5.323	-0.003	33007940	0.5000	0.2286	
2	5.061	5.062	-0.001	42569523	0.5000	0.1824	
						RPD = 22.48	
4 Dicamba							
1	5.482	5.484	-0.002	130508126	0.5000	0.2480	
2	5.217	5.219	-0.002	181960886	0.5000	0.2353	
						RPD = 5.26	
5 MCPP							
1	5.652	5.654	-0.002	18536996	50.0	29.3	
2	5.331	5.334	-0.003	33248918	50.0	24.1	
						RPD = 19.73	
6 MCPA							
1	5.772	5.775	-0.003	23048509	50.0	21.9	
2	5.522	5.525	-0.003	38287550	50.0	18.1	
						RPD = 18.79	
7 Dichlorprop							
1	6.051	6.053	-0.002	38938717	0.5000	0.2938	
2	5.773	5.775	-0.002	52675005	0.5000	0.2598	
						RPD = 12.28	
8 2,4-D							
1	6.211	6.213	-0.002	52177209	0.5000	0.3339	
2	5.990	5.994	-0.004	65414483	0.5000	0.2387	
						RPD = 33.26	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
9 Silvex (2,4,5-TP)							
1	6.726	6.728	-0.002	193293857	0.5000	0.3134	
2	6.495	6.498	-0.003	266465308	0.5000	0.2742	
						RPD = 13.35	
10 2,4,5-T							
1	6.833	6.834	-0.001	201145662	0.5000	0.3275	
2	6.702	6.704	-0.002	278635018	0.5000	0.2823	
						RPD = 14.84	
11 2,4-DB							
1	6.997	6.999	-0.002	19961913	0.5000	0.1861	
2	6.879	6.881	-0.002	28907353	0.5000	0.1614	
						RPD = 14.21	
12 Picloram							
1	7.287	7.288	-0.001	161425350	0.5000	0.1783	
2	7.257	7.259	-0.002	227478737	0.5000	0.1681	
						RPD = 5.94	
13 Dinoseb							
1	7.343	7.346	-0.003	35167318	0.5000	0.0966	
2	6.972	6.974	-0.002	30422455	0.5000	0.0621	
						RPD = 43.49	

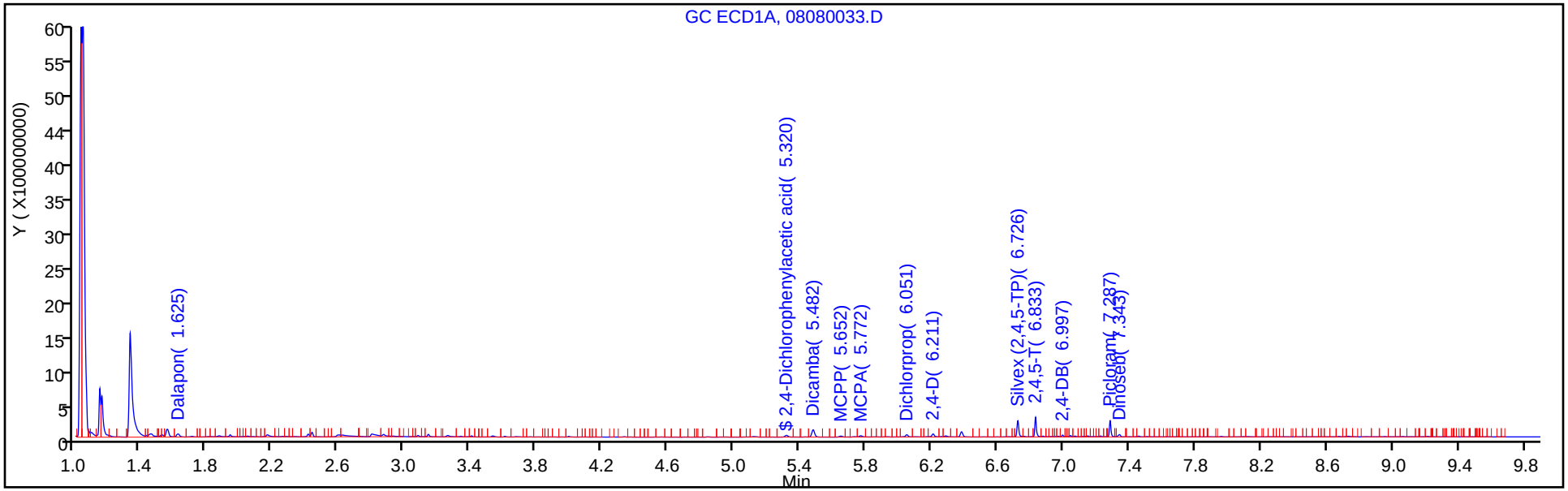
Report Date: 10-Aug-2018 12:25:39 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

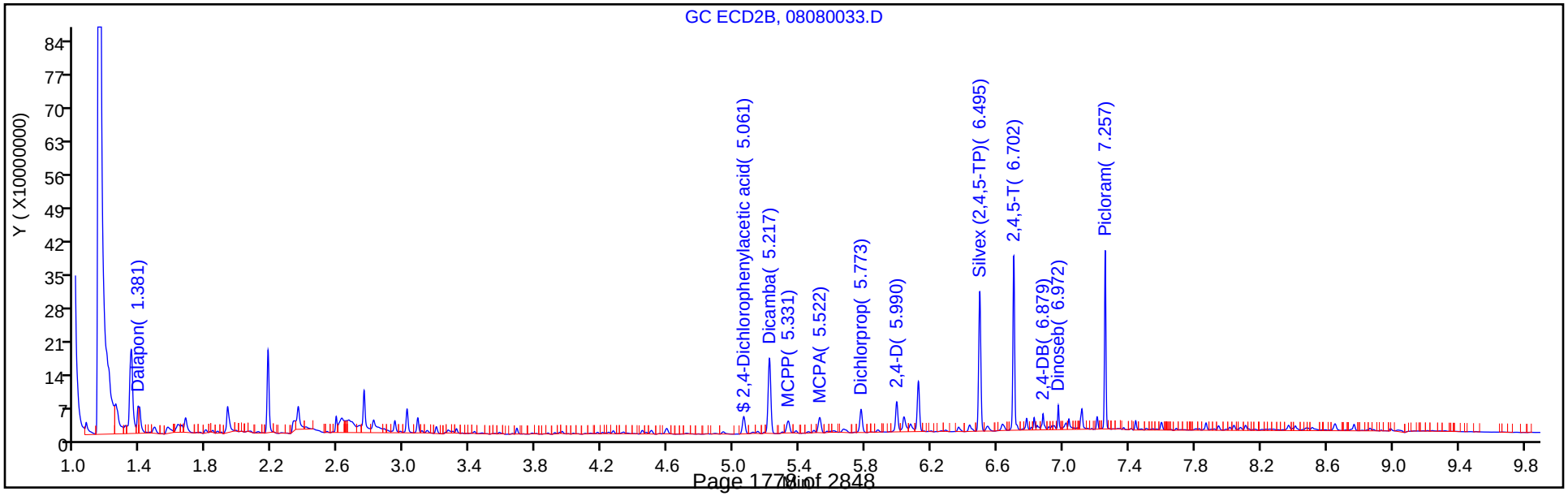
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080033.D

Injection Date:	09-Aug-2018 00:58:13	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	LCS 280-423271/2-D			Worklist Smp#:	33
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	33
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080033.D				
Lims ID:	LCS 280-423271/2-D				
Client ID:					
Sample Type:	LCS				
Inject. Date:	09-Aug-2018 00:58:13	ALS Bottle#:	33	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	LCS 280-423271/2				
Misc. Info.:	280-0072814-033				
Operator ID:	TEM	Instrument ID:	SGC_M		
Method:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m				
Limit Group:	GCSV - 8151				
Method Label:	8151A: Herbicides: DV-GC-0022				
Last Update:	10-Aug-2018 12:25:37	Calib Date:	08-Aug-2018 11:41:27		
Integrator:	Falcon				
Quant Method:	External Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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:	CTX0307				
First Level Reviewer: mooret		Date:	10-Aug-2018 12:25:06		

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.2286	45.73

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.1824	36.48

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: | Lab Sample ID: 280-112289-A-1-E MS

Matrix: Solid (TCLP) | Lab File ID: 08080038.D

Analysis Method: 8151A | Date Collected: 07/20/2018 11:00

Extraction Method: 8151A | Date Extracted: 07/25/2018 09:20

Sample wt/vol: 100(mL) | Date Analyzed: 08/09/2018 02:16

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.: 425378 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	0.0279	J	0.040	0.0021
93-72-1	Silvex (2,4,5-TP)	0.0331		0.010	0.0017

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	38		10-131

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080038.D
Lims ID: 280-112289-A-1-E MS
Client ID:
Sample Type: MS
Inject. Date: 09-Aug-2018 02:16:48 ALS Bottle#: 38 Worklist Smp#: 38
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 280-112289-A-1-E
Misc. Info.: 280-0072814-038
Operator ID: TEM Instrument ID: SGC_M

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 10-Aug-2018 12:25:01 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
1 2,4-DBDinoseb							
1		-0.060				ND	
2		-0.060					
2 Dalapon							
1	1.626	1.617	0.009	76434010	0.5000	0.4026	
2	1.382	1.379	0.003	25938698	0.5000	0.0755	
						RPD = 136.80	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.321	5.323	-0.002	29418006	0.5000	0.2018	
2	5.061	5.062	-0.001	44799280	0.5000	0.1920	
						RPD = 5.01	
4 Dicamba							
1	5.482	5.484	-0.002	166508382	0.5000	0.3200	
2	5.217	5.219	-0.002	223198137	0.5000	0.2920	
						RPD = 9.13	
5 MCPP							
1	5.652	5.654	-0.002	21023585	50.0	33.7	
2	5.330	5.334	-0.004	34393702	50.0	25.2	
						RPD = 28.71	
6 MCPA							
1	5.772	5.775	-0.003	23786931	50.0	22.7	
2	5.522	5.525	-0.003	42725022	50.0	21.4	
						RPD = 5.83	
7 Dichlorprop							
1	6.051	6.053	-0.002	43825012	0.5000	0.3325	
2	5.772	5.775	-0.003	63293998	0.5000	0.3156	
						RPD = 5.20	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
8 2,4-D							
1	6.210	6.213	-0.003	60102872	0.5000	0.3865	
2	5.990	5.994	-0.004	75449374	0.5000	0.2788	
						RPD = 32.39	
14 Pentachlorophenol							
1	6.384	6.381	0.003	96394793		0.0472	
2	6.228	6.242	-0.014	111094		-0.008824	
9 Silvex (2,4,5-TP)							
1	6.726	6.728	-0.002	232059733	0.5000	0.3784	
2	6.493	6.498	-0.005	319534641	0.5000	0.3308	
						RPD = 13.43	
10 2,4,5-T							
1	6.833	6.834	-0.001	243827257	0.5000	0.3987	
2	6.701	6.704	-0.003	338142612	0.5000	0.3440	
						RPD = 14.75	
11 2,4-DB							
1	6.997	6.999	-0.002	22139303	0.5000	0.2076	
2	6.879	6.881	-0.002	21686189	0.5000	0.1147	
						RPD = 57.65	
12 Picloram							
1	7.287	7.288	-0.001	256546841	0.5000	0.2866	
2	7.257	7.259	-0.002	354116648	0.5000	0.2639	
						RPD = 8.25	
13 Dinoseb							
1	7.342	7.346	-0.004	36775122	0.5000	0.1010	
2	6.972	6.974	-0.002	26671862	0.5000	0.0563	
						RPD = 56.83	

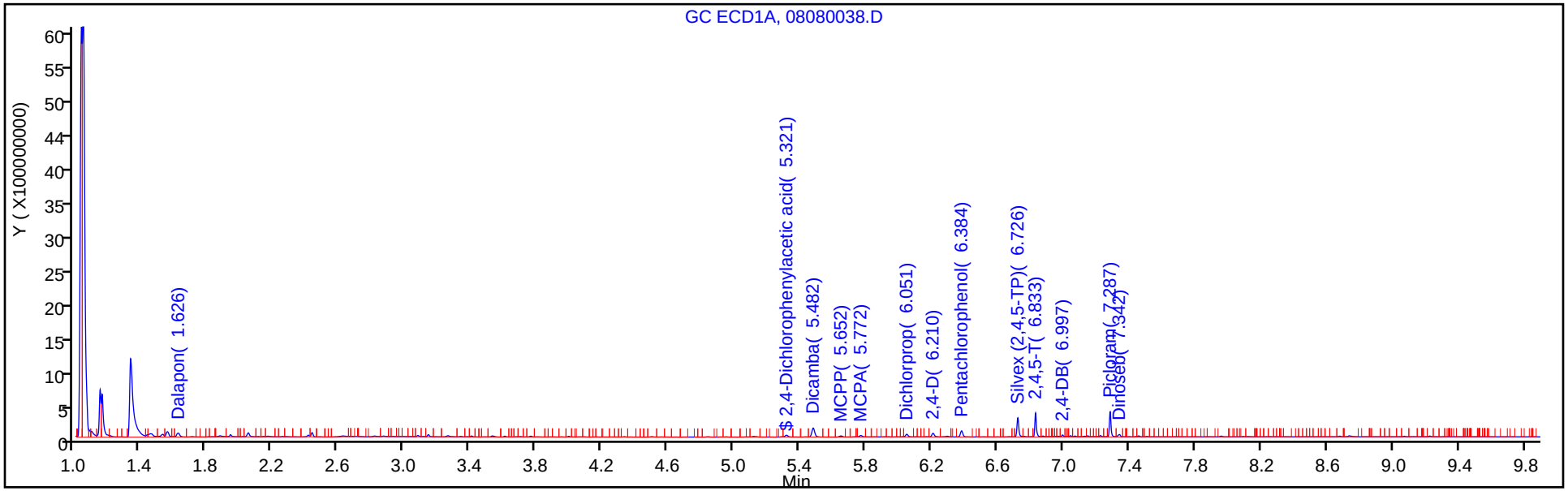
Report Date: 10-Aug-2018 12:25:35 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

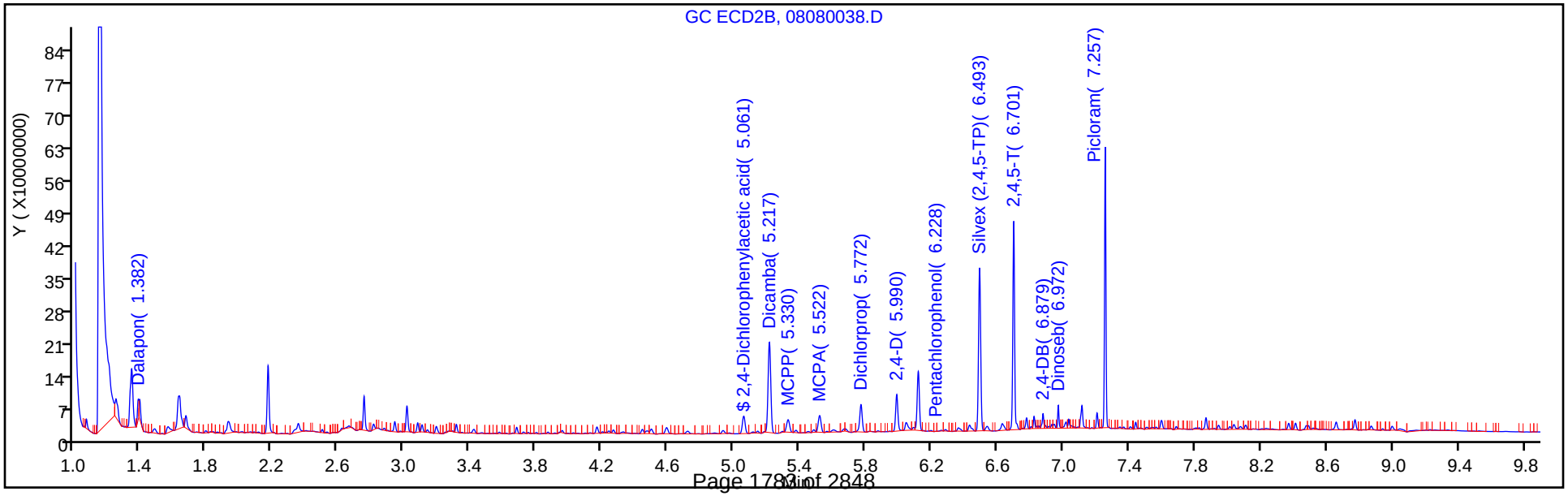
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080038.D

Injection Date:	09-Aug-2018 02:16:48	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	280-112289-A-1-E MS			Worklist Smp#:	38
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	38
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080038.D				
Lims ID:	280-112289-A-1-E MS				
Client ID:					
Sample Type:	MS				
Inject. Date:	09-Aug-2018 02:16:48	ALS Bottle#:	38	Worklist Smp#:	38
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	280-112289-A-1-E				
Misc. Info.:	280-0072814-038				
Operator ID:	TEM	Instrument ID:	SGC_M		
Method:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m				
Limit Group:	GCSV - 8151				
Method Label:	8151A: Herbicides: DV-GC-0022				
Last Update:	10-Aug-2018 12:25:01	Calib Date:	08-Aug-2018 11:41:27		
Integrator:	Falcon				
Quant Method:	External Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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:	CTX0307				

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.2018	40.37

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.1920	38.40

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver | Job No.: 160-29498-1

SDG No.:

Client Sample ID: | Lab Sample ID: 280-112289-A-1-F MSD

Matrix: Solid (TCLP) | Lab File ID: 08080039.D

Analysis Method: 8151A | Date Collected: 07/20/2018 11:00

Extraction Method: 8151A | Date Extracted: 07/25/2018 09:20

Sample wt/vol: 100(mL) | Date Analyzed: 08/09/2018 02:32

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.: 425378 | Units: mg/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
94-75-7	2,4-D	0.0340	J	0.040	0.0021
93-72-1	Silvex (2,4,5-TP)	0.0362		0.010	0.0017

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	45		10-131

TestAmerica Denver
Target Compound Quantitation Report

Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080039.D
Lims ID: 280-112289-A-1-F MSD
Client ID:
Sample Type: MSD
Inject. Date: 09-Aug-2018 02:32:34 ALS Bottle#: 39 Worklist Smp#: 39
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 280-112289-A-1-F
Misc. Info.: 280-0072814-039
Operator ID: TEM Instrument ID: SGC_M

Method: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m
Limit Group: GCSV - 8151
Method Label: 8151A: Herbicides: DV-GC-0022
Last Update: 10-Aug-2018 12:25:01 Calib Date: 08-Aug-2018 11:41:27
Integrator: Falcon
Quant Method: External Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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: CTX0307

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
1 2,4-DBDinoseb							
1		-0.060				ND	
2		-0.060					
2 Dalapon							
1	1.628	1.617	0.011	68857893	0.5000	0.3618	
2	1.383	1.379	0.004	10978360	0.5000	0.0257	
						RPD = 173.46	
$ 3 2,4-Dichlorophenylacetic acid							
1	5.319	5.323	-0.004	38100153	0.5000	0.2666	
2	5.059	5.062	-0.003	52068597	0.5000	0.2231	
						RPD = 17.77	
4 Dicamba							
1	5.482	5.484	-0.002	173860681	0.5000	0.3347	
2	5.216	5.219	-0.003	243475404	0.5000	0.3199	
						RPD = 4.51	
5 MCPP							
1	5.652	5.654	-0.002	24179700	50.0	39.2	
2	5.330	5.334	-0.004	46161862	50.0	37.3	
						RPD = 5.02	
6 MCPA							
1	5.772	5.775	-0.003	28582686	50.0	27.9	
2	5.522	5.525	-0.003	51349638	50.0	27.8	
						RPD = 0.27	
7 Dichlorprop							
1	6.050	6.053	-0.003	49821929	0.5000	0.3799	
2	5.772	5.775	-0.003	78935864	0.5000	0.3978	
						RPD = 4.60	

Col	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
8 2,4-D							
1	6.210	6.213	-0.003	66751816	0.5000	0.4307	
2	5.989	5.994	-0.005	90566563	0.5000	0.3398	
						RPD = 23.61	
14 Pentachlorophenol							
1	6.382	6.381	0.001	109805274		0.0551	
2	6.232	6.242	-0.010	357061		-0.008724	
9 Silvex (2,4,5-TP)							
1	6.725	6.728	-0.003	246260711	0.5000	0.4022	
2	6.493	6.498	-0.005	348675966	0.5000	0.3619	
						RPD = 10.56	
10 2,4,5-T							
1	6.832	6.834	-0.002	253536785	0.5000	0.4149	
2	6.701	6.704	-0.003	372648573	0.5000	0.3797	
						RPD = 8.86	
11 2,4-DB							
1	6.997	6.999	-0.002	19523222	0.5000	0.1817	
2	6.878	6.881	-0.003	38083615	0.5000	0.2210	
						RPD = 19.52	
12 Picloram							
1	7.287	7.288	-0.001	302961524	0.5000	0.3394	
2	7.257	7.259	-0.002	441122406	0.5000	0.3297	
						RPD = 2.90	
13 Dinoseb							
1	7.343	7.346	-0.003	34261285	0.5000	0.0941	
2	6.971	6.974	-0.003	40650484	0.5000	0.0779	
						RPD = 18.89	

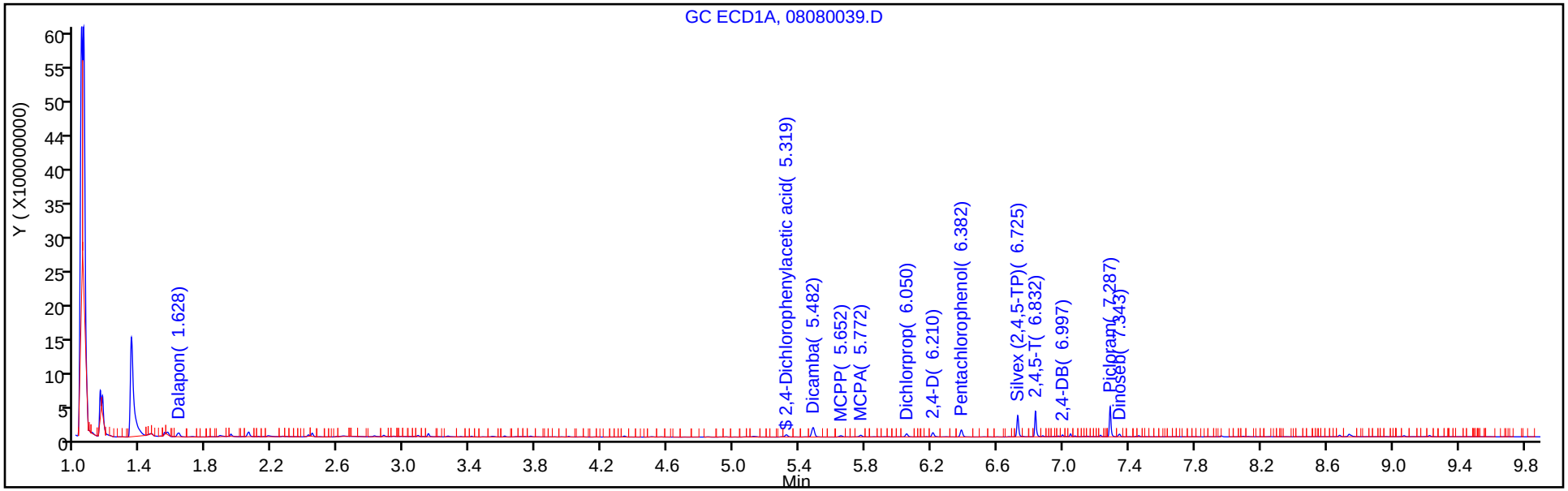
Report Date: 10-Aug-2018 12:25:36 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Denver

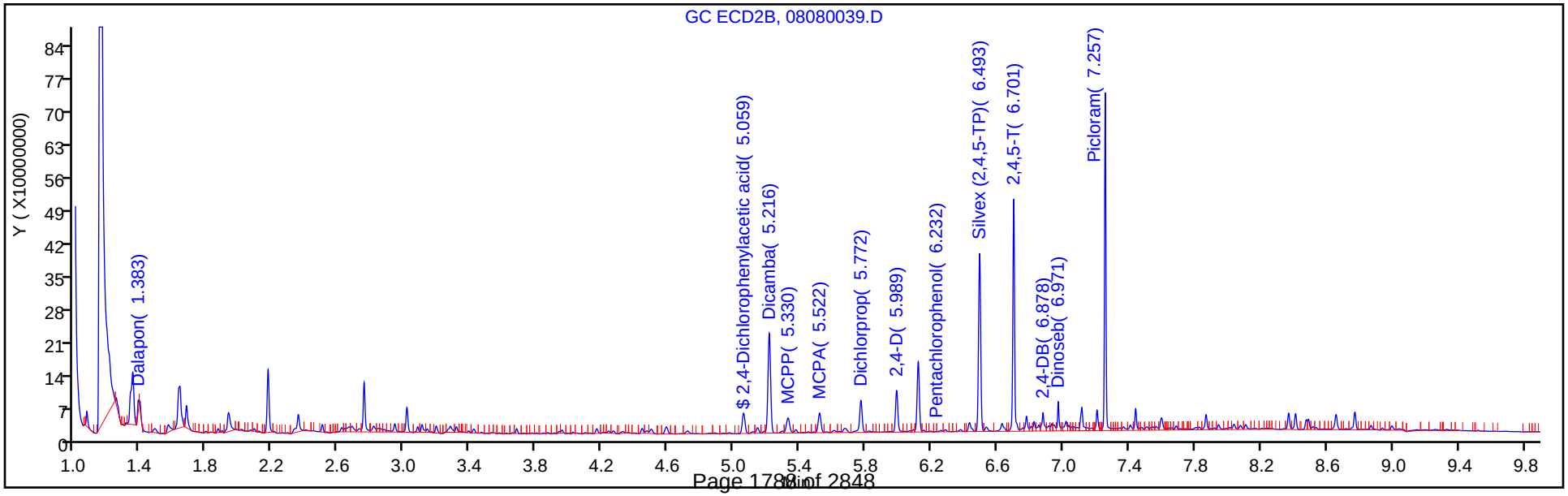
Data File: \\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080039.D

Injection Date:	09-Aug-2018 02:32:34	Instrument ID:	SGC_M	Operator ID:	TEM
Lims ID:	280-112289-A-1-F MSD			Worklist Smp#:	39
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	39
Method:	8151_615	Limit Group:	GCSV - 8151		

Column: CLP1 Pesticides Column 1 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Column: CLP2 Pesticides Column 2 (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



TestAmerica Denver
Recovery Report

Data File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\08080039.D				
Lims ID:	280-112289-A-1-F MSD				
Client ID:					
Sample Type:	MSD				
Inject. Date:	09-Aug-2018 02:32:34	ALS Bottle#:	39	Worklist Smp#:	39
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Sample Info:	280-112289-A-1-F				
Misc. Info.:	280-0072814-039				
Operator ID:	TEM	Instrument ID:	SGC_M		
Method:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72814.b\8151_615.m				
Limit Group:	GCSV - 8151				
Method Label:	8151A: Herbicides: DV-GC-0022				
Last Update:	10-Aug-2018 12:25:01	Calib Date:	08-Aug-2018 11:41:27		
Integrator:	Falcon				
Quant Method:	External Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Denver\ChromData\SGC_M\20180808-72797.b\08080009.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:	CTX0307				

Surrogate Recovery, Detector: GC ECD1A

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.2666	53.33

Surrogate Recovery, Detector: GC ECD2B

Compound	Amount Added	Amount Recovered	% Rec.
$ 3 2,4-Dichlorophenylacetic acid	0.5000	0.2231	44.63

HERBICIDES ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_M Start Date: 08/08/2018 10:03

Analysis Batch Number: 425303 End Date: 08/08/2018 11:58

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD7 280-425303/3 IC		08/08/2018 10:03	1	08080003.D	CLP1 0.32(mm)
STD7 280-425303/3 IC		08/08/2018 10:03	1	08080003.D	CLP2 0.32(mm)
STD6 280-425303/4 IC		08/08/2018 10:19	1	08080004.D	CLP1 0.32(mm)
STD6 280-425303/4 IC		08/08/2018 10:19	1	08080004.D	CLP2 0.32(mm)
STD5 280-425303/5 IC		08/08/2018 10:35	1	08080005.D	CLP1 0.32(mm)
STD5 280-425303/5 IC		08/08/2018 10:35	1	08080005.D	CLP2 0.32(mm)
STD4 280-425303/6 ICRT		08/08/2018 10:50	1	08080006.D	CLP1 0.32(mm)
STD4 280-425303/6 ICRT		08/08/2018 10:50	1	08080006.D	CLP2 0.32(mm)
STD3 280-425303/7 IC		08/08/2018 11:07	1	08080007.D	CLP1 0.32(mm)
STD3 280-425303/7 IC		08/08/2018 11:07	1	08080007.D	CLP2 0.32(mm)
STD2 280-425303/8 IC		08/08/2018 11:24	1	08080008.D	CLP1 0.32(mm)
STD2 280-425303/8 IC		08/08/2018 11:24	1	08080008.D	CLP2 0.32(mm)
STD1 280-425303/9 IC		08/08/2018 11:41	1	08080009.D	CLP1 0.32(mm)
STD1 280-425303/9 IC		08/08/2018 11:41	1	08080009.D	CLP2 0.32(mm)
ICV 280-425303/10		08/08/2018 11:58	1	08080010.D	CLP1 0.32(mm)
ICV 280-425303/10		08/08/2018 11:58	1	08080010.D	CLP2 0.32(mm)

HERBICIDES ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_M Start Date: 08/08/2018 16:52

Analysis Batch Number: 425378 End Date: 08/09/2018 06:44

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVRT 280-425378/3		08/08/2018 16:52	1	08080003.D	CLP1 0.32(mm)
CCVRT 280-425378/3		08/08/2018 16:52	1	08080003.D	CLP2 0.32(mm)
ZZZZZ		08/08/2018 17:10	1		CLP1 0.32(mm)
ZZZZZ		08/08/2018 17:10	1		CLP2 0.32(mm)
ZZZZZ		08/08/2018 17:27	1		CLP1 0.32(mm)
ZZZZZ		08/08/2018 17:27	1		CLP2 0.32(mm)
ZZZZZ		08/08/2018 17:45	1		CLP1 0.32(mm)
ZZZZZ		08/08/2018 17:45	1		CLP2 0.32(mm)
ZZZZZ		08/08/2018 18:02	1		CLP1 0.32(mm)
ZZZZZ		08/08/2018 18:02	1		CLP2 0.32(mm)
ZZZZZ		08/08/2018 18:19	1		CLP1 0.32(mm)
ZZZZZ		08/08/2018 18:19	1		CLP2 0.32(mm)
CCV 280-425378/17		08/08/2018 20:46	1		CLP1 0.32(mm)
CCV 280-425378/17		08/08/2018 20:46	1		CLP2 0.32(mm)
CCV 280-425378/31		08/09/2018 00:26	1	08080031.D	CLP1 0.32(mm)
CCV 280-425378/31		08/09/2018 00:26	1	08080031.D	CLP2 0.32(mm)
LB 280-423271/1-D		08/09/2018 00:42	1	08080032.D	CLP1 0.32(mm)
LB 280-423271/1-D		08/09/2018 00:42	1	08080032.D	CLP2 0.32(mm)
LCS 280-423271/2-D		08/09/2018 00:58	1	08080033.D	CLP1 0.32(mm)
LCS 280-423271/2-D		08/09/2018 00:58	1	08080033.D	CLP2 0.32(mm)
160-29498-3		08/09/2018 01:13	1	08080034.D	CLP1 0.32(mm)
160-29498-3		08/09/2018 01:13	1	08080034.D	CLP2 0.32(mm)
ZZZZZ		08/09/2018 01:29	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 01:29	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 01:45	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 01:45	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 02:01	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 02:01	1		CLP2 0.32(mm)
280-112289-A-1-E MS		08/09/2018 02:16	1	08080038.D	CLP1 0.32(mm)
280-112289-A-1-E MS		08/09/2018 02:16	1	08080038.D	CLP2 0.32(mm)
280-112289-A-1-F MSD		08/09/2018 02:32	1	08080039.D	CLP1 0.32(mm)
280-112289-A-1-F MSD		08/09/2018 02:32	1	08080039.D	CLP2 0.32(mm)
CCV 280-425378/40		08/09/2018 02:48	1	08080040.D	CLP1 0.32(mm)
CCV 280-425378/40		08/09/2018 02:48	1	08080040.D	CLP2 0.32(mm)
ZZZZZ		08/09/2018 03:03	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 03:03	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 03:19	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 03:19	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 03:35	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 03:35	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 03:50	5		CLP1 0.32(mm)
ZZZZZ		08/09/2018 03:50	5		CLP2 0.32(mm)
ZZZZZ		08/09/2018 04:06	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 04:06	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 04:22	10		CLP1 0.32(mm)

8151A

HERBICIDES ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: SGC_M Start Date: 08/08/2018 16:52

Analysis Batch Number: 425378 End Date: 08/09/2018 06:44

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		08/09/2018 04:22	10		CLP2 0.32(mm)
ZZZZZ		08/09/2018 04:37	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 04:37	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 04:53	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 04:53	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 05:09	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 05:09	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 05:24	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 05:24	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 05:40	1		CLP1 0.32(mm)
ZZZZZ		08/09/2018 05:40	1		CLP2 0.32(mm)
ZZZZZ		08/09/2018 05:56	5		CLP1 0.32(mm)
ZZZZZ		08/09/2018 05:56	5		CLP2 0.32(mm)
ZZZZZ		08/09/2018 06:11	5		CLP1 0.32(mm)
ZZZZZ		08/09/2018 06:11	5		CLP2 0.32(mm)
ZZZZZ		08/09/2018 06:27	5		CLP1 0.32(mm)
ZZZZZ		08/09/2018 06:27	5		CLP2 0.32(mm)
CCV 280-425378/55		08/09/2018 06:44	1		CLP1 0.32(mm)
CCV 280-425378/55		08/09/2018 06:44	1		CLP2 0.32(mm)

HERBICIDES BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423271 Batch Start Date: 07/23/18 14:57 Batch Analyst: Bourgery, David F

Batch Method: 1311 Batch End Date: 07/24/18 19:17

Lab Sample ID	Client Sample ID	Method Chain	Basis	ExtractFluid	AnalysisComment				
LB 280-423271/1		1311, 8151A, 8151A		t1					
LCS 280-423271/2		1311, 8151A, 8151A		t1					
160-29498-A-3	CRC-B22-0105	1311, 8151A, 8151A	P	t1	TOX				

Batch Notes	
First End time	07/24/18 09:54
First Start time	07/23/18 14:57

Basis	Basis Description
P	TCLP

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.

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	1
1. Solid	X	X	X	X	X	X	X	X	X	X
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Sample weight, 5.0 +/- 0.1g	5.08	5.09	5.03	4.91	5.08	4.97	4.97	4.96	4.91	4.93
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	17:40	17:46	17:54	18:00	18:00	18:00	18:00	18:00	18:00	18:00
b. Stop Time for Mixing	17:45	17:51	17:59	18:05	18:05	18:05	18:05	18:05	18:05	18:05
c. pH reading after mixing	9.3	9.07	9.62	9.65	9.74	9.70	10.24	9.48	9.64	9.56
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X	X	X	X	X	X	X	X	X	X
a. HCL Lot# used	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037
b. Pipette ID	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846	311846	311846	311846	311846	311846	311846	311846	311846	311846
Termometer Correction Factor	0	0	0	0	0	0	0	0	0	0
b. Start Time	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47
c. Start Temperature (Observed)	50	50	50	50	50	50	50	50	50	50
Start Temperature (Actual)	50	50	50	50	50	50	50	50	50	50
d. Finish Time	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57
e. Finish Temperature (Observed)	51	51	51	51	51	51	51	51	51	51
Finish Temperature (Actual)	51	51	51	51	51	51	51	51	51	51
f. pH reading after heating (temperature corrected)	1.63	1.57	1.73	1.85	2.07	2.02	2.54	2.14	2.33	2.00
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N	N	N	N	N	N	N	N	N	N
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Weight of wet solids after filtration (g)	100.07	100.21	100.47	100.37	100.89	100.91	100.13	101.45	101.11	101.60
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94
6. Vol of Fluid = wet solids x 20 (mL)	2001	2004	2009	2007	2018	2018	2003	2029	2022	2032
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Leach start date and time	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15
3. Leach stop date and time	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57
4. Room temperature										
Thermometer Correction Factor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a.Temp Min (Observed) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
b.Temp Max (Observed) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
c.Temp Min (Actual) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
d.Temp Max (Actual) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
5. pH of leachate	4.99	4.97	5.21	5.28	5.35	5.43	5.74	5.72	5.96	5.44
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
A. Sample Description										
Number of phases	1									
1. Solid	X									
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Sample weight, 5.0 +/- 0.1g	4.98									
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT									
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	18:00									
b. Stop Time for Mixing	18:05									
c. pH reading after mixing	9.3									
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X									
a. HCL Lot# used	1N HCl_00037									
b. Pipette ID	TCLP#2									
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846									
Termometer Correction Factor	0									
b. Start Time	18:47									
c. Start Temperature (Observed)	50									
Start Temperature (Actual)	50	0	0	0	0	0	0	0	0	0
d. Finish Time	18:57									
e. Finish Temperature (Observed)	51									
Finish Temperature (Actual)	51	0	0	0	0	0	0	0	0	0
f. pH reading after heating (temperature corrected)	1.59									
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1									
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Weight of wet solids after filtration (g)	100.35									
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**TCLP 1**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256						
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94									
6. Vol of Fluid = wet solids x 20 (mL)	2007									
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y									
2. Leach start date and time	7/23/18 20:15									
3. Leach stop date and time	7/24/18 12:57									
4. Room temperature										
Thermometer Correction Factor	0.0									
a.Temp Min (Observed) (^oC)	23.4									
b.Temp Max (Observed) (^oC)	24.4									
c.Temp Min (Actual) (^oC)	23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d.Temp Max (Actual) (^oC)	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. pH of leachate	5.04									
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	
1. Solid	X	X	X	X	X	X	X	X	X	
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No		**N**	**N**	**N**	**N**	**N**			**N**	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Sample weight, 5.0 +/- 0.1g		4.92	5.04	4.93	4.97	5.06			5.01	
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID		TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT			TCLP BT	
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing		11:27	11:27	11:27	11:27	11:27			11:27	
b. Stop Time for Mixing		11:32	11:32	11:32	11:32	11:32			11:32	
c. pH reading after mixing		8.77	9.65	9.68	11.62	9.26			7.85	
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**		X	X	X	X	X			X	
a. HCL Lot# used		1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037			1N HCl_00037	
b. Pipette ID		TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2			TCLP#2	
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID		311846	311846	311846	311846	311846			311846	
Termometer Correction Factor		0	0	0	0	0			0	
b. Start Time		11:56	11:56	11:56	11:56	11:56			11:56	
c. Start Temperature (Observed)		50	50	50	50	50			50	
Start Temperature (Actual)	0	50	50	50	50	50	0	0	50	0
d. Finish Time		12:06	12:06	12:06	12:06	12:06			12:06	
e. Finish Temperature (Observed)		53	53	53	53	53			53	
Finish Temperature (Actual)	0	53	53	53	53	53	0	0	53	0
f. pH reading after heating (temperature corrected)		1.83	5.83	5.88	2.15	1.65			1.99	
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1		Fluid 1			Fluid 1	Fluid 1			Fluid 1	
2. If pH from C.7.f is > 5.0, use Leach Fluid #2			Fluid 2	Fluid 2						
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
E. Determination of Sample Size										
1. Particle size reduction? Yes/no		N	N	N	N	N			N	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Weight of wet solids after filtration (g)		100.02	100.23	102.23	100.76	102.32			101.95	
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	#VALUE!	TCLP 1	TCLP 2	TCLP 2	TCLP 1	TCLP 1	#VALUE!	#VALUE!	TCLP 1	#VALUE!
1. TCLP Fluid 1 Lot #	T1_00251	T1_00256	T1_00251	T1_00251	T1_00256	T1_00256			T1_00256	
2. TCLP Fluid 2 Lot #			T2_00105	T2_00105						
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid		4.94	2.89	2.89	4.94	4.94			4.94	2.89/4.94
6. Vol of Fluid = wet solids x 20 (mL)		2000	2005	2045	2015	2046			2039	
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?		Y	Y	Y	Y	Y			Y	Y
2. Leach start date and time		7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57			7/23/18 14:57	7/23/18 14:57
3. Leach stop date and time		7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54			7/24/18 9:54	7/24/18 9:54
4. Room temperature										
Thermometer Correction Factor		0.0	0.0	0.0	0.0	0.0			0.0	0.0
a.Temp Min (Observed) (^oC)		23.4	23.4	23.4	23.4	23.4			23.4	23.4
b.Temp Max (Observed) (^oC)		24.4	24.4	24.4	24.4	24.4			24.4	24.4
c.Temp Min (Actual) (^oC)	0.0	23.4	23.4	23.4	23.4	23.4	0.0	0.0	23.4	23.4
d.Temp Max (Actual) (^oC)	0.0	24.4	24.4	24.4	24.4	24.4	0.0	0.0	24.4	24.4
5. pH of leachate		5.38	5.85	5.85	6.12	5.33			5.40	2.88/4.94
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
H.Determination of Amount of Leach Fluid										
1. Balance ID	24950431				24950431	24950431		24950431		
2. ZHE vessel number	Verona				Don	EEE		Rachael		AAA
3. Weight of material added to ZHE (g)	25.00				25.19	25.07		25.14		
"X" if there was headspace in container.	X									
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)	25				25	25		25		
7. Weight of fluid to add (g)	500	0	0	0	504	501	0	503	0	0
a. TCLP Fluid 1 Lot #	T1_00255				T1_00255	T1_00255		T1_00255		T1_00255
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid	4.92				4.92	4.92		4.92		4.92
8. Percent Wet Solids (%)	100	#DIV/0!	#DIV/0!	#DIV/0!	100	100	#DIV/0!	100	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)	40				40	40		40		40
b. Reading #2 (psi)	40				40	40		40		40
2. Rotator checked to be rotating between 28 and 32 RPM?	Y				Y	Y		Y		Y
3. Leach start date & time	7/23/18 17:36				7/23/18 17:36	7/23/18 17:36		7/23/18 17:36		7/23/18 17:36
4. Leach stop date & time					7/24/18 9:54	7/24/18 9:54		7/24/18 9:54		7/24/18 9:54
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	#DIV/0!	0.0	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

LogTag ID	1000645053
User ID	TCLP (+0.0)
LogTag battery	OK
Non alert range	21.0 to 25.0 °C
Time zone	UTC -07:00, daylight time
Number of readings	728
Reading interval	10 Minutes
Number of starts	231
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	21 Hours, 50 Minutes
Reading range	23.4 to 24.4 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.94 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	21 Hours, 50 Minutes
Statistics for between the first reading and inspection mark #1:	
First reading	7/23/2018 2:55:27 PM
Last reading	7/23/2018 5:25:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.4 to 24.0 °C
Average reading	23.8 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.78 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #1 and inspection mark #2:	
First reading	7/23/2018 5:35:27 PM
Last reading	7/23/2018 8:05:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.6 to 24.1 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

Mean Kinetic Temperature	23.93 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #2 and the last reading:	
First reading	7/23/2018 8:15:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	16 Hours, 30 Minutes
Reading range	23.6 to 24.4 °C
Average reading	24.0 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.96 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	16 Hours, 30 Minutes

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	1
1. Solid	X	X	X	X	X	X	X	X	X	X
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Sample weight, 5.0 +/- 0.1g	5.08	5.09	5.03	4.91	5.08	4.97	4.97	4.96	4.91	4.93
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	17:40	17:46	17:54	18:00	18:00	18:00	18:00	18:00	18:00	18:00
b. Stop Time for Mixing	17:45	17:51	17:59	18:05	18:05	18:05	18:05	18:05	18:05	18:05
c. pH reading after mixing	9.3	9.07	9.62	9.65	9.74	9.70	10.24	9.48	9.64	9.56
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X	X	X	X	X	X	X	X	X	X
a. HCL Lot# used	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037
b. Pipette ID	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846	311846	311846	311846	311846	311846	311846	311846	311846	311846
Termometer Correction Factor	0	0	0	0	0	0	0	0	0	0
b. Start Time	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47
c. Start Temperature (Observed)	50	50	50	50	50	50	50	50	50	50
Start Temperature (Actual)	50	50	50	50	50	50	50	50	50	50
d. Finish Time	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57
e. Finish Temperature (Observed)	51	51	51	51	51	51	51	51	51	51
Finish Temperature (Actual)	51	51	51	51	51	51	51	51	51	51
f. pH reading after heating (temperature corrected)	1.63	1.57	1.73	1.85	2.07	2.02	2.54	2.14	2.33	2.00
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N	N	N	N	N	N	N	N	N	N
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Weight of wet solids after filtration (g)	100.07	100.21	100.47	100.37	100.89	100.91	100.13	101.45	101.11	101.60
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94
6. Vol of Fluid = wet solids x 20 (mL)	2001	2004	2009	2007	2018	2018	2003	2029	2022	2032
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Leach start date and time	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15
3. Leach stop date and time	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57
4. Room temperature										
Thermometer Correction Factor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a.Temp Min (Observed) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
b.Temp Max (Observed) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
c.Temp Min (Actual) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
d.Temp Max (Actual) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
5. pH of leachate	4.99	4.97	5.21	5.28	5.35	5.43	5.74	5.72	5.96	5.44
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
A. Sample Description										
Number of phases	1									
1. Solid	X									
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Sample weight, 5.0 +/- 0.1g	4.98									
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT									
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	18:00									
b. Stop Time for Mixing	18:05									
c. pH reading after mixing	9.3									
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X									
a. HCL Lot# used	1N HCl_00037									
b. Pipette ID	TCLP#2									
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846									
Termometer Correction Factor	0									
b. Start Time	18:47									
c. Start Temperature (Observed)	50									
Start Temperature (Actual)	50	0	0	0	0	0	0	0	0	0
d. Finish Time	18:57									
e. Finish Temperature (Observed)	51									
Finish Temperature (Actual)	51	0	0	0	0	0	0	0	0	0
f. pH reading after heating (temperature corrected)	1.59									
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1									
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Weight of wet solids after filtration (g)	100.35									
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**TCLP 1**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256						
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94									
6. Vol of Fluid = wet solids x 20 (mL)	2007									
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y									
2. Leach start date and time	7/23/18 20:15									
3. Leach stop date and time	7/24/18 12:57									
4. Room temperature										
Thermometer Correction Factor	0.0									
a.Temp Min (Observed) (^oC)	23.4									
b.Temp Max (Observed) (^oC)	24.4									
c.Temp Min (Actual) (^oC)	23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d.Temp Max (Actual) (^oC)	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. pH of leachate	5.04									
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	
1. Solid	X	X	X	X	X	X	X	X	X	
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No		**N**	**N**	**N**	**N**	**N**			**N**	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Sample weight, 5.0 +/- 0.1g		4.92	5.04	4.93	4.97	5.06			5.01	
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID		TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT			TCLP BT	
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing		11:27	11:27	11:27	11:27	11:27			11:27	
b. Stop Time for Mixing		11:32	11:32	11:32	11:32	11:32			11:32	
c. pH reading after mixing		8.77	9.65	9.68	11.62	9.26			7.85	
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**		X	X	X	X	X			X	
a. HCL Lot# used		1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037			1N HCl_00037	
b. Pipette ID		TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2			TCLP#2	
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID		311846	311846	311846	311846	311846			311846	
Termometer Correction Factor		0	0	0	0	0			0	
b. Start Time		11:56	11:56	11:56	11:56	11:56			11:56	
c. Start Temperature (Observed)		50	50	50	50	50			50	
Start Temperature (Actual)	0	50	50	50	50	50	0	0	50	0
d. Finish Time		12:06	12:06	12:06	12:06	12:06			12:06	
e. Finish Temperature (Observed)		53	53	53	53	53			53	
Finish Temperature (Actual)	0	53	53	53	53	53	0	0	53	0
f. pH reading after heating (temperature corrected)		1.83	5.83	5.88	2.15	1.65			1.99	
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1		Fluid 1			Fluid 1	Fluid 1			Fluid 1	
2. If pH from C.7.f is > 5.0, use Leach Fluid #2			Fluid 2	Fluid 2						
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
E. Determination of Sample Size										
1. Particle size reduction? Yes/no		N	N	N	N	N			N	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Weight of wet solids after filtration (g)		100.02	100.23	102.23	100.76	102.32			101.95	
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	#VALUE!	TCLP 1	TCLP 2	TCLP 2	TCLP 1	TCLP 1	#VALUE!	#VALUE!	TCLP 1	#VALUE!
1. TCLP Fluid 1 Lot #	T1_00251	T1_00256	T1_00251	T1_00251	T1_00256	T1_00256			T1_00256	
2. TCLP Fluid 2 Lot #			T2_00105	T2_00105						
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid		4.94	2.89	2.89	4.94	4.94			4.94	2.89/4.94
6. Vol of Fluid = wet solids x 20 (mL)		2000	2005	2045	2015	2046			2039	
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?		Y	Y	Y	Y	Y			Y	Y
2. Leach start date and time		7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57			7/23/18 14:57	7/23/18 14:57
3. Leach stop date and time		7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54			7/24/18 9:54	7/24/18 9:54
4. Room temperature										
Thermometer Correction Factor		0.0	0.0	0.0	0.0	0.0			0.0	0.0
a.Temp Min (Observed) (^oC)		23.4	23.4	23.4	23.4	23.4			23.4	23.4
b.Temp Max (Observed) (^oC)		24.4	24.4	24.4	24.4	24.4			24.4	24.4
c.Temp Min (Actual) (^oC)	0.0	23.4	23.4	23.4	23.4	23.4	0.0	0.0	23.4	23.4
d.Temp Max (Actual) (^oC)	0.0	24.4	24.4	24.4	24.4	24.4	0.0	0.0	24.4	24.4
5. pH of leachate		5.38	5.85	5.85	6.12	5.33			5.40	2.88/4.94
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
H.Determination of Amount of Leach Fluid										
1. Balance ID	24950431				24950431	24950431		24950431		
2. ZHE vessel number	Verona				Don	EEE		Rachael		AAA
3. Weight of material added to ZHE (g)	25.00				25.19	25.07		25.14		
"X" if there was headspace in container.	X									
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)	25				25	25		25		
7. Weight of fluid to add (g)	500	0	0	0	504	501	0	503	0	0
a. TCLP Fluid 1 Lot #	T1_00255				T1_00255	T1_00255		T1_00255		T1_00255
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid	4.92				4.92	4.92		4.92		4.92
8. Percent Wet Solids (%)	100	#DIV/0!	#DIV/0!	#DIV/0!	100	100	#DIV/0!	100	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)	40				40	40		40		40
b. Reading #2 (psi)	40				40	40		40		40
2. Rotator checked to be rotating between 28 and 32 RPM?	Y				Y	Y		Y		Y
3. Leach start date & time	7/23/18 17:36				7/23/18 17:36	7/23/18 17:36		7/23/18 17:36		7/23/18 17:36
4. Leach stop date & time					7/24/18 9:54	7/24/18 9:54		7/24/18 9:54		7/24/18 9:54
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	#DIV/0!	0.0	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

LogTag ID	1000645053
User ID	TCLP (+0.0)
LogTag battery	OK
Non alert range	21.0 to 25.0 °C
Time zone	UTC -07:00, daylight time
Number of readings	728
Reading interval	10 Minutes
Number of starts	231
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	21 Hours, 50 Minutes
Reading range	23.4 to 24.4 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.94 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	21 Hours, 50 Minutes
Statistics for between the first reading and inspection mark #1:	
First reading	7/23/2018 2:55:27 PM
Last reading	7/23/2018 5:25:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.4 to 24.0 °C
Average reading	23.8 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.78 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #1 and inspection mark #2:	
First reading	7/23/2018 5:35:27 PM
Last reading	7/23/2018 8:05:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.6 to 24.1 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

Mean Kinetic Temperature	23.93 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #2 and the last reading:	
First reading	7/23/2018 8:15:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	16 Hours, 30 Minutes
Reading range	23.6 to 24.4 °C
Average reading	24.0 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.96 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	16 Hours, 30 Minutes

HERBICIDES BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423557 Batch Start Date: 07/25/18 09:20 Batch Analyst: Stewart, Klaudia J

Batch Method: 8151A Batch End Date: 07/26/18 13:28

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	ReceivedpH	FirstAdjustpH	SecondAdjustpH	8151 LCS 00096
LB 280-423271/1-A		8151A, 8151A		100 mL	10 mL	6 SU	>12 SU	<2	
LCS 280-423271/2-A		8151A, 8151A		100 mL	10 mL	6 SU	>12 SU	<2	0.5 mL
160-29498-A-3-A	CRC-B22-0105	8151A, 8151A	P	100 mL	10 mL	6 SU	>12 SU	<2	
280-112289-A-1-A MS		8151A, 8151A	P	100 mL	10 mL	6 SU	>12 SU	<2	0.5 mL
280-112289-A-1-A MSD		8151A, 8151A	P	100 mL	10 mL	6 SU	>12 SU	<2	0.5 mL

Lab Sample ID	Client Sample ID	Method Chain	Basis	8151Surrogate 00164					
LB 280-423271/1-A		8151A, 8151A		1 mL					
LCS 280-423271/2-A		8151A, 8151A		1 mL					
160-29498-A-3-A	CRC-B22-0105	8151A, 8151A	P	1 mL					
280-112289-A-1-A MS		8151A, 8151A	P	1 mL					
280-112289-A-1-A MSD		8151A, 8151A	P	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.

HERBICIDES BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423557 Batch Start Date: 07/25/18 09:20 Batch Analyst: Stewart, Klaudia J

Batch Method: 8151A Batch End Date: 07/26/18 13:28

Batch Notes	
Acid Used for pH Adjustment ID	12N H2SO4
Balance ID	B442138757
Base Used to Adjust pH ID	37% KOH
Batch Comment	DV-OP-0011 BB8@10mL SilicicAcid_00028 Methanol 00208
Concentration 1 Equipment ID	A
Analyst ID - Concentration	KO/MF (trainer) AAG (trainee)
Concentration 1 Corrected Temperature	65 Degrees C
Diethyl Ether ID	EthylEther_01798/99/1795
Analyst ID - Extraction	KS
Sulfuric Acid Lot Number	12N H2SO4_00489
Potassium Hydroxide ID	37% KOH_00212
MeCL2 ID	MeCl2_Cycl_00397
Acidified Na2SO4 ID	Acid_NA2SO4_00590/593
NaCl ID	177082
Pipette/Syringe/Dispenser ID	K
Analyst ID - Spike Analyst	KS
Analyst ID - Spike Witness Analyst	Reviwer: JZ
Sufficient Volume for Batch QC	Yes
TMSDM ID	TMSD_00113
Concentration 1 Uncorrected Temperature	67 Degrees C
Reagent Water ID	S ELGA

Basis	Basis Description
P	TCLP

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

COVER PAGE
METALS

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG No.:

Project: Former Carnotite Site - Non-Rad Analysis

Client Sample ID	Lab Sample ID
CRC-B22-0105	160-29498-3

Comments:

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - TCLP

Client Sample ID: CRC-B22-0105 Lab Sample ID: 160-29498-3

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG ID.:

Matrix: Solid Date Sampled: 07/12/2018 11:50

Reporting Basis: WET Date Received: 07/13/2018 09:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7440-38-2	Arsenic	0.022	0.50	0.022	mg/L	U		1	6010B
7440-39-3	Barium	0.19	1.0	0.0040	mg/L	J	B	1	6010B
7440-43-9	Cadmium	0.0041	0.10	0.0020	mg/L	J		1	6010B
7440-47-3	Chromium	0.0030	0.50	0.0030	mg/L	U		1	6010B
7439-92-1	Lead	0.023	0.50	0.014	mg/L	J	B	1	6010B
7782-49-2	Selenium	0.032	0.10	0.032	mg/L	U		1	6010B
7440-22-4	Silver	0.0050	0.50	0.0050	mg/L	U		1	6010B
7439-97-6	Mercury	0.000030	0.0020	0.000030	mg/L	U		1	7470A

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

ICV Source: ICP ICV_00599 Concentration Units: mg/L

CCV Source: ICP CCV_00334

Analyte	ICV 280-423884/9 07/26/2018 11:30				ICV 280-423884/10 07/26/2018 11:34				CCV 280-423884/33 07/26/2018 12:54			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Arsenic	0.255	J	0.250	102	0.257	J	0.250	103	0.972		1.00	97
Barium	0.253	J	0.250	101	0.255	J	0.250	102	0.494	J	0.500	99
Cadmium	0.249		0.250	100	0.251		0.250	100	0.490		0.500	98
Chromium	0.247	J	0.250	99	0.249	J	0.250	99	0.490	J	0.500	98
Lead	0.258	J	0.250	103	0.257	J	0.250	103	0.988		1.00	99
Selenium	0.486		0.500	97	0.489		0.500	98	0.965		1.00	97
Silver	0.246	J	0.250	98	0.247	J	0.250	99	0.481	J	0.500	96

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 Denver Job No.: 160-29498-1

SDG No.:

ICV Source: ICP ICV_00599 Concentration Units: mg/L

CCV Source: ICP CCV_00334

Analyte	CCV 280-423884/47 07/26/2018 13:41											
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Arsenic	0.968		1.00	97								
Barium	0.491	J	0.500	98								
Cadmium	0.479		0.500	96								
Chromium	0.481	J	0.500	96								
Lead	0.979		1.00	98								
Selenium	0.962		1.00	96								
Silver	0.481	J	0.500	96								

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 Denver Job No.: 160-29498-1

SDG No.:

ICV Source: Hg Biwk ICV_00253 Concentration Units: mg/L

CCV Source: Hg Daily Spk_02209

Analyte	ICV 280-423543/9-A 07/25/2018 14:21				CCV 280-423543/12-A 07/25/2018 17:08				CCV 280-423543/12-A 07/25/2018 17:35			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Mercury	0.00400		0.00400	100	0.00497		0.00500	99	0.00504		0.00500	101

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 Denver Job No.: 160-29498-1

SDG No.:

ICV Source: Hg Biwk ICV_00253 Concentration Units: mg/L

CCV Source: Hg Daily Spk_02209

Analyte	CCV 280-423543/12-A 07/25/2018 18:00											
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Mercury	0.00501		0.00500	100								

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 Denver Job No.: 160-29498-1

SDG No.:

Method: 6010B Instrument ID: MT_051

Lab Sample ID: CRI 280-423884/15 Concentration Units: mg/L

CRQL Check Standard Source: ICP LLCCV_02311

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Arsenic	0.0150	0.022	U	99	50-150
Barium	0.0100	0.00982	J	98	50-150
Cadmium	0.00500	0.00497	J	99	50-150
Chromium	0.0100	0.00954	J	95	50-150
Lead	0.00900	0.014	U	91	50-150
Selenium	0.0200	0.032	U	80	50-150
Silver	0.0100	0.00958	J	96	50-150

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

FORM IIB-IN

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	ICB 280-423884/14 07/26/2018 11:48		CCB 280-423884/34 07/26/2018 12:57		CCB 280-423884/48 07/26/2018 13:45			
		Found	C	Found	C	Found	C	Found	C
Arsenic	0.50	0.022	U	0.022	U	0.022	U		
Barium	1.0	0.0040	U	0.0040	U	0.0040	U		
Cadmium	0.10	0.0020	U	0.0020	U	0.0020	U		
Chromium	0.50	0.0030	U	0.0030	U	0.0030	U		
Lead	0.50	0.014	U	0.014	U	0.014	U		
Selenium	0.10	0.032	U	0.032	U	0.032	U		
Silver	0.50	0.0050	U	0.0050	U	0.0050	U		

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	ICB 280-423543/10-A 07/25/2018 14:23		CCB 280-423543/13-A 07/25/2018 17:10		CCB 280-423543/13-A 07/25/2018 17:37		CCB 280-423543/13-A 07/25/2018 18:02	
		Found	C	Found	C	Found	C	Found	C
Mercury	0.0020	0.000030	U	0.000030	U	0.000030	U	0.000030	U

Italicized analytes were not requested for this sequence.

3-IN
METHOD BLANK
METALS - TCLP

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Concentration Units: mg/L Lab Sample ID: LB 280-423271/1-B

Instrument Code: MT_051 Batch No.: 423884

CAS No.	Analyte	Concentration	C	Q	Method
7440-38-2	Arsenic	0.022	U		6010B
7440-39-3	Barium	0.00698	J		6010B
7440-43-9	Cadmium	0.0020	U		6010B
7440-47-3	Chromium	0.0030	U		6010B
7439-92-1	Lead	0.0259	J		6010B
7782-49-2	Selenium	0.032	U		6010B
7440-22-4	Silver	0.0050	U		6010B

3-IN
METHOD BLANK
METALS - TCLP

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Concentration Units: mg/L Lab Sample ID: LB 280-423271/1-C

Instrument Code: MT_034 Batch No.: 423711

CAS No.	Analyte	Concentration	C	Q	Method
7439-97-6	Mercury	0.000030	U		7470A

FORM III-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICSA 280-423884/16 Instrument ID: MT_051

Lab File ID: 51A072618A.csv ICS Source: ICP ICSA_00167

Concentration Units: mg/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Arsenic		**0.0062**	
Barium		**-0.0002**	
Cadmium		**-0.0005**	
Chromium		**0.0012**	
Lead		**0.0062**	
Selenium		**0.0060**	
Silver		**-0.0002**	
Aluminum	*500*	*523*	*105*
Antimony		*-0.0084*	
Beryllium		*-0.0005*	
Boron		*0.0056*	
Calcium	*500*	*473*	*95*
Cobalt		*-0.0026*	
Copper		*-0.0063*	
Iron	*200*	*195*	*97*
Lithium		*0.0038*	
Magnesium	*500*	*513*	*103*
Manganese		*0.0017*	
Molybdenum		*0.0001*	
Nickel		*-0.0022*	
Phosphorus		*0.0007*	
Potassium		*0.0554*	
Silicon		*0.0375*	
Sodium		*0.0493*	
Strontium		*0.0048*	
Thallium		*0.0020*	
Thorium		*0.0003*	
Tin		*0.0071*	
Titanium		*0.0003*	
Vanadium		*0.0015*	
Zinc		*0.0011*	
Zirconium		*-0.0005*	

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

FORM IVA-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Lab Sample ID: ICSAB 280-423884/17 Instrument ID: MT_051

Lab File ID: 51A072618A.csv ICS Source: ICP ICSAB_00187

Concentration Units: mg/L

Analyte	True Solution AB	Found Solution AB	Percent Recovery
Arsenic	**2.00**	**2.11**	**105**
Barium	**0.500**	**0.497**	**99**
Cadmium	**1.00**	**0.939**	**94**
Chromium	**0.500**	**0.480**	**96**
Lead	**1.00**	**0.995**	**99**
Selenium	**5.00**	**5.11**	**102**
Silver	**1.00**	**1.12**	**112**
Aluminum	*500*	*522*	*104*
Antimony	*1.00*	*1.06*	*106*
Beryllium	*0.500*	*0.490*	*98*
Boron	*2.00*	*2.11*	*106*
Calcium	*500*	*467*	*93*
Cobalt	*0.500*	*0.460*	*92*
Copper	*0.500*	*0.525*	*105*
Iron	*200*	*192*	*96*
Lithium	*1.00*	*1.06*	*106*
Magnesium	*500*	*508*	*102*
Manganese	*0.500*	*0.501*	*100*
Molybdenum	*1.00*	*0.953*	*95*
Nickel	*1.00*	*0.917*	*92*
Phosphorus	*2.00*	*2.02*	*101*
Potassium	*50.0*	*53.9*	*108*
Silicon	*10.0*	*10.7*	*107*
Sodium	*50.0*	*56.2*	*112*
Strontium	*1.00*	*0.999*	*100*
Thallium	*10.0*	*9.65*	*96*
Thorium	*2.00*	*2.06*	*103*
Tin	*10.0*	*9.44*	*94*
Titanium	*1.00*	*1.03*	*103*
Vanadium	*0.500*	*0.495*	*99*
Zinc	*1.00*	*0.922*	*92*
Zirconium	*1.00*	*0.996*	*100*

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

FORM IVA-IN

5A-IN
MATRIX SPIKE SAMPLE RECOVERY
METALS - TCLP

Client ID: _____ Lab ID: 280-112230-G-1-C MS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.: _____

Matrix: Solid Concentration Units: mg/L

% Solids: _____

Analyte	SSR	C		Sample Result (SR)	C		Spike Added (SA)	%R	Control Limit %R	Q	Method
Arsenic	3.90			0.022	U		4.00	97	80-120		6010B
Barium	11.8			0.35	J		12.0	95	80-120		6010B
Cadmium	1.02			0.0020	U		1.10	92	80-120		6010B
Chromium	4.81			0.0030	U		5.20	92	80-120		6010B
Lead	5.32			0.014	U		5.50	97	80-120		6010B
Selenium	2.86			0.032	U		3.00	95	80-120		6010B
Silver	1.03			0.0050	U		1.05	98	80-120		6010B

SSR = Spiked Sample Result

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

FORM VA - IN

5A-IN
MATRIX SPIKE SAMPLE RECOVERY
METALS - TCLP

Client ID: Lab ID: 280-112230-G-1-F MS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid Concentration Units: mg/L

% Solids:

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Mercury	0.00512		0.000030	U	0.00500	102	90-116		7470A

SSR = Spiked Sample Result

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

FORM VA - IN

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS - TCLP

Client ID: _____ Lab ID: 280-112230-G-1-D MSD

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.: _____

Matrix: Solid Concentration Units: mg/L

% Solids: _____

Analyte	(SDR)	C	Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Arsenic	3.72		4.00	93	80-120	5	20		6010B
Barium	11.2		12.0	91	80-120	5	20		6010B
Cadmium	0.966		1.10	88	80-120	5	20		6010B
Chromium	4.61		5.20	89	80-120	4	20		6010B
Lead	5.10		5.50	93	80-120	4	20		6010B
Selenium	2.72		3.00	91	80-120	5	20		6010B
Silver	0.985		1.05	94	80-120	5	20		6010B

SDR = Sample Duplicate Result

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

FORM VD - IN

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS - TCLP

Client ID: _____ Lab ID: 280-112230-G-1-G MSD

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.: _____

Matrix: Solid Concentration Units: mg/L

% Solids: _____

Analyte	(SDR) C		Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Mercury	0.00496		0.00500	99	90-116	3	10		7470A

SDR = Sample Duplicate Result

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

FORM VD - IN

5B-IN
POST DIGESTION SPIKE SAMPLE RECOVERY
METALS - TCLP

Client ID: _____ Lab ID: 280-112230-G-1-B PDS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.: _____

Matrix: Solid Concentration Units: mg/L

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Arsenic	0.990		0.022	U	1.00	99	80-120		6010B
Barium	0.825	J	0.35	J	0.500	95	80-120		6010B
Cadmium	0.228		0.0020	U	0.250	91	80-120		6010B
Chromium	0.232	J	0.0030	U	0.250	93	80-120		6010B
Lead	0.472	J	0.014	U	0.500	94	80-120		6010B
Selenium	0.941		0.032	U	1.00	94	80-120		6010B
Silver	0.244	J	0.0050	U	0.250	98	80-120		6010B

SSR = Spiked Sample Result

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

FORM VB - IN

5B-IN
POST DIGESTION SPIKE SAMPLE RECOVERY
METALS - TCLP

Client ID: _____ Lab ID: 280-112230-G-1-E PDS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.: _____

Matrix: Solid Concentration Units: mg/L

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Mercury	0.00511		0.000030	U	0.00500	102	85-115		7470A

SSR = Spiked Sample Result

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

FORM VB - IN

7A-IN
LAB CONTROL SAMPLE
METALS - TCLP

Lab ID: LCS 280-423271/2-B

Lab Name: TestAmerica Denver Job No.: 160-29498-1

Sample Matrix: Solid LCS Source: TCLP Spike_00017

Analyte	Solid(mg/L)							
	True	Found	C	%R	Limits		Q	Method
Arsenic	4.00	3.84		96	80	120		6010B
Barium	12.0	11.4		95	80	120		6010B
Cadmium	1.10	1.03		94	80	120		6010B
Chromium	5.20	4.85		93	80	120		6010B
Lead	5.50	5.35		97	80	120		6010B
Selenium	3.00	2.79		93	80	120		6010B
Silver	1.05	1.01		97	80	120		6010B

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

FORM VIIA - IN

7D-IN
LAB CONTROL SAMPLE DUPLICATE
METALS - TCLP

Lab ID: LCSD 280-423271/19-B

Lab Name: TestAmerica Denver Job No.: 160-29498-1

Sample Matrix: Solid LCS Source: TCLP Spike_00017

Analyte	(SDR)	C	Spike Added	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Arsenic	3.85		4.00	96	80-120	0	20		6010B
Barium	11.4		12.0	95	80-120	1	20		6010B
Cadmium	1.03		1.10	94	80-120	0	20		6010B
Chromium	4.88		5.20	94	80-120	1	20		6010B
Lead	5.37		5.50	98	80-120	0	20		6010B
Selenium	2.81		3.00	94	80-120	1	20		6010B
Silver	1.02		1.05	97	80-120	1	20		6010B

SDR = Spike Duplicate Results
Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIID - IN

7A-IN
LAB CONTROL SAMPLE
METALS - TCLP

Lab ID: LCS 280-423271/2-C

Lab Name: TestAmerica Denver Job No.: 160-29498-1

Sample Matrix: Solid LCS Source: Hg Daily Spk_02209

Analyte	Solid(mg/L)							
	True	Found	C	%R	Limits		Q	Method
Mercury	0.00500	0.00525		105	90	116		7470A

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

FORM VIIA - IN

7D-IN
LAB CONTROL SAMPLE DUPLICATE
METALS - TCLP

Lab ID: LCSD 280-423271/19-C

Lab Name: TestAmerica Denver Job No.: 160-29498-1

Sample Matrix: Solid LCS Source: Hg Daily Spk_02209

Analyte	(SDR)	C	Spike Added	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Mercury	0.00518		0.00500	104	90-116	1	10		7470A

SDR = Spike Duplicate Results
Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIID - IN

8-IN
ICP-AES AND ICP-MS SERIAL DILUTIONS
METALS - TCLP

Lab ID: 280-112230-G-1-B SD ^5

SDG No:

Lab Name: TestAmerica Denver Job No: 160-29498-1

Matrix: Solid Concentration Units: mg/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Method
Arsenic	0.022	U	0.11	U	NC		6010B
Barium	0.35	J	0.305	J	13	V	6010B
Cadmium	0.0020	U	0.010	U	NC		6010B
Chromium	0.0030	U	0.015	U	NC		6010B
Lead	0.014	U	0.070	U	NC		6010B
Selenium	0.032	U	0.16	U	NC		6010B
Silver	0.0050	U	0.025	U	NC		6010B

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 - TCLP

Lab ID: 280-112230-G-1-E SD ^5

SDG No:

Lab Name: TestAmerica Denver Job No: 160-29498-1

Matrix: Solid Concentration Units: mg/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Method
Mercury	0.000030	U	0.00015	U	NC		7470A

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

FORM VIII-IN

9-IN
DETECTION LIMITS
METALS - TCLP

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: MT_051

Method: 6010B MDL Date: 12/22/2016 00:00

Prep Method: 3010A

Leach Method: 1311

Analyte	Wavelength/ Mass	RL (mg/L)	MDL (mg/L)
Arsenic	189	0.5	0.022
Barium	455.4	1	0.004
Cadmium	228.8	0.1	0.002
Chromium	205.5	0.5	0.003
Lead	220.3	0.5	0.014
Selenium	196	0.1	0.032
Silver	328	0.5	0.005

9-IN
CALIBRATION BLANK DETECTION LIMITS
METALS - TCLP

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: MT_051

Method: 6010B XMDL Date: 12/22/2016 00:00

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Arsenic		0.5	0.022
Barium		1	0.004
Cadmium		0.1	0.002
Chromium		0.5	0.003
Lead		0.5	0.014
Selenium		0.1	0.032
Silver		0.5	0.005

9-IN
DETECTION LIMITS
METALS - TCLP

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: MT_034

Method: 7470A MDL Date: 08/09/2015 00:00

Prep Method: 7470A

Leach Method: 1311

Analyte	Wavelength/ Mass	RL (mg/L)	MDL (mg/L)
Mercury	253.7	0.002	0.00003

9-IN
CALIBRATION BLANK DETECTION LIMITS
METALS - TCLP

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: MT_034

Method: 7470A XMDL Date: 11/30/2010 11:27

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Mercury		0.002	0.00003

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG No.:

ICP-AES Instrument ID: MT_051 Date: 06/14/2018

Analyte	Wave Length	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	K
Aluminum	167.019													0.0012	
Aluminum	396.152								0.000173						
Antimony	206.834		-0.000014									0.011394		-0.000086	
Arsenic	188.98													-0.000007	
Barium	493.408			-0.000045			0.000255		0.000002					0.000008	
Beryllium	234.861							0.000015						0.000104	
Bismuth	223.061													0.000065	
Boron	249.678		.0								0.001755			-0.00006	
Cadmium	214.439										0.000016			0.0000116	
Calcium	315.887									0.000711					
Chromium	205.56						-0.00057							-0.000018	
Cobalt	237.863														
Copper	324.754		0.000007						-0.000011					0.000016	
Iron	238.204														
Iron	259.94														
Lead	220.353		-0.0001111											0.00003	
Lithium	670.783														
Magnesium	279.078													-0.00029	
Manganese	257.61														
Molybdenum	202.032														
Nickel	231.604													0.000006	
Phosphorus	213.618														
Potassium	766.491														
Selenium	196.026		0.000015											-0.0002	
Silicon	288.158														
Silver	328.066														
Sodium	589.592					0.451997									
Sodium	589.593					0.38916									
Strontium	407.771														
Sulfur	181.972														

X-IN

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG No.:

ICP-AES Instrument ID: MT_051 Date: 06/14/2018

Analyte	Wave Length	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	K
Thallium	190.794								0		0.001808	0		-0.000012	
Thorium	288.505						-0.01079							-0.00002	
Tin	189.925														
Titanium	336.122								0.000022						
Uranium	409.013								-0.0000416					0.000203	
Vanadium	292.401											-0.00679		0	
Zinc	206.2														
Zirconium	343.823													0.000022	

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG No.:

ICP-AES Instrument ID: MT_051 Date: 06/14/2018

Analyte	Wave Length	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Se	Si	Sn	Sr
Aluminum	396.152				0.031769										
Aluminum	167.019														
Antimony	206.834				-0.00208									0.000337	
Arsenic	188.98														
Barium	493.408														
Beryllium	234.861				-0.00022										
Bismuth	223.061														
Boron	249.678														
Cadmium	214.439														
Calcium	315.887														
Chromium	205.56				-0.00012										
Cobalt	237.863														
Copper	324.754				0.000505										
Iron	238.204														
Iron	259.94														
Lead	220.353				-0.00158										
Lithium	670.783														
Magnesium	279.078														
Manganese	257.61														
Molybdenum	202.032														
Nickel	231.604														
Phosphorus	213.618														
Potassium	766.491														
Selenium	196.026			000816.											
Silicon	288.158														
Silver	328.066														
Sodium	589.593														
Sodium	589.592														
Strontium	407.771														
Sulfur	181.972			0.00474											

X-IN

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG No.:

ICP-AES Instrument ID: MT_051 Date: 06/14/2018

Analyte	Wave Length	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Se	Si	Sn	Sr
Thallium	190.794				-0.00112										
Thorium	288.505		0	-0.0025											
Tin	189.925														
Titanium	336.122														
Uranium	409.013														
Vanadium	292.401				-0.000580										
Zinc	206.2														
Zirconium	343.823														

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG No.:

ICP-AES Instrument ID: MT_051 Date: 06/14/2018

Analyte	Wave Length	Th	Ti	Tl	U	V	Zn	Zr							
Aluminum	167.019														
Aluminum	396.152														
Antimony	206.834		0.000287		-0.0011			-0.00142							
Arsenic	188.98														
Barium	493.408														
Beryllium	234.861														
Bismuth	223.061														
Boron	249.678														
Cadmium	214.439														
Calcium	315.887														
Chromium	205.56														
Cobalt	237.863		0.001949												
Copper	324.754	0.00368	-0.00033		-0.00091										
Iron	238.204														
Iron	259.94														
Lead	220.353				0.0010										
Lithium	670.783														
Magnesium	279.078				-0.00469										
Manganese	257.61														
Molybdenum	202.032														
Nickel	231.604			0.000176											
Phosphorus	213.618														
Potassium	766.491														
Selenium	196.026														
Silicon	288.158														
Silver	328.066				-0.00053	-0.0046		0.0047							
Sodium	589.592														
Sodium	589.593														
Strontium	407.771														
Sulfur	181.972														

X-IN

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG No.:

ICP-AES Instrument ID: MT_051 Date: 06/14/2018

Analyte	Wave Length	Th	Ti	Tl	U	V	Zn	Zr							
Thallium	190.794		-0.002												
Thorium	288.505				0.007837	0.01375									
Tin	189.925														
Titanium	336.122														
Uranium	409.013							-0.01707							
Vanadium	292.401	0.002372	0.000675		-0.00164										
Zinc	206.2														
Zirconium	343.823														

11-IN
LINEAR RANGES
METALS

Lab Name: TestAmerica Denver Job No: 160-29498-1

SDG No.:

Instrument ID: MT_051 Date: 07/06/2018 14:18

Analyte	Integ. Time (Sec.)	Concentration (mg/L)	Method
Arsenic		10	6010B
Barium		25	6010B
Cadmium		25	6010B
Chromium		10	6010B
Lead		50	6010B
Selenium		10	6010B
Silver		2.5	6010B

12-IN
PREPARATION LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Prep Method: 3010A

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight	Initial Volume (mL)	Final Volume (mL)
LB 280-423271/1-B	07/25/2018 16:00	423503		10	50
LCS 280-423271/2-B	07/25/2018 16:00	423503		10	50
LCSD 280-423271/19-B	07/25/2018 16:00	423503		10	50
160-29498-3	07/25/2018 16:00	423503		10	50
280-112230-G-1-C MS	07/25/2018 16:00	423503		10	50
280-112230-G-1-D MSD	07/25/2018 16:00	423503		10	50

12-IN
PREPARATION LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Prep Method: 7470A

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight	Initial Volume (mL)	Final Volume (mL)
LB 280-423271/1-C	07/25/2018 10:54	423539		30	50
LCS 280-423271/2-C	07/25/2018 10:54	423539		30	50
LCSD 280-423271/19-C	07/25/2018 10:54	423539		30	50
160-29498-3	07/25/2018 10:54	423539		30	50
280-112230-G-1-F MS	07/25/2018 10:54	423539		30	50
280-112230-G-1-G MSD	07/25/2018 10:54	423539		30	50

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: MT_051 Analysis Method: 6010B

Start Date: 07/26/2018 10:50 End Date: 07/26/2018 21:38

Lab Sample Id	D/F	Type	Time	Analytes																										
				Ag	As	Ba	Cd	Cr	Pb	Se																				
ICIS 280-423884/1	1		10:50	X	X	X	X	X	X	X																				
IC 280-423884/2			10:53	X	X	X	X	X	X	X																				
IC 280-423884/3			10:56	X	X	X	X	X	X	X																				
ZZZZZZ			11:00																											
ZZZZZZ			11:03																											
ICVH 280-423884/6	1		11:07	X	X	X	X	X	X	X																				
ICVH 280-423884/7	1		11:11	X	X	X	X	X	X	X																				
ZZZZZZ			11:21																											
ICV 280-423884/9	1		11:30	X	X	X	X	X	X	X																				
ICV 280-423884/10	1		11:34	X	X	X	X	X	X	X																				
ICVL 280-423884/11			11:37																											
CCVH 280-423884/12			11:41																											
CCV 280-423884/13			11:44																											
ICB 280-423884/14	1		11:48	X	X	X	X	X	X	X																				
CRI 280-423884/15	1		11:51	X	X	X	X	X	X	X																				
ICSA 280-423884/16	1		11:54	X	X	X	X	X	X	X																				
ICSAB 280-423884/17	1		11:58	X	X	X	X	X	X	X																				
LRA 280-423884/18			12:02																											
CCVH 280-423884/19			12:05																											
CCV 280-423884/20			12:09																											
CCB 280-423884/21			12:12																											
CCVL 280-423884/22			12:15																											
ZZZZZZ			12:19																											
ZZZZZZ			12:22																											
ZZZZZZ			12:25																											
ZZZZZZ			12:29																											
ZZZZZZ			12:32																											
ZZZZZZ			12:37																											
ZZZZZZ			12:40																											
ZZZZZZ			12:44																											
ZZZZZZ			12:47																											
CCVH 280-423884/32	1		12:51	X	X	X	X	X	X	X																				
CCV 280-423884/33	1		12:54	X	X	X	X	X	X	X																				
CCB 280-423884/34	1		12:57	X	X	X	X	X	X	X																				
CCVL 280-423884/35			13:01																											
LB 280-423271/1-B	1	P	13:04	X	X	X	X	X	X	X																				
LCS 280-423271/2-B	1	P	13:07	X	X	X	X	X	X	X																				
LCSD 280-423271/19-B	1	P	13:11	X	X	X	X	X	X	X																				
160-29498-3	1	P	13:14	X	X	X	X	X	X	X																				
ZZZZZZ			13:18																											
280-112230-G-1-B SD ^5	5	P	13:21	X	X	X	X	X	X	X																				
280-112230-G-1-C MS	1	P	13:24	X	X	X	X	X	X	X																				

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: MT_051 Analysis Method: 6010B

Start Date: 07/26/2018 10:50 End Date: 07/26/2018 21:38

Lab Sample Id	D/F	Type	Time	Analytes																								
				Ag	As	Ba	Cd	Cr	Pb	Se																		
280-112230-G-1-D MSD	1	P	13:28	X	X	X	X	X	X	X																		
280-112230-G-1-B PDS	1	P	13:31	X	X	X	X	X	X	X																		
ZZZZZZ			13:35																									
CCVH 280-423884/46	1		13:38	X	X	X	X	X	X	X																		
CCV 280-423884/47	1		13:41	X	X	X	X	X	X	X																		
CCB 280-423884/48	1		13:45	X	X	X	X	X	X	X																		
CCVL 280-423884/49			13:48																									
ZZZZZZ			13:51																									
ZZZZZZ			13:55																									
ZZZZZZ			13:58																									
ZZZZZZ			14:02																									
ZZZZZZ			14:05																									
ZZZZZZ			14:08																									
ZZZZZZ			14:12																									
ZZZZZZ			14:15																									
ZZZZZZ			14:18																									
ZZZZZZ			14:22																									
CCVH 280-423884/60			14:25																									
CCV 280-423884/61			14:29																									
CCB 280-423884/62			14:32																									
CCVL 280-423884/63			14:35																									
ZZZZZZ			14:39																									
ZZZZZZ			14:42																									
ZZZZZZ			14:46																									
ZZZZZZ			14:49																									
ZZZZZZ			14:52																									
ZZZZZZ			14:56																									
ZZZZZZ			14:59																									
ZZZZZZ			15:02																									
CCVH 280-423884/72			15:06																									
CCV 280-423884/73			15:09																									
CCB 280-423884/74			15:13																									
CCVL 280-423884/75			15:16																									
ZZZZZZ			15:19																									
ZZZZZZ			15:23																									
ZZZZZZ			15:26																									
ZZZZZZ			15:30																									
ZZZZZZ			15:33																									
ZZZZZZ			15:36																									
ZZZZZZ			15:40																									
ZZZZZZ			15:43																									
ZZZZZZ			15:46																									

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: MT_051 Analysis Method: 6010B

Start Date: 07/26/2018 10:50 End Date: 07/26/2018 21:38

Lab Sample Id	D/F	Type	Time	Analytes																								
				Ag	As	Ba	Cd	Cr	Pb	Se																		
CCVH 280-423884/85			15:50																									
CCV 280-423884/86			15:53																									
CCB 280-423884/87			15:57																									
CCVL 280-423884/88			16:00																									
ZZZZZZ			16:03																									
ZZZZZZ			16:07																									
ZZZZZZ			16:10																									
ZZZZZZ			16:14																									
ZZZZZZ			16:17																									
ZZZZZZ			16:20																									
ZZZZZZ			16:24																									
ZZZZZZ			16:27																									
CCVH 280-423884/97			16:30																									
CCV 280-423884/98			16:34																									
CCB 280-423884/99			16:37																									
CCVL 280-423884/100			16:41																									
ZZZZZZ			16:44																									
ZZZZZZ			16:47																									
ZZZZZZ			16:51																									
ZZZZZZ			16:54																									
ZZZZZZ			16:58																									
ZZZZZZ			17:01																									
ZZZZZZ			17:04																									
ZZZZZZ			17:08																									
ZZZZZZ			17:11																									
ZZZZZZ			17:14																									
CCVH 280-423884/111			17:18																									
CCV 280-423884/112			17:21																									
CCB 280-423884/113			17:25																									
CCVL 280-423884/114			17:28																									
ZZZZZZ			17:31																									
ZZZZZZ			17:35																									
ZZZZZZ			17:38																									
ZZZZZZ			17:42																									
ZZZZZZ			17:45																									
ZZZZZZ			17:48																									
ZZZZZZ			17:52																									
ZZZZZZ			17:55																									
ZZZZZZ			17:58																									
CCVH 280-423884/124			18:02																									
CCV 280-423884/125			18:05																									
CCB 280-423884/126			18:09																									

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: MT_051 Analysis Method: 6010B

Start Date: 07/26/2018 10:50 End Date: 07/26/2018 21:38

Lab Sample Id	D/F	Type	Time	Analytes																								
				Ag	As	Ba	Cd	Cr	Pb	Se																		
CCVL 280-423884/127			18:12																									
ZZZZZZ			18:15																									
ZZZZZZ			18:19																									
ZZZZZZ			18:22																									
ZZZZZZ			18:26																									
ZZZZZZ			18:29																									
ZZZZZZ			18:32																									
ZZZZZZ			18:36																									
ZZZZZZ			18:39																									
ZZZZZZ			18:42																									
ZZZZZZ			18:46																									
CCVH 280-423884/138			18:49																									
CCV 280-423884/139			18:53																									
CCB 280-423884/140			18:56																									
CCVL 280-423884/141			18:59																									
ZZZZZZ			19:12																									
ZZZZZZ			19:16																									
ZZZZZZ			19:19																									
ZZZZZZ			19:22																									
ZZZZZZ			19:26																									
CCVH 280-423884/147			19:29																									
CCV 280-423884/148			19:32																									
CCB 280-423884/149			19:36																									
CCVL 280-423884/150			19:39																									
ZZZZZZ			19:43																									
ZZZZZZ			19:46																									
ZZZZZZ			19:49																									
ZZZZZZ			19:53																									
ZZZZZZ			19:56																									
ZZZZZZ			20:00																									
ZZZZZZ			20:03																									
ZZZZZZ			20:06																									
ZZZZZZ			20:10																									
CCVH 280-423884/160			20:13																									
CCV 280-423884/161			20:16																									
CCB 280-423884/162			20:20																									
CCVL 280-423884/163			20:23																									
ZZZZZZ			20:27																									
ZZZZZZ			20:30																									
ZZZZZZ			20:33																									
ZZZZZZ			20:37																									
ZZZZZZ			20:40																									

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: MT_051 Analysis Method: 6010B

Start Date: 07/26/2018 10:50 End Date: 07/26/2018 21:38

Lab Sample Id	D/F	Type	Time	Analytes																								
				Ag	As	Ba	Cd	Cr	Pb	Se																		
ZZZZZZ			20:44																									
ZZZZZZ			20:47																									
ZZZZZZ			20:50																									
ZZZZZZ			20:54																									
CCVH 280-423884/173			20:57																									
CCV 280-423884/174			21:00																									
CCB 280-423884/175			21:04																									
CCVL 280-423884/176			21:07																									
ZZZZZZ			21:11																									
ZZZZZZ			21:14																									
ZZZZZZ			21:17																									
ZZZZZZ			21:21																									
ZZZZZZ			21:24																									
CCVH 280-423884/182			21:27																									
CCV 280-423884/183			21:31																									
CCB 280-423884/184			21:34																									
CCVL 280-423884/185			21:38																									

Prep Types:
P = TCLP

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: MT_034 Analysis Method: 7470A

Start Date: 07/25/2018 14:03 End Date: 07/25/2018 19:23

Lab Sample Id	D/F	Type	Time	Analytes
				Hg
IC 280-423543/1-A			14:03	X
IC 280-423543/2-A			14:05	X
IC 280-423543/3-A			14:07	X
IC 280-423543/4-A			14:09	X
IC 280-423543/5-A			14:12	X
IC 280-423543/6-A			14:14	X
IC 280-423543/7-A			14:16	X
IC 280-423543/8-A			14:18	X
ICV 280-423543/9-A	1		14:21	X
ICB 280-423543/10-A	1		14:23	X
CRA 280-423543/11-A			14:25	
CCV 280-423543/12-A			14:28	
CCB 280-423543/13-A			14:30	
ZZZZZZ			14:32	
ZZZZZZ			14:34	
ZZZZZZ			14:36	
ZZZZZZ			14:39	
ZZZZZZ			14:41	
ZZZZZZ			14:43	
ZZZZZZ			14:45	
ZZZZZZ			14:48	
ZZZZZZ			14:50	
ZZZZZZ			14:52	
CCV 280-423543/12-A			14:54	
CCB 280-423543/13-A			14:56	
ZZZZZZ			14:59	
ZZZZZZ			15:01	
ZZZZZZ			15:03	
ZZZZZZ			15:05	
ZZZZZZ			15:08	
ZZZZZZ			15:10	
ZZZZZZ			15:12	
ZZZZZZ			15:14	
ZZZZZZ			15:16	
ZZZZZZ			15:19	
CCV 280-423543/12-A			15:21	
CCB 280-423543/13-A			15:23	
ZZZZZZ			15:25	
ZZZZZZ			15:28	
ZZZZZZ			15:30	
ZZZZZZ			15:32	
ZZZZZZ			15:34	

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: MT_034 Analysis Method: 7470A

Start Date: 07/25/2018 14:03 End Date: 07/25/2018 19:23

Lab Sample Id	D/F	Type	Time	Analytes
				Hg
ZZZZZZ			15:37	
ZZZZZZ			15:39	
ZZZZZZ			15:41	
ZZZZZZ			15:43	
ZZZZZZ			15:45	
CCV 280-423543/12-A			15:48	
CCB 280-423543/13-A			15:50	
ZZZZZZ			15:52	
ZZZZZZ			15:54	
ZZZZZZ			15:57	
ZZZZZZ			15:59	
ZZZZZZ			16:01	
ZZZZZZ			16:03	
ZZZZZZ			16:06	
ZZZZZZ			16:08	
ZZZZZZ			16:10	
ZZZZZZ			16:12	
CCV 280-423543/12-A			16:14	
CCB 280-423543/13-A			16:17	
ZZZZZZ			16:19	
ZZZZZZ			16:21	
ZZZZZZ			16:23	
ZZZZZZ			16:26	
ZZZZZZ			16:28	
ZZZZZZ			16:30	
ZZZZZZ			16:32	
ZZZZZZ			16:35	
ZZZZZZ			16:37	
ZZZZZZ			16:39	
CCV 280-423543/12-A			16:41	
CCB 280-423543/13-A			16:43	
ZZZZZZ			16:46	
ZZZZZZ			16:48	
ZZZZZZ			16:50	
ZZZZZZ			16:52	
ZZZZZZ			16:55	
ZZZZZZ			16:57	
ZZZZZZ			16:59	
ZZZZZZ			17:01	
ZZZZZZ			17:03	
ZZZZZZ			17:06	
CCV 280-423543/12-A	1		17:08	X

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: MT_034 Analysis Method: 7470A

Start Date: 07/25/2018 14:03 End Date: 07/25/2018 19:23

Lab Sample Id	D/F	Type	Time	Analytes
				Hg
CCB 280-423543/13-A	1		17:10	X
ZZZZZZ			17:12	
ZZZZZZ			17:15	
ZZZZZZ			17:17	
ZZZZZZ			17:19	
ZZZZZZ			17:21	
ZZZZZZ			17:24	
LB 280-423271/1-C	1	P	17:26	X
LCS 280-423271/2-C	1	P	17:28	X
LCSD 280-423271/19-C	1	P	17:30	X
160-29498-3	1	P	17:32	X
CCV 280-423543/12-A	1		17:35	X
CCB 280-423543/13-A	1		17:37	X
ZZZZZZ			17:39	
280-112230-G-1-E SD ^5	5	P	17:41	X
280-112230-G-1-F MS	1	P	17:44	X
280-112230-G-1-G MSD	1	P	17:46	X
280-112230-G-1-E PDS	1	P	17:48	X
ZZZZZZ			17:50	
ZZZZZZ			17:53	
ZZZZZZ			17:55	
ZZZZZZ			17:57	
CCV 280-423543/12-A	1		18:00	X
CCB 280-423543/13-A	1		18:02	X
ZZZZZZ			18:05	
ZZZZZZ			18:07	
ZZZZZZ			18:09	
ZZZZZZ			18:11	
ZZZZZZ			18:14	
ZZZZZZ			18:16	
ZZZZZZ			18:18	
ZZZZZZ			18:20	
ZZZZZZ			18:23	
ZZZZZZ			18:25	
CCV 280-423543/12-A			18:27	
CCB 280-423543/13-A			18:29	
ZZZZZZ			18:31	
ZZZZZZ			18:34	
ZZZZZZ			18:36	
ZZZZZZ			18:38	
ZZZZZZ			18:40	
ZZZZZZ			18:43	

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: MT_034 Analysis Method: 7470A

Start Date: 07/25/2018 14:03 End Date: 07/25/2018 19:23

Lab Sample Id	D/F	Type	Time	Analytes																								
				Hg																								
ZZZZZZ			18:45																									
ZZZZZZ			18:47																									
ZZZZZZ			18:49																									
ZZZZZZ			18:52																									
CCV 280-423543/12-A			18:54																									
CCB 280-423543/13-A			18:56																									
ZZZZZZ			18:58																									
ZZZZZZ			19:01																									
ZZZZZZ			19:03																									
ZZZZZZ			19:05																									
ZZZZZZ			19:07																									
ZZZZZZ			19:10																									
ZZZZZZ			19:12																									
ZZZZZZ			19:14																									
ZZZZZZ			19:16																									
ZZZZZZ			19:18																									
CCV 280-423543/12-A			19:21																									
CCB 280-423543/13-A			19:23																									

Prep Types:
P = TCLP

FORM XIII-IN

15-IN
ICP INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
METALS

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

ICP Instrument ID: MT_051 Start Date: 07/26/2018 End Date: 07/26/2018

Lab Sample ID	Time	Internal Standards %RI For:									
		Element Y 242.219	Q	Element Y 377.433	Q	Element Y 488.368	Q	Element	Q	Element	Q
ICIS 280-423884/1	10:50										
ICVH 280-423884/6	11:07	100		99		100					
ICVH 280-423884/7	11:11	100		99		100					
ICV 280-423884/9	11:30	103		103		103					
ICV 280-423884/10	11:34	101		100		101					
ICB 280-423884/14	11:48	101		101		102					
CRI 280-423884/15	11:51	103		102		103					
ICSA 280-423884/16	11:54	90		89		97					
ICSAB 280-423884/17	11:58	89		89		96					
CCVH 280-423884/32	12:51	101		100		102					
CCV 280-423884/33	12:54	100		100		100					
CCB 280-423884/34	12:57	101		101		101					
LB 280-423271/1-B	13:04	99		99		102					
LCS 280-423271/2-B	13:07	99		99		103					
LCSD 280-423271/19-B	13:11	101		102		105					
160-29498-3	13:14	101		102		107					
280-112230-G-1-B SD ^5	13:21	104		105		109					
280-112230-G-1-C MS	13:24	99		100		105					
280-112230-G-1-D MSD	13:28	101		102		107					
280-112230-G-1-B PDS	13:31	99		101		106					
CCVH 280-423884/46	13:38	101		101		104					
CCV 280-423884/47	13:41	103		104		106					
CCB 280-423884/48	13:45	103		104		104					

METALS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423271 Batch Start Date: 07/23/18 14:57 Batch Analyst: Bourgery, David F

Batch Method: 1311 Batch End Date: 07/24/18 19:17

Lab Sample ID	Client Sample ID	Method Chain	Basis	ExtractFluid	AnalysisComment				
LB 280-423271/1		1311, 3010A, 6010B		t1					
LCS 280-423271/2		1311, 3010A, 6010B		t1					
160-29498-A-3	CRC-B22-0105	1311, 3010A, 6010B	P	t1	TOX				
LCSD 280-423271/19		1311, 3010A, 6010B		t1					

Batch Notes	
First End time	07/24/18 09:54
First Start time	07/23/18 14:57

Basis	Basis Description
P	TCLP

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.

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	1
1. Solid	X	X	X	X	X	X	X	X	X	X
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Sample weight, 5.0 +/- 0.1g	5.08	5.09	5.03	4.91	5.08	4.97	4.97	4.96	4.91	4.93
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	17:40	17:46	17:54	18:00	18:00	18:00	18:00	18:00	18:00	18:00
b. Stop Time for Mixing	17:45	17:51	17:59	18:05	18:05	18:05	18:05	18:05	18:05	18:05
c. pH reading after mixing	9.3	9.07	9.62	9.65	9.74	9.70	10.24	9.48	9.64	9.56
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X	X	X	X	X	X	X	X	X	X
a. HCL Lot# used	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037
b. Pipette ID	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846	311846	311846	311846	311846	311846	311846	311846	311846	311846
Termometer Correction Factor	0	0	0	0	0	0	0	0	0	0
b. Start Time	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47
c. Start Temperature (Observed)	50	50	50	50	50	50	50	50	50	50
Start Temperature (Actual)	50	50	50	50	50	50	50	50	50	50
d. Finish Time	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57
e. Finish Temperature (Observed)	51	51	51	51	51	51	51	51	51	51
Finish Temperature (Actual)	51	51	51	51	51	51	51	51	51	51
f. pH reading after heating (temperature corrected)	1.63	1.57	1.73	1.85	2.07	2.02	2.54	2.14	2.33	2.00
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N	N	N	N	N	N	N	N	N	N
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Weight of wet solids after filtration (g)	100.07	100.21	100.47	100.37	100.89	100.91	100.13	101.45	101.11	101.60
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94
6. Vol of Fluid = wet solids x 20 (mL)	2001	2004	2009	2007	2018	2018	2003	2029	2022	2032
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Leach start date and time	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15
3. Leach stop date and time	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57
4. Room temperature										
Thermometer Correction Factor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a.Temp Min (Observed) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
b.Temp Max (Observed) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
c.Temp Min (Actual) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
d.Temp Max (Actual) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
5. pH of leachate	4.99	4.97	5.21	5.28	5.35	5.43	5.74	5.72	5.96	5.44
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
A. Sample Description										
Number of phases	1									
1. Solid	X									
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Sample weight, 5.0 +/- 0.1g	4.98									
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT									
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	18:00									
b. Stop Time for Mixing	18:05									
c. pH reading after mixing	9.3									
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X									
a. HCL Lot# used	1N HCl_00037									
b. Pipette ID	TCLP#2									
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846									
Termometer Correction Factor	0									
b. Start Time	18:47									
c. Start Temperature (Observed)	50									
Start Temperature (Actual)	50	0	0	0	0	0	0	0	0	0
d. Finish Time	18:57									
e. Finish Temperature (Observed)	51									
Finish Temperature (Actual)	51	0	0	0	0	0	0	0	0	0
f. pH reading after heating (temperature corrected)	1.59									
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1									
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Weight of wet solids after filtration (g)	100.35									
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**TCLP 1**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256						
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94									
6. Vol of Fluid = wet solids x 20 (mL)	2007									
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y									
2. Leach start date and time	7/23/18 20:15									
3. Leach stop date and time	7/24/18 12:57									
4. Room temperature										
Thermometer Correction Factor	0.0									
a.Temp Min (Observed) (^oC)	23.4									
b.Temp Max (Observed) (^oC)	24.4									
c.Temp Min (Actual) (^oC)	23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d.Temp Max (Actual) (^oC)	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. pH of leachate	5.04									
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	
1. Solid	X	X	X	X	X	X	X	X	X	
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No		**N**	**N**	**N**	**N**	**N**			**N**	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Sample weight, 5.0 +/- 0.1g		4.92	5.04	4.93	4.97	5.06			5.01	
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID		TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT			TCLP BT	
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing		11:27	11:27	11:27	11:27	11:27			11:27	
b. Stop Time for Mixing		11:32	11:32	11:32	11:32	11:32			11:32	
c. pH reading after mixing		8.77	9.65	9.68	11.62	9.26			7.85	
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**		X	X	X	X	X			X	
a. HCL Lot# used		1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037			1N HCl_00037	
b. Pipette ID		TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2			TCLP#2	
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID		311846	311846	311846	311846	311846			311846	
Termometer Correction Factor		0	0	0	0	0			0	
b. Start Time		11:56	11:56	11:56	11:56	11:56			11:56	
c. Start Temperature (Observed)		50	50	50	50	50			50	
Start Temperature (Actual)	0	50	50	50	50	50	0	0	50	0
d. Finish Time		12:06	12:06	12:06	12:06	12:06			12:06	
e. Finish Temperature (Observed)		53	53	53	53	53			53	
Finish Temperature (Actual)	0	53	53	53	53	53	0	0	53	0
f. pH reading after heating (temperature corrected)		1.83	5.83	5.88	2.15	1.65			1.99	
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1		Fluid 1			Fluid 1	Fluid 1			Fluid 1	
2. If pH from C.7.f is > 5.0, use Leach Fluid #2			Fluid 2	Fluid 2						
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
E. Determination of Sample Size										
1. Particle size reduction? Yes/no		N	N	N	N	N			N	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Weight of wet solids after filtration (g)		100.02	100.23	102.23	100.76	102.32			101.95	
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	#VALUE!	TCLP 1	TCLP 2	TCLP 2	TCLP 1	TCLP 1	#VALUE!	#VALUE!	TCLP 1	#VALUE!
1. TCLP Fluid 1 Lot #	T1_00251	T1_00256	T1_00251	T1_00251	T1_00256	T1_00256			T1_00256	
2. TCLP Fluid 2 Lot #			T2_00105	T2_00105						
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid		4.94	2.89	2.89	4.94	4.94			4.94	2.89/4.94
6. Vol of Fluid = wet solids x 20 (mL)		2000	2005	2045	2015	2046			2039	
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?		Y	Y	Y	Y	Y			Y	Y
2. Leach start date and time		7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57			7/23/18 14:57	7/23/18 14:57
3. Leach stop date and time		7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54			7/24/18 9:54	7/24/18 9:54
4. Room temperature										
Thermometer Correction Factor		0.0	0.0	0.0	0.0	0.0			0.0	0.0
a.Temp Min (Observed) (^oC)		23.4	23.4	23.4	23.4	23.4			23.4	23.4
b.Temp Max (Observed) (^oC)		24.4	24.4	24.4	24.4	24.4			24.4	24.4
c.Temp Min (Actual) (^oC)	0.0	23.4	23.4	23.4	23.4	23.4	0.0	0.0	23.4	23.4
d.Temp Max (Actual) (^oC)	0.0	24.4	24.4	24.4	24.4	24.4	0.0	0.0	24.4	24.4
5. pH of leachate		5.38	5.85	5.85	6.12	5.33			5.40	2.88/4.94
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
H.Determination of Amount of Leach Fluid										
1. Balance ID	24950431				24950431	24950431		24950431		
2. ZHE vessel number	Verona				Don	EEE		Rachael		AAA
3. Weight of material added to ZHE (g)	25.00				25.19	25.07		25.14		
"X" if there was headspace in container.	X									
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)	25				25	25		25		
7. Weight of fluid to add (g)	500	0	0	0	504	501	0	503	0	0
a. TCLP Fluid 1 Lot #	T1_00255				T1_00255	T1_00255		T1_00255		T1_00255
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid	4.92				4.92	4.92		4.92		4.92
8. Percent Wet Solids (%)	100	#DIV/0!	#DIV/0!	#DIV/0!	100	100	#DIV/0!	100	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)	40				40	40		40		40
b. Reading #2 (psi)	40				40	40		40		40
2. Rotator checked to be rotating between 28 and 32 RPM?	Y				Y	Y		Y		Y
3. Leach start date & time	7/23/18 17:36				7/23/18 17:36	7/23/18 17:36		7/23/18 17:36		7/23/18 17:36
4. Leach stop date & time					7/24/18 9:54	7/24/18 9:54		7/24/18 9:54		7/24/18 9:54
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	#DIV/0!	0.0	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

LogTag ID	1000645053
User ID	TCLP (+0.0)
LogTag battery	OK
Non alert range	21.0 to 25.0 °C
Time zone	UTC -07:00, daylight time
Number of readings	728
Reading interval	10 Minutes
Number of starts	231
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	21 Hours, 50 Minutes
Reading range	23.4 to 24.4 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.94 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	21 Hours, 50 Minutes
Statistics for between the first reading and inspection mark #1:	
First reading	7/23/2018 2:55:27 PM
Last reading	7/23/2018 5:25:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.4 to 24.0 °C
Average reading	23.8 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.78 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #1 and inspection mark #2:	
First reading	7/23/2018 5:35:27 PM
Last reading	7/23/2018 8:05:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.6 to 24.1 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

Mean Kinetic Temperature	23.93 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #2 and the last reading:	
First reading	7/23/2018 8:15:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	16 Hours, 30 Minutes
Reading range	23.6 to 24.4 °C
Average reading	24.0 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.96 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	16 Hours, 30 Minutes

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	1
1. Solid	X	X	X	X	X	X	X	X	X	X
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Sample weight, 5.0 +/- 0.1g	5.08	5.09	5.03	4.91	5.08	4.97	4.97	4.96	4.91	4.93
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	17:40	17:46	17:54	18:00	18:00	18:00	18:00	18:00	18:00	18:00
b. Stop Time for Mixing	17:45	17:51	17:59	18:05	18:05	18:05	18:05	18:05	18:05	18:05
c. pH reading after mixing	9.3	9.07	9.62	9.65	9.74	9.70	10.24	9.48	9.64	9.56
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X	X	X	X	X	X	X	X	X	X
a. HCL Lot# used	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037
b. Pipette ID	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846	311846	311846	311846	311846	311846	311846	311846	311846	311846
Termometer Correction Factor	0	0	0	0	0	0	0	0	0	0
b. Start Time	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47
c. Start Temperature (Observed)	50	50	50	50	50	50	50	50	50	50
Start Temperature (Actual)	50	50	50	50	50	50	50	50	50	50
d. Finish Time	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57
e. Finish Temperature (Observed)	51	51	51	51	51	51	51	51	51	51
Finish Temperature (Actual)	51	51	51	51	51	51	51	51	51	51
f. pH reading after heating (temperature corrected)	1.63	1.57	1.73	1.85	2.07	2.02	2.54	2.14	2.33	2.00
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N	N	N	N	N	N	N	N	N	N
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Weight of wet solids after filtration (g)	100.07	100.21	100.47	100.37	100.89	100.91	100.13	101.45	101.11	101.60
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94
6. Vol of Fluid = wet solids x 20 (mL)	2001	2004	2009	2007	2018	2018	2003	2029	2022	2032
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Leach start date and time	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15
3. Leach stop date and time	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57
4. Room temperature										
Thermometer Correction Factor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a.Temp Min (Observed) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
b.Temp Max (Observed) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
c.Temp Min (Actual) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
d.Temp Max (Actual) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
5. pH of leachate	4.99	4.97	5.21	5.28	5.35	5.43	5.74	5.72	5.96	5.44
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
A. Sample Description										
Number of phases	1									
1. Solid	X									
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Sample weight, 5.0 +/- 0.1g	4.98									
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT									
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	18:00									
b. Stop Time for Mixing	18:05									
c. pH reading after mixing	9.3									
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X									
a. HCL Lot# used	1N HCl_00037									
b. Pipette ID	TCLP#2									
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846									
Termometer Correction Factor	0									
b. Start Time	18:47									
c. Start Temperature (Observed)	50									
Start Temperature (Actual)	50	0	0	0	0	0	0	0	0	0
d. Finish Time	18:57									
e. Finish Temperature (Observed)	51									
Finish Temperature (Actual)	51	0	0	0	0	0	0	0	0	0
f. pH reading after heating (temperature corrected)	1.59									
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1									
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Weight of wet solids after filtration (g)	100.35									
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**TCLP 1**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256						
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94									
6. Vol of Fluid = wet solids x 20 (mL)	2007									
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y									
2. Leach start date and time	7/23/18 20:15									
3. Leach stop date and time	7/24/18 12:57									
4. Room temperature										
Thermometer Correction Factor	0.0									
a.Temp Min (Observed) (^oC)	23.4									
b.Temp Max (Observed) (^oC)	24.4									
c.Temp Min (Actual) (^oC)	23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d.Temp Max (Actual) (^oC)	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. pH of leachate	5.04									
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	
1. Solid	X	X	X	X	X	X	X	X	X	
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No		**N**	**N**	**N**	**N**	**N**			**N**	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Sample weight, 5.0 +/- 0.1g		4.92	5.04	4.93	4.97	5.06			5.01	
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID		TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT			TCLP BT	
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing		11:27	11:27	11:27	11:27	11:27			11:27	
b. Stop Time for Mixing		11:32	11:32	11:32	11:32	11:32			11:32	
c. pH reading after mixing		8.77	9.65	9.68	11.62	9.26			7.85	
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**		X	X	X	X	X			X	
a. HCL Lot# used		1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037			1N HCl_00037	
b. Pipette ID		TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2			TCLP#2	
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID		311846	311846	311846	311846	311846			311846	
Termometer Correction Factor		0	0	0	0	0			0	
b. Start Time		11:56	11:56	11:56	11:56	11:56			11:56	
c. Start Temperature (Observed)		50	50	50	50	50			50	
Start Temperature (Actual)	0	50	50	50	50	50	0	0	50	0
d. Finish Time		12:06	12:06	12:06	12:06	12:06			12:06	
e. Finish Temperature (Observed)		53	53	53	53	53			53	
Finish Temperature (Actual)	0	53	53	53	53	53	0	0	53	0
f. pH reading after heating (temperature corrected)		1.83	5.83	5.88	2.15	1.65			1.99	
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1		Fluid 1			Fluid 1	Fluid 1			Fluid 1	
2. If pH from C.7.f is > 5.0, use Leach Fluid #2			Fluid 2	Fluid 2						
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
E. Determination of Sample Size										
1. Particle size reduction? Yes/no		N	N	N	N	N			N	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Weight of wet solids after filtration (g)		100.02	100.23	102.23	100.76	102.32			101.95	
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	#VALUE!	TCLP 1	TCLP 2	TCLP 2	TCLP 1	TCLP 1	#VALUE!	#VALUE!	TCLP 1	#VALUE!
1. TCLP Fluid 1 Lot #	T1_00251	T1_00256	T1_00251	T1_00251	T1_00256	T1_00256			T1_00256	
2. TCLP Fluid 2 Lot #			T2_00105	T2_00105						
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid		4.94	2.89	2.89	4.94	4.94			4.94	2.89/4.94
6. Vol of Fluid = wet solids x 20 (mL)		2000	2005	2045	2015	2046			2039	
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?		Y	Y	Y	Y	Y			Y	Y
2. Leach start date and time		7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57			7/23/18 14:57	7/23/18 14:57
3. Leach stop date and time		7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54			7/24/18 9:54	7/24/18 9:54
4. Room temperature										
Thermometer Correction Factor		0.0	0.0	0.0	0.0	0.0			0.0	0.0
a.Temp Min (Observed) (^oC)		23.4	23.4	23.4	23.4	23.4			23.4	23.4
b.Temp Max (Observed) (^oC)		24.4	24.4	24.4	24.4	24.4			24.4	24.4
c.Temp Min (Actual) (^oC)	0.0	23.4	23.4	23.4	23.4	23.4	0.0	0.0	23.4	23.4
d.Temp Max (Actual) (^oC)	0.0	24.4	24.4	24.4	24.4	24.4	0.0	0.0	24.4	24.4
5. pH of leachate		5.38	5.85	5.85	6.12	5.33			5.40	2.88/4.94
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
H.Determination of Amount of Leach Fluid										
1. Balance ID	24950431				24950431	24950431		24950431		
2. ZHE vessel number	Verona				Don	EEE		Rachael		AAA
3. Weight of material added to ZHE (g)	25.00				25.19	25.07		25.14		
"X" if there was headspace in container.	X									
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)	25				25	25		25		
7. Weight of fluid to add (g)	500	0	0	0	504	501	0	503	0	0
a. TCLP Fluid 1 Lot #	T1_00255				T1_00255	T1_00255		T1_00255		T1_00255
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid	4.92				4.92	4.92		4.92		4.92
8. Percent Wet Solids (%)	100	#DIV/0!	#DIV/0!	#DIV/0!	100	100	#DIV/0!	100	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)	40				40	40		40		40
b. Reading #2 (psi)	40				40	40		40		40
2. Rotator checked to be rotating between 28 and 32 RPM?	Y				Y	Y		Y		Y
3. Leach start date & time	7/23/18 17:36				7/23/18 17:36	7/23/18 17:36		7/23/18 17:36		7/23/18 17:36
4. Leach stop date & time					7/24/18 9:54	7/24/18 9:54		7/24/18 9:54		7/24/18 9:54
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	#DIV/0!	0.0	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

LogTag ID	1000645053
User ID	TCLP (+0.0)
LogTag battery	OK
Non alert range	21.0 to 25.0 °C
Time zone	UTC -07:00, daylight time
Number of readings	728
Reading interval	10 Minutes
Number of starts	231
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	21 Hours, 50 Minutes
Reading range	23.4 to 24.4 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.94 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	21 Hours, 50 Minutes
Statistics for between the first reading and inspection mark #1:	
First reading	7/23/2018 2:55:27 PM
Last reading	7/23/2018 5:25:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.4 to 24.0 °C
Average reading	23.8 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.78 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #1 and inspection mark #2:	
First reading	7/23/2018 5:35:27 PM
Last reading	7/23/2018 8:05:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.6 to 24.1 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

Mean Kinetic Temperature	23.93 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #2 and the last reading:	
First reading	7/23/2018 8:15:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	16 Hours, 30 Minutes
Reading range	23.6 to 24.4 °C
Average reading	24.0 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.96 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	16 Hours, 30 Minutes

METALS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423503 Batch Start Date: 07/25/18 16:00 Batch Analyst: Jones, Micaela R

Batch Method: 3010A Batch End Date: 07/25/18 21:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	Initial pH	InitialAmount	FinalAmount	ICP SPK 2B 00077	ICP SPK 3A 00149	TCLP Spike 00017
LB 280-423271/1-A		3010A, 6010B		<2 SU	10 mL	50 mL			
LCS 280-423271/2-A		3010A, 6010B		<2 SU	10 mL	50 mL	0.1 mL	0.1 mL	0.1 mL
LCSD 280-423271/19-A		3010A, 6010B		<2 SU	10 mL	50 mL	0.1 mL	0.1 mL	0.1 mL
160-29498-A-3-A	CRC-B22-0105	3010A, 6010B	P	<2 SU	10 mL	50 mL			
280-112230-G-1-A MS		3010A, 6010B	P	<2 SU	10 mL	50 mL	0.1 mL	0.1 mL	0.1 mL
280-112230-G-1-A MSD		3010A, 6010B	P	<2 SU	10 mL	50 mL	0.1 mL	0.1 mL	0.1 mL

Batch Notes	
Temperature - Corrected - End	94 Degrees C
Temperature - Corrected - Start	91 Degrees C
Digestion End Time	07/25/2018 21:45
Digestion Start Time	07/25/2018 16:00
Digestion Unit ID	05
Hydrochloric Acid ID	0000189306-11/29
Nitric Acid ID	0000192582-01/05
Pipette/Syringe/Dispenser ID	MET-109
Thermometer ID	MT2050
Digestion Tube/Cup ID	1802043
Temperature - Uncorrected - End	93 Degrees C
Temperature - Uncorrected - Start	90 Degrees C

Basis	Basis Description
P	TCLP

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 Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423271 Batch Start Date: 07/23/18 14:57 Batch Analyst: Bourgery, David F

Batch Method: 1311 Batch End Date: 07/24/18 19:17

Lab Sample ID	Client Sample ID	Method Chain	Basis	ExtractFluid	AnalysisComment				
LB 280-423271/1		1311, 7470A, 7470A		t1					
LCS 280-423271/2		1311, 7470A, 7470A		t1					
160-29498-A-3	CRC-B22-0105	1311, 7470A, 7470A	P	t1	TOX				
LCSD 280-423271/19		1311, 7470A, 7470A		t1					

Batch Notes	
First End time	07/24/18 09:54
First Start time	07/23/18 14:57

Basis	Basis Description
P	TCLP

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.

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	1
1. Solid	X	X	X	X	X	X	X	X	X	X
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Sample weight, 5.0 +/- 0.1g	5.08	5.09	5.03	4.91	5.08	4.97	4.97	4.96	4.91	4.93
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	17:40	17:46	17:54	18:00	18:00	18:00	18:00	18:00	18:00	18:00
b. Stop Time for Mixing	17:45	17:51	17:59	18:05	18:05	18:05	18:05	18:05	18:05	18:05
c. pH reading after mixing	9.3	9.07	9.62	9.65	9.74	9.70	10.24	9.48	9.64	9.56
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X	X	X	X	X	X	X	X	X	X
a. HCL Lot# used	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037
b. Pipette ID	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846	311846	311846	311846	311846	311846	311846	311846	311846	311846
Termometer Correction Factor	0	0	0	0	0	0	0	0	0	0
b. Start Time	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47
c. Start Temperature (Observed)	50	50	50	50	50	50	50	50	50	50
Start Temperature (Actual)	50	50	50	50	50	50	50	50	50	50
d. Finish Time	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57
e. Finish Temperature (Observed)	51	51	51	51	51	51	51	51	51	51
Finish Temperature (Actual)	51	51	51	51	51	51	51	51	51	51
f. pH reading after heating (temperature corrected)	1.63	1.57	1.73	1.85	2.07	2.02	2.54	2.14	2.33	2.00
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N	N	N	N	N	N	N	N	N	N
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Weight of wet solids after filtration (g)	100.07	100.21	100.47	100.37	100.89	100.91	100.13	101.45	101.11	101.60
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94
6. Vol of Fluid = wet solids x 20 (mL)	2001	2004	2009	2007	2018	2018	2003	2029	2022	2032
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Leach start date and time	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15
3. Leach stop date and time	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57
4. Room temperature										
Thermometer Correction Factor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a.Temp Min (Observed) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
b.Temp Max (Observed) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
c.Temp Min (Actual) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
d.Temp Max (Actual) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
5. pH of leachate	4.99	4.97	5.21	5.28	5.35	5.43	5.74	5.72	5.96	5.44
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
A. Sample Description										
Number of phases	1									
1. Solid	X									
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Sample weight, 5.0 +/- 0.1g	4.98									
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT									
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	18:00									
b. Stop Time for Mixing	18:05									
c. pH reading after mixing	9.3									
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X									
a. HCL Lot# used	1N HCl_00037									
b. Pipette ID	TCLP#2									
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846									
Termometer Correction Factor	0									
b. Start Time	18:47									
c. Start Temperature (Observed)	50									
Start Temperature (Actual)	50	0	0	0	0	0	0	0	0	0
d. Finish Time	18:57									
e. Finish Temperature (Observed)	51									
Finish Temperature (Actual)	51	0	0	0	0	0	0	0	0	0
f. pH reading after heating (temperature corrected)	1.59									
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1									
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Weight of wet solids after filtration (g)	100.35									
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**TCLP 1**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256						
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94									
6. Vol of Fluid = wet solids x 20 (mL)	2007									
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y									
2. Leach start date and time	7/23/18 20:15									
3. Leach stop date and time	7/24/18 12:57									
4. Room temperature										
Thermometer Correction Factor	0.0									
a.Temp Min (Observed) (^oC)	23.4									
b.Temp Max (Observed) (^oC)	24.4									
c.Temp Min (Actual) (^oC)	23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d.Temp Max (Actual) (^oC)	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. pH of leachate	5.04									
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	
1. Solid	X	X	X	X	X	X	X	X	X	
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No		**N**	**N**	**N**	**N**	**N**			**N**	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Sample weight, 5.0 +/- 0.1g		4.92	5.04	4.93	4.97	5.06			5.01	
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID		TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT			TCLP BT	
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing		11:27	11:27	11:27	11:27	11:27			11:27	
b. Stop Time for Mixing		11:32	11:32	11:32	11:32	11:32			11:32	
c. pH reading after mixing		8.77	9.65	9.68	11.62	9.26			7.85	
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**		X	X	X	X	X			X	
a. HCL Lot# used		1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037			1N HCl_00037	
b. Pipette ID		TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2			TCLP#2	
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID		311846	311846	311846	311846	311846			311846	
Termometer Correction Factor		0	0	0	0	0			0	
b. Start Time		11:56	11:56	11:56	11:56	11:56			11:56	
c. Start Temperature (Observed)		50	50	50	50	50			50	
Start Temperature (Actual)	0	50	50	50	50	50	0	0	50	0
d. Finish Time		12:06	12:06	12:06	12:06	12:06			12:06	
e. Finish Temperature (Observed)		53	53	53	53	53			53	
Finish Temperature (Actual)	0	53	53	53	53	53	0	0	53	0
f. pH reading after heating (temperature corrected)		1.83	5.83	5.88	2.15	1.65			1.99	
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1		Fluid 1			Fluid 1	Fluid 1			Fluid 1	
2. If pH from C.7.f is > 5.0, use Leach Fluid #2			Fluid 2	Fluid 2						
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
E. Determination of Sample Size										
1. Particle size reduction? Yes/no		N	N	N	N	N			N	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Weight of wet solids after filtration (g)		100.02	100.23	102.23	100.76	102.32			101.95	
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	#VALUE!	TCLP 1	TCLP 2	TCLP 2	TCLP 1	TCLP 1	#VALUE!	#VALUE!	TCLP 1	#VALUE!
1. TCLP Fluid 1 Lot #	T1_00251	T1_00256	T1_00251	T1_00251	T1_00256	T1_00256			T1_00256	
2. TCLP Fluid 2 Lot #			T2_00105	T2_00105						
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid		4.94	2.89	2.89	4.94	4.94			4.94	2.89/4.94
6. Vol of Fluid = wet solids x 20 (mL)		2000	2005	2045	2015	2046			2039	
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?		Y	Y	Y	Y	Y			Y	Y
2. Leach start date and time		7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57			7/23/18 14:57	7/23/18 14:57
3. Leach stop date and time		7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54			7/24/18 9:54	7/24/18 9:54
4. Room temperature										
Thermometer Correction Factor		0.0	0.0	0.0	0.0	0.0			0.0	0.0
a.Temp Min (Observed) (^oC)		23.4	23.4	23.4	23.4	23.4			23.4	23.4
b.Temp Max (Observed) (^oC)		24.4	24.4	24.4	24.4	24.4			24.4	24.4
c.Temp Min (Actual) (^oC)	0.0	23.4	23.4	23.4	23.4	23.4	0.0	0.0	23.4	23.4
d.Temp Max (Actual) (^oC)	0.0	24.4	24.4	24.4	24.4	24.4	0.0	0.0	24.4	24.4
5. pH of leachate		5.38	5.85	5.85	6.12	5.33			5.40	2.88/4.94
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
H.Determination of Amount of Leach Fluid										
1. Balance ID	24950431				24950431	24950431		24950431		
2. ZHE vessel number	Verona				Don	EEE		Rachael		AAA
3. Weight of material added to ZHE (g)	25.00				25.19	25.07		25.14		
"X" if there was headspace in container.	X									
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)	25				25	25		25		
7. Weight of fluid to add (g)	500	0	0	0	504	501	0	503	0	0
a. TCLP Fluid 1 Lot #	T1_00255				T1_00255	T1_00255		T1_00255		T1_00255
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid	4.92				4.92	4.92		4.92		4.92
8. Percent Wet Solids (%)	100	#DIV/0!	#DIV/0!	#DIV/0!	100	100	#DIV/0!	100	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)	40				40	40		40		40
b. Reading #2 (psi)	40				40	40		40		40
2. Rotator checked to be rotating between 28 and 32 RPM?	Y				Y	Y		Y		Y
3. Leach start date & time	7/23/18 17:36				7/23/18 17:36	7/23/18 17:36		7/23/18 17:36		7/23/18 17:36
4. Leach stop date & time					7/24/18 9:54	7/24/18 9:54		7/24/18 9:54		7/24/18 9:54
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	#DIV/0!	0.0	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

LogTag ID	1000645053
User ID	TCLP (+0.0)
LogTag battery	OK
Non alert range	21.0 to 25.0 °C
Time zone	UTC -07:00, daylight time
Number of readings	728
Reading interval	10 Minutes
Number of starts	231
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	21 Hours, 50 Minutes
Reading range	23.4 to 24.4 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.94 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	21 Hours, 50 Minutes
Statistics for between the first reading and inspection mark #1:	
First reading	7/23/2018 2:55:27 PM
Last reading	7/23/2018 5:25:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.4 to 24.0 °C
Average reading	23.8 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.78 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #1 and inspection mark #2:	
First reading	7/23/2018 5:35:27 PM
Last reading	7/23/2018 8:05:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.6 to 24.1 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

Mean Kinetic Temperature	23.93 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #2 and the last reading:	
First reading	7/23/2018 8:15:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	16 Hours, 30 Minutes
Reading range	23.6 to 24.4 °C
Average reading	24.0 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.96 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	16 Hours, 30 Minutes

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	1
1. Solid	X	X	X	X	X	X	X	X	X	X
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Sample weight, 5.0 +/- 0.1g	5.08	5.09	5.03	4.91	5.08	4.97	4.97	4.96	4.91	4.93
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	17:40	17:46	17:54	18:00	18:00	18:00	18:00	18:00	18:00	18:00
b. Stop Time for Mixing	17:45	17:51	17:59	18:05	18:05	18:05	18:05	18:05	18:05	18:05
c. pH reading after mixing	9.3	9.07	9.62	9.65	9.74	9.70	10.24	9.48	9.64	9.56
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X	X	X	X	X	X	X	X	X	X
a. HCL Lot# used	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037
b. Pipette ID	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846	311846	311846	311846	311846	311846	311846	311846	311846	311846
Termometer Correction Factor	0	0	0	0	0	0	0	0	0	0
b. Start Time	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47	18:47
c. Start Temperature (Observed)	50	50	50	50	50	50	50	50	50	50
Start Temperature (Actual)	50	50	50	50	50	50	50	50	50	50
d. Finish Time	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57	18:57
e. Finish Temperature (Observed)	51	51	51	51	51	51	51	51	51	51
Finish Temperature (Actual)	51	51	51	51	51	51	51	51	51	51
f. pH reading after heating (temperature corrected)	1.63	1.57	1.73	1.85	2.07	2.02	2.54	2.14	2.33	2.00
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1	Fluid 1
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N	N	N	N	N	N	N	N	N	N
If yes, write NCM descibing how.										
2. Balance ID	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431	24950431
3. Weight of wet solids after filtration (g)	100.07	100.21	100.47	100.37	100.89	100.91	100.13	101.45	101.11	101.60
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1	TCLP 1
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256	T1_00256
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94
6. Vol of Fluid = wet solids x 20 (mL)	2001	2004	2009	2007	2018	2018	2003	2029	2022	2032
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Leach start date and time	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15	7/23/18 20:15
3. Leach stop date and time	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57	7/24/18 12:57
4. Room temperature										
Thermometer Correction Factor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a.Temp Min (Observed) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
b.Temp Max (Observed) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
c.Temp Min (Actual) (^oC)	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
d.Temp Max (Actual) (^oC)	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
5. pH of leachate	4.99	4.97	5.21	5.28	5.35	5.43	5.74	5.72	5.96	5.44
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301	112301	112301	112301	112301	112301	112301	112301	112301	112301
Sample No.	1	2	3	4	5	6	7	8	9	10
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012
TCLP/SPLP Worksheet No. 1
Sample Description

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
A. Sample Description										
Number of phases	1									
1. Solid	X									
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No	**N**									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Sample weight, 5.0 +/- 0.1g	4.98									
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID	TCLP BT									
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing	18:00									
b. Stop Time for Mixing	18:05									
c. pH reading after mixing	9.3									
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**	X									
a. HCL Lot# used	1N HCl_00037									
b. Pipette ID	TCLP#2									
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID	311846									
Termometer Correction Factor	0									
b. Start Time	18:47									
c. Start Temperature (Observed)	50									
Start Temperature (Actual)	50	0	0	0	0	0	0	0	0	0
d. Finish Time	18:57									
e. Finish Temperature (Observed)	51									
Finish Temperature (Actual)	51	0	0	0	0	0	0	0	0	0
f. pH reading after heating (temperature corrected)	1.59									
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1	Fluid 1									
2. If pH from C.7.f is > 5.0, use Leach Fluid #2										
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
E. Determination of Sample Size										
1. Particle size reduction? Yes/no	N									
If yes, write NCM descibing how.										
2. Balance ID	24950431									
3. Weight of wet solids after filtration (g)	100.35									
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	**TCLP 1**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**
1. TCLP Fluid 1 Lot #	T1_00256	T1_00256	T1_00256	T1_00256						
2. TCLP Fluid 2 Lot #										
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid	4.94									
6. Vol of Fluid = wet solids x 20 (mL)	2007									
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?	Y									
2. Leach start date and time	7/23/18 20:15									
3. Leach stop date and time	7/24/18 12:57									
4. Room temperature										
Thermometer Correction Factor	0.0									
a.Temp Min (Observed) (^oC)	23.4									
b.Temp Max (Observed) (^oC)	24.4									
c.Temp Min (Actual) (^oC)	23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d.Temp Max (Actual) (^oC)	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. pH of leachate	5.04									
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	112301									
Sample No.	11									
H.Determination of Amount of Leach Fluid										
1. Balance ID										
2. ZHE vessel number	Tim	3								
3. Weight of material added to ZHE (g)										
"X" if there was headspace in container.										
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)										
7. Weight of fluid to add (g)	0	0	0	0	0	0	0	0	0	0
a. TCLP Fluid 1 Lot #										
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid										
8. Percent Wet Solids (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)										
b. Reading #2 (psi)										
2. Rotator checked to be rotating between 28 and 32 RPM?										
3. Leach start date & time										
4. Leach stop date & time										
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

Analyst: DB

Date: 7.23.18

DV-IP-0012

TCLP/SPLP Worksheet No. 1

Sample Description

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
A. Sample Description										
Number of phases	1	1	1	1	1	1	1	1	1	
1. Solid	X	X	X	X	X	X	X	X	X	
2. Liquid										
a. lighter than water										
b. water										
c. heavier than water										
B. Percent Solid Phase										
Balance ID										
1. Weight of filter (g)										
2. Weight of subsample										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Weight of filtrate										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. density of filtrate (g/mL)										
4. Total weight wet solids (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Weight percent solids (wet) (%)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Weight percent solids (dry)										
a. gross dry weight 1 (g)										
b. gross dry weight 2 (g)										
c. percent dry solids (%)										
d. Oven Temp (observed) (^{o}C)										
Thermometer Correction Factor	0									
Oven Temp Actual (^{o}C)	0	0	0	0	0	0	0	0	0	0
7. Vol. of initial aqueous filtrate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Vol. of initial organic filtrate (mL)										

Comments:

$$(\text{Weight percent dry solids, B.6.c}) = 100 \times \frac{(\text{Gross dry weight 2 or 1, B.6.b or B.6.a if B.6.a is blank}) - (\text{Weight of filter, B.1})}{(\text{Weight of subsample .B.2.c})}$$

(Net Weight of Subsample, B.2.c) = (gross weight, B.2.a) - (tare weight, B.2.b)

(Net Weight of Filtrate, B.3.c) = (gross weight, B.3.a) - (tare weight, B.3.b)

(Total weight wet solids, B.4) = (Weight subsample, B.2.c) - (Weight filtrate, B.3.c)

(Vol of initail filtrate, B.7) = (Weight of filtrate, B.3.c) / (Denisity of filtrate, B.3.d)

(Weight percent wet solids, B.5.) = 100 X (Total weight wet solids, B.4.) / (Weight of subsample, B.2.c.)

Analyst: DB

DV-IP-0012
TCLP Worksheet No. 2
Selection of Leach Fluid

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
C. Leach Fluid Determination- Does not apply to determination of volatile organic components or SPLP.										
1. Particle size reduction? (<1mm) Yes/No		**N**	**N**	**N**	**N**	**N**			**N**	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Sample weight, 5.0 +/- 0.1g		4.92	5.04	4.93	4.97	5.06			5.01	
4. Add 96.5 (+/- 2% or 94.57mL to 98.43mL)										
a. Pipette ID or Grad Cylinder ID		TCLP BT	TCLP BT	TCLP BT	TCLP BT	TCLP BT			TCLP BT	
5. Initial pH (after 5 min. mixing time)										
a. Start Time for Mixing		11:27	11:27	11:27	11:27	11:27			11:27	
b. Stop Time for Mixing		11:32	11:32	11:32	11:32	11:32			11:32	
c. pH reading after mixing		8.77	9.65	9.68	11.62	9.26			7.85	
6. If pH > 5.0, then add 3.5 mL 1N HCL & mark **"X"**		X	X	X	X	X			X	
a. HCL Lot# used		1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037	1N HCl_00037			1N HCl_00037	
b. Pipette ID		TCLP#2	TCLP#2	TCLP#2	TCLP#2	TCLP#2			TCLP#2	
7. Secondary pH (after 10min at 50C to 55C)										
a. Thermometer ID		311846	311846	311846	311846	311846			311846	
Termometer Correction Factor		0	0	0	0	0			0	
b. Start Time		11:56	11:56	11:56	11:56	11:56			11:56	
c. Start Temperature (Observed)		50	50	50	50	50			50	
Start Temperature (Actual)	0	50	50	50	50	50	0	0	50	0
d. Finish Time		12:06	12:06	12:06	12:06	12:06			12:06	
e. Finish Temperature (Observed)		53	53	53	53	53			53	
Finish Temperature (Actual)	0	53	53	53	53	53	0	0	53	0
f. pH reading after heating (temperature corrected)		1.83	5.83	5.88	2.15	1.65			1.99	
D. Selection of Leach Fluid										
1. If pH from C.5. or C.7.f. is <5.0 use Leach Fluid #1		Fluid 1			Fluid 1	Fluid 1			Fluid 1	
2. If pH from C.7.f is > 5.0, use Leach Fluid #2			Fluid 2	Fluid 2						
3. SPLP Fluid 1: Soils- East of the Mississippi River; Wastewates; or Wastewaters										
4. SPLP Fluid 2: Soils- West of Mississippi River										
5. SPLP Fluid 3: If VOCs or Cyanide containing wastes.										
6. **X** if filtrate and fluid are miscible										

Analyst: DB

DV-IP-0012

TCLP/SPLP Worksheet No. 3

Bottle Leach Procedure for Metals and Semi-Volatile Organic Components

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
E. Determination of Sample Size										
1. Particle size reduction? Yes/no		N	N	N	N	N			N	
If yes, write NCM descibing how.										
2. Balance ID		24950431	24950431	24950431	24950431	24950431			24950431	
3. Weight of wet solids after filtration (g)		100.02	100.23	102.23	100.76	102.32			101.95	
F. Determination of Amount of Leach Fluid										
Fluid Type from Wksht 2	#VALUE!	TCLP 1	TCLP 2	TCLP 2	TCLP 1	TCLP 1	#VALUE!	#VALUE!	TCLP 1	#VALUE!
1. TCLP Fluid 1 Lot #	T1_00251	T1_00256	T1_00251	T1_00251	T1_00256	T1_00256			T1_00256	
2. TCLP Fluid 2 Lot #			T2_00105	T2_00105						
3. SPLP 1 (East) Lot #										
4. SPLP 2 (West) Lot #										
5. pH of leach fluid		4.94	2.89	2.89	4.94	4.94			4.94	2.89/4.94
6. Vol of Fluid = wet solids x 20 (mL)		2000	2005	2045	2015	2046			2039	
G. Record of Leach - leach period is 16 to 20 hours										
1. Rotator checked to be rotating between 28 and 32 RPM?		Y	Y	Y	Y	Y			Y	Y
2. Leach start date and time		7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57	7/23/18 14:57			7/23/18 14:57	7/23/18 14:57
3. Leach stop date and time		7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54	7/24/18 9:54			7/24/18 9:54	7/24/18 9:54
4. Room temperature										
Thermometer Correction Factor		0.0	0.0	0.0	0.0	0.0			0.0	0.0
a.Temp Min (Observed) (^oC)		23.4	23.4	23.4	23.4	23.4			23.4	23.4
b.Temp Max (Observed) (^oC)		24.4	24.4	24.4	24.4	24.4			24.4	24.4
c.Temp Min (Actual) (^oC)	0.0	23.4	23.4	23.4	23.4	23.4	0.0	0.0	23.4	23.4
d.Temp Max (Actual) (^oC)	0.0	24.4	24.4	24.4	24.4	24.4	0.0	0.0	24.4	24.4
5. pH of leachate		5.38	5.85	5.85	6.12	5.33			5.40	2.88/4.94
Was the sample multiphasic?	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6. Volume of leachate (mL)										
a. Oil recovered from leachate (mL)										
7. Volume of initial filtrate for recombination (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8. Combined initial filtrate + leachate (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
COMMENTS:										

(Volume of Fluid, F.4) = (Weight of wet solids, E.3) X 20

(Vol. of Combined Filtrate and Leachate, G.8) = (Vol of Leachate, G.6) + (Vol of Filtrate, G.7)

$$(\text{Vol. of Inital Filtrate for Recombinat ion, G.7}) = \frac{(\text{Solids Leachated, E.3})}{(\text{Tot. Wet Solids, B.4})} \times \frac{(\text{LeachateRe covered, G.6})}{(\text{FluidAdded , F.6})} \times (\text{InitialFil trat, B.7})$$

Analyst: DB

DV-IP-0012
TCLP/SPLP Worksheet No. 4
ZHE Leach

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Login No.	160-29498	160-29498	112151	112151	112230	112289	112289	320-41149	550-106063	LB
Sample No.	2	3	1	2	1	1	2	36	1	
H.Determination of Amount of Leach Fluid										
1. Balance ID	24950431				24950431	24950431		24950431		
2. ZHE vessel number	Verona				Don	EEE		Rachael		AAA
3. Weight of material added to ZHE (g)	25.00				25.19	25.07		25.14		
"X" if there was headspace in container.	X									
4. Weight of filtrate in syringe										
a. gross weight (g)										
b. tare weight (g)										
c. net weight (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Volume of filtrate in syringe (mL)										
6. Wet solids in ZHE (g)	25				25	25		25		
7. Weight of fluid to add (g)	500	0	0	0	504	501	0	503	0	0
a. TCLP Fluid 1 Lot #	T1_00255				T1_00255	T1_00255		T1_00255		T1_00255
b. SPLP Fluid 3 Lot #										
c. pH of Blank Fluid	4.92				4.92	4.92		4.92		4.92
8. Percent Wet Solids (%)	100	#DIV/0!	#DIV/0!	#DIV/0!	100	100	#DIV/0!	100	#DIV/0!	#DIV/0!
I. Record of ZHE Leach - the Leach period is 16 to 20 hours.										
1. Leak Check										
a. Reading #1 (psi)	40				40	40		40		40
b. Reading #2 (psi)	40				40	40		40		40
2. Rotator checked to be rotating between 28 and 32 RPM?	Y				Y	Y		Y		Y
3. Leach start date & time	7/23/18 17:36				7/23/18 17:36	7/23/18 17:36		7/23/18 17:36		7/23/18 17:36
4. Leach stop date & time					7/24/18 9:54	7/24/18 9:54		7/24/18 9:54		7/24/18 9:54
5. Room temperature										
Thermometer Correction Factor										
a.Temp Min (Observed) (^oC)										
b.Temp Max (Observed) (^oC)										
c.Temp Min (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
d. Temp Max (Actual) (^oC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6. **X** if still under positive pressure after leaching										
7. Volume of leachate recovered (mL)										
a. Volume of oil recovered after leaching										
8. Vol. of initial aqueous filtrate for recombination										
a. Calculated from Worksheet 1 (mL)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b. Calculated from Worksheet 4 (mL)	0.0	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	#DIV/0!	0.0	#DIV/0!	#DIV/0!

(Net Weight of Filtrate, H.4.c) = (Gross weight, H.4.a.) - (Tare weight, H.4.b.)

(Percent Wet Solids, H.8.) = 100 X **[** (Wet Solids in ZHE, H.6) / (Weight of material added to ZHE, H.3) **]**

(Wet Solids in ZHE, H.6) = (Weight of material added to ZHE, H.3.) - (net weight of filtrate, H.4.c.)

(Vol of Filtrate for recombination, I.7.b) = (Vol of Leachate Recvd, I.6) X (Weight of Filtrate, H.4.c) / (Vol Fluid Added, H.7.)

(Weight of Fluid to add, H.7.) = (Wet Solids in ZHE, H.6) X 20

(Vol of Filtrate for recombination, I.7.a) = **[** (Wet Solids in ZHE, H.6.) / (Tot Wet Solids, B.4) **]** X **[** (Vol Leachate Recvd, I.6.) / (Vol Fluid Add, H.7.) **]** X (Vol Filtrate, B.7.)

COMMENTS:

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

LogTag ID	1000645053
User ID	TCLP (+0.0)
LogTag battery	OK
Non alert range	21.0 to 25.0 °C
Time zone	UTC -07:00, daylight time
Number of readings	728
Reading interval	10 Minutes
Number of starts	231
First reading	7/23/2018 2:55:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	21 Hours, 50 Minutes
Reading range	23.4 to 24.4 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.94 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	21 Hours, 50 Minutes
Statistics for between the first reading and inspection mark #1:	
First reading	7/23/2018 2:55:27 PM
Last reading	7/23/2018 5:25:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.4 to 24.0 °C
Average reading	23.8 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.78 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #1 and inspection mark #2:	
First reading	7/23/2018 5:35:27 PM
Last reading	7/23/2018 8:05:27 PM
Elapsed Time	2 Hours, 30 Minutes
Reading range	23.6 to 24.1 °C
Average reading	23.9 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes

LogTag ID 1000645053
User ID TCLP (+0.0)
First reading 7/23/2018 2:55:27 PM
Last reading 7/24/2018 12:45:27 PM
Name of file TCLP (+0.0)1000645053 Started 7-23-2018, Finished 7-24-2018.ltd
File location C:\Users\DenOrgPrep\Documents\My LogTag Data\

Mean Kinetic Temperature	23.93 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	2 Hours, 30 Minutes
Statistics for between inspection mark #2 and the last reading:	
First reading	7/23/2018 8:15:27 PM
Last reading	7/24/2018 12:45:27 PM
Elapsed Time	16 Hours, 30 Minutes
Reading range	23.6 to 24.4 °C
Average reading	24.0 °C
Standard Deviation (S)	0.2 °C
Degree Minutes below lower alert	0.00 °C-Minutes
Degree Minutes above upper alert	0.00 °C-Minutes
Mean Kinetic Temperature	23.96 °C
Time below lower alert	None
Time above upper alert	None
Time not in alert	16 Hours, 30 Minutes

METALS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423539 Batch Start Date: 07/25/18 10:54 Batch Analyst: Baca, Tessa E

Batch Method: 7470A Batch End Date: 07/25/18 12:54

Lab Sample ID	Client Sample ID	Method Chain	Basis	Initial pH	InitialAmount	FinalAmount	Hg Daily Spk 02209		
LB 280-423271/1-A		7470A, 7470A		<2	30 mL	50 mL			
LCS 280-423271/2-A		7470A, 7470A		<2	30 mL	50 mL	1.5 mL		
LCSD 280-423271/19-A		7470A, 7470A		<2	30 mL	50 mL	1.5 mL		
160-29498-A-3-A	CRC-B22-0105	7470A, 7470A	P	<2	30 mL	50 mL			
280-112230-G-1-A MS		7470A, 7470A	P	<2	30 mL	50 mL	1.5 mL		
280-112230-G-1-A MSD		7470A, 7470A	P	<2	30 mL	50 mL	1.5 mL		

Batch Notes	
Batch Comment	DV-MT-0017
Temperature - Corrected - End	92 Degrees C
Temperature - Corrected - Start	92 Degrees C
Digestion End Time	1254
Digestion Start Time	1054
Digestion Unit ID	14
Sulfuric Acid ID	161554-07/17/19
Nitric Acid ID	192582-07/10/19
Hydroxylamine ID	172066-07/20/19
Potassium Persulfate ID	190425-07/10/19
Potassium Permanganate ID	172224-07/24/19
Pipette/Syringe/Dispenser ID	MET70
Analyst ID - Spike Analyst	TB
Sufficient Volume for Batch QC	yes
Thermometer ID	QA-9
Digestion Tube/Cup ID	1802043
Temperature - Uncorrected - End	92 Degrees C
Temperature - Uncorrected - Start	92 Degrees C

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 Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423539 Batch Start Date: 07/25/18 10:54 Batch Analyst: Baca, Tessa E

Batch Method: 7470A Batch End Date: 07/25/18 12:54

Basis	Basis Description
P	TCLP

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 Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423543 Batch Start Date: 07/25/18 10:54 Batch Analyst: Baca, Tessa E

Batch Method: 245.1 Batch End Date: 07/25/18 12:54

Lab Sample ID	Client Sample ID	Method Chain	Basis	Initial pH	InitialAmount	FinalAmount	Hg Biwk ICV 00253	Hg Daily Spk 02209	
ICV 280-423543/9		245.1, 7470A		<2	30 mL	50 mL	0.3 mL		
ICB 280-423543/10		245.1, 7470A		<2	30 mL	50 mL			
CCV 280-423543/12		245.1, 7470A		<2	30 mL	50 mL		1.5 mL	
CCB 280-423543/13		245.1, 7470A		<2	30 mL	50 mL			

Batch Notes	
Batch Comment	DV-MT-0015
Temperature - Corrected - End	94 Degrees C
Temperature - Corrected - Start	93 Degrees C
Digestion End Time	07/25/2018 12:54
Digestion Start Time	07/25/2018 10:54
Digestion Unit ID	13
Sulfuric Acid Lot Number	161554-07/17/19
Nitric Acid ID	192582-07/10/19
Hydroxylamine ID	172066-07/20/19
Potassium Persulfate ID	190425-07/10/19
Potassium Permanganate ID	172224-07/24/19
Pipette/Syringe/Dispenser ID	MET70
Analyst ID - Spike Analyst	TB
Thermometer ID	QA-8
Digestion Tube/Cup ID	1802043
Temperature - Uncorrected - End	94 Degrees C
Temperature - Uncorrected - Start	93 Degrees C

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.

Path: D:\My Results\51A072618.esws

Date created: 7/26/2018 10:45:21 AM

Instrument used: MY14490005

Software Version : 7.3.1.9507

Firmware Version : 3442

Notes:

Sample Name: icis

Date: 7/26/2018 10:50:02 AM Rack:Tube: S1:5

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000000	ppm	N/A	N/A	-414.230000	Y 377.433
Al (167.019 nm)	0.000000	ppm	N/A	N/A	-0.218643	Y_R 377.433
Al H (396.152 nm)	0.000000	ppm	N/A	N/A	29.071816	Y_R 377.433
As (188.980 nm)	0.000000	ppm	N/A	N/A	-3.708760	Y 242.219
B (249.678 nm)	0.000000	ppm	N/A	N/A	63.877600	Y 242.219
Ba (493.408 nm)	0.000000	ppm	N/A	N/A	520.846000	Y_R 488.368
Be (234.861 nm)	0.000000	ppm	N/A	N/A	-49.435200	Y_R 488.368
Bi (223.061 nm)	0.000000	ppm	N/A	N/A	14.584200	Y 377.433
Ca (315.887 nm)	0.000000	ppm	N/A	N/A	-75.763822	Y_R 377.433
Cd (214.439 nm)	0.000000	ppm	N/A	N/A	-3.104810	Y 377.433
Co (228.615 nm)	0.000000	ppm	N/A	N/A	-36.340400	Y 242.219
Cr (205.560 nm)	0.000000	ppm	N/A	N/A	0.924967	Y 377.433
Cu (324.754 nm)	0.000000	ppm	N/A	N/A	318.548000	Y 377.433
Fe (238.204 nm)	0.000000	ppm	N/A	N/A	16.422654	Y_R 377.433
Fe H (259.940 nm)	0.000000	ppm	N/A	N/A	7.365510	Y_R 377.433
K (766.491 nm)	0.000000	ppm	N/A	N/A	-736.600000	Y_R2 488.368
Li (670.783 nm)	0.000000	ppm	N/A	N/A	-1165.000000	Y_R2 488.368
Mg (279.078 nm)	0.000000	ppm	N/A	N/A	46.688500	Y 377.433
Mn (257.610 nm)	0.000000	ppm	N/A	N/A	52.081800	Y 377.433
Mo (202.032 nm)	0.000000	ppm	N/A	N/A	-0.550223	Y 377.433
Na (589.592 nm)	0.000000	ppm	N/A	N/A	247.533000	Y_R2 488.368
Na H (589.593 nm)	0.000000	ppm	N/A	N/A	2017.229696	Y_R 488.368
Ni (231.604 nm)	0.000000	ppm	N/A	N/A	1.765960	Y 377.433
P (213.618 nm)	0.000000	ppm	N/A	N/A	21.308400	Y 242.219
Pb (220.353 nm)	0.000000	ppm	N/A	N/A	3.623290	Y 242.219
S (181.972 nm)	0.000000	ppm	N/A	N/A	23.854073	Y 377.433
Sb (206.834 nm)	0.000000	ppm	N/A	N/A	-16.908800	Y 377.433
Se (196.026 nm)	0.000000	ppm	N/A	N/A	14.163800	Y 242.219
Si (288.158 nm)	0.000000	ppm	N/A	N/A	845.155000	Y 377.433
Sn (189.925 nm)	0.000000	ppm	N/A	N/A	7.032170	Y 377.433
Sr (421.552 nm)	0.000000	ppm	N/A	N/A	141.502945	Y_R 488.368
Th (288.505 nm)	0.000000	ppm	N/A	N/A	72.542000	Y 377.433
Ti (336.122 nm)	0.000000	ppm	N/A	N/A	-206.017000	Y 377.433
Tl (190.794 nm)	0.000000	ppm	N/A	N/A	-5.778100	Y 377.433
U (409.013 nm)	0.000000	ppm	N/A	N/A	-91.682000	Y 377.433
V (292.401 nm)	0.000000	ppm	N/A	N/A	19.510600	Y 377.433
Zn (206.200 nm)	0.000000	ppm	N/A	N/A	17.127400	Y 377.433
Zr (343.823 nm)	0.000000	ppm	N/A	N/A	-12.128900	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.000000	20440.278950	0.000000	0.00
Y 377.433	1.000000	1100452.753591	0.000000	0.00
Y_R 377.433	1.000000	77094.600000	0.000000	0.00
Y_R 488.368	1.000000	43700.400000	0.000000	0.00
Y_R2 488.368	1.000000	86737.460909	0.000000	0.00

Sample Name: ic1

Date: 7/26/2018 10:53:26 AM Rack:Tube: 3:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	1.000000	ppm	N/A	N/A	49926.700000	Y 377.433
Al (167.019 nm)	1.000000	ppm	N/A	N/A	497.027000	Y_R 377.433
Al H (396.152 nm)	1.000000	ppm	N/A	N/A	2670.683395	Y_R 377.433
As (188.980 nm)	2.000000	ppm	N/A	N/A	2830.990000	Y 242.219
B (249.678 nm)	1.000000	ppm	N/A	N/A	27791.300000	Y 242.219
Ba (493.408 nm)	1.000000	ppm	N/A	N/A	119863.000000	Y_R 488.368
Be (234.861 nm)	1.000000	ppm	N/A	N/A	323752.000000	Y_R 488.368
Bi (223.061 nm)		ppm	N/A	N/A	11.625600	Y 377.433
Ca (315.887 nm)	10.000000	ppm	N/A	N/A	8187.079506	Y_R 377.433
Cd (214.439 nm)	1.000000	ppm	N/A	N/A	66054.000000	Y 377.433
Co (228.615 nm)	1.000000	ppm	N/A	N/A	20730.200000	Y 242.219
Cr (205.560 nm)	1.000000	ppm	N/A	N/A	16919.800000	Y 377.433
Cu (324.754 nm)	1.000000	ppm	N/A	N/A	65344.800000	Y 377.433
Fe (238.204 nm)	5.000000	ppm	N/A	N/A	18850.521877	Y_R 377.433
Fe H (259.940 nm)	5.000000	ppm	N/A	N/A	10113.300000	Y_R 377.433
K (766.491 nm)	100.000000	ppm	N/A	N/A	120513.000000	Y_R2 488.368
Li (670.783 nm)	2.000000	ppm	N/A	N/A	69323.100000	Y_R2 488.368
Mg (279.078 nm)	40.000000	ppm	N/A	N/A	244140.000000	Y 377.433
Mn (257.610 nm)	1.000000	ppm	N/A	N/A	271413.000000	Y 377.433
Mo (202.032 nm)	1.000000	ppm	N/A	N/A	9977.460000	Y 377.433
Na (589.592 nm)	10.000000	ppm	N/A	N/A	69554.800000	Y_R2 488.368
Na H (589.593 nm)	10.000000	ppm	N/A	N/A	43586.772200	Y_R 488.368
Ni (231.604 nm)	1.000000	ppm	N/A	N/A	7776.360000	Y 377.433
P (213.618 nm)	2.000000	ppm	N/A	N/A	5077.660000	Y 242.219
Pb (220.353 nm)	2.000000	ppm	N/A	N/A	6360.110000	Y 242.219
S (181.972 nm)		ppm	N/A	N/A	27.260541	Y 377.433
Sb (206.834 nm)	2.000000	ppm	N/A	N/A	6039.150000	Y 377.433
Se (196.026 nm)	2.000000	ppm	N/A	N/A	2229.220000	Y 242.219
Si (288.158 nm)	10.000000	ppm	N/A	N/A	91685.100000	Y 377.433
Sn (189.925 nm)	2.000000	ppm	N/A	N/A	4686.810000	Y 377.433
Sr (421.552 nm)	1.000000	ppm	N/A	N/A	216713.402266	Y_R 488.368
Th (288.505 nm)		ppm	N/A	N/A	122.932000	Y 377.433
Ti (336.122 nm)	1.000000	ppm	N/A	N/A	144014.000000	Y 377.433
Tl (190.794 nm)	2.000000	ppm	N/A	N/A	5084.610000	Y 377.433
U (409.013 nm)		ppm	N/A	N/A	-169.580000	Y 377.433
V (292.401 nm)	1.000000	ppm	N/A	N/A	43096.200000	Y 377.433
Zn (206.200 nm)	1.000000	ppm	N/A	N/A	5761.220000	Y 377.433
Zr (343.823 nm)	1.000000	ppm	N/A	N/A	136083.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.969646	19819.842027	0.004252	0.44
Y 377.433	0.961985	1058618.894022	0.002548	0.26
Y_R 377.433	0.976379	75273.500000	0.004191	0.43
Y_R 488.368	0.983109	42962.300000	0.001352	0.14
Y_R2 488.368	1.002270	86934.390684	0.008198	0.82

Sample Name: ic2

Date: 7/26/2018 10:56:51 AM
Rack:Tube: 3:2

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)		ppm	N/A	N/A	-1024.460000	Y 377.433
Al (167.019 nm)	100.000000	ppm	N/A	N/A	41309.200000	Y_R 377.433
Al H (396.152 nm)	100.000000	ppm	N/A	N/A	251780.866405	Y_R 377.433
As (188.980 nm)		ppm	N/A	N/A	-3.932090	Y 242.219
B (249.678 nm)		ppm	N/A	N/A	-123.694000	Y 242.219
Ba (493.408 nm)		ppm	N/A	N/A	716.407000	Y_R 488.368
Be (234.861 nm)		ppm	N/A	N/A	3299.800000	Y_R 488.368
Bi (223.061 nm)	2.000000	ppm	N/A	N/A	5623.250000	Y 377.433
Ca (315.887 nm)		ppm	N/A	N/A	-88.345591	Y_R 377.433
Cd (214.439 nm)		ppm	N/A	N/A	94.325500	Y 377.433
Co (228.615 nm)		ppm	N/A	N/A	-13.685300	Y 242.219
Cr (205.560 nm)		ppm	N/A	N/A	-27.048800	Y 377.433
Cu (324.754 nm)		ppm	N/A	N/A	331.692000	Y 377.433
Fe (238.204 nm)	100.000000	ppm	N/A	N/A	365375.605411	Y_R 377.433
Fe H (259.940 nm)	100.000000	ppm	N/A	N/A	196143.000000	Y_R 377.433
K (766.491 nm)		ppm	N/A	N/A	-654.920000	Y_R2 488.368
Li (670.783 nm)		ppm	N/A	N/A	-1180.440000	Y_R2 488.368
Mg (279.078 nm)		ppm	N/A	N/A	-883.531000	Y 377.433
Mn (257.610 nm)		ppm	N/A	N/A	797.133000	Y 377.433
Mo (202.032 nm)		ppm	N/A	N/A	2.344910	Y 377.433
Na (589.592 nm)	500.000000	ppm	N/A	N/A	3250050.000000	Y_R2 488.368
Na H (589.593 nm)	500.000000	ppm	N/A	N/A	1974496.274243	Y_R 488.368
Ni (231.604 nm)		ppm	N/A	N/A	35.722100	Y 377.433
P (213.618 nm)		ppm	N/A	N/A	14.203500	Y 242.219
Pb (220.353 nm)		ppm	N/A	N/A	28.509300	Y 242.219
S (181.972 nm)	10.000000	ppm	N/A	N/A	5674.256689	Y 377.433
Sb (206.834 nm)		ppm	N/A	N/A	-123.951000	Y 377.433
Se (196.026 nm)		ppm	N/A	N/A	-5.135270	Y 242.219
Si (288.158 nm)		ppm	N/A	N/A	1338.820000	Y 377.433
Sn (189.925 nm)		ppm	N/A	N/A	18.373400	Y 377.433
Sr (421.552 nm)		ppm	N/A	N/A	335.410399	Y_R 488.368
Th (288.505 nm)	10.000000	ppm	N/A	N/A	27851.300000	Y 377.433
Ti (336.122 nm)		ppm	N/A	N/A	159.456000	Y 377.433
Tl (190.794 nm)		ppm	N/A	N/A	-27.596600	Y 377.433
U (409.013 nm)	20.000000	ppm	N/A	N/A	96789.000000	Y 377.433
V (292.401 nm)		ppm	N/A	N/A	-42.878700	Y 377.433
Zn (206.200 nm)		ppm	N/A	N/A	6.883310	Y 377.433
Zr (343.823 nm)		ppm	N/A	N/A	-742.754000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.953632	19492.509500	0.001272	0.13
Y 377.433	0.936418	1030483.797072	0.000690	0.07
Y_R 377.433	0.979670	75527.200000	0.004829	0.49
Y_R 488.368	0.990427	43282.100000	0.023330	2.36
Y_R2 488.368	1.009221	87537.303901	0.007721	0.77

Sample Name: S1-5225151

Date: 7/26/2018 11:00:16 AM Rack:Tube: 3:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.992295	ppm	0.000171	0.02	49596.500000	Y 377.433
Al (167.019 nm)	1.011960	ppm	0.017718	1.75	506.055000	Y_R 377.433
Al H (396.152 nm)	1.012626	ppm	0.003819	0.38	2786.430418	Y_R 377.433
As (188.980 nm)	1.977210	ppm	0.002029	0.10	2798.650000	Y 242.219
B (249.678 nm)	0.993945	ppm	0.002134	0.21	27663.200000	Y 242.219
Ba (493.408 nm)	1.000690	ppm	0.009346	0.93	119972.000000	Y_R 488.368
Be (234.861 nm)	0.998637	ppm	0.012211	1.22	323412.000000	Y_R 488.368
Bi (223.061 nm)	-0.002256 u	ppm	0.000991	43.92	9.198420	Y 377.433
Ca (315.887 nm)	9.965061	ppm	0.117508	1.18	8158.795399	Y_R 377.433
Cd (214.439 nm)	0.996017	ppm	0.001169	0.12	65797.400000	Y 377.433
Co (228.615 nm)	0.994028	ppm	0.002499	0.25	20646.500000	Y 242.219
Cr (205.560 nm)	0.991087	ppm	0.003260	0.33	16755.700000	Y 377.433
Cu (324.754 nm)	0.992161	ppm	0.001121	0.11	64844.900000	Y 377.433
Fe (238.204 nm)	5.007158	ppm	0.056906	1.14	18877.486303	Y_R 377.433
Fe H (259.940 nm)	4.998450	ppm	0.053268	1.07	10110.200000	Y_R 377.433
K (766.491 nm)	99.249000	ppm	0.126033	0.13	119602.000000	Y_R2 488.368
Li (670.783 nm)	1.989530	ppm	0.006946	0.35	68954.200000	Y_R2 488.368
Mg (279.078 nm)	39.774000	ppm	0.037389	0.09	242751.000000	Y 377.433
Mn (257.610 nm)	0.992912	ppm	0.002066	0.21	269490.000000	Y 377.433
Mo (202.032 nm)	0.995756	ppm	0.000222	0.02	9935.120000	Y 377.433
Na (589.592 nm)	9.977900	ppm	0.020172	0.20	71526.800000	Y_R2 488.368
Na H (589.593 nm)	10.229227	ppm	0.143806	1.41	45501.913541	Y_R 488.368
Ni (231.604 nm)	0.992869	ppm	0.001251	0.13	7723.880000	Y 377.433
P (213.618 nm)	1.975380	ppm	0.001988	0.10	5015.430000	Y 242.219
Pb (220.353 nm)	1.986310	ppm	0.005872	0.30	6311.690000	Y 242.219
S (181.972 nm)	-0.000752 u	ppm	0.000970	> 100.00	26.088596	Y 377.433
Sb (206.834 nm)	1.987620	ppm	0.001959	0.10	6025.910000	Y 377.433
Se (196.026 nm)	1.985550	ppm	0.008915	0.45	2213.340000	Y 242.219
Si (288.158 nm)	10.037400	ppm	0.017610	0.18	92024.700000	Y 377.433
Sn (189.925 nm)	1.987520	ppm	0.002856	0.14	4657.620000	Y 377.433
Sr (421.552 nm)	1.001705	ppm	0.008041	0.80	217082.681546	Y_R 488.368
Th (288.505 nm)	0.002012 u	ppm	0.005318	> 100.00	111.897000	Y 377.433
Ti (336.122 nm)	0.997864	ppm	0.001602	0.16	143738.000000	Y 377.433
Tl (190.794 nm)	1.986350	ppm	0.005135	0.26	5046.370000	Y 377.433
U (409.013 nm)	-0.002450 u	ppm	0.000861	35.14	-182.977000	Y 377.433
V (292.401 nm)	0.992476	ppm	0.002838	0.29	42486.300000	Y 377.433
Zn (206.200 nm)	0.991088	ppm	0.001094	0.11	5710.030000	Y 377.433
Zr (343.823 nm)	0.996895	ppm	0.002891	0.29	135676.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.995710	20352.588666	0.002451	0.25
Y 377.433	0.988236	1087507.475099	0.001152	0.12
Y_R 377.433	0.997310	76887.200000	0.014616	1.47
Y_R 488.368	1.002710	43818.700000	0.012653	1.26
Y_R2 488.368	1.027606	89131.963805	0.007540	0.73

Sample Name: S2-5225152

Date: 7/26/2018 11:03:39 AM Rack:Tube: 3:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001451 u	ppm	0.000003	0.19	-1020.490000	Y 377.433
Al (167.019 nm)	83.968200 o	ppm	0.213620	0.25	41812.200000	Y_R 377.433
Al H (396.152 nm)	100.331026	ppm	0.055782	0.06	252613.837581	Y_R 377.433
As (188.980 nm)	-0.000611 u	ppm	0.001671	> 100.00	-5.566140	Y 242.219
B (249.678 nm)	-0.000876 u	ppm	0.000406	46.38	-126.477000	Y 242.219
Ba (493.408 nm)	0.000552	ppm	0.000025	4.51	682.059000	Y_R 488.368
Be (234.861 nm)	-0.000063 u	ppm	0.000045	70.54	3302.410000	Y_R 488.368
Bi (223.061 nm)	1.979640	ppm	0.006099	0.31	5584.370000	Y 377.433
Ca (315.887 nm)	-0.011991 u	ppm	0.005492	45.80	-85.670227	Y_R 377.433
Cd (214.439 nm)	-0.000197 u	ppm	0.000084	42.70	89.414200	Y 377.433
Co (228.615 nm)	0.001329	ppm	0.000096	7.26	-8.674810	Y 242.219
Cr (205.560 nm)	0.000163	ppm	0.000064	39.06	-26.729800	Y 377.433
Cu (324.754 nm)	-0.012059 u	ppm	0.000044	0.37	312.536000	Y 377.433
Fe (238.204 nm)	96.951372 o	ppm	0.166520	0.17	365214.776297	Y_R 377.433
Fe H (259.940 nm)	100.028000	ppm	0.302488	0.30	196198.000000	Y_R 377.433
K (766.491 nm)	0.068973	ppm	0.019322	28.01	-652.971000	Y_R2 488.368
Li (670.783 nm)	-0.001207 u	ppm	0.000390	32.30	-1207.530000	Y_R2 488.368
Mg (279.078 nm)	-0.030681 u	ppm	0.000181	0.59	-887.154000	Y 377.433
Mn (257.610 nm)	0.002728	ppm	0.000026	0.94	792.437000	Y 377.433
Mo (202.032 nm)	-0.000118 u	ppm	0.000125	> 100.00	-1.726500	Y 377.433
Na (589.592 nm)	469.166000 o	ppm	2.170780	0.46	3251910.000000	Y_R2 488.368
Na H (589.593 nm)	495.982151	ppm	0.333333	0.07	1958663.554873	Y_R 488.368
Ni (231.604 nm)	0.002973	ppm	0.000440	14.80	29.536600	Y 377.433
P (213.618 nm)	-0.003023 u	ppm	0.000748	24.76	13.666000	Y 242.219
Pb (220.353 nm)	-0.004569 u	ppm	0.001230	26.93	25.885300	Y 242.219
S (181.972 nm)	9.961748	ppm	0.012358	0.12	5652.651477	Y 377.433
Sb (206.834 nm)	-0.003931 u	ppm	0.001836	46.71	-125.611000	Y 377.433
Se (196.026 nm)	-0.002943 u	ppm	0.001033	35.12	-8.991860	Y 242.219
Si (288.158 nm)	0.056251	ppm	0.000810	1.44	1356.140000	Y 377.433
Sn (189.925 nm)	0.004222	ppm	0.000907	21.47	16.911800	Y 377.433
Sr (421.552 nm)	0.000874	ppm	0.000018	2.07	330.836832	Y_R 488.368
Th (288.505 nm)	9.987750	ppm	0.019879	0.20	28245.700000	Y 377.433
Ti (336.122 nm)	0.002507	ppm	0.000040	1.59	155.800000	Y 377.433
Tl (190.794 nm)	-0.008630 u	ppm	0.000343	3.97	-30.797200	Y 377.433
U (409.013 nm)	19.936300	ppm	0.090420	0.45	96578.600000	Y 377.433
V (292.401 nm)	0.007676	ppm	0.000128	1.67	-34.213400	Y 377.433
Zn (206.200 nm)	-0.001351 u	ppm	0.000335	24.78	9.367200	Y 377.433
Zr (343.823 nm)	-0.007472 u	ppm	0.000053	0.71	-730.049000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.950764	19433.883958	0.001311	0.14
Y 377.433	0.934686	1028577.396865	0.000332	0.04
Y_R 377.433	0.973828	75076.800000	0.001558	0.16
Y_R 488.368	0.991755	43340.100000	0.005393	0.54
Y_R2 488.368	0.994401	86251.811222	0.000324	0.03

Sample Name: ICVH-5236952

Date: 7/26/2018 11:07:04 AM Rack:Tube: 3:5

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000653 u	ppm	0.000123	18.85	-579.056000	Y 377.433
Al (167.019 nm)	36.997200 o	ppm	0.221170	0.60	18443.500000	Y_R 377.433
Al H (396.152 nm)	39.924322	ppm	0.250245	0.63	100614.582559	Y_R 377.433
As (188.980 nm)	-0.001938 u	ppm	0.001868	96.38	-7.237530	Y 242.219
B (249.678 nm)	0.001022	ppm	0.000080	7.80	-38.853700	Y 242.219
Ba (493.408 nm)	0.000253	ppm	0.000328	> 100.00	626.267000	Y_R 488.368
Be (234.861 nm)	0.000072	ppm	0.000080	> 100.00	2630.810000	Y_R 488.368
Bi (223.061 nm)	0.498219	ppm	0.002530	0.51	1426.120000	Y 377.433
Ca (315.887 nm)	-0.005588 u	ppm	0.002599	46.51	-80.380208	Y_R 377.433
Cd (214.439 nm)	-0.000279 u	ppm	0.000042	15.06	61.806600	Y 377.433
Co (228.615 nm)	0.001837	ppm	0.000098	5.35	1.826770	Y 242.219
Cr (205.560 nm)	0.001253	ppm	0.000168	13.38	-1.873080	Y 377.433
Cu (324.754 nm)	-0.002100 u	ppm	0.000030	1.45	541.846000	Y 377.433
Fe (238.204 nm)	76.469217 o	ppm	0.568168	0.74	288062.185439	Y_R 377.433
Fe H (259.940 nm)	78.746700	ppm	0.545712	0.69	154524.000000	Y_R 377.433
K (766.491 nm)	0.026831	ppm	0.001645	6.13	-704.067000	Y_R2 488.368
Li (670.783 nm)	0.000014 u	ppm	0.000139	> 100.00	-1164.510000	Y_R2 488.368
Mg (279.078 nm)	-0.011211 u	ppm	0.001261	11.25	-302.317000	Y 377.433
Mn (257.610 nm)	0.001276	ppm	0.000028	2.23	398.451000	Y 377.433
Mo (202.032 nm)	-0.000100 u	ppm	0.000016	16.35	-1.545630	Y 377.433
Na (589.592 nm)	38.781200 o	ppm	0.359805	0.93	269029.000000	Y_R2 488.368
Na H (589.593 nm)	40.057265	ppm	0.414655	1.04	162031.537071	Y_R 488.368
Ni (231.604 nm)	0.002662	ppm	0.000646	24.29	26.135000	Y 377.433
P (213.618 nm)	-0.002676 u	ppm	0.000190	7.11	14.542200	Y 242.219
Pb (220.353 nm)	-0.000026 u	ppm	0.000025	98.42	12.345000	Y 242.219
S (181.972 nm)	3.958630	ppm	0.006562	0.17	2260.642877	Y 377.433
Sb (206.834 nm)	-0.002603 u	ppm	0.000978	37.56	-63.413400	Y 377.433
Se (196.026 nm)	0.001990	ppm	0.000651	32.73	0.010032	Y 242.219
Si (288.158 nm)	0.007823	ppm	0.000489	6.24	916.220000	Y 377.433
Sn (189.925 nm)	0.002545	ppm	0.000889	34.91	12.987200	Y 377.433
Sr (421.552 nm)	0.000255	ppm	0.000135	53.08	196.629643	Y_R 488.368
Th (288.505 nm)	2.982420	ppm	0.016537	0.55	8460.210000	Y 377.433
Ti (336.122 nm)	0.000597	ppm	0.000072	12.07	-119.911000	Y 377.433
Tl (190.794 nm)	-0.001103 u	ppm	0.000491	44.57	-10.987400	Y 377.433
U (409.013 nm)	5.010570	ppm	0.028098	0.56	24257.200000	Y 377.433
V (292.401 nm)	0.001897	ppm	0.000034	1.80	50.524400	Y 377.433
Zn (206.200 nm)	-0.002953 u	ppm	0.000184	6.24	0.166314	Y 377.433
Zr (343.823 nm)	-0.001769 u	ppm	0.000112	6.34	-16.933700	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.998693	20413.560360	0.003822	0.38
Y 377.433	0.989818	1089247.826154	0.002074	0.21
Y_R 377.433	0.994961	76706.100000	0.005323	0.54
Y_R 488.368	1.004450	43895.100000	0.006831	0.68
Y_R2 488.368	1.039127	90131.217640	0.000501	0.05

Sample Name: ICVH-5236952

Date: 7/26/2018 11:11:54 AM Rack:Tube: 3:5

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000516 u	ppm	0.000245	47.49	-571.961000	Y 377.433
Al (167.019 nm)	37.292200 o	ppm	0.107996	0.29	18590.300000	Y_R 377.433
Al H (396.152 nm)	40.046036	ppm	0.166308	0.42	100920.839426	Y_R 377.433
As (188.980 nm)	-0.000203 u	ppm	0.002325	> 100.00	-4.779480	Y 242.219
B (249.678 nm)	0.000897	ppm	0.000040	4.45	-42.530000	Y 242.219
Ba (493.408 nm)	0.000026 u	ppm	0.000215	> 100.00	599.275000	Y_R 488.368
Be (234.861 nm)	0.000033	ppm	0.000039	> 100.00	2622.140000	Y_R 488.368
Bi (223.061 nm)	0.493936	ppm	0.000403	0.08	1414.140000	Y 377.433
Ca (315.887 nm)	-0.008666 u	ppm	0.008428	97.24	-82.923959	Y_R 377.433
Cd (214.439 nm)	-0.000269 u	ppm	0.000073	27.17	62.576500	Y 377.433
Co (228.615 nm)	0.001758	ppm	0.000034	1.96	0.180186	Y 242.219
Cr (205.560 nm)	0.001432	ppm	0.000202	14.08	1.105850	Y 377.433
Cu (324.754 nm)	-0.002171 u	ppm	0.000130	5.98	536.281000	Y 377.433
Fe (238.204 nm)	76.663323 o	ppm	0.543804	0.71	288793.348795	Y_R 377.433
Fe H (259.940 nm)	78.863900	ppm	0.574973	0.73	154754.000000	Y_R 377.433
K (766.491 nm)	0.020867 u	ppm	0.042886	> 100.00	-711.299000	Y_R2 488.368
Li (670.783 nm)	-0.000607 u	ppm	0.001664	> 100.00	-1186.400000	Y_R2 488.368
Mg (279.078 nm)	-0.011669 u	ppm	0.001380	11.83	-305.184000	Y 377.433
Mn (257.610 nm)	0.001261	ppm	0.000020	1.62	394.198000	Y 377.433
Mo (202.032 nm)	-0.000002 u	ppm	0.000034	> 100.00	-0.574172	Y 377.433
Na (589.592 nm)	38.713400 o	ppm	0.010867	0.03	268558.000000	Y_R2 488.368
Na H (589.593 nm)	39.765653	ppm	0.149273	0.38	160881.793348	Y_R 488.368
Ni (231.604 nm)	0.002677	ppm	0.000274	10.23	26.257800	Y 377.433
P (213.618 nm)	-0.001310 u	ppm	0.000616	47.00	17.997100	Y 242.219
Pb (220.353 nm)	-0.000822 u	ppm	0.000393	47.87	9.774470	Y 242.219
S (181.972 nm)	3.949687	ppm	0.015877	0.40	2255.589856	Y 377.433
Sb (206.834 nm)	-0.002531 u	ppm	0.000516	20.37	-63.218700	Y 377.433
Se (196.026 nm)	0.003809	ppm	0.000082	2.14	1.999790	Y 242.219
Si (288.158 nm)	0.009078	ppm	0.000424	4.67	927.616000	Y 377.433
Sn (189.925 nm)	0.001565	ppm	0.000304	19.43	10.693100	Y 377.433
Sr (421.552 nm)	0.000233	ppm	0.000135	58.12	191.913942	Y_R 488.368
Th (288.505 nm)	2.984640	ppm	0.001913	0.06	8466.260000	Y 377.433
Ti (336.122 nm)	0.000654	ppm	0.000039	6.01	-111.626000	Y 377.433
Tl (190.794 nm)	-0.003327 u	ppm	0.000608	18.26	-16.653700	Y 377.433
U (409.013 nm)	5.009470	ppm	0.008135	0.16	24252.000000	Y 377.433
V (292.401 nm)	0.001586	ppm	0.000107	6.77	36.870600	Y 377.433
Zn (206.200 nm)	-0.003056 u	ppm	0.000115	3.77	-0.427934	Y 377.433
Zr (343.823 nm)	-0.001815 u	ppm	0.000002	0.12	-22.708400	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.995078	20339.662255	0.002123	0.21
Y 377.433	0.986589	1085694.375711	0.002906	0.29
Y_R 377.433	0.988514	76209.100000	0.001569	0.16
Y_R 488.368	1.002120	43793.100000	0.003885	0.39
Y_R2 488.368	1.017645	88267.976000	0.008002	0.79

Sample Name: ICV-5236951

Date: 7/26/2018 11:21:04 AM Rack:Tube: 3:6

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.235140 Q	ppm	0.000278	0.12	11436.700000 Q	Y 377.433
Al (167.019 nm)	0.247221	ppm	0.003907	1.58	122.860000	Y_R 377.433
Al H (396.152 nm)	0.203758 u	ppm	0.006987	3.43	686.443609	Y_R 377.433
As (188.980 nm)	0.241229	ppm	0.001339	0.55	338.194000	Y 242.219
B (249.678 nm)	0.234085 Q	ppm	0.000769	0.33	6565.520000 Q	Y 242.219
Ba (493.408 nm)	0.240993	ppm	0.000666	0.28	29288.100000	Y_R 488.368
Be (234.861 nm)	0.232543 Q	ppm	0.000610	0.26	75240.000000 Q	Y_R 488.368
Bi (223.061 nm)	-0.001361 u	ppm	0.000239	17.57	10.812800	Y 377.433
Ca (315.887 nm)	1.948720	ppm	0.019847	1.02	1534.572898	Y_R 377.433
Cd (214.439 nm)	0.237765	ppm	0.000325	0.14	15703.500000	Y 377.433
Co (228.615 nm)	0.237400 Q	ppm	0.000864	0.36	4903.330000 Q	Y 242.219
Cr (205.560 nm)	0.237577	ppm	0.001874	0.79	4017.650000	Y 377.433
Cu (324.754 nm)	0.233880 Q	ppm	0.000061	0.03	15527.300000 Q	Y 377.433
Fe (238.204 nm)	0.241544	ppm	0.000610	0.25	926.276085	Y_R 377.433
Fe H (259.940 nm)	0.082822 u	ppm	0.003441	4.15	484.443000	Y_R 377.433
K (766.491 nm)	19.070100	ppm	0.018588	0.10	22385.700000	Y_R2 488.368
Li (670.783 nm)	0.241639	ppm	0.000175	0.07	7351.330000	Y_R2 488.368
Mg (279.078 nm)	9.392750 Q	ppm	0.025462	0.27	57363.800000 Q	Y 377.433
Mn (257.610 nm)	0.247626	ppm	0.000232	0.09	67248.200000	Y 377.433
Mo (202.032 nm)	0.230963 Q	ppm	0.000620	0.27	2304.000000 Q	Y 377.433
Na (589.592 nm)	1.952760	ppm	0.001057	0.05	14294.500000	Y_R2 488.368
Na H (589.593 nm)	1.350274 u	ppm	0.007316	0.54	9745.573173	Y_R 488.368
Ni (231.604 nm)	0.235939 Q	ppm	0.000237	0.10	1836.780000 Q	Y 377.433
P (213.618 nm)	1.864240 Q	ppm	0.005872	0.31	4734.450000 Q	Y 242.219
Pb (220.353 nm)	0.246154	ppm	0.000955	0.39	784.742000	Y 242.219
S (181.972 nm)	-0.002567 u	ppm	0.001251	48.75	23.066256	Y 377.433
Sb (206.834 nm)	0.242342	ppm	0.001296	0.53	723.010000	Y 377.433
Se (196.026 nm)	0.467482 Q	ppm	0.000147	0.03	532.162000 Q	Y 242.219
Si (288.158 nm)	1.940790	ppm	0.009642	0.50	18475.200000	Y 377.433
Sn (189.925 nm)	0.474901 Q	ppm	0.000855	0.18	1118.250000 Q	Y 377.433
Sr (421.552 nm)	0.243724	ppm	0.000057	0.02	52925.362436	Y_R 488.368
Th (288.505 nm)	0.000692	ppm	0.000109	15.77	83.018800	Y 377.433
Ti (336.122 nm)	0.240828	ppm	0.000803	0.33	34532.300000	Y 377.433
Tl (190.794 nm)	0.496741	ppm	0.001646	0.33	1257.720000	Y 377.433
U (409.013 nm)	0.004062	ppm	0.001174	28.90	-91.827400	Y 377.433
V (292.401 nm)	0.236156 Q	ppm	0.000619	0.26	10123.600000 Q	Y 377.433
Zn (206.200 nm)	0.233910 Q	ppm	0.000656	0.28	1360.730000 Q	Y 377.433
Zr (343.823 nm)	0.238898	ppm	0.000639	0.27	32501.600000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.030386	21061.386032	0.001047	0.10
Y 377.433	1.028803	1132149.001401	0.001649	0.16
Y_R 377.433	1.040110	80187.200000	0.005738	0.55
Y_R 488.368	1.050000	45885.700000	0.002401	0.23
Y_R2 488.368	1.071253	92917.754492	0.001914	0.18

Sample Name: ICV-5236951

Date: 7/26/2018 11:30:35 AM Rack:Tube: 3:6

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.245773	ppm	0.000020	0.01	11972.800000	Y 377.433
Al (167.019 nm)	0.257890	ppm	0.005816	2.26	128.172000	Y_R 377.433
Al H (396.152 nm)	0.212532 u	ppm	0.008495	4.00	709.451956	Y_R 377.433
As (188.980 nm)	0.255314	ppm	0.000574	0.22	358.158000	Y 242.219
B (249.678 nm)	0.245222	ppm	0.000338	0.14	6874.830000	Y 242.219
Ba (493.408 nm)	0.253454	ppm	0.001498	0.59	30775.500000	Y_R 488.368
Be (234.861 nm)	0.246618	ppm	0.000739	0.30	79797.100000	Y_R 488.368
Bi (223.061 nm)	-0.001856 u	ppm	0.001470	79.20	9.427630	Y 377.433
Ca (315.887 nm)	2.035581	ppm	0.002693	0.13	1606.350611	Y_R 377.433
Cd (214.439 nm)	0.248787	ppm	0.000311	0.13	16431.600000	Y 377.433
Co (228.615 nm)	0.247732	ppm	0.000861	0.35	5118.330000	Y 242.219
Cr (205.560 nm)	0.247335	ppm	0.000294	0.12	4182.570000	Y 377.433
Cu (324.754 nm)	0.244952	ppm	0.000000	0.00	16248.400000	Y 377.433
Fe (238.204 nm)	0.253659	ppm	0.003205	1.26	971.908567	Y_R 377.433
Fe H (259.940 nm)	0.091858 u	ppm	0.001955	2.13	502.136000	Y_R 377.433
K (766.491 nm)	19.979600	ppm	0.012341	0.06	23488.600000	Y_R2 488.368
Li (670.783 nm)	0.252566	ppm	0.002179	0.86	7736.450000	Y_R2 488.368
Mg (279.078 nm)	9.820540	ppm	0.013995	0.14	59974.600000	Y 377.433
Mn (257.610 nm)	0.258118	ppm	0.000151	0.06	70095.300000	Y 377.433
Mo (202.032 nm)	0.242034	ppm	0.000305	0.13	2414.460000	Y 377.433
Na (589.592 nm)	2.035910	ppm	0.000340	0.02	14896.500000	Y_R2 488.368
Na H (589.593 nm)	1.405616 u	ppm	0.015692	1.12	9975.880950	Y_R 488.368
Ni (231.604 nm)	0.248982	ppm	0.001255	0.50	1938.220000	Y 377.433
P (213.618 nm)	1.950200	ppm	0.000580	0.03	4951.760000	Y 242.219
Pb (220.353 nm)	0.258232	ppm	0.000129	0.05	823.044000	Y 242.219
S (181.972 nm)	0.003022 u	ppm	0.004988	> 100.00	26.253062	Y 377.433
Sb (206.834 nm)	0.250434	ppm	0.002485	0.99	747.789000	Y 377.433
Se (196.026 nm)	0.486330	ppm	0.001490	0.31	553.049000	Y 242.219
Si (288.158 nm)	2.030060	ppm	0.003550	0.17	19286.200000	Y 377.433
Sn (189.925 nm)	0.500636	ppm	0.002014	0.40	1178.460000	Y 377.433
Sr (421.552 nm)	0.254326	ppm	0.001136	0.45	55221.437357	Y_R 488.368
Th (288.505 nm)	0.003438	ppm	0.001461	42.49	90.742500	Y 377.433
Ti (336.122 nm)	0.251792	ppm	0.000124	0.05	36113.900000	Y 377.433
Tl (190.794 nm)	0.515615	ppm	0.000305	0.06	1305.720000	Y 377.433
U (409.013 nm)	-0.000980 u	ppm	0.002183	> 100.00	-117.153000	Y 377.433
V (292.401 nm)	0.246889	ppm	0.000030	0.01	10583.700000	Y 377.433
Zn (206.200 nm)	0.245262	ppm	0.000055	0.02	1425.940000	Y 377.433
Zr (343.823 nm)	0.249545	ppm	0.000280	0.11	33950.600000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.029740	21048.173059	0.000330	0.03
Y 377.433	1.027322	1130518.896507	0.001578	0.15
Y_R 377.433	1.026000	79099.300000	0.003343	0.33
Y_R 488.368	1.033530	45165.800000	0.004792	0.46
Y_R2 488.368	1.057072	91687.716719	0.000327	0.03

Sample Name: ICV-5236951

Date: 7/26/2018 11:34:16 AM Rack:Tube: 3:6

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.247159	ppm	0.000565	0.23	12042.700000	Y 377.433
Al (167.019 nm)	0.253149	ppm	0.002223	0.88	125.815000	Y_R 377.433
Al H (396.152 nm)	0.213832 u	ppm	0.000540	0.25	712.844232	Y_R 377.433
As (188.980 nm)	0.257120	ppm	0.003171	1.23	360.718000	Y 242.219
B (249.678 nm)	0.245501	ppm	0.000688	0.28	6882.590000	Y 242.219
Ba (493.408 nm)	0.255365	ppm	0.000139	0.05	31003.600000	Y_R 488.368
Be (234.861 nm)	0.248540	ppm	0.000595	0.24	80419.400000	Y_R 488.368
Bi (223.061 nm)	-0.002831 u	ppm	0.001709	60.36	6.693350	Y 377.433
Ca (315.887 nm)	2.031497	ppm	0.002976	0.15	1602.977295	Y_R 377.433
Cd (214.439 nm)	0.250717	ppm	0.000509	0.20	16559.000000	Y 377.433
Co (228.615 nm)	0.249268	ppm	0.000678	0.27	5150.260000	Y 242.219
Cr (205.560 nm)	0.248639	ppm	0.001493	0.60	4204.610000	Y 377.433
Cu (324.754 nm)	0.245121	ppm	0.000180	0.07	16258.700000	Y 377.433
Fe (238.204 nm)	0.254946	ppm	0.000678	0.27	976.758151	Y_R 377.433
Fe H (259.940 nm)	0.094186 u	ppm	0.003289	3.49	506.697000	Y_R 377.433
K (766.491 nm)	20.014100	ppm	0.034776	0.17	23530.400000	Y_R2 488.368
Li (670.783 nm)	0.252222	ppm	0.004011	1.59	7724.320000	Y_R2 488.368
Mg (279.078 nm)	9.887640	ppm	0.032192	0.33	60384.000000	Y 377.433
Mn (257.610 nm)	0.259958	ppm	0.000688	0.26	70594.700000	Y 377.433
Mo (202.032 nm)	0.243805	ppm	0.000969	0.40	2432.140000	Y 377.433
Na (589.592 nm)	2.040480	ppm	0.000473	0.02	14932.400000	Y_R2 488.368
Na H (589.593 nm)	1.441927 u	ppm	0.006449	0.45	10120.986746	Y_R 488.368
Ni (231.604 nm)	0.249713	ppm	0.001665	0.67	1943.900000	Y 377.433
P (213.618 nm)	1.961550	ppm	0.010619	0.54	4980.460000	Y 242.219
Pb (220.353 nm)	0.257263	ppm	0.002695	1.05	819.959000	Y 242.219
S (181.972 nm)	-0.004323 u	ppm	0.000970	22.44	22.106932	Y 377.433
Sb (206.834 nm)	0.254117	ppm	0.001451	0.57	758.970000	Y 377.433
Se (196.026 nm)	0.489319	ppm	0.000983	0.20	556.361000	Y 242.219
Si (288.158 nm)	2.050950	ppm	0.001770	0.09	19476.000000	Y 377.433
Sn (189.925 nm)	0.501440	ppm	0.000654	0.13	1180.350000	Y 377.433
Sr (421.552 nm)	0.256584	ppm	0.000617	0.24	55710.344921	Y_R 488.368
Th (288.505 nm)	0.001708 u	ppm	0.002764	> 100.00	85.994300	Y 377.433
Ti (336.122 nm)	0.252411	ppm	0.000415	0.16	36203.100000	Y 377.433
Tl (190.794 nm)	0.519521	ppm	0.000197	0.04	1315.660000	Y 377.433
U (409.013 nm)	0.003005	ppm	0.002894	96.30	-97.951000	Y 377.433
V (292.401 nm)	0.248097	ppm	0.001018	0.41	10635.000000	Y 377.433
Zn (206.200 nm)	0.247108	ppm	0.002180	0.88	1436.540000	Y 377.433
Zr (343.823 nm)	0.251009	ppm	0.000507	0.20	34149.800000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.009824	20641.092112	0.000418	0.04
Y 377.433	1.004401	1105295.785686	0.002037	0.20
Y_R 377.433	1.008640	77760.900000	0.001825	0.18
Y_R 488.368	1.010300	44150.500000	0.004553	0.45
Y_R2 488.368	1.039032	90123.024478	0.014323	1.38

Sample Name: ICVL-5236949

Date: 7/26/2018 11:37:56 AM Rack:Tube: 3:7

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009815	ppm	0.000533	5.43	80.303000	Y 377.433
Al (167.019 nm)	0.107174	ppm	0.000890	0.83	53.136000	Y_R 377.433
Al H (396.152 nm)	0.053857 u	ppm	0.003580	6.65	291.521660	Y_R 377.433
As (188.980 nm)	0.016686	ppm	0.003327	19.94	19.940200	Y 242.219
B (249.678 nm)	0.096987	ppm	0.000291	0.30	2753.370000	Y 242.219
Ba (493.408 nm)	0.009996	ppm	0.000104	1.04	1713.850000	Y_R 488.368
Be (234.861 nm)	0.001000	ppm	0.000003	0.33	277.202000	Y_R 488.368
Bi (223.061 nm)	0.102129	ppm	0.002260	2.21	301.007000	Y 377.433
Ca (315.887 nm)	0.210083	ppm	0.004738	2.26	97.827112	Y_R 377.433
Cd (214.439 nm)	0.005059	ppm	0.000121	2.38	331.210000	Y 377.433
Co (228.615 nm)	0.010136	ppm	0.000039	0.38	174.528000	Y 242.219
Cr (205.560 nm)	0.009787	ppm	0.000089	0.90	166.431000	Y 377.433
Cu (324.754 nm)	0.015322	ppm	0.000255	1.66	1313.200000	Y 377.433
Fe (238.204 nm)	0.102234	ppm	0.000362	0.35	401.521018	Y_R 377.433
Fe H (259.940 nm)	-0.058200 u	ppm	0.001185	2.04	208.294000	Y_R 377.433
K (766.491 nm)	3.067830	ppm	0.052203	1.70	2983.120000	Y_R2 488.368
Li (670.783 nm)	0.020190	ppm	0.000534	2.65	-453.437000	Y_R2 488.368
Mg (279.078 nm)	0.197349	ppm	0.001898	0.96	1249.390000	Y 377.433
Mn (257.610 nm)	0.010293	ppm	0.000084	0.82	2845.100000	Y 377.433
Mo (202.032 nm)	0.018527	ppm	0.000124	0.67	184.314000	Y 377.433
Na (589.592 nm)	1.032530	ppm	0.000283	0.03	7424.720000	Y_R2 488.368
Na H (589.593 nm)	0.323120 u	ppm	0.017337	5.37	5463.765523	Y_R 488.368
Ni (231.604 nm)	0.040544	ppm	0.000090	0.22	317.005000	Y 377.433
P (213.618 nm)	2.802600 o	ppm	0.005735	0.20	7106.770000	Y 242.219
Pb (220.353 nm)	0.009091	ppm	0.001860	20.46	32.553500	Y 242.219
S (181.972 nm)	0.099014	ppm	0.000652	0.66	79.828534	Y 377.433
Sb (206.834 nm)	0.020296	ppm	0.000263	1.30	44.607900	Y 377.433
Se (196.026 nm)	0.019274	ppm	0.000657	3.41	35.501500	Y 242.219
Si (288.158 nm)	0.487950	ppm	0.000240	0.05	5277.690000	Y 377.433
Sn (189.925 nm)	0.099501	ppm	0.000365	0.37	239.854000	Y 377.433
Sr (421.552 nm)	0.010138	ppm	0.000214	2.11	2337.175089	Y_R 488.368
Th (288.505 nm)	0.014608	ppm	0.000492	3.37	114.773000	Y 377.433
Ti (336.122 nm)	0.010009	ppm	0.000005	0.05	1237.980000	Y 377.433
Tl (190.794 nm)	0.015764	ppm	0.000028	0.17	34.280200	Y 377.433
U (409.013 nm)	0.062355	ppm	0.002521	4.04	209.206000	Y 377.433
V (292.401 nm)	0.009877	ppm	0.000005	0.05	439.435000	Y 377.433
Zn (206.200 nm)	0.018431	ppm	0.000427	2.32	122.999000	Y 377.433
Zr (343.823 nm)	0.014868	ppm	0.000026	0.17	2011.630000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.016318	20773.823244	0.005225	0.51
Y 377.433	1.012744	1114476.545936	0.006786	0.67
Y_R 377.433	1.013150	78108.500000	0.003412	0.34
Y_R 488.368	1.020970	44617.000000	0.012400	1.21
Y_R2 488.368	1.048034	90903.815548	0.014172	1.35

Sample Name: CCVH-5225153

Date: 7/26/2018 11:41:19 AM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000749 u	ppm	0.000179	23.84	-723.367000	Y 377.433
Al (167.019 nm)	46.222600 o	ppm	0.499027	1.08	23014.100000	Y_R 377.433
Al H (396.152 nm)	50.839869	ppm	0.339734	0.67	128080.969322	Y_R 377.433
As (188.980 nm)	0.000405 u	ppm	0.000759	> 100.00	-3.639040	Y 242.219
B (249.678 nm)	-0.000131 u	ppm	0.000062	47.75	-24.272200	Y 242.219
Ba (493.408 nm)	0.000343 u	ppm	0.000549	> 100.00	610.340000	Y_R 488.368
Be (234.861 nm)	0.000121	ppm	0.000107	88.37	1706.110000	Y_R 488.368
Bi (223.061 nm)	1.007140	ppm	0.000457	0.05	2848.200000	Y 377.433
Ca (315.887 nm)	0.005004	ppm	0.005203	> 100.00	-71.628718	Y_R 377.433
Cd (214.439 nm)	-0.000134 u	ppm	0.000014	10.19	41.772600	Y 377.433
Co (228.615 nm)	0.000763	ppm	0.000076	9.91	-20.459300	Y 242.219
Cr (205.560 nm)	-0.000266 u	ppm	0.000014	5.30	-19.048200	Y 377.433
Cu (324.754 nm)	-0.005598 u	ppm	0.000064	1.15	346.756000	Y 377.433
Fe (238.204 nm)	49.284947 o	ppm	0.390739	0.79	185663.938162	Y_R 377.433
Fe H (259.940 nm)	50.752900	ppm	0.251756	0.50	99706.700000	Y_R 377.433
K (766.491 nm)	0.070056	ppm	0.011703	16.71	-651.658000	Y_R2 488.368
Li (670.783 nm)	-0.000364 u	ppm	0.000434	> 100.00	-1177.830000	Y_R2 488.368
Mg (279.078 nm)	-0.011352 u	ppm	0.001081	9.52	-402.462000	Y 377.433
Mn (257.610 nm)	0.001540	ppm	0.000031	1.99	469.982000	Y 377.433
Mo (202.032 nm)	-0.000285 u	ppm	0.000182	63.85	-3.396800	Y 377.433
Na (589.592 nm)	240.421000 o	ppm	0.148192	0.06	1666540.000000	Y_R2 488.368
Na H (589.593 nm)	252.949467	ppm	4.196419	1.66	1000960.143151	Y_R 488.368
Ni (231.604 nm)	0.002138	ppm	0.001015	47.47	20.759000	Y 377.433
P (213.618 nm)	-0.004944 u	ppm	0.001306	26.42	8.809500	Y 242.219
Pb (220.353 nm)	-0.002022 u	ppm	0.000857	42.38	15.975900	Y 242.219
S (181.972 nm)	5.045836	ppm	0.008657	0.17	2874.959218	Y 377.433
Sb (206.834 nm)	-0.004272 u	ppm	0.002005	46.92	-79.105300	Y 377.433
Se (196.026 nm)	0.001408	ppm	0.000961	68.26	5.594130	Y 242.219
Si (288.158 nm)	0.029040	ppm	0.001139	3.92	1108.950000	Y 377.433
Sn (189.925 nm)	0.003213	ppm	0.001418	44.14	14.550900	Y 377.433
Sr (421.552 nm)	0.000479	ppm	0.000011	2.27	245.264366	Y_R 488.368
Th (288.505 nm)	5.069550	ppm	0.002059	0.04	14373.100000	Y 377.433
Ti (336.122 nm)	0.001287	ppm	0.000040	3.14	-20.355600	Y 377.433
Tl (190.794 nm)	-0.003552 u	ppm	0.001253	35.27	-16.370300	Y 377.433
U (409.013 nm)	10.227000	ppm	0.018976	0.19	49498.200000	Y 377.433
V (292.401 nm)	0.004051	ppm	0.000325	8.02	-2.899270	Y 377.433
Zn (206.200 nm)	-0.002248 u	ppm	0.000612	27.21	4.216770	Y 377.433
Zr (343.823 nm)	-0.003866 u	ppm	0.000060	1.56	-386.079000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.970747	19842.345961	0.000777	0.08
Y 377.433	0.955982	1052012.657731	0.000527	0.06
Y_R 377.433	0.982851	75772.500000	0.009479	0.96
Y_R 488.368	0.991110	43311.900000	0.016959	1.71
Y_R2 488.368	1.008560	87479.904216	0.003581	0.36

Sample Name: CCV-5225154

Date: 7/26/2018 11:44:44 AM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.492828	ppm	0.000474	0.10	24424.200000	Y 377.433
Al (167.019 nm)	0.521717	ppm	0.009152	1.75	260.759000	Y_R 377.433
Al H (396.152 nm)	0.500357 u	ppm	0.001799	0.36	1455.956003	Y_R 377.433
As (188.980 nm)	0.998012	ppm	0.001869	0.19	1410.800000	Y 242.219
B (249.678 nm)	0.495284	ppm	0.000671	0.14	13816.900000	Y 242.219
Ba (493.408 nm)	0.501850	ppm	0.002266	0.45	60426.300000	Y_R 488.368
Be (234.861 nm)	0.499573	ppm	0.002036	0.41	161764.000000	Y_R 488.368
Bi (223.061 nm)	-0.002181 u	ppm	0.000637	29.21	8.942710	Y 377.433
Ca (315.887 nm)	5.084325	ppm	0.010766	0.21	4125.627874	Y_R 377.433
Cd (214.439 nm)	0.499015	ppm	0.000530	0.11	32963.700000	Y 377.433
Co (228.615 nm)	0.502071	ppm	0.003343	0.67	10410.400000	Y 242.219
Cr (205.560 nm)	0.498218	ppm	0.001393	0.28	8423.540000	Y 377.433
Cu (324.754 nm)	0.496612	ppm	0.001596	0.32	32616.200000	Y 377.433
Fe (238.204 nm)	2.527854	ppm	0.004382	0.17	9538.391835	Y_R 377.433
Fe H (259.940 nm)	2.463130 u	ppm	0.012084	0.49	5145.570000	Y_R 377.433
K (766.491 nm)	49.761900	ppm	0.135145	0.27	59599.300000	Y_R2 488.368
Li (670.783 nm)	0.993684	ppm	0.003033	0.31	33856.400000	Y_R2 488.368
Mg (279.078 nm)	19.712700	ppm	0.005154	0.03	120336.000000	Y 377.433
Mn (257.610 nm)	0.500332	ppm	0.000699	0.14	135823.000000	Y 377.433
Mo (202.032 nm)	0.503750	ppm	0.000083	0.02	5025.870000	Y 377.433
Na (589.592 nm)	5.016120	ppm	0.003771	0.08	36079.000000	Y_R2 488.368
Na H (589.593 nm)	4.801768 u	ppm	0.030919	0.64	23610.062011	Y_R 488.368
Ni (231.604 nm)	0.504436	ppm	0.002502	0.50	3925.060000	Y 377.433
P (213.618 nm)	0.992121	ppm	0.001144	0.12	2529.570000	Y 242.219
Pb (220.353 nm)	1.008020	ppm	0.000855	0.08	3204.870000	Y 242.219
S (181.972 nm)	0.003421	ppm	0.003476	> 100.00	27.128167	Y 377.433
Sb (206.834 nm)	1.000880	ppm	0.000789	0.08	3025.970000	Y 377.433
Se (196.026 nm)	0.994917	ppm	0.001622	0.16	1116.120000	Y 242.219
Si (288.158 nm)	5.031440	ppm	0.018554	0.37	46550.700000	Y 377.433
Sn (189.925 nm)	1.006540	ppm	0.001967	0.20	2362.230000	Y 377.433
Sr (421.552 nm)	0.502652	ppm	0.001815	0.36	109001.733707	Y_R 488.368
Th (288.505 nm)	0.004316	ppm	0.000503	11.65	101.566000	Y 377.433
Ti (336.122 nm)	0.504948	ppm	0.000358	0.07	72633.700000	Y 377.433
Tl (190.794 nm)	1.015460	ppm	0.001518	0.15	2576.990000	Y 377.433
U (409.013 nm)	0.000652 u	ppm	0.001199	> 100.00	-128.403000	Y 377.433
V (292.401 nm)	0.497847	ppm	0.000401	0.08	21321.400000	Y 377.433
Zn (206.200 nm)	0.500946	ppm	0.001703	0.34	2894.610000	Y 377.433
Zr (343.823 nm)	0.500681	ppm	0.000397	0.08	68136.100000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.014113	20728.757965	0.001843	0.18
Y 377.433	1.010061	1111524.223189	0.000578	0.06
Y_R 377.433	1.011460	77978.200000	0.002306	0.23
Y_R 488.368	1.017610	44470.100000	0.002448	0.24
Y_R2 488.368	1.055917	91587.578834	0.005529	0.52

Sample Name: ICB

Date: 7/26/2018 11:48:07 AM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000133 u	ppm	0.000193	> 100.00	-407.378000	Y 377.433
Al (167.019 nm)	0.003879	ppm	0.001006	25.93	1.709370	Y_R 377.433
Al H (396.152 nm)	-0.049288 u	ppm	0.005314	10.78	30.424770	Y_R 377.433
As (188.980 nm)	0.001854	ppm	0.000700	37.74	-1.080620	Y 242.219
B (249.678 nm)	0.000835	ppm	0.000164	19.62	87.025100	Y 242.219
Ba (493.408 nm)	-0.000178 u	ppm	0.000221	> 100.00	499.582000	Y_R 488.368
Be (234.861 nm)	0.000078	ppm	0.000025	32.37	-24.115300	Y_R 488.368
Bi (223.061 nm)	0.000995	ppm	0.000148	14.83	17.375700	Y 377.433
Ca (315.887 nm)	0.004570	ppm	0.004278	93.62	-71.987628	Y_R 377.433
Cd (214.439 nm)	0.000060	ppm	0.000051	86.21	0.827296	Y 377.433
Co (228.615 nm)	0.000136	ppm	0.000099	72.72	-33.505600	Y 242.219
Cr (205.560 nm)	-0.000153 u	ppm	0.000038	24.68	-1.657230	Y 377.433
Cu (324.754 nm)	0.000218	ppm	0.000142	65.23	334.796000	Y 377.433
Fe (238.204 nm)	-0.000331 u	ppm	0.000618	> 100.00	15.176730	Y_R 377.433
Fe H (259.940 nm)	-0.159642 u	ppm	0.001805	1.13	9.648740	Y_R 377.433
K (766.491 nm)	0.031357	ppm	0.032163	> 100.00	-698.579000	Y_R2 488.368
Li (670.783 nm)	-0.000661 u	ppm	0.000088	13.25	-1188.300000	Y_R2 488.368
Mg (279.078 nm)	0.002101	ppm	0.002834	> 100.00	59.602200	Y 377.433
Mn (257.610 nm)	0.000039 u	ppm	0.000071	> 100.00	62.714700	Y 377.433
Mo (202.032 nm)	0.000145	ppm	0.000005	3.58	0.895281	Y 377.433
Na (589.592 nm)	0.005249	ppm	0.002715	51.71	284.299000	Y_R2 488.368
Na H (589.593 nm)	-0.662903 u	ppm	0.003693	0.56	1568.383641	Y_R 488.368
Ni (231.604 nm)	0.000303	ppm	0.000092	30.50	4.123470	Y 377.433
P (213.618 nm)	0.000004 u	ppm	0.002348	> 100.00	21.319700	Y 242.219
Pb (220.353 nm)	0.000346	ppm	0.000350	> 100.00	4.711420	Y 242.219
S (181.972 nm)	-0.004178 u	ppm	0.003102	74.25	21.493336	Y 377.433
Sb (206.834 nm)	-0.001138 u	ppm	0.001645	> 100.00	-20.353800	Y 377.433
Se (196.026 nm)	-0.001555 u	ppm	0.000120	7.69	12.441500	Y 242.219
Si (288.158 nm)	-0.000367 u	ppm	0.000259	70.54	841.824000	Y 377.433
Sn (189.925 nm)	0.000196 u	ppm	0.000314	> 100.00	7.490030	Y 377.433
Sr (421.552 nm)	0.000131	ppm	0.000058	44.51	169.941540	Y_R 488.368
Th (288.505 nm)	0.001845	ppm	0.001618	87.68	77.594900	Y 377.433
Ti (336.122 nm)	0.000086	ppm	0.000071	82.21	-193.579000	Y 377.433
Tl (190.794 nm)	0.001232	ppm	0.000135	10.97	-2.644310	Y 377.433
U (409.013 nm)	0.001118 u	ppm	0.003645	> 100.00	-86.283500	Y 377.433
V (292.401 nm)	-0.000033 u	ppm	0.000033	98.04	19.115600	Y 377.433
Zn (206.200 nm)	-0.002957 u	ppm	0.000048	1.62	0.143901	Y 377.433
Zr (343.823 nm)	0.000053	ppm	0.000004	8.02	-4.955000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.010706	20659.105533	0.002592	0.26
Y 377.433	1.008086	1109350.553204	0.001787	0.18
Y_R 377.433	1.006090	77563.900000	0.010791	1.07
Y_R 488.368	1.016310	44413.300000	0.005826	0.57
Y_R2 488.368	1.040509	90251.099947	0.003522	0.34

Sample Name: CRI-5236949

Date: 7/26/2018 11:51:29 AM Rack:Tube: 3:8

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009582	ppm	0.000352	3.67	68.573600	Y 377.433
Al (167.019 nm)	0.102161	ppm	0.002148	2.10	50.642600	Y_R 377.433
Al H (396.152 nm)	0.055241 u	ppm	0.011068	20.04	294.933452	Y_R 377.433
As (188.980 nm)	0.014861	ppm	0.000576	3.87	17.353200	Y 242.219
B (249.678 nm)	0.095229	ppm	0.000019	0.02	2704.590000	Y 242.219
Ba (493.408 nm)	0.009820	ppm	0.000024	0.25	1692.920000	Y_R 488.368
Be (234.861 nm)	0.000990	ppm	0.000008	0.82	273.762000	Y_R 488.368
Bi (223.061 nm)	0.101112	ppm	0.000511	0.51	298.154000	Y 377.433
Ca (315.887 nm)	0.205642	ppm	0.012641	6.15	94.157777	Y_R 377.433
Cd (214.439 nm)	0.004965	ppm	0.000028	0.57	324.972000	Y 377.433
Co (228.615 nm)	0.009994	ppm	0.000130	1.30	171.580000	Y 242.219
Cr (205.560 nm)	0.009536	ppm	0.000131	1.38	162.177000	Y 377.433
Cu (324.754 nm)	0.014904	ppm	0.000023	0.15	1286.420000	Y 377.433
Fe (238.204 nm)	0.101977	ppm	0.002460	2.41	400.553494	Y_R 377.433
Fe H (259.940 nm)	-0.059662 u	ppm	0.001592	2.67	205.430000	Y_R 377.433
K (766.491 nm)	3.077740	ppm	0.065946	2.14	2995.130000	Y_R2 488.368
Li (670.783 nm)	0.021135	ppm	0.000161	0.76	-420.101000	Y_R2 488.368
Mg (279.078 nm)	0.193107	ppm	0.000459	0.24	1223.550000	Y 377.433
Mn (257.610 nm)	0.010154	ppm	0.000023	0.22	2807.410000	Y 377.433
Mo (202.032 nm)	0.017846	ppm	0.000192	1.07	177.516000	Y 377.433
Na (589.592 nm)	1.009450	ppm	0.002168	0.21	7264.260000	Y_R2 488.368
Na H (589.593 nm)	0.359669 u	ppm	0.000828	0.23	5607.545421	Y_R 488.368
Ni (231.604 nm)	0.040013	ppm	0.001091	2.73	312.873000	Y 377.433
P (213.618 nm)	2.745430 o	ppm	0.004080	0.15	6962.250000	Y 242.219
Pb (220.353 nm)	0.008226	ppm	0.002035	24.74	29.801500	Y 242.219
S (181.972 nm)	0.094063	ppm	0.000902	0.96	77.030388	Y 377.433
Sb (206.834 nm)	0.019830	ppm	0.000344	1.73	43.199400	Y 377.433
Se (196.026 nm)	0.016045	ppm	0.001899	11.84	31.925500	Y 242.219
Si (288.158 nm)	0.480712	ppm	0.000161	0.03	5211.940000	Y 377.433
Sn (189.925 nm)	0.097478	ppm	0.000592	0.61	235.121000	Y 377.433
Sr (421.552 nm)	0.010004	ppm	0.000064	0.64	2308.131179	Y_R 488.368
Th (288.505 nm)	0.014140	ppm	0.000089	0.63	113.438000	Y 377.433
Ti (336.122 nm)	0.009955	ppm	0.000070	0.70	1230.150000	Y 377.433
Tl (190.794 nm)	0.015771	ppm	0.000536	3.40	34.299400	Y 377.433
U (409.013 nm)	0.060474	ppm	0.001922	3.18	200.129000	Y 377.433
V (292.401 nm)	0.009687	ppm	0.000098	1.01	431.528000	Y 377.433
Zn (206.200 nm)	0.017794	ppm	0.000335	1.88	119.340000	Y 377.433
Zr (343.823 nm)	0.014599	ppm	0.000049	0.34	1975.100000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.030013	21053.752442	0.001929	0.19
Y 377.433	1.024433	1127340.467346	0.001441	0.14
Y_R 377.433	1.022540	78832.500000	0.011012	1.08
Y_R 488.368	1.028790	44958.500000	0.005982	0.58
Y_R2 488.368	1.065818	92446.384038	0.001735	0.16

Sample Name: ICSA-5209627

Date: 7/26/2018 11:54:53 AM Rack:Tube: 3:9

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000200 u	ppm	0.000303	> 100.00	-424.787000	Y 377.433
Al (167.019 nm)	220.938000 o	ppm	1.173510	0.53	109974.000000	Y_R 377.433
Al H (396.152 nm)	522.879966 o	ppm	4.459984	0.85	1316065.266377	Y_R 377.433
As (188.980 nm)	0.006225	ppm	0.003080	49.48	3.220750	Y 242.219
B (249.678 nm)	0.005575	ppm	0.000096	1.72	-99.100800	Y 242.219
Ba (493.408 nm)	-0.000236 u	ppm	0.000422	> 100.00	788.172000	Y_R 488.368
Be (234.861 nm)	-0.000509 Ku	ppm	0.000072	14.04	6213.860000 K	Y_R 488.368
Bi (223.061 nm)	-0.005933 u	ppm	0.002155	36.32	32.740100	Y 377.433
Ca (315.887 nm)	472.691012 o	ppm	1.050083	0.22	390501.415947	Y_R 377.433
Cd (214.439 nm)	-0.000454 u	ppm	0.000090	19.85	168.658000	Y 377.433
Co (228.615 nm)	-0.002589 u	ppm	0.000232	8.98	-90.083300	Y 242.219
Cr (205.560 nm)	0.001153	ppm	0.000415	36.00	-37.699900	Y 377.433
Cu (324.754 nm)	-0.006259 u	ppm	0.000081	1.29	14.369900	Y 377.433
Fe (238.204 nm)	185.476547 o	ppm	1.056267	0.57	698673.161666	Y_R 377.433
Fe H (259.940 nm)	194.824000	ppm	1.006480	0.52	381827.000000	Y_R 377.433
K (766.491 nm)	0.055381	ppm	0.032120	58.00	-669.451000	Y_R2 488.368
Li (670.783 nm)	0.003809	ppm	0.000036	0.95	-1030.760000	Y_R2 488.368
Mg (279.078 nm)	512.795000 o	ppm	3.140930	0.61	3128950.000000	Y 377.433
Mn (257.610 nm)	0.001664 K	ppm	0.000002	0.10	503.496000 K	Y 377.433
Mo (202.032 nm)	0.000081 u	ppm	0.000309	> 100.00	0.260052	Y 377.433
Na (589.592 nm)	0.049283	ppm	0.008146	16.53	593.589000	Y_R2 488.368
Na H (589.593 nm)	0.200845 u	ppm	0.027375	13.63	4974.052137	Y_R 488.368
Ni (231.604 nm)	-0.002191 u	ppm	0.000503	22.95	-6.357420	Y 377.433
P (213.618 nm)	0.000662	ppm	0.000217	32.71	22.982000	Y 242.219
Pb (220.353 nm)	0.006222 K	ppm	0.000487	7.82	-146.056000 K	Y 242.219
S (181.972 nm)	0.057084 K	ppm	0.001504	2.64	56.113313 K	Y 377.433
Sb (206.834 nm)	-0.008446 u	ppm	0.002889	34.21	-114.390000	Y 377.433
Se (196.026 nm)	0.005999	ppm	0.002649	44.17	-11.732300	Y 242.219
Si (288.158 nm)	0.037465	ppm	0.001885	5.03	1185.490000	Y 377.433
Sn (189.925 nm)	0.007056	ppm	0.000944	13.38	23.542500	Y 377.433
Sr (421.552 nm)	0.004790 K	ppm	0.000106	2.21	1178.853912 K	Y_R 488.368
Th (288.505 nm)	0.000320 u	ppm	0.002549	> 100.00	63.503400	Y 377.433
Ti (336.122 nm)	0.000317	ppm	0.000090	28.26	1345.250000	Y 377.433
Tl (190.794 nm)	0.002015	ppm	0.000304	15.08	-6.481020	Y 377.433
U (409.013 nm)	-0.004751 u	ppm	0.004827	> 100.00	-23.766800	Y 377.433
V (292.401 nm)	0.001467	ppm	0.000066	4.50	83.963900	Y 377.433
Zn (206.200 nm)	0.001084	ppm	0.000275	25.32	23.356200	Y 377.433
Zr (343.823 nm)	-0.000484 u	ppm	0.000092	19.10	493.561000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.895889	18312.211814	0.000972	0.11
Y 377.433	0.892771	982451.820694	0.002956	0.33
Y_R 377.433	0.962535	74206.300000	0.004403	0.46
Y_R 488.368	0.971013	42433.700000	0.006417	0.66
Y_R2 488.368	0.987715	85671.869520	0.000408	0.04

Sample Name: ICSAB-5232439

Date: 7/26/2018 11:58:48 AM Rack:Tube: 3:10

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	1.118400 o	ppm	0.000165	0.01	56032.500000	Y 377.433
Al (167.019 nm)	220.410000 o	ppm	0.547584	0.25	109710.000000	Y_R 377.433
Al H (396.152 nm)	521.583097 o	ppm	0.240208	0.05	1312875.448160	Y_R 377.433
As (188.980 nm)	2.108260	ppm	0.006941	0.33	2982.570000	Y 242.219
B (249.678 nm)	2.111400 o	ppm	0.000874	0.04	58317.300000	Y 242.219
Ba (493.408 nm)	0.496823	ppm	0.004748	0.96	60107.000000	Y_R 488.368
Be (234.861 nm)	0.489887	ppm	0.004519	0.92	164837.000000	Y_R 488.368
Bi (223.061 nm)	1.030820	ppm	0.002249	0.22	2939.590000	Y 377.433
Ca (315.887 nm)	466.686365 o	ppm	0.227355	0.05	385540.421201	Y_R 377.433
Cd (214.439 nm)	0.939069	ppm	0.002690	0.29	62228.100000	Y 377.433
Co (228.615 nm)	0.459653	ppm	0.001887	0.41	9550.150000	Y 242.219
Cr (205.560 nm)	0.480075	ppm	0.002134	0.44	8059.520000	Y 377.433
Cu (324.754 nm)	0.525071	ppm	0.000365	0.07	35027.200000	Y 377.433
Fe (238.204 nm)	182.799998 o	ppm	0.986307	0.54	688591.082840	Y_R 377.433
Fe H (259.940 nm)	192.463000	ppm	0.184385	0.10	377204.000000	Y_R 377.433
K (766.491 nm)	53.850300	ppm	0.340159	0.63	64556.500000	Y_R2 488.368
Li (670.783 nm)	1.057640	ppm	0.001844	0.17	36110.500000	Y_R2 488.368
Mg (279.078 nm)	508.112000 o	ppm	0.582482	0.11	3100380.000000	Y 377.433
Mn (257.610 nm)	0.500598	ppm	0.000261	0.05	135895.000000	Y 377.433
Mo (202.032 nm)	0.953106	ppm	0.001953	0.20	9509.550000	Y 377.433
Na (589.592 nm)	52.182700 o	ppm	0.097831	0.19	362968.000000	Y_R2 488.368
Na H (589.593 nm)	56.179536	ppm	0.305831	0.54	226066.432137	Y_R 488.368
Ni (231.604 nm)	0.916620	ppm	0.002473	0.27	7150.130000	Y 377.433
P (213.618 nm)	2.019110	ppm	0.005180	0.26	5125.970000	Y 242.219
Pb (220.353 nm)	0.994855	ppm	0.005188	0.52	2991.590000	Y 242.219
S (181.972 nm)	1.143018	ppm	0.000541	0.05	671.035581	Y 377.433
Sb (206.834 nm)	1.058370	ppm	0.002779	0.26	3132.590000	Y 377.433
Se (196.026 nm)	5.108740 o	ppm	0.009123	0.18	5641.100000	Y 242.219
Si (288.158 nm)	10.742400	ppm	0.086017	0.80	98429.100000	Y 377.433
Sn (189.925 nm)	9.444420 o	ppm	0.038472	0.41	22105.900000	Y 377.433
Sr (421.552 nm)	0.999283	ppm	0.009299	0.93	216558.204511	Y_R 488.368
Th (288.505 nm)	2.061870	ppm	0.006706	0.33	5808.440000	Y 377.433
Ti (336.122 nm)	1.026430	ppm	0.000865	0.08	149312.000000	Y 377.433
Tl (190.794 nm)	9.646690 o	ppm	0.014824	0.15	24535.400000	Y 377.433
U (409.013 nm)	0.004638	ppm	0.000268	5.78	-62.463300	Y 377.433
V (292.401 nm)	0.494966	ppm	0.000247	0.05	21401.700000	Y 377.433
Zn (206.200 nm)	0.922439	ppm	0.002437	0.26	5315.700000	Y 377.433
Zr (343.823 nm)	0.995774	ppm	0.000266	0.03	136070.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.889011	18171.624292	0.000677	0.08
Y 377.433	0.889630	978995.879841	0.000096	0.01
Y_R 377.433	0.960659	74061.600000	0.002693	0.28
Y_R 488.368	0.962198	42048.500000	0.010188	1.06
Y_R2 488.368	0.990046	85874.057962	0.002482	0.25

Sample Name: LRA-5209732

Date: 7/26/2018 12:02:12 PM Rack:Tube: 3:11

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.006518 u	ppm	0.000088	1.35	-2491.060000	Y 377.433
Al (167.019 nm)	0.007819	ppm	0.002628	33.61	292.976000	Y_R 377.433
Al H (396.152 nm)	0.010156 u	ppm	0.007529	74.13	559.810058	Y_R 377.433
As (188.980 nm)	9.878990 o	ppm	0.015645	0.16	13993.500000	Y 242.219
B (249.678 nm)	9.769580 o	ppm	0.016791	0.17	270381.000000	Y 242.219
Ba (493.408 nm)	11.872000 o	ppm	0.182102	1.53	1417770.000000	Y_R 488.368
Be (234.861 nm)	-0.001569 u	ppm	0.000311	19.80	15426.800000	Y_R 488.368
Bi (223.061 nm)	-0.027393 u	ppm	0.001632	5.96	26.144800	Y 377.433
Ca (315.887 nm)	0.093591	ppm	0.004426	4.73	2.697309	Y_R 377.433
Cd (214.439 nm)	1.911520 o	ppm	0.000218	0.01	126784.000000	Y 377.433
Co (228.615 nm)	4.895350 o	ppm	0.013403	0.27	102015.000000	Y 242.219
Cr (205.560 nm)	9.591500 o	ppm	0.012916	0.13	162121.000000	Y 377.433
Cu (324.754 nm)	10.234900 o	ppm	0.025933	0.25	666315.000000	Y 377.433
Fe (238.204 nm)	471.746499 o	ppm	4.638209	0.98	1777000.495929	Y_R 377.433
Fe H (259.940 nm)	491.260000	ppm	6.844740	1.39	962310.000000	Y_R 377.433
K (766.491 nm)	-0.012776 u	ppm	0.043948	> 100.00	-752.090000	Y_R2 488.368
Li (670.783 nm)	0.002411	ppm	0.000989	41.01	-1080.020000	Y_R2 488.368
Mg (279.078 nm)	0.011003	ppm	0.002543	23.11	-749.989000	Y 377.433
Mn (257.610 nm)	9.491150 o	ppm	0.029758	0.31	2575580.000000	Y 377.433
Mo (202.032 nm)	4.761990 o	ppm	0.009604	0.20	47514.700000	Y 377.433
Na (589.592 nm)	0.009298	ppm	0.007856	84.49	25499.500000	Y_R2 488.368
Na H (589.593 nm)	-0.268534 u	ppm	0.051100	19.03	15114.036716	Y_R 488.368
Ni (231.604 nm)	9.767660 o	ppm	0.005910	0.06	75970.800000	Y 377.433
P (213.618 nm)	-0.823887 u	ppm	0.003352	0.41	-2061.620000	Y 242.219
Pb (220.353 nm)	10.113100 o	ppm	0.027751	0.27	32168.300000	Y 242.219
S (181.972 nm)	0.005022	ppm	0.006646	> 100.00	52.056716	Y 377.433
Sb (206.834 nm)	0.014278	ppm	0.002371	16.60	201.187000	Y 377.433
Se (196.026 nm)	4.996380 o	ppm	0.017494	0.35	5454.720000	Y 242.219
Si (288.158 nm)	48.875500 o	ppm	0.183815	0.38	444830.000000	Y 377.433
Sn (189.925 nm)	0.002714	ppm	0.000674	24.84	13.382300	Y 377.433
Sr (421.552 nm)	9.993041 o	ppm	0.061510	0.62	2164353.440227	Y_R 488.368
Th (288.505 nm)	0.020706	ppm	0.002074	10.02	704.880000	Y 377.433
Ti (336.122 nm)	9.681760 o	ppm	0.006223	0.06	1396100.000000	Y 377.433
Tl (190.794 nm)	5.036290 o	ppm	0.011672	0.23	12757.400000	Y 377.433
U (409.013 nm)	-0.033476 u	ppm	0.007107	21.23	222.298000	Y 377.433
V (292.401 nm)	9.703900 o	ppm	0.020245	0.21	415384.000000	Y 377.433
Zn (206.200 nm)	9.462270 o	ppm	0.034396	0.36	54369.300000	Y 377.433
Zr (343.823 nm)	-0.001909 u	ppm	0.000035	1.85	1179.730000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.013897	20724.347377	0.004078	0.40
Y 377.433	1.018433	1120737.896658	0.006972	0.68
Y_R 377.433	1.029090	79336.900000	0.002015	0.20
Y_R 488.368	1.040620	45475.400000	0.002694	0.26
Y_R2 488.368	1.061402	92063.309964	0.003283	0.31

Sample Name: CCVH-5225153

Date: 7/26/2018 12:05:36 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000610 u	ppm	0.000115	18.83	-712.099000	Y 377.433
Al (167.019 nm)	45.893400 o	ppm	0.352879	0.77	22850.000000	Y_R 377.433
Al H (396.152 nm)	50.118504	ppm	0.278065	0.55	126265.844658	Y_R 377.433
As (188.980 nm)	0.001539	ppm	0.001149	74.64	-2.025450	Y 242.219
B (249.678 nm)	0.004765	ppm	0.000089	1.87	112.558000	Y 242.219
Ba (493.408 nm)	0.000560	ppm	0.000007	1.19	635.567000	Y_R 488.368
Be (234.861 nm)	0.000125	ppm	0.000028	22.73	1685.130000	Y_R 488.368
Bi (223.061 nm)	0.986879	ppm	0.002121	0.21	2791.270000	Y 377.433
Ca (315.887 nm)	0.011282	ppm	0.006501	57.63	-66.441442	Y_R 377.433
Cd (214.439 nm)	-0.000051 u	ppm	0.000024	46.24	46.544000	Y 377.433
Co (228.615 nm)	0.000751	ppm	0.000188	25.00	-20.705900	Y 242.219
Cr (205.560 nm)	0.000090	ppm	0.000039	43.63	-12.828200	Y 377.433
Cu (324.754 nm)	-0.005215 u	ppm	0.000172	3.30	369.035000	Y 377.433
Fe (238.204 nm)	48.711631 o	ppm	0.273882	0.56	183504.360438	Y_R 377.433
Fe H (259.940 nm)	50.248400	ppm	0.364403	0.73	98718.800000	Y_R 377.433
K (766.491 nm)	0.039490	ppm	0.017957	45.47	-688.719000	Y_R2 488.368
Li (670.783 nm)	-0.000859 u	ppm	0.000258	30.07	-1195.280000	Y_R2 488.368
Mg (279.078 nm)	-0.006720 u	ppm	0.000514	7.65	-368.448000	Y 377.433
Mn (257.610 nm)	0.001730	ppm	0.000018	1.03	521.450000	Y 377.433
Mo (202.032 nm)	-0.000035 u	ppm	0.000063	> 100.00	-0.896546	Y 377.433
Na (589.592 nm)	236.954000 o	ppm	0.915044	0.39	1642510.000000	Y_R2 488.368
Na H (589.593 nm)	250.773757	ppm	0.619940	0.25	992387.154108	Y_R 488.368
Ni (231.604 nm)	0.001481	ppm	0.000217	14.66	15.614900	Y 377.433
P (213.618 nm)	-0.002149 u	ppm	0.001093	50.86	15.874900	Y 242.219
Pb (220.353 nm)	-0.000081 u	ppm	0.000659	> 100.00	21.843600	Y 242.219
S (181.972 nm)	4.892338	ppm	0.009528	0.19	2788.227219	Y 377.433
Sb (206.834 nm)	-0.005478 u	ppm	0.001592	29.06	-82.006100	Y 377.433
Se (196.026 nm)	0.000862	ppm	0.000389	45.08	5.118640	Y 242.219
Si (288.158 nm)	0.031071	ppm	0.000401	1.29	1127.400000	Y 377.433
Sn (189.925 nm)	0.002208	ppm	0.000291	13.17	12.198400	Y 377.433
Sr (421.552 nm)	0.000692	ppm	0.000080	11.63	291.338009	Y_R 488.368
Th (288.505 nm)	5.003560	ppm	0.031516	0.63	14186.300000	Y 377.433
Ti (336.122 nm)	0.001742	ppm	0.000048	2.77	45.279700	Y 377.433
Tl (190.794 nm)	-0.003069 u	ppm	0.000001	0.03	-15.124900	Y 377.433
U (409.013 nm)	10.078500	ppm	0.006395	0.06	48778.500000	Y 377.433
V (292.401 nm)	0.004204	ppm	0.000047	1.13	8.122640	Y 377.433
Zn (206.200 nm)	-0.002418 u	ppm	0.000466	19.26	3.235800	Y 377.433
Zr (343.823 nm)	-0.003828 u	ppm	0.000033	0.86	-382.862000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.987066	20175.898916	0.001093	0.11
Y 377.433	0.975947	1073983.228385	0.001243	0.13
Y_R 377.433	1.005050	77483.600000	0.005363	0.53
Y_R 488.368	1.001970	43786.300000	0.002447	0.24
Y_R2 488.368	1.041849	90367.302779	0.003355	0.32

Sample Name: CCV-5225154

Date: 7/26/2018 12:09:00 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.485614	ppm	0.001161	0.24	24060.700000	Y 377.433
Al (167.019 nm)	0.516578	ppm	0.008479	1.64	258.186000	Y_R 377.433
Al H (396.152 nm)	0.494014 u	ppm	0.006048	1.22	1439.385384	Y_R 377.433
As (188.980 nm)	0.981293	ppm	0.002057	0.21	1387.100000	Y 242.219
B (249.678 nm)	0.491181	ppm	0.001566	0.32	13702.800000	Y 242.219
Ba (493.408 nm)	0.495647	ppm	0.002968	0.60	59685.900000	Y_R 488.368
Be (234.861 nm)	0.492491	ppm	0.003381	0.69	159471.000000	Y_R 488.368
Bi (223.061 nm)	-0.001572 u	ppm	0.002162	> 100.00	10.645800	Y 377.433
Ca (315.887 nm)	5.024671	ppm	0.022583	0.45	4076.332570	Y_R 377.433
Cd (214.439 nm)	0.494061	ppm	0.001589	0.32	32636.400000	Y 377.433
Co (228.615 nm)	0.495851	ppm	0.001639	0.33	10280.900000	Y 242.219
Cr (205.560 nm)	0.493027	ppm	0.001821	0.37	8335.800000	Y 377.433
Cu (324.754 nm)	0.489683	ppm	0.002061	0.42	32165.500000	Y 377.433
Fe (238.204 nm)	2.509653	ppm	0.014991	0.60	9469.833746	Y_R 377.433
Fe H (259.940 nm)	2.442550 u	ppm	0.022068	0.90	5105.260000	Y_R 377.433
K (766.491 nm)	48.939800	ppm	0.112535	0.23	58602.500000	Y_R2 488.368
Li (670.783 nm)	0.976815	ppm	0.003659	0.37	33261.900000	Y_R2 488.368
Mg (279.078 nm)	19.529300	ppm	0.018954	0.10	119216.000000	Y 377.433
Mn (257.610 nm)	0.496529	ppm	0.000974	0.20	134791.000000	Y 377.433
Mo (202.032 nm)	0.497039	ppm	0.001039	0.21	4958.910000	Y 377.433
Na (589.592 nm)	4.930520	ppm	0.014681	0.30	35472.300000	Y_R2 488.368
Na H (589.593 nm)	4.578546 u	ppm	0.033998	0.74	22724.003713	Y_R 488.368
Ni (231.604 nm)	0.497301	ppm	0.000337	0.07	3869.570000	Y 377.433
P (213.618 nm)	0.966610	ppm	0.000987	0.10	2465.070000	Y 242.219
Pb (220.353 nm)	0.994168	ppm	0.002975	0.30	3160.870000	Y 242.219
S (181.972 nm)	0.002428 u	ppm	0.008036	> 100.00	26.553126	Y 377.433
Sb (206.834 nm)	0.988722	ppm	0.001093	0.11	2989.010000	Y 377.433
Se (196.026 nm)	0.980103	ppm	0.002984	0.30	1099.710000	Y 242.219
Si (288.158 nm)	4.997490	ppm	0.031335	0.63	46242.400000	Y 377.433
Sn (189.925 nm)	0.988130	ppm	0.002676	0.27	2319.150000	Y 377.433
Sr (421.552 nm)	0.496551	ppm	0.003267	0.66	107680.394259	Y_R 488.368
Th (288.505 nm)	0.004356	ppm	0.001395	32.02	101.490000	Y 377.433
Ti (336.122 nm)	0.499597	ppm	0.000806	0.16	71861.800000	Y 377.433
Tl (190.794 nm)	1.006750	ppm	0.004909	0.49	2554.840000	Y 377.433
U (409.013 nm)	-0.001594 u	ppm	0.001256	78.82	-138.785000	Y 377.433
V (292.401 nm)	0.493418	ppm	0.000975	0.20	21132.500000	Y 377.433
Zn (206.200 nm)	0.495736	ppm	0.002234	0.45	2864.680000	Y 377.433
Zr (343.823 nm)	0.495645	ppm	0.001501	0.30	67450.600000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.008795	20620.060719	0.000447	0.04
Y 377.433	1.002857	1103596.466265	0.000037	0.00
Y_R 377.433	1.006570	77600.800000	0.003587	0.36
Y_R 488.368	1.013380	44285.100000	0.004724	0.47
Y_R2 488.368	1.037870	90022.211221	0.005674	0.55

Sample Name: CCB

Date: 7/26/2018 12:12:23 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000255	ppm	0.000091	35.69	-401.313000	Y 377.433
Al (167.019 nm)	0.001072 u	ppm	0.001931	> 100.00	0.315752	Y_R 377.433
Al H (396.152 nm)	-0.055322 u	ppm	0.001420	2.57	15.222621	Y_R 377.433
As (188.980 nm)	0.001042	ppm	0.001024	98.30	-2.232560	Y 242.219
B (249.678 nm)	0.003028	ppm	0.000295	9.73	147.847000	Y 242.219
Ba (493.408 nm)	-0.000163 u	ppm	0.000044	26.93	501.396000	Y_R 488.368
Be (234.861 nm)	0.000016	ppm	0.000018	> 100.00	-44.069700	Y_R 488.368
Bi (223.061 nm)	0.000702 u	ppm	0.001455	> 100.00	16.552400	Y 377.433
Ca (315.887 nm)	0.005477	ppm	0.002194	40.05	-71.238036	Y_R 377.433
Cd (214.439 nm)	0.000023	ppm	0.000003	12.26	-1.615540	Y 377.433
Co (228.615 nm)	0.000079	ppm	0.000020	24.90	-34.695800	Y 242.219
Cr (205.560 nm)	-0.000078 u	ppm	0.000236	> 100.00	-0.390095	Y 377.433
Cu (324.754 nm)	0.000263	ppm	0.000311	> 100.00	337.084000	Y 377.433
Fe (238.204 nm)	0.002751	ppm	0.001365	49.61	26.784885	Y_R 377.433
Fe H (259.940 nm)	-0.158837 u	ppm	0.004225	2.66	11.226700	Y_R 377.433
K (766.491 nm)	0.045766	ppm	0.046086	> 100.00	-681.108000	Y_R2 488.368
Li (670.783 nm)	0.000819 u	ppm	0.001437	> 100.00	-1136.120000	Y_R2 488.368
Mg (279.078 nm)	0.001989	ppm	0.000252	12.68	58.956800	Y 377.433
Mn (257.610 nm)	0.000067	ppm	0.000008	12.60	70.198900	Y 377.433
Mo (202.032 nm)	-0.000102 u	ppm	0.000007	6.66	-1.572870	Y 377.433
Na (589.592 nm)	-0.003567 u	ppm	0.003233	90.64	222.625000	Y_R2 488.368
Na H (589.593 nm)	-0.773245 u	ppm	0.006722	0.87	1133.294128	Y_R 488.368
Ni (231.604 nm)	-0.000200 u	ppm	0.000254	> 100.00	0.208734	Y 377.433
P (213.618 nm)	-0.000223 u	ppm	0.002501	> 100.00	20.745400	Y 242.219
Pb (220.353 nm)	-0.000106 u	ppm	0.000450	> 100.00	3.275600	Y 242.219
S (181.972 nm)	-0.005418 u	ppm	0.005544	> 100.00	20.792704	Y 377.433
Sb (206.834 nm)	-0.000864 u	ppm	0.000071	8.22	-19.511600	Y 377.433
Se (196.026 nm)	-0.003622 u	ppm	0.002138	59.01	10.151600	Y 242.219
Si (288.158 nm)	-0.001553 u	ppm	0.000576	37.11	831.047000	Y 377.433
Sn (189.925 nm)	0.000803	ppm	0.000369	45.98	8.910310	Y 377.433
Sr (421.552 nm)	0.000019 u	ppm	0.000072	> 100.00	145.688182	Y_R 488.368
Th (288.505 nm)	0.001862 u	ppm	0.003326	> 100.00	77.621200	Y 377.433
Ti (336.122 nm)	0.000157	ppm	0.000019	11.93	-183.393000	Y 377.433
Tl (190.794 nm)	-0.000280 u	ppm	0.000521	> 100.00	-6.491590	Y 377.433
U (409.013 nm)	0.000306 u	ppm	0.003479	> 100.00	-90.195600	Y 377.433
V (292.401 nm)	-0.000007 u	ppm	0.000002	31.57	19.990800	Y 377.433
Zn (206.200 nm)	-0.002955 u	ppm	0.000033	1.11	0.154202	Y 377.433
Zr (343.823 nm)	-0.000056 u	ppm	0.000017	30.50	-19.735700	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.026923	20990.596356	0.003766	0.37
Y 377.433	1.025841	1128889.416448	0.003095	0.30
Y_R 377.433	1.024460	78980.600000	0.002083	0.20
Y_R 488.368	1.029070	44970.900000	0.006509	0.63
Y_R2 488.368	1.054505	91465.044677	0.000250	0.02

Sample Name: CCVL-5236949

Date: 7/26/2018 12:15:46 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009224	ppm	0.000154	1.67	50.667400	Y 377.433
Al (167.019 nm)	0.105691	ppm	0.002222	2.10	52.397000	Y_R 377.433
Al H (396.152 nm)	0.052069 u	ppm	0.006466	12.42	286.912192	Y_R 377.433
As (188.980 nm)	0.015689	ppm	0.000871	5.55	18.527600	Y 242.219
B (249.678 nm)	0.095562	ppm	0.000344	0.36	2713.830000	Y 242.219
Ba (493.408 nm)	0.009614	ppm	0.000226	2.35	1668.250000	Y_R 488.368
Be (234.861 nm)	0.000988	ppm	0.000005	0.55	273.139000	Y_R 488.368
Bi (223.061 nm)	0.100091	ppm	0.000011	0.01	295.293000	Y 377.433
Ca (315.887 nm)	0.200640	ppm	0.001737	0.87	90.024878	Y_R 377.433
Cd (214.439 nm)	0.004998	ppm	0.000124	2.47	327.192000	Y 377.433
Co (228.615 nm)	0.009928	ppm	0.000241	2.43	170.206000	Y 242.219
Cr (205.560 nm)	0.009305	ppm	0.000138	1.48	158.283000	Y 377.433
Cu (324.754 nm)	0.014584	ppm	0.000265	1.82	1265.650000	Y 377.433
Fe (238.204 nm)	0.100902	ppm	0.002559	2.54	396.500961	Y_R 377.433
Fe H (259.940 nm)	-0.060939 u	ppm	0.000875	1.44	202.930000	Y_R 377.433
K (766.491 nm)	3.047330	ppm	0.008328	0.27	2958.260000	Y_R2 488.368
Li (670.783 nm)	0.019042	ppm	0.000656	3.44	-493.889000	Y_R2 488.368
Mg (279.078 nm)	0.194412	ppm	0.001068	0.55	1231.640000	Y 377.433
Mn (257.610 nm)	0.010064	ppm	0.000011	0.11	2783.170000	Y 377.433
Mo (202.032 nm)	0.017502	ppm	0.000041	0.24	174.080000	Y 377.433
Na (589.592 nm)	0.996185	ppm	0.000571	0.06	7172.630000	Y_R2 488.368
Na H (589.593 nm)	0.264123 u	ppm	0.033476	12.67	5231.177072	Y_R 488.368
Ni (231.604 nm)	0.039555	ppm	0.000590	1.49	309.316000	Y 377.433
P (213.618 nm)	2.714650 o	ppm	0.002360	0.09	6884.440000	Y 242.219
Pb (220.353 nm)	0.009456	ppm	0.000639	6.76	33.702400	Y 242.219
S (181.972 nm)	0.087954	ppm	0.000170	0.19	73.578358	Y 377.433
Sb (206.834 nm)	0.016431	ppm	0.001725	10.50	32.915100	Y 377.433
Se (196.026 nm)	0.018822	ppm	0.001301	6.91	35.001000	Y 242.219
Si (288.158 nm)	0.477234	ppm	0.002525	0.53	5180.350000	Y 377.433
Sn (189.925 nm)	0.097734	ppm	0.000622	0.64	235.718000	Y 377.433
Sr (421.552 nm)	0.009924	ppm	0.000204	2.06	2290.689187	Y_R 488.368
Th (288.505 nm)	0.017213	ppm	0.001419	8.25	121.869000	Y 377.433
Ti (336.122 nm)	0.009875	ppm	0.000057	0.58	1218.750000	Y 377.433
Tl (190.794 nm)	0.016220	ppm	0.002465	15.20	35.445900	Y 377.433
U (409.013 nm)	0.061789	ppm	0.000912	1.48	206.505000	Y 377.433
V (292.401 nm)	0.009480	ppm	0.000004	0.04	422.888000	Y 377.433
Zn (206.200 nm)	0.017345	ppm	0.000132	0.76	116.761000	Y 377.433
Zr (343.823 nm)	0.014521	ppm	0.000087	0.60	1964.410000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.029042	21033.899165	0.000818	0.08
Y 377.433	1.024093	1126965.706080	0.001595	0.16
Y_R 377.433	1.022100	78798.100000	0.007257	0.71
Y_R 488.368	1.025910	44832.800000	0.024245	2.36
Y_R2 488.368	1.044569	90603.267714	0.006631	0.63

Sample Name: Bottle 110516-B-1

Date: 7/26/2018 12:19:09 PM Rack:Tube: 1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000907	ppm	0.000481	52.99	-369.417000	Y 377.433
Al (167.019 nm)	6.327870 o	ppm	0.154070	2.43	3149.940000	Y_R 377.433
Al H (396.152 nm)	6.716950	ppm	0.119773	1.78	17112.728760	Y_R 377.433
As (188.980 nm)	0.005845	ppm	0.000783	13.40	4.514590	Y 242.219
B (249.678 nm)	0.206375	ppm	0.006059	2.94	5776.220000	Y 242.219
Ba (493.408 nm)	0.260550	ppm	0.004009	1.54	31652.400000	Y_R 488.368
Be (234.861 nm)	0.000690	ppm	0.000023	3.37	380.176000	Y_R 488.368
Bi (223.061 nm)	-0.002101 u	ppm	0.001770	84.25	9.808190	Y 377.433
Ca (315.887 nm)	129.803933 o	ppm	0.077363	0.06	107179.192947	Y_R 377.433
Cd (214.439 nm)	0.000505	ppm	0.000032	6.37	36.757000	Y 377.433
Co (228.615 nm)	0.006081	ppm	0.000250	4.11	95.163900	Y 242.219
Cr (205.560 nm)	0.004666	ppm	0.000161	3.44	77.997600	Y 377.433
Cu (324.754 nm)	0.012483	ppm	0.000294	2.35	1047.570000	Y 377.433
Fe (238.204 nm)	5.972506 o	ppm	0.043742	0.73	22513.777005	Y_R 377.433
Fe H (259.940 nm)	5.982370 n	ppm	0.062607	1.05	12036.900000	Y_R 377.433
K (766.491 nm)	6.017930	ppm	0.039342	0.65	6560.090000	Y_R2 488.368
Li (670.783 nm)	0.034177	ppm	0.000306	0.90	39.532900	Y_R2 488.368
Mg (279.078 nm)	29.266000	ppm	0.910510	3.11	178627.000000	Y 377.433
Mn (257.610 nm)	1.015830	ppm	0.030448	3.00	275708.000000	Y 377.433
Mo (202.032 nm)	-0.000079 u	ppm	0.000372	> 100.00	-1.342160	Y 377.433
Na (589.592 nm)	122.668000 o	ppm	0.265281	0.22	850982.000000	Y_R2 488.368
Na H (589.593 nm)	128.347656	ppm	0.587571	0.46	510214.826806	Y_R 488.368
Ni (231.604 nm)	0.006375	ppm	0.000629	9.87	51.618200	Y 377.433
P (213.618 nm)	0.259062	ppm	0.006131	2.37	676.262000	Y 242.219
Pb (220.353 nm)	0.005627	ppm	0.001218	21.64	19.652500	Y 242.219
S (181.972 nm)	65.770195 o	ppm	1.967029	2.99	37189.372198	Y 377.433
Sb (206.834 nm)	-0.005291 u	ppm	0.000992	18.74	-34.679700	Y 377.433
Se (196.026 nm)	-0.000200 u	ppm	0.000772	> 100.00	13.688600	Y 242.219
Si (288.158 nm)	26.073400 o	ppm	1.699210	6.52	237696.000000	Y 377.433
Sn (189.925 nm)	0.001737	ppm	0.000132	7.63	11.096500	Y 377.433
Sr (421.552 nm)	1.489877 o	ppm	0.001397	0.09	322806.975626	Y_R 488.368
Th (288.505 nm)	0.007824	ppm	0.000193	2.47	116.388000	Y 377.433
Ti (336.122 nm)	0.133428	ppm	0.016890	12.66	19450.200000	Y 377.433
Tl (190.794 nm)	0.003250	ppm	0.003085	94.92	1.675830	Y 377.433
U (409.013 nm)	0.004564	ppm	0.001519	33.29	-90.461200	Y 377.433
V (292.401 nm)	0.010595	ppm	0.000397	3.74	480.003000	Y 377.433
Zn (206.200 nm)	0.023052	ppm	0.001085	4.71	149.539000	Y 377.433
Zr (343.823 nm)	0.005039	ppm	0.000891	17.69	692.039000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.993523	20307.894483	0.017500	1.76
Y 377.433	0.996539	1096643.552182	0.020079	2.01
Y_R 377.433	1.046640	80690.500000	0.000803	0.08
Y_R 488.368	1.047830	45790.500000	0.004704	0.45
Y_R2 488.368	1.071401	92930.596765	0.003091	0.29

Sample Name: Bottle 112137-D-13

Date: 7/26/2018 12:22:32 PM Rack:Tube: 1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000975	ppm	0.000102	10.44	-365.365000	Y 377.433
Al (167.019 nm)	-0.002662 u	ppm	0.004455	> 100.00	18.932100	Y_R 377.433
Al H (396.152 nm)	0.011494 u	ppm	0.004642	40.38	329.112195	Y_R 377.433
As (188.980 nm)	0.008533	ppm	0.000754	8.83	8.044440	Y 242.219
B (249.678 nm)	0.495036	ppm	0.000542	0.11	13732.900000	Y 242.219
Ba (493.408 nm)	0.048105	ppm	0.000405	0.84	6374.410000	Y_R 488.368
Be (234.861 nm)	0.000039	ppm	0.000022	56.13	1118.690000	Y_R 488.368
Bi (223.061 nm)	-0.002561 u	ppm	0.000610	23.82	13.657200	Y 377.433
Ca (315.887 nm)	333.562606 o	ppm	1.234607	0.37	275541.792173	Y_R 377.433
Cd (214.439 nm)	-0.000012 u	ppm	0.000064	> 100.00	32.337100	Y 377.433
Co (228.615 nm)	0.000455	ppm	0.000078	17.15	-26.907200	Y 242.219
Cr (205.560 nm)	-0.000179 u	ppm	0.000075	42.21	-12.546200	Y 377.433
Cu (324.754 nm)	-0.002384 u	ppm	0.000376	15.75	-35.313900	Y 377.433
Fe (238.204 nm)	33.429558 o	ppm	0.241324	0.72	125939.544051	Y_R 377.433
Fe H (259.940 nm)	34.774100 n	ppm	0.163960	0.47	68417.000000	Y_R 377.433
K (766.491 nm)	15.023800	ppm	0.013481	0.09	17479.600000	Y_R2 488.368
Li (670.783 nm)	0.085138	ppm	0.000299	0.35	1835.610000	Y_R2 488.368
Mg (279.078 nm)	96.999000 o	ppm	0.579831	0.60	591906.000000	Y 377.433
Mn (257.610 nm)	1.195040 o	ppm	0.007141	0.60	324339.000000	Y 377.433
Mo (202.032 nm)	0.000122 u	ppm	0.000251	> 100.00	0.664864	Y 377.433
Na (589.592 nm)	129.154000 o	ppm	0.592916	0.46	895481.000000	Y_R2 488.368
Na H (589.593 nm)	136.081124	ppm	1.437150	1.06	540475.505454	Y_R 488.368
Ni (231.604 nm)	0.005341	ppm	0.001211	22.68	44.889400	Y 377.433
P (213.618 nm)	0.459180	ppm	0.002103	0.46	1182.200000	Y 242.219
Pb (220.353 nm)	0.001243	ppm	0.000558	44.93	10.777000	Y 242.219
S (181.972 nm)	255.893758 bo	ppm	0.585288	0.23	144617.320633	Y 377.433
Sb (206.834 nm)	-0.002395 u	ppm	0.000751	31.36	-33.074500	Y 377.433
Se (196.026 nm)	0.007984	ppm	0.000889	11.13	16.674900	Y 242.219
Si (288.158 nm)	21.169500 o	ppm	0.221372	1.05	193149.000000	Y 377.433
Sn (189.925 nm)	0.005876	ppm	0.001359	23.13	20.780700	Y 377.433
Sr (421.552 nm)	1.104519 o	ppm	0.019068	1.73	239349.383207	Y_R 488.368
Th (288.505 nm)	0.007388	ppm	0.002454	33.22	117.011000	Y 377.433
Ti (336.122 nm)	0.000420	ppm	0.000069	16.50	917.004000	Y 377.433
Tl (190.794 nm)	-0.002777 u	ppm	0.001452	52.29	-13.888800	Y 377.433
U (409.013 nm)	-0.009943 u	ppm	0.000184	1.85	-174.229000	Y 377.433
V (292.401 nm)	0.000855	ppm	0.000073	8.56	58.620700	Y 377.433
Zn (206.200 nm)	-0.002879 u	ppm	0.000135	4.70	0.588429	Y 377.433
Zr (343.823 nm)	0.000010 u	ppm	0.000046	> 100.00	91.961000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.973521	19899.050974	0.006677	0.69
Y 377.433	0.996353	1096438.916647	0.009715	0.98
Y_R 377.433	1.036590	79915.100000	0.000947	0.09
Y_R 488.368	1.043960	45621.600000	0.010145	0.97
Y_R2 488.368	1.060448	91980.543112	0.008770	0.83

Sample Name: 280-112080-L-3-B

Date: 7/26/2018 12:25:55 PM Rack:Tube: 1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000412	ppm	0.000042	10.22	-393.325000	Y 377.433
Al (167.019 nm)	0.035644	ppm	0.002370	6.65	17.537600	Y_R 377.433
Al H (396.152 nm)	-0.007750 u	ppm	0.005649	72.89	167.669081	Y_R 377.433
As (188.980 nm)	0.002049	ppm	0.001618	78.97	-0.804527	Y 242.219
B (249.678 nm)	0.007308	ppm	0.000237	3.25	266.420000	Y 242.219
Ba (493.408 nm)	0.031496	ppm	0.000377	1.20	4297.630000	Y_R 488.368
Be (234.861 nm)	0.000040	ppm	0.000016	40.13	-34.713600	Y_R 488.368
Bi (223.061 nm)	-0.001127 u	ppm	0.000432	38.33	11.432600	Y 377.433
Ca (315.887 nm)	75.050541 o	ppm	0.370989	0.49	61937.322818	Y_R 377.433
Cd (214.439 nm)	0.000116	ppm	0.000042	36.44	4.615890	Y 377.433
Co (228.615 nm)	-0.000014 u	ppm	0.000056	> 100.00	-36.632600	Y 242.219
Cr (205.560 nm)	0.001158	ppm	0.000046	3.96	20.493700	Y 377.433
Cu (324.754 nm)	0.001584	ppm	0.000192	12.12	370.306000	Y 377.433
Fe (238.204 nm)	0.052427	ppm	0.001678	3.20	213.905405	Y_R 377.433
Fe H (259.940 nm)	-0.107794 nu	ppm	0.001780	1.65	111.178000	Y_R 377.433
K (766.491 nm)	1.394800	ppm	0.036723	2.63	954.589000	Y_R2 488.368
Li (670.783 nm)	0.002777	ppm	0.000760	27.38	-1067.140000	Y_R2 488.368
Mg (279.078 nm)	0.905051	ppm	0.001239	0.14	5569.740000	Y 377.433
Mn (257.610 nm)	0.002015	ppm	0.000046	2.30	598.802000	Y 377.433
Mo (202.032 nm)	-0.000202 u	ppm	0.000053	26.17	-2.562820	Y 377.433
Na (589.592 nm)	16.122600 o	ppm	0.027000	0.17	112056.000000	Y_R2 488.368
Na H (589.593 nm)	16.528630	ppm	0.300328	1.82	69345.780403	Y_R 488.368
Ni (231.604 nm)	-0.000109 u	ppm	0.000399	> 100.00	0.923881	Y 377.433
P (213.618 nm)	0.016400	ppm	0.001416	8.64	62.770500	Y 242.219
Pb (220.353 nm)	0.000630	ppm	0.000394	62.62	5.586270	Y 242.219
S (181.972 nm)	1.198631	ppm	0.014163	1.18	701.134147	Y 377.433
Sb (206.834 nm)	-0.001618 u	ppm	0.000013	0.78	-21.759500	Y 377.433
Se (196.026 nm)	-0.002889 u	ppm	0.001332	46.10	10.955600	Y 242.219
Si (288.158 nm)	3.871370	ppm	0.005721	0.15	36012.600000	Y 377.433
Sn (189.925 nm)	0.000439	ppm	0.000458	> 100.00	8.058880	Y 377.433
Sr (421.552 nm)	0.053097	ppm	0.000726	1.37	11640.764696	Y_R 488.368
Th (288.505 nm)	-0.000576 u	ppm	0.001210	> 100.00	70.832800	Y 377.433
Ti (336.122 nm)	0.000447	ppm	0.000087	19.50	97.178300	Y 377.433
Tl (190.794 nm)	0.000816	ppm	0.000660	80.91	-3.704690	Y 377.433
U (409.013 nm)	-0.001774 u	ppm	0.001056	59.52	-115.543000	Y 377.433
V (292.401 nm)	0.000358	ppm	0.000085	23.88	35.900100	Y 377.433
Zn (206.200 nm)	0.068873	ppm	0.000512	0.74	412.738000	Y 377.433
Zr (343.823 nm)	0.000029 u	ppm	0.000112	> 100.00	-7.968990	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.010537	20655.653455	0.003613	0.36
Y 377.433	1.023173	1125953.229818	0.002549	0.25
Y_R 377.433	1.055630	81383.500000	0.005427	0.51
Y_R 488.368	1.063450	46473.400000	0.016659	1.57
Y_R2 488.368	1.072762	93048.678373	0.003129	0.29

Sample Name: Bottle 112080-L-3

Date: 7/26/2018 12:29:18 PM Rack:Tube: 1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000634	ppm	0.000019	2.94	-382.322000	Y 377.433
Al (167.019 nm)	0.016340	ppm	0.002229	13.64	7.913800	Y_R 377.433
Al H (396.152 nm)	-0.013979 u	ppm	0.000915	6.55	150.759824	Y_R 377.433
As (188.980 nm)	0.001681	ppm	0.000196	11.65	-1.325770	Y 242.219
B (249.678 nm)	0.005980	ppm	0.000374	6.25	229.673000	Y 242.219
Ba (493.408 nm)	0.030070	ppm	0.000586	1.95	4126.790000	Y_R 488.368
Be (234.861 nm)	0.000151	ppm	0.000002	1.08	-0.149930	Y_R 488.368
Bi (223.061 nm)	0.003376	ppm	0.000423	12.52	24.054000	Y 377.433
Ca (315.887 nm)	72.129952 o	ppm	0.193297	0.27	59524.085389	Y_R 377.433
Cd (214.439 nm)	0.000187	ppm	0.000036	19.43	9.258570	Y 377.433
Co (228.615 nm)	0.000188	ppm	0.000119	63.17	-32.446700	Y 242.219
Cr (205.560 nm)	0.000838	ppm	0.000093	11.11	15.098900	Y 377.433
Cu (324.754 nm)	0.001778	ppm	0.000098	5.52	384.782000	Y 377.433
Fe (238.204 nm)	0.012521	ppm	0.000045	0.36	63.585126	Y_R 377.433
Fe H (259.940 nm)	-0.145863 nu	ppm	0.005868	4.02	36.630900	Y_R 377.433
K (766.491 nm)	1.346200	ppm	0.018507	1.37	895.663000	Y_R2 488.368
Li (670.783 nm)	0.003462	ppm	0.001012	29.24	-1042.980000	Y_R2 488.368
Mg (279.078 nm)	0.891234	ppm	0.009110	1.02	5485.390000	Y 377.433
Mn (257.610 nm)	0.001891	ppm	0.000025	1.31	565.234000	Y 377.433
Mo (202.032 nm)	0.000026 u	ppm	0.000156	> 100.00	-0.294105	Y 377.433
Na (589.592 nm)	17.591800 o	ppm	0.013766	0.08	122236.000000	Y_R2 488.368
Na H (589.593 nm)	17.887231	ppm	0.046241	0.26	74698.295962	Y_R 488.368
Ni (231.604 nm)	0.000660	ppm	0.000083	12.54	6.891740	Y 377.433
P (213.618 nm)	0.015336	ppm	0.000518	3.38	60.081500	Y 242.219
Pb (220.353 nm)	0.001097	ppm	0.001367	> 100.00	7.086880	Y 242.219
S (181.972 nm)	1.258504	ppm	0.011728	0.93	734.964233	Y 377.433
Sb (206.834 nm)	-0.003213 u	ppm	0.002300	71.58	-26.606800	Y 377.433
Se (196.026 nm)	-0.004398 u	ppm	0.001329	30.22	9.292370	Y 242.219
Si (288.158 nm)	3.962430	ppm	0.001881	0.05	36839.900000	Y 377.433
Sn (189.925 nm)	0.001170	ppm	0.001512	> 100.00	9.770870	Y 377.433
Sr (421.552 nm)	0.051248	ppm	0.000263	0.51	11240.353437	Y_R 488.368
Th (288.505 nm)	-0.000561 u	ppm	0.002852	> 100.00	70.957400	Y 377.433
Ti (336.122 nm)	0.001033	ppm	0.000055	5.28	172.735000	Y 377.433
Tl (190.794 nm)	0.000071 u	ppm	0.001360	> 100.00	-5.597740	Y 377.433
U (409.013 nm)	-0.003487 u	ppm	0.001243	35.65	-123.287000	Y 377.433
V (292.401 nm)	0.000155	ppm	0.000180	> 100.00	27.149500	Y 377.433
Zn (206.200 nm)	0.066833	ppm	0.000573	0.86	401.022000	Y 377.433
Zr (343.823 nm)	-0.000074 u	ppm	0.000026	35.19	-22.190700	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.038720	21231.732662	0.001565	0.15
Y 377.433	1.048791	1154144.489911	0.002232	0.21
Y_R 377.433	1.077390	83061.000000	0.001017	0.09
Y_R 488.368	1.082640	47311.800000	0.004866	0.45
Y_R2 488.368	1.097904	95229.364757	0.003031	0.28

Sample Name: 280-112080-I-5-A@2

Date: 7/26/2018 12:32:41 PM Rack:Tube: 1:5

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.001187	ppm	0.000322	27.13	-354.483000	Y 377.433
Al (167.019 nm)	0.002791	ppm	0.003086	> 100.00	1.178600	Y_R 377.433
Al H (396.152 nm)	-0.033432 u	ppm	0.004073	12.18	94.034552	Y_R 377.433
As (188.980 nm)	-0.002373 u	ppm	0.000859	36.21	-7.072810	Y 242.219
B (249.678 nm)	0.003063	ppm	0.000047	1.52	148.788000	Y 242.219
Ba (493.408 nm)	0.057543	ppm	0.000088	0.15	7401.190000	Y_R 488.368
Be (234.861 nm)	-0.000303 u	ppm	0.000038	12.39	-147.044000	Y_R 488.368
Bi (223.061 nm)	0.001662	ppm	0.000893	53.70	19.248400	Y 377.433
Ca (315.887 nm)	54.286651 o	ppm	0.187589	0.35	44780.461934	Y_R 377.433
Cd (214.439 nm)	0.027973	ppm	0.000205	0.73	1844.730000	Y 377.433
Co (228.615 nm)	-0.000112 u	ppm	0.000628	> 100.00	-38.662800	Y 242.219
Cr (205.560 nm)	-0.000014 u	ppm	0.000078	> 100.00	0.675990	Y 377.433
Cu (324.754 nm)	-0.000309 u	ppm	0.000139	45.07	269.544000	Y 377.433
Fe (238.204 nm)	0.015636	ppm	0.001184	7.57	75.321635	Y_R 377.433
Fe H (259.940 nm)	-0.148218 nu	ppm	0.003708	2.50	32.019300	Y_R 377.433
K (766.491 nm)	1.316200	ppm	0.026630	2.02	859.276000	Y_R2 488.368
Li (670.783 nm)	0.013008	ppm	0.001240	9.53	-706.554000	Y_R2 488.368
Mg (279.078 nm)	1.734340	ppm	0.015803	0.91	10630.200000	Y 377.433
Mn (257.610 nm)	11.273800 o	ppm	0.072149	0.64	3059340.000000	Y 377.433
Mo (202.032 nm)	0.000057 u	ppm	0.000142	> 100.00	0.020511	Y 377.433
Na (589.592 nm)	4.883640	ppm	0.022981	0.47	34217.500000	Y_R2 488.368
Na H (589.593 nm)	4.601360 u	ppm	0.058452	1.27	22371.196377	Y_R 488.368
Ni (231.604 nm)	0.064303	ppm	0.000460	0.72	501.717000	Y 377.433
P (213.618 nm)	0.002053	ppm	0.001754	85.44	26.497800	Y 242.219
Pb (220.353 nm)	0.001434	ppm	0.001562	> 100.00	8.175440	Y 242.219
S (181.972 nm)	0.621562	ppm	0.011411	1.84	405.149750	Y 377.433
Sb (206.834 nm)	-0.002430 u	ppm	0.000510	20.99	-24.269800	Y 377.433
Se (196.026 nm)	-0.002704 u	ppm	0.000623	23.04	21.318200	Y 242.219
Si (288.158 nm)	2.340900	ppm	0.016007	0.68	22109.900000	Y 377.433
Sn (189.925 nm)	0.000421 u	ppm	0.001045	> 100.00	8.016520	Y 377.433
Sr (421.552 nm)	0.044680	ppm	0.000213	0.48	9817.889581	Y_R 488.368
Th (288.505 nm)	0.039738	ppm	0.000823	2.07	427.268000	Y 377.433
Ti (336.122 nm)	0.000021	ppm	0.000014	63.66	-30.060000	Y 377.433
Tl (190.794 nm)	0.000282 u	ppm	0.000689	> 100.00	-5.060550	Y 377.433
U (409.013 nm)	-0.005497 u	ppm	0.000180	3.28	-129.369000	Y 377.433
V (292.401 nm)	-0.000711 u	ppm	0.000050	6.99	-6.846650	Y 377.433
Zn (206.200 nm)	0.118993	ppm	0.000759	0.64	700.632000	Y 377.433
Zr (343.823 nm)	-0.000092 u	ppm	0.000045	48.76	-24.669600	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.002249	20486.246410	0.002356	0.24
Y 377.433	1.009788	1111224.025595	0.001704	0.17
Y_R 377.433	1.018870	78549.000000	0.005465	0.54
Y_R 488.368	1.030830	45047.600000	0.008184	0.79
Y_R2 488.368	1.091125	94641.428544	0.001950	0.18

Sample Name: 280-112263-A-4-A@2

Date: 7/26/2018 12:37:29 PM Rack:Tube: 1:6

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000494 u	ppm	0.000151	30.66	-439.027000	Y 377.433
Al (167.019 nm)	0.113239	ppm	0.000666	0.59	59.248500	Y_R 377.433
Al H (396.152 nm)	0.078061 u	ppm	0.003829	4.91	418.173476	Y_R 377.433
As (188.980 nm)	0.029018	ppm	0.000721	2.49	37.367800	Y 242.219
B (249.678 nm)	0.003886	ppm	0.000119	3.05	167.489000	Y 242.219
Ba (493.408 nm)	0.016052	ppm	0.000194	1.21	2478.300000	Y_R 488.368
Be (234.861 nm)	-0.000133 u	ppm	0.000015	11.11	85.797800	Y_R 488.368
Bi (223.061 nm)	-0.001504 u	ppm	0.000251	16.69	11.332000	Y 377.433
Ca (315.887 nm)	154.153027 o	ppm	1.527117	0.99	127298.482004	Y_R 377.433
Cd (214.439 nm)	0.024623	ppm	0.000183	0.74	1629.140000	Y 377.433
Co (228.615 nm)	0.098220	ppm	0.000553	0.56	2003.330000	Y 242.219
Cr (205.560 nm)	-0.000196 u	ppm	0.000078	39.50	-4.011200	Y 377.433
Cu (324.754 nm)	0.001873	ppm	0.000109	5.82	340.967000	Y 377.433
Fe (238.204 nm)	5.164265	ppm	0.045855	0.89	19469.278034	Y_R 377.433
Fe H (259.940 nm)	5.172480 n	ppm	0.055659	1.08	10451.000000	Y_R 377.433
K (766.491 nm)	3.097700	ppm	0.040641	1.31	3019.340000	Y_R2 488.368
Li (670.783 nm)	0.013312	ppm	0.000168	1.26	-695.838000	Y_R2 488.368
Mg (279.078 nm)	18.132000	ppm	0.087288	0.48	110685.000000	Y 377.433
Mn (257.610 nm)	6.049440 o	ppm	0.041316	0.68	1641640.000000	Y 377.433
Mo (202.032 nm)	0.000092	ppm	0.000004	4.19	0.365980	Y 377.433
Na (589.592 nm)	0.610096	ppm	0.002940	0.48	4512.320000	Y_R2 488.368
Na H (589.593 nm)	0.038337 u	ppm	0.011737	30.62	4348.849084	Y_R 488.368
Ni (231.604 nm)	0.826802	ppm	0.007962	0.96	6430.070000	Y 377.433
P (213.618 nm)	-0.000777 u	ppm	0.004031	> 100.00	19.345200	Y 242.219
Pb (220.353 nm)	0.023128	ppm	0.000212	0.92	77.553300	Y 242.219
S (181.972 nm)	188.502333 bo	ppm	1.266930	0.67	106551.400159	Y 377.433
Sb (206.834 nm)	-0.003695 u	ppm	0.000708	19.16	-29.465900	Y 377.433
Se (196.026 nm)	0.018455	ppm	0.001594	8.64	38.907200	Y 242.219
Si (288.158 nm)	1.587610	ppm	0.000895	0.06	15267.000000	Y 377.433
Sn (189.925 nm)	0.000706	ppm	0.000360	50.91	8.684980	Y 377.433
Sr (421.552 nm)	0.732464	ppm	0.001614	0.22	158772.621921	Y_R 488.368
Th (288.505 nm)	0.057940	ppm	0.003373	5.82	364.108000	Y 377.433
Ti (336.122 nm)	-0.000275 u	ppm	0.000036	13.07	244.876000	Y 377.433
Tl (190.794 nm)	-0.000178 u	ppm	0.000376	> 100.00	-5.949160	Y 377.433
U (409.013 nm)	-0.138807 u	ppm	0.000901	0.65	-790.294000	Y 377.433
V (292.401 nm)	-0.000301 u	ppm	0.000065	21.63	9.259410	Y 377.433
Zn (206.200 nm)	11.712700 o	ppm	0.101141	0.86	67295.700000	Y 377.433
Zr (343.823 nm)	-0.000626 u	ppm	0.000007	1.11	-81.458800	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.205042	24631.390849	0.008984	0.75
Y 377.433	1.218290	1340670.112491	0.007544	0.62
Y_R 377.433	1.253060	96603.800000	0.009448	0.75
Y_R 488.368	1.264440	55256.600000	0.021853	1.73
Y_R2 488.368	1.266979	109894.576868	0.006301	0.50

Sample Name: 280-112263-A-5-A@2

Date: 7/26/2018 12:40:53 PM Rack:Tube: 1:7

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000508 u	ppm	0.000140	27.51	-439.808000	Y 377.433
Al (167.019 nm)	0.114625	ppm	0.001712	1.49	59.921700	Y_R 377.433
Al H (396.152 nm)	0.083664 u	ppm	0.010947	13.08	432.068087	Y_R 377.433
As (188.980 nm)	0.030319	ppm	0.001134	3.74	39.211900	Y 242.219
B (249.678 nm)	0.004072	ppm	0.000030	0.73	172.722000	Y 242.219
Ba (493.408 nm)	0.016362	ppm	0.000552	3.37	2515.200000	Y_R 488.368
Be (234.861 nm)	-0.000119 u	ppm	0.000011	9.05	89.566300	Y_R 488.368
Bi (223.061 nm)	-0.001897 u	ppm	0.002043	> 100.00	10.224800	Y 377.433
Ca (315.887 nm)	153.481419 o	ppm	1.788667	1.17	126743.542301	Y_R 377.433
Cd (214.439 nm)	0.024673	ppm	0.000244	0.99	1632.360000	Y 377.433
Co (228.615 nm)	0.098830	ppm	0.000668	0.68	2015.990000	Y 242.219
Cr (205.560 nm)	-0.000114 u	ppm	0.000062	54.28	-2.604210	Y 377.433
Cu (324.754 nm)	0.001659	ppm	0.000096	5.76	329.903000	Y 377.433
Fe (238.204 nm)	5.144725	ppm	0.068827	1.34	19395.673481	Y_R 377.433
Fe H (259.940 nm)	5.124330 n	ppm	0.064626	1.26	10356.700000	Y_R 377.433
K (766.491 nm)	3.014710	ppm	0.051915	1.72	2918.710000	Y_R2 488.368
Li (670.783 nm)	0.013744	ppm	0.000417	3.03	-680.605000	Y_R2 488.368
Mg (279.078 nm)	18.157700	ppm	0.136062	0.75	110842.000000	Y 377.433
Mn (257.610 nm)	6.071370 o	ppm	0.036154	0.60	1647590.000000	Y 377.433
Mo (202.032 nm)	0.000011 u	ppm	0.000097	> 100.00	-0.441349	Y 377.433
Na (589.592 nm)	0.613524	ppm	0.001367	0.22	4537.030000	Y_R2 488.368
Na H (589.593 nm)	0.061223 u	ppm	0.025016	40.86	4439.485736	Y_R 488.368
Ni (231.604 nm)	0.832685	ppm	0.011632	1.40	6475.810000	Y 377.433
P (213.618 nm)	-0.000529 u	ppm	0.001080	> 100.00	19.970300	Y 242.219
Pb (220.353 nm)	0.024798	ppm	0.000642	2.59	82.863000	Y 242.219
S (181.972 nm)	189.112520 bo	ppm	1.596188	0.84	106896.236242	Y 377.433
Sb (206.834 nm)	-0.002928 u	ppm	0.001118	38.19	-27.134400	Y 377.433
Se (196.026 nm)	0.019154	ppm	0.001325	6.92	39.706100	Y 242.219
Si (288.158 nm)	1.594380	ppm	0.022298	1.40	15328.500000	Y 377.433
Sn (189.925 nm)	-0.000064 u	ppm	0.000757	> 100.00	6.883560	Y 377.433
Sr (421.552 nm)	0.739066	ppm	0.009463	1.28	160202.462111	Y_R 488.368
Th (288.505 nm)	0.055563	ppm	0.001887	3.40	357.990000	Y 377.433
Ti (336.122 nm)	-0.000221 u	ppm	0.000033	14.77	251.184000	Y 377.433
Tl (190.794 nm)	-0.000172 u	ppm	0.000456	> 100.00	-5.932340	Y 377.433
U (409.013 nm)	-0.138583 u	ppm	0.000890	0.64	-789.135000	Y 377.433
V (292.401 nm)	-0.000482 u	ppm	0.000090	18.69	2.442900	Y 377.433
Zn (206.200 nm)	11.856900 o	ppm	0.240554	2.03	68124.000000	Y 377.433
Zr (343.823 nm)	-0.000640 u	ppm	0.000047	7.36	-83.407900	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.211355	24760.443587	0.005693	0.47
Y 377.433	1.223356	1346245.931981	0.005248	0.43
Y_R 377.433	1.224640	94413.200000	0.003940	0.32
Y_R 488.368	1.218420	53245.300000	0.003766	0.31
Y_R2 488.368	1.267832	109968.503810	0.000170	0.01

Sample Name: 280-112221-D-12-B@10

Date: 7/26/2018 12:44:15 PM Rack:Tube: 1:8

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000624	ppm	0.000092	14.70	-382.883000	Y 377.433
Al (167.019 nm)	0.003009	ppm	0.002987	99.26	1.284620	Y_R 377.433
Al H (396.152 nm)	-0.036527 u	ppm	0.001568	4.29	86.637821	Y_R 377.433
As (188.980 nm)	0.022353	ppm	0.001559	6.98	27.972600	Y 242.219
B (249.678 nm)	9.316060 o	ppm	0.615195	6.60	258374.000000	Y 242.219
Ba (493.408 nm)	0.005966	ppm	0.000281	4.71	1243.800000	Y_R 488.368
Be (234.861 nm)	0.000062	ppm	0.000001	1.35	-32.576500	Y_R 488.368
Bi (223.061 nm)	0.001489	ppm	0.001230	82.66	18.760800	Y 377.433
Ca (315.887 nm)	46.103385 o	ppm	1.223531	2.65	38018.740523	Y_R 377.433
Cd (214.439 nm)	0.000082	ppm	0.000007	8.17	2.298470	Y 377.433
Co (228.615 nm)	-0.000566 u	ppm	0.000190	33.57	-48.093700	Y 242.219
Cr (205.560 nm)	-0.000069 u	ppm	0.000108	> 100.00	-0.349645	Y 377.433
Cu (324.754 nm)	0.001594	ppm	0.000051	3.21	398.591000	Y 377.433
Fe (238.204 nm)	0.011720	ppm	0.000683	5.83	60.569982	Y_R 377.433
Fe H (259.940 nm)	-0.156827 nu	ppm	0.000201	0.13	15.161600	Y_R 377.433
K (766.491 nm)	76.176300	ppm	0.914014	1.20	91626.500000	Y_R2 488.368
Li (670.783 nm)	0.363618	ppm	0.007079	1.95	11650.400000	Y_R2 488.368
Mg (279.078 nm)	571.732000 o	ppm	34.986200	6.12	3488940.000000	Y 377.433
Mn (257.610 nm)	0.019790	ppm	0.001294	6.54	5422.220000	Y 377.433
Mo (202.032 nm)	0.049888	ppm	0.003907	7.83	497.230000	Y 377.433
Na (589.592 nm)	741.105000 o	ppm	6.401460	0.86	5136650.000000	Y_R2 488.368
Na H (589.593 nm)	893.732282	ppm	11.983915	1.34	3526056.199450	Y_R 488.368
Ni (231.604 nm)	0.002946	ppm	0.000604	20.52	24.671300	Y 377.433
P (213.618 nm)	0.014366	ppm	0.001643	11.44	57.627300	Y 242.219
Pb (220.353 nm)	-0.000875 u	ppm	0.000351	40.09	0.562813	Y 242.219
S (181.972 nm)	1120.894643 bo	ppm	61.683772	5.50	633374.509164	Y 377.433
Sb (206.834 nm)	-0.001346 u	ppm	0.000351	26.06	-21.278300	Y 377.433
Se (196.026 nm)	-0.000360 u	ppm	0.003433	> 100.00	13.780800	Y 242.219
Si (288.158 nm)	0.074019	ppm	0.008414	11.37	1517.540000	Y 377.433
Sn (189.925 nm)	0.001397	ppm	0.000924	66.15	10.301700	Y 377.433
Sr (421.552 nm)	2.477298 o	ppm	0.051169	2.07	536654.709984	Y_R 488.368
Th (288.505 nm)	0.007501	ppm	0.001481	19.75	93.714500	Y 377.433
Ti (336.122 nm)	0.000389	ppm	0.000058	14.96	-3.151990	Y 377.433
Tl (190.794 nm)	0.002013	ppm	0.000452	22.44	-0.798776	Y 377.433
U (409.013 nm)	-0.014944 u	ppm	0.002493	16.68	-173.477000	Y 377.433
V (292.401 nm)	0.000793	ppm	0.000116	14.64	55.942600	Y 377.433
Zn (206.200 nm)	-0.002492 u	ppm	0.000024	0.95	2.814650	Y 377.433
Zr (343.823 nm)	0.000147	ppm	0.000009	6.00	7.959740	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.928071	18970.031063	0.006500	0.70
Y 377.433	0.940577	1035060.347237	0.005859	0.62
Y_R 377.433	1.023230	78885.400000	0.004101	0.40
Y_R 488.368	1.028290	44936.800000	0.006011	0.58
Y_R2 488.368	1.050804	91144.074791	0.001145	0.11

Sample Name: 280-112221-D-15-B@10

Date: 7/26/2018 12:47:37 PM Rack:Tube: 1:9

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000661	ppm	0.000060	9.11	-381.041000	Y 377.433
Al (167.019 nm)	0.182743	ppm	0.004158	2.28	90.731200	Y_R 377.433
Al H (396.152 nm)	0.158971 u	ppm	0.001503	0.95	570.961741	Y_R 377.433
As (188.980 nm)	0.015759	ppm	0.002834	17.98	18.625600	Y 242.219
B (249.678 nm)	4.454770 o	ppm	0.325621	7.31	123583.000000	Y 242.219
Ba (493.408 nm)	0.012880	ppm	0.000492	3.82	2067.100000	Y_R 488.368
Be (234.861 nm)	0.000071	ppm	0.000003	3.65	-21.728800	Y_R 488.368
Bi (223.061 nm)	0.000818 u	ppm	0.001284	> 100.00	16.903800	Y 377.433
Ca (315.887 nm)	37.769936 o	ppm	0.871846	2.31	31132.943150	Y_R 377.433
Cd (214.439 nm)	0.000971	ppm	0.000042	4.38	61.153100	Y 377.433
Co (228.615 nm)	-0.000825 u	ppm	0.000235	28.53	-53.127000	Y 242.219
Cr (205.560 nm)	0.000596	ppm	0.000493	82.71	10.961600	Y 377.433
Cu (324.754 nm)	0.001924	ppm	0.000145	7.54	424.596000	Y 377.433
Fe (238.204 nm)	0.133764	ppm	0.002152	1.61	520.289324	Y_R 377.433
Fe H (259.940 nm)	-0.035313 nu	ppm	0.001273	3.60	253.112000	Y_R 377.433
K (766.491 nm)	41.576500	ppm	0.306441	0.74	49674.500000	Y_R2 488.368
Li (670.783 nm)	0.224017	ppm	0.002911	1.30	6730.270000	Y_R2 488.368
Mg (279.078 nm)	656.769000 o	ppm	43.997900	6.70	4007870.000000	Y 377.433
Mn (257.610 nm)	0.046079	ppm	0.003272	7.10	12556.000000	Y 377.433
Mo (202.032 nm)	0.000473	ppm	0.000195	41.27	4.167390	Y 377.433
Na (589.592 nm)	353.029000 o	ppm	2.087780	0.59	2447020.000000	Y_R2 488.368
Na H (589.593 nm)	414.659967	ppm	18.624725	4.49	1638215.777269	Y_R 488.368
Ni (231.604 nm)	0.000406	ppm	0.000463	> 100.00	4.925110	Y 377.433
P (213.618 nm)	0.076532	ppm	0.009413	12.30	214.794000	Y 242.219
Pb (220.353 nm)	0.002876	ppm	0.000211	7.33	12.690500	Y 242.219
S (181.972 nm)	979.329364 bo	ppm	58.167773	5.94	553384.496804	Y 377.433
Sb (206.834 nm)	0.000493	ppm	0.000592	> 100.00	-15.428200	Y 377.433
Se (196.026 nm)	0.005216	ppm	0.002409	46.19	19.958700	Y 242.219
Si (288.158 nm)	0.836743	ppm	0.066853	7.99	8446.120000	Y 377.433
Sn (189.925 nm)	0.000995	ppm	0.001084	> 100.00	9.361320	Y 377.433
Sr (421.552 nm)	0.774291	ppm	0.031805	4.11	167831.133198	Y_R 488.368
Th (288.505 nm)	0.007557	ppm	0.001549	20.50	94.531900	Y 377.433
Ti (336.122 nm)	0.009536	ppm	0.000781	8.19	1289.430000	Y 377.433
Tl (190.794 nm)	0.001521	ppm	0.000211	13.88	-1.958450	Y 377.433
U (409.013 nm)	-0.011482 u	ppm	0.002051	17.86	-154.912000	Y 377.433
V (292.401 nm)	0.000816	ppm	0.000041	5.06	58.137100	Y 377.433
Zn (206.200 nm)	-0.001597 u	ppm	0.000180	11.29	7.954540	Y 377.433
Zr (343.823 nm)	0.000551	ppm	0.000059	10.72	63.205400	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.952215	19463.548851	0.004370	0.46
Y 377.433	0.965882	1062908.050141	0.003035	0.31
Y_R 377.433	1.026660	79149.900000	0.006741	0.66
Y_R 488.368	1.017670	44472.600000	0.025174	2.47
Y_R2 488.368	1.053514	91379.121296	0.002396	0.23

Sample Name: CCVH-5225153

Date: 7/26/2018 12:51:01 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001205 u	ppm	0.000243	20.19	-740.778000	Y 377.433
Al (167.019 nm)	45.556600 o	ppm	0.361214	0.79	22682.300000	Y_R 377.433
Al H (396.152 nm)	49.823468	ppm	0.472087	0.95	125523.454772	Y_R 377.433
As (188.980 nm)	0.001289	ppm	0.001246	96.69	-2.376230	Y 242.219
B (249.678 nm)	0.006530	ppm	0.000030	0.46	162.090000	Y 242.219
Ba (493.408 nm)	0.000459	ppm	0.000411	89.64	623.203000	Y_R 488.368
Be (234.861 nm)	0.000209	ppm	0.000033	15.78	1700.910000	Y_R 488.368
Bi (223.061 nm)	0.978111	ppm	0.000632	0.06	2766.620000	Y 377.433
Ca (315.887 nm)	0.011789	ppm	0.001065	9.04	-66.022485	Y_R 377.433
Cd (214.439 nm)	-0.000150 u	ppm	0.000047	31.52	39.619700	Y 377.433
Co (228.615 nm)	0.001021	ppm	0.000072	7.08	-15.119700	Y 242.219
Cr (205.560 nm)	-0.000003 u	ppm	0.000071	> 100.00	-14.302900	Y 377.433
Cu (324.754 nm)	-0.005998 u	ppm	0.000194	3.23	313.848000	Y 377.433
Fe (238.204 nm)	48.691316 o	ppm	0.357094	0.73	183427.839236	Y_R 377.433
Fe H (259.940 nm)	49.919500	ppm	0.342152	0.69	98074.700000	Y_R 377.433
K (766.491 nm)	0.096648	ppm	0.032507	33.63	-619.415000	Y_R2 488.368
Li (670.783 nm)	0.000567 u	ppm	0.001694	> 100.00	-1145.020000	Y_R2 488.368
Mg (279.078 nm)	0.347389	ppm	0.029179	8.40	1794.370000	Y 377.433
Mn (257.610 nm)	0.001821	ppm	0.000018	0.98	546.151000	Y 377.433
Mo (202.032 nm)	-0.000114 u	ppm	0.000094	82.69	-1.687150	Y 377.433
Na (589.592 nm)	233.338000 o	ppm	1.154510	0.49	1617450.000000	Y_R2 488.368
Na H (589.593 nm)	249.582066	ppm	0.877991	0.35	987690.743012	Y_R 488.368
Ni (231.604 nm)	0.002045	ppm	0.000418	20.42	19.987600	Y 377.433
P (213.618 nm)	-0.002382 u	ppm	0.000410	17.20	15.286800	Y 242.219
Pb (220.353 nm)	-0.002160 u	ppm	0.000844	39.09	15.207800	Y 242.219
S (181.972 nm)	5.763193 Q	ppm	0.055192	0.96	3280.295477 Q	Y 377.433
Sb (206.834 nm)	-0.004500 u	ppm	0.000272	6.05	-78.783900	Y 377.433
Se (196.026 nm)	0.000206 u	ppm	0.001413	> 100.00	4.458210	Y 242.219
Si (288.158 nm)	0.024258	ppm	0.000618	2.55	1065.510000	Y 377.433
Sn (189.925 nm)	0.002064	ppm	0.002045	99.08	11.860600	Y 377.433
Sr (421.552 nm)	0.000632	ppm	0.000147	23.29	278.299936	Y_R 488.368
Th (288.505 nm)	4.984140	ppm	0.020337	0.41	14131.400000	Y 377.433
Ti (336.122 nm)	0.001505	ppm	0.000108	7.15	11.162300	Y 377.433
Tl (190.794 nm)	-0.003744 u	ppm	0.001203	32.12	-16.829000	Y 377.433
U (409.013 nm)	10.073600	ppm	0.010391	0.10	48754.500000	Y 377.433
V (292.401 nm)	0.003307	ppm	0.000059	1.77	-30.604400	Y 377.433
Zn (206.200 nm)	-0.001912 u	ppm	0.000132	6.92	6.143000	Y 377.433
Zr (343.823 nm)	-0.003903 u	ppm	0.000079	2.02	-394.070000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.005869	20560.237208	0.002012	0.20
Y 377.433	0.998520	1098823.603428	0.002970	0.30
Y_R 377.433	1.007640	77683.400000	0.006985	0.69
Y_R 488.368	1.015050	44358.200000	0.003286	0.32
Y_R2 488.368	1.032233	89533.270166	0.002886	0.28

Sample Name: CCV-5225154

Date: 7/26/2018 12:54:24 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.481447	ppm	0.002482	0.52	23851.500000	Y 377.433
Al (167.019 nm)	0.523001	ppm	0.004377	0.84	261.375000	Y_R 377.433
Al H (396.152 nm)	0.496104 u	ppm	0.001821	0.37	1444.345137	Y_R 377.433
As (188.980 nm)	0.972228	ppm	0.002472	0.25	1374.250000	Y 242.219
B (249.678 nm)	0.486013	ppm	0.001745	0.36	13559.400000	Y 242.219
Ba (493.408 nm)	0.494074	ppm	0.002480	0.50	59498.000000	Y_R 488.368
Be (234.861 nm)	0.487991	ppm	0.003041	0.62	158013.000000	Y_R 488.368
Bi (223.061 nm)	-0.002754 u	ppm	0.000525	19.08	7.328160	Y 377.433
Ca (315.887 nm)	4.989251	ppm	0.021630	0.43	4047.063000	Y_R 377.433
Cd (214.439 nm)	0.489948	ppm	0.002884	0.59	32364.700000	Y 377.433
Co (228.615 nm)	0.494451	ppm	0.001090	0.22	10251.700000	Y 242.219
Cr (205.560 nm)	0.489538	ppm	0.004819	0.98	8276.830000	Y 377.433
Cu (324.754 nm)	0.482312	ppm	0.002008	0.42	31686.800000	Y 377.433
Fe (238.204 nm)	2.507528	ppm	0.017167	0.68	9461.828208	Y_R 377.433
Fe H (259.940 nm)	2.412970 u	ppm	0.018425	0.76	5047.350000	Y_R 377.433
K (766.491 nm)	48.797200	ppm	0.012681	0.03	58429.600000	Y_R2 488.368
Li (670.783 nm)	0.966945	ppm	0.000084	0.01	32914.000000	Y_R2 488.368
Mg (279.078 nm)	19.365200	ppm	0.131828	0.68	118215.000000	Y 377.433
Mn (257.610 nm)	0.492953	ppm	0.002914	0.59	133820.000000	Y 377.433
Mo (202.032 nm)	0.494164	ppm	0.004202	0.85	4930.220000	Y 377.433
Na (589.592 nm)	4.945860	ppm	0.014084	0.28	35574.800000	Y_R2 488.368
Na H (589.593 nm)	5.687441 u	ppm	0.058967	1.04	27091.951798	Y_R 488.368
Ni (231.604 nm)	0.492691	ppm	0.002727	0.55	3833.710000	Y 377.433
P (213.618 nm)	0.959601	ppm	0.003580	0.37	2447.350000	Y 242.219
Pb (220.353 nm)	0.988062	ppm	0.004734	0.48	3141.490000	Y 242.219
S (181.972 nm)	0.146132	ppm	0.001700	1.16	107.738617	Y 377.433
Sb (206.834 nm)	0.979927	ppm	0.009427	0.96	2962.300000	Y 377.433
Se (196.026 nm)	0.965430	ppm	0.004060	0.42	1083.460000	Y 242.219
Si (288.158 nm)	4.953080	ppm	0.021365	0.43	45838.900000	Y 377.433
Sn (189.925 nm)	0.980211	ppm	0.004750	0.48	2300.620000	Y 377.433
Sr (421.552 nm)	0.493384	ppm	0.002539	0.51	106994.552664	Y_R 488.368
Th (288.505 nm)	0.002943	ppm	0.003267	> 100.00	97.433700	Y 377.433
Ti (336.122 nm)	0.496918	ppm	0.002053	0.41	71475.400000	Y 377.433
Tl (190.794 nm)	0.996593	ppm	0.007857	0.79	2529.000000	Y 377.433
U (409.013 nm)	-0.000522 u	ppm	0.003700	> 100.00	-133.551000	Y 377.433
V (292.401 nm)	0.490403	ppm	0.002692	0.55	21003.600000	Y 377.433
Zn (206.200 nm)	0.489424	ppm	0.002635	0.54	2828.420000	Y 377.433
Zr (343.823 nm)	0.496224	ppm	0.000824	0.17	67529.300000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.998679	20413.278398	0.002506	0.25
Y 377.433	0.996535	1096639.922990	0.005955	0.60
Y_R 377.433	0.996477	76823.000000	0.009106	0.91
Y_R 488.368	1.003550	43855.500000	0.007360	0.73
Y_R2 488.368	1.017713	88273.816249	0.002454	0.24

Sample Name: CCB

Date: 7/26/2018 12:57:46 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000127	ppm	0.000125	98.34	-407.802000	Y 377.433
Al (167.019 nm)	0.002554	ppm	0.001226	47.98	1.051610	Y_R 377.433
Al H (396.152 nm)	-0.053531 u	ppm	0.000772	1.44	19.718217	Y_R 377.433
As (188.980 nm)	0.002945	ppm	0.001490	50.60	0.465350	Y 242.219
B (249.678 nm)	0.002494	ppm	0.000128	5.12	133.039000	Y 242.219
Ba (493.408 nm)	0.000168 u	ppm	0.000243	> 100.00	540.919000	Y_R 488.368
Be (234.861 nm)	0.000021	ppm	0.000022	> 100.00	-42.679300	Y_R 488.368
Bi (223.061 nm)	0.002717	ppm	0.000904	33.27	22.204700	Y 377.433
Ca (315.887 nm)	-0.000807 u	ppm	0.004642	> 100.00	-76.430558	Y_R 377.433
Cd (214.439 nm)	0.000042	ppm	0.000058	> 100.00	-0.351437	Y 377.433
Co (228.615 nm)	0.000082 u	ppm	0.000356	> 100.00	-34.625600	Y 242.219
Cr (205.560 nm)	-0.000145 u	ppm	0.000302	> 100.00	-1.524390	Y 377.433
Cu (324.754 nm)	-0.000035 u	ppm	0.000059	> 100.00	317.721000	Y 377.433
Fe (238.204 nm)	0.000709	ppm	0.000361	50.88	19.095046	Y_R 377.433
Fe H (259.940 nm)	-0.156036 u	ppm	0.002192	1.40	16.710100	Y_R 377.433
K (766.491 nm)	0.041934	ppm	0.037906	90.39	-685.755000	Y_R2 488.368
Li (670.783 nm)	-0.001049 u	ppm	0.000806	76.85	-1201.960000	Y_R2 488.368
Mg (279.078 nm)	0.002786	ppm	0.000072	2.59	63.761600	Y 377.433
Mn (257.610 nm)	0.000039	ppm	0.000028	72.08	62.732300	Y 377.433
Mo (202.032 nm)	0.000117	ppm	0.000060	51.44	0.614350	Y 377.433
Na (589.592 nm)	0.041516	ppm	0.004407	10.61	534.906000	Y_R2 488.368
Na H (589.593 nm)	-0.061163 u	ppm	0.010579	17.30	3939.262750	Y_R 488.368
Ni (231.604 nm)	-0.000128 u	ppm	0.000142	> 100.00	0.771182	Y 377.433
P (213.618 nm)	-0.000307 u	ppm	0.002015	> 100.00	20.531200	Y 242.219
Pb (220.353 nm)	-0.000654 u	ppm	0.000502	76.73	1.540000	Y 242.219
S (181.972 nm)	0.095733 Z	ppm	0.001838	1.92	77.947339 Z	Y 377.433
Sb (206.834 nm)	-0.001049 u	ppm	0.003687	> 100.00	-20.081200	Y 377.433
Se (196.026 nm)	-0.000574 u	ppm	0.000379	66.09	13.528100	Y 242.219
Si (288.158 nm)	-0.002312 u	ppm	0.001016	43.94	824.155000	Y 377.433
Sn (189.925 nm)	0.000033 u	ppm	0.000603	> 100.00	7.110160	Y 377.433
Sr (421.552 nm)	0.000011 u	ppm	0.000192	> 100.00	143.886687	Y_R 488.368
Th (288.505 nm)	0.001325	ppm	0.000744	56.14	76.177000	Y 377.433
Ti (336.122 nm)	0.000134	ppm	0.000094	70.33	-186.716000	Y 377.433
Tl (190.794 nm)	0.001086	ppm	0.001272	> 100.00	-3.014140	Y 377.433
U (409.013 nm)	0.001868 u	ppm	0.003107	> 100.00	-82.631700	Y 377.433
V (292.401 nm)	0.000052 u	ppm	0.000176	> 100.00	22.504600	Y 377.433
Zn (206.200 nm)	-0.003060 u	ppm	0.000141	4.61	-0.448631	Y 377.433
Zr (343.823 nm)	0.000073	ppm	0.000019	25.88	-2.197170	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.006388	20570.848105	0.002426	0.24
Y 377.433	1.006960	1108111.636387	0.002537	0.25
Y_R 377.433	0.995696	76762.800000	0.006270	0.63
Y_R 488.368	1.008630	44077.400000	0.003062	0.30
Y_R2 488.368	1.019099	88394.049414	0.000377	0.04

Sample Name: CCVL-5236949

Date: 7/26/2018 1:01:09 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009474	ppm	0.000219	2.31	63.223300	Y 377.433
Al (167.019 nm)	0.099363	ppm	0.002047	2.06	49.249200	Y_R 377.433
Al H (396.152 nm)	0.051783 u	ppm	0.001490	2.88	286.224509	Y_R 377.433
As (188.980 nm)	0.014732	ppm	0.003252	22.07	17.170700	Y 242.219
B (249.678 nm)	0.094612	ppm	0.000218	0.23	2687.500000	Y 242.219
Ba (493.408 nm)	0.009869	ppm	0.000125	1.26	1698.780000	Y_R 488.368
Be (234.861 nm)	0.000990	ppm	0.000012	1.21	273.859000	Y_R 488.368
Bi (223.061 nm)	0.099345	ppm	0.000668	0.67	293.198000	Y 377.433
Ca (315.887 nm)	0.203400	ppm	0.003233	1.59	92.305421	Y_R 377.433
Cd (214.439 nm)	0.004945	ppm	0.000014	0.29	323.673000	Y 377.433
Co (228.615 nm)	0.009842	ppm	0.000183	1.86	168.420000	Y 242.219
Cr (205.560 nm)	0.009204	ppm	0.000078	0.85	156.563000	Y 377.433
Cu (324.754 nm)	0.013985	ppm	0.000166	1.19	1226.410000	Y 377.433
Fe (238.204 nm)	0.099019	ppm	0.000551	0.56	389.409029	Y_R 377.433
Fe H (259.940 nm)	-0.061273 u	ppm	0.002245	3.66	202.277000	Y_R 377.433
K (766.491 nm)	3.022590	ppm	0.056571	1.87	2928.260000	Y_R2 488.368
Li (670.783 nm)	0.018517	ppm	0.000082	0.44	-512.378000	Y_R2 488.368
Mg (279.078 nm)	0.193356	ppm	0.000358	0.19	1225.180000	Y 377.433
Mn (257.610 nm)	0.009998	ppm	0.000041	0.41	2765.230000	Y 377.433
Mo (202.032 nm)	0.017786	ppm	0.000070	0.39	176.923000	Y 377.433
Na (589.592 nm)	1.023540	ppm	0.007443	0.73	7362.220000	Y_R2 488.368
Na H (589.593 nm)	0.883014 u	ppm	0.020277	2.30	7669.999527	Y_R 488.368
Ni (231.604 nm)	0.038353	ppm	0.000115	0.30	299.964000	Y 377.433
P (213.618 nm)	2.661470 o	ppm	0.003379	0.13	6749.970000	Y 242.219
Pb (220.353 nm)	0.009162	ppm	0.002075	22.65	32.766900	Y 242.219
S (181.972 nm)	0.159915 Q	ppm	0.002001	1.25	114.238887 Q	Y 377.433
Sb (206.834 nm)	0.017080	ppm	0.001514	8.86	34.874900	Y 377.433
Se (196.026 nm)	0.015625	ppm	0.000443	2.84	31.460000	Y 242.219
Si (288.158 nm)	0.474451	ppm	0.000338	0.07	5155.070000	Y 377.433
Sn (189.925 nm)	0.095226	ppm	0.000210	0.22	229.851000	Y 377.433
Sr (421.552 nm)	0.009847	ppm	0.000137	1.39	2274.172085	Y_R 488.368
Th (288.505 nm)	0.014136	ppm	0.001652	11.69	113.332000	Y 377.433
Ti (336.122 nm)	0.009680	ppm	0.000080	0.83	1190.580000	Y 377.433
Tl (190.794 nm)	0.015344	ppm	0.002277	14.84	33.216200	Y 377.433
U (409.013 nm)	0.060706	ppm	0.009626	15.86	201.255000	Y 377.433
V (292.401 nm)	0.009415	ppm	0.000318	3.38	419.916000	Y 377.433
Zn (206.200 nm)	0.017134	ppm	0.000183	1.07	115.547000	Y 377.433
Zr (343.823 nm)	0.014459	ppm	0.000109	0.75	1956.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.017317	20794.239369	0.001363	0.13
Y 377.433	1.016091	1118160.596700	0.002107	0.21
Y_R 377.433	1.018430	78515.300000	0.001514	0.15
Y_R 488.368	1.023520	44728.400000	0.004399	0.43
Y_R2 488.368	1.041961	90377.025194	0.000074	0.01

Sample Name: LB 280-423271/1-B

Date: 7/26/2018 1:04:33 PM Rack:Tube: 1:10

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000110 u	ppm	0.000053	47.81	-419.619000	Y 377.433
Al (167.019 nm)	0.005376	ppm	0.001195	22.23	2.462150	Y_R 377.433
Al H (396.152 nm)	-0.049514 u	ppm	0.007742	15.64	29.951923	Y_R 377.433
As (188.980 nm)	0.001613 u	ppm	0.002347	> 100.00	-1.422960	Y 242.219
B (249.678 nm)	0.041331	ppm	0.000752	1.82	1209.850000	Y 242.219
Ba (493.408 nm)	0.001396	ppm	0.000088	6.33	687.546000	Y_R 488.368
Be (234.861 nm)	0.000040	ppm	0.000005	11.17	-35.917000	Y_R 488.368
Bi (223.061 nm)	0.003300	ppm	0.000533	16.15	23.840700	Y 377.433
Ca (315.887 nm)	0.264830	ppm	0.008461	3.19	143.061301	Y_R 377.433
Cd (214.439 nm)	0.000046	ppm	0.000031	68.49	-0.083106	Y 377.433
Co (228.615 nm)	0.000120	ppm	0.000028	23.32	-33.848700	Y 242.219
Cr (205.560 nm)	0.000270	ppm	0.000055	20.28	5.489390	Y 377.433
Cu (324.754 nm)	0.002896	ppm	0.000303	10.46	508.998000	Y 377.433
Fe (238.204 nm)	0.012441	ppm	0.000191	1.53	63.287344	Y_R 377.433
Fe H (259.940 nm)	-0.148018 nu	ppm	0.002919	1.97	32.411200	Y_R 377.433
K (766.491 nm)	0.110355	ppm	0.054348	49.25	-602.795000	Y_R2 488.368
Li (670.783 nm)	-0.002075 u	ppm	0.000914	44.03	-1238.140000	Y_R2 488.368
Mg (279.078 nm)	0.045424	ppm	0.001037	2.28	324.005000	Y 377.433
Mn (257.610 nm)	0.000298	ppm	0.000008	2.82	132.857000	Y 377.433
Mo (202.032 nm)	0.000231	ppm	0.000047	20.30	1.755260	Y 377.433
Na (589.592 nm)	291.955000 o	ppm	1.278770	0.44	2023710.000000	Y_R2 488.368
Na H (589.593 nm)	312.315218	ppm	0.714550	0.23	1234901.065857	Y_R 488.368
Ni (231.604 nm)	-0.000255 u	ppm	0.000585	> 100.00	-0.220100	Y 377.433
P (213.618 nm)	0.001346	ppm	0.000785	58.34	24.712000	Y 242.219
Pb (220.353 nm)	0.005179	ppm	0.001380	26.65	20.068400	Y 242.219
S (181.972 nm)	0.062580	ppm	0.001967	3.14	59.215120	Y 377.433
Sb (206.834 nm)	-0.000452 u	ppm	0.002337	> 100.00	-18.252800	Y 377.433
Se (196.026 nm)	-0.000463 u	ppm	0.000514	> 100.00	13.649000	Y 242.219
Si (288.158 nm)	0.036055	ppm	0.004724	13.10	1172.680000	Y 377.433
Sn (189.925 nm)	-0.000626 u	ppm	0.000629	> 100.00	5.566570	Y 377.433
Sr (421.552 nm)	0.000815	ppm	0.000006	0.70	317.905845	Y_R 488.368
Th (288.505 nm)	0.004521	ppm	0.000716	15.84	84.994900	Y 377.433
Ti (336.122 nm)	0.000275	ppm	0.000002	0.67	-165.552000	Y 377.433
Tl (190.794 nm)	-0.000858 u	ppm	0.001257	> 100.00	-7.964770	Y 377.433
U (409.013 nm)	-0.009621 u	ppm	0.004152	43.16	-138.323000	Y 377.433
V (292.401 nm)	0.000022 u	ppm	0.000068	> 100.00	21.479000	Y 377.433
Zn (206.200 nm)	0.000437	ppm	0.000382	87.49	19.636300	Y 377.433
Zr (343.823 nm)	0.000055	ppm	0.000028	50.68	-4.670150	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.992145	20279.721641	0.002748	0.28
Y 377.433	0.990751	1090274.985547	0.003432	0.35
Y_R 377.433	1.012950	78092.800000	0.007663	0.76
Y_R 488.368	1.020430	44593.200000	0.004691	0.46
Y_R2 488.368	1.033745	89664.400433	0.004243	0.41

Sample Name: LCS 280-423271/2-B

Date: 7/26/2018 1:07:56 PM Rack:Tube: 1:11

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.202703	ppm	0.000465	0.23	9786.100000	Y 377.433
Al (167.019 nm)	0.380226	ppm	0.004605	1.21	188.967000	Y_R 377.433
Al H (396.152 nm)	0.347923 u	ppm	0.007074	2.03	1048.953355	Y_R 377.433
As (188.980 nm)	0.767863	ppm	0.000988	0.13	1084.620000	Y 242.219
B (249.678 nm)	0.223586	ppm	0.000640	0.29	6267.470000	Y 242.219
Ba (493.408 nm)	2.277620 o	ppm	0.014325	0.63	272335.000000	Y_R 488.368
Be (234.861 nm)	0.009167	ppm	0.000079	0.86	2913.810000	Y_R 488.368
Bi (223.061 nm)	0.376995	ppm	0.003540	0.94	1071.840000	Y 377.433
Ca (315.887 nm)	9.492600	ppm	0.032037	0.34	7767.943353	Y_R 377.433
Cd (214.439 nm)	0.205995	ppm	0.001472	0.71	13604.600000	Y 377.433
Co (228.615 nm)	0.093546	ppm	0.000334	0.36	1913.990000	Y 242.219
Cr (205.560 nm)	0.970955	ppm	0.005074	0.52	16427.800000	Y 377.433
Cu (324.754 nm)	0.430963	ppm	0.002596	0.60	28350.200000	Y 377.433
Fe (238.204 nm)	0.196356	ppm	0.000082	0.04	756.059055	Y_R 377.433
Fe H (259.940 nm)	0.035375 nu	ppm	0.002405	6.80	391.532000	Y_R 377.433
K (766.491 nm)	9.794710	ppm	0.059031	0.60	11139.400000	Y_R2 488.368
Li (670.783 nm)	0.190555	ppm	0.000704	0.37	5550.920000	Y_R2 488.368
Mg (279.078 nm)	9.149760	ppm	0.033649	0.37	55870.800000	Y 377.433
Mn (257.610 nm)	0.093336	ppm	0.000325	0.35	25379.700000	Y 377.433
Mo (202.032 nm)	0.186760	ppm	0.000261	0.14	1862.940000	Y 377.433
Na (589.592 nm)	279.428000 o	ppm	0.955753	0.34	1941720.000000	Y_R2 488.368
Na H (589.593 nm)	299.663395	ppm	2.497875	0.83	1187344.207763	Y_R 488.368
Ni (231.604 nm)	0.092066	ppm	0.000704	0.77	718.064000	Y 377.433
P (213.618 nm)	1.872500	ppm	0.001652	0.09	4755.320000	Y 242.219
Pb (220.353 nm)	1.070960	ppm	0.003522	0.33	3407.490000	Y 242.219
S (181.972 nm)	0.423239	ppm	0.008180	1.93	263.249876	Y 377.433
Sb (206.834 nm)	0.096129	ppm	0.000090	0.09	305.205000	Y 377.433
Se (196.026 nm)	0.557963	ppm	0.003525	0.63	632.230000	Y 242.219
Si (288.158 nm)	1.935360	ppm	0.012554	0.65	18426.000000	Y 377.433
Sn (189.925 nm)	0.372272	ppm	0.001181	0.32	878.107000	Y 377.433
Sr (421.552 nm)	0.188408	ppm	0.001433	0.76	40945.310627	Y_R 488.368
Th (288.505 nm)	0.202789	ppm	0.000418	0.21	649.242000	Y 377.433
Ti (336.122 nm)	0.192077	ppm	0.000688	0.36	27525.400000	Y 377.433
Tl (190.794 nm)	0.380508	ppm	0.000138	0.04	961.605000	Y 377.433
U (409.013 nm)	0.389614	ppm	0.003659	0.94	1786.100000	Y 377.433
V (292.401 nm)	0.094464	ppm	0.000427	0.45	3798.740000	Y 377.433
Zn (206.200 nm)	0.472185	ppm	0.001817	0.38	2729.400000	Y 377.433
Zr (343.823 nm)	0.095148	ppm	0.000359	0.38	12937.700000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.991841	20273.513290	0.001027	0.10
Y 377.433	0.992577	1092284.175353	0.002196	0.22
Y_R 377.433	1.024860	79011.000000	0.009133	0.89
Y_R 488.368	1.030650	45039.700000	0.007949	0.77
Y_R2 488.368	1.043457	90506.771294	0.002629	0.25

Sample Name: LCSD 280-423271/19-B

Date: 7/26/2018 1:11:19 PM Rack:Tube: 1:12

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.203815	ppm	0.000314	0.15	9842.110000	Y 377.433
Al (167.019 nm)	0.378948	ppm	0.011753	3.10	188.336000	Y_R 377.433
Al H (396.152 nm)	0.350849 u	ppm	0.002388	0.68	1056.387628	Y_R 377.433
As (188.980 nm)	0.769858	ppm	0.000632	0.08	1087.450000	Y 242.219
B (249.678 nm)	0.225131	ppm	0.000216	0.10	6310.330000	Y 242.219
Ba (493.408 nm)	2.289690 o	ppm	0.016156	0.71	273777.000000	Y_R 488.368
Be (234.861 nm)	0.009211	ppm	0.000072	0.78	2928.440000	Y_R 488.368
Bi (223.061 nm)	0.377783	ppm	0.001165	0.31	1074.050000	Y 377.433
Ca (315.887 nm)	9.553437	ppm	0.063904	0.67	7818.212966	Y_R 377.433
Cd (214.439 nm)	0.206416	ppm	0.001178	0.57	13632.500000	Y 377.433
Co (228.615 nm)	0.093945	ppm	0.000110	0.12	1922.290000	Y 242.219
Cr (205.560 nm)	0.976600	ppm	0.003835	0.39	16523.300000	Y 377.433
Cu (324.754 nm)	0.437453	ppm	0.001874	0.43	28771.400000	Y 377.433
Fe (238.204 nm)	0.204380	ppm	0.001563	0.76	786.284857	Y_R 377.433
Fe H (259.940 nm)	0.043799 nu	ppm	0.003085	7.04	408.027000	Y_R 377.433
K (766.491 nm)	9.967670	ppm	0.020050	0.20	11349.100000	Y_R2 488.368
Li (670.783 nm)	0.193856	ppm	0.003346	1.73	5667.270000	Y_R2 488.368
Mg (279.078 nm)	9.136690	ppm	0.036292	0.40	55791.100000	Y 377.433
Mn (257.610 nm)	0.093510	ppm	0.000255	0.27	25427.100000	Y 377.433
Mo (202.032 nm)	0.187388	ppm	0.000037	0.02	1869.210000	Y 377.433
Na (589.592 nm)	280.146000 o	ppm	0.102332	0.04	1946720.000000	Y_R2 488.368
Na H (589.593 nm)	299.686835	ppm	1.256404	0.42	1187448.106768	Y_R 488.368
Ni (231.604 nm)	0.092552	ppm	0.000020	0.02	721.840000	Y 377.433
P (213.618 nm)	1.884400	ppm	0.000878	0.05	4785.400000	Y 242.219
Pb (220.353 nm)	1.073380	ppm	0.003696	0.34	3415.180000	Y 242.219
S (181.972 nm)	0.428072	ppm	0.002775	0.65	265.981801	Y 377.433
Sb (206.834 nm)	0.098392	ppm	0.000094	0.10	312.243000	Y 377.433
Se (196.026 nm)	0.562747	ppm	0.003478	0.62	637.528000	Y 242.219
Si (288.158 nm)	1.952540	ppm	0.009269	0.47	18582.000000	Y 377.433
Sn (189.925 nm)	0.372680	ppm	0.000548	0.15	879.061000	Y 377.433
Sr (421.552 nm)	0.189196	ppm	0.001240	0.66	41116.042604	Y_R 488.368
Th (288.505 nm)	0.201031	ppm	0.002807	1.40	644.369000	Y 377.433
Ti (336.122 nm)	0.192625	ppm	0.000751	0.39	27604.700000	Y 377.433
Tl (190.794 nm)	0.380070	ppm	0.001840	0.48	960.485000	Y 377.433
U (409.013 nm)	0.390409	ppm	0.000114	0.03	1789.910000	Y 377.433
V (292.401 nm)	0.094868	ppm	0.000696	0.73	3814.150000	Y 377.433
Zn (206.200 nm)	0.470612	ppm	0.002493	0.53	2720.370000	Y 377.433
Zr (343.823 nm)	0.095355	ppm	0.000325	0.34	12965.900000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.012383	20693.396974	0.000609	0.06
Y 377.433	1.016611	1118732.574590	0.000646	0.06
Y_R 377.433	1.045470	80600.200000	0.006370	0.61
Y_R 488.368	1.053430	46035.500000	0.004904	0.47
Y_R2 488.368	1.068165	92649.902762	0.017929	1.68

Sample Name: 160-29498-A-3-B

Date: 7/26/2018 1:14:43 PM Rack:Tube: 1:13

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000429	ppm	0.000102	23.66	-392.653000	Y 377.433
Al (167.019 nm)	0.010882	ppm	0.001102	10.13	5.196810	Y_R 377.433
Al H (396.152 nm)	-0.032641 u	ppm	0.001615	4.95	88.599816	Y_R 377.433
As (188.980 nm)	0.001780	ppm	0.001374	77.16	-1.185370	Y 242.219
B (249.678 nm)	0.015252	ppm	0.000346	2.27	486.763000	Y 242.219
Ba (493.408 nm)	0.037281	ppm	0.000566	1.52	4979.030000	Y_R 488.368
Be (234.861 nm)	0.000033	ppm	0.000011	32.76	-38.480300	Y_R 488.368
Bi (223.061 nm)	-0.002290 u	ppm	0.001220	53.28	8.163020	Y 377.433
Ca (315.887 nm)	37.368310 o	ppm	0.283357	0.76	30801.085774	Y_R 377.433
Cd (214.439 nm)	0.000813	ppm	0.000037	4.57	50.606200	Y 377.433
Co (228.615 nm)	0.000343	ppm	0.000134	38.97	-29.210300	Y 242.219
Cr (205.560 nm)	0.000328	ppm	0.000016	4.74	6.477510	Y 377.433
Cu (324.754 nm)	0.001163	ppm	0.000098	8.45	371.044000	Y 377.433
Fe (238.204 nm)	0.007740	ppm	0.000277	3.58	45.578883	Y_R 377.433
Fe H (259.940 nm)	-0.156390 nu	ppm	0.001361	0.87	16.017600	Y_R 377.433
K (766.491 nm)	0.387530	ppm	0.065542	16.91	-266.723000	Y_R2 488.368
Li (670.783 nm)	0.003342	ppm	0.000127	3.79	-1047.210000	Y_R2 488.368
Mg (279.078 nm)	19.056300	ppm	0.080559	0.42	116335.000000	Y 377.433
Mn (257.610 nm)	0.264862	ppm	0.000779	0.29	71925.500000	Y 377.433
Mo (202.032 nm)	-0.000087 u	ppm	0.000039	44.29	-1.419590	Y 377.433
Na (589.592 nm)	272.307000 o	ppm	1.019940	0.37	1887610.000000	Y_R2 488.368
Na H (589.593 nm)	288.186472	ppm	2.150002	0.75	1139855.382700	Y_R 488.368
Ni (231.604 nm)	0.000088	ppm	0.000109	> 100.00	2.454250	Y 377.433
P (213.618 nm)	0.144680	ppm	0.002104	1.45	387.085000	Y 242.219
Pb (220.353 nm)	0.004516	ppm	0.001238	27.41	17.961600	Y 242.219
S (181.972 nm)	0.070553	ppm	0.003341	4.74	64.427279	Y 377.433
Sb (206.834 nm)	-0.003033 u	ppm	0.000616	20.30	-26.066400	Y 377.433
Se (196.026 nm)	-0.001538 u	ppm	0.002551	> 100.00	12.697900	Y 242.219
Si (288.158 nm)	0.255218	ppm	0.002865	1.12	3163.560000	Y 377.433
Sn (189.925 nm)	0.002042	ppm	0.001107	54.20	11.809700	Y 377.433
Sr (421.552 nm)	0.033904	ppm	0.000412	1.22	7484.111509	Y_R 488.368
Th (288.505 nm)	0.003362	ppm	0.002955	87.91	87.581500	Y 377.433
Ti (336.122 nm)	0.000313	ppm	0.000025	8.07	-41.927900	Y 377.433
Tl (190.794 nm)	0.001758	ppm	0.000207	11.75	-1.304790	Y 377.433
U (409.013 nm)	-0.008513 u	ppm	0.001266	14.87	-140.542000	Y 377.433
V (292.401 nm)	0.000191	ppm	0.000054	28.42	29.267600	Y 377.433
Zn (206.200 nm)	0.469207	ppm	0.001240	0.26	2712.290000	Y 377.433
Zr (343.823 nm)	0.000031	ppm	0.000036	> 100.00	-7.949730	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.013035	20706.711060	0.002930	0.29
Y 377.433	1.017252	1119437.384083	0.005467	0.54
Y_R 377.433	1.047090	80724.700000	0.004259	0.41
Y_R 488.368	1.070000	46759.500000	0.024706	2.31
Y_R2 488.368	1.060962	92025.161054	0.003360	0.32

Sample Name: 280-112230-G-1-B

Date: 7/26/2018 1:18:06 PM Rack:Tube: 1:14

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000381	ppm	0.000440	> 100.00	-394.961000	Y 377.433
Al (167.019 nm)	0.044321	ppm	0.004457	10.06	21.872200	Y_R 377.433
Al H (396.152 nm)	0.025117 u	ppm	0.006986	27.81	268.593634	Y_R 377.433
As (188.980 nm)	0.002452	ppm	0.000286	11.66	-0.233894	Y 242.219
B (249.678 nm)	0.034354	ppm	0.000074	0.22	1016.300000	Y 242.219
Ba (493.408 nm)	0.069989	ppm	0.000066	0.09	8901.500000	Y_R 488.368
Be (234.861 nm)	-0.000005 u	ppm	0.000019	> 100.00	-48.212400	Y_R 488.368
Bi (223.061 nm)	0.000294	ppm	0.000313	> 100.00	15.424300	Y 377.433
Ca (315.887 nm)	116.739578 o	ppm	0.702297	0.60	96384.320605	Y_R 377.433
Cd (214.439 nm)	0.000122	ppm	0.000018	14.40	5.040790	Y 377.433
Co (228.615 nm)	0.001517	ppm	0.000316	20.83	-4.816650	Y 242.219
Cr (205.560 nm)	0.000176	ppm	0.000158	89.63	3.871110	Y 377.433
Cu (324.754 nm)	0.002516	ppm	0.000015	0.59	402.188000	Y 377.433
Fe (238.204 nm)	0.086869	ppm	0.000866	1.00	343.643225	Y_R 377.433
Fe H (259.940 nm)	-0.077212 nu	ppm	0.005305	6.87	171.064000	Y_R 377.433
K (766.491 nm)	1.027000	ppm	0.018823	1.83	508.631000	Y_R2 488.368
Li (670.783 nm)	0.003590	ppm	0.000328	9.14	-1038.460000	Y_R2 488.368
Mg (279.078 nm)	2.685370	ppm	0.016552	0.62	16433.700000	Y 377.433
Mn (257.610 nm)	1.012980	ppm	0.004440	0.44	274935.000000	Y 377.433
Mo (202.032 nm)	-0.000035 u	ppm	0.000074	> 100.00	-0.898240	Y 377.433
Na (589.592 nm)	265.238000 o	ppm	0.800672	0.30	1838690.000000	Y_R2 488.368
Na H (589.593 nm)	283.752496	ppm	0.634818	0.22	1122415.620351	Y_R 488.368
Ni (231.604 nm)	0.000590	ppm	0.000459	77.84	6.356540	Y 377.433
P (213.618 nm)	0.001413	ppm	0.000073	5.16	24.881800	Y 242.219
Pb (220.353 nm)	0.000707	ppm	0.000311	44.05	5.827060	Y 242.219
S (181.972 nm)	0.876343	ppm	0.001649	0.19	521.727370	Y 377.433
Sb (206.834 nm)	-0.002706 u	ppm	0.000766	28.30	-25.114200	Y 377.433
Se (196.026 nm)	-0.000025 u	ppm	0.001508	> 100.00	15.030900	Y 242.219
Si (288.158 nm)	4.314900	ppm	0.019626	0.45	40041.700000	Y 377.433
Sn (189.925 nm)	0.001111	ppm	0.000039	3.55	9.631230	Y 377.433
Sr (421.552 nm)	0.234384	ppm	0.000698	0.30	50902.462358	Y_R 488.368
Th (288.505 nm)	0.007653	ppm	0.005673	74.13	115.664000	Y 377.433
Ti (336.122 nm)	0.001220	ppm	0.000054	4.46	341.473000	Y 377.433
Tl (190.794 nm)	0.001724	ppm	0.000290	16.83	-1.393480	Y 377.433
U (409.013 nm)	-0.008093 u	ppm	0.001741	21.51	-154.632000	Y 377.433
V (292.401 nm)	-0.000102 u	ppm	0.000073	72.09	16.851500	Y 377.433
Zn (206.200 nm)	0.005323	ppm	0.000477	8.96	47.705800	Y 377.433
Zr (343.823 nm)	0.000080	ppm	0.000029	35.91	-0.961257	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.999943	20439.109656	0.002434	0.24
Y 377.433	1.010166	1111639.511694	0.005282	0.52
Y_R 377.433	1.055190	81349.600000	0.007017	0.67
Y_R 488.368	1.066910	46624.400000	0.002543	0.24
Y_R2 488.368	1.090971	94628.055503	0.005595	0.51

Sample Name: 280-112230-G-1-Bsd@5

Date: 7/26/2018 1:21:30 PM Rack:Tube: 1:15

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000185	ppm	0.000255	> 100.00	-404.783000	Y 377.433
Al (167.019 nm)	0.011090	ppm	0.003684	33.22	5.305830	Y_R 377.433
Al H (396.152 nm)	-0.034817 u	ppm	0.003945	11.33	76.021415	Y_R 377.433
As (188.980 nm)	0.001729	ppm	0.001554	89.89	-1.258830	Y 242.219
B (249.678 nm)	0.006843	ppm	0.000609	8.90	253.597000	Y 242.219
Ba (493.408 nm)	0.012201	ppm	0.000144	1.18	1981.980000	Y_R 488.368
Be (234.861 nm)	0.000016	ppm	0.000015	95.71	-43.790500	Y_R 488.368
Bi (223.061 nm)	-0.000308 u	ppm	0.000602	> 100.00	13.724800	Y 377.433
Ca (315.887 nm)	21.115443 o	ppm	0.440263	2.09	17371.595862	Y_R 377.433
Cd (214.439 nm)	0.000033	ppm	0.000010	29.22	-0.897053	Y 377.433
Co (228.615 nm)	0.000557	ppm	0.000057	10.26	-24.773600	Y 242.219
Cr (205.560 nm)	0.000017 u	ppm	0.000112	> 100.00	1.200010	Y 377.433
Cu (324.754 nm)	0.000798	ppm	0.000139	17.40	357.568000	Y 377.433
Fe (238.204 nm)	0.017046	ppm	0.000685	4.02	80.632896	Y_R 377.433
Fe H (259.940 nm)	-0.144266 nu	ppm	0.002146	1.49	39.758200	Y_R 377.433
K (766.491 nm)	0.197454	ppm	0.034585	17.52	-497.188000	Y_R2 488.368
Li (670.783 nm)	0.003440	ppm	0.000328	9.53	-1043.740000	Y_R2 488.368
Mg (279.078 nm)	0.549649	ppm	0.040773	7.42	3400.920000	Y 377.433
Mn (257.610 nm)	0.208722	ppm	0.014772	7.08	56691.000000	Y 377.433
Mo (202.032 nm)	0.000056 u	ppm	0.000258	> 100.00	0.008694	Y 377.433
Na (589.592 nm)	46.048700 o	ppm	0.289549	0.63	319424.000000	Y_R2 488.368
Na H (589.593 nm)	51.694808	ppm	0.405131	0.78	207903.027370	Y_R 488.368
Ni (231.604 nm)	-0.000605 u	ppm	0.000092	15.26	-2.940430	Y 377.433
P (213.618 nm)	-0.002476 u	ppm	0.000629	25.42	15.048800	Y 242.219
Pb (220.353 nm)	-0.000208 u	ppm	0.000183	88.15	2.944490	Y 242.219
S (181.972 nm)	0.190367	ppm	0.009194	4.83	131.975475	Y 377.433
Sb (206.834 nm)	-0.001171 u	ppm	0.000419	35.79	-20.445800	Y 377.433
Se (196.026 nm)	-0.002721 u	ppm	0.000616	22.63	11.335000	Y 242.219
Si (288.158 nm)	0.870716	ppm	0.065419	7.51	8754.740000	Y 377.433
Sn (189.925 nm)	0.000341 u	ppm	0.000823	> 100.00	7.831100	Y 377.433
Sr (421.552 nm)	0.041730	ppm	0.000320	0.77	9178.985778	Y_R 488.368
Th (288.505 nm)	0.000778 u	ppm	0.001345	> 100.00	79.123700	Y 377.433
Ti (336.122 nm)	0.000501	ppm	0.000018	3.58	-66.634600	Y 377.433
Tl (190.794 nm)	-0.000294 u	ppm	0.000325	> 100.00	-6.526150	Y 377.433
U (409.013 nm)	-0.001919 u	ppm	0.000063	3.27	-105.271000	Y 377.433
V (292.401 nm)	0.000064	ppm	0.000050	78.51	23.364400	Y 377.433
Zn (206.200 nm)	-0.001372 u	ppm	0.000230	16.75	9.243970	Y 377.433
Zr (343.823 nm)	-0.000036 u	ppm	0.000091	> 100.00	-16.941300	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.037422	21205.194487	0.005882	0.57
Y 377.433	1.046288	1151390.394136	0.004841	0.46
Y_R 377.433	1.077540	83072.400000	0.000112	0.01
Y_R 488.368	1.091860	47714.700000	0.010538	0.97
Y_R2 488.368	1.113651	96595.234825	0.005039	0.45

Sample Name: 280-112230-G-1-C MS

Date: 7/26/2018 1:24:54 PM Rack:Tube: 1:16

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.206638	ppm	0.000185	0.09	9984.870000	Y 377.433
Al (167.019 nm)	0.413558	ppm	0.000558	0.14	205.579000	Y_R 377.433
Al H (396.152 nm)	0.414174 u	ppm	0.005026	1.21	1266.988838	Y_R 377.433
As (188.980 nm)	0.779245	ppm	0.001866	0.24	1100.750000	Y 242.219
B (249.678 nm)	0.226597	ppm	0.000314	0.14	6350.890000	Y 242.219
Ba (493.408 nm)	2.360730 o	ppm	0.013876	0.59	282283.000000	Y_R 488.368
Be (234.861 nm)	0.009116	ppm	0.000069	0.75	2899.690000	Y_R 488.368
Bi (223.061 nm)	0.381546	ppm	0.004054	1.06	1084.610000	Y 377.433
Ca (315.887 nm)	126.859171 o	ppm	1.019645	0.80	104746.100672	Y_R 377.433
Cd (214.439 nm)	0.203222	ppm	0.000626	0.31	13421.500000	Y 377.433
Co (228.615 nm)	0.094676	ppm	0.000203	0.21	1937.460000	Y 242.219
Cr (205.560 nm)	0.961288	ppm	0.001337	0.14	16264.300000	Y 377.433
Cu (324.754 nm)	0.434994	ppm	0.002468	0.57	28531.000000	Y 377.433
Fe (238.204 nm)	0.258788	ppm	0.005805	2.24	991.230401	Y_R 377.433
Fe H (259.940 nm)	0.100068 nu	ppm	0.003253	3.25	518.215000	Y_R 377.433
K (766.491 nm)	10.815700	ppm	0.048099	0.44	12377.300000	Y_R2 488.368
Li (670.783 nm)	0.195997	ppm	0.003339	1.70	5742.730000	Y_R2 488.368
Mg (279.078 nm)	11.654000	ppm	0.015758	0.14	71152.800000	Y 377.433
Mn (257.610 nm)	1.113750 o	ppm	0.001735	0.16	302281.000000	Y 377.433
Mo (202.032 nm)	0.187180	ppm	0.000256	0.14	1867.140000	Y 377.433
Na (589.592 nm)	276.897000 o	ppm	1.757390	0.63	1924350.000000	Y_R2 488.368
Na H (589.593 nm)	298.953823	ppm	2.637565	0.88	1184631.262944	Y_R 488.368
Ni (231.604 nm)	0.092413	ppm	0.000229	0.25	720.767000	Y 377.433
P (213.618 nm)	1.893020	ppm	0.002609	0.14	4807.190000	Y 242.219
Pb (220.353 nm)	1.064900	ppm	0.000080	0.01	3388.160000	Y 242.219
S (181.972 nm)	1.265565	ppm	0.002239	0.18	741.916736	Y 377.433
Sb (206.834 nm)	0.096214	ppm	0.000609	0.63	305.078000	Y 377.433
Se (196.026 nm)	0.571252	ppm	0.003614	0.63	647.854000	Y 242.219
Si (288.158 nm)	6.384440	ppm	0.036798	0.58	58841.400000	Y 377.433
Sn (189.925 nm)	0.369680	ppm	0.000249	0.07	872.042000	Y 377.433
Sr (421.552 nm)	0.423030	ppm	0.001438	0.34	91757.819485	Y_R 488.368
Th (288.505 nm)	0.202437	ppm	0.000676	0.33	669.975000	Y 377.433
Ti (336.122 nm)	0.194854	ppm	0.000033	0.02	28300.100000	Y 377.433
Tl (190.794 nm)	0.378883	ppm	0.000720	0.19	957.466000	Y 377.433
U (409.013 nm)	0.384857	ppm	0.001552	0.40	1739.070000	Y 377.433
V (292.401 nm)	0.094335	ppm	0.000093	0.10	3798.390000	Y 377.433
Zn (206.200 nm)	0.463918	ppm	0.000730	0.16	2681.910000	Y 377.433
Zr (343.823 nm)	0.096046	ppm	0.000011	0.01	13060.100000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.987437	20183.480972	0.001896	0.19
Y 377.433	0.999190	1099561.274436	0.001700	0.17
Y_R 377.433	1.040900	80248.000000	0.012706	1.22
Y_R 488.368	1.047320	45768.200000	0.009125	0.87
Y_R2 488.368	1.076413	93365.315989	0.005581	0.52

Sample Name: 280-112230-G-1-D MSD

Date: 7/26/2018 1:28:18 PM
Rack:Tube: 1:17

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.197041	ppm	0.000856	0.43	9501.560000	Y 377.433
Al (167.019 nm)	0.397164	ppm	0.005885	1.48	197.413000	Y_R 377.433
Al H (396.152 nm)	0.390882 u	ppm	0.001718	0.44	1204.906289	Y_R 377.433
As (188.980 nm)	0.744699	ppm	0.005371	0.72	1051.790000	Y 242.219
B (249.678 nm)	0.216009	ppm	0.000708	0.33	6057.150000	Y 242.219
Ba (493.408 nm)	2.242340 o	ppm	0.007629	0.34	268153.000000	Y_R 488.368
Be (234.861 nm)	0.008662	ppm	0.000050	0.57	2752.370000	Y_R 488.368
Bi (223.061 nm)	0.366608	ppm	0.000051	0.01	1042.720000	Y 377.433
Ca (315.887 nm)	120.400994 o	ppm	0.688229	0.57	99409.804392	Y_R 377.433
Cd (214.439 nm)	0.193202	ppm	0.000077	0.04	12759.600000	Y 377.433
Co (228.615 nm)	0.089981	ppm	0.000037	0.04	1839.610000	Y 242.219
Cr (205.560 nm)	0.922968	ppm	0.003519	0.38	15616.000000	Y 377.433
Cu (324.754 nm)	0.415934	ppm	0.001569	0.38	27294.100000	Y 377.433
Fe (238.204 nm)	0.235366	ppm	0.002309	0.98	903.002505	Y_R 377.433
Fe H (259.940 nm)	0.075031 nu	ppm	0.000854	1.14	469.187000	Y_R 377.433
K (766.491 nm)	10.304600	ppm	0.040620	0.39	11757.600000	Y_R2 488.368
Li (670.783 nm)	0.188043	ppm	0.000995	0.53	5462.380000	Y_R2 488.368
Mg (279.078 nm)	11.111400	ppm	0.047521	0.43	67842.000000	Y 377.433
Mn (257.610 nm)	1.064050	ppm	0.003332	0.31	288795.000000	Y 377.433
Mo (202.032 nm)	0.179055	ppm	0.001021	0.57	1786.060000	Y 377.433
Na (589.592 nm)	264.105000 o	ppm	0.344532	0.13	1835440.000000	Y_R2 488.368
Na H (589.593 nm)	283.328962	ppm	1.292536	0.46	1122939.800444	Y_R 488.368
Ni (231.604 nm)	0.087320	ppm	0.001176	1.35	681.141000	Y 377.433
P (213.618 nm)	1.809520	ppm	0.005530	0.31	4596.080000	Y 242.219
Pb (220.353 nm)	1.019120	ppm	0.004443	0.44	3242.670000	Y 242.219
S (181.972 nm)	1.205736	ppm	0.006812	0.56	707.979362	Y 377.433
Sb (206.834 nm)	0.091152	ppm	0.000286	0.31	288.513000	Y 377.433
Se (196.026 nm)	0.543458	ppm	0.002906	0.53	617.029000	Y 242.219
Si (288.158 nm)	6.080170	ppm	0.004547	0.07	56077.400000	Y 377.433
Sn (189.925 nm)	0.352701	ppm	0.000654	0.19	832.313000	Y 377.433
Sr (421.552 nm)	0.402066	ppm	0.000882	0.22	87217.675653	Y_R 488.368
Th (288.505 nm)	0.192670	ppm	0.001264	0.66	641.482000	Y 377.433
Ti (336.122 nm)	0.186416	ppm	0.000368	0.20	27062.400000	Y 377.433
Tl (190.794 nm)	0.361648	ppm	0.000171	0.05	913.646000	Y 377.433
U (409.013 nm)	0.372462	ppm	0.002862	0.77	1680.680000	Y 377.433
V (292.401 nm)	0.090533	ppm	0.000102	0.11	3645.160000	Y 377.433
Zn (206.200 nm)	0.442017	ppm	0.001877	0.42	2556.120000	Y 377.433
Zr (343.823 nm)	0.091677	ppm	0.000008	0.01	12465.300000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.006370	20570.480823	0.000865	0.09
Y 377.433	1.018642	1120967.360275	0.000271	0.03
Y_R 377.433	1.063080	81957.500000	0.003792	0.36
Y_R 488.368	1.068800	46706.800000	0.000977	0.09
Y_R2 488.368	1.072104	92991.578301	0.009450	0.88

Sample Name: 280-112230-G-1-Bpds

Date: 7/26/2018 1:31:40 PM
Rack:Tube: 1:18

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.048888	ppm	0.000254	0.52	2037.430000	Y 377.433
Al (167.019 nm)	0.992090	ppm	0.011134	1.12	493.739000	Y_R 377.433
Al H (396.152 nm)	1.037767	ppm	0.008856	0.85	2827.298751	Y_R 377.433
As (188.980 nm)	0.198036	ppm	0.000227	0.11	276.967000	Y 242.219
B (249.678 nm)	0.131520	ppm	0.000151	0.11	3711.040000	Y 242.219
Ba (493.408 nm)	0.165048	ppm	0.001789	1.08	20251.200000	Y_R 488.368
Be (234.861 nm)	0.045216	ppm	0.000208	0.46	14624.400000	Y_R 488.368
Bi (223.061 nm)	0.000682 u	ppm	0.001316	> 100.00	16.693500	Y 377.433
Ca (315.887 nm)	132.551918 o	ppm	0.460654	0.35	109449.835694	Y_R 377.433
Cd (214.439 nm)	0.045532	ppm	0.000100	0.22	3005.770000	Y 377.433
Co (228.615 nm)	0.047729	ppm	0.000092	0.19	956.765000	Y 242.219
Cr (205.560 nm)	0.046348	ppm	0.000097	0.21	784.220000	Y 377.433
Cu (324.754 nm)	0.050151	ppm	0.000275	0.55	3492.670000	Y 377.433
Fe (238.204 nm)	1.055533	ppm	0.000154	0.01	3992.425266	Y_R 377.433
Fe H (259.940 nm)	0.918897 nu	ppm	0.004136	0.45	2121.650000	Y_R 377.433
K (766.491 nm)	21.257000	ppm	0.168365	0.79	25037.300000	Y_R2 488.368
Li (670.783 nm)	0.107966	ppm	0.001680	1.56	2640.160000	Y_R2 488.368
Mg (279.078 nm)	20.394800	ppm	0.092071	0.45	124488.000000	Y 377.433
Mn (257.610 nm)	1.036290	ppm	0.000709	0.07	281262.000000	Y 377.433
Mo (202.032 nm)	0.046534	ppm	0.000041	0.09	463.762000	Y 377.433
Na (589.592 nm)	280.105000 o	ppm	0.032035	0.01	1941930.000000	Y_R2 488.368
Na H (589.593 nm)	299.482131	ppm	3.402904	1.14	1184496.224957	Y_R 488.368
Ni (231.604 nm)	0.045525	ppm	0.000021	0.05	356.011000	Y 377.433
P (213.618 nm)	1.895370	ppm	0.008241	0.43	4813.140000	Y 242.219
Pb (220.353 nm)	0.094391	ppm	0.000858	0.91	304.537000	Y 242.219
S (181.972 nm)	0.856947	ppm	0.001168	0.14	510.826684	Y 377.433
Sb (206.834 nm)	0.093323	ppm	0.001014	1.09	265.009000	Y 377.433
Se (196.026 nm)	0.188180	ppm	0.000131	0.07	223.312000	Y 242.219
Si (288.158 nm)	9.156900	ppm	0.078199	0.85	84026.400000	Y 377.433
Sn (189.925 nm)	0.093622	ppm	0.000657	0.70	226.097000	Y 377.433
Sr (421.552 nm)	0.278717	ppm	0.002439	0.88	60503.715268	Y_R 488.368
Th (288.505 nm)	0.203249	ppm	0.005369	2.64	670.170000	Y 377.433
Ti (336.122 nm)	0.050503	ppm	0.000434	0.86	7499.280000	Y 377.433
Tl (190.794 nm)	0.189079	ppm	0.000835	0.44	475.268000	Y 377.433
U (409.013 nm)	0.495675	ppm	0.000544	0.11	2279.420000	Y 377.433
V (292.401 nm)	0.047716	ppm	0.000443	0.93	2049.180000	Y 377.433
Zn (206.200 nm)	0.187195	ppm	0.000146	0.08	1092.390000	Y 377.433
Zr (343.823 nm)	0.048974	ppm	0.000199	0.41	6656.300000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.993842	20314.414963	0.003098	0.31
Y 377.433	1.008582	1109896.860583	0.002495	0.25
Y_R 377.433	1.053970	81255.200000	0.000170	0.02
Y_R 488.368	1.063630	46481.000000	0.005452	0.51
Y_R2 488.368	1.083843	94009.789145	0.008573	0.79

Sample Name: 280-112289-A-1-B

Date: 7/26/2018 1:35:03 PM Rack:Tube: 1:19

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000335	ppm	0.000318	94.68	-397.281000	Y 377.433
Al (167.019 nm)	0.007111	ppm	0.000788	11.09	3.337010	Y_R 377.433
Al H (396.152 nm)	-0.041966 u	ppm	0.001581	3.77	66.422375	Y_R 377.433
As (188.980 nm)	0.001914	ppm	0.001554	81.18	-0.996527	Y 242.219
B (249.678 nm)	0.043071	ppm	0.000126	0.29	1258.070000	Y 242.219
Ba (493.408 nm)	0.194117	ppm	0.001109	0.57	23696.900000	Y_R 488.368
Be (234.861 nm)	0.000058	ppm	0.000006	10.80	-29.558700	Y_R 488.368
Bi (223.061 nm)	0.000544 u	ppm	0.002065	> 100.00	16.115800	Y 377.433
Ca (315.887 nm)	40.334875 o	ppm	0.224020	0.56	33252.311922	Y_R 377.433
Cd (214.439 nm)	0.000253	ppm	0.000011	4.46	13.627600	Y 377.433
Co (228.615 nm)	-0.000200 u	ppm	0.000210	> 100.00	-40.495700	Y 242.219
Cr (205.560 nm)	0.000439	ppm	0.000125	28.58	8.336490	Y 377.433
Cu (324.754 nm)	0.004076	ppm	0.000013	0.32	557.190000	Y 377.433
Fe (238.204 nm)	0.032418	ppm	0.000948	2.93	138.534570	Y_R 377.433
Fe H (259.940 nm)	-0.129177 nu	ppm	0.001688	1.31	69.306100	Y_R 377.433
K (766.491 nm)	0.315169	ppm	0.014713	4.67	-354.460000	Y_R2 488.368
Li (670.783 nm)	0.003578	ppm	0.000919	25.69	-1038.880000	Y_R2 488.368
Mg (279.078 nm)	11.159300	ppm	0.011509	0.10	68144.500000	Y 377.433
Mn (257.610 nm)	0.104028	ppm	0.000029	0.03	28281.100000	Y 377.433
Mo (202.032 nm)	-0.000065 u	ppm	0.000039	59.99	-1.200070	Y 377.433
Na (589.592 nm)	262.026000 o	ppm	0.056420	0.02	1816690.000000	Y_R2 488.368
Na H (589.593 nm)	279.653803	ppm	2.253196	0.81	1106389.496088	Y_R 488.368
Ni (231.604 nm)	0.000289	ppm	0.000038	13.29	4.009140	Y 377.433
P (213.618 nm)	0.051902	ppm	0.000585	1.13	152.527000	Y 242.219
Pb (220.353 nm)	0.001050	ppm	0.001165	> 100.00	6.949230	Y 242.219
S (181.972 nm)	0.124256	ppm	0.002023	1.63	94.340899	Y 377.433
Sb (206.834 nm)	0.000024 u	ppm	0.002289	> 100.00	-16.808900	Y 377.433
Se (196.026 nm)	-0.000893 u	ppm	0.003029	> 100.00	13.260800	Y 242.219
Si (288.158 nm)	0.968244	ppm	0.003649	0.38	9640.680000	Y 377.433
Sn (189.925 nm)	0.000316	ppm	0.000254	80.26	7.772350	Y 377.433
Sr (421.552 nm)	0.075535	ppm	0.000239	0.32	16500.206375	Y_R 488.368
Th (288.505 nm)	0.002414	ppm	0.001676	69.41	81.400200	Y 377.433
Ti (336.122 nm)	0.000347	ppm	0.000005	1.44	-27.654300	Y 377.433
Tl (190.794 nm)	-0.000304 u	ppm	0.001005	> 100.00	-6.554450	Y 377.433
U (409.013 nm)	-0.007599 u	ppm	0.000162	2.13	-136.686000	Y 377.433
V (292.401 nm)	-0.000010 u	ppm	0.000099	> 100.00	20.168400	Y 377.433
Zn (206.200 nm)	0.007854	ppm	0.000091	1.16	62.241500	Y 377.433
Zr (343.823 nm)	-0.000056 u	ppm	0.000152	> 100.00	-19.632000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.006181	20566.630283	0.002150	0.21
Y 377.433	1.018863	1121211.121724	0.000261	0.03
Y_R 377.433	1.061980	81872.600000	0.010092	0.95
Y_R 488.368	1.070530	46782.400000	0.010726	1.00
Y_R2 488.368	1.075488	93285.139272	0.008192	0.76

Sample Name: CCVH-5225153

Date: 7/26/2018 1:38:26 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000576 u	ppm	0.000225	39.07	-709.949000	Y 377.433
Al (167.019 nm)	44.992500 o	ppm	0.418682	0.93	22401.600000	Y_R 377.433
Al H (396.152 nm)	49.415963	ppm	0.181482	0.37	124498.056346	Y_R 377.433
As (188.980 nm)	-0.001429 u	ppm	0.002203	> 100.00	-6.223830	Y 242.219
B (249.678 nm)	-0.000756 u	ppm	0.000008	1.08	-39.136400	Y 242.219
Ba (493.408 nm)	0.000371	ppm	0.000007	1.95	612.256000	Y_R 488.368
Be (234.861 nm)	0.000081	ppm	0.000109	> 100.00	1643.160000	Y_R 488.368
Bi (223.061 nm)	0.973813	ppm	0.004759	0.49	2754.470000	Y 377.433
Ca (315.887 nm)	0.010811	ppm	0.002419	22.37	-66.830011	Y_R 377.433
Cd (214.439 nm)	-0.000179 u	ppm	0.000013	7.16	37.197400	Y 377.433
Co (228.615 nm)	0.000961	ppm	0.000124	12.86	-16.367100	Y 242.219
Cr (205.560 nm)	-0.000032 u	ppm	0.000353	> 100.00	-14.646100	Y 377.433
Cu (324.754 nm)	-0.005953 u	ppm	0.000037	0.63	307.115000	Y 377.433
Fe (238.204 nm)	48.124063 o	ppm	0.061883	0.13	181291.097634	Y_R 377.433
Fe H (259.940 nm)	49.389100	ppm	0.186324	0.38	97036.100000	Y_R 377.433
K (766.491 nm)	0.117801	ppm	0.078892	66.97	-593.767000	Y_R2 488.368
Li (670.783 nm)	0.002934	ppm	0.000061	2.07	-1061.590000	Y_R2 488.368
Mg (279.078 nm)	-0.008452 u	ppm	0.000779	9.22	-377.150000	Y 377.433
Mn (257.610 nm)	0.001518	ppm	0.000017	1.15	463.939000	Y 377.433
Mo (202.032 nm)	-0.000142 u	ppm	0.000026	18.11	-1.962690	Y 377.433
Na (589.592 nm)	231.136000 o	ppm	0.456971	0.20	1602180.000000	Y_R2 488.368
Na H (589.593 nm)	247.577239	ppm	4.815544	1.95	979790.541084	Y_R 488.368
Ni (231.604 nm)	0.001552	ppm	0.000366	23.57	16.129300	Y 377.433
P (213.618 nm)	-0.003574 u	ppm	0.000172	4.81	12.271800	Y 242.219
Pb (220.353 nm)	-0.001949 u	ppm	0.001233	63.26	16.067500	Y 242.219
S (181.972 nm)	4.855846	ppm	0.006029	0.12	2767.607401	Y 377.433
Sb (206.834 nm)	-0.003556 u	ppm	0.000290	8.15	-75.891900	Y 377.433
Se (196.026 nm)	-0.001411 u	ppm	0.000070	4.95	2.766120	Y 242.219
Si (288.158 nm)	0.025629	ppm	0.002067	8.07	1077.970000	Y 377.433
Sn (189.925 nm)	0.003126	ppm	0.001025	32.79	14.345800	Y 377.433
Sr (421.552 nm)	0.000498	ppm	0.000018	3.57	249.463909	Y_R 488.368
Th (288.505 nm)	4.961820	ppm	0.013180	0.27	14070.100000	Y 377.433
Ti (336.122 nm)	0.001521	ppm	0.000074	4.89	13.524800	Y 377.433
Tl (190.794 nm)	-0.003002 u	ppm	0.001400	46.64	-14.926300	Y 377.433
U (409.013 nm)	10.091000	ppm	0.058138	0.58	48838.000000	Y 377.433
V (292.401 nm)	0.003491	ppm	0.000051	1.46	-27.553600	Y 377.433
Zn (206.200 nm)	-0.002029 u	ppm	0.000221	10.91	5.472330	Y 377.433
Zr (343.823 nm)	-0.003786 u	ppm	0.000076	2.02	-379.603000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.008603	20616.122124	0.000863	0.09
Y 377.433	1.009649	1111071.204802	0.003710	0.37
Y_R 377.433	1.040020	80179.700000	0.004062	0.39
Y_R 488.368	1.044370	45639.300000	0.019823	1.90
Y_R2 488.368	1.072445	93021.180865	0.000874	0.08

Sample Name: CCV-5225154

Date: 7/26/2018 1:41:49 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.480851	ppm	0.001042	0.22	23821.200000	Y 377.433
Al (167.019 nm)	0.519225	ppm	0.001461	0.28	259.478000	Y_R 377.433
Al H (396.152 nm)	0.490709 u	ppm	0.001828	0.37	1430.222939	Y_R 377.433
As (188.980 nm)	0.967584	ppm	0.003845	0.40	1367.670000	Y 242.219
B (249.678 nm)	0.485577	ppm	0.000018	0.00	13547.200000	Y 242.219
Ba (493.408 nm)	0.491486	ppm	0.000636	0.13	59188.800000	Y_R 488.368
Be (234.861 nm)	0.477502	ppm	0.000875	0.18	154617.000000	Y_R 488.368
Bi (223.061 nm)	-0.002069 u	ppm	0.000184	8.88	9.244510	Y 377.433
Ca (315.887 nm)	4.945594	ppm	0.022301	0.45	4010.983576	Y_R 377.433
Cd (214.439 nm)	0.478727	ppm	0.001060	0.22	31623.400000	Y 377.433
Co (228.615 nm)	0.491707	ppm	0.001977	0.40	10194.600000	Y 242.219
Cr (205.560 nm)	0.480839	ppm	0.003432	0.71	8129.770000	Y 377.433
Cu (324.754 nm)	0.484801	ppm	0.000659	0.14	31848.400000	Y 377.433
Fe (238.204 nm)	2.471559	ppm	0.008430	0.34	9326.339407	Y_R 377.433
Fe H (259.940 nm)	2.395720 u	ppm	0.010583	0.44	5013.570000	Y_R 377.433
K (766.491 nm)	48.345000	ppm	0.019766	0.04	57881.300000	Y_R2 488.368
Li (670.783 nm)	0.969372	ppm	0.005349	0.55	32999.600000	Y_R2 488.368
Mg (279.078 nm)	18.937900	ppm	0.010401	0.05	115608.000000	Y 377.433
Mn (257.610 nm)	0.486675	ppm	0.000418	0.09	132117.000000	Y 377.433
Mo (202.032 nm)	0.487707	ppm	0.001629	0.33	4865.800000	Y 377.433
Na (589.592 nm)	4.919550	ppm	0.003425	0.07	35386.400000	Y_R2 488.368
Na H (589.593 nm)	5.943850 u	ppm	0.031813	0.54	28099.464739	Y_R 488.368
Ni (231.604 nm)	0.484973	ppm	0.000767	0.16	3773.690000	Y 377.433
P (213.618 nm)	0.953647	ppm	0.006750	0.71	2432.300000	Y 242.219
Pb (220.353 nm)	0.979184	ppm	0.000045	0.00	3113.300000	Y 242.219
S (181.972 nm)	0.023239	ppm	0.000329	1.42	38.283222	Y 377.433
Sb (206.834 nm)	0.970280	ppm	0.001907	0.20	2932.830000	Y 377.433
Se (196.026 nm)	0.962285	ppm	0.005929	0.62	1079.980000	Y 242.219
Si (288.158 nm)	4.915590	ppm	0.031596	0.64	45498.400000	Y 377.433
Sn (189.925 nm)	0.963544	ppm	0.002036	0.21	2261.620000	Y 377.433
Sr (421.552 nm)	0.491522	ppm	0.000194	0.04	106591.263805	Y_R 488.368
Th (288.505 nm)	0.007671	ppm	0.001461	19.05	110.482000	Y 377.433
Ti (336.122 nm)	0.494230	ppm	0.000565	0.11	71087.600000	Y 377.433
Tl (190.794 nm)	0.983913	ppm	0.000252	0.03	2496.750000	Y 377.433
U (409.013 nm)	-0.000670 u	ppm	0.001503	> 100.00	-133.884000	Y 377.433
V (292.401 nm)	0.485346	ppm	0.000790	0.16	20788.600000	Y 377.433
Zn (206.200 nm)	0.477283	ppm	0.000422	0.09	2758.680000	Y 377.433
Zr (343.823 nm)	0.490888	ppm	0.001334	0.27	66803.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.027866	21009.861310	0.000971	0.09
Y 377.433	1.035621	1139652.424640	0.000524	0.05
Y_R 377.433	1.048900	80864.900000	0.005028	0.48
Y_R 488.368	1.055330	46118.500000	0.001160	0.11
Y_R2 488.368	1.087579	94333.828075	0.001625	0.15

Sample Name: CCB

Date: 7/26/2018 1:45:11 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000413	ppm	0.000147	35.56	-393.412000	Y 377.433
Al (167.019 nm)	0.006360	ppm	0.001602	25.19	2.943870	Y_R 377.433
Al H (396.152 nm)	-0.047624 u	ppm	0.003321	6.97	34.585385	Y_R 377.433
As (188.980 nm)	0.002022	ppm	0.000539	26.66	-0.842467	Y 242.219
B (249.678 nm)	0.000859	ppm	0.000088	10.27	87.709400	Y 242.219
Ba (493.408 nm)	0.000074	ppm	0.000030	40.23	529.715000	Y_R 488.368
Be (234.861 nm)	0.000106	ppm	0.000007	6.92	-15.042200	Y_R 488.368
Bi (223.061 nm)	0.000243	ppm	0.000133	54.62	15.266900	Y 377.433
Ca (315.887 nm)	0.012639	ppm	0.008365	66.19	-65.320328	Y_R 377.433
Cd (214.439 nm)	0.000128	ppm	0.000037	29.13	5.330200	Y 377.433
Co (228.615 nm)	0.000308	ppm	0.000058	18.89	-29.950500	Y 242.219
Cr (205.560 nm)	0.000046 u	ppm	0.000073	> 100.00	1.701270	Y 377.433
Cu (324.754 nm)	0.000162	ppm	0.000136	83.80	330.166000	Y 377.433
Fe (238.204 nm)	0.000662	ppm	0.000684	> 100.00	18.914769	Y_R 377.433
Fe H (259.940 nm)	-0.157605 u	ppm	0.001368	0.87	13.638700	Y_R 377.433
K (766.491 nm)	0.015020	ppm	0.003594	23.92	-718.388000	Y_R2 488.368
Li (670.783 nm)	0.001554	ppm	0.001285	82.69	-1110.240000	Y_R2 488.368
Mg (279.078 nm)	0.004322	ppm	0.001598	36.96	73.112100	Y 377.433
Mn (257.610 nm)	0.000058	ppm	0.000018	30.85	67.825400	Y 377.433
Mo (202.032 nm)	-0.000116 u	ppm	0.000070	60.22	-1.708730	Y 377.433
Na (589.592 nm)	0.035301	ppm	0.013256	37.55	492.172000	Y_R2 488.368
Na H (589.593 nm)	0.205904 u	ppm	0.001517	0.74	4991.837785	Y_R 488.368
Ni (231.604 nm)	-0.000003 u	ppm	0.000634	> 100.00	1.740930	Y 377.433
P (213.618 nm)	-0.000345 u	ppm	0.000958	> 100.00	20.435000	Y 242.219
Pb (220.353 nm)	0.000603	ppm	0.000245	40.56	5.536130	Y 242.219
S (181.972 nm)	0.018146	ppm	0.003076	16.95	34.107602	Y 377.433
Sb (206.834 nm)	-0.000383 u	ppm	0.000389	> 100.00	-18.060900	Y 377.433
Se (196.026 nm)	-0.000505 u	ppm	0.003398	> 100.00	13.603900	Y 242.219
Si (288.158 nm)	-0.001928 u	ppm	0.000617	31.99	827.636000	Y 377.433
Sn (189.925 nm)	0.000216	ppm	0.000129	59.53	7.537730	Y 377.433
Sr (421.552 nm)	0.000016 u	ppm	0.000130	> 100.00	145.000525	Y_R 488.368
Th (288.505 nm)	0.001537	ppm	0.000688	44.77	76.782100	Y 377.433
Ti (336.122 nm)	0.000268	ppm	0.000057	21.35	-167.309000	Y 377.433
Tl (190.794 nm)	0.001764	ppm	0.000626	35.47	-1.289130	Y 377.433
U (409.013 nm)	-0.001084 u	ppm	0.002876	> 100.00	-96.933800	Y 377.433
V (292.401 nm)	-0.000032 u	ppm	0.000242	> 100.00	18.637200	Y 377.433
Zn (206.200 nm)	-0.002968 u	ppm	0.000119	4.01	0.077219	Y 377.433
Zr (343.823 nm)	0.000038 u	ppm	0.000131	> 100.00	-6.928540	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.032168	21097.811960	0.004273	0.41
Y 377.433	1.039211	1143602.716831	0.003405	0.33
Y_R 377.433	1.037920	80017.600000	0.004127	0.40
Y_R 488.368	1.040040	45450.200000	0.008890	0.85
Y_R2 488.368	1.070132	92820.499397	0.008957	0.84

Sample Name: CCVL-5236949

Date: 7/26/2018 1:48:34 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009541	ppm	0.000123	1.28	66.620100	Y 377.433
Al (167.019 nm)	0.100563	ppm	0.003760	3.74	49.846000	Y_R 377.433
Al H (396.152 nm)	0.049085 u	ppm	0.006448	13.14	279.437093	Y_R 377.433
As (188.980 nm)	0.015076	ppm	0.000051	0.34	17.658200	Y 242.219
B (249.678 nm)	0.093842	ppm	0.000185	0.20	2666.170000	Y 242.219
Ba (493.408 nm)	0.009271	ppm	0.000116	1.25	1627.400000	Y_R 488.368
Be (234.861 nm)	0.000974	ppm	0.000030	3.04	268.624000	Y_R 488.368
Bi (223.061 nm)	0.098232	ppm	0.000356	0.36	290.078000	Y 377.433
Ca (315.887 nm)	0.201963	ppm	0.006875	3.40	91.118305	Y_R 377.433
Cd (214.439 nm)	0.004916	ppm	0.000006	0.12	321.767000	Y 377.433
Co (228.615 nm)	0.010183	ppm	0.000048	0.47	175.492000	Y 242.219
Cr (205.560 nm)	0.009490	ppm	0.000124	1.30	161.411000	Y 377.433
Cu (324.754 nm)	0.014509	ppm	0.000062	0.42	1260.430000	Y 377.433
Fe (238.204 nm)	0.098719	ppm	0.001076	1.09	388.279376	Y_R 377.433
Fe H (259.940 nm)	-0.060544 u	ppm	0.001869	3.09	203.703000	Y_R 377.433
K (766.491 nm)	2.964620	ppm	0.011173	0.38	2857.980000	Y_R2 488.368
Li (670.783 nm)	0.023245	ppm	0.000195	0.84	-345.747000	Y_R2 488.368
Mg (279.078 nm)	0.186807	ppm	0.001034	0.55	1185.250000	Y 377.433
Mn (257.610 nm)	0.009878	ppm	0.000019	0.19	2732.490000	Y 377.433
Mo (202.032 nm)	0.017872	ppm	0.000065	0.37	177.778000	Y 377.433
Na (589.592 nm)	1.031580	ppm	0.004131	0.40	7417.580000	Y_R2 488.368
Na H (589.593 nm)	1.033655 u	ppm	0.011319	1.10	8263.446823	Y_R 488.368
Ni (231.604 nm)	0.038349	ppm	0.000468	1.22	299.933000	Y 377.433
P (213.618 nm)	2.662390 o	ppm	0.022691	0.85	6752.310000	Y 242.219
Pb (220.353 nm)	0.007802	ppm	0.000470	6.02	28.442100	Y 242.219
S (181.972 nm)	0.107144	ppm	0.002970	2.77	84.421129	Y 377.433
Sb (206.834 nm)	0.018909	ppm	0.000157	0.83	40.424000	Y 377.433
Se (196.026 nm)	0.014841	ppm	0.001317	8.87	30.592000	Y 242.219
Si (288.158 nm)	0.469672	ppm	0.002075	0.44	5111.650000	Y 377.433
Sn (189.925 nm)	0.095034	ppm	0.000890	0.94	229.401000	Y 377.433
Sr (421.552 nm)	0.009685	ppm	0.000180	1.86	2238.977523	Y_R 488.368
Th (288.505 nm)	0.016339	ppm	0.000360	2.20	119.412000	Y 377.433
Ti (336.122 nm)	0.009840	ppm	0.000076	0.77	1213.680000	Y 377.433
Tl (190.794 nm)	0.015513	ppm	0.001099	7.08	33.648300	Y 377.433
U (409.013 nm)	0.060373	ppm	0.001139	1.89	199.661000	Y 377.433
V (292.401 nm)	0.009327	ppm	0.000265	2.84	416.060000	Y 377.433
Zn (206.200 nm)	0.016692	ppm	0.000183	1.10	113.005000	Y 377.433
Zr (343.823 nm)	0.014269	ppm	0.000048	0.33	1930.130000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.052195	21507.163410	0.000225	0.02
Y 377.433	1.059679	1166126.790303	0.001387	0.13
Y_R 377.433	1.067640	82309.200000	0.002878	0.27
Y_R 488.368	1.076310	47035.200000	0.003080	0.29
Y_R2 488.368	1.094391	94924.736905	0.005904	0.54

Sample Name: 280-112301-A-1-B

Date: 7/26/2018 1:51:56 PM Rack:Tube: 1:20

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000230	ppm	0.000095	41.37	-402.557000	Y 377.433
Al (167.019 nm)	0.041829	ppm	0.002216	5.30	20.600000	Y_R 377.433
Al H (396.152 nm)	-0.006062 u	ppm	0.005618	92.68	145.026888	Y_R 377.433
As (188.980 nm)	0.003366	ppm	0.000087	2.60	1.062350	Y 242.219
B (249.678 nm)	0.019450	ppm	0.000043	0.22	603.112000	Y 242.219
Ba (493.408 nm)	0.097921	ppm	0.001258	1.29	12210.200000	Y_R 488.368
Be (234.861 nm)	0.000081	ppm	0.000022	27.44	-22.244300	Y_R 488.368
Bi (223.061 nm)	-0.000961 u	ppm	0.000802	83.44	11.894900	Y 377.433
Ca (315.887 nm)	13.489199 o	ppm	0.075356	0.56	11070.150215	Y_R 377.433
Cd (214.439 nm)	0.000139	ppm	0.000071	50.78	6.136600	Y 377.433
Co (228.615 nm)	-0.000020 u	ppm	0.000002	8.25	-36.728200	Y 242.219
Cr (205.560 nm)	0.000495	ppm	0.000147	29.75	9.291700	Y 377.433
Cu (324.754 nm)	0.003134	ppm	0.000023	0.74	514.659000	Y 377.433
Fe (238.204 nm)	0.033079	ppm	0.000640	1.94	141.023529	Y_R 377.433
Fe H (259.940 nm)	-0.127056 nu	ppm	0.000256	0.20	73.459700	Y_R 377.433
K (766.491 nm)	1.255200	ppm	0.034201	2.72	785.323000	Y_R2 488.368
Li (670.783 nm)	0.003389	ppm	0.000049	1.45	-1045.560000	Y_R2 488.368
Mg (279.078 nm)	1.477690	ppm	0.002556	0.17	9064.120000	Y 377.433
Mn (257.610 nm)	0.004992	ppm	0.000020	0.41	1406.680000	Y 377.433
Mo (202.032 nm)	-0.000191 u	ppm	0.000011	5.62	-2.457580	Y 377.433
Na (589.592 nm)	254.753000 o	ppm	1.375060	0.54	1766080.000000	Y_R2 488.368
Na H (589.593 nm)	270.690950	ppm	4.130011	1.53	1070972.966570	Y_R 488.368
Ni (231.604 nm)	-0.000046 u	ppm	0.000202	> 100.00	1.406920	Y 377.433
P (213.618 nm)	0.258346	ppm	0.001029	0.40	674.452000	Y 242.219
Pb (220.353 nm)	-0.000251 u	ppm	0.000760	> 100.00	2.799610	Y 242.219
S (181.972 nm)	0.093295	ppm	0.001967	2.11	76.582917	Y 377.433
Sb (206.834 nm)	-0.000820 u	ppm	0.000822	> 100.00	-19.371800	Y 377.433
Se (196.026 nm)	-0.000952 u	ppm	0.002548	> 100.00	13.107900	Y 242.219
Si (288.158 nm)	0.608733	ppm	0.001653	0.27	6374.890000	Y 377.433
Sn (189.925 nm)	0.000335 u	ppm	0.000486	> 100.00	7.815850	Y 377.433
Sr (421.552 nm)	0.078349	ppm	0.000782	1.00	17109.614737	Y_R 488.368
Th (288.505 nm)	0.004302	ppm	0.002301	53.49	84.509000	Y 377.433
Ti (336.122 nm)	0.001099	ppm	0.000025	2.29	-4.726660	Y 377.433
Tl (190.794 nm)	-0.000247 u	ppm	0.000226	91.49	-6.411390	Y 377.433
U (409.013 nm)	-0.009428 u	ppm	0.004955	52.55	-140.072000	Y 377.433
V (292.401 nm)	0.000241	ppm	0.000122	50.46	30.815600	Y 377.433
Zn (206.200 nm)	0.000850	ppm	0.000079	9.31	22.010100	Y 377.433
Zr (343.823 nm)	0.000099	ppm	0.000017	17.37	1.484730	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.008142	20606.699836	0.003838	0.38
Y 377.433	1.011279	1112864.845784	0.002604	0.26
Y_R 377.433	1.048660	80846.000000	0.009220	0.88
Y_R 488.368	1.057450	46211.100000	0.007117	0.67
Y_R2 488.368	1.087570	94333.073090	0.007714	0.71

Sample Name: 280-112301-A-2-B

Date: 7/26/2018 1:55:18 PM Rack:Tube: 1:21

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000176	ppm	0.000022	12.46	-405.330000	Y 377.433
Al (167.019 nm)	0.082368	ppm	0.003096	3.76	40.769100	Y_R 377.433
Al H (396.152 nm)	0.033026 u	ppm	0.002722	8.24	241.036977	Y_R 377.433
As (188.980 nm)	0.001368	ppm	0.001538	> 100.00	-1.770030	Y 242.219
B (249.678 nm)	0.030850	ppm	0.000112	0.36	919.184000	Y 242.219
Ba (493.408 nm)	0.104393	ppm	0.000739	0.71	12981.300000	Y_R 488.368
Be (234.861 nm)	0.000064	ppm	0.000003	4.59	-26.969000	Y_R 488.368
Bi (223.061 nm)	0.001666	ppm	0.001640	98.47	19.264600	Y 377.433
Ca (315.887 nm)	8.054497	ppm	0.012952	0.16	6579.541148	Y_R 377.433
Cd (214.439 nm)	0.000243	ppm	0.000019	7.86	12.995800	Y 377.433
Co (228.615 nm)	0.000315	ppm	0.000005	1.45	-29.736900	Y 242.219
Cr (205.560 nm)	0.001374	ppm	0.000071	5.19	24.155300	Y 377.433
Cu (324.754 nm)	0.007331	ppm	0.000011	0.15	790.629000	Y 377.433
Fe (238.204 nm)	0.050316	ppm	0.000747	1.48	205.953557	Y_R 377.433
Fe H (259.940 nm)	-0.109496 nu	ppm	0.001457	1.33	107.845000	Y_R 377.433
K (766.491 nm)	1.310020	ppm	0.035231	2.69	851.794000	Y_R2 488.368
Li (670.783 nm)	0.005143	ppm	0.000117	2.28	-983.736000	Y_R2 488.368
Mg (279.078 nm)	1.261190	ppm	0.002128	0.17	7742.860000	Y 377.433
Mn (257.610 nm)	0.061946	ppm	0.000002	0.00	16861.900000	Y 377.433
Mo (202.032 nm)	0.000119	ppm	0.000083	70.25	0.633510	Y 377.433
Na (589.592 nm)	287.646000 o	ppm	1.036550	0.36	1994070.000000	Y_R2 488.368
Na H (589.593 nm)	309.221146	ppm	1.318739	0.43	1222812.976804	Y_R 488.368
Ni (231.604 nm)	0.000080 u	ppm	0.000264	> 100.00	2.386960	Y 377.433
P (213.618 nm)	0.310512	ppm	0.001733	0.56	806.338000	Y 242.219
Pb (220.353 nm)	0.037812	ppm	0.001174	3.10	123.763000	Y 242.219
S (181.972 nm)	0.107287	ppm	0.000481	0.45	84.640570	Y 377.433
Sb (206.834 nm)	0.000031 u	ppm	0.001042	> 100.00	-16.774600	Y 377.433
Se (196.026 nm)	-0.000017 u	ppm	0.000865	> 100.00	14.191200	Y 242.219
Si (288.158 nm)	0.930441	ppm	0.002754	0.30	9297.270000	Y 377.433
Sn (189.925 nm)	0.000905	ppm	0.001269	> 100.00	9.150210	Y 377.433
Sr (421.552 nm)	0.064561	ppm	0.000494	0.76	14123.709057	Y_R 488.368
Th (288.505 nm)	0.003471	ppm	0.002885	83.12	83.471300	Y 377.433
Ti (336.122 nm)	0.002261	ppm	0.000053	2.36	145.575000	Y 377.433
Tl (190.794 nm)	-0.000105 u	ppm	0.001157	> 100.00	-6.056170	Y 377.433
U (409.013 nm)	-0.009336 u	ppm	0.005098	54.60	-138.500000	Y 377.433
V (292.401 nm)	0.000194	ppm	0.000088	45.23	28.055200	Y 377.433
Zn (206.200 nm)	0.002067	ppm	0.000260	12.58	29.000200	Y 377.433
Zr (343.823 nm)	0.000134	ppm	0.000032	24.07	6.311700	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.022979	20909.983766	0.000216	0.02
Y 377.433	1.027198	1130382.648756	0.000250	0.02
Y_R 377.433	1.074220	82816.300000	0.007482	0.70
Y_R 488.368	1.080660	47225.100000	0.007299	0.68
Y_R2 488.368	1.114058	96630.560005	0.005957	0.53

Sample Name: 280-112301-A-3-B

Date: 7/26/2018 1:58:41 PM Rack:Tube: 1:22

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000430	ppm	0.000088	20.47	-392.570000	Y 377.433
Al (167.019 nm)	0.016982	ppm	0.001757	10.35	8.238570	Y_R 377.433
Al H (396.152 nm)	-0.025814 u	ppm	0.003093	11.98	110.476284	Y_R 377.433
As (188.980 nm)	0.004363	ppm	0.001674	38.37	2.475400	Y 242.219
B (249.678 nm)	0.022086	ppm	0.000242	1.10	676.226000	Y 242.219
Ba (493.408 nm)	0.157714	ppm	0.000293	0.19	19354.400000	Y_R 488.368
Be (234.861 nm)	0.000035	ppm	0.000008	21.93	-37.404200	Y_R 488.368
Bi (223.061 nm)	-0.001224 u	ppm	0.000129	10.54	11.154300	Y 377.433
Ca (315.887 nm)	48.120215 o	ppm	0.239038	0.50	39685.216072	Y_R 377.433
Cd (214.439 nm)	0.000245	ppm	0.000103	41.89	13.091100	Y 377.433
Co (228.615 nm)	0.000206	ppm	0.000117	57.11	-32.067800	Y 242.219
Cr (205.560 nm)	0.000888	ppm	0.000314	35.40	15.948000	Y 377.433
Cu (324.754 nm)	0.003433	ppm	0.000154	4.49	509.307000	Y 377.433
Fe (238.204 nm)	0.021376	ppm	0.000368	1.72	96.942665	Y_R 377.433
Fe H (259.940 nm)	-0.141376 nu	ppm	0.001966	1.39	45.418500	Y_R 377.433
K (766.491 nm)	1.488300	ppm	0.021339	1.43	1067.950000	Y_R2 488.368
Li (670.783 nm)	0.003908	ppm	0.001980	50.67	-1027.270000	Y_R2 488.368
Mg (279.078 nm)	4.043840	ppm	0.002358	0.06	24723.700000	Y 377.433
Mn (257.610 nm)	0.020218	ppm	0.000023	0.11	5538.360000	Y 377.433
Mo (202.032 nm)	-0.000027 u	ppm	0.000059	> 100.00	-0.816645	Y 377.433
Na (589.592 nm)	275.794000 o	ppm	3.327120	1.21	1912040.000000	Y_R2 488.368
Na H (589.593 nm)	296.843718	ppm	1.276930	0.43	1174091.678552	Y_R 488.368
Ni (231.604 nm)	-0.000938 u	ppm	0.000828	88.25	-5.525210	Y 377.433
P (213.618 nm)	0.424972	ppm	0.002435	0.57	1095.710000	Y 242.219
Pb (220.353 nm)	0.003890	ppm	0.000440	11.30	15.962900	Y 242.219
S (181.972 nm)	0.319630	ppm	0.004154	1.30	204.511719	Y 377.433
Sb (206.834 nm)	-0.000738 u	ppm	0.000024	3.28	-19.101300	Y 377.433
Se (196.026 nm)	-0.003129 u	ppm	0.002662	85.09	10.712400	Y 242.219
Si (288.158 nm)	0.907650	ppm	0.000227	0.03	9090.240000	Y 377.433
Sn (189.925 nm)	-0.000862 u	ppm	0.001136	> 100.00	5.015270	Y 377.433
Sr (421.552 nm)	0.147058	ppm	0.000373	0.25	31990.234484	Y_R 488.368
Th (288.505 nm)	0.000031 u	ppm	0.000129	> 100.00	72.984200	Y 377.433
Ti (336.122 nm)	0.000410	ppm	0.000143	34.75	6.295340	Y 377.433
Tl (190.794 nm)	-0.000267 u	ppm	0.001009	> 100.00	-6.458630	Y 377.433
U (409.013 nm)	-0.008091 u	ppm	0.003737	46.19	-140.682000	Y 377.433
V (292.401 nm)	0.000589	ppm	0.000047	7.97	45.624800	Y 377.433
Zn (206.200 nm)	0.000784	ppm	0.000469	59.83	21.631500	Y 377.433
Zr (343.823 nm)	0.000020	ppm	0.000015	74.16	-9.313710	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.018827	20825.098894	0.003800	0.37
Y 377.433	1.026168	1129248.866683	0.001703	0.17
Y_R 377.433	1.065690	82159.000000	0.002544	0.24
Y_R 488.368	1.067750	46661.100000	0.000933	0.09
Y_R2 488.368	1.101241	95518.819673	0.017283	1.57

Sample Name: 280-112301-A-4-B

Date: 7/26/2018 2:02:03 PM Rack:Tube: 1:23

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000165	ppm	0.000110	66.57	-406.248000	Y 377.433
Al (167.019 nm)	0.039962	ppm	0.002834	7.09	19.664400	Y_R 377.433
Al H (396.152 nm)	0.001753 u	ppm	0.002349	> 100.00	186.688737	Y_R 377.433
As (188.980 nm)	0.004129	ppm	0.001835	44.45	2.143310	Y 242.219
B (249.678 nm)	0.025341	ppm	0.000326	1.29	766.496000	Y 242.219
Ba (493.408 nm)	0.141892	ppm	0.000424	0.30	17469.700000	Y_R 488.368
Be (234.861 nm)	0.000051	ppm	0.000004	8.16	-32.367600	Y_R 488.368
Bi (223.061 nm)	-0.001139 u	ppm	0.000119	10.42	11.394300	Y 377.433
Ca (315.887 nm)	63.398821 o	ppm	0.280962	0.44	52309.689290	Y_R 377.433
Cd (214.439 nm)	0.000826	ppm	0.000064	7.78	51.507200	Y 377.433
Co (228.615 nm)	0.000556	ppm	0.000208	37.46	-24.782100	Y 242.219
Cr (205.560 nm)	0.001946	ppm	0.000098	5.03	33.846700	Y 377.433
Cu (324.754 nm)	0.008187	ppm	0.000252	3.08	808.447000	Y 377.433
Fe (238.204 nm)	0.019711	ppm	0.001508	7.65	90.670657	Y_R 377.433
Fe H (259.940 nm)	-0.139204 nu	ppm	0.000068	0.05	49.671900	Y_R 377.433
K (766.491 nm)	1.323650	ppm	0.043888	3.32	868.318000	Y_R2 488.368
Li (670.783 nm)	0.005750	ppm	0.000304	5.28	-962.354000	Y_R2 488.368
Mg (279.078 nm)	1.981720	ppm	0.004270	0.22	12139.900000	Y 377.433
Mn (257.610 nm)	0.172402	ppm	0.000140	0.08	46835.300000	Y 377.433
Mo (202.032 nm)	0.001903	ppm	0.000030	1.60	18.434500	Y 377.433
Na (589.592 nm)	288.343000 o	ppm	2.706380	0.94	1998970.000000	Y_R2 488.368
Na H (589.593 nm)	308.359347	ppm	1.246091	0.40	1219454.618460	Y_R 488.368
Ni (231.604 nm)	0.000931	ppm	0.000554	59.47	9.006070	Y 377.433
P (213.618 nm)	0.194646	ppm	0.000064	0.03	513.409000	Y 242.219
Pb (220.353 nm)	0.083332	ppm	0.000275	0.33	268.428000	Y 242.219
S (181.972 nm)	0.550329	ppm	0.005068	0.92	335.272459	Y 377.433
Sb (206.834 nm)	0.000422 u	ppm	0.001006	> 100.00	-15.568400	Y 377.433
Se (196.026 nm)	-0.003572 u	ppm	0.000875	24.50	10.360400	Y 242.219
Si (288.158 nm)	0.800948	ppm	0.005181	0.65	8120.960000	Y 377.433
Sn (189.925 nm)	-0.000033 u	ppm	0.000782	> 100.00	6.955880	Y 377.433
Sr (421.552 nm)	0.147625	ppm	0.000418	0.28	32112.830987	Y_R 488.368
Th (288.505 nm)	0.004506	ppm	0.000141	3.12	88.802300	Y 377.433
Ti (336.122 nm)	0.000595	ppm	0.000042	7.00	81.585400	Y 377.433
Tl (190.794 nm)	-0.000487 u	ppm	0.000038	7.82	-7.025510	Y 377.433
U (409.013 nm)	-0.010099 u	ppm	0.000915	9.06	-153.525000	Y 377.433
V (292.401 nm)	0.002515	ppm	0.000170	6.77	128.599000	Y 377.433
Zn (206.200 nm)	0.049091	ppm	0.000136	0.28	299.108000	Y 377.433
Zr (343.823 nm)	-0.000008 u	ppm	0.000065	> 100.00	-13.116100	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.018481	20818.040888	0.001252	0.12
Y 377.433	1.026165	1129246.301795	0.004684	0.46
Y_R 377.433	1.078760	83166.800000	0.003731	0.35
Y_R 488.368	1.086650	47487.200000	0.004728	0.44
Y_R2 488.368	1.093067	94809.887115	0.008215	0.75

Sample Name: 280-112301-A-5-B

Date: 7/26/2018 2:05:25 PM Rack:Tube: 1:24

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000214	ppm	0.000238	> 100.00	-404.479000	Y 377.433
Al (167.019 nm)	0.036218	ppm	0.004616	12.75	17.794000	Y_R 377.433
Al H (396.152 nm)	0.004089 u	ppm	0.001665	40.73	198.204883	Y_R 377.433
As (188.980 nm)	0.004590	ppm	0.001976	43.04	2.796760	Y 242.219
B (249.678 nm)	0.018952	ppm	0.000137	0.72	589.370000	Y 242.219
Ba (493.408 nm)	0.125393	ppm	0.000814	0.65	15503.900000	Y_R 488.368
Be (234.861 nm)	0.000073	ppm	0.000010	14.03	-25.656600	Y_R 488.368
Bi (223.061 nm)	-0.000062 u	ppm	0.002304	> 100.00	14.411300	Y 377.433
Ca (315.887 nm)	76.445794 o	ppm	0.318343	0.42	63090.198295	Y_R 377.433
Cd (214.439 nm)	0.000241	ppm	0.000006	2.65	12.819800	Y 377.433
Co (228.615 nm)	0.000076 u	ppm	0.000132	> 100.00	-34.760600	Y 242.219
Cr (205.560 nm)	0.001214	ppm	0.000010	0.86	21.452500	Y 377.433
Cu (324.754 nm)	0.002982	ppm	0.000155	5.19	459.192000	Y 377.433
Fe (238.204 nm)	0.005853	ppm	0.000168	2.88	38.469551	Y_R 377.433
Fe H (259.940 nm)	-0.156264 nu	ppm	0.001279	0.82	16.264400	Y_R 377.433
K (766.491 nm)	1.446480	ppm	0.045298	3.13	1017.240000	Y_R2 488.368
Li (670.783 nm)	0.004065	ppm	0.002141	52.66	-1021.720000	Y_R2 488.368
Mg (279.078 nm)	2.228600	ppm	0.007713	0.35	13646.500000	Y 377.433
Mn (257.610 nm)	0.057092	ppm	0.000036	0.06	15544.700000	Y 377.433
Mo (202.032 nm)	0.001332	ppm	0.000130	9.74	12.742800	Y 377.433
Na (589.592 nm)	288.155000 o	ppm	1.107000	0.38	1997640.000000	Y_R2 488.368
Na H (589.593 nm)	306.930030	ppm	1.541776	0.50	1213805.868304	Y_R 488.368
Ni (231.604 nm)	0.000179 u	ppm	0.000565	> 100.00	3.158660	Y 377.433
P (213.618 nm)	0.119927	ppm	0.000954	0.80	324.506000	Y 242.219
Pb (220.353 nm)	0.005087	ppm	0.001150	22.60	19.750300	Y 242.219
S (181.972 nm)	0.492952	ppm	0.005056	1.03	302.544058	Y 377.433
Sb (206.834 nm)	-0.001126 u	ppm	0.001848	> 100.00	-20.276600	Y 377.433
Se (196.026 nm)	0.000018 u	ppm	0.001028	> 100.00	14.235400	Y 242.219
Si (288.158 nm)	0.959837	ppm	0.010546	1.10	9564.310000	Y 377.433
Sn (189.925 nm)	0.000412 u	ppm	0.001753	> 100.00	7.995530	Y 377.433
Sr (421.552 nm)	0.126003	ppm	0.001395	1.11	27430.200502	Y_R 488.368
Th (288.505 nm)	0.002942	ppm	0.001044	35.49	82.106500	Y 377.433
Ti (336.122 nm)	0.000349	ppm	0.000140	40.11	87.532800	Y 377.433
Tl (190.794 nm)	-0.000104 u	ppm	0.001659	> 100.00	-6.047110	Y 377.433
U (409.013 nm)	-0.012008 u	ppm	0.000702	5.85	-165.445000	Y 377.433
V (292.401 nm)	0.006189	ppm	0.000456	7.38	286.510000	Y 377.433
Zn (206.200 nm)	0.005992	ppm	0.000353	5.89	51.547800	Y 377.433
Zr (343.823 nm)	-0.000047 u	ppm	0.000144	> 100.00	-18.467600	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.009708	20638.721322	0.000922	0.09
Y 377.433	1.016789	1118928.586826	0.001125	0.11
Y_R 377.433	1.054990	81333.600000	0.001508	0.14
Y_R 488.368	1.064720	46528.600000	0.004802	0.45
Y_R2 488.368	1.074856	93230.322159	0.005205	0.48

Sample Name: 280-112301-A-6-B

Date: 7/26/2018 2:08:48 PM Rack:Tube: 1:25

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000206	ppm	0.000170	82.62	-404.559000	Y 377.433
Al (167.019 nm)	0.020425	ppm	0.001779	8.71	9.949370	Y_R 377.433
Al H (396.152 nm)	-0.021670 u	ppm	0.005038	23.25	134.884945	Y_R 377.433
As (188.980 nm)	0.003659	ppm	0.000755	20.63	1.476860	Y 242.219
B (249.678 nm)	0.018880	ppm	0.000026	0.14	587.335000	Y 242.219
Ba (493.408 nm)	0.131782	ppm	0.001025	0.78	16267.100000	Y_R 488.368
Be (234.861 nm)	0.000045	ppm	0.000015	34.38	-34.331100	Y_R 488.368
Bi (223.061 nm)	-0.000230 u	ppm	0.000294	> 100.00	13.941700	Y 377.433
Ca (315.887 nm)	80.058237 o	ppm	0.360078	0.45	66075.103337	Y_R 377.433
Cd (214.439 nm)	0.000280	ppm	0.000046	16.45	15.409600	Y 377.433
Co (228.615 nm)	0.000049 u	ppm	0.000264	> 100.00	-35.315800	Y 242.219
Cr (205.560 nm)	0.001644	ppm	0.000061	3.72	28.730900	Y 377.433
Cu (324.754 nm)	0.002558	ppm	0.000325	12.71	427.978000	Y 377.433
Fe (238.204 nm)	0.019455	ppm	0.001187	6.10	89.706612	Y_R 377.433
Fe H (259.940 nm)	-0.141604 nu	ppm	0.002869	2.03	44.971200	Y_R 377.433
K (766.491 nm)	1.033830	ppm	0.005234	0.51	516.907000	Y_R2 488.368
Li (670.783 nm)	0.005906	ppm	0.000456	7.71	-956.846000	Y_R2 488.368
Mg (279.078 nm)	1.968570	ppm	0.000969	0.05	12059.600000	Y 377.433
Mn (257.610 nm)	0.052034	ppm	0.000039	0.08	14172.000000	Y 377.433
Mo (202.032 nm)	0.000520	ppm	0.000421	81.03	4.639980	Y 377.433
Na (589.592 nm)	267.332000 o	ppm	0.804804	0.30	1853330.000000	Y_R2 488.368
Na H (589.593 nm)	288.127117	ppm	1.771470	0.61	1139716.965706	Y_R 488.368
Ni (231.604 nm)	-0.000470 u	ppm	0.000462	98.26	-1.892340	Y 377.433
P (213.618 nm)	0.142040	ppm	0.001480	1.04	380.411000	Y 242.219
Pb (220.353 nm)	0.014568	ppm	0.001079	7.41	49.897300	Y 242.219
S (181.972 nm)	0.541131	ppm	0.001767	0.33	329.753282	Y 377.433
Sb (206.834 nm)	-0.001306 u	ppm	0.001842	> 100.00	-20.800800	Y 377.433
Se (196.026 nm)	-0.004601 u	ppm	0.001873	40.69	9.110680	Y 242.219
Si (288.158 nm)	0.867857	ppm	0.008699	1.00	8728.770000	Y 377.433
Sn (189.925 nm)	0.000913	ppm	0.000091	9.98	9.167800	Y 377.433
Sr (421.552 nm)	0.167508	ppm	0.000685	0.41	36418.949642	Y_R 488.368
Th (288.505 nm)	-0.000179 u	ppm	0.002351	> 100.00	73.264900	Y 377.433
Ti (336.122 nm)	0.000406	ppm	0.000024	5.80	107.205000	Y 377.433
Tl (190.794 nm)	0.000297	ppm	0.000403	> 100.00	-5.025150	Y 377.433
U (409.013 nm)	-0.006108 u	ppm	0.003815	62.45	-137.591000	Y 377.433
V (292.401 nm)	0.004364	ppm	0.000066	1.51	207.340000	Y 377.433
Zn (206.200 nm)	0.008997	ppm	0.000764	8.49	68.807800	Y 377.433
Zr (343.823 nm)	0.000001 u	ppm	0.000064	> 100.00	-11.958600	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.021172	20873.030320	0.003557	0.35
Y 377.433	1.031860	1135513.699077	0.002447	0.24
Y_R 377.433	1.073100	82730.300000	0.006371	0.59
Y_R 488.368	1.075860	47015.400000	0.005105	0.47
Y_R2 488.368	1.097928	95231.507526	0.001841	0.17

Sample Name: 280-112301-A-7-B

Date: 7/26/2018 2:12:10 PM Rack:Tube: 1:26

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000391	ppm	0.000114	29.21	-395.061000	Y 377.433
Al (167.019 nm)	0.025821	ppm	0.001999	7.74	12.626800	Y_R 377.433
Al H (396.152 nm)	-0.007637 u	ppm	0.004344	56.89	189.955050	Y_R 377.433
As (188.980 nm)	0.001954	ppm	0.002004	> 100.00	-0.939442	Y 242.219
B (249.678 nm)	0.044457	ppm	0.000117	0.26	1296.530000	Y 242.219
Ba (493.408 nm)	0.104367	ppm	0.000102	0.10	13006.100000	Y_R 488.368
Be (234.861 nm)	0.000055	ppm	0.000019	34.10	-31.674400	Y_R 488.368
Bi (223.061 nm)	0.000252	ppm	0.000281	> 100.00	15.292400	Y 377.433
Ca (315.887 nm)	124.646015 o	ppm	0.714132	0.57	102917.286417	Y_R 377.433
Cd (214.439 nm)	0.000939	ppm	0.000021	2.25	58.949500	Y 377.433
Co (228.615 nm)	0.000687	ppm	0.000154	22.48	-22.079000	Y 242.219
Cr (205.560 nm)	0.002246	ppm	0.000033	1.48	38.909300	Y 377.433
Cu (324.754 nm)	0.001672	ppm	0.000223	13.33	339.327000	Y 377.433
Fe (238.204 nm)	0.010130	ppm	0.000319	3.15	54.581055	Y_R 377.433
Fe H (259.940 nm)	-0.150760 nu	ppm	0.002259	1.50	27.042400	Y_R 377.433
K (766.491 nm)	1.620460	ppm	0.051505	3.18	1228.200000	Y_R2 488.368
Li (670.783 nm)	0.005821	ppm	0.000641	11.01	-959.827000	Y_R2 488.368
Mg (279.078 nm)	2.485240	ppm	0.011604	0.47	15212.500000	Y 377.433
Mn (257.610 nm)	0.208983	ppm	0.000602	0.29	56762.000000	Y 377.433
Mo (202.032 nm)	0.003449	ppm	0.000130	3.77	33.868600	Y 377.433
Na (589.592 nm)	304.400000 o	ppm	0.286209	0.09	2110180.000000	Y_R2 488.368
Na H (589.593 nm)	327.808001	ppm	0.621011	0.19	1296056.923351	Y_R 488.368
Ni (231.604 nm)	0.008035	ppm	0.000539	6.71	64.230600	Y 377.433
P (213.618 nm)	0.019647	ppm	0.000965	4.91	70.979600	Y 242.219
Pb (220.353 nm)	0.040545	ppm	0.000843	2.08	132.429000	Y 242.219
S (181.972 nm)	4.007264	ppm	0.017363	0.43	2288.678095	Y 377.433
Sb (206.834 nm)	0.001874	ppm	0.001162	62.02	-11.171900	Y 377.433
Se (196.026 nm)	-0.002520 u	ppm	0.001169	46.40	11.560700	Y 242.219
Si (288.158 nm)	4.165610	ppm	0.035695	0.86	38685.600000	Y 377.433
Sn (189.925 nm)	0.001576	ppm	0.002027	> 100.00	10.720300	Y 377.433
Sr (421.552 nm)	0.294109	ppm	0.000135	0.05	63837.231435	Y_R 488.368
Th (288.505 nm)	0.003615	ppm	0.000654	18.08	87.177600	Y 377.433
Ti (336.122 nm)	0.000286	ppm	0.000038	13.37	232.155000	Y 377.433
Tl (190.794 nm)	0.000916	ppm	0.000043	4.72	-3.458160	Y 377.433
U (409.013 nm)	-0.013742 u	ppm	0.003455	25.14	-183.693000	Y 377.433
V (292.401 nm)	0.003401	ppm	0.000240	7.06	165.990000	Y 377.433
Zn (206.200 nm)	0.063712	ppm	0.000757	1.19	383.094000	Y 377.433
Zr (343.823 nm)	-0.000037 u	ppm	0.000001	1.46	-17.080900	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.009833	20641.270843	0.005037	0.50
Y 377.433	1.019378	1121777.699781	0.006866	0.67
Y_R 377.433	1.059350	81670.000000	0.002383	0.22
Y_R 488.368	1.063950	46495.300000	0.002257	0.21
Y_R2 488.368	1.080929	93756.996599	0.000491	0.05

Sample Name: 280-112301-A-8-B

Date: 7/26/2018 2:15:34 PM Rack:Tube: 1:27

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000334	ppm	0.000195	58.31	-397.358000	Y 377.433
Al (167.019 nm)	0.026475	ppm	0.001275	4.82	14.013800	Y_R 377.433
Al H (396.152 nm)	-0.002244 u	ppm	0.004066	> 100.00	196.356048	Y_R 377.433
As (188.980 nm)	0.001712	ppm	0.001260	73.60	-1.300200	Y 242.219
B (249.678 nm)	0.107953	ppm	0.000085	0.08	3054.360000	Y 242.219
Ba (493.408 nm)	0.128889	ppm	0.001339	1.04	15930.400000	Y_R 488.368
Be (234.861 nm)	0.000043	ppm	0.000025	57.97	24.787000	Y_R 488.368
Bi (223.061 nm)	-0.000492 u	ppm	0.000579	> 100.00	13.531700	Y 377.433
Ca (315.887 nm)	108.645762 o	ppm	0.609173	0.56	89696.528101	Y_R 377.433
Cd (214.439 nm)	0.000965	ppm	0.000034	3.52	62.543300	Y 377.433
Co (228.615 nm)	0.005129	ppm	0.000152	2.97	70.166900	Y 242.219
Cr (205.560 nm)	0.000035	ppm	0.000002	5.71	0.964370	Y 377.433
Cu (324.754 nm)	0.002131	ppm	0.000119	5.60	384.103000	Y 377.433
Fe (238.204 nm)	1.745341	ppm	0.013533	0.78	6590.808958	Y_R 377.433
Fe H (259.940 nm)	1.642420 nu	ppm	0.019564	1.19	3538.450000	Y_R 377.433
K (766.491 nm)	1.462530	ppm	0.030165	2.06	1036.710000	Y_R2 488.368
Li (670.783 nm)	0.005364	ppm	0.000439	8.19	-975.948000	Y_R2 488.368
Mg (279.078 nm)	1.964500	ppm	0.000290	0.01	12031.700000	Y 377.433
Mn (257.610 nm)	0.495501	ppm	0.000140	0.03	134512.000000	Y 377.433
Mo (202.032 nm)	0.001163	ppm	0.000300	25.80	11.053900	Y 377.433
Na (589.592 nm)	270.291000 o	ppm	1.549680	0.57	1873840.000000	Y_R2 488.368
Na H (589.593 nm)	290.231033	ppm	1.077449	0.37	1148004.792481	Y_R 488.368
Ni (231.604 nm)	0.001746	ppm	0.000337	19.30	15.419700	Y 377.433
P (213.618 nm)	0.002024	ppm	0.001933	95.53	26.424900	Y 242.219
Pb (220.353 nm)	0.334584	ppm	0.000088	0.03	1067.140000	Y 242.219
S (181.972 nm)	3.678905	ppm	0.005384	0.15	2103.906981	Y 377.433
Sb (206.834 nm)	0.010376	ppm	0.001183	11.40	14.056600	Y 377.433
Se (196.026 nm)	-0.003465 u	ppm	0.002952	85.19	10.387200	Y 242.219
Si (288.158 nm)	1.089740	ppm	0.001492	0.14	10744.400000	Y 377.433
Sn (189.925 nm)	0.000211 u	ppm	0.001165	> 100.00	7.526190	Y 377.433
Sr (421.552 nm)	0.137301	ppm	0.000466	0.34	29877.086263	Y_R 488.368
Th (288.505 nm)	0.002274	ppm	0.001026	45.10	89.420600	Y 377.433
Ti (336.122 nm)	0.000140	ppm	0.000001	0.58	160.237000	Y 377.433
Tl (190.794 nm)	0.000676	ppm	0.000457	67.53	-4.095740	Y 377.433
U (409.013 nm)	-0.007348 u	ppm	0.000746	10.16	-147.702000	Y 377.433
V (292.401 nm)	0.000163	ppm	0.000021	12.87	27.876000	Y 377.433
Zn (206.200 nm)	0.190305	ppm	0.000366	0.19	1110.260000	Y 377.433
Zr (343.823 nm)	-0.000033 u	ppm	0.000010	30.34	-11.316800	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.018810	20824.757971	0.000596	0.06
Y 377.433	1.032017	1135686.037726	0.000446	0.04
Y_R 377.433	1.068950	82409.900000	0.005798	0.54
Y_R 488.368	1.073130	46896.200000	0.004772	0.44
Y_R2 488.368	1.090678	94602.649051	0.006798	0.62

Sample Name: 280-112301-A-9-B

Date: 7/26/2018 2:18:57 PM Rack:Tube: 1:28

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000344	ppm	0.000102	29.81	-396.961000	Y 377.433
Al (167.019 nm)	0.010235	ppm	0.000225	2.20	4.905490	Y_R 377.433
Al H (396.152 nm)	-0.016794 u	ppm	0.002614	15.57	171.937090	Y_R 377.433
As (188.980 nm)	0.001307	ppm	0.000746	57.11	-1.857140	Y 242.219
B (249.678 nm)	0.034966	ppm	0.000171	0.49	1033.420000	Y 242.219
Ba (493.408 nm)	0.121636	ppm	0.000054	0.04	15070.000000	Y_R 488.368
Be (234.861 nm)	0.000025	ppm	0.000003	11.29	-39.640900	Y_R 488.368
Bi (223.061 nm)	0.000025 u	ppm	0.000575	> 100.00	14.664200	Y 377.433
Ca (315.887 nm)	136.473136 o	ppm	0.646462	0.47	112689.851582	Y_R 377.433
Cd (214.439 nm)	0.001988	ppm	0.000002	0.12	128.304000	Y 377.433
Co (228.615 nm)	0.003372	ppm	0.000342	10.14	33.694100	Y 242.219
Cr (205.560 nm)	0.000529	ppm	0.000189	35.75	9.854850	Y 377.433
Cu (324.754 nm)	0.002802	ppm	0.000095	3.39	405.684000	Y 377.433
Fe (238.204 nm)	0.057971	ppm	0.001360	2.35	234.787433	Y_R 377.433
Fe H (259.940 nm)	-0.106167 nu	ppm	0.000119	0.11	114.365000	Y_R 377.433
K (766.491 nm)	1.232520	ppm	0.035142	2.85	757.819000	Y_R2 488.368
Li (670.783 nm)	0.005692	ppm	0.000767	13.47	-964.393000	Y_R2 488.368
Mg (279.078 nm)	4.264020	ppm	0.007903	0.19	26067.200000	Y 377.433
Mn (257.610 nm)	0.398512	ppm	0.000734	0.18	108193.000000	Y 377.433
Mo (202.032 nm)	0.001899	ppm	0.000152	8.01	18.395000	Y 377.433
Na (589.592 nm)	294.591000 o	ppm	0.136214	0.05	2042240.000000	Y_R2 488.368
Na H (589.593 nm)	314.795745	ppm	0.144764	0.05	1244797.990691	Y_R 488.368
Ni (231.604 nm)	0.002293	ppm	0.000460	20.07	19.597500	Y 377.433
P (213.618 nm)	0.006442	ppm	0.001129	17.52	37.596000	Y 242.219
Pb (220.353 nm)	0.037756	ppm	0.000867	2.30	123.576000	Y 242.219
S (181.972 nm)	3.005614	ppm	0.012099	0.40	1723.210893	Y 377.433
Sb (206.834 nm)	-0.002277 u	ppm	0.001225	53.78	-23.796900	Y 377.433
Se (196.026 nm)	-0.000851 u	ppm	0.000648	76.13	13.568500	Y 242.219
Si (288.158 nm)	1.203420	ppm	0.003589	0.30	11777.000000	Y 377.433
Sn (189.925 nm)	0.001095	ppm	0.000398	36.32	9.593220	Y 377.433
Sr (421.552 nm)	0.277731	ppm	0.000274	0.10	60290.215602	Y_R 488.368
Th (288.505 nm)	0.002753	ppm	0.003666	> 100.00	88.764600	Y 377.433
Ti (336.122 nm)	0.000136	ppm	0.000170	> 100.00	248.012000	Y 377.433
Tl (190.794 nm)	0.000547	ppm	0.000109	19.91	-4.382540	Y 377.433
U (409.013 nm)	-0.008314 u	ppm	0.000865	10.41	-159.765000	Y 377.433
V (292.401 nm)	0.000834	ppm	0.000016	1.96	56.497500	Y 377.433
Zn (206.200 nm)	0.833646	ppm	0.002039	0.24	4805.660000	Y 377.433
Zr (343.823 nm)	-0.000065 u	ppm	0.000089	> 100.00	-20.821000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.999783	20435.845498	0.000761	0.08
Y 377.433	1.009947	1111398.767253	0.001442	0.14
Y_R 377.433	1.049460	80907.300000	0.001436	0.14
Y_R 488.368	1.062200	46418.500000	0.004980	0.47
Y_R2 488.368	1.068917	92715.162502	0.002140	0.20

Sample Name: 280-112301-A-10-B

Date: 7/26/2018 2:22:21 PM Rack:Tube: 1:29

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000082 u	ppm	0.000182	> 100.00	-410.057000	Y 377.433
Al (167.019 nm)	0.022673	ppm	0.006459	28.49	11.062900	Y_R 377.433
Al H (396.152 nm)	-0.011827 u	ppm	0.006126	51.79	157.495420	Y_R 377.433
As (188.980 nm)	0.003509	ppm	0.001671	47.60	1.265140	Y 242.219
B (249.678 nm)	0.022923	ppm	0.000332	1.45	699.454000	Y 242.219
Ba (493.408 nm)	0.182620	ppm	0.000926	0.51	22333.100000	Y_R 488.368
Be (234.861 nm)	0.000026	ppm	0.000007	27.63	-40.538300	Y_R 488.368
Bi (223.061 nm)	0.000795	ppm	0.001049	> 100.00	16.814900	Y 377.433
Ca (315.887 nm)	75.099981 o	ppm	0.530836	0.71	61978.175149	Y_R 377.433
Cd (214.439 nm)	0.001953	ppm	0.000038	1.97	125.933000	Y 377.433
Co (228.615 nm)	0.000641	ppm	0.000135	21.02	-23.021300	Y 242.219
Cr (205.560 nm)	0.002645	ppm	0.000202	7.63	45.666200	Y 377.433
Cu (324.754 nm)	0.002651	ppm	0.000129	4.87	440.107000	Y 377.433
Fe (238.204 nm)	0.012620	ppm	0.000196	1.56	63.958194	Y_R 377.433
Fe H (259.940 nm)	-0.147497 nu	ppm	0.001660	1.13	33.431700	Y_R 377.433
K (766.491 nm)	1.045470	ppm	0.021076	2.02	531.029000	Y_R2 488.368
Li (670.783 nm)	0.003898	ppm	0.001324	33.96	-1027.600000	Y_R2 488.368
Mg (279.078 nm)	1.114570	ppm	0.001347	0.12	6848.260000	Y 377.433
Mn (257.610 nm)	0.419098	ppm	0.000485	0.12	113779.000000	Y 377.433
Mo (202.032 nm)	-0.000035 u	ppm	0.000028	79.20	-0.902519	Y 377.433
Na (589.592 nm)	262.267000 o	ppm	0.998786	0.38	1818340.000000	Y_R2 488.368
Na H (589.593 nm)	281.811203	ppm	0.781569	0.28	1114879.297892	Y_R 488.368
Ni (231.604 nm)	0.001088	ppm	0.000301	27.65	10.220900	Y 377.433
P (213.618 nm)	0.137275	ppm	0.000020	0.01	368.363000	Y 242.219
Pb (220.353 nm)	0.141004	ppm	0.001295	0.92	451.736000	Y 242.219
S (181.972 nm)	0.684139	ppm	0.004676	0.68	411.537087	Y 377.433
Sb (206.834 nm)	0.003177	ppm	0.001398	44.00	-7.184730	Y 377.433
Se (196.026 nm)	-0.002002 u	ppm	0.001215	60.69	12.321000	Y 242.219
Si (288.158 nm)	0.888867	ppm	0.000640	0.07	8919.620000	Y 377.433
Sn (189.925 nm)	0.001008	ppm	0.000142	14.13	9.391000	Y 377.433
Sr (421.552 nm)	0.149164	ppm	0.000665	0.45	32446.222388	Y_R 488.368
Th (288.505 nm)	0.005281	ppm	0.004022	76.17	96.202000	Y 377.433
Ti (336.122 nm)	0.000384	ppm	0.000004	1.09	88.501200	Y 377.433
Tl (190.794 nm)	0.000740	ppm	0.000098	13.23	-3.896930	Y 377.433
U (409.013 nm)	-0.008361 u	ppm	0.003466	41.45	-147.510000	Y 377.433
V (292.401 nm)	-0.000194 u	ppm	0.000263	> 100.00	11.784800	Y 377.433
Zn (206.200 nm)	5.825400 o	ppm	0.042935	0.74	33478.800000	Y 377.433
Zr (343.823 nm)	-0.000020 u	ppm	0.000025	> 100.00	-14.747800	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.010002	20644.721852	0.000695	0.07
Y 377.433	1.019761	1122198.358743	0.002311	0.23
Y_R 377.433	1.044440	80520.500000	0.009143	0.88
Y_R 488.368	1.052950	46014.400000	0.001352	0.13
Y_R2 488.368	1.067735	92612.638590	0.008619	0.81

Sample Name: CCVH-5225153

Date: 7/26/2018 2:25:45 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001040 u	ppm	0.000359	34.56	-730.647000	Y 377.433
Al (167.019 nm)	45.363600 o	ppm	0.257365	0.57	22586.100000	Y_R 377.433
Al H (396.152 nm)	49.471711	ppm	0.278187	0.56	124638.346475	Y_R 377.433
As (188.980 nm)	0.000487	ppm	0.000470	96.59	-3.509370	Y 242.219
B (249.678 nm)	-0.000632 u	ppm	0.000306	48.51	-35.871400	Y 242.219
Ba (493.408 nm)	0.000333	ppm	0.000078	23.30	607.816000	Y_R 488.368
Be (234.861 nm)	0.000109	ppm	0.000024	22.53	1655.390000	Y_R 488.368
Bi (223.061 nm)	0.969649	ppm	0.002718	0.28	2742.820000	Y 377.433
Ca (315.887 nm)	0.007938 u	ppm	0.013026	> 100.00	-69.204523	Y_R 377.433
Cd (214.439 nm)	-0.000133 u	ppm	0.000044	33.16	40.357600	Y 377.433
Co (228.615 nm)	0.000709	ppm	0.000103	14.47	-21.599700	Y 242.219
Cr (205.560 nm)	-0.000109 u	ppm	0.000042	38.56	-15.972200	Y 377.433
Cu (324.754 nm)	-0.005887 u	ppm	0.000436	7.41	309.096000	Y 377.433
Fe (238.204 nm)	48.363300 o	ppm	0.114621	0.24	182192.262482	Y_R 377.433
Fe H (259.940 nm)	49.566600	ppm	0.121600	0.25	97383.600000	Y_R 377.433
K (766.491 nm)	0.082983	ppm	0.057654	69.48	-635.983000	Y_R2 488.368
Li (670.783 nm)	0.000536	ppm	0.000016	2.89	-1146.110000	Y_R2 488.368
Mg (279.078 nm)	-0.011300 u	ppm	0.001007	8.91	-391.857000	Y 377.433
Mn (257.610 nm)	0.001522	ppm	0.000030	2.00	465.111000	Y 377.433
Mo (202.032 nm)	0.000143	ppm	0.000051	35.81	0.873271	Y 377.433
Na (589.592 nm)	231.832000 o	ppm	0.122355	0.05	1607010.000000	Y_R2 488.368
Na H (589.593 nm)	245.511149	ppm	0.238809	0.10	971648.787791	Y_R 488.368
Ni (231.604 nm)	0.000445	ppm	0.000235	52.92	7.526170	Y 377.433
P (213.618 nm)	-0.003668 u	ppm	0.000687	18.72	12.036000	Y 242.219
Pb (220.353 nm)	-0.001712 u	ppm	0.001000	58.40	16.505400	Y 242.219
S (181.972 nm)	4.845297	ppm	0.001560	0.03	2761.646652	Y 377.433
Sb (206.834 nm)	-0.002019 u	ppm	0.001772	87.75	-70.941500	Y 377.433
Se (196.026 nm)	-0.000124 u	ppm	0.000129	> 100.00	4.169330	Y 242.219
Si (288.158 nm)	0.022363	ppm	0.002329	10.42	1048.300000	Y 377.433
Sn (189.925 nm)	0.001839	ppm	0.000501	27.27	11.335100	Y 377.433
Sr (421.552 nm)	0.000382	ppm	0.000058	15.10	224.315223	Y_R 488.368
Th (288.505 nm)	4.931900	ppm	0.038631	0.78	13984.800000	Y 377.433
Ti (336.122 nm)	0.001499	ppm	0.000117	7.79	10.238800	Y 377.433
Tl (190.794 nm)	-0.002852 u	ppm	0.000360	12.61	-14.547100	Y 377.433
U (409.013 nm)	10.025200	ppm	0.013200	0.13	48519.700000	Y 377.433
V (292.401 nm)	0.003341	ppm	0.000060	1.79	-31.718400	Y 377.433
Zn (206.200 nm)	-0.001879 u	ppm	0.000471	25.09	6.335230	Y 377.433
Zr (343.823 nm)	-0.003866 u	ppm	0.000035	0.91	-390.294000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.017419	20796.320832	0.000528	0.05
Y 377.433	1.014667	1116593.399085	0.000304	0.03
Y_R 377.433	1.032690	79614.500000	0.000716	0.07
Y_R 488.368	1.049020	45842.700000	0.001884	0.18
Y_R2 488.368	1.059139	91866.995718	0.004513	0.43

Sample Name: CCV-5225154

Date: 7/26/2018 2:29:09 PM
Rack:Tube: S1:2

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.478724	ppm	0.000704	0.15	23714.000000	Y 377.433
Al (167.019 nm)	0.519503	ppm	0.015110	2.91	259.614000	Y_R 377.433
Al H (396.152 nm)	0.484089 u	ppm	0.005385	1.11	1413.529415	Y_R 377.433
As (188.980 nm)	0.968807	ppm	0.001142	0.12	1369.410000	Y 242.219
B (249.678 nm)	0.479713	ppm	0.000362	0.08	13384.500000	Y 242.219
Ba (493.408 nm)	0.491236	ppm	0.001287	0.26	59159.000000	Y_R 488.368
Be (234.861 nm)	0.477038	ppm	0.000674	0.14	154466.000000	Y_R 488.368
Bi (223.061 nm)	-0.002700 u	ppm	0.002184	80.88	7.475540	Y 377.433
Ca (315.887 nm)	4.924103	ppm	0.036027	0.73	3993.226470	Y_R 377.433
Cd (214.439 nm)	0.480290	ppm	0.000639	0.13	31726.700000	Y 377.433
Co (228.615 nm)	0.489299	ppm	0.000244	0.05	10144.600000	Y 242.219
Cr (205.560 nm)	0.482530	ppm	0.000207	0.04	8158.380000	Y 377.433
Cu (324.754 nm)	0.479767	ppm	0.001439	0.30	31520.700000	Y 377.433
Fe (238.204 nm)	2.476912	ppm	0.018910	0.76	9346.503149	Y_R 377.433
Fe H (259.940 nm)	2.400040 u	ppm	0.019724	0.82	5022.020000	Y_R 377.433
K (766.491 nm)	48.542900	ppm	0.146449	0.30	58121.300000	Y_R2 488.368
Li (670.783 nm)	0.968213	ppm	0.005766	0.60	32958.700000	Y_R2 488.368
Mg (279.078 nm)	18.930900	ppm	0.089548	0.47	115565.000000	Y 377.433
Mn (257.610 nm)	0.485784	ppm	0.001868	0.38	131875.000000	Y 377.433
Mo (202.032 nm)	0.488025	ppm	0.002577	0.53	4868.970000	Y 377.433
Na (589.592 nm)	4.919800	ppm	0.003898	0.08	35388.500000	Y_R2 488.368
Na H (589.593 nm)	6.067722 u	ppm	0.071607	1.18	28587.799970	Y_R 488.368
Ni (231.604 nm)	0.484414	ppm	0.000093	0.02	3769.340000	Y 377.433
P (213.618 nm)	0.948283	ppm	0.003969	0.42	2418.740000	Y 242.219
Pb (220.353 nm)	0.977992	ppm	0.000281	0.03	3109.530000	Y 242.219
S (181.972 nm)	0.010160	ppm	0.003434	33.80	30.888736	Y 377.433
Sb (206.834 nm)	0.968329	ppm	0.003872	0.40	2926.970000	Y 377.433
Se (196.026 nm)	0.955627	ppm	0.005395	0.56	1072.600000	Y 242.219
Si (288.158 nm)	4.866650	ppm	0.009543	0.20	45053.800000	Y 377.433
Sn (189.925 nm)	0.964354	ppm	0.004221	0.44	2263.510000	Y 377.433
Sr (421.552 nm)	0.491074	ppm	0.001204	0.25	106494.294385	Y_R 488.368
Th (288.505 nm)	0.006500	ppm	0.000628	9.67	107.288000	Y 377.433
Ti (336.122 nm)	0.494555	ppm	0.001505	0.30	71134.300000	Y 377.433
Tl (190.794 nm)	0.980799	ppm	0.006079	0.62	2488.810000	Y 377.433
U (409.013 nm)	0.003564	ppm	0.002932	82.27	-113.297000	Y 377.433
V (292.401 nm)	0.484915	ppm	0.001594	0.33	20769.300000	Y 377.433
Zn (206.200 nm)	0.480329	ppm	0.002311	0.48	2776.180000	Y 377.433
Zr (343.823 nm)	0.490696	ppm	0.001869	0.38	66776.900000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.035214	21160.060930	0.003190	0.31
Y 377.433	1.037810	1142061.006478	0.005719	0.55
Y_R 377.433	1.046910	80711.200000	0.004323	0.41
Y_R 488.368	1.054580	46085.800000	0.000147	0.01
Y_R2 488.368	1.083243	93957.756476	0.000908	0.08

Sample Name: CCB

Date: 7/26/2018 2:32:31 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000210 u	ppm	0.000303	> 100.00	-403.651000	Y 377.433
Al (167.019 nm)	0.000781 u	ppm	0.001156	> 100.00	0.170081	Y_R 377.433
Al H (396.152 nm)	-0.053203 u	ppm	0.005453	10.25	20.576008	Y_R 377.433
As (188.980 nm)	0.001786	ppm	0.000580	32.48	-1.177020	Y 242.219
B (249.678 nm)	0.000939	ppm	0.000275	29.31	89.909500	Y 242.219
Ba (493.408 nm)	-0.000345 u	ppm	0.000159	46.05	479.655000	Y_R 488.368
Be (234.861 nm)	0.000226	ppm	0.000201	88.82	23.751700	Y_R 488.368
Bi (223.061 nm)	0.001287	ppm	0.000830	64.49	18.193300	Y 377.433
Ca (315.887 nm)	0.004467 u	ppm	0.006480	> 100.00	-72.072314	Y_R 377.433
Cd (214.439 nm)	0.000228	ppm	0.000230	> 100.00	11.959100	Y 377.433
Co (228.615 nm)	0.000445	ppm	0.000224	50.22	-27.089400	Y 242.219
Cr (205.560 nm)	0.000066 u	ppm	0.000386	> 100.00	2.039340	Y 377.433
Cu (324.754 nm)	0.000288	ppm	0.000050	17.38	337.990000	Y 377.433
Fe (238.204 nm)	0.000541	ppm	0.000044	8.09	18.458685	Y_R 377.433
Fe H (259.940 nm)	-0.159683 u	ppm	0.002389	1.50	9.569240	Y_R 377.433
K (766.491 nm)	0.107106	ppm	0.054913	51.27	-606.734000	Y_R2 488.368
Li (670.783 nm)	0.001353	ppm	0.000117	8.66	-1117.300000	Y_R2 488.368
Mg (279.078 nm)	0.008031	ppm	0.007888	98.22	95.718000	Y 377.433
Mn (257.610 nm)	0.000208	ppm	0.000266	> 100.00	108.506000	Y 377.433
Mo (202.032 nm)	0.000296	ppm	0.000066	22.41	2.404530	Y 377.433
Na (589.592 nm)	0.042398	ppm	0.002343	5.53	540.756000	Y_R2 488.368
Na H (589.593 nm)	0.304848 u	ppm	0.030291	9.94	5381.452065	Y_R 488.368
Ni (231.604 nm)	0.000322 u	ppm	0.000666	> 100.00	4.265920	Y 377.433
P (213.618 nm)	-0.000033 u	ppm	0.001183	> 100.00	21.224700	Y 242.219
Pb (220.353 nm)	-0.000447 u	ppm	0.000147	32.82	2.201040	Y 242.219
S (181.972 nm)	0.013610	ppm	0.000685	5.03	31.544830	Y 377.433
Sb (206.834 nm)	0.000168 u	ppm	0.001105	> 100.00	-16.401700	Y 377.433
Se (196.026 nm)	0.000100 u	ppm	0.001021	> 100.00	14.274200	Y 242.219
Si (288.158 nm)	-0.001552 u	ppm	0.001776	> 100.00	831.059000	Y 377.433
Sn (189.925 nm)	0.000086	ppm	0.000092	> 100.00	7.234010	Y 377.433
Sr (421.552 nm)	0.000061	ppm	0.000074	> 100.00	154.734709	Y_R 488.368
Th (288.505 nm)	0.004428	ppm	0.001093	24.69	84.843200	Y 377.433
Ti (336.122 nm)	0.000456	ppm	0.000232	50.87	-140.295000	Y 377.433
Tl (190.794 nm)	0.000979	ppm	0.000978	99.88	-3.288000	Y 377.433
U (409.013 nm)	0.007407	ppm	0.000844	11.39	-55.818000	Y 377.433
V (292.401 nm)	0.000008 u	ppm	0.000264	> 100.00	20.187700	Y 377.433
Zn (206.200 nm)	-0.002833 u	ppm	0.000438	15.47	0.856046	Y 377.433
Zr (343.823 nm)	0.000157 u	ppm	0.000271	> 100.00	9.270140	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.045647	21373.311430	0.000882	0.08
Y 377.433	1.054546	1160478.497778	0.001816	0.17
Y_R 377.433	1.053150	81192.200000	0.001701	0.16
Y_R 488.368	1.064890	46536.100000	0.014524	1.36
Y_R2 488.368	1.077146	93428.916584	0.004810	0.45

Sample Name: CCVL-5236949

Date: 7/26/2018 2:35:55 PM
Rack:Tube: S1:3
Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009415	ppm	0.000056	0.59	60.253600	Y 377.433
Al (167.019 nm)	0.096092	ppm	0.001394	1.45	47.623000	Y_R 377.433
Al H (396.152 nm)	0.048414 u	ppm	0.004683	9.67	277.757506	Y_R 377.433
As (188.980 nm)	0.015307	ppm	0.000115	0.75	17.984900	Y 242.219
B (249.678 nm)	0.093325	ppm	0.000128	0.14	2651.800000	Y 242.219
Ba (493.408 nm)	0.009284	ppm	0.000185	2.00	1628.940000	Y_R 488.368
Be (234.861 nm)	0.000954	ppm	0.000013	1.39	262.041000	Y_R 488.368
Bi (223.061 nm)	0.100171	ppm	0.001222	1.22	295.515000	Y 377.433
Ca (315.887 nm)	0.206916	ppm	0.002924	1.41	95.210581	Y_R 377.433
Cd (214.439 nm)	0.004853	ppm	0.000035	0.72	317.609000	Y 377.433
Co (228.615 nm)	0.010087	ppm	0.000081	0.81	173.491000	Y 242.219
Cr (205.560 nm)	0.009288	ppm	0.000023	0.24	157.996000	Y 377.433
Cu (324.754 nm)	0.014525	ppm	0.000047	0.33	1262.330000	Y 377.433
Fe (238.204 nm)	0.098815	ppm	0.000508	0.51	388.641499	Y_R 377.433
Fe H (259.940 nm)	-0.061116 u	ppm	0.000269	0.44	202.584000	Y_R 377.433
K (766.491 nm)	3.034650	ppm	0.004875	0.16	2942.890000	Y_R2 488.368
Li (670.783 nm)	0.023057	ppm	0.000310	1.35	-352.383000	Y_R2 488.368
Mg (279.078 nm)	0.186358	ppm	0.000545	0.29	1182.480000	Y 377.433
Mn (257.610 nm)	0.009881	ppm	0.000022	0.22	2733.310000	Y 377.433
Mo (202.032 nm)	0.017894	ppm	0.000521	2.91	178.000000	Y 377.433
Na (589.592 nm)	1.033110	ppm	0.001805	0.17	7427.440000	Y_R2 488.368
Na H (589.593 nm)	1.127246 u	ppm	0.004417	0.39	8631.888696	Y_R 488.368
Ni (231.604 nm)	0.038033	ppm	0.000246	0.65	297.476000	Y 377.433
P (213.618 nm)	2.651870 o	ppm	0.008202	0.31	6725.710000	Y 242.219
Pb (220.353 nm)	0.008700	ppm	0.000740	8.50	31.300200	Y 242.219
S (181.972 nm)	0.096224	ppm	0.003109	3.23	78.250511	Y 377.433
Sb (206.834 nm)	0.018925	ppm	0.001752	9.26	40.463500	Y 377.433
Se (196.026 nm)	0.014710	ppm	0.001586	10.78	30.447100	Y 242.219
Si (288.158 nm)	0.464024	ppm	0.002076	0.45	5060.350000	Y 377.433
Sn (189.925 nm)	0.094372	ppm	0.000881	0.93	227.852000	Y 377.433
Sr (421.552 nm)	0.009704	ppm	0.000087	0.90	2243.208922	Y_R 488.368
Th (288.505 nm)	0.016912	ppm	0.002555	15.10	121.025000	Y 377.433
Ti (336.122 nm)	0.009876	ppm	0.000053	0.54	1218.880000	Y 377.433
Tl (190.794 nm)	0.015956	ppm	0.001815	11.37	34.772400	Y 377.433
U (409.013 nm)	0.060071	ppm	0.000167	0.28	198.197000	Y 377.433
V (292.401 nm)	0.009321	ppm	0.000167	1.79	416.195000	Y 377.433
Zn (206.200 nm)	0.016563	ppm	0.000468	2.83	112.267000	Y 377.433
Zr (343.823 nm)	0.014383	ppm	0.000100	0.69	1945.630000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.063612	21740.532678	0.006503	0.61
Y 377.433	1.070542	1178080.930151	0.004735	0.44
Y_R 377.433	1.082410	83447.900000	0.001565	0.14
Y_R 488.368	1.097070	47942.500000	0.005562	0.51
Y_R2 488.368	1.115547	96759.711817	0.003351	0.30

Sample Name: 280-112301-A-11-B

Date: 7/26/2018 2:39:19 PM Rack:Tube: 1:30

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000099 u	ppm	0.000147	> 100.00	-419.182000	Y 377.433
Al (167.019 nm)	0.037270	ppm	0.000041	0.11	18.326400	Y_R 377.433
Al H (396.152 nm)	-0.014031 u	ppm	0.003851	27.45	128.233421	Y_R 377.433
As (188.980 nm)	0.002210	ppm	0.000993	44.90	-0.576090	Y 242.219
B (249.678 nm)	0.021625	ppm	0.000221	1.02	663.434000	Y 242.219
Ba (493.408 nm)	0.117627	ppm	0.000730	0.62	14563.700000	Y_R 488.368
Be (234.861 nm)	0.000069	ppm	0.000002	2.27	-26.508900	Y_R 488.368
Bi (223.061 nm)	-0.000799 u	ppm	0.001474	> 100.00	12.347500	Y 377.433
Ca (315.887 nm)	20.926088 o	ppm	0.094585	0.45	17215.135264	Y_R 377.433
Cd (214.439 nm)	0.000114	ppm	0.000041	36.19	4.447340	Y 377.433
Co (228.615 nm)	0.000172	ppm	0.000054	31.47	-32.745000	Y 242.219
Cr (205.560 nm)	0.001093	ppm	0.000101	9.20	19.418400	Y 377.433
Cu (324.754 nm)	0.004943	ppm	0.000195	3.94	626.734000	Y 377.433
Fe (238.204 nm)	0.021027	ppm	0.001318	6.27	95.629323	Y_R 377.433
Fe H (259.940 nm)	-0.137512 nu	ppm	0.000384	0.28	52.984100	Y_R 377.433
K (766.491 nm)	1.337180	ppm	0.028615	2.14	884.717000	Y_R2 488.368
Li (670.783 nm)	0.003746	ppm	0.000099	2.65	-1032.980000	Y_R2 488.368
Mg (279.078 nm)	2.710760	ppm	0.005882	0.22	16588.700000	Y 377.433
Mn (257.610 nm)	0.023751	ppm	0.000032	0.14	6497.150000	Y 377.433
Mo (202.032 nm)	-0.000102 u	ppm	0.000097	95.06	-1.567030	Y 377.433
Na (589.592 nm)	259.972000 o	ppm	0.651996	0.25	1802290.000000	Y_R2 488.368
Na H (589.593 nm)	277.988380	ppm	1.900366	0.68	1099749.289827	Y_R 488.368
Ni (231.604 nm)	-0.000397 u	ppm	0.000126	31.68	-1.324500	Y 377.433
P (213.618 nm)	0.332868	ppm	0.001002	0.30	862.858000	Y 242.219
Pb (220.353 nm)	0.003932	ppm	0.000273	6.95	16.097400	Y 242.219
S (181.972 nm)	0.221476	ppm	0.000162	0.07	149.060147	Y 377.433
Sb (206.834 nm)	-0.000741 u	ppm	0.001002	> 100.00	-19.109200	Y 377.433
Se (196.026 nm)	-0.004144 u	ppm	0.002461	59.38	9.591090	Y 242.219
Si (288.158 nm)	0.905876	ppm	0.004449	0.49	9074.130000	Y 377.433
Sn (189.925 nm)	0.001422	ppm	0.000167	11.73	10.358600	Y 377.433
Sr (421.552 nm)	0.124441	ppm	0.000724	0.58	27091.969504	Y_R 488.368
Th (288.505 nm)	0.001108	ppm	0.001336	> 100.00	76.055700	Y 377.433
Ti (336.122 nm)	0.000783	ppm	0.000052	6.68	-26.646600	Y 377.433
Tl (190.794 nm)	0.000481 u	ppm	0.002014	> 100.00	-4.557260	Y 377.433
U (409.013 nm)	-0.007219 u	ppm	0.002966	41.09	-130.901000	Y 377.433
V (292.401 nm)	0.000571	ppm	0.000306	53.54	44.729700	Y 377.433
Zn (206.200 nm)	0.002386	ppm	0.000123	5.16	30.833400	Y 377.433
Zr (343.823 nm)	0.000006 u	ppm	0.000027	> 100.00	-11.223200	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.022407	20898.274123	0.000379	0.04
Y 377.433	1.028700	1132035.644140	0.001205	0.12
Y_R 377.433	1.058280	81587.300000	0.000282	0.03
Y_R 488.368	1.064420	46515.400000	0.001282	0.12
Y_R2 488.368	1.092800	94786.682870	0.001271	0.12

Sample Name: MB 280-423634/1-A

Date: 7/26/2018 2:42:42 PM Rack:Tube: 1:31

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000048 u	ppm	0.000001	1.17	-416.566000	Y 377.433
Al (167.019 nm)	0.000214 u	ppm	0.003382	> 100.00	-0.111601	Y_R 377.433
Al H (396.152 nm)	-0.052865 u	ppm	0.006966	13.18	21.399327	Y_R 377.433
As (188.980 nm)	0.001620 u	ppm	0.003141	> 100.00	-1.412760	Y 242.219
B (249.678 nm)	0.000463	ppm	0.000364	78.56	76.706100	Y 242.219
Ba (493.408 nm)	-0.000296 u	ppm	0.000274	92.46	485.497000	Y_R 488.368
Be (234.861 nm)	0.000046	ppm	0.000012	26.70	-34.415300	Y_R 488.368
Bi (223.061 nm)	-0.000160 u	ppm	0.002476	> 100.00	14.134500	Y 377.433
Ca (315.887 nm)	0.018584	ppm	0.004214	22.67	-60.408028	Y_R 377.433
Cd (214.439 nm)	0.000005 u	ppm	0.000055	> 100.00	-2.788180	Y 377.433
Co (228.615 nm)	0.000197	ppm	0.000073	36.99	-32.242700	Y 242.219
Cr (205.560 nm)	-0.000067 u	ppm	0.000109	> 100.00	-0.203055	Y 377.433
Cu (324.754 nm)	-0.000019 u	ppm	0.000060	> 100.00	318.030000	Y 377.433
Fe (238.204 nm)	0.001675	ppm	0.000169	10.06	22.731922	Y_R 377.433
Fe H (259.940 nm)	-0.157354 nu	ppm	0.002992	1.90	14.129800	Y_R 377.433
K (766.491 nm)	0.156862	ppm	0.035116	22.39	-546.406000	Y_R2 488.368
Li (670.783 nm)	0.002388	ppm	0.002113	88.51	-1080.840000	Y_R2 488.368
Mg (279.078 nm)	0.000681 u	ppm	0.002098	> 100.00	50.990200	Y 377.433
Mn (257.610 nm)	0.000016	ppm	0.000001	9.00	56.532800	Y 377.433
Mo (202.032 nm)	-0.000124 u	ppm	0.000089	71.75	-1.787800	Y 377.433
Na (589.592 nm)	0.086937	ppm	0.001986	2.28	849.427000	Y_R2 488.368
Na H (589.593 nm)	0.440530 u	ppm	0.019353	4.39	5916.118164	Y_R 488.368
Ni (231.604 nm)	-0.000512 u	ppm	0.000210	40.99	-2.214670	Y 377.433
P (213.618 nm)	-0.000351 u	ppm	0.000210	59.66	20.420500	Y 242.219
Pb (220.353 nm)	0.000169 u	ppm	0.000410	> 100.00	4.146440	Y 242.219
S (181.972 nm)	0.009406	ppm	0.007503	79.77	29.168917	Y 377.433
Sb (206.834 nm)	-0.000382 u	ppm	0.002260	> 100.00	-18.051700	Y 377.433
Se (196.026 nm)	-0.003560 u	ppm	0.004462	> 100.00	10.220800	Y 242.219
Si (288.158 nm)	-0.003807 u	ppm	0.000806	21.18	810.567000	Y 377.433
Sn (189.925 nm)	-0.000461 u	ppm	0.000689	> 100.00	5.953360	Y 377.433
Sr (421.552 nm)	0.000014	ppm	0.000003	19.92	144.475255	Y_R 488.368
Th (288.505 nm)	0.000364 u	ppm	0.004042	> 100.00	73.440800	Y 377.433
Ti (336.122 nm)	0.000386	ppm	0.000097	25.23	-150.310000	Y 377.433
Tl (190.794 nm)	-0.000391 u	ppm	0.001434	> 100.00	-6.775810	Y 377.433
U (409.013 nm)	0.002935	ppm	0.003106	> 100.00	-77.453000	Y 377.433
V (292.401 nm)	-0.000056 u	ppm	0.000110	> 100.00	17.599300	Y 377.433
Zn (206.200 nm)	-0.002544 u	ppm	0.000301	11.82	2.513080	Y 377.433
Zr (343.823 nm)	-0.000099 u	ppm	0.000098	99.29	-25.541800	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.059700	21660.558007	0.001857	0.18
Y 377.433	1.065575	1172615.200219	0.001222	0.11
Y_R 377.433	1.084600	83616.400000	0.002253	0.21
Y_R 488.368	1.092050	47723.200000	0.003061	0.28
Y_R2 488.368	1.117851	96959.584045	0.000069	0.01

Sample Name: LCS 280-423634/2-A

Date: 7/26/2018 2:46:05 PM Rack:Tube: 1:32

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.049818	ppm	0.000114	0.23	2066.900000	Y 377.433
Al (167.019 nm)	1.978260	ppm	0.011675	0.59	984.071000	Y_R 377.433
Al H (396.152 nm)	2.012964	ppm	0.006098	0.30	5316.779904	Y_R 377.433
As (188.980 nm)	1.001860	ppm	0.002912	0.29	1416.270000	Y 242.219
B (249.678 nm)	0.987501	ppm	0.002247	0.23	27466.100000	Y 242.219
Ba (493.408 nm)	1.995430 o	ppm	0.011397	0.57	238669.000000	Y_R 488.368
Be (234.861 nm)	0.047546	ppm	0.000312	0.66	15320.900000	Y_R 488.368
Bi (223.061 nm)	1.968330	ppm	0.003429	0.17	5534.610000	Y 377.433
Ca (315.887 nm)	48.603449 o	ppm	0.220711	0.45	40084.560912	Y_R 377.433
Cd (214.439 nm)	0.095671	ppm	0.000086	0.09	6318.240000	Y 377.433
Co (228.615 nm)	0.477652	ppm	0.000237	0.05	9922.470000	Y 242.219
Cr (205.560 nm)	0.193523	ppm	0.000190	0.10	3272.350000	Y 377.433
Cu (324.754 nm)	0.239633	ppm	0.000715	0.30	15933.000000	Y 377.433
Fe (238.204 nm)	0.995000	ppm	0.002399	0.24	3764.409898	Y_R 377.433
Fe H (259.940 nm)	0.850802 nu	ppm	0.004196	0.49	1988.300000	Y_R 377.433
K (766.491 nm)	49.407500	ppm	0.125987	0.25	59169.600000	Y_R2 488.368
Li (670.783 nm)	0.978699	ppm	0.000948	0.10	33328.300000	Y_R2 488.368
Mg (279.078 nm)	48.107700 o	ppm	0.022231	0.05	293557.000000	Y 377.433
Mn (257.610 nm)	0.484672	ppm	0.000645	0.13	131573.000000	Y 377.433
Mo (202.032 nm)	0.954300	ppm	0.001385	0.15	9521.460000	Y 377.433
Na (589.592 nm)	48.156200 o	ppm	0.231936	0.48	338236.000000	Y_R2 488.368
Na H (589.593 nm)	52.406862	ppm	0.306136	0.58	212711.031828	Y_R 488.368
Ni (231.604 nm)	0.470716	ppm	0.001441	0.31	3664.180000	Y 377.433
P (213.618 nm)	9.688920 o	ppm	0.020932	0.22	24516.600000	Y 242.219
Pb (220.353 nm)	0.501874	ppm	0.003784	0.75	1599.610000	Y 242.219
S (181.972 nm)	1.951595	ppm	0.002185	0.11	1127.874527	Y 377.433
Sb (206.834 nm)	0.499374	ppm	0.001469	0.29	1488.760000	Y 377.433
Se (196.026 nm)	1.961000	ppm	0.003505	0.18	2186.590000	Y 242.219
Si (288.158 nm)	9.865600	ppm	0.002941	0.03	90464.300000	Y 377.433
Sn (189.925 nm)	1.907700	ppm	0.004967	0.26	4470.840000	Y 377.433
Sr (421.552 nm)	0.988203	ppm	0.007315	0.74	214158.579061	Y_R 488.368
Th (288.505 nm)	1.024230	ppm	0.000974	0.10	2989.970000	Y 377.433
Ti (336.122 nm)	0.985195	ppm	0.000517	0.05	142034.000000	Y 377.433
Tl (190.794 nm)	2.011610	ppm	0.001391	0.07	5108.600000	Y 377.433
U (409.013 nm)	2.079820	ppm	0.000228	0.01	9934.220000	Y 377.433
V (292.401 nm)	0.491448	ppm	0.000167	0.03	21095.500000	Y 377.433
Zn (206.200 nm)	0.471614	ppm	0.002621	0.56	2726.120000	Y 377.433
Zr (343.823 nm)	0.485047	ppm	0.000327	0.07	66003.600000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.024969	20950.656266	0.001896	0.19
Y 377.433	1.034518	1138437.993773	0.001415	0.14
Y_R 377.433	1.067470	82296.300000	0.002280	0.21
Y_R 488.368	1.077120	47070.500000	0.005437	0.50
Y_R2 488.368	1.091616	94684.007316	0.003427	0.31

Sample Name: 280-112256-A-1-F

Date: 7/26/2018 2:49:28 PM Rack:Tube: 1:33

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000436	ppm	0.000144	32.93	-392.389000	Y 377.433
Al (167.019 nm)	0.020951	ppm	0.003845	18.35	10.491200	Y_R 377.433
Al H (396.152 nm)	-0.010802 u	ppm	0.000419	3.87	174.593699	Y_R 377.433
As (188.980 nm)	0.003621	ppm	0.003132	86.49	1.418290	Y 242.219
B (249.678 nm)	0.619205	ppm	0.000701	0.11	17232.000000	Y 242.219
Ba (493.408 nm)	0.103103	ppm	0.001280	1.24	12851.400000	Y_R 488.368
Be (234.861 nm)	0.000005 u	ppm	0.000022	> 100.00	-32.033600	Y_R 488.368
Bi (223.061 nm)	0.001071	ppm	0.001195	> 100.00	17.677200	Y 377.433
Ca (315.887 nm)	106.726540 o	ppm	0.340808	0.32	88110.704085	Y_R 377.433
Cd (214.439 nm)	0.000018 u	ppm	0.000034	> 100.00	-1.366010	Y 377.433
Co (228.615 nm)	0.000425	ppm	0.000369	86.99	-27.510100	Y 242.219
Cr (205.560 nm)	0.000024	ppm	0.000009	37.14	1.170140	Y 377.433
Cu (324.754 nm)	0.000856	ppm	0.000090	10.47	303.900000	Y 377.433
Fe (238.204 nm)	0.478233	ppm	0.004006	0.84	1817.840850	Y_R 377.433
Fe H (259.940 nm)	0.317411 nu	ppm	0.000742	0.23	943.816000	Y_R 377.433
K (766.491 nm)	3.935160	ppm	0.010511	0.27	4034.750000	Y_R2 488.368
Li (670.783 nm)	0.077166	ppm	0.000281	0.36	1554.650000	Y_R2 488.368
Mg (279.078 nm)	81.020800 o	ppm	0.403139	0.50	494462.000000	Y 377.433
Mn (257.610 nm)	0.874271	ppm	0.001196	0.14	237295.000000	Y 377.433
Mo (202.032 nm)	0.008920	ppm	0.000287	3.21	88.457700	Y 377.433
Na (589.592 nm)	256.486000 o	ppm	0.171676	0.07	1778100.000000	Y_R2 488.368
Na H (589.593 nm)	277.243127	ppm	2.289079	0.83	1096798.071769	Y_R 488.368
Ni (231.604 nm)	0.005958	ppm	0.000143	2.41	48.114000	Y 377.433
P (213.618 nm)	0.012546	ppm	0.000860	6.86	53.026500	Y 242.219
Pb (220.353 nm)	0.001347	ppm	0.000530	39.34	7.879230	Y 242.219
S (181.972 nm)	100.468884 o	ppm	0.148634	0.15	56795.148140	Y 377.433
Sb (206.834 nm)	-0.001590 u	ppm	0.001014	63.76	-21.903000	Y 377.433
Se (196.026 nm)	0.041447	ppm	0.000127	0.31	60.749000	Y 242.219
Si (288.158 nm)	7.544440	ppm	0.056059	0.74	69378.900000	Y 377.433
Sn (189.925 nm)	0.001765	ppm	0.000703	39.81	11.161400	Y 377.433
Sr (421.552 nm)	2.987223 o	ppm	0.024664	0.83	647090.048176	Y_R 488.368
Th (288.505 nm)	0.009240	ppm	0.002015	21.81	117.112000	Y 377.433
Ti (336.122 nm)	0.000550	ppm	0.000038	7.00	213.170000	Y 377.433
Tl (190.794 nm)	0.002956	ppm	0.000143	4.85	1.705260	Y 377.433
U (409.013 nm)	0.003018	ppm	0.002763	91.55	-98.386700	Y 377.433
V (292.401 nm)	0.000115	ppm	0.000105	91.20	26.608700	Y 377.433
Zn (206.200 nm)	0.007450	ppm	0.000287	3.85	59.923200	Y 377.433
Zr (343.823 nm)	0.000068	ppm	0.000060	88.57	-1.467460	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.001124	20463.248124	0.005691	0.57
Y 377.433	1.012359	1114053.467038	0.006987	0.69
Y_R 377.433	1.068990	82413.400000	0.000411	0.04
Y_R 488.368	1.073930	46931.300000	0.013819	1.29
Y_R2 488.368	1.085014	94111.361486	0.006214	0.57

Sample Name: 280-112256-A-1-Fsd@5

Date: 7/26/2018 2:52:51 PM Rack:Tube: 1:34

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000363	ppm	0.000006	1.56	-395.863000	Y 377.433
Al (167.019 nm)	0.005299	ppm	0.004220	79.64	2.474080	Y_R 377.433
Al H (396.152 nm)	-0.041709 u	ppm	0.002722	6.53	59.083091	Y_R 377.433
As (188.980 nm)	0.002754	ppm	0.002749	99.84	0.193052	Y 242.219
B (249.678 nm)	0.120662	ppm	0.000030	0.02	3409.370000	Y 242.219
Ba (493.408 nm)	0.020150	ppm	0.000290	1.44	2930.880000	Y_R 488.368
Be (234.861 nm)	0.000009 u	ppm	0.000017	> 100.00	-43.454800	Y_R 488.368
Bi (223.061 nm)	-0.001721 u	ppm	0.000461	26.81	9.775740	Y 377.433
Ca (315.887 nm)	21.777227 o	ppm	0.052200	0.24	17918.417908	Y_R 377.433
Cd (214.439 nm)	0.000007 u	ppm	0.000026	> 100.00	-2.569870	Y 377.433
Co (228.615 nm)	0.000072 u	ppm	0.000195	> 100.00	-34.850000	Y 242.219
Cr (205.560 nm)	-0.000079 u	ppm	0.000050	62.51	-0.451610	Y 377.433
Cu (324.754 nm)	0.000298	ppm	0.000108	36.35	325.699000	Y 377.433
Fe (238.204 nm)	0.095674	ppm	0.000469	0.49	376.810688	Y_R 377.433
Fe H (259.940 nm)	-0.065358 nu	ppm	0.000600	0.92	194.277000	Y_R 377.433
K (766.491 nm)	0.821417	ppm	0.014478	1.76	259.362000	Y_R2 488.368
Li (670.783 nm)	0.017640	ppm	0.000834	4.73	-543.278000	Y_R2 488.368
Mg (279.078 nm)	15.876800	ppm	0.059342	0.37	96932.200000	Y 377.433
Mn (257.610 nm)	0.178606	ppm	0.000552	0.31	48518.900000	Y 377.433
Mo (202.032 nm)	0.001208	ppm	0.000476	39.44	11.499800	Y 377.433
Na (589.592 nm)	51.906300 o	ppm	0.262005	0.50	360039.000000	Y_R2 488.368
Na H (589.593 nm)	55.786258	ppm	0.611664	1.10	224034.151889	Y_R 488.368
Ni (231.604 nm)	0.000531	ppm	0.000212	39.83	5.900470	Y 377.433
P (213.618 nm)	0.002374	ppm	0.000271	11.41	27.311100	Y 242.219
Pb (220.353 nm)	0.000046 u	ppm	0.000798	> 100.00	3.758410	Y 242.219
S (181.972 nm)	19.586051 o	ppm	0.106707	0.54	11091.237034	Y 377.433
Sb (206.834 nm)	-0.001359 u	ppm	0.001075	79.13	-21.048600	Y 377.433
Se (196.026 nm)	0.008420	ppm	0.000791	9.40	23.628500	Y 242.219
Si (288.158 nm)	1.468380	ppm	0.009609	0.65	14183.900000	Y 377.433
Sn (189.925 nm)	0.000172	ppm	0.000164	95.08	7.434790	Y 377.433
Sr (421.552 nm)	0.597309	ppm	0.006987	1.17	129501.876842	Y_R 488.368
Th (288.505 nm)	0.004677	ppm	0.000992	21.21	89.309700	Y 377.433
Ti (336.122 nm)	0.000320	ppm	0.000029	9.11	-90.567500	Y 377.433
Tl (190.794 nm)	0.001200	ppm	0.001049	87.45	-2.730690	Y 377.433
U (409.013 nm)	-0.000140 u	ppm	0.004072	> 100.00	-96.709000	Y 377.433
V (292.401 nm)	-0.000182 u	ppm	0.000128	70.38	13.181500	Y 377.433
Zn (206.200 nm)	-0.000950 u	ppm	0.000133	14.03	11.672500	Y 377.433
Zr (343.823 nm)	0.000002 u	ppm	0.000062	> 100.00	-11.577000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.048359	21428.748615	0.005225	0.50
Y 377.433	1.054987	1160963.590666	0.007100	0.67
Y_R 377.433	1.078840	83173.000000	0.005039	0.47
Y_R 488.368	1.089570	47614.800000	0.013695	1.26
Y_R2 488.368	1.095948	95059.712287	0.009522	0.87

Sample Name: 280-112256-A-1-G MS

Date: 7/26/2018 2:56:14 PM
Rack:Tube: 1:35

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.051785	ppm	0.000040	0.08	2167.200000	Y 377.433
Al (167.019 nm)	1.921570	ppm	0.023573	1.23	956.159000	Y_R 377.433
Al H (396.152 nm)	2.066810	ppm	0.009059	0.44	5497.496304	Y_R 377.433
As (188.980 nm)	1.017930	ppm	0.004184	0.41	1439.040000	Y 242.219
B (249.678 nm)	1.624630 o	ppm	0.004451	0.27	45131.000000	Y 242.219
Ba (493.408 nm)	2.084870 o	ppm	0.009867	0.47	249368.000000	Y_R 488.368
Be (234.861 nm)	0.047726	ppm	0.000113	0.24	15395.200000	Y_R 488.368
Bi (223.061 nm)	1.986790	ppm	0.005933	0.30	5586.480000	Y 377.433
Ca (315.887 nm)	151.854822 o	ppm	0.815317	0.54	125399.551276	Y_R 377.433
Cd (214.439 nm)	0.093335	ppm	0.000137	0.15	6164.420000	Y 377.433
Co (228.615 nm)	0.471435	ppm	0.000003	0.00	9793.280000	Y 242.219
Cr (205.560 nm)	0.191516	ppm	0.000525	0.27	3238.250000	Y 377.433
Cu (324.754 nm)	0.245303	ppm	0.001111	0.45	16227.200000	Y 377.433
Fe (238.204 nm)	1.449574	ppm	0.006212	0.43	5476.705835	Y_R 377.433
Fe H (259.940 nm)	1.320230 nu	ppm	0.009245	0.70	2907.550000	Y_R 377.433
K (766.491 nm)	54.453500	ppm	0.344577	0.63	65287.900000	Y_R2 488.368
Li (670.783 nm)	1.070150	ppm	0.007324	0.68	36551.500000	Y_R2 488.368
Mg (279.078 nm)	127.554000 o	ppm	0.075050	0.06	778362.000000	Y 377.433
Mn (257.610 nm)	1.334630 o	ppm	0.000633	0.05	362219.000000	Y 377.433
Mo (202.032 nm)	0.954605	ppm	0.001050	0.11	9524.510000	Y 377.433
Na (589.592 nm)	299.771000 o	ppm	2.860920	0.95	2082300.000000	Y_R2 488.368
Na H (589.593 nm)	324.164008	ppm	0.836852	0.26	1283696.289042	Y_R 488.368
Ni (231.604 nm)	0.467396	ppm	0.001735	0.37	3638.270000	Y 377.433
P (213.618 nm)	9.874990 o	ppm	0.022142	0.22	24987.000000	Y 242.219
Pb (220.353 nm)	0.491740	ppm	0.000314	0.06	1567.470000	Y 242.219
S (181.972 nm)	101.870662 o	ppm	0.240376	0.24	57588.439132	Y 377.433
Sb (206.834 nm)	0.506458	ppm	0.000522	0.10	1509.920000	Y 377.433
Se (196.026 nm)	2.031130	ppm	0.010104	0.50	2264.930000	Y 242.219
Si (288.158 nm)	17.327000 o	ppm	0.043224	0.25	158244.000000	Y 377.433
Sn (189.925 nm)	1.881250	ppm	0.005040	0.27	4408.950000	Y 377.433
Sr (421.552 nm)	3.904483 o	ppm	0.003612	0.09	845742.803857	Y_R 488.368
Th (288.505 nm)	1.024070	ppm	0.004389	0.43	3008.130000	Y 377.433
Ti (336.122 nm)	0.983578	ppm	0.000984	0.10	142130.000000	Y 377.433
Tl (190.794 nm)	1.921960	ppm	0.005954	0.31	4880.400000	Y 377.433
U (409.013 nm)	2.095380	ppm	0.005344	0.26	9988.580000	Y 377.433
V (292.401 nm)	0.486943	ppm	0.000095	0.02	20900.900000	Y 377.433
Zn (206.200 nm)	0.455948	ppm	0.002112	0.46	2636.130000	Y 377.433
Zr (343.823 nm)	0.488601	ppm	0.000020	0.00	66488.600000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.981087	20053.698290	0.002400	0.24
Y 377.433	0.995116	1095078.490300	0.001628	0.16
Y_R 377.433	1.040500	80216.900000	0.003314	0.32
Y_R 488.368	1.047720	45785.800000	0.003465	0.33
Y_R2 488.368	1.065620	92429.183984	0.005820	0.55

Sample Name: 280-112256-A-1-H MSD

Date: 7/26/2018 2:59:36 PM
Rack:Tube: 1:36

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.051991	ppm	0.000233	0.45	2178.750000	Y 377.433
Al (167.019 nm)	1.936660	ppm	0.010109	0.52	963.674000	Y_R 377.433
Al H (396.152 nm)	2.074795	ppm	0.018493	0.89	5521.095636	Y_R 377.433
As (188.980 nm)	1.022540	ppm	0.003276	0.32	1445.570000	Y 242.219
B (249.678 nm)	1.677990 o	ppm	0.000975	0.06	46610.600000	Y 242.219
Ba (493.408 nm)	2.105130 o	ppm	0.007749	0.37	251787.000000	Y_R 488.368
Be (234.861 nm)	0.047596	ppm	0.000242	0.51	15352.400000	Y_R 488.368
Bi (223.061 nm)	1.999620	ppm	0.004085	0.20	5622.450000	Y 377.433
Ca (315.887 nm)	156.164989 o	ppm	0.947741	0.61	128960.974816	Y_R 377.433
Cd (214.439 nm)	0.093457	ppm	0.000260	0.28	6172.490000	Y 377.433
Co (228.615 nm)	0.472905	ppm	0.000900	0.19	9824.760000	Y 242.219
Cr (205.560 nm)	0.192700	ppm	0.000411	0.21	3258.250000	Y 377.433
Cu (324.754 nm)	0.246998	ppm	0.000091	0.04	16334.300000	Y 377.433
Fe (238.204 nm)	1.473188	ppm	0.009768	0.66	5565.654898	Y_R 377.433
Fe H (259.940 nm)	1.335300 nu	ppm	0.008434	0.63	2937.050000	Y_R 377.433
K (766.491 nm)	55.370800	ppm	0.178962	0.32	66400.000000	Y_R2 488.368
Li (670.783 nm)	1.084720	ppm	0.007503	0.69	37064.900000	Y_R2 488.368
Mg (279.078 nm)	130.890000 o	ppm	0.466278	0.36	798719.000000	Y 377.433
Mn (257.610 nm)	1.368270 o	ppm	0.002450	0.18	371349.000000	Y 377.433
Mo (202.032 nm)	0.975613	ppm	0.000582	0.06	9734.130000	Y 377.433
Na (589.592 nm)	312.930000 o	ppm	1.288850	0.41	2173540.000000	Y_R2 488.368
Na H (589.593 nm)	337.859461	ppm	3.323205	0.98	1337685.344025	Y_R 488.368
Ni (231.604 nm)	0.469694	ppm	0.001226	0.26	3656.150000	Y 377.433
P (213.618 nm)	9.930450 o	ppm	0.005062	0.05	25127.300000	Y 242.219
Pb (220.353 nm)	0.493553	ppm	0.000001	0.00	1573.140000	Y 242.219
S (181.972 nm)	105.906064 o	ppm	0.271484	0.26	59868.687627	Y 377.433
Sb (206.834 nm)	0.522118	ppm	0.005741	1.10	1557.240000	Y 377.433
Se (196.026 nm)	2.047180	ppm	0.003262	0.16	2282.730000	Y 242.219
Si (288.158 nm)	17.931400 o	ppm	0.025776	0.14	163734.000000	Y 377.433
Sn (189.925 nm)	1.925120	ppm	0.000985	0.05	4511.590000	Y 377.433
Sr (421.552 nm)	4.023119 o	ppm	0.008026	0.20	871435.938246	Y_R 488.368
Th (288.505 nm)	1.023040	ppm	0.002716	0.27	3006.140000	Y 377.433
Ti (336.122 nm)	1.008450	ppm	0.000873	0.09	145731.000000	Y 377.433
Tl (190.794 nm)	1.934230	ppm	0.002128	0.11	4911.450000	Y 377.433
U (409.013 nm)	2.104440	ppm	0.005223	0.25	10031.100000	Y 377.433
V (292.401 nm)	0.488793	ppm	0.000689	0.14	20980.300000	Y 377.433
Zn (206.200 nm)	0.456741	ppm	0.000923	0.20	2640.690000	Y 377.433
Zr (343.823 nm)	0.495892	ppm	0.000414	0.08	67481.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.983052	20093.848130	0.000830	0.08
Y 377.433	0.998673	1098992.069763	0.000290	0.03
Y_R 377.433	1.049690	80925.500000	0.006612	0.63
Y_R 488.368	1.056840	46184.300000	0.003249	0.31
Y_R2 488.368	1.063931	92282.681529	0.001057	0.10

Sample Name: 280-112256-A-1-Fpds

Date: 7/26/2018 3:02:59 PM Rack:Tube: 1:37

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.050682	ppm	0.000053	0.11	2126.990000	Y 377.433
Al (167.019 nm)	0.968250	ppm	0.002569	0.27	482.123000	Y_R 377.433
Al H (396.152 nm)	0.994216	ppm	0.011322	1.14	2714.425659	Y_R 377.433
As (188.980 nm)	0.203594	ppm	0.000617	0.30	284.841000	Y 242.219
B (249.678 nm)	0.715951	ppm	0.001683	0.24	19915.100000	Y 242.219
Ba (493.408 nm)	0.200051	ppm	0.000930	0.46	24426.700000	Y_R 488.368
Be (234.861 nm)	0.046974	ppm	0.000181	0.38	15206.500000	Y_R 488.368
Bi (223.061 nm)	-0.001499 u	ppm	0.002845	> 100.00	10.651300	Y 377.433
Ca (315.887 nm)	123.140320 o	ppm	0.270608	0.22	101673.180402	Y_R 377.433
Cd (214.439 nm)	0.045950	ppm	0.000019	0.04	3033.810000	Y 377.433
Co (228.615 nm)	0.047303	ppm	0.000094	0.20	947.909000	Y 242.219
Cr (205.560 nm)	0.047407	ppm	0.000000	0.00	801.975000	Y 377.433
Cu (324.754 nm)	0.049700	ppm	0.000197	0.40	3471.680000	Y 377.433
Fe (238.204 nm)	1.451329	ppm	0.002722	0.19	5483.316040	Y_R 377.433
Fe H (259.940 nm)	1.308910 nu	ppm	0.002700	0.21	2885.370000	Y_R 377.433
K (766.491 nm)	23.724200	ppm	0.048913	0.21	28028.800000	Y_R2 488.368
Li (670.783 nm)	0.174180	ppm	0.000432	0.25	4973.810000	Y_R2 488.368
Mg (279.078 nm)	97.493000 o	ppm	0.098901	0.10	594965.000000	Y 377.433
Mn (257.610 nm)	0.901669	ppm	0.000608	0.07	244730.000000	Y 377.433
Mo (202.032 nm)	0.055783	ppm	0.000072	0.13	556.056000	Y 377.433
Na (589.592 nm)	269.426000 o	ppm	2.207220	0.82	1867990.000000	Y_R2 488.368
Na H (589.593 nm)	293.055203	ppm	0.010001	0.00	1159205.536532	Y_R 488.368
Ni (231.604 nm)	0.051558	ppm	0.000334	0.65	402.938000	Y 377.433
P (213.618 nm)	1.957210	ppm	0.003055	0.16	4969.470000	Y 242.219
Pb (220.353 nm)	0.096469	ppm	0.000761	0.79	311.232000	Y 242.219
S (181.972 nm)	99.044950 o	ppm	0.227117	0.23	55990.638737	Y 377.433
Sb (206.834 nm)	0.100576	ppm	0.000135	0.13	286.750000	Y 377.433
Se (196.026 nm)	0.237429	ppm	0.001307	0.55	277.646000	Y 242.219
Si (288.158 nm)	12.390400 o	ppm	0.064297	0.52	113399.000000	Y 377.433
Sn (189.925 nm)	0.094957	ppm	0.000661	0.70	229.222000	Y 377.433
Sr (421.552 nm)	2.969204 o	ppm	0.004291	0.14	643187.713290	Y_R 488.368
Th (288.505 nm)	0.210737	ppm	0.000222	0.11	688.576000	Y 377.433
Ti (336.122 nm)	0.050597	ppm	0.000047	0.09	7483.370000	Y 377.433
Tl (190.794 nm)	0.194358	ppm	0.000603	0.31	488.664000	Y 377.433
U (409.013 nm)	0.523435	ppm	0.002786	0.53	2416.120000	Y 377.433
V (292.401 nm)	0.048422	ppm	0.000391	0.81	2078.690000	Y 377.433
Zn (206.200 nm)	0.190012	ppm	0.000270	0.14	1108.570000	Y 377.433
Zr (343.823 nm)	0.049674	ppm	0.000048	0.10	6752.670000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.998510	20409.830499	0.002755	0.28
Y 377.433	1.014471	1116376.923712	0.001973	0.19
Y_R 377.433	1.055570	81379.100000	0.002816	0.27
Y_R 488.368	1.059510	46300.900000	0.004805	0.45
Y_R2 488.368	1.081769	93829.879997	0.000455	0.04

Sample Name: CCVH-5225153

Date: 7/26/2018 3:06:22 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001421 u	ppm	0.000001	0.09	-751.499000	Y 377.433
Al (167.019 nm)	45.659600 o	ppm	0.660146	1.45	22733.700000	Y_R 377.433
Al H (396.152 nm)	49.901271	ppm	0.331756	0.66	125719.226416	Y_R 377.433
As (188.980 nm)	0.000458 u	ppm	0.001387	> 100.00	-3.555470	Y 242.219
B (249.678 nm)	0.000820	ppm	0.000284	34.66	3.497280	Y 242.219
Ba (493.408 nm)	0.000046	ppm	0.000006	14.00	574.036000	Y_R 488.368
Be (234.861 nm)	0.000096	ppm	0.000068	70.63	1669.160000	Y_R 488.368
Bi (223.061 nm)	0.978815	ppm	0.002858	0.29	2768.620000	Y 377.433
Ca (315.887 nm)	0.015790	ppm	0.007032	44.54	-62.716727	Y_R 377.433
Cd (214.439 nm)	-0.000185 u	ppm	0.000007	3.52	37.460500	Y 377.433
Co (228.615 nm)	0.000725	ppm	0.000043	5.93	-21.261100	Y 242.219
Cr (205.560 nm)	-0.000185 u	ppm	0.000080	43.04	-17.427400	Y 377.433
Cu (324.754 nm)	-0.005982 u	ppm	0.000034	0.57	305.250000	Y 377.433
Fe (238.204 nm)	48.998724 o	ppm	0.088466	0.18	184585.787978	Y_R 377.433
Fe H (259.940 nm)	50.053300	ppm	0.204042	0.41	98336.800000	Y_R 377.433
K (766.491 nm)	0.135674	ppm	0.059183	43.62	-572.096000	Y_R2 488.368
Li (670.783 nm)	0.002517	ppm	0.002533	> 100.00	-1076.270000	Y_R2 488.368
Mg (279.078 nm)	0.010298	ppm	0.008879	86.22	-262.817000	Y 377.433
Mn (257.610 nm)	0.001659	ppm	0.000077	4.64	502.326000	Y 377.433
Mo (202.032 nm)	-0.000084 u	ppm	0.000068	80.86	-1.384830	Y 377.433
Na (589.592 nm)	234.202000 o	ppm	0.423468	0.18	1623430.000000	Y_R2 488.368
Na H (589.593 nm)	250.337342	ppm	4.406742	1.76	990666.603113	Y_R 488.368
Ni (231.604 nm)	0.001689	ppm	0.000173	10.25	17.229600	Y 377.433
P (213.618 nm)	-0.003737 u	ppm	0.001345	36.00	11.861800	Y 242.219
Pb (220.353 nm)	-0.002205 u	ppm	0.001206	54.68	15.058600	Y 242.219
S (181.972 nm)	4.936797	ppm	0.027087	0.55	2813.348183	Y 377.433
Sb (206.834 nm)	-0.004327 u	ppm	0.002657	61.39	-78.300000	Y 377.433
Se (196.026 nm)	-0.001023 u	ppm	0.000053	5.20	3.065440	Y 242.219
Si (288.158 nm)	0.027212	ppm	0.000060	0.22	1092.350000	Y 377.433
Sn (189.925 nm)	0.002390	ppm	0.000258	10.79	12.624900	Y 377.433
Sr (421.552 nm)	0.000664	ppm	0.000050	7.57	285.339116	Y_R 488.368
Th (288.505 nm)	4.955600	ppm	0.006603	0.13	14052.000000	Y 377.433
Ti (336.122 nm)	0.001583	ppm	0.000052	3.26	22.441300	Y 377.433
Tl (190.794 nm)	-0.001664 u	ppm	0.000123	7.36	-11.540600	Y 377.433
U (409.013 nm)	10.106100	ppm	0.009113	0.09	48911.700000	Y 377.433
V (292.401 nm)	0.003300	ppm	0.000026	0.80	-34.842600	Y 377.433
Zn (206.200 nm)	-0.002632 u	ppm	0.000140	5.33	2.007330	Y 377.433
Zr (343.823 nm)	-0.003856 u	ppm	0.000045	1.17	-387.272000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.023222	20914.953114	0.000101	0.01
Y 377.433	1.021631	1124256.488988	0.001545	0.15
Y_R 377.433	1.045820	80626.900000	0.006638	0.63
Y_R 488.368	1.056010	46147.900000	0.020856	1.97
Y_R2 488.368	1.076085	93336.914503	0.008750	0.81

Sample Name: CCV-5225154

Date: 7/26/2018 3:09:44 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.481114	ppm	0.000282	0.06	23834.000000	Y 377.433
Al (167.019 nm)	0.519059	ppm	0.000669	0.13	259.406000	Y_R 377.433
Al H (396.152 nm)	0.493558 u	ppm	0.001151	0.23	1437.559757	Y_R 377.433
As (188.980 nm)	0.975405	ppm	0.002613	0.27	1378.760000	Y 242.219
B (249.678 nm)	0.485385	ppm	0.000413	0.09	13541.900000	Y 242.219
Ba (493.408 nm)	0.494645	ppm	0.002563	0.52	59565.900000	Y_R 488.368
Be (234.861 nm)	0.478018	ppm	0.003462	0.72	154784.000000	Y_R 488.368
Bi (223.061 nm)	-0.001221 u	ppm	0.001603	> 100.00	11.626000	Y 377.433
Ca (315.887 nm)	4.962633	ppm	0.018783	0.38	4025.065915	Y_R 377.433
Cd (214.439 nm)	0.486202	ppm	0.001669	0.34	32117.200000	Y 377.433
Co (228.615 nm)	0.494840	ppm	0.001988	0.40	10259.700000	Y 242.219
Cr (205.560 nm)	0.484997	ppm	0.002816	0.58	8200.120000	Y 377.433
Cu (324.754 nm)	0.482147	ppm	0.000470	0.10	31675.200000	Y 377.433
Fe (238.204 nm)	2.507629	ppm	0.015083	0.60	9462.210862	Y_R 377.433
Fe H (259.940 nm)	2.411540 u	ppm	0.014121	0.59	5044.540000	Y_R 377.433
K (766.491 nm)	48.917700	ppm	0.057048	0.12	58575.700000	Y_R2 488.368
Li (670.783 nm)	0.970232	ppm	0.002719	0.28	33029.900000	Y_R2 488.368
Mg (279.078 nm)	19.130100	ppm	0.033155	0.17	116781.000000	Y 377.433
Mn (257.610 nm)	0.490071	ppm	0.000331	0.07	133038.000000	Y 377.433
Mo (202.032 nm)	0.491359	ppm	0.000192	0.04	4902.230000	Y 377.433
Na (589.592 nm)	4.942810	ppm	0.009374	0.19	35554.800000	Y_R2 488.368
Na H (589.593 nm)	6.025692 u	ppm	0.059610	0.99	28425.427491	Y_R 488.368
Ni (231.604 nm)	0.487701	ppm	0.000276	0.06	3794.900000	Y 377.433
P (213.618 nm)	0.954143	ppm	0.003057	0.32	2433.550000	Y 242.219
Pb (220.353 nm)	0.986394	ppm	0.002265	0.23	3136.220000	Y 242.219
S (181.972 nm)	0.027390	ppm	0.002940	10.74	40.632582	Y 377.433
Sb (206.834 nm)	0.975439	ppm	0.001265	0.13	2948.560000	Y 377.433
Se (196.026 nm)	0.964777	ppm	0.000406	0.04	1082.730000	Y 242.219
Si (288.158 nm)	4.936410	ppm	0.003445	0.07	45687.500000	Y 377.433
Sn (189.925 nm)	0.971617	ppm	0.000887	0.09	2280.510000	Y 377.433
Sr (421.552 nm)	0.492971	ppm	0.002518	0.51	106905.103892	Y_R 488.368
Th (288.505 nm)	0.007295	ppm	0.000386	5.29	109.605000	Y 377.433
Ti (336.122 nm)	0.497758	ppm	0.000110	0.02	71596.400000	Y 377.433
Tl (190.794 nm)	0.991445	ppm	0.001573	0.16	2515.910000	Y 377.433
U (409.013 nm)	-0.000876 u	ppm	0.004062	> 100.00	-134.833000	Y 377.433
V (292.401 nm)	0.488144	ppm	0.000256	0.05	20907.600000	Y 377.433
Zn (206.200 nm)	0.483468	ppm	0.002027	0.42	2794.210000	Y 377.433
Zr (343.823 nm)	0.492425	ppm	0.000219	0.04	67012.300000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.043063	21320.497855	0.000583	0.06
Y 377.433	1.046034	1151110.736173	0.001623	0.16
Y_R 377.433	1.058490	81603.900000	0.003478	0.33
Y_R 488.368	1.067700	46659.000000	0.005533	0.52
Y_R2 488.368	1.082560	93898.527503	0.006227	0.58

Sample Name: CCB

Date: 7/26/2018 3:13:07 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000050 u	ppm	0.000146	> 100.00	-411.703000	Y 377.433
Al (167.019 nm)	0.004147	ppm	0.002908	70.13	1.843580	Y_R 377.433
Al H (396.152 nm)	-0.057138 u	ppm	0.000583	1.02	10.642604	Y_R 377.433
As (188.980 nm)	0.000078 u	ppm	0.000496	> 100.00	-3.597700	Y 242.219
B (249.678 nm)	0.001462	ppm	0.000292	19.98	104.429000	Y 242.219
Ba (493.408 nm)	-0.000362 u	ppm	0.000126	34.86	477.693000	Y_R 488.368
Be (234.861 nm)	0.000043	ppm	0.000054	> 100.00	-35.342700	Y_R 488.368
Bi (223.061 nm)	0.000976	ppm	0.000375	38.43	17.322600	Y 377.433
Ca (315.887 nm)	0.007324	ppm	0.003517	48.02	-69.711907	Y_R 377.433
Cd (214.439 nm)	0.000058	ppm	0.000031	53.31	0.696520	Y 377.433
Co (228.615 nm)	0.000138 u	ppm	0.000202	> 100.00	-33.473300	Y 242.219
Cr (205.560 nm)	-0.000087 u	ppm	0.000154	> 100.00	-0.549574	Y 377.433
Cu (324.754 nm)	-0.000050 u	ppm	0.000100	> 100.00	316.325000	Y 377.433
Fe (238.204 nm)	0.000921	ppm	0.000282	30.56	19.893405	Y_R 377.433
Fe H (259.940 nm)	-0.161037 u	ppm	0.000319	0.20	6.918580	Y_R 377.433
K (766.491 nm)	0.119380	ppm	0.044313	37.12	-591.853000	Y_R2 488.368
Li (670.783 nm)	0.001143	ppm	0.000964	84.27	-1124.700000	Y_R2 488.368
Mg (279.078 nm)	0.002133 u	ppm	0.003227	> 100.00	59.712800	Y 377.433
Mn (257.610 nm)	0.000038	ppm	0.000024	64.57	62.317000	Y 377.433
Mo (202.032 nm)	-0.000177 u	ppm	0.000020	11.05	-2.317080	Y 377.433
Na (589.592 nm)	0.020253	ppm	0.005887	29.07	387.466000	Y_R2 488.368
Na H (589.593 nm)	0.220513 u	ppm	0.010401	4.72	5049.208048	Y_R 488.368
Ni (231.604 nm)	0.000273 u	ppm	0.000522	> 100.00	3.884960	Y 377.433
P (213.618 nm)	-0.000542 u	ppm	0.001349	> 100.00	19.939400	Y 242.219
Pb (220.353 nm)	-0.000076 u	ppm	0.000733	> 100.00	3.386140	Y 242.219
S (181.972 nm)	0.018431	ppm	0.001518	8.24	34.268379	Y 377.433
Sb (206.834 nm)	0.000258 u	ppm	0.000527	> 100.00	-16.130700	Y 377.433
Se (196.026 nm)	-0.003489 u	ppm	0.001866	53.49	10.299700	Y 242.219
Si (288.158 nm)	-0.003506 u	ppm	0.000367	10.47	813.308000	Y 377.433
Sn (189.925 nm)	0.000103 u	ppm	0.001200	> 100.00	7.273530	Y 377.433
Sr (421.552 nm)	0.000004 u	ppm	0.000084	> 100.00	142.371884	Y_R 488.368
Th (288.505 nm)	0.002163 u	ppm	0.003555	> 100.00	78.542200	Y 377.433
Ti (336.122 nm)	0.000345	ppm	0.000042	12.03	-156.239000	Y 377.433
Tl (190.794 nm)	0.000858	ppm	0.000236	27.45	-3.592920	Y 377.433
U (409.013 nm)	0.000306 u	ppm	0.000681	> 100.00	-90.202200	Y 377.433
V (292.401 nm)	0.000002 u	ppm	0.000097	> 100.00	20.128900	Y 377.433
Zn (206.200 nm)	-0.002988 u	ppm	0.000161	5.39	-0.033264	Y 377.433
Zr (343.823 nm)	0.000115	ppm	0.000006	5.31	3.537200	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.051377	21490.442217	0.007262	0.69
Y 377.433	1.058449	1164773.522646	0.008794	0.83
Y_R 377.433	1.061360	81825.000000	0.011883	1.12
Y_R 488.368	1.077650	47093.900000	0.004372	0.41
Y_R2 488.368	1.091559	94679.023272	0.002751	0.25

Sample Name: CCVL-5236949

Date: 7/26/2018 3:16:30 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009137	ppm	0.000015	0.16	46.237700	Y 377.433
Al (167.019 nm)	0.100171	ppm	0.000351	0.35	49.651100	Y_R 377.433
Al H (396.152 nm)	0.048311 u	ppm	0.000782	1.62	277.499873	Y_R 377.433
As (188.980 nm)	0.014037	ppm	0.000637	4.54	16.185600	Y 242.219
B (249.678 nm)	0.093917	ppm	0.000004	0.00	2668.220000	Y 242.219
Ba (493.408 nm)	0.009297	ppm	0.000101	1.08	1630.460000	Y_R 488.368
Be (234.861 nm)	0.000975	ppm	0.000020	2.00	268.937000	Y_R 488.368
Bi (223.061 nm)	0.099483	ppm	0.002458	2.47	293.586000	Y 377.433
Ca (315.887 nm)	0.206512	ppm	0.001479	0.72	94.876754	Y_R 377.433
Cd (214.439 nm)	0.004837	ppm	0.000034	0.70	316.534000	Y 377.433
Co (228.615 nm)	0.010219	ppm	0.000031	0.30	176.226000	Y 242.219
Cr (205.560 nm)	0.009422	ppm	0.000272	2.89	160.256000	Y 377.433
Cu (324.754 nm)	0.014202	ppm	0.000063	0.44	1240.270000	Y 377.433
Fe (238.204 nm)	0.098938	ppm	0.000577	0.58	389.103815	Y_R 377.433
Fe H (259.940 nm)	-0.060024 u	ppm	0.002325	3.87	204.721000	Y_R 377.433
K (766.491 nm)	3.018550	ppm	0.028872	0.96	2923.370000	Y_R2 488.368
Li (670.783 nm)	0.021828	ppm	0.000281	1.29	-395.698000	Y_R2 488.368
Mg (279.078 nm)	0.186584	ppm	0.001715	0.92	1183.830000	Y 377.433
Mn (257.610 nm)	0.009850	ppm	0.000020	0.20	2724.910000	Y 377.433
Mo (202.032 nm)	0.017749	ppm	0.000331	1.87	176.548000	Y 377.433
Na (589.592 nm)	1.013210	ppm	0.018254	1.80	7289.510000	Y_R2 488.368
Na H (589.593 nm)	1.113630 u	ppm	0.021733	1.95	8578.236668	Y_R 488.368
Ni (231.604 nm)	0.038091	ppm	0.000354	0.93	297.929000	Y 377.433
P (213.618 nm)	2.644170 o	ppm	0.006415	0.24	6706.240000	Y 242.219
Pb (220.353 nm)	0.008434	ppm	0.000081	0.96	30.460100	Y 242.219
S (181.972 nm)	0.099016	ppm	0.000487	0.49	79.827921	Y 377.433
Sb (206.834 nm)	0.017924	ppm	0.001420	7.92	37.423100	Y 377.433
Se (196.026 nm)	0.014808	ppm	0.000272	1.83	30.554900	Y 242.219
Si (288.158 nm)	0.463827	ppm	0.001759	0.38	5058.560000	Y 377.433
Sn (189.925 nm)	0.092899	ppm	0.001831	1.97	224.404000	Y 377.433
Sr (421.552 nm)	0.009834	ppm	0.000126	1.28	2271.369798	Y_R 488.368
Th (288.505 nm)	0.016934	ppm	0.002874	16.97	121.104000	Y 377.433
Ti (336.122 nm)	0.009970	ppm	0.000053	0.53	1232.430000	Y 377.433
Tl (190.794 nm)	0.014344	ppm	0.000705	4.92	30.671400	Y 377.433
U (409.013 nm)	0.060384	ppm	0.004563	7.56	199.713000	Y 377.433
V (292.401 nm)	0.009162	ppm	0.000095	1.03	408.911000	Y 377.433
Zn (206.200 nm)	0.016564	ppm	0.000060	0.36	112.272000	Y 377.433
Zr (343.823 nm)	0.014423	ppm	0.000030	0.21	1951.110000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.071243	21896.508451	0.000459	0.04
Y 377.433	1.079071	1187467.091660	0.000204	0.02
Y_R 377.433	1.076120	82962.800000	0.004553	0.42
Y_R 488.368	1.086120	47463.700000	0.019655	1.81
Y_R2 488.368	1.113927	96619.206945	0.003699	0.33

Sample Name: MB 280-423566/1-A

Date: 7/26/2018 3:19:53 PM Rack:Tube: 1:38

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000037 u	ppm	0.000185	> 100.00	-416.011000	Y 377.433
Al (167.019 nm)	-0.000796 u	ppm	0.000260	32.62	-0.613311	Y_R 377.433
Al H (396.152 nm)	-0.052201 u	ppm	0.004603	8.82	23.073698	Y_R 377.433
As (188.980 nm)	0.001865	ppm	0.000564	30.23	-1.065140	Y 242.219
B (249.678 nm)	0.001164	ppm	0.000047	4.08	96.145800	Y 242.219
Ba (493.408 nm)	-0.000512 u	ppm	0.000112	21.92	459.786000	Y_R 488.368
Be (234.861 nm)	0.000026	ppm	0.000011	42.68	-41.035700	Y_R 488.368
Bi (223.061 nm)	0.000666 u	ppm	0.000976	> 100.00	16.452000	Y 377.433
Ca (315.887 nm)	0.023280	ppm	0.000660	2.83	-56.527724	Y_R 377.433
Cd (214.439 nm)	0.000037	ppm	0.000050	> 100.00	-0.668006	Y 377.433
Co (228.615 nm)	0.000190	ppm	0.000203	> 100.00	-32.409200	Y 242.219
Cr (205.560 nm)	0.000122 u	ppm	0.000245	> 100.00	2.985250	Y 377.433
Cu (324.754 nm)	0.000096	ppm	0.000027	27.78	325.565000	Y 377.433
Fe (238.204 nm)	0.002095	ppm	0.001248	59.57	24.314183	Y_R 377.433
Fe H (259.940 nm)	-0.156685 nu	ppm	0.002873	1.83	15.440200	Y_R 377.433
K (766.491 nm)	0.086935	ppm	0.061937	71.25	-631.192000	Y_R2 488.368
Li (670.783 nm)	0.003385	ppm	0.001446	42.71	-1045.680000	Y_R2 488.368
Mg (279.078 nm)	0.001246	ppm	0.000107	8.56	54.376600	Y 377.433
Mn (257.610 nm)	0.000053	ppm	0.000022	42.38	66.423100	Y 377.433
Mo (202.032 nm)	0.000014 u	ppm	0.000071	> 100.00	-0.411346	Y 377.433
Na (589.592 nm)	0.037576	ppm	0.015045	40.04	506.965000	Y_R2 488.368
Na H (589.593 nm)	-0.058523 u	ppm	0.013066	22.33	3949.364415	Y_R 488.368
Ni (231.604 nm)	-0.000380 u	ppm	0.000272	71.43	-1.190550	Y 377.433
P (213.618 nm)	-0.000466 u	ppm	0.002723	> 100.00	20.130100	Y 242.219
Pb (220.353 nm)	-0.000096 u	ppm	0.000041	42.52	3.312930	Y 242.219
S (181.972 nm)	0.012958	ppm	0.001330	10.26	31.175991	Y 377.433
Sb (206.834 nm)	-0.000906 u	ppm	0.000370	40.86	-19.639600	Y 377.433
Se (196.026 nm)	-0.001449 u	ppm	0.000329	22.73	12.558700	Y 242.219
Si (288.158 nm)	-0.003804 u	ppm	0.000276	7.26	810.600000	Y 377.433
Sn (189.925 nm)	0.000689 u	ppm	0.000995	> 100.00	8.645090	Y 377.433
Sr (421.552 nm)	-0.000043 u	ppm	0.000119	> 100.00	132.221923	Y_R 488.368
Th (288.505 nm)	0.002908	ppm	0.002012	69.19	80.555300	Y 377.433
Ti (336.122 nm)	0.000291	ppm	0.000013	4.40	-163.986000	Y 377.433
Tl (190.794 nm)	0.001118	ppm	0.000769	68.84	-2.932800	Y 377.433
U (409.013 nm)	0.002649	ppm	0.000935	35.31	-78.846500	Y 377.433
V (292.401 nm)	-0.000040 u	ppm	0.000113	> 100.00	18.183700	Y 377.433
Zn (206.200 nm)	-0.001043 u	ppm	0.001435	> 100.00	11.136500	Y 377.433
Zr (343.823 nm)	-0.000024 u	ppm	0.000034	> 100.00	-15.400600	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.067551	21821.033542	0.001884	0.18
Y 377.433	1.076523	1184662.832417	0.003284	0.31
Y_R 377.433	1.082040	83419.300000	0.005302	0.49
Y_R 488.368	1.094540	47832.000000	0.006090	0.56
Y_R2 488.368	1.127584	97803.776547	0.006423	0.57

Sample Name: LCS 280-423566/2-A

Date: 7/26/2018 3:23:15 PM Rack:Tube: 1:39

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.048930	ppm	0.000438	0.89	2024.500000	Y 377.433
Al (167.019 nm)	1.952800	ppm	0.023352	1.20	971.396000	Y_R 377.433
Al H (396.152 nm)	1.978579	ppm	0.017832	0.90	5229.429674	Y_R 377.433
As (188.980 nm)	0.970149	ppm	0.010329	1.06	1371.320000	Y 242.219
B (249.678 nm)	0.977341	ppm	0.002111	0.22	27184.000000	Y 242.219
Ba (493.408 nm)	1.965340 o	ppm	0.011084	0.56	235077.000000	Y_R 488.368
Be (234.861 nm)	0.047145	ppm	0.000091	0.19	15190.900000	Y_R 488.368
Bi (223.061 nm)	1.932840	ppm	0.007480	0.39	5435.100000	Y 377.433
Ca (315.887 nm)	47.833048 o	ppm	0.282460	0.59	39447.989416	Y_R 377.433
Cd (214.439 nm)	0.093595	ppm	0.000092	0.10	6181.070000	Y 377.433
Co (228.615 nm)	0.467836	ppm	0.002054	0.44	9718.400000	Y 242.219
Cr (205.560 nm)	0.190842	ppm	0.001223	0.64	3227.020000	Y 377.433
Cu (324.754 nm)	0.234916	ppm	0.000432	0.18	15624.300000	Y 377.433
Fe (238.204 nm)	0.978089	ppm	0.008956	0.92	3700.708733	Y_R 377.433
Fe H (259.940 nm)	0.833546 nu	ppm	0.000880	0.11	1954.510000	Y_R 377.433
K (766.491 nm)	48.443800	ppm	0.152400	0.31	58001.200000	Y_R2 488.368
Li (670.783 nm)	0.963884	ppm	0.000224	0.02	32806.100000	Y_R2 488.368
Mg (279.078 nm)	47.076100 o	ppm	0.012252	0.03	287263.000000	Y 377.433
Mn (257.610 nm)	0.475582	ppm	0.000292	0.06	129107.000000	Y 377.433
Mo (202.032 nm)	0.949442	ppm	0.000188	0.02	9472.990000	Y 377.433
Na (589.592 nm)	47.639700 o	ppm	0.192228	0.40	334589.000000	Y_R2 488.368
Na H (589.593 nm)	51.209941	ppm	0.291335	0.57	207962.285356	Y_R 488.368
Ni (231.604 nm)	0.461096	ppm	0.002653	0.58	3589.320000	Y 377.433
P (213.618 nm)	9.399760 o	ppm	0.027026	0.29	23785.600000	Y 242.219
Pb (220.353 nm)	0.490097	ppm	0.000095	0.02	1562.100000	Y 242.219
S (181.972 nm)	1.948395	ppm	0.001901	0.10	1126.039645	Y 377.433
Sb (206.834 nm)	0.496930	ppm	0.001046	0.21	1481.440000	Y 377.433
Se (196.026 nm)	1.899480	ppm	0.001123	0.06	2118.440000	Y 242.219
Si (288.158 nm)	9.744860	ppm	0.011595	0.12	89367.500000	Y 377.433
Sn (189.925 nm)	1.895570	ppm	0.004922	0.26	4442.440000	Y 377.433
Sr (421.552 nm)	0.971381	ppm	0.004496	0.46	210515.419820	Y_R 488.368
Th (288.505 nm)	0.999761	ppm	0.002452	0.25	2920.590000	Y 377.433
Ti (336.122 nm)	0.981074	ppm	0.000064	0.01	141437.000000	Y 377.433
Tl (190.794 nm)	1.968440	ppm	0.002763	0.14	4998.740000	Y 377.433
U (409.013 nm)	2.049500	ppm	0.003800	0.19	9787.610000	Y 377.433
V (292.401 nm)	0.482553	ppm	0.000320	0.07	20713.400000	Y 377.433
Zn (206.200 nm)	0.462290	ppm	0.002643	0.57	2672.560000	Y 377.433
Zr (343.823 nm)	0.484004	ppm	0.000229	0.05	65861.500000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.034285	21141.079058	0.000078	0.01
Y 377.433	1.043185	1147976.310159	0.000042	0.00
Y_R 377.433	1.059830	81707.300000	0.001414	0.13
Y_R 488.368	1.069030	46717.000000	0.001296	0.12
Y_R2 488.368	1.095211	94995.830167	0.004396	0.40

Sample Name: LCSD 280-423566/3-A

Date: 7/26/2018 3:26:39 PM Rack:Tube: 1:40

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.048216	ppm	0.000126	0.26	1988.580000	Y 377.433
Al (167.019 nm)	1.925970	ppm	0.008709	0.45	958.053000	Y_R 377.433
Al H (396.152 nm)	1.964900	ppm	0.026229	1.33	5194.493620	Y_R 377.433
As (188.980 nm)	0.963770	ppm	0.003493	0.36	1362.280000	Y 242.219
B (249.678 nm)	0.967272	ppm	0.002097	0.22	26904.700000	Y 242.219
Ba (493.408 nm)	1.947460 o	ppm	0.007345	0.38	232944.000000	Y_R 488.368
Be (234.861 nm)	0.046962	ppm	0.000034	0.07	15131.800000	Y_R 488.368
Bi (223.061 nm)	1.918750	ppm	0.008508	0.44	5395.570000	Y 377.433
Ca (315.887 nm)	47.427637 o	ppm	0.312712	0.66	39113.004098	Y_R 377.433
Cd (214.439 nm)	0.093413	ppm	0.000173	0.19	6169.050000	Y 377.433
Co (228.615 nm)	0.465869	ppm	0.000894	0.19	9677.280000	Y 242.219
Cr (205.560 nm)	0.189898	ppm	0.000434	0.23	3211.060000	Y 377.433
Cu (324.754 nm)	0.232768	ppm	0.000081	0.03	15485.300000	Y 377.433
Fe (238.204 nm)	0.974054	ppm	0.004815	0.49	3685.508074	Y_R 377.433
Fe H (259.940 nm)	0.827253 nu	ppm	0.005129	0.62	1942.190000	Y_R 377.433
K (766.491 nm)	48.423900	ppm	0.049264	0.10	57976.900000	Y_R2 488.368
Li (670.783 nm)	0.956995	ppm	0.003463	0.36	32563.400000	Y_R2 488.368
Mg (279.078 nm)	46.966100 o	ppm	0.014377	0.03	286592.000000	Y 377.433
Mn (257.610 nm)	0.473473	ppm	0.000442	0.09	128534.000000	Y 377.433
Mo (202.032 nm)	0.945015	ppm	0.000169	0.02	9428.820000	Y 377.433
Na (589.592 nm)	47.430000 o	ppm	0.189055	0.40	333098.000000	Y_R2 488.368
Na H (589.593 nm)	51.052668	ppm	0.170416	0.33	207324.933009	Y_R 488.368
Ni (231.604 nm)	0.459424	ppm	0.001159	0.25	3576.310000	Y 377.433
P (213.618 nm)	9.341510 o	ppm	0.021535	0.23	23638.300000	Y 242.219
Pb (220.353 nm)	0.485425	ppm	0.001792	0.37	1547.220000	Y 242.219
S (181.972 nm)	1.927953	ppm	0.002015	0.10	1114.484384	Y 377.433
Sb (206.834 nm)	0.492038	ppm	0.002387	0.49	1466.700000	Y 377.433
Se (196.026 nm)	1.887200	ppm	0.001157	0.06	2104.840000	Y 242.219
Si (288.158 nm)	9.719990	ppm	0.004877	0.05	89141.500000	Y 377.433
Sn (189.925 nm)	1.888910	ppm	0.001494	0.08	4426.860000	Y 377.433
Sr (421.552 nm)	0.964726	ppm	0.003980	0.41	209073.962065	Y_R 488.368
Th (288.505 nm)	0.998111	ppm	0.002705	0.27	2915.460000	Y 377.433
Ti (336.122 nm)	0.974454	ppm	0.001041	0.11	140481.000000	Y 377.433
Tl (190.794 nm)	1.961350	ppm	0.004460	0.23	4980.720000	Y 377.433
U (409.013 nm)	2.029160	ppm	0.002456	0.12	9689.500000	Y 377.433
V (292.401 nm)	0.479987	ppm	0.000303	0.06	20603.800000	Y 377.433
Zn (206.200 nm)	0.461716	ppm	0.000309	0.07	2669.260000	Y 377.433
Zr (343.823 nm)	0.480252	ppm	0.000083	0.02	65350.900000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.027192	20996.085188	0.002427	0.24
Y 377.433	1.032803	1136550.501747	0.000398	0.04
Y_R 377.433	1.051790	81087.000000	0.004009	0.38
Y_R 488.368	1.058290	46247.500000	0.002322	0.22
Y_R2 488.368	1.079199	93606.974316	0.005536	0.51

Sample Name: 280-112144-C-5-I

Date: 7/26/2018 3:30:02 PM Rack:Tube: 1:41

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000161	ppm	0.000171	> 100.00	-406.868000	Y 377.433
Al (167.019 nm)	0.093137	ppm	0.006470	6.95	46.141100	Y_R 377.433
Al H (396.152 nm)	0.046008 u	ppm	0.001723	3.75	280.400159	Y_R 377.433
As (188.980 nm)	0.001248	ppm	0.000091	7.27	-1.940210	Y 242.219
B (249.678 nm)	1.876340 o	ppm	0.004540	0.24	52089.900000	Y 242.219
Ba (493.408 nm)	0.014047	ppm	0.000316	2.25	2202.850000	Y_R 488.368
Be (234.861 nm)	0.000050	ppm	0.000004	8.32	-30.500100	Y_R 488.368
Bi (223.061 nm)	-0.001443 u	ppm	0.001244	86.25	10.553100	Y 377.433
Ca (315.887 nm)	23.358303 o	ppm	0.131494	0.56	19224.836055	Y_R 377.433
Cd (214.439 nm)	0.000090	ppm	0.000023	25.06	2.942940	Y 377.433
Co (228.615 nm)	0.000224	ppm	0.000292	> 100.00	-31.588000	Y 242.219
Cr (205.560 nm)	0.000726	ppm	0.000011	1.54	13.189100	Y 377.433
Cu (324.754 nm)	0.001693	ppm	0.000046	2.70	412.972000	Y 377.433
Fe (238.204 nm)	0.078788	ppm	0.000451	0.57	313.203615	Y_R 377.433
Fe H (259.940 nm)	-0.086358 nu	ppm	0.000464	0.54	153.154000	Y_R 377.433
K (766.491 nm)	2.897850	ppm	0.079062	2.73	2777.010000	Y_R2 488.368
Li (670.783 nm)	0.089397	ppm	0.000894	1.00	1985.710000	Y_R2 488.368
Mg (279.078 nm)	18.699000	ppm	0.012619	0.07	114154.000000	Y 377.433
Mn (257.610 nm)	0.002081	ppm	0.000006	0.29	616.742000	Y 377.433
Mo (202.032 nm)	0.000068 u	ppm	0.000142	> 100.00	0.127978	Y 377.433
Na (589.592 nm)	374.429000 o	ppm	0.982310	0.26	2595340.000000	Y_R2 488.368
Na H (589.593 nm)	406.981097	ppm	5.064881	1.24	1607957.594296	Y_R 488.368
Ni (231.604 nm)	-0.001065 u	ppm	0.000480	45.05	-6.506620	Y 377.433
P (213.618 nm)	0.003175	ppm	0.000181	5.70	29.334300	Y 242.219
Pb (220.353 nm)	0.000339 u	ppm	0.000960	> 100.00	4.684040	Y 242.219
S (181.972 nm)	39.577545 o	ppm	0.131010	0.33	22386.765725	Y 377.433
Sb (206.834 nm)	-0.001003 u	ppm	0.001670	> 100.00	-19.955700	Y 377.433
Se (196.026 nm)	-0.002536 u	ppm	0.004267	> 100.00	11.341800	Y 242.219
Si (288.158 nm)	7.213910	ppm	0.006361	0.09	66376.300000	Y 377.433
Sn (189.925 nm)	0.001630	ppm	0.000557	34.16	10.845400	Y 377.433
Sr (421.552 nm)	0.657698	ppm	0.006610	1.01	142580.310528	Y_R 488.368
Th (288.505 nm)	0.002698	ppm	0.001365	50.60	80.310200	Y 377.433
Ti (336.122 nm)	0.003115	ppm	0.000007	0.24	317.521000	Y 377.433
Tl (190.794 nm)	0.002040	ppm	0.002166	> 100.00	-0.603011	Y 377.433
U (409.013 nm)	0.006426	ppm	0.003589	55.86	-65.266400	Y 377.433
V (292.401 nm)	0.003498	ppm	0.000037	1.06	170.370000	Y 377.433
Zn (206.200 nm)	0.010160	ppm	0.000108	1.06	75.487900	Y 377.433
Zr (343.823 nm)	0.000251	ppm	0.000087	34.47	22.271600	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.021524	20880.242244	0.001500	0.15
Y 377.433	1.027795	1131039.474032	0.002375	0.23
Y_R 377.433	1.063560	81994.500000	0.005564	0.52
Y_R 488.368	1.064520	46519.800000	0.009490	0.89
Y_R2 488.368	1.090955	94626.676183	0.000035	0.00

Sample Name: 280-112144-C-5-lsd@5

Date: 7/26/2018 3:33:25 PM Rack:Tube: 1:42

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000060 u	ppm	0.000012	19.49	-417.126000	Y 377.433
Al (167.019 nm)	0.020270	ppm	0.002941	14.51	9.869520	Y_R 377.433
Al H (396.152 nm)	-0.027421 u	ppm	0.001660	6.05	87.295132	Y_R 377.433
As (188.980 nm)	0.000101 u	ppm	0.001618	> 100.00	-3.565800	Y 242.219
B (249.678 nm)	0.373336	ppm	0.018505	4.96	10415.500000	Y 242.219
Ba (493.408 nm)	0.002393	ppm	0.000164	6.86	807.450000	Y_R 488.368
Be (234.861 nm)	0.000029	ppm	0.000009	30.18	-39.463000	Y_R 488.368
Bi (223.061 nm)	0.000224 u	ppm	0.001543	> 100.00	15.215600	Y 377.433
Ca (315.887 nm)	4.336368	ppm	0.097362	2.25	3507.309246	Y_R 377.433
Cd (214.439 nm)	0.000081	ppm	0.000028	34.93	2.267170	Y 377.433
Co (228.615 nm)	0.000303	ppm	0.000137	45.28	-30.018300	Y 242.219
Cr (205.560 nm)	0.000044	ppm	0.000016	37.20	1.663130	Y 377.433
Cu (324.754 nm)	0.000447	ppm	0.000088	19.77	345.846000	Y 377.433
Fe (238.204 nm)	0.015225	ppm	0.002240	14.71	73.773562	Y_R 377.433
Fe H (259.940 nm)	-0.147207 nu	ppm	0.000733	0.50	33.999100	Y_R 377.433
K (766.491 nm)	0.555291	ppm	0.063725	11.48	-63.314100	Y_R2 488.368
Li (670.783 nm)	0.015642	ppm	0.001339	8.56	-613.694000	Y_R2 488.368
Mg (279.078 nm)	3.823950	ppm	0.174572	4.57	23381.900000	Y 377.433
Mn (257.610 nm)	0.000522	ppm	0.000006	1.12	193.671000	Y 377.433
Mo (202.032 nm)	-0.000149 u	ppm	0.000069	45.99	-2.039770	Y 377.433
Na (589.592 nm)	66.856400 o	ppm	0.191729	0.29	463616.000000	Y_R2 488.368
Na H (589.593 nm)	76.302098	ppm	2.669940	3.50	304861.428900	Y_R 488.368
Ni (231.604 nm)	-0.000525 u	ppm	0.000221	42.10	-2.319280	Y 377.433
P (213.618 nm)	0.001649	ppm	0.001115	67.63	25.477400	Y 242.219
Pb (220.353 nm)	0.000022 u	ppm	0.000313	> 100.00	3.666900	Y 242.219
S (181.972 nm)	7.872465	ppm	0.375266	4.77	4472.114949	Y 377.433
Sb (206.834 nm)	-0.001511 u	ppm	0.000388	25.65	-21.469800	Y 377.433
Se (196.026 nm)	-0.000448 u	ppm	0.003268	> 100.00	13.665700	Y 242.219
Si (288.158 nm)	1.464080	ppm	0.071076	4.85	14144.800000	Y 377.433
Sn (189.925 nm)	0.000177 u	ppm	0.000514	> 100.00	7.447320	Y 377.433
Sr (421.552 nm)	0.121211	ppm	0.003850	3.18	26392.460506	Y_R 488.368
Th (288.505 nm)	0.001761	ppm	0.002045	> 100.00	77.321300	Y 377.433
Ti (336.122 nm)	0.001173	ppm	0.000132	11.22	-23.136900	Y 377.433
Tl (190.794 nm)	0.001155	ppm	0.000655	56.68	-2.841950	Y 377.433
U (409.013 nm)	-0.003890 u	ppm	0.001078	27.72	-111.403000	Y 377.433
V (292.401 nm)	0.000789	ppm	0.000036	4.50	54.344000	Y 377.433
Zn (206.200 nm)	-0.000184 u	ppm	0.000349	> 100.00	16.072600	Y 377.433
Zr (343.823 nm)	0.000150	ppm	0.000003	2.03	8.280210	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.045915	21378.791515	0.001969	0.19
Y 377.433	1.050711	1156257.482273	0.001531	0.15
Y_R 377.433	1.056060	81416.800000	0.006372	0.60
Y_R 488.368	1.057170	46198.600000	0.018910	1.79
Y_R2 488.368	1.079468	93630.276319	0.000752	0.07

Sample Name: 280-112144-C-5-J MS

Date: 7/26/2018 3:36:48 PM Rack:Tube: 1:43

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.050251	ppm	0.000002	0.00	2090.950000	Y 377.433
Al (167.019 nm)	2.059090	ppm	0.025621	1.24	1024.300000	Y_R 377.433
Al H (396.152 nm)	2.153693	ppm	0.006601	0.31	5680.087067	Y_R 377.433
As (188.980 nm)	0.989159	ppm	0.004070	0.41	1398.270000	Y 242.219
B (249.678 nm)	2.879880 o	ppm	0.001871	0.06	79936.300000	Y 242.219
Ba (493.408 nm)	1.966980 o	ppm	0.000777	0.04	235278.000000	Y_R 488.368
Be (234.861 nm)	0.046316	ppm	0.000378	0.82	14925.700000	Y_R 488.368
Bi (223.061 nm)	1.975560	ppm	0.004718	0.24	5554.910000	Y 377.433
Ca (315.887 nm)	70.384937 o	ppm	0.201680	0.29	58082.260975	Y_R 377.433
Cd (214.439 nm)	0.093074	ppm	0.000146	0.16	6146.730000	Y 377.433
Co (228.615 nm)	0.469676	ppm	0.003170	0.67	9757.100000	Y 242.219
Cr (205.560 nm)	0.189742	ppm	0.000394	0.21	3208.390000	Y 377.433
Cu (324.754 nm)	0.243300	ppm	0.000514	0.21	16151.800000	Y 377.433
Fe (238.204 nm)	1.069459	ppm	0.004254	0.40	4044.882665	Y_R 377.433
Fe H (259.940 nm)	0.923354 nu	ppm	0.001825	0.20	2130.380000	Y_R 377.433
K (766.491 nm)	52.769900	ppm	0.496507	0.94	63246.500000	Y_R2 488.368
Li (670.783 nm)	1.066830	ppm	0.007816	0.73	36434.400000	Y_R2 488.368
Mg (279.078 nm)	66.224700 o	ppm	0.214339	0.32	404114.000000	Y 377.433
Mn (257.610 nm)	0.475131	ppm	0.001239	0.26	128984.000000	Y 377.433
Mo (202.032 nm)	0.952172	ppm	0.001680	0.18	9500.240000	Y 377.433
Na (589.592 nm)	415.473000 o	ppm	0.653412	0.16	2883940.000000	Y_R2 488.368
Na H (589.593 nm)	454.348247	ppm	0.424188	0.09	1796583.199563	Y_R 488.368
Ni (231.604 nm)	0.462464	ppm	0.000288	0.06	3599.880000	Y 377.433
P (213.618 nm)	9.606570 o	ppm	0.021785	0.23	24308.400000	Y 242.219
Pb (220.353 nm)	0.485889	ppm	0.001078	0.22	1548.710000	Y 242.219
S (181.972 nm)	41.466687 o	ppm	0.143607	0.35	23455.464450	Y 377.433
Sb (206.834 nm)	0.507145	ppm	0.000241	0.05	1512.240000	Y 377.433
Se (196.026 nm)	1.932370	ppm	0.001805	0.09	2154.860000	Y 242.219
Si (288.158 nm)	17.266300 o	ppm	0.042458	0.25	157692.000000	Y 377.433
Sn (189.925 nm)	1.901880	ppm	0.012910	0.68	4457.210000	Y 377.433
Sr (421.552 nm)	1.618558 o	ppm	0.002318	0.14	350675.748756	Y_R 488.368
Th (288.505 nm)	1.001730	ppm	0.003379	0.34	2926.500000	Y 377.433
Ti (336.122 nm)	0.993884	ppm	0.000162	0.02	143356.000000	Y 377.433
Tl (190.794 nm)	1.910600	ppm	0.006706	0.35	4851.450000	Y 377.433
U (409.013 nm)	2.058750	ppm	0.013370	0.65	9827.670000	Y 377.433
V (292.401 nm)	0.484843	ppm	0.000495	0.10	20811.400000	Y 377.433
Zn (206.200 nm)	0.469399	ppm	0.000612	0.13	2713.400000	Y 377.433
Zr (343.823 nm)	0.487088	ppm	0.000508	0.10	66281.500000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.996025	20359.032835	0.006711	0.67
Y 377.433	1.006690	1107814.444655	0.008304	0.82
Y_R 377.433	1.056400	81443.100000	0.000087	0.01
Y_R 488.368	1.064490	46518.800000	0.001747	0.16
Y_R2 488.368	1.090153	94557.102275	0.004703	0.43

Sample Name: 280-112144-C-5-K MSD

Date: 7/26/2018 3:40:11 PM Rack:Tube: 1:44

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.047231	ppm	0.000338	0.72	1946.320000	Y 377.433
Al (167.019 nm)	1.969050	ppm	0.007035	0.36	979.496000	Y_R 377.433
Al H (396.152 nm)	2.045874	ppm	0.003352	0.16	5407.540449	Y_R 377.433
As (188.980 nm)	0.936692	ppm	0.001625	0.17	1323.900000	Y 242.219
B (249.678 nm)	2.863020 o	ppm	0.001806	0.06	79467.700000	Y 242.219
Ba (493.408 nm)	1.858880 o	ppm	0.015538	0.84	222378.000000	Y_R 488.368
Be (234.861 nm)	0.043911	ppm	0.000202	0.46	14144.500000	Y_R 488.368
Bi (223.061 nm)	1.867260	ppm	0.002379	0.13	5251.190000	Y 377.433
Ca (315.887 nm)	67.719691 o	ppm	0.053145	0.08	55880.007076	Y_R 377.433
Cd (214.439 nm)	0.088220	ppm	0.000090	0.10	5826.010000	Y 377.433
Co (228.615 nm)	0.444998	ppm	0.001652	0.37	9244.530000	Y 242.219
Cr (205.560 nm)	0.178582	ppm	0.000040	0.02	3019.610000	Y 377.433
Cu (324.754 nm)	0.229704	ppm	0.000434	0.19	15266.400000	Y 377.433
Fe (238.204 nm)	1.010365	ppm	0.002168	0.21	3822.285844	Y_R 377.433
Fe H (259.940 nm)	0.865426 nu	ppm	0.007832	0.90	2016.940000	Y_R 377.433
K (766.491 nm)	50.191800	ppm	0.035646	0.07	60120.600000	Y_R2 488.368
Li (670.783 nm)	1.010720	ppm	0.009868	0.98	34456.900000	Y_R2 488.368
Mg (279.078 nm)	63.625700 o	ppm	0.028364	0.04	388257.000000	Y 377.433
Mn (257.610 nm)	0.449952	ppm	0.000456	0.10	122152.000000	Y 377.433
Mo (202.032 nm)	0.950996	ppm	0.001452	0.15	9488.500000	Y 377.433
Na (589.592 nm)	413.881000 o	ppm	3.338380	0.81	2872680.000000	Y_R2 488.368
Na H (589.593 nm)	449.421959	ppm	2.595016	0.58	1777061.833047	Y_R 488.368
Ni (231.604 nm)	0.436251	ppm	0.000177	0.04	3395.940000	Y 377.433
P (213.618 nm)	9.065040 o	ppm	0.041378	0.46	22939.300000	Y 242.219
Pb (220.353 nm)	0.459728	ppm	0.001360	0.30	1465.270000	Y 242.219
S (181.972 nm)	41.246515 o	ppm	0.080456	0.20	23330.991732	Y 377.433
Sb (206.834 nm)	0.506653	ppm	0.002919	0.58	1510.720000	Y 377.433
Se (196.026 nm)	1.815250	ppm	0.000689	0.04	2025.140000	Y 242.219
Si (288.158 nm)	17.196600 o	ppm	0.021797	0.13	157059.000000	Y 377.433
Sn (189.925 nm)	1.901400	ppm	0.014323	0.75	4456.090000	Y 377.433
Sr (421.552 nm)	1.563643 o	ppm	0.016756	1.07	338782.625715	Y_R 488.368
Th (288.505 nm)	0.950649	ppm	0.002885	0.30	2780.840000	Y 377.433
Ti (336.122 nm)	0.991101	ppm	0.000549	0.06	142946.000000	Y 377.433
Tl (190.794 nm)	1.807680	ppm	0.002386	0.13	4589.400000	Y 377.433
U (409.013 nm)	1.955500	ppm	0.006332	0.32	9327.950000	Y 377.433
V (292.401 nm)	0.458965	ppm	0.000338	0.07	19702.000000	Y 377.433
Zn (206.200 nm)	0.445245	ppm	0.002098	0.47	2574.650000	Y 377.433
Zr (343.823 nm)	0.487397	ppm	0.000195	0.04	66323.500000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.990101	20237.947216	0.001799	0.18
Y 377.433	0.998617	1098931.043130	0.000247	0.02
Y_R 377.433	1.047430	80751.300000	0.000677	0.06
Y_R 488.368	1.053720	46048.200000	0.006214	0.59
Y_R2 488.368	1.066222	92481.361255	0.007716	0.72

Sample Name: 280-112144-C-5-Ipds

Date: 7/26/2018 3:43:36 PM Rack:Tube: 1:45

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.049724	ppm	0.000159	0.32	2078.200000	Y 377.433
Al (167.019 nm)	1.051970	ppm	0.010134	0.96	523.512000	Y_R 377.433
Al H (396.152 nm)	1.047709	ppm	0.006868	0.66	2812.646675	Y_R 377.433
As (188.980 nm)	0.195613	ppm	0.000181	0.09	273.533000	Y 242.219
B (249.678 nm)	1.947700 o	ppm	0.008434	0.43	54069.000000	Y 242.219
Ba (493.408 nm)	0.110176	ppm	0.000390	0.35	13680.800000	Y_R 488.368
Be (234.861 nm)	0.045888	ppm	0.000206	0.45	14841.800000	Y_R 488.368
Bi (223.061 nm)	-0.001271 u	ppm	0.000409	32.19	11.217200	Y 377.433
Ca (315.887 nm)	41.536680 o	ppm	0.348653	0.84	34245.370770	Y_R 377.433
Cd (214.439 nm)	0.046330	ppm	0.000087	0.19	3058.520000	Y 377.433
Co (228.615 nm)	0.047128	ppm	0.000100	0.21	944.378000	Y 242.219
Cr (205.560 nm)	0.047418	ppm	0.000101	0.21	802.321000	Y 377.433
Cu (324.754 nm)	0.049921	ppm	0.000095	0.19	3541.190000	Y 377.433
Fe (238.204 nm)	1.057707	ppm	0.007668	0.73	4000.614969	Y_R 377.433
Fe H (259.940 nm)	0.919054 nu	ppm	0.006387	0.69	2121.960000	Y_R 377.433
K (766.491 nm)	22.718800	ppm	0.070260	0.31	26809.800000	Y_R2 488.368
Li (670.783 nm)	0.185718	ppm	0.000190	0.10	5380.440000	Y_R2 488.368
Mg (279.078 nm)	36.930500	ppm	0.042418	0.11	225393.000000	Y 377.433
Mn (257.610 nm)	0.049519	ppm	0.000004	0.01	13489.700000	Y 377.433
Mo (202.032 nm)	0.047184	ppm	0.000270	0.57	470.253000	Y 377.433
Na (589.592 nm)	385.301000 o	ppm	1.039130	0.27	2670900.000000	Y_R2 488.368
Na H (589.593 nm)	414.799019	ppm	1.143247	0.28	1638861.708906	Y_R 488.368
Ni (231.604 nm)	0.044689	ppm	0.000633	1.42	349.507000	Y 377.433
P (213.618 nm)	1.908150	ppm	0.002257	0.12	4845.450000	Y 242.219
Pb (220.353 nm)	0.096752	ppm	0.000084	0.09	312.131000	Y 242.219
S (181.972 nm)	38.565221 o	ppm	0.090077	0.23	21814.887967	Y 377.433
Sb (206.834 nm)	0.099464	ppm	0.001405	1.41	283.546000	Y 377.433
Se (196.026 nm)	0.189179	ppm	0.001438	0.76	223.531000	Y 242.219
Si (288.158 nm)	12.112400 o	ppm	0.014066	0.12	110874.000000	Y 377.433
Sn (189.925 nm)	0.095202	ppm	0.000491	0.52	229.793000	Y 377.433
Sr (421.552 nm)	0.683505	ppm	0.001352	0.20	148169.397721	Y_R 488.368
Th (288.505 nm)	0.206792	ppm	0.003521	1.70	659.355000	Y 377.433
Ti (336.122 nm)	0.053075	ppm	0.000135	0.26	7580.720000	Y 377.433
Tl (190.794 nm)	0.191236	ppm	0.001440	0.75	480.741000	Y 377.433
U (409.013 nm)	0.518851	ppm	0.006195	1.19	2410.200000	Y 377.433
V (292.401 nm)	0.051574	ppm	0.000105	0.20	2213.610000	Y 377.433
Zn (206.200 nm)	0.196762	ppm	0.000698	0.35	1147.350000	Y 377.433
Zr (343.823 nm)	0.049592	ppm	0.000136	0.27	6740.380000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.003549	20512.811576	0.000891	0.09
Y 377.433	1.012580	1114296.506314	0.002070	0.20
Y_R 377.433	1.054190	81272.700000	0.007174	0.68
Y_R 488.368	1.066270	46596.400000	0.002229	0.21
Y_R2 488.368	1.079946	93671.785234	0.009096	0.84

Sample Name: 280-112138-H-2-C

Date: 7/26/2018 3:46:59 PM Rack:Tube: 1:46

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000056 u	ppm	0.000067	> 100.00	-417.258000	Y 377.433
Al (167.019 nm)	0.046407	ppm	0.000610	1.31	22.879000	Y_R 377.433
Al H (396.152 nm)	-0.003279 u	ppm	0.000902	27.53	147.999988	Y_R 377.433
As (188.980 nm)	0.002573	ppm	0.000322	12.51	-0.062743	Y 242.219
B (249.678 nm)	0.653298	ppm	0.003546	0.54	18178.100000	Y 242.219
Ba (493.408 nm)	0.026596	ppm	0.000272	1.02	3695.770000	Y_R 488.368
Be (234.861 nm)	0.000017	ppm	0.000008	48.24	-42.853800	Y_R 488.368
Bi (223.061 nm)	0.000641	ppm	0.000201	31.40	16.389900	Y 377.433
Ca (315.887 nm)	3.463543	ppm	0.013544	0.39	2786.107763	Y_R 377.433
Cd (214.439 nm)	-0.000052 u	ppm	0.000047	90.32	-6.490610	Y 377.433
Co (228.615 nm)	0.000099 u	ppm	0.000204	> 100.00	-34.266800	Y 242.219
Cr (205.560 nm)	0.000172	ppm	0.000166	96.63	3.806930	Y 377.433
Cu (324.754 nm)	0.000220	ppm	0.000062	28.14	331.001000	Y 377.433
Fe (238.204 nm)	0.036228	ppm	0.000204	0.56	152.888037	Y_R 377.433
Fe H (259.940 nm)	-0.123720 nu	ppm	0.002419	1.96	79.992100	Y_R 377.433
K (766.491 nm)	0.511666	ppm	0.003437	0.67	-116.209000	Y_R2 488.368
Li (670.783 nm)	0.106809	ppm	0.000135	0.13	2599.400000	Y_R2 488.368
Mg (279.078 nm)	0.643510	ppm	0.000114	0.02	3973.570000	Y 377.433
Mn (257.610 nm)	0.015695	ppm	0.000059	0.37	4311.070000	Y 377.433
Mo (202.032 nm)	0.004106	ppm	0.000052	1.26	40.419200	Y 377.433
Na (589.592 nm)	241.356000 o	ppm	1.284910	0.53	1673080.000000	Y_R2 488.368
Na H (589.593 nm)	258.197712	ppm	5.627924	2.18	1021669.684949	Y_R 488.368
Ni (231.604 nm)	-0.000442 u	ppm	0.000046	10.44	-1.668690	Y 377.433
P (213.618 nm)	0.023358	ppm	0.000991	4.24	80.362000	Y 242.219
Pb (220.353 nm)	-0.000211 u	ppm	0.001250	> 100.00	2.916060	Y 242.219
S (181.972 nm)	37.519267 o	ppm	0.164723	0.44	21223.792073	Y 377.433
Sb (206.834 nm)	-0.000495 u	ppm	0.000634	> 100.00	-18.440600	Y 377.433
Se (196.026 nm)	-0.002594 u	ppm	0.000517	19.94	11.298000	Y 242.219
Si (288.158 nm)	3.996270	ppm	0.020047	0.50	37147.300000	Y 377.433
Sn (189.925 nm)	0.000163	ppm	0.000047	28.60	7.413900	Y 377.433
Sr (421.552 nm)	0.132318	ppm	0.001966	1.49	28797.831863	Y_R 488.368
Th (288.505 nm)	0.004335	ppm	0.000503	11.59	84.947600	Y 377.433
Ti (336.122 nm)	0.000760	ppm	0.000015	2.00	-85.519300	Y 377.433
Tl (190.794 nm)	0.001236	ppm	0.000014	1.13	-2.647760	Y 377.433
U (409.013 nm)	0.009639	ppm	0.001927	19.99	-45.658800	Y 377.433
V (292.401 nm)	0.001130	ppm	0.000036	3.19	68.292900	Y 377.433
Zn (206.200 nm)	-0.001404 u	ppm	0.000175	12.50	9.064150	Y 377.433
Zr (343.823 nm)	0.000137	ppm	0.000054	39.35	6.615090	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.029953	21052.518507	0.000029	0.00
Y 377.433	1.035066	1139041.510980	0.002041	0.20
Y_R 377.433	1.060580	81765.200000	0.001994	0.19
Y_R 488.368	1.068390	46689.200000	0.012604	1.18
Y_R2 488.368	1.080281	93700.856058	0.006378	0.59

Sample Name: CCVH-5225153

Date: 7/26/2018 3:50:22 PM
Rack:Tube: S1:1

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001316 u	ppm	0.000004	0.27	-741.576000	Y 377.433
Al (167.019 nm)	44.721600 o	ppm	0.393421	0.88	22266.500000	Y_R 377.433
Al H (396.152 nm)	48.960506	ppm	0.160468	0.33	123351.997243	Y_R 377.433
As (188.980 nm)	0.001086 u	ppm	0.002385	> 100.00	-2.653940	Y 242.219
B (249.678 nm)	0.001309	ppm	0.000160	12.24	19.054300	Y 242.219
Ba (493.408 nm)	0.000205	ppm	0.000218	> 100.00	591.849000	Y_R 488.368
Be (234.861 nm)	0.000048	ppm	0.000048	99.50	1613.230000	Y_R 488.368
Bi (223.061 nm)	0.962699	ppm	0.004109	0.43	2723.200000	Y 377.433
Ca (315.887 nm)	0.010593	ppm	0.000639	6.03	-67.010184	Y_R 377.433
Cd (214.439 nm)	-0.000155 u	ppm	0.000025	15.95	38.174100	Y 377.433
Co (228.615 nm)	0.001088	ppm	0.000137	12.56	-13.714700	Y 242.219
Cr (205.560 nm)	-0.000032 u	ppm	0.000259	> 100.00	-14.476600	Y 377.433
Cu (324.754 nm)	-0.006501 u	ppm	0.000259	3.99	271.488000	Y 377.433
Fe (238.204 nm)	47.891724 o	ppm	0.213843	0.45	180415.918373	Y_R 377.433
Fe H (259.940 nm)	48.923500	ppm	0.205696	0.42	96124.400000	Y_R 377.433
K (766.491 nm)	0.108797	ppm	0.016283	14.97	-604.684000	Y_R2 488.368
Li (670.783 nm)	0.003041	ppm	0.000131	4.30	-1057.800000	Y_R2 488.368
Mg (279.078 nm)	-0.011406 u	ppm	0.000334	2.93	-388.176000	Y 377.433
Mn (257.610 nm)	0.001437	ppm	0.000016	1.11	442.128000	Y 377.433
Mo (202.032 nm)	-0.000189 u	ppm	0.000186	98.39	-2.435370	Y 377.433
Na (589.592 nm)	228.497000 o	ppm	0.598770	0.26	1583900.000000	Y_R2 488.368
Na H (589.593 nm)	246.948236	ppm	0.265247	0.11	977311.769699	Y_R 488.368
Ni (231.604 nm)	0.001234	ppm	0.000436	35.35	13.636200	Y 377.433
P (213.618 nm)	-0.003833 u	ppm	0.001445	37.71	11.618200	Y 242.219
Pb (220.353 nm)	-0.003843 u	ppm	0.000656	17.08	9.536320	Y 242.219
S (181.972 nm)	4.818618	ppm	0.009722	0.20	2746.571744	Y 377.433
Sb (206.834 nm)	-0.005379 u	ppm	0.000347	6.46	-80.542300	Y 377.433
Se (196.026 nm)	-0.002529 u	ppm	0.002892	> 100.00	1.642180	Y 242.219
Si (288.158 nm)	0.022522	ppm	0.000573	2.54	1049.740000	Y 377.433
Sn (189.925 nm)	0.002269	ppm	0.000523	23.03	12.342200	Y 377.433
Sr (421.552 nm)	0.000532	ppm	0.000038	7.20	256.742557	Y_R 488.368
Th (288.505 nm)	4.897780	ppm	0.028513	0.58	13887.700000	Y 377.433
Ti (336.122 nm)	0.001505	ppm	0.000061	4.05	11.101500	Y 377.433
Tl (190.794 nm)	-0.002520 u	ppm	0.000273	10.81	-13.680600	Y 377.433
U (409.013 nm)	9.950190	ppm	0.003445	0.03	48155.400000	Y 377.433
V (292.401 nm)	0.003156	ppm	0.000142	4.49	-34.682400	Y 377.433
Zn (206.200 nm)	-0.002612 u	ppm	0.000545	20.88	2.123300	Y 377.433
Zr (343.823 nm)	-0.003894 u	ppm	0.000012	0.32	-396.114000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.017785	20803.804601	0.005408	0.53
Y 377.433	1.015477	1117484.882432	0.005366	0.53
Y_R 377.433	1.069640	82463.200000	0.003931	0.37
Y_R 488.368	1.069100	46720.000000	0.008037	0.75
Y_R2 488.368	1.090657	94600.814677	0.001960	0.18

Sample Name: CCV-5225154

Date: 7/26/2018 3:53:46 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.472792	ppm	0.001542	0.33	23415.000000	Y 377.433
Al (167.019 nm)	0.517083	ppm	0.001294	0.25	258.400000	Y_R 377.433
Al H (396.152 nm)	0.480914 u	ppm	0.008708	1.81	1404.978414	Y_R 377.433
As (188.980 nm)	0.958586	ppm	0.003753	0.39	1354.920000	Y 242.219
B (249.678 nm)	0.477565	ppm	0.002020	0.42	13324.700000	Y 242.219
Ba (493.408 nm)	0.487201	ppm	0.002440	0.50	58677.200000	Y_R 488.368
Be (234.861 nm)	0.469012	ppm	0.005443	1.16	151867.000000	Y_R 488.368
Bi (223.061 nm)	-0.003061 u	ppm	0.001071	35.01	6.460050	Y 377.433
Ca (315.887 nm)	4.878321	ppm	0.032071	0.66	3955.393386	Y_R 377.433
Cd (214.439 nm)	0.474725	ppm	0.002001	0.42	31359.100000	Y 377.433
Co (228.615 nm)	0.484992	ppm	0.002370	0.49	10054.900000	Y 242.219
Cr (205.560 nm)	0.477502	ppm	0.001108	0.23	8073.430000	Y 377.433
Cu (324.754 nm)	0.473815	ppm	0.001740	0.37	31134.000000	Y 377.433
Fe (238.204 nm)	2.470515	ppm	0.019764	0.80	9322.409346	Y_R 377.433
Fe H (259.940 nm)	2.371590 u	ppm	0.004560	0.19	4966.310000	Y_R 377.433
K (766.491 nm)	47.976500	ppm	0.084876	0.18	57434.500000	Y_R2 488.368
Li (670.783 nm)	0.955654	ppm	0.003758	0.39	32516.100000	Y_R2 488.368
Mg (279.078 nm)	18.719000	ppm	0.069921	0.37	114272.000000	Y 377.433
Mn (257.610 nm)	0.480416	ppm	0.001577	0.33	130419.000000	Y 377.433
Mo (202.032 nm)	0.482058	ppm	0.001216	0.25	4809.430000	Y 377.433
Na (589.592 nm)	4.861240	ppm	0.003628	0.07	34972.400000	Y_R2 488.368
Na H (589.593 nm)	5.998540 u	ppm	0.049938	0.83	28310.283455	Y_R 488.368
Ni (231.604 nm)	0.477689	ppm	0.003217	0.67	3717.040000	Y 377.433
P (213.618 nm)	0.930834	ppm	0.000325	0.03	2374.620000	Y 242.219
Pb (220.353 nm)	0.970938	ppm	0.004452	0.46	3087.130000	Y 242.219
S (181.972 nm)	0.029485	ppm	0.019098	64.77	41.790296	Y 377.433
Sb (206.834 nm)	0.959155	ppm	0.003883	0.40	2899.080000	Y 377.433
Se (196.026 nm)	0.951422	ppm	0.003385	0.36	1067.940000	Y 242.219
Si (288.158 nm)	4.840630	ppm	0.004880	0.10	44817.400000	Y 377.433
Sn (189.925 nm)	0.949186	ppm	0.004689	0.49	2228.020000	Y 377.433
Sr (421.552 nm)	0.485688	ppm	0.002840	0.58	105327.802359	Y_R 488.368
Th (288.505 nm)	0.008805	ppm	0.003281	37.26	113.401000	Y 377.433
Ti (336.122 nm)	0.489524	ppm	0.001560	0.32	70408.600000	Y 377.433
Tl (190.794 nm)	0.974277	ppm	0.001903	0.20	2472.240000	Y 377.433
U (409.013 nm)	0.003125 u	ppm	0.008296	> 100.00	-114.832000	Y 377.433
V (292.401 nm)	0.478792	ppm	0.001485	0.31	20507.400000	Y 377.433
Zn (206.200 nm)	0.472373	ppm	0.003966	0.84	2730.480000	Y 377.433
Zr (343.823 nm)	0.484731	ppm	0.000984	0.20	65965.100000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.053124	21526.143258	0.003007	0.29
Y 377.433	1.060282	1166789.762281	0.001974	0.19
Y_R 377.433	1.074340	82825.600000	0.010604	0.99
Y_R 488.368	1.081680	47269.700000	0.011707	1.08
Y_R2 488.368	1.100814	95481.826742	0.002113	0.19

Sample Name: CCB

Date: 7/26/2018 3:57:08 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000013 u	ppm	0.000087	> 100.00	-413.414000	Y 377.433
Al (167.019 nm)	0.003948	ppm	0.000887	22.46	1.743810	Y_R 377.433
Al H (396.152 nm)	-0.054356 u	ppm	0.002211	4.07	17.672543	Y_R 377.433
As (188.980 nm)	0.001674	ppm	0.000498	29.74	-1.336770	Y 242.219
B (249.678 nm)	0.001422	ppm	0.000089	6.23	103.306000	Y 242.219
Ba (493.408 nm)	-0.000529 u	ppm	0.000124	23.52	457.709000	Y_R 488.368
Be (234.861 nm)	0.000090	ppm	0.000049	54.55	-20.232900	Y_R 488.368
Bi (223.061 nm)	0.000753 u	ppm	0.001281	> 100.00	16.695300	Y 377.433
Ca (315.887 nm)	0.008123	ppm	0.004492	55.30	-69.051824	Y_R 377.433
Cd (214.439 nm)	0.000047	ppm	0.000001	2.62	-0.016954	Y 377.433
Co (228.615 nm)	0.000172	ppm	0.000162	94.09	-32.770900	Y 242.219
Cr (205.560 nm)	-0.000025 u	ppm	0.000065	> 100.00	0.496605	Y 377.433
Cu (324.754 nm)	0.000187	ppm	0.000088	46.87	332.284000	Y 377.433
Fe (238.204 nm)	-0.000042 u	ppm	0.000303	> 100.00	16.263155	Y_R 377.433
Fe H (259.940 nm)	-0.157816 u	ppm	0.004442	2.81	13.224700	Y_R 377.433
K (766.491 nm)	0.181815	ppm	0.024248	13.34	-516.150000	Y_R2 488.368
Li (670.783 nm)	0.002784	ppm	0.000391	14.03	-1066.880000	Y_R2 488.368
Mg (279.078 nm)	0.002584	ppm	0.001196	46.28	62.621100	Y 377.433
Mn (257.610 nm)	0.000055	ppm	0.000034	61.89	66.872800	Y 377.433
Mo (202.032 nm)	0.000294	ppm	0.000128	43.56	2.383910	Y 377.433
Na (589.592 nm)	0.038772	ppm	0.005035	12.99	515.426000	Y_R2 488.368
Na H (589.593 nm)	0.216192 u	ppm	0.012950	5.99	5031.996072	Y_R 488.368
Ni (231.604 nm)	-0.000375 u	ppm	0.000685	> 100.00	-1.153880	Y 377.433
P (213.618 nm)	-0.001283 u	ppm	0.001127	87.86	18.064700	Y 242.219
Pb (220.353 nm)	-0.000225 u	ppm	0.000886	> 100.00	2.893370	Y 242.219
S (181.972 nm)	0.008421	ppm	0.001204	14.30	28.612333	Y 377.433
Sb (206.834 nm)	0.000053 u	ppm	0.001324	> 100.00	-16.732000	Y 377.433
Se (196.026 nm)	-0.004375 u	ppm	0.003875	88.56	9.318190	Y 242.219
Si (288.158 nm)	-0.004842 u	ppm	0.000124	2.57	801.168000	Y 377.433
Sn (189.925 nm)	0.000052 u	ppm	0.000537	> 100.00	7.153910	Y 377.433
Sr (421.552 nm)	0.000093	ppm	0.000050	54.27	161.613415	Y_R 488.368
Th (288.505 nm)	0.004435	ppm	0.001723	38.85	84.738100	Y 377.433
Ti (336.122 nm)	0.000391	ppm	0.000071	18.21	-149.639000	Y 377.433
Tl (190.794 nm)	0.001347	ppm	0.000160	11.84	-2.349010	Y 377.433
U (409.013 nm)	-0.000384 u	ppm	0.000591	> 100.00	-93.541000	Y 377.433
V (292.401 nm)	-0.000102 u	ppm	0.000335	> 100.00	16.005900	Y 377.433
Zn (206.200 nm)	-0.002827 u	ppm	0.000068	2.39	0.890489	Y 377.433
Zr (343.823 nm)	0.000004 u	ppm	0.000123	> 100.00	-11.585100	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.062616	21720.167238	0.002908	0.27
Y 377.433	1.073039	1180828.320840	0.005131	0.48
Y_R 377.433	1.077630	83079.800000	0.004786	0.44
Y_R 488.368	1.086620	47485.900000	0.006265	0.58
Y_R2 488.368	1.107350	96048.686568	0.004852	0.44

Sample Name: CCVL-5236949

Date: 7/26/2018 4:00:32 PM
Rack:Tube: S1:3

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.008977	ppm	0.000090	1.00	38.327500	Y 377.433
Al (167.019 nm)	0.100282	ppm	0.001217	1.21	49.706900	Y_R 377.433
Al H (396.152 nm)	0.046226 u	ppm	0.000755	1.63	272.225194	Y_R 377.433
As (188.980 nm)	0.014048	ppm	0.000807	5.75	16.200900	Y 242.219
B (249.678 nm)	0.093255	ppm	0.000139	0.15	2649.870000	Y 242.219
Ba (493.408 nm)	0.009427	ppm	0.000041	0.44	1645.980000	Y_R 488.368
Be (234.861 nm)	0.000948	ppm	0.000005	0.50	260.138000	Y_R 488.368
Bi (223.061 nm)	0.095638	ppm	0.001803	1.89	282.804000	Y 377.433
Ca (315.887 nm)	0.203863	ppm	0.003921	1.92	92.687565	Y_R 377.433
Cd (214.439 nm)	0.004744	ppm	0.000023	0.49	310.384000	Y 377.433
Co (228.615 nm)	0.010206	ppm	0.000013	0.13	175.970000	Y 242.219
Cr (205.560 nm)	0.009284	ppm	0.000070	0.76	157.930000	Y 377.433
Cu (324.754 nm)	0.014018	ppm	0.000381	2.72	1229.140000	Y 377.433
Fe (238.204 nm)	0.099778	ppm	0.003148	3.15	392.269670	Y_R 377.433
Fe H (259.940 nm)	-0.062459 u	ppm	0.003297	5.28	199.953000	Y_R 377.433
K (766.491 nm)	3.035800	ppm	0.003118	0.10	2944.280000	Y_R2 488.368
Li (670.783 nm)	0.021218	ppm	0.001571	7.41	-417.184000	Y_R2 488.368
Mg (279.078 nm)	0.184010	ppm	0.000570	0.31	1168.270000	Y 377.433
Mn (257.610 nm)	0.009725	ppm	0.000003	0.03	2690.990000	Y 377.433
Mo (202.032 nm)	0.017577	ppm	0.000533	3.03	174.832000	Y 377.433
Na (589.592 nm)	1.016360	ppm	0.004183	0.41	7311.130000	Y_R2 488.368
Na H (589.593 nm)	1.137402 u	ppm	0.018469	1.62	8671.816477	Y_R 488.368
Ni (231.604 nm)	0.037653	ppm	0.000102	0.27	294.523000	Y 377.433
P (213.618 nm)	2.614900 o	ppm	0.036564	1.40	6632.230000	Y 242.219
Pb (220.353 nm)	0.008609	ppm	0.000220	2.55	30.995800	Y 242.219
S (181.972 nm)	0.100701	ppm	0.005487	5.45	80.779932	Y 377.433
Sb (206.834 nm)	0.018635	ppm	0.001183	6.35	39.592000	Y 377.433
Se (196.026 nm)	0.016258	ppm	0.000737	4.53	32.160600	Y 242.219
Si (288.158 nm)	0.457729	ppm	0.002708	0.59	5003.170000	Y 377.433
Sn (189.925 nm)	0.091700	ppm	0.000094	0.10	221.599000	Y 377.433
Sr (421.552 nm)	0.009737	ppm	0.000041	0.42	2250.323757	Y_R 488.368
Th (288.505 nm)	0.015345	ppm	0.001996	13.01	116.574000	Y 377.433
Ti (336.122 nm)	0.009888	ppm	0.000060	0.61	1220.640000	Y 377.433
Tl (190.794 nm)	0.015442	ppm	0.000394	2.55	33.468400	Y 377.433
U (409.013 nm)	0.057507	ppm	0.002070	3.60	185.791000	Y 377.433
V (292.401 nm)	0.009133	ppm	0.000137	1.50	408.199000	Y 377.433
Zn (206.200 nm)	0.016165	ppm	0.000479	2.96	109.983000	Y 377.433
Zr (343.823 nm)	0.014191	ppm	0.000016	0.11	1919.570000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.081345	22102.998409	0.000857	0.08
Y 377.433	1.090590	1200142.394959	0.001213	0.11
Y_R 377.433	1.092100	84195.100000	0.003333	0.31
Y_R 488.368	1.090620	47660.500000	0.014208	1.30
Y_R2 488.368	1.116446	96837.705112	0.001449	0.13

Sample Name: LB2 280-423270/1-B

Date: 7/26/2018 4:03:56 PM Rack:Tube: 1:47

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000320 u	ppm	0.000259	81.17	-430.248000	Y 377.433
Al (167.019 nm)	0.004535	ppm	0.000634	13.98	2.042430	Y_R 377.433
Al H (396.152 nm)	-0.050495 u	ppm	0.007121	14.10	27.380836	Y_R 377.433
As (188.980 nm)	0.001372	ppm	0.001921	> 100.00	-1.764380	Y 242.219
B (249.678 nm)	0.009949	ppm	0.000157	1.58	339.718000	Y 242.219
Ba (493.408 nm)	-0.000116 u	ppm	0.000080	68.46	506.968000	Y_R 488.368
Be (234.861 nm)	0.000015 u	ppm	0.000023	> 100.00	-44.269400	Y_R 488.368
Bi (223.061 nm)	-0.000121 u	ppm	0.000518	> 100.00	14.245600	Y 377.433
Ca (315.887 nm)	0.091955	ppm	0.006398	6.96	0.216999	Y_R 377.433
Cd (214.439 nm)	0.000023 u	ppm	0.000036	> 100.00	-1.584250	Y 377.433
Co (228.615 nm)	0.000435	ppm	0.000034	7.89	-27.317300	Y 242.219
Cr (205.560 nm)	-0.000075 u	ppm	0.000067	88.70	-0.354319	Y 377.433
Cu (324.754 nm)	0.002002	ppm	0.000191	9.53	448.993000	Y 377.433
Fe (238.204 nm)	0.009764	ppm	0.001815	18.59	53.201463	Y_R 377.433
Fe H (259.940 nm)	-0.152069 nu	ppm	0.000138	0.09	24.479200	Y_R 377.433
K (766.491 nm)	0.059595	ppm	0.044954	75.43	-664.342000	Y_R2 488.368
Li (670.783 nm)	0.003857	ppm	0.000097	2.51	-1029.050000	Y_R2 488.368
Mg (279.078 nm)	0.009405	ppm	0.000209	2.22	104.197000	Y 377.433
Mn (257.610 nm)	0.000308	ppm	0.000025	8.22	135.631000	Y 377.433
Mo (202.032 nm)	-0.000229 u	ppm	0.000184	80.04	-2.839360	Y 377.433
Na (589.592 nm)	0.721401	ppm	0.000363	0.05	5247.280000	Y_R2 488.368
Na H (589.593 nm)	0.700848 u	ppm	0.048207	6.88	6942.199633	Y_R 488.368
Ni (231.604 nm)	-0.000792 u	ppm	0.000005	0.62	-4.396130	Y 377.433
P (213.618 nm)	-0.000150 u	ppm	0.000636	> 100.00	20.930100	Y 242.219
Pb (220.353 nm)	0.000646	ppm	0.000199	30.85	5.664570	Y 242.219
S (181.972 nm)	0.008192	ppm	0.001648	20.11	28.483488	Y 377.433
Sb (206.834 nm)	0.000142 u	ppm	0.000516	> 100.00	-16.466900	Y 377.433
Se (196.026 nm)	-0.000687 u	ppm	0.002778	> 100.00	13.401400	Y 242.219
Si (288.158 nm)	-0.003011 u	ppm	0.000284	9.43	817.801000	Y 377.433
Sn (189.925 nm)	0.000632 u	ppm	0.001254	> 100.00	8.511000	Y 377.433
Sr (421.552 nm)	0.000165	ppm	0.000031	19.11	177.149655	Y_R 488.368
Th (288.505 nm)	0.000178 u	ppm	0.000741	> 100.00	72.948400	Y 377.433
Ti (336.122 nm)	0.000316	ppm	0.000009	2.70	-160.211000	Y 377.433
Tl (190.794 nm)	0.000550 u	ppm	0.000878	> 100.00	-4.376950	Y 377.433
U (409.013 nm)	0.000309 u	ppm	0.001539	> 100.00	-90.178900	Y 377.433
V (292.401 nm)	-0.000042 u	ppm	0.000060	> 100.00	18.023000	Y 377.433
Zn (206.200 nm)	-0.002152 u	ppm	0.000271	12.59	4.764910	Y 377.433
Zr (343.823 nm)	-0.000100 u	ppm	0.000048	48.05	-25.705100	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.081108	22098.144562	0.004307	0.40
Y 377.433	1.091575	1201226.448240	0.004004	0.37
Y_R 377.433	1.120750	86403.800000	0.000244	0.02
Y_R 488.368	1.131240	49435.700000	0.007140	0.63
Y_R2 488.368	1.138061	98712.537346	0.001175	0.10

Sample Name: LCS 280-423270/2-B

Date: 7/26/2018 4:07:19 PM Rack:Tube: 1:48

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.184371	ppm	0.000113	0.06	8863.300000	Y 377.433
Al (167.019 nm)	0.373205	ppm	0.011802	3.16	185.471000	Y_R 377.433
Al H (396.152 nm)	0.330670 u	ppm	0.001182	0.36	1004.201494	Y_R 377.433
As (188.980 nm)	0.704666	ppm	0.000714	0.10	995.049000	Y 242.219
B (249.678 nm)	0.183319	ppm	0.000180	0.10	5150.720000	Y 242.219
Ba (493.408 nm)	2.174930 o	ppm	0.006622	0.30	260080.000000	Y_R 488.368
Be (234.861 nm)	0.008509	ppm	0.000041	0.48	2701.430000	Y_R 488.368
Bi (223.061 nm)	0.345246	ppm	0.000831	0.24	982.804000	Y 377.433
Ca (315.887 nm)	8.891138	ppm	0.002524	0.03	7270.955457	Y_R 377.433
Cd (214.439 nm)	0.191021	ppm	0.000971	0.51	12615.500000	Y 377.433
Co (228.615 nm)	0.088056	ppm	0.000285	0.32	1799.420000	Y 242.219
Cr (205.560 nm)	0.913641	ppm	0.001446	0.16	15458.200000	Y 377.433
Cu (324.754 nm)	0.389157	ppm	0.000000	0.00	25629.100000	Y 377.433
Fe (238.204 nm)	0.188705	ppm	0.003711	1.97	727.239800	Y_R 377.433
Fe H (259.940 nm)	0.027397 nu	ppm	0.002437	8.89	375.910000	Y_R 377.433
K (766.491 nm)	9.043190	ppm	0.097945	1.08	10228.200000	Y_R2 488.368
Li (670.783 nm)	0.179985	ppm	0.002451	1.36	5178.400000	Y_R2 488.368
Mg (279.078 nm)	8.533120	ppm	0.016625	0.19	52108.400000	Y 377.433
Mn (257.610 nm)	0.089025	ppm	0.000149	0.17	24210.000000	Y 377.433
Mo (202.032 nm)	0.174022	ppm	0.000309	0.18	1735.850000	Y 377.433
Na (589.592 nm)	9.505650	ppm	0.046886	0.49	70736.800000	Y_R2 488.368
Na H (589.593 nm)	9.987398	ppm	0.011030	0.11	45731.090444	Y_R 488.368
Ni (231.604 nm)	0.085176	ppm	0.000240	0.28	664.480000	Y 377.433
P (213.618 nm)	1.700040	ppm	0.005635	0.33	4319.320000	Y 242.219
Pb (220.353 nm)	1.006280	ppm	0.000205	0.02	3201.950000	Y 242.219
S (181.972 nm)	0.352697	ppm	0.001233	0.35	223.378508	Y 377.433
Sb (206.834 nm)	0.089060	ppm	0.000745	0.84	281.885000	Y 377.433
Se (196.026 nm)	0.511841	ppm	0.000825	0.16	581.142000	Y 242.219
Si (288.158 nm)	1.777830	ppm	0.003458	0.19	16994.900000	Y 377.433
Sn (189.925 nm)	0.348793	ppm	0.001679	0.48	823.168000	Y 377.433
Sr (421.552 nm)	0.179412	ppm	0.000109	0.06	38997.159609	Y_R 488.368
Th (288.505 nm)	0.187299	ppm	0.002299	1.23	605.518000	Y 377.433
Ti (336.122 nm)	0.179492	ppm	0.000227	0.13	25708.500000	Y 377.433
Tl (190.794 nm)	0.366297	ppm	0.000287	0.08	925.517000	Y 377.433
U (409.013 nm)	0.379283	ppm	0.002363	0.62	1736.690000	Y 377.433
V (292.401 nm)	0.088551	ppm	0.000045	0.05	3560.750000	Y 377.433
Zn (206.200 nm)	0.427833	ppm	0.000435	0.10	2474.640000	Y 377.433
Zr (343.823 nm)	0.089209	ppm	0.000099	0.11	12129.400000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.072192	21915.909642	0.002194	0.20
Y 377.433	1.082503	1191243.735374	0.002091	0.19
Y_R 377.433	1.100460	84839.600000	0.000607	0.06
Y_R 488.368	1.108760	48453.100000	0.001778	0.16
Y_R2 488.368	1.124492	97535.619786	0.000916	0.08

Sample Name: 280-112151-A-1-B

Date: 7/26/2018 4:10:41 PM Rack:Tube: 1:49

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000001 u	ppm	0.000350	> 100.00	-414.133000	Y 377.433
Al (167.019 nm)	0.005542	ppm	0.000861	15.53	3.011270	Y_R 377.433
Al H (396.152 nm)	0.009691 u	ppm	0.002344	24.19	339.604491	Y_R 377.433
As (188.980 nm)	0.000457	ppm	0.000095	20.76	-3.069500	Y 242.219
B (249.678 nm)	0.008486	ppm	0.000335	3.95	297.961000	Y 242.219
Ba (493.408 nm)	0.086117	ppm	0.001665	1.93	10887.200000	Y_R 488.368
Be (234.861 nm)	-0.000002 u	ppm	0.000012	> 100.00	-23.250500	Y_R 488.368
Bi (223.061 nm)	-0.000844 u	ppm	0.001290	> 100.00	12.362200	Y 377.433
Ca (315.887 nm)	367.704320 o	ppm	1.823125	0.50	303752.556517	Y_R 377.433
Cd (214.439 nm)	0.002079	ppm	0.000012	0.56	135.102000	Y 377.433
Co (228.615 nm)	0.003317	ppm	0.000051	1.53	32.539900	Y 242.219
Cr (205.560 nm)	0.000059 u	ppm	0.000112	> 100.00	1.674590	Y 377.433
Cu (324.754 nm)	-0.002261 u	ppm	0.000111	4.93	-89.008100	Y 377.433
Fe (238.204 nm)	0.781713	ppm	0.002267	0.29	2960.993685	Y_R 377.433
Fe H (259.940 nm)	0.631990 nu	ppm	0.003453	0.55	1559.830000	Y_R 377.433
K (766.491 nm)	0.499548	ppm	0.006478	1.30	-130.902000	Y_R2 488.368
Li (670.783 nm)	0.003926	ppm	0.000080	2.05	-1026.610000	Y_R2 488.368
Mg (279.078 nm)	3.113940	ppm	0.005435	0.17	19047.800000	Y 377.433
Mn (257.610 nm)	0.871383	ppm	0.000946	0.11	236512.000000	Y 377.433
Mo (202.032 nm)	-0.000056 u	ppm	0.000106	> 100.00	-1.113960	Y 377.433
Na (589.592 nm)	0.584356	ppm	0.002211	0.38	4482.280000	Y_R2 488.368
Na H (589.593 nm)	0.872799 u	ppm	0.028802	3.30	7707.791450	Y_R 488.368
Ni (231.604 nm)	0.002015	ppm	0.000437	21.67	17.471700	Y 377.433
P (213.618 nm)	0.003436	ppm	0.001471	42.81	29.994100	Y 242.219
Pb (220.353 nm)	0.004159	ppm	0.000035	0.84	16.838000	Y 242.219
S (181.972 nm)	0.443154	ppm	0.009867	2.23	276.566450	Y 377.433
Sb (206.834 nm)	-0.001130 u	ppm	0.001552	> 100.00	-20.513200	Y 377.433
Se (196.026 nm)	0.001175 u	ppm	0.001904	> 100.00	16.076800	Y 242.219
Si (288.158 nm)	0.284504	ppm	0.002220	0.78	3429.590000	Y 377.433
Sn (189.925 nm)	-0.000046 u	ppm	0.000116	> 100.00	6.925630	Y 377.433
Sr (421.552 nm)	1.491824 o	ppm	0.024654	1.65	323228.750421	Y_R 488.368
Th (288.505 nm)	-0.001849 u	ppm	0.001399	75.66	85.988800	Y 377.433
Ti (336.122 nm)	-0.000335 u	ppm	0.000069	20.65	917.701000	Y 377.433
Tl (190.794 nm)	0.000444	ppm	0.000428	96.33	-4.659590	Y 377.433
U (409.013 nm)	-0.004124 u	ppm	0.005247	> 100.00	-186.034000	Y 377.433
V (292.401 nm)	0.000582	ppm	0.000460	79.07	45.998000	Y 377.433
Zn (206.200 nm)	0.233448	ppm	0.000075	0.03	1358.070000	Y 377.433
Zr (343.823 nm)	0.000002 u	ppm	0.000100	> 100.00	-9.439960	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.017806	20804.247202	0.002321	0.23
Y 377.433	1.036820	1140971.255176	0.001479	0.14
Y_R 377.433	1.069690	82467.500000	0.004532	0.42
Y_R 488.368	1.065220	46550.600000	0.018526	1.74
Y_R2 488.368	1.101170	95512.716003	0.005218	0.47

Sample Name: 280-112151-A-2-B

Date: 7/26/2018 4:14:04 PM Rack:Tube: 1:50

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000074 u	ppm	0.000217	> 100.00	-417.895000	Y 377.433
Al (167.019 nm)	0.008322	ppm	0.003035	36.48	4.505190	Y_R 377.433
Al H (396.152 nm)	0.006679 u	ppm	0.004340	64.97	319.399601	Y_R 377.433
As (188.980 nm)	0.001684	ppm	0.001082	64.24	-1.331250	Y 242.219
B (249.678 nm)	0.008750	ppm	0.000128	1.47	304.908000	Y 242.219
Ba (493.408 nm)	0.073340	ppm	0.000245	0.33	9355.610000	Y_R 488.368
Be (234.861 nm)	0.000026	ppm	0.000004	15.36	-8.076010	Y_R 488.368
Bi (223.061 nm)	0.000969	ppm	0.000686	70.77	17.479800	Y 377.433
Ca (315.887 nm)	338.815895 o	ppm	1.054363	0.31	279882.502050	Y_R 377.433
Cd (214.439 nm)	0.000928	ppm	0.000014	1.49	59.240600	Y 377.433
Co (228.615 nm)	0.001938	ppm	0.000205	10.57	3.903440	Y 242.219
Cr (205.560 nm)	-0.000278 u	ppm	0.000109	39.00	-4.085110	Y 377.433
Cu (324.754 nm)	-0.002292 u	ppm	0.000077	3.35	-70.848300	Y 377.433
Fe (238.204 nm)	0.966645	ppm	0.000517	0.05	3657.599692	Y_R 377.433
Fe H (259.940 nm)	0.827701 nu	ppm	0.002236	0.27	1943.070000	Y_R 377.433
K (766.491 nm)	0.418213	ppm	0.000392	0.09	-229.519000	Y_R2 488.368
Li (670.783 nm)	0.005525	ppm	0.000645	11.67	-970.257000	Y_R2 488.368
Mg (279.078 nm)	2.626610	ppm	0.005781	0.22	16073.500000	Y 377.433
Mn (257.610 nm)	0.693506	ppm	0.000653	0.09	188243.000000	Y 377.433
Mo (202.032 nm)	-0.000112 u	ppm	0.000055	49.19	-1.665700	Y 377.433
Na (589.592 nm)	1.230440	ppm	0.006074	0.49	8932.520000	Y_R2 488.368
Na H (589.593 nm)	1.467192 u	ppm	0.033898	2.31	10036.953815	Y_R 488.368
Ni (231.604 nm)	0.001498	ppm	0.000035	2.32	13.455900	Y 377.433
P (213.618 nm)	0.002358	ppm	0.001258	53.37	27.269600	Y 242.219
Pb (220.353 nm)	0.001335	ppm	0.000661	49.52	7.894110	Y 242.219
S (181.972 nm)	0.394187	ppm	0.002588	0.66	248.425878	Y 377.433
Sb (206.834 nm)	-0.003025 u	ppm	0.001545	51.07	-26.310600	Y 377.433
Se (196.026 nm)	-0.000750 u	ppm	0.004037	> 100.00	13.743800	Y 242.219
Si (288.158 nm)	0.276706	ppm	0.001647	0.60	3358.750000	Y 377.433
Sn (189.925 nm)	0.002180	ppm	0.000535	24.53	12.133300	Y 377.433
Sr (421.552 nm)	1.390813 o	ppm	0.009664	0.69	301352.443960	Y_R 488.368
Th (288.505 nm)	-0.001930 u	ppm	0.001817	94.14	81.963800	Y 377.433
Ti (336.122 nm)	-0.000282 u	ppm	0.000020	7.24	833.271000	Y 377.433
Tl (190.794 nm)	0.000882	ppm	0.000094	10.62	-3.558440	Y 377.433
U (409.013 nm)	-0.004237 u	ppm	0.000504	11.89	-180.501000	Y 377.433
V (292.401 nm)	0.000677	ppm	0.000086	12.63	49.784400	Y 377.433
Zn (206.200 nm)	0.190069	ppm	0.000586	0.31	1108.900000	Y 377.433
Zr (343.823 nm)	0.000069	ppm	0.000030	42.99	0.175287	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.020292	20855.052709	0.000281	0.03
Y 377.433	1.039647	1144082.413675	0.000093	0.01
Y_R 377.433	1.068080	82343.300000	0.002540	0.24
Y_R 488.368	1.079570	47177.800000	0.006321	0.59
Y_R2 488.368	1.104954	95840.923807	0.003860	0.35

Sample Name: 280-112151-A-2-Bsd@5

Date: 7/26/2018 4:17:26 PM Rack:Tube: 1:51

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000088 u	ppm	0.000017	19.47	-418.510000	Y 377.433
Al (167.019 nm)	0.000748	ppm	0.001003	> 100.00	0.263546	Y_R 377.433
Al H (396.152 nm)	-0.035482 u	ppm	0.001902	5.36	93.302265	Y_R 377.433
As (188.980 nm)	0.001402	ppm	0.000249	17.77	-1.724150	Y 242.219
B (249.678 nm)	0.001950	ppm	0.000483	24.76	117.641000	Y 242.219
Ba (493.408 nm)	0.013410	ppm	0.000444	3.31	2136.800000	Y_R 488.368
Be (234.861 nm)	0.000027	ppm	0.000003	10.91	-34.609700	Y_R 488.368
Bi (223.061 nm)	0.000126 u	ppm	0.000535	> 100.00	14.971000	Y 377.433
Ca (315.887 nm)	64.449462 o	ppm	1.300643	2.02	53177.816743	Y_R 377.433
Cd (214.439 nm)	0.000218	ppm	0.000045	20.57	11.460200	Y 377.433
Co (228.615 nm)	0.000684	ppm	0.000194	28.36	-22.142200	Y 242.219
Cr (205.560 nm)	-0.000080 u	ppm	0.000143	> 100.00	-0.488193	Y 377.433
Cu (324.754 nm)	-0.000462 u	ppm	0.000002	0.35	244.483000	Y 377.433
Fe (238.204 nm)	0.182454	ppm	0.006062	3.32	703.695685	Y_R 377.433
Fe H (259.940 nm)	0.022521 nu	ppm	0.008275	36.74	366.362000	Y_R 377.433
K (766.491 nm)	0.163788	ppm	0.049437	30.18	-538.008000	Y_R2 488.368
Li (670.783 nm)	0.003912	ppm	0.001552	39.66	-1027.100000	Y_R2 488.368
Mg (279.078 nm)	0.550899	ppm	0.021510	3.90	3408.270000	Y 377.433
Mn (257.610 nm)	0.145115	ppm	0.006066	4.18	39430.700000	Y 377.433
Mo (202.032 nm)	0.000235	ppm	0.000120	50.89	1.795010	Y 377.433
Na (589.592 nm)	0.242459	ppm	0.007769	3.20	1956.800000	Y_R2 488.368
Na H (589.593 nm)	0.196973 u	ppm	0.032352	16.42	4970.389861	Y_R 488.368
Ni (231.604 nm)	-0.000683 u	ppm	0.000131	19.16	-3.533310	Y 377.433
P (213.618 nm)	0.000305 u	ppm	0.001859	> 100.00	22.078900	Y 242.219
Pb (220.353 nm)	0.000257	ppm	0.000105	40.71	4.433720	Y 242.219
S (181.972 nm)	0.079273	ppm	0.002824	3.56	69.031232	Y 377.433
Sb (206.834 nm)	-0.002851 u	ppm	0.001846	64.74	-25.581600	Y 377.433
Se (196.026 nm)	-0.001645 u	ppm	0.001430	86.91	12.431900	Y 242.219
Si (288.158 nm)	0.052387	ppm	0.003240	6.19	1321.030000	Y 377.433
Sn (189.925 nm)	0.001042	ppm	0.000177	16.93	9.471260	Y 377.433
Sr (421.552 nm)	0.262525	ppm	0.006337	2.41	56997.071241	Y_R 488.368
Th (288.505 nm)	-0.001912 u	ppm	0.002159	> 100.00	70.234600	Y 377.433
Ti (336.122 nm)	0.000316	ppm	0.000117	37.03	44.637000	Y 377.433
Tl (190.794 nm)	0.000777 u	ppm	0.002065	> 100.00	-3.806280	Y 377.433
U (409.013 nm)	-0.001486 u	ppm	0.002550	> 100.00	-111.865000	Y 377.433
V (292.401 nm)	-0.000070 u	ppm	0.000031	44.17	17.520400	Y 377.433
Zn (206.200 nm)	0.037050	ppm	0.001365	3.69	229.946000	Y 377.433
Zr (343.823 nm)	0.000134	ppm	0.000110	81.83	6.708110	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.058233	21630.581614	0.003293	0.31
Y 377.433	1.071818	1179485.031726	0.004152	0.39
Y_R 377.433	1.090770	84092.700000	0.001628	0.15
Y_R 488.368	1.099790	48061.400000	0.007454	0.68
Y_R2 488.368	1.124061	97498.185234	0.001388	0.12

Sample Name: 280-112151-A-2-C MS

Date: 7/26/2018 4:20:49 PM
Rack:Tube: 1:52

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.180541	ppm	0.000193	0.11	8671.350000	Y 377.433
Al (167.019 nm)	0.336060	ppm	0.008305	2.47	167.564000	Y_R 377.433
Al H (396.152 nm)	0.364534 u	ppm	0.005203	1.43	1236.185785	Y_R 377.433
As (188.980 nm)	0.682395	ppm	0.002733	0.40	963.473000	Y 242.219
B (249.678 nm)	0.175184	ppm	0.000490	0.28	4923.280000	Y 242.219
Ba (493.408 nm)	2.105150 o	ppm	0.012443	0.59	251835.000000	Y_R 488.368
Be (234.861 nm)	0.007893	ppm	0.000099	1.26	2534.650000	Y_R 488.368
Bi (223.061 nm)	0.329950	ppm	0.001469	0.45	940.081000	Y 377.433
Ca (315.887 nm)	347.040190 o	ppm	1.544348	0.45	286678.209961	Y_R 377.433
Cd (214.439 nm)	0.175016	ppm	0.000894	0.51	11559.300000	Y 377.433
Co (228.615 nm)	0.082591	ppm	0.000036	0.04	1685.290000	Y 242.219
Cr (205.560 nm)	0.836011	ppm	0.005024	0.60	14144.500000	Y 377.433
Cu (324.754 nm)	0.370187	ppm	0.002470	0.67	24156.800000	Y 377.433
Fe (238.204 nm)	1.121059	ppm	0.004034	0.36	4239.250258	Y_R 377.433
Fe H (259.940 nm)	0.984590 nu	ppm	0.008930	0.91	2250.290000	Y_R 377.433
K (766.491 nm)	9.375390	ppm	0.004199	0.04	10631.000000	Y_R2 488.368
Li (670.783 nm)	0.177947	ppm	0.000976	0.55	5106.570000	Y_R2 488.368
Mg (279.078 nm)	10.433300	ppm	0.022211	0.21	63703.500000	Y 377.433
Mn (257.610 nm)	0.771433	ppm	0.001444	0.19	209389.000000	Y 377.433
Mo (202.032 nm)	0.160243	ppm	0.000241	0.15	1598.360000	Y 377.433
Na (589.592 nm)	9.904210	ppm	0.048455	0.49	73350.300000	Y_R2 488.368
Na H (589.593 nm)	10.518326	ppm	0.034844	0.33	47752.462294	Y_R 488.368
Ni (231.604 nm)	0.079488	ppm	0.000197	0.25	620.253000	Y 377.433
P (213.618 nm)	1.640020	ppm	0.000969	0.06	4167.570000	Y 242.219
Pb (220.353 nm)	0.938910	ppm	0.001197	0.13	2987.780000	Y 242.219
S (181.972 nm)	0.732338	ppm	0.001180	0.16	439.699890	Y 377.433
Sb (206.834 nm)	0.083397	ppm	0.000195	0.23	262.033000	Y 377.433
Se (196.026 nm)	0.497935	ppm	0.002801	0.56	566.144000	Y 242.219
Si (288.158 nm)	1.959940	ppm	0.008130	0.41	18649.200000	Y 377.433
Sn (189.925 nm)	0.317903	ppm	0.002020	0.64	750.889000	Y 377.433
Sr (421.552 nm)	1.558243 o	ppm	0.007077	0.45	337613.255312	Y_R 488.368
Th (288.505 nm)	0.172193	ppm	0.001990	1.16	576.952000	Y 377.433
Ti (336.122 nm)	0.167215	ppm	0.000376	0.23	25015.900000	Y 377.433
Tl (190.794 nm)	0.334869	ppm	0.001662	0.50	845.590000	Y 377.433
U (409.013 nm)	0.347433	ppm	0.000727	0.21	1514.740000	Y 377.433
V (292.401 nm)	0.082883	ppm	0.000026	0.03	3342.230000	Y 377.433
Zn (206.200 nm)	0.578053	ppm	0.001768	0.31	3337.520000	Y 377.433
Zr (343.823 nm)	0.083029	ppm	0.000320	0.39	11291.200000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.016735	20782.354153	0.001464	0.14
Y 377.433	1.038205	1142495.849551	0.002040	0.20
Y_R 377.433	1.063220	81968.600000	0.011173	1.05
Y_R 488.368	1.076820	47057.500000	0.011323	1.05
Y_R2 488.368	1.095146	94990.144257	0.001417	0.13

Sample Name: 280-112151-A-2-D MSD

Date: 7/26/2018 4:24:12 PM
Rack:Tube: 1:53

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.192470	ppm	0.000654	0.34	9271.620000	Y 377.433
Al (167.019 nm)	0.355243	ppm	0.002789	0.79	177.162000	Y_R 377.433
Al H (396.152 nm)	0.382846 u	ppm	0.001663	0.43	1292.005093	Y_R 377.433
As (188.980 nm)	0.725783	ppm	0.002729	0.38	1024.970000	Y 242.219
B (249.678 nm)	0.186395	ppm	0.000007	0.00	5234.230000	Y 242.219
Ba (493.408 nm)	2.252840 o	ppm	0.016210	0.72	269466.000000	Y_R 488.368
Be (234.861 nm)	0.008328	ppm	0.000070	0.84	2678.380000	Y_R 488.368
Bi (223.061 nm)	0.351871	ppm	0.003026	0.86	1001.570000	Y 377.433
Ca (315.887 nm)	367.453074 o	ppm	1.556886	0.42	303545.063195	Y_R 377.433
Cd (214.439 nm)	0.187299	ppm	0.001094	0.58	12370.700000	Y 377.433
Co (228.615 nm)	0.087401	ppm	0.000461	0.53	1785.600000	Y 242.219
Cr (205.560 nm)	0.893188	ppm	0.000450	0.05	15111.800000	Y 377.433
Cu (324.754 nm)	0.393751	ppm	0.002289	0.58	25675.200000	Y 377.433
Fe (238.204 nm)	1.217985	ppm	0.002509	0.21	4604.351404	Y_R 377.433
Fe H (259.940 nm)	1.089930 nu	ppm	0.000310	0.03	2456.560000	Y_R 377.433
K (766.491 nm)	9.964810	ppm	0.052775	0.53	11345.600000	Y_R2 488.368
Li (670.783 nm)	0.189373	ppm	0.000701	0.37	5509.280000	Y_R2 488.368
Mg (279.078 nm)	11.131300	ppm	0.035293	0.32	67962.200000	Y 377.433
Mn (257.610 nm)	0.820380	ppm	0.002986	0.36	222672.000000	Y 377.433
Mo (202.032 nm)	0.170622	ppm	0.000097	0.06	1701.920000	Y 377.433
Na (589.592 nm)	10.489900	ppm	0.032754	0.31	77722.800000	Y_R2 488.368
Na H (589.593 nm)	11.244609	ppm	0.061101	0.54	50763.410081	Y_R 488.368
Ni (231.604 nm)	0.084904	ppm	0.000823	0.97	662.396000	Y 377.433
P (213.618 nm)	1.744010	ppm	0.005905	0.34	4430.470000	Y 242.219
Pb (220.353 nm)	0.996097	ppm	0.004896	0.49	3169.550000	Y 242.219
S (181.972 nm)	0.778068	ppm	0.005291	0.68	465.668102	Y 377.433
Sb (206.834 nm)	0.088152	ppm	0.001335	1.51	278.231000	Y 377.433
Se (196.026 nm)	0.530792	ppm	0.005394	1.02	602.561000	Y 242.219
Si (288.158 nm)	2.098580	ppm	0.001570	0.07	19908.600000	Y 377.433
Sn (189.925 nm)	0.336462	ppm	0.000334	0.10	794.317000	Y 377.433
Sr (421.552 nm)	1.667843 o	ppm	0.012480	0.75	361349.417840	Y_R 488.368
Th (288.505 nm)	0.183317	ppm	0.001696	0.93	609.562000	Y 377.433
Ti (336.122 nm)	0.178276	ppm	0.000575	0.32	26676.200000	Y 377.433
Tl (190.794 nm)	0.356274	ppm	0.000147	0.04	900.009000	Y 377.433
U (409.013 nm)	0.371525	ppm	0.001375	0.37	1626.930000	Y 377.433
V (292.401 nm)	0.087823	ppm	0.000533	0.61	3537.950000	Y 377.433
Zn (206.200 nm)	0.616411	ppm	0.003945	0.64	3557.850000	Y 377.433
Zr (343.823 nm)	0.088268	ppm	0.000211	0.24	12004.400000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.010452	20653.926296	0.000961	0.10
Y 377.433	1.029282	1132676.025017	0.001635	0.16
Y_R 377.433	1.076890	83022.400000	0.002408	0.22
Y_R 488.368	1.084340	47385.900000	0.006598	0.61
Y_R2 488.368	1.107812	96088.774063	0.002101	0.19

Sample Name: 280-112151-A-2-Bpds

Date: 7/26/2018 4:27:34 PM Rack:Tube: 1:54

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.049640	ppm	0.000190	0.38	2075.240000	Y 377.433
Al (167.019 nm)	0.946273	ppm	0.003898	0.41	471.474000	Y_R 377.433
Al H (396.152 nm)	1.016911	ppm	0.008960	0.88	2870.652815	Y_R 377.433
As (188.980 nm)	0.198553	ppm	0.000290	0.15	277.690000	Y 242.219
B (249.678 nm)	0.108277	ppm	0.000615	0.57	3065.130000	Y 242.219
Ba (493.408 nm)	0.170512	ppm	0.000338	0.20	20956.600000	Y_R 488.368
Be (234.861 nm)	0.046134	ppm	0.000108	0.24	14951.000000	Y_R 488.368
Bi (223.061 nm)	-0.003378 u	ppm	0.001316	38.97	5.466500	Y 377.433
Ca (315.887 nm)	351.494634 o	ppm	1.971535	0.56	290358.772507	Y_R 377.433
Cd (214.439 nm)	0.046493	ppm	0.000178	0.38	3070.200000	Y 377.433
Co (228.615 nm)	0.047927	ppm	0.000066	0.14	960.788000	Y 242.219
Cr (205.560 nm)	0.046549	ppm	0.000103	0.22	787.355000	Y 377.433
Cu (324.754 nm)	0.045981	ppm	0.000039	0.08	3065.210000	Y 377.433
Fe (238.204 nm)	1.919787	ppm	0.007066	0.37	7247.915768	Y_R 377.433
Fe H (259.940 nm)	1.811630 nu	ppm	0.007125	0.39	3869.800000	Y_R 377.433
K (766.491 nm)	20.672800	ppm	0.000691	0.00	24328.900000	Y_R2 488.368
Li (670.783 nm)	0.103756	ppm	0.001277	1.23	2491.780000	Y_R2 488.368
Mg (279.078 nm)	20.542800	ppm	0.069588	0.34	125389.000000	Y 377.433
Mn (257.610 nm)	0.729140	ppm	0.001806	0.25	197912.000000	Y 377.433
Mo (202.032 nm)	0.046535	ppm	0.000286	0.62	463.781000	Y 377.433
Na (589.592 nm)	21.039700 o	ppm	0.031016	0.15	146431.000000	Y_R2 488.368
Na H (589.593 nm)	22.449879	ppm	0.174288	0.78	92819.777115	Y_R 488.368
Ni (231.604 nm)	0.045802	ppm	0.000640	1.40	358.208000	Y 377.433
P (213.618 nm)	1.892710	ppm	0.003905	0.21	4806.410000	Y 242.219
Pb (220.353 nm)	0.098465	ppm	0.000640	0.65	317.544000	Y 242.219
S (181.972 nm)	0.398551	ppm	0.000935	0.23	250.985173	Y 377.433
Sb (206.834 nm)	0.096804	ppm	0.001589	1.64	275.334000	Y 377.433
Se (196.026 nm)	0.192586	ppm	0.001554	0.81	227.724000	Y 242.219
Si (288.158 nm)	5.209410	ppm	0.004265	0.08	48167.400000	Y 377.433
Sn (189.925 nm)	0.093674	ppm	0.000795	0.85	226.218000	Y 377.433
Sr (421.552 nm)	1.429569 o	ppm	0.009482	0.66	309745.907341	Y_R 488.368
Th (288.505 nm)	0.197087	ppm	0.001901	0.96	646.216000	Y 377.433
Ti (336.122 nm)	0.049239	ppm	0.000121	0.25	8015.620000	Y 377.433
Tl (190.794 nm)	0.193436	ppm	0.001567	0.81	486.340000	Y 377.433
U (409.013 nm)	0.510171	ppm	0.006238	1.22	2305.700000	Y 377.433
V (292.401 nm)	0.048525	ppm	0.000145	0.30	2084.170000	Y 377.433
Zn (206.200 nm)	0.369490	ppm	0.002722	0.74	2139.510000	Y 377.433
Zr (343.823 nm)	0.049171	ppm	0.000167	0.34	6685.640000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.014198	20730.480964	0.001279	0.13
Y 377.433	1.033516	1137335.194546	0.003034	0.29
Y_R 377.433	1.070200	82506.600000	0.001311	0.12
Y_R 488.368	1.074240	46944.900000	0.002456	0.23
Y_R2 488.368	1.096545	95111.561088	0.013019	1.19

Sample Name: CCVH-5225153

Date: 7/26/2018 4:30:58 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001193 u	ppm	0.000141	11.83	-734.366000	Y 377.433
Al (167.019 nm)	45.136900 o	ppm	0.306220	0.68	22473.200000	Y_R 377.433
Al H (396.152 nm)	49.063101	ppm	0.255003	0.52	123610.188616	Y_R 377.433
As (188.980 nm)	0.000132 u	ppm	0.000462	> 100.00	-4.008290	Y 242.219
B (249.678 nm)	-0.000752 u	ppm	0.000020	2.63	-38.536300	Y 242.219
Ba (493.408 nm)	0.000097	ppm	0.000023	23.75	579.214000	Y_R 488.368
Be (234.861 nm)	0.000066	ppm	0.000015	22.60	1627.900000	Y_R 488.368
Bi (223.061 nm)	0.961955	ppm	0.006067	0.63	2721.160000	Y 377.433
Ca (315.887 nm)	0.038205	ppm	0.000727	1.90	-44.195283	Y_R 377.433
Cd (214.439 nm)	-0.000120 u	ppm	0.000057	47.57	40.772100	Y 377.433
Co (228.615 nm)	0.000917	ppm	0.000278	30.35	-17.268600	Y 242.219
Cr (205.560 nm)	-0.000005 u	ppm	0.000166	> 100.00	-14.096700	Y 377.433
Cu (324.754 nm)	-0.006156 u	ppm	0.000065	1.05	290.284000	Y 377.433
Fe (238.204 nm)	48.290796 o	ppm	0.290409	0.60	181919.150718	Y_R 377.433
Fe H (259.940 nm)	49.100500	ppm	0.252856	0.51	96471.100000	Y_R 377.433
K (766.491 nm)	0.113636	ppm	0.040995	36.08	-598.817000	Y_R2 488.368
Li (670.783 nm)	0.003572	ppm	0.000183	5.12	-1039.120000	Y_R2 488.368
Mg (279.078 nm)	-0.008760 u	ppm	0.003108	35.48	-371.360000	Y 377.433
Mn (257.610 nm)	0.001546	ppm	0.000088	5.71	471.553000	Y 377.433
Mo (202.032 nm)	-0.000014 u	ppm	0.000048	> 100.00	-0.693152	Y 377.433
Na (589.592 nm)	228.721000 o	ppm	0.334726	0.15	1585450.000000	Y_R2 488.368
Na H (589.593 nm)	244.938809	ppm	3.252369	1.33	969393.451057	Y_R 488.368
Ni (231.604 nm)	0.001658	ppm	0.000398	24.01	16.938100	Y 377.433
P (213.618 nm)	-0.001621 u	ppm	0.000326	20.08	17.209700	Y 242.219
Pb (220.353 nm)	-0.003453 u	ppm	0.000452	13.08	10.658900	Y 242.219
S (181.972 nm)	4.800379	ppm	0.005173	0.11	2736.265901	Y 377.433
Sb (206.834 nm)	-0.002336 u	ppm	0.001073	45.93	-71.264400	Y 377.433
Se (196.026 nm)	-0.001513 u	ppm	0.004697	> 100.00	2.709840	Y 242.219
Si (288.158 nm)	0.020854	ppm	0.000775	3.72	1034.590000	Y 377.433
Sn (189.925 nm)	0.003009	ppm	0.000636	21.12	14.073300	Y 377.433
Sr (421.552 nm)	0.000516	ppm	0.000024	4.74	253.179806	Y_R 488.368
Th (288.505 nm)	4.883910	ppm	0.018988	0.39	13848.300000	Y 377.433
Ti (336.122 nm)	0.001612	ppm	0.000015	0.91	26.725500	Y 377.433
Tl (190.794 nm)	-0.003039 u	ppm	0.000342	11.27	-15.010600	Y 377.433
U (409.013 nm)	9.932560	ppm	0.022007	0.22	48070.300000	Y 377.433
V (292.401 nm)	0.003261	ppm	0.000134	4.09	-30.554700	Y 377.433
Zn (206.200 nm)	-0.002487 u	ppm	0.000219	8.79	2.840080	Y 377.433
Zr (343.823 nm)	-0.003921 u	ppm	0.000069	1.77	-398.879000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.042662	21312.292420	0.003539	0.34
Y 377.433	1.043286	1148086.993486	0.004388	0.42
Y_R 377.433	1.077640	83079.900000	0.001037	0.10
Y_R 488.368	1.085920	47455.100000	0.007161	0.66
Y_R2 488.368	1.117236	96906.232619	0.005792	0.52

Sample Name: CCV-5225154

Date: 7/26/2018 4:34:21 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.474066	ppm	0.000562	0.12	23479.000000	Y 377.433
Al (167.019 nm)	0.515273	ppm	0.010747	2.09	257.504000	Y_R 377.433
Al H (396.152 nm)	0.483650 u	ppm	0.006277	1.30	1411.878949	Y_R 377.433
As (188.980 nm)	0.959656	ppm	0.001290	0.13	1356.440000	Y 242.219
B (249.678 nm)	0.477540	ppm	0.000106	0.02	13324.200000	Y 242.219
Ba (493.408 nm)	0.489664	ppm	0.003150	0.64	58971.100000	Y_R 488.368
Be (234.861 nm)	0.466571	ppm	0.003338	0.72	151077.000000	Y_R 488.368
Bi (223.061 nm)	-0.003621 u	ppm	0.001118	30.86	4.889010	Y 377.433
Ca (315.887 nm)	4.902677	ppm	0.021123	0.43	3975.518778	Y_R 377.433
Cd (214.439 nm)	0.476278	ppm	0.000986	0.21	31461.700000	Y 377.433
Co (228.615 nm)	0.489272	ppm	0.003260	0.67	10143.800000	Y 242.219
Cr (205.560 nm)	0.475857	ppm	0.000595	0.13	8045.610000	Y 377.433
Cu (324.754 nm)	0.474920	ppm	0.000631	0.13	31205.100000	Y 377.433
Fe (238.204 nm)	2.485296	ppm	0.012388	0.50	9378.085761	Y_R 377.433
Fe H (259.940 nm)	2.380330 u	ppm	0.013966	0.59	4983.420000	Y_R 377.433
K (766.491 nm)	48.171800	ppm	0.090191	0.19	57671.300000	Y_R2 488.368
Li (670.783 nm)	0.961024	ppm	0.002137	0.22	32705.400000	Y_R2 488.368
Mg (279.078 nm)	18.761000	ppm	0.046180	0.25	114528.000000	Y 377.433
Mn (257.610 nm)	0.482111	ppm	0.000958	0.20	130878.000000	Y 377.433
Mo (202.032 nm)	0.483154	ppm	0.000352	0.07	4820.360000	Y 377.433
Na (589.592 nm)	4.925060	ppm	0.042740	0.87	35419.500000	Y_R2 488.368
Na H (589.593 nm)	5.343889 u	ppm	0.072423	1.36	25732.830107	Y_R 488.368
Ni (231.604 nm)	0.477493	ppm	0.002678	0.56	3715.520000	Y 377.433
P (213.618 nm)	0.936670	ppm	0.002501	0.27	2389.380000	Y 242.219
Pb (220.353 nm)	0.973297	ppm	0.000888	0.09	3094.630000	Y 242.219
S (181.972 nm)	0.006379	ppm	0.000011	0.17	28.735915	Y 377.433
Sb (206.834 nm)	0.965391	ppm	0.001733	0.18	2917.870000	Y 377.433
Se (196.026 nm)	0.952250	ppm	0.002348	0.25	1068.850000	Y 242.219
Si (288.158 nm)	4.856240	ppm	0.005672	0.12	44959.200000	Y 377.433
Sn (189.925 nm)	0.949100	ppm	0.001478	0.16	2227.820000	Y 377.433
Sr (421.552 nm)	0.487539	ppm	0.002808	0.58	105728.788202	Y_R 488.368
Th (288.505 nm)	0.004487	ppm	0.001301	29.00	101.585000	Y 377.433
Ti (336.122 nm)	0.490877	ppm	0.001142	0.23	70603.700000	Y 377.433
Tl (190.794 nm)	0.976917	ppm	0.002318	0.24	2478.970000	Y 377.433
U (409.013 nm)	0.006203	ppm	0.004025	64.88	-99.949200	Y 377.433
V (292.401 nm)	0.480886	ppm	0.001047	0.22	20597.900000	Y 377.433
Zn (206.200 nm)	0.474481	ppm	0.000126	0.03	2742.590000	Y 377.433
Zr (343.823 nm)	0.486112	ppm	0.000344	0.07	66153.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.063175	21731.586992	0.001155	0.11
Y 377.433	1.069195	1176599.099457	0.002555	0.24
Y_R 377.433	1.090370	84061.500000	0.007415	0.68
Y_R 488.368	1.099950	48068.500000	0.009700	0.88
Y_R2 488.368	1.123189	97422.557376	0.007449	0.66

Sample Name: CCB

Date: 7/26/2018 4:37:44 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000065 u	ppm	0.000279	> 100.00	-410.874000	Y 377.433
Al (167.019 nm)	0.000567 u	ppm	0.006758	> 100.00	0.063037	Y_R 377.433
Al H (396.152 nm)	-0.052764 u	ppm	0.002542	4.82	21.676519	Y_R 377.433
As (188.980 nm)	0.002885	ppm	0.001422	49.30	0.380856	Y 242.219
B (249.678 nm)	0.000705	ppm	0.000229	32.54	83.415700	Y 242.219
Ba (493.408 nm)	-0.000431 u	ppm	0.000114	26.39	469.371000	Y_R 488.368
Be (234.861 nm)	0.000046	ppm	0.000008	17.20	-34.718900	Y_R 488.368
Bi (223.061 nm)	0.000344	ppm	0.000125	36.29	15.547800	Y 377.433
Ca (315.887 nm)	0.008749	ppm	0.005089	58.17	-68.534568	Y_R 377.433
Cd (214.439 nm)	0.000052	ppm	0.000034	64.75	0.337454	Y 377.433
Co (228.615 nm)	0.000236	ppm	0.000173	73.53	-31.446100	Y 242.219
Cr (205.560 nm)	0.000071	ppm	0.000093	> 100.00	2.129430	Y 377.433
Cu (324.754 nm)	0.000124	ppm	0.000091	73.06	327.718000	Y 377.433
Fe (238.204 nm)	-0.000479 u	ppm	0.001081	> 100.00	14.618798	Y_R 377.433
Fe H (259.940 nm)	-0.160703 u	ppm	0.001507	0.94	7.571340	Y_R 377.433
K (766.491 nm)	0.082065	ppm	0.011230	13.68	-637.096000	Y_R2 488.368
Li (670.783 nm)	0.002662	ppm	0.000861	32.35	-1071.160000	Y_R2 488.368
Mg (279.078 nm)	0.000166 u	ppm	0.000868	> 100.00	47.802300	Y 377.433
Mn (257.610 nm)	-0.000021 u	ppm	0.000009	42.82	46.490500	Y 377.433
Mo (202.032 nm)	0.000260	ppm	0.000150	57.75	2.043190	Y 377.433
Na (589.592 nm)	0.011828	ppm	0.008153	68.93	328.196000	Y_R2 488.368
Na H (589.593 nm)	-0.148435 u	ppm	0.033787	22.76	3594.905156	Y_R 488.368
Ni (231.604 nm)	-0.000304 u	ppm	0.000398	> 100.00	-0.596297	Y 377.433
P (213.618 nm)	-0.000702 u	ppm	0.000759	> 100.00	19.532700	Y 242.219
Pb (220.353 nm)	0.000184 u	ppm	0.000986	> 100.00	4.198640	Y 242.219
S (181.972 nm)	0.003196	ppm	0.000249	7.79	25.659976	Y 377.433
Sb (206.834 nm)	0.000223	ppm	0.000145	65.19	-16.222300	Y 377.433
Se (196.026 nm)	-0.001088 u	ppm	0.000367	33.68	12.958400	Y 242.219
Si (288.158 nm)	-0.005797 u	ppm	0.000244	4.22	792.491000	Y 377.433
Sn (189.925 nm)	0.000376	ppm	0.000384	> 100.00	7.912520	Y 377.433
Sr (421.552 nm)	0.000025 u	ppm	0.000059	> 100.00	146.910621	Y_R 488.368
Th (288.505 nm)	0.002002	ppm	0.000497	24.81	78.022700	Y 377.433
Ti (336.122 nm)	0.000374	ppm	0.000011	2.85	-152.004000	Y 377.433
Tl (190.794 nm)	0.001202	ppm	0.001589	> 100.00	-2.719710	Y 377.433
U (409.013 nm)	0.002677	ppm	0.000710	26.51	-78.709900	Y 377.433
V (292.401 nm)	-0.000243 u	ppm	0.000058	23.86	9.602000	Y 377.433
Zn (206.200 nm)	-0.002634 u	ppm	0.000028	1.05	1.995840	Y 377.433
Zr (343.823 nm)	0.000003 u	ppm	0.000044	> 100.00	-11.695800	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.070529	21881.912712	0.001600	0.15
Y 377.433	1.080171	1188677.115438	0.000170	0.02
Y_R 377.433	1.085920	83718.400000	0.009792	0.90
Y_R 488.368	1.104870	48283.200000	0.026833	2.43
Y_R2 488.368	1.119448	97098.055564	0.001962	0.18

Sample Name: CCVL-5236949

Date: 7/26/2018 4:41:07 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.008805	ppm	0.000186	2.11	29.509000	Y 377.433
Al (167.019 nm)	0.098029	ppm	0.001945	1.98	48.585800	Y_R 377.433
Al H (396.152 nm)	0.048423 u	ppm	0.002183	4.51	277.728736	Y_R 377.433
As (188.980 nm)	0.014183	ppm	0.000767	5.41	16.392000	Y 242.219
B (249.678 nm)	0.092615	ppm	0.000154	0.17	2632.120000	Y 242.219
Ba (493.408 nm)	0.009047	ppm	0.000183	2.02	1600.590000	Y_R 488.368
Be (234.861 nm)	0.000956	ppm	0.000018	1.91	262.883000	Y_R 488.368
Bi (223.061 nm)	0.096933	ppm	0.000036	0.04	286.434000	Y 377.433
Ca (315.887 nm)	0.208650	ppm	0.003965	1.90	96.643181	Y_R 377.433
Cd (214.439 nm)	0.004780	ppm	0.000035	0.74	312.737000	Y 377.433
Co (228.615 nm)	0.010071	ppm	0.000085	0.84	173.149000	Y 242.219
Cr (205.560 nm)	0.009257	ppm	0.000167	1.80	157.462000	Y 377.433
Cu (324.754 nm)	0.013877	ppm	0.000092	0.66	1219.970000	Y 377.433
Fe (238.204 nm)	0.099483	ppm	0.000966	0.97	391.158667	Y_R 377.433
Fe H (259.940 nm)	-0.060124 u	ppm	0.001092	1.82	204.525000	Y_R 377.433
K (766.491 nm)	2.996460	ppm	0.005170	0.17	2896.580000	Y_R2 488.368
Li (670.783 nm)	0.021276	ppm	0.000193	0.91	-415.160000	Y_R2 488.368
Mg (279.078 nm)	0.183717	ppm	0.000754	0.41	1166.380000	Y 377.433
Mn (257.610 nm)	0.009729	ppm	0.000019	0.20	2692.270000	Y 377.433
Mo (202.032 nm)	0.017299	ppm	0.000076	0.44	172.059000	Y 377.433
Na (589.592 nm)	1.003150	ppm	0.001566	0.16	7218.890000	Y_R2 488.368
Na H (589.593 nm)	0.810285 u	ppm	0.041819	5.16	7382.448187	Y_R 488.368
Ni (231.604 nm)	0.037667	ppm	0.000570	1.51	294.631000	Y 377.433
P (213.618 nm)	2.606430 o	ppm	0.017365	0.67	6610.830000	Y 242.219
Pb (220.353 nm)	0.009742	ppm	0.001571	16.12	34.610600	Y 242.219
S (181.972 nm)	0.090923	ppm	0.005272	5.80	75.254950	Y 377.433
Sb (206.834 nm)	0.018905	ppm	0.000280	1.48	40.399800	Y 377.433
Se (196.026 nm)	0.016627	ppm	0.000019	0.11	32.569900	Y 242.219
Si (288.158 nm)	0.461924	ppm	0.002056	0.45	5041.270000	Y 377.433
Sn (189.925 nm)	0.092229	ppm	0.000668	0.72	222.839000	Y 377.433
Sr (421.552 nm)	0.009554	ppm	0.000084	0.87	2210.527497	Y_R 488.368
Th (288.505 nm)	0.017440	ppm	0.000740	4.24	122.478000	Y 377.433
Ti (336.122 nm)	0.009924	ppm	0.000028	0.29	1225.760000	Y 377.433
Tl (190.794 nm)	0.015033	ppm	0.000347	2.31	32.427600	Y 377.433
U (409.013 nm)	0.060433	ppm	0.000487	0.81	199.975000	Y 377.433
V (292.401 nm)	0.009209	ppm	0.000057	0.62	411.376000	Y 377.433
Zn (206.200 nm)	0.016383	ppm	0.000431	2.63	111.230000	Y 377.433
Zr (343.823 nm)	0.014293	ppm	0.000056	0.39	1933.320000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.085874	22195.571971	0.000238	0.02
Y 377.433	1.095151	1205162.117103	0.000192	0.02
Y_R 377.433	1.097370	84601.100000	0.005816	0.53
Y_R 488.368	1.113810	48673.900000	0.007666	0.69
Y_R2 488.368	1.128514	97884.439918	0.003327	0.29

Sample Name: MB 280-423578/1-A

Date: 7/26/2018 4:44:31 PM Rack:Tube: 1:55

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000186 u	ppm	0.000204	> 100.00	-423.488000	Y 377.433
Al (167.019 nm)	0.002144	ppm	0.002113	98.55	0.848887	Y_R 377.433
Al H (396.152 nm)	-0.053458 u	ppm	0.000279	0.52	19.904393	Y_R 377.433
As (188.980 nm)	0.000554	ppm	0.000155	28.02	-2.923890	Y 242.219
B (249.678 nm)	0.000624	ppm	0.000085	13.64	81.162800	Y 242.219
Ba (493.408 nm)	-0.000365 u	ppm	0.000109	29.96	477.322000	Y_R 488.368
Be (234.861 nm)	0.000015	ppm	0.000001	7.02	-44.661100	Y_R 488.368
Bi (223.061 nm)	-0.000047 u	ppm	0.000173	> 100.00	14.452000	Y 377.433
Ca (315.887 nm)	0.023394	ppm	0.008724	37.29	-56.433952	Y_R 377.433
Cd (214.439 nm)	0.000001 u	ppm	0.000018	> 100.00	-3.020470	Y 377.433
Co (228.615 nm)	0.000354	ppm	0.000036	10.23	-28.994900	Y 242.219
Cr (205.560 nm)	-0.000249 u	ppm	0.000061	24.54	-3.290010	Y 377.433
Cu (324.754 nm)	-0.000133 u	ppm	0.000098	73.67	311.172000	Y 377.433
Fe (238.204 nm)	0.003140	ppm	0.000373	11.86	28.249584	Y_R 377.433
Fe H (259.940 nm)	-0.158384 nu	ppm	0.000546	0.34	12.113400	Y_R 377.433
K (766.491 nm)	0.128348	ppm	0.091191	71.05	-580.979000	Y_R2 488.368
Li (670.783 nm)	0.004078	ppm	0.002029	49.76	-1021.270000	Y_R2 488.368
Mg (279.078 nm)	0.000168 u	ppm	0.000446	> 100.00	47.823100	Y 377.433
Mn (257.610 nm)	0.000097	ppm	0.000015	15.09	78.367900	Y 377.433
Mo (202.032 nm)	-0.000159 u	ppm	0.000061	38.70	-2.131810	Y 377.433
Na (589.592 nm)	0.029053	ppm	0.005508	18.96	448.422000	Y_R2 488.368
Na H (589.593 nm)	-0.265097 u	ppm	0.037828	14.27	3135.582569	Y_R 488.368
Ni (231.604 nm)	-0.000643 u	ppm	0.000077	11.96	-3.232890	Y 377.433
P (213.618 nm)	-0.000290 u	ppm	0.000033	11.30	20.575400	Y 242.219
Pb (220.353 nm)	-0.000120 u	ppm	0.001040	> 100.00	3.236390	Y 242.219
S (181.972 nm)	0.004875	ppm	0.001541	31.62	26.608991	Y 377.433
Sb (206.834 nm)	-0.001698 u	ppm	0.000361	21.24	-22.047500	Y 377.433
Se (196.026 nm)	0.000138 u	ppm	0.001313	> 100.00	14.315400	Y 242.219
Si (288.158 nm)	-0.004404 u	ppm	0.000166	3.77	805.148000	Y 377.433
Sn (189.925 nm)	0.000487	ppm	0.000010	1.96	8.172520	Y 377.433
Sr (421.552 nm)	-0.000037 u	ppm	0.000010	26.70	133.542079	Y_R 488.368
Th (288.505 nm)	0.000645	ppm	0.000257	39.84	74.247700	Y 377.433
Ti (336.122 nm)	0.000351	ppm	0.000038	10.92	-155.406000	Y 377.433
Tl (190.794 nm)	0.000741	ppm	0.000073	9.92	-3.891280	Y 377.433
U (409.013 nm)	0.001292	ppm	0.001577	> 100.00	-85.414800	Y 377.433
V (292.401 nm)	0.000079	ppm	0.000039	49.46	23.667300	Y 377.433
Zn (206.200 nm)	-0.001563 u	ppm	0.000103	6.60	8.146650	Y 377.433
Zr (343.823 nm)	0.000039	ppm	0.000003	6.48	-6.813200	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.083879	22154.794073	0.003621	0.33
Y 377.433	1.096630	1206789.807501	0.002821	0.26
Y_R 377.433	1.097370	84601.200000	0.004716	0.43
Y_R 488.368	1.100410	48088.500000	0.021604	1.96
Y_R2 488.368	1.148545	99621.834418	0.011721	1.02

Sample Name: LCS 280-423578/2-A

Date: 7/26/2018 4:47:53 PM Rack:Tube: 1:56

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.047672	ppm	0.000112	0.24	1962.330000	Y 377.433
Al (167.019 nm)	1.919040	ppm	0.018991	0.99	954.598000	Y_R 377.433
Al H (396.152 nm)	1.947466	ppm	0.012395	0.64	5150.125782	Y_R 377.433
As (188.980 nm)	0.952872	ppm	0.003965	0.42	1346.840000	Y 242.219
B (249.678 nm)	0.971189	ppm	0.002363	0.24	27012.900000	Y 242.219
Ba (493.408 nm)	1.930040 o	ppm	0.016726	0.87	230865.000000	Y_R 488.368
Be (234.861 nm)	0.045829	ppm	0.000495	1.08	14764.200000	Y_R 488.368
Bi (223.061 nm)	1.901040	ppm	0.009926	0.52	5345.910000	Y 377.433
Ca (315.887 nm)	46.936634 o	ppm	0.259804	0.55	38707.294810	Y_R 377.433
Cd (214.439 nm)	0.091869	ppm	0.000364	0.40	6067.030000	Y 377.433
Co (228.615 nm)	0.458314	ppm	0.001603	0.35	9520.380000	Y 242.219
Cr (205.560 nm)	0.186822	ppm	0.000681	0.36	3159.050000	Y 377.433
Cu (324.754 nm)	0.230794	ppm	0.000885	0.38	15355.600000	Y 377.433
Fe (238.204 nm)	0.954314	ppm	0.004056	0.42	3611.152094	Y_R 377.433
Fe H (259.940 nm)	0.812540 nu	ppm	0.003396	0.42	1913.380000	Y_R 377.433
K (766.491 nm)	47.878900	ppm	0.184300	0.38	57316.200000	Y_R2 488.368
Li (670.783 nm)	0.947620	ppm	0.001394	0.15	32232.900000	Y_R2 488.368
Mg (279.078 nm)	46.165800 o	ppm	0.194602	0.42	281709.000000	Y 377.433
Mn (257.610 nm)	0.467060	ppm	0.001695	0.36	126794.000000	Y 377.433
Mo (202.032 nm)	0.942070	ppm	0.004085	0.43	9399.430000	Y 377.433
Na (589.592 nm)	46.707600 o	ppm	0.037232	0.08	328054.000000	Y_R2 488.368
Na H (589.593 nm)	50.025522	ppm	0.426874	0.85	203259.200374	Y_R 488.368
Ni (231.604 nm)	0.452561	ppm	0.002948	0.65	3522.910000	Y 377.433
P (213.618 nm)	9.245160 o	ppm	0.021106	0.23	23394.700000	Y 242.219
Pb (220.353 nm)	0.484296	ppm	0.000422	0.09	1543.610000	Y 242.219
S (181.972 nm)	1.918570	ppm	0.006482	0.34	1109.164056	Y 377.433
Sb (206.834 nm)	0.493318	ppm	0.004152	0.84	1470.520000	Y 377.433
Se (196.026 nm)	1.870870	ppm	0.011377	0.61	2086.750000	Y 242.219
Si (288.158 nm)	9.731250	ppm	0.104228	1.07	89243.800000	Y 377.433
Sn (189.925 nm)	1.873450	ppm	0.005522	0.29	4390.700000	Y 377.433
Sr (421.552 nm)	0.953089	ppm	0.008532	0.90	206553.692864	Y_R 488.368
Th (288.505 nm)	0.985074	ppm	0.011184	1.14	2878.640000	Y 377.433
Ti (336.122 nm)	0.974535	ppm	0.004065	0.42	140491.000000	Y 377.433
Tl (190.794 nm)	1.930780	ppm	0.005898	0.31	4902.880000	Y 377.433
U (409.013 nm)	2.019660	ppm	0.018979	0.94	9643.600000	Y 377.433
V (292.401 nm)	0.474636	ppm	0.001823	0.38	20374.000000	Y 377.433
Zn (206.200 nm)	0.451910	ppm	0.001014	0.22	2612.940000	Y 377.433
Zr (343.823 nm)	0.479688	ppm	0.001741	0.36	65274.100000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.045371	21367.668362	0.000334	0.03
Y 377.433	1.057124	1163315.009802	0.001589	0.15
Y_R 377.433	1.083650	83543.200000	0.006930	0.64
Y_R 488.368	1.093050	47766.900000	0.009716	0.89
Y_R2 488.368	1.115764	96778.576610	0.009052	0.81

Sample Name: 280-112349-D-1-A

Date: 7/26/2018 4:51:16 PM Rack:Tube: 1:57

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000036 u	ppm	0.000087	> 100.00	-416.382000	Y 377.433
Al (167.019 nm)	23.296400 o	ppm	0.409904	1.76	11584.100000	Y_R 377.433
Al H (396.152 nm)	25.451478	ppm	0.157878	0.62	64307.091768	Y_R 377.433
As (188.980 nm)	0.001347	ppm	0.001833	> 100.00	-1.805290	Y 242.219
B (249.678 nm)	2.261900 o	ppm	0.002230	0.10	62779.700000	Y 242.219
Ba (493.408 nm)	0.042027	ppm	0.001251	2.98	5596.030000	Y_R 488.368
Be (234.861 nm)	0.000008 u	ppm	0.000022	> 100.00	-31.475400	Y_R 488.368
Bi (223.061 nm)	-0.000176 u	ppm	0.001635	> 100.00	14.186300	Y 377.433
Ca (315.887 nm)	246.373212 o	ppm	1.529311	0.62	203498.561770	Y_R 377.433
Cd (214.439 nm)	0.000142	ppm	0.000019	13.32	6.817180	Y 377.433
Co (228.615 nm)	0.001392	ppm	0.000296	21.25	-7.318350	Y 242.219
Cr (205.560 nm)	0.069456	ppm	0.000453	0.65	1175.830000	Y 377.433
Cu (324.754 nm)	0.021387	ppm	0.000119	0.55	1547.240000	Y 377.433
Fe (238.204 nm)	0.509478	ppm	0.005211	1.02	1935.533571	Y_R 377.433
Fe H (259.940 nm)	0.351994 nu	ppm	0.003704	1.05	1011.540000	Y_R 377.433
K (766.491 nm)	3.271930	ppm	0.080420	2.46	3230.580000	Y_R2 488.368
Li (670.783 nm)	0.024487	ppm	0.000650	2.65	-301.983000	Y_R2 488.368
Mg (279.078 nm)	8.076710	ppm	0.028529	0.35	49332.700000	Y 377.433
Mn (257.610 nm)	0.193424	ppm	0.000368	0.19	52539.800000	Y 377.433
Mo (202.032 nm)	0.028839	ppm	0.000077	0.27	287.209000	Y 377.433
Na (589.592 nm)	35.741800 o	ppm	0.155177	0.43	248054.000000	Y_R2 488.368
Na H (589.593 nm)	37.464476	ppm	0.831994	2.22	151857.114107	Y_R 488.368
Ni (231.604 nm)	0.042953	ppm	0.000463	1.08	335.729000	Y 377.433
P (213.618 nm)	0.193934	ppm	0.001187	0.61	511.608000	Y 242.219
Pb (220.353 nm)	0.003811	ppm	0.001847	48.47	6.483310	Y 242.219
S (181.972 nm)	203.612119 bo	ppm	0.834401	0.41	115073.412134	Y 377.433
Sb (206.834 nm)	-0.000975 u	ppm	0.000574	58.82	-18.848800	Y 377.433
Se (196.026 nm)	0.000003 u	ppm	0.003813	> 100.00	14.652400	Y 242.219
Si (288.158 nm)	0.819427	ppm	0.001739	0.21	8288.830000	Y 377.433
Sn (189.925 nm)	0.002839	ppm	0.000994	35.02	13.674000	Y 377.433
Sr (421.552 nm)	0.361231	ppm	0.008246	2.28	78373.982235	Y_R 488.368
Th (288.505 nm)	-0.000551 u	ppm	0.001397	> 100.00	75.151200	Y 377.433
Ti (336.122 nm)	0.003019	ppm	0.000050	1.67	1014.670000	Y 377.433
Tl (190.794 nm)	0.001672	ppm	0.000330	19.76	-1.629610	Y 377.433
U (409.013 nm)	-0.006186 u	ppm	0.001722	27.83	-171.514000	Y 377.433
V (292.401 nm)	0.003566	ppm	0.000003	0.08	153.282000	Y 377.433
Zn (206.200 nm)	0.016030	ppm	0.000701	4.38	109.205000	Y 377.433
Zr (343.823 nm)	0.000269	ppm	0.000002	0.72	26.084900	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.017240	20792.673308	0.001301	0.13
Y 377.433	1.037519	1141740.948569	0.003532	0.34
Y_R 377.433	1.069770	82473.300000	0.001564	0.15
Y_R 488.368	1.085390	47431.900000	0.018365	1.69
Y_R2 488.368	1.098697	95298.209519	0.008988	0.82

Sample Name: 280-112349-D-1-Asd@5

Date: 7/26/2018 4:54:40 PM Rack:Tube: 1:58

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000011 u	ppm	0.000047	> 100.00	-414.775000	Y 377.433
Al (167.019 nm)	4.192420 o	ppm	0.102713	2.45	2084.500000	Y_R 377.433
Al H (396.152 nm)	4.238413	ppm	0.077733	1.83	10838.164904	Y_R 377.433
As (188.980 nm)	-0.000288 u	ppm	0.001016	> 100.00	-4.117360	Y 242.219
B (249.678 nm)	0.421897	ppm	0.031233	7.40	11761.800000	Y 242.219
Ba (493.408 nm)	0.006740	ppm	0.000541	8.03	1335.410000	Y_R 488.368
Be (234.861 nm)	0.000019	ppm	0.000014	73.44	-40.756800	Y_R 488.368
Bi (223.061 nm)	-0.000584 u	ppm	0.000051	8.72	12.963600	Y 377.433
Ca (315.887 nm)	41.967293 o	ppm	0.699264	1.67	34601.152963	Y_R 377.433
Cd (214.439 nm)	0.000001 u	ppm	0.000095	> 100.00	-2.958750	Y 377.433
Co (228.615 nm)	0.000315	ppm	0.000074	23.59	-29.779800	Y 242.219
Cr (205.560 nm)	0.013377	ppm	0.001051	7.86	227.215000	Y 377.433
Cu (324.754 nm)	0.004006	ppm	0.000319	7.97	553.513000	Y 377.433
Fe (238.204 nm)	0.087768	ppm	0.002006	2.29	347.029821	Y_R 377.433
Fe H (259.940 nm)	-0.074097 nu	ppm	0.002022	2.73	177.165000	Y_R 377.433
K (766.491 nm)	0.552579	ppm	0.040455	7.32	-66.602200	Y_R2 488.368
Li (670.783 nm)	0.004600	ppm	0.001884	40.95	-1002.870000	Y_R2 488.368
Mg (279.078 nm)	1.562070	ppm	0.112785	7.22	9578.940000	Y 377.433
Mn (257.610 nm)	0.037649	ppm	0.002668	7.09	10268.400000	Y 377.433
Mo (202.032 nm)	0.005378	ppm	0.000497	9.24	53.114100	Y 377.433
Na (589.592 nm)	5.762150	ppm	0.019551	0.34	40198.300000	Y_R2 488.368
Na H (589.593 nm)	6.184066 u	ppm	0.183970	2.97	28556.674946	Y_R 488.368
Ni (231.604 nm)	0.007608	ppm	0.000444	5.83	60.919500	Y 377.433
P (213.618 nm)	0.033807	ppm	0.001722	5.09	106.779000	Y 242.219
Pb (220.353 nm)	0.001124	ppm	0.001426	> 100.00	5.627350	Y 242.219
S (181.972 nm)	39.029005 o	ppm	2.904321	7.44	22076.912624	Y 377.433
Sb (206.834 nm)	-0.000266 u	ppm	0.001391	> 100.00	-17.483500	Y 377.433
Se (196.026 nm)	-0.002581 u	ppm	0.001002	38.81	11.390600	Y 242.219
Si (288.158 nm)	0.149633	ppm	0.012775	8.54	2204.420000	Y 377.433
Sn (189.925 nm)	0.001257	ppm	0.000640	50.89	9.974440	Y 377.433
Sr (421.552 nm)	0.061547	ppm	0.001609	2.61	13470.874922	Y_R 488.368
Th (288.505 nm)	-0.002566 u	ppm	0.001052	40.98	66.130100	Y 377.433
Ti (336.122 nm)	0.000920	ppm	0.000081	8.76	60.294300	Y 377.433
Tl (190.794 nm)	0.000565	ppm	0.000361	63.82	-4.359200	Y 377.433
U (409.013 nm)	-0.000239 u	ppm	0.000215	89.70	-101.322000	Y 377.433
V (292.401 nm)	0.000446	ppm	0.000053	11.91	35.947200	Y 377.433
Zn (206.200 nm)	0.000257 u	ppm	0.000442	> 100.00	18.606400	Y 377.433
Zr (343.823 nm)	0.000003 u	ppm	0.000073	> 100.00	-11.490000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.054405	21552.336863	0.000678	0.06
Y 377.433	1.065500	1172532.706032	0.000456	0.04
Y_R 377.433	1.076630	83002.600000	0.007254	0.67
Y_R 488.368	1.086670	47487.800000	0.017410	1.60
Y_R2 488.368	1.097075	95157.491306	0.002598	0.24

Sample Name: 280-112349-D-1-B MS

Date: 7/26/2018 4:58:03 PM
Rack:Tube: 1:59

Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.050430	ppm	0.000278	0.55	2100.730000	Y 377.433
Al (167.019 nm)	24.352800 o	ppm	0.001992	0.01	12110.000000	Y_R 377.433
Al H (396.152 nm)	27.018592	ppm	0.029459	0.11	68343.361347	Y_R 377.433
As (188.980 nm)	1.013370	ppm	0.000300	0.03	1432.570000	Y 242.219
B (249.678 nm)	3.259980 o	ppm	0.000935	0.03	90475.300000	Y 242.219
Ba (493.408 nm)	2.048660 o	ppm	0.015103	0.74	245079.000000	Y_R 488.368
Be (234.861 nm)	0.046638	ppm	0.000420	0.90	15042.100000	Y_R 488.368
Bi (223.061 nm)	1.968650	ppm	0.008240	0.42	5535.590000	Y 377.433
Ca (315.887 nm)	286.545529 o	ppm	1.174993	0.41	236692.371041	Y_R 377.433
Cd (214.439 nm)	0.092154	ppm	0.000752	0.82	6086.440000	Y 377.433
Co (228.615 nm)	0.478725	ppm	0.000242	0.05	9944.960000	Y 242.219
Cr (205.560 nm)	0.257243	ppm	0.000385	0.15	4350.240000	Y 377.433
Cu (324.754 nm)	0.266982	ppm	0.000001	0.00	17548.000000	Y 377.433
Fe (238.204 nm)	1.481626	ppm	0.001999	0.13	5597.442208	Y_R 377.433
Fe H (259.940 nm)	1.337620 nu	ppm	0.001866	0.14	2941.580000	Y_R 377.433
K (766.491 nm)	53.380000	ppm	0.235508	0.44	63986.200000	Y_R2 488.368
Li (670.783 nm)	1.015950	ppm	0.006701	0.66	34641.300000	Y_R2 488.368
Mg (279.078 nm)	55.192500 o	ppm	0.268357	0.49	336790.000000	Y 377.433
Mn (257.610 nm)	0.665089	ppm	0.001985	0.30	180531.000000	Y 377.433
Mo (202.032 nm)	0.979081	ppm	0.002108	0.22	9768.730000	Y 377.433
Na (589.592 nm)	82.183400 o	ppm	0.047103	0.06	574177.000000	Y_R2 488.368
Na H (589.593 nm)	88.634855	ppm	0.331439	0.37	355523.878409	Y_R 488.368
Ni (231.604 nm)	0.500202	ppm	0.000714	0.14	3893.180000	Y 377.433
P (213.618 nm)	9.831740 o	ppm	0.026810	0.27	24877.700000	Y 242.219
Pb (220.353 nm)	0.497216	ppm	0.002552	0.51	1575.800000	Y 242.219
S (181.972 nm)	203.575532 bo	ppm	0.531895	0.26	115053.990706	Y 377.433
Sb (206.834 nm)	0.508944	ppm	0.002476	0.49	1518.510000	Y 377.433
Se (196.026 nm)	1.957890	ppm	0.003504	0.18	2183.620000	Y 242.219
Si (288.158 nm)	10.829000	ppm	0.026426	0.24	99215.800000	Y 377.433
Sn (189.925 nm)	1.849270	ppm	0.004594	0.25	4334.120000	Y 377.433
Sr (421.552 nm)	1.348935 o	ppm	0.006969	0.52	292283.011285	Y_R 488.368
Th (288.505 nm)	1.010020	ppm	0.000014	0.00	2954.000000	Y 377.433
Ti (336.122 nm)	0.997105	ppm	0.001208	0.12	144510.000000	Y 377.433
Tl (190.794 nm)	1.832380	ppm	0.005978	0.33	4652.320000	Y 377.433
U (409.013 nm)	2.107160	ppm	0.000335	0.02	10018.100000	Y 377.433
V (292.401 nm)	0.482466	ppm	0.001053	0.22	20687.500000	Y 377.433
Zn (206.200 nm)	0.469232	ppm	0.002508	0.53	2712.440000	Y 377.433
Zr (343.823 nm)	0.491635	ppm	0.000110	0.02	66901.700000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.992678	20290.610183	0.008867	0.89
Y 377.433	1.015097	1117066.102047	0.010444	1.03
Y_R 377.433	1.058930	81637.500000	0.004946	0.47
Y_R 488.368	1.068280	46684.300000	0.002091	0.20
Y_R2 488.368	1.082750	93914.970311	0.001355	0.13

Sample Name: 280-112349-D-1-C MSD

Date: 7/26/2018 5:01:27 PM Rack:Tube: 1:60

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.050124	ppm	0.000261	0.52	2086.140000	Y 377.433
Al (167.019 nm)	24.466900 o	ppm	0.160562	0.66	12166.800000	Y_R 377.433
Al H (396.152 nm)	27.255228	ppm	0.134460	0.49	68939.938932	Y_R 377.433
As (188.980 nm)	1.003140	ppm	0.000405	0.04	1418.070000	Y 242.219
B (249.678 nm)	3.283970 o	ppm	0.004293	0.13	91140.300000	Y 242.219
Ba (493.408 nm)	2.042540 o	ppm	0.011095	0.54	244349.000000	Y_R 488.368
Be (234.861 nm)	0.046842	ppm	0.000293	0.63	15107.300000	Y_R 488.368
Bi (223.061 nm)	1.960180	ppm	0.007872	0.40	5511.870000	Y 377.433
Ca (315.887 nm)	288.281145 o	ppm	0.955135	0.33	238126.483274	Y_R 377.433
Cd (214.439 nm)	0.092049	ppm	0.000216	0.24	6079.450000	Y 377.433
Co (228.615 nm)	0.476749	ppm	0.000815	0.17	9903.980000	Y 242.219
Cr (205.560 nm)	0.258586	ppm	0.001101	0.43	4372.950000	Y 377.433
Cu (324.754 nm)	0.267169	ppm	0.001359	0.51	17561.000000	Y 377.433
Fe (238.204 nm)	1.473255	ppm	0.005308	0.36	5565.908557	Y_R 377.433
Fe H (259.940 nm)	1.336300 nu	ppm	0.003449	0.26	2939.000000	Y_R 377.433
K (766.491 nm)	53.502400	ppm	0.014062	0.03	64134.600000	Y_R2 488.368
Li (670.783 nm)	1.015660	ppm	0.002168	0.21	34631.000000	Y_R2 488.368
Mg (279.078 nm)	55.242000 o	ppm	0.104435	0.19	337092.000000	Y 377.433
Mn (257.610 nm)	0.666158	ppm	0.000723	0.11	180822.000000	Y 377.433
Mo (202.032 nm)	0.983388	ppm	0.000349	0.04	9811.710000	Y 377.433
Na (589.592 nm)	83.271600 o	ppm	0.353023	0.42	581707.000000	Y_R2 488.368
Na H (589.593 nm)	89.341871	ppm	0.507272	0.57	358304.113275	Y_R 488.368
Ni (231.604 nm)	0.499946	ppm	0.001161	0.23	3891.220000	Y 377.433
P (213.618 nm)	9.796310 o	ppm	0.019648	0.20	24788.100000	Y 242.219
Pb (220.353 nm)	0.496951	ppm	0.000484	0.10	1574.790000	Y 242.219
S (181.972 nm)	206.112977 bo	ppm	0.387180	0.19	116487.753132	Y 377.433
Sb (206.834 nm)	0.510686	ppm	0.000449	0.09	1523.860000	Y 377.433
Se (196.026 nm)	1.951480	ppm	0.002910	0.15	2176.520000	Y 242.219
Si (288.158 nm)	10.859000	ppm	0.009790	0.09	99488.600000	Y 377.433
Sn (189.925 nm)	1.856690	ppm	0.008382	0.45	4351.480000	Y 377.433
Sr (421.552 nm)	1.349102 o	ppm	0.007869	0.58	292319.082811	Y_R 488.368
Th (288.505 nm)	1.010440	ppm	0.000693	0.07	2954.770000	Y 377.433
Ti (336.122 nm)	0.997933	ppm	0.002350	0.24	144635.000000	Y 377.433
Tl (190.794 nm)	1.849120	ppm	0.003802	0.21	4694.900000	Y 377.433
U (409.013 nm)	2.086140	ppm	0.011218	0.54	9915.850000	Y 377.433
V (292.401 nm)	0.481503	ppm	0.000559	0.12	20646.900000	Y 377.433
Zn (206.200 nm)	0.466266	ppm	0.000715	0.15	2695.400000	Y 377.433
Zr (343.823 nm)	0.492135	ppm	0.001328	0.27	66969.700000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.993294	20303.196232	0.007910	0.80
Y 377.433	1.013308	1115097.839428	0.007151	0.71
Y_R 377.433	1.055640	81384.200000	0.000343	0.03
Y_R 488.368	1.059460	46298.700000	0.000561	0.05
Y_R2 488.368	1.072379	93015.407705	0.005668	0.53

Sample Name: 280-112349-D-2-A

Date: 7/26/2018 5:04:50 PM Rack:Tube: 1:61

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000078 u	ppm	0.000051	65.39	-418.715000	Y 377.433
Al (167.019 nm)	26.898900 o	ppm	0.348421	1.30	13375.500000	Y_R 377.433
Al H (396.152 nm)	29.420739	ppm	0.088218	0.30	74301.477333	Y_R 377.433
As (188.980 nm)	0.001646	ppm	0.000688	41.78	-1.382210	Y 242.219
B (249.678 nm)	2.391680 o	ppm	0.001554	0.06	66377.900000	Y 242.219
Ba (493.408 nm)	0.042557	ppm	0.000071	0.17	5662.850000	Y_R 488.368
Be (234.861 nm)	0.000014	ppm	0.000004	25.54	-25.311100	Y_R 488.368
Bi (223.061 nm)	-0.001671 u	ppm	0.000880	52.70	10.018100	Y 377.433
Ca (315.887 nm)	260.863622 o	ppm	1.094329	0.42	215471.760214	Y_R 377.433
Cd (214.439 nm)	0.000120	ppm	0.000036	29.58	5.538120	Y 377.433
Co (228.615 nm)	0.001962	ppm	0.000036	1.82	4.588240	Y 242.219
Cr (205.560 nm)	0.090386	ppm	0.000027	0.03	1529.890000	Y 377.433
Cu (324.754 nm)	0.023175	ppm	0.000097	0.42	1654.570000	Y 377.433
Fe (238.204 nm)	0.642526	ppm	0.002737	0.43	2436.702898	Y_R 377.433
Fe H (259.940 nm)	0.490682 nu	ppm	0.000090	0.02	1283.120000	Y_R 377.433
K (766.491 nm)	3.297230	ppm	0.081346	2.47	3261.260000	Y_R2 488.368
Li (670.783 nm)	0.020930	ppm	0.000199	0.95	-427.355000	Y_R2 488.368
Mg (279.078 nm)	9.181770	ppm	0.002065	0.02	56075.900000	Y 377.433
Mn (257.610 nm)	0.285163	ppm	0.000163	0.06	77434.300000	Y 377.433
Mo (202.032 nm)	0.032672	ppm	0.000435	1.33	325.450000	Y 377.433
Na (589.592 nm)	37.427900 o	ppm	0.078026	0.21	259741.000000	Y_R2 488.368
Na H (589.593 nm)	39.130434	ppm	0.274531	0.70	158422.612029	Y_R 488.368
Ni (231.604 nm)	0.061436	ppm	0.000245	0.40	479.456000	Y 377.433
P (213.618 nm)	0.202401	ppm	0.000378	0.19	533.013000	Y 242.219
Pb (220.353 nm)	0.004464	ppm	0.000651	14.59	7.135590	Y 242.219
S (181.972 nm)	214.570785 bo	ppm	0.148765	0.07	121265.742579	Y 377.433
Sb (206.834 nm)	-0.001267 u	ppm	0.000880	69.50	-19.237500	Y 377.433
Se (196.026 nm)	-0.001361 u	ppm	0.002185	> 100.00	13.260000	Y 242.219
Si (288.158 nm)	1.144810	ppm	0.002345	0.20	11244.600000	Y 377.433
Sn (189.925 nm)	0.001713	ppm	0.000716	41.83	11.040100	Y 377.433
Sr (421.552 nm)	0.365886	ppm	0.002583	0.71	79382.175078	Y_R 488.368
Th (288.505 nm)	0.000083 u	ppm	0.000763	> 100.00	78.917300	Y 377.433
Ti (336.122 nm)	0.005257	ppm	0.000161	3.07	1383.700000	Y 377.433
Tl (190.794 nm)	0.016771	ppm	0.003798	22.64	36.776600	Y 377.433
U (409.013 nm)	-0.005007 u	ppm	0.001874	37.42	-168.653000	Y 377.433
V (292.401 nm)	0.004829	ppm	0.000168	3.47	201.330000	Y 377.433
Zn (206.200 nm)	0.024384	ppm	0.000202	0.83	157.192000	Y 377.433
Zr (343.823 nm)	0.000464	ppm	0.000003	0.56	52.948000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.014337	20733.325486	0.000798	0.08
Y 377.433	1.034802	1138751.063598	0.000050	0.00
Y_R 377.433	1.052660	81154.300000	0.006165	0.59
Y_R 488.368	1.069740	46748.000000	0.003797	0.35
Y_R2 488.368	1.076432	93366.988325	0.002310	0.21

Sample Name: 280-112349-D-3-A

Date: 7/26/2018 5:08:12 PM Rack:Tube: 1:62

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000272 u	ppm	0.000304	> 100.00	-428.197000	Y 377.433
Al (167.019 nm)	19.921600 o	ppm	0.283252	1.42	9906.000000	Y_R 377.433
Al H (396.152 nm)	21.646836	ppm	0.159292	0.74	54729.839039	Y_R 377.433
As (188.980 nm)	0.002227	ppm	0.001895	85.10	-0.558029	Y 242.219
B (249.678 nm)	2.211940 o	ppm	0.004868	0.22	61394.600000	Y 242.219
Ba (493.408 nm)	0.045869	ppm	0.000242	0.53	6052.170000	Y_R 488.368
Be (234.861 nm)	-0.000014 u	ppm	0.000016	> 100.00	-39.144100	Y_R 488.368
Bi (223.061 nm)	-0.000844 u	ppm	0.003886	> 100.00	12.311000	Y 377.433
Ca (315.887 nm)	236.580798 o	ppm	1.579657	0.67	195407.243184	Y_R 377.433
Cd (214.439 nm)	0.000080	ppm	0.000040	49.78	2.691030	Y 377.433
Co (228.615 nm)	0.001874	ppm	0.000321	17.15	2.709080	Y 242.219
Cr (205.560 nm)	0.071681	ppm	0.000087	0.12	1213.460000	Y 377.433
Cu (324.754 nm)	0.022401	ppm	0.000122	0.54	1619.760000	Y 377.433
Fe (238.204 nm)	0.504063	ppm	0.005236	1.04	1915.135515	Y_R 377.433
Fe H (259.940 nm)	0.349170 nu	ppm	0.003335	0.96	1006.010000	Y_R 377.433
K (766.491 nm)	3.816900	ppm	0.001886	0.05	3891.360000	Y_R2 488.368
Li (670.783 nm)	0.023474	ppm	0.001265	5.39	-337.695000	Y_R2 488.368
Mg (279.078 nm)	9.683180	ppm	0.006788	0.07	59135.900000	Y 377.433
Mn (257.610 nm)	0.229804	ppm	0.000188	0.08	62412.100000	Y 377.433
Mo (202.032 nm)	0.034723	ppm	0.000506	1.46	345.915000	Y 377.433
Na (589.592 nm)	141.460000 o	ppm	0.307628	0.22	980768.000000	Y_R2 488.368
Na H (589.593 nm)	149.638004	ppm	0.843473	0.56	593895.550022	Y_R 488.368
Ni (231.604 nm)	0.051128	ppm	0.000295	0.58	399.296000	Y 377.433
P (213.618 nm)	0.156464	ppm	0.000515	0.33	416.876000	Y 242.219
Pb (220.353 nm)	0.004328	ppm	0.000692	15.98	9.459130	Y 242.219
S (181.972 nm)	230.839397 bo	ppm	0.304432	0.13	130458.016658	Y 377.433
Sb (206.834 nm)	-0.001750 u	ppm	0.000265	15.14	-20.196600	Y 377.433
Se (196.026 nm)	-0.003967 u	ppm	0.002878	72.53	10.225600	Y 242.219
Si (288.158 nm)	1.052980	ppm	0.002463	0.23	10410.400000	Y 377.433
Sn (189.925 nm)	0.782031	ppm	0.000545	0.07	1836.900000	Y 377.433
Sr (421.552 nm)	0.378716	ppm	0.001952	0.52	82160.761436	Y_R 488.368
Th (288.505 nm)	0.000983	ppm	0.001255	> 100.00	80.197200	Y 377.433
Ti (336.122 nm)	0.003890	ppm	0.000052	1.32	1109.320000	Y 377.433
Tl (190.794 nm)	0.005694	ppm	0.000825	14.48	8.588760	Y 377.433
U (409.013 nm)	-0.007826 u	ppm	0.002277	29.10	-177.495000	Y 377.433
V (292.401 nm)	0.003235	ppm	0.000068	2.09	138.758000	Y 377.433
Zn (206.200 nm)	0.019347	ppm	0.000493	2.55	128.256000	Y 377.433
Zr (343.823 nm)	0.000317	ppm	0.000123	38.71	32.519600	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.989445	20224.526205	0.001466	0.15
Y 377.433	1.004422	1105319.503995	0.001385	0.14
Y_R 377.433	1.038310	80048.300000	0.007369	0.71
Y_R 488.368	1.059370	46294.700000	0.005613	0.53
Y_R2 488.368	1.070285	92833.842982	0.005685	0.53

Sample Name: 280-112349-D-4-A

Date: 7/26/2018 5:11:35 PM Rack:Tube: 1:63

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000063 u	ppm	0.000093	> 100.00	-417.547000	Y 377.433
Al (167.019 nm)	4.435010 o	ppm	0.065836	1.48	2205.160000	Y_R 377.433
Al H (396.152 nm)	4.733466	ppm	0.026162	0.55	12171.905123	Y_R 377.433
As (188.980 nm)	0.001730	ppm	0.001479	85.49	-1.257650	Y 242.219
B (249.678 nm)	2.377580 o	ppm	0.002491	0.10	65987.900000	Y 242.219
Ba (493.408 nm)	0.039771	ppm	0.000572	1.44	5324.650000	Y_R 488.368
Be (234.861 nm)	0.000009 u	ppm	0.000022	> 100.00	-43.850100	Y_R 488.368
Bi (223.061 nm)	-0.000474 u	ppm	0.000507	> 100.00	13.281900	Y 377.433
Ca (315.887 nm)	238.932235 o	ppm	1.058088	0.44	197350.198344	Y_R 377.433
Cd (214.439 nm)	0.000208	ppm	0.000004	2.04	10.777700	Y 377.433
Co (228.615 nm)	0.001152	ppm	0.000191	16.55	-12.382200	Y 242.219
Cr (205.560 nm)	0.012513	ppm	0.000206	1.65	212.529000	Y 377.433
Cu (324.754 nm)	0.014295	ppm	0.000081	0.56	1082.090000	Y 377.433
Fe (238.204 nm)	0.140282	ppm	0.002557	1.82	544.841510	Y_R 377.433
Fe H (259.940 nm)	-0.020568 nu	ppm	0.000007	0.03	281.984000	Y_R 377.433
K (766.491 nm)	3.259690	ppm	0.008820	0.27	3215.750000	Y_R2 488.368
Li (670.783 nm)	0.020246	ppm	0.000803	3.97	-451.459000	Y_R2 488.368
Mg (279.078 nm)	7.968810	ppm	0.019845	0.25	48674.900000	Y 377.433
Mn (257.610 nm)	0.201834	ppm	0.000256	0.13	54821.900000	Y 377.433
Mo (202.032 nm)	0.029606	ppm	0.000235	0.79	294.855000	Y 377.433
Na (589.592 nm)	118.010000 o	ppm	0.445431	0.38	818226.000000	Y_R2 488.368
Na H (589.593 nm)	125.749996	ppm	2.277572	1.81	499755.354850	Y_R 488.368
Ni (231.604 nm)	0.034165	ppm	0.000232	0.68	267.396000	Y 377.433
P (213.618 nm)	0.077292	ppm	0.000048	0.06	216.716000	Y 242.219
Pb (220.353 nm)	0.003569	ppm	0.000291	8.15	13.082000	Y 242.219
S (181.972 nm)	230.610161 bo	ppm	0.361767	0.16	130328.414784	Y 377.433
Sb (206.834 nm)	-0.001391 u	ppm	0.000734	52.79	-21.109600	Y 377.433
Se (196.026 nm)	-0.000203 u	ppm	0.000689	> 100.00	14.169300	Y 242.219
Si (288.158 nm)	0.903636	ppm	0.001131	0.13	9053.790000	Y 377.433
Sn (189.925 nm)	0.000880	ppm	0.000032	3.62	9.092070	Y 377.433
Sr (421.552 nm)	0.348658	ppm	0.003838	1.10	75650.970653	Y_R 488.368
Th (288.505 nm)	-0.001645 u	ppm	0.000953	57.93	72.291900	Y 377.433
Ti (336.122 nm)	0.000747	ppm	0.000009	1.27	663.104000	Y 377.433
Tl (190.794 nm)	0.002926	ppm	0.000321	10.97	1.578320	Y 377.433
U (409.013 nm)	-0.006860 u	ppm	0.001753	25.55	-173.618000	Y 377.433
V (292.401 nm)	0.001755	ppm	0.000337	19.19	91.928500	Y 377.433
Zn (206.200 nm)	0.011062	ppm	0.000407	3.68	80.668800	Y 377.433
Zr (343.823 nm)	0.000111	ppm	0.000048	43.20	3.364240	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.002673	20494.909169	0.002893	0.29
Y 377.433	1.023906	1126760.490437	0.000962	0.09
Y_R 377.433	1.080670	83313.700000	0.005282	0.49
Y_R 488.368	1.090200	47642.200000	0.012602	1.16
Y_R2 488.368	1.106761	95997.607708	0.000425	0.04

Sample Name: 280-112349-A-5-A

Date: 7/26/2018 5:14:58 PM Rack:Tube: 1:64

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000052 u	ppm	0.000328	> 100.00	-411.945000	Y 377.433
Al (167.019 nm)	21.463800 o	ppm	0.280774	1.31	10672.900000	Y_R 377.433
Al H (396.152 nm)	23.356942	ppm	0.176746	0.76	59037.846287	Y_R 377.433
As (188.980 nm)	0.001905	ppm	0.002284	> 100.00	-1.015430	Y 242.219
B (249.678 nm)	1.838550 o	ppm	0.003370	0.18	51041.300000	Y 242.219
Ba (493.408 nm)	0.049233	ppm	0.000061	0.12	6456.550000	Y_R 488.368
Be (234.861 nm)	0.000016	ppm	0.000008	51.65	-26.024100	Y_R 488.368
Bi (223.061 nm)	-0.003024 u	ppm	0.000198	6.53	6.213790	Y 377.433
Ca (315.887 nm)	248.534861 o	ppm	1.774531	0.71	205284.698104	Y_R 377.433
Cd (214.439 nm)	0.000161	ppm	0.000095	58.84	8.203940	Y 377.433
Co (228.615 nm)	0.001657	ppm	0.000106	6.42	-1.803740	Y 242.219
Cr (205.560 nm)	0.064424	ppm	0.000269	0.42	1090.660000	Y 377.433
Cu (324.754 nm)	0.043032	ppm	0.000434	1.01	2952.040000	Y 377.433
Fe (238.204 nm)	0.597463	ppm	0.003727	0.62	2266.956732	Y_R 377.433
Fe H (259.940 nm)	0.444727 nu	ppm	0.006835	1.54	1193.130000	Y_R 377.433
K (766.491 nm)	3.621110	ppm	0.048972	1.35	3653.970000	Y_R2 488.368
Li (670.783 nm)	0.024565	ppm	0.000218	0.89	-299.217000	Y_R2 488.368
Mg (279.078 nm)	8.843080	ppm	0.013486	0.15	54009.100000	Y 377.433
Mn (257.610 nm)	0.170899	ppm	0.000433	0.25	46427.500000	Y 377.433
Mo (202.032 nm)	0.031342	ppm	0.000353	1.13	312.178000	Y 377.433
Na (589.592 nm)	135.445000 o	ppm	0.562429	0.42	939084.000000	Y_R2 488.368
Na H (589.593 nm)	145.455857	ppm	0.450112	0.31	577418.543249	Y_R 488.368
Ni (231.604 nm)	0.037196	ppm	0.000025	0.07	290.976000	Y 377.433
P (213.618 nm)	0.195619	ppm	0.000455	0.23	515.869000	Y 242.219
Pb (220.353 nm)	0.003488	ppm	0.000254	7.29	6.211350	Y 242.219
S (181.972 nm)	250.632214 bo	ppm	0.856078	0.34	141641.598965	Y 377.433
Sb (206.834 nm)	0.000606 u	ppm	0.000862	> 100.00	-14.182800	Y 377.433
Se (196.026 nm)	-0.001466 u	ppm	0.005573	> 100.00	12.951200	Y 242.219
Si (288.158 nm)	0.906183	ppm	0.011889	1.31	9076.920000	Y 377.433
Sn (189.925 nm)	0.001827	ppm	0.000363	19.89	11.307800	Y 377.433
Sr (421.552 nm)	0.383485	ppm	0.001666	0.43	83193.532539	Y_R 488.368
Th (288.505 nm)	-0.003285 u	ppm	0.000405	12.33	67.119900	Y 377.433
Ti (336.122 nm)	0.003816	ppm	0.000065	1.71	1136.540000	Y 377.433
Tl (190.794 nm)	0.002528	ppm	0.001378	54.50	0.535233	Y 377.433
U (409.013 nm)	-0.006742 u	ppm	0.001594	23.65	-174.597000	Y 377.433
V (292.401 nm)	0.003283	ppm	0.000225	6.86	142.225000	Y 377.433
Zn (206.200 nm)	0.027134	ppm	0.000341	1.26	172.987000	Y 377.433
Zr (343.823 nm)	0.000576	ppm	0.000071	12.37	68.083000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.002405	20489.446925	0.000523	0.05
Y 377.433	1.021986	1124647.265056	0.002057	0.20
Y_R 377.433	1.064480	82065.400000	0.008874	0.83
Y_R 488.368	1.068490	46693.700000	0.005656	0.53
Y_R2 488.368	1.080474	93717.559603	0.001673	0.15

Sample Name: CCVH-5225153

Date: 7/26/2018 5:18:21 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001013 u	ppm	0.000046	4.55	-728.579000	Y 377.433
Al (167.019 nm)	45.251700 o	ppm	0.308044	0.68	22530.400000	Y_R 377.433
Al H (396.152 nm)	49.404773	ppm	0.329437	0.67	124469.924063	Y_R 377.433
As (188.980 nm)	-0.000758 u	ppm	0.000332	43.80	-5.273100	Y 242.219
B (249.678 nm)	0.001371	ppm	0.000289	21.06	19.776300	Y 242.219
Ba (493.408 nm)	-0.000189 u	ppm	0.000160	84.90	545.457000	Y_R 488.368
Be (234.861 nm)	-0.000020 u	ppm	0.000138	> 100.00	1611.430000	Y_R 488.368
Bi (223.061 nm)	0.972078	ppm	0.004264	0.44	2749.610000	Y 377.433
Ca (315.887 nm)	0.016374	ppm	0.003923	23.96	-62.233884	Y_R 377.433
Cd (214.439 nm)	-0.000189 u	ppm	0.000011	5.57	36.589200	Y 377.433
Co (228.615 nm)	0.001145	ppm	0.000137	11.99	-12.549900	Y 242.219
Cr (205.560 nm)	-0.000051 u	ppm	0.000001	1.74	-14.968900	Y 377.433
Cu (324.754 nm)	-0.006237 u	ppm	0.000031	0.50	289.995000	Y 377.433
Fe (238.204 nm)	48.579937 o	ppm	0.303423	0.62	183008.295169	Y_R 377.433
Fe H (259.940 nm)	49.427700	ppm	0.263538	0.53	97111.800000	Y_R 377.433
K (766.491 nm)	0.163823	ppm	0.060354	36.84	-537.965000	Y_R2 488.368
Li (670.783 nm)	0.004974	ppm	0.000251	5.04	-989.710000	Y_R2 488.368
Mg (279.078 nm)	-0.012368 u	ppm	0.000646	5.22	-397.516000	Y 377.433
Mn (257.610 nm)	0.001380	ppm	0.000009	0.67	426.612000	Y 377.433
Mo (202.032 nm)	0.000126	ppm	0.000080	63.22	0.710783	Y 377.433
Na (589.592 nm)	230.519000 o	ppm	0.386480	0.17	1597910.000000	Y_R2 488.368
Na H (589.593 nm)	248.028618	ppm	3.206664	1.29	981568.723954	Y_R 488.368
Ni (231.604 nm)	0.001453	ppm	0.000623	42.89	15.360000	Y 377.433
P (213.618 nm)	-0.006011 u	ppm	0.000524	8.71	6.110300	Y 242.219
Pb (220.353 nm)	-0.001028 u	ppm	0.000958	93.19	18.661900	Y 242.219
S (181.972 nm)	4.885971	ppm	0.009511	0.19	2784.628621	Y 377.433
Sb (206.834 nm)	-0.003009 u	ppm	0.000650	21.58	-73.827600	Y 377.433
Se (196.026 nm)	-0.002543 u	ppm	0.003824	> 100.00	1.501990	Y 242.219
Si (288.158 nm)	0.020047	ppm	0.000627	3.13	1027.260000	Y 377.433
Sn (189.925 nm)	0.001918	ppm	0.000143	7.45	11.520900	Y 377.433
Sr (421.552 nm)	0.000517	ppm	0.000080	15.46	253.536589	Y_R 488.368
Th (288.505 nm)	4.952290	ppm	0.025184	0.51	14040.900000	Y 377.433
Ti (336.122 nm)	0.001642	ppm	0.000007	0.41	30.940500	Y 377.433
Tl (190.794 nm)	-0.002364 u	ppm	0.000428	18.09	-13.304300	Y 377.433
U (409.013 nm)	10.026800	ppm	0.010620	0.11	48527.300000	Y 377.433
V (292.401 nm)	0.003330	ppm	0.000035	1.04	-29.717900	Y 377.433
Zn (206.200 nm)	-0.002608 u	ppm	0.000398	15.25	2.147630	Y 377.433
Zr (343.823 nm)	-0.003891 u	ppm	0.000115	2.96	-393.823000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.055124	21567.031823	0.002060	0.20
Y 377.433	1.061745	1168400.677466	0.001789	0.17
Y_R 377.433	1.104720	85168.200000	0.004581	0.41
Y_R 488.368	1.112790	48629.500000	0.021043	1.89
Y_R2 488.368	1.147256	99510.051757	0.004169	0.36

Sample Name: CCV-5225154

Date: 7/26/2018 5:21:44 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.478787	ppm	0.000727	0.15	23717.100000	Y 377.433
Al (167.019 nm)	0.526648	ppm	0.009445	1.79	263.174000	Y_R 377.433
Al H (396.152 nm)	0.490327 u	ppm	0.004031	0.82	1429.133956	Y_R 377.433
As (188.980 nm)	0.968667	ppm	0.003050	0.31	1369.210000	Y 242.219
B (249.678 nm)	0.483591	ppm	0.000865	0.18	13492.000000	Y 242.219
Ba (493.408 nm)	0.495199	ppm	0.003760	0.76	59631.900000	Y_R 488.368
Be (234.861 nm)	0.470717	ppm	0.002220	0.47	152420.000000	Y_R 488.368
Bi (223.061 nm)	-0.003532 u	ppm	0.000452	12.79	5.144400	Y 377.433
Ca (315.887 nm)	4.948669	ppm	0.043579	0.88	4013.524772	Y_R 377.433
Cd (214.439 nm)	0.481100	ppm	0.001357	0.28	31780.200000	Y 377.433
Co (228.615 nm)	0.491492	ppm	0.002786	0.57	10190.100000	Y 242.219
Cr (205.560 nm)	0.483091	ppm	0.000195	0.04	8167.940000	Y 377.433
Cu (324.754 nm)	0.480180	ppm	0.000445	0.09	31546.900000	Y 377.433
Fe (238.204 nm)	2.506036	ppm	0.018937	0.76	9456.208641	Y_R 377.433
Fe H (259.940 nm)	2.404500 u	ppm	0.019338	0.80	5030.760000	Y_R 377.433
K (766.491 nm)	48.536000	ppm	0.132298	0.27	58112.900000	Y_R2 488.368
Li (670.783 nm)	0.967149	ppm	0.001191	0.12	32921.200000	Y_R2 488.368
Mg (279.078 nm)	18.900600	ppm	0.005338	0.03	115380.000000	Y 377.433
Mn (257.610 nm)	0.486664	ppm	0.001105	0.23	132114.000000	Y 377.433
Mo (202.032 nm)	0.488332	ppm	0.001009	0.21	4872.030000	Y 377.433
Na (589.592 nm)	4.868180	ppm	0.031814	0.65	35038.000000	Y_R2 488.368
Na H (589.593 nm)	5.460386 u	ppm	0.050239	0.92	26197.967001	Y_R 488.368
Ni (231.604 nm)	0.482112	ppm	0.000275	0.06	3751.430000	Y 377.433
P (213.618 nm)	0.940462	ppm	0.000112	0.01	2398.960000	Y 242.219
Pb (220.353 nm)	0.982588	ppm	0.004494	0.46	3124.130000	Y 242.219
S (181.972 nm)	0.047265	ppm	0.000121	0.26	51.851283	Y 377.433
Sb (206.834 nm)	0.974248	ppm	0.001176	0.12	2944.880000	Y 377.433
Se (196.026 nm)	0.965106	ppm	0.002479	0.26	1083.100000	Y 242.219
Si (288.158 nm)	4.868170	ppm	0.007762	0.16	45067.600000	Y 377.433
Sn (189.925 nm)	0.957937	ppm	0.001844	0.19	2248.500000	Y 377.433
Sr (421.552 nm)	0.492963	ppm	0.003610	0.73	106903.418519	Y_R 488.368
Th (288.505 nm)	0.003398 u	ppm	0.006359	> 100.00	98.758200	Y 377.433
Ti (336.122 nm)	0.496681	ppm	0.000999	0.20	71441.000000	Y 377.433
Tl (190.794 nm)	0.980704	ppm	0.001582	0.16	2488.570000	Y 377.433
U (409.013 nm)	0.002213	ppm	0.000627	28.32	-119.778000	Y 377.433
V (292.401 nm)	0.486133	ppm	0.000175	0.04	20821.700000	Y 377.433
Zn (206.200 nm)	0.477408	ppm	0.000866	0.18	2759.400000	Y 377.433
Zr (343.823 nm)	0.492189	ppm	0.000025	0.01	66980.200000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.052561	21514.642171	0.000356	0.03
Y 377.433	1.059663	1166108.546391	0.000366	0.03
Y_R 377.433	1.082290	83438.900000	0.005576	0.52
Y_R 488.368	1.090990	47676.800000	0.004779	0.44
Y_R2 488.368	1.109584	96242.481069	0.001602	0.14

Sample Name: CCB

Date: 7/26/2018 5:25:07 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000266 u	ppm	0.000119	44.80	-427.619000	Y 377.433
Al (167.019 nm)	-0.002077 u	ppm	0.000666	32.06	-1.251380	Y_R 377.433
Al H (396.152 nm)	-0.057929 u	ppm	0.001101	1.90	8.665730	Y_R 377.433
As (188.980 nm)	0.000121 u	ppm	0.002770	> 100.00	-3.536720	Y 242.219
B (249.678 nm)	0.001636	ppm	0.000068	4.16	109.244000	Y 242.219
Ba (493.408 nm)	-0.000521 u	ppm	0.000023	4.50	458.685000	Y_R 488.368
Be (234.861 nm)	0.000051	ppm	0.000003	6.48	-32.786300	Y_R 488.368
Bi (223.061 nm)	0.000188 u	ppm	0.000553	> 100.00	15.110500	Y 377.433
Ca (315.887 nm)	0.013088	ppm	0.003620	27.66	-64.949431	Y_R 377.433
Cd (214.439 nm)	0.000038	ppm	0.000043	> 100.00	-0.622780	Y 377.433
Co (228.615 nm)	0.000248	ppm	0.000293	> 100.00	-31.189800	Y 242.219
Cr (205.560 nm)	-0.000225 u	ppm	0.000076	33.70	-2.888470	Y 377.433
Cu (324.754 nm)	-0.000073 u	ppm	0.000043	58.52	314.119000	Y 377.433
Fe (238.204 nm)	0.000525	ppm	0.000424	80.88	18.399426	Y_R 377.433
Fe H (259.940 nm)	-0.158591 u	ppm	0.004874	3.07	11.708400	Y_R 377.433
K (766.491 nm)	0.091650	ppm	0.014743	16.09	-625.474000	Y_R2 488.368
Li (670.783 nm)	0.003757	ppm	0.000617	16.43	-1032.580000	Y_R2 488.368
Mg (279.078 nm)	0.000396 u	ppm	0.000776	> 100.00	49.110300	Y 377.433
Mn (257.610 nm)	-0.000012 u	ppm	0.000039	> 100.00	48.828000	Y 377.433
Mo (202.032 nm)	0.000285	ppm	0.000035	12.33	2.297990	Y 377.433
Na (589.592 nm)	0.026502	ppm	0.001330	5.02	429.626000	Y_R2 488.368
Na H (589.593 nm)	-0.134937 u	ppm	0.028699	21.27	3647.967041	Y_R 488.368
Ni (231.604 nm)	-0.000310 u	ppm	0.000127	41.09	-0.642070	Y 377.433
P (213.618 nm)	-0.001325 u	ppm	0.001287	97.11	17.957600	Y 242.219
Pb (220.353 nm)	-0.000015 u	ppm	0.000859	> 100.00	3.581620	Y 242.219
S (181.972 nm)	0.036708	ppm	0.003013	8.21	44.595593	Y 377.433
Sb (206.834 nm)	0.000015 u	ppm	0.000775	> 100.00	-16.868800	Y 377.433
Se (196.026 nm)	-0.003736 u	ppm	0.000318	8.50	10.025400	Y 242.219
Si (288.158 nm)	-0.005367 u	ppm	0.001142	21.27	796.397000	Y 377.433
Sn (189.925 nm)	0.000257 u	ppm	0.000393	> 100.00	7.633870	Y 377.433
Sr (421.552 nm)	-0.000052 u	ppm	0.000000	0.24	130.214554	Y_R 488.368
Th (288.505 nm)	0.002739	ppm	0.001445	52.75	80.145600	Y 377.433
Ti (336.122 nm)	0.000358	ppm	0.000027	7.41	-154.328000	Y 377.433
Tl (190.794 nm)	0.003727	ppm	0.000698	18.73	3.707890	Y 377.433
U (409.013 nm)	0.002716	ppm	0.002236	82.32	-78.524200	Y 377.433
V (292.401 nm)	-0.000217 u	ppm	0.000078	36.22	10.367500	Y 377.433
Zn (206.200 nm)	-0.002969 u	ppm	0.000131	4.42	0.071619	Y 377.433
Zr (343.823 nm)	-0.000023 u	ppm	0.000015	62.89	-15.268800	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.077400	22022.347631	0.001912	0.18
Y 377.433	1.091570	1201220.740283	0.002287	0.21
Y_R 377.433	1.106660	85317.500000	0.004750	0.43
Y_R 488.368	1.104630	48272.700000	0.006499	0.59
Y_R2 488.368	1.136481	98575.508310	0.002284	0.20

Sample Name: CCVL-5236949

Date: 7/26/2018 5:28:31 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.008975	ppm	0.000056	0.62	38.027600	Y 377.433
Al (167.019 nm)	0.105864	ppm	0.002414	2.28	52.482700	Y_R 377.433
Al H (396.152 nm)	0.045560 u	ppm	0.004443	9.75	270.569428	Y_R 377.433
As (188.980 nm)	0.015494	ppm	0.000634	4.09	18.249900	Y 242.219
B (249.678 nm)	0.094349	ppm	0.000428	0.45	2680.200000	Y 242.219
Ba (493.408 nm)	0.009294	ppm	0.000029	0.31	1630.160000	Y_R 488.368
Be (234.861 nm)	0.000956	ppm	0.000012	1.26	262.669000	Y_R 488.368
Bi (223.061 nm)	0.098207	ppm	0.001103	1.12	290.007000	Y 377.433
Ca (315.887 nm)	0.211352	ppm	0.010784	5.10	98.876192	Y_R 377.433
Cd (214.439 nm)	0.004818	ppm	0.000044	0.91	315.285000	Y 377.433
Co (228.615 nm)	0.010044	ppm	0.000032	0.32	172.592000	Y 242.219
Cr (205.560 nm)	0.009425	ppm	0.000152	1.61	160.302000	Y 377.433
Cu (324.754 nm)	0.014120	ppm	0.000143	1.01	1234.950000	Y 377.433
Fe (238.204 nm)	0.101086	ppm	0.000351	0.35	397.196807	Y_R 377.433
Fe H (259.940 nm)	-0.061256 u	ppm	0.000543	0.89	202.309000	Y_R 377.433
K (766.491 nm)	3.081640	ppm	0.059800	1.94	2999.870000	Y_R2 488.368
Li (670.783 nm)	0.022293	ppm	0.000577	2.59	-379.302000	Y_R2 488.368
Mg (279.078 nm)	0.186226	ppm	0.000608	0.33	1181.590000	Y 377.433
Mn (257.610 nm)	0.009857	ppm	0.000013	0.13	2726.770000	Y 377.433
Mo (202.032 nm)	0.017927	ppm	0.000350	1.95	178.320000	Y 377.433
Na (589.592 nm)	1.012340	ppm	0.001394	0.14	7283.360000	Y_R2 488.368
Na H (589.593 nm)	0.809673 u	ppm	0.013129	1.62	7380.386745	Y_R 488.368
Ni (231.604 nm)	0.038038	ppm	0.000355	0.93	297.515000	Y 377.433
P (213.618 nm)	2.639180 o	ppm	0.015250	0.58	6693.610000	Y 242.219
Pb (220.353 nm)	0.008802	ppm	0.001285	14.60	31.634800	Y 242.219
S (181.972 nm)	0.120273	ppm	0.001677	1.39	91.839148	Y 377.433
Sb (206.834 nm)	0.018424	ppm	0.001494	8.11	38.935600	Y 377.433
Se (196.026 nm)	0.014937	ppm	0.001454	9.74	30.697500	Y 242.219
Si (288.158 nm)	0.470495	ppm	0.000415	0.09	5119.130000	Y 377.433
Sn (189.925 nm)	0.092131	ppm	0.001503	1.63	222.609000	Y 377.433
Sr (421.552 nm)	0.009811	ppm	0.000096	0.98	2266.308869	Y_R 488.368
Th (288.505 nm)	0.014161	ppm	0.001411	9.97	113.436000	Y 377.433
Ti (336.122 nm)	0.009971	ppm	0.000021	0.21	1232.540000	Y 377.433
Tl (190.794 nm)	0.015298	ppm	0.000046	0.30	33.101200	Y 377.433
U (409.013 nm)	0.063036	ppm	0.000244	0.39	212.565000	Y 377.433
V (292.401 nm)	0.009239	ppm	0.000198	2.14	412.126000	Y 377.433
Zn (206.200 nm)	0.016701	ppm	0.000545	3.27	113.056000	Y 377.433
Zr (343.823 nm)	0.014470	ppm	0.000033	0.23	1957.480000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.072140	21914.834534	0.003526	0.33
Y 377.433	1.080792	1189361.073461	0.004640	0.43
Y_R 377.433	1.092260	84207.300000	0.006927	0.63
Y_R 488.368	1.096030	47897.200000	0.008286	0.76
Y_R2 488.368	1.125847	97653.153356	0.007622	0.68

Sample Name: MB 280-423573/1-A

Date: 7/26/2018 5:31:54 PM Rack:Tube: 1:65

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000004 u	ppm	0.000174	> 100.00	-414.362000	Y 377.433
Al (167.019 nm)	0.004433	ppm	0.000206	4.65	1.986830	Y_R 377.433
Al H (396.152 nm)	-0.053198 u	ppm	0.003406	6.40	20.567598	Y_R 377.433
As (188.980 nm)	0.000001 u	ppm	0.000561	> 100.00	-3.707170	Y 242.219
B (249.678 nm)	0.000835	ppm	0.000183	21.92	87.036000	Y 242.219
Ba (493.408 nm)	-0.000377 u	ppm	0.000309	82.01	475.897000	Y_R 488.368
Be (234.861 nm)	0.000032	ppm	0.000002	6.07	-39.017200	Y_R 488.368
Bi (223.061 nm)	0.000593	ppm	0.000331	55.74	16.248200	Y 377.433
Ca (315.887 nm)	0.019988	ppm	0.008573	42.89	-59.248111	Y_R 377.433
Cd (214.439 nm)	0.000094	ppm	0.000068	72.67	3.091590	Y 377.433
Co (228.615 nm)	0.000483	ppm	0.000051	10.49	-26.310800	Y 242.219
Cr (205.560 nm)	-0.000148 u	ppm	0.000106	71.26	-1.583320	Y 377.433
Cu (324.754 nm)	0.000092	ppm	0.000098	> 100.00	325.435000	Y 377.433
Fe (238.204 nm)	0.002246	ppm	0.000984	43.83	24.881355	Y_R 377.433
Fe H (259.940 nm)	-0.156668 nu	ppm	0.002200	1.40	15.472900	Y_R 377.433
K (766.491 nm)	0.090400	ppm	0.015451	17.09	-626.991000	Y_R2 488.368
Li (670.783 nm)	0.003749	ppm	0.000650	17.33	-1032.850000	Y_R2 488.368
Mg (279.078 nm)	-0.000634 u	ppm	0.000051	7.99	42.894200	Y 377.433
Mn (257.610 nm)	0.000037	ppm	0.000015	41.06	62.063100	Y 377.433
Mo (202.032 nm)	-0.000050 u	ppm	0.000167	> 100.00	-1.044160	Y 377.433
Na (589.592 nm)	0.023358	ppm	0.011417	48.88	408.495000	Y_R2 488.368
Na H (589.593 nm)	-0.282370 u	ppm	0.030907	10.95	3067.298638	Y_R 488.368
Ni (231.604 nm)	-0.000395 u	ppm	0.000062	15.77	-1.304130	Y 377.433
P (213.618 nm)	-0.001682 u	ppm	0.000905	53.81	17.056400	Y 242.219
Pb (220.353 nm)	0.000668	ppm	0.000350	52.38	5.743820	Y 242.219
S (181.972 nm)	0.026306	ppm	0.002720	10.34	38.717958	Y 377.433
Sb (206.834 nm)	-0.000215 u	ppm	0.000049	22.75	-17.554700	Y 377.433
Se (196.026 nm)	-0.002601 u	ppm	0.003669	> 100.00	11.282100	Y 242.219
Si (288.158 nm)	-0.005974 u	ppm	0.000531	8.89	790.890000	Y 377.433
Sn (189.925 nm)	0.000584	ppm	0.000655	> 100.00	8.399550	Y 377.433
Sr (421.552 nm)	-0.000025 u	ppm	0.000103	> 100.00	136.184134	Y_R 488.368
Th (288.505 nm)	0.001137 u	ppm	0.001726	> 100.00	75.644100	Y 377.433
Ti (336.122 nm)	0.000382	ppm	0.000074	19.27	-150.936000	Y 377.433
Tl (190.794 nm)	0.001512	ppm	0.000406	26.83	-1.930140	Y 377.433
U (409.013 nm)	0.003380	ppm	0.002850	84.31	-75.301700	Y 377.433
V (292.401 nm)	0.000035 u	ppm	0.000080	> 100.00	21.524300	Y 377.433
Zn (206.200 nm)	-0.002423 u	ppm	0.000046	1.90	3.209150	Y 377.433
Zr (343.823 nm)	-0.000031 u	ppm	0.000070	> 100.00	-16.332000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.072371	21919.571811	0.001178	0.11
Y 377.433	1.084122	1193025.262140	0.000597	0.06
Y_R 377.433	1.095420	84450.900000	0.003037	0.28
Y_R 488.368	1.105040	48290.900000	0.010716	0.97
Y_R2 488.368	1.124239	97513.602038	0.005065	0.45

Sample Name: LCS 280-423573/2-A

Date: 7/26/2018 5:35:17 PM Rack:Tube: 1:66

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.049211	ppm	0.000303	0.62	2036.470000	Y 377.433
Al (167.019 nm)	1.979540	ppm	0.029675	1.50	984.698000	Y_R 377.433
Al H (396.152 nm)	1.998054	ppm	0.028990	1.45	5277.958707	Y_R 377.433
As (188.980 nm)	0.993024	ppm	0.000337	0.03	1403.740000	Y 242.219
B (249.678 nm)	0.979447	ppm	0.001690	0.17	27242.600000	Y 242.219
Ba (493.408 nm)	1.987360 o	ppm	0.016861	0.85	237706.000000	Y_R 488.368
Be (234.861 nm)	0.047244	ppm	0.000520	1.10	15223.900000	Y_R 488.368
Bi (223.061 nm)	1.951510	ppm	0.004114	0.21	5487.440000	Y 377.433
Ca (315.887 nm)	48.207674 o	ppm	0.601487	1.25	39757.536938	Y_R 377.433
Cd (214.439 nm)	0.094417	ppm	0.000308	0.33	6235.360000	Y 377.433
Co (228.615 nm)	0.474621	ppm	0.001610	0.34	9859.090000	Y 242.219
Cr (205.560 nm)	0.192910	ppm	0.000725	0.38	3262.020000	Y 377.433
Cu (324.754 nm)	0.237293	ppm	0.000850	0.36	15779.600000	Y 377.433
Fe (238.204 nm)	0.988273	ppm	0.009884	1.00	3739.069178	Y_R 377.433
Fe H (259.940 nm)	0.836088 nu	ppm	0.019821	2.37	1959.490000	Y_R 377.433
K (766.491 nm)	49.040600	ppm	0.333784	0.68	58724.700000	Y_R2 488.368
Li (670.783 nm)	0.970107	ppm	0.006840	0.71	33025.500000	Y_R2 488.368
Mg (279.078 nm)	47.479800 o	ppm	0.110466	0.23	289726.000000	Y 377.433
Mn (257.610 nm)	0.480688	ppm	0.000713	0.15	130492.000000	Y 377.433
Mo (202.032 nm)	0.943305	ppm	0.002320	0.25	9411.760000	Y 377.433
Na (589.592 nm)	48.011500 o	ppm	0.431128	0.90	337211.000000	Y_R2 488.368
Na H (589.593 nm)	51.479170	ppm	0.464934	0.90	209044.706988	Y_R 488.368
Ni (231.604 nm)	0.464663	ppm	0.000313	0.07	3617.060000	Y 377.433
P (213.618 nm)	9.541270 o	ppm	0.015558	0.16	24143.300000	Y 242.219
Pb (220.353 nm)	0.497877	ppm	0.000950	0.19	1586.920000	Y 242.219
S (181.972 nm)	1.966301	ppm	0.003545	0.18	1136.167752	Y 377.433
Sb (206.834 nm)	0.496161	ppm	0.000795	0.16	1479.170000	Y 377.433
Se (196.026 nm)	1.940590	ppm	0.007367	0.38	2163.980000	Y 242.219
Si (288.158 nm)	9.744460	ppm	0.008528	0.09	89363.800000	Y 377.433
Sn (189.925 nm)	1.877340	ppm	0.009848	0.52	4399.790000	Y 377.433
Sr (421.552 nm)	0.979776	ppm	0.006090	0.62	212333.413102	Y_R 488.368
Th (288.505 nm)	1.017440	ppm	0.001186	0.12	2970.340000	Y 377.433
Ti (336.122 nm)	0.978034	ppm	0.002475	0.25	141000.000000	Y 377.433
Tl (190.794 nm)	1.984560	ppm	0.004258	0.21	5039.840000	Y 377.433
U (409.013 nm)	2.074870	ppm	0.006309	0.30	9910.800000	Y 377.433
V (292.401 nm)	0.487695	ppm	0.001344	0.28	20934.300000	Y 377.433
Zn (206.200 nm)	0.463372	ppm	0.000925	0.20	2678.780000	Y 377.433
Zr (343.823 nm)	0.481182	ppm	0.001349	0.28	65477.500000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.036017	21176.475341	0.000754	0.07
Y 377.433	1.048664	1154004.878630	0.002033	0.19
Y_R 377.433	1.078880	83175.600000	0.013301	1.23
Y_R 488.368	1.087600	47528.400000	0.011391	1.05
Y_R2 488.368	1.105409	95880.347436	0.003626	0.33

Sample Name: LCSD 280-423573/3-A

Date: 7/26/2018 5:38:40 PM Rack:Tube: 1:67

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.048743	ppm	0.000114	0.23	2014.500000	Y 377.433
Al (167.019 nm)	1.957830	ppm	0.029663	1.52	973.898000	Y_R 377.433
Al H (396.152 nm)	1.972351	ppm	0.018792	0.95	5212.964538	Y_R 377.433
As (188.980 nm)	0.970789	ppm	0.006234	0.64	1372.230000	Y 242.219
B (249.678 nm)	0.978296	ppm	0.002435	0.25	27210.500000	Y 242.219
Ba (493.408 nm)	1.971750 o	ppm	0.010958	0.56	235842.000000	Y_R 488.368
Be (234.861 nm)	0.046397	ppm	0.000211	0.45	14949.500000	Y_R 488.368
Bi (223.061 nm)	1.931520	ppm	0.003754	0.19	5431.390000	Y 377.433
Ca (315.887 nm)	47.720930 o	ppm	0.389539	0.82	39355.347312	Y_R 377.433
Cd (214.439 nm)	0.093378	ppm	0.000075	0.08	6166.740000	Y 377.433
Co (228.615 nm)	0.471642	ppm	0.001071	0.23	9797.230000	Y 242.219
Cr (205.560 nm)	0.190023	ppm	0.002168	1.14	3213.180000	Y 377.433
Cu (324.754 nm)	0.234883	ppm	0.000227	0.10	15622.700000	Y 377.433
Fe (238.204 nm)	0.985227	ppm	0.008013	0.81	3727.595735	Y_R 377.433
Fe H (259.940 nm)	0.832589 nu	ppm	0.007461	0.90	1952.640000	Y_R 377.433
K (766.491 nm)	48.522400	ppm	0.185960	0.38	58096.400000	Y_R2 488.368
Li (670.783 nm)	0.960782	ppm	0.004390	0.46	32696.800000	Y_R2 488.368
Mg (279.078 nm)	46.959600 o	ppm	0.109038	0.23	286552.000000	Y 377.433
Mn (257.610 nm)	0.475838	ppm	0.001006	0.21	129176.000000	Y 377.433
Mo (202.032 nm)	0.942055	ppm	0.001103	0.12	9399.290000	Y 377.433
Na (589.592 nm)	47.332700 o	ppm	0.387804	0.82	332473.000000	Y_R2 488.368
Na H (589.593 nm)	51.149937	ppm	0.144774	0.28	207731.524795	Y_R 488.368
Ni (231.604 nm)	0.459369	ppm	0.001229	0.27	3575.890000	Y 377.433
P (213.618 nm)	9.451510 o	ppm	0.007685	0.08	23916.400000	Y 242.219
Pb (220.353 nm)	0.492580	ppm	0.001410	0.29	1570.030000	Y 242.219
S (181.972 nm)	1.941300	ppm	0.007127	0.37	1122.028669	Y 377.433
Sb (206.834 nm)	0.496421	ppm	0.000365	0.07	1479.940000	Y 377.433
Se (196.026 nm)	1.918100	ppm	0.001774	0.09	2139.070000	Y 242.219
Si (288.158 nm)	9.759370	ppm	0.021045	0.22	89499.200000	Y 377.433
Sn (189.925 nm)	1.881390	ppm	0.008125	0.43	4409.280000	Y 377.433
Sr (421.552 nm)	0.972527	ppm	0.004028	0.41	210763.438043	Y_R 488.368
Th (288.505 nm)	1.003810	ppm	0.000561	0.06	2931.670000	Y 377.433
Ti (336.122 nm)	0.977617	ppm	0.001858	0.19	140938.000000	Y 377.433
Tl (190.794 nm)	1.971150	ppm	0.001027	0.05	5005.690000	Y 377.433
U (409.013 nm)	2.052390	ppm	0.005108	0.25	9801.990000	Y 377.433
V (292.401 nm)	0.482449	ppm	0.000242	0.05	20709.800000	Y 377.433
Zn (206.200 nm)	0.457683	ppm	0.002362	0.52	2646.100000	Y 377.433
Zr (343.823 nm)	0.480892	ppm	0.000656	0.14	65438.100000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.035463	21165.157149	0.002375	0.23
Y 377.433	1.050112	1155599.054157	0.002872	0.27
Y_R 377.433	1.089360	83983.600000	0.010395	0.95
Y_R 488.368	1.097790	47974.000000	0.006641	0.60
Y_R2 488.368	1.117752	96950.933289	0.002554	0.23

Sample Name: 280-112332-C-5-A

Date: 7/26/2018 5:42:02 PM Rack:Tube: 1:68

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000352	ppm	0.000102	29.00	-396.603000	Y 377.433
Al (167.019 nm)	-0.000242 u	ppm	0.000761	> 100.00	22.430700	Y_R 377.433
Al H (396.152 nm)	-0.042590 u	ppm	0.000046	0.11	59.769463	Y_R 377.433
As (188.980 nm)	0.030264	ppm	0.002352	7.77	38.807100	Y 242.219
B (249.678 nm)	0.555976	ppm	0.001420	0.26	15416.600000	Y 242.219
Ba (493.408 nm)	5.440340 o	ppm	0.043491	0.80	649827.000000	Y_R 488.368
Be (234.861 nm)	-0.000027 u	ppm	0.000053	> 100.00	1226.770000	Y_R 488.368
Bi (223.061 nm)	-0.002991 u	ppm	0.001086	36.32	13.152100	Y 377.433
Ca (315.887 nm)	28.697581 o	ppm	0.226701	0.79	23636.598321	Y_R 377.433
Cd (214.439 nm)	-0.000145 u	ppm	0.000040	27.41	27.657900	Y 377.433
Co (228.615 nm)	0.009842	ppm	0.000063	0.64	168.037000	Y 242.219
Cr (205.560 nm)	0.002042	ppm	0.000109	5.32	23.854400	Y 377.433
Cu (324.754 nm)	0.001017	ppm	0.000101	9.96	408.305000	Y 377.433
Fe (238.204 nm)	37.589685 o	ppm	0.345318	0.92	141609.993019	Y_R 377.433
Fe H (259.940 nm)	38.295900 n	ppm	0.327613	0.86	75313.400000	Y_R 377.433
K (766.491 nm)	2.043330	ppm	0.001225	0.06	1740.930000	Y_R2 488.368
Li (670.783 nm)	0.042000	ppm	0.001048	2.50	315.255000	Y_R2 488.368
Mg (279.078 nm)	103.698000 o	ppm	0.012699	0.01	632781.000000	Y 377.433
Mn (257.610 nm)	1.006070	ppm	0.000801	0.08	273060.000000	Y 377.433
Mo (202.032 nm)	0.000034 u	ppm	0.000074	> 100.00	-0.212924	Y 377.433
Na (589.592 nm)	174.393000 o	ppm	1.565080	0.90	1220430.000000	Y_R2 488.368
Na H (589.593 nm)	187.439089	ppm	0.872154	0.47	748293.129368	Y_R 488.368
Ni (231.604 nm)	0.016883	ppm	0.000004	0.02	134.811000	Y 377.433
P (213.618 nm)	0.212407	ppm	0.001684	0.79	558.310000	Y 242.219
Pb (220.353 nm)	0.001052	ppm	0.000573	54.46	10.590600	Y 242.219
S (181.972 nm)	0.460920	ppm	0.005964	1.29	286.959980	Y 377.433
Sb (206.834 nm)	-0.001887 u	ppm	0.000531	28.12	-32.477600	Y 377.433
Se (196.026 nm)	-0.001826 u	ppm	0.002453	> 100.00	4.800140	Y 242.219
Si (288.158 nm)	17.110900 o	ppm	0.067579	0.39	156281.000000	Y 377.433
Sn (189.925 nm)	0.002260	ppm	0.000940	41.60	12.319900	Y 377.433
Sr (421.552 nm)	1.297683 o	ppm	0.012602	0.97	281183.251555	Y_R 488.368
Th (288.505 nm)	0.010105	ppm	0.000004	0.04	120.103000	Y 377.433
Ti (336.122 nm)	0.000562	ppm	0.000077	13.66	-33.780700	Y 377.433
Tl (190.794 nm)	0.003898	ppm	0.001591	40.83	3.017050	Y 377.433
U (409.013 nm)	-0.005387 u	ppm	0.001727	32.05	-86.113900	Y 377.433
V (292.401 nm)	0.000023 u	ppm	0.000151	> 100.00	22.050700	Y 377.433
Zn (206.200 nm)	0.002593	ppm	0.000102	3.94	32.021400	Y 377.433
Zr (343.823 nm)	-0.000054 u	ppm	0.000051	95.01	94.831300	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.042598	21311.000647	0.001537	0.15
Y 377.433	1.069769	1177230.478619	0.003330	0.31
Y_R 377.433	1.122350	86527.300000	0.006900	0.61
Y_R 488.368	1.131980	49468.100000	0.006006	0.53
Y_R2 488.368	1.170868	101558.081041	0.001529	0.13

Sample Name: 280-112332-C-5-Asd@5

Date: 7/26/2018 5:45:25 PM Rack:Tube: 1:69

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000061	ppm	0.000038	62.77	-411.166000	Y 377.433
Al (167.019 nm)	0.001352	ppm	0.000851	62.94	5.093400	Y_R 377.433
Al H (396.152 nm)	-0.050450 u	ppm	0.007959	15.78	30.024229	Y_R 377.433
As (188.980 nm)	0.006169	ppm	0.001064	17.25	4.957590	Y 242.219
B (249.678 nm)	0.108004	ppm	0.000040	0.04	3045.640000	Y 242.219
Ba (493.408 nm)	1.091160	ppm	0.006327	0.58	130751.000000	Y_R 488.368
Be (234.861 nm)	0.000032	ppm	0.000011	34.87	222.829000	Y_R 488.368
Bi (223.061 nm)	-0.001168 u	ppm	0.000085	7.32	12.726900	Y 377.433
Ca (315.887 nm)	5.868591	ppm	0.033227	0.57	4773.360762	Y_R 377.433
Cd (214.439 nm)	-0.000041 u	ppm	0.000043	> 100.00	2.412190	Y 377.433
Co (228.615 nm)	0.002082	ppm	0.000034	1.63	6.885420	Y 242.219
Cr (205.560 nm)	0.000285	ppm	0.000122	42.61	3.380990	Y 377.433
Cu (324.754 nm)	0.000405	ppm	0.000125	30.77	349.030000	Y 377.433
Fe (238.204 nm)	7.653419 o	ppm	0.041473	0.54	28845.473257	Y_R 377.433
Fe H (259.940 nm)	7.655000 n	ppm	0.043634	0.57	15312.300000	Y_R 377.433
K (766.491 nm)	0.476859	ppm	0.000207	0.04	-158.412000	Y_R2 488.368
Li (670.783 nm)	0.010239	ppm	0.000793	7.74	-804.146000	Y_R2 488.368
Mg (279.078 nm)	20.511800	ppm	0.055145	0.27	125203.000000	Y 377.433
Mn (257.610 nm)	0.205485	ppm	0.000693	0.34	55812.800000	Y 377.433
Mo (202.032 nm)	-0.000086 u	ppm	0.000049	56.60	-1.410730	Y 377.433
Na (589.592 nm)	35.516100 o	ppm	0.081059	0.23	248711.000000	Y_R2 488.368
Na H (589.593 nm)	37.597873	ppm	0.155196	0.41	153440.187869	Y_R 488.368
Ni (231.604 nm)	0.003004	ppm	0.000024	0.80	25.478700	Y 377.433
P (213.618 nm)	0.039572	ppm	0.000512	1.29	121.354000	Y 242.219
Pb (220.353 nm)	-0.000119 u	ppm	0.001140	> 100.00	3.980670	Y 242.219
S (181.972 nm)	0.101701	ppm	0.002104	2.07	81.863677	Y 377.433
Sb (206.834 nm)	-0.000855 u	ppm	0.001319	> 100.00	-21.503600	Y 377.433
Se (196.026 nm)	-0.000508 u	ppm	0.001566	> 100.00	12.105400	Y 242.219
Si (288.158 nm)	3.344990	ppm	0.014302	0.43	31231.000000	Y 377.433
Sn (189.925 nm)	0.000005 u	ppm	0.000628	> 100.00	7.044720	Y 377.433
Sr (421.552 nm)	0.260355	ppm	0.001654	0.64	56527.086134	Y_R 488.368
Th (288.505 nm)	0.001748	ppm	0.000512	29.29	81.335300	Y 377.433
Ti (336.122 nm)	0.000356	ppm	0.000059	16.49	-136.118000	Y 377.433
Tl (190.794 nm)	0.001434	ppm	0.000419	29.21	-2.360700	Y 377.433
U (409.013 nm)	0.001867	ppm	0.000012	0.62	-76.170200	Y 377.433
V (292.401 nm)	-0.000163 u	ppm	0.000283	> 100.00	12.629600	Y 377.433
Zn (206.200 nm)	-0.001515 u	ppm	0.000305	20.15	8.424250	Y 377.433
Zr (343.823 nm)	-0.000018 u	ppm	0.000075	> 100.00	8.668870	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.067864	21827.440596	0.002904	0.27
Y 377.433	1.083734	1192598.029511	0.002291	0.21
Y_R 377.433	1.098740	84706.700000	0.004559	0.41
Y_R 488.368	1.107680	48405.900000	0.004447	0.40
Y_R2 488.368	1.118560	97021.025954	0.002631	0.24

Sample Name: 280-112332-C-5-B MS

Date: 7/26/2018 5:48:47 PM Rack:Tube: 1:70

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.051765	ppm	0.000051	0.10	2167.680000	Y 377.433
Al (167.019 nm)	1.928150	ppm	0.030358	1.57	981.663000	Y_R 377.433
Al H (396.152 nm)	2.035570	ppm	0.022215	1.09	5384.854601	Y_R 377.433
As (188.980 nm)	1.050390	ppm	0.009475	0.90	1484.680000	Y 242.219
B (249.678 nm)	1.598830 o	ppm	0.002465	0.15	44354.600000	Y 242.219
Ba (493.408 nm)	7.459800 o	ppm	0.056109	0.75	890842.000000	Y_R 488.368
Be (234.861 nm)	0.045672	ppm	0.000862	1.89	15985.400000	Y_R 488.368
Bi (223.061 nm)	2.000720	ppm	0.001667	0.08	5632.320000	Y 377.433
Ca (315.887 nm)	75.464396 o	ppm	0.406192	0.54	62279.337842	Y_R 377.433
Cd (214.439 nm)	0.091471	ppm	0.000248	0.27	6080.660000	Y 377.433
Co (228.615 nm)	0.492157	ppm	0.000179	0.04	10224.700000	Y 242.219
Cr (205.560 nm)	0.193205	ppm	0.000664	0.34	3255.540000	Y 377.433
Cu (324.754 nm)	0.252935	ppm	0.000054	0.02	16813.500000	Y 377.433
Fe (238.204 nm)	38.132950 o	ppm	0.291625	0.76	143656.374513	Y_R 377.433
Fe H (259.940 nm)	39.005300 n	ppm	0.212648	0.55	76702.600000	Y_R 377.433
K (766.491 nm)	52.702200	ppm	0.207967	0.39	63164.400000	Y_R2 488.368
Li (670.783 nm)	1.043260	ppm	0.006590	0.63	35603.800000	Y_R2 488.368
Mg (279.078 nm)	150.972000 o	ppm	0.116238	0.08	921201.000000	Y 377.433
Mn (257.610 nm)	1.467220 o	ppm	0.004194	0.29	398200.000000	Y 377.433
Mo (202.032 nm)	0.951977	ppm	0.004067	0.43	9498.280000	Y 377.433
Na (589.592 nm)	222.681000 o	ppm	2.659190	1.19	1559390.000000	Y_R2 488.368
Na H (589.593 nm)	242.304582	ppm	2.480115	1.02	966537.607425	Y_R 488.368
Ni (231.604 nm)	0.478445	ppm	0.000274	0.06	3725.900000	Y 377.433
P (213.618 nm)	9.965620 o	ppm	0.009920	0.10	25216.200000	Y 242.219
Pb (220.353 nm)	0.496895	ppm	0.001047	0.21	1587.600000	Y 242.219
S (181.972 nm)	2.470166	ppm	0.004232	0.17	1423.489098	Y 377.433
Sb (206.834 nm)	0.508053	ppm	0.000077	0.02	1504.900000	Y 377.433
Se (196.026 nm)	2.016360	ppm	0.001149	0.06	2240.630000	Y 242.219
Si (288.158 nm)	27.025200 o	ppm	0.357311	1.32	246342.000000	Y 377.433
Sn (189.925 nm)	1.855560	ppm	0.015794	0.85	4348.830000	Y 377.433
Sr (421.552 nm)	2.288943 o	ppm	0.011151	0.49	495862.178655	Y_R 488.368
Th (288.505 nm)	1.034300	ppm	0.006457	0.62	3038.180000	Y 377.433
Ti (336.122 nm)	1.015320	ppm	0.001635	0.16	146464.000000	Y 377.433
Tl (190.794 nm)	1.931120	ppm	0.006460	0.33	4902.550000	Y 377.433
U (409.013 nm)	2.141490	ppm	0.012688	0.59	10263.400000	Y 377.433
V (292.401 nm)	0.486718	ppm	0.001411	0.29	20889.600000	Y 377.433
Zn (206.200 nm)	0.450388	ppm	0.002214	0.49	2604.200000	Y 377.433
Zr (343.823 nm)	0.499730	ppm	0.001159	0.23	68114.900000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.029889	21051.218261	0.004604	0.45
Y 377.433	1.063213	1170015.293967	0.008860	0.83
Y_R 377.433	1.132520	87311.200000	0.011286	1.00
Y_R 488.368	1.139440	49794.200000	0.011964	1.05
Y_R2 488.368	1.168633	101364.289301	0.009067	0.78

Sample Name: 280-112332-C-5-C MSD

Date: 7/26/2018 5:52:10 PM Rack:Tube: 1:71

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.051730	ppm	0.000303	0.59	2165.760000	Y 377.433
Al (167.019 nm)	1.925200	ppm	0.011940	0.62	980.356000	Y_R 377.433
Al H (396.152 nm)	2.014595	ppm	0.016522	0.82	5331.513575	Y_R 377.433
As (188.980 nm)	1.039660	ppm	0.006398	0.62	1469.470000	Y 242.219
B (249.678 nm)	1.593130 o	ppm	0.008707	0.55	44195.900000	Y 242.219
Ba (493.408 nm)	7.423370 o	ppm	0.085490	1.15	886495.000000	Y_R 488.368
Be (234.861 nm)	0.045280	ppm	0.000131	0.29	15867.900000	Y_R 488.368
Bi (223.061 nm)	1.994590	ppm	0.010395	0.52	5615.200000	Y 377.433
Ca (315.887 nm)	75.370000 o	ppm	0.580877	0.77	62201.339961	Y_R 377.433
Cd (214.439 nm)	0.091194	ppm	0.000215	0.24	6062.670000	Y 377.433
Co (228.615 nm)	0.486114	ppm	0.002451	0.50	10098.900000	Y 242.219
Cr (205.560 nm)	0.192889	ppm	0.000242	0.13	3250.140000	Y 377.433
Cu (324.754 nm)	0.251306	ppm	0.001307	0.52	16709.100000	Y 377.433
Fe (238.204 nm)	38.418515 o	ppm	0.255565	0.67	144732.045663	Y_R 377.433
Fe H (259.940 nm)	39.278900 n	ppm	0.245817	0.63	77238.300000	Y_R 377.433
K (766.491 nm)	52.428300	ppm	0.118680	0.23	62832.300000	Y_R2 488.368
Li (670.783 nm)	1.035710	ppm	0.006916	0.67	35337.600000	Y_R2 488.368
Mg (279.078 nm)	152.840000 o	ppm	0.411023	0.27	932601.000000	Y 377.433
Mn (257.610 nm)	1.481290 o	ppm	0.003750	0.25	402017.000000	Y 377.433
Mo (202.032 nm)	0.945233	ppm	0.002934	0.31	9431.000000	Y 377.433
Na (589.592 nm)	223.791000 o	ppm	0.472682	0.21	1567010.000000	Y_R2 488.368
Na H (589.593 nm)	240.726601	ppm	4.252606	1.77	960283.648587	Y_R 488.368
Ni (231.604 nm)	0.478685	ppm	0.001259	0.26	3727.780000	Y 377.433
P (213.618 nm)	9.907280 o	ppm	0.059311	0.60	25068.700000	Y 242.219
Pb (220.353 nm)	0.491779	ppm	0.004882	0.99	1571.340000	Y 242.219
S (181.972 nm)	2.454865	ppm	0.007844	0.32	1414.881760	Y 377.433
Sb (206.834 nm)	0.501505	ppm	0.003368	0.67	1485.120000	Y 377.433
Se (196.026 nm)	1.984900	ppm	0.007857	0.40	2205.740000	Y 242.219
Si (288.158 nm)	27.220100 o	ppm	0.123876	0.46	248112.000000	Y 377.433
Sn (189.925 nm)	1.848430	ppm	0.008482	0.46	4332.160000	Y 377.433
Sr (421.552 nm)	2.257937 o	ppm	0.047226	2.09	489147.143617	Y_R 488.368
Th (288.505 nm)	1.033510	ppm	0.006287	0.61	3035.790000	Y 377.433
Ti (336.122 nm)	1.006820	ppm	0.002479	0.25	145237.000000	Y 377.433
Tl (190.794 nm)	1.927490	ppm	0.008241	0.43	4893.330000	Y 377.433
U (409.013 nm)	2.121900	ppm	0.004878	0.23	10169.100000	Y 377.433
V (292.401 nm)	0.485241	ppm	0.001628	0.34	20827.100000	Y 377.433
Zn (206.200 nm)	0.449250	ppm	0.000971	0.22	2597.660000	Y 377.433
Zr (343.823 nm)	0.495960	ppm	0.001596	0.32	67602.500000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.022090	20891.800695	0.001080	0.11
Y 377.433	1.050765	1156317.127300	0.000693	0.07
Y_R 377.433	1.122980	86575.400000	0.001054	0.09
Y_R 488.368	1.134250	49567.300000	0.000497	0.04
Y_R2 488.368	1.157650	100411.644938	0.002786	0.24

Sample Name: 280-112332-C-5-Apds

Date: 7/26/2018 5:55:33 PM Rack:Tube: 1:72

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.050286	ppm	0.000007	0.01	2107.120000	Y 377.433
Al (167.019 nm)	0.966685	ppm	0.019242	1.99	503.567000	Y_R 377.433
Al H (396.152 nm)	0.941711	ppm	0.011355	1.21	2548.216773	Y_R 377.433
As (188.980 nm)	0.226774	ppm	0.001767	0.78	317.326000	Y 242.219
B (249.678 nm)	0.649705	ppm	0.000739	0.11	18016.800000	Y 242.219
Ba (493.408 nm)	5.374090 o	ppm	0.130939	2.44	641925.000000	Y_R 488.368
Be (234.861 nm)	0.043302	ppm	0.000718	1.66	15272.600000	Y_R 488.368
Bi (223.061 nm)	-0.005134 u	ppm	0.000740	14.42	7.246080	Y 377.433
Ca (315.887 nm)	47.079005 o	ppm	0.706757	1.50	38824.906960	Y_R 377.433
Cd (214.439 nm)	0.044740	ppm	0.000084	0.19	2993.250000	Y 377.433
Co (228.615 nm)	0.056621	ppm	0.000208	0.37	1141.410000	Y 242.219
Cr (205.560 nm)	0.048323	ppm	0.000160	0.33	806.221000	Y 377.433
Cu (324.754 nm)	0.049934	ppm	0.000086	0.17	3577.910000	Y 377.433
Fe (238.204 nm)	38.113500 o	ppm	0.433355	1.14	143583.110683	Y_R 377.433
Fe H (259.940 nm)	38.829300 n	ppm	0.398409	1.03	76357.900000	Y_R 377.433
K (766.491 nm)	21.435200	ppm	0.025347	0.12	25253.500000	Y_R2 488.368
Li (670.783 nm)	0.137985	ppm	0.000594	0.43	3698.160000	Y_R2 488.368
Mg (279.078 nm)	120.228000 o	ppm	0.307768	0.26	733633.000000	Y 377.433
Mn (257.610 nm)	1.028000	ppm	0.000195	0.02	279012.000000	Y 377.433
Mo (202.032 nm)	0.045814	ppm	0.000035	0.08	456.586000	Y 377.433
Na (589.592 nm)	188.844000 o	ppm	1.065650	0.56	1320450.000000	Y_R2 488.368
Na H (589.593 nm)	204.286537	ppm	2.626907	1.29	814616.535289	Y_R 488.368
Ni (231.604 nm)	0.061119	ppm	0.000292	0.48	479.002000	Y 377.433
P (213.618 nm)	2.096110	ppm	0.003443	0.16	5320.630000	Y 242.219
Pb (220.353 nm)	0.094442	ppm	0.000531	0.56	308.447000	Y 242.219
S (181.972 nm)	0.452501	ppm	0.006264	1.38	282.261117	Y 377.433
Sb (206.834 nm)	0.097887	ppm	0.000259	0.26	268.963000	Y 377.433
Se (196.026 nm)	0.194246	ppm	0.000844	0.43	221.885000	Y 242.219
Si (288.158 nm)	21.852200 o	ppm	0.115244	0.53	199351.000000	Y 377.433
Sn (189.925 nm)	0.092501	ppm	0.000545	0.59	223.473000	Y 377.433
Sr (421.552 nm)	1.312393 o	ppm	0.019727	1.50	284369.031533	Y_R 488.368
Th (288.505 nm)	0.209243	ppm	0.000852	0.41	685.302000	Y 377.433
Ti (336.122 nm)	0.050590	ppm	0.000164	0.32	7239.950000	Y 377.433
Tl (190.794 nm)	0.191365	ppm	0.000365	0.19	479.981000	Y 377.433
U (409.013 nm)	0.519038	ppm	0.001745	0.34	2446.910000	Y 377.433
V (292.401 nm)	0.047518	ppm	0.000164	0.34	2038.810000	Y 377.433
Zn (206.200 nm)	0.180558	ppm	0.000464	0.26	1054.270000	Y 377.433
Zr (343.823 nm)	0.049693	ppm	0.000007	0.01	6866.730000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.042201	21302.886566	0.002201	0.21
Y 377.433	1.071525	1179162.164923	0.001103	0.10
Y_R 377.433	1.151540	88777.500000	0.012662	1.10
Y_R 488.368	1.160840	50729.100000	0.017859	1.54
Y_R2 488.368	1.171273	101593.230448	0.007420	0.63

Sample Name: 280-112332-C-7-A

Date: 7/26/2018 5:58:56 PM Rack:Tube: 1:73

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000144 u	ppm	0.000062	42.81	-421.382000	Y 377.433
Al (167.019 nm)	0.013094	ppm	0.002825	21.58	6.323000	Y_R 377.433
Al H (396.152 nm)	-0.038721 u	ppm	0.003075	7.94	57.107277	Y_R 377.433
As (188.980 nm)	0.000880 u	ppm	0.002135	> 100.00	-2.461610	Y 242.219
B (249.678 nm)	0.002461	ppm	0.000129	5.25	132.035000	Y 242.219
Ba (493.408 nm)	0.006816	ppm	0.000063	0.92	1334.440000	Y_R 488.368
Be (234.861 nm)	0.000036	ppm	0.000009	26.35	-36.209500	Y_R 488.368
Bi (223.061 nm)	0.001053 u	ppm	0.002225	> 100.00	17.547600	Y 377.433
Ca (315.887 nm)	0.231443	ppm	0.003468	1.50	115.473978	Y_R 377.433
Cd (214.439 nm)	0.000091	ppm	0.000062	68.19	2.973580	Y 377.433
Co (228.615 nm)	0.000431	ppm	0.000034	7.90	-27.391900	Y 242.219
Cr (205.560 nm)	0.002560	ppm	0.000030	1.19	44.214400	Y 377.433
Cu (324.754 nm)	0.004200	ppm	0.000216	5.13	592.023000	Y 377.433
Fe (238.204 nm)	0.050894	ppm	0.000285	0.56	208.132295	Y_R 377.433
Fe H (259.940 nm)	-0.112174 nu	ppm	0.002566	2.29	102.601000	Y_R 377.433
K (766.491 nm)	0.195486	ppm	0.024292	12.43	-499.574000	Y_R2 488.368
Li (670.783 nm)	0.003683	ppm	0.000967	26.26	-1035.190000	Y_R2 488.368
Mg (279.078 nm)	0.134170	ppm	0.001189	0.89	865.479000	Y 377.433
Mn (257.610 nm)	0.002730	ppm	0.000018	0.67	792.906000	Y 377.433
Mo (202.032 nm)	0.000260	ppm	0.000084	32.30	2.041470	Y 377.433
Na (589.592 nm)	0.274923	ppm	0.005539	2.01	2167.460000	Y_R2 488.368
Na H (589.593 nm)	0.454334 u	ppm	0.038546	8.48	5977.727657	Y_R 488.368
Ni (231.604 nm)	0.000883	ppm	0.000540	61.17	8.637330	Y 377.433
P (213.618 nm)	0.000128 u	ppm	0.001541	> 100.00	21.631700	Y 242.219
Pb (220.353 nm)	0.000345 u	ppm	0.001343	> 100.00	4.709460	Y 242.219
S (181.972 nm)	0.037596	ppm	0.003494	9.29	45.104550	Y 377.433
Sb (206.834 nm)	-0.000971 u	ppm	0.000884	91.07	-19.768900	Y 377.433
Se (196.026 nm)	-0.005967 u	ppm	0.001076	18.02	7.545990	Y 242.219
Si (288.158 nm)	0.031967	ppm	0.000441	1.38	1135.550000	Y 377.433
Sn (189.925 nm)	-0.000404 u	ppm	0.000584	> 100.00	6.086940	Y 377.433
Sr (421.552 nm)	0.001958	ppm	0.000046	2.33	565.450883	Y_R 488.368
Th (288.505 nm)	0.002653	ppm	0.000199	7.51	79.871800	Y 377.433
Ti (336.122 nm)	0.000565	ppm	0.000007	1.31	-123.917000	Y 377.433
Tl (190.794 nm)	0.001858	ppm	0.000784	42.19	-1.051350	Y 377.433
U (409.013 nm)	0.002006	ppm	0.001488	74.19	-81.956300	Y 377.433
V (292.401 nm)	0.000173	ppm	0.000095	54.87	26.620500	Y 377.433
Zn (206.200 nm)	0.000796	ppm	0.000217	27.21	21.699300	Y 377.433
Zr (343.823 nm)	0.000076	ppm	0.000072	95.79	-1.681000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.086548	22209.340371	0.002662	0.24
Y 377.433	1.101745	1212418.308146	0.003476	0.32
Y_R 377.433	1.106890	85335.100000	0.000607	0.05
Y_R 488.368	1.120710	48975.500000	0.002822	0.25
Y_R2 488.368	1.136789	98602.224730	0.009697	0.85

Sample Name: CCVH-5225153

Date: 7/26/2018 6:02:20 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001193 u	ppm	0.000133	11.15	-738.214000	Y 377.433
Al (167.019 nm)	45.231100 o	ppm	0.589439	1.30	22520.300000	Y_R 377.433
Al H (396.152 nm)	49.358241	ppm	0.310723	0.63	124352.812682	Y_R 377.433
As (188.980 nm)	0.001151	ppm	0.001324	> 100.00	-2.569370	Y 242.219
B (249.678 nm)	0.000350	ppm	0.000298	85.12	-8.776490	Y 242.219
Ba (493.408 nm)	-0.000282 u	ppm	0.000055	19.65	534.504000	Y_R 488.368
Be (234.861 nm)	-0.000063 u	ppm	0.000074	> 100.00	1602.450000	Y_R 488.368
Bi (223.061 nm)	0.973933	ppm	0.002029	0.21	2754.840000	Y 377.433
Ca (315.887 nm)	0.015749	ppm	0.002128	13.51	-62.749822	Y_R 377.433
Cd (214.439 nm)	-0.000198 u	ppm	0.000012	6.12	36.184300	Y 377.433
Co (228.615 nm)	0.000810	ppm	0.000109	13.48	-19.490800	Y 242.219
Cr (205.560 nm)	-0.000011 u	ppm	0.000053	> 100.00	-14.348600	Y 377.433
Cu (324.754 nm)	-0.006181 u	ppm	0.000160	2.59	283.424000	Y 377.433
Fe (238.204 nm)	48.723909 o	ppm	0.432483	0.89	183550.609575	Y_R 377.433
Fe H (259.940 nm)	49.617700	ppm	0.378137	0.76	97483.900000	Y_R 377.433
K (766.491 nm)	0.083921	ppm	0.027223	32.44	-634.846000	Y_R2 488.368
Li (670.783 nm)	0.003897	ppm	0.000450	11.55	-1027.630000	Y_R2 488.368
Mg (279.078 nm)	-0.010480 u	ppm	0.000010	0.09	-386.856000	Y 377.433
Mn (257.610 nm)	0.001419	ppm	0.000006	0.45	437.161000	Y 377.433
Mo (202.032 nm)	-0.000085 u	ppm	0.000233	> 100.00	-1.403190	Y 377.433
Na (589.592 nm)	228.638000 o	ppm	0.576764	0.25	1584870.000000	Y_R2 488.368
Na H (589.593 nm)	245.775532	ppm	4.770080	1.94	972690.324977	Y_R 488.368
Ni (231.604 nm)	0.001125	ppm	0.000309	27.51	12.821800	Y 377.433
P (213.618 nm)	-0.002450 u	ppm	0.000769	31.38	15.113600	Y 242.219
Pb (220.353 nm)	-0.002275 u	ppm	0.000774	34.04	14.792500	Y 242.219
S (181.972 nm)	4.875472	ppm	0.004834	0.10	2778.696342	Y 377.433
Sb (206.834 nm)	-0.003615 u	ppm	0.001970	54.50	-75.766300	Y 377.433
Se (196.026 nm)	0.000126 u	ppm	0.002834	> 100.00	4.424870	Y 242.219
Si (288.158 nm)	0.020282	ppm	0.000604	2.98	1029.400000	Y 377.433
Sn (189.925 nm)	0.002477	ppm	0.001465	59.13	12.828200	Y 377.433
Sr (421.552 nm)	0.000475	ppm	0.000066	13.87	244.437480	Y_R 488.368
Th (288.505 nm)	4.913040	ppm	0.006846	0.14	13932.300000	Y 377.433
Ti (336.122 nm)	0.001672	ppm	0.000034	2.04	35.252300	Y 377.433
Tl (190.794 nm)	-0.002606 u	ppm	0.001269	48.70	-13.924900	Y 377.433
U (409.013 nm)	10.076400	ppm	0.002389	0.02	48767.500000	Y 377.433
V (292.401 nm)	0.003257	ppm	0.000014	0.43	-37.941500	Y 377.433
Zn (206.200 nm)	-0.002625 u	ppm	0.000516	19.67	2.049290	Y 377.433
Zr (343.823 nm)	-0.003954 u	ppm	0.000079	1.99	-401.930000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.042065	21300.091108	0.001779	0.17
Y 377.433	1.043884	1148745.406705	0.002180	0.21
Y_R 377.433	1.096630	84544.200000	0.007319	0.67
Y_R 488.368	1.114880	48720.600000	0.016962	1.52
Y_R2 488.368	1.129406	97961.786437	0.004631	0.41

Sample Name: CCV-5225154

Date: 7/26/2018 6:05:43 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.478257	ppm	0.000932	0.19	23690.400000	Y 377.433
Al (167.019 nm)	0.526785	ppm	0.001211	0.23	263.241000	Y_R 377.433
Al H (396.152 nm)	0.489611 u	ppm	0.005266	1.08	1427.166608	Y_R 377.433
As (188.980 nm)	0.970241	ppm	0.001809	0.19	1371.440000	Y 242.219
B (249.678 nm)	0.484095	ppm	0.000867	0.18	13506.000000	Y 242.219
Ba (493.408 nm)	0.494538	ppm	0.003842	0.78	59552.800000	Y_R 488.368
Be (234.861 nm)	0.469920	ppm	0.000753	0.16	152162.000000	Y_R 488.368
Bi (223.061 nm)	-0.002856 u	ppm	0.000441	15.43	7.039870	Y 377.433
Ca (315.887 nm)	4.925272	ppm	0.042425	0.86	3994.189444	Y_R 377.433
Cd (214.439 nm)	0.476609	ppm	0.000566	0.12	31483.500000	Y 377.433
Co (228.615 nm)	0.491242	ppm	0.002729	0.56	10184.800000	Y 242.219
Cr (205.560 nm)	0.479076	ppm	0.000963	0.20	8100.030000	Y 377.433
Cu (324.754 nm)	0.479940	ppm	0.001512	0.32	31532.200000	Y 377.433
Fe (238.204 nm)	2.504823	ppm	0.025910	1.03	9451.639063	Y_R 377.433
Fe H (259.940 nm)	2.409010 u	ppm	0.016246	0.67	5039.600000	Y_R 377.433
K (766.491 nm)	48.442700	ppm	0.060740	0.13	57999.800000	Y_R2 488.368
Li (670.783 nm)	0.962993	ppm	0.001905	0.20	32774.800000	Y_R2 488.368
Mg (279.078 nm)	18.809400	ppm	0.052777	0.28	114823.000000	Y 377.433
Mn (257.610 nm)	0.484457	ppm	0.001375	0.28	131515.000000	Y 377.433
Mo (202.032 nm)	0.486516	ppm	0.001247	0.26	4853.910000	Y 377.433
Na (589.592 nm)	4.871790	ppm	0.001900	0.04	35060.700000	Y_R2 488.368
Na H (589.593 nm)	5.556738 u	ppm	0.087940	1.58	26576.544215	Y_R 488.368
Ni (231.604 nm)	0.478702	ppm	0.000522	0.11	3724.920000	Y 377.433
P (213.618 nm)	0.942213	ppm	0.000619	0.07	2403.390000	Y 242.219
Pb (220.353 nm)	0.980496	ppm	0.001467	0.15	3117.500000	Y 242.219
S (181.972 nm)	0.021021	ppm	0.002606	12.40	37.017057	Y 377.433
Sb (206.834 nm)	0.968447	ppm	0.002045	0.21	2927.190000	Y 377.433
Se (196.026 nm)	0.965199	ppm	0.003642	0.38	1083.200000	Y 242.219
Si (288.158 nm)	4.874790	ppm	0.016123	0.33	45127.700000	Y 377.433
Sn (189.925 nm)	0.951480	ppm	0.000630	0.07	2233.390000	Y 377.433
Sr (421.552 nm)	0.493002	ppm	0.004521	0.92	106911.850977	Y_R 488.368
Th (288.505 nm)	0.006681	ppm	0.005201	77.85	107.771000	Y 377.433
Ti (336.122 nm)	0.494648	ppm	0.000541	0.11	71147.800000	Y 377.433
Tl (190.794 nm)	0.980329	ppm	0.000230	0.02	2487.630000	Y 377.433
U (409.013 nm)	0.007071	ppm	0.006661	94.19	-96.053100	Y 377.433
V (292.401 nm)	0.483242	ppm	0.000820	0.17	20698.800000	Y 377.433
Zn (206.200 nm)	0.474685	ppm	0.000178	0.04	2743.760000	Y 377.433
Zr (343.823 nm)	0.489920	ppm	0.000071	0.01	66671.400000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.068166	21833.608890	0.002788	0.26
Y 377.433	1.080335	1188857.875179	0.003561	0.33
Y_R 377.433	1.101650	84931.400000	0.003934	0.36
Y_R 488.368	1.109420	48482.300000	0.003819	0.34
Y_R2 488.368	1.124631	97547.657343	0.003076	0.27

Sample Name: CCB

Date: 7/26/2018 6:09:06 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000365 u	ppm	0.000191	52.35	-432.562000	Y 377.433
Al (167.019 nm)	0.004972	ppm	0.002083	41.89	2.253780	Y_R 377.433
Al H (396.152 nm)	-0.053159 u	ppm	0.003504	6.59	20.680546	Y_R 377.433
As (188.980 nm)	-0.000619 u	ppm	0.000265	42.83	-4.585480	Y 242.219
B (249.678 nm)	0.001190	ppm	0.000052	4.39	96.856500	Y 242.219
Ba (493.408 nm)	-0.000429 u	ppm	0.000167	38.87	469.719000	Y_R 488.368
Be (234.861 nm)	0.000093	ppm	0.000041	44.38	-19.456100	Y_R 488.368
Bi (223.061 nm)	0.000448 u	ppm	0.000927	> 100.00	15.839800	Y 377.433
Ca (315.887 nm)	0.002734	ppm	0.000474	17.35	-73.504330	Y_R 377.433
Cd (214.439 nm)	0.000130	ppm	0.000096	74.46	5.453050	Y 377.433
Co (228.615 nm)	0.000474	ppm	0.000027	5.78	-26.503200	Y 242.219
Cr (205.560 nm)	-0.000024 u	ppm	0.000040	> 100.00	0.514699	Y 377.433
Cu (324.754 nm)	0.000273	ppm	0.000030	11.16	336.387000	Y 377.433
Fe (238.204 nm)	0.000939	ppm	0.000349	37.18	19.960660	Y_R 377.433
Fe H (259.940 nm)	-0.161791 u	ppm	0.001576	0.97	5.441040	Y_R 377.433
K (766.491 nm)	0.088435	ppm	0.000202	0.23	-629.373000	Y_R2 488.368
Li (670.783 nm)	0.003111	ppm	0.002023	65.01	-1055.350000	Y_R2 488.368
Mg (279.078 nm)	0.003600	ppm	0.002397	66.59	68.713400	Y 377.433
Mn (257.610 nm)	0.000051	ppm	0.000042	82.02	65.890500	Y 377.433
Mo (202.032 nm)	0.000216	ppm	0.000093	43.13	1.607250	Y 377.433
Na (589.592 nm)	0.013513	ppm	0.004679	34.63	340.402000	Y_R2 488.368
Na H (589.593 nm)	-0.060782 u	ppm	0.035061	57.68	3940.565412	Y_R 488.368
Ni (231.604 nm)	-0.000231 u	ppm	0.000024	10.36	-0.026733	Y 377.433
P (213.618 nm)	-0.000438 u	ppm	0.000443	> 100.00	20.200000	Y 242.219
Pb (220.353 nm)	-0.000535 u	ppm	0.000402	75.15	1.917070	Y 242.219
S (181.972 nm)	0.014637	ppm	0.000926	6.33	32.124698	Y 377.433
Sb (206.834 nm)	0.000547 u	ppm	0.001981	> 100.00	-15.251500	Y 377.433
Se (196.026 nm)	0.000910 u	ppm	0.002887	> 100.00	15.171500	Y 242.219
Si (288.158 nm)	-0.004865 u	ppm	0.000570	11.72	800.958000	Y 377.433
Sn (189.925 nm)	-0.000101 u	ppm	0.000802	> 100.00	6.796360	Y 377.433
Sr (421.552 nm)	-0.000012 u	ppm	0.000057	> 100.00	138.875653	Y_R 488.368
Th (288.505 nm)	0.001960	ppm	0.000007	0.34	77.941500	Y 377.433
Ti (336.122 nm)	0.000444	ppm	0.000047	10.50	-142.013000	Y 377.433
Tl (190.794 nm)	0.002565	ppm	0.000327	12.73	0.749148	Y 377.433
U (409.013 nm)	0.005676	ppm	0.004056	71.46	-64.183000	Y 377.433
V (292.401 nm)	-0.000004 u	ppm	0.000098	> 100.00	19.451600	Y 377.433
Zn (206.200 nm)	-0.003105 u	ppm	0.000014	0.47	-0.707898	Y 377.433
Zr (343.823 nm)	0.000059	ppm	0.000055	94.41	-4.139590	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.076803	22010.160329	0.001924	0.18
Y 377.433	1.091617	1201272.667969	0.001236	0.11
Y_R 377.433	1.092300	84210.200000	0.011998	1.10
Y_R 488.368	1.103530	48224.700000	0.007933	0.72
Y_R2 488.368	1.127671	97811.326307	0.000396	0.04

Sample Name: CCVL-5236949

Date: 7/26/2018 6:12:30 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009069	ppm	0.000042	0.46	42.817000	Y 377.433
Al (167.019 nm)	0.103158	ppm	0.002078	2.01	51.137200	Y_R 377.433
Al H (396.152 nm)	0.046621 u	ppm	0.001974	4.23	273.229010	Y_R 377.433
As (188.980 nm)	0.013759	ppm	0.000690	5.02	15.790800	Y 242.219
B (249.678 nm)	0.093899	ppm	0.000022	0.02	2667.730000	Y 242.219
Ba (493.408 nm)	0.009453	ppm	0.000335	3.55	1649.100000	Y_R 488.368
Be (234.861 nm)	0.000953	ppm	0.000010	1.01	261.923000	Y_R 488.368
Bi (223.061 nm)	0.098035	ppm	0.000575	0.59	289.525000	Y 377.433
Ca (315.887 nm)	0.200906	ppm	0.003131	1.56	90.244656	Y_R 377.433
Cd (214.439 nm)	0.004726	ppm	0.000011	0.24	309.216000	Y 377.433
Co (228.615 nm)	0.010385	ppm	0.000058	0.56	179.673000	Y 242.219
Cr (205.560 nm)	0.009326	ppm	0.000116	1.25	158.642000	Y 377.433
Cu (324.754 nm)	0.014131	ppm	0.000085	0.60	1235.900000	Y 377.433
Fe (238.204 nm)	0.100852	ppm	0.000714	0.71	396.314838	Y_R 377.433
Fe H (259.940 nm)	-0.063077 u	ppm	0.001308	2.07	198.744000	Y_R 377.433
K (766.491 nm)	3.038270	ppm	0.001436	0.05	2947.270000	Y_R2 488.368
Li (670.783 nm)	0.023191	ppm	0.001027	4.43	-347.651000	Y_R2 488.368
Mg (279.078 nm)	0.184106	ppm	0.000263	0.14	1168.710000	Y 377.433
Mn (257.610 nm)	0.009768	ppm	0.000003	0.03	2702.800000	Y 377.433
Mo (202.032 nm)	0.017726	ppm	0.000439	2.48	176.324000	Y 377.433
Na (589.592 nm)	1.005760	ppm	0.006355	0.63	7238.360000	Y_R2 488.368
Na H (589.593 nm)	0.846453 u	ppm	0.025343	2.99	7525.643403	Y_R 488.368
Ni (231.604 nm)	0.037888	ppm	0.000264	0.70	296.350000	Y 377.433
P (213.618 nm)	2.622650 o	ppm	0.000105	0.00	6651.840000	Y 242.219
Pb (220.353 nm)	0.009033	ppm	0.000498	5.51	32.363600	Y 242.219
S (181.972 nm)	0.099219	ppm	0.001218	1.23	79.942358	Y 377.433
Sb (206.834 nm)	0.017355	ppm	0.000411	2.37	35.700100	Y 377.433
Se (196.026 nm)	0.017503	ppm	0.001291	7.37	33.539700	Y 242.219
Si (288.158 nm)	0.464568	ppm	0.004519	0.97	5065.290000	Y 377.433
Sn (189.925 nm)	0.092403	ppm	0.000499	0.54	223.245000	Y 377.433
Sr (421.552 nm)	0.009641	ppm	0.000047	0.48	2229.541025	Y_R 488.368
Th (288.505 nm)	0.014884	ppm	0.001644	11.05	115.402000	Y 377.433
Ti (336.122 nm)	0.009985	ppm	0.000024	0.24	1234.550000	Y 377.433
Tl (190.794 nm)	0.015635	ppm	0.001394	8.92	33.958700	Y 377.433
U (409.013 nm)	0.063461	ppm	0.002185	3.44	214.631000	Y 377.433
V (292.401 nm)	0.009288	ppm	0.000088	0.95	414.456000	Y 377.433
Zn (206.200 nm)	0.016154	ppm	0.000303	1.87	109.918000	Y 377.433
Zr (343.823 nm)	0.014398	ppm	0.000040	0.27	1947.700000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.085370	22185.266656	0.000635	0.06
Y 377.433	1.097161	1207373.584024	0.000888	0.08
Y_R 377.433	1.109900	85567.200000	0.003415	0.31
Y_R 488.368	1.111070	48554.400000	0.002289	0.21
Y_R2 488.368	1.137359	98651.662385	0.001957	0.17

Sample Name: MB 280-423580/1-A

Date: 7/26/2018 6:15:53 PM Rack:Tube: 1:74

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000286 u	ppm	0.000086	30.01	-428.474000	Y 377.433
Al (167.019 nm)	0.007549	ppm	0.002003	26.53	3.540900	Y_R 377.433
Al H (396.152 nm)	-0.050188 u	ppm	0.004077	8.12	28.163269	Y_R 377.433
As (188.980 nm)	0.001339 u	ppm	0.002521	> 100.00	-1.810730	Y 242.219
B (249.678 nm)	0.000676	ppm	0.000072	10.66	82.616500	Y 242.219
Ba (493.408 nm)	-0.000429 u	ppm	0.000123	28.69	469.670000	Y_R 488.368
Be (234.861 nm)	0.000040	ppm	0.000004	11.33	-36.311900	Y_R 488.368
Bi (223.061 nm)	-0.000853 u	ppm	0.000169	19.75	12.192600	Y 377.433
Ca (315.887 nm)	0.021902	ppm	0.001044	4.77	-57.666460	Y_R 377.433
Cd (214.439 nm)	0.000041	ppm	0.000040	97.43	-0.376390	Y 377.433
Co (228.615 nm)	0.000445	ppm	0.000040	9.06	-27.105400	Y 242.219
Cr (205.560 nm)	-0.000020 u	ppm	0.000060	> 100.00	0.579826	Y 377.433
Cu (324.754 nm)	0.000154	ppm	0.000133	86.73	329.483000	Y 377.433
Fe (238.204 nm)	0.009575	ppm	0.001810	18.90	52.491472	Y_R 377.433
Fe H (259.940 nm)	-0.150476 nu	ppm	0.000199	0.13	27.597900	Y_R 377.433
K (766.491 nm)	0.126621	ppm	0.048938	38.65	-583.072000	Y_R2 488.368
Li (670.783 nm)	0.003643	ppm	0.000235	6.45	-1036.610000	Y_R2 488.368
Mg (279.078 nm)	0.000575	ppm	0.000162	28.10	50.326600	Y 377.433
Mn (257.610 nm)	0.000038	ppm	0.000004	10.03	62.399700	Y 377.433
Mo (202.032 nm)	0.000275	ppm	0.000063	22.88	2.195410	Y 377.433
Na (589.592 nm)	0.021531	ppm	0.000671	3.12	395.463000	Y_R2 488.368
Na H (589.593 nm)	-0.257397 u	ppm	0.012606	4.90	3165.532224	Y_R 488.368
Ni (231.604 nm)	-0.000784 u	ppm	0.000590	75.28	-4.328360	Y 377.433
P (213.618 nm)	-0.002154 u	ppm	0.000387	17.99	15.863600	Y 242.219
Pb (220.353 nm)	-0.001697 u	ppm	0.000235	13.83	-1.782490	Y 242.219
S (181.972 nm)	0.011630	ppm	0.000089	0.76	30.425723	Y 377.433
Sb (206.834 nm)	-0.000603 u	ppm	0.000642	> 100.00	-18.724600	Y 377.433
Se (196.026 nm)	-0.002659 u	ppm	0.000204	7.69	11.217200	Y 242.219
Si (288.158 nm)	-0.005024 u	ppm	0.000117	2.33	799.521000	Y 377.433
Sn (189.925 nm)	-0.000373 u	ppm	0.000045	12.08	6.159290	Y 377.433
Sr (421.552 nm)	0.000073	ppm	0.000042	57.05	157.405181	Y_R 488.368
Th (288.505 nm)	0.000652 u	ppm	0.002110	> 100.00	74.236000	Y 377.433
Ti (336.122 nm)	0.000552	ppm	0.000031	5.62	-126.378000	Y 377.433
Tl (190.794 nm)	0.001895	ppm	0.001390	73.35	-0.955452	Y 377.433
U (409.013 nm)	0.002742	ppm	0.002425	88.44	-78.395600	Y 377.433
V (292.401 nm)	-0.000111 u	ppm	0.000152	> 100.00	15.304400	Y 377.433
Zn (206.200 nm)	-0.002274 u	ppm	0.000240	10.57	4.064990	Y 377.433
Zr (343.823 nm)	0.000026	ppm	0.000012	47.32	-8.580490	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.088641	22252.118391	0.000641	0.06
Y 377.433	1.103764	1214640.235796	0.001892	0.17
Y_R 377.433	1.120230	86363.900000	0.007279	0.65
Y_R 488.368	1.121950	49029.800000	0.010264	0.91
Y_R2 488.368	1.149745	99725.993021	0.011233	0.98

Sample Name: LCS 280-423580/2-A

Date: 7/26/2018 6:19:16 PM Rack:Tube: 1:75

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.049024	ppm	0.000186	0.38	2029.430000	Y 377.433
Al (167.019 nm)	1.991720	ppm	0.037756	1.90	990.748000	Y_R 377.433
Al H (396.152 nm)	1.996718	ppm	0.014244	0.71	5275.129445	Y_R 377.433
As (188.980 nm)	0.978355	ppm	0.001270	0.13	1382.950000	Y 242.219
B (249.678 nm)	0.990160	ppm	0.001859	0.19	27539.500000	Y 242.219
Ba (493.408 nm)	1.976840 o	ppm	0.011347	0.57	236451.000000	Y_R 488.368
Be (234.861 nm)	0.046712	ppm	0.000378	0.81	15050.500000	Y_R 488.368
Bi (223.061 nm)	1.935520	ppm	0.003694	0.19	5442.600000	Y 377.433
Ca (315.887 nm)	47.772428 o	ppm	0.368633	0.77	39397.899142	Y_R 377.433
Cd (214.439 nm)	0.093375	ppm	0.000051	0.05	6166.510000	Y 377.433
Co (228.615 nm)	0.471926	ppm	0.002232	0.47	9803.570000	Y 242.219
Cr (205.560 nm)	0.190641	ppm	0.000207	0.11	3223.620000	Y 377.433
Cu (324.754 nm)	0.235828	ppm	0.000460	0.20	15683.900000	Y 377.433
Fe (238.204 nm)	0.982549	ppm	0.006437	0.66	3717.508091	Y_R 377.433
Fe H (259.940 nm)	0.843002 nu	ppm	0.012052	1.43	1973.030000	Y_R 377.433
K (766.491 nm)	48.936800	ppm	0.442446	0.90	58598.900000	Y_R2 488.368
Li (670.783 nm)	0.966148	ppm	0.005383	0.56	32885.900000	Y_R2 488.368
Mg (279.078 nm)	47.039000 o	ppm	0.000085	0.00	287036.000000	Y 377.433
Mn (257.610 nm)	0.476729	ppm	0.000556	0.12	129418.000000	Y 377.433
Mo (202.032 nm)	0.952904	ppm	0.000159	0.02	9507.530000	Y 377.433
Na (589.592 nm)	47.475900 o	ppm	0.634414	1.34	333476.000000	Y_R2 488.368
Na H (589.593 nm)	51.104648	ppm	0.523510	1.02	207557.942286	Y_R 488.368
Ni (231.604 nm)	0.460217	ppm	0.001307	0.28	3582.490000	Y 377.433
P (213.618 nm)	9.474150 o	ppm	0.020086	0.21	23973.600000	Y 242.219
Pb (220.353 nm)	0.495018	ppm	0.000296	0.06	1577.760000	Y 242.219
S (181.972 nm)	1.959802	ppm	0.003065	0.16	1132.484202	Y 377.433
Sb (206.834 nm)	0.502660	ppm	0.001994	0.40	1498.740000	Y 377.433
Se (196.026 nm)	1.930790	ppm	0.000323	0.02	2153.120000	Y 242.219
Si (288.158 nm)	9.843540	ppm	0.062933	0.64	90263.900000	Y 377.433
Sn (189.925 nm)	1.897710	ppm	0.004089	0.22	4447.450000	Y 377.433
Sr (421.552 nm)	0.972956	ppm	0.005793	0.60	210856.328792	Y_R 488.368
Th (288.505 nm)	1.008260	ppm	0.003954	0.39	2944.400000	Y 377.433
Ti (336.122 nm)	0.989011	ppm	0.001537	0.16	142582.000000	Y 377.433
Tl (190.794 nm)	1.975040	ppm	0.004302	0.22	5015.520000	Y 377.433
U (409.013 nm)	2.069330	ppm	0.003852	0.19	9883.510000	Y 377.433
V (292.401 nm)	0.483816	ppm	0.000650	0.13	20767.900000	Y 377.433
Zn (206.200 nm)	0.459841	ppm	0.001287	0.28	2658.500000	Y 377.433
Zr (343.823 nm)	0.487449	ppm	0.000254	0.05	66330.500000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.046099	21382.548015	0.001952	0.19
Y 377.433	1.060349	1166863.554820	0.003290	0.31
Y_R 377.433	1.093470	84300.400000	0.006894	0.63
Y_R 488.368	1.103910	48241.400000	0.006015	0.54
Y_R2 488.368	1.117812	96956.133182	0.012528	1.12

Sample Name: 280-112331-A-1-A

Date: 7/26/2018 6:22:39 PM Rack:Tube: 1:76

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000102 u	ppm	0.000377	> 100.00	-419.910000	Y 377.433
Al (167.019 nm)	0.192676	ppm	0.009176	4.76	95.624700	Y_R 377.433
Al H (396.152 nm)	0.150664 u	ppm	0.004145	2.75	537.429213	Y_R 377.433
As (188.980 nm)	0.003004	ppm	0.000947	31.52	0.548897	Y 242.219
B (249.678 nm)	0.010797	ppm	0.000115	1.06	363.129000	Y 242.219
Ba (493.408 nm)	0.196744	ppm	0.000614	0.31	24002.100000	Y_R 488.368
Be (234.861 nm)	0.000064	ppm	0.000016	24.95	-28.041900	Y_R 488.368
Bi (223.061 nm)	0.000024 u	ppm	0.000342	> 100.00	14.663200	Y 377.433
Ca (315.887 nm)	5.597048	ppm	0.013898	0.25	4548.988937	Y_R 377.433
Cd (214.439 nm)	0.000026	ppm	0.000033	> 100.00	-1.302900	Y 377.433
Co (228.615 nm)	0.000529	ppm	0.000308	58.12	-25.281300	Y 242.219
Cr (205.560 nm)	0.014712	ppm	0.000115	0.78	249.771000	Y 377.433
Cu (324.754 nm)	0.002511	ppm	0.000100	3.99	477.786000	Y 377.433
Fe (238.204 nm)	0.059337	ppm	0.000906	1.53	239.935743	Y_R 377.433
Fe H (259.940 nm)	-0.100735 nu	ppm	0.001724	1.71	125.002000	Y_R 377.433
K (766.491 nm)	118.300000 o	ppm	0.062797	0.05	142701.000000	Y_R2 488.368
Li (670.783 nm)	0.144127	ppm	0.001285	0.89	3914.630000	Y_R2 488.368
Mg (279.078 nm)	1.339640	ppm	0.002187	0.16	8221.690000	Y 377.433
Mn (257.610 nm)	0.004868	ppm	0.000009	0.19	1372.960000	Y 377.433
Mo (202.032 nm)	0.018434	ppm	0.000042	0.23	183.389000	Y 377.433
Na (589.592 nm)	76.127600 o	ppm	0.222891	0.29	528284.000000	Y_R2 488.368
Na H (589.593 nm)	81.827437	ppm	0.362695	0.44	326830.795750	Y_R 488.368
Ni (231.604 nm)	0.000905	ppm	0.000223	24.61	8.807720	Y 377.433
P (213.618 nm)	0.008540	ppm	0.002953	34.58	42.899400	Y 242.219
Pb (220.353 nm)	0.000166 u	ppm	0.000563	> 100.00	3.978480	Y 242.219
S (181.972 nm)	6.211940	ppm	0.035088	0.56	3533.862923	Y 377.433
Sb (206.834 nm)	0.002934	ppm	0.000684	23.32	-7.644330	Y 377.433
Se (196.026 nm)	-0.001207 u	ppm	0.001506	> 100.00	12.822000	Y 242.219
Si (288.158 nm)	1.115260	ppm	0.005567	0.50	10976.200000	Y 377.433
Sn (189.925 nm)	0.000712	ppm	0.000808	> 100.00	8.698230	Y 377.433
Sr (421.552 nm)	0.400318	ppm	0.000425	0.11	86839.108811	Y_R 488.368
Th (288.505 nm)	0.003749	ppm	0.002714	72.39	83.091900	Y 377.433
Ti (336.122 nm)	0.002232	ppm	0.000045	2.00	133.655000	Y 377.433
Tl (190.794 nm)	0.003490	ppm	0.000683	19.56	3.040760	Y 377.433
U (409.013 nm)	-0.001016 u	ppm	0.004338	> 100.00	-97.690000	Y 377.433
V (292.401 nm)	0.004256	ppm	0.000067	1.57	198.087000	Y 377.433
Zn (206.200 nm)	0.004048	ppm	0.000078	1.93	40.378900	Y 377.433
Zr (343.823 nm)	0.000206	ppm	0.000037	17.92	16.084600	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.051921	21501.564270	0.000800	0.08
Y 377.433	1.061511	1168142.299621	0.001189	0.11
Y_R 377.433	1.100030	84806.300000	0.008127	0.74
Y_R 488.368	1.106580	48358.000000	0.003743	0.34
Y_R2 488.368	1.123594	97457.656614	0.002579	0.23

Sample Name: 280-112331-C-5-A

Date: 7/26/2018 6:26:01 PM Rack:Tube: 1:77

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000232 u	ppm	0.000008	3.41	-425.862000	Y 377.433
Al (167.019 nm)	0.004456	ppm	0.005858	> 100.00	1.998100	Y_R 377.433
Al H (396.152 nm)	-0.051736 u	ppm	0.001227	2.37	24.254580	Y_R 377.433
As (188.980 nm)	0.001420	ppm	0.000783	55.11	-1.696160	Y 242.219
B (249.678 nm)	0.000611	ppm	0.000221	36.16	80.804200	Y 242.219
Ba (493.408 nm)	-0.000482 u	ppm	0.000134	27.73	463.288000	Y_R 488.368
Be (234.861 nm)	0.000036	ppm	0.000009	23.47	-37.583200	Y_R 488.368
Bi (223.061 nm)	-0.000585 u	ppm	0.000272	46.48	12.942700	Y 377.433
Ca (315.887 nm)	0.023701	ppm	0.004522	19.08	-56.180240	Y_R 377.433
Cd (214.439 nm)	0.000069	ppm	0.000045	66.19	1.433630	Y 377.433
Co (228.615 nm)	0.000367	ppm	0.000132	36.05	-28.720000	Y 242.219
Cr (205.560 nm)	0.000003 u	ppm	0.000086	> 100.00	0.978334	Y 377.433
Cu (324.754 nm)	0.000112	ppm	0.000025	22.28	326.095000	Y 377.433
Fe (238.204 nm)	0.001987	ppm	0.000893	44.93	23.906546	Y_R 377.433
Fe H (259.940 nm)	-0.158986 nu	ppm	0.002750	1.73	10.934500	Y_R 377.433
K (766.491 nm)	0.129614	ppm	0.011323	8.74	-579.443000	Y_R2 488.368
Li (670.783 nm)	0.004085	ppm	0.000732	17.91	-1021.030000	Y_R2 488.368
Mg (279.078 nm)	0.000735	ppm	0.000606	82.47	51.246300	Y 377.433
Mn (257.610 nm)	-0.000014 u	ppm	0.000012	82.62	48.278500	Y 377.433
Mo (202.032 nm)	0.000163	ppm	0.000156	95.71	1.079570	Y 377.433
Na (589.592 nm)	0.026755	ppm	0.000583	2.18	431.834000	Y_R2 488.368
Na H (589.593 nm)	-0.080402 u	ppm	0.015882	19.75	3863.082059	Y_R 488.368
Ni (231.604 nm)	-0.000195 u	ppm	0.000377	> 100.00	0.249532	Y 377.433
P (213.618 nm)	-0.000208 u	ppm	0.000548	> 100.00	20.783400	Y 242.219
Pb (220.353 nm)	-0.000214 u	ppm	0.000427	> 100.00	2.937470	Y 242.219
S (181.972 nm)	0.011280	ppm	0.003343	29.64	30.227722	Y 377.433
Sb (206.834 nm)	0.000968 u	ppm	0.001384	> 100.00	-13.969800	Y 377.433
Se (196.026 nm)	-0.003257 u	ppm	0.000071	2.18	10.555700	Y 242.219
Si (288.158 nm)	-0.003373 u	ppm	0.001621	48.06	814.518000	Y 377.433
Sn (189.925 nm)	0.000022 u	ppm	0.000546	> 100.00	7.083540	Y 377.433
Sr (421.552 nm)	-0.000062 u	ppm	0.000052	85.03	128.167218	Y_R 488.368
Th (288.505 nm)	0.002147	ppm	0.002286	> 100.00	78.443500	Y 377.433
Ti (336.122 nm)	0.000491	ppm	0.000107	21.85	-135.173000	Y 377.433
Tl (190.794 nm)	0.001042	ppm	0.001063	> 100.00	-3.125630	Y 377.433
U (409.013 nm)	-0.000646 u	ppm	0.001277	> 100.00	-94.800100	Y 377.433
V (292.401 nm)	-0.000087 u	ppm	0.000101	> 100.00	15.990200	Y 377.433
Zn (206.200 nm)	-0.001461 u	ppm	0.000089	6.11	8.735860	Y 377.433
Zr (343.823 nm)	-0.000019 u	ppm	0.000028	> 100.00	-14.767900	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.085163	22181.028888	0.000797	0.07
Y 377.433	1.099507	1209955.833726	0.001100	0.10
Y_R 377.433	1.113740	85863.300000	0.001750	0.16
Y_R 488.368	1.124900	49158.500000	0.005850	0.52
Y_R2 488.368	1.147627	99542.287438	0.005728	0.50

Sample Name: 280-112331-A-10-A

Date: 7/26/2018 6:29:24 PM Rack:Tube: 1:78

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000030 u	ppm	0.000401	> 100.00	-416.053000	Y 377.433
Al (167.019 nm)	0.725252	ppm	0.001240	0.17	360.771000	Y_R 377.433
Al H (396.152 nm)	0.738425 u	ppm	0.008618	1.17	2089.980604	Y_R 377.433
As (188.980 nm)	0.003502	ppm	0.000560	15.99	1.249380	Y 242.219
B (249.678 nm)	0.095500	ppm	0.000007	0.01	2710.850000	Y 242.219
Ba (493.408 nm)	0.284291	ppm	0.001016	0.36	34491.900000	Y_R 488.368
Be (234.861 nm)	0.000070	ppm	0.000012	17.24	-6.381240	Y_R 488.368
Bi (223.061 nm)	-0.000502 u	ppm	0.001635	> 100.00	13.285700	Y 377.433
Ca (315.887 nm)	177.058432 o	ppm	0.911273	0.51	146224.844681	Y_R 377.433
Cd (214.439 nm)	0.000052	ppm	0.000006	12.11	0.952639	Y 377.433
Co (228.615 nm)	0.000148	ppm	0.000137	93.00	-32.716700	Y 242.219
Cr (205.560 nm)	0.003998	ppm	0.000109	2.73	68.377800	Y 377.433
Cu (324.754 nm)	-0.000872 u	ppm	0.000173	19.84	139.197000	Y 377.433
Fe (238.204 nm)	0.596053	ppm	0.002742	0.46	2261.645540	Y_R 377.433
Fe H (259.940 nm)	0.439291 nu	ppm	0.003981	0.91	1182.480000	Y_R 377.433
K (766.491 nm)	1.844460	ppm	0.005669	0.31	1499.790000	Y_R2 488.368
Li (670.783 nm)	0.038292	ppm	0.000528	1.38	184.561000	Y_R2 488.368
Mg (279.078 nm)	45.352300 o	ppm	0.127568	0.28	276801.000000	Y 377.433
Mn (257.610 nm)	0.010233	ppm	0.000030	0.30	2828.930000	Y 377.433
Mo (202.032 nm)	0.000564	ppm	0.000607	> 100.00	5.077020	Y 377.433
Na (589.592 nm)	73.304800 o	ppm	0.303372	0.41	508906.000000	Y_R2 488.368
Na H (589.593 nm)	79.311832	ppm	0.272092	0.34	317006.527102	Y_R 488.368
Ni (231.604 nm)	-0.000913 u	ppm	0.000165	18.03	-5.307480	Y 377.433
P (213.618 nm)	0.024040	ppm	0.002042	8.49	82.084500	Y 242.219
Pb (220.353 nm)	0.001632	ppm	0.000534	32.72	8.545600	Y 242.219
S (181.972 nm)	17.344060 o	ppm	0.069177	0.40	9823.973335	Y 377.433
Sb (206.834 nm)	-0.002390 u	ppm	0.000595	24.88	-24.188700	Y 377.433
Se (196.026 nm)	-0.002122 u	ppm	0.000167	7.85	11.710500	Y 242.219
Si (288.158 nm)	14.544100 o	ppm	0.086285	0.59	132964.000000	Y 377.433
Sn (189.925 nm)	0.000055 u	ppm	0.000820	> 100.00	7.159870	Y 377.433
Sr (421.552 nm)	1.032943	ppm	0.002234	0.22	223847.934192	Y_R 488.368
Th (288.505 nm)	0.001483	ppm	0.001270	85.64	76.881100	Y 377.433
Ti (336.122 nm)	0.015430	ppm	0.000280	1.82	2583.610000	Y 377.433
Tl (190.794 nm)	0.001657	ppm	0.001014	61.16	-1.648960	Y 377.433
U (409.013 nm)	-0.001749 u	ppm	0.004143	> 100.00	-135.803000	Y 377.433
V (292.401 nm)	0.002837	ppm	0.000075	2.64	142.687000	Y 377.433
Zn (206.200 nm)	0.010078	ppm	0.000475	4.72	75.013700	Y 377.433
Zr (343.823 nm)	0.000686	ppm	0.000065	9.52	83.097600	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.026380	20979.499478	0.002412	0.23
Y 377.433	1.045634	1150671.116769	0.003842	0.37
Y_R 377.433	1.082980	83491.600000	0.000725	0.07
Y_R 488.368	1.095200	47860.600000	0.007526	0.69
Y_R2 488.368	1.101590	95549.149044	0.001062	0.10

Sample Name: 280-112331-A-10-Asd@5

Date: 7/26/2018 6:32:47 PM Rack:Tube: 1:79

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000028 u	ppm	0.000209	> 100.00	-412.804000	Y 377.433
Al (167.019 nm)	0.177664	ppm	0.002112	1.19	88.200200	Y_R 377.433
Al H (396.152 nm)	0.141018 u	ppm	0.001649	1.17	524.938775	Y_R 377.433
As (188.980 nm)	0.000440 u	ppm	0.001811	> 100.00	-3.086670	Y 242.219
B (249.678 nm)	0.018844	ppm	0.000058	0.31	586.150000	Y 242.219
Ba (493.408 nm)	0.055712	ppm	0.000839	1.51	7178.390000	Y_R 488.368
Be (234.861 nm)	0.000053	ppm	0.000007	13.49	-27.865500	Y_R 488.368
Bi (223.061 nm)	-0.001354 u	ppm	0.000422	31.16	10.809400	Y 377.433
Ca (315.887 nm)	35.843339 o	ppm	0.229366	0.64	29541.025274	Y_R 377.433
Cd (214.439 nm)	-0.000043 u	ppm	0.000090	> 100.00	-5.820930	Y 377.433
Co (228.615 nm)	-0.000010 u	ppm	0.000241	> 100.00	-36.374200	Y 242.219
Cr (205.560 nm)	0.000736	ppm	0.000105	14.20	13.338000	Y 377.433
Cu (324.754 nm)	-0.000321 u	ppm	0.000000	0.12	273.705000	Y 377.433
Fe (238.204 nm)	0.125406	ppm	0.001273	1.01	488.805673	Y_R 377.433
Fe H (259.940 nm)	-0.036777 nu	ppm	0.001328	3.61	250.243000	Y_R 377.433
K (766.491 nm)	0.494276	ppm	0.013613	2.75	-137.294000	Y_R2 488.368
Li (670.783 nm)	0.010209	ppm	0.001355	13.27	-805.207000	Y_R2 488.368
Mg (279.078 nm)	9.030920	ppm	0.060769	0.67	55156.300000	Y 377.433
Mn (257.610 nm)	0.002139	ppm	0.000066	3.08	632.592000	Y 377.433
Mo (202.032 nm)	0.000223	ppm	0.000090	40.41	1.676910	Y 377.433
Na (589.592 nm)	14.764300 o	ppm	0.024712	0.17	102693.000000	Y_R2 488.368
Na H (589.593 nm)	15.358572	ppm	0.232745	1.52	64759.246414	Y_R 488.368
Ni (231.604 nm)	-0.000933 u	ppm	0.000381	40.81	-5.480560	Y 377.433
P (213.618 nm)	0.003300	ppm	0.000701	21.23	29.652000	Y 242.219
Pb (220.353 nm)	-0.000111 u	ppm	0.000458	> 100.00	3.194080	Y 242.219
S (181.972 nm)	3.366227	ppm	0.017996	0.53	1925.913256	Y 377.433
Sb (206.834 nm)	-0.000580 u	ppm	0.001769	> 100.00	-18.663400	Y 377.433
Se (196.026 nm)	-0.002142 u	ppm	0.001822	85.07	11.770700	Y 242.219
Si (288.158 nm)	2.916970	ppm	0.024039	0.82	27342.900000	Y 377.433
Sn (189.925 nm)	-0.000042 u	ppm	0.000165	> 100.00	6.934140	Y 377.433
Sr (421.552 nm)	0.205364	ppm	0.003346	1.63	44617.543051	Y_R 488.368
Th (288.505 nm)	-0.001546 u	ppm	0.002256	> 100.00	68.197000	Y 377.433
Ti (336.122 nm)	0.005241	ppm	0.000288	5.50	663.893000	Y 377.433
Tl (190.794 nm)	0.001323	ppm	0.001384	> 100.00	-2.437180	Y 377.433
U (409.013 nm)	0.000624 u	ppm	0.000992	> 100.00	-95.866200	Y 377.433
V (292.401 nm)	0.000326	ppm	0.000222	68.20	34.297800	Y 377.433
Zn (206.200 nm)	-0.000451 u	ppm	0.000257	56.92	14.536700	Y 377.433
Zr (343.823 nm)	0.000209	ppm	0.000071	34.25	16.644100	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.065558	21780.295621	0.005249	0.49
Y 377.433	1.079456	1187890.409111	0.007447	0.69
Y_R 377.433	1.101280	84902.800000	0.003761	0.34
Y_R 488.368	1.121150	48994.600000	0.013159	1.17
Y_R2 488.368	1.132818	98257.779886	0.005796	0.51

Sample Name: 280-112331-A-10-B MS

Date: 7/26/2018 6:36:09 PM Rack:Tube: 1:80

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.051625	ppm	0.000075	0.15	2158.590000	Y 377.433
Al (167.019 nm)	3.222710 o	ppm	0.022975	0.71	1603.300000	Y_R 377.433
Al H (396.152 nm)	3.422661	ppm	0.023248	0.68	8942.732800	Y_R 377.433
As (188.980 nm)	1.016400	ppm	0.003617	0.36	1436.860000	Y 242.219
B (249.678 nm)	1.126810 o	ppm	0.001340	0.12	31327.400000	Y 242.219
Ba (493.408 nm)	2.311780 o	ppm	0.020091	0.87	276467.000000	Y_R 488.368
Be (234.861 nm)	0.048239	ppm	0.000441	0.91	15569.700000	Y_R 488.368
Bi (223.061 nm)	2.013580	ppm	0.006330	0.31	5661.650000	Y 377.433
Ca (315.887 nm)	227.535682 o	ppm	2.707138	1.19	187933.459503	Y_R 377.433
Cd (214.439 nm)	0.093477	ppm	0.000150	0.16	6174.040000	Y 377.433
Co (228.615 nm)	0.474819	ppm	0.001776	0.37	9864.910000	Y 242.219
Cr (205.560 nm)	0.197367	ppm	0.001042	0.53	3337.150000	Y 377.433
Cu (324.754 nm)	0.245298	ppm	0.000329	0.13	16170.900000	Y 377.433
Fe (238.204 nm)	1.717348	ppm	0.017714	1.03	6485.363823	Y_R 377.433
Fe H (259.940 nm)	1.582610 nu	ppm	0.018162	1.15	3421.330000	Y_R 377.433
K (766.491 nm)	53.185900	ppm	0.227770	0.43	63750.900000	Y_R2 488.368
Li (670.783 nm)	1.040630	ppm	0.002964	0.28	35511.100000	Y_R2 488.368
Mg (279.078 nm)	94.123400 o	ppm	0.511066	0.54	574359.000000	Y 377.433
Mn (257.610 nm)	0.491451	ppm	0.001647	0.34	133413.000000	Y 377.433
Mo (202.032 nm)	0.964869	ppm	0.002099	0.22	9626.930000	Y 377.433
Na (589.592 nm)	123.510000 o	ppm	0.768457	0.62	861161.000000	Y_R2 488.368
Na H (589.593 nm)	133.349119	ppm	1.570955	1.18	531992.499028	Y_R 488.368
Ni (231.604 nm)	0.461397	ppm	0.002099	0.46	3591.680000	Y 377.433
P (213.618 nm)	9.875220 o	ppm	0.014004	0.14	24987.600000	Y 242.219
Pb (220.353 nm)	0.499137	ppm	0.000967	0.19	1590.490000	Y 242.219
S (181.972 nm)	20.016708 o	ppm	0.046179	0.23	11335.402123	Y 377.433
Sb (206.834 nm)	0.516323	ppm	0.000867	0.17	1539.810000	Y 377.433
Se (196.026 nm)	2.006670	ppm	0.001891	0.09	2237.050000	Y 242.219
Si (288.158 nm)	25.860400 o	ppm	0.023044	0.09	235761.000000	Y 377.433
Sn (189.925 nm)	1.901060	ppm	0.001115	0.06	4455.310000	Y 377.433
Sr (421.552 nm)	2.025663 o	ppm	0.010216	0.50	438843.288008	Y_R 488.368
Th (288.505 nm)	1.028770	ppm	0.003954	0.38	3003.150000	Y 377.433
Ti (336.122 nm)	1.024450	ppm	0.003556	0.35	148266.000000	Y 377.433
Tl (190.794 nm)	1.970160	ppm	0.009080	0.46	5002.890000	Y 377.433
U (409.013 nm)	2.125750	ppm	0.000220	0.01	10120.200000	Y 377.433
V (292.401 nm)	0.496494	ppm	0.001322	0.27	21310.900000	Y 377.433
Zn (206.200 nm)	0.471483	ppm	0.000906	0.19	2725.370000	Y 377.433
Zr (343.823 nm)	0.495186	ppm	0.001333	0.27	67385.600000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.002172	20484.672803	0.002175	0.22
Y 377.433	1.021015	1123578.248848	0.001595	0.16
Y_R 377.433	1.064230	82046.400000	0.011072	1.04
Y_R 488.368	1.075570	47003.000000	0.010888	1.01
Y_R2 488.368	1.091676	94689.227751	0.001545	0.14

Sample Name: 280-112331-A-10-C MSD

Date: 7/26/2018 6:39:31 PM Rack:Tube: 1:81

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.051352	ppm	0.000116	0.23	2145.320000	Y 377.433
Al (167.019 nm)	3.208640 o	ppm	0.009932	0.31	1596.300000	Y_R 377.433
Al H (396.152 nm)	3.419908	ppm	0.020471	0.60	8934.423672	Y_R 377.433
As (188.980 nm)	1.018370	ppm	0.000776	0.08	1439.670000	Y 242.219
B (249.678 nm)	1.126900 o	ppm	0.003805	0.34	31329.700000	Y 242.219
Ba (493.408 nm)	2.299990 o	ppm	0.018674	0.81	275058.000000	Y_R 488.368
Be (234.861 nm)	0.047848	ppm	0.000415	0.87	15443.100000	Y_R 488.368
Bi (223.061 nm)	2.004030	ppm	0.007816	0.39	5634.860000	Y 377.433
Ca (315.887 nm)	225.512441 o	ppm	0.897684	0.40	186261.687378	Y_R 377.433
Cd (214.439 nm)	0.092548	ppm	0.000356	0.38	6112.640000	Y 377.433
Co (228.615 nm)	0.470998	ppm	0.000959	0.20	9785.430000	Y 242.219
Cr (205.560 nm)	0.197028	ppm	0.000119	0.06	3331.430000	Y 377.433
Cu (324.754 nm)	0.244117	ppm	0.000783	0.32	16095.500000	Y 377.433
Fe (238.204 nm)	1.713040	ppm	0.016101	0.94	6469.135297	Y_R 377.433
Fe H (259.940 nm)	1.569420 nu	ppm	0.013362	0.85	3395.500000	Y_R 377.433
K (766.491 nm)	52.866300	ppm	0.386534	0.73	63363.300000	Y_R2 488.368
Li (670.783 nm)	1.034070	ppm	0.005457	0.53	35279.600000	Y_R2 488.368
Mg (279.078 nm)	93.570100 o	ppm	0.261054	0.28	570982.000000	Y 377.433
Mn (257.610 nm)	0.488510	ppm	0.001450	0.30	132615.000000	Y 377.433
Mo (202.032 nm)	0.959245	ppm	0.002032	0.21	9570.800000	Y 377.433
Na (589.592 nm)	122.999000 o	ppm	0.634413	0.52	857589.000000	Y_R2 488.368
Na H (589.593 nm)	132.538329	ppm	1.266661	0.96	528784.939005	Y_R 488.368
Ni (231.604 nm)	0.456905	ppm	0.002547	0.56	3556.750000	Y 377.433
P (213.618 nm)	9.827940 o	ppm	0.030587	0.31	24868.100000	Y 242.219
Pb (220.353 nm)	0.497543	ppm	0.001547	0.31	1585.430000	Y 242.219
S (181.972 nm)	19.923409 o	ppm	0.113117	0.57	11282.676307	Y 377.433
Sb (206.834 nm)	0.513333	ppm	0.000072	0.01	1530.810000	Y 377.433
Se (196.026 nm)	1.996980	ppm	0.008865	0.44	2226.310000	Y 242.219
Si (288.158 nm)	25.894600 o	ppm	0.021619	0.08	236072.000000	Y 377.433
Sn (189.925 nm)	1.890100	ppm	0.006197	0.33	4429.660000	Y 377.433
Sr (421.552 nm)	2.022922 o	ppm	0.020895	1.03	438249.476534	Y_R 488.368
Th (288.505 nm)	1.025240	ppm	0.007231	0.71	2993.020000	Y 377.433
Ti (336.122 nm)	1.021960	ppm	0.004477	0.44	147900.000000	Y 377.433
Tl (190.794 nm)	1.957590	ppm	0.010103	0.52	4970.910000	Y 377.433
U (409.013 nm)	2.119100	ppm	0.003199	0.15	10088.500000	Y 377.433
V (292.401 nm)	0.493715	ppm	0.001745	0.35	21191.500000	Y 377.433
Zn (206.200 nm)	0.464795	ppm	0.001879	0.40	2686.950000	Y 377.433
Zr (343.823 nm)	0.493838	ppm	0.001792	0.36	67202.200000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.007913	20602.024946	0.001058	0.10
Y 377.433	1.030593	1134118.824704	0.002314	0.22
Y_R 377.433	1.077340	83056.900000	0.003139	0.29
Y_R 488.368	1.086860	47496.400000	0.008770	0.81
Y_R2 488.368	1.102920	95664.488172	0.004352	0.39

Sample Name: 280-112331-A-10-Apds

Date: 7/26/2018 6:42:54 PM Rack:Tube: 1:82

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.049849	ppm	0.000270	0.54	2085.020000	Y 377.433
Al (167.019 nm)	1.807810	ppm	0.008229	0.46	899.669000	Y_R 377.433
Al H (396.152 nm)	1.882807	ppm	0.008420	0.45	4979.704940	Y_R 377.433
As (188.980 nm)	0.199640	ppm	0.001082	0.54	279.235000	Y 242.219
B (249.678 nm)	0.195217	ppm	0.001500	0.77	5476.220000	Y 242.219
Ba (493.408 nm)	0.378118	ppm	0.005019	1.33	45694.200000	Y_R 488.368
Be (234.861 nm)	0.046652	ppm	0.000310	0.66	15107.500000	Y_R 488.368
Bi (223.061 nm)	-0.003356 u	ppm	0.001320	39.33	5.467310	Y 377.433
Ca (315.887 nm)	191.743953 o	ppm	1.335243	0.70	158359.287269	Y_R 377.433
Cd (214.439 nm)	0.045851	ppm	0.000083	0.18	3027.430000	Y 377.433
Co (228.615 nm)	0.046267	ppm	0.000399	0.86	927.285000	Y 242.219
Cr (205.560 nm)	0.051218	ppm	0.000151	0.29	866.436000	Y 377.433
Cu (324.754 nm)	0.046721	ppm	0.000196	0.42	3227.260000	Y 377.433
Fe (238.204 nm)	1.590219	ppm	0.009189	0.58	6006.492693	Y_R 377.433
Fe H (259.940 nm)	1.449050 nu	ppm	0.015478	1.07	3159.800000	Y_R 377.433
K (766.491 nm)	21.665700	ppm	0.038124	0.18	25532.900000	Y_R2 488.368
Li (670.783 nm)	0.134924	ppm	0.000885	0.66	3590.270000	Y_R2 488.368
Mg (279.078 nm)	63.414500 o	ppm	0.095643	0.15	387006.000000	Y 377.433
Mn (257.610 nm)	0.057388	ppm	0.000022	0.04	15624.800000	Y 377.433
Mo (202.032 nm)	0.047664	ppm	0.000313	0.66	475.042000	Y 377.433
Na (589.592 nm)	90.895400 o	ppm	0.037528	0.04	631021.000000	Y_R2 488.368
Na H (589.593 nm)	96.834972	ppm	1.067567	1.10	386153.297245	Y_R 488.368
Ni (231.604 nm)	0.044100	ppm	0.000260	0.59	344.959000	Y 377.433
P (213.618 nm)	1.939640	ppm	0.004350	0.22	4925.070000	Y 242.219
Pb (220.353 nm)	0.099140	ppm	0.000077	0.08	319.429000	Y 242.219
S (181.972 nm)	17.197489 o	ppm	0.004238	0.02	9741.279617	Y 377.433
Sb (206.834 nm)	0.099154	ppm	0.001058	1.07	282.580000	Y 377.433
Se (196.026 nm)	0.194977	ppm	0.002545	1.31	229.865000	Y 242.219
Si (288.158 nm)	19.679200 o	ppm	0.123536	0.63	179611.000000	Y 377.433
Sn (189.925 nm)	0.096201	ppm	0.000490	0.51	232.132000	Y 377.433
Sr (421.552 nm)	1.059862	ppm	0.010754	1.01	229677.771102	Y_R 488.368
Th (288.505 nm)	0.204290	ppm	0.003336	1.63	652.322000	Y 377.433
Ti (336.122 nm)	0.073736	ppm	0.000273	0.37	11039.400000	Y 377.433
Tl (190.794 nm)	0.194956	ppm	0.000126	0.06	490.088000	Y 377.433
U (409.013 nm)	0.522624	ppm	0.001347	0.26	2398.230000	Y 377.433
V (292.401 nm)	0.051300	ppm	0.000253	0.49	2202.250000	Y 377.433
Zn (206.200 nm)	0.191398	ppm	0.001053	0.55	1116.530000	Y 377.433
Zr (343.823 nm)	0.050452	ppm	0.000060	0.12	6859.010000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.017269	20793.267049	0.001071	0.11
Y 377.433	1.036924	1141086.085254	0.001699	0.16
Y_R 377.433	1.076530	82994.300000	0.001729	0.16
Y_R 488.368	1.087100	47506.800000	0.005958	0.55
Y_R2 488.368	1.100335	95440.276484	0.001810	0.16

Sample Name: 280-112331-A-11-A

Date: 7/26/2018 6:46:17 PM Rack:Tube: 1:83

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000229	ppm	0.000049	21.43	-404.235000	Y 377.433
Al (167.019 nm)	1.540780	ppm	0.012910	0.84	766.501000	Y_R 377.433
Al H (396.152 nm)	1.541627	ppm	0.006191	0.40	4071.481555	Y_R 377.433
As (188.980 nm)	0.003507	ppm	0.001191	33.96	1.252630	Y 242.219
B (249.678 nm)	0.248552	ppm	0.000511	0.21	6954.000000	Y 242.219
Ba (493.408 nm)	0.198628	ppm	0.002122	1.07	24247.100000	Y_R 488.368
Be (234.861 nm)	0.000150	ppm	0.000004	2.77	31.384100	Y_R 488.368
Bi (223.061 nm)	-0.001643 u	ppm	0.001267	77.08	10.151900	Y 377.433
Ca (315.887 nm)	86.198200 o	ppm	0.334031	0.39	71148.458229	Y_R 377.433
Cd (214.439 nm)	0.000177	ppm	0.000015	8.33	9.585170	Y 377.433
Co (228.615 nm)	0.001493	ppm	0.000132	8.81	-4.583030	Y 242.219
Cr (205.560 nm)	0.008315	ppm	0.000140	1.68	141.313000	Y 377.433
Cu (324.754 nm)	0.002036	ppm	0.000154	7.55	392.122000	Y 377.433
Fe (238.204 nm)	0.953327	ppm	0.003086	0.32	3607.434998	Y_R 377.433
Fe H (259.940 nm)	0.807476 nu	ppm	0.006702	0.83	1903.460000	Y_R 377.433
K (766.491 nm)	2.652610	ppm	0.010315	0.39	2479.670000	Y_R2 488.368
Li (670.783 nm)	0.036962	ppm	0.000297	0.80	137.694000	Y_R2 488.368
Mg (279.078 nm)	20.442300	ppm	0.001284	0.01	124791.000000	Y 377.433
Mn (257.610 nm)	0.243772	ppm	0.000239	0.10	66202.400000	Y 377.433
Mo (202.032 nm)	0.002591	ppm	0.000326	12.60	25.299200	Y 377.433
Na (589.592 nm)	140.261000 o	ppm	0.544412	0.39	972776.000000	Y_R2 488.368
Na H (589.593 nm)	150.066331	ppm	1.806409	1.20	595737.109441	Y_R 488.368
Ni (231.604 nm)	0.003496	ppm	0.000236	6.76	28.994700	Y 377.433
P (213.618 nm)	0.033749	ppm	0.000268	0.79	106.631000	Y 242.219
Pb (220.353 nm)	0.002181	ppm	0.000535	24.53	10.035300	Y 242.219
S (181.972 nm)	8.254536	ppm	0.020789	0.25	4688.644629	Y 377.433
Sb (206.834 nm)	-0.002609 u	ppm	0.000140	5.35	-24.844000	Y 377.433
Se (196.026 nm)	0.000104 u	ppm	0.000815	> 100.00	14.321500	Y 242.219
Si (288.158 nm)	16.146500 o	ppm	0.040517	0.25	147520.000000	Y 377.433
Sn (189.925 nm)	0.000777	ppm	0.000793	> 100.00	8.850310	Y 377.433
Sr (421.552 nm)	0.587147	ppm	0.004461	0.76	127300.952620	Y_R 488.368
Th (288.505 nm)	0.000551 u	ppm	0.000892	> 100.00	79.575600	Y 377.433
Ti (336.122 nm)	0.020622	ppm	0.000048	0.23	3042.950000	Y 377.433
Tl (190.794 nm)	0.004256	ppm	0.000194	4.57	4.923850	Y 377.433
U (409.013 nm)	-0.003457 u	ppm	0.000909	26.30	-125.193000	Y 377.433
V (292.401 nm)	0.010149	ppm	0.000290	2.85	455.644000	Y 377.433
Zn (206.200 nm)	0.002463	ppm	0.000843	34.21	31.276400	Y 377.433
Zr (343.823 nm)	0.001047	ppm	0.000085	8.10	133.225000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.040899	21276.272107	0.000542	0.05
Y 377.433	1.055498	1161525.539547	0.003021	0.29
Y_R 377.433	1.085070	83652.900000	0.003316	0.31
Y_R 488.368	1.092680	47750.600000	0.001325	0.12
Y_R2 488.368	1.111588	96416.289440	0.006089	0.55

Sample Name: CCVH-5225153

Date: 7/26/2018 6:49:41 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001484 u	ppm	0.000028	1.91	-750.451000	Y 377.433
Al (167.019 nm)	45.845300 o	ppm	0.221677	0.48	22825.600000	Y_R 377.433
Al H (396.152 nm)	49.449819	ppm	0.186001	0.38	124583.253786	Y_R 377.433
As (188.980 nm)	0.002156	ppm	0.000723	33.54	-1.143010	Y 242.219
B (249.678 nm)	-0.000273 u	ppm	0.000444	> 100.00	-25.755100	Y 242.219
Ba (493.408 nm)	0.000003 u	ppm	0.000287	> 100.00	568.365000	Y_R 488.368
Be (234.861 nm)	0.000105	ppm	0.000034	32.76	1650.520000	Y_R 488.368
Bi (223.061 nm)	0.971102	ppm	0.005743	0.59	2746.870000	Y 377.433
Ca (315.887 nm)	0.013899	ppm	0.000268	1.93	-64.278537	Y_R 377.433
Cd (214.439 nm)	-0.000127 u	ppm	0.000067	52.69	40.631200	Y 377.433
Co (228.615 nm)	0.000952	ppm	0.000339	35.55	-16.538300	Y 242.219
Cr (205.560 nm)	-0.000017 u	ppm	0.000024	> 100.00	-14.387100	Y 377.433
Cu (324.754 nm)	-0.006521 u	ppm	0.000174	2.66	272.688000	Y 377.433
Fe (238.204 nm)	48.701653 o	ppm	0.291043	0.60	183466.774575	Y_R 377.433
Fe H (259.940 nm)	49.433600	ppm	0.202380	0.41	97123.400000	Y_R 377.433
K (766.491 nm)	0.103213	ppm	0.025456	24.66	-611.454000	Y_R2 488.368
Li (670.783 nm)	0.002204	ppm	0.001280	58.07	-1087.320000	Y_R2 488.368
Mg (279.078 nm)	-0.008930 u	ppm	0.002399	26.86	-374.521000	Y 377.433
Mn (257.610 nm)	0.001468	ppm	0.000001	0.04	450.533000	Y 377.433
Mo (202.032 nm)	0.000059 u	ppm	0.000158	> 100.00	0.038226	Y 377.433
Na (589.592 nm)	228.723000 o	ppm	1.990240	0.87	1585460.000000	Y_R2 488.368
Na H (589.593 nm)	247.227955	ppm	1.390556	0.56	978413.709772	Y_R 488.368
Ni (231.604 nm)	0.001286	ppm	0.000456	35.43	14.061600	Y 377.433
P (213.618 nm)	-0.002967 u	ppm	0.000296	9.99	13.806500	Y 242.219
Pb (220.353 nm)	-0.001278 u	ppm	0.000145	11.31	17.656700	Y 242.219
S (181.972 nm)	4.883223	ppm	0.035180	0.72	2783.076284	Y 377.433
Sb (206.834 nm)	-0.004940 u	ppm	0.000449	9.10	-79.427300	Y 377.433
Se (196.026 nm)	-0.002085 u	ppm	0.000832	39.93	2.017920	Y 242.219
Si (288.158 nm)	0.024372	ppm	0.003580	14.69	1066.550000	Y 377.433
Sn (189.925 nm)	0.002390	ppm	0.001059	44.32	12.624600	Y 377.433
Sr (421.552 nm)	0.000530	ppm	0.000121	22.81	256.298785	Y_R 488.368
Th (288.505 nm)	4.943940	ppm	0.009616	0.19	14016.200000	Y 377.433
Ti (336.122 nm)	0.001604	ppm	0.000070	4.35	25.443600	Y 377.433
Tl (190.794 nm)	-0.003026 u	ppm	0.001772	58.55	-14.988000	Y 377.433
U (409.013 nm)	10.014300	ppm	0.008273	0.08	48466.700000	Y 377.433
V (292.401 nm)	0.002739	ppm	0.000166	6.05	-52.427500	Y 377.433
Zn (206.200 nm)	-0.002214 u	ppm	0.000177	8.00	4.409960	Y 377.433
Zr (343.823 nm)	-0.003969 u	ppm	0.000077	1.94	-404.560000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.036269	21181.633557	0.002083	0.20
Y 377.433	1.037038	1141210.967294	0.004326	0.42
Y_R 377.433	1.071630	82616.600000	0.006969	0.65
Y_R 488.368	1.081530	47263.200000	0.007063	0.65
Y_R2 488.368	1.097590	95202.154710	0.000680	0.06

Sample Name: CCV-5225154

Date: 7/26/2018 6:53:05 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.477231	ppm	0.000978	0.20	23638.500000	Y 377.433
Al (167.019 nm)	0.527234	ppm	0.005039	0.96	263.463000	Y_R 377.433
Al H (396.152 nm)	0.480145 u	ppm	0.002687	0.56	1403.248286	Y_R 377.433
As (188.980 nm)	0.975258	ppm	0.005250	0.54	1378.550000	Y 242.219
B (249.678 nm)	0.483565	ppm	0.000435	0.09	13491.200000	Y 242.219
Ba (493.408 nm)	0.493935	ppm	0.003220	0.65	59481.000000	Y_R 488.368
Be (234.861 nm)	0.471289	ppm	0.000781	0.17	152605.000000	Y_R 488.368
Bi (223.061 nm)	-0.002811 u	ppm	0.001406	50.01	7.165100	Y 377.433
Ca (315.887 nm)	4.920606	ppm	0.016823	0.34	3990.334618	Y_R 377.433
Cd (214.439 nm)	0.478426	ppm	0.000437	0.09	31603.500000	Y 377.433
Co (228.615 nm)	0.491555	ppm	0.000370	0.08	10191.100000	Y 242.219
Cr (205.560 nm)	0.480578	ppm	0.000240	0.05	8125.430000	Y 377.433
Cu (324.754 nm)	0.478336	ppm	0.000502	0.11	31427.600000	Y 377.433
Fe (238.204 nm)	2.506796	ppm	0.008582	0.34	9459.070500	Y_R 377.433
Fe H (259.940 nm)	2.400720 u	ppm	0.024629	1.03	5023.360000	Y_R 377.433
K (766.491 nm)	48.060600	ppm	0.056829	0.12	57536.500000	Y_R2 488.368
Li (670.783 nm)	0.960271	ppm	0.004635	0.48	32678.800000	Y_R2 488.368
Mg (279.078 nm)	18.786000	ppm	0.004347	0.02	114681.000000	Y 377.433
Mn (257.610 nm)	0.484104	ppm	0.000342	0.07	131419.000000	Y 377.433
Mo (202.032 nm)	0.485811	ppm	0.000412	0.08	4846.870000	Y 377.433
Na (589.592 nm)	4.837900	ppm	0.008452	0.17	34824.400000	Y_R2 488.368
Na H (589.593 nm)	5.518143 u	ppm	0.055038	1.00	26423.767182	Y_R 488.368
Ni (231.604 nm)	0.479556	ppm	0.000931	0.19	3731.560000	Y 377.433
P (213.618 nm)	0.942290	ppm	0.006743	0.72	2403.580000	Y 242.219
Pb (220.353 nm)	0.979425	ppm	0.003758	0.38	3114.090000	Y 242.219
S (181.972 nm)	0.005150	ppm	0.004188	81.32	28.045218	Y 377.433
Sb (206.834 nm)	0.970718	ppm	0.001609	0.17	2934.140000	Y 377.433
Se (196.026 nm)	0.961641	ppm	0.006738	0.70	1079.250000	Y 242.219
Si (288.158 nm)	4.876970	ppm	0.011619	0.24	45147.500000	Y 377.433
Sn (189.925 nm)	0.951759	ppm	0.002411	0.25	2234.040000	Y 377.433
Sr (421.552 nm)	0.491265	ppm	0.003395	0.69	106535.766597	Y_R 488.368
Th (288.505 nm)	0.002406 u	ppm	0.004922	> 100.00	95.673400	Y 377.433
Ti (336.122 nm)	0.490638	ppm	0.001043	0.21	70569.400000	Y 377.433
Tl (190.794 nm)	0.979407	ppm	0.000436	0.04	2485.310000	Y 377.433
U (409.013 nm)	0.004563	ppm	0.002348	51.47	-108.009000	Y 377.433
V (292.401 nm)	0.482970	ppm	0.000316	0.07	20686.600000	Y 377.433
Zn (206.200 nm)	0.473950	ppm	0.001420	0.30	2739.540000	Y 377.433
Zr (343.823 nm)	0.488352	ppm	0.000395	0.08	66458.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.070318	21877.595441	0.000409	0.04
Y 377.433	1.084117	1193019.083706	0.001587	0.15
Y_R 377.433	1.099300	84750.400000	0.002269	0.21
Y_R 488.368	1.108860	48457.700000	0.002039	0.18
Y_R2 488.368	1.128667	97897.722266	0.001765	0.16

Sample Name: CCB

Date: 7/26/2018 6:56:27 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000275 u	ppm	0.000020	7.37	-427.867000	Y 377.433
Al (167.019 nm)	0.003847	ppm	0.000107	2.78	1.695020	Y_R 377.433
Al H (396.152 nm)	-0.050141 u	ppm	0.005836	11.64	28.273602	Y_R 377.433
As (188.980 nm)	0.001333	ppm	0.000748	56.10	-1.819850	Y 242.219
B (249.678 nm)	0.000836	ppm	0.000190	22.78	87.037800	Y 242.219
Ba (493.408 nm)	-0.000442 u	ppm	0.000235	53.21	468.135000	Y_R 488.368
Be (234.861 nm)	0.000106	ppm	0.000034	32.27	-14.939900	Y_R 488.368
Bi (223.061 nm)	-0.000399 u	ppm	0.000566	> 100.00	13.464800	Y 377.433
Ca (315.887 nm)	0.017036	ppm	0.011573	67.93	-61.687380	Y_R 377.433
Cd (214.439 nm)	0.000086	ppm	0.000033	38.57	2.602840	Y 377.433
Co (228.615 nm)	0.000130 u	ppm	0.000242	> 100.00	-33.637500	Y 242.219
Cr (205.560 nm)	0.000003 u	ppm	0.000023	> 100.00	0.973898	Y 377.433
Cu (324.754 nm)	0.000260	ppm	0.000137	52.75	336.858000	Y 377.433
Fe (238.204 nm)	0.001349	ppm	0.000699	51.83	21.503851	Y_R 377.433
Fe H (259.940 nm)	-0.158145 u	ppm	0.000508	0.32	12.581800	Y_R 377.433
K (766.491 nm)	0.078397	ppm	0.000060	0.08	-641.544000	Y_R2 488.368
Li (670.783 nm)	0.002945	ppm	0.001348	45.77	-1061.200000	Y_R2 488.368
Mg (279.078 nm)	0.003325	ppm	0.000469	14.10	67.145700	Y 377.433
Mn (257.610 nm)	0.000085	ppm	0.000036	42.14	75.198700	Y 377.433
Mo (202.032 nm)	0.000230	ppm	0.000031	13.56	1.741640	Y 377.433
Na (589.592 nm)	0.022718	ppm	0.002198	9.68	404.089000	Y_R2 488.368
Na H (589.593 nm)	-0.119182 u	ppm	0.004067	3.41	3710.376140	Y_R 488.368
Ni (231.604 nm)	-0.000269 u	ppm	0.000031	11.63	-0.323215	Y 377.433
P (213.618 nm)	0.000711	ppm	0.000382	53.74	23.105500	Y 242.219
Pb (220.353 nm)	-0.000235 u	ppm	0.000023	9.73	2.860780	Y 242.219
S (181.972 nm)	0.006681	ppm	0.001116	16.71	27.629293	Y 377.433
Sb (206.834 nm)	0.000855	ppm	0.000482	56.44	-14.307800	Y 377.433
Se (196.026 nm)	-0.001518 u	ppm	0.000065	4.30	12.482400	Y 242.219
Si (288.158 nm)	-0.004618 u	ppm	0.000753	16.30	803.201000	Y 377.433
Sn (189.925 nm)	-0.000820 u	ppm	0.000157	19.09	5.114000	Y 377.433
Sr (421.552 nm)	-0.000016 u	ppm	0.000006	35.79	138.019649	Y_R 488.368
Th (288.505 nm)	0.000711 u	ppm	0.001512	> 100.00	74.381500	Y 377.433
Ti (336.122 nm)	0.000416	ppm	0.000067	16.07	-145.987000	Y 377.433
Tl (190.794 nm)	0.001592	ppm	0.000031	1.93	-1.726670	Y 377.433
U (409.013 nm)	0.002206 u	ppm	0.003681	> 100.00	-80.998100	Y 377.433
V (292.401 nm)	-0.000057 u	ppm	0.000132	> 100.00	17.872500	Y 377.433
Zn (206.200 nm)	-0.002619 u	ppm	0.000125	4.78	2.085460	Y 377.433
Zr (343.823 nm)	0.000136	ppm	0.000056	41.45	6.413700	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.074493	21962.938132	0.001071	0.10
Y 377.433	1.087291	1196512.393367	0.001118	0.10
Y_R 377.433	1.092100	84194.700000	0.000903	0.08
Y_R 488.368	1.097840	47976.000000	0.000172	0.02
Y_R2 488.368	1.113279	96562.951570	0.008964	0.81

Sample Name: CCVL-5236949

Date: 7/26/2018 6:59:51 PM
Rack:Tube: S1:3
Weight (g): 1
Volume (mL): 1
Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.008824	ppm	0.000102	1.15	30.340100	Y 377.433
Al (167.019 nm)	0.103415	ppm	0.002765	2.67	51.263900	Y_R 377.433
Al H (396.152 nm)	0.051453 u	ppm	0.000801	1.56	285.357476	Y_R 377.433
As (188.980 nm)	0.015696	ppm	0.000190	1.21	18.537400	Y 242.219
B (249.678 nm)	0.093409	ppm	0.000250	0.27	2654.150000	Y 242.219
Ba (493.408 nm)	0.009084	ppm	0.000071	0.79	1605.000000	Y_R 488.368
Be (234.861 nm)	0.000957	ppm	0.000012	1.27	262.924000	Y_R 488.368
Bi (223.061 nm)	0.097504	ppm	0.003905	4.01	288.036000	Y 377.433
Ca (315.887 nm)	0.205798	ppm	0.000559	0.27	94.286859	Y_R 377.433
Cd (214.439 nm)	0.004777	ppm	0.000031	0.64	312.585000	Y 377.433
Co (228.615 nm)	0.010258	ppm	0.000063	0.61	177.043000	Y 242.219
Cr (205.560 nm)	0.009293	ppm	0.000108	1.16	158.080000	Y 377.433
Cu (324.754 nm)	0.014106	ppm	0.000152	1.08	1234.530000	Y 377.433
Fe (238.204 nm)	0.099466	ppm	0.000298	0.30	391.092320	Y_R 377.433
Fe H (259.940 nm)	-0.062395 u	ppm	0.001070	1.72	200.078000	Y_R 377.433
K (766.491 nm)	3.029280	ppm	0.081610	2.69	2936.380000	Y_R2 488.368
Li (670.783 nm)	0.023698	ppm	0.000707	2.99	-329.770000	Y_R2 488.368
Mg (279.078 nm)	0.183689	ppm	0.000230	0.13	1166.060000	Y 377.433
Mn (257.610 nm)	0.009791	ppm	0.000034	0.35	2708.970000	Y 377.433
Mo (202.032 nm)	0.017531	ppm	0.000019	0.11	174.369000	Y 377.433
Na (589.592 nm)	0.997417	ppm	0.004106	0.41	7179.250000	Y_R2 488.368
Na H (589.593 nm)	0.790302 u	ppm	0.008320	1.05	7303.742512	Y_R 488.368
Ni (231.604 nm)	0.037668	ppm	0.000316	0.84	294.641000	Y 377.433
P (213.618 nm)	2.644190 o	ppm	0.010430	0.39	6706.280000	Y 242.219
Pb (220.353 nm)	0.008597	ppm	0.000308	3.58	30.989100	Y 242.219
S (181.972 nm)	0.091437	ppm	0.002594	2.84	75.545375	Y 377.433
Sb (206.834 nm)	0.019481	ppm	0.000850	4.36	42.131300	Y 377.433
Se (196.026 nm)	0.016012	ppm	0.000673	4.21	31.888600	Y 242.219
Si (288.158 nm)	0.465691	ppm	0.001693	0.36	5075.490000	Y 377.433
Sn (189.925 nm)	0.091987	ppm	0.000662	0.72	222.272000	Y 377.433
Sr (421.552 nm)	0.009603	ppm	0.000011	0.12	2221.188774	Y_R 488.368
Th (288.505 nm)	0.016892	ppm	0.000404	2.39	121.062000	Y 377.433
Ti (336.122 nm)	0.010008	ppm	0.000071	0.71	1237.830000	Y 377.433
Tl (190.794 nm)	0.015675	ppm	0.000725	4.62	34.060200	Y 377.433
U (409.013 nm)	0.061898	ppm	0.003514	5.68	207.062000	Y 377.433
V (292.401 nm)	0.009231	ppm	0.000230	2.50	411.987000	Y 377.433
Zn (206.200 nm)	0.016350	ppm	0.000016	0.10	111.040000	Y 377.433
Zr (343.823 nm)	0.014392	ppm	0.000014	0.10	1946.900000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.089579	22271.307330	0.003242	0.30
Y 377.433	1.101575	1212231.008149	0.005396	0.49
Y_R 377.433	1.106300	85289.400000	0.003426	0.31
Y_R 488.368	1.116650	48798.200000	0.007648	0.68
Y_R2 488.368	1.139619	98847.630827	0.014009	1.23

Sample Name: MB 280-423752/1-A

Date: 7/26/2018 7:12:40 PM Rack:Tube: 1:84

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000185 u	ppm	0.000340	> 100.00	-423.492000	Y 377.433
Al (167.019 nm)	0.006060	ppm	0.000023	0.37	2.794590	Y_R 377.433
Al H (396.152 nm)	-0.049214 u	ppm	0.000630	1.28	30.599902	Y_R 377.433
As (188.980 nm)	0.000081 u	ppm	0.002329	> 100.00	-3.593260	Y 242.219
B (249.678 nm)	-0.000146 u	ppm	0.000206	> 100.00	59.825500	Y 242.219
Ba (493.408 nm)	-0.000599 u	ppm	0.000128	21.44	449.342000	Y_R 488.368
Be (234.861 nm)	0.000011	ppm	0.000006	52.41	-45.901500	Y_R 488.368
Bi (223.061 nm)	0.000940	ppm	0.001177	> 100.00	17.220400	Y 377.433
Ca (315.887 nm)	0.037087	ppm	0.005753	15.51	-45.119249	Y_R 377.433
Cd (214.439 nm)	0.000064 u	ppm	0.000090	> 100.00	1.103710	Y 377.433
Co (228.615 nm)	0.000124	ppm	0.000144	> 100.00	-33.782000	Y 242.219
Cr (205.560 nm)	-0.000260 u	ppm	0.000220	84.42	-3.478420	Y 377.433
Cu (324.754 nm)	-0.000026 u	ppm	0.000098	> 100.00	316.698000	Y 377.433
Fe (238.204 nm)	-0.000003 u	ppm	0.000172	> 100.00	16.410755	Y_R 377.433
Fe H (259.940 nm)	-0.158574 nu	ppm	0.000678	0.43	11.741300	Y_R 377.433
K (766.491 nm)	0.074856	ppm	0.030234	40.39	-645.838000	Y_R2 488.368
Li (670.783 nm)	0.004077	ppm	0.000663	16.27	-1021.300000	Y_R2 488.368
Mg (279.078 nm)	-0.000589 u	ppm	0.001159	> 100.00	43.140800	Y 377.433
Mn (257.610 nm)	0.000169	ppm	0.000006	3.72	98.027500	Y 377.433
Mo (202.032 nm)	0.000058	ppm	0.000023	38.67	0.032838	Y 377.433
Na (589.592 nm)	0.022634	ppm	0.003118	13.77	403.000000	Y_R2 488.368
Na H (589.593 nm)	-0.289359 u	ppm	0.016484	5.70	3039.529909	Y_R 488.368
Ni (231.604 nm)	-0.000444 u	ppm	0.000086	19.32	-1.688170	Y 377.433
P (213.618 nm)	0.000805	ppm	0.000497	61.74	23.343700	Y 242.219
Pb (220.353 nm)	-0.000170 u	ppm	0.000951	> 100.00	3.079720	Y 242.219
S (181.972 nm)	0.002362 u	ppm	0.005446	> 100.00	25.188830	Y 377.433
Sb (206.834 nm)	-0.000032 u	ppm	0.000826	> 100.00	-17.015000	Y 377.433
Se (196.026 nm)	-0.001344 u	ppm	0.002685	> 100.00	12.675600	Y 242.219
Si (288.158 nm)	-0.005018 u	ppm	0.000847	16.89	799.571000	Y 377.433
Sn (189.925 nm)	-0.000257 u	ppm	0.000135	52.76	6.431910	Y 377.433
Sr (421.552 nm)	-0.000083 u	ppm	0.000123	> 100.00	123.569037	Y_R 488.368
Th (288.505 nm)	-0.000159 u	ppm	0.002627	> 100.00	72.063800	Y 377.433
Ti (336.122 nm)	0.000314	ppm	0.000063	20.00	-160.711000	Y 377.433
Tl (190.794 nm)	0.001159	ppm	0.000419	36.16	-2.828610	Y 377.433
U (409.013 nm)	0.001234 u	ppm	0.002129	> 100.00	-85.699800	Y 377.433
V (292.401 nm)	0.000002 u	ppm	0.000022	> 100.00	19.717300	Y 377.433
Zn (206.200 nm)	-0.001158 u	ppm	0.000660	57.00	10.478600	Y 377.433
Zr (343.823 nm)	-0.000062 u	ppm	0.000098	> 100.00	-20.550900	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.082721	22131.120257	0.001780	0.16
Y 377.433	1.097521	1207770.225419	0.000371	0.03
Y_R 377.433	1.105770	85248.800000	0.002784	0.25
Y_R 488.368	1.108330	48434.400000	0.003095	0.28
Y_R2 488.368	1.137671	98678.684357	0.003597	0.32

Sample Name: 280-112275-A-29-A LCS

Date: 7/26/2018 7:16:02 PM Rack:Tube: 1:85

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.048275	ppm	0.000033	0.07	1991.190000	Y 377.433
Al (167.019 nm)	1.982840	ppm	0.014506	0.73	986.378000	Y_R 377.433
Al H (396.152 nm)	1.981440	ppm	0.017034	0.86	5235.850072	Y_R 377.433
As (188.980 nm)	0.973774	ppm	0.000575	0.06	1376.460000	Y 242.219
B (249.678 nm)	0.975852	ppm	0.000000	0.00	27142.500000	Y 242.219
Ba (493.408 nm)	1.965390 o	ppm	0.007529	0.38	235084.000000	Y_R 488.368
Be (234.861 nm)	0.045845	ppm	0.000577	1.26	14772.800000	Y_R 488.368
Bi (223.061 nm)	1.930440	ppm	0.004384	0.23	5428.380000	Y 377.433
Ca (315.887 nm)	47.540404 o	ppm	0.264251	0.56	39206.181773	Y_R 377.433
Cd (214.439 nm)	0.093326	ppm	0.000143	0.15	6163.340000	Y 377.433
Co (228.615 nm)	0.467932	ppm	0.000293	0.06	9720.090000	Y 242.219
Cr (205.560 nm)	0.189746	ppm	0.000516	0.27	3208.490000	Y 377.433
Cu (324.754 nm)	0.234783	ppm	0.000495	0.21	15615.600000	Y 377.433
Fe (238.204 nm)	1.052142	ppm	0.007588	0.72	3979.651496	Y_R 377.433
Fe H (259.940 nm)	0.905433 nu	ppm	0.005817	0.64	2095.280000	Y_R 377.433
K (766.491 nm)	48.753900	ppm	0.160219	0.33	58377.100000	Y_R2 488.368
Li (670.783 nm)	0.962112	ppm	0.002377	0.25	32743.700000	Y_R2 488.368
Mg (279.078 nm)	46.901300 o	ppm	0.072953	0.16	286197.000000	Y 377.433
Mn (257.610 nm)	0.475109	ppm	0.000206	0.04	128978.000000	Y 377.433
Mo (202.032 nm)	0.943843	ppm	0.001007	0.11	9417.120000	Y 377.433
Na (589.592 nm)	47.276500 o	ppm	0.050171	0.11	332070.000000	Y_R2 488.368
Na H (589.593 nm)	50.904255	ppm	0.157696	0.31	206757.136898	Y_R 488.368
Ni (231.604 nm)	0.457979	ppm	0.000830	0.18	3565.080000	Y 377.433
P (213.618 nm)	9.393440 o	ppm	0.003935	0.04	23769.600000	Y 242.219
Pb (220.353 nm)	0.492174	ppm	0.000111	0.02	1568.710000	Y 242.219
S (181.972 nm)	1.947916	ppm	0.001427	0.07	1125.763744	Y 377.433
Sb (206.834 nm)	0.496482	ppm	0.002006	0.40	1480.120000	Y 377.433
Se (196.026 nm)	1.909530	ppm	0.000547	0.03	2129.550000	Y 242.219
Si (288.158 nm)	9.776420	ppm	0.003344	0.03	89654.100000	Y 377.433
Sn (189.925 nm)	1.880450	ppm	0.000997	0.05	4407.070000	Y 377.433
Sr (421.552 nm)	0.969929	ppm	0.004889	0.50	210200.807472	Y_R 488.368
Th (288.505 nm)	0.998779	ppm	0.006648	0.67	2917.480000	Y 377.433
Ti (336.122 nm)	0.976603	ppm	0.000470	0.05	140791.000000	Y 377.433
Tl (190.794 nm)	1.965470	ppm	0.002216	0.11	4991.230000	Y 377.433
U (409.013 nm)	2.049430	ppm	0.003748	0.18	9787.780000	Y 377.433
V (292.401 nm)	0.481273	ppm	0.001120	0.23	20658.900000	Y 377.433
Zn (206.200 nm)	0.462194	ppm	0.001461	0.32	2672.010000	Y 377.433
Zr (343.823 nm)	0.481322	ppm	0.000763	0.16	65496.900000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.036588	21188.147236	0.001315	0.13
Y 377.433	1.048181	1153473.838525	0.003205	0.31
Y_R 377.433	1.094080	84347.300000	0.016082	1.47
Y_R 488.368	1.105210	48298.100000	0.016750	1.52
Y_R2 488.368	1.116112	96808.759851	0.006315	0.57

Sample Name: 280-112275-A-30-A LCS

Date: 7/26/2018 7:19:25 PM Rack:Tube: 1:86

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.048438	ppm	0.000228	0.47	1999.230000	Y 377.433
Al (167.019 nm)	1.972830	ppm	0.028552	1.45	981.357000	Y_R 377.433
Al H (396.152 nm)	1.982826	ppm	0.001656	0.08	5239.596221	Y_R 377.433
As (188.980 nm)	0.971499	ppm	0.005770	0.59	1373.240000	Y 242.219
B (249.678 nm)	0.980854	ppm	0.003122	0.32	27281.300000	Y 242.219
Ba (493.408 nm)	1.968700 o	ppm	0.006893	0.35	235479.000000	Y_R 488.368
Be (234.861 nm)	0.046722	ppm	0.000012	0.03	15054.000000	Y_R 488.368
Bi (223.061 nm)	1.922260	ppm	0.006505	0.34	5405.420000	Y 377.433
Ca (315.887 nm)	47.603004 o	ppm	0.216813	0.46	39257.906619	Y_R 377.433
Cd (214.439 nm)	0.093193	ppm	0.000123	0.13	6154.470000	Y 377.433
Co (228.615 nm)	0.467159	ppm	0.001474	0.32	9704.170000	Y 242.219
Cr (205.560 nm)	0.190181	ppm	0.001060	0.56	3215.860000	Y 377.433
Cu (324.754 nm)	0.235655	ppm	0.000912	0.39	15671.100000	Y 377.433
Fe (238.204 nm)	0.979143	ppm	0.002282	0.23	3704.679749	Y_R 377.433
Fe H (259.940 nm)	0.834655 nu	ppm	0.002673	0.32	1956.680000	Y_R 377.433
K (766.491 nm)	48.614800	ppm	0.035686	0.07	58208.400000	Y_R2 488.368
Li (670.783 nm)	0.957116	ppm	0.000528	0.06	32567.600000	Y_R2 488.368
Mg (279.078 nm)	46.863000 o	ppm	0.000987	0.00	285963.000000	Y 377.433
Mn (257.610 nm)	0.474960	ppm	0.000430	0.09	128938.000000	Y 377.433
Mo (202.032 nm)	0.946413	ppm	0.000321	0.03	9442.770000	Y 377.433
Na (589.592 nm)	47.226500 o	ppm	0.299723	0.63	331731.000000	Y_R2 488.368
Na H (589.593 nm)	51.197010	ppm	0.068750	0.13	207914.154133	Y_R 488.368
Ni (231.604 nm)	0.459403	ppm	0.001664	0.36	3576.140000	Y 377.433
P (213.618 nm)	9.427940 o	ppm	0.026283	0.28	23856.800000	Y 242.219
Pb (220.353 nm)	0.493871	ppm	0.000687	0.14	1574.120000	Y 242.219
S (181.972 nm)	1.966526	ppm	0.007239	0.37	1136.279556	Y 377.433
Sb (206.834 nm)	0.496500	ppm	0.000661	0.13	1480.130000	Y 377.433
Se (196.026 nm)	1.913190	ppm	0.007955	0.42	2133.630000	Y 242.219
Si (288.158 nm)	9.793190	ppm	0.009148	0.09	89806.400000	Y 377.433
Sn (189.925 nm)	1.885060	ppm	0.013274	0.70	4417.860000	Y 377.433
Sr (421.552 nm)	0.970377	ppm	0.002598	0.27	210297.939589	Y_R 488.368
Th (288.505 nm)	0.999963	ppm	0.001273	0.13	2921.080000	Y 377.433
Ti (336.122 nm)	0.979604	ppm	0.000842	0.09	141224.000000	Y 377.433
Tl (190.794 nm)	1.964650	ppm	0.003080	0.16	4989.110000	Y 377.433
U (409.013 nm)	2.060830	ppm	0.000788	0.04	9842.830000	Y 377.433
V (292.401 nm)	0.481981	ppm	0.001326	0.28	20688.500000	Y 377.433
Zn (206.200 nm)	0.459923	ppm	0.000754	0.16	2658.970000	Y 377.433
Zr (343.823 nm)	0.482562	ppm	0.000371	0.08	65665.300000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.042297	21304.850626	0.000004	0.00
Y 377.433	1.056470	1162595.210073	0.000773	0.07
Y_R 377.433	1.085370	83676.500000	0.000786	0.07
Y_R 488.368	1.093270	47776.400000	0.002022	0.18
Y_R2 488.368	1.120502	97189.525877	0.005215	0.47

Sample Name: 280-112275-A-31-A LCS

Date: 7/26/2018 7:22:48 PM Rack:Tube: 1:87

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.049948	ppm	0.000007	0.01	2071.650000	Y 377.433
Al (167.019 nm)	2.010380	ppm	0.004304	0.21	1000.040000	Y_R 377.433
Al H (396.152 nm)	2.019629	ppm	0.012853	0.64	5333.270438	Y_R 377.433
As (188.980 nm)	1.003640	ppm	0.005153	0.51	1418.790000	Y 242.219
B (249.678 nm)	0.986985	ppm	0.000621	0.06	27452.000000	Y 242.219
Ba (493.408 nm)	2.027090 o	ppm	0.012297	0.61	242447.000000	Y_R 488.368
Be (234.861 nm)	0.047527	ppm	0.000156	0.33	15315.400000	Y_R 488.368
Bi (223.061 nm)	1.986850	ppm	0.010240	0.52	5586.550000	Y 377.433
Ca (315.887 nm)	48.923211 o	ppm	0.124774	0.26	40348.774601	Y_R 377.433
Cd (214.439 nm)	0.095946	ppm	0.000360	0.38	6336.390000	Y 377.433
Co (228.615 nm)	0.484012	ppm	0.003744	0.77	10054.400000	Y 242.219
Cr (205.560 nm)	0.195839	ppm	0.000883	0.45	3311.550000	Y 377.433
Cu (324.754 nm)	0.242551	ppm	0.000430	0.18	16120.900000	Y 377.433
Fe (238.204 nm)	1.002904	ppm	0.005336	0.53	3794.180181	Y_R 377.433
Fe H (259.940 nm)	0.855778 nu	ppm	0.007330	0.86	1998.050000	Y_R 377.433
K (766.491 nm)	49.968100	ppm	0.160279	0.32	59849.300000	Y_R2 488.368
Li (670.783 nm)	0.989134	ppm	0.001196	0.12	33696.100000	Y_R2 488.368
Mg (279.078 nm)	48.313600 o	ppm	0.160499	0.33	294813.000000	Y 377.433
Mn (257.610 nm)	0.488753	ppm	0.001507	0.31	132681.000000	Y 377.433
Mo (202.032 nm)	0.952555	ppm	0.002198	0.23	9504.050000	Y 377.433
Na (589.592 nm)	48.665600 o	ppm	0.197283	0.41	341828.000000	Y_R2 488.368
Na H (589.593 nm)	52.726088	ppm	0.233256	0.44	213998.232363	Y_R 488.368
Ni (231.604 nm)	0.471235	ppm	0.002246	0.48	3668.220000	Y 377.433
P (213.618 nm)	9.700370 o	ppm	0.015814	0.16	24545.600000	Y 242.219
Pb (220.353 nm)	0.508409	ppm	0.002403	0.47	1620.480000	Y 242.219
S (181.972 nm)	1.961342	ppm	0.001450	0.07	1133.386574	Y 377.433
Sb (206.834 nm)	0.499756	ppm	0.005261	1.05	1489.940000	Y 377.433
Se (196.026 nm)	1.977410	ppm	0.005770	0.29	2204.760000	Y 242.219
Si (288.158 nm)	9.832320	ppm	0.017884	0.18	90161.900000	Y 377.433
Sn (189.925 nm)	1.891900	ppm	0.001098	0.06	4433.860000	Y 377.433
Sr (421.552 nm)	0.998823	ppm	0.006582	0.66	216458.576067	Y_R 488.368
Th (288.505 nm)	1.029700	ppm	0.001015	0.10	3005.820000	Y 377.433
Ti (336.122 nm)	0.986204	ppm	0.001860	0.19	142180.000000	Y 377.433
Tl (190.794 nm)	2.026760	ppm	0.008490	0.42	5147.220000	Y 377.433
U (409.013 nm)	2.120480	ppm	0.006434	0.30	10131.300000	Y 377.433
V (292.401 nm)	0.496295	ppm	0.001080	0.22	21302.400000	Y 377.433
Zn (206.200 nm)	0.471254	ppm	0.002284	0.48	2724.050000	Y 377.433
Zr (343.823 nm)	0.484968	ppm	0.000753	0.16	65992.900000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.043332	21326.001793	0.001706	0.16
Y 377.433	1.057829	1164091.376389	0.003253	0.31
Y_R 377.433	1.098380	84679.000000	0.003689	0.34
Y_R 488.368	1.106980	48375.700000	0.005207	0.47
Y_R2 488.368	1.128543	97886.919142	0.004572	0.41

Sample Name: 280-112275-A-32-A LCS

Date: 7/26/2018 7:26:12 PM Rack:Tube: 1:88

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.050095	ppm	0.000265	0.53	2080.010000	Y 377.433
Al (167.019 nm)	2.022160	ppm	0.012246	0.61	1005.900000	Y_R 377.433
Al H (396.152 nm)	2.021979	ppm	0.012241	0.61	5339.468950	Y_R 377.433
As (188.980 nm)	1.000350	ppm	0.002989	0.30	1414.130000	Y 242.219
B (249.678 nm)	0.991247	ppm	0.002957	0.30	27570.100000	Y 242.219
Ba (493.408 nm)	2.019140 o	ppm	0.010308	0.51	241498.000000	Y_R 488.368
Be (234.861 nm)	0.048099	ppm	0.000060	0.12	15500.600000	Y_R 488.368
Bi (223.061 nm)	1.981830	ppm	0.005076	0.26	5572.470000	Y 377.433
Ca (315.887 nm)	48.897466 o	ppm	0.215021	0.44	40327.502368	Y_R 377.433
Cd (214.439 nm)	0.095735	ppm	0.000080	0.08	6322.440000	Y 377.433
Co (228.615 nm)	0.482105	ppm	0.001015	0.21	10015.000000	Y 242.219
Cr (205.560 nm)	0.195174	ppm	0.000017	0.01	3300.290000	Y 377.433
Cu (324.754 nm)	0.242090	ppm	0.000267	0.11	16092.000000	Y 377.433
Fe (238.204 nm)	1.005329	ppm	0.005597	0.56	3803.317398	Y_R 377.433
Fe H (259.940 nm)	0.857522 nu	ppm	0.006604	0.77	2001.460000	Y_R 377.433
K (766.491 nm)	49.789600	ppm	0.323611	0.65	59632.900000	Y_R2 488.368
Li (670.783 nm)	0.983671	ppm	0.008419	0.86	33503.500000	Y_R2 488.368
Mg (279.078 nm)	48.247600 o	ppm	0.023184	0.05	294411.000000	Y 377.433
Mn (257.610 nm)	0.487811	ppm	0.000070	0.01	132425.000000	Y 377.433
Mo (202.032 nm)	0.956027	ppm	0.002547	0.27	9538.700000	Y 377.433
Na (589.592 nm)	48.212800 o	ppm	0.443628	0.92	338673.000000	Y_R2 488.368
Na H (589.593 nm)	52.609086	ppm	0.173961	0.33	213529.241192	Y_R 488.368
Ni (231.604 nm)	0.470757	ppm	0.000755	0.16	3664.500000	Y 377.433
P (213.618 nm)	9.691970 o	ppm	0.052886	0.55	24524.300000	Y 242.219
Pb (220.353 nm)	0.506997	ppm	0.002901	0.57	1615.930000	Y 242.219
S (181.972 nm)	1.988219	ppm	0.012536	0.63	1148.570860	Y 377.433
Sb (206.834 nm)	0.502040	ppm	0.001073	0.21	1496.840000	Y 377.433
Se (196.026 nm)	1.969070	ppm	0.012291	0.62	2195.530000	Y 242.219
Si (288.158 nm)	9.897020	ppm	0.000867	0.01	90749.700000	Y 377.433
Sn (189.925 nm)	1.895380	ppm	0.003249	0.17	4442.020000	Y 377.433
Sr (421.552 nm)	0.994536	ppm	0.004322	0.43	215530.046284	Y_R 488.368
Th (288.505 nm)	1.028940	ppm	0.002049	0.20	3003.390000	Y 377.433
Ti (336.122 nm)	0.990934	ppm	0.002093	0.21	142862.000000	Y 377.433
Tl (190.794 nm)	2.021820	ppm	0.004891	0.24	5134.600000	Y 377.433
U (409.013 nm)	2.111890	ppm	0.002189	0.10	10089.600000	Y 377.433
V (292.401 nm)	0.495366	ppm	0.000561	0.11	21263.600000	Y 377.433
Zn (206.200 nm)	0.472318	ppm	0.000253	0.05	2730.160000	Y 377.433
Zr (343.823 nm)	0.486601	ppm	0.000665	0.14	66215.100000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.041821	21295.102896	0.000644	0.06
Y 377.433	1.056117	1162206.326268	0.001567	0.15
Y_R 377.433	1.082220	83433.100000	0.002711	0.25
Y_R 488.368	1.091740	47709.600000	0.000585	0.05
Y_R2 488.368	1.107761	96084.370343	0.007092	0.64

Sample Name: CCVH-5225153

Date: 7/26/2018 7:29:35 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001381 u	ppm	0.000034	2.48	-746.128000	Y 377.433
Al (167.019 nm)	45.995200 o	ppm	0.409071	0.89	22900.100000	Y_R 377.433
Al H (396.152 nm)	49.334178	ppm	0.208925	0.42	124292.299526	Y_R 377.433
As (188.980 nm)	-0.000372 u	ppm	0.001033	> 100.00	-4.725610	Y 242.219
B (249.678 nm)	0.000153 u	ppm	0.000442	> 100.00	-13.896500	Y 242.219
Ba (493.408 nm)	-0.000110 u	ppm	0.000322	> 100.00	554.820000	Y_R 488.368
Be (234.861 nm)	0.000017 u	ppm	0.000024	> 100.00	1621.200000	Y_R 488.368
Bi (223.061 nm)	0.973791	ppm	0.000278	0.03	2754.410000	Y 377.433
Ca (315.887 nm)	0.018432	ppm	0.000325	1.76	-60.533222	Y_R 377.433
Cd (214.439 nm)	-0.000170 u	ppm	0.000062	36.64	37.772100	Y 377.433
Co (228.615 nm)	0.001112	ppm	0.000372	33.47	-13.222900	Y 242.219
Cr (205.560 nm)	-0.000122 u	ppm	0.000107	87.61	-16.158300	Y 377.433
Cu (324.754 nm)	-0.006384 u	ppm	0.000218	3.42	279.470000	Y 377.433
Fe (238.204 nm)	48.536377 o	ppm	0.215731	0.44	182844.210769	Y_R 377.433
Fe H (259.940 nm)	49.443700	ppm	0.349944	0.71	97143.000000	Y_R 377.433
K (766.491 nm)	0.062253	ppm	0.011732	18.85	-661.118000	Y_R2 488.368
Li (670.783 nm)	0.002927	ppm	0.000824	28.17	-1061.840000	Y_R2 488.368
Mg (279.078 nm)	-0.009926 u	ppm	0.000470	4.73	-381.477000	Y 377.433
Mn (257.610 nm)	0.001440	ppm	0.000011	0.80	442.743000	Y 377.433
Mo (202.032 nm)	-0.000098 u	ppm	0.000269	> 100.00	-1.526610	Y 377.433
Na (589.592 nm)	229.079000 o	ppm	0.779315	0.34	1587930.000000	Y_R2 488.368
Na H (589.593 nm)	245.736840	ppm	0.804512	0.33	972537.531089	Y_R 488.368
Ni (231.604 nm)	0.001152	ppm	0.000080	6.92	13.022500	Y 377.433
P (213.618 nm)	-0.002909 u	ppm	0.001077	37.03	13.954300	Y 242.219
Pb (220.353 nm)	-0.002201 u	ppm	0.001218	55.31	14.836500	Y 242.219
S (181.972 nm)	4.881573	ppm	0.022839	0.47	2782.143742	Y 377.433
Sb (206.834 nm)	-0.003956 u	ppm	0.000291	7.35	-76.555700	Y 377.433
Se (196.026 nm)	-0.002530 u	ppm	0.001894	74.89	1.529140	Y 242.219
Si (288.158 nm)	0.022469	ppm	0.000182	0.81	1049.260000	Y 377.433
Sn (189.925 nm)	0.001545	ppm	0.000550	35.62	10.646500	Y 377.433
Sr (421.552 nm)	0.000474	ppm	0.000081	17.11	244.068321	Y_R 488.368
Th (288.505 nm)	4.941860	ppm	0.005288	0.11	14011.100000	Y 377.433
Ti (336.122 nm)	0.001602	ppm	0.000043	2.66	25.172400	Y 377.433
Tl (190.794 nm)	-0.002080 u	ppm	0.000481	23.12	-12.580700	Y 377.433
U (409.013 nm)	10.022200	ppm	0.063639	0.63	48505.000000	Y 377.433
V (292.401 nm)	0.003132	ppm	0.000118	3.78	-37.472600	Y 377.433
Zn (206.200 nm)	-0.002868 u	ppm	0.000218	7.59	0.651836	Y 377.433
Zr (343.823 nm)	-0.003842 u	ppm	0.000016	0.41	-387.306000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.040413	21266.336741	0.003153	0.30
Y 377.433	1.042894	1147656.050580	0.003017	0.29
Y_R 377.433	1.082520	83456.500000	0.005783	0.53
Y_R 488.368	1.098690	48013.200000	0.001456	0.13
Y_R2 488.368	1.103596	95723.121904	0.002747	0.25

Sample Name: CCV-5225154

Date: 7/26/2018 7:32:59 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.478801	ppm	0.000498	0.10	23717.400000	Y 377.433
Al (167.019 nm)	0.524038	ppm	0.013199	2.52	261.868000	Y_R 377.433
Al H (396.152 nm)	0.492082 u	ppm	0.016850	3.42	1433.403053	Y_R 377.433
As (188.980 nm)	0.973965	ppm	0.006082	0.62	1376.720000	Y 242.219
B (249.678 nm)	0.484035	ppm	0.000683	0.14	13504.400000	Y 242.219
Ba (493.408 nm)	0.492853	ppm	0.003325	0.67	59351.700000	Y_R 488.368
Be (234.861 nm)	0.471663	ppm	0.003473	0.74	152726.000000	Y_R 488.368
Bi (223.061 nm)	-0.002827 u	ppm	0.000366	12.94	7.117190	Y 377.433
Ca (315.887 nm)	4.914026	ppm	0.060166	1.22	3984.898413	Y_R 377.433
Cd (214.439 nm)	0.479942	ppm	0.000937	0.20	31703.700000	Y 377.433
Co (228.615 nm)	0.493841	ppm	0.001033	0.21	10238.800000	Y 242.219
Cr (205.560 nm)	0.483526	ppm	0.000348	0.07	8175.300000	Y 377.433
Cu (324.754 nm)	0.480402	ppm	0.000944	0.20	31561.500000	Y 377.433
Fe (238.204 nm)	2.494601	ppm	0.017422	0.70	9413.134390	Y_R 377.433
Fe H (259.940 nm)	2.398420 u	ppm	0.032486	1.35	5018.860000	Y_R 377.433
K (766.491 nm)	48.407400	ppm	0.093098	0.19	57957.000000	Y_R2 488.368
Li (670.783 nm)	0.963562	ppm	0.003167	0.33	32794.800000	Y_R2 488.368
Mg (279.078 nm)	18.896200	ppm	0.026331	0.14	115353.000000	Y 377.433
Mn (257.610 nm)	0.485726	ppm	0.000018	0.00	131859.000000	Y 377.433
Mo (202.032 nm)	0.487059	ppm	0.000373	0.08	4859.330000	Y 377.433
Na (589.592 nm)	4.848000	ppm	0.015534	0.32	34891.600000	Y_R2 488.368
Na H (589.593 nm)	5.312001 u	ppm	0.058815	1.11	25610.127775	Y_R 488.368
Ni (231.604 nm)	0.480074	ppm	0.000158	0.03	3735.590000	Y 377.433
P (213.618 nm)	0.946845	ppm	0.007426	0.78	2415.100000	Y 242.219
Pb (220.353 nm)	0.982036	ppm	0.004087	0.42	3122.380000	Y 242.219
S (181.972 nm)	0.003068	ppm	0.000811	26.43	26.874209	Y 377.433
Sb (206.834 nm)	0.973309	ppm	0.000453	0.05	2942.060000	Y 377.433
Se (196.026 nm)	0.965935	ppm	0.003464	0.36	1084.020000	Y 242.219
Si (288.158 nm)	4.896600	ppm	0.000177	0.00	45325.800000	Y 377.433
Sn (189.925 nm)	0.956874	ppm	0.000872	0.09	2246.010000	Y 377.433
Sr (421.552 nm)	0.490821	ppm	0.001594	0.32	106439.595762	Y_R 488.368
Th (288.505 nm)	0.004289	ppm	0.002705	63.06	101.091000	Y 377.433
Ti (336.122 nm)	0.494855	ppm	0.000159	0.03	71177.600000	Y 377.433
Tl (190.794 nm)	0.984501	ppm	0.000306	0.03	2498.260000	Y 377.433
U (409.013 nm)	0.000029 u	ppm	0.005061	> 100.00	-130.086000	Y 377.433
V (292.401 nm)	0.484751	ppm	0.000183	0.04	20762.300000	Y 377.433
Zn (206.200 nm)	0.477703	ppm	0.000455	0.10	2761.100000	Y 377.433
Zr (343.823 nm)	0.489344	ppm	0.000106	0.02	66593.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.060758	21682.196230	0.002768	0.26
Y 377.433	1.069136	1176534.084242	0.000680	0.06
Y_R 377.433	1.089840	84020.500000	0.010040	0.92
Y_R 488.368	1.098440	48002.100000	0.008296	0.76
Y_R2 488.368	1.108480	96146.772869	0.000938	0.08

Sample Name: CCB

Date: 7/26/2018 7:36:22 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000422 u	ppm	0.000036	8.43	-435.334000	Y 377.433
Al (167.019 nm)	0.003623	ppm	0.003671	> 100.00	1.583380	Y_R 377.433
Al H (396.152 nm)	-0.049769 u	ppm	0.009404	18.90	29.183611	Y_R 377.433
As (188.980 nm)	0.003791	ppm	0.001279	33.74	1.664960	Y 242.219
B (249.678 nm)	0.000968	ppm	0.000307	31.69	90.716200	Y 242.219
Ba (493.408 nm)	-0.000358 u	ppm	0.000072	20.17	478.095000	Y_R 488.368
Be (234.861 nm)	0.000040	ppm	0.000002	4.41	-36.413000	Y_R 488.368
Bi (223.061 nm)	0.000673	ppm	0.000604	89.75	16.471900	Y 377.433
Ca (315.887 nm)	0.009344	ppm	0.003649	39.05	-68.043117	Y_R 377.433
Cd (214.439 nm)	0.000038	ppm	0.000009	24.84	-0.586124	Y 377.433
Co (228.615 nm)	0.000330	ppm	0.000192	58.06	-29.482200	Y 242.219
Cr (205.560 nm)	-0.000075 u	ppm	0.000065	86.48	-0.351407	Y 377.433
Cu (324.754 nm)	-0.000100 u	ppm	0.000001	1.34	311.526000	Y 377.433
Fe (238.204 nm)	0.000545	ppm	0.000151	27.72	18.474474	Y_R 377.433
Fe H (259.940 nm)	-0.160398 u	ppm	0.000118	0.07	8.169680	Y_R 377.433
K (766.491 nm)	0.123339	ppm	0.077797	63.08	-587.052000	Y_R2 488.368
Li (670.783 nm)	0.003635	ppm	0.001650	45.38	-1036.890000	Y_R2 488.368
Mg (279.078 nm)	0.000344	ppm	0.000436	> 100.00	48.923100	Y 377.433
Mn (257.610 nm)	0.000002	ppm	0.000000	7.56	52.716900	Y 377.433
Mo (202.032 nm)	-0.000134 u	ppm	0.000011	8.51	-1.889230	Y 377.433
Na (589.592 nm)	0.005238 u	ppm	0.013804	> 100.00	283.345000	Y_R2 488.368
Na H (589.593 nm)	-0.233912 u	ppm	0.026944	11.52	3258.459144	Y_R 488.368
Ni (231.604 nm)	-0.000833 u	ppm	0.000135	16.23	-4.709230	Y 377.433
P (213.618 nm)	-0.002216 u	ppm	0.001723	77.72	15.705200	Y 242.219
Pb (220.353 nm)	0.000568 u	ppm	0.000938	> 100.00	5.416180	Y 242.219
S (181.972 nm)	-0.000810 u	ppm	0.004592	> 100.00	23.396686	Y 377.433
Sb (206.834 nm)	0.001511	ppm	0.000512	33.89	-12.316500	Y 377.433
Se (196.026 nm)	0.000094 u	ppm	0.000372	> 100.00	14.267600	Y 242.219
Si (288.158 nm)	-0.003944 u	ppm	0.001082	27.45	809.329000	Y 377.433
Sn (189.925 nm)	0.000031 u	ppm	0.000370	> 100.00	7.103790	Y 377.433
Sr (421.552 nm)	-0.000056 u	ppm	0.000021	37.29	129.270844	Y_R 488.368
Th (288.505 nm)	-0.001068 u	ppm	0.003405	> 100.00	69.469900	Y 377.433
Ti (336.122 nm)	0.000281	ppm	0.000017	6.03	-165.463000	Y 377.433
Tl (190.794 nm)	0.002176	ppm	0.000916	42.12	-0.240117	Y 377.433
U (409.013 nm)	0.005244	ppm	0.001458	27.81	-66.277000	Y 377.433
V (292.401 nm)	-0.000006 u	ppm	0.000288	> 100.00	19.205600	Y 377.433
Zn (206.200 nm)	-0.003016 u	ppm	0.000139	4.59	-0.197546	Y 377.433
Zr (343.823 nm)	0.000057	ppm	0.000002	2.79	-4.371490	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.075227	21977.933528	0.002536	0.24
Y 377.433	1.088206	1197519.743189	0.000233	0.02
Y_R 377.433	1.088120	83887.800000	0.004600	0.42
Y_R 488.368	1.110710	48538.400000	0.001282	0.12
Y_R2 488.368	1.124848	97566.492766	0.008975	0.80

Sample Name: CCVL-5236949

Date: 7/26/2018 7:39:46 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.008878	ppm	0.000008	0.09	33.131300	Y 377.433
Al (167.019 nm)	0.101251	ppm	0.003728	3.68	50.188700	Y_R 377.433
Al H (396.152 nm)	0.050703 u	ppm	0.000557	1.10	283.496613	Y_R 377.433
As (188.980 nm)	0.016577	ppm	0.001240	7.48	19.786000	Y 242.219
B (249.678 nm)	0.094018	ppm	0.000061	0.07	2671.020000	Y 242.219
Ba (493.408 nm)	0.009447	ppm	0.000061	0.65	1648.420000	Y_R 488.368
Be (234.861 nm)	0.000945	ppm	0.000018	1.95	259.145000	Y_R 488.368
Bi (223.061 nm)	0.098775	ppm	0.001502	1.52	291.601000	Y 377.433
Ca (315.887 nm)	0.206885	ppm	0.001561	0.75	95.185014	Y_R 377.433
Cd (214.439 nm)	0.004792	ppm	0.000011	0.24	313.540000	Y 377.433
Co (228.615 nm)	0.010034	ppm	0.000187	1.86	172.391000	Y 242.219
Cr (205.560 nm)	0.009137	ppm	0.000304	3.32	155.439000	Y 377.433
Cu (324.754 nm)	0.014305	ppm	0.000062	0.44	1246.910000	Y 377.433
Fe (238.204 nm)	0.100430	ppm	0.001462	1.46	394.724395	Y_R 377.433
Fe H (259.940 nm)	-0.060367 u	ppm	0.000585	0.97	204.051000	Y_R 377.433
K (766.491 nm)	3.027210	ppm	0.033462	1.11	2933.860000	Y_R2 488.368
Li (670.783 nm)	0.023389	ppm	0.001801	7.70	-340.669000	Y_R2 488.368
Mg (279.078 nm)	0.185996	ppm	0.000952	0.51	1180.180000	Y 377.433
Mn (257.610 nm)	0.009808	ppm	0.000024	0.24	2713.640000	Y 377.433
Mo (202.032 nm)	0.017814	ppm	0.000335	1.88	177.194000	Y 377.433
Na (589.592 nm)	0.990060	ppm	0.005268	0.53	7128.730000	Y_R2 488.368
Na H (589.593 nm)	0.659756 u	ppm	0.008383	1.27	6789.530947	Y_R 488.368
Ni (231.604 nm)	0.037697	ppm	0.000844	2.24	294.865000	Y 377.433
P (213.618 nm)	2.625130 o	ppm	0.022591	0.86	6658.110000	Y 242.219
Pb (220.353 nm)	0.009288	ppm	0.000304	3.27	33.179400	Y 242.219
S (181.972 nm)	0.095375	ppm	0.003464	3.63	77.770506	Y 377.433
Sb (206.834 nm)	0.016968	ppm	0.000059	0.35	34.520900	Y 377.433
Se (196.026 nm)	0.015027	ppm	0.001441	9.59	30.797100	Y 242.219
Si (288.158 nm)	0.463873	ppm	0.001237	0.27	5058.970000	Y 377.433
Sn (189.925 nm)	0.093174	ppm	0.000710	0.76	225.049000	Y 377.433
Sr (421.552 nm)	0.009598	ppm	0.000138	1.44	2220.248733	Y_R 488.368
Th (288.505 nm)	0.017011	ppm	0.002773	16.30	121.366000	Y 377.433
Ti (336.122 nm)	0.009908	ppm	0.000010	0.10	1223.430000	Y 377.433
Tl (190.794 nm)	0.016200	ppm	0.000625	3.86	35.396700	Y 377.433
U (409.013 nm)	0.064583	ppm	0.004208	6.52	220.071000	Y 377.433
V (292.401 nm)	0.009292	ppm	0.000110	1.18	414.440000	Y 377.433
Zn (206.200 nm)	0.016627	ppm	0.000811	4.88	112.633000	Y 377.433
Zr (343.823 nm)	0.014322	ppm	0.000040	0.28	1937.340000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.081506	22106.289995	0.004177	0.39
Y 377.433	1.092655	1202415.193346	0.002929	0.27
Y_R 377.433	1.108530	85461.600000	0.001884	0.17
Y_R 488.368	1.126640	49234.700000	0.010440	0.93
Y_R2 488.368	1.134725	98423.155051	0.005406	0.48

Sample Name: MB 280-423668/1-A

Date: 7/26/2018 7:43:10 PM Rack:Tube: 1:89

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000142 u	ppm	0.000240	> 100.00	-421.008000	Y 377.433
Al (167.019 nm)	0.001884	ppm	0.000617	32.78	0.718292	Y_R 377.433
Al H (396.152 nm)	-0.050392 u	ppm	0.000097	0.19	27.842264	Y_R 377.433
As (188.980 nm)	0.000831	ppm	0.000850	> 100.00	-2.531010	Y 242.219
B (249.678 nm)	0.003455	ppm	0.000138	3.99	159.670000	Y 242.219
Ba (493.408 nm)	-0.000511 u	ppm	0.000228	44.55	459.894000	Y_R 488.368
Be (234.861 nm)	0.000040	ppm	0.000009	22.56	-36.663500	Y_R 488.368
Bi (223.061 nm)	0.000474	ppm	0.000162	34.28	15.912700	Y 377.433
Ca (315.887 nm)	0.010969	ppm	0.002525	23.02	-66.700041	Y_R 377.433
Cd (214.439 nm)	0.000065	ppm	0.000046	71.17	1.185700	Y 377.433
Co (228.615 nm)	0.000348	ppm	0.000158	45.40	-29.012400	Y 242.219
Cr (205.560 nm)	-0.000090 u	ppm	0.000062	68.63	-0.602424	Y 377.433
Cu (324.754 nm)	0.000399	ppm	0.000087	21.72	345.182000	Y 377.433
Fe (238.204 nm)	0.000848	ppm	0.000007	0.81	19.615106	Y_R 377.433
Fe H (259.940 nm)	-0.157740 nu	ppm	0.003238	2.05	13.374500	Y_R 377.433
K (766.491 nm)	0.096074	ppm	0.044939	46.78	-620.110000	Y_R2 488.368
Li (670.783 nm)	0.002131	ppm	0.001893	88.86	-1089.900000	Y_R2 488.368
Mg (279.078 nm)	0.000953	ppm	0.000150	15.76	52.530300	Y 377.433
Mn (257.610 nm)	0.001096	ppm	0.000014	1.24	349.577000	Y 377.433
Mo (202.032 nm)	0.002666	ppm	0.000276	10.35	26.046500	Y 377.433
Na (589.592 nm)	0.012425 u	ppm	0.018625	> 100.00	332.564000	Y_R2 488.368
Na H (589.593 nm)	-0.404355 u	ppm	0.016069	3.97	2586.525129	Y_R 488.368
Ni (231.604 nm)	-0.000740 u	ppm	0.000049	6.62	-3.989580	Y 377.433
P (213.618 nm)	0.000196 u	ppm	0.002039	> 100.00	21.803900	Y 242.219
Pb (220.353 nm)	-0.000383 u	ppm	0.000544	> 100.00	2.393980	Y 242.219
S (181.972 nm)	0.008259	ppm	0.001851	22.41	28.523906	Y 377.433
Sb (206.834 nm)	0.001724	ppm	0.001150	66.69	-11.709900	Y 377.433
Se (196.026 nm)	-0.000699 u	ppm	0.000137	19.59	13.390700	Y 242.219
Si (288.158 nm)	0.022669	ppm	0.000140	0.62	1051.080000	Y 377.433
Sn (189.925 nm)	0.005758	ppm	0.001830	31.79	20.504400	Y 377.433
Sr (421.552 nm)	-0.000029 u	ppm	0.000052	> 100.00	135.229969	Y_R 488.368
Th (288.505 nm)	-0.000297 u	ppm	0.000932	> 100.00	71.714900	Y 377.433
Ti (336.122 nm)	0.003492	ppm	0.000117	3.35	297.656000	Y 377.433
Tl (190.794 nm)	0.001937	ppm	0.000025	1.27	-0.869820	Y 377.433
U (409.013 nm)	0.003172	ppm	0.001470	46.35	-76.431800	Y 377.433
V (292.401 nm)	-0.000023 u	ppm	0.000158	> 100.00	18.877900	Y 377.433
Zn (206.200 nm)	-0.002146 u	ppm	0.000267	12.43	4.802570	Y 377.433
Zr (343.823 nm)	0.001406	ppm	0.000013	0.95	179.266000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.092380	22328.559105	0.000437	0.04
Y 377.433	1.106795	1217975.659585	0.002830	0.26
Y_R 377.433	1.107510	85382.700000	0.008293	0.75
Y_R 488.368	1.120510	48966.600000	0.002777	0.25
Y_R2 488.368	1.124512	97537.293584	0.001669	0.15

Sample Name: LCS 280-423668/2-A

Date: 7/26/2018 7:46:34 PM Rack:Tube: 1:90

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.050132	ppm	0.000174	0.35	2082.150000	Y 377.433
Al (167.019 nm)	2.009090	ppm	0.021032	1.05	999.401000	Y_R 377.433
Al H (396.152 nm)	2.012966	ppm	0.008435	0.42	5316.278778	Y_R 377.433
As (188.980 nm)	1.004130	ppm	0.001193	0.12	1419.490000	Y 242.219
B (249.678 nm)	0.987882	ppm	0.000721	0.07	27476.800000	Y 242.219
Ba (493.408 nm)	2.013680 o	ppm	0.003043	0.15	240847.000000	Y_R 488.368
Be (234.861 nm)	0.047151	ppm	0.000287	0.61	15193.700000	Y_R 488.368
Bi (223.061 nm)	1.978550	ppm	0.003319	0.17	5563.280000	Y 377.433
Ca (315.887 nm)	48.517677 o	ppm	0.192304	0.40	40013.688429	Y_R 377.433
Cd (214.439 nm)	0.095592	ppm	0.000456	0.48	6313.020000	Y 377.433
Co (228.615 nm)	0.480994	ppm	0.003650	0.76	9991.680000	Y 242.219
Cr (205.560 nm)	0.194279	ppm	0.000330	0.17	3285.160000	Y 377.433
Cu (324.754 nm)	0.240605	ppm	0.000092	0.04	15997.100000	Y 377.433
Fe (238.204 nm)	1.001775	ppm	0.005906	0.59	3789.928947	Y_R 377.433
Fe H (259.940 nm)	0.858087 nu	ppm	0.000871	0.10	2002.570000	Y_R 377.433
K (766.491 nm)	49.579900	ppm	0.117658	0.24	59378.700000	Y_R2 488.368
Li (670.783 nm)	0.980456	ppm	0.004986	0.51	33390.200000	Y_R2 488.368
Mg (279.078 nm)	48.075400 o	ppm	0.047673	0.10	293360.000000	Y 377.433
Mn (257.610 nm)	0.486401	ppm	0.001014	0.21	132043.000000	Y 377.433
Mo (202.032 nm)	0.951120	ppm	0.003384	0.36	9489.740000	Y 377.433
Na (589.592 nm)	48.278800 o	ppm	0.019690	0.04	339119.000000	Y_R2 488.368
Na H (589.593 nm)	51.905510	ppm	0.125318	0.24	210751.470623	Y_R 488.368
Ni (231.604 nm)	0.469800	ppm	0.001009	0.21	3657.050000	Y 377.433
P (213.618 nm)	9.695590 o	ppm	0.004295	0.04	24533.500000	Y 242.219
Pb (220.353 nm)	0.503404	ppm	0.001713	0.34	1604.510000	Y 242.219
S (181.972 nm)	1.973519	ppm	0.005639	0.29	1140.262771	Y 377.433
Sb (206.834 nm)	0.500699	ppm	0.003049	0.61	1492.820000	Y 377.433
Se (196.026 nm)	1.975670	ppm	0.001803	0.09	2202.840000	Y 242.219
Si (288.158 nm)	9.799360	ppm	0.078722	0.80	89862.500000	Y 377.433
Sn (189.925 nm)	1.894030	ppm	0.009672	0.51	4438.850000	Y 377.433
Sr (421.552 nm)	0.993020	ppm	0.002594	0.26	215201.796785	Y_R 488.368
Th (288.505 nm)	1.027920	ppm	0.002437	0.24	3000.240000	Y 377.433
Ti (336.122 nm)	0.983748	ppm	0.001017	0.10	141825.000000	Y 377.433
Tl (190.794 nm)	2.010090	ppm	0.010979	0.55	5104.800000	Y 377.433
U (409.013 nm)	2.094860	ppm	0.007566	0.36	10007.300000	Y 377.433
V (292.401 nm)	0.492580	ppm	0.000606	0.12	21144.500000	Y 377.433
Zn (206.200 nm)	0.471479	ppm	0.001939	0.41	2725.350000	Y 377.433
Zr (343.823 nm)	0.484339	ppm	0.000681	0.14	65907.200000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.044276	21345.293825	0.001516	0.15
Y 377.433	1.057543	1163776.384413	0.003339	0.32
Y_R 377.433	1.105890	85257.800000	0.010982	0.99
Y_R 488.368	1.113030	48639.900000	0.008554	0.77
Y_R2 488.368	1.136004	98534.136357	0.001989	0.18

Sample Name: 280-112355-D-4-A

Date: 7/26/2018 7:49:57 PM Rack:Tube: 2:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000001 u	ppm	0.000041	> 100.00	-415.931000	Y 377.433
Al (167.019 nm)	0.176209	ppm	0.004036	2.29	87.488000	Y_R 377.433
Al H (396.152 nm)	0.129976 u	ppm	0.000236	0.18	492.956595	Y_R 377.433
As (188.980 nm)	0.003918	ppm	0.001478	37.73	1.843120	Y 242.219
B (249.678 nm)	0.355907	ppm	0.001398	0.39	9932.000000	Y 242.219
Ba (493.408 nm)	0.031978	ppm	0.000265	0.83	4342.340000	Y_R 488.368
Be (234.861 nm)	0.000048	ppm	0.000003	5.84	-31.001900	Y_R 488.368
Bi (223.061 nm)	-0.002327 u	ppm	0.000712	30.60	8.084260	Y 377.433
Ca (315.887 nm)	21.196500 o	ppm	0.125775	0.59	17438.572082	Y_R 377.433
Cd (214.439 nm)	0.000041	ppm	0.000056	> 100.00	-0.243261	Y 377.433
Co (228.615 nm)	0.000342	ppm	0.000320	93.75	-29.093600	Y 242.219
Cr (205.560 nm)	0.000901	ppm	0.000221	24.54	16.064900	Y 377.433
Cu (324.754 nm)	0.004912	ppm	0.000034	0.69	624.063000	Y 377.433
Fe (238.204 nm)	0.144448	ppm	0.000634	0.44	560.533422	Y_R 377.433
Fe H (259.940 nm)	-0.019252 nu	ppm	0.000233	1.21	284.561000	Y_R 377.433
K (766.491 nm)	3.019050	ppm	0.004112	0.14	2923.970000	Y_R2 488.368
Li (670.783 nm)	0.032986	ppm	0.000078	0.24	-2.436240	Y_R2 488.368
Mg (279.078 nm)	13.355100	ppm	0.041693	0.31	81543.600000	Y 377.433
Mn (257.610 nm)	0.032119	ppm	0.000089	0.28	8768.020000	Y 377.433
Mo (202.032 nm)	0.027998	ppm	0.000378	1.35	278.812000	Y 377.433
Na (589.592 nm)	198.242000 o	ppm	0.024423	0.01	1374280.000000	Y_R2 488.368
Na H (589.593 nm)	212.640526	ppm	0.706208	0.33	842150.720209	Y_R 488.368
Ni (231.604 nm)	0.002174	ppm	0.000132	6.06	18.678400	Y 377.433
P (213.618 nm)	0.116199	ppm	0.001224	1.05	315.079000	Y 242.219
Pb (220.353 nm)	0.000190 u	ppm	0.000313	> 100.00	4.057560	Y 242.219
S (181.972 nm)	97.974274 o	ppm	0.404998	0.41	55383.348476	Y 377.433
Sb (206.834 nm)	0.000743	ppm	0.000161	21.69	-14.870400	Y 377.433
Se (196.026 nm)	0.006819	ppm	0.000825	12.10	21.717500	Y 242.219
Si (288.158 nm)	3.297170	ppm	0.004719	0.14	30796.700000	Y 377.433
Sn (189.925 nm)	0.000477	ppm	0.000101	21.21	8.147810	Y 377.433
Sr (421.552 nm)	0.460313	ppm	0.000278	0.06	99832.372163	Y_R 488.368
Th (288.505 nm)	0.002690	ppm	0.002491	92.60	81.205400	Y 377.433
Ti (336.122 nm)	0.004477	ppm	0.000025	0.56	507.023000	Y 377.433
Tl (190.794 nm)	0.002457	ppm	0.001554	63.25	0.373134	Y 377.433
U (409.013 nm)	0.023279	ppm	0.003376	14.50	16.879200	Y 377.433
V (292.401 nm)	0.008771	ppm	0.000281	3.21	396.351000	Y 377.433
Zn (206.200 nm)	0.025327	ppm	0.000167	0.66	162.610000	Y 377.433
Zr (343.823 nm)	0.000180	ppm	0.000129	71.91	12.766800	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.053922	21542.457189	0.001869	0.18
Y 377.433	1.065203	1172206.108811	0.002129	0.20
Y_R 377.433	1.111390	85681.800000	0.005634	0.51
Y_R 488.368	1.116340	48784.700000	0.000301	0.03
Y_R2 488.368	1.135586	98497.846969	0.004540	0.40

Sample Name: 280-112355-D-4-A SD@5

Date: 7/26/2018 7:53:20 PM Rack:Tube: 2:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000448 u	ppm	0.000047	10.43	-436.938000	Y 377.433
Al (167.019 nm)	0.037553	ppm	0.001601	4.26	18.472100	Y_R 377.433
Al H (396.152 nm)	-0.014642 u	ppm	0.008161	55.73	119.889153	Y_R 377.433
As (188.980 nm)	0.000189 u	ppm	0.000982	> 100.00	-3.441680	Y 242.219
B (249.678 nm)	0.070878	ppm	0.000385	0.54	2029.090000	Y 242.219
Ba (493.408 nm)	0.006185	ppm	0.000149	2.42	1260.090000	Y_R 488.368
Be (234.861 nm)	0.000042	ppm	0.000026	60.91	-35.255100	Y_R 488.368
Bi (223.061 nm)	-0.000524 u	ppm	0.001078	> 100.00	13.121300	Y 377.433
Ca (315.887 nm)	4.336978	ppm	0.020457	0.47	3507.812733	Y_R 377.433
Cd (214.439 nm)	0.000055	ppm	0.000046	83.35	0.550666	Y 377.433
Co (228.615 nm)	0.000271	ppm	0.000068	25.15	-30.690500	Y 242.219
Cr (205.560 nm)	0.000038 u	ppm	0.000090	> 100.00	1.547550	Y 377.433
Cu (324.754 nm)	0.000879	ppm	0.000150	17.02	373.500000	Y 377.433
Fe (238.204 nm)	0.029753	ppm	0.001254	4.22	128.497580	Y_R 377.433
Fe H (259.940 nm)	-0.130111 nu	ppm	0.000560	0.43	67.478100	Y_R 377.433
K (766.491 nm)	0.672596	ppm	0.000692	0.10	78.917600	Y_R2 488.368
Li (670.783 nm)	0.010066	ppm	0.000187	1.86	-810.237000	Y_R2 488.368
Mg (279.078 nm)	2.702700	ppm	0.010355	0.38	16539.600000	Y 377.433
Mn (257.610 nm)	0.006514	ppm	0.000024	0.36	1819.850000	Y 377.433
Mo (202.032 nm)	0.005526	ppm	0.000000	0.01	54.589000	Y 377.433
Na (589.592 nm)	41.092400 o	ppm	0.057229	0.14	285061.000000	Y_R2 488.368
Na H (589.593 nm)	43.670421	ppm	0.102465	0.23	176275.753396	Y_R 488.368
Ni (231.604 nm)	-0.000178 u	ppm	0.000039	22.02	0.385467	Y 377.433
P (213.618 nm)	0.020323	ppm	0.000251	1.24	72.687800	Y 242.219
Pb (220.353 nm)	-0.001475 u	ppm	0.000768	52.06	-1.117110	Y 242.219
S (181.972 nm)	19.355412 o	ppm	0.098370	0.51	10960.458113	Y 377.433
Sb (206.834 nm)	0.000305 u	ppm	0.000466	> 100.00	-16.013300	Y 377.433
Se (196.026 nm)	0.000243 u	ppm	0.000772	> 100.00	14.433400	Y 242.219
Si (288.158 nm)	0.645883	ppm	0.002721	0.42	6712.350000	Y 377.433
Sn (189.925 nm)	0.000602	ppm	0.000693	> 100.00	8.441890	Y 377.433
Sr (421.552 nm)	0.094796	ppm	0.000422	0.45	20671.554394	Y_R 488.368
Th (288.505 nm)	0.004535	ppm	0.003887	85.71	85.226800	Y 377.433
Ti (336.122 nm)	0.001341	ppm	0.000248	18.47	1.027680	Y 377.433
Tl (190.794 nm)	0.001326	ppm	0.000903	68.10	-2.422310	Y 377.433
U (409.013 nm)	0.006120	ppm	0.000770	12.58	-62.877700	Y 377.433
V (292.401 nm)	0.001655	ppm	0.000021	1.24	91.182600	Y 377.433
Zn (206.200 nm)	0.002529	ppm	0.000179	7.09	31.653000	Y 377.433
Zr (343.823 nm)	-0.000017 u	ppm	0.000073	> 100.00	-14.314900	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.074737	21967.928648	0.004308	0.40
Y 377.433	1.084296	1193216.730856	0.006164	0.57
Y_R 377.433	1.111970	85726.900000	0.003323	0.30
Y_R 488.368	1.113750	48671.200000	0.000905	0.08
Y_R2 488.368	1.145968	99398.328400	0.004775	0.42

Sample Name: 280-112355-D-4-B MS

Date: 7/26/2018 7:56:41 PM Rack:Tube: 2:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.051431	ppm	0.000250	0.49	2144.510000	Y 377.433
Al (167.019 nm)	2.260960	ppm	0.032653	1.44	1124.740000	Y_R 377.433
Al H (396.152 nm)	2.304364	ppm	0.015075	0.65	6061.213655	Y_R 377.433
As (188.980 nm)	1.034840	ppm	0.001939	0.19	1463.010000	Y 242.219
B (249.678 nm)	1.355000 o	ppm	0.000563	0.04	37656.300000	Y 242.219
Ba (493.408 nm)	2.064010 o	ppm	0.017552	0.85	246858.000000	Y_R 488.368
Be (234.861 nm)	0.048367	ppm	0.000066	0.14	15591.500000	Y_R 488.368
Bi (223.061 nm)	2.023650	ppm	0.002230	0.11	5689.780000	Y 377.433
Ca (315.887 nm)	70.129763 o	ppm	0.528622	0.75	57871.416334	Y_R 377.433
Cd (214.439 nm)	0.095568	ppm	0.000126	0.13	6311.580000	Y 377.433
Co (228.615 nm)	0.493185	ppm	0.004157	0.84	10245.600000	Y 242.219
Cr (205.560 nm)	0.194937	ppm	0.000606	0.31	3296.180000	Y 377.433
Cu (324.754 nm)	0.256233	ppm	0.000374	0.15	16995.700000	Y 377.433
Fe (238.204 nm)	1.168210	ppm	0.008188	0.70	4416.858226	Y_R 377.433
Fe H (259.940 nm)	1.030970 nu	ppm	0.008617	0.84	2341.120000	Y_R 377.433
K (766.491 nm)	54.040400	ppm	0.004143	0.01	64787.000000	Y_R2 488.368
Li (670.783 nm)	1.033820	ppm	0.004226	0.41	35271.100000	Y_R2 488.368
Mg (279.078 nm)	62.515600 o	ppm	0.097789	0.16	381476.000000	Y 377.433
Mn (257.610 nm)	0.528088	ppm	0.000627	0.12	143355.000000	Y 377.433
Mo (202.032 nm)	0.979153	ppm	0.001235	0.13	9769.440000	Y 377.433
Na (589.592 nm)	241.854000 o	ppm	1.385020	0.57	1680840.000000	Y_R2 488.368
Na H (589.593 nm)	262.276711	ppm	1.247364	0.48	1039798.170938	Y_R 488.368
Ni (231.604 nm)	0.480981	ppm	0.000563	0.12	3743.960000	Y 377.433
P (213.618 nm)	10.104000 o	ppm	0.017269	0.17	25566.100000	Y 242.219
Pb (220.353 nm)	0.504952	ppm	0.000022	0.00	1609.410000	Y 242.219
S (181.972 nm)	99.171643 o	ppm	0.105052	0.11	56061.228757	Y 377.433
Sb (206.834 nm)	0.510629	ppm	0.002703	0.53	1522.450000	Y 377.433
Se (196.026 nm)	2.015610	ppm	0.008516	0.42	2247.080000	Y 242.219
Si (288.158 nm)	13.329500 o	ppm	0.015300	0.11	121930.000000	Y 377.433
Sn (189.925 nm)	1.914860	ppm	0.002184	0.11	4487.600000	Y 377.433
Sr (421.552 nm)	1.461544 o	ppm	0.012790	0.88	316670.908007	Y_R 488.368
Th (288.505 nm)	1.045750	ppm	0.001629	0.16	3052.740000	Y 377.433
Ti (336.122 nm)	1.001080	ppm	0.000632	0.06	144393.000000	Y 377.433
Tl (190.794 nm)	1.995590	ppm	0.008657	0.43	5067.760000	Y 377.433
U (409.013 nm)	2.157310	ppm	0.004055	0.19	10305.000000	Y 377.433
V (292.401 nm)	0.507681	ppm	0.000569	0.11	21791.200000	Y 377.433
Zn (206.200 nm)	0.496562	ppm	0.001729	0.35	2869.420000	Y 377.433
Zr (343.823 nm)	0.490132	ppm	0.000556	0.11	66696.200000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.028166	21016.008553	0.000169	0.02
Y 377.433	1.041961	1146629.186026	0.000098	0.01
Y_R 377.433	1.087500	83840.000000	0.000917	0.08
Y_R 488.368	1.095700	47882.600000	0.002693	0.25
Y_R2 488.368	1.101927	95578.334463	0.002926	0.27

Sample Name: 280-112355-D-4-C MSD

Date: 7/26/2018 8:00:03 PM Rack:Tube: 2:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.051627	ppm	0.000260	0.50	2157.450000	Y 377.433
Al (167.019 nm)	2.261050	ppm	0.015580	0.69	1124.780000	Y_R 377.433
Al H (396.152 nm)	2.290674	ppm	0.007822	0.34	6028.528304	Y_R 377.433
As (188.980 nm)	1.033550	ppm	0.006798	0.66	1461.180000	Y 242.219
B (249.678 nm)	1.383990 o	ppm	0.003132	0.23	38460.100000	Y 242.219
Ba (493.408 nm)	2.059740 o	ppm	0.004501	0.22	246349.000000	Y_R 488.368
Be (234.861 nm)	0.047930	ppm	0.000255	0.53	15447.600000	Y_R 488.368
Bi (223.061 nm)	2.020980	ppm	0.001182	0.06	5682.290000	Y 377.433
Ca (315.887 nm)	69.835814 o	ppm	0.150717	0.22	57628.530746	Y_R 377.433
Cd (214.439 nm)	0.095015	ppm	0.000053	0.06	6275.050000	Y 377.433
Co (228.615 nm)	0.488577	ppm	0.004039	0.83	10150.800000	Y 242.219
Cr (205.560 nm)	0.194061	ppm	0.000087	0.05	3281.300000	Y 377.433
Cu (324.754 nm)	0.255636	ppm	0.000553	0.22	16956.300000	Y 377.433
Fe (238.204 nm)	1.154742	ppm	0.000017	0.00	4366.126759	Y_R 377.433
Fe H (259.940 nm)	1.022780 nu	ppm	0.004998	0.49	2325.060000	Y_R 377.433
K (766.491 nm)	53.673300	ppm	0.176092	0.33	64341.800000	Y_R2 488.368
Li (670.783 nm)	1.028460	ppm	0.003584	0.35	35082.100000	Y_R2 488.368
Mg (279.078 nm)	62.027100 o	ppm	0.093630	0.15	378496.000000	Y 377.433
Mn (257.610 nm)	0.519494	ppm	0.000033	0.01	141023.000000	Y 377.433
Mo (202.032 nm)	1.001920	ppm	0.000985	0.10	9996.620000	Y 377.433
Na (589.592 nm)	240.721000 o	ppm	0.107335	0.04	1672980.000000	Y_R2 488.368
Na H (589.593 nm)	261.952864	ppm	0.079911	0.03	1038517.915849	Y_R 488.368
Ni (231.604 nm)	0.478910	ppm	0.000098	0.02	3727.840000	Y 377.433
P (213.618 nm)	10.074800 o	ppm	0.016728	0.17	25492.100000	Y 242.219
Pb (220.353 nm)	0.502525	ppm	0.003399	0.68	1601.570000	Y 242.219
S (181.972 nm)	98.996970 o	ppm	0.153783	0.16	55962.508690	Y 377.433
Sb (206.834 nm)	0.522017	ppm	0.001463	0.28	1556.760000	Y 377.433
Se (196.026 nm)	2.018900	ppm	0.013809	0.68	2250.720000	Y 242.219
Si (288.158 nm)	13.567700 o	ppm	0.025243	0.19	124095.000000	Y 377.433
Sn (189.925 nm)	1.951290	ppm	0.005157	0.26	4572.840000	Y 377.433
Sr (421.552 nm)	1.454944 o	ppm	0.001008	0.07	315241.407483	Y_R 488.368
Th (288.505 nm)	1.038300	ppm	0.006384	0.61	3031.730000	Y 377.433
Ti (336.122 nm)	1.023470	ppm	0.000734	0.07	147621.000000	Y 377.433
Tl (190.794 nm)	1.981890	ppm	0.001728	0.09	5032.710000	Y 377.433
U (409.013 nm)	2.151030	ppm	0.002447	0.11	10273.700000	Y 377.433
V (292.401 nm)	0.505044	ppm	0.000217	0.04	21677.500000	Y 377.433
Zn (206.200 nm)	0.493563	ppm	0.000982	0.20	2852.200000	Y 377.433
Zr (343.823 nm)	0.500974	ppm	0.000810	0.16	68171.700000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.037605	21208.934707	0.001152	0.11
Y 377.433	1.055226	1161226.542718	0.002923	0.28
Y_R 377.433	1.101220	84898.300000	0.007107	0.65
Y_R 488.368	1.111450	48570.700000	0.004220	0.38
Y_R2 488.368	1.144860	99302.225376	0.004470	0.39

Sample Name: 280-112355-D-4-A PDS

Date: 7/26/2018 8:03:26 PM Rack:Tube: 2:5

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.048895	ppm	0.000299	0.61	2035.270000	Y 377.433
Al (167.019 nm)	1.139250	ppm	0.011782	1.03	566.945000	Y_R 377.433
Al H (396.152 nm)	1.115022	ppm	0.007665	0.69	2983.213395	Y_R 377.433
As (188.980 nm)	0.198023	ppm	0.001655	0.84	276.947000	Y 242.219
B (249.678 nm)	0.450140	ppm	0.001260	0.28	12545.400000	Y 242.219
Ba (493.408 nm)	0.127468	ppm	0.000999	0.78	15744.000000	Y_R 488.368
Be (234.861 nm)	0.045560	ppm	0.000414	0.91	14735.800000	Y_R 488.368
Bi (223.061 nm)	-0.003021 u	ppm	0.000280	9.27	6.319650	Y 377.433
Ca (315.887 nm)	39.418717 o	ppm	0.052998	0.13	32495.331316	Y_R 377.433
Cd (214.439 nm)	0.046205	ppm	0.000059	0.13	3050.320000	Y 377.433
Co (228.615 nm)	0.047567	ppm	0.000013	0.03	953.524000	Y 242.219
Cr (205.560 nm)	0.047140	ppm	0.000029	0.06	797.550000	Y 377.433
Cu (324.754 nm)	0.053069	ppm	0.000159	0.30	3746.550000	Y 377.433
Fe (238.204 nm)	1.117835	ppm	0.006323	0.57	4227.106420	Y_R 377.433
Fe H (259.940 nm)	0.986365 nu	ppm	0.000007	0.00	2253.760000	Y_R 377.433
K (766.491 nm)	22.477400	ppm	0.027557	0.12	26517.000000	Y_R2 488.368
Li (670.783 nm)	0.130105	ppm	0.000308	0.24	3420.420000	Y_R2 488.368
Mg (279.078 nm)	31.651500	ppm	0.061459	0.19	193178.000000	Y 377.433
Mn (257.610 nm)	0.078469	ppm	0.000176	0.22	21345.600000	Y 377.433
Mo (202.032 nm)	0.073722	ppm	0.000062	0.08	735.044000	Y 377.433
Na (589.592 nm)	212.620000 o	ppm	0.505588	0.24	1474130.000000	Y_R2 488.368
Na H (589.593 nm)	227.204676	ppm	2.006799	0.88	899639.193050	Y_R 488.368
Ni (231.604 nm)	0.047377	ppm	0.000703	1.48	370.416000	Y 377.433
P (213.618 nm)	2.021300	ppm	0.008178	0.40	5131.510000	Y 242.219
Pb (220.353 nm)	0.094943	ppm	0.000281	0.30	306.257000	Y 242.219
S (181.972 nm)	96.399441 o	ppm	0.317843	0.33	54493.627834	Y 377.433
Sb (206.834 nm)	0.100571	ppm	0.000271	0.27	286.670000	Y 377.433
Se (196.026 nm)	0.195590	ppm	0.000694	0.35	230.645000	Y 242.219
Si (288.158 nm)	8.105190	ppm	0.029704	0.37	74472.600000	Y 377.433
Sn (189.925 nm)	0.095234	ppm	0.000382	0.40	229.868000	Y 377.433
Sr (421.552 nm)	0.496854	ppm	0.004119	0.83	107746.042891	Y_R 488.368
Th (288.505 nm)	0.202661	ppm	0.003714	1.83	648.898000	Y 377.433
Ti (336.122 nm)	0.053755	ppm	0.000140	0.26	7672.100000	Y 377.433
Tl (190.794 nm)	0.193856	ppm	0.000305	0.16	487.330000	Y 377.433
U (409.013 nm)	0.529255	ppm	0.003975	0.75	2461.130000	Y 377.433
V (292.401 nm)	0.056675	ppm	0.000224	0.40	2431.750000	Y 377.433
Zn (206.200 nm)	0.209524	ppm	0.000025	0.01	1220.650000	Y 377.433
Zr (343.823 nm)	0.049188	ppm	0.000130	0.26	6685.520000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.044548	21350.853482	0.000060	0.01
Y 377.433	1.055739	1161790.387128	0.000392	0.04
Y_R 377.433	1.100040	84807.200000	0.002609	0.24
Y_R 488.368	1.111740	48583.300000	0.007922	0.71
Y_R2 488.368	1.124558	97541.264978	0.003644	0.32

Sample Name: 280-112355-D-6-A

Date: 7/26/2018 8:06:49 PM Rack:Tube: 2:6

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000622	ppm	0.000034	5.44	-384.287000	Y 377.433
Al (167.019 nm)	0.001913	ppm	0.001581	82.61	6.403460	Y_R 377.433
Al H (396.152 nm)	0.011432 u	ppm	0.000791	6.92	334.928496	Y_R 377.433
As (188.980 nm)	0.015853	ppm	0.001474	9.30	18.665900	Y 242.219
B (249.678 nm)	1.363550 o	ppm	0.000374	0.03	37855.900000	Y 242.219
Ba (493.408 nm)	0.067691	ppm	0.000030	0.04	8690.520000	Y_R 488.368
Be (234.861 nm)	-0.000053 u	ppm	0.000003	6.44	251.957000	Y_R 488.368
Bi (223.061 nm)	-0.001799 u	ppm	0.000961	53.38	11.270500	Y 377.433
Ca (315.887 nm)	343.556744 o	ppm	1.518648	0.44	283799.791300	Y_R 377.433
Cd (214.439 nm)	0.000088	ppm	0.000001	1.15	12.747600	Y 377.433
Co (228.615 nm)	0.003829	ppm	0.000365	9.53	43.174700	Y 242.219
Cr (205.560 nm)	0.000079 u	ppm	0.000116	> 100.00	-0.682136	Y 377.433
Cu (324.754 nm)	-0.002028 u	ppm	0.000122	6.02	-46.926100	Y 377.433
Fe (238.204 nm)	9.343443 o	ppm	0.081134	0.87	35211.489957	Y_R 377.433
Fe H (259.940 nm)	9.454350 n	ppm	0.069328	0.73	18835.800000	Y_R 377.433
K (766.491 nm)	4.090410	ppm	0.035182	0.86	4222.990000	Y_R2 488.368
Li (670.783 nm)	0.134726	ppm	0.000817	0.61	3583.290000	Y_R2 488.368
Mg (279.078 nm)	131.313000 o	ppm	0.003903	0.00	801344.000000	Y 377.433
Mn (257.610 nm)	2.447410 o	ppm	0.005874	0.24	664185.000000	Y 377.433
Mo (202.032 nm)	0.019533	ppm	0.000492	2.52	194.352000	Y 377.433
Na (589.592 nm)	696.388000 o	ppm	1.351790	0.19	4826870.000000	Y_R2 488.368
Na H (589.593 nm)	780.353234	ppm	4.760550	0.61	3079333.971251	Y_R 488.368
Ni (231.604 nm)	0.006552	ppm	0.001421	21.68	53.155000	Y 377.433
P (213.618 nm)	0.074442	ppm	0.002507	3.37	209.512000	Y 242.219
Pb (220.353 nm)	0.000964	ppm	0.000604	62.70	7.577460	Y 242.219
S (181.972 nm)	742.053991 bo	ppm	0.028424	0.00	419320.742983	Y 377.433
Sb (206.834 nm)	-0.003703 u	ppm	0.000623	16.83	-30.864700	Y 377.433
Se (196.026 nm)	0.001002 u	ppm	0.001814	> 100.00	15.418800	Y 242.219
Si (288.158 nm)	8.857230	ppm	0.010680	0.12	81304.200000	Y 377.433
Sn (189.925 nm)	0.001014	ppm	0.000289	28.51	9.404680	Y 377.433
Sr (421.552 nm)	6.257180 o	ppm	0.031905	0.51	1355270.855931	Y_R 488.368
Th (288.505 nm)	0.013401	ppm	0.003603	26.88	163.054000	Y 377.433
Ti (336.122 nm)	0.000189	ppm	0.000010	5.46	915.823000	Y 377.433
Tl (190.794 nm)	0.005081	ppm	0.000183	3.60	6.821840	Y 377.433
U (409.013 nm)	0.060895	ppm	0.003728	6.12	142.442000	Y 377.433
V (292.401 nm)	0.000756	ppm	0.000130	17.15	51.271500	Y 377.433
Zn (206.200 nm)	0.037042	ppm	0.000213	0.58	229.902000	Y 377.433
Zr (343.823 nm)	0.000201	ppm	0.000058	28.72	43.737100	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.973170	19891.866669	0.006676	0.69
Y 377.433	1.001861	1102500.572815	0.006361	0.63
Y_R 377.433	1.078260	83127.700000	0.010329	0.96
Y_R 488.368	1.075450	46997.800000	0.004787	0.45
Y_R2 488.368	1.085487	94152.410563	0.003924	0.36

Sample Name: 280-112355-D-8-A

Date: 7/26/2018 8:10:11 PM Rack:Tube: 2:7

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000555	ppm	0.000016	2.86	-391.122000	Y 377.433
Al (167.019 nm)	0.022264	ppm	0.001007	4.52	10.907200	Y_R 377.433
Al H (396.152 nm)	0.027780 u	ppm	0.002880	10.37	375.102602	Y_R 377.433
As (188.980 nm)	0.002099	ppm	0.002312	> 100.00	-0.734769	Y 242.219
B (249.678 nm)	2.628420 o	ppm	0.003171	0.12	72943.000000	Y 242.219
Ba (493.408 nm)	0.022141	ppm	0.000266	1.20	3245.760000	Y_R 488.368
Be (234.861 nm)	0.000060	ppm	0.000007	11.26	-27.237900	Y_R 488.368
Bi (223.061 nm)	0.000112 u	ppm	0.003125	> 100.00	14.914100	Y 377.433
Ca (315.887 nm)	344.432351 o	ppm	1.827921	0.53	284523.291173	Y_R 377.433
Cd (214.439 nm)	0.000025	ppm	0.000033	> 100.00	-1.347030	Y 377.433
Co (228.615 nm)	0.000322	ppm	0.000106	33.01	-29.638700	Y 242.219
Cr (205.560 nm)	0.000273	ppm	0.000177	64.79	5.507000	Y 377.433
Cu (324.754 nm)	-0.001042 u	ppm	0.000107	10.30	-4.124330	Y 377.433
Fe (238.204 nm)	0.091493	ppm	0.000859	0.94	361.058773	Y_R 377.433
Fe H (259.940 nm)	-0.078016 nu	ppm	0.005103	6.54	169.490000	Y_R 377.433
K (766.491 nm)	6.498540	ppm	0.023529	0.36	7142.830000	Y_R2 488.368
Li (670.783 nm)	0.417176	ppm	0.000030	0.01	13538.000000	Y_R2 488.368
Mg (279.078 nm)	206.197000 o	ppm	0.205106	0.10	1258320.000000	Y 377.433
Mn (257.610 nm)	0.256706	ppm	0.000645	0.25	69712.100000	Y 377.433
Mo (202.032 nm)	0.003220	ppm	0.000353	10.97	31.577600	Y 377.433
Na (589.592 nm)	1209.880000 o	ppm	1.618920	0.13	8385660.000000	Y_R2 488.368
Na H (589.593 nm)	1340.177916	ppm	1.168957	0.09	5285350.823941	Y_R 488.368
Ni (231.604 nm)	0.003244	ppm	0.000164	5.07	26.997400	Y 377.433
P (213.618 nm)	0.019782	ppm	0.000800	4.04	71.319600	Y 242.219
Pb (220.353 nm)	0.000117 u	ppm	0.000213	> 100.00	4.448960	Y 242.219
S (181.972 nm)	1162.183852 bo	ppm	3.663927	0.32	656705.204359	Y 377.433
Sb (206.834 nm)	-0.002855 u	ppm	0.000355	12.44	-26.141900	Y 377.433
Se (196.026 nm)	0.014738	ppm	0.004027	27.33	30.699100	Y 242.219
Si (288.158 nm)	9.115250	ppm	0.010570	0.12	83648.100000	Y 377.433
Sn (189.925 nm)	0.000882	ppm	0.000591	67.02	9.096480	Y 377.433
Sr (421.552 nm)	5.938038 o	ppm	0.005582	0.09	1286153.709650	Y_R 488.368
Th (288.505 nm)	0.006780	ppm	0.000544	8.02	100.568000	Y 377.433
Ti (336.122 nm)	0.000859	ppm	0.000133	15.52	1014.780000	Y 377.433
Tl (190.794 nm)	0.003008	ppm	0.000126	4.18	1.864950	Y 377.433
U (409.013 nm)	0.183428	ppm	0.002171	1.18	726.609000	Y 377.433
V (292.401 nm)	0.001882	ppm	0.000165	8.79	91.707900	Y 377.433
Zn (206.200 nm)	0.004149	ppm	0.000044	1.06	40.958200	Y 377.433
Zr (343.823 nm)	-0.000035 u	ppm	0.000100	> 100.00	-16.682500	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.937586	19164.513998	0.000890	0.09
Y 377.433	0.966403	1063480.388605	0.002154	0.22
Y_R 377.433	1.070430	82524.200000	0.007717	0.72
Y_R 488.368	1.070440	46778.700000	0.002345	0.22
Y_R2 488.368	1.086586	94247.686820	0.008564	0.79

Sample Name: CCVH-5225153

Date: 7/26/2018 8:13:35 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001093 u	ppm	0.000123	11.29	-731.999000	Y 377.433
Al (167.019 nm)	45.424500 o	ppm	0.330481	0.73	22616.200000	Y_R 377.433
Al H (396.152 nm)	49.055885	ppm	0.177445	0.36	123592.043862	Y_R 377.433
As (188.980 nm)	-0.000708 u	ppm	0.000623	87.93	-5.198780	Y 242.219
B (249.678 nm)	0.001180	ppm	0.000290	24.55	15.038200	Y 242.219
Ba (493.408 nm)	-0.000277 u	ppm	0.000004	1.46	534.626000	Y_R 488.368
Be (234.861 nm)	0.000009 u	ppm	0.000023	> 100.00	1609.340000	Y_R 488.368
Bi (223.061 nm)	0.968321	ppm	0.004495	0.46	2739.020000	Y 377.433
Ca (315.887 nm)	0.048858	ppm	0.008277	16.94	-35.392971	Y_R 377.433
Cd (214.439 nm)	-0.000179 u	ppm	0.000068	37.77	36.908500	Y 377.433
Co (228.615 nm)	0.000958	ppm	0.000257	26.79	-16.434400	Y 242.219
Cr (205.560 nm)	-0.000069 u	ppm	0.000071	> 100.00	-15.173500	Y 377.433
Cu (324.754 nm)	-0.005742 u	ppm	0.000001	0.02	317.398000	Y 377.433
Fe (238.204 nm)	48.163898 o	ppm	0.220744	0.46	181441.148423	Y_R 377.433
Fe H (259.940 nm)	49.168700	ppm	0.204763	0.42	96604.500000	Y_R 377.433
K (766.491 nm)	0.120639	ppm	0.063907	52.97	-590.325000	Y_R2 488.368
Li (670.783 nm)	0.004593	ppm	0.000233	5.06	-1003.130000	Y_R2 488.368
Mg (279.078 nm)	0.040219	ppm	0.002314	5.75	-75.383800	Y 377.433
Mn (257.610 nm)	0.001595	ppm	0.000025	1.57	484.962000	Y 377.433
Mo (202.032 nm)	0.000085	ppm	0.000020	22.95	0.298611	Y 377.433
Na (589.592 nm)	229.265000 o	ppm	1.740380	0.76	1589220.000000	Y_R2 488.368
Na H (589.593 nm)	244.955923	ppm	2.708790	1.11	969460.002671	Y_R 488.368
Ni (231.604 nm)	0.001468	ppm	0.000099	6.71	15.460900	Y 377.433
P (213.618 nm)	-0.003140 u	ppm	0.001074	34.19	13.368800	Y 242.219
Pb (220.353 nm)	-0.002149 u	ppm	0.000132	6.15	15.107000	Y 242.219
S (181.972 nm)	5.344324	ppm	0.044701	0.84	3043.616840	Y 377.433
Sb (206.834 nm)	-0.003167 u	ppm	0.002219	70.06	-74.133400	Y 377.433
Se (196.026 nm)	-0.001436 u	ppm	0.002855	> 100.00	2.796280	Y 242.219
Si (288.158 nm)	0.025142	ppm	0.001237	4.92	1073.550000	Y 377.433
Sn (189.925 nm)	0.001949	ppm	0.000055	2.83	11.593200	Y 377.433
Sr (421.552 nm)	0.001167	ppm	0.000002	0.13	394.206341	Y_R 488.368
Th (288.505 nm)	4.921370	ppm	0.001199	0.02	13954.500000	Y 377.433
Ti (336.122 nm)	0.001538	ppm	0.000081	5.26	16.092900	Y 377.433
Tl (190.794 nm)	-0.002728 u	ppm	0.000140	5.13	-14.219000	Y 377.433
U (409.013 nm)	9.994040	ppm	0.029547	0.30	48368.100000	Y 377.433
V (292.401 nm)	0.003185	ppm	0.000213	6.69	-37.045500	Y 377.433
Zn (206.200 nm)	-0.002598 u	ppm	0.000072	2.77	2.202460	Y 377.433
Zr (343.823 nm)	-0.003839 u	ppm	0.000046	1.19	-387.803000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.055553	21575.807266	0.000003	0.00
Y 377.433	1.063620	1170463.555116	0.001952	0.18
Y_R 377.433	1.099280	84748.200000	0.001729	0.16
Y_R 488.368	1.119090	48904.700000	0.010003	0.89
Y_R2 488.368	1.118904	97050.902983	0.002724	0.24

Sample Name: CCV-5225154

Date: 7/26/2018 8:16:58 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.476656	ppm	0.000525	0.11	23609.700000	Y 377.433
Al (167.019 nm)	0.532074	ppm	0.002324	0.44	265.863000	Y_R 377.433
Al H (396.152 nm)	0.487310 u	ppm	0.003604	0.74	1421.213709	Y_R 377.433
As (188.980 nm)	0.963527	ppm	0.003945	0.41	1361.920000	Y 242.219
B (249.678 nm)	0.481861	ppm	0.001039	0.22	13444.000000	Y 242.219
Ba (493.408 nm)	0.492740	ppm	0.003411	0.69	59338.400000	Y_R 488.368
Be (234.861 nm)	0.472265	ppm	0.000973	0.21	152921.000000	Y_R 488.368
Bi (223.061 nm)	-0.003688 u	ppm	0.001741	47.20	4.703190	Y 377.433
Ca (315.887 nm)	4.931580	ppm	0.030202	0.61	3999.400848	Y_R 377.433
Cd (214.439 nm)	0.475227	ppm	0.000319	0.07	31392.200000	Y 377.433
Co (228.615 nm)	0.489899	ppm	0.000126	0.03	10156.900000	Y 242.219
Cr (205.560 nm)	0.477282	ppm	0.000202	0.04	8069.670000	Y 377.433
Cu (324.754 nm)	0.478994	ppm	0.000338	0.07	31469.700000	Y 377.433
Fe (238.204 nm)	2.487433	ppm	0.009961	0.40	9386.135997	Y_R 377.433
Fe H (259.940 nm)	2.392820 u	ppm	0.013767	0.58	5007.890000	Y_R 377.433
K (766.491 nm)	48.181500	ppm	0.246293	0.51	57683.100000	Y_R2 488.368
Li (670.783 nm)	0.955603	ppm	0.006925	0.72	32514.300000	Y_R2 488.368
Mg (279.078 nm)	18.717400	ppm	0.034615	0.18	114262.000000	Y 377.433
Mn (257.610 nm)	0.482273	ppm	0.000222	0.05	130922.000000	Y 377.433
Mo (202.032 nm)	0.483995	ppm	0.002317	0.48	4828.760000	Y 377.433
Na (589.592 nm)	4.939770	ppm	0.016156	0.33	35529.000000	Y_R2 488.368
Na H (589.593 nm)	6.464557 u	ppm	0.141772	2.19	30152.563135	Y_R 488.368
Ni (231.604 nm)	0.477692	ppm	0.001037	0.22	3717.070000	Y 377.433
P (213.618 nm)	0.940733	ppm	0.005740	0.61	2399.650000	Y 242.219
Pb (220.353 nm)	0.975895	ppm	0.000293	0.03	3102.880000	Y 242.219
S (181.972 nm)	0.137022	ppm	0.008303	6.06	102.557634	Y 377.433
Sb (206.834 nm)	0.965402	ppm	0.001569	0.16	2917.950000	Y 377.433
Se (196.026 nm)	0.959037	ppm	0.006255	0.65	1076.370000	Y 242.219
Si (288.158 nm)	4.898880	ppm	0.009481	0.19	45346.600000	Y 377.433
Sn (189.925 nm)	0.949425	ppm	0.004742	0.50	2228.580000	Y 377.433
Sr (421.552 nm)	0.491436	ppm	0.003725	0.76	106572.761579	Y_R 488.368
Th (288.505 nm)	0.005948	ppm	0.001081	18.18	105.496000	Y 377.433
Ti (336.122 nm)	0.491999	ppm	0.000178	0.04	70765.600000	Y 377.433
Tl (190.794 nm)	0.976217	ppm	0.004645	0.48	2477.180000	Y 377.433
U (409.013 nm)	-0.000541 u	ppm	0.001097	> 100.00	-132.784000	Y 377.433
V (292.401 nm)	0.480801	ppm	0.000268	0.06	20593.700000	Y 377.433
Zn (206.200 nm)	0.471132	ppm	0.001981	0.42	2723.350000	Y 377.433
Zr (343.823 nm)	0.487369	ppm	0.000112	0.02	66324.100000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.064523	21759.144826	0.002924	0.27
Y 377.433	1.075132	1183132.312222	0.003848	0.36
Y_R 377.433	1.089460	83991.600000	0.001673	0.15
Y_R 488.368	1.094880	47846.500000	0.000872	0.08
Y_R2 488.368	1.114481	96667.251725	0.001279	0.11

Sample Name: CCB

Date: 7/26/2018 8:20:22 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000065 u	ppm	0.000025	37.72	-417.487000	Y 377.433
Al (167.019 nm)	0.003740	ppm	0.003563	95.27	1.642150	Y_R 377.433
Al H (396.152 nm)	-0.047667 u	ppm	0.002176	4.56	34.514628	Y_R 377.433
As (188.980 nm)	0.002250	ppm	0.001969	87.50	-0.519099	Y 242.219
B (249.678 nm)	0.001389	ppm	0.000096	6.92	102.385000	Y 242.219
Ba (493.408 nm)	-0.000542 u	ppm	0.000352	64.81	456.125000	Y_R 488.368
Be (234.861 nm)	0.000095	ppm	0.000011	12.03	-18.615200	Y_R 488.368
Bi (223.061 nm)	0.000696 u	ppm	0.002688	> 100.00	16.536100	Y 377.433
Ca (315.887 nm)	0.022730	ppm	0.004943	21.75	-56.982297	Y_R 377.433
Cd (214.439 nm)	0.000108	ppm	0.000003	2.50	4.060000	Y 377.433
Co (228.615 nm)	0.000327	ppm	0.000162	49.39	-29.547600	Y 242.219
Cr (205.560 nm)	-0.000176 u	ppm	0.000070	39.62	-2.049020	Y 377.433
Cu (324.754 nm)	0.000321	ppm	0.000241	75.26	340.590000	Y 377.433
Fe (238.204 nm)	0.002796	ppm	0.000363	12.99	26.955400	Y_R 377.433
Fe H (259.940 nm)	-0.160598 u	ppm	0.001480	0.92	7.778100	Y_R 377.433
K (766.491 nm)	0.054419	ppm	0.056908	> 100.00	-670.616000	Y_R2 488.368
Li (670.783 nm)	0.002982	ppm	0.000710	23.80	-1059.880000	Y_R2 488.368
Mg (279.078 nm)	0.006030	ppm	0.000375	6.22	83.548700	Y 377.433
Mn (257.610 nm)	0.000080	ppm	0.000002	1.99	73.744600	Y 377.433
Mo (202.032 nm)	0.000336	ppm	0.000007	2.09	2.804850	Y 377.433
Na (589.592 nm)	0.061230	ppm	0.010580	17.28	670.847000	Y_R2 488.368
Na H (589.593 nm)	0.452892 u	ppm	0.067385	14.88	5964.633060	Y_R 488.368
Ni (231.604 nm)	-0.000512 u	ppm	0.000009	1.70	-2.212840	Y 377.433
P (213.618 nm)	-0.001984 u	ppm	0.000579	29.19	16.291500	Y 242.219
Pb (220.353 nm)	0.000216 u	ppm	0.000432	> 100.00	4.300650	Y 242.219
S (181.972 nm)	0.087144 Z	ppm	0.000816	0.94	73.093910 Z	Y 377.433
Sb (206.834 nm)	0.000389	ppm	0.000087	22.41	-15.732400	Y 377.433
Se (196.026 nm)	-0.001037 u	ppm	0.002785	> 100.00	13.014600	Y 242.219
Si (288.158 nm)	-0.005202 u	ppm	0.001531	29.43	797.901000	Y 377.433
Sn (189.925 nm)	-0.000118 u	ppm	0.000776	> 100.00	6.757070	Y 377.433
Sr (421.552 nm)	0.000164	ppm	0.000050	30.11	177.122261	Y_R 488.368
Th (288.505 nm)	0.003340	ppm	0.000508	15.22	81.774800	Y 377.433
Ti (336.122 nm)	0.000358	ppm	0.000007	2.05	-154.394000	Y 377.433
Tl (190.794 nm)	0.001825	ppm	0.000486	26.61	-1.133910	Y 377.433
U (409.013 nm)	0.002231	ppm	0.002311	> 100.00	-80.874700	Y 377.433
V (292.401 nm)	0.000222	ppm	0.000027	12.09	29.671500	Y 377.433
Zn (206.200 nm)	-0.002916 u	ppm	0.000053	1.81	0.380213	Y 377.433
Zr (343.823 nm)	0.000053	ppm	0.000074	> 100.00	-4.965500	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.078605	22046.995192	0.002734	0.25
Y 377.433	1.093009	1202804.691549	0.002707	0.25
Y_R 377.433	1.098760	84708.300000	0.000780	0.07
Y_R 488.368	1.103260	48212.800000	0.014552	1.32
Y_R2 488.368	1.125435	97617.405138	0.003507	0.31

Sample Name: CCVL-5236949

Date: 7/26/2018 8:23:45 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009059	ppm	0.000324	3.57	42.212500	Y 377.433
Al (167.019 nm)	0.103372	ppm	0.004137	4.00	51.243700	Y_R 377.433
Al H (396.152 nm)	0.046249 u	ppm	0.005164	11.17	272.317175	Y_R 377.433
As (188.980 nm)	0.015414	ppm	0.001079	7.00	18.137400	Y 242.219
B (249.678 nm)	0.093567	ppm	0.000555	0.59	2658.500000	Y 242.219
Ba (493.408 nm)	0.008959	ppm	0.000370	4.13	1590.180000	Y_R 488.368
Be (234.861 nm)	0.000954	ppm	0.000038	3.95	261.986000	Y_R 488.368
Bi (223.061 nm)	0.097360	ppm	0.000612	0.63	287.632000	Y 377.433
Ca (315.887 nm)	0.210146	ppm	0.010662	5.07	97.879673	Y_R 377.433
Cd (214.439 nm)	0.004791	ppm	0.000029	0.61	313.495000	Y 377.433
Co (228.615 nm)	0.009986	ppm	0.000124	1.24	171.387000	Y 242.219
Cr (205.560 nm)	0.009132	ppm	0.000055	0.60	155.346000	Y 377.433
Cu (324.754 nm)	0.014201	ppm	0.000044	0.31	1239.970000	Y 377.433
Fe (238.204 nm)	0.100973	ppm	0.000749	0.74	396.769203	Y_R 377.433
Fe H (259.940 nm)	-0.061106 u	ppm	0.003365	5.51	202.604000	Y_R 377.433
K (766.491 nm)	3.023380	ppm	0.018609	0.62	2929.220000	Y_R2 488.368
Li (670.783 nm)	0.022596	ppm	0.000963	4.26	-368.639000	Y_R2 488.368
Mg (279.078 nm)	0.184821	ppm	0.000994	0.54	1172.990000	Y 377.433
Mn (257.610 nm)	0.009752	ppm	0.000028	0.28	2698.460000	Y 377.433
Mo (202.032 nm)	0.017950	ppm	0.000364	2.03	178.554000	Y 377.433
Na (589.592 nm)	1.014870	ppm	0.003443	0.34	7300.290000	Y_R2 488.368
Na H (589.593 nm)	1.243701 u	ppm	0.003280	0.26	9090.443940	Y_R 488.368
Ni (231.604 nm)	0.037764	ppm	0.000759	2.01	295.390000	Y 377.433
P (213.618 nm)	2.633450 o	ppm	0.009915	0.38	6679.140000	Y 242.219
Pb (220.353 nm)	0.008337	ppm	0.001073	12.87	30.158500	Y 242.219
S (181.972 nm)	0.147436 Q	ppm	0.007924	5.37	107.187002 Q	Y 377.433
Sb (206.834 nm)	0.018814	ppm	0.000947	5.03	40.102600	Y 377.433
Se (196.026 nm)	0.015701	ppm	0.002195	13.98	31.544300	Y 242.219
Si (288.158 nm)	0.465376	ppm	0.003585	0.77	5072.630000	Y 377.433
Sn (189.925 nm)	0.092210	ppm	0.001063	1.15	222.794000	Y 377.433
Sr (421.552 nm)	0.009793	ppm	0.000240	2.45	2262.406618	Y_R 488.368
Th (288.505 nm)	0.017562	ppm	0.000118	0.67	122.911000	Y 377.433
Ti (336.122 nm)	0.009910	ppm	0.000132	1.33	1223.810000	Y 377.433
Tl (190.794 nm)	0.015343	ppm	0.001657	10.80	33.213800	Y 377.433
U (409.013 nm)	0.062641	ppm	0.006187	9.88	210.655000	Y 377.433
V (292.401 nm)	0.009250	ppm	0.000182	1.97	412.533000	Y 377.433
Zn (206.200 nm)	0.016243	ppm	0.000236	1.45	110.426000	Y 377.433
Zr (343.823 nm)	0.014314	ppm	0.000099	0.69	1936.210000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.081666	22109.558366	0.001378	0.13
Y 377.433	1.094272	1204194.587958	0.002941	0.27
Y_R 377.433	1.097350	84599.600000	0.000273	0.02
Y_R 488.368	1.105030	48290.300000	0.024176	2.19
Y_R2 488.368	1.129018	97928.130180	0.000682	0.06

Sample Name: MB 280-423465/1-B

Date: 7/26/2018 8:27:08 PM Rack:Tube: 2:8

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000044 u	ppm	0.000100	> 100.00	-416.367000	Y 377.433
Al (167.019 nm)	0.006017	ppm	0.003682	61.20	2.776870	Y_R 377.433
Al H (396.152 nm)	-0.051180 u	ppm	0.002118	4.14	25.664122	Y_R 377.433
As (188.980 nm)	0.000152 u	ppm	0.000296	> 100.00	-3.493720	Y 242.219
B (249.678 nm)	0.001037	ppm	0.000194	18.71	92.631400	Y 242.219
Ba (493.408 nm)	-0.000657 u	ppm	0.000117	17.79	442.418000	Y_R 488.368
Be (234.861 nm)	0.000052	ppm	0.000009	17.22	-32.279600	Y_R 488.368
Bi (223.061 nm)	-0.000659 u	ppm	0.000176	26.74	12.737900	Y 377.433
Ca (315.887 nm)	0.024383	ppm	0.000632	2.59	-55.616545	Y_R 377.433
Cd (214.439 nm)	-0.000020 u	ppm	0.000054	> 100.00	-4.417180	Y 377.433
Co (228.615 nm)	0.000249	ppm	0.000043	17.20	-31.177400	Y 242.219
Cr (205.560 nm)	-0.000072 u	ppm	0.000030	41.43	-0.294989	Y 377.433
Cu (324.754 nm)	0.000151	ppm	0.000109	71.91	328.894000	Y 377.433
Fe (238.204 nm)	0.006641	ppm	0.001225	18.45	41.436530	Y_R 377.433
Fe H (259.940 nm)	-0.154084 nu	ppm	0.003390	2.20	20.533000	Y_R 377.433
K (766.491 nm)	0.143058	ppm	0.028207	19.72	-563.142000	Y_R2 488.368
Li (670.783 nm)	0.003560	ppm	0.001345	37.79	-1039.540000	Y_R2 488.368
Mg (279.078 nm)	0.001185	ppm	0.000296	25.02	53.999500	Y 377.433
Mn (257.610 nm)	0.000928	ppm	0.000014	1.53	303.773000	Y 377.433
Mo (202.032 nm)	0.000125	ppm	0.000082	66.08	0.693326	Y 377.433
Na (589.592 nm)	0.038862	ppm	0.007297	18.78	515.458000	Y_R2 488.368
Na H (589.593 nm)	0.072172 u	ppm	0.037087	51.39	4464.184876	Y_R 488.368
Ni (231.604 nm)	0.000103 u	ppm	0.000482	> 100.00	2.563460	Y 377.433
P (213.618 nm)	-0.002681 u	ppm	0.000414	15.45	14.529400	Y 242.219
Pb (220.353 nm)	-0.000819 u	ppm	0.000693	84.62	1.012160	Y 242.219
S (181.972 nm)	0.055150	ppm	0.001790	3.25	55.018673	Y 377.433
Sb (206.834 nm)	-0.000099 u	ppm	0.000921	> 100.00	-17.208500	Y 377.433
Se (196.026 nm)	-0.002693 u	ppm	0.002252	83.62	11.180700	Y 242.219
Si (288.158 nm)	-0.003858 u	ppm	0.000329	8.52	810.107000	Y 377.433
Sn (189.925 nm)	0.000418	ppm	0.000429	> 100.00	8.009600	Y 377.433
Sr (421.552 nm)	0.000019 u	ppm	0.000145	> 100.00	145.666889	Y_R 488.368
Th (288.505 nm)	0.001593	ppm	0.000166	10.40	76.918400	Y 377.433
Ti (336.122 nm)	0.000370	ppm	0.000016	4.41	-152.667000	Y 377.433
Tl (190.794 nm)	0.000724	ppm	0.001003	> 100.00	-3.934970	Y 377.433
U (409.013 nm)	0.000617 u	ppm	0.001893	> 100.00	-88.688500	Y 377.433
V (292.401 nm)	0.000021 u	ppm	0.000067	> 100.00	20.768700	Y 377.433
Zn (206.200 nm)	-0.002094 u	ppm	0.000373	17.80	5.101910	Y 377.433
Zr (343.823 nm)	0.000006 u	ppm	0.000076	> 100.00	-11.321100	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.090027	22280.463927	0.005208	0.48
Y 377.433	1.106091	1217200.502844	0.005762	0.52
Y_R 377.433	1.113540	85847.600000	0.006471	0.58
Y_R 488.368	1.123330	49090.100000	0.004767	0.42
Y_R2 488.368	1.138927	98787.611663	0.009171	0.81

Sample Name: LCS 280-423465/2-B

Date: 7/26/2018 8:30:30 PM Rack:Tube: 2:9

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.050760	ppm	0.000170	0.34	2111.970000	Y 377.433
Al (167.019 nm)	2.062460	ppm	0.000116	0.01	1025.950000	Y_R 377.433
Al H (396.152 nm)	2.064279	ppm	0.008358	0.40	5446.234528	Y_R 377.433
As (188.980 nm)	1.017420	ppm	0.004088	0.40	1438.330000	Y 242.219
B (249.678 nm)	0.995864	ppm	0.003177	0.32	27698.300000	Y 242.219
Ba (493.408 nm)	2.045630 o	ppm	0.001436	0.07	244660.000000	Y_R 488.368
Be (234.861 nm)	0.048496	ppm	0.000137	0.28	15629.500000	Y_R 488.368
Bi (223.061 nm)	2.002660	ppm	0.015109	0.75	5630.890000	Y 377.433
Ca (315.887 nm)	49.577410 o	ppm	0.038840	0.08	40889.329930	Y_R 377.433
Cd (214.439 nm)	0.096411	ppm	0.000546	0.57	6367.100000	Y 377.433
Co (228.615 nm)	0.485488	ppm	0.000806	0.17	10085.300000	Y 242.219
Cr (205.560 nm)	0.197262	ppm	0.000963	0.49	3335.610000	Y 377.433
Cu (324.754 nm)	0.244816	ppm	0.000965	0.39	16268.800000	Y 377.433
Fe (238.204 nm)	1.013689	ppm	0.000363	0.04	3834.806260	Y_R 377.433
Fe H (259.940 nm)	0.873232 nu	ppm	0.002712	0.31	2032.230000	Y_R 377.433
K (766.491 nm)	49.518200	ppm	0.462670	0.93	59303.800000	Y_R2 488.368
Li (670.783 nm)	0.976840	ppm	0.009162	0.94	33262.800000	Y_R2 488.368
Mg (279.078 nm)	48.628800 o	ppm	0.247847	0.51	296736.000000	Y 377.433
Mn (257.610 nm)	0.493971	ppm	0.001924	0.39	134097.000000	Y 377.433
Mo (202.032 nm)	0.954766	ppm	0.003595	0.38	9526.110000	Y 377.433
Na (589.592 nm)	48.022000 o	ppm	0.430883	0.90	337408.000000	Y_R2 488.368
Na H (589.593 nm)	53.556008	ppm	0.068462	0.13	217288.102479	Y_R 488.368
Ni (231.604 nm)	0.475943	ppm	0.001863	0.39	3704.840000	Y 377.433
P (213.618 nm)	9.830270 o	ppm	0.041751	0.42	24874.000000	Y 242.219
Pb (220.353 nm)	0.511419	ppm	0.002080	0.41	1630.090000	Y 242.219
S (181.972 nm)	1.998349	ppm	0.019494	0.98	1154.313864	Y 377.433
Sb (206.834 nm)	0.500631	ppm	0.003985	0.80	1492.520000	Y 377.433
Se (196.026 nm)	1.994930	ppm	0.009088	0.46	2224.170000	Y 242.219
Si (288.158 nm)	9.867480	ppm	0.024436	0.25	90481.300000	Y 377.433
Sn (189.925 nm)	1.902470	ppm	0.012387	0.65	4458.600000	Y 377.433
Sr (421.552 nm)	1.010325	ppm	0.001553	0.15	218949.529437	Y_R 488.368
Th (288.505 nm)	1.045240	ppm	0.000609	0.06	3049.870000	Y 377.433
Ti (336.122 nm)	0.990501	ppm	0.004979	0.50	142802.000000	Y 377.433
Tl (190.794 nm)	2.036150	ppm	0.008441	0.41	5171.090000	Y 377.433
U (409.013 nm)	2.139010	ppm	0.002699	0.13	10220.600000	Y 377.433
V (292.401 nm)	0.500196	ppm	0.001549	0.31	21469.700000	Y 377.433
Zn (206.200 nm)	0.473823	ppm	0.001144	0.24	2738.810000	Y 377.433
Zr (343.823 nm)	0.487681	ppm	0.002607	0.53	66362.100000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.047871	21418.785154	0.003577	0.34
Y 377.433	1.064896	1171867.687663	0.005307	0.50
Y_R 377.433	1.094050	84345.100000	0.002767	0.25
Y_R 488.368	1.103250	48212.400000	0.002381	0.22
Y_R2 488.368	1.143265	99163.946002	0.003226	0.28

Sample Name: LCSD 280-423465/3-B

Date: 7/26/2018 8:33:52 PM Rack:Tube: 2:10

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.052145	ppm	0.000210	0.40	2182.320000	Y 377.433
Al (167.019 nm)	2.078720	ppm	0.008758	0.42	1034.040000	Y_R 377.433
Al H (396.152 nm)	2.099845	ppm	0.017331	0.83	5537.916019	Y_R 377.433
As (188.980 nm)	1.034010	ppm	0.005300	0.51	1461.830000	Y 242.219
B (249.678 nm)	1.022990	ppm	0.002591	0.25	28450.900000	Y 242.219
Ba (493.408 nm)	2.082050 o	ppm	0.008304	0.40	249006.000000	Y_R 488.368
Be (234.861 nm)	0.049501	ppm	0.000448	0.90	15954.400000	Y_R 488.368
Bi (223.061 nm)	2.048530	ppm	0.000218	0.01	5759.530000	Y 377.433
Ca (315.887 nm)	50.460983 o	ppm	0.150604	0.30	41619.413063	Y_R 377.433
Cd (214.439 nm)	0.098005	ppm	0.000177	0.18	6472.430000	Y 377.433
Co (228.615 nm)	0.498217	ppm	0.000059	0.01	10350.800000	Y 242.219
Cr (205.560 nm)	0.200549	ppm	0.000837	0.42	3391.160000	Y 377.433
Cu (324.754 nm)	0.254632	ppm	0.000111	0.04	16908.200000	Y 377.433
Fe (238.204 nm)	1.035284	ppm	0.002619	0.25	3916.151346	Y_R 377.433
Fe H (259.940 nm)	0.895662 nu	ppm	0.000793	0.09	2076.150000	Y_R 377.433
K (766.491 nm)	51.402600	ppm	0.617560	1.20	61588.700000	Y_R2 488.368
Li (670.783 nm)	1.007420	ppm	0.013250	1.32	34340.400000	Y_R2 488.368
Mg (279.078 nm)	49.517300 o	ppm	0.042417	0.09	302157.000000	Y 377.433
Mn (257.610 nm)	0.502476	ppm	0.000649	0.13	136405.000000	Y 377.433
Mo (202.032 nm)	0.977339	ppm	0.000856	0.09	9751.350000	Y 377.433
Na (589.592 nm)	50.164300 o	ppm	0.785634	1.57	352333.000000	Y_R2 488.368
Na H (589.593 nm)	54.600049	ppm	0.285871	0.52	221439.247429	Y_R 488.368
Ni (231.604 nm)	0.484344	ppm	0.001715	0.35	3770.210000	Y 377.433
P (213.618 nm)	10.026600 o	ppm	0.016127	0.16	25370.300000	Y 242.219
Pb (220.353 nm)	0.521894	ppm	0.003362	0.64	1663.370000	Y 242.219
S (181.972 nm)	2.047294	ppm	0.002810	0.14	1181.992755	Y 377.433
Sb (206.834 nm)	0.517095	ppm	0.001393	0.27	1542.220000	Y 377.433
Se (196.026 nm)	2.044120	ppm	0.008546	0.42	2278.660000	Y 242.219
Si (288.158 nm)	10.110800	ppm	0.014469	0.14	92691.300000	Y 377.433
Sn (189.925 nm)	1.948680	ppm	0.007547	0.39	4566.730000	Y 377.433
Sr (421.552 nm)	1.028647	ppm	0.004778	0.46	222917.529614	Y_R 488.368
Th (288.505 nm)	1.063540	ppm	0.005333	0.50	3101.940000	Y 377.433
Ti (336.122 nm)	1.017520	ppm	0.000537	0.05	146701.000000	Y 377.433
Tl (190.794 nm)	2.073430	ppm	0.008098	0.39	5265.820000	Y 377.433
U (409.013 nm)	2.175610	ppm	0.009902	0.46	10396.700000	Y 377.433
V (292.401 nm)	0.509325	ppm	0.000110	0.02	21861.700000	Y 377.433
Zn (206.200 nm)	0.483346	ppm	0.000948	0.20	2793.510000	Y 377.433
Zr (343.823 nm)	0.500942	ppm	0.000978	0.20	68167.000000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.041815	21294.979008	0.002254	0.22
Y 377.433	1.058976	1165353.028525	0.001513	0.14
Y_R 377.433	1.086560	83767.500000	0.008363	0.77
Y_R 488.368	1.095850	47889.200000	0.009598	0.88
Y_R2 488.368	1.105067	95850.739384	0.003297	0.30

Sample Name: 280-112084-G-1-C

Date: 7/26/2018 8:37:15 PM Rack:Tube: 2:11

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000007 u	ppm	0.000029	> 100.00	-416.780000	Y 377.433
Al (167.019 nm)	4.894810 o	ppm	0.041169	0.84	2434.890000	Y_R 377.433
Al H (396.152 nm)	4.896233	ppm	0.034448	0.70	12479.309875	Y_R 377.433
As (188.980 nm)	0.005815	ppm	0.000730	12.55	4.513890	Y 242.219
B (249.678 nm)	1.113380 o	ppm	0.004794	0.43	30931.900000	Y 242.219
Ba (493.408 nm)	0.078720	ppm	0.000430	0.55	9918.030000	Y_R 488.368
Be (234.861 nm)	0.000207	ppm	0.000004	1.94	81.459300	Y_R 488.368
Bi (223.061 nm)	-0.001888 u	ppm	0.000623	33.02	9.651030	Y 377.433
Ca (315.887 nm)	2.898082	ppm	0.030286	1.05	2318.875780	Y_R 377.433
Cd (214.439 nm)	0.000068	ppm	0.000003	4.86	3.518340	Y 377.433
Co (228.615 nm)	0.000899	ppm	0.000095	10.52	-16.049200	Y 242.219
Cr (205.560 nm)	0.013548	ppm	0.000127	0.94	229.444000	Y 377.433
Cu (324.754 nm)	0.001841	ppm	0.000048	2.58	438.123000	Y 377.433
Fe (238.204 nm)	1.949277	ppm	0.011434	0.59	7358.999007	Y_R 377.433
Fe H (259.940 nm)	1.845190 nu	ppm	0.007025	0.38	3935.520000	Y_R 377.433
K (766.491 nm)	1.682640	ppm	0.078600	4.67	1303.590000	Y_R2 488.368
Li (670.783 nm)	0.149873	ppm	0.000204	0.14	4117.130000	Y_R2 488.368
Mg (279.078 nm)	1.320570	ppm	0.004815	0.36	8100.690000	Y 377.433
Mn (257.610 nm)	0.044135	ppm	0.000214	0.48	12028.500000	Y 377.433
Mo (202.032 nm)	0.042777	ppm	0.000154	0.36	426.275000	Y 377.433
Na (589.592 nm)	292.401000 o	ppm	0.071072	0.02	2026970.000000	Y_R2 488.368
Na H (589.593 nm)	314.953685	ppm	2.438050	0.77	1245376.957930	Y_R 488.368
Ni (231.604 nm)	0.002147	ppm	0.000100	4.65	18.551400	Y 377.433
P (213.618 nm)	0.081932	ppm	0.004357	5.32	228.447000	Y 242.219
Pb (220.353 nm)	-0.000045 u	ppm	0.000102	> 100.00	1.802320	Y 242.219
S (181.972 nm)	45.768616 o	ppm	0.225265	0.49	25885.081882	Y 377.433
Sb (206.834 nm)	-0.000063 u	ppm	0.001550	> 100.00	-17.767500	Y 377.433
Se (196.026 nm)	0.001916 u	ppm	0.002921	> 100.00	15.990500	Y 242.219
Si (288.158 nm)	13.848800 o	ppm	0.145836	1.05	126648.000000	Y 377.433
Sn (189.925 nm)	0.000315	ppm	0.000235	74.56	7.769900	Y 377.433
Sr (421.552 nm)	0.115235	ppm	0.000718	0.62	25098.071534	Y_R 488.368
Th (288.505 nm)	0.006918	ppm	0.000650	9.40	93.974600	Y 377.433
Ti (336.122 nm)	0.041690	ppm	0.000638	1.53	5815.570000	Y 377.433
Tl (190.794 nm)	0.001893	ppm	0.000806	42.59	-1.344490	Y 377.433
U (409.013 nm)	0.049593	ppm	0.001746	3.52	149.659000	Y 377.433
V (292.401 nm)	0.015252	ppm	0.000154	1.01	670.306000	Y 377.433
Zn (206.200 nm)	0.002993	ppm	0.000271	9.04	34.320000	Y 377.433
Zr (343.823 nm)	0.003301	ppm	0.000019	0.58	443.087000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.039485	21247.373470	0.004471	0.43
Y 377.433	1.048590	1153923.915850	0.004003	0.38
Y_R 377.433	1.090180	84046.700000	0.009148	0.84
Y_R 488.368	1.098270	47994.700000	0.006466	0.59
Y_R2 488.368	1.112063	96457.507489	0.006734	0.61

Sample Name: 280-112222-A-1-B

Date: 7/26/2018 8:40:38 PM Rack:Tube: 2:12

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.084053	ppm	0.000176	0.21	3808.710000	Y 377.433
Al (167.019 nm)	0.025796	ppm	0.005483	21.25	12.615200	Y_R 377.433
Al H (396.152 nm)	0.021341 u	ppm	0.004061	19.03	291.231487	Y_R 377.433
As (188.980 nm)	-0.111859 u	ppm	0.001775	1.59	-162.253000	Y 242.219
B (249.678 nm)	-0.013320 u	ppm	0.000491	3.69	-305.444000	Y 242.219
Ba (493.408 nm)	0.009281	ppm	0.000141	1.52	1673.830000	Y_R 488.368
Be (234.861 nm)	-0.028593 u	ppm	0.000043	0.15	-9307.490000	Y_R 488.368
Bi (223.061 nm)	0.038589	ppm	0.000263	0.68	122.802000	Y 377.433
Ca (315.887 nm)	190.284471 o	ppm	1.184106	0.62	157153.313153	Y_R 377.433
Cd (214.439 nm)	0.000334	ppm	0.000028	8.51	18.975900	Y 377.433
Co (228.615 nm)	0.000038 u	ppm	0.000272	> 100.00	-35.558700	Y 242.219
Cr (205.560 nm)	0.384135	ppm	0.000184	0.05	6500.060000	Y 377.433
Cu (324.754 nm)	-0.016465 u	ppm	0.000046	0.28	-260.826000	Y 377.433
Fe (238.204 nm)	0.015030	ppm	0.000997	6.63	73.038899	Y_R 377.433
Fe H (259.940 nm)	-0.154560 nu	ppm	0.000184	0.12	19.601500	Y_R 377.433
K (766.491 nm)	18.059700	ppm	0.000580	0.00	21160.700000	Y_R2 488.368
Li (670.783 nm)	0.050496	ppm	0.000342	0.68	614.692000	Y_R2 488.368
Mg (279.078 nm)	28.456500	ppm	0.018766	0.07	173690.000000	Y 377.433
Mn (257.610 nm)	####	ppm	N/A	N/A	####	Y 377.433
Mo (202.032 nm)	0.000434	ppm	0.000002	0.40	3.778950	Y 377.433
Na (589.592 nm)	857.913000 o	ppm	3.245670	0.38	5946220.000000	Y_R2 488.368
Na H (589.593 nm)	953.700843	ppm	0.825013	0.09	3762373.465136	Y_R 488.368
Ni (231.604 nm)	-0.074708 u	ppm	0.000657	0.88	-577.315000	Y 377.433
P (213.618 nm)	0.033688	ppm	0.004560	13.54	106.476000	Y 242.219
Pb (220.353 nm)	0.111628	ppm	0.001988	1.78	359.196000	Y 242.219
S (181.972 nm)	78.221355 o	ppm	0.089523	0.11	44222.068873	Y 377.433
Sb (206.834 nm)	-0.040586 u	ppm	0.000087	0.21	-127.473000	Y 377.433
Se (196.026 nm)	0.629554	ppm	0.002505	0.40	711.411000	Y 242.219
Si (288.158 nm)	20.394900 o	ppm	0.008081	0.04	186112.000000	Y 377.433
Sn (189.925 nm)	0.003529	ppm	0.000344	9.76	15.290000	Y 377.433
Sr (421.552 nm)	0.820685	ppm	0.000333	0.04	177878.780160	Y_R 488.368
Th (288.505 nm)	9.588250	ppm	0.021829	0.23	26713.500000	Y 377.433
Ti (336.122 nm)	-0.001721 u	ppm	0.000011	0.62	151.257000	Y 377.433
Tl (190.794 nm)	0.027667	ppm	0.003721	13.45	64.640000	Y 377.433
U (409.013 nm)	-0.205318 u	ppm	0.000002	0.00	-1124.990000	Y 377.433
V (292.401 nm)	-0.075876 u	ppm	0.000480	0.63	-3101.580000	Y 377.433
Zn (206.200 nm)	0.008654	ppm	0.000614	7.10	66.835400	Y 377.433
Zr (343.823 nm)	-0.006281 u	ppm	0.000089	1.41	-866.865000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	0.950781	19434.231864	0.001153	0.12
Y 377.433	0.980063	1078513.109323	0.000181	0.02
Y_R 377.433	1.085850	83713.000000	0.006046	0.56
Y_R 488.368	1.098830	48019.300000	0.000013	0.00
Y_R2 488.368	1.111871	96440.899927	0.005061	0.46

Sample Name: 280-112222-A-2-B

Date: 7/26/2018 8:44:02 PM Rack:Tube: 2:13

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.020596	ppm	0.000037	0.18	620.823000	Y 377.433
Al (167.019 nm)	0.006243	ppm	0.000881	14.11	2.891190	Y_R 377.433
Al H (396.152 nm)	-0.017166 u	ppm	0.000678	3.95	168.887273	Y_R 377.433
As (188.980 nm)	-0.029369 u	ppm	0.002996	10.20	-45.335500	Y 242.219
B (249.678 nm)	0.036950	ppm	0.000193	0.52	1088.390000	Y 242.219
Ba (493.408 nm)	0.006625	ppm	0.000051	0.77	1343.050000	Y_R 488.368
Be (234.861 nm)	-0.008311 u	ppm	0.000124	1.49	-2740.240000	Y_R 488.368
Bi (223.061 nm)	0.012184	ppm	0.000359	2.95	48.753600	Y 377.433
Ca (315.887 nm)	131.822801 o	ppm	0.144274	0.11	108847.350982	Y_R 377.433
Cd (214.439 nm)	0.000115	ppm	0.000021	18.46	4.489350	Y 377.433
Co (228.615 nm)	-0.000219 u	ppm	0.000232	> 100.00	-40.894200	Y 242.219
Cr (205.560 nm)	0.159845	ppm	0.000623	0.39	2705.320000	Y 377.433
Cu (324.754 nm)	-0.006124 u	ppm	0.000187	3.06	95.748800	Y 377.433
Fe (238.204 nm)	0.009841	ppm	0.000950	9.65	53.492689	Y_R 377.433
Fe H (259.940 nm)	-0.160736 nu	ppm	0.000914	0.57	7.506330	Y_R 377.433
K (766.491 nm)	4.853420	ppm	0.110386	2.27	5148.130000	Y_R2 488.368
Li (670.783 nm)	0.031506	ppm	0.000294	0.93	-54.612200	Y_R2 488.368
Mg (279.078 nm)	17.633500	ppm	0.015117	0.09	107651.000000	Y 377.433
Mn (257.610 nm)	####	ppm	N/A	N/A	####	Y 377.433
Mo (202.032 nm)	0.000439	ppm	0.000099	22.59	3.827090	Y 377.433
Na (589.592 nm)	202.175000 o	ppm	0.466853	0.23	1401480.000000	Y_R2 488.368
Na H (589.593 nm)	218.595779	ppm	3.576921	1.64	865592.715888	Y_R 488.368
Ni (231.604 nm)	-0.021271 u	ppm	0.000463	2.18	-163.116000	Y 377.433
P (213.618 nm)	0.038398	ppm	0.001802	4.69	118.385000	Y 242.219
Pb (220.353 nm)	0.028796	ppm	0.002899	10.07	95.281800	Y 242.219
S (181.972 nm)	74.825088 o	ppm	0.156436	0.21	42303.041101	Y 377.433
Sb (206.834 nm)	-0.011518 u	ppm	0.001287	11.17	-46.454800	Y 377.433
Se (196.026 nm)	0.202040	ppm	0.001974	0.98	237.927000	Y 242.219
Si (288.158 nm)	14.732100 o	ppm	0.001003	0.01	134671.000000	Y 377.433
Sn (189.925 nm)	0.000555 u	ppm	0.000935	> 100.00	8.329820	Y 377.433
Sr (421.552 nm)	0.556957	ppm	0.007147	1.28	120762.730481	Y_R 488.368
Th (288.505 nm)	2.617590	ppm	0.004649	0.18	7345.030000	Y 377.433
Ti (336.122 nm)	-0.000259 u	ppm	0.000092	35.68	176.605000	Y 377.433
Tl (190.794 nm)	0.011813	ppm	0.001125	9.53	24.287900	Y 377.433
U (409.013 nm)	-0.047291 u	ppm	0.002535	5.36	-347.638000	Y 377.433
V (292.401 nm)	-0.018764 u	ppm	0.000046	0.24	-721.739000	Y 377.433
Zn (206.200 nm)	-0.000276 u	ppm	0.000815	> 100.00	15.544200	Y 377.433
Zr (343.823 nm)	-0.001517 u	ppm	0.000026	1.69	-218.514000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.007962	20603.020878	0.000258	0.03
Y 377.433	1.021283	1123873.943813	0.002083	0.20
Y_R 377.433	1.070340	82517.400000	0.001210	0.11
Y_R 488.368	1.075030	46979.400000	0.009935	0.92
Y_R2 488.368	1.111905	96443.859516	0.006012	0.54

Sample Name: 280-112222-A-3-B

Date: 7/26/2018 8:47:25 PM Rack:Tube: 2:14

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000101	ppm	0.000107	> 100.00	-409.294000	Y 377.433
Al (167.019 nm)	0.005130	ppm	0.001740	33.92	2.365510	Y_R 377.433
Al H (396.152 nm)	-0.019068 u	ppm	0.001398	7.33	167.645815	Y_R 377.433
As (188.980 nm)	0.001990	ppm	0.002077	> 100.00	-0.888457	Y 242.219
B (249.678 nm)	0.066422	ppm	0.000576	0.87	1905.500000	Y 242.219
Ba (493.408 nm)	0.043040	ppm	0.000592	1.38	5690.910000	Y_R 488.368
Be (234.861 nm)	0.000009	ppm	0.000004	38.39	-44.584900	Y_R 488.368
Bi (223.061 nm)	-0.001416 u	ppm	0.000166	11.73	10.622700	Y 377.433
Ca (315.887 nm)	139.948258 o	ppm	1.573963	1.12	115561.288854	Y_R 377.433
Cd (214.439 nm)	-0.000002 u	ppm	0.000068	> 100.00	-3.162580	Y 377.433
Co (228.615 nm)	-0.000340 u	ppm	0.000086	25.32	-43.401300	Y 242.219
Cr (205.560 nm)	0.075097	ppm	0.000289	0.38	1271.460000	Y 377.433
Cu (324.754 nm)	0.000117 u	ppm	0.000469	> 100.00	228.165000	Y 377.433
Fe (238.204 nm)	0.054774	ppm	0.000342	0.63	222.746756	Y_R 377.433
Fe H (259.940 nm)	-0.104801 nu	ppm	0.001320	1.26	117.039000	Y_R 377.433
K (766.491 nm)	4.015220	ppm	0.022501	0.56	4131.820000	Y_R2 488.368
Li (670.783 nm)	0.031427	ppm	0.002005	6.38	-57.387000	Y_R2 488.368
Mg (279.078 nm)	17.044900	ppm	0.002396	0.01	104060.000000	Y 377.433
Mn (257.610 nm)	0.149054	ppm	0.025487	17.10	40499.700000	Y 377.433
Mo (202.032 nm)	0.000175	ppm	0.000001	0.52	1.193340	Y 377.433
Na (589.592 nm)	80.435800 o	ppm	0.143840	0.18	557817.000000	Y_R2 488.368
Na H (589.593 nm)	85.869696	ppm	0.205625	0.24	342604.962869	Y_R 488.368
Ni (231.604 nm)	-0.000182 u	ppm	0.000322	> 100.00	0.356838	Y 377.433
P (213.618 nm)	0.008436	ppm	0.000607	7.19	42.635100	Y 242.219
Pb (220.353 nm)	0.000020 u	ppm	0.000527	> 100.00	3.661690	Y 242.219
S (181.972 nm)	72.833975 o	ppm	0.130458	0.18	41178.378749	Y 377.433
Sb (206.834 nm)	-0.002771 u	ppm	0.001505	54.30	-22.722500	Y 377.433
Se (196.026 nm)	0.026730	ppm	0.000484	1.81	43.890600	Y 242.219
Si (288.158 nm)	13.462700 o	ppm	0.193868	1.44	123141.000000	Y 377.433
Sn (189.925 nm)	0.000938	ppm	0.000922	98.35	9.226950	Y 377.433
Sr (421.552 nm)	0.539345	ppm	0.001750	0.32	116948.456795	Y_R 488.368
Th (288.505 nm)	0.000619 u	ppm	0.003032	> 100.00	77.443000	Y 377.433
Ti (336.122 nm)	0.000071	ppm	0.000051	72.93	250.124000	Y 377.433
Tl (190.794 nm)	0.002253	ppm	0.001537	68.22	-0.048008	Y 377.433
U (409.013 nm)	0.000606 u	ppm	0.002943	> 100.00	-117.277000	Y 377.433
V (292.401 nm)	0.001037	ppm	0.000498	48.01	43.489000	Y 377.433
Zn (206.200 nm)	-0.001502 u	ppm	0.000458	30.50	8.497530	Y 377.433
Zr (343.823 nm)	-0.000015 u	ppm	0.000119	> 100.00	-13.944400	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.033477	21124.560909	0.002213	0.21
Y 377.433	1.049054	1154434.506785	0.000618	0.06
Y_R 377.433	1.075180	82890.300000	0.008081	0.75
Y_R 488.368	1.086670	47488.000000	0.008451	0.78
Y_R2 488.368	1.105657	95901.841834	0.006258	0.57

Sample Name: 280-112261-D-1-B

Date: 7/26/2018 8:50:48 PM Rack:Tube: 2:15

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000128	ppm	0.000085	66.55	-407.534000	Y 377.433
Al (167.019 nm)	0.000229 u	ppm	0.003040	> 100.00	4.998940	Y_R 377.433
Al H (396.152 nm)	-0.022960 u	ppm	0.004761	20.74	145.919258	Y_R 377.433
As (188.980 nm)	0.009520	ppm	0.000487	5.11	9.699030	Y 242.219
B (249.678 nm)	0.012980	ppm	0.000040	0.31	409.552000	Y 242.219
Ba (493.408 nm)	0.188573	ppm	0.000364	0.19	23060.800000	Y_R 488.368
Be (234.861 nm)	-0.000053 u	ppm	0.000001	1.03	221.585000	Y_R 488.368
Bi (223.061 nm)	-0.002499 u	ppm	0.000842	33.71	9.135220	Y 377.433
Ca (315.887 nm)	112.718236 o	ppm	0.564726	0.50	93061.548919	Y_R 377.433
Cd (214.439 nm)	-0.000035 u	ppm	0.000001	3.78	3.649310	Y 377.433
Co (228.615 nm)	0.000550	ppm	0.000009	1.60	-24.919200	Y 242.219
Cr (205.560 nm)	0.000179	ppm	0.000097	53.98	1.347190	Y 377.433
Cu (324.754 nm)	-0.000100 u	ppm	0.000155	> 100.00	241.127000	Y 377.433
Fe (238.204 nm)	8.376556 o	ppm	0.050744	0.61	31569.398443	Y_R 377.433
Fe H (259.940 nm)	8.490580 n	ppm	0.072800	0.86	16948.500000	Y_R 377.433
K (766.491 nm)	5.185340	ppm	0.022809	0.44	5550.580000	Y_R2 488.368
Li (670.783 nm)	0.010605	ppm	0.000316	2.98	-791.229000	Y_R2 488.368
Mg (279.078 nm)	12.166200	ppm	0.026754	0.22	74273.600000	Y 377.433
Mn (257.610 nm)	1.333710 o	ppm	0.008422	0.63	361970.000000	Y 377.433
Mo (202.032 nm)	-0.000110 u	ppm	0.000055	49.82	-1.652450	Y 377.433
Na (589.592 nm)	432.843000 o	ppm	1.184160	0.27	3000560.000000	Y_R2 488.368
Na H (589.593 nm)	469.147829	ppm	0.627022	0.13	1853109.985689	Y_R 488.368
Ni (231.604 nm)	0.000028 u	ppm	0.000394	> 100.00	2.379270	Y 377.433
P (213.618 nm)	0.003888	ppm	0.001498	38.54	31.137700	Y 242.219
Pb (220.353 nm)	0.001357	ppm	0.001188	87.53	8.716920	Y 242.219
S (181.972 nm)	1.448689	ppm	0.015266	1.05	845.972173	Y 377.433
Sb (206.834 nm)	-0.002377 u	ppm	0.000978	41.14	-26.311700	Y 377.433
Se (196.026 nm)	-0.002223 u	ppm	0.002808	> 100.00	11.052500	Y 242.219
Si (288.158 nm)	5.720570	ppm	0.038581	0.67	52810.800000	Y 377.433
Sn (189.925 nm)	0.001355	ppm	0.000180	13.26	10.202300	Y 377.433
Sr (421.552 nm)	0.229935	ppm	0.000255	0.11	49938.856368	Y_R 488.368
Th (288.505 nm)	0.004692	ppm	0.000334	7.11	113.812000	Y 377.433
Ti (336.122 nm)	0.000251	ppm	0.000035	14.06	189.257000	Y 377.433
Tl (190.794 nm)	0.002084	ppm	0.000095	4.57	-0.735156	Y 377.433
U (409.013 nm)	-0.012517 u	ppm	0.006791	54.25	-166.991000	Y 377.433
V (292.401 nm)	0.000184	ppm	0.000033	17.72	28.102900	Y 377.433
Zn (206.200 nm)	-0.001679 u	ppm	0.000153	9.11	7.482240	Y 377.433
Zr (343.823 nm)	0.000805	ppm	0.000011	1.36	123.080000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.020166	20852.473730	0.000430	0.04
Y 377.433	1.035020	1138990.874609	0.000482	0.05
Y_R 377.433	1.091310	84133.800000	0.007390	0.68
Y_R 488.368	1.103970	48244.100000	0.001560	0.14
Y_R2 488.368	1.109653	96248.451489	0.003938	0.35

Sample Name: 280-112261-D-2-B

Date: 7/26/2018 8:54:10 PM Rack:Tube: 2:16

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000214	ppm	0.000004	1.86	-403.315000	Y 377.433
Al (167.019 nm)	0.004412	ppm	0.002390	54.18	2.044650	Y_R 377.433
Al H (396.152 nm)	-0.028555 u	ppm	0.001420	4.97	115.832426	Y_R 377.433
As (188.980 nm)	0.005321	ppm	0.001523	28.63	3.831600	Y 242.219
B (249.678 nm)	0.009878	ppm	0.000254	2.57	337.853000	Y 242.219
Ba (493.408 nm)	0.093332	ppm	0.000053	0.06	11677.600000	Y_R 488.368
Be (234.861 nm)	-0.000026 u	ppm	0.000015	57.33	-54.126400	Y_R 488.368
Bi (223.061 nm)	-0.000602 u	ppm	0.000256	42.51	12.917200	Y 377.433
Ca (315.887 nm)	75.888740 o	ppm	0.270083	0.36	62629.912921	Y_R 377.433
Cd (214.439 nm)	0.000046 u	ppm	0.000094	> 100.00	0.065243	Y 377.433
Co (228.615 nm)	0.006436	ppm	0.000126	1.96	97.304300	Y 242.219
Cr (205.560 nm)	0.000062	ppm	0.000010	15.57	1.938410	Y 377.433
Cu (324.754 nm)	0.001907	ppm	0.000078	4.09	391.418000	Y 377.433
Fe (238.204 nm)	0.115098	ppm	0.001195	1.04	449.976145	Y_R 377.433
Fe H (259.940 nm)	-0.047950 nu	ppm	0.000833	1.74	228.365000	Y_R 377.433
K (766.491 nm)	1.509710	ppm	0.043530	2.88	1093.910000	Y_R2 488.368
Li (670.783 nm)	0.009853	ppm	0.000951	9.65	-817.722000	Y_R2 488.368
Mg (279.078 nm)	12.749700	ppm	0.009201	0.07	77849.600000	Y 377.433
Mn (257.610 nm)	1.414750 o	ppm	0.013221	0.93	383961.000000	Y 377.433
Mo (202.032 nm)	0.001250	ppm	0.000430	34.38	11.923200	Y 377.433
Na (589.592 nm)	28.233800 o	ppm	0.024396	0.09	196127.000000	Y_R2 488.368
Na H (589.593 nm)	30.683646	ppm	0.100894	0.33	125187.929904	Y_R 488.368
Ni (231.604 nm)	0.006074	ppm	0.000061	1.01	48.997000	Y 377.433
P (213.618 nm)	0.000312 u	ppm	0.001202	> 100.00	22.096000	Y 242.219
Pb (220.353 nm)	0.001111	ppm	0.000231	20.74	7.127220	Y 242.219
S (181.972 nm)	0.315340	ppm	0.003026	0.96	205.796307	Y 377.433
Sb (206.834 nm)	-0.002673 u	ppm	0.001818	68.04	-25.021300	Y 377.433
Se (196.026 nm)	-0.002051 u	ppm	0.001532	74.70	13.137600	Y 242.219
Si (288.158 nm)	10.832300	ppm	0.100080	0.92	99245.300000	Y 377.433
Sn (189.925 nm)	0.000817 u	ppm	0.001683	> 100.00	8.943490	Y 377.433
Sr (421.552 nm)	0.193615	ppm	0.000407	0.21	42072.986190	Y_R 488.368
Th (288.505 nm)	0.000542	ppm	0.000538	99.10	104.490000	Y 377.433
Ti (336.122 nm)	0.000143	ppm	0.000024	16.84	56.272400	Y 377.433
Tl (190.794 nm)	0.000501	ppm	0.000297	59.31	-4.482970	Y 377.433
U (409.013 nm)	-0.000153 u	ppm	0.000722	> 100.00	-107.810000	Y 377.433
V (292.401 nm)	-0.000222 u	ppm	0.000159	71.64	11.401900	Y 377.433
Zn (206.200 nm)	-0.000009 u	ppm	0.000348	> 100.00	17.074600	Y 377.433
Zr (343.823 nm)	-0.000015 u	ppm	0.000039	> 100.00	-13.841600	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.056008	21585.107423	0.000255	0.02
Y 377.433	1.070949	1178528.901773	0.000106	0.01
Y_R 377.433	1.096170	84508.800000	0.005116	0.47
Y_R 488.368	1.100010	48070.800000	0.000400	0.04
Y_R2 488.368	1.126487	97708.637510	0.006724	0.60

Sample Name: CCVH-5225153

Date: 7/26/2018 8:57:33 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.001100 u	ppm	0.000058	5.25	-733.447000	Y 377.433
Al (167.019 nm)	46.029700 o	ppm	0.525004	1.14	22917.300000	Y_R 377.433
Al H (396.152 nm)	49.359841	ppm	0.222883	0.45	124356.849395	Y_R 377.433
As (188.980 nm)	0.001343	ppm	0.001703	> 100.00	-2.294660	Y 242.219
B (249.678 nm)	-0.000788 u	ppm	0.000213	27.03	-40.009300	Y 242.219
Ba (493.408 nm)	-0.000401 u	ppm	0.000054	13.57	520.145000	Y_R 488.368
Be (234.861 nm)	0.000002 u	ppm	0.000081	> 100.00	1617.320000	Y_R 488.368
Bi (223.061 nm)	0.973732	ppm	0.001516	0.16	2754.240000	Y 377.433
Ca (315.887 nm)	0.021702	ppm	0.001442	6.65	-57.831042	Y_R 377.433
Cd (214.439 nm)	-0.000162 u	ppm	0.000030	18.45	38.357200	Y 377.433
Co (228.615 nm)	0.001065	ppm	0.000099	9.31	-14.208600	Y 242.219
Cr (205.560 nm)	-0.000026 u	ppm	0.000001	2.13	-14.546500	Y 377.433
Cu (324.754 nm)	-0.005820 u	ppm	0.000162	2.78	317.159000	Y 377.433
Fe (238.204 nm)	48.382273 o	ppm	0.056143	0.12	182263.727187	Y_R 377.433
Fe H (259.940 nm)	49.587700	ppm	0.185997	0.38	97425.100000	Y_R 377.433
K (766.491 nm)	0.156631	ppm	0.022909	14.63	-546.686000	Y_R2 488.368
Li (670.783 nm)	0.004021	ppm	0.000480	11.93	-1023.280000	Y_R2 488.368
Mg (279.078 nm)	-0.008365 u	ppm	0.000209	2.49	-373.574000	Y 377.433
Mn (257.610 nm)	0.005362	ppm	0.000271	5.06	1507.180000	Y 377.433
Mo (202.032 nm)	-0.000039 u	ppm	0.000170	> 100.00	-0.939635	Y 377.433
Na (589.592 nm)	230.985000 o	ppm	0.678773	0.29	1601130.000000	Y_R2 488.368
Na H (589.593 nm)	244.667062	ppm	3.278596	1.34	968321.671052	Y_R 488.368
Ni (231.604 nm)	0.001727	ppm	0.000145	8.38	17.491200	Y 377.433
P (213.618 nm)	-0.002855 u	ppm	0.000486	17.01	14.089400	Y 242.219
Pb (220.353 nm)	-0.002855 u	ppm	0.001119	39.21	12.902300	Y 242.219
S (181.972 nm)	4.895994	ppm	0.000920	0.02	2790.302559	Y 377.433
Sb (206.834 nm)	-0.004427 u	ppm	0.000174	3.93	-78.172500	Y 377.433
Se (196.026 nm)	-0.000984 u	ppm	0.003084	> 100.00	3.242380	Y 242.219
Si (288.158 nm)	0.025108	ppm	0.000727	2.89	1073.230000	Y 377.433
Sn (189.925 nm)	0.001109	ppm	0.000476	42.94	9.626610	Y 377.433
Sr (421.552 nm)	0.000466	ppm	0.000123	26.33	242.403577	Y_R 488.368
Th (288.505 nm)	4.948420	ppm	0.021186	0.43	14030.600000	Y 377.433
Ti (336.122 nm)	0.001632	ppm	0.000001	0.03	29.431400	Y 377.433
Tl (190.794 nm)	-0.004850 u	ppm	0.000474	9.77	-19.628400	Y 377.433
U (409.013 nm)	10.017200	ppm	0.019784	0.20	48480.400000	Y 377.433
V (292.401 nm)	0.003198	ppm	0.000074	2.33	-36.033300	Y 377.433
Zn (206.200 nm)	-0.002726 u	ppm	0.000221	8.10	1.467750	Y 377.433
Zr (343.823 nm)	-0.003953 u	ppm	0.000006	0.16	-402.475000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.047480	21410.781108	0.003208	0.31
Y 377.433	1.051356	1156967.546417	0.003605	0.34
Y_R 377.433	1.083840	83558.000000	0.005400	0.50
Y_R 488.368	1.109140	48470.000000	0.011054	1.00
Y_R2 488.368	1.109112	96201.563560	0.001270	0.11

Sample Name: CCV-5225154

Date: 7/26/2018 9:00:56 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.480940	ppm	0.001509	0.31	23825.400000	Y 377.433
Al (167.019 nm)	0.530013	ppm	0.010123	1.91	264.848000	Y_R 377.433
Al H (396.152 nm)	0.487216 u	ppm	0.014471	2.97	1421.355243	Y_R 377.433
As (188.980 nm)	0.972171	ppm	0.002368	0.24	1374.170000	Y 242.219
B (249.678 nm)	0.483836	ppm	0.000488	0.10	13498.900000	Y 242.219
Ba (493.408 nm)	0.494938	ppm	0.002038	0.41	59600.600000	Y_R 488.368
Be (234.861 nm)	0.473426	ppm	0.000883	0.19	153297.000000	Y_R 488.368
Bi (223.061 nm)	-0.002886 u	ppm	0.002548	88.28	6.955060	Y 377.433
Ca (315.887 nm)	4.949457	ppm	0.040991	0.83	4014.174268	Y_R 377.433
Cd (214.439 nm)	0.478732	ppm	0.000394	0.08	31623.700000	Y 377.433
Co (228.615 nm)	0.493722	ppm	0.002353	0.48	10236.400000	Y 242.219
Cr (205.560 nm)	0.481731	ppm	0.001212	0.25	8144.910000	Y 377.433
Cu (324.754 nm)	0.483922	ppm	0.001173	0.24	31791.000000	Y 377.433
Fe (238.204 nm)	2.494528	ppm	0.021646	0.87	9412.858800	Y_R 377.433
Fe H (259.940 nm)	2.408120 u	ppm	0.017208	0.71	5037.840000	Y_R 377.433
K (766.491 nm)	48.420600	ppm	0.044644	0.09	57973.000000	Y_R2 488.368
Li (670.783 nm)	0.960087	ppm	0.004533	0.47	32672.300000	Y_R2 488.368
Mg (279.078 nm)	18.916600	ppm	0.041175	0.22	115478.000000	Y 377.433
Mn (257.610 nm)	0.499939	ppm	0.000651	0.13	135716.000000	Y 377.433
Mo (202.032 nm)	0.488059	ppm	0.001482	0.30	4869.310000	Y 377.433
Na (589.592 nm)	4.895710	ppm	0.005477	0.11	35228.200000	Y_R2 488.368
Na H (589.593 nm)	6.120625 u	ppm	0.034153	0.56	28799.417333	Y_R 488.368
Ni (231.604 nm)	0.483158	ppm	0.001943	0.40	3759.570000	Y 377.433
P (213.618 nm)	0.950723	ppm	0.000114	0.01	2424.900000	Y 242.219
Pb (220.353 nm)	0.980675	ppm	0.000282	0.03	3118.040000	Y 242.219
S (181.972 nm)	0.022509	ppm	0.000517	2.30	37.902034	Y 377.433
Sb (206.834 nm)	0.970528	ppm	0.000631	0.07	2933.580000	Y 377.433
Se (196.026 nm)	0.966567	ppm	0.002776	0.29	1084.730000	Y 242.219
Si (288.158 nm)	4.915910	ppm	0.033246	0.68	45501.200000	Y 377.433
Sn (189.925 nm)	0.960409	ppm	0.001500	0.16	2254.280000	Y 377.433
Sr (421.552 nm)	0.492882	ppm	0.002793	0.57	106885.884208	Y_R 488.368
Th (288.505 nm)	0.004010	ppm	0.001197	29.85	100.658000	Y 377.433
Ti (336.122 nm)	0.495541	ppm	0.000715	0.14	71276.600000	Y 377.433
Tl (190.794 nm)	0.983342	ppm	0.002984	0.30	2495.300000	Y 377.433
U (409.013 nm)	0.000369 u	ppm	0.003620	> 100.00	-128.663000	Y 377.433
V (292.401 nm)	0.485601	ppm	0.000542	0.11	20799.600000	Y 377.433
Zn (206.200 nm)	0.477432	ppm	0.001249	0.26	2759.540000	Y 377.433
Zr (343.823 nm)	0.490423	ppm	0.000078	0.02	66739.800000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.061008	21687.307691	0.000484	0.05
Y 377.433	1.069035	1176422.958967	0.000925	0.09
Y_R 377.433	1.090630	84081.600000	0.003914	0.36
Y_R 488.368	1.096740	47928.000000	0.002661	0.24
Y_R2 488.368	1.115791	96780.834916	0.004232	0.38

Sample Name: CCB

Date: 7/26/2018 9:04:19 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000003 u	ppm	0.000024	> 100.00	-414.375000	Y 377.433
Al (167.019 nm)	0.001682	ppm	0.001487	88.43	0.617431	Y_R 377.433
Al H (396.152 nm)	-0.053418 u	ppm	0.000120	0.22	20.044133	Y_R 377.433
As (188.980 nm)	0.000699	ppm	0.000462	66.18	-2.718490	Y 242.219
B (249.678 nm)	0.000733	ppm	0.000073	9.92	84.204400	Y 242.219
Ba (493.408 nm)	-0.000386 u	ppm	0.000209	54.11	474.800000	Y_R 488.368
Be (234.861 nm)	0.000138	ppm	0.000011	8.10	-4.945270	Y_R 488.368
Bi (223.061 nm)	0.000807 u	ppm	0.002768	> 100.00	16.847800	Y 377.433
Ca (315.887 nm)	0.010950	ppm	0.006335	57.85	-66.715691	Y_R 377.433
Cd (214.439 nm)	0.000105	ppm	0.000009	8.37	3.828070	Y 377.433
Co (228.615 nm)	0.000431	ppm	0.000090	20.87	-27.388700	Y 242.219
Cr (205.560 nm)	0.000141	ppm	0.000026	18.39	3.310150	Y 377.433
Cu (324.754 nm)	0.000402	ppm	0.000044	11.06	345.176000	Y 377.433
Fe (238.204 nm)	0.000510	ppm	0.000328	64.38	18.343377	Y_R 377.433
Fe H (259.940 nm)	-0.158140 u	ppm	0.003901	2.47	12.589800	Y_R 377.433
K (766.491 nm)	0.066267	ppm	0.014620	22.06	-656.251000	Y_R2 488.368
Li (670.783 nm)	0.003285	ppm	0.000609	18.54	-1049.200000	Y_R2 488.368
Mg (279.078 nm)	0.004955	ppm	0.001085	21.90	76.935400	Y 377.433
Mn (257.610 nm)	0.001803 Z	ppm	0.000167	9.28	541.339000 Z	Y 377.433
Mo (202.032 nm)	0.000277	ppm	0.000007	2.55	2.215540	Y 377.433
Na (589.592 nm)	0.036769	ppm	0.013495	36.70	501.423000	Y_R2 488.368
Na H (589.593 nm)	0.344311 u	ppm	0.027318	7.93	5536.810360	Y_R 488.368
Ni (231.604 nm)	0.000047 u	ppm	0.000263	> 100.00	2.131020	Y 377.433
P (213.618 nm)	-0.001482 u	ppm	0.000549	37.04	17.560500	Y 242.219
Pb (220.353 nm)	0.000063 u	ppm	0.000717	> 100.00	3.824310	Y 242.219
S (181.972 nm)	0.020463	ppm	0.001228	6.00	35.421032	Y 377.433
Sb (206.834 nm)	0.001474	ppm	0.001071	72.67	-12.442100	Y 377.433
Se (196.026 nm)	0.000468 u	ppm	0.000794	> 100.00	14.683300	Y 242.219
Si (288.158 nm)	-0.003038 u	ppm	0.000144	4.75	817.553000	Y 377.433
Sn (189.925 nm)	0.000468	ppm	0.000357	76.31	8.127720	Y 377.433
Sr (421.552 nm)	0.000043	ppm	0.000006	14.39	150.795633	Y_R 488.368
Th (288.505 nm)	0.002259	ppm	0.000465	20.58	78.852900	Y 377.433
Ti (336.122 nm)	0.000422	ppm	0.000053	12.64	-145.191000	Y 377.433
Tl (190.794 nm)	0.001696	ppm	0.000668	39.39	-1.461820	Y 377.433
U (409.013 nm)	0.006410	ppm	0.001920	29.95	-60.642300	Y 377.433
V (292.401 nm)	0.000238	ppm	0.000197	82.79	29.947100	Y 377.433
Zn (206.200 nm)	-0.002716 u	ppm	0.000331	12.19	1.527200	Y 377.433
Zr (343.823 nm)	0.000089	ppm	0.000011	11.90	0.014808	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.067330	21816.524573	0.005205	0.49
Y 377.433	1.077680	1185936.010134	0.005498	0.51
Y_R 377.433	1.082380	83445.400000	0.004807	0.44
Y_R 488.368	1.081030	47241.600000	0.011200	1.04
Y_R2 488.368	1.113242	96559.826349	0.003609	0.32

Sample Name: CCVL-5236949

Date: 7/26/2018 9:07:42 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009156	ppm	0.000071	0.78	47.166700	Y 377.433
Al (167.019 nm)	0.105028	ppm	0.002998	2.85	52.068200	Y_R 377.433
Al H (396.152 nm)	0.050921 u	ppm	0.006341	12.45	284.069645	Y_R 377.433
As (188.980 nm)	0.015223	ppm	0.000981	6.44	17.866500	Y 242.219
B (249.678 nm)	0.093660	ppm	0.000295	0.32	2661.070000	Y 242.219
Ba (493.408 nm)	0.009353	ppm	0.000286	3.06	1637.200000	Y_R 488.368
Be (234.861 nm)	0.000937	ppm	0.000001	0.13	256.683000	Y_R 488.368
Bi (223.061 nm)	0.098932	ppm	0.000193	0.20	292.041000	Y 377.433
Ca (315.887 nm)	0.217500	ppm	0.006167	2.84	103.956127	Y_R 377.433
Cd (214.439 nm)	0.004807	ppm	0.000064	1.34	314.533000	Y 377.433
Co (228.615 nm)	0.010075	ppm	0.000089	0.88	173.253000	Y 242.219
Cr (205.560 nm)	0.009422	ppm	0.000110	1.17	160.249000	Y 377.433
Cu (324.754 nm)	0.014482	ppm	0.000101	0.70	1259.270000	Y 377.433
Fe (238.204 nm)	0.102163	ppm	0.000985	0.96	401.253967	Y_R 377.433
Fe H (259.940 nm)	-0.061806 u	ppm	0.003064	4.96	201.231000	Y_R 377.433
K (766.491 nm)	3.034200	ppm	0.089441	2.95	2942.350000	Y_R2 488.368
Li (670.783 nm)	0.024111	ppm	0.000409	1.69	-315.237000	Y_R2 488.368
Mg (279.078 nm)	0.186407	ppm	0.000018	0.01	1182.720000	Y 377.433
Mn (257.610 nm)	0.010691	ppm	0.000077	0.72	2953.080000	Y 377.433
Mo (202.032 nm)	0.017846	ppm	0.000036	0.20	177.514000	Y 377.433
Na (589.592 nm)	1.016360	ppm	0.006165	0.61	7311.550000	Y_R2 488.368
Na H (589.593 nm)	1.139815 u	ppm	0.015682	1.38	8681.537914	Y_R 488.368
Ni (231.604 nm)	0.038115	ppm	0.001262	3.31	298.119000	Y 377.433
P (213.618 nm)	2.659300 o	ppm	0.008833	0.33	6744.490000	Y 242.219
Pb (220.353 nm)	0.008552	ppm	0.000496	5.80	30.835100	Y 242.219
S (181.972 nm)	0.106279	ppm	0.001245	1.17	83.934346	Y 377.433
Sb (206.834 nm)	0.018995	ppm	0.001306	6.87	40.668100	Y 377.433
Se (196.026 nm)	0.015954	ppm	0.000383	2.40	31.824900	Y 242.219
Si (288.158 nm)	0.465848	ppm	0.000866	0.19	5076.920000	Y 377.433
Sn (189.925 nm)	0.094350	ppm	0.000152	0.16	227.800000	Y 377.433
Sr (421.552 nm)	0.009777	ppm	0.000186	1.90	2258.890324	Y_R 488.368
Th (288.505 nm)	0.016671	ppm	0.000016	0.09	120.416000	Y 377.433
Ti (336.122 nm)	0.009870	ppm	0.000014	0.14	1218.000000	Y 377.433
Tl (190.794 nm)	0.015354	ppm	0.000175	1.14	33.240100	Y 377.433
U (409.013 nm)	0.061363	ppm	0.001663	2.71	204.462000	Y 377.433
V (292.401 nm)	0.009364	ppm	0.000056	0.59	417.857000	Y 377.433
Zn (206.200 nm)	0.016482	ppm	0.000216	1.31	111.803000	Y 377.433
Zr (343.823 nm)	0.014329	ppm	0.000033	0.23	1938.310000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.082023	22116.841947	0.002227	0.21
Y 377.433	1.090334	1199861.403301	0.001247	0.11
Y_R 377.433	1.108980	85496.700000	0.002496	0.23
Y_R 488.368	1.118270	48868.800000	0.011489	1.03
Y_R2 488.368	1.127676	97811.774082	0.000189	0.02

Sample Name: 280-112261-D-3-B

Date: 7/26/2018 9:11:05 PM Rack:Tube: 2:17

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000122	ppm	0.000049	40.10	-407.916000	Y 377.433
Al (167.019 nm)	0.006019	ppm	0.000238	3.95	2.781820	Y_R 377.433
Al H (396.152 nm)	-0.040424 u	ppm	0.001542	3.81	65.350585	Y_R 377.433
As (188.980 nm)	0.001973	ppm	0.000773	39.19	-0.912986	Y 242.219
B (249.678 nm)	0.007029	ppm	0.000197	2.80	258.752000	Y 242.219
Ba (493.408 nm)	0.005928	ppm	0.000164	2.76	1235.270000	Y_R 488.368
Be (234.861 nm)	0.000014	ppm	0.000010	72.25	-44.676900	Y_R 488.368
Bi (223.061 nm)	0.000138 u	ppm	0.000646	> 100.00	14.974200	Y 377.433
Ca (315.887 nm)	28.886799 o	ppm	0.175875	0.61	23792.945736	Y_R 377.433
Cd (214.439 nm)	0.000099	ppm	0.000077	78.04	3.462740	Y 377.433
Co (228.615 nm)	-0.000016 u	ppm	0.000056	> 100.00	-36.671900	Y 242.219
Cr (205.560 nm)	0.000347	ppm	0.000115	33.08	6.784450	Y 377.433
Cu (324.754 nm)	0.000047	ppm	0.000009	19.61	303.347000	Y 377.433
Fe (238.204 nm)	0.012344	ppm	0.000326	2.64	62.919171	Y_R 377.433
Fe H (259.940 nm)	-0.146423 nu	ppm	0.003710	2.53	35.535000	Y_R 377.433
K (766.491 nm)	0.945513	ppm	0.005933	0.63	409.827000	Y_R2 488.368
Li (670.783 nm)	0.006291	ppm	0.001035	16.46	-943.278000	Y_R2 488.368
Mg (279.078 nm)	5.346040	ppm	0.013946	0.26	32670.200000	Y 377.433
Mn (257.610 nm)	0.023118	ppm	0.005320	23.01	6325.480000	Y 377.433
Mo (202.032 nm)	0.000300	ppm	0.000113	37.54	2.441050	Y 377.433
Na (589.592 nm)	3.666350	ppm	0.029959	0.82	25670.400000	Y_R2 488.368
Na H (589.593 nm)	3.787255 u	ppm	0.038577	1.02	19110.547354	Y_R 488.368
Ni (231.604 nm)	-0.000584 u	ppm	0.000079	13.54	-2.771540	Y 377.433
P (213.618 nm)	0.027197	ppm	0.002062	7.58	90.066000	Y 242.219
Pb (220.353 nm)	-0.000487 u	ppm	0.001625	> 100.00	2.054450	Y 242.219
S (181.972 nm)	5.965992	ppm	0.013395	0.22	3394.941146	Y 377.433
Sb (206.834 nm)	-0.000892 u	ppm	0.001160	> 100.00	-19.581600	Y 377.433
Se (196.026 nm)	-0.000989 u	ppm	0.001883	> 100.00	13.086700	Y 242.219
Si (288.158 nm)	5.132350	ppm	0.024795	0.48	47467.400000	Y 377.433
Sn (189.925 nm)	0.000072	ppm	0.000091	> 100.00	7.200980	Y 377.433
Sr (421.552 nm)	0.083100	ppm	0.000468	0.56	18138.552606	Y_R 488.368
Th (288.505 nm)	0.001323 u	ppm	0.002968	> 100.00	76.567500	Y 377.433
Ti (336.122 nm)	0.000305	ppm	0.000035	11.36	-70.126600	Y 377.433
Tl (190.794 nm)	0.000767	ppm	0.000337	43.96	-3.827070	Y 377.433
U (409.013 nm)	-0.000797 u	ppm	0.001430	> 100.00	-101.419000	Y 377.433
V (292.401 nm)	-0.000156 u	ppm	0.000089	57.07	13.905600	Y 377.433
Zn (206.200 nm)	-0.000111 u	ppm	0.000105	94.24	16.490300	Y 377.433
Zr (343.823 nm)	-0.000039 u	ppm	0.000054	> 100.00	-17.381800	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.075737	21988.367604	0.006196	0.58
Y 377.433	1.085363	1194390.834215	0.007156	0.66
Y_R 377.433	1.116030	86040.000000	0.006840	0.61
Y_R 488.368	1.137560	49711.800000	0.006228	0.55
Y_R2 488.368	1.132222	98206.078997	0.004546	0.40

Sample Name: 280-112261-D-3-B SD@5

Date: 7/26/2018 9:14:28 PM Rack:Tube: 2:18

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000093 u	ppm	0.000060	64.90	-418.783000	Y 377.433
Al (167.019 nm)	0.002984	ppm	0.001019	34.13	1.267190	Y_R 377.433
Al H (396.152 nm)	-0.050684 u	ppm	0.001072	2.11	29.468762	Y_R 377.433
As (188.980 nm)	0.000469 u	ppm	0.001358	> 100.00	-3.043770	Y 242.219
B (249.678 nm)	0.001586	ppm	0.000455	28.67	107.851000	Y 242.219
Ba (493.408 nm)	0.000911	ppm	0.000345	37.84	630.936000	Y_R 488.368
Be (234.861 nm)	0.000044	ppm	0.000011	24.51	-35.064600	Y_R 488.368
Bi (223.061 nm)	0.000584 u	ppm	0.000888	> 100.00	16.221700	Y 377.433
Ca (315.887 nm)	5.915939	ppm	0.030742	0.52	4812.484225	Y_R 377.433
Cd (214.439 nm)	0.000069	ppm	0.000048	69.32	1.474510	Y 377.433
Co (228.615 nm)	0.000174	ppm	0.000117	67.17	-32.729200	Y 242.219
Cr (205.560 nm)	0.000067 u	ppm	0.000119	> 100.00	2.061640	Y 377.433
Cu (324.754 nm)	0.000119	ppm	0.000047	39.67	323.555000	Y 377.433
Fe (238.204 nm)	0.003655	ppm	0.000197	5.39	30.190256	Y_R 377.433
Fe H (259.940 nm)	-0.156694 nu	ppm	0.001095	0.70	15.422700	Y_R 377.433
K (766.491 nm)	0.301281	ppm	0.012916	4.29	-371.298000	Y_R2 488.368
Li (670.783 nm)	0.003386	ppm	0.000655	19.33	-1045.650000	Y_R2 488.368
Mg (279.078 nm)	1.084980	ppm	0.001798	0.17	6667.730000	Y 377.433
Mn (257.610 nm)	0.005634	ppm	0.001398	24.81	1581.020000	Y 377.433
Mo (202.032 nm)	0.000147	ppm	0.000003	1.80	0.918780	Y 377.433
Na (589.592 nm)	0.760653	ppm	0.001309	0.17	5521.780000	Y_R2 488.368
Na H (589.593 nm)	0.690414 u	ppm	0.026465	3.83	6902.254078	Y_R 488.368
Ni (231.604 nm)	-0.000735 u	ppm	0.000388	52.77	-3.948710	Y 377.433
P (213.618 nm)	0.007474	ppm	0.000492	6.59	40.203400	Y 242.219
Pb (220.353 nm)	-0.000168 u	ppm	0.001485	> 100.00	3.077610	Y 242.219
S (181.972 nm)	1.205343	ppm	0.008464	0.70	704.936077	Y 377.433
Sb (206.834 nm)	-0.001732 u	ppm	0.001649	95.24	-22.143000	Y 377.433
Se (196.026 nm)	-0.002611 u	ppm	0.000039	1.51	11.276000	Y 242.219
Si (288.158 nm)	1.028540	ppm	0.000930	0.09	10188.400000	Y 377.433
Sn (189.925 nm)	0.000080	ppm	0.000016	19.68	7.218250	Y 377.433
Sr (421.552 nm)	0.017165	ppm	0.000269	1.56	3858.989655	Y_R 488.368
Th (288.505 nm)	0.002789	ppm	0.000171	6.11	80.316200	Y 377.433
Ti (336.122 nm)	0.000265	ppm	0.000002	0.93	-149.152000	Y 377.433
Tl (190.794 nm)	0.000095	ppm	0.000022	23.51	-5.535670	Y 377.433
U (409.013 nm)	0.002254	ppm	0.003000	> 100.00	-81.956300	Y 377.433
V (292.401 nm)	-0.000133 u	ppm	0.000074	55.94	14.589900	Y 377.433
Zn (206.200 nm)	-0.002358 u	ppm	0.000420	17.82	3.583700	Y 377.433
Zr (343.823 nm)	0.000036	ppm	0.000040	> 100.00	-7.191290	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.079781	22071.032943	0.001120	0.10
Y 377.433	1.089344	1198771.737653	0.002458	0.23
Y_R 377.433	1.089650	84005.800000	0.007452	0.68
Y_R 488.368	1.091530	47700.200000	0.011677	1.07
Y_R2 488.368	1.118522	97017.740646	0.002576	0.23

Sample Name: 280-112261-D-3-C MS

Date: 7/26/2018 9:17:50 PM Rack:Tube: 2:19

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.052301	ppm	0.000199	0.38	2189.240000	Y 377.433
Al (167.019 nm)	2.079010	ppm	0.021240	1.02	1034.190000	Y_R 377.433
Al H (396.152 nm)	2.106096	ppm	0.000049	0.00	5566.713182	Y_R 377.433
As (188.980 nm)	1.041380	ppm	0.004367	0.42	1472.290000	Y 242.219
B (249.678 nm)	1.026290	ppm	0.001341	0.13	28542.600000	Y 242.219
Ba (493.408 nm)	2.092360 o	ppm	0.009137	0.44	250244.000000	Y_R 488.368
Be (234.861 nm)	0.049349	ppm	0.000133	0.27	15904.400000	Y_R 488.368
Bi (223.061 nm)	2.052910	ppm	0.000017	0.00	5771.810000	Y 377.433
Ca (315.887 nm)	78.781788 o	ppm	0.451753	0.57	65020.451223	Y_R 377.433
Cd (214.439 nm)	0.098627	ppm	0.000588	0.60	6513.530000	Y 377.433
Co (228.615 nm)	0.497487	ppm	0.004219	0.85	10335.600000	Y 242.219
Cr (205.560 nm)	0.201367	ppm	0.000668	0.33	3404.980000	Y 377.433
Cu (324.754 nm)	0.252685	ppm	0.000329	0.13	16761.300000	Y 377.433
Fe (238.204 nm)	1.030753	ppm	0.007096	0.69	3899.083086	Y_R 377.433
Fe H (259.940 nm)	0.894880 nu	ppm	0.007310	0.82	2074.620000	Y_R 377.433
K (766.491 nm)	52.473000	ppm	0.020295	0.04	62886.500000	Y_R2 488.368
Li (670.783 nm)	1.014430	ppm	0.005639	0.56	34587.400000	Y_R2 488.368
Mg (279.078 nm)	55.366700 o	ppm	0.232809	0.42	337851.000000	Y 377.433
Mn (257.610 nm)	0.534381	ppm	0.004239	0.79	145062.000000	Y 377.433
Mo (202.032 nm)	0.982952	ppm	0.003047	0.31	9807.360000	Y 377.433
Na (589.592 nm)	54.252000 o	ppm	0.029597	0.05	380691.000000	Y_R2 488.368
Na H (589.593 nm)	58.475411	ppm	0.256465	0.44	236723.334058	Y_R 488.368
Ni (231.604 nm)	0.487128	ppm	0.002336	0.48	3791.860000	Y 377.433
P (213.618 nm)	10.135600 o	ppm	0.038705	0.38	25646.000000	Y 242.219
Pb (220.353 nm)	0.520140	ppm	0.001847	0.36	1657.780000	Y 242.219
S (181.972 nm)	8.262554	ppm	0.023470	0.28	4693.955244	Y 377.433
Sb (206.834 nm)	0.518444	ppm	0.002170	0.42	1546.270000	Y 377.433
Se (196.026 nm)	2.039400	ppm	0.000046	0.00	2273.470000	Y 242.219
Si (288.158 nm)	15.366100 o	ppm	0.044332	0.29	140431.000000	Y 377.433
Sn (189.925 nm)	1.971460	ppm	0.014473	0.73	4620.030000	Y 377.433
Sr (421.552 nm)	1.115422 o	ppm	0.004317	0.39	241710.475239	Y_R 488.368
Th (288.505 nm)	1.063650	ppm	0.001536	0.14	3103.400000	Y 377.433
Ti (336.122 nm)	1.014550	ppm	0.000941	0.09	146363.000000	Y 377.433
Tl (190.794 nm)	2.071890	ppm	0.001694	0.08	5261.890000	Y 377.433
U (409.013 nm)	2.177260	ppm	0.009262	0.43	10398.900000	Y 377.433
V (292.401 nm)	0.510739	ppm	0.000442	0.09	21921.600000	Y 377.433
Zn (206.200 nm)	0.486741	ppm	0.000723	0.15	2813.010000	Y 377.433
Zr (343.823 nm)	0.498990	ppm	0.001060	0.21	67901.200000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.035668	21169.339610	0.006871	0.66
Y 377.433	1.048204	1153498.949554	0.006742	0.64
Y_R 377.433	1.088170	83892.200000	0.007410	0.68
Y_R 488.368	1.097040	47940.900000	0.008313	0.76
Y_R2 488.368	1.116775	96866.266210	0.004666	0.42

Sample Name: 280-112261-D-3-D MSD

Date: 7/26/2018 9:21:12 PM Rack:Tube: 2:20

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.051216	ppm	0.000113	0.22	2135.320000	Y 377.433
Al (167.019 nm)	2.062990	ppm	0.022229	1.08	1026.220000	Y_R 377.433
Al H (396.152 nm)	2.070376	ppm	0.022041	1.06	5475.367982	Y_R 377.433
As (188.980 nm)	1.023160	ppm	0.001455	0.14	1446.460000	Y 242.219
B (249.678 nm)	1.018570	ppm	0.000193	0.02	28328.200000	Y 242.219
Ba (493.408 nm)	2.058710 o	ppm	0.013612	0.66	246228.000000	Y_R 488.368
Be (234.861 nm)	0.048970	ppm	0.000212	0.43	15782.300000	Y_R 488.368
Bi (223.061 nm)	2.020210	ppm	0.002192	0.11	5680.120000	Y 377.433
Ca (315.887 nm)	78.020126 o	ppm	0.595197	0.76	64391.100495	Y_R 377.433
Cd (214.439 nm)	0.097163	ppm	0.000150	0.15	6416.850000	Y 377.433
Co (228.615 nm)	0.488712	ppm	0.001902	0.39	10152.800000	Y 242.219
Cr (205.560 nm)	0.199180	ppm	0.000607	0.30	3368.010000	Y 377.433
Cu (324.754 nm)	0.248424	ppm	0.000040	0.02	16482.800000	Y 377.433
Fe (238.204 nm)	1.025533	ppm	0.010129	0.99	3879.419767	Y_R 377.433
Fe H (259.940 nm)	0.885574 nu	ppm	0.011133	1.26	2056.390000	Y_R 377.433
K (766.491 nm)	51.967900	ppm	0.030541	0.06	62274.100000	Y_R2 488.368
Li (670.783 nm)	1.003290	ppm	0.000600	0.06	34195.000000	Y_R2 488.368
Mg (279.078 nm)	54.531900 o	ppm	0.007961	0.01	332757.000000	Y 377.433
Mn (257.610 nm)	0.514854	ppm	0.005168	1.00	139764.000000	Y 377.433
Mo (202.032 nm)	0.969019	ppm	0.001670	0.17	9668.330000	Y 377.433
Na (589.592 nm)	53.227100 o	ppm	0.039302	0.07	373516.000000	Y_R2 488.368
Na H (589.593 nm)	57.907695	ppm	0.445224	0.77	234452.197638	Y_R 488.368
Ni (231.604 nm)	0.480612	ppm	0.000415	0.09	3741.160000	Y 377.433
P (213.618 nm)	9.970760 o	ppm	0.008994	0.09	25229.200000	Y 242.219
Pb (220.353 nm)	0.513734	ppm	0.001744	0.34	1637.410000	Y 242.219
S (181.972 nm)	8.192156	ppm	0.018309	0.22	4654.125259	Y 377.433
Sb (206.834 nm)	0.510042	ppm	0.000718	0.14	1520.940000	Y 377.433
Se (196.026 nm)	2.010790	ppm	0.008983	0.45	2241.750000	Y 242.219
Si (288.158 nm)	15.200800 o	ppm	0.018461	0.12	138929.000000	Y 377.433
Sn (189.925 nm)	1.947920	ppm	0.000410	0.02	4564.950000	Y 377.433
Sr (421.552 nm)	1.098100 o	ppm	0.006465	0.59	237959.120562	Y_R 488.368
Th (288.505 nm)	1.044550	ppm	0.002312	0.22	3048.980000	Y 377.433
Ti (336.122 nm)	1.001350	ppm	0.000084	0.01	144458.000000	Y 377.433
Tl (190.794 nm)	2.046490	ppm	0.006159	0.30	5197.320000	Y 377.433
U (409.013 nm)	2.146590	ppm	0.001971	0.09	10250.900000	Y 377.433
V (292.401 nm)	0.502925	ppm	0.000187	0.04	21585.700000	Y 377.433
Zn (206.200 nm)	0.480993	ppm	0.001507	0.31	2779.990000	Y 377.433
Zr (343.823 nm)	0.493087	ppm	0.000570	0.12	67097.900000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.031921	21092.758935	0.002614	0.25
Y 377.433	1.045712	1150756.439899	0.000948	0.09
Y_R 377.433	1.074610	82846.400000	0.007477	0.70
Y_R 488.368	1.085430	47433.600000	0.006333	0.58
Y_R2 488.368	1.097938	95232.328010	0.004660	0.42

Sample Name: 280-112261-D-3-B PDS

Date: 7/26/2018 9:24:34 PM Rack:Tube: 2:21

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.048707	ppm	0.000324	0.67	2027.760000	Y 377.433
Al (167.019 nm)	1.001940	ppm	0.014871	1.48	498.598000	Y_R 377.433
Al H (396.152 nm)	0.961923	ppm	0.006210	0.65	2599.410049	Y_R 377.433
As (188.980 nm)	0.194765	ppm	0.001239	0.64	272.332000	Y 242.219
B (249.678 nm)	0.106931	ppm	0.000319	0.30	3029.320000	Y 242.219
Ba (493.408 nm)	0.104118	ppm	0.000017	0.02	12959.200000	Y_R 488.368
Be (234.861 nm)	0.046579	ppm	0.000028	0.06	15063.800000	Y_R 488.368
Bi (223.061 nm)	-0.002083 u	ppm	0.001413	67.84	8.929740	Y 377.433
Ca (315.887 nm)	47.392453 o	ppm	0.285348	0.60	39083.905267	Y_R 377.433
Cd (214.439 nm)	0.046825	ppm	0.000115	0.24	3091.160000	Y 377.433
Co (228.615 nm)	0.047044	ppm	0.000272	0.58	942.519000	Y 242.219
Cr (205.560 nm)	0.047686	ppm	0.000238	0.50	806.858000	Y 377.433
Cu (324.754 nm)	0.047744	ppm	0.000101	0.21	3395.700000	Y 377.433
Fe (238.204 nm)	0.995508	ppm	0.007823	0.79	3766.323501	Y_R 377.433
Fe H (259.940 nm)	0.853145 nu	ppm	0.001587	0.19	1992.890000	Y_R 377.433
K (766.491 nm)	20.277100	ppm	0.030955	0.15	23849.200000	Y_R2 488.368
Li (670.783 nm)	0.102496	ppm	0.001190	1.16	2447.380000	Y_R2 488.368
Mg (279.078 nm)	23.644400	ppm	0.032917	0.14	144317.000000	Y 377.433
Mn (257.610 nm)	0.070430	ppm	0.004396	6.24	19164.200000	Y 377.433
Mo (202.032 nm)	0.048058	ppm	0.000243	0.51	478.977000	Y 377.433
Na (589.592 nm)	22.693400 o	ppm	0.059998	0.26	157750.000000	Y_R2 488.368
Na H (589.593 nm)	24.317324	ppm	0.011024	0.05	100111.479601	Y_R 488.368
Ni (231.604 nm)	0.045302	ppm	0.000166	0.37	354.281000	Y 377.433
P (213.618 nm)	1.914730	ppm	0.001175	0.06	4862.090000	Y 242.219
Pb (220.353 nm)	0.097391	ppm	0.000291	0.30	314.167000	Y 242.219
S (181.972 nm)	5.979683	ppm	0.000025	0.00	3402.803115	Y 377.433
Sb (206.834 nm)	0.094202	ppm	0.001171	1.24	267.655000	Y 377.433
Se (196.026 nm)	0.190665	ppm	0.002513	1.32	225.206000	Y 242.219
Si (288.158 nm)	10.046400	ppm	0.124619	1.24	92106.600000	Y 377.433
Sn (189.925 nm)	0.097750	ppm	0.000782	0.80	235.756000	Y 377.433
Sr (421.552 nm)	0.131895	ppm	0.000071	0.05	28706.336280	Y_R 488.368
Th (288.505 nm)	0.202341	ppm	0.000530	0.26	647.196000	Y 377.433
Ti (336.122 nm)	0.050078	ppm	0.000181	0.36	7167.090000	Y 377.433
Tl (190.794 nm)	0.198665	ppm	0.002524	1.27	499.663000	Y 377.433
U (409.013 nm)	0.516110	ppm	0.001916	0.37	2395.670000	Y 377.433
V (292.401 nm)	0.048292	ppm	0.000235	0.49	2072.270000	Y 377.433
Zn (206.200 nm)	0.186131	ppm	0.000795	0.43	1086.280000	Y 377.433
Zr (343.823 nm)	0.049492	ppm	0.000131	0.26	6726.480000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.057840	21622.550056	0.000899	0.08
Y 377.433	1.070351	1177870.671414	0.001424	0.13
Y_R 377.433	1.096250	84515.200000	0.004115	0.38
Y_R 488.368	1.102430	48176.800000	0.000232	0.02
Y_R2 488.368	1.114484	96667.489253	0.008794	0.79

Sample Name: CCVH-5225153

Date: 7/26/2018 9:27:57 PM Rack:Tube: S1:1

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	-0.000809 u	ppm	0.000159	19.60	-722.533000	Y 377.433
Al (167.019 nm)	45.966600 o	ppm	0.422853	0.92	22886.200000	Y_R 377.433
Al H (396.152 nm)	49.597088	ppm	0.237496	0.48	124953.826803	Y_R 377.433
As (188.980 nm)	0.002613	ppm	0.000743	28.42	-0.499649	Y 242.219
B (249.678 nm)	-0.000114 u	ppm	0.000101	88.66	-22.135900	Y 242.219
Ba (493.408 nm)	0.000026 u	ppm	0.000246	> 100.00	571.487000	Y_R 488.368
Be (234.861 nm)	0.000023	ppm	0.000026	> 100.00	1640.470000	Y_R 488.368
Bi (223.061 nm)	0.981006	ppm	0.002230	0.23	2774.730000	Y 377.433
Ca (315.887 nm)	0.010795	ppm	0.007168	66.39	-66.843159	Y_R 377.433
Cd (214.439 nm)	-0.000138 u	ppm	0.000013	9.66	40.472900	Y 377.433
Co (228.615 nm)	0.000976	ppm	0.000127	13.00	-16.049700	Y 242.219
Cr (205.560 nm)	0.000131	ppm	0.000125	95.69	-12.033900	Y 377.433
Cu (324.754 nm)	-0.005416 u	ppm	0.000034	0.63	340.046000	Y 377.433
Fe (238.204 nm)	48.641759 o	ppm	0.238218	0.49	183241.167307	Y_R 377.433
Fe H (259.940 nm)	49.919800	ppm	0.296494	0.59	98075.400000	Y_R 377.433
K (766.491 nm)	0.152975	ppm	0.025055	16.38	-551.118000	Y_R2 488.368
Li (670.783 nm)	0.003769	ppm	0.000489	12.98	-1032.160000	Y_R2 488.368
Mg (279.078 nm)	-0.006433 u	ppm	0.002094	32.56	-366.612000	Y 377.433
Mn (257.610 nm)	0.003392	ppm	0.000298	8.78	972.549000	Y 377.433
Mo (202.032 nm)	-0.000150 u	ppm	0.000096	63.96	-2.043960	Y 377.433
Na (589.592 nm)	231.023000 o	ppm	0.174046	0.08	1601410.000000	Y_R2 488.368
Na H (589.593 nm)	249.475256	ppm	1.269600	0.51	987270.059062	Y_R 488.368
Ni (231.604 nm)	0.001584	ppm	0.000981	61.95	16.405400	Y 377.433
P (213.618 nm)	-0.003619 u	ppm	0.000860	23.77	12.159400	Y 242.219
Pb (220.353 nm)	-0.002527 u	ppm	0.000262	10.38	14.315000	Y 242.219
S (181.972 nm)	4.914125	ppm	0.004099	0.08	2800.542275	Y 377.433
Sb (206.834 nm)	-0.004176 u	ppm	0.002124	50.87	-78.010300	Y 377.433
Se (196.026 nm)	0.000582 u	ppm	0.003595	> 100.00	4.874030	Y 242.219
Si (288.158 nm)	0.026774	ppm	0.001070	4.00	1088.370000	Y 377.433
Sn (189.925 nm)	0.002182	ppm	0.000204	9.35	12.137500	Y 377.433
Sr (421.552 nm)	0.000541	ppm	0.000066	12.29	258.627800	Y_R 488.368
Th (288.505 nm)	4.959160	ppm	0.033780	0.68	14063.400000	Y 377.433
Ti (336.122 nm)	0.001593	ppm	0.000008	0.52	23.779300	Y 377.433
Tl (190.794 nm)	-0.002727 u	ppm	0.000311	11.41	-14.241500	Y 377.433
U (409.013 nm)	10.130100	ppm	0.034291	0.34	49028.200000	Y 377.433
V (292.401 nm)	0.003692	ppm	0.000081	2.19	-21.079400	Y 377.433
Zn (206.200 nm)	-0.002624 u	ppm	0.000011	0.41	2.052860	Y 377.433
Zr (343.823 nm)	-0.003862 u	ppm	0.000026	0.68	-388.611000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.039794	21253.673785	0.001412	0.14
Y 377.433	1.040375	1144883.974422	0.001238	0.12
Y_R 377.433	1.075520	82917.100000	0.007279	0.68
Y_R 488.368	1.085240	47425.600000	0.006318	0.58
Y_R2 488.368	1.095789	95045.976957	0.000600	0.05

Sample Name: CCV-5225154

Date: 7/26/2018 9:31:21 PM Rack:Tube: S1:2

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.482152	ppm	0.001799	0.37	23886.700000	Y 377.433
Al (167.019 nm)	0.547009	ppm	0.007672	1.40	273.317000	Y_R 377.433
Al H (396.152 nm)	0.499572 u	ppm	0.005120	1.02	1452.562444	Y_R 377.433
As (188.980 nm)	0.975216	ppm	0.000390	0.04	1378.490000	Y 242.219
B (249.678 nm)	0.484276	ppm	0.000092	0.02	13511.100000	Y 242.219
Ba (493.408 nm)	0.496041	ppm	0.001594	0.32	59732.300000	Y_R 488.368
Be (234.861 nm)	0.472097	ppm	0.001839	0.39	152868.000000	Y_R 488.368
Bi (223.061 nm)	-0.002691 u	ppm	0.000087	3.23	7.506880	Y 377.433
Ca (315.887 nm)	4.965786	ppm	0.039677	0.80	4027.670209	Y_R 377.433
Cd (214.439 nm)	0.482537	ppm	0.004194	0.87	31875.100000	Y 377.433
Co (228.615 nm)	0.492244	ppm	0.001931	0.39	10205.700000	Y 242.219
Cr (205.560 nm)	0.482897	ppm	0.002354	0.49	8164.630000	Y 377.433
Cu (324.754 nm)	0.485313	ppm	0.002031	0.42	31881.400000	Y 377.433
Fe (238.204 nm)	2.515280	ppm	0.015694	0.62	9491.028823	Y_R 377.433
Fe H (259.940 nm)	2.437800 u	ppm	0.018230	0.75	5095.960000	Y_R 377.433
K (766.491 nm)	48.418300	ppm	0.228990	0.47	57970.100000	Y_R2 488.368
Li (670.783 nm)	0.962382	ppm	0.002311	0.24	32753.200000	Y_R2 488.368
Mg (279.078 nm)	18.953400	ppm	0.119805	0.63	115702.000000	Y 377.433
Mn (257.610 nm)	0.495483	ppm	0.000310	0.06	134507.000000	Y 377.433
Mo (202.032 nm)	0.488466	ppm	0.002798	0.57	4873.370000	Y 377.433
Na (589.592 nm)	4.912200	ppm	0.001415	0.03	35344.800000	Y_R2 488.368
Na H (589.593 nm)	5.728282 u	ppm	0.096939	1.69	27254.435751	Y_R 488.368
Ni (231.604 nm)	0.486970	ppm	0.005085	1.04	3789.220000	Y 377.433
P (213.618 nm)	0.951356	ppm	0.009380	0.99	2426.500000	Y 242.219
Pb (220.353 nm)	0.984705	ppm	0.001776	0.18	3130.850000	Y 242.219
S (181.972 nm)	0.016570	ppm	0.002779	16.77	34.538103	Y 377.433
Sb (206.834 nm)	0.972756	ppm	0.005180	0.53	2940.390000	Y 377.433
Se (196.026 nm)	0.970502	ppm	0.001482	0.15	1089.080000	Y 242.219
Si (288.158 nm)	4.908070	ppm	0.073620	1.50	45430.100000	Y 377.433
Sn (189.925 nm)	0.964623	ppm	0.007207	0.75	2264.140000	Y 377.433
Sr (421.552 nm)	0.495487	ppm	0.002333	0.47	107449.987077	Y_R 488.368
Th (288.505 nm)	0.002231	ppm	0.000598	26.79	95.727000	Y 377.433
Ti (336.122 nm)	0.494609	ppm	0.000541	0.11	71142.300000	Y 377.433
Tl (190.794 nm)	0.984994	ppm	0.006196	0.63	2499.500000	Y 377.433
U (409.013 nm)	0.003258	ppm	0.000816	25.04	-114.794000	Y 377.433
V (292.401 nm)	0.485033	ppm	0.002614	0.54	20774.200000	Y 377.433
Zn (206.200 nm)	0.478757	ppm	0.003093	0.65	2767.150000	Y 377.433
Zr (343.823 nm)	0.491074	ppm	0.002060	0.42	66828.500000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.066146	21792.320195	0.005169	0.48
Y 377.433	1.073572	1181415.155170	0.010416	0.97
Y_R 377.433	1.097780	84633.100000	0.001628	0.15
Y_R 488.368	1.105800	48323.800000	0.000953	0.09
Y_R2 488.368	1.117462	96925.794837	0.005103	0.46

Sample Name: CCB

Date: 7/26/2018 9:34:43 PM Rack:Tube: S1:4

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.000039 u	ppm	0.000124	> 100.00	-412.076000	Y 377.433
Al (167.019 nm)	0.007655	ppm	0.000781	10.20	3.589480	Y_R 377.433
Al H (396.152 nm)	-0.048456 u	ppm	0.007264	14.99	32.533534	Y_R 377.433
As (188.980 nm)	0.002062	ppm	0.000496	24.04	-0.786421	Y 242.219
B (249.678 nm)	0.000798	ppm	0.000222	27.86	85.994100	Y 242.219
Ba (493.408 nm)	-0.000369 u	ppm	0.000107	28.90	476.806000	Y_R 488.368
Be (234.861 nm)	0.000183	ppm	0.000093	51.04	9.856040	Y_R 488.368
Bi (223.061 nm)	0.002078	ppm	0.000426	20.51	20.413000	Y 377.433
Ca (315.887 nm)	0.020089	ppm	0.006395	31.83	-59.164502	Y_R 377.433
Cd (214.439 nm)	0.000173	ppm	0.000105	60.46	8.348520	Y 377.433
Co (228.615 nm)	0.000188	ppm	0.000232	> 100.00	-32.435000	Y 242.219
Cr (205.560 nm)	-0.000122 u	ppm	0.000062	50.89	-1.143140	Y 377.433
Cu (324.754 nm)	0.000459	ppm	0.000127	27.63	348.989000	Y 377.433
Fe (238.204 nm)	0.002945	ppm	0.001030	34.97	27.516350	Y_R 377.433
Fe H (259.940 nm)	-0.158519 u	ppm	0.002563	1.62	11.847800	Y_R 377.433
K (766.491 nm)	0.087601	ppm	0.026147	29.85	-630.384000	Y_R2 488.368
Li (670.783 nm)	0.004062	ppm	0.000187	4.61	-1021.850000	Y_R2 488.368
Mg (279.078 nm)	0.005554	ppm	0.003552	63.95	80.743700	Y 377.433
Mn (257.610 nm)	0.001361 Z	ppm	0.000245	18.01	421.532000 Z	Y 377.433
Mo (202.032 nm)	0.000329	ppm	0.000295	89.70	2.728970	Y 377.433
Na (589.592 nm)	0.033700	ppm	0.007239	21.48	480.557000	Y_R2 488.368
Na H (589.593 nm)	-0.009216 u	ppm	0.003358	36.44	4143.882603	Y_R 488.368
Ni (231.604 nm)	-0.000198 u	ppm	0.000032	15.92	0.227414	Y 377.433
P (213.618 nm)	0.000950	ppm	0.001035	> 100.00	23.710500	Y 242.219
Pb (220.353 nm)	-0.000808 u	ppm	0.000433	53.59	1.037460	Y 242.219
S (181.972 nm)	0.006516	ppm	0.000011	0.16	27.539468	Y 377.433
Sb (206.834 nm)	0.000782	ppm	0.000241	30.86	-14.531800	Y 377.433
Se (196.026 nm)	-0.001417 u	ppm	0.000320	22.55	12.594600	Y 242.219
Si (288.158 nm)	-0.003487 u	ppm	0.000868	24.89	813.480000	Y 377.433
Sn (189.925 nm)	-0.000577 u	ppm	0.000834	> 100.00	5.681810	Y 377.433
Sr (421.552 nm)	0.000187	ppm	0.000045	24.16	181.907875	Y_R 488.368
Th (288.505 nm)	0.002158	ppm	0.000687	31.82	78.439300	Y 377.433
Ti (336.122 nm)	0.000420	ppm	0.000068	16.28	-145.447000	Y 377.433
Tl (190.794 nm)	0.001875	ppm	0.000546	29.13	-1.006610	Y 377.433
U (409.013 nm)	0.002354	ppm	0.001901	80.75	-80.284300	Y 377.433
V (292.401 nm)	0.000098 u	ppm	0.000335	> 100.00	24.202200	Y 377.433
Zn (206.200 nm)	-0.003005 u	ppm	0.000280	9.31	-0.130824	Y 377.433
Zr (343.823 nm)	0.000088 u	ppm	0.000165	> 100.00	-0.136308	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.075272	21978.851496	0.009573	0.89
Y 377.433	1.086166	1195274.764173	0.014747	1.36
Y_R 377.433	1.101710	84935.800000	0.004131	0.37
Y_R 488.368	1.096860	47933.400000	0.005546	0.51
Y_R2 488.368	1.129252	97948.451344	0.001569	0.14

Sample Name: CCVL-5236949

Date: 7/26/2018 9:38:07 PM Rack:Tube: S1:3

Weight (g): 1 Volume (mL): 1 Dilution: 1

Analyte Results

Label	Solution Concentration	Unit	SD	%RSD	Intensity	Internal Standard
Ag (328.068 nm)	0.009233	ppm	0.000080	0.86	51.136900	Y 377.433
Al (167.019 nm)	0.101927	ppm	0.005086	4.99	50.526600	Y_R 377.433
Al H (396.152 nm)	0.050413 u	ppm	0.000117	0.23	282.772329	Y_R 377.433
As (188.980 nm)	0.014599	ppm	0.000971	6.65	16.982000	Y 242.219
B (249.678 nm)	0.093388	ppm	0.000617	0.66	2653.550000	Y 242.219
Ba (493.408 nm)	0.009540	ppm	0.000022	0.23	1659.450000	Y_R 488.368
Be (234.861 nm)	0.000973	ppm	0.000001	0.10	268.326000	Y_R 488.368
Bi (223.061 nm)	0.098390	ppm	0.001370	1.39	290.521000	Y 377.433
Ca (315.887 nm)	0.208881	ppm	0.000316	0.15	96.834234	Y_R 377.433
Cd (214.439 nm)	0.004769	ppm	0.000013	0.27	312.069000	Y 377.433
Co (228.615 nm)	0.009970	ppm	0.000023	0.23	171.070000	Y 242.219
Cr (205.560 nm)	0.009361	ppm	0.000040	0.42	159.218000	Y 377.433
Cu (324.754 nm)	0.014448	ppm	0.000071	0.49	1257.170000	Y 377.433
Fe (238.204 nm)	0.102937	ppm	0.000349	0.34	404.167579	Y_R 377.433
Fe H (259.940 nm)	-0.058200 u	ppm	0.000905	1.56	208.294000	Y_R 377.433
K (766.491 nm)	3.015880	ppm	0.018704	0.62	2920.120000	Y_R2 488.368
Li (670.783 nm)	0.025080	ppm	0.000268	1.07	-281.071000	Y_R2 488.368
Mg (279.078 nm)	0.185513	ppm	0.000386	0.21	1177.360000	Y 377.433
Mn (257.610 nm)	0.010405	ppm	0.000040	0.39	2875.640000	Y 377.433
Mo (202.032 nm)	0.017753	ppm	0.000333	1.87	176.590000	Y 377.433
Na (589.592 nm)	1.006980	ppm	0.003639	0.36	7246.620000	Y_R2 488.368
Na H (589.593 nm)	0.884001 u	ppm	0.019064	2.16	7673.506595	Y_R 488.368
Ni (231.604 nm)	0.038449	ppm	0.000033	0.09	300.711000	Y 377.433
P (213.618 nm)	2.660390 o	ppm	0.026312	0.99	6747.230000	Y 242.219
Pb (220.353 nm)	0.008700	ppm	0.002058	23.66	31.294400	Y 242.219
S (181.972 nm)	0.099457	ppm	0.001515	1.52	80.078874	Y 377.433
Sb (206.834 nm)	0.019362	ppm	0.000151	0.78	41.785400	Y 377.433
Se (196.026 nm)	0.016305	ppm	0.004140	25.39	32.212800	Y 242.219
Si (288.158 nm)	0.464523	ppm	0.002293	0.49	5064.880000	Y 377.433
Sn (189.925 nm)	0.092421	ppm	0.001401	1.52	223.286000	Y 377.433
Sr (421.552 nm)	0.009833	ppm	0.000007	0.08	2271.053447	Y_R 488.368
Th (288.505 nm)	0.017057	ppm	0.000127	0.74	121.411000	Y 377.433
Ti (336.122 nm)	0.009885	ppm	0.000025	0.26	1220.150000	Y 377.433
Tl (190.794 nm)	0.015249	ppm	0.000691	4.53	32.975100	Y 377.433
U (409.013 nm)	0.061054	ppm	0.000306	0.50	202.967000	Y 377.433
V (292.401 nm)	0.009369	ppm	0.000094	1.00	418.279000	Y 377.433
Zn (206.200 nm)	0.016841	ppm	0.000181	1.07	113.863000	Y 377.433
Zr (343.823 nm)	0.014313	ppm	0.000128	0.89	1936.120000	Y 377.433

Internal Standards Results

Label	Ratio	Intensity	SD	%RSD
Y 242.219	1.089592	22271.566810	0.004649	0.43
Y 377.433	1.098884	1209270.217714	0.007690	0.70
Y_R 377.433	1.113340	85832.200000	0.005152	0.46
Y_R 488.368	1.120200	48953.100000	0.004850	0.43
Y_R2 488.368	1.138071	98713.372305	0.005747	0.51

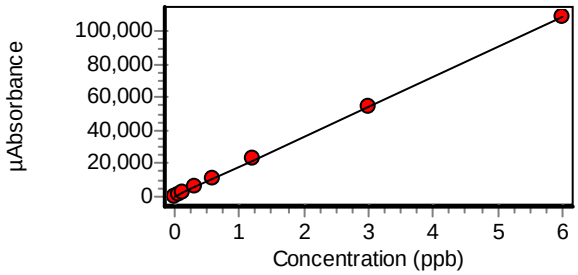
Report Generated By CETAC QuickTrace
Analyst: bacat
Worksheet file: C:\Program Files\QuickTrace\Worksheets\2018\07-Jul\180725ba.wsz
Date Started: 7/25/2018 11:20:31 AM
Comment:

Results

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	Wt.	Vol.	ODF
IC 280-423543/1-A	STD	07/25/18 02:03:10 pm	0.000	15	15.71		1.00	1.00	1.00
IC 280-423543/2-A	STD	07/25/18 02:05:24 pm	0.060	1138	1.30		1.00	1.00	1.00
IC 280-423543/3-A	STD	07/25/18 02:07:38 pm	0.120	2334	1.29		1.00	1.00	1.00
IC 280-423543/4-A	STD	07/25/18 02:09:52 pm	0.300	5733	1.20		1.00	1.00	1.00
IC 280-423543/5-A	STD	07/25/18 02:12:08 pm	0.600	11482	1.12		1.00	1.00	1.00
IC 280-423543/6-A	STD	07/25/18 02:14:23 pm	1.200	23060	1.13		1.00	1.00	1.00
IC 280-423543/7-A	STD	07/25/18 02:16:40 pm	3.000	54619	1.22		1.00	1.00	1.00
IC 280-423543/8-A	STD	07/25/18 02:18:57 pm	6.000	108576	0.96		1.00	1.00	1.00

Calibration

Equation: A = 395.108 + 18067.030C
R2: 0.99986
SEE: 483.1897
Flags:



ICV 280-423543/9-A	ICV	07/25/18 02:21:17 pm	2.400	43762	1.29		1.00	1.00	1.00
% Recovery 100.01									
ICB 280-423543/10-A	ICB	07/25/18 02:23:30 pm	-0.024	-44	8.73		1.00	1.00	1.00

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	Wt.	Vol.	ODF
CRA 280-423543/11-A	CRDL	07/25/18 02:25:44 pm	0.108	2347	0.80		1.00	1.00	1.00
% Recovery 90.03									
CCV 280-423543/12-A	CCV	07/25/18 02:28:01 pm	3.004	54669	1.18		1.00	1.00	1.00
% Recovery 100.13									
CCB 280-423543/13-A	CCB	07/25/18 02:30:14 pm	-0.024	-34	10.67		1.00	1.00	1.00
MB 280-423536/1-A	UNK	07/25/18 02:32:26 pm	-0.022	-8	8.05		1.00	1.00	1.00
LCS 280-423536/2-A	UNK	07/25/18 02:34:39 pm	3.033	55193	0.99		1.00	1.00	1.00
280-112263-A-1-E	UNK	07/25/18 02:36:51 pm	-0.025	-57	6.56		1.00	1.00	1.00
280-112263-A-2-E	UNK	07/25/18 02:39:04 pm	-0.022	2	121.33		1.00	1.00	1.00
280-112263-A-3-C	UNK	07/25/18 02:41:18 pm	-0.022	3	47.29		1.00	1.00	1.00
280-112263-A-4-C	UNK	07/25/18 02:43:31 pm	-0.021	14	13.29		1.00	1.00	1.00
280-112263-A-4-D MS	UNK	07/25/18 02:45:45 pm	3.044	55396	1.32		1.00	1.00	1.00
280-112263-A-4-E MSD	UNK	07/25/18 02:48:00 pm	3.002	54623	1.00		1.00	1.00	1.00
280-112263-A-5-C	UNK	07/25/18 02:50:14 pm	-0.026	-77	1.58		1.00	1.00	1.00
280-112263-A-6	UNK	07/25/18 02:52:29 pm	-0.022	-8	23.05		1.00	1.00	1.00
CCV 280-423543/12-A	CCV	07/25/18 02:54:45 pm	2.989	54405	1.11		1.00	1.00	1.00
% Recovery 99.65									
CCB 280-423543/13-A	CCB	07/25/18 02:56:58 pm	-0.024	-37	5.02		1.00	1.00	1.00
280-112263-A-7-C	UNK	07/25/18 02:59:13 pm	-0.022	-7	13.67		1.00	1.00	1.00
280-112263-A-8-C	UNK	07/25/18 03:01:29 pm	-0.021	9	13.71		1.00	1.00	1.00

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	Wt.	Vol.	ODF
280-112263-A-9-C	UNK	07/25/18 03:03:41 pm	-0.020	30	6.79		1.00	1.00	1.00
280-112263-A-10-C	UNK	07/25/18 03:05:53 pm	-0.021	8	19.83		1.00	1.00	1.00
MB 280-423535/1-A	UNK	07/25/18 03:08:05 pm	-0.022	3	79.27		1.00	1.00	1.00
LCS 280-423535/2-A	UNK	07/25/18 03:10:18 pm	2.931	53357	1.08		1.00	1.00	1.00
280-112120-A-2-C	UNK	07/25/18 03:12:31 pm	0.078	1812	1.19		1.00	1.00	1.00
280-112312-A-1-B	UNK	07/25/18 03:14:44 pm	0.077	1779	0.96		1.00	1.00	1.00
280-112135-A-2-A	UNK	07/25/18 03:16:58 pm	0.073	1723	0.90		1.00	1.00	1.00
280-112149-A-1-B	UNK	07/25/18 03:19:12 pm	-0.021	19	23.20		1.00	1.00	1.00
CCV 280-423543/12-A % Recovery 100.61	CCV	07/25/18 03:21:28 pm	3.018	54927	1.18		1.00	1.00	1.00
CCB 280-423543/13-A	CCB	07/25/18 03:23:41 pm	-0.024	-38	9.97		1.00	1.00	1.00
280-112190-C-2-A	UNK	07/25/18 03:25:55 pm	0.139	2899	0.95		1.00	1.00	1.00
280-112265-B-1-F	UNK	07/25/18 03:28:09 pm	-0.022	4	69.03		1.00	1.00	1.00
280-112265-B-2-F	UNK	07/25/18 03:30:24 pm	-0.021	22	4.42		1.00	1.00	1.00
280-112265-B-3-D	UNK	07/25/18 03:32:39 pm	-0.017	96	6.15		1.00	1.00	1.00
280-112265-B-4-F	UNK	07/25/18 03:34:51 pm	-0.020	26	3.46		1.00	1.00	1.00
280-112265-B-4-G MS	UNK	07/25/18 03:37:04 pm	2.921	53178	1.24		1.00	1.00	1.00
280-112265-B-4-H MSD	UNK	07/25/18 03:39:16 pm	2.939	53503	1.19		1.00	1.00	1.00

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	Wt.	Vol.	ODF
280-112083-D-1-D	UNK	07/25/18 03:41:29 pm	-0.016	97	5.60		1.00	1.00	1.00
MB 280-423542/1-A	UNK	07/25/18 03:43:42 pm	-0.022	2	125.80		1.00	1.00	1.00
LCS 280-423542/2-A	UNK	07/25/18 03:45:55 pm	2.968	54026	0.86		1.00	1.00	1.00
CCV 280-423543/12-A	CCV	07/25/18 03:48:11 pm	3.012	54813	1.32		1.00	1.00	1.00
% Recovery 100.40									
CCB 280-423543/13-A	CCB	07/25/18 03:50:24 pm	-0.024	-44	7.11		1.00	1.00	1.00
LCSD 280-423542/3-A	UNK	07/25/18 03:52:38 pm	2.972	54095	1.15		1.00	1.00	1.00
280-111798-G-1-G	UNK	07/25/18 03:54:52 pm	0.033	996	0.95		1.00	1.00	1.00
280-111798-E-2-G	UNK	07/25/18 03:57:06 pm	-0.007	262	1.54		1.00	1.00	1.00
280-111798-C-3-E	UNK	07/25/18 03:59:20 pm	0.007	521	0.96		1.00	1.00	1.00
280-111798-E-4-E	UNK	07/25/18 04:01:35 pm	-0.018	65	2.36		1.00	1.00	1.00
280-111798-E-4-Esd@5	UNK	07/25/18 04:03:50 pm	-0.013	163	2.91		1.00	1.00	1.00
280-111798-E-4-F MS	UNK	07/25/18 04:06:02 pm	3.040	55315	0.92		1.00	1.00	1.00
280-111798-E-4-G MSD	UNK	07/25/18 04:08:15 pm	2.659	48430	1.05		1.00	1.00	1.00
280-111798-E-4-Epds	UNK	07/25/18 04:10:27 pm	2.969	54038	1.01		1.00	1.00	1.00
280-111798-G-5-E	UNK	07/25/18 04:12:40 pm	-0.026	-74	4.70		1.00	1.00	1.00
CCV 280-423543/12-A	CCV	07/25/18 04:14:56 pm	3.016	54891	0.90		1.00	1.00	1.00
% Recovery 100.54									
CCB 280-423543/13-A	CCB	07/25/18 04:17:09 pm	-0.024	-40	10.12		1.00	1.00	1.00

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	Wt.	Vol.	ODF
280-111798-G-6-E	UNK	07/25/18 04:19:22 pm	-0.022	2	147.56		1.00	1.00	1.00
280-112235-C-9-E	UNK	07/25/18 04:21:36 pm	-0.021	20	13.97		1.00	1.00	1.00
280-112235-C-10-C	UNK	07/25/18 04:23:49 pm	-0.021	20	22.78		1.00	1.00	1.00
280-112235-C-11-C	UNK	07/25/18 04:26:03 pm	-0.020	39	1.69		1.00	1.00	1.00
280-112235-C-12-C	UNK	07/25/18 04:28:17 pm	-0.022	-4	49.93		1.00	1.00	1.00
280-112235-C-13-C	UNK	07/25/18 04:30:32 pm	-0.020	29	4.86		1.00	1.00	1.00
280-112031-E-4-G	UNK	07/25/18 04:32:47 pm	-0.021	11	14.93		1.00	1.00	1.00
280-112047-G-1-E	UNK	07/25/18 04:35:02 pm	-0.022	-4	31.43		1.00	1.00	1.00
MB 280-423572/1-A	UNK	07/25/18 04:37:14 pm	-0.022	4	39.30		1.00	1.00	1.00
LCS 280-423572/2-A	UNK	07/25/18 04:39:27 pm	1.746	31936	2.33		1.00	1.00	1.00
CCV 280-423543/12-A % Recovery 100.23	CCV	07/25/18 04:41:43 pm	3.007	54721	0.96		1.00	1.00	1.00
CCB 280-423543/13-A	CCB	07/25/18 04:43:56 pm	-0.024	-43	6.04		1.00	1.00	1.00
LCSD 280-423572/3-A	UNK	07/25/18 04:46:09 pm	3.032	55179	1.09		1.00	1.00	1.00
280-111991-E-1-C	UNK	07/25/18 04:48:22 pm	-0.026	-68	2.62		1.00	1.00	1.00
280-111991-G-3-G	UNK	07/25/18 04:50:35 pm	-0.021	16	7.80		1.00	1.00	1.00
280-111991-G-3-Gsd@5	UNK	07/25/18 04:52:48 pm	-0.013	166	2.04		1.00	1.00	1.00
280-111991-G-3-H MS	UNK	07/25/18 04:55:02 pm	2.685	48901	1.13		1.00	1.00	1.00

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	Wt.	Vol.	ODF
280-111991-G-3-I MSD	UNK	07/25/18 04:57:16 pm	2.714	49431	1.53		1.00	1.00	1.00
280-111991-G-3-Gpds	UNK	07/25/18 04:59:30 pm	2.667	48588	0.77		1.00	1.00	1.00
280-111991-G-4-C	UNK	07/25/18 05:01:44 pm	-0.036	-256	1.50		1.00	1.00	1.00
280-111991-E-5-C	UNK	07/25/18 05:03:59 pm	-0.021	14	24.57		1.00	1.00	1.00
280-111991-E-6-G	UNK	07/25/18 05:06:14 pm	-0.017	94	1.78		1.00	1.00	1.00
CCV 280-423543/12-A	CCV	07/25/18 05:08:31 pm	2.984	54311	1.46		1.00	1.00	1.00
% Recovery 99.47									
CCB 280-423543/13-A	CCB	07/25/18 05:10:44 pm	-0.024	-45	2.19		1.00	1.00	1.00
280-111991-E-6-H MS	UNK	07/25/18 05:12:57 pm	3.055	55589	0.97		1.00	1.00	1.00
280-111991-E-6-I MSD	UNK	07/25/18 05:15:10 pm	2.920	53147	0.49		1.00	1.00	1.00
280-111991-E-7-C	UNK	07/25/18 05:17:23 pm	-0.023	-26	13.62		1.00	1.00	1.00
280-111991-E-8-C	UNK	07/25/18 05:19:36 pm	-0.016	105	1.57		1.00	1.00	1.00
280-111991-E-9-C	UNK	07/25/18 05:21:50 pm	-0.022	4	34.59		1.00	1.00	1.00
280-111932-A-2-C	UNK	07/25/18 05:24:03 pm	-0.020	35	8.41		1.00	1.00	1.00
LB 280-423271/1-C	UNK	07/25/18 05:26:17 pm	-0.022	-1	147.60		1.00	1.00	1.00
LCS 280-423271/2-C	UNK	07/25/18 05:28:31 pm	3.149	57291	0.71		1.00	1.00	1.00
LCSD 280-423271/19-C	UNK	07/25/18 05:30:45 pm	3.110	56575	0.98		1.00	1.00	1.00
160-29498-A-3-C	UNK	07/25/18 05:32:59 pm	-0.024	-47	8.74		1.00	1.00	1.00

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	Wt.	Vol.	ODF
CCV 280-423543/12-A	CCV	07/25/18 05:35:17 pm	3.024	55022	0.87		1.00	1.00	1.00
% Recovery 100.79									
CCB 280-423543/13-A	CCB	07/25/18 05:37:29 pm	-0.025	-51	4.77		1.00	1.00	1.00
280-112230-G-1-E	UNK	07/25/18 05:39:44 pm	-0.019	49	3.14		1.00	1.00	1.00
280-112230-G-1-Esd@5	UNK	07/25/18 05:41:59 pm	-0.013	157	1.39		1.00	1.00	1.00
280-112230-G-1-F MS	UNK	07/25/18 05:44:13 pm	3.069	55837	0.74		1.00	1.00	1.00
280-112230-G-1-G MSD	UNK	07/25/18 05:46:26 pm	2.975	54141	0.67		1.00	1.00	1.00
280-112230-G-1-Epds	UNK	07/25/18 05:48:40 pm	3.065	55768	0.69		1.00	1.00	1.00
280-112289-A-1-C	UNK	07/25/18 05:50:53 pm	-0.024	-40	10.78		1.00	1.00	1.00
MB 280-423427/1-A	UNK	07/25/18 05:53:07 pm	-0.022	0	324.85		1.00	1.00	1.00
LCS 280-423427/2-A	UNK	07/25/18 05:55:20 pm	3.064	55761	0.76		1.00	1.00	1.00
280-112284-A-1-B	UNK	07/25/18 05:57:34 pm	-0.023	-24	12.63		1.00	1.00	1.00
CCV 280-423543/12-A	CCV	07/25/18 06:00:41 pm	3.008	54733	0.98		1.00	1.00	1.00
% Recovery 100.25									
CCB 280-423543/13-A	CCB	07/25/18 06:02:54 pm	-0.024	-39	8.00		1.00	1.00	1.00
280-112044-L-1-C	UNK	07/25/18 06:05:09 pm	-0.020	33	11.23		1.00	1.00	1.00
280-112044-L-2-C	UNK	07/25/18 06:07:23 pm	-0.021	17	12.55		1.00	1.00	1.00
280-112044-L-4-C	UNK	07/25/18 06:09:38 pm	-0.020	28	10.58		1.00	1.00	1.00
280-112044-L-4-D MS	UNK	07/25/18 06:11:53 pm	3.034	55207	0.67		1.00	1.00	1.00

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	Wt.	Vol.	ODF
280-112044-L-4-E MSD	UNK	07/25/18 06:14:07 pm	3.051	55520	1.08		1.00	1.00	1.00
280-112080-L-1-J	UNK	07/25/18 06:16:20 pm	-0.026	-82	3.04		1.00	1.00	1.00
280-112080-L-2-D	UNK	07/25/18 06:18:34 pm	-0.021	8	18.35		1.00	1.00	1.00
280-112080-L-3-D	UNK	07/25/18 06:20:48 pm	-0.022	6	46.63		1.00	1.00	1.00
280-112080-L-4-D	UNK	07/25/18 06:23:02 pm	-0.020	39	2.70		1.00	1.00	1.00
280-112080-I-5-C	UNK	07/25/18 06:25:15 pm	-0.023	-27	9.62		1.00	1.00	1.00
CCV 280-423543/12-A % Recovery 100.19	CCV	07/25/18 06:27:32 pm	3.006	54699	1.32		1.00	1.00	1.00
CCB 280-423543/13-A	CCB	07/25/18 06:29:45 pm	-0.026	-82	0.77		1.00	1.00	1.00
280-112153-L-1-D	UNK	07/25/18 06:31:58 pm	-0.024	-45	3.13		1.00	1.00	1.00
280-112153-L-2-D	UNK	07/25/18 06:34:12 pm	-0.018	64	3.44		1.00	1.00	1.00
280-112166-L-1-C	UNK	07/25/18 06:36:27 pm	-0.002	363	1.88		1.00	1.00	1.00
490-156019-A-1-D	UNK	07/25/18 06:38:41 pm	-0.018	74	6.29		1.00	1.00	1.00
490-156019-A-2-B	UNK	07/25/18 06:40:56 pm	-0.023	-21	9.34		1.00	1.00	1.00
490-156019-A-3-B	UNK	07/25/18 06:43:11 pm	-0.023	-13	25.36		1.00	1.00	1.00
490-156019-A-4-B	UNK	07/25/18 06:45:25 pm	-0.022	-4	41.96		1.00	1.00	1.00
MB 280-423604/1-A	UNK	07/25/18 06:47:39 pm	-0.023	-13	14.63		1.00	1.00	1.00
LCS 280-423604/2-A	UNK	07/25/18 06:49:53 pm	2.957	53818	0.98		1.00	1.00	1.00

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	Wt.	Vol.	ODF
280-112256-A-1-C	UNK	07/25/18 06:52:07 pm	-0.026	-70	5.84		1.00	1.00	1.00
CCV 280-423543/12-A	CCV	07/25/18 06:54:24 pm	2.997	54535	0.98		1.00	1.00	1.00
% Recovery 99.89									
CCB 280-423543/13-A	CCB	07/25/18 06:56:37 pm	-0.026	-73	3.72		1.00	1.00	1.00
280-112256-A-1-D MS	UNK	07/25/18 06:58:51 pm	2.567	46782	1.27		1.00	1.00	1.00
280-112256-A-1-E MSD	UNK	07/25/18 07:01:05 pm	2.504	45636	1.06		1.00	1.00	1.00
LB2 280-423270/1-C	UNK	07/25/18 07:03:19 pm	-0.041	-340	2.23		1.00	1.00	1.00
LCS 280-423270/2-C	UNK	07/25/18 07:05:33 pm	3.089	56202	0.33		1.00	1.00	1.00
280-112151-A-1-C	UNK	07/25/18 07:07:47 pm	-0.028	-114	1.46		1.00	1.00	1.00
280-112151-A-2-E	UNK	07/25/18 07:10:02 pm	-0.020	41	6.08		1.00	1.00	1.00
280-112151-A-2-F MS	UNK	07/25/18 07:12:17 pm	3.172	57697	0.98		1.00	1.00	1.00
280-112151-A-2-G MSD	UNK	07/25/18 07:14:32 pm	3.107	56528	0.82		1.00	1.00	1.00
LCS 280-423572/2-A	UNK	07/25/18 07:16:45 pm	2.986	54336	0.97		1.00	1.00	1.00
LCSD 280-423572/3-A	UNK	07/25/18 07:18:57 pm	3.030	55143	0.92		1.00	1.00	1.00
CCV 280-423543/12-A	CCV	07/25/18 07:21:14 pm	3.012	54806	0.95		1.00	1.00	1.00
% Recovery 100.39									
CCB 280-423543/13-A	CCB	07/25/18 07:23:27 pm	-0.027	-88	2.55		1.00	1.00	1.00

Analysis Parameters

Instrument M-7500 Mercury Analyzer

Conditions

Gas flow (mL/min)	Sample Uptake (s)	Rinse (s)	Read delay (s)	Replicates (#)	Replicate time (s)	Pump speed (%)	Wavelength (nm)
100	35.00	90.00	56.00	4	1.50	50	253.65

ASX Pump Rate (%)
20

Instrumental Zero

Zero before first sample: No

Zero periodically: Yes

Before each calibration.

Baseline Correction

#1 Start time (s)	#1 End time (s)	#2 Start time (s)	#2 End time (s)
20.00	24.00		

Standby Mode

Enabled: Yes

Standby Options: pump off, gas off, lamp off

Autodilution

Enabled: No

Condition:

Tube # range:

If no autodilution tubes remaining

Calibration

Settings

Algorithm	Through blank	Weighted fit	Cal. Type	Racalibration rate	Reslope rate	Reslope standard
Linear	No	No	Normal	0	0	N/A

Limits

Calibration slope		Reslope		Coeff. of Determination
Lower (%)	Upper (%)	Lower (%)	Upper (%)	
20	150	75	125	0.99500

Error action: Flag and continue

QC

GLP Override: Yes

QC Tests

CCB

Concentration (ppb)
0.0600

Failure flag: Q

Error action for manually inserted QC: Stop analysis

ICB

Concentration (ppb)
0.0600

Failure flag: Z

Error action for manually inserted QC: Stop analysis

CCV

Concentration (ppb)	Low Limit %	High Limit %
3.0000	80.0000	120.0000

Failure flag: Q

Error action for manually inserted QC: Stop analysis

ICV

Concentration (ppb)	Low Limit %	High Limit %
2.4000	94.6000	105.4000

Failure flag: Q

Error action for manually inserted QC: Stop analysis

CRDL

Concentration (ppb)	Low Limit %	High Limit %
0.1200	50.0000	150.0000

Failure flag: Y

Error action for manually inserted QC: Stop analysis

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29498-1

SDG No.:

Project: Former Carnotite Site - Non-Rad Analysis

Client Sample ID	Lab Sample ID
CRC-B20-0206	160-29498-1
CRC-B21-0205	160-29498-2
CRC-B22-0105	160-29498-3
CRC-B23-0104	160-29498-4

Comments:

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG No.:

Project: Former Carnotite Site - Non-Rad Analysis

Client Sample ID	Lab Sample ID
CRC-B21-0205	160-29498-2
CRC-B23-0104	160-29498-4

Comments:

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29498-1

SDG No.:

Project: Former Carnotite Site - Non-Rad Analysis

Client Sample ID	Lab Sample ID
CRC-B21-0205	160-29498-2
CRC-B23-0104	160-29498-4

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: CRC-B21-0205 Lab Sample ID: 160-29498-2

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG ID.:

Matrix: Solid Date Sampled: 07/12/2018 11:40

Reporting Basis: WET Date Received: 07/13/2018 09:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
	pH adj. to 25 deg C	8.0	0.1	0.1	SU			1	9045D
	Free Liquid	Pass	0.10	0.10	NONE			1	9095B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: CRC-B23-0104 Lab Sample ID: 160-29498-4

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG ID.:

Matrix: Solid Date Sampled: 07/12/2018 12:10

Reporting Basis: WET Date Received: 07/13/2018 09:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
	Flashpoint	>60	1.00	1.00	Degrees C			1	1010A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: CRC-B21-0205 Lab Sample ID: 160-29498-2

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG ID.:

Matrix: Solid Date Sampled: 07/12/2018 11:40

Reporting Basis: WET Date Received: 07/13/2018 09:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
57-12-5	Cyanide, Total	1.0	0.45	0.092	mg/Kg			1	9012A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: CRC-B23-0104 Lab Sample ID: 160-29498-4

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG ID.:

Matrix: Solid Date Sampled: 07/12/2018 12:10

Reporting Basis: WET Date Received: 07/13/2018 09:30

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18496-25-8	Sulfide	76	10	2.4	mg/Kg		H F1	1	9034

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: CRC-B21-0205 Lab Sample ID: 160-29498-2

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG ID.:

Matrix: Solid Date Sampled: 07/12/2018 11:40

Reporting Basis: DRY Date Received: 07/13/2018 09:30

% Solids: 94.2

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
64743-03-9	Phenols, Total	1.7	2.7	1.1	mg/Kg	J	F1 F2	1	9066

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: CRC-B23-0104 Lab Sample ID: 160-29498-4

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG ID.:

Matrix: Solid Date Sampled: 07/12/2018 12:10

Reporting Basis: DRY Date Received: 07/13/2018 09:30

% Solids: 88.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
	Halogens, Extractable Organic	27	54	27	mg/Kg	U		1	9023

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Analyst: JCB Batch Start Date: 07/19/2018

Reporting Units: SU Analytical Batch No.: 376775

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
4	ICV	23:14	pH adj. to 25 deg C	7.0	7.00	100	99.0-101.0		pH Buffer 7SS_00034
8	CCV	23:35	pH adj. to 25 deg C	7.0	7.00	100	99.0-101.0		pH Buffer 7SS_00034

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

FORM II-IN

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Analyst: PAH Batch Start Date: 07/24/2018

Reporting Units: mg/L Analytical Batch No.: 423433

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
14	ICV	09:59	Cyanide, Total	0.104	0.100	104	90-110		CN ICV Daily_01169
15	ICB	10:01	Cyanide, Total	0.0020				U	
29	CCV	10:22	Cyanide, Total	0.205	0.200	102	90-110		CN CAL 1 ppm_01403
30	CCB	10:24	Cyanide, Total	0.0020				U	
44	CCV	10:48	Cyanide, Total	0.211	0.200	105	90-110		CN CAL 1 ppm_01403
45	CCB	10:50	Cyanide, Total	0.0020				U	
59	CCV	11:14	Cyanide, Total	0.212	0.200	106	90-110		CN CAL 1 ppm_01403
60	CCB	11:16	Cyanide, Total	0.0020				U	
71	CCV	11:36	Cyanide, Total	0.214	0.200	107	90-110		CN CAL 1 ppm_01403
72	CCB	11:38	Cyanide, Total	0.0020				U	

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

FORM II-IN

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Analyst: SDL Batch Start Date: 08/07/2018

Reporting Units: mg/L Analytical Batch No.: 534505

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
1	ICV	18:19	Phenols, Total	0.695	0.750	93	90-110		W_Phenol STD_00001
2	ICB	18:20	Phenols, Total	0.020				U	
3	CCV	18:21	Phenols, Total	1.00	1.00	100	90-110		W_Phenol CCV_00010
4	CCB	18:22	Phenols, Total	0.020				U	
12	CCV	18:30	Phenols, Total	1.00	1.00	100	90-110		W_Phenol CCV_00010
13	CCB	18:31	Phenols, Total	0.020				U	

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

FORM II-IN

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Analyst: VRP Batch Start Date: 07/19/2018

Reporting Units: mg/Kg Analytical Batch No.: 530916

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
2	CCV	15:56	Halogens, Extractable Organic	479	498	96	90-110		W_EOX STD_00075
5	CCV	15:56	Halogens, Extractable Organic	498	498	100	90-110		W_EOX STD_00075
6	CCB	15:56	Halogens, Extractable Organic	25				U	
15	CCV	15:56	Halogens, Extractable Organic	508	498	102	90-110		W_EOX STD_00075
16	CCB	15:56	Halogens, Extractable Organic	25				U	
17	CCV	15:56	Halogens, Extractable Organic	484	498	97	90-110		W_EOX STD_00075
18	CCB	15:56	Halogens, Extractable Organic	25				U	
25	CCB	15:56	Halogens, Extractable Organic	25				U	
26	CCV	12:03	Halogens, Extractable Organic	531	498	107	90-110		W_EOX STD_00075
27	CCB	12:03	Halogens, Extractable Organic	25				U	
34	CCV	12:03	Halogens, Extractable Organic	500	498	100	90-110		W_EOX STD_00075
35	CCB	12:03	Halogens, Extractable Organic	25				U	

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

FORM II-IN

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 378201 Date: 07/27/2018 19:26							
1010A	MB 160-378201/1	Flashpoint	>60		Degrees C	1.00	1

FORM III-IN

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 423433	Date: 07/24/2018 10:41	Prep Batch: 423359	Date: 07/24/2018 06:50				
9012A	MB 280-423359/4-A	Cyanide, Total	0.10	U	mg/Kg	0.50	1
Batch ID: 423463	Date: 07/24/2018 14:58	Prep Batch: 423448	Date: 07/24/2018 13:20				
9034	MB 280-423448/1-A	Sulfide	2.4	U	mg/Kg	10	1

FORM III-IN

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 530916	Date: 07/19/2018 15:56	Prep Batch: 530110	Date: 07/19/2018 14:45				
9023	MB 490-530110/1-A	Halogens, Extractable Organic	25	U	mg/Kg	50	1
Batch ID: 534505	Date: 08/07/2018 18:23	Prep Batch: 534142	Date: 08/06/2018 12:57				
9066	MB 490-534142/1-A	Phenols, Total	1.0	U	mg/Kg	2.5	1

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 423433	Date: 07/24/2018 11:19		Prep Batch: 423359		Date: 07/24/2018 06:50						
9012A	280-111993-A-1-L	Cyanide, Total	0.78		mg/Kg						F1 F2
9012A	280-111993-A-1-L MS	Cyanide, Total	6.75		mg/Kg	4.94	121	90-110			F1
Batch ID: 423463	Date: 07/24/2018 14:58		Prep Batch: 423448		Date: 07/24/2018 13:20						
9034	160-29498-4	Sulfide	76		mg/Kg						H F1
9034	160-29498-4 MS	Sulfide	79.8		mg/Kg	114	4	38-104			F1

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

FORM V-IN

5-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 423463	Date: 07/24/2018 14:58		Prep Batch: 423448		Date: 07/24/2018 13:20						
9034	160-29498-4 MSD	Sulfide	79.4		mg/Kg	113	3	38-104	1	35	F1

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

FORM V-IN

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 530916	Date: 07/19/2018 15:56		Prep Batch: 530110		Date: 07/19/2018 14:45						
9023	560-74639-A-1 4-B	Halogens, Extractable Organic	30	U	mg/Kg						
9023	560-74639-A-1 4-B MS	Halogens, Extractable Organic	1030		mg/Kg	1190	87	70-130			
Batch ID: 534505	Date: 08/07/2018 18:26		Prep Batch: 534142		Date: 08/06/2018 12:57						
9066	160-29498-2	Phenols, Total	1.7	J	mg/Kg						F1 F2
9066	160-29498-2 MS	Phenols, Total	43.3		mg/Kg	41.2	101	70-130			

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM V-IN

5-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 530916	Date: 07/19/2018 15:56		Prep Batch: 530110		Date: 07/19/2018 14:45						
9023	560-74639-A-1 4-C MSD	Halogens, Extractable Organic	1170		mg/Kg	1190	98	70-130	12	20	
Batch ID: 534505	Date: 08/07/2018 18:27		Prep Batch: 534142		Date: 08/06/2018 12:57						
9066	160-29498-2 MSD	Phenols, Total	17.9		mg/Kg	41.2	39	70-130	83	23	F1 F2

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM V-IN

6-IN
DUPLICATE
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Client Sample ID	Lab Sample ID	Analyte	Result	Unit	RPD	RPD Limit	Qual
Batch ID: 378201 Date: 07/27/2018 21:09								
1010A	CRC-B23-0104	160-29498-4	Flashpoint	>60	Degrees C			
1010A	CRC-B23-0104	160-29498-4 DU	Flashpoint	>60	Degrees C	NC	20	
Batch ID: 376775 Date: 07/19/2018 23:31		Prep Batch: 376770	Date: 07/19/2018 20:42					
9045D	CRC-B21-0205	160-29498-2	pH adj. to 25 deg C	8.0	SU			
9045D	CRC-B21-0205	160-29498-2 DU	pH adj. to 25 deg C	8.0	SU	0.9	5	
Batch ID: 381470 Date: 08/09/2018 18:50								
9095B	CRC-B21-0205	160-29498-2	Free Liquid	Pass	NONE			
9095B	CRC-B21-0205	160-29498-2 DU	Free Liquid	Pass	NONE	NC		

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.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 378201	Date: 07/27/2018 20:00										
						LCS Source: p-Xylene_00013					
1010A	LCS 160-378201/2	Flashpoint	27.50		Degrees C	25.0	110	90-110			
Batch ID: 376775	Date: 07/19/2018 23:24										
						LCS Source: pH Buffer 7SS_00034					
9045D	LCS 160-376775/5	pH adj. to 25 deg C	7.0		SU	7.00	100	99.0-10 1.0			

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 Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 423433	Date: 07/24/2018 10:39		Prep Batch: 423359			Date: 07/24/2018 06:50					
						LCS Source: CN ICV Int_00493					
9012A	LCS 280-423359/3-A	Cyanide, Total	5.12		mg/Kg	5.00	102	90-110			
Batch ID: 423463	Date: 07/24/2018 14:58		Prep Batch: 423448			Date: 07/24/2018 13:20					
						LCS Source: SFD CAL INT_01521					
9034	LCS 280-423448/2-A	Sulfide	100		mg/Kg	114	88	38-104			

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

FORM VIIA-IN

7A-IN
LOW LEVEL CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 423433	Date: 07/24/2018 10:38		Prep Batch: 423359		Date: 07/24/2018 06:50						
					LCS Source: CN 10ppm_00305						
9012A	LLCS 280-423359/2-A	Cyanide, Total	5.55		mg/Kg	5.00	111	51-150			

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

FORM VIIA-IN

7A-IN
HIGH LEVEL CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 423433	Date: 07/24/2018 10:36		Prep Batch: 423359		Date: 07/24/2018 06:50						
					LCS Source: CN 10ppm_00305						
9012A	HLCS 280-423359/1-A	Cyanide, Total	18.3		mg/Kg	17.5	105	90-110			

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.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 530916	Date: 07/19/2018 15:56		Prep Batch: 530110		Date: 07/19/2018 14:45						
					LCS Source: W_EOX Spike S_00019						
9023	LCS 490-530110/2-A	Halogens, Extractable Organic	932		mg/Kg	995	94	80-120	3	20	
Batch ID: 534505	Date: 08/07/2018 18:24		Prep Batch: 534142		Date: 08/06/2018 12:57						
					LCS Source: Phenol LCSINT_00028						
9066	LCS 490-534142/2-A	Phenols, Total	35.2		mg/Kg	38.0	93	80-120			

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

FORM VIIA-IN

7A-IN
LAB CONTROL SAMPLE DUPLICATE
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 530916	Date: 07/19/2018 15:56		Prep Batch: 530110		Date: 07/19/2018 14:45						
					LCSD Source: W_EOX Spike S_00019						
9023	LCSD 490-530110/3-A	Halogens, Extractable Organic	961		mg/Kg	995	97	80-120	3	20	

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

FORM VIIA-IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: 1010A RL Date: 01/28/2011 13:28

Analyte	Wavelength/ Mass	RL (Degrees C)	
Flashpoint		1	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: 1010A XRL Date: 01/28/2011 13:29

Analyte	Wavelength/ Mass	XRL (Degrees C)	
Flashpoint		1	

FORM IX - IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: 5STAR#4

Method: 9045D RL Date: 01/01/2011 15:49

Prep Method: DILeach_Prep

Analyte	Wavelength/ Mass	RL (SU)	
pH adj. to 25 deg C		0.1	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: 5STAR#4

Method: 9045D XRL Date: 01/01/2011 08:43

Analyte	Wavelength/ Mass	XRL (SU)	
pH adj. to 25 deg C		0.1	

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: 9095B RL Date: 01/01/2011 15:56

Analyte	Wavelength/ Mass	RL (NONE)	
Free Liquid		0.1	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: 9095B XRL Date: 01/01/2011 15:57

Analyte	Wavelength/ Mass	XRL (NONE)	
Free Liquid		0.1	

FORM IX - IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture RL Date: 01/28/2011 14:43

Analyte	Wavelength/ Mass	RL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture XRL Date: 01/28/2011 14:42

Analyte	Wavelength/ Mass	XRL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: WC_Alp 1

Method: 9012A MDL Date: 10/11/2010 11:51

Prep Method: 9012A

Analyte	Wavelength/ Mass	RL (mg/Kg)	MDL (mg/Kg)
Cyanide, Total		0.5	0.103

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: WC_Alp 1

Method: 9012A XMDL Date: 10/11/2010 11:55

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Cyanide, Total		0.01	0.002

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: 9034 MDL Date: 11/28/2016 10:55

Prep Method: 9030B

Analyte	Wavelength/ Mass	RL (mg/Kg)	MDL (mg/Kg)
Sulfide		10	2.4

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: 9034 XMDL Date: 11/28/2016 11:01

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Sulfide		4	0.79

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: 9066 MDL Date: 08/20/2015 08:32

Prep Method: Distill/Phenol

Analyte	Wavelength/ Mass	RL (mg/Kg)	MDL (mg/Kg)
Phenols, Total		2.5	1

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29498-1

SDG Number:

Matrix: Solid 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: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: 9023 MDL Date: 07/03/2013 12:23

Prep Method: 9023

Analyte	Wavelength/ Mass	RL (mg/Kg)	MDL (mg/Kg)
Halogens, Extractable Organic		50	25

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job Number: 160-29498-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: 9023 XMDL Date: 04/30/2014 10:04

Analyte	Wavelength/ Mass	XRL (mg/Kg)	XMDL (mg/Kg)
Halogens, Extractable Organic		50	25

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Prep Method: DILeach_Prep

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
160-29498-2	07/19/2018 20:42	376770	20.0459		20
160-29498-2 DU	07/19/2018 20:42	376770	19.9936		20

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Prep Method: 9012A

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
HLCS 280-423359/1-A	07/24/2018 06:50	423359	1		50
LLCS 280-423359/2-A	07/24/2018 06:50	423359	1		50
LCS 280-423359/3-A	07/24/2018 06:50	423359	1		50
MB 280-423359/4-A	07/24/2018 06:50	423359	1		50
280-111993-A-1-L MS	07/24/2018 06:50	423359	1.0117		50
160-29498-2	07/24/2018 06:50	423359	1.1202		50

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Prep Method: 9030B

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 280-423448/1-A	07/24/2018 13:20	423448	10		50
LCS 280-423448/2-A	07/24/2018 13:20	423448	10		50
160-29498-4	07/24/2018 13:20	423448	10.05		50
160-29498-4 MS	07/24/2018 13:20	423448	10.02		50
160-29498-4 MSD	07/24/2018 13:20	423448	10.08		50

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Prep Method: Distill/Phenol

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 490-534142/1-A	08/06/2018 12:57	534142	1.00		50
LCS 490-534142/2-A	08/06/2018 12:57	534142	1.00		50
160-29498-2	08/06/2018 12:57	534142	0.98		50
160-29498-2 MS	08/06/2018 12:57	534142	0.98		50
160-29498-2 MSD	08/06/2018 12:57	534142	0.98		50

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Prep Method: 9023

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 490-530110/1-A	07/19/2018 14:45	530110	1.00		1
LCS 490-530110/2-A	07/19/2018 14:45	530110	1.00		1
LCSD 490-530110/3-A	07/19/2018 14:45	530110	1.00		1
560-74639-A-14-B MS	07/19/2018 14:45	530110	1.02		1
560-74639-A-14-C MSD	07/19/2018 14:45	530110	1.02		1
160-29498-4	07/24/2018 15:27	530110	1.05		1

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: 1010A

Start Date: 07/27/2018 19:26 End Date: 07/28/2018 00:36

Lab Sample Id	D/F	Type	Time	Analytes																								
				FP																								
MB 160-378201/1	1	T	19:26	X																								
LCS 160-378201/2	1	T	20:00	X																								
160-29498-4	1	T	20:35	X																								
160-29498-4 DU	1	T	21:09	X																								
ZZZZZZ			21:44																									
ZZZZZZ			22:18																									
ZZZZZZ			22:53																									
ZZZZZZ			23:27																									
ZZZZZZ			00:02																									
ZZZZZZ			00:36																									

Prep Types:
T = Total/NA

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Instrument ID: 5STAR#4 Analysis Method: 9045D

Start Date: 07/19/2018 23:06 End Date: 07/19/2018 23:35

Lab Sample Id	D/F	Type	Time	Analytes																								
				pH																								
IC 160-376775/1			23:06	X																								
IC 160-376775/2			23:08	X																								
IC 160-376775/3			23:12	X																								
ICV 160-376775/4	1		23:14	X																								
LCS 160-376775/5	1	T	23:24	X																								
160-29498-2	1	T	23:27	X																								
160-29498-2 DU	1	T	23:31	X																								
CCV 160-376775/8	1		23:35	X																								

Prep Types:
T = Total/NA

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: 9095B

Start Date: 08/09/2018 18:34 End Date: 08/09/2018 18:50

Lab Sample Id	D/F	Type	Time	Analytes																								
				PF																								
160-29498-2	1	T	18:34	X																								
160-29498-2 DU	1	T	18:50	X																								

Prep Types:
T = Total/NA

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: Moisture

Start Date: 07/17/2018 16:08 End Date: 07/17/2018 16:09

Lab Sample Id	D/F	Type	Time	Analytes																								
				% Sol	Moist																							
160-29498-1	1	T	16:08	X	X																							
160-29498-2	1	T	16:08	X	X																							
160-29498-3	1	T	16:08	X	X																							
160-29498-4	1	T	16:08	X	X																							
160-29498-4 DU	1	T	16:09	X	X																							

Prep Types:
T = Total/NA

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: WC_Alp 1 Analysis Method: 9012A

Start Date: 07/24/2018 09:40 End Date: 07/24/2018 12:56

Lab Sample Id	D/F	Type	Time	Analytes																								
				CN																								
ZZZZZZ			09:40																									
ZZZZZZ			09:41																									
ZZZZZZ			09:43																									
ZZZZZZ			09:44																									
IC 280-423433/5			09:46	X																								
IC 280-423433/6			09:47	X																								
IC 280-423433/7			09:49	X																								
IC 280-423433/8			09:50	X																								
IC 280-423433/9			09:52	X																								
IC 280-423433/10			09:53	X																								
IC 280-423433/11			09:55	X																								
ZZZZZZ			09:56																									
ZZZZZZ			09:58																									
ICV 280-423433/14	1		09:59	X																								
ICB 280-423433/15	1		10:01	X																								
ZZZZZZ			10:02																									
ZZZZZZ			10:04																									
ZZZZZZ			10:05																									
ZZZZZZ			10:07																									
ZZZZZZ			10:09																									
ZZZZZZ			10:10																									
ZZZZZZ			10:12																									
ZZZZZZ			10:13																									
ZZZZZZ			10:15																									
ZZZZZZ			10:16																									
ZZZZZZ			10:18																									
ZZZZZZ			10:19																									
ZZZZZZ			10:21																									
CCV 280-423433/29	1		10:22	X																								
CCB 280-423433/30	1		10:24	X																								
ZZZZZZ			10:25																									
ZZZZZZ			10:30																									
ZZZZZZ			10:32																									
ZZZZZZ			10:33																									
ZZZZZZ			10:35																									
HLCS 280-423359/1-A	1	T	10:36	X																								
LLCS 280-423359/2-A	1	T	10:38	X																								
LCS 280-423359/3-A	1	T	10:39	X																								
MB 280-423359/4-A	1	T	10:41	X																								
ZZZZZZ			10:42																									
ZZZZZZ			10:44																									
ZZZZZZ			10:45																									

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: WC_Alp 1 Analysis Method: 9012A

Start Date: 07/24/2018 09:40 End Date: 07/24/2018 12:56

Lab Sample Id	D/F	Type	Time	Analytes
				CN
ZZZZZZ			10:47	
CCV 280-423433/44	1		10:48	X
CCB 280-423433/45	1		10:50	X
ZZZZZZ			10:51	
ZZZZZZ			10:56	
ZZZZZZ			10:58	
ZZZZZZ			10:59	
ZZZZZZ			11:01	
ZZZZZZ			11:02	
ZZZZZZ			11:04	
ZZZZZZ			11:05	
ZZZZZZ			11:07	
ZZZZZZ			11:08	
ZZZZZZ			11:10	
ZZZZZZ			11:11	
ZZZZZZ			11:13	
CCV 280-423433/59	1		11:14	X
CCB 280-423433/60	1		11:16	X
ZZZZZZ			11:17	
280-111993-A-1-L MS	1	T	11:19	X
ZZZZZZ			11:20	
ZZZZZZ			11:22	
ZZZZZZ			11:23	
ZZZZZZ			11:25	
ZZZZZZ			11:26	
160-29498-2	1	T	11:28	X
ZZZZZZ			11:33	
ZZZZZZ			11:35	
CCV 280-423433/71	1		11:36	X
CCB 280-423433/72	1		11:38	X
ZZZZZZ			11:39	
ZZZZZZ			11:51	
ZZZZZZ			11:52	
ZZZZZZ			11:54	
ZZZZZZ			11:55	
IC 280-423433/78			11:57	X
IC 280-423433/79			11:58	X
IC 280-423433/80			12:00	X
IC 280-423433/81			12:01	X
IC 280-423433/82			12:03	X
IC 280-423433/83			12:04	X
IC 280-423433/84			12:06	X

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: WC_Alp 1 Analysis Method: 9012A

Start Date: 07/24/2018 09:40 End Date: 07/24/2018 12:56

Lab Sample Id	D/F	Type	Time	Analytes																								
				CN																								
ZZZZZZ			12:07																									
ZZZZZZ			12:09																									
ICV 280-423433/87			12:10																									
ICB 280-423433/88			12:12																									
ZZZZZZ			12:13																									
ZZZZZZ			12:15																									
ZZZZZZ			12:16																									
ZZZZZZ			12:18																									
ZZZZZZ			12:19																									
ZZZZZZ			12:21																									
ZZZZZZ			12:22																									
ZZZZZZ			12:24																									
ZZZZZZ			12:25																									
ZZZZZZ			12:27																									
ZZZZZZ			12:28																									
ZZZZZZ			12:30																									
ZZZZZZ			12:31																									
CCV 280-423433/102			12:33																									
CCB 280-423433/103			12:34																									
ZZZZZZ			12:36																									
ZZZZZZ			12:41																									
ZZZZZZ			12:43																									
ZZZZZZ			12:44																									
ZZZZZZ			12:46																									
ZZZZZZ			12:47																									
ZZZZZZ			12:49																									
ZZZZZZ			12:50																									
ZZZZZZ			12:52																									
CCV 280-423433/113			12:53																									
CCB 280-423433/114			12:55																									
ZZZZZZ			12:56																									

Prep Types:
T = Total/NA

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: 9034

Start Date: 07/24/2018 14:58 End Date: 07/24/2018 14:58

Lab Sample Id	D/F	Type	Time	Analytes																								
				S2																								
ZZZZZZ			14:58																									
ZZZZZZ			14:58																									
ZZZZZZ			14:58																									
ZZZZZZ			14:58																									
ZZZZZZ			14:58																									
ZZZZZZ			14:58																									
ZZZZZZ			14:58																									
ZZZZZZ			14:58																									
MB 280-423448/1-A	1	T	14:58	X																								
LCS 280-423448/2-A	1	T	14:58	X																								
160-29498-4	1	T	14:58	X																								
160-29498-4 MS	1	T	14:58	X																								
160-29498-4 MSD	1	T	14:58	X																								
ZZZZZZ			14:58																									

Prep Types:
T = Total/NA

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: 9066

Start Date: 08/07/2018 18:19 End Date: 08/07/2018 18:31

Lab Sample Id	D/F	Type	Time	Analytes																								
				PhenT																								
ICV 490-534505/1	1		18:19	X																								
ICB 490-534505/2	1		18:20	X																								
CCV 490-534505/3	1		18:21	X																								
CCB 490-534505/4	1		18:22	X																								
MB 490-534142/1-A	1	T	18:23	X																								
LCS 490-534142/2-A	1	T	18:24	X																								
160-29498-2	1	T	18:25	X																								
160-29498-2 MS	1	T	18:26	X																								
160-29498-2 MSD	1	T	18:27	X																								
ZZZZZZ			18:28																									
CCV 490-534505/11			18:29																									
CCV 490-534505/12	1		18:30	X																								
CCB 490-534505/13	1		18:31	X																								

Prep Types:
T = Total/NA

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: 9023

Start Date: 07/19/2018 15:56 End Date: 07/25/2018 12:03

Lab Sample Id	D/F	Type	Time	Analytes
				EOH
ZZZZZZ			15:56	
CCV 490-530916/2	1		15:56	X
MB 490-530110/1-A	1	T	15:56	X
LCS 490-530110/2-A	1	T	15:56	X
CCV 490-530916/5	1		15:56	X
CCB 490-530916/6	1		15:56	X
ZZZZZZ			15:56	
ZZZZZZ			15:56	
560-74639-A-14-B MS	1	T	15:56	X
560-74639-A-14-C MSD	1	T	15:56	X
ZZZZZZ			15:56	
ZZZZZZ			15:56	
ZZZZZZ			15:56	
ZZZZZZ			15:56	
CCV 490-530916/15	1		15:56	X
CCB 490-530916/16	1		15:56	X
CCV 490-530916/17	1		15:56	X
CCB 490-530916/18	1		15:56	X
ZZZZZZ			15:56	
ZZZZZZ			15:56	
ZZZZZZ			15:56	
ZZZZZZ			15:56	
ZZZZZZ			15:56	
LCSD 490-530110/3-A	1	T	15:56	X
CCB 490-530916/25	1		15:56	X
CCV 490-530916/26	1		12:03	X
CCB 490-530916/27	1		12:03	X
160-29498-4	1	T	12:03	X
ZZZZZZ			12:03	
ZZZZZZ			12:03	
ZZZZZZ			12:03	
ZZZZZZ			12:03	
ZZZZZZ			12:03	
CCV 490-530916/34	1		12:03	X
CCB 490-530916/35	1		12:03	X
ZZZZZZ			12:03	

Prep Types:
T = Total/NA

FORM XIII-IN

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Batch Number: 378201 Batch Start Date: 07/27/18 19:26 Batch Analyst: Banner, Justin C

Batch Method: 1010A Batch End Date: 07/28/18 01:11

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	InitialTemp	ObsFlash	p-Xylene 00013	
MB 160-378201/1		1010A		70 mL	70 mL	24 Celsius	>60 Celsius		
LCS 160-378201/2		1010A		70 mL	70 mL	19 Celsius	27 Celsius	70 mL	
160-29498-A-4	CRC-B23-0104	1010A	T	70 mL	70 mL	14 Celsius	>60 Celsius		
160-29498-A-4 DU	CRC-B23-0104	1010A	T	70 mL	70 mL	22 Celsius	>60 Celsius		

Batch Notes	
Barometer ID	Lambert Airport
Barometric Pressure - Corrected	763.27 mm Hg (sea-level) mmHg
Equipment ID	Pensky Marten Closed Cup
Thermometer ID	22235
Barometric Pressure - Uncorrected	748.00 mm Hg (Ambient) mmHg

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 St. Louis Job No.: 160-29498-1

SDG No.:

Batch Number: 378539 Batch Start Date: 07/27/18 19:26 Batch Analyst: Banner, Justin C

Batch Method: 1010A Batch End Date: 07/28/18 01:11

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	InitialTemp	ObsFlash	p-Xylene 00013	
MB 160-378539/1		1010A		70 mL	70 mL	24 Celsius	>60 Celsius		
LCS 160-378539/2		1010A		70 mL	70 mL	19 Celsius	27 Celsius	70 mL	
160-29498-A-4	CRC-B23-0104	1010A	T	70 mL	70 mL	14 Celsius	>60 Celsius		
160-29498-A-4 DU	CRC-B23-0104	1010A	T	70 mL	70 mL	22 Celsius	>60 Celsius		

Batch Notes	
Barometer ID	Lambert Airport
Barometric Pressure - Corrected	763.27 mm Hg (sea-level) mmHg
Equipment ID	Pensky Marten Closed Cup
Thermometer ID	22235
Barometric Pressure - Uncorrected	748.00 mm Hg (Ambient) mmHg

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 St. Louis Job No.: 160-29498-1

SDG No.:

Batch Number: 376770 Batch Start Date: 07/19/18 20:42 Batch Analyst: Banner, Justin C

Batch Method: DILeach_Prep Batch End Date: 07/19/18 20:57

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount				
160-29498-A-2	CRC-B21-0205	DILeach_Prep, 9045D	T	20.0459 g	20 mL				
160-29498-A-2 DU	CRC-B21-0205	DILeach_Prep, 9045D	T	19.9936 g	20 mL				

Batch Notes	
Balance ID	1123051741

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 St. Louis Job No.: 160-29498-1

SDG No.:

Batch Number: 376775 Batch Start Date: 07/19/18 23:06 Batch Analyst: Banner, Justin C

Batch Method: 9045D Batch End Date: 07/19/18 23:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	SampleTemp	pH Buffer 7SS 00034		
ICV 160-376775/4		9045D		20 mL	20 mL	26.3 Celsius	20 mL		
LCS 160-376775/5		9045D		20 mL	20 mL	26.3 Celsius	20 mL		
160-29498-A-2-B	CRC-B21-0205	9045D	T	20.0459 g	20 mL	26.5 Celsius			
160-29498-A-2-C DU	CRC-B21-0205	9045D	T	19.9936 g	20 mL	26.5 Celsius			
CCV 160-376775/8		9045D		20 mL	20 mL	26.2 Celsius	20 mL		

Batch Notes	
Balance ID	1123051741
pH Buffer 1 ID	1392657 (4)
pH Buffer 2 ID	1392658 (7)
pH Buffer 3 ID	1314555 (10)
pH Buffer 4 ID	1308833 (7 SS)
Calibration Date and Time	07/19/2018 23:06
pH Meter Calibration Slope	98.1
pH Meter ID	5STAR#4
Pipette/Syringe/Dispenser ID	WC001
Probe ID	Orion pH Probe
Sufficient volume for sample dup	Yes
Thermometer ID	Orion pH Probe

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 St. Louis Job No.: 160-29498-1

SDG No.:

Batch Number: 381470 Batch Start Date: 08/09/18 18:34 Batch Analyst: Banner, Justin C

Batch Method: 9095B Batch End Date: 08/09/18 19:06

Lab Sample ID	Client Sample ID	Method Chain	Basis	FinalAmount	FreeLiquid				
160-29498-A-2	CRC-B21-0205	9095B	T	100.3450 g	0 mL				
160-29498-A-2 DU	CRC-B21-0205	9095B	T	103.4690 g	0 mL				

Batch Notes	
Batch Comment	Balance ID: 1123051741

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 St. Louis Job No.: 160-29498-1

SDG No.:

Batch Number: 376332 Batch Start Date: 07/17/18 16:08 Batch Analyst: Galow, Stacy L

Batch Method: Moisture Batch End Date: 07/18/18 18:24

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
160-29498-A-1	CRC-B20-0206	Moisture	T	1	1.0354 g	15.1080 g	13.8894 g		
160-29498-A-2	CRC-B21-0205	Moisture	T	2	1.0522 g	20.9198 g	19.7670 g		
160-29498-C-3	CRC-B22-0105	Moisture	T	3	1.0414 g	14.5116 g	13.5233 g		
160-29498-A-4	CRC-B23-0104	Moisture	T	4	1.0383 g	19.5124 g	17.4230 g		
160-29498-A-4 DU	CRC-B23-0104	Moisture	T	5	1.0257 g	16.1634 g	14.6152 g		

Batch Notes	
Balance ID	0034150065
Date and Time Samples in Desiccator	07/18/2018 18:24
Date and Time Samples out of Desiccator	07/18/2018 18:24
Date samples were placed in the oven	07/17/2018
Oven Temp In	103 Degrees C
Time samples were place in the oven	16:39
Date samples were removed from oven	07/18/2018
Oven Temp Out	103 Degrees C
Time Samples were removed from oven	18:24
Oven ID	OA
Thermometer ID	A142186

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 Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423359 Batch Start Date: 07/24/18 07:38 Batch Analyst: Hirshman, Philip A

Batch Method: 9012A Batch End Date: 07/24/18 11:15

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	SulfideCheck	ChlorineCheck	DistillpHCheck	CN 10ppm 00305
HLCS 280-423359/1		9012A, 9012A		1 g	50 mL	N	N	>12	1.75 mL
LLCS 280-423359/2		9012A, 9012A		1 g	50 mL	N	N	>12	0.5 mL
LCS 280-423359/3		9012A, 9012A		1 g	50 mL	N	N	>12	
MB 280-423359/4		9012A, 9012A		1 g	50 mL	N	N	>12	
280-111993-A-1-B MS		9012A, 9012A	T	1.0117 g	50 mL	N	N	>12	
160-29498-C-2	CRC-B21-0205	9012A, 9012A	T	1.1202 g	50 mL	N	N	>12	

Lab Sample ID	Client Sample ID	Method Chain	Basis	CN ICV Int 00493					
HLCS 280-423359/1		9012A, 9012A							
LLCS 280-423359/2		9012A, 9012A							
LCS 280-423359/3		9012A, 9012A		0.5 mL					
MB 280-423359/4		9012A, 9012A							
280-111993-A-1-B MS		9012A, 9012A	T	0.5 mL					
160-29498-C-2	CRC-B21-0205	9012A, 9012A	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.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423359 Batch Start Date: 07/24/18 07:38 Batch Analyst: Hirshman, Philip A

Batch Method: 9012A Batch End Date: 07/24/18 11:15

Batch Notes	
Balance ID	M19170
Batch Comment	AA training PH/AW
Bismuth Nitrate ID	Bismuth N_00025
Cadmium Carbonate ID	CAD CHL CN_00004
Chlorination End Time	06/29/2018 00:00
Chlorination Start Time	07/23/2018 00:00
Distillation End Time	07/24/2018 11:15
Distillation Start Time	07/24/2018 07:38
Magnesium Chloride Reagent ID Number	Mag Chloride_00081
Sodium Hydroxide ID	2 % NaOH_00334
Pipette/Syringe/Dispenser ID	BMF1000 BMF5000
Sulfamic Acid ID	Sulfamic Acid_00090
Sulfuric Acid Reagent ID Number	Sulfuric Acid_00213

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 Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423433 Batch Start Date: 07/24/18 09:40 Batch Analyst: Hirshman, Philip A

Batch Method: 9012A Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	CN CAL 1 ppm 01403	CN ICV Daily 01169		
ICV 280-423433/14		9012A		50 mL	50 mL		50 mL		
ICB 280-423433/15		9012A		50 mL	50 mL				
CCV 280-423433/29		9012A		50 mL	50 mL	10 mL			
CCB 280-423433/30		9012A		50 mL	50 mL				
HLCS 280-423359/1-A		9012A		50 mL	50 mL				
LLCS 280-423359/2-A		9012A		50 mL	50 mL				
LCS 280-423359/3-A		9012A		50 mL	50 mL				
MB 280-423359/4-A		9012A		50 mL	50 mL				
CCV 280-423433/44		9012A		50 mL	50 mL	10 mL			
CCB 280-423433/45		9012A		50 mL	50 mL				
CCV 280-423433/59		9012A		50 mL	50 mL	10 mL			
CCB 280-423433/60		9012A		50 mL	50 mL				
280-111993-A-1-L MS		9012A	T	50 mL	50 mL				
160-29498-C-2-B	CRC-B21-0205	9012A	T	50 mL	50 mL				
CCV 280-423433/71		9012A		50 mL	50 mL	10 mL			
CCB 280-423433/72		9012A		50 mL	50 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.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423433 Batch Start Date: 07/24/18 09:40 Batch Analyst: Hirshman, Philip A

Batch Method: 9012A Batch End Date:

Batch Notes	
Batch Comment	AA training PH
Buffer Reagent ID	CN Buffer_00114
Chloramine-T ID	CN Chlor-T_00961
Sodium Hydroxide ID	1%NaOH_00340
Pipette/Syringe/Dispenser ID	BMF1000 BMF5000
Pyridine-Barbituric Acid ID	CN Pyr/Barb_00197

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 Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423448 Batch Start Date: 07/24/18 14:43 Batch Analyst: Weigand, Adam W

Batch Method: 9030B Batch End Date: 07/24/18 16:13

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	DistillUnitPort	Final pH	SFD CAL INT 01521	
MB 280-423448/1		9030B, 9034		10 g	50 mL	1	<2 SU		
LCS 280-423448/2		9030B, 9034		10 g	50 mL	2	<2 SU	1 mL	
160-29498-C-4	CRC-B23-0104	9030B, 9034	T	10.05 g	50 mL	4	<2 SU		
160-29498-C-4 MS	CRC-B23-0104	9030B, 9034	T	10.02 g	50 mL	5	<2 SU	1 mL	
160-29498-C-4 MSD	CRC-B23-0104	9030B, 9034	T	10.08 g	50 mL	6	<2 SU	1 mL	

Batch Notes	
Formaldehyde ID	form_00105
Pipette ID	AZ1000, AZ5000
Sulfuric Acid Reagent ID Number	SulfuricAcid_00213
Zinc Acetate Buffer ID	znac_00100

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 Denver Job No.: 160-29498-1

SDG No.:

Batch Number: 423463 Batch Start Date: 07/24/18 14:43 Batch Analyst: Weigand, Adam W

Batch Method: 9034 Batch End Date: 07/24/18 16:13

Lab Sample ID	Client Sample ID	Method Chain	Basis	BuretStart1	BuretStop1	IodineAmount	TitrantVolume1	FinalAmount	AnalysisComment
MB 280-423448/1-A		9034		31.10 mL	32.10 mL	1 mL	1 mL	50 mL	
LCS 280-423448/2-A		9034		32.10 mL	34.60 mL	5 mL	2.5 mL	50 mL	
160-29498-C-4-A	CRC-B23-0104	9034	T	34.60 mL	35.70 mL	3 mL	1.1 mL	50 mL	3mL Iodine required for color change
160-29498-C-4-B MS	CRC-B23-0104	9034	T	35.70 mL	37.70 mL	4 mL	2 mL	50 mL	
160-29498-C-4-C MSD	CRC-B23-0104	9034	T	37.70 mL	39.70 mL	4 mL	2 mL	50 mL	

Batch Notes	
Hydrochloric Acid ID	HCL Sol_00159
Iodine ID	Iod_00202
Normality of Iodine Solution	0.0250 N
Sodium Thiosulfate ID	Na Thio_00133
Pipette/Syringe/Dispenser ID	AZ1000, AZ5000
Starch Reagent ID	Starch Ind_00049
Normality of First Titrant	0.0250 N
Zinc Acetate Buffer ID	znac_00100

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.: 160-29498-1

SDG No.:

Batch Number: 534142 Batch Start Date: 08/06/18 12:57 Batch Analyst: Tyus, Lashanda D

Batch Method: Distill/Phenol Batch End Date: 08/06/18 13:57

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Final pH	Phenol LCSINT 00028		
MB 490-534142/1		Distill/Phenol, 9066		1.00 g	50 mL				
LCS 490-534142/2		Distill/Phenol, 9066		1.00 g	50 mL		0.38 mL		
160-29498-E-2	CRC-B21-0205	Distill/Phenol, 9066	T	0.98 g	50 mL	4.03 SU			
160-29498-E-2 MS	CRC-B21-0205	Distill/Phenol, 9066	T	0.98 g	50 mL	4.03 SU	0.38 mL		
160-29498-E-2 MSD	CRC-B21-0205	Distill/Phenol, 9066	T	0.98 g	50 mL	4.03 SU	0.38 mL		

Batch Notes	
Acid used for pH adjustment	4492783
Balance ID	MS802S-B207710926
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.: 160-29498-1

SDG No.:

Batch Number: 534505 Batch Start Date: 08/07/18 18:19 Batch Analyst: Loggins, Shannon D

Batch Method: 9066 Batch End Date: 08/07/18 18:32

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	W_Phenol CCV 00010	W_Phenol STD 00001		
ICV 490-534505/1		9066		50 mL	50 mL		0.0375 mL		
ICB 490-534505/2		9066		50 mL	50 mL				
CCV 490-534505/3		9066		50 mL	50 mL	0.5 mL			
CCB 490-534505/4		9066		50 mL	50 mL				
MB 490-534142/1-A		9066		50 mL	50 mL				
LCS 490-534142/2-A		9066		50 mL	50 mL				
160-29498-E-2-A	CRC-B21-0205	9066	T	50 mL	50 mL				
160-29498-E-2-B MS	CRC-B21-0205	9066	T	50 mL	50 mL				
160-29498-E-2-C MSD	CRC-B21-0205	9066	T	50 mL	50 mL				
CCV 490-534505/12		9066		50 mL	50 mL	0.5 mL			
CCB 490-534505/13		9066		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.: 160-29498-1

SDG No.:

Batch Number: 530110 Batch Start Date: 07/19/18 14:45 Batch Analyst: Patel, Viren R

Batch Method: 9023 Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	W_EOX Spike S 00019			
MB 490-530110/1		9023, 9023		1.00 g	1 mL				
LCS 490-530110/2		9023, 9023		1.00 g	1 mL	1 mL			
LCSD 490-530110/3		9023, 9023		1.00 g	1 mL	1 mL			
560-74639-A-14 MS		9023, 9023	T	1.02 g	1 mL	1 mL			
560-74639-A-14 MSD		9023, 9023	T	1.02 g	1 mL	1 mL			
160-29498-B-4	CRC-B23-0104	9023, 9023	T	1.05 g	1 mL				

Batch Notes	
Ethyl Acetate ID	4450578
Ottawa Sand ID	3979651

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.: 160-29498-1

SDG No.:

Batch Number: 530916 Batch Start Date: 07/19/18 15:56 Batch Analyst: Patel, Viren R

Batch Method: 9023 Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	CalcMsg	W_EOX STD 00075		
CCV 490-530916/2		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank	5 mL		
MB 490-530110/1-A		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
LCS 490-530110/2-A		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
CCV 490-530916/5		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank	5 mL		
CCB 490-530916/6		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
560-74639-A-14-B MS		9023	T	1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
560-74639-A-14-C MSD		9023	T	1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
CCV 490-530916/15		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank	5 mL		
CCB 490-530916/16		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
CCV 490-530916/17		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank	5 mL		
CCB 490-530916/18		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
LCSD 490-530110/3-A		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
CCB 490-530916/25		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
CCV 490-530916/26		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank	5 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.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Nashville Job No.: 160-29498-1

SDG No.:

Batch Number: 530916 Batch Start Date: 07/19/18 15:56 Batch Analyst: Patel, Viren R

Batch Method: 9023 Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	CalcMsg	W_EOX STD 00075		
CCB 490-530916/27		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
160-29498-B-4-A	CRC-B23-0104	9023	T	1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			
CCV 490-530916/34		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank	5 mL		
CCB 490-530916/35		9023		1.0 g	1.0 mL	Not Calculated. Nominal Amount left blank			

Batch Notes	
Perform Calculation (0=No, 1=Yes)	1

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.

Laboratory Bench Sheet
Flashpoint
Closed Cup: SW 1010A & ASTM D-93
Open Cup: ASTM D-92

Analyst:	**J Banner**	**BATCH #**	**378201**
Date:	**07/27/18**	**Sea Level Pressure (mbar)[1]**	**1017.6**
		Sea Level Pressure (mmHg)[2]	**763.27**

Sample ID	Start Temp	Observed Flashpoint	Ambient Barometric Pressure[3]	Corrected Flashpoint[4]	Comment
	℃	℃	mm Hg	℃	
MB	24.0	>60	748.00	>60	
LCS	19.0	27.0	748.00	27.4	
160-29498-A-4	14.0	>60	748.00	>60	
160-29498-A-4 DU	22.0	>60	748.00	>60	
680-155352-A-1	9.0	>60	748.00	>60	
680-155352-A-2	8.0	>60	748.00	>60	
680-155352-A-3	9.0	>60	748.00	>60	
160-29656-C-3	9.0	>60	748.00	>60	
160-29656-A-4	22.0	>60	748.00	>60	
160-29595-C-1	8.0	>60	748.00	>60	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	
			0.00	0.0	

1) The barometric pressure reading is taken from Lambert-St. Louis International Airport. This data is found at http://w1.weather.gov/data/obhistory/KSTL.html
2) 1 mbar = 0.75006 mm Hg

3) The sea level to ambient barometric pressure conversion factor for St. Louis is 0.98. This is calculated using data found at http://dnr.wi.gov/regulations/labcert/BODCalibration2.html
Correction Factor = [760 - (Altitude X 0.026)] / 760
Altitude of Lambert- St. Louis International Airport = 563' (Altitude was obtained at https://viewer.nationalmap.gov/theme/elevation)
Correction Factor = [760 - (563 X 0.026)] / 760 = 0.98

4) The equation for corrected flashpoint is taken from the ASTM methods D92 and D93.
Corrected Flashpoint = C + 0.033 * (760 - P)
C = observed flash point, °C
P = ambient barometric pressure, mmHg

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Colorimetric Cyanide Data Review Checklist

LIMS Prep Batch #: 423209/423359 423384 LIMS Analytical Batch #: 423433	SOP No.: DV-WC-21	Instrument ID: Alp1
Analyst/1st Reviewer/Date: AA training PH 7-26-18	QC Type (circle): Standard DOD Q4 DoD Q5 QAPP_____ Other_____	
Method:(circle): 335.1 335.4 9012A 9012B 4500 CN-E 4500CN-G 4500CN-I 9012A/B-nonamenable		
Matrix (circle): Water Solid Waste Leachate		Circle: Total Amenable WAD Free CN

Review Items	Yes	No	NA	2nd Rev	If No, why is data reportable?
A. Calibration/Instrument Run QC					
1. Verify intermediate standards for correct concentration stated in SOP (ICAL pts at correct concentration)	✓			✓	
2. Frequency: Daily	✓			✓	
3. Number of Points: 1st order: 5 standards; 2nd order: 6 standards	✓			✓	
4. Linearity and intercept: r ≥ 0.995 and |x-intercept| < ½ RL	✓			✓	
5. ICV, second source: run before samples (90-110% recovery)	✓			✓	
6. CCV: 10% frequency & closing, (90-110% recovery)	✓			✓	
7. Distilled check standard, high and low concentration: HLCS - 90-110% recovery LLCS: 90-110% recovery (335.4, DoD) Note: LLCSREC value in TALS is for LOQV assessment.	✓			✓	
8. ICB/CCB: run before samples, 10% frequency, & closing Result < ½ RL; DoD < LOD	✓			✓	
B. Client Sample and QC Sample Results					
9. Samples with results > linear range diluted and reanalyzed?	✓			✓	Comments:
10. On-instrument response of diluted sample is >10X MB on-instrument response	✓			✓	Comments:
C. Preparation/Matrix QC					
11. Method Blank: one per preparation batch Result < ½ RL *If no, list blank ID & explain:*	✓			✓	□ No analyte > RL in associated samples □ Sample results >10x blank □ Insufficient sample for reanalysis
12. LCS: one per preparation batch 90-110% recovery (Total) / Lab limits (Amenable/WAD) DoD5: 83-116%(water); 76-120% (solid) *If no, list LCS ID & explain:*	✓			✓	□ Insufficient sample for reanalysis □ LCS %R > QC limits & samples < RL
13. MS/MSD or Dup (amenable only) frequency: A pair per 10 samples *If no, list QC ID & explain:*	✓			✓	□ Insufficient sample

Review Items	Yes	No	NA	2nd Rev	If No, why is data reportable?
14. MS/MSD recovery & RPD: 90-110% recovery (Total and Non-Amenable) Lab limits (Amenable, Free and WAD) DoD5: 83-116%(water); 76-120% (solid); RPD 20% 20% RPD *If no, list MS or MSD ID & explain:*	✓			✓	□ LCS acceptable – matrix effects □ Native analyte > 4x spike level □ Matrix effect and native analyte > 4x spike
D. Raw Data & TALS Data Entry					
15. Raw Data/Run Log					
a. Unused data is clearly identified	✓			✓	
b. All cross outs are initialed and dated	✓			✓	
c. Out of control QC is clearly identified	✓			✓	
d. Any data that has a qualifier is commented on with appropriate action taken	✓			✓	
e. The first page of the run includes the filename, instrument, and analyst initials/signature	✓			✓	
f. Analyst initials/signature provided	✓			✓	
16. TALS Samples Tab					
a. LIMS Sample IDs / Containers are correct	✓			✓	
b. Method and matrix are correct	✓			✓	
c. Date and time match raw data	✓			✓	
d. Dilutions are correct	✓			✓	
e. Correct suffix (MS/MSD/DU) designated (where applicable)	✓			✓	
17. TALS Worksheet Tab is complete and correct	✓			✓	
18. Sample pH, presence of chlorine/sulfide recorded in prep batch?	✓			✓	
19. NCM written for any samples needing preservation at the bench?	✓			✓	
20. TALS Reagent Tab is complete and correct	✓			✓	
21. TALS QC Links Tab is correct	✓			✓	
22. TALS Sample Results Tab					
a. All unused data are marked Rejected or Accepted	✓			✓	
b. All reported analytes are marked Primary or Secondary	✓			✓	
23. TALS Batch Information Screen documentation is complete	✓			✓	
24. TALS Status set to appropriate review level	✓			✓	
25. Historical Data Checker: Check historical data. Print charts for outliers. Take corrective action as is appropriate	✓			✓	
E. Final Report and NCMs (2nd level review only)					
26. Were all job/project requirements met?				✓	
27. Results for samples and QC correct on final report?				✓	
28. Are all necessary scanned documents in TALS?				✓	
29. NCMs reviewed for applicability, correct references to batches, grammar/typographical errors?				✓	
30. NCM written for any samples preserved at the bench?				✓	

Comments: _____

2nd Reviewer: CS **Review Date:** 7/27/18

Run Results Report

Facility Name
Facility Location
Department
Operator Name PH
Operator ID PH
Platform FS III/IV/3100
Software Rev Code 222
Data system ID 57

Result path C:\FLOW_4\C072418.RST
Sample table path C:\FLOW_4\c072418.tbl
Method path C:\FLOW_4\cyanide.mth
Date acquired 24-Jul-18
Time acquired 11:44

				Cyanide, Total		
Date	Time	Cup	Name	Response	Calc [ppb]	Flags
24-Jul-18	09:40	107	Sync	266883	383.103	
24-Jul-18	09:41	0	Carryover	189	-1.733	LO
24-Jul-18	09:43	0	Carryover	31	-1.962	LO
24-Jul-18	09:44	0	Baseline	0	-2.006	BL
24-Jul-18	09:46	101	CAL 0.00 ppb	568	-1.187	LO
24-Jul-18	09:47	102	CAL 10.0 ppb	7759	9.190	
24-Jul-18	09:49	103	CAL 20.0 ppb	15136	19.835	
24-Jul-18	09:50	104	CAL 50.0 ppb	35834	49.701	
24-Jul-18	09:52	105	CAL 100 ppb	71787	101.581	
24-Jul-18	09:53	106	Cal 200 ppb	141667	202.418	
24-Jul-18	09:55	107	Cal 400 ppb	277527	398.462	
24-Jul-18	09:56	0	BLK	-182	-2.268	LO
24-Jul-18	09:58	0	Baseline	0	-2.006	BL
24-Jul-18	09:59	108	ICV 100 ppb	73462	103.998	
24-Jul-18	10:01	0	ICB	-113	-2.170	LO
24-Jul-18	10:02	0	Baseline	0	-2.006	BL
24-Jul-18	10:04	113	HLCS 280-423209/1-A	247888	355.694	
24-Jul-18	10:05	114	LLCS 280-423209/2-A	70285	99.414	
24-Jul-18	10:07	115	LCS 280-423209/3-A	76383	108.213	
24-Jul-18	10:09	116	MB 280-423209/4-A	3338	2.811	
24-Jul-18	10:10	117	280-112035-D-19-D	1726	0.484	
24-Jul-18	10:12	118	280-112043-V-1-A	3368	2.854	
24-Jul-18	10:13	119	280-112043-V-1-B MS	73152	103.551	
24-Jul-18	10:15	120	280-112043-V-1-C MSD	74747	105.853	
24-Jul-18	10:16	121	280-112043-J-6-A	7495	8.809	
24-Jul-18	10:18	122	280-112080-M-1-A	1268	-0.177	LO
24-Jul-18	10:19	0	BLK	-29	-2.048	LO
24-Jul-18	10:21	0	baseline	0	-2.006	BL
24-Jul-18	10:22	109	CCV 200PPB	143247	204.697	
24-Jul-18	10:24	0	CCB	30	-1.963	LO
24-Jul-18	10:25	0	Baseline	0	-2.006	BL
24-Jul-18	10:30	123	280-112080-M-2-A	1477	0.125	
24-Jul-18	10:32	124	280-112080-M-3-A	6450	7.302	
24-Jul-18	10:33	125	280-112080-M-4-A	3103	2.471	
24-Jul-18	10:35	126	280-112080-M-5-A	2173	1.129	
24-Jul-18	10:36	127	HLCS 280-423359/1-A	255167	366.196	
24-Jul-18	10:38	128	LLCS 280-423359/2-A	78334	111.029	
24-Jul-18	10:39	129	LCS 280-423359/3-A	72336	102.374	
24-Jul-18	10:41	130	MB 280-423359/4-A	2201	1.170	
24-Jul-18	10:42	131	280-111920-A-7-K	39435	54.898	
24-Jul-18	10:44	132	280-111920-A-7-L MS	99463	141.518	
24-Jul-18	10:45	0	BLK	16	-1.983	LO
24-Jul-18	10:47	0	baseline	0	-2.006	BL
24-Jul-18	10:48	109	CCV 200PPB	147614	210.999	
24-Jul-18	10:50	0	CCB	-173	-2.256	LO
24-Jul-18	10:51	0	Baseline	0	-2.006	BL

Result path C:\FLOW_4\C072418.RST
Sample table path C:\FLOW_4\c072418.tbl
Method path C:\FLOW_4\cyanide.mth
Date acquired 24-Jul-18
Time acquired 11:44

				Cyanide, Total		
Date	Time	Cup	Name	Response	Calc [ppb]	Flags
24-Jul-18	10:56	133	280-111920-A-7-M MSD	105732	150.564	
24-Jul-18	10:58	134	280-111920-A-1-F	9841	12.195	
24-Jul-18	10:59	135	280-111920-A-2-F	10968	13.820	
24-Jul-18	11:01	136	280-111920-A-3-F	10266	12.807	
24-Jul-18	11:02	137	280-111920-A-4-F	34696	48.060	
24-Jul-18	11:04	138	280-111920-A-5-F	26262	35.889	
24-Jul-18	11:05	139	280-111920-A-6-H	45661	63.882	
24-Jul-18	11:07	140	280-111920-A-8-E	40104	55.864	
24-Jul-18	11:08	141	280-111920-A-9-E	41530	57.921	
24-Jul-18	11:10	142	280-111993-A-1-K	13039	16.808	
24-Jul-18	11:11	0	BLK	-39	-2.063	LO
24-Jul-18	11:13	0	baseline	0	-2.006	BL
24-Jul-18	11:14	109	CCV 200PPB	148375	212.097	
24-Jul-18	11:16	0	CCB	-5	-2.014	LO
24-Jul-18	11:17	0	Baseline	0	-2.006	BL
24-Jul-18	11:19	143	280-111993-A-1-L MS	96096	136.659	
24-Jul-18	11:20	144	280-111993-A-1-M MSD	81343	115.371	
24-Jul-18	11:22	145	280-111993-A-2-E	15388	20.198	
24-Jul-18	11:23	146	280-111993-A-3-E	9696	11.984	
24-Jul-18	11:25	147	280-112230-I-1-A	2565	1.694	
24-Jul-18	11:26	148	280-111930-C-1-A	17203	22.817	
24-Jul-18	11:28	149	160-29498-C-2-B	17253	22.890	
24-Jul-18	11:33	0	BLK	40	-1.948	LO
24-Jul-18	11:35	0	baseline	0	-2.006	BL
24-Jul-18	11:36	109	CCV 200PPB	149434	213.626	
24-Jul-18	11:38	0	CCB	51	-1.933	LO
24-Jul-18	11:39	0	Baseline	0	-2.006	BL

Cyanide, Total:Calibration 1: Peak 5-73

File name: C:\FLOW_4\C072418.RST
Date: 24-Jul-18
Operator: PH

*	Name	Conc	Height
*	CAL 0.00 ppb	0.000000	568.008545
*	CAL 10.0 ppb	10.000000	7759.027344
*	CAL 20.0 ppb	20.000000	15136.194336
*	CAL 50.0 ppb	50.000000	35833.847656
*	CAL 100 ppb	100.000000	71786.687500
*	Cal 200 ppb	200.000000	141667.156250
*	Cal 400 ppb	400.000000	277526.781250

Calib Coef:
y=bx+a
a: (intercept) 1.3904e+03
b: 6.9301e+02

Corr Coef: 0.999949

Carryover: 0.071%

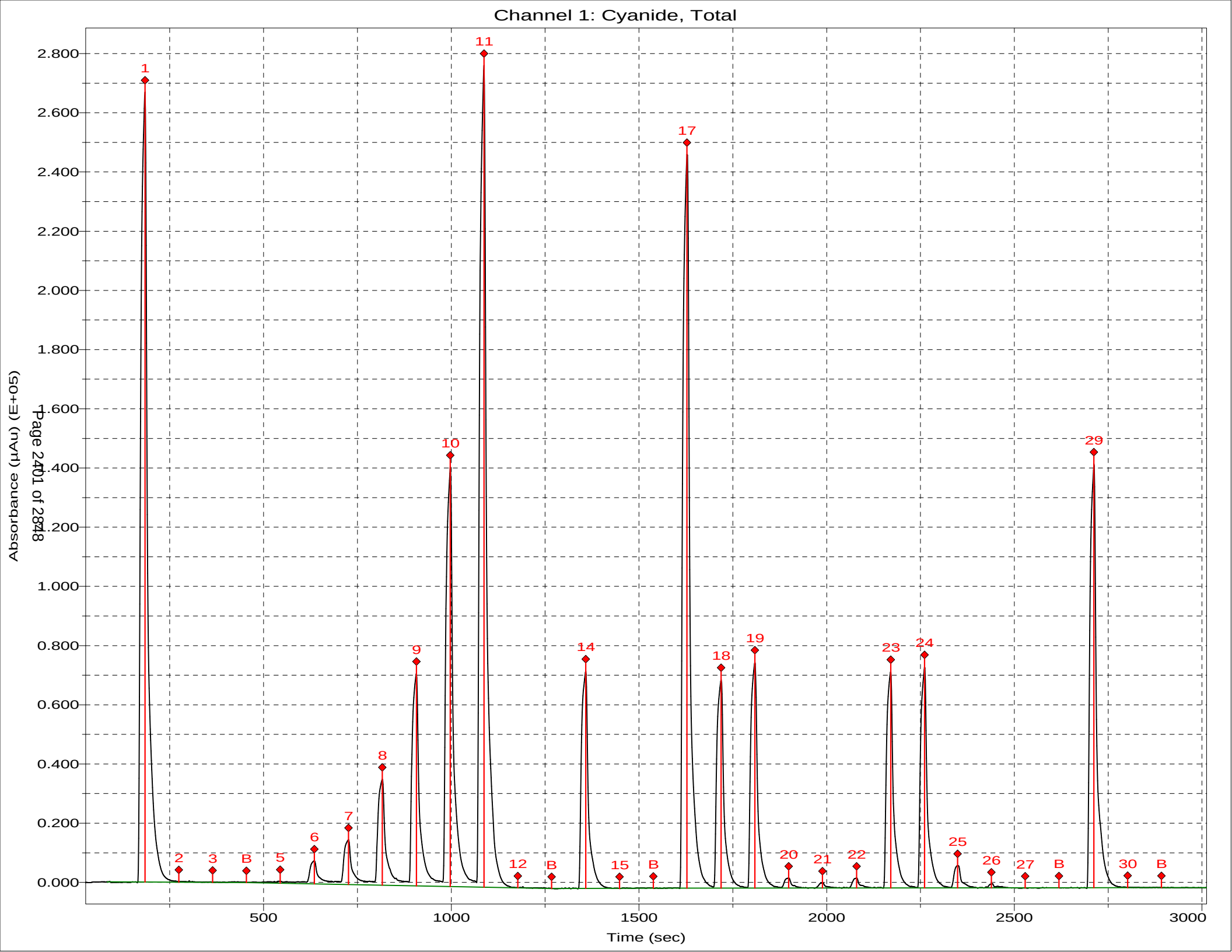
No Drift Peaks

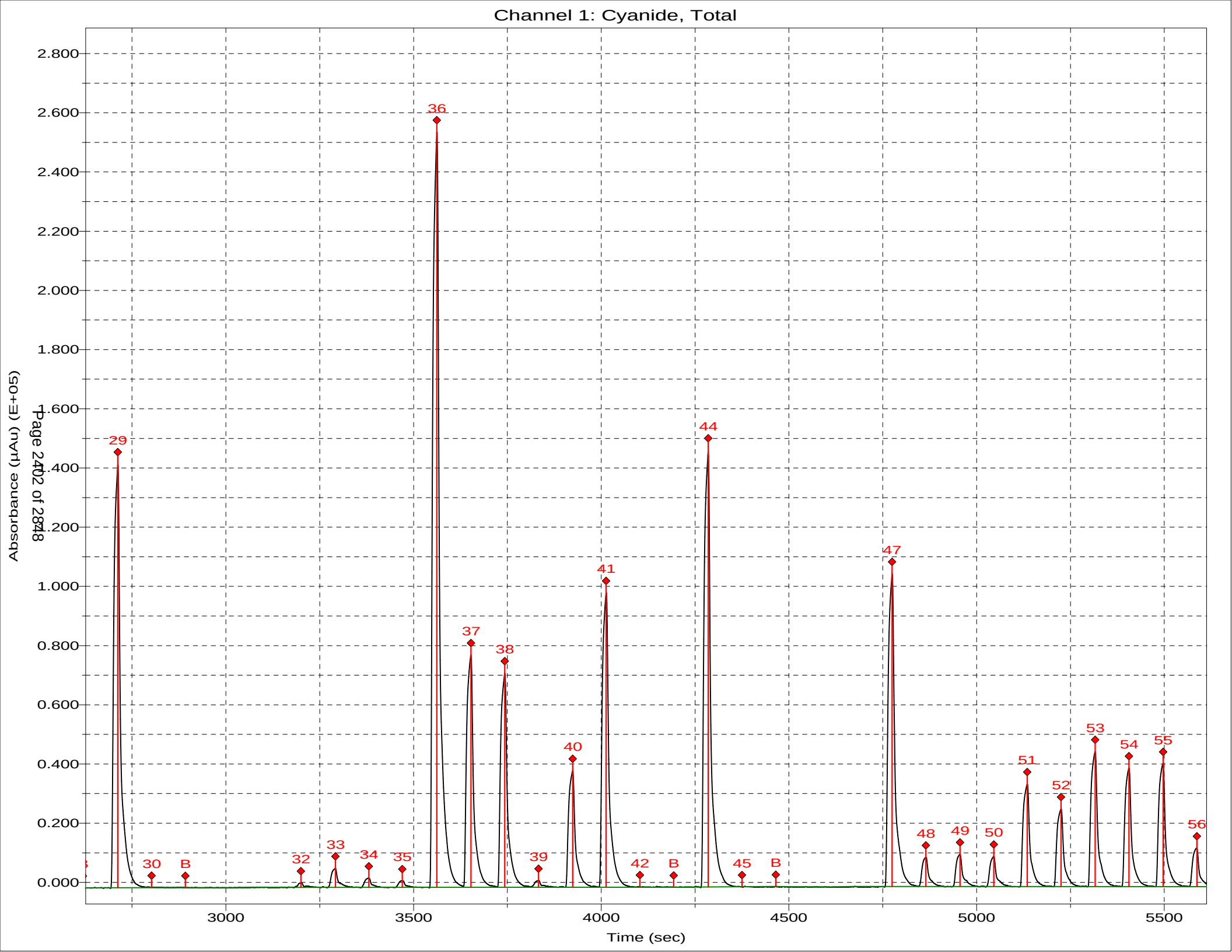
Peak Table:Cyanide, Total

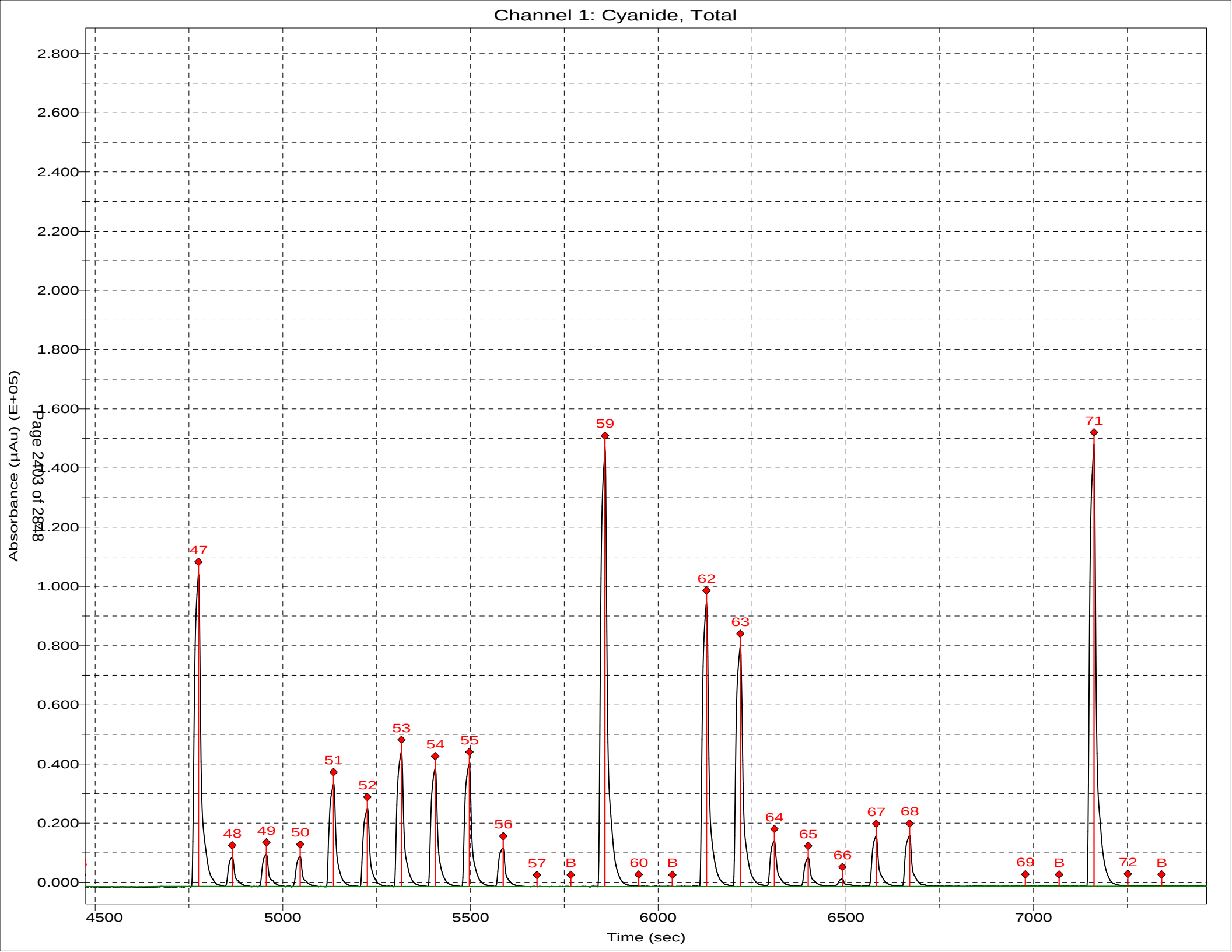
File name: C:\FLOW_4\C072418.RST
Date: 24-Jul-18
Operator: PH

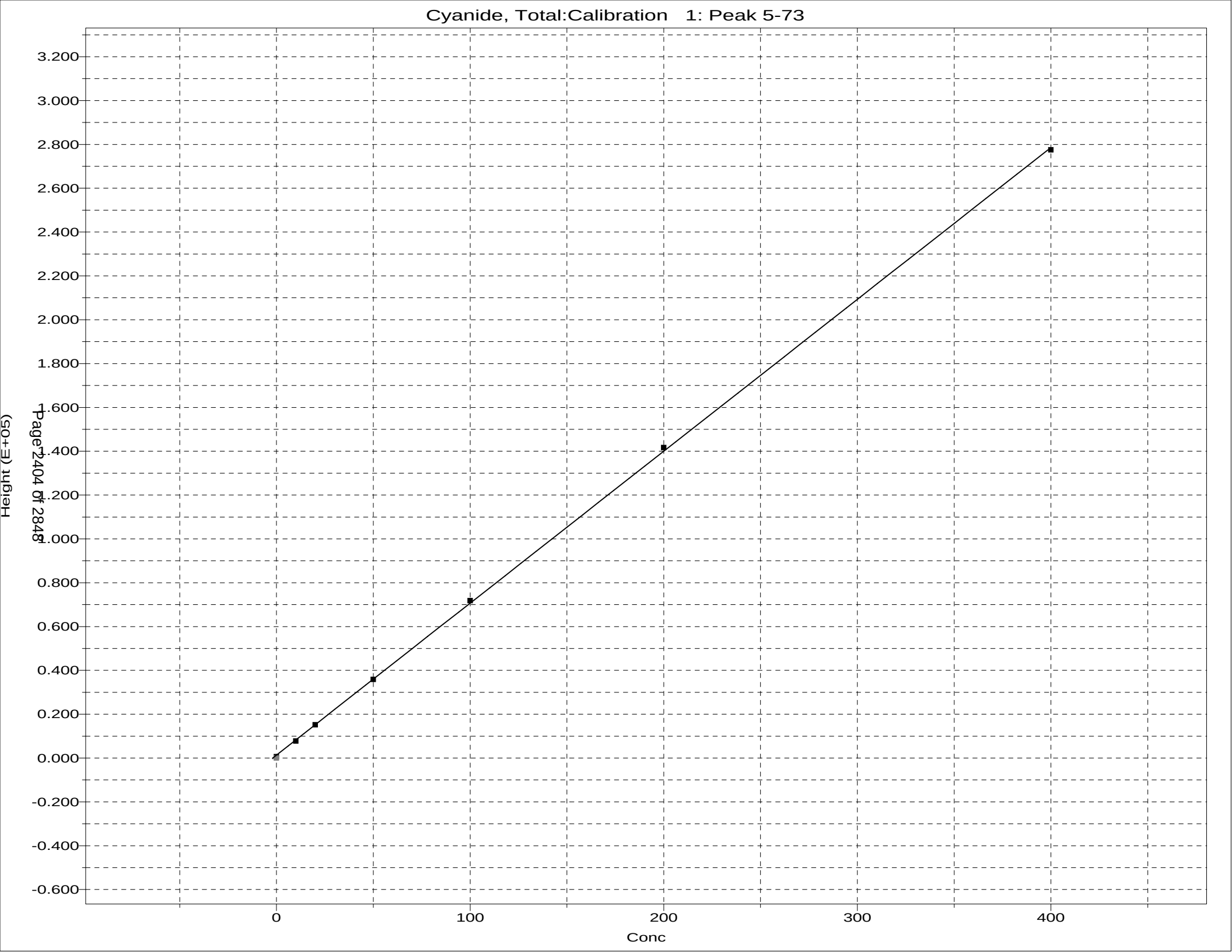
Peak	Cup	Name	R	Type	Dil	Wt	Height	Calc. (ppb)	Flags
1	107	Sync	1	SYNC	1	1	266883	383.102844	
2	0	Carryover	1	CO	1	1	189	-1.732996	LO
3	0	Carryover	2	CO	1	1	31	-1.961767	LO
B	0	Baseline	1	RB	1	1	0	-2.006359	BL
5	101	CAL 0.00 ppb	1	C	1	1	568	-1.186729	LO
6	102	CAL 10.0 ppb	1	C	1	1	7759	9.189830	
7	103	CAL 20.0 ppb	1	C	1	1	15136	19.834997	
8	104	CAL 50.0 ppb	1	C	1	1	35834	49.701477	
9	105	CAL 100 ppb	1	C	1	1	71787	101.581017	
10	106	Cal 200 ppb	1	C	1	1	141667	202.417740	
11	107	Cal 400 ppb	1	C	1	1	277527	398.461670	
12	0	BLK	1	BLNK	1	1	-182	-2.268476	LO
B	0	Baseline	1	RB	1	1	0	-2.006359	BL
14	108	ICV 100 ppb	1	CCV	1	1	73462	103.998253	
15	0	ICB	1	U	1	1	-113	-2.169550	LO
B	0	Baseline	1	RB	1	1	0	-2.006359	BL
17	113	HLCS 280-423209/1-A 1	U		1	1	247888	355.693512	
18	114	LLCS 280-423209/2-A 1	U		1	1	70285	99.414421	
19	115	LCS 280-423209/3-A 1	U		1	1	76383	108.213417	
20	116	MB 280-423209/4-A 1	U		1	1	3338	2.810902	
21	117	280-112035-D-19-D 1	U		1	1	1726	0.484132	
22	118	280-112043-V-1-A 1	U		1	1	3368	2.853636	
23	119	280-112043-V-1-B MS 1	U		1	1	73152	103.551414	
24	120	280-112043-V-1-C MSD 1	U		1	1	74747	105.853081	
25	121	280-112043-J-6-A 1	U		1	1	7495	8.808891	
26	122	280-112080-M-1-A 1	U		1	1	1268	-0.176697	LO
27	0	BLK	1	BLNK	1	1	-29	-2.047866	LO
B	0	baseline	1	RB	1	1	0	-2.006359	BL
29	109	CCV 200PPB	1	CCV	1	1	143247	204.697098	
30	0	CCB	1	U	1	1	30	-1.963402	LO
B	0	Baseline	1	RB	1	1	0	-2.006359	BL
32	123	280-112080-M-2-A 1	U		1	1	1477	0.124726	
33	124	280-112080-M-3-A 1	U		1	1	6450	7.301519	
34	125	280-112080-M-4-A 1	U		1	1	3103	2.470573	
35	126	280-112080-M-5-A 1	U		1	1	2173	1.129147	
36	127	HLCS 280-423359/1-A 1	U		1	1	255167	366.196442	
37	128	LLCS 280-423359/2-A 1	U		1	1	78334	111.028687	
38	129	LCS 280-423359/3-A 1	U		1	1	72336	102.373848	
39	130	MB 280-423359/4-A 1	U		1	1	2201	1.170146	
40	131	280-111920-A-7-K 1	U		1	1	39435	54.897694	
41	132	280-111920-A-7-L MS 1	U		1	1	99463	141.518295	
42	0	BLK	1	BLNK	1	1	16	-1.982555	LO
B	0	baseline	1	RB	1	1	0	-2.006359	BL
44	109	CCV 200PPB	1	CCV	1	1	147614	210.998642	
45	0	CCB	1	U	1	1	-173	-2.256180	LO
B	0	Baseline	1	RB	1	1	0	-2.006359	BL
47	133	280-111920-A-7-M MSD 1	U		1	1	105732	150.563858	
48	134	280-111920-A-1-F 1	U		1	1	9841	12.194507	
49	135	280-111920-A-2-F 1	U		1	1	10968	13.820010	
50	136	280-111920-A-3-F 1	U		1	1	10266	12.806763	
51	137	280-111920-A-4-F 1	U		1	1	34696	48.059998	
52	138	280-111920-A-5-F 1	U		1	1	26262	35.889297	
53	139	280-111920-A-6-H 1	U		1	1	45661	63.882126	
54	140	280-111920-A-8-E 1	U		1	1	40104	55.863750	
55	141	280-111920-A-9-E 1	U		1	1	41530	57.920570	
56	142	280-111993-A-1-K 1	U		1	1	13039	16.808483	
57	0	BLK	1	BLNK	1	1	-39	-2.062826	LO
B	0	baseline	1	RB	1	1	0	-2.006359	BL
59	109	CCV 200PPB	1	CCV	1	1	148375	212.097473	
60	0	CCB	1	U	1	1	-5	-2.014241	LO
B	0	Baseline	1	RB	1	1	0	-2.006359	BL
62	143	280-111993-A-1-L MS 1	U		1	1	96096	136.659302	
63	144	280-111993-A-1-M MSD 1	U		1	1	81343	115.371208	
64	145	280-111993-A-2-E 1	U		1	1	15388	20.198479	
65	146	280-111993-A-3-E 1	U		1	1	9696	11.984474	
66	147	280-112230-I-1-A 1	U		1	1	2565	1.694426	
67	148	280-111930-C-1-A 1	U		1	1	17203	22.817022	
68	149	160-29498-C-2-B 1	U		1	1	17253	22.889883	
69	0	BLK	1	BLNK	1	1	40	-1.948286	LO
B	0	baseline	1	RB	1	1	0	-2.006359	BL

Peak	Cup	Name	R	Type	Dil	Wt	Height	Calc. (ppb)	Flags
71	109	CCV 200PPB	1	CCV	1	1	149434	213.625702	
72	0	CCB	1	U	1	1	51	-1.932896	LO
B	0	Baseline	1	RB	1	1	0	-2.006359	BL


Channel 1: Cyanide, Total
Absorbance (µAu) (E+05)
Time (sec)
Page 2401 of 2848
2.800
2.600
2.400
2.200
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
500
1000
1500
2000
2500
3000
1
2
3
B
5
6
7
8
9
10
11
12
B
14
15
B
17
18
19
20
21
22
23
24
25
26
27
B
29
30
B


Channel 1: Cyanide, Total
Absorbance (µAu) (E+05)
Time (sec)
Page 2402 of 2848
2.800
2.600
2.400
2.200
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
3000
3500
4000
4500
5000
5500
29
30
B
32
33
34
35
36
37
38
39
40
41
42
B
44
45
B
47
48
49
50
51
52
53
54
55
56


Channel 1: Cyanide, Total
Absorbance (µAu) (E+05)
Time (sec)
2.800
2.600
2.400
2.200
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
4500
5000
5500
6000
6500
7000
47
48
49
50
51
52
53
54
55
56
57
B
59
60
B
62
63
64
65
66
67
68
69
B
71
72
B


Cyanide, Total:Calibration 1: Peak 5-73
3.200
3.000
2.800
2.600
2.400
2.200
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
-0.200
-0.400
-0.600
Height (E+05)
0
100
200
300
400
Conc

Run Results Report

Facility Name
Facility Location
Department
Operator Name PH
Operator ID PH
Platform FS III/IV/3100
Software Rev Code 222
Data system ID 57

Result path C:\FLOW_4\C072418A.RST
Sample table path C:\FLOW_4\c072418a.tbl
Method path C:\FLOW_4\cyanide.mth
Date acquired 24-Jul-18
Time acquired 13:01

				Cyanide, Total		
Date	Time	Cup	Name	Response	Calc [ppb]	Flags
24-Jul-18	11:51	107	Sync	305329	396.745	
24-Jul-18	11:52	0	Carryover	310	-1.000	LO
24-Jul-18	11:54	0	Carryover	-9	-1.417	LO
24-Jul-18	11:55	0	Baseline	0	-1.404	BL
24-Jul-18	11:57	101	CAL 0.00 ppb	429	-0.845	LO
24-Jul-18	11:58	102	CAL 10.0 ppb	8244	9.346	
24-Jul-18	12:00	103	CAL 20.0 ppb	16110	19.603	
24-Jul-18	12:01	104	CAL 50.0 ppb	39323	49.873	
24-Jul-18	12:03	105	CAL 100 ppb	78648	101.153	
24-Jul-18	12:04	106	Cal 200 ppb	156148	202.212	
24-Jul-18	12:06	107	Cal 400 ppb	306796	398.658	
24-Jul-18	12:07	0	BLK	-143	-1.591	LO
24-Jul-18	12:09	0	Baseline	0	-1.404	BL
24-Jul-18	12:10	108	ICV 100 ppb	82663	106.388	
24-Jul-18	12:12	0	ICB	-53	-1.474	LO
24-Jul-18	12:13	0	Baseline	0	-1.404	BL
24-Jul-18	12:15	201	HLCS 280-423384/1-A	284029	368.970	
24-Jul-18	12:16	202	LLCS 280-423384/2-A	83088	106.942	
24-Jul-18	12:18	203	LCS 280-423384/3-A	84914	109.323	
24-Jul-18	12:19	204	MB 280-423384/4-A	3111	2.653	
24-Jul-18	12:21	205	280-112081-D-1-A	1760	0.890	
24-Jul-18	12:22	206	280-112081-D-1-B MS	82506	106.184	
24-Jul-18	12:24	207	280-112081-D-1-C MSD	83978	108.103	
24-Jul-18	12:25	208	280-112081-D-2-A	1906	1.081	
24-Jul-18	12:27	209	280-112081-D-3-A	2494	1.848	
24-Jul-18	12:28	210	280-112081-D-4-A	2255	1.536	
24-Jul-18	12:30	0	BLK	3	-1.400	LO
24-Jul-18	12:31	0	baseline	0	-1.404	BL
24-Jul-18	12:33	109	CCV 200PPB	153680	198.994	
24-Jul-18	12:34	0	CCB	-115	-1.554	LO
24-Jul-18	12:36	0	Baseline	0	-1.404	BL
24-Jul-18	12:41	211	280-112081-D-5-A	1541	0.605	
24-Jul-18	12:43	212	280-112081-D-6-A	6253	6.749	
24-Jul-18	12:44	213	280-112160-A-1-A	2270	1.556	
24-Jul-18	12:46	214	280-112153-M-1-A	5632	5.940	
24-Jul-18	12:47	215	280-112153-M-2-A	5551	5.834	
24-Jul-18	12:49	216	280-112166-M-1-A	6232	6.722	
24-Jul-18	12:50	0	BLK	-69	-1.494	LO
24-Jul-18	12:52	0	baseline	0	-1.404	BL
24-Jul-18	12:53	109	CCV 200PPB	154815	200.475	
24-Jul-18	12:55	0	CCB	-54	-1.475	LO
24-Jul-18	12:56	0	Baseline	0	-1.404	BL

Cyanide, Total:Calibration   1: Peak 5-42

File name: C:\FLOW_4\C072418A.RST
Date: 24-Jul-18
Operator: PH

*	Name	Conc	Height
*	CAL 0.00 ppb	0.000000	429.388367
*	CAL 10.0 ppb	10.000000	8243.924805
*	CAL 20.0 ppb	20.000000	16109.885742
*	CAL 50.0 ppb	50.000000	39323.414062
*	CAL 100 ppb	100.000000	78648.257812
*	Cal 200 ppb	200.000000	156147.984375
*	Cal 400 ppb	400.000000	306796.125000

Calib Coef:
y=bx+a
a: (intercept) 1.0771e+03
b: 7.6687e+02

Corr Coef: 0.999963

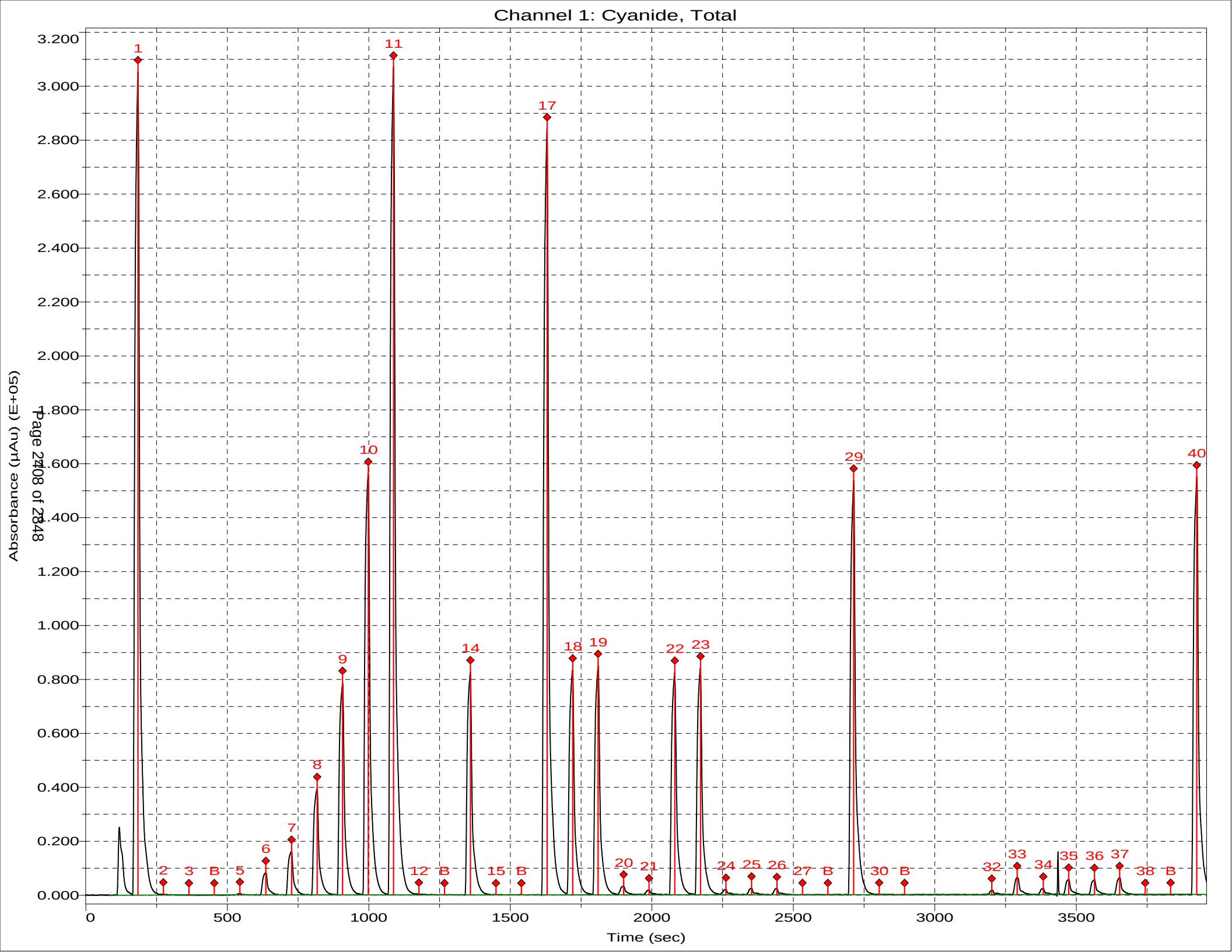
Carryover: 0.101%

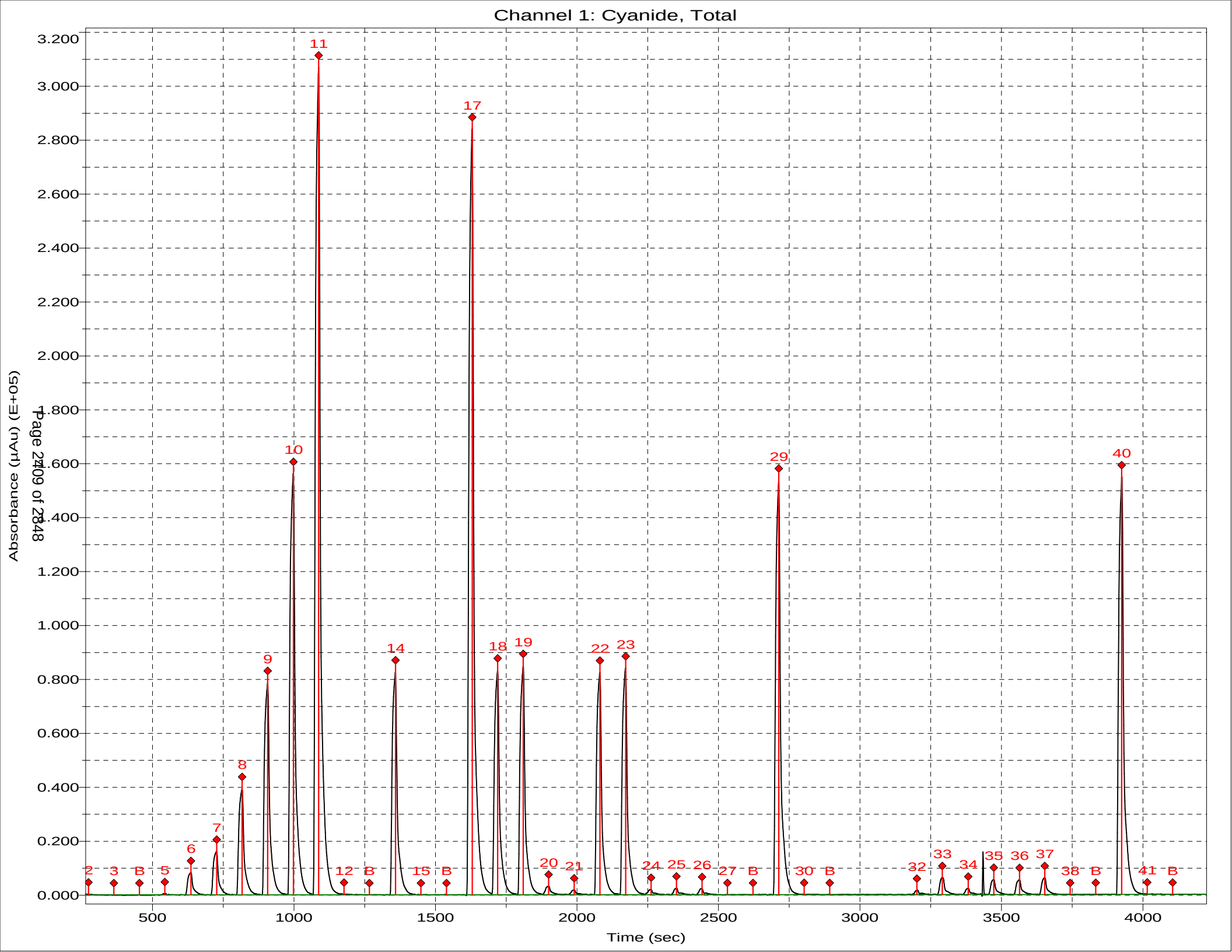
No Drift Peaks

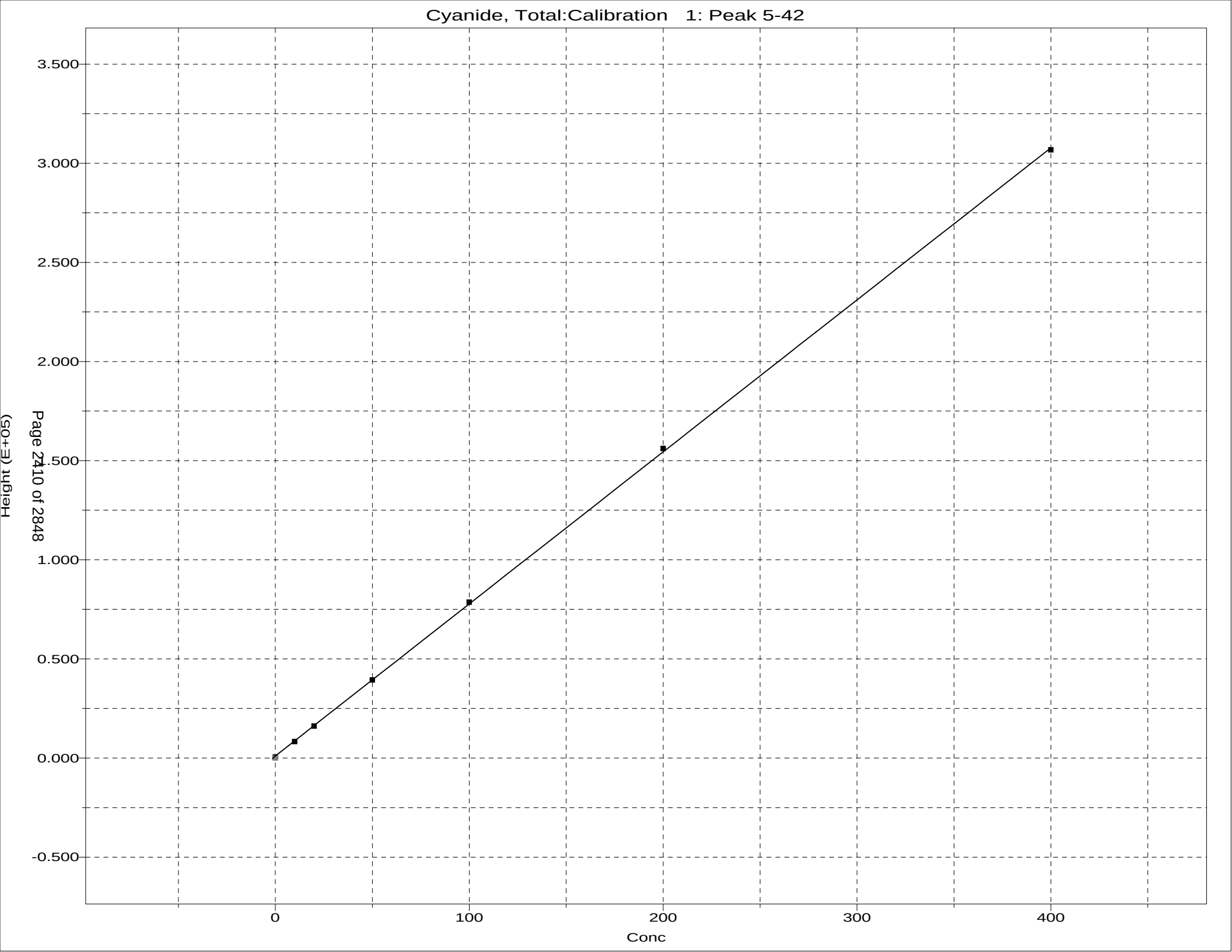
Peak Table:Cyanide, Total

File name: C:\FLOW_4\C072418A.RST
Date: 24-Jul-18
Operator: PH

Peak	Cup	Name	R	Type	Dil	Wt	Height	Calc. (ppb)	Flags
1	107	Sync	1	SYNC	1	1	305329	396.744995	
2	0	Carryover	1	CO	1	1	310	-1.000376	LO
3	0	Carryover	2	CO	1	1	-9	-1.416603	LO
B	0	Baseline	1	RB	1	1	0	-1.404473	BL
5	101	CAL 0.00 ppb	1	C	1	1	429	-0.844551	LO
6	102	CAL 10.0 ppb	1	C	1	1	8244	9.345603	
7	103	CAL 20.0 ppb	1	C	1	1	16110	19.602814	
8	104	CAL 50.0 ppb	1	C	1	1	39323	49.873253	
9	105	CAL 100 ppb	1	C	1	1	78648	101.152832	
10	106	Cal 200 ppb	1	C	1	1	156148	202.212463	
11	107	Cal 400 ppb	1	C	1	1	306796	398.657623	
12	0	BLK	1	BLNK	1	1	-143	-1.591069	LO
B	0	Baseline	1	RB	1	1	0	-1.404473	BL
14	108	ICV 100 ppb	1	CCV	1	1	82663	106.387817	
15	0	ICB	1	U	1	1	-53	-1.473953	LO
B	0	Baseline	1	RB	1	1	0	-1.404473	BL
17	201	HLCS 280-423384/1-A 1	U		1	1	284029	368.969757	
18	202	LLCS 280-423384/2-A 1	U		1	1	83088	106.942184	
19	203	LCS 280-423384/3-A 1	U		1	1	84914	109.323067	
20	204	MB 280-423384/4-A 1	U		1	1	3111	2.652555	
21	205	280-112081-D-1-A 1	U		1	1	1760	0.890266	
22	206	280-112081-D-1-B MS 1	U		1	1	82506	106.183708	
23	207	280-112081-D-1-C MSD 1	U		1	1	83978	108.102531	
24	208	280-112081-D-2-A 1	U		1	1	1906	1.081025	
25	209	280-112081-D-3-A 1	U		1	1	2494	1.847580	
26	210	280-112081-D-4-A 1	U		1	1	2255	1.536392	
27	0	BLK	1	BLNK	1	1	3	-1.400399	LO
B	0	baseline	1	RB	1	1	0	-1.404473	BL
29	109	CCV 200PPB	1	CCV	1	1	153680	198.993759	
30	0	CCB	1	U	1	1	-115	-1.554399	LO
B	0	Baseline	1	RB	1	1	0	-1.404473	BL
32	211	280-112081-D-5-A 1	U		1	1	1541	0.604666	
33	212	280-112081-D-6-A 1	U		1	1	6253	6.748846	
34	213	280-112160-A-1-A 1	U		1	1	2270	1.555616	
35	214	280-112153-M-1-A 1	U		1	1	5632	5.940118	
36	215	280-112153-M-2-A 1	U		1	1	5551	5.834336	
37	216	280-112166-M-1-A 1	U		1	1	6232	6.721618	
38	0	BLK	1	BLNK	1	1	-69	-1.494177	LO
B	0	baseline	1	RB	1	1	0	-1.404473	BL
40	109	CCV 200PPB	1	CCV	1	1	154815	200.474762	
41	0	CCB	1	U	1	1	-54	-1.474841	LO
B	0	Baseline	1	RB	1	1	0	-1.404473	BL


Channel 1: Cyanide, Total
Absorbance (µAu) (E+05)
Time (sec)
Page 2408 of 2848
3.200
3.000
2.800
2.600
2.400
2.200
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
0
500
1000
1500
2000
2500
3000
3500
1
2
3
B
5
6
7
8
9
10
11
12
B
14
15
B
17
18
19
20
21
22
23
24
25
26
27
B
29
30
B
32
33
34
35
36
37
38
B
40


Channel 1: Cyanide, Total
Absorbance (µAu) (E+05)
Time (sec)
3.200
3.000
2.800
2.600
2.400
2.200
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
500
1000
1500
2000
2500
3000
3500
4000
2 3 B 5 6 7 8 9 10 11 12 B 14 15 B 17 18 19 20 21 22 23 24 25 26 27 B 29 30 B 32 33 34 35 36 37 38 B 40 41 B


Cyanide, Total:Calibration 1: Peak 5-42
3.500
3.000
2.500
2.000
1.500
1.000
0.500
0.000
-0.500
Height (E+05)
0
100
200
300
400
Conc

Sulfide by Titration

Analyst:	AW	SOP Information:	
Date:	7/24/2018	Number:	91

Titration Solutions		Calibration Information	
Solution 1:	Iodine	Source/Ver-Lot#:	INT_01521
TALS ID	Iod_00202	Prep Date:	7/13/2018
Normality:	0.025	Made By:	AW
Solution 2:	sodium thiosulfate	Concentration:	1140
TALS ID	Na Thio_00133	Expiration Date:	10/13/2018
Normality:	0.025		
	Starch Indicator		
TALS ID	Starch Ind_00049		

ICV Information	
Source/Ver-Lot#:	
Prep Date:	
Made By:	
Concentration:	#DIV/0!
Expiration Date:	

	CAL Volume	Buret Start	Buret End	mL Iodine	Final mL	Conc mg/L
CAL	5	30.00	35.70	20	5.70	1144.000
CAL	5	35.70	41.50	20	5.80	1136.000

For SM4500 S2 D colorimetric

	CAL Volume	Buret Start	Buret End	mL Iodine	Final mL	Conc mg/L
ICV					0.00	#DIV/0!
ICV					0.00	#DIV/0!

TALS Raw Data Report

Job Number: 280-112225-1
LIMS Batch: 423463
Equipment: NOEQUIP

Laboratory: TestAmerica Denver

RS# 1 Lab ID: **MB 280-423451/1-A** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		0 mg/L	1.9 U mg/L				
Sulfide as H2S		0 mg/L	2.0 U mg/L				

RS# 2 Lab ID: **LCS 280-423451/2-A** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		20.8 mg/L	mg/L	91	50 106		
Sulfide as H2S		22.1 mg/L	mg/L				

RS# 3 Lab ID: **280-112225-B-5-B** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		0 mg/L	1.9 U mg/L				
Sulfide as H2S		0 mg/L	2.0 U mg/L				

RS# 4 Lab ID: **280-112225-B-5-C MS** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		16.8 mg/L	mg/L	74	50 106		
Sulfide as H2S		17.85 mg/L	mg/L				

RS# 5 Lab ID: **280-112225-B-5-D MSD** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		17.6 mg/L	mg/L	77	50 106	5	20
Sulfide as H2S		18.7 mg/L	mg/L				

RS# 6 Lab ID: **280-112225-B-4-B** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		0 mg/L	1.9 U mg/L				
Sulfide as H2S		0 mg/L	2.0 U mg/L				

RS# 7 Lab ID: **280-112225-B-3-B** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		0 mg/L	1.9 U mg/L				
Sulfide as H2S		0 mg/L	2.0 U mg/L				

RS# 8 Lab ID: **280-112225-B-2-D** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		16 mg/L	mg/L				
Sulfide as H2S		17 mg/L	mg/L				

TALS Raw Data Report

Job Number: 280-112230-1
LIMS Batch: 423463
Equipment: NOEQUIP

Laboratory: TestAmerica Denver

RS# 9 Lab ID: **MB 280-423448/1-A** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		0 mg/L	10 U mg/Kg				
Sulfide as H2S		0 mg/L	mg/Kg				

RS# 10 Lab ID: **LCS 280-423448/2-A** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		20 mg/L	mg/Kg	88	38 104		
Sulfide as H2S		21.25 mg/L	mg/Kg				

RS# 11 Lab ID: **160-29498-C-4-A** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		15.2 mg/L	mg/Kg				
Sulfide as H2S		16.15 mg/L	mg/Kg				

RS# 12 Lab ID: **160-29498-C-4-B MS** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		16 mg/L	mg/Kg	4	38 104		
Sulfide as H2S		17 mg/L	mg/Kg				

RS# 13 Lab ID: **160-29498-C-4-C MSD** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		16 mg/L	mg/Kg	3	38 104	1	35
Sulfide as H2S		17 mg/L	mg/Kg				

RS# 14 Lab ID: **280-112230-E-1-A** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		0 mg/L	12 U mg/Kg				
Sulfide as H2S		0 mg/L	mg/Kg				

TALS Raw Data Report

Job Number: 280-29498-1
LIMS Batch: 423463
Equipment: NOEQUIP

Laboratory: TestAmerica Denver

RS# 9 Lab ID: **MB 280-423448/1-A** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		0 mg/L	2.4 U mg/Kg				
Sulfide as H2S		0 mg/L	2.5 U mg/Kg				

RS# 10 Lab ID: **LCS 280-423448/2-A** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		20 mg/L	mg/Kg	88	38 104		
Sulfide as H2S		21.25 mg/L	mg/Kg				

RS# 11 Lab ID: **160-29498-C-4-A** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		15.2 mg/L	mg/Kg				
Sulfide as H2S		16.15 mg/L	mg/Kg				

RS# 12 Lab ID: **160-29498-C-4-B MS** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		16 mg/L	mg/Kg	4	38 104		
Sulfide as H2S		17 mg/L	mg/Kg				

RS# 13 Lab ID: **160-29498-C-4-C MSD** Inj Date: 7/24/2018 2:58:00PM Dil: 1.0 Meth: 9034

Analyte	Rspnse	Raw Res/Units	Final Res/Qual/Units	% Rec	Rec Lmt	% RPD	RPD Lmt
Sulfide		16 mg/L	mg/Kg	3	38 104	1	35
Sulfide as H2S		17 mg/L	mg/Kg				

Original Run Filename: OM_8-7-2018_06-19-14PM.OMN Created: 8/7/2018 6:19:14 PM
Original Run Author's Signature: [nvlwet]
Current Run Filename: OM_8-7-2018_06-19-14PM.OMN Last Modified: 8/7/2018 6:32:12 PM
Current Run Author's Signature: [NVLWET]
Description: Default New Run

Sample	Rep.	Cup No.	Channel 3 Phenol			Detection Time
			Conc. (mg/L)	Area (V.s)	Height (V)	
ICV	1	1	0.695	1.27	0.0945	8/7/2018@6:20:06 PM
Calibration:			Table/Fig. : 1			
ICB	1	2	1.03e-3	0.0141	1.12e-3	8/7/2018@6:20:58 PM
CCV	1	3	1.00	1.82	0.134	8/7/2018@6:21:49 PM
CCB	1	4	-3.33e-3	6.20e-3	8.00e-4	8/7/2018@6:22:42 PM
MB 490-534142/1-A	1	5	-2.75e-3	7.25e-3	7.60e-4	8/7/2018@6:23:34 PM
LCS 490-534142/2-A	1	6	0.704	1.28	0.0925	8/7/2018@6:24:26 PM
160-29498-E-2-A	1	7	0.0312	0.0684	4.55e-3	8/7/2018@6:25:17 PM
160-29498-E-2-B MS	1	8	0.800	1.45	0.101	8/7/2018@6:26:09 PM
160-29498-E-2-C MSD	1	9	0.331	0.608	0.0424	8/7/2018@6:27:00 PM
280-112479-B-3-A	1	10	0.733	1.33	0.0969	8/7/2018@6:27:52 PM
CCV	1	11	3.21	5.79	1.65	8/7/2018@6:28:44 PM
CCV	1	3	1.00	1.82	0.129	8/7/2018@6:29:36 PM
CCB	1	4	2.52e-3	0.0167	1.27e-3	8/7/2018@6:30:29 PM

Analyte Properties Table for : OM_8-7-2018_06-19-14PM.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

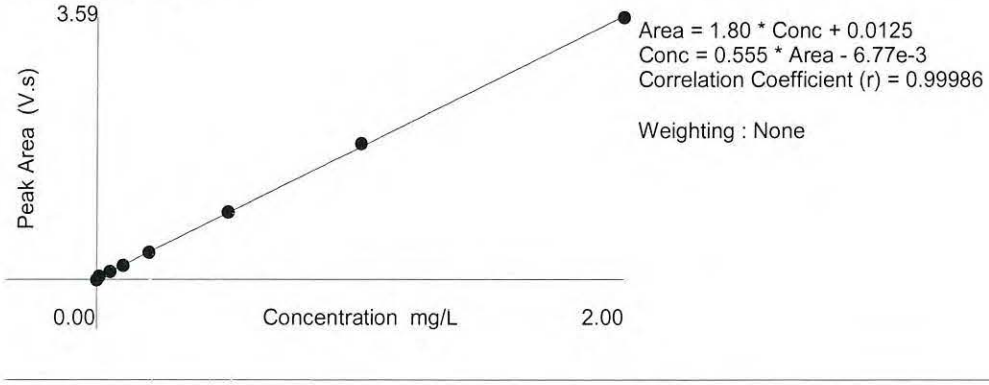
Channel 3 - Current View



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)



Lachat 3 Phenolics 420.4 and 9066 Date : 7/13/2018

Original Run Filename: OM_7-13-2018_02-30-31PM.OMN Created: 7/13/2018 2:30:31 PM
Original Run Author's Signature: [nvlwet]
Current Run Filename: OM_7-13-2018_02-30-31PMCAL.omn Last Modified: 7/13/2018 2:41:36 PM
Current Run Author's Signature: [NVLWET]
Description: Default New Run

Sample	Rep.	Cup No.	Channel 3 Phenol Conc. (mg/L)	Area (V.s)	Height (V)	Detection Time
CalStd A	1	S1	2.00	3.99	0.273	7/13/2018@2:31:20 PM
CalStd B	1	S2	1.00	1.86	0.128	7/13/2018@2:32:11 PM
DQM Test: Minimum Correlation Coefficient						
Result:			1.00000 > 0.99990			
Message			Pass			
Action						
CalStd C	1	S3	0.500	1.01	0.0691	7/13/2018@2:33:02 PM
DQM Test: Minimum Correlation Coefficient						
Result:			0.99862 < 0.99990			
Message			Fail			
Action						
CalStd D	1	S4	0.200	0.414	0.0301	7/13/2018@2:33:55 PM
DQM Test: Minimum Correlation Coefficient						
Result:			0.99947 < 0.99990			
Message			Fail			
Action						
CalStd E	1	S5	0.100	0.196	0.0138	7/13/2018@2:34:47 PM
DQM Test: Minimum Correlation Coefficient						
Result:			0.99971 < 0.99990			
Message			Fail			
Action						
CalStd F	1	S6	0.0500	0.112	7.75e-3	7/13/2018@2:35:39 PM
DQM Test: Minimum Correlation Coefficient						
Result:			0.99983 < 0.99990			
Message			Fail			
Action						
CalStd G	1	S7	0.0100	0.0378	2.75e-3	7/13/2018@2:36:33 PM
DQM Test: Minimum Correlation Coefficient						
Result:			0.99994 > 0.99990			
Message			Pass			
Action						
CalStd H	1	S8	0.00	0.0282	2.46e-3	7/13/2018@2:37:26 PM
DQM Test: Minimum Correlation Coefficient						
Result:			0.99994 > 0.99990			
Message			Pass			
Action						

Analyte Properties Table for : OM_7-13-2018_02-30-31PMCAL.omn

Property	Channel 3 Phenol
Concentration Units	mg/L
Calibration Fit Type	First Order
Clear Calibration	Yes
Force through Zero	No
Calibration Weighting	1/x
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	20
Peak Base Width	36

Lachat 3 | Phenolics 420.4 and 9066 | Date : 7/13/2018

Channel 3 - Current View

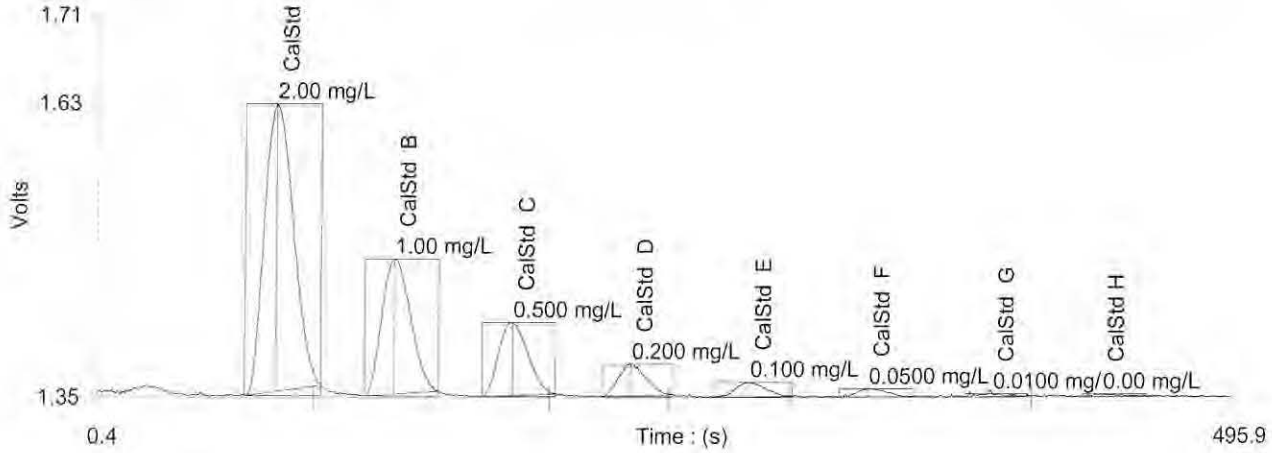
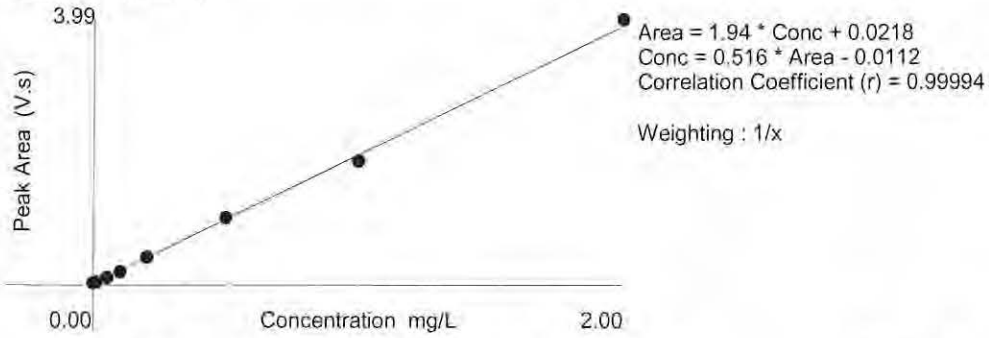


Table : 1 (Phenol)

	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	3.99	0.273	0.0	-2.5	2.05	7/13/2018	2:31:20 PM
2	1.00	1	1.86	0.128	0.0	4.8	0.950	7/13/2018	2:32:11 PM
3	0.500	1	1.01	0.0691	0.0	-1.9	0.509	7/13/2018	2:33:02 PM
4	0.200	1	0.414	0.0301	0.0	-1.2	0.202	7/13/2018	2:33:55 PM
5	0.100	1	0.196	0.0138	0.0	8.8	0.0901	7/13/2018	2:34:47 PM
6	0.0500	1	0.112	7.75e-3	0.0	5.6	0.0465	7/13/2018	2:35:39 PM
7	0.0100	1	0.0378	2.75e-3	0.0	8.2	8.29e-3	7/13/2018	2:36:33 PM
8	0.00	1	0.0282	2.46e-3			3.36e-3	7/13/2018	2:37:26 PM

Figure : 1 (Phenol)



2.00 ppm : 8 mL H_2O + 2 mL 10 ppm phenol std.

1.00 ppm : 9 mL H_2O + 1 mL 10 ppm phenol std.

0.500 ppm : 9.5 mL H_2O + 0.5 mL 10 ppm phenol std.

0.200 ppm : 9 mL H_2O + 1 mL 2 ppm

0.100 ppm : 9 mL H_2O + 1 mL 1 ppm

0.0500 ppm : 9 mL H_2O + 1 mL 0.5 ppm

0.0100 ppm : 9 mL H_2O + 1 mL 6.1 ppm

0.00 ppm : DI H_2O

- 10 ppm phenol std : 9 mL H_2O + 1 mL 100 ppm
- 100 ppm phenol std: 9 mL H_2O + 1 mL 1000 ppm
- 1000 ppm phenol std: TALS ID 3709151
- 2nd source ICV: TALS ID 4028136

BATCH # 530916

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Reagents for EOX 9023

Nashville, TN

Source CCV

2024679
ID: W_1,2,3-Trich_00005
Exp:01/11/20 Prpd:CLJ Opn:07/16/15
S_1,2,3-Trichlorobenzene

2nd Source LCS

3107187
ID: W_1,2,3-Trich_00007
Exp:06/28/21 Prpd:CLJ Opn:06/28/16
S_1,2,3-Trichlorobenzene

CCV

4262276
ID: W_EOXSTDstock_00029
Exp: 08/21/18 Prpd: RN Crl: 02/21/18
I_EOX Standard (stock) 10

4262285
ID: W_EOX STD_00074
Exp: 08/21/18 Prpd: RN Crl: 02/21/18
W_EOX STD

4477281
ID: W_EOX STD_00075
Exp: 08/21/18 Prpd: CLJ Crl: 06/29/18
W_EOX STD

LCS

4374220
ID: W_EOX Spike S_00019
Exp: 09/30/18 Prpd: CLJ Crl: 04/30/18
I_EOX Spike Soln/ Seconda

NaCl Cell Check

4215669
ID: W_NaCL S TOX_00035
Exp: 11/30/18 Prpd: RN Crl: 05/31/18
W_NaCl Solution for TOX C

4215670
ID: W_NaCL S TOX_00035
Exp: 11/30/18 Prpd: RN Crl: 05/31/18
W_NaCl Solution for TOX C

Ethyl Acetate

4450578
ID: W_EthylAcetat_00081
Exp:12/21/21 Prpd:CLJ Opn:05/14/18
S_Ethyl Acetate

Cell Electrolyte Solution

4386143
ID: W_TOXElectrol_00215
Exp: 07/09/18 Prpd: CLJ Crl: 06/04/18
TOX Electrolyte

4497878
ID: W_TOXElec_300_00015
Exp: 11/16/18 Prpd: CLJ Crl: 07/13/18
Electrolyte for TOX 300

Sea Sand

3979651
ID: WC_seasand_00035
Exp:05/31/19 Prpd:CLJ Opn:12/11/14
S-Seasand

Balance ID #
B2076931 4

Tox-9 9023 EOx Batch #530916 VP 7/23/18

112

Item-Type2	SAMP ID	Vol	Unit	Counts	Unit	Counts Avg	Unit	PPM	Unit	PPM Avg	Unit	Date/Time	Weigh	Unit	Solvent	Unit
Cell Check		10	µl	10.3180	µg							7/19/2018 15:56				
Cell Check		10	µl	10.0336	µg	10.1758	µg					7/19/2018 16:17				
System Check		25	µl	2.4989	µg			499.772	ppm			7/19/2018 16:40				
System Check		25	µl	2.2713	µg			454.262	ppm			7/19/2018 16:54				
System Check		25	µl	2.4128	µg	2.3943	µg	482.570	ppm	478.868	ppm	7/19/2018 17:13				
Carbon Blank				-0.0967	µg			0.000	ppm			7/19/2018 17:22				
Carbon Blank				-0.0035	µg	0.0000	µg	0.000	ppm	0.000	ppm	7/19/2018 17:31				
Sample	LCS	25	µl	4.6311	µg			926.212	ppm			7/19/2018 17:51	1	g	5	ml
Sample	LCS	25	µl	4.6914	µg	4.6612	µg	938.279	ppm	932.246	ppm	7/19/2018 18:15	1	g	5	ml
System Check		25	µl	3.1569	µg			631.379	ppm			7/20/2018 13:39				
System Check		25	µl	2.5608	µg			512.154	ppm			7/20/2018 13:56				
System Check		25	µl	2.4200	µg	2.4904	µg	483.996	ppm	498.075	ppm	7/20/2018 14:18				
System Blank		25	µl	0.2796	µg			55.917	ppm			7/20/2018 14:36				
System Blank		25	µl	0.0017	µg			0.339	ppm			7/20/2018 14:48				
System Blank		25	µl	-0.0002	µg	0.0008	µg	0.000	ppm	0.169	ppm	7/20/2018 14:56				
Sample	560-74539-A-13	25	µl	0.0189	µg			3.784	ppm			7/20/2018 15:12	1	g	5	ml
Sample	560-74539-A-13	25	µl	0.0143	µg	0.0166	µg	2.858	ppm	3.321	ppm	7/20/2018 15:35	1	g	5	ml
Sample	560-74539-A-14	25	µl	0.0047	µg			0.937	ppm			7/20/2018 15:45	1.01	g	5	ml
Sample	560-74539-A-14	25	µl	0.0048	µg	0.0048	µg	0.953	ppm	0.945	ppm	7/20/2018 15:55	1.01	g	5	ml
Sample	560-74539-A-14 MS	25	µl	4.4854	µg			879.484	ppm			7/20/2018 16:13	1.02	g	5	ml
Sample	560-74539-A-14 MS	25	µl	4.3524	µg	4.4189	µg	853.412	ppm	866.448	ppm	7/20/2018 16:30	1.02	g	5	ml
Sample	560-74539-A-14 MSD	25	µl	5.0397	µg			988.169	ppm			7/20/2018 16:53	1.02	g	5	ml
Sample	560-74539-A-14 MSD	25	µl	4.9521	µg	4.9959	µg	971.000	ppm	979.585	ppm	7/20/2018 17:09	1.02	g	5	ml
Sample	560-74539-A-15	25	µl	-0.0499	µg			0.000	ppm			7/20/2018 17:18	1.02	g	5	ml
Sample	560-74539-A-15	25	µl	0.1767	µg	0.0634	µg	34.642	ppm	17.321	ppm	7/20/2018 17:27	1.02	g	5	ml
Sample	560-74539-A-16	25	µl	0.0075	µg			1.449	ppm			7/20/2018 17:41	1.03	g	5	ml
Sample	560-74539-A-16	25	µl	0.0444	µg	0.0259	µg	8.615	ppm	5.032	ppm	7/20/2018 17:53	1.03	g	5	ml
Sample	560-74539-A-17	25	µl	0.0124	µg			2.371	ppm			7/20/2018 18:07	1.05	g	5	ml
Sample	560-74539-A-17	25	µl	0.0153	µg	0.0139	µg	2.918	ppm	2.645	ppm	7/20/2018 18:18	1.05	g	5	ml
Sample	560-74539-A-18	25	µl	0.0179	µg			3.442	ppm			7/20/2018 18:29	1.04	g	5	ml
Sample	560-74539-A-18	25	µl	-0.0130	µg	0.0025	µg	0.000	ppm	1.721	ppm	7/20/2018 18:37	1.04	g	5	ml
System Check		25	µl	2.4499	µg			489.981	ppm			7/20/2018 19:01				
System Check		25	µl	2.6300	µg	2.5400		526.002	ppm	507.992	ppm	7/20/2018 19:14				
System Blank		25	µl	-0.1650	µg			0.000	ppm			7/20/2018 19:22				
System Blank		25	µl	-0.0365	µg	-0.1008		0.000	ppm	0.000	ppm	7/20/2018 19:31				
System Check		25	µl	2.5308	µg			506.163	ppm			7/23/2018 12:42				
System Check		25	µl	2.3082	µg	2.4195	µg	461.642	ppm	483.902	ppm	7/23/2018 13:15				
System Blank		25	µl	0.0236	µg			4.724	ppm			7/23/2018 13:24				
System Blank		25	µl	-0.0625	µg	-0.0194		0.000	ppm	2.362	ppm	7/23/2018 13:40				
Sample	560-74639-A-19	25	µl	0.0573	µg			11.013	ppm			7/23/2018 13:54	1.04	g	5	ml
Sample	560-74639-A-19	25	µl	0.0459	µg	0.0516	µg	8.824	ppm	9.919	ppm	7/23/2018 14:25	1.04	g	5	ml

Tox-9 9023 Eox Batch #530916 VD 7/23/18 212

Sample	560-74639-A-20	25	µl	0.3295	µg			65.257	ppm			7/23/2018 14:37	1.01	g	5	ml
Sample	560-74639-A-20	25	µl	-0.0139	µg	0.1578	µg	0.000	ppm	32.628	ppm	7/23/2018 14:49	1.01	g	5	ml
Sample	560-74639-A-21	25	µl	0.0392	µg			7.396	ppm			7/23/2018 14:58	1.06	g	5	ml
Sample	560-74639-A-21	25	µl	0.0169	µg	0.0281	µg	3.192	ppm	5.294	ppm	7/23/2018 15:07	1.06	g	5	ml
Sample	460-16512-A-1	25	µl	0.0414	µg			13.130	ppm			7/23/2018 15:20	0.63	g	5	ml
Sample	460-16512-A-1	25	µl	0.0400	µg	0.0407	µg	12.714	ppm	12.922	ppm	7/23/2018 15:36	0.63	g	5	ml
Sample	490-155782-A-2	25	µl	0.0156	µg			3.031	ppm			7/23/2018 15:47	1.03	g	5	ml
Sample	490-155782-A-2	25	µl	0.0089	µg	0.0123	µg	1.729	ppm	2.380	ppm	7/23/2018 15:55	1.03	g	5	ml
Sample	LCSD	25	µl	4.8791	µg			975.819	ppm	961.489		7/23/2018 16:10	1	g	5	ml
Sample	LCSD	25	µl	5.5800	µg			1116.009	Reject			7/23/2018 16:42	1	g	5	ml
Sample	LCSD	25	µl	4.7358	µg	4.8074	µg	947.160	ppm	~~1013.496~~	ppm	7/23/2018 16:56	1	g	5	ml
System Blank		25	µl	-0.1005	µg			0.000	ppm			7/23/2018 17:08				
System Blank		25	µl	0.0373	µg	-0.0316	µg	7.465	ppm	3.732	ppm	7/23/2018 17:17				

9023_Prep Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 490-530110

Analyst: Patel, Viren R

Batch Open: 7/19/2018 2:45:00PM

Batch End:

Preparation, EOX

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~490-530110/1 N/A	N/A		1.00 g	1 mL	N/A	N/A	N/A		
2	LCS~490-530110/2 N/A	N/A		1.00 g	1 mL	N/A	N/A	N/A		
3	LCSD~490-530110/3 N/A	N/A		1.00 g	1 mL	N/A	N/A	N/A		
4	560-74639-A-13 (9023)	N/A (560-74639-1)	Solid	1.00 g	1 mL	7/23/18	8_Days	3		
5	560-74639-A-14 (9023)	N/A (560-74639-1)	Solid	1.01 g	1 mL	7/23/18	8_Days	3		
6	560-74639-A-14~MS (9023)	N/A (560-74639-1)	Solid	1.02 g	1 mL	7/23/18	8_Days	3		
7	560-74639-A-14~MSD (9023)	N/A (560-74639-1)	Solid	1.02 g	1 mL	7/23/18	8_Days	3		
8	560-74639-A-15 (9023)	N/A (560-74639-1)	Solid	1.02 g	1 mL	7/23/18	8_Days	3		
9	560-74639-A-16 (9023)	N/A (560-74639-1)	Solid	1.03 g	1 mL	7/23/18	8_Days	3		
10	560-74639-A-17 (9023)	N/A (560-74639-1)	Solid	1.05 g	1 mL	7/23/18	8_Days	3		
11	560-74639-A-18 (9023)	N/A (560-74639-1)	Solid	1.04 g	1 mL	7/23/18	8_Days	3		
12	560-74639-A-19 (9023)	N/A (560-74639-1)	Solid	1.04 g	1 mL	7/23/18	8_Days	3		
13	560-74639-A-20 (9023)	N/A (560-74639-1)	Solid	1.01 g	1 mL	7/23/18	8_Days	3		
14	560-74639-A-21 (9023)	N/A (560-74639-1)	Solid	1.06 g	1 mL	7/23/18	8_Days	3		

9023_Prep Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 490-530110 Analyst: Patel, Viren R Batch Open: 7/19/2018 2:45:00PM

Batch End:

15	460-160512-A-1 (9023)	N/A (460-160512-1)	Solid	0.63 g	1 mL	7/25/18	8_Days	4	
16	490-155782-A-2 (9023)	Well Pad 90710 (490-155782-2)	Solid	1.03 g	1 mL	7/27/18	8_Days	2	
17	490-155782-A-4 (9023)	Well Pad 90710 (490-155782-2)	Solid	1.04 g	1 mL	7/27/18	8_Days	2	

9023_Prep Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 490-530110

Analyst: Patel, Viren R

Batch Open: 7/19/2018 2:45:00PM

Batch End:

Batch Notes

Ottawa Sand ID	3979651
Ethyl Acetate ID	4450578
Acetic Acid ID	
Batch Comment	

Comments

9023_Prep Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 490-530110

Analyst: Patel, Viren R

Batch Open: 7/19/2018 2:45:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
LCS 490-530110/2	W_EOX Spike S_00019	1.0 mL	1 mL		
LCSD 490-530110/3	W_EOX Spike S_00019	1.0 mL	1 mL		
560-74639-A-14 MS	W_EOX Spike S_00019	1.0 mL	1 mL		
560-74639-A-14 MSD	W_EOX Spike S_00019	1.0 mL	1 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

Sample Request Form: 285387

Wet Chemistry - TOX 7/19/2018 11:06:01 AM Assigned to:Johnson, Cynthia L

In Sonic bath at 2:45 for 15 min 7/19/18

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
400-156242-D-1	SITE 4	400-4255429	9023	9023	08/08 23:59	07/24/18	MHS	VA	S35	Unconfirmed
460-160512-A-1	CM-Brick-WC01	460-6142022	9023	9023	08/09 23:59	07/25/18	OLP	DE	S63 0.63g	Unconfirmed
490-155782-A-2	18071607802	490-4503686	9023	9023	08/13 23:59	07/27/18	MCG	PA	S76 1.03g	Unconfirmed
490-155782-A-4	18071607804	490-4503697	9023	9023	08/13 23:59	07/27/18	MCG	PA	S76 1.04g	Unconfirmed
560-74639-A-13	1S	560-1641220	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23 1.00g	Unconfirmed
560-74639-14	2S MS/MSD		9023	9023	08/07 23:59	07/23/18	LAM	TX	S23 1.01g	Unconfirmed
560-74639-15	3S		9023	9023	08/07 23:59	07/23/18	LAM	TX	S23 1.02g	Unconfirmed
560-74639-16	4S		9023	9023	08/07 23:59	07/23/18	LAM	TX	S23 1.03g	Unconfirmed
560-74639-17	5S		9023	9023	08/07 23:59	07/23/18	LAM	TX	S23 1.05g	Unconfirmed
560-74639-18	6S		9023	9023	08/07 23:59	07/23/18	LAM	TX	S23 1.04g	Unconfirmed
560-74639-19	7S		9023	9023	08/07 23:59	07/23/18	LAM	TX	S23 1.04g	Unconfirmed
560-74639-20	8S		9023	9023	08/07 23:59	07/23/18	LAM	TX	S23 1.01g	Unconfirmed
560-74639-21	9S		9023	9023	08/07 23:59	07/23/18	LAM	TX	S23 1.06g	Unconfirmed

MB- 1.00g / LCS - 1.00g / LCSD - 1.00g / 639 MS - 1.02g / MSD - 1.02g /

Sample Request Form: 285418

Wet Chemistry - TOX 7/19/2018 1:37:43 PM Assigned to:Johnson, Cynthia L

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
560-74639-A-13	1S	560-1641220	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23	Unconfirmed
560-74639-A-14	2S	560-1641221	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23	Unconfirmed
560-74639-A-15	3S	560-1641222	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23	Unconfirmed
560-74639-A-16	4S	560-1641223	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23	Unconfirmed
560-74639-A-17	5S	560-1641224	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23	Unconfirmed
560-74639-A-18	6S	560-1641225	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23	Unconfirmed
560-74639-A-19	7S	560-1641226	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23	Unconfirmed
560-74639-A-20	8S	560-1641227	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23	Unconfirmed
560-74639-A-21	9S	560-1641228	9023	9023	08/07 23:59	07/23/18	LAM	TX	S23	Unconfirmed

BATCH # 530416

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Reagents for EOX 9023

Nashville, TN

Source CCV

2024679
ID: W_1,2,3-Trich_00005
Exp: 01/11/20 Prpd: CLJ Opn: 07/16/15
S_1,2,3-Trichlorobenzene

2nd Source LCS

3107187
ID: W_1,2,3-Trich_00007
Exp: 06/28/21 Prpd: CLJ Opn: 06/28/16
S_1,2,3-Trichlorobenzene

CCV

4262276
ID: W_EOXSTDstock_00029
Exp: 08/21/18 Prpd: RN Crt: 02/21/18
I_EOX Standard (stock) 10

4262285
ID: W_EOX STD_00074
Exp: 08/21/18 Prpd: RN Crt: 02/21/18
W_EOX STD

4477281
ID: W_EOX STD_00075
Exp: 08/21/18 Prpd: CLJ Crt: 06/29/18
W_EOX STD

LCS

4374220
ID: W_EOX Spike S_00019
Exp: 09/30/18 Prpd: CLJ Crt: 04/30/18
I_EOX Spike Soln/ Seconda

NaCl Cell Check

4215669
ID: W_NaCL S TOX_00035
Exp: 11/30/18 Prpd: RN Crt: 05/31/18
W_NaCl Solution for TOX C

4215670
ID: W_NaCL S TOX_00035
Exp: 11/30/18 Prpd: RN Crt: 05/31/18
W_NaCl Solution for TOX C

Ethyl Acetate

4450578
ID: W_EthylAcetat_00081
Exp: 12/21/21 Prpd: CLJ Opn: 06/14/18
S_Ethyl Acetate

Cell Electrolyte Solution

4386143
ID: W_TOXElectrol_00215
Exp: 07/09/18 Prpd: CLJ Crt: 06/04/18
TOX Electrolyte

4497878
ID: W_TOXElec_300_00015
Exp: 11/16/18 Prpd: CLJ Crt: 07/13/18
Electrolyte for TOX 300

Sea Sand

3979651
ID: WC_seasand_00035
Exp: 05/31/19 Prpd: CLJ Opn: 12/11/14
S-Seasand

BALANCE ID # B2076931 4

TOX-9
902360x Batch #530916 VP 7125118

Item-Type2	SAMP ID	Vol	Unit	Counts	Unit	Counts Ave	Unit	PPM	Unit	PPM Ave	Unit	Date/Time	Weigh	Unit	Solvent	Unit
Cell Check		10	µl	10.4613	µg	10.2710	µg					7/25/2018 12:03				
System Check		25	µl	2.6793	µg			535.857	ppm			7/25/2018 12:58				
System Check		25	µl	-0.1498	µg			-29.955	ppm			7/25/2018 13:38				
System Check		25	µl	2.6312	µg	2.6552		526.235	ppm	531.0457	ppm	7/25/2018 13:53				
System Blank		25	µl	0.0189	µg			3.77951	ppm			7/25/2018 14:10				
System Blank		25	µl	0.0080	µg	0.0135		1.60809	ppm	2.6938	ppm	7/25/2018 14:18				
Sample	160-29498-B-4	25	µl	0.3060	µg			58.2801	ppm			7/25/2018 14:35	1.05	g	5	ml
Sample	160-29498-B-4	25	µl	0.0047	µg			0.89874	ppm			7/25/2018 14:44	1.05	g	5	ml
Sample	160-29498-B-4	25	µl	0.0294	µg	0.0171	µg	5.6091	ppm	3.253921	ppm	7/25/2018 14:54	1.05	g	5	ml
Sample	460-160644-B-1	25	µl	0.0146	µg			2.87242	ppm			7/25/2018 15:03	1.02	g	5	ml
Sample	460-160644-B-1	25	µl	0.0127	µg	0.0137	µg	2.49439	ppm	2.683405	ppm	7/25/2018 15:11	1.02	g	5	ml
Sample	460-160870-C-1	25	µl	0.0050	µg			1.0066	ppm			7/25/2018 15:21	1	g	5	ml
Sample	460-160870-C-1	25	µl	0.0105	µg	0.0078	µg	2.10817	ppm	1.557387	ppm	7/25/2018 15:30	1	g	5	ml
Sample	460-160870-C-2	25	µl	0.0053	µg			1.0276	ppm			7/25/2018 15:38	1.03	g	5	ml
Sample	460-160870-C-2	25	µl	0.2439	µg	0.1246	µg	47.3672	ppm	24.19742	ppm	7/25/2018 15:53	1.03	g	5	ml
Sample	490-156068-A-1	25	µl	0.0412	µg			9.16604	ppm			7/25/2018 16:02	0.9	g	5	ml
Sample	490-156068-A-1	25	µl	0.0051	µg	0.0232	µg	1.14418	ppm	5.155108	ppm	7/25/2018 16:10	0.9	g	5	ml
Sample	490-155782-A-4	25	µl	0.1400	µg			26.9227	ppm			7/25/2018 16:21	1.04	g	5	ml
Sample	490-155782-A-4	25	µl	0.1178	µg	0.1289	µg	22.6566	ppm	24.78964	ppm	7/25/2018 16:42	1.04	g	5	ml
System Check		25	µl	2.5594	µg			511.884	ppm			7/25/2018 16:54				
System Check		25	µl	2.4363	µg	2.4978	µg	487.253	ppm	499.5687	ppm	7/25/2018 17:11				
System Blank		25	µl	0.0152	µg			3.03288	ppm			7/25/2018 17:25				
System Blank		25	µl	0.0162	µg	0.0157	µg	3.24079	ppm	3.136833	ppm	7/25/2018 17:35				

9023_Prep Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 490-530110 Analyst: Patel, Viren R Batch Open: 7/19/2018 2:45:00PM

Batch End:

Preparation, EOX

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	Matrix	Initial Amount	Final Amount	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~490-530110/1 N/A	N/A		1.00 g	1 mL	N/A	N/A	N/A		490-450843 4
2	LCS~490-530110/2 N/A	N/A		1.00 g	1 mL	N/A	N/A	N/A		490-450843 5
3	LCSD~490-530110/3 N/A	N/A		1.00 g	1 mL	N/A	N/A	N/A		490-450843 6
4	560-74639-A-13 (9023)	N/A (560-74639-1)	Solid	1.00 g	1 mL	7/23/18	8_Days	3		490-450843 7
5	560-74639-A-14 (9023)	N/A (560-74639-1)	Solid	1.01 g	1 mL	7/23/18	8_Days	3		490-450843 8
6	560-74639-A-14~MS (9023)	N/A (560-74639-1)	Solid	1.02 g	1 mL	7/23/18	8_Days	3		490-450843 9
7	560-74639-A-14~MSD (9023)	N/A (560-74639-1)	Solid	1.02 g	1 mL	7/23/18	8_Days	3		490-450844 0
8	560-74639-A-15 (9023)	N/A (560-74639-1)	Solid	1.02 g	1 mL	7/23/18	8_Days	3		490-450844 1
9	560-74639-A-16 (9023)	N/A (560-74639-1)	Solid	1.03 g	1 mL	7/23/18	8_Days	3		490-450844 2
10	560-74639-A-17 (9023)	N/A (560-74639-1)	Solid	1.05 g	1 mL	7/23/18	8_Days	3		490-450844 3
11	560-74639-A-18 (9023)	N/A (560-74639-1)	Solid	1.04 g	1 mL	7/23/18	8_Days	3		490-450844 4
12	560-74639-A-19 (9023)	N/A (560-74639-1)	Solid	1.04 g	1 mL	7/23/18	8_Days	3		490-450844 5
13	560-74639-A-20 (9023)	N/A (560-74639-1)	Solid	1.01 g	1 mL	7/23/18	8_Days	3		490-450844 6
14	560-74639-A-21 (9023)	N/A (560-74639-1)	Solid	1.06 g	1 mL	7/23/18	8_Days	3		490-450844 7

9023_Prep Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 490-530110 Analyst: Patel, Viren R Batch Open: 7/19/2018 2:45:00PM

Batch End:

15	460-160512-A-1 (9023)	N/A (460-160512-1)	Solid	0.63 g	1 mL	7/25/18	8_Days	4	
16	490-155782-A-2 (9023)	Well Pad 90710 (490-155782-2)	Solid	1.03 g	1 mL	7/27/18	8_Days	2	
17	490-155782-A-4 (9023)	Well Pad 90710 (490-155782-2)	Solid	1.04 g	1 mL	7/27/18	8_Days	2	
18	160-29498-B-4 (9023)	N/A (160-29498-1)	Solid	1.05 g	1 mL	8/3/18	21_Days	4	
19	460-160644-B-1 (9023)	N/A (460-160644-1)	Solid	1.02 g	1 mL	7/26/18	8_Days	4	
20	460-160870-C-1 (9023)	N/A (460-160870-1)	Solid	1.00 g	1 mL	7/25/18	4_Day_RUSH	1	
21	460-160870-C-2 (9023)	N/A (460-160870-1)	Solid	1.03 g	1 mL	7/25/18	4_Day_RUSH	1	
22	490-156068-A-1 (9023)	N/A (490-156068-1)	Solid	0.90 g	1 mL	7/27/18	4_Day_RUSH	2	

9023_Prep Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 490-530110 Analyst: Patel, Viren R Batch Open: 7/19/2018 2:45:00PM

Batch End:

Batch Notes

Ottawa Sand ID	3979651
Ethyl Acetate ID	4450578
Acetic Acid ID	
Batch Comment	

Comments

160-29498-B-4

Method Comments: RAD SCREEENS REQUIRED PRIOR TO SHIPPING!

9023_Prep Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 490-530110 Analyst: Patel, Viren R Batch Open: 7/19/2018 2:45:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
LCS 490-530110/2	W_EOX Spike S_00019	1.0 mL	1 mL		
LCSD 490-530110/3	W_EOX Spike S_00019	1.0 mL	1 mL		
560-74639-A-14 MS	W_EOX Spike S_00019	1.0 mL	1 mL		
560-74639-A-14 MSD	W_EOX Spike S_00019	1.0 mL	1 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

Sample Request Form: 285851

Wet Chemistry - TOX 7/24/2018 11:22:37 AM Assigned to:

Sample	Client Sample ID	Container	Method	Analytical Method	Hold Time	Due	PM	State Code	Storage	Hazard Level
160-29498-B-4	CRC-B23-0104	160-1508910	9023	9023	08/09 23:59	08/03/18	CYLS	IL	S108 1.05g	Level 1 radioactive
M RAD SCREEENS REQUIRED PRIOR TO SHIPPING!										
400-156242-D-1 NOT found	SITE 4	400-4255429	9023	9023	08/08 23:59	07/24/18	MHS	VA	S35	Unconfirmed
460-160644-B-1	Tank 470 LCO18-40	460-6147136	9023	9023	08/13 23:59	07/26/18	MAM	DE	S92 1.02g	Unconfirmed
460-160870-C-1	AMTRAK-SSYd01	460-6155608	9023	9023	08/16 23:59	07/25/18	JKM	PA	S108 1.00g	Unconfirmed
460-160870-C-2	AMTRAK-SSYd02	460-6155609	9023	9023	08/16 23:59	07/25/18	JKM	PA	S108 1.03g	Unconfirmed
~~490-155782-A-4~~	18071607804	490-4503697	9023	9023	08/13 23:59	07/27/18	MCG	PA	S76 ~~0.90g~~ VP 7127118	Level 1 radioactive
490-156068-A-1	77733-001	490-4512638	9023	9023	08/17 23:59	07/27/18	JSO	MI	S117 0.90g	Unconfirmed

ALPHA SPECTROSCOPY

Method A-01-R Th

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

Prep Batch: 384585

Preparation, Extraction Chromatography Resin Actinide Separation

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 384585

Lab ID: MB 160-384585/1-A
Client ID:
Sigma: 2
Analyzed: 08/28/18 19:45
Detector: AV1
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 240

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Thorium-230	-0.02404	0.0796	0.0796	U	pCi/g	1.00	0.128	385767

Tracer	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.250	0.404	0.598		pCi/g	0.0724	6.05	86.7	30 - 110

Lab ID: LCS 160-384585/2-A
Client ID:
Sigma: 2
Analyzed: 08/28/18 19:45
Detector: AV3
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 240

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Thorium-230	25.56	1.33	2.52		pCi/g	1.00	0.229	385811

Tracer	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	10.88	0.819	1.23		pCi/g	0.0745	12.1	90.0	30 - 110

Lab ID: 160-29498-1
Client ID: CRC-B20-0206
Sigma: 2
Analyzed: 08/29/18 18:13
Detector: AV13
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 240

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Thorium-230	35.0	1.17	3.16		pCi/g	1.00	0.136	386035

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.30	0.346	0.500		pCi/g	0.0390	6.04	71.2	30 - 110

Lab ID: 160-29498-1 DU
Client ID: CRC-B20-0206
Sigma: 2
Analyzed: 08/28/18 19:45
Detector: AV7
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 240

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Thorium-230	37.95	1.27	3.43		pCi/g	1.00	0.146	385829

Tracer	DU Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.685	0.396	0.558		pCi/g	0.0626	6.03	77.7	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 384585

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 160-384585/1-A	Thorium-230			-0.02404	U	pCi/g							-.60379634

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-384585/2-A	Thorium-230		24.5	25.56		pCi/g	104	81 - 118					.6064662616

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29498-1	Thorium-230	35.0		37.95		pCi/g			8	0.45	1.27	1	

Glossary:

Ts = Count Duration, Sample

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Batch Number: 384585 Batch Start Date: 08/22/18 16:06 Batch Analyst: Chapman, Jessica L

Batch Method: ExtChrom Batch End Date: 08/25/18 06:22

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	Th-229 00024	TRM-2 00002			
MB 160-384585/1		ExtChrom, A-01-R		1.0000 g	0.2 mL				
LCS 160-384585/2		ExtChrom, A-01-R		0.5005 g	0.2 mL	0.5005 g			
160-29498-A-1-B	CRC-B20-0206	ExtChrom, A-01-R	T	1.0032 g	0.2 mL				
160-29498-A-1-B DU	CRC-B20-0206	ExtChrom, A-01-R	T	1.0043 g	0.2 mL				

Batch Notes	
Balance ID	0034150037
Analyst ID - Column	nmn
Column Date	8/24/18
Analyst ID - CoPrecipitation	nmn
CoPrecipitation Date	8/25/18
Pipette ID	RAD117
Analyst ID - Reagent Drop Witness	CMM per KNF
Analyst ID - Reagent Drop	KNF
SOP Number	ST-RC-0003, ST-RC-0004, 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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:32:30AM 8/29/2018

Sample

Sample Name: MB 160-384585/1-A
SampleType: Blank
: MB 160-384585/1-A
Sample Collection Date: 8/25/2018 6:23:00AM

Spectrum #3 Analysis #1
Sample Weight : 1.0000g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 384585
AnalysisID: 739247

Analyst: 60040

Tracer

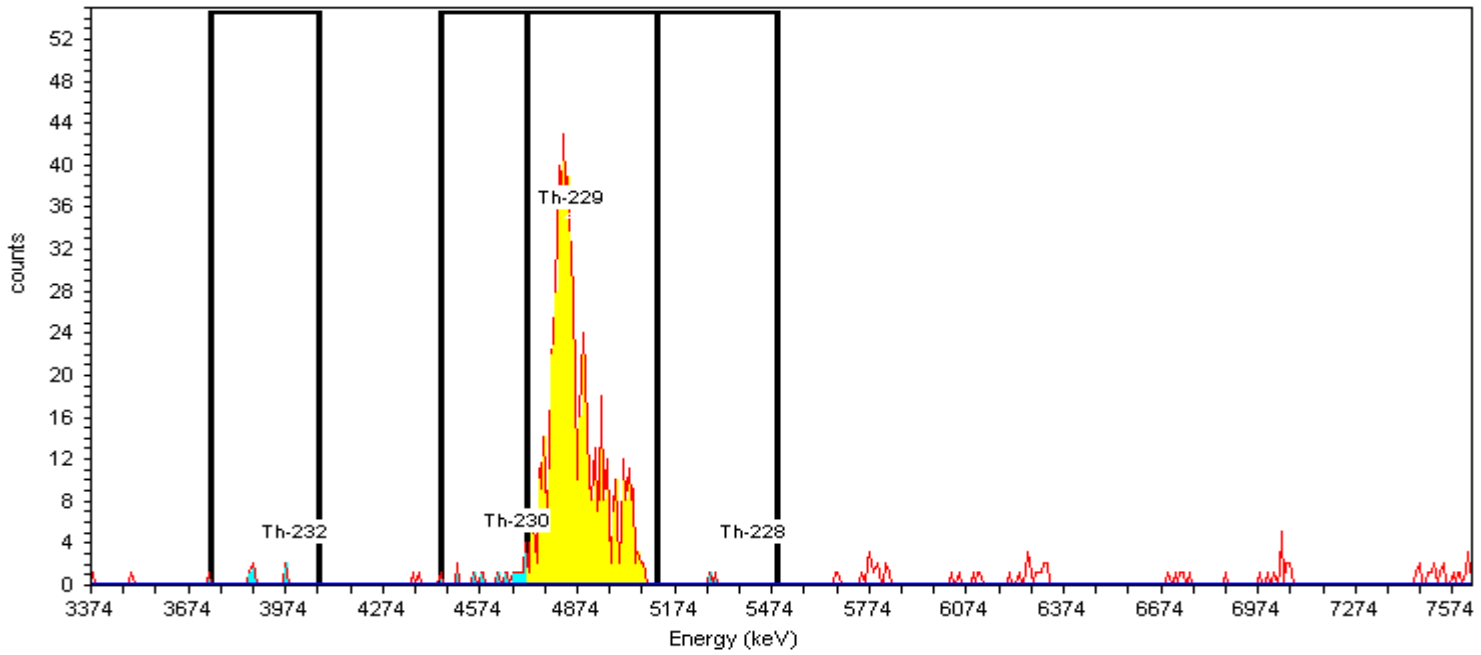
Tracer Name: Th-229_00024
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 11:00:55AM

Tracer Nuclide: Th-229
Tracer Recovery: 85.73%

Acquisition

Detector: AV1
Serial Number: 49-188 AA4
Acquisition Start Date: 8/28/2018 7:45:26PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 8/11/2018 5:19:02PM
Background Info: Sample: ICB;AV1; Det: AV1; Spectrum #1; Aug-11-2018 17:19

Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.36% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/25/2018 4:20:33PM
MDA Constants: Kα = 1.65 , Kβ = 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	43.9	100.2	6	1.6354	4.36	0.039	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	.8	99.7	20	2.0000	17.66	0.159	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	78.7	99.6	673	1.7500	671.22	5.192	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	43.4	99.8	2	2.0000	0.00	0.000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:34:50AM 8/29/2018

Sample

Sample Name: MB 160-384585/1-A
SampleType: Blank
: MB 160-384585/1-A
Sample Collection Date: 8/25/2018 6:23:00AM

Spectrum #3 Analysis #1
Sample Weight : 1.0000g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 384585
AnalysisID: 739248

Analyst: 60040

Tracer

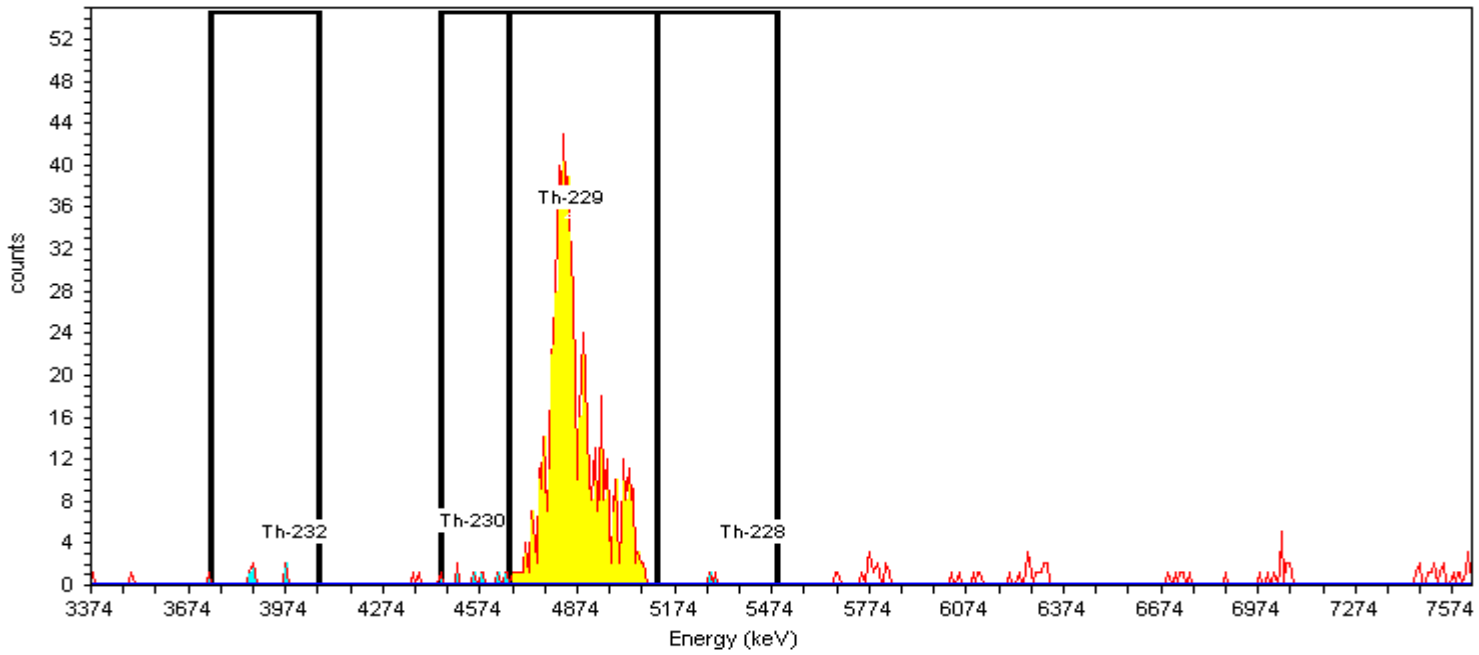
Tracer Name: Th-229_00024
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 11:00:55AM

Tracer Nuclide: Th-229
Tracer Recovery: 86.72%

Acquisition

Detector: AV1
Serial Number: 49-188 AA4
Acquisition Start Date: 8/28/2018 7:45:26PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 8/11/2018 5:19:02PM
Background Info: Sample: ICB;AV1; Det: AV1; Spectrum #1; Aug-11-2018 17:19

Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.36% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/25/2018 4:20:33PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Manual Integration for tailing
RTM 8/29/2018

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	43.9	100.2	6	1.6354	4.36	0.039	pCi/g
Th-230	4556.4	4,687.5	-131.1	4448.3	4664.6	14.4	99.7	9	1.0000	8.00	0.071	pCi/g
Th-229	4848.0	4,845.3	2.7	4664.6	5119.5	78.7	99.8	683	3.0000	680.00	5.252	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	43.4	99.8	2	2.0000	0.00	0.000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:33:03AM 8/29/2018

Sample

Sample Name: LCS 160-384585/2-A
SampleType: Control
: LCS 160-384585/2-A
Sample Collection Date: 8/25/2018 6:23:00AM

Spectrum #3 Analysis #1
Sample Weight : 0.5005g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 384585
AnalysisID: 739246

Analyst: 60040

Tracer

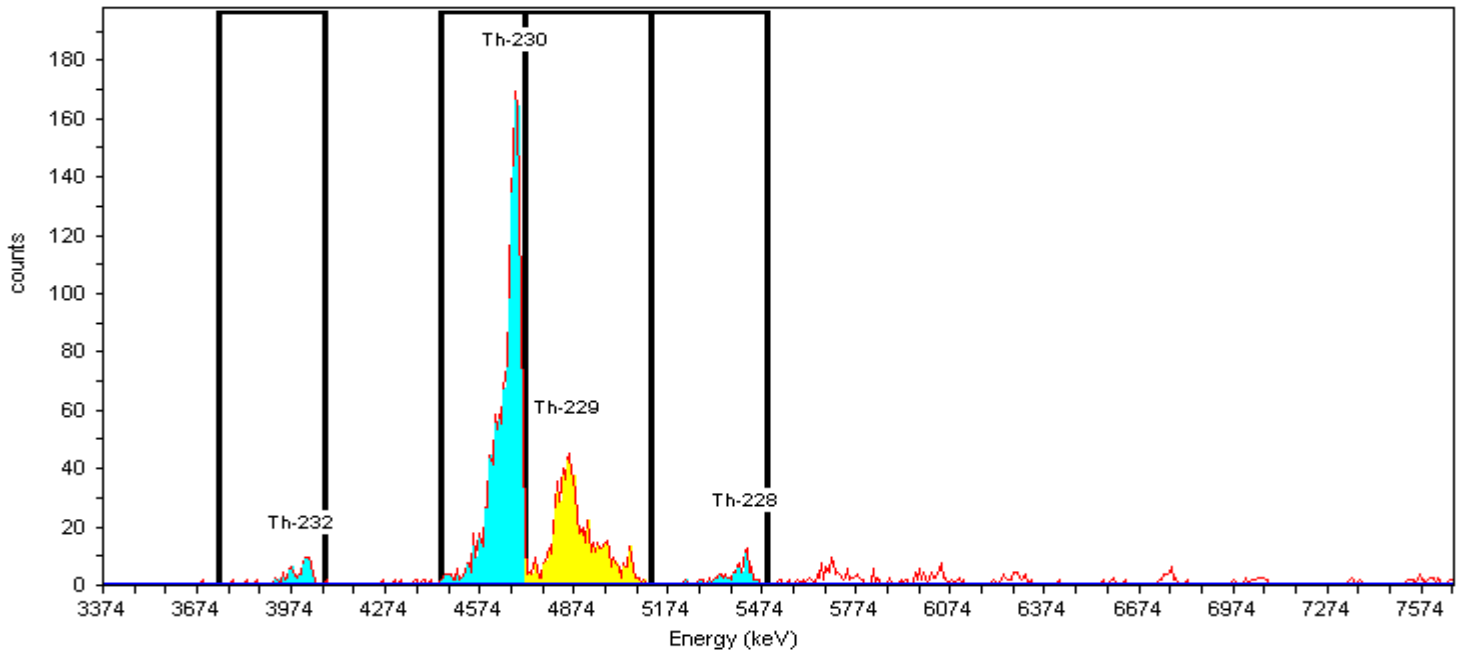
Tracer Name: Th-229_00024
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 11:00:55AM

Tracer Nuclide: Th-229
Tracer Recovery: 92.23%

Acquisition

Detector: AV3
Serial Number: 49-202 FF7
Acquisition Start Date: 8/28/2018 7:45:27PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 8/11/2018 5:16:27PM
Background Info: Sample: ICB;AV3; Det: AV3; Spectrum #1; Aug-11-2018 17:16

Calibration Name: IC-8877;AV3-05142018
Calibration Date: 5/14/2018 6:25:15PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.44% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/25/2018 4:20:32PM
MDA Constants: Kα = 1.65 , Kβ = 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	29.1	100.2	71	1.8854	69.11	1.148	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	37.1	99.7	1492	3.5000	1488.85	24.849	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	83.6	99.6	725	0.2500	724.41	11.161	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	59.7	99.8	83	1.0000	82.00	1.372	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:35:26AM 8/29/2018

Sample

Sample Name: LCS 160-384585/2-A
SampleType: Control
: LCS 160-384585/2-A
Sample Collection Date: 8/25/2018 6:23:00AM

Spectrum #3 Analysis #1
Sample Weight : 0.5005g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 384585
AnalysisID: 739249

Analyst: 60040

Tracer

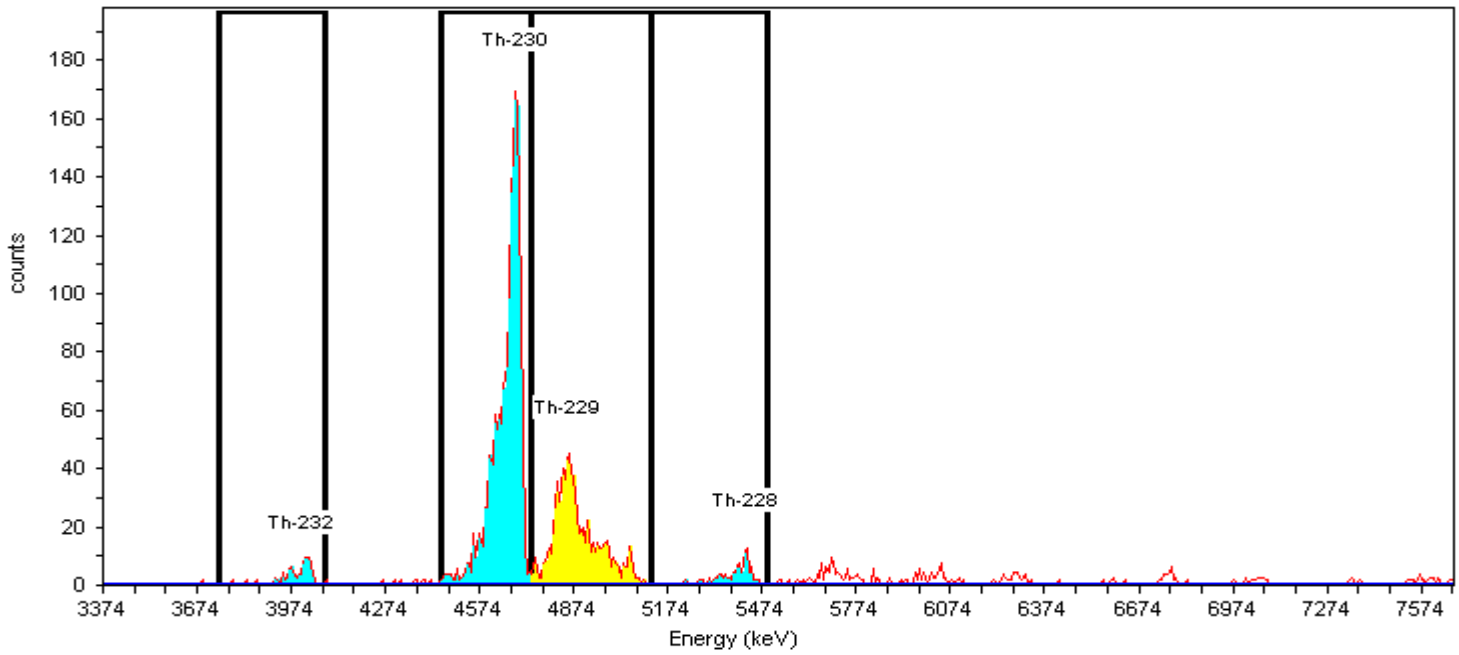
Tracer Name: Th-229_00024
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 11:00:55AM

Tracer Nuclide: Th-229
Tracer Recovery: 89.98%

Acquisition

Detector: AV3
Serial Number: 49-202 FF7
Acquisition Start Date: 8/28/2018 7:45:27PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 8/11/2018 5:16:27PM
Background Info: Sample: ICB;AV3; Det: AV3; Spectrum #1; Aug-11-2018 17:16

Calibration Name: IC-8877;AV3-05142018
Calibration Date: 5/14/2018 6:25:15PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.44% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/25/2018 4:20:32PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Manual Integration for tailing
RTM 8/29/2018

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	29.1	100.2	71	1.8854	69.11	1.176	pCi/g
Th-230	4688.0	4,687.5	0.5	4448.3	4739.1	49.3	99.7	1503	3.5000	1499.50	25.652	pCi/g
Th-229	4848.0	4,845.3	2.7	4739.1	5119.5	83.6	99.6	707	0.2500	706.75	10.889	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	59.7	99.8	83	1.0000	82.00	1.406	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:23:04PM 8/29/2018

Sample

Sample Name: 160-29498-A-1-J
SampleType: Sample
: 160-29498-A-1-J
Sample Collection Date: 7/11/2018 3:08:00PM

Spectrum #4 Analysis #1
Sample Weight : 1.0032g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 384585
AnalysisID: 739437

Analyst: 60040

Tracer

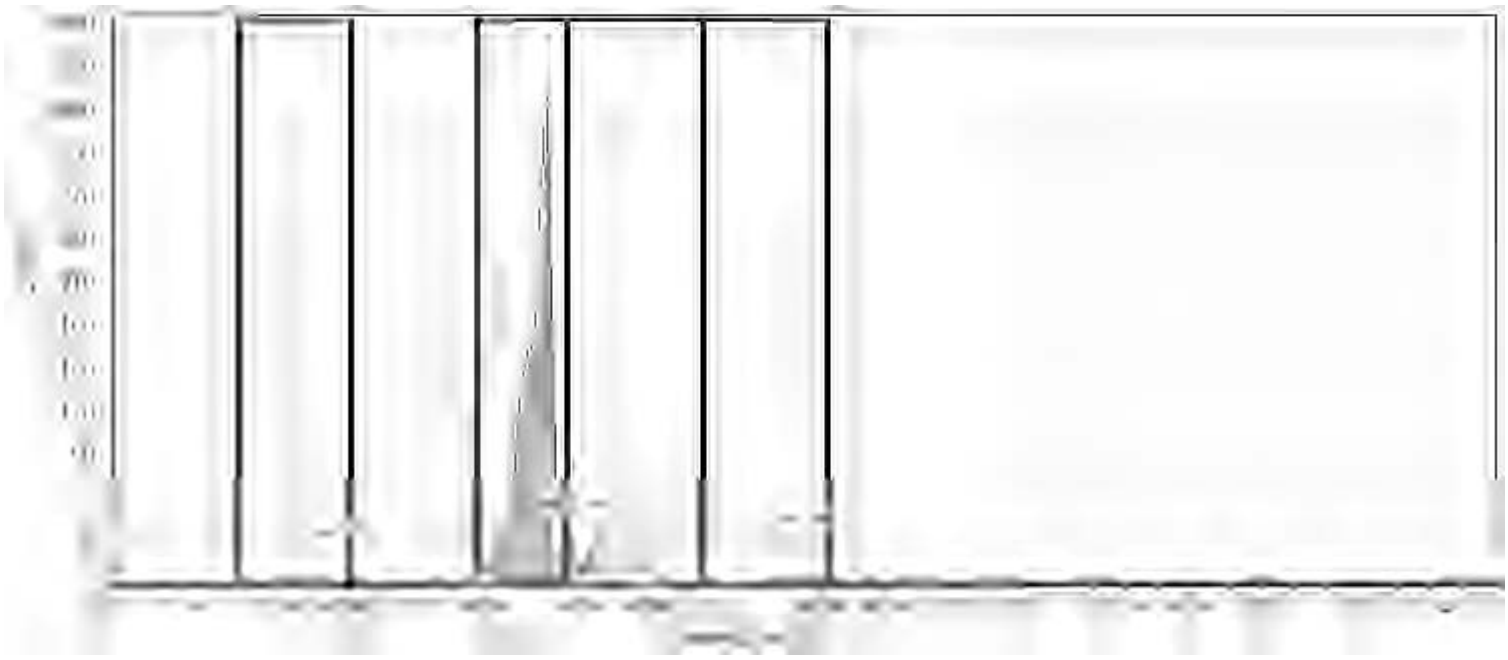
Tracer Name: Th-229_00024
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 11:00:28AM

Tracer Nuclide: Th-229
Tracer Recovery: 71.52%

Acquisition

Detector: AV13
Serial Number: 49-155M7
Acquisition Start Date: 8/29/2018 6:13:15PM
Live Time: 240.00 min.
Real Time: 249.48 min.
Background Date: 8/13/2018 2:36:29PM
Background Info: Sample: ICB;AV13; Det: AV13; Spectrum #1; Aug-13-2018 14:36

Calibration Name: IC-1370621;AV13-05142018
Calibration Date: 5/14/2018 6:27:37PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.95% +/- 0.24% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/25/2018 4:20:32PM
MDA Constants: Kα = 1.65 , Kβ = 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	91.7	100.2	95	0.5000	94.93	0.920	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	61.1	99.7	3582	1.0000	3581.12	34.868	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	81.7	99.6	620	0.5000	619.47	4.318	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	57.0	99.8	100	1.2500	99.01	0.967	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:04:38PM 8/30/2018

Sample

Sample Name: 160-29498-A-1-J
SampleType: Sample
: 160-29498-A-1-J
Sample Collection Date: 7/11/2018 3:08:00PM

Spectrum #4 Analysis #1
Sample Weight : 1.0032g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 384585
AnalysisID: 739557

Analyst: 60040

Tracer

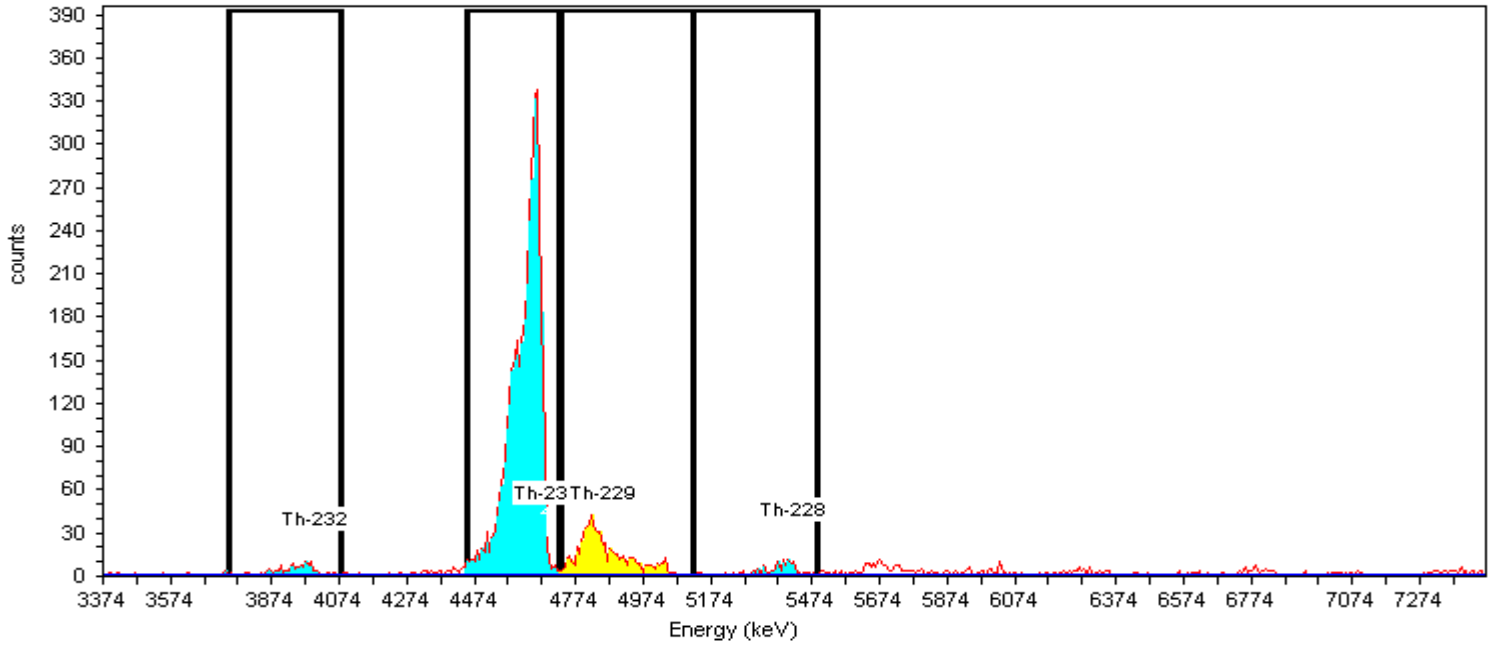
Tracer Name: Th-229_00024
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 11:00:28AM

Tracer Nuclide: Th-229
Tracer Recovery: 71.17%

Acquisition

Detector: AV13
Serial Number: 49-155M7
Acquisition Start Date: 8/29/2018 6:13:15PM
Live Time: 240.00 min.
Real Time: 249.48 min.
Background Date: 8/13/2018 2:36:29PM
Background Info: Sample: ICB;AV13; Det: AV13; Spectrum #1; Aug-13-2018 14:36

Calibration Name: IC-1370621;AV13-05142018
Calibration Date: 5/14/2018 6:27:37PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.95% +/- 0.24% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/25/2018 4:20:32PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Manual Integration for tailing.
ALS 8/28/2018

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	91.7	100.2	95	0.5000	94.93	0.924	pCi/g
Th-230	4688.0	4,687.5	0.5	4448.3	4724.2	77.4	99.7	3586	1.0000	3585.00	35.076	pCi/g
Th-229	4848.0	4,845.3	2.7	4731.7	5119.5	81.7	99.6	617	0.5000	616.50	4.297	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	57.0	99.8	100	1.2500	99.01	0.972	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:33:16AM 8/29/2018

Sample

Sample Name: 160-29498-A-1-K DU
SampleType: Sample
: 160-29498-A-1-K DU
Sample Collection Date: 7/11/2018 3:08:00PM

Spectrum #3 Analysis #1
Sample Weight : 1.0043g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 384585
AnalysisID: 739245

Analyst: 60040

Tracer

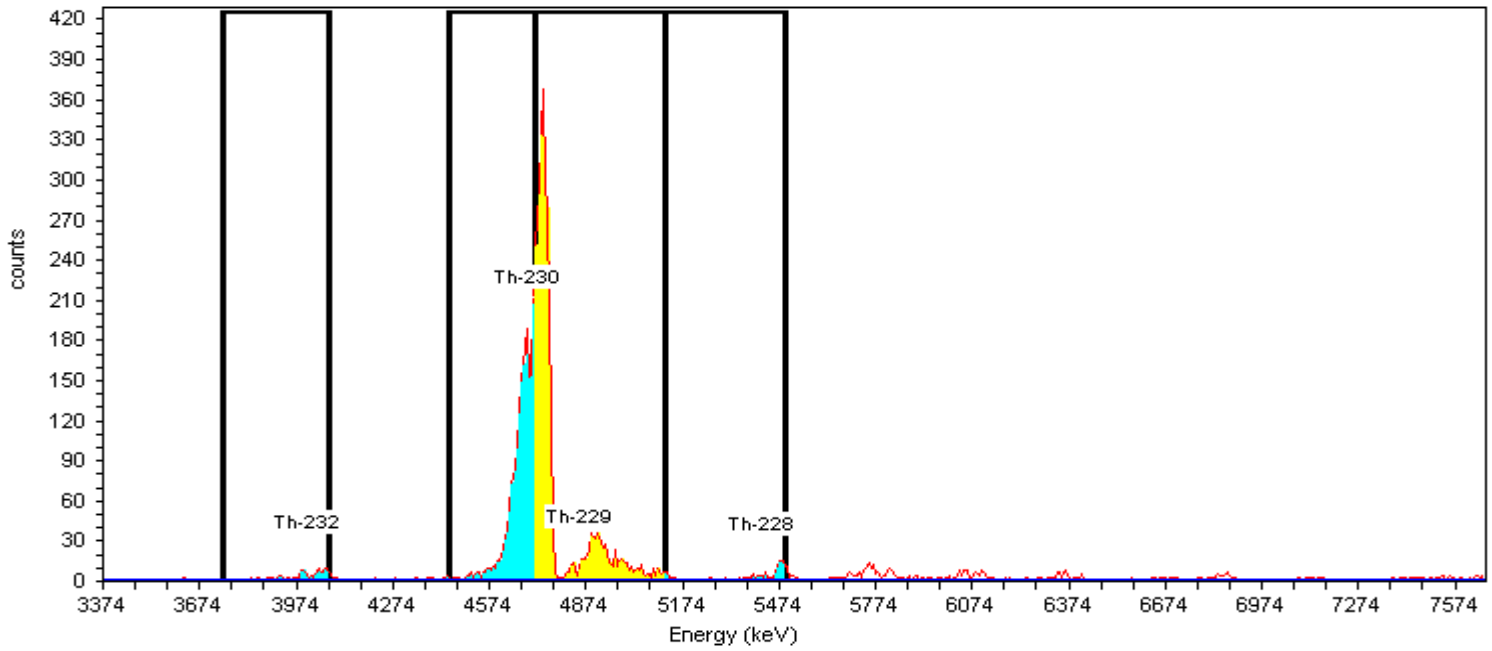
Tracer Name: Th-229_00024
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 11:00:55AM

Tracer Nuclide: Th-229
Tracer Recovery: 303.87%

Acquisition

Detector: AV7
Serial Number: 48-158EE5
Acquisition Start Date: 8/28/2018 7:45:31PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 8/11/2018 5:16:28PM
Background Info: Sample: ICB;AV7; Det: AV7; Spectrum #1; Aug-11-2018 17:16

Calibration Name: IC-9793;AV7-05142018
Calibration Date: 5/14/2018 6:26:13PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.98% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/25/2018 4:20:32PM
MDA Constants: Kα = 1.65 , Kβ = 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	80	0.5000	79.33	0.212	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	27.0	99.7	1892	0.8270	1890.69	5.076	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	.0	99.6	2246	1.7500	2244.39	18.326	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	327.8	99.8	100	1.7500	98.19	0.264	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:36:37AM 8/29/2018

Sample

Sample Name: 160-29498-A-1-K DU
SampleType: Sample
: 160-29498-A-1-K DU
Sample Collection Date: 7/11/2018 3:08:00PM

Spectrum #3 Analysis #1
Sample Weight : 1.0043g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 384585
AnalysisID: 739250

Analyst: 60040

Tracer

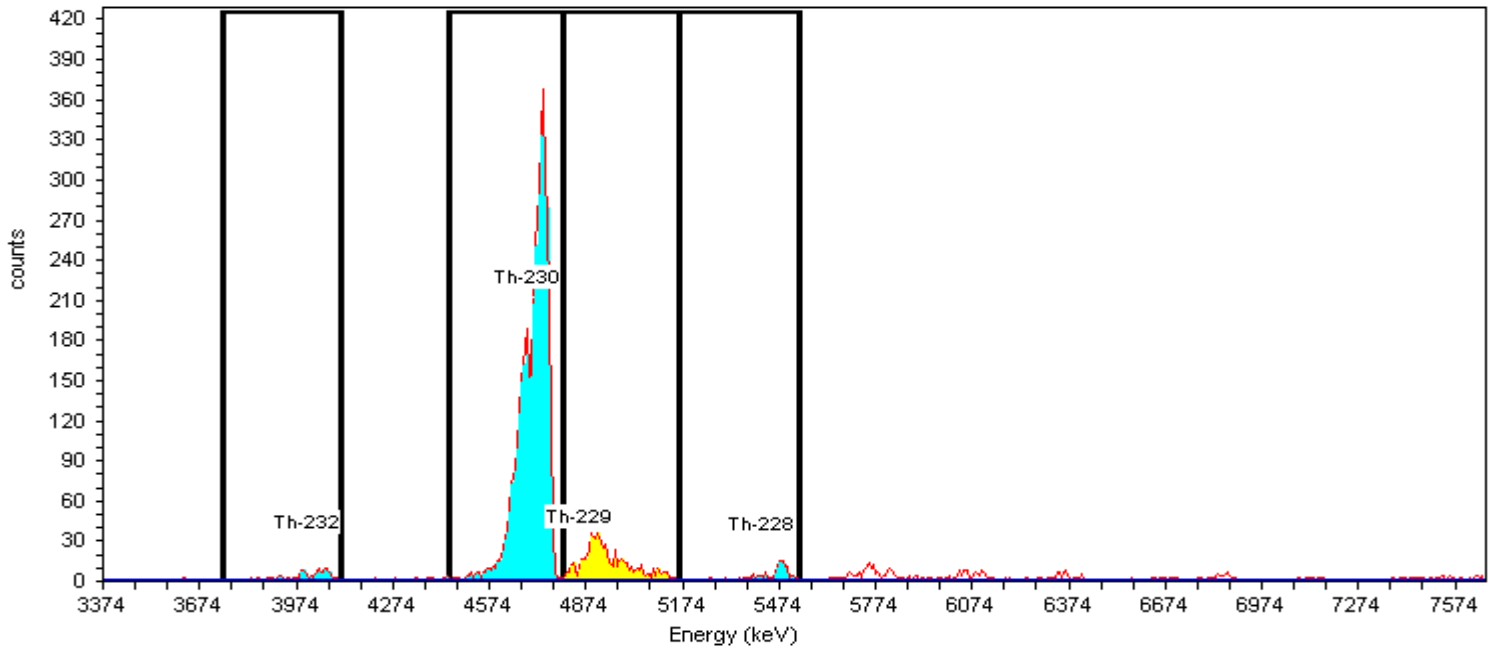
Tracer Name: Th-229_00024
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 11:00:55AM

Tracer Nuclide: Th-229
Tracer Recovery: 77.71%

Acquisition

Detector: AV7
Serial Number: 48-158EE5
Acquisition Start Date: 8/28/2018 7:45:31PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 8/11/2018 5:16:28PM
Background Info: Sample: ICB;AV7; Det: AV7; Spectrum #1; Aug-11-2018 17:16

Calibration Name: IC-9793;AV7-05142018
Calibration Date: 5/14/2018 6:26:13PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.98% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/25/2018 4:20:32PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Manual Integration for tailing
RTM 8/29/2018

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	3739.8	4112.7	46.6	100.2	91	0.5000	90.50	0.945	pCi/g
Th-230	4688.0	4,687.5	0.5	4448.3	4798.8	76.9	99.7	3626	1.5000	3624.50	38.048	pCi/g
Th-229	4848.0	4,845.3	2.7	4798.8	5164.2	79.5	97.5	563	1.5000	561.50	4.687	pCi/g
Th-228	5420.0	5,423.3	-3.3	5164.2	5537.1	35.3	99.8	101	1.5000	99.50	1.047	pCi/g

Method A-01-R U

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

Prep Batch: 378568

Preparation, Extraction Chromatography Resin Actinide Separation

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378568

Lab ID: MB 160-378568/1-A
Client ID:
Sigma: 2
Analyzed: 08/09/18 14:21
Detector: AV148
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 360

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.01077	0.0267	0.0267	U	pCi/g	1.00	0.0522	381472
Uranium-235	0.004190	0.0143	0.0143	U	pCi/g	1.00	0.0359	381472
Uranium-238	0.02487	0.0244	0.0245	U	pCi/g	1.00	0.0288	381472

Tracer	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.314	0.318	0.548		pCi/g	0.0514	5.98	88.3	30 - 110

Lab ID: LCS 160-378568/2-A
Client ID:
Sigma: 2
Analyzed: 08/09/18 14:21
Detector: AV151
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 360

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	5.951	0.389	0.633		pCi/g	1.00	0.0489	381474
Uranium-238	6.322	0.400	0.665		pCi/g	1.00	0.0190	381474

Tracer	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	4.784	0.311	0.508		pCi/g	0.0525	5.98	79.4	30 - 110

Lab ID: 160-29498-1
Client ID: CRC-B20-0206
Sigma: 2
Analyzed: 08/09/18 14:21
Detector: AV153
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 360

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	19.2	0.879	1.84		pCi/g	1.00	0.0833	381476
Uranium-235	1.09	0.235	0.252		pCi/g	1.00	0.0793	381476
Uranium-238	19.9	0.894	1.89		pCi/g	1.00	0.0928	381476

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	2.91	0.245	0.346		pCi/g	0.0589	5.67	51.0	30 - 110

Lab ID: 160-29498-1 DU
Client ID: CRC-B20-0206
Sigma: 2
Analyzed: 08/09/18 14:21
Detector: AV154
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 360

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	19.61	0.885	1.87		pCi/g	1.00	0.0708	381477
Uranium-235	0.9671	0.221	0.236		pCi/g	1.00	0.0881	381477
Uranium-238	19.02	0.871	1.82		pCi/g	1.00	0.0825	381477

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378568

Tracer	DU Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	2.996	0.249	0.354		pCi/g	0.0621	5.80	51.3	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 160-378568/1-A	Uranium-234			0.01077	U	pCi/g							.80765696
MB 160-378568/1-A	Uranium-235			0.004190	U	pCi/g							.58502905
MB 160-378568/1-A	Uranium-238			0.02487	U	pCi/g							2.03243048

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-378568/2-A	Uranium-234		6.37	5.951		pCi/g	93	84 - 120					-.899602943
LCS 160-378568/2-A	Uranium-238		6.51	6.322		pCi/g	97	82 - 122					-.395290024 8

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29498-1	Uranium-234	19.2		19.61		pCi/g			2	0.11	0.32	1	
160-29498-1	Uranium-235	1.09		0.9671		pCi/g			12	0.26	0.72	1	
160-29498-1	Uranium-238	19.9		19.02		pCi/g			4	0.23	0.64	1	

Glossary:

Ts = Count Duration, Sample

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Batch Number: 378568 Batch Start Date: 07/29/18 15:19 Batch Analyst: Fox, Kassie N

Batch Method: ExtChrom Batch End Date: 08/08/18 08:42

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	U-232 00039	UNAT 00014			
MB 160-378568/1		ExtChrom, A-01-R		1.0 g	0.2 mL				
LCS 160-378568/2		ExtChrom, A-01-R		1.0 g	0.2 mL	0.2 mL			
160-29498-A-1-B	CRC-B20-0206	ExtChrom, A-01-R	T	1.0553 g	0.2 mL				
160-29498-A-1-B DU	CRC-B20-0206	ExtChrom, A-01-R	T	1.0319 g	0.2 mL				

Batch Notes	
Balance ID	1123433897
Analyst ID - Column	nmn
Column Date	8/7/18
Analyst ID - CoPrecipitation	nmn
CoPrecipitation Date	8/8/18
Pipette ID	RAD117
Analyst ID - Reagent Drop Witness	CMM per KNF
Analyst ID - Reagent Drop	KNF
SOP Number	RC-ST-0003, ST-RC-0004, ST-RC-0100, ST-RC-0238

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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:41:24PM 8/9/2018

Sample

Sample Name: MB 160-378568/1-A Type: Blank
Spectrum #1 Analysis #1
: MB 160-378568/1-A
Sample Collection Date: 8/8/2018 8:41:00AM
Comment:

Sample Weight : 1.00 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378568
AnalysisResultsID: 224991
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

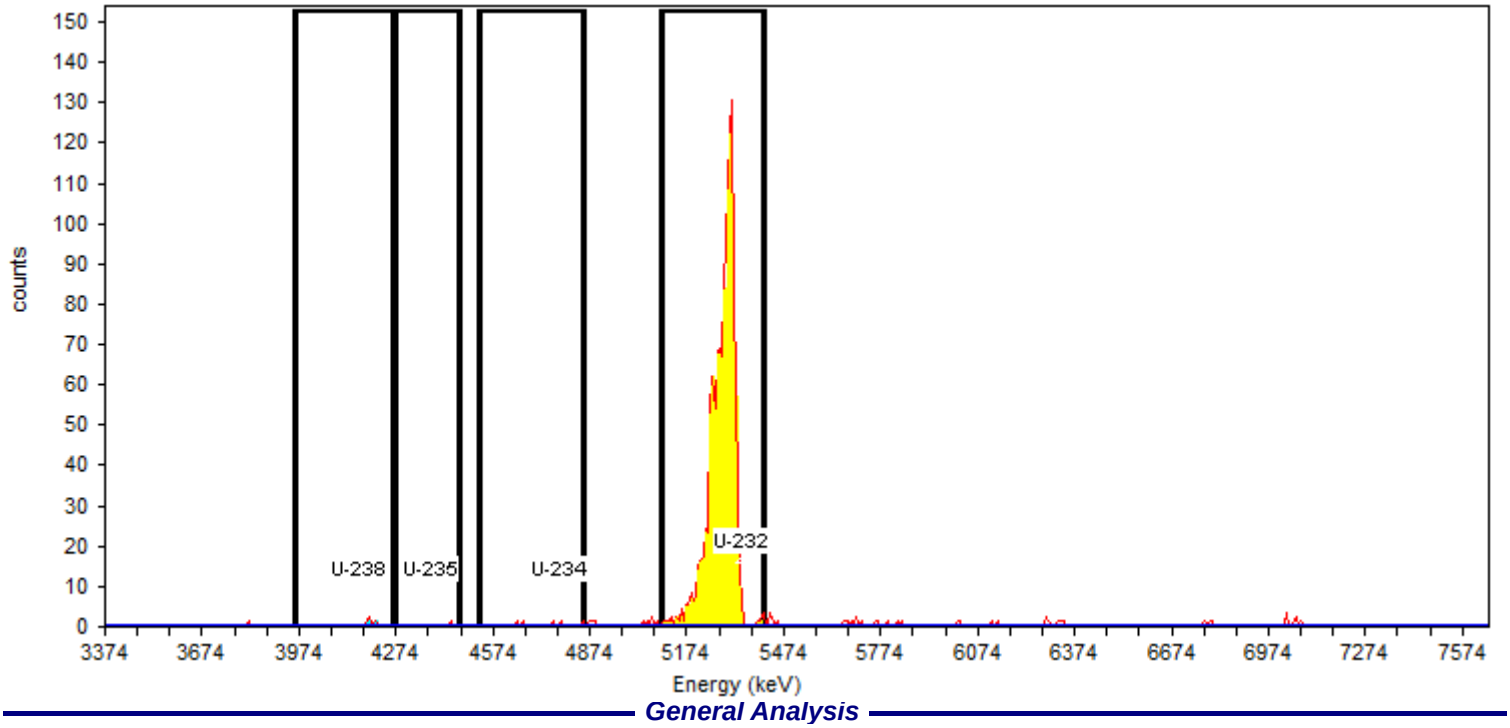
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM / mL x (Vol.) 0.20 mL = 15.50 DPM
Tracer Ref. Date: 4/7/2003 8:30:02AM

Tracer Nuclide: U-232
Tracer Recovery: 88.25%

Acquisition

Detector: AV148 SN: 50-05/R2
Acquisition Start Date: 8/9/2018 2:21:28PM
Live Time: 360.00 min.
Real Time: 360.23 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

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 / Ch^2
Efficiency: 26.37% +/- 0.38% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/9/2018 2:20:14PM
MDA Constants: Kα = 1.64 , Kβ = 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	44.2	100.0	5	0.3750	4.63	2.487E-002	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	1	0.3750	0.63	4.190E-003	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	.3	99.8	5	3.0000	2.00	1.077E-002	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	72.5	100.1	1125	4.1250	1120.88	6.160E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:40:10PM 8/9/2018

Sample

Sample Name: LCS 160-378568/2-A Type: Control
Spectrum #1 Analysis #1
: LCS 160-378568/2-A
Sample Collection Date: 8/8/2018 8:41:00AM
Comment:

Sample Weight : 1.00 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378568
AnalysisResultsID: 224988
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

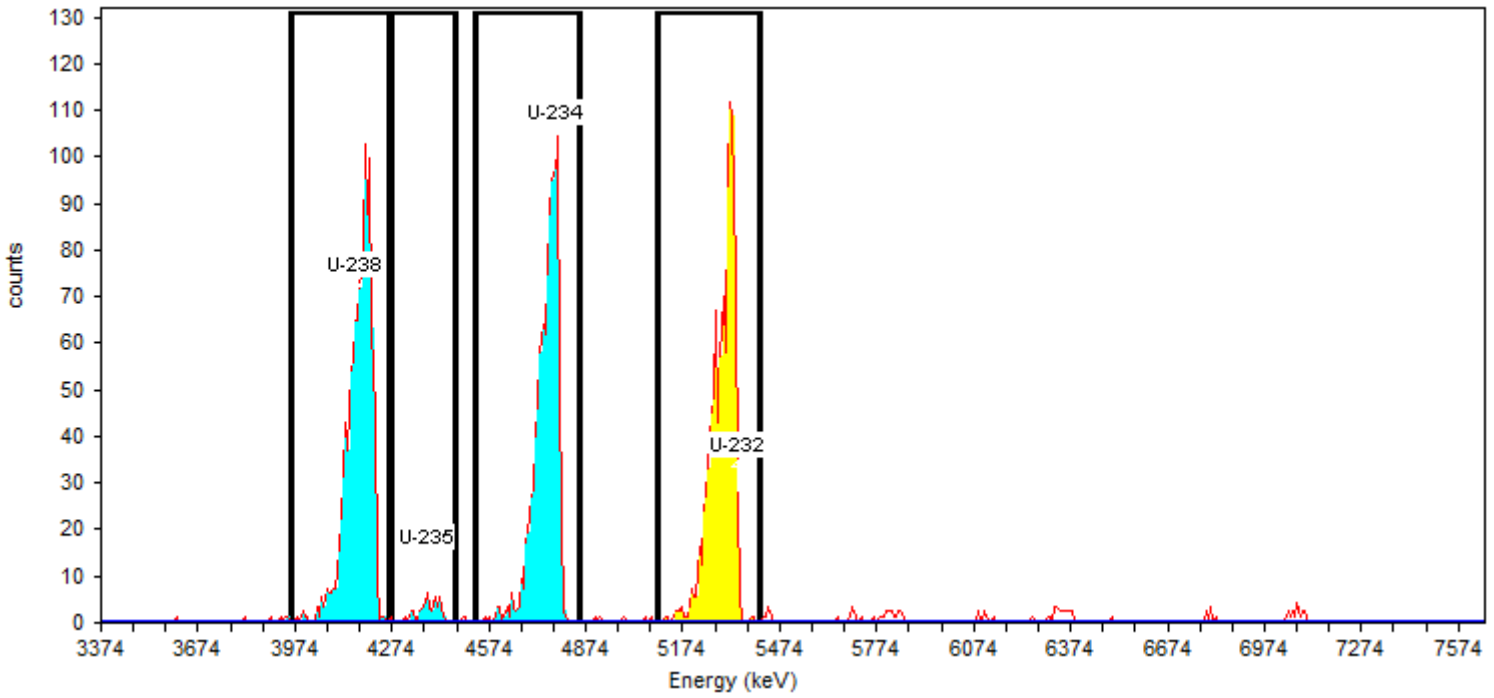
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM / mL x (Vol.) 0.20 mL = 15.50 DPM
Tracer Ref. Date: 4/7/2003 8:30:02AM

Tracer Nuclide: U-232
Tracer Recovery: 79.44%

Acquisition

Detector: AV151 SN: 50-05/R5
Acquisition Start Date: 8/9/2018 2:21:28PM
Live Time: 360.00 min.
Real Time: 360.00 min.
Background Date: 7/21/2018 9:28:13PM
Bkgd Info: Sample: ICB;AV151; Det: AV151; Spectrum #1; 7/21/2018 9:28:13 PM

Energy Calibration: IC-8877;AV151-20171113
Efficiency Calibration:IC-8877;AV151-20171113
Calibration Date: 11/13/2017 12:21:30PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.91% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/9/2018 2:20:12PM
MDA Constants: Kα = 1.64 , Kβ = 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	79.9	100.0	1000	0.0000	1000.00	6.322E+000	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	65.0	80.2	43	0.7500	42.25	3.330E-001	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	69.7	99.8	941	1.5000	939.50	5.951E+000	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	77.8	100.1	957	3.7500	953.25	5.545E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:40:53PM 8/9/2018

Sample

Sample Name: 160-29498-A-1-D Type: Sample
Spectrum #1 Analysis #1
: 160-29498-A-1-D
Sample Collection Date: 7/11/2018 3:08:00PM
Comment:

Sample Weight : 1.06 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378568
AnalysisResultsID: 224989
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

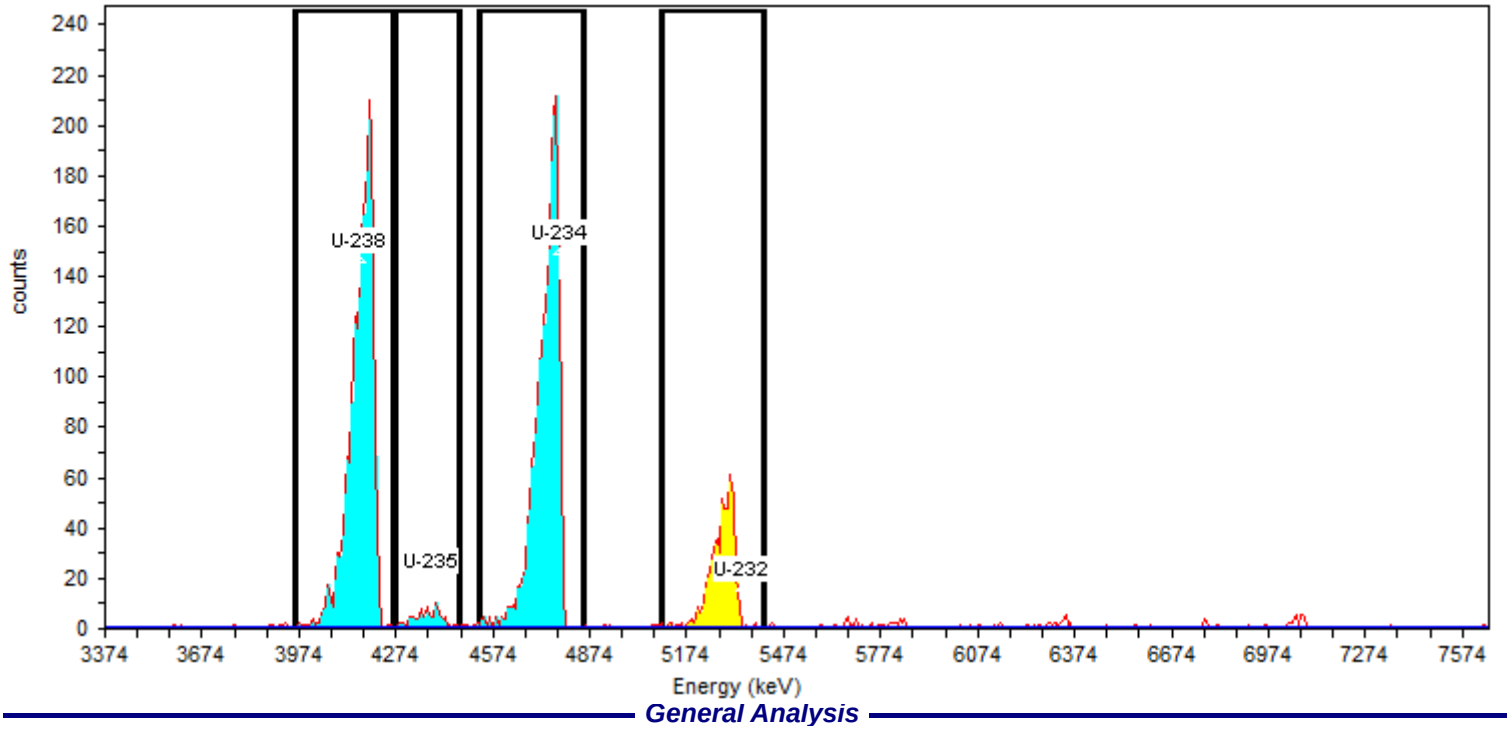
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM / mL x (Vol.) 0.20 mL = 15.50 DPM
Tracer Ref. Date: 4/7/2003 8:30:02AM

Tracer Nuclide: U-232
Tracer Recovery: 51.00%

Acquisition

Detector: AV153 SN: 54-011 Y6
Acquisition Start Date: 8/9/2018 2:21:28PM
Live Time: 360.00 min.
Real Time: 360.00 min.
Background Date: 7/21/2018 9:28:12PM
Bkgd Info: Sample: ICB;AV153; Det: AV153; Spectrum #1; 7/21/2018 9:28:12 PM

Energy Calibration: IC-8879;AV153-20171113
Efficiency Calibration:IC-8879;AV153-20171113
Calibration Date: 11/13/2017 12:21:42PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.17% +/- 0.31% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/9/2018 2:20:12PM
MDA Constants: Kα = 1.64 , Kβ = 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	72.7	100.0	1982	2.6250	1979.38	1.986E+001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	92.6	80.2	88	0.7500	87.25	1.092E+000	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	71.1	99.8	1910	1.8750	1908.13	1.918E+001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	75.1	100.1	574	4.8750	569.13	3.373E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:41:08PM 8/9/2018

Sample

Sample Name: 160-29498-A-1-E DU Type: Sample
Spectrum #1 Analysis #1
: 160-29498-A-1-E DU
Sample Collection Date: 7/11/2018 3:08:00PM
Comment:

Sample Weight : 1.03 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378568
AnalysisResultsID: 224990
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

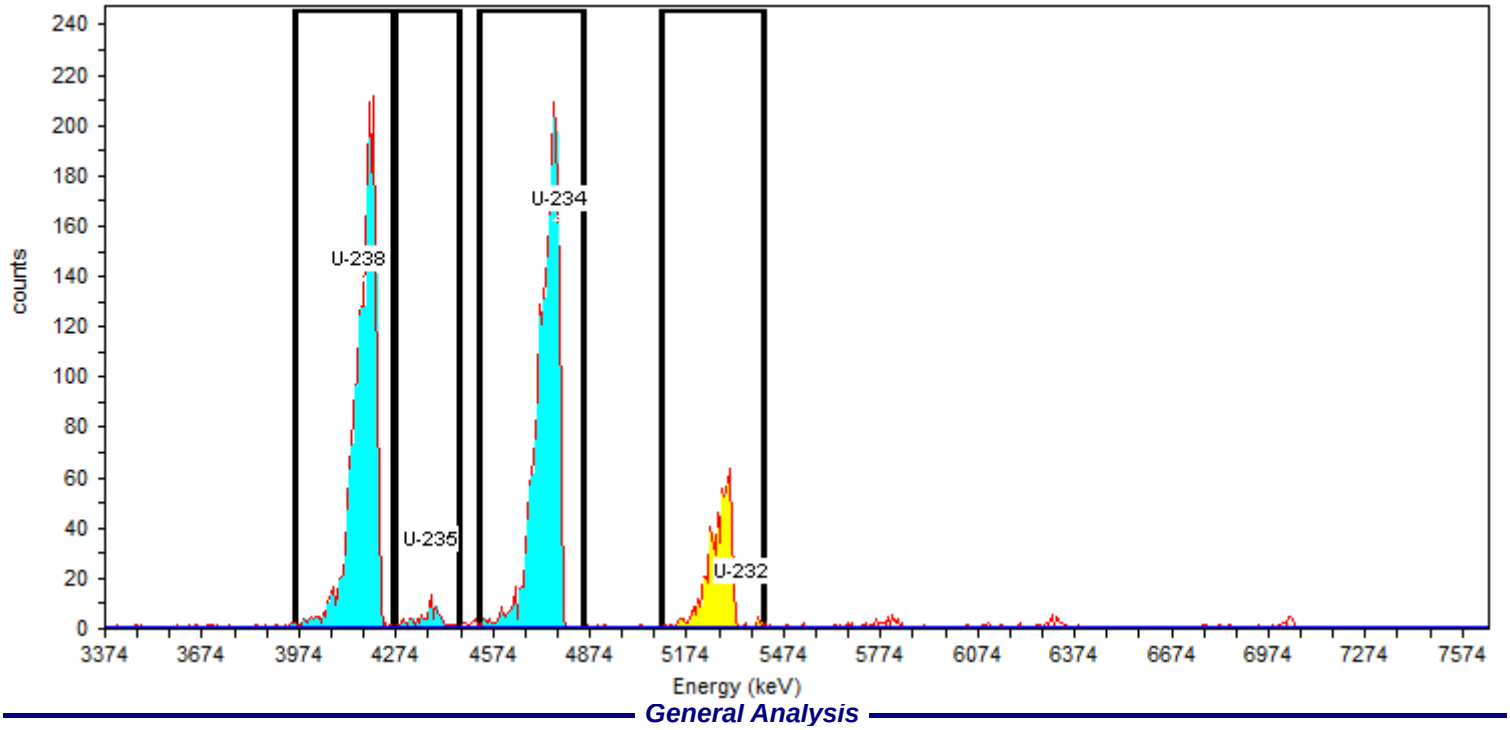
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM / mL x (Vol.) 0.20 mL = 15.50 DPM
Tracer Ref. Date: 4/7/2003 8:30:02AM

Tracer Nuclide: U-232
Tracer Recovery: 51.35%

Acquisition

Detector: AV154 SN: 50-05/JJ7
Acquisition Start Date: 8/9/2018 2:21:29PM
Live Time: 360.00 min.
Real Time: 360.00 min.
Background Date: 7/21/2018 9:28:13PM
Bkgd Info: Sample: ICB;AV154; Det: AV154; Spectrum #1; 7/21/2018 9:28:13 PM

Energy Calibration: IC-9792;AV154-20171113
Efficiency Calibration:IC-9792;AV154-20171113
Calibration Date: 11/13/2017 12:21:47PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.71% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/9/2018 2:20:12PM
MDA Constants: Kα = 1.64 , Kβ = 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	67.4	100.0	1912	1.8750	1910.13	1.902E+001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	39.9	80.2	79	1.1250	77.88	9.671E-001	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	73.3	99.8	1966	1.1250	1964.88	1.961E+001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	76.5	100.1	592	5.6250	586.38	3.473E+000	pCi/g

Daily Checks

Alpha Spectroscopy Daily Pulser Check

Analysis Date: 08/09/18

		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**
AV148	08/09/18 10:46	5992	5703.5 - 6303.9	Pass	15.1	10 - 20	Pass	221.9	216.9 - 226.9	Pass	5022	4981.7 - 5061.7	Pass
AV151	08/09/18 10:46	5874	5405.9 - 5974.9	Pass	12.8	10 - 20	Pass	222.0	217.2 - 227.2	Pass	5022	4984.2 - 5064.2	Pass
AV153	08/09/18 10:46	5986	5695.9 - 6295.5	Pass	16.4	10 - 20	Pass	223.0	218.0 - 228.0	Pass	5030	4989.8 - 5069.8	Pass
AV154	08/09/18 10:46	5773	5390.7 - 5958.1	Pass	12.9	10 - 20	Pass	220.9	216.8 - 226.8	Pass	5014	4980.8 - 5060.8	Pass

Analysis Date: 08/28/18

		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**
AV1	08/28/18 00:17	7319	6961.0 - 7693.7	Pass	17.2	10 - 20	Pass	224.1	218.5 - 228.5	Pass	5038	4993.7 - 5073.7	Pass
AV3	08/28/18 00:17	7191	6900.2 - 7626.5	Pass	13.0	10 - 20	Pass	225.0	220.0 - 230.0	Pass	5045	5004.9 - 5084.9	Pass
AV7	08/28/18 00:17	7323	6979.5 - 7714.2	Pass	16.7	10 - 20	Pass	235.0	226.3 - 236.3	Pass	5120	5052.3 - 5132.3	Pass

Analysis Date: 08/29/18

		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**
AV13	08/29/18 01:16	7724	7261.8 - 8026.2	Pass	18.3	10 - 20	Pass	223.0	217.4 - 227.4	Pass	5030	4985.7 - 5065.7	Pass

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:22:19AM 8/28/2018

Sample

Sample Name: Pulser;AV1
Comment:

Spectrum #12 Analysis #1

Batch

Batch Name: August2018a
Description:

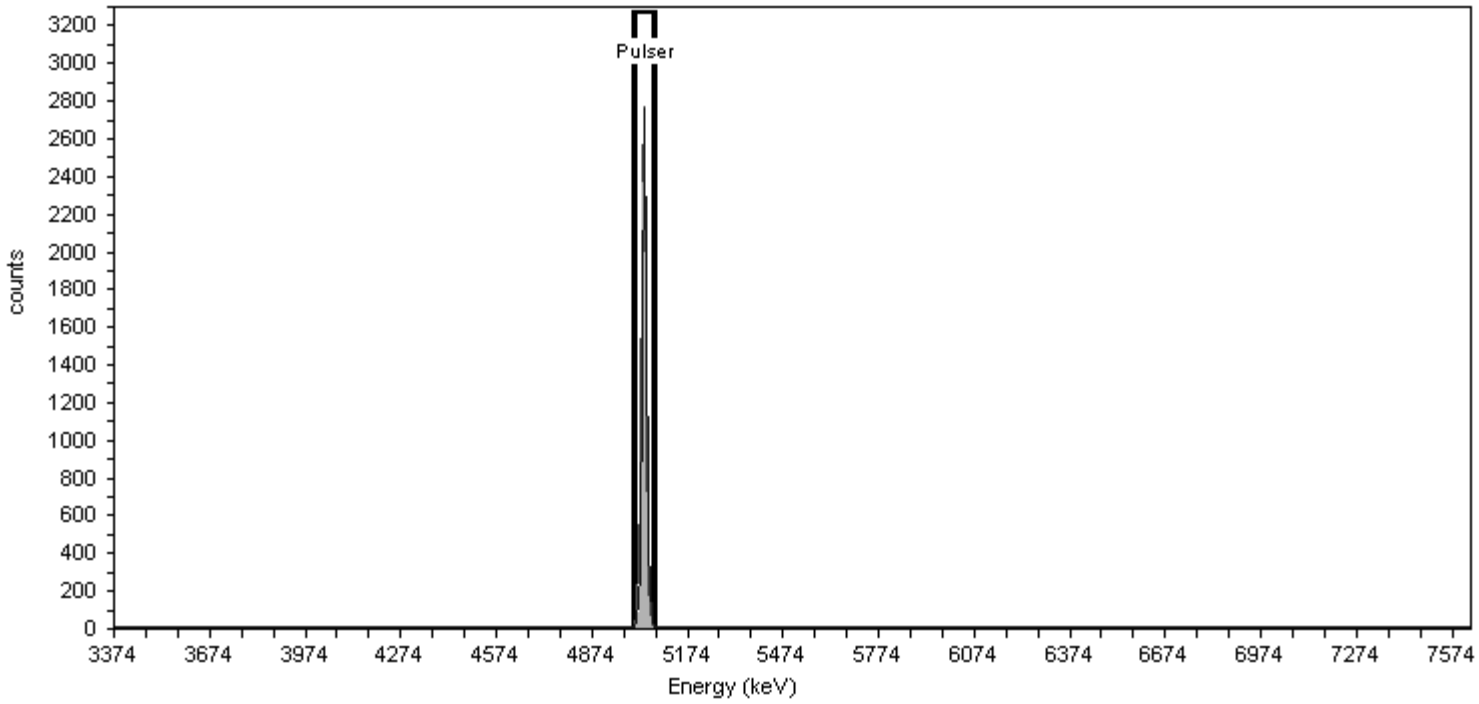
Analyst: 60040

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 8/28/2018 12:17:39AM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.36% +/- 0.28% 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	5038.220	5008.941	5067.499	17.20	6,840.98	7,319.29

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:22:37AM 8/28/2018

Sample

Sample Name: Pulser;AV3
Comment:

Spectrum #12 Analysis #1

Batch

Batch Name: August2018a
Description:

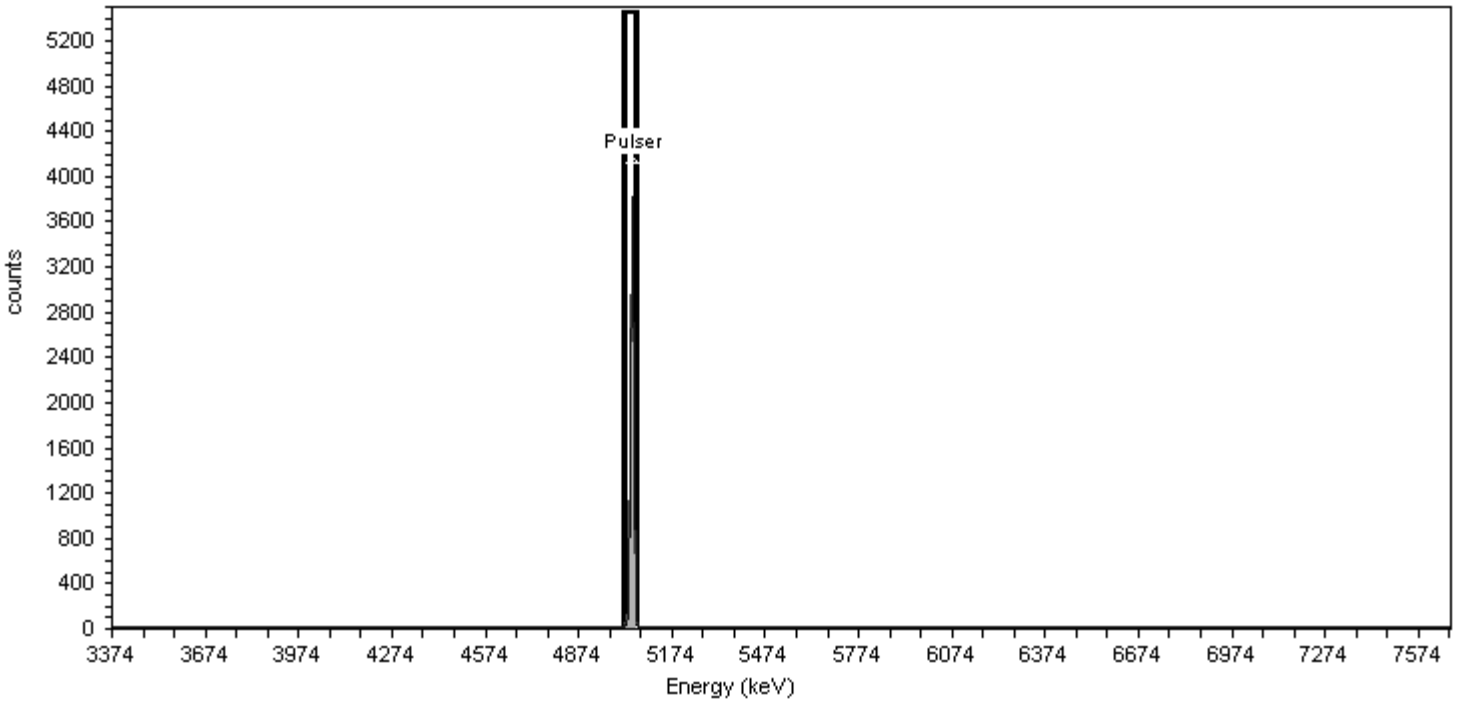
Analyst: 60040

Acquisition

Detector: AV3 , SN: 49-202 FF7
Acquisition Start Date: 8/28/2018 12:17:11AM
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 / Ch^2

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	5045.085	5022.917	5067.252	13.02	7,118.35	7,190.90

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:22:55AM 8/28/2018

Sample

Sample Name: Pulser;AV7
Comment:

Spectrum #12 Analysis #1

Batch

Batch Name: August2018a
Description:

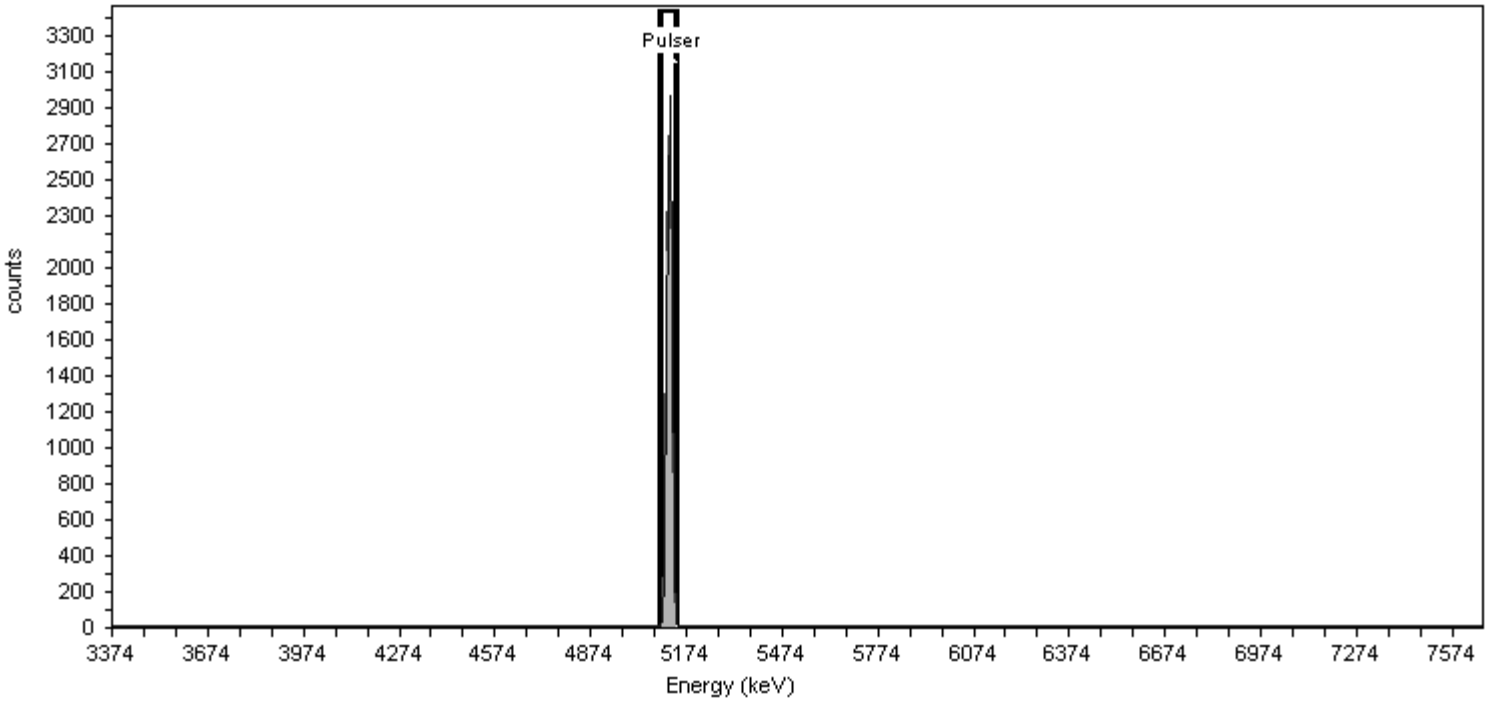
Analyst: 60040

Acquisition

Detector: AV7 , SN: 48-158EE5
Acquisition Start Date: 8/28/2018 12:17:13AM
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 / Ch^2

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	5119.822	5091.429	5148.215	16.68	7,099.30	7,322.76

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:23:48AM 8/29/2018

Sample

Sample Name: Pulser;AV13
Comment:

Spectrum #13 Analysis #1

Batch

Batch Name: August2018a
Description:

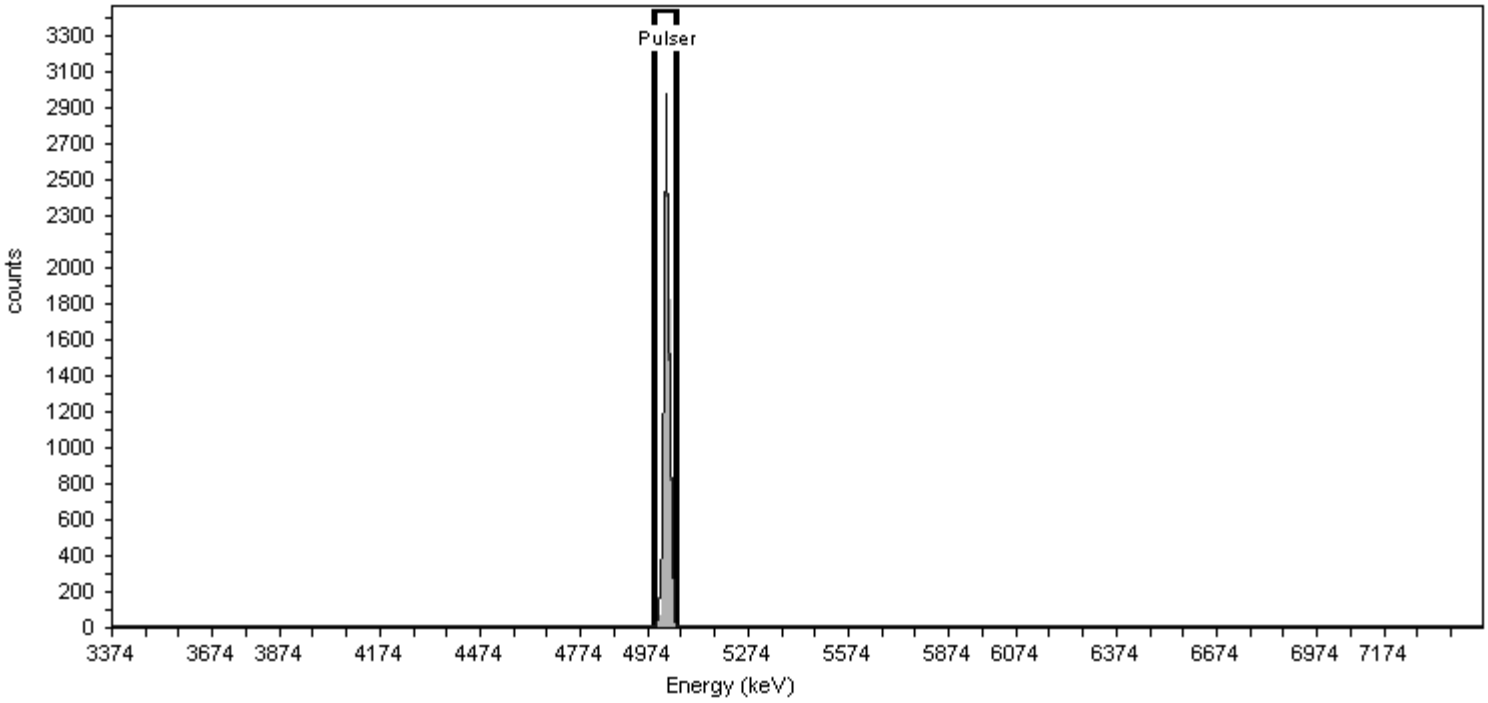
Analyst: 60040

Acquisition

Detector: AV13 , SN: 49-155M7
Acquisition Start Date: 8/29/2018 1:16:23AM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1370621;AV13-05142018
Calibration Date: 5/14/2018 6:27:37PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.95% +/- 0.24% 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	5029.964	4998.751	5061.177	18.34	7,812.10	7,724.06

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:09:05AM 8/9/2018

Sample

Sample Name: Pulser;AV148
Comment:

Spectrum #12 Analysis #1

Batch

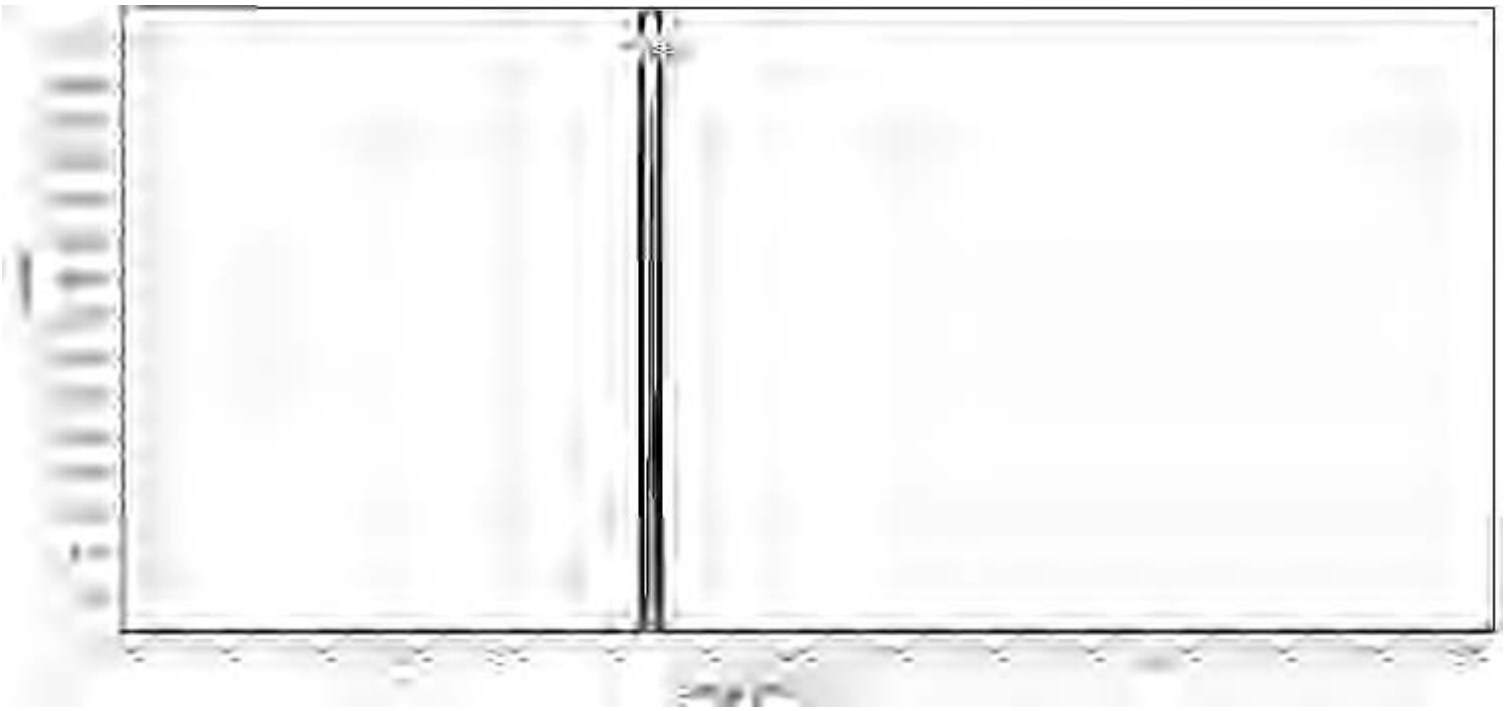
Batch Name: July2018a
Description:

Acquisition

Detector: AV148 , SN: 50-05/R2
Acquisition Start Date: 8/9/2018 10:46:23AM
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 / Ch^2



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	5021.901	4996.256	5047.545	15.07	5,817.35	5,992.10

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:09:18AM 8/9/2018

Sample

Sample Name: Pulser;AV151
Comment:

Spectrum #12 Analysis #1

Batch

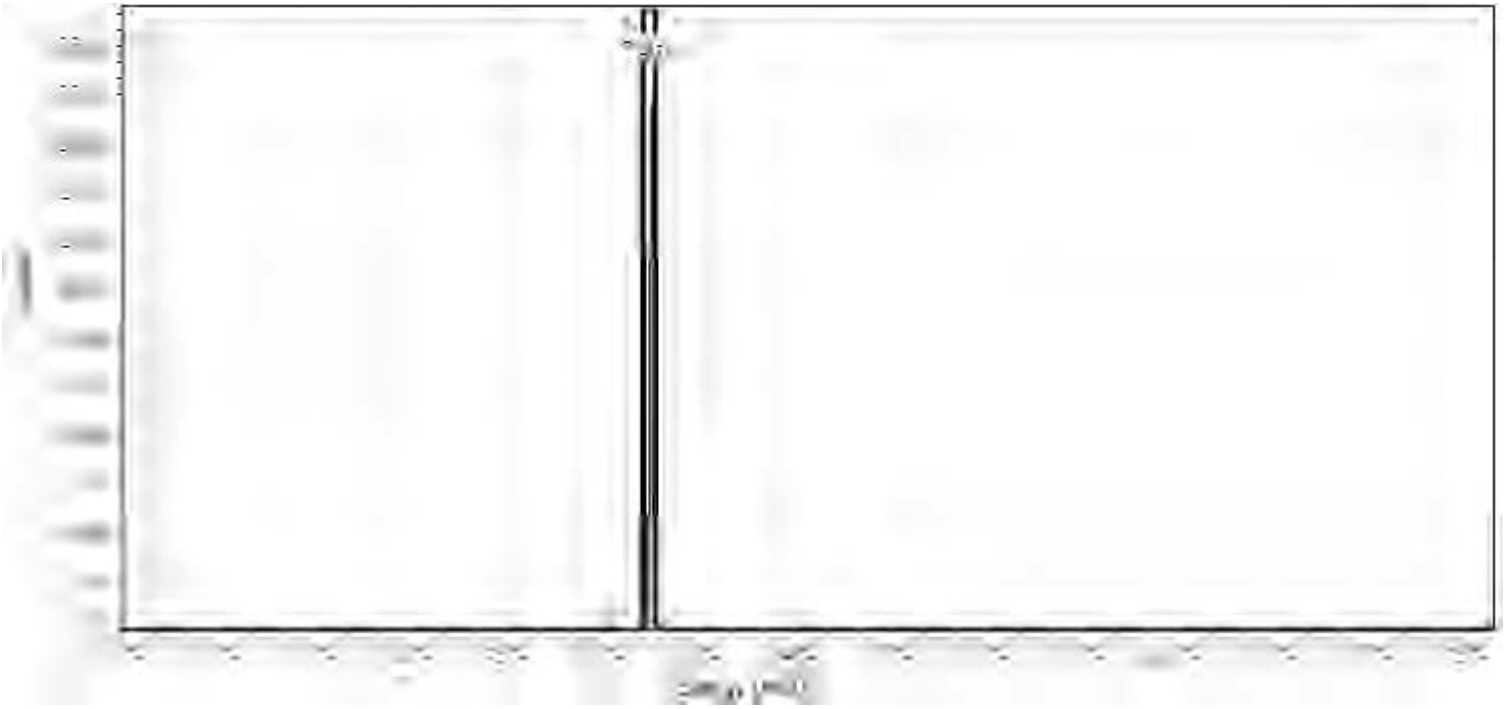
Batch Name: July2018a
Description:

Acquisition

Detector: AV151 , SN: 50-05/R5
Acquisition Start Date: 8/9/2018 10:46:24AM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8877;AV151-20171113
Calibration Date: 11/13/2017 12:21:30PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5022.414	5000.645	5044.182	12.79	5,958.59	5,873.98

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:09:24AM 8/9/2018

Sample

Sample Name: Pulser;AV153
Comment:

Spectrum #12 Analysis #1

Batch

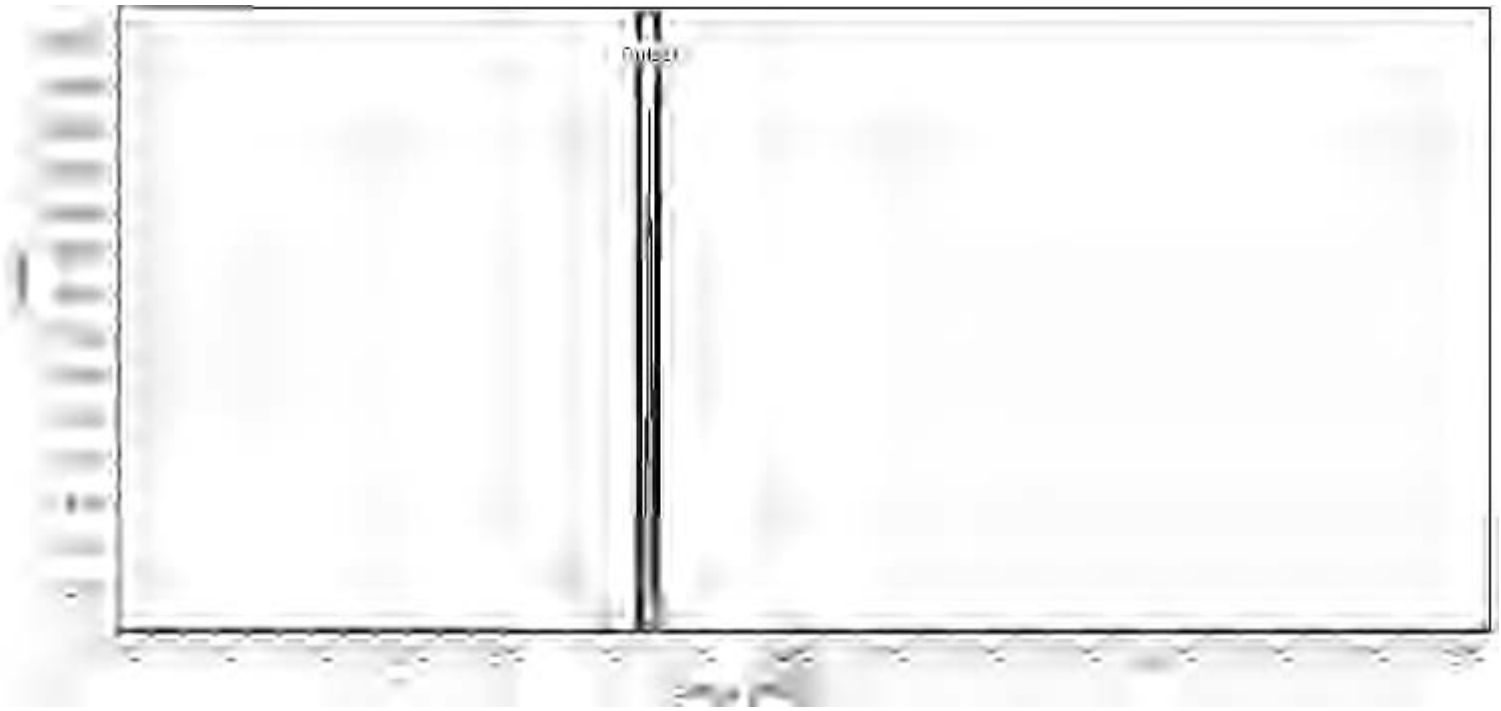
Batch Name: July2018a
Description:

Acquisition

Detector: AV153 , SN: 54-011 Y6
Acquisition Start Date: 8/9/2018 10:46:24AM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8879;AV153-20171113
Calibration Date: 11/13/2017 12:21:42PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5030.176	5002.323	5058.029	16.36	5,826.89	5,985.64

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:09:38AM 8/9/2018

Sample

Sample Name: Pulser;AV154
Comment:

Spectrum #12 Analysis #1

Batch

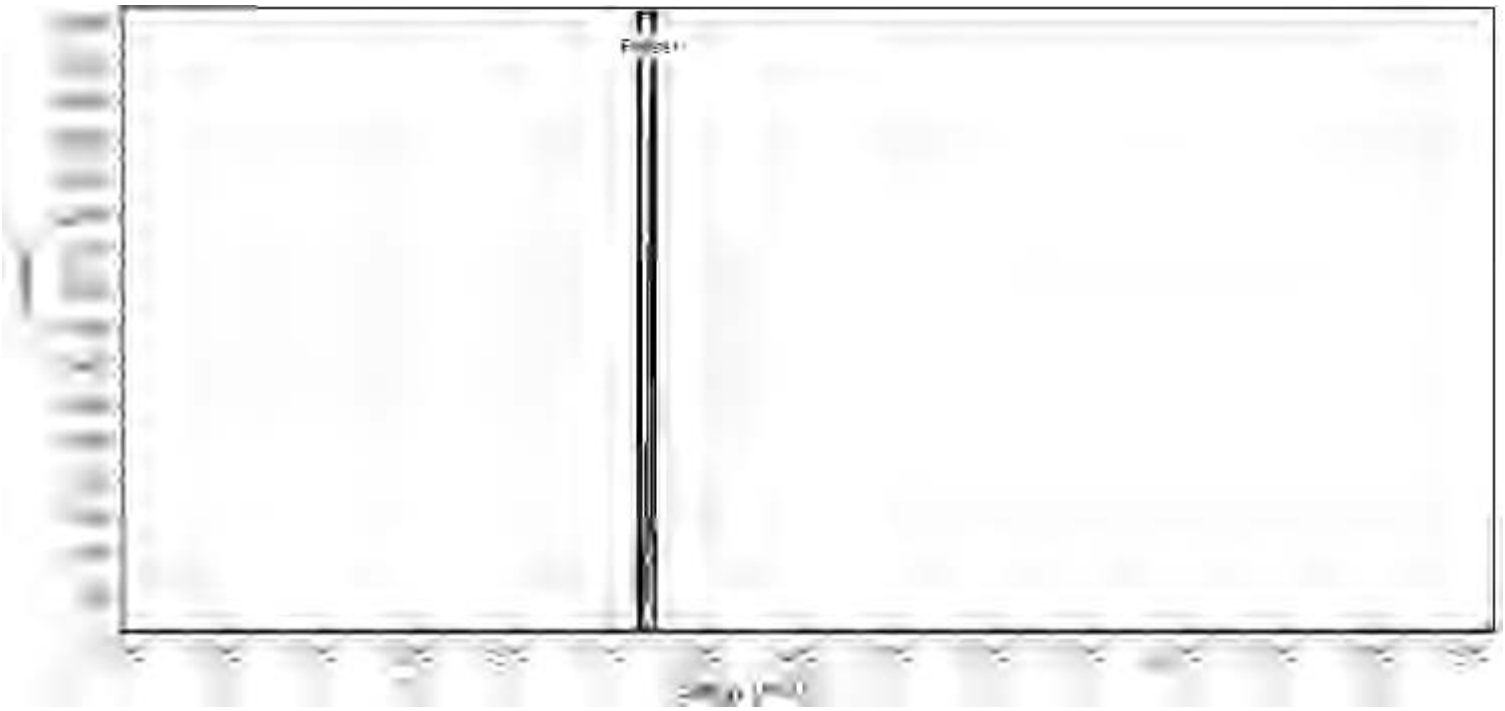
Batch Name: July2018a
Description:

Acquisition

Detector: AV154 , SN: 50-05/JJ7
Acquisition Start Date: 8/9/2018 10:46:24AM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-9792;AV154-20171113
Calibration Date: 11/13/2017 12:21:47PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5014.448	4992.544	5036.351	12.87	5,167.44	5,773.04

Initial Calibrations

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:23:49PM 5/14/2018

Calibration

Sample Name: IC-7107;AV1-05142018
Description:
Detector: AV1

Calibration Date: 5/14/2018 6:23:45PM
Analyst: 60040

Source Info

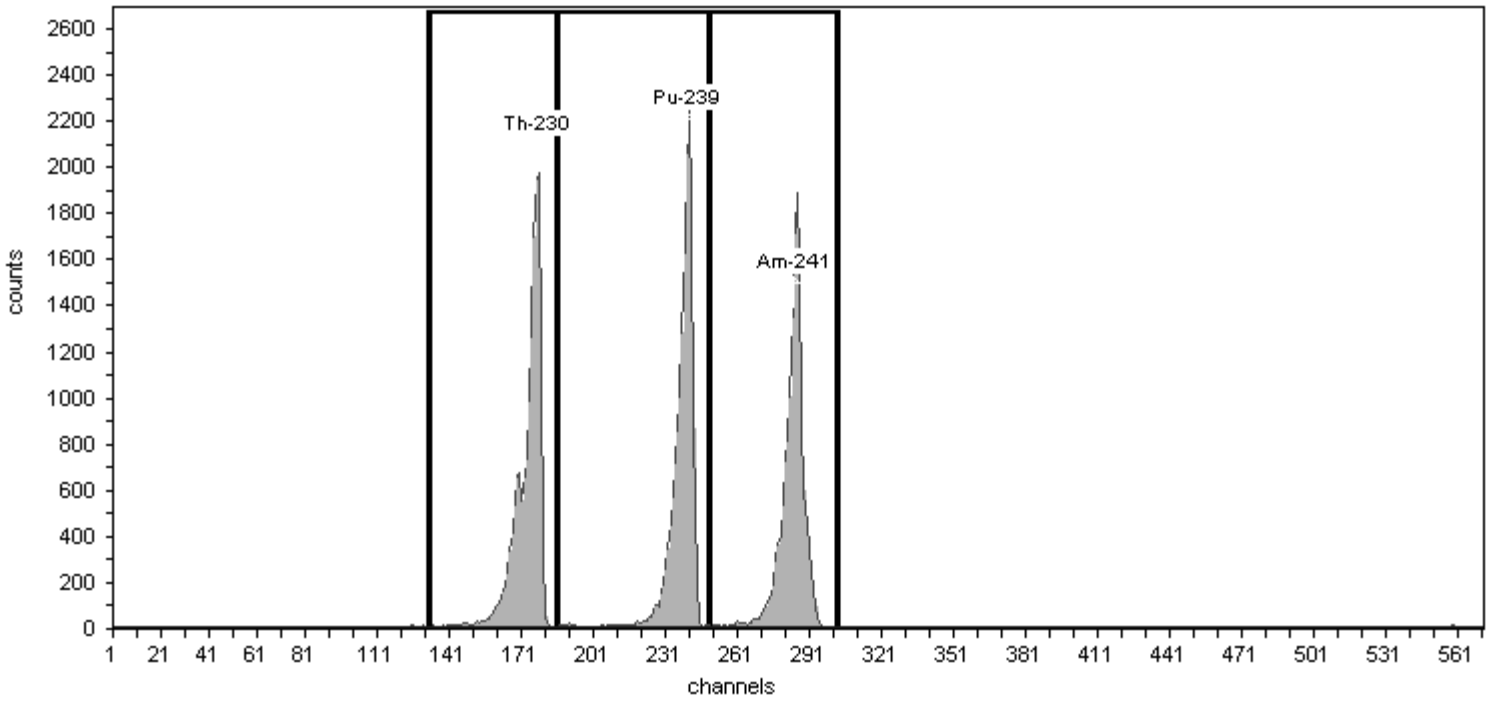
Certificate ID: 82232-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 5/14/2018 3:44:27PM
Live Time: 140.00 min.
Real Time: 140.09 min.
Efficiency: 24.36% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	15,240.00	108.86
Pu-239	240	5.16	186	249	0.00	15,352.00	109.66
Am-241	284	5.49	249	303	0.00	14,427.00	103.05

FWHM > 100keV
RTM 6/22/2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:25:19PM 5/14/2018

Calibration

Sample Name: IC-8877;AV3-05142018
Description:
Detector: AV3

Calibration Date: 5/14/2018 6:25:15PM
Analyst: 60040

Source Info

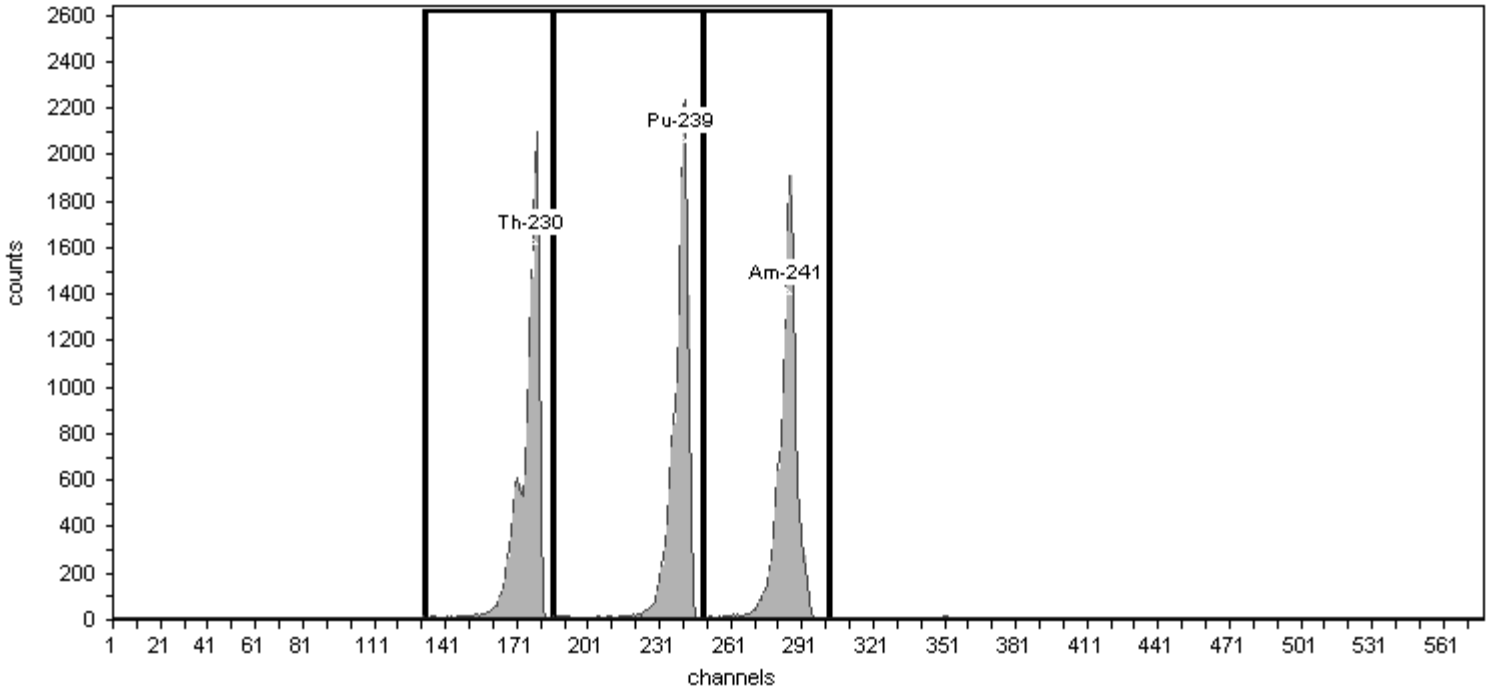
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



General Analysis

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:26:17PM 5/14/2018

Calibration

Sample Name: IC-9793;AV7-05142018
Description:
Detector: AV7

Calibration Date: 5/14/2018 6:26:13PM
Analyst: 60040

Source Info

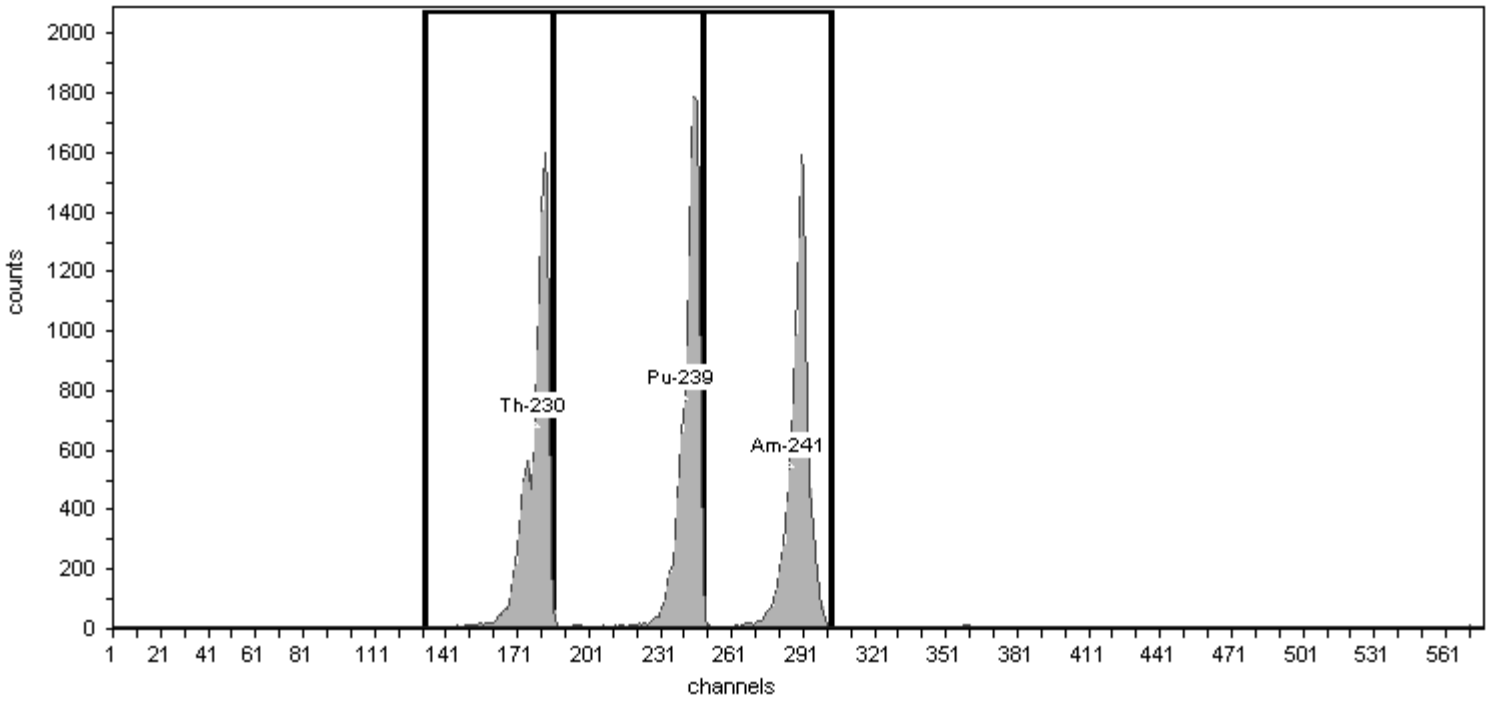
Certificate ID: 82241-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



General Analysis

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:27:41PM 5/14/2018

Calibration

Sample Name: IC-1370621;AV13-05142018
Description:
Detector: AV13

Calibration Date: 5/14/2018 6:27:37PM
Analyst: 60040

Source Info

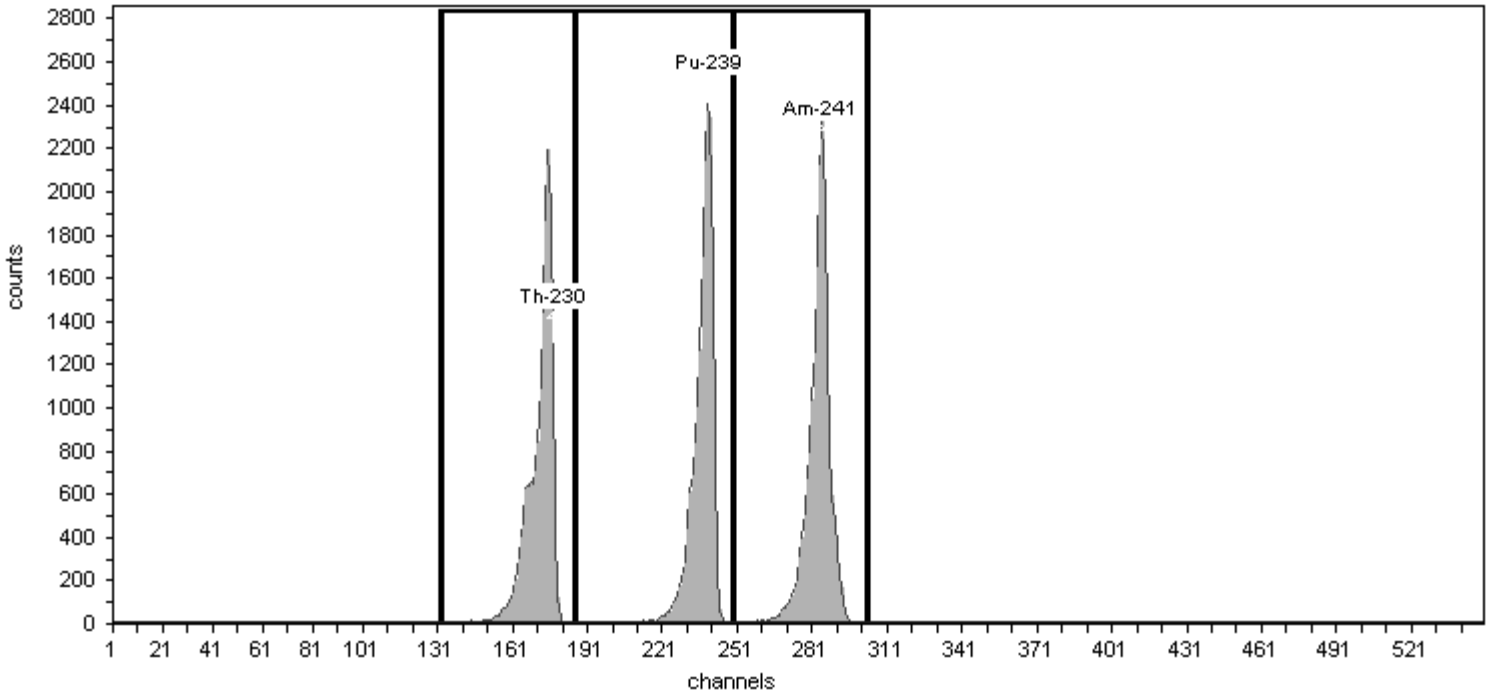
Certificate ID: 108345_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV13 , SN: 49-155M7
Acquisition Start Date: 5/14/2018 3:53:32PM
Live Time: 140.00 min.
Real Time: 140.13 min.
Efficiency: 26.95% +/- 0.24% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	16,510.00	117.93
Pu-239	240	5.16	186	249	0.00	17,454.00	124.67
Am-241	284	5.49	249	303	0.00	17,940.00	128.14

FWHM > 100keV
RTM 6/22/2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:24:56PM 11/13/2017

Calibration

Sample Name: IC-8874;AV148-20171113a
Description:
Detector: AV148

Analyst: 60040
Analysis Date: 11/13/2017 12:24:55PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82233-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

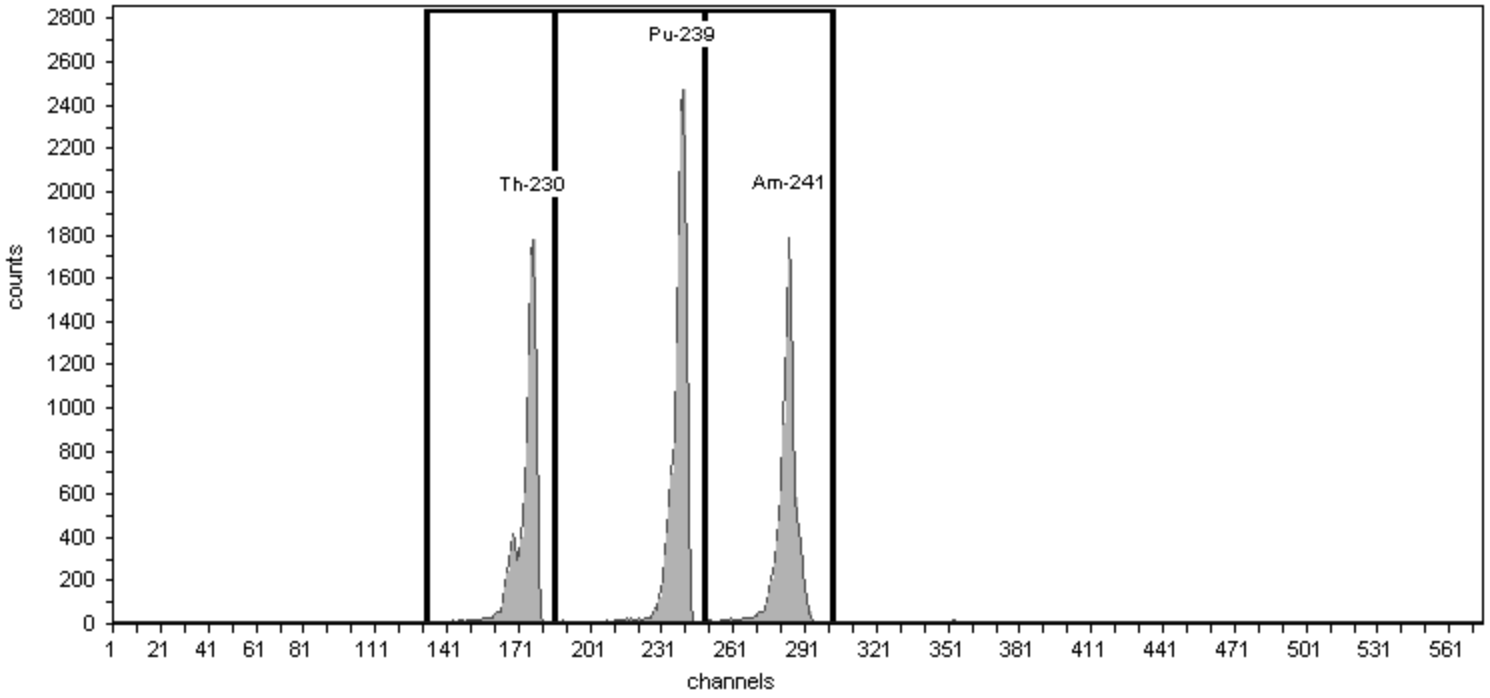
Detector: AV148 , SN: 50-05/R2
Acquisition Start Date: 11/13/2017 10:03:59AM

Live Time: 140.00 min.
Real Time: 140.01 min.

Efficiency Calibration Name: IC-8874;AV148-20171113a

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:34:52PM 11/13/2017

Calibration

Sample Name: IC-8877;AV151-20171113
Description:
Detector: AV151

Analyst: 60040
Analysis Date: 11/13/2017 12:21:30PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82236-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

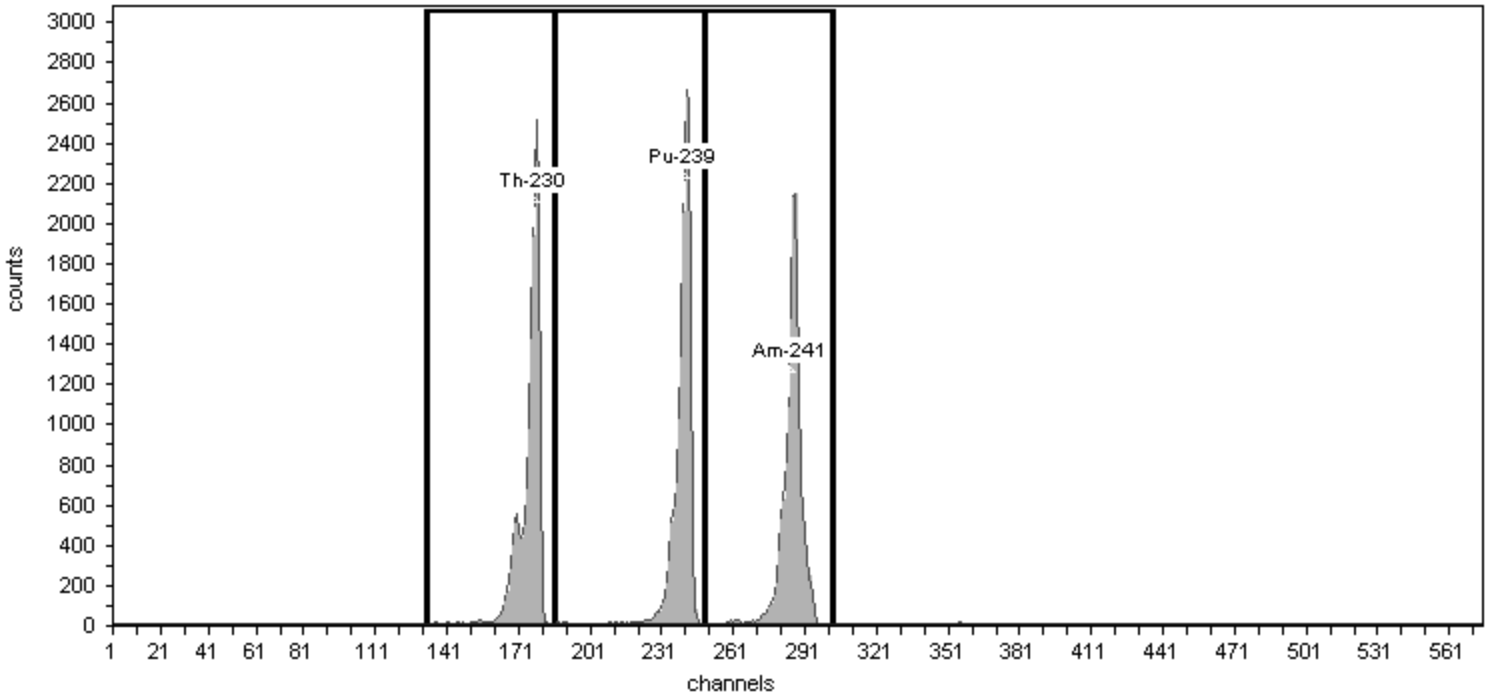
Detector: AV151 , SN: 50-05/R5
Acquisition Start Date: 11/13/2017 9:46:44AM

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 / Ch^2

Efficiency Calibration Name: IC-8877;AV151-20171113

Efficiency: 24.91% +/- 0.30% 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	30.07	14,432.00	103.09
Pu-239	240	5,155.40	186	249	31.26	14,763.00	105.45
Am-241	284	5,485.70	249	303	32.74	14,012.00	100.09

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:34:58PM 11/13/2017

Calibration

Sample Name: IC-8879;AV153-20171113
Description:
Detector: AV153

Analyst: 60040
Analysis Date: 11/13/2017 12:21:42PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82238-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

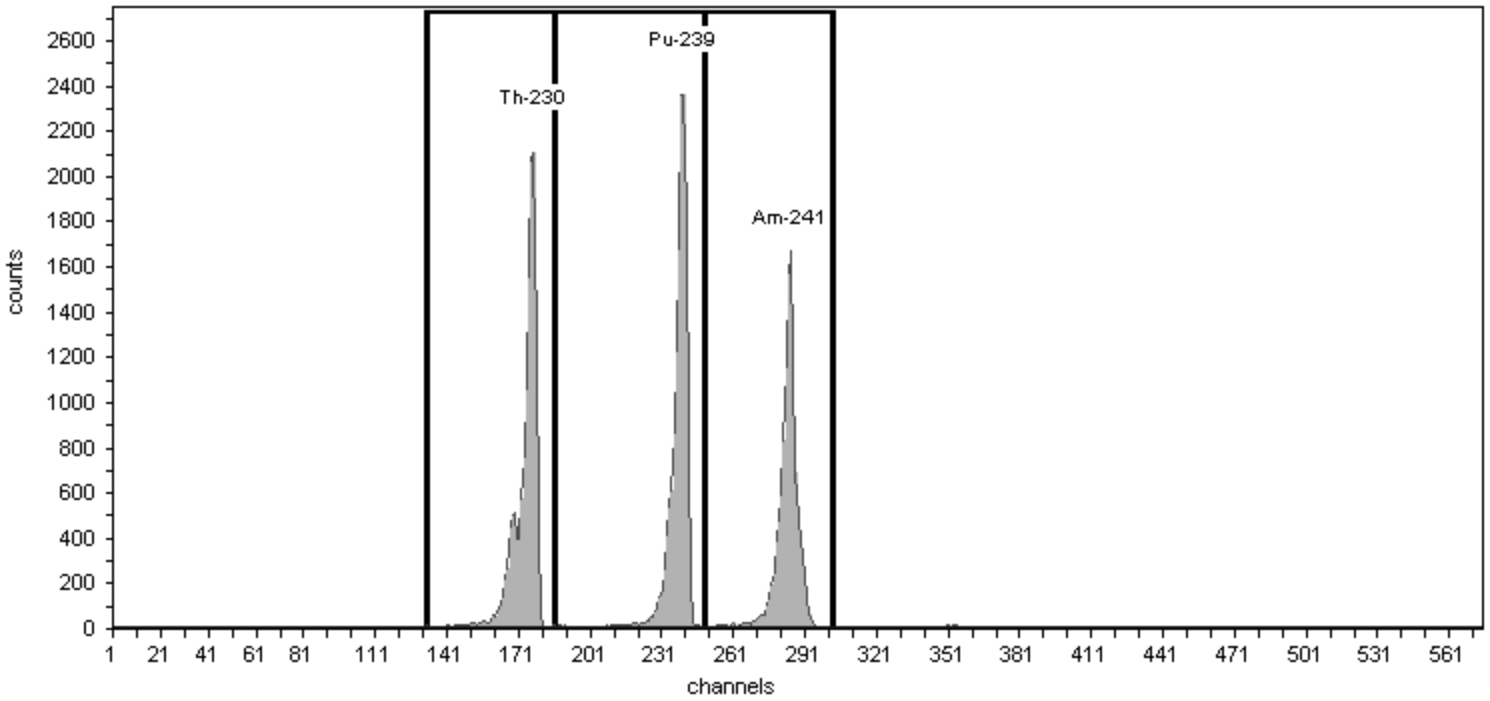
Detector: AV153 , SN: 54-011 Y6
Acquisition Start Date: 11/13/2017 9:48:03AM

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 / Ch^2

Efficiency Calibration Name: IC-8879;AV153-20171113

Efficiency: 23.17% +/- 0.31% 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	32.08	13,276.00	94.83
Pu-239	240	5,155.40	186	249	35.29	13,964.00	99.74
Am-241	284	5,485.70	249	303	34.81	11,268.00	80.49

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:35:02PM 11/13/2017

Calibration

Sample Name: IC-9792;AV154-20171113
Description:
Detector: AV154

Analyst: 60040
Analysis Date: 11/13/2017 12:21:47PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82240-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

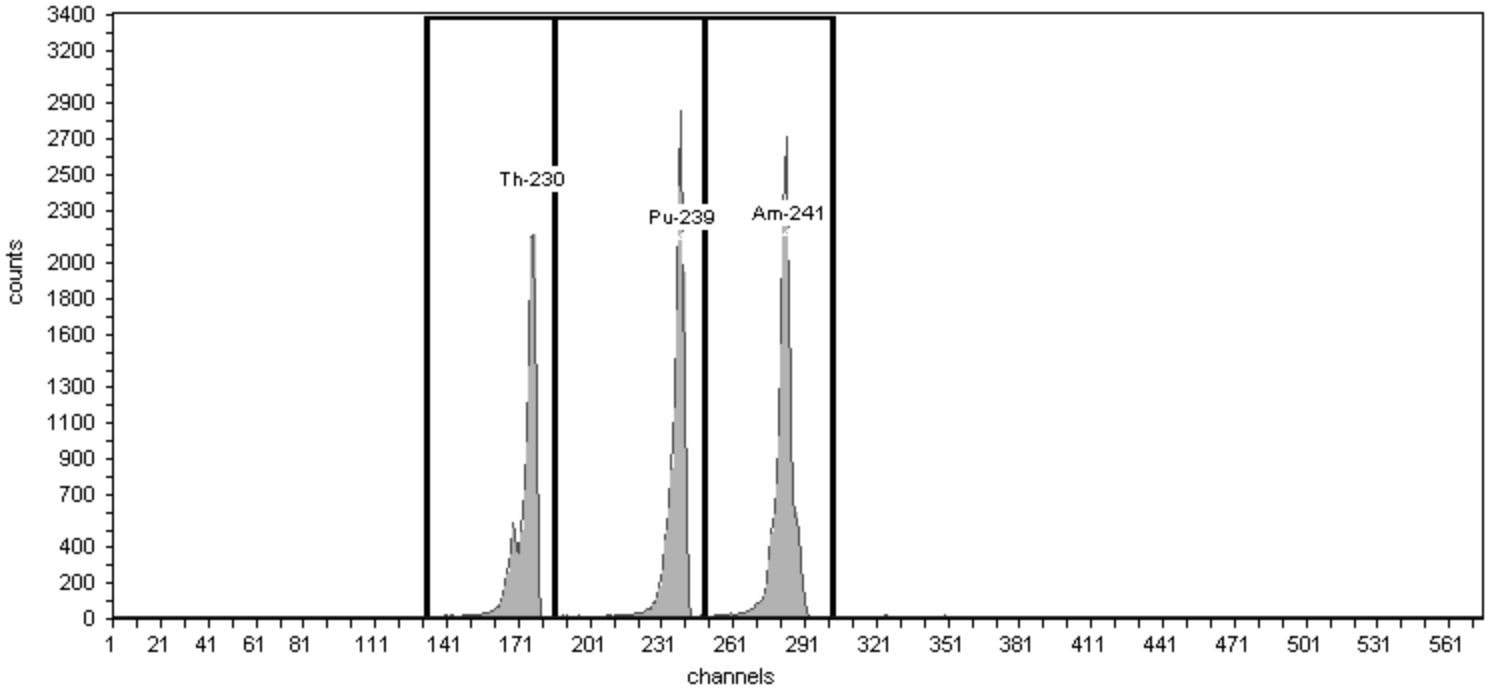
Detector: AV154 , SN: 50-05/JJ7
Acquisition Start Date: 11/13/2017 9:48:38AM

Live Time: 140.00 min.
Real Time: 140.01 min.

Efficiency Calibration Name: IC-9792;AV154-20171113

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.71% +/- 0.29% 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	29.28	12,508.00	89.34
Pu-239	240	5,155.40	186	249	29.50	14,495.00	103.54
Am-241	284	5,485.70	249	303	30.24	16,173.00	115.52

Initial Calibration Verifications

Alpha Spectroscopy Calibration Summary

Detector: AV1

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371830/1	05/14/18 15:44	82232-334_00001	0.2436	0.20-0.32		
ICV 160-371933/1	05/18/18 19:25	82236-334_00001	0.2326	0.20-0.32	95.5	95-105
CCV 160-382694/1	08/14/18 14:05	82232-334_00001	0.2385	0.20-0.32	97.9	95-105

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 160-382709/1	08/14/18 14:06	82236-334_00001	0.2445	0.20-0.32	100.1	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 160-382723/1	08/14/18 14:08	82241-334_00001	0.2253	0.20-0.32	98.1	95-105

Detector: AV13

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371834/1	05/14/18 15:53	108345_00001	0.2695	0.20-0.32		
ICV 160-371949/1	05/20/18 11:51	108346_00001	0.2669	0.20-0.32	99.0	95-105
CCV 160-382698/1	08/14/18 14:11	108345_00001	0.2718	0.20-0.32	100.8	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

Detector: AV151

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337254/1	11/13/17 09:46	82236-334_00001	0.2491	0.20-0.32		
ICV 160-337586/1	11/15/17 11:45	82232-334_00001	0.2464	0.20-0.32	98.9	95-105
CCV 160-378433/1	07/24/18 10:33	82236-334_00001	0.2455	0.20-0.32	98.6	95-105

Detector: AV153

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337256/1	11/13/17 09:48	82238-334_00001	0.2317	0.20-0.32		
ICV 160-337588/1	11/15/17 11:52	82244-334_00001	0.2338	0.20-0.32	100.9	95-105
CCV 160-378435/1	07/24/18 10:34	82238-334_00001	0.2208	0.20-0.32	95.3	95-105

Detector: AV154

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337257/1	11/13/17 09:48	82240-334_00001	0.2371	0.20-0.32		
ICV 160-337589/1	11/15/17 11:52	82246-334_00001	0.2363	0.20-0.32	99.7	95-105
CCV 160-378436/1	07/24/18 10:34	82240-334_00001	0.2329	0.20-0.32	98.2	95-105

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:58:09PM 5/19/2018

Calibration

Sample Name: ICV-8877;AV1-05182018
Description:
Detector: AV1

Calibration Date: 5/19/2018 3:58:05PM
Analyst: 60040

Source Info

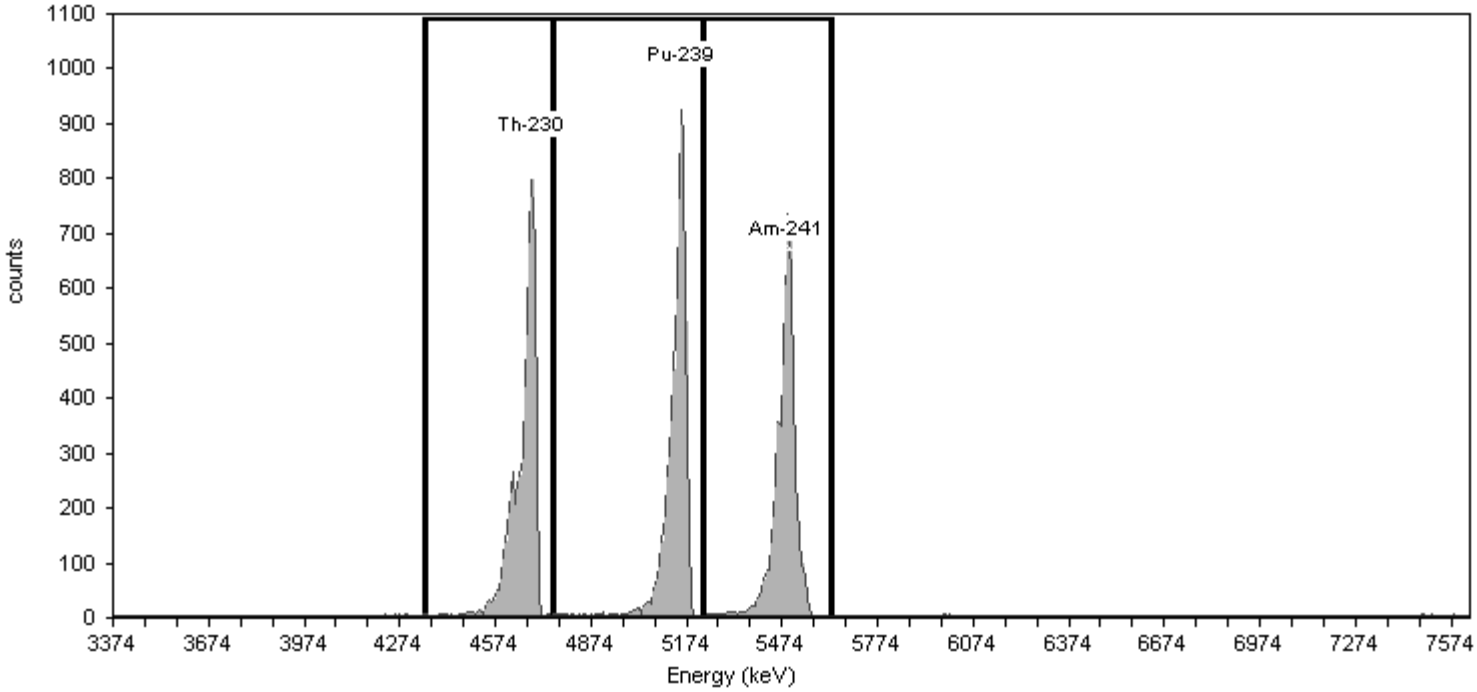
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 5/18/2018 7:25:01PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 23.26% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,697.00	94.95
Pu-239	240	5.16	186	249	0.00	6,038.00	100.63
Am-241	284	5.49	249	303	0.00	5,570.00	92.83

FWHM > 100keV
RTM 6/22/2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:58:37PM 5/19/2018

Calibration

Sample Name: ICV-7107;AV3-05182018
Description:
Detector: AV3

Calibration Date: 5/19/2018 3:58:34PM
Analyst: 60040

Source Info

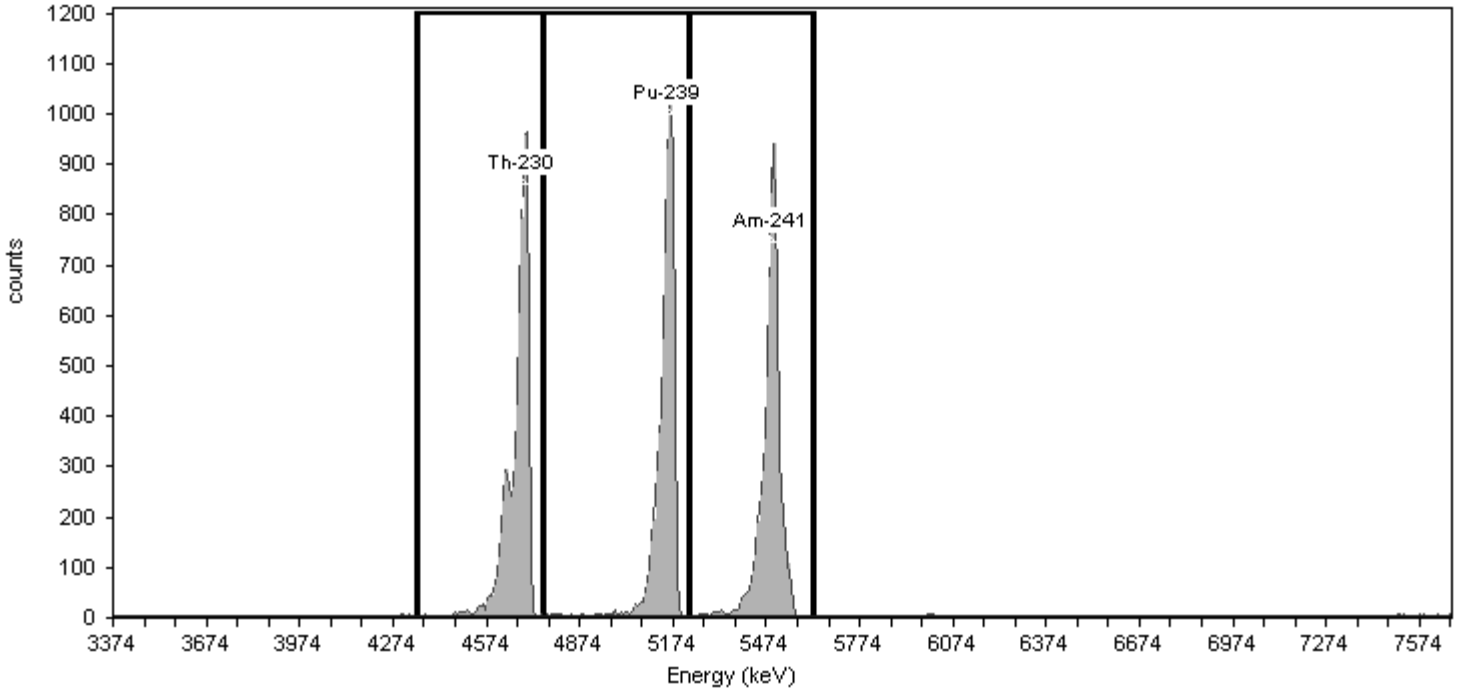
Certificate ID: 82232-334
Prepared by: Analytics

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 / Ch^2



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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:59:12PM 5/19/2018

Calibration

Sample Name: ICV-9520;AV7-05182018
Description:
Detector: AV7

Calibration Date: 5/19/2018 3:59:09PM
Analyst: 60040

Source Info

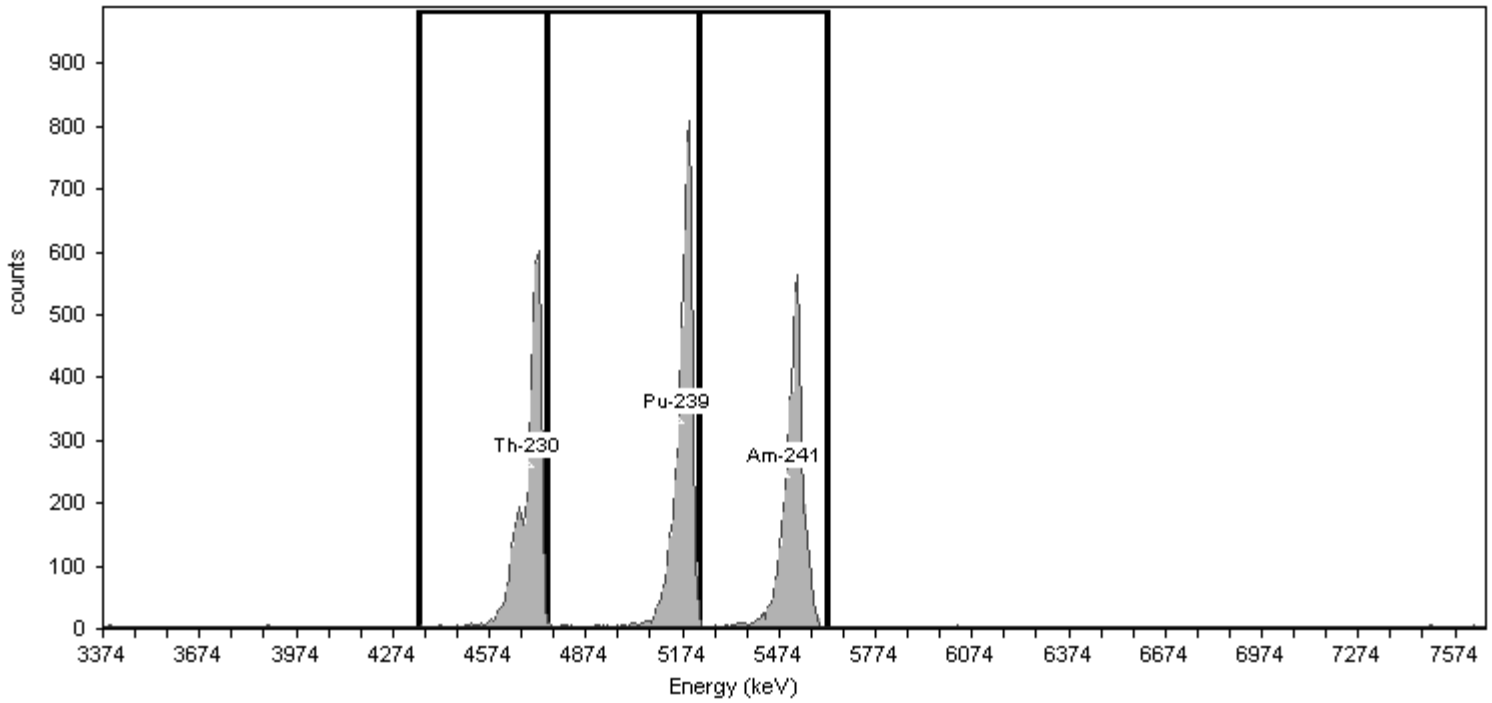
Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



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	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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:03:32PM 5/20/2018

Calibration

Sample Name: ICV-1370622;AV13-05202018
Description:
Detector: AV13

Calibration Date: 5/20/2018 4:03:14PM
Analyst: 60040

Source Info

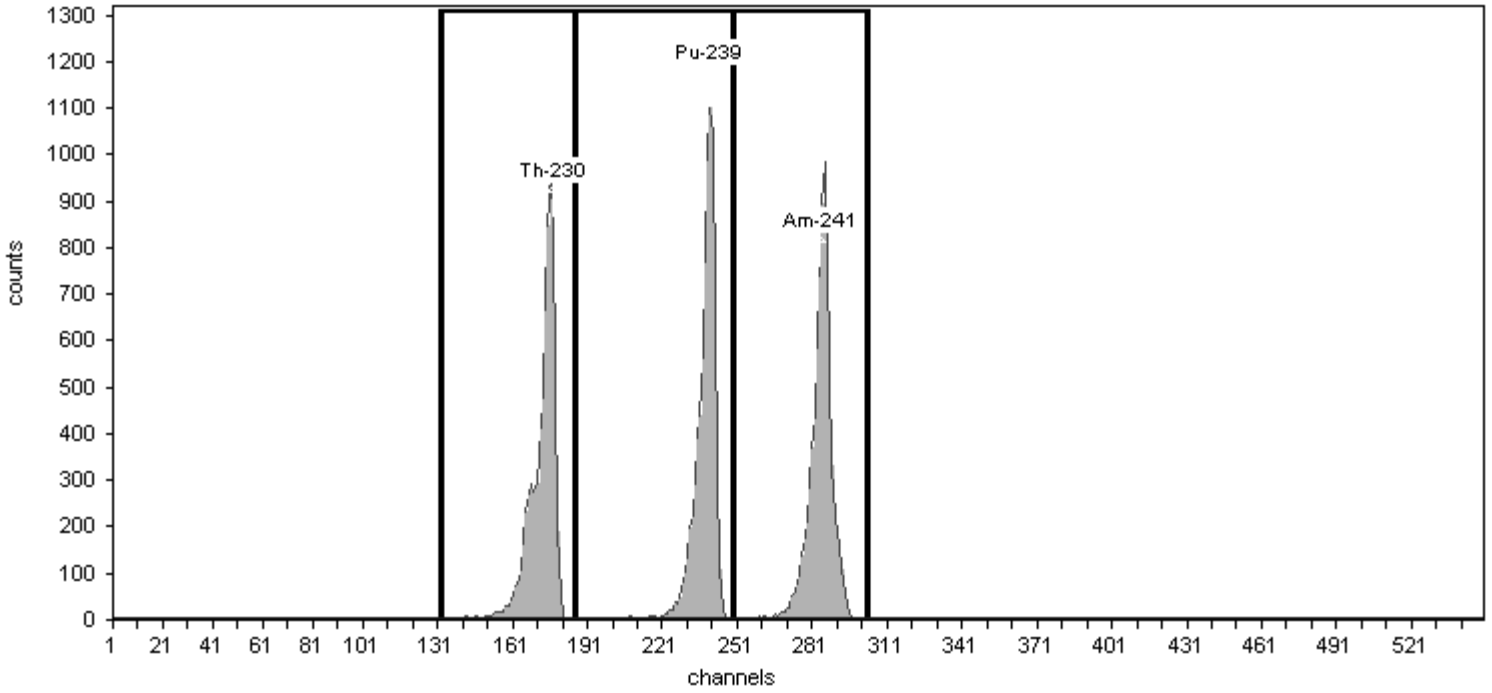
Certificate ID: 108346_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV13 , SN: 49-155M7
Acquisition Start Date: 5/20/2018 11:51:08AM
Live Time: 60.00 min.
Real Time: 60.01 min.
Efficiency: 26.69% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	7,271.00	121.18
Pu-239	240	5.16	186	249	0.00	7,629.00	127.15
Am-241	284	5.49	249	303	0.00	7,600.00	126.67

FWHM > 100keV
RTM 6/22/2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:50:34PM 11/15/2017

Calibration

Sample Name: ICV-9795;AV148-20171115
Description:
Detector: AV148

Analyst: 60040
Analysis Date: 11/15/2017 12:50:32PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82243-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

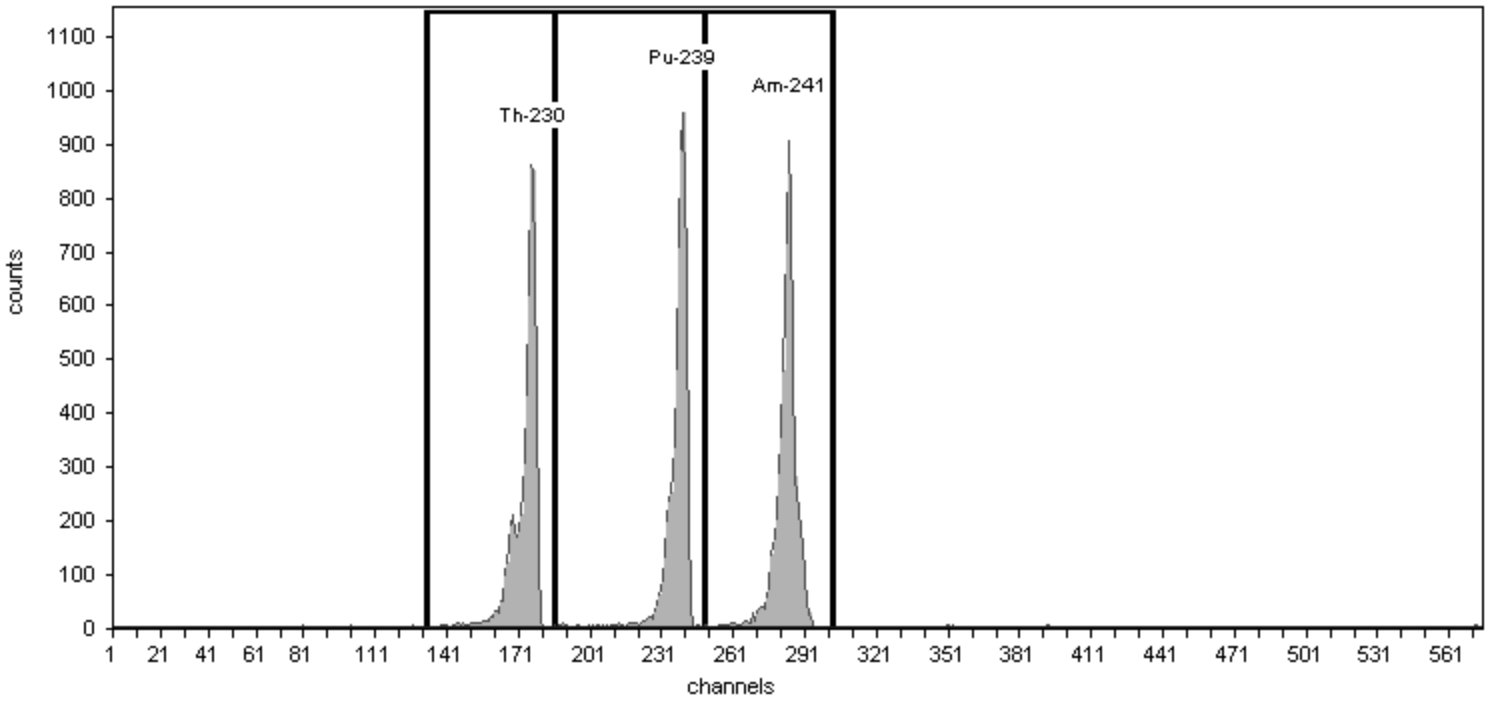
Detector: AV148 , SN: 50-05/R2
Acquisition Start Date: 11/15/2017 11:50:26AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9795;AV148-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:46:00PM 11/15/2017

Calibration

Sample Name: ICV-7107;AV151-20171115
Description:
Detector: AV151

Analyst: 60040
Analysis Date: 11/15/2017 12:45:58PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82232-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

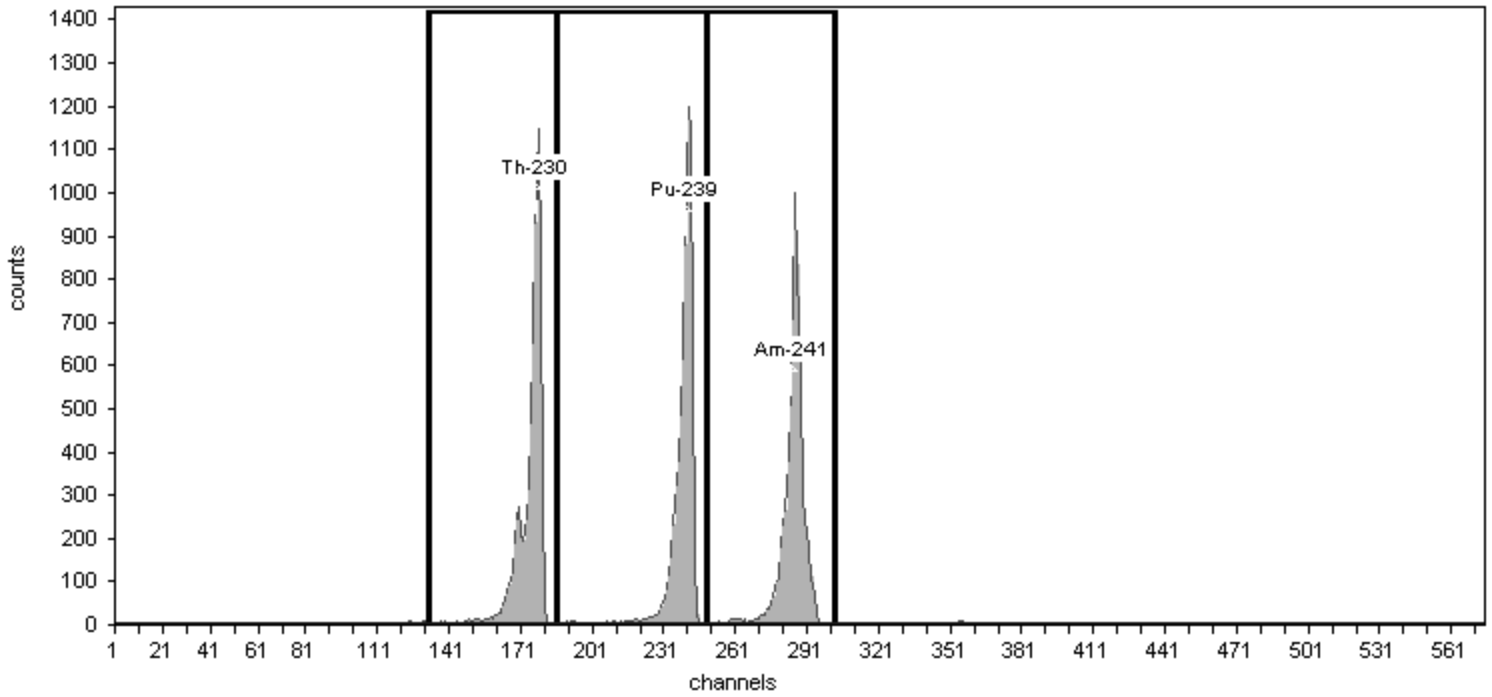
Detector: AV151 , SN: 50-05/R5
Acquisition Start Date: 11/15/2017 11:45:34AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-7107;AV151-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 24.64% +/- 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	28.90	6,543.00	109.05
Pu-239	240	5,155.40	186	249	31.07	6,698.00	111.63
Am-241	284	5,485.70	249	303	31.83	6,287.00	104.78

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:52:18PM 11/15/2017

Calibration

Sample Name: ICV-9817;AV153-20171115
Description:
Detector: AV153

Analyst: 60040
Analysis Date: 11/15/2017 12:52:16PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82244-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

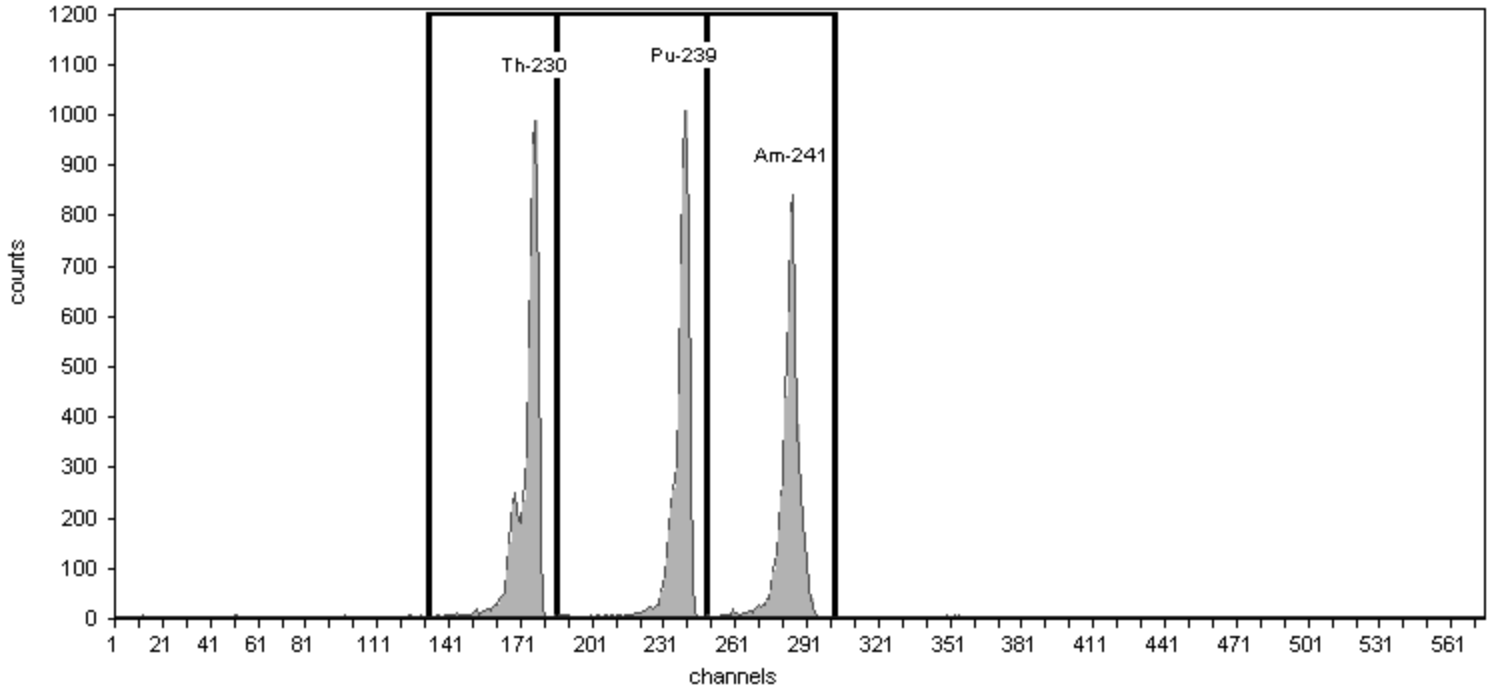
Detector: AV153 , SN: 54-011 Y6
Acquisition Start Date: 11/15/2017 11:52:13AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9817;AV153-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.38% +/- 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	33.51	6,197.00	103.28
Pu-239	240	5,155.40	186	249	32.76	5,687.00	94.78
Am-241	284	5,485.70	249	303	36.56	5,699.00	94.98

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:52:53PM 11/15/2017

Calibration

Sample Name: ICV-9885;AV154-20171115
Description:
Detector: AV154

Analyst: 60040
Analysis Date: 11/15/2017 12:52:51PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

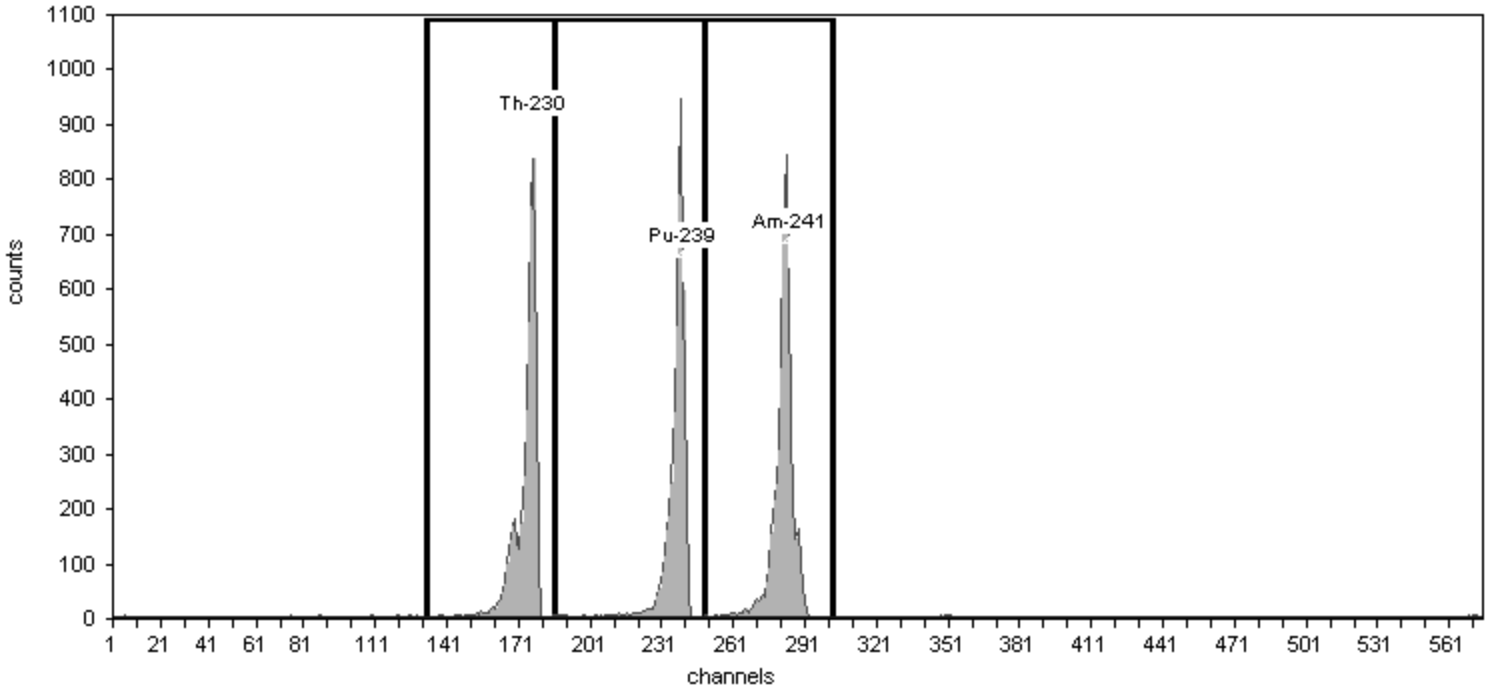
Detector: AV154 , SN: 50-05/JJ7
Acquisition Start Date: 11/15/2017 11:52:47AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9885;AV154-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.63% +/- 0.46% 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	28.97	4,685.00	78.08
Pu-239	240	5,155.40	186	249	27.70	4,586.00	76.43
Am-241	284	5,485.70	249	303	29.50	5,071.00	84.52

Monthly Calibration Verifications

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:21:46PM 8/14/2018

Calibration

Sample Name: CCV-7107;AV1-08142018c
Description:
Detector: AV1

Calibration Date: 8/14/2018 3:10:30PM
Analyst: 60040

Source Info

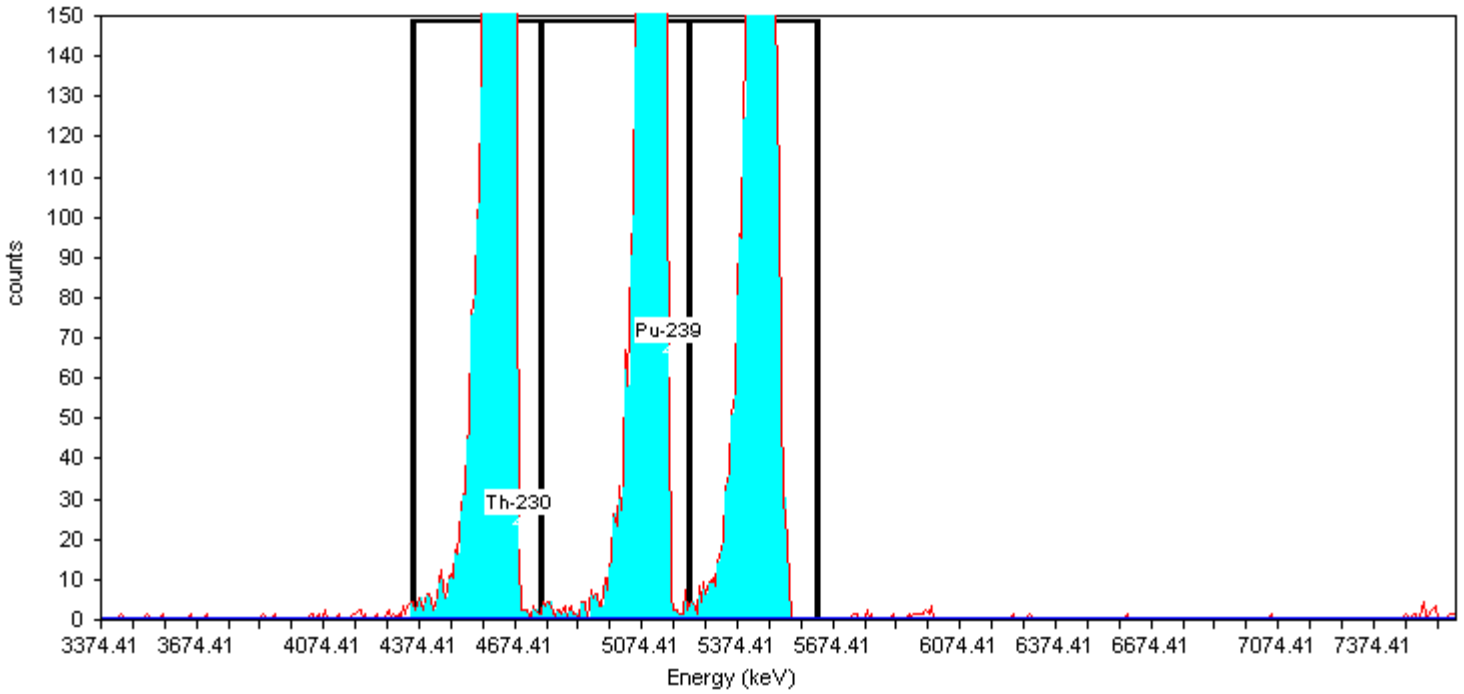
Certificate ID: 82232-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 8/14/2018 2:05:28PM
Live Time: 60.00 min.
Real Time: 60.02 min.
Efficiency: 23.85% +/- 0.38% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,305.00	105.08
Pu-239	240	5.16	186	249	0.00	6,479.00	107.98
Am-241	284	5.49	249	303	0.00	6,108.00	101.80

FWHM < 100 keV
ALS 8/15/2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:21:58PM 8/14/2018

Calibration

Sample Name: CCV-8877;AV3-08142018b
Description:
Detector: AV3

Calibration Date: 8/14/2018 3:10:42PM
Analyst: 60040

Source Info

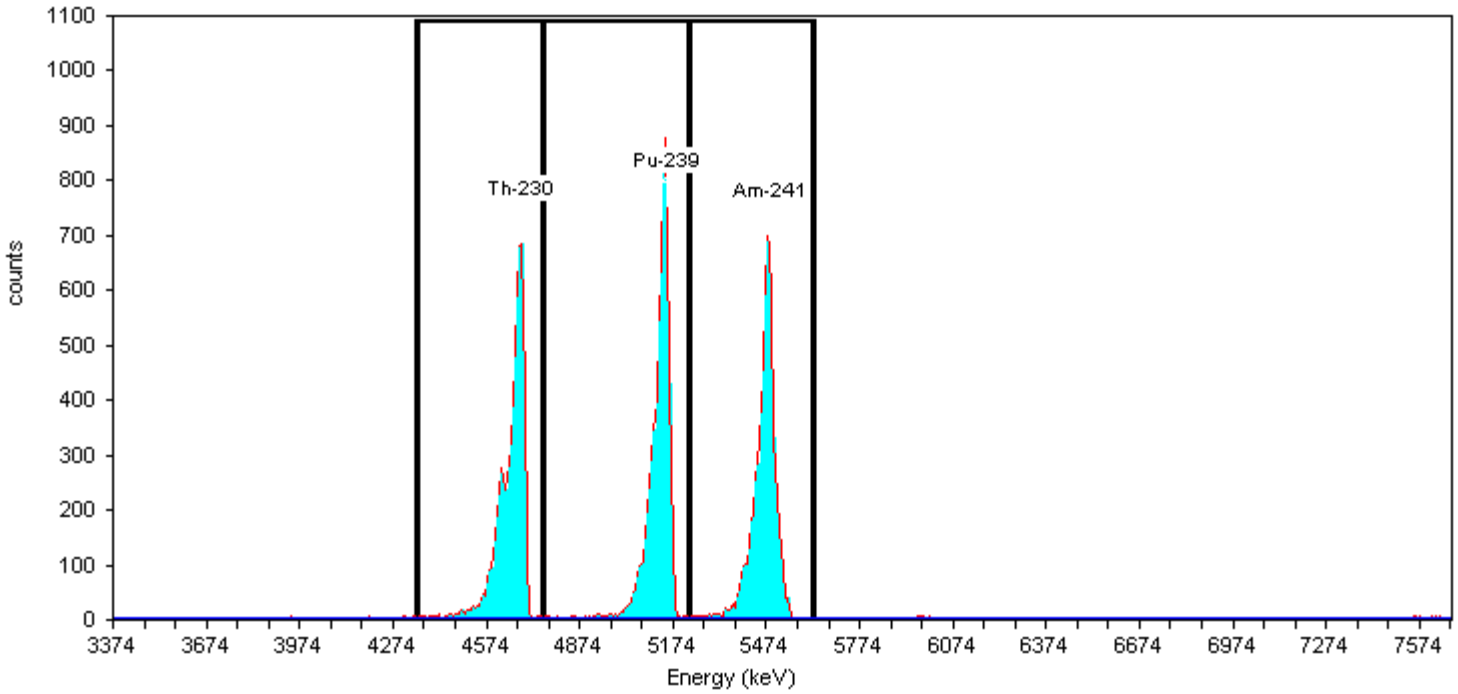
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV3 , SN: 49-202 FF7
Acquisition Start Date: 8/14/2018 2:06:15PM
Live Time: 60.00 min.
Real Time: 60.02 min.
Efficiency: 24.45% +/- 0.41% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,866.00	97.77
Pu-239	240	5.16	186	249	0.00	6,391.00	106.52
Am-241	284	5.49	249	303	0.00	5,952.00	99.20

FWHM < 100 keV
ALS 8/15/2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:22:24PM 8/14/2018

Calibration

Sample Name: CCV-9793;AV7-08142018a
Description:
Detector: AV7

Calibration Date: 8/14/2018 3:12:20PM
Analyst: 60040

Source Info

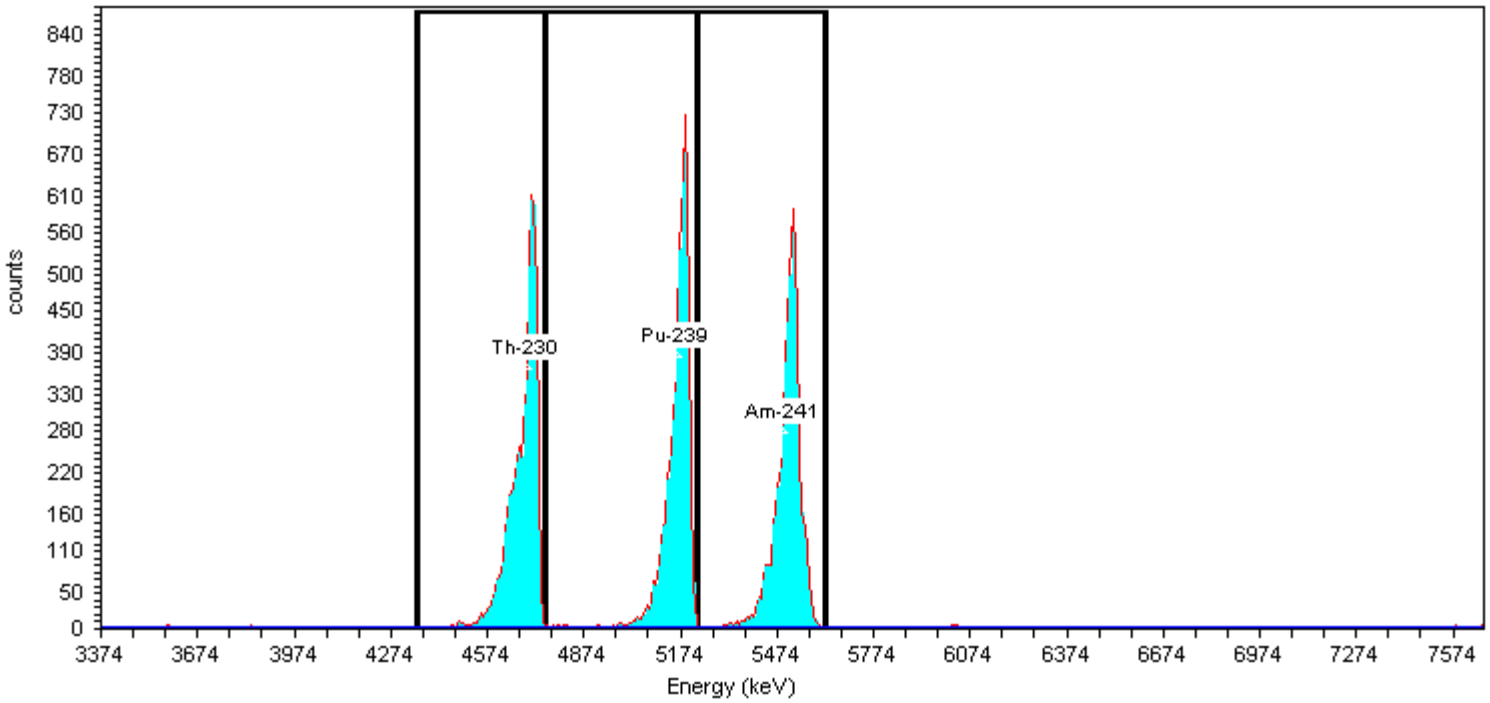
Certificate ID: 82241-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV7 , SN: 48-158EE5
Acquisition Start Date: 8/14/2018 2:08:02PM
Live Time: 60.00 min.
Real Time: 60.03 min.
Efficiency: 22.53% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,330.00	88.83
Pu-239	240	5.16	186	249	0.00	5,607.00	93.45
Am-241	284	5.49	249	303	0.00	5,275.00	87.92

FWHM < 100 keV
ALS 8/15/2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:16:01PM 8/14/2018

Calibration

Sample Name: CCV-1370621;AV13-08142018
Description:
Detector: AV13

Calibration Date: 8/14/2018 3:15:57PM
Analyst: 60040

Source Info

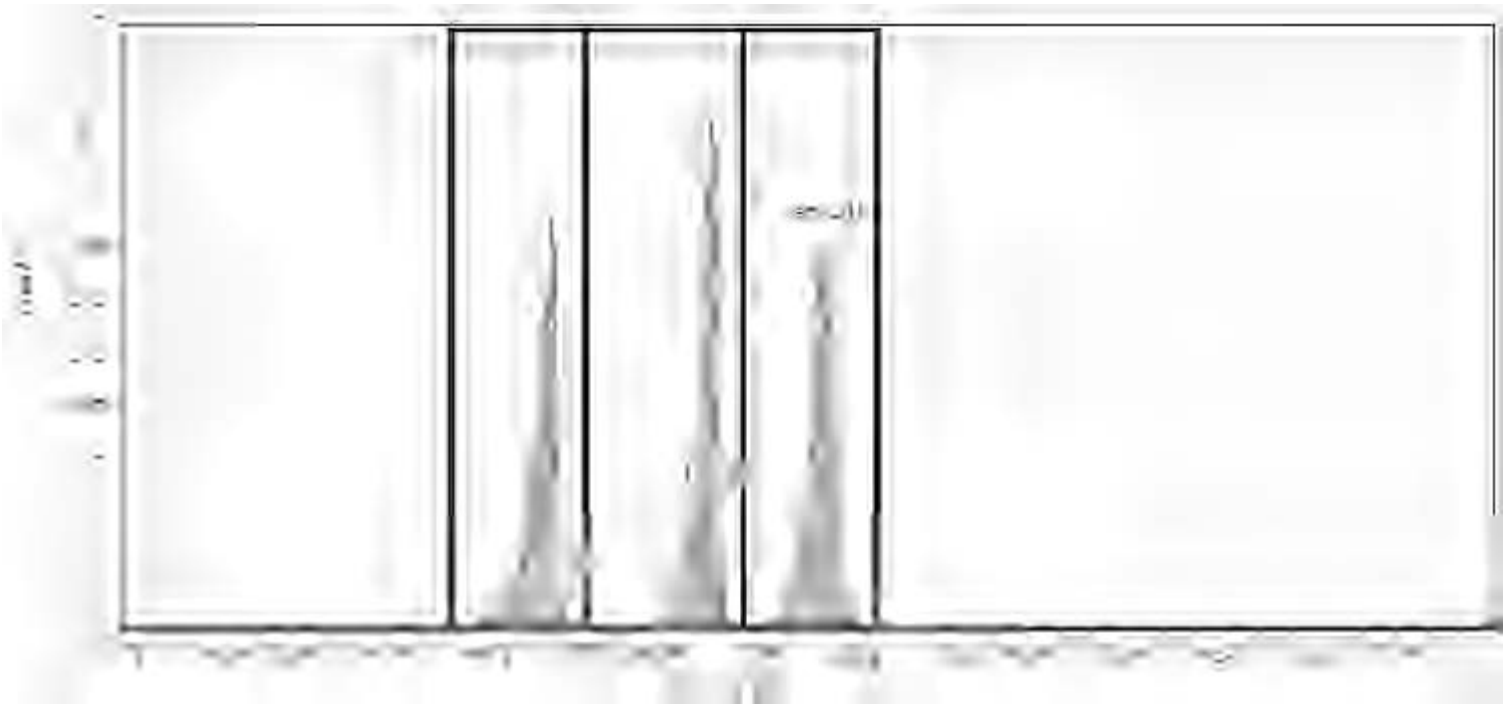
Certificate ID: 108345_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV13 , SN: 49-155M7
Acquisition Start Date: 8/14/2018 2:11:44PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 27.18% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	7,080.00	118.00
Pu-239	240	5.16	186	249	0.00	7,529.00	125.48
Am-241	284	5.49	249	303	0.00	7,822.00	130.37

FWHM < 100 keV
ALS 8/15/2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:47:03AM 7/24/2018

Calibration

Sample Name: CCV-8874;AV148-20180724
Description:
Detector: AV148

Analyst: 60040
Analysis Date: 7/24/2018 11:47:01AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82233-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

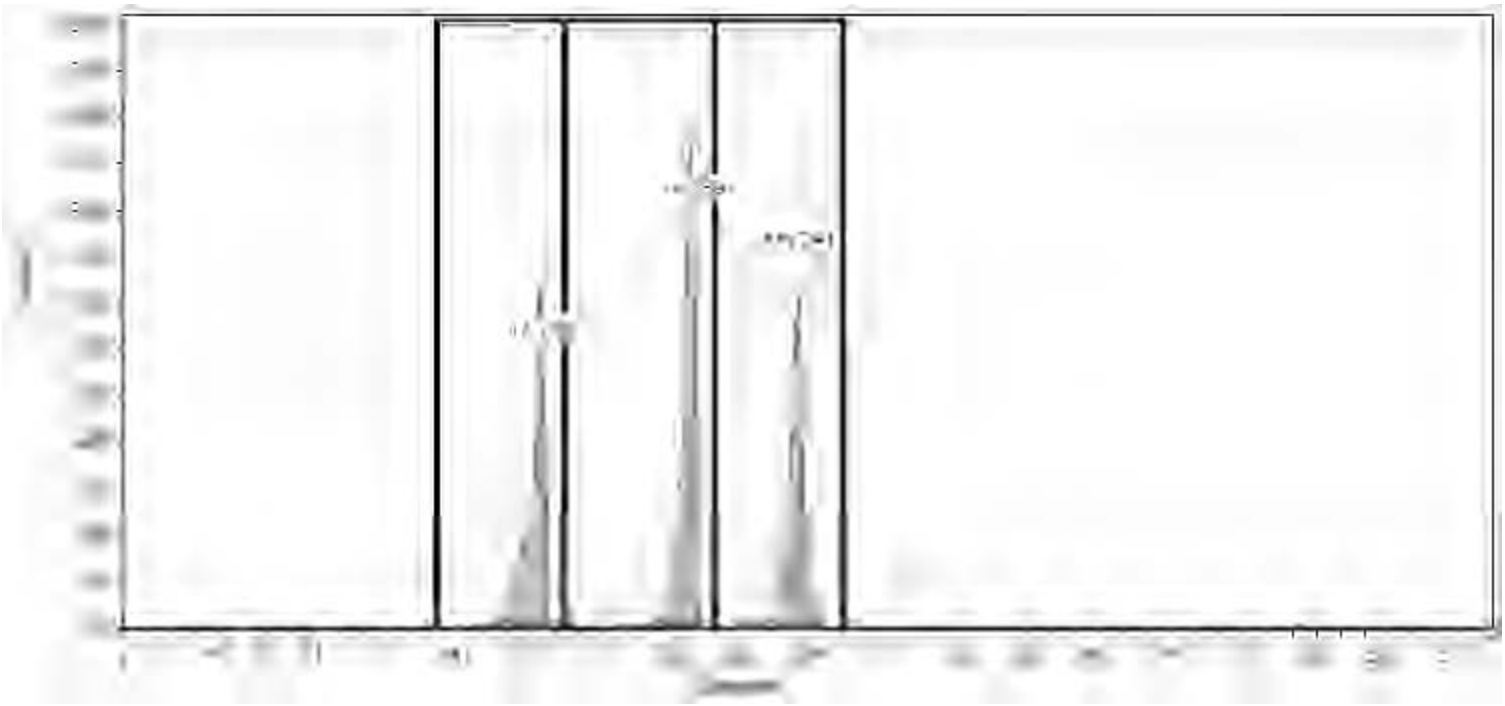
Detector: AV148 , SN: 50-05/R2
Acquisition Start Date: 7/24/2018 10:32:15AM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: CCV-8874;AV148-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:47:31AM 7/24/2018

Calibration

Sample Name: CCV-8877;AV151-20180724
Description:
Detector: AV151

Analyst: 60040
Analysis Date: 7/24/2018 11:47:30AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82236-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

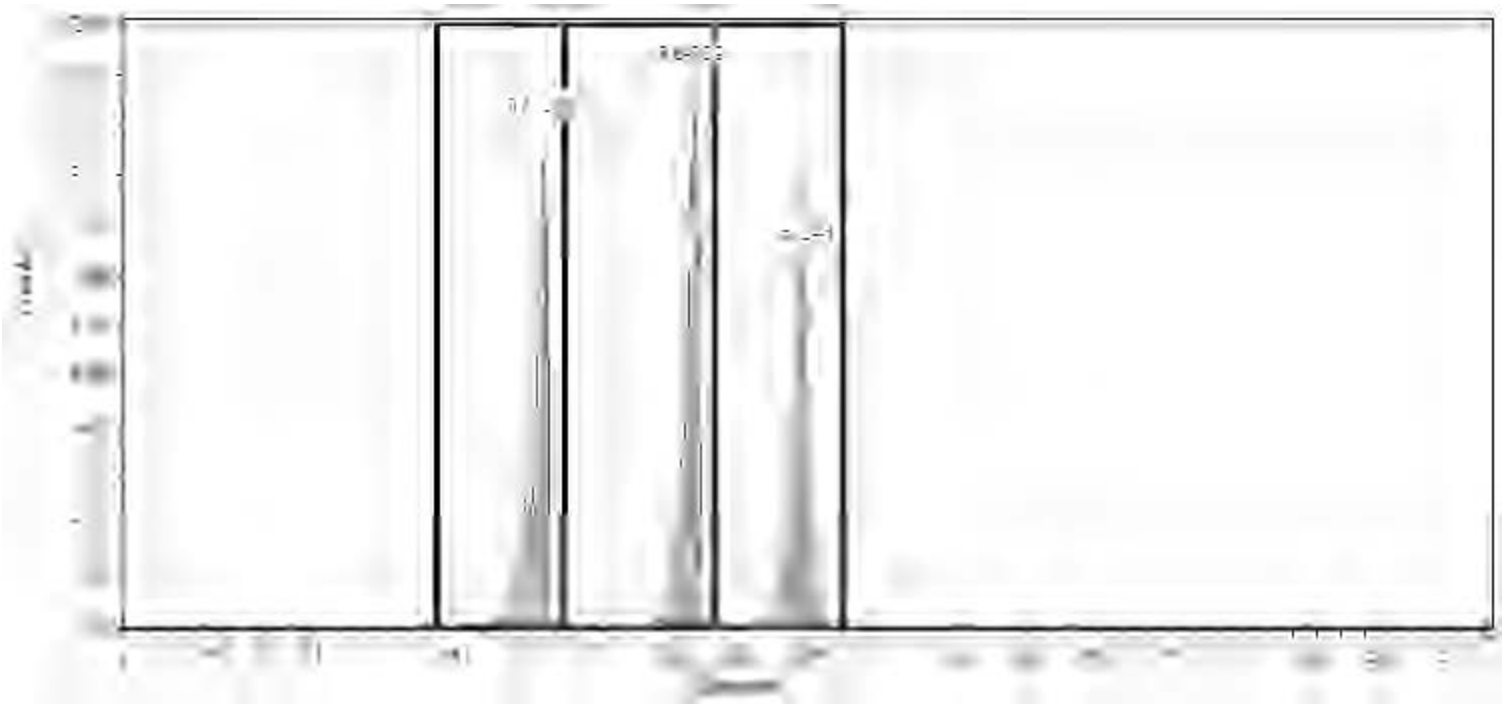
Detector: AV151 , SN: 50-05/R5
Acquisition Start Date: 7/24/2018 10:33:39AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8877;AV151-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.55% +/- 0.41% 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	33.83	6,041.00	100.68
Pu-239	240	5,155.40	186	249	35.43	6,255.00	104.25
Am-241	284	5,485.70	249	303	33.74	5,942.00	99.03

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:47:43AM 7/24/2018

Calibration

Sample Name: CCV-8879;AV153-20180724
Description:
Detector: AV153

Analyst: 60040
Analysis Date: 7/24/2018 11:47:41AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82238-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

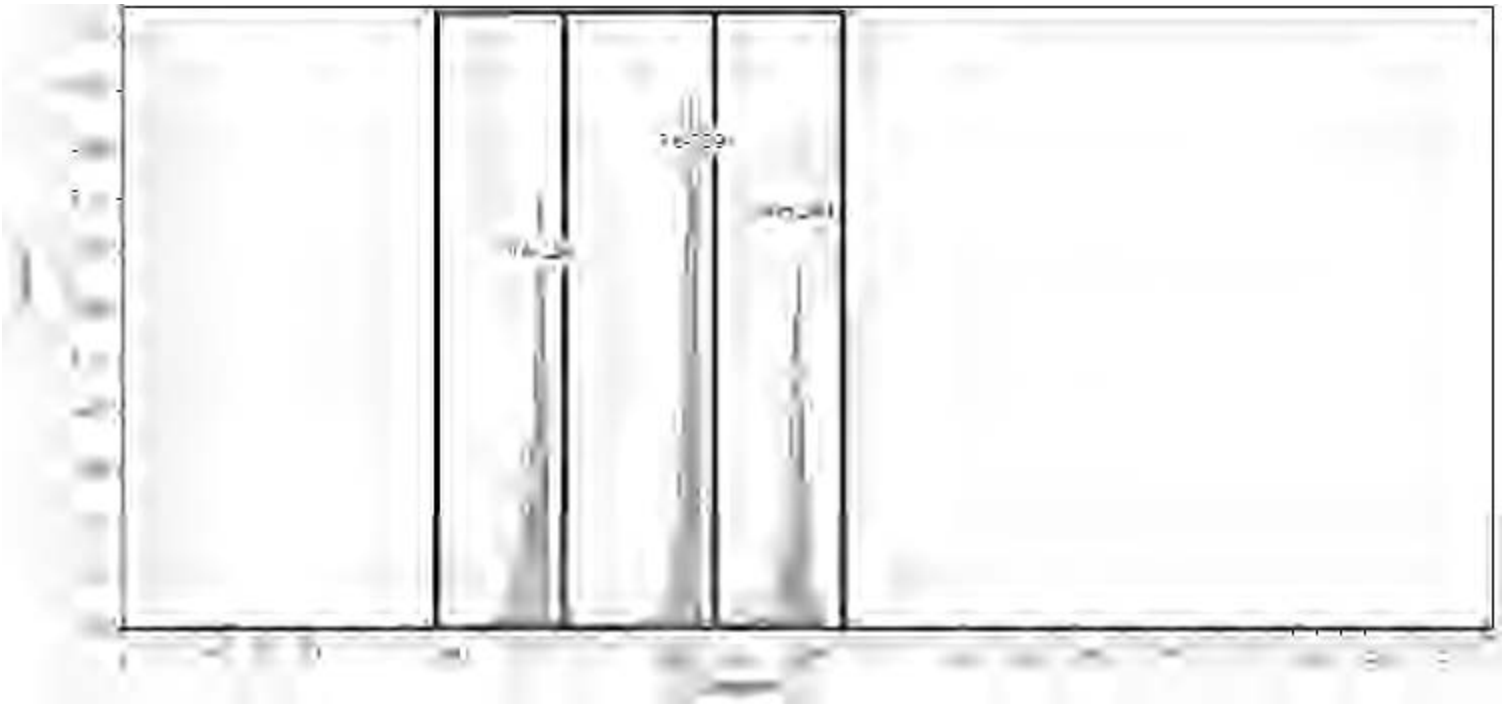
Detector: AV153 , SN: 54-011 Y6
Acquisition Start Date: 7/24/2018 10:34:20AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8879;AV153-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 22.08% +/- 0.40% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 0

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	33.07	5,417.00	90.28
Pu-239	240	5,155.40	186	249	34.09	5,717.00	95.28
Am-241	284	5,485.70	249	303	36.64	4,584.00	76.40

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:47:49AM 7/24/2018

Calibration

Sample Name: CCV-9792;AV154-20180724
Description:
Detector: AV154

Analyst: 60040
Analysis Date: 7/24/2018 11:47:48AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82240-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

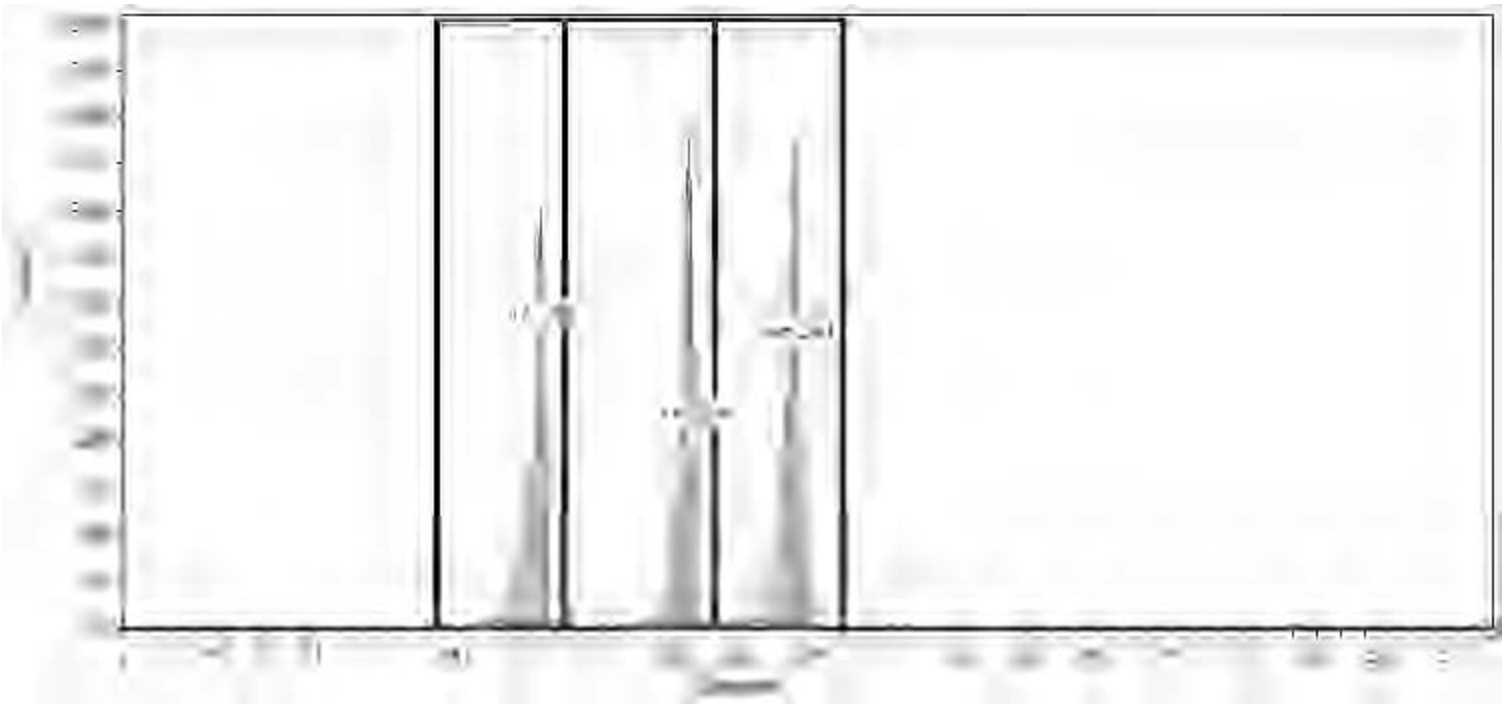
Detector: AV154 , SN: 50-05/JJ7
Acquisition Start Date: 7/24/2018 10:34:36AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9792;AV154-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.29% +/- 0.38% 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	30.08	5,298.00	88.30
Pu-239	240	5,155.40	186	249	33.10	6,007.00	100.12
Am-241	284	5,485.70	249	303	32.77	6,856.00	114.27

Monthly Backgrounds

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:32:46AM 8/12/2018

Sample

Sample Name: ICB;AV1
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: August2018
Description:

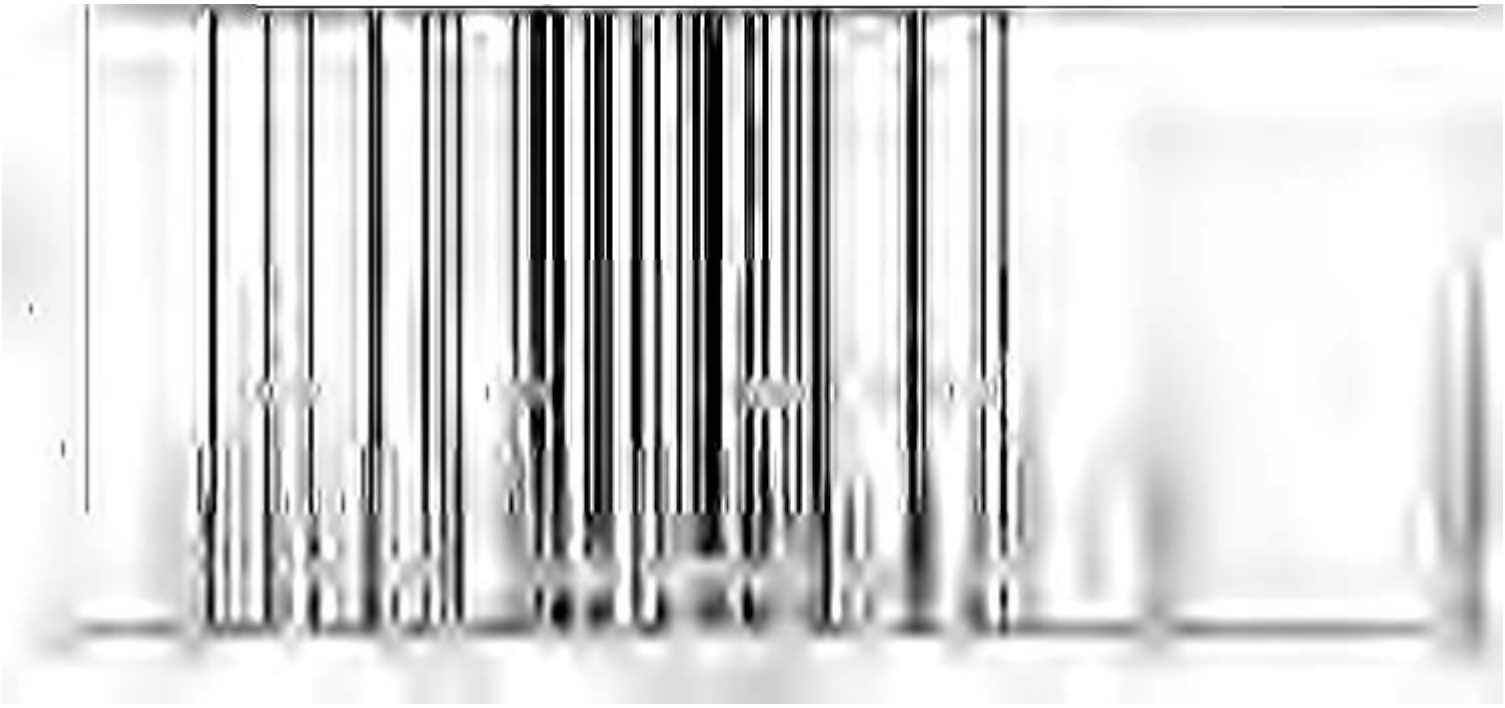
Analyst: 60040

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 8/11/2018 5:19:02PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.36% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 96.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	6.00	6.250E-003	2.756E-003
U-235	4.36	4.26	4.46	4.00	4.167E-003	2.329E-003
Th-230	4.68	4.40	4.75	10.00	1.042E-002	3.455E-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	8.00	8.333E-003	3.125E-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	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	5.00	5.208E-003	2.552E-003
Am-243	5.23	5.05	5.31	6.00	6.250E-003	2.756E-003
U-232	5.25	5.06	5.40	9.00	9.375E-003	3.294E-003
Th-228	5.45	5.19	5.51	7.00	7.292E-003	2.946E-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	7.00	7.292E-003	2.946E-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	1.00	1.042E-003	1.473E-003
Pu-236	5.76	5.61	5.89	7.00	7.292E-003	2.946E-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	5.00	5.208E-003	2.552E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:33:31AM 8/12/2018

Sample

Sample Name: ICB;AV3
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: August2018
Description:

Analyst: 60040

Acquisition

Detector: AV3 , SN: 49-202 FF7
Acquisition Start Date: 8/11/2018 5:16:27PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.36% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 69.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	12.00	1.250E-002	3.756E-003
U-235	4.36	4.26	4.46	3.00	3.125E-003	2.083E-003
Th-230	4.68	4.40	4.75	15.00	1.563E-002	4.167E-003
U-234	4.71	4.51	4.82	13.00	1.354E-002	3.898E-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	1.00	1.042E-003	1.473E-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	0.00	0.000E+000	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	3.00	3.125E-003	2.083E-003
U-232	5.25	5.06	5.40	3.00	3.125E-003	2.083E-003
Th-228	5.45	5.19	5.51	4.00	4.167E-003	2.329E-003
Po-210	5.28	5.23	5.29	3.00	3.125E-003	2.083E-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	3.00	3.125E-003	2.083E-003
Cm-244	5.78	5.64	5.90	2.00	2.083E-003	1.804E-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	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:23:01AM 8/12/2018

Sample

Sample Name: ICB;AV7
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: August2018
Description:

Analyst: 60040

Acquisition

Detector: AV7 , SN: 48-158EE5
Acquisition Start Date: 8/11/2018 5:16:28PM
Live Time: 960.00 min.
Real Time: 960.02 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 / Ch^2

Efficiency: 22.98% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 111.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	2.00	2.083E-003	1.804E-003
U-238	4.14	3.92	4.24	3.00	3.125E-003	2.083E-003
U-235	4.36	4.26	4.46	4.00	4.167E-003	2.329E-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	7.00	7.292E-003	2.946E-003
Pu-242	4.90	4.68	4.95	6.00	6.250E-003	2.756E-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	2.00	2.083E-003	1.804E-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	4.00	4.167E-003	2.329E-003
Am-243	5.23	5.05	5.31	5.00	5.208E-003	2.552E-003
U-232	5.25	5.06	5.40	6.00	6.250E-003	2.756E-003
Th-228	5.45	5.19	5.51	4.00	4.167E-003	2.329E-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	4.00	4.167E-003	2.329E-003
Am-241	5.48	5.30	5.60	4.00	4.167E-003	2.329E-003
Cm-245	5.42	5.40	5.45	1.00	1.042E-003	1.473E-003
Pu-236	5.76	5.61	5.89	9.00	9.375E-003	3.294E-003
Cm-244	5.78	5.64	5.90	7.00	7.292E-003	2.946E-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	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:38:25AM 8/14/2018

Sample

Sample Name: ICB;AV13
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: August2018a
Description:

Analyst: 60040

Acquisition

Detector: AV13 , SN: 49-155M7
Acquisition Start Date: 8/13/2018 2:36:29PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-1370621;AV13-05142018
Calibration Date: 5/14/2018 6:27:37PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.95% +/- 0.24% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 43.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	2.00	2.083E-003	1.804E-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	4.00	4.167E-003	2.329E-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	2.00	2.083E-003	1.804E-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	0.00	0.000E+000	1.473E-003
Am-243	5.23	5.05	5.31	0.00	0.000E+000	1.473E-003
U-232	5.25	5.06	5.40	1.00	1.042E-003	1.473E-003
Th-228	5.45	5.19	5.51	5.00	5.208E-003	2.552E-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	6.00	6.250E-003	2.756E-003
Am-241	5.48	5.30	5.60	7.00	7.292E-003	2.946E-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	5.00	5.208E-003	2.552E-003
Cm-244	5.78	5.64	5.90	5.00	5.208E-003	2.552E-003
Th-227	6.07	5.93	6.18	3.00	3.125E-003	2.083E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:41:50PM 7/22/2018

Sample

Sample Name: ICB;AV148
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

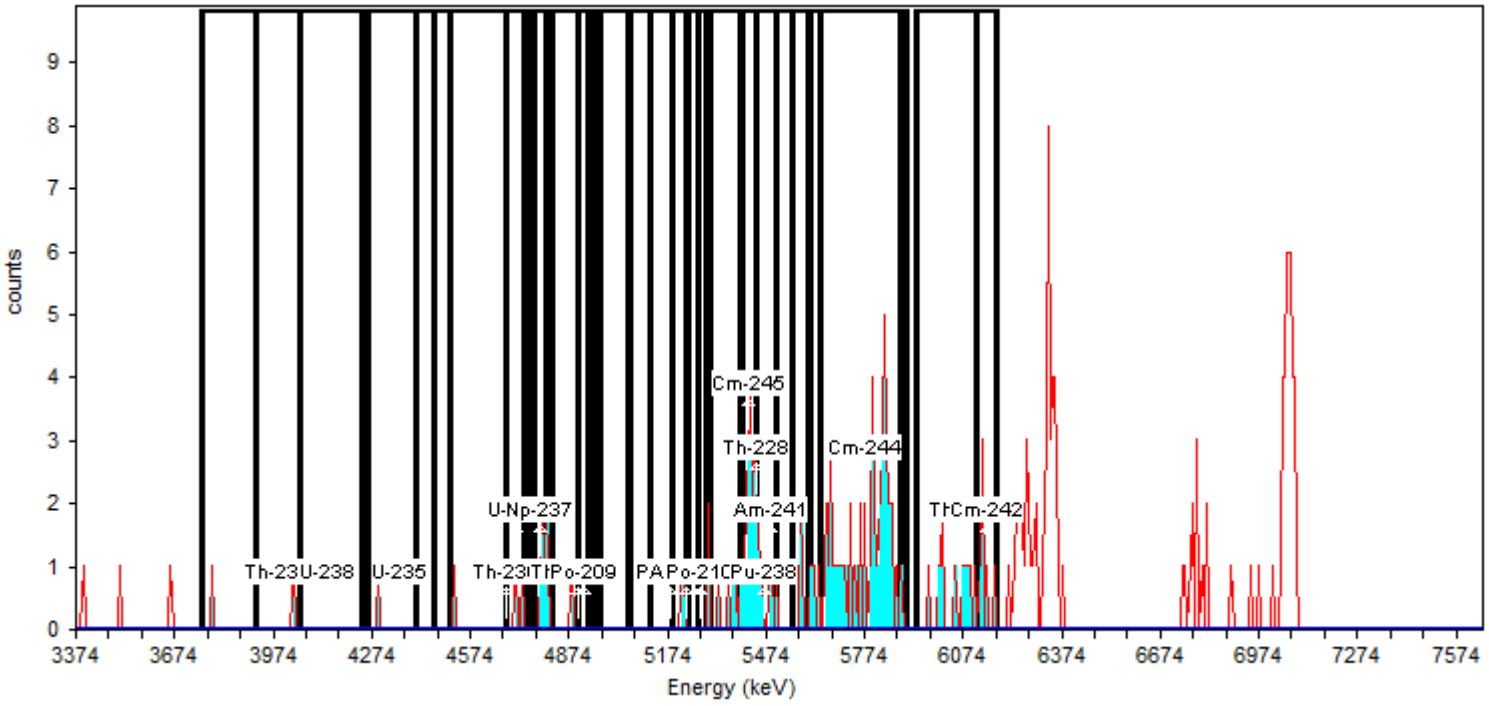
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV148 , SN: 50-05/R2
Acquisition Start Date: 7/21/2018 9:28:13PM
Live Time: 960.00 min.
Real Time: 960.07 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 / Ch^2



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)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:52PM 7/22/2018

Sample

Sample Name: ICB;AV151
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

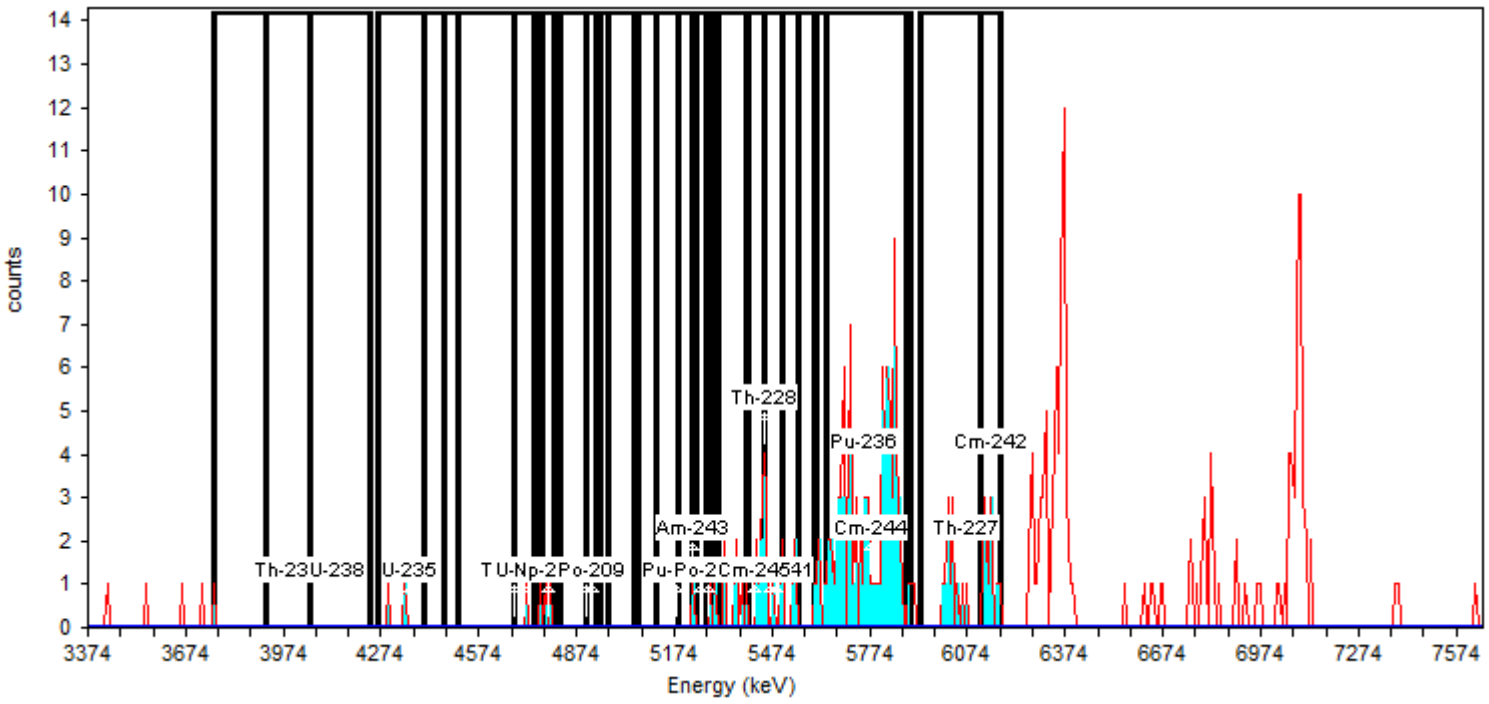
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV151 , SN: 50-05/R5
Acquisition Start Date: 7/21/2018 9:28:13PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8877;AV151-20171113
Calibration Date: 11/13/2017 12:21:30PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 307.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	2.00	2.083E-003	1.804E-003
Th-230	4,679.48	4,403.55	4,746.60	1.00	1.042E-003	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	4.00	4.167E-003	2.329E-003
Th-229	4,858.46	4,739.14	5,119.48	3.00	3.125E-003	2.083E-003
Np-237	4,783.89	4,768.97	4,806.26	2.00	2.083E-003	1.804E-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	1.00	1.042E-003	1.473E-003
Am-243	5,231.34	5,052.36	5,305.92	3.00	3.125E-003	2.083E-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	26.00	2.708E-002	5.413E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-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	28.00	2.917E-002	5.610E-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	93.00	9.687E-002	1.010E-002
Cm-244	5,775.74	5,641.51	5,902.52	91.00	9.479E-002	9.991E-003
Th-227	6,074.04	5,932.35	6,178.45	24.00	2.500E-002	5.208E-003
Cm-242	6,148.62	6,118.79	6,178.45	12.00	1.250E-002	3.756E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:45PM 7/22/2018

Sample

Sample Name: ICB;AV153
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

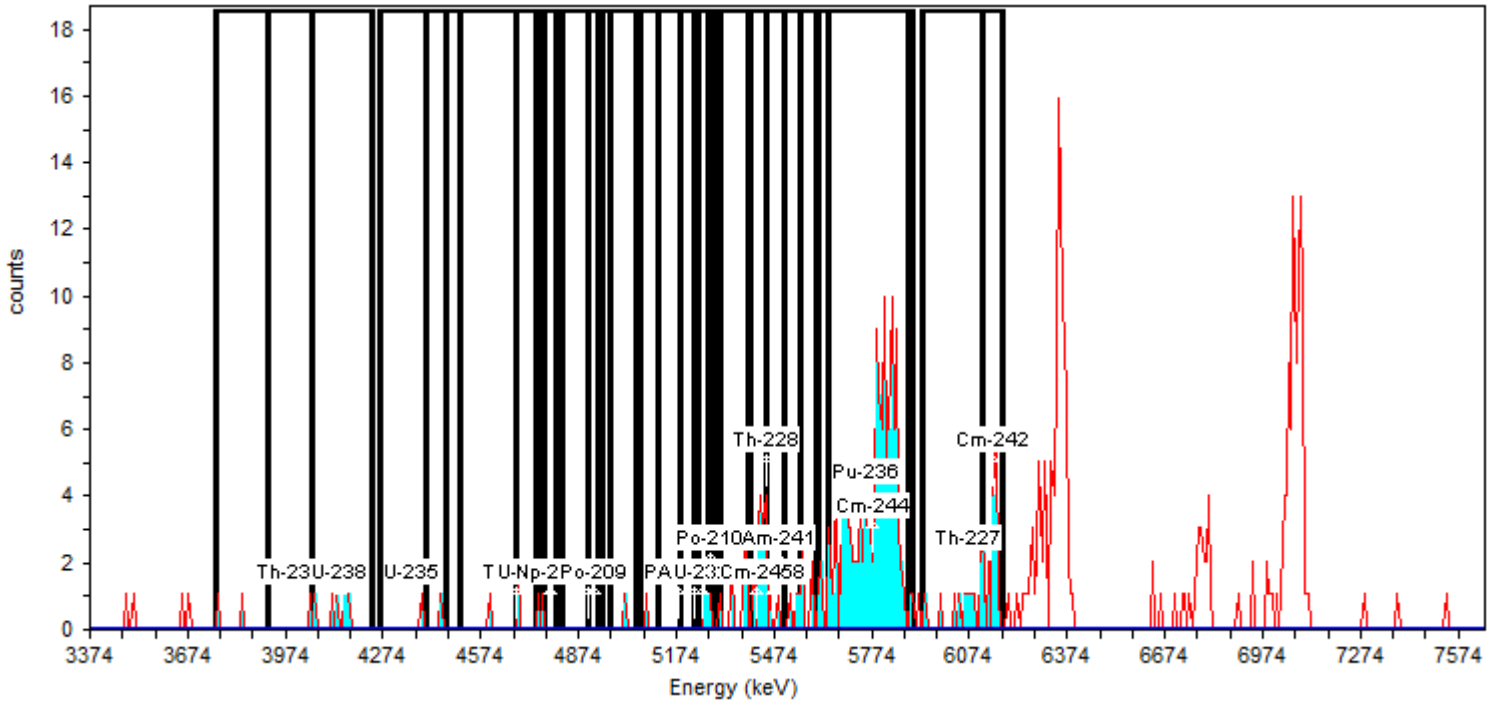
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV153 , SN: 54-011 Y6
Acquisition Start Date: 7/21/2018 9:28:12PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-8879;AV153-20171113
Calibration Date: 11/13/2017 12:21:42PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 428.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	3.00	3.125E-003	2.083E-003
U-238	4,135.08	3,918.81	4,239.49	7.00	7.292E-003	2.946E-003
U-235	4,358.81	4,261.86	4,463.21	2.00	2.083E-003	1.804E-003
Th-230	4,679.48	4,403.55	4,746.60	5.00	5.208E-003	2.552E-003
U-234	4,709.31	4,507.96	4,821.17	5.00	5.208E-003	2.552E-003
Pu-242	4,903.21	4,679.48	4,947.95	4.00	4.167E-003	2.329E-003
Th-229	4,858.46	4,739.14	5,119.48	4.00	4.167E-003	2.329E-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	5.00	5.208E-003	2.552E-003
U-232	5,253.71	5,059.82	5,402.86	12.00	1.250E-002	3.756E-003
Th-228	5,447.61	5,186.59	5,507.27	29.00	3.021E-002	5.705E-003
Po-210	5,276.09	5,231.34	5,291.00	3.00	3.125E-003	2.083E-003
Pu-238	5,469.98	5,268.63	5,552.01	31.00	3.229E-002	5.893E-003
Am-241	5,484.90	5,298.46	5,604.22	34.00	3.542E-002	6.163E-003
Cm-245	5,417.78	5,395.41	5,447.61	16.00	1.667E-002	4.295E-003
Pu-236	5,760.83	5,611.67	5,887.60	129.00	1.344E-001	1.188E-002
Cm-244	5,775.74	5,641.51	5,902.52	128.00	1.333E-001	1.183E-002
Th-227	6,074.04	5,932.35	6,178.45	27.00	2.812E-002	5.512E-003
Cm-242	6,148.62	6,118.79	6,178.45	16.00	1.667E-002	4.295E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:59PM 7/22/2018

Sample

Sample Name: ICB;AV154
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

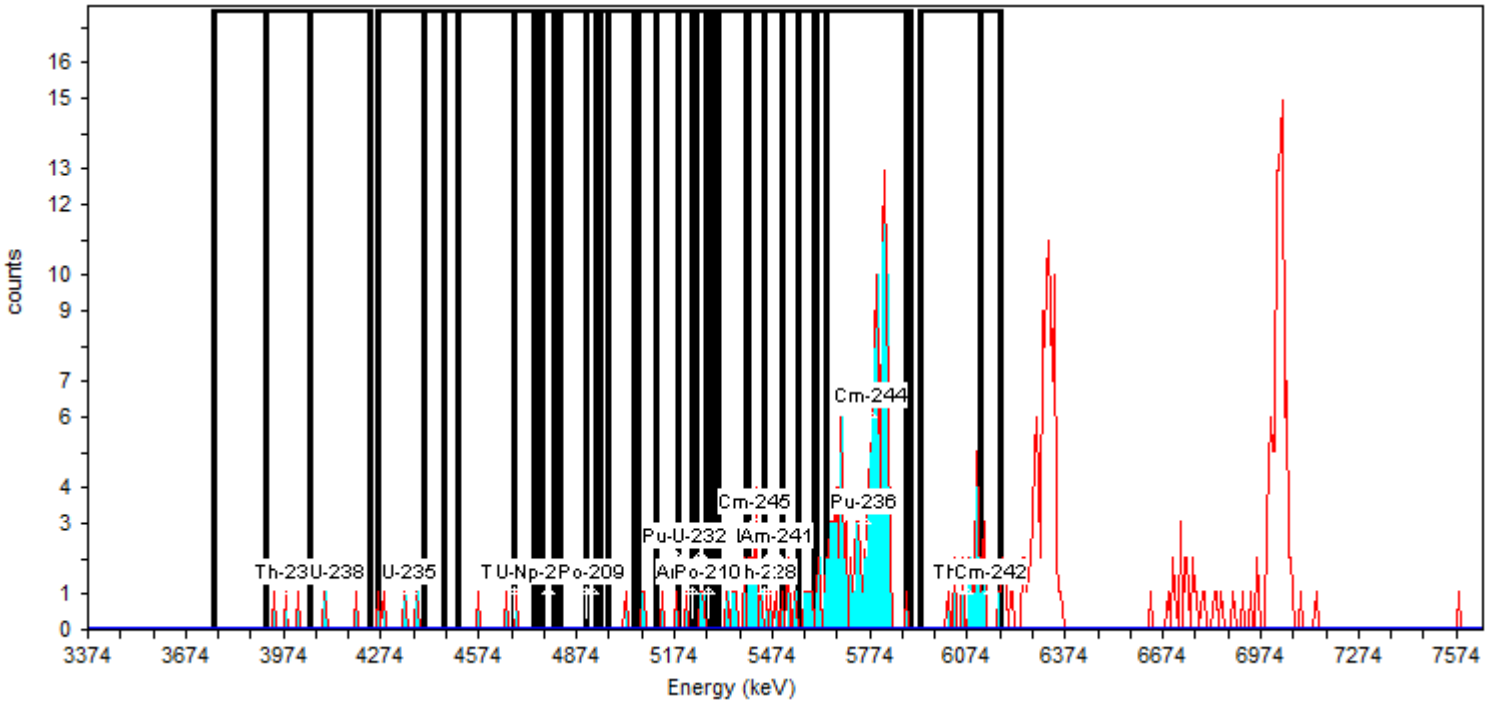
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV154 , SN: 50-05/JJ7
Acquisition Start Date: 7/21/2018 9:28:13PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9792;AV154-20171113
Calibration Date: 11/13/2017 12:21:47PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 383.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	3.00	3.125E-003	2.083E-003
U-238	4,135.08	3,918.81	4,239.49	5.00	5.208E-003	2.552E-003
U-235	4,358.81	4,261.86	4,463.21	4.00	4.167E-003	2.329E-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	3.00	3.125E-003	2.083E-003
Pu-242	4,903.21	4,679.48	4,947.95	1.00	1.042E-003	1.473E-003
Th-229	4,858.46	4,739.14	5,119.48	3.00	3.125E-003	2.083E-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	6.00	6.250E-003	2.756E-003
Am-243	5,231.34	5,052.36	5,305.92	7.00	7.292E-003	2.946E-003
U-232	5,253.71	5,059.82	5,402.86	15.00	1.563E-002	4.167E-003
Th-228	5,447.61	5,186.59	5,507.27	24.00	2.500E-002	5.208E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-003
Pu-238	5,469.98	5,268.63	5,552.01	24.00	2.500E-002	5.208E-003
Am-241	5,484.90	5,298.46	5,604.22	28.00	2.917E-002	5.610E-003
Cm-245	5,417.78	5,395.41	5,447.61	11.00	1.146E-002	3.608E-003
Pu-236	5,760.83	5,611.67	5,887.60	119.00	1.240E-001	1.141E-002
Cm-244	5,775.74	5,641.51	5,902.52	115.00	1.198E-001	1.122E-002
Th-227	6,074.04	5,932.35	6,178.45	23.00	2.396E-002	5.103E-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: AV1

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:44	140	IC 160-371830/1		371830			RTM
05/18/18 19:25	60	ICV 160-371933/1		371933			PS
08/11/18 17:19	960	ICB 160-381939/1		381939			PS
08/14/18 14:05	60	CCV 160-382694/1		382694			PS
08/28/18 00:17	1	PULSER 160-385767/1		385767			ALS
08/28/18 02:36	240	ZZZZZ		385767			
08/28/18 19:45	240	MB 160-384585/1-A		385767	384585	A-01-R	ALS

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
08/11/18 17:16	960	ICB 160-381984/1		381984			PS
08/14/18 14:06	60	CCV 160-382709/1		382709			PS
08/28/18 00:17	1	PULSER 160-385811/1		385811			ALS
08/28/18 02:36	240	ZZZZZ		385811			
08/28/18 19:45	240	LCS 160-384585/2-A		385811	384585	A-01-R	ALS

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
08/11/18 17:16	960	ICB 160-382011/1		382011			PS
08/14/18 14:08	60	CCV 160-382723/1		382723			PS
08/28/18 00:17	1	PULSER 160-385829/1		385829			ALS
08/28/18 02:36	240	ZZZZZ		385829			
08/28/18 19:45	240	160-29498-1 DU	CRC-B20-0206 DU	385829	384585	A-01-R	ALS

Detector: AV13

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:53	140	IC 160-371834/1		371834			PS
05/20/18 11:51	60	ICV 160-371949/1		371949			PS
08/13/18 14:36	960	ICB 160-382160/1		382160			PS
08/14/18 14:11	60	CCV 160-382698/1		382698			PS
08/29/18 01:16	1	PULSER 160-386035/1		386035			ALS
08/29/18 01:57	240	ZZZZZ		386035			
08/29/18 18:13	240	160-29498-1	CRC-B20-0206	386035	384585	A-01-R	ALS

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
08/09/18 10:46	1	PULSER 160-381472/1		381472			ALS
08/09/18 14:21	360	MB 160-378568/1-A		381472	378568	A-01-R	ALS

Alpha Spectroscopy Run Log

Detector: AV151

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 09:46	140	IC 160-337254/1		337254			PS
11/15/17 11:45	60	ICV 160-337586/1		337586			PS
07/21/18 21:28	960	ICB 160-378375/1		378375			PS
07/24/18 10:33	60	CCV 160-378433/1		378433			PS
08/09/18 10:46	1	PULSER 160-381474/1		381474			ALS
08/09/18 14:21	360	LCS 160-378568/2-A		381474	378568	A-01-R	ALS

Detector: AV153

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 09:48	140	IC 160-337256/1		337256			PS
11/15/17 11:52	60	ICV 160-337588/1		337588			PS
07/21/18 21:28	960	ICB 160-378376/1		378376			PS
07/24/18 10:34	60	CCV 160-378435/1		378435			PS
08/09/18 10:46	1	PULSER 160-381476/1		381476			ALS
08/09/18 14:21	360	160-29498-1	CRC-B20-0206	381476	378568	A-01-R	ALS

Detector: AV154

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 09:48	140	IC 160-337257/1		337257			PS
11/15/17 11:52	60	ICV 160-337589/1		337589			PS
07/21/18 21:28	960	ICB 160-378377/1		378377			PS
07/24/18 10:34	60	CCV 160-378436/1		378436			PS
08/09/18 10:46	1	PULSER 160-381477/1		381477			ALS
08/09/18 14:21	360	160-29498-1 DU	CRC-B20-0206 DU	381477	378568	A-01-R	ALS

GAMMA SPECTROSCOPY

Method 901.1
Ra-226

Radium-226 & Other Gamma Emitters (GS) by Method 901.1

Prep Batch: 376740

Fill Geometry, 21-Day In-Growth

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Lab ID: MB 160-376740/1-A | Analyzed: 08/09/18 01:24 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV12 | Decay Corrected: No

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.1402	0.289	0.289	U	pCi/g		1.43	381202
Radium-226	-0.1323	0.149	0.149	U	pCi/g	1.00	0.490	381202
Radium-228	-0.01752	0.246	0.246	U	pCi/g		0.306	381202
Thallium-208	-0.004696	0.00383	0.00386	U	pCi/g		0.131	381202
Thorium-232	-0.01752	0.246	0.246	U	pCi/g		0.306	381202
Thorium-234	0.5011	0.905	0.907	U	pCi/g		1.38	381202
Uranium-235	0.07006	0.107	0.107	U	pCi/g		0.669	381202
Uranium-238	0.5011	0.905	0.907	U	pCi/g		1.38	381202
Actinium-228	-0.01752	0.246	0.246	U	pCi/g		0.306	381202
Bismuth-212	-0.4385	1.02	1.02	U	pCi/g		1.75	381202
Bismuth-214	-0.1323	0.149	0.149	U	pCi/g		0.490	381202
Lead-210	0.9041	1.49	1.49	U	pCi/g		2.30	381202
Lead-212	-0.05787	0.0648	0.0651	U	pCi/g		0.179	381202
Lead-214	0.009031	0.128	0.128	U	pCi/g		0.186	381202
Potassium-40	0.5436	0.384	0.388		pCi/g		0.501	381202
Protactinium-231	0.3578	1.36	1.36	U	pCi/g		4.55	381202

Lab ID: LCS 160-376740/2-A | Analyzed: 08/09/18 01:24 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV19 | Decay Corrected: No

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Americium-241	99.26	1.70	11.7		pCi/g		1.22	381207
Cesium-137	31.67	0.817	3.34		pCi/g		0.273	381207
Cobalt-60	13.89	0.444	1.45		pCi/g		0.137	381207

Lab ID: 160-29479-A-2-E DU | Analyzed: 08/09/18 06:35 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV9 | Decay Corrected: No

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.0000	0.338	0.338	U	pCi/g		1.08	381204
Radium-226	0.2690	0.0991	0.103		pCi/g	1.00	0.111	381204
Radium-228	0.1903	0.164	0.166		pCi/g		0.176	381204
Thallium-208	0.07889	0.0732	0.0737		pCi/g		0.0607	381204
Thorium-232	0.1903	0.164	0.166		pCi/g		0.176	381204
Thorium-234	0.4880	1.06	1.07	U	pCi/g		1.79	381204
Uranium-235	-0.1655	0.281	0.282	U	pCi/g		0.893	381204

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Lab ID: 160-29479-A-2-E DU | Analyzed: 08/09/18 06:35 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV9 | Decay Corrected: No

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-238	0.4880	1.06	1.07	U	pCi/g		1.79	381204
Actinium-228	0.1903	0.164	0.166		pCi/g		0.176	381204
Bismuth-212	0.1810	0.390	0.390	U	pCi/g		0.678	381204
Bismuth-214	0.2690	0.0991	0.103		pCi/g		0.111	381204
Lead-210	-0.4156	1.31	1.31	U	pCi/g		2.22	381204
Lead-212	0.1927	0.0599	0.0649		pCi/g		0.0731	381204
Lead-214	0.4207	0.0992	0.108		pCi/g		0.0790	381204
Potassium-40	13.23	1.48	2.01		pCi/g		0.611	381204
Protactinium-231	0.5503	1.97	1.97	U	pCi/g		3.33	381204

Lab ID: 160-29498-1 | Analyzed: 08/09/18 07:19 | Ts: 30 | Sigma: 2
Client ID: CRC-B20-0206 | Detector: GV5 | Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	1.07	2.68	2.68	U	pCi/g		4.46	381208
Radium-226	17.6	0.896	2.03		pCi/g	1.00	0.365	381208
Radium-228	1.37	0.544	0.562		pCi/g		0.626	381208
Thallium-208	0.458	0.186	0.192		pCi/g		0.199	381208
Thorium-232	1.37	0.544	0.562		pCi/g		0.626	381208
Thorium-234	16.2	3.39	3.79		pCi/g		4.90	381208
Uranium-235	2.18	1.00	1.03		pCi/g		1.20	381208
Uranium-238	16.2	3.39	3.79		pCi/g		4.90	381208
Actinium-228	1.37	0.544	0.562		pCi/g		0.626	381208
Bismuth-212	-1.07	2.55	2.55	U	pCi/g		4.30	381208
Bismuth-214	17.6	0.896	2.03		pCi/g		0.365	381208
Lead-210	19.5	4.38	4.94		pCi/g		5.40	381208
Lead-212	1.09	0.234	0.273		pCi/g		0.312	381208
Lead-214	19.3	0.754	2.15		pCi/g		0.500	381208
Potassium-40	12.8	2.93	3.21		pCi/g		2.16	381208
Protactinium-231	0.000	2.75	2.75	U	pCi/g		21.1	381208

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

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 160-376740/1-A	Actinium-227			0.1402	U	pCi/g							.96894531
MB 160-376740/1-A	Radium-226			-0.1323	U	pCi/g							-1.7736483
MB 160-376740/1-A	Radium-228			-0.01752	U	pCi/g							-.14237
MB 160-376740/1-A	Thallium-208			-0.004696	U	pCi/g							-2.4307159
MB 160-376740/1-A	Thorium-232			-0.01752	U	pCi/g							-.14237
MB 160-376740/1-A	Thorium-234			0.5011	U	pCi/g							1.1051717
MB 160-376740/1-A	Uranium-235			0.07006	U	pCi/g							1.3107283
MB 160-376740/1-A	Uranium-238			0.5011	U	pCi/g							1.1051717
MB 160-376740/1-A	Actinium-228			-0.01752	U	pCi/g							-.14237
MB 160-376740/1-A	Bismuth-212			-0.4385	U	pCi/g							-.861731
MB 160-376740/1-A	Bismuth-214			-0.1323	U	pCi/g							-1.7736483
MB 160-376740/1-A	Lead-210			0.9041	U	pCi/g							1.2137360
MB 160-376740/1-A	Lead-212			-0.05787	U	pCi/g							-1.7777789
MB 160-376740/1-A	Lead-214			0.009031	U	pCi/g							.1410421
MB 160-376740/1-A	Potassium-40			0.5436		pCi/g							2.8000019
MB 160-376740/1-A	Protactinium-231			0.3578	U	pCi/g							.52460852

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-376740/2-A	Americium-241		96.8	99.26		pCi/g	103	87 - 116					.3028552534
LCS 160-376740/2-A	Cesium-137		28.2	31.67		pCi/g	112	87 - 120					1.550867582
LCS 160-376740/2-A	Cobalt-60		12.9	13.89		pCi/g	108	87 - 115					1.0109586728

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29479-A-2-E DU	Actinium-227	-0.325		0.0000	U	pCi/g			200	0.31	0.82	1	
160-29479-A-2-E DU	Radium-226	0.329		0.2690		pCi/g			20	0.25	0.70	1	
160-29479-A-2-E DU	Radium-228	0.272		0.1903		pCi/g			35	0.19	0.52	1	
160-29479-A-2-E DU	Thallium-208	0.0719		0.07889		pCi/g			9	0.05	0.15	1	
160-29479-A-2-E DU	Thorium-232	0.272		0.1903		pCi/g			35	0.19	0.52	1	
160-29479-A-2-E DU	Thorium-234	0.667		0.4880	U	pCi/g			31	0.11	0.30	1	
160-29479-A-2-E DU	Uranium-235	-0.0465		-0.1655	U	pCi/g			112	0.20	0.56	1	
160-29479-A-2-E DU	Uranium-238	0.667		0.4880	U	pCi/g			31	0.11	0.30	1	

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29479-A-2-E DU	Actinium-228	0.272		0.1903		pCi/g			35	0.19	0.52	1	
160-29479-A-2-E DU	Bismuth-212	0.341		0.1810	U	pCi/g			61	0.16	0.45	1	
160-29479-A-2-E DU	Bismuth-214	0.329		0.2690		pCi/g			20	0.25	0.70	1	
160-29479-A-2-E DU	Lead-210	0.349		-0.4156	U	pCi/g			2310	0.29	0.82	1	
160-29479-A-2-E DU	Lead-212	0.212		0.1927		pCi/g			9	0.13	0.36	1	
160-29479-A-2-E DU	Lead-214	0.371		0.4207		pCi/g			12	0.22	0.63	1	
160-29479-A-2-E DU	Potassium-40	13.1		13.23		pCi/g			1	0.04	0.11	1	
160-29479-A-2-E DU	Protactinium-231	-0.0000000405		0.5503	U	pCi/g			200	0.13	0.36	1	

Glossary:

Ts = Count Duration, Sample

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29498-1

SDG No.:

Batch Number: 376740 Batch Start Date: 07/19/18 15:00 Batch Analyst: Small, Sean J

Batch Method: Fill_Geo-21 Batch End Date: 07/19/18 17:29

Lab Sample ID	Client Sample ID	Method Chain	Basis	TareWeight	GrossWeight	InitialAmount	IngDecDate1	IngDecDate3	Geometry
MB 160-376740/1		Fill_Geo-21, 901.1				291.18 g	7/19/18 16:36	8/9/18	Tuna Can
LCS 160-376740/2		Fill_Geo-21, 901.1				341.9 g	7/19/18 16:36	8/9/18	Tuna Can
160-29479-A-2-B DU		Fill_Geo-21, 901.1	T	46.5 g	409.4 g	362.9 g	7/19/18 16:36	8/9/18	Tuna can
160-29498-A-1-B	CRC-B20-0206	Fill_Geo-21, 901.1	T	46.4 g	347.1 g	300.7 g	7/19/18 16:36	8/9/18	Tuna can

Lab Sample ID	Client Sample ID	Method Chain	Basis	Tuna Can LCS 00007					
MB 160-376740/1		Fill_Geo-21, 901.1							
LCS 160-376740/2		Fill_Geo-21, 901.1		# g					
160-29479-A-2-B DU		Fill_Geo-21, 901.1	T						
160-29498-A-1-B	CRC-B20-0206	Fill_Geo-21, 901.1	T						

Batch Notes	
Balance ID	1121432711
SOP Number	ST-RC-0003, ST-RC-0025

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.

Test America St. Louis Spectrum ID: 12_Gamma_20181337

Sample Description: 376740_Gamma_MB 160-376740~1-A
Detector: Detector #12
Batch ID: 376740
Work Order Number: Gamma
Lot Number: MB 160-376740~1-A

Decay to Time: 8/9/2018 01:23 Live Time: 1800 sec
Acquisition Time: 8/9/2018 01:24:00 Real Time: 1801 sec
Analysis Time: 8/9/2018 01:54 Dead Time: 0.04 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: Client_Long_Rev14.lib
Bkgd Correction File: 12_2018-07-14_1810.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-1.081E-01	2733.1	2.955E+00	2.955E+00	1.060E+01
NA-22	0.000E+00	1.#INF	7.024E-02	7.024E-02	5.177E-01
K-40	5.857E+00	35.4	2.071E+00	2.092E+00	5.395E+00
Sc-46	3.587E-02	839.6	3.012E-01	3.012E-01	1.128E+00
CR-51	2.213E+00	188.1	4.164E+00	4.165E+00	1.418E+01
MN-54	3.085E-01	40.8	1.259E-01	1.269E-01	3.789E-01
FE-59	7.411E-02	796.9	5.905E-01	5.906E-01	1.498E+00
Co-56	-4.128E-01	94.3	3.894E-01	3.900E-01	1.224E+00
CO-57	2.153E-01	104.4	2.248E-01	2.251E-01	5.081E-01
CO-58	3.433E-01	38.4	1.318E-01	1.330E-01	3.729E-01
CO-60	0.000E+00	1.#INF	7.266E-02	7.267E-02	5.355E-01
ZN-65	0.000E+00	1.#INF	1.775E-01	1.775E-01	2.366E+00
NB-94	-1.236E-01	349.1	4.315E-01	4.316E-01	1.059E+00
ZR-95	0.000E+00	1.#INF	8.792E-02	8.792E-02	1.771E+00
NB-95	-1.452E-01	173.2	2.515E-01	2.516E-01	9.124E-01
RU-103	2.469E-01	95.4	2.354E-01	2.358E-01	6.147E-01
RH-106	4.341E+00	90.2	3.914E+00	3.920E+00	2.476E+01
AG-108M	-3.156E-01	111.7	3.524E-01	3.528E-01	8.956E-01
AG-110M	1.348E-02	564.7	7.610E-02	7.610E-02	1.531E+00
SN-113	3.813E-01	120.8	4.607E-01	4.611E-01	1.579E+00
SB-124	-2.191E-01	276.6	6.060E-01	6.061E-01	2.084E+00
SB-125	1.211E+00	30.2	3.652E-01	3.703E-01	1.685E+00
I-131	1.908E-01	161.9	3.090E-01	3.092E-01	6.408E-01
Gd-153	-4.190E-01	167.6	7.022E-01	7.026E-01	2.400E+00
Ga-68	3.667E+00	324.3	1.189E+01	1.189E+01	2.964E+01
Tc-99m	1.165E-01	180.7	2.104E-01	2.105E-01	7.251E-01
BA-133	-4.346E-01	116.5	5.063E-01	5.068E-01	1.278E+00
CS-134	-2.758E-01	102.9	2.839E-01	2.842E-01	2.302E+00
CS-137	3.647E-01	95.3	3.476E-01	3.481E-01	1.192E+00
CE-139	1.826E-01	107.7	1.967E-01	1.969E-01	6.713E-01
Ba-140	6.621E-01	146.8	9.717E-01	9.723E-01	2.510E+00
La-140	6.796E-01	35.3	2.396E-01	2.422E-01	6.487E-01
CE-141	3.215E-02	1473.1	4.735E-01	4.735E-01	1.644E+00

CE-144	8.916E-01	170.8	1.523E+00	1.523E+00	5.254E+00
PM-144	-1.974E-01	241.3	4.763E-01	4.764E-01	1.149E+00
EU-152	2.662E+00	28.9	7.686E-01	7.804E-01	3.355E+00
EU-154	1.515E+00	135.5	2.053E+00	2.054E+00	7.388E+00
EU-155	0.000E+00	1.#INF	5.538E-01	5.538E-01	3.495E+00
HF-181	2.935E-02	100.2	2.940E-02	2.944E-02	1.211E+00
Ta-182	0.000E+00	1.#INF	1.826E-01	1.826E-01	2.648E+00
Hg-203	-2.972E-01	96.3	2.863E-01	2.868E-01	9.701E-01
TL-208	-5.059E-02	40.8	2.065E-02	2.081E-02	1.413E+00
pm-146	7.442E-01	96.2	7.161E-01	7.171E-01	1.783E+00
y-88	1.157E-01	354.7	4.103E-01	4.103E-01	1.009E+00
Cd-113m	4.833E+02	673.6	3.256E+03	3.256E+03	1.162E+04
Cd-109	0.000E+00	1.#INF	1.003E+00	1.003E+00	2.232E+01
Cf-251	7.257E-01	134.4	9.754E-01	9.761E-01	2.604E+00
Cf-249	2.183E-01	115.3	2.516E-01	2.519E-01	1.778E+00
Sn-126	1.283E+00	181.2	2.325E+00	2.326E+00	8.000E+00
PB-210	9.740E+00	82.2	8.002E+00	8.025E+00	2.474E+01
PB-212	-6.235E-01	56.0	3.492E-01	3.507E-01	1.929E+00
PB-214	9.729E-02	709.0	6.898E-01	6.898E-01	2.005E+00
BI-207	5.212E-01	28.9	1.505E-01	1.528E-01	7.981E-01
BI-212	-4.724E+00	115.9	5.477E+00	5.482E+00	1.882E+01
U-235	7.548E-01	76.1	5.746E-01	5.759E-01	7.206E+00
BI-214	-1.426E+00	56.2	8.006E-01	8.039E-01	5.276E+00
BI-210M	-5.157E-01	90.8	4.681E-01	4.689E-01	1.580E+00
AC-228	-1.888E-01	702.4	1.326E+00	1.326E+00	3.294E+00
TH-227	1.511E+00	103.0	1.557E+00	1.559E+00	1.539E+01
TH-229	-4.635E+00	107.2	4.968E+00	4.974E+00	1.299E+01
TH-234	5.399E+00	90.3	4.876E+00	4.885E+00	1.482E+01
PA-231	3.854E+00	190.5	7.345E+00	7.347E+00	4.905E+01
PA-233	3.129E-01	304.9	9.538E-01	9.539E-01	4.002E+00
PA-234	-9.055E-01	122.7	1.111E+00	1.112E+00	3.774E+00
PA-234M	2.101E+01	140.1	2.944E+01	2.946E+01	1.074E+02
AM-241	3.300E-01	190.3	6.280E-01	6.282E-01	2.170E+00
Np-237	-1.382E+00	151.7	2.095E+00	2.097E+00	7.097E+00
Ir-192	-4.697E-02	94.6	4.444E-02	4.452E-02	1.936E+00
Cs-136	-2.820E-01	149.5	4.216E-01	4.219E-01	1.470E+00
Np-239	5.471E-01	164.1	8.978E-01	8.983E-01	3.069E+00
Nd-147	-3.126E+00	99.3	3.104E+00	3.109E+00	7.523E+00
TL-210	1.141E-01	178.6	2.037E-01	2.038E-01	1.484E+00
Total	5.569E+02				

Analyst: Morgan Reichert

TestAmerica Inc Spectrum name: 12_Gamma_20181337.An1

Sample description
376740_Gamma_MB 160-376740~1-A

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20181337.An1

Acquisition information
Start time:	8/9/2018 1:24:00 AM
Live time:	1800
Real time:	1801
Dead time:	0.04 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration
Filename: 12_Soil_TunaCan.Clb
12_TunaCan_108513

Energy Calibration
Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration
Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files
Main analysis library:	Client_Long_Rev14.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 1:23:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2018-07-14_1810.PBC 7/14/2018 6:10:12 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 4 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0416

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.50	13.	82.15	0.82	1.805E-02	46.54	4.250	PBC<MDA	PB210
50.14	2.	700.00	0.85	2.193E-02	50.14	8.000	PBC<MDA	TH227
59.54	6.	190.28	0.86	2.817E-02	59.54	35.900	PBC<MDA	AM241
63.59	33.	26.10	0.74	2.989E-02	63.29	3.810	PBC<MDA	TH234
					64.28	9.700	6.268E+00	Sn126
80.99	20.	49.18	0.89	3.466E-02	80.99	34.060	PBC<MDA	BA133
92.48	2.	555.36	1.34	3.637E-02	92.59	5.584	PBC<MDA	TH234
93.35	7.	208.60	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
106.13	8.	164.10	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
121.78	7.	104.91	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.257E-01	CO57
122.06	7.	117.35	0.93	3.724E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.257E-01	CO57
133.02	7.	179.60	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
133.54	7.	170.77	0.94	3.670E-02	133.54	11.090	PBC<MDA	CE144
136.30	7.	167.49	0.94	3.652E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	9.333E-01	CO57
136.47	7.	172.81	0.94	3.651E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	9.333E-01	CO57
140.51	7.	180.67	0.95	3.623E-02	140.51	89.300	PBC<MDA	Tc99m
163.38	8.	112.06	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
165.85	9.	107.73	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
176.60	7.	134.42	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	7.	156.98	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
205.33	7.	134.42	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235
210.85	6.	147.47	1.02	2.980E-02	210.85	2.990	PBC<MDA	TH229
242.28	3.	355.38	1.05	2.716E-02	242.00	7.430	PBC<MDA	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
256.24	8.	103.04	1.06	2.608E-02	256.24	7.000	PBC<MDA	TH227
263.70	1.	673.61	1.07	2.554E-02	263.70	0.006	PBC<MDA	Cd113m
277.28	8.	94.06	1.08	2.462E-02	277.28	6.310	PBC<MDA	TL208
284.30	4.	224.62	1.09	2.416E-02	284.30	6.140	PBC<MDA	I131
293.78	2.	708.99	1.10	2.350E-02	295.09	19.300	PBC<MDA	PB214
296.00	9.	178.57	1.10	2.345E-02	296.00	79.000	PBC<MDA	TL210
300.03	9.	184.34	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.367E+00	PA231
					300.18	6.200	3.321E+00	PA233
300.07	9.	190.55	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.367E+00	PA231
					300.18	6.200	3.321E+00	PA233
300.18	6.	304.85	1.11	2.320E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	5.365E+00	PA231
					300.18	6.200	2.129E+00	PA233
320.08	9.	188.12	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
328.76	7.	93.55	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
333.44	7.	115.28	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
344.29	7.	140.00	1.15	2.090E-02	344.29	26.500	PBC<MDA	EU152
364.48	3.	233.33	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
391.69	8.	120.82	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
427.88	1.	562.73	1.23	1.770E-02	427.88	29.600	PBC<MDA	SB125
453.88	3.	233.33	1.26	1.692E-02	453.88	65.000	PBC<MDA	pm146
468.06	6.	94.61	1.27	1.653E-02	468.06	51.750	PBC<MDA	Ir192
497.05	6.	95.36	1.30	1.580E-02	497.05	90.900	PBC<MDA	RU103
511.86	39.	41.33	2.56	1.546E-02	511.86	20.000	6.949E+00	RH106
537.26	4.	146.76	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
563.24	5.	153.84	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.47	1.	932.74	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.163E-01	PA234
					569.70	97.740	2.655E-02	BI207
569.70	4.	135.41	1.37	1.427E-02	569.32	15.380	1.054E+00	CS134
					569.47	8.200	1.977E+00	PA234
					569.70	97.740	1.659E-01	BI207
635.89	11.	30.15	1.43	1.317E-02	635.89	11.310	4.104E+00	SB125
661.66	7.	95.31	1.45	1.279E-02	661.66	85.210	PBC<MDA	CS137
747.16	5.	96.22	1.53	1.171E-02	747.16	34.000	PBC<MDA	pm146
763.94	0.	932.74	1.55	1.152E-02	763.94	22.280	PBC<MDA	AG110M
810.78	7.	38.39	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58
815.77	15.	35.26	1.60	1.099E-02	815.77	23.280	3.304E+00	La140
834.85	6.	40.82	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
860.56	6.	40.82	1.64	1.057E-02	860.56	12.420	PBC<MDA	TL208
873.23	4.	135.53	1.65	1.046E-02	873.23	12.270	PBC<MDA	EU154
880.53	4.	112.22	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
889.28	1.	839.64	1.66	1.033E-02	889.28	99.984	PBC<MDA	Sc46
898.04	2.	354.73	1.67	1.025E-02	898.04	93.700	PBC<MDA	y88
964.11	9.	33.33	1.73	9.739E-03	964.11	14.605	3.515E+00	EU152
1001.00	3.	140.11	1.76	9.476E-03	1001.00	0.837	PBC<MDA	PA234M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1037.84	2.	324.35	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1050.36	9.	90.15	1.81	9.147E-03	1050.36	1.560	PBC<MDA	RH106
1063.66	12.	28.87	1.82	9.063E-03	1063.66	74.500	9.874E-01	BI207
1077.40	2.	324.35	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	1.	796.87	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1112.07	12.	28.87	1.86	8.770E-03	1112.07	13.644	5.572E+00	EU152
1460.83	8.	35.36	2.16	7.112E-03	1460.83	10.670	5.857E+00	K40
1764.49	7.	37.80	2.40	6.075E-03	1764.49	15.400	PBC<MDA	BI214

No unknown peaks passed sensitivity test.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.65	46.50	46.	13.	0.007	82.15	0.823
TH-227	200.18	50.14	97.	2.	0.001	700.00	0.855
AM-241	237.74	59.54	62.	6.	0.003	190.28	0.865s
TH-234	253.94	63.59	35.	11.	0.006	90.31	0.744s
Sn-126	256.71	64.28	72.	7.	0.004	181.18	0.869s
BA-133	323.50	80.99	23.	20.	0.011	49.18	0.887s
Np-237	345.49	86.49	149.	-12.	-0.006	151.67	0.892s
EU-155	345.70	86.54	137.	-12.	-0.006	145.83	0.892s
Sn-126	347.29	86.94	126.	-12.	-0.006	139.75	0.892s
Sn-126	349.81	87.57	115.	-9.	-0.005	170.78	0.893s
Cd-109	351.68	88.04	124.	0.	0.000	1000.00	0.894s
Nd-147	363.92	91.10	124.	0.	0.000	1000.00	0.897s
TH-234	369.44	92.48	40.	2.	0.001	555.36	1.338s
AC-228	372.91	93.35	113.	7.	0.004	208.60	0.899s
Gd-153	389.50	97.50	93.	-8.	-0.005	167.57	0.903s
Np-239	397.50	99.50	102.	0.	0.000	1000.00	0.905s
Gd-153	412.29	103.20	102.	0.	0.000	1000.00	0.909s
Np-239	414.29	103.70	102.	0.	0.000	1000.00	0.909s
EU-155	420.73	105.31	102.	0.	0.000	1000.00	0.911s
Np-239	424.00	106.13	89.	8.	0.005	164.10	0.912s
EU-152	486.55	121.78	25.	7.	0.004	104.91	0.928
CO-57	487.69	122.06	32.	7.	0.004	117.35	0.928
EU-154	491.84	123.10	64.	-11.	-0.006	105.80	0.929s
PA-234	524.60	131.29	82.	-11.	-0.006	122.71	0.938s
HF-181	531.51	133.02	65.	7.	0.004	179.60	0.939s
CE-144	533.57	133.54	59.	7.	0.004	170.77	0.940s
HF-181	544.61	136.30	57.	7.	0.004	167.49	0.943s
CO-57	545.30	136.47	61.	7.	0.004	172.81	0.943s
Tc-99m	561.44	140.51	67.	7.	0.004	180.67	0.947s
U-235	574.53	143.79	108.	-7.	-0.004	146.72	0.950s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ba-140	649.99	162.66	76.	-12.	-0.006	109.66	0.969s
U-235	652.87	163.38	39.	8.	0.005	112.06	0.970s
CE-139	662.76	165.85	42.	9.	0.005	107.73	0.973s
Cf-251	705.72	176.60	26.	7.	0.004	134.42	0.983s
U-235	742.18	185.72	34.	7.	0.004	156.98	0.992s
TH-229	773.32	193.51	40.	-12.	-0.006	107.20	1.000s
U-235	820.59	205.33	26.	7.	0.004	134.42	1.012s
TH-229	842.65	210.85	18.	6.	0.003	147.47	1.018s
Cf-251	907.22	227.00	26.	-2.	-0.001	573.93	1.034s
PB-212	953.73	238.63	68.	-13.	-0.007	56.01	1.046s
PB-214	967.18	242.00	55.	3.	0.002	355.38	1.049s
TH-227	1024.13	256.24	18.	8.	0.005	103.04	1.063s
Cd-113m	1053.96	263.70	40.	1.	0.001	673.61	1.070s
BI-210M	1062.48	265.83	51.	-12.	-0.007	90.78	1.072s
TL-208	1108.27	277.28	21.	8.	0.004	94.06	1.084s
Hg-203	1115.93	279.20	48.	-11.	-0.006	96.35	1.086s
I-131	1136.32	284.30	18.	4.	0.002	224.62	1.091s
PB-214	1179.47	295.09	111.	2.	0.001	708.99	1.101s
TL-210	1183.11	296.00	113.	9.	0.005	178.57	1.102s
PB-212	1199.22	300.03	121.	9.	0.005	184.34	1.106
PA-231	1199.38	300.07	130.	9.	0.005	190.55	1.106s
PA-233	1199.82	300.18	138.	6.	0.003	304.85	1.107s
PA-231	1209.70	302.65	144.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	144.	0.	0.000	1000.00	1.109s
Ba-140	1218.49	304.85	144.	0.	0.000	1000.00	1.111s
Ir-192	1232.85	308.44	143.	0.	0.000	1000.00	1.115s
PA-233	1247.13	312.01	143.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	194.	-11.	-0.006	180.94	1.123s
CR-51	1279.41	320.08	131.	9.	0.005	188.12	1.126s
La-140	1314.10	328.76	17.	7.	0.004	93.55	1.135s
Cf-249	1332.81	333.44	28.	7.	0.004	115.28	1.139s
AC-228	1352.33	338.32	55.	-10.	-0.005	112.35	1.144s
Cs-136	1361.32	340.57	65.	-10.	-0.005	120.92	1.146
EU-152	1376.18	344.29	43.	7.	0.004	140.00	1.150s
HF-181	1382.35	345.83	67.	-10.	-0.005	121.97	1.151s
BA-133	1423.02	356.00	32.	-10.	-0.005	116.51	1.162s
I-131	1456.95	364.48	12.	3.	0.002	233.33	1.170s
BA-133	1534.35	383.84	56.	-9.	-0.005	122.22	1.189s
Cf-249	1550.79	387.95	65.	0.	0.000	1000.00	1.193s
SN-113	1565.74	391.69	46.	8.	0.005	120.82	1.196s
SB-125	1710.45	427.88	8.	1.	0.001	562.73	1.232s
AG-108M	1734.69	433.94	24.	-9.	-0.005	111.67	1.238s
pm-146	1814.45	453.88	12.	3.	0.002	233.33	1.257s
SB-125	1852.39	463.37	22.	0.	0.000	1000.00	1.266s
Ir-192	1871.16	468.06	14.	6.	0.003	94.61	1.271s
HF-181	1926.90	482.00	30.	-5.	-0.003	173.21	1.284
La-140	1946.98	487.02	49.	-8.	-0.004	128.70	1.289s
RU-103	1987.11	497.05	8.	6.	0.004	95.36	1.298s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	2046.35	511.86	33.	39.	0.021	41.33	2.563
Nd-147	2122.88	531.00	26.	-11.	-0.006	99.31	1.331s
Ba-140	2147.92	537.26	9.	4.	0.002	146.76	1.337s
CS-134	2251.82	563.24	13.	5.	0.003	153.84	1.362s
PA-234	2276.75	569.47	19.	1.	0.000	932.74	1.368s
BI-207	2277.68	569.70	14.	4.	0.002	135.41	1.368s
TL-208	2330.96	583.02	35.	-14.	-0.008	92.60	1.381s
SB-125	2400.87	600.50	94.	-11.	-0.006	129.95	1.397s
SB-124	2409.79	602.73	105.	-5.	-0.003	276.60	1.399s
CS-134	2417.71	604.71	127.	-12.	-0.007	136.76	1.401s
BI-214	2436.11	609.31	148.	-16.	-0.009	56.15	1.405s
AG-108M	2455.99	614.28	146.	0.	0.000	1000.00	1.410s
PM-144	2471.12	618.06	146.	0.	0.000	1000.00	1.414s
SB-125	2542.43	635.89	0.	11.	0.006	30.15	1.430s
I-131	2546.77	636.97	11.	0.	0.000	1000.00	1.432s
AG-110M	2629.92	657.76	29.	-6.	-0.003	140.07	1.451s
CS-137	2645.51	661.66	20.	7.	0.004	95.31	1.455s
PM-144	2785.05	696.54	23.	-4.	-0.002	241.30	1.487s
NB-94	2809.41	702.63	19.	-3.	-0.001	349.11	1.493s
SB-124	2890.04	722.79	22.	-5.	-0.003	140.00	1.512s
AG-108M	2890.65	722.94	27.	0.	0.000	1000.00	1.512s
EU-154	2892.32	723.36	27.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	27.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	36.	-8.	-0.004	115.93	1.516
pm-146	2941.78	735.72	23.	-12.	-0.007	91.24	1.524s
pm-146	2987.55	747.16	5.	5.	0.003	96.22	1.535
ZR-95	3025.83	756.73	14.	0.	0.000	1000.00	1.543s
AG-110M	3054.69	763.94	5.	0.	0.000	932.74	1.550s
NB-95	3062.08	765.79	12.	-3.	-0.002	173.21	1.552s
PA-234M	3064.57	766.41	3.	0.	0.000	1000.00	1.552s
EU-152	3114.61	778.92	14.	-5.	-0.003	164.92	1.564s
BI-212	3140.62	785.42	14.	-8.	-0.004	105.33	1.570s
CS-134	3182.42	795.87	26.	-8.	-0.004	101.98	1.579s
TL-210	3197.35	799.60	33.	0.	0.000	1000.00	1.583s
CS-134	3206.76	801.95	34.	-1.	-0.001	830.66	1.585s
CO-58	3242.06	810.78	0.	7.	0.004	38.39	1.593s
La-140	3262.05	815.77	7.	15.	0.008	35.26	1.598s
Cs-136	3272.97	818.50	32.	-6.	-0.003	149.54	1.600s
MN-54	3338.38	834.85	0.	6.	0.003	40.82	1.615s
Co-56	3386.08	846.77	20.	-11.	-0.006	94.33	1.626s
TL-208	3441.27	860.56	0.	6.	0.003	40.82	1.638s
NB-94	3483.41	871.10	10.	-3.	-0.002	159.86	1.648s
EU-154	3491.95	873.23	10.	4.	0.002	135.53	1.650s
PA-234	3521.16	880.53	10.	4.	0.002	112.22	1.657s
PA-234	3532.00	883.24	15.	0.	0.000	1000.00	1.659s
AG-110M	3537.78	884.68	15.	0.	0.000	1000.00	1.660
Sc-46	3556.17	889.28	15.	1.	0.000	839.64	1.664s
y-88	3591.22	898.04	10.	2.	0.001	354.73	1.672s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	3643.36	911.07	10.	-1.	-0.001	702.38	1.684s
AG-110M	3749.09	937.49	15.	-6.	-0.003	147.67	1.708s
PA-234	3783.21	946.02	10.	-3.	-0.002	238.82	1.716s
EU-152	3855.60	964.11	0.	9.	0.005	33.33	1.732s
AC-228	3875.05	968.97	9.	0.	0.000	1000.00	1.736s
PA-234M	4003.22	1001.00	7.	3.	0.002	140.11	1.765s
EU-154	4018.33	1004.77	3.	0.	0.000	1000.00	1.768s
Co-56	4150.66	1037.84	5.	2.	0.001	324.35	1.798s
Cs-136	4191.60	1048.07	32.	-14.	-0.008	62.60	1.807s
RH-106	4200.76	1050.36	28.	9.	0.005	90.15	1.809s
BI-207	4253.99	1063.66	0.	12.	0.007	28.87	1.820s
Ga-68	4308.98	1077.40	5.	2.	0.001	324.35	1.833s
FE-59	4396.44	1099.25	5.	1.	0.000	796.87	1.852s
EU-152	4447.76	1112.07	0.	12.	0.007	28.87	1.863s
ZN-65	4461.66	1115.55	12.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	34.	-9.	-0.005	95.09	1.870s
Sc-46	4481.68	1120.55	27.	-12.	-0.006	80.30	1.870s
Ta-182	4484.69	1121.30	6.	0.	0.000	1000.00	1.871s
CO-60	4692.57	1173.24	11.	-6.	-0.003	137.58	1.916s
Ta-182	4755.86	1189.05	0.	0.	0.000	1000.00	1.930s
Ta-182	4885.39	1221.41	11.	-4.	-0.002	188.42	1.957s
Co-56	4952.92	1238.28	11.	-6.	-0.004	130.84	1.972s
NA-22	5098.03	1274.53	0.	0.	0.000	1000.00	2.003s
EU-154	5098.09	1274.54	0.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	0.	0.	0.000	1000.00	2.017s
TL-210	5252.04	1313.00	6.	-2.	-0.001	343.80	2.036s
CO-60	5330.11	1332.50	0.	0.	0.000	1000.00	2.052s
AG-110M	5537.48	1384.30	0.	0.	0.000	1000.00	2.096s
EU-152	5632.39	1408.00	6.	-1.	-0.001	600.00	2.115s
K-40	5843.92	1460.83	0.	8.	0.004	35.36	2.159s
La-140	6386.02	1596.21	0.	0.	0.000	1000.00	2.269s
SB-124	6765.58	1690.98	0.	0.	0.000	1000.00	2.345s
BI-214	7060.00	1764.49	0.	7.	0.004	37.80	2.403s
Co-56	7087.48	1771.35	18.	-8.	-0.005	79.16	2.408s
y-88	7346.69	1836.06	0.	0.	0.000	1000.00	2.459s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Peak Code	Peak MDA Value Bq/Sample	COMMENTS
BE-7	C	-1.0811E-01				5.31E+01	
			477.60	-1.081E-01	%(	1.060E+01	2.73E+03 1.05E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	N	5.8566E+00					4.66E+11	
			1460.83	5.857E+00	?(	5.395E+00	3.54E+01	1.07E+01 G
Sc-46	F	3.5874E-02					8.38E+01	
			889.28	3.587E-02	?(	1.128E+00	8.40E+02	1.00E+02 G
			1120.55	-7.384E-01	+ P	1.721E+00	8.03E+01	1.00E+02 G
CR-51	F	2.2135E+00					2.77E+01	
			320.08	2.213E+00	?(	1.418E+01	1.88E+02	9.94E+00 G
MN-54	C	3.0847E-01					3.12E+02	
			834.85	3.085E-01	?(	3.789E-01	4.08E+01	1.00E+02 G
FE-59	F	7.4108E-02					4.45E+01	
			1099.25	7.411E-02	?(	1.498E+00	7.97E+02	5.65E+01 G
			1291.60	0.000E+00	-	1.210E+00	1.00E+03	4.32E+01 G
Co-56	C	-4.1284E-01					7.73E+01	
			846.77	-5.716E-01	?(	1.224E+00	9.43E+01	9.99E+01 G
			1238.28	-6.583E-01	+	1.912E+00	1.31E+02	6.61E+01 G
			1037.84	7.101E-01	&(	5.740E+00	3.24E+02	1.41E+01 G
			1771.35	-4.970E+00	+	1.327E+01	7.92E+01	1.55E+01 A
CO-57	C	2.1528E-01					2.72E+02	
			122.06	1.257E-01	(	5.081E-01	1.17E+02	8.56E+01 G
			136.47	9.333E-01	?(	5.563E+00	1.73E+02	1.07E+01 G
CO-58	C	3.4330E-01					7.09E+01	
			810.78	3.433E-01	?(	3.729E-01	3.84E+01	9.95E+01 G
NB-94	I	-1.2361E-01					7.41E+06	
			702.63	-1.236E-01	?(	1.059E+00	3.49E+02	9.79E+01 G
			871.10	-1.592E-01	+	9.257E-01	1.60E+02	9.99E+01 G
NB-95	I	-1.4519E-01					6.40E+01	
			765.79	-1.452E-01	?(	9.124E-01	1.73E+02	9.98E+01 G
RU-103	I	2.4690E-01					3.93E+01	
			497.05	2.469E-01	?(	6.147E-01	9.54E+01	9.09E+01 G
			610.30	-2.717E-06	%	4.203E+01	4.48E+08	5.75E+00 GA
RH-106	I	4.3413E+00					3.74E+02	
			621.92	-4.181E-01	%(	2.476E+01	1.72E+03	9.93E+00 G
			1050.36	3.464E+01	?(	1.061E+02	9.02E+01	1.56E+00 G
			511.86	6.949E+00	?	5.322E+00	4.13E+01	2.00E+01 GA

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
AG-108M	C	-3.1561E-01						1.53E+05	
			433.94	-3.156E-01	?(	8.956E-01	1.12E+02	9.05E+01	G
			722.94	0.000E+00	+	1.373E+00	1.00E+03	9.08E+01	G
			614.28	0.000E+00	+	2.702E+00	1.00E+03	8.98E+01	G
AG-110M	F	1.3476E-02						2.50E+02	
			884.68	0.000E+00	?(	1.531E+00	1.00E+03	7.27E+01	G
			657.76	-2.590E-01	+	1.264E+00	1.40E+02	9.46E+01	G
			937.49	-9.761E-01	+	3.377E+00	1.48E+02	3.44E+01	G
			1384.30	0.000E+00	?(	2.271E+00	1.00E+03	2.43E+01	G
			763.94	7.213E-02	?(	2.765E+00	9.33E+02	2.23E+01	G
SN-113	F	3.8132E-01						1.15E+02	
			391.69	3.813E-01	?(	1.579E+00	1.21E+02	6.40E+01	G
SB-124	F	-2.1908E-01						6.02E+01	
			602.73	-2.191E-01	?(	2.084E+00	2.77E+02	9.83E+01	G
			1690.98	0.000E+00	+	1.359E+00	1.00E+03	4.78E+01	G
			722.79	-2.142E+00	+	1.053E+01	1.40E+02	1.08E+01	G
SB-125	I	1.2114E+00						1.01E+03	
			427.88	1.061E-01	?(	1.685E+00	5.63E+02	2.96E+01	G
			600.50	-2.461E+00	+	1.086E+01	1.30E+02	1.79E+01	G
			635.89	4.104E+00	?(	2.750E+00	3.02E+01	1.13E+01	G
			463.37	0.000E+00	&	7.825E+00	1.00E+03	1.05E+01	G
I-131	I	1.9081E-01						8.02E+00	
			364.48	1.020E-01	?(	6.408E-01	2.33E+02	8.17E+01	G
			284.30	1.373E+00	?(	8.486E+00	2.25E+02	6.14E+00	G
			636.97	0.000E+00	-	1.071E+01	1.00E+03	7.17E+00	G
Gd-153	F	-4.1904E-01						2.42E+02	
			97.50	-4.190E-01	?(	2.400E+00	1.68E+02	3.00E+01	G
			103.20	0.000E+00	+	3.407E+00	1.00E+03	2.18E+01	G
Ga-68	C	3.6665E+00						4.71E-02	
			1077.40	3.667E+00	?(	2.964E+01	3.24E+02	3.30E+00	G
Tc-99m	I	1.1648E-01						2.51E-01	
			140.51	1.165E-01	?(	7.251E-01	1.81E+02	8.93E+01	G
BA-133	F	-4.3458E-01						3.85E+03	
			356.00	-4.346E-01	&(	1.278E+00	1.17E+02	6.20E+01	G
			302.85	0.000E+00	+	7.711E+00	1.00E+03	1.83E+01	G
			383.84	-2.908E+00	+	1.215E+01	1.22E+02	8.94E+00	GA
			80.99	9.256E-01	?	1.187E+00	4.92E+01	3.41E+01	GA

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	I -2.7585E-01					7.54E+02	
		604.71	-4.971E-01	&(	2.302E+00	1.37E+02	9.76E+01 G
		795.87	-4.354E-01	+	1.524E+00	1.02E+02	8.55E+01 G
		569.32	-8.432E-02	%	5.868E+00	1.87E+03	1.54E+01 G
		801.95	-5.746E-01	+	1.717E+01	8.31E+02	8.69E+00 G
		563.24	2.311E+00	?(	9.019E+00	1.54E+02	8.35E+00 G
CS-137	I 3.6467E-01					1.10E+04	
		661.66	3.647E-01	?(	1.192E+00	9.53E+01	8.52E+01 G
CE-139	F 1.8256E-01					1.38E+02	
		165.85	1.826E-01	?(	6.713E-01	1.08E+02	7.99E+01 G
Ba-140	I 6.6212E-01					1.28E+01	
		537.26	6.621E-01	?(	2.510E+00	1.47E+02	2.44E+01 G
		162.66	-3.034E+00	+	1.127E+01	1.10E+02	6.22E+00 G
		304.85	0.000E+00	&	3.311E+01	1.00E+03	4.29E+00 G
La-140	I 6.7957E-01					1.28E+01	
		1596.21	0.000E+00	?(	6.487E-01	1.00E+03	9.54E+01 G
		487.02	-6.088E-01	+	2.689E+00	1.29E+02	4.55E+01 G
		328.76	8.634E-01	&(	2.771E+00	9.35E+01	2.03E+01 G
		815.77	3.304E+00	?(	3.224E+00	3.53E+01	2.33E+01 G
CE-141	I 3.2146E-02					3.25E+01	
		145.44	3.215E-02	%(	1.644E+00	1.47E+03	4.82E+01 G
CE-144	I 8.9160E-01					2.85E+02	
		133.54	8.916E-01	?(	5.254E+00	1.71E+02	1.11E+01 G
PM-144	C -1.9738E-01					3.63E+02	
		696.54	-1.974E-01	?(	1.149E+00	2.41E+02	9.90E+01 G
		618.06	0.000E+00	+	2.461E+00	1.00E+03	9.91E+01 G
EU-152	F 2.6623E+00					4.94E+03	
		344.29	6.943E-01	?(	3.355E+00	1.40E+02	2.65E+01 G
		1112.07	5.572E+00	?(	3.422E+00	2.89E+01	1.36E+01 G
		121.78	3.763E-01	-	1.357E+00	1.05E+02	2.86E+01 G
		778.92	-1.889E+00	+	7.612E+00	1.65E+02	1.29E+01 G
		964.11	3.515E+00	?(	2.879E+00	3.33E+01	1.46E+01 G
		244.69	-3.242E-08	%	1.014E+01	8.80E+09	7.58E+00 G
		1408.00	-3.611E-01	-	5.101E+00	6.00E+02	2.10E+01 GA
EU-154	I 1.5146E+00					3.14E+03	
		873.23	1.515E+00	?(	7.388E+00	1.36E+02	1.23E+01 G
		123.10	-4.095E-01	-	1.468E+00	1.06E+02	4.08E+01 G
		1274.54	0.000E+00	-	1.470E+00	1.00E+03	3.52E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.36	0.000E+00	-	6.171E+00	1.00E+03	2.02E+01 G
		1004.77	0.000E+00	-	3.445E+00	1.00E+03	1.80E+01 G
		996.33	-9.187E-02	%	9.684E+00	2.72E+03	1.06E+01 G
HF-181	F 2.9354E-02					4.24E+01	
		482.00	-1.992E-01	?(	1.211E+00	1.73E+02	8.05E+01 G
		133.02	2.280E-01	?(	1.412E+00	1.80E+02	4.33E+01 G
		345.83	-1.735E+00	+	7.209E+00	1.22E+02	1.51E+01 G
		136.30	1.703E+00	?(	9.846E+00	1.67E+02	5.85E+00 G
Hg-203	F -2.9719E-01					4.66E+01	
		279.20	-2.972E-01	?(	9.701E-01	9.63E+01	8.15E+01 G
TL-208	N -5.0592E-02					6.98E+02	
		583.02	-6.361E-01	?(	1.413E+00	9.26E+01	8.45E+01 G
		277.28	2.694E+00	(	8.667E+00	9.41E+01	6.31E+00 G
		860.56	2.538E+00	?(	3.118E+00	4.08E+01	1.24E+01 G
pm-146	C 7.4421E-01					2.02E+03	
		747.16	7.442E-01	&(	1.783E+00	9.62E+01	3.40E+01 G
		735.72	-2.471E+00	+	5.259E+00	9.12E+01	2.25E+01 G
		453.88	1.515E-01	-	9.522E-01	2.33E+02	6.50E+01 G
y-88	F 1.1566E-01					1.07E+02	
		898.04	1.157E-01	?(	1.009E+00	3.55E+02	9.37E+01 G
		1836.06	0.000E+00	-	7.036E-01	1.00E+03	9.92E+01 G
Cd-113m	4.8334E+02					5.33E+03	
		263.70	4.833E+02	?(	1.162E+04	6.74E+02	6.00E-03 K
Cf-251	T 7.2565E-01					3.28E+05	
		176.60	7.257E-01	?(	2.604E+00	1.34E+02	1.70E+01 G
		227.00	-5.178E-01	+	8.176E+00	5.74E+02	6.30E+00 GA
Cf-249	T 2.1825E-01					1.28E+05	
		387.95	0.000E+00	&(	1.778E+00	1.00E+03	6.60E+01 G
		333.44	1.147E+00	?(	4.564E+00	1.15E+02	1.55E+01 G
Sn-126	1.2830E+00					3.65E+07	
		87.57	-3.746E-01	-	2.180E+00	1.71E+02	3.75E+01 GA
		64.28	1.283E+00	&(	8.000E+00	1.81E+02	9.70E+00 G
		86.94	-1.999E+00	+	9.469E+00	1.40E+02	9.04E+00 GA
PB-210	N 9.7401E+00					8.14E+03	
		46.54	9.740E+00	(P	2.474E+01	8.22E+01	4.25E+00 G

(Page 13 of 21)

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	N	-6.2351E-01					6.98E+02	
			238.63	-6.235E-01	?(P	1.929E+00	5.60E+01	4.33E+01 G
			300.03	6.275E+00		3.943E+01	1.84E+02	3.28E+00 GA
PB-214	N	9.7294E-02					5.84E+05	
			351.93	1.412E-02	%(P	2.005E+00	3.95E+03	3.76E+01 G
			295.09	2.593E-01	&(P	6.335E+00	7.09E+02	1.93E+01 G
			242.00	8.259E-01	?	1.029E+01	3.55E+02	7.43E+00 GA
BI-207	C	5.2122E-01					1.18E+04	
			569.70	1.659E-01	&(	7.981E-01	1.35E+02	9.77E+01 G
			1063.66	9.874E-01	?(	6.064E-01	2.89E+01	7.45E+01 G
BI-212	N	-4.7241E+00					6.98E+02	
			727.17	-4.724E+00	?(	1.882E+01	1.16E+02	7.55E+00 G
			785.42	-3.074E+01	+	7.742E+01	1.05E+02	1.28E+00 GA
U-235	N	7.5479E-01					2.57E+11	
			143.79	-9.978E-01	?(P	7.206E+00	1.47E+02	1.10E+01 G
			205.33	2.684E+00	?(	9.632E+00	1.34E+02	5.01E+00 G
			163.38	2.634E+00	?(	1.011E+01	1.12E+02	5.08E+00 G
			185.72	2.099E-01	P	9.619E-01	1.57E+02	5.40E+01 GA
BI-214	N	-1.4258E+00					5.84E+05	
			609.31	-1.426E+00	?(P	5.276E+00	5.62E+01	4.61E+01 G
			1120.29	-3.881E+00	+	1.255E+01	9.51E+01	1.51E+01 G
			1764.49	4.157E+00	+	4.376E+00	3.78E+01	1.54E+01 G
BI-210M	T	-5.1567E-01					1.10E+09	
			265.83	-5.157E-01	?(	1.580E+00	9.08E+01	5.00E+01 G
			304.90	5.769E-02	%	5.046E+00	2.53E+03	2.80E+01 G
AC-228	N	-1.8880E-01					2.10E+03	
			911.07	-1.888E-01	?(	3.294E+00	7.02E+02	2.90E+01 G
			968.97	0.000E+00	+	5.473E+00	1.00E+03	1.75E+01 G
			338.32	-2.127E+00	+	8.139E+00	1.12E+02	1.20E+01 G
			93.35	2.010E+00	?	1.434E+01	2.09E+02	5.56E+00 XA
TH-227	N	1.5107E+00					7.95E+03	
			50.14	6.332E-01	?(	1.539E+01	7.00E+02	8.00E+00 G
			256.24	2.514E+00	?(	6.897E+00	1.03E+02	7.00E+00 G
TH-229	N	-4.6346E+00					2.68E+06	
			193.51	-4.635E+00	?(	1.299E+01	1.07E+02	4.40E+00 G
			210.85	3.534E+00	+	1.413E+01	1.47E+02	2.99E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	N	5.3991E+00					1.63E+12	
			63.29	5.399E+00	*(P	1.482E+01	9.03E+01	3.81E+00 G
			92.59	4.855E-01	- P	8.825E+00	5.55E+02	5.58E+00 G
PA-231	N	3.8544E+00					1.20E+07	
			302.65	0.000E+00	?(	4.905E+01	1.00E+03	2.88E+00 G
			300.07	8.367E+00	?(	5.432E+01	1.91E+02	2.46E+00 G
PA-233	C	3.1286E-01					7.82E+08	
			312.01	0.000E+00	?(	4.002E+00	1.00E+03	3.60E+01 G
			300.18	2.129E+00	?(	2.223E+01	3.05E+02	6.20E+00 G
PA-234	N	-9.0551E-01					1.63E+12	
			131.29	-9.055E-01	?(	3.774E+00	1.23E+02	1.80E+01 G
			946.02	-1.260E+00	+	7.326E+00	2.39E+02	1.34E+01 G
			569.47	3.163E-01	+	1.092E+01	9.33E+02	8.20E+00 G
			883.24	0.000E+00	+	1.158E+01	1.00E+03	9.60E+00 G
			880.53	4.006E+00	?	1.586E+01	1.12E+02	6.00E+00 GA
PA-234M	N	2.1014E+01					1.63E+12	
			1001.00	2.101E+01	?(	1.074E+02	1.40E+02	8.37E-01 G
			766.41	0.000E+00	-	1.696E+02	1.00E+03	2.94E-01 G
AM-241	T	3.3002E-01					1.58E+05	
			59.54	3.300E-01	&(	2.170E+00	1.90E+02	3.59E+01 G
Np-237	F	-1.3815E+00					2.14E+06	
			86.49	-1.382E+00	?(	7.097E+00	1.52E+02	1.31E+01 G
Ir-192	F	-4.6973E-02					7.40E+01	
			316.49	-3.160E-01	?(	1.936E+00	1.81E+02	8.70E+01 G
			468.06	4.056E-01	?(	1.322E+00	9.46E+01	5.18E+01 G
			308.44	0.000E+00	+	4.499E+00	1.00E+03	3.18E+01 G
Cs-136	F	-2.8196E-01					1.30E+01	
			818.50	-2.820E-01	?(	1.470E+00	1.50E+02	1.00E+02 G
			1048.07	-1.065E+00	+	2.193E+00	6.26E+01	8.00E+01 G
			340.57	-5.485E-01	+	2.260E+00	1.21E+02	4.69E+01 G
Np-239	T	5.4709E-01					2.36E+00	
			103.70	0.000E+00	-	3.093E+00	1.00E+03	2.40E+01 X
			106.13	5.471E-01	?(	3.069E+00	1.64E+02	2.27E+01 G
			99.50	0.000E+00	-	4.980E+00	1.00E+03	1.50E+01 X
Nd-147		-3.1260E+00					1.11E+01	
			531.00	-3.126E+00	?(	7.523E+00	9.93E+01	1.30E+01 G
			91.10	0.000E+00	+	2.957E+00	1.00E+03	2.83E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-210	N 1.1407E-01					5.84E+05	
		799.60	0.000E+00	?(	1.484E+00	1.00E+03	9.90E+01 G
		296.00	2.569E-01	?(	1.565E+00	1.79E+02	7.90E+01 G
		1313.00	-5.700E-01	+	4.721E+00	3.44E+02	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity
TH-227	50.14	97.	2.	0.001	700.00	6.332E-01
AM-241	59.54	62.	6.	0.003	190.28	3.300E-01
Sn-126	64.28	72.	7.	0.004	181.18	1.283E+00
BA-133	80.99	23.	20.	0.011	49.18	9.256E-01
Np-237	86.49	149.	-12.	-0.006	151.67	-1.382E+00
EU-155	86.54	137.	-12.	-0.006	145.83	-5.896E-01
Sn-126	86.94	126.	-12.	-0.006	139.75	-1.999E+00
Sn-126	87.57	115.	-9.	-0.005	170.78	-3.746E-01
AC-228	93.35	113.	7.	0.004	208.60	2.010E+00
Gd-153	97.50	93.	-8.	-0.005	167.57	-4.190E-01

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Np-239	106.13	89.	8.	0.005	164.10	5.471E-01	
EU-152	121.78	25.	7.	0.004	104.91	3.763E-01	
CO-57	122.06	32.	7.	0.004	117.35	1.257E-01	
EU-154	123.10	64.	-11.	-0.006	105.80	-4.095E-01	
PA-234	131.29	82.	-11.	-0.006	122.71	-9.055E-01	
HF-181	133.02	65.	7.	0.004	179.60	2.280E-01	
CE-144	133.54	59.	7.	0.004	170.77	8.916E-01	
HF-181	136.30	57.	7.	0.004	167.49	1.703E+00	
CO-57	136.47	61.	7.	0.004	172.81	9.333E-01	
Tc-99m	140.51	67.	7.	0.004	180.67	1.165E-01	
U-235	143.79	108.	-7.	-0.004	146.72	-9.978E-01	P
Ba-140	162.66	76.	-12.	-0.006	109.66	-3.034E+00	
U-235	163.38	39.	8.	0.005	112.06	2.634E+00	
CE-139	165.85	42.	9.	0.005	107.73	1.826E-01	
Cf-251	176.60	26.	7.	0.004	134.42	7.257E-01	
U-235	185.72	34.	7.	0.004	156.98	2.099E-01	P
TH-229	193.51	40.	-12.	-0.006	107.20	-4.635E+00	
U-235	205.33	26.	7.	0.004	134.42	2.684E+00	
TH-229	210.85	18.	6.	0.003	147.47	3.534E+00	
Cf-251	227.00	26.	-2.	-0.001	573.93	-5.178E-01	
TH-227	256.24	18.	8.	0.005	103.04	2.514E+00	
Cd-113m	263.70	40.	1.	0.001	673.61	4.833E+02	
BI-210M	265.83	51.	-12.	-0.007	90.78	-5.157E-01	
TL-208	277.28	21.	8.	0.004	94.06	2.694E+00	
Hg-203	279.20	48.	-11.	-0.006	96.35	-2.972E-01	
I-131	284.30	18.	4.	0.002	224.62	1.373E+00	
TL-210	296.00	113.	9.	0.005	178.57	2.569E-01	
PA-231	300.07	130.	9.	0.005	190.55	8.367E+00	
PA-233	300.18	138.	6.	0.003	304.85	2.129E+00	
Ir-192	316.49	194.	-11.	-0.006	180.94	-3.160E-01	
CR-51	320.08	131.	9.	0.005	188.12	2.213E+00	
Cf-249	333.44	28.	7.	0.004	115.28	1.147E+00	
AC-228	338.32	55.	-10.	-0.005	112.35	-2.127E+00	
Cs-136	340.57	65.	-10.	-0.005	120.92	-5.485E-01	
EU-152	344.29	43.	7.	0.004	140.00	6.943E-01	
HF-181	345.83	67.	-10.	-0.005	121.97	-1.735E+00	
BA-133	356.00	32.	-10.	-0.005	116.51	-4.346E-01	
I-131	364.48	12.	3.	0.002	233.33	1.020E-01	
BA-133	383.84	56.	-9.	-0.005	122.22	-2.908E+00	
SN-113	391.69	46.	8.	0.005	120.82	3.813E-01	
SB-125	427.88	8.	1.	0.001	562.73	1.061E-01	
AG-108M	433.94	24.	-9.	-0.005	111.67	-3.156E-01	
pm-146	453.88	12.	3.	0.002	233.33	1.515E-01	
Ir-192	468.06	14.	6.	0.003	94.61	4.056E-01	
HF-181	482.00	30.	-5.	-0.003	173.21	-1.992E-01	
RU-103	497.05	8.	6.	0.004	95.36	2.469E-01	
RH-106	511.86	33.	39.	0.021	41.33	6.949E+00	
Nd-147	531.00	26.	-11.	-0.006	99.31	-3.126E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Ba-140	537.26	9.	4.	0.002	146.76	6.621E-01		
CS-134	563.24	13.	5.	0.003	153.84	2.311E+00		
PA-234	569.47	19.	1.	0.000	932.74	3.163E-01		
BI-207	569.70	14.	4.	0.002	135.41	1.659E-01		
TL-208	583.02	35.	-14.	-0.008	92.60	-6.361E-01		
SB-125	600.50	94.	-11.	-0.006	129.95	-2.461E+00		
SB-124	602.73	105.	-5.	-0.003	276.60	-2.191E-01		
CS-134	604.71	127.	-12.	-0.007	136.76	-4.971E-01		
BI-214	609.31	148.	-16.	-0.009	56.15	-1.426E+00		P
SB-125	635.89	0.	11.	0.006	30.15	4.104E+00		
AG-110M	657.76	29.	-6.	-0.003	140.07	-2.590E-01		
CS-137	661.66	20.	7.	0.004	95.31	3.647E-01		
PM-144	696.54	23.	-4.	-0.002	241.30	-1.974E-01		
NB-94	702.63	19.	-3.	-0.001	349.11	-1.236E-01		
SB-124	722.79	22.	-5.	-0.003	140.00	-2.142E+00		
BI-212	727.17	36.	-8.	-0.004	115.93	-4.724E+00		
pm-146	735.72	23.	-12.	-0.007	91.24	-2.471E+00		
pm-146	747.16	5.	5.	0.003	96.22	7.442E-01		
AG-110M	763.94	5.	0.	0.000	932.74	7.213E-02		
NB-95	765.79	12.	-3.	-0.002	173.21	-1.452E-01		
EU-152	778.92	14.	-5.	-0.003	164.92	-1.889E+00		
BI-212	785.42	14.	-8.	-0.004	105.33	-3.074E+01		
CS-134	795.87	26.	-8.	-0.004	101.98	-4.354E-01		
CS-134	801.95	34.	-1.	-0.001	830.66	-5.746E-01		
CO-58	810.78	0.	7.	0.004	38.39	3.433E-01		
Cs-136	818.50	32.	-6.	-0.003	149.54	-2.820E-01		
MN-54	834.85	0.	6.	0.003	40.82	3.085E-01		
Co-56	846.77	20.	-11.	-0.006	94.33	-5.716E-01		
TL-208	860.56	0.	6.	0.003	40.82	2.538E+00		
NB-94	871.10	10.	-3.	-0.002	159.86	-1.592E-01		
EU-154	873.23	10.	4.	0.002	135.53	1.515E+00		
PA-234	880.53	10.	4.	0.002	112.22	4.006E+00		
Sc-46	889.28	15.	1.	0.000	839.64	3.587E-02		
y-88	898.04	10.	2.	0.001	354.73	1.157E-01		
AC-228	911.07	10.	-1.	-0.001	702.38	-1.888E-01		
AG-110M	937.49	15.	-6.	-0.003	147.67	-9.761E-01		
PA-234	946.02	10.	-3.	-0.002	238.82	-1.260E+00		
EU-152	964.11	0.	9.	0.005	33.33	3.515E+00		
PA-234M	1001.00	7.	3.	0.002	140.11	2.101E+01		
Co-56	1037.84	5.	2.	0.001	324.35	7.101E-01		
Cs-136	1048.07	32.	-14.	-0.008	62.60	-1.065E+00		
RH-106	1050.36	28.	9.	0.005	90.15	3.464E+01		
BI-207	1063.66	0.	12.	0.007	28.87	9.874E-01		
Ga-68	1077.40	5.	2.	0.001	324.35	3.667E+00		
FE-59	1099.25	5.	1.	0.000	796.87	7.411E-02		
EU-152	1112.07	0.	12.	0.007	28.87	5.572E+00		
BI-214	1120.29	34.	-9.	-0.005	95.09	-3.881E+00		
Sc-46	1120.55	27.	-12.	-0.006	80.30	-7.384E-01		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	1173.24	11.	-6.	-0.003	137.58	-3.740E-01	
Ta-182	1221.41	11.	-4.	-0.002	188.42	-1.091E+00	
Co-56	1238.28	11.	-6.	-0.004	130.84	-6.583E-01	
TL-210	1313.00	6.	-2.	-0.001	343.80	-5.700E-01	
EU-152	1408.00	6.	-1.	-0.001	600.00	-3.611E-01	
BI-214	1764.49	0.	7.	0.004	37.80	4.157E+00	
Co-56	1771.35	18.	-8.	-0.005	79.16	-4.970E+00	

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

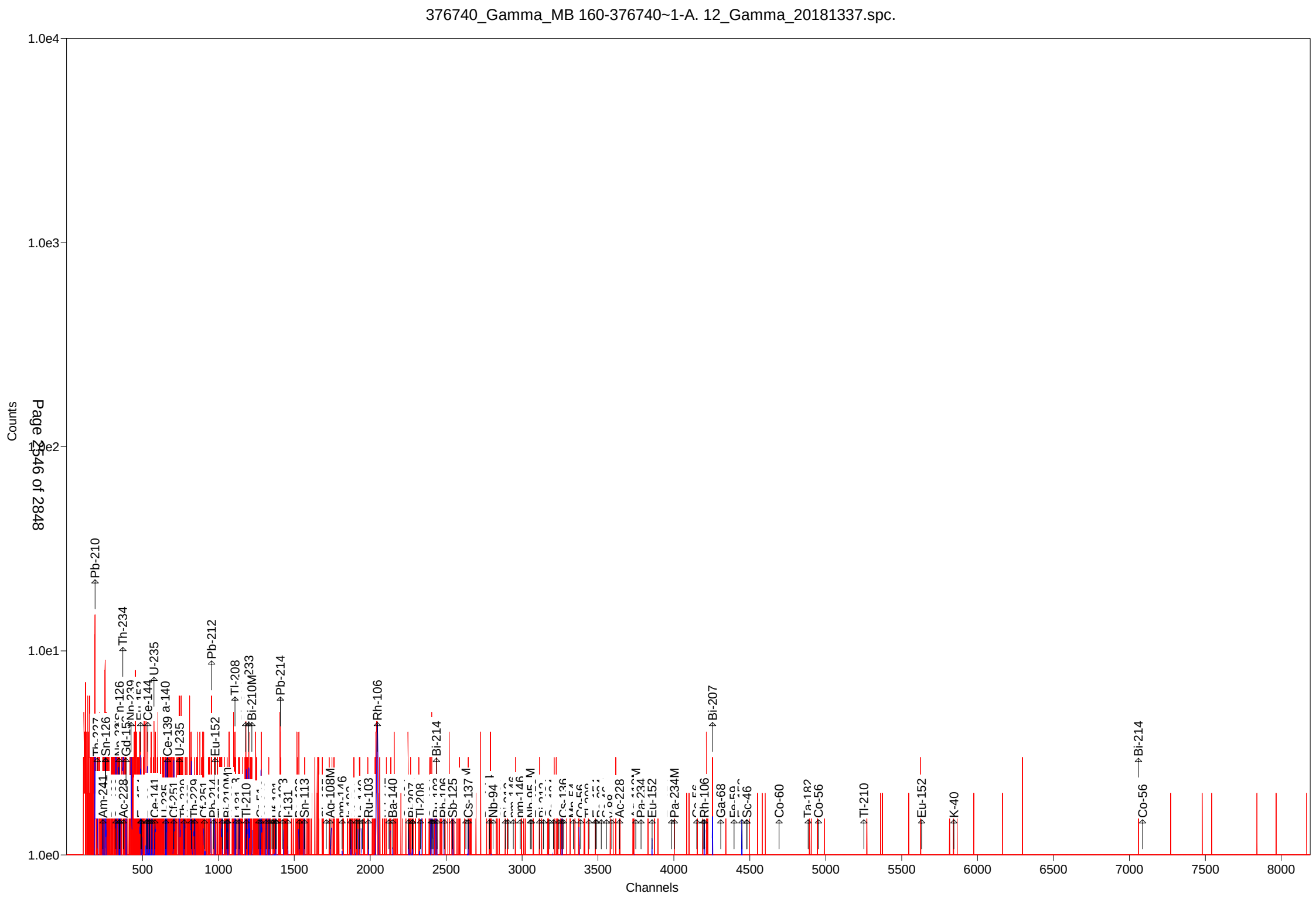
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-1.0811E-01	-1.0811E-01	2.733E+03%	1.06E+01
NA-22	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.18E-01
K-40	#	5.8566E+00	5.8566E+00	3.536E+01%	5.40E+00
Sc-46	#A	3.5873E-02	3.5874E-02	8.396E+02%	1.13E+00
CR-51	#A	2.2134E+00	2.2135E+00	1.881E+02%	1.42E+01
MN-54	#A	3.0847E-01	3.0847E-01	4.082E+01%	3.79E-01
FE-59	#A	7.4107E-02	7.4108E-02	7.969E+02%	1.50E+00
Co-56	#A	-4.1284E-01	-4.1284E-01	9.433E+01%	1.22E+00
CO-57	#A	2.1528E-01	2.1528E-01	1.044E+02%	5.08E-01
CO-58	#A	3.4329E-01	3.4330E-01	3.839E+01%	3.73E-01
CO-60	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.36E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.37E+00
NB-94	#A	-1.2361E-01	-1.2361E-01	3.491E+02%	1.06E+00
ZR-95	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.77E+00
NB-95	#A	-1.4519E-01	-1.4519E-01	1.732E+02%	9.12E-01
RU-103	#A	2.4690E-01	2.4690E-01	9.536E+01%	6.15E-01
RH-106	#A	4.3413E+00	4.3413E+00	9.015E+01%	2.48E+01
AG-108M	#A	-3.1561E-01	-3.1561E-01	1.117E+02%	8.96E-01
AG-110M	#A	1.3476E-02	1.3476E-02	5.647E+02%	1.53E+00
SN-113	#A	3.8132E-01	3.8132E-01	1.208E+02%	1.58E+00
SB-124	#A	-2.1908E-01	-2.1908E-01	2.766E+02%	2.08E+00
SB-125	#A	1.2114E+00	1.2114E+00	3.015E+01%	1.69E+00
I-131	#A	1.9080E-01	1.9081E-01	1.619E+02%	6.41E-01
Gd-153	#A	-4.1904E-01	-4.1904E-01	1.676E+02%	2.40E+00
Ga-68	#A	3.6293E+00	3.6665E+00	3.243E+02%	2.96E+01
Tc-99m	#A	1.1625E-01	1.1648E-01	1.807E+02%	7.25E-01
BA-133	#A	-4.3458E-01	-4.3458E-01	1.165E+02%	1.28E+00
CS-134	#A	-2.7585E-01	-2.7585E-01	1.029E+02%	2.30E+00
CS-137	#A	3.6467E-01	3.6467E-01	9.531E+01%	1.19E+00
CE-139	#A	1.8256E-01	1.8256E-01	1.077E+02%	6.71E-01
Ba-140	#A	6.6210E-01	6.6212E-01	1.468E+02%	2.51E+00
La-140	#C	6.7955E-01	6.7957E-01	3.526E+01%	6.49E-01
CE-141	#A	3.2145E-02	3.2146E-02	1.473E+03%	1.64E+00

CE-144 #A	8.9160E-01	8.9160E-01	1.708E+02%		5.25E+00
PM-144 #A	-1.9738E-01	-1.9738E-01	2.413E+02%		1.15E+00
EU-152 #A	2.6623E+00	2.6623E+00	2.887E+01%		3.35E+00
EU-154 #A	1.5146E+00	1.5146E+00	1.355E+02%		7.39E+00
EU-155 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.50E+00
HF-181 #A	2.9354E-02	2.9354E-02	1.002E+02%		1.21E+00
Ta-182 #A	0.0000E+00	0.0000E+00	7.071E+02%		2.65E+00
Hg-203 #A	-2.9719E-01	-2.9719E-01	9.635E+01%		9.70E-01
TL-208 #A	-5.0592E-02	-5.0592E-02	4.082E+01%		1.41E+00
pm-146 #A	7.4421E-01	7.4421E-01	9.622E+01%		1.78E+00
y-88 #A	1.1566E-01	1.1566E-01	3.547E+02%		1.01E+00
Cd-113m#A	4.8334E+02	4.8334E+02	6.736E+02%		1.16E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		2.23E+01
Cf-251 #A	7.2565E-01	7.2565E-01	1.344E+02%		2.60E+00
Cf-249 #A	2.1825E-01	2.1825E-01	1.153E+02%		1.78E+00
Sn-126 #A	1.2830E+00	1.2830E+00	1.812E+02%		8.00E+00
PB-210 A	9.7401E+00	9.7401E+00	8.215E+01%		2.47E+01
PB-212 A	-6.2351E-01	-6.2351E-01	5.601E+01%		1.93E+00
PB-214 #A	9.7294E-02	9.7294E-02	7.090E+02%		2.00E+00
BI-207 #A	5.2122E-01	5.2122E-01	2.887E+01%		7.98E-01
BI-212 #A	-4.7241E+00	-4.7241E+00	1.159E+02%		1.88E+01
U-235 #A	7.5479E-01	7.5479E-01	7.612E+01%		7.21E+00
BI-214 #A	-1.4258E+00	-1.4258E+00	5.615E+01%		5.28E+00
BI-210M#A	-5.1567E-01	-5.1567E-01	9.078E+01%		1.58E+00
AC-228 #A	-1.8880E-01	-1.8880E-01	7.024E+02%		3.29E+00
TH-227 #A	1.5107E+00	1.5107E+00	1.030E+02%		1.54E+01
TH-229 #A	-4.6346E+00	-4.6346E+00	1.072E+02%		1.30E+01
TH-234 #A	5.3991E+00	5.3991E+00	9.031E+01%		1.48E+01
PA-231 #A	3.8544E+00	3.8544E+00	1.905E+02%		4.91E+01
PA-233 #A	3.1286E-01	3.1286E-01	3.049E+02%		4.00E+00
PA-234 #A	-9.0551E-01	-9.0551E-01	1.227E+02%		3.77E+00
PA-234M#A	2.1014E+01	2.1014E+01	1.401E+02%		1.07E+02
AM-241 #A	3.3002E-01	3.3002E-01	1.903E+02%		2.17E+00
Np-237 #A	-1.3815E+00	-1.3815E+00	1.517E+02%		7.10E+00
Ir-192 #A	-4.6973E-02	-4.6973E-02	9.461E+01%		1.94E+00
Cs-136 #A	-2.8195E-01	-2.8196E-01	1.495E+02%		1.47E+00
Np-239 #A	5.4698E-01	5.4709E-01	1.641E+02%		3.07E+00
Nd-147 #A	-3.1259E+00	-3.1260E+00	9.931E+01%		7.52E+00
TL-210 #A	1.1407E-01	1.1407E-01	1.786E+02%		1.48E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.1 keV)	0.000E+00	Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV)	0.0000000E+00	Bq/Sample


376740_Gamma_MB 160-376740~1-A. 12_Gamma_20181337.spc.
Counts
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
Channels
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-210
Th-234
U-235
Pb-212
Tl-208
Bi-210M
Pb-214
Ce-139
a-140
Eu-152
Rh-106
Bi-214
Bi-207
Co-60
Co-56
Eu-152
K-40
Bi-214
Co-56

Test America St. Louis Spectrum ID: 19_Gamma_20181430

Sample Description: 376740_Gamma_LCS 160-376740~2-A
Detector: Detector #19
Batch ID: 376740
Work Order Number: Gamma
Lot Number: LCS 160-376740~2-A

Decay to Time: 8/9/2018 01:24 Live Time: 1800 sec
Acquisition Time: 8/9/2018 01:24:38 Real Time: 1807 sec
Analysis Time: 8/9/2018 01:54 Dead Time: 0.39 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 19_Soil_TunaCan.Clb
Efficiency Cal Desc: 19_TunaCan_108513
Efficiency Cal Date: 4/16/2018 12:11
Energy Cal Date: 4/16/2018 11:22
Library: Client_Long_Rev14.lib
Bkgd Correction File: 19_2018-07-14_1824.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-1.733E+01	103.3	1.790E+01	1.793E+01	5.942E+01
NA-22	-8.579E-01	89.2	7.654E-01	7.666E-01	2.589E+00
K-40	-8.758E+00	117.7	1.031E+01	1.032E+01	2.260E+01
Sc-46	-1.965E+00	103.2	2.027E+00	2.029E+00	6.749E+00
CR-51	-1.029E-01	19726.8	2.029E+01	2.029E+01	6.779E+01
MN-54	6.870E-02	2282.0	1.568E+00	1.568E+00	3.608E+00
FE-59	-2.738E+00	124.9	3.421E+00	3.423E+00	8.341E+00
Co-56	1.615E+00	60.1	9.717E-01	9.751E-01	3.113E+00
CO-57	0.000E+00	1.#INF	2.645E-01	2.645E-01	2.982E+00
CO-58	-1.965E+00	69.7	1.369E+00	1.373E+00	5.414E+00
CO-60	1.758E+02	1.6	2.809E+00	9.194E+00	1.731E+00
ZN-65	-5.404E+00	74.6	4.032E+00	4.041E+00	1.336E+01
NB-94	2.298E+00	49.6	1.140E+00	1.146E+00	2.529E+00
ZR-95	6.529E-01	384.9	2.513E+00	2.513E+00	5.771E+00
NB-95	1.520E+00	69.6	1.057E+00	1.060E+00	3.501E+00
RU-103	1.657E-01	995.9	1.651E+00	1.651E+00	3.892E+00
RH-106	-1.645E+01	62.3	1.025E+01	1.029E+01	4.216E+01
AG-108M	9.753E-01	111.6	1.088E+00	1.089E+00	3.975E+00
AG-110M	2.056E+00	84.6	1.738E+00	1.741E+00	8.054E+00
SN-113	2.211E+00	101.7	2.249E+00	2.251E+00	7.467E+00
SB-124	-1.623E+00	130.0	2.109E+00	2.111E+00	7.019E+00
SB-125	4.263E+00	90.2	3.846E+00	3.852E+00	1.213E+01
I-131	8.053E-01	142.0	1.143E+00	1.144E+00	3.802E+00
Gd-153	1.511E+00	342.2	5.170E+00	5.171E+00	1.716E+01
Ga-68	-2.844E+01	250.6	7.128E+01	7.129E+01	1.570E+02
Tc-99m	0.000E+00	1.#INF	6.690E-01	6.690E-01	4.962E+00
BA-133	-2.159E+00	97.9	2.112E+00	2.115E+00	7.012E+00
CS-134	2.789E-01	94.2	2.626E-01	2.630E-01	6.957E+00
CS-137	4.007E+02	1.3	5.169E+00	2.110E+01	3.450E+00
CE-139	1.100E+00	97.3	1.071E+00	1.072E+00	3.551E+00
Ba-140	2.189E+00	236.3	5.172E+00	5.173E+00	1.221E+01
La-140	-1.907E+00	65.2	1.244E+00	1.247E+00	3.211E+00
CE-141	1.726E+00	151.1	2.607E+00	2.609E+00	8.649E+00

CE-144	0.000E+00	1.#INF	2.755E+00	2.755E+00	3.817E+01
PM-144	9.322E-01	89.4	8.337E-01	8.351E-01	2.485E+00
EU-152	2.666E+00	97.8	2.607E+00	2.611E+00	2.248E+01
EU-154	9.128E+00	78.9	7.201E+00	7.216E+00	4.008E+01
EU-155	1.707E+00	130.8	2.233E+00	2.235E+00	2.416E+01
HF-181	-2.287E+00	105.1	2.404E+00	2.407E+00	7.978E+00
Ta-182	6.026E+00	87.5	5.273E+00	5.282E+00	2.012E+01
Hg-203	4.552E-01	299.9	1.365E+00	1.365E+00	3.322E+00
TL-208	3.828E+00	32.0	1.225E+00	1.241E+00	2.796E+00
pm-146	-5.523E+00	65.3	3.606E+00	3.617E+00	1.086E+01
y-88	0.000E+00	1.#INF	1.977E+00	1.977E+00	4.375E+00
Cd-113m	3.103E+04	44.8	1.391E+04	1.403E+04	3.384E+04
Cd-109	2.367E+01	130.7	3.094E+01	3.097E+01	1.026E+02
Cf-251	-1.735E+00	295.7	5.131E+00	5.132E+00	1.303E+01
Cf-249	1.432E+00	148.2	2.122E+00	2.123E+00	7.804E+00
Sn-126	-2.254E+01	217.0	4.891E+01	4.893E+01	1.616E+02
PB-210	1.112E+04	1.0	1.128E+02	7.035E+02	2.161E+02
PB-212	1.935E+00	131.5	2.544E+00	2.546E+00	8.456E+00
PB-214	1.107E+01	22.3	2.470E+00	2.533E+00	6.562E+00
BI-207	-5.575E-01	164.6	9.174E-01	9.179E-01	3.102E+00
BI-212	1.083E+01	139.0	1.506E+01	1.507E+01	5.071E+01
U-235	4.671E+00	196.4	9.173E+00	9.176E+00	3.930E+01
BI-214	1.001E+01	18.4	1.840E+00	1.909E+00	5.178E+00
BI-210M	-2.262E+00	88.7	2.007E+00	2.010E+00	6.655E+00
AC-228	8.181E+00	47.9	3.922E+00	3.944E+00	1.577E+01
TH-227	1.834E+01	155.9	2.859E+01	2.861E+01	9.476E+01
TH-229	-1.055E+00	2037.8	2.151E+01	2.151E+01	5.477E+01
TH-234	-6.875E+01	113.3	7.791E+01	7.801E+01	4.129E+02
PA-231	3.606E+00	705.8	2.545E+01	2.545E+01	2.238E+02
PA-233	1.717E+00	319.8	5.489E+00	5.490E+00	1.826E+01
PA-234	2.305E+00	118.5	2.732E+00	2.735E+00	7.934E+00
PA-234M	2.787E+02	63.7	1.776E+02	1.782E+02	7.164E+02
AM-241	1.256E+03	0.9	1.076E+01	7.389E+01	1.546E+01
Np-237	6.879E+00	129.4	8.901E+00	8.910E+00	2.952E+01
Ir-192	1.279E+00	88.5	1.132E+00	1.135E+00	7.672E+00
Cs-136	2.831E-01	76.5	2.166E-01	2.172E-01	5.873E+00
Np-239	3.819E+00	174.8	6.675E+00	6.679E+00	2.212E+01
Nd-147	1.009E+01	92.1	9.298E+00	9.315E+00	2.171E+01
TL-210	6.070E-01	167.7	1.018E+00	1.018E+00	4.992E+00
Total	4.443E+04				

Analyst: Morgan Reichert

TestAmerica Inc Spectrum name: 19_Gamma_20181430.An1

Sample description
376740_Gamma_LCS 160-376740~2-A

Spectrum Filename: C:\User\SPC\Det19\19_Gamma_20181430.An1

Acquisition information
Start time:	8/9/2018 1:24:38 AM
Live time:	1800
Real time:	1807
Dead time:	0.39 %
Detector ID:	19

Detector system
Ge19 SN/11146715

Calibration
Filename: 19_Soil_TunaCan.Clb
19_TunaCan_108513

Energy Calibration
Created:	4/16/2018 11:22:57 AM
Zero offset:	0.177 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration
Created:	4/16/2018 12:11:21 PM
Type:	Polynomial
Uncertainty:	0.841 %
Coefficients:	-0.371612 -4.869309 0.466742
	-0.049787 0.002234 -0.000039

Library Files
Main analysis library:	Client_Long_Rev14.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	150 (37.71keV)
Stop channel:	8000 (1999.42keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 1:24:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	19_2018-07-14_1824.PBC 7/14/2018 6:24:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 31 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1441

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.72	14542.	1.01	0.93	1.720E-02	46.54	4.250	1.112E+04	PB210
49.95	53.	154.62	0.94	2.030E-02	50.14	8.000	1.780E+01	TH227
59.69	21205.	0.86	0.91	2.620E-02	59.54	35.900	1.256E+03	AM241
80.99	20.	279.79	0.97	3.218E-02	80.99	34.060	PBC<MDA	BA133
86.49	54.	129.41	0.97	3.300E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	2.935E+00	EU155
					86.94	9.040	9.951E+00	Sn126
86.54	54.	130.84	0.97	3.301E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	2.935E+00	EU155
					86.94	9.040	9.951E+00	Sn126
86.89	54.	131.94	0.97	3.306E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	2.936E+00	EU155
					86.94	9.040	9.955E+00	Sn126
87.96	77.	44.74	0.47	3.319E-02	87.57	37.500	3.442E+00	Sn126
					88.04	3.790	3.400E+01	Cd109
91.10	45.	147.54	0.97	3.352E-02	91.10	28.300	PBC<MDA	Nd147
93.35	54.	175.82	0.98	3.372E-02	93.35	5.561	PBC<MDA	AC228
97.50	28.	342.15	0.98	3.401E-02	97.50	30.000	PBC<MDA	Gd153
106.13	54.	174.77	0.99	3.430E-02	106.13	22.700	PBC<MDA	Np239
112.36	46.	55.54	0.61	3.429E-02				
121.78	25.	185.26	1.00	3.401E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	4.772E-01	CO57
131.24	25.	118.55	0.28	3.348E-02	131.29	18.000	PBC<MDA	PA234
143.79	39.	196.37	1.02	3.254E-02	143.79	10.960	PBC<MDA	U235
145.44	49.	151.07	1.02	3.240E-02	145.44	48.200	PBC<MDA	CE141
163.38	5.	881.49	1.04	3.076E-02	163.38	5.080	PBC<MDA	U235
165.85	48.	97.33	1.04	3.053E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.44	66.	58.35	0.98	2.864E-02	185.72	54.000	PBC<MDA	U235
227.00	46.	95.24	1.10	2.503E-02	227.00	6.300	PBC<MDA	Cf251
238.65	36.	131.50	1.11	2.413E-02	238.63	43.300	PBC<MDA	PB212
242.01	46.	103.84	1.11	2.388E-02	242.00	7.430	PBC<MDA	PB214
263.21	75.	44.84	1.58	2.238E-02	263.70	0.006	PBC<MDA	Cd113m
279.20	14.	299.89	1.14	2.141E-02	279.20	81.460	PBC<MDA	Hg203
294.85	107.	30.89	2.97	2.050E-02	295.09	19.300	1.505E+01	PB214
					296.00	79.000	3.685E+00	TL210
296.00	40.	167.69	1.16	2.045E-02	296.00	79.000	PBC<MDA	TL210
300.03	40.	170.27	1.16	2.023E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
300.07	7.	996.40	1.16	2.023E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	7.828E+00	PA231
					300.18	6.200	3.107E+00	PA233
313.00	22.	319.75	1.17	1.962E-02	312.01	36.000	PBC<MDA	PA233
328.76	41.	140.47	1.18	1.882E-02	328.76	20.300	PBC<MDA	La140
333.44	39.	148.16	1.19	1.861E-02	333.44	15.510	PBC<MDA	Cf249
338.40	62.	47.94	1.71	1.839E-02	338.32	12.010	PBC<MDA	AC228
351.63	109.	32.23	1.27	1.782E-02	351.93	37.600	9.021E+00	PB214
391.69	42.	101.69	1.24	1.637E-02	391.69	64.000	PBC<MDA	SN113
433.59	22.	182.76	1.27	1.510E-02	433.94	90.480	PBC<MDA	AG108M
453.88	30.	128.13	1.29	1.458E-02	453.88	65.000	PBC<MDA	pm146
463.37	47.	90.20	1.30	1.434E-02	463.37	10.470	PBC<MDA	SB125
468.06	45.	88.54	1.30	1.423E-02	468.06	51.750	PBC<MDA	Ir192
497.05	4.	995.92	1.33	1.358E-02	497.05	90.900	PBC<MDA	RU103
511.86	73.	74.11	2.59	1.328E-02	511.86	20.000	PBC<MDA	RH106
531.00	30.	92.10	1.35	1.291E-02	531.00	13.000	PBC<MDA	Nd147
537.26	12.	236.29	1.36	1.279E-02	537.26	24.390	PBC<MDA	Ba140
563.24	21.	129.36	1.38	1.234E-02	563.24	8.350	PBC<MDA	CS134
569.32	11.	156.52	1.38	1.224E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	6.274E+00	PA234
					569.70	97.740	5.265E-01	BI207
583.05	70.	32.01	1.45	1.202E-02	583.02	84.500	3.828E+00	TL208
609.32	95.	18.37	1.42	1.163E-02	609.31	46.090	9.800E+00	BI214
618.06	14.	153.92	1.42	1.151E-02	618.06	99.100	PBC<MDA	PM144
636.97	16.	141.95	1.44	1.125E-02	636.97	7.170	PBC<MDA	I131
657.76	27.	439.49	1.46	1.098E-02	657.76	94.640	PBC<MDA	AG110M
661.75	6719.	1.29	1.40	1.093E-02	661.66	85.210	4.007E+02	CS137
696.54	23.	91.13	1.49	1.052E-02	696.54	99.000	PBC<MDA	PM144
702.63	42.	49.63	1.49	1.045E-02	702.63	97.900	PBC<MDA	NB94
722.02	18.	127.95	1.51	1.024E-02	722.94	90.840	PBC<MDA	AG108M
727.17	15.	139.04	1.51	1.019E-02	727.17	7.550	PBC<MDA	BI212
735.72	20.	108.01	1.52	1.010E-02	735.72	22.500	PBC<MDA	pm146
756.73	6.	384.93	1.53	9.896E-03	756.73	54.460	PBC<MDA	ZR95
765.79	27.	69.56	1.54	9.809E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	5.163E+02	PA234M
766.41	22.	86.88	1.54	9.803E-03	765.79	99.790	PBC<MDA	NB95

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					766.41	0.294	4.153E+02	PA234M
779.42	22.	97.81	1.55	9.687E-03	778.92	12.940	PBC<MDA	EU152
785.42	26.	88.16	1.56	9.628E-03	785.42	1.280	PBC<MDA	BI212
801.95	8.	290.41	1.57	9.481E-03	801.95	8.690	PBC<MDA	CS134
846.77	27.	84.73	1.60	9.108E-03	846.77	99.935	PBC<MDA	Co56
884.68	33.	84.55	1.63	8.818E-03	884.68	72.680	PBC<MDA	AG110M
911.95	15.	216.45	1.65	8.629E-03	911.07	29.000	PBC<MDA	AC228
964.11	6.	400.59	1.69	8.274E-03	964.11	14.605	PBC<MDA	EU152
969.65	29.	72.13	1.69	8.244E-03	968.97	17.460	PBC<MDA	AC228
996.33	32.	78.89	1.71	8.075E-03	996.33	10.600	PBC<MDA	EU154
1001.00	28.	93.26	1.72	8.047E-03	1001.00	0.837	PBC<MDA	PA234M
1048.07	21.	76.52	1.75	7.775E-03	1048.07	80.000	PBC<MDA	Cs136
1121.30	30.	95.07	1.80	7.389E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	6.355E+00	Ta182
1173.37	2293.	2.23	1.84	7.138E-03	1173.24	99.900	1.787E+02	CO60
1189.05	11.	146.93	1.85	7.065E-03	1189.05	16.200	PBC<MDA	Ta182
1238.28	13.	85.40	1.89	6.848E-03	1238.28	66.070	PBC<MDA	Co56
1332.63	2011.	2.29	1.86	6.465E-03	1332.50	99.980	1.728E+02	CO60
1690.98	4.	158.45	2.18	5.307E-03	1690.98	47.790	PBC<MDA	SB124
1764.69	15.	41.47	2.22	5.112E-03	1764.49	15.400	PBC<MDA	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
448.39	112.36	260.	46.	1.341E+03	55.54	0.605	- sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.30	46.54	3607.	14542.	8.079	1.01	0.935D
TH-227	199.70	50.14	3531.	54.	0.030	155.88	0.938D
AM-241	237.86	59.69	3074.	21205.	11.780	0.86	0.909
TH-234	252.25	63.29	27998.	-130.	-0.072	113.33	0.950s
Sn-126	256.21	64.28	28514.	-110.	-0.061	216.98	0.951

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	323.00	80.99	957.	20.	0.011	279.79	0.966s
Np-237	344.99	86.49	2373.	54.	0.030	129.41	0.971s
EU-155	345.20	86.54	2426.	54.	0.030	130.84	0.971s
Sn-126	346.79	86.94	2470.	54.	0.030	131.94	0.971s
Sn-126	349.31	87.57	2482.	54.	0.030	69.49	0.972D
Cd-109	351.19	88.04	2429.	54.	0.030	130.72	0.972A
Nd-147	363.42	91.10	2167.	45.	0.025	147.54	0.975s
TH-234	369.37	92.59	2351.	-84.	-0.047	66.44	0.976s
AC-228	372.41	93.35	4440.	54.	0.030	175.82	0.977
Gd-153	389.00	97.50	4494.	28.	0.015	342.15	0.981s
Np-239	396.99	99.50	4522.	0.	0.000	1000.00	0.982
Gd-153	411.78	103.20	4522.	0.	0.000	1000.00	0.986s
Np-239	413.78	103.70	4522.	0.	0.000	1000.00	0.986s
Np-239	423.49	106.13	4348.	54.	0.030	174.77	0.988s
EU-152	486.04	121.78	1060.	25.	0.014	185.26	1.002
CO-57	487.18	122.06	1085.	0.	0.000	1000.00	1.003s
EU-154	491.33	123.10	1146.	-55.	-0.031	88.03	1.004s
PA-234	524.09	131.29	320.	25.	0.014	118.55	0.280D
HF-181	531.00	133.02	2950.	-44.	-0.024	175.21	1.013s
CE-144	533.06	133.54	2906.	0.	0.000	1000.00	1.013s
HF-181	544.09	136.30	2906.	0.	0.000	1000.00	1.015s
CO-57	544.79	136.47	2906.	0.	0.000	1000.00	1.016s
Tc-99m	560.92	140.51	2906.	0.	0.000	1000.00	1.019s
U-235	574.02	143.79	2867.	39.	0.022	196.37	1.022s
CE-141	580.63	145.44	2661.	49.	0.027	151.07	1.024s
Ba-140	649.47	162.66	1011.	-48.	-0.027	94.23	1.039s
U-235	652.34	163.38	929.	5.	0.003	881.49	1.040s
CE-139	662.23	165.85	1081.	48.	0.027	97.33	1.042
Cf-251	705.19	176.60	609.	-16.	-0.009	295.69	1.051s
U-235	740.53	185.44	413.	66.	0.037	58.35	0.983s
TH-229	842.11	210.85	653.	-22.	-0.012	214.25	1.082
Cf-251	906.68	227.00	524.	46.	0.025	95.24	1.096
PB-212	953.18	238.63	1126.	36.	0.020	131.50	1.106
PB-214	966.63	242.00	1122.	46.	0.026	103.84	1.109s
EU-152	977.41	244.69	1390.	-50.	-0.028	106.00	1.111s
Cd-113m	1051.43	263.21	288.	75.	0.042	44.84	1.581s
BI-210M	1061.92	265.83	784.	-45.	-0.025	88.73	1.130s
Hg-203	1115.37	279.20	475.	14.	0.008	299.89	1.141
I-131	1135.76	284.30	512.	-41.	-0.023	109.18	1.146s
PB-214	1177.94	294.85	258.	107.	0.060	30.89	2.974s
TL-210	1182.54	296.00	2204.	40.	0.022	167.69	1.156s
PB-212	1198.65	300.03	2244.	40.	0.022	170.27	1.159
PA-231	1198.81	300.07	2438.	7.	0.004	996.40	1.159s
PA-233	1199.25	300.18	2445.	0.	0.000	1000.00	1.159
PA-231	1209.13	302.65	2445.	0.	0.000	1000.00	1.162
BA-133	1209.93	302.85	2445.	0.	0.000	1000.00	1.162
Ba-140	1217.92	304.85	2445.	0.	0.000	1000.00	1.164s
BI-210M	1218.11	304.90	2445.	0.	0.000	1000.00	1.164s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ir-192	1232.27	308.44	2445.	0.	0.000	1000.00	1.167s
PA-233	1246.56	312.01	2423.	22.	0.012	319.75	1.170s
Ir-192	1264.46	316.49	2445.	0.	0.000	1000.00	1.173s
La-140	1313.52	328.76	1617.	41.	0.023	140.47	1.184s
Cf-249	1332.23	333.44	1658.	39.	0.022	148.16	1.188
AC-228	1352.04	338.40	224.	62.	0.034	47.94	1.709s
Cs-136	1360.74	340.57	1697.	0.	0.000	1000.00	1.194s
HF-181	1381.77	345.83	432.	-14.	-0.008	281.71	1.199s
PB-214	1404.97	351.63	269.	109.	0.060	32.23	1.266
BA-133	1422.43	356.00	847.	-43.	-0.024	97.86	1.207s
BA-133	1533.76	383.84	1023.	-17.	-0.009	272.46	1.231s
Cf-249	1550.19	387.95	1039.	0.	0.000	1000.00	1.235s
SN-113	1565.14	391.69	878.	42.	0.023	101.69	1.238s
AG-108M	1734.08	433.94	416.	22.	0.012	182.76	1.273s
pm-146	1813.83	453.88	372.	30.	0.017	128.13	1.290s
SB-125	1851.76	463.37	872.	47.	0.026	90.20	1.298
Ir-192	1870.53	468.06	788.	45.	0.025	88.54	1.302
BE-7	1908.66	477.60	1105.	-46.	-0.026	103.31	1.310s
HF-181	1926.26	482.00	1151.	-46.	-0.026	105.11	1.313
La-140	1946.35	487.02	1121.	-45.	-0.025	105.51	1.317s
RU-103	1986.48	497.05	323.	4.	0.002	995.92	1.326s
RH-106	2045.71	511.86	440.	73.	0.041	74.11	2.588s
Nd-147	2122.23	531.00	182.	30.	0.017	92.10	1.354
Ba-140	2147.27	537.26	200.	12.	0.007	236.29	1.359s
CS-134	2251.16	563.24	178.	21.	0.012	129.36	1.380s
CS-134	2275.49	569.32	152.	11.	0.006	156.52	1.385s
BI-207	2277.02	569.70	189.	-12.	-0.007	164.57	1.385s
TL-208	2330.40	583.05	108.	70.	0.039	32.01	1.454
SB-125	2400.20	600.50	973.	-34.	-0.019	86.11	1.410
SB-124	2409.12	602.73	940.	-34.	-0.019	129.97	1.412s
CS-134	2417.03	604.71	906.	-34.	-0.019	127.52	1.414
BI-214	2435.44	609.31	103.	95.	0.053	18.37	1.417D
RU-103	2439.39	610.30	872.	-34.	-0.019	124.78	1.418s
PM-144	2470.44	618.06	212.	14.	0.008	153.92	1.424s
RH-106	2485.86	621.92	322.	-34.	-0.019	62.34	1.427
SB-125	2541.74	635.89	236.	-31.	-0.017	68.50	1.439
I-131	2546.08	636.97	235.	16.	0.009	141.95	1.440
AG-110M	2629.23	657.76	6915.	27.	0.015	439.49	1.456s
CS-137	2645.18	661.75	140.	6719.	3.733	1.29	1.401
PM-144	2784.35	696.54	89.	23.	0.013	91.13	1.487s
NB-94	2808.70	702.63	89.	42.	0.024	49.63	1.492s
SB-124	2889.33	722.79	250.	-15.	-0.008	154.58	1.507s
AG-108M	2889.93	722.94	247.	18.	0.010	127.95	1.507s
EU-154	2891.61	723.36	235.	0.	0.000	1000.00	1.508s
ZR-95	2894.98	724.20	235.	0.	0.000	1000.00	1.508s
BI-212	2906.86	727.17	210.	15.	0.008	139.04	1.511s
pm-146	2941.07	735.72	103.	20.	0.011	108.01	1.518s
pm-146	2986.83	747.16	187.	-34.	-0.019	65.28	1.526s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZR-95	3025.11	756.73	131.	6.	0.004	384.93	1.534
AG-110M	3053.97	763.94	149.	-14.	-0.008	123.43	1.539s
NB-95	3061.35	765.79	160.	27.	0.015	69.56	1.541s
PA-234M	3063.85	766.41	164.	22.	0.012	86.88	1.541s
EU-152	3113.88	778.92	98.	22.	0.012	97.81	1.551s
BI-212	3139.88	785.42	112.	26.	0.015	88.16	1.556s
CS-134	3181.68	795.87	288.	-20.	-0.011	122.07	1.564s
TL-210	3196.61	799.60	308.	0.	0.000	1000.00	1.567s
CS-134	3206.02	801.95	289.	8.	0.005	290.41	1.569
CO-58	3241.32	810.78	360.	-33.	-0.018	69.68	1.575s
La-140	3261.30	815.77	319.	-18.	-0.010	127.87	1.579s
Cs-136	3272.22	818.50	424.	-17.	-0.009	174.80	1.581s
Co-56	3385.32	846.77	107.	27.	0.015	84.73	1.603s
TL-208	3440.51	860.56	201.	-23.	-0.013	98.29	1.614
NB-94	3482.65	871.10	187.	-27.	-0.015	75.00	1.621s
PA-234	3520.39	880.53	527.	-38.	-0.021	86.99	1.628
PA-234	3531.23	883.24	489.	-38.	-0.021	83.81	1.630
AG-110M	3537.01	884.68	375.	33.	0.018	84.55	1.632
Sc-46	3555.40	889.28	498.	-31.	-0.017	103.16	1.635s
y-88	3590.45	898.04	175.	0.	0.000	1000.00	1.642
AC-228	3642.58	911.07	215.	15.	0.008	216.45	1.651s
AG-110M	3748.30	937.49	220.	-11.	-0.006	297.97	1.671
PA-234	3782.42	946.02	250.	-28.	-0.016	125.58	1.677
EU-152	3854.81	964.11	319.	6.	0.004	400.59	1.691
AC-228	3874.26	968.97	202.	29.	0.016	72.13	1.694s
EU-154	3983.73	996.33	294.	32.	0.018	78.89	1.714s
PA-234M	4002.41	1001.00	326.	28.	0.016	93.26	1.718s
EU-154	4017.53	1004.77	433.	-35.	-0.020	84.84	1.721s
Co-56	4149.84	1037.84	185.	-37.	-0.021	82.67	1.745s
Cs-136	4190.78	1048.07	120.	21.	0.012	76.52	1.752s
RH-106	4199.94	1050.36	229.	-34.	-0.019	64.99	1.754s
BI-207	4253.17	1063.66	165.	-27.	-0.015	106.35	1.763s
Ga-68	4308.15	1077.40	155.	-11.	-0.006	250.65	1.773s
FE-59	4395.60	1099.25	171.	-21.	-0.012	124.94	1.789s
EU-152	4446.92	1112.07	400.	-35.	-0.020	81.73	1.798
ZN-65	4460.81	1115.55	353.	-37.	-0.020	74.61	1.800s
Ta-182	4483.84	1121.30	378.	30.	0.016	95.07	1.804s
CO-60	4692.22	1173.37	47.	2293.	1.274	2.23	1.838
Ta-182	4754.99	1189.05	48.	11.	0.006	146.93	1.852s
Ta-182	4884.51	1221.41	70.	-24.	-0.013	67.46	1.874s
Co-56	4952.04	1238.28	21.	13.	0.007	85.40	1.886s
NA-22	5097.14	1274.53	37.	-10.	-0.006	89.22	1.910s
EU-154	5097.19	1274.54	48.	0.	0.000	1000.00	1.910s
FE-59	5165.45	1291.60	27.	-5.	-0.003	255.75	1.922s
TL-210	5251.13	1313.00	43.	-19.	-0.011	81.22	1.936s
CO-60	5329.73	1332.63	14.	2011.	1.117	2.29	1.864
AG-110M	5536.55	1384.30	11.	-3.	-0.002	243.10	1.984s
EU-152	5631.44	1408.00	45.	-20.	-0.011	83.37	1.999s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	5842.95	1460.83	25.	-10.	-0.006	117.69	2.033s
La-140	6385.01	1596.21	36.	-18.	-0.010	65.22	2.119s
SB-124	6764.54	1690.98	6.	4.	0.002	158.45	2.176s
BI-214	7058.94	1764.49	12.	15.	0.008	41.47	2.219s
Co-56	7086.41	1771.35	18.	0.	0.000	1000.00	2.223s
y-88	7345.60	1836.06	12.	-7.	-0.004	87.53	2.261

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	-1.7331E+01				5.31E+01	
			477.60	-1.733E+01	?(	5.942E+01	1.03E+02 1.05E+01 G
NA-22	C	-8.5792E-01				9.50E+02	
			1274.53	-8.579E-01	?(	2.589E+00	8.92E+01 9.99E+01 G
K-40	N	-8.7584E+00				4.66E+11	
			1460.83	-8.758E+00	?(P	2.260E+01	1.18E+02 1.07E+01 G
Sc-46	F	-1.9648E+00				8.38E+01	
			889.28	-1.965E+00	&(	6.749E+00	1.03E+02 1.00E+02 G
			1120.55	0.000E+00	} P	7.404E+00	1.44E+03 1.00E+02 G
CR-51	F	-1.0285E-01				2.77E+01	
			320.08	-1.029E-01	%(P	6.779E+01	1.97E+04 9.94E+00 G
MN-54	C	6.8702E-02				3.12E+02	
			834.85	6.870E-02	&(P	3.608E+00	2.28E+03 1.00E+02 G
FE-59	F	-2.7378E+00				4.45E+01	
			1099.25	-2.738E+00	?(P	8.341E+00	1.25E+02 5.65E+01 G
			1291.60	-9.057E-01	+	5.196E+00	2.56E+02 4.32E+01 G
Co-56	C	1.6154E+00				7.73E+01	
			846.77	1.627E+00	?(P	3.113E+00	8.47E+01 9.99E+01 G
			1238.28	1.598E+00	&(P	2.982E+00	8.54E+01 6.61E+01 G
			1037.84	-1.853E+01	+	3.318E+01	8.27E+01 1.41E+01 G
			1771.35	0.000E+00	-	1.603E+01	1.00E+03 1.55E+01 A
CO-58	C	-1.9653E+00				7.09E+01	
			810.78	-1.965E+00	?(P	5.414E+00	6.97E+01 9.95E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	F	1.7575E+02					1.93E+03	
			1332.50	1.728E+02	(	1.731E+00	2.29E+00	1.00E+02 G
			1173.24	1.787E+02	(	2.691E+00	2.23E+00	9.99E+01 G
ZN-65	F	-5.4043E+00					2.44E+02	
			1115.55	-5.404E+00	?(	1.336E+01	7.46E+01	5.06E+01 G
NB-94	I	2.2978E+00					7.41E+06	
			702.63	2.298E+00	&(	2.529E+00	4.96E+01	9.79E+01 G
			871.10	-1.663E+00	-	4.139E+00	7.50E+01	9.99E+01 G
ZR-95	I	6.5288E-01					6.40E+01	
			756.73	6.529E-01	?(	5.771E+00	3.85E+02	5.45E+01 G
			724.20	0.000E+00	&	9.127E+00	1.00E+03	4.42E+01 G
NB-95	I	1.5202E+00					6.40E+01	
			765.79	1.520E+00	&(	3.501E+00	6.96E+01	9.98E+01 G
RU-103	I	1.6574E-01					3.93E+01	
			497.05	1.657E-01	?(P	3.892E+00	9.96E+02	9.09E+01 G
			610.30	-2.811E+01	+	1.167E+02	1.25E+02	5.75E+00 GA
RH-106	I	-1.6450E+01					3.74E+02	
			621.92	-1.645E+01	&(P	4.216E+01	6.23E+01	9.93E+00 G
			1050.36	-1.567E+02	+	3.361E+02	6.50E+01	1.56E+00 G
			511.86	1.529E+01	+	2.102E+01	7.41E+01	2.00E+01 GA
AG-108M	C	9.7525E-01					1.53E+05	
			433.94	8.947E-01	?(	3.975E+00	1.83E+02	9.05E+01 G
			722.94	1.056E+00	&(	4.535E+00	1.28E+02	9.08E+01 G
			614.28	-8.197E-02	&	7.638E+00	2.78E+03	8.98E+01 G
AG-110M	F	2.0556E+00					2.50E+02	
			884.68	2.868E+00	?(	8.054E+00	8.46E+01	7.27E+01 G
			657.76	1.432E+00	?(	2.086E+01	4.39E+02	9.46E+01 G
			937.49	-2.105E+00	&	1.375E+01	2.98E+02	3.44E+01 G
			1384.30	-1.216E+00	-	6.709E+00	2.43E+02	2.43E+01 G
			763.94	-3.637E+00	+	1.514E+01	1.23E+02	2.23E+01 G
SN-113	F	2.2114E+00					1.15E+02	
			391.69	2.211E+00	?(	7.467E+00	1.02E+02	6.40E+01 G
SB-124	F	-1.6227E+00					6.02E+01	
			602.73	-1.623E+00	&(	7.019E+00	1.30E+02	9.83E+01 G
			1690.98	8.645E-01	+ P	3.105E+00	1.58E+02	4.78E+01 G
			722.79	-7.363E+00	&	3.832E+01	1.55E+02	1.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	4.2635E+00					1.01E+03	
			427.88	-3.688E-01	%(	1.213E+01	1.35E+03	2.96E+01 G
			600.50	-8.928E+00	+ P	3.918E+01	8.61E+01	1.79E+01 G
			635.89	-1.340E+01	+ P	3.239E+01	6.85E+01	1.13E+01 G
			463.37	1.736E+01	(P	5.192E+01	9.02E+01	1.05E+01 G
I-131	I	8.0534E-01					8.02E+00	
			364.48	-6.223E-02	%(P	3.802E+00	4.40E+03	8.17E+01 G
			284.30	-1.757E+01	&	4.636E+01	1.09E+02	6.14E+00 G
			636.97	1.069E+01	(P	5.106E+01	1.42E+02	7.17E+00 G
Gd-153	F	1.5111E+00					2.42E+02	
			97.50	1.511E+00	?(	1.716E+01	3.42E+02	3.00E+01 G
			103.20	0.000E+00	-	2.352E+01	1.00E+03	2.18E+01 G
Ga-68	C	-2.8437E+01					4.71E-02	
			1077.40	-2.844E+01	&(	1.570E+02	2.51E+02	3.30E+00 G
BA-133	F	-2.1585E+00					3.85E+03	
			356.00	-2.159E+00	&(	7.012E+00	9.79E+01	6.20E+01 G
			302.85	0.000E+00	+	3.518E+01	1.00E+03	1.83E+01 G
			383.84	-6.226E+00	&	5.668E+01	2.72E+02	8.94E+00 GA
			80.99	1.001E+00	+ P	7.445E+00	2.80E+02	3.41E+01 GA
CS-134	I	2.7895E-01					7.54E+02	
			604.71	-1.639E+00	?(	6.957E+00	1.28E+02	9.76E+01 G
			795.87	-1.363E+00	+	5.572E+00	1.22E+02	8.55E+01 G
			569.32	3.344E+00	?(	1.773E+01	1.57E+02	1.54E+01 G
			801.95	5.619E+00	?(	5.522E+01	2.90E+02	8.69E+00 G
			563.24	1.150E+01	&(	3.495E+01	1.29E+02	8.35E+00 G
CS-137	I	4.0069E+02					1.10E+04	
			661.66	4.007E+02	(	3.450E+00	1.29E+00	8.52E+01 G
CE-139	F	1.0999E+00					1.38E+02	
			165.85	1.100E+00	&(	3.551E+00	9.73E+01	7.99E+01 G
Ba-140	I	2.1887E+00					1.28E+01	
			537.26	2.189E+00	?(P	1.221E+01	2.36E+02	2.44E+01 G
			162.66	-1.399E+01	+	4.371E+01	9.42E+01	6.22E+00 G
			304.85	0.000E+00	&	1.511E+02	1.00E+03	4.29E+00 G
La-140	I	-1.9067E+00					1.28E+01	
			1596.21	-1.907E+00	?(P	3.211E+00	6.52E+01	9.54E+01 G
			487.02	-4.011E+00	+	1.405E+01	1.06E+02	4.55E+01 G
			328.76	5.925E+00	&	2.765E+01	1.40E+02	2.03E+01 G
			815.77	-4.598E+00	& P	2.190E+01	1.28E+02	2.33E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	I	1.7259E+00					3.25E+01	
			145.44	1.726E+00	?(	8.649E+00	1.51E+02	4.82E+01 G
PM-144	C	9.3215E-01					3.63E+02	
			696.54	1.202E+00	&(	2.485E+00	9.11E+01	9.90E+01 G
			618.06	6.631E-01	?(P	3.442E+00	1.54E+02	9.91E+01 G
EU-152	F	2.6657E+00					4.94E+03	
			344.29	4.045E-01	%(	2.248E+01	1.66E+03	2.65E+01 G
			1112.07	-1.937E+01	+	5.254E+01	8.17E+01	1.36E+01 G
			121.78	1.429E+00	(	8.826E+00	1.85E+02	2.86E+01 G
			778.92	9.751E+00	?(	2.165E+01	9.78E+01	1.29E+01 G
			964.11	2.912E+00	(	3.949E+01	4.01E+02	1.46E+01 G
			244.69	-1.553E+01	+	5.460E+01	1.06E+02	7.58E+00 G
			1408.00	-8.411E+00	&	1.457E+01	8.34E+01	2.10E+01 GA
EU-154	I	9.1281E+00					3.14E+03	
			873.23	-6.781E-01	&(	4.008E+01	1.73E+03	1.23E+01 G
			123.10	-2.207E+00	&	6.436E+00	8.80E+01	4.08E+01 G
			1274.54	0.000E+00	+	8.225E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	1.991E+01	1.00E+03	2.02E+01 G
			1004.77	-1.361E+01	+	3.833E+01	8.48E+01	1.80E+01 G
			996.33	2.048E+01	*(	5.362E+01	7.89E+01	1.06E+01 G
EU-155	I	1.7068E+00					1.81E+03	
			105.31	-7.113E-02	%(P	2.416E+01	6.00E+03	2.12E+01 G
			86.54	2.935E+00	&(	1.273E+01	1.31E+02	3.07E+01 G
HF-181	F	-2.2873E+00					4.24E+01	
			482.00	-2.287E+00	?(	7.978E+00	1.05E+02	8.05E+01 G
			133.02	-1.692E+00	+	9.838E+00	1.75E+02	4.33E+01 G
			345.83	-2.957E+00	+	2.030E+01	2.82E+02	1.51E+01 G
			136.30	0.000E+00	&	7.279E+01	1.00E+03	5.85E+00 G
Ta-182	F	6.0265E+00					1.14E+02	
			1121.30	6.355E+00	&(	2.012E+01	9.51E+01	3.49E+01 G
			1221.41	-7.108E+00	+ P	1.238E+01	6.75E+01	2.70E+01 G
			1189.05	5.318E+00	&(P	1.699E+01	1.47E+02	1.62E+01 G
Hg-203	F	4.5515E-01					4.66E+01	
			279.20	4.552E-01	&(	3.322E+00	3.00E+02	8.15E+01 G
TL-208	N	3.8279E+00					6.98E+02	
			583.02	3.828E+00	(	2.796E+00	3.20E+01	8.45E+01 G
			277.28	-1.345E+00	%	4.854E+01	1.07E+03	6.31E+00 G
			860.56	-1.143E+01	- P	3.418E+01	9.83E+01	1.24E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
pm-146	C	-5.5234E+00						2.02E+03	
			747.16	-5.523E+00	?(P	1.086E+01	6.53E+01	3.40E+01	G
			735.72	4.969E+00	&	1.220E+01	1.08E+02	2.25E+01	G
			453.88	1.747E+00	+ P	5.432E+00	1.28E+02	6.50E+01	G
Cd-113m		3.1031E+04						5.33E+03	
			263.70	3.103E+04	(	3.384E+04	4.48E+01	6.00E-03	K
Cd-109	F	2.3672E+01						4.53E+02	
									Derived Ave Activity
			88.04	2.367E+01	}(	1.026E+02	1.31E+02	3.79E+00	G
Cf-251	T	-1.7353E+00						3.28E+05	
			176.60	-1.735E+00	?(	1.303E+01	2.96E+02	1.70E+01	G
			227.00	1.604E+01		3.854E+01	9.52E+01	6.30E+00	GA
Cf-249	T	1.4320E+00						1.28E+05	
			387.95	0.000E+00	(	7.804E+00	1.00E+03	6.60E+01	G
			333.44	7.525E+00	&(	3.705E+01	1.48E+02	1.55E+01	G
Sn-126		-2.2542E+01						3.65E+07	
			87.57	2.395E+00	}	1.050E+01	6.95E+01	3.75E+01	GA
			64.28	-2.254E+01	(	1.616E+02	2.17E+02	9.70E+00	G
			86.94	9.955E+00	&	4.355E+01	1.32E+02	9.04E+00	GA
PB-210	N	1.1123E+04						8.14E+03	
			46.54	1.112E+04	(P	2.161E+02	1.01E+00	4.25E+00	G
PB-212	N	1.9348E+00						6.98E+02	
			238.63	1.935E+00	?(P	8.456E+00	1.31E+02	4.33E+01	G
			300.03	3.308E+01	P	1.870E+02	1.70E+02	3.28E+00	GA
PB-214	N	1.1065E+01						5.84E+05	
			351.93	9.021E+00	(	6.562E+00	3.22E+01	3.76E+01	G
			295.09	1.505E+01	*(	1.089E+01	3.09E+01	1.93E+01	G
			242.00	1.443E+01	?	4.971E+01	1.04E+02	7.43E+00	GA
BI-207	C	-5.5747E-01						1.18E+04	
			569.70	-5.575E-01	&(	3.102E+00	1.65E+02	9.77E+01	G
			1063.66	-2.619E+00	+	6.068E+00	1.06E+02	7.45E+01	G
BI-212	N	1.0830E+01						6.98E+02	
			727.17	1.083E+01	&(	5.071E+01	1.39E+02	7.55E+00	G
			785.42	1.178E+02	& P	2.349E+02	8.82E+01	1.28E+00	GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
U-235	N	4.6713E+00					2.57E+11	
			143.79	6.030E+00	?(P	3.930E+01	1.96E+02	1.10E+01 G
			205.33	5.800E-01	& P	5.047E+01	3.42E+03	5.01E+00 G
			163.38	1.741E+00	&(P	5.145E+01	8.81E+02	5.08E+00 G
			185.72	2.379E+00	* P	3.498E+00	5.84E+01	5.40E+01 GA
BI-214	N	1.0014E+01					5.84E+05	
			609.31	9.800E+00	(P	5.178E+00	1.84E+01	4.61E+01 G
			1120.29	0.000E+00	} P	4.740E+01	1.46E+03	1.51E+01 G
			1764.49	1.066E+01	?(P	1.326E+01	4.15E+01	1.54E+01 G
BI-210M	T	-2.2618E+00					1.10E+09	
			265.83	-2.262E+00	?(	6.655E+00	8.87E+01	5.00E+01 G
			304.90	0.000E+00	&	2.315E+01	1.00E+03	2.80E+01 G
AC-228	N	8.1815E+00					2.10E+03	
			911.07	3.330E+00	&(	1.577E+01	2.16E+02	2.90E+01 G
			968.97	1.114E+01	?(	2.663E+01	7.21E+01	1.75E+01 G
			338.32	1.559E+01	(	1.822E+01	4.79E+01	1.20E+01 G
			93.35	1.593E+01		9.279E+01	1.76E+02	5.56E+00 XA
TH-227	N	1.8341E+01					7.95E+03	
			50.14	1.834E+01	!(	9.476E+01	1.56E+02	8.00E+00 G
			256.24	-1.156E+00	%	3.796E+01	1.29E+03	7.00E+00 G
TH-229	N	-1.0554E+00					2.68E+06	
			193.51	-1.055E+00	&(	5.477E+01	2.04E+03	4.40E+00 G
			210.85	-1.578E+01	& P	8.584E+01	2.14E+02	2.99E+00 G
TH-234	N	-6.8750E+01					1.63E+12	
			63.29	-6.875E+01	(P	4.129E+02	1.13E+02	3.81E+00 G
			92.59	-2.484E+01	+ P	6.759E+01	6.64E+01	5.58E+00 G
PA-231	N	3.6062E+00					1.20E+07	
			302.65	0.000E+00	?(	2.238E+02	1.00E+03	2.88E+00 G
			300.07	7.828E+00	(	2.599E+02	9.96E+02	2.46E+00 G
PA-233	C	1.7166E+00					7.82E+08	
			312.01	1.717E+00	&(P	1.826E+01	3.20E+02	3.60E+01 G
			300.18	0.000E+00	-	1.033E+02	1.00E+03	6.20E+00 G
PA-234	N	2.3046E+00					1.63E+12	
			131.29	2.305E+00	(	7.934E+00	1.19E+02	1.80E+01 G
			946.02	-1.383E+01	-	3.774E+01	1.26E+02	1.34E+01 G
			569.47	0.000E+00	}	3.546E+01	1.51E+03	8.20E+00 G
			883.24	-2.493E+01	-	6.932E+01	8.38E+01	9.60E+00 G
			880.53	-3.975E+01	-	1.148E+02	8.70E+01	6.00E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234M	N	2.7868E+02					1.63E+12	
			1001.00	2.307E+02	?(P	7.164E+02	9.33E+01	8.37E-01 G
			766.41	4.153E+02	&(	1.204E+03	8.69E+01	2.94E-01 G
AM-241	T	1.2557E+03					1.58E+05	
			59.54	1.256E+03	(	1.546E+01	8.57E-01	3.59E+01 G
Np-237	F	6.8786E+00					2.14E+06	
			86.49	6.879E+00	&(	2.952E+01	1.29E+02	1.31E+01 G
Ir-192	F	1.2791E+00					7.40E+01	
			316.49	0.000E+00	?(	7.672E+00	1.00E+03	8.70E+01 G
			468.06	3.431E+00	(	1.007E+01	8.85E+01	5.18E+01 G
			308.44	0.000E+00	&	2.061E+01	1.00E+03	3.18E+01 G
Cs-136	F	2.8310E-01					1.30E+01	
			818.50	-1.001E+00	?(	5.873E+00	1.75E+02	1.00E+02 G
			1048.07	1.889E+00	&(	4.808E+00	7.65E+01	8.00E+01 G
			340.57	0.000E+00	-	1.260E+01	1.00E+03	4.69E+01 G
Np-239	T	3.8194E+00					2.36E+00	
			103.70	0.000E+00	-	2.136E+01	1.00E+03	2.40E+01 X
			106.13	3.819E+00	&(	2.212E+01	1.75E+02	2.27E+01 G
			99.50	0.000E+00	&	3.432E+01	1.00E+03	1.50E+01 X
Nd-147		1.0095E+01					1.11E+01	
			531.00	1.009E+01	(	2.171E+01	9.21E+01	1.30E+01 G
			91.10	2.627E+00	-	1.286E+01	1.48E+02	2.83E+01 G
TL-210	N	6.0703E-01					5.84E+05	
			799.60	0.000E+00	?(	4.992E+00	1.00E+03	9.90E+01 G
			296.00	1.367E+00	&(	7.615E+00	1.68E+02	7.90E+01 G
			1313.00	-7.706E+00	+	1.341E+01	8.12E+01	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
    negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
    failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.

& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-234	63.29	27998.	-130.	-0.072	113.33	-6.875E+01	P
BA-133	80.99	957.	20.	0.011	279.79	1.001E+00	P
Np-237	86.49	2373.	54.	0.030	129.41	6.879E+00	
EU-155	86.54	2426.	54.	0.030	130.84	2.935E+00	
Nd-147	91.10	2167.	45.	0.025	147.54	2.627E+00	
TH-234	92.59	2351.	-84.	-0.047	66.44	-2.484E+01	P
Gd-153	97.50	4494.	28.	0.015	342.15	1.511E+00	
Np-239	106.13	4348.	54.	0.030	174.77	3.819E+00	
EU-154	123.10	1146.	-55.	-0.031	88.03	-2.207E+00	
HF-181	133.02	2950.	-44.	-0.024	175.21	-1.692E+00	
Ba-140	162.66	1011.	-48.	-0.027	94.23	-1.399E+01	
Cf-251	176.60	609.	-16.	-0.009	295.69	-1.735E+00	
TH-229	210.85	653.	-22.	-0.012	214.25	-1.578E+01	P
Cf-251	227.00	524.	46.	0.025	95.24	1.604E+01	
BI-210M	265.83	784.	-45.	-0.025	88.73	-2.262E+00	
I-131	284.30	512.	-41.	-0.023	109.18	-1.757E+01	
TL-210	296.00	2204.	40.	0.022	167.69	1.367E+00	
PA-231	300.07	2438.	7.	0.004	996.40	7.828E+00	
La-140	328.76	1617.	41.	0.023	140.47	5.925E+00	
Cf-249	333.44	1658.	39.	0.022	148.16	7.525E+00	
HF-181	345.83	432.	-14.	-0.008	281.71	-2.957E+00	
BA-133	356.00	847.	-43.	-0.024	97.86	-2.159E+00	
BA-133	383.84	1023.	-17.	-0.009	272.46	-6.226E+00	
SN-113	391.69	878.	42.	0.023	101.69	2.211E+00	
pm-146	453.88	372.	30.	0.017	128.13	1.747E+00	P
Ir-192	468.06	788.	45.	0.025	88.54	3.431E+00	
BE-7	477.60	1105.	-46.	-0.026	103.31	-1.733E+01	
HF-181	482.00	1151.	-46.	-0.026	105.11	-2.287E+00	
La-140	487.02	1121.	-45.	-0.025	105.51	-4.011E+00	
RU-103	497.05	323.	4.	0.002	995.92	1.657E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
RH-106	511.86	440.	73.	0.041	74.11	1.529E+01		
Nd-147	531.00	182.	30.	0.017	92.10	1.009E+01		
Ba-140	537.26	200.	12.	0.007	236.29	2.189E+00	P	
CS-134	563.24	178.	21.	0.012	129.36	1.150E+01		
CS-134	569.32	152.	11.	0.006	156.52	3.344E+00		
BI-207	569.70	189.	-12.	-0.007	164.57	-5.575E-01		
SB-124	602.73	940.	-34.	-0.019	129.97	-1.623E+00		
CS-134	604.71	906.	-34.	-0.019	127.52	-1.639E+00		
RU-103	610.30	872.	-34.	-0.019	124.78	-2.811E+01		
PM-144	618.06	212.	14.	0.008	153.92	6.631E-01	P	
RH-106	621.92	322.	-34.	-0.019	62.34	-1.645E+01	P	
I-131	636.97	235.	16.	0.009	141.95	1.069E+01	P	
AG-110M	657.76	6915.	27.	0.015	439.49	1.432E+00		
PM-144	696.54	89.	23.	0.013	91.13	1.202E+00		
NB-94	702.63	89.	42.	0.024	49.63	2.298E+00		
SB-124	722.79	250.	-15.	-0.008	154.58	-7.363E+00		
BI-212	727.17	210.	15.	0.008	139.04	1.083E+01		
pm-146	735.72	103.	20.	0.011	108.01	4.969E+00		
pm-146	747.16	187.	-34.	-0.019	65.28	-5.523E+00	P	
ZR-95	756.73	131.	6.	0.004	384.93	6.529E-01		
AG-110M	763.94	149.	-14.	-0.008	123.43	-3.637E+00		
NB-95	765.79	160.	27.	0.015	69.56	1.520E+00		
PA-234M	766.41	164.	22.	0.012	86.88	4.153E+02		
BI-212	785.42	112.	26.	0.015	88.16	1.178E+02	P	
CS-134	795.87	288.	-20.	-0.011	122.07	-1.363E+00		
CS-134	801.95	289.	8.	0.005	290.41	5.619E+00		
CO-58	810.78	360.	-33.	-0.018	69.68	-1.965E+00	P	
La-140	815.77	319.	-18.	-0.010	127.87	-4.598E+00	P	
Cs-136	818.50	424.	-17.	-0.009	174.80	-1.001E+00		
Co-56	846.77	107.	27.	0.015	84.73	1.627E+00	P	
NB-94	871.10	187.	-27.	-0.015	75.00	-1.663E+00		
AG-110M	884.68	375.	33.	0.018	84.55	2.868E+00		
AG-110M	937.49	220.	-11.	-0.006	297.97	-2.105E+00		
EU-154	996.33	294.	32.	0.018	78.89	2.048E+01		
PA-234M	1001.00	326.	28.	0.016	93.26	2.307E+02	P	
EU-154	1004.77	433.	-35.	-0.020	84.84	-1.361E+01		
Co-56	1037.84	185.	-37.	-0.021	82.67	-1.853E+01		
Cs-136	1048.07	120.	21.	0.012	76.52	1.889E+00		
RH-106	1050.36	229.	-34.	-0.019	64.99	-1.567E+02		
BI-207	1063.66	165.	-27.	-0.015	106.35	-2.619E+00		
Ga-68	1077.40	155.	-11.	-0.006	250.65	-2.844E+01		
FE-59	1099.25	171.	-21.	-0.012	124.94	-2.738E+00	P	
ZN-65	1115.55	353.	-37.	-0.020	74.61	-5.404E+00		
Ta-182	1121.30	378.	30.	0.016	95.07	6.355E+00		
Ta-182	1189.05	48.	11.	0.006	146.93	5.318E+00	P	
Ta-182	1221.41	70.	-24.	-0.013	67.46	-7.108E+00	P	
Co-56	1238.28	21.	13.	0.007	85.40	1.598E+00	P	
NA-22	1274.53	37.	-10.	-0.006	89.22	-8.579E-01		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
FE-59	1291.60	27.	-5.	-0.003	255.75	-9.057E-01		
TL-210	1313.00	43.	-19.	-0.011	81.22	-7.706E+00		
AG-110M	1384.30	11.	-3.	-0.002	243.10	-1.216E+00		
K-40	1460.83	25.	-10.	-0.006	117.69	-8.758E+00		P
La-140	1596.21	36.	-18.	-0.010	65.22	-1.907E+00		P
SB-124	1690.98	6.	4.	0.002	158.45	8.645E-01		P
y-88	1836.06	12.	-7.	-0.004	87.53	-8.176E-01		P

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

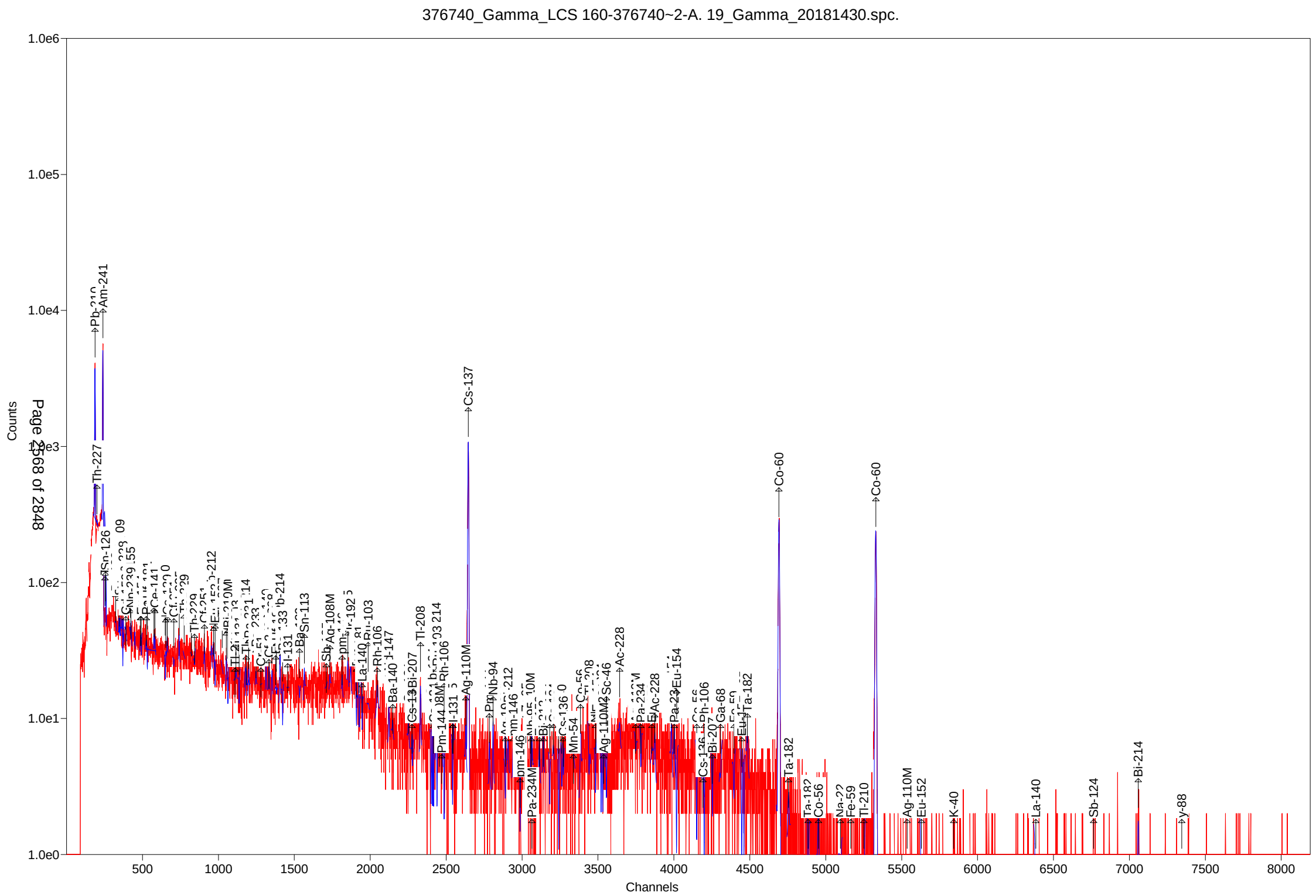
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-1.7331E+01	-1.7331E+01	1.033E+02%	5.94E+01
NA-22	#A	-8.5792E-01	-8.5792E-01	8.922E+01%	2.59E+00
K-40	#A	-8.7584E+00	-8.7584E+00	1.177E+02%	2.26E+01
Sc-46	#A	-1.9648E+00	-1.9648E+00	1.032E+02%	6.75E+00
CR-51	#A	-1.0285E-01	-1.0285E-01	1.973E+04%	6.78E+01
MN-54	#A	6.8702E-02	6.8702E-02	2.282E+03%	3.61E+00
FE-59	#A	-2.7378E+00	-2.7378E+00	1.249E+02%	8.34E+00
Co-56	#A	1.6154E+00	1.6154E+00	6.015E+01%	3.11E+00
CO-57	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.98E+00
CO-58	#A	-1.9653E+00	-1.9653E+00	6.968E+01%	5.41E+00
CO-60		1.7575E+02	1.7575E+02	1.598E+00%	1.73E+00
ZN-65	#A	-5.4043E+00	-5.4043E+00	7.461E+01%	1.34E+01
NB-94	#A	2.2978E+00	2.2978E+00	4.963E+01%	2.53E+00
ZR-95	#A	6.5287E-01	6.5288E-01	3.849E+02%	5.77E+00
NB-95	#A	1.5202E+00	1.5202E+00	6.956E+01%	3.50E+00
RU-103	#A	1.6574E-01	1.6574E-01	9.959E+02%	3.89E+00
RH-106	#A	-1.6450E+01	-1.6450E+01	6.234E+01%	4.22E+01
AG-108M	#A	9.7525E-01	9.7525E-01	1.116E+02%	3.98E+00
AG-110M	#A	2.0556E+00	2.0556E+00	8.455E+01%	8.05E+00
SN-113	#A	2.2114E+00	2.2114E+00	1.017E+02%	7.47E+00
SB-124	#A	-1.6227E+00	-1.6227E+00	1.300E+02%	7.02E+00
SB-125	A	4.2635E+00	4.2635E+00	9.020E+01%	1.21E+01
I-131	#A	8.0531E-01	8.0534E-01	1.420E+02%	3.80E+00
Gd-153	#A	1.5111E+00	1.5111E+00	3.422E+02%	1.72E+01
Ga-68	#A	-2.8253E+01	-2.8437E+01	2.506E+02%	1.57E+02
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.96E+00
BA-133	#A	-2.1585E+00	-2.1585E+00	9.786E+01%	7.01E+00
CS-134	#A	2.7895E-01	2.7895E-01	9.415E+01%	6.96E+00
CS-137		4.0069E+02	4.0069E+02	1.290E+00%	3.45E+00
CE-139	A	1.0999E+00	1.0999E+00	9.733E+01%	3.55E+00
Ba-140	#A	2.1886E+00	2.1887E+00	2.363E+02%	1.22E+01
La-140	#A	-1.9067E+00	-1.9067E+00	6.522E+01%	3.21E+00
CE-141	#A	1.7258E+00	1.7259E+00	1.511E+02%	8.65E+00

CE-144 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.82E+01
PM-144 #A	9.3215E-01	9.3215E-01	8.944E+01%		2.48E+00
EU-152 A	2.6657E+00	2.6657E+00	9.781E+01%		2.25E+01
EU-154 #A	9.1281E+00	9.1281E+00	7.889E+01%		4.01E+01
EU-155 #A	1.7068E+00	1.7068E+00	1.308E+02%		2.42E+01
HF-181 #A	-2.2873E+00	-2.2873E+00	1.051E+02%		7.98E+00
Ta-182 #A	6.0265E+00	6.0265E+00	8.750E+01%		2.01E+01
Hg-203 #A	4.5515E-01	4.5515E-01	2.999E+02%		3.32E+00
TL-208	3.8279E+00	3.8279E+00	3.201E+01%		2.80E+00
pm-146 #A	-5.5234E+00	-5.5234E+00	6.528E+01%		1.09E+01
y-88 #A	0.0000E+00	0.0000E+00	1.000E+03%		4.38E+00
Cd-113m A	3.1031E+04	3.1031E+04	4.484E+01%		3.38E+04
Cd-109 #A	2.3672E+01	2.3672E+01	1.307E+02%		1.03E+02
Cf-251 #A	-1.7353E+00	-1.7353E+00	2.957E+02%		1.30E+01
Cf-249 #A	1.4320E+00	1.4320E+00	1.482E+02%		7.80E+00
Sn-126 #A	-2.2542E+01	-2.2542E+01	2.170E+02%		1.62E+02
PB-210	1.1123E+04	1.1123E+04	1.014E+00%		2.16E+02
PB-212 A	1.9348E+00	1.9348E+00	1.315E+02%		8.46E+00
PB-214	1.1065E+01	1.1065E+01	2.232E+01%		6.56E+00
BI-207 #A	-5.5747E-01	-5.5747E-01	1.646E+02%		3.10E+00
BI-212 #A	1.0830E+01	1.0830E+01	1.390E+02%		5.07E+01
U-235 #A	4.6713E+00	4.6713E+00	1.964E+02%		3.93E+01
BI-214	1.0014E+01	1.0014E+01	1.837E+01%		5.18E+00
BI-210M#A	-2.2618E+00	-2.2618E+00	8.873E+01%		6.66E+00
AC-228 A	8.1815E+00	8.1815E+00	4.794E+01%		1.58E+01
TH-227 #A	1.8341E+01	1.8341E+01	1.559E+02%		9.48E+01
TH-229 #A	-1.0554E+00	-1.0554E+00	2.038E+03%		5.48E+01
TH-234 #A	-6.8750E+01	-6.8750E+01	1.133E+02%		4.13E+02
PA-231 #A	3.6062E+00	3.6062E+00	7.058E+02%		2.24E+02
PA-233 #A	1.7166E+00	1.7166E+00	3.198E+02%		1.83E+01
PA-234 A	2.3046E+00	2.3046E+00	1.185E+02%		7.93E+00
PA-234M#A	2.7868E+02	2.7868E+02	6.373E+01%		7.16E+02
AM-241	1.2557E+03	1.2557E+03	8.565E-01%		1.55E+01
Np-237 #A	6.8786E+00	6.8786E+00	1.294E+02%		2.95E+01
Ir-192 #A	1.2791E+00	1.2791E+00	8.854E+01%		7.67E+00
Cs-136 #A	2.8309E-01	2.8310E-01	7.652E+01%		5.87E+00
Np-239 #A	3.8189E+00	3.8194E+00	1.748E+02%		2.21E+01
Nd-147 #A	1.0095E+01	1.0095E+01	9.210E+01%		2.17E+01
TL-210 #A	6.0703E-01	6.0703E-01	1.677E+02%		4.99E+00

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.7 to 1999.4 keV)	4.401E+04	Bq/Sample
Total Decayed Activity (37.7 to 1999.4 keV)	4.4010684E+04	Bq/Sample


376740_Gamma_LCS 160-376740~2-A. 19_Gamma_20181430.spc.
Counts
Channels
1.0e6
1.0e5
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Th-227
Pb-210
Am-241
Sn-126
Cs-137
Co-60
Co-60
Ag-110M
Ta-182
Bi-214
Sb-124
La-140
K-40
Eu-152
Ag-110M
Ta-182
Co-56
Na-22
Fe-59
Tl-210
y-88
Ac-228
Bi-207
Tl-208
Rh-106
Ba-140
La-140
Pu-103
Sb-108M
Sn-113
I-131
Pb-214
Th-229
Ce-141
Pa-234M
Pa-234
Sc-46
Mn-54
Cs-136
Ga-68
Eu-154
Pm-146
Nb-94
Pm-144
Ru-106
Bi-212
Th-232
Th-228
Ra-224
Ra-223
Ra-226
Th-230
Cf-251
Cf-249
Cm-245
Cm-243
Pu-239
Np-237
U-233
U-235
U-238

Test America St. Louis Spectrum ID: 9_Gamma_20183355

Sample Description: 376740_Gamma_160-29479-A-2-E DU
Detector: Detector # 9
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29479-A-2-E DU

Decay to Time: 8/9/2018 06:34 Live Time: 1800 sec
Acquisition Time: 8/9/2018 06:35:06 Real Time: 1803 sec
Analysis Time: 8/9/2018 07:05 Dead Time: 0.17 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 9_Soil_TunaCan.Clb
Efficiency Cal Desc: 9_Soil_TunaCan_90099_050312
Efficiency Cal Date: 6/14/2012 10:19
Energy Cal Date: 3/1/2012 13:57
Library: Client_Long_Rev14.lib
Bkgd Correction File: 9_2018-07-14_1810.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-3.513E+00	100.9	3.545E+00	3.549E+00	1.192E+01
NA-22	5.108E-02	591.6	3.022E-01	3.022E-01	1.120E+00
K-40	1.777E+02	5.6	9.961E+00	1.349E+01	8.205E+00
Sc-46	1.351E-01	290.8	3.931E-01	3.931E-01	1.377E+00
CR-51	2.520E+00	164.4	4.142E+00	4.144E+00	1.396E+01
MN-54	3.663E-02	988.3	3.620E-01	3.620E-01	8.626E-01
FE-59	3.201E-01	233.8	7.481E-01	7.483E-01	1.715E+00
Co-56	8.009E-01	35.7	2.862E-01	2.891E-01	9.636E-01
CO-57	-7.343E-02	223.6	1.642E-01	1.642E-01	5.651E-01
CO-58	-3.600E-01	103.9	3.742E-01	3.746E-01	1.272E+00
CO-60	3.604E-01	91.3	3.290E-01	3.295E-01	7.463E-01
ZN-65	1.942E-01	519.9	1.010E+00	1.010E+00	3.544E+00
NB-94	3.504E-01	98.1	3.438E-01	3.442E-01	1.164E+00
ZR-95	4.893E-01	95.9	4.692E-01	4.699E-01	1.095E+00
NB-95	-5.849E-01	68.7	4.021E-01	4.033E-01	1.333E+00
RU-103	-1.458E-01	215.2	3.138E-01	3.138E-01	7.757E-01
RH-106	1.270E+00	166.1	2.110E+00	2.111E+00	1.905E+01
AG-108M	9.728E-02	201.6	1.961E-01	1.962E-01	6.591E-01
AG-110M	4.137E-01	83.7	3.464E-01	3.470E-01	1.268E+00
SN-113	1.539E-01	265.2	4.081E-01	4.082E-01	1.412E+00
SB-124	4.598E-01	109.4	5.030E-01	5.035E-01	1.664E+00
SB-125	1.498E+00	35.7	5.355E-01	5.410E-01	1.242E+00
I-131	2.587E-01	95.9	2.481E-01	2.485E-01	6.269E-01
Gd-153	3.224E-01	119.8	3.860E-01	3.865E-01	3.745E+00
Ga-68	3.709E+00	324.8	1.205E+01	1.205E+01	2.850E+01
Tc-99m	-2.819E-01	156.5	4.411E-01	4.413E-01	1.474E+00
BA-133	-2.304E-02	121.2	2.793E-02	2.795E-02	1.999E+00
CS-134	4.593E-01	60.0	2.755E-01	2.766E-01	1.730E+00
CS-137	-1.286E-02	3201.0	4.117E-01	4.117E-01	1.312E+00
CE-139	2.338E-01	107.4	2.512E-01	2.522E-01	8.448E-01
Ba-140	2.273E-01	127.6	2.900E-01	2.903E-01	2.632E+00
La-140	1.521E-02	146.8	2.233E-02	2.234E-02	1.220E+00
CE-141	4.187E-01	167.2	7.000E-01	7.003E-01	2.346E+00

CE-144	-2.146E+00	148.6	3.189E+00	3.191E+00	1.066E+01
PM-144	-4.710E-01	78.4	3.692E-01	3.700E-01	1.302E+00
EU-152	8.850E-01	72.0	6.376E-01	6.393E-01	4.658E+00
EU-154	2.608E+00	68.8	1.796E+00	1.801E+00	5.962E+00
EU-155	-1.643E-02	5613.1	9.221E-01	9.221E-01	3.318E+00
HF-181	-4.860E-01	103.5	5.031E-01	5.037E-01	1.691E+00
Ta-182	2.044E+00	69.1	1.413E+00	1.417E+00	4.710E+00
Hg-203	-3.436E-01	85.5	2.937E-01	2.944E-01	9.829E-01
TL-208	1.059E+00	46.4	4.916E-01	4.947E-01	8.150E-01
pm-146	5.937E-01	138.4	8.220E-01	8.226E-01	1.994E+00
y-88	3.074E-01	102.6	3.153E-01	3.157E-01	7.540E-01
Cd-113m	3.841E+03	85.9	3.298E+03	3.307E+03	1.107E+04
Cd-109	0.000E+00	1.#INF	8.977E+00	8.977E+00	3.037E+01
Cf-251	-6.227E-01	196.8	1.226E+00	1.227E+00	3.202E+00
Cf-249	2.879E-01	122.4	3.524E-01	3.527E-01	1.203E+00
Sn-126	1.919E+00	160.3	3.077E+00	3.079E+00	1.038E+01
PB-210	-5.581E+00	157.2	8.772E+00	8.779E+00	2.974E+01
PB-212	2.587E+00	15.5	4.020E-01	4.355E-01	9.817E-01
PB-214	5.649E+00	11.8	6.660E-01	7.278E-01	1.061E+00
BI-207	-7.820E-02	268.0	2.096E-01	2.096E-01	7.786E-01
BI-212	2.430E+00	107.6	2.616E+00	2.619E+00	9.106E+00
U-235	-2.223E+00	85.0	1.889E+00	1.893E+00	1.198E+01
BI-214	3.612E+00	18.4	6.657E-01	6.916E-01	1.497E+00
BI-210M	-1.515E-02	2685.3	4.068E-01	4.068E-01	1.425E+00
AC-228	2.556E+00	43.2	1.104E+00	1.111E+00	2.357E+00
TH-227	0.000E+00	1.#INF	2.272E+00	2.272E+00	1.454E+01
TH-229	4.523E+00	86.0	3.891E+00	3.907E+00	1.182E+01
TH-234	6.553E+00	109.0	7.146E+00	7.154E+00	2.398E+01
PA-231	7.390E+00	179.1	1.323E+01	1.324E+01	4.469E+01
PA-233	-1.271E-01	111.3	1.414E-01	1.416E-01	4.127E+00
PA-234	8.530E-01	84.3	7.191E-01	7.205E-01	6.264E+00
PA-234M	-8.508E+01	45.4	3.862E+01	3.885E+01	2.382E+02
AM-241	-9.157E-01	108.7	9.952E-01	9.964E-01	3.329E+00
Np-237	0.000E+00	1.#INF	2.867E+00	2.867E+00	9.599E+00
Ir-192	1.747E-02	103.1	1.801E-02	1.804E-02	1.682E+00
Cs-136	4.199E-01	90.8	3.811E-01	3.819E-01	1.286E+00
Np-239	-3.986E-01	229.6	9.152E-01	9.155E-01	3.107E+00
Nd-147	1.737E+00	91.5	1.590E+00	1.593E+00	3.914E+00
TL-210	2.320E-01	98.1	2.276E-01	2.280E-01	7.441E-01
Total	4.081E+03				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 9_Gamma_20183355.An1

Sample description
376740_Gamma_160-29479-A-2-E DU

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20183355.An1

Acquisition information
Start time: 8/9/2018 6:35:06 AM
Live time: 1800
Real time: 1803
Dead time: 0.17 %
Detector ID: 9

Detector system
Ge9 S/N100228730

Calibration
Filename: 9_Soil_TunaCan.Clb
9_Soil_TunaCan_90099_050312

Energy Calibration
Created: 3/1/2012 1:57:17 PM
Zero offset: 0.074 keV
Gain: 0.250 keV/channel
Quadratic: -2.269E-08 keV/channel^2

Efficiency Calibration
Created: 6/14/2012 10:19:51 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.30 %
Log(Eff): -8.079856E-01 + (-2.367265E-01*Log(E)) + (-3.950640E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.42 %
Log(Eff): -2.387916E+01 + (8.875647E+00*Log(E)) + (-9.401100E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev14.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.08keV)
Stop channel: 8000 (1999.34keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 6:34:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2018-07-14_1810.PBC 7/14/2018 6:10:12 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.1657

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
63.29	18.	109.04	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
64.28	13.	160.32	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
77.25	94.	18.16	0.97	4.682E-02				
87.62	30.	40.25	1.04	5.038E-02	87.57	37.500	PBC<MDA	Sn126
93.04	17.	187.06	1.04	5.171E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	3.220E+00	AC228
99.50	16.	114.77	1.05	5.266E-02	99.50	15.000	PBC<MDA	Np239
103.20	16.	119.76	1.05	5.303E-02	103.20	21.800	PBC<MDA	Gd153
					103.70	24.000	6.954E-01	Np239
121.78	10.	144.73	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.265E-01	CO57
145.44	18.	167.17	1.09	5.012E-02	145.44	48.200	PBC<MDA	CE141
165.85	16.	107.44	1.11	4.736E-02	165.85	79.900	PBC<MDA	CE139
185.72	39.	36.50	1.13	4.403E-02	185.72	54.000	9.191E-01	U235
193.51	15.	105.56	1.14	4.287E-02	193.51	4.400	PBC<MDA	TH229
205.33	3.	395.81	1.15	4.123E-02	205.33	5.010	PBC<MDA	U235
210.85	10.	135.84	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
238.42	76.	17.70	0.53	3.734E-02	238.63	43.300	2.613E+00	PB212
241.74	29.	31.93	1.18	3.697E-02	242.00	7.430	5.792E+00	PB214
263.70	14.	85.87	1.20	3.489E-02	263.70	0.006	PBC<MDA	Cd113m
277.28	13.	85.41	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
295.01	7.	283.68	1.23	3.232E-02	295.09	19.300	PBC<MDA	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
296.00	12.	166.42	1.23	3.225E-02	296.00	79.000	PBC<MDA	TL210
300.00	1.	632.46	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.854E-01	PA231
					300.18	6.200	3.514E-01	PA233
300.18	12.	178.32	1.24	3.194E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.585E+00	PA231
					300.18	6.200	3.407E+00	PA233
302.57	12.	179.09	1.24	3.176E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.162E+00	BA133
302.85	12.	183.59	1.24	3.175E-02	302.65	2.880	7.391E+00	PA231
					302.85	18.330	1.162E+00	BA133
304.85	12.	187.74	1.24	3.160E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	7.652E-01	BI210M
320.08	14.	164.37	1.25	3.056E-02	320.08	9.940	PBC<MDA	CR51
328.76	12.	146.82	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
338.08	8.	222.07	1.27	2.940E-02	338.32	12.010	PBC<MDA	AC228
351.70	109.	11.79	1.43	2.860E-02	351.93	37.600	5.649E+00	PB214
364.48	11.	95.91	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
383.84	17.	56.86	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
387.95	9.	122.39	1.31	2.671E-02	387.95	66.000	PBC<MDA	Cf249
391.69	5.	265.18	1.32	2.653E-02	391.69	64.000	PBC<MDA	SN113
427.88	21.	35.75	1.35	2.491E-02	427.88	29.600	1.602E+00	SB125
468.06	10.	103.07	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
511.86	49.	39.98	2.67	2.188E-02	511.86	20.000	6.220E+00	RH106
531.00	9.	91.52	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
563.24	9.	96.03	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
569.16	2.	322.89	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	7.173E-01	PA234
					569.70	97.740	PBC<MDA	BI207
569.32	9.	68.54	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.965E+00	PA234
					569.70	97.740	PBC<MDA	BI207
569.70	-3.	268.00	1.47	2.023E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	PBC<MDA	PA234
					569.70	97.740	PBC<MDA	BI207
582.93	21.	51.01	1.48	1.989E-02	583.02	84.500	PBC<MDA	TL208
600.50	9.	180.25	1.50	1.946E-02	600.50	17.860	PBC<MDA	SB125
602.73	9.	192.22	1.50	1.940E-02	602.73	98.260	PBC<MDA	SB124
604.71	9.	191.40	1.50	1.936E-02	604.71	97.620	PBC<MDA	CS134
609.02	61.	18.43	1.76	1.925E-02	609.31	46.090	3.840E+00	BI214
610.30	9.	196.48	1.51	1.922E-02	610.30	5.750	PBC<MDA	RU103
614.28	9.	201.60	1.51	1.913E-02	614.28	89.850	PBC<MDA	AG108M
618.06	4.	494.35	1.51	1.904E-02	618.06	99.100	PBC<MDA	PM144
635.89	5.	114.89	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
702.63	11.	98.11	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
722.79	8.	109.39	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.769E-01	AG108M
					723.36	20.220	1.245E+00	EU154

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
727.17	6.	107.62	1.60	1.686E-02	727.17	7.550	PBC<MDA	BI212
747.16	6.	138.44	1.62	1.651E-02	747.16	34.000	PBC<MDA	pm146
756.73	8.	95.90	1.62	1.635E-02	756.73	54.460	PBC<MDA	ZR95
785.42	8.	88.51	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
795.87	6.	83.72	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
799.60	6.	103.80	1.66	1.568E-02	799.60	98.960	PBC<MDA	TL210
818.50	12.	90.77	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136
834.85	1.	988.26	1.69	1.517E-02	834.85	99.980	PBC<MDA	MN54
860.49	8.	97.42	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
873.23	8.	68.84	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
882.92	7.	159.25	1.72	1.453E-02	883.24	9.600	PBC<MDA	PA234
884.68	8.	83.74	1.73	1.451E-02	884.68	72.680	PBC<MDA	AG110M
889.28	4.	290.84	1.73	1.445E-02	889.28	99.984	PBC<MDA	Sc46
898.04	7.	102.57	1.74	1.434E-02	898.04	93.700	PBC<MDA	y88
910.98	19.	43.19	1.75	1.418E-02	911.07	29.000	2.567E+00	AC228
937.49	3.	238.82	1.77	1.387E-02	937.49	34.360	PBC<MDA	AG110M
946.02	8.	112.15	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
964.11	12.	72.04	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
968.83	11.	86.83	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
1037.84	9.	91.07	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1050.36	3.	166.13	1.85	1.269E-02	1050.36	1.560	PBC<MDA	RH106
1077.40	2.	324.82	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1099.25	4.	233.75	1.89	1.224E-02	1099.25	56.500	PBC<MDA	FE59
1115.55	2.	519.93	1.90	1.210E-02	1115.55	50.600	PBC<MDA	ZN65
1120.29	10.	112.02	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.30	13.	80.45	1.90	1.205E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.747E+00	Ta182
1189.05	9.	112.49	1.95	1.150E-02	1189.05	16.200	PBC<MDA	Ta182
1221.41	3.	327.45	1.97	1.126E-02	1221.41	27.000	PBC<MDA	Ta182
1238.28	26.	35.73	1.98	1.114E-02	1238.28	66.070	1.997E+00	Co56
1274.53	1.	591.61	2.01	1.088E-02	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.451E-01	EU154
1332.50	7.	91.28	2.05	1.050E-02	1332.50	99.980	PBC<MDA	CO60
1384.30	2.	324.47	2.08	1.018E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	2.	248.63	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.50	333.	5.61	1.92	9.749E-03	1460.83	10.670	1.777E+02	K40
1764.16	18.	28.24	2.31	8.350E-03	1764.49	15.400	7.593E+00	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
308.59	77.25	53.	94.	2.001E+03	18.16	0.975	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.80	46.54	144.	-11.	-0.006	157.20	0.998s
TH-227	200.20	50.14	155.	0.	0.000	1000.00	1.001s
AM-241	237.77	59.54	266.	-22.	-0.012	108.69	1.010s
TH-234	252.77	63.29	176.	18.	0.010	109.04	1.014s
Sn-126	256.74	64.28	223.	13.	0.007	160.32	1.015
BA-133	323.56	80.99	315.	-23.	-0.013	82.66	1.031s
Np-237	345.55	86.49	564.	0.	0.000	177.66	1.036A
EU-155	345.76	86.54	526.	-19.	-0.011	171.72	1.036s
Sn-126	349.87	87.57	491.	30.	0.017	40.25	1.037D
Cd-109	351.75	88.04	478.	0.	0.000	1000.00	1.038A
Nd-147	363.99	91.10	491.	0.	0.000	1000.00	1.041s
TH-234	369.94	92.59	491.	0.	0.000	1000.00	1.042s
AC-228	372.98	93.35	478.	17.	0.009	187.06	1.043s
Np-239	397.58	99.50	158.	16.	0.009	114.77	1.049s
Gd-153	412.37	103.20	174.	16.	0.009	119.76	1.052
Np-239	424.09	106.13	194.	-9.	-0.005	229.61	1.055s
EU-152	486.65	121.78	107.	10.	0.006	144.73	1.070s
CO-57	487.80	122.06	87.	-6.	-0.003	223.61	1.070s
EU-154	491.95	123.10	112.	-12.	-0.007	124.82	1.071s
PA-234	524.72	131.29	490.	-22.	-0.012	84.31	1.079s
HF-181	531.64	133.02	512.	-22.	-0.012	145.60	1.081
CE-144	533.69	133.54	534.	-22.	-0.012	148.59	1.081s
HF-181	544.74	136.30	557.	-22.	-0.012	151.23	1.084s
CO-57	545.43	136.47	579.	-22.	-0.012	154.17	1.084s
Tc-99m	561.57	140.51	601.	-22.	-0.012	156.48	1.088s
U-235	574.67	143.79	624.	-22.	-0.012	85.00	1.091s
CE-141	581.29	145.44	454.	18.	0.010	167.17	1.092s
Ba-140	650.15	162.66	169.	-20.	-0.011	94.65	1.108s
U-235	653.03	163.38	189.	-20.	-0.011	101.36	1.109s
CE-139	662.92	165.85	138.	16.	0.009	107.44	1.111s
Cf-251	705.90	176.60	81.	-9.	-0.005	196.83	1.122
U-235	742.37	185.72	48.	39.	0.022	36.50	1.130s
TH-229	773.52	193.51	64.	15.	0.009	105.56	1.137s
U-235	820.80	205.33	36.	3.	0.002	395.81	1.148
TH-229	842.87	210.85	45.	10.	0.005	135.84	1.153s
Cf-251	907.45	227.00	92.	-16.	-0.009	120.00	1.168s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	953.97	238.63	31.	75.	0.042	15.54	1.179D
PB-214	967.43	242.00	27.	29.	0.016	31.93	1.182D
EU-152	978.21	244.69	233.	-16.	-0.009	133.31	1.185s
TH-227	1024.40	256.24	92.	-20.	-0.011	96.89	1.195s
Cd-113m	1054.23	263.70	70.	14.	0.008	85.87	1.202
TL-208	1108.55	277.28	58.	13.	0.007	85.41	1.215
Hg-203	1116.22	279.20	96.	-17.	-0.009	85.49	1.216s
I-131	1136.61	284.30	52.	-3.	-0.002	474.15	1.221
PB-214	1179.77	295.09	190.	7.	0.004	283.68	1.231
TL-210	1183.41	296.00	197.	12.	0.007	166.42	1.231s
PB-212	1199.52	300.03	216.	0.	0.000	761.58	1.235D
PA-231	1199.68	300.07	209.	1.	0.001	632.46	1.235D
PA-233	1200.12	300.18	228.	12.	0.007	178.32	1.235s
PA-231	1210.00	302.65	231.	12.	0.007	179.09	1.237s
BA-133	1210.81	302.85	243.	12.	0.007	183.59	1.238s
Ba-140	1218.80	304.85	256.	12.	0.007	187.74	1.240s
BI-210M	1218.99	304.90	326.	-14.	-0.008	180.72	1.240s
Ir-192	1233.16	308.44	312.	-14.	-0.008	176.36	1.243s
PA-233	1247.44	312.01	298.	-15.	-0.008	133.19	1.246s
Ir-192	1265.35	316.49	283.	-11.	-0.006	211.86	1.250s
CR-51	1279.73	320.08	249.	14.	0.008	164.37	1.253s
La-140	1314.43	328.76	139.	12.	0.006	146.82	1.261s
Cf-249	1333.15	333.44	210.	-15.	-0.008	143.05	1.265s
AC-228	1352.66	338.32	173.	8.	0.005	222.07	1.270
Cs-136	1361.66	340.57	176.	0.	0.000	1000.00	1.272s
EU-152	1376.53	344.29	176.	0.	0.000	1000.00	1.275s
HF-181	1382.70	345.83	176.	0.	0.000	1000.00	1.276s
PB-214	1406.17	351.70	15.	109.	0.061	11.79	1.431s
BA-133	1423.37	356.00	169.	-12.	-0.007	158.36	1.285s
I-131	1457.31	364.48	24.	11.	0.006	95.91	1.293s
BA-133	1534.73	383.84	40.	17.	0.010	56.86	1.310s
Cf-249	1551.17	387.95	58.	9.	0.005	122.39	1.314s
SN-113	1566.12	391.69	75.	5.	0.003	265.18	1.317s
SB-125	1710.86	427.88	9.	21.	0.012	35.75	1.349s
AG-108M	1735.10	433.94	26.	0.	0.000	1000.00	1.354s
pm-146	1814.87	453.88	30.	-6.	-0.004	181.90	1.372s
SB-125	1852.82	463.37	73.	-15.	-0.008	51.34	1.380s
Ir-192	1871.59	468.06	44.	10.	0.005	103.07	1.384s
BE-7	1909.73	477.60	112.	-15.	-0.009	100.91	1.392s
HF-181	1927.34	482.00	131.	-16.	-0.009	103.52	1.396s
La-140	1947.43	487.02	147.	-7.	-0.004	244.54	1.400s
RU-103	1987.56	497.05	30.	-5.	-0.003	215.19	1.409s
RH-106	2046.81	511.86	49.	49.	0.027	39.98	2.672s
Nd-147	2123.35	531.00	13.	9.	0.005	91.52	1.438s
Ba-140	2148.39	537.26	22.	-6.	-0.003	172.86	1.444s
CS-134	2252.30	563.24	14.	9.	0.005	96.03	1.466s
CS-134	2276.64	569.32	14.	9.	0.005	68.54	1.471s
PA-234	2277.24	569.47	23.	2.	0.001	322.89	1.471s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	2278.16	569.70	29.	-3.	-0.002	268.00	1.471s
TL-208	2331.45	583.02	22.	21.	0.012	51.01	1.482
SB-125	2401.36	600.50	128.	9.	0.005	180.25	1.497s
SB-124	2410.29	602.73	136.	9.	0.005	192.22	1.499s
CS-134	2418.21	604.71	145.	9.	0.005	191.40	1.500s
BI-214	2435.46	609.02	21.	61.	0.034	18.43	1.756
RU-103	2440.56	610.30	154.	9.	0.005	196.48	1.505s
AG-108M	2456.49	614.28	163.	9.	0.005	201.60	1.508s
PM-144	2471.62	618.06	172.	4.	0.002	494.35	1.512s
SB-125	2542.94	635.89	14.	5.	0.003	114.89	1.526s
I-131	2547.28	636.97	43.	-14.	-0.008	78.58	1.527s
AG-110M	2630.43	657.76	45.	-8.	-0.005	137.10	1.544s
PM-144	2785.58	696.54	65.	-15.	-0.008	78.39	1.576s
NB-94	2809.93	702.63	49.	11.	0.006	98.11	1.581s
SB-124	2890.57	722.79	31.	8.	0.004	109.39	1.598
AG-108M	2891.17	722.94	39.	0.	0.000	1000.00	1.598
EU-154	2892.85	723.36	39.	0.	0.000	1000.00	1.598
ZR-95	2896.22	724.20	39.	0.	0.000	1000.00	1.599s
BI-212	2908.11	727.17	15.	6.	0.003	107.62	1.601s
pm-146	2942.31	735.72	28.	-5.	-0.003	228.91	1.608s
pm-146	2988.08	747.16	14.	6.	0.003	138.44	1.617s
ZR-95	3026.36	756.73	10.	8.	0.004	95.90	1.625s
AG-110M	3055.23	763.94	24.	-3.	-0.002	238.05	1.631s
NB-95	3062.61	765.79	60.	-17.	-0.009	68.75	1.632s
PA-234M	3065.10	766.41	73.	-4.	-0.002	285.38	1.633s
EU-152	3115.14	778.92	20.	-3.	-0.002	332.78	1.643s
BI-212	3141.15	785.42	22.	8.	0.005	88.51	1.648s
CS-134	3182.95	795.87	9.	6.	0.003	83.72	1.656s
TL-210	3197.88	799.60	15.	6.	0.003	103.80	1.659s
CS-134	3207.29	801.95	12.	0.	0.000	1000.00	1.661s
CO-58	3242.59	810.78	49.	-10.	-0.006	103.92	1.668s
La-140	3262.58	815.77	60.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	50.	12.	0.006	90.77	1.674s
MN-54	3338.91	834.85	20.	1.	0.001	988.26	1.687s
Co-56	3386.61	846.77	25.	-7.	-0.004	161.52	1.696s
TL-208	3441.80	860.56	11.	8.	0.004	97.42	1.707s
NB-94	3483.94	871.10	20.	0.	0.000	1000.00	1.715s
EU-154	3492.47	873.23	13.	8.	0.005	68.84	1.717s
PA-234	3521.68	880.53	61.	-9.	-0.005	133.64	1.722s
PA-234	3532.53	883.24	62.	7.	0.004	159.25	1.724s
AG-110M	3538.30	884.68	21.	8.	0.005	83.74	1.725s
Sc-46	3556.69	889.28	50.	4.	0.002	290.84	1.729s
y-88	3591.74	898.04	11.	7.	0.004	102.57	1.736s
AC-228	3643.88	911.07	10.	19.	0.011	43.19	1.746s
AG-110M	3749.60	937.49	10.	3.	0.002	238.82	1.766s
PA-234	3783.72	946.02	15.	8.	0.004	112.15	1.772
EU-152	3856.11	964.11	34.	12.	0.007	72.04	1.786s
AC-228	3875.56	968.97	38.	11.	0.006	86.83	1.790s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	3985.03	996.33	75.	-17.	-0.009	77.35	1.810
PA-234M	4003.71	1001.00	92.	-17.	-0.009	45.39	1.814s
EU-154	4018.82	1004.77	110.	-9.	-0.005	174.94	1.816s
Co-56	4151.13	1037.84	11.	9.	0.005	91.07	1.841s
Cs-136	4192.07	1048.07	16.	0.	0.000	1000.00	1.848s
RH-106	4201.23	1050.36	14.	3.	0.002	166.13	1.850
BI-207	4254.46	1063.66	28.	-7.	-0.004	120.77	1.860s
Ga-68	4309.44	1077.40	11.	2.	0.001	324.82	1.870s
FE-59	4396.88	1099.25	16.	4.	0.002	233.75	1.886s
EU-152	4448.20	1112.07	69.	-6.	-0.003	166.57	1.895s
ZN-65	4462.09	1115.55	61.	2.	0.001	519.93	1.897s
BI-214	4481.06	1120.29	52.	10.	0.005	112.02	1.901s
Sc-46	4482.12	1120.55	76.	-14.	-0.008	92.67	1.901s
Ta-182	4485.12	1121.30	50.	13.	0.007	80.45	1.901s
Ta-182	4756.25	1189.05	17.	9.	0.005	112.49	1.949s
Ta-182	4885.75	1221.41	17.	3.	0.002	327.45	1.972s
Co-56	4953.27	1238.28	12.	26.	0.015	35.73	1.984s
NA-22	5098.35	1274.53	17.	1.	0.001	591.61	2.008s
EU-154	5098.40	1274.54	18.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	23.	-2.	-0.001	674.39	2.020s
TL-210	5252.32	1313.00	11.	-3.	-0.002	243.10	2.034s
CO-60	5330.37	1332.50	6.	7.	0.004	91.28	2.047s
AG-110M	5537.69	1384.30	6.	2.	0.001	324.47	2.082s
EU-152	5632.56	1408.00	7.	2.	0.001	248.63	2.097s
K-40	5842.70	1460.50	7.	333.	0.185	5.61	1.917
La-140	6385.95	1596.21	12.	-3.	-0.002	579.84	2.215s
BI-214	7059.65	1764.49	3.	18.	0.010	28.24	2.314s
Co-56	7087.11	1771.35	32.	-5.	-0.003	171.24	2.318s
y-88	7346.20	1836.06	13.	-5.	-0.003	104.30	2.354s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	Peak MDA Value Bq/Sample	Peak COMMENTS
BE-7	C	-3.5128E+00				5.31E+01	
			477.60	-3.513E+00	?(	1.192E+01 1.01E+02	1.05E+01 G
NA-22	C	5.1077E-02				9.50E+02	
			1274.53	5.108E-02	?(	1.120E+00 5.92E+02	9.99E+01 G
K-40	N	1.7765E+02				4.66E+11	
			1460.83	1.777E+02	(P	8.205E+00 5.61E+00	1.07E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sc-46	F 1.3515E-01					8.38E+01	
		889.28	1.351E-01	&(	1.377E+00	2.91E+02	1.00E+02 G
		1120.55	-6.400E-01	&	1.995E+00	9.27E+01	1.00E+02 G
CR-51	F 2.5200E+00					2.77E+01	
		320.08	2.520E+00	&(	1.396E+01	1.64E+02	9.94E+00 G
MN-54	C 3.6628E-02					3.12E+02	
		834.85	3.663E-02	?(	8.626E-01	9.88E+02	1.00E+02 G
FE-59	F 3.2005E-01					4.45E+01	
		1099.25	3.201E-01	?(P	1.715E+00	2.34E+02	5.65E+01 G
		1291.60	-1.991E-01	+	2.973E+00	6.74E+02	4.32E+01 G
Co-56	C 8.0093E-01					7.73E+01	
		846.77	-2.593E-01	?(	9.636E-01	1.62E+02	9.99E+01 G
		1238.28	1.997E+00	?(P	1.400E+00	3.57E+01	6.61E+01 G
		1037.84	2.707E+00	?(P	5.554E+00	9.11E+01	1.41E+01 G
		1771.35	-2.084E+00	+	1.251E+01	1.71E+02	1.55E+01 A
CO-57	C -7.3431E-02					2.72E+02	
		122.06	-7.343E-02	&(	5.651E-01	2.24E+02	8.56E+01 G
		136.47	-2.251E+00	&	1.160E+01	1.54E+02	1.07E+01 G
CO-58	C -3.6003E-01					7.09E+01	
		810.78	-3.600E-01	?(	1.272E+00	1.04E+02	9.95E+01 G
CO-60	F 3.6041E-01					1.93E+03	
		1332.50	3.604E-01	?(P	7.463E-01	9.13E+01	1.00E+02 G
		1173.24	-4.121E-02	% P	1.172E+00	1.25E+03	9.99E+01 G
ZN-65	F 1.9420E-01					2.44E+02	
		1115.55	1.942E-01	?(	3.544E+00	5.20E+02	5.06E+01 G
NB-94	I 3.5040E-01					7.41E+06	
		702.63	3.504E-01	?(P	1.164E+00	9.81E+01	9.79E+01 G
		871.10	0.000E+00	-	8.921E-01	1.00E+03	9.99E+01 G
ZR-95	I 4.8927E-01					6.40E+01	
		756.73	4.893E-01	?(P	1.095E+00	9.59E+01	5.45E+01 G
		724.20	0.000E+00	-	2.368E+00	1.00E+03	4.42E+01 G
NB-95	I -5.8493E-01					6.40E+01	
		765.79	-5.849E-01	?(	1.333E+00	6.87E+01	9.98E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
RU-103	I	-1.4580E-01						3.93E+01	
			497.05	-1.458E-01	?(	7.757E-01	2.15E+02	9.09E+01	G
			610.30	4.556E+00	?	3.043E+01	1.96E+02	5.75E+00	GA
RH-106	I	1.2700E+00						3.74E+02	
			621.92	-2.252E-06	%(	1.905E+01	2.46E+08	9.93E+00	G
			1050.36	9.354E+00	&(	5.595E+01	1.66E+02	1.56E+00	G
			511.86	6.220E+00	?	4.485E+00	4.00E+01	2.00E+01	GA
AG-108M	C	9.7276E-02						1.53E+05	
			433.94	0.000E+00	?(	6.591E-01	1.00E+03	9.05E+01	G
			722.94	0.000E+00	&(	1.149E+00	1.00E+03	9.08E+01	G
			614.28	2.936E-01	?(	2.011E+00	2.02E+02	8.98E+01	G
AG-110M	F	4.1369E-01						2.50E+02	
			884.68	4.471E-01	?(	1.268E+00	8.37E+01	7.27E+01	G
			657.76	-2.682E-01	- P	1.100E+00	1.37E+02	9.46E+01	G
			937.49	3.497E-01	?(	2.034E+00	2.39E+02	3.44E+01	G
			1384.30	4.042E-01	?(P	3.215E+00	3.24E+02	2.43E+01	G
			763.94	-4.607E-01	-	3.922E+00	2.38E+02	2.23E+01	G
SN-113	F	1.5391E-01						1.15E+02	
			391.69	1.539E-01	?(P	1.412E+00	2.65E+02	6.40E+01	G
SB-124	F	4.5979E-01						6.02E+01	
			602.73	2.544E-01	?(P	1.664E+00	1.92E+02	9.83E+01	G
			1690.98	-2.252E-02	% P	9.906E-01	1.11E+04	4.78E+01	G
			722.79	2.327E+00	&(	8.739E+00	1.09E+02	1.08E+01	G
SB-125	I	1.4982E+00						1.01E+03	
			427.88	1.602E+00	?(P	1.242E+00	3.57E+01	2.96E+01	G
			600.50	1.441E+00	?(	8.846E+00	1.80E+02	1.79E+01	G
			635.89	1.317E+00	?(	5.308E+00	1.15E+02	1.13E+01	G
			463.37	-3.385E+00	- P	9.569E+00	5.13E+01	1.05E+01	G
I-131	I	2.5868E-01						8.02E+00	
			364.48	2.587E-01	?(P	6.269E-01	9.59E+01	8.17E+01	G
			284.30	-8.188E-01	&	9.912E+00	4.74E+02	6.14E+00	G
			636.97	-6.009E+00	+ P	1.380E+01	7.86E+01	7.17E+00	G
Gd-153	F	3.2235E-01						2.42E+02	
			97.50	-2.022E-07	%(	3.745E+00	5.48E+08	3.00E+01	G
			103.20	7.660E-01	(	3.086E+00	1.20E+02	2.18E+01	G
Ga-68	C	3.7093E+00						4.71E-02	
			1077.40	3.709E+00	(	2.850E+01	3.25E+02	3.30E+00	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Tc-99m	I	-2.8186E-01					2.51E-01	
			140.51	-2.819E-01	&(	1.474E+00	1.56E+02	8.93E+01 G
BA-133	F	-2.3036E-02					3.85E+03	
			356.00	-3.730E-01	*(	1.999E+00	1.58E+02	6.20E+01 G
			302.85	1.162E+00	&(	7.201E+00	1.84E+02	1.83E+01 G
			383.84	4.034E+00	? P	7.471E+00	5.69E+01	8.94E+00 GA
			80.99	-7.631E-01	+ P	2.884E+00	8.27E+01	3.41E+01 GA
CS-134	I	4.5935E-01					7.54E+02	
			604.71	2.657E-01	?(	1.730E+00	1.91E+02	9.76E+01 G
			795.87	2.426E-01	?(	6.942E-01	8.37E+01	8.55E+01 G
			569.32	1.581E+00	?(	3.595E+00	6.85E+01	1.54E+01 G
			801.95	0.000E+00	-	7.606E+00	1.00E+03	8.69E+00 G
			563.24	2.878E+00	?(	6.570E+00	9.60E+01	8.35E+00 G
CS-137	I	-1.2863E-02					1.10E+04	
			661.66	-1.286E-02	%(P	1.312E+00	3.20E+03	8.52E+01 G
CE-139	F	2.3384E-01					1.38E+02	
			165.85	2.338E-01	?(	8.448E-01	1.07E+02	7.99E+01 G
Ba-140	I	2.2731E-01					1.28E+01	
			537.26	-6.111E-01	?(	2.632E+00	1.73E+02	2.44E+01 G
			162.66	-3.785E+00	& P	1.206E+01	9.46E+01	6.22E+00 G
			304.85	4.994E+00	?(	3.164E+01	1.88E+02	4.29E+00 G
La-140	I	1.5208E-02					1.28E+01	
			1596.21	-2.067E-01	?(P	1.220E+00	5.80E+02	9.54E+01 G
			487.02	-3.817E-01	&	3.185E+00	2.45E+02	4.55E+01 G
			328.76	1.058E+00	?(	5.263E+00	1.47E+02	2.03E+01 G
			815.77	0.000E+00	&	5.997E+00	1.00E+03	2.33E+01 G
CE-141	I	4.1870E-01					3.25E+01	
			145.44	4.187E-01	?(	2.346E+00	1.67E+02	4.82E+01 G
CE-144	I	-2.1461E+00					2.85E+02	
			133.54	-2.146E+00	&(	1.066E+01	1.49E+02	1.11E+01 G
PM-144	C	-4.7101E-01					3.63E+02	
			696.54	-4.710E-01	?(P	1.302E+00	7.84E+01	9.90E+01 G
			618.06	1.111E-01	+	1.880E+00	4.94E+02	9.91E+01 G
EU-152	F	8.8503E-01					4.94E+03	
			344.29	0.000E+00	?(	4.658E+00	1.00E+03	2.65E+01 G
			1112.07	-1.882E+00	+ P	1.386E+01	1.67E+02	1.36E+01 G
			121.78	3.786E-01	?(	1.863E+00	1.45E+02	2.86E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			778.92	-8.051E-01	+	6.320E+00	3.33E+02	1.29E+01 G
			964.11	3.482E+00	&(	8.357E+00	7.20E+01	1.46E+01 G
			244.69	-3.289E+00	+	1.474E+01	1.33E+02	7.58E+00 G
			1408.00	6.313E-01	? P	3.867E+00	2.49E+02	2.10E+01 GA
EU-154	I	2.6082E+00					3.14E+03	
			873.23	2.608E+00	&(	5.962E+00	6.88E+01	1.23E+01 G
			123.10	-3.172E-01	-	1.340E+00	1.25E+02	4.08E+01 G
			1274.54	0.000E+00	-	3.261E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	&	5.165E+00	1.00E+03	2.02E+01 G
			1004.77	-2.032E+00	-	1.213E+01	1.75E+02	1.80E+01 G
			996.33	-6.599E+00	-	1.703E+01	7.74E+01	1.06E+01 G
EU-155	I	-1.6427E-02					1.81E+03	
			105.31	-1.643E-02	%(P	3.318E+00	5.61E+03	2.12E+01 G
			86.54	-6.885E-01	+	3.959E+00	1.72E+02	3.07E+01 G
HF-181	F	-4.8597E-01					4.24E+01	
			482.00	-4.860E-01	?(	1.691E+00	1.04E+02	8.05E+01 G
			133.02	-5.487E-01	&	2.671E+00	1.46E+02	4.33E+01 G
			345.83	0.000E+00	+	8.216E+00	1.00E+03	1.51E+01 G
			136.30	-4.107E+00	&	2.077E+01	1.51E+02	5.85E+00 G
Ta-182	F	2.0436E+00					1.14E+02	
			1121.30	1.747E+00	?(	4.710E+00	8.05E+01	3.49E+01 G
			1221.41	5.482E-01	-	4.006E+00	3.27E+02	2.70E+01 G
			1189.05	2.683E+00	?(	6.535E+00	1.12E+02	1.62E+01 G
Hg-203	F	-3.4359E-01					4.66E+01	
			279.20	-3.436E-01	?(	9.829E-01	8.55E+01	8.15E+01 G
TL-208	N	1.0592E+00					6.98E+02	
			583.02	6.885E-01	?(P	8.150E-01	5.10E+01	8.45E+01 G
			277.28	3.486E+00	(	1.000E+01	8.54E+01	6.31E+00 G
			860.56	2.349E+00	?(P	5.399E+00	9.74E+01	1.24E+01 G
pm-146	C	5.9372E-01					2.02E+03	
			747.16	5.937E-01	?(	1.994E+00	1.38E+02	3.40E+01 G
			735.72	-7.389E-01	+	4.045E+00	2.29E+02	2.25E+01 G
			453.88	-2.267E-01	-	1.016E+00	1.82E+02	6.50E+01 G
y-88	F	3.0736E-01					1.07E+02	
			898.04	3.074E-01	?(P	7.540E-01	1.03E+02	9.37E+01 G
			1836.06	-3.322E-01	+ P	1.343E+00	1.04E+02	9.92E+01 G
Cd-113m		3.8407E+03					5.33E+03	
			263.70	3.841E+03	(	1.107E+04	8.59E+01	6.00E-03 K

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
Cf-251	T	-6.2265E-01						3.28E+05	
			176.60	-6.227E-01	&(	3.202E+00	1.97E+02	1.70E+01	G
			227.00	-3.657E+00	&	1.083E+01	1.20E+02	6.30E+00	GA
Cf-249	T	2.8791E-01						1.28E+05	
			387.95	2.879E-01	&(	1.203E+00	1.22E+02	6.60E+01	G
			333.44	-1.759E+00	+	8.479E+00	1.43E+02	1.55E+01	G
Sn-126		1.9193E+00						3.65E+07	
			87.57	8.828E-01	}	3.116E+00	4.02E+01	3.75E+01	GA
			64.28	1.919E+00	(	1.038E+01	1.60E+02	9.70E+00	G
			86.94	0.000E+00	}	1.287E+01	1.34E+03	9.04E+00	GA
PB-210	N	-5.5805E+00						8.14E+03	
			46.54	-5.581E+00	(	2.974E+01	1.57E+02	4.25E+00	G
PB-212	N	2.5869E+00						6.98E+02	
			238.63	2.587E+00	(	9.817E-01	1.55E+01	4.33E+01	G
			300.03	0.000E+00	}	3.777E+01	7.62E+02	3.28E+00	GA
PB-214	N	5.6487E+00						5.84E+05	
			351.93	5.649E+00	@(P	1.061E+00	1.18E+01	3.76E+01	G
			295.09	6.190E-01	- P	5.962E+00	2.84E+02	1.93E+01	G
			242.00	5.792E+00	P	5.478E+00	3.19E+01	7.43E+00	GA
BI-207	C	-7.8203E-02						1.18E+04	
			569.70	-7.820E-02	?(P	7.786E-01	2.68E+02	9.77E+01	G
			1063.66	-4.021E-01	+ P	1.618E+00	1.21E+02	7.45E+01	G
BI-212	N	2.4304E+00						6.98E+02	
			727.17	2.430E+00	?(	9.106E+00	1.08E+02	7.55E+00	G
			785.42	2.212E+01	?	6.662E+01	8.85E+01	1.28E+00	GA
U-235	N	-2.2227E+00						2.57E+11	
			143.79	-2.223E+00	?(P	1.198E+01	8.50E+01	1.10E+01	G
			205.33	8.068E-01	&	8.248E+00	3.96E+02	5.01E+00	G
			163.38	-4.598E+00	+	1.560E+01	1.01E+02	5.08E+00	G
			185.72	9.191E-01	+	8.151E-01	3.65E+01	5.40E+01	GA
BI-214	N	3.6122E+00						5.84E+05	
			609.31	3.840E+00	(P	1.497E+00	1.84E+01	4.61E+01	G
			1120.29	2.917E+00	&(P	1.111E+01	1.12E+02	1.51E+01	G
			1764.49	7.593E+00	+ P	4.897E+00	2.82E+01	1.54E+01	G
BI-210M	T	-1.5149E-02						1.10E+09	
			265.83	-1.515E-02	%(	1.425E+00	2.69E+03	5.00E+01	G
			304.90	-8.973E-01	+	5.456E+00	1.81E+02	2.80E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	N	2.5557E+00					2.10E+03	
			911.07	2.567E+00	?(	2.357E+00	4.32E+01	2.90E+01 G
			968.97	2.538E+00	?(	7.437E+00	8.68E+01	1.75E+01 G
			338.32	1.336E+00	-	1.008E+01	2.22E+02	1.20E+01 G
			93.35	3.220E+00	?	2.020E+01	1.87E+02	5.56E+00 XA
TH-229	N	4.5231E+00					2.68E+06	
			193.51	4.516E+00	?(P	1.182E+01	1.06E+02	4.40E+00 G
			210.85	4.534E+00	&(P	1.554E+01	1.36E+02	2.99E+00 G
TH-234	N	6.5528E+00					1.63E+12	
			63.29	6.553E+00	*(	2.398E+01	1.09E+02	3.81E+00 G
			92.59	0.000E+00	-	2.045E+01	1.00E+03	5.58E+00 G
PA-231	N	7.3896E+00					1.20E+07	
			302.65	7.390E+00	&(	4.469E+01	1.79E+02	2.88E+00 G
			300.07	8.854E-01	}	4.954E+01	6.32E+02	2.46E+00 G
PA-233	C	-1.2710E-01					7.82E+08	
			312.01	-7.358E-01	?(P	4.127E+00	1.33E+02	3.60E+01 G
			300.18	3.407E+00	?(	2.052E+01	1.78E+02	6.20E+00 G
PA-234	N	8.5298E-01					1.63E+12	
			131.29	-1.314E+00	?(P	6.264E+00	8.43E+01	1.80E+01 G
			946.02	2.408E+00	(	6.249E+00	1.12E+02	1.34E+01 G
			569.47	7.173E-01	?(	8.366E+00	3.23E+02	8.20E+00 G
			883.24	2.862E+00	?(	1.568E+01	1.59E+02	9.60E+00 G
			880.53	-5.416E+00	+	2.478E+01	1.34E+02	6.00E+00 GA
PA-234M	N	-8.5078E+01					1.63E+12	
			1001.00	-8.508E+01	?(P	2.382E+02	4.54E+01	8.37E-01 G
			766.41	-5.024E+01	+	4.973E+02	2.85E+02	2.94E-01 G
AM-241	T	-9.1567E-01					1.58E+05	
			59.54	-9.157E-01	?(	3.329E+00	1.09E+02	3.59E+01 G
Ir-192	F	1.7472E-02					7.40E+01	
			316.49	-2.352E-01	?(	1.682E+00	2.12E+02	8.70E+01 G
			468.06	4.425E-01	?(	1.552E+00	1.03E+02	5.18E+01 G
			308.44	-7.997E-01	+	4.746E+00	1.76E+02	3.18E+01 G
Cs-136	F	4.1990E-01					1.30E+01	
			818.50	4.199E-01	?(	1.286E+00	9.08E+01	1.00E+02 G
			1048.07	0.000E+00	-	1.166E+00	1.00E+03	8.00E+01 G
			340.57	0.000E+00	-	2.612E+00	1.00E+03	4.69E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Np-239 T	-3.9858E-01					2.36E+00	
		103.70	8.022E-02 %		2.922E+00	1.06E+03	2.40E+01 X
		106.13	-3.986E-01 &(		3.107E+00	2.30E+02	2.27E+01 G
		99.50	1.118E+00 ?		4.316E+00	1.15E+02	1.50E+01 X
Nd-147	1.7374E+00					1.11E+01	
		531.00	1.737E+00 &(		3.914E+00	9.15E+01	1.30E+01 G
		91.10	0.000E+00 -		4.060E+00	1.00E+03	2.83E+01 G
TL-210 N	2.3205E-01					5.84E+05	
		799.60	2.065E-01 ?(		7.441E-01	1.04E+02	9.90E+01 G
		296.00	2.640E-01 ?(		1.485E+00	1.66E+02	7.90E+01 G
		1313.00	-8.298E-01 +		4.580E+00	2.43E+02	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
    negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
    failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the
    library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
    to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	144.	-11.	-0.006	157.20	-5.581E+00	
AM-241	59.54	266.	-22.	-0.012	108.69	-9.157E-01	
TH-234	63.29	176.	18.	0.010	109.04	6.553E+00	
BA-133	80.99	315.	-23.	-0.013	82.66	-7.631E-01	P
EU-155	86.54	526.	-19.	-0.011	171.72	-6.885E-01	
Np-239	99.50	158.	16.	0.009	114.77	1.118E+00	
Gd-153	103.20	174.	16.	0.009	119.76	7.660E-01	
Np-239	106.13	194.	-9.	-0.005	229.61	-3.986E-01	
EU-152	121.78	107.	10.	0.006	144.73	3.786E-01	
CO-57	122.06	87.	-6.	-0.003	223.61	-7.343E-02	
EU-154	123.10	112.	-12.	-0.007	124.82	-3.172E-01	
HF-181	133.02	512.	-22.	-0.012	145.60	-5.487E-01	
CE-144	133.54	534.	-22.	-0.012	148.59	-2.146E+00	
HF-181	136.30	557.	-22.	-0.012	151.23	-4.107E+00	
CO-57	136.47	579.	-22.	-0.012	154.17	-2.251E+00	
Tc-99m	140.51	601.	-22.	-0.012	156.48	-2.819E-01	
U-235	143.79	624.	-22.	-0.012	85.00	-2.223E+00	P
CE-141	145.44	454.	18.	0.010	167.17	4.187E-01	
Ba-140	162.66	169.	-20.	-0.011	94.65	-3.785E+00	P
U-235	163.38	189.	-20.	-0.011	101.36	-4.598E+00	
CE-139	165.85	138.	16.	0.009	107.44	2.338E-01	
Cf-251	176.60	81.	-9.	-0.005	196.83	-6.227E-01	
U-235	185.72	48.	39.	0.022	36.50	9.191E-01	
TH-229	193.51	64.	15.	0.009	105.56	4.516E+00	P
U-235	205.33	36.	3.	0.002	395.81	8.068E-01	
TH-229	210.85	45.	10.	0.005	135.84	4.534E+00	P
Cf-251	227.00	92.	-16.	-0.009	120.00	-3.657E+00	
EU-152	244.69	233.	-16.	-0.009	133.31	-3.289E+00	
TH-227	256.24	92.	-20.	-0.011	96.89	-4.444E+00	
Cd-113m	263.70	70.	14.	0.008	85.87	3.841E+03	
Hg-203	279.20	96.	-17.	-0.009	85.49	-3.436E-01	
I-131	284.30	52.	-3.	-0.002	474.15	-8.188E-01	
TL-210	296.00	197.	12.	0.007	166.42	2.640E-01	
PA-233	300.18	228.	12.	0.007	178.32	3.407E+00	
BA-133	302.85	243.	12.	0.007	183.59	1.162E+00	
Ba-140	304.85	256.	12.	0.007	187.74	4.994E+00	
BI-210M	304.90	326.	-14.	-0.008	180.72	-8.973E-01	
Ir-192	308.44	312.	-14.	-0.008	176.36	-7.997E-01	
PA-233	312.01	298.	-15.	-0.008	133.19	-7.358E-01	P
Ir-192	316.49	283.	-11.	-0.006	211.86	-2.352E-01	
CR-51	320.08	249.	14.	0.008	164.37	2.520E+00	
La-140	328.76	139.	12.	0.006	146.82	1.058E+00	
Cf-249	333.44	210.	-15.	-0.008	143.05	-1.759E+00	
BA-133	356.00	169.	-12.	-0.007	158.36	-3.730E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	364.48	24.	11.	0.006	95.91	2.587E-01	P
BA-133	383.84	40.	17.	0.010	56.86	4.034E+00	P
Cf-249	387.95	58.	9.	0.005	122.39	2.879E-01	
SN-113	391.69	75.	5.	0.003	265.18	1.539E-01	P
pm-146	453.88	30.	-6.	-0.004	181.90	-2.267E-01	
Ir-192	468.06	44.	10.	0.005	103.07	4.425E-01	
BE-7	477.60	112.	-15.	-0.009	100.91	-3.513E+00	
HF-181	482.00	131.	-16.	-0.009	103.52	-4.860E-01	
La-140	487.02	147.	-7.	-0.004	244.54	-3.817E-01	
RU-103	497.05	30.	-5.	-0.003	215.19	-1.458E-01	
RH-106	511.86	49.	49.	0.027	39.98	6.220E+00	
Nd-147	531.00	13.	9.	0.005	91.52	1.737E+00	
Ba-140	537.26	22.	-6.	-0.003	172.86	-6.111E-01	
CS-134	563.24	14.	9.	0.005	96.03	2.878E+00	
CS-134	569.32	14.	9.	0.005	68.54	1.581E+00	
BI-207	569.70	29.	-3.	-0.002	268.00	-7.820E-02	P
SB-124	602.73	136.	9.	0.005	192.22	2.544E-01	P
CS-134	604.71	145.	9.	0.005	191.40	2.657E-01	
RU-103	610.30	154.	9.	0.005	196.48	4.556E+00	
AG-108M	614.28	163.	9.	0.005	201.60	2.936E-01	
PM-144	618.06	172.	4.	0.002	494.35	1.111E-01	
I-131	636.97	43.	-14.	-0.008	78.58	-6.009E+00	P
AG-110M	657.76	45.	-8.	-0.005	137.10	-2.682E-01	P
PM-144	696.54	65.	-15.	-0.008	78.39	-4.710E-01	P
NB-94	702.63	49.	11.	0.006	98.11	3.504E-01	P
SB-124	722.79	31.	8.	0.004	109.39	2.327E+00	
BI-212	727.17	15.	6.	0.003	107.62	2.430E+00	
pm-146	735.72	28.	-5.	-0.003	228.91	-7.389E-01	
pm-146	747.16	14.	6.	0.003	138.44	5.937E-01	
ZR-95	756.73	10.	8.	0.004	95.90	4.893E-01	P
AG-110M	763.94	24.	-3.	-0.002	238.05	-4.607E-01	
NB-95	765.79	60.	-17.	-0.009	68.75	-5.849E-01	
PA-234M	766.41	73.	-4.	-0.002	285.38	-5.024E+01	
EU-152	778.92	20.	-3.	-0.002	332.78	-8.051E-01	
BI-212	785.42	22.	8.	0.005	88.51	2.212E+01	
CS-134	795.87	9.	6.	0.003	83.72	2.426E-01	
TL-210	799.60	15.	6.	0.003	103.80	2.065E-01	
CO-58	810.78	49.	-10.	-0.006	103.92	-3.600E-01	
Cs-136	818.50	50.	12.	0.006	90.77	4.199E-01	
MN-54	834.85	20.	1.	0.001	988.26	3.663E-02	
Co-56	846.77	25.	-7.	-0.004	161.52	-2.593E-01	
EU-154	873.23	13.	8.	0.005	68.84	2.608E+00	
AG-110M	884.68	21.	8.	0.005	83.74	4.471E-01	
Sc-46	889.28	50.	4.	0.002	290.84	1.351E-01	
y-88	898.04	11.	7.	0.004	102.57	3.074E-01	P
AG-110M	937.49	10.	3.	0.002	238.82	3.497E-01	
EU-152	964.11	34.	12.	0.007	72.04	3.482E+00	
EU-154	996.33	75.	-17.	-0.009	77.35	-6.599E+00	

(Page 19 of 22)

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
PA-234M	1001.00	92.	-17.	-0.009	45.39	-8.508E+01		P
EU-154	1004.77	110.	-9.	-0.005	174.94	-2.032E+00		
Co-56	1037.84	11.	9.	0.005	91.07	2.707E+00		P
RH-106	1050.36	14.	3.	0.002	166.13	9.354E+00		
BI-207	1063.66	28.	-7.	-0.004	120.77	-4.021E-01		P
Ga-68	1077.40	11.	2.	0.001	324.82	3.709E+00		
FE-59	1099.25	16.	4.	0.002	233.75	3.201E-01		P
EU-152	1112.07	69.	-6.	-0.003	166.57	-1.882E+00		P
Sc-46	1120.55	76.	-14.	-0.008	92.67	-6.400E-01		
Ta-182	1121.30	50.	13.	0.007	80.45	1.747E+00		
Ta-182	1189.05	17.	9.	0.005	112.49	2.683E+00		
Ta-182	1221.41	17.	3.	0.002	327.45	5.482E-01		
Co-56	1238.28	12.	26.	0.015	35.73	1.997E+00		P
NA-22	1274.53	17.	1.	0.001	591.61	5.108E-02		
FE-59	1291.60	23.	-2.	-0.001	674.39	-1.991E-01		
TL-210	1313.00	11.	-3.	-0.002	243.10	-8.298E-01		
CO-60	1332.50	6.	7.	0.004	91.28	3.604E-01		P
AG-110M	1384.30	6.	2.	0.001	324.47	4.042E-01		P
EU-152	1408.00	7.	2.	0.001	248.63	6.313E-01		P
La-140	1596.21	12.	-3.	-0.002	579.84	-2.067E-01		P
Co-56	1771.35	32.	-5.	-0.003	171.24	-2.084E+00		
y-88	1836.06	13.	-5.	-0.003	104.30	-3.322E-01		P

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-3.5128E+00	-3.5128E+00	1.009E+02%	1.19E+01
NA-22	#A	5.1077E-02	5.1077E-02	5.916E+02%	1.12E+00
K-40		1.7765E+02	1.7765E+02	5.607E+00%	8.20E+00
Sc-46	#A	1.3515E-01	1.3515E-01	2.908E+02%	1.38E+00
CR-51	#A	2.5200E+00	2.5200E+00	1.644E+02%	1.40E+01
MN-54	#A	3.6628E-02	3.6628E-02	9.883E+02%	8.63E-01
FE-59	#A	3.2005E-01	3.2005E-01	2.338E+02%	1.72E+00
Co-56	#A	8.0093E-01	8.0093E-01	3.573E+01%	9.64E-01
CO-57	#A	-7.3431E-02	-7.3431E-02	2.236E+02%	5.65E-01
CO-58	#A	-3.6002E-01	-3.6003E-01	1.039E+02%	1.27E+00
CO-60	#A	3.6041E-01	3.6041E-01	9.128E+01%	7.46E-01
ZN-65	#A	1.9420E-01	1.9420E-01	5.199E+02%	3.54E+00
NB-94	#A	3.5040E-01	3.5040E-01	9.811E+01%	1.16E+00
ZR-95	#A	4.8926E-01	4.8927E-01	9.590E+01%	1.09E+00
NB-95	#A	-5.8492E-01	-5.8493E-01	6.875E+01%	1.33E+00
RU-103	#A	-1.4580E-01	-1.4580E-01	2.152E+02%	7.76E-01
RH-106	#A	1.2700E+00	1.2700E+00	1.661E+02%	1.90E+01
AG-108M	#A	9.7276E-02	9.7276E-02	2.016E+02%	6.59E-01

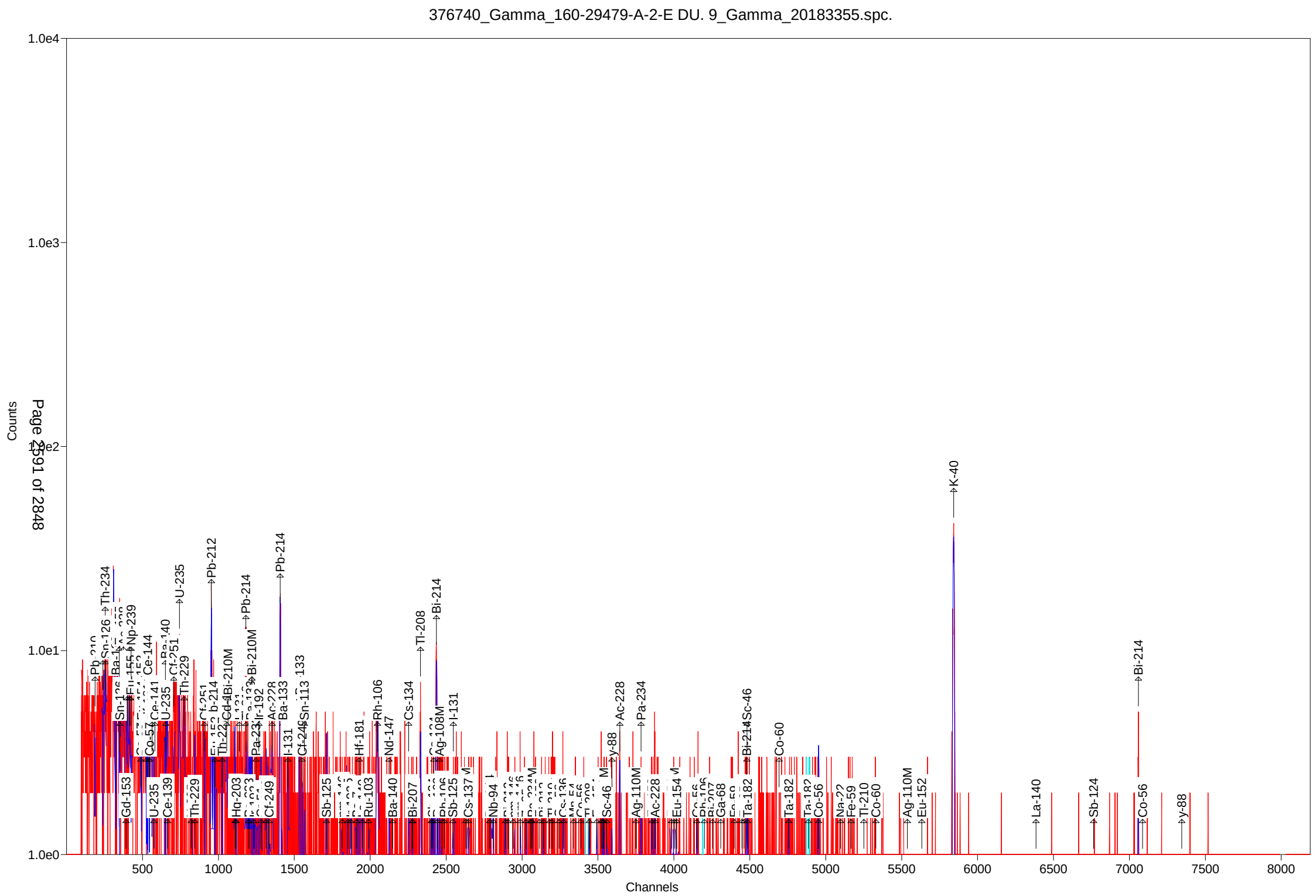
AG-110M#A	4.1369E-01	4.1369E-01	8.374E+01%	1.27E+00
SN-113 #A	1.5391E-01	1.5391E-01	2.652E+02%	1.41E+00
SB-124 #A	4.5979E-01	4.5979E-01	1.094E+02%	1.66E+00
SB-125 #	1.4982E+00	1.4982E+00	3.575E+01%	1.24E+00
I-131 #A	2.5866E-01	2.5868E-01	9.591E+01%	6.27E-01
Gd-153 #A	3.2235E-01	3.2235E-01	1.198E+02%	3.75E+00
Ga-68 #A	3.6679E+00	3.7093E+00	3.248E+02%	2.85E+01
Tc-99m #A	-2.8127E-01	-2.8186E-01	1.565E+02%	1.47E+00
BA-133 #A	-2.3036E-02	-2.3036E-02	1.212E+02%	2.00E+00
CS-134 #A	4.5935E-01	4.5935E-01	5.998E+01%	1.73E+00
CS-137 #A	-1.2863E-02	-1.2863E-02	3.201E+03%	1.31E+00
CE-139 #A	2.3384E-01	2.3384E-01	1.074E+02%	8.45E-01
Ba-140 #A	2.2730E-01	2.2731E-01	1.276E+02%	2.63E+00
La-140 #A	1.5207E-02	1.5208E-02	1.468E+02%	1.22E+00
CE-141 #A	4.1869E-01	4.1870E-01	1.672E+02%	2.35E+00
CE-144 #A	-2.1461E+00	-2.1461E+00	1.486E+02%	1.07E+01
PM-144 #A	-4.7101E-01	-4.7101E-01	7.839E+01%	1.30E+00
EU-152 #A	8.8503E-01	8.8503E-01	7.204E+01%	4.66E+00
EU-154 #A	2.6082E+00	2.6082E+00	6.884E+01%	5.96E+00
EU-155 #A	-1.6427E-02	-1.6427E-02	5.613E+03%	3.32E+00
HF-181 #A	-4.8596E-01	-4.8597E-01	1.035E+02%	1.69E+00
Ta-182 #A	2.0436E+00	2.0436E+00	6.915E+01%	4.71E+00
Hg-203 #A	-3.4358E-01	-3.4359E-01	8.549E+01%	9.83E-01
TL-208	1.0592E+00	1.0592E+00	4.641E+01%	8.15E-01
pm-146 #A	5.9372E-01	5.9372E-01	1.384E+02%	1.99E+00
y-88 #A	3.0736E-01	3.0736E-01	1.026E+02%	7.54E-01
Cd-113m#A	3.8407E+03	3.8407E+03	8.587E+01%	1.11E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	3.04E+01
Cf-251 #A	-6.2265E-01	-6.2265E-01	1.968E+02%	3.20E+00
Cf-249 #A	2.8791E-01	2.8791E-01	1.224E+02%	1.20E+00
Sn-126 A	1.9193E+00	1.9193E+00	1.603E+02%	1.04E+01
PB-210 #A	-5.5805E+00	-5.5805E+00	1.572E+02%	2.97E+01
PB-212	2.5869E+00	2.5869E+00	1.554E+01%	9.82E-01
PB-214	5.6487E+00	5.6487E+00	1.179E+01%	1.06E+00
BI-207 #A	-7.8203E-02	-7.8203E-02	2.680E+02%	7.79E-01
BI-212 #A	2.4304E+00	2.4304E+00	1.076E+02%	9.11E+00
U-235 #A	-2.2227E+00	-2.2227E+00	8.500E+01%	1.20E+01
BI-214	3.6122E+00	3.6122E+00	1.843E+01%	1.50E+00
BI-210M#A	-1.5149E-02	-1.5149E-02	2.685E+03%	1.43E+00
AC-228 #	2.5557E+00	2.5557E+00	4.319E+01%	2.36E+00
TH-227 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.45E+01
TH-229 #A	4.5231E+00	4.5231E+00	8.602E+01%	1.18E+01
TH-234 #A	6.5528E+00	6.5528E+00	1.090E+02%	2.40E+01
PA-231 #A	7.3896E+00	7.3896E+00	1.791E+02%	4.47E+01
PA-233 #A	-1.2710E-01	-1.2710E-01	1.113E+02%	4.13E+00
PA-234 A	8.5298E-01	8.5298E-01	8.431E+01%	6.26E+00
PA-234M#A	-8.5078E+01	-8.5078E+01	4.539E+01%	2.38E+02
AM-241 #A	-9.1567E-01	-9.1567E-01	1.087E+02%	3.33E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%	9.60E+00

Ir-192 #A	1.7472E-02	1.7472E-02	1.031E+02%	1.68E+00
Cs-136 #A	4.1988E-01	4.1990E-01	9.077E+01%	1.29E+00
Np-239 #A	-3.9849E-01	-3.9858E-01	2.296E+02%	3.11E+00
Nd-147 #A	1.7373E+00	1.7374E+00	9.152E+01%	3.91E+00
TL-210 #A	2.3205E-01	2.3205E-01	9.807E+01%	7.44E-01

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.3 keV) 1.931E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 1.9311758E+02 Bq/Sample


376740_Gamma_160-29479-A-2-E DU. 9_Gamma_20183355.spc.
Counts
Channels
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Th-234
Sn-126
Np-239
Ce-144
Co-57
Ce-141
U-235
Ra-140
Cf-251
U-235
Th-229
Pb-212
Th-227
Cd-109
Bi-210M
Pb-214
Bi-210M
Ir-192
Pa-233
Ac-228
Ba-133
I-131
Cf-249
Sn-113
Pb-214
Sb-125
Hf-181
Ru-103
Rh-106
Nd-147
Ba-140
Bi-207
Cs-134
Tl-208
Bi-214
Ag-108M
I-131
Cs-137
Nb-94
Sc-46
y-88
Ac-228
Pa-234
Ag-110M
Ac-228
Eu-154
Ga-68
Bi-214
Sc-46
Ta-182
Co-60
Ta-182
Co-56
Na-22
Fe-59
Tl-210
Co-60
Ag-110M
Eu-152
K-40
La-140
Sb-124
Bi-214
Co-56
y-88

Test America St. Louis Spectrum ID: 5_Gamma_20182723

Sample Description: 376740_Gamma_160-29498-A-1-C
Detector: Detector # 5
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29498-A-1-C

Decay to Time: 8/9/2018 07:19 Live Time: 1800 sec
Acquisition Time: 8/9/2018 07:19:59 Real Time: 1823 sec
Analysis Time: 8/9/2018 07:50 Dead Time: 1.25 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev14.lib
Bkgd Correction File: 5_2018-07-14_1831.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-7.093E+00	114.9	8.151E+00	8.159E+00	2.737E+01
NA-22	-1.198E+00	88.4	1.059E+00	1.061E+00	3.568E+00
K-40	1.428E+02	11.4	1.628E+01	1.784E+01	2.402E+01
Sc-46	-1.972E+00	89.9	1.774E+00	1.776E+00	5.906E+00
CR-51	1.048E+00	794.0	8.322E+00	8.323E+00	2.819E+01
MN-54	1.100E+00	93.1	1.025E+00	1.027E+00	2.359E+00
FE-59	1.942E+00	96.9	1.882E+00	1.885E+00	4.881E+00
Co-56	6.333E+00	17.8	1.126E+00	1.172E+00	2.267E+00
CO-57	6.909E-01	96.7	6.678E-01	6.688E-01	2.219E+00
CO-58	-1.620E+00	87.3	1.415E+00	1.417E+00	4.715E+00
CO-60	3.544E-01	104.6	3.706E-01	3.710E-01	2.454E+00
ZN-65	0.000E+00	1.#INF	5.939E-01	5.939E-01	1.784E+01
NB-94	2.465E+00	43.1	1.062E+00	1.069E+00	2.422E+00
ZR-95	-4.302E-01	401.2	1.726E+00	1.726E+00	4.489E+00
NB-95	0.000E+00	1.#INF	2.372E-01	2.372E-01	5.142E+00
RU-103	3.671E-02	2431.0	8.924E-01	8.924E-01	2.254E+00
RH-106	1.669E+01	72.7	1.213E+01	1.216E+01	2.801E+01
AG-108M	-1.209E+00	78.7	9.508E-01	9.528E-01	2.898E+00
AG-110M	1.213E+00	81.7	9.910E-01	9.929E-01	6.821E+00
SN-113	-1.883E-01	898.0	1.691E+00	1.691E+00	5.713E+00
SB-124	1.511E+00	92.2	1.393E+00	1.396E+00	1.120E+01
SB-125	5.858E+00	45.5	2.667E+00	2.683E+00	6.838E+00
I-131	1.366E+00	98.6	1.347E+00	1.349E+00	2.436E+00
Gd-153	2.371E+00	282.2	6.692E+00	6.694E+00	2.216E+01
Ga-68	9.000E+00	521.4	4.693E+01	4.693E+01	1.070E+02
Tc-99m	-7.640E-01	130.6	9.975E-01	9.985E-01	3.314E+00
BA-133	-1.500E+00	268.0	4.020E+00	4.021E+00	1.336E+01
CS-134	1.687E+00	158.6	2.676E+00	2.677E+00	1.134E+01
CS-137	1.330E-01	740.6	9.851E-01	9.852E-01	3.403E+00
CE-139	-9.034E-01	107.7	9.727E-01	9.765E-01	3.231E+00
Ba-140	-3.180E+00	111.8	3.554E+00	3.558E+00	1.018E+01
La-140	2.239E+00	36.3	8.135E-01	8.221E-01	3.384E+00
CE-141	-1.405E+00	123.7	1.739E+00	1.740E+00	5.777E+00

CE-144	-1.642E+00	423.7	6.956E+00	6.956E+00	2.325E+01
PM-144	5.728E-01	123.8	7.090E-01	7.096E-01	2.225E+00
EU-152	7.779E+00	23.9	1.858E+00	1.902E+00	1.298E+01
EU-154	8.444E+00	75.4	6.366E+00	6.381E+00	2.123E+01
EU-155	-3.416E+00	77.9	2.663E+00	2.669E+00	3.305E+01
HF-181	3.363E-01	319.7	1.075E+00	1.075E+00	3.659E+00
Ta-182	6.910E-01	47.1	3.254E-01	3.272E-01	2.669E+01
Hg-203	-1.236E+00	63.7	7.877E-01	7.909E-01	3.821E+00
TL-208	5.097E+00	20.3	1.037E+00	1.070E+00	2.211E+00
pm-146	2.431E+00	88.5	2.152E+00	2.156E+00	6.358E+00
y-88	9.735E-01	129.1	1.257E+00	1.258E+00	2.909E+00
Cd-113m	-9.107E+03	144.7	1.318E+04	1.319E+04	4.409E+04
Cd-109	-1.921E+01	290.7	5.583E+01	5.585E+01	1.849E+02
Cf-251	-1.831E+00	239.2	4.380E+00	4.383E+00	1.171E+01
Cf-249	8.955E-01	166.5	1.491E+00	1.492E+00	5.007E+00
Sn-126	8.459E+00	158.3	1.339E+01	1.340E+01	4.446E+01
PB-210	2.172E+02	11.2	2.437E+01	2.751E+01	6.008E+01
PB-212	1.214E+01	10.7	1.300E+00	1.519E+00	3.471E+00
PB-214	2.150E+02	2.0	4.195E+00	1.193E+01	5.566E+00
BI-207	1.375E+00	25.8	3.551E-01	3.622E-01	2.444E+00
BI-212	-1.186E+01	119.6	1.419E+01	1.420E+01	4.780E+01
U-235	2.422E+01	23.0	5.577E+00	5.712E+00	1.337E+01
BI-214	1.953E+02	2.6	4.985E+00	1.131E+01	4.060E+00
BI-210M	1.575E+00	96.2	1.515E+00	1.518E+00	5.045E+00
AC-228	1.529E+01	19.8	3.027E+00	3.126E+00	6.967E+00
TH-227	1.191E+01	125.1	1.490E+01	1.491E+01	4.957E+01
TH-229	1.941E+01	76.6	1.487E+01	1.495E+01	4.581E+01
TH-234	1.798E+02	10.5	1.888E+01	2.109E+01	5.451E+01
PA-231	0.000E+00	1.#INF	1.529E+01	1.529E+01	2.345E+02
PA-233	-9.419E-01	252.8	2.381E+00	2.382E+00	6.116E+00
PA-234	-4.805E-01	94.3	4.532E-01	4.538E-01	1.500E+01
PA-234M	-9.361E-01	18286.6	1.712E+02	1.712E+02	5.896E+02
AM-241	1.331E+00	283.6	3.774E+00	3.775E+00	1.256E+01
Np-237	-5.591E+00	295.3	1.651E+01	1.651E+01	5.466E+01
Ir-192	5.754E-01	98.2	5.652E-01	5.662E-01	3.336E+00
Cs-136	9.080E-01	149.0	1.353E+00	1.354E+00	4.965E+00
Np-239	-3.111E+00	298.1	9.272E+00	9.273E+00	3.070E+01
Nd-147	-3.941E+00	180.5	7.115E+00	7.119E+00	1.767E+01
TL-210	-1.563E+00	87.7	1.371E+00	1.374E+00	4.570E+00
Total	1.131E+03				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 5_Gamma_20182723.An1

Sample description
376740_Gamma_160-29498-A-1-C

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20182723.An1

Acquisition information
Start time: 8/9/2018 7:19:59 AM
Live time: 1800
Real time: 1823
Dead time: 1.25 %
Detector ID: 5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_Soil_TunaCan.Clb
5_Soil_TunaCan_90099_032612

Energy Calibration
Created: 2/28/2012 7:35:48 PM
Zero offset: 0.158 keV
Gain: 0.250 keV/channel
Quadratic: 3.911E-08 keV/channel^2

Efficiency Calibration
Created: 3/27/2012 5:20:37 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.466115E-01 + (-7.830454E-01*Log(E)) +
(-4.117504E-03*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.43 %
Log(Eff): -2.462251E+01 + (9.075211E+00*Log(E)) +
(-9.664422E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev14.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.62keV)
Stop channel: 8000 (2000.81keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 7:19:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2018-07-14_1831.PBC 7/14/2018 6:31:50 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 28 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.1510

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.64	297.	11.22	0.80	1.795E-02	46.54	4.250	2.172E+02	PB210
50.14	34.	125.12	0.79	2.012E-02	50.14	8.000	PBC<MDA	TH227
53.38	119.	28.66	0.72	2.203E-02				
57.49	51.	48.61	0.79	2.424E-02				
60.19	67.	43.87	0.80	2.562E-02	59.54	35.900	PBC<MDA	AM241
63.33	335.	10.49	0.80	2.711E-02	63.29	3.810	1.799E+02	TH234
64.28	41.	158.27	0.80	2.757E-02	64.28	9.700	PBC<MDA	Sn126
72.77	53.	54.54	0.81	3.085E-02				
74.85	822.	5.22	0.81	3.152E-02				
77.15	1297.	3.73	0.82	3.220E-02				
79.30	117.	29.24	0.82	3.278E-02				
83.87	231.	14.09	0.82	3.384E-02				
87.15	422.	8.39	0.83	3.447E-02	86.49	13.100	5.216E+01	Np237
					86.54	30.700	2.225E+01	EU155
					86.94	9.040	7.540E+01	Sn126
					87.57	37.500	1.812E+01	Sn126
89.76	220.	13.80	0.83	3.489E-02				
92.57	487.	7.36	0.83	3.527E-02	92.59	5.584	1.374E+02	TH234
					93.35	5.561	1.376E+02	AC228
94.83	71.	36.50	0.83	3.552E-02				
97.50	46.	282.21	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
122.06	38.	96.65	0.86	3.582E-02	121.78	28.580	PBC<MDA	EU152

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					122.06	85.600	6.909E-01	CO57
123.10	8.	459.07	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
143.59	123.	28.89	0.93	3.371E-02	143.79	10.960	1.848E+01	U235
163.47	90.	38.48	0.45	3.102E-02	163.38	5.080	3.164E+01	U235
186.09	722.	7.01	1.07	2.849E-02	185.72	54.000	2.603E+01	U235
193.51	32.	116.34	0.93	2.758E-02	193.51	4.400	PBC<MDA	TH229
205.85	69.	49.56	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
210.85	36.	99.67	0.95	2.569E-02	210.85	2.990	PBC<MDA	TH229
238.80	220.	10.92	0.98	2.318E-02	238.63	43.300	1.219E+01	PB212
242.11	691.	4.61	0.98	2.292E-02	242.00	7.430	2.255E+02	PB214
245.45	68.	24.51	0.98	2.266E-02	244.69	7.580	2.202E+01	EU152
265.83	30.	96.23	1.00	2.121E-02	265.83	50.000	PBC<MDA	BI210M
295.35	1490.	3.13	1.01	1.943E-02	295.09	19.300	2.205E+02	PB214
					296.00	79.000	5.401E+01	TL210
320.08	3.	794.02	1.06	1.818E-02	320.08	9.940	PBC<MDA	CR51
328.76	55.	48.23	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.52	64.	27.55	1.02	1.735E-02	338.32	12.010	PBC<MDA	AC228
340.57	11.	308.96	1.08	1.727E-02	340.57	46.900	PBC<MDA	Cs136
352.09	2413.	2.33	1.04	1.680E-02	351.93	37.600	2.122E+02	PB214
364.48	21.	109.57	1.10	1.632E-02	364.48	81.700	PBC<MDA	I131
389.03	43.	40.21	0.46	1.546E-02	387.95	66.000	2.327E+00	Cf249
427.88	48.	45.53	1.16	1.428E-02	427.88	29.600	PBC<MDA	SB125
468.06	19.	98.23	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
482.00	6.	319.67	1.21	1.293E-02	482.00	80.500	PBC<MDA	HF181
487.02	50.	36.33	1.21	1.282E-02	487.02	45.500	4.736E+00	La140
511.86	134.	22.56	2.48	1.230E-02	511.86	20.000	3.027E+01	RH106
540.07	18.	34.72	0.72	1.176E-02				
569.47	10.	138.78	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	6.223E+00	PA234
					569.70	97.740	5.222E-01	BI207
583.52	86.	20.34	1.95	1.103E-02	583.02	84.500	5.097E+00	TL208
600.50	18.	359.00	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
602.73	15.	412.35	1.32	1.073E-02	602.73	98.260	PBC<MDA	SB124
604.71	18.	361.13	1.32	1.070E-02	604.71	97.620	PBC<MDA	CS134
609.59	1726.	2.54	1.25	1.063E-02	609.31	46.090	1.953E+02	BI214
					610.30	5.750	1.571E+03	RU103
618.06	20.	123.77	1.33	1.051E-02	618.06	99.100	PBC<MDA	PM144
621.92	17.	93.47	1.33	1.045E-02	621.92	9.930	PBC<MDA	RH106
636.97	9.	163.95	1.34	1.025E-02	636.97	7.170	PBC<MDA	I131
657.76	17.	81.71	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
661.66	2.	740.61	1.37	9.924E-03	661.66	85.210	PBC<MDA	CS137
696.54	2.	922.50	1.40	9.507E-03	696.54	99.000	PBC<MDA	PM144
702.63	41.	43.07	1.40	9.438E-03	702.63	97.900	2.465E+00	NB94
722.79	16.	92.21	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.095E+00	AG108M
					723.36	20.220	4.922E+00	EU154
735.72	6.	302.87	1.43	9.081E-03	735.72	22.500	PBC<MDA	pm146
747.16	17.	88.52	1.44	8.965E-03	747.16	34.000	PBC<MDA	pm146

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
768.61	174.	10.44	1.42	8.755E-03				
778.92	13.	125.22	1.46	8.657E-03	778.92	12.940	PBC<MDA	EU152
785.42	22.	97.00	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
801.95	13.	158.60	1.48	8.448E-03	801.95	8.690	PBC<MDA	CS134
818.50	15.	148.99	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
834.85	16.	93.15	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54
846.77	9.	156.35	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
860.83	3.	477.37	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
873.23	15.	75.39	1.54	7.866E-03	873.23	12.270	PBC<MDA	EU154
898.04	13.	129.15	1.56	7.684E-03	898.04	93.700	PBC<MDA	y88
911.07	58.	23.31	0.68	7.591E-03	911.07	29.000	1.475E+01	AC228
946.02	2.	796.87	1.60	7.355E-03	946.02	13.400	PBC<MDA	PA234
964.11	55.	23.88	1.61	7.239E-03	964.11	14.605	2.908E+01	EU152
969.00	37.	32.01	1.20	7.209E-03	968.97	17.460	1.618E+01	AC228
1037.84	4.	402.66	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1050.36	12.	111.28	1.67	6.736E-03	1050.36	1.560	PBC<MDA	RH106
1063.66	28.	25.83	1.68	6.666E-03	1063.66	74.500	3.178E+00	BI207
1077.89	3.	521.39	1.69	6.594E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	9.	158.05	1.71	6.484E-03	1099.25	56.500	PBC<MDA	FE59
1120.75	371.	6.26	1.55	6.379E-03	1120.29	15.100	2.128E+02	BI214
					1120.55	99.987	3.231E+01	Sc46
					1121.30	34.900	9.262E+01	Ta182
1173.24	13.	104.57	1.76	6.138E-03	1173.24	99.900	PBC<MDA	CO60
1221.41	25.	47.08	1.79	5.934E-03	1221.41	27.000	8.554E+00	Ta182
1238.28	111.	17.78	1.80	5.866E-03	1238.28	66.070	1.585E+01	Co56
1291.60	12.	112.27	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	6.	218.16	1.85	5.583E-03	1313.00	21.000	PBC<MDA	TL210
1384.30	13.	84.21	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	61.	21.42	1.91	5.264E-03	1408.00	21.005	3.079E+01	EU152
1461.49	140.	11.39	1.32	5.103E-03	1460.83	10.670	1.428E+02	K40
1690.98	5.	175.40	2.08	4.511E-03	1690.98	47.790	PBC<MDA	SB124
1765.47	276.	6.02	1.40	4.349E-03	1764.49	15.400	2.272E+02	BI214
1771.35	9.	269.13	2.12	4.337E-03	1771.35	15.480	PBC<MDA	Co56
1836.06	1.	913.38	2.15	4.208E-03	1836.06	99.200	PBC<MDA	y88

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV		Suspected Nuclide
213.08	53.38	348.	119.	5.403E+03	28.66	0.719	-	sM
229.38	57.41	278.	52.	2.157E+03	47.15	0.795	-	sD
240.21	60.11	362.	66.	2.578E+03	42.56	0.797	-	sD
290.69	72.76	397.	53.	1.729E+03	54.54	0.811	-	sD
299.02	74.84	510.	822.	2.608E+04	5.22	0.813	-	D
308.24	77.14	523.	1297.	4.028E+04	3.73	0.815	-	D
316.84	79.29	527.	117.	3.571E+03	29.24	0.817	-	D

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
335.01	83.86	364.	231.	6.828E+03	13.40	0.822	- sD
348.12	87.14	509.	393.	1.140E+04	9.56	0.825	- sD
358.57	89.75	355.	219.	6.274E+03	13.93	0.828	- sD
378.86	94.82	363.	71.	2.010E+03	39.56	0.833	- sD
744.73	186.09	409.	612.	2.146E+04	6.19	0.926	- sD
982.28	245.42	106.	68.	3.020E+03	24.43	0.985	- sD
1556.68	389.03	111.	44.	2.847E+03	37.12	1.122	- sD
2160.89	540.07	10.	18.	1.573E+03	34.72	0.716	- s
3075.16	768.61	39.	174.	1.988E+04	10.44	1.424	-
7060.22	1765.47	30.	254.	5.850E+04	6.97	2.115	- sD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	186.10	46.64	291.	297.	0.165	11.22	0.803
TH-227	200.11	50.14	914.	34.	0.019	125.12	0.787s
AM-241	237.72	59.54	1897.	22.	0.012	283.58	0.797
TH-234	252.74	63.29	448.	335.	0.186	10.50	0.801D
Sn-126	256.71	64.28	2056.	41.	0.023	158.27	0.802
BA-133	323.61	80.99	8996.	-45.	-0.025	298.64	0.819s
Np-237	345.63	86.49	8917.	-45.	-0.025	295.28	0.825s
EU-155	345.84	86.54	8872.	-45.	-0.025	294.54	0.825s
Sn-126	347.43	86.94	8826.	-45.	-0.025	293.69	0.825
Sn-126	349.95	87.57	8781.	-45.	-0.025	292.67	0.826
Cd-109	351.83	88.04	8671.	-45.	-0.025	290.66	0.826s
Nd-147	364.08	91.10	8626.	-46.	-0.025	288.82	0.829s
TH-234	370.05	92.59	439.	470.	0.261	7.82	0.831D
AC-228	373.09	93.35	8524.	-46.	-0.025	286.32	0.832s
Gd-153	389.70	97.50	8334.	46.	0.025	282.21	0.836s
Np-239	397.71	99.50	8524.	-46.	-0.026	284.14	0.838s
Gd-153	412.52	103.20	1032.	-32.	-0.018	140.92	0.842s
Np-239	414.52	103.70	1065.	0.	0.000	1000.00	0.842s
EU-155	420.98	105.31	9474.	-47.	-0.026	77.94	0.844s
Np-239	424.25	106.13	9378.	-46.	-0.026	298.05	0.845s
EU-152	486.88	121.78	836.	-39.	-0.022	105.63	0.861s
CO-57	488.03	122.06	660.	38.	0.021	96.65	0.861s
EU-154	492.18	123.10	676.	8.	0.004	459.07	0.862s
PA-234	524.99	131.29	1298.	-40.	-0.022	127.77	0.871s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
HF-181	531.91	133.02	1118.	-41.	-0.023	115.31	0.872s
CE-144	533.97	133.54	1167.	-11.	-0.006	423.67	0.873s
HF-181	545.02	136.30	1360.	-42.	-0.023	125.14	0.876s
CO-57	545.72	136.47	1454.	-35.	-0.019	155.69	0.876s
Tc-99m	561.88	140.51	1386.	-41.	-0.023	130.57	0.880s
U-235	574.20	143.59	342.	123.	0.068	28.89	0.933s
CE-141	581.61	145.44	1257.	-41.	-0.023	123.75	0.885s
Ba-140	650.54	162.66	981.	-41.	-0.023	110.29	0.902s
U-235	653.79	163.47	315.	90.	0.050	38.48	0.453s
CE-139	663.32	165.85	940.	-41.	-0.023	107.67	0.905s
Cf-251	706.34	176.60	497.	-17.	-0.009	239.21	0.916s
U-235	742.85	185.72	1023.	56.	0.031	82.39	0.925D
TH-229	774.03	193.51	437.	32.	0.018	116.34	0.933s
U-235	821.35	205.33	351.	69.	0.038	49.56	0.945s
TH-229	843.44	210.85	400.	36.	0.020	99.67	0.950s
Cf-251	908.08	227.00	357.	-12.	-0.006	289.55	0.966s
PB-212	954.64	238.63	166.	220.	0.122	10.70	0.978D
PB-214	968.10	242.00	163.	691.	0.384	4.61	0.981D
EU-152	978.89	244.69	1614.	-32.	-0.018	179.91	0.984s
TH-227	1025.11	256.24	341.	-5.	-0.003	692.39	0.995s
Cd-113m	1054.97	263.70	451.	-21.	-0.012	144.67	1.002s
BI-210M	1063.50	265.83	403.	30.	0.017	96.23	1.005s
TL-208	1109.33	277.28	532.	-36.	-0.020	92.52	1.016
Hg-203	1117.00	279.20	571.	-37.	-0.021	63.72	1.017
I-131	1137.41	284.30	260.	-5.	-0.003	567.63	1.022s
PB-214	1181.64	295.35	171.	1490.	0.828	3.13	1.006
TL-210	1184.24	296.00	2487.	-29.	-0.016	243.99	1.034s
PB-212	1200.37	300.03	2458.	-12.	-0.007	382.27	1.038
PA-231	1200.53	300.07	2446.	0.	0.000	1000.00	1.038
PA-233	1200.97	300.18	2428.	-18.	-0.010	380.84	1.038
PA-231	1210.86	302.65	2410.	0.	0.000	1000.00	1.040
BA-133	1211.66	302.85	2410.	0.	0.000	1000.00	1.040
Ba-140	1219.66	304.85	2410.	0.	0.000	1000.00	1.042s
BI-210M	1219.85	304.90	2410.	0.	0.000	1000.00	1.042s
PA-233	1248.32	312.01	231.	-11.	-0.006	252.82	1.049s
Ir-192	1266.25	316.49	400.	0.	0.000	1000.00	1.053
CR-51	1280.63	320.08	365.	3.	0.002	794.02	1.057s
La-140	1315.35	328.76	188.	55.	0.031	48.23	1.065s
Cf-249	1334.08	333.44	238.	-25.	-0.014	115.73	1.070
AC-228	1353.61	338.32	514.	27.	0.015	120.12	1.074
Cs-136	1362.62	340.57	541.	11.	0.006	308.96	1.077s
EU-152	1377.49	344.29	491.	-27.	-0.015	117.65	1.080s
HF-181	1383.66	345.83	575.	-30.	-0.017	113.28	1.082
PB-214	1408.72	352.09	169.	2413.	1.341	2.33	1.042
BA-133	1424.36	356.00	2778.	-28.	-0.015	267.96	1.091s
I-131	1458.32	364.48	143.	21.	0.012	109.57	1.099s
BA-133	1535.78	383.84	405.	-20.	-0.011	140.69	1.117s
Cf-249	1552.22	387.95	369.	16.	0.009	166.53	1.121s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SN-113	1567.19	391.69	446.	-3.	-0.002	898.00	1.125s
SB-125	1711.99	427.88	112.	48.	0.027	45.53	1.158
AG-108M	1736.25	433.94	188.	-28.	-0.015	78.66	1.164s
pm-146	1816.05	453.88	173.	-25.	-0.014	88.07	1.182s
SB-125	1854.01	463.37	270.	-15.	-0.008	145.34	1.191s
Ir-192	1872.79	468.06	166.	19.	0.011	98.23	1.195s
BE-7	1910.94	477.59	194.	-18.	-0.010	114.93	1.204s
HF-181	1928.56	482.00	200.	6.	0.004	319.67	1.208s
La-140	1948.65	487.02	72.	50.	0.028	36.33	1.212s
RH-106	2048.06	511.86	120.	134.	0.074	22.56	2.485
Nd-147	2124.62	531.00	100.	-11.	-0.006	180.53	1.252s
Ba-140	2149.67	537.26	115.	-16.	-0.009	111.78	1.258s
CS-134	2253.60	563.24	128.	-25.	-0.014	90.17	1.280s
CS-134	2277.94	569.32	100.	-6.	-0.003	239.21	1.286
PA-234	2278.54	569.47	98.	10.	0.006	138.78	1.286
TL-208	2334.73	583.52	54.	86.	0.048	20.34	1.948s
SB-125	2402.69	600.50	2006.	18.	0.010	359.00	1.313s
SB-124	2411.61	602.73	2026.	15.	0.009	412.35	1.315s
CS-134	2419.53	604.71	2042.	18.	0.010	361.13	1.317s
BI-214	2439.04	609.59	50.	1723.	0.957	2.55	1.252
RU-103	2441.89	610.30	2059.	18.	0.010	361.38	1.322s
PM-144	2472.94	618.06	285.	20.	0.011	123.77	1.328s
RH-106	2488.37	621.92	113.	17.	0.009	93.47	1.332s
I-131	2548.61	636.97	54.	9.	0.005	163.95	1.345s
AG-110M	2631.76	657.76	89.	17.	0.009	81.71	1.362
CS-137	2647.36	661.66	111.	2.	0.001	740.61	1.366s
PM-144	2786.90	696.54	56.	2.	0.001	922.50	1.395s
NB-94	2811.25	702.63	65.	41.	0.023	43.07	1.400s
SB-124	2891.88	722.79	108.	16.	0.009	92.21	1.417s
AG-108M	2892.48	722.94	124.	0.	0.000	1000.00	1.417s
EU-154	2894.16	723.36	124.	0.	0.000	1000.00	1.418
ZR-95	2897.53	724.20	150.	-22.	-0.012	81.33	1.418
BI-212	2909.41	727.17	149.	-15.	-0.008	119.61	1.421s
pm-146	2943.61	735.72	69.	6.	0.003	302.87	1.428s
pm-146	2989.37	747.16	48.	17.	0.009	88.52	1.437s
ZR-95	3027.65	756.73	61.	-4.	-0.002	401.19	1.445s
AG-110M	3056.50	763.94	290.	-7.	-0.004	338.21	1.451s
NB-95	3063.89	765.79	283.	0.	0.000	1000.00	1.453s
PA-234M	3066.38	766.41	283.	0.	0.000	1000.00	1.453s
EU-152	3116.41	778.92	56.	13.	0.007	125.22	1.463s
BI-212	3142.41	785.42	93.	22.	0.012	97.00	1.468s
CS-134	3184.19	795.87	178.	-24.	-0.013	82.91	1.477s
TL-210	3199.12	799.60	202.	-24.	-0.013	87.71	1.480
CS-134	3208.53	801.95	215.	13.	0.007	158.60	1.482s
CO-58	3243.82	810.78	213.	-24.	-0.013	87.33	1.489s
La-140	3263.80	815.77	237.	-24.	-0.014	91.69	1.493s
Cs-136	3274.72	818.50	235.	15.	0.008	148.99	1.495s
MN-54	3340.10	834.85	47.	16.	0.009	93.15	1.508s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	3387.78	846.77	42.	9.	0.005	156.35	1.518s
TL-208	3442.95	860.56	57.	3.	0.002	477.37	1.529s
NB-94	3485.08	871.10	70.	-4.	-0.002	300.00	1.537s
EU-154	3493.61	873.23	54.	15.	0.008	75.39	1.539s
PA-234	3522.80	880.53	186.	-19.	-0.011	104.07	1.544
PA-234	3533.64	883.24	205.	0.	0.000	1000.00	1.547
AG-110M	3539.41	884.68	205.	0.	0.000	1000.00	1.547s
Sc-46	3557.79	889.28	292.	-27.	-0.015	89.94	1.551
y-88	3592.83	898.04	56.	13.	0.007	129.15	1.558s
AC-228	3644.93	911.07	29.	58.	0.032	23.31	0.675s
AG-110M	3750.60	937.49	219.	-38.	-0.021	84.58	1.589s
PA-234	3784.70	946.02	56.	2.	0.001	796.87	1.595s
EU-152	3857.05	964.11	60.	55.	0.031	23.88	1.609
AC-228	3876.58	969.00	23.	37.	0.020	32.01	1.200s
EU-154	3985.88	996.33	142.	-21.	-0.012	82.37	1.633s
EU-154	4019.65	1004.77	105.	-26.	-0.015	88.52	1.639s
Co-56	4151.87	1037.84	50.	4.	0.002	402.66	1.664s
Cs-136	4192.77	1048.07	78.	-19.	-0.011	69.63	1.671s
RH-106	4201.93	1050.36	90.	12.	0.007	111.28	1.673s
BI-207	4255.11	1063.66	6.	28.	0.016	25.83	1.682s
Ga-68	4310.04	1077.40	50.	3.	0.002	521.39	1.692s
FE-59	4397.41	1099.25	40.	9.	0.005	158.05	1.708s
EU-152	4448.68	1112.07	489.	-16.	-0.009	193.12	1.717s
ZN-65	4462.56	1115.55	473.	0.	0.000	1000.00	1.720s
BI-214	4483.35	1120.75	31.	369.	0.205	6.31	1.546
Sc-46	4482.57	1120.55	473.	0.	0.000	1000.00	1.723
Ta-182	4485.56	1121.30	500.	-22.	-0.012	147.97	1.724
CO-60	4693.21	1173.24	35.	13.	0.007	104.57	1.760
Ta-182	4756.42	1189.05	60.	-21.	-0.012	82.78	1.771
Ta-182	4885.79	1221.41	21.	25.	0.014	47.08	1.793
Co-56	4953.23	1238.28	53.	111.	0.061	17.78	1.804s
NA-22	5098.13	1274.53	53.	-12.	-0.007	88.45	1.828s
EU-154	5098.19	1274.54	66.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	32.	12.	0.007	112.27	1.840s
TL-210	5251.91	1313.00	32.	6.	0.003	218.16	1.854s
CO-60	5329.85	1332.50	22.	-5.	-0.003	292.05	1.866s
AG-110M	5536.88	1384.30	21.	13.	0.007	84.21	1.899
EU-152	5631.62	1408.00	22.	61.	0.034	21.42	1.914
K-40	5845.38	1461.49	20.	140.	0.078	11.39	1.320s
La-140	6383.73	1596.21	28.	-2.	-0.001	538.99	2.024s
SB-124	6762.39	1690.98	11.	5.	0.003	175.40	2.076s
BI-214	7056.06	1764.49	296.	-10.	-0.005	248.57	2.114s
Co-56	7083.46	1771.35	278.	9.	0.005	269.13	2.117s
y-88	7341.96	1836.06	12.	1.	0.001	913.38	2.149s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	-7.0926E+00				5.31E+01	
			477.60	-7.093E+00	?(	2.737E+01	1.15E+02 1.05E+01 G
NA-22	C	-1.1976E+00				9.50E+02	
			1274.53	-1.198E+00	?(	3.568E+00	8.84E+01 9.99E+01 G
K-40	N	1.4285E+02				4.66E+11	
			1460.83	1.428E+02	(P	2.402E+01	1.14E+01 1.07E+01 G
Sc-46	F	-1.9720E+00				8.38E+01	
			889.28	-1.972E+00	?(	5.906E+00	8.99E+01 1.00E+02 G
			1120.55	0.000E+00	+	9.063E+00	1.00E+03 1.00E+02 G
CR-51	F	1.0481E+00				2.77E+01	
			320.08	1.048E+00	*(P	2.819E+01	7.94E+02 9.94E+00 G
MN-54	C	1.1005E+00				3.12E+02	
			834.85	1.100E+00	?(P	2.359E+00	9.31E+01 1.00E+02 G
FE-59	F	1.9417E+00				4.45E+01	
			1099.25	1.365E+00	?(	4.881E+00	1.58E+02 5.65E+01 G
			1291.60	2.696E+00	?(P	6.616E+00	1.12E+02 4.32E+01 G
Co-56	C	6.3331E+00				7.73E+01	
			846.77	6.198E-01	(	2.267E+00	1.56E+02 9.99E+01 G
			1238.28	1.585E+01	(P	5.272E+00	1.78E+01 6.61E+01 G
			1037.84	2.250E+00	?(P	2.063E+01	4.03E+02 1.41E+01 G
			1771.35	7.309E+00	?	6.655E+01	2.69E+02 1.55E+01 A
CO-57	C	6.9094E-01				2.72E+02	
			122.06	6.909E-01	(	2.219E+00	9.67E+01 8.56E+01 G
			136.47	-5.243E+00	&	2.715E+01	1.56E+02 1.07E+01 G
CO-58	C	-1.6201E+00				7.09E+01	
			810.78	-1.620E+00	?(	4.715E+00	8.73E+01 9.95E+01 G
CO-60	F	3.5440E-01				1.93E+03	
			1332.50	-4.605E-01	(P	2.454E+00	2.92E+02 1.00E+02 G
			1173.24	1.170E+00	?(P	2.746E+00	1.05E+02 9.99E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	I	2.4652E+00					7.41E+06	
			702.63	2.465E+00	?(	2.422E+00	4.31E+01	9.79E+01 G
			871.10	-2.822E-01	-	2.942E+00	3.00E+02	9.99E+01 G
ZR-95	I	-4.3022E-01					6.40E+01	
			756.73	-4.302E-01	?(P	4.489E+00	4.01E+02	5.45E+01 G
			724.20	-3.016E+00	+	8.171E+00	8.13E+01	4.42E+01 G
RU-103	I	3.6710E-02					3.93E+01	
			497.05	3.671E-02	%(P	2.254E+00	2.43E+03	9.09E+01 G
			610.30	1.619E+01	?	1.949E+02	3.61E+02	5.75E+00 GA
RH-106	I	1.6694E+01					3.74E+02	
			621.92	8.935E+00	*(	2.801E+01	9.35E+01	9.93E+00 G
			1050.36	6.608E+01	?(	2.487E+02	1.11E+02	1.56E+00 G
			511.86	3.027E+01		1.214E+01	2.26E+01	2.00E+01 GA
AG-108M	C	-1.2088E+00					1.53E+05	
			433.94	-1.209E+00	?(P	2.898E+00	7.87E+01	9.05E+01 G
			722.94	0.000E+00	+	3.624E+00	1.00E+03	9.08E+01 G
			614.28	2.776E-01	%	1.259E+01	1.36E+03	8.98E+01 G
AG-110M	F	1.2128E+00					2.50E+02	
			884.68	0.000E+00	*(	6.821E+00	1.00E+03	7.27E+01 G
			657.76	1.005E+00	?(	2.745E+00	8.17E+01	9.46E+01 G
			937.49	-8.258E+00	+	1.565E+01	8.46E+01	3.44E+01 G
			1384.30	5.651E+00	&(	1.038E+01	8.42E+01	2.43E+01 G
			763.94	-2.031E+00	+	2.326E+01	3.38E+02	2.23E+01 G
SN-113	F	-1.8825E-01					1.15E+02	
			391.69	-1.883E-01	?(	5.713E+00	8.98E+02	6.40E+01 G
SB-124	F	1.5111E+00					6.02E+01	
			602.73	8.151E-01	&(P	1.120E+01	4.12E+02	9.83E+01 G
			1690.98	1.203E+00	?(	4.742E+00	1.75E+02	4.78E+01 G
			722.79	9.200E+00	?(	2.845E+01	9.22E+01	1.08E+01 G
SB-125	I	5.8576E+00					1.01E+03	
			427.88	6.308E+00	(P	6.838E+00	4.55E+01	2.96E+01 G
			600.50	5.111E+00	&(	6.111E+01	3.59E+02	1.79E+01 G
			635.89	-8.299E-01	% P	2.033E+01	1.40E+03	1.13E+01 G
			463.37	-5.986E+00	- P	3.149E+01	1.45E+02	1.05E+01 G
I-131	I	1.3664E+00					8.02E+00	
			364.48	8.687E-01	&(P	2.436E+00	1.10E+02	8.17E+01 G
			284.30	-2.406E+00	+	3.514E+01	5.68E+02	6.14E+00 G
			636.97	7.038E+00	?(P	2.788E+01	1.64E+02	7.17E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Gd-153	F	2.3715E+00					2.42E+02	
			97.50	2.371E+00	&(	2.216E+01	2.82E+02	3.00E+01 G
			103.20	-2.293E+00	&	1.076E+01	1.41E+02	2.18E+01 G
Ga-68	C	9.0001E+00					4.71E-02	
			1077.40	9.000E+00	?(	1.070E+02	5.21E+02	3.30E+00 G
Tc-99m	I	-7.6398E-01					2.51E-01	
			140.51	-7.640E-01	?(	3.314E+00	1.31E+02	8.93E+01 G
BA-133	F	-1.5002E+00					3.85E+03	
			356.00	-1.500E+00	?(	1.336E+01	2.68E+02	6.20E+01 G
			302.85	0.000E+00	&	3.686E+01	1.00E+03	1.83E+01 G
			383.84	-8.148E+00	+	3.838E+01	1.41E+02	8.94E+00 GA
			80.99	-2.209E+00	+	2.185E+01	2.99E+02	3.41E+01 GA
CS-134	I	1.6871E+00					7.54E+02	
			604.71	9.432E-01	?(	1.134E+01	3.61E+02	9.76E+01 G
			795.87	-1.798E+00	&	4.963E+00	8.29E+01	8.55E+01 G
			569.32	-1.926E+00	+	1.583E+01	2.39E+02	1.54E+01 G
			801.95	1.004E+01	?(	5.375E+01	1.59E+02	8.69E+00 G
			563.24	-1.476E+01	+	3.248E+01	9.02E+01	8.35E+00 G
CS-137	I	1.3302E-01					1.10E+04	
			661.66	1.330E-01	?(P	3.403E+00	7.41E+02	8.52E+01 G
CE-139	F	-9.0338E-01					1.38E+02	
			165.85	-9.034E-01	(	3.231E+00	1.08E+02	7.99E+01 G
Ba-140	I	-3.1796E+00					1.28E+01	
			537.26	-3.180E+00	&(P	1.018E+01	1.12E+02	2.44E+01 G
			162.66	-1.164E+01	&	4.265E+01	1.10E+02	6.22E+00 G
			304.85	0.000E+00	+	1.584E+02	1.00E+03	4.29E+00 G
La-140	I	2.2390E+00					1.28E+01	
			1596.21	-2.869E-01	&(	3.384E+00	5.39E+02	9.54E+01 G
			487.02	4.736E+00	*(P	4.032E+00	3.63E+01	4.55E+01 G
			328.76	8.513E+00	?(P	1.024E+01	4.82E+01	2.03E+01 G
			815.77	-6.976E+00	+	2.133E+01	9.17E+01	2.33E+01 G
CE-141	I	-1.4051E+00					3.25E+01	
			145.44	-1.405E+00	?(	5.777E+00	1.24E+02	4.82E+01 G
CE-144	I	-1.6418E+00					2.85E+02	
			133.54	-1.642E+00	?(	2.325E+01	4.24E+02	1.11E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-144	C 5.7281E-01					3.63E+02	
		696.54	9.838E-02	@(	2.225E+00	9.22E+02	9.90E+01 G
		618.06	1.047E+00	&(P	4.342E+00	1.24E+02	9.91E+01 G
EU-152	F 7.7789E+00					4.94E+03	
		344.29	-3.308E+00	?(	1.298E+01	1.18E+02	2.65E+01 G
		1112.07	-1.036E+01	+	6.709E+01	1.93E+02	1.36E+01 G
		121.78	-2.124E+00	+	7.456E+00	1.06E+02	2.86E+01 G
		778.92	6.447E+00	(	1.864E+01	1.25E+02	1.29E+01 G
		964.11	2.908E+01	?(	2.034E+01	2.39E+01	1.46E+01 G
		244.69	-1.024E+01	&	6.129E+01	1.80E+02	7.58E+00 G
		1408.00	3.079E+01	P	1.227E+01	2.14E+01	2.10E+01 GA
EU-154	I 8.4443E+00					3.14E+03	
		873.23	8.444E+00	?(P	2.123E+01	7.54E+01	1.23E+01 G
		123.10	3.060E-01	&	4.719E+00	4.59E+02	4.08E+01 G
		1274.54	0.000E+00	-	1.116E+01	1.00E+03	3.52E+01 G
		723.36	0.000E+00	&	1.629E+01	1.00E+03	2.02E+01 G
		1004.77	-1.152E+01	-	2.227E+01	8.85E+01	1.80E+01 G
		996.33	-1.580E+01	-	4.339E+01	8.24E+01	1.06E+01 G
EU-155	I -3.4161E+00					1.81E+03	
		105.31	-3.416E+00	(P	3.305E+01	7.79E+01	2.12E+01 G
		86.54	-2.385E+00	+	2.326E+01	2.95E+02	3.07E+01 G
HF-181	F 3.3633E-01					4.24E+01	
		482.00	3.363E-01	&(P	3.659E+00	3.20E+02	8.05E+01 G
		133.02	-1.521E+00	+	5.824E+00	1.15E+02	4.33E+01 G
		345.83	-6.558E+00	+	2.475E+01	1.13E+02	1.51E+01 G
		136.30	-1.153E+01	&	4.793E+01	1.25E+02	5.85E+00 G
Ta-182	F 6.9102E-01					1.14E+02	
		1121.30	-5.392E+00	(	2.669E+01	1.48E+02	3.49E+01 G
		1221.41	8.554E+00	(	8.403E+00	4.71E+02	2.70E+01 G
		1189.05	-1.204E+01	+	2.193E+01	8.28E+01	1.62E+01 G
Hg-203	F -1.2362E+00					4.66E+01	
		279.20	-1.236E+00	&(P	3.821E+00	6.37E+01	8.15E+01 G
TL-208	N 5.0966E+00					6.98E+02	
		583.02	5.097E+00	@(P	2.211E+00	2.03E+01	8.45E+01 G
		277.28	-1.541E+01	-	4.738E+01	9.25E+01	6.31E+00 G
		860.56	1.885E+00	- P	2.122E+01	4.77E+02	1.24E+01 G
pm-146	C 2.4312E+00					2.02E+03	
		747.16	3.021E+00	&(	6.358E+00	8.85E+01	3.40E+01 G
		735.72	1.541E+00	?(	1.129E+01	3.03E+02	2.25E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		453.88	-1.563E+00	- P	4.022E+00	8.81E+01	6.50E+01 G
y-88	F 9.7354E-01					1.07E+02	
		898.04	9.735E-01	(P	2.909E+00	1.29E+02	9.37E+01 G
		1836.06	1.229E-01	- P	2.516E+00	9.13E+02	9.92E+01 G
Cd-113m	-9.1073E+03					5.33E+03	
		263.70	-9.107E+03	&(	4.409E+04	1.45E+02	6.00E-03 K
Cd-109	F -1.9210E+01					4.53E+02	
		88.04	-1.921E+01	?(	1.849E+02	2.91E+02	3.79E+00 G
Cf-251	T -1.8309E+00					3.28E+05	
		176.60	-1.831E+00	(	1.171E+01	2.39E+02	1.70E+01 G
		227.00	-4.256E+00	+	3.309E+01	2.90E+02	6.30E+00 GA
Cf-249	T 8.9553E-01					1.28E+05	
		387.95	8.955E-01	&(	5.007E+00	1.67E+02	6.60E+01 G
		333.44	-5.164E+00	+	1.522E+01	1.16E+02	1.55E+01 G
Sn-126	8.4592E+00					3.65E+07	
		87.57	-1.945E+00	-	1.885E+01	2.93E+02	3.75E+01 GA
		64.28	8.459E+00	(	4.446E+01	1.58E+02	9.70E+00 G
		86.94	-8.085E+00	+	7.863E+01	2.94E+02	9.04E+00 GA
PB-210	N 2.1725E+02					8.14E+03	
		46.54	2.172E+02	(P	6.008E+01	1.12E+01	4.25E+00 G
PB-212	N 1.2144E+01					6.98E+02	
		238.63	1.214E+01	(P	3.471E+00	1.07E+01	4.33E+01 G
		300.03	-1.077E+01	- P	2.064E+02	3.82E+02	3.28E+00 GA
PB-214	N 2.1502E+02					5.84E+05	
		351.93	2.122E+02	(P	5.566E+00	2.33E+00	3.76E+01 G
		295.09	2.205E+02	(P	9.425E+00	3.13E+00	1.93E+01 G
		242.00	2.255E+02		2.026E+01	4.61E+00	7.43E+00 GA
BI-207	C 1.3746E+00					1.18E+04	
		569.70	-2.410E-08	%(	2.444E+00	2.91E+09	9.77E+01 G
		1063.66	3.178E+00	?(P	1.536E+00	2.58E+01	7.45E+01 G
BI-212	N -1.1860E+01					6.98E+02	
		727.17	-1.186E+01	?(	4.780E+01	1.20E+02	7.55E+00 G
		785.42	1.094E+02	?	2.410E+02	9.70E+01	1.28E+00 GA
U-235	N 2.4222E+01					2.57E+11	
		143.79	1.848E+01	@(P	1.337E+01	2.89E+01	1.10E+01 G
		205.33	2.925E+01	&(P	3.799E+01	4.96E+01	5.01E+00 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		163.38	3.164E+01	(P	3.012E+01	3.85E+01	5.08E+00 G
		185.72	2.006E+00	-	5.472E+00	8.24E+01	5.40E+01 GA
BI-214 N	1.9528E+02						5.84E+05
		609.31	1.953E+02	(P	4.060E+00	2.55E+00	4.61E+01 G
		1120.29	2.128E+02	+ P	1.651E+01	6.31E+00	1.51E+01 G
		1764.49	-8.052E+00	- P	6.868E+01	2.49E+02	1.54E+01 G
BI-210M T	1.5749E+00						1.10E+09
		265.83	1.575E+00	@(	5.045E+00	9.62E+01	5.00E+01 G
		304.90	0.000E+00	-	2.426E+01	1.00E+03	2.80E+01 G
AC-228 N	1.5289E+01						2.10E+03
		911.07	1.475E+01	@(P	6.967E+00	2.33E+01	2.90E+01 G
		968.97	1.618E+01	(	1.113E+01	3.20E+01	1.75E+01 G
		338.32	7.207E+00	- P	2.888E+01	1.20E+02	1.20E+01 G
		93.35	-1.290E+01	-	1.223E+02	2.86E+02	5.56E+00 XA
TH-227 N	1.1908E+01						7.95E+03
		50.14	1.191E+01	@(P	4.957E+01	1.25E+02	8.00E+00 G
		256.24	-1.815E+00	-	3.222E+01	6.92E+02	7.00E+00 G
TH-229 N	1.9408E+01						2.68E+06
		193.51	1.480E+01	?(	4.581E+01	1.16E+02	4.40E+00 G
		210.85	2.619E+01	?(	6.936E+01	9.97E+01	2.99E+00 G
TH-234 N	1.7985E+02						1.63E+12
		63.29	1.798E+02	(P	5.451E+01	1.05E+01	3.81E+00 G
		92.59	1.325E+02	- P	2.831E+01	7.82E+00	5.58E+00 G
PA-233 C	-9.4187E-01						7.82E+08
		312.01	-9.419E-01	(	6.116E+00	2.53E+02	3.60E+01 G
		300.18	-8.567E+00	+	1.086E+02	3.81E+02	6.20E+00 G
PA-234 N	-4.8046E-01						1.63E+12
		131.29	-3.534E+00	&(	1.500E+01	1.28E+02	1.80E+01 G
		946.02	1.127E+00	+	2.118E+01	7.97E+02	1.34E+01 G
		569.47	6.223E+00	?(	2.936E+01	1.39E+02	8.20E+00 G
		883.24	0.000E+00	+	5.157E+01	1.00E+03	9.60E+00 G
		880.53	-2.252E+01	+	7.854E+01	1.04E+02	6.00E+00 GA
PA-234M N	-9.3607E-01						1.63E+12
		1001.00	-9.361E-01	%(	5.896E+02	1.83E+04	8.37E-01 G
		766.41	0.000E+00	+	1.746E+03	1.00E+03	2.94E-01 G
AM-241 T	1.3309E+00						1.58E+05
		59.54	1.331E+00	(P	1.256E+01	2.84E+02	3.59E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Np-237	F -5.5906E+00					2.14E+06	
		86.49	-5.591E+00	&(	5.466E+01	2.95E+02	1.31E+01 G
Ir-192	F 5.7538E-01					7.40E+01	
		316.49	0.000E+00	(	3.336E+00	1.00E+03	8.70E+01 G
		468.06	1.543E+00	&(	5.076E+00	9.82E+01	5.18E+01 G
		308.44	3.733E-01	&	2.141E+01	1.72E+03	3.18E+01 G
Cs-136	F 9.0802E-01					1.30E+01	
		818.50	9.895E-01	?(	4.965E+00	1.49E+02	1.00E+02 G
		1048.07	-1.955E+00	+	4.514E+00	6.96E+01	8.00E+01 G
		340.57	7.343E-01	?(	7.624E+00	3.09E+02	4.69E+01 G
Np-239	T -3.1107E+00					2.36E+00	
		103.70	0.000E+00	+	9.918E+00	1.00E+03	2.40E+01 X
		106.13	-3.111E+00	(	3.070E+01	2.98E+02	2.27E+01 G
		99.50	-4.745E+00	+	4.465E+01	2.84E+02	1.50E+01 X
Nd-147	-3.9414E+00					1.11E+01	
		531.00	-3.941E+00	(	1.767E+01	1.81E+02	1.30E+01 G
		91.10	-2.548E+00	+	2.437E+01	2.89E+02	2.83E+01 G
TL-210	N -1.5629E+00					5.84E+05	
		799.60	-1.563E+00	&(	4.570E+00	8.77E+01	9.90E+01 G
		296.00	-1.051E+00	+	8.522E+00	2.44E+02	7.90E+01 G
		1313.00	2.843E+00	?	1.377E+01	2.18E+02	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
    negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
    failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the
    library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
    to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation

Peak Codes:
G - Gamma Ray

F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-227	50.14	914.	34.	0.019	125.12	1.191E+01	P
BA-133	80.99	8996.	-45.	-0.025	298.64	-2.209E+00	
Np-237	86.49	8917.	-45.	-0.025	295.28	-5.591E+00	
EU-155	86.54	8872.	-45.	-0.025	294.54	-2.385E+00	
Cd-109	88.04	8671.	-45.	-0.025	290.66	-1.921E+01	
Nd-147	91.10	8626.	-46.	-0.025	288.82	-2.548E+00	
Gd-153	97.50	8334.	46.	0.025	282.21	2.371E+00	
Np-239	99.50	8524.	-46.	-0.026	284.14	-4.745E+00	
Gd-153	103.20	1032.	-32.	-0.018	140.92	-2.293E+00	
EU-155	105.31	9474.	-47.	-0.026	77.94	-3.416E+00	P
Np-239	106.13	9378.	-46.	-0.026	298.05	-3.111E+00	
EU-152	121.78	836.	-39.	-0.022	105.63	-2.124E+00	
CO-57	122.06	660.	38.	0.021	96.65	6.909E-01	
EU-154	123.10	676.	8.	0.004	459.07	3.060E-01	
PA-234	131.29	1298.	-40.	-0.022	127.77	-3.534E+00	
HF-181	133.02	1118.	-41.	-0.023	115.31	-1.521E+00	
CE-144	133.54	1167.	-11.	-0.006	423.67	-1.642E+00	
HF-181	136.30	1360.	-42.	-0.023	125.14	-1.153E+01	
CO-57	136.47	1454.	-35.	-0.019	155.69	-5.243E+00	
Tc-99m	140.51	1386.	-41.	-0.023	130.57	-7.640E-01	
CE-141	145.44	1257.	-41.	-0.023	123.75	-1.405E+00	
Ba-140	162.66	981.	-41.	-0.023	110.29	-1.164E+01	
CE-139	165.85	940.	-41.	-0.023	107.67	-9.034E-01	
Cf-251	176.60	497.	-17.	-0.009	239.21	-1.831E+00	
TH-229	193.51	437.	32.	0.018	116.34	1.480E+01	
TH-229	210.85	400.	36.	0.020	99.67	2.619E+01	
Cf-251	227.00	357.	-12.	-0.006	289.55	-4.256E+00	
EU-152	244.69	1614.	-32.	-0.018	179.91	-1.024E+01	
TH-227	256.24	341.	-5.	-0.003	692.39	-1.815E+00	
Cd-113m	263.70	451.	-21.	-0.012	144.67	-9.107E+03	
BI-210M	265.83	403.	30.	0.017	96.23	1.575E+00	
Hg-203	279.20	571.	-37.	-0.021	63.72	-1.236E+00	P
I-131	284.30	260.	-5.	-0.003	567.63	-2.406E+00	
TL-210	296.00	2487.	-29.	-0.016	243.99	-1.051E+00	
PA-233	300.18	2428.	-18.	-0.010	380.84	-8.567E+00	
PA-233	312.01	231.	-11.	-0.006	252.82	-9.419E-01	
CR-51	320.08	365.	3.	0.002	794.02	1.048E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
La-140	328.76	188.	55.	0.031	48.23	8.513E+00	P	
Cs-136	340.57	541.	11.	0.006	308.96	7.343E-01		
EU-152	344.29	491.	-27.	-0.015	117.65	-3.308E+00		
HF-181	345.83	575.	-30.	-0.017	113.28	-6.558E+00		
BA-133	356.00	2778.	-28.	-0.015	267.96	-1.500E+00		
I-131	364.48	143.	21.	0.012	109.57	8.687E-01	P	
BA-133	383.84	405.	-20.	-0.011	140.69	-8.148E+00		
SN-113	391.69	446.	-3.	-0.002	898.00	-1.883E-01		
SB-125	427.88	112.	48.	0.027	45.53	6.308E+00	P	
AG-108M	433.94	188.	-28.	-0.015	78.66	-1.209E+00	P	
pm-146	453.88	173.	-25.	-0.014	88.07	-1.563E+00	P	
SB-125	463.37	270.	-15.	-0.008	145.34	-5.986E+00	P	
Ir-192	468.06	166.	19.	0.011	98.23	1.543E+00		
BE-7	477.59	194.	-18.	-0.010	114.93	-7.093E+00		
HF-181	482.00	200.	6.	0.004	319.67	3.363E-01	P	
La-140	487.02	72.	50.	0.028	36.33	4.736E+00	P	
RH-106	511.86	120.	134.	0.074	22.56	3.027E+01		
Nd-147	531.00	100.	-11.	-0.006	180.53	-3.941E+00		
Ba-140	537.26	115.	-16.	-0.009	111.78	-3.180E+00	P	
CS-134	563.24	128.	-25.	-0.014	90.17	-1.476E+01		
CS-134	569.32	100.	-6.	-0.003	239.21	-1.926E+00		
PA-234	569.47	98.	10.	0.006	138.78	6.223E+00		
SB-125	600.50	2006.	18.	0.010	359.00	5.111E+00		
SB-124	602.73	2026.	15.	0.009	412.35	8.151E-01	P	
CS-134	604.71	2042.	18.	0.010	361.13	9.432E-01		
RU-103	610.30	2059.	18.	0.010	361.38	1.619E+01		
PM-144	618.06	285.	20.	0.011	123.77	1.047E+00	P	
RH-106	621.92	113.	17.	0.009	93.47	8.935E+00		
I-131	636.97	54.	9.	0.005	163.95	7.038E+00	P	
AG-110M	657.76	89.	17.	0.009	81.71	1.005E+00		
CS-137	661.66	111.	2.	0.001	740.61	1.330E-01	P	
PM-144	696.54	56.	2.	0.001	922.50	9.838E-02		
SB-124	722.79	108.	16.	0.009	92.21	9.200E+00		
ZR-95	724.20	150.	-22.	-0.012	81.33	-3.016E+00		
BI-212	727.17	149.	-15.	-0.008	119.61	-1.186E+01		
pm-146	735.72	69.	6.	0.003	302.87	1.541E+00		
pm-146	747.16	48.	17.	0.009	88.52	3.021E+00		
ZR-95	756.73	61.	-4.	-0.002	401.19	-4.302E-01	P	
AG-110M	763.94	290.	-7.	-0.004	338.21	-2.031E+00		
EU-152	778.92	56.	13.	0.007	125.22	6.447E+00		
BI-212	785.42	93.	22.	0.012	97.00	1.094E+02		
CS-134	795.87	178.	-24.	-0.013	82.91	-1.798E+00		
TL-210	799.60	202.	-24.	-0.013	87.71	-1.563E+00		
CS-134	801.95	215.	13.	0.007	158.60	1.004E+01		
CO-58	810.78	213.	-24.	-0.013	87.33	-1.620E+00		
La-140	815.77	237.	-24.	-0.014	91.69	-6.976E+00		
Cs-136	818.50	235.	15.	0.008	148.99	9.895E-01		
MN-54	834.85	47.	16.	0.009	93.15	1.100E+00	P	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
EU-154	873.23	54.	15.	0.008	75.39	8.444E+00		P
PA-234	880.53	186.	-19.	-0.011	104.07	-2.252E+01		
Sc-46	889.28	292.	-27.	-0.015	89.94	-1.972E+00		
y-88	898.04	56.	13.	0.007	129.15	9.735E-01		P
AG-110M	937.49	219.	-38.	-0.021	84.58	-8.258E+00		
PA-234	946.02	56.	2.	0.001	796.87	1.127E+00		
EU-152	964.11	60.	55.	0.031	23.88	2.908E+01		
EU-154	996.33	142.	-21.	-0.012	82.37	-1.580E+01		
EU-154	1004.77	105.	-26.	-0.015	88.52	-1.152E+01		
Cs-136	1048.07	78.	-19.	-0.011	69.63	-1.955E+00		
RH-106	1050.36	90.	12.	0.007	111.28	6.608E+01		
BI-207	1063.66	6.	28.	0.016	25.83	3.178E+00		P
FE-59	1099.25	40.	9.	0.005	158.05	1.365E+00		
EU-152	1112.07	489.	-16.	-0.009	193.12	-1.036E+01		
Ta-182	1121.30	500.	-22.	-0.012	147.97	-5.392E+00		
CO-60	1173.24	35.	13.	0.007	104.57	1.170E+00		P
Ta-182	1189.05	60.	-21.	-0.012	82.78	-1.204E+01		
Ta-182	1221.41	21.	25.	0.014	47.08	8.554E+00		
NA-22	1274.53	53.	-12.	-0.007	88.45	-1.198E+00		
FE-59	1291.60	32.	12.	0.007	112.27	2.696E+00		P
TL-210	1313.00	32.	6.	0.003	218.16	2.843E+00		
CO-60	1332.50	22.	-5.	-0.003	292.05	-4.605E-01		P
AG-110M	1384.30	21.	13.	0.007	84.21	5.651E+00		
EU-152	1408.00	22.	61.	0.034	21.42	3.079E+01		P
La-140	1596.21	28.	-2.	-0.001	538.99	-2.869E-01		
SB-124	1690.98	11.	5.	0.003	175.40	1.203E+00		
y-88	1836.06	12.	1.	0.001	913.38	1.229E-01		P

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-7.0926E+00	-7.0926E+00	1.149E+02%	2.74E+01
NA-22	#A	-1.1976E+00	-1.1976E+00	8.845E+01%	3.57E+00
K-40		1.4285E+02	1.4285E+02	1.139E+01%	2.40E+01
Sc-46	#A	-1.9720E+00	-1.9720E+00	8.994E+01%	5.91E+00
CR-51	#A	1.0481E+00	1.0481E+00	7.940E+02%	2.82E+01
MN-54	#A	1.1005E+00	1.1005E+00	9.315E+01%	2.36E+00
FE-59	#A	1.9416E+00	1.9417E+00	9.693E+01%	4.88E+00
Co-56	#C	6.3330E+00	6.3331E+00	1.778E+01%	2.27E+00
CO-57	#A	6.9094E-01	6.9094E-01	9.665E+01%	2.22E+00
CO-58	#A	-1.6201E+00	-1.6201E+00	8.733E+01%	4.72E+00
CO-60	#A	3.5440E-01	3.5440E-01	1.046E+02%	2.45E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.78E+01
NB-94	#	2.4652E+00	2.4652E+00	4.307E+01%	2.42E+00

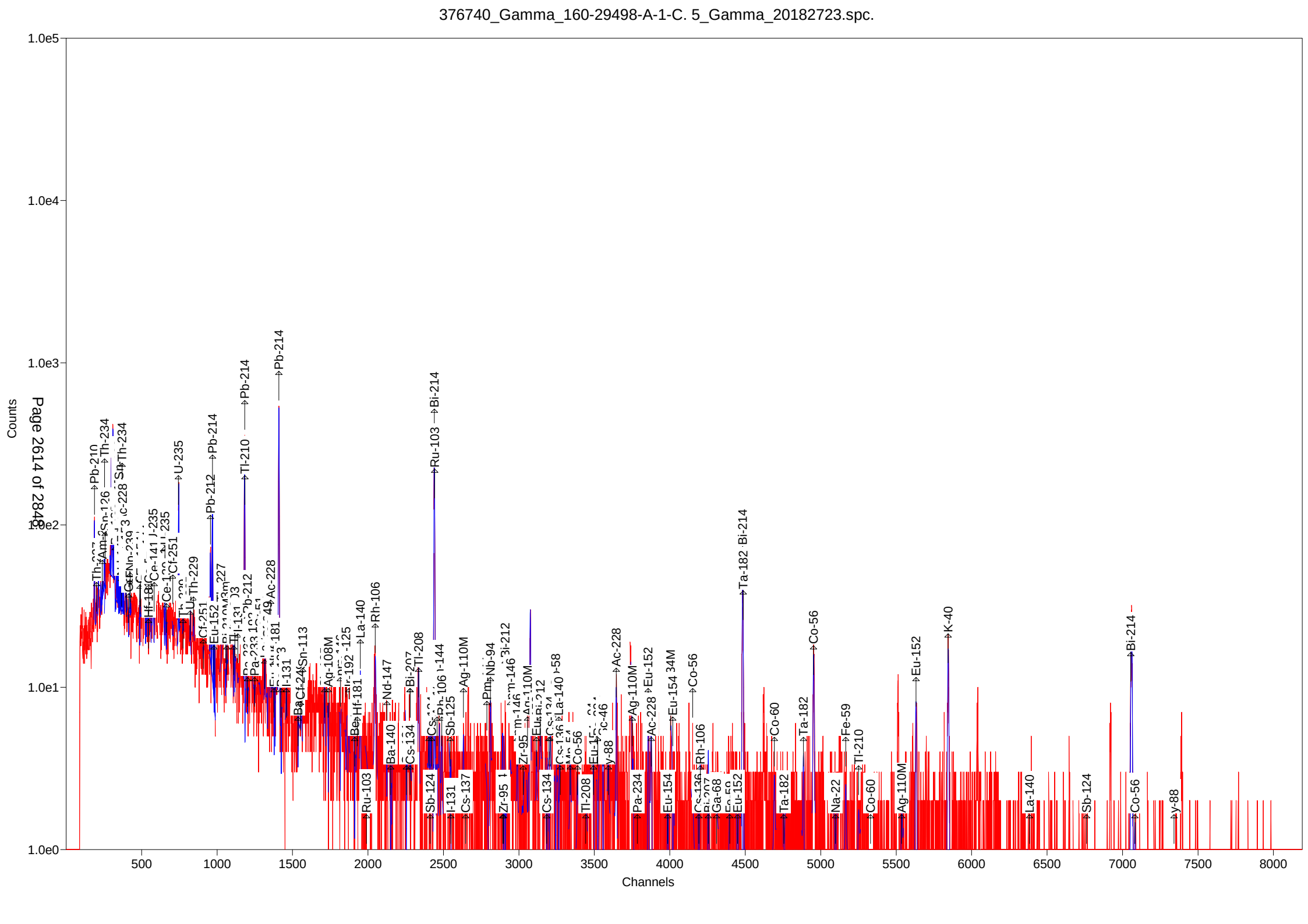
ZR-95	#A	-4.3022E-01	-4.3022E-01	4.012E+02%	4.49E+00
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.14E+00
RU-103	#A	3.6710E-02	3.6710E-02	2.431E+03%	2.25E+00
RH-106	#A	1.6694E+01	1.6694E+01	7.266E+01%	2.80E+01
AG-108M	#A	-1.2088E+00	-1.2088E+00	7.866E+01%	2.90E+00
AG-110M	#A	1.2128E+00	1.2128E+00	8.171E+01%	6.82E+00
SN-113	#A	-1.8825E-01	-1.8825E-01	8.980E+02%	5.71E+00
SB-124	#A	1.5111E+00	1.5111E+00	9.221E+01%	1.12E+01
SB-125	#A	5.8576E+00	5.8576E+00	4.553E+01%	6.84E+00
I-131	#A	1.3664E+00	1.3664E+00	9.860E+01%	2.44E+00
Gd-153	#A	2.3715E+00	2.3715E+00	2.822E+02%	2.22E+01
Ga-68	#A	8.9101E+00	9.0001E+00	5.214E+02%	1.07E+02
Tc-99m	#A	-7.6254E-01	-7.6398E-01	1.306E+02%	3.31E+00
BA-133	#A	-1.5002E+00	-1.5002E+00	2.680E+02%	1.34E+01
CS-134	#A	1.6871E+00	1.6871E+00	1.586E+02%	1.13E+01
CS-137	#A	1.3302E-01	1.3302E-01	7.406E+02%	3.40E+00
CE-139	#A	-9.0338E-01	-9.0338E-01	1.077E+02%	3.23E+00
Ba-140	#A	-3.1795E+00	-3.1796E+00	1.118E+02%	1.02E+01
La-140	#A	2.2389E+00	2.2390E+00	3.633E+01%	3.38E+00
CE-141	#A	-1.4051E+00	-1.4051E+00	1.237E+02%	5.78E+00
CE-144	#A	-1.6418E+00	-1.6418E+00	4.237E+02%	2.33E+01
PM-144	#A	5.7281E-01	5.7281E-01	1.238E+02%	2.22E+00
EU-152	#A	7.7789E+00	7.7789E+00	2.388E+01%	1.30E+01
EU-154	#A	8.4443E+00	8.4443E+00	7.539E+01%	2.12E+01
EU-155	#A	-3.4161E+00	-3.4161E+00	7.794E+01%	3.30E+01
HF-181	#A	3.3632E-01	3.3633E-01	3.197E+02%	3.66E+00
Ta-182	#A	6.9101E-01	6.9102E-01	4.708E+01%	2.67E+01
Hg-203	#A	-1.2362E+00	-1.2362E+00	6.372E+01%	3.82E+00
TL-208	#	5.0966E+00	5.0966E+00	2.034E+01%	2.21E+00
pm-146	#A	2.4312E+00	2.4312E+00	8.852E+01%	6.36E+00
y-88	#A	9.7353E-01	9.7354E-01	1.291E+02%	2.91E+00
Cd-113m	#A	-9.1073E+03	-9.1073E+03	1.447E+02%	4.41E+04
Cd-109	#A	-1.9210E+01	-1.9210E+01	2.907E+02%	1.85E+02
Cf-251	#A	-1.8309E+00	-1.8309E+00	2.392E+02%	1.17E+01
Cf-249	A	8.9553E-01	8.9553E-01	1.665E+02%	5.01E+00
Sn-126	A	8.4592E+00	8.4592E+00	1.583E+02%	4.45E+01
PB-210		2.1725E+02	2.1725E+02	1.122E+01%	6.01E+01
PB-212		1.2144E+01	1.2144E+01	1.070E+01%	3.47E+00
PB-214		2.1502E+02	2.1502E+02	1.951E+00%	5.57E+00
BI-207	#A	1.3746E+00	1.3746E+00	2.583E+01%	2.44E+00
BI-212	#A	-1.1860E+01	-1.1860E+01	1.196E+02%	4.78E+01
U-235		2.4222E+01	2.4222E+01	2.303E+01%	1.34E+01
BI-214		1.9528E+02	1.9528E+02	2.553E+00%	4.06E+00
BI-210M	#A	1.5749E+00	1.5749E+00	9.623E+01%	5.05E+00
AC-228		1.5289E+01	1.5289E+01	1.980E+01%	6.97E+00
TH-227	#A	1.1908E+01	1.1908E+01	1.251E+02%	4.96E+01
TH-229	#A	1.9408E+01	1.9408E+01	7.660E+01%	4.58E+01
TH-234		1.7985E+02	1.7985E+02	1.050E+01%	5.45E+01
PA-231	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.34E+02

PA-233 #A	-9.4187E-01	-9.4187E-01	2.528E+02%	6.12E+00
PA-234 #A	-4.8046E-01	-4.8046E-01	9.432E+01%	1.50E+01
PA-234M#A	-9.3607E-01	-9.3607E-01	1.829E+04%	5.90E+02
AM-241 A	1.3309E+00	1.3309E+00	2.836E+02%	1.26E+01
Np-237 #A	-5.5906E+00	-5.5906E+00	2.953E+02%	5.47E+01
Ir-192 #A	5.7538E-01	5.7538E-01	9.823E+01%	3.34E+00
Cs-136 #A	9.0798E-01	9.0802E-01	1.490E+02%	4.96E+00
Np-239 #A	-3.1101E+00	-3.1107E+00	2.981E+02%	3.07E+01
Nd-147 #A	-3.9413E+00	-3.9414E+00	1.805E+02%	1.77E+01
TL-210 #A	-1.5629E+00	-1.5629E+00	8.771E+01%	4.57E+00

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 2000.8 keV) 1.007E+03 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 1.0069860E+03 Bq/Sample


376740_Gamma_160-29498-A-1-C. 5_Gamma_20182723.spc.
Counts
Channels
1.0e5
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-210
Th-234
Sn-126
Th-234
U-235
Pb-212
Pb-214
Tl-210
Pb-214
Ac-228
Cf-251
Eu-152
Ru-103
Bi-214
Ta-182
Bi-214
Co-56
K-40
Eu-152
Bi-214
Co-56
Ag-110M
La-140
Sb-124
Co-56
y-88

Daily Checks

Test America
St. Louis
Quality Control Check

Spectrum: 5_20180809001_QCAsLeft
Description: Quality control Check (QC Source 'A') Post Stabilization
Acquired: 8/9/2018 12:26:03 AM
Detector: Detector # 5
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.60	59.79	60.04	PASS
FWHM	0.74	0.00	0.00	0.75	1.84	1.94	PASS
ActivityDiff	636.60	-5.00	-4.00	-0.94	4.00	5.00	PASS
QA-662							
FWHM	1.36	0.00	0.00	1.38	3.06	3.16	PASS
ActivityDiff	596.80	-5.00	-4.00	-2.10	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.50	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.68	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.91	4.10	4.20	PASS
ActivityDiff	1164.20	-5.00	-4.00	-0.95	4.00	5.00	PASS

Analyst: Morgan Reichert Reviewer: Morgan Reichert

Test America
St. Louis
Background Check

Spectrum: 5_20180809002_BG
Description: Background Contamination Check
Acquired: 8/9/2018 12:45:40 AM
Detector: Detector # 5
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.45	1.30	1.35	1.43	1.55	1.60	PASS

Analyst: Morgan Reichert Reviewer: Morgan Reichert

Test America
St. Louis
Quality Control Check

Spectrum: 9_20180808026_QCAsLeft
Description: Quality control Check (QC Source 'E') Post Stabilization
Acquired: 8/9/2018 12:21:08 AM
Detector: Detector # 9
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.80	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.55	59.79	60.04	PASS
FWHM	1.08	0.00	0.00	0.96	2.18	2.28	PASS
ActivityDiff	649.44	-5.00	-4.00	-2.38	4.00	5.00	PASS
QA-662							
FWHM	1.62	0.00	0.00	1.47	3.32	3.42	PASS
ActivityDiff	607.56	-5.00	-4.00	-1.33	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.70	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.35	1333.01	1333.26	PASS
FWHM	2.12	0.00	0.00	1.96	4.32	4.42	PASS
ActivityDiff	1191.31	-5.00	-4.00	-0.61	4.00	5.00	PASS

Analyst: Morgan Reichert Reviewer: Morgan Reichert

Test America
St. Louis
Background Check

Spectrum: 9_20180809001_BG
Description: Background Contamination Check
Acquired: 8/9/2018 12:42:48 AM
Detector: Detector # 9
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.89	1.53	1.65	1.77	2.14	2.26	PASS

Analyst: Morgan Reichert Reviewer: Morgan Reichert

Test America
St. Louis
Quality Control Check

Spectrum: 12_20180809001_QCAsLeft
Description: Quality control Check (QC Source 'H') Post Stabilization
Acquired: 8/9/2018 12:22:02 AM
Detector: Detector #12
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.59	59.79	60.04	PASS
FWHM	0.90	0.00	0.00	0.84	2.00	2.10	PASS
ActivityDiff	691.00	-5.00	-4.00	0.70	4.00	5.00	PASS
QA-662							
FWHM	1.48	0.00	0.00	1.42	3.18	3.28	PASS
ActivityDiff	659.00	-5.00	-4.00	-0.35	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.30	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.55	1333.01	1333.26	PASS
FWHM	2.00	0.00	0.00	2.05	4.20	4.30	PASS
ActivityDiff	1274.00	-5.00	-4.00	0.09	4.00	5.00	PASS

Analyst: Morgan Reichert Reviewer: Morgan Reichert

Test America
St. Louis
Background Check

Spectrum: 12_20180809002_BG
Description: Background Contamination Check
Acquired: 8/9/2018 12:41:53 AM
Detector: Detector #12
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.00	1.89	1.93	1.95	2.07	2.10	PASS

Analyst: Morgan Reichert Reviewer: Morgan Reichert

Test America
St. Louis
Quality Control Check

Spectrum: 19_20180808026_QCAsLeft
Description: Quality control Check (QC Source 'F') Post Stabilization
Acquired: 8/9/2018 12:21:10 AM
Detector: Detector #19
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	238.00	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.73	59.79	60.04	PASS
FWHM	0.89	0.00	0.00	0.90	1.99	2.09	PASS
ActivityDiff	663.00	-5.00	-4.00	-0.95	4.00	5.00	PASS
QA-662							
FWHM	1.47	0.00	0.00	1.45	3.17	3.27	PASS
ActivityDiff	633.00	-5.00	-4.00	-1.00	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.90	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.70	1333.01	1333.26	PASS
FWHM	1.92	0.00	0.00	1.89	4.12	4.22	PASS
ActivityDiff	1222.00	-5.00	-4.00	-1.41	4.00	5.00	PASS

Analyst: Morgan Reichert Reviewer: Morgan Reichert

Test America
St. Louis
Background Check

Spectrum: 19_20180809001_BG
Description: Background Contamination Check
Acquired: 8/9/2018 12:40:22 AM
Detector: Detector #19
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.30	2.15	2.20	2.26	2.39	2.44	PASS

Analyst: Morgan Reichert Reviewer: Morgan Reichert

Initial Calibrations

Gamma Verification per Geometry

Detector: Ge5

Geometry: Tunacan

Reference date 1/1/2012

Calibration Standard: 90099

Standard volume g / vial 1550

Standard volume transferred in g / geometry 317.8

lab ID# of cal standard Rad12-0007

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	γ abundance	Bq/sample	Count Results	%recovery
Pb-210	3094	634	0.0425	14926	14353	96.2
Am-241	2037	418	0.3590	1163	1230.2	105.7
Cd-109	2881	591	0.0361	16363	16101	98.4
Co-57	1511	310	0.8560	362	347.72	96.1
Ce-139	2139	439	0.7990	549	538.4	98.1
Hg-203	4651	954	0.8146	1171	1208.4	103.2
Sn-113	3015	618	0.6400	966	972.07	100.6
Cs-137	1938	397	0.8510	467	462.35	99.0
Y-88	7264	1489	0.9370	1589	1559.3	98.1
Co-60	3580	734	0.9997	734	722.51	98.4
Co-60	3581	734	0.9999	734	739.67	100.7
Y-88	7690	1577	0.9920	1589	1613.8	101.5

Reviewed By: Jody Watson

Date: 3/27/2012

Calibration Data from file: 5_Soil_TunaCan.Clb
Energy Calibration Date: 3/27/2012 Time: 5:20:02 PM
Efficiency Calibration Date: 3/27/2012 Time: 5:20:37 PM

Calibration Description:
5_Soil_TunaCan_90099_032612

Energy Calibration Fit
Energy = 0.1351 +0.249831*Channel +2.72022e-008*Channel**2
FWHM (ch) = 2.8138 +0.001050*Channel -2.57606e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
186.01	46.54	46.61	-0.15%	0.74	0.75	-1.17%
237.86	59.54	59.56	-0.04%	0.74	0.77	-4.07%
351.46	88.03	87.95	0.10%	0.80	0.79	1.28%
487.52	122.06	121.94	0.10%	0.85	0.83	2.66%
663.26	165.85	165.85	0.00%	0.88	0.87	0.98%
1116.90	279.17	279.20	-0.01%	0.97	0.99	-2.35%
1567.36	391.69	391.78	-0.02%	1.12	1.10	1.78%
2647.45	661.66	661.74	-0.01%	1.38	1.35	1.91%
3592.51	898.02	898.01	0.00%	1.55	1.56	-1.11%
4692.96	1173.24	1173.18	0.00%	1.77	1.79	-1.18%
5329.72	1332.50	1332.44	0.00%	1.93	1.92	0.31%
7342.77	1836.01	1836.05	-0.00%	2.29	2.29	0.24%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.8682 %
Ln(Eff) = 0.6466 -0.783045*Ln(Eng) -0.0041175*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 1.4296 %
Ln(Eff) = -24.6225 +9.075211*Ln(Eng) -0.966442*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	1.7205E-002	1.7882E-002	-3.93%
59.54	2.6619E-002	2.5335E-002	4.82%
88.03	3.4045E-002	3.4617E-002	-1.68%
122.06	3.4394E-002	3.5819E-002	-4.15%
165.85	========== Knee ==========		
165.85	3.0704E-002	3.1331E-002	-2.04%
279.17	2.1030E-002	2.0365E-002	3.17%
391.69	1.5475E-002	1.5370E-002	0.68%
661.66	9.8486E-003	9.9244E-003	-0.77%
898.02	7.5404E-003	7.6837E-003	-1.90%
1173.24	6.0360E-003	6.1381E-003	-1.69%
1332.50	5.5560E-003	5.5144E-003	0.75%
1836.01	4.2722E-003	4.2078E-003	1.51%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.54	4.25	8.15E+003	14918.00	634.00	4.10%	1/1/2012 11:00:00 AM
Am-241	59.54	35.70	1.58E+005	1170.90	418.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	16371.00	591.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	362.15	310.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	549.44	439.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	1170.60	954.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	965.63	618.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	465.91	397.00	4.00%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	1589.10	1489.00	3.90%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	734.73	734.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	734.15	734.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	1589.70	1577.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  3/27/2012 5:22:03 PM
TestAmerica                    Spectrum name: 5_TunaCan_20120810.An1

Sample description
     5_TunaCan_90099_032612


Spectrum Filename: C:\User\SPC\Det5\5_TunaCan_20120810.An1

Acquisition information
       Start time:                 3/26/2012 3:05:42 PM
       Live time:                3600
       Real time:                3652
       Dead time:                   1.44 %
       Detector ID:                    5

Detector system
     Ge 5 SN/157


Calibration
       Filename:                   5_Soil_TunaCan.Clb
     5_Soil_TunaCan_90099_032612


       Energy Calibration
            Created:               3/27/2012 5:20:02 PM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:             2.720E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/27/2012 5:20:37 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   0.87 %
            Log(Eff):              6.466115E-01 + (-7.830454E-01*Log(E) ) +
                                   ( -4.117504E-03*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.43 %
            Log(Eff):             -2.462251E+01 + ( 9.075211E+00*Log(E) ) +
                                   ( -9.664422E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.61keV )
       Stop channel:            8000 (  2000.53keV )
       Peak rejection level:      10.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method
```

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	average of three points.
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2012 11:00:00 AM
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%

Energy Calibration

Normalized diff: 0.0527

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq	Nuc
46.61	38986.	0.74	0.74	1.793E-02	46.54	4.250	1.435E+04	Pb210
59.56	40041.	0.74	0.74	2.535E-02	59.54	35.700	1.230E+03	AM241
70.85	1493.	9.22	0.78	3.019E-02				
72.87	2354.	5.96	0.78	3.089E-02				
87.95	63754.	0.53	0.80	3.460E-02	88.03	3.610	1.610E+04	CD109
121.94	30888.	0.76	0.85	3.583E-02	122.06	85.600	3.477E+02	CO57
136.41	3768.	3.80	0.89	3.457E-02				
165.85	31597.	0.74	0.88	3.066E-02	165.85	79.900	5.384E+02	Ce139
279.20	20358.	0.87	0.97	2.036E-02	279.17	81.500	1.208E+03	Hg203
391.78	20611.	0.93	1.12	1.537E-02	391.69	64.000	9.721E+02	SN113
661.74	14000.	1.10	1.38	9.923E-03	661.66	85.210	4.623E+02	CS137
898.01	23228.	0.82	1.55	7.684E-03	898.02	93.700	1.559E+03	Y898
1173.18	15468.	0.93	1.77	6.138E-03	1173.24	99.900	7.225E+02	Co1173
1332.44	14238.	0.98	1.93	5.515E-03	1332.50	99.982	7.397E+02	Co1332
1836.04	13938.	0.87	2.30	4.208E-03	1836.01	99.200	1.614E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
291.16	72.88	8722.	2253.	7.295E+04	7.09	0.801	-
545.44	136.41	5274.	3768.	1.090E+05	3.80	0.888	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	186.01	46.61	12895.	38986.	10.829	0.74	0.743
AM-241	237.86	59.56	13293.	40041.	11.122	0.74	0.735
CD-109	351.46	87.95	12894.	63754.	17.710	0.53	0.805
CO-57	487.52	121.94	6935.	30888.	8.580	0.76	0.852
Ce-139	663.26	165.85	5616.	31597.	8.777	0.74	0.883
Hg-203	1116.90	279.20	2848.	20358.	5.655	0.87	0.966
SN-113	1567.36	391.78	3046.	20611.	5.725	0.93	1.119
CS-137	2647.45	661.74	1982.	14000.	3.889	1.10	1.380
Y-898	3592.51	898.01	1944.	23228.	6.452	0.82	1.547
Co-1173	4692.96	1173.18	847.	15468.	4.297	0.93	1.774
Co-1332	5329.75	1332.44	693.	14238.	3.955	0.98	1.927
Y-1836	7342.72	1836.04	102.	13938.	3.872	0.87	2.295

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq	Peak Energy keV	Peak Activity Bq	Code	Peak MDA Value Bq			COMMENTS
Pb-210	N	1.4353E+04				8.15E+03			
			46.54	1.435E+04	(	1.958E+02	7.44E-01	4.25E+00	G
AM-241		1.2302E+03				1.58E+05			
			59.54	1.230E+03	(	1.659E+01	7.44E-01	3.57E+01	G
CD-109		1.6101E+04				4.63E+02			
			88.03	1.610E+04	(	1.343E+02	5.28E-01	3.61E+00	G
CO-57		3.4772E+02				2.72E+02			
			122.06	3.477E+02	(	4.399E+00	7.60E-01	8.56E+01	G

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ce-139	5.3840E+02					1.38E+02	
		165.85	5.384E+02	(	5.997E+00	7.36E-01	7.99E+01 G
Hg-203	1.2084E+03					4.66E+01	
		279.17	1.208E+03	(	1.492E+01	8.69E-01	8.15E+01 G
SN-113	9.7207E+02					1.15E+02	
		391.69	9.721E+02	(	1.226E+01	9.31E-01	6.40E+01 G
CS-137	4.6235E+02					1.10E+04	
		661.66	4.623E+02	(	6.941E+00	1.10E+00	8.52E+01 G
Y-898	1.5593E+03					1.07E+02	
		898.02	1.559E+03	(	1.397E+01	8.19E-01	9.37E+01 G
Co-1173	7.2251E+02					1.93E+03	
		1173.24	7.225E+02	(	6.463E+00	9.30E-01	9.99E+01 G
Co-1332	7.3967E+02					1.93E+03	
		1332.50	7.397E+02	(	6.515E+00	9.82E-01	1.00E+02 G
Y-1836	1.6138E+03					1.07E+02	
		1836.01	1.614E+03	(	5.776E+00	8.71E-01	9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- - - -

Gamma Verification per Geometry

Detector: Ge9

Geometry: Tunacan

Reference date 1/1/2012

Calibration Standard: 90099

Standard volume g / vial 1550

Standard volume transferred in g / geometry 317.8

lab ID# of cal standard 6699

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	γ abundance	Bq/sample	Count Results	%recovery
Pb-210	3094	634	0.0425	14926	14240	95.4
Am-241	2037	418	0.3590	1163	1244.5	107.0
Cd-109	2881	591	0.0361	16363	15902	97.2
Co-57	1511	310	0.8560	362	347.48	96.0
Ce-139	2139	439	0.7990	549	535.87	97.6
Hg-203	4651	954	0.8146	1171	1216.7	103.9
Sn-113	3015	618	0.6400	966	970.65	100.5
Cs-137	1938	397	0.8510	467	466.58	99.9
Y-88	7264	1489	0.9370	1589	1552.5	97.7
Co-60	3580	734	0.9997	734	727.12	99.0
Co-60	3581	734	0.9999	734	719.75	98.0
Y-88	7690	1577	0.9920	1589	1638.8	103.1

Reviewed By: Jody Watson

Date: 6/14/2012

Calibration Data from file: 9_Soil_TunaCan.Clb
Energy Calibration Date: 6/14/2012 Time: 10:19:40 AM
Efficiency Calibration Date: 6/14/2012 Time: 10:19:51 AM

Calibration Description:
9_Soil_TunaCan_90099_050312

Energy Calibration Fit
Energy = 0.0875 +0.250109*Channel -2.0385e-008*Channel**2
FWHM (ch) = 4.1690 +0.000934*Channel -2.36522e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
185.85	46.54	46.57	-0.06%	1.07	1.09	-1.37%
237.85	59.54	59.58	-0.06%	1.08	1.10	-1.96%
351.79	88.03	88.07	-0.05%	1.12	1.12	-0.18%
487.79	122.06	122.08	-0.02%	1.14	1.16	-1.17%
662.64	165.85	165.81	0.02%	1.23	1.19	2.51%
1115.53	279.17	279.07	0.04%	1.30	1.30	0.44%
1565.74	391.69	391.64	0.01%	1.43	1.39	2.81%
2645.81	661.66	661.69	-0.00%	1.60	1.62	-0.83%
3591.21	898.02	898.02	0.00%	1.80	1.80	-0.02%
4692.44	1173.24	1173.26	-0.00%	2.01	2.01	0.18%
5329.80	1332.50	1332.54	-0.00%	2.09	2.12	-1.38%
7344.77	1836.01	1835.98	0.00%	2.45	2.44	0.55%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.3038 %
Ln(Eff) = -0.8080 -0.236727*Ln(Eng) -0.0395064*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 1.4241 %
Ln(Eff) = -23.8792 +8.875647*Ln(Eng) -0.94011*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	2.4596E-002	2.5767E-002	-4.76%
59.54	3.8891E-002	3.6589E-002	5.92%
88.03	4.9059E-002	5.0504E-002	-2.95%
122.06	5.0886E-002	5.3031E-002	-4.22%
165.85	========== Knee ==========		
165.85	4.6197E-002	4.7361E-002	-2.52%
279.17	3.4900E-002	3.3566E-002	3.82%
391.69	2.6668E-002	2.6526E-002	0.53%
661.66	1.8125E-002	1.8099E-002	0.14%
898.02	1.4012E-002	1.4341E-002	-2.34%
1173.24	1.1507E-002	1.1627E-002	-1.05%
1332.50	1.0296E-002	1.0501E-002	-2.00%
1836.01	8.3305E-003	8.0796E-003	3.01%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.54	4.25	8.15E+003	14918.00	634.00	4.10%	1/1/2012 11:00:00 AM
Am-241	59.54	35.70	1.58E+005	1170.90	418.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	16371.00	591.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	362.15	310.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	549.44	439.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	1170.60	954.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	965.63	618.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	465.91	397.00	4.00%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	1589.10	1489.00	3.90%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	734.73	734.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	734.15	734.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	1589.70	1577.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  6/14/2012 10:20:07 AM
TestAmerica, Inc                Spectrum name: 9_TunaCan_20120147.An1

Sample description
     9_TunaCan_90099_050312


Spectrum Filename: C:\User\SPC\Det9\9_TunaCan_20120147.An1

Acquisition information
       Start time:                5/3/2012 1:37:42 PM
       Live time:               3600
       Real time:               3661
       Dead time:                 1.65 %
       Detector ID:                  9

Detector system
     Ge 9 SN/100113


Calibration
       Filename:                  9_Soil_TunaCan.Clb
     9_Soil_TunaCan_90099_050312


       Energy Calibration
            Created:              6/14/2012 10:19:40 AM
            Zero offset:          0.088 keV
            Gain:                 0.250 keV/channel
            Quadratic:           -2.039E-08 keV/channel^2

       Efficiency Calibration
            Created:              6/14/2012 10:19:51 AM
            Knee Energy:        165.85 keV
            Above the Knee:       Quadratic        Uncertainty =   1.30 %
            Log(Eff):            -8.079856E-01 + (-2.367265E-01*Log(E) ) +
                                  ( -3.950640E-02*Log(E)^2 )
            Below the Knee:       Quadratic        Uncertainty =   1.42 %
            Log(Eff):            -2.387916E+01 + ( 8.875647E+00*Log(E) ) +
                                  ( -9.401100E-01*Log(E)^2 )

Library Files
       Main analysis library:     DET_EnergyStandardMix & Pb.Lib
       Library Match Width:       0.500
       Peak stripping:            Library based

Analysis parameters
       Analysis engine:           Env32   G53W4.25
       Start channel:           150 (    37.60keV )
       Stop channel:           8000 (  1999.66keV )
       Peak rejection level:     10.000%
       Peak search sensitivity:   3
       Sample Size:               1.0000E+00
       Activity scaling factor:   1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                  1.0000E+00
       Detection limit method:    Reg. Guide 4.16 Method
```

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	average of three points.
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2012 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%

Energy Calibration

Normalized diff: 0.0265

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq	Nuc
46.57	55553.	0.67	1.07	2.579E-02	46.54	4.250	1.424E+04	Pb210
59.56	58492.	0.66	1.08	3.660E-02	59.54	35.700	1.245E+03	AM241
88.07	86792.	0.48	1.12	5.052E-02	88.03	3.610	1.590E+04	CD109
122.08	41484.	0.73	1.14	5.303E-02	122.06	85.600	3.475E+02	CO57
136.48	5266.	4.55	1.22	5.150E-02				
165.81	39272.	0.74	1.23	4.626E-02	165.85	79.900	5.359E+02	Ce139
279.06	19221.	1.24	1.30	3.358E-02	279.17	81.500	1.217E+03	Hg203
391.64	28263.	0.86	1.43	2.653E-02	391.69	64.000	9.707E+02	SN113
661.69	25703.	0.90	1.61	1.810E-02	661.66	85.210	4.666E+02	CS137
898.02	33728.	0.69	1.80	1.434E-02	898.02	93.700	1.552E+03	Y898
1173.24	29087.	0.72	2.01	1.163E-02	1173.24	99.900	7.271E+02	Co1173
1332.54	26026.	0.70	2.09	1.050E-02	1332.50	99.982	7.198E+02	Co1332
1835.94	21237.	0.73	2.46	8.080E-03	1836.01	99.200	1.639E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
545.34	136.48	10776.	5266.	1.023E+05	4.55	1.225	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.85	46.57	18837.	55553.	15.431	0.67	1.071
AM-241	237.79	59.56	19448.	58492.	16.248	0.66	1.078
CD-109	351.79	88.07	19261.	86792.	24.109	0.48	1.122
CO-57	487.79	122.08	11232.	41484.	11.523	0.73	1.142
Ce-139	662.64	165.81	9084.	39272.	10.909	0.74	1.225
Hg-203	1115.51	279.06	6250.	19221.	5.339	1.24	1.302
SN-113	1565.73	391.64	4864.	28263.	7.851	0.86	1.434
CS-137	2645.81	661.69	4037.	25703.	7.140	0.90	1.605
Y-898	3591.21	898.02	2958.	33728.	9.369	0.69	1.803
Co-1173	4692.36	1173.24	1710.	29087.	8.080	0.72	2.014
Co-1332	5329.80	1332.54	1048.	26026.	7.229	0.70	2.088
Y-1836	7344.62	1835.94	304.	21237.	5.899	0.73	2.457

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq		COMMENTS
Pb-210	N	1.4240E+04				8.15E+03		
			46.54	1.424E+04	(	1.646E+02	6.67E-01 4.25E+00 G	
AM-241		1.2445E+03				1.58E+05		
			59.54	1.245E+03	(	1.388E+01	6.60E-01 3.57E+01 G	
CD-109		1.5902E+04				4.63E+02		
			88.03	1.590E+04	(	1.190E+02	4.84E-01 3.61E+00 G	
CO-57		3.4748E+02				2.72E+02		
			122.06	3.475E+02	(	4.159E+00	7.31E-01 8.56E+01 G	

ORTEC g v - i (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA		Comments
Ce-139	5.3587E+02						1.38E+02	
		165.85	5.359E+02	(	6.097E+00	7.41E-01	7.99E+01	G
Hg-203	1.2167E+03						4.66E+01	
		279.17	1.217E+03	(	2.349E+01	1.24E+00	8.15E+01	G
SN-113	9.7065E+02						1.15E+02	
		391.69	9.707E+02	(	1.125E+01	8.60E-01	6.40E+01	G
CS-137	4.6658E+02						1.10E+04	
		661.66	4.666E+02	(	5.424E+00	8.98E-01	8.52E+01	G
Y-898	1.5525E+03						1.07E+02	
		898.02	1.552E+03	(	1.179E+01	6.92E-01	9.37E+01	G
Co-1173	7.2712E+02						1.93E+03	
		1173.24	7.271E+02	(	4.884E+00	7.20E-01	9.99E+01	G
Co-1332	7.1975E+02						1.93E+03	
		1332.50	7.198E+02	(	4.248E+00	6.98E-01	1.00E+02	G
Y-1836	1.6388E+03						1.07E+02	
		1836.01	1.639E+03	(	6.479E+00	7.29E-01	9.92E+01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape

ORTEC g v - i (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq	Time Corrected Activity Bq	Uncertainty 1 Sigma Counting	MDA
Pb-210	1.4091E+04	1.4240E+04	6.667E-01%	1.65E+02
AM-241	1.2439E+03	1.2445E+03	6.605E-01%	1.39E+01
CD-109	1.3223E+04	1.5902E+04	4.843E-01%	1.19E+02
CO-57	2.5385E+02	3.4748E+02	7.313E-01%	4.16E+00
Ce-139	2.8828E+02	5.3587E+02	7.410E-01%	6.10E+00
Hg-203	1.9517E+02	1.2167E+03	1.239E+00%	2.35E+01
SN-113	4.6244E+02	9.7065E+02	8.599E-01%	1.13E+01
CS-137	4.6297E+02	4.6658E+02	8.981E-01%	5.42E+00
Y-898	6.9723E+02	1.5525E+03	6.917E-01%	1.18E+01
Co-1173	6.9559E+02	7.2712E+02	7.204E-01%	4.88E+00
Co-1332	6.8854E+02	7.1975E+02	6.982E-01%	4.25E+00
Y-1836	7.3602E+02	1.6388E+03	7.291E-01%	6.48E+00

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 1999.7 keV) 3.304E+04 Bq
Total Decayed Activity (37.6 to 1999.7 keV) 3.9561668E+04 Bq

Analyzed by: _____
admin

Reviewed by: _____
Supervisor

Laboratory: TestAmerica, Inc

Gamma Verification per Geometry

Detector: Ge12
Geometry: Tuna Can
Reference date: 1/1/2018
Calibration Standard: 108513
Standard volume g / vial: 1550
Standard volume transferred in g / geometry: 342.2
lab ID# of cal standard: #1402359 / Tuna Can_2018_00001

Isotope	Certified Activity - Bq	Geometry Activity - Bq	Count Results	%recovery
Pb-210	72410	15986	16000	100.1
Am-241	5770	1274	1261	99.0
Cd-109	79700	17596	18250	103.7
Co-57	1809	399	393.1	98.4
Ce-139	2723	601	585.9	97.5
Hg-203	5868	1296	1312	101.3
Sn-113	4658	1028	1059	103.0
Cs-137	2283	504	509.8	101.1
Y-88	7810	1724	1705	98.9
Co-60	3574	789	776.5	98.4
Co-60	3574	789	765.4	97.0
Y-88	7810	1724	1769	102.6

Reviewed By: Jody Watson

Date: 4/23/2018

Calibration Data from file: 12_Soil_TunaCan.Clb
Energy Calibration Date: 4/20/2018 Time: 11:53:01 AM
Efficiency Calibration Date: 4/20/2018 Time: 11:53:09 AM

Calibration Description:
12_TunaCan_108513

Energy Calibration Fit
Energy = 0.0591 +0.250183*Channel -3.73476e-008*Channel**2
FWHM (ch) = 3.2115 +0.001032*Channel -1.75096e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
185.95	46.54	46.58	-0.09%	0.84	0.85	-1.23%
237.82	59.54	59.56	-0.03%	0.86	0.86	-0.65%
351.66	88.03	88.03	-0.01%	0.89	0.89	-0.96%
487.75	122.06	122.08	-0.01%	0.92	0.93	-0.62%
662.97	165.85	165.91	-0.03%	0.97	0.97	0.22%
1115.42	279.17	279.07	0.04%	1.11	1.09	2.13%
1565.35	391.69	391.59	0.02%	1.20	1.20	0.60%
2645.53	661.66	661.66	-0.00%	1.49	1.45	2.30%
3591.22	898.02	898.04	-0.00%	1.66	1.67	-0.91%
4692.62	1173.24	1173.25	-0.00%	1.85	1.92	-3.60%
5330.40	1332.50	1332.57	-0.01%	2.09	2.05	1.92%
7346.34	1836.01	1835.97	0.00%	2.46	2.46	0.18%

Efficiency Calibration Fit
Polynomial Uncertainty = 1.0201 %
Coefficients:
-0.363508 -4.707999 0.462125 -0.051256 0.002384 -0.000043

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	1.8052E-002	1.7999E-002	0.29%
59.54	2.7878E-002	2.8172E-002	-1.06%
88.03	3.7143E-002	3.5814E-002	3.58%
122.06	3.6658E-002	3.7240E-002	-1.59%
165.85	3.3189E-002	3.4052E-002	-2.60%
279.17	2.4853E-002	2.4494E-002	1.45%
391.69	1.9499E-002	1.8934E-002	2.90%
661.66	1.2936E-002	1.2789E-002	1.13%
898.02	1.0139E-002	1.0253E-002	-1.13%
1173.24	8.2922E-003	8.4265E-003	-1.62%
1332.50	7.4182E-003	7.6470E-003	-3.08%
1836.01	6.0193E-003	5.8663E-003	2.54%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.50	4.25	8.11E+003	15986.00	679.41	4.20%	1/1/2018 11:00:00 AM
Am-241	59.50	35.70	1.58E+005	1273.90	454.78	3.60%	1/1/2018 11:00:00 AM
Cd-109	88.00	3.61	4.61E+002	17596.00	635.22	4.10%	1/1/2018 11:00:00 AM
Co-57	122.10	85.60	2.72E+002	399.38	341.87	3.40%	1/1/2018 11:00:00 AM
Ce-139	165.90	79.90	1.38E+002	601.20	480.36	3.60%	1/1/2018 11:00:00 AM
Hg-203	279.20	81.50	4.66E+001	1295.50	1055.83	3.50%	1/1/2018 11:00:00 AM
Sn-113	391.70	64.00	1.15E+002	1028.40	658.18	3.90%	1/1/2018 11:00:00 AM
Cs-137	661.70	85.21	1.10E+004	504.03	429.48	4.10%	1/1/2018 11:00:00 AM
Y-88	898.00	93.70	1.07E+002	1724.30	1615.67	3.70%	1/1/2018 11:00:00 AM
Co-60	1173.20	99.90	1.93E+003	789.05	788.26	3.90%	1/1/2018 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	789.05	788.89	3.90%	1/1/2018 11:00:00 AM
Y-88	1836.10	99.20	1.07E+002	1724.30	1710.51	3.70%	1/1/2018 11:00:00 AM

Test America St. Louis Spectrum ID: 12_TunaCan_20180005

Sample Description: 12_TunaCan_108513
Detector: Detector #12
Batch ID: 12
Work Order Number: TunaCan
Lot Number: 108513

Decay to Time: 1/1/2018 11:00 Live Time: 3600 sec
Acquisition Time: 4/18/2018 13:54:19 Real Time: 3652 sec
Analysis Time: 4/20/2018 11:55 Dead Time: 1.41 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: DET_EnergyStandardMix & Pb.lib
Bkgd Correction File: 12_2017-05-07_0806.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
Pb-210	1.600E+04	0.6	9.485E+01	1.031E+03	1.853E+02
AM-241	1.261E+03	0.7	9.223E+00	8.039E+01	1.659E+01
CD-109	1.825E+04	0.4	7.598E+01	1.135E+03	1.134E+02
CO-57	3.931E+02	0.8	3.042E+00	2.279E+01	5.110E+00
Ce-139	5.859E+02	0.7	4.357E+00	3.335E+01	6.791E+00
Hg-203	1.312E+03	1.1	1.414E+01	7.659E+01	2.206E+01
SN-113	1.059E+03	0.9	9.013E+00	6.310E+01	1.205E+01
CS-137	5.098E+02	0.9	4.734E+00	2.665E+01	6.233E+00
Y-898	1.705E+03	0.8	1.331E+01	8.765E+01	1.505E+01
Co-1173	7.765E+02	0.9	6.740E+00	3.922E+01	6.891E+00
Co-1332	7.654E+02	0.8	6.419E+00	3.866E+01	6.071E+00
Y-1836	1.769E+03	0.8	1.413E+01	1.018E+02	8.211E+00
Total	4.438E+04				

Analyst: Jody Watson

TestAmerica Inc Spectrum name: 12_TunaCan_20180005.An1

Sample description
12_TunaCan_108513

Spectrum Filename: C:\User\SPC\Det12\12_TunaCan_20180005.An1

Acquisition information

Start time:	4/18/2018 1:54:19 PM
Live time:	3600
Real time:	3652
Dead time:	1.41 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration

Filename:	12_Soil_TunaCan.Clb

12_TunaCan_108513

Energy Calibration

Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files

Main analysis library:	DET_EnergyStandardMix & Pb.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2018 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2017-05-07_0806.PBC 5/7/2017 8:06:54 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.0332

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
27.87	601.	9.86	0.70	3.939E-03				
33.44	3191.	3.58	0.84	8.062E-03				
36.78	534.	21.42	0.84	1.059E-02				
38.00	764.	15.14	0.84	1.151E-02				
46.62	43669.	0.59	0.85	1.805E-02	46.54	4.250	1.600E+04	Pb210
49.75	200.	71.91	0.85	2.153E-02				
59.56	45621.	0.73	0.86	2.818E-02	59.54	35.700	1.261E+03	AM241
70.78	903.	16.81	0.88	3.227E-02				
72.97	1715.	8.94	0.88	3.286E-02				
74.88	161.	95.77	0.88	3.334E-02				
77.23	29.	497.10	0.88	3.389E-02				
82.47	1429.	10.54	0.89	3.493E-02				
84.79	2014.	7.84	0.89	3.532E-02				
88.06	72330.	0.42	0.89	3.581E-02	88.03	3.610	1.825E+04	CD109
90.37	144.	87.05	0.90	3.612E-02				
122.08	34326.	0.77	0.92	3.724E-02	122.06	85.600	3.931E+02	CO57
136.51	4200.	4.35	0.96	3.651E-02				
165.91	33460.	0.74	0.97	3.405E-02	165.85	79.900	5.859E+02	Ce139
206.00	117.	63.94	0.45	3.024E-02				
238.46	443.	25.54	0.90	2.744E-02				
255.00	1168.	12.03	0.88	2.617E-02				
279.07	19187.	1.08	1.11	2.450E-02	279.17	81.500	1.312E+03	Hg203
286.67	107.	74.95	0.64	2.401E-02				
351.85	322.	30.50	1.33	2.056E-02				
391.59	24235.	0.85	1.20	1.894E-02	391.69	64.000	1.059E+03	SN113
500.18	113.	56.68	0.53	1.573E-02				
583.01	248.	32.33	0.89	1.403E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
601.08	176.	44.64	0.64	1.372E-02				
643.04	164.	48.09	0.69	1.306E-02				
661.66	19866.	0.93	1.49	1.279E-02	661.66	85.210	5.098E+02	CS137
695.58	154.	52.24	0.30	1.233E-02				
712.59	169.	39.74	0.69	1.212E-02				
814.18	641.	15.80	1.86	1.101E-02				
890.80	44.	76.23	0.45	1.031E-02				
898.03	29383.	0.78	1.66	1.025E-02	898.02	93.700	1.705E+03	Y898
924.59	170.	51.69	2.08	1.004E-02				
1059.91	148.	40.90	0.51	9.087E-03				
1173.24	22640.	0.87	1.85	8.426E-03	1173.24	99.900	7.765E+02	Co1173
1217.40	45.	61.22	0.33	8.195E-03				
1271.51	36.	60.60	1.04	7.928E-03				
1301.67	34.	60.56	0.43	7.787E-03				
1332.57	20270.	0.84	2.09	7.647E-03	1332.50	99.982	7.654E+02	Co1332
1491.52	180.	28.09	0.33	6.994E-03				
1835.92	18468.	0.80	2.47	5.867E-03	1836.01	99.200	1.769E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV		Suspected Nuclide
111.16	27.87	1248.	601.	1.526E+05	9.86	0.703	-	s
133.41	33.32	4927.	3191.	3.959E+05	3.58	0.838	-	sD
146.77	36.66	6263.	534.	5.040E+04	21.42	0.841	-	sD
151.64	37.88	6317.	764.	6.642E+04	15.14	0.842	-	sD
198.79	49.71	10292.	213.	9.912E+03	67.59	0.855	-	sc
282.69	70.80	11078.	903.	2.799E+04	16.81	0.876	-	D
291.44	72.99	10900.	1715.	5.219E+04	8.94	0.878	-	D
299.07	74.90	11841.	161.	4.837E+03	95.77	0.880	-	c
308.48	77.26	10683.	29.	8.685E+02	497.10	0.883	-	c
329.43	82.44	10620.	1431.	4.097E+04	10.52	0.888	-	D
338.70	84.76	11438.	2016.	5.707E+04	7.83	0.890	-	sD
361.04	90.35	7839.	145.	4.014E+03	86.78	0.896	-	sc
545.45	136.51	7622.	4200.	1.150E+05	4.35	0.964	-	
823.26	206.00	2348.	117.	3.869E+03	63.94	0.454	-	s
953.03	238.46	3718.	443.	1.615E+04	25.54	0.897	-	s
1019.19	255.00	4459.	1168.	4.464E+04	12.03	0.878	-	
1145.82	286.67	2108.	107.	4.456E+03	74.95	0.636	-	s
1406.43	351.85	2440.	322.	1.569E+04	30.50	1.334	-	
1999.63	500.18	1252.	113.	7.164E+03	56.68	0.530	-	s
2330.90	583.01	1545.	248.	1.767E+04	32.33	0.894	-	s
2403.19	601.08	1564.	176.	1.283E+04	44.64	0.638	-	s
2571.03	643.04	1587.	164.	1.258E+04	48.09	0.694	-	s
2781.20	695.58	1652.	154.	1.250E+04	52.24	0.304	-	s
2849.27	712.59	1184.	169.	1.395E+04	39.74	0.695	-	s

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
3255.67	814.18	1648.	641.	5.823E+04	15.80	1.859	- s
3562.26	890.80	503.	44.	4.283E+03	76.23	0.452	- sc
3697.47	924.59	1556.	170.	1.690E+04	51.69	2.082	- s
4239.01	1059.91	879.	148.	1.629E+04	40.90	0.508	- s
4869.35	1217.40	238.	45.	5.491E+03	61.22	0.330	- s
5085.97	1271.51	165.	36.	4.541E+03	60.60	1.043	- s
5206.71	1301.67	156.	34.	4.366E+03	60.56	0.434	- s
5966.81	1491.52	462.	180.	2.581E+04	28.09	0.329	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Pb.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.79	46.54	11653.	43669.	12.130	0.59	0.851D
AM-241	237.82	59.56	16449.	45621.	12.672	0.73	0.859
CD-109	351.65	88.03	9195.	72330.	20.092	0.42	0.894D
CO-57	487.75	122.08	9060.	34326.	9.535	0.77	0.923
Ce-139	662.97	165.91	6830.	33460.	9.295	0.74	0.975
Hg-203	1115.42	279.07	4712.	19187.	5.330	1.08	1.109
SN-113	1565.35	391.59	3432.	24235.	6.732	0.85	1.204
CS-137	2645.53	661.66	2656.	19866.	5.518	0.93	1.489
Y-898	3591.19	898.03	3033.	29383.	8.162	0.78	1.658
Co-1173	4692.59	1173.24	1810.	22640.	6.289	0.87	1.852
Co-1332	5330.41	1332.57	1150.	20270.	5.631	0.84	2.092
Y-1836	7346.14	1835.92	317.	18468.	5.130	0.80	2.475

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Peak Code	Peak MDA Value Bq/Sample	COMMENTS
Pb-210	N	1.6003E+04				8.15E+03	
			46.54	1.600E+04	(P	1.853E+02 5.93E-01 4.25E+00 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	1.2606E+03					1.58E+05	
		59.54	1.261E+03	(	1.659E+01	7.32E-01	3.57E+01 G
CD-109	1.8246E+04					4.63E+02	
		88.03	1.825E+04	(	1.134E+02	4.16E-01	3.61E+00 G
CO-57	3.9307E+02					2.72E+02	
		122.06	3.931E+02	(	5.110E+00	7.74E-01	8.56E+01 G
Ce-139	5.8589E+02					1.38E+02	
		165.85	5.859E+02	(	6.791E+00	7.44E-01	7.99E+01 G
Hg-203	1.3123E+03					4.66E+01	
		279.17	1.312E+03	(	2.206E+01	1.08E+00	8.15E+01 G
SN-113	1.0590E+03					1.15E+02	
		391.69	1.059E+03	(	1.205E+01	8.51E-01	6.40E+01 G
CS-137	5.0981E+02					1.10E+04	
		661.66	5.098E+02	(	6.233E+00	9.29E-01	8.52E+01 G
Y-898	1.7049E+03					1.07E+02	
		898.02	1.705E+03	(	1.505E+01	7.81E-01	9.37E+01 G
Co-1173	7.7646E+02					1.93E+03	
		1173.24	7.765E+02	(	6.891E+00	8.68E-01	9.99E+01 G
Co-1332	7.6541E+02					1.93E+03	
		1332.50	7.654E+02	(	6.071E+00	8.39E-01	1.00E+02 G
Y-1836	1.7690E+03					1.07E+02	
		1836.01	1.769E+03	(	8.211E+00	7.99E-01	9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the

library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
Pb-210	1.5857E+04	1.6003E+04	5.927E-01%	1.85E+02
AM-241	1.2600E+03	1.2606E+03	7.317E-01%	1.66E+01
CD-109	1.5540E+04	1.8246E+04	4.164E-01%	1.13E+02
CO-57	2.9911E+02	3.9307E+02	7.739E-01%	5.11E+00
Ce-139	3.4161E+02	5.8589E+02	7.437E-01%	6.79E+00
Hg-203	2.6699E+02	1.3123E+03	1.078E+00%	2.21E+01
SN-113	5.5555E+02	1.0590E+03	8.510E-01%	1.20E+01
CS-137	5.0637E+02	5.0981E+02	9.286E-01%	6.23E+00
Y-898	8.4955E+02	1.7049E+03	7.808E-01%	1.50E+01
Co-1173	7.4709E+02	7.7646E+02	8.681E-01%	6.89E+00
Co-1332	7.3646E+02	7.6541E+02	8.386E-01%	6.07E+00
Y-1836	8.8152E+02	1.7690E+03	7.985E-01%	8.21E+00

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.1 keV) 3.784E+04 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 4.4384840E+04 Bq/Sample

Gamma Verification per Geometry

Detector: **Ge19**
Geometry: **Tuna Can**
Reference date: **1/1/2018**
Calibration Standard: **108513**
Standard volume g / vial: **1550**
Standard volume transferred in g / geometry: **342.2**
lab ID# of cal standard: #1402359 / Tuna Can_2018_00001

Isotope	Certified Activity - Bq	Geometry Activity - Bq	Count Results	%recovery
Pb-210	72410	15986	16000	100.1
Am-241	5770	1274	1262	99.1
Cd-109	79700	17596	18110	102.9
Co-57	1809	399	392.1	98.2
Ce-139	2723	601	592.2	98.5
Hg-203	5868	1296	1308	101.0
Sn-113	4658	1028	1045	101.6
Cs-137	2283	504	518.1	102.8
Y-88	7810	1724	1691	98.1
Co-60	3574	789	778.3	98.6
Co-60	3574	789	770.3	97.6
Y-88	7810	1724	1762	102.2

Reviewed By: Jody Watson

Date: 4/17/2018

Calibration Data from file: 19_Soil_TunaCan.Clb
Energy Calibration Date: 4/16/2018 Time: 12:11:10 PM
Efficiency Calibration Date: 4/16/2018 Time: 12:11:21 PM

Calibration Description:
19_TunaCan_108513

Energy Calibration Fit
Energy = 0.1766 +0.250204*Channel -3.73478e-008*Channel**2
FWHM (ch) = 3.5649 +0.000922*Channel -2.36904e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
185.55	46.54	46.60	-0.13%	0.89	0.93	-4.67%
237.43	59.54	59.58	-0.07%	0.92	0.95	-2.49%
351.31	88.03	88.07	-0.05%	0.99	0.97	1.45%
487.25	122.06	122.08	-0.02%	1.02	1.00	1.42%
662.37	165.85	165.89	-0.02%	1.07	1.04	2.92%
1114.62	279.17	279.01	0.06%	1.17	1.14	2.29%
1564.53	391.69	391.54	0.04%	1.23	1.24	-0.87%
2644.90	661.66	661.68	-0.00%	1.46	1.46	0.15%
3590.43	898.02	898.04	-0.00%	1.63	1.64	-0.77%
4691.85	1173.24	1173.27	-0.00%	1.84	1.84	-0.05%
5329.60	1332.50	1332.60	-0.01%	1.94	1.95	-0.29%
7345.15	1836.01	1835.95	0.00%	2.27	2.26	0.25%

Efficiency Calibration Fit
Polynomial Uncertainty = 0.8405 %
Coefficients:
-0.371612 -4.869309 0.466742 -0.049787 0.002234 -0.000039

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	1.7090E-002	1.7048E-002	0.25%
59.54	2.5898E-002	2.6134E-002	-0.91%
88.03	3.4294E-002	3.3195E-002	3.21%
122.06	3.3380E-002	3.3999E-002	-1.85%
165.85	3.0076E-002	3.0529E-002	-1.51%
279.17	2.1644E-002	2.1412E-002	1.07%
391.69	1.6644E-002	1.6371E-002	1.64%
661.66	1.1237E-002	1.0933E-002	2.71%
898.02	8.5558E-003	8.7213E-003	-1.93%
1173.24	7.0410E-003	7.1383E-003	-1.38%
1332.50	6.3120E-003	6.4652E-003	-2.43%
1836.01	5.0415E-003	4.9331E-003	2.15%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.50	4.25	8.11E+003	15986.00	679.41	4.20%	1/1/2018 11:00:00 AM
Am-241	59.50	35.70	1.58E+005	1273.90	454.78	3.60%	1/1/2018 11:00:00 AM
Cd-109	88.00	3.61	4.61E+002	17596.00	635.22	4.10%	1/1/2018 11:00:00 AM
Co-57	122.10	85.60	2.72E+002	399.38	341.87	3.40%	1/1/2018 11:00:00 AM
Ce-139	165.90	79.90	1.38E+002	601.20	480.36	3.60%	1/1/2018 11:00:00 AM
Hg-203	279.20	81.50	4.66E+001	1295.50	1055.83	3.50%	1/1/2018 11:00:00 AM
Sn-113	391.70	64.00	1.15E+002	1028.40	658.18	3.90%	1/1/2018 11:00:00 AM
Cs-137	661.70	85.21	1.10E+004	504.03	429.48	4.10%	1/1/2018 11:00:00 AM
Y-88	898.00	93.70	1.07E+002	1724.30	1615.67	3.70%	1/1/2018 11:00:00 AM
Co-60	1173.20	99.90	1.93E+003	789.05	788.26	3.90%	1/1/2018 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	789.05	788.89	3.90%	1/1/2018 11:00:00 AM
Y-88	1836.10	99.20	1.07E+002	1724.30	1710.51	3.70%	1/1/2018 11:00:00 AM

Test America St. Louis Spectrum ID: 19_TunaCan_20180020

Sample Description: 19_TunaCan_108513
Detector: Detector #19
Batch ID: 19
Work Order Number: TunaCan
Lot Number: 108513

Decay to Time: 1/1/2018 11:00 Live Time: 3600 sec
Acquisition Time: 3/14/2018 15:23:10 Real Time: 3652 sec
Analysis Time: 4/16/2018 13:51 Dead Time: 1.43 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 19_Soil_TunaCan.Clb
Efficiency Cal Desc: 19_TunaCan_108513
Efficiency Cal Date: 4/16/2018 12:11
Energy Cal Date: 4/16/2018 11:22
Library: DET_EnergyStandardMix & Pb.lib
Bkgd Correction File: 19_2017-05-03_0244.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
Pb-210	1.600E+04	0.6	9.827E+01	1.032E+03	1.956E+02
AM-241	1.262E+03	0.8	9.764E+00	8.057E+01	1.778E+01
CD-109	1.811E+04	0.4	7.707E+01	1.127E+03	1.177E+02
CO-57	3.921E+02	0.9	3.334E+00	2.277E+01	5.681E+00
Ce-139	5.922E+02	0.7	4.306E+00	3.370E+01	6.700E+00
Hg-203	1.308E+03	0.8	1.088E+01	7.580E+01	1.542E+01
SN-113	1.045E+03	0.8	8.323E+00	6.221E+01	1.083E+01
CS-137	5.181E+02	1.1	5.945E+00	2.731E+01	8.219E+00
Y-898	1.691E+03	0.7	1.196E+01	8.678E+01	1.289E+01
Co-1173	7.783E+02	0.9	6.815E+00	3.933E+01	6.923E+00
Co-1332	7.703E+02	1.0	7.560E+00	3.911E+01	7.892E+00
Y-1836	1.762E+03	0.8	1.428E+01	1.014E+02	1.026E+01
Total	4.424E+04				

Analyst: Jody Watson

TestAmerica Inc Spectrum name: 19_TunaCan_20180020.An1

Sample description
19_TunaCan_108513

Spectrum Filename: C:\User\SPC\Det19\19_TunaCan_20180020.An1

Acquisition information

Start time:	3/14/2018 3:23:10 PM
Live time:	3600
Real time:	3652
Dead time:	1.43 %
Detector ID:	19

Detector system
Ge19 SN/11146715

Calibration
Filename: 19_Soil_TunaCan.Clb
19_TunaCan_108513

Energy Calibration

Created:	4/16/2018 11:22:57 AM
Zero offset:	0.177 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/16/2018 12:11:21 PM
Type:	Polynomial
Uncertainty:	0.841 %
Coefficients:	-0.371612 -4.869309 0.466742
	-0.049787 0.002234 -0.000039

Library Files

Main analysis library:	DET_EnergyStandardMix & Pb.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	150 (37.71keV)
Stop channel:	8000 (1999.42keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2018 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	19_2017-05-03_0244.PBC 5/3/2017 2:44:56 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.0474

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.64	41485.	0.61	0.93	1.711E-02	46.54	4.250	1.600E+04	Pb210
49.66	185.	79.61	0.94	2.004E-02				
59.58	42387.	0.77	0.92	2.615E-02	59.54	35.700	1.262E+03	AM241
70.77	1497.	10.76	0.96	2.996E-02				
72.98	2850.	5.71	0.96	3.053E-02				
77.04	130.	105.86	0.96	3.144E-02				
82.61	1804.	9.10	0.97	3.245E-02				
84.89	1999.	8.21	0.97	3.279E-02				
88.09	70129.	0.43	0.97	3.320E-02	88.03	3.610	1.811E+04	CD109
109.95	270.	55.08	0.90	3.432E-02				
122.08	34171.	0.85	1.02	3.400E-02	122.06	85.600	3.921E+02	CO57
136.52	4531.	4.35	1.04	3.311E-02				
156.45	191.	70.26	0.48	3.141E-02				
165.89	36156.	0.73	1.07	3.053E-02	165.85	79.900	5.922E+02	Ce139
255.00	1262.	10.74	1.03	2.296E-02				
279.01	28100.	0.83	1.17	2.142E-02	279.17	81.500	1.308E+03	Hg203
374.53	40.	110.13	0.47	1.696E-02				
391.54	25531.	0.80	1.23	1.638E-02	391.69	64.000	1.045E+03	SN113
438.33	68.	61.86	0.55	1.498E-02				
450.42	51.	90.94	0.45	1.466E-02				
579.11	37.	118.27	1.39	1.208E-02				
583.45	143.	40.12	1.40	1.201E-02				
590.49	120.	62.06	0.55	1.191E-02				
602.94	89.	61.09	0.46	1.172E-02				
608.99	230.	39.38	0.89	1.163E-02				
634.72	58.	97.26	0.36	1.128E-02				
661.68	17295.	1.15	1.46	1.093E-02	661.66	85.210	5.181E+02	CS137

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
680.83	293.	36.47	0.98	1.070E-02				
701.88	76.	74.94	0.28	1.046E-02				
813.88	662.	13.53	1.81	9.378E-03				
898.02	31118.	0.71	1.63	8.721E-03	898.02	93.700	1.691E+03	Y898
919.02	96.	39.05	0.43	8.573E-03				
973.55	110.	43.13	1.47	8.215E-03				
1173.23	19468.	0.88	1.84	7.138E-03	1173.24	99.900	7.783E+02	Co1173
1311.47	54.	70.42	0.52	6.547E-03				
1332.58	17466.	0.98	1.95	6.465E-03	1332.50	99.982	7.703E+02	Co1332
1426.68	175.	38.25	0.53	6.121E-03				
1515.29	59.	39.89	1.20	5.826E-03				
1553.02	72.	48.79	0.62	5.708E-03				
1619.47	59.	52.31	0.50	5.509E-03				
1835.90	19413.	0.81	2.27	4.933E-03	1836.01	99.200	1.762E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV		Suspected Nuclide
197.98	49.61	10751.	205.	1.023E+04	71.88	0.937	-	c
282.14	70.75	12228.	1497.	4.997E+04	10.76	0.956	-	D
290.98	72.96	11800.	2850.	9.335E+04	5.71	0.958	-	D
307.22	77.02	9412.	130.	4.137E+03	105.86	0.962	-	c
329.65	82.59	12567.	1809.	5.576E+04	9.07	0.967	-	sD
338.75	84.87	12449.	2015.	6.145E+04	8.14	0.969	-	sD
438.78	109.95	7282.	270.	7.868E+03	55.08	0.905	-	s
544.98	136.52	8574.	4531.	1.368E+05	4.35	1.039	-	s
624.64	156.45	5607.	191.	6.070E+03	70.26	0.482	-	s
1018.60	255.00	4278.	1262.	5.496E+04	10.74	1.030	-	
1496.54	374.53	900.	40.	2.387E+03	110.13	0.471	-	c
1751.63	438.33	774.	68.	4.506E+03	61.86	0.545	-	s
1800.00	450.42	900.	51.	3.478E+03	90.94	0.447	-	sc
2314.63	579.33	954.	37.	3.086E+03	118.27	1.393	-	sc
2331.99	583.67	1569.	143.	1.188E+04	40.12	1.396	-	sD
2360.15	590.49	1480.	120.	1.008E+04	62.06	0.550	-	s
2409.97	602.94	1012.	89.	7.593E+03	61.09	0.464	-	s
2434.16	608.99	1840.	230.	1.977E+04	39.38	0.887	-	s
2537.07	634.72	1084.	58.	5.099E+03	97.26	0.355	-	sc
2721.49	680.83	2304.	293.	2.739E+04	36.47	0.976	-	s
2805.71	701.88	1056.	76.	7.264E+03	74.94	0.285	-	s
3253.74	813.88	1425.	662.	7.059E+04	13.53	1.808	-	s
3674.40	919.02	530.	96.	1.126E+04	39.05	0.432	-	s
3892.57	973.55	682.	110.	1.345E+04	43.13	1.468	-	s
5245.01	1311.47	348.	54.	8.248E+03	70.42	0.522	-	s
5706.21	1426.68	646.	175.	2.859E+04	38.25	0.525	-	s
6061.00	1515.29	198.	59.	1.013E+04	39.89	1.199	-	s

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
6212.08	1553.02	345.	72.	1.256E+04	48.79	0.621	- s
6478.17	1619.47	284.	59.	1.074E+04	52.31	0.497	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Pb.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.31	46.54	11710.	41485.	11.524	0.61	0.935D
AM-241	237.43	59.58	16272.	42387.	11.774	0.77	0.923
CD-109	351.15	88.03	9451.	70129.	19.480	0.43	0.972D
CO-57	487.25	122.08	11165.	34171.	9.492	0.85	1.017
Ce-139	662.37	165.89	7603.	36156.	10.043	0.73	1.073
Hg-203	1114.62	279.01	4975.	28100.	7.806	0.83	1.168
SN-113	1564.53	391.54	3156.	25531.	7.092	0.80	1.227
CS-137	2644.90	661.68	3399.	17295.	4.804	1.15	1.461
Y-898	3590.36	898.02	2532.	31118.	8.644	0.71	1.632
Co-1173	4691.69	1173.23	1338.	19468.	5.408	0.88	1.845
Co-1332	5329.52	1332.58	1430.	17466.	4.852	0.98	1.948
Y-1836	7344.98	1835.90	561.	19413.	5.392	0.81	2.273

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Peak Code	Peak MDA Value Bq/Sample	COMMENTS
Pb-210	N	1.6003E+04				8.15E+03	
			46.54	1.600E+04	(	1.956E+02 6.14E-01 4.25E+00	G
AM-241		1.2624E+03				1.58E+05	
			59.54	1.262E+03	(	1.778E+01 7.73E-01 3.57E+01	G
CD-109		1.8113E+04				4.63E+02	
			88.03	1.811E+04	(	1.177E+02 4.25E-01 3.61E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	3.9206E+02					2.72E+02	
		122.06	3.921E+02	(	5.681E+00	8.50E-01	8.56E+01 G
Ce-139	5.9221E+02					1.38E+02	
		165.85	5.922E+02	(	6.700E+00	7.27E-01	7.99E+01 G
Hg-203	1.3079E+03					4.66E+01	
		279.17	1.308E+03	(	1.542E+01	8.32E-01	8.15E+01 G
SN-113	1.0455E+03					1.15E+02	
		391.69	1.045E+03	(	1.083E+01	7.96E-01	6.40E+01 G
CS-137	5.1806E+02					1.10E+04	
		661.66	5.181E+02	(	8.219E+00	1.15E+00	8.52E+01 G
Y-898	1.6914E+03					1.07E+02	
		898.02	1.691E+03	(	1.289E+01	7.07E-01	9.37E+01 G
Co-1173	7.7829E+02					1.93E+03	
		1173.24	7.783E+02	(	6.923E+00	8.76E-01	9.99E+01 G
Co-1332	7.7032E+02					1.93E+03	
		1332.50	7.703E+02	(	7.892E+00	9.81E-01	1.00E+02 G
Y-1836	1.7620E+03					1.07E+02	
		1836.01	1.762E+03	(	1.026E+01	8.10E-01	9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation

Peak Codes:
G - Gamma Ray

F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
Pb-210	1.5905E+04	1.6003E+04	6.141E-01%	1.96E+02
AM-241	1.2620E+03	1.2624E+03	7.734E-01%	1.78E+01
CD-109	1.6256E+04	1.8113E+04	4.255E-01%	1.18E+02
CO-57	3.2615E+02	3.9206E+02	8.503E-01%	5.68E+00
Ce-139	4.1173E+02	5.9221E+02	7.271E-01%	6.70E+00
Hg-203	4.4729E+02	1.3079E+03	8.318E-01%	1.54E+01
SN-113	6.7689E+02	1.0455E+03	7.961E-01%	1.08E+01
CS-137	5.1570E+02	5.1806E+02	1.148E+00%	8.22E+00
Y-898	1.0578E+03	1.6914E+03	7.071E-01%	1.29E+01
Co-1173	7.5832E+02	7.7829E+02	8.756E-01%	6.92E+00
Co-1332	7.5056E+02	7.7032E+02	9.814E-01%	7.89E+00
Y-1836	1.1019E+03	1.7620E+03	8.103E-01%	1.03E+01

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.7 to 1999.4 keV) 3.947E+04 Bq/Sample
Total Decayed Activity (37.7 to 1999.4 keV) 4.4235852E+04 Bq/Sample

Initial Calibration Verifications

2nd Source Verification

Detector: Ge5

Geometry: Tunacan

Reference date 1/1/2010

Source: 81427-334

Standard volume g / vial 1550

Standard volume transferred in g / geometry 318.5

lab ID# of cal standard 6665

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	418	0.359	1164	1160.9	99.7
Cs-137	1926	396	0.851	465	442.36	95.1
Co-60	3611	742	0.99974	742	700.21	94.3
Co-60	3612	742	0.999856	742	701.86	94.6

Reviewed By: Jody Watson

Date: 3/27/2012

```
     ORTEC g v - i (3263) Env32  G53W4.25  3/28/2012 7:35:49 AM    Page  1
TestAmerica                     Spectrum name: 5_TunaCan2nd_20120813.An1

Sample description
     5_TunaCan2nd_Rad10_032712


Spectrum Filename: C:\User\SPC\Det5\5_TunaCan2nd_20120813.An1

Acquisition information
       Start time:                 3/27/2012 10:12:05 AM
       Live time:                7200
       Real time:                7250
       Dead time:                   0.69 %
       Detector ID:                    5

Detector system
     Ge 5 SN/157


Calibration
       Filename:                   5_Soil_TunaCan.Clb
     5_Soil_TunaCan_90099_032612


       Energy Calibration
            Created:               3/27/2012 5:20:02 PM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:             2.720E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/27/2012 5:20:37 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   0.87 %
            Log(Eff):              6.466115E-01 + (-7.830454E-01*Log(E) ) +
                                   ( -4.117504E-03*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.43 %
            Log(Eff):             -2.462251E+01 + ( 9.075211E+00*Log(E) ) +
                                   ( -9.664422E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.61keV )
       Stop channel:            8000 (  2000.53keV )
       Peak rejection level:    1000.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method


     ORTEC g v - i (3263) Env32  G53W4.25  3/28/2012 7:35:49 AM    Page  2
TestAmerica                     Spectrum name: 5_TunaCan2nd_20120813.An1
                                      Page 1
```

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2010 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2012-02-26_0305.PBC 2/26/2012 3:05:30 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 33.1557

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
36.81	1005.	12.08	0.62	1.151E-02				
46.61	72616.	0.49	0.73	1.792E-02	46.54	4.250	1.421E+04	Pb210
49.73	1326.	15.18	0.68	1.987E-02				
59.57	75329.	0.49	0.74	2.535E-02	59.54	35.700	1.161E+03	AM241
87.94	40851.	0.68	0.80	3.460E-02	88.03	3.610	1.542E+04	CD109
96.44	148.	47.31	0.80	3.568E-02				
99.01	160.	48.52	0.81	3.589E-02				
105.59	109.	69.79	0.52	3.619E-02				
121.94	9225.	1.66	0.84	3.583E-02	122.06	85.600	3.348E+02	CO57
129.89	126.	62.97	0.30	3.522E-02				
136.43	1263.	7.42	0.90	3.457E-02				
165.86	1574.	6.14	0.84	3.133E-02	165.85	79.900	5.319E+02	Ce139
238.72	327.	27.04	0.86	2.319E-02				
247.25	57.	84.47	0.31	2.252E-02				
259.02	93.	60.17	0.97	2.167E-02				
260.46	98.	58.62	0.97	2.157E-02				
322.65	45.	91.14	0.46	1.806E-02				
351.63	256.	27.79	1.06	1.681E-02				
391.95	494.	16.33	1.15	1.536E-02	391.69	64.000	9.501E+02	SN113
407.02	43.	90.43	0.56	1.489E-02				
412.80	202.	35.90	0.77	1.471E-02				
420.83	123.	52.91	0.72	1.448E-02				
510.72	188.	44.32	0.50	1.232E-02				
542.81	148.	28.69	0.36	1.171E-02				
583.30	161.	33.50	0.69	1.103E-02				
661.70	25605.	0.71	1.39	9.924E-03	661.66	85.210	4.424E+02	CS137
762.61	129.	36.06	0.79	8.812E-03				
796.90	151.	38.71	0.30	8.493E-03				
886.67	129.	46.77	0.30	7.766E-03				
897.77	428.	19.21	1.38	7.686E-03	898.02	93.700	1.665E+03	Y898
932.49	230.	35.52	0.82	7.445E-03				

1008.65	104.	56.29	0.28	6.970E-03				
1173.15	23044.	0.73	1.79	6.138E-03	1173.24	99.900	7.002E+02	Co1173
1332.39	20769.	0.71	1.87	5.515E-03	1332.50	99.982	7.019E+02	Co1332
1836.05	245.	7.47	1.56	4.208E-03	1836.01	99.200	1.642E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
146.78	36.81	4847.	1005.	8.731E+04	12.08	0.625	-
198.52	49.73	12365.	1326.	6.673E+04	15.18	0.681	- s
385.40	96.42	1874.	90.	2.532E+03	71.31	0.588	- sc
395.68	98.99	2103.	121.	3.381E+03	58.44	0.394	- s

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
422.09	105.59	2271.	109.	3.012E+03	69.79	0.518	- sc
519.32	129.89	2194.	126.	3.592E+03	62.97	0.298	- s
545.51	136.43	2377.	1263.	3.654E+04	7.42	0.900	- s
954.90	238.72	2247.	327.	1.410E+04	27.04	0.863	- sM
989.00	247.25	1031.	57.	2.516E+03	84.47	0.312	- sc
1036.13	259.01	1532.	93.	4.309E+03	60.17	0.968	- D
1041.90	260.46	1588.	98.	4.525E+03	58.62	0.970	- D
1290.76	322.65	744.	45.	2.473E+03	91.14	0.455	- c
1406.70	351.63	1442.	256.	1.523E+04	27.79	1.058	- s
1628.36	407.02	667.	43.	2.866E+03	90.43	0.562	- sc
1651.47	412.80	1438.	202.	1.370E+04	35.90	0.775	- s
1683.60	420.83	1291.	123.	8.472E+03	52.91	0.720	- s
2043.25	510.72	1553.	188.	1.523E+04	44.32	0.503	- s
2171.67	542.81	587.	148.	1.267E+04	28.69	0.362	- s
2333.63	583.30	785.	161.	1.460E+04	33.50	0.694	- s
3050.97	762.61	614.	129.	1.468E+04	36.06	0.794	- s
3188.11	796.90	856.	151.	1.782E+04	38.71	0.295	- s
3547.15	886.67	963.	129.	1.665E+04	46.77	0.296	- s
3730.41	932.49	1438.	230.	3.096E+04	35.52	0.818	- s
4035.01	1008.65	864.	104.	1.490E+04	56.29	0.275	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	186.01	46.61	16470.	72552.	10.077	0.49	0.733
AM-241	237.88	59.57	15419.	75329.	10.462	0.49	0.735
CD-109	351.46	87.94	8772.	40851.	5.674	0.68	0.804
CO-57	487.54	121.94	3880.	9225.	1.281	1.66	0.838
Ce-139	663.30	165.86	2329.	1574.	0.219	6.14	0.840
SN-113	1568.04	391.95	1640.	494.	0.069	16.33	1.153
CS-137	2647.28	661.70	1362.	25582.	3.553	0.71	1.394
Y-898	3591.55	897.77	1410.	428.	0.060	19.21	1.376

Co-1173	4692.83	1173.15	788.	23044.	3.201	0.73	1.786
Co-1332	5329.55	1332.39	98.	20769.	2.885	0.71	1.870
Y-1836	7342.76	1836.05	15.	245.	0.034	7.47	1.556s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample		COMMENTS
Pb-210	N	1.4212E+04				8.15E+03		
			46.54	1.421E+04	(P	1.177E+02	4.91E-01	4.25E+00 G
AM-241		1.1609E+03				1.58E+05		
			59.54	1.161E+03	(	8.959E+00	4.87E-01	3.57E+01 G
CD-109		1.5419E+04				4.63E+02		
			88.03	1.542E+04	(	1.658E+02	6.81E-01	3.61E+00 G
CO-57		3.3478E+02				2.72E+02		
			122.06	3.348E+02	(	1.063E+01	1.66E+00	8.56E+01 G
Ce-139		5.3191E+02				1.38E+02		
			165.85	5.319E+02	(	7.689E+01	6.14E+00	7.99E+01 G
Hg-203		-6.5193E-03				4.66E+01		
			279.17	-6.519E-03	%(	1.788E+00	8.22E+03	8.15E+01 G
SN-113		9.5011E+02				1.15E+02		
			391.69	9.501E+02	(	3.682E+02	1.63E+01	6.40E+01 G
CS-137		4.4236E+02				1.10E+04		
			661.66	4.424E+02	(P	3.020E+00	7.12E-01	8.52E+01 G
Y-898		1.6655E+03				1.07E+02		
			898.02	1.665E+03	(	6.908E+02	1.92E+01	9.37E+01 G
Co-1173		7.0021E+02				1.93E+03		
			1173.24	7.002E+02	(	4.056E+00	7.32E-01	9.99E+01 G
Co-1332		7.0186E+02				1.93E+03		
			1332.50	7.019E+02	(	1.651E+00	7.07E-01	1.00E+02 G
Y-1836		1.6424E+03				1.07E+02		
			1836.01	1.642E+03	(	1.392E+02	7.47E+00	9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.

@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the
library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting		MDA Bq/Sample
Pb-210	1.3259E+04	1.4212E+04	4.918E-01%		1.18E+02
AM-241	1.1568E+03	1.1609E+03	4.867E-01%		8.96E+00
CD-109	4.5403E+03	1.5419E+04	6.810E-01%		1.66E+02
CO-57	4.1787E+01	3.3478E+02	1.660E+00%		1.06E+01
Ce-139	8.7347E+00	5.3191E+02	6.138E+00%		7.69E+01
Hg-203 #A	-6.5193E-03	>12 Halflives	8.2197E+03%	1.7882E+00	
SN-113	6.9747E+00	9.5011E+02	1.633E+01%		3.68E+02
CS-137	4.2015E+02	4.4236E+02	7.122E-01%		3.02E+00
Y-898	8.2662E+00	1.6655E+03	1.921E+01%		6.91E+02
Co-1173	5.2196E+02	7.0021E+02	7.316E-01%		4.06E+00
Co-1332	5.2320E+02	7.0186E+02	7.069E-01%		1.65E+00
Y-1836	8.1520E+00	1.6424E+03	7.471E+00%		1.39E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.

```
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded
----------------------------   S U M M A R Y   ----------------------------
Total Activity (  279.0 to  2000.5 keV)     2.050E+04  Bq/Sample
Total Decayed Activity (  279.0 to  2000.5 keV) 3.7761527E+04  Bq/Sample
```

2nd Source Verification

Detector: Ge9

Geometry: Tunacan

Reference date 1/1/2010

Source: 81427-334

Standard volume g / vial 1550

Standard volume transferred in g / geometry 318.5

lab ID# of cal standard 6665

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	418	0.359	1164	1169.4	100.4
Cs-137	1926	396	0.851	465	444.52	95.6
Co-60	3611	742	0.99974	742	687.72	92.7
Co-60	3612	742	0.999856	742	692.56	93.3

Reviewed By: Jody Watson

Date: 6/14/2012

ORTEC g v - i (3263) Env32 G53W4.25 6/14/2012 1:20:45 PM Page 1
TestAmerica, Inc Spectrum name: 9_TunaCan_20120371.An1

Sample description
9_TunaCan_90099_061412

Spectrum Filename: C:\User\SPC\Det9\9_TunaCan_20120371.An1

Acquisition information
Start time: 6/14/2012 10:54:15 AM
Live time: 3600
Real time: 3629
Dead time: 0.81 %
Detector ID: 9

Detector system
Ge 9 SN/100113

Calibration
Filename: 9_Soil_TunaCan.Clb
9_Soil_TunaCan_90099_050312

Energy Calibration
Created: 6/14/2012 10:19:40 AM
Zero offset: 0.088 keV
Gain: 0.250 keV/channel
Quadratic: -2.039E-08 keV/channel^2

Efficiency Calibration
Created: 6/14/2012 10:19:51 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.30 %
Log(Eff): -8.079856E-01 + (-2.367265E-01*Log(E)) + (-3.950640E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.42 %
Log(Eff): -2.387916E+01 + (8.875647E+00*Log(E)) + (-9.401100E-01*Log(E)^2)

Library Files
Main analysis library: DET_EnergyStandardMix & Pb.Lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.25
Start channel: 150 (37.60keV)
Stop channel: 8000 (1999.66keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

ORTEC g v - i (3263) Env32 G53W4.25 6/14/2012 1:20:45 PM Page 2
TestAmerica, Inc Spectrum name: 9_TunaCan_20120371.An1
Page 1

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2010 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2012-05-27_0502.PBC 5/27/2012 5:02:59 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0390

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
36.54	860.	12.66	1.34	1.634E-02				
46.62	48876.	0.54	1.09	2.580E-02	46.54	4.250	1.338E+04	Pb210
50.03	116.	122.12	1.09	2.886E-02				
59.57	54776.	0.62	1.11	3.661E-02	59.54	35.700	1.169E+03	AM241
63.90	47.	193.18	0.35	3.962E-02				
88.09	26880.	0.87	1.14	5.052E-02	88.03	3.610	1.566E+04	CD109
122.10	5522.	2.86	1.15	5.303E-02	122.06	85.600	3.312E+02	CO57
136.38	729.	11.64	1.25	5.151E-02				
165.67	814.	10.74	1.30	4.629E-02	165.85	79.900	5.417E+02	Ce139
295.46	252.	33.13	0.56	3.229E-02				
316.16	66.	75.82	0.25	3.082E-02				
356.41	45.	97.50	1.36	2.835E-02				
358.68	42.	110.02	1.37	2.822E-02				
379.76	37.	75.05	0.46	2.711E-02				
391.75	310.	24.80	1.08	2.652E-02	391.69	64.000	1.113E+03	SN113
454.98	83.	53.05	0.37	2.383E-02				
568.66	103.	37.41	0.47	2.026E-02				
626.42	84.	49.00	0.45	1.885E-02				
661.66	23324.	0.76	1.61	1.810E-02	661.66	85.210	4.445E+02	CS137
821.54	239.	27.43	0.39	1.536E-02				
876.16	66.	52.19	0.61	1.462E-02				
898.25	346.	23.61	1.52	1.434E-02	898.02	93.700	2.406E+03	Y898
937.90	34.	79.64	0.44	1.387E-02				
1071.41	38.	61.01	0.57	1.249E-02				
1085.31	68.	35.74	1.00	1.237E-02				
1098.64	14.	140.33	0.47	1.225E-02				
1173.23	20836.	0.81	2.05	1.163E-02	1173.24	99.900	6.877E+02	Co1173
1332.49	18966.	0.75	2.11	1.050E-02	1332.50	99.982	6.926E+02	Co1332
1835.90	150.	10.23	1.72	8.080E-03	1836.01	99.200	1.745E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
145.76	36.54	3297.	860.	5.262E+04	12.66	1.336	- s
199.48	49.98	8660.	956.	3.313E+04	18.50	0.958	- sM
255.13	63.90	2893.	47.	1.186E+03	193.18	0.347	- sc
544.97	136.38	1941.	729.	1.415E+04	11.64	1.247	-

TestAmerica, Inc Spectrum name: 9_TunaCan_20120371.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
1181.07	295.46	1550.	252.	7.804E+03	33.13	0.562	- s
1263.87	316.16	856.	66.	2.136E+03	75.82	0.245	- sc
1424.84	356.47	930.	45.	1.579E+03	97.50	1.363	- sc
1433.89	358.73	1025.	42.	1.473E+03	110.02	1.365	- sc
1518.22	379.76	367.	37.	1.365E+03	75.05	0.460	- sc
1819.03	454.98	702.	83.	3.496E+03	53.05	0.375	- s
2273.73	568.66	433.	103.	5.068E+03	37.41	0.468	- s
2504.73	626.42	460.	84.	4.455E+03	49.00	0.451	- s
3285.25	821.54	812.	239.	1.556E+04	27.43	0.391	- s
3503.76	876.16	400.	66.	4.538E+03	52.19	0.608	- s
3750.76	937.90	332.	34.	2.488E+03	79.64	0.436	- sc
4284.91	1071.41	226.	38.	3.015E+03	61.01	0.571	- s
4340.51	1085.31	224.	68.	5.498E+03	35.74	1.000	- s
4393.86	1098.64	186.	14.	1.143E+03	140.33	0.472	- sc

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.86	46.57	13300.	51041.	14.178	0.65	1.116
AM-241	237.82	59.57	11784.	54776.	15.216	0.62	1.111
CD-109	351.87	88.09	5995.	26880.	7.467	0.87	1.137
CO-57	487.85	122.10	3767.	5522.	1.534	2.86	1.155
Ce-139	662.09	165.67	1864.	814.	0.226	10.74	1.299
Hg-203	1120.44	280.29	2362.	-52.	-0.014	133.84	1.296s
SN-113	1565.85	391.67	1962.	266.	0.074	24.38	1.393
CS-137	2645.72	661.66	1258.	23324.	6.479	0.76	1.614
Y-898	3592.12	898.25	1148.	346.	0.096	23.61	1.524s
Co-1173	4692.30	1173.23	840.	20836.	5.788	0.81	2.049
Co-1332	5329.58	1332.49	131.	18966.	5.268	0.75	2.109
Y-1836	7344.43	1835.90	14.	150.	0.042	10.23	1.719s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample		COMMENTS
Pb-210	N	1.3971E+04				8.15E+03		
			46.54	1.397E+04	(	1.478E+02	6.46E-01 4.25E+00	G
AM-241		1.1694E+03				1.58E+05		
			59.54	1.169E+03	(	1.086E+01	6.16E-01 3.57E+01	G
CD-109		1.5657E+04				4.63E+02		
			88.03	1.566E+04	(	2.117E+02	8.71E-01 3.61E+00	G
CO-57		3.3118E+02				2.72E+02		
			122.06	3.312E+02	(	1.731E+01	2.86E+00 8.56E+01	G
Ce-139		5.4173E+02				1.38E+02		
			165.85	5.417E+02	(	1.357E+02	1.07E+01 7.99E+01	G
Hg-203		-5.2429E-01				4.66E+01		
			279.17	-5.243E-01	?(	2.327E+00	1.34E+02 8.15E+01	G
SN-113		9.5260E+02				1.15E+02		
			391.69	9.526E+02	?(	7.503E+02	2.44E+01 6.40E+01	G
CS-137		4.4452E+02				1.10E+04		
			661.66	4.445E+02	(	3.202E+00	7.63E-01 8.52E+01	G
Y-898		2.4057E+03				1.07E+02		
			898.02	2.406E+03	@(	1.118E+03	2.36E+01 9.37E+01	G
Co-1173		6.8772E+02				1.93E+03		
			1173.24	6.877E+02	(	4.547E+00	8.09E-01 9.99E+01	G
Co-1332		6.9256E+02				1.93E+03		
			1332.50	6.926E+02	(	2.044E+00	7.49E-01 1.00E+02	G
Y-1836		1.7452E+03				1.07E+02		
			1836.01	1.745E+03	(	2.388E+02	1.02E+01 9.92E+01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.

@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the

library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity
Hg-203	280.29	2362.	-52.	-0.014	133.84	0.000E+00

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting		MDA Bq/Sample
Pb-210	1.2947E+04	1.3971E+04	6.459E-01%		1.48E+02
AM-241	1.1648E+03	1.1694E+03	6.156E-01%		1.09E+01
CD-109	4.0954E+03	1.5657E+04	8.713E-01%		2.12E+02
CO-57	3.3792E+01	3.3118E+02	2.862E+00%		1.73E+01
Ce-139	5.9752E+00	5.4173E+02	1.074E+01%		1.36E+02
Hg-203 #A	-5.2429E-01	>12 Halflives	1.3384E+02%	2.3272E+00	
SN-113 #	4.3447E+00	9.5260E+02	2.438E+01%		7.50E+02
CS-137	4.2011E+02	4.4452E+02	7.635E-01%		3.20E+00
Y-898 #	7.1422E+00	2.4057E+03	2.361E+01%		1.12E+03
Co-1173	4.9827E+02	6.8772E+02	8.087E-01%		4.55E+00
Co-1332	5.0178E+02	6.9256E+02	7.487E-01%		2.04E+00
Y-1836	5.1813E+00	1.7452E+03	1.023E+01%		2.39E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (379.7 to 1999.7 keV)	1.968E+04	Bq/Sample
Total Decayed Activity (379.7 to 1999.7 keV)	3.8598309E+04	Bq/Sample

2nd Source Verification

Detector: **Ge12**
Geometry: **Tunacan**
Reference date: **10/1/2006**
Calibration Standard: **74139-334**
Standard volume g / vial: **1550**
Standard volume transferred in g / geometry: **341.9**
lab ID# of cal standard: **1282974**

Isotope	Certified Activity gamma/sec	Geometry Activity	%abundance	Bq/sample	Count Results	%recovery
Am-241	2034	449	0.359	1250	1288	103.1
Cs-137	1926	425	0.851	499	509.9	102.1
Co-60	3612	797	0.999856	797	833.8	104.6

Reviewed By: Jody Watson

Date: 4/24/2018

Test America St. Louis Spectrum ID: 12_TunaCan_20180012

Sample Description: 12_TunaCan_ICV
Detector: Detector #12
Batch ID: 12
Work Order Number: TunaCan
Lot Number: ICV

Decay to Time: 10/1/2006 11:00 Live Time: 5000 sec
Acquisition Time: 4/24/2018 09:26:18 Real Time: 5018 sec
Analysis Time: 4/24/2018 10:50 Dead Time: 0.36 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: DET_EnergyStandardMix & Pb.lib
Bkgd Correction File: 12_2017-05-07_0806.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
Pb-210	1.634E+04	0.6	9.464E+01	1.053E+03	1.764E+02
AM-241	1.288E+03	0.4	5.772E+00	8.177E+01	8.914E+00
CD-109	2.726E+04	25.0	6.823E+03	7.030E+03	1.764E+04
CO-57	1.000E+100	153.6	5.398E-01	5.402E-01	1.425E+00
Ce-139	1.000E+100	106.9	5.267E-01	5.274E-01	1.390E+00
Hg-203	1.000E+100	297.5	6.855E-01	6.856E-01	1.730E+00
SN-113	1.000E+100	692.4	1.143E+00	1.143E+00	2.762E+00
CS-137	5.099E+02	0.8	3.904E+00	2.652E+01	3.285E+00
Y-898	1.000E+100	140.9	1.086E+00	1.086E+00	2.342E+00
Co-1173	8.106E+02	1.3	1.069E+01	4.173E+01	9.187E+00
Co-1332	8.338E+02	1.3	1.078E+01	4.290E+01	6.803E+00
Y-1836	1.000E+100	127.2	4.662E-01	4.667E-01	9.202E-01
Total	6.000E+100				

Analyst: Jody Watson

TestAmerica Inc Spectrum name: 12_TunaCan_20180012.An1

Sample description
12_TunaCan_ICV

Spectrum Filename: C:\User\SPC\Det12\12_TunaCan_20180012.An1

Acquisition information

Start time:	4/24/2018 9:26:18 AM
Live time:	5000
Real time:	5018
Dead time:	0.36 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration

Filename:	12_Soil_TunaCan.Clb

12_TunaCan_108513

Energy Calibration

Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files

Main analysis library:	DET_EnergyStandardMix & Pb.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/1/2006 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2017-05-07_0806.PBC 5/7/2017 8:06:54 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 7 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 25.3541

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
28.13	58.	46.71	0.75	4.137E-03				
32.13	394.	18.65	0.81	7.163E-03				
36.69	330.	25.31	0.84	1.059E-02				
46.66	43625.	0.58	0.85	1.811E-02	46.54	4.250	1.634E+04	Pb210
49.83	321.	44.33	0.85	2.160E-02				
59.65	63562.	0.45	0.86	2.820E-02	59.54	35.700	1.288E+03	AM241
70.53	127.	49.58	1.39	3.219E-02				
74.86	220.	28.10	0.88	3.333E-02				
77.21	369.	16.72	0.88	3.387E-02				
87.68	350.	23.71	0.81	3.578E-02	88.03	3.610	3.034E+04	CD109
93.18	213.	27.98	1.16	3.644E-02				
165.85	67.	106.94	0.97	3.405E-02	165.85	79.900	HL>Cutoff	Ce139
238.54	388.	19.10	0.88	2.744E-02				
279.17	23.	297.48	1.09	2.449E-02	279.17	81.500	HL>Cutoff	Hg203
307.48	44.	92.73	0.49	2.278E-02				
312.92	63.	62.15	0.30	2.248E-02				
320.20	50.	55.24	0.61	2.209E-02				
355.42	79.	51.62	0.51	2.040E-02				
384.05	22.	98.42	0.50	1.922E-02				
428.92	42.	63.02	0.59	1.766E-02				
454.01	126.	41.89	2.09	1.692E-02				
493.21	76.	56.00	0.64	1.589E-02				
583.05	231.	19.93	1.19	1.403E-02				
609.57	255.	15.76	1.66	1.358E-02				
661.72	21282.	0.77	1.42	1.279E-02	661.66	85.210	5.099E+02	CS137
898.02	37.	140.94	1.67	1.025E-02	898.02	93.700	HL>Cutoff	Y898
1173.31	7459.	1.32	1.92	8.426E-03	1173.24	99.900	8.106E+02	Co1173

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1332.58	6951.	1.30	1.98	7.647E-03	1332.50	99.982	8.318E+02	Co1332

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV		Suspected Nuclide
112.21	28.13	314.	58.	1.406E+04	46.71	0.750	-	s
128.21	32.13	1577.	394.	5.496E+04	18.65	0.810	-	
146.44	36.67	3332.	330.	3.120E+04	25.31	0.841	-	sD
199.29	49.79	9113.	333.	1.539E+04	40.96	0.855	-	sD
281.70	70.53	1447.	127.	3.956E+03	49.58	1.387	-	s
299.02	74.84	1784.	220.	6.587E+03	28.10	0.880	-	D
308.40	77.19	1706.	369.	1.088E+04	16.72	0.883	-	sD
372.24	93.18	1248.	213.	5.837E+03	27.98	1.163	-	sM
953.35	238.54	1339.	388.	1.414E+04	19.10	0.882	-	s
1229.01	307.48	572.	44.	1.931E+03	92.73	0.491	-	sc
1250.75	312.92	513.	63.	2.788E+03	62.15	0.295	-	s
1279.88	320.20	329.	50.	2.263E+03	55.24	0.611	-	s
1420.71	355.42	528.	79.	3.873E+03	51.62	0.511	-	s
1535.20	384.00	232.	22.	1.118E+03	98.42	0.497	-	sc
1714.62	428.92	312.	42.	2.406E+03	63.02	0.590	-	s
1814.96	454.01	760.	126.	7.448E+03	41.89	2.094	-	s
1971.76	493.21	502.	76.	4.813E+03	56.00	0.640	-	s
2331.07	583.05	403.	231.	1.644E+04	19.93	1.194	-	
2437.14	609.57	326.	255.	1.877E+04	15.76	1.660	-	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_EnergyStandardMix & Pb.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.79	46.54	10103.	43625.	8.725	0.58	0.851D
AM-241	237.76	59.54	8808.	63562.	12.712	0.45	0.865D
CD-109	350.62	87.77	1861.	315.	0.063	25.03	0.760s
CO-57	487.68	122.06	2320.	-56.	-0.011	153.64	0.928
Ce-139	662.74	165.85	1600.	67.	0.013	106.94	0.973s
Hg-203	1115.81	279.17	1331.	23.	0.005	297.48	1.086s
SN-113	1565.74	391.69	1248.	-10.	-0.002	692.39	1.196s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	2645.75	661.72	832.	21282.	4.256	0.77	1.422
Y-898	3591.15	898.02	555.	37.	0.007	140.94	1.672s
Co-1173	4692.85	1173.31	308.	7459.	1.492	1.32	1.921
Co-1332	5330.42	1332.58	135.	6968.	1.394	1.29	1.978
Y-1836	7346.49	1836.01	27.	-11.	-0.002	127.17	2.459s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	Peak MDA Value Bq/Sample		COMMENTS
Pb-210	N	1.6338E+04				8.15E+03		
			46.54	1.634E+04	(P	1.764E+02	5.79E-01	4.25E+00 G
AM-241		1.2876E+03				1.58E+05		
			59.54	1.288E+03	(	8.914E+00	4.48E-01	3.57E+01 G
CD-109		2.7262E+04				4.63E+02		
			88.03	2.726E+04	*(	1.764E+04	2.50E+01	3.61E+00 G
CO-57		-3.5134E-01				2.72E+02		
			122.06	-3.513E-01	(	1.425E+00	1.54E+02	8.56E+01 G
Ce-139		4.9250E-01				1.38E+02		
			165.85	4.925E-01	?(	1.390E+00	1.07E+02	7.99E+01 G
Hg-203		2.3043E-01				4.66E+01		
			279.17	2.304E-01	&(	1.730E+00	2.97E+02	8.15E+01 G
SN-113		-1.6505E-01				1.15E+02		
			391.69	-1.650E-01	&(	2.762E+00	6.92E+02	6.40E+01 G
CS-137		5.0987E+02				1.10E+04		
			661.66	5.099E+02	(	3.285E+00	7.66E-01	8.52E+01 G
Y-898		7.7025E-01				1.07E+02		
			898.02	7.703E-01	&(	2.342E+00	1.41E+02	9.37E+01 G
Co-1173		8.1058E+02				1.93E+03		
			1173.24	8.106E+02	(	9.187E+00	1.32E+00	9.99E+01 G
Co-1332		8.3376E+02				1.93E+03		
			1332.50	8.338E+02	(	6.803E+00	1.29E+00	1.00E+02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
Y-1836	-3.6659E-01				1.07E+02	
		1836.01	-3.666E-01	?(	9.202E-01	1.27E+02 9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity
CO-57	122.06	2320.	-56.	-0.011	153.64	0.000E+00
Ce-139	165.85	1600.	67.	0.013	106.94	0.000E+00
Hg-203	279.17	1331.	23.	0.005	297.48	0.000E+00
SN-113	391.69	1248.	-10.	-0.002	692.39	0.000E+00
Y-898	898.02	555.	37.	0.007	140.94	0.000E+00
Y-1836	1836.01	27.	-11.	-0.002	127.17	0.000E+00

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
Pb-210	1.1406E+04	1.6338E+04	5.793E-01%	1.76E+02
AM-241	1.2640E+03	1.2876E+03	4.483E-01%	8.91E+00
CD-109 #	4.8702E+01	2.7262E+04	2.503E+01%	1.76E+04
CO-57 #A	-3.5134E-01	>12 Halflives	1.536E+02%	1.43E+00
Ce-139 #A	4.9250E-01	>12 Halflives	1.069E+02%	1.39E+00
Hg-203 #A	2.3043E-01	>12 Halflives	2.975E+02%	1.73E+00
SN-113 #A	-1.6505E-01	>12 Halflives	6.924E+02%	2.76E+00
CS-137	3.9058E+02	5.0987E+02	7.657E-01%	3.29E+00
Y-898 #A	7.7025E-01	>12 Halflives	1.409E+02%	2.34E+00
Co-1173	1.7721E+02	8.1058E+02	1.318E+00%	9.19E+00
Co-1332	1.8227E+02	8.3376E+02	1.293E+00%	6.80E+00
Y-1836 #A	-3.6659E-01	>12 Halflives	1.272E+02%	9.20E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.1 keV) 1.347E+04 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 4.7041629E+04 Bq/Sample

2nd Source Verification

Detector: **Ge19**
Geometry: **Tunacan**
Reference date: **10/1/2006**
Calibration Standard: **74139-334**
Standard volume g / vial: **1550**
Standard volume transferred in g / geometry: **341.9**
lab ID# of cal standard: **1282974**

Isotope	Certified Activity dpm/mass/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	449	0.359	1250	1313	105.1
Cs-137	1926	425	0.851	499	520	104.2
Co-60	3612	797	0.999856	797	852.3	107.0

Reviewed By: Jody Watson

Date: 4/20/2018

TestAmerica Inc Spectrum name: 19_TunaCan_20180077.An1

Sample description
19_TunaCan_ICV

Spectrum Filename: C:\User\SPC\Det19\19_TunaCan_20180077.An1

Acquisition information

Start time:	4/20/2018 11:09:29 AM
Live time:	5000
Real time:	5017
Dead time:	0.33 %
Detector ID:	19

Detector system
Ge19 SN/11146715

Calibration
Filename: 19_Soil_TunaCan.Clb
19_TunaCan_108513

Energy Calibration

Created:	4/16/2018 11:22:57 AM
Zero offset:	0.177 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/16/2018 12:11:21 PM
Type:	Polynomial
Uncertainty:	0.841 %
Coefficients:	-0.371612 -4.869309 0.466742
	-0.049787 0.002234 -0.000039

Library Files

Main analysis library:	DET_EnergyStandardMix & Pb.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	150 (37.71keV)
Stop channel:	8000 (1999.42keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Test America St. Louis Spectrum ID: 19_TunaCan_20180077

Sample Description: 19_TunaCan_ICV
Detector: Detector #19
Batch ID: 19
Work Order Number: TunaCan
Lot Number: ICV

Decay to Time: 10/1/2006 11:00 Live Time: 5000 sec
Acquisition Time: 4/20/2018 11:09:29 Real Time: 5017 sec
Analysis Time: 4/20/2018 14:51 Dead Time: 0.33 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 19_Soil_TunaCan.Clb
Efficiency Cal Desc: 19_TunaCan_108513
Efficiency Cal Date: 4/16/2018 12:11
Energy Cal Date: 4/16/2018 11:22
Library: DET_EnergyStandardMix & Pb.lib
Bkgd Correction File: 19_2018-04-08_1846.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
Pb-210	1.650E+04	0.6	9.640E+01	1.063E+03	1.744E+02
AM-241	1.313E+03	0.5	6.894E+00	8.344E+01	9.974E+00
CD-109	3.738E+04	20.7	7.737E+03	8.077E+03	1.896E+04
CO-57	1.000E+100	211.0	6.331E-01	6.334E-01	1.592E+00
Ce-139	1.000E+100	99.6	6.348E-01	6.358E-01	1.593E+00
Hg-203	1.000E+100	373.3	7.558E-01	7.559E-01	2.516E+00
SN-113	1.000E+100	155.7	8.400E-01	8.406E-01	3.066E+00
CS-137	5.203E+02	0.8	4.133E+00	2.709E+01	3.044E+00
Y-898	1.000E+100	101.0	1.285E+00	1.287E+00	2.765E+00
Co-1173	8.308E+02	1.4	1.173E+01	4.298E+01	9.972E+00
Co-1332	8.523E+02	1.3	1.136E+01	4.394E+01	5.252E+00
Y-1836	1.000E+100	870.9	3.744E+00	3.744E+00	1.054E+00
Total	6.000E+100				

Analyst: Jody Watson

Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/1/2006 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	19_2018-04-08_1846.PBC 4/8/2018 6:46:00 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 6 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.0720

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
44.25	824.	17.08	0.93	1.551E-02				
46.68	41733.	0.58	0.93	1.715E-02	46.54	4.250	1.650E+04	Pb210
49.79	341.	39.16	0.94	2.016E-02				
59.62	60109.	0.53	0.90	2.617E-02	59.54	35.700	1.313E+03	AM241
74.97	186.	31.71	0.96	3.099E-02				
77.20	287.	21.92	0.96	3.147E-02				
87.56	402.	20.70	1.81	3.319E-02	88.03	3.610	3.738E+04	CD109
165.85	78.	99.62	1.04	3.053E-02	165.85	79.900	HL>Cutoff	Ce139
182.09	60.	62.86	0.35	2.898E-02				
238.45	394.	15.79	1.44	2.415E-02				
274.68	114.	32.95	1.42	2.168E-02				
302.83	39.	62.96	0.34	2.009E-02				
352.06	200.	22.00	1.15	1.782E-02				
438.49	43.	83.30	0.29	1.498E-02				
533.21	81.	44.24	0.90	1.287E-02				
661.74	18571.	0.79	1.47	1.093E-02	661.66	85.210	5.203E+02	CS137
862.76	25.	64.29	0.63	8.983E-03				
878.66	89.	46.18	0.42	8.863E-03				
1173.34	6485.	1.41	1.82	7.138E-03	1173.24	99.900	8.308E+02	Co1173
1332.62	6030.	1.33	1.85	6.465E-03	1332.50	99.982	8.523E+02	Co1332

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV		Suspected Nuclide
176.55	44.21	10886.	853.	5.501E+04	17.63	0.932	-	sD
198.69	49.75	8765.	357.	1.770E+04	37.47	0.937	-	sD
298.95	74.97	1637.	186.	5.997E+03	31.71	0.960	-	sD
307.87	77.19	1825.	287.	9.107E+03	21.92	0.962	-	sD
727.12	182.09	591.	60.	2.082E+03	62.86	0.346	-	s
952.44	238.45	1002.	394.	1.631E+04	15.79	1.438	-	s
1097.28	274.68	483.	114.	5.242E+03	32.95	1.420	-	s
1209.83	302.83	282.	39.	1.942E+03	62.96	0.340	-	sc
1406.67	352.06	549.	200.	1.122E+04	22.00	1.153	-	
1752.27	438.49	465.	43.	2.871E+03	83.30	0.289	-	c
2131.09	533.21	325.	81.	6.269E+03	44.24	0.897	-	s
3449.28	862.76	100.	25.	2.783E+03	64.29	0.628	-	s
3512.90	878.66	320.	89.	1.004E+04	46.18	0.424	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Pb.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.31	46.54	8855.	41733.	8.347	0.58	0.935D
AM-241	237.59	59.62	9494.	60109.	12.022	0.53	0.904
CD-109	349.28	87.56	1868.	402.	0.080	20.70	1.808s
CO-57	487.17	122.06	2413.	-44.	-0.009	210.99	1.003s
Ce-139	662.22	165.85	1690.	78.	0.016	99.62	1.042
Hg-203	1115.25	279.17	2166.	-18.	-0.004	373.28	1.141s
SN-113	1565.13	391.69	1148.	-28.	-0.006	155.72	1.238s
CS-137	2645.14	661.74	517.	18571.	3.714	0.79	1.469
Y-898	3590.37	898.02	560.	-52.	-0.010	101.01	1.642s
Co-1173	4692.11	1173.34	260.	6485.	1.297	1.41	1.816
Co-1332	5329.67	1332.62	55.	6030.	1.206	1.33	1.853
Y-1836	7345.40	1836.01	25.	-11.	-0.002	870.90	2.261s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
Pb-210	N	1.6496E+04				8.15E+03	
			46.54	1.650E+04	(P	1.744E+02 5.84E-01 4.25E+00 G	
AM-241		1.3126E+03				1.58E+05	
			59.54	1.313E+03	(	9.974E+00 5.25E-01 3.57E+01 G	
CD-109		3.7383E+04				4.63E+02	
			88.03	3.738E+04	*(	1.896E+04 2.07E+01 3.61E+00 G	
CO-57		-3.0008E-01				2.72E+02	
			122.06	-3.001E-01	?(	1.592E+00 2.11E+02 8.56E+01 G	
Ce-139		6.3720E-01				1.38E+02	
			165.85	6.372E-01	&(	1.593E+00 9.96E+01 7.99E+01 G	
Hg-203		-2.0247E-01				4.66E+01	
			279.17	-2.025E-01	?(	2.516E+00 3.73E+02 8.15E+01 G	
SN-113		-5.3940E-01				1.15E+02	
			391.69	-5.394E-01	&(P	3.066E+00 1.56E+02 6.40E+01 G	
CS-137		5.2035E+02				1.10E+04	
			661.66	5.203E+02	(	3.044E+00 7.94E-01 8.52E+01 G	
Y-898		-1.2727E+00				1.07E+02	
			898.02	-1.273E+00	?(	2.765E+00 1.01E+02 9.37E+01 G	
Co-1173		8.3078E+02				1.93E+03	
			1173.24	8.308E+02	(P	9.972E+00 1.41E+00 9.99E+01 G	
Co-1332		8.5225E+02				1.93E+03	
			1332.50	8.523E+02	(	5.252E+00 1.33E+00 1.00E+02 G	
Y-1836		-4.2991E-01				1.07E+02	
			1836.01	-4.299E-01	?(P	1.054E+00 8.71E+02 9.92E+01 G	

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.

@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
CO-57	122.06	2413.	-44.	-0.009	210.99	0.000E+00	
Ce-139	165.85	1690.	78.	0.016	99.62	0.000E+00	
Hg-203	279.17	2166.	-18.	-0.004	373.28	0.000E+00	
SN-113	391.69	1148.	-28.	-0.006	155.72	0.000E+00	P
Y-898	898.02	560.	-52.	-0.010	101.01	0.000E+00	
Y-1836	1836.01	25.	-11.	-0.002	870.90	0.000E+00	P

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
Pb-210	1.1520E+04	1.6496E+04	5.844E-01%	1.74E+02
AM-241	1.2885E+03	1.3126E+03	5.252E-01%	9.97E+00
CD-109 #	6.7177E+01	3.7383E+04	2.070E+01%	1.90E+04
CO-57 #A	-3.0008E-01	>12 Halflives	2.110E+02%	1.59E+00
Ce-139 #A	6.3720E-01	>12 Halflives	9.962E+01%	1.59E+00
Hg-203 #A	-2.0247E-01	>12 Halflives	3.733E+02%	2.52E+00
SN-113 #A	-5.3940E-01	>12 Halflives	1.557E+02%	3.07E+00
CS-137	3.9871E+02	5.2035E+02	7.943E-01%	3.04E+00
Y-898 #A	-1.2727E+00	>12 Halflives	1.010E+02%	2.77E+00

Co-1173	1.8188E+02	8.3078E+02	1.412E+00%	9.97E+00
Co-1332	1.8658E+02	8.5225E+02	1.333E+00%	5.25E+00
Y-1836 #A	-4.2991E-01	>12 Halflives	8.709E+02%	1.05E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.7 to 1999.4 keV) 1.364E+04 Bq/Sample
Total Decayed Activity (37.7 to 1999.4 keV) 5.7394852E+04 Bq/Sample

Monthly Backgrounds

Test America
St. Louis
Background Check

Spectrum: 5_20180713019_BGLong
Description: Background Long PBC Count
Acquired: 7/13/2018 10:26:49 PM
Detector: Detector # 5
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.45	1.30	1.35	1.43	1.55	1.60	PASS

Analyst: Mike Aldridge Reviewer:

TestAmerica Inc Spectrum name: 5_20180713019_BGLong.An1

Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det5\5_20180713019_BGLong.An1

Acquisition information
Start time:	7/13/2018 10:26:49 PM
Live time:	72000
Real time:	72253
Dead time:	0.35 %
Detector ID:	5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_QC.Clb
Ge5_QC

Energy Calibration
Created:	2/28/2012 7:35:48 PM
Zero offset:	0.158 keV
Gain:	0.250 keV/channel
Quadratic:	3.911E-08 keV/channel^2

Efficiency Calibration
Created:	1/6/2011 8:03:22 AM		
Knee Energy:	0.00 keV		
Above the Knee:	Interpolative	Uncertainty =	0.00 %
Below the Knee:	Interpolative	Uncertainty =	0.00 %

Library Files
Main analysis library:	DET_Long Background PBC.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	150 (37.62keV)
Stop channel:	8000 (2000.81keV)
Peak rejection level:	30.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3

TestAmerica Inc Spectrum name: 5_20180713019_BGLong.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1457

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. DPS	Nuc
46.56	560.	9.38	0.67	5.679E-02	46.54	4.250	3.222E+00	PB210
59.38	178.	21.15	0.61	7.399E-02	59.54	35.900	9.298E-02	AM241
63.35	596.	7.58	0.77	7.932E-02	63.29	3.810	2.742E+00	TH234
84.45	200.	24.07	1.16	1.076E-01				
92.58	878.	5.88	0.89	1.129E-01	92.59	5.584	1.935E+00	TH234
					93.35	5.561	1.942E+00	AC228
185.95	438.	9.74	0.88	9.602E-02	185.72	54.000	1.171E-01	U235
					185.99	3.280	1.930E+00	Ra226
238.70	173.	19.51	0.72	8.322E-02	238.63	43.300	6.667E-02	PB212
351.96	180.	23.10	1.42	5.573E-02	351.93	37.600	1.191E-01	PB214
511.33	1781.	4.78	2.15	3.834E-02	511.86	20.000	3.229E+00	RH106
602.92	90.	29.59	2.45	3.242E-02	602.73	98.260	3.909E-02	SB124
					600.50	17.860	2.141E-01	SB125
					604.71	97.620	3.951E-02	CS134
609.59	152.	27.19	1.06	3.199E-02	609.31	46.090	1.432E-01	BI214
					610.30	5.750	1.150E+00	RU103
661.88	202.	18.67	1.65	2.860E-02	661.66	85.210	1.154E-01	CS137
1120.80	78.	29.74	1.36	1.646E-02	1120.29	15.100	4.358E-01	BI214
					1120.55	99.987	6.583E-02	Sc46
					1121.30	34.900	1.888E-01	Ta182
1461.10	140.	14.70	1.33	1.300E-02	1460.83	10.670	1.399E+00	K40
1764.84	77.	18.23	3.05	1.105E-02	1764.49	15.400	6.283E-01	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
337.45	84.45	605.	200.	1.858E+03	24.07	1.161	- s
2045.93	511.33	608.	1781.	4.646E+04	4.78	2.152	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_Long Background PBC.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.79	46.56	628.	560.	0.008	9.38	0.669s
AM-241	237.11	59.38	467.	178.	0.002	21.15	0.608
TH-234	252.99	63.35	482.	596.	0.008	7.58	0.768
TH-234	370.02	92.58	566.	878.	0.012	5.88	0.893s
Ra-226	743.77	185.95	436.	438.	0.006	9.74	0.877
PB-212	954.89	238.70	341.	173.	0.002	19.51	0.718s
PB-214	1408.21	351.96	402.	180.	0.002	23.10	1.420s
SB-124	2412.38	602.92	184.	90.	0.001	29.59	2.446s
BI-214	2439.05	609.59	322.	152.	0.002	27.19	1.059
CS-137	2648.23	661.88	238.	202.	0.003	18.67	1.648s
BI-214	4483.56	1120.80	92.	78.	0.001	29.74	1.365
K-40	5843.82	1461.10	48.	140.	0.002	14.70	1.332s
BI-214	7057.44	1764.84	20.	77.	0.001	18.23	3.046s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Peak Code	MDA Value DPS	COMMENTS
K-40	N	1.3987E+00				4.66E+11	
			1460.83	1.399E+00	@(	3.516E-01 1.47E+01 1.07E+01	G

(Page 4 of 8)

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-124	F 3.9095E-02					6.02E+01	
		602.73	3.909E-02	(	2.877E-02	2.96E+01	9.83E+01 G
		1690.98	0.000E+00	%	6.958E-02	1.00E+03	4.78E+01 G
		722.79	0.000E+00	%	2.144E-01	1.00E+03	1.08E+01 G
CS-137	I 1.1539E-01					1.10E+04	
		661.66	1.154E-01	*(	4.247E-02	1.87E+01	8.52E+01 G
PB-210	N 3.2216E+00					8.14E+03	
		46.54	3.222E+00	@(	6.878E-01	9.38E+00	4.25E+00 G
PB-212	N 6.6671E-02					6.98E+02	
		238.63	6.667E-02	(	3.421E-02	1.95E+01	4.33E+01 G
		300.03	0.000E+00	%	3.625E-01	8.04E+01	3.28E+00 GA
PB-214	N 1.1908E-01					5.84E+05	
		351.93	1.191E-01	(	6.375E-02	2.31E+01	3.76E+01 G
		295.09	0.000E+00	&	6.676E-02	2.49E+02	1.93E+01 G
		242.00	0.000E+00	@	2.167E-01	0.00E+00	7.43E+00 GA
BI-214	N 1.4317E-01					5.84E+05	
		609.31	1.432E-01	(	8.131E-02	2.72E+01	4.61E+01 G
		1120.29	4.358E-01	+	2.649E-01	2.97E+01	1.51E+01 G
		1764.49	6.283E-01	+	1.922E-01	1.82E+01	1.54E+01 G
TH-234	N 2.7421E+00					1.63E+12	
		63.29	2.742E+00	(	4.832E-01	7.58E+00	3.81E+00 G
		92.59	1.935E+00	-	2.501E-01	5.88E+00	5.58E+00 G
Ra-226	1.9296E+00					5.84E+05	
		185.99	1.930E+00	(	4.409E-01	9.74E+00	3.28E+00 G
AM-241	T 9.2984E-02					1.58E+05	
		59.54	9.298E-02	(	5.390E-02	2.12E+01	3.59E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.

= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Activity DPS	Time of Count Uncertainty 1 Sigma Counting	MDA
BE-7	<	1.5353E-01		
NA-22	<	4.3965E-02		
K-40	#	1.3987E+00	1.4702E+01%	3.516E-01
Sc-46	<	2.2274E-02		
CR-51	<	1.1439E-01		
MN-54	<	2.3949E-02		
FE-59	<	5.1814E-02		
Co-56	<	2.6290E-02		
CO-57	<	7.1209E-03		
CO-58	<	1.9592E-02		
CO-60	<	3.4146E-02		
ZN-65	<	7.4913E-02		
NB-94	<	2.4006E-02		
ZR-95	<	4.1001E-02		
NB-95	<	2.1763E-02		
RU-103	<	1.7526E-02		
RH-106	<	2.1377E-01		
AG-108M	<	1.6248E-02		
AG-110M	<	4.8748E-02		
SN-113	<	2.2094E-02		
SB-124	#	3.9095E-02	2.9593E+01%	2.877E-02

SB-125	<	4.7850E-02			
I-131	<	1.6644E-02			
BA-133	<	3.5190E-02			
CS-134	<	1.3683E-02			
CS-137	#	1.1539E-01	1.8672E+01%		4.247E-02
CE-139	<	1.2018E-02			
Ba-140	<	7.7138E-02			
La-140	<	3.1494E-02			
CE-141	<	1.8132E-02			
CE-144	<	9.8076E-02			
PM-144	<	2.6374E-02			
EU-152	<	5.4752E-02			
EU-154	<	1.9971E-01			
EU-155	<	3.9500E-02			
HF-181	<	1.9127E-02			
Ta-182	<	1.5359E-01			
Hg-203	<	1.3926E-02			
TL-208	<	2.4485E-02			
pm-146	<	6.5882E-02			
y-88	<	2.8025E-02			
PB-210	#	3.2216E+00	9.3825E+00%		6.878E-01
PB-212		6.6671E-02	1.9510E+01%		3.421E-02
PB-214		1.1908E-01	2.3096E+01%		6.375E-02
BI-207	<	3.4960E-02			
BI-212	<	4.5552E-01			
BI-214		1.4317E-01	2.7192E+01%		8.131E-02
BI-210M	<	2.2013E-02			
RA-224	<	4.1532E-01			
AC-228	<	8.4638E-02			
TH-227	<	1.4406E-01			
TH-229	<	2.3361E-01			
TH-234		2.7421E+00	7.5820E+00%		4.832E-01
PA-231	<	5.5357E-01			
PA-233	<	3.4973E-02			
PA-234	<	6.2070E-02			
PA-234M	<	5.9114E+00			
Ra-226		1.9296E+00	9.7420E+00%		4.409E-01
U-235	<	7.9967E-02			
AM-241		9.2984E-02	2.1151E+01%		5.390E-02
Np-237	<	9.6818E-02			

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

TestAmerica Inc Spectrum name: 5_20180713019_BGLong.An1

---------- S U M M A R Y ----------

Total Activity (	37.6 to	2000.8 keV)	9.868E+00 DPS

Test America
St. Louis
Background Check

Spectrum: 9_20180713016_BGLong
Description: Background Long PBC Count
Acquired: 7/13/2018 10:07:09 PM
Detector: Detector # 9
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.89	1.53	1.65	1.78	2.14	2.26	PASS

Analyst: Mike Aldridge Reviewer: Rachel Mueller

Test America
St. Louis
Background Check

Spectrum: 12_20180713018_BGLong
Description: Background Long PBC Count
Acquired: 7/13/2018 10:08:10 PM
Detector: Detector #12
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.00	1.89	1.93	1.98	2.07	2.10	PASS

Analyst: Mike Aldridge Reviewer: Rachel Mueller

(Page 1 of 1)

Test America
St. Louis
Background Check

Spectrum: 19_20180713018_BGLong
Description: Background Long PBC Count
Acquired: 7/13/2018 10:22:52 PM
Detector: Detector #19
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.30	2.15	2.20	2.26	2.39	2.44	PASS

Analyst: Mike Aldridge Reviewer:

TestAmerica Inc Spectrum name: 19_20180713018_BGLong.An1

Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det19\19_20180713018_BGLong.An1

Acquisition information
Start time:	7/13/2018 10:22:52 PM
Live time:	72000
Real time:	72080
Dead time:	0.11 %
Detector ID:	19

Detector system
Ge19 SN/11146715

Calibration
Filename: 19_QC.Clb
19_QC_Source F_83725-334

Energy Calibration
Created:	4/16/2018 11:22:57 AM
Zero offset:	0.177 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration
Created:	4/17/2018 2:50:57 PM		
Knee Energy:	0.00 keV		
Above the Knee:	Interpolative	Uncertainty =	0.00 %
Below the Knee:	Interpolative	Uncertainty =	0.00 %

Library Files
Main analysis library:	DET_Long Background PBC.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	150 (37.71keV)
Stop channel:	8000 (1999.42keV)
Peak rejection level:	30.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1221

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. DPS	Nuc
46.64	1384.	5.12	1.01	5.743E-02	46.54	4.250	7.894E+00	PB210
63.35	778.	9.40	1.04	7.727E-02	63.29	3.810	3.674E+00	TH234
74.98	236.	22.00	1.01	9.107E-02				
87.26	225.	22.73	0.93	1.057E-01	86.49	13.100	2.274E-01	Np237
					86.54	30.700	9.699E-02	EU155
92.76	1141.	7.85	1.12	1.128E-01	92.59	5.584	2.521E+00	TH234
					93.35	5.561	2.509E+00	AC228
144.27	251.	26.73	1.06	1.466E-01	143.79	10.960	2.173E-01	U235
185.67	541.	11.86	0.96	1.371E-01	185.72	54.000	1.014E-01	U235
					185.99	3.280	1.670E+00	Ra226
238.41	489.	12.16	1.24	1.252E-01	238.63	43.300	1.252E-01	PB212
497.44	106.	27.92	0.79	6.689E-02	497.05	90.900	2.421E-02	RU103
609.12	249.	19.97	0.95	4.161E-02	609.31	46.090	1.805E-01	BI214
					610.30	5.750	1.455E+00	RU103
1461.14	324.	10.87	2.03	1.343E-02	1460.83	10.670	3.140E+00	K40
1764.62	136.	16.33	1.76	9.848E-03	1764.49	15.400	1.245E+00	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
298.98	74.98	984.	236.	2.591E+03	22.00	1.005	-	M
348.08	87.26	893.	225.	2.126E+03	22.73	0.933	-	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_Long Background PBC.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.70	46.64	1090.	1384.	0.019	5.12	1.005
TH-234	252.52	63.35	1305.	778.	0.011	9.40	1.038
TH-234	370.06	92.76	1650.	1141.	0.016	7.85	1.121s
U-235	575.97	144.27	1163.	251.	0.003	26.73	1.056s
U-235	741.65	185.72	973.	511.	0.007	9.09	0.965D
PB-212	952.30	238.41	793.	489.	0.007	12.16	1.236
RU-103	1988.04	497.44	220.	106.	0.001	27.92	0.788s
BI-214	2434.67	609.12	460.	249.	0.003	19.97	0.948s
K-40	5844.20	1461.14	110.	324.	0.004	10.87	2.027s
BI-214	7059.46	1764.62	55.	136.	0.002	16.33	1.757

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Code	MDA Value DPS	COMMENTS
K-40	N	3.1402E+00				4.66E+11	
			1460.83	3.140E+00	@(	5.000E-01 1.09E+01 1.07E+01	G
RU-103	I	2.4212E-02				3.93E+01	
			497.05	2.421E-02	(	1.641E-02 2.79E+01 9.09E+01	G
			610.30	0.000E+00	%	6.126E-01 0.00E+00 5.75E+00	GA
PB-210	N	7.8938E+00				8.14E+03	
			46.54	7.894E+00	(	8.926E-01 5.12E+00 4.25E+00	G
PB-212	N	1.2520E-01				6.98E+02	
			238.63	1.252E-01	(	3.432E-02 1.22E+01 4.33E+01	G
			300.03	0.000E+00	%	2.604E-01 1.31E+02 3.28E+00	GA

Nuclide		Ave activity	Energy		Activity	Code	Peak MDA	Comments
BI-214	N	1.8052E-01					5.84E+05	
			609.31	1.805E-01	(7.442E-02	2.00E+01	4.61E+01	G
			1120.29	0.000E+00	% 2.202E-01	4.11E+01	1.51E+01	G
			1764.49	1.245E+00	+ 3.413E-01	1.63E+01	1.54E+01	G
TH-234	N	3.6740E+00					1.63E+12	
			63.29	3.674E+00	(8.078E-01	9.40E+00	3.81E+00	G
			92.59	2.521E+00	- 4.242E-01	7.85E+00	5.58E+00	G
U-235	N	2.1726E-01					2.57E+11	
			185.72	9.589E-02	} 2.778E-02	9.09E+00	5.40E+01	GA
			143.79	2.173E-01	*(1.397E-01	2.67E+01	1.10E+01	G
			205.33	0.000E+00	% 1.754E-01	4.88E+01	5.01E+00	G
			163.38	0.000E+00	% 1.752E-01	5.61E+01	5.08E+00	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the
library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Time of Count Uncertainty 1 Sigma

Nuclide		Activity DPS	Counting	MDA
BE-7	<	9.0460E-02		
NA-22	<	2.5852E-02		
K-40	#	3.1402E+00	1.0871E+01%	5.000E-01
Sc-46	<	3.3022E-02		
CR-51	<	8.5514E-02		
MN-54	<	2.3868E-02		
FE-59	<	5.3911E-02		
Co-56	<	2.4675E-02		
CO-57	<	1.9380E-02		
CO-58	<	2.3264E-02		
CO-60	<	3.3455E-02		
ZN-65	<	9.6629E-02		
NB-94	<	2.8576E-02		
ZR-95	<	4.0654E-02		
NB-95	<	4.7014E-02		
RU-103	#	2.4212E-02	2.7922E+01%	1.641E-02
RH-106	<	1.9520E-01		
AG-108M	<	1.2708E-02		
AG-110M	<	5.6915E-02		
SN-113	<	1.4610E-02		
SB-124	<	3.9018E-02		
SB-125	<	3.8202E-02		
I-131	<	1.0692E-02		
BA-133	<	1.6881E-02		
CS-134	<	2.4248E-02		
CS-137	<	1.5466E-02		
CE-139	<	1.7378E-02		
Ba-140	<	5.2733E-02		
La-140	<	3.6269E-02		
CE-141	<	1.7115E-02		
CE-144	<	6.0279E-02		
PM-144	<	3.0460E-02		
EU-152	<	5.2117E-02		
EU-154	<	1.1845E-01		
EU-155	<	5.1194E-02		
HF-181	<	8.5069E-03		

Ta-182	<	1.6795E-01			
Hg-203	<	1.1115E-02			
TL-208	<	1.9939E-02			
pm-146	<	6.8112E-02			
y-88	<	3.3839E-02			
PB-210		7.8938E+00	5.1164E+00%		8.926E-01
PB-212		1.2520E-01	1.2158E+01%		3.432E-02
PB-214	<	3.8459E-02			
BI-207	<	2.9037E-02			
BI-212	<	5.2915E-01			
BI-214		1.8052E-01	1.9969E+01%		7.442E-02
BI-210M	<	1.7121E-02			
RA-224	<	3.0161E-01			
AC-228	<	1.2780E-01			
TH-227	<	8.3217E-02			
TH-229	<	2.0618E-01			
TH-234		3.6740E+00	9.3975E+00%		8.078E-01
PA-231	<	2.1873E-01			
PA-233	<	2.3369E-02			
PA-234	<	7.3394E-02			
PA-234M	<	3.9002E+00			
U-235	#	2.1726E-01	2.6733E+01%		1.397E-01
AM-241	<	8.3830E-02			
Np-237	<	1.3807E-01			

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.7 to 1999.4 keV) 1.526E+01 DPS

Run Logs

Gamma Spectroscopy Run Log

Detector: GV5

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/26/12 15:05		IC 160-12297/1		12297			JLW
03/27/12 10:12		ICV 160-12297/2		12297			JLW
12/07/16 01:00		CCB 160-282801/1		282801			
12/07/16 01:42		CCV 160-282801/2		282801			
12/07/16 02:04		CCV 160-282801/3		282801			
12/07/16 07:35	30	ZZZZZ		282801			
12/07/16 08:34	30	ZZZZZ		282801			
12/07/16 09:33		ACVTOP 160-282801/6		282801			KLS
12/07/16 09:33		ACVTOP 160-282835/1		282835			PS
07/13/18 22:26		ICB 160-375693/1		375693			RTM
08/09/18 00:03		CCV 160-381208/1		381208			
08/09/18 00:26		CCV 160-381208/2		381208			KLS
08/09/18 00:45		CCB 160-381208/3		381208			KLS
08/09/18 01:19	30	ZZZZZ		381208			
08/09/18 06:39	30	ZZZZZ		381208			
08/09/18 07:19	30	160-29498-1	CRC-B20-0206	381208	376740	901.1	KLS
08/09/18 08:30	30	ZZZZZ		381208			
08/09/18 09:10	30	ZZZZZ		381208			
08/09/18 10:03	30	ZZZZZ		381208			
08/09/18 10:51	30	ZZZZZ		381208			
08/09/18 11:47	30	ZZZZZ		381208			
08/09/18 12:42	30	ZZZZZ		381208			
08/09/18 13:24	30	ZZZZZ		381208			
08/09/18 14:13	30	ZZZZZ		381208			
08/09/18 14:54	30	ZZZZZ		381208			
08/09/18 15:31	30	ZZZZZ		381208			
08/09/18 16:28	30	ZZZZZ		381208			
08/09/18 17:13	30	ZZZZZ		381208			
08/09/18 18:12	30	ZZZZZ		381208			
08/09/18 18:45	30	ZZZZZ		381208			
08/09/18 19:19	30	ZZZZZ		381208			
08/09/18 20:00	30	ZZZZZ		381208			
08/09/18 20:33	30	ZZZZZ		381208			
08/09/18 21:21	30	ZZZZZ		381208			
08/09/18 21:58	30	ZZZZZ		381208			

Detector: GV9

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/03/12 13:37		IC 160-12326/1		12326			JLW
06/14/12 10:54		ICV 160-12326/2		12326			JLW
12/05/16 11:08		ACVTOP 160-282744/1		282744			PS
07/13/18 22:07		ICB 160-375695/1		375695			RTM
08/09/18 00:00		CCV 160-381204/1		381204			
08/09/18 00:21		CCV 160-381204/2		381204			KLS
08/09/18 00:42		CCB 160-381204/3		381204			KLS
08/09/18 01:18	30	ZZZZZ		381204			
08/09/18 06:35	30	160-29479-A-2-E DU		381204	376740	901.1	KLS
08/09/18 07:15	30	ZZZZZ		381204			
08/09/18 08:24	30	ZZZZZ		381204			
08/09/18 09:09	30	ZZZZZ		381204			
08/09/18 09:59	30	ZZZZZ		381204			
08/09/18 10:42	30	ZZZZZ		381204			

Gamma Spectroscopy Run Log

Detector: GV9 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
08/09/18 11:31		ZZZZZ		381204			
08/09/18 11:43	30	ZZZZZ		381204			
08/09/18 12:43	30	ZZZZZ		381204			
08/09/18 13:22		TCCLBA 160-381336/1-A		381204			
08/09/18 13:36		TCCLBC 160-381336/3-A		381204			
08/09/18 13:51		TCCLBB 160-381336/2-A		381204			
08/09/18 14:14	30	ZZZZZ		381204			
08/09/18 14:54	30	ZZZZZ		381204			
08/09/18 15:32	30	ZZZZZ		381204			
08/09/18 16:28	30	ZZZZZ		381204			
08/09/18 17:13	30	ZZZZZ		381204			
08/09/18 18:09	30	ZZZZZ		381204			
08/09/18 18:43	30	ZZZZZ		381204			
08/09/18 19:16	30	ZZZZZ		381204			
08/09/18 19:56		ZZZZZ		381204			
08/09/18 20:08		ZZZZZ		381204			
08/09/18 20:21		ZZZZZ		381204			
08/09/18 20:36	30	ZZZZZ		381204			
08/09/18 21:19	30	ZZZZZ		381204			
08/09/18 21:57	30	ZZZZZ		381204			
08/09/18 22:28	30	ZZZZZ		381204			
08/09/18 23:04	30	ZZZZZ		381204			

Detector: GV12

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
04/18/18 13:54		IC 160-364854/1		364854			JLW
04/24/18 09:26		ICV 160-364854/2		364854			JLW
07/13/18 22:08		ICB 160-375694/1		375694			RTM
08/09/18 00:01		CCV 160-381202/1		381202			
08/09/18 00:22		CCV 160-381202/2		381202			CDR
08/09/18 00:41		CCB 160-381202/3		381202			CDR
08/09/18 01:24	30	MB 160-376740/1-A		381202	376740	901.1	CDR
08/09/18 06:36	30	ZZZZZ		381202			
08/09/18 07:17	30	ZZZZZ		381202			
08/09/18 08:25	30	ZZZZZ		381202			
08/09/18 09:14	30	ZZZZZ		381202			
08/09/18 10:00	30	ZZZZZ		381202			
08/09/18 10:43	30	ZZZZZ		381202			
08/09/18 11:32		ZZZZZ		381202			
08/09/18 11:44	30	ZZZZZ		381202			
08/09/18 12:45	30	ZZZZZ		381202			
08/09/18 13:23		TCCLBB 160-381336/2-A		381202			
08/09/18 13:38		TCCLBA 160-381336/1-A		381202			
08/09/18 13:52		TCCLBC 160-381336/3-A		381202			
08/09/18 14:15	30	ZZZZZ		381202			
08/09/18 14:56	30	ZZZZZ		381202			

Gamma Spectroscopy Run Log

Detector: GV12 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
08/09/18 15:33	30	ZZZZZ		381202			
08/09/18 16:30	30	ZZZZZ		381202			
08/09/18 17:15	30	ZZZZZ		381202			
08/09/18 18:07	30	ZZZZZ		381202			
08/09/18 18:41	60	ZZZZZ		381202			
08/09/18 19:42		ZZZZZ		381202			
08/09/18 19:54		ZZZZZ		381202			
08/09/18 20:10		ZZZZZ		381202			
08/09/18 20:23		ZZZZZ		381202			
08/09/18 20:40	60	ZZZZZ		381202			
08/09/18 21:47	60	ZZZZZ		381202			
08/09/18 22:50	60	ZZZZZ		381202			

Detector: GV19

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/14/18 10:55		ZZZZZ		364044			
03/14/18 15:23		IC 160-364044/1		364044			JLW
04/20/18 09:45		ICV 160-364044/3		364044			JLW
07/13/18 22:22		ICB 160-375699/1		375699			RTM
08/09/18 00:00		CCV 160-381207/1		381207			
08/09/18 00:21		CCV 160-381207/2		381207			CDR
08/09/18 00:40		CCB 160-381207/3		381207			CDR
08/09/18 01:24	30	LCS 160-376740/2-A		381207	376740	901.1	CDR
08/09/18 06:37	30	ZZZZZ		381207			
08/09/18 07:16	30	ZZZZZ		381207			
08/09/18 08:27	30	ZZZZZ		381207			
08/09/18 09:21	30	ZZZZZ		381207			
08/09/18 09:59	30	ZZZZZ		381207			
08/09/18 10:48	30	ZZZZZ		381207			
08/09/18 11:39	30	ZZZZZ		381207			
08/09/18 12:45	30	ZZZZZ		381207			
08/09/18 13:23		TCCLBC 160-381336/3-A		381207			
08/09/18 13:37		TCCLBB 160-381336/2-A		381207			
08/09/18 14:06		TCCLBA 160-381336/1-A		381207			
08/09/18 14:17	30	ZZZZZ		381207			
08/09/18 14:57	30	ZZZZZ		381207			
08/09/18 15:33	30	ZZZZZ		381207			
08/09/18 16:31	30	ZZZZZ		381207			
08/09/18 17:15	30	ZZZZZ		381207			
08/09/18 18:06		TCCLBA 160-381336/1-A		381207			
08/09/18 18:17	30	ZZZZZ		381207			
08/09/18 18:53	60	ZZZZZ		381207			
08/09/18 19:56		ZZZZZ		381207			
08/09/18 20:09		ZZZZZ		381207			
08/09/18 20:22		ZZZZZ		381207			
08/09/18 20:39	60	ZZZZZ		381207			
08/09/18 21:53	60	ZZZZZ		381207			
08/09/18 22:57	60	ZZZZZ		381207			

GAS FLOW PROPORTIONAL COUNTER

Method 9310

Gross Alpha / Beta (GFPC) by Method 9310

Prep Batch: 379964

Preparation, Thin Layer Technique

Gas Flow Proportional Counter Analysis Detail Report
Prep Batch: 379964

Lab ID: MB 160-379964/1-A | Analyzed: 08/02/18 21:07 | Decay Corrected: No | Ts: 200
Client ID: | Detector: Protean0 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Gross Alpha	3.495	3.09	3.12	U	pCi/g	10.0	4.76	28	77	0.140	0.077	0.10111	379949
Gross Beta	1.110	1.84	1.84	U	pCi/g	10.0	3.05	150	645	0.750	0.645	0.41012	379949

Lab ID: LCS 160-379964/2-A | Analyzed: 08/02/18 21:07 | Decay Corrected: No | Ts: 200
Client ID: | Detector: Protean1 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Gross Alpha	21.97	5.86	6.37		pCi/g	10.0	5.29	86	76	0.430	0.076	0.11557	379949
Gross Beta	22.44	3.57	4.22		pCi/g	10.0	3.65	387	491	1.935	0.491	0.41836	379949

Lab ID: 160-29498-1 | Analyzed: 08/02/18 21:07 | Decay Corrected: No | Ts: 200
Client ID: CRC-B20-0206 | Detector: Protean3 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Gross Alpha	365	20.7	46.4		pCi/g	10.0	5.74	1292	111	6.460	0.111	0.10509	379949
Gross Beta	154	8.28	17.5		pCi/g	10.0	6.25	2713	656	13.565	0.656	0.41347	379949

Lab ID: 160-29498-1 DU | Analyzed: 08/02/18 21:07 | Decay Corrected: No | Ts: 200
Client ID: CRC-B20-0206 | Detector: Protean5 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Cs	Cb	CPMs	CPMb	Eff	Anly Batch
Gross Alpha	432.0	23.3	54.5		pCi/g	10.0	5.11	1408	70	7.040	0.070	0.09715	379949
Gross Beta	157.7	8.88	18.1		pCi/g	10.0	7.09	2951	437	14.755	0.437	0.41133	379949

Gas Flow Proportional Counter Analysis Detail Report
Prep Batch: 379964

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 160-379964/1-A	Gross Alpha			3.495	U	pCi/g							2.24158798
MB 160-379964/1-A	Gross Beta			1.110	U	pCi/g							1.20610878

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-379964/2-A	Gross Alpha		27.1	21.97		pCi/g	81	44 - 140					-1.014107431
LCS 160-379964/2-A	Gross Beta		26.8	22.44		pCi/g	84	38 - 130					-1.327875150

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29498-1	Gross Alpha	365		432.0		pCi/g			17	0.67	1.88	1	
160-29498-1	Gross Beta	154		157.7		pCi/g			2	0.10	0.29	1	

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.: 160-29498-1

SDG No.:

Batch Number: 379964 Batch Start Date: 08/02/18 14:49 Batch Analyst: Burt, Matthew R

Batch Method: Thin_Layer Batch End Date: 08/02/18 15:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	TareWtPlncht	GrossWtPlncht	MassPlncht	Rocky Flats 00001	
MB 160-379964/1		Thin_Layer, 9310		0.0803 g	8.9619 g	9.0422 g	0.0803 g		
LCS 160-379964/2		Thin_Layer, 9310		0.0628 g	8.9919 g	9.0547 g	0.0628 g	0.0628 g	
160-29498-A-1-B	CRC-B20-0206	Thin_Layer, 9310	T	0.0746 g	8.9825 g	9.0571 g	0.0746 g		
160-29498-A-1-B DU	CRC-B20-0206	Thin_Layer, 9310	T	0.0748 g	9.0064 g	9.0812 g	0.0748 g		

Batch Notes	
Balance ID	27050421
SOP Number	ST-RC-0020

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 MB 160-379964/1-A

Repeat 1

Carrier No. 0

Batch ID 379964

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 8/2/2018 9:07:18 PM

Count Ended 8/3/2018 12:27:30 AM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.077	28	0.140	0.063
sd	0.009	5.292	0.026	0.028
Beta	0.645	150	0.750	0.105
sd	0.025	12.247	0.061	0.066

Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - B

Addr: 1

Sample ID LCS 160-379964/2-A

Repeat 1

Carrier No. 0

Batch ID 379964

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 8/2/2018 9:07:25 PM

Count Ended 8/3/2018 12:27:37 AM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.076	86	0.430	0.354
sd	0.009	9.274	0.046	0.047
Beta	0.491	387	1.935	1.444
sd	0.022	19.672	0.098	0.101

Alpha/Beta Count Results

Sample Activity Report

Protean 0-3 - D

Addr: 3

Sample ID 160-29498-A-1-F

Repeat 1

Carrier No. 0

Batch ID 379964

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 8/2/2018 9:07:33 PM

Count Ended 8/3/2018 12:27:46 AM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.111	1,292	6.460	6.349
sd	0.011	35.944	0.180	0.180
Beta	0.656	2,713	13.565	12.909
sd	0.026	52.086	0.260	0.262

Alpha/Beta Count Results

Sample Activity Report

Protean 4-7 - B

Addr: 5

Sample ID 160-29498-A-1-G DU

Repeat 1

Carrier No. 0

Batch ID 379964

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 8/2/2018 9:07:42 PM

Count Ended 8/3/2018 12:27:55 AM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.070	1,408	7.040	6.970
sd	0.008	37.523	0.188	0.188
Beta	0.437	2,951	14.755	14.318
sd	0.021	54.323	0.272	0.272

Daily Checks

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Gas Proportional Counter Daily Quality Control Checks

APPROVED
By Conrad Reuscher at 5:37 pm, Aug 02, 2018

Thursday, August 02, 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											
12:06 AM	**Efficiency**	12358.34	12598.25	377.95	-239.91	Pass					
	Background										
	Crosstalk	4145.000	4210.200	44.960	-65.200	Pass					
12:11 AM	**Efficiency**						49815.23	48583.18	1457.50	1232.05	Pass
	Background										
	Crosstalk						26.898	23.225	5.043	3.673	NA
4:57 AM	**Efficiency**										
	Background	0.200	0.096	0.037	0.104	Pass	0.910	0.716	0.094	0.194	Pass
	Crosstalk										
Detector 1											
12:06 AM	**Efficiency**	13160.97	13515.73	405.47	-354.75	Pass					
	Background										
	Crosstalk	4532.500	4578.400	63.081	-45.900	Pass					
12:11 AM	**Efficiency**						48353.09	47659.85	1429.80	693.24	Pass
	Background										
	Crosstalk						12.688	10.950	2.549	1.738	NA
4:57 AM	**Efficiency**										
	Background	0.065	0.111	0.029	-0.046	Pass	0.525	0.498	0.078	0.028	Pass
	Crosstalk										
Detector 2											
12:06 AM	**Efficiency**	13562.79	14068.05	422.04	-505.26	**FAIL**					
	Background										
	Crosstalk	4802.500	4802.250	75.574	0.250	Pass					
12:11 AM	**Efficiency**						49951.95	49887.83	1496.63	64.13	Pass
	Background										
	Crosstalk						7.105	5.375	1.806	1.730	NA

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Gas Proportional Counter Daily Quality Control Checks

Thursday, August 02, 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
1:36 AM	**Efficiency**	13518.76	14068.05	422.04	-549.29	**FAIL**					
	Background										
	Crosstalk	4804.500	4802.250	75.574	2.250	Pass					
4:57 AM	**Efficiency**										
	Background	0.110	0.088	0.031	0.022	Pass	0.550	0.541	0.087	0.009	Pass
	Crosstalk										
Detector 3											
12:06 AM	**Efficiency**	13146.96	13271.53	398.15	-124.56	Pass					
	Background										
	Crosstalk	4471.000	4349.025	65.645	121.975	Pass					
12:11 AM	**Efficiency**						58887.43	59018.83	1770.56	-131.40	Pass
	Background										
	Crosstalk						8.120	10.375	2.724	-2.255	NA
4:57 AM	**Efficiency**										
	Background	0.140	0.085	0.023	0.055	Pass	0.785	0.682	0.093	0.103	Pass
	Crosstalk										
Detector 4											
12:06 AM	**Efficiency**	16284.96	16556.85	496.71	-271.89	Pass					
	Background										
	Crosstalk	6349.500	6135.800	62.856	213.700	**DOEF**					
12:11 AM	**Efficiency**						56272.36	56572.13	1697.16	-299.76	Pass
	Background										
	Crosstalk						4.568	0.850	0.651	3.718	NA
4:58 AM	**Efficiency**										
	Background	0.185	0.073	0.013	0.113	**FAIL**	0.550	0.435	0.045	0.115	Pass
	Crosstalk										
8:47 AM	**Efficiency**										
	Background	0.120	0.073	0.013	0.048	**FAIL**	0.440	0.435	0.045	0.005	Pass
	Crosstalk										

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Gas Proportional Counter Daily Quality Control Checks

Thursday, August 02, 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 5											
12:06 AM	**Efficiency**	15731.02	15673.68	470.21	57.34	Pass					
	Background										
	Crosstalk	6575.000	6104.975	888.403	470.025	Pass					
12:11 AM	**Efficiency**						53507.89	53786.35	1613.59	-278.46	Pass
	Background										
	Crosstalk						2.030	0.325	0.373	1.705	NA
4:58 AM	**Efficiency**										
	Background	0.115	0.074	0.018	0.042	Pass	0.460	0.418	0.056	0.042	Pass
	Crosstalk										
Detector 6											
12:06 AM	**Efficiency**	14611.13	14736.55	442.10	-125.42	Pass					
	Background										
	Crosstalk	5852.000	5498.275	745.701	353.725	Pass					
12:11 AM	**Efficiency**						50967.95	51221.45	1536.64	-253.50	Pass
	Background										
	Crosstalk						1.524	0.700	0.410	0.824	NA
4:58 AM	**Efficiency**										
	Background	0.110	0.114	0.035	-0.004	Pass	0.505	0.418	0.055	0.087	Pass
	Crosstalk										
Detector 7											
12:07 AM	**Efficiency**	15167.07	15385.65	461.57	-218.58	Pass					
	Background										
	Crosstalk	5834.000	5760.050	798.954	73.950	Pass					
12:11 AM	**Efficiency**						44698.52	44749.03	1342.47	-50.50	Pass
	Background										
	Crosstalk						2.538	1.425	0.922	1.113	NA

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Gas Proportional Counter Daily Quality Control Checks

Thursday, August 02, 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
4:58 AM	**Efficiency**										
	Background	0.085	0.072	0.027	0.013	Pass	0.500	0.523	0.066	-0.023	Pass
	Crosstalk										
Detector 8											
12:07 AM	**Efficiency**						46022.75	46135.45	1384.06	-112.70	Pass
	Background										
	Crosstalk						3.553	0.725	0.638	2.828	NA
12:11 AM	**Efficiency**	11558.19	11620.55	348.62	-62.36	Pass					
	Background										
	Crosstalk	4106.500	3784.000	489.685	322.500	Pass					
4:58 AM	**Efficiency**										
	Background	0.085	0.097	0.034	-0.012	Pass	0.430	0.445	0.078	-0.015	Pass
	Crosstalk										
Detector 9											
12:07 AM	**Efficiency**						47935.34	47841.35	1435.24	93.99	Pass
	Background										
	Crosstalk						5.075	10.350	2.705	-5.275	NA
12:12 AM	**Efficiency**	13157.47	13544.15	406.32	-386.68	Pass					
	Background										
	Crosstalk	4716.500	4627.500	61.771	89.000	Pass					
4:58 AM	**Efficiency**										
	Background	0.110	0.115	0.033	-0.005	Pass	0.485	0.440	0.052	0.045	Pass
	Crosstalk										
Detector 10											
12:07 AM	**Efficiency**						49418.65	49376.35	1481.29	42.30	Pass
	Background										
	Crosstalk						19.286	28.625	5.591	-9.339	NA

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Gas Proportional Counter Daily Quality Control Checks

Thursday, August 02, 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
12:12 AM	**Efficiency**	13410.67	13960.33	418.81	-549.66	FAIL					
	Background										
	Crosstalk	4838.000	4854.775	66.791	-16.775	Pass					
1:39 AM	**Efficiency**	13632.85	13960.33	418.81	-327.48	Pass					
	Background										
	Crosstalk	4897.000	4854.775	66.791	42.225	Pass					
4:59 AM	**Efficiency**										
	Background	0.120	0.105	0.038	0.015	Pass	0.480	0.420	0.089	0.060	Pass
	Crosstalk										
Detector 11											
12:07 AM	**Efficiency**						58990.31	59256.13	1777.68	-265.82	Pass
	Background										
	Crosstalk						22.838	33.400	4.406	-10.562	NA
12:12 AM	**Efficiency**	13117.44	13382.03	401.46	-264.59	Pass					
	Background										
	Crosstalk	4578.000	4646.925	43.882	-68.925	Pass					
4:58 AM	**Efficiency**										
	Background	0.085	0.096	0.029	-0.011	Pass	0.465	0.470	0.063	-0.004	Pass
	Crosstalk										
Detector 12											
12:07 AM	**Efficiency**						0.00	57255.23	1717.66	-57255.23	FAIL
	Background										
	Crosstalk						0.000	22.750	5.663	-22.750	NA
12:12 AM	**Efficiency**	0.00	16555.28	496.66	-16555.28	FAIL					
	Background										
	Crosstalk	6.000	5593.325	888.555	-5587.325	DOEF					
4:58 AM	**Efficiency**										
	Background	0.000	0.073	0.021	-0.073	FAIL	0.000	0.483	0.059	-0.483	FAIL
	Crosstalk										

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Gas Proportional Counter Daily Quality Control Checks

Thursday, August 02, 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											
12:08 AM	**Efficiency**						54862.44	55313.48	1659.40	-451.03	Pass
	Background										
	Crosstalk						7.613	8.025	2.603	-0.412	NA
12:12 AM	**Efficiency**	16629.73	16489.13	494.67	140.60	Pass					
	Background										
	Crosstalk	6243.000	5831.525	819.117	411.475	Pass					
4:58 AM	**Efficiency**										
	Background	0.315	0.141	0.019	0.174	**FAIL**	0.800	0.480	0.068	0.320	**FAIL**
	Crosstalk										
8:47 AM	**Efficiency**										
	Background	0.180	0.141	0.019	0.039	Pass	0.415	0.480	0.068	-0.065	Pass
	Crosstalk										
Detector 14											
12:08 AM	**Efficiency**						51561.10	51515.98	1545.48	45.12	Pass
	Background										
	Crosstalk						2.030	0.950	0.742	1.080	NA
12:12 AM	**Efficiency**	14648.65	15209.15	456.27	-560.50	**FAIL**					
	Background										
	Crosstalk	5660.000	5770.450	63.706	-110.450	Pass					
1:36 AM	**Efficiency**	14596.61	15209.15	456.27	-612.54	**FAIL**					
	Background										
	Crosstalk	5716.500	5770.450	63.706	-53.950	Pass					
4:58 AM	**Efficiency**										
	Background	0.115	0.106	0.036	0.009	Pass	0.435	0.434	0.070	0.001	Pass
	Crosstalk										
Detector 15											

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Gas Proportional Counter Daily Quality Control Checks

Thursday, August 02, 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
12:08 AM	**Efficiency**						45047.64	45036.85	1351.11	10.79	Pass
	Background										
	Crosstalk						6.598	2.575	1.417	4.023	NA
12:12 AM	**Efficiency**	14823.29	14890.68	446.72	-67.38	Pass					
	Background										
	Crosstalk	5535.500	5361.500	749.037	174.000	Pass					
4:58 AM	**Efficiency**										
	Background	0.160	0.133	0.018	0.028	Pass	0.610	0.553	0.100	0.057	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.

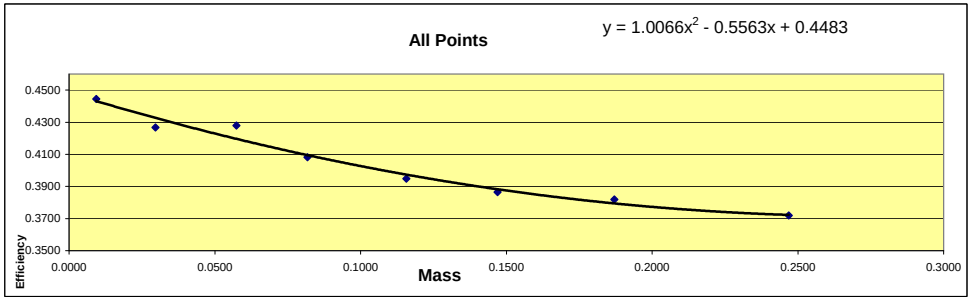
Alpha Beta Calibrations

Curve is for Gross Beta
Strontium 90
and
Total Strontium

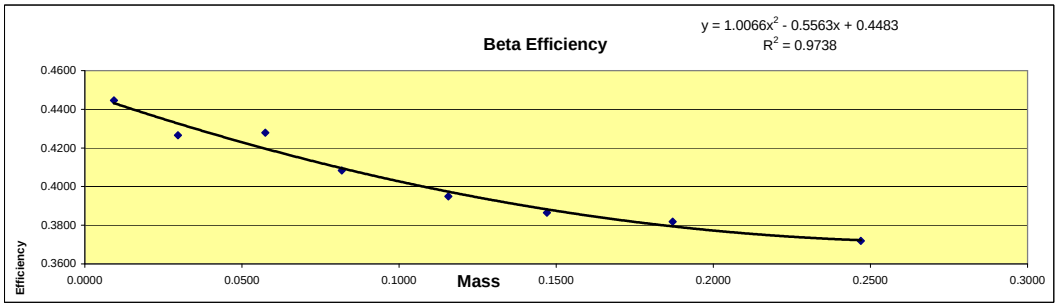
Protean 0

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

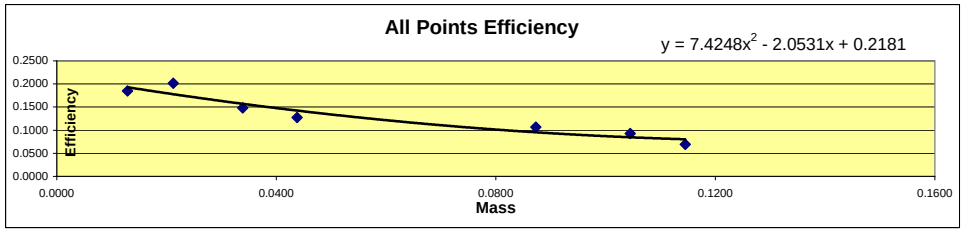
Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	3/27/2013
Elapsed Time:	1287.000 days
Half Life:	10409.625 days
Exponential Term:	0.91787171
Corrected Activity:	20707.1857 dpm/mL
Decay Activity (Sr/Y-90)	41414.3714 dpm

Curve is for Gross Alpha

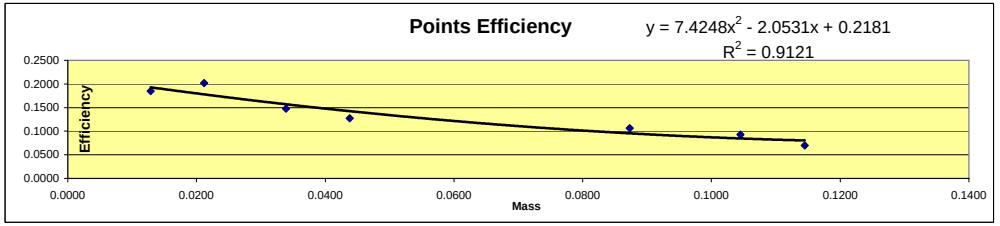
Protean 0

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

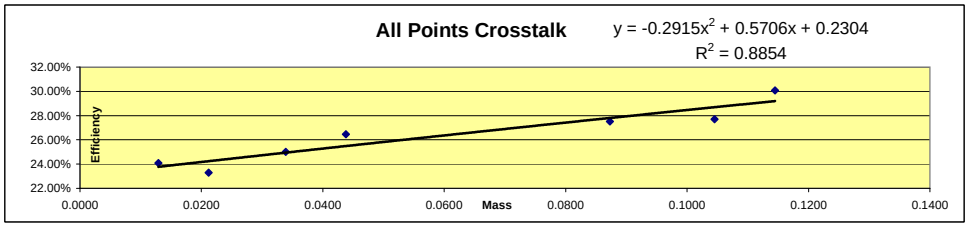
Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0129	0.1849	0.1929	-4.14%
0.0212	0.2017	0.1779	13.35%
0.0339	0.1480	0.1570	-5.75%
0.0438	0.1275	0.1424	-10.45%
0.0873	0.1063	0.0955	11.38%
0.1045	0.0928	0.0846	9.60%
0.1145	0.0695	0.0804	-13.46%



Mass	Efficiency
0.0129	0.1849
0.0212	0.2017
0.0339	0.1480
0.0438	0.1275
0.0873	0.1063
0.1045	0.0928
0.1145	0.0695



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%	Min
0	ICABT-51465;A2	0.0212	20.89	10003	3037	478.84	145.3805649	23.29%	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%	Max
0	ICABT-51465;A6	0.0873	19.82	10007	3797	504.89	191.5741675	27.51%	30.07%
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%	Mean 26.31%



Standard ID
Thorium-230
Th-230_00016 #51465
Cert # 92523 Ref. date 11/29/2012
Activity 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** **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	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 -** **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;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** **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	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 -** **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;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** **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	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 -** **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;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** **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	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 -** **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;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** **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	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 -** **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;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 11/13/201! 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	0.071	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 -** **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;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 11/15/201! 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 11/15/201! 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 11/15/201! 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 11/15/201! 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 -** **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;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 11/15/201! 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 -** **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;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 11/15/201! 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			

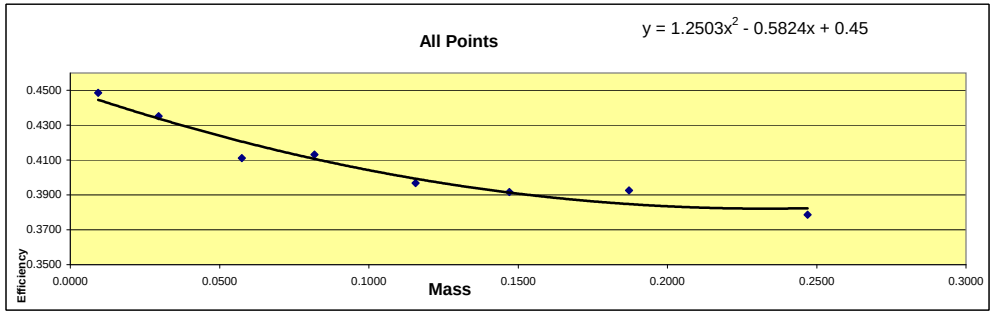
*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

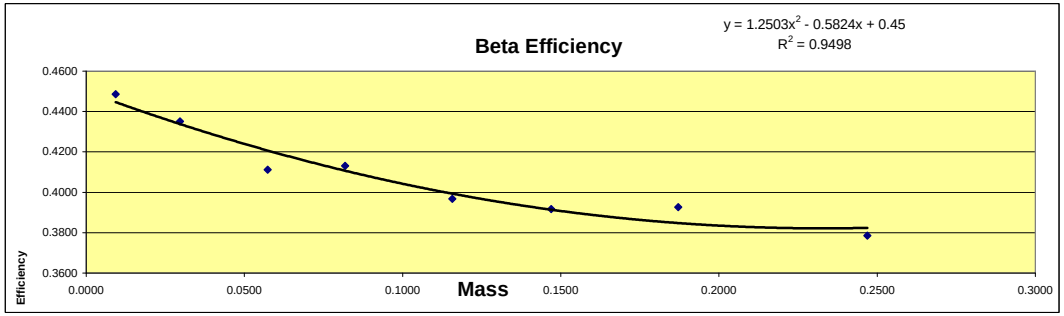
Protean 1

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 9/172009

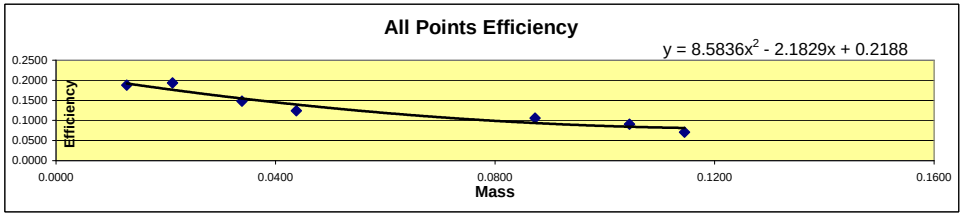
Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	3/27/2013
Elapsed Time:	1287.000 days
Half Life:	10409.625 days
Exponential Term:	0.917871706
Corrected Activity:	20707.18568 dpm/mL
Decay Activity (Sr/Y-90)	41414.37137 dpm

Curve is for Gross Alpha

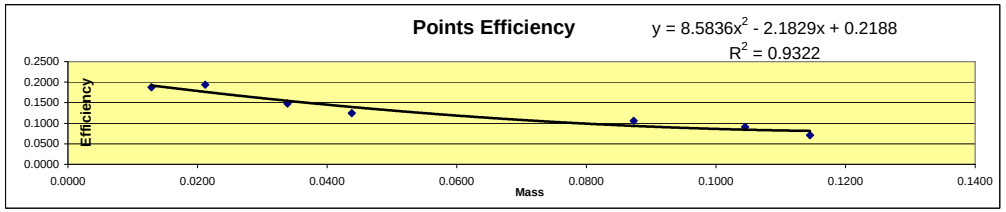
Protean 1

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
1	ICABT-51465l;A1	11/15/2015 1:27:50 PM	22.43	10004	446.010	2374.5	0.1878	1mL	0.0129
1	ICABT-51465l;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-51465l;A6	11/14/2015 9:57:48 PM	50	25132	502.640	4749.0	0.1058	2mL	0.0873
1	ICABT-51465l;A7	11/15/2015 11:19:41 PM	23.12	10004	432.699	4749.0	0.0911	2mL	0.1045
1	ICABT-51465l;A8	11/15/2015 10:41:00 PM	29.7	10003	336.801	4749.0	0.0709	2mL	0.1145

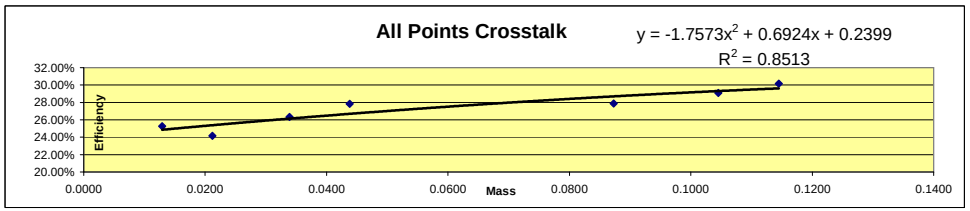
Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0129	0.1878	0.1921	-2.21%
0.0212	0.1939	0.1764	9.91%
0.0339	0.1481	0.1547	-4.24%
0.0438	0.1243	0.1397	-10.98%
0.0873	0.1058	0.0937	13.02%
0.1045	0.0911	0.0844	7.93%
0.1145	0.0709	0.0814	-12.86%



Mass	Efficiency
0.0129	0.1878
0.0212	0.1939
0.0339	0.1481
0.0438	0.1243
0.0873	0.1058
0.1045	0.0911
0.1145	0.0709



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
1	ICABT-51465l;A1	0.0129	22.43	10004	3383	446.01	150.8247882	25.27%	Min
1	ICABT-51465l;A2	0.0212	50	23017	7336	460.34	146.72	24.17%	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%	Max
1	ICABT-51465l;A6	0.0873	50	25132	9717	502.64	194.34	27.88%	30.14%
1	ICABT-51465l;A7	0.1045	23.12	10004	4101	432.70	177.3788927	29.07%	
1	ICABT-51465l;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 Ref. date 11/29/2012
Activity 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 -** **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;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 -** **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;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 -** **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;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 -** **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;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 11/13/201! 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 11/14/201! 21:07 **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	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 -** **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;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 11/15/201! 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 -** **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;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 11/15/201! 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 -** **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;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 11/15/201! 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 -** **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;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 11/15/201! 22:11 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **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 -** **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;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 11/15/201! 22:56 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **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			

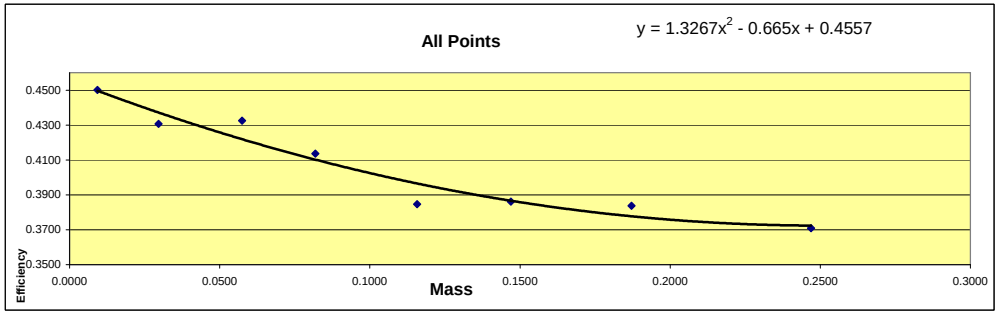
*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

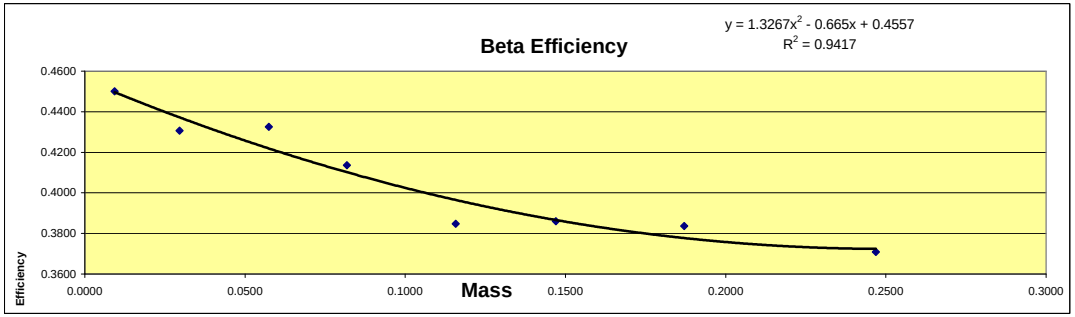
Protean 3

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41414.371 CPM	Sr-90 Eff	Standard Aliquot
3	B1	3/27/2013 1:10:44 AM	0.0093	1.01	18824	18637.624	0.4500	1mL
3	B2	3/27/2013 12:52:35 AM	0.0296	1.01	18014	17835.644	0.4307	1mL
3	B3	3/27/2013 12:34:03 AM	0.0574	1.01	18090	17910.891	0.4325	1mL
3	B4	3/27/2013 12:24:55 AM	0.0818	1.01	17300	17128.713	0.4136	1mL
3	B5	3/27/2013 9:21:04 AM	0.1157	1.01	16093	15933.663	0.3847	1mL
3	B6	3/27/2013 8:55:51 AM	0.1470	1.01	16150	15990.099	0.3861	1mL
3	B7	3/27/2013 8:51:20 AM	0.1871	1.01	16049	15890.099	0.3837	1mL
3	B8	3/27/2013 2:16:15 AM	0.2469	1.01	15514	15360.396	0.3709	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0093	0.4500	0.4496	0.09%
0.0296	0.4307	0.4372	-1.49%
0.0574	0.4325	0.4219	2.51%
0.0818	0.4136	0.4102	0.83%
0.1157	0.3847	0.3965	-2.97%
0.1470	0.3861	0.3866	-0.13%
0.1871	0.3837	0.3777	1.58%
0.2469	0.3709	0.3724	-0.40%



Mass	Efficiency
0.0093	0.4500
0.0296	0.4307
0.0574	0.4325
0.0818	0.4136
0.1157	0.3847
0.1470	0.3861
0.1871	0.3837
0.2469	0.3709



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

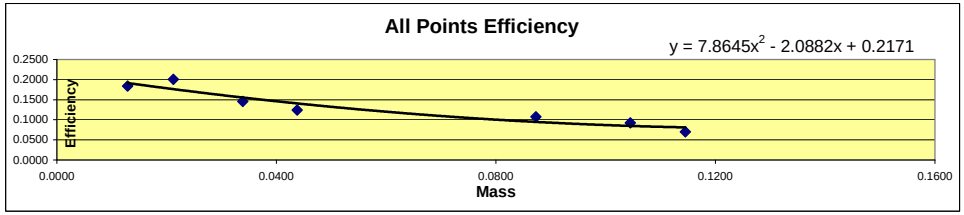
Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	3/27/2013
Elapsed Time:	1287.000 days
Half Life:	10409.625 days
Exponential Term:	0.917871706
Corrected Activity:	20707.18568 dpm/mL
Decay Activity (Sr/Y-90)	41414.37137 dpm

Curve is for Gross Alpha

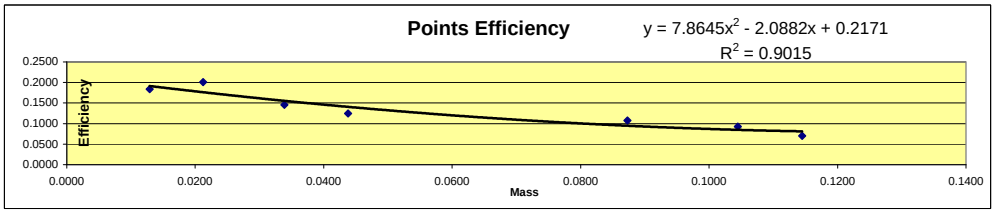
Protean 3

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
3	ICABT-51465I;A1	11/15/2015 6:19:56 PM	22.91	10003	436.622	2374.5	0.1839	1mL	0.0129
3	ICABT-51465I;A2	11/15/2015 2:32:05 PM	20.99	10000	476.417	2374.5	0.2006	1mL	0.0212
3	ICABT-51465;A3	11/15/2015 1:34:28 PM	28.9	10003	346.125	2374.5	0.1458	1mL	0.0339
3	ICABT-51465;A4	11/13/2015 1:19:12 PM	50	14785	295.700	2374.5	0.1245	1mL	0.0438
3	ICABT-51465I;A6	11/15/2015 10:30:47 PM	19.59	10003	510.618	4749.0	0.1075	2mL	0.0873
3	ICABT-51465I;A7	11/15/2015 9:15:53 PM	22.81	10001	438.448	4749.0	0.0923	2mL	0.1045
3	ICABT-51465I;A8	11/14/2015 9:58:08 PM	50	16587	331.740	4749.0	0.0699	2mL	0.1145

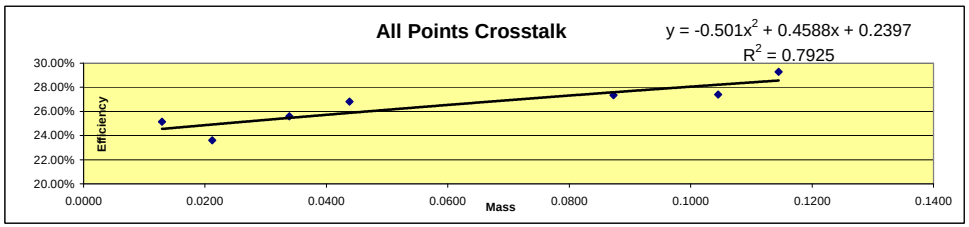
Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0129	0.1839	0.1915	-3.96%
0.0212	0.2006	0.1764	13.76%
0.0339	0.1458	0.1553	-6.17%
0.0438	0.1245	0.1407	-11.51%
0.0873	0.1075	0.0947	13.49%
0.1045	0.0923	0.0848	8.92%
0.1145	0.0699	0.0811	-13.87%



Mass	Efficiency
0.0129	0.1839
0.0212	0.2006
0.0339	0.1458
0.0438	0.1245
0.0873	0.1075
0.1045	0.0923
0.1145	0.0699



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
3	ICABT-51465I;A1	0.0129	22.91	10003	3360	436.62	146.66	25.14%	Min
3	ICABT-51465I;A2	0.0212	20.99	10000	3090	476.42	147.21	23.61%	23.61%
3	ICABT-51465;A3	0.0339	28.9	10003	3442	346.12	119.10	25.60%	
3	ICABT-51465;A4	0.0438	50	14785	5419	295.70	108.38	26.82%	Max
3	ICABT-51465I;A6	0.0873	19.59	10003	3763	510.62	192.09	27.34%	29.28%
3	ICABT-51465I;A7	0.1045	22.81	10001	3774	438.45	165.45	27.40%	
3	ICABT-51465I;A8	0.1145	50	16587	6868	331.74	137.36	29.28%	Mean
									26.46%



Standard ID
Thorium-230
Th-230_00016 #51465
Cert # 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

Low Level Alpha/Beta Count Results
Sample Activity Report

Protean 0-3 - D **Address:** *3*

Sample ID ***ICABT-6322;B4*** **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	0.038	14	13.861	13.823
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	0.363	17,300	17,128.713	17,128.350
sd	0.000			0.019	131.529	130.227	130.227

	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 - D **Address:** *3*

Sample ID *ICABT-6322;B3* **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	0.038	14	13.861	13.823
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	0.363	18,090	17,910.891	17,910.528
sd	0.000			0.019	134.499	133.167	133.167

	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 - D **Address:** ***3***

Sample ID ***ICABT-6322;B2*** **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	0.038	13	12.871	12.833
sd	0.000			0.006	3.606	3.570	3.570
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.363	18,014	17,835.644	17,835.281
sd	0.000			0.019	134.216	132.887	132.887

	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 - D **Address:** *3*

Sample ID ***ICABT-6322;B1*** **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	0.038	19	18.812	18.774
sd	0.000			0.006	4.359	4.316	4.316
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.363	18,824	18,637.624	18,637.261
sd	0.000			0.019	137.201	135.842	135.842

	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 -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Protean 0-3 - D **Address:** *3*

Sample ID ***ICABT-6322;B8*** **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 02:15 **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	0.038	13	12.871	12.833
sd	0.000			0.006	3.606	3.570	3.570
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.363	15,514	15,360.396	15,360.033
sd	0.000			0.019	124.555	123.322	123.322

	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 - D **Address:** *3*

Sample ID *ICABT-6322;B7* **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	0.038	6	5.941	5.903
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	0.363	16,049	15,890.099	15,889.736
sd	0.000			0.019	126.685	125.430	125.430

	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 - D **Address:** *3*

Sample ID ***ICABT-6322;B6*** **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	0.038	10	9.901	9.863
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	0.363	16,150	15,990.099	15,989.736
sd	0.000			0.019	127.083	125.824	125.824

	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 - D **Address:** *3*

Sample ID ***ICABT-6322;B5*** **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 09:20 **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	0.038	13	12.871	12.833
sd	0.000			0.006	3.606	3.570	3.570
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.363	16,093	15,933.663	15,933.300
sd	0.000			0.019	126.858	125.602	125.602

	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 - D **Address:** ***3***

Sample ID ***ICABT-51465;A4*** **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 11/13/201! 12:29 **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	0.084	14,785	295.700	295.616
sd	0.000			0.009	121.594	2.432	2.432
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	5,419	108.380	107.748
sd	0.000			0.025	73.614	1.472	1.472

	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 - D **Address:** *3*

Sample ID *ICABT-51465;A8* **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 11/14/201! 21:07 **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	0.084	16,587	331.740	331.656
sd	0.000			0.009	128.791	2.576	2.576
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	6,868	137.360	136.728
sd	0.000			0.025	82.873	1.657	1.658

	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 - D **Address:** *3*

Sample ID ***ICABT-51465;A3*** **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 11/15/201! 13:05 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 28.90 ***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	0.084	10,003	346.125	346.041
sd	0.000			0.009	100.015	3.461	3.461
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	3,442	119.100	118.468
sd	0.000			0.025	58.669	2.030	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 - D **Address:** *3*

Sample ID ***ICABT-51465;A2*** **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 11/15/201! 14:11 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 20.99 ***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	0.084	10,000	476.417	476.333
sd	0.000			0.009	100.000	4.764	4.764
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	3,090	147.213	146.581
sd	0.000			0.025	55.588	2.648	2.648

	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 - D **Address:** *3*

Sample ID ***ICABT-51465;A1*** **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 11/15/201! 17:56 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 22.91 ***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	0.084	10,003	436.622	436.538
sd	0.000			0.009	100.015	4.366	4.366
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	3,360	146.661	146.029
sd	0.000			0.025	57.966	2.530	2.530

	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 - D **Address:** *3*

Sample ID ***ICABT-51465;A7*** **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 11/15/201! 20:53 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 22.81 ***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	0.084	10,001	438.448	438.364
sd	0.000			0.009	100.005	4.384	4.384
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	3,774	165.454	164.822
sd	0.000			0.025	61.433	2.693	2.693

	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 - D **Address:** ***3***

Sample ID ***ICABT-51465;A6*** **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 11/15/201! 22:11 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 19.59 ***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	0.084	10,003	510.618	510.534
sd	0.000			0.009	100.015	5.105	5.105
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	3,763	192.088	191.456
sd	0.000			0.025	61.343	3.131	3.131

	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			

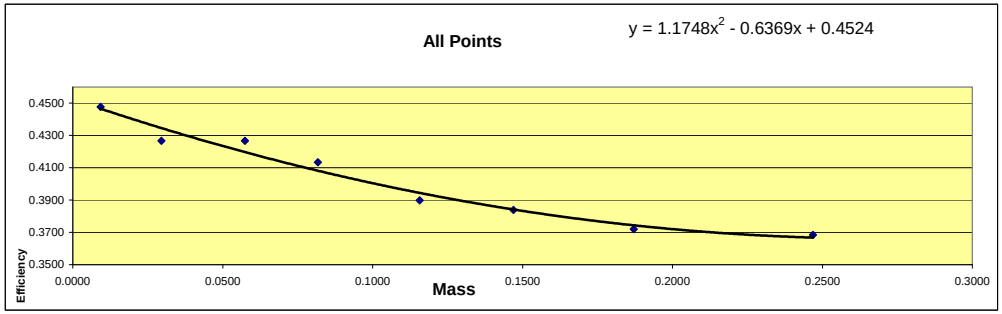
*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

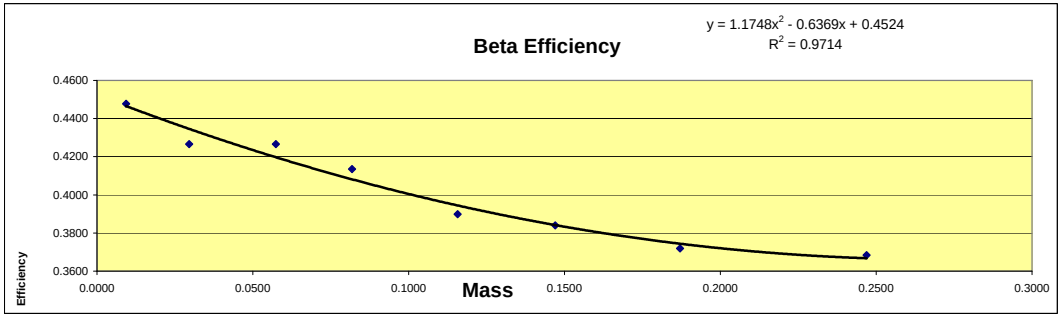
Protean 5

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41414.371 CPM 18545.545	Sr-90 Eff	Standard Aliquot
5	B1	3/27/2013 8:51:21 AM	0.0093	1.01	18731		0.4478	1mL
5	B2	3/27/2013 2:16:23 AM	0.0296	1.01	17847	17670.297	0.4267	1mL
5	B3	3/27/2013 1:10:45 AM	0.0574	1.01	17845	17668.317	0.4266	1mL
5	B4	3/27/2013 12:52:36 AM	0.0818	1.01	17296	17124.752	0.4135	1mL
5	B5	3/27/2013 12:34:19 AM	0.1157	1.01	16309	16147.525	0.3899	1mL
5	B6	3/27/2013 12:25:10 AM	0.1470	1.01	16061	15901.980	0.3840	1mL
5	B7	3/27/2013 9:21:18 AM	0.1871	1.01	15558	15403.960	0.3719	1mL
5	B8	3/27/2013 8:56:23 AM	0.2469	1.01	15409	15256.436	0.3684	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0093	0.4478	0.4466	0.27%
0.0296	0.4267	0.4346	-1.82%
0.0574	0.4266	0.4197	1.65%
0.0818	0.4135	0.4082	1.31%
0.1157	0.3899	0.3944	-1.15%
0.1470	0.3840	0.3842	-0.05%
0.1871	0.3719	0.3744	-0.64%
0.2469	0.3684	0.3668	0.44%



Mass	Efficiency
0.0093	0.4478
0.0296	0.4267
0.0574	0.4266
0.0818	0.4135
0.1157	0.3899
0.1470	0.3840
0.1871	0.3719
0.2469	0.3684



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

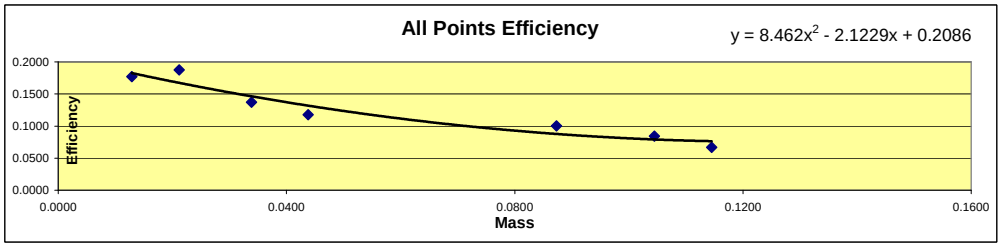
Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	3/27/2013
Elapsed Time:	1287.000 days
Half Life:	10409.625 days
Exponential Term:	0.917871706
Corrected Activity:	20707.18568 dpm/mL
Decay Activity (Sr/Y-90)	41414.37137 dpm

Curve is for Gross Alpha

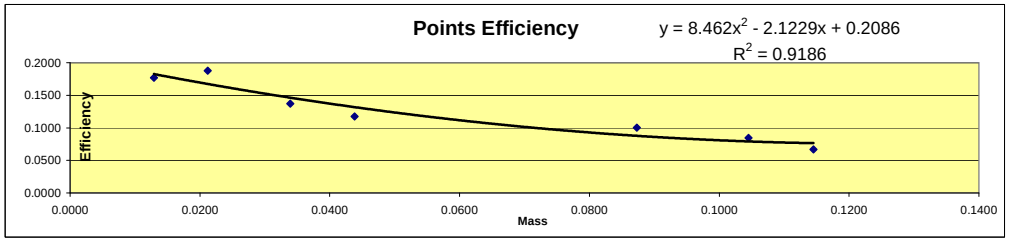
Protean 5

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
5	ICABT-51465;A1	11/24/2015 3:02:55	50	21017	420.340	2374.5	0.1770	1mL	0.0129
5	ICABT-51465;A2	11/24/2015 12:57:49	50	22292	445.840	2374.5	0.1878	1mL	0.0212
5	ICABT-51465;A3	11/24/2015 4:51:28	30.68	10002	326.010	2374.5	0.1373	1mL	0.0339
5	ICABT-51465;A4	11/24/2015 3:50:45	35.83	10000	279.096	2374.5	0.1175	1mL	0.0438
5	ICABT-51465;A6	11/24/2015 6:08:44	20.96	10002	477.195	4749.0	0.1005	2mL	0.0873
5	ICABT-51465;A7	11/24/2015 9:06:33	24.94	10002	401.043	4749.0	0.0844	2mL	0.1045
5	ICABT-51465;A8	11/24/2015 8:06:23	31.51	10002	317.423	4749.0	0.0668	2mL	0.1145

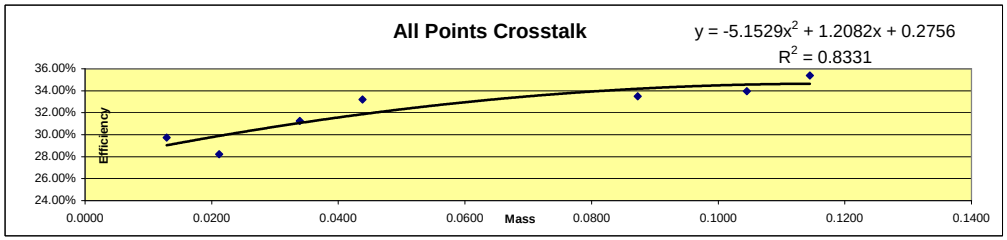
Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0129	0.1770	0.1826	-3.07%
0.0212	0.1878	0.1674	12.17%
0.0339	0.1373	0.1464	-6.19%
0.0438	0.1175	0.1319	-10.85%
0.0873	0.1005	0.0878	14.49%
0.1045	0.0844	0.0792	6.67%
0.1145	0.0668	0.0765	-12.59%



Mass	Efficiency
0.0129	0.1770
0.0212	0.1878
0.0339	0.1373
0.0438	0.1175
0.0873	0.1005
0.1045	0.0844
0.1145	0.0668



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
5	ICABT-51465;A1	0.0129	50	21017	8891	420.34	177.82	29.73%	Min
5	ICABT-51465;A2	0.0212	50	22292	8770	445.84	175.40	28.23%	28.23%
5	ICABT-51465;A3	0.0339	30.68	10002	4545	326.01	148.14	31.24%	
5	ICABT-51465;A4	0.0438	35.83	10000	4973	279.10	138.79	33.21%	Max
5	ICABT-51465;A6	0.0873	20.96	10002	5035	477.19	240.22	33.48%	35.38%
5	ICABT-51465;A7	0.1045	24.94	10002	5146	401.04	206.34	33.97%	
5	ICABT-51465;A8	0.1145	31.51	10002	5475	317.42	173.75	35.38%	Mean
									32.18%



Standard ID
Thorium-230
Th-230_00016 #51465
Cert # 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

Low Level Alpha/Beta Count Results
Sample Activity Report

Protean 4-7 - B **Address:** ***5***

Sample ID ***ICABT-6322;B6*** **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 00:24 **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	0.033	0	0.000	-0.033
sd	0.000			0.006	0.000	0.000	0.256
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	16,061	15,901.980	15,901.591
sd	0.000			0.020	126.732	125.477	125.477

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-6322;B5*** **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 00:33 **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	0.033	0	0.000	-0.033
sd	0.000			0.006	0.000	0.000	0.256
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	16,309	16,147.525	16,147.136
sd	0.000			0.020	127.707	126.442	126.442

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-6322;B4*** **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	0.033	0	0.000	-0.033
sd	0.000			0.006	0.000	0.000	0.256
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	17,296	17,124.752	17,124.363
sd	0.000			0.020	131.514	130.212	130.212

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-6322;B3*** **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	0.033	2	1.980	1.947
sd	0.000			0.006	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	0.389	17,845	17,668.317	17,667.928
sd	0.000			0.020	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 -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Protean 4-7 - B **Address:** *5*

Sample ID ***ICABT-6322;B2*** **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 02:15 **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	0.033	0	0.000	-0.033
sd	0.000			0.006	0.000	0.000	0.256
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	17,847	17,670.297	17,669.908
sd	0.000			0.020	133.593	132.270	132.270

	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 4-7 - B **Address:** ***5***

Sample ID ***ICABT-6322;B1*** **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 08:50 **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	0.033	0	0.000	-0.033
sd	0.000			0.006	0.000	0.000	0.256
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	18,731	18,545.545	18,545.156
sd	0.000			0.020	136.861	135.506	135.506

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-6322;B8*** **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 08:55 **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	0.033	0	0.000	-0.033
sd	0.000			0.006	0.000	0.000	0.256
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	15,409	15,256.436	15,256.047
sd	0.000			0.020	124.133	122.904	122.904

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-6322;B7*** **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 09:20 **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	0.033	1	0.990	0.957
sd	0.000			0.006	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	0.389	15,558	15,403.960	15,403.571
sd	0.000			0.020	124.732	123.497	123.497

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-51465;A2*** **Repeat** ***43***

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 11/24/201! 12:06 **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	0.066	22,292	445.840	445.774
sd	0.000			0.008	149.305	2.986	2.986
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	8,770	175.400	174.978
sd	0.000			0.021	93.648	1.873	1.873

	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 4-7 - B **Address:** ***5***

Sample ID ***ICABT-51465;A1*** **Repeat** ***44***

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 11/24/201! 14:12 **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	0.066	21,017	420.340	420.274
sd	0.000			0.008	144.972	2.899	2.899
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	8,891	177.820	177.398
sd	0.000			0.021	94.292	1.886	1.886

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-51465;A4*** **Repeat** ***45***

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 11/24/201! 15:14 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 35.83 ***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	10,000	279.096	279.030
sd	0.000			0.008	100.000	2.791	2.791
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	4,973	138.794	138.372
sd	0.000			0.021	70.520	1.968	1.968

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-51465;A3*** **Repeat** ***46***

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 11/24/201! 16:20 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 30.68 ***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	10,002	326.010	325.944
sd	0.000			0.008	100.010	3.260	3.260
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	4,545	148.142	147.720
sd	0.000			0.021	67.417	2.197	2.198

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-51465;A6*** **Repeat** ***43***

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 11/24/201! 17:47 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 20.96 ***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	10,002	477.195	477.129
sd	0.000			0.008	100.010	4.771	4.771
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	5,035	240.219	239.797
sd	0.000			0.021	70.958	3.385	3.385

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-51465;A8*** **Repeat** ***45***

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 11/24/201! 19:34 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 31.51 ***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	10,002	317.423	317.357
sd	0.000			0.008	100.010	3.174	3.174
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	5,475	173.754	173.332
sd	0.000			0.021	73.993	2.348	2.348

	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 4-7 - B **Address:** *5*

Sample ID ***ICABT-51465;A7*** **Repeat** ***46***

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 11/24/201! 20:41 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 24.94 ***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	10,002	401.043	400.977
sd	0.000			0.008	100.010	4.010	4.010
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	5,146	206.335	205.913
sd	0.000			0.021	71.736	2.876	2.876

	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**

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				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean 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** **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	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** **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	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 -** **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;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 11/20/201! 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 11/20/201! 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 11/20/201! 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	0.071	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 -** **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	
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				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean 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** **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	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** **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	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 -** **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 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 11/20/201! 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	0.080	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 -** **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;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 11/20/201! 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 -** **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;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 11/20/201! 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	
3	102.50%	86.14%	87.36%	92.00%

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)
3	5.144	4.323	4.384

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Protean Beta ICV - 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
3	99.35%	97.05%	99.74%	98.72%

Beta Activity 2000.929 pCi

Beta Activity 2000.263 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:	4/2/2013		(or date at which you wish to determine activity)
Elapsed Time:	124.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.991777188		
Corrected Activity:	2220.291591	dpm	
Decay Activity (Sr/Y-90)	4440.583182	dpm	2000.263 pCi

Low Level Alpha/Beta Count Results
Sample Activity Report

Protean 0-3 - D **Address:** ***3***

Sample ID ***ICVABT-51512;Beta 2*** **Repeat** ***6***

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 11:38 **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	0.038	10	2.000	1.962
sd	0.000			0.006	3.162	0.632	0.632
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.363	8,583	1,716.600	1,716.237
sd	0.000			0.019	92.644	18.529	18.529

	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 - D **Address:** ***3***

Sample ID ***ICVABT-51512;Beta 1*** **Repeat** ***7***

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 12:32 **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	0.038	14	2.800	2.762
sd	0.000			0.006	3.742	0.748	0.748
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.363	9,384	1,876.800	1,876.437
sd	0.000			0.019	96.871	19.374	19.374

	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 - D **Address:** ***3***

Sample ID ***ICVABT-51512;Beta 3*** **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	0.038	6	1.200	1.162
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	0.363	8,391	1,678.200	1,677.837
sd	0.000			0.019	91.602	18.320	18.320

	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 - D **Address:** *3*

Sample ID ***ICVABT-181198;A3*** **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 11/20/201! 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	0.084	6,134	204.467	204.383
sd	0.000			0.009	78.320	2.611	2.611
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	2,383	79.433	78.801
sd	0.000			0.025	48.816	1.627	1.627

	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 - D **Address:** *3*

Sample ID ***ICVABT-181198;A2*** **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 11/20/201! 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	0.084	7,534	251.133	251.049
sd	0.000			0.009	86.799	2.893	2.893
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	2,528	84.267	83.635
sd	0.000			0.025	50.279	1.676	1.676

	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 - D **Address:** *3*

Sample ID ***ICVABT-181198;A1*** **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 11/20/201! 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	0.084	12,955	431.833	431.749
sd	0.000			0.009	113.820	3.794	3.794
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.632	3,981	132.700	132.068
sd	0.000			0.025	63.095	2.103	2.103

	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	
5	102.56%	102.38%	101.88%	102.27%

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)
5	5.147	5.138	5.113

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Protean Beta ICV - 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
5	98.40%	97.40%	100.60%	98.80%

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 4-7 - B **Address:** ***5***

Sample ID ***ICVABT-51512;Beta 3*** **Repeat** ***7***

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 12:32 **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	0.033	1	0.200	0.167
sd	0.000			0.006	1.000	0.200	0.200
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	8,393	1,678.600	1,678.211
sd	0.000			0.020	91.613	18.323	18.323

	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 -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Protean 4-7 - B **Address:** *5*

Sample ID ***ICVABT-51512;Beta 2*** **Repeat** *8*

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 12:46 **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	0.033	1	0.200	0.167
sd	0.000			0.006	1.000	0.200	0.200
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	8,568	1,713.600	1,713.211
sd	0.000			0.020	92.563	18.513	18.513

	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 4-7 - B **Address:** ***5***

Sample ID ***ICVABT-51512;Beta 1*** **Repeat** ***9***

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 13:04 **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	0.033	0	0.000	-0.033
sd	0.000			0.006	0.000	0.000	0.115
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.389	9,244	1,848.800	1,848.411
sd	0.000			0.020	96.146	19.229	19.229

	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 4-7 - B **Address:** ***5***

Sample ID ***ICVABT-181198; A3*** **Repeat** ***104***

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 12:56 **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	0.066	8,023	267.433	267.367
sd	0.000			0.008	89.571	2.986	2.986
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	3,465	115.500	115.078
sd	0.000			0.021	58.864	1.962	1.962

	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 4-7 - B **Address:** ***5***

Sample ID ***ICVABT-181198; A2*** **Repeat** ***105***

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 13:59 **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	0.066	12,111	403.700	403.634
sd	0.000			0.008	110.050	3.668	3.668
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	4,725	157.500	157.078
sd	0.000			0.021	68.739	2.291	2.291

	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 4-7 - B **Address:** ***5***

Sample ID ***ICVABT-181198; A1*** **Repeat** ***25***

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 15:12 **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	0.066	6,454	215.133	215.067
sd	0.000			0.008	80.337	2.678	2.678
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.422	3,056	101.867	101.445
sd	0.000			0.021	55.281	1.843	1.843

	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**

Monthly Backgrounds

Alpha/Beta Count Results

Source Count Report

Protean 0-3 - A

Addr: 0

Sample ID ICB
ICB; Monthly Backgrounds

Batch ID ICB;Monthly Backgrounds

Repeat 518
Carrier No. 0
Detector Volts 1515

Residual Wt 0 ***mg***
Count Began 7/27/2018 2:36:07 PM
Count Ended 7/28/2018 7:16:59 AM
Sample Count Time 1,000.00 ***mins***

Calibration Date 2/15/2016 5:20:09 PM
Backgrounds From
Background Count Time 0.00

Half Life 0.00 ***Years***
Decay Factor 1.000

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	77	0.077	0.000	0.077
sd	8.775	0.009	0.000	0.009
Beta	645	0.645	0.000	0.645
sd	25.397	0.025	0.000	0.025

	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
ICB; Monthly Backgrounds

Batch ID ICB;Monthly Backgrounds

Repeat 517
Carrier No. 0

Detector Volts 1515

Residual Wt 0 ***mg***
Count Began 7/27/2018 2:35:02 PM
Count Ended 7/28/2018 7:15:53 AM

Calibration Date 2/15/2016 5:20:09 PM
Backgrounds From

Half Life 0.00 ***Years***
Decay Factor 1.000

Sample Count Time 1,000.00 ***mins***
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	76	0.076	0.000	0.076
sd	8.718	0.009	0.000	0.009
Beta	491	0.491	0.000	0.491
sd	22.159	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

Protean 0-3 - D

Addr: 3

Sample ID ICB
ICB; Monthly Backgrounds

Batch ID ICB;Monthly Backgrounds

Repeat 520
Carrier No. 0
Detector Volts 1515

Residual Wt 0 ***mg***
Count Began 7/27/2018 2:38:21 PM
Count Ended 7/28/2018 7:18:12 AM
Sample Count Time 1,000.00 ***mins***

Calibration Date 2/15/2016 5:20:09 PM
Backgrounds From
Background Count Time 0.00

Half Life 0.00 ***Years***
Decay Factor 1.000

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	111	0.111	0.000	0.111
sd	10.536	0.011	0.000	0.011
Beta	656	0.656	0.000	0.656
sd	25.612	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 4-7 - B

Addr: 5

Sample ID ICB
ICB; Monthly Backgrounds

Batch ID ICB;Monthly Backgrounds

Repeat 522
Carrier No. 0
Detector Volts 1515

Residual Wt 0 ***mg***
Count Began 7/27/2018 2:40:30 PM
Count Ended 7/28/2018 7:20:25 AM
Sample Count Time 1,000.00 ***mins***

Calibration Date 2/15/2016 5:20:09 PM
Backgrounds From
Background Count Time 0.00

Half Life 0.00 ***Years***
Decay Factor 1.000

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	70	0.070	0.000	0.070
sd	8.367	0.008	0.000	0.008
Beta	437	0.437	0.000	0.437
sd	20.905	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

Run Logs

Gas Flow Proportional Counter Run Log

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
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
07/27/18 14:36	1000	ICB 160-378545/2		378545			PS
08/02/18 00:04	2	CCVA 160-379949/5		379949			CDR
08/02/18 00:09	2	CCVB 160-379949/21		379949			CDR
08/02/18 01:37	200	CCB 160-379949/40		379949			CDR
08/02/18 05:46	100	ZZZZZ		379949			
08/02/18 09:27	200	ZZZZZ		379949			
08/02/18 15:56	200	ZZZZZ		379949			
08/02/18 21:07	200	MB 160-379964/1-A		379949	379964	9310	CDR

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			

Gas Flow Proportional Counter Run Log

Detector: Protean1 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/15 22:11	29.7	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
07/27/18 14:35	1000	ICB 160-378545/1		378545			PS
08/02/18 00:04	2	CCVA 160-379949/6		379949			CDR
08/02/18 00:09	2	CCVB 160-379949/22		379949			CDR
08/02/18 01:37	200	CCB 160-379949/41		379949			CDR
08/02/18 05:47	100	ZZZZZ		379949			
08/02/18 09:27	200	ZZZZZ		379949			
08/02/18 15:56	200	ZZZZZ		379949			
08/02/18 21:07	200	LCS 160-379964/2-A		379949	379964	9310	CDR

Detector: Protean3

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 160-224049/10		224049			JLW
03/27/13 00:32	1.01	ICABT 160-224049/11		224049			JLW
03/27/13 00:51	1.01	ICABT 160-224049/12		224049			JLW
03/27/13 01:06	1.01	ZZZZZ		224049			
03/27/13 01:09	1.01	ICABT 160-224049/14		224049			JLW
03/27/13 02:15	1.01	ICABT 160-224049/15		224049			JLW
03/27/13 08:49	1.01	ICABT 160-224049/16		224049			JLW
03/27/13 08:54	1.01	ICABT 160-224049/17		224049			JLW
03/27/13 09:20	1.01	ICABT 160-224049/18		224049			JLW
03/28/13 11:38	5	ICVABT 160-224049/19		224049			JLW
03/28/13 12:32	5	ICVABT 160-224049/20		224049			JLW
04/02/13 21:11	5	ICVABT 160-224049/21		224049			JLW
11/13/15 12:29	50	ICABT 160-224049/22		224049			JLW
11/14/15 21:07	50	ICABT 160-224049/23		224049			JLW
11/15/15 13:05	29	ICABT 160-224049/1		224049			JLW
11/15/15 14:11	21	ICABT 160-224049/2		224049			JLW
11/15/15 17:56	23	ICABT 160-224049/3		224049			JLW
11/15/15 20:53	23	ICABT 160-224049/4		224049			JLW
11/15/15 22:11	20	ICABT 160-224049/5		224049			JLW
11/15/15 22:56	24	ZZZZZ		224049			
11/20/15 14:28	30	ICVABT 160-224049/7		224049			JLW
11/20/15 18:43	30	ICVABT 160-224049/8		224049			JLW
11/20/15 19:40	30	ZZZZZ		224049			
11/20/15 19:40	30	ICVABT 160-224049/24		224049			JLW
07/27/18 14:38	1000	ICB 160-378545/4		378545			PS
08/02/18 00:04	2	CCVA 160-379949/8		379949			CDR
08/02/18 00:09	2	CCVB 160-379949/24		379949			CDR
08/02/18 01:37	200	CCB 160-379949/42		379949			CDR
08/02/18 15:56	200	ZZZZZ		379949			
08/02/18 21:07	200	160-29498-1	CRC-B20-0206	379949	379964	9310	CDR

Detector: Protean5

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/13 00:24	1.01	ICABT 160-224295/12		224295			JLW

Gas Flow Proportional Counter Run Log

Detector: Protean5 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/13 00:33	1.01	ICABT 160-224295/13		224295			JLW
03/27/13 00:51	1.01	ICABT 160-224295/14		224295			JLW
03/27/13 01:06	1.01	ZZZZZ		224295			
03/27/13 01:09	1.01	ICABT 160-224295/16		224295			JLW
03/27/13 02:15	1.01	ICABT 160-224295/17		224295			JLW
03/27/13 08:50	1.01	ICABT 160-224295/18		224295			JLW
03/27/13 08:55	1.01	ICABT 160-224295/19		224295			JLW
03/27/13 09:20	1.01	ICABT 160-224295/20		224295			JLW
03/28/13 12:32	5	ICVABT 160-224295/21		224295			JLW
03/28/13 12:46	5	ICVABT 160-224295/22		224295			JLW
03/28/13 13:04	5	ICVABT 160-224295/23		224295			JLW
11/24/15 12:06	50	ICABT 160-224295/1		224295			JLW
11/24/15 14:12	50	ICABT 160-224295/2		224295			JLW
11/24/15 15:14	36	ICABT 160-224295/3		224295			JLW
11/24/15 16:20	31	ICABT 160-224295/4		224295			JLW
11/24/15 17:47	21	ICABT 160-224295/5		224295			JLW
11/24/15 18:26	26	ZZZZZ		224295			
11/24/15 19:34	32	ICABT 160-224295/7		224295			JLW
11/24/15 20:41	25	ICABT 160-224295/8		224295			JLW
11/24/15 21:33	30	ZZZZZ		224295			
11/24/15 22:56	24	ZZZZZ		224295			
11/25/15 09:44	30	ZZZZZ		224295			
11/25/15 18:18	30	ZZZZZ		224295			
11/25/15 22:45	30	ZZZZZ		224295			
11/27/15 08:56	30	ZZZZZ		224295			
12/03/15 12:56	30	ICVABT 160-224295/27		224295			JLW
12/03/15 13:59	30	ICVABT 160-224295/28		224295			JLW
12/03/15 15:12	30	ICVABT 160-224295/29		224295			JLW
07/27/18 14:40	1000	ICB 160-378545/6		378545			PS
08/02/18 00:04	2	CCVA 160-379949/10		379949			CDR
08/02/18 00:09	2	CCVB 160-379949/26		379949			CDR
08/02/18 01:37	200	CCB 160-379949/44		379949			CDR
08/02/18 15:57	200	ZZZZZ		379949			
08/02/18 21:07	200	160-29498-1 DU	CRC-B20-0206 DU	379949	379964	9310	CDR

Radiological
Pre-Preparation Data

Radiological
Pre-Preparation Data

Shipping and Receiving Documents

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone: 314.298.8566 Fax: 314.298.8757

Chain of Custody Record

215030

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Kris Schnoes	Site Contact: Kris Schnoes	Date: 7/12/18	COC No:
Company Name: Tetra Tech	Tel/Fax: 773 791 8058	Lab Contact:	Carrier: Fed Ex	____ of ____ COCs
Address: 1 S. Wacker Ste 3700	Analysis Turnaround Time			Sampler:
City/State/Zip: Chicago, IL 60606	☐ CALENDAR DAYS ☒ WORKING DAYS			For Lab Use Only:
Phone: 773/791-8058	TAT if different from Below ____			Walk-in Client:
Fax:	☒ 2 weeks			Lab Sampling:
Project Name: Carnotite Reduction Co	☐ 1 week			Job / SDG No.:
Site: Chicago, IL	☐ 2 days			
PO#	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Gross Alpha/Beta	Isotopic U (Nom Sep)	Th-230	TCLP VOA	Cyanide	pH	Phenol	Paint Filter	PCBs	TCLP Metals + Hg	TCLP SVOA	TCLP Hexavalent Chrom	Ignitability	Sulfide	EOX	Sample Specific Notes:
CRC-B20-0206	7/11/18	G ⇔ 1508		S	1			X	X	X													
CRC-B21-0205	7/12/18	G ⇔ 1140		S	5						X	X	X	X	X	X							
CRC-B22-0105	7/12/18	G ⇔ 1150		S	3												X	X	X				
CRC-B23-0104	7/12/18	G ⇔ 1210		S	3															X	X	X	Pancake 70cpm, background=40cpm

160-29498 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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 & Comments: FedEx Tracking: 8061 7065 0099

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: ____ Corr'd: ____ Therm ID No.: ____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kristine Schnoes	Tetra Tech	7/12/18 1800	McK	TA STL	071318 0930
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

FedEx Express **NEW Package US Airbill**

FedEx Tracking Number 8061 7065 0099

Form ID No. 0200

Recipient's Copy

1 From

Date 7/12/18

Sender's Name Kris Schnoes Phone 713 767 5058

Company Tetra Tech

Address 1 S. Wacker Dr Ste. 3700 Dept./Floor/Suite/Room

City Chicago State IL ZIP 60606

2 Your Internal Billing Reference 103232840/004.0096

3 To

Recipient's Name Chenise Lambert-Sykes Phone 314 298-8566

Company Test America

Address 13715 Rider Trail North Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City Earth City State MO ZIP 63045

HOLD Weekday — FedEx location address REQUIRED. **NOT available for** FedEx First Overnight.

HOLD Saturday — FedEx location address **REQUIRED. Available ONLY for** FedEx Priority Overnight and FedEx 2Day to select locations.

8061 7065 0099

4 Express Package Service * To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs.
For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day

- FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [X] FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

- FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
- FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.

FedEx Envelope* | FedEx Pak* | FedEx Box | FedEx Tube | [X] Other

6 Special Handling and Delivery Signature Options

SATURDAY Delivery — **NOT available for** FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver

No Signature Required — Package may be left without obtaining a signature for delivery.

Direct Signature — Someone at recipient's address may sign for delivery. *Fee applies.*

Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. *Fee applies.*

Does this shipment contain dangerous goods?

One box must be checked.

[X] No | Yes — As per attached Shipper's Declaration | Yes — Shipper's Declaration not required | Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

Cargo Aircraft Only

7 Payment *Bill to:*

Enter FedEx Acct. No. or Credit Card No. below.

[X] Sender — Acct. No. in Section 1 will be billed | Recipient | Third Party | Credit Card | Cash/Check

Total Packages 1 Total Weight 25 lbs.

Credit Card Auth.

†Our liability is limited to US$100 unless you declare a higher value. See the current FedEx Service Guide for details.

644

Rev. Date 1/12 • Part #167082 • ©2012 FedEx • PRINTED IN U.S.A. SRF

fedex.com 1.800.GoFedEx 1.800.463.3339

160-29498 Waybill

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lambert-Sykes, Chenise Y	Carrier Tracking No(s):	COC No: 160-144933.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: chenise.lambert-sykes@testamericainc.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Louisiana		Job #: 160-29498-1
Address: 4955 Yarrow Street,	Due Date Requested: 8/7/2018			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Former Carnotite Site - Non-Rad Analysis	Project #: 16007488			
Site:	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260B/1311_Z TCLP 8260 sublist	8082A/3546_PCB_1YR Standard 8082A list	9012A/9012A_Prep	8270C/1311_T TCLP regulatory list	8081B/1311_T TCLP Regulatory list	8151A/1311_T TCLP analytes	6010B/1311T_M RCRA Analytes	7470A/1311T_Hg	9034/9030B	Total Number of containers	Special Instructions/Note:
			Preservation Code:														
CRC-B21-0205 (160-29498-2)	7/12/18	11:40 Central		Solid			X	X	X							3	RAD SCREEENS REQUIRED PRIOR TO SHIPPING!
CRC-B22-0105 (160-29498-3)	7/12/18	11:50 Central		Solid						X	X	X	X	X		3	RAD SCREEENS REQUIRED PRIOR TO SHIPPING!
CRC-B23-0104 (160-29498-4)	7/12/18	12:10 Central		Solid											X	1	RAD SCREEENS REQUIRED PRIOR TO SHIPPING!

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

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/tests/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 complicance to TestAmerica Laboratories, Inc.

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* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature] 071718 1900	071718 1900		Reed Kf	7-21-18 0845	TA-Dn
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 5.6 IRH 8 0.0

Ver: 09/20/2016

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

160-29498 Chain of Custody

Cooler Received/Opened On 07/21/18 @ 10:10

Time Samples Removed From Cooler 12:57 Time Samples Placed In Storage 13:02 (2 Hour Window)

1. Tracking # 3655 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 17960358 pH Strip Lot Chlorine Strip Lot

2. Temperature of rep. sample or temp blank when opened: 5.6 *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 (intial) 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)

● ⬅ Larger than this.

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 (intial) JJ

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 (intial) JJ

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 (intial) JJ

I certify that I attached a label with the unique LIMS number to each container (intial) JJ

21. Were there Non-Conformance issues at login? YES...(NO) Was a NCM generated? YES...(NO)...#

BIS = Broken in shipment

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

160-29498

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lambert-Sykes, Chen...		COC No: 160-144942.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: chenise.lambert-sykes@testamericainc.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): NELAP - Louisiana		Job #: 160-29498-1
Address: 2960 Foster Creighton Drive, ,	Due Date Requested: 8/3/2018			
City: Nashville	TAT Requested (days):			
State, Zip: TN, 37204				
Phone: 615-726-0177(Tel) 615-726-3404(Fax)	PO #:			
Email:	WO #:			
Project Name: Former Carnotite Site - Non-Rad Analysis	Project #: 16007488			
Site:	SSOW#:			

Analysis Requested

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 - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9066/Distill_Phenol Total Phenols	9023/9023_Prep Extractable Organic Halides	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
CRC-B21-0205 (160-29498-2)	7/12/18	11:40 Central		Solid			X		1	RAD SCREEENS REQUIRED PRIOR TO SHIPPING!
CRC-B23-0104 (160-29498-4)	7/12/18	12:10 Central		Solid				X	1	RAD SCREEENS 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/tests/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 complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 2/20/18 1735	Company TAStL	Received by:	Date/Time: 07/21/18 10:10	Company TA-WAS
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 5.6

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 160-29498-1

Login Number: 29498
List Number: 1
Creator: McKinney, Gerrod E

List Source: TestAmerica St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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	0.4
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?	N/A	
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 <6mm (1/4").	N/A	
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: 160-29498-1

Login Number: 29498
List Number: 3
Creator: Pottruff, Reed W

List Source: TestAmerica Denver
List Creation: 07/21/18 01:16 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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?	N/A	
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 <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 160-29521-1

Job Description: Former Carnotite Site - Non-Rad Analysis

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
8/22/2018 11:59 AM

Chenise Y Lambert-Sykes, Project Manager I
13715 Rider Trail North, Earth City, MO, 63045
(314)298-8566
chenise.lambert-sykes@testamericainc.com
08/22/2018

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.

Table of Contents

Cover Title Page 1

Data Summaries 4

- Definitions 4
- Case Narrative 5
- Client Sample Results 7
- Default Detection Limits 29
- Tracer/Carrier Summary 30
- QC Sample Results 32
- QC Association 39
- Chronicle 43
- Certification Summary 51
- Method Summary 52
- Sample Summary 53
- Reagent Traceability 54
  - COAs 61

Inorganic Sample Data 252

- General Chemistry Data 252
  - Gen Chem Cover Page 253
  - Gen Chem MDL 254
  - Gen Chem Analysis Run Log 256
  - Gen Chem Prep Data 257

Radiochemistry Raw Data 259

- Alpha Spectroscopy 259
  - Method A-01-R Th 260
  - Method A-01-R U 305
  - Daily Checks 349

Table of Contents

Initial Calibrations 408

Initial Calibration Verifications 458

Monthly Calibration Verifications 515

Monthly Backgrounds 565

Run Logs 664

Gamma Spectroscopy 675

Method 901.1 Ra-226 676

Daily Checks 1405

Initial Calibrations 1426

Initial Calibration Verifications 1502

Monthly Backgrounds 1571

Run Logs 1626

Pre-Preparation Data 1634

Shipping and Receiving Documents 1638

Client Chain of Custody 1639

Sample Receipt Checklist 1641

Definitions/Glossary

Client: Tetra Tech, Inc. TestAmerica Job ID: 160-29521-1
Project/Site: Former Carnotite Site - Non-Rad Analysis

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	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: 160-29521-1

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 07/14/2018; the samples arrived in good condition, and properly preserved. The temperature of the coolers at receipt was 17.0 C.

Centrifugation could not be performed as requested as the water content was inadequate to produce sufficient volume for the water analysis. Samples were analyzed as soils.

PERCENT SOLIDS

Samples CRC-B9-1416 (160-29521-1), CRC-B9-2022 (160-29521-2), CRC-B6-1618 (160-29521-3), CRC-B6-2426 (160-29521-4), CRC-B3-0204 (160-29521-5), CRC-B3-0608 (160-29521-6), CRC-B3-1618 (160-29521-7), CRC-B13-0305 (160-29521-8), CRC-B13-0608 (160-29521-9), CRC-B15-0204 (160-29521-10), CRC-B15-0608 (160-29521-11), CRC-B15-1214 (160-29521-12), CRC-B16-0608 (160-29521-13), CRC-B16-0204 (160-29521-14), CRC-B16-1416 (160-29521-15), CRC-B18-0204 (160-29521-16), CRC-B18-0608 (160-29521-17), CRC-B18-0809 (160-29521-18), CRC-B19-0204 (160-29521-19), CRC-B19-0810 (160-29521-20), CRC-B19-1618 (160-29521-21) and CRC-B19-2224 (160-29521-22) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 07/17/2018.

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

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples CRC-B9-1416 (160-29521-1), CRC-B9-2022 (160-29521-2), CRC-B6-1618 (160-29521-3), CRC-B6-2426 (160-29521-4), CRC-B3-0204 (160-29521-5), CRC-B3-0608 (160-29521-6), CRC-B3-1618 (160-29521-7), CRC-B13-0305 (160-29521-8), CRC-B13-0608 (160-29521-9), CRC-B15-0204 (160-29521-10), CRC-B15-0608 (160-29521-11), CRC-B15-1214 (160-29521-12),

CRC-B16-0608 (160-29521-13), CRC-B16-0204 (160-29521-14), CRC-B16-1416 (160-29521-15), CRC-B18-0204 (160-29521-16), CRC-B18-0608 (160-29521-17), CRC-B18-0809 (160-29521-18), CRC-B19-0204 (160-29521-19), CRC-B19-0810 (160-29521-20), CRC-B19-1618 (160-29521-21) and CRC-B19-2224 (160-29521-22) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA 901.1. The samples were dried on 07/18/2018, prepared on 07/19/2018 and analyzed on 08/09/2018 and 08/10/2018.

Prep Batch: 160-376766
Insufficient sample volume was provided for the following sample to fill a tuna can geometry calibrated for radium-226 analysis by gamma spectroscopy: CRC-B18-0204 (160-29521-16), (LCS 160-376766/2-A), (MB 160-376766/1-A), (160-29527-A-1-A) and (160-29527-A-1-B DU). The use of a 100 mL solid geometry could potentially bias the results low due to the loss of radon into the headspace of the container.

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

ISOTOPIC THORIUM (ALPHA SPECTROMETRY)
Samples CRC-B9-1416 (160-29521-1), CRC-B9-2022 (160-29521-2), CRC-B6-1618 (160-29521-3), CRC-B6-2426 (160-29521-4), CRC-B3-0204 (160-29521-5), CRC-B3-0608 (160-29521-6), CRC-B3-1618 (160-29521-7), CRC-B13-0305 (160-29521-8), CRC-B13-0608 (160-29521-9), CRC-B15-0204 (160-29521-10), CRC-B15-0608 (160-29521-11), CRC-B15-1214 (160-29521-12), CRC-B16-0608 (160-29521-13), CRC-B16-0204 (160-29521-14), CRC-B16-1416 (160-29521-15), CRC-B18-0204 (160-29521-16), CRC-B18-0608 (160-29521-17), CRC-B18-0809 (160-29521-18), CRC-B19-0204 (160-29521-19), CRC-B19-0810 (160-29521-20), CRC-B19-1618 (160-29521-21) and CRC-B19-2224 (160-29521-22) were analyzed for Isotopic Thorium (Alpha Spectrometry) in accordance with DOE A01R_Th. The samples were dried on 07/18/2018, prepared on 07/24/2018 and 07/29/2018 and analyzed on 08/04/2018, 08/10/2018 and 08/15/2018.

Prep Batch: 160-377729
The following samples could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: CRC-B9-1416 (160-29521-1), CRC-B9-2022 (160-29521-2), CRC-B6-1618 (160-29521-3) and CRC-B6-2426 (160-29521-4). Samples from job 490-155782 contain rocks. Samples from jobs 160-29479 and 160-29521 contain sand and rocks.

Prep Batch: 160-378572
The following samples could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: CRC-B3-0204 (160-29521-5), CRC-B3-0608 (160-29521-6), CRC-B3-1618 (160-29521-7), CRC-B13-0305 (160-29521-8), CRC-B13-0608 (160-29521-9), CRC-B15-0204 (160-29521-10), CRC-B15-0608 (160-29521-11), CRC-B15-1214 (160-29521-12), CRC-B16-0608 (160-29521-13), CRC-B16-0204 (160-29521-14), CRC-B16-1416 (160-29521-15), CRC-B18-0204 (160-29521-16), CRC-B18-0608 (160-29521-17), CRC-B18-0809 (160-29521-18), CRC-B19-0204 (160-29521-19), CRC-B19-0810 (160-29521-20), CRC-B19-1618 (160-29521-21), CRC-B19-2224 (160-29521-22) and (160-29521-A-5-B DU). The samples contain rocks.

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

ISOTOPIC URANIUM (ALPHA SPECTROMETRY)
Samples CRC-B9-1416 (160-29521-1), CRC-B9-2022 (160-29521-2), CRC-B6-1618 (160-29521-3), CRC-B6-2426 (160-29521-4), CRC-B3-0204 (160-29521-5), CRC-B3-0608 (160-29521-6), CRC-B3-1618 (160-29521-7), CRC-B13-0305 (160-29521-8), CRC-B13-0608 (160-29521-9), CRC-B15-0204 (160-29521-10), CRC-B15-0608 (160-29521-11), CRC-B15-1214 (160-29521-12), CRC-B16-0608 (160-29521-13), CRC-B16-0204 (160-29521-14), CRC-B16-1416 (160-29521-15), CRC-B18-0204 (160-29521-16), CRC-B18-0608 (160-29521-17), CRC-B18-0809 (160-29521-18), CRC-B19-0204 (160-29521-19), CRC-B19-0810 (160-29521-20), CRC-B19-1618 (160-29521-21) and CRC-B19-2224 (160-29521-22) were analyzed for Isotopic Uranium (Alpha Spectrometry) in accordance with DOE. The samples were dried on 07/18/2018, prepared on 07/24/2018 and 07/29/2018 and analyzed on 08/04/2018, 08/10/2018 and 08/13/2018.

Prep Batch: 160-377742
The following samples could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: CRC-B9-1416 (160-29521-1), CRC-B9-2022 (160-29521-2), CRC-B6-1618 (160-29521-3) and CRC-B6-2426 (160-29521-4). Samples contain rocks and sand.

Prep Batch: 160-378574
The following samples could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: CRC-B3-0204 (160-29521-5), CRC-B3-0608 (160-29521-6), CRC-B3-1618 (160-29521-7), CRC-B13-0305 (160-29521-8), CRC-B13-0608 (160-29521-9), CRC-B15-0204 (160-29521-10), CRC-B15-0608 (160-29521-11), CRC-B15-1214 (160-29521-12), CRC-B16-0608 (160-29521-13), CRC-B16-0204 (160-29521-14), CRC-B16-1416 (160-29521-15), CRC-B18-0204 (160-29521-16), CRC-B18-0608 (160-29521-17), CRC-B18-0809 (160-29521-18), CRC-B19-0204 (160-29521-19), CRC-B19-0810 (160-29521-20), CRC-B19-1618 (160-29521-21), CRC-B19-2224 (160-29521-22) and (160-29521-A-5-B DU). The samples contain rocks.

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

Client Sample ID: CRC-B9-1416 — Lab Sample ID: 160-29521-1

Date Collected: 07/12/18 08:00 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.6**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**80.4**		0.1	0.1	%			07/17/18 22:33	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.0440	U	0.696	0.696		1.20	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Actinium-228	0.140	U	0.189	0.189		0.357	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Bismuth-212	-0.446	U	0.914	0.916		1.55	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Bismuth-214	**0.342**		0.104	0.110		0.0736	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Lead-210	0.0992	U	1.35	1.35		2.33	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Lead-212	**0.216**		0.104	0.107		0.113	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Lead-214	**0.211**		0.108	0.110		0.158	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Potassium-40	**11.6**		1.75	2.12		0.921	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Protactinium-231	0.566	U	1.53	1.54		3.51	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Radium-226	**0.342**		0.104	0.110	1.00	0.0736	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Radium-228	0.140	U	0.189	0.189		0.357	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Thallium-208	**0.116**		0.0494	0.0508		0.0490	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Thorium-232	0.140	U	0.189	0.189		0.357	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Thorium-234	-0.384	U	0.920	0.921		1.63	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Uranium-235	0.135	U	0.294	0.294		0.595	pCi/g	07/19/18 15:00	08/09/18 06:38	1
Uranium-238	-0.384	U	0.920	0.921		1.63	pCi/g	07/19/18 15:00	08/09/18 06:38	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	**0.408**		0.169	0.172	1.00	0.153	pCi/g	07/24/18 17:17	08/04/18 14:31	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*99.0*		*30 - 110*	*07/24/18 17:17*	*08/04/18 14:31*	*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	**0.276**		0.111	0.114	1.00	0.0506	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-235	0.0277	U	0.0392	0.0392	1.00	0.0415	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-238	**0.340**		0.124	0.127	1.00	0.0577	pCi/g	07/24/18 18:48	08/04/18 14:34	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*86.0*		*30 - 110*	*07/24/18 18:48*	*08/04/18 14:34*	*1*

Client Sample ID: CRC-B9-2022 — Lab Sample ID: 160-29521-2

Date Collected: 07/12/18 08:30 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**22.2**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B9-2022 — Lab Sample ID: 160-29521-2

Date Collected: 07/12/18 08:30 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	**77.8**		0.1	0.1	%			07/17/18 22:33	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.0456	U	0.204	0.205		1.27	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Actinium-228	**0.356**		0.265	0.267		0.283	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Bismuth-212	0.415	U	0.892	0.893		1.55	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Bismuth-214	**0.592**		0.160	0.172		0.112	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Lead-210	0.758	U	1.48	1.49		2.20	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Lead-212	**0.351**		0.103	0.113		0.118	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Lead-214	**0.669**		0.147	0.163		0.160	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Potassium-40	**12.9**		2.15	2.52		0.978	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Protactinium-231	0.661	U	2.08	2.08		4.81	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Radium-226	**0.592**		0.160	0.172	1.00	0.112	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Radium-228	**0.356**		0.265	0.267		0.283	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Thallium-208	**0.136**		0.126	0.127		0.108	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Thorium-232	**0.356**		0.265	0.267		0.283	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Thorium-234	1.21	U	0.699	0.711		1.62	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Uranium-235	0.128	U	0.319	0.320		0.679	pCi/g	07/19/18 15:00	08/09/18 06:39	1
Uranium-238	1.21	U	0.699	0.711		1.62	pCi/g	07/19/18 15:00	08/09/18 06:39	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	**0.382**		0.162	0.165	1.00	0.144	pCi/g	07/24/18 17:17	08/04/18 14:30	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*94.2*		*30 - 110*	*07/24/18 17:17*	*08/04/18 14:30*	*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	**0.259**		0.104	0.107	1.00	0.0681	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-235	0.0202	U	0.0358	0.0359	1.00	0.0647	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-238	**0.356**		0.120	0.124	1.00	0.0519	pCi/g	07/24/18 18:48	08/04/18 14:34	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*103*		*30 - 110*	*07/24/18 18:48*	*08/04/18 14:34*	*1*

Client Sample ID: CRC-B6-1618 — Lab Sample ID: 160-29521-3

Date Collected: 07/11/18 16:40 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**21.1**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**78.9**		0.1	0.1	%			07/17/18 22:33	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.288	U	0.206	0.208		1.11	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Actinium-228	**0.432**		0.142	0.149		0.0794	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Bismuth-212	0.0348	U	0.595	0.595		1.07	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Bismuth-214	**0.405**		0.132	0.139		0.118	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Lead-210	0.162	U	1.49	1.49		2.55	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Lead-212	**0.249**		0.0754	0.0820		0.0969	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Lead-214	**0.423**		0.102	0.111		0.132	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Potassium-40	**14.9**		1.63	2.23		0.654	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Protactinium-231	0.000	U	0.306	0.306		3.87	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Radium-226	**0.405**		0.132	0.139	1.00	0.118	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Radium-228	**0.432**		0.142	0.149		0.0794	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Thallium-208	**0.132**		0.0487	0.0506		0.0422	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Thorium-232	**0.432**		0.142	0.149		0.0794	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Thorium-234	0.000	U	0.804	0.804		2.41	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Uranium-235	0.150	U	0.455	0.455		0.762	pCi/g	07/19/18 15:00	08/09/18 07:15	1
Uranium-238	0.000	U	0.804	0.804		2.41	pCi/g	07/19/18 15:00	08/09/18 07:15	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	**0.406**		0.167	0.170	1.00	0.145	pCi/g	07/24/18 17:17	08/04/18 14:30	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*78.6*		*30 - 110*	*07/24/18 17:17*	*08/04/18 14:30*	*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	**0.347**		0.122	0.125	1.00	0.0637	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-235	0.0130	U	0.0260	0.0260	1.00	0.0390	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-238	**0.317**		0.116	0.119	1.00	0.0592	pCi/g	07/24/18 18:48	08/04/18 14:34	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*105*		*30 - 110*	*07/24/18 18:48*	*08/04/18 14:34*	*1*

Client Sample ID: CRC-B6-2426 — Lab Sample ID: 160-29521-4

Date Collected: 07/11/18 17:05 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**22.2**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**77.8**		0.1	0.1	%			07/17/18 22:33	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.356	U	1.06	1.06		1.79	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Actinium-228	**0.530**		0.210	0.217		0.426	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Bismuth-212	0.392	U	0.973	0.974		1.67	pCi/g	07/19/18 15:00	08/09/18 07:17	1

Client Sample ID: CRC-B6-2426 — Lab Sample ID: 160-29521-4

Date Collected: 07/11/18 17:05 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Bismuth-214	**0.885**		0.204	0.223		0.170	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Lead-210	2.27	U	1.99	2.01		2.74	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Lead-212	**0.375**		0.111	0.118		0.140	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Lead-214	**0.870**		0.179	0.199		0.176	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Potassium-40	**15.1**		2.10	2.59		0.898	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Protactinium-231	0.000	U	0.411	0.411		6.34	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Radium-226	**0.885**		0.204	0.223	1.00	0.170	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Radium-228	**0.530**		0.210	0.217		0.426	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Thallium-208	**0.180**		0.0630	0.0656		0.0448	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Thorium-232	**0.530**		0.210	0.217		0.426	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Thorium-234	**2.01**		1.16	1.18		1.54	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Uranium-235	0.0488	U	0.196	0.196		1.14	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Uranium-238	**2.01**		1.16	1.18		1.54	pCi/g	07/19/18 15:00	08/09/18 07:17	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	**0.391**		0.162	0.165	1.00	0.142	pCi/g	07/24/18 17:17	08/04/18 14:30	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*79.3*		*30 - 110*	*07/24/18 17:17*	*08/04/18 14:30*	*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	**0.339**		0.120	0.124	1.00	0.0595	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-235	0.000	U	0.00488	0.00488	1.00	0.0390	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-238	**0.391**		0.129	0.133	1.00	0.0594	pCi/g	07/24/18 18:48	08/04/18 14:34	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*97.3*		*30 - 110*	*07/24/18 18:48*	*08/04/18 14:34*	*1*

Client Sample ID: CRC-B3-0204 — Lab Sample ID: 160-29521-5

Date Collected: 07/12/18 17:10 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**13.6**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**86.4**		0.1	0.1	%			07/17/18 22:33	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.486	U	1.12	1.12		1.88	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Actinium-228	**0.411**		0.302	0.305		0.312	pCi/g	07/19/18 15:00	08/09/18 07:16	1

Client Sample ID: CRC-B3-0204 — Lab Sample ID: 160-29521-5

Date Collected: 07/12/18 17:10 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Bismuth-212	0.00945	U	1.18	1.18		2.09	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Bismuth-214	**1.19**		0.217	0.250		0.140	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Lead-210	1.84	U	1.39	1.41		1.91	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Lead-212	**0.616**		0.124	0.147		0.129	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Lead-214	**1.36**		0.205	0.249		0.119	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Potassium-40	**14.2**		2.07	2.53		0.743	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Protactinium-231	0.000	U	0.880	0.880		6.58	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Radium-226	**1.19**		0.217	0.250	1.00	0.140	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Radium-228	**0.411**		0.302	0.305		0.312	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Thallium-208	**0.268**		0.0871	0.0915		0.0682	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Thorium-232	**0.411**		0.302	0.305		0.312	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Thorium-234	1.10	U	0.721	0.730		2.17	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Uranium-235	0.151	U	0.294	0.295		1.09	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Uranium-238	1.10	U	0.721	0.730		2.17	pCi/g	07/19/18 15:00	08/09/18 07:16	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	**0.803**		0.216	0.226	1.00	0.152	pCi/g	07/29/18 16:09	08/10/18 18:53	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*89.8*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:53*	*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	**0.700**		0.172	0.182	1.00	0.0546	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.0106	U	0.0266	0.0266	1.00	0.0595	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.795**		0.183	0.195	1.00	0.0478	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*110*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B3-0608 — Lab Sample ID: 160-29521-6

Date Collected: 07/12/18 17:20 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**7.4**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**92.6**		0.1	0.1	%			07/17/18 22:33	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.132	U	0.676	0.676		0.983	pCi/g	07/19/18 15:00	08/09/18 07:16	1

Client Sample ID: CRC-B3-0608 — Lab Sample ID: 160-29521-6

Date Collected: 07/12/18 17:20 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-228	0.182	U	0.192	0.193		0.274	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Bismuth-212	-0.0204	U	0.609	0.609		1.11	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Bismuth-214	**0.260**		0.112	0.115		0.143	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Lead-210	0.444	U	1.14	1.14		1.81	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Lead-212	**0.212**		0.0780	0.0827		0.103	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Lead-214	**0.288**		0.105	0.109		0.111	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Potassium-40	**11.7**		1.57	1.97		0.781	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Protactinium-231	0.000	U	0.788	0.788		3.85	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Radium-226	**0.260**		0.112	0.115	1.00	0.143	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Radium-228	0.182	U	0.192	0.193		0.274	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Thallium-208	0.0207	U	0.0739	0.0739		0.0972	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Thorium-232	0.182	U	0.192	0.193		0.274	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Thorium-234	**1.40**		0.847	0.860		1.29	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Uranium-235	-0.0377	U	0.339	0.339		0.586	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Uranium-238	**1.40**		0.847	0.860		1.29	pCi/g	07/19/18 15:00	08/09/18 07:16	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	**0.326**		0.153	0.156	1.00	0.154	pCi/g	07/29/18 16:09	08/15/18 19:24	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*91.3*		*30 - 110*	*07/29/18 16:09*	*08/15/18 19:24*	*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	**0.222**		0.106	0.108	1.00	0.0742	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.000	U	0.00567	0.00567	1.00	0.0454	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.252**		0.111	0.113	1.00	0.0552	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*80.0*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B3-1618 — Lab Sample ID: 160-29521-7

Date Collected: 07/12/18 17:30 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**22.1**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**77.9**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B3-1618 — Lab Sample ID: 160-29521-7

Date Collected: 07/12/18 17:30 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.393	U	1.19	1.19		2.01	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Actinium-228	0.227	U	0.304	0.305		0.337	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Bismuth-212	0.809	U	1.59	1.60		2.69	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Bismuth-214	**0.594**		0.198	0.207		0.196	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Lead-210	1.58	U	2.36	2.37		3.15	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Lead-212	**0.416**		0.145	0.152		0.153	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Lead-214	**0.719**		0.167	0.182		0.111	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Potassium-40	**15.6**		2.26	2.76		1.21	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Protactinium-231	1.09	U	2.79	2.79		6.34	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Radium-226	**0.594**		0.198	0.207	1.00	0.196	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Radium-228	0.227	U	0.304	0.305		0.337	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Thallium-208	**0.140**		0.0680	0.0695		0.0657	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Thorium-232	0.227	U	0.304	0.305		0.337	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Thorium-234	0.416	U	0.481	0.484		3.51	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Uranium-235	-0.323	U	0.438	0.440		0.917	pCi/g	07/19/18 15:00	08/09/18 07:16	1
Uranium-238	0.416	U	0.481	0.484		3.51	pCi/g	07/19/18 15:00	08/09/18 07:16	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	**0.536**		0.184	0.190	1.00	0.147	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*87.3*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.415**		0.137	0.141	1.00	0.0630	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	-0.00259	U	0.00517	0.00517	1.00	0.0628	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.462**		0.143	0.149	1.00	0.0503	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*95.5*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B13-0305 — Lab Sample ID: 160-29521-8

Date Collected: 07/12/18 15:10 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**12.0**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**88.0**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B13-0305 — Lab Sample ID: 160-29521-8

Date Collected: 07/12/18 15:10 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.376	U	0.346	0.349		1.45	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Actinium-228	**0.304**		0.243	0.245		0.262	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Bismuth-212	-0.0383	U	0.793	0.793		1.58	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Bismuth-214	**0.433**		0.142	0.149		0.125	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Lead-210	-0.417	U	1.32	1.32		3.32	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Lead-212	**0.295**		0.0808	0.0894		0.0882	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Lead-214	**0.640**		0.146	0.160		0.125	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Potassium-40	**9.82**		1.61	1.90		0.713	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Protactinium-231	0.401	U	1.65	1.65		4.72	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Radium-226	**0.433**		0.142	0.149	1.00	0.125	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Radium-228	**0.304**		0.243	0.245		0.262	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Thallium-208	**0.168**		0.0594	0.0619		0.0529	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Thorium-232	**0.304**		0.243	0.245		0.262	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Thorium-234	0.985	U	0.673	0.681		1.64	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Uranium-235	0.0292	U	0.550	0.550		0.929	pCi/g	07/19/18 15:00	08/09/18 07:17	1
Uranium-238	0.985	U	0.673	0.681		1.64	pCi/g	07/19/18 15:00	08/09/18 07:17	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	**0.402**		0.175	0.179	1.00	0.163	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*86.0*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.339**		0.136	0.139	1.00	0.0759	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.0467	U	0.0578	0.0579	1.00	0.0755	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.485**		0.162	0.167	1.00	0.0757	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*78.5*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B13-0608 — Lab Sample ID: 160-29521-9

Date Collected: 07/12/18 15:20 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**4.3**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**95.7**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B13-0608 — Lab Sample ID: 160-29521-9

Date Collected: 07/12/18 15:20 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.145	U	0.371	0.371		0.999	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Actinium-228	0.0817	U	0.158	0.158		0.346	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Bismuth-212	-0.572	U	0.962	0.964		1.61	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Bismuth-214	**0.207**		0.119	0.121		0.176	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Lead-210	-0.264	U	1.36	1.36		2.37	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Lead-212	0.0722	U	0.0718	0.0724		0.116	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Lead-214	**0.241**		0.105	0.108		0.147	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Potassium-40	**11.7**		1.63	2.02		0.629	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Protactinium-231	-0.747	U	2.81	2.81		4.72	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Radium-226	**0.207**		0.119	0.121	1.00	0.176	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Radium-228	0.0817	U	0.158	0.158		0.346	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Thallium-208	0.0323	U	0.107	0.107		0.0899	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Thorium-232	0.0817	U	0.158	0.158		0.346	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Thorium-234	-0.188	U	0.819	0.819		1.44	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Uranium-235	0.119	U	0.239	0.240		0.520	pCi/g	07/19/18 15:00	08/09/18 07:18	1
Uranium-238	-0.188	U	0.819	0.819		1.44	pCi/g	07/19/18 15:00	08/09/18 07:18	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	**0.250**		0.141	0.143	1.00	0.143	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*87.1*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.197**		0.0938	0.0953	1.00	0.0503	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.0137	U	0.0275	0.0275	1.00	0.0412	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.172**		0.0884	0.0896	1.00	0.0573	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*86.2*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B15-0204 — Lab Sample ID: 160-29521-10

Date Collected: 07/13/18 10:10 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**11.2**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**88.8**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B15-0204 — Lab Sample ID: 160-29521-10

Date Collected: 07/13/18 10:10 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.0773	U	0.126	0.126		1.90	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Actinium-228	**0.699**		0.208	0.220		0.114	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Bismuth-212	0.282	U	1.01	1.01		1.75	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Bismuth-214	**1.06**		0.219	0.244		0.187	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Lead-210	0.831	U	1.77	1.78		2.68	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Lead-212	**0.501**		0.118	0.129		0.139	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Lead-214	**1.27**		0.211	0.247		0.161	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Potassium-40	**12.9**		1.76	2.19		0.444	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Protactinium-231	0.855	U	2.94	2.94		6.59	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Radium-226	**1.06**		0.219	0.244	1.00	0.187	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Radium-228	**0.699**		0.208	0.220		0.114	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Thallium-208	**0.227**		0.0767	0.0801		0.0613	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Thorium-232	**0.699**		0.208	0.220		0.114	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Thorium-234	-0.0976	U	2.13	2.13		3.62	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Uranium-235	0.178	U	0.802	0.802		1.34	pCi/g	07/19/18 17:38	08/09/18 18:07	1
Uranium-238	-0.0976	U	2.13	2.13		3.62	pCi/g	07/19/18 17:38	08/09/18 18:07	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	**1.61**		0.300	0.329	1.00	0.151	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*72.9*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.695**		0.172	0.182	1.00	0.0681	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.00818	U	0.0271	0.0271	1.00	0.0680	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.722**		0.174	0.185	1.00	0.0478	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*109*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B15-0608 — Lab Sample ID: 160-29521-11

Date Collected: 07/13/18 10:15 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**3.6**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**96.4**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B15-0608 — Lab Sample ID: 160-29521-11

Date Collected: 07/13/18 10:15 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.246	U	0.580	0.581		0.836	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Actinium-228	**0.328**		0.137	0.141		0.105	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Bismuth-212	0.368	U	0.734	0.735		1.25	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Bismuth-214	**0.244**		0.104	0.107		0.115	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Lead-210	0.304	U	1.30	1.30		1.95	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Lead-212	**0.127**		0.0708	0.0727		0.103	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Lead-214	**0.258**		0.102	0.106		0.109	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Potassium-40	**11.1**		1.62	1.98		0.659	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Protactinium-231	0.316	U	1.12	1.12		3.68	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Radium-226	**0.244**		0.104	0.107	1.00	0.115	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Radium-228	**0.328**		0.137	0.141		0.105	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Thallium-208	0.0463	U	0.0902	0.0904		0.0984	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Thorium-232	**0.328**		0.137	0.141		0.105	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Thorium-234	0.0116	U	0.0883	0.0883		1.85	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Uranium-235	0.126	U	0.322	0.322		0.523	pCi/g	07/19/18 17:38	08/09/18 18:09	1
Uranium-238	0.0116	U	0.0883	0.0883		1.85	pCi/g	07/19/18 17:38	08/09/18 18:09	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	**0.321**		0.156	0.158	1.00	0.147	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*72.6*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.250**		0.105	0.107	1.00	0.0714	pCi/g	07/29/18 16:45	08/13/18 20:10	1
Uranium-235	0.000	U	0.00489	0.00489	1.00	0.0392	pCi/g	07/29/18 16:45	08/13/18 20:10	1
Uranium-238	**0.262**		0.105	0.107	1.00	0.0314	pCi/g	07/29/18 16:45	08/13/18 20:10	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*100*		*30 - 110*	*07/29/18 16:45*	*08/13/18 20:10*	*1*

Client Sample ID: CRC-B15-1214 — Lab Sample ID: 160-29521-12

Date Collected: 07/13/18 10:20 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**17.7**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**82.3**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B15-1214 — Lab Sample ID: 160-29521-12

Date Collected: 07/13/18 10:20 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.251	U	0.762	0.763		1.30	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Actinium-228	0.112	U	0.203	0.203		0.219	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Bismuth-212	0.361	U	0.925	0.926		1.60	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Bismuth-214	**0.396**		0.142	0.148		0.123	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Lead-210	-0.886	U	1.52	1.53		3.15	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Lead-212	**0.181**		0.0761	0.0796		0.0991	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Lead-214	**0.378**		0.0978	0.105		0.0868	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Potassium-40	**12.6**		1.89	2.29		0.693	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Protactinium-231	0.600	U	1.85	1.85		4.24	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Radium-226	**0.396**		0.142	0.148	1.00	0.123	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Radium-228	0.112	U	0.203	0.203		0.219	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Thallium-208	0.0652	U	0.0911	0.0913		0.0869	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Thorium-232	0.112	U	0.203	0.203		0.219	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Thorium-234	-0.122	U	1.44	1.44		2.47	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Uranium-235	0.141	U	0.280	0.280		0.826	pCi/g	07/19/18 17:38	08/09/18 18:11	1
Uranium-238	-0.122	U	1.44	1.44		2.47	pCi/g	07/19/18 17:38	08/09/18 18:11	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	**0.176**		0.132	0.133	1.00	0.148	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*77.4*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.174**		0.0939	0.0950	1.00	0.0687	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.000	U	0.00564	0.00564	1.00	0.0451	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.277**		0.116	0.118	1.00	0.0362	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*86.3*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B16-0608 — Lab Sample ID: 160-29521-13

Date Collected: 07/13/18 07:50 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**3.7**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**96.3**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B16-0608 — Lab Sample ID: 160-29521-13

Date Collected: 07/13/18 07:50 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.0850	U	0.260	0.260		0.974	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Actinium-228	**0.345**		0.184	0.188		0.192	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Bismuth-212	-0.438	U	0.794	0.795		1.34	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Bismuth-214	**0.429**		0.141	0.148		0.124	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Lead-210	0.923	U	1.04	1.05		1.60	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Lead-212	**0.195**		0.0709	0.0753		0.0905	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Lead-214	**0.373**		0.101	0.108		0.0888	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Potassium-40	**12.8**		1.63	2.09		0.774	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Protactinium-231	0.522	U	1.58	1.58		3.62	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Radium-226	**0.429**		0.141	0.148	1.00	0.124	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Radium-228	**0.345**		0.184	0.188		0.192	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Thallium-208	**0.0658**		0.0411	0.0416		0.0503	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Thorium-232	**0.345**		0.184	0.188		0.192	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Thorium-234	0.668	U	0.598	0.602		1.61	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Uranium-235	0.0256	U	0.0991	0.0991		0.619	pCi/g	07/19/18 17:38	08/09/18 18:08	1
Uranium-238	0.668	U	0.598	0.602		1.61	pCi/g	07/19/18 17:38	08/09/18 18:08	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**		0.141	0.141	1.00	0.153	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*72.7*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.205**		0.103	0.104	1.00	0.0708	pCi/g	07/29/18 16:45	08/13/18 20:10	1
Uranium-235	0.0155	U	0.0310	0.0310	1.00	0.0465	pCi/g	07/29/18 16:45	08/13/18 20:10	1
Uranium-238	**0.308**		0.124	0.127	1.00	0.0566	pCi/g	07/29/18 16:45	08/13/18 20:10	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*86.6*		*30 - 110*	*07/29/18 16:45*	*08/13/18 20:10*	*1*

Client Sample ID: CRC-B16-0204 — Lab Sample ID: 160-29521-14

Date Collected: 07/13/18 07:40 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.2**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**91.8**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B16-0204 — Lab Sample ID: 160-29521-14

Date Collected: 07/13/18 07:40 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.272	U	0.525	0.526		2.02	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Actinium-228	0.293	U	0.369	0.370		0.512	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Bismuth-212	-0.0533	U	1.24	1.24		2.21	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Bismuth-214	**1.09**		0.264	0.286		0.215	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Lead-210	2.13	U	2.19	2.21		3.00	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Lead-212	**0.562**		0.126	0.139		0.131	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Lead-214	**1.26**		0.252	0.283		0.188	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Potassium-40	**9.41**		1.97	2.19		1.48	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Protactinium-231	0.976	U	3.08	3.09		6.98	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Radium-226	**1.09**		0.264	0.286	1.00	0.215	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Radium-228	0.293	U	0.369	0.370		0.512	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Thallium-208	**0.233**		0.0853	0.0885		0.0770	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Thorium-232	0.293	U	0.369	0.370		0.512	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Thorium-234	1.06	U	0.855	0.863		2.34	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Uranium-235	-0.405	U	0.642	0.643		1.71	pCi/g	07/19/18 17:38	08/09/18 18:17	1
Uranium-238	1.06	U	0.855	0.863		2.34	pCi/g	07/19/18 17:38	08/09/18 18:17	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	**1.25**		0.269	0.289	1.00	0.155	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*76.5*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.860**		0.198	0.210	1.00	0.0640	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.0394	U	0.0488	0.0489	1.00	0.0638	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.814**		0.192	0.204	1.00	0.0639	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*104*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B16-1416 — Lab Sample ID: 160-29521-15

Date Collected: 07/13/18 08:00 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**19.2**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**80.8**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B16-1416 — Lab Sample ID: 160-29521-15

Date Collected: 07/13/18 08:00 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.332	U	0.691	0.692		1.16	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Actinium-228	0.112	U	0.192	0.192		0.254	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Bismuth-212	-0.388	U	0.681	0.683		1.15	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Bismuth-214	**0.191**		0.0840	0.0863		0.0964	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Lead-210	0.202	U	1.16	1.16		1.99	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Lead-212	**0.154**		0.0634	0.0665		0.0870	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Lead-214	**0.386**		0.107	0.114		0.0933	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Potassium-40	**12.9**		1.52	2.02		0.654	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Protactinium-231	0.691	U	2.12	2.12		3.57	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Radium-226	**0.191**		0.0840	0.0863	1.00	0.0964	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Radium-228	0.112	U	0.192	0.192		0.254	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Thallium-208	**0.116**		0.0482	0.0497		0.0463	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Thorium-232	0.112	U	0.192	0.192		0.254	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Thorium-234	0.479	U	1.10	1.10		1.84	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Uranium-235	0.181	U	0.281	0.281		0.714	pCi/g	07/19/18 17:38	08/09/18 18:43	1
Uranium-238	0.479	U	1.10	1.10		1.84	pCi/g	07/19/18 17:38	08/09/18 18:43	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	**0.240**		0.144	0.145	1.00	0.157	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*84.7*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.308**		0.118	0.121	1.00	0.0342	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.000	U	0.00532	0.00532	1.00	0.0426	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.262**		0.109	0.111	1.00	0.0341	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*87.4*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B18-0204 — Lab Sample ID: 160-29521-16

Date Collected: 07/13/18 12:40 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**8.4**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**91.6**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B18-0204 — Lab Sample ID: 160-29521-16

Date Collected: 07/13/18 12:40 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.299	U	0.548	0.549		0.944	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Actinium-228	**1.08**		0.236	0.260		0.169	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Bismuth-212	-0.0644	U	1.04	1.04		1.86	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Bismuth-214	**1.54**		0.255	0.301		0.205	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Lead-210	**1.51**		1.08	1.10		1.50	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Lead-212	**0.863**		0.138	0.177		0.154	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Lead-214	**1.57**		0.199	0.257		0.167	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Potassium-40	**11.4**		1.70	2.06		0.889	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Protactinium-231	0.000	U	0.734	0.734		6.14	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Radium-226	**1.54**		0.255	0.301	1.00	0.205	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Radium-228	**1.08**		0.236	0.260		0.169	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Thallium-208	**0.347**		0.0884	0.0955		0.0751	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Thorium-232	**1.08**		0.236	0.260		0.169	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Thorium-234	1.11	U	0.576	0.587		1.53	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Uranium-235	0.214	U	0.455	0.455		0.812	pCi/g	07/19/18 18:22	08/10/18 01:27	1
Uranium-238	1.11	U	0.576	0.587		1.53	pCi/g	07/19/18 18:22	08/10/18 01:27	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	**1.56**		0.276	0.305	1.00	0.141	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*97.1*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**1.46**		0.256	0.284	1.00	0.0583	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.0533	U	0.0561	0.0563	1.00	0.0636	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**1.43**		0.254	0.281	1.00	0.0336	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*89.4*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B18-0608 — Lab Sample ID: 160-29521-17

Date Collected: 07/13/18 12:50 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**15.5**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**84.5**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B18-0608 — Lab Sample ID: 160-29521-17

Date Collected: 07/13/18 12:50 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.578	U	1.24	1.24		2.08	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Actinium-228	**0.758**		0.242	0.254		0.414	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Bismuth-212	0.407	U	1.21	1.21		2.10	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Bismuth-214	**1.54**		0.265	0.310		0.164	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Lead-210	-1.68	U	2.27	2.28		5.71	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Lead-212	**0.932**		0.164	0.203		0.172	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Lead-214	**1.56**		0.261	0.307		0.178	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Potassium-40	**13.4**		2.16	2.56		0.947	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Protactinium-231	-1.37	U	5.10	5.10		8.56	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Radium-226	**1.54**		0.265	0.310	1.00	0.164	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Radium-228	**0.758**		0.242	0.254		0.414	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Thallium-208	**0.369**		0.0975	0.105		0.0732	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Thorium-232	**0.758**		0.242	0.254		0.414	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Thorium-234	0.997	U	0.989	0.995		2.94	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Uranium-235	0.221	U	0.836	0.836		1.60	pCi/g	07/19/18 18:22	08/09/18 19:21	1
Uranium-238	0.997	U	0.989	0.995		2.94	pCi/g	07/19/18 18:22	08/09/18 19:21	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	**1.29**		0.256	0.278	1.00	0.147	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*89.5*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.985**		0.205	0.221	1.00	0.0645	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.00822	U	0.0272	0.0272	1.00	0.0683	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.897**		0.196	0.210	1.00	0.0682	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*98.5*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B18-0809 — Lab Sample ID: 160-29521-18

Date Collected: 07/13/18 12:55 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**18.8**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**81.2**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B18-0809 — Lab Sample ID: 160-29521-18

Date Collected: 07/13/18 12:55 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.243	U	0.647	0.647		1.75	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Actinium-228	**0.526**		0.156	0.165		0.303	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Bismuth-212	-0.101	U	1.05	1.05		1.90	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Bismuth-214	**0.719**		0.190	0.205		0.159	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Lead-210	0.901	U	1.82	1.82		3.05	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Lead-212	**0.465**		0.112	0.127		0.126	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Lead-214	**1.05**		0.171	0.203		0.174	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Potassium-40	**12.2**		1.93	2.30		0.823	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Protactinium-231	0.000	U	0.685	0.685		6.21	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Radium-226	**0.719**		0.190	0.205	1.00	0.159	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Radium-228	**0.526**		0.156	0.165		0.303	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Thallium-208	**0.231**		0.0666	0.0707		0.0475	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Thorium-232	**0.526**		0.156	0.165		0.303	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Thorium-234	0.730	U	0.643	0.648		1.90	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Uranium-235	-0.0672	U	0.971	0.971		1.02	pCi/g	07/19/18 18:22	08/09/18 20:02	1
Uranium-238	0.730	U	0.643	0.648		1.90	pCi/g	07/19/18 18:22	08/09/18 20:02	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	**0.909**		0.234	0.246	1.00	0.157	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*80.1*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.642**		0.164	0.173	1.00	0.0541	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.0364	U	0.0451	0.0452	1.00	0.0590	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.509**		0.145	0.152	1.00	0.0312	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*98.9*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B19-0204 — Lab Sample ID: 160-29521-19

Date Collected: 07/13/18 15:50 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**11.5**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**88.5**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B19-0204 — Lab Sample ID: 160-29521-19

Date Collected: 07/13/18 15:50 **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.299	U	0.974	0.975		1.50	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Actinium-228	**1.02**		0.304	0.321		0.279	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Bismuth-212	0.665	U	1.39	1.39		2.36	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Bismuth-214	**1.39**		0.265	0.302		0.172	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Lead-210	-0.567	U	2.06	2.06		3.12	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Lead-212	**0.941**		0.156	0.198		0.144	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Lead-214	**1.44**		0.200	0.250		0.175	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Potassium-40	**11.4**		2.25	2.54		1.46	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Protactinium-231	1.05	U	3.27	3.27		5.53	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Radium-226	**1.39**		0.265	0.302	1.00	0.172	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Radium-228	**1.02**		0.304	0.321		0.279	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Thallium-208	**0.327**		0.0827	0.0893		0.0379	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Thorium-232	**1.02**		0.304	0.321		0.279	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Thorium-234	1.16	U	0.688	0.699		2.04	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Uranium-235	0.0452	U	0.168	0.168		0.956	pCi/g	07/19/18 18:22	08/09/18 20:33	1
Uranium-238	1.16	U	0.688	0.699		2.04	pCi/g	07/19/18 18:22	08/09/18 20:33	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	**1.26**		0.266	0.286	1.00	0.160	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*90.4*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**1.43**		0.251	0.278	1.00	0.0706	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.0382	U	0.0473	0.0474	1.00	0.0618	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**1.21**		0.229	0.251	1.00	0.0327	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*87.2*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B19-0810 — Lab Sample ID: 160-29521-20

Date Collected: 07/13/18 16:00 **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**14.5**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**85.5**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B19-0810 — Lab Sample ID: 160-29521-20

Date Collected: 07/13/18 16:00 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.294	U	1.16	1.16		1.96	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Actinium-228	**1.08**		0.274	0.296		0.124	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Bismuth-212	-0.344	U	1.26	1.26		2.17	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Bismuth-214	**1.78**		0.258	0.318		0.124	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Lead-210	-0.315	U	2.41	2.41		4.13	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Lead-212	**0.725**		0.144	0.172		0.179	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Lead-214	**1.97**		0.235	0.312		0.188	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Potassium-40	**15.0**		2.09	2.60		0.812	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Protactinium-231	0.887	U	3.15	3.15		7.05	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Radium-226	**1.78**		0.258	0.318	1.00	0.124	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Radium-228	**1.08**		0.274	0.296		0.124	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Thallium-208	**0.384**		0.105	0.113		0.0933	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Thorium-232	**1.08**		0.274	0.296		0.124	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Thorium-234	0.230	U	1.98	1.98		3.35	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Uranium-235	0.261	U	0.513	0.514		1.01	pCi/g	07/19/18 18:22	08/09/18 20:28	1
Uranium-238	0.230	U	1.98	1.98		3.35	pCi/g	07/19/18 18:22	08/09/18 20:28	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	**1.15**		0.249	0.267	1.00	0.153	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*91.3*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.935**		0.202	0.217	1.00	0.0496	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	**0.0542**		0.0542	0.0544	1.00	0.0407	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**1.00**		0.209	0.225	1.00	0.0326	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*85.5*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B19-1618 — Lab Sample ID: 160-29521-21

Date Collected: 07/13/18 16:10 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**17.4**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**82.6**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B19-1618 — Lab Sample ID: 160-29521-21

Date Collected: 07/13/18 16:10 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.181	U	0.868	0.868		1.48	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Actinium-228	**0.404**		0.231	0.234		0.221	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Bismuth-212	0.379	U	1.28	1.28		2.21	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Bismuth-214	**0.362**		0.144	0.149		0.138	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Lead-210	0.681	U	1.42	1.43		2.40	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Lead-212	**0.257**		0.0997	0.105		0.136	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Lead-214	**0.586**		0.125	0.139		0.119	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Potassium-40	**10.5**		1.76	2.06		0.798	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Protactinium-231	-0.212	U	3.22	3.22		5.49	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Radium-226	**0.362**		0.144	0.149	1.00	0.138	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Radium-228	**0.404**		0.231	0.234		0.221	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Thallium-208	**0.101**		0.0642	0.0650		0.0754	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Thorium-232	**0.404**		0.231	0.234		0.221	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Thorium-234	1.18	U	0.806	0.816		1.92	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Uranium-235	-0.266	U	0.315	0.316		0.973	pCi/g	07/19/18 18:22	08/09/18 20:35	1
Uranium-238	1.18	U	0.806	0.816		1.92	pCi/g	07/19/18 18:22	08/09/18 20:35	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	**0.281**		0.137	0.139	1.00	0.134	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*91.4*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.278**		0.111	0.113	1.00	0.0563	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	**0.0404**		0.0467	0.0468	1.00	0.0404	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.389**		0.130	0.134	1.00	0.0324	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*109*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Client Sample ID: CRC-B19-2224 — Lab Sample ID: 160-29521-22

Date Collected: 07/13/18 16:20 — **Matrix: Solid**
Date Received: 07/14/18 08:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**18.8**		0.1	0.1	%			07/17/18 22:33	1
Percent Solids	**81.2**		0.1	0.1	%			07/17/18 22:33	1

Client Sample ID: CRC-B19-2224 — Lab Sample ID: 160-29521-22

Date Collected: 07/13/18 16:20 — **Matrix: Solid**
Date Received: 07/14/18 08:25

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.169	U	0.760	0.760		1.29	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Actinium-228	**0.288**		0.175	0.177		0.200	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Bismuth-212	-0.0108	U	0.697	0.697		1.25	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Bismuth-214	**0.524**		0.126	0.138		0.104	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Lead-210	0.659	U	1.42	1.43		2.40	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Lead-212	**0.326**		0.0768	0.0876		0.0835	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Lead-214	**0.488**		0.122	0.132		0.101	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Potassium-40	**13.5**		1.60	2.12		0.695	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Protactinium-231	0.000	U	0.504	0.504		4.11	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Radium-226	**0.524**		0.126	0.138	1.00	0.104	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Radium-228	**0.288**		0.175	0.177		0.200	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Thallium-208	**0.152**		0.0601	0.0621		0.0543	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Thorium-232	**0.288**		0.175	0.177		0.200	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Thorium-234	0.289	U	1.25	1.25		2.13	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Uranium-235	-0.0317	U	0.0410	0.0411		0.971	pCi/g	07/19/18 18:22	08/09/18 20:36	1
Uranium-238	0.289	U	1.25	1.25		2.13	pCi/g	07/19/18 18:22	08/09/18 20:36	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	**0.366**		0.150	0.153	1.00	0.135	pCi/g	07/29/18 16:09	08/10/18 18:54	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*87.6*		*30 - 110*	*07/29/18 16:09*	*08/10/18 18:54*	*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	**0.263**		0.108	0.110	1.00	0.0502	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.0274	U	0.0388	0.0389	1.00	0.0412	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	**0.484**		0.146	0.152	1.00	0.0330	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*106*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

Default Detection Limits

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

TestAmerica Job ID: 160-29521-1

General Chemistry

Analyte	RL	MDL	Units	Method
Percent Moisture	0.1	0.1	%	Moisture
Percent Solids	0.1	0.1	%	Moisture

Tracer/Carrier Summary

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

TestAmerica Job ID: 160-29521-1

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

Matrix: Solid

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	horium-22 (30-110)
160-29521-1	CRC-B9-1416	99.0
160-29521-2	CRC-B9-2022	94.2
160-29521-3	CRC-B6-1618	78.6
160-29521-4	CRC-B6-2426	79.3
160-29521-5	CRC-B3-0204	89.8
160-29521-5 DU	CRC-B3-0204	99.5
160-29521-6	CRC-B3-0608	91.3
160-29521-7	CRC-B3-1618	87.3
160-29521-8	CRC-B13-0305	86.0
160-29521-9	CRC-B13-0608	87.1
160-29521-10	CRC-B15-0204	72.9
160-29521-11	CRC-B15-0608	72.6
160-29521-12	CRC-B15-1214	77.4
160-29521-13	CRC-B16-0608	72.7
160-29521-14	CRC-B16-0204	76.5
160-29521-15	CRC-B16-1416	84.7
160-29521-16	CRC-B18-0204	97.1
160-29521-17	CRC-B18-0608	89.5
160-29521-18	CRC-B18-0809	80.1
160-29521-19	CRC-B19-0204	90.4
160-29521-20	CRC-B19-0810	91.3
160-29521-21	CRC-B19-1618	91.4
160-29521-22	CRC-B19-2224	87.6
490-155782-F-2-F DU	Duplicate	70.5
LCS 160-377729/2-A	Lab Control Sample	93.5
LCS 160-378572/2-A	Lab Control Sample	93.1
MB 160-377729/1-A	Method Blank	100
MB 160-378572/1-A	Method Blank	80.9

Tracer/Carrier Legend

Thorium-229 = Thorium-229

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

Matrix: Solid

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	ranium-23 (30-110)
160-29521-1	CRC-B9-1416	86.0
160-29521-2	CRC-B9-2022	103
160-29521-3	CRC-B6-1618	105
160-29521-4	CRC-B6-2426	97.3
160-29521-5	CRC-B3-0204	110
160-29521-5 DU	CRC-B3-0204	89.3
160-29521-6	CRC-B3-0608	80.0
160-29521-7	CRC-B3-1618	95.5
160-29521-8	CRC-B13-0305	78.5
160-29521-9	CRC-B13-0608	86.2
160-29521-10	CRC-B15-0204	109

Tracer/Carrier Summary

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

TestAmerica Job ID: 160-29521-1

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

Matrix: Solid

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	ranium-23 (30-110)
160-29521-11	CRC-B15-0608	100
160-29521-12	CRC-B15-1214	86.3
160-29521-13	CRC-B16-0608	86.6
160-29521-14	CRC-B16-0204	104
160-29521-15	CRC-B16-1416	87.4
160-29521-16	CRC-B18-0204	89.4
160-29521-17	CRC-B18-0608	98.5
160-29521-18	CRC-B18-0809	98.9
160-29521-19	CRC-B19-0204	87.2
160-29521-20	CRC-B19-0810	85.5
160-29521-21	CRC-B19-1618	109
160-29521-22	CRC-B19-2224	106
490-155782-F-2-H DU	Duplicate	88.8
LCS 160-377742/2-A	Lab Control Sample	82.1
LCS 160-378574/2-A	Lab Control Sample	90.3
MB 160-377742/1-A	Method Blank	90.9
MB 160-378574/1-A	Method Blank	91.6

Tracer/Carrier Legend

Uranium-232 = Uranium-232

Method: Moisture - Percent Moisture

Lab Sample ID: 160-29521-22 DU **Client Sample ID: CRC-B19-2224**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 376375

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	18.8		18.7		%		0.4	30
Percent Solids	81.2		81.3		%		0.09	30

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-376740/1-A **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 381202 **Prep Batch: 376740**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.1402	U	0.289	0.289		1.43	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Actinium-228	-0.01752	U	0.246	0.246		0.306	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Bismuth-212	-0.4385	U	1.02	1.02		1.75	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Bismuth-214	-0.1323	U	0.149	0.149		0.490	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Lead-210	0.9041	U	1.49	1.49		2.30	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Lead-212	-0.05787	U	0.0648	0.0651		0.179	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Lead-214	0.009031	U	0.128	0.128		0.186	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Potassium-40	0.5436		0.384	0.388		0.501	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Protactinium-231	0.3578	U	1.36	1.36		4.55	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Radium-226	-0.1323	U	0.149	0.149	1.00	0.490	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Radium-228	-0.01752	U	0.246	0.246		0.306	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Thallium-208	-0.004696	U	0.00383	0.00386		0.131	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Thorium-232	-0.01752	U	0.246	0.246		0.306	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Thorium-234	0.5011	U	0.905	0.907		1.38	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Uranium-235	0.07006	U	0.107	0.107		0.669	pCi/g	07/19/18 15:00	08/09/18 01:24	1
Uranium-238	0.5011	U	0.905	0.907		1.38	pCi/g	07/19/18 15:00	08/09/18 01:24	1

Lab Sample ID: LCS 160-376740/2-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 381207 **Prep Batch: 376740**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	96.8	99.26		11.7		1.22	pCi/g	103	87 - 116
Cesium-137	28.2	31.67		3.34		0.273	pCi/g	112	87 - 120
Cobalt-60	12.9	13.89		1.45		0.137	pCi/g	108	87 - 115

Lab Sample ID: 160-29479-A-2-E DU **Client Sample ID: Duplicate**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 381204 **Prep Batch: 376740**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium-227	-0.325	U	0.0000	U	0.338		1.08	pCi/g	0.31	1
Actinium-228	0.272	U	0.1903		0.166		0.176	pCi/g	0.19	1
Bismuth-212	0.341	U	0.1810	U	0.390		0.678	pCi/g	0.16	1
Bismuth-214	0.329		0.2690		0.103		0.111	pCi/g	0.25	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 160-29479-A-2-E DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381204 — **Prep Batch: 376740**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Lead-210	0.349	U	-0.4156	U	1.31		2.22	pCi/g	0.29	1
Lead-212	0.212		0.1927		0.0649		0.0731	pCi/g	0.13	1
Lead-214	0.371		0.4207		0.108		0.0790	pCi/g	0.22	1
Potassium-40	13.1		13.23		2.01		0.611	pCi/g	0.04	1
Protactinium-231	-0.0000000405	U	0.5503	U	1.97		3.33	pCi/g	0.13	1
Radium-226	0.329		0.2690		0.103	1.00	0.111	pCi/g	0.25	1
Radium-228	0.272	U	0.1903		0.166		0.176	pCi/g	0.19	1
Thallium-208	0.0719		0.07889		0.0737		0.0607	pCi/g	0.05	1
Thorium-232	0.272	U	0.1903		0.166		0.176	pCi/g	0.19	1
Thorium-234	0.667	U	0.4880	U	1.07		1.79	pCi/g	0.11	1
Uranium-235	-0.0465	U	-0.1655	U	0.282		0.893	pCi/g	0.20	1
Uranium-238	0.667	U	0.4880	U	1.07		1.79	pCi/g	0.11	1

Lab Sample ID: MB 160-376765/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381203 — **Prep Batch: 376765**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.1020	U	0.305	0.305		0.678	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Actinium-228	0.09479	U	0.180	0.181		0.224	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Bismuth-212	-0.3579	U	0.751	0.752		1.44	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Bismuth-214	-0.06220	U	0.104	0.104		0.349	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Lead-210	0.4951	U	1.01	1.01		1.58	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Lead-212	-0.07233	U	0.0559	0.0567		0.179	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Lead-214	-0.006153	U	0.0895	0.0895		0.164	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Potassium-40	-0.3683	U	0.847	0.847		1.19	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Protactinium-231	-0.6810	U	1.94	1.94		3.31	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Radium-226	-0.06220	U	0.104	0.104	1.00	0.349	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Radium-228	0.09479	U	0.180	0.181		0.224	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Thallium-208	0.01635	U	0.0404	0.0404		0.0645	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Thorium-232	0.09479	U	0.180	0.181		0.224	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Thorium-234	0.4005	U	0.513	0.515		1.30	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Uranium-235	-0.1513	U	0.308	0.308		0.559	pCi/g	07/19/18 17:38	08/09/18 16:28	1
Uranium-238	0.4005	U	0.513	0.515		1.30	pCi/g	07/19/18 17:38	08/09/18 16:28	1

Lab Sample ID: LCS 160-376765/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381205 — **Prep Batch: 376765**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	96.8	95.84		10.1		1.30	pCi/g	99	87 - 116
Cesium-137	28.2	26.93		2.90		0.265	pCi/g	95	87 - 120
Cobalt-60	12.9	12.38		1.31		0.154	pCi/g	96	87 - 115

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 160-29569-A-1-C DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381208 — **Prep Batch: 376765**

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Actinium-227	-0.353	U		0.06409	U	0.647		0.948	pCi/g			0.29	1
Actinium-228	0.476			0.5562		0.210		0.324	pCi/g			0.22	1
Bismuth-212	0.194	U		1.205		0.508		0.370	pCi/g			0.82	1
Bismuth-214	0.588			0.5513		0.154		0.109	pCi/g			0.12	1
Lead-210	0.372	U		-0.4112	U	1.40		2.14	pCi/g			0.28	1
Lead-212	0.436			0.5040		0.119		0.0984	pCi/g			0.30	1
Lead-214	0.621			0.4092		0.134		0.129	pCi/g			0.75	1
Potassium-40	9.33			8.334		1.72		0.729	pCi/g			0.30	1
Protactinium-231	-0.642	U		0.0000	U	0.474		4.56	pCi/g			0.21	1
Radium-226	0.588			0.5513		0.154	1.00	0.109	pCi/g			0.12	1
Radium-228	0.476			0.5562		0.210		0.324	pCi/g			0.22	1
Thallium-208	0.273			0.1922		0.0577		0.0275	pCi/g			0.65	1
Thorium-232	0.476			0.5562		0.210		0.324	pCi/g			0.22	1
Thorium-234	0.240	U		1.394	U	1.21		1.51	pCi/g			0.69	1
Uranium-235	0.0974	U		-0.01323	U	0.415		0.540	pCi/g			0.14	1
Uranium-238	0.240	U		1.394	U	1.21		1.51	pCi/g			0.69	1

Lab Sample ID: MB 160-376766/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381202 — **Prep Batch: 376766**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.007379	U	0.0129	0.0129		0.943	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Actinium-228	0.1581		0.0877	0.0892		0.0966	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Bismuth-212	-0.05670	U	0.691	0.691		1.24	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Bismuth-214	-0.1116	U	0.141	0.141		0.340	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Lead-210	0.3549	U	0.868	0.869		1.34	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Lead-212	0.01741	U	0.0979	0.0979		0.135	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Lead-214	0.05431	U	0.0885	0.0886		0.131	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Potassium-40	0.1534	U	1.06	1.06		1.15	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Protactinium-231	0.0000	U	0.736	0.736		4.06	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Radium-226	-0.1116	U	0.141	0.141	1.00	0.340	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Radium-228	0.1581		0.0877	0.0892		0.0966	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Thallium-208	-0.008553	U	0.0778	0.0778		0.0967	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Thorium-232	0.1581		0.0877	0.0892		0.0966	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Thorium-234	0.1703	U	0.697	0.697		1.16	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Uranium-235	-0.02816	U	0.137	0.137		0.612	pCi/g	07/19/18 18:22	08/09/18 18:41	1
Uranium-238	0.1703	U	0.697	0.697		1.16	pCi/g	07/19/18 18:22	08/09/18 18:41	1

Lab Sample ID: LCS 160-376766/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381203 — **Prep Batch: 376766**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Americium-241			100	96.39		10.1		0.833	pCi/g	96	87 - 116		

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: LCS 160-376766/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381203 — **Prep Batch: 376766**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Cesium-137			32.3	29.15		3.11		0.271	pCi/g	90	87 - 120		
Cobalt-60			23.3	21.48		2.21		0.139	pCi/g	92	87 - 115		

Lab Sample ID: 160-29527-A-1-B DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381202 — **Prep Batch: 376766**

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Actinium-227	-1.03	U		0.8400	U	2.74		4.54	pCi/g			0.32	1
Actinium-228	1.51			1.495		0.667		0.902	pCi/g			0.01	1
Bismuth-212	0.000	U		-1.458	U	2.79		4.64	pCi/g			0.34	1
Bismuth-214	42.4			42.29		4.46		0.553	pCi/g			0.01	1
Lead-210	22.8			25.82		5.04		4.41	pCi/g			0.32	1
Lead-212	1.24			1.212		0.299		0.397	pCi/g			0.04	1
Lead-214	45.6			44.84		4.64		0.666	pCi/g			0.08	1
Potassium-40	-0.540	U		1.094	U	2.74		2.76	pCi/g			0.27	1
Protactinium-231	-3.76	U		0.0000	U	2.71		27.2	pCi/g			0.18	1
Radium-226	42.4			42.29		4.46	1.00	0.553	pCi/g			0.01	1
Radium-228	1.51			1.495		0.667		0.902	pCi/g			0.01	1
Thallium-208	0.501			0.5924		0.224		0.219	pCi/g			0.16	1
Thorium-232	1.51			1.495		0.667		0.902	pCi/g			0.01	1
Thorium-234	-0.715	U		0.7887	U	5.08		8.43	pCi/g			0.14	1
Uranium-235	0.222	U		0.5014	U	1.08		3.64	pCi/g			0.15	1
Uranium-238	-0.715	U		0.7887	U	5.08		8.43	pCi/g			0.14	1

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

Lab Sample ID: MB 160-377729/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 380567 — **Prep Batch: 377729**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium-230	-0.01242	U	0.0892	0.0893	1.00	0.141	pCi/g	07/24/18 17:17	08/04/18 14:31	1

Tracer	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*100*		*30 - 110*	*07/24/18 17:17*	*08/04/18 14:31*	*1*

Lab Sample ID: LCS 160-377729/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 380576 — **Prep Batch: 377729**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Thorium-230			24.5	22.98		2.38	1.00	0.240	pCi/g	94	81 - 118		

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

Lab Sample ID: LCS 160-377729/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 380576 — **Prep Batch: 377729**

Tracer	LCS %Yield	LCS Qualifier	Limits
Thorium-229	93.5		30 - 110

Lab Sample ID: 490-155782-F-2-F DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 380507 — **Prep Batch: 377729**

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Thorium-230	0.719			1.147		0.303	1.00	0.184	pCi/g			0.78	1

Tracer	DU %Yield	DU Qualifier	Limits
Thorium-229	70.5		30 - 110

Lab Sample ID: MB 160-378572/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381881 — **Prep Batch: 378572**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium-230	0.06903	U	0.110	0.110	1.00	0.147	pCi/g	07/29/18 16:09	08/10/18 18:53	1

Tracer	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Thorium-229	80.9		30 - 110	07/29/18 16:09	08/10/18 18:53	1

Lab Sample ID: LCS 160-378572/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 382801 — **Prep Batch: 378572**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Thorium-230			24.5	24.91		2.57	1.00	0.244	pCi/g	102	81 - 118		

Tracer	LCS %Yield	LCS Qualifier	Limits
Thorium-229	93.1		30 - 110

Lab Sample ID: 160-29521-5 DU — **Client Sample ID: CRC-B3-0204**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381884 — **Prep Batch: 378572**

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Thorium-230	0.803			1.048		0.251	1.00	0.144	pCi/g			0.51	1

Tracer	DU %Yield	DU Qualifier	Limits
Thorium-229	99.5		30 - 110

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

Lab Sample ID: MB 160-377742/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 380552 — **Prep Batch: 377742**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium-234	0.02041	U	0.0289	0.0289	1.00	0.0306	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-235	0.0000	U	0.00476	0.00476	1.00	0.0381	pCi/g	07/24/18 18:48	08/04/18 14:34	1
Uranium-238	-0.003820	U	0.00540	0.00541	1.00	0.0529	pCi/g	07/24/18 18:48	08/04/18 14:34	1

Tracer	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*90.9*		*30 - 110*	*07/24/18 18:48*	*08/04/18 14:34*	*1*

Lab Sample ID: LCS 160-377742/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 380553 — **Prep Batch: 377742**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Uranium-234			6.37	6.552		0.774	1.00	0.0642	pCi/g	103	84 - 120		
Uranium-238			6.51	7.127		0.824	1.00	0.0585	pCi/g	109	82 - 122		

Tracer	*LCS %Yield*	*LCS Qualifier*	*Limits*
Uranium-232	*82.1*		*30 - 110*

Lab Sample ID: 490-155782-F-2-H DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 380555 — **Prep Batch: 377742**

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Uranium-234	0.786			0.9606		0.229	1.00	0.0944	pCi/g			0.40	1
Uranium-235	0.0719			0.01171	U	0.0293	1.00	0.0656	pCi/g			0.62	1
Uranium-238	0.830			1.122		0.248	1.00	0.0748	pCi/g			0.64	1

Tracer	*DU %Yield*	*DU Qualifier*	*Limits*
Uranium-232	*88.8*		*30 - 110*

Lab Sample ID: MB 160-378574/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 381662 — **Prep Batch: 378574**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium-234	0.009101	U	0.0228	0.0228	1.00	0.0510	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-235	0.02788	U	0.0394	0.0395	1.00	0.0418	pCi/g	07/29/18 16:45	08/10/18 19:21	1
Uranium-238	0.01118	U	0.0224	0.0224	1.00	0.0335	pCi/g	07/29/18 16:45	08/10/18 19:21	1

Tracer	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium-232	*91.6*		*30 - 110*	*07/29/18 16:45*	*08/10/18 19:21*	*1*

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

Lab Sample ID: LCS 160-378574/2-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 382200 **Prep Batch: 378574**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Uranium-234			6.37	6.418		0.787	1.00	0.0826	pCi/g	101	84 - 120		
Uranium-238			6.51	6.137		0.760	1.00	0.0382	pCi/g	94	82 - 122		

Tracer	*LCS %Yield*	*LCS Qualifier*	*Limits*
Uranium-232	*90.3*		*30 - 110*

Lab Sample ID: 160-29521-5 DU **Client Sample ID: CRC-B3-0204**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 382201 **Prep Batch: 378574**

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Uranium-234	0.700			0.7339		0.193	1.00	0.0638	pCi/g			0.09	1
Uranium-235	0.0106	U		0.06978		0.0627	1.00	0.0419	pCi/g			0.66	1
Uranium-238	0.795			0.7051		0.187	1.00	0.0336	pCi/g			0.24	1

Tracer	*DU %Yield*	*DU Qualifier*	*Limits*
Uranium-232	*89.3*		*30 - 110*

General Chemistry

Analysis Batch: 376375

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-1	CRC-B9-1416	Total/NA	Solid	Moisture	
160-29521-2	CRC-B9-2022	Total/NA	Solid	Moisture	
160-29521-3	CRC-B6-1618	Total/NA	Solid	Moisture	
160-29521-4	CRC-B6-2426	Total/NA	Solid	Moisture	
160-29521-5	CRC-B3-0204	Total/NA	Solid	Moisture	
160-29521-6	CRC-B3-0608	Total/NA	Solid	Moisture	
160-29521-7	CRC-B3-1618	Total/NA	Solid	Moisture	
160-29521-8	CRC-B13-0305	Total/NA	Solid	Moisture	
160-29521-9	CRC-B13-0608	Total/NA	Solid	Moisture	
160-29521-10	CRC-B15-0204	Total/NA	Solid	Moisture	
160-29521-11	CRC-B15-0608	Total/NA	Solid	Moisture	
160-29521-12	CRC-B15-1214	Total/NA	Solid	Moisture	
160-29521-13	CRC-B16-0608	Total/NA	Solid	Moisture	
160-29521-14	CRC-B16-0204	Total/NA	Solid	Moisture	
160-29521-15	CRC-B16-1416	Total/NA	Solid	Moisture	
160-29521-16	CRC-B18-0204	Total/NA	Solid	Moisture	
160-29521-17	CRC-B18-0608	Total/NA	Solid	Moisture	
160-29521-18	CRC-B18-0809	Total/NA	Solid	Moisture	
160-29521-19	CRC-B19-0204	Total/NA	Solid	Moisture	
160-29521-20	CRC-B19-0810	Total/NA	Solid	Moisture	
160-29521-21	CRC-B19-1618	Total/NA	Solid	Moisture	
160-29521-22	CRC-B19-2224	Total/NA	Solid	Moisture	
160-29521-22 DU	CRC-B19-2224	Total/NA	Solid	Moisture	

Rad

Leach Batch: 376403

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29479-A-2-E DU	Duplicate	Total/NA	Solid	Dry and Grind	

Leach Batch: 376422

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-1	CRC-B9-1416	Total/NA	Solid	Dry and Grind	
160-29521-2	CRC-B9-2022	Total/NA	Solid	Dry and Grind	
160-29521-3	CRC-B6-1618	Total/NA	Solid	Dry and Grind	
160-29521-4	CRC-B6-2426	Total/NA	Solid	Dry and Grind	
160-29521-5	CRC-B3-0204	Total/NA	Solid	Dry and Grind	
160-29521-6	CRC-B3-0608	Total/NA	Solid	Dry and Grind	
160-29521-7	CRC-B3-1618	Total/NA	Solid	Dry and Grind	
160-29521-8	CRC-B13-0305	Total/NA	Solid	Dry and Grind	
160-29521-9	CRC-B13-0608	Total/NA	Solid	Dry and Grind	
160-29521-10	CRC-B15-0204	Total/NA	Solid	Dry and Grind	
160-29521-11	CRC-B15-0608	Total/NA	Solid	Dry and Grind	
160-29521-12	CRC-B15-1214	Total/NA	Solid	Dry and Grind	
160-29521-13	CRC-B16-0608	Total/NA	Solid	Dry and Grind	
160-29521-14	CRC-B16-0204	Total/NA	Solid	Dry and Grind	
160-29521-15	CRC-B16-1416	Total/NA	Solid	Dry and Grind	
160-29521-16	CRC-B18-0204	Total/NA	Solid	Dry and Grind	
160-29521-17	CRC-B18-0608	Total/NA	Solid	Dry and Grind	
160-29521-18	CRC-B18-0809	Total/NA	Solid	Dry and Grind	

Rad (Continued)

Leach Batch: 376422 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-19	CRC-B19-0204	Total/NA	Solid	Dry and Grind	
160-29521-20	CRC-B19-0810	Total/NA	Solid	Dry and Grind	
160-29521-21	CRC-B19-1618	Total/NA	Solid	Dry and Grind	
160-29521-22	CRC-B19-2224	Total/NA	Solid	Dry and Grind	
160-29521-5 DU	CRC-B3-0204	Total/NA	Solid	Dry and Grind	

Leach Batch: 376448

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29569-A-1-C DU	Duplicate	Total/NA	Solid	Dry and Grind	

Leach Batch: 376723

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155782-F-2-F DU	Duplicate	Total/NA	Solid	Dry and Grind	
490-155782-F-2-H DU	Duplicate	Total/NA	Solid	Dry and Grind	

Prep Batch: 376740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-1	CRC-B9-1416	Total/NA	Solid	Fill_Geo-21	376422
160-29521-2	CRC-B9-2022	Total/NA	Solid	Fill_Geo-21	376422
160-29521-3	CRC-B6-1618	Total/NA	Solid	Fill_Geo-21	376422
160-29521-4	CRC-B6-2426	Total/NA	Solid	Fill_Geo-21	376422
160-29521-5	CRC-B3-0204	Total/NA	Solid	Fill_Geo-21	376422
160-29521-6	CRC-B3-0608	Total/NA	Solid	Fill_Geo-21	376422
160-29521-7	CRC-B3-1618	Total/NA	Solid	Fill_Geo-21	376422
160-29521-8	CRC-B13-0305	Total/NA	Solid	Fill_Geo-21	376422
160-29521-9	CRC-B13-0608	Total/NA	Solid	Fill_Geo-21	376422
MB 160-376740/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-376740/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-29479-A-2-E DU	Duplicate	Total/NA	Solid	Fill_Geo-21	376403

Prep Batch: 376765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-10	CRC-B15-0204	Total/NA	Solid	Fill_Geo-21	376422
160-29521-11	CRC-B15-0608	Total/NA	Solid	Fill_Geo-21	376422
160-29521-12	CRC-B15-1214	Total/NA	Solid	Fill_Geo-21	376422
160-29521-13	CRC-B16-0608	Total/NA	Solid	Fill_Geo-21	376422
160-29521-14	CRC-B16-0204	Total/NA	Solid	Fill_Geo-21	376422
160-29521-15	CRC-B16-1416	Total/NA	Solid	Fill_Geo-21	376422
MB 160-376765/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-376765/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-29569-A-1-C DU	Duplicate	Total/NA	Solid	Fill_Geo-21	376448

Prep Batch: 376766

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-16	CRC-B18-0204	Total/NA	Solid	Fill_Geo-21	376422
160-29521-17	CRC-B18-0608	Total/NA	Solid	Fill_Geo-21	376422
160-29521-18	CRC-B18-0809	Total/NA	Solid	Fill_Geo-21	376422
160-29521-19	CRC-B19-0204	Total/NA	Solid	Fill_Geo-21	376422
160-29521-20	CRC-B19-0810	Total/NA	Solid	Fill_Geo-21	376422
160-29521-21	CRC-B19-1618	Total/NA	Solid	Fill_Geo-21	376422
160-29521-22	CRC-B19-2224	Total/NA	Solid	Fill_Geo-21	376422

Rad (Continued)

Prep Batch: 376766 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 160-376766/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-376766/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-29527-A-1-B DU	Duplicate	Total/NA	Solid	Fill_Geo-21	

Prep Batch: 377729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-1	CRC-B9-1416	Total/NA	Solid	ExtChrom	376422
160-29521-2	CRC-B9-2022	Total/NA	Solid	ExtChrom	376422
160-29521-3	CRC-B6-1618	Total/NA	Solid	ExtChrom	376422
160-29521-4	CRC-B6-2426	Total/NA	Solid	ExtChrom	376422
MB 160-377729/1-A	Method Blank	Total/NA	Solid	ExtChrom	
LCS 160-377729/2-A	Lab Control Sample	Total/NA	Solid	ExtChrom	
490-155782-F-2-F DU	Duplicate	Total/NA	Solid	ExtChrom	376723

Prep Batch: 377742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-1	CRC-B9-1416	Total/NA	Solid	ExtChrom	376422
160-29521-2	CRC-B9-2022	Total/NA	Solid	ExtChrom	376422
160-29521-3	CRC-B6-1618	Total/NA	Solid	ExtChrom	376422
160-29521-4	CRC-B6-2426	Total/NA	Solid	ExtChrom	376422
MB 160-377742/1-A	Method Blank	Total/NA	Solid	ExtChrom	
LCS 160-377742/2-A	Lab Control Sample	Total/NA	Solid	ExtChrom	
490-155782-F-2-H DU	Duplicate	Total/NA	Solid	ExtChrom	376723

Prep Batch: 378572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-5	CRC-B3-0204	Total/NA	Solid	ExtChrom	376422
160-29521-6	CRC-B3-0608	Total/NA	Solid	ExtChrom	376422
160-29521-7	CRC-B3-1618	Total/NA	Solid	ExtChrom	376422
160-29521-8	CRC-B13-0305	Total/NA	Solid	ExtChrom	376422
160-29521-9	CRC-B13-0608	Total/NA	Solid	ExtChrom	376422
160-29521-10	CRC-B15-0204	Total/NA	Solid	ExtChrom	376422
160-29521-11	CRC-B15-0608	Total/NA	Solid	ExtChrom	376422
160-29521-12	CRC-B15-1214	Total/NA	Solid	ExtChrom	376422
160-29521-13	CRC-B16-0608	Total/NA	Solid	ExtChrom	376422
160-29521-14	CRC-B16-0204	Total/NA	Solid	ExtChrom	376422
160-29521-15	CRC-B16-1416	Total/NA	Solid	ExtChrom	376422
160-29521-16	CRC-B18-0204	Total/NA	Solid	ExtChrom	376422
160-29521-17	CRC-B18-0608	Total/NA	Solid	ExtChrom	376422
160-29521-18	CRC-B18-0809	Total/NA	Solid	ExtChrom	376422
160-29521-19	CRC-B19-0204	Total/NA	Solid	ExtChrom	376422
160-29521-20	CRC-B19-0810	Total/NA	Solid	ExtChrom	376422
160-29521-21	CRC-B19-1618	Total/NA	Solid	ExtChrom	376422
160-29521-22	CRC-B19-2224	Total/NA	Solid	ExtChrom	376422
MB 160-378572/1-A	Method Blank	Total/NA	Solid	ExtChrom	
LCS 160-378572/2-A	Lab Control Sample	Total/NA	Solid	ExtChrom	
160-29521-5 DU	CRC-B3-0204	Total/NA	Solid	ExtChrom	376422

Prep Batch: 378574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-5	CRC-B3-0204	Total/NA	Solid	ExtChrom	376422

Rad (Continued)

Prep Batch: 378574 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29521-6	CRC-B3-0608	Total/NA	Solid	ExtChrom	376422
160-29521-7	CRC-B3-1618	Total/NA	Solid	ExtChrom	376422
160-29521-8	CRC-B13-0305	Total/NA	Solid	ExtChrom	376422
160-29521-9	CRC-B13-0608	Total/NA	Solid	ExtChrom	376422
160-29521-10	CRC-B15-0204	Total/NA	Solid	ExtChrom	376422
160-29521-11	CRC-B15-0608	Total/NA	Solid	ExtChrom	376422
160-29521-12	CRC-B15-1214	Total/NA	Solid	ExtChrom	376422
160-29521-13	CRC-B16-0608	Total/NA	Solid	ExtChrom	376422
160-29521-14	CRC-B16-0204	Total/NA	Solid	ExtChrom	376422
160-29521-15	CRC-B16-1416	Total/NA	Solid	ExtChrom	376422
160-29521-16	CRC-B18-0204	Total/NA	Solid	ExtChrom	376422
160-29521-17	CRC-B18-0608	Total/NA	Solid	ExtChrom	376422
160-29521-18	CRC-B18-0809	Total/NA	Solid	ExtChrom	376422
160-29521-19	CRC-B19-0204	Total/NA	Solid	ExtChrom	376422
160-29521-20	CRC-B19-0810	Total/NA	Solid	ExtChrom	376422
160-29521-21	CRC-B19-1618	Total/NA	Solid	ExtChrom	376422
160-29521-22	CRC-B19-2224	Total/NA	Solid	ExtChrom	376422
MB 160-378574/1-A	Method Blank	Total/NA	Solid	ExtChrom	
LCS 160-378574/2-A	Lab Control Sample	Total/NA	Solid	ExtChrom	
160-29521-5 DU	CRC-B3-0204	Total/NA	Solid	ExtChrom	376422

Lab Chronicle

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

TestAmerica Job ID: 160-29521-1

Client Sample ID: CRC-B9-1416

Lab Sample ID: 160-29521-1

Date Collected: 07/12/18 08:00

Matrix: Solid

Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376740	07/19/18 15:00	SJS	TAL SL
Total/NA	Analysis	901.1		1	381209	08/09/18 06:38	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			377729	07/24/18 17:17	TAT	TAL SL
Total/NA	Analysis	A-01-R		1	380546	08/04/18 14:31	ALS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			377742	07/24/18 18:48	TAT	TAL SL
Total/NA	Analysis	A-01-R		1	380566	08/04/18 14:34	ALS	TAL SL

Client Sample ID: CRC-B9-2022

Lab Sample ID: 160-29521-2

Date Collected: 07/12/18 08:30

Matrix: Solid

Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376740	07/19/18 15:00	SJS	TAL SL
Total/NA	Analysis	901.1		1	381208	08/09/18 06:39	KLS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			377729	07/24/18 17:17	TAT	TAL SL
Total/NA	Analysis	A-01-R		1	380549	08/04/18 14:30	ALS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			377742	07/24/18 18:48	TAT	TAL SL
Total/NA	Analysis	A-01-R		1	380568	08/04/18 14:34	ALS	TAL SL

Client Sample ID: CRC-B6-1618

Lab Sample ID: 160-29521-3

Date Collected: 07/11/18 16:40

Matrix: Solid

Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376740	07/19/18 15:00	SJS	TAL SL
Total/NA	Analysis	901.1		1	381204	08/09/18 07:15	KLS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			377729	07/24/18 17:17	TAT	TAL SL
Total/NA	Analysis	A-01-R		1	380550	08/04/18 14:30	ALS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			377742	07/24/18 18:48	TAT	TAL SL
Total/NA	Analysis	A-01-R		1	380569	08/04/18 14:34	ALS	TAL SL

Client Sample ID: CRC-B6-2426 Lab Sample ID: 160-29521-4

Date Collected: 07/11/18 17:05 **Matrix: Solid**
Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376740	07/19/18 15:00	SJS	TAL SL
Total/NA	Analysis	901.1		1	381202	08/09/18 07:17	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			377729	07/24/18 17:17	TAT	TAL SL
Total/NA	Analysis	A-01-R		1	380551	08/04/18 14:30	ALS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			377742	07/24/18 18:48	TAT	TAL SL
Total/NA	Analysis	A-01-R		1	380570	08/04/18 14:34	ALS	TAL SL

Client Sample ID: CRC-B3-0204 Lab Sample ID: 160-29521-5

Date Collected: 07/12/18 17:10 **Matrix: Solid**
Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376740	07/19/18 15:00	SJS	TAL SL
Total/NA	Analysis	901.1		1	381205	08/09/18 07:16	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381883	08/10/18 18:53	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381664	08/10/18 19:21	RTM	TAL SL

Client Sample ID: CRC-B3-0608 Lab Sample ID: 160-29521-6

Date Collected: 07/12/18 17:20 **Matrix: Solid**
Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376740	07/19/18 15:00	SJS	TAL SL
Total/NA	Analysis	901.1		1	381206	08/09/18 07:16	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381666	08/10/18 19:21	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	382816	08/15/18 19:24	ALS	TAL SL

Client Sample ID: CRC-B3-1618 Lab Sample ID: 160-29521-7

Date Collected: 07/12/18 17:30 **Matrix: Solid**
Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376740	07/19/18 15:00	SJS	TAL SL
Total/NA	Analysis	901.1		1	381207	08/09/18 07:16	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381886	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381667	08/10/18 19:21	RTM	TAL SL

Client Sample ID: CRC-B13-0305 Lab Sample ID: 160-29521-8

Date Collected: 07/12/18 15:10 **Matrix: Solid**
Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376740	07/19/18 15:00	SJS	TAL SL
Total/NA	Analysis	901.1		1	381210	08/09/18 07:17	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381887	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381668	08/10/18 19:21	RTM	TAL SL

Client Sample ID: CRC-B13-0608 Lab Sample ID: 160-29521-9

Date Collected: 07/12/18 15:20 **Matrix: Solid**
Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376740	07/19/18 15:00	SJS	TAL SL
Total/NA	Analysis	901.1		1	381209	08/09/18 07:18	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381890	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381669	08/10/18 19:21	RTM	TAL SL

Lab Chronicle

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

TestAmerica Job ID: 160-29521-1

Client Sample ID: CRC-B15-0204
Date Collected: 07/13/18 10:10
Date Received: 07/14/18 08:25

Lab Sample ID: 160-29521-10
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376765	07/19/18 17:38	SJS	TAL SL
Total/NA	Analysis	901.1		1	381202	08/09/18 18:07	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381891	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381670	08/10/18 19:21	RTM	TAL SL

Client Sample ID: CRC-B15-0608
Date Collected: 07/13/18 10:15
Date Received: 07/14/18 08:25

Lab Sample ID: 160-29521-11
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376765	07/19/18 17:38	SJS	TAL SL
Total/NA	Analysis	901.1		1	381203	08/09/18 18:09	KLS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381892	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	382202	08/13/18 20:10	ALS	TAL SL

Client Sample ID: CRC-B15-1214
Date Collected: 07/13/18 10:20
Date Received: 07/14/18 08:25

Lab Sample ID: 160-29521-12
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376765	07/19/18 17:38	SJS	TAL SL
Total/NA	Analysis	901.1		1	381205	08/09/18 18:11	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381893	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381673	08/10/18 19:21	RTM	TAL SL

Lab Chronicle

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

TestAmerica Job ID: 160-29521-1

Client Sample ID: CRC-B16-0608

Lab Sample ID: 160-29521-13

Date Collected: 07/13/18 07:50

Matrix: Solid

Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376765	07/19/18 17:38	SJS	TAL SL
Total/NA	Analysis	901.1		1	381206	08/09/18 18:08	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381894	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	382204	08/13/18 20:10	ALS	TAL SL

Client Sample ID: CRC-B16-0204

Lab Sample ID: 160-29521-14

Date Collected: 07/13/18 07:40

Matrix: Solid

Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376765	07/19/18 17:38	SJS	TAL SL
Total/NA	Analysis	901.1		1	381207	08/09/18 18:17	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381895	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381676	08/10/18 19:21	RTM	TAL SL

Client Sample ID: CRC-B16-1416

Lab Sample ID: 160-29521-15

Date Collected: 07/13/18 08:00

Matrix: Solid

Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376765	07/19/18 17:38	SJS	TAL SL
Total/NA	Analysis	901.1		1	381204	08/09/18 18:43	KLS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381897	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381677	08/10/18 19:21	RTM	TAL SL

Lab Chronicle

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

TestAmerica Job ID: 160-29521-1

Client Sample ID: CRC-B18-0204

Lab Sample ID: 160-29521-16

Date Collected: 07/13/18 12:40

Matrix: Solid

Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376766	07/19/18 18:22	SJS	TAL SL
Total/NA	Analysis	901.1		1	381549	08/10/18 01:27	KLS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381898	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381678	08/10/18 19:21	RTM	TAL SL

Client Sample ID: CRC-B18-0608

Lab Sample ID: 160-29521-17

Date Collected: 07/13/18 12:50

Matrix: Solid

Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376766	07/19/18 18:22	SJS	TAL SL
Total/NA	Analysis	901.1		1	381210	08/09/18 19:21	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381899	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381680	08/10/18 19:21	RTM	TAL SL

Client Sample ID: CRC-B18-0809

Lab Sample ID: 160-29521-18

Date Collected: 07/13/18 12:55

Matrix: Solid

Date Received: 07/14/18 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376766	07/19/18 18:22	SJS	TAL SL
Total/NA	Analysis	901.1		1	381210	08/09/18 20:02	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381900	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381681	08/10/18 19:21	RTM	TAL SL

Lab Chronicle

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

TestAmerica Job ID: 160-29521-1

Client Sample ID: CRC-B19-0204
Date Collected: 07/13/18 15:50
Date Received: 07/14/18 08:25

Lab Sample ID: 160-29521-19
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376766	07/19/18 18:22	SJS	TAL SL
Total/NA	Analysis	901.1		1	381208	08/09/18 20:33	KLS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381901	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381682	08/10/18 19:21	RTM	TAL SL

Client Sample ID: CRC-B19-0810
Date Collected: 07/13/18 16:00
Date Received: 07/14/18 08:25

Lab Sample ID: 160-29521-20
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376766	07/19/18 18:22	SJS	TAL SL
Total/NA	Analysis	901.1		1	381209	08/09/18 20:28	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381902	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381683	08/10/18 19:21	RTM	TAL SL

Client Sample ID: CRC-B19-1618
Date Collected: 07/13/18 16:10
Date Received: 07/14/18 08:25

Lab Sample ID: 160-29521-21
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376766	07/19/18 18:22	SJS	TAL SL
Total/NA	Analysis	901.1		1	381210	08/09/18 20:35	CDR	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381903	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381684	08/10/18 19:21	RTM	TAL SL

Lab Chronicle

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

TestAmerica Job ID: 160-29521-1

Client Sample ID: CRC-B19-2224

Date Collected: 07/13/18 16:20
Date Received: 07/14/18 08:25

Lab Sample ID: 160-29521-22

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	376375	07/17/18 22:33	SDB	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	Fill_Geo-21			376766	07/19/18 18:22	SJS	TAL SL
Total/NA	Analysis	901.1		1	381204	08/09/18 20:36	KLS	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378572	07/29/18 16:09	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381904	08/10/18 18:54	RTM	TAL SL
Total/NA	Leach	Dry and Grind			376422	07/18/18 10:36	DRO	TAL SL
Total/NA	Prep	ExtChrom			378574	07/29/18 16:45	KNF	TAL SL
Total/NA	Analysis	A-01-R		1	381685	08/10/18 19:21	RTM	TAL SL

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 160-29521-1
Project/Site: Former Carnotite Site - Non-Rad Analysis

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
901.1	Fill_Geo-21	Solid	Actinium-227
901.1	Fill_Geo-21	Solid	Actinium-228
901.1	Fill_Geo-21	Solid	Bismuth-212
901.1	Fill_Geo-21	Solid	Bismuth-214
901.1	Fill_Geo-21	Solid	Lead-210
901.1	Fill_Geo-21	Solid	Lead-212
901.1	Fill_Geo-21	Solid	Lead-214
901.1	Fill_Geo-21	Solid	Potassium-40
901.1	Fill_Geo-21	Solid	Protactinium-231
901.1	Fill_Geo-21	Solid	Radium-226
901.1	Fill_Geo-21	Solid	Radium-228
901.1	Fill_Geo-21	Solid	Thallium-208
901.1	Fill_Geo-21	Solid	Thorium-232
901.1	Fill_Geo-21	Solid	Thorium-234
901.1	Fill_Geo-21	Solid	Uranium-235
901.1	Fill_Geo-21	Solid	Uranium-238
A-01-R	ExtChrom	Solid	Uranium-235
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 160-29521-1
Project/Site: Former Carnotite Site - Non-Rad Analysis

Method	Method Description	Protocol	Laboratory
Moisture	Percent Moisture	EPA	TAL SL
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	TAL SL
A-01-R	Isotopic Thorium (Alpha Spectrometry)	DOE	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
ExtChrom	Preparation, Extraction Chromatography Resin Actinide Separation	None	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL

Protocol References:

DOE = U.S. Department of Energy
EPA = US Environmental Protection Agency
None = None

Laboratory References:

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: 160-29521-1
Project/Site: Former Carnotite Site - Non-Rad Analysis

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-29521-1	CRC-B9-1416	Solid	07/12/18 08:00	07/14/18 08:25
160-29521-2	CRC-B9-2022	Solid	07/12/18 08:30	07/14/18 08:25
160-29521-3	CRC-B6-1618	Solid	07/11/18 16:40	07/14/18 08:25
160-29521-4	CRC-B6-2426	Solid	07/11/18 17:05	07/14/18 08:25
160-29521-5	CRC-B3-0204	Solid	07/12/18 17:10	07/14/18 08:25
160-29521-6	CRC-B3-0608	Solid	07/12/18 17:20	07/14/18 08:25
160-29521-7	CRC-B3-1618	Solid	07/12/18 17:30	07/14/18 08:25
160-29521-8	CRC-B13-0305	Solid	07/12/18 15:10	07/14/18 08:25
160-29521-9	CRC-B13-0608	Solid	07/12/18 15:20	07/14/18 08:25
160-29521-10	CRC-B15-0204	Solid	07/13/18 10:10	07/14/18 08:25
160-29521-11	CRC-B15-0608	Solid	07/13/18 10:15	07/14/18 08:25
160-29521-12	CRC-B15-1214	Solid	07/13/18 10:20	07/14/18 08:25
160-29521-13	CRC-B16-0608	Solid	07/13/18 07:50	07/14/18 08:25
160-29521-14	CRC-B16-0204	Solid	07/13/18 07:40	07/14/18 08:25
160-29521-15	CRC-B16-1416	Solid	07/13/18 08:00	07/14/18 08:25
160-29521-16	CRC-B18-0204	Solid	07/13/18 12:40	07/14/18 08:25
160-29521-17	CRC-B18-0608	Solid	07/13/18 12:50	07/14/18 08:25
160-29521-18	CRC-B18-0809	Solid	07/13/18 12:55	07/14/18 08:25
160-29521-19	CRC-B19-0204	Solid	07/13/18 15:50	07/14/18 08:25
160-29521-20	CRC-B19-0810	Solid	07/13/18 16:00	07/14/18 08:25
160-29521-21	CRC-B19-1618	Solid	07/13/18 16:10	07/14/18 08:25
160-29521-22	CRC-B19-2224	Solid	07/13/18 16:20	07/14/18 08:25

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
100mL Solid_00002	03/01/16	Eckert & Ziegler, Lot 83814-334			(Purchased Reagent)		Americium-241	625 Bq
							Cd-109	8549 Bq
							Ce-139	284 Bq
							Cesium-137	237 Bq
							Co-57	185 Bq
							Cobalt-60	390 Bq
							Hg-203	615 Bq
							Lead-210	7636 Bq
							Sn-113	503 Bq
							Y-88	820 Bq
100mL solid_00003	02/09/17	Eckert & Ziegler, Lot 90099			(Purchased Reagent)		Americium-241	608 Bq
							Cd-109	8547 Bq
							Ce-139	287 Bq
							Cesium-137	244 Bq
							Co-57	189 Bq
							Cobalt-60	384 Bq
							Hg-203	611 Bq
							Lead-210	7797 Bq
							Sn-113	505 Bq
							Y-88	830 Bq
100mL Solid_00011	09/19/18	Eckert & Ziegler, Lot 83814-334			(Purchased Reagent)		Americium-241	225.36 dpm/g
							Cesium-137	85.38 dpm/g
							Cobalt-60	140.38 dpm/g
108001_00001	12/06/67	Eckert and Ziegler, Lot 108001			(Purchased Reagent)		Americium-241	7.286 Bq
							Pu-239	6.646 Bq
							Thorium-230	6.01 Bq
108002_00001	12/07/67	Eckert and Ziegler, Lot 108002			(Purchased Reagent)		Americium-241	8.089 Bq
							Pu-239	8.515 Bq
							Thorium-230	9.349 Bq
108345_00001	01/22/68	Eckert & Ziegler, Lot 108345			(Purchased Reagent)		Americium-241	7.916 Bq
							Pu-239	7.695 Bq
							Thorium-230	7.314 Bq
108346_00001	01/22/68	Eckert & Ziegler, Lot 108346			(Purchased Reagent)		Americium-241	8.008 Bq
							Pu-239	7.835 Bq
							Thorium-230	7.57 Bq
108347_00001	01/23/68	Eckert & Ziegler, Lot 108347			(Purchased Reagent)		Americium-241	8.643 Bq
							Pu-239	8.035 Bq
							Thorium-230	8.101 Bq
108348_00001	01/23/68	Eckert & Ziegler, Lot 108348			(Purchased Reagent)		Americium-241	7.497 Bq
							Pu-239	7.067 Bq
							Thorium-230	6.956 Bq
82232-334_00001	06/03/60	Eckert & Ziegler, Lot 82232-334			(Purchased Reagent)		Americium-241	7.281 Bq
							Pu-239	7.137 Bq
							Thorium-230	7.63 Bq

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
82233-334_00001	06/03/60	Eckert & Zigler, Lot 82233-334			(Purchased Reagent)		Americium-241	5.114 Bq
							Pu-239	6.064 Bq
							Thorium-230	4.95 Bq
82234-334_00001	06/02/60	Eckert & Zigler, Lot 82234-334			(Purchased Reagent)		Americium-241	5.652 Bq
							Pu-239	5.936 Bq
							Thorium-230	5.685 Bq
82235-334_00001	06/04/60	Eckert & Ziegler, Lot 82235-334			(Purchased Reagent)		Americium-241	7.466 Bq
							Pu-239	6.897 Bq
							Thorium-230	7.167 Bq
82236-334_00001	06/02/60	Eckert & Ziegler, Lot 82236-334			(Purchased Reagent)		Americium-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)		Americium-241	5.608 Bq
							Pu-239	6.424 Bq
							Thorium-230	5.856 Bq
82238-334_00001	06/01/60	Eckert & Ziegler, Lot 82238-334			(Purchased Reagent)		Americium-241	5.932 Bq
							Pu-239	6.753 Bq
							Thorium-230	7.099 Bq
82240-334_00001	06/08/60	Eckert & Ziegler, Lot 82240-334			(Purchased Reagent)		Americium-241	8.298 Bq
							Pu-239	7.163 Bq
							Thorium-230	6.304 Bq
82241-334_00001	06/08/60	Eckert & Ziegler, Lot 82241-334			(Purchased Reagent)		Americium-241	6.638 Bq
							Pu-239	6.797 Bq
							Thorium-230	6.629 Bq
82242-334_00001	06/08/60	Eckert & Ziegler, Lot 82242-334			(Purchased Reagent)		Americium-241	7.145 Bq
							Pu-239	6.414 Bq
							Thorium-230	6.583 Bq
82243-334_00001	06/09/60	Eckert & Ziegler, Lot 82243-334			(Purchased Reagent)		Americium-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)		Americium-241	6.897 Bq
							Pu-239	6.717 Bq
							Thorium-230	7.352 Bq
82245-334_00001	06/09/60	Eckert & Ziegler, Lot 82245-334			(Purchased Reagent)		Americium-241	5.528 Bq
							Pu-239	5.437 Bq
							Thorium-230	6.727 Bq
82246-334_00001	06/09/60	Eckert & Ziegler, Lot 82246-334			(Purchased Reagent)		Americium-241	6.002 Bq
							Pu-239	5.353 Bq
							Thorium-230	5.57 Bq
82247-334_00001	06/10/60	Eckert & Ziegler, Lot 82247-334			(Purchased Reagent)		Americium-241	6.291 Bq
							Pu-239	5.746 Bq
							Thorium-230	6.251 Bq
Marn Soil_00002	03/01/16	Eckert & Ziegler, Lot 83814-334			(Purchased Reagent)		Americium-241	2870 Bq

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Cd-109	39231 Bq
							Ce-139	1302 Bq
							Cesium-137	1087 Bq
							Co-57	849 Bq
							Cobalt-60	1788 Bq
							Hg-203	2820 Bq
							Lead-210	35040 Bq
							Sn-113	2306 Bq
							Y-88	3762 Bq
MarnSolid_00002	02/09/17	Eckert & Ziegler, Lot 90099			(Purchased Reagent)		Americium-241	2797 Bq
							Cd-109	39337 Bq
							Ce-139	1320 Bq
							Cesium-137	1122 Bq
							Co-57	870 Bq
							Hg-203	2814 Bq
							Lead-210	35883 Bq
							Sn-113	2322 Bq
							Y-88	3821 Bq
Source A_00001	04/01/59	02/23/11	water, Lot 79670-334	0.9986 Source	Gamma Ampuole_00001	0.9986 g	Americium-241	9.4429 Bq
							Cd-109	132.909 Bq
							Ce-139	4.4538 Bq
							Cesium-137	3.7296 Bq
							Co-57	2.9513 Bq
							Cobalt-60	6.2002 Bq
							Hg-203	9.6996 Bq
							Sn-113	7.6266 Bq
							Y-88	12.712 Bq
.Gamma Ampuole_00001	04/07/59	Analytics, Lot 79670-334			(Purchased Reagent)		Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source C_00001	04/01/59	02/23/12	water, Lot 79670-334	1.0148 g	Gamma Ampuole_00001	1.0148 g	Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
.Gamma Ampuole_00001	04/07/59	Analytics, Lot 79670-334			(Purchased Reagent)		Americium-241	9442.9 Bq

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source D_00001	04/01/59	02/23/11	water, Lot 79670-334	0.9781 g	Gamma Ampuole_00001	0.9781 g	Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
.Gamma Ampuole_00001	04/07/59		Analytics, Lot 79670-334		(Purchased Reagent)		Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source E_00001	04/01/59	02/23/11	water, Lot 79670-334	1.0205 g	Gamma Ampuole_00001	1.0205 g	Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
.Gamma Ampuole_00001	04/07/59		Analytics, Lot 79670-334		(Purchased Reagent)		Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source F_00001	01/01/61	02/23/11	water, Lot 83725-334	10 mL	Gamma Ampuole_00003	2.0327 mL	Americium-241	1846.42 Bq
							Cd-109	26819.3 Bq

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Ce-139	890.424 Bq
							Cesium-137	743.562 Bq
							Co-57	580.6 Bq
							Cobalt-60	1222.38 Bq
							Hg-203	1926.02 Bq
							Sn-113	1576.93 Bq
							Y-88	2572.87 Bq
.Gamma Ampuole_00003	01/19/61	Analytics, Lot 83725-334			(Purchased Reagent)		Americium-241	9083.6 Bq
							Cd-109	131939 Bq
							Ce-139	4380.5 Bq
							Cesium-137	3658 Bq
							Co-57	2856.3 Bq
							Cobalt-60	6013.6 Bq
							Hg-203	9475.2 Bq
							Sn-113	7757.8 Bq
							Y-88	12657.4 Bq
Source H_00002	01/01/51	01/01/12	wataer, Lot 83725-334	10 mL	Gamma Ampuole_00003	2.1184 g	Americium-241	1924.27 Bq
							Cd-109	27950 Bq
							Ce-139	927.965 Bq
							Cesium-137	774.911 Bq
							Co-57	605.079 Bq
							Cobalt-60	1273.92 Bq
							Hg-203	2007.23 Bq
							Sn-113	1643.41 Bq
							Y-88	2681.34 Bq
.Gamma Ampuole_00003	01/19/61	Analytics, Lot 83725-334			(Purchased Reagent)		Americium-241	9083.6 Bq
							Cd-109	131939 Bq
							Ce-139	4380.5 Bq
							Cesium-137	3658 Bq
							Co-57	2856.3 Bq
							Cobalt-60	6013.6 Bq
							Hg-203	9475.2 Bq
							Sn-113	7757.8 Bq
							Y-88	12657.4 Bq
Tc (T) Dil #1_00293	08/10/18	08/09/18	Blood Bank Saline, Lot 231596	100 mL	Tc (T) Source_00282	1 mL	Tc-99m	200000 pCi/ml
.Tc (T) Source_00282	08/10/18	Triad, Lot 20170508			(Purchased Reagent)		Tc-99m	20 uCi/ml
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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
TRM-2_00002	03/20/50	DOE, Lot TRM-2			(Purchased Reagent)		Lead-210	22.1 pCi/g
							Radium-226	25.4 pCi/g
							Thorium-230	24.5 pCi/g
							Uranium-234	6.2 pCi/g
							Uranium-238	6 pCi/g
Tuna Can LCS_00006	09/29/17	Analytics, Lot 74139-334			(Purchased Reagent)		Americium-241	219 dpm/g
							Cesium-137	82.3 dpm/g
							Cobalt-60	136 dpm/g
Tuna Can LCS_00007	09/21/18	Analytics, Lot 74139-334			(Purchased Reagent)		Americium-241	219 dpm/g
							Cesium-137	82.3 dpm/g
							Cobalt-60	136 dpm/g
Tuna Can_00002	02/03/15	Eckert & Ziegler, Lot 81427-334			(Purchased Reagent)		Americium-241	1164 Bq
							Cd-109	16063 Bq
							Ce-139	546 Bq
							Cesium-137	465 Bq
							Co-57	357 Bq
							Cobalt-60	742 Bq
							Hg-203	1208 Bq
							Lead-210	15186 Bq
							Sn-113	943 Bq
							Y-88	1571 Bq
Tuna Can_00003	02/09/17	Eckert & Ziegler, Lot 90099			(Purchased Reagent)		Americium-241	1164 Bq
							Cd-109	16373 Bq
							Ce-139	549 Bq
							Cesium-137	467 Bq
							Co-57	362 Bq
							Cobalt-60	735 Bq
							Hg-203	1171 Bq
							Lead-210	14936 Bq
							Sn-113	967 Bq
							Y-88	1590 Bq
Tuna Can_00006	03/01/16	Eckert & Ziegler, Lot 83814-334			(Purchased Reagent)		Americium-241	1195 Bq
							Cd-109	16353 Bq
							Ce-139	543 Bq
							Cesium-137	453 Bq
							Co-57	354 Bq
							Cobalt-60	745 Bq
							Hg-203	1175 Bq
							Lead-210	14606 Bq
							Sn-113	961 Bq
							Y-88	1568 Bq
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.: 160-29521-1

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

Reagent

100mL Solid_00002

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

83814-334

1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: Test America St. Louis
P.O. No.: 2395112, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.016927

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Pb-210	46.5	8.120E+03	———	3.021E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.090E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	2.873E+03	0.8	2.3	4.9	HPGe
Co-57	122.1	2.718E+02	8.711E+04	1.475E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	2.111E+03	0.5	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	4.660E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	2.994E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	1.877E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.224E+05	7.150E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	3.626E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	3.627E+03	0.6	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	7.570E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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)

Corporate Office
Laboratory

Comments:
1550 grams of sand. Homogeneous down to 10 gram aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 2/11/11
J. D. McCorvey, QA Manager Alternate

Reagent

100mL solid_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

90099
1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: TestAmerica St. Louis / Earth City, MO
P.O. No.: 2454150, Item 1
Reference Date: 01-Jan-2012 12:00 PM EST **Grams of Master Source:** 0.017180

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	3.094E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.037E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.677E+05	2.881E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.795E+04	1.511E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.245E+05	2.139E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.707E+05	4.651E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.755E+05	3.015E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.128E+05	1.938E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.228E+05	7.264E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.084E+05	3.580E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	3.581E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.476E+05	7.690E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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:
1550 grams of sand. Homogenous down to 10 grams aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 30 JAN 12
J.D. McCorvey, Counting Room Manager

Reagent

100mL Solid_00011

Standard ID Number: 100mLSoild_00011 (1278177)
True Value = 32.95 pCi/g
Date Analyzed: 9/19/2017

Radionuclide: Cs-137

	Replicates	
#1	31.06	pCi/g
#2	32.59	pCi/g
#3	30.91	pCi/g

Mean = 31.52

1 sigma = 0.92967736

1.96 sigma = 1.822168

True Value minus 5% = 31.3025 (True Value - 5%)
True Value plus 5% = 34.5975 (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: JW 9/21/17

2nd Reviewed By/Date: RM 9.25.17

Standard ID Number: 100mLSolid_00011 (1278177)
True Value = 26.15 pCi/g
Date Analyzed: 9/19/2017

Radionuclide: Co-60

	Replicates	
#1	24.53	pCi/g
#2	26.65	pCi/g
#3	26.24	pCi/g

Mean = 25.8066667

1 sigma = 1.12447025

1.96 sigma = 2.203962

True Value minus 5% = 24.8425 (True Value - 5%)
True Value plus 5% = 27.4575 (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: gw 9/25/17

2nd Reviewed By/Date: RM 9.25.17

Standard ID Number: 100mLSolid_00011 (1278177)
True Value = 100.4 pCi/g
Date Analyzed: 9/19/2017

Radionuclide: Am-241

	Replicates	
#1	101.5	pCi/g
#2	102.2	pCi/g
#3	101.8	pCi/g

Mean = 101.833333

1 sigma = 0.35118846

1.96 sigma = 0.688329

True Value minus 5% = 95.38 (True Value - 5%)
True Value plus 5% = 105.42 (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: 9/25/17

2nd Reviewed By/Date: 9.25.17

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING



Reagent ID: 100mL Solid_00011

Type:	ASTD	Expiration Date:	09/13/2017
Description:	Mixed Gamma 100mL solid LCS	Laboratory:	TestAmerica St. Louis
No. of Bottles:	1	Prepared By:	Watson, Jody L
Storage Location:	RAD Soil Prep Reagents	Vendor:	Eckert & Ziegler
Reagent Volume:	166.060 g	Vendor Lot #:	83814-334
Creation Date:	02/15/2011	Vendor Cat #:	
Open Date:			
Container(s):	1278177		
Comment:	Rad11-0025 Upon recertification the Am-241 value has been updated to reflex the certified value per Terry Romanko. 12/30/14 Jody Watson		

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
Am-241					225.36000	dpm/g
Co-60					140.38000	dpm/g
Cs-137					85.38000	dpm/g

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 314746 **Operator:**

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-314746~2-	LCS	166.06g	1.00	GammaVision	GV13	9 / 19 / 17 14:19	60

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	1.398E+000pCi/g	3.438E-001	3.363E-001	8.302E-001	4.027E-001	1.68	0.3438
AG-108M	10982	5.623E-002pCi/g	2.805E-002	2.790E-002	2.378E-001	1.167E-001	0.24	0.0280
AG-110M	10973	3.877E-002pCi/g	4.752E-002	4.748E-002	5.716E-001	2.810E-001	0.07	0.0475
AM-241	10818	1.015E+002pCi/g	5.301E+000	5.984E-001	8.339E-001	4.142E-001	121.70	5.3008
BA-133	10469	-1.296E-001pCi/g	1.125E-001	1.123E-001	3.716E-001	1.830E-001	-0.35	0.1125
BA-140	10463	-1.067E-002pCi/g	9.924E-003	9.908E-003	8.353E-001	4.079E-001	-0.01	0.0099
BE-7	10435	9.282E-001pCi/g	9.461E-001	9.449E-001	3.130E+000	1.544E+000	0.30	0.9461
BI-207	10195	7.295E-002pCi/g	5.576E-002	5.563E-002	1.843E-001	8.961E-002	0.40	0.0558
BI-210M	10173	-1.482E-001pCi/g	1.200E-001	1.196E-001	3.956E-001	1.949E-001	-0.37	0.1200
BI-212	10160	1.357E+000pCi/g	9.840E-001	9.815E-001	3.246E+000	1.583E+000	0.42	0.9840
BI-214	10154	1.410E-001pCi/g	8.197E-002	8.164E-002	8.612E-001	4.249E-001	0.16	0.0820
CD-109	9254	3.317E+001pCi/g	2.345E+000	1.442E+000	4.101E+000	2.027E+000	8.09	2.3445
CD-113M	17462	-1.196E+003pCi/g	9.777E+002	9.747E+002	3.224E+003	1.588E+003	-0.37	977.7440
CE-139	9241	-6.790E-002pCi/g	6.198E-002	6.164E-002	2.040E-001	1.007E-001	-0.33	0.0620
CE-141	9235	-1.103E-001pCi/g	1.490E-001	1.488E-001	4.927E-001	2.443E-001	-0.22	0.1490
CE-144	9221	-2.052E-001pCi/g	6.275E-001	6.274E-001	2.081E+000	1.032E+000	-0.10	0.6275
CF-249	9215	4.161E-002pCi/g	1.372E-001	1.372E-001	4.565E-001	2.254E-001	0.09	0.1372
CF-251	13690	-3.241E-001pCi/g	3.241E-001	3.228E-001	7.754E-001	3.813E-001	-0.42	0.3241
CO-56	8704	1.359E-001pCi/g	4.963E-002	4.914E-002	2.598E-001	1.265E-001	0.52	0.0496
CO-57	13694	5.616E-002pCi/g	5.535E-002	5.527E-002	1.829E-001	9.041E-002	0.31	0.0554
CO-58	8698	-2.511E-002pCi/g	9.856E-002	9.855E-002	3.303E-001	1.619E-001	-0.08	0.0986
CO-60	8692	2.453E+001pCi/g	1.252E+000	2.239E-001	1.673E-001	7.873E-002	146.60	1.2517
CR-51	8604	5.190E-001pCi/g	6.737E-001	6.731E-001	1.624E+000	7.955E-001	0.32	0.6737
CS-134	8553	2.803E-002pCi/g	1.720E-002	1.714E-002	4.069E-001	2.008E-001	0.07	0.0172
CS-136	8546	1.449E-001pCi/g	6.998E-002	6.948E-002	3.489E-001	1.711E-001	0.42	0.0700
CS-137	8539	3.106E+001pCi/g	1.644E+000	3.026E-001	2.479E-001	1.207E-001	125.26	1.6438
EU-152	7145	-4.723E-002pCi/g	5.675E-002	5.670E-002	1.317E+000	6.523E-001	-0.04	0.0568
EU-154	7138	4.569E-001pCi/g	2.762E-001	2.752E-001	2.762E+000	1.353E+000	0.17	0.2762
EU-155	7131	-2.534E-001pCi/g	4.363E-001	4.361E-001	1.442E+000	7.171E-001	-0.18	0.4363
FE-59	7073	-2.375E-002pCi/g	2.655E-001	2.655E-001	5.587E-001	2.719E-001	-0.04	0.2655
GA-68	18005	5.562E+000pCi/g	5.541E+000	5.532E+000	1.155E+001	5.606E+000	0.48	5.5408
GD-153	6824	6.945E-002pCi/g	3.021E-001	3.021E-001	1.000E+000	4.973E-001	0.07	0.3021
HF-181	6495	0.000E+000pCi/g	5.643E-002	5.643E-002	4.184E-001	2.065E-001	0.00	0.0564
HG-203	6466	-2.989E-002pCi/g	6.738E-002	6.736E-002	2.246E-001	1.105E-001	-0.13	0.0674
I-131	6380	1.133E-001pCi/g	7.388E-002	7.365E-002	2.209E-001	1.083E-001	0.51	0.0739
IR-192	6303	1.043E-008pCi/g	1.307E-001	1.307E-001	4.344E-001	2.154E-001	0.00	0.1307
K-40	6148	1.476E-001pCi/g	6.218E-001	6.217E-001	1.291E+000	5.956E-001	0.11	0.6218
LA-140	6096	3.254E-002pCi/g	7.113E-002	7.111E-002	1.503E-001	6.910E-002	0.22	0.0711
MN-54	5382	2.227E-002pCi/g	1.176E-001	1.175E-001	2.554E-001	1.243E-001	0.09	0.1176
NA-22	5201	3.390E-002pCi/g	4.098E-002	4.095E-002	1.396E-001	6.503E-002	0.24	0.0410
NB-94	5160	-1.179E-001pCi/g	9.329E-002	9.309E-002	3.081E-001	1.511E-001	-0.38	0.0933
NB-95	5154	-2.645E-002pCi/g	8.261E-002	8.260E-002	2.772E-001	1.355E-001	-0.10	0.0826
ND-147	5083	6.851E-002pCi/g	1.246E-001	1.246E-001	1.463E+000	7.134E-001	0.05	0.1246
NP-237	4757	3.794E-001pCi/g	6.920E-001	6.917E-001	2.288E+000	1.137E+000	0.17	0.6920
NP-239	4751	-2.400E-001pCi/g	4.154E-001	4.152E-001	1.373E+000	6.827E-001	-0.17	0.4154
PA-231	4541	-2.574E+000pCi/g	3.808E+000	3.805E+000	1.260E+001	6.247E+000	-0.20	3.8077
PA-233	4535	3.296E-002pCi/g	3.134E-001	3.134E-001	1.041E+000	5.160E-001	0.03	0.3134
PA-234	4528	2.880E-001pCi/g	1.932E-001	1.927E-001	1.256E+000	6.228E-001	0.23	0.1932
PA-234M	19453	1.910E+000pCi/g	1.448E+001	1.448E+001	4.855E+001	2.381E+001	0.04	14.4756
PB-210	4467	1.003E+003pCi/g	5.925E+001	6.256E+000	1.002E+001	4.981E+000	100.18	59.2502

PB-212	4454	5.111E-001pCi/g	9.549E-002	8.958E-002	2.792E-001	1.365E-001	1.83	0.0955
PB-214	4448	5.123E-001pCi/g	1.273E-001	1.245E-001	3.842E-001	1.875E-001	1.33	0.1273
PM-144	19585	-1.142E-001pCi/g	8.793E-002	8.773E-002	2.903E-001	1.422E-001	-0.39	0.0879
PM-146	2464	-5.293E-002pCi/g	7.649E-002	7.644E-002	6.504E-001	3.162E-001	-0.08	0.0765
RH-106	1882	1.044E+000pCi/g	1.269E+000	1.268E+000	4.206E+000	2.076E+000	0.25	1.2694
RU-103	1828	-2.123E-002pCi/g	9.363E-002	9.362E-002	2.182E-001	1.066E-001	-0.10	0.0936
SB-124	1784	-1.014E-001pCi/g	1.233E-001	1.232E-001	4.085E-001	2.016E-001	-0.25	0.1233
SB-125	1777	9.901E-002pCi/g	1.041E-001	1.040E-001	7.294E-001	3.579E-001	0.14	0.1041
SC-46	1739	-3.298E-002pCi/g	1.263E-001	1.263E-001	4.222E-001	2.076E-001	-0.08	0.1263
SN-113	1570	1.412E-001pCi/g	1.355E-001	1.353E-001	4.481E-001	2.211E-001	0.32	0.1355
SN-126	17459	-1.165E+000pCi/g	2.616E+000	2.615E+000	8.631E+000	4.305E+000	-0.14	2.6156
TA-182	1301	-3.232E-002pCi/g	2.333E-002	2.327E-002	1.298E+000	6.367E-001	-0.02	0.0233
TC-99M	17412	0.000E+000pCi/g	2.609E-002	2.609E-002	2.808E-001	1.392E-001	0.00	0.0261
TH-227	1058	-2.185E+000pCi/g	3.921E+000	3.919E+000	1.293E+001	6.452E+000	-0.17	3.9210
TH-229	1046	-1.161E+000pCi/g	1.360E+000	1.357E+000	3.262E+000	1.605E+000	-0.36	1.3600
TH-234	1027	-2.992E+000pCi/g	6.648E+000	6.646E+000	2.194E+001	1.094E+001	-0.14	6.6483
TL-208	929	1.648E-001pCi/g	1.467E-001	1.464E-001	2.227E-001	1.084E-001	0.74	0.1467
U-235	281	4.636E-001pCi/g	4.384E-001	4.378E-001	2.180E+000	1.081E+000	0.21	0.4384
Y-88	74	6.441E-002pCi/g	1.424E-001	1.424E-001	3.080E-001	1.502E-001	0.21	0.1424
ZN-65	31	0.000E+000pCi/g	5.033E-002	5.033E-002	8.747E-001	4.289E-001	0.00	0.0503
ZR-95	7	1.286E-002pCi/g	8.501E-003	8.475E-003	4.004E-001	1.945E-001	0.03	0.0085

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	ZFactor
LCS 160-314746~2-A	LCS 160-314746~2-A	CS-137	3.106E+001 pCi/g	3.295E+001	94.27%	-0.7878
		CO-60	2.453E+001 pCi/g	2.615E+001	93.82%	-0.8835
		AM-241	1.015E+002 pCi/g	1.004E+002	101.06%	0.1421

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 314746 **Operator:**

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-314746~2-	LCS	166.06g	1.00	GammaVision	GV03	9 / 19 / 17 15:29	60

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	1.765E+000pCi/g	4.616E-001	4.527E-001	9.344E-001	4.518E-001	1.89	0.4616
AG-108M	10982	1.066E-001pCi/g	1.026E-001	1.025E-001	2.470E-001	1.207E-001	0.43	0.1026
AG-110M	10973	9.311E-002pCi/g	7.899E-002	7.885E-002	6.170E-001	3.025E-001	0.15	0.0790
AM-241	10818	1.022E+002pCi/g	5.339E+000	6.178E-001	8.649E-001	4.292E-001	118.13	5.3385
BA-133	10469	-1.373E-001pCi/g	1.397E-001	1.396E-001	4.626E-001	2.278E-001	-0.30	0.1397
BA-140	10463	3.491E-002pCi/g	3.656E-001	3.656E-001	8.586E-001	4.171E-001	0.04	0.3656
BE-7	10435	1.518E-001pCi/g	1.075E+000	1.075E+000	3.588E+000	1.768E+000	0.04	1.0747
BI-207	10195	1.922E-002pCi/g	8.239E-002	8.238E-002	2.769E-001	1.353E-001	0.07	0.0824
BI-210M	10173	-2.759E-002pCi/g	1.223E-001	1.223E-001	4.089E-001	2.009E-001	-0.07	0.1223
BI-212	10160	1.468E+000pCi/g	1.172E+000	1.169E+000	3.876E+000	1.888E+000	0.38	1.1718
BI-214	10154	3.449E-001pCi/g	1.096E-001	1.081E-001	3.621E-001	1.740E-001	0.95	0.1096
CD-109	9254	1.395E+000pCi/g	1.883E+000	1.882E+000	6.231E+000	3.087E+000	0.22	1.8832
CD-113M	17462	1.286E+002pCi/g	1.036E+003	1.036E+003	3.468E+003	1.705E+003	0.04	1,036.1929
CE-139	9241	6.042E-002pCi/g	6.241E-002	6.214E-002	2.060E-001	1.015E-001	0.29	0.0624
CE-141	9235	-9.604E-002pCi/g	1.133E-001	1.132E-001	3.755E-001	1.853E-001	-0.26	0.1133
CE-144	9221	4.601E-001pCi/g	3.337E-001	3.329E-001	8.785E-001	4.290E-001	0.52	0.3337
CF-249	9215	-8.811E-003pCi/g	1.389E-001	1.389E-001	4.646E-001	2.288E-001	-0.02	0.1389
CF-251	13690	8.525E-002pCi/g	3.026E-001	3.025E-001	8.055E-001	3.950E-001	0.11	0.3026
CO-56	8704	1.776E-001pCi/g	1.276E-001	1.273E-001	2.741E-001	1.328E-001	0.65	0.1276
CO-57	13694	-2.782E-002pCi/g	4.726E-002	4.724E-002	1.573E-001	7.736E-002	-0.18	0.0473
CO-58	8698	3.321E-002pCi/g	1.131E-001	1.131E-001	3.794E-001	1.856E-001	0.09	0.1131
CO-60	8692	2.565E+001pCi/g	1.311E+000	2.448E-001	1.388E-001	6.336E-002	184.77	1.3109
CR-51	8604	7.571E-001pCi/g	1.174E+000	1.174E+000	3.891E+000	1.925E+000	0.19	1.1742
CS-134	8553	1.936E-001pCi/g	1.553E-001	1.550E-001	4.461E-001	2.198E-001	0.43	0.1553
CS-136	8546	-1.455E-001pCi/g	1.240E-001	1.237E-001	4.100E-001	2.009E-001	-0.35	0.1240
CS-137	8539	3.259E+001pCi/g	1.729E+000	3.383E-001	2.486E-001	1.202E-001	131.09	1.7290
EU-152	7145	2.202E-001pCi/g	2.180E-001	2.177E-001	1.210E+000	5.968E-001	0.18	0.2180
EU-154	7138	6.083E-001pCi/g	3.120E-001	3.105E-001	3.154E+000	1.542E+000	0.19	0.3120
EU-155	7131	-4.209E-003pCi/g	3.398E-001	3.398E-001	1.028E+000	5.088E-001	0.00	0.3398
FE-59	7073	-2.056E-002pCi/g	8.148E-002	8.147E-002	6.541E-001	3.179E-001	-0.03	0.0815
GA-68	18005	-4.784E+000pCi/g	7.211E+000	7.206E+000	1.509E+001	7.334E+000	-0.32	7.2112
GD-153	6824	1.711E-001pCi/g	1.757E-001	1.753E-001	7.020E-001	3.474E-001	0.24	0.1757
HF-181	6495	1.311E-001pCi/g	1.390E-001	1.389E-001	4.604E-001	2.268E-001	0.28	0.1390
HG-203	6466	1.892E-002pCi/g	7.285E-002	7.284E-002	2.438E-001	1.197E-001	0.08	0.0729
I-131	6380	-2.810E-002pCi/g	9.747E-002	9.746E-002	2.514E-001	1.230E-001	-0.11	0.0975
IR-192	6303	1.344E-001pCi/g	1.153E-001	1.150E-001	4.186E-001	2.070E-001	0.32	0.1153
K-40	6148	5.776E-001pCi/g	6.263E-001	6.256E-001	1.490E+000	6.836E-001	0.39	0.6263
LA-140	6096	1.198E-001pCi/g	9.002E-002	8.980E-002	1.545E-001	6.991E-002	0.78	0.0900
MN-54	5382	6.772E-002pCi/g	1.188E-001	1.188E-001	2.673E-001	1.295E-001	0.25	0.1188
NA-22	5201	-1.121E-001pCi/g	6.065E-002	6.039E-002	1.970E-001	9.266E-002	-0.57	0.0606
NB-94	5160	6.441E-002pCi/g	9.438E-002	9.432E-002	2.129E-001	1.027E-001	0.30	0.0944
NB-95	5154	1.247E-002pCi/g	8.457E-002	8.457E-002	2.858E-001	1.390E-001	0.04	0.0846
ND-147	5083	-5.881E-001pCi/g	7.149E-001	7.141E-001	1.660E+000	8.072E-001	-0.35	0.7149
NP-237	4757	2.880E-001pCi/g	6.281E-001	6.278E-001	2.080E+000	1.032E+000	0.14	0.6281
NP-239	4751	1.950E-001pCi/g	2.844E-001	2.842E-001	9.419E-001	4.662E-001	0.21	0.2844
PA-231	4541	-2.516E+000pCi/g	4.017E+000	4.014E+000	1.331E+001	6.588E+000	-0.19	4.0168
PA-233	4535	0.000E+000pCi/g	9.537E-002	9.537E-002	1.098E+000	5.436E-001	0.00	0.0954
PA-234	4528	-5.579E-002pCi/g	7.830E-002	7.825E-002	1.154E+000	5.706E-001	-0.05	0.0783
PA-234M	19453	1.921E+001pCi/g	1.574E+001	1.571E+001	5.204E+001	2.545E+001	0.37	15.7357
PB-210	4467	9.321E+002pCi/g	5.500E+001	5.467E+000	9.522E+000	4.729E+000	97.89	55.0047

PB-212	4454	3.563E-001pCi/g	9.560E-002	9.278E-002	2.941E-001	1.433E-001	1.21	0.0956
PB-214	4448	6.354E-001pCi/g	1.841E-001	1.811E-001	4.602E-001	2.244E-001	1.38	0.1841
PM-144	19585	-7.506E-002pCi/g	5.952E-002	5.939E-002	2.342E-001	1.135E-001	-0.32	0.0595
PM-146	2464	-5.993E-002pCi/g	1.025E-001	1.024E-001	7.252E-001	3.514E-001	-0.08	0.1025
RH-106	1882	-9.334E-002pCi/g	7.996E-002	7.981E-002	4.792E+000	2.363E+000	-0.02	0.0800
RU-103	1828	-7.017E-002pCi/g	1.064E-001	1.064E-001	2.575E-001	1.257E-001	-0.27	0.1064
SB-124	1784	9.252E-002pCi/g	1.317E-001	1.316E-001	4.374E-001	2.154E-001	0.21	0.1317
SB-125	1777	-2.543E-001pCi/g	1.217E-001	1.210E-001	7.766E-001	3.799E-001	-0.33	0.1217
SC-46	1739	5.708E-002pCi/g	1.244E-001	1.243E-001	4.160E-001	2.036E-001	0.14	0.1244
SN-113	1570	-1.279E-001pCi/g	1.417E-001	1.415E-001	3.413E-001	1.670E-001	-0.37	0.1417
SN-126	17459	6.026E-001pCi/g	5.958E-001	5.950E-001	1.970E+000	9.730E-001	0.31	0.5958
TA-182	1301	1.515E-001pCi/g	1.224E-001	1.221E-001	1.427E+000	6.982E-001	0.11	0.1224
TC-99M	17412	5.212E-002pCi/g	6.244E-002	6.237E-002	2.069E-001	1.020E-001	0.25	0.0624
TH-227	1058	8.796E-001pCi/g	1.245E+000	1.244E+000	4.117E+000	2.042E+000	0.21	1.2447
TH-229	1046	1.208E+000pCi/g	1.212E+000	1.208E+000	3.198E+000	1.567E+000	0.38	1.2124
TH-234	1027	-1.698E+000pCi/g	1.053E+000	1.049E+000	4.887E+000	2.414E+000	-0.35	1.0526
TL-208	929	3.131E-001pCi/g	1.129E-001	1.117E-001	2.328E-001	1.127E-001	1.35	0.1129
U-235	281	5.282E-001pCi/g	5.041E-001	5.034E-001	1.629E+000	8.039E-001	0.32	0.5041
Y-88	74	7.874E-002pCi/g	1.584E-001	1.584E-001	3.433E-001	1.670E-001	0.23	0.1584
ZN-65	31	0.000E+000pCi/g	1.839E-001	1.839E-001	9.799E-001	4.796E-001	0.00	0.1839
ZR-95	7	-3.351E-002pCi/g	1.998E-001	1.998E-001	4.573E-001	2.216E-001	-0.07	0.1998

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity		StdAdded	Recovery	ZFactor
LCS 160-314746~2-A	LCS 160-314746~2-A	CS-137	3.259E+001	pCi/g	3.295E+001	98.93%	-0.1434
		CO-60	2.565E+001	pCi/g	2.615E+001	98.11%	-0.2639
		AM-241	1.022E+002	pCi/g	1.004E+002	101.74%	0.2334

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 314746 **Operator:**

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-314746~2-	LCS	166.06g	1.00	GammaVision	GV14	9 / 19 / 17 20:16	60

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	9.122E-001pCi/g	4.729E-001	4.706E-001	1.174E+000	5.693E-001	0.78	0.4729
AG-108M	10982	5.057E-002pCi/g	5.708E-002	5.702E-002	2.712E-001	1.326E-001	0.19	0.0571
AG-110M	10973	2.013E-001pCi/g	2.250E-001	2.248E-001	9.082E-001	4.472E-001	0.22	0.2250
AM-241	10818	1.018E+002pCi/g	5.315E+000	6.060E-001	8.465E-001	4.200E-001	120.20	5.3155
BA-133	10469	-1.384E-001pCi/g	1.467E-001	1.466E-001	4.862E-001	2.393E-001	-0.28	0.1467
BA-140	10463	-1.529E-001pCi/g	7.106E-001	7.105E-001	9.586E-001	4.659E-001	-0.16	0.7106
BE-7	10435	-1.144E+000pCi/g	3.874E-001	3.830E-001	3.542E+000	1.743E+000	-0.32	0.3874
BI-207	10195	4.435E-002pCi/g	5.163E-002	5.158E-002	2.362E-001	1.146E-001	0.19	0.0516
BI-210M	10173	-1.375E-001pCi/g	1.294E-001	1.292E-001	4.282E-001	2.104E-001	-0.32	0.1294
BI-212	10160	-1.262E+000pCi/g	1.270E+000	1.268E+000	4.222E+000	2.055E+000	-0.30	1.2697
BI-214	10154	1.983E-001pCi/g	3.743E-001	3.742E-001	1.031E+000	5.076E-001	0.19	0.3743
CD-109	9254	2.748E+001pCi/g	2.468E+000	1.935E+000	5.923E+000	2.933E+000	4.64	2.4678
CD-113M	17462	4.619E+002pCi/g	1.043E+003	1.043E+003	3.481E+003	1.710E+003	0.13	1,043.2113
CE-139	9241	-2.067E-003pCi/g	6.440E-002	6.440E-002	2.149E-001	1.058E-001	-0.01	0.0644
CE-141	9235	6.737E-002pCi/g	1.147E-001	1.147E-001	3.811E-001	1.881E-001	0.18	0.1147
CE-144	9221	3.737E-001pCi/g	4.993E-001	4.989E-001	1.655E+000	8.172E-001	0.23	0.4993
CF-249	9215	2.365E-001pCi/g	9.393E-002	9.314E-002	2.361E-001	1.142E-001	1.00	0.0939
CF-251	13690	1.001E-001pCi/g	2.920E-001	2.919E-001	7.777E-001	3.809E-001	0.13	0.2920
CO-56	8704	1.782E-001pCi/g	8.609E-002	8.561E-002	3.898E-001	1.901E-001	0.46	0.0861
CO-57	13694	0.000E+000pCi/g	3.194E-002	3.194E-002	1.833E-001	9.033E-002	0.00	0.0319
CO-58	8698	1.379E-001pCi/g	1.197E-001	1.195E-001	3.966E-001	1.936E-001	0.35	0.1197
CO-60	8692	2.524E+001pCi/g	1.295E+000	2.657E-001	1.480E-001	6.690E-002	170.56	1.2948
CR-51	8604	-3.141E-001pCi/g	7.807E-001	7.805E-001	2.605E+000	1.281E+000	-0.12	0.7807
CS-134	8553	1.910E-001pCi/g	7.620E-002	7.555E-002	4.689E-001	2.307E-001	0.41	0.0762
CS-136	8546	1.376E-001pCi/g	1.059E-001	1.056E-001	4.085E-001	1.996E-001	0.34	0.1059
CS-137	8539	3.091E+001pCi/g	1.645E+000	3.478E-001	2.672E-001	1.290E-001	115.69	1.6453
EU-152	7145	4.736E-001pCi/g	2.723E-001	2.712E-001	1.158E+000	5.703E-001	0.41	0.2723
EU-154	7138	-2.930E-002pCi/g	2.002E-002	1.996E-002	5.358E+000	2.639E+000	-0.01	0.0200
EU-155	7131	-2.016E-001pCi/g	2.250E-001	2.248E-001	7.452E-001	3.675E-001	-0.27	0.2250
FE-59	7073	-2.548E-003pCi/g	3.130E-001	3.130E-001	6.855E-001	3.321E-001	0.00	0.3130
GA-68	18005	7.634E+000pCi/g	6.523E+000	6.509E+000	1.406E+001	6.786E+000	0.54	6.5229
GD-153	6824	1.912E-001pCi/g	1.395E-001	1.390E-001	5.435E-001	2.682E-001	0.35	0.1395
HF-181	6495	6.381E-002pCi/g	8.431E-002	8.424E-002	4.583E-001	2.254E-001	0.14	0.0843
HG-203	6466	1.184E-002pCi/g	7.701E-002	7.700E-002	2.580E-001	1.266E-001	0.05	0.0770
I-131	6380	2.931E-002pCi/g	8.388E-002	8.386E-002	2.529E-001	1.235E-001	0.12	0.0839
IR-192	6303	3.644E-002pCi/g	8.713E-002	8.710E-002	2.931E-001	1.441E-001	0.12	0.0871
K-40	6148	-3.504E-001pCi/g	6.850E-001	6.848E-001	1.624E+000	7.398E-001	-0.22	0.6850
LA-140	6096	1.261E-001pCi/g	2.968E-002	2.892E-002	4.747E-002	1.501E-002	2.66	0.0297
MN-54	5382	5.710E-002pCi/g	1.300E-001	1.300E-001	2.935E-001	1.420E-001	0.19	0.1300
NA-22	5201	-5.206E-002pCi/g	9.675E-002	9.672E-002	2.091E-001	9.774E-002	-0.25	0.0968
NB-94	5160	-1.223E-001pCi/g	1.145E-001	1.143E-001	2.656E-001	1.286E-001	-0.46	0.1145
NB-95	5154	1.316E-001pCi/g	9.629E-002	9.604E-002	3.179E-001	1.545E-001	0.41	0.0963
ND-147	5083	5.332E-001pCi/g	7.019E-001	7.013E-001	1.702E+000	8.262E-001	0.31	0.7019
NP-237	4757	3.466E-001pCi/g	6.170E-001	6.167E-001	2.043E+000	1.013E+000	0.17	0.6170
NP-239	4751	-1.062E-001pCi/g	2.198E-001	2.197E-001	7.308E-001	3.606E-001	-0.15	0.2198
PA-231	4541	0.000E+000pCi/g	6.501E-001	6.500E-001	1.207E+001	5.964E+000	0.00	0.6501
PA-233	4535	2.881E-003pCi/g	2.947E-001	2.947E-001	9.826E-001	4.854E-001	0.00	0.2947
PA-234	4528	1.713E-001pCi/g	2.987E-001	2.986E-001	9.922E-001	4.897E-001	0.17	0.2987
PA-234M	19453	2.131E+001pCi/g	1.439E+001	1.435E+001	5.470E+001	2.669E+001	0.39	14.3935
PB-210	4467	9.758E+002pCi/g	5.766E+001	6.436E+000	1.069E+001	5.310E+000	91.33	57.6601

PB-212	4454	3.859E-001pCi/g	1.536E-001	1.516E-001	3.954E-001	1.938E-001	0.98	0.1536
PB-214	4448	5.890E-001pCi/g	1.600E-001	1.571E-001	4.240E-001	2.058E-001	1.39	0.1600
PM-144	19585	3.774E-002pCi/g	5.084E-002	5.080E-002	2.485E-001	1.201E-001	0.15	0.0508
PM-146	2464	-2.991E-001pCi/g	3.415E-001	3.411E-001	7.947E-001	3.847E-001	-0.38	0.3415
RH-106	1882	2.561E+000pCi/g	1.709E+000	1.704E+000	4.833E+000	2.379E+000	0.53	1.7092
RU-103	1828	-1.162E-001pCi/g	4.650E-002	4.612E-002	3.043E-001	1.488E-001	-0.38	0.0465
SB-124	1784	-3.491E-002pCi/g	1.216E-002	1.202E-002	4.716E-001	2.321E-001	-0.07	0.0122
SB-125	1777	2.358E-001pCi/g	2.355E-001	2.352E-001	8.353E-001	4.085E-001	0.28	0.2355
SC-46	1739	1.398E-001pCi/g	2.027E-001	2.026E-001	6.733E-001	3.317E-001	0.21	0.2027
SN-113	1570	5.029E-002pCi/g	1.564E-001	1.564E-001	5.218E-001	2.569E-001	0.10	0.1564
SN-126	17459	5.541E-001pCi/g	5.714E-001	5.707E-001	1.890E+000	9.332E-001	0.29	0.5714
TA-182	1301	4.631E-001pCi/g	3.185E-001	3.176E-001	1.731E+000	8.480E-001	0.27	0.3185
TC-99M	17412	4.941E-002pCi/g	6.271E-002	6.265E-002	2.079E-001	1.025E-001	0.24	0.0627
TH-227	1058	8.584E+000pCi/g	1.760E+000	1.696E+000	4.394E+000	2.181E+000	1.95	1.7599
TH-229	1046	2.791E-001pCi/g	1.170E+000	1.170E+000	3.415E+000	1.674E+000	0.08	1.1705
TH-234	1027	-1.169E+000pCi/g	6.046E+000	6.046E+000	4.717E+000	2.328E+000	-0.25	6.0462
TL-208	929	2.267E-001pCi/g	1.509E-001	1.504E-001	2.572E-001	1.245E-001	0.88	0.1509
U-235	281	5.994E-001pCi/g	4.190E-001	4.179E-001	1.615E+000	7.967E-001	0.37	0.4190
Y-88	74	2.794E-001pCi/g	1.543E-001	1.537E-001	3.406E-001	1.649E-001	0.82	0.1543
ZN-65	31	-4.322E-001pCi/g	3.422E-001	3.415E-001	1.131E+000	5.533E-001	-0.38	0.3422
ZR-95	7	-1.584E-001pCi/g	6.094E-001	6.094E-001	4.959E-001	2.400E-001	-0.32	0.6094

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	ZFactor
LCS 160-314746~2-A	LCS 160-314746~2-A	CS-137	3.091E+001 pCi/g	3.294E+001	93.83%	-0.8454
		CO-60	2.524E+001 pCi/g	2.614E+001	96.55%	-0.4833
		AM-241	1.018E+002 pCi/g	1.004E+002	101.32%	0.1778

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Please Count 3 times

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Gamma Barcode Report

Long

Sample 314746_Gamma_MB 160-314746~1-A

Instrument Operator: **Sample ID** MB 160-314746~1-A MB 160-314 **Sample Title:** MB 160-314746~1-A

Sample Type: solid **Batch ID:** 314746 **Geometry:**

9/19/17

Sample 314746_Gamma_LCS 160-314746~2-A

Instrument Operator: **Sample ID** LCS 160-314746~2-A LCS 160-31 **Sample Title:** LCS 160-314746~2-A

Sample Type: solid **Batch ID:** 314746 **Geometry:** 100mL Solid

1=(13) 2=(3) 3=(14)

Sample 314746_Gamma_240-81169-B-18-B

Instrument Operator: **Sample ID** 240-81169-B-18-B 240-81169- **Sample Title:** 240-81169-B-18-B

Sample Type: solid **Batch ID:** 314746 **Geometry:**

9/19/17

Sample 314746_Gamma_240-81169-B-18-C DU

Instrument Operator: **Sample ID** 240-81169-B-18-C DU 240-81169- **Sample Title:** 240-81169-B-18-C DU

Sample Type: solid **Batch ID:** 314746 **Geometry:**

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

83814-334

1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: Test America St. Louis
P.O. No.: 2395112, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.016927

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Pb-210	46.5	8.120E+03	———	3.021E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.090E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	2.873E+03	0.8	2.3	4.9	HPGe
Co-57	122.1	2.718E+02	8.711E+04	1.475E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	2.111E+03	0.5	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	4.660E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	2.994E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	1.877E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.224E+05	7.150E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	3.626E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	3.627E+03	0.6	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	7.570E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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)

ANA Form005 Rev —

Comments:
1550 grams of sand. Homogeneous down to 10 gram aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 2/11/11
J. D. McCorvey, QA Manager Alternate

Reagent

108001_00001

Eckert & Ziegler
Analytics

1368446
ID: 108001_00001
Exp:12/06/67 Prpd:JLW Opn:01/29/18
Alpha Calibration source

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: 108001
Source Description: 24.1 mm Diameter x 0.77 mm Thick Stainless Steel Disk
Product Code: MIX-EAB-FOIL
Customer: TestAmerica Laboratories - St. Louis
P.O. Number: 2698841, 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 (if detected) were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectrometry. Eckert & Ziegler Analytics (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: 06-December-2017 12:00 PM EST

Isotope	Activity, Bq	Energy Range, keV	Half-Life, d	Uncertainty u_A, %	u_B, %	U, %*
Pu-239	6.646E+00	4950-5240	8.806E+06	1.2	1.5	3.9
Am-241	7.286E+00	5280-5600	1.580E+05	1.1	1.5	3.8
Th-230	6.010E+00	4470-4760	2.753E+07	1.2	1.5	3.9
Total Activity	1.997E+01	3000-8000		0.7	1.5	3.4

***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)

SRS Number: 108001

Comments:

Diameter of active area: 19 mm

Mounted on customer supplied 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.

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 Calibrated by: _____

A. Chen, Spectroscopist

QC Approved by: _____ Date: 19-DEC-17

J. Lahr, Spectroscopist

Reagent

108002_00001

Eckert & Ziegler
Analytics

1368447
ID: 108002_00001
Exp:12/07/67 Prpd:JLW Opn:01/25/18
Alpha Calibration source

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: 108002
Source Description: 24.1 mm Diameter x 0.77 mm Thick Stainless Steel Disk
Product Code: MIX-EAB-FOIL
Customer: TestAmerica Laboratories - St. Louis
P.O. Number: 2698841, 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 (if detected) were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectrometry. Eckert & Ziegler Analytics (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: 07-December-2017 12:00 PM EST

Isotope	Activity, Bq	Energy Range, keV	Half-Life, d	Uncertainty u_A, %	u_B, %	U, %*
Pu-239	8.515E+00	4950-5240	8.806E+06	1.0	1.5	3.7
Am-241	8.089E+00	5280-5600	1.580E+05	1.0	1.5	3.7
Th-230	9.349E+00	4470-4760	2.753E+07	1.0	1.5	3.6
Total Activity	2.599E+01	3000-8000		0.6	1.5	3.3

***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)

SRS Number: 108002

Comments:

Diameter of active area: 19 mm

Mounted on customer supplied 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.

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 Calibrated by: _____

A. Chen, Spectroscopist

QC Approved by: _____ Date: 19-DEC-17

J. Lahr, Spectroscopist

Reagent

108345_00001

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: 108345
Source Description: 24.1 mm Diameter x 0.77 mm Thick Stainless Steel Disk
Product Code: MIX-EAB-FOIL
Customer: TestAmerica Laboratories - St. Louis
P.O. Number: 2695542, 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 (if detected) were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectrometry. Eckert & Ziegler Analytics (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: 22-January-2018 12:00 PM EST

Isotope	Activity, Bq	Energy Range, keV	Half-Life, d	Uncertainty u_A, %	u_B, %	U, %*
Pu-239	7.695E+00	4950-5240	8.806E+06	1.1	1.5	3.7
Am-241	7.916E+00	5280-5600	1.580E+05	1.1	1.5	3.7
Th-230	7.314E+00	4470-4760	2.753E+07	1.1	1.5	3.7
Total Activity	2.294E+01	3000-8000		0.7	1.5	3.3

***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)

SRS Number: 108345

Comments:

Diameter of active area: 19 mm

Mounted on customer supplied 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.

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 Calibrated by: _____

A. Chen, Spectroscopist

QC Approved by: _____ Date: 29-JAN-18

J. Lahr, Spectroscopist

Reagent

108346_00001

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: 108346
Source Description: 24.1 mm Diameter x 0.77 mm Thick Stainless Steel Disk
Product Code: MIX-EAB-FOIL
Customer: TestAmerica Laboratories - St. Louis
P.O. Number: 2695542, 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 (if detected) were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectrometry. Eckert & Ziegler Analytics (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: 22-January-2018 12:00 PM EST

Isotope	Activity, Bq	Energy Range, keV	Half-Life, d	Uncertainty u_A, %	u_B, %	U, %*
Pu-239	7.835E+00	4950-5240	8.806E+06	1.2	1.5	3.8
Am-241	8.008E+00	5280-5600	1.580E+05	1.2	1.5	3.8
Th-230	7.570E+00	4470-4760	2.753E+07	1.2	1.5	3.8
Total Activity	2.343E+01	3000-8000		0.9	1.5	3.5

***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)

SRS Number: 108346

Comments:

Diameter of active area: 19 mm

Mounted on customer supplied 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.

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 Calibrated by: _____

A. Chen, Spectroscopist

QC Approved by: _____ Date: 29-JAN-18

J. Lahr, Spectroscopist

Reagent

108347_00001

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: 108347
Source Description: 24.1 mm Diameter x 0.77 mm Thick Stainless Steel Disk
Product Code: MIX-EAB-FOIL
Customer: TestAmerica Laboratories - St. Louis
P.O. Number: 2702184, 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 (if detected) were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectrometry. Eckert & Ziegler Analytics (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: 23-January-2018 12:00 PM EST

Isotope	Activity, Bq	Energy Range, keV	Half-Life, d	Uncertainty u_A, %	u_B, %	U, %*
Pu-239	8.035E+00	4950-5240	8.806E+06	1.0	1.5	3.6
Am-241	8.643E+00	5280-5600	1.580E+05	1.0	1.5	3.6
Th-230	8.101E+00	4470-4760	2.753E+07	1.0	1.5	3.6
Total Activity	2.480E+01	3000-8000		0.5	1.5	3.2

***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)

SRS Number: 108347

Comments:

Diameter of active area: 19 mm

Mounted on customer supplied 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.

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 Calibrated by: _____

A. Chen, Spectroscopist

QC Approved by: _____ Date: 29-JAN-18

J. Lahr, Spectroscopist

Reagent

108348_00001

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: 108348
Source Description: 24.1 mm Diameter x 0.77 mm Thick Stainless Steel Disk
Product Code: MIX-EAB-FOIL
Customer: TestAmerica Laboratories - St. Louis
P.O. Number: 2702184, 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 (if detected) were calculated from the total activity and the fraction of activity for each radionuclide determined by alpha spectrometry. Eckert & Ziegler Analytics (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: 23-January-2018 12:00 PM EST

Isotope	Activity, Bq	Energy Range, keV	Half-Life, d	Uncertainty u_A, %	u_B, %	U, %*
Pu-239	7.067E+00	4950-5240	8.806E+06	1.1	1.5	3.7
Am-241	7.497E+00	5280-5600	1.580E+05	1.1	1.5	3.7
Th-230	6.956E+00	4470-4760	2.753E+07	1.1	1.5	3.7
Total Activity	2.154E+01	3000-8000		0.7	1.5	3.3

***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)

SRS Number: 108348

Comments:

Diameter of active area: 19 mm

Mounted on customer supplied 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.

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 Calibrated by: _____

A. Chen, Spectroscopist

QC Approved by: _____ Date: 29-JAN-18

J. Lahr, Spectroscopist

Reagent

82232-334_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

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)

ACCREDITED SOURCE CALIBRATION LABORATORY
HEALTH PHYSICS SOCIETY
FOUNDED 1956

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82233-334_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

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)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82234-334_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

82234-334

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	5.685E+00	4420-4800	7.540E+04	0.9	1.1	2.8
Pu-239	5.936E+00	4950-5240	2.410E+04	0.9	1.1	2.8
Am-241	5.652E+00	5280-5600	4.326E+02	0.9	1.1	2.8
Total Activity	1.732E+01	3000-8000		0.5	1.1	2.4

***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)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82235-334_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

82235-334

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: 4-Jun-2010 12:00 PM EST

Isotope	Activity (Bq)	Energy Range (keV)	Half-Life, years	Uncertainty* Type (%) u_A	u_B	U
Th-230	7.167E+00	4420-4800	7.540E+04	0.8	1.1	2.7
Pu-239	6.897E+00	4950-5240	2.410E+04	0.8	1.1	2.7
Am-241	7.466E+00	5280-5600	4.326E+02	0.8	1.1	2.7
Total Activity	2.161E+01	3000-8000		0.5	1.1	2.4

***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)

ACCREDITED SOURCE CALIBRATION LABORATORY
HEALTH PHYSICS SOCIETY
FOUNDED 1958

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82236-334_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

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."

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1958

Comments:
Diameter of active area: 19 mm. Disk mounted on customer supplied disk 31.8 mm diameter x 0.46 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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82237-334_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

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."

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1958

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82238-334_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

82238-334

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	7.099E+00	4420-4800	7.540E+04	1.0	1.1	3.0
Pu-239	6.753E+00	4950-5240	2.410E+04	1.1	1.1	3.1
Am-241	5.932E+00	5280-5600	4.326E+02	1.1	1.1	3.1
Total Activity	1.983E+01	3000-8000		0.8	1.1	2.7

***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)

ACCREDITED SOURCE CALIBRATION LABORATORY — HEALTH PHYSICS SOCIETY — FOUNDED 1958

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82240-334_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

82240-334

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	6.304E+00	4420-4800	7.540E+04	0.9	1.1	2.8
Pu-239	7.163E+00	4950-5240	2.410E+04	0.8	1.1	2.7
Am-241	8.298E+00	5280-5600	4.326E+02	0.8	1.1	2.7
Total Activity	2.182E+01	3000-8000		0.5	1.1	2.4

***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)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1958

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82241-334_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

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."

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY
HEALTH PHYSICS SOCIETY
FOUNDED 1956

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82242-334_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

82242-334

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	6.583E+00	4420-4800	7.540E+04	0.9	1.1	2.8
Pu-239	6.414E+00	4950-5240	2.410E+04	0.9	1.1	2.8
Am-241	7.145E+00	5280-5600	4.326E+02	0.9	1.1	2.8
Total Activity	2.018E+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)

ACCREDITED SOURCE CALIBRATION LABORATORY — HEALTH PHYSICS SOCIETY — FOUNDED 1958

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82243-334_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

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)

ACCREDITED SOURCE CALIBRATION LABORATORY
HEALTH PHYSICS SOCIETY
FOUNDED 1966

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82244-334_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

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

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	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)

ACCREDITED SOURCE CALIBRATION LABORATORY
HEALTH PHYSICS SOCIETY
FOUNDED 1956

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82245-334_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

82245-334

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	6.727E+00	4420-4800	7.540E+04	1.0	1.1	3.0
Pu-239	5.437E+00	4950-5240	2.410E+04	1.1	1.1	3.1
Am-241	5.528E+00	5280-5600	4.326E+02	1.1	1.1	3.1
Total Activity	1.773E+01	3000-8000		0.8	1.1	2.7

***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)

ACCREDITED SOURCE CALIBRATION LABORATORY — HEALTH PHYSICS SOCIETY — FOUNDED 1956

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

82246-334_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

82246-334

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	5.570E+00	4420-4800	7.540E+04	1.0	1.1	3.0
Pu-239	5.353E+00	4950-5240	2.410E+04	1.0	1.1	3.0
Am-241	6.002E+00	5280-5600	4.326E+02	1.0	1.1	3.0
Total Activity	1.696E+01	3000-8000		0.7	1.1	2.6

***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)

ACCREDITED SOURCE CALIBRATION LABORATORY
HEALTH PHYSICS SOCIETY
FOUNDED 1956

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: _____ Date: 06.24.2010
E. A. Taskaev, QA Manager Alternate

Reagent

82247-334_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

82247-334

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: 10-Jun-2010 12:00 PM EST

Isotope	Activity (Bq)	Energy Range (keV)	Half-Life, years	Uncertainty* Type (%) u_A	u_B	U
Th-230	6.251E+00	4420-4800	7.540E+04	0.9	1.1	2.8
Pu-239	5.746E+00	4950-5240	2.410E+04	0.9	1.1	2.8
Am-241	6.291E+00	5280-5600	4.326E+02	0.9	1.1	2.8
Total Activity	1.832E+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)

ACCREDITED SOURCE CALIBRATION LABORATORY
HEALTH PHYSICS SOCIETY
FOUNDED 1956

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: _____ Date: 06-24-2010
E. A. Taskaev, QA Manager Alternate

Reagent

Gamma Ampuole_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

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics 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."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: _____ for
W. Mao, Radiochemist

QA Approved: _____ Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Gamma Ampuole_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

83725-334

5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis/Earth City, MO
P.O. No.: 2397508, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.028066

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	3.261E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	4.763E+03	0.8	1.7	3.8	HPGe
Co-57	122.1	2.718E+02	8.711E+04	2.445E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	3.500E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	7.727E+03	0.4	1.1	2.3	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	4.965E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	3.113E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	1.066E+02	4.224E+05	1.186E+04	0.5	1.1	2.4	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	6.012E+03	0.6	1.1	2.5	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	6.015E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	1.255E+04	0.5	1.1	2.4	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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:
5.30203 grams 4M HCl solution with approximately 30 µg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the reference date.

Source Prepared by: M Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 13 JAN 11
J. D. McCorvey, QA Manager Alternate

Reagent

Marn Soil_00002

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

83814-334

1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: Test America St. Louis
P.O. No.: 2395112, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.016927

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Pb-210	46.5	8.120E+03	———	3.021E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.090E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	2.873E+03	0.8	2.3	4.9	HPGe
Co-57	122.1	2.718E+02	8.711E+04	1.475E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	2.111E+03	0.5	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	4.660E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	2.994E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	1.877E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.224E+05	7.150E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	3.626E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	3.627E+03	0.6	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	7.570E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

Comments:
1550 grams of sand. Homogeneous down to 10 gram aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 2/11/11
J. D. McCorvey, QA Manager Alternate

Reagent

MarnSolid_00002

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

90099
1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: TestAmerica St. Louis / Earth City, MO
P.O. No.: 2454150, Item 1
Reference Date: 01-Jan-2012 12:00 PM EST **Grams of Master Source:** 0.017180

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	3.094E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.037E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.677E+05	2.881E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.795E+04	1.511E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.245E+05	2.139E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.707E+05	4.651E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.755E+05	3.015E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.128E+05	1.938E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.228E+05	7.264E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.084E+05	3.580E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	3.581E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.476E+05	7.690E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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:
1550 grams of sand. Homogenous down to 10 grams aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 30 JAN 12
J.D. McCorvey, Counting Room Manager

Reagent

Source A_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

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics 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."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: for
W. Mao, Radiochemist

QA Approved: Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source C_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

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics 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."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: for
W. Mao, Radiochemist

QA Approved: Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source D_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

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics 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."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: _____ for
W. Mao, Radiochemist

QA Approved: _____ Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source E_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

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics 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."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: _____ for
W. Mao, Radiochemist

QA Approved: _____ Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source F_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

83725-334

5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis/Earth City, MO
P.O. No.: 2397508, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.028066

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	3.261E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	4.763E+03	0.8	1.7	3.8	HPGe
Co-57	122.1	2.718E+02	8.711E+04	2.445E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	3.500E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	7.727E+03	0.4	1.1	2.3	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	4.965E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	3.113E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	1.066E+02	4.224E+05	1.186E+04	0.5	1.1	2.4	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	6.012E+03	0.6	1.1	2.5	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	6.015E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	1.255E+04	0.5	1.1	2.4	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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:
5.30203 grams 4M HCl solution with approximately 30 µg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the reference date.

Source Prepared by: M Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 13 JAN 11
J. D. McCorvey, QA Manager Alternate

Reagent

Source H_00002

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

83725-334

5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis/Earth City, MO
P.O. No.: 2397508, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.028066

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	3.261E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	4.763E+03	0.8	1.7	3.8	HPGe
Co-57	122.1	2.718E+02	8.711E+04	2.445E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	3.500E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	7.727E+03	0.4	1.1	2.3	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	4.965E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	3.113E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	1.066E+02	4.224E+05	1.186E+04	0.5	1.1	2.4	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	6.012E+03	0.6	1.1	2.5	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	6.015E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	1.255E+04	0.5	1.1	2.4	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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:
5.30203 grams 4M HCl solution with approximately 30 µg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the reference date.

Source Prepared by: M Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 13 JAN 11
J. D. McCorvey, QA Manager Alternate

Reagent

Th-229_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

97790
Th-229 5 mL Liquid in Flame Sealed Vial

430569
ID: Th-229_00016
Exp:08/06/64 Prpd:SCB Opn:08/20/14
Th-229 Ampoule

Customer: TestAmerica - St. Louis
P.O. No.: 2573570, Item 1 Product Code: 8229

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* , % Type u_A	u_B	U	Reference Date (12:00 PM EST)
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: _____ Date: 06 AUG 14
A. Chen, Spectroscopist

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

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,

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.

1380 Seaboard Industrial Boulevard
Atlanta, Georgia 30318 USA
Phone (404) 352-8677 • Fax (404) 352-2837
Email: analytics@ezag.com (Tax EIN: 58-1406082)

Eckert & Ziegler
Analytics

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	69.18	dpm/mL
#2	67.64	dpm/mL
#3	64.07	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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:43:30AM 12/21/2017

Sample

Sample Name: Ver1 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

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

Batch Name: Th 229 tracer
AnalysisResultsID: 206417
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

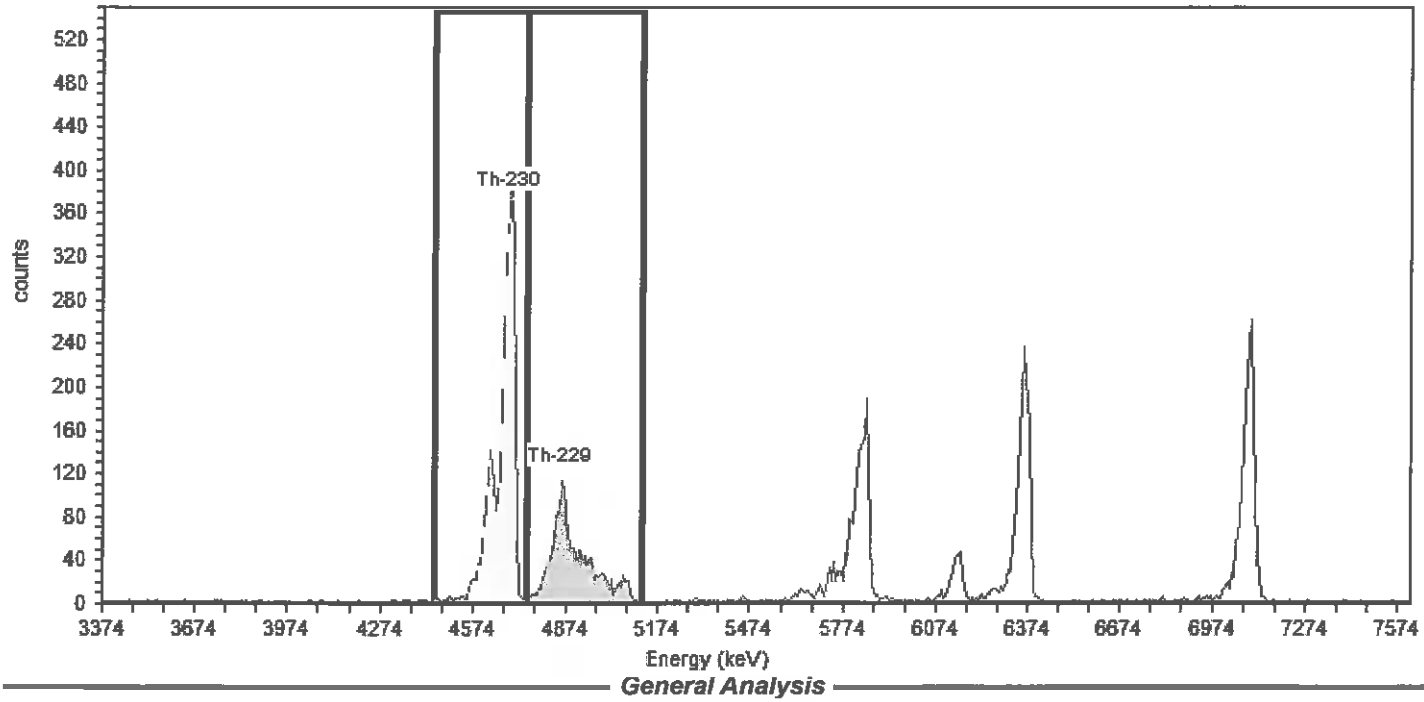
Tracer Name: Th-230_00036
Tracer Activity: 44.56 DPM / mL x (Vol.) 0.30 mL = 13.37 DPM
Tracer Ref. Date: 8/8/2013 11:41:20AM

Tracer Nuclide: Th-230
Tracer Recovery: 92.23%

Acquisition

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

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 / Ch^2
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: Kα = 1.64 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:44:04AM 12/21/2017

Sample

Sample Name: Ver2 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

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

Batch Name: Th 229 tracer
AnalysisResultsID: 206418
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

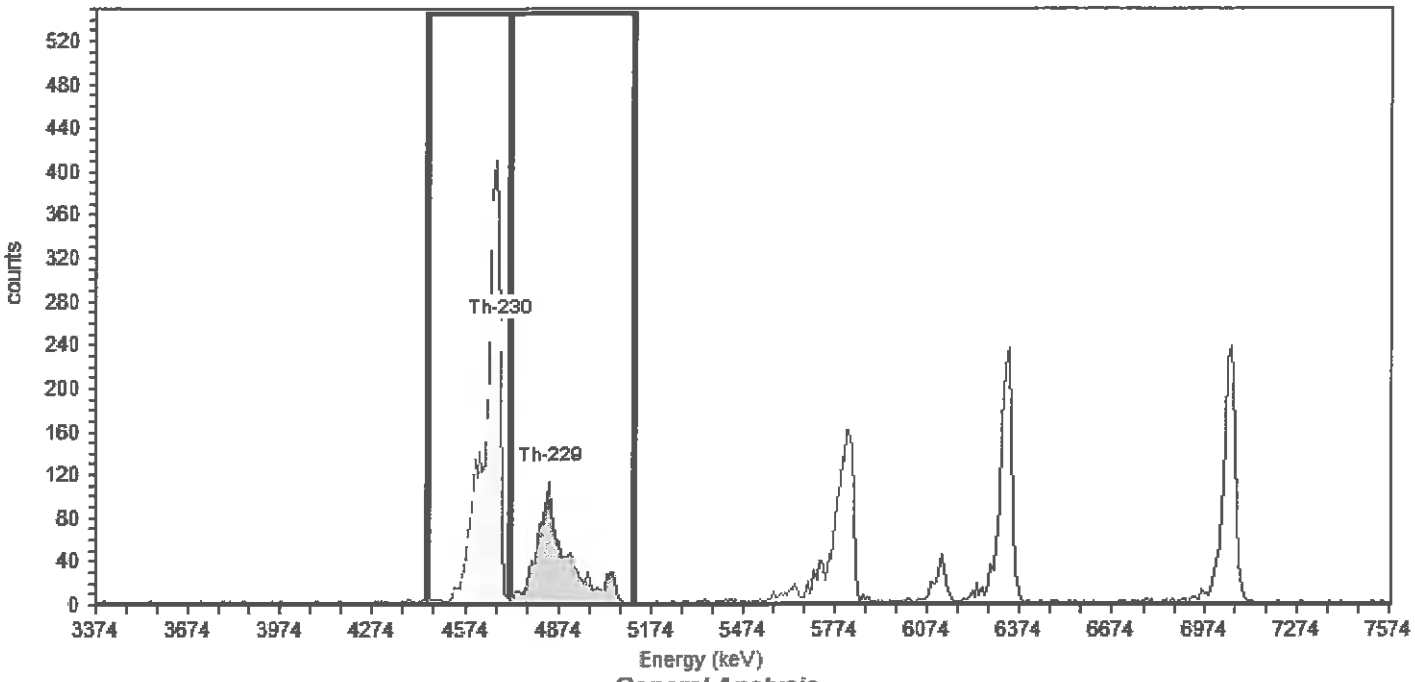
Tracer Name: Th-230_00036
Tracer Activity: 44.56 DPM / mL x (Vol.) 0.30 mL = 13.37 DPM
Tracer Ref. Date: 8/8/2013 11:41:20AM

Tracer Nuclide: Th-230
Tracer Recovery: 108.60%

Acquisition

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

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 / Ch^2
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: Kα = 1.64 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:45:14AM 12/21/2017

Sample

Sample Name: Ver3 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

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

Batch Name: Th 229 tracer
AnalysisResultsID: 206420
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

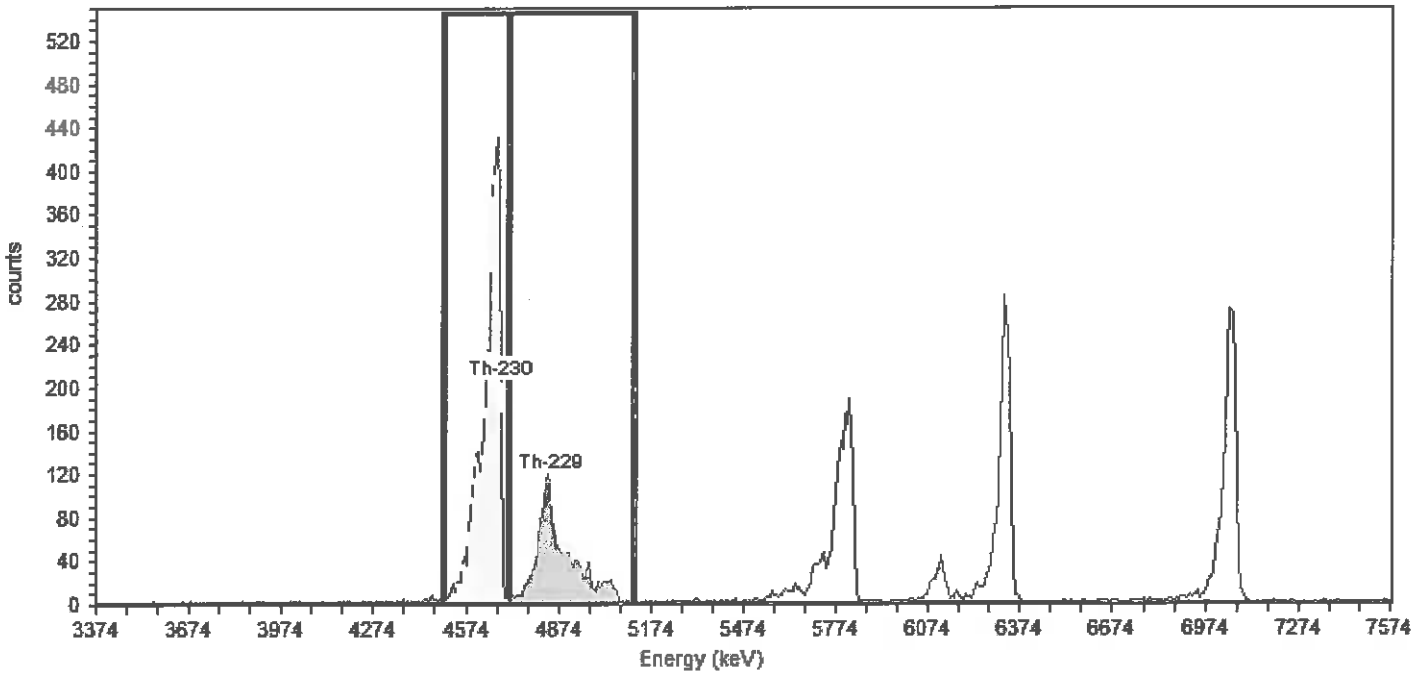
Tracer Name: Th-230_00036
Tracer Activity: 44.56 DPM / mL x (Vol.) 0.30 mL = 13.37 DPM
Tracer Ref. Date: 8/8/2013 11:41:20AM

Tracer Nuclide: Th-230
Tracer Recovery: 121.11%

Acquisition

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

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 / Ch^2
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: Kα = 1.64 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Th-229 Tracer Verification (coppt.)

Standard Verification

Batch No. : _____

Balance ID : _____

No.	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	VER. 1	0.1	210	
2	2	1	211	
3	3		212	
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

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

Tracer ☐ N/A

Initials / Date

Isotope : Th-230
Std Sol'n No. : Th-230-00036
Vol (mL) : 0.3
Ref Activity (dpm/mL) : 44.5646
Act Ref Date : 08-08-13

Samples Spiked and Traced By: SUB 12/19/17
Initials / Date

Verification Signature & Date: PM 12/19/17
Initials / Date

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.
		☐
		☐

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_2O ☐

Prepared By : _____
Date : _____

Reviewed by: _____
Date: _____

Th-229 Tracer ONLY VER.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Standard Verification (Coppt)

Batch No. : _____

Balance ID : _____

No.	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	VER. 1	0.1	205	RC: 147
2	2	96	207	RC: 149
3	3	94	209	RC: 152
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

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

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 12/19/17

Initials / Date

Verification Signature & Date:

JDM 12/19/17

Initials / Date

LCS Standard ☐ N/A

Initials / Date

Isotope : I

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_2O ☐

Prepared By : _____

Date : _____

Reviewed by: _____

Date: _____

\\Slsvr01\RAD\MasterForms\RAD-0045 Rev(3)

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:01:20AM 1/15/2018

Sample

Sample Name: Ver. 1
SampleType: Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Sample Collection Date:

Batch

Batch Name: Th-229 Tracer Only
AnalysisID: 719841

Analyst: 60040

Tracer

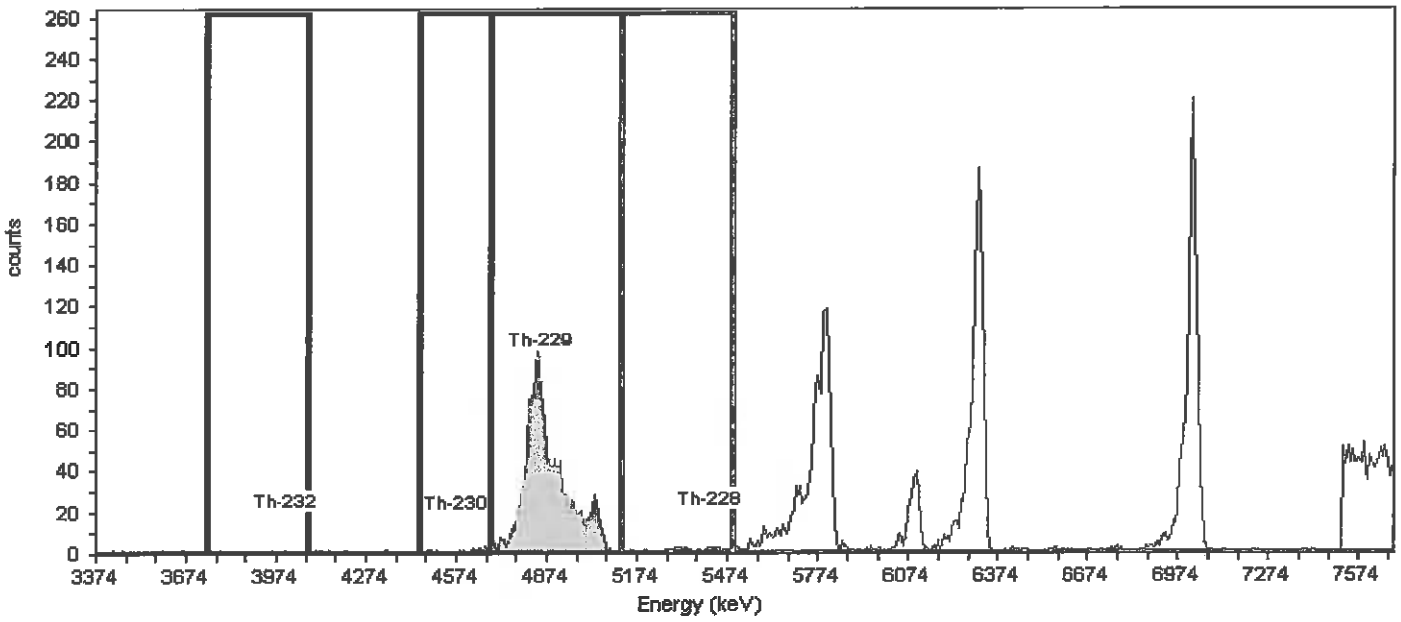
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

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
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:01:54AM 1/15/2018

Sample

Sample Name: Ver 2
SampleType: Sample
:
Sample Collection Date:

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: Th-229 Tracer Only
AnalysisID: 719839

Analyst: 60040

Tracer

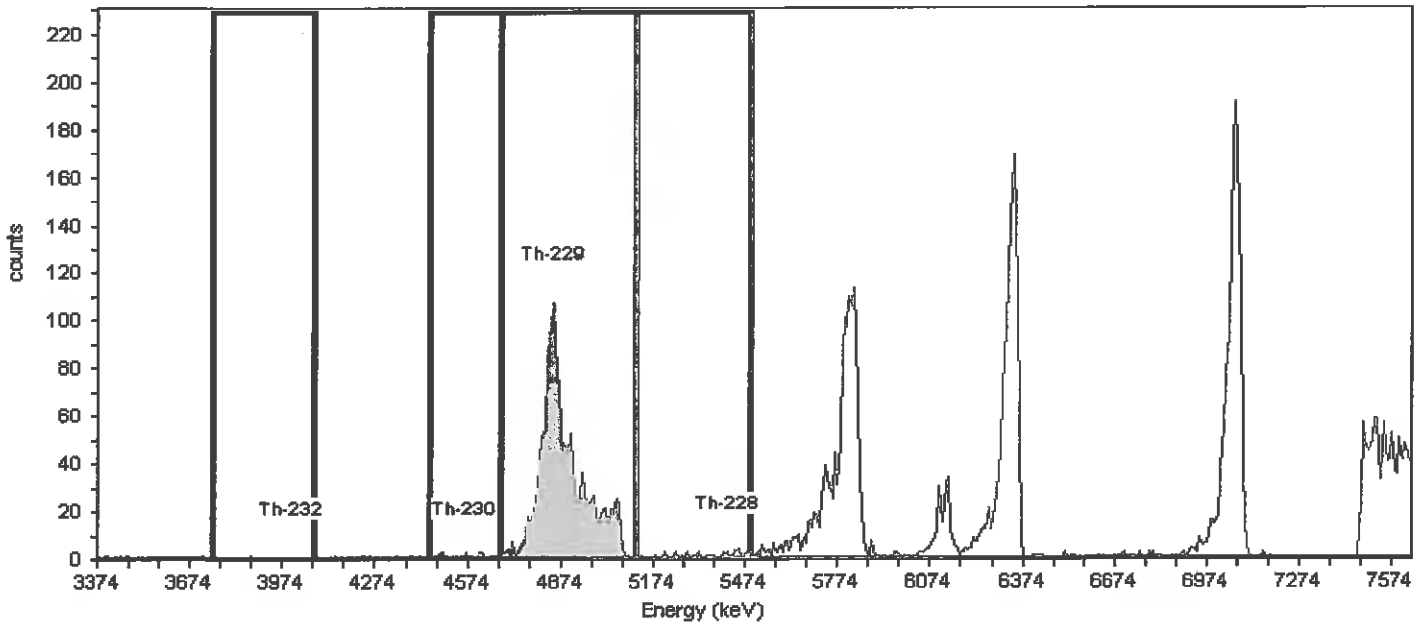
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

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
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:02:07AM 1/15/2018

Sample

Sample Name: Ver 3
SampleType: Sample
:
Sample Collection Date:

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: Th-229 Tracer Only
AnalysisID: 719837

Analyst: 60040

Tracer

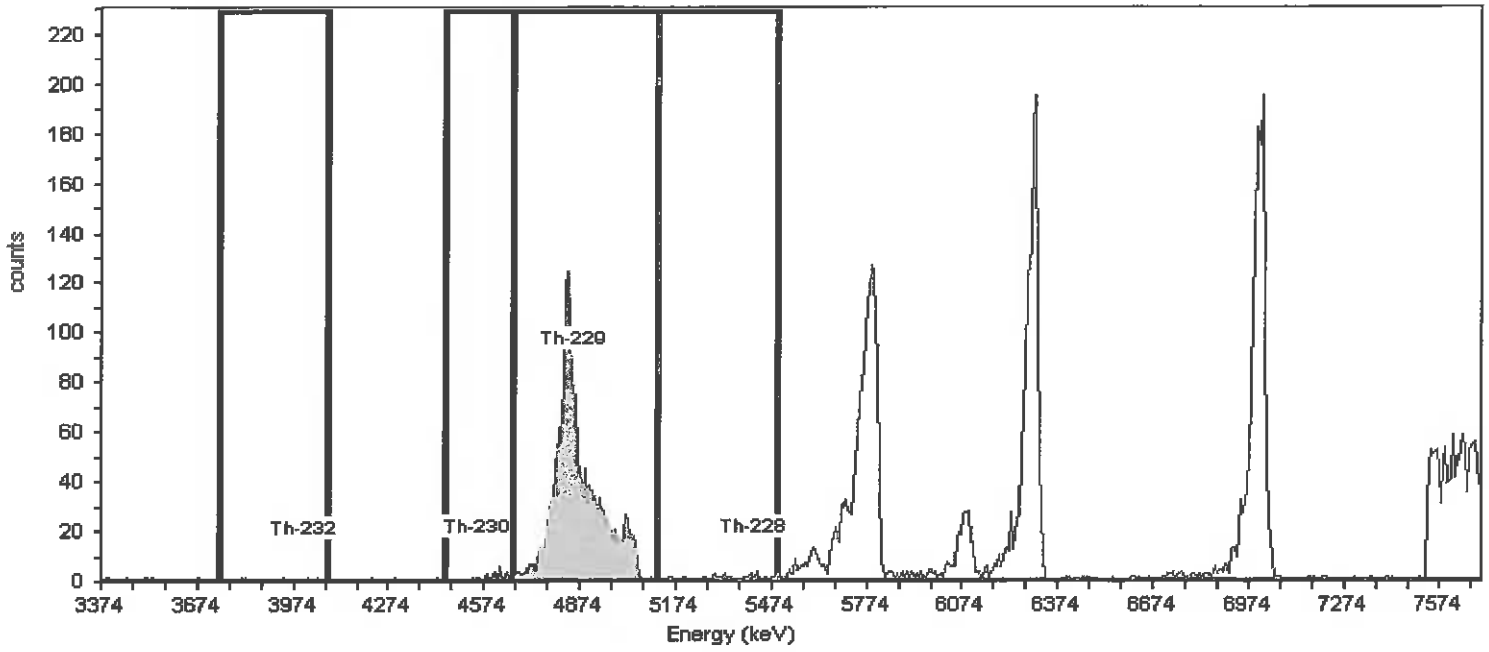
Tracer Name: Undefined
Tracer Activity:
Tracer Ref. Date:

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
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING



Reagent ID: Th-229_00023

Description:	Th-229 Tracer	Expiration Date:	12/20/2018
No. of Bottles:	1	Laboratory:	TestAmerica St. Louis
Storage Location:	RAD Actinide STDs	Prepared By:	Bernsen, Sarah C
Reagent Volume:	500.000 mL	Solvent:	0.1M HNO3
Creation Date:	12/15/2017	Solvent Lot:	n/a
Open Date:			
Container(s):	1347365		
Comment:			

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

TRM-2_00002

Perry, Doug E

From: Salmi, Douglas R
Sent: March 20, 2000 10:48 AM
To: Perry, Doug E; Puissant, Pamela M
Subject: FW: SRMs for radiochemistry LCSs

Pam, Doug
FYI

-----Original Message-----
From: Minteer@aol.com [mailto:Minteer@aol.com]
Sent: March 20, 2000 10:36 AM
To: drsalmi@sandia.gov
Cc: dbourne@doeal.gov; GLDechant@aol.com; crandallb@quanterra.com
Subject: SRMs for radiochemistry LCSs

Doug:

As we discussed by telephone, please send approximately 500 grams each of PEM-1, TRM-2, and NBHD to STL St. Louis. These are to be used by STL as laboratory control samples. As with our other laboratories, STL will be asked to provide summaries of the data obtained in quarterly progress reports. This is not to assess their proficiency, but rather to help us develop interlaboratory acceptance criteria. The known values (given below) for PEM and TRM are good because the samples are well characterized. The known values for NBHD result from a single analysis and hence should be taken as estimates. All the values below are in pCi/g.

PEM-1:

Parameter	Result	Std. Dev.
Pu-238	8.03	0.37
Pu-239	41.0	3.0
Am-241	32.5	1.1
Cs-137	73.5	0.9
U-234	5.99	0.2
U-235	0.27	0.04
U-238	18.1	0.5

TRM-2

Parameter	Result	Uncertainty
U-238	6.0	+/- 4.0
U-234	6.2	+/- 4.0
Th-230	24.5	+/- 0.6
Ra-226	25.4	+/- 0.9
Pb-210	22.1	+/- 1.2

NBHD

Parameter	Result	Uncertainty
Am-241	1.47	+/- 0.28
Ra-226	67.3	+/- 5.5
U-234	174	none available
U-235	8.7	"
U-238	212	"
Cs-137	52.1	+/- 4.6
Pb-210	78.3	+/- 2.4
Pu-239/40	4.7	+/- 0.63
Pu-238	0.3	+/- 0.11
Th-230	83.4	+/- 6.5

Reagent

Tuna Can LCS_00006

Rec'd : 12-26-06

ANALYTICS
An Isotope Products Laboratories Company

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

74139-334
1.0 Liter Sand in 1 Liter Wide Mouth HDPE "S" Bottle

Customer: Severn Trent Laboratories/Earth City, MO
P.O. No.: 2169577, Item 1
Calibration Date: 01-Oct-2006 12:00 EST **Grams of Master Source:** 0.01552

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics 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."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Pb-210	46.5	8145.9	———	3079.8	0.33	1.46	2.99	4π LS
Am-241	59.5	157860	———	2034.3	0.33	1.46	2.99	4π LS
Cd-109	88.0	462.60	189000	2933.5	0.57	1.70	3.59	HPGe
Co-57	122.1	271.79	94570	1467.8	0.34	1.30	2.69	HPGe
Ce-139	165.9	137.6	133800	2076.7	0.35	1.10	2.31	HPGe
Hg-203	279.2	46.61	295300	4583	0.40	1.10	2.34	HPGe
Sn-113	391.7	115.1	185600	2880.7	0.42	1.10	2.35	HPGe
Cs-137	661.7	10983	116700	1811.3	0.70	1.20	2.78	HPGe
Y-88	898.0	106.60	455400	7068	0.50	1.10	2.42	HPGe
Co-60	1173.2	1925.4	226900	3522	0.60	1.10	2.51	HPGe
Co-60	1332.5	1925.4	227000	3523	0.90	1.10	2.84	HPGe
Y-88	1836.1	106.6	481200	7469	0.90	1.10	2.84	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
1550 grams of sand. NOTE: Homogeneity was checked by the addition of Tc-99 tracer to the solution used to spike the sand. Ten 10-gram aliquots were removed after mixing and counted to measure the Tc-99. The standard deviation for the 10 measurements was 1.3% with a range of 4.8%. This demonstrates reasonable homogeneity for this source material down to a 10-gram aliquot.
This standard will expire one year after the calibration date.

Source Prepared by: M. I. Taskaeva, Radiochemist

QA Approved: for D. M. Montgomery, QA Manager Date: 12-21-06

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

St. Louis Radiological Standard Reverification Form

Standard ID Number: Tuna Can LCS_00006 (1012459)
True Value = 97.08 pCi/g
Date Analyzed: 9/29/2016

Radionuclide: Gamma LCS Am-241

	Replicates	
#1	96.82	pCi/g
#2	96.69	pCi/g
#3	97.75	pCi/g

Mean = 97.08667

1 sigma = 0.578129

1.96 sigma = 1.133133

True Value minus 5% = 92.226 (True Value - 5%)
True Value plus 5% = 101.934 (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 10/03/16

SOP Reference: STL-QA-0002, Current Revision

St. Louis Radiological Standard Reverification Form

Standard ID Number: Tuna Can LCS_00006 (112459)
True Value = 29.45 pCi/g
Date Analyzed: 9/29/2016

Radionuclide: Gamma LCS Cs-137

	Replicates	
#1	28.26	pCi/g
#2	28.64	pCi/g
#3	28.37	pCi/g

Mean = 28.42333

1 sigma = 0.195533

1.96 sigma = 0.383246

True Value minus 5% = 27.9775 (True Value - 5%)
True Value plus 5% = 30.9225 (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 10/03/16

SOP Reference: STL-QA-0002, Current Revision

St. Louis Radiological Standard Reverification Form

Standard ID Number: Tuna Can LCS_00006 (1012459)
True Value = 16.46 pCi/g
Date Analyzed: 9/29/116

Radionuclide: Gamma LCS Co-60

	Replicates	
#1	16.04	pCi/g
#2	15.77	pCi/g
#3	16.14	pCi/g

Mean = 15.98333

1 sigma = 0.191398

1.96 sigma = 0.375141

True Value minus 5% = 15.637 (True Value - 5%)
True Value plus 5% = 17.283 (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 10/3/16

SOP Reference: STL-QA-0002, Current Revision

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 272277 **Operator:**

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-272277~2-	LCS	341.90g	1.00	GammaVision	GV15	9 / 29 / 16 13:06	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	-2.044E-001pCi/g	5.500E-001	5.499E-001	1.436E+000	6.946E-001	-0.14	0.5500
AG-108M	10982	-1.018E-001pCi/g	9.743E-002	9.729E-002	3.075E-001	1.497E-001	-0.33	0.0974
AG-110M	10973	5.076E-002pCi/g	4.575E-002	4.567E-002	7.684E-001	3.751E-001	0.07	0.0457
AM-241	10818	9.682E+001pCi/g	5.100E+000	8.709E-001	1.290E+000	6.388E-001	75.07	5.0999
BA-133	10469	-1.624E-001pCi/g	1.661E-001	1.659E-001	5.506E-001	2.703E-001	-0.29	0.1661
BA-140	10463	-1.425E-001pCi/g	1.058E-001	1.055E-001	1.079E+000	5.219E-001	-0.13	0.1058
BE-7	10435	1.275E-001pCi/g	1.233E+000	1.233E+000	4.134E+000	2.030E+000	0.03	1.2334
BI-207	10195	1.058E-001pCi/g	7.194E-002	7.173E-002	2.372E-001	1.139E-001	0.45	0.0719
BI-210M	10173	8.477E-002pCi/g	9.587E-002	9.574E-002	4.994E-001	2.447E-001	0.17	0.0959
BI-212	10160	1.553E+000pCi/g	1.216E+000	1.214E+000	4.030E+000	1.941E+000	0.39	1.2163
BI-214	10154	8.681E-002pCi/g	3.647E-002	3.619E-002	1.088E+000	5.336E-001	0.08	0.0365
CD-109	9254	0.000E+000pCi/g	3.288E+000	3.288E+000	1.089E+001	5.402E+000	0.00	3.2880
CD-113M	17462	-1.456E+003pCi/g	1.073E+003	1.069E+003	3.536E+003	1.727E+003	-0.41	1,072.9969
CE-139	9241	7.398E-002pCi/g	7.038E-002	7.003E-002	2.323E-001	1.140E-001	0.32	0.0704
CE-141	9235	1.679E-002pCi/g	1.287E-001	1.287E-001	3.270E-001	1.601E-001	0.05	0.1287
CE-144	9221	-5.823E-001pCi/g	1.611E+000	1.610E+000	2.809E+000	1.390E+000	-0.21	1.6107
CF-249	9215	-3.279E-002pCi/g	1.794E-001	1.794E-001	6.001E-001	2.950E-001	-0.05	0.1794
CF-251	13690	-4.067E-001pCi/g	3.994E-001	3.978E-001	1.002E+000	4.903E-001	-0.41	0.3994
CO-56	8704	1.139E-001pCi/g	1.826E-001	1.825E-001	3.036E-001	1.454E-001	0.38	0.1826
CO-57	13694	4.528E-001pCi/g	4.266E-001	4.260E-001	1.102E+000	5.361E-001	0.41	0.4266
CO-58	8698	-1.658E-001pCi/g	1.376E-001	1.373E-001	4.558E-001	2.217E-001	-0.36	0.1376
CO-60	8692	1.604E+001pCi/g	8.400E-001	2.396E-001	9.914E-002	4.016E-002	161.75	0.8400
CR-51	8604	-9.651E-001pCi/g	1.169E+000	1.168E+000	3.438E+000	1.690E+000	-0.28	1.1689
CS-134	8553	6.593E-002pCi/g	8.889E-002	8.882E-002	5.089E-001	2.495E-001	0.13	0.0889
CS-136	8546	1.258E-001pCi/g	1.227E-001	1.225E-001	4.083E-001	1.980E-001	0.31	0.1227
CS-137	8539	2.826E+001pCi/g	1.520E+000	3.844E-001	2.878E-001	1.379E-001	98.20	1.5198
EU-152	7145	5.245E-001pCi/g	5.014E-001	5.007E-001	1.782E+000	8.797E-001	0.29	0.5014
EU-154	7138	4.532E-001pCi/g	3.576E-001	3.568E-001	3.623E+000	1.758E+000	0.13	0.3576
EU-155	7131	3.186E-001pCi/g	4.804E-001	4.800E-001	1.590E+000	7.880E-001	0.20	0.4804
FE-59	7073	-4.662E-001pCi/g	2.724E-001	2.714E-001	8.335E-001	4.027E-001	-0.56	0.2724
GA-68	18005	-2.864E+000pCi/g	6.167E+000	6.165E+000	1.352E+001	6.483E+000	-0.21	6.1671
GD-153	6824	-2.389E-001pCi/g	3.642E-001	3.639E-001	1.205E+000	5.975E-001	-0.20	0.3642
HF-181	6495	2.232E-002pCi/g	9.381E-002	9.380E-002	5.455E-001	2.678E-001	0.04	0.0938
HG-203	6466	-1.176E-001pCi/g	9.784E-002	9.761E-002	3.233E-001	1.585E-001	-0.36	0.0978
I-131	6380	1.345E-001pCi/g	1.325E-001	1.323E-001	2.783E-001	1.352E-001	0.48	0.1325
IR-192	6303	1.051E-001pCi/g	1.544E-001	1.543E-001	5.121E-001	2.528E-001	0.21	0.1544
K-40	6148	-3.414E-001pCi/g	3.403E+000	3.403E+000	1.694E+000	7.511E-001	-0.20	3.4027
LA-140	6096	6.964E-002pCi/g	2.842E-002	2.818E-002	6.304E-002	1.993E-002	1.10	0.0284
MN-54	5382	9.032E-003pCi/g	1.343E-001	1.343E-001	3.074E-001	1.474E-001	0.03	0.1343
NA-22	5201	7.656E-002pCi/g	4.569E-002	4.553E-002	1.483E-001	6.510E-002	0.52	0.0457
NB-94	5160	-6.911E-003pCi/g	8.527E-002	8.527E-002	2.509E-001	1.199E-001	-0.03	0.0853
NB-95	5154	-1.314E-001pCi/g	1.080E-001	1.078E-001	3.580E-001	1.732E-001	-0.37	0.1080
ND-147	5083	2.116E-001pCi/g	7.933E-001	7.932E-001	1.870E+000	9.017E-001	0.11	0.7933
NP-237	4757	-5.339E-001pCi/g	9.394E-001	9.389E-001	3.110E+000	1.543E+000	-0.17	0.9394
NP-239	4751	2.951E-001pCi/g	4.471E-001	4.467E-001	1.480E+000	7.333E-001	0.20	0.4471
PA-231	4541	0.000E+000pCi/g	1.548E+000	1.548E+000	1.296E+001	6.385E+000	0.00	1.5484
PA-233	4535	2.505E-001pCi/g	3.660E-001	3.657E-001	1.214E+000	5.993E-001	0.21	0.3660
PA-234	4528	9.127E-002pCi/g	1.542E-001	1.541E-001	1.714E+000	8.480E-001	0.05	0.1542
PA-234M	19453	2.654E+001pCi/g	1.513E+001	1.507E+001	5.612E+001	2.718E+001	0.47	15.1341
PB-210	4467	8.473E+002pCi/g	5.040E+001	8.041E+000	1.484E+001	7.350E+000	57.08	50.3970

PB-212	4454	5.507E-001pCi/g	1.742E-001	1.705E-001	3.941E-001	1.917E-001	1.40	0.1742
PB-214	4448	4.656E-001pCi/g	1.811E-001	1.795E-001	4.906E-001	2.371E-001	0.95	0.1811
PM-144	19585	-9.279E-002pCi/g	8.379E-002	8.365E-002	2.603E-001	1.247E-001	-0.36	0.0838
PM-146	2464	3.553E-001pCi/g	2.541E-001	2.534E-001	6.570E-001	3.117E-001	0.54	0.2541
RH-106	1882	0.000E+000pCi/g	4.336E-001	4.336E-001	5.120E+000	2.511E+000	0.00	0.4336
RU-103	1828	-1.980E-002pCi/g	1.475E-001	1.475E-001	2.961E-001	1.436E-001	-0.07	0.1475
SB-124	1784	1.062E-001pCi/g	8.303E-002	8.285E-002	5.042E-001	2.473E-001	0.21	0.0830
SB-125	1777	4.580E-001pCi/g	3.330E-001	3.322E-001	8.845E-001	4.300E-001	0.52	0.3330
SC-46	1739	-2.124E-001pCi/g	1.825E-001	1.822E-001	6.042E-001	2.955E-001	-0.35	0.1825
SN-113	1570	1.126E-001pCi/g	1.827E-001	1.826E-001	6.081E-001	2.988E-001	0.19	0.1827
SN-126	17459	-1.643E+000pCi/g	3.686E+000	3.685E+000	1.217E+001	6.066E+000	-0.13	3.6865
TA-182	1301	4.928E-001pCi/g	2.524E-001	2.512E-001	1.407E+000	6.803E-001	0.35	0.2524
TC-99M	17412	-2.091E-002pCi/g	1.038E-001	1.038E-001	3.452E-001	1.707E-001	-0.06	0.1038
TH-227	1058	5.331E+000pCi/g	2.061E+000	2.040E+000	6.682E+000	3.307E+000	0.80	2.0609
TH-229	1046	-1.252E+000pCi/g	1.725E+000	1.722E+000	4.349E+000	2.130E+000	-0.29	1.7249
TH-234	1027	-4.940E+000pCi/g	6.015E+000	6.009E+000	3.121E+001	1.555E+001	-0.16	6.0150
TL-208	929	4.162E-001pCi/g	1.180E-001	1.160E-001	2.299E-001	1.095E-001	1.81	0.1180
U-235	281	4.038E-001pCi/g	3.951E-001	3.946E-001	2.769E+000	1.369E+000	0.15	0.3951
Y-88	74	5.514E-002pCi/g	1.992E-002	1.971E-002	3.695E-001	1.776E-001	0.15	0.0199
ZN-65	31	0.000E+000pCi/g	1.231E-001	1.231E-001	1.061E+000	5.145E-001	0.00	0.1231
ZR-95	7	7.816E-003pCi/g	2.150E-001	2.150E-001	4.933E-001	2.360E-001	0.02	0.2150

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity		StdAdded	Recovery	ZFactor
LCS 160-272277~2-A	LCS 160-272277~2-A	CS-137	2.826E+001	pCi/g	2.945E+001	95.99%	-0.5385
		CO-60	1.604E+001	pCi/g	1.646E+001	97.45%	-0.3492
		AM-241	9.682E+001	pCi/g	9.708E+001	99.74%	-0.0356

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal	ZFactor

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 272277 **Operator:**

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-272277~2-	LCS	341.90g	1.00	GammaVision	GV05	9 / 29 / 16 19:17	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	6.948E-001pCi/g	4.428E-001	4.413E-001	1.386E+000	6.661E-001	0.50	0.4428
AG-108M	10982	-4.815E-002pCi/g	1.360E-001	1.359E-001	3.314E-001	1.611E-001	-0.15	0.1360
AG-110M	10973	-6.551E-002pCi/g	5.828E-002	5.819E-002	7.502E-001	3.646E-001	-0.09	0.0583
AM-241	10818	9.669E+001pCi/g	5.084E+000	8.185E-001	1.163E+000	5.751E-001	83.11	5.0845
BA-133	10469	-1.677E-001pCi/g	1.639E-001	1.637E-001	5.438E-001	2.661E-001	-0.31	0.1639
BA-140	10463	7.654E-001pCi/g	4.133E-001	4.114E-001	9.742E-001	4.664E-001	0.79	0.4133
BE-7	10435	-5.190E-001pCi/g	1.221E+000	1.221E+000	3.698E+000	1.806E+000	-0.14	1.2210
BI-207	10195	1.327E-001pCi/g	2.286E-001	2.285E-001	5.028E-001	2.394E-001	0.26	0.2286
BI-210M	10173	1.105E-001pCi/g	1.761E-001	1.760E-001	4.963E-001	2.426E-001	0.22	0.1761
BI-212	10160	-8.056E-001pCi/g	1.326E+000	1.326E+000	4.824E+000	2.326E+000	-0.17	1.3264
BI-214	10154	-3.129E-001pCi/g	1.874E-001	1.867E-001	1.276E+000	6.260E-001	-0.25	0.1874
CD-109	9254	1.605E+000pCi/g	2.280E+000	2.278E+000	7.558E+000	3.734E+000	0.21	2.2797
CD-113M	17462	-1.293E+003pCi/g	1.131E+003	1.128E+003	3.745E+003	1.826E+003	-0.35	1,131.1129
CE-139	9241	-6.545E-002pCi/g	8.083E-002	8.059E-002	2.679E-001	1.316E-001	-0.24	0.0808
CE-141	9235	7.536E-003pCi/g	1.415E-001	1.415E-001	4.733E-001	2.330E-001	0.02	0.1415
CE-144	9221	1.609E-001pCi/g	5.660E-001	5.659E-001	1.890E+000	9.298E-001	0.09	0.5660
CF-249	9215	-5.097E-002pCi/g	4.175E-002	4.166E-002	6.544E-001	3.214E-001	-0.08	0.0417
CF-251	13690	2.258E-001pCi/g	3.420E-001	3.414E-001	9.101E-001	4.433E-001	0.25	0.3420
CO-56	8704	-2.777E-003pCi/g	1.256E-001	1.256E-001	3.392E-001	1.622E-001	-0.01	0.1256
CO-57	13694	0.000E+000pCi/g	3.371E-002	3.371E-002	2.220E-001	1.091E-001	0.00	0.0337
CO-58	8698	1.419E-001pCi/g	1.238E-001	1.236E-001	4.114E-001	1.985E-001	0.34	0.1238
CO-60	8692	1.577E+001pCi/g	8.296E-001	2.480E-001	5.871E-002	1.856E-002	268.60	0.8296
CR-51	8604	8.429E-001pCi/g	8.344E-001	8.332E-001	2.771E+000	1.352E+000	0.30	0.8344
CS-134	8553	-1.864E-002pCi/g	1.769E-002	1.766E-002	5.873E-001	2.880E-001	-0.03	0.0177
CS-136	8546	1.666E-002pCi/g	1.960E-002	1.958E-002	4.831E-001	2.344E-001	0.03	0.0196
CS-137	8539	2.864E+001pCi/g	1.546E+000	4.128E-001	3.089E-001	1.474E-001	92.72	1.5462
EU-152	7145	2.755E-001pCi/g	3.412E-001	3.409E-001	1.401E+000	6.875E-001	0.20	0.3412
EU-154	7138	1.747E-001pCi/g	1.106E-001	1.102E-001	3.597E+000	1.737E+000	0.05	0.1106
EU-155	7131	2.480E-001pCi/g	3.696E-001	3.694E-001	1.226E+000	6.054E-001	0.20	0.3696
FE-59	7073	1.492E-001pCi/g	1.439E-001	1.437E-001	7.280E-001	3.478E-001	0.20	0.1439
GA-68	18005	-6.353E+000pCi/g	7.244E+000	7.235E+000	1.575E+001	7.557E+000	-0.40	7.2435
GD-153	6824	5.593E-002pCi/g	1.741E-001	1.741E-001	5.826E-001	2.858E-001	0.10	0.1741
HF-181	6495	1.366E-001pCi/g	1.060E-001	1.057E-001	4.948E-001	2.417E-001	0.28	0.1060
HG-203	6466	2.250E-002pCi/g	1.022E-001	1.022E-001	2.611E-001	1.269E-001	0.09	0.1022
I-131	6380	2.210E-002pCi/g	1.184E-002	1.179E-002	2.971E-001	1.441E-001	0.07	0.0118
IR-192	6303	8.284E-002pCi/g	7.520E-002	7.504E-002	3.258E-001	1.592E-001	0.25	0.0752
K-40	6148	7.507E-001pCi/g	5.361E-001	5.347E-001	1.327E+000	5.540E-001	0.57	0.5361
LA-140	6096	8.699E-002pCi/g	7.949E-002	7.936E-002	1.364E-001	5.501E-002	0.64	0.0795
MN-54	5382	-1.165E-001pCi/g	1.521E-001	1.520E-001	3.439E-001	1.646E-001	-0.34	0.1521
NA-22	5201	-2.814E-002pCi/g	5.797E-002	5.795E-002	2.055E-001	9.236E-002	-0.14	0.0580
NB-94	5160	6.783E-002pCi/g	6.927E-002	6.918E-002	2.389E-001	1.130E-001	0.28	0.0693
NB-95	5154	-1.620E-001pCi/g	1.191E-001	1.188E-001	3.935E-001	1.900E-001	-0.41	0.1191
ND-147	5083	-6.514E-001pCi/g	8.776E-001	8.768E-001	2.138E+000	1.031E+000	-0.30	0.8776
NP-237	4757	-4.627E-001pCi/g	7.177E-001	7.172E-001	2.379E+000	1.176E+000	-0.19	0.7177
NP-239	4751	2.276E-001pCi/g	3.340E-001	3.337E-001	1.108E+000	5.467E-001	0.21	0.3340
PA-231	4541	0.000E+000pCi/g	1.373E+000	1.373E+000	1.362E+001	6.701E+000	0.00	1.3729
PA-233	4535	2.236E-001pCi/g	3.060E-001	3.057E-001	1.017E+000	4.997E-001	0.22	0.3060
PA-234	4528	2.928E-001pCi/g	4.437E-001	4.434E-001	1.312E+000	6.465E-001	0.22	0.4437
PA-234M	19453	2.108E+001pCi/g	1.857E+001	1.854E+001	6.416E+001	3.107E+001	0.33	18.5748
PB-210	4467	8.671E+002pCi/g	5.159E+001	8.329E+000	1.461E+001	7.229E+000	59.34	51.5925

PB-212	4454	7.463E-001pCi/g	1.602E-001	1.528E-001	3.656E-001	1.769E-001	2.04	0.1602
PB-214	4448	2.370E-001pCi/g	2.355E-001	2.351E-001	7.474E-001	3.643E-001	0.32	0.2355
PM-144	19585	7.285E-002pCi/g	5.436E-002	5.422E-002	2.571E-001	1.222E-001	0.28	0.0544
PM-146	2464	1.040E-001pCi/g	3.321E-001	3.321E-001	7.921E-001	3.765E-001	0.13	0.3321
RA-226	1950	-4.839E-001pCi/g	3.042E+000	3.042E+000	5.837E+000	2.855E+000	-0.08	3.0419
RH-106	1882	-3.016E-001pCi/g	9.937E-001	9.936E-001	3.367E+000	1.626E+000	-0.09	0.9937
RU-103	1828	-6.222E-002pCi/g	1.352E-001	1.352E-001	3.240E-001	1.568E-001	-0.19	0.1352
SB-124	1784	-4.848E-002pCi/g	4.616E-002	4.609E-002	5.906E-001	2.896E-001	-0.08	0.0462
SB-125	1777	3.726E-001pCi/g	5.015E-001	5.012E-001	9.624E-001	4.671E-001	0.39	0.5015
SC-46	1739	-1.934E-001pCi/g	1.709E-001	1.706E-001	5.668E-001	2.757E-001	-0.34	0.1709
SN-113	1570	-1.832E-001pCi/g	6.511E-002	6.443E-002	6.636E-001	3.257E-001	-0.28	0.0651
SN-126	17459	-3.558E-001pCi/g	8.245E-001	8.243E-001	2.749E+000	1.352E+000	-0.13	0.8245
TA-182	1301	6.142E-001pCi/g	5.525E-001	5.517E-001	1.835E+000	8.906E-001	0.33	0.5525
TC-99M	17412	-6.331E-002pCi/g	7.898E-002	7.890E-002	2.620E-001	1.290E-001	-0.24	0.0790
TH-227	1058	1.965E+000pCi/g	1.983E+000	1.980E+000	6.552E+000	3.239E+000	0.30	1.9825
TH-229	1046	3.332E-001pCi/g	3.014E-001	3.002E-001	4.053E+000	1.977E+000	0.08	0.3014
TH-234	1027	5.142E-001pCi/g	1.278E+000	1.278E+000	6.351E+000	3.118E+000	0.08	1.2779
TL-208	929	3.882E-001pCi/g	9.932E-002	9.725E-002	2.123E-001	9.976E-002	1.83	0.0993
U-235	281	-5.267E-001pCi/g	7.677E-001	7.672E-001	2.130E+000	1.049E+000	-0.25	0.7677
Y-88	74	1.200E-001pCi/g	1.531E-001	1.529E-001	3.472E-001	1.653E-001	0.35	0.1531
ZN-65	31	-4.722E-001pCi/g	4.068E-001	4.061E-001	1.349E+000	6.559E-001	-0.35	0.4068
ZR-95	7	4.516E-001pCi/g	1.936E-001	1.922E-001	4.383E-001	2.068E-001	1.03	0.1936

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity		StdAdded	Recovery	ZFactor
LCS 160-272277~2-A	LCS 160-272277~2-A	CS-137	2.864E+001	pCi/g	2.944E+001	97.28%	-0.3615
		CO-60	1.577E+001	pCi/g	1.646E+001	95.82%	-0.5732
		AM-241	9.669E+001	pCi/g	9.708E+001	99.60%	-0.0539

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal	ZFactor

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 272277 **Operator:**

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-272277~2-	LCS	341.90g	1.00	GammaVision	GV10	9 / 30 / 16 19:13	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	5.161E-001pCi/g	4.930E-001	4.923E-001	1.066E+000	5.139E-001	0.48	0.4930
AG-108M	10982	-1.283E-001pCi/g	3.696E-002	3.637E-002	2.872E-001	1.401E-001	-0.45	0.0370
AG-110M	10973	-2.436E-001pCi/g	2.130E-001	2.126E-001	7.050E-001	3.451E-001	-0.35	0.2130
AM-241	10818	9.775E+001pCi/g	5.141E+000	8.314E-001	1.213E+000	6.008E-001	80.58	5.1409
BA-133	10469	7.040E-002pCi/g	1.351E-001	1.350E-001	4.510E-001	2.211E-001	0.16	0.1351
BA-140	10463	1.818E-001pCi/g	1.964E-001	1.962E-001	8.653E-001	4.175E-001	0.21	0.1964
BE-7	10435	-6.992E-001pCi/g	1.118E+000	1.117E+000	3.720E+000	1.828E+000	-0.19	1.1175
BI-207	10195	8.667E-002pCi/g	7.816E-002	7.803E-002	2.212E-001	1.066E-001	0.39	0.0782
BI-210M	10173	6.373E-002pCi/g	1.358E-001	1.357E-001	3.452E-001	1.681E-001	0.18	0.1358
BI-212	10160	1.530E+000pCi/g	1.367E+000	1.365E+000	4.535E+000	2.206E+000	0.34	1.3671
BI-214	10154	5.778E-001pCi/g	1.375E-001	1.341E-001	3.590E-001	1.707E-001	1.61	0.1375
CD-109	9254	1.642E+000pCi/g	2.301E+000	2.299E+000	7.619E+000	3.770E+000	0.22	2.3006
CD-113M	17462	9.148E+000pCi/g	9.992E+002	9.992E+002	3.367E+003	1.646E+003	0.00	999.2489
CE-139	9241	-2.055E-002pCi/g	6.937E-002	6.934E-002	2.318E-001	1.139E-001	-0.09	0.0694
CE-141	9235	1.025E-001pCi/g	7.847E-002	7.830E-002	2.128E-001	1.033E-001	0.48	0.0785
CE-144	9221	-4.688E-001pCi/g	5.253E-001	5.247E-001	1.741E+000	8.573E-001	-0.27	0.5253
CF-249	9215	1.362E-001pCi/g	1.495E-001	1.494E-001	4.985E-001	2.448E-001	0.27	0.1495
CF-251	13690	-3.095E-001pCi/g	3.513E-001	3.502E-001	9.286E-001	4.543E-001	-0.33	0.3513
CO-56	8704	1.879E-002pCi/g	1.572E-002	1.569E-002	2.803E-001	1.350E-001	0.07	0.0157
CO-57	13694	9.703E-002pCi/g	5.787E-002	5.764E-002	1.624E-001	7.956E-002	0.60	0.0579
CO-58	8698	2.483E-003pCi/g	9.680E-002	9.680E-002	3.289E-001	1.594E-001	0.01	0.0968
CO-60	8692	1.614E+001pCi/g	8.382E-001	2.145E-001	1.235E-001	5.442E-002	130.66	0.8382
CR-51	8604	-3.859E-001pCi/g	8.135E-001	8.132E-001	2.716E+000	1.332E+000	-0.14	0.8135
CS-134	8553	1.234E-001pCi/g	1.022E-001	1.020E-001	4.481E-001	2.199E-001	0.28	0.1022
CS-136	8546	1.085E-001pCi/g	7.572E-002	7.546E-002	2.841E-001	1.370E-001	0.38	0.0757
CS-137	8539	2.837E+001pCi/g	1.515E+000	3.427E-001	2.201E-001	1.050E-001	128.88	1.5151
EU-152	7145	4.455E-001pCi/g	3.696E-001	3.689E-001	1.216E+000	5.980E-001	0.37	0.3696
EU-154	7138	-8.727E-001pCi/g	8.178E-001	8.165E-001	2.720E+000	1.317E+000	-0.32	0.8178
EU-155	7131	2.450E-001pCi/g	3.372E-001	3.369E-001	1.118E+000	5.521E-001	0.22	0.3372
FE-59	7073	2.567E-001pCi/g	2.385E-001	2.382E-001	5.017E-001	2.396E-001	0.51	0.2385
GA-68	18005	-3.762E+000pCi/g	5.213E+000	5.209E+000	1.136E+001	5.457E+000	-0.33	5.2128
GD-153	6824	-1.804E-001pCi/g	2.541E-001	2.539E-001	8.419E-001	4.162E-001	-0.21	0.2541
HF-181	6495	9.232E-002pCi/g	1.044E-001	1.043E-001	4.959E-001	2.437E-001	0.19	0.1044
HG-203	6466	9.088E-002pCi/g	8.062E-002	8.045E-002	2.668E-001	1.306E-001	0.34	0.0806
I-131	6380	1.416E-002pCi/g	1.182E-002	1.180E-002	2.746E-001	1.339E-001	0.05	0.0118
IR-192	6303	-3.206E-003pCi/g	3.257E-003	3.251E-003	5.126E-001	2.534E-001	-0.01	0.0033
K-40	6148	-6.666E-002pCi/g	7.052E-001	7.052E-001	1.635E+000	7.434E-001	-0.04	0.7052
LA-140	6096	2.337E-002pCi/g	2.000E-002	1.996E-002	2.006E-001	9.142E-002	0.12	0.0200
MN-54	5382	1.200E-001pCi/g	1.052E-001	1.050E-001	2.364E-001	1.131E-001	0.51	0.1052
NA-22	5201	4.984E-002pCi/g	3.571E-002	3.562E-002	1.182E-001	5.202E-002	0.42	0.0357
NB-94	5160	3.947E-002pCi/g	6.204E-002	6.201E-002	2.207E-001	1.058E-001	0.18	0.0620
NB-95	5154	-1.353E-001pCi/g	9.204E-002	9.177E-002	3.033E-001	1.468E-001	-0.45	0.0920
ND-147	5083	-8.055E-001pCi/g	7.738E-001	7.724E-001	1.795E+000	8.692E-001	-0.45	0.7738
NP-237	4757	-4.782E-001pCi/g	6.851E-001	6.846E-001	2.269E+000	1.123E+000	-0.21	0.6851
NP-239	4751	-2.392E-001pCi/g	3.314E-001	3.311E-001	1.098E+000	5.427E-001	-0.22	0.3314
PA-231	4541	-2.858E+000pCi/g	4.644E+000	4.642E+000	1.540E+001	7.616E+000	-0.19	4.6444
PA-233	4535	-3.087E-003pCi/g	1.223E-001	1.223E-001	1.280E+000	6.331E-001	0.00	0.1223
PA-234	4528	6.645E-001pCi/g	3.995E-001	3.981E-001	5.016E-001	2.427E-001	1.32	0.3995
PA-234M	19453	1.019E+001pCi/g	7.871E+000	7.854E+000	5.194E+001	2.527E+001	0.20	7.8710
PB-210	4467	8.424E+002pCi/g	5.010E+001	7.962E+000	1.486E+001	7.359E+000	56.69	50.1004

PB-212	4454	7.213E-001pCi/g	1.549E-001	1.477E-001	3.494E-001	1.699E-001	2.06	0.1549
PB-214	4448	3.560E-001pCi/g	1.635E-001	1.624E-001	4.269E-001	2.062E-001	0.83	0.1635
PM-144	19585	4.197E-002pCi/g	5.362E-002	5.358E-002	2.115E-001	1.012E-001	0.20	0.0536
PM-146	2464	1.534E-001pCi/g	1.432E-001	1.429E-001	6.480E-001	3.101E-001	0.24	0.1432
RA-226	1950	4.820E-001pCi/g	1.940E+000	1.940E+000	5.198E+000	2.545E+000	0.09	1.9401
RH-106	1882	-1.076E+000pCi/g	8.905E-001	8.888E-001	2.950E+000	1.433E+000	-0.36	0.8905
RU-103	1828	5.218E-002pCi/g	9.724E-002	9.721E-002	2.375E-001	1.149E-001	0.22	0.0972
SB-124	1784	6.289E-002pCi/g	1.316E-001	1.316E-001	4.394E-001	2.156E-001	0.14	0.1316
SB-125	1777	-4.060E-001pCi/g	2.384E-001	2.375E-001	9.120E-001	4.454E-001	-0.45	0.2384
SC-46	1739	-1.325E-001pCi/g	1.242E-001	1.241E-001	5.329E-001	2.611E-001	-0.25	0.1242
SN-113	1570	1.363E-001pCi/g	1.516E-001	1.514E-001	5.030E-001	2.469E-001	0.27	0.1516
SN-126	17459	7.980E-001pCi/g	7.805E-001	7.794E-001	2.583E+000	1.272E+000	0.31	0.7805
TA-182	1301	3.939E-001pCi/g	3.736E-001	3.730E-001	1.242E+000	6.027E-001	0.32	0.3736
TC-99M	17412	-6.172E-002pCi/g	7.271E-002	7.262E-002	2.410E-001	1.188E-001	-0.26	0.0727
TH-227	1058	1.284E+000pCi/g	1.960E+000	1.958E+000	6.493E+000	3.214E+000	0.20	1.9597
TH-229	1046	1.458E+000pCi/g	1.568E+000	1.564E+000	3.942E+000	1.930E+000	0.37	1.5684
TH-234	1027	-1.796E+000pCi/g	5.751E+000	5.750E+000	6.531E+000	3.215E+000	-0.27	5.7506
TL-208	929	1.957E-001pCi/g	1.575E-001	1.572E-001	2.636E-001	1.271E-001	0.74	0.1575
U-235	281	2.796E-001pCi/g	5.431E-001	5.429E-001	1.808E+000	8.902E-001	0.15	0.5431
Y-88	74	-2.025E-001pCi/g	1.338E-001	1.334E-001	3.814E-001	1.849E-001	-0.53	0.1338
ZN-65	31	2.825E-001pCi/g	2.450E-001	2.446E-001	8.132E-001	3.940E-001	0.35	0.2450
ZR-95	7	-1.550E-001pCi/g	1.946E-001	1.944E-001	4.389E-001	2.107E-001	-0.35	0.1946

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity		StdAdded	Recovery	ZFactor
LCS 160-272277~2-A	LCS 160-272277~2-A	CS-137	2.837E+001	pCi/g	2.944E+001	96.35%	-0.4918
		CO-60	1.614E+001	pCi/g	1.645E+001	98.11%	-0.2592
		AM-241	9.775E+001	pCi/g	9.708E+001	100.69%	0.0929

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal	ZFactor

Reagent

Tuna Can LCS_00007

ANALYTICS
An Isotope Products Laboratories Company

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

74139-334
1.0 Liter Sand in 1 Liter Wide Mouth HDPE "S" Bottle

Customer: Severn Trent Laboratories/Earth City, MO
P.O. No.: 2169577, Item 1
Calibration Date: 01-Oct-2006 12:00 EST Grams of Master Source: 0.01552

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics 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."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Pb-210	46.5	8145.9	———	3079.5	0.33	1.46	2.99	4π LS
Am-241	59.5	157860	———	2034.3	0.33	1.46	2.99	4π LS
Cd-109	88.0	462.60	189000	2933.5	0.57	1.70	3.59	HPGe
Co-57	122.1	271.79	94670	1467.8	0.34	1.30	2.69	HPGe
Ce-139	165.9	137.6	133800	2076.7	0.35	1.10	2.31	HPGe
Hg-203	279.2	46.61	295300	4583	0.40	1.10	2.34	HPGe
Sn-113	391.7	115.1	185600	2880.7	0.42	1.10	2.35	HPGe
Cs-137	661.7	10983	116700	1811.3	0.70	1.20	2.78	HPGe
Y-88	898.0	106.60	455400	7068	0.50	1.10	2.42	HPGe
Co-60	1173.2	1925.4	226900	3522	0.60	1.10	2.51	HPGe
Co-60	1332.5	1925.4	227000	3523	0.90	1.10	2.84	HPGe
Y-88	1836.1	106.6	481200	7469	0.90	1.10	2.84	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
1550 grams of sand. NOTE: Homogeneity was checked by the addition of Tc-99 tracer to the solution used to spike the sand. Ten 10-gram aliquots were removed after mixing and counted to measure the Tc-99. The standard deviation for the 10 measurements was 1.3% with a range of 4.8%. This demonstrates reasonable homogeneity for this source material down to a 10-gram aliquot.
This standard will expire one year after the calibration date.

Source Prepared by: M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: for
D. M. Montgomery, QA Manager

Date: 12-21-06

End of Certificate

St. Louis Radiological Standard Verification

Standard ID Number: Tuna Can LCS_00007 (1282974)
True Value = 28.79 pCi/g
Date Analyzed: 9/21/2017

Radionuclide: Cs-137

	Replicates	
#1	28.31	pCi/g
#2	28.6	pCi/g
#3	28.53	pCi/g

Mean = 28.48

1 sigma = 0.15132746

1.96 sigma = 0.296602

True Value minus 5% = 27.3505 (True Value - 5%)
True Value plus 5% = 30.2295 (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: JW 9/26/17

2nd Reviewed By/Date: RM 9-27-17

Standard ID Number: Tuna Can LCS_00007 (1282974)
True Value = 14.47 pCi/g
Date Analyzed: 9/21/2017

Radionuclide: Co-60

	Replicates	
#1	14.46	pCi/g
#2	14.27	pCi/g
#3	14.39	pCi/g

Mean = 14.3733333

1 sigma = 0.09609024

1.96 sigma = 0.188337

True Value minus 5% = 13.7465 (True Value - 5%)
True Value plus 5% = 15.1935 (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: JW 9/26/17

2nd Reviewed By/Date: lm 9.27.17

Standard ID Number: Tuna Can LCS_00007 (1282974)
True Value = 96.93 pCi/g
Date Analyzed: 9/21/2017

Radionuclide: Am-241

	Replicates	
#1	93.28	pCi/g
#2	93.97	pCi/g
#3	92.89	pCi/g

Mean = 93.38

1 sigma = 0.54690036

1.96 sigma = 1.071925

True Value minus 5% = 92.0835 (True Value - 5%)
True Value plus 5% = 101.7765 (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: JW 9/26/17

2nd Reviewed By/Date: RM 9.27.17

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING



Reagent ID: Tuna Can LCS_00007

Type:	ASTD	Expiration Date:	09/21/2018
Description:	Mixed Gamma Tuna Can LCS	Laboratory:	TestAmerica St. Louis
No. of Bottles:	1	Prepared By:	Watson, Jody L
Storage Location:	Gamma Closet	Vendor:	Analytics
Reagent Volume:	341.900 g	Vendor Lot #:	74139-334
Creation Date:	10/01/2006	Vendor Cat #:	
Open Date:			
Container(s):	1282974		
Comment:			

Reagent Analyte Information

Analyte	Source ID	Source Exp. Date	Source Conc.	Source Conc. Units	Final Conc.	Final Conc. Units
Am-241					219.00000	dpm/g
Co-60					136.00000	dpm/g
Cs-137					82.30000	dpm/g

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 325347 **Operator:**

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-325347~2-	LCS	341.90g	1.00	GammaVision	GV16	9 / 21 / 17 3:43	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	9.048E-001pCi/g	2.661E-001	2.621E-001	6.631E-001	3.146E-001	1.36	0.2661
AG-108M	10982	3.668E-002pCi/g	1.157E-001	1.157E-001	2.696E-001	1.317E-001	0.14	0.1157
AG-110M	10973	-2.316E-001pCi/g	1.957E-001	1.953E-001	6.472E-001	3.170E-001	-0.36	0.1957
AM-241	10818	9.328E+001pCi/g	4.901E+000	7.673E-001	1.120E+000	5.552E-001	83.26	4.9013
BA-133	10469	-1.453E-001pCi/g	1.365E-001	1.363E-001	4.518E-001	2.219E-001	-0.32	0.1365
BA-140	10463	6.864E-001pCi/g	3.618E-001	3.600E-001	7.634E-001	3.681E-001	0.90	0.3618
BE-7	10435	-1.077E+000pCi/g	1.079E+000	1.078E+000	3.575E+000	1.759E+000	-0.30	1.0795
BI-207	10195	8.400E-002pCi/g	7.160E-002	7.147E-002	2.093E-001	1.011E-001	0.40	0.0716
BI-210M	10173	1.437E-001pCi/g	1.414E-001	1.411E-001	3.403E-001	1.661E-001	0.42	0.1414
BI-212	10160	1.463E+000pCi/g	1.237E+000	1.234E+000	4.096E+000	1.993E+000	0.36	1.2367
BI-214	10154	5.551E-001pCi/g	1.698E-001	1.673E-001	3.340E-001	1.591E-001	1.66	0.1698
CD-109	9254	0.000E+000pCi/g	1.206E+000	1.206E+000	8.996E+000	4.463E+000	0.00	1.2058
CD-113M	17462	-2.036E+001pCi/g	1.066E+003	1.066E+003	3.577E+003	1.755E+003	-0.01	1,065.6537
CE-139	9241	-2.403E-002pCi/g	6.710E-002	6.706E-002	2.238E-001	1.101E-001	-0.11	0.0671
CE-141	9235	-2.619E-002pCi/g	1.673E-001	1.673E-001	5.562E-001	2.753E-001	-0.05	0.1673
CE-144	9221	4.653E-001pCi/g	6.901E-001	6.897E-001	2.286E+000	1.132E+000	0.20	0.6901
CF-249	9215	4.298E-002pCi/g	1.363E-001	1.363E-001	4.555E-001	2.238E-001	0.09	0.1363
CF-251	13690	6.063E-002pCi/g	3.338E-001	3.338E-001	8.475E-001	4.149E-001	0.07	0.3338
CO-56	8704	1.207E-001pCi/g	1.049E-001	1.047E-001	2.271E-001	1.089E-001	0.53	0.1049
CO-57	13694	4.884E-001pCi/g	7.303E-001	7.299E-001	2.419E+000	1.198E+000	0.20	0.7303
CO-58	8698	9.260E-002pCi/g	9.393E-002	9.381E-002	3.126E-001	1.518E-001	0.30	0.0939
CO-60	8692	1.446E+001pCi/g	7.501E-001	1.891E-001	7.878E-002	3.285E-002	183.54	0.7501
CR-51	8604	1.380E+000pCi/g	6.647E-001	6.606E-001	1.513E+000	7.337E-001	0.91	0.6647
CS-134	8553	1.602E-001pCi/g	1.266E-001	1.263E-001	4.088E-001	2.007E-001	0.39	0.1266
CS-136	8546	-4.685E-002pCi/g	1.111E-001	1.111E-001	2.430E-001	1.170E-001	-0.19	0.1111
CS-137	8539	2.831E+001pCi/g	1.508E+000	3.231E-001	2.024E-001	9.666E-002	139.88	1.5079
EU-152	7145	1.876E-001pCi/g	1.741E-001	1.738E-001	1.466E+000	7.240E-001	0.13	0.1741
EU-154	7138	4.033E-001pCi/g	4.069E-001	4.064E-001	2.449E+000	1.185E+000	0.16	0.4069
EU-155	7131	2.237E-001pCi/g	2.684E-001	2.681E-001	1.489E+000	7.387E-001	0.15	0.2684
FE-59	7073	3.201E-002pCi/g	2.488E-001	2.488E-001	5.291E-001	2.545E-001	0.06	0.2488
GA-68	18005	-4.863E-002pCi/g	4.659E+000	4.659E+000	9.945E+000	4.775E+000	0.00	4.6590
GD-153	6824	-9.950E-003pCi/g	1.058E-002	1.057E-002	9.331E-001	4.623E-001	-0.01	0.0106
HF-181	6495	1.083E-001pCi/g	1.229E-001	1.228E-001	4.796E-001	2.360E-001	0.23	0.1229
HG-203	6466	-3.624E-002pCi/g	7.772E-002	7.769E-002	2.596E-001	1.273E-001	-0.14	0.0777
I-131	6380	1.408E-002pCi/g	2.242E-002	2.240E-002	2.512E-001	1.225E-001	0.06	0.0224
IR-192	6303	1.702E-002pCi/g	1.564E-002	1.560E-002	2.984E-001	1.466E-001	0.06	0.0156
K-40	6148	6.025E-001pCi/g	4.185E-001	4.174E-001	1.106E+000	4.874E-001	0.54	0.4185
LA-140	6096	-8.046E-002pCi/g	5.037E-002	5.019E-002	1.685E-001	7.637E-002	-0.48	0.0504
MN-54	5382	6.604E-004pCi/g	1.070E-001	1.070E-001	2.363E-001	1.135E-001	0.00	0.1070
NA-22	5201	-1.279E-001pCi/g	6.593E-002	6.562E-002	2.133E-001	1.003E-001	-0.60	0.0659
NB-94	5160	-5.086E-002pCi/g	8.124E-002	8.120E-002	2.727E-001	1.322E-001	-0.19	0.0812
NB-95	5154	0.000E+000pCi/g	3.061E-002	3.061E-002	2.565E-001	1.239E-001	0.00	0.0306
ND-147	5083	1.060E-001pCi/g	6.941E-001	6.941E-001	1.632E+000	7.906E-001	0.06	0.6941
NP-237	4757	3.913E-001pCi/g	7.714E-001	7.711E-001	2.554E+000	1.267E+000	0.15	0.7714
NP-239	4751	-9.779E-002pCi/g	4.296E-001	4.296E-001	1.425E+000	7.070E-001	-0.07	0.4296
PA-231	4541	0.000E+000pCi/g	1.002E+000	1.002E+000	1.318E+001	6.513E+000	0.00	1.0016
PA-233	4535	-3.806E-003pCi/g	3.221E-001	3.221E-001	1.179E+000	5.834E-001	0.00	0.3221
PA-234	4528	1.113E+000pCi/g	4.538E-001	4.501E-001	1.387E+000	6.863E-001	0.80	0.4538
PA-234M	19453	6.869E+000pCi/g	6.140E+000	6.130E+000	4.528E+001	2.201E+001	0.15	6.1399
PB-210	4467	7.675E+002pCi/g	4.562E+001	7.069E+000	1.340E+001	6.641E+000	57.27	45.6164

PB-212	4454	1.236E-001pCi/g	1.686E-001	1.684E-001	5.593E-001	2.754E-001	0.22	0.1686
PB-214	4448	7.401E-001pCi/g	1.726E-001	1.683E-001	4.225E-001	2.048E-001	1.75	0.1726
PM-144	19585	-2.998E-002pCi/g	6.878E-002	6.877E-002	2.326E-001	1.122E-001	-0.13	0.0688
PM-146	2464	7.664E-002pCi/g	2.679E-001	2.679E-001	6.105E-001	2.928E-001	0.13	0.2679
RH-106	1882	-1.029E+000pCi/g	1.345E+000	1.344E+000	4.469E+000	2.197E+000	-0.23	1.3453
RU-103	1828	1.035E-001pCi/g	9.723E-002	9.709E-002	2.256E-001	1.094E-001	0.46	0.0972
SB-124	1784	6.493E-002pCi/g	8.596E-002	8.589E-002	3.647E-001	1.787E-001	0.18	0.0860
SB-125	1777	1.207E-001pCi/g	7.017E-002	6.990E-002	8.276E-001	4.043E-001	0.15	0.0702
SC-46	1739	1.233E-001pCi/g	9.496E-002	9.475E-002	4.767E-001	2.335E-001	0.26	0.0950
SN-113	1570	1.378E-001pCi/g	1.461E-001	1.459E-001	4.842E-001	2.380E-001	0.28	0.1461
SN-126	17459	-1.547E+000pCi/g	3.304E+000	3.303E+000	1.091E+001	5.436E+000	-0.14	3.3036
TA-182	1301	1.291E-001pCi/g	2.200E-001	2.200E-001	1.126E+000	5.468E-001	0.11	0.2200
TC-99M	17412	-6.321E-002pCi/g	9.084E-002	9.077E-002	3.009E-001	1.489E-001	-0.21	0.0908
TH-227	1058	3.015E+000pCi/g	5.085E+000	5.082E+000	1.678E+001	8.363E+000	0.18	5.0847
TH-229	1046	-1.547E+000pCi/g	1.476E+000	1.471E+000	3.702E+000	1.815E+000	-0.42	1.4764
TH-234	1027	-4.867E+000pCi/g	6.764E+000	6.759E+000	2.817E+001	1.404E+001	-0.17	6.7638
TL-208	929	8.356E-002pCi/g	9.786E-002	9.777E-002	2.303E-001	1.110E-001	0.36	0.0979
U-235	281	-2.825E-002pCi/g	3.082E-002	3.079E-002	2.375E+000	1.175E+000	-0.01	0.0308
Y-88	74	-8.803E-002pCi/g	1.370E-001	1.369E-001	2.980E-001	1.438E-001	-0.30	0.1370
ZN-65	31	2.702E-001pCi/g	2.035E-001	2.031E-001	6.732E-001	3.253E-001	0.40	0.2035
ZR-95	7	1.762E-001pCi/g	1.492E-001	1.490E-001	3.353E-001	1.598E-001	0.53	0.1492

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	ZFactor
LCS 160-325347~2-A	LCS 160-325347~2-A	CS-137	2.831E+001 pCi/g	2.879E+001	98.34%	-0.2223
		CO-60	1.446E+001 pCi/g	1.447E+001	99.89%	-0.0145
		AM-241	9.328E+001 pCi/g	9.693E+001	96.23%	-0.5168

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 327342 **Operator:**

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-327342~2-	LCS	341.90g	1.00	GammaVision	GV16	9 / 21 / 17 4:42	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	8.500E-001pCi/g	4.315E-001	4.293E-001	9.173E-001	4.417E-001	0.93	0.4315
AG-108M	10982	9.481E-002pCi/g	4.196E-002	4.168E-002	1.710E-001	8.234E-002	0.55	0.0420
AG-110M	10973	2.660E-001pCi/g	1.258E-001	1.250E-001	5.898E-001	2.883E-001	0.45	0.1258
AM-241	10818	9.397E+001pCi/g	4.945E+000	8.199E-001	1.222E+000	6.061E-001	76.89	4.9452
BA-133	10469	-1.453E-001pCi/g	1.318E-001	1.315E-001	4.360E-001	2.140E-001	-0.33	0.1318
BA-140	10463	5.361E-002pCi/g	3.530E-001	3.530E-001	8.313E-001	4.020E-001	0.06	0.3530
BE-7	10435	-1.086E+000pCi/g	1.072E+000	1.071E+000	3.550E+000	1.746E+000	-0.31	1.0722
BI-207	10195	2.619E-002pCi/g	6.426E-002	6.425E-002	2.170E-001	1.050E-001	0.12	0.0643
BI-210M	10173	1.103E-001pCi/g	1.431E-001	1.430E-001	4.310E-001	2.115E-001	0.26	0.1431
BI-212	10160	1.101E+000pCi/g	8.695E-001	8.676E-001	2.882E+000	1.386E+000	0.38	0.8695
BI-214	10154	5.139E-001pCi/g	1.198E-001	1.168E-001	3.497E-001	1.670E-001	1.47	0.1198
CD-109	9254	6.280E-001pCi/g	2.773E+000	2.773E+000	9.198E+000	4.564E+000	0.07	2.7735
CD-113M	17462	-1.256E+003pCi/g	1.086E+003	1.083E+003	3.587E+003	1.760E+003	-0.35	1,085.7017
CE-139	9241	6.951E-002pCi/g	6.700E-002	6.668E-002	2.210E-001	1.087E-001	0.31	0.0670
CE-141	9235	9.782E-002pCi/g	1.627E-001	1.627E-001	5.395E-001	2.670E-001	0.18	0.1627
CE-144	9221	4.705E-001pCi/g	6.877E-001	6.873E-001	2.278E+000	1.128E+000	0.21	0.6877
CF-249	9215	1.320E-001pCi/g	1.307E-001	1.305E-001	4.332E-001	2.126E-001	0.30	0.1307
CF-251	13690	-3.563E-001pCi/g	3.086E-001	3.070E-001	1.017E+000	4.995E-001	-0.35	0.3086
CO-56	8704	1.030E-001pCi/g	4.239E-002	4.206E-002	2.271E-001	1.089E-001	0.45	0.0424
CO-57	13694	5.054E-002pCi/g	5.763E-002	5.757E-002	1.911E-001	9.406E-002	0.26	0.0576
CO-58	8698	-1.279E-001pCi/g	7.199E-002	7.168E-002	3.394E-001	1.652E-001	-0.38	0.0720
CO-60	8692	1.427E+001pCi/g	7.415E-001	1.906E-001	7.412E-002	3.052E-002	192.59	0.7415
CR-51	8604	-8.335E-001pCi/g	4.560E-001	4.538E-001	4.338E+000	2.146E+000	-0.19	0.4560
CS-134	8553	1.485E-001pCi/g	1.204E-001	1.201E-001	4.276E-001	2.101E-001	0.35	0.1204
CS-136	8546	9.370E-002pCi/g	2.502E-002	2.443E-002	2.556E-001	1.233E-001	0.37	0.0250
CS-137	8539	2.860E+001pCi/g	1.523E+000	3.276E-001	2.249E-001	1.079E-001	127.17	1.5234
EU-152	7145	-3.312E-001pCi/g	1.998E-001	1.991E-001	1.602E+000	7.919E-001	-0.21	0.1998
EU-154	7138	5.882E-001pCi/g	3.374E-001	3.360E-001	2.309E+000	1.116E+000	0.25	0.3374
EU-155	7131	9.622E-002pCi/g	4.703E-001	4.703E-001	1.560E+000	7.741E-001	0.06	0.4703
FE-59	7073	-2.265E-001pCi/g	2.692E-001	2.690E-001	5.651E-001	2.725E-001	-0.40	0.2692
GA-68	18005	1.605E+000pCi/g	4.810E+000	4.809E+000	1.020E+001	4.904E+000	0.16	4.8096
GD-153	6824	-9.427E-002pCi/g	2.781E-001	2.780E-001	9.227E-001	4.571E-001	-0.10	0.2781
HF-181	6495	-1.433E-001pCi/g	1.439E-001	1.437E-001	4.765E-001	2.344E-001	-0.30	0.1439
HG-203	6466	8.908E-002pCi/g	7.501E-002	7.484E-002	2.480E-001	1.214E-001	0.36	0.0750
I-131	6380	7.504E-002pCi/g	7.274E-002	7.264E-002	2.476E-001	1.207E-001	0.30	0.0727
IR-192	6303	6.064E-002pCi/g	1.383E-001	1.382E-001	4.593E-001	2.271E-001	0.13	0.1383
K-40	6148	2.839E-002pCi/g	5.578E-001	5.578E-001	1.382E+000	6.252E-001	0.02	0.5578
LA-140	6096	-1.272E-002pCi/g	6.694E-002	6.694E-002	1.343E-001	5.927E-002	-0.09	0.0669
MN-54	5382	-1.293E-002pCi/g	7.314E-002	7.314E-002	2.220E-001	1.064E-001	-0.06	0.0731
NA-22	5201	-9.911E-002pCi/g	5.513E-002	5.491E-002	1.791E-001	8.323E-002	-0.55	0.0551
NB-94	5160	7.171E-002pCi/g	8.219E-002	8.210E-002	2.744E-001	1.331E-001	0.26	0.0822
NB-95	5154	6.785E-002pCi/g	6.382E-002	6.373E-002	2.130E-001	1.022E-001	0.32	0.0638
ND-147	5083	-3.054E-001pCi/g	7.104E-001	7.102E-001	1.663E+000	8.061E-001	-0.18	0.7104
NP-237	4757	-5.319E-001pCi/g	1.657E+000	1.657E+000	2.693E+000	1.337E+000	-0.20	1.6574
NP-239	4751	2.641E-001pCi/g	4.419E-001	4.416E-001	1.462E+000	7.256E-001	0.18	0.4419
PA-231	4541	-9.132E-002pCi/g	9.741E-002	9.729E-002	1.310E+001	6.472E+000	-0.01	0.0974
PA-233	4535	3.446E-001pCi/g	3.778E-001	3.774E-001	1.090E+000	5.386E-001	0.32	0.3778
PA-234	4528	2.876E-001pCi/g	4.140E-001	4.137E-001	1.371E+000	6.786E-001	0.21	0.4140
PA-234M	19453	-2.098E+001pCi/g	1.502E+001	1.498E+001	5.286E+001	2.580E+001	-0.40	15.0219
PB-210	4467	8.153E+002pCi/g	4.866E+001	8.716E+000	1.491E+001	7.395E+000	54.69	48.6615

PB-212	4454	5.258E-001pCi/g	1.077E-001	1.021E-001	3.165E-001	1.540E-001	1.66	0.1077
PB-214	4448	6.432E-001pCi/g	1.307E-001	1.263E-001	3.806E-001	1.838E-001	1.69	0.1307
PM-144	19585	-6.996E-002pCi/g	8.109E-002	8.101E-002	2.708E-001	1.313E-001	-0.26	0.0811
PM-146	2464	2.538E-001pCi/g	2.166E-001	2.162E-001	4.878E-001	2.315E-001	0.52	0.2166
RH-106	1882	9.992E-001pCi/g	1.049E+000	1.048E+000	3.485E+000	1.705E+000	0.29	1.0495
RU-103	1828	-1.026E-002pCi/g	7.167E-002	7.167E-002	2.444E-001	1.187E-001	-0.04	0.0717
SB-124	1784	-1.032E-001pCi/g	1.298E-001	1.297E-001	4.310E-001	2.118E-001	-0.24	0.1298
SB-125	1777	-1.763E-001pCi/g	1.830E-001	1.828E-001	8.131E-001	3.971E-001	-0.22	0.1830
SC-46	1739	1.436E-001pCi/g	1.225E-001	1.223E-001	4.056E-001	1.980E-001	0.35	0.1225
SN-113	1570	-9.433E-002pCi/g	7.930E-002	7.915E-002	5.086E-001	2.502E-001	-0.19	0.0793
SN-126	17459	-1.523E+000pCi/g	3.319E+000	3.318E+000	1.096E+001	5.462E+000	-0.14	3.3190
TA-182	1301	2.064E-001pCi/g	3.682E-001	3.680E-001	1.234E+000	6.007E-001	0.17	0.3682
TC-99M	17412	0.000E+000pCi/g	3.379E-002	3.379E-002	3.005E-001	1.487E-001	0.00	0.0338
TH-227	1058	-3.064E+000pCi/g	5.199E+000	5.196E+000	1.716E+001	8.551E+000	-0.18	5.1990
TH-229	1046	-1.641E+000pCi/g	1.217E+000	1.210E+000	3.998E+000	1.963E+000	-0.41	1.2168
TH-234	1027	-4.774E+000pCi/g	7.226E+000	7.222E+000	2.799E+001	1.395E+001	-0.17	7.2259
TL-208	929	2.380E-001pCi/g	9.205E-002	9.122E-002	2.092E-001	1.004E-001	1.14	0.0920
U-235	281	0.000E+000pCi/g	2.223E-001	2.223E-001	2.402E+000	1.189E+000	0.00	0.2223
Y-88	74	-1.225E-001pCi/g	1.401E-001	1.399E-001	3.034E-001	1.465E-001	-0.40	0.1401
ZN-65	31	-1.401E-001pCi/g	2.510E-001	2.509E-001	8.418E-001	4.096E-001	-0.17	0.2510
ZR-95	7	-4.541E-003pCi/g	4.520E-003	4.514E-003	4.071E-001	1.957E-001	-0.01	0.0045

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity		StdAdded	Recovery	ZFactor
LCS 160-327342~2-A	LCS 160-327342~2-A	CS-137	2.860E+001	pCi/g	2.879E+001	99.33%	-0.0887
		CO-60	1.427E+001	pCi/g	1.447E+001	98.62%	-0.1892
		AM-241	9.397E+001	pCi/g	9.693E+001	96.95%	-0.4168

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Analysis Report for Gamma Spectroscopy

Batch: 327322 **Operator:**

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-327322~2-	LCS	341.90g	1.00	GammaVision	GV16	9 / 21 / 17 3:01	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	8.750E-002pCi/g	4.692E-001	4.692E-001	1.026E+000	4.960E-001	0.09	0.4692
AG-108M	10982	3.131E-002pCi/g	4.204E-002	4.201E-002	2.628E-001	1.283E-001	0.12	0.0420
AG-110M	10973	1.045E-001pCi/g	8.401E-002	8.384E-002	5.938E-001	2.903E-001	0.18	0.0840
AM-241	10818	9.289E+001pCi/g	4.865E+000	6.537E-001	9.745E-001	4.823E-001	95.32	4.8649
BA-133	10469	1.368E-001pCi/g	1.303E-001	1.301E-001	4.317E-001	2.119E-001	0.32	0.1303
BA-140	10463	2.647E-001pCi/g	3.485E-001	3.482E-001	8.135E-001	3.931E-001	0.33	0.3485
BE-7	10435	-1.104E+000pCi/g	1.063E+000	1.061E+000	3.519E+000	1.730E+000	-0.31	1.0630
BI-207	10195	1.758E-002pCi/g	2.874E-002	2.873E-002	2.146E-001	1.038E-001	0.08	0.0287
BI-210M	10173	-6.782E-002pCi/g	1.268E-001	1.267E-001	4.230E-001	2.075E-001	-0.16	0.1268
BI-212	10160	-9.206E-001pCi/g	1.301E+000	1.300E+000	3.534E+000	1.712E+000	-0.26	1.3012
BI-214	10154	6.724E-001pCi/g	2.010E-001	1.979E-001	3.908E-001	1.875E-001	1.72	0.2010
CD-109	9254	5.730E+000pCi/g	1.460E+000	1.425E+000	3.488E+000	1.709E+000	1.64	1.4600
CD-113M	17462	-2.443E+002pCi/g	1.040E+003	1.040E+003	3.484E+003	1.709E+003	-0.07	1,040.1179
CE-139	9241	-5.180E-002pCi/g	7.253E-002	7.237E-002	2.405E-001	1.184E-001	-0.22	0.0725
CE-141	9235	-1.095E-001pCi/g	1.695E-001	1.694E-001	5.616E-001	2.780E-001	-0.19	0.1695
CE-144	9221	-4.716E-001pCi/g	7.236E-001	7.231E-001	2.397E+000	1.187E+000	-0.20	0.7236
CF-249	9215	1.332E-001pCi/g	1.321E-001	1.319E-001	4.376E-001	2.149E-001	0.30	0.1321
CF-251	13690	2.555E-001pCi/g	3.216E-001	3.208E-001	8.102E-001	3.963E-001	0.32	0.3216
CO-56	8704	7.595E-002pCi/g	4.158E-002	4.139E-002	2.386E-001	1.146E-001	0.32	0.0416
CO-57	13694	6.304E-002pCi/g	5.399E-002	5.389E-002	1.784E-001	8.773E-002	0.35	0.0540
CO-58	8698	4.917E-002pCi/g	9.888E-002	9.885E-002	3.320E-001	1.615E-001	0.15	0.0989
CO-60	8692	1.439E+001pCi/g	7.463E-001	1.867E-001	7.056E-002	2.874E-002	203.99	0.7463
CR-51	8604	-1.736E-002pCi/g	5.160E-001	5.160E-001	2.376E+000	1.165E+000	-0.01	0.5160
CS-134	8553	2.089E-001pCi/g	1.678E-001	1.674E-001	4.023E-001	1.974E-001	0.52	0.1678
CS-136	8546	8.617E-002pCi/g	5.071E-002	5.047E-002	2.414E-001	1.162E-001	0.36	0.0507
CS-137	8539	2.853E+001pCi/g	1.519E+000	3.225E-001	1.931E-001	9.202E-002	147.72	1.5188
EU-152	7145	6.155E-001pCi/g	3.994E-001	3.981E-001	1.428E+000	7.051E-001	0.43	0.3994
EU-154	7138	7.701E-001pCi/g	4.669E-001	4.652E-001	2.363E+000	1.142E+000	0.33	0.4669
EU-155	7131	2.663E-001pCi/g	4.397E-001	4.395E-001	1.455E+000	7.218E-001	0.18	0.4397
FE-59	7073	-4.433E-002pCi/g	2.429E-001	2.429E-001	5.165E-001	2.483E-001	-0.09	0.2429
GA-68	18005	-2.186E+000pCi/g	5.044E+000	5.043E+000	1.068E+001	5.136E+000	-0.20	5.0442
GD-153	6824	7.494E-002pCi/g	3.280E-001	3.280E-001	1.088E+000	5.398E-001	0.07	0.3280
HF-181	6495	1.034E-001pCi/g	1.372E-001	1.371E-001	4.695E-001	2.310E-001	0.22	0.1372
HG-203	6466	-1.999E-002pCi/g	7.720E-002	7.719E-002	2.586E-001	1.268E-001	-0.08	0.0772
I-131	6380	1.331E-002pCi/g	1.020E-001	1.020E-001	2.485E-001	1.212E-001	0.05	0.1020
IR-192	6303	2.431E-002pCi/g	1.338E-001	1.338E-001	4.456E-001	2.202E-001	0.05	0.1338
K-40	6148	-8.047E-001pCi/g	2.674E+000	2.674E+000	1.708E+000	7.880E-001	-0.47	2.6744
LA-140	6096	8.073E-002pCi/g	7.575E-002	7.563E-002	1.128E-001	4.852E-002	0.72	0.0757
MN-54	5382	1.764E-002pCi/g	1.033E-001	1.033E-001	2.279E-001	1.093E-001	0.08	0.1033
NA-22	5201	3.114E-002pCi/g	4.610E-002	4.608E-002	1.592E-001	7.327E-002	0.20	0.0461
NB-94	5160	9.861E-002pCi/g	7.976E-002	7.960E-002	2.642E-001	1.280E-001	0.37	0.0798
NB-95	5154	0.000E+000pCi/g	4.536E-002	4.536E-002	2.484E-001	1.199E-001	0.00	0.0454
ND-147	5083	1.353E+000pCi/g	6.646E-001	6.601E-001	1.513E+000	7.312E-001	0.89	0.6646
NP-237	4757	-5.262E-001pCi/g	3.908E-001	3.897E-001	2.736E+000	1.358E+000	-0.19	0.3908
NP-239	4751	-2.565E-001pCi/g	4.286E-001	4.284E-001	1.418E+000	7.037E-001	-0.18	0.4286
PA-231	4541	-5.356E-008pCi/g	3.922E+000	3.922E+000	1.307E+001	6.461E+000	0.00	3.9218
PA-233	4535	-3.806E-003pCi/g	1.397E-001	1.397E-001	1.069E+000	5.284E-001	0.00	0.1397
PA-234	4528	3.080E-001pCi/g	2.599E-001	2.594E-001	5.782E-001	2.820E-001	0.53	0.2599
PA-234M	19453	1.595E+001pCi/g	1.353E+001	1.350E+001	4.482E+001	2.178E+001	0.36	13.5253
PB-210	4467	7.622E+002pCi/g	4.531E+001	7.090E+000	1.361E+001	6.748E+000	55.98	45.3109

PB-212	4454	7.513E-001pCi/g	1.780E-001	1.712E-001	3.711E-001	1.813E-001	2.02	0.1780
PB-214	4448	5.325E-001pCi/g	1.616E-001	1.592E-001	4.404E-001	2.137E-001	1.21	0.1616
PM-144	19585	3.767E-002pCi/g	5.127E-002	5.124E-002	2.457E-001	1.188E-001	0.15	0.0513
PM-146	2464	-3.219E-001pCi/g	2.884E-001	2.879E-001	6.460E-001	3.105E-001	-0.50	0.2884
RH-106	1882	1.934E+000pCi/g	1.280E+000	1.276E+000	4.067E+000	1.996E+000	0.48	1.2804
RU-103	1828	1.121E-001pCi/g	5.519E-002	5.488E-002	1.474E-001	7.024E-002	0.76	0.0552
SB-124	1784	1.132E-001pCi/g	1.399E-001	1.398E-001	3.919E-001	1.923E-001	0.29	0.1399
SB-125	1777	1.076E-001pCi/g	8.679E-002	8.662E-002	8.612E-001	4.211E-001	0.12	0.0868
SC-46	1739	0.000E+000pCi/g	6.229E-002	6.229E-002	4.333E-001	2.118E-001	0.00	0.0623
SN-113	1570	5.394E-002pCi/g	1.424E-001	1.424E-001	4.754E-001	2.336E-001	0.11	0.1424
SN-126	17459	-1.519E+000pCi/g	3.303E+000	3.302E+000	1.090E+001	5.435E+000	-0.14	3.3026
TA-182	1301	-4.896E-001pCi/g	3.452E-001	3.444E-001	1.139E+000	5.530E-001	-0.43	0.3452
TC-99M	17412	0.000E+000pCi/g	1.694E-002	1.694E-002	3.153E-001	1.561E-001	0.00	0.0169
TH-227	1058	7.587E-001pCi/g	1.843E+000	1.843E+000	6.115E+000	3.029E+000	0.12	1.8434
TH-229	1046	-1.629E+000pCi/g	1.554E+000	1.548E+000	3.893E+000	1.910E+000	-0.42	1.5535
TH-234	1027	-4.783E+000pCi/g	1.167E+000	1.140E+000	2.788E+001	1.390E+001	-0.17	1.1667
TL-208	929	3.622E-001pCi/g	9.634E-002	9.449E-002	1.952E-001	9.343E-002	1.86	0.0963
U-235	281	3.472E-001pCi/g	7.050E-001	7.048E-001	2.523E+000	1.250E+000	0.14	0.7050
Y-88	74	-9.672E-003pCi/g	1.010E-002	1.009E-002	2.867E-001	1.382E-001	-0.03	0.0101
ZN-65	31	0.000E+000pCi/g	1.100E-001	1.100E-001	7.843E-001	3.808E-001	0.00	0.1100
ZR-95	7	-5.796E-002pCi/g	1.604E-001	1.604E-001	3.658E-001	1.750E-001	-0.16	0.1604

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity		StdAdded	Recovery	ZFactor
LCS 160-327322~2-A	LCS 160-327322~2-A	CS-137	2.853E+001	pCi/g	2.879E+001	99.09%	-0.1216
		CO-60	1.439E+001	pCi/g	1.447E+001	99.44%	-0.0771
		AM-241	9.289E+001	pCi/g	9.693E+001	95.83%	-0.5747

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Reagent

Tuna Can_00002

Rec'd 2/3/10

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

81427-334

1.0 Liter Sand in 1 Liter HDPE Silgan Jar

Customer: TestAmerica/St. Louis, MO
P.O. No.: 2339090, Item 1
Reference Date: 01-Jan-2010 12:00 PM EST **Grams of Master Source:** 0.017570

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Pb-210	46.5	8.120E+03	———	3.141E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.034E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.606E+05	2.822E+03	0.4	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.471E+04	1.488E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.209E+05	2.124E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.726E+05	4.790E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.672E+05	2.938E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.096E+05	1.926E+03	0.6	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.077E+05	7.163E+03	0.4	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.055E+05	3.611E+03	0.5	1.9	3.9	HPGe
Co-60	1332.5	1.925E+03	2.056E+05	3.612E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.308E+05	7.569E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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)

ACCREDITED SOURCE CALIBRATION LABORATORY — HEALTH PHYSICS SOCIETY — FOUNDED 1956

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta, Georgia 30318

Comments:
1550 grams of sand.
This standard will expire one year after the reference date.

Source Prepared by: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 2/1/10
J. D. McCorvey, QA Manager Alternate

Reagent

Tuna Can_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

90099
1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: TestAmerica St. Louis / Earth City, MO
P.O. No.: 2454150, Item 1
Reference Date: 01-Jan-2012 12:00 PM EST **Grams of Master Source:** 0.017180

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	3.094E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.037E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.677E+05	2.881E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.795E+04	1.511E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.245E+05	2.139E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.707E+05	4.651E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.755E+05	3.015E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.128E+05	1.938E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.228E+05	7.264E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.084E+05	3.580E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	3.581E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.476E+05	7.690E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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:
1550 grams of sand. Homogenous down to 10 grams aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 30 JAN 12
J.D. McCorvey, Counting Room Manager

Reagent

Tuna Can_00006

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

83814-334

1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: Test America St. Louis
P.O. No.: 2395112, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.016927

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. 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.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Pb-210	46.5	8.120E+03	———	3.021E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.090E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	2.873E+03	0.8	2.3	4.9	HPGe
Co-57	122.1	2.718E+02	8.711E+04	1.475E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	2.111E+03	0.5	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	4.660E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	2.994E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	1.877E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.224E+05	7.150E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	3.626E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	3.627E+03	0.6	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	7.570E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **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)

Corporate Office
Laboratory

Comments:
1550 grams of sand. Homogeneous down to 10 gram aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 2/11/11
J. D. McCorvey, QA Manager Alternate

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*, % Type u_A	u_B	U	Reference Date (12:00 PM EST)
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, Radiochemist

QA Approved: J. D. McCorvey, QA Manager Alternate Date: 8/25/11

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

U-232_00040

Standard ID Number:	U-232_00040 (Clean)		Radionuclide:
True Value =	77.177	dpm/mL	U-232
Date Analyzed:	12/20/2017		

	Replicates	
#1	83.23	dpm/mL
#2	76.85	dpm/mL
#3	78.14	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: Rm 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

Sample Name: Ver1 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

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

Batch Name: U232 Clean
AnalysisResultsID: 206424
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

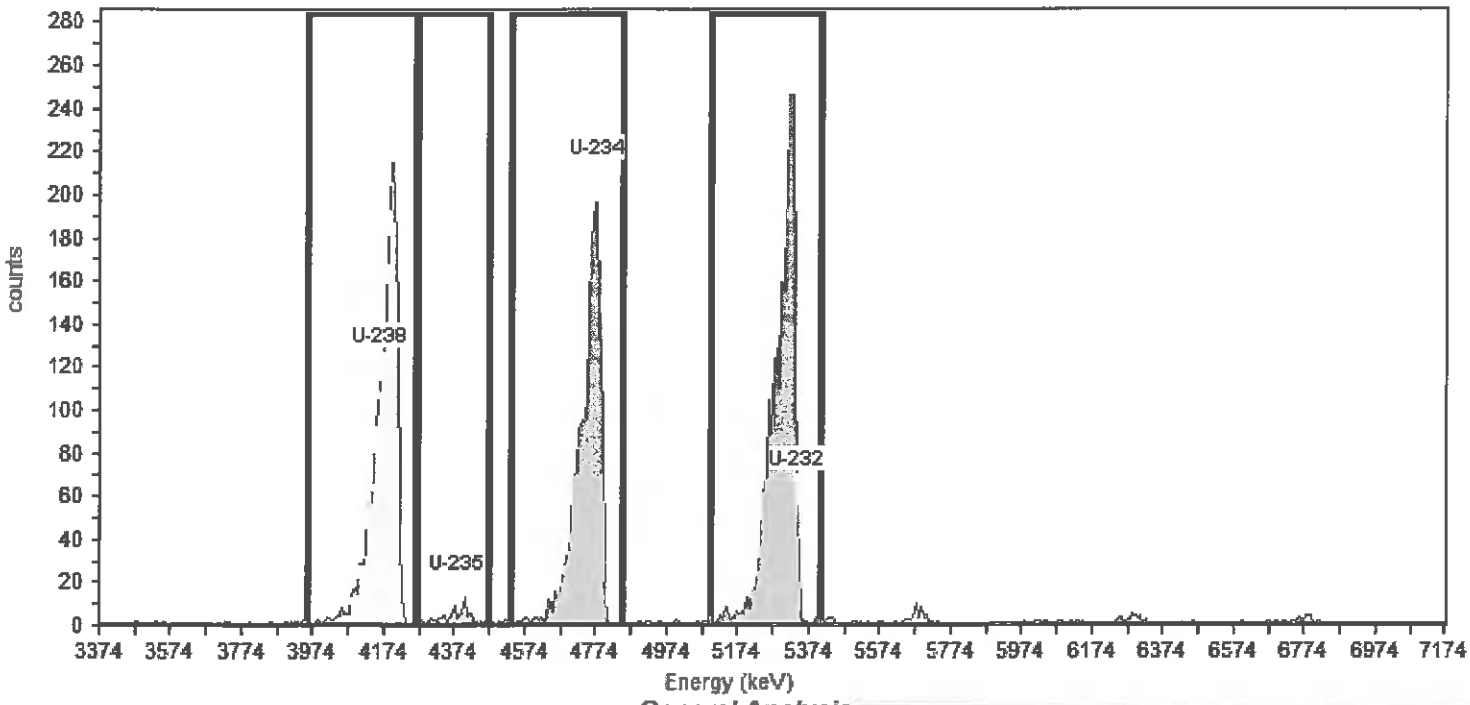
Tracer Name: UNAT_00013
Tracer Activity: 72.26 DPM / mL x (Vol.) 0.10 mL = 7.23 DPM
Tracer Ref. Date: 3/30/2008 11:48:31AM

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 / Ch^2
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: Kα = 1.64 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:51:03AM 12/21/2017

Sample

Sample Name: Ver2 Type: Sample
Spectrum #1 Analysis #1
:
Sample Collection Date:
Comment:

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

Batch Name: U232 Clean
AnalysisResultsID: 206425
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

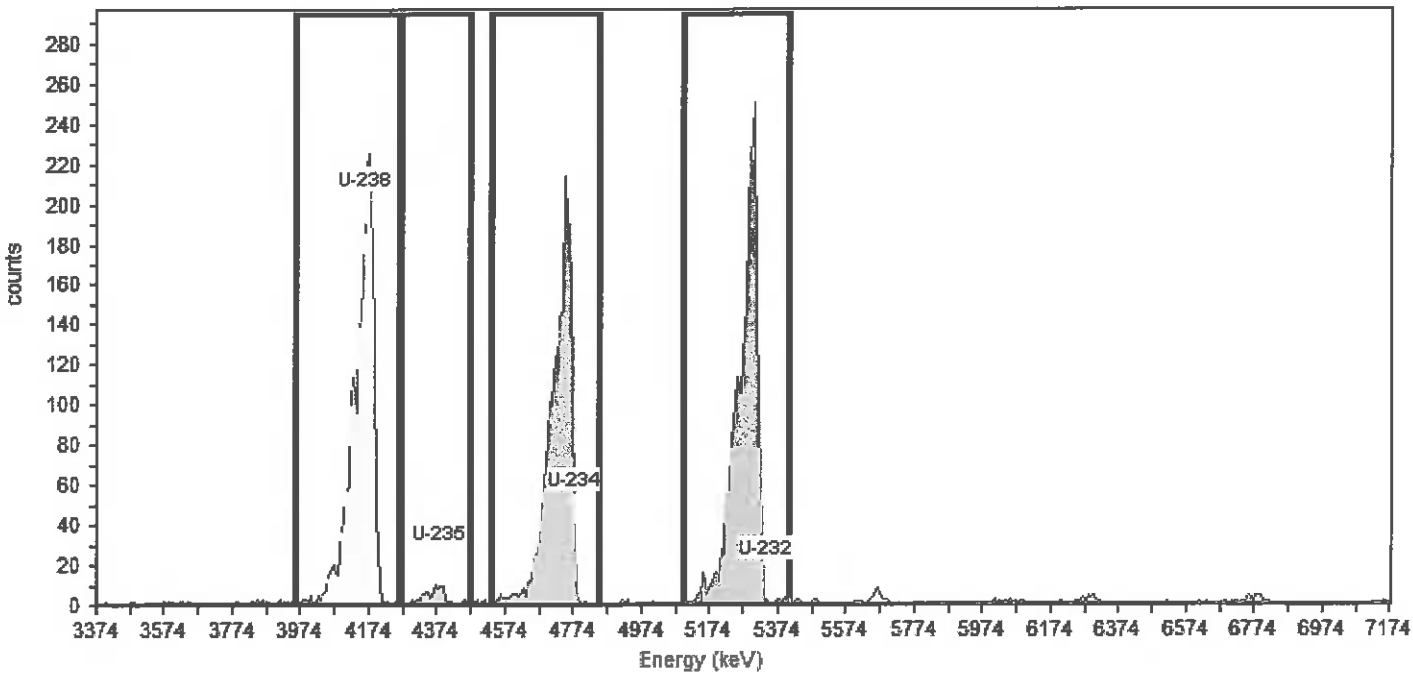
Tracer Name: UNAT_00013
Tracer Activity: 72.26 DPM / mL x (Vol.) 0.10 mL = 7.23 DPM
Tracer Ref. Date: 3/30/2008 11:48:31AM

Tracer Nuclide: U-238
Tracer Recovery: 103.73%

Acquisition

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

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 / Ch^2
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: Kα = 1.64 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:51:36AM 12/21/2017

Sample

Sample Name: Ver3 Type: Sample
Spectrum #1 Analysis #1

Sample Collection Date:
Comment:

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

Batch Name: U232 Clean
AnalysisResultsID: 206426
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

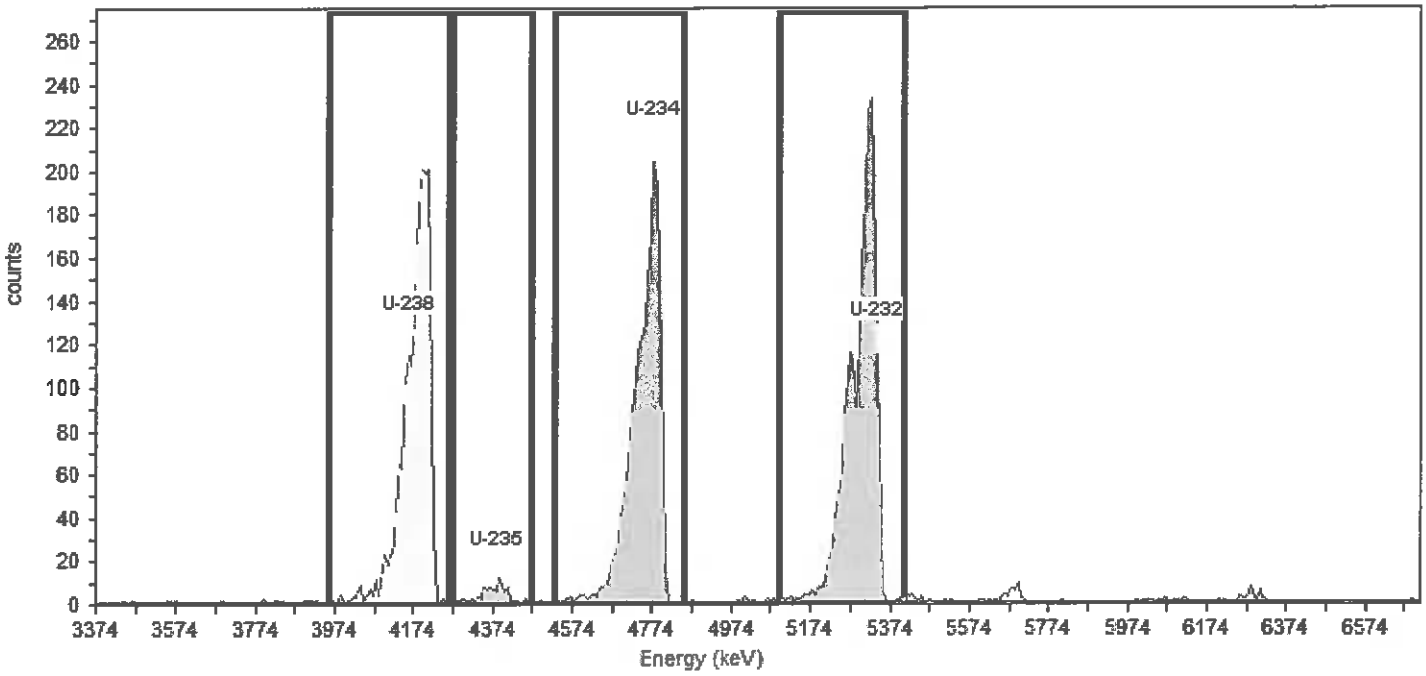
Tracer Name: UNAT_00013
Tracer Activity: 72.26 DPM / mL x (Vol.) 0.10 mL = 7.23 DPM
Tracer Ref. Date: 3/30/2008 11:48:31AM

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 / Ch^2
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: Kα = 1.64 , Kβ = 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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Standard Verification (coppt.)

Batch No. : _____

Balance ID : _____

No.	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	VER. 1	0.1	239	
2	2	1	240	
3	3		242	
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

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

Tracer ☐ N/A

Initials / Date

Isotope : UNAT
Std Sol'n No. : UNAT-00013
Vol (mL) : 0.1
Ref Activity (dpm/mL) : _____
Act Ref Date : _____

Samples Spiked and Traced By:
SLB 12/19/17
Initials / Date

Verification Signature & Date:
[signature] 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) : 82.245
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_2O ☐

Prepared By : _____
Date : _____

Reviewed by: _____
Date: _____

\\Slsvr01\RAD\MasterForms\RAD-0045 Rev(3)

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

U-232 Clean Tracer VER.

Standard Verification ONLY

Batch No. : _____

(COPPA) Balance ID : _____

No.	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	VER. 1 LC²: 136	0.1	235	LC: 247
2	1 2 LC²: 137	1	237	LC: 248 Sh,ST
3	1 3 LC²: 138	1	238	LC: 249
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

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

Tracer ☐ N/A

Initials / Date

Clean

Isotope : U-232

Std Sol'n No. : U-232-000140

Vol (mL) : 0.1

Ref Activity (dpm/mL) : 82.245

Act Ref Date : 08-25-11

Samples Spiked and Traced By:

SNB 12/19/17
Initials / Date

Verification Signature & Date:

DAM 12/19/17
Initials / Date

LCS Standard ☐ N/A

Initials / Date

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_2O ☐

Prepared By : _____

Date : _____

Reviewed by: _____

Date: _____

\\Slsvr01\RAD\MasterForms\RAD-0045 Rev(3)

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:04:10AM 12/28/2017

Sample

Sample Name: Verification 1
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: 718500

Analyst: 60040

Tracer

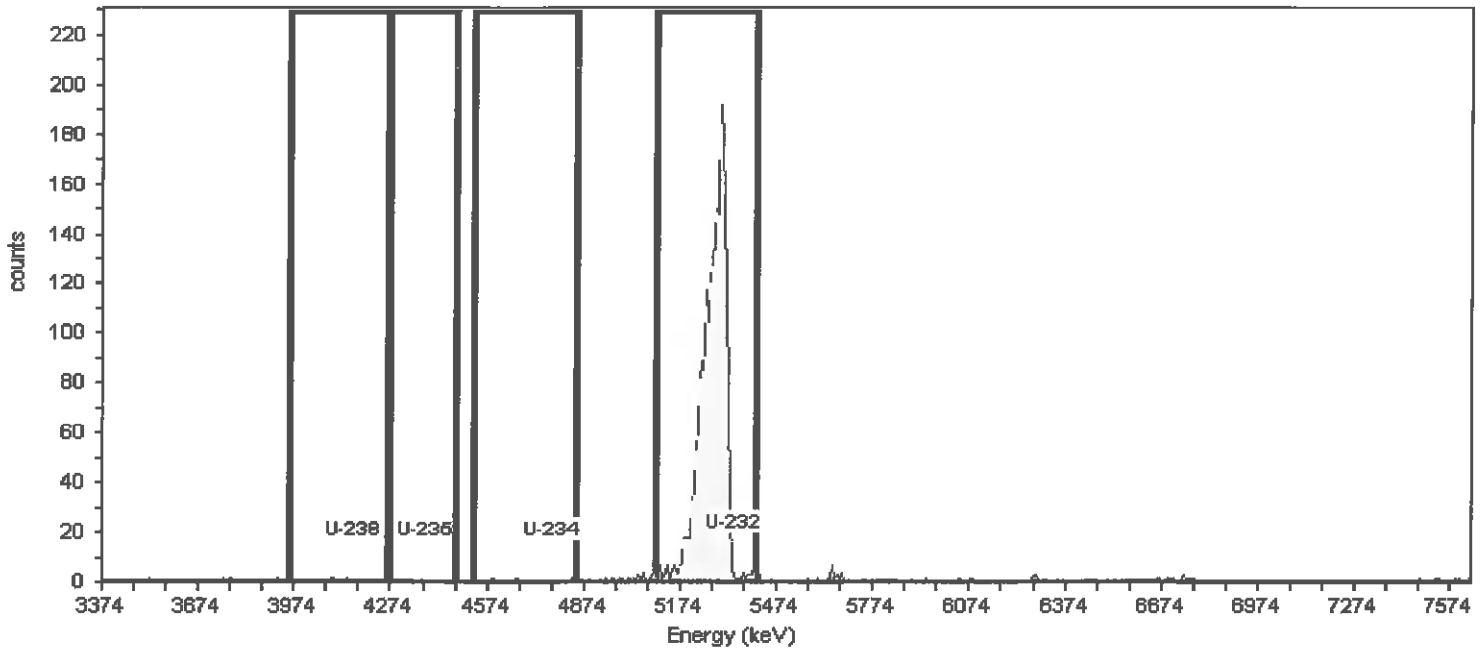
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.10 mL = 8.22 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232
Tracer Recovery: 104.22%

Acquisition

Detector: AV136
Serial Number: 49-169O2
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
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:04:25AM 12/28/2017

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

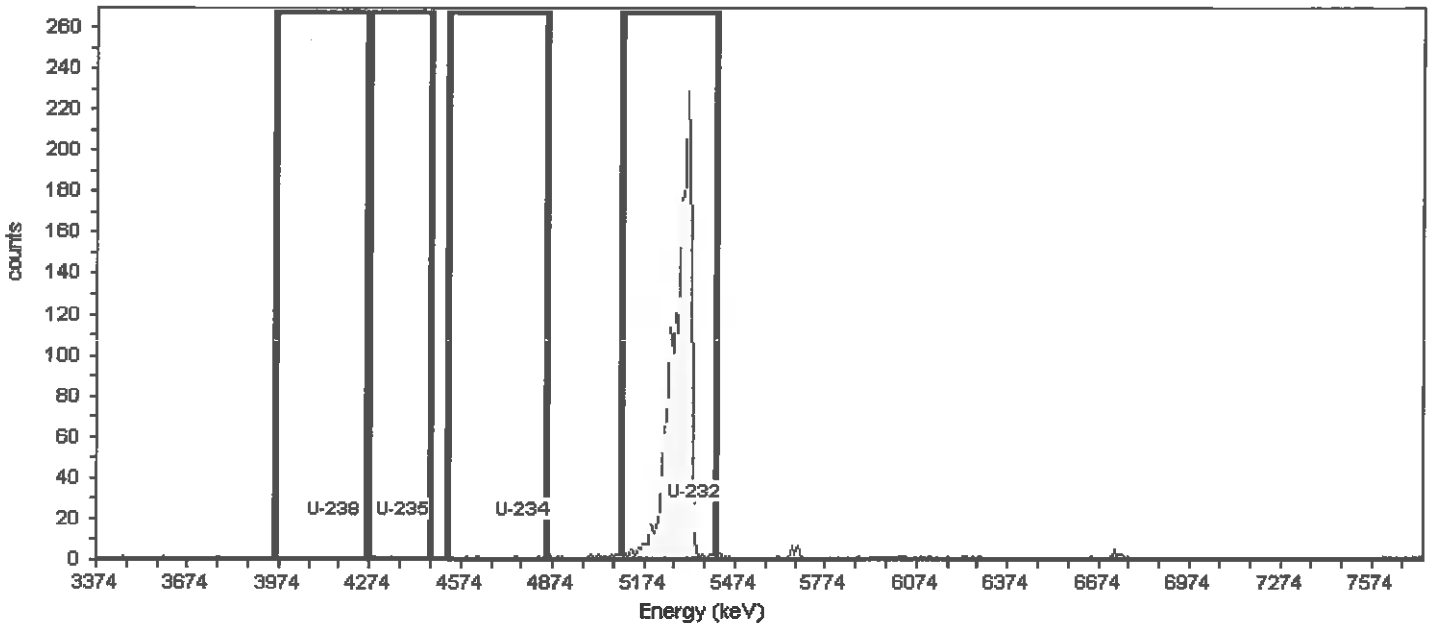
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.10 mL = 8.22 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

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
Energy Cal: Gain = 7.4575 keV / Ch
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:04:39AM 12/28/2017

Sample

Sample Name: Verification 3
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: 718501

Analyst: 60040

Tracer

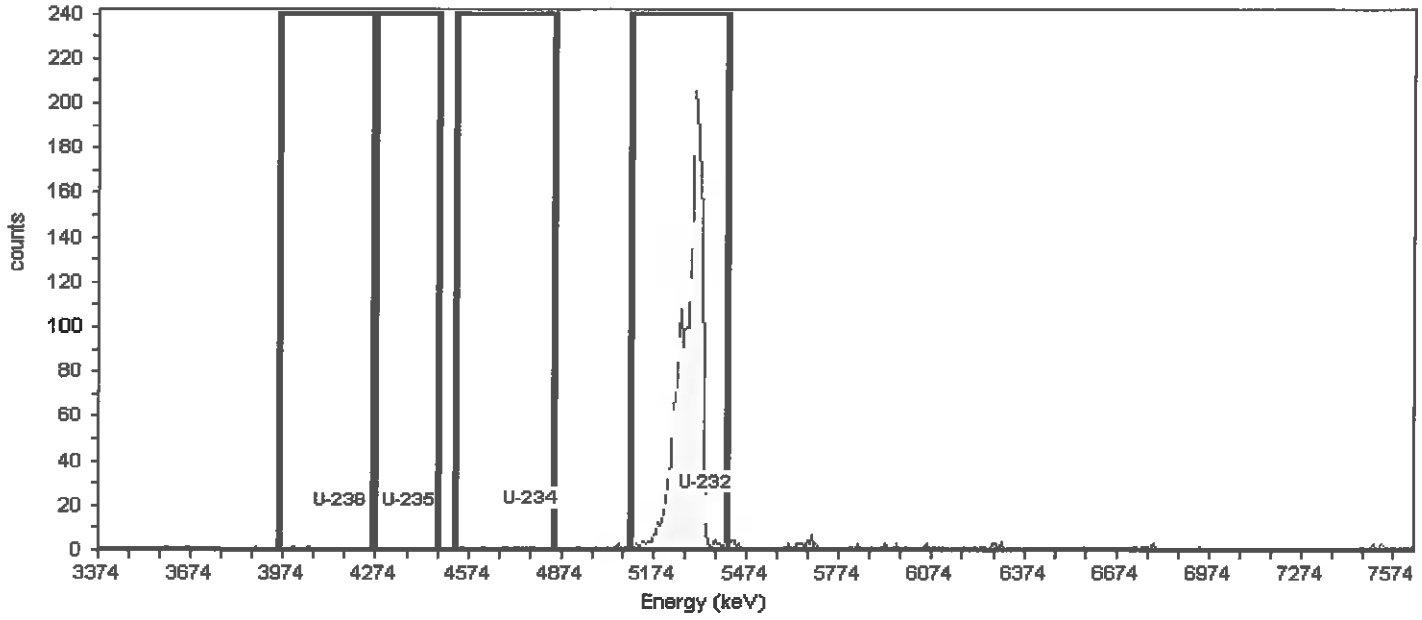
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.10 mL = 8.22 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232
Tracer Recovery: 104.17%

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
Energy Cal: Gain = 7.4575 keV / Ch
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: Kα = 1.65 , Kβ = 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 ± 0.0000011 g U/g solution**
[10.1356 mg U/g solution ± 0.0011 mg U/g solution]

	$^{234}U/^{238}U$	$^{235}U/^{238}U$
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
marrss
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 $U = k*u_c$, where u_c is the

September 30, 2010
Argonne, Illinois

www.nbl.doe.gov

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 μg 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.

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: Rm 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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:33:28PM 12/15/2017

Sample

Sample Name: Verification 1
SampleType: Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Sample Collection Date:

Batch

Batch Name: U-232_00039
AnalysisID: 717874

Analyst: 60040

Tracer

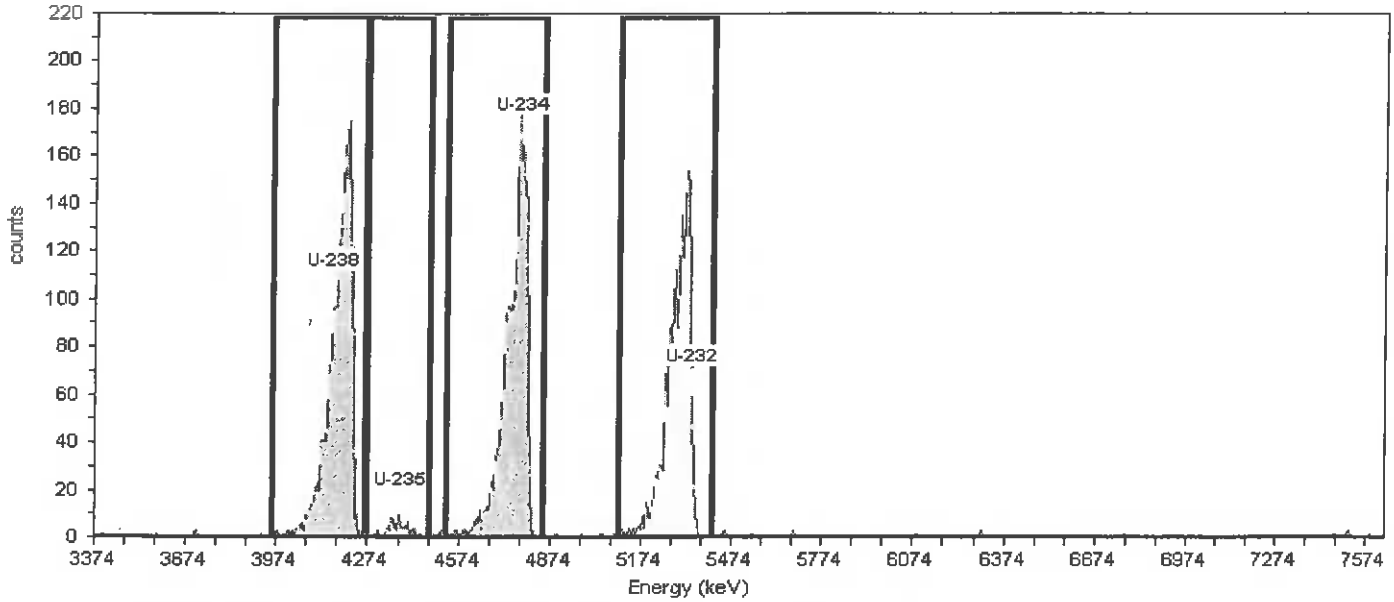
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

Tracer Nuclide: U-232
Tracer Recovery: 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
Energy Cal: Gain = 7.4575 keV / Ch
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:33:58PM 12/15/2017

Sample

Sample Name: Verification 2
SampleType: Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Sample Collection Date:

Batch

Batch Name: U-232_00039
AnalysisID: 717875

Analyst: 60040

Tracer

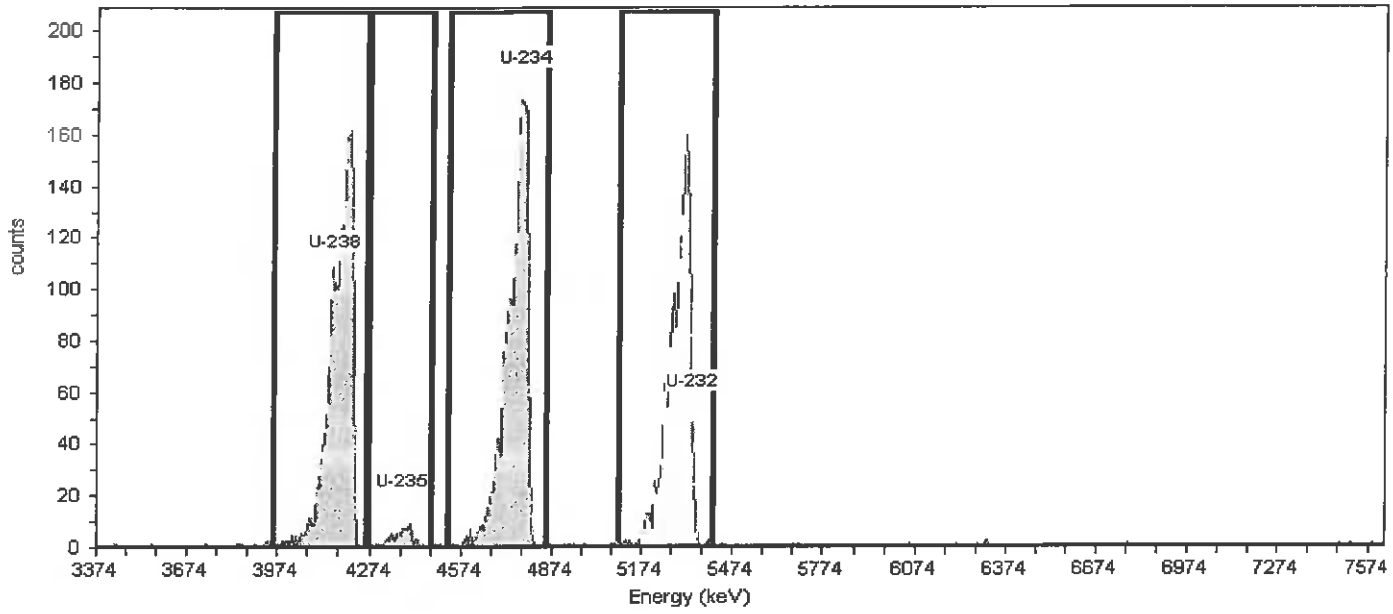
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

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
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:34:11PM 12/15/2017

Sample

Sample Name: Verification 3
SampleType: Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Sample Collection Date:

Batch

Batch Name: U-232_00039
AnalysisID: 717876

Analyst: 60040

Tracer

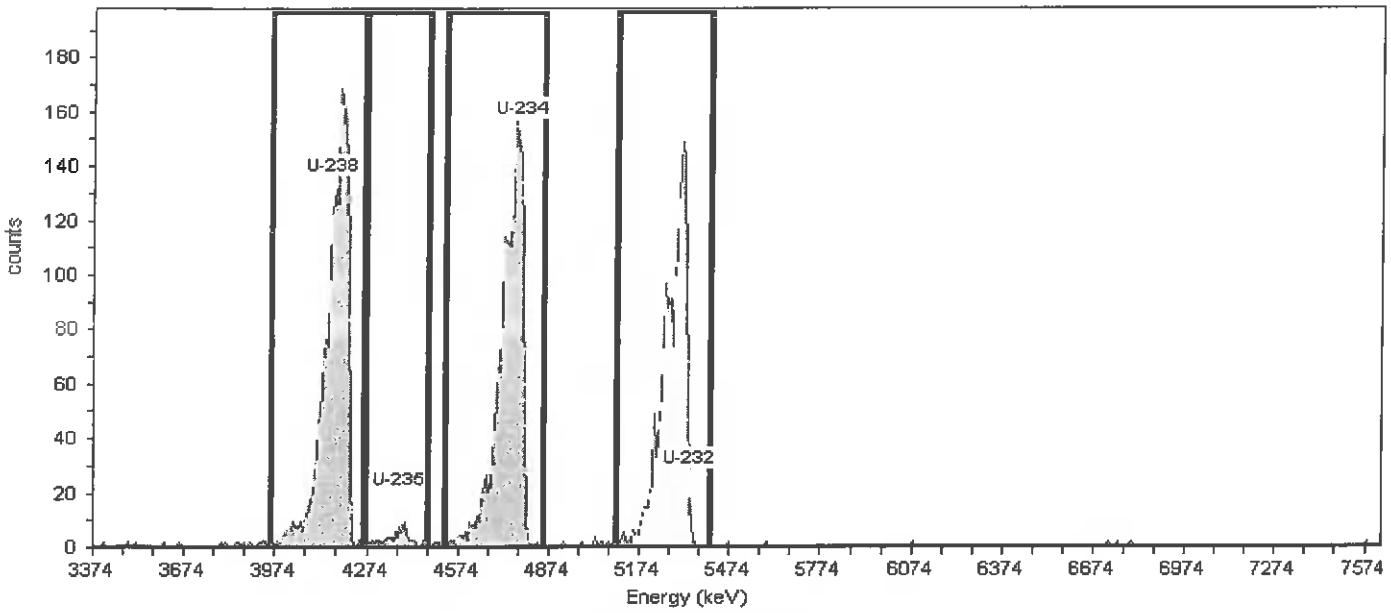
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

Tracer Nuclide: U-232
Tracer Recovery: 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
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

UNAT_00013

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

testAmerica
THE LEADER IN ENVIRONMENTAL TESTING

U-232 Tracer Ver.

Aliquot Only

Batch No.

Balance ID :

No.	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	Ver 1	0.1	113	DC = 118
2	2	1	116	1 = 119
3	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				

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

Tracer ☐ N/A (Initials / Date)

Isotope : UNAT
Std Sol'n No. : UNAT-00013
Vol (mL) : 0.1
Ref Activity (dpm/mL) : 72.2650 (U-238)
Act Ref Date : 3-30-08
New Brunswick

Samples Spiked and Traced By: SMB 11/22/17 (Initials / Date)

Verification Signature & Date: amm 11/22/2017 (Initials / Date)

LCS Standard ☐ N/A (Initials / Date)

Isotope : U-232 Uncert
Std Sol'n ID. : U-232-00039
Vol (mL) : 0.1
Ref Activity (dpm/mL) : 77.476
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	Matrix
Long Count ☐	Soil ☐
Short Count ☐	H_2O ☐

Prepared By : _____
Date : _____

Reviewed by: _____
Date: _____

\\Slsvr01\RAD\MasterForms\RAD-0045 Rev(3)

Uranium only via UTEVA

Batch: ST-RC-0238

*All rinses should flow at 1 mL/minute unless 2M HNO_3 may be done at 3 mL/minute)

UTEVA lot: UTSR17E

11.4.4 UTEVA cartridge

11.4.5 5mL 2M HNO_3 COMPLETED

11.4.6 Load 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

Form: RAD-0060, Revised 09/17/13

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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:33:28PM 12/15/2017

Sample

Sample Name: Verification 1
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_00039
AnalysisID: 717874

Analyst: 60040

Tracer

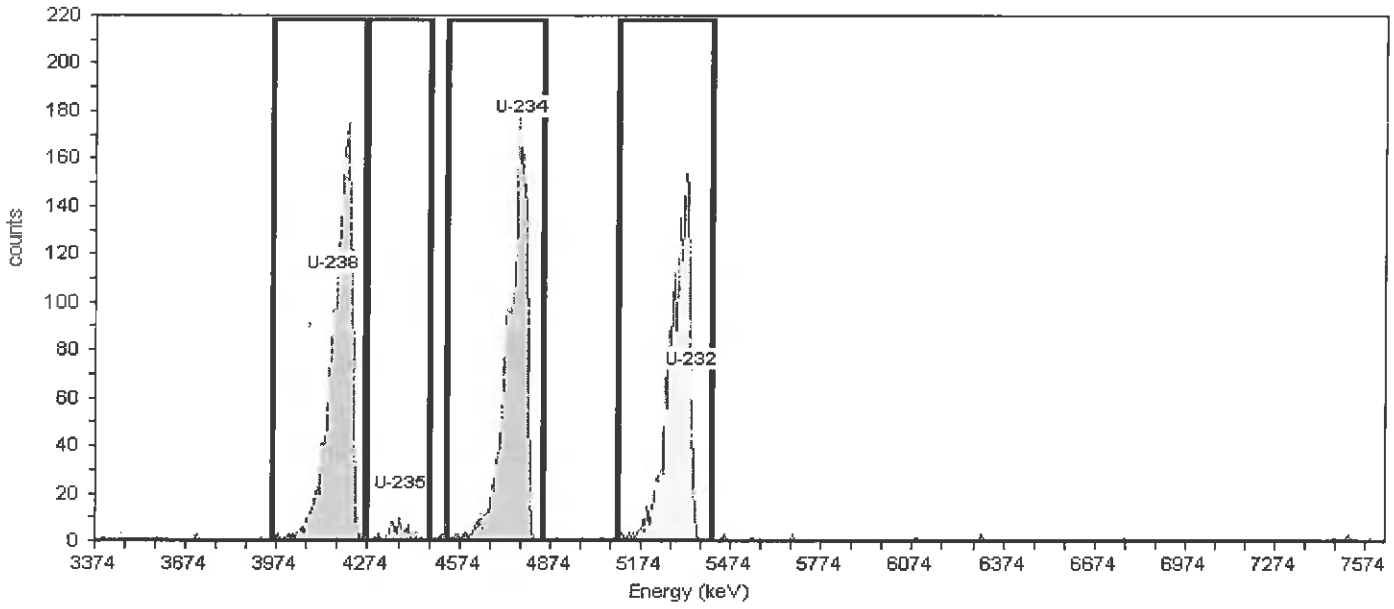
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

Tracer Nuclide: U-232
Tracer Recovery: 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
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:33:58PM 12/15/2017

Sample

Sample Name: Verification 2
SampleType: Sample

Spectrum #1 Analysis #1
Sample Volume : 0.1000mL
Aliquot: N/A Aliquot Fraction: N/A

Sample Collection Date:

Batch

Batch Name: U-232_00039
AnalysisID: 717875

Analyst: 60040

Tracer

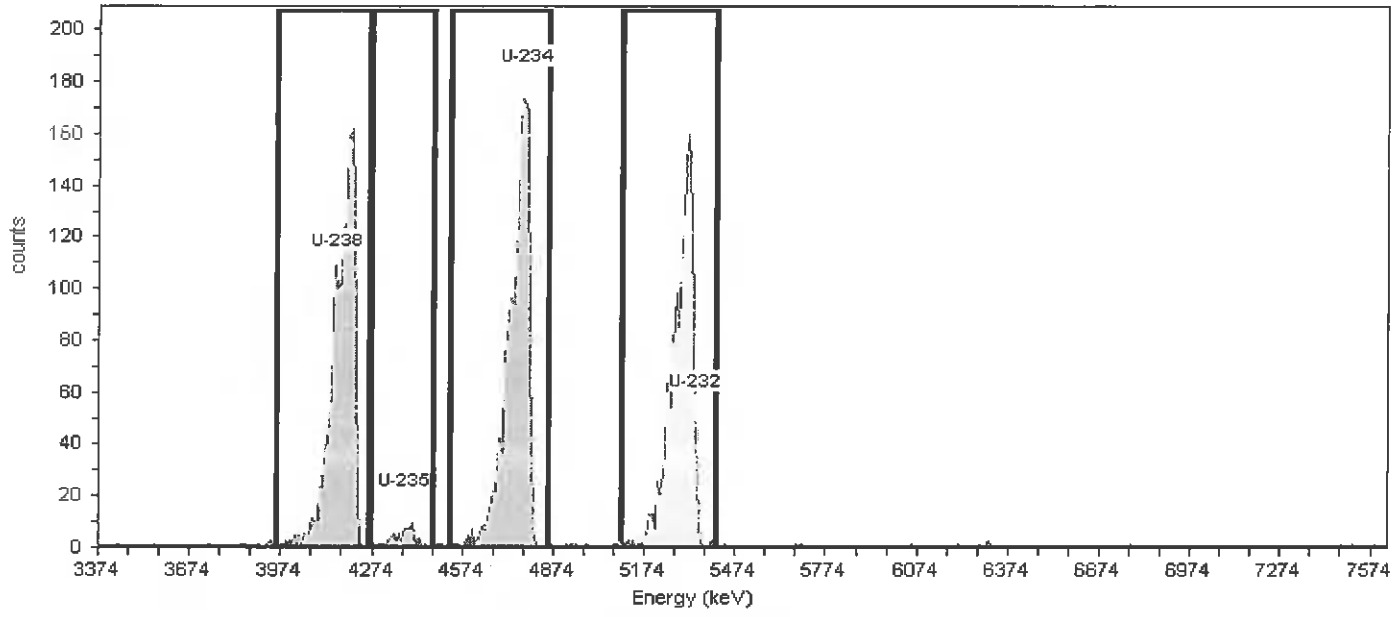
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

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
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:34:11PM 12/15/2017

Sample

Sample Name: Verification 3
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_00039
AnalysisID: 717876

Analyst: 60040

Tracer

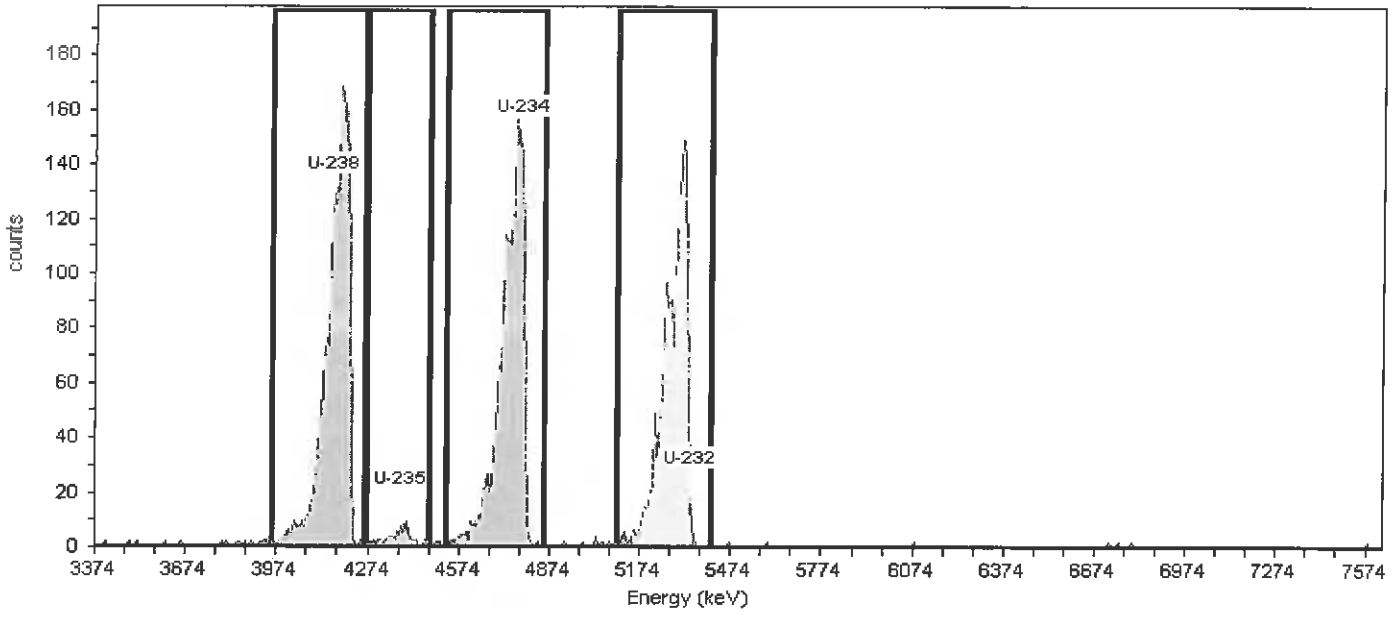
Tracer Name: U-232_00039
Tracer Activity: 77.48 DPM/mL x (Vol.)0.10 mL = 7.75 DPM
Tracer Ref. Date: 4/7/2003 11:00:47PM

Tracer Nuclide: U-232
Tracer Recovery: 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
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
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: Kα = 1.65 , Kβ = 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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING



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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

U-232 Tracer Ver.

Aliquot Only

Batch No. :

960 wks

Balance ID :

No.	Sample Number	Aliquot (g / mL)	Crucible ID	Dilution
1	Ver 1	0.1	113	QC = 118
2	2	1	116	= 119
3	3	1	117	= 120
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

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

Tracer ☐ N/A

Initials / Date

Isotope : UNAT

Std Sol'n No. : UNAT-00013

Vol (mL) : 0.1

Ref Activity (dpm/mL) : 72.2650 (0.235)

Act Ref Date : 3-30-05

New Brunswick

Samples Spiked and Traced By:

SAB 11/22/17

Initials / Date

Verification Signature & Date:

amm 11/22/2017

Initials / Date

LCS Standard ☐ N/A

Initials / Date

Isotope : U-232 UNCRAN

Std Sol'n ID. : U-232-00039

Vol (mL) : 0.1

Ref Activity (dpm/mL) : 77.47 ±

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	Matrix
Long Count ☐	Soil ☐
Short Count ☐	H_2O ☐

Prepared By : _____

Date : _____

Reviewed by: _____

Date: _____

Uranium only via UTEVA

ST-RC-0238

Batch:

*All stages should flow at 1 mL/minute (only 2M HNO3 may be done at 3 mL/minute)

UTEVA lot: UTSR17E

11.4.4 UTEVA cartridge

11.4.5 5mL 2M HNO_3 — COMPLETED

11.4.6 Load 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

Form: RAD-0060, Revised 09/17/13

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29521-1

SDG No.:

Project: Former Carnotite Site - Non-Rad Analysis

Client Sample ID	Lab Sample ID
CRC-B9-1416	160-29521-1
CRC-B9-2022	160-29521-2
CRC-B6-1618	160-29521-3
CRC-B6-2426	160-29521-4
CRC-B3-0204	160-29521-5
CRC-B3-0608	160-29521-6
CRC-B3-1618	160-29521-7
CRC-B13-0305	160-29521-8
CRC-B13-0608	160-29521-9
CRC-B15-0204	160-29521-10
CRC-B15-0608	160-29521-11
CRC-B15-1214	160-29521-12
CRC-B16-0608	160-29521-13
CRC-B16-0204	160-29521-14
CRC-B16-1416	160-29521-15
CRC-B18-0204	160-29521-16
CRC-B18-0608	160-29521-17
CRC-B18-0809	160-29521-18
CRC-B19-0204	160-29521-19
CRC-B19-0810	160-29521-20
CRC-B19-1618	160-29521-21
CRC-B19-2224	160-29521-22

Comments:

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29521-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture RL Date: 01/28/2011 14:43

Analyte	Wavelength/ Mass	RL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job Number: 160-29521-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture XRL Date: 01/28/2011 14:42

Analyte	Wavelength/ Mass	XRL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: Moisture

Start Date: 07/17/2018 22:33 End Date: 07/17/2018 22:33

Lab Sample Id	D/F	Type	Time	Analytes																										
				% Sol	Moist																									
ZZZZZZ			22:33																											
ZZZZZZ			22:33																											
ZZZZZZ			22:33																											
ZZZZZZ			22:33																											
ZZZZZZ			22:33																											
ZZZZZZ			22:33																											
ZZZZZZ			22:33																											
ZZZZZZ			22:33																											
ZZZZZZ			22:33																											
ZZZZZZ			22:33																											
160-29521-1	1	T	22:33	X	X																									
160-29521-2	1	T	22:33	X	X																									
160-29521-3	1	T	22:33	X	X																									
160-29521-4	1	T	22:33	X	X																									
160-29521-5	1	T	22:33	X	X																									
160-29521-6	1	T	22:33	X	X																									
160-29521-7	1	T	22:33	X	X																									
160-29521-8	1	T	22:33	X	X																									
160-29521-9	1	T	22:33	X	X																									
160-29521-10	1	T	22:33	X	X																									
160-29521-11	1	T	22:33	X	X																									
160-29521-12	1	T	22:33	X	X																									
160-29521-13	1	T	22:33	X	X																									
160-29521-14	1	T	22:33	X	X																									
160-29521-15	1	T	22:33	X	X																									
160-29521-16	1	T	22:33	X	X																									
160-29521-17	1	T	22:33	X	X																									
160-29521-18	1	T	22:33	X	X																									
160-29521-19	1	T	22:33	X	X																									
160-29521-20	1	T	22:33	X	X																									
160-29521-21	1	T	22:33	X	X																									
160-29521-22	1	T	22:33	X	X																									
160-29521-22 DU	1	T	22:33	X	X																									

Prep Types:
T = Total/NA

FORM XIII-IN

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 376375 Batch Start Date: 07/17/18 23:15 Batch Analyst: Braatz, Steve D

Batch Method: Moisture Batch End Date: 07/18/18 18:13

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
160-29521-B-1	CRC-B9-1416	Moisture	T	11	1.0117 g	17.7359 g	14.4553 g		
160-29521-A-2	CRC-B9-2022	Moisture	T	12	1.0322 g	20.5519 g	16.2221 g		
160-29521-A-3	CRC-B6-1618	Moisture	T	13	1.0368 g	17.3644 g	13.9183 g		
160-29521-A-4	CRC-B6-2426	Moisture	T	14	1.0041 g	19.1598 g	15.1338 g		
160-29521-A-5	CRC-B3-0204	Moisture	T	15	1.0308 g	23.6748 g	20.6031 g		
160-29521-A-6	CRC-B3-0608	Moisture	T	16	1.0526 g	13.9106 g	12.9546 g		
160-29521-A-7	CRC-B3-1618	Moisture	T	17	1.0308 g	18.1243 g	14.3542 g		
160-29521-A-8	CRC-B13-0305	Moisture	T	18	1.0428 g	22.7852 g	20.1707 g		
160-29521-A-9	CRC-B13-0608	Moisture	T	19	1.0140 g	13.6913 g	13.1423 g		
160-29521-A-10	CRC-B15-0204	Moisture	T	20	1.0288 g	15.6757 g	14.0368 g		
160-29521-A-11	CRC-B15-0608	Moisture	T	21	1.0434 g	14.3722 g	13.8974 g		
160-29521-A-12	CRC-B15-1214	Moisture	T	22	1.0666 g	16.8429 g	14.0551 g		
160-29521-A-13	CRC-B16-0608	Moisture	T	23	1.0461 g	19.9962 g	19.3025 g		
160-29521-A-14	CRC-B16-0204	Moisture	T	24	1.0316 g	19.0570 g	17.5752 g		
160-29521-B-15	CRC-B16-1416	Moisture	T	25	1.0380 g	17.5559 g	14.3822 g		
160-29521-A-16	CRC-B18-0204	Moisture	T	26	1.0304 g	17.0496 g	15.6983 g		
160-29521-B-17	CRC-B18-0608	Moisture	T	27	1.0460 g	14.0038 g	11.9932 g		
160-29521-B-18	CRC-B18-0809	Moisture	T	28	1.0667 g	13.9711 g	11.5490 g		
160-29521-B-19	CRC-B19-0204	Moisture	T	29	1.0444 g	16.4151 g	14.6409 g		
160-29521-A-20	CRC-B19-0810	Moisture	T	30	1.0315 g	17.7589 g	15.3298 g		
160-29521-A-21	CRC-B19-1618	Moisture	T	31	1.0158 g	14.8194 g	12.4146 g		
160-29521-B-22	CRC-B19-2224	Moisture	T	32	1.0186 g	25.4219 g	20.8333 g		
160-29521-B-22 DU	CRC-B19-2224	Moisture	T	33	1.0597 g	18.6688 g	15.3701 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 St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 376375 Batch Start Date: 07/17/18 23:15 Batch Analyst: Braatz, Steve D

Batch Method: Moisture Batch End Date: 07/18/18 18:13

Batch Notes	
Balance ID	0034150065
Batch Comment	TRAY A
Date samples were placed in the oven	07/17/2018
Oven Temp In	103.0 Degrees C
Time samples were place in the oven	23:15
Date samples were removed from oven	07/18/2018
Oven Temp Out	103.1 Degrees C
Time Samples were removed from oven	18:13
Oven ID	OA
Thermometer ID	A142186

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 SPECTROSCOPY

Method A-01-R Th

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

Prep Batch: 377729

Preparation, Extraction Chromatography Resin Actinide Separation

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 377729

Lab ID: MB 160-377729/1-A
Client ID:
Sigma: 2
Analyzed: 08/04/18 14:31
Detector: AV7
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	-0.01242	0.0892	0.0893	U	pCi/g	1.00	0.141	380567

Tracer	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	6.082	0.516	0.726		pCi/g	0.0667	6.05	100	30 - 110

Lab ID: LCS 160-377729/2-A
Client ID:
Sigma: 2
Analyzed: 08/04/18 14:30
Detector: AV8
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	22.98	1.39	2.38		pCi/g	1.00	0.240	380576

Tracer	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	11.33	0.938	1.34		pCi/g	0.132	12.1	93.5	30 - 110

Lab ID: 490-155782-F-2-F DU
Client ID:
Sigma: 2
Analyzed: 08/04/18 14:30
Detector: AV10
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Thorium-230	1.147	0.288	0.303		pCi/g	1.00	0.184	380507

Tracer	DU Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.290	0.430	0.561		pCi/g	0.0656	6.09	70.5	30 - 110

Lab ID: 160-29521-1
Client ID: CRC-B9-1416
Sigma: 2
Analyzed: 08/04/18 14:31
Detector: AV24
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	0.408	0.169	0.172		pCi/g	1.00	0.153	380546

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	6.04	0.526	0.731		pCi/g	0.0773	6.11	99.0	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 377729

Lab ID: 160-29521-2
Client ID: CRC-B9-2022
Sigma: 2

Analyzed: 08/04/18 14:30
Detector: AV43
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	0.382	0.162	0.165		pCi/g	1.00	0.144	380549

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.74	0.497	0.692		pCi/g	0.0322	6.09	94.2	30 - 110

Lab ID: 160-29521-3
Client ID: CRC-B6-1618
Sigma: 2

Analyzed: 08/04/18 14:30
Detector: AV44
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	0.406	0.167	0.170		pCi/g	1.00	0.145	380550

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.77	0.418	0.579		pCi/g	0.0417	6.07	78.6	30 - 110

Lab ID: 160-29521-4
Client ID: CRC-B6-2426
Sigma: 2

Analyzed: 08/04/18 14:30
Detector: AV45
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	0.391	0.162	0.165		pCi/g	1.00	0.142	380551

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.79	0.415	0.578		pCi/g	0.0581	6.04	79.3	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 160-377729/1-A	Thorium-230			-0.01242	U	pCi/g							-.2782733

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-377729/2-A	Thorium-230		24.5	22.98		pCi/g	94	81 - 118					-.8710231 191

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
490-155782-F-2-F DU	Thorium-230	0.719		1.147		pCi/g			46	0.78	2.20	1	

Glossary:

Ts = Count Duration, Sample

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 377729 Batch Start Date: 07/24/18 17:17 Batch Analyst: Turley, Taylor A

Batch Method: ExtChrom Batch End Date: 08/03/18 20:27

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	Th-229 00023	TRM-2 00002			
MB 160-377729/1		ExtChrom, A-01-R		1 g	0.2 mL				
LCS 160-377729/2		ExtChrom, A-01-R		0.4993 g	0.2 mL	0.4993 g			
490-155782-F-2-A DU		ExtChrom, A-01-R	T	0.9947 g	0.2 mL				
160-29521-B-1-B	CRC-B9-1416	ExtChrom, A-01-R	T	0.9916 g	0.2 mL				
160-29521-B-2-A	CRC-B9-2022	ExtChrom, A-01-R	T	0.9936 g	0.2 mL				
160-29521-B-3-A	CRC-B6-1618	ExtChrom, A-01-R	T	0.9975 g	0.2 mL				
160-29521-A-4-B	CRC-B6-2426	ExtChrom, A-01-R	T	1.0027 g	0.2 mL				

Batch Notes	
Balance ID	1123433897
Analyst ID - Column	NMN per CMM
Column Date	08/01/2018
Analyst ID - CoPrecipitation	CMM
CoPrecipitation Date	08/03/2018
Pipette ID	RAD117
Analyst ID - Reagent Drop Witness	TAT per CMM
Analyst ID - Reagent Drop	CMM
SOP Number	ST-RC-0003, ST-RC-0004, 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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:31:50PM 8/4/2018

Sample

Sample Name: MB 160-377729/1-A
SampleType: Blank
: MB 160-377729/1-A
Sample Collection Date: 8/3/2018 8:28:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0000g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377729
AnalysisID: 735901

Analyst: 60040

Tracer

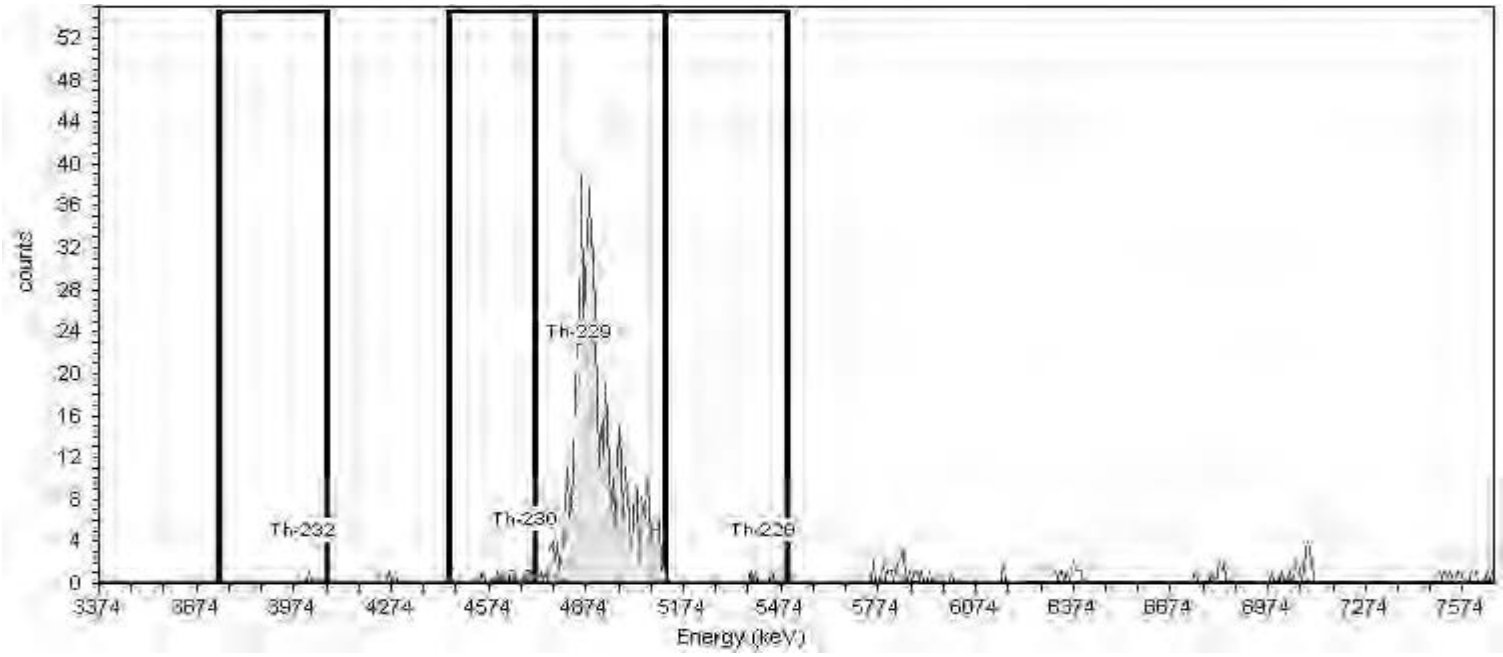
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 100.45%

Acquisition

Detector: AV7
Serial Number: 48-158EE5
Acquisition Start Date: 8/4/2018 2:31:14PM
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
Energy Cal: 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: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/4/2018 2:26:21PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	42.4	100.2	1	0.7500	0.25	0.003	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	22.9	99.7	8	0.3750	7.63	0.083	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	77.4	99.6	557	0.7500	556.44	6.084	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	.0	99.8	3	1.6713	1.52	0.017	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:32:08PM 8/4/2018

Sample

Sample Name: LCS 160-377729/2-A
SampleType: Control
: LCS 160-377729/2-A
Sample Collection Date: 8/3/2018 8:28:00PM

Spectrum #1 Analysis #1
Sample Weight : 0.4993g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377729
AnalysisID: 735903

Analyst: 60040

Tracer

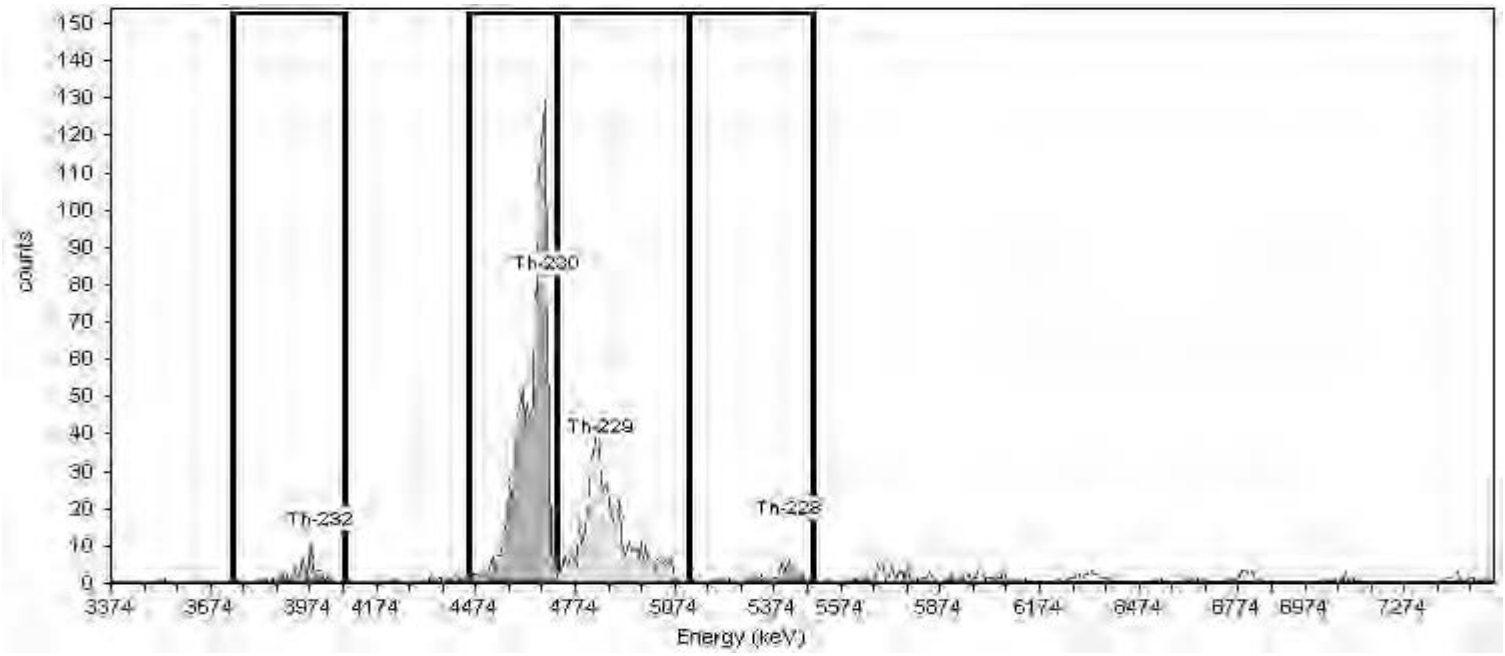
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 93.47%

Acquisition

Detector: AV8
Serial Number: 41-137Q6
Acquisition Start Date: 8/4/2018 2:30:44PM
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
Energy Cal: 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: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/4/2018 2:26:19PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	63.6	100.2	55	0.3750	54.63	1.126	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	23.6	99.7	1116	1.8750	1113.91	23.078	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	89.8	99.6	586	1.1250	584.97	11.338	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	78.3	99.8	45	0.7500	44.25	0.916	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:32:44PM 8/4/2018

Sample

Sample Name: 490-155782-F-2-F DU
SampleType: Sample
: 490-155782-F-2-F DU
Sample Collection Date: 7/16/2018 9:55:00AM

Spectrum #1 Analysis #1
Sample Weight : 0.9947g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377729
AnalysisID: 735907

Analyst: 60040

Tracer

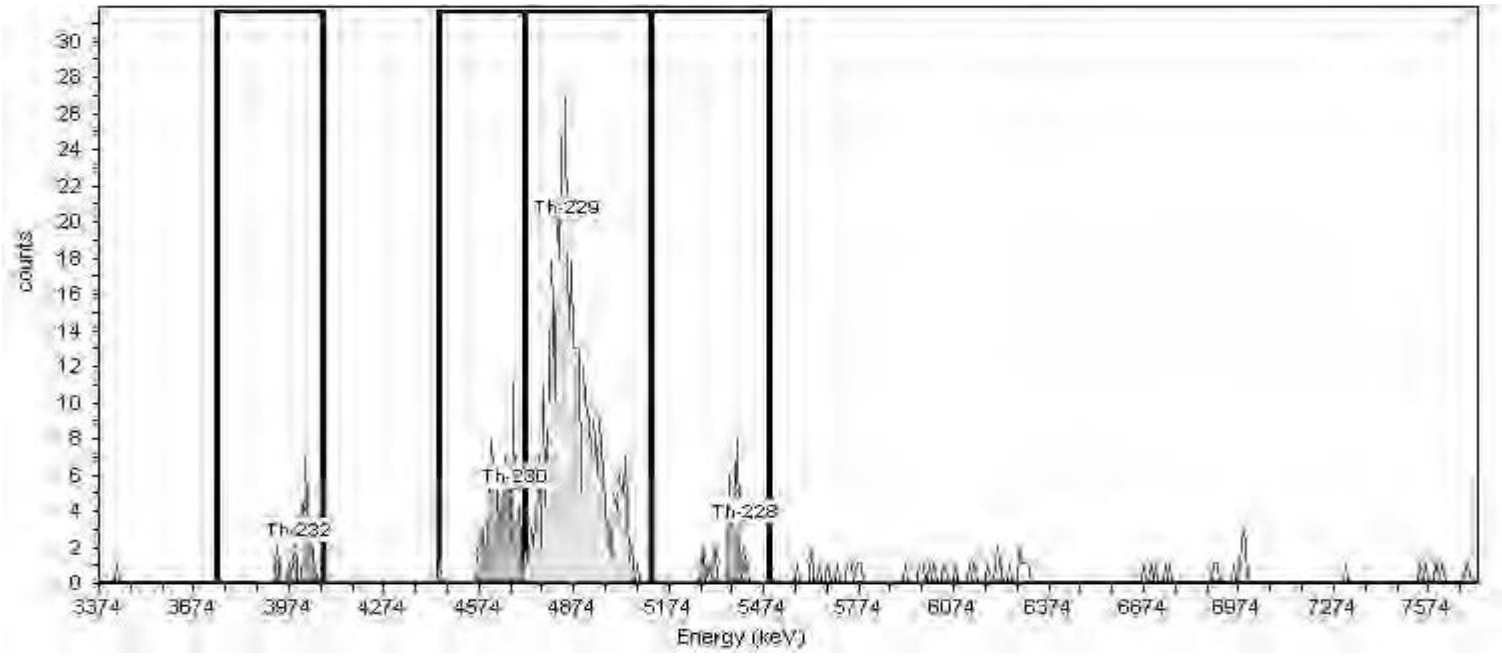
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 70.48%

Acquisition

Detector: AV10
Serial Number: 49-155N2
Acquisition Start Date: 8/4/2018 2:30:46PM
Live Time: 180.00 min.
Real Time: 180.01 min.
Background Date: 7/12/2018 1:39:32PM
Background Info: Sample: ICB;AV10; Det: AV10; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-9885;AV10-05142018
Calibration Date: 5/14/2018 6:26:57PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 23.49% +/- 0.35% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/4/2018 2:26:19PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	18.6	100.2	22	0.1875	21.81	0.331	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	14.6	99.7	83	1.1250	81.54	1.242	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	100.3	99.6	400	0.7500	399.22	4.292	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	44.6	99.8	34	1.5000	32.50	0.495	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:32:35PM 8/4/2018

Sample

Sample Name: 160-29521-B-1-D
SampleType: Sample
: 160-29521-B-1-D
Sample Collection Date: 7/12/2018 8:00:00AM

Spectrum #1 Analysis #1
Sample Weight : 0.9916g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377729
AnalysisID: 735906

Analyst: 60040

Tracer

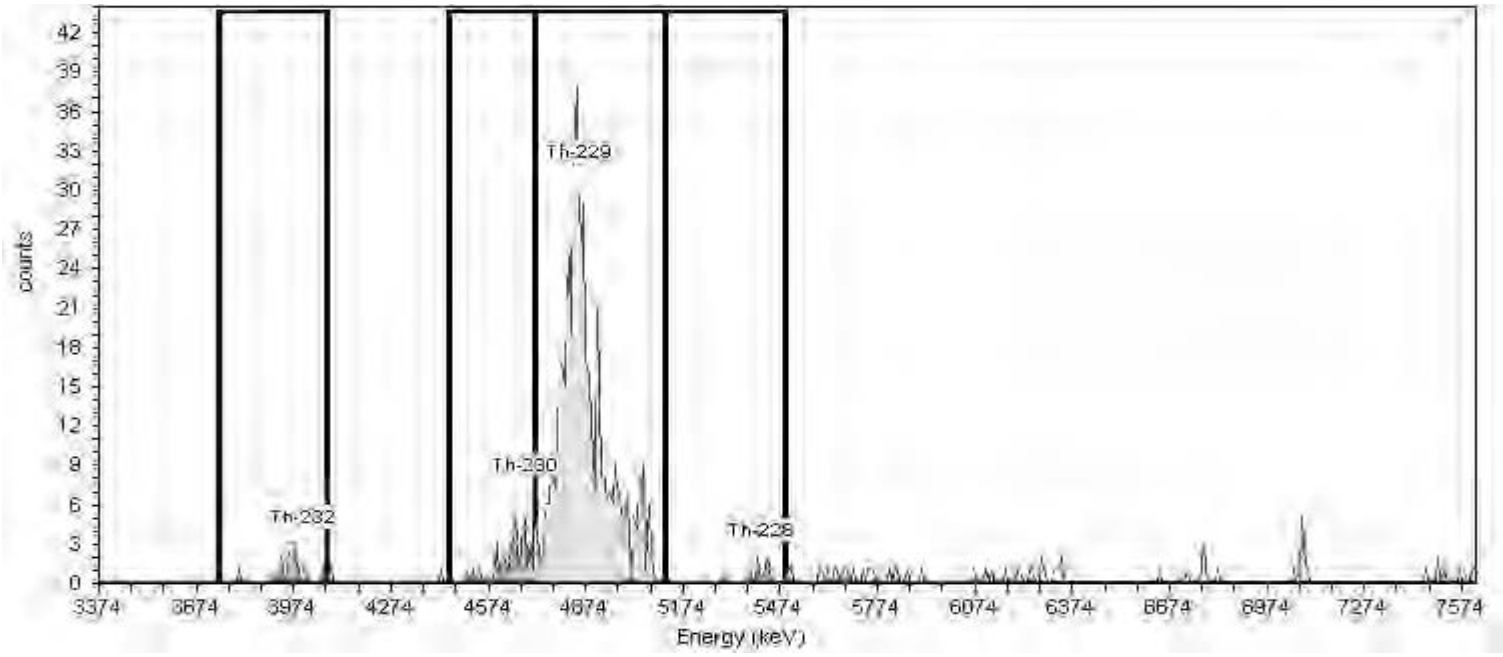
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 98.97%

Acquisition

Detector: AV24
Serial Number: 47-137Q4
Acquisition Start Date: 8/4/2018 2:31:01PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:46PM
Background Info: Sample: ICB;AV24; Det: AV24; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-9817;AV24-05142018
Calibration Date: 5/15/2018 12:28:57PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.21% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/4/2018 2:26:19PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Shifted 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	54.4	100.2	17	0.9375	16.06	0.184	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	24.7	99.7	45	1.3125	43.72	0.503	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	85.3	99.6	531	1.1130	529.92	6.045	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	65.5	99.8	10	2.0505	8.04	0.092	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:32:57PM 8/4/2018

Sample

Sample Name: 160-29521-B-2-C
SampleType: Sample
: 160-29521-B-2-C
Sample Collection Date: 7/12/2018 8:30:00AM

Spectrum #1 Analysis #1
Sample Weight : 0.9936g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377729
AnalysisID: 735908

Analyst: 60040

Tracer

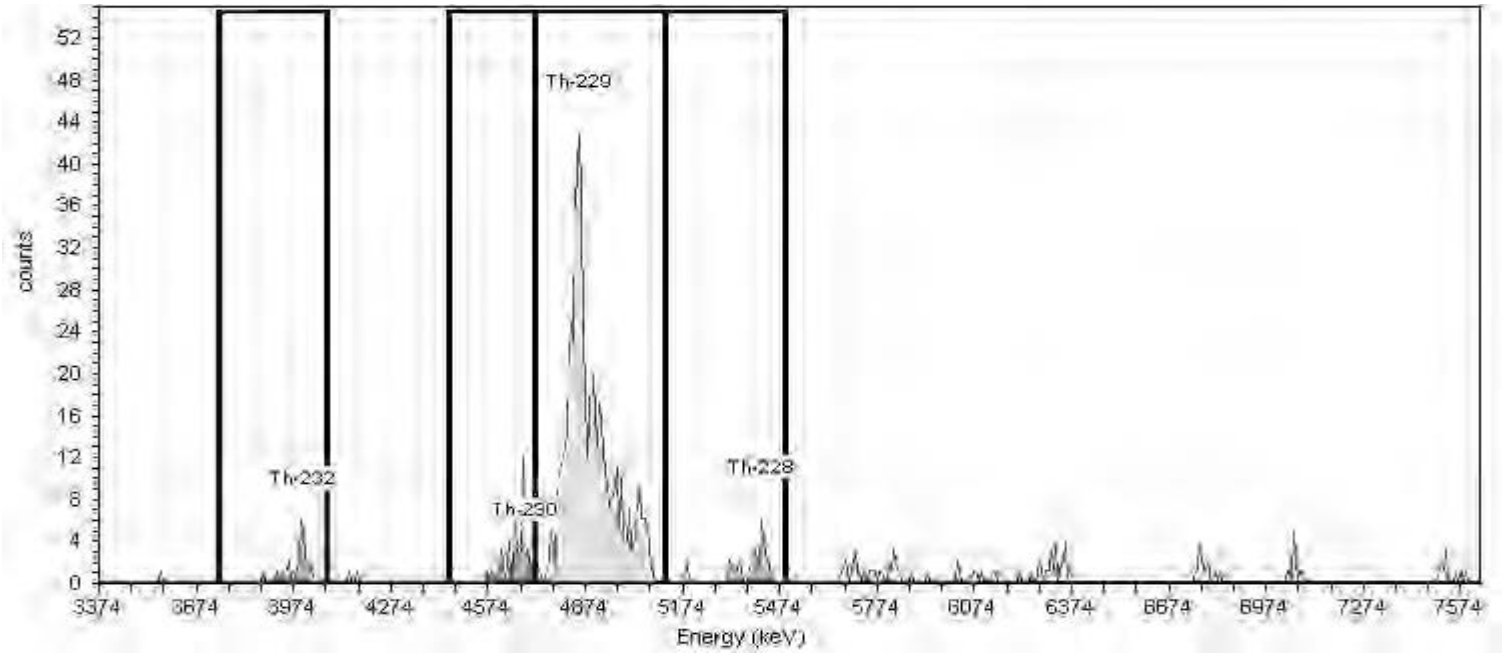
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 94.20%

Acquisition

Detector: AV43
Serial Number: 49-190X4
Acquisition Start Date: 8/4/2018 2:30:49PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:53PM
Background Info: Sample: ICB;AV43; Det: AV43; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-9885;AV43-05142018
Calibration Date: 5/15/2018 12:26:18PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 23.51% +/- 0.35% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/4/2018 2:26:19PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	47.7	100.2	26	0.8515	25.15	0.285	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	12.9	99.7	42	0.1875	41.81	0.477	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	69.7	99.6	534	0.0000	534.00	5.742	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	51.4	99.8	33	2.4375	30.56	0.348	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:33:16PM 8/4/2018

Sample

Sample Name: 160-29521-B-3-C
SampleType: Sample
: 160-29521-B-3-C
Sample Collection Date: 7/11/2018 4:40:00PM

Spectrum #1 Analysis #1
Sample Weight : 0.9975g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377729
AnalysisID: 735910

Analyst: 60040

Tracer

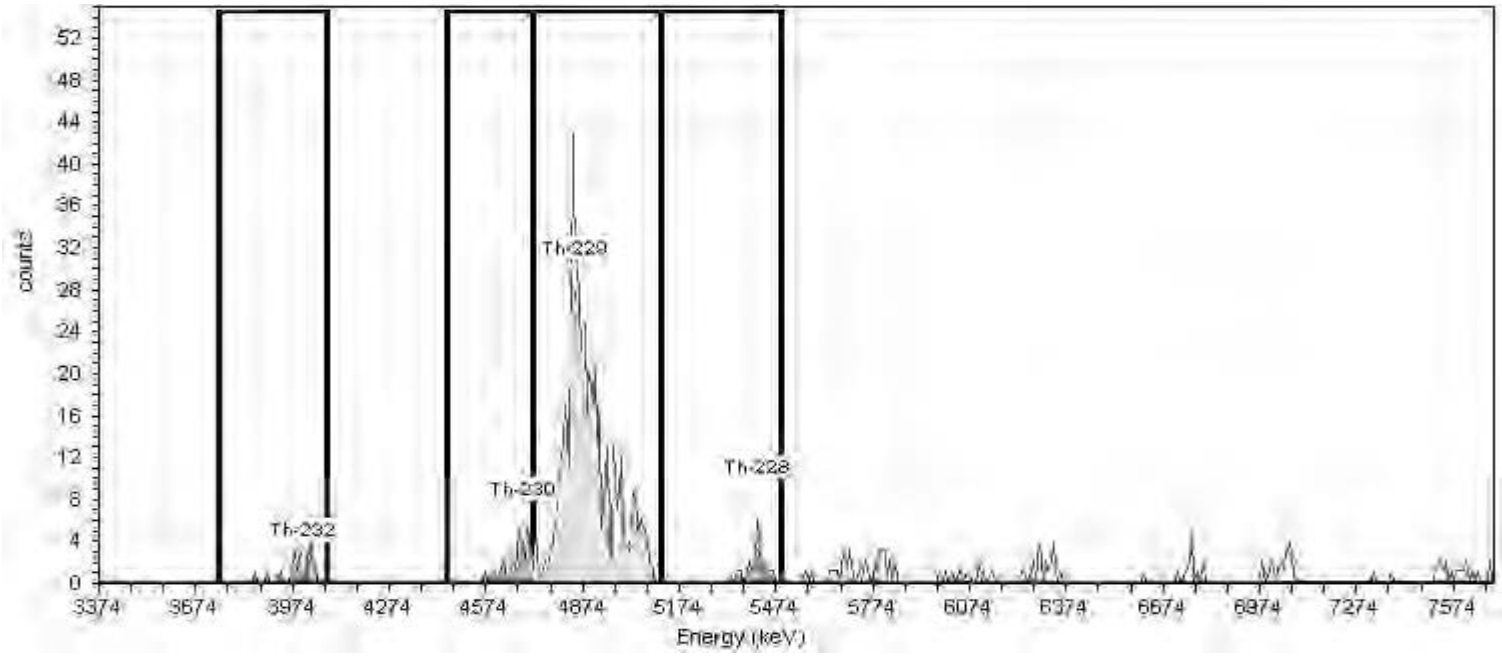
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 79.21%

Acquisition

Detector: AV44
Serial Number: 50-051JJ1
Acquisition Start Date: 8/4/2018 2:30:51PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:54PM
Background Info: Sample: ICB;AV44; Det: AV44; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1368446;AV44-05142018
Calibration Date: 5/15/2018 12:26:50PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 27.49% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/4/2018 2:26:19PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	19.1	100.2	24	0.7500	23.25	0.267	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	48.6	99.7	35	0.0000	35.09	0.406	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	97.2	99.6	525	0.1875	524.91	4.809	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	72.9	99.8	24	2.0625	21.85	0.252	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:32:44PM 8/5/2018

Sample

Sample Name: 160-29521-B-3-C
SampleType: Sample
: 160-29521-B-3-C
Sample Collection Date: 7/11/2018 4:40:00PM

Spectrum #1 Analysis #1
Sample Weight : 0.9975g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377729
AnalysisID: 735944

Analyst: 60040

Tracer

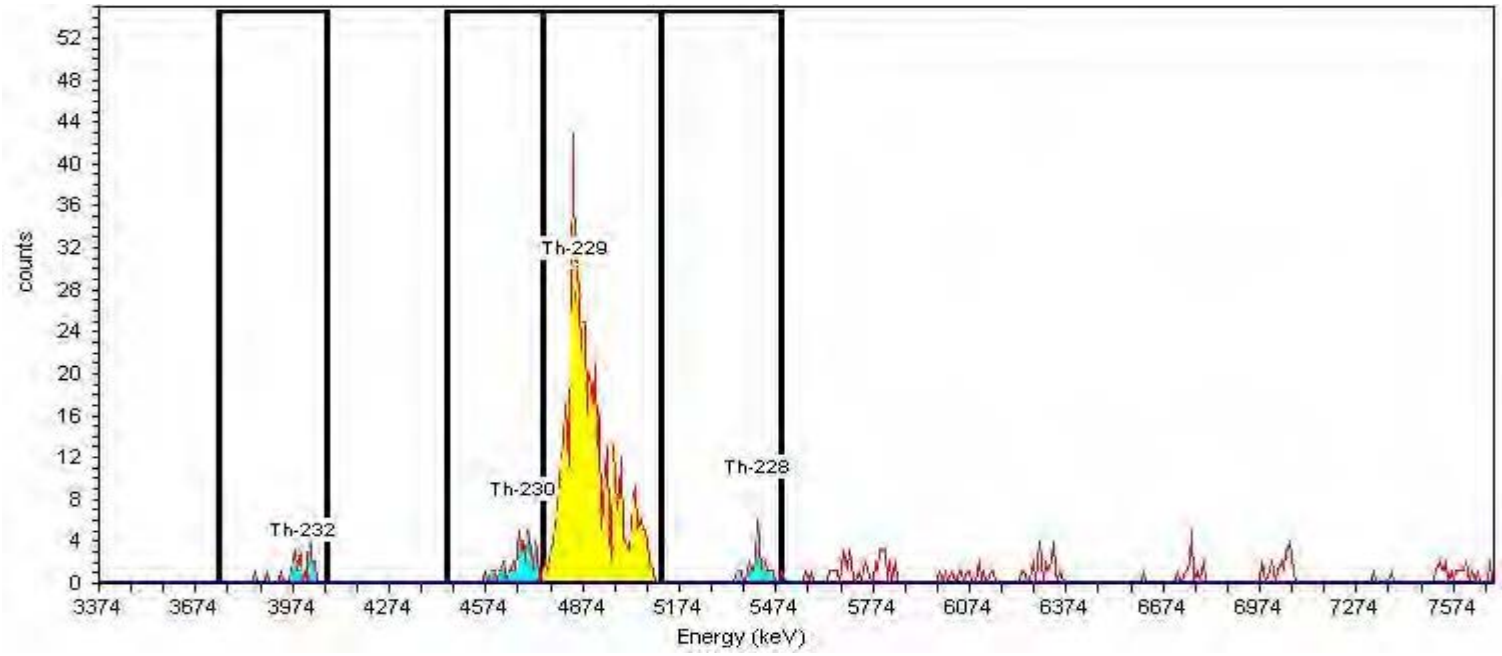
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 78.59%

Acquisition

Detector: AV44
Serial Number: 50-051JJ1
Acquisition Start Date: 8/4/2018 2:30:51PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:54PM
Background Info: Sample: ICB;AV44; Det: AV44; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1368446;AV44-05142018
Calibration Date: 5/15/2018 12:26:50PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.49% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/4/2018 2:26:19PM
MDA Constants: Kα = 1.65 , Kβ = 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	19.1	100.2	24	0.7500	23.25	0.269	pCi/g
Th-230	4688.0	4,687.5	0.5	4448.3	4746.6	58.4	99.7	43	0.0000	43.00	0.501	pCi/g
Th-229	4848.0	4,845.3	2.7	4746.6	5119.5	97.2	99.6	521	0.1875	520.81	4.772	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	72.9	99.8	24	2.0625	21.85	0.254	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:33:34PM 8/4/2018

Sample

Sample Name: 160-29521-A-4-D
SampleType: Sample
: 160-29521-A-4-D
Sample Collection Date: 7/11/2018 5:05:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0027g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377729
AnalysisID: 735912

Analyst: 60040

Tracer

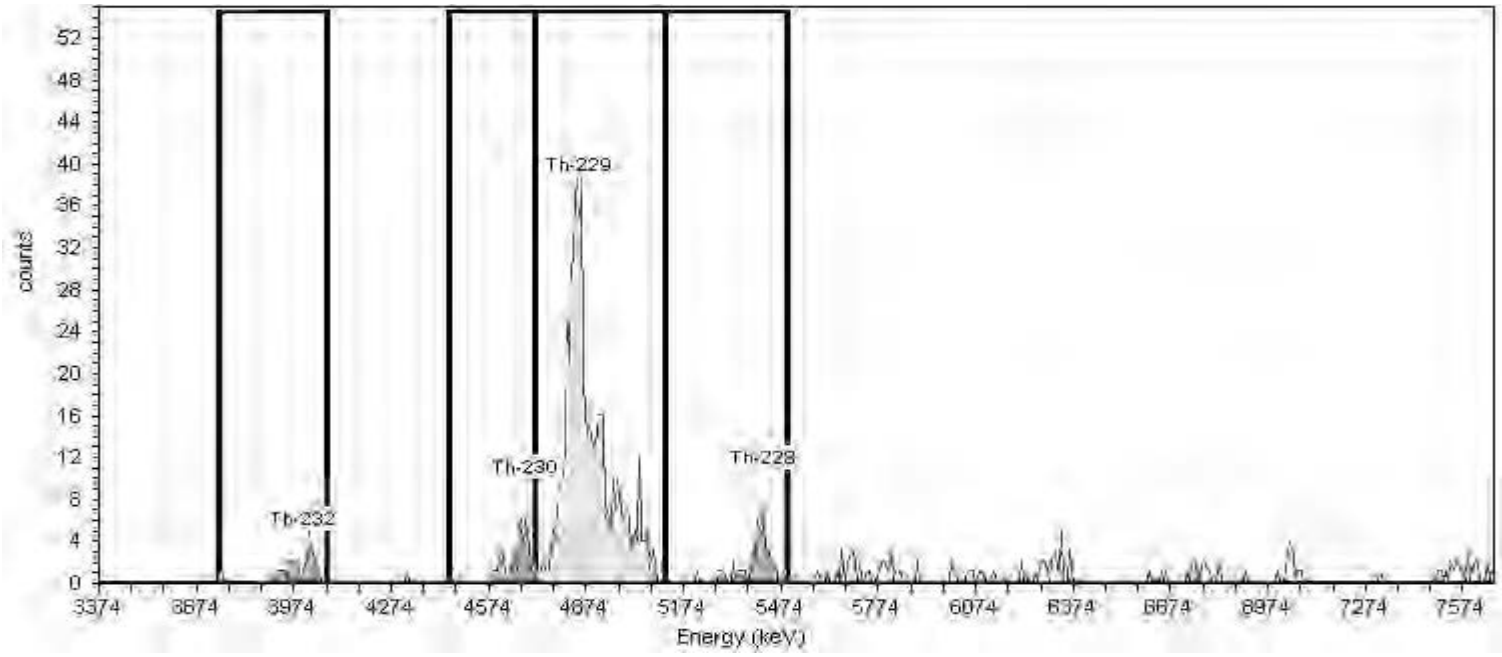
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 79.27%

Acquisition

Detector: AV45
Serial Number: 48-158FF2
Acquisition Start Date: 8/4/2018 2:30:52PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:55PM
Background Info: Sample: ICB;AV45; Det: AV45; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1368447;AV45-05142018a
Calibration Date: 5/15/2018 12:29:34PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 27.95% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/4/2018 2:26:19PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	18.9	100.2	31	0.1875	31.24	0.351	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	29.6	99.7	43	0.0058	43.03	0.486	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	65.8	99.6	535	0.9433	534.09	4.788	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	70.8	99.8	47	0.5625	46.44	0.524	pCi/g

Prep Batch: 378572

Preparation, Extraction Chromatography Resin Actinide Separation

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378572

Lab ID: MB 160-378572/1-A
Client ID:
Sigma: 2
Analyzed: 08/10/18 18:53
Detector: AV15
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	0.06903	0.110	0.110	U	pCi/g	1.00	0.147	381881

Tracer	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.897	0.426	0.592		pCi/g	0.0681	6.05	80.9	30 - 110

Lab ID: LCS 160-378572/2-A
Client ID:
Sigma: 2
Analyzed: 08/15/18 19:24
Detector: AV1
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	24.91	1.48	2.57		pCi/g	1.00	0.244	382801

Tracer	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	11.16	0.956	1.34		pCi/g	0.145	12.0	93.1	30 - 110

Lab ID: 160-29521-5
Client ID: CRC-B3-0204
Sigma: 2
Analyzed: 08/10/18 18:53
Detector: AV19
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	0.803	0.216	0.226		pCi/g	1.00	0.152	381883

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.28	0.468	0.645		pCi/g	0.0538	5.89	89.8	30 - 110

Lab ID: 160-29521-5 DU
Client ID: CRC-B3-0204
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV20
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Thorium-230	1.048	0.235	0.251		pCi/g	1.00	0.144	381884

Tracer	DU Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.848	0.509	0.707		pCi/g	0.0969	5.88	99.5	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378572

Lab ID: 160-29521-6
Client ID: CRC-B3-0608
Sigma: 2
Analyzed: 08/15/18 19:24
Detector: AV3
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	0.326	0.153	0.156		pCi/g	1.00	0.154	382816

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.25	0.453	0.632		pCi/g	0.0444	5.75	91.3	30 - 110

Lab ID: 160-29521-7
Client ID: CRC-B3-1618
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV23
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	0.536	0.184	0.190		pCi/g	1.00	0.147	381886

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.20	0.458	0.633		pCi/g	0.0525	5.96	87.3	30 - 110

Lab ID: 160-29521-8
Client ID: CRC-B13-0305
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV24
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	0.402	0.175	0.179		pCi/g	1.00	0.163	381887

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.98	0.465	0.625		pCi/g	0.0733	5.79	86.0	30 - 110

Lab ID: 160-29521-9
Client ID: CRC-B13-0608
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV43
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	0.250	0.141	0.143		pCi/g	1.00	0.143	381890

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.83	0.434	0.594		pCi/g	0.0293	5.54	87.1	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378572

Lab ID: 160-29521-10
Client ID: CRC-B15-0204
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV44
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	1.61	0.300	0.329		pCi/g	1.00	0.151	381891

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.39	0.400	0.544		pCi/g	0.0414	6.03	72.9	30 - 110

Lab ID: 160-29521-11
Client ID: CRC-B15-0608
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV45
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	0.321	0.156	0.158		pCi/g	1.00	0.147	381892

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.23	0.383	0.522		pCi/g	0.0560	5.83	72.6	30 - 110

Lab ID: 160-29521-12
Client ID: CRC-B15-1214
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV47
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	0.176	0.132	0.133		pCi/g	1.00	0.148	381893

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.63	0.412	0.567		pCi/g	0.0275	5.98	77.4	30 - 110

Lab ID: 160-29521-13
Client ID: CRC-B16-0608
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV48
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	0.141	0.141		pCi/g	1.00	0.153	381894

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.39	0.403	0.547		pCi/g	0.0565	6.04	72.7	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378572

Lab ID: 160-29521-14
Client ID: CRC-B16-0204
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV49
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	1.25	0.269	0.289		pCi/g	1.00	0.155	381895

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.61	0.419	0.570		pCi/g	0.0538	6.03	76.5	30 - 110

Lab ID: 160-29521-15
Client ID: CRC-B16-1416
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV52
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	0.240	0.144	0.145		pCi/g	1.00	0.157	381897

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.77	0.427	0.586		pCi/g	0.0581	5.63	84.7	30 - 110

Lab ID: 160-29521-16
Client ID: CRC-B18-0204
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV53
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	1.56	0.276	0.305		pCi/g	1.00	0.141	381898

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.72	0.490	0.686		pCi/g	0.0547	5.89	97.1	30 - 110

Lab ID: 160-29521-17
Client ID: CRC-B18-0608
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV54
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	1.29	0.256	0.278		pCi/g	1.00	0.147	381899

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.04	0.447	0.615		pCi/g	0.0517	5.63	89.5	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378572

Lab ID: 160-29521-18
Client ID: CRC-B18-0809
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV56
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	0.909	0.234	0.246		pCi/g	1.00	0.157	381900

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	4.79	0.434	0.592		pCi/g	0.0447	5.98	80.1	30 - 110

Lab ID: 160-29521-19
Client ID: CRC-B19-0204
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV57
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	1.26	0.266	0.286		pCi/g	1.00	0.160	381901

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.28	0.478	0.653		pCi/g	0.0660	5.84	90.4	30 - 110

Lab ID: 160-29521-20
Client ID: CRC-B19-0810
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV58
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	1.15	0.249	0.267		pCi/g	1.00	0.153	381902

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.52	0.481	0.668		pCi/g	0.0673	6.05	91.3	30 - 110

Lab ID: 160-29521-21
Client ID: CRC-B19-1618
Sigma: 2
Analyzed: 08/10/18 18:54
Detector: AV60
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	0.281	0.137	0.139		pCi/g	1.00	0.134	381903

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.50	0.441	0.639		pCi/g	0.0539	6.02	91.4	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378572

Lab ID: 160-29521-22
Client ID: CRC-B19-2224
Sigma: 2

Analyzed: 08/10/18 18:54
Detector: AV62
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	0.366	0.150	0.153		pCi/g	1.00	0.135	381904

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Thorium-229	5.27	0.431	0.618		pCi/g	0.0264	6.02	87.6	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 160-378572/1-A	Thorium-230			0.06903	U	pCi/g							1.24963362

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-378572/2-A	Thorium-230		24.5	24.91		pCi/g	102	81 - 118					.2308174804

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29521-5	Thorium-230	0.803		1.048		pCi/g			26	0.51	1.45	1	

Glossary:

Ts = Count Duration, Sample

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 378572 Batch Start Date: 07/29/18 16:09 Batch Analyst: Fox, Kassie N

Batch Method: ExtChrom Batch End Date: 08/09/18 18:38

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	Th-229 00023	TRM-2 00002			
MB 160-378572/1		ExtChrom, A-01-R		1.0 g	0.2 mL				
LCS 160-378572/2		ExtChrom, A-01-R		0.5052 g	0.2 mL	0.5052 g			
160-29521-A-5-B	CRC-B3-0204	ExtChrom, A-01-R	T	1.0284 g	0.2 mL				
160-29521-A-5-B DU	CRC-B3-0204	ExtChrom, A-01-R	T	1.0305 g	0.2 mL				
160-29521-A-6-B	CRC-B3-0608	ExtChrom, A-01-R	T	1.0536 g	0.2 mL				
160-29521-A-7-B	CRC-B3-1618	ExtChrom, A-01-R	T	1.0166 g	0.2 mL				
160-29521-A-8-B	CRC-B13-0305	ExtChrom, A-01-R	T	1.0458 g	0.2 mL				
160-29521-A-9-B	CRC-B13-0608	ExtChrom, A-01-R	T	1.0929 g	0.2 mL				
160-29521-A-10-B	CRC-B15-0204	ExtChrom, A-01-R	T	1.0047 g	0.2 mL				
160-29521-A-11-B	CRC-B15-0608	ExtChrom, A-01-R	T	1.0394 g	0.2 mL				
160-29521-B-12-A	CRC-B15-1214	ExtChrom, A-01-R	T	1.0123 g	0.2 mL				
160-29521-B-13-A	CRC-B16-0608	ExtChrom, A-01-R	T	1.0029 g	0.2 mL				
160-29521-A-14-B	CRC-B16-0204	ExtChrom, A-01-R	T	1.0048 g	0.2 mL				
160-29521-B-15-B	CRC-B16-1416	ExtChrom, A-01-R	T	1.0749 g	0.2 mL				
160-29521-A-16-B	CRC-B18-0204	ExtChrom, A-01-R	T	1.0284 g	0.2 mL				
160-29521-B-17-B	CRC-B18-0608	ExtChrom, A-01-R	T	1.0754 g	0.2 mL				
160-29521-A-18-A	CRC-B18-0809	ExtChrom, A-01-R	T	1.0125 g	0.2 mL				
160-29521-A-19-A	CRC-B19-0204	ExtChrom, A-01-R	T	1.0364 g	0.2 mL				
160-29521-B-20-A	CRC-B19-0810	ExtChrom, A-01-R	T	1.0001 g	0.2 mL				
160-29521-A-21-B	CRC-B19-1618	ExtChrom, A-01-R	T	1.0061 g	0.2 mL				
160-29521-A-22-A	CRC-B19-2224	ExtChrom, A-01-R	T	1.0061 g	0.2 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.

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 378572 Batch Start Date: 07/29/18 16:09 Batch Analyst: Fox, Kassie N

Batch Method: ExtChrom Batch End Date: 08/09/18 18:38

Batch Notes	
Balance ID	1123433897
Analyst ID - Column	NMN per CMM
Column Date	08/08/2018
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-0003, ST-RC-0004, 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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:54:24PM 8/10/2018

Sample

Sample Name: MB 160-378572/1-A
SampleType: Blank
: MB 160-378572/1-A
Sample Collection Date: 8/9/2018 6:39:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0000g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736762

Analyst: 60040

Tracer

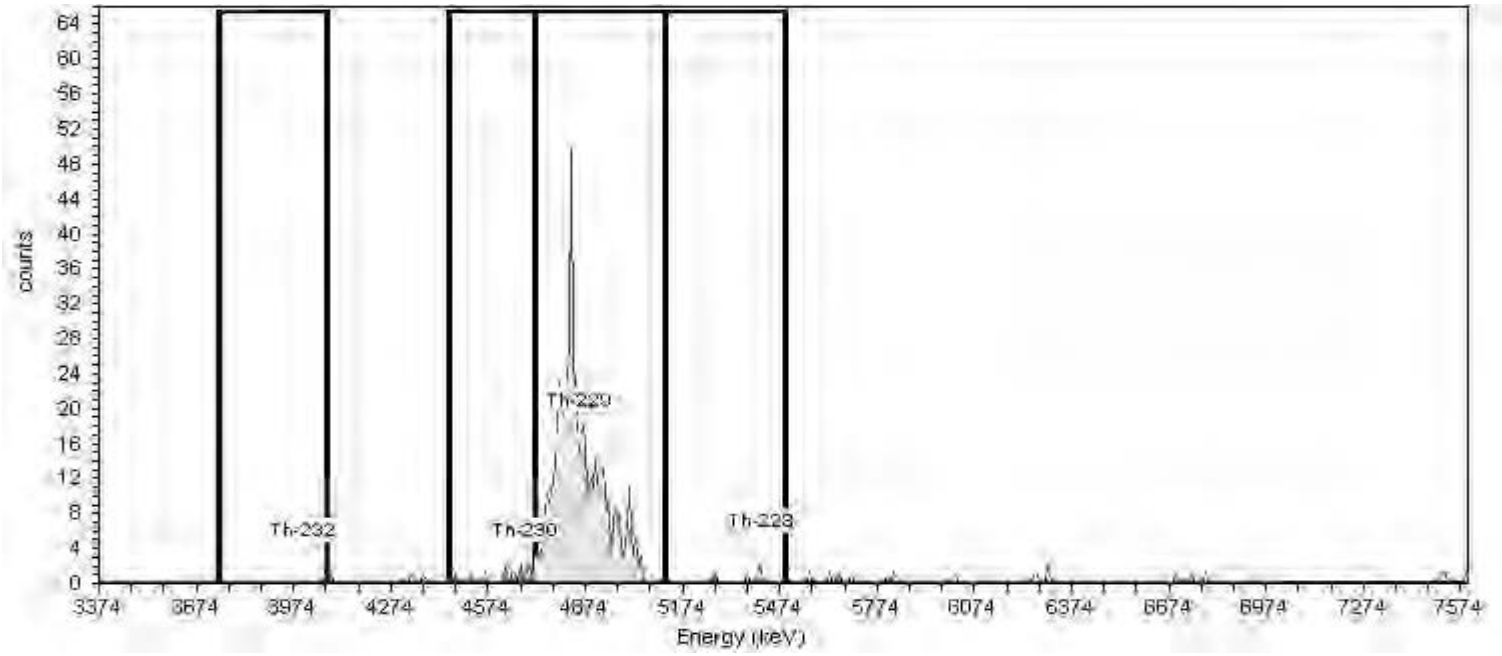
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 80.89%

Acquisition

Detector: AV15
Serial Number: 41-172C5
Acquisition Start Date: 8/10/2018 6:53:55PM
Live Time: 180.00 min.
Real Time: 180.01 min.
Background Date: 7/12/2018 1:39:30PM
Background Info: Sample: ICB;AV15; Det: AV15; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1370619;AV15-05142018
Calibration Date: 5/14/2018 6:28:04PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 27.26% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:31PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	0	0.2735	-0.27	-0.003	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	38.7	99.7	15	0.5625	14.44	0.164	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	86.8	99.6	533	1.5000	531.50	4.899	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	166.8	99.8	7	1.3125	5.69	0.065	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:25:12PM 8/15/2018

Sample

Sample Name: LCS 160-378572/2-A
SampleType: Control
: LCS 160-378572/2-A
Sample Collection Date: 8/9/2018 6:39:00PM

Spectrum #2 Analysis #1
Sample Weight : 0.5052g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736998

Analyst: 60040

Tracer

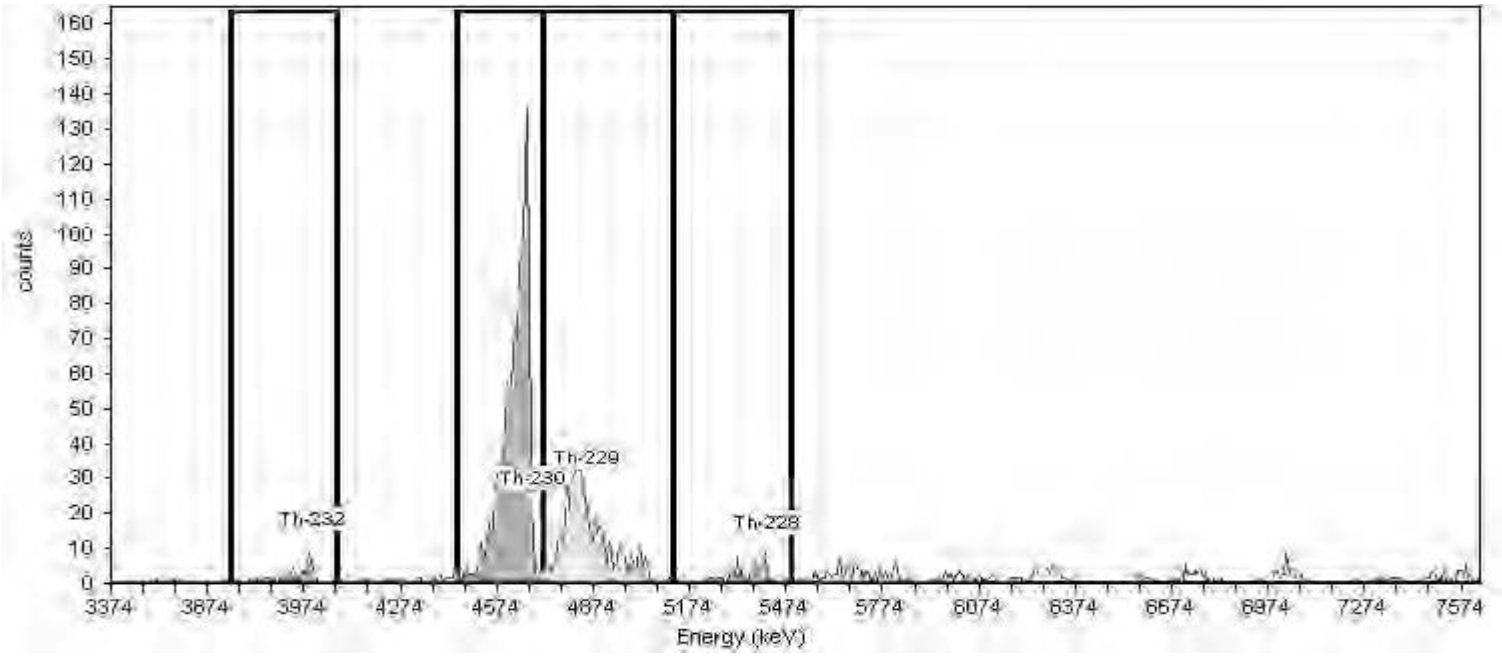
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 93.11%

Acquisition

Detector: AV1
Serial Number: 49-188 AA4
Acquisition Start Date: 8/15/2018 7:24:47PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 8/11/2018 5:19:02PM
Background Info: Sample: ICB;AV1; Det: AV1; Spectrum #1; Aug-11-2018 17:19

Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.36% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	49.4	100.2	51	1.2265	49.77	1.085	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	47.0	99.7	1143	1.5000	1141.53	25.006	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	83.9	99.6	548	1.3125	546.78	11.163	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	47.0	99.8	64	1.5000	62.48	1.375	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:55:57PM 8/10/2018

Sample

Sample Name: 160-29521-A-5-D
SampleType: Sample
: 160-29521-A-5-D
Sample Collection Date: 7/12/2018 5:10:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0284g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736764

Analyst: 60040

Tracer

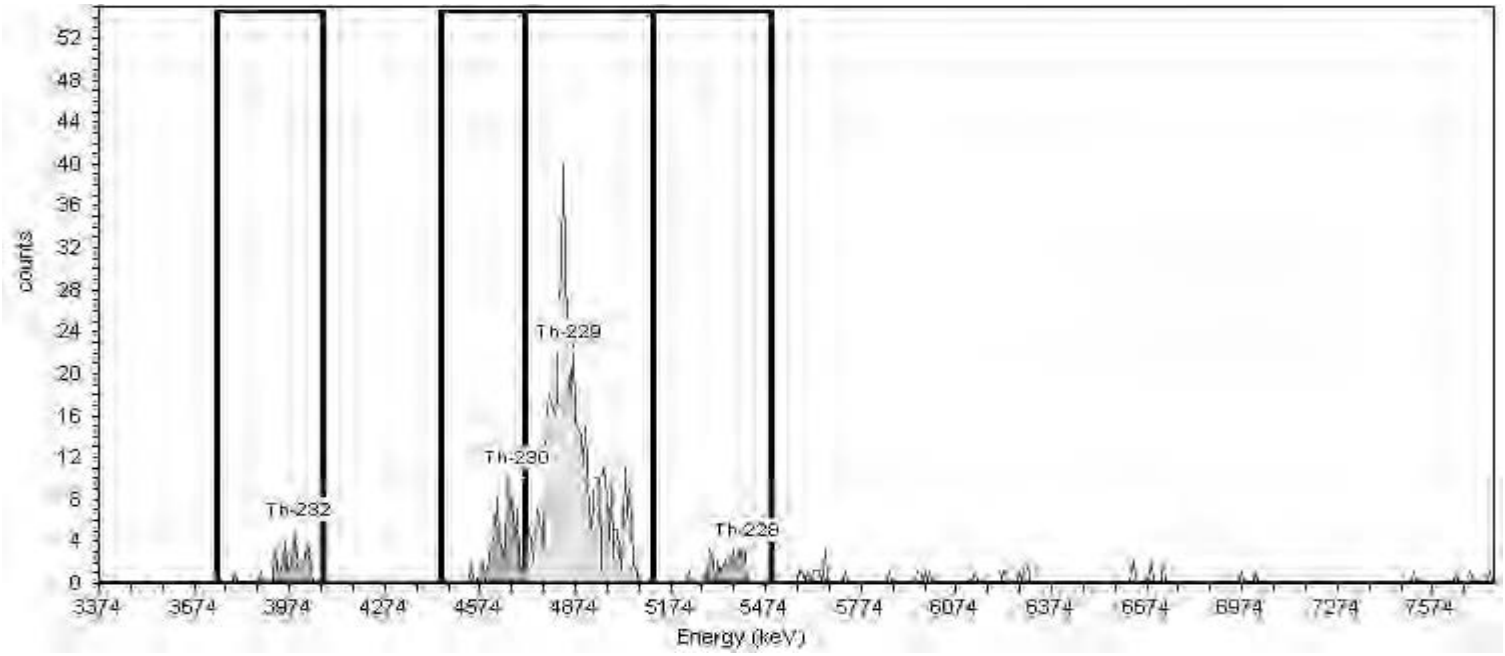
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 89.76%

Acquisition

Detector: AV19
Serial Number: 50-025FF5
Acquisition Start Date: 8/10/2018 6:53:58PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:36PM
Background Info: Sample: ICB;AV19; Det: AV19; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-8877;AV19-05142018
Calibration Date: 5/15/2018 12:27:55PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 23.60% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	68.8	100.2	37	0.6422	36.36	0.417	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	26.6	99.7	79	1.1250	78.00	0.899	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	96.8	99.6	511	0.3750	510.75	5.286	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	103.2	99.8	35	1.5000	33.50	0.386	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:56:06PM 8/10/2018

Sample

Sample Name: 160-29521-A-5-E DU
SampleType: Sample
: 160-29521-A-5-E DU
Sample Collection Date: 7/12/2018 5:10:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0305g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736765

Analyst: 60040

Tracer

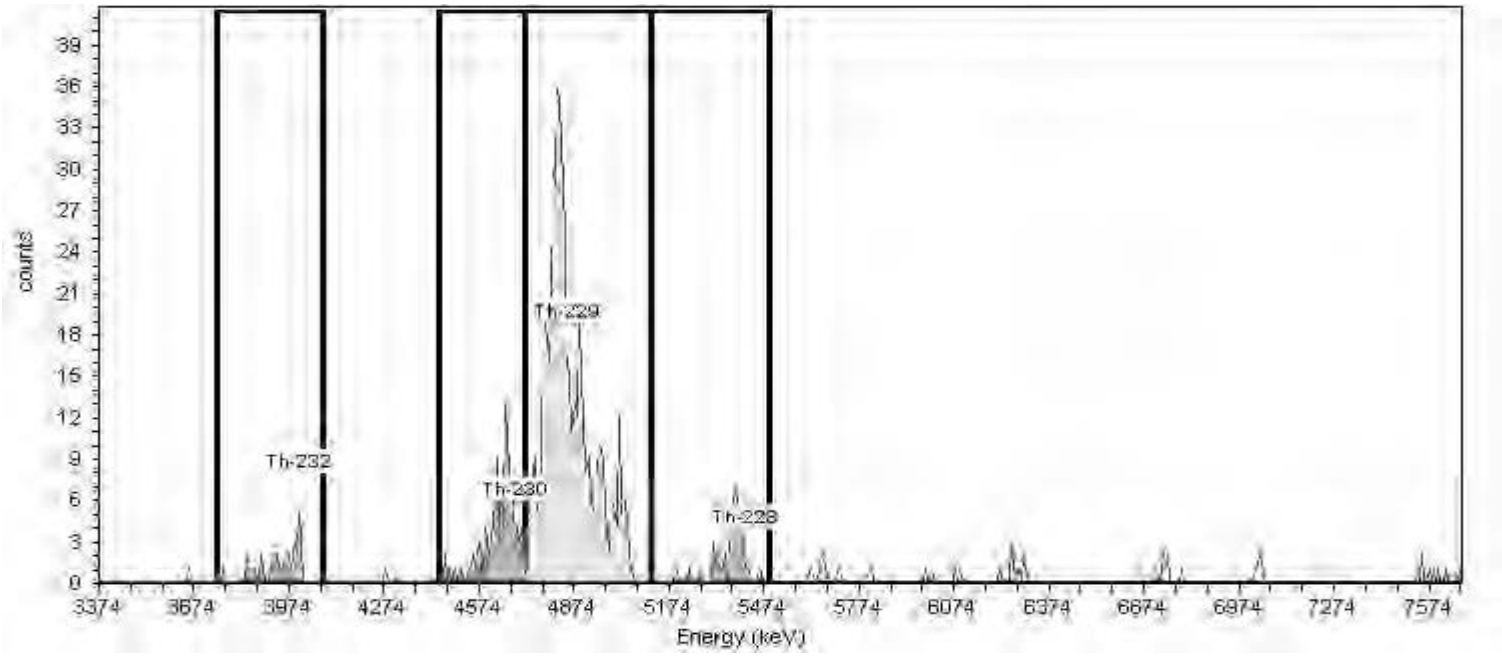
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 99.53%

Acquisition

Detector: AV20
Serial Number: 48-121A7
Acquisition Start Date: 8/10/2018 6:54:00PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:38PM
Background Info: Sample: ICB;AV20; Det: AV20; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-9520;AV20-05142018
Calibration Date: 5/15/2018 12:28:08PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.15% +/- 0.32% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	91.4	100.2	37	0.3750	36.63	0.403	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	50.9	99.7	104	0.5683	103.46	1.143	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	73.0	99.6	534	2.6188	531.41	5.850	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	49.8	99.8	48	2.0505	45.95	0.507	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:24:54PM 8/15/2018

Sample

Sample Name: 160-29521-A-6-D
SampleType: Sample
: 160-29521-A-6-D
Sample Collection Date: 7/12/2018 5:20:00PM

Spectrum #2 Analysis #1
Sample Weight : 1.0536g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736997

Analyst: 60040

Tracer

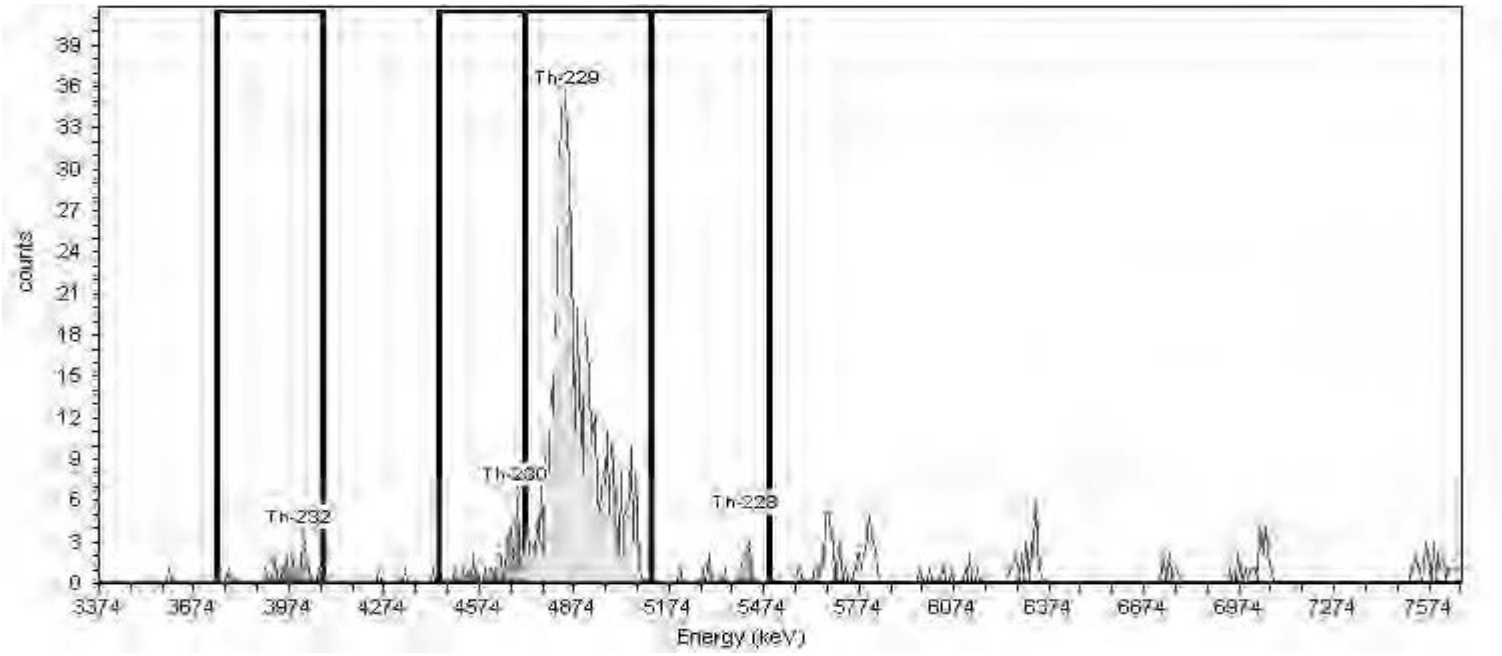
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 91.31%

Acquisition

Detector: AV3
Serial Number: 49-202 FF7
Acquisition Start Date: 8/15/2018 7:24:48PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 8/11/2018 5:16:27PM
Background Info: Sample: ICB;AV3; Det: AV3; Spectrum #1; Aug-11-2018 17:16

Calibration Name: IC-8877;AV3-05142018
Calibration Date: 5/14/2018 6:25:15PM
Energy Cal: 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 = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 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	68.2	100.2	20	1.4140	19.04	0.202	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	31.1	99.7	42	2.6250	39.44	0.421	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	67.9	99.6	538	0.1875	537.87	5.249	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	42.7	99.8	14	0.7500	13.25	0.142	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:56:33PM 8/10/2018

Sample

Sample Name: 160-29521-A-7-D
SampleType: Sample
: 160-29521-A-7-D
Sample Collection Date: 7/12/2018 5:30:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0166g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736767

Analyst: 60040

Tracer

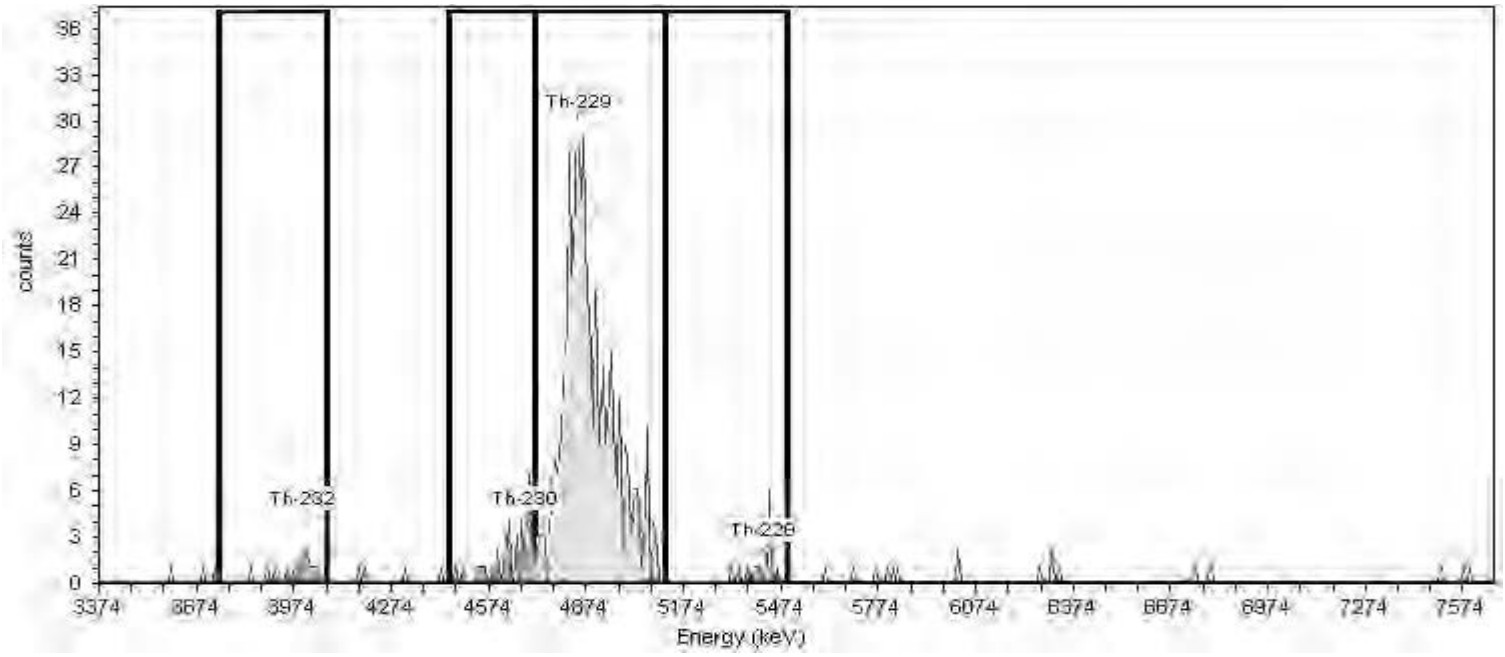
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 88.99%

Acquisition

Detector: AV23
Serial Number: 48-158FF3
Acquisition Start Date: 8/10/2018 6:54:03PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:44PM
Background Info: Sample: ICB;AV23; Det: AV23; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-9795;AV23-05142018
Calibration Date: 5/15/2018 12:28:43PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.46% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	67.8	100.2	17	0.7500	16.25	0.183	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	32.5	99.7	43	0.3750	42.69	0.484	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	90.6	99.6	525	0.3630	524.70	5.302	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	40.6	99.8	18	2.2380	15.76	0.179	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:31:05PM 8/13/2018

Sample

Sample Name: 160-29521-A-7-D
SampleType: Sample
: 160-29521-A-7-D
Sample Collection Date: 7/12/2018 5:30:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0166g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736942

Analyst: 60040

Tracer

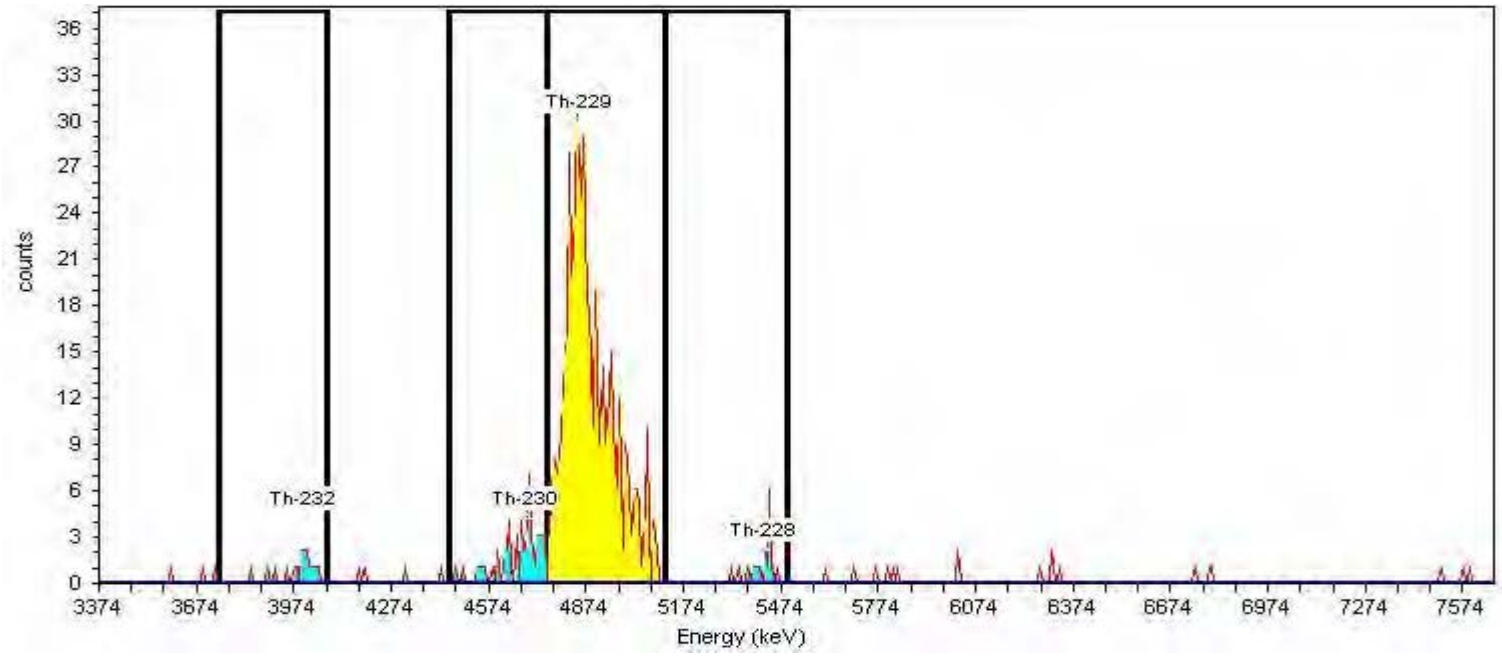
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 87.28%

Acquisition

Detector: AV23
Serial Number: 48-158FF3
Acquisition Start Date: 8/10/2018 6:54:03PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:44PM
Background Info: Sample: ICB;AV23; Det: AV23; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-9795;AV23-05142018
Calibration Date: 5/15/2018 12:28:43PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.46% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 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	67.8	100.2	17	0.7500	16.25	0.187	pCi/g
Th-230	4688.0	4,687.5	0.5	4448.3	4754.1	70.3	99.7	55	0.3750	54.63	0.632	pCi/g
Th-229	4848.0	4,845.3	2.7	4754.1	5119.5	90.6	99.6	515	0.3750	514.63	5.200	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	40.6	99.8	18	2.2380	15.76	0.182	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:56:42PM 8/10/2018

Sample

Sample Name: 160-29521-A-8-D
SampleType: Sample
: 160-29521-A-8-D
Sample Collection Date: 7/12/2018 3:10:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0458g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736768

Analyst: 60040

Tracer

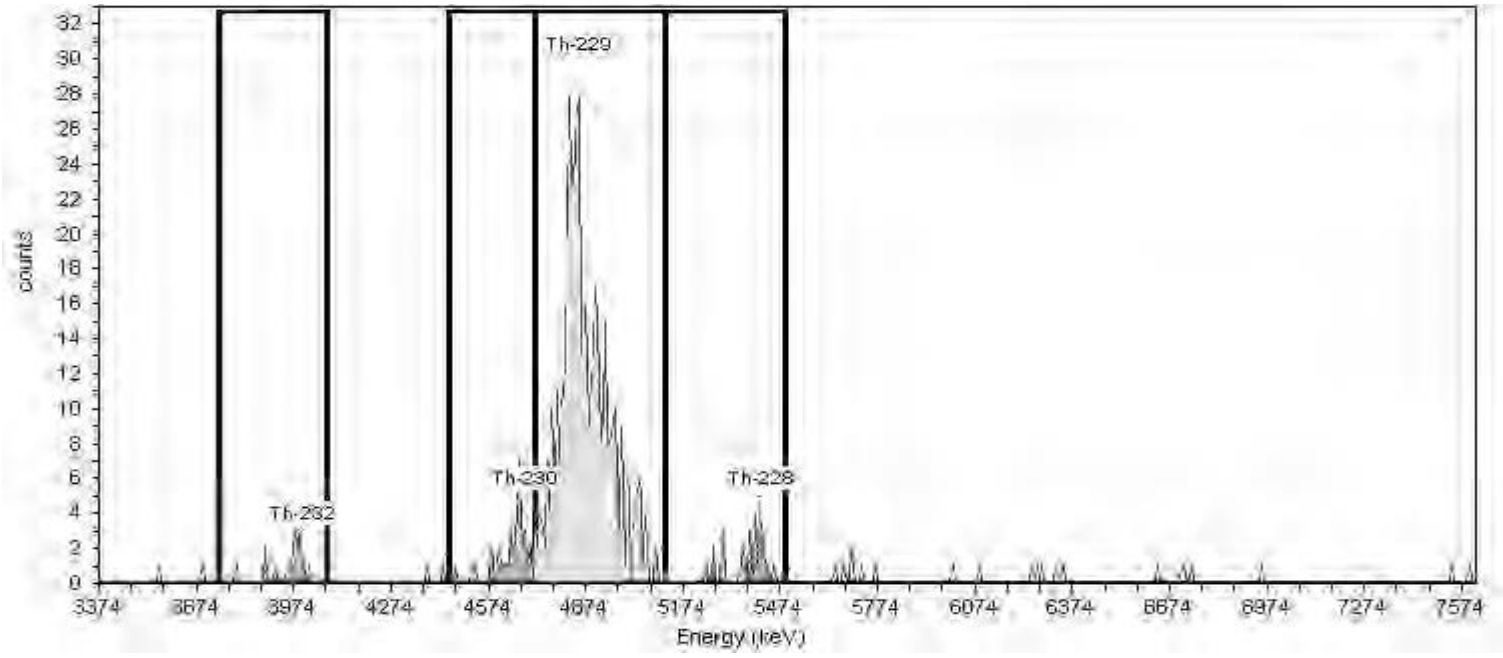
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 86.05%

Acquisition

Detector: AV24
Serial Number: 47-137Q4
Acquisition Start Date: 8/10/2018 6:54:04PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:46PM
Background Info: Sample: ICB;AV24; Det: AV24; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-9817;AV24-05142018
Calibration Date: 5/15/2018 12:28:57PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.21% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	48.2	100.2	20	0.9375	19.06	0.238	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	25.6	99.7	41	1.3125	39.63	0.498	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	83.6	99.6	462	1.1130	460.76	4.984	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	52.1	99.8	32	2.0505	29.89	0.375	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:56:52PM 8/10/2018

Sample

Sample Name: 160-29521-A-9-D
SampleType: Sample
: 160-29521-A-9-D
Sample Collection Date: 7/12/2018 3:20:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0929g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736769

Analyst: 60040

Tracer

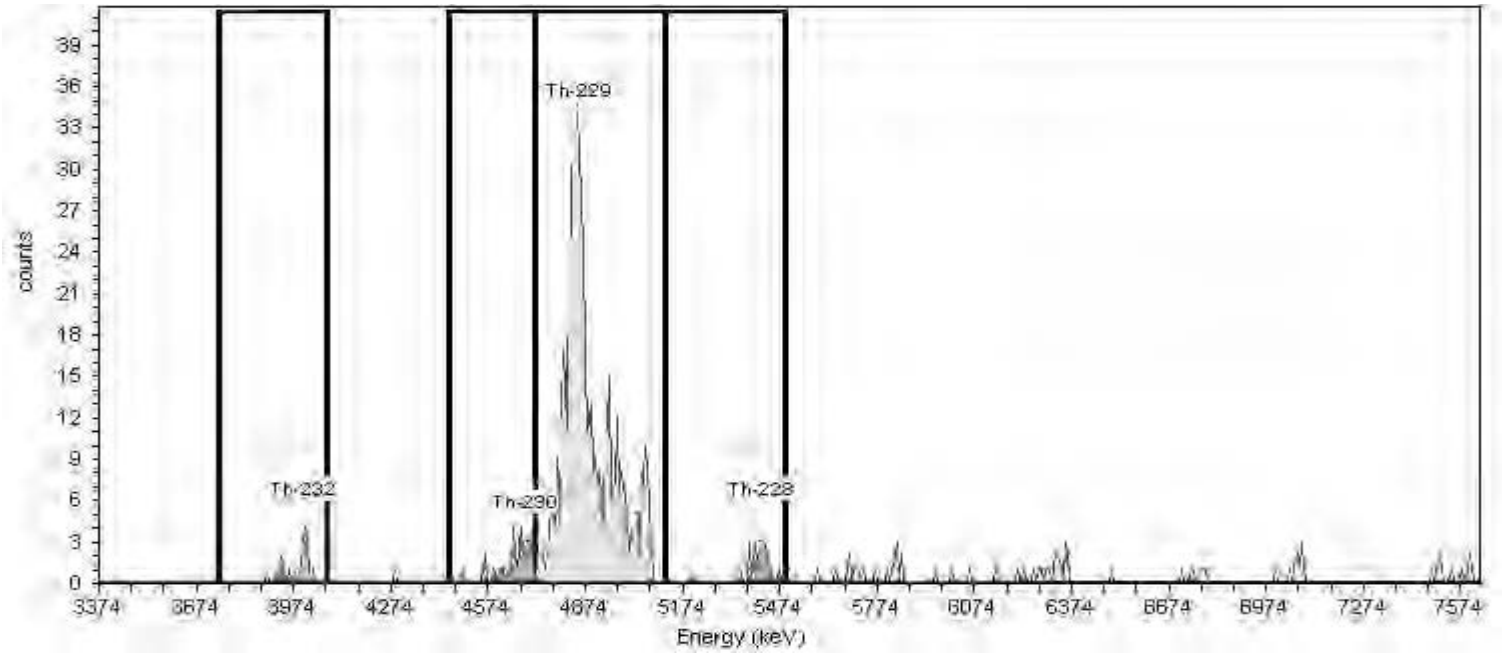
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 87.15%

Acquisition

Detector: AV43
Serial Number: 49-190X4
Acquisition Start Date: 8/10/2018 6:54:06PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:53PM
Background Info: Sample: ICB;AV43; Det: AV43; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-9885;AV43-05142018
Calibration Date: 5/15/2018 12:26:18PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 23.51% +/- 0.35% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	55.7	100.2	18	0.8515	17.15	0.191	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	40.5	99.7	31	0.1875	30.84	0.346	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	65.9	99.6	494	0.0000	494.03	4.830	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	63.9	99.8	22	2.4375	19.56	0.219	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:57:01PM 8/10/2018

Sample

Sample Name: 160-29521-A-10-D
SampleType: Sample
: 160-29521-A-10-D
Sample Collection Date: 7/13/2018 10:10:00AM

Spectrum #1 Analysis #1
Sample Weight : 1.0047g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736770

Analyst: 60040

Tracer

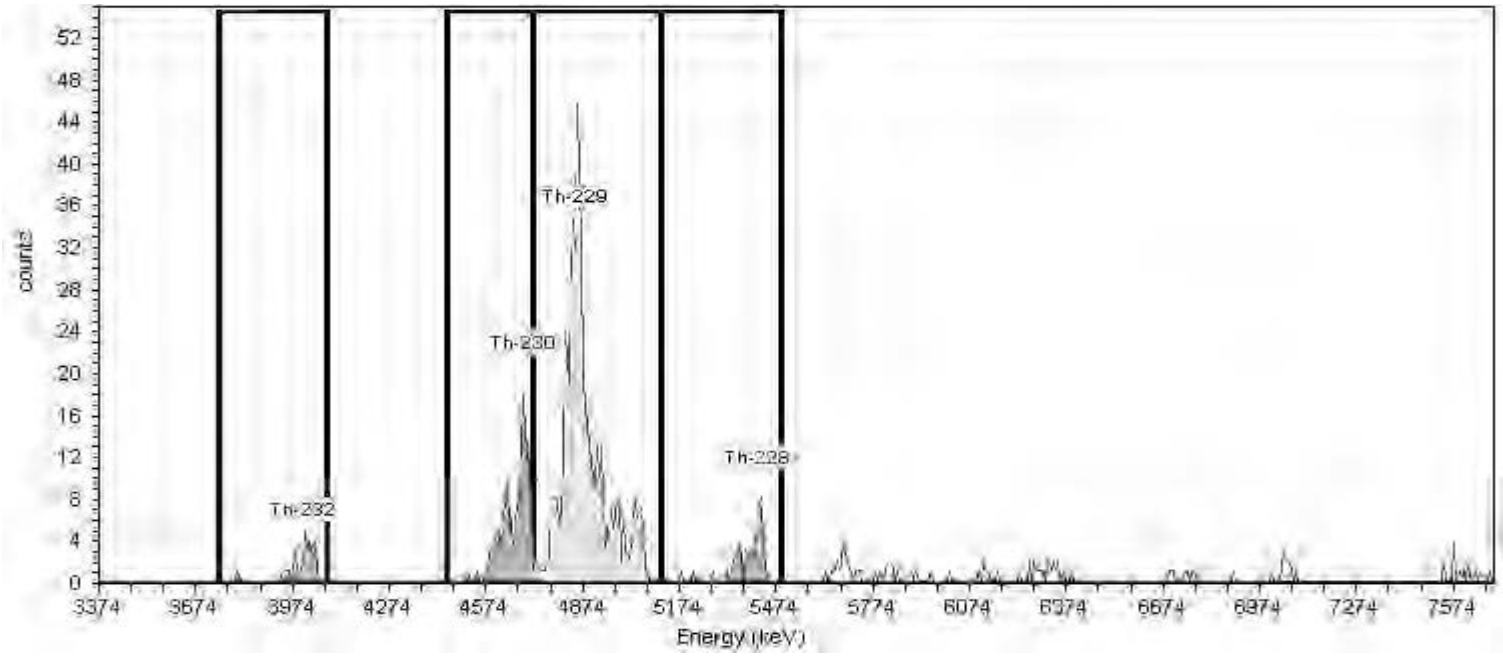
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 72.86%

Acquisition

Detector: AV44
Serial Number: 50-051JJ1
Acquisition Start Date: 8/10/2018 6:54:08PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:54PM
Background Info: Sample: ICB;AV44; Det: AV44; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1368446;AV44-05142018
Calibration Date: 5/15/2018 12:26:50PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 27.49% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity	Units
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	77.7	99.8	49	2.0625	46.94	0.585	pCi/g
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	30.0	100.2	32	0.7500	31.25	0.388	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	37.6	99.7	137	0.0000	137.03	1.709	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	62.7	99.6	483	0.1875	482.84	4.392	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:57:10PM 8/10/2018

Sample

Sample Name: 160-29521-A-11-D
SampleType: Sample
: 160-29521-A-11-D
Sample Collection Date: 7/13/2018 10:15:00AM

Spectrum #1 Analysis #1
Sample Weight : 1.0394g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736771

Analyst: 60040

Tracer

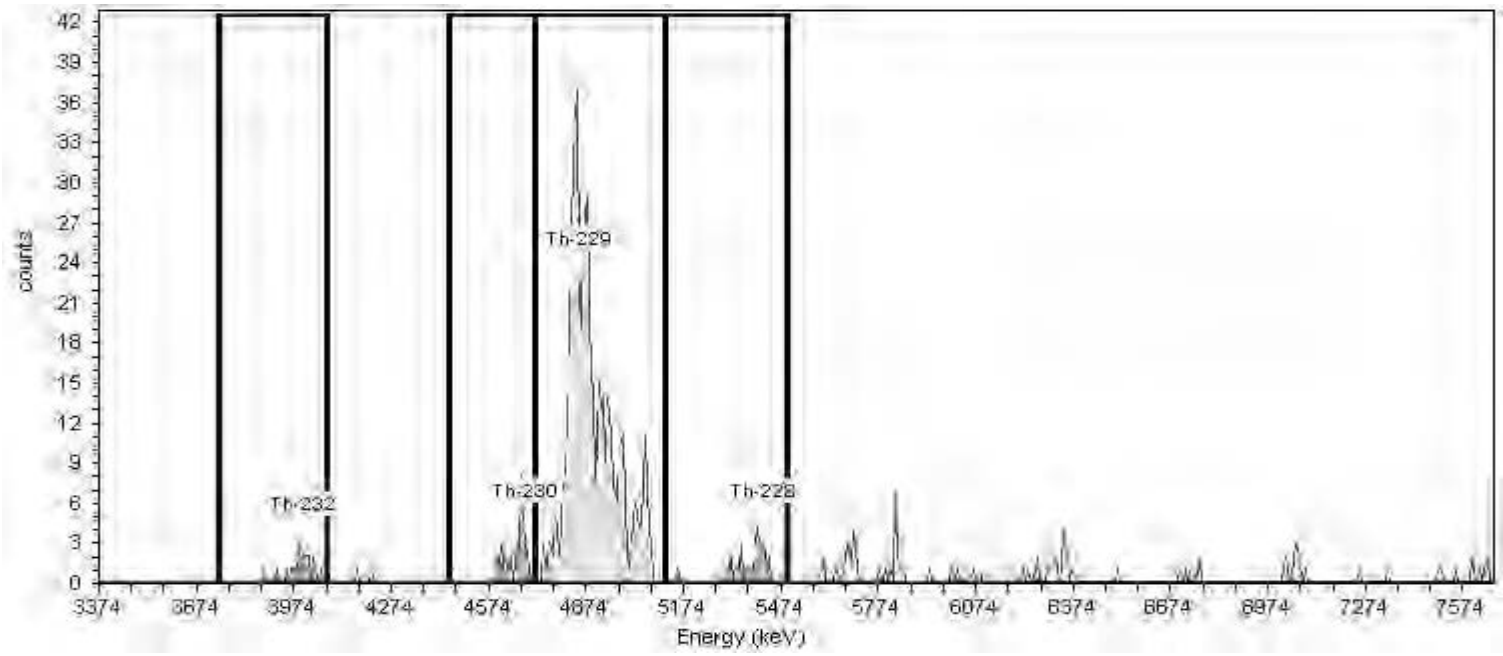
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 72.59%

Acquisition

Detector: AV45
Serial Number: 48-158FF2
Acquisition Start Date: 8/10/2018 6:54:09PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:55PM
Background Info: Sample: ICB;AV45; Det: AV45; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1368447;AV45-05142018a
Calibration Date: 5/15/2018 12:29:34PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 27.95% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 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	52.0	100.2	19	0.1875	18.81	0.223	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	20.3	99.7	35	0.0058	34.99	0.417	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	84.9	99.6	490	0.9433	489.06	4.230	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	48.8	99.8	32	0.5625	31.44	0.374	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:57:27PM 8/10/2018

Sample

Sample Name: 160-29521-B-12-C
SampleType: Sample
: 160-29521-B-12-C
Sample Collection Date: 7/13/2018 10:20:00AM

Spectrum #1 Analysis #1
Sample Weight : 1.0123g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736772

Analyst: 60040

Tracer

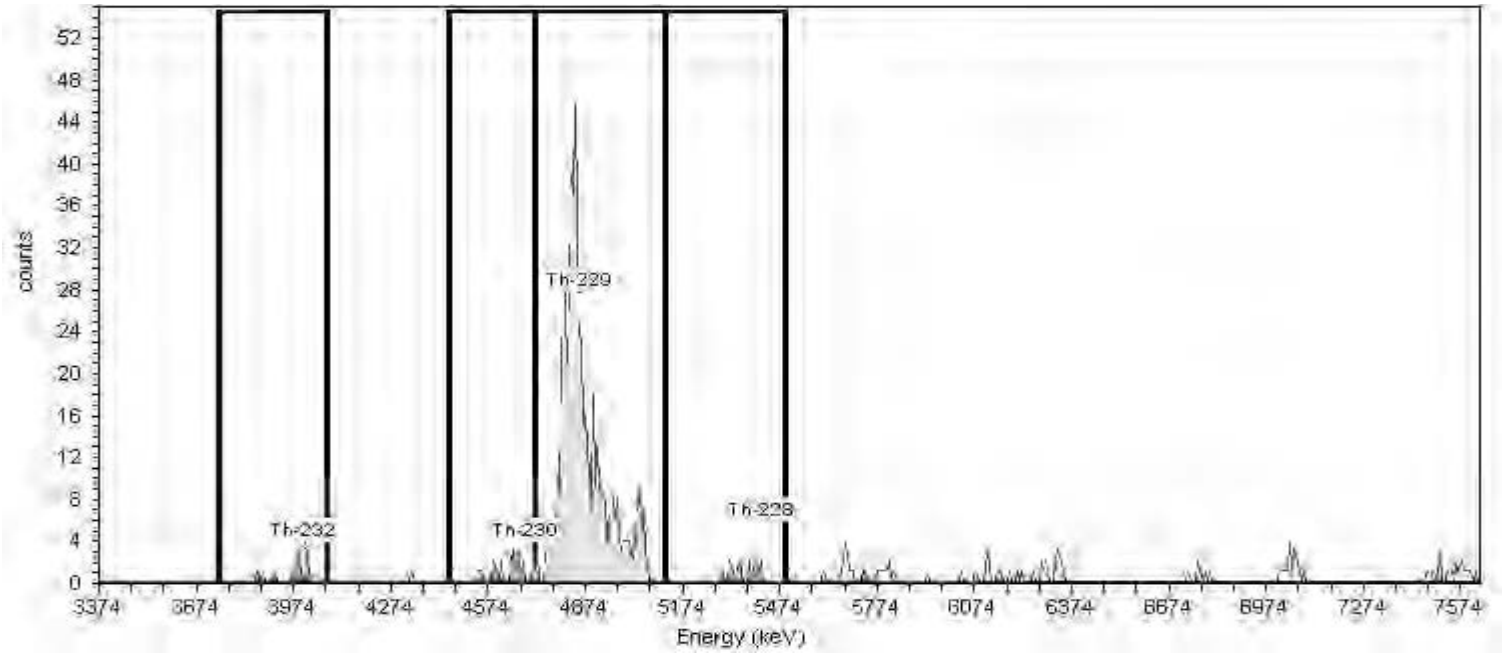
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 77.38%

Acquisition

Detector: AV47
Serial Number: 46-032336
Acquisition Start Date: 8/10/2018 6:54:10PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:57PM
Background Info: Sample: ICB;AV47; Det: AV47; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1370622;AV47-05142018
Calibration Date: 5/15/2018 12:27:14PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 27.02% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 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	54.0	100.2	15	0.1875	14.81	0.175	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	37.0	99.7	23	0.1875	22.87	0.271	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	66.4	99.6	504	0.0000	504.06	4.630	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	108.4	99.8	17	3.0000	14.00	0.166	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:57:36PM 8/10/2018

Sample

Sample Name: 160-29521-B-13-C
SampleType: Sample
: 160-29521-B-13-C
Sample Collection Date: 7/13/2018 7:50:00AM

Spectrum #1 Analysis #1
Sample Weight : 1.0029g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736773

Analyst: 60040

Tracer

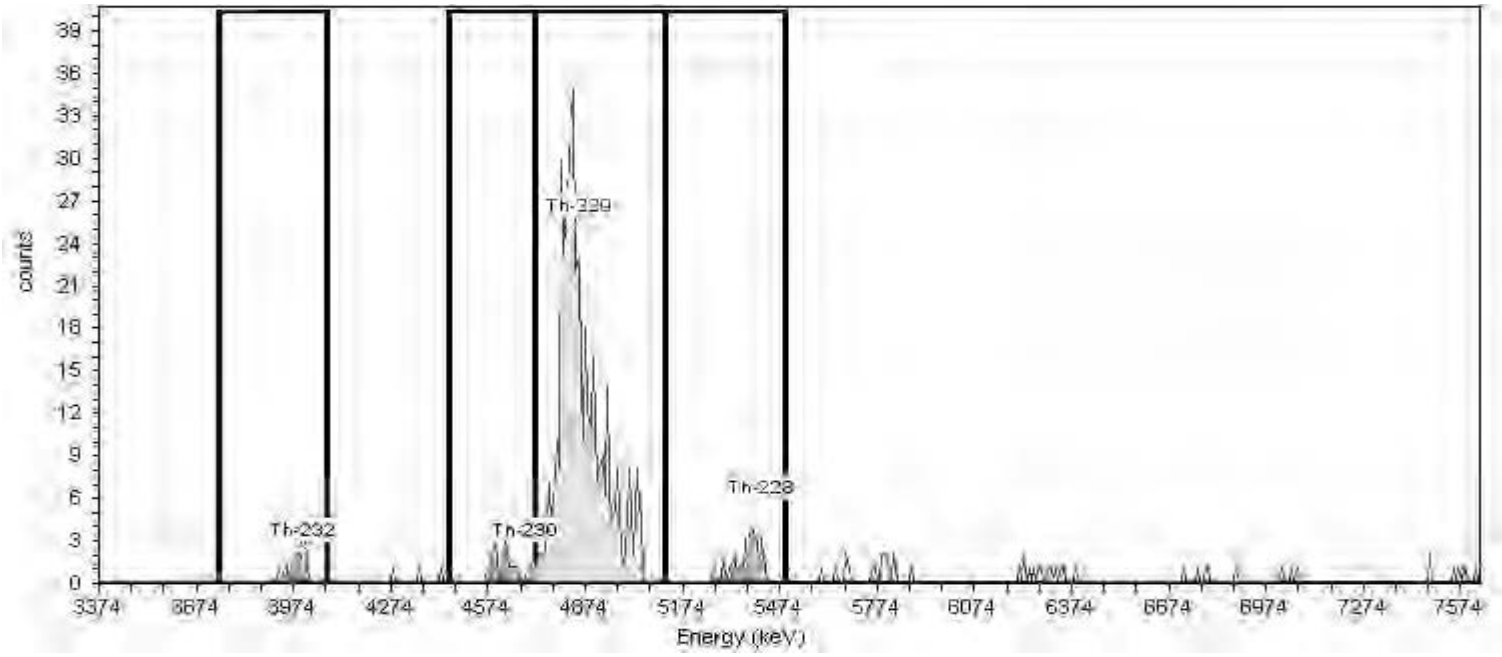
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 72.70%

Acquisition

Detector: AV48
Serial Number: 46-033P6
Acquisition Start Date: 8/10/2018 6:54:12PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:58PM
Background Info: Sample: ICB;AV48; Det: AV48; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1370619;AV48-05142018
Calibration Date: 5/15/2018 12:27:25PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 27.06% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	52.2	100.2	16	0.3750	15.63	0.198	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	5.0	99.7	23	0.0000	23.00	0.293	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	69.5	99.6	475	0.7500	474.25	4.391	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	60.9	99.8	32	1.8750	30.13	0.383	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:57:45PM 8/10/2018

Sample

Sample Name: 160-29521-A-14-D
SampleType: Sample
: 160-29521-A-14-D
Sample Collection Date: 7/13/2018 7:40:00AM

Spectrum #1 Analysis #1
Sample Weight : 1.0048g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736774

Analyst: 60040

Tracer

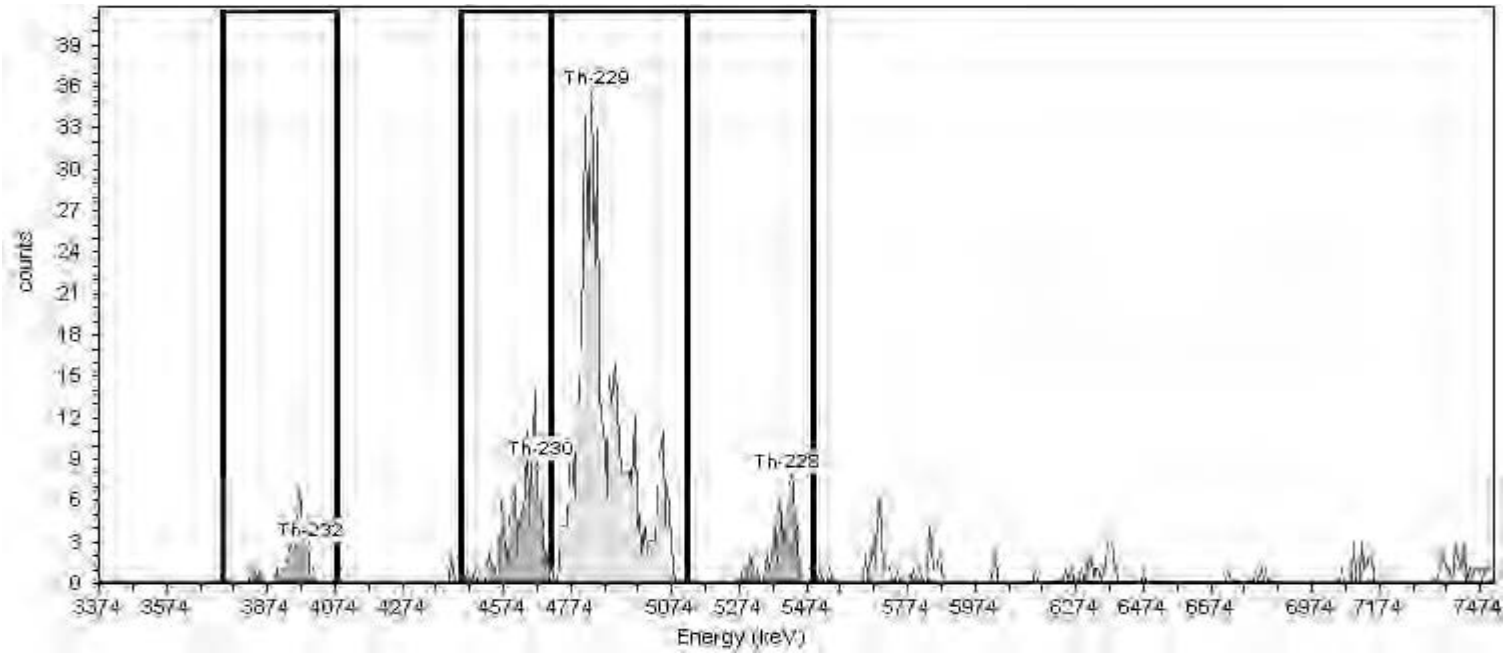
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 76.48%

Acquisition

Detector: AV49
Serial Number: 47-043hh4
Acquisition Start Date: 8/10/2018 6:54:13PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:40:00PM
Background Info: Sample: ICB;AV49; Det: AV49; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-1370620;AV49-05142018
Calibration Date: 5/15/2018 12:27:36PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.27% +/- 0.24% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	55.2	100.2	39	0.8297	38.17	0.472	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	49.7	99.7	109	0.5625	108.41	1.348	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	68.9	99.6	485	0.5505	484.42	4.610	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	54.7	99.8	58	3.5505	54.45	0.677	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:59:17PM 8/10/2018

Sample

Sample Name: 160-29521-B-15-D
SampleType: Sample
: 160-29521-B-15-D
Sample Collection Date: 7/13/2018 8:00:00AM

Spectrum #1 Analysis #1
Sample Weight : 1.0749g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736776

Analyst: 60040

Tracer

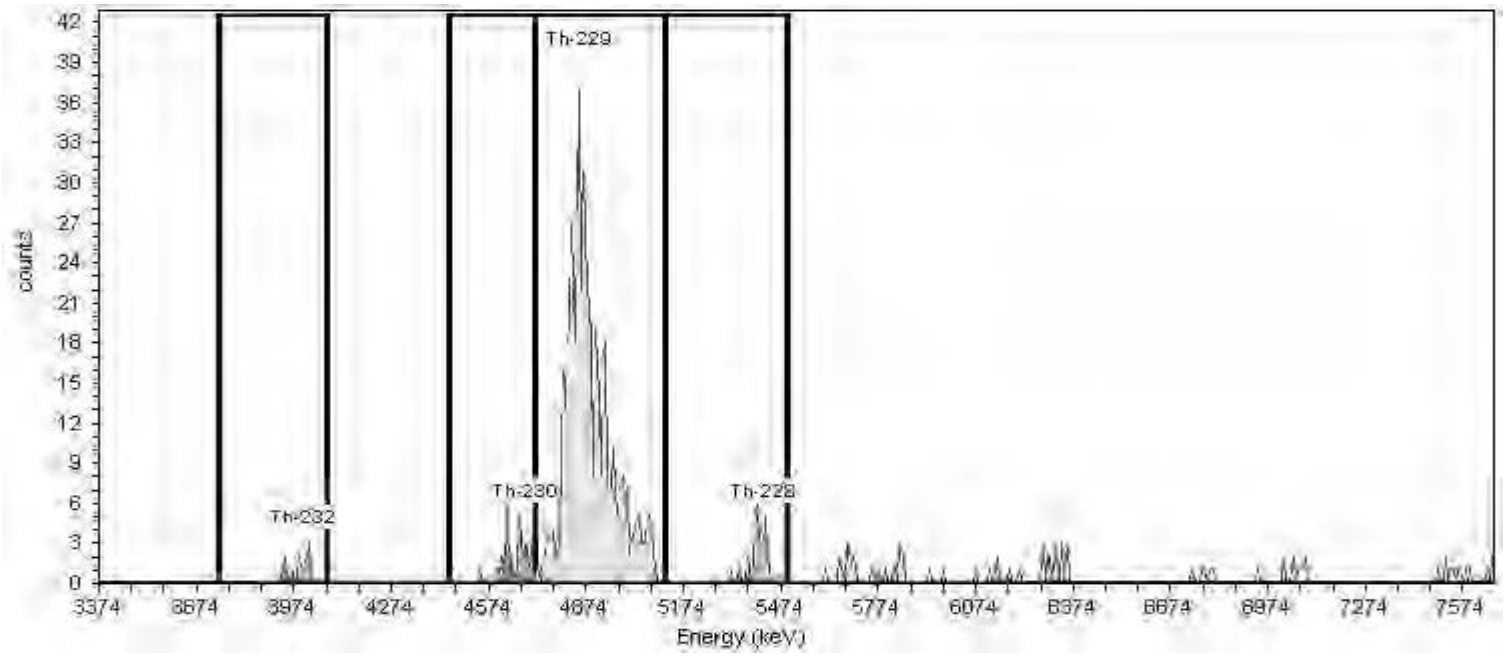
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 84.69%

Acquisition

Detector: AV52
Serial Number: 49-155N7
Acquisition Start Date: 8/10/2018 6:54:14PM
Live Time: 180.00 min.
Real Time: 180.01 min.
Background Date: 7/12/2018 1:40:02PM
Background Info: Sample: ICB;AV52; Det: AV52; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-8877;AV52-05152018
Calibration Date: 5/15/2018 3:36:50PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.50% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	45.8	100.2	14	0.7500	13.25	0.148	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	27.2	99.7	32	2.2442	29.79	0.335	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	91.6	99.6	501	0.7442	500.29	4.772	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	48.0	99.8	30	2.0625	27.94	0.314	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:57:54PM 8/10/2018

Sample

Sample Name: 160-29521-A-16-D
SampleType: Sample
: 160-29521-A-16-D
Sample Collection Date: 7/13/2018 12:40:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0284g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736775

Analyst: 60040

Tracer

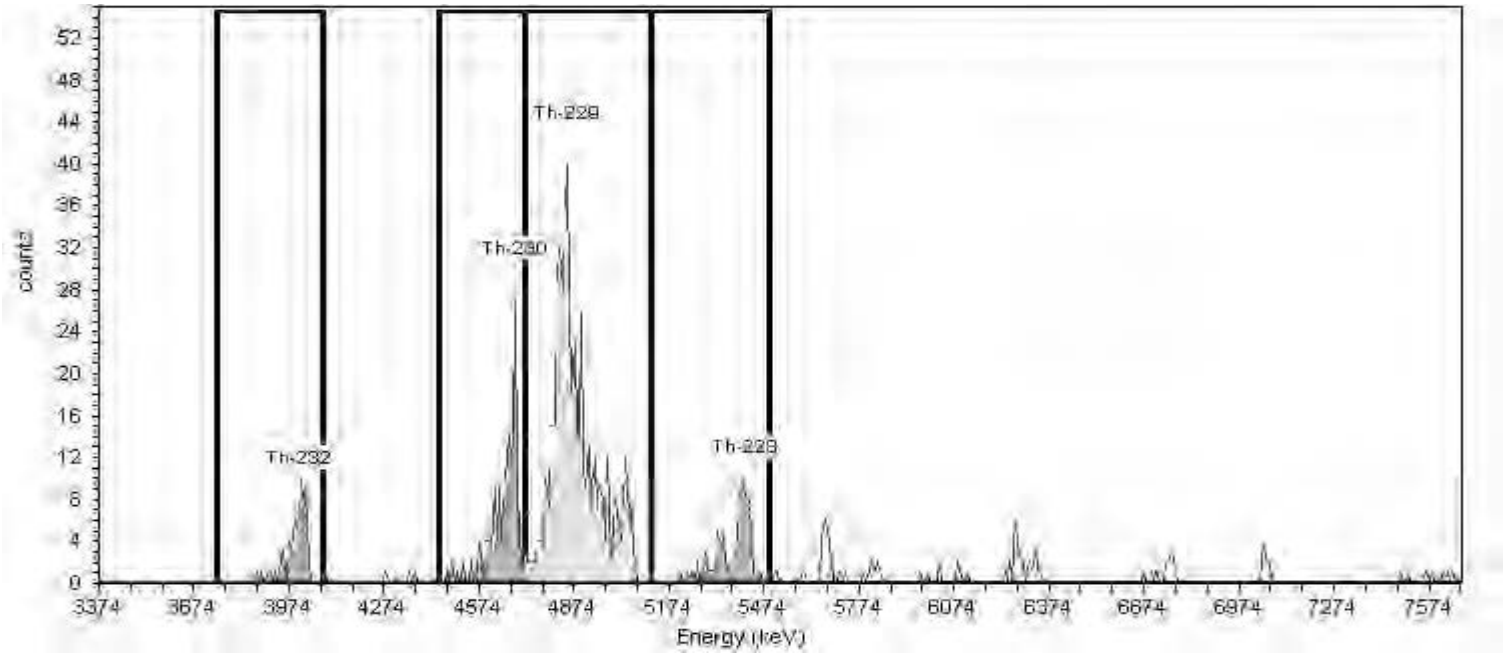
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 97.09%

Acquisition

Detector: AV53
Serial Number: 50-051A6
Acquisition Start Date: 8/10/2018 6:54:15PM
Live Time: 180.00 min.
Real Time: 180.01 min.
Background Date: 7/13/2018 12:11:28PM
Background Info: Sample: ICB;AV53; Det: AV53; Spectrum #2; Jul-13-2018 12:11

Calibration Name: IC-9520;AV53-05152018
Calibration Date: 5/15/2018 3:37:10PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 23.27% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	53.9	100.2	64	0.3750	63.63	0.684	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	26.3	99.7	154	0.3808	153.59	1.659	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	77.1	99.6	545	0.3808	544.59	5.718	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	48.4	99.8	88	2.2500	85.66	0.925	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:59:26PM 8/10/2018

Sample

Sample Name: 160-29521-B-17-D
SampleType: Sample
: 160-29521-B-17-D
Sample Collection Date: 7/13/2018 12:50:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0754g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736777

Analyst: 60040

Tracer

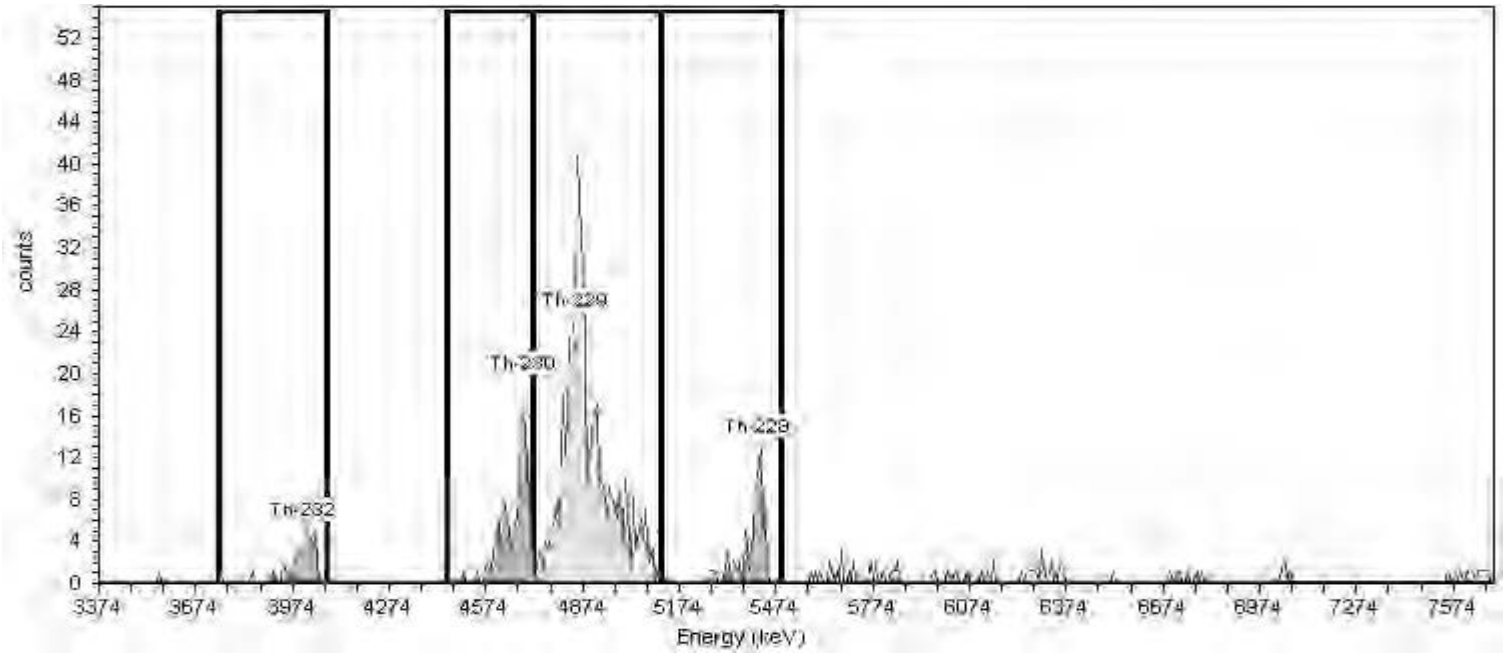
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 89.50%

Acquisition

Detector: AV54
Serial Number: 46-033P4
Acquisition Start Date: 8/10/2018 6:54:17PM
Live Time: 180.00 min.
Real Time: 180.01 min.
Background Date: 7/12/2018 1:40:04PM
Background Info: Sample: ICB;AV54; Det: AV54; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-9792;AV54-05152018
Calibration Date: 5/15/2018 3:37:57PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 23.62% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	37.4	100.2	46	0.5625	45.86	0.504	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	35.5	99.7	126	0.9375	125.03	1.381	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	72.5	99.6	510	0.3870	509.58	5.041	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	52.7	99.8	72	2.0745	69.93	0.772	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:59:35PM 8/10/2018

Sample

Sample Name: 160-29521-A-18-C
SampleType: Sample
: 160-29521-A-18-C
Sample Collection Date: 7/13/2018 12:55:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0125g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736778

Analyst: 60040

Tracer

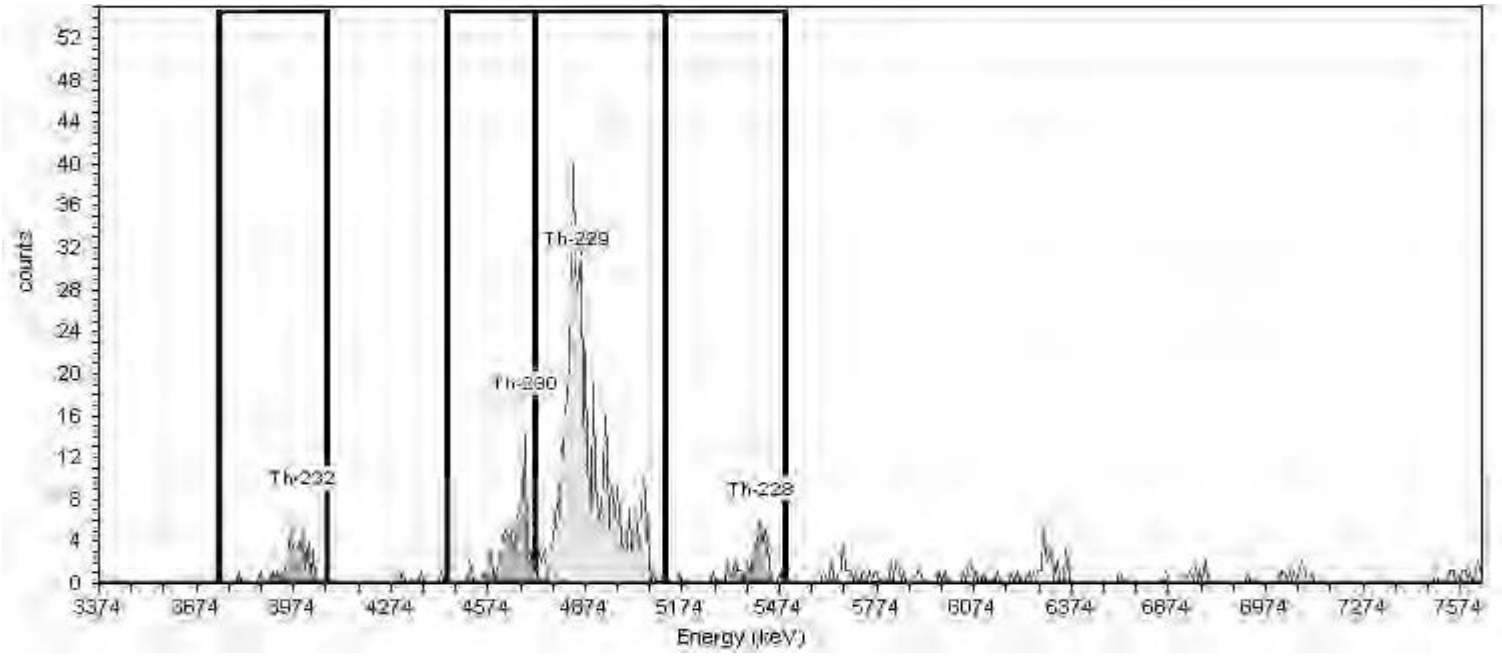
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 80.13%

Acquisition

Detector: AV56
Serial Number: 52-059EE5
Acquisition Start Date: 8/10/2018 6:54:17PM
Live Time: 180.00 min.
Real Time: 180.01 min.
Background Date: 7/12/2018 1:40:09PM
Background Info: Sample: ICB;AV56; Det: AV56; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-9795;AV56-05152018
Calibration Date: 5/15/2018 3:38:31PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 25.25% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	24.6	99.7	83	0.9375	82.00	1.005	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	69.1	99.6	488	0.1875	487.75	4.793	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	51.3	99.8	43	2.4375	40.56	0.497	pCi/g
Th-232	3999.0	4,010.0	-11.0	3743.0	4072.0	88.1	100.2	42	0.3750	41.63	0.507	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:59:44PM 8/10/2018

Sample

Sample Name: 160-29521-A-19-C
SampleType: Sample
: 160-29521-A-19-C
Sample Collection Date: 7/13/2018 3:50:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0364g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736779

Analyst: 60040

Tracer

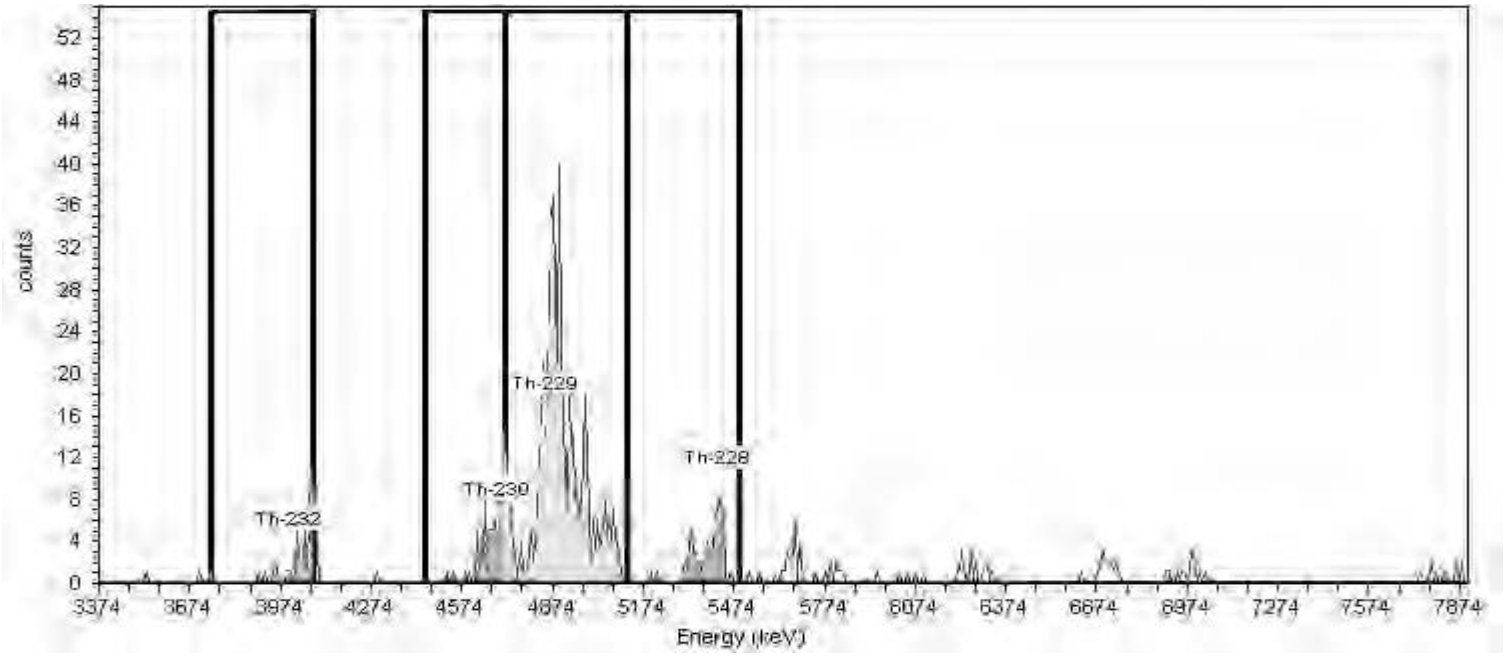
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 95.83%

Acquisition

Detector: AV57
Serial Number: 48-158EE3
Acquisition Start Date: 8/10/2018 6:54:18PM
Live Time: 180.00 min.
Real Time: 180.01 min.
Background Date: 7/12/2018 1:40:11PM
Background Info: Sample: ICB;AV57; Det: AV57; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-9817;AV57-05152018
Calibration Date: 5/15/2018 3:38:42PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 22.40% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	.7	100.2	34	1.1250	33.28	0.374	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	12.2	99.7	90	1.1250	88.72	1.001	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	78.5	99.6	519	1.3125	517.53	5.600	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	56.1	99.8	74	2.2500	71.66	0.808	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:32:16PM 8/13/2018

Sample

Sample Name: 160-29521-A-19-C
SampleType: Sample
: 160-29521-A-19-C
Sample Collection Date: 7/13/2018 3:50:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0364g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736943

Analyst: 60040

Tracer

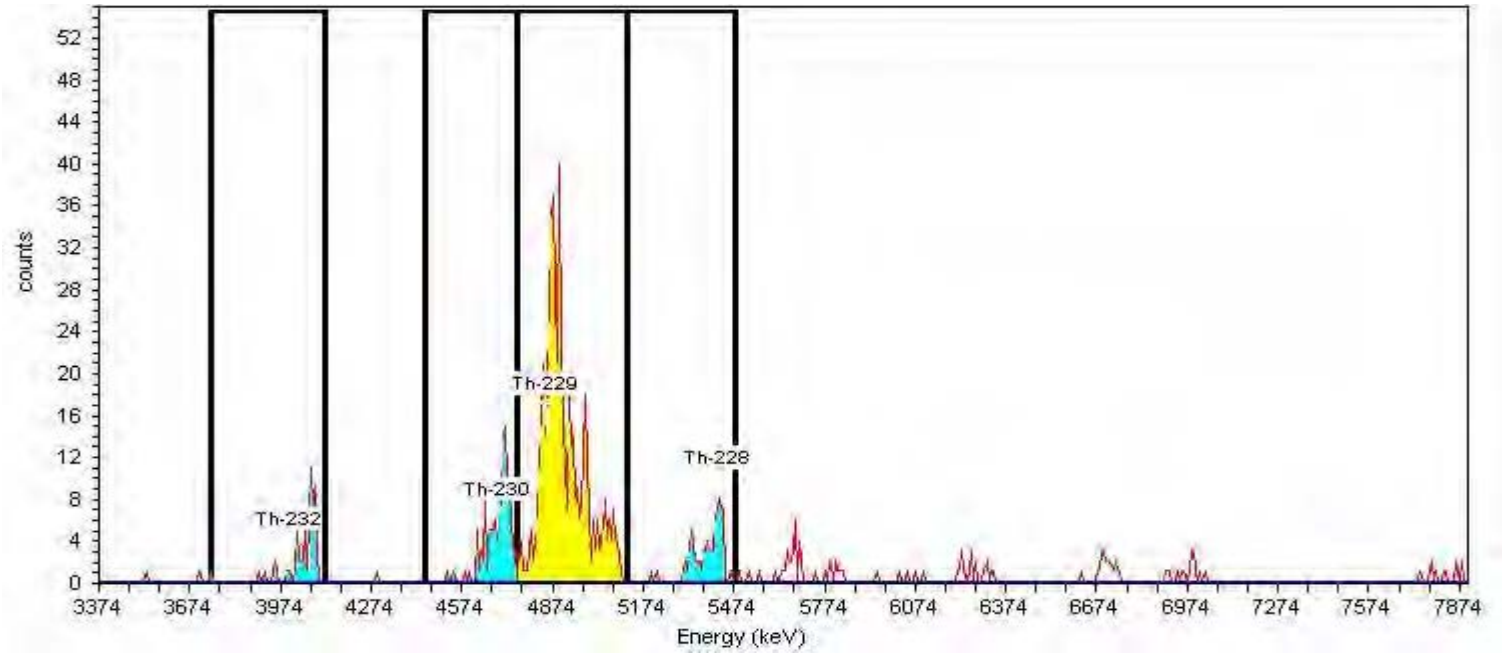
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 90.41%

Acquisition

Detector: AV57
Serial Number: 48-158EE3
Acquisition Start Date: 8/10/2018 6:54:18PM
Live Time: 180.00 min.
Real Time: 180.01 min.
Background Date: 7/12/2018 1:40:11PM
Background Info: Sample: ICB;AV57; Det: AV57; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-9817;AV57-05152018
Calibration Date: 5/15/2018 3:38:42PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.40% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 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	3739.8	4120.2	13.9	100.2	56	1.3125	54.69	0.651	pCi/g
Th-230	4688.0	4,687.5	0.5	4448.3	4754.1	24.3	99.7	115	1.6875	113.31	1.355	pCi/g
Th-229	4848.0	4,845.3	2.7	4754.1	5119.5	78.5	99.6	489	0.7500	488.25	5.284	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.5	5477.4	36.1	99.8	73	2.2500	70.75	0.846	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:59:53PM 8/10/2018

Sample

Sample Name: 160-29521-B-20-C
SampleType: Sample
: 160-29521-B-20-C
Sample Collection Date: 7/13/2018 4:00:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0001g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736780

Analyst: 60040

Tracer

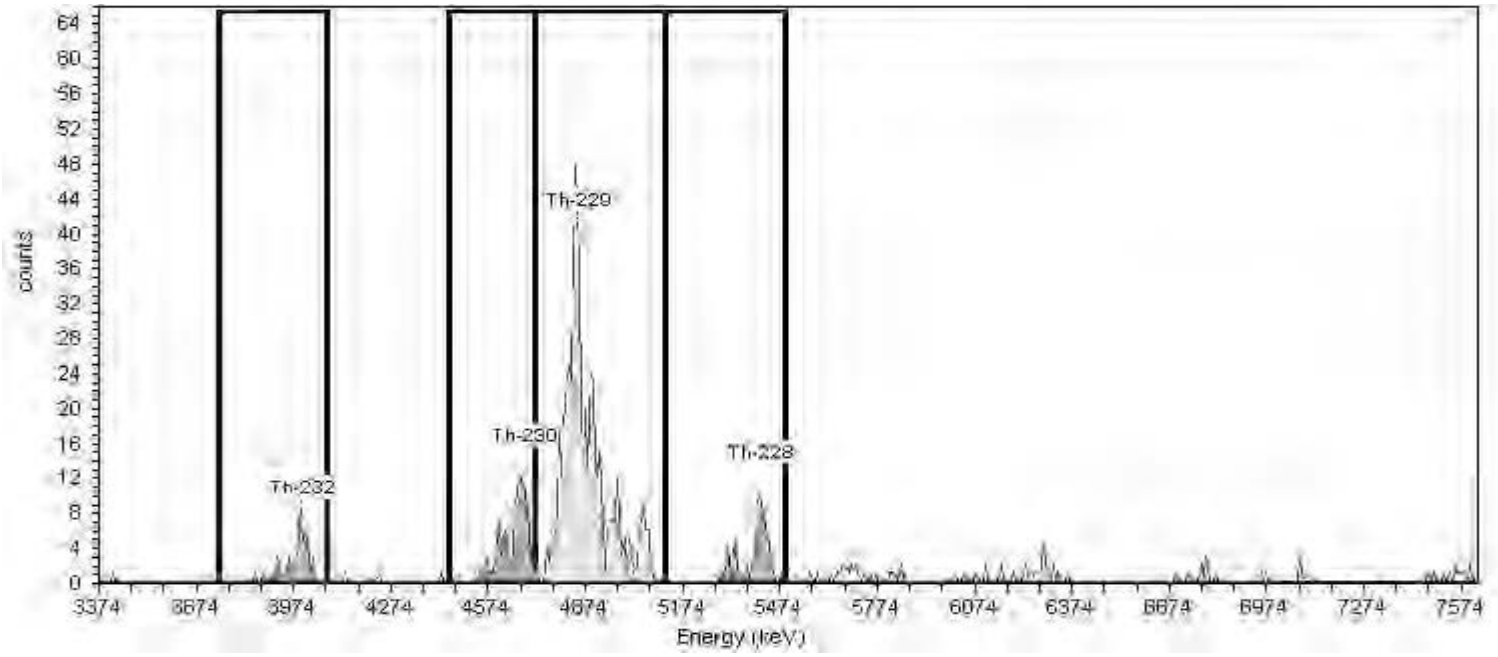
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 91.25%

Acquisition

Detector: AV58
Serial Number: 52-102 C5
Acquisition Start Date: 8/10/2018 6:54:21PM
Live Time: 180.00 min.
Real Time: 180.01 min.
Background Date: 7/13/2018 12:11:31PM
Background Info: Sample: ICB;AV58; Det: AV58; Spectrum #2; Jul-13-2018 12:11

Calibration Name: IC-9885;AV58-05152018
Calibration Date: 5/15/2018 3:38:55PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.05% +/- 0.36% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	51.1	100.2	52	0.6485	51.35	0.584	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	31.2	99.7	110	1.3125	108.72	1.243	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	75.5	99.6	530	0.9255	529.11	5.526	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	48.6	99.8	75	3.9255	71.07	0.812	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:00:03PM 8/10/2018

Sample

Sample Name: 160-29521-A-21-D
SampleType: Sample
: 160-29521-A-21-D
Sample Collection Date: 7/13/2018 4:10:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0061g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736781

Analyst: 60040

Tracer

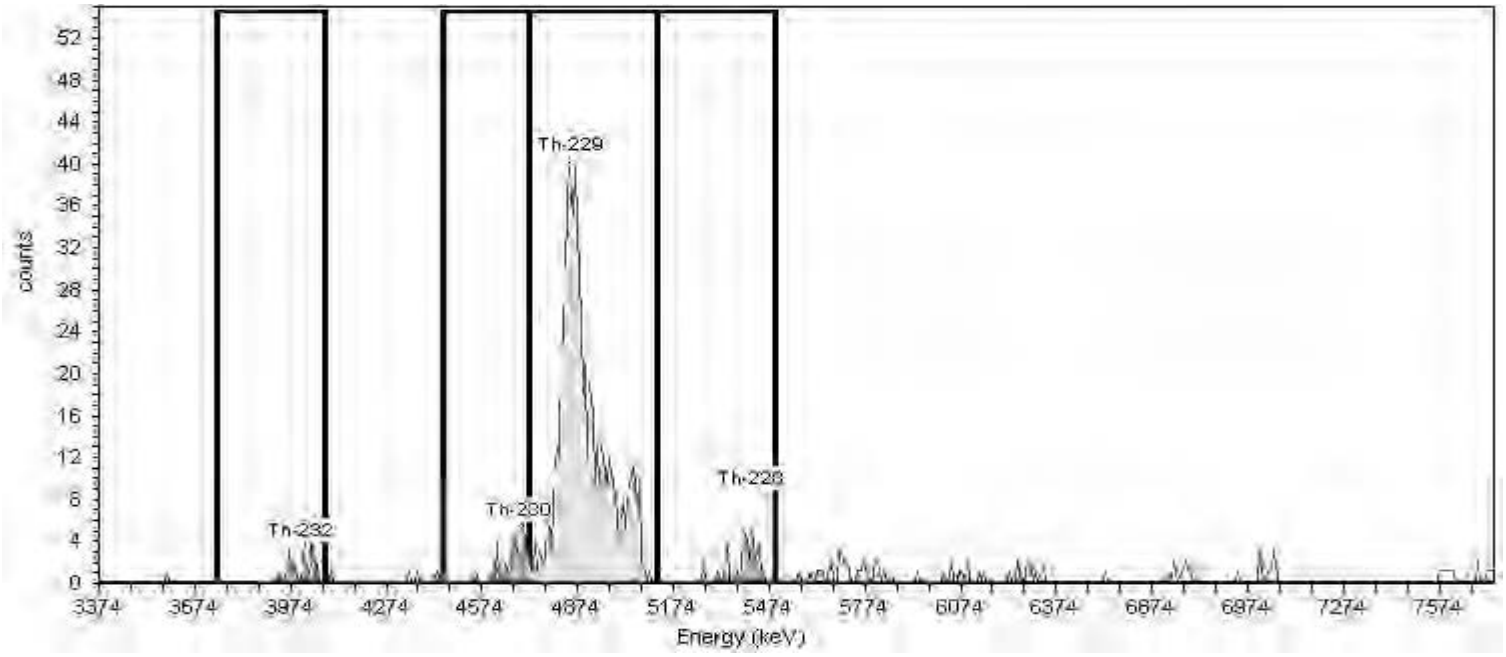
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 91.40%

Acquisition

Detector: AV60
Serial Number: 49-027117
Acquisition Start Date: 8/10/2018 6:54:22PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/13/2018 12:11:34PM
Background Info: Sample: ICB;AV60; Det: AV60; Spectrum #2; Jul-13-2018 12:11

Calibration Name: IC-1368446;AV60-05152018
Calibration Date: 5/15/2018 3:39:06PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 28.28% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	10.4	100.2	23	0.3750	22.63	0.217	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	42.2	99.7	40	0.9375	39.03	0.377	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	78.3	99.6	624	0.7500	623.22	5.502	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	53.9	99.8	39	2.4375	36.56	0.353	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:00:12PM 8/10/2018

Sample

Sample Name: 160-29521-A-22-C
SampleType: Sample
: 160-29521-A-22-C
Sample Collection Date: 7/13/2018 4:20:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0061g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 378572
AnalysisID: 736782

Analyst: 60040

Tracer

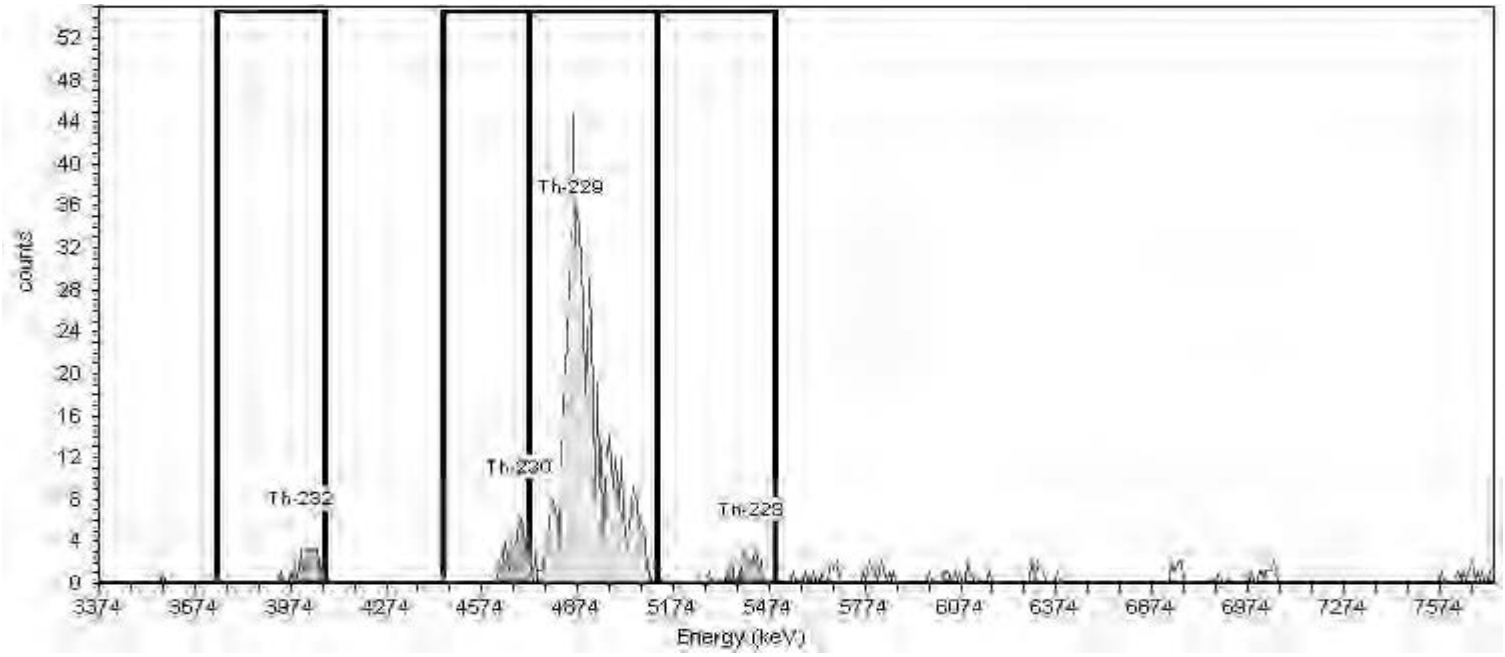
Tracer Name: Th-229_00023
Tracer Activity: 67.23 DPM/mL x (Vol.)0.20 mL = 13.45 DPM
Tracer Ref. Date: 8/6/2014 12:00:17PM

Tracer Nuclide: Th-229
Tracer Recovery: 87.61%

Acquisition

Detector: AV62
Serial Number: 52-060FF2
Acquisition Start Date: 8/10/2018 6:54:23PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:40:16PM
Background Info: Sample: ICB;AV62; Det: AV62; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-1368447;AV62-05152018
Calibration Date: 5/15/2018 3:39:22PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 28.40% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = Th2007_ROI
Decay Correction: 8/10/2018 6:50:30PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	39.1	100.2	26	0.1875	26.27	0.262	pCi/g
Th-230	4688.0	4,687.5	0.5	4446.0	4717.0	39.3	99.7	47	0.5625	46.01	0.461	pCi/g
Th-229	4848.0	4,845.3	2.7	4717.0	5119.0	84.6	99.6	600	0.0000	599.88	5.274	pCi/g
Th-228	5420.0	5,423.3	-3.3	5119.0	5493.0	54.1	99.8	22	0.9375	21.06	0.211	pCi/g

Method A-01-R U

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

Prep Batch: 377742

Preparation, Extraction Chromatography Resin Actinide Separation

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 377742

Lab ID: MB 160-377742/1-A
Client ID:
Sigma: 2
Analyzed: 08/04/18 14:34
Detector: AV47
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	0.02041	0.0289	0.0289	U	pCi/g	1.00	0.0306	380552
Uranium-235	0.0000	0.00476	0.00476	U	pCi/g	1.00	0.0381	380552
Uranium-238	-0.003820	0.00540	0.00541	U	pCi/g	1.00	0.0529	380552

Tracer	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.301	0.484	0.717		pCi/g	0.0754	6.91	90.9	30 - 110

Lab ID: LCS 160-377742/2-A
Client ID:
Sigma: 2
Analyzed: 08/04/18 14:34
Detector: AV48
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	6.552	0.544	0.774		pCi/g	1.00	0.0642	380553
Uranium-238	7.127	0.567	0.824		pCi/g	1.00	0.0585	380553

Tracer	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.690	0.459	0.663		pCi/g	0.0657	6.91	82.1	30 - 110

Lab ID: 490-155782-F-2-H DU
Client ID:
Sigma: 2
Analyzed: 08/04/18 14:34
Detector: AV52
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.9606	0.214	0.229		pCi/g	1.00	0.0944	380555
Uranium-235	0.01171	0.0293	0.0293	U	pCi/g	1.00	0.0656	380555
Uranium-238	1.122	0.229	0.248		pCi/g	1.00	0.0748	380555

Tracer	DU Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.189	0.504	0.724		pCi/g	0.0626	6.95	88.8	30 - 110

Lab ID: 160-29521-1
Client ID: CRC-B9-1416
Sigma: 2
Analyzed: 08/04/18 14:34
Detector: AV69
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.276	0.111	0.114		pCi/g	1.00	0.0506	380566
Uranium-235	0.0277	0.0392	0.0392	U	pCi/g	1.00	0.0415	380566
Uranium-238	0.340	0.124	0.127		pCi/g	1.00	0.0577	380566

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 377742

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.01	0.479	0.696		pCi/g	0.0617	6.97	86.0	30 - 110

Lab ID: 160-29521-2
Client ID: CRC-B9-2022
Sigma: 2
Analyzed: 08/04/18 14:34
Detector: AV70
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.259	0.104	0.107		pCi/g	1.00	0.0681	380568
Uranium-235	0.0202	0.0358	0.0359	U	pCi/g	1.00	0.0647	380568
Uranium-238	0.356	0.120	0.124		pCi/g	1.00	0.0519	380568

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	7.21	0.546	0.815		pCi/g	0.0667	6.95	103	30 - 110

Lab ID: 160-29521-3
Client ID: CRC-B6-1618
Sigma: 2
Analyzed: 08/04/18 14:34
Detector: AV71
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.347	0.122	0.125		pCi/g	1.00	0.0637	380569
Uranium-235	0.0130	0.0260	0.0260	U	pCi/g	1.00	0.0390	380569
Uranium-238	0.317	0.116	0.119		pCi/g	1.00	0.0592	380569

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	7.28	0.564	0.832		pCi/g	0.0913	6.93	105	30 - 110

Lab ID: 160-29521-4
Client ID: CRC-B6-2426
Sigma: 2
Analyzed: 08/04/18 14:34
Detector: AV72
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.339	0.120	0.124		pCi/g	1.00	0.0595	380570
Uranium-235	0.000	0.00488	0.00488	U	pCi/g	1.00	0.0390	380570
Uranium-238	0.391	0.129	0.133		pCi/g	1.00	0.0594	380570

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.73	0.523	0.770		pCi/g	0.0690	6.89	97.3	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 377742

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 160-377742/1-A	Uranium-234			0.02041	U	pCi/g							1.411725 47
MB 160-377742/1-A	Uranium-235			0.0000	U	pCi/g							.
MB 160-377742/1-A	Uranium-238			-0.003820	U	pCi/g							-1.411725 47

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-377742/2-A	Uranium-234		6.37	6.552		pCi/g	103	84 - 120					.3400118 809
LCS 160-377742/2-A	Uranium-238		6.51	7.127		pCi/g	109	82 - 122					1.103867 6679

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
490-155782-F-2-H DU	Uranium-234	0.786		0.9606		pCi/g			20	0.40	1.14	1	
490-155782-F-2-H DU	Uranium-235	0.0719		0.01171	U	pCi/g			144	0.62	1.64	1	
490-155782-F-2-H DU	Uranium-238	0.830		1.122		pCi/g			30	0.64	1.79	1	

Glossary:

Ts = Count Duration, Sample

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 377742 Batch Start Date: 07/24/18 18:48 Batch Analyst: Turley, Taylor A

Batch Method: ExtChrom Batch End Date: 08/03/18 20:29

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	U-232 00040	UNAT 00014			
MB 160-377742/1		ExtChrom, A-01-R		1 g	0.2 mL				
LCS 160-377742/2		ExtChrom, A-01-R		1 g	0.2 mL	0.2 mL			
490-155782-F-2-A DU		ExtChrom, A-01-R	T	0.9947 g	0.2 mL				
160-29521-B-1-B	CRC-B9-1416	ExtChrom, A-01-R	T	0.9916 g	0.2 mL				
160-29521-B-2-A	CRC-B9-2022	ExtChrom, A-01-R	T	0.9936 g	0.2 mL				
160-29521-B-3-A	CRC-B6-1618	ExtChrom, A-01-R	T	0.9975 g	0.2 mL				
160-29521-A-4-B	CRC-B6-2426	ExtChrom, A-01-R	T	1.0027 g	0.2 mL				

Batch Notes	
Balance ID	1123433897
Analyst ID - Column	NMN per CMM
Column Date	08/01/2018
Analyst ID - CoPrecipitation	CMM
CoPrecipitation Date	08/03/2018
Pipette ID	RAD117
Analyst ID - Reagent Drop Witness	TAT per CMM
Analyst ID - Reagent Drop	CMM
SOP Number	ST-RC-0003, ST-RC-0004, 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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:36:16PM 8/4/2018

Sample

Sample Name: MB 160-377742/1-A
SampleType: Blank
: MB 160-377742/1-A
Sample Collection Date: 8/3/2018 8:30:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0000g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377742
AnalysisID: 735918

Analyst: 60040

Tracer

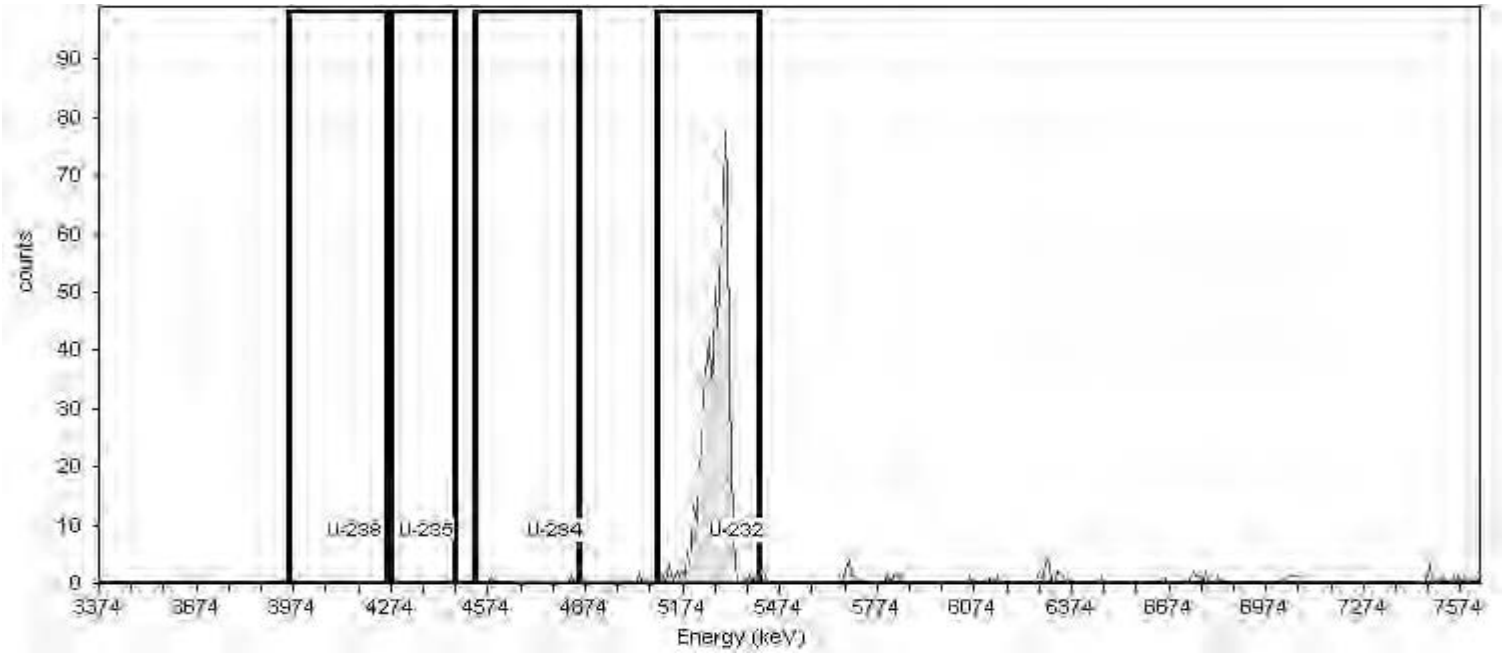
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232
Tracer Recovery: 90.92%

Acquisition

Detector: AV47
Serial Number: 46-032336
Acquisition Start Date: 8/4/2018 2:34:15PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:57PM
Background Info: Sample: ICB;AV47; Det: AV47; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1370622;AV47-05142018
Calibration Date: 5/15/2018 12:27:14PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 27.02% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 8/4/2018 2:31:19PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	0.3750	-0.38	-0.004	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	0.0000	0.00	0.000	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	10.2	99.8	2	0.0000	2.00	0.020	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	79.3	100.1	683	2.0625	680.94	6.737	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:36:25PM 8/4/2018

Sample

Sample Name: LCS 160-377742/2-A
SampleType: Control
: LCS 160-377742/2-A
Sample Collection Date: 8/3/2018 8:30:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0000g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377742
AnalysisID: 735919

Analyst: 60040

Tracer

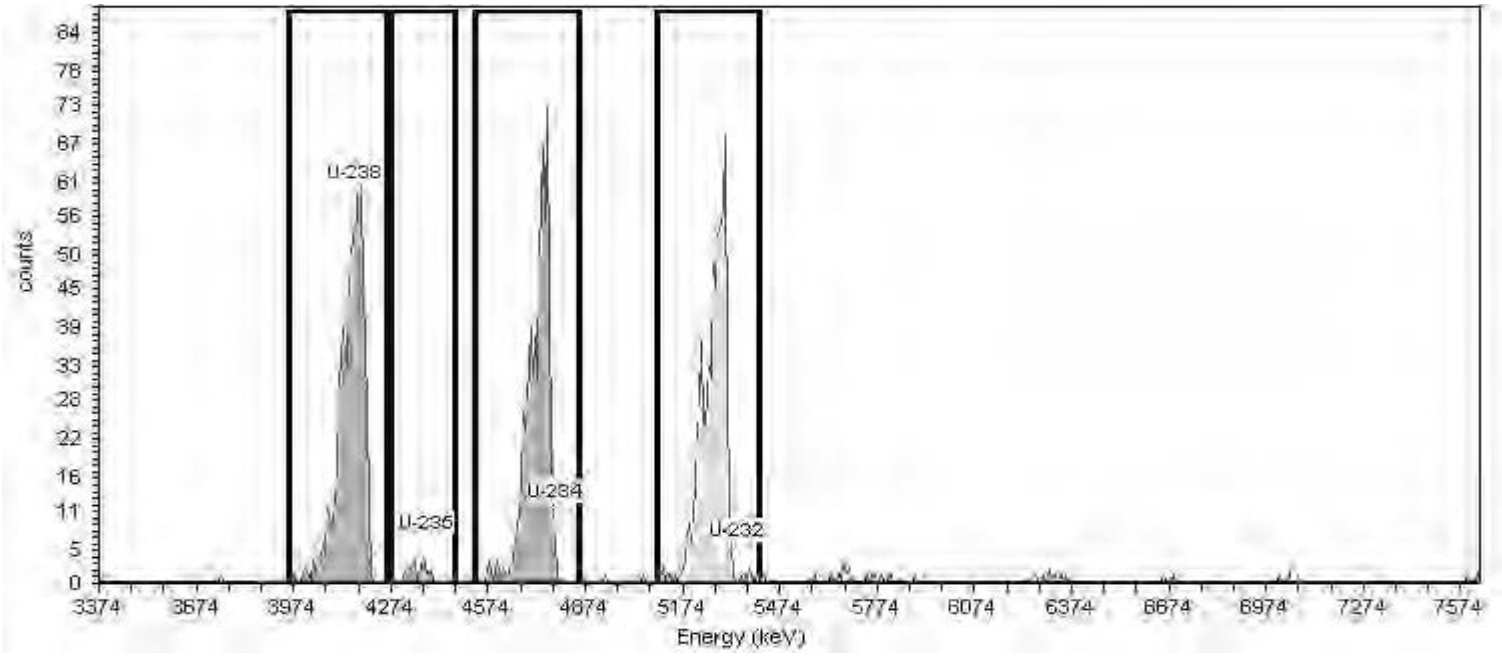
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232
Tracer Recovery: 82.10%

Acquisition

Detector: AV48
Serial Number: 46-033P6
Acquisition Start Date: 8/4/2018 2:34:16PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:39:58PM
Background Info: Sample: ICB;AV48; Det: AV48; Spectrum #1; Jul-12-2018 13:39

Calibration Name: IC-1370619;AV48-05142018
Calibration Date: 5/15/2018 12:27:25PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 27.06% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 8/4/2018 2:31:18PM
MDA Constants: Kα = 1.65 , Kβ = 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	74.8	100.0	633	0.3750	632.63	7.127	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	70.1	80.2	24	0.1875	23.81	0.334	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	72.7	99.8	581	0.5625	580.44	6.552	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	78.2	100.1	617	1.3125	615.69	6.083	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:36:43PM 8/4/2018

Sample

Sample Name: 490-155782-F-2-H DU
SampleType: Sample
: 490-155782-F-2-H DU
Sample Collection Date: 7/16/2018 9:55:00AM

Spectrum #1 Analysis #1
Sample Weight : 0.9947g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377742
AnalysisID: 735921

Analyst: 60040

Tracer

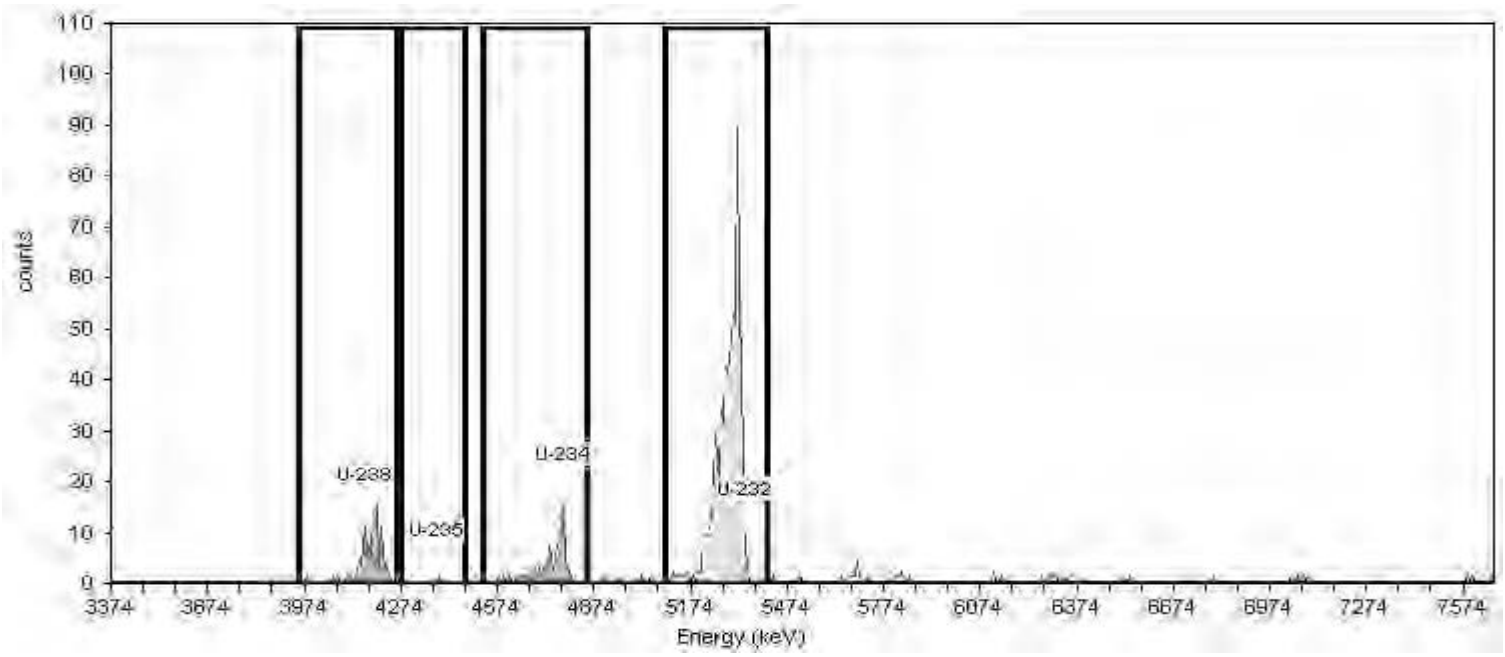
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232
Tracer Recovery: 88.83%

Acquisition

Detector: AV52
Serial Number: 49-155N7
Acquisition Start Date: 8/4/2018 2:34:18PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:40:02PM
Background Info: Sample: ICB;AV52; Det: AV52; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-8877;AV52-05152018
Calibration Date: 5/15/2018 3:36:50PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.50% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 8/4/2018 2:31:18PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	74.2	100.0	98	0.9375	97.06	1.122	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	1	0.1875	0.81	0.012	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	53.0	99.8	85	2.0625	82.94	0.961	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	70.0	100.1	604	0.7500	603.25	6.617	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:38:35PM 8/4/2018

Sample

Sample Name: 160-29521-B-1-E
SampleType: Sample
: 160-29521-B-1-E
Sample Collection Date: 7/12/2018 8:00:00AM

Spectrum #1 Analysis #1
Sample Weight : 0.9916g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377742
AnalysisID: 735932

Analyst: 60040

Tracer

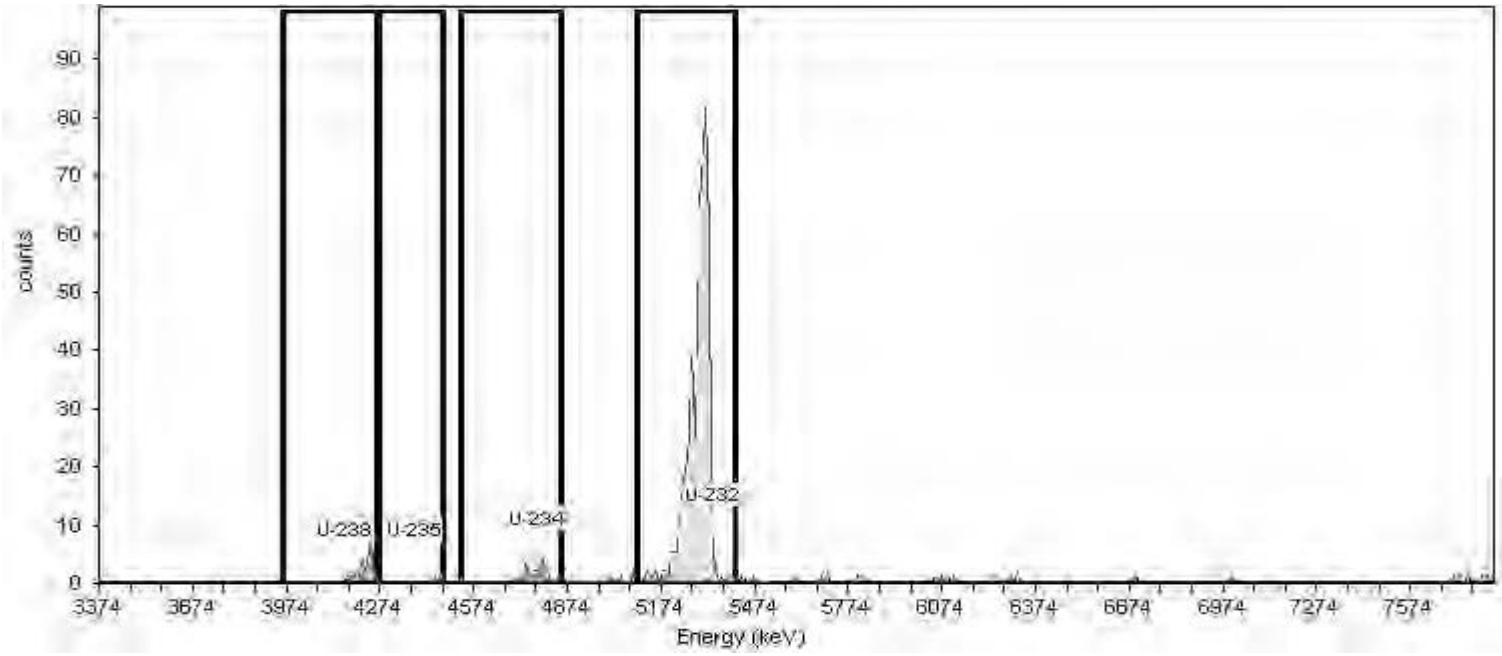
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232
Tracer Recovery: 86.01%

Acquisition

Detector: AV69
Serial Number: 49-155DD5
Acquisition Start Date: 8/4/2018 2:34:28PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:40:25PM
Background Info: Sample: ICB;AV69; Det: AV69; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-8874;AV69-05152018
Calibration Date: 5/15/2018 6:39:25PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.43% +/- 0.38% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 8/4/2018 2:31:18PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Deviation 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	20.0	100.0	31	0.3750	30.63	0.340	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	12.0	80.2	2	0.0000	2.00	0.028	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	80.0	99.8	25	0.1875	24.81	0.276	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	56.6	100.1	631	0.9375	630.06	6.427	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:38:44PM 8/4/2018

Sample

Sample Name: 160-29521-B-2-D
SampleType: Sample
: 160-29521-B-2-D
Sample Collection Date: 7/12/2018 8:30:00AM

Spectrum #1 Analysis #1
Sample Weight : 0.9936g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377742
AnalysisID: 735933

Analyst: 60040

Tracer

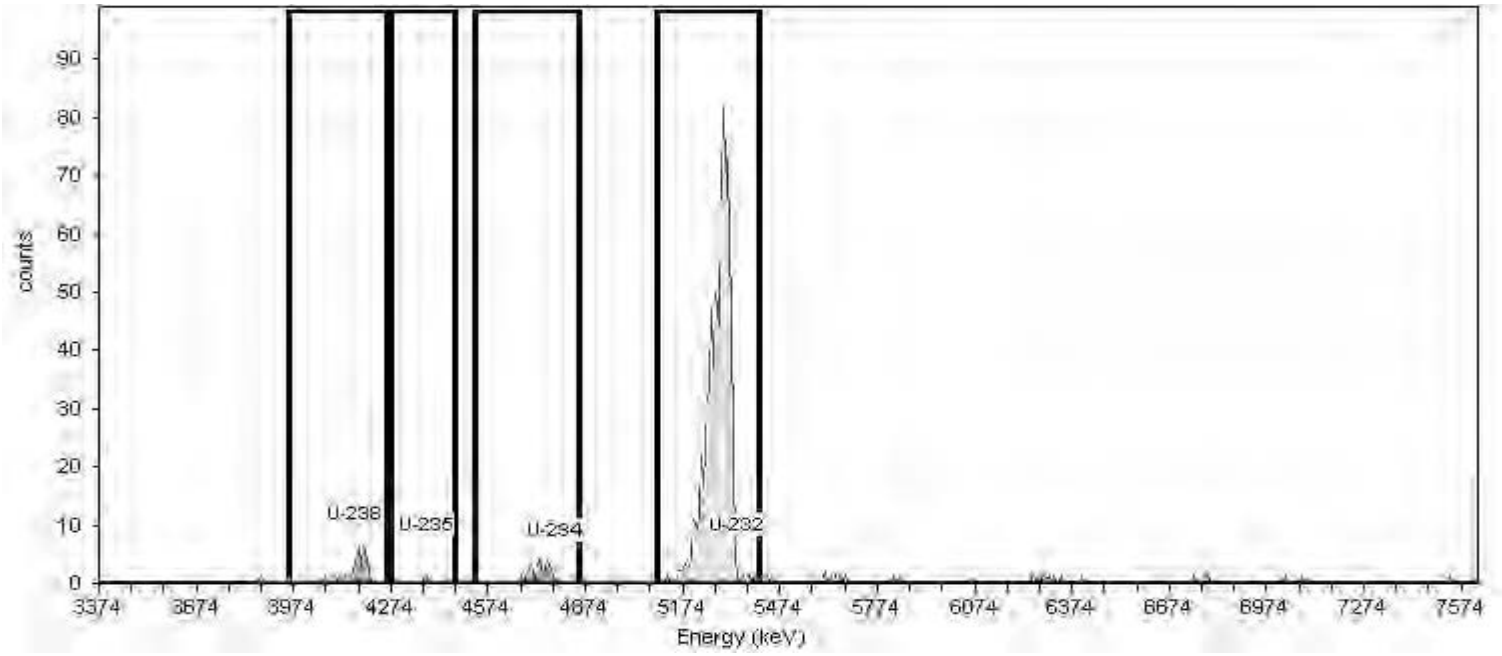
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232
Tracer Recovery: 103.38%

Acquisition

Detector: AV70
Serial Number: 48-158FF1
Acquisition Start Date: 8/4/2018 2:34:30PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:40:26PM
Background Info: Sample: ICB;AV70; Det: AV70; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-8877;AV70-05152018
Calibration Date: 5/15/2018 6:36:23PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.40% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 8/4/2018 2:31:18PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	47.9	100.0	36	0.3750	35.63	0.356	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	17.4	80.2	2	0.3750	1.63	0.020	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	73.4	99.8	27	1.1250	25.88	0.259	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	68.2	100.1	700	0.9375	699.06	7.709	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:38:53PM 8/4/2018

Sample

Sample Name: 160-29521-B-3-D
SampleType: Sample
: 160-29521-B-3-D
Sample Collection Date: 7/11/2018 4:40:00PM

Spectrum #1 Analysis #1
Sample Weight : 0.9975g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377742
AnalysisID: 735934

Analyst: 60040

Tracer

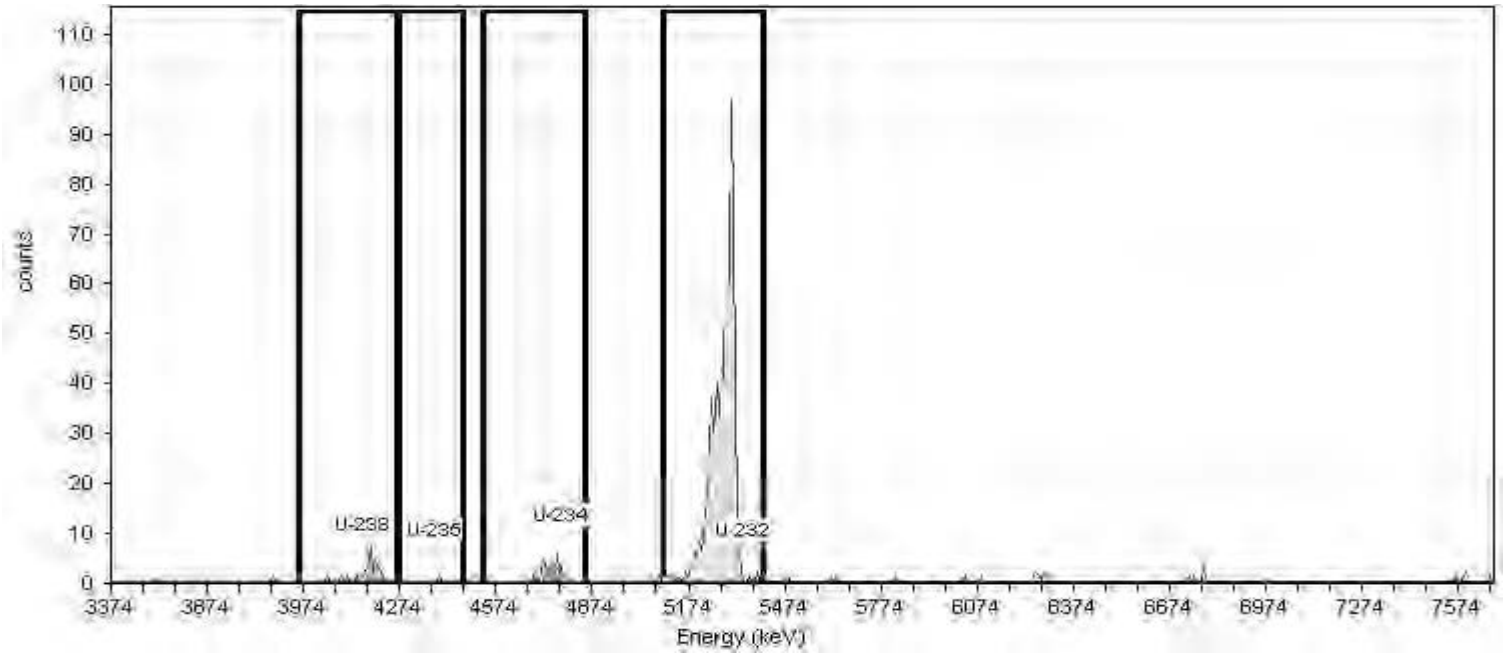
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232
Tracer Recovery: 104.77%

Acquisition

Detector: AV71
Serial Number: 48-158EE6
Acquisition Start Date: 8/4/2018 2:34:31PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:40:28PM
Background Info: Sample: ICB;AV71; Det: AV71; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-9520;AV71-05152018
Calibration Date: 5/15/2018 6:36:40PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 23.00% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 8/4/2018 2:31:18PM
MDA Constants: Kα = 1.65 , Kβ = 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	50.1	100.0	31	0.5625	30.44	0.317	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	1	0.0000	1.00	0.013	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	83.4	99.8	34	0.7500	33.25	0.347	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	69.6	100.1	670	2.2500	667.75	7.782	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:39:01PM 8/4/2018

Sample

Sample Name: 160-29521-A-4-E
SampleType: Sample
: 160-29521-A-4-E
Sample Collection Date: 7/11/2018 5:05:00PM

Spectrum #1 Analysis #1
Sample Weight : 1.0027g
Aliquot: N/A Aliquot Fraction: N/A

Batch

Batch Name: 377742
AnalysisID: 735935

Analyst: 60040

Tracer

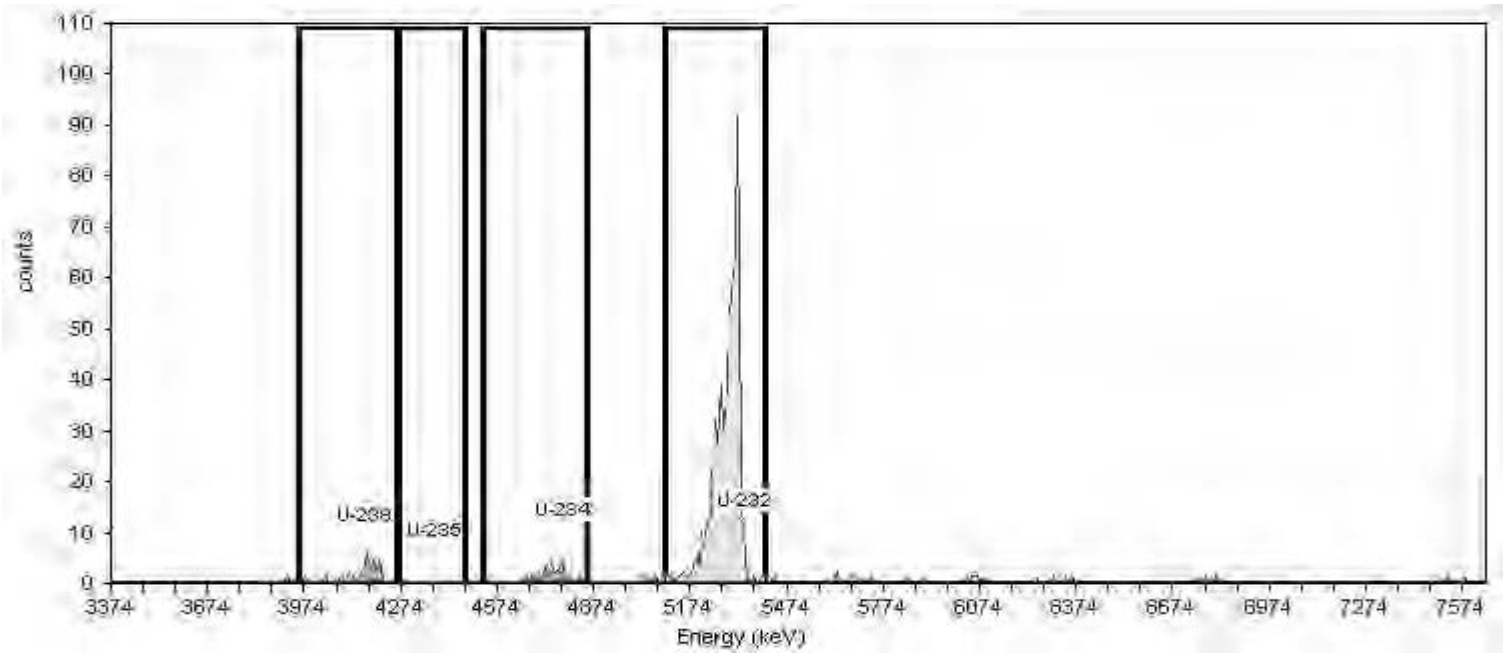
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM/mL x (Vol.)0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 12:00:28PM

Tracer Nuclide: U-232
Tracer Recovery: 97.31%

Acquisition

Detector: AV72
Serial Number: 48-05a21
Acquisition Start Date: 8/4/2018 2:34:33PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/12/2018 1:40:30PM
Background Info: Sample: ICB;AV72; Det: AV72; Spectrum #1; Jul-12-2018 13:40

Calibration Name: IC-9792;AV72-05152018
Calibration Date: 5/15/2018 6:36:51PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 24.58% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 8/4/2018 2:31:18PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	Peak Expected keV	Peak Diffted 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	57.5	100.0	38	0.5625	37.44	0.391	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	0.0000	0.00	0.000	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	78.4	99.8	33	0.5625	32.44	0.339	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	66.1	100.1	664	1.1250	662.88	7.190	pCi/g

Prep Batch: 378574

Preparation, Extraction Chromatography Resin Actinide Separation

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378574

Lab ID: MB 160-378574/1-A
Client ID:
Sigma: 2

Analyzed: 08/10/18 19:21
Detector: AV175
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	0.009101	0.0228	0.0228	U	pCi/g	1.00	0.0510	381662
Uranium-235	0.02788	0.0394	0.0395	U	pCi/g	1.00	0.0418	381662
Uranium-238	0.01118	0.0224	0.0224	U	pCi/g	1.00	0.0335	381662

Tracer	MB Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.349	0.511	0.738		pCi/g	0.0784	6.91	91.6	30 - 110

Lab ID: LCS 160-378574/2-A
Client ID:
Sigma: 2

Analyzed: 08/13/18 20:10
Detector: AV165
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	6.418	0.573	0.787		pCi/g	1.00	0.0826	382200
Uranium-238	6.137	0.559	0.760		pCi/g	1.00	0.0382	382200

Tracer	LCS Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.255	0.538	0.752		pCi/g	0.110	6.91	90.3	30 - 110

Lab ID: 160-29521-5
Client ID: CRC-B3-0204
Sigma: 2

Analyzed: 08/10/18 19:21
Detector: AV187
Dil Fac: 1

Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.700	0.172	0.182		pCi/g	1.00	0.0546	381664
Uranium-235	0.0106	0.0266	0.0266	U	pCi/g	1.00	0.0595	381664
Uranium-238	0.795	0.183	0.195		pCi/g	1.00	0.0478	381664

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	7.42	0.586	0.855		pCi/g	0.0785	6.72	110	30 - 110

Lab ID: 160-29521-5 DU
Client ID: CRC-B3-0204
Sigma: 2

Analyzed: 08/13/18 20:10
Detector: AV166
Dil Fac: 1

Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.7339	0.182	0.193		pCi/g	1.00	0.0638	382201
Uranium-235	0.06978	0.0624	0.0627		pCi/g	1.00	0.0419	382201
Uranium-238	0.7051	0.178	0.187		pCi/g	1.00	0.0336	382201

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378574

Tracer	DU Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.007	0.491	0.704		pCi/g	0.0901	6.70	89.3	30 - 110

Lab ID: 160-29521-6
Client ID: CRC-B3-0608
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV189
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.222	0.106	0.108		pCi/g	1.00	0.0742	381666
Uranium-235	0.000	0.00567	0.00567	U	pCi/g	1.00	0.0454	381666
Uranium-238	0.252	0.111	0.113		pCi/g	1.00	0.0552	381666

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.26	0.453	0.633		pCi/g	0.0812	6.56	80.0	30 - 110

Lab ID: 160-29521-7
Client ID: CRC-B3-1618
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV190
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.415	0.137	0.141		pCi/g	1.00	0.0630	381667
Uranium-235	-0.00259	0.00517	0.00517	U	pCi/g	1.00	0.0628	381667
Uranium-238	0.462	0.143	0.149		pCi/g	1.00	0.0503	381667

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.51	0.525	0.758		pCi/g	0.0860	6.80	95.5	30 - 110

Lab ID: 160-29521-8
Client ID: CRC-B13-0305
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV191
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.339	0.136	0.139		pCi/g	1.00	0.0759	381668
Uranium-235	0.0467	0.0578	0.0579	U	pCi/g	1.00	0.0755	381668
Uranium-238	0.485	0.162	0.167		pCi/g	1.00	0.0757	381668

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.20	0.467	0.640		pCi/g	0.0799	6.61	78.5	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378574

Lab ID: 160-29521-9
Client ID: CRC-B13-0608
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV192
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.197	0.0938	0.0953		pCi/g	1.00	0.0503	381669
Uranium-235	0.0137	0.0275	0.0275	U	pCi/g	1.00	0.0412	381669
Uranium-238	0.172	0.0884	0.0896		pCi/g	1.00	0.0573	381669

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.47	0.457	0.648		pCi/g	0.0817	6.32	86.2	30 - 110

Lab ID: 160-29521-10
Client ID: CRC-B15-0204
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV194
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.695	0.172	0.182		pCi/g	1.00	0.0681	381670
Uranium-235	0.00818	0.0271	0.0271	U	pCi/g	1.00	0.0680	381670
Uranium-238	0.722	0.174	0.185		pCi/g	1.00	0.0478	381670

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	7.50	0.587	0.861		pCi/g	0.0981	6.88	109	30 - 110

Lab ID: 160-29521-11
Client ID: CRC-B15-0608
Sigma: 2
Analyzed: 08/13/18 20:10
Detector: AV167
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.250	0.105	0.107		pCi/g	1.00	0.0714	382202
Uranium-235	0.000	0.00489	0.00489	U	pCi/g	1.00	0.0392	382202
Uranium-238	0.262	0.105	0.107		pCi/g	1.00	0.0314	382202

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.69	0.531	0.773		pCi/g	0.0804	6.65	100	30 - 110

Lab ID: 160-29521-12
Client ID: CRC-B15-1214
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV198
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.174	0.0939	0.0950		pCi/g	1.00	0.0687	381673
Uranium-235	0.000	0.00564	0.00564	U	pCi/g	1.00	0.0451	381673

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378574

Lab ID: 160-29521-12
Client ID: CRC-B15-1214
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV198
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-238	0.277	0.116	0.118		pCi/g	1.00	0.0362	381673

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.91	0.497	0.703		pCi/g	0.0938	6.82	86.3	30 - 110

Lab ID: 160-29521-13
Client ID: CRC-B16-0608
Sigma: 2
Analyzed: 08/13/18 20:10
Detector: AV170
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.205	0.103	0.104		pCi/g	1.00	0.0708	382204
Uranium-235	0.0155	0.0310	0.0310	U	pCi/g	1.00	0.0465	382204
Uranium-238	0.308	0.124	0.127		pCi/g	1.00	0.0566	382204

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.99	0.509	0.715		pCi/g	0.0948	6.89	86.6	30 - 110

Lab ID: 160-29521-14
Client ID: CRC-B16-0204
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV203
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.860	0.198	0.210		pCi/g	1.00	0.0640	381676
Uranium-235	0.0394	0.0488	0.0489	U	pCi/g	1.00	0.0638	381676
Uranium-238	0.814	0.192	0.204		pCi/g	1.00	0.0639	381676

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	7.21	0.583	0.841		pCi/g	0.115	6.88	104	30 - 110

Lab ID: 160-29521-15
Client ID: CRC-B16-1416
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV206
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.308	0.118	0.121		pCi/g	1.00	0.0342	381677
Uranium-235	0.000	0.00532	0.00532	U	pCi/g	1.00	0.0426	381677
Uranium-238	0.262	0.109	0.111		pCi/g	1.00	0.0341	381677

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378574

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.63	0.474	0.669		pCi/g	0.0643	6.43	87.4	30 - 110

Lab ID: 160-29521-16
Client ID: CRC-B18-0204
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV208
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	1.46	0.256	0.284		pCi/g	1.00	0.0583	381678
Uranium-235	0.0533	0.0561	0.0563	U	pCi/g	1.00	0.0636	381678
Uranium-238	1.43	0.254	0.281		pCi/g	1.00	0.0336	381678

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.03	0.492	0.706		pCi/g	0.0839	6.72	89.4	30 - 110

Lab ID: 160-29521-17
Client ID: CRC-B18-0608
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV212
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.985	0.205	0.221		pCi/g	1.00	0.0645	381680
Uranium-235	0.00822	0.0272	0.0272	U	pCi/g	1.00	0.0683	381680
Uranium-238	0.897	0.196	0.210		pCi/g	1.00	0.0682	381680

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.35	0.515	0.741		pCi/g	0.0995	6.42	98.5	30 - 110

Lab ID: 160-29521-18
Client ID: CRC-B18-0809
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV213
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.642	0.164	0.173		pCi/g	1.00	0.0541	381681
Uranium-235	0.0364	0.0451	0.0452	U	pCi/g	1.00	0.0590	381681
Uranium-238	0.509	0.145	0.152		pCi/g	1.00	0.0312	381681

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	6.77	0.528	0.776		pCi/g	0.0812	6.82	98.9	30 - 110

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378574

Lab ID: 160-29521-19
Client ID: CRC-B19-0204
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV215
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	1.43	0.251	0.278		pCi/g	1.00	0.0706	381682
Uranium-235	0.0382	0.0473	0.0474	U	pCi/g	1.00	0.0618	381682
Uranium-238	1.21	0.229	0.251		pCi/g	1.00	0.0327	381682

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.83	0.471	0.679		pCi/g	0.0794	6.67	87.2	30 - 110

Lab ID: 160-29521-20
Client ID: CRC-B19-0810
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV216
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.935	0.202	0.217		pCi/g	1.00	0.0496	381683
Uranium-235	0.0542	0.0542	0.0544		pCi/g	1.00	0.0407	381683
Uranium-238	1.00	0.209	0.225		pCi/g	1.00	0.0326	381683

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	5.93	0.470	0.685		pCi/g	0.0687	6.91	85.5	30 - 110

Lab ID: 160-29521-21
Client ID: CRC-B19-1618
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV217
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.278	0.111	0.113		pCi/g	1.00	0.0563	381684
Uranium-235	0.0404	0.0467	0.0468		pCi/g	1.00	0.0404	381684
Uranium-238	0.389	0.130	0.134		pCi/g	1.00	0.0324	381684

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	7.47	0.593	0.863		pCi/g	0.0833	6.87	109	30 - 110

Lab ID: 160-29521-22
Client ID: CRC-B19-2224
Sigma: 2
Analyzed: 08/10/18 19:21
Detector: AV218
Dil Fac: 1
Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-234	0.263	0.108	0.110		pCi/g	1.00	0.0502	381685
Uranium-235	0.0274	0.0388	0.0389	U	pCi/g	1.00	0.0412	381685

Alpha Spectroscopy Analysis Detail Report
Prep Batch: 378574

Lab ID: 160-29521-22
Client ID: CRC-B19-2224
Sigma: 2

Analyzed: 08/10/18 19:21
Detector: AV218
Dil Fac: 1

Decay Corrected: No
Yield Truncated: No
Ts: 180

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-238	0.484	0.146	0.152		pCi/g	1.00	0.0330	381685

Tracer	Result	Count Unc	Total Unc	Qualifier	Unit	MDC	Spike Added	% Rec	% Rec Limits
Uranium-232	7.31	0.585	0.848		pCi/g	0.0862	6.87	106	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 160-378574/1-A	Uranium-234			0.009101	U	pCi/g							.79813484
MB 160-378574/1-A	Uranium-235			0.02788	U	pCi/g							1.4117254 7
MB 160-378574/1-A	Uranium-238			0.01118	U	pCi/g							.99911917

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-378574/2-A	Uranium-234		6.37	6.418		pCi/g	101	84 - 120					.08926958 74
LCS 160-378574/2-A	Uranium-238		6.51	6.137		pCi/g	94	82 - 122					-.67380731 67

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29521-5	Uranium-234	0.700		0.7339		pCi/g			5	0.09	0.25	1	
160-29521-5	Uranium-235	0.0106		0.06978		pCi/g			147	0.66	1.74	1	
160-29521-5	Uranium-238	0.795		0.7051		pCi/g			12	0.24	0.67	1	

Glossary:
Ts = Count Duration, Sample

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 378574 Batch Start Date: 07/29/18 16:45 Batch Analyst: Fox, Kassie N

Batch Method: ExtChrom Batch End Date: 08/09/18 18:52

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	U-232 00040	UNAT 00014			
MB 160-378574/1		ExtChrom, A-01-R		1.0 g	0.2 mL				
LCS 160-378574/2		ExtChrom, A-01-R		1.0 g	0.2 mL	0.2 mL			
160-29521-A-5-B	CRC-B3-0204	ExtChrom, A-01-R	T	1.0284 g	0.2 mL				
160-29521-A-5-B DU	CRC-B3-0204	ExtChrom, A-01-R	T	1.0305 g	0.2 mL				
160-29521-A-6-B	CRC-B3-0608	ExtChrom, A-01-R	T	1.0536 g	0.2 mL				
160-29521-A-7-B	CRC-B3-1618	ExtChrom, A-01-R	T	1.0166 g	0.2 mL				
160-29521-A-8-B	CRC-B13-0305	ExtChrom, A-01-R	T	1.0458 g	0.2 mL				
160-29521-A-9-B	CRC-B13-0608	ExtChrom, A-01-R	T	1.0929 g	0.2 mL				
160-29521-A-10-B	CRC-B15-0204	ExtChrom, A-01-R	T	1.0047 g	0.2 mL				
160-29521-A-11-B	CRC-B15-0608	ExtChrom, A-01-R	T	1.0394 g	0.2 mL				
160-29521-B-12-A	CRC-B15-1214	ExtChrom, A-01-R	T	1.0123 g	0.2 mL				
160-29521-B-13-A	CRC-B16-0608	ExtChrom, A-01-R	T	1.0029 g	0.2 mL				
160-29521-A-14-B	CRC-B16-0204	ExtChrom, A-01-R	T	1.0048 g	0.2 mL				
160-29521-B-15-B	CRC-B16-1416	ExtChrom, A-01-R	T	1.0749 g	0.2 mL				
160-29521-A-16-B	CRC-B18-0204	ExtChrom, A-01-R	T	1.0284 g	0.2 mL				
160-29521-B-17-B	CRC-B18-0608	ExtChrom, A-01-R	T	1.0754 g	0.2 mL				
160-29521-A-18-A	CRC-B18-0809	ExtChrom, A-01-R	T	1.0125 g	0.2 mL				
160-29521-A-19-A	CRC-B19-0204	ExtChrom, A-01-R	T	1.0364 g	0.2 mL				
160-29521-B-20-A	CRC-B19-0810	ExtChrom, A-01-R	T	1.0001 g	0.2 mL				
160-29521-A-21-B	CRC-B19-1618	ExtChrom, A-01-R	T	1.0061 g	0.2 mL				
160-29521-A-22-A	CRC-B19-2224	ExtChrom, A-01-R	T	1.0061 g	0.2 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.

ALPHA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 378574 Batch Start Date: 07/29/18 16:45 Batch Analyst: Fox, Kassie N

Batch Method: ExtChrom Batch End Date: 08/09/18 18:52

Batch Notes	
Balance ID	1123433897
Analyst ID - Column	NMN per CMM
Column Date	08/08/2018
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-0003, ST-RC-0004, 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.

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:26:22PM 8/10/2018

Sample

Sample Name: MB 160-378574/1-A Type: Blank
Spectrum #1 Analysis #1
: MB 160-378574/1-A
Sample Collection Date: 8/9/2018 6:53:00PM
Comment:

Sample Weight : 1.00 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225150
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

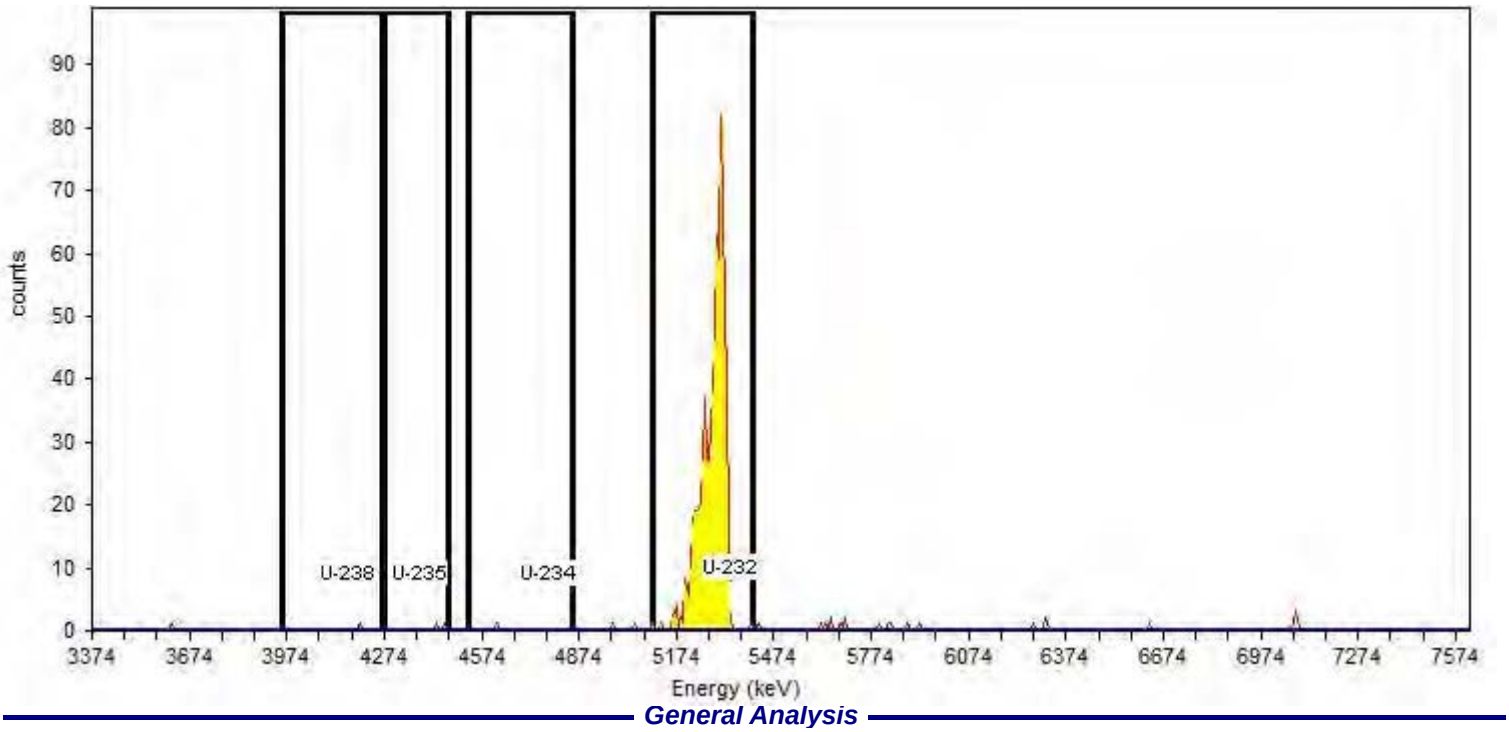
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 91.62%

Acquisition

Detector: AV175 SN: 50-117H1
Acquisition Start Date: 8/10/2018 7:21:36PM
Live Time: 180.00 min.
Real Time: 180.03 min.
Background Date: 7/21/2018 9:28:16PM
Bkgd Info: Sample: ICB;AV175; Det: AV175; Spectrum #1; 7/21/2018 9:28:16 PM

Energy Calibration: IC-9885;AV175-20171113
Efficiency Calibration:IC-9885;AV175-20171113
Calibration Date: 11/13/2017 3:17:24PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.43% +/- 0.36% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:25PM
MDA Constants: Kα = 1.64 , Kβ = 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	44.5	100.0	1	0.0000	1.00	1.118E-002	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	10.6	80.2	2	0.0000	2.00	2.788E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	44.5	99.8	1	0.1875	0.81	9.102E-003	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	61.0	100.1	622	1.6875	620.31	6.789E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:12:28PM 8/13/2018

Sample

Sample Name: LCS 160-378574/2-A Type: Control
Spectrum #2 Analysis #1
: LCS 160-378574/2-A
Sample Collection Date: 8/9/2018 6:53:00PM
Comment:

Sample Weight : 1.00 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225331
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

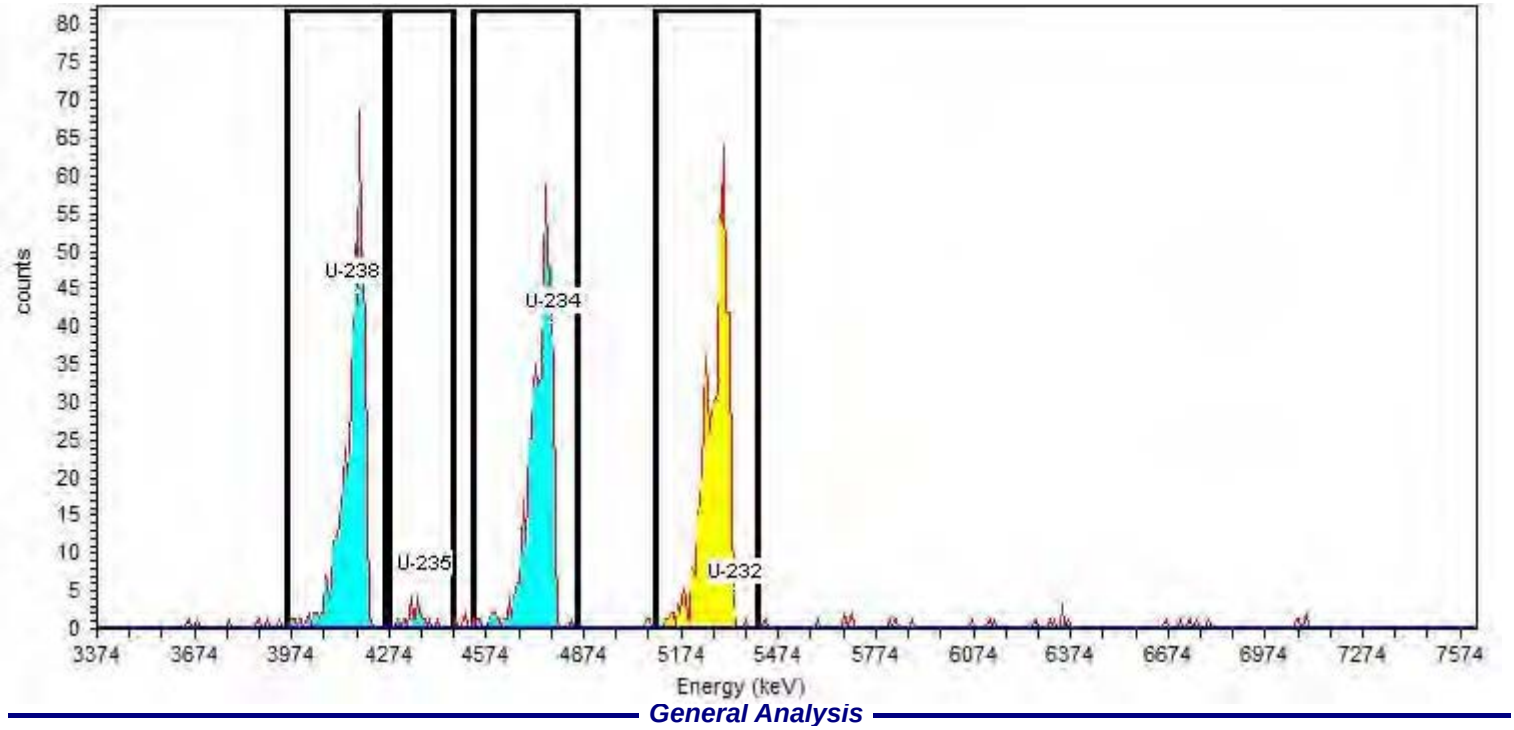
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 90.28%

Acquisition

Detector: AV165 SN: 50-112F7
Acquisition Start Date: 8/13/2018 8:10:40PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:15PM
Bkgd Info: Sample: ICB;AV165; Det: AV165; Spectrum #1; 7/21/2018 9:28:15 PM

Energy Calibration: IC-8876;AV165-20171113
Efficiency Calibration:IC-8876;AV165-20171113
Calibration Date: 11/13/2017 3:16:40PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 21.77% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	55.1	100.0	482	0.0000	482.00	6.137E+000	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	43.6	80.2	19	0.0000	19.00	3.016E-001	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	74.2	99.8	504	0.9375	503.06	6.418E+000	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	80.0	100.1	548	3.3750	544.63	6.689E+000	pCi/g

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:26:17PM 8/10/2018

Sample

Sample Name: 160-29521-A-5-F Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-5-F
Sample Collection Date: 7/12/2018 5:10:00PM
Comment:

Sample Weight : 1.03 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225149
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

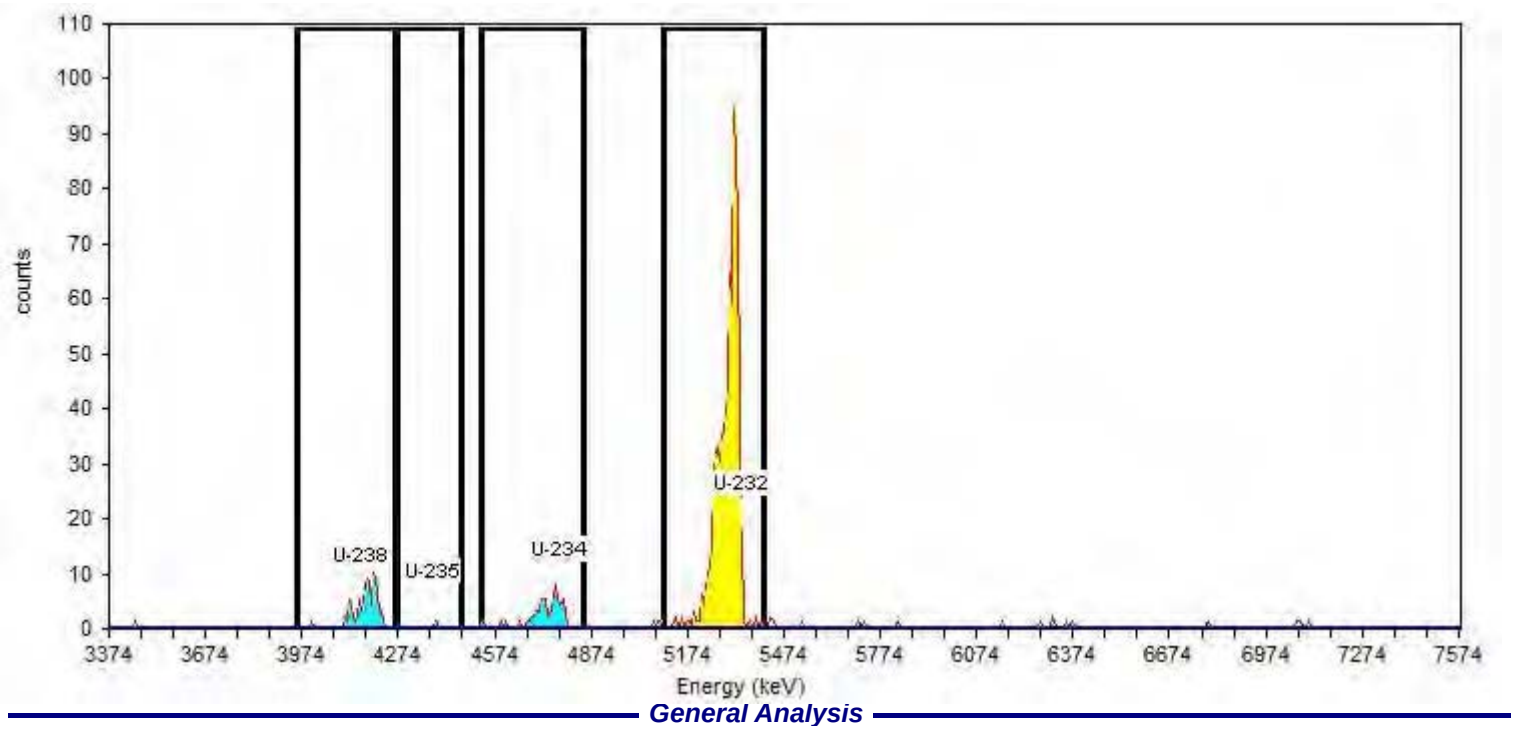
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 110.10%

Acquisition

Detector: AV187 SN: 50-119I2
Acquisition Start Date: 8/10/2018 7:21:38PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:17PM
Bkgd Info: Sample: ICB;AV187; Det: AV187; Spectrum #1; 7/21/2018 9:28:17 PM

Energy Calibration: IC-8875;AV187-20171113
Efficiency Calibration:IC-8875;AV187-20171113
Calibration Date: 11/14/2017 8:46:54AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 21.07% +/- 0.31% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	64.6	100.0	76	0.1875	75.81	7.952E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	1	0.1875	0.81	1.063E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	94.1	99.8	67	0.3750	66.63	7.002E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	61.9	100.1	644	1.1250	642.88	7.933E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:12:32PM 8/13/2018

Sample

Sample Name: 160-29521-A-5-G DU Type: Sample
Spectrum #2 Analysis #1
: 160-29521-A-5-G DU
Sample Collection Date: 7/12/2018 5:10:00PM
Comment:

Sample Weight : 1.03 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225332
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

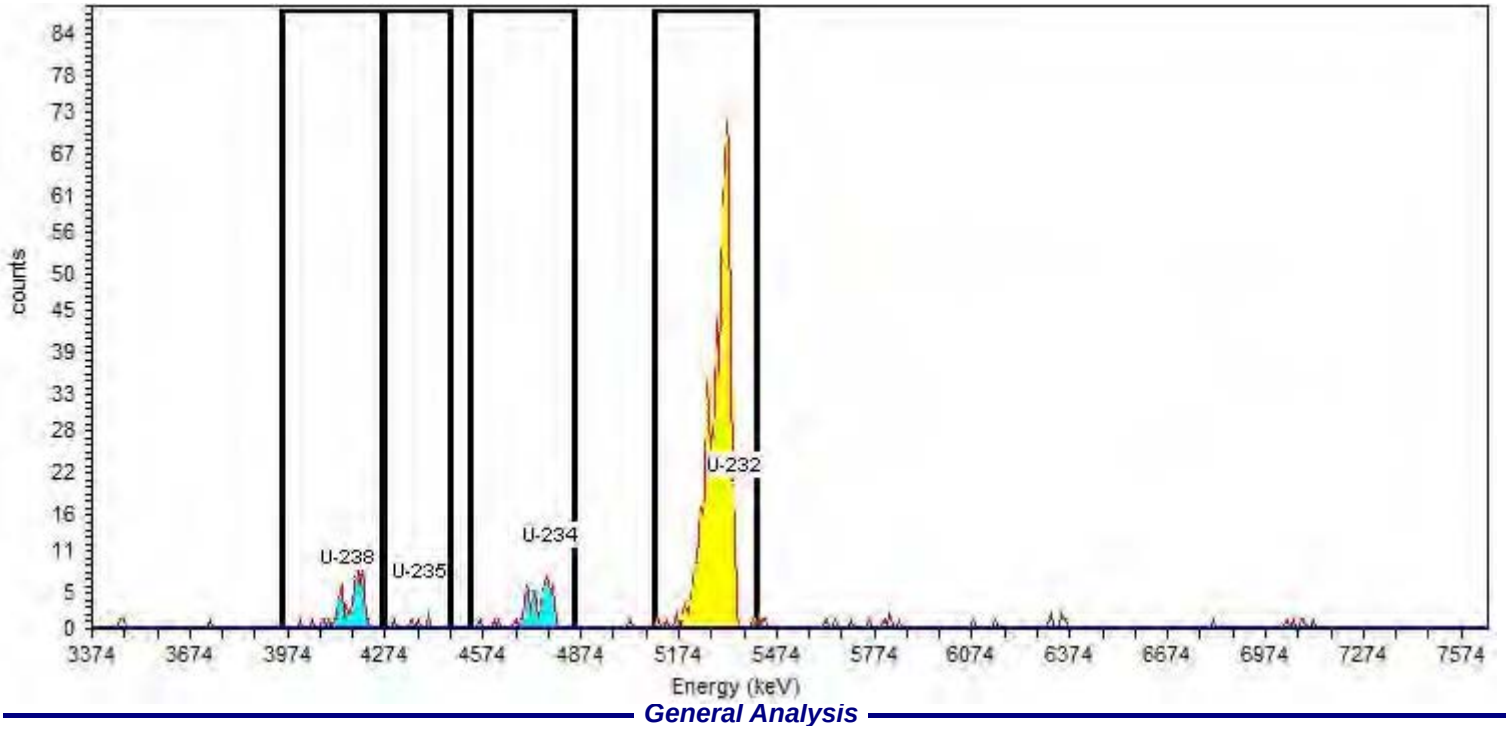
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 89.35%

Acquisition

Detector: AV166 SN: 50-112 G1
Acquisition Start Date: 8/13/2018 8:10:40PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:15PM
Bkgd Info: Sample: ICB;AV166; Det: AV166; Spectrum #1; 7/21/2018 9:28:15 PM

Energy Calibration: IC-8877;AV166-20171113
Efficiency Calibration:IC-8877;AV166-20171113
Calibration Date: 11/13/2017 3:16:45PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.28% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	55.7	100.0	63	0.0000	63.00	7.051E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	64.5	80.2	5	0.0000	5.00	6.978E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	95.7	99.8	66	0.5625	65.44	7.339E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	60.9	100.1	604	2.8125	601.19	6.424E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:24:47PM 8/10/2018

Sample

Sample Name: 160-29521-A-6-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-6-E
Sample Collection Date: 7/12/2018 5:20:00PM
Comment:

Sample Weight : 1.05 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225136
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

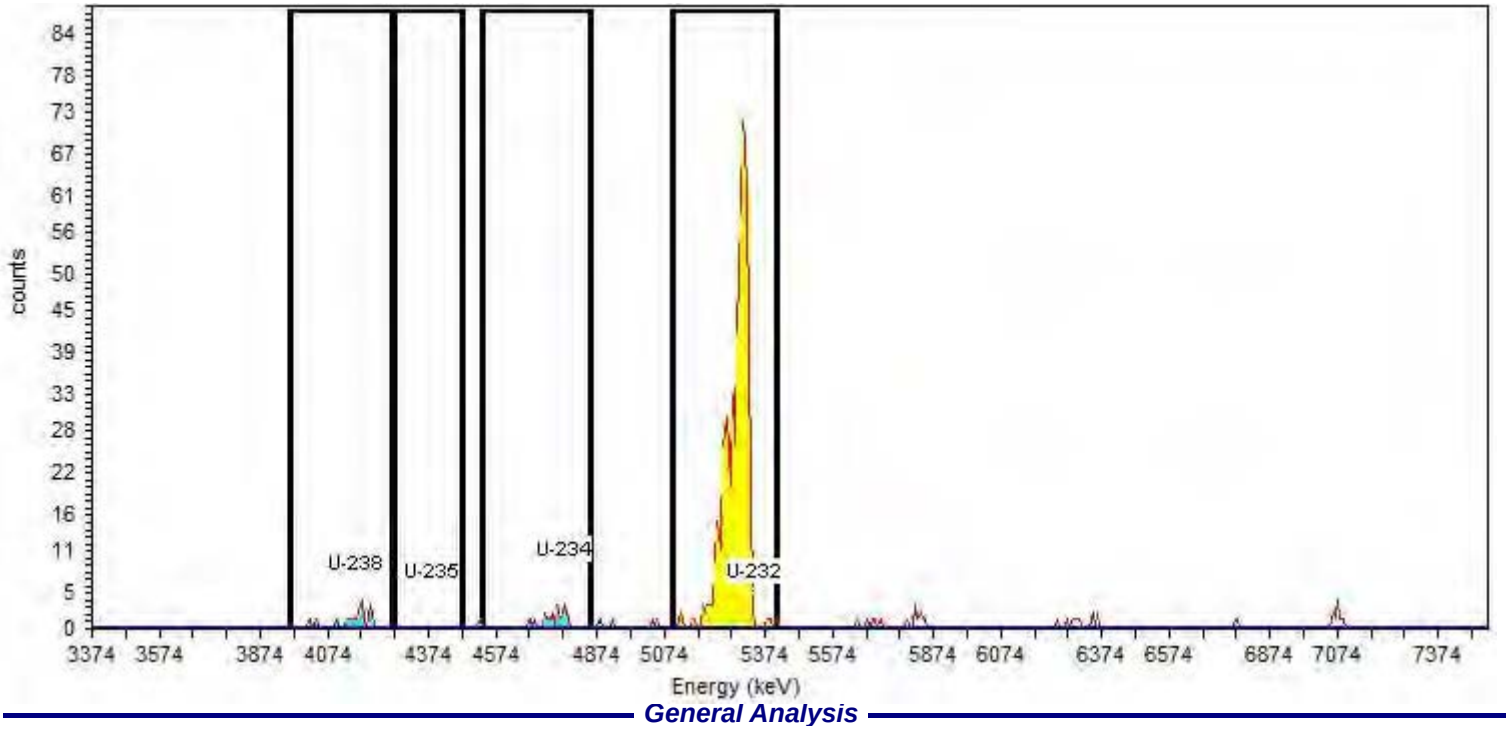
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 79.98%

Acquisition

Detector: AV189 SN: 50-112A3
Acquisition Start Date: 8/10/2018 7:21:39PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/20/2018 9:02:37PM
Bkgd Info: Sample: ICB;AV189; Det: AV189; Spectrum #1; 7/20/2018 9:02:37 PM

Energy Calibration: IC-8877;AV189-20171113
Efficiency Calibration:IC-8877;AV189-20171113
Calibration Date: 11/14/2017 8:46:59AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.49% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	58.6	100.0	21	0.1875	20.81	2.524E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	0.0000	0.00	0.000E+000	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	64.8	99.8	19	0.7500	18.25	2.218E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	55.3	100.1	545	2.2500	542.75	5.625E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:21:39PM 8/10/2018

Sample

Sample Name: 160-29521-A-7-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-7-E
Sample Collection Date: 7/12/2018 5:30:00PM
Comment:

Sample Weight : 1.02 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225135
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

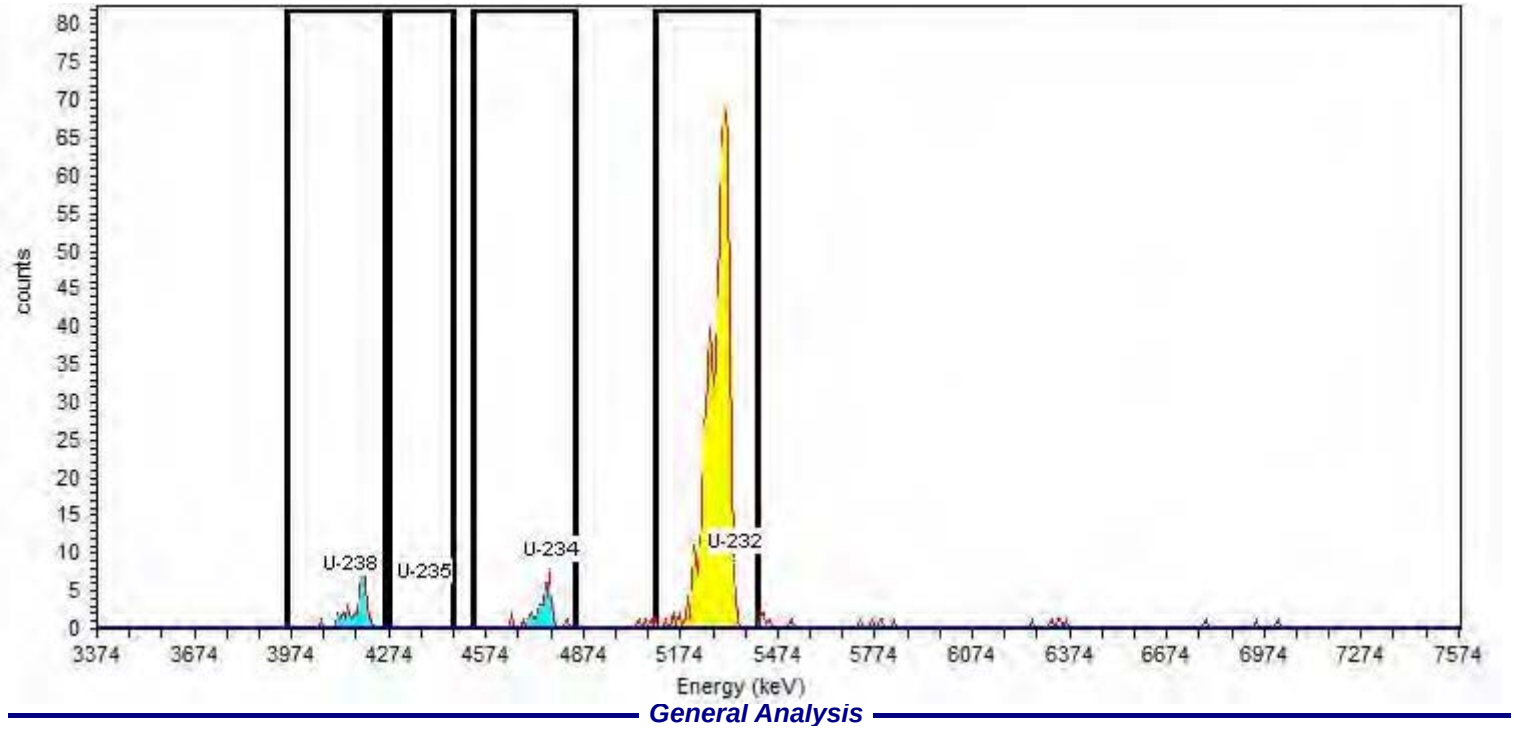
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 95.54%

Acquisition

Detector: AV190 SN: 50-119I7
Acquisition Start Date: 8/10/2018 7:21:39PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:17PM
Bkgd Info: Sample: ICB;AV190; Det: AV190; Spectrum #1; 7/21/2018 9:28:17 PM

Energy Calibration: IC-9520;AV190-20171113
Efficiency Calibration:IC-9520;AV190-20171113
Calibration Date: 11/14/2017 8:47:05AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.30% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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-232	5343.2	5,320.3	22.9	5097.1	5410.3	68.1	100.1	619	2.0625	616.94	6.963E+000	pCi/g
U-238	4157.5	4,196.0	-38.5	3956.1	4261.9	49.5	100.0	42	0.1875	41.81	4.623E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	0.1875	-0.19	-2.585E-003	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	46.9	99.8	38	0.5625	37.44	4.148E-001	pCi/g

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:24:52PM 8/10/2018

Sample

Sample Name: 160-29521-A-8-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-8-E
Sample Collection Date: 7/12/2018 3:10:00PM
Comment:

Sample Weight : 1.05 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225137
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

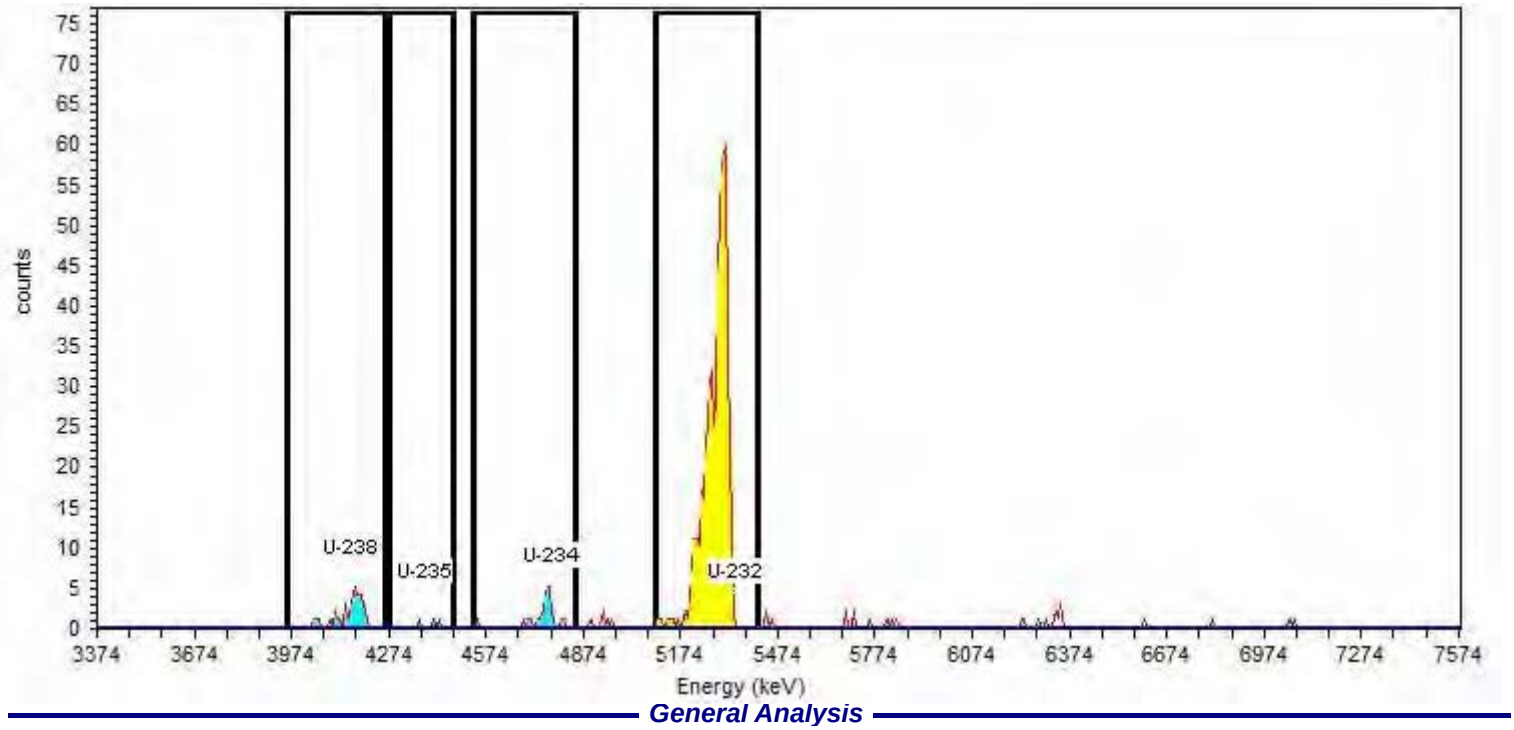
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 78.52%

Acquisition

Detector: AV191 SN: 50-112A2
Acquisition Start Date: 8/10/2018 7:21:39PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:18PM
Bkgd Info: Sample: ICB;AV191; Det: AV191; Spectrum #1; 7/21/2018 9:28:18 PM

Energy Calibration: IC-8879;AV191-20171113
Efficiency Calibration:IC-8879;AV191-20171113
Calibration Date: 11/14/2017 8:47:10AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.90% +/- 0.31% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	51.7	100.0	37	0.5625	36.44	4.849E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	74.6	80.2	3	0.1875	2.81	4.667E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	44.5	99.8	26	0.5625	25.44	3.392E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	62.1	100.1	500	1.6875	498.31	5.563E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:26:27PM 8/10/2018

Sample

Sample Name: 160-29521-A-9-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-9-E
Sample Collection Date: 7/12/2018 3:20:00PM
Comment:

Sample Weight : 1.09 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225151
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

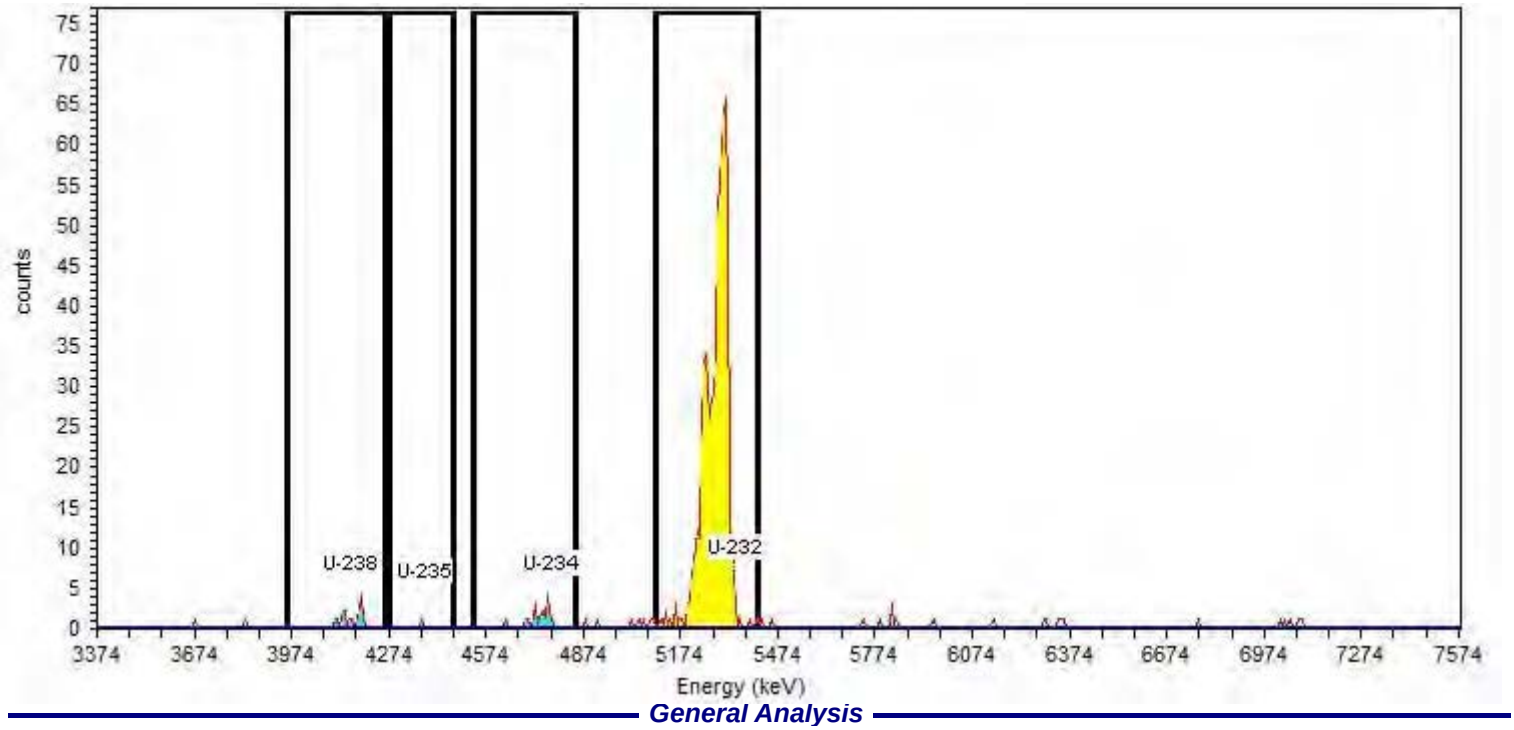
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 86.22%

Acquisition

Detector: AV192 SN: 50-119J7
Acquisition Start Date: 8/10/2018 7:21:40PM
Live Time: 180.00 min.
Real Time: 180.05 min.
Background Date: 7/21/2018 9:28:18PM
Bkgd Info: Sample: ICB;AV192; Det: AV192; Spectrum #1; 7/21/2018 9:28:18 PM

Energy Calibration: IC-9792;AV192-20171113
Efficiency Calibration:IC-9792;AV192-20171113
Calibration Date: 11/14/2017 8:47:16AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.09% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	93.3	100.0	16	0.3750	15.63	1.723E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	1	0.0000	1.00	1.375E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	67.4	99.8	18	0.1875	17.81	1.968E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	66.2	100.1	578	2.4375	575.56	5.846E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:25:03PM 8/10/2018

Sample

Sample Name: 160-29521-A-10-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-10-E
Sample Collection Date: 7/13/2018 10:10:00AM
Comment:

Sample Weight : 1.00 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225139
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

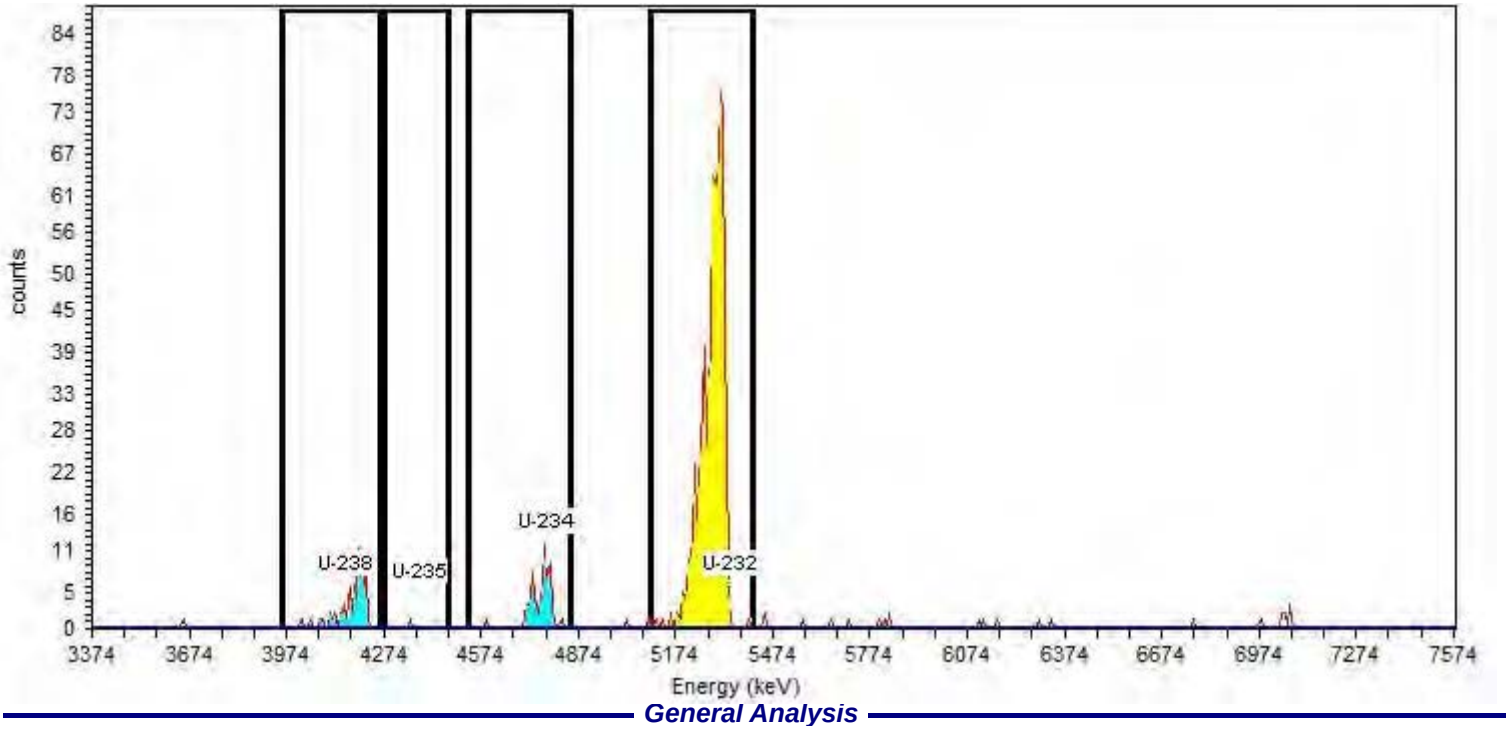
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 108.80%

Acquisition

Detector: AV194 SN: 50-119J2
Acquisition Start Date: 8/10/2018 7:21:40PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:18PM
Bkgd Info: Sample: ICB;AV194; Det: AV194; Spectrum #1; 7/21/2018 9:28:18 PM

Energy Calibration: IC-9794;AV194-20171113a
Efficiency Calibration:IC-9794;AV194-20171113a
Calibration Date: 11/14/2017 8:47:42AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 21.81% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	58.2	100.0	69	0.1875	68.81	7.223E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	1	0.3750	0.63	8.180E-003	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	76.9	99.8	67	0.9375	66.06	6.948E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	60.0	100.1	660	2.4375	657.56	8.024E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:10:47PM 8/13/2018

Sample

Sample Name: 160-29521-A-11-E Type: Sample
Spectrum #2 Analysis #1
: 160-29521-A-11-E
Sample Collection Date: 7/13/2018 10:15:00AM
Comment:

Sample Weight : 1.04 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225330
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

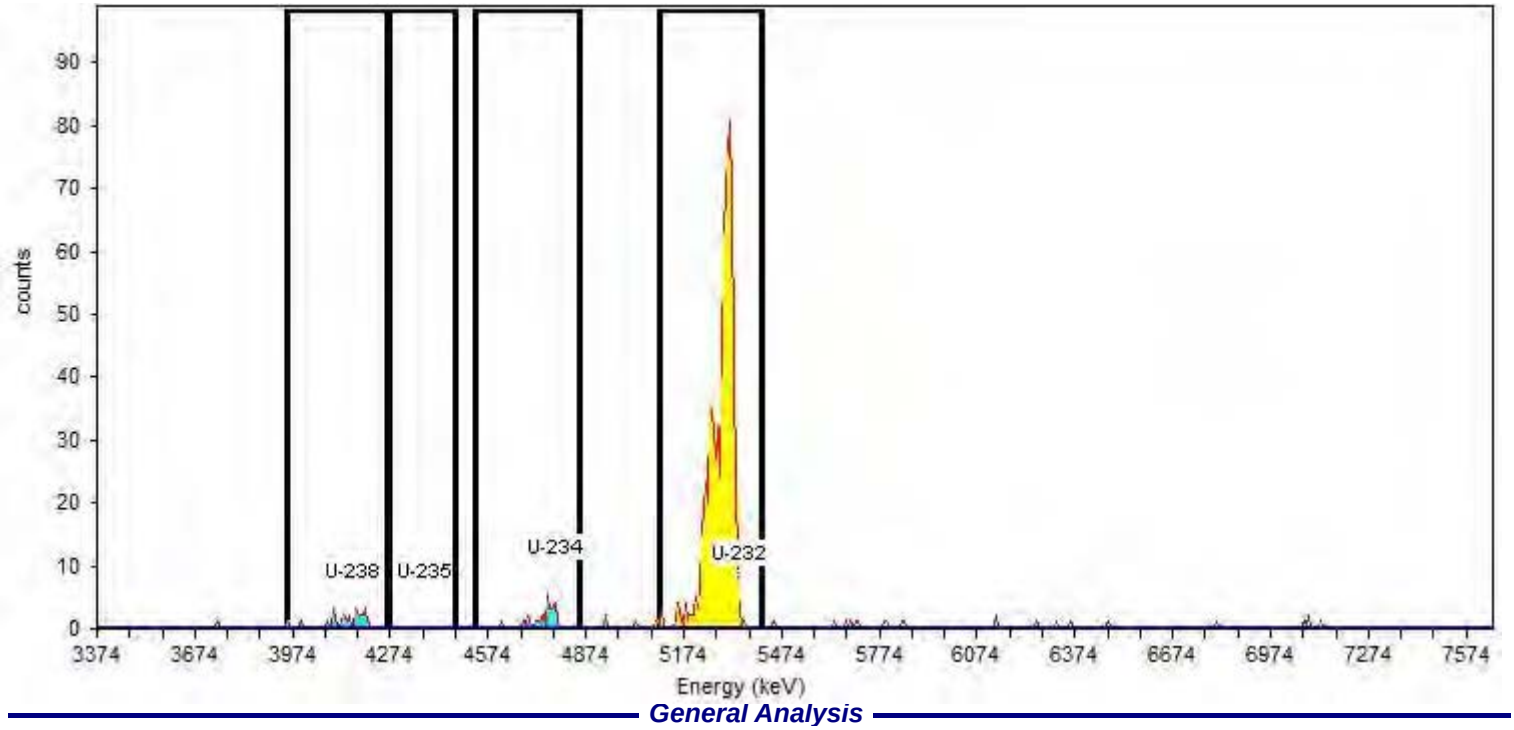
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 100.35%

Acquisition

Detector: AV167 SN: 50-112 G3
Acquisition Start Date: 8/13/2018 8:10:40PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:15PM
Bkgd Info: Sample: ICB;AV167; Det: AV167; Spectrum #1; 7/21/2018 9:28:15 PM

Energy Calibration: IC-9520;AV167-20171113
Efficiency Calibration:IC-9520;AV167-20171113
Calibration Date: 11/13/2017 3:16:50PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 22.92% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	89.0	100.0	25	0.0000	25.00	2.617E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	0.0000	0.00	0.000E+000	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	48.9	99.8	25	1.1250	23.88	2.504E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	55.6	100.1	639	1.6875	637.31	7.154E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:24:58PM 8/10/2018

Sample

Sample Name: 160-29521-B-12-D Type: Sample
Spectrum #1 Analysis #1
: 160-29521-B-12-D
Sample Collection Date: 7/13/2018 10:20:00AM
Comment:

Sample Weight : 1.01 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225138
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

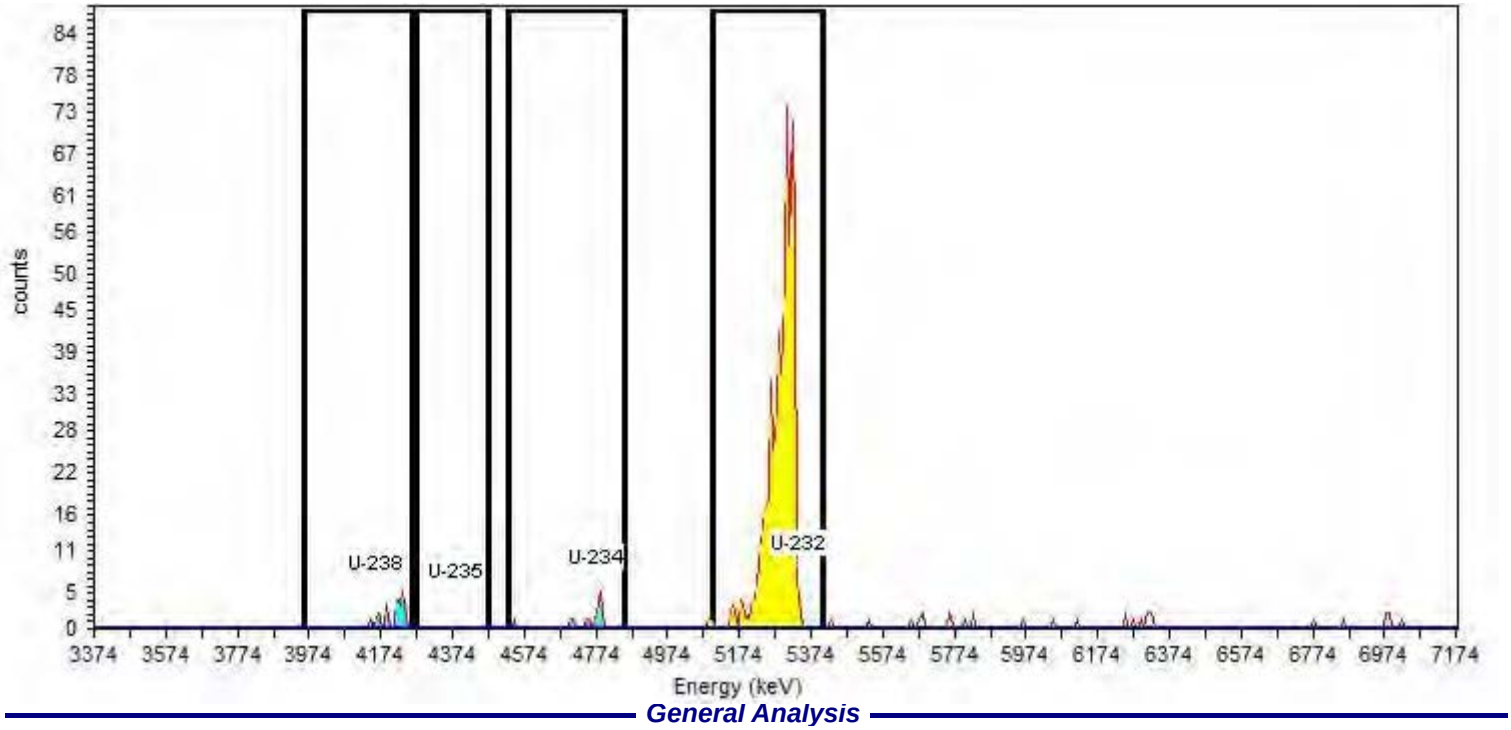
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 86.35%

Acquisition

Detector: AV198 SN: 50-117AA7
Acquisition Start Date: 8/10/2018 7:21:40PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:19PM
Bkgd Info: Sample: ICB;AV198; Det: AV198; Spectrum #1; 7/21/2018 9:28:19 PM

Energy Calibration: IC-9885;AV198-20171113a
Efficiency Calibration:IC-9885;AV198-20171113a
Calibration Date: 11/14/2017 8:47:47AM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.75% +/- 0.36% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	20.6	100.0	23	0.0000	23.00	2.773E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	0.0000	0.00	0.000E+000	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	46.8	99.8	15	0.5625	14.44	1.744E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	61.6	100.1	571	2.8125	568.19	6.320E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:13:11PM 8/13/2018

Sample

Sample Name: 160-29521-B-13-D Type: Sample
Spectrum #2 Analysis #1
: 160-29521-B-13-D
Sample Collection Date: 7/13/2018 7:50:00AM
Comment:

Sample Weight : 1.00 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225333
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

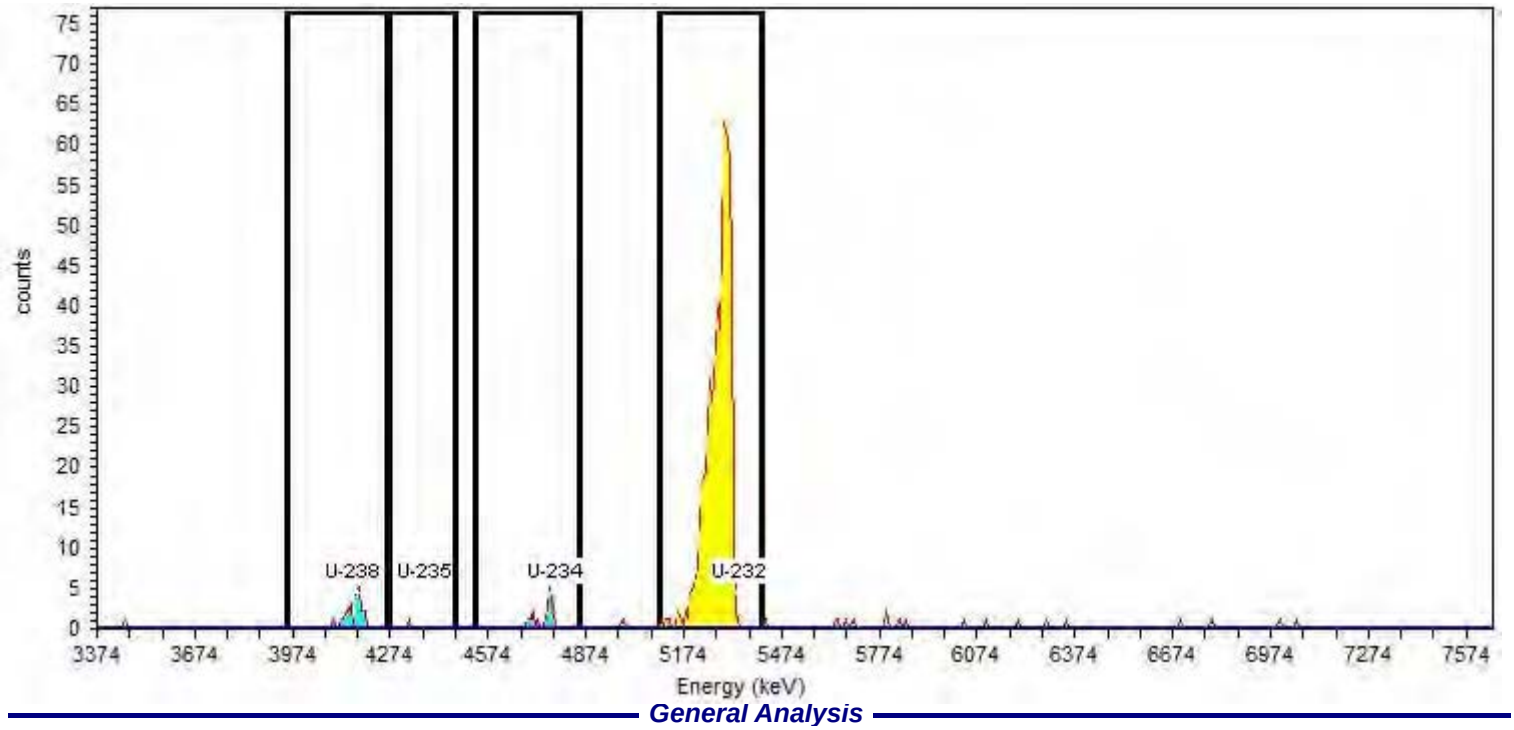
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 86.63%

Acquisition

Detector: AV170 SN: 50-112 G7
Acquisition Start Date: 8/13/2018 8:10:41PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:15PM
Bkgd Info: Sample: ICB;AV170; Det: AV170; Spectrum #1; 7/21/2018 9:28:15 PM

Energy Calibration: IC-9793;AV170-20171113
Efficiency Calibration:IC-9793;AV170-20171113
Calibration Date: 11/13/2017 3:17:08PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.18% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	58.3	100.0	25	0.1875	24.81	3.083E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	1	0.0000	1.00	1.550E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	45.1	99.8	17	0.5625	16.44	2.047E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	72.2	100.1	559	2.6250	556.38	6.400E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:25:12PM 8/10/2018

Sample

Sample Name: 160-29521-A-14-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-14-E
Sample Collection Date: 7/13/2018 7:40:00AM
Comment:

Sample Weight : 1.00 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225141
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

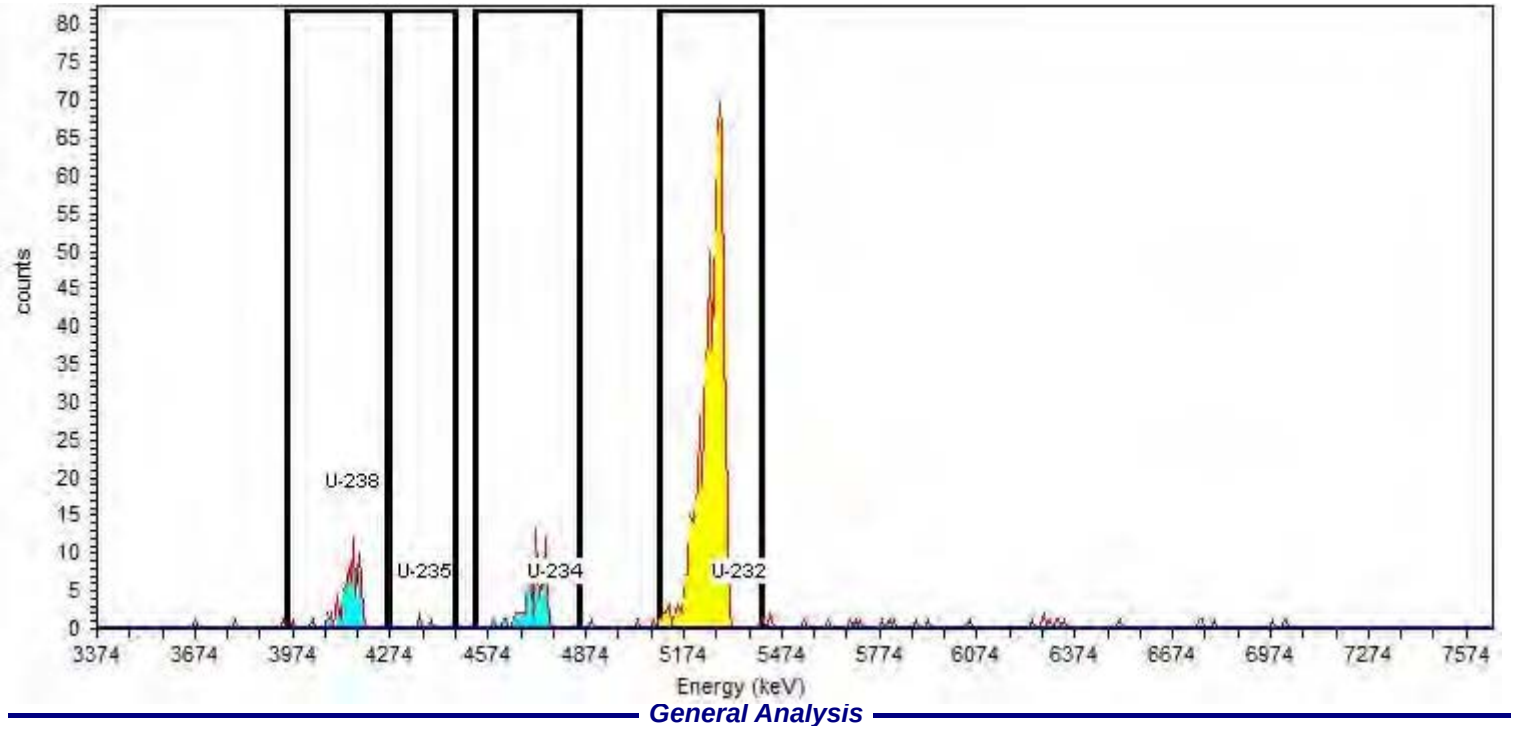
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 104.49%

Acquisition

Detector: AV203 SN: 50-117J4
Acquisition Start Date: 8/10/2018 7:21:41PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:20PM
Bkgd Info: Sample: ICB;AV203; Det: AV203; Spectrum #1; 7/21/2018 9:28:20 PM

Energy Calibration: IC-8876;AV203-20171114
Efficiency Calibration:IC-8876;AV203-20171114
Calibration Date: 11/14/2017 12:01:12PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 21.22% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	57.3	100.0	73	0.5625	72.44	8.136E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	3	0.1875	2.81	3.939E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	64.8	99.8	77	0.5625	76.44	8.603E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	65.8	100.1	618	3.5625	614.44	7.705E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:26:33PM 8/10/2018

Sample

Sample Name: 160-29521-B-15-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-B-15-E
Sample Collection Date: 7/13/2018 8:00:00AM
Comment:

Sample Weight : 1.07 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225152
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

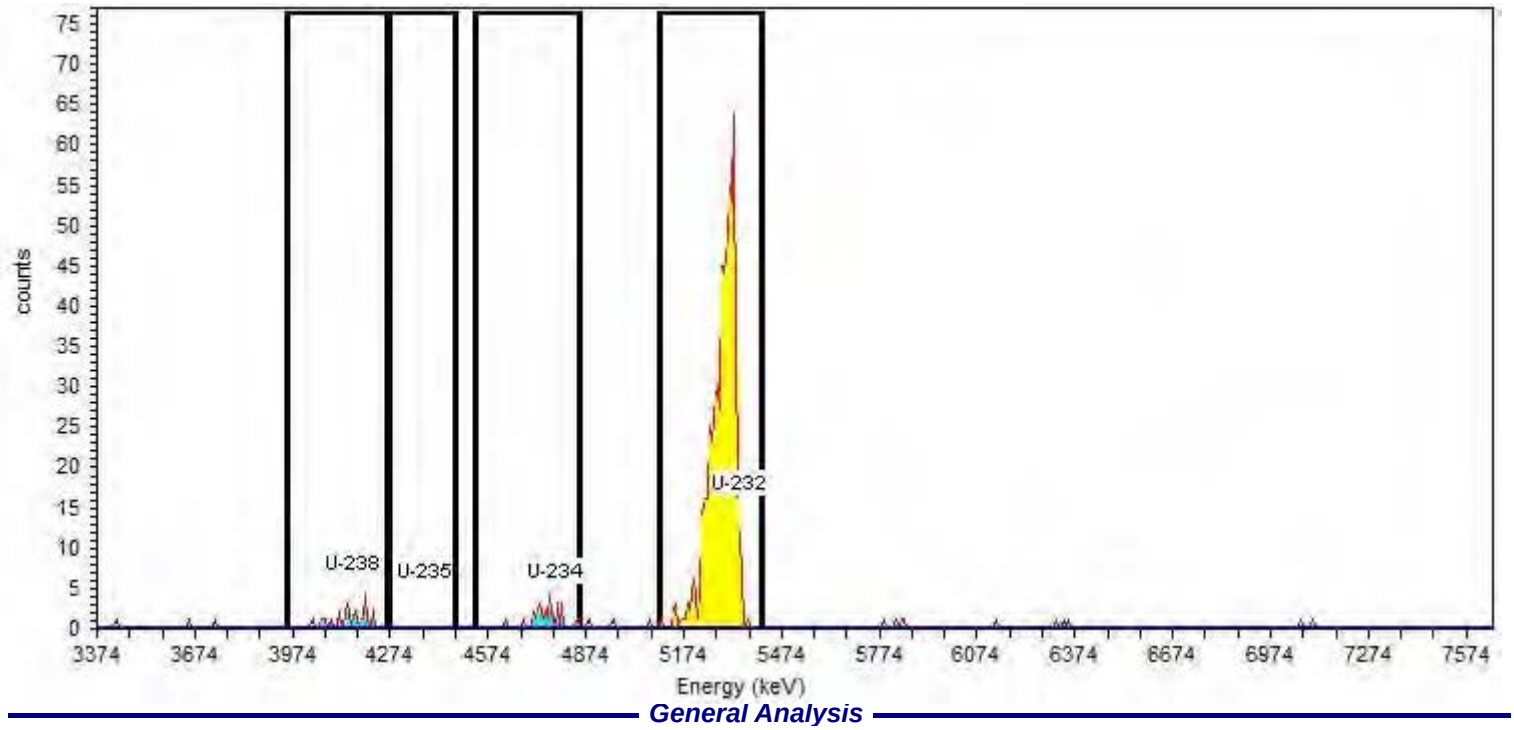
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 87.38%

Acquisition

Detector: AV206 SN: 5604420
Acquisition Start Date: 8/10/2018 7:21:41PM
Live Time: 180.00 min.
Real Time: 180.16 min.
Background Date: 7/21/2018 9:28:21PM
Bkgd Info: Sample: ICB;AV206; Det: AV206; Spectrum #1; 7/21/2018 9:28:21 PM

Energy Calibration: IC-8879;AV206-20171114
Efficiency Calibration:IC-8879;AV206-20171114
Calibration Date: 11/14/2017 12:00:54PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 23.42% +/- 0.32% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	106.9	100.0	23	0.0000	23.00	2.617E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	.0	80.2	0	0.0000	0.00	0.000E+000	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	84.8	99.8	27	0.0000	27.00	3.078E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	71.8	100.1	568	0.9375	567.06	6.023E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:25:08PM 8/10/2018

Sample

Sample Name: 160-29521-A-16-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-16-E
Sample Collection Date: 7/13/2018 12:40:00PM
Comment:

Sample Weight : 1.03 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225140
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

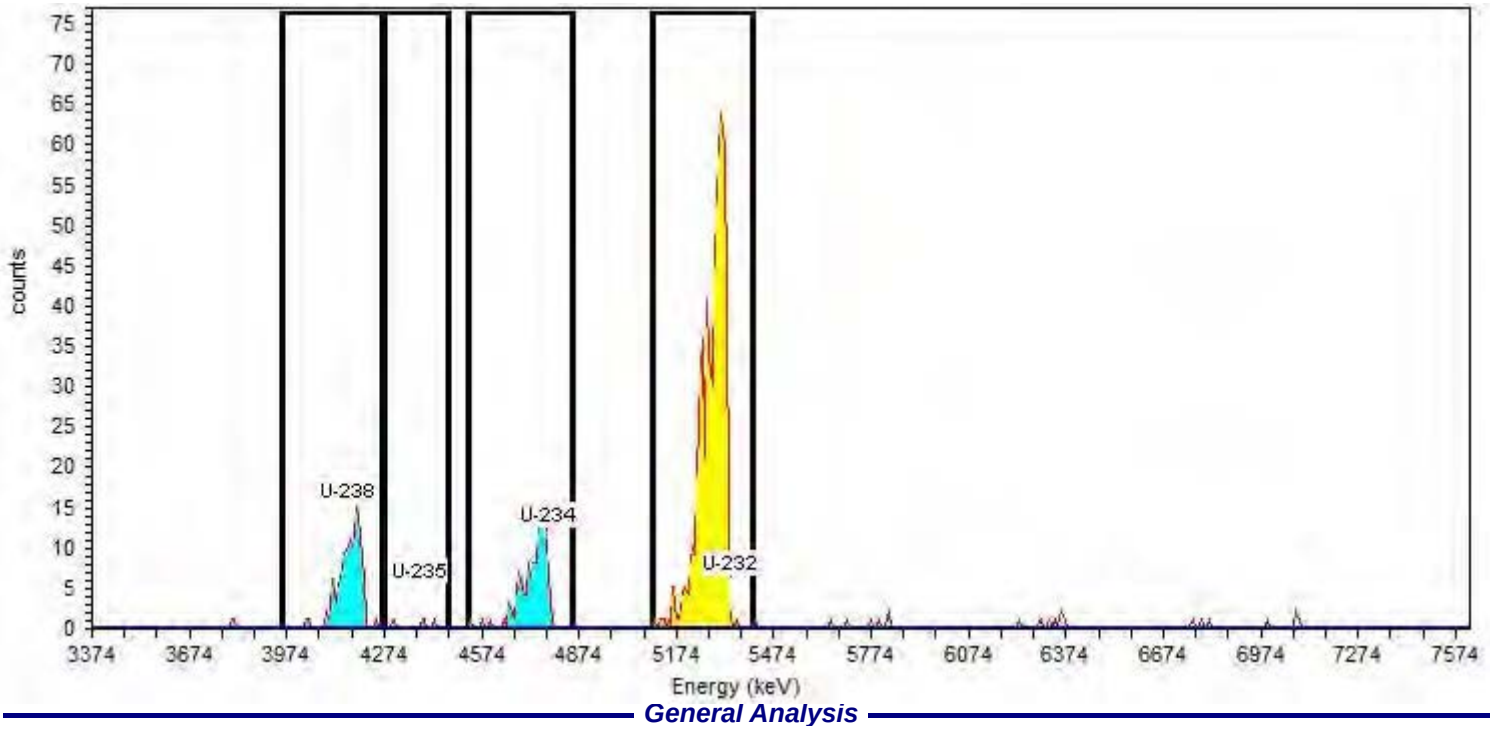
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 89.45%

Acquisition

Detector: AV208 SN: 50-112Z6
Acquisition Start Date: 8/10/2018 7:21:41PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:21PM
Bkgd Info: Sample: ICB;AV208; Det: AV208; Spectrum #1; 7/21/2018 9:28:21 PM

Energy Calibration: IC-9793;AV208-20171114
Efficiency Calibration:IC-9793;AV208-20171114
Calibration Date: 11/14/2017 12:00:42PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.28% +/- 0.31% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	74.8	100.0	128	0.0000	128.00	1.434E+000	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	106.0	80.2	4	0.1875	3.81	5.327E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	60.5	99.8	130	0.3750	129.63	1.455E+000	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	79.2	100.1	604	2.2500	601.75	6.445E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:25:55PM 8/10/2018

Sample

Sample Name: 160-29521-B-17-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-B-17-E
Sample Collection Date: 7/13/2018 12:50:00PM
Comment:

Sample Weight : 1.08 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225145
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

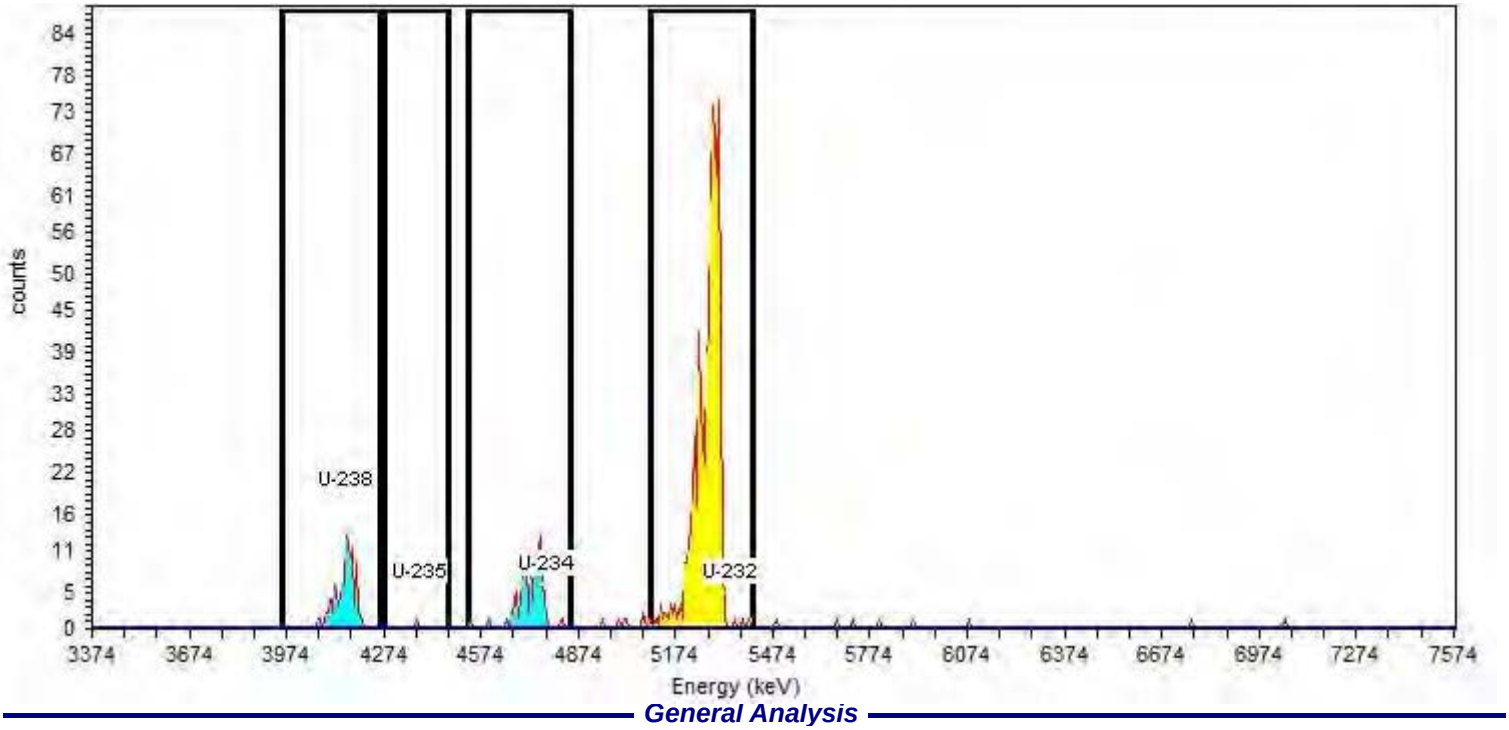
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 98.48%

Acquisition

Detector: AV212 SN: 49-155m5
Acquisition Start Date: 8/10/2018 7:21:41PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/20/2018 9:02:42PM
Bkgd Info: Sample: ICB;AV212; Det: AV212; Spectrum #1; 7/20/2018 9:02:42 PM

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 / Ch^2
Efficiency: 22.41% +/- 0.33% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	57.4	100.0	86	0.9375	85.06	8.968E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	1	0.3750	0.63	8.216E-003	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	80.1	99.8	94	0.7500	93.25	9.851E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	59.7	100.1	615	3.3750	611.63	6.785E+000	pCi/g

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:26:02PM 8/10/2018

Sample

Sample Name: 160-29521-A-18-D Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-18-D
Sample Collection Date: 7/13/2018 12:55:00PM
Comment:

Sample Weight : 1.01 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225146
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

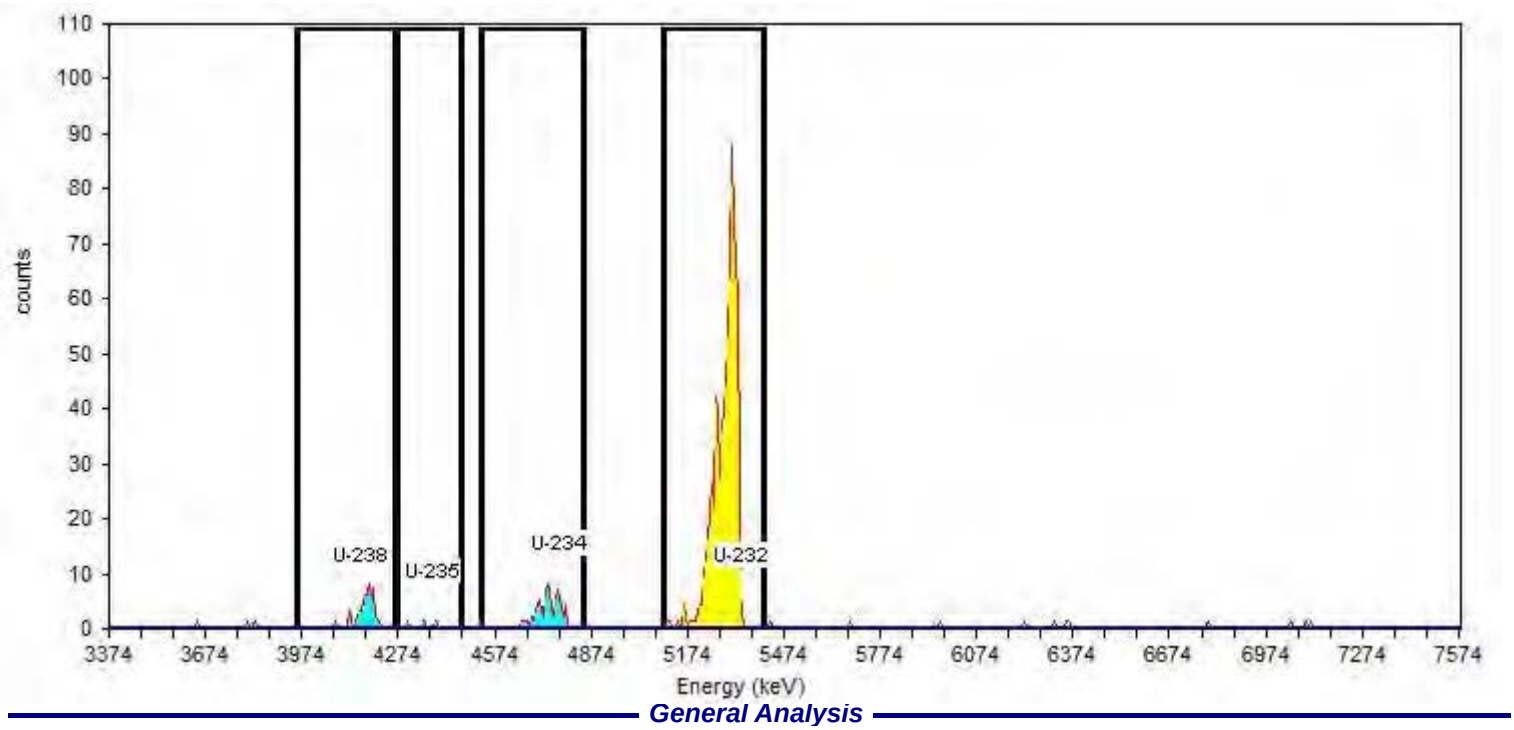
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 98.93%

Acquisition

Detector: AV213 SN: 54-011 Y1
Acquisition Start Date: 8/10/2018 7:21:41PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/20/2018 9:02:43PM
Bkgd Info: Sample: ICB;AV213; Det: AV213; Spectrum #1; 7/20/2018 9:02:43 PM

Energy Calibration: IC-9885;AV213-20171114
Efficiency Calibration:IC-9885;AV213-20171114
Calibration Date: 11/14/2017 12:01:29PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 24.04% +/- 0.36% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	50.6	100.0	49	0.0000	49.00	5.092E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	3	0.1875	2.81	3.644E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	85.7	99.8	62	0.3750	61.63	6.416E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	61.1	100.1	661	1.8750	659.13	7.240E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:25:26PM 8/10/2018

Sample

Sample Name: 160-29521-A-19-D Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-19-D
Sample Collection Date: 7/13/2018 3:50:00PM
Comment:

Sample Weight : 1.04 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225144
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

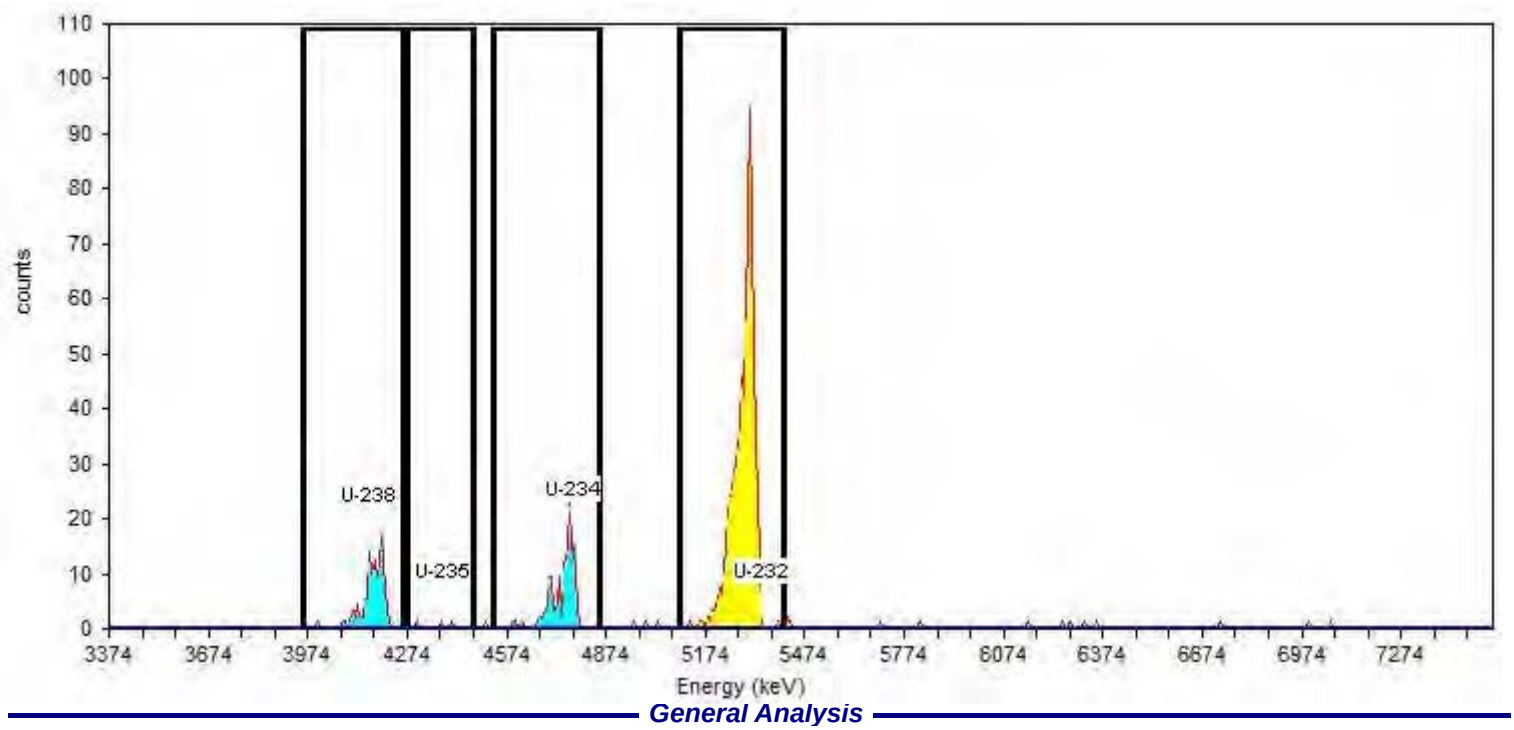
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 87.17%

Acquisition

Detector: AV215 SN: 50-119J4
Acquisition Start Date: 8/10/2018 7:21:42PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:22PM
Bkgd Info: Sample: ICB;AV215; Det: AV215; Spectrum #1; 7/21/2018 9:28:22 PM

Energy Calibration: IC-7107;AV215-20171114
Efficiency Calibration:IC-7107;AV215-20171114
Calibration Date: 11/14/2017 3:23:29PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 25.45% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	61.6	100.0	111	0.0000	111.00	1.208E+000	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	122.6	80.2	3	0.1875	2.81	3.817E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	48.8	99.8	132	0.9375	131.06	1.429E+000	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	58.2	100.1	617	2.2500	614.75	6.232E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:25:21PM 8/10/2018

Sample

Sample Name: 160-29521-B-20-D Type: Sample
Spectrum #1 Analysis #1
: 160-29521-B-20-D
Sample Collection Date: 7/13/2018 4:00:00PM
Comment:

Sample Weight : 1.00 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225143
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

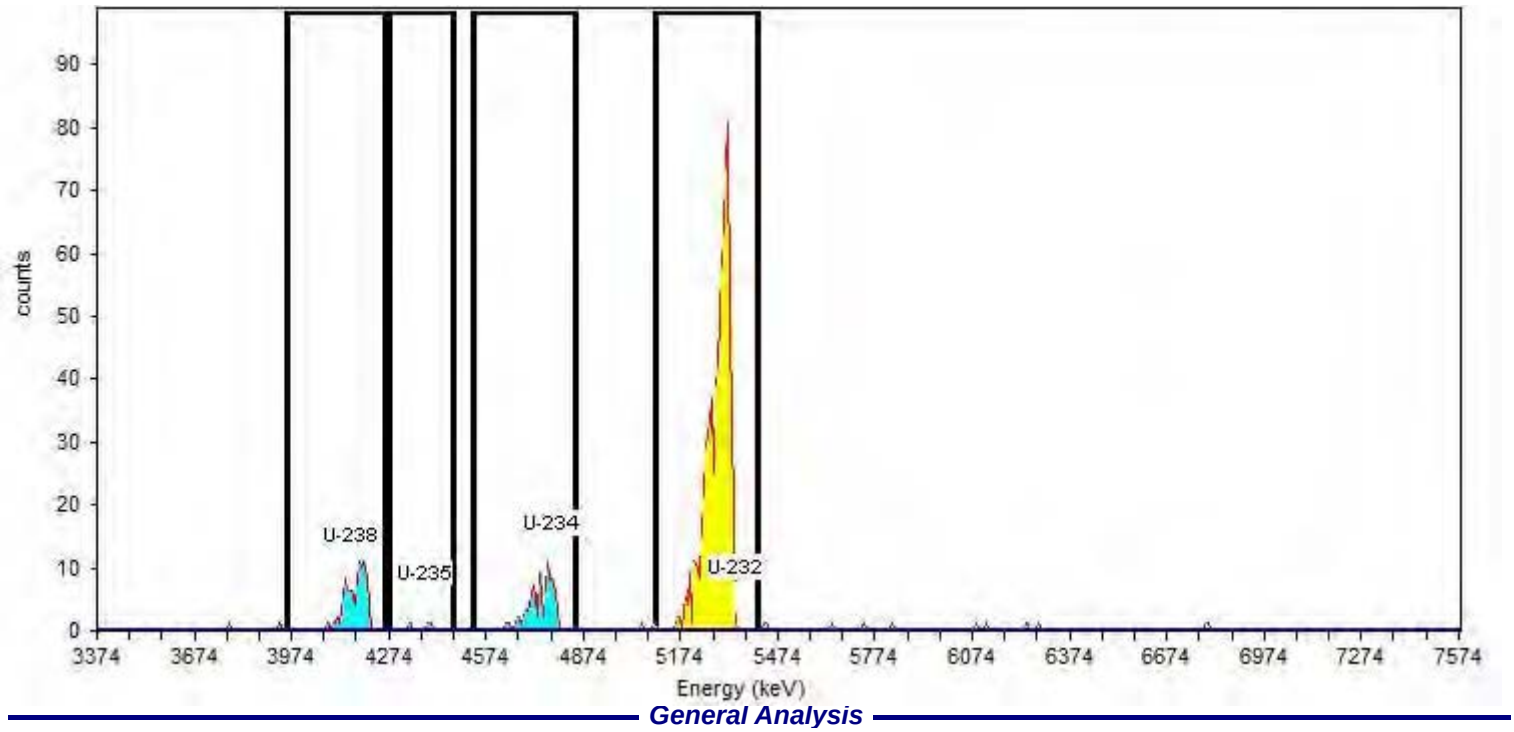
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 85.55%

Acquisition

Detector: AV216 SN: 50-117J5
Acquisition Start Date: 8/10/2018 7:21:42PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/20/2018 9:02:43PM
Bkgd Info: Sample: ICB;AV216; Det: AV216; Spectrum #1; 7/20/2018 9:02:43 PM

Energy Calibration: IC-8874;AV216-20171114
Efficiency Calibration:IC-8874;AV216-20171114
Calibration Date: 11/14/2017 3:23:21PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.89% +/- 0.38% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	82.0	100.0	92	0.0000	92.00	1.001E+000	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	19.3	80.2	4	0.0000	4.00	5.425E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	84.2	99.8	86	0.1875	85.81	9.352E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	63.1	100.1	639	1.5000	637.50	6.338E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:26:12PM 8/10/2018

Sample

Sample Name: 160-29521-A-21-E Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-21-E
Sample Collection Date: 7/13/2018 4:10:00PM
Comment:

Sample Weight : 1.01 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225148
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

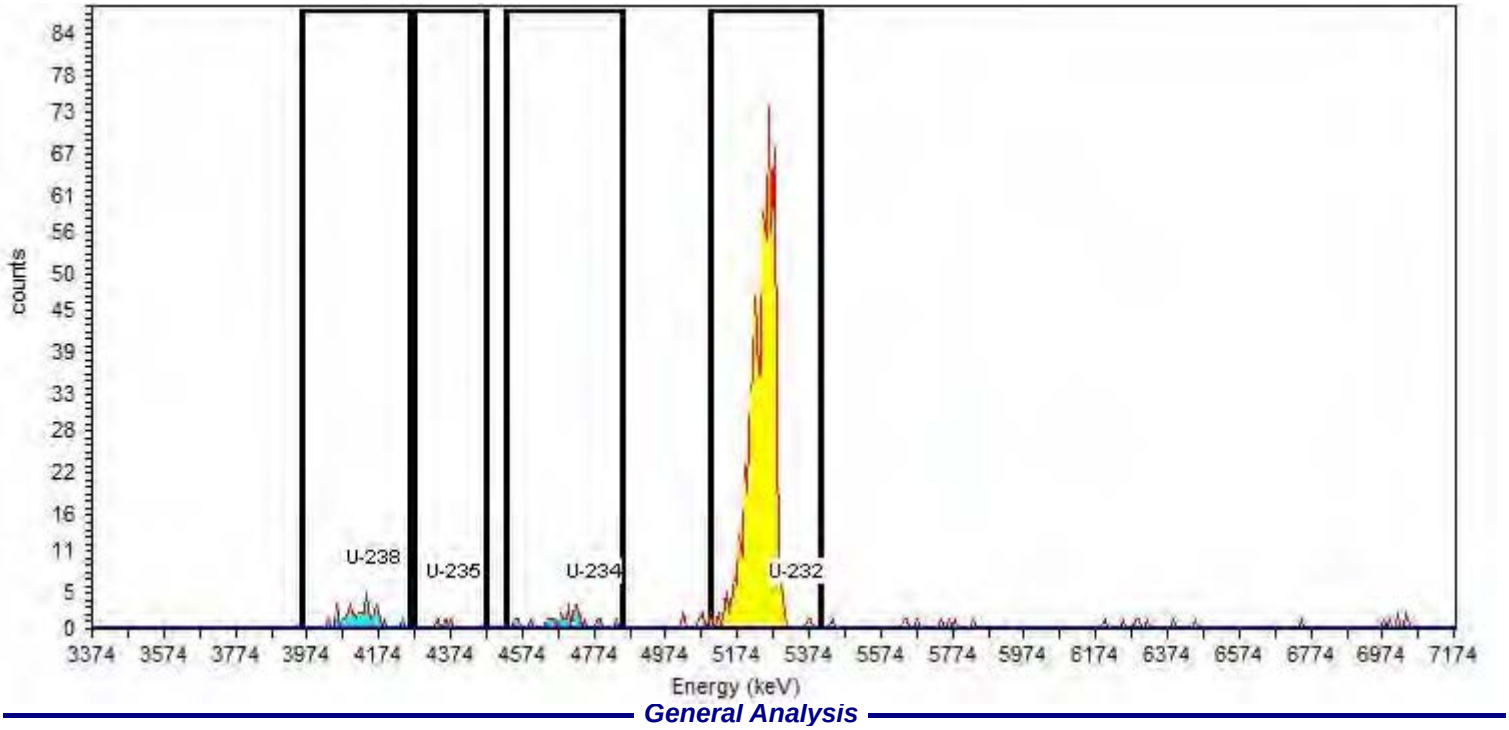
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 108.50%

Acquisition

Detector: AV217 SN: 50-117I2
Acquisition Start Date: 8/10/2018 7:21:42PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/20/2018 9:02:44PM
Bkgd Info: Sample: ICB;AV217; Det: AV217; Spectrum #1; 7/20/2018 9:02:44 PM

Energy Calibration: IC-8875;AV217-20171114
Efficiency Calibration:IC-8875;AV217-20171114
Calibration Date: 11/14/2017 3:23:16PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 21.21% +/- 0.31% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	100.2	100.0	36	0.0000	36.00	3.891E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	52.2	80.2	3	0.0000	3.00	4.043E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	73.0	99.8	26	0.3750	25.63	2.775E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	74.4	100.1	639	1.3125	637.69	7.991E+000	pCi/g

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:26:07PM 8/10/2018

Sample

Sample Name: 160-29521-A-22-D Type: Sample
Spectrum #1 Analysis #1
: 160-29521-A-22-D
Sample Collection Date: 7/13/2018 4:20:00PM
Comment:

Sample Weight : 1.01 Sample Units: g
First Stage Dilution: N/A
Aliquot: N/A Aliquot Fraction: N/A
Dilution 2: N/A
Lab Preparation:

Batch

Batch Name: 378574
AnalysisResultsID: 225147
Description:

Client Name: Undefined
Client Contact:
Analyst: 60040

Tracer

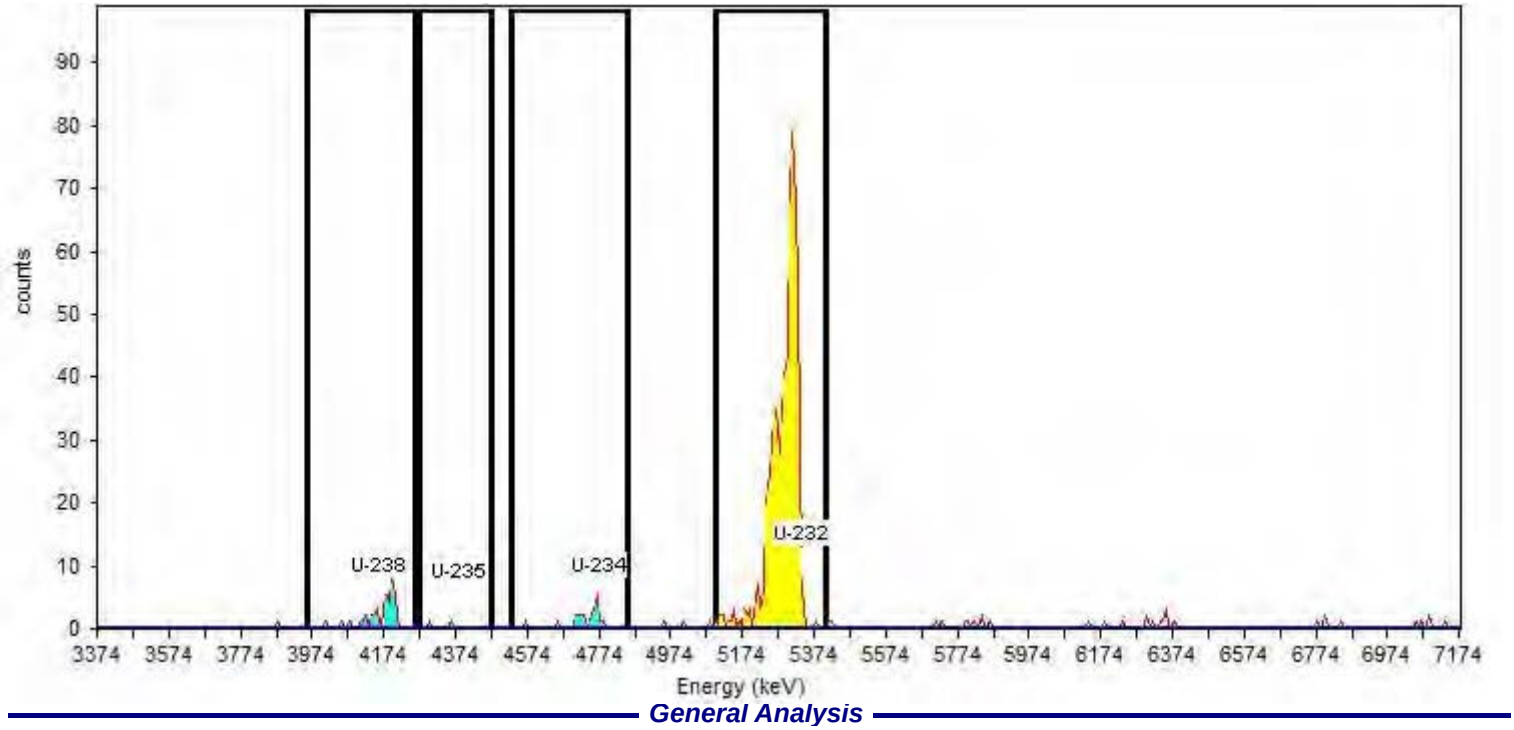
Tracer Name: U-232_00040
Tracer Activity: 82.25 DPM / mL x (Vol.) 0.20 mL = 16.45 DPM
Tracer Ref. Date: 8/25/2011 11:47:15AM

Tracer Nuclide: U-232
Tracer Recovery: 106.10%

Acquisition

Detector: AV218 SN: 50-117Z7
Acquisition Start Date: 8/10/2018 7:21:42PM
Live Time: 180.00 min.
Real Time: 180.00 min.
Background Date: 7/21/2018 9:28:23PM
Bkgd Info: Sample: ICB;AV218; Det: AV218; Spectrum #1; 7/21/2018 9:28:23 PM

Energy Calibration: IC-8876;AV218-20171114a
Efficiency Calibration:IC-8876;AV218-20171114a
Calibration Date: 11/14/2017 3:23:35PM
Energy Cal: Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 21.31% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction:8/10/2018 7:17:24PM
MDA Constants: Kα = 1.64 , Kβ = 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	48.7	100.0	44	0.0000	44.00	4.841E-001	pCi/g
U-235	4381.2	4,396.0	-14.8	4269.3	4470.7	18.3	80.2	2	0.0000	2.00	2.744E-002	pCi/g
U-234	4776.4	4,775.8	0.6	4530.3	4851.0	77.7	99.8	24	0.1875	23.81	2.625E-001	pCi/g
U-232	5343.2	5,320.3	22.9	5097.1	5410.3	60.6	100.1	628	1.5000	626.50	7.814E+000	pCi/g

Daily Checks

Alpha Spectroscopy Daily Pulser Check

Analysis Date: 08/04/18

		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
AV7	08/04/18 11:00	7326	6979.5 - 7714.2	Pass	16.6	10 - 20	Pass	233.0	226.3 - 236.3	Pass	5104	5052.3 - 5132.3	Pass
AV8	08/04/18 11:00	7348	7015.5 - 7753.9	Pass	15.6	10 - 20	Pass	222.9	219.0 - 229.0	Pass	5029	4997.4 - 5077.4	Pass
AV10	08/04/18 11:00	7659	7183.9 - 7940.1	Pass	15.3	10 - 20	Pass	224.1	218.4 - 228.4	Pass	5038	4993.0 - 5073.0	Pass
AV24	08/04/18 11:01	7650	7289.7 - 8057.0	Pass	15.1	10 - 20	Pass	219.1	214.6 - 224.6	Pass	5001	4964.4 - 5044.4	Pass
AV43	08/04/18 11:01	7488	7101.8 - 7849.4	Pass	11.8	10 - 20	Pass	220.9	215.9 - 225.9	Pass	5015	4974.4 - 5054.4	Pass
AV44	08/04/18 11:01	7367	7181.1 - 7937.1	Pass	12.5	10 - 20	Pass	222.1	216.0 - 226.0	Pass	5023	4974.9 - 5054.9	Pass
AV45	08/04/18 11:01	7629	7277.0 - 8043.0	Pass	18.7	10 - 20	Pass	209.0	205.9 - 215.9	Pass	4925	4900.0 - 4980.0	Pass
AV47	08/04/18 11:01	7552	7271.8 - 8037.2	Pass	13.8	10 - 20	Pass	219.0	214.0 - 224.0	Pass	5000	4960.2 - 5040.2	Pass
AV48	08/04/18 11:01	7542	7259.1 - 8023.2	Pass	15.5	10 - 20	Pass	218.0	216.0 - 226.0	Pass	4993	4974.9 - 5054.9	Pass
AV52	08/04/18 11:01	7289	6954.9 - 7686.9	Pass	14.8	10 - 20	Pass	223.1	217.0 - 227.0	Pass	5030	4982.4 - 5062.4	Pass
AV69	08/04/18 11:01	7421	7056.8 - 7799.6	Pass	14.5	10 - 20	Pass	217.0	212.0 - 222.0	Pass	4985	4945.5 - 5025.5	Pass
AV70	08/04/18 11:01	7355	6984.2 - 7719.3	Pass	17.4	10 - 20	Pass	216.1	209.9 - 219.9	Pass	4978	4929.5 - 5009.5	Pass
AV71	08/04/18 11:01	7416	7058.3 - 7801.3	Pass	14.7	10 - 20	Pass	214.9	212.0 - 222.0	Pass	4970	4945.1 - 5025.1	Pass
AV72	08/04/18 11:01	7418	6951.5 - 7683.3	Pass	13.7	10 - 20	Pass	225.0	220.0 - 230.0	Pass	5045	5004.8 - 5084.8	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
AV15	08/10/18 14:23	7691	7303.8 - 8072.6	Pass	15.0	10 - 20	Pass	225.1	219.4 - 229.4	Pass	5046	5000.2 - 5080.2	Pass
AV19	08/10/18 14:23	7577	7146.1 - 7898.3	Pass	12.1	10 - 20	Pass	224.0	219.0 - 229.0	Pass	5037	4997.6 - 5077.6	Pass
AV20	08/10/18 14:23	7677	7319.9 - 8090.4	Pass	14.7	10 - 20	Pass	223.0	218.0 - 228.0	Pass	5030	4990.3 - 5070.3	Pass
AV23	08/10/18 14:23	7652	7289.1 - 8056.3	Pass	16.2	10 - 20	Pass	226.0	220.5 - 230.5	Pass	5052	5008.6 - 5088.6	Pass
AV24	08/10/18 14:23	7616	7289.7 - 8057.0	Pass	16.0	10 - 20	Pass	219.2	214.6 - 224.6	Pass	5001	4964.4 - 5044.4	Pass
AV43	08/10/18 14:23	7581	7101.8 - 7849.4	Pass	11.7	10 - 20	Pass	222.0	215.9 - 225.9	Pass	5023	4974.4 - 5054.4	Pass
AV44	08/10/18 14:23	7534	7181.1 - 7937.1	Pass	12.1	10 - 20	Pass	221.0	216.0 - 226.0	Pass	5015	4974.9 - 5054.9	Pass
AV45	08/10/18 14:23	7676	7277.0 - 8043.0	Pass	19.1	10 - 20	Pass	213.0	205.9 - 215.9	Pass	4956	4900.0 - 4980.0	Pass
AV47	08/10/18 14:23	7665	7271.8 - 8037.2	Pass	14.5	10 - 20	Pass	218.9	214.0 - 224.0	Pass	5000	4960.2 - 5040.2	Pass
AV48	08/10/18 14:23	7634	7259.1 - 8023.2	Pass	15.8	10 - 20	Pass	217.2	216.0 - 226.0	Pass	4986	4974.9 - 5054.9	Pass
AV49	08/10/18 14:23	7597	7234.7 - 7996.2	Pass	16.8	10 - 20	Pass	221.2	215.0 - 225.0	Pass	5017	4967.8 - 5047.8	Pass
AV52	08/10/18 14:23	7308	6954.9 - 7686.9	Pass	15.9	10 - 20	Pass	222.9	217.0 - 227.0	Pass	5029	4982.4 - 5062.4	Pass
AV53	08/10/18 14:23	7165	6904.4 - 7631.2	Pass	11.7	10 - 20	Pass	219.9	215.0 - 225.0	Pass	5007	4967.5 - 5047.5	Pass
AV54	08/10/18 14:23	7317	6952.1 - 7683.9	Pass	14.5	10 - 20	Pass	223.0	218.0 - 228.0	Pass	5030	4989.7 - 5069.7	Pass
AV56	08/10/18 14:23	7314	6947.0 - 7678.3	Pass	14.9	10 - 20	Pass	224.1	218.0 - 228.0	Pass	5038	4989.8 - 5069.8	Pass
AV57	08/10/18 14:23	7305	6628.0 - 7325.6	Pass	15.3	10 - 20	Pass	225.9	220.9 - 230.9	Pass	5052	5011.8 - 5091.8	Pass
AV58	08/10/18 14:23	7312	6730.3 - 7438.7	Pass	13.5	10 - 20	Pass	218.9	215.0 - 225.0	Pass	5000	4967.9 - 5047.9	Pass
AV60	08/10/18 14:23	7155	6808.2 - 7524.8	Pass	16.9	10 - 20	Pass	221.1	214.9 - 224.9	Pass	5016	4967.2 - 5047.2	Pass
AV62	08/10/18 14:23	7184	6804.7 - 7521.0	Pass	17.2	10 - 20	Pass	222.0	216.9 - 226.9	Pass	5022	4982.0 - 5062.0	Pass
AV175	08/10/18 14:24	5781	5495.4 - 6073.8	Pass	13.0	10 - 20	Pass	221.0	216.3 - 226.3	Pass	5015	4977.0 - 5057.0	Pass

Alpha Spectroscopy Daily Pulser Check

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
AV187	08/10/18 14:24	5895	5591.4 - 6180.0	Pass	12.2	10 - 20	Pass	223.0	218.0 - 228.0	Pass	5030	4989.8 - 5069.8	Pass
AV189	08/10/18 14:25	5905	5591.3 - 6179.9	Pass	12.6	10 - 20	Pass	224.0	219.0 - 229.0	Pass	5037	4997.5 - 5077.5	Pass
AV190	08/10/18 14:25	6006	5645.8 - 6240.1	Pass	15.7	10 - 20	Pass	222.9	218.5 - 228.5	Pass	5030	4993.4 - 5073.4	Pass
AV191	08/10/18 14:25	6022	5597.2 - 6186.4	Pass	14.2	10 - 20	Pass	220.9	217.0 - 227.0	Pass	5014	4982.7 - 5062.7	Pass
AV192	08/10/18 14:25	5982	5693.0 - 6292.3	Pass	16.7	10 - 20	Pass	222.0	217.0 - 227.0	Pass	5022	4982.2 - 5062.2	Pass
AV194	08/10/18 14:25	6018	5711.1 - 6312.3	Pass	13.6	10 - 20	Pass	221.9	217.4 - 227.4	Pass	5022	4985.6 - 5065.6	Pass
AV198	08/10/18 14:25	6003	5693.9 - 6293.2	Pass	15.2	10 - 20	Pass	224.0	219.0 - 229.0	Pass	5037	4997.4 - 5077.4	Pass
AV203	08/10/18 14:25	6006	5705.4 - 6306.0	Pass	18.8	10 - 20	Pass	208.0	203.0 - 213.0	Pass	4918	4878.0 - 4958.0	Pass
AV206	08/10/18 14:25	5956	5668.1 - 6264.7	Pass	17.2	10 - 20	Pass	221.1	216.0 - 226.0	Pass	5016	4974.9 - 5054.9	Pass
AV208	08/10/18 14:25	6010	5565.4 - 6151.3	Pass	14.7	10 - 20	Pass	224.0	219.0 - 229.0	Pass	5038	4997.5 - 5077.5	Pass
AV212	08/10/18 14:25	6034	5733.2 - 6336.7	Pass	13.8	10 - 20	Pass	219.0	214.3 - 224.3	Pass	5000	4962.1 - 5042.1	Pass
AV213	08/10/18 14:25	5891	5673.7 - 6271.0	Pass	18.1	10 - 20	Pass	223.2	218.0 - 228.0	Pass	5031	4990.2 - 5070.2	Pass
AV215	08/10/18 14:25	6018	5713.8 - 6315.3	Pass	13.5	10 - 20	Pass	224.0	219.0 - 229.0	Pass	5037	4997.2 - 5077.2	Pass
AV216	08/10/18 14:25	6024	5667.3 - 6263.8	Pass	13.9	10 - 20	Pass	225.1	219.6 - 229.6	Pass	5046	5002.2 - 5082.2	Pass
AV217	08/10/18 14:25	5952	5516.4 - 6097.1	Pass	17.2	10 - 20	Pass	217.1	212.4 - 222.4	Pass	4986	4948.4 - 5028.4	Pass
AV218	08/10/18 14:25	6011	5693.0 - 6292.2	Pass	14.7	10 - 20	Pass	222.9	219.0 - 229.0	Pass	5029	4997.4 - 5077.4	Pass

Analysis Date: 08/13/18

		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
AV165	08/13/18 14:20	5811	5506.8 - 6086.4	Pass	12.7	10 - 20	Pass	224.1	218.5 - 228.5	Pass	5038	4993.5 - 5073.5	Pass
AV166	08/13/18 14:20	6023	5712.2 - 6313.5	Pass	14.4	10 - 20	Pass	224.1	218.0 - 228.0	Pass	5038	4990.0 - 5070.0	Pass
AV167	08/13/18 14:20	5885	5597.5 - 6186.7	Pass	12.8	10 - 20	Pass	225.0	220.0 - 230.0	Pass	5045	5005.1 - 5085.1	Pass
AV170	08/13/18 14:20	6035	5722.0 - 6324.4	Pass	14.0	10 - 20	Pass	224.1	219.1 - 229.1	Pass	5038	4997.9 - 5077.9	Pass

Analysis Date: 08/15/18

		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
AV1	08/15/18 18:36	7321	6961.0 - 7693.7	Pass	17.0	10 - 20	Pass	222.8	218.5 - 228.5	Pass	5029	4993.7 - 5073.7	Pass
AV3	08/15/18 18:36	7106	6900.2 - 7626.5	Pass	12.8	10 - 20	Pass	225.0	220.0 - 230.0	Pass	5045	5004.9 - 5084.9	Pass

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:39:25PM 8/15/2018

Sample

Sample Name: Pulser;AV1
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: August2018a
Description:

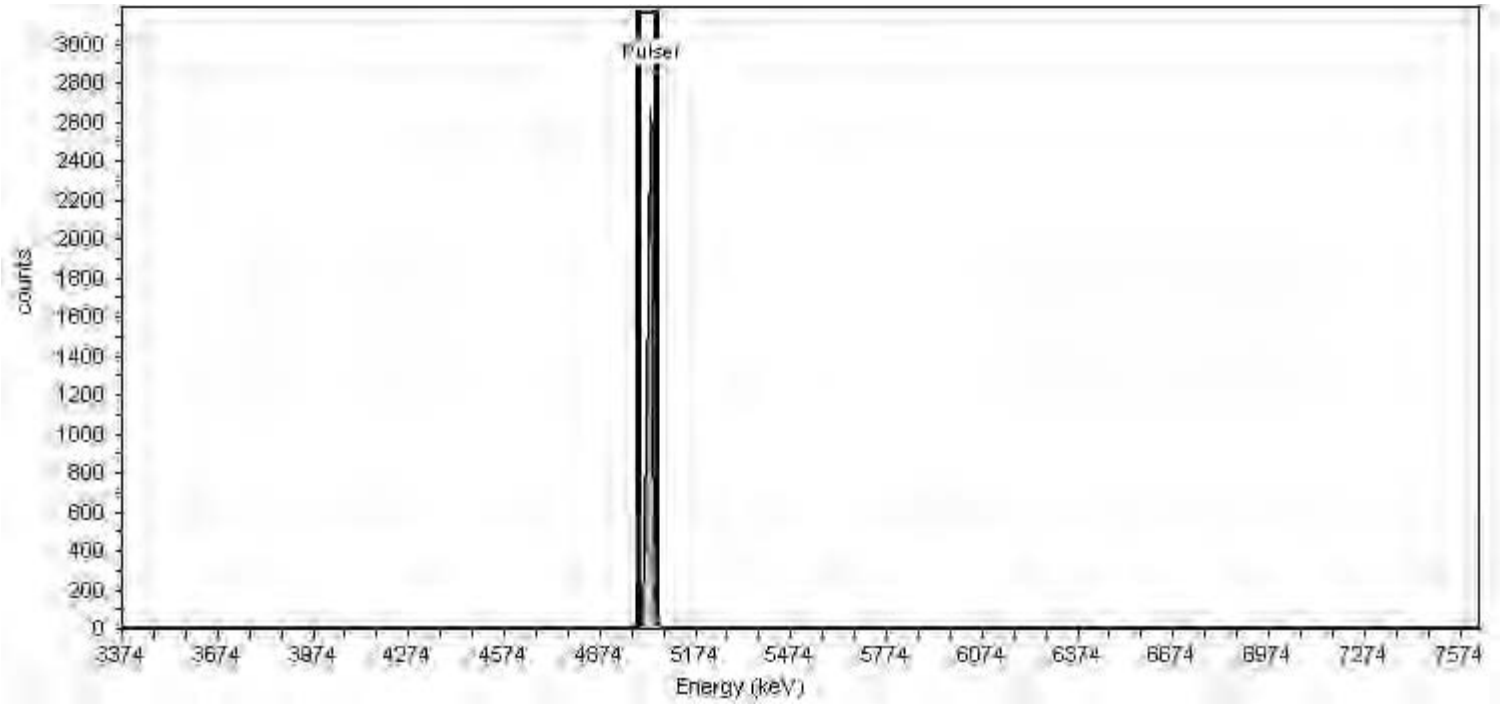
Analyst: 60040

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 8/15/2018 6:36:37PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.36% +/- 0.28% 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	5028.857	4999.957	5057.758	16.98	6,507.44	7,320.99

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:39:43PM 8/15/2018

Sample

Sample Name: Pulser;AV3
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: August2018a
Description:

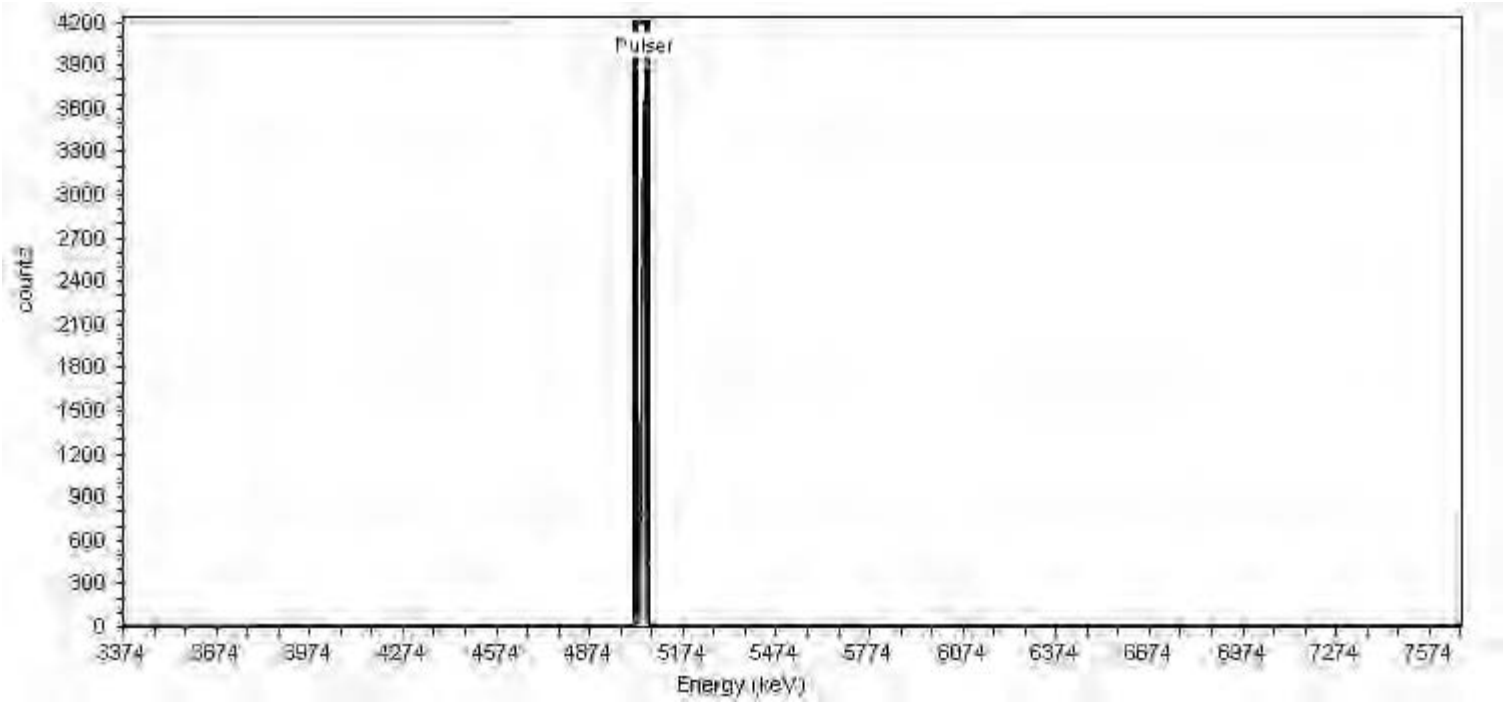
Analyst: 60040

Acquisition

Detector: AV3 , SN: 49-202 FF7
Acquisition Start Date: 8/15/2018 6:36:12PM
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 / Ch^2

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	5045.215	5023.344	5067.087	12.85	6,738.50	7,106.20

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:10:49AM 8/4/2018

Sample

Sample Name: Pulser;AV7
Comment:

Spectrum #20 Analysis #1

Batch

Batch Name: July2018a
Description:

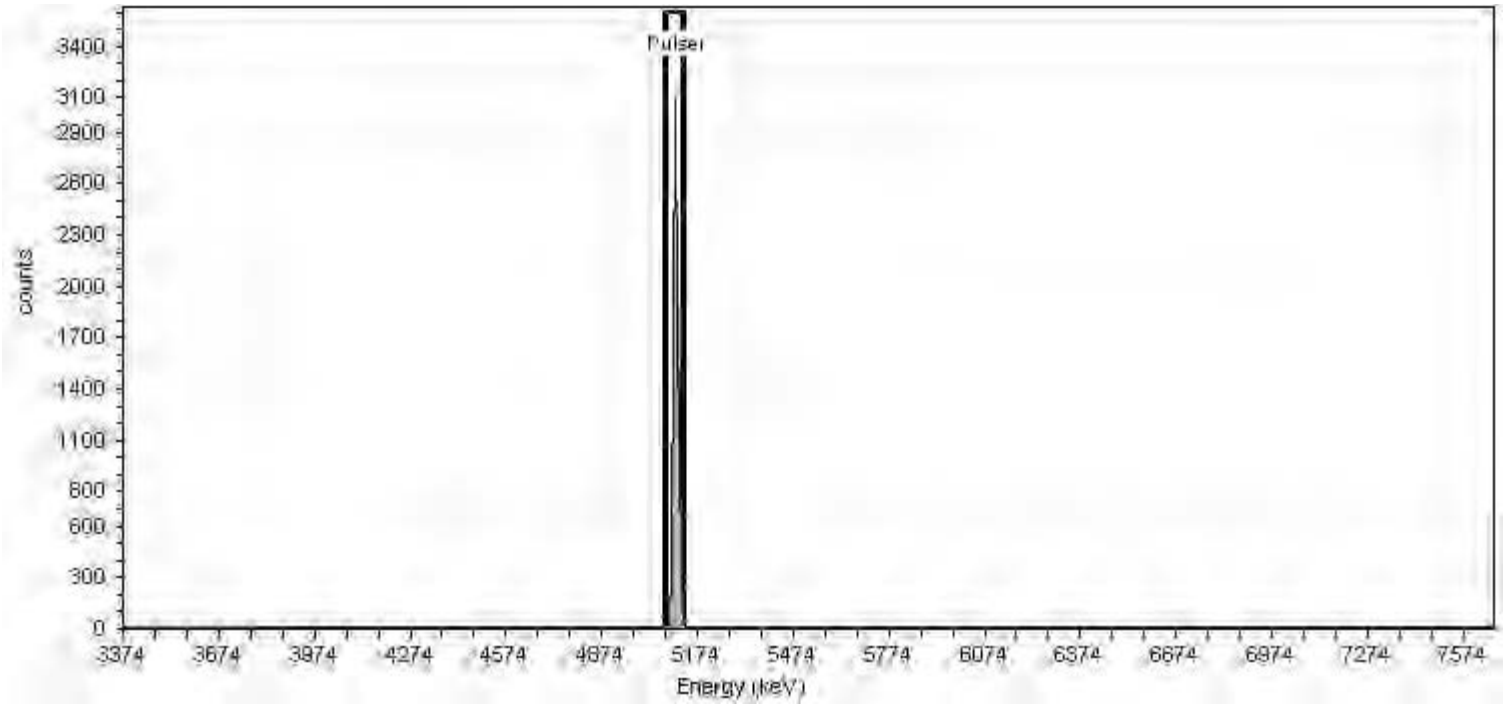
Analyst: 60040

Acquisition

Detector: AV7 , SN: 48-158EE5
Acquisition Start Date: 8/4/2018 11:00:43AM
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 / Ch^2

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	5104.499	5076.188	5132.811	16.63	7,390.46	7,326.21

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:10:58AM 8/4/2018

Sample

Sample Name: Pulser;AV8
Comment:

Spectrum #20 Analysis #1

Batch

Batch Name: July2018a
Description:

Analyst: 60040

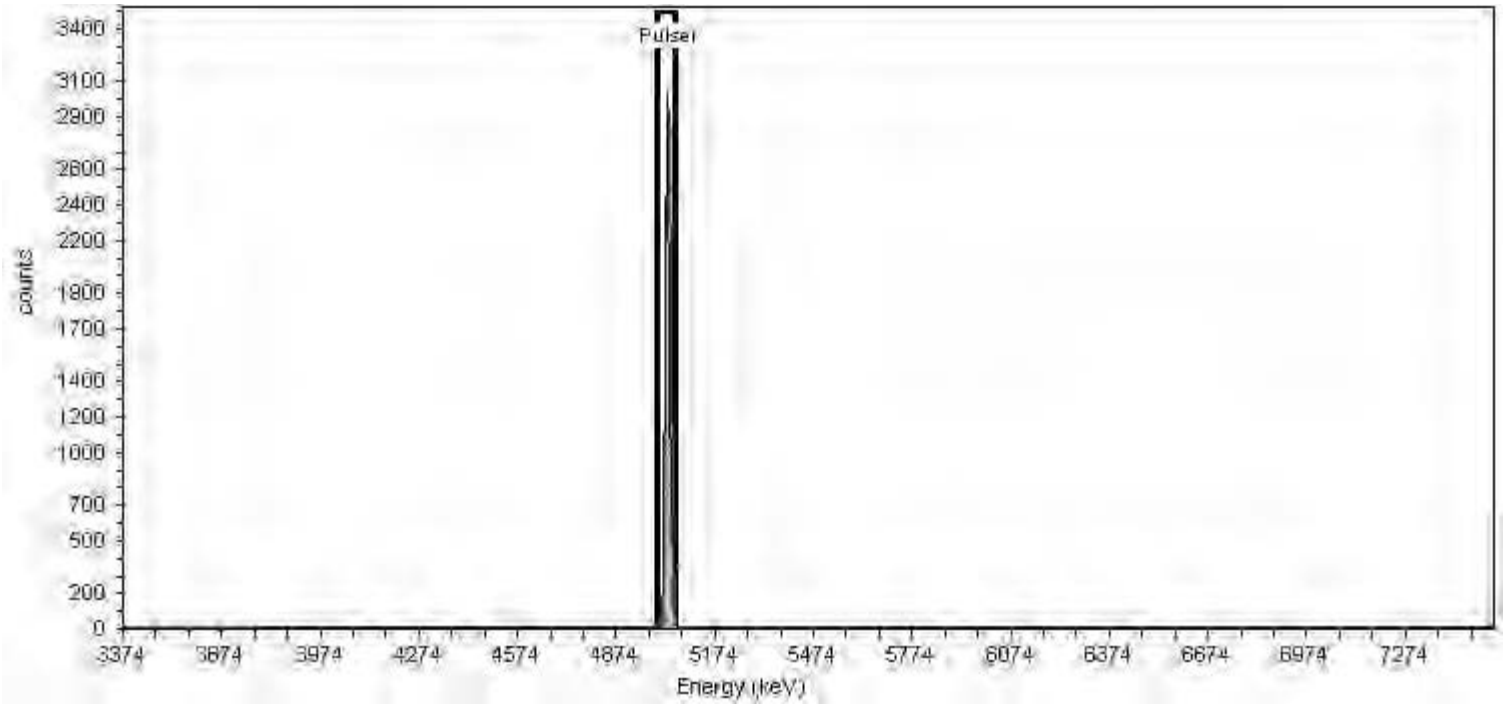
Acquisition

Detector: AV8 , SN: 41-137Q6
Acquisition Start Date: 8/4/2018 11:00:44AM
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 / Ch^2

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	5029.074	5002.491	5055.656	15.62	6,809.60	7,347.50

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:11:16AM 8/4/2018

Sample

Sample Name: Pulser;AV10
Comment:

Spectrum #21 Analysis #1

Batch

Batch Name: July2018a
Description:

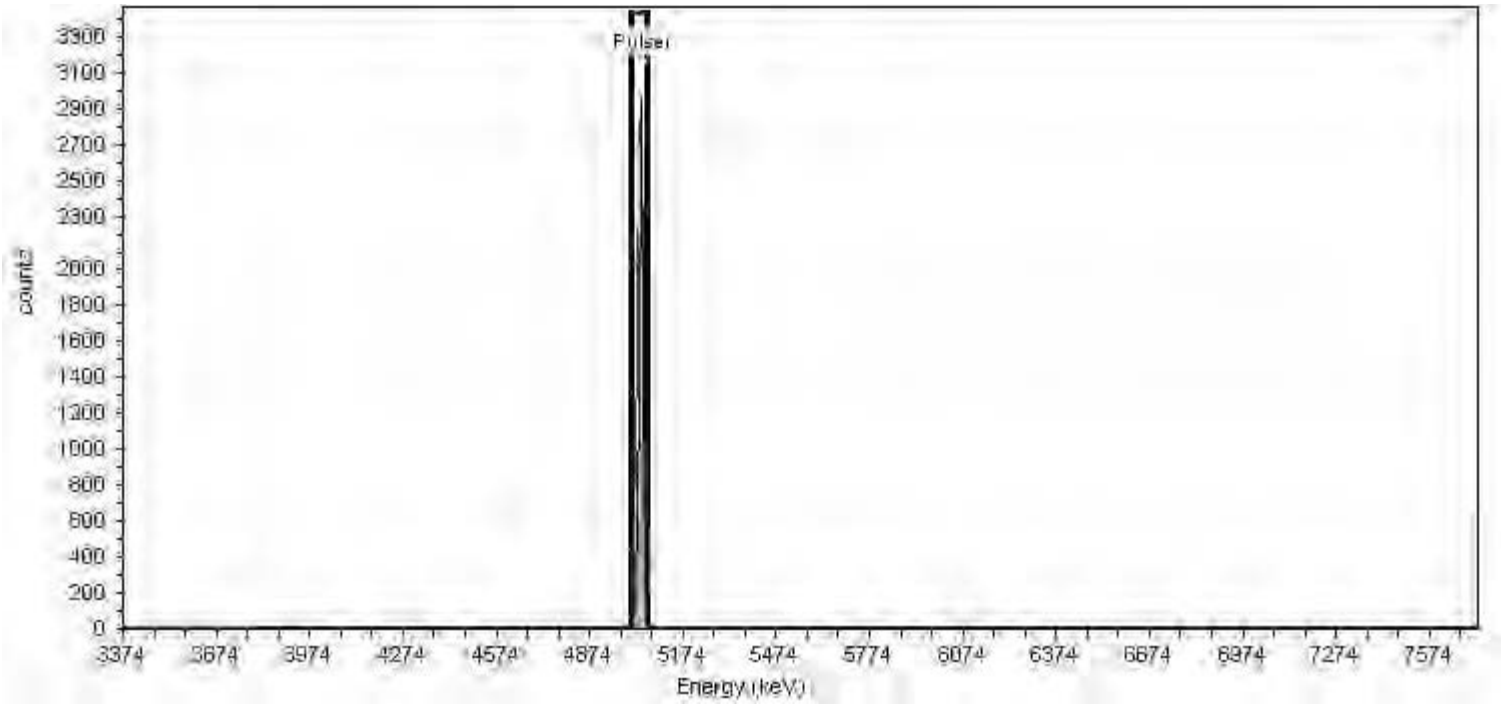
Analyst: 60040

Acquisition

Detector: AV10 , SN: 49-155N2
Acquisition Start Date: 8/4/2018 11:00:46AM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-9885;AV10-05142018
Calibration Date: 5/14/2018 6:26:57PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.49% +/- 0.35% 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	5038.400	5012.400	5064.401	15.28	6,483.48	7,659.45

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:38:47PM 8/10/2018

Sample

Sample Name: Pulser;AV15
Comment:

Spectrum #25 Analysis #1

Batch

Batch Name: July2018a
Description:

Analyst: 60040

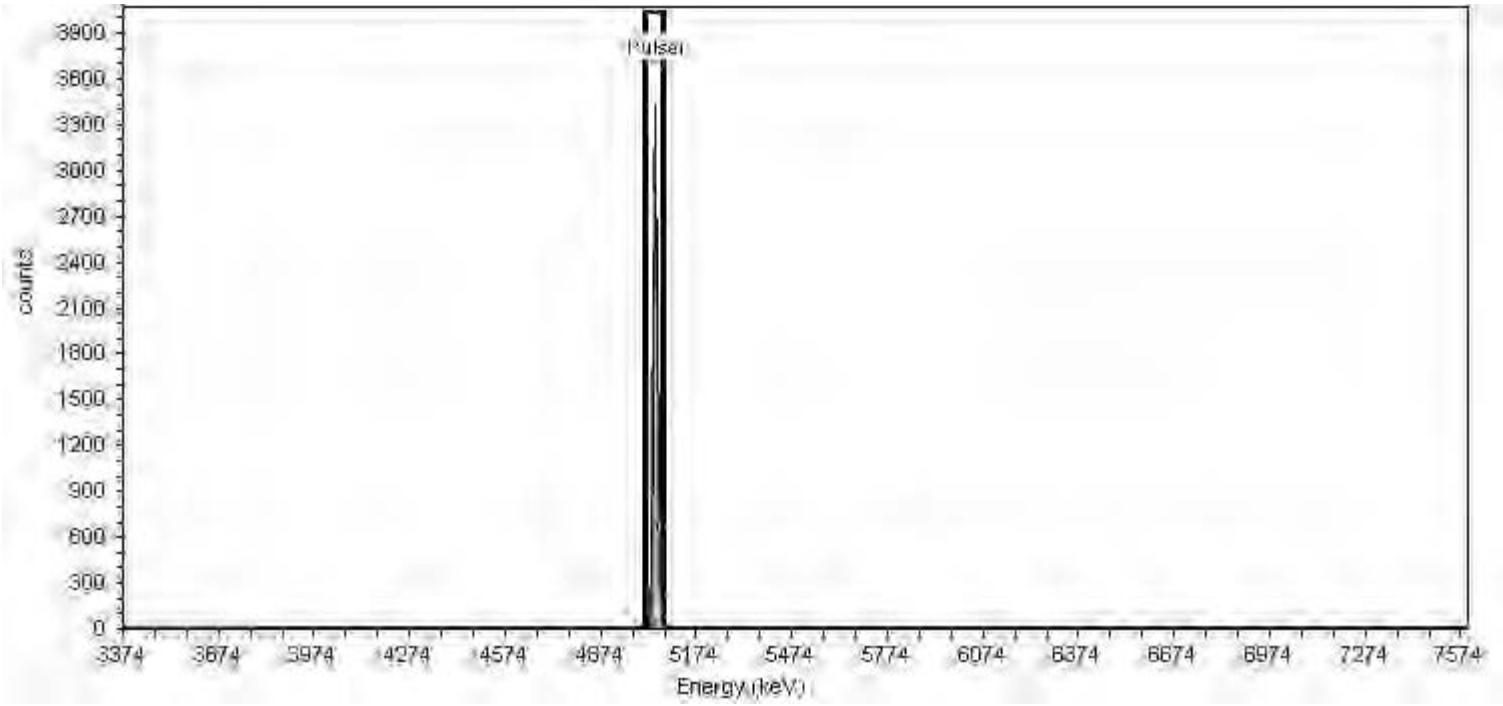
Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 8/10/2018 2:23:14PM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1370619;AV15-05142018
Calibration Date: 5/14/2018 6:28:04PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.26% +/- 0.23% 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	5045.572	5020.064	5071.080	14.99	7,406.60	7,691.37

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:39:05PM 8/10/2018

Sample

Sample Name: Pulser;AV19
Comment:

Spectrum #25 Analysis #1

Batch

Batch Name: July2018a
Description:

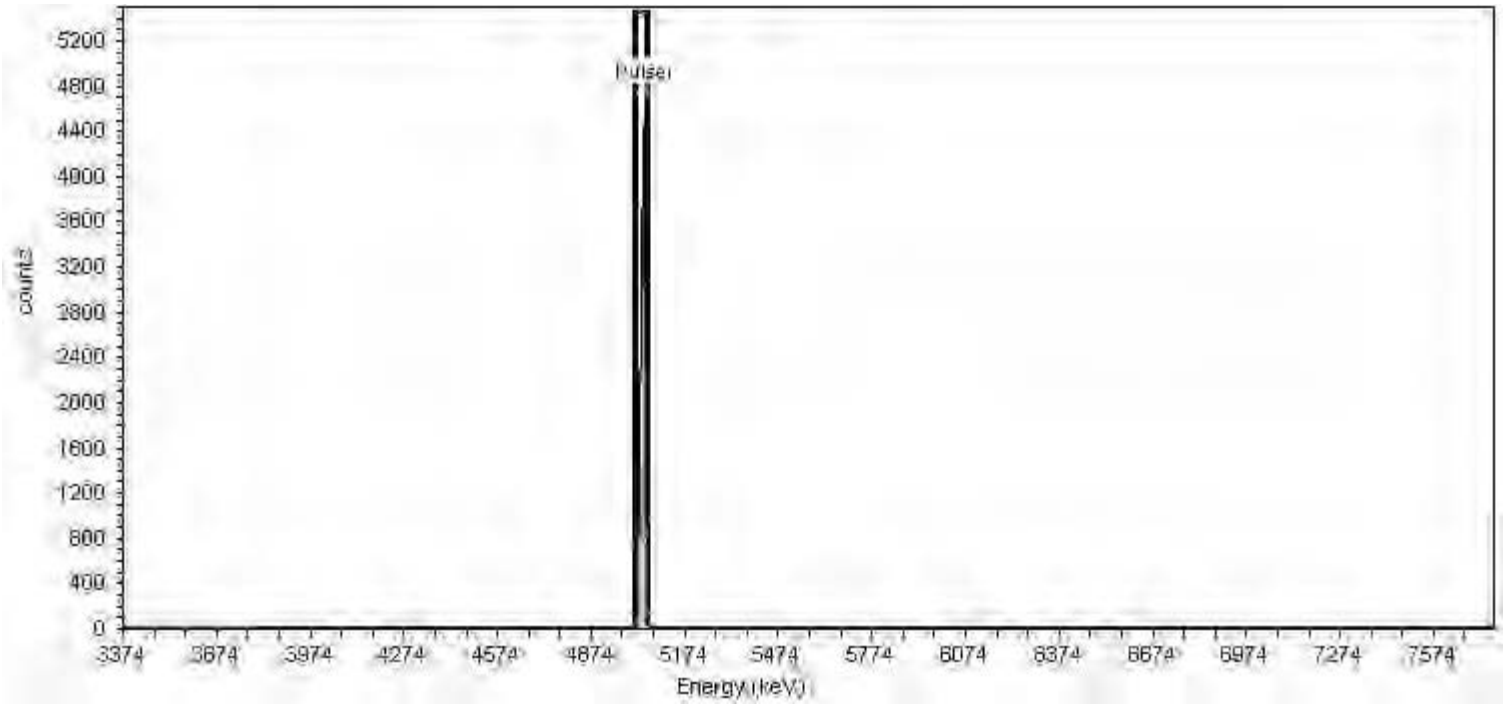
Analyst: 60040

Acquisition

Detector: AV19 , SN: 50-025FF5
Acquisition Start Date: 8/10/2018 2:23:19PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-8877;AV19-05142018
Calibration Date: 5/15/2018 12:27:55PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.60% +/- 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	5037.418	5016.772	5058.064	12.13	7,724.32	7,577.28

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:39:13PM 8/10/2018

Sample

Sample Name: Pulser;AV20
Comment:

Spectrum #25 Analysis #1

Batch

Batch Name: July2018a
Description:

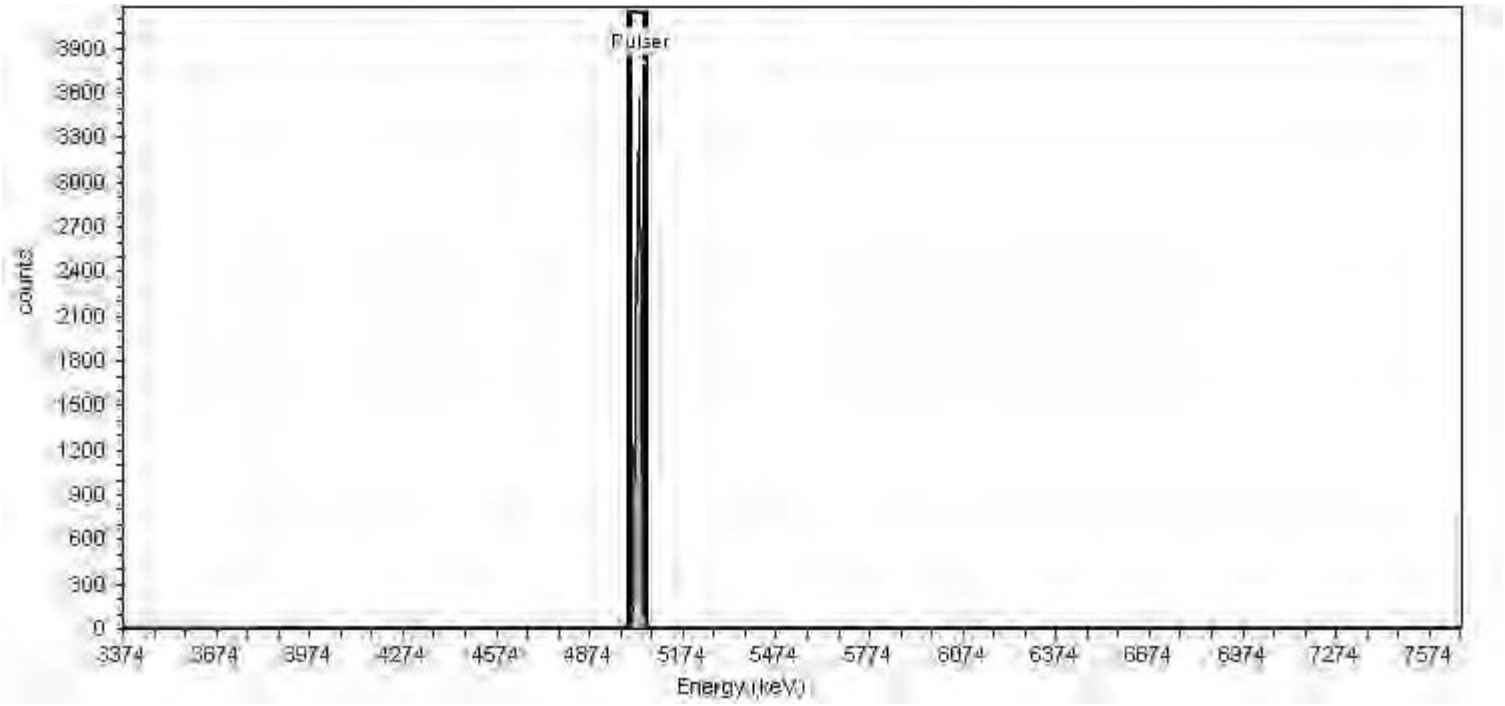
Analyst: 60040

Acquisition

Detector: AV20 , SN: 48-121A7
Acquisition Start Date: 8/10/2018 2:23:20PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9520;AV20-05142018
Calibration Date: 5/15/2018 12:28:08PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.15% +/- 0.32% 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	5030.136	5005.045	5055.226	14.74	7,569.94	7,676.79

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:39:31PM 8/10/2018

Sample

Sample Name: Pulser;AV23
Comment:

Spectrum #25 Analysis #1

Batch

Batch Name: July2018a
Description:

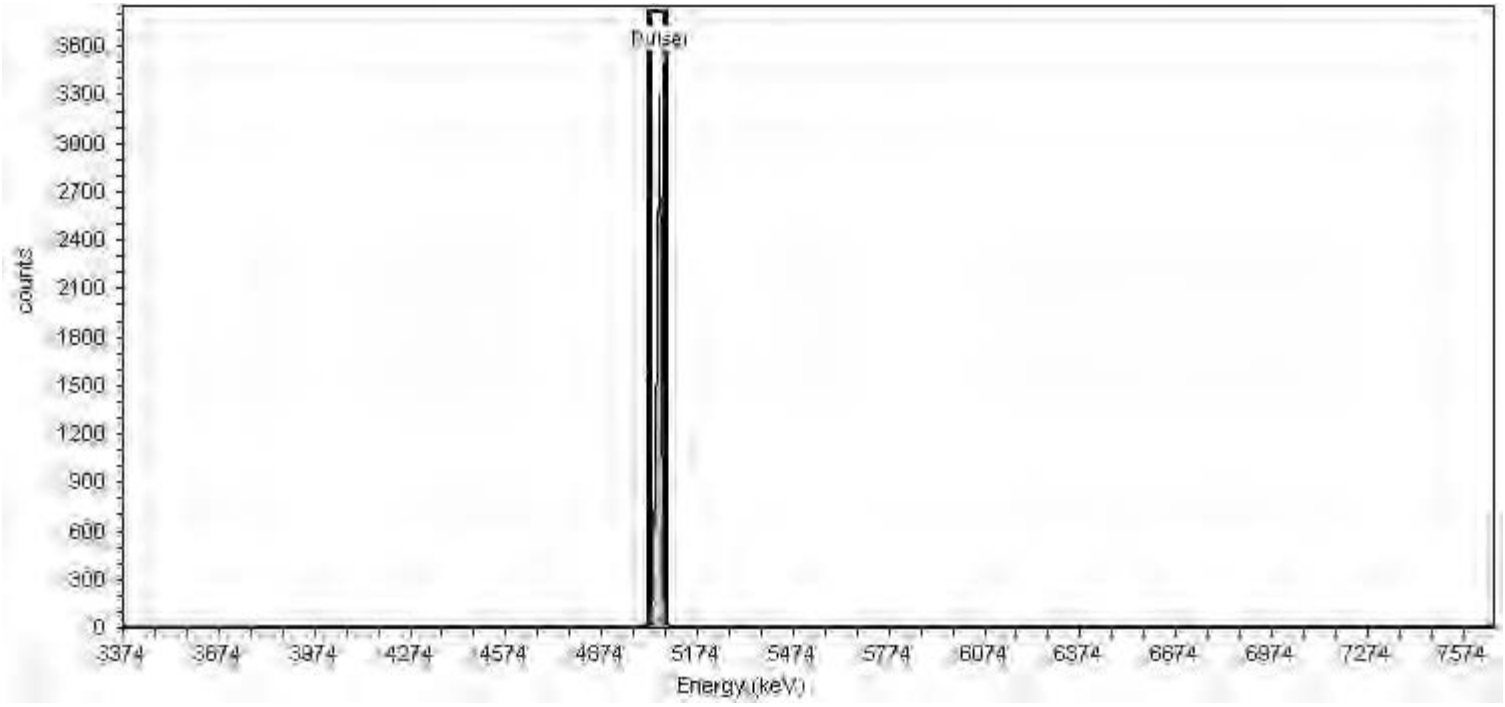
Analyst: 60040

Acquisition

Detector: AV23 , SN: 48-158FF3
Acquisition Start Date: 8/10/2018 2:23:24PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9795;AV23-05142018
Calibration Date: 5/15/2018 12:28:43PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.46% +/- 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	5052.217	5024.651	5079.783	16.20	7,663.68	7,652.04

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:13:06AM 8/4/2018

Sample

Sample Name: Pulser;AV24
Comment:

Spectrum #21 Analysis #1

Batch

Batch Name: July2018a
Description:

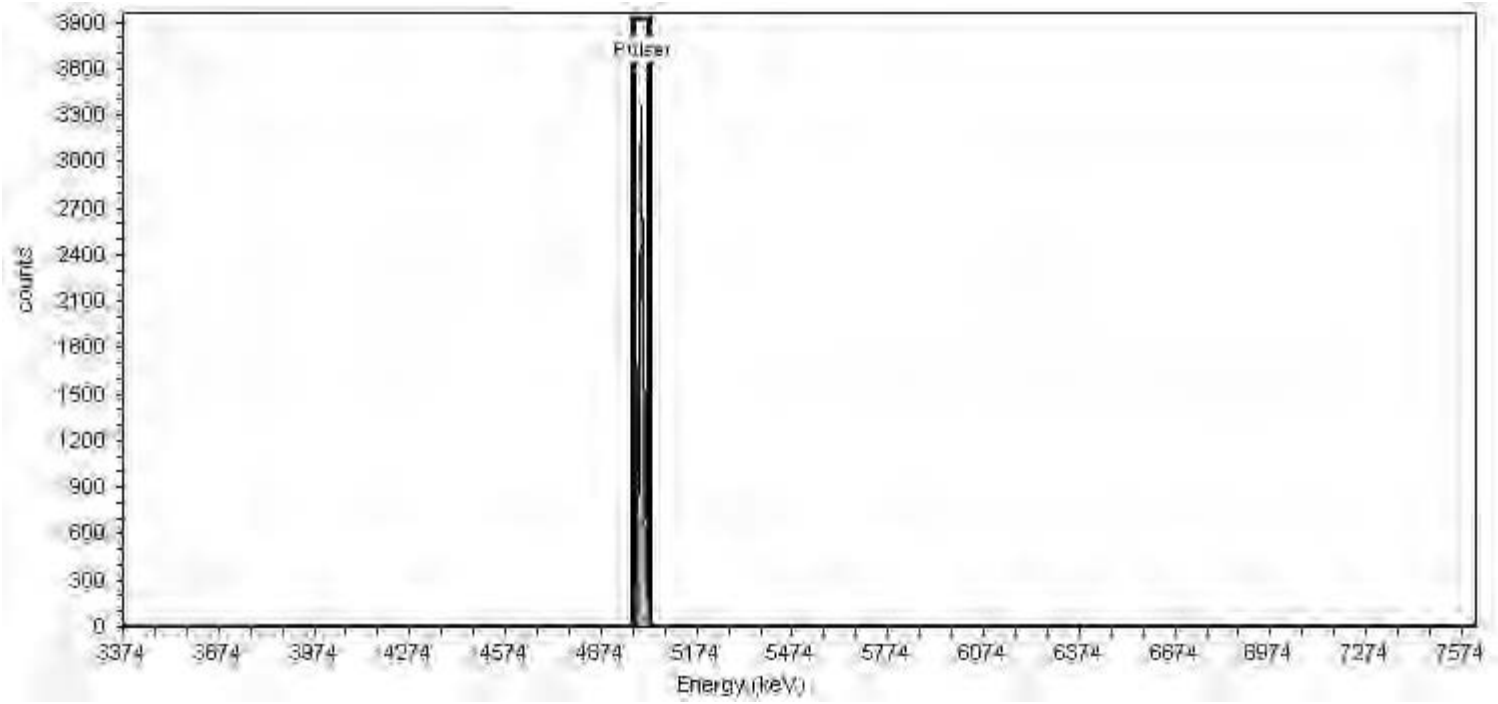
Analyst: 60040

Acquisition

Detector: AV24 , SN: 47-137Q4
Acquisition Start Date: 8/4/2018 11:01:05AM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9817;AV24-05142018
Calibration Date: 5/15/2018 12:28:57PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.21% +/- 0.28% 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	5000.839	4975.221	5026.458	15.05	7,272.91	7,649.79

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:39:48PM 8/10/2018

Sample

Sample Name: Pulser;AV24
Comment:

Spectrum #26 Analysis #1

Batch

Batch Name: July2018a
Description:

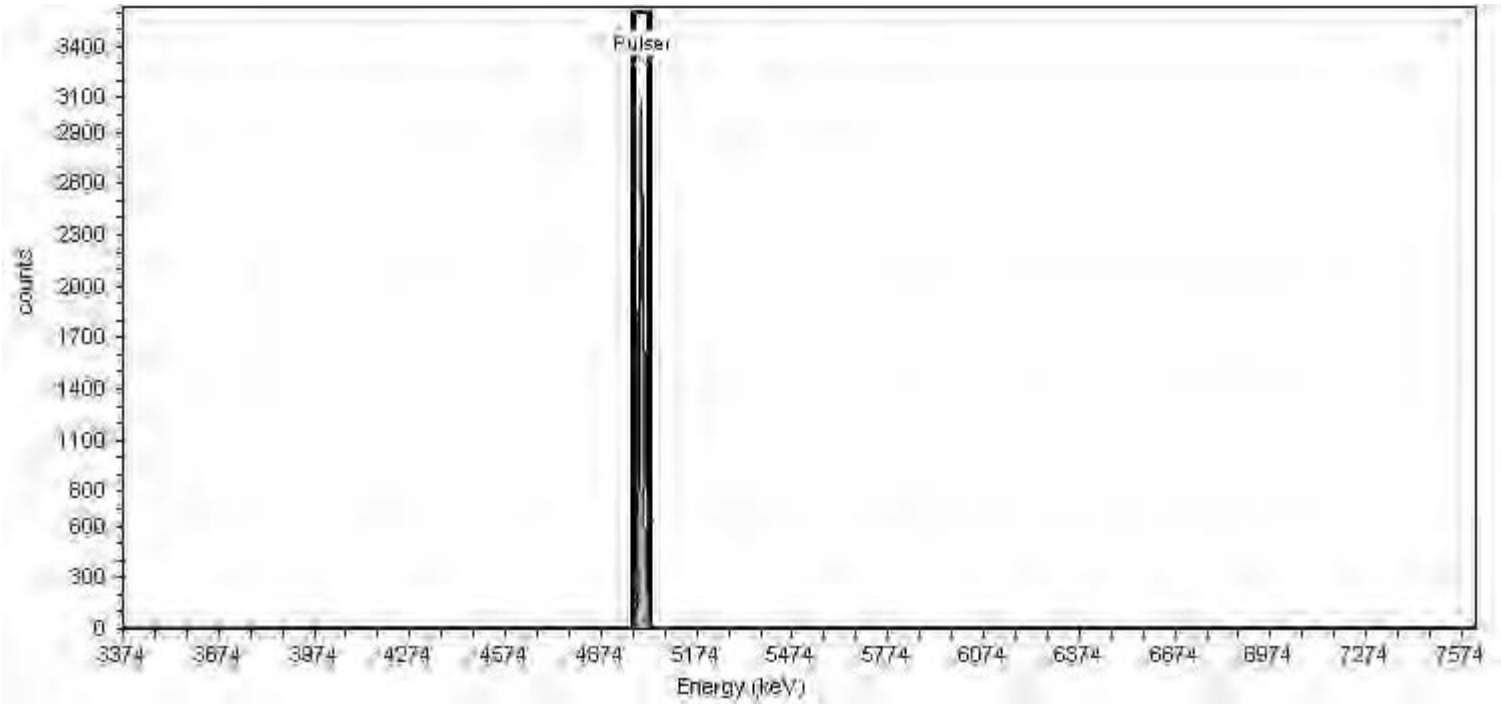
Analyst: 60040

Acquisition

Detector: AV24 , SN: 47-137Q4
Acquisition Start Date: 8/10/2018 2:23:25PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9817;AV24-05142018
Calibration Date: 5/15/2018 12:28:57PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.21% +/- 0.28% 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	5001.319	4974.012	5028.626	16.04	7,121.37	7,615.51

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:13:15AM 8/4/2018

Sample

Sample Name: Pulser;AV43
Comment:

Spectrum #18 Analysis #1

Batch

Batch Name: July2018b
Description:

Analyst: 60040

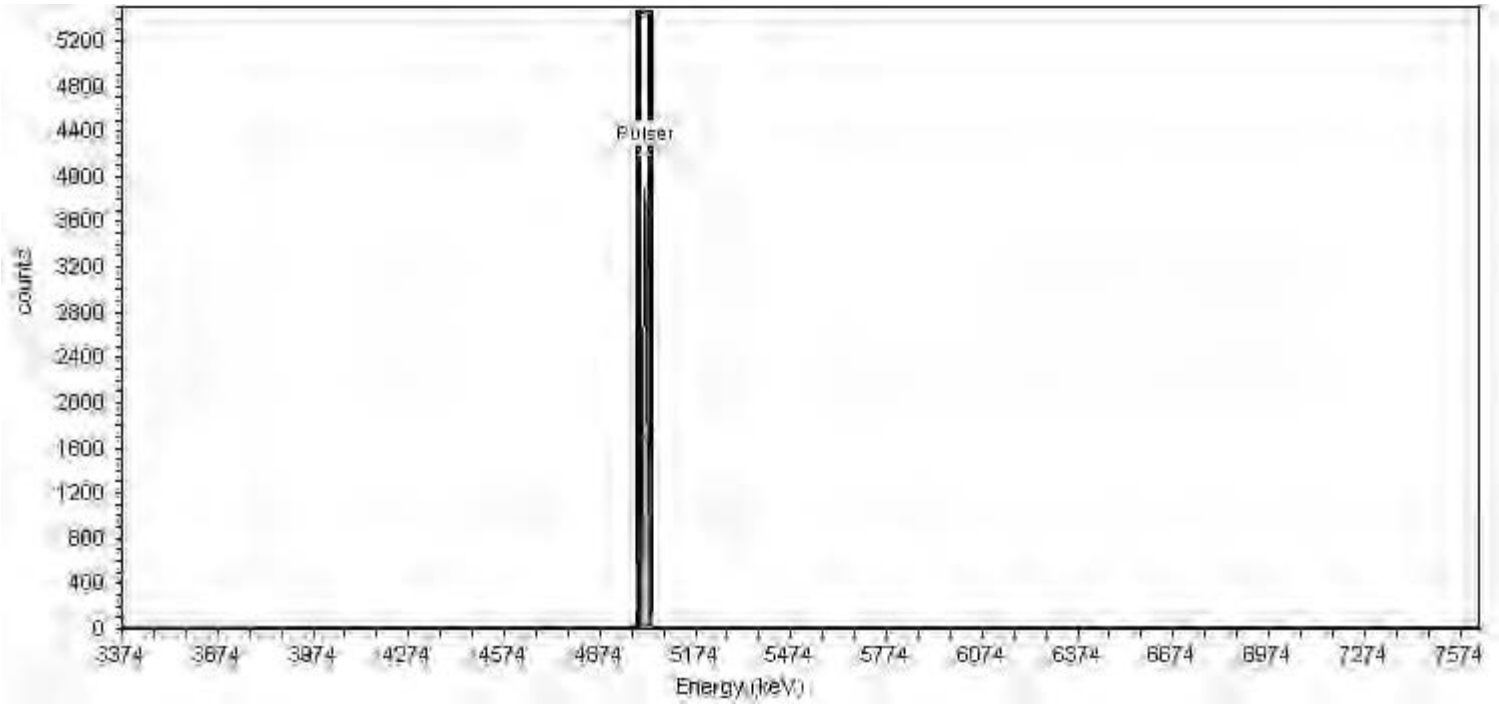
Acquisition

Detector: AV43 , SN: 49-190X4
Acquisition Start Date: 8/4/2018 11:01:06AM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-9885;AV43-05142018
Calibration Date: 5/15/2018 12:26:18PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.51% +/- 0.35% 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	5014.603	4994.536	5034.670	11.79	6,558.49	7,488.31

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:39:57PM 8/10/2018

Sample

Sample Name: Pulser;AV43
Comment:

Spectrum #23 Analysis #1

Batch

Batch Name: July2018b
Description:

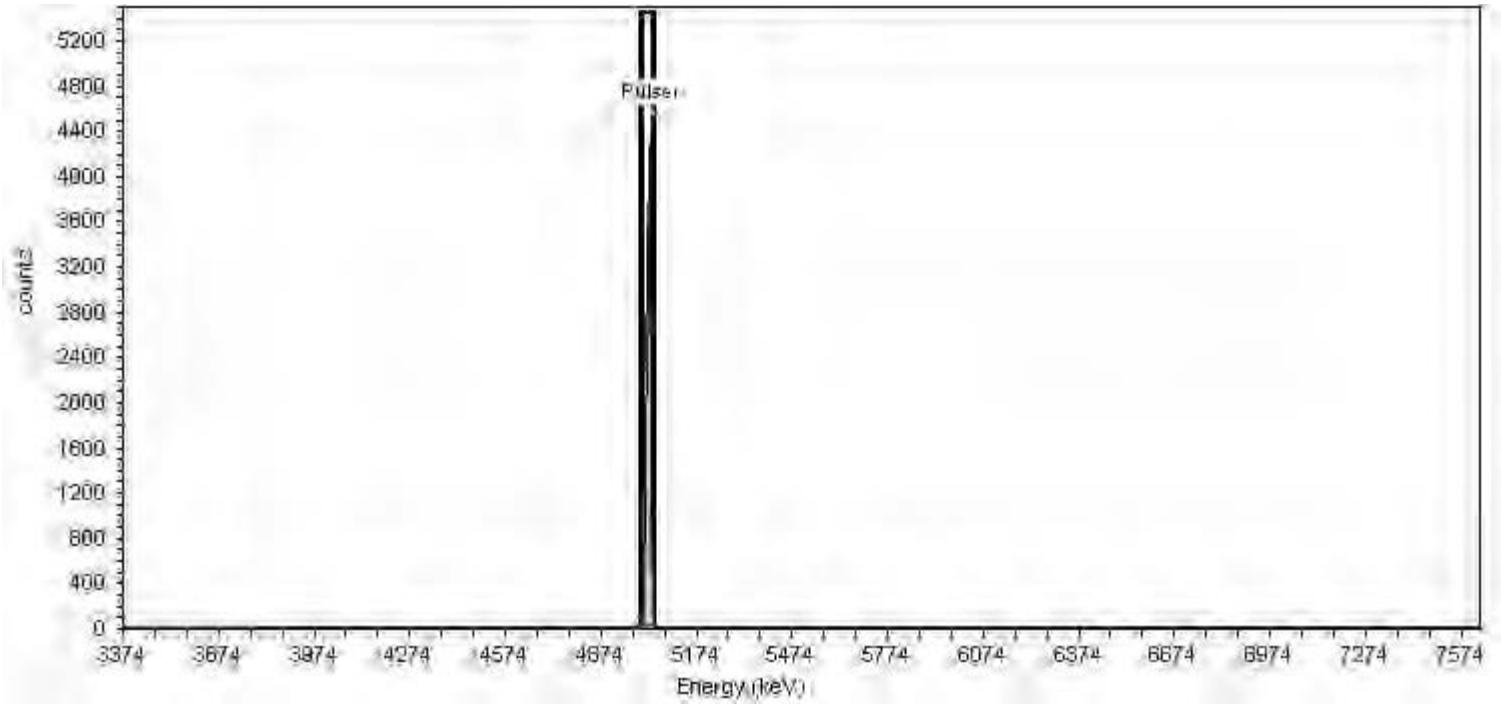
Analyst: 60040

Acquisition

Detector: AV43 , SN: 49-190X4
Acquisition Start Date: 8/10/2018 2:23:27PM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-9885;AV43-05142018
Calibration Date: 5/15/2018 12:26:18PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.51% +/- 0.35% 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	5022.718	5002.799	5042.637	11.70	7,162.72	7,581.31

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:13:24AM 8/4/2018

Sample

Sample Name: Pulser;AV44
Comment:

Spectrum #19 Analysis #1

Batch

Batch Name: July2018b
Description:

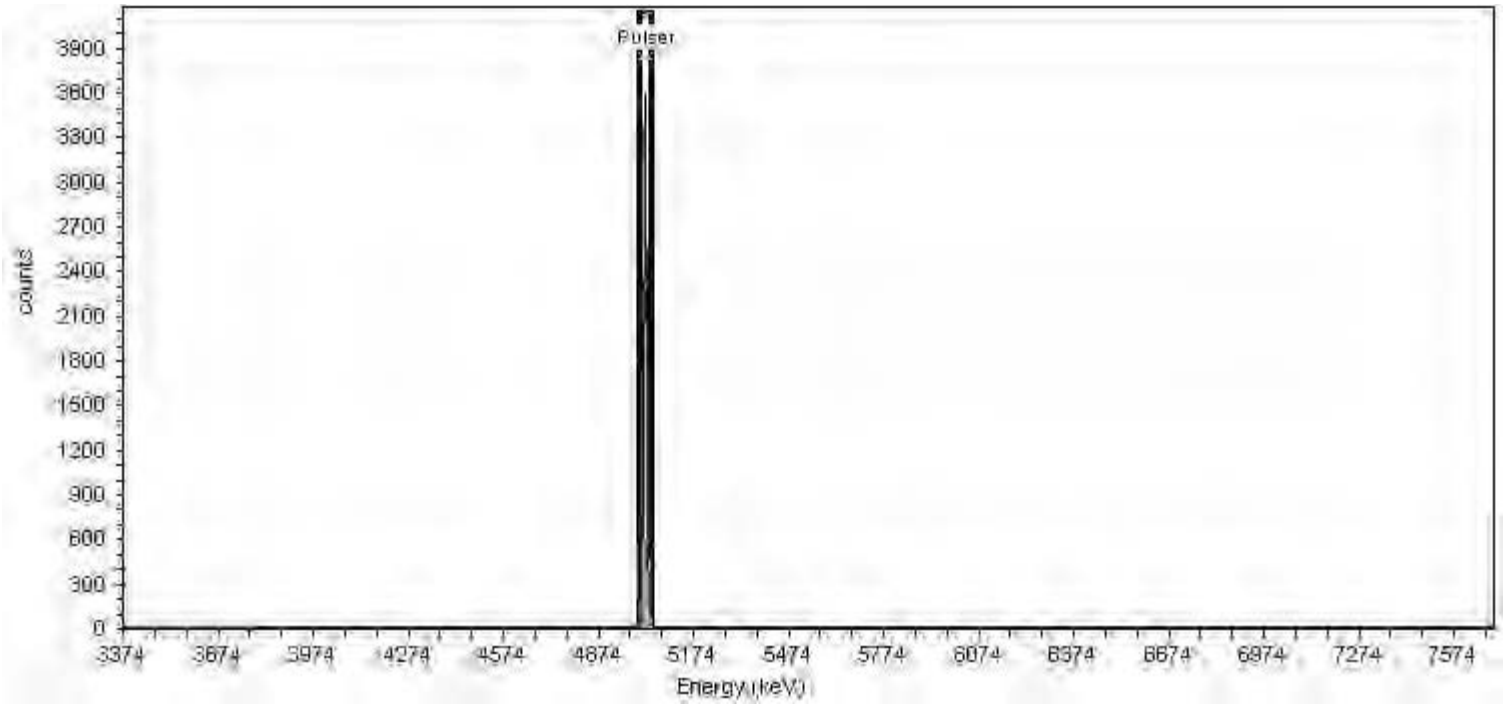
Analyst: 60040

Acquisition

Detector: AV44 , SN: 50-051JJ1
Acquisition Start Date: 8/4/2018 11:01:08AM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1368446;AV44-05142018
Calibration Date: 5/15/2018 12:26:50PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.49% +/- 0.26% 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	5023.180	5001.983	5044.377	12.45	6,441.61	7,366.90

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:40:06PM 8/10/2018

Sample

Sample Name: Pulser;AV44
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

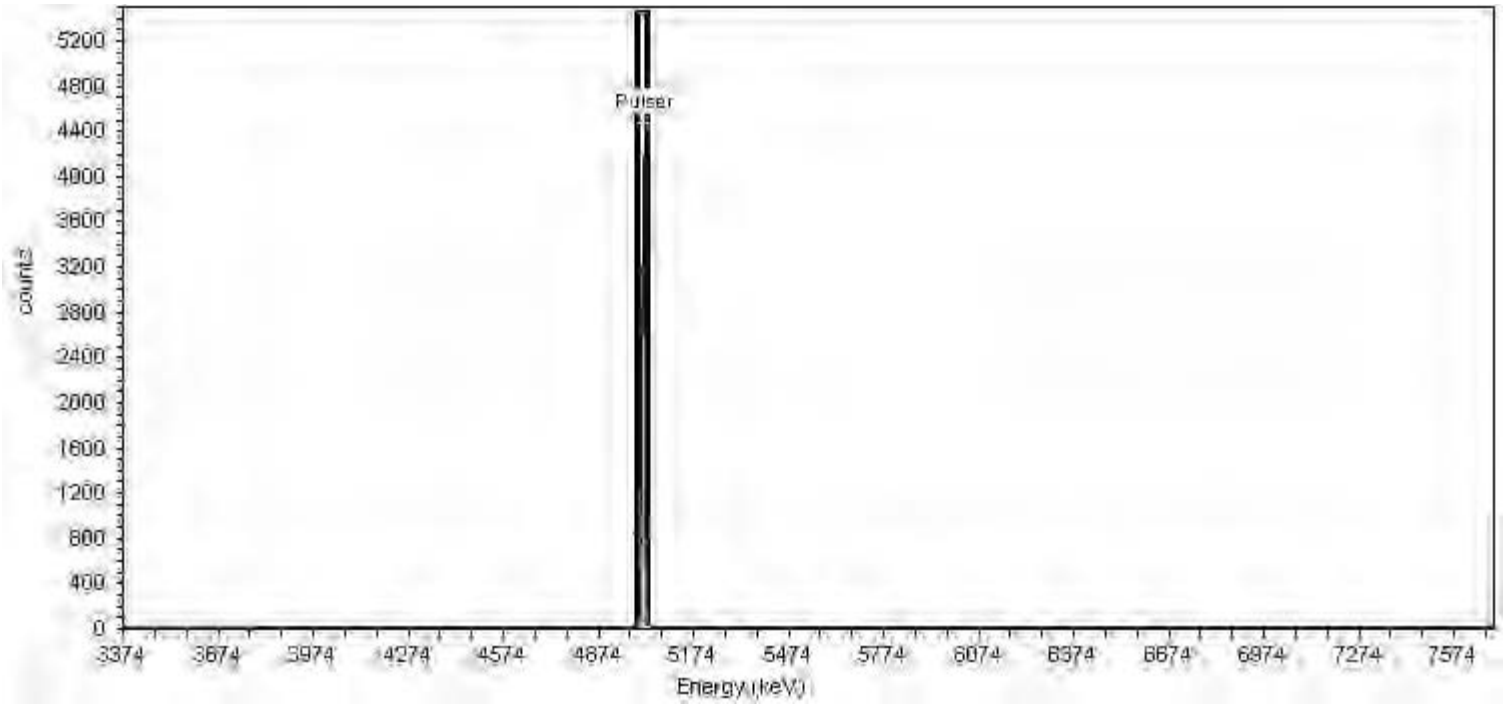
Analyst: 60040

Acquisition

Detector: AV44 , SN: 50-051JJ1
Acquisition Start Date: 8/10/2018 2:23:29PM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1368446;AV44-05142018
Calibration Date: 5/15/2018 12:26:50PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.49% +/- 0.26% 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	5015.236	4994.648	5035.825	12.10	7,242.44	7,534.48

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:13:33AM 8/4/2018

Sample

Sample Name: Pulser;AV45
Comment:

Spectrum #19 Analysis #1

Batch

Batch Name: July2018b
Description:

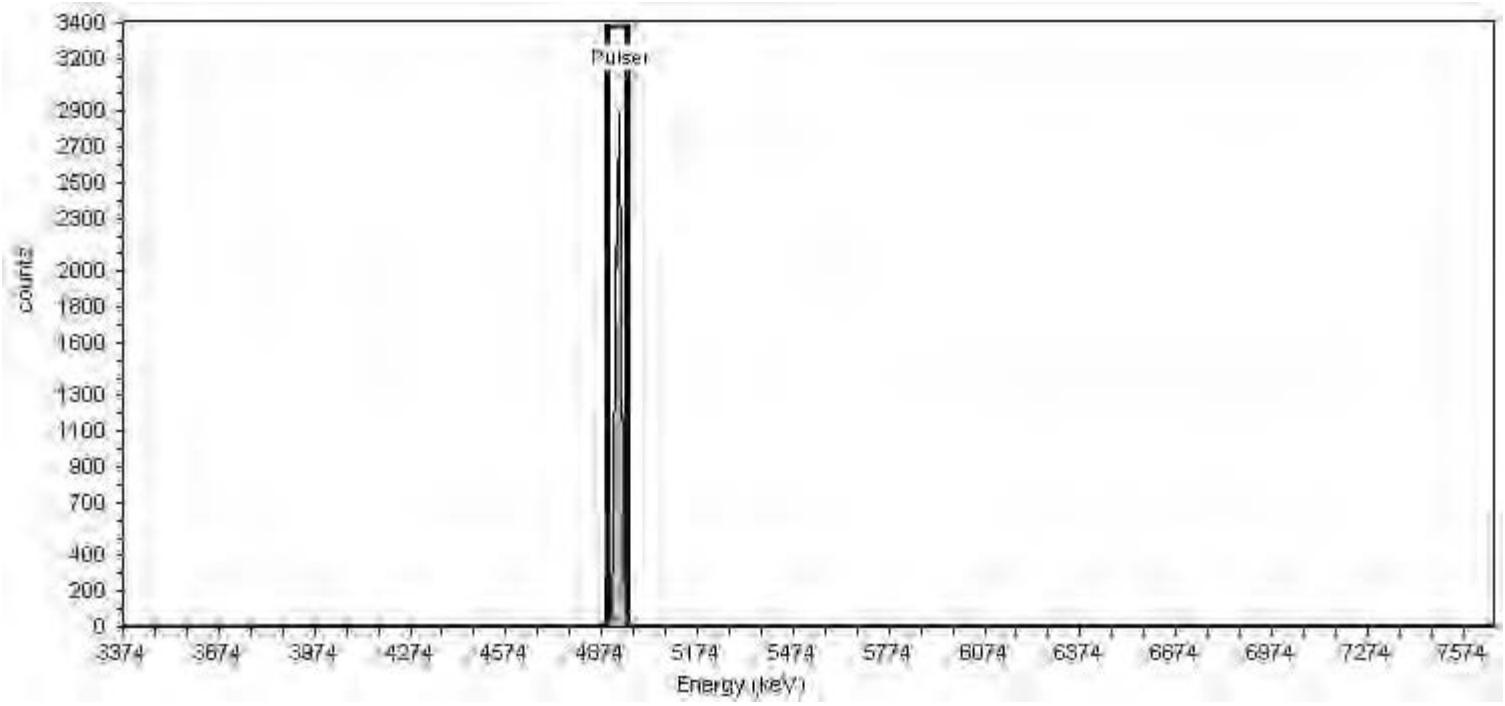
Analyst: 60040

Acquisition

Detector: AV45 , SN: 48-158FF2
Acquisition Start Date: 8/4/2018 11:01:09AM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1368447;AV45-05142018a
Calibration Date: 5/15/2018 12:29:34PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.95% +/- 0.23% 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	4925.486	4893.604	4957.368	18.73	7,754.56	7,628.88

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:40:15PM 8/10/2018

Sample

Sample Name: Pulser;AV45
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

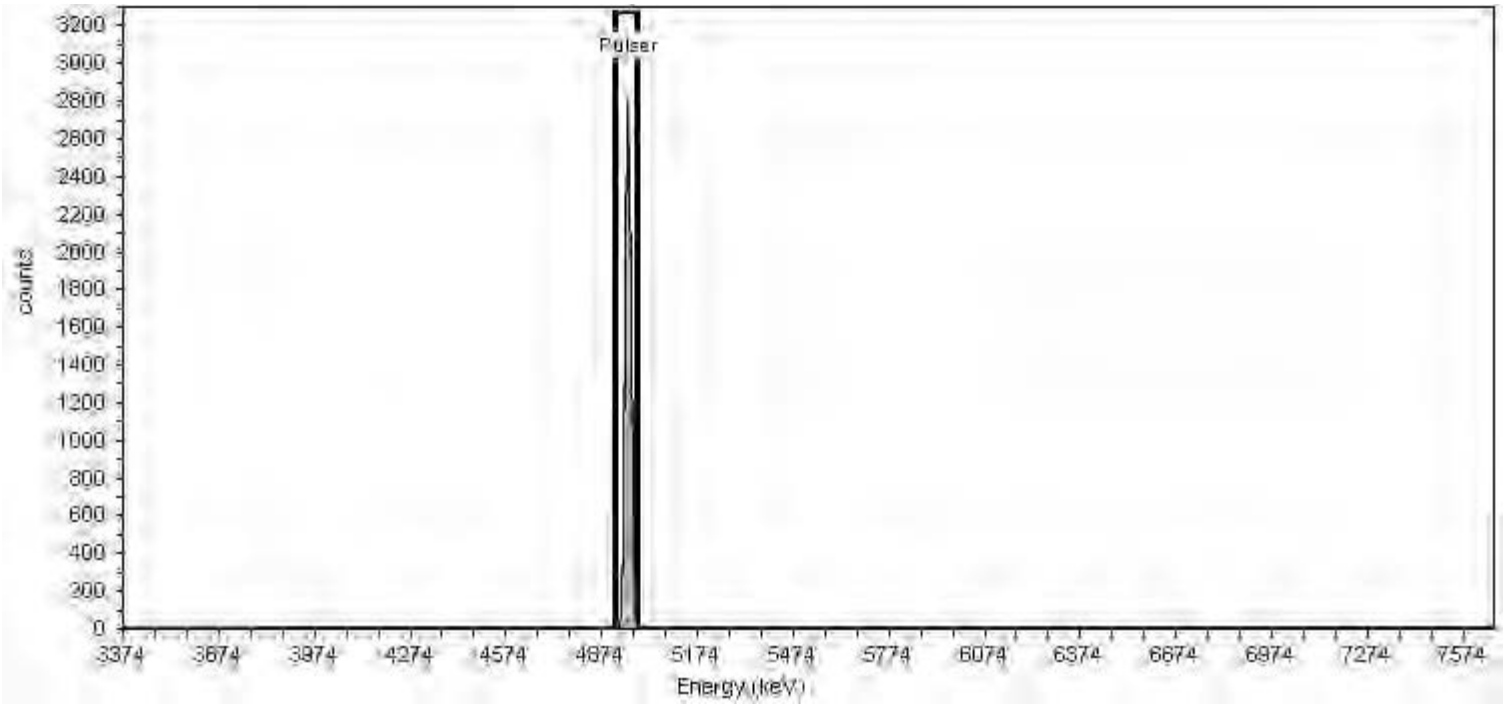
Analyst: 60040

Acquisition

Detector: AV45 , SN: 48-158FF2
Acquisition Start Date: 8/10/2018 2:23:30PM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1368447;AV45-05142018a
Calibration Date: 5/15/2018 12:29:34PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.95% +/- 0.23% 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	4955.604	4923.048	4988.161	19.13	7,672.47	7,676.23

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:13:42AM 8/4/2018

Sample

Sample Name: Pulser;AV47
Comment:

Spectrum #19 Analysis #1

Batch

Batch Name: July2018b
Description:

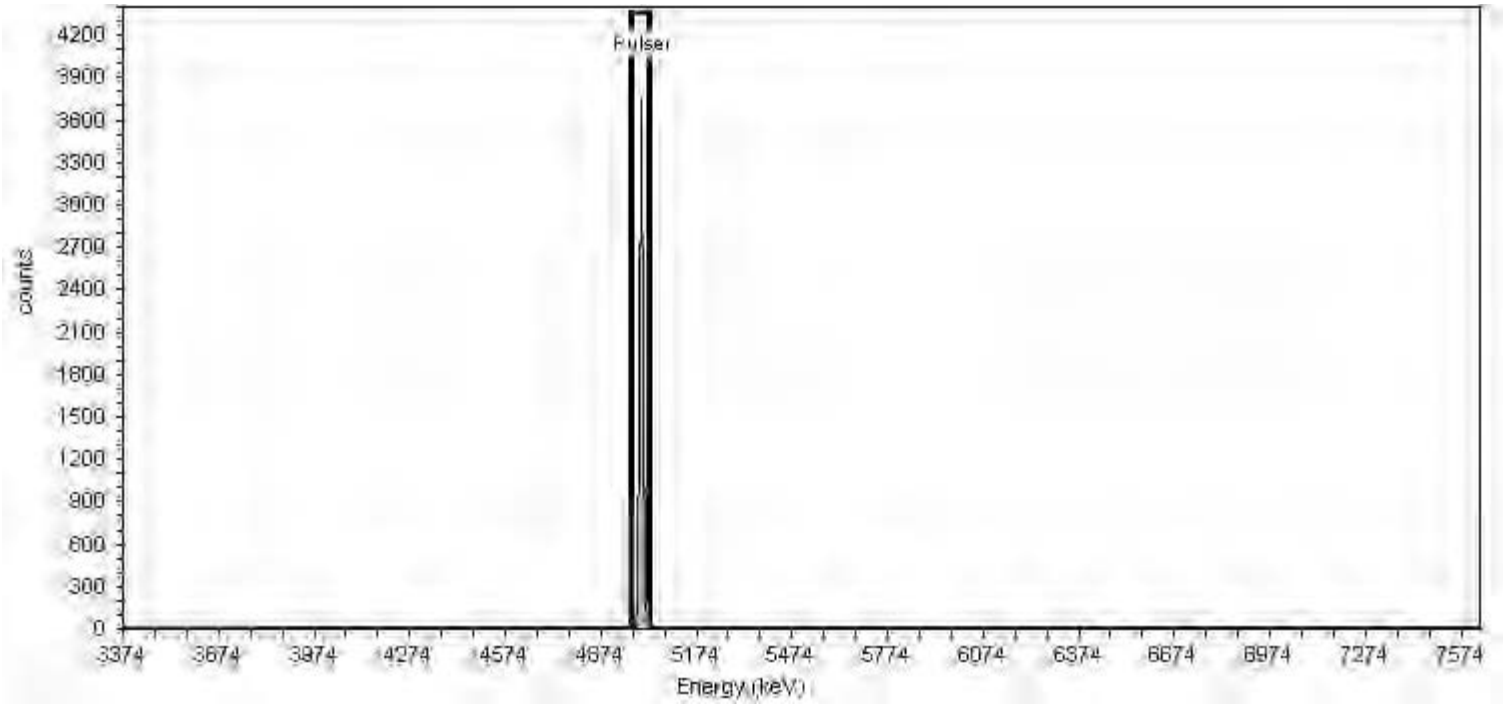
Analyst: 60040

Acquisition

Detector: AV47 , SN: 46-032336
Acquisition Start Date: 8/4/2018 11:01:11AM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1370622;AV47-05142018
Calibration Date: 5/15/2018 12:27:14PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.02% +/- 0.23% 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	5000.094	4976.560	5023.627	13.83	7,436.39	7,552.39

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:40:23PM 8/10/2018

Sample

Sample Name: Pulser;AV47
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

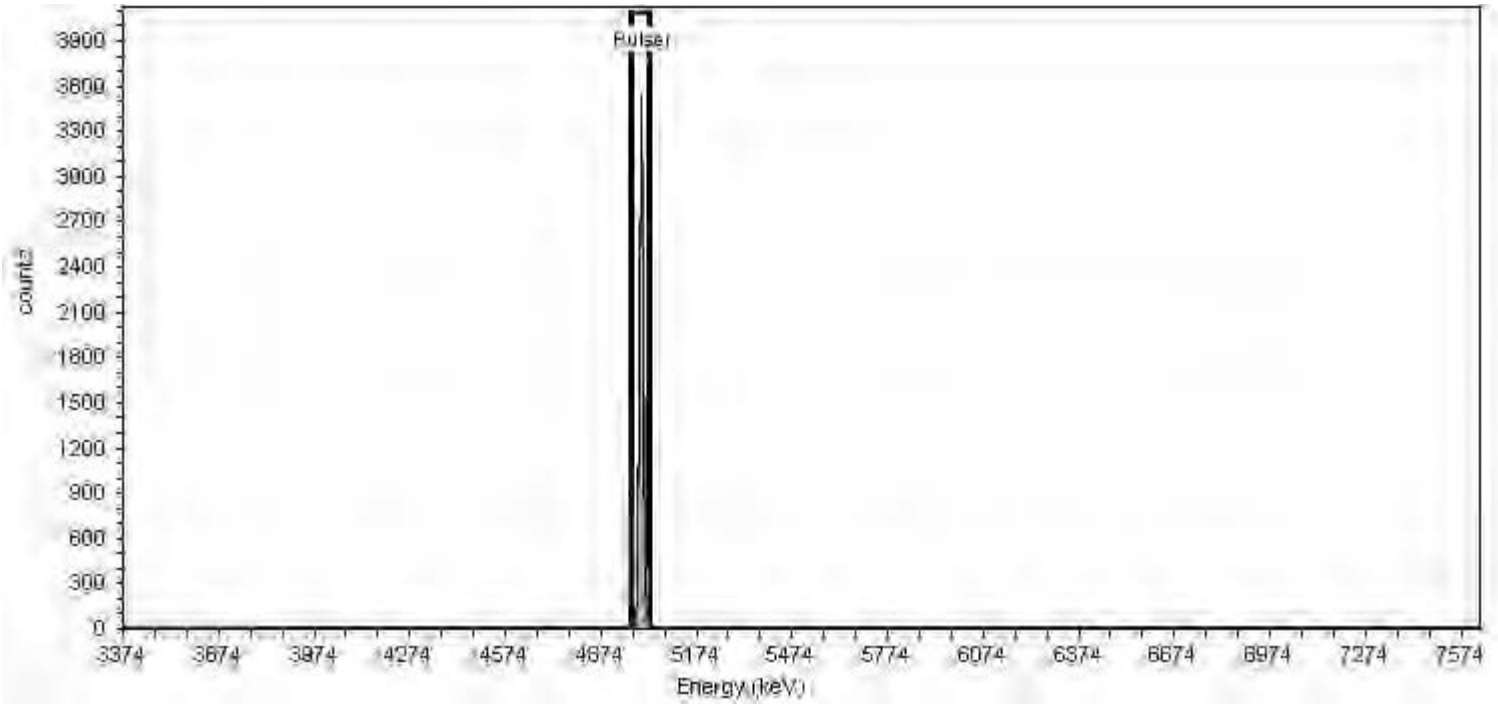
Analyst: 60040

Acquisition

Detector: AV47 , SN: 46-032336
Acquisition Start Date: 8/10/2018 2:23:32PM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1370622;AV47-05142018
Calibration Date: 5/15/2018 12:27:14PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.02% +/- 0.23% 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	4999.623	4974.857	5024.389	14.55	7,388.73	7,665.37

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:13:51AM 8/4/2018

Sample

Sample Name: Pulser;AV48
Comment:

Spectrum #19 Analysis #1

Batch

Batch Name: July2018b
Description:

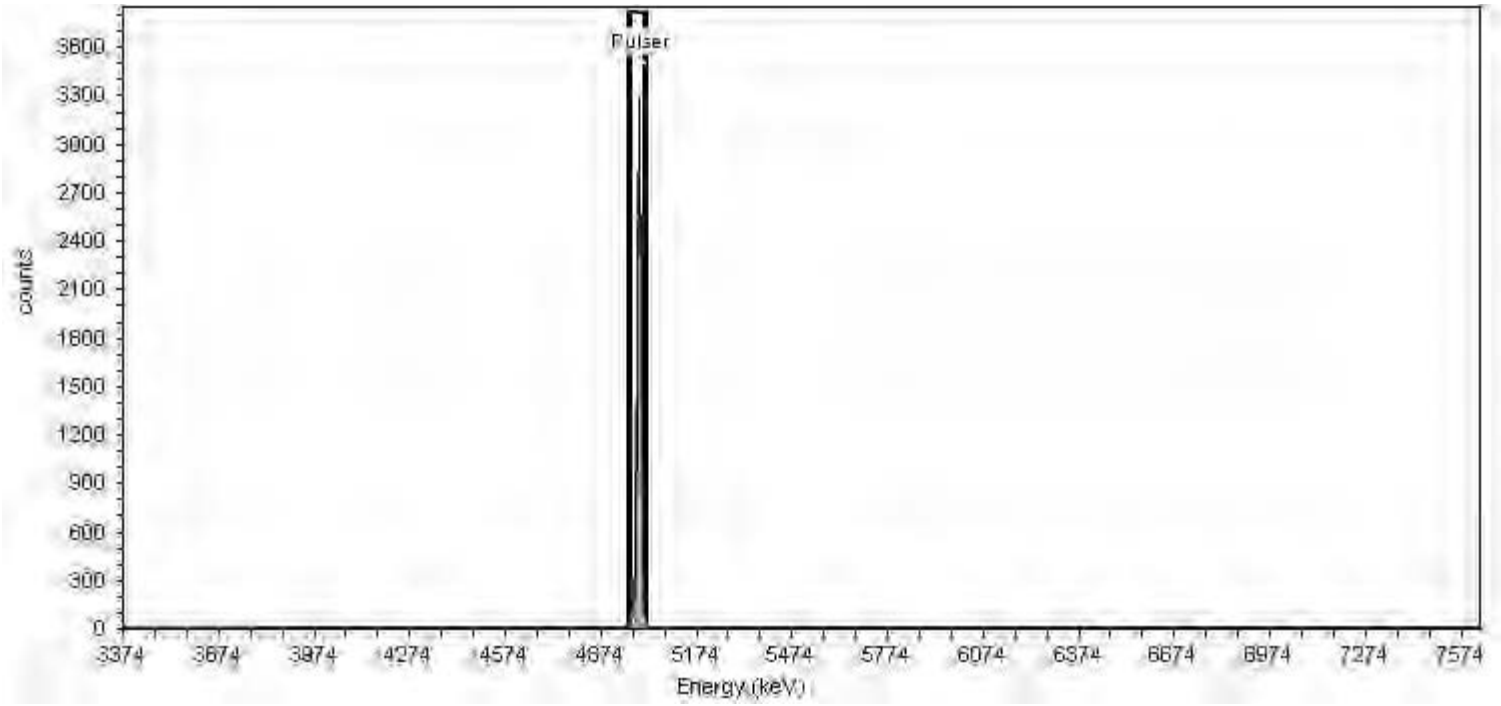
Analyst: 60040

Acquisition

Detector: AV48 , SN: 46-033P6
Acquisition Start Date: 8/4/2018 11:01:13AM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1370619;AV48-05142018
Calibration Date: 5/15/2018 12:27:25PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.06% +/- 0.23% 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	4993.027	4966.563	5019.492	15.55	7,341.88	7,541.74

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:40:32PM 8/10/2018

Sample

Sample Name: Pulser;AV48
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

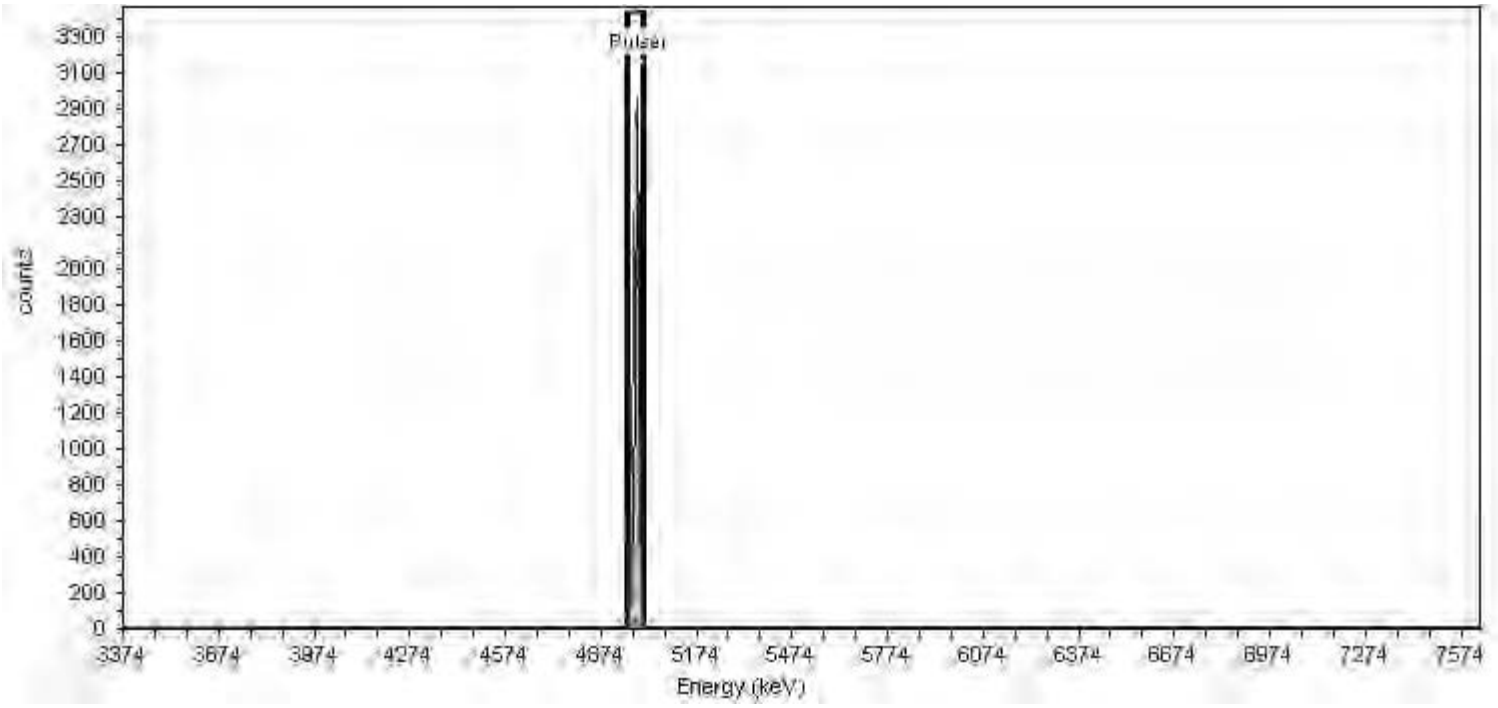
Analyst: 60040

Acquisition

Detector: AV48 , SN: 46-033P6
Acquisition Start Date: 8/10/2018 2:23:35PM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1370619;AV48-05142018
Calibration Date: 5/15/2018 12:27:25PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.06% +/- 0.23% 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	4986.498	4959.521	5013.473	15.85	6,740.34	7,633.90

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:40:41PM 8/10/2018

Sample

Sample Name: Pulser;AV49
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

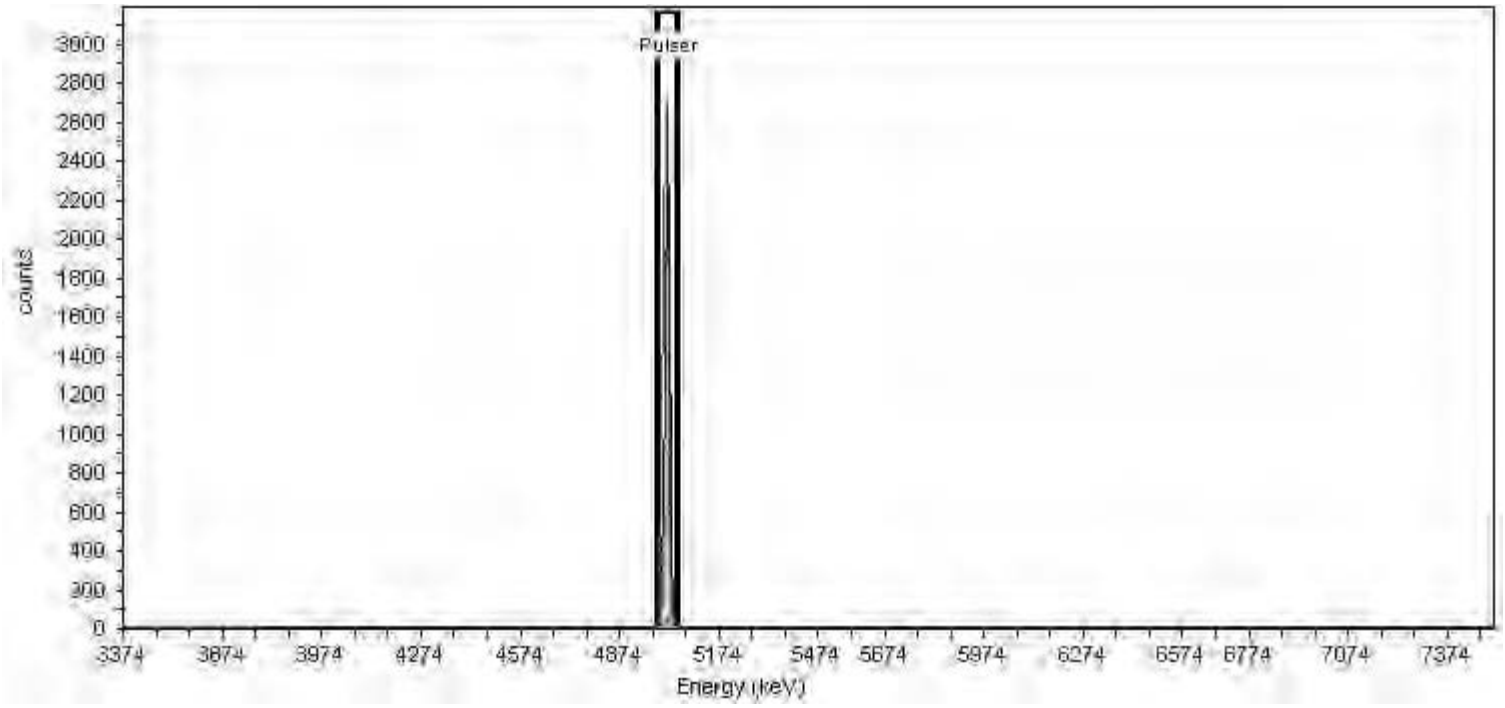
Analyst: 60040

Acquisition

Detector: AV49 , SN: 47-043hh4
Acquisition Start Date: 8/10/2018 2:23:36PM
Live Time: 1.00 min.
Real Time: 1.02 min.
Calibration Name: IC-1370620;AV49-05142018
Calibration Date: 5/15/2018 12:27:36PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.27% +/- 0.24% 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	5016.603	4988.015	5045.191	16.80	6,523.51	7,597.08

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:14:12AM 8/4/2018

Sample

Sample Name: Pulser;AV52
Comment:

Spectrum #19 Analysis #1

Batch

Batch Name: July2018b
Description:

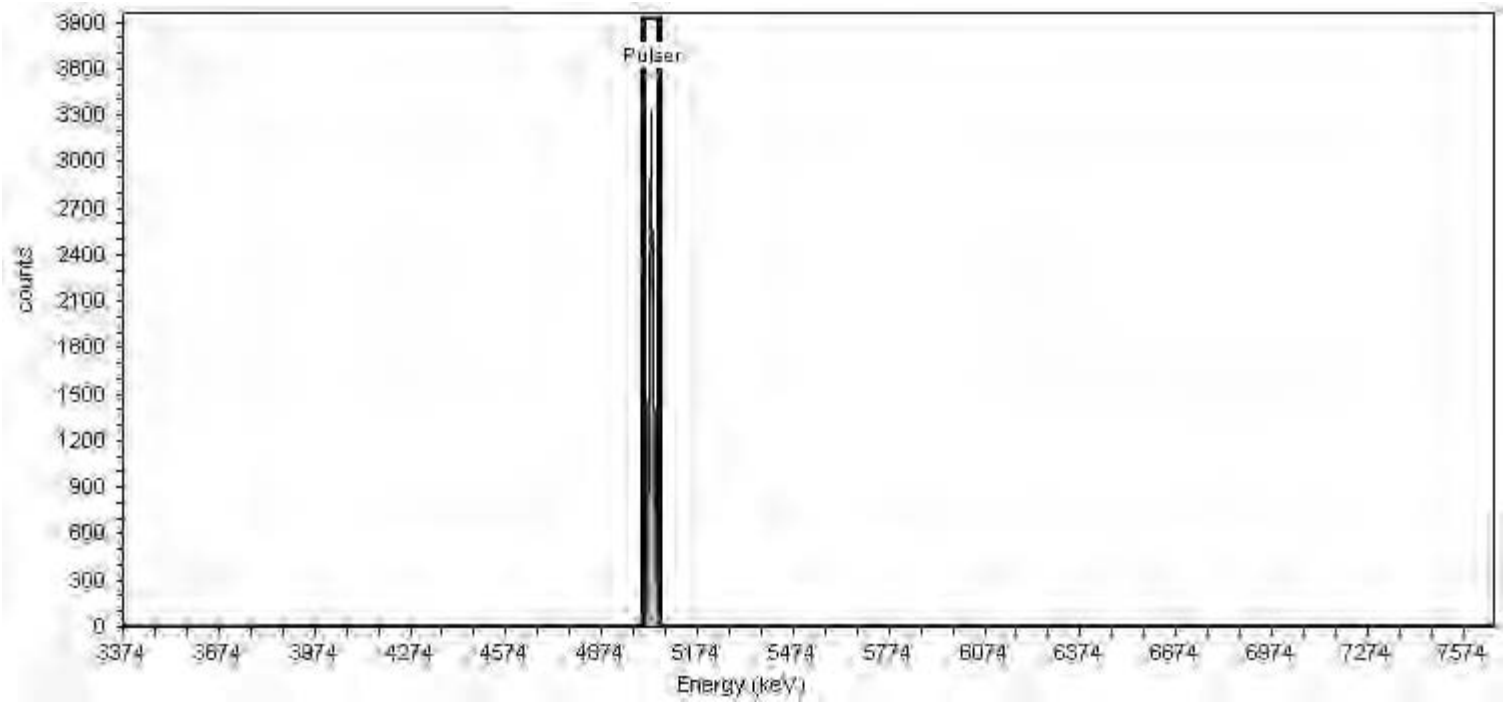
Analyst: 60040

Acquisition

Detector: AV52 , SN: 49-155N7
Acquisition Start Date: 8/4/2018 11:01:18AM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-8877;AV52-05152018
Calibration Date: 5/15/2018 3:36:50PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.50% +/- 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	5030.414	5005.178	5055.650	14.83	7,083.79	7,288.89

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:41:03PM 8/10/2018

Sample

Sample Name: Pulser;AV52
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

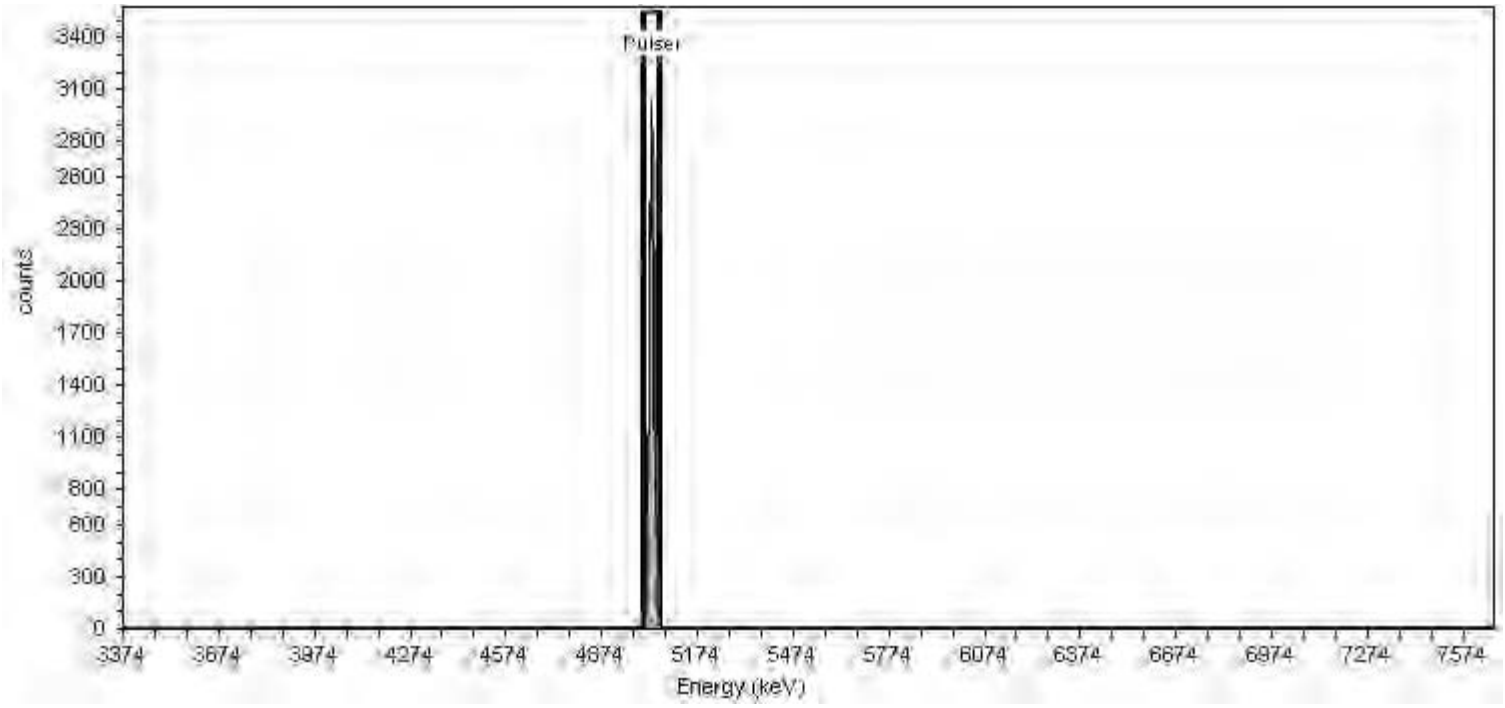
Analyst: 60040

Acquisition

Detector: AV52 , SN: 49-155N7
Acquisition Start Date: 8/10/2018 2:23:39PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-8877;AV52-05152018
Calibration Date: 5/15/2018 3:36:50PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.50% +/- 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	5029.203	5002.153	5056.253	15.89	6,942.95	7,308.11

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:41:11PM 8/10/2018

Sample

Sample Name: Pulser;AV53
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

Analyst: 60040

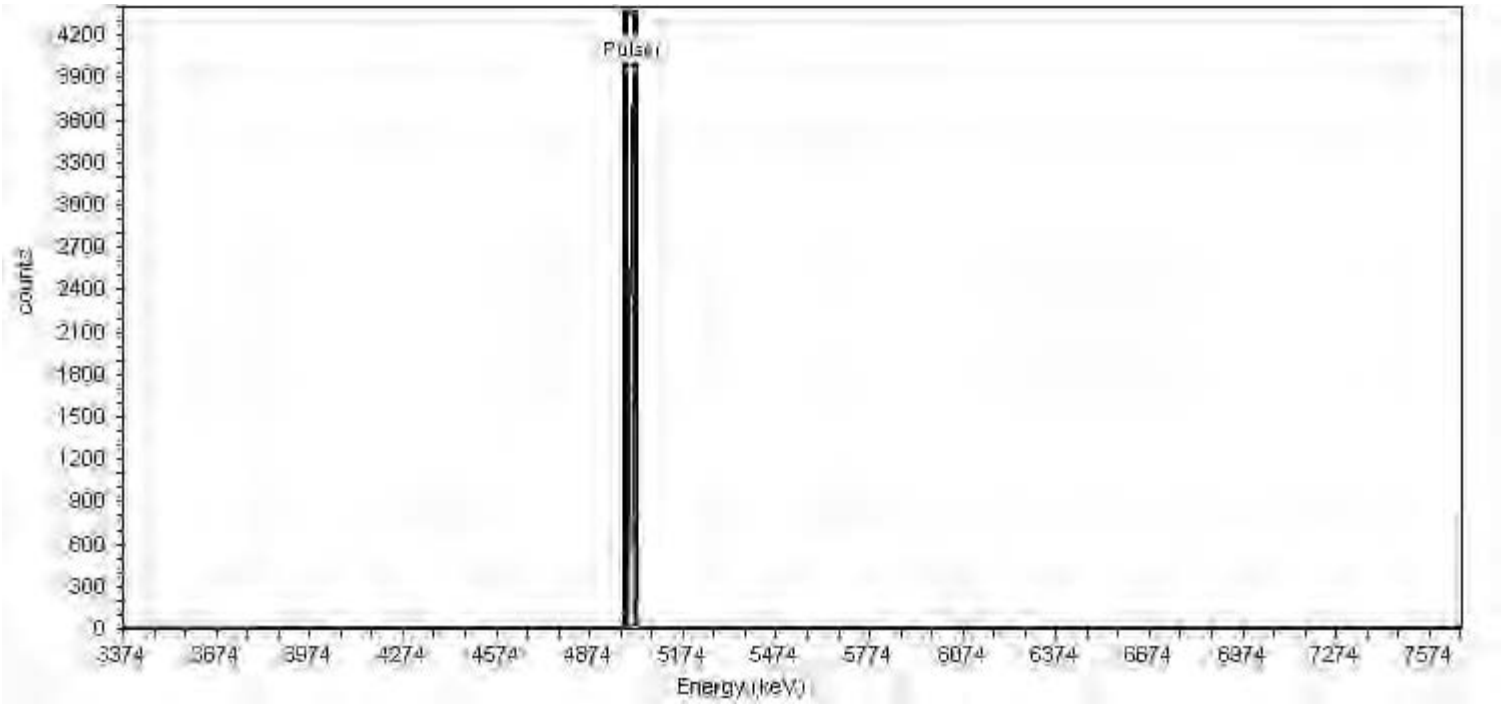
Acquisition

Detector: AV53 , SN: 50-051A6
Acquisition Start Date: 8/10/2018 2:23:41PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9520;AV53-05152018
Calibration Date: 5/15/2018 3:37:10PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.27% +/- 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	5007.112	4987.115	5027.110	11.75	6,248.40	7,165.04

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:41:20PM 8/10/2018

Sample

Sample Name: Pulser;AV54
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

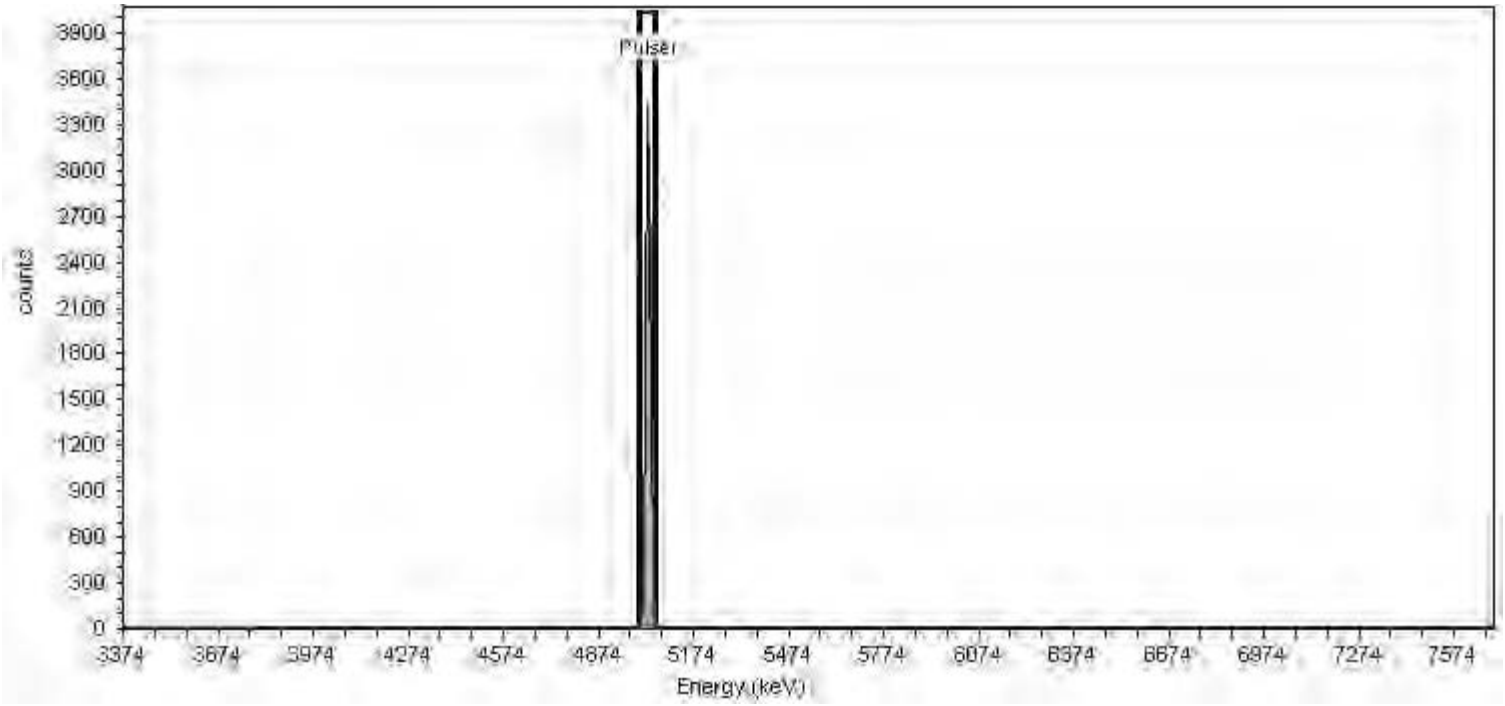
Analyst: 60040

Acquisition

Detector: AV54 , SN: 46-033P4
Acquisition Start Date: 8/10/2018 2:23:42PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9792;AV54-05152018
Calibration Date: 5/15/2018 3:37:57PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.62% +/- 0.28% 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	5029.642	5004.999	5054.284	14.48	7,134.56	7,317.16

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:41:29PM 8/10/2018

Sample

Sample Name: Pulser;AV56
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

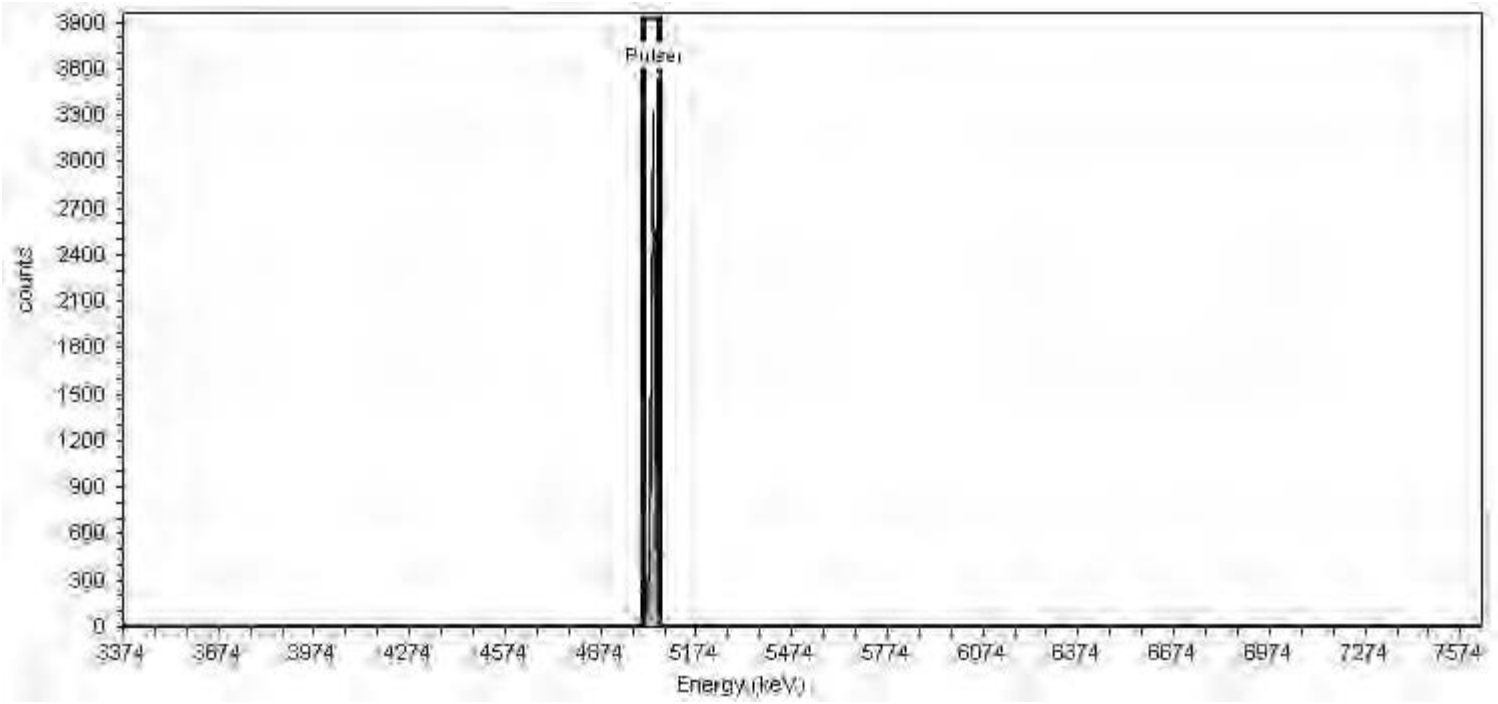
Analyst: 60040

Acquisition

Detector: AV56 , SN: 52-059EE5
Acquisition Start Date: 8/10/2018 2:23:44PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9795;AV56-05152018
Calibration Date: 5/15/2018 3:38:31PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.25% +/- 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	5037.991	5012.701	5063.280	14.86	7,090.27	7,313.50

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:41:38PM 8/10/2018

Sample

Sample Name: Pulser;AV57
Comment:

Spectrum #25 Analysis #1

Batch

Batch Name: July2018b
Description:

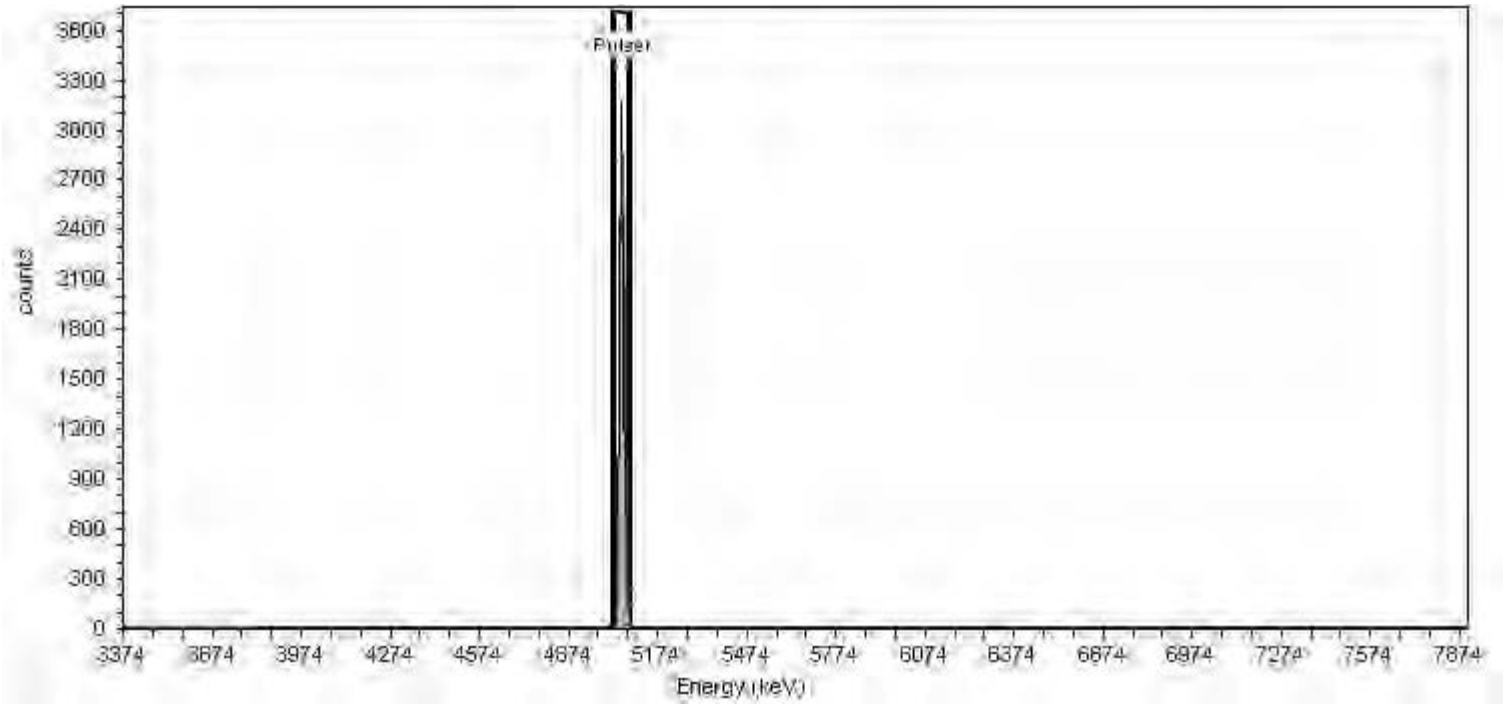
Analyst: 60040

Acquisition

Detector: AV57 , SN: 48-158EE3
Acquisition Start Date: 8/10/2018 2:23:45PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9817;AV57-05152018
Calibration Date: 5/15/2018 3:38:42PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.40% +/- 0.28% 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	5051.869	5025.843	5077.896	15.29	6,955.75	7,304.96

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:41:47PM 8/10/2018

Sample

Sample Name: Pulser;AV58
Comment:

Spectrum #25 Analysis #1

Batch

Batch Name: July2018b
Description:

Analyst: 60040

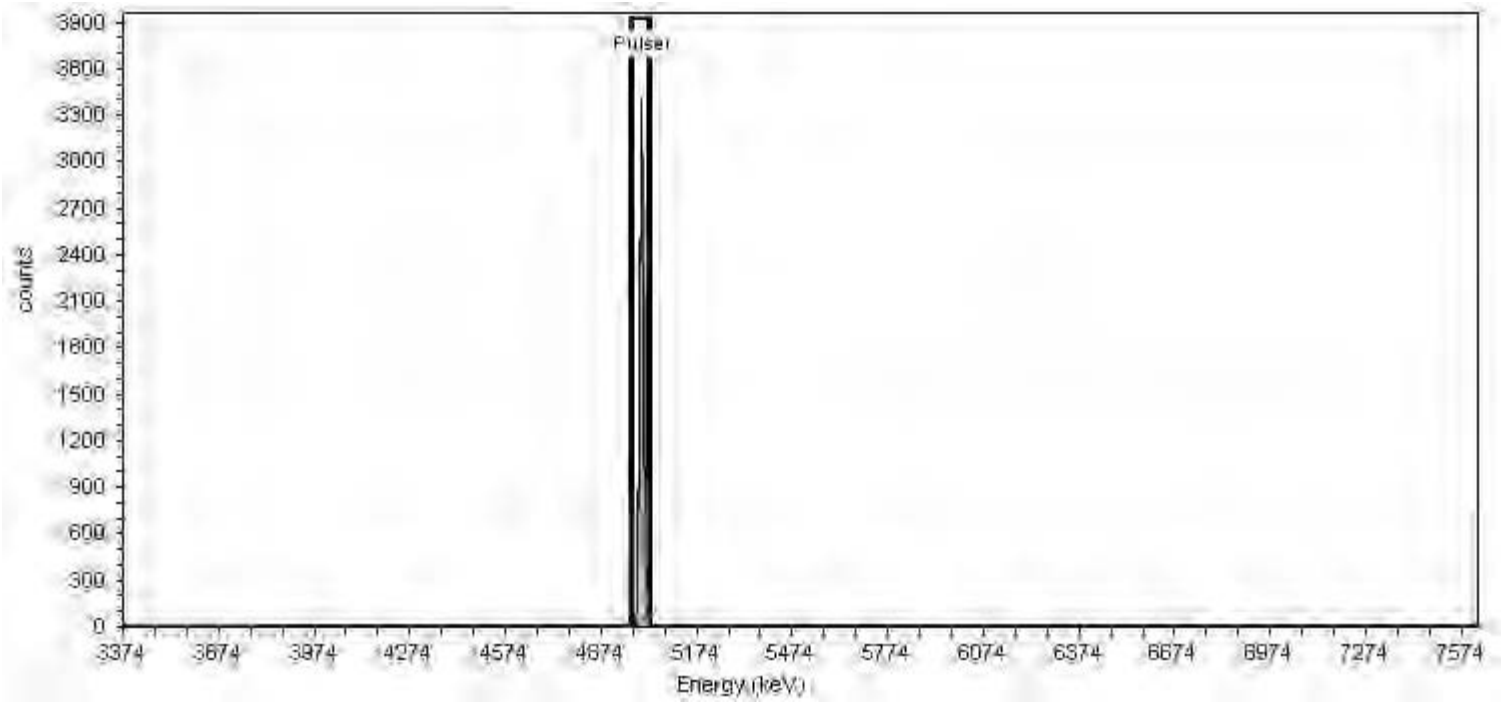
Acquisition

Detector: AV58 , SN: 52-102 C5
Acquisition Start Date: 8/10/2018 2:23:46PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9885;AV58-05152018
Calibration Date: 5/15/2018 3:38:55PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.05% +/- 0.36% 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	4999.722	4976.772	5022.672	13.48	6,584.75	7,311.88

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:42:04PM 8/10/2018

Sample

Sample Name: Pulser;AV60
Comment:

Spectrum #24 Analysis #1

Batch

Batch Name: July2018b
Description:

Analyst: 60040

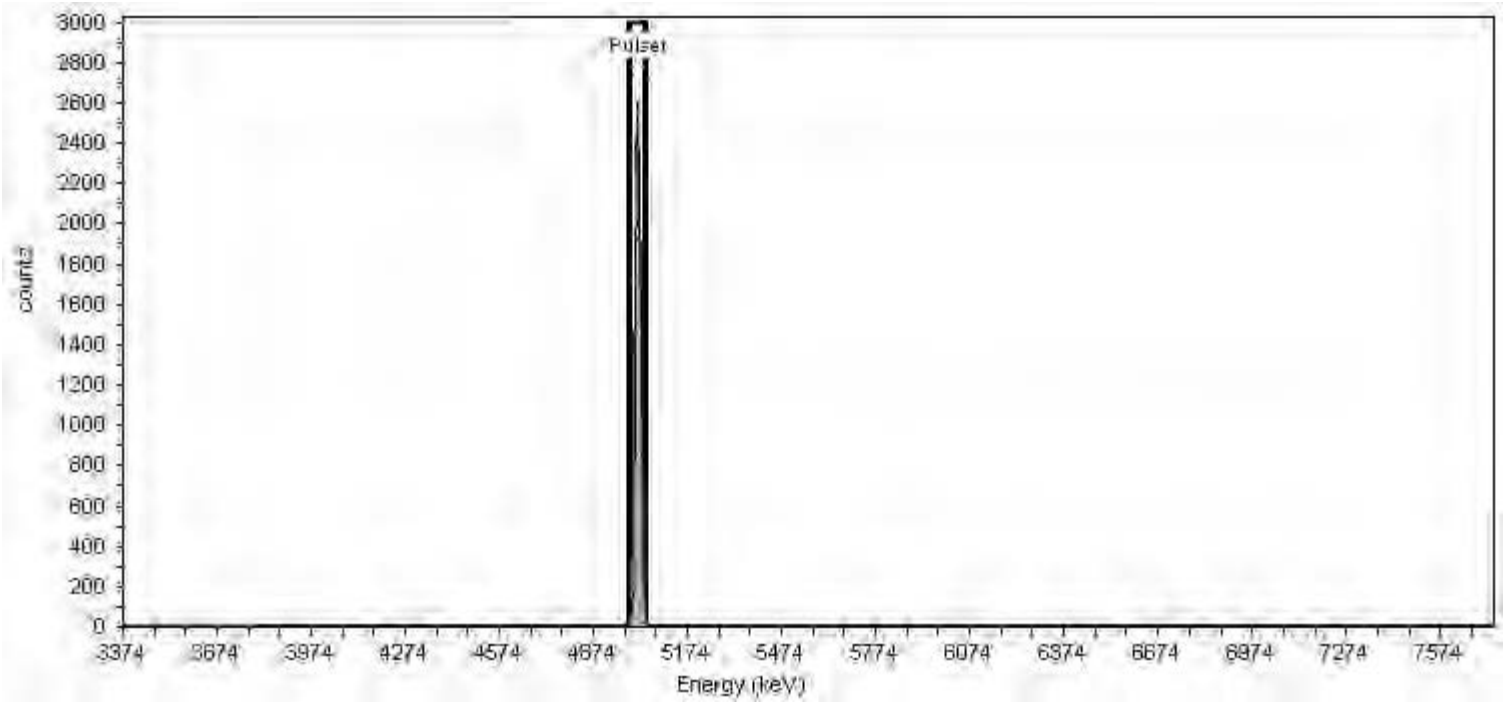
Acquisition

Detector: AV60 , SN: 49-027117
Acquisition Start Date: 8/10/2018 2:23:48PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-1368446;AV60-05152018
Calibration Date: 5/15/2018 3:39:06PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.28% +/- 0.26% 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	5015.810	4987.018	5044.602	16.92	6,330.54	7,155.48

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:42:13PM 8/10/2018

Sample

Sample Name: Pulser;AV62
Comment:

Spectrum #25 Analysis #1

Batch

Batch Name: July2018b
Description:

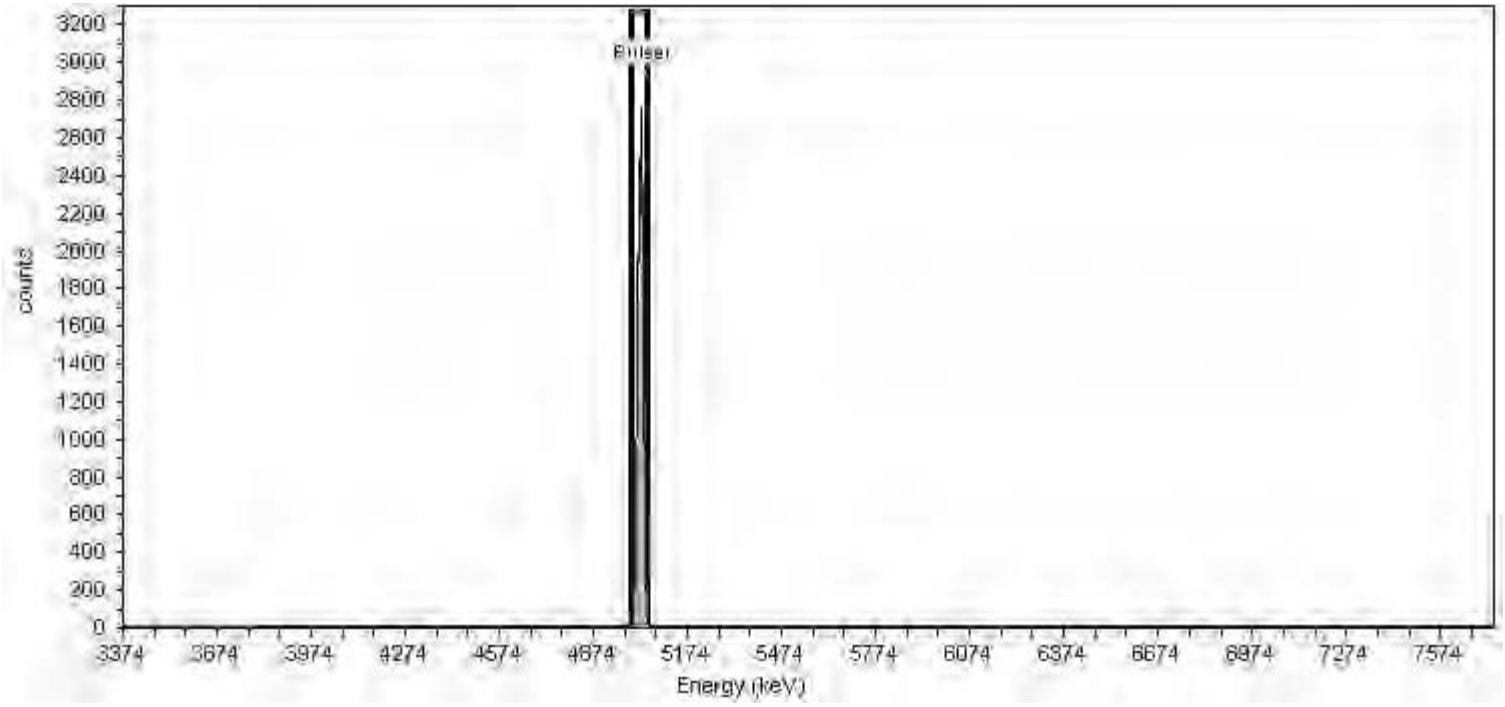
Analyst: 60040

Acquisition

Detector: AV62 , SN: 52-060FF2
Acquisition Start Date: 8/10/2018 2:23:50PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-1368447;AV62-05152018
Calibration Date: 5/15/2018 3:39:22PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.40% +/- 0.23% 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	5022.441	4993.245	5051.638	17.15	6,792.28	7,183.77

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:16:06AM 8/4/2018

Sample

Sample Name: Pulser;AV69
Comment:

Spectrum #19 Analysis #1

Batch

Batch Name: July2018b
Description:

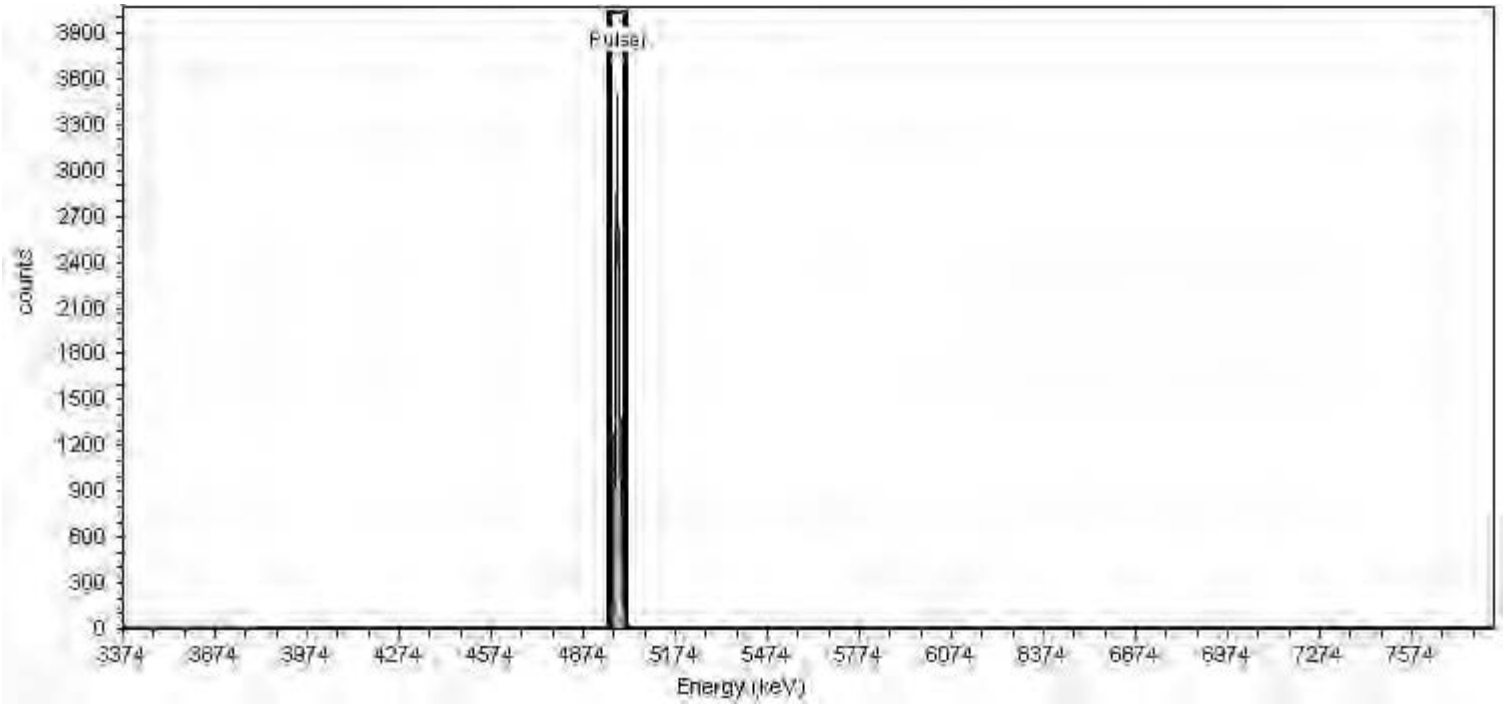
Analyst: 60040

Acquisition

Detector: AV69 , SN: 49-155DD5
Acquisition Start Date: 8/4/2018 11:01:36AM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-8874;AV69-05152018
Calibration Date: 5/15/2018 6:39:25PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.43% +/- 0.38% 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	4985.475	4960.786	5010.165	14.51	7,280.88	7,421.08

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:16:19AM 8/4/2018

Sample

Sample Name: Pulser;AV70
Comment:

Spectrum #19 Analysis #1

Batch

Batch Name: July2018b
Description:

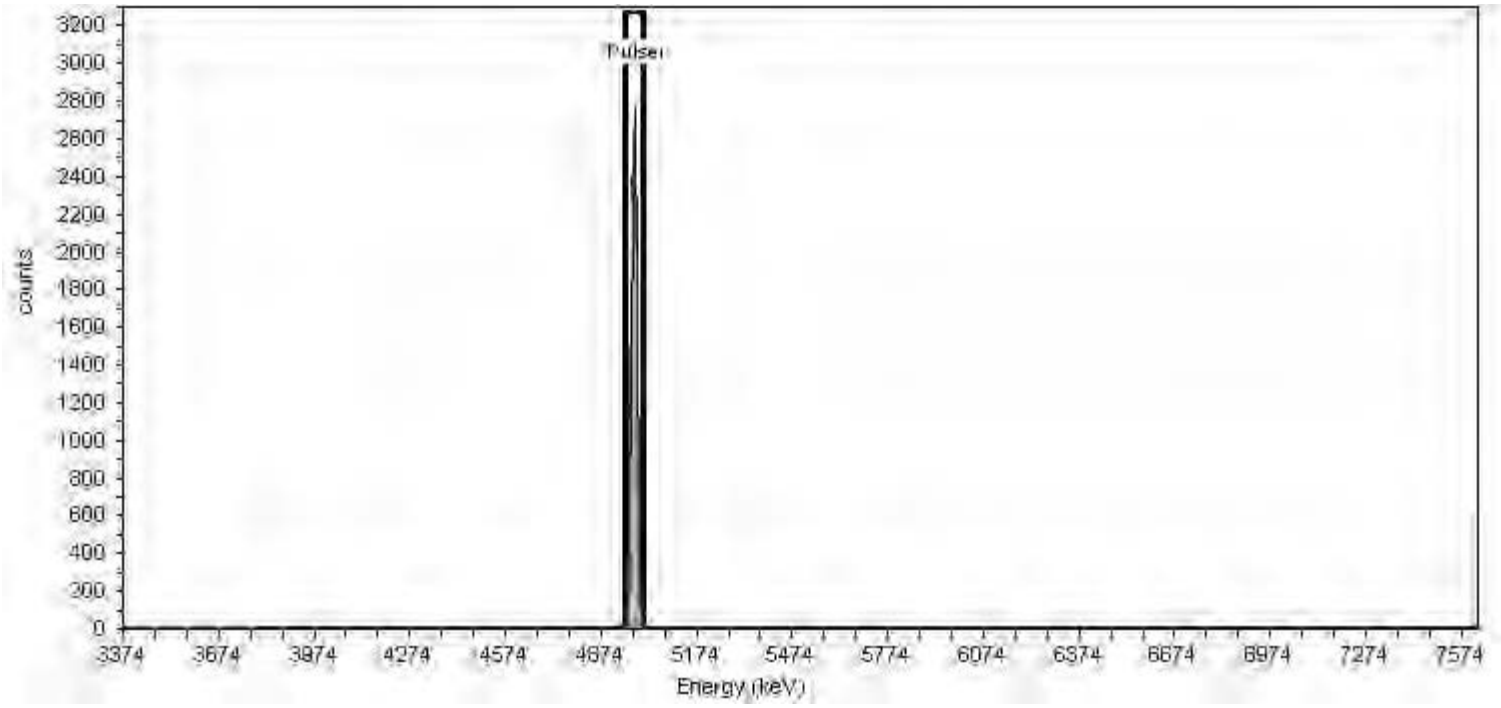
Analyst: 60040

Acquisition

Detector: AV70 , SN: 48-158FF1
Acquisition Start Date: 8/4/2018 11:01:37AM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-8877;AV70-05152018
Calibration Date: 5/15/2018 6:36:23PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.40% +/- 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	4978.410	4948.712	5008.107	17.45	6,941.26	7,354.92

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:16:28AM 8/4/2018

Sample

Sample Name: Pulser;AV71
Comment:

Spectrum #19 Analysis #1

Batch

Batch Name: July2018b
Description:

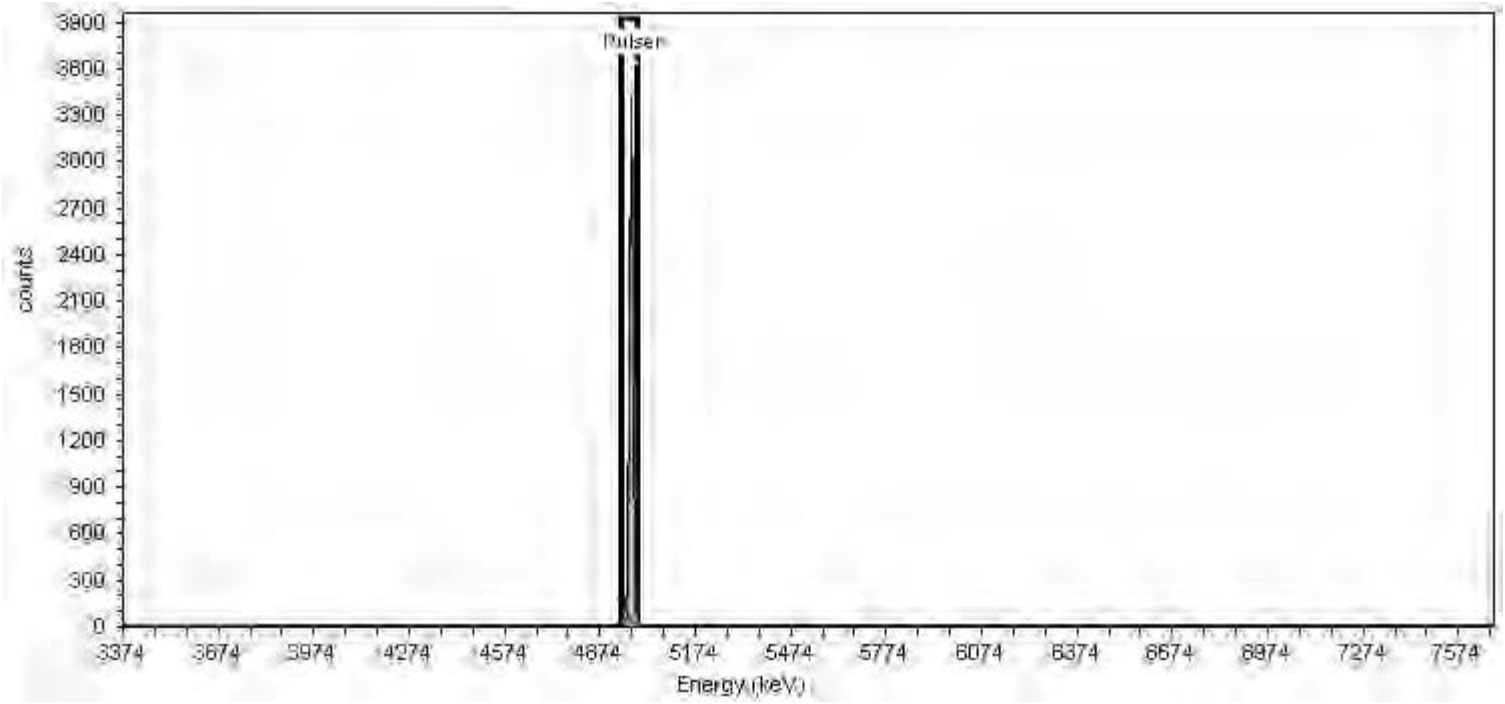
Analyst: 60040

Acquisition

Detector: AV71 , SN: 48-158EE6
Acquisition Start Date: 8/4/2018 11:01:38AM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9520;AV71-05152018
Calibration Date: 5/15/2018 6:36:40PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.00% +/- 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	4969.758	4944.784	4994.731	14.67	7,192.61	7,416.12

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:16:37AM 8/4/2018

Sample

Sample Name: Pulser;AV72
Comment:

Spectrum #20 Analysis #1

Batch

Batch Name: July2018b
Description:

Analyst: 60040

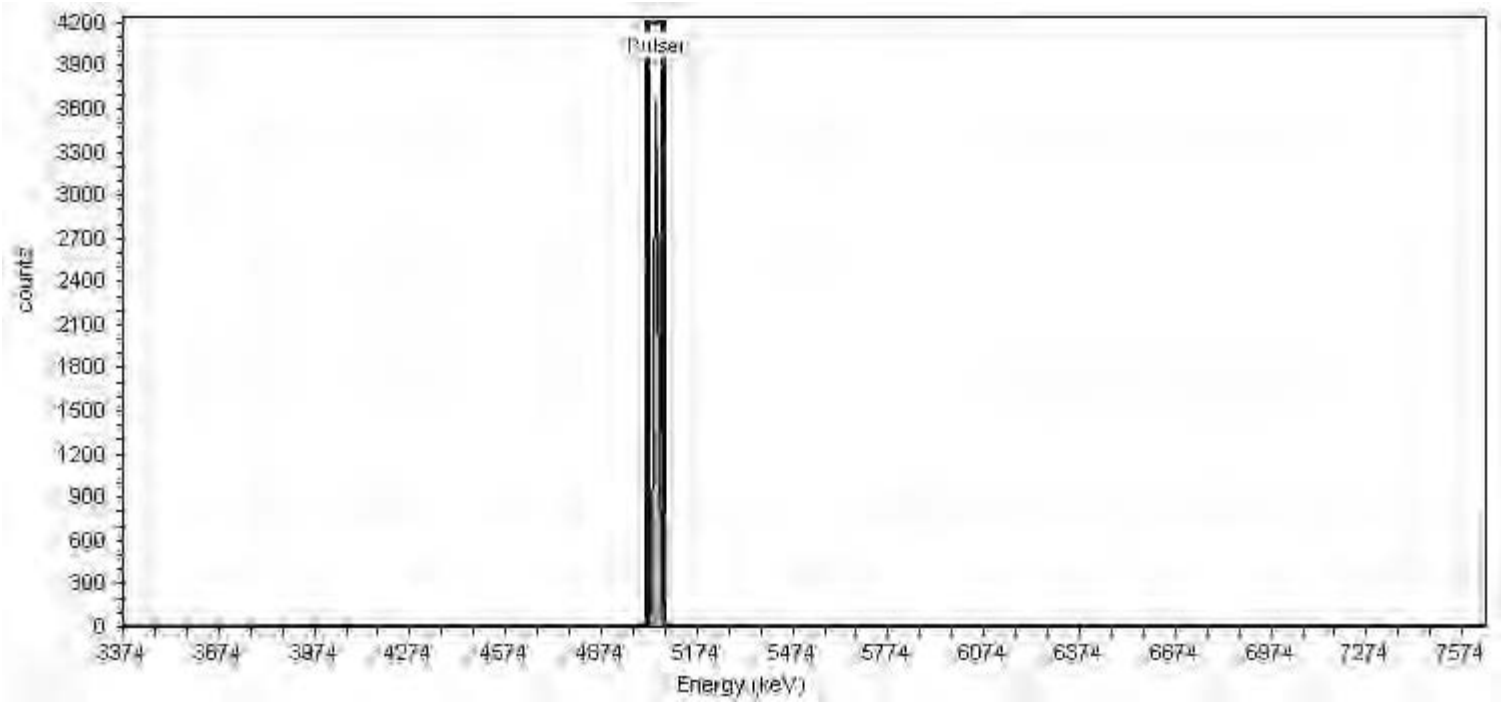
Acquisition

Detector: AV72 , SN: 48-05a21
Acquisition Start Date: 8/4/2018 11:01:39AM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9792;AV72-05152018
Calibration Date: 5/15/2018 6:36:51PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.58% +/- 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	5044.537	5021.301	5067.772	13.65	7,164.62	7,417.57

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:49:04PM 8/13/2018

Sample

Sample Name: Pulser;AV165
Comment:

Spectrum #15 Analysis #1

Batch

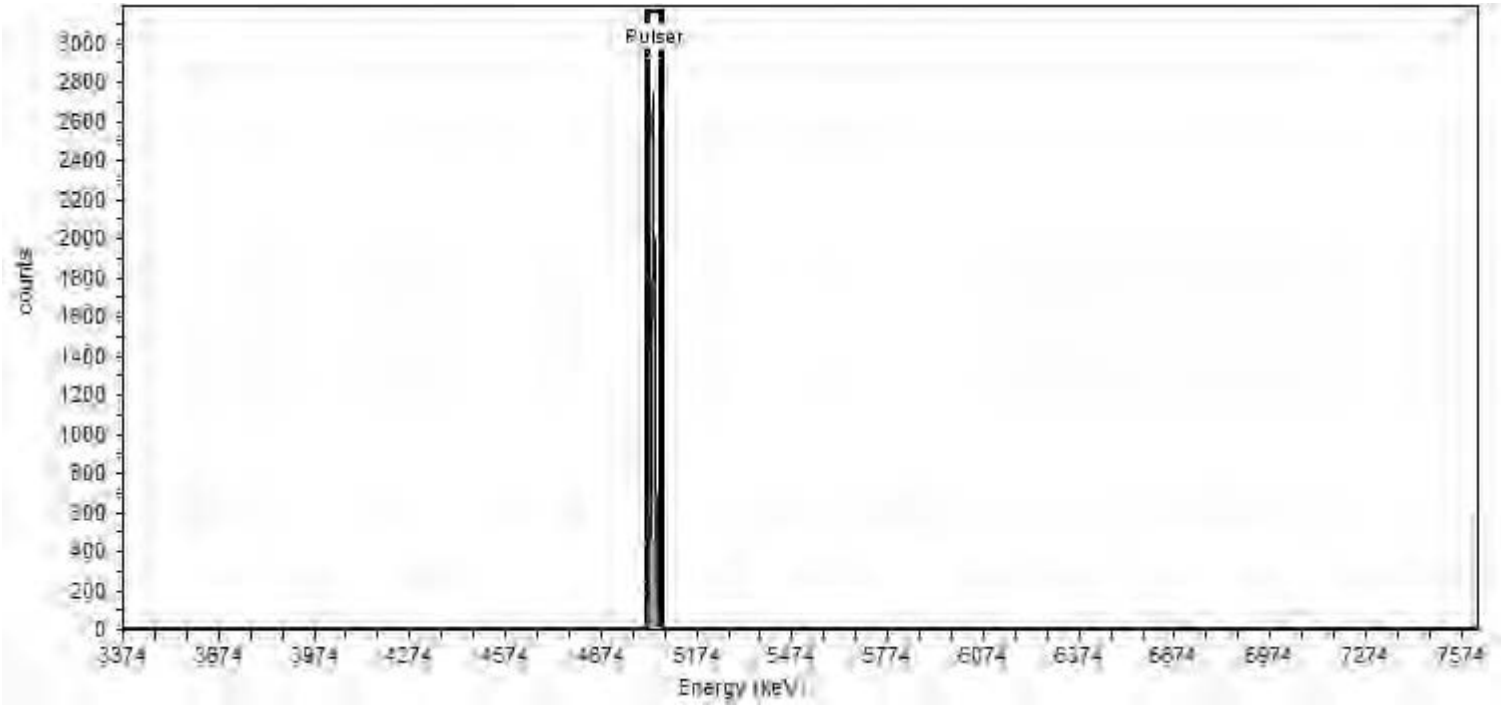
Batch Name: July2018a
Description:

Acquisition

Detector: AV165 , SN: 50-112F7
Acquisition Start Date: 8/13/2018 2:20:19PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8876;AV165-20171113
Calibration Date: 11/13/2017 3:16:40PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5038.232	5016.646	5059.818	12.68	5,007.27	5,810.62

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:49:07PM 8/13/2018

Sample

Sample Name: Pulser;AV166
Comment:

Spectrum #15 Analysis #1

Batch

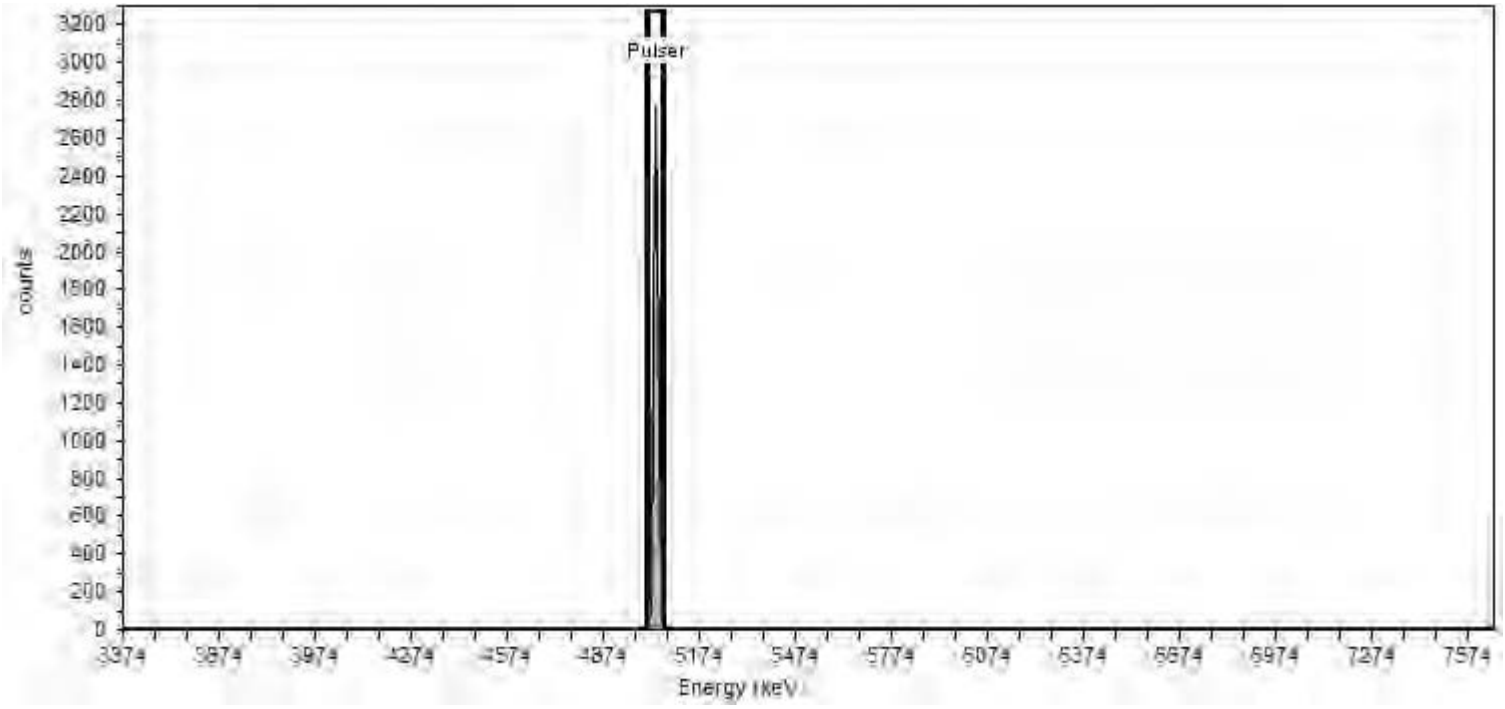
Batch Name: July2018a
Description:

Acquisition

Detector: AV166 , SN: 50-112 G1
Acquisition Start Date: 8/13/2018 2:20:19PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8877;AV166-20171113
Calibration Date: 11/13/2017 3:16:45PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5037.840	5013.359	5062.321	14.38	5,717.99	6,023.08

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:49:09PM 8/13/2018

Sample

Sample Name: Pulser;AV167
Comment:

Spectrum #15 Analysis #1

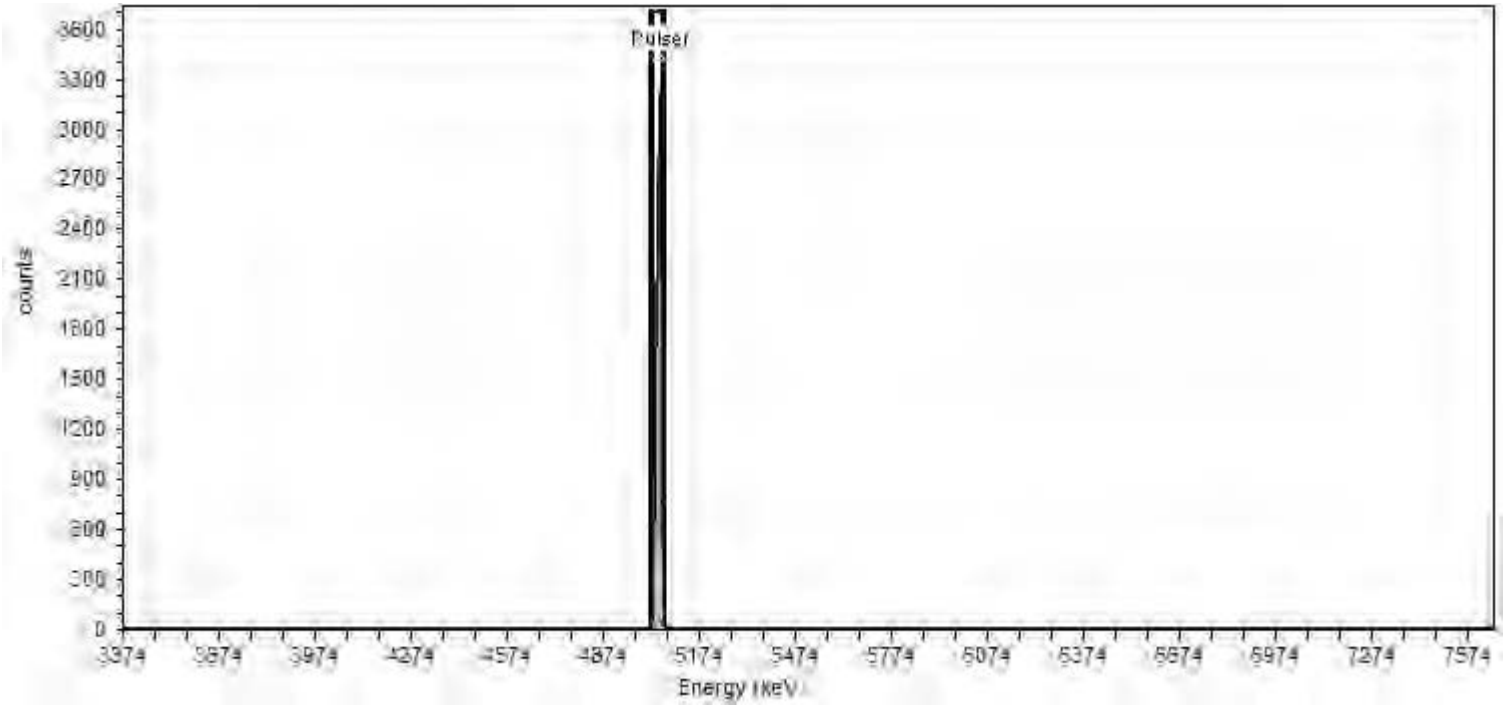
Batch

Batch Name: July2018a
Description:

Acquisition

Detector: AV167 , SN: 50-112 G3
Acquisition Start Date: 8/13/2018 2:20:20PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9520;AV167-20171113
Calibration Date: 11/13/2017 3:16:50PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5045.139	5023.326	5066.951	12.81	5,910.16	5,884.87

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:49:15PM 8/13/2018

Sample

Sample Name: Pulser;AV170
Comment:

Spectrum #15 Analysis #1

Batch

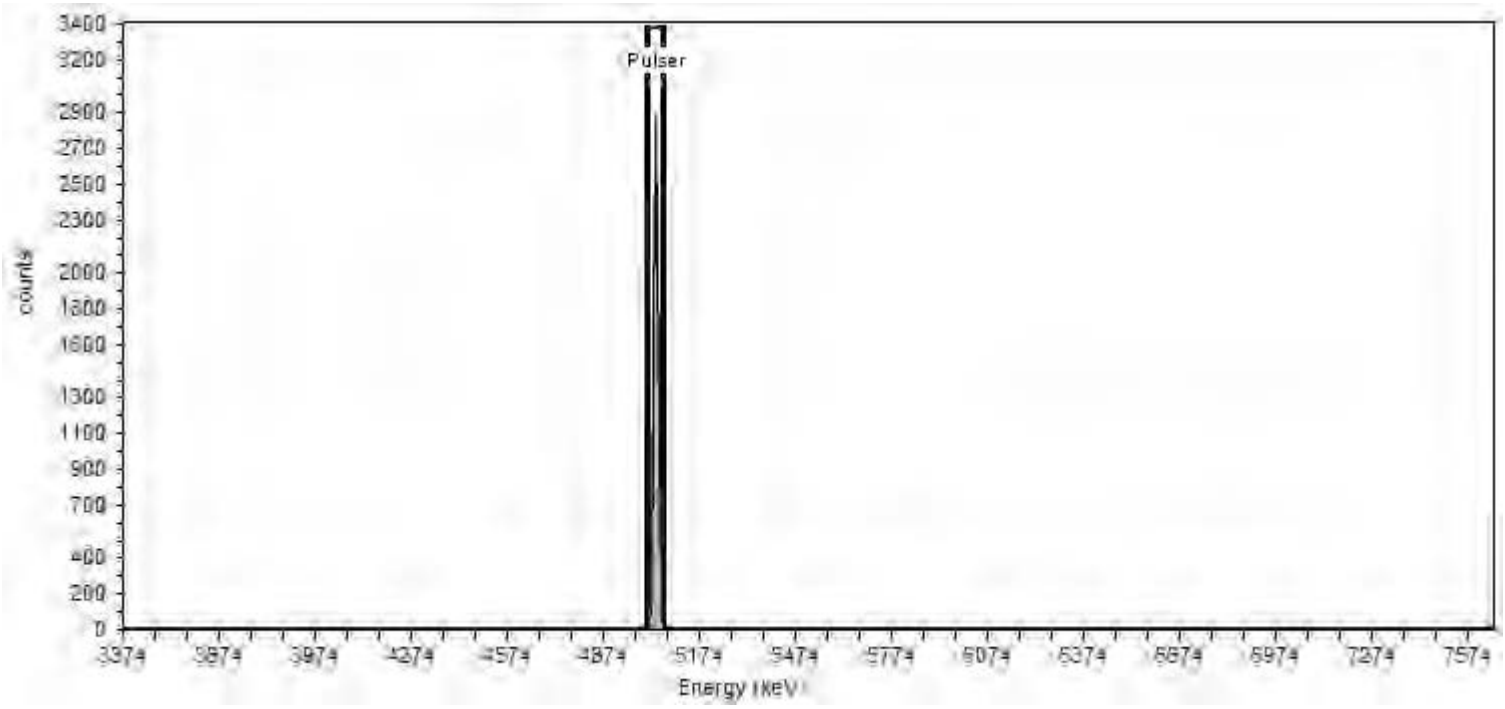
Batch Name: July2018a
Description:

Acquisition

Detector: AV170 , SN: 50-112 G7
Acquisition Start Date: 8/13/2018 2:20:20PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9793;AV170-20171113
Calibration Date: 11/13/2017 3:17:08PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5037.828	5014.002	5061.654	14.00	5,783.24	6,034.57

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:31PM 8/10/2018

Sample

Sample Name: Pulser;AV175
Comment:

Spectrum #13 Analysis #1

Batch

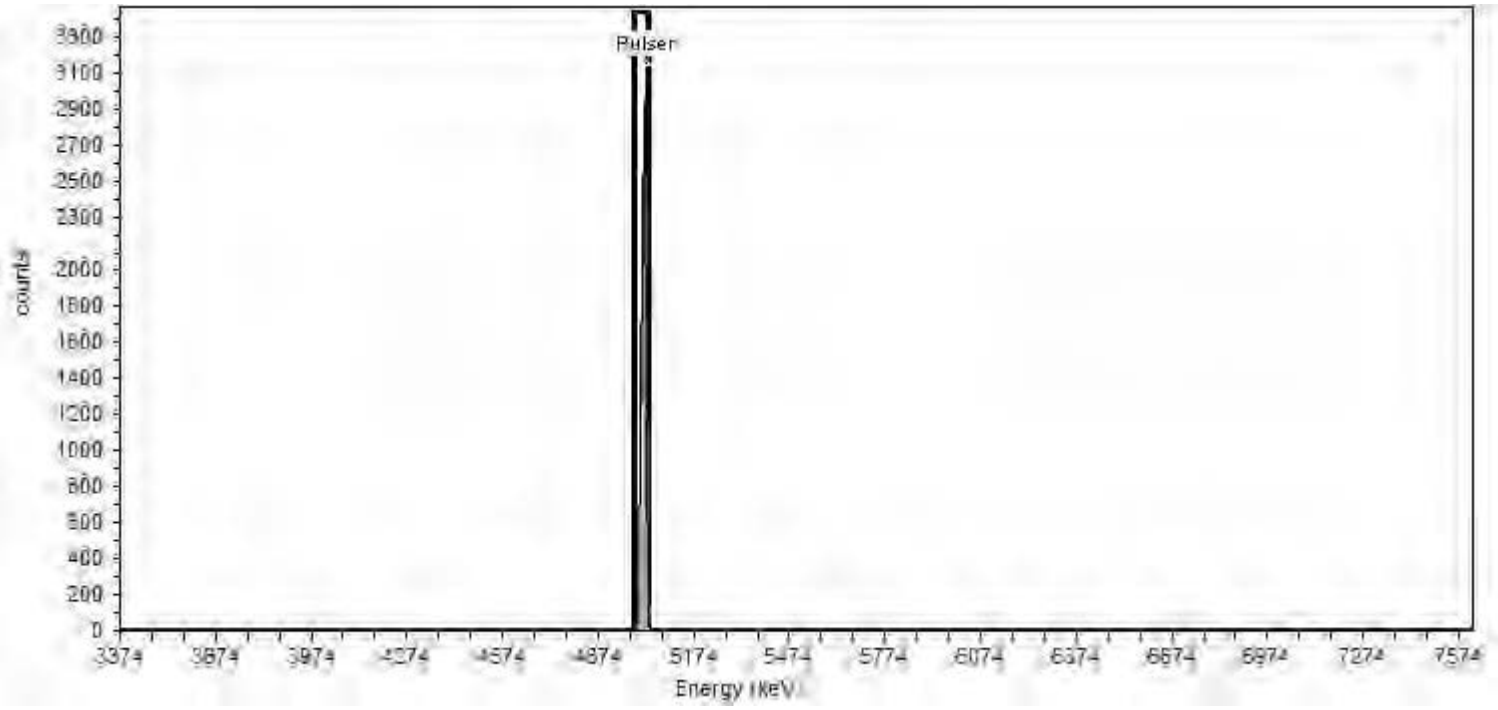
Batch Name: July2018a
Description:

Acquisition

Detector: AV175 , SN: 50-117H1
Acquisition Start Date: 8/10/2018 2:24:53PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-9885;AV175-20171113
Calibration Date: 11/13/2017 3:17:24PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5014.763	4992.565	5036.962	13.04	5,516.80	5,780.94

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:33PM 8/10/2018

Sample

Sample Name: Pulser;AV187
Comment:

Spectrum #13 Analysis #1

Batch

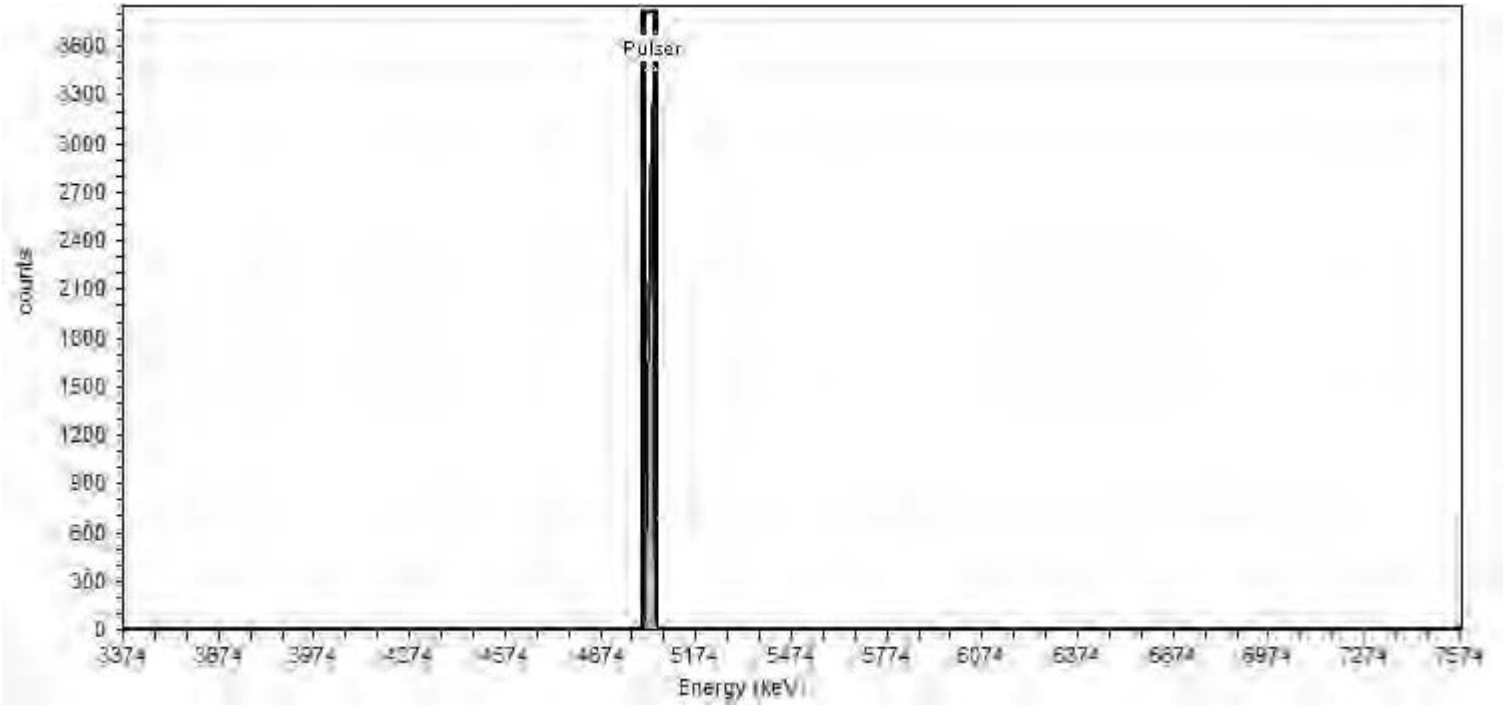
Batch Name: July2018b
Description:

Acquisition

Detector: AV187 , SN: 50-119I2
Acquisition Start Date: 8/10/2018 2:24:59PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8875;AV187-20171113
Calibration Date: 11/14/2017 8:46:54AM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5030.144	5009.326	5050.962	12.23	5,698.41	5,895.21

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:35PM 8/10/2018

Sample

Sample Name: Pulser;AV189
Comment:

Spectrum #13 Analysis #1

Batch

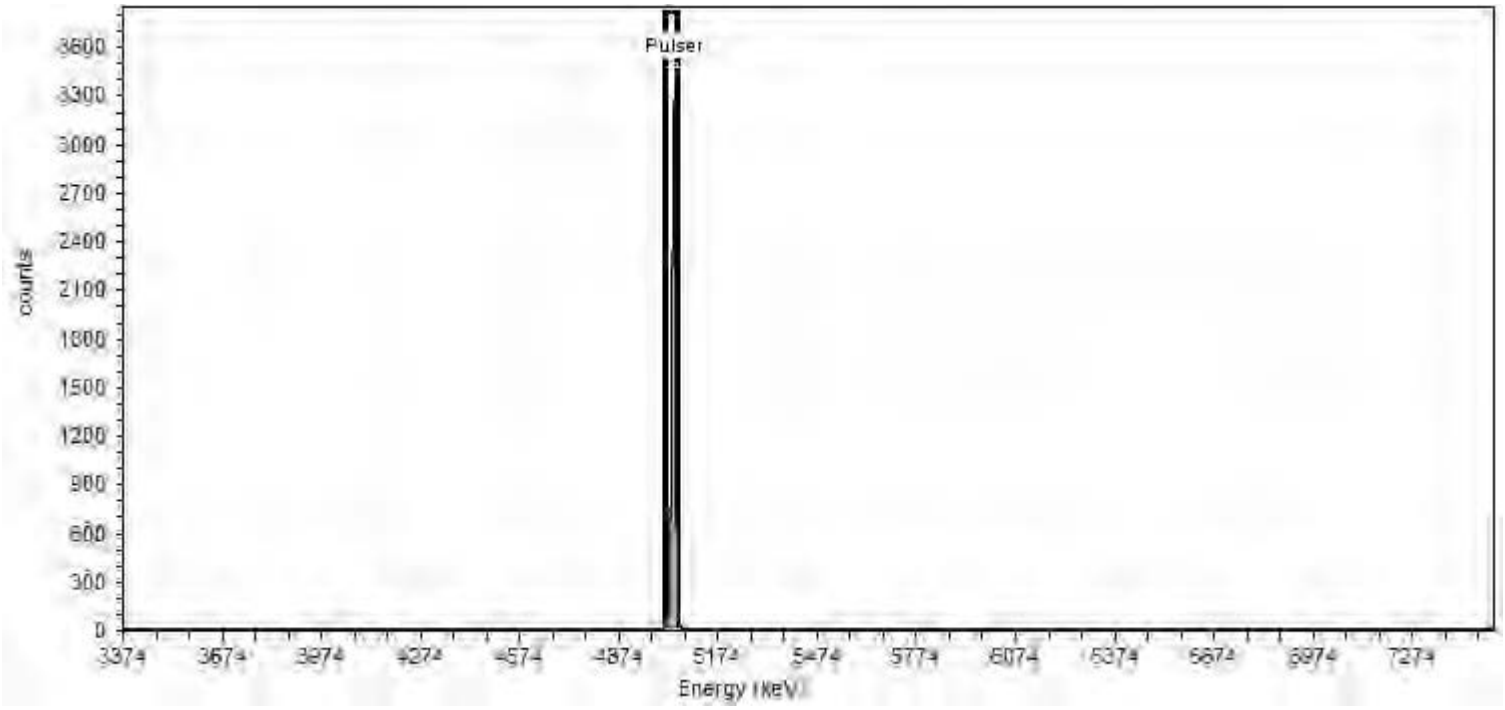
Batch Name: July2018b
Description:

Acquisition

Detector: AV189 , SN: 50-112A3
Acquisition Start Date: 8/10/2018 2:25:00PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8877;AV189-20171113
Calibration Date: 11/14/2017 8:46:59AM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5037.428	5015.958	5058.898	12.61	5,905.85	5,905.20

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:36PM 8/10/2018

Sample

Sample Name: Pulser;AV190
Comment:

Spectrum #13 Analysis #1

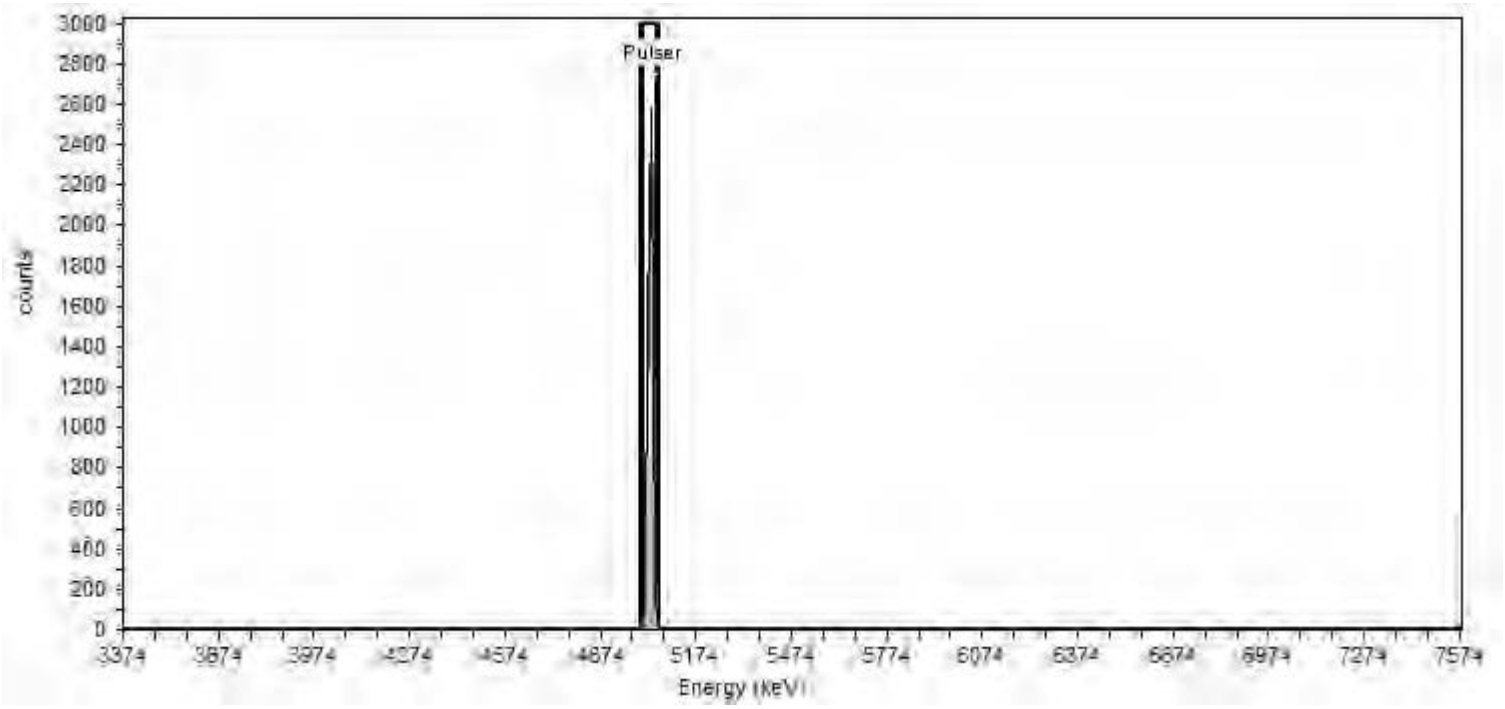
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV190 , SN: 50-119I7
Acquisition Start Date: 8/10/2018 2:25:00PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-9520;AV190-20171113
Calibration Date: 11/14/2017 8:47:05AM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5029.515	5002.804	5056.226	15.69	5,812.38	6,005.54

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:37PM 8/10/2018

Sample

Sample Name: Pulser;AV191
Comment:

Spectrum #13 Analysis #1

Batch

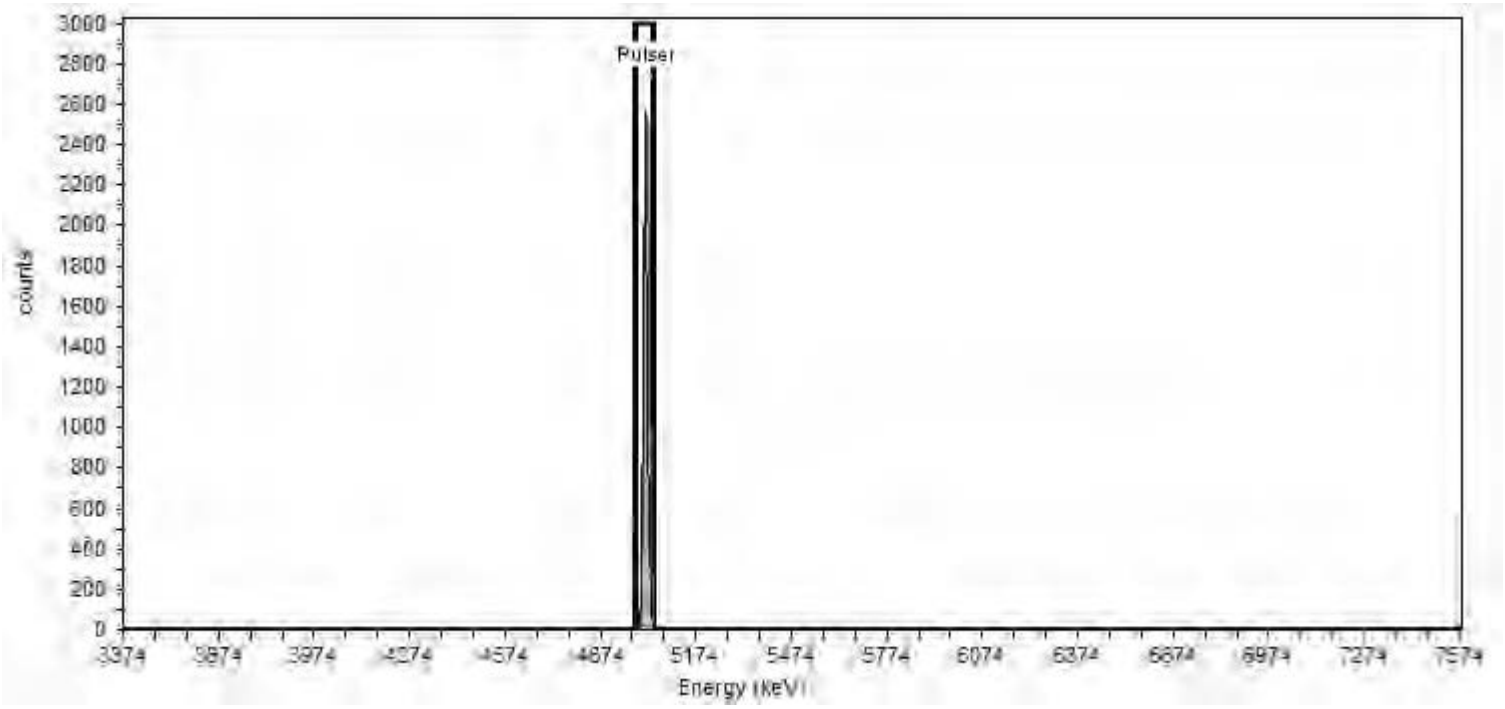
Batch Name: July2018b
Description:

Acquisition

Detector: AV191 , SN: 50-112A2
Acquisition Start Date: 8/10/2018 2:25:00PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8879;AV191-20171113
Calibration Date: 11/14/2017 8:47:10AM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5014.112	4989.917	5038.307	14.21	5,242.50	6,022.03

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:39PM 8/10/2018

Sample

Sample Name: Pulser;AV192
Comment:

Spectrum #14 Analysis #1

Batch

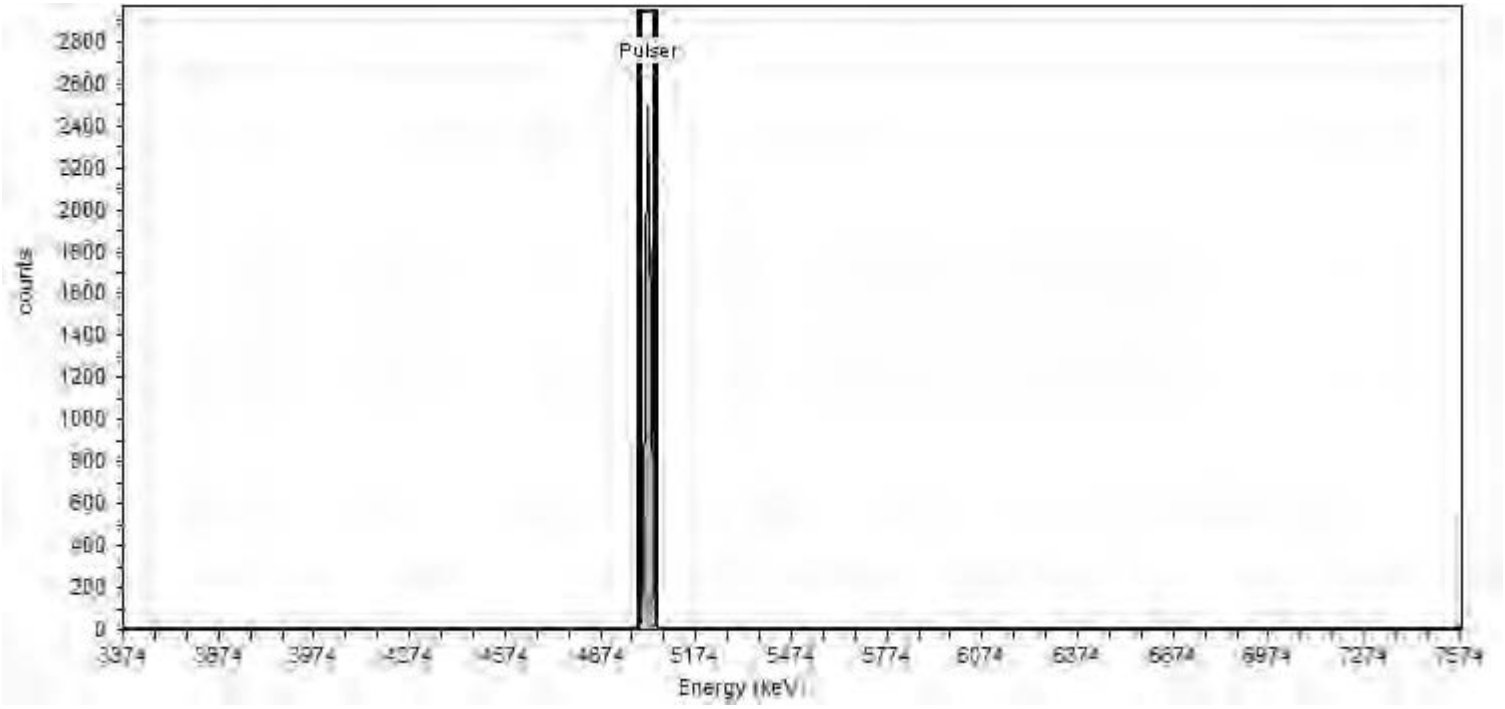
Batch Name: July2018b
Description:

Acquisition

Detector: AV192 , SN: 50-119J7
Acquisition Start Date: 8/10/2018 2:25:00PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-9792;AV192-20171113
Calibration Date: 11/14/2017 8:47:16AM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5022.408	4993.957	5050.859	16.71	5,975.91	5,982.45

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:40PM 8/10/2018

Sample

Sample Name: Pulser;AV194
Comment:

Spectrum #13 Analysis #1

Batch

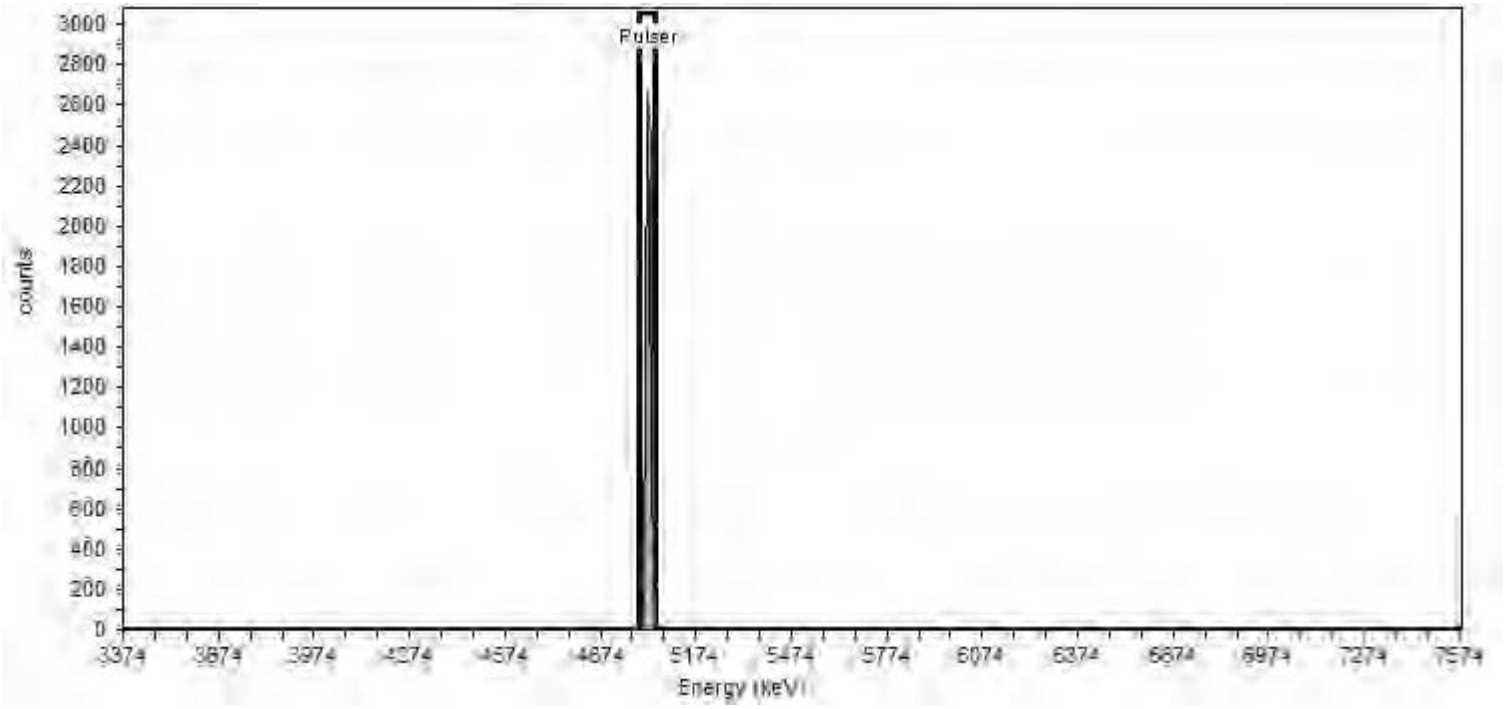
Batch Name: July2018b
Description:

Acquisition

Detector: AV194 , SN: 50-119J2
Acquisition Start Date: 8/10/2018 2:25:00PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-9794;AV194-20171113a
Calibration Date: 11/14/2017 8:47:42AM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5021.824	4998.649	5044.999	13.62	5,194.79	6,017.86

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:43PM 8/10/2018

Sample

Sample Name: Pulser;AV198
Comment:

Spectrum #13 Analysis #1

Batch

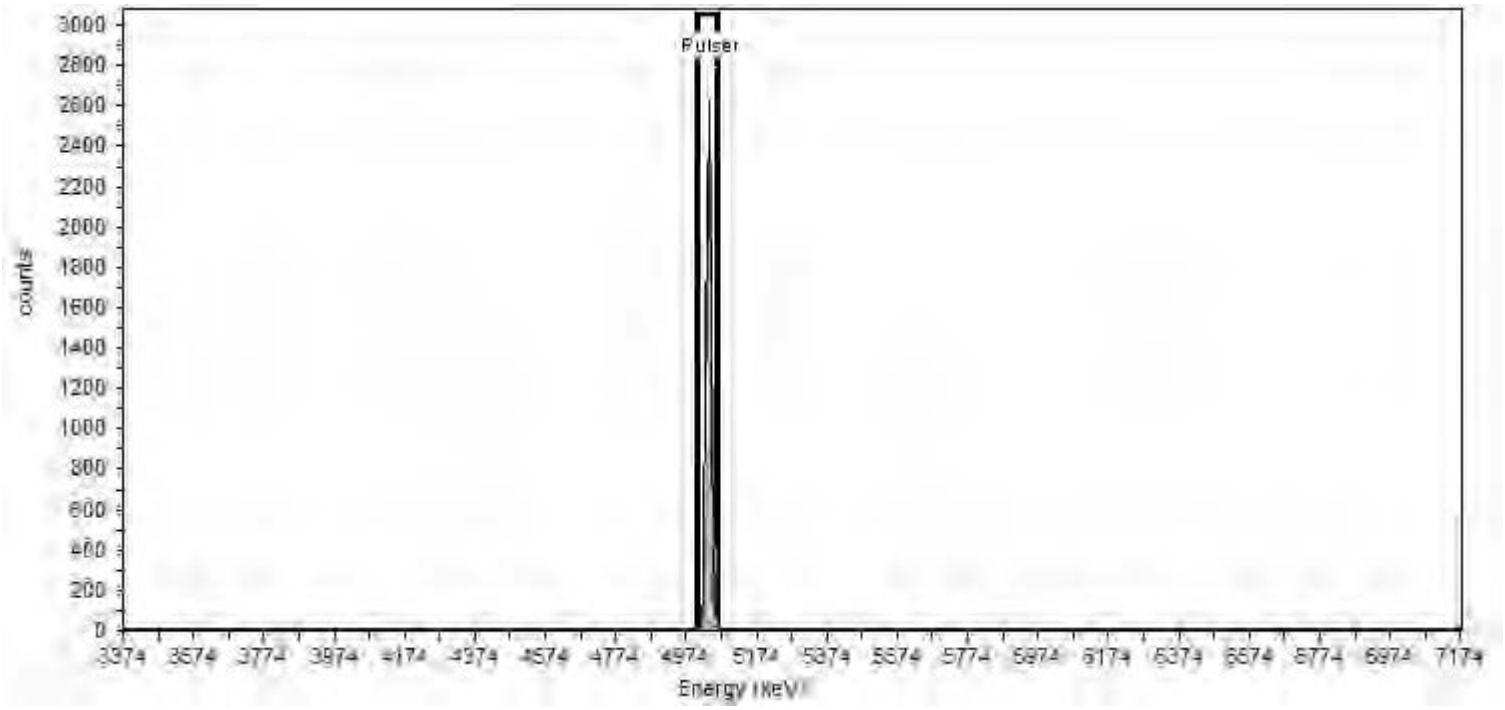
Batch Name: July2018b
Description:

Acquisition

Detector: AV198 , SN: 50-117AA7
Acquisition Start Date: 8/10/2018 2:25:01PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-9885;AV198-20171113a
Calibration Date: 11/14/2017 8:47:47AM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5037.088	5011.225	5062.950	15.19	5,712.54	6,002.50

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:47PM 8/10/2018

Sample

Sample Name: Pulser;AV203
Comment:

Spectrum #13 Analysis #1

Batch

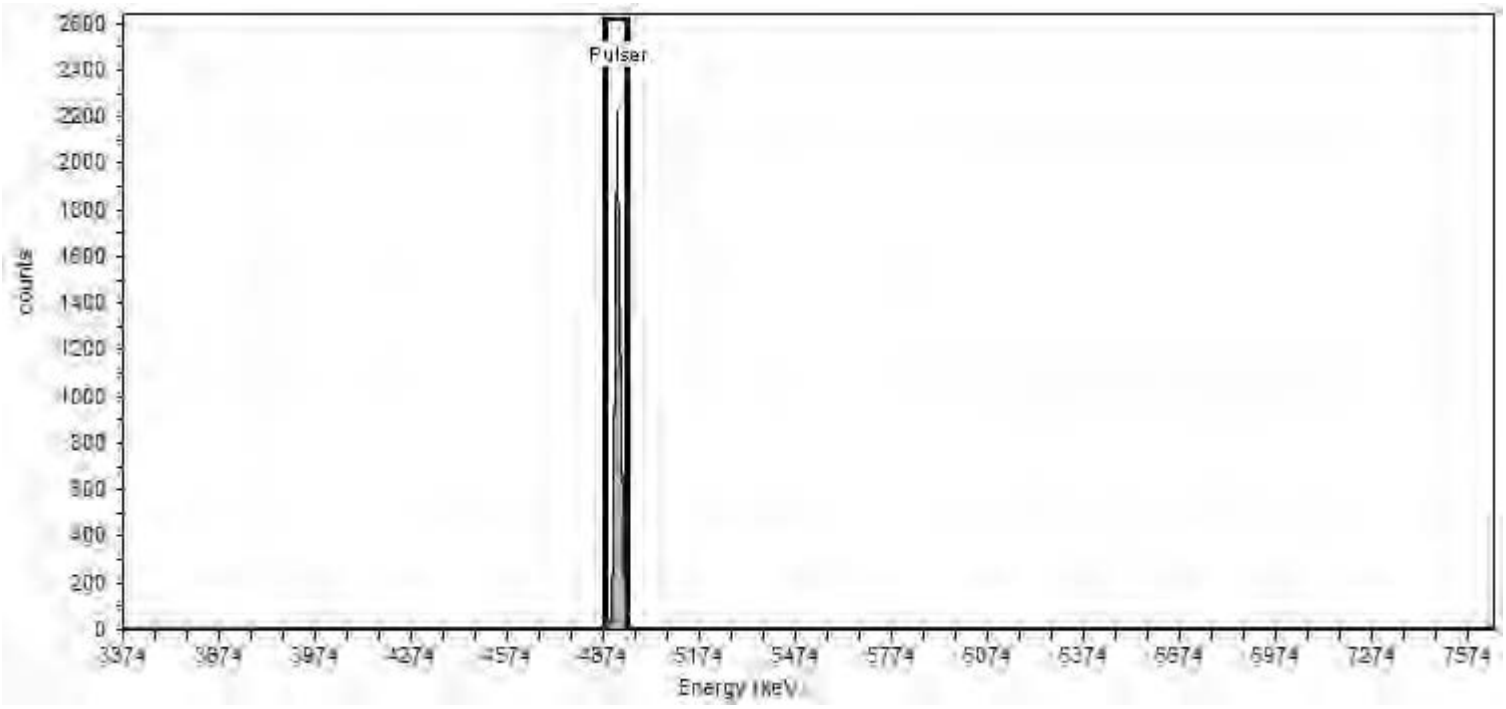
Batch Name: July2018b
Description:

Acquisition

Detector: AV203 , SN: 50-117J4
Acquisition Start Date: 8/10/2018 2:25:02PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8876;AV203-20171114
Calibration Date: 11/14/2017 12:01:12PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4918.129	4886.072	4950.186	18.83	6,014.17	6,006.40

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:48PM 8/10/2018

Sample

Sample Name: Pulser;AV206
Comment:

Spectrum #13 Analysis #1

Batch

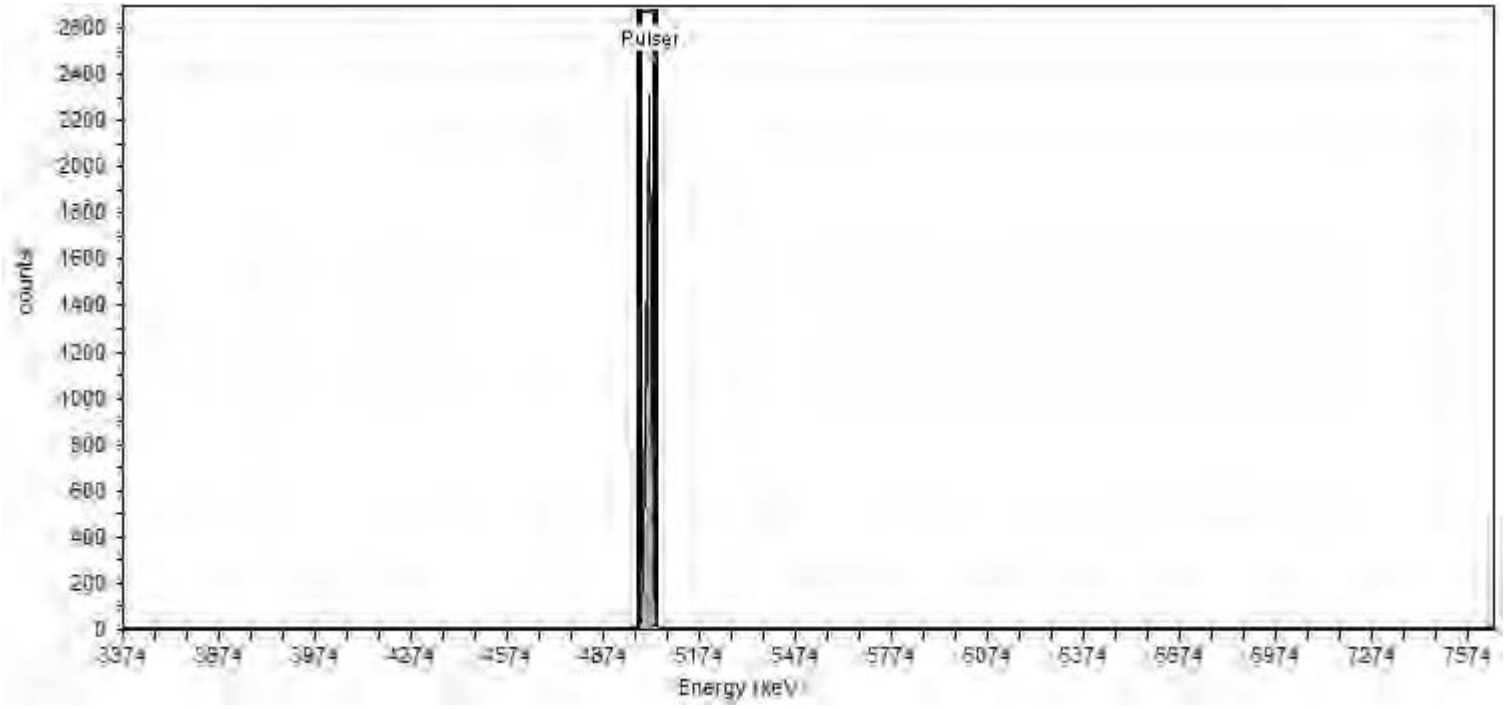
Batch Name: July2018b
Description:

Acquisition

Detector: AV206 , SN: 5604420
Acquisition Start Date: 8/10/2018 2:25:02PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8879;AV206-20171114
Calibration Date: 11/14/2017 12:00:54PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5015.505	4986.183	5044.827	17.23	5,712.99	5,955.72

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:49PM 8/10/2018

Sample

Sample Name: Pulser;AV208
Comment:

Spectrum #13 Analysis #1

Batch

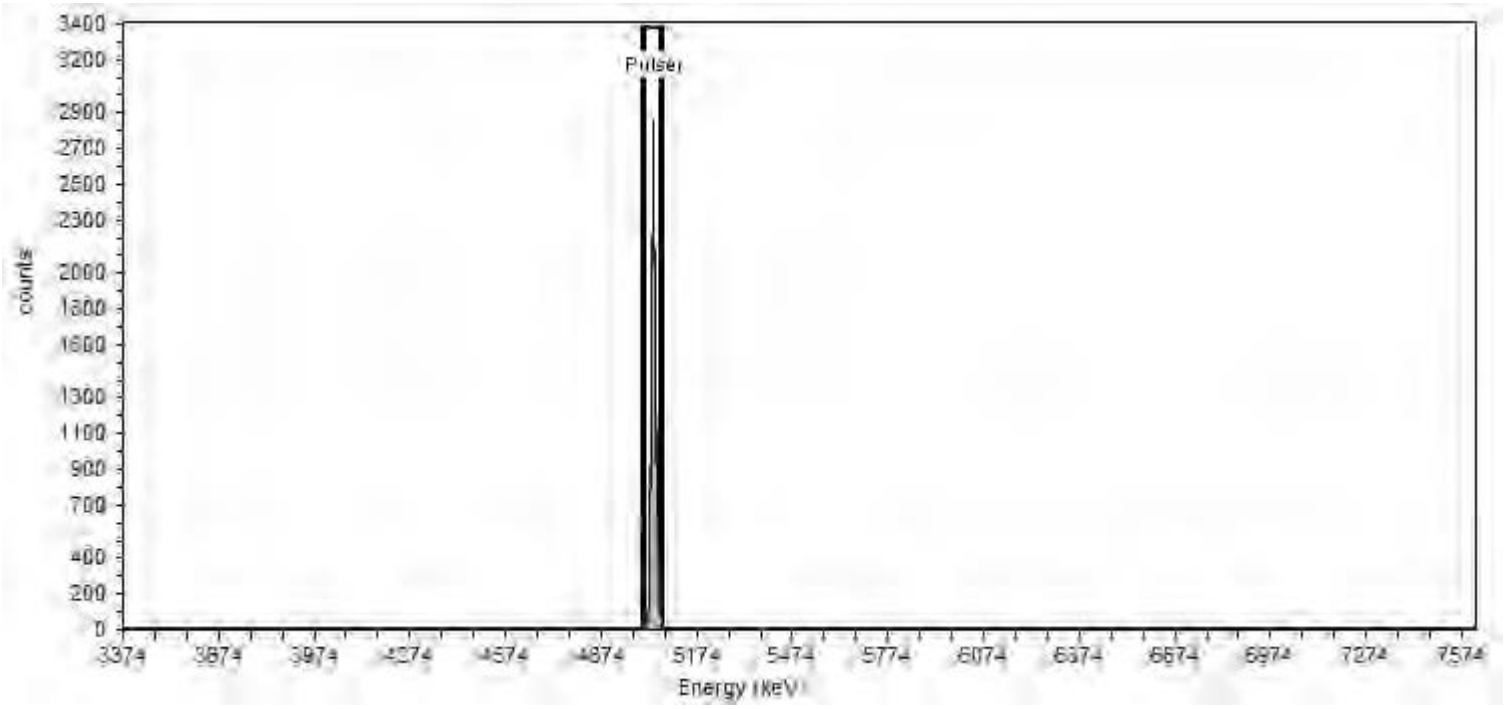
Batch Name: July2018b
Description:

Acquisition

Detector: AV208 , SN: 50-112Z6
Acquisition Start Date: 8/10/2018 2:25:02PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-9793;AV208-20171114
Calibration Date: 11/14/2017 12:00:42PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5037.534	5012.463	5062.605	14.73	6,047.37	6,009.89

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:51PM 8/10/2018

Sample

Sample Name: Pulser;AV212
Comment:

Spectrum #13 Analysis #1

Batch

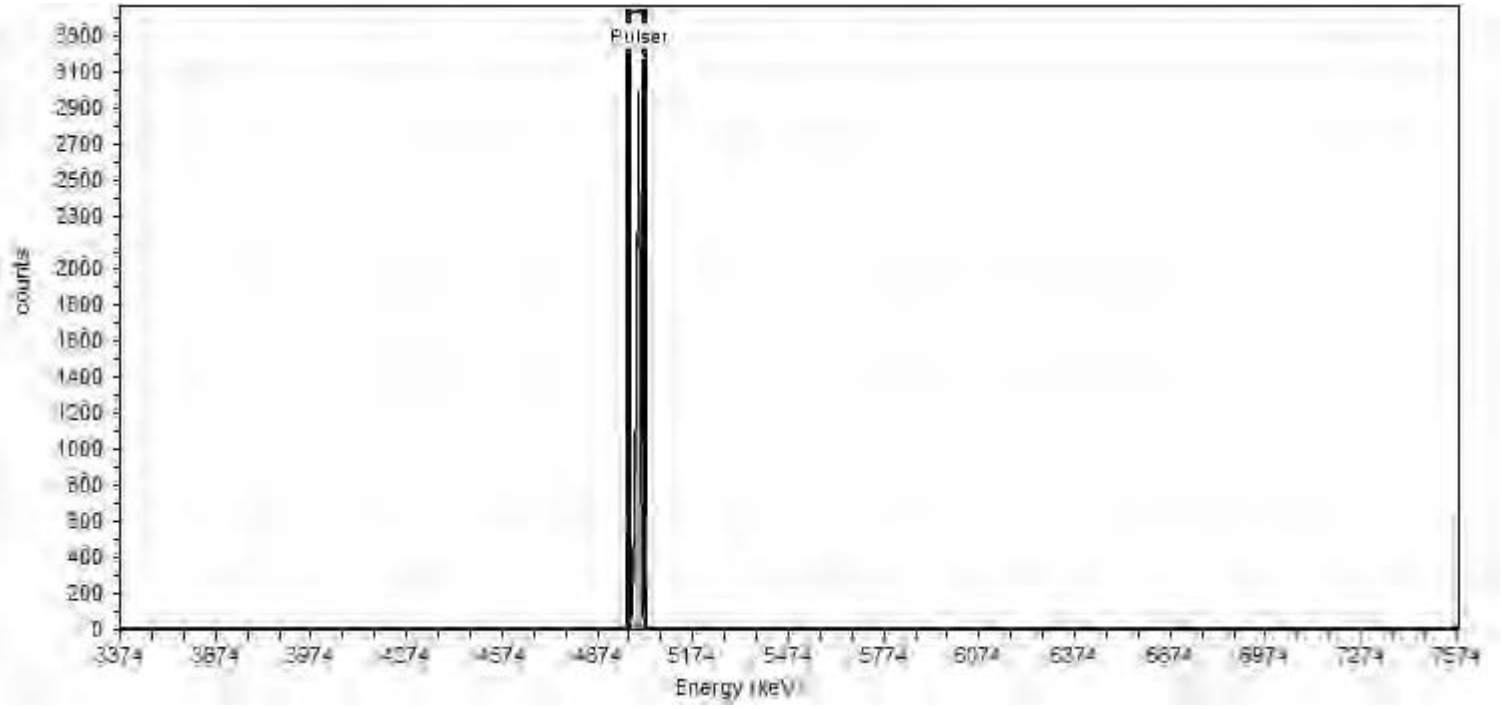
Batch Name: July2018c
Description:

Acquisition

Detector: AV212 , SN: 49-155m5
Acquisition Start Date: 8/10/2018 2:25:21PM
Live Time: 1.00 min.
Real Time: 1.01 min.
Calibration Name: IC-9884;AV212-20171114
Calibration Date: 11/14/2017 12:01:41PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4999.880	4976.330	5023.430	13.84	5,921.99	6,033.91

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:52PM 8/10/2018

Sample

Sample Name: Pulser;AV213
Comment:

Spectrum #13 Analysis #1

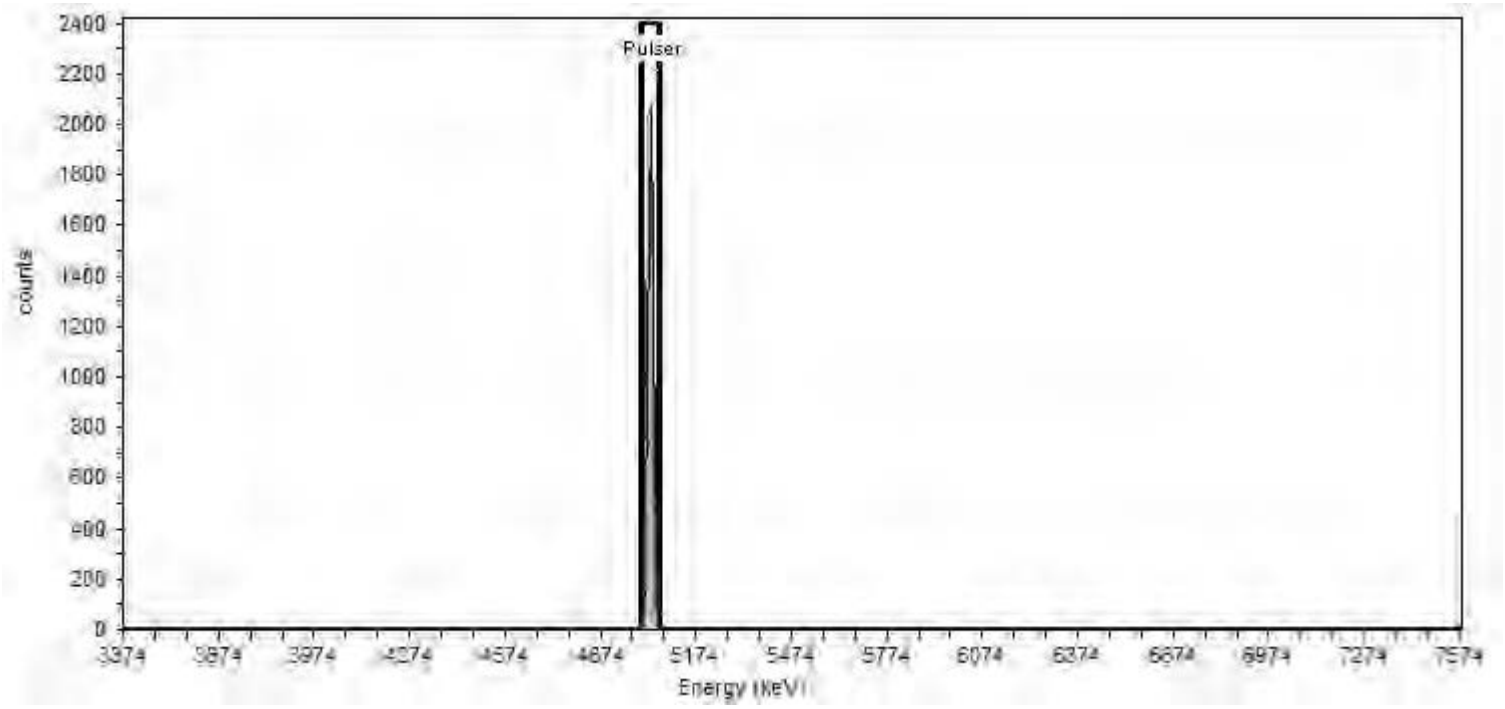
Batch

Batch Name: July2018c
Description:

Acquisition

Detector: AV213 , SN: 54-011 Y1
Acquisition Start Date: 8/10/2018 2:25:21PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-9885;AV213-20171114
Calibration Date: 11/14/2017 12:01:29PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5031.200	5000.354	5062.046	18.12	5,408.67	5,890.78

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:53PM 8/10/2018

Sample

Sample Name: Pulser;AV215
Comment:

Spectrum #13 Analysis #1

Batch

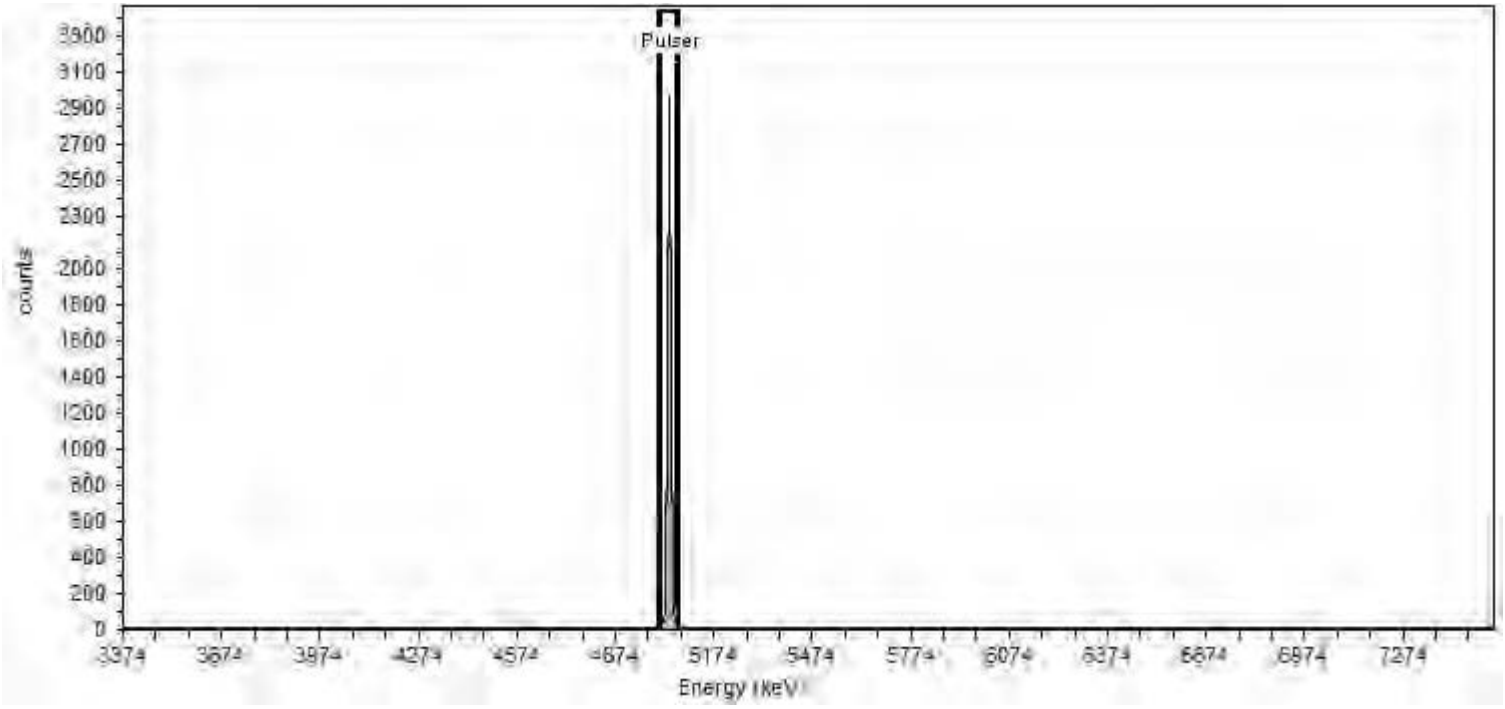
Batch Name: July2018c
Description:

Acquisition

Detector: AV215 , SN: 50-119J4
Acquisition Start Date: 8/10/2018 2:25:21PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-7107;AV215-20171114
Calibration Date: 11/14/2017 3:23:29PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5037.458	5014.445	5060.470	13.52	5,742.29	6,018.48

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:54PM 8/10/2018

Sample

Sample Name: Pulser;AV216
Comment:

Spectrum #13 Analysis #1

Batch

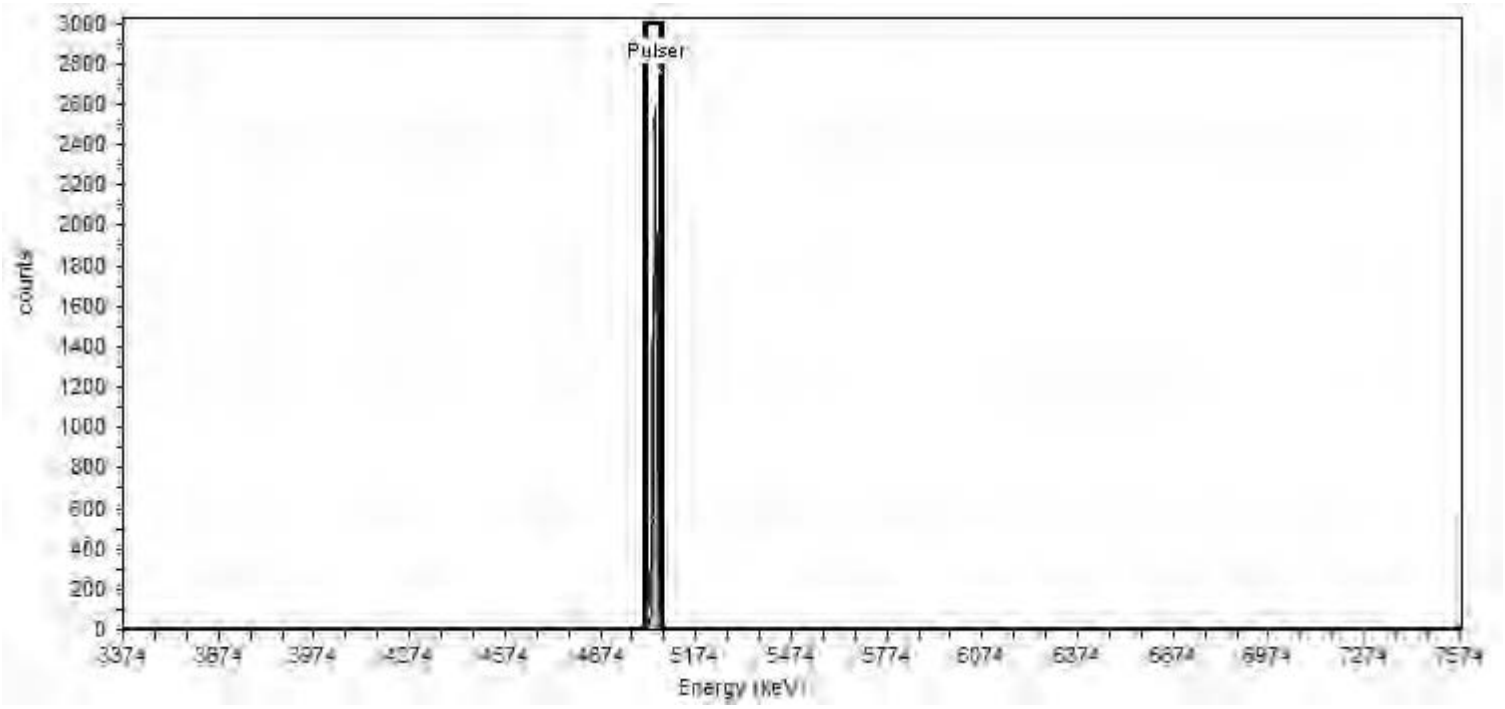
Batch Name: July2018c
Description:

Acquisition

Detector: AV216 , SN: 50-117J5
Acquisition Start Date: 8/10/2018 2:25:22PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8874;AV216-20171114
Calibration Date: 11/14/2017 3:23:21PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5045.762	5022.133	5069.390	13.88	5,153.49	6,024.31

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:55PM 8/10/2018

Sample

Sample Name: Pulser;AV217
Comment:

Spectrum #13 Analysis #1

Batch

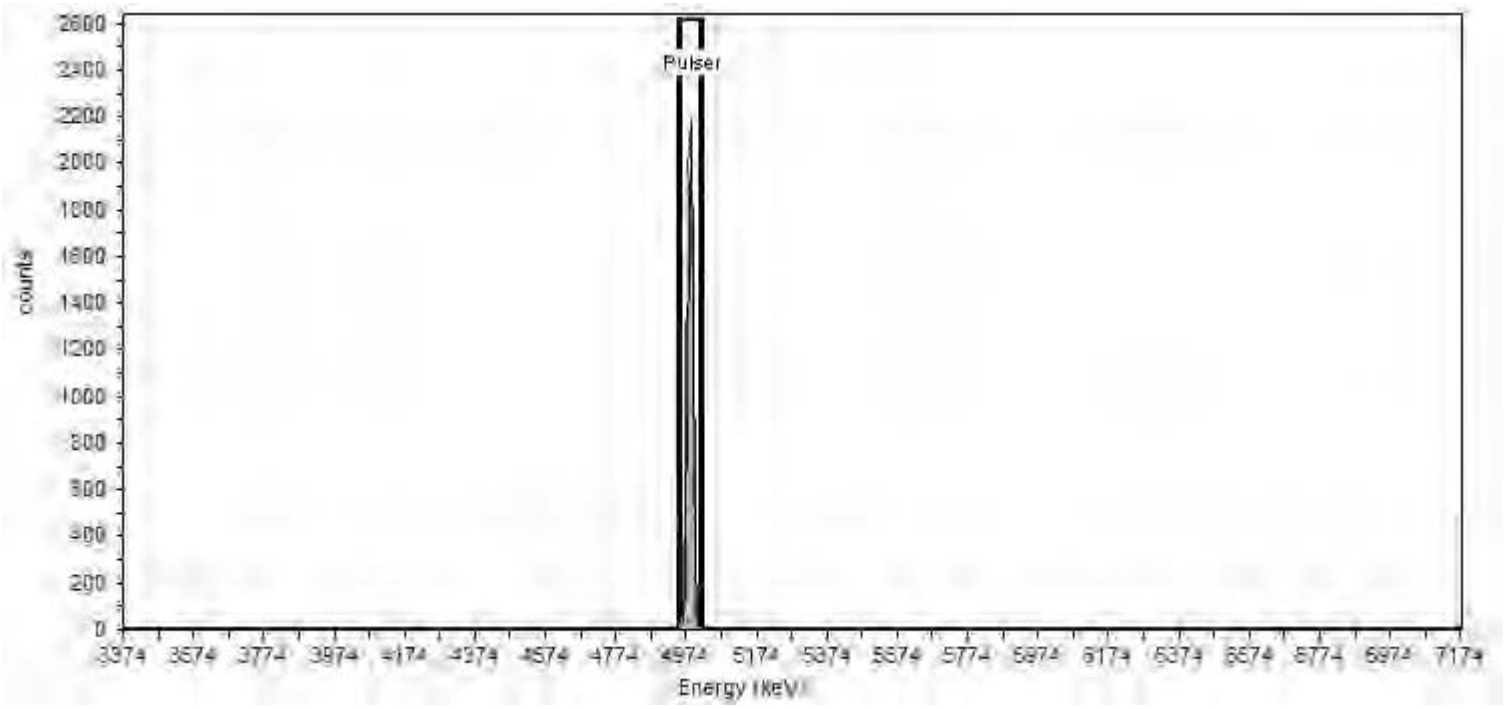
Batch Name: July2018c
Description:

Acquisition

Detector: AV217 , SN: 50-117I2
Acquisition Start Date: 8/10/2018 2:25:22PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8875;AV217-20171114
Calibration Date: 11/14/2017 3:23:16PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4986.149	4956.949	5015.350	17.16	5,394.88	5,952.38

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Pulser Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:01:56PM 8/10/2018

Sample

Sample Name: Pulser;AV218
Comment:

Spectrum #13 Analysis #1

Batch

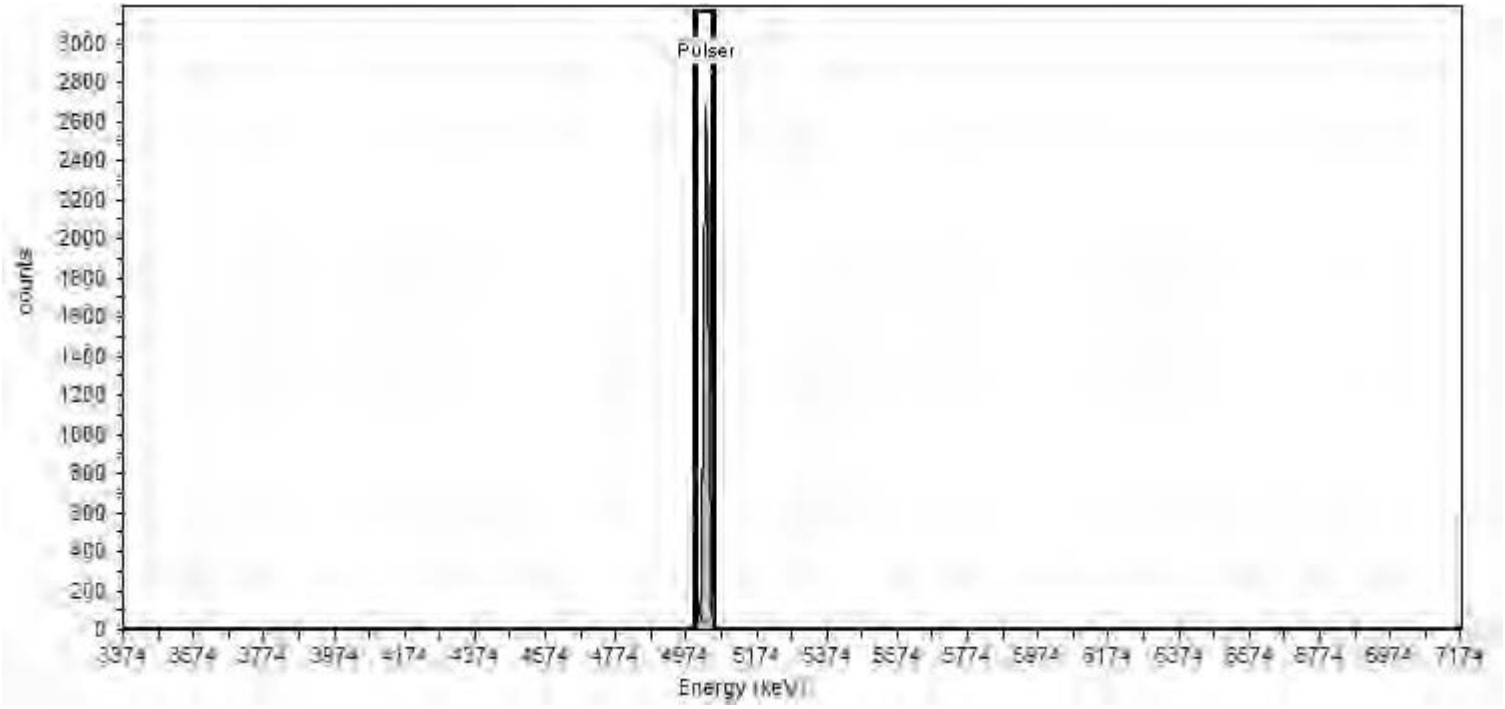
Batch Name: July2018c
Description:

Acquisition

Detector: AV218 , SN: 50-117Z7
Acquisition Start Date: 8/10/2018 2:25:22PM
Live Time: 1.00 min.
Real Time: 1.00 min.
Calibration Name: IC-8876;AV218-20171114a
Calibration Date: 11/14/2017 3:23:35PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5029.444	5004.444	5054.443	14.69	5,643.70	6,010.66

Initial Calibrations

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:23:49PM 5/14/2018

Calibration

Sample Name: IC-7107;AV1-05142018
Description:
Detector: AV1

Calibration Date: 5/14/2018 6:23:45PM
Analyst: 60040

Source Info

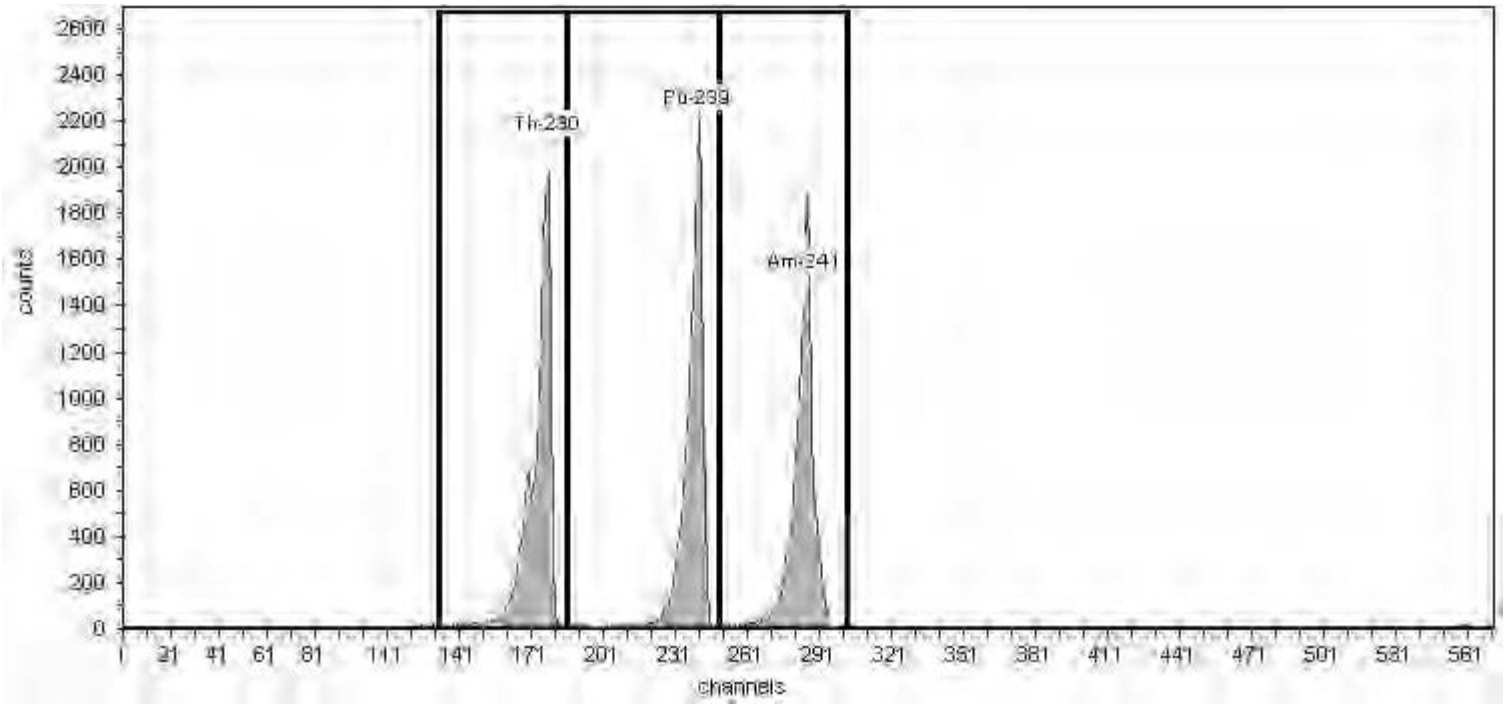
Certificate ID: 82232-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 5/14/2018 3:44:27PM
Live Time: 140.00 min.
Real Time: 140.09 min.
Efficiency: 24.36% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	15,240.00	108.86
Pu-239	240	5.16	186	249	0.00	15,352.00	109.66
Am-241	284	5.49	249	303	0.00	14,427.00	103.05

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:25:19PM 5/14/2018

Calibration

Sample Name: IC-8877;AV3-05142018
Description:
Detector: AV3

Calibration Date: 5/14/2018 6:25:15PM
Analyst: 60040

Source Info

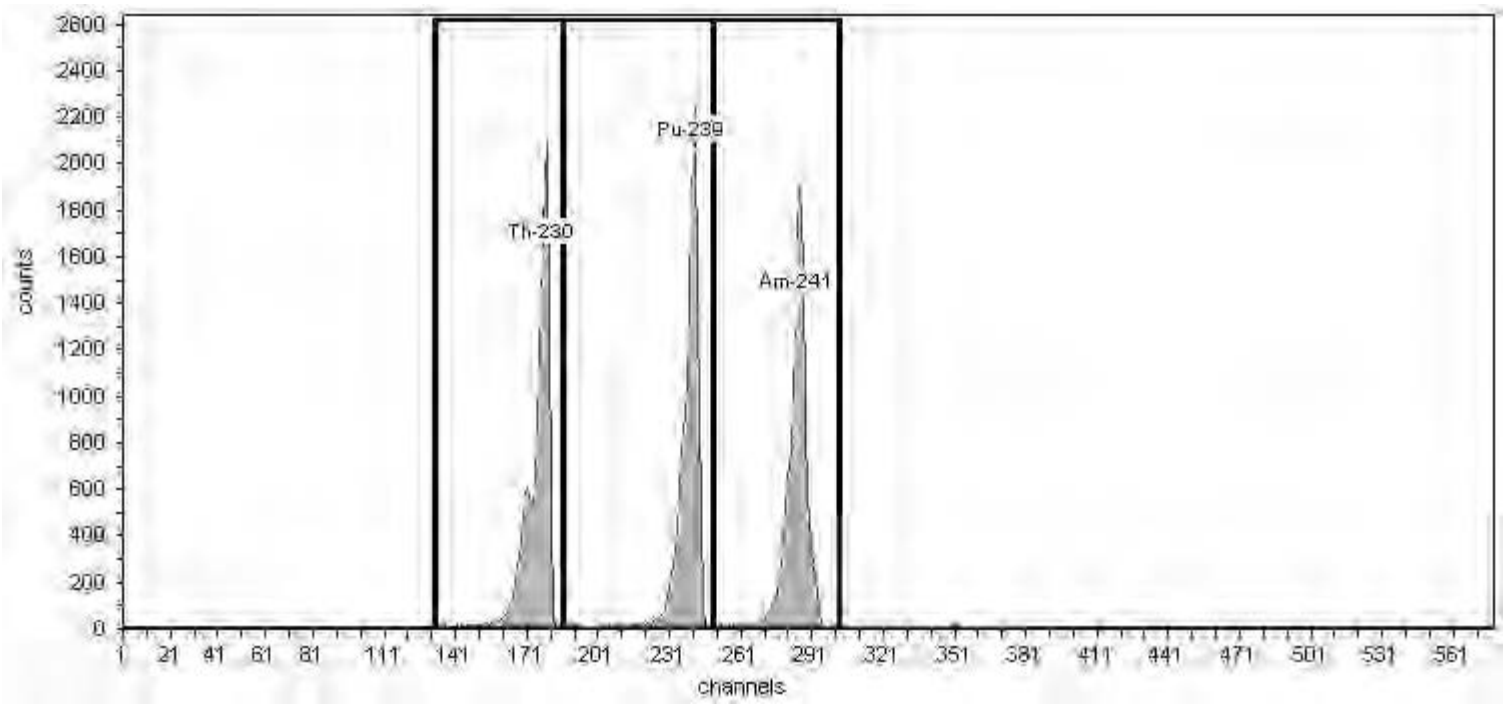
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



General Analysis

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:26:17PM 5/14/2018

Calibration

Sample Name: IC-9793;AV7-05142018
Description:
Detector: AV7

Calibration Date: 5/14/2018 6:26:13PM
Analyst: 60040

Source Info

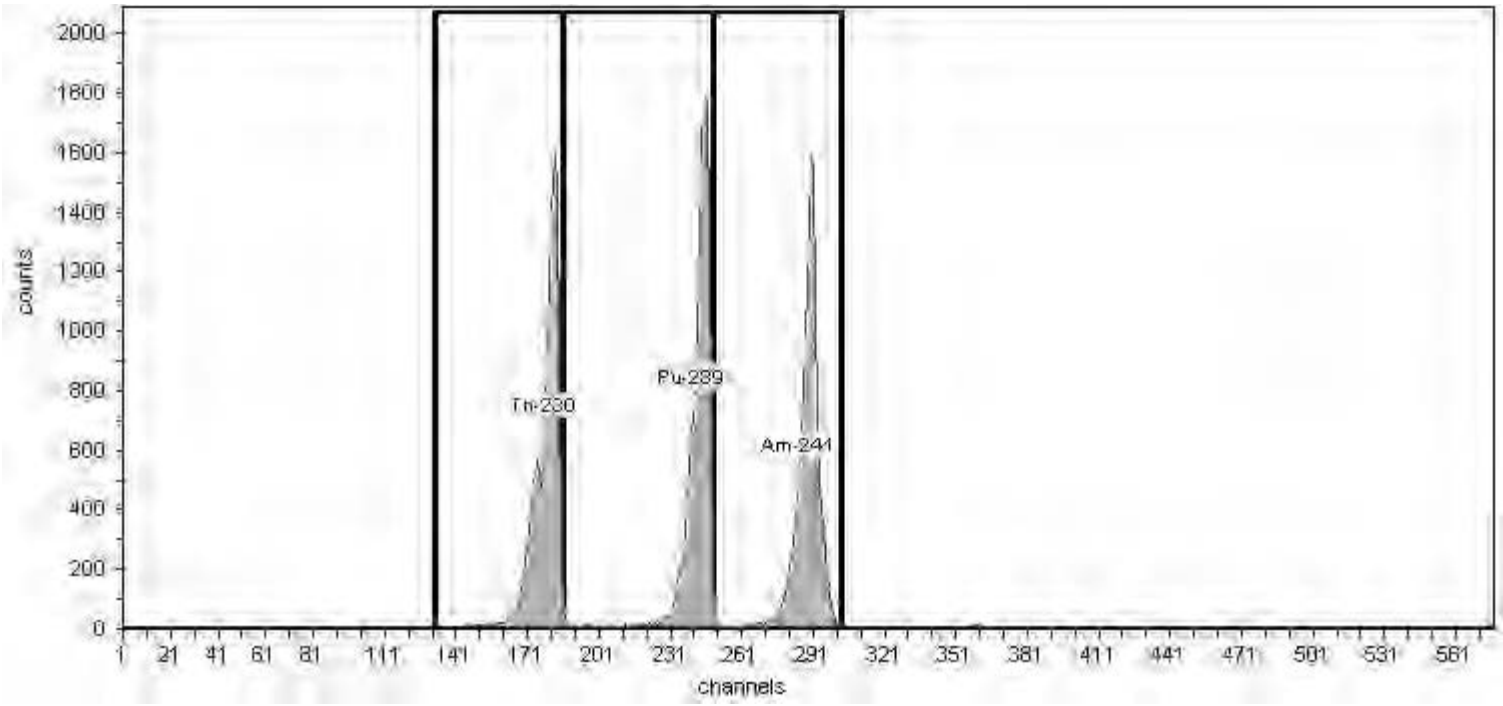
Certificate ID: 82241-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



General Analysis

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:26:31PM 5/14/2018

Calibration

Sample Name: IC-9795;AV8-05142018
Description:
Detector: AV8

Calibration Date: 5/14/2018 6:26:27PM
Analyst: 60040

Source Info

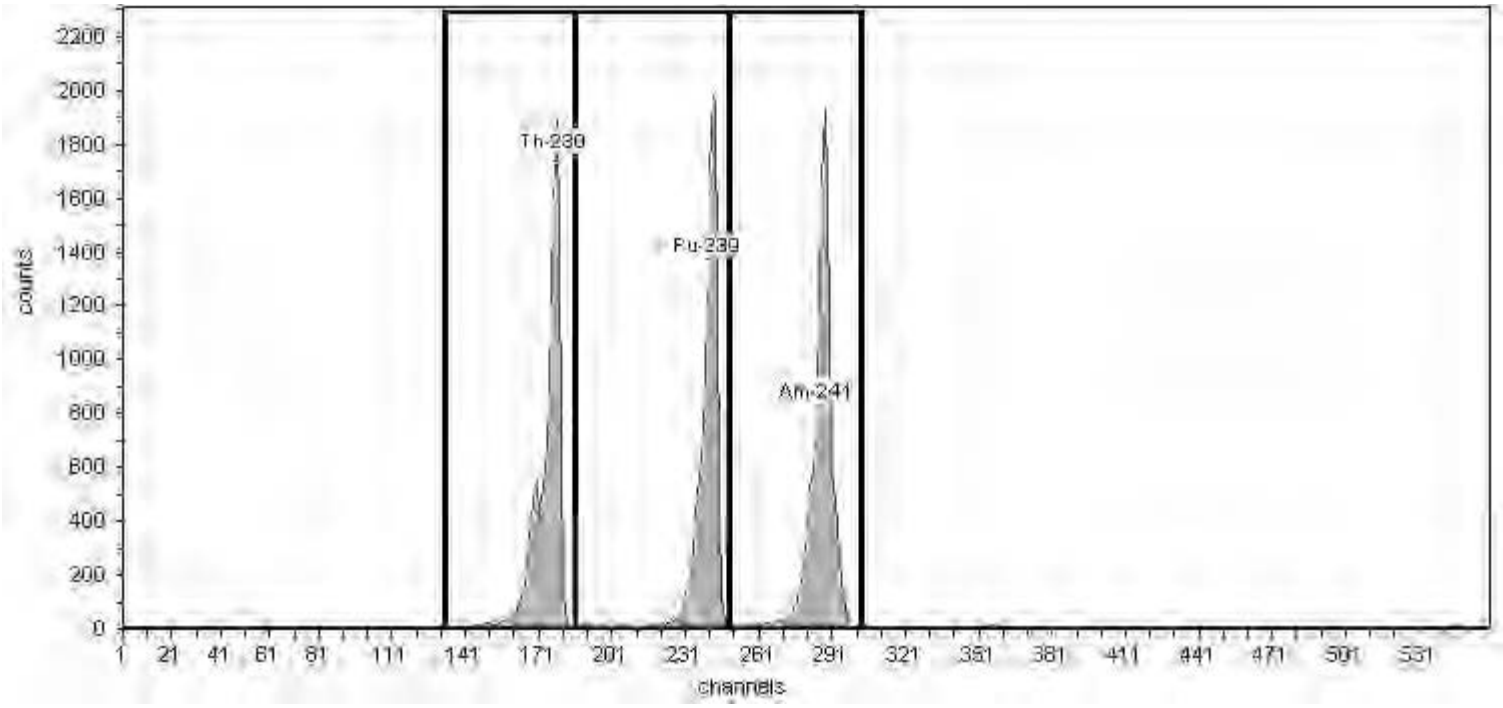
Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



General Analysis

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:27:02PM 5/14/2018

Calibration

Sample Name: IC-9885;AV10-05142018
Description:
Detector: AV10

Calibration Date: 5/14/2018 6:26:57PM
Analyst: 60040

Source Info

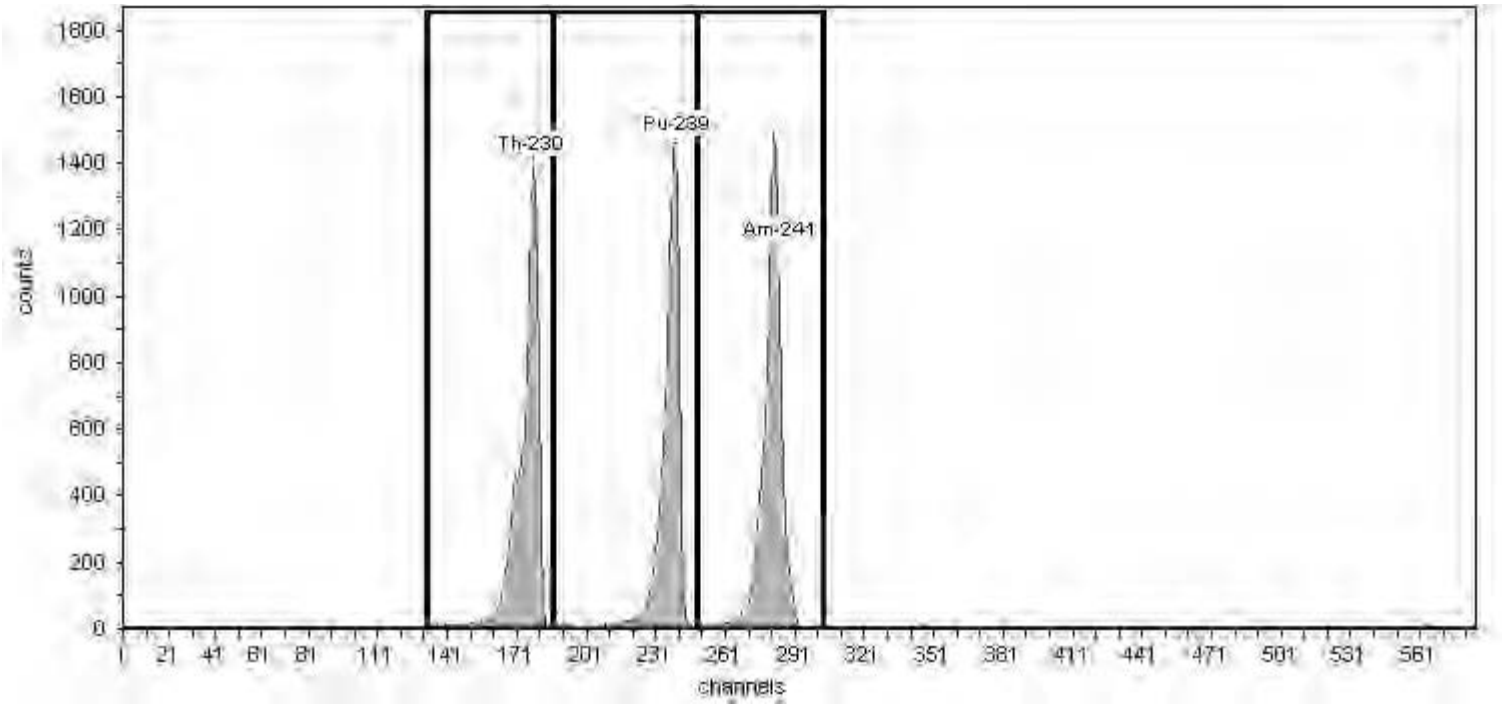
Certificate ID: 82246-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV10 , SN: 49-155N2
Acquisition Start Date: 5/14/2018 3:48:31PM
Live Time: 140.00 min.
Real Time: 140.12 min.
Efficiency: 23.49% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	11,054.00	78.96
Pu-239	240	5.16	186	249	0.00	10,563.00	75.45
Am-241	284	5.49	249	303	0.00	11,647.00	83.19

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:28:08PM 5/14/2018

Calibration

Sample Name: IC-1370619;AV15-05142018
Description:
Detector: AV15

Calibration Date: 5/14/2018 6:28:04PM
Analyst: 60040

Source Info

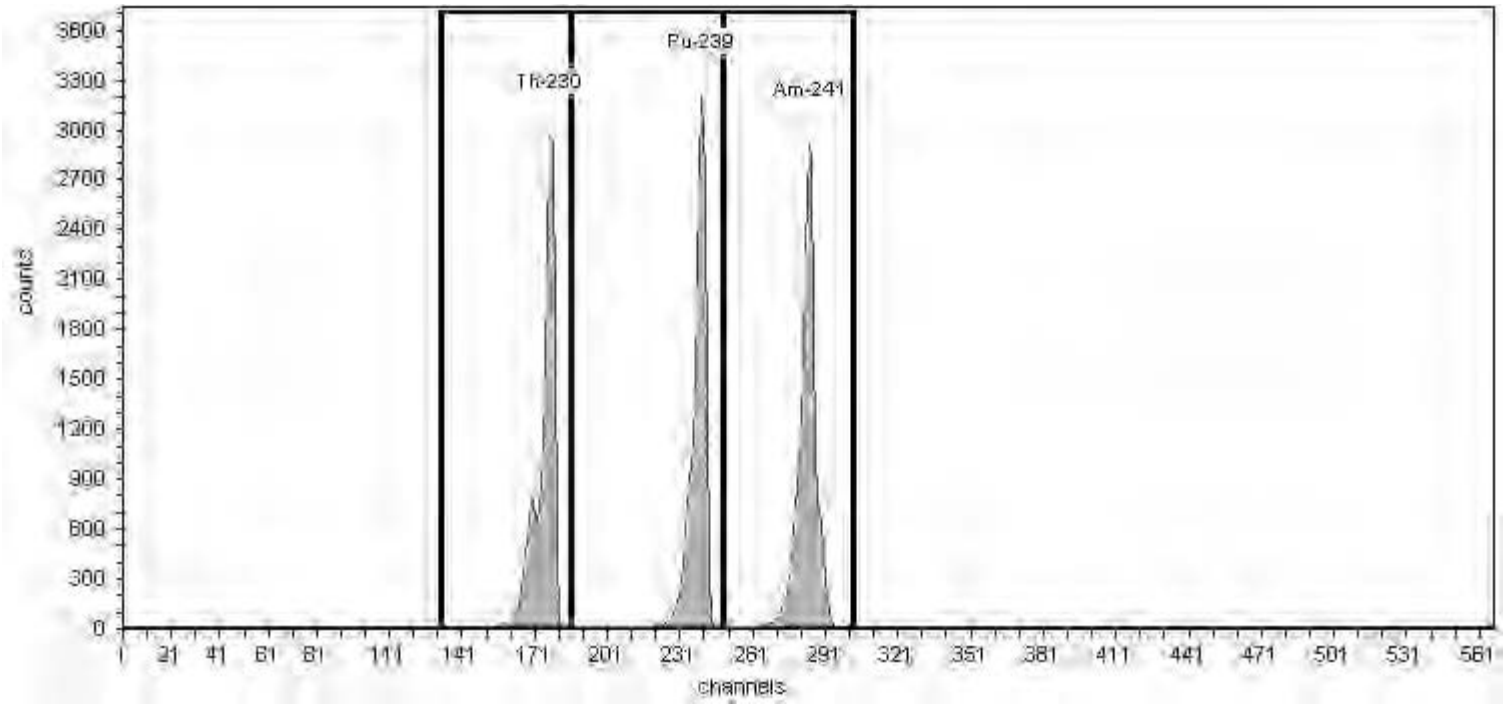
Certificate ID: 108347_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00AM
Description:

Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 5/14/2018 3:57:06PM
Live Time: 140.00 min.
Real Time: 140.13 min.
Efficiency: 27.26% +/- 0.23% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	18,686.00	133.47
Pu-239	240	5.16	186	249	0.00	18,291.00	130.65
Am-241	284	5.49	249	303	0.00	19,767.00	141.19

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:28:01PM 5/15/2018

Calibration

Sample Name: IC-8877;AV19-05142018
Description:
Detector: AV19

Calibration Date: 5/15/2018 12:27:55PM
Analyst: 60040

Source Info

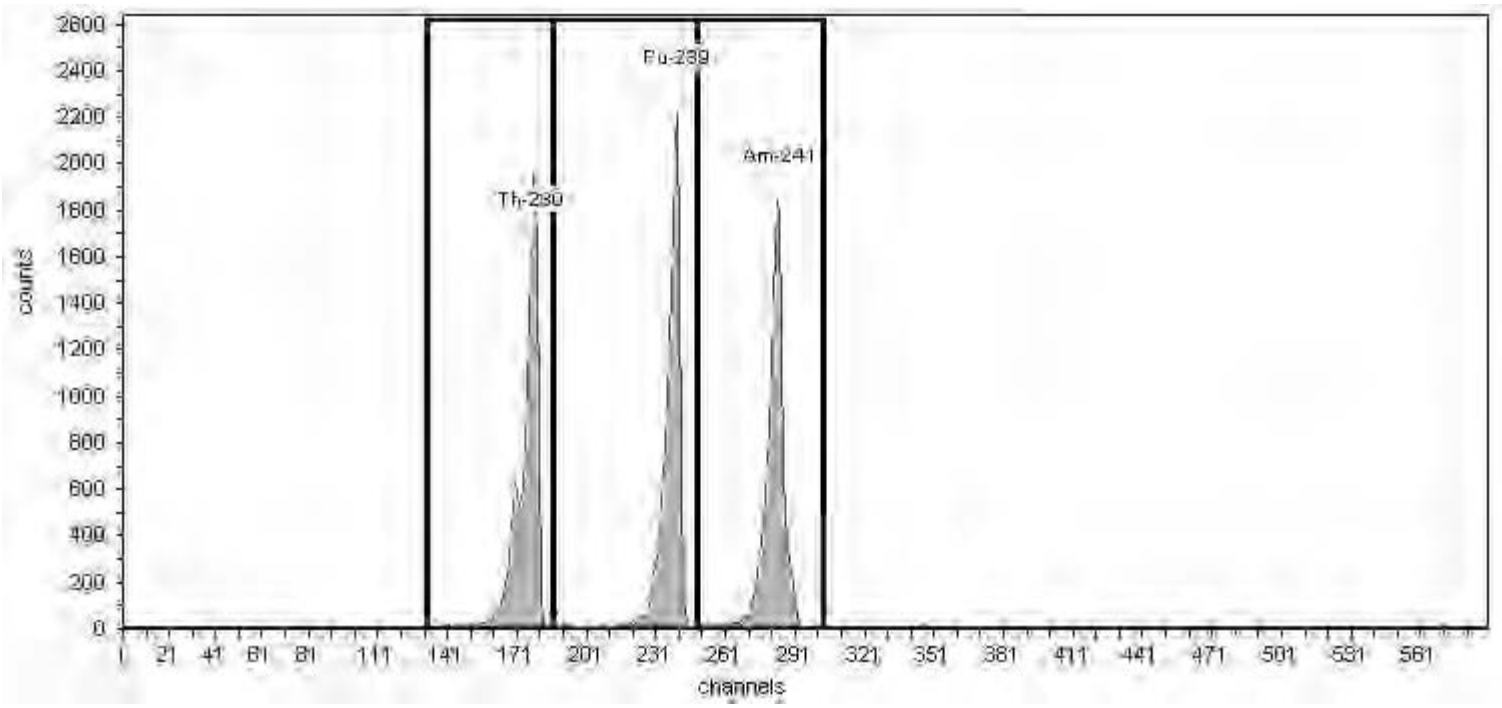
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV19 , SN: 50-025FF5
Acquisition Start Date: 5/14/2018 6:35:50PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 23.60% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	13,623.00	97.31
Pu-239	240	5.16	186	249	0.00	13,975.00	99.82
Am-241	284	5.49	249	303	0.00	13,324.00	95.17

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:28:13PM 5/15/2018

Calibration

Sample Name: IC-9520;AV20-05142018
Description:
Detector: AV20

Calibration Date: 5/15/2018 12:28:08PM
Analyst: 60040

Source Info

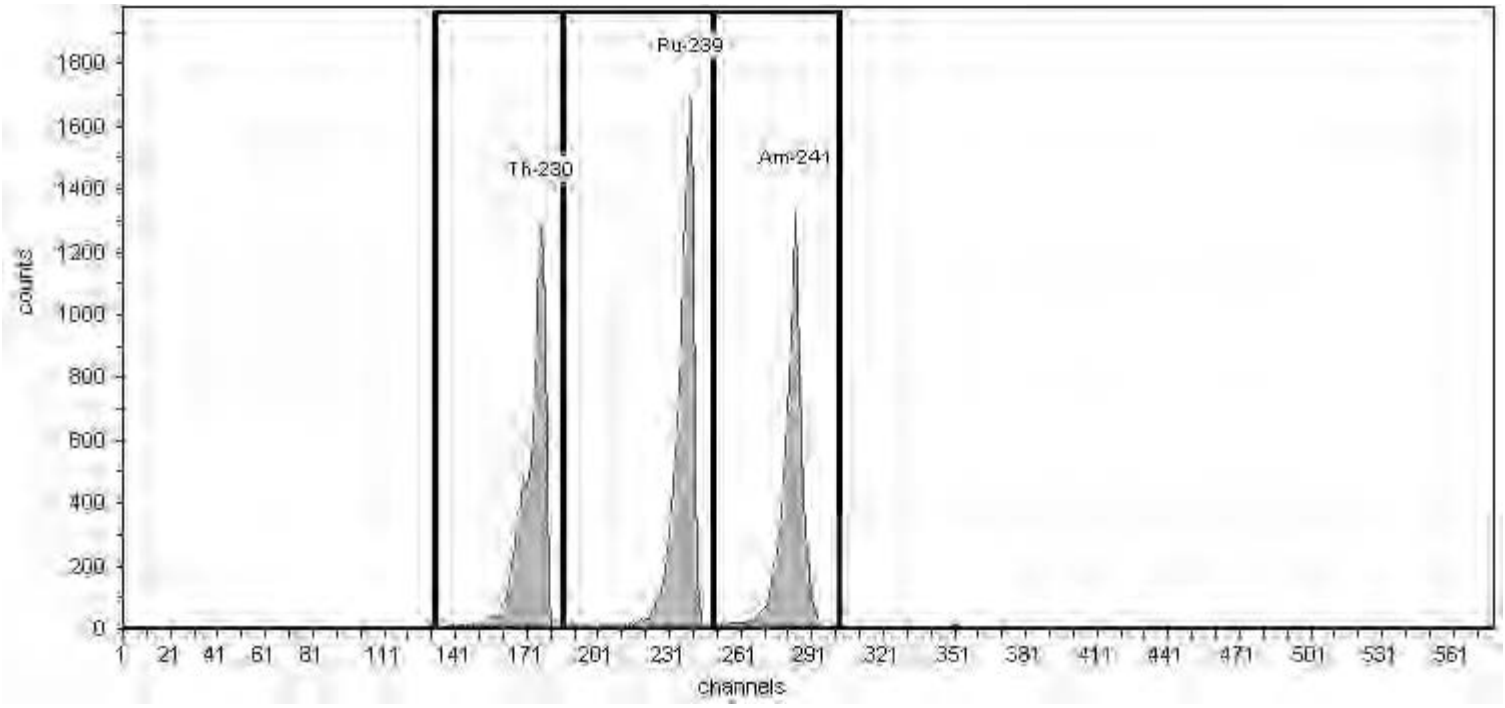
Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Acquisition

Detector: AV20 , SN: 48-121A7
Acquisition Start Date: 5/14/2018 6:36:08PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 22.15% +/- 0.32% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	10,460.00	74.71
Pu-239	240	5.16	186	249	0.00	12,682.00	90.59
Am-241	284	5.49	249	303	0.00	10,037.00	71.69

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:28:47PM 5/15/2018

Calibration

Sample Name: IC-9795;AV23-05142018
Description:
Detector: AV23

Calibration Date: 5/15/2018 12:28:43PM
Analyst: 60040

Source Info

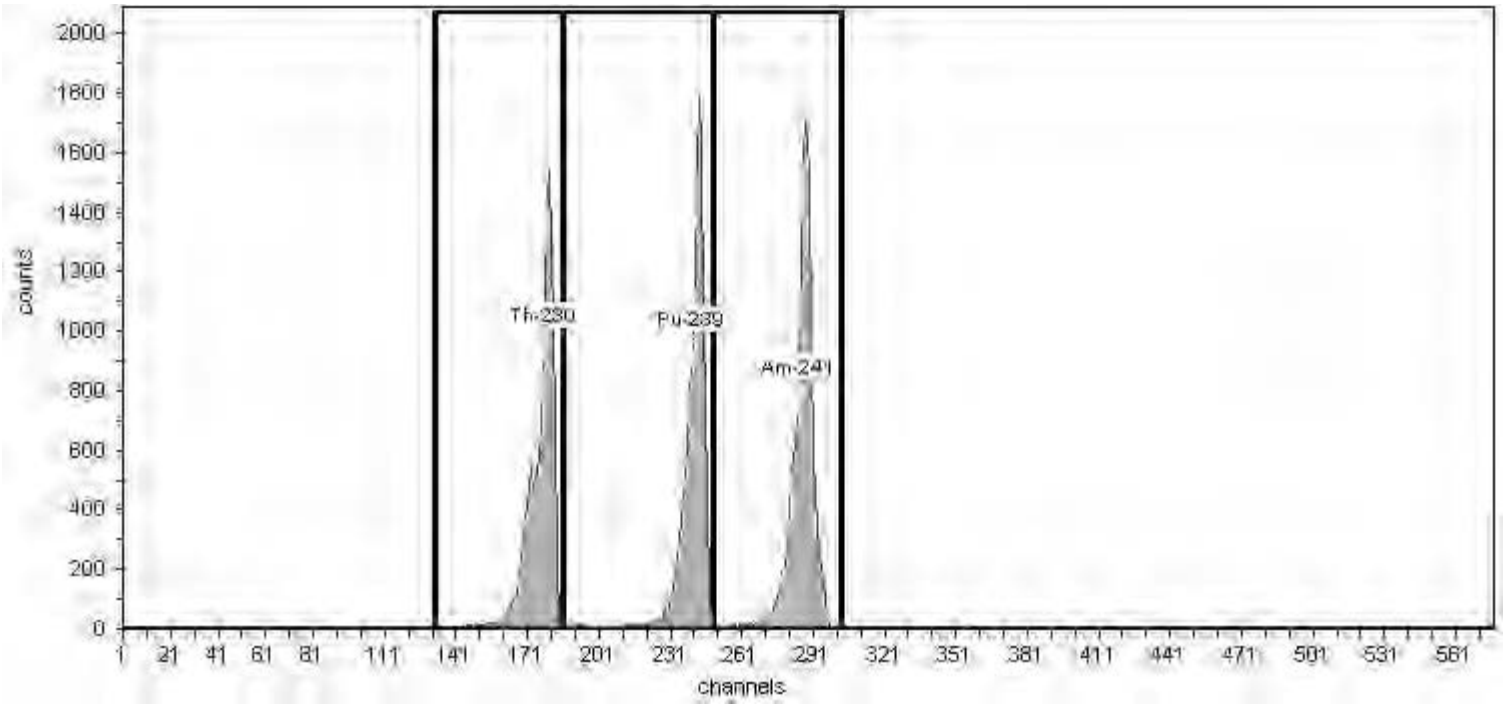
Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV23 , SN: 48-158FF3
Acquisition Start Date: 5/14/2018 6:37:31PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 24.46% +/- 0.33% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	11,962.00	85.44
Pu-239	240	5.16	186	249	0.00	12,196.00	87.11
Am-241	284	5.49	249	303	0.00	13,128.00	93.77

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:29:00PM 5/15/2018

Calibration

Sample Name: IC-9817;AV24-05142018
Description:
Detector: AV24

Calibration Date: 5/15/2018 12:28:57PM
Analyst: 60040

Source Info

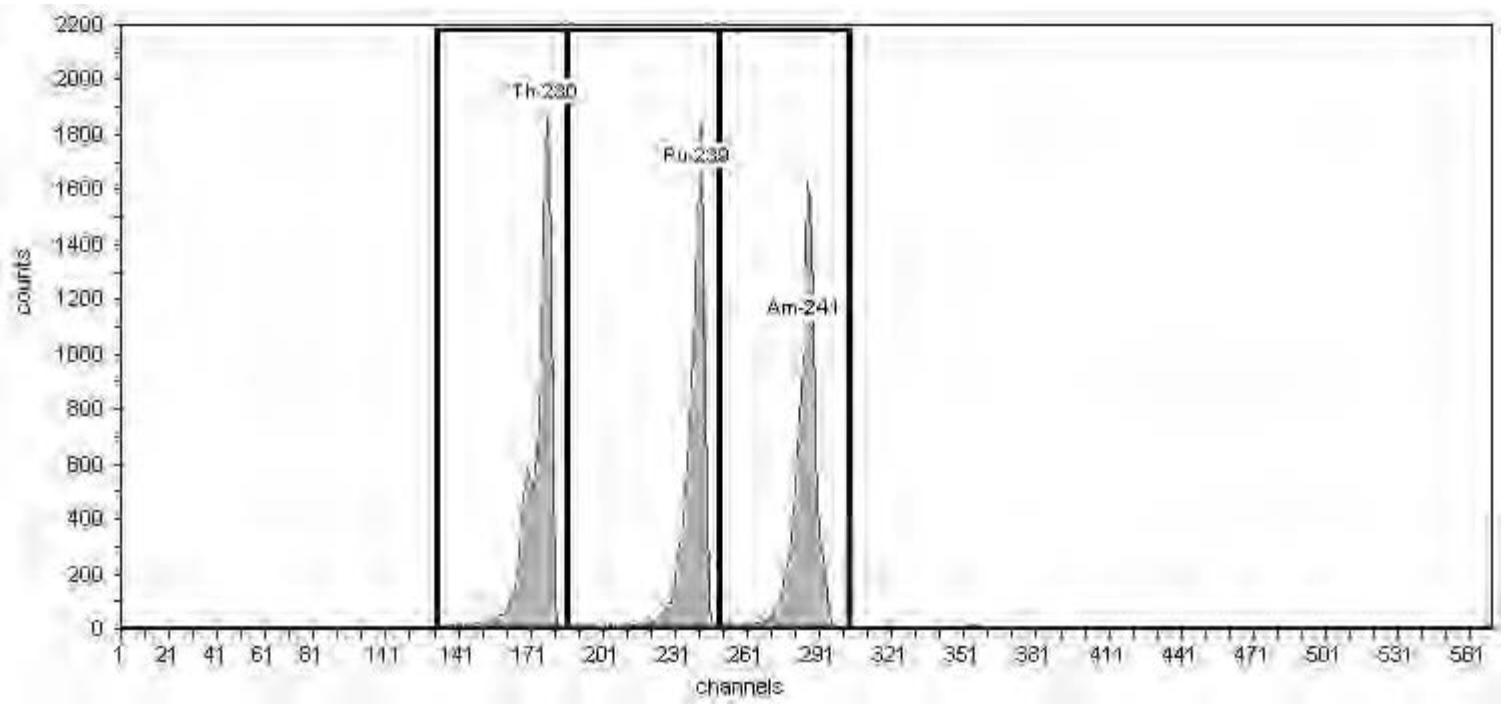
Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV24 , SN: 47-137Q4
Acquisition Start Date: 5/14/2018 6:37:42PM
Live Time: 140.00 min.
Real Time: 140.12 min.
Efficiency: 22.21% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	13,641.00	97.43
Pu-239	240	5.16	186	249	0.00	12,687.00	90.62
Am-241	284	5.49	249	303	0.00	12,649.00	90.35

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:26:31PM 5/15/2018

Calibration

Sample Name: IC-9885;AV43-05142018
Description:
Detector: AV43

Calibration Date: 5/15/2018 12:26:18PM
Analyst: 60040

Source Info

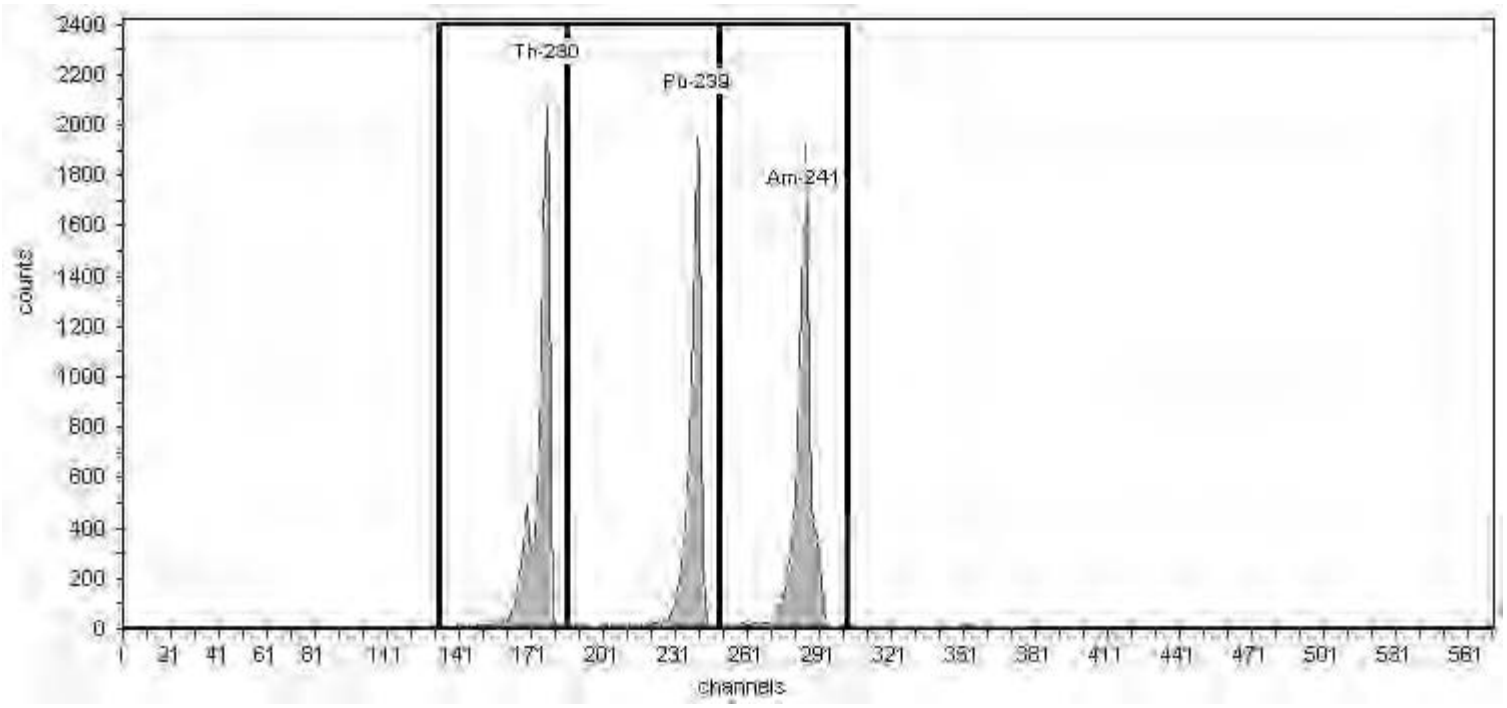
Certificate ID: 82246-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV43 , SN: 49-190X4
Acquisition Start Date: 5/14/2018 6:37:54PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 23.51% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	11,231.00	80.22
Pu-239	240	5.16	186	249	0.00	10,340.00	73.86
Am-241	284	5.49	249	303	0.00	11,727.00	83.76

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:26:54PM 5/15/2018

Calibration

Sample Name: IC-1368446;AV44-05142018
Description:
Detector: AV44

Calibration Date: 5/15/2018 12:26:50PM
Analyst: 60040

Source Info

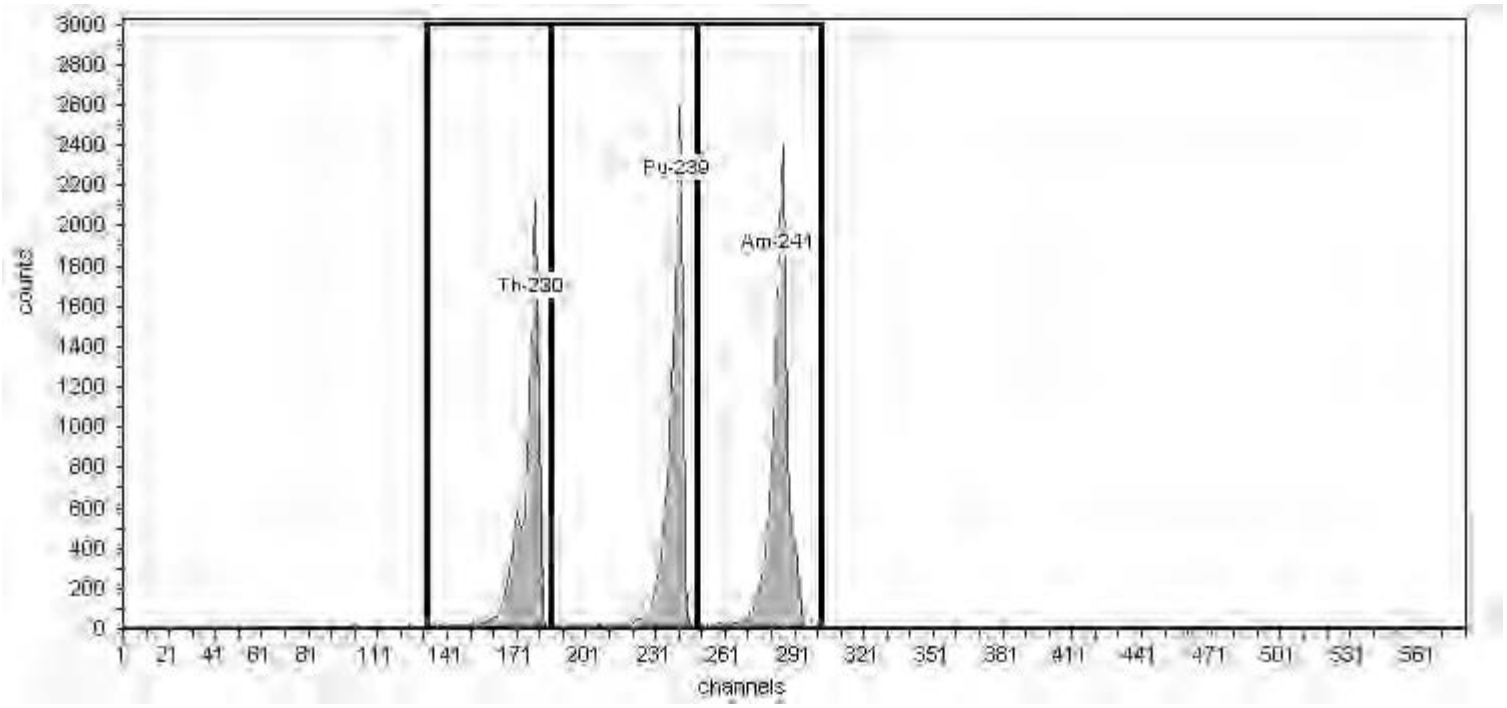
Certificate ID: 108001_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/6/2017 11:00:00AM
Description:

Acquisition

Detector: AV44 , SN: 50-051JJ1
Acquisition Start Date: 5/14/2018 6:38:43PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 27.49% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	13,858.00	98.99
Pu-239	240	5.16	186	249	0.00	15,600.00	111.43
Am-241	284	5.49	249	303	0.00	16,599.00	118.56

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:30:06PM 5/15/2018

Calibration

Sample Name: IC-1368447;AV45-05142018a
Description:
Detector: AV45

Calibration Date: 5/15/2018 12:29:34PM
Analyst: 60040

Source Info

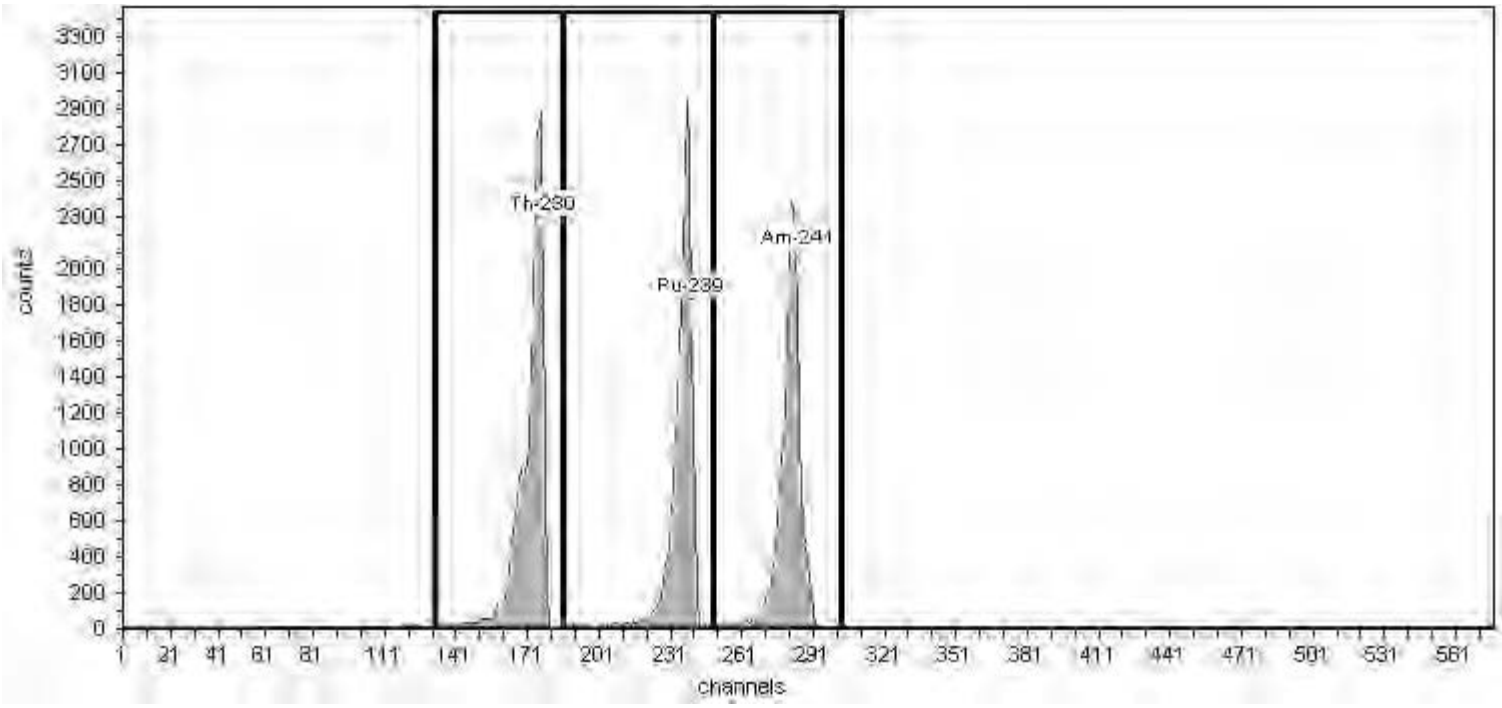
Certificate ID: 108002_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/1/2017 11:00:00AM
Description:

Acquisition

Detector: AV45 , SN: 48-158FF2
Acquisition Start Date: 5/14/2018 6:51:32PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 27.95% +/- 0.23% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	21,966.00	156.90
Pu-239	240	5.16	186	249	0.00	19,966.00	142.61
Am-241	284	5.49	249	303	0.00	19,006.00	135.76

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:27:18PM 5/15/2018

Calibration

Sample Name: IC-1370622;AV47-05142018
Description:
Detector: AV47

Calibration Date: 5/15/2018 12:27:14PM
Analyst: 60040

Source Info

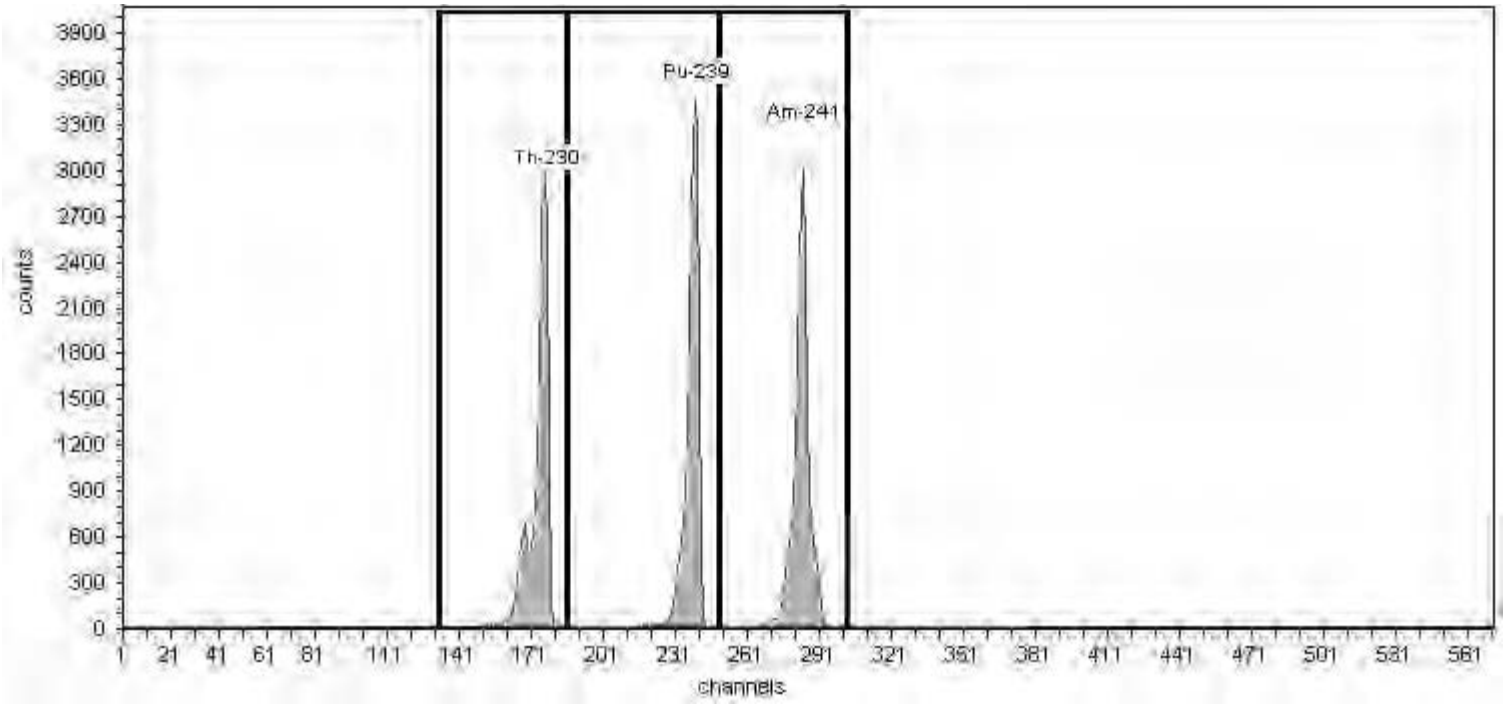
Certificate ID: 108346_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV47 , SN: 46-032336
Acquisition Start Date: 5/14/2018 6:40:15PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 27.02% +/- 0.23% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	17,177.00	122.69
Pu-239	240	5.16	186	249	0.00	17,986.00	128.47
Am-241	284	5.49	249	303	0.00	17,993.00	128.52

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:27:29PM 5/15/2018

Calibration

Sample Name: IC-1370619;AV48-05142018
Description:
Detector: AV48

Calibration Date: 5/15/2018 12:27:25PM
Analyst: 60040

Source Info

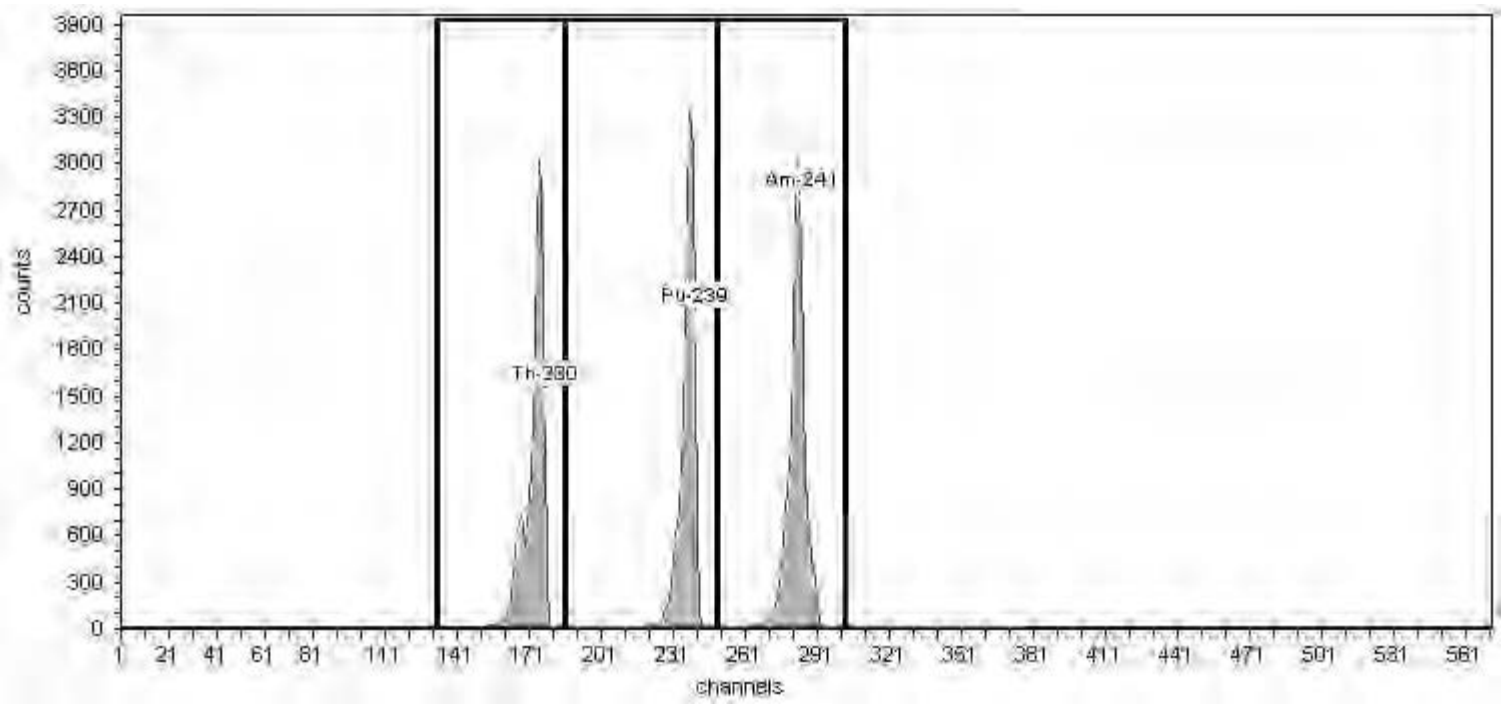
Certificate ID: 108347_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00AM
Description:

Acquisition

Detector: AV48 , SN: 46-033P6
Acquisition Start Date: 5/14/2018 6:40:17PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 27.06% +/- 0.23% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	18,367.00	131.19
Pu-239	240	5.16	186	249	0.00	18,273.00	130.52
Am-241	284	5.49	249	303	0.00	19,691.00	140.65

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:12:25PM 7/16/2018

Calibration

Sample Name: IC-1370620;AV49-05142018
Description:
Detector: AV49

Calibration Date: 5/15/2018 12:27:36PM
Analyst: 60040

Source Info

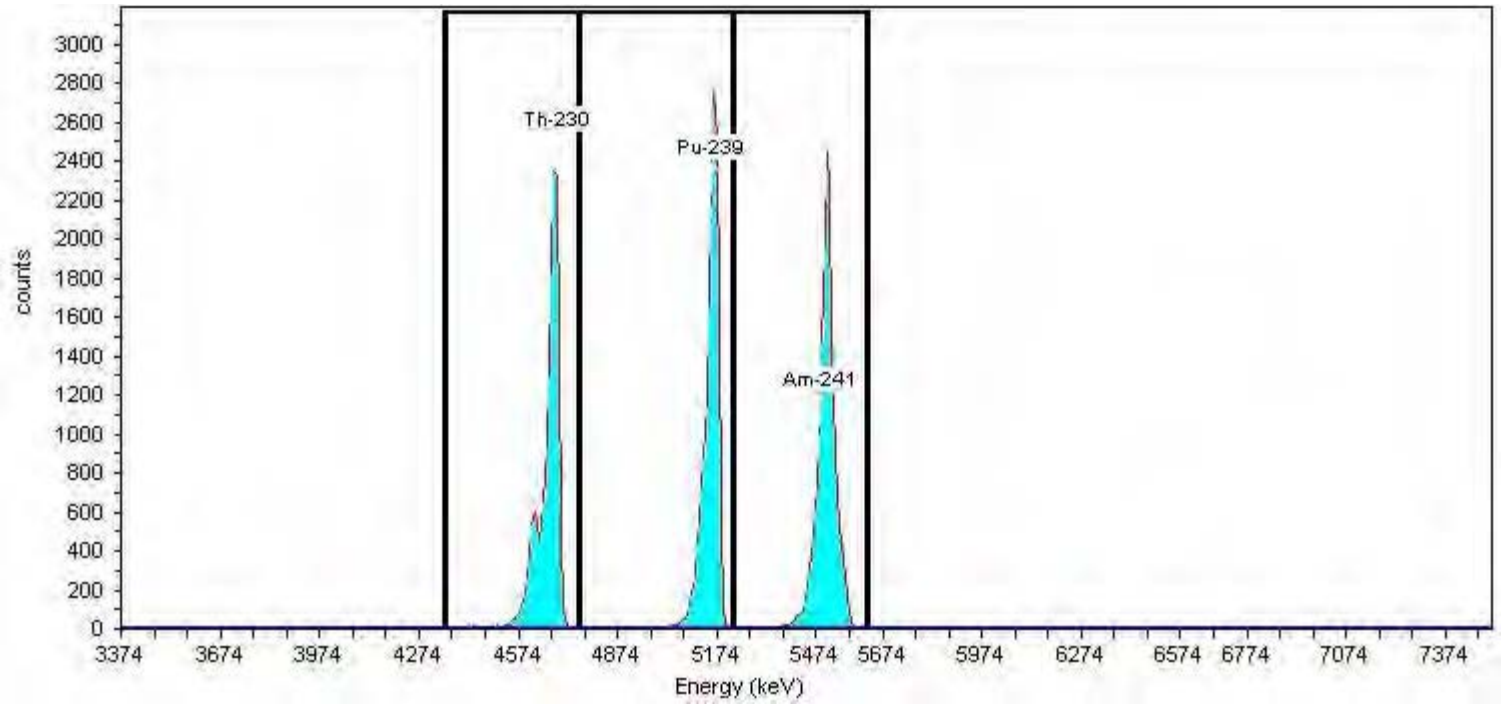
Certificate ID: 108348_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00PM
Description:

Acquisition

Detector: AV49 , SN: 47-043hh4
Acquisition Start Date: 5/14/2018 6:41:18PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 26.27% +/- 0.24% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	15,182.00	108.44
Pu-239	240	5.16	186	249	0.00	15,886.00	113.47
Am-241	284	5.49	249	303	0.00	16,440.00	117.43

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:36:55PM 5/15/2018

Calibration

Sample Name: IC-8877;AV52-05152018
Description:
Detector: AV52

Calibration Date: 5/15/2018 3:36:50PM
Analyst: 60040

Source Info

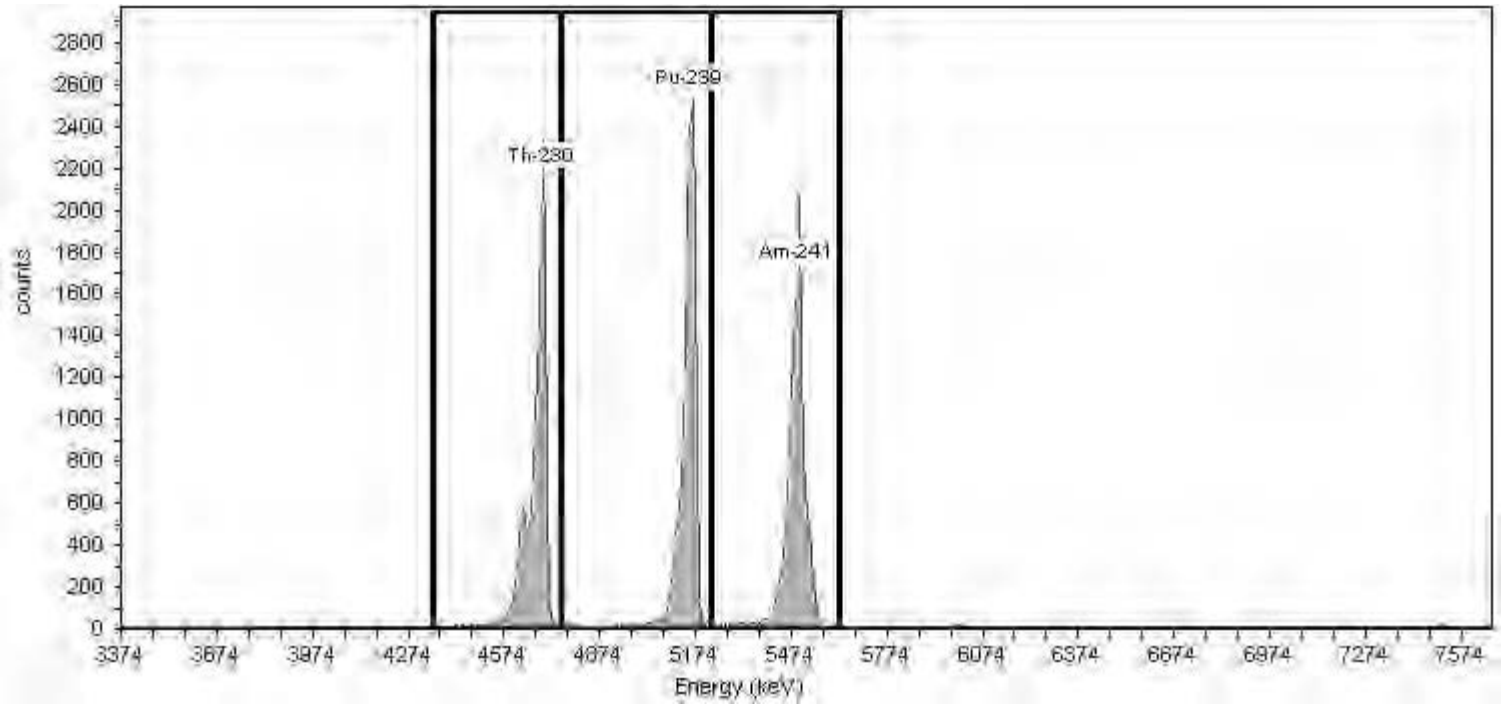
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV52 , SN: 49-155N7
Acquisition Start Date: 5/15/2018 12:36:54PM
Live Time: 140.00 min.
Real Time: 140.10 min.
Efficiency: 24.50% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	14,001.00	100.01
Pu-239	240	5.16	186	249	0.00	14,612.00	104.37
Am-241	284	5.49	249	303	0.00	13,904.00	99.31

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:37:14PM 5/15/2018

Calibration

Sample Name: IC-9520;AV53-05152018
Description:
Detector: AV53

Calibration Date: 5/15/2018 3:37:10PM
Analyst: 60040

Source Info

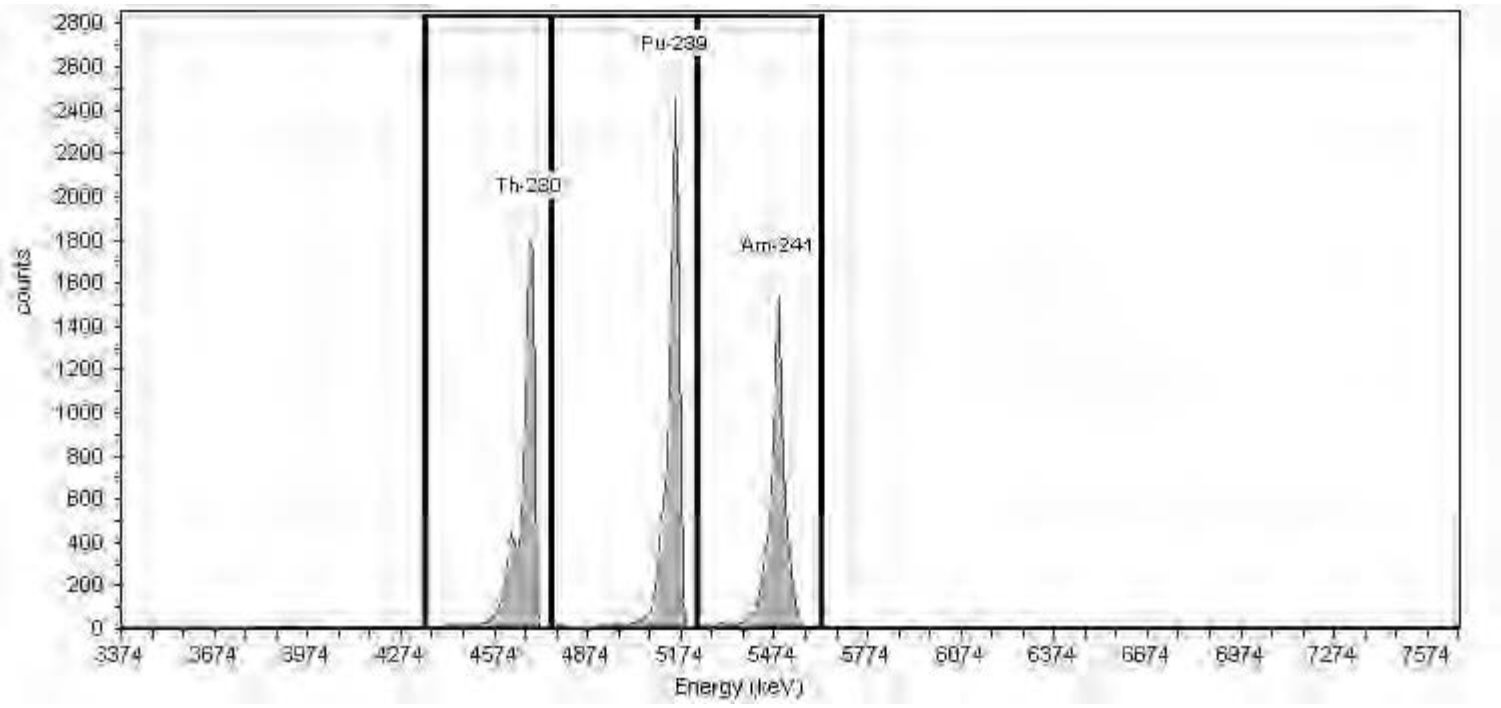
Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Acquisition

Detector: AV53 , SN: 50-051A6
Acquisition Start Date: 5/15/2018 12:37:17PM
Live Time: 140.00 min.
Real Time: 140.10 min.
Efficiency: 23.27% +/- 0.33% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	11,020.00	78.71
Pu-239	240	5.16	186	249	0.00	13,301.00	95.01
Am-241	284	5.49	249	303	0.00	10,530.00	75.21

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:38:02PM 5/15/2018

Calibration

Sample Name: IC-9792;AV54-05152018
Description:
Detector: AV54

Calibration Date: 5/15/2018 3:37:57PM
Analyst: 60040

Source Info

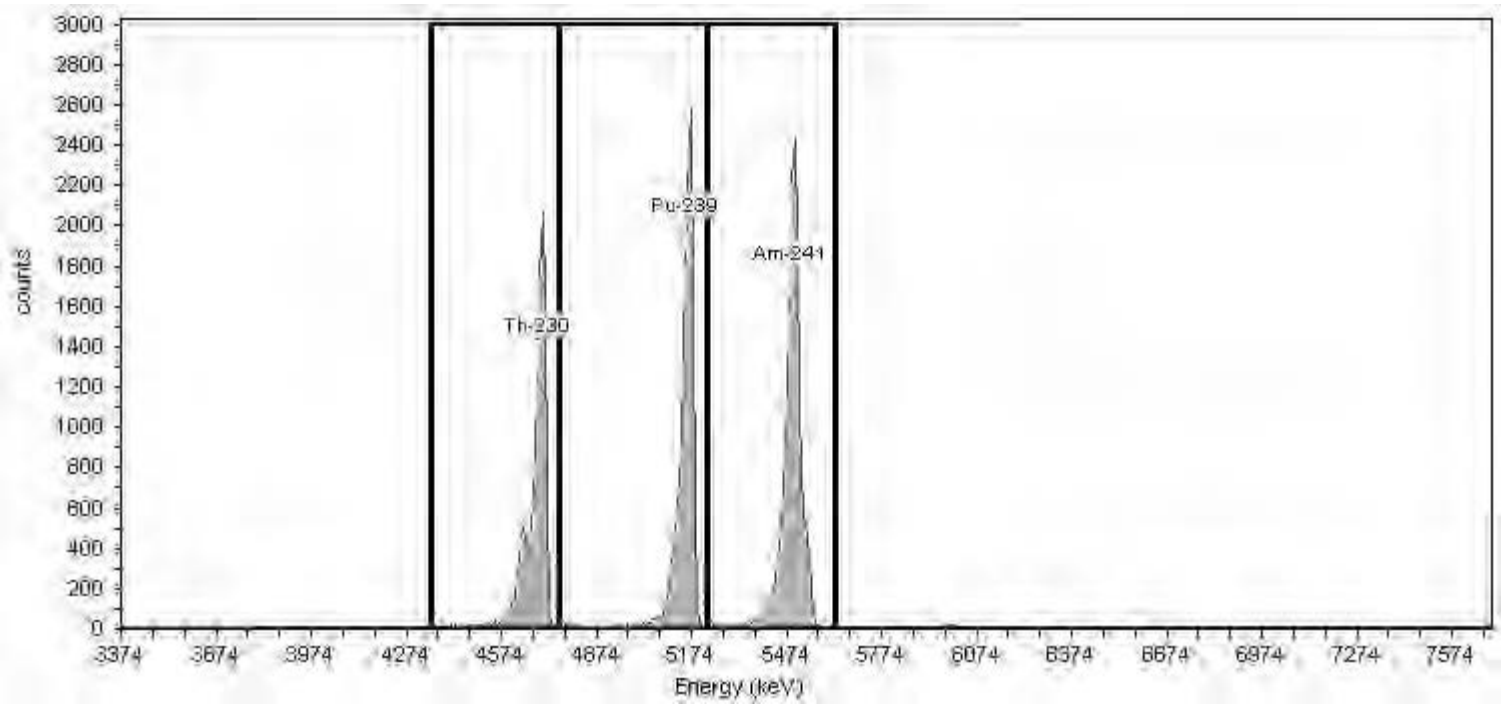
Certificate ID: 82240-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV54 , SN: 46-033P4
Acquisition Start Date: 5/15/2018 12:37:33PM
Live Time: 140.00 min.
Real Time: 140.10 min.
Efficiency: 23.62% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	12,363.00	88.31
Pu-239	240	5.16	186	249	0.00	14,261.00	101.86
Am-241	284	5.49	249	303	0.00	16,341.00	116.72

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:38:34PM 5/15/2018

Calibration

Sample Name: IC-9795;AV56-05152018
Description:
Detector: AV56

Calibration Date: 5/15/2018 3:38:31PM
Analyst: 60040

Source Info

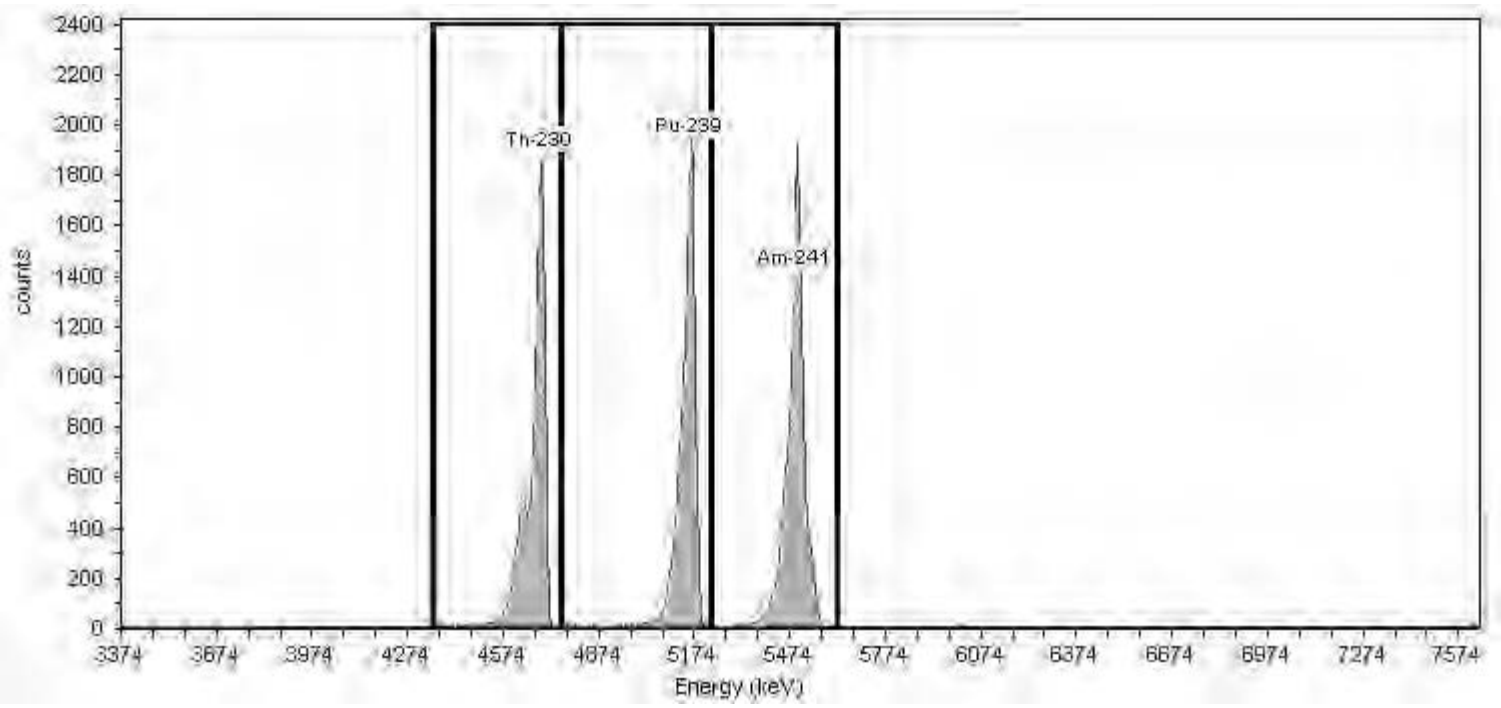
Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV56 , SN: 52-059EE5
Acquisition Start Date: 5/15/2018 12:38:26PM
Live Time: 140.00 min.
Real Time: 140.10 min.
Efficiency: 25.25% +/- 0.34% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	12,377.00	88.41
Pu-239	240	5.16	186	249	0.00	12,528.00	89.49
Am-241	284	5.49	249	303	0.00	13,590.00	97.07

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:38:46PM 5/15/2018

Calibration

Sample Name: IC-9817;AV57-05152018
Description:
Detector: AV57

Calibration Date: 5/15/2018 3:38:42PM
Analyst: 60040

Source Info

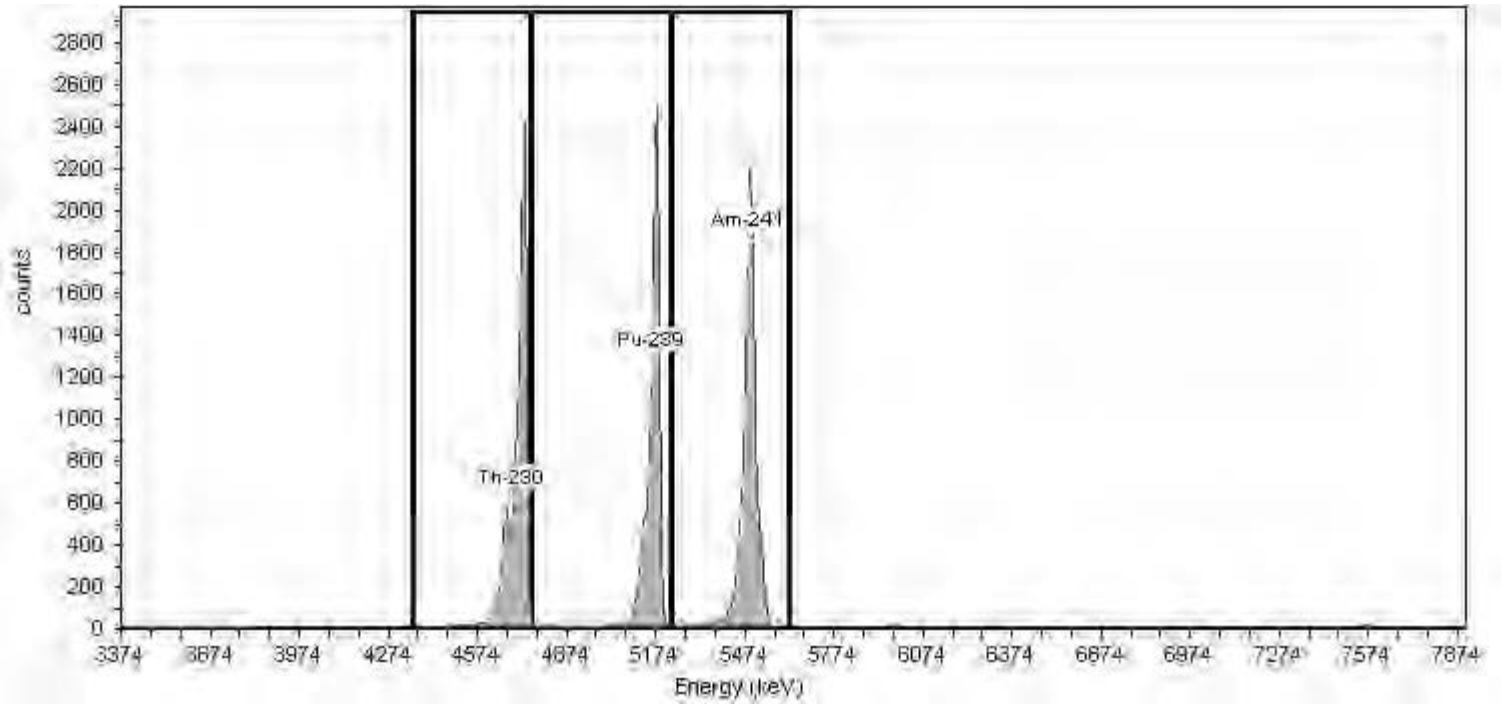
Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV57 , SN: 48-158EE3
Acquisition Start Date: 5/15/2018 12:38:54PM
Live Time: 140.00 min.
Real Time: 140.10 min.
Efficiency: 22.40% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	13,874.00	99.10
Pu-239	240	5.16	186	249	0.00	12,635.00	90.25
Am-241	284	5.49	249	303	0.00	12,789.00	91.35

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:38:59PM 5/15/2018

Calibration

Sample Name: IC-9885;AV58-05152018
Description:
Detector: AV58

Calibration Date: 5/15/2018 3:38:55PM
Analyst: 60040

Source Info

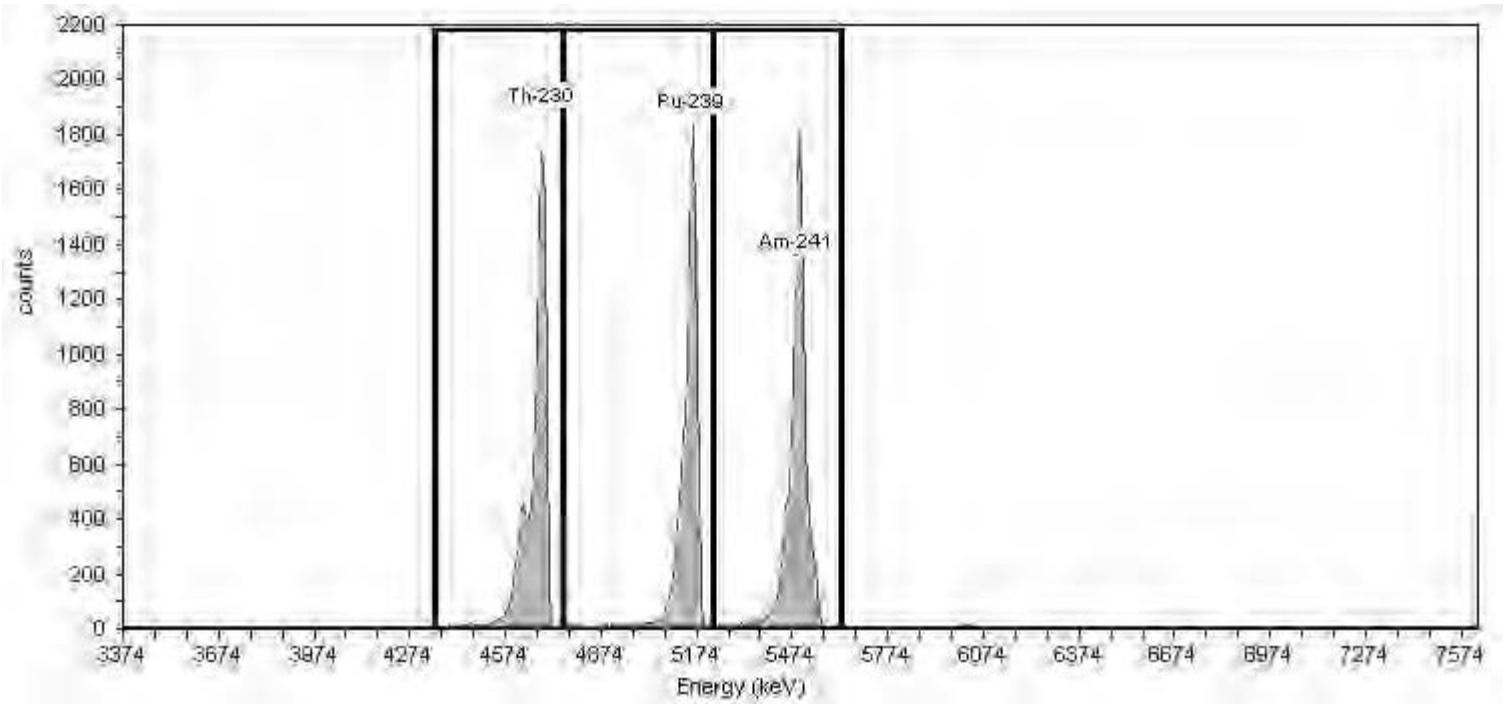
Certificate ID: 82246-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV58 , SN: 52-102 C5
Acquisition Start Date: 5/15/2018 12:39:21PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 24.05% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	11,232.00	80.23
Pu-239	240	5.16	186	249	0.00	10,843.00	77.45
Am-241	284	5.49	249	303	0.00	11,976.00	85.54

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:39:10PM 5/15/2018

Calibration

Sample Name: IC-1368446;AV60-05152018
Description:
Detector: AV60

Calibration Date: 5/15/2018 3:39:06PM
Analyst: 60040

Source Info

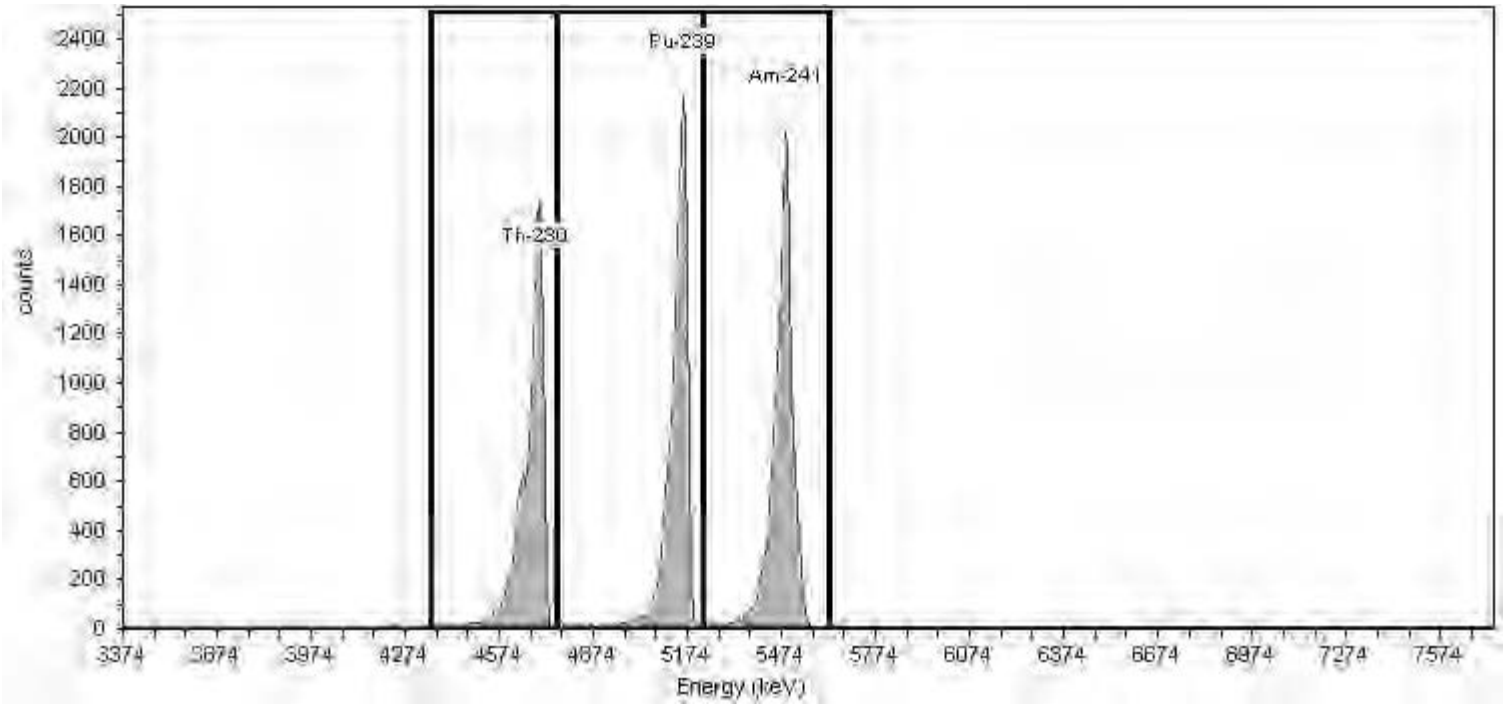
Certificate ID: 108001_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/6/2017 11:00:00AM
Description:

Acquisition

Detector: AV60 , SN: 49-027117
Acquisition Start Date: 5/15/2018 12:39:39PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 28.28% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	14,250.00	101.79
Pu-239	240	5.16	186	249	0.00	16,170.00	115.50
Am-241	284	5.49	249	303	0.00	16,975.00	121.25

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:39:25PM 5/15/2018

Calibration

Sample Name: IC-1368447;AV62-05152018
Description:
Detector: AV62

Calibration Date: 5/15/2018 3:39:22PM
Analyst: 60040

Source Info

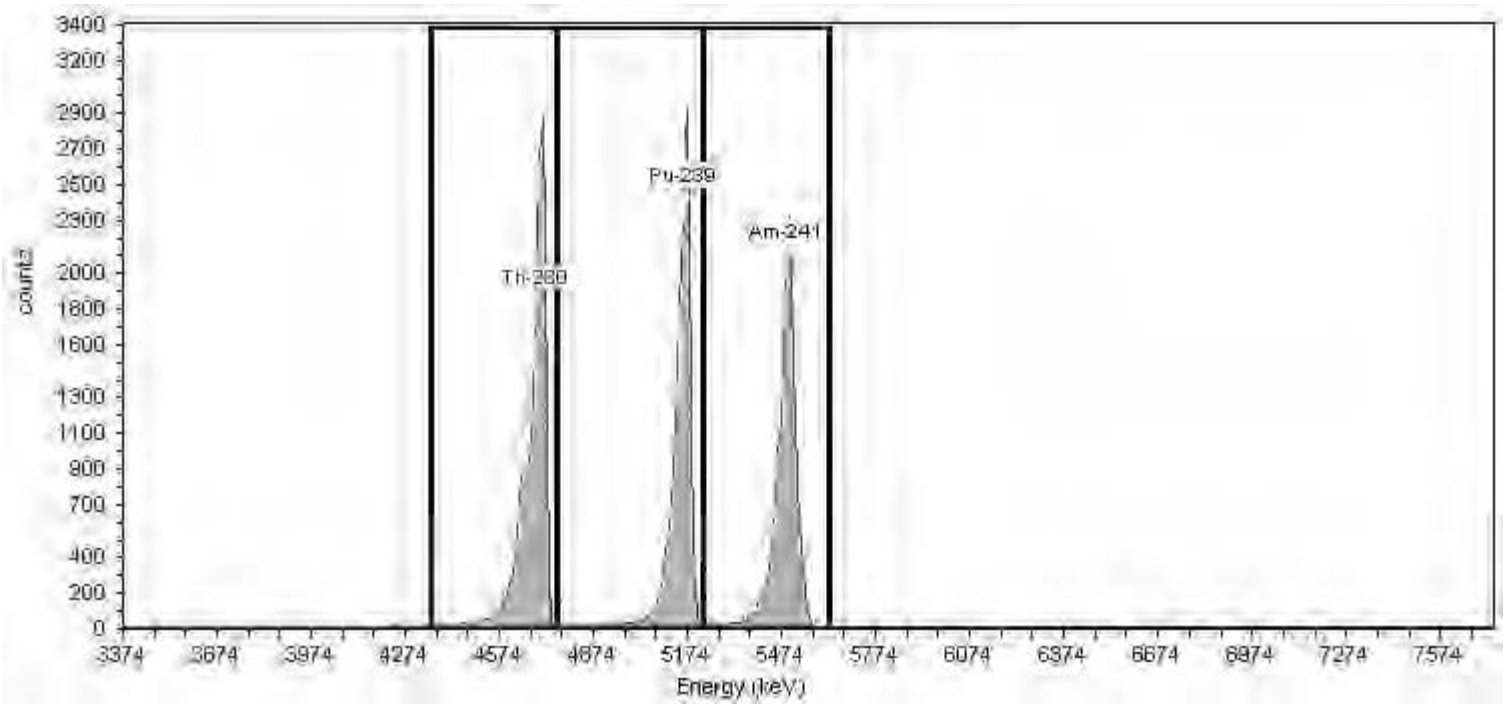
Certificate ID: 108002_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/1/2017 11:00:00AM
Description:

Acquisition

Detector: AV62 , SN: 52-060FF2
Acquisition Start Date: 5/15/2018 12:40:11PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 28.40% +/- 0.23% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	22,234.00	158.81
Pu-239	240	5.16	186	249	0.00	20,494.00	146.39
Am-241	284	5.49	249	303	0.00	19,202.00	137.16

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:13:38PM 7/16/2018

Calibration

Sample Name: IC-8874;AV69-05152018
Description:
Detector: AV69

Calibration Date: 5/15/2018 6:39:25PM
Analyst: 60040

Source Info

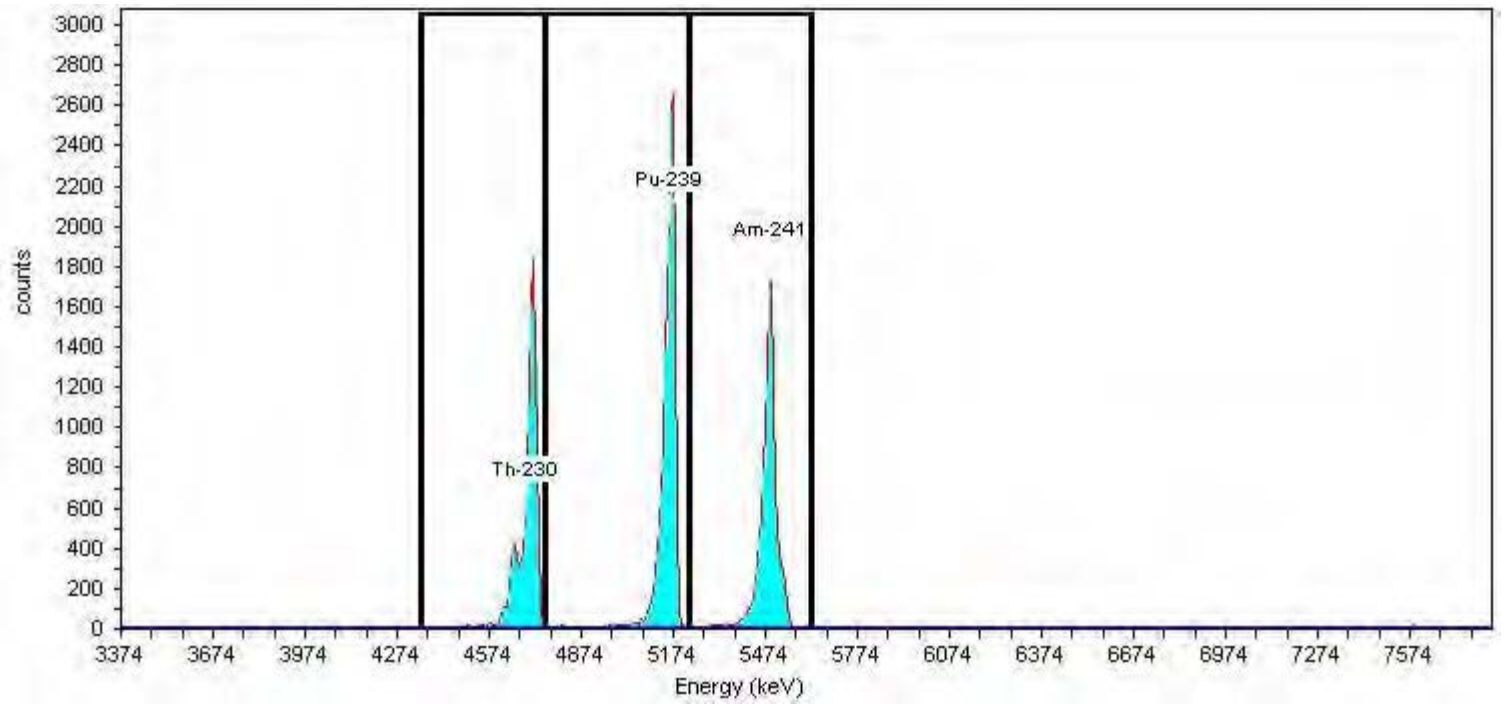
Certificate ID: 82233-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV69 , SN: 49-155DD5
Acquisition Start Date: 5/15/2018 3:45:35PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 26.43% +/- 0.38% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	10,543.00	75.31
Pu-239	240	5.16	186	249	0.00	14,132.00	100.94
Am-241	284	5.49	249	303	0.00	10,999.00	78.56

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:36:28PM 5/15/2018

Calibration

Sample Name: IC-8877;AV70-05152018
Description:
Detector: AV70

Calibration Date: 5/15/2018 6:36:23PM
Analyst: 60040

Source Info

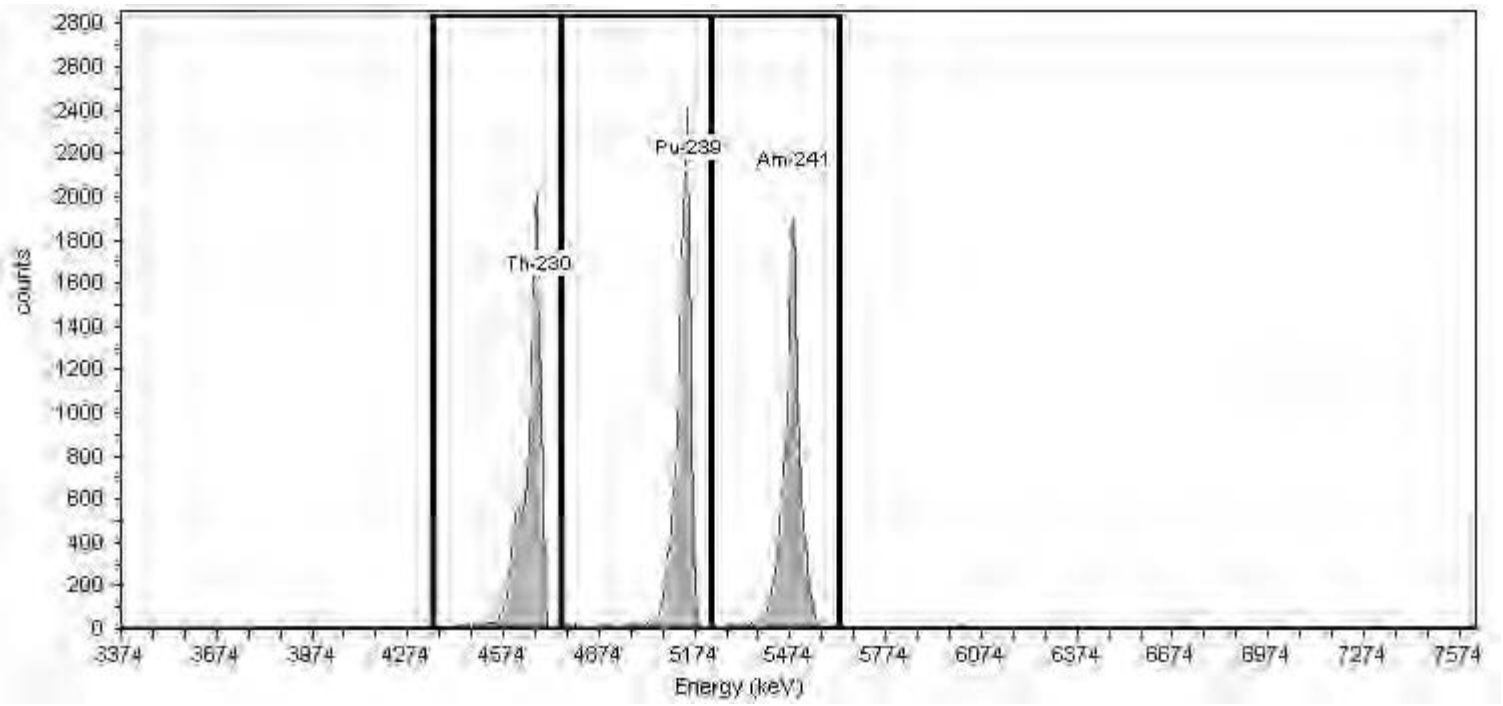
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV70 , SN: 48-158FF1
Acquisition Start Date: 5/15/2018 3:45:50PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 24.40% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	13,992.00	99.94
Pu-239	240	5.16	186	249	0.00	14,576.00	104.11
Am-241	284	5.49	249	303	0.00	13,770.00	98.36

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:36:43PM 5/15/2018

Calibration

Sample Name: IC-9520;AV71-05152018
Description:
Detector: AV71

Calibration Date: 5/15/2018 6:36:40PM
Analyst: 60040

Source Info

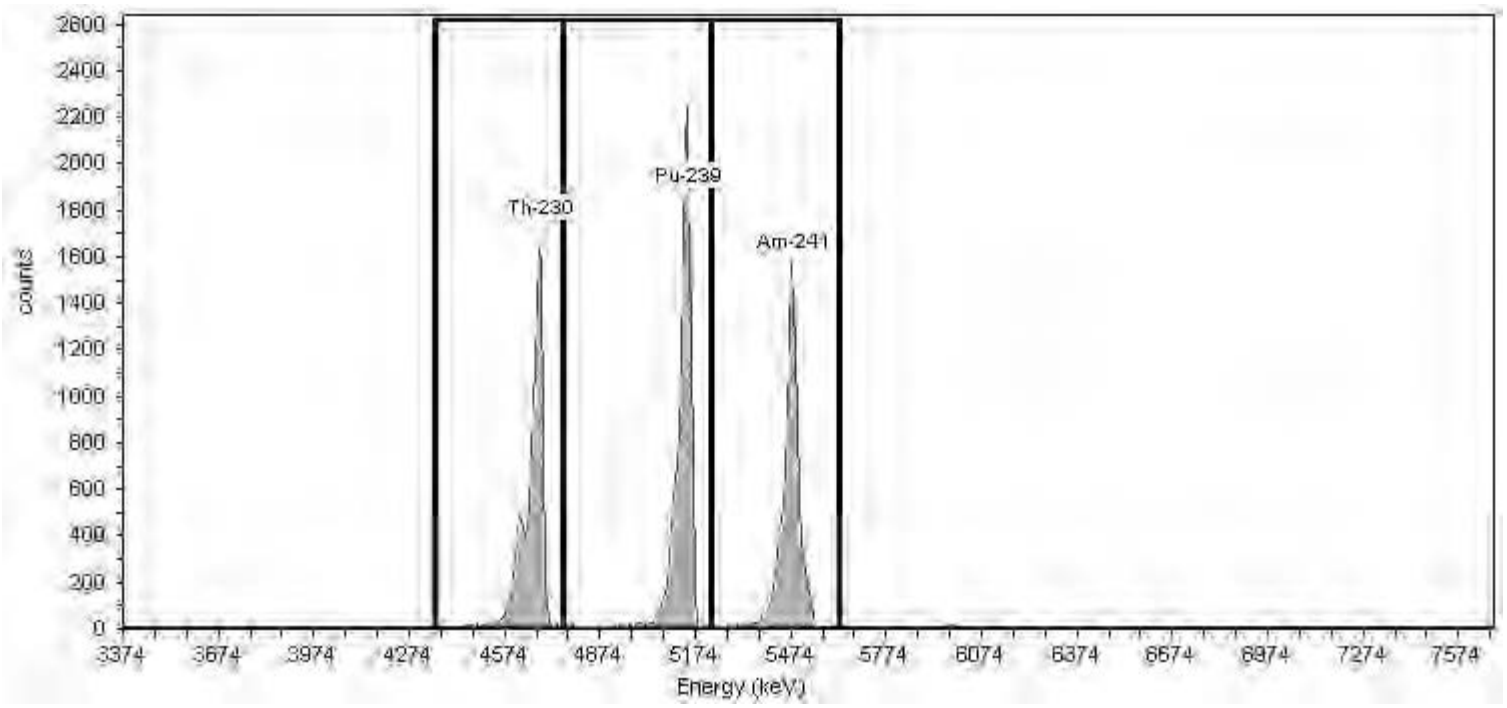
Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Acquisition

Detector: AV71 , SN: 48-158EE6
Acquisition Start Date: 5/15/2018 3:46:14PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 23.00% +/- 0.33% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	10,904.00	77.89
Pu-239	240	5.16	186	249	0.00	13,002.00	92.87
Am-241	284	5.49	249	303	0.00	10,526.00	75.19

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:36:54PM 5/15/2018

Calibration

Sample Name: IC-9792;AV72-05152018
Description:
Detector: AV72

Calibration Date: 5/15/2018 6:36:51PM
Analyst: 60040

Source Info

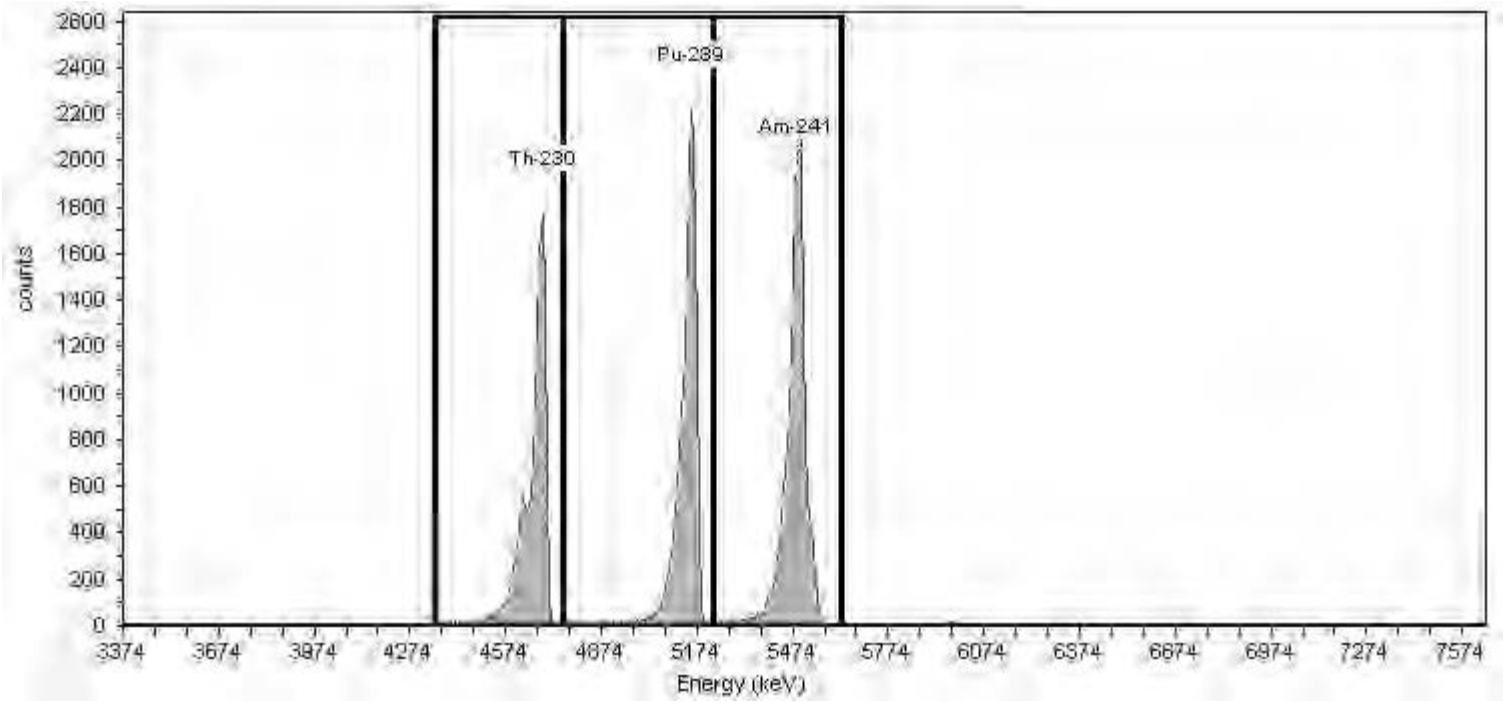
Certificate ID: 82240-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV72 , SN: 48-05a21
Acquisition Start Date: 5/15/2018 3:46:37PM
Live Time: 140.00 min.
Real Time: 140.11 min.
Efficiency: 24.58% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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	12,917.00	92.26
Pu-239	240	5.16	186	249	0.00	14,959.00	106.85
Am-241	284	5.49	249	303	0.00	16,853.00	120.38

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:16:41PM 11/13/2017

Calibration

Sample Name: IC-8876;AV165-20171113
Description:
Detector: AV165

Analyst: 60040
Analysis Date: 11/13/2017 3:16:40PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82235-334
Prepared by: Analytics
Description:

Certification Date: 6/4/2010 12:00:00PM

Acquisition

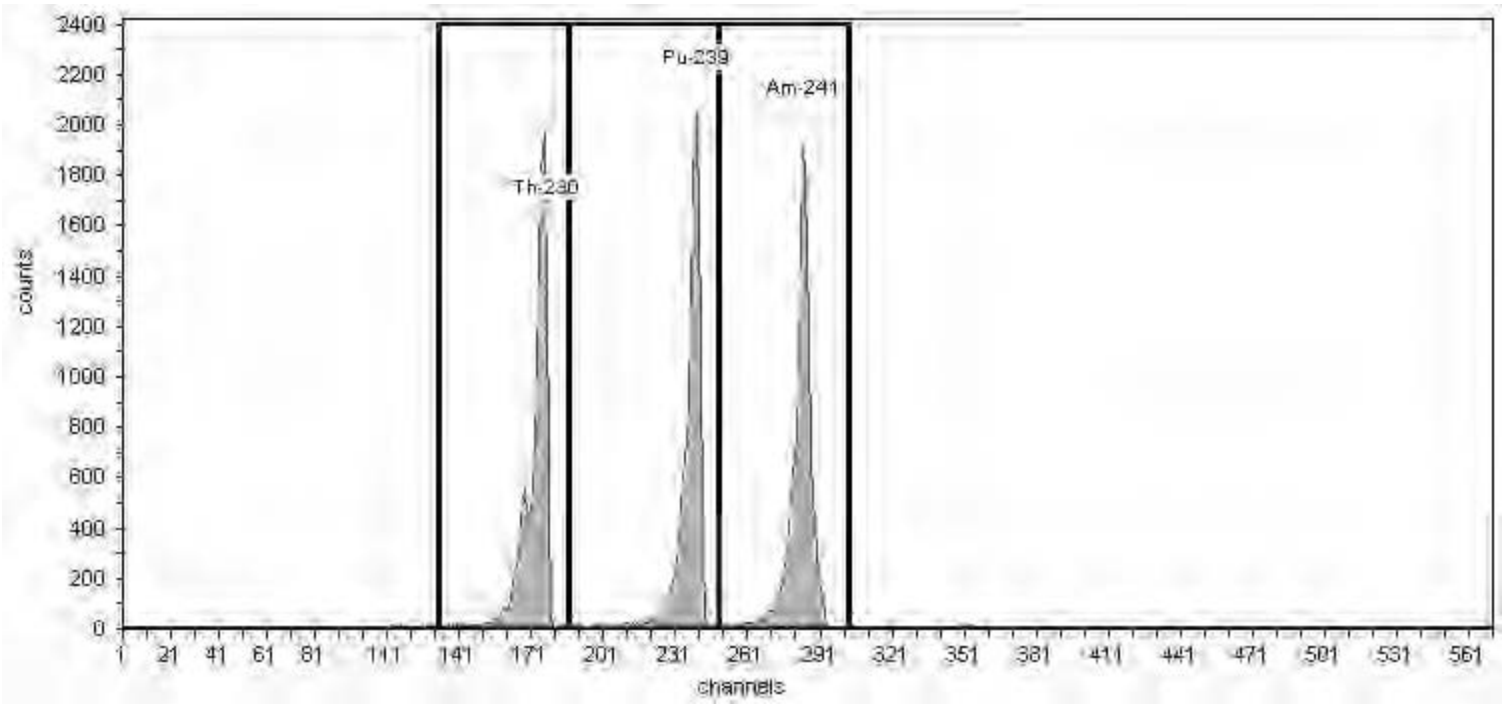
Detector: AV165 , SN: 50-112F7
Acquisition Start Date: 11/13/2017 12:45:39PM

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 / Ch^2

Efficiency Calibration Name: IC-8876;AV165-20171113

Efficiency: 21.77% +/- 0.27% 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	34.19	13,159.00	93.99
Pu-239	240	5,155.40	186	249	35.54	12,788.00	91.34
Am-241	284	5,485.70	249	303	34.53	13,291.00	94.94

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:16:46PM 11/13/2017

Calibration

Sample Name: IC-8877;AV166-20171113
Description:
Detector: AV166

Analyst: 60040
Analysis Date: 11/13/2017 3:16:45PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82236-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

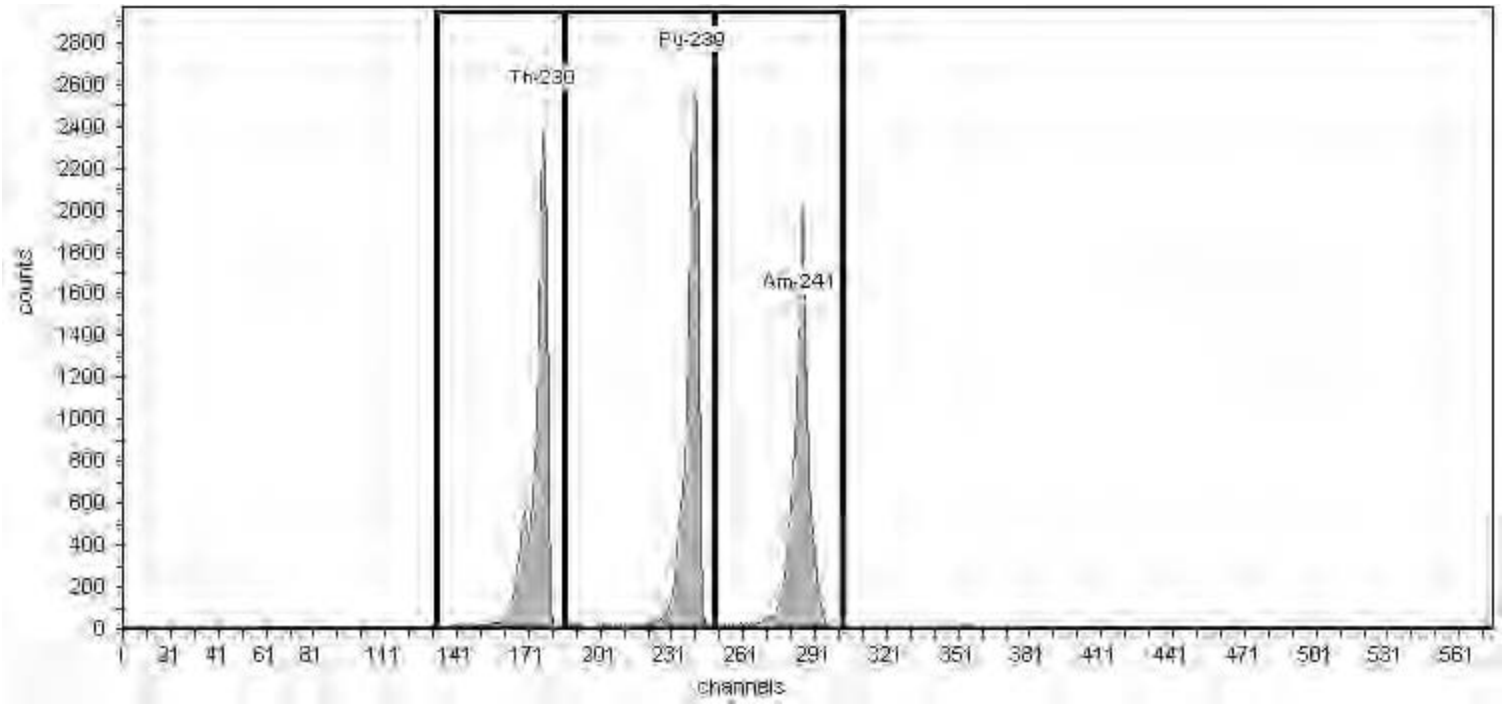
Detector: AV166 , SN: 50-112 G1
Acquisition Start Date: 11/13/2017 12:45:58PM

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 / Ch^2

Efficiency Calibration Name: IC-8877;AV166-20171113

Efficiency: 24.28% +/- 0.30% 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	29.87	14,028.00	100.20
Pu-239	240	5,155.40	186	249	33.89	14,721.00	105.15
Am-241	284	5,485.70	249	303	34.76	13,451.00	96.08

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:16:52PM 11/13/2017

Calibration

Sample Name: IC-9520;AV167-20171113
Description:
Detector: AV167

Analyst: 60040
Analysis Date: 11/13/2017 3:16:50PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82237-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

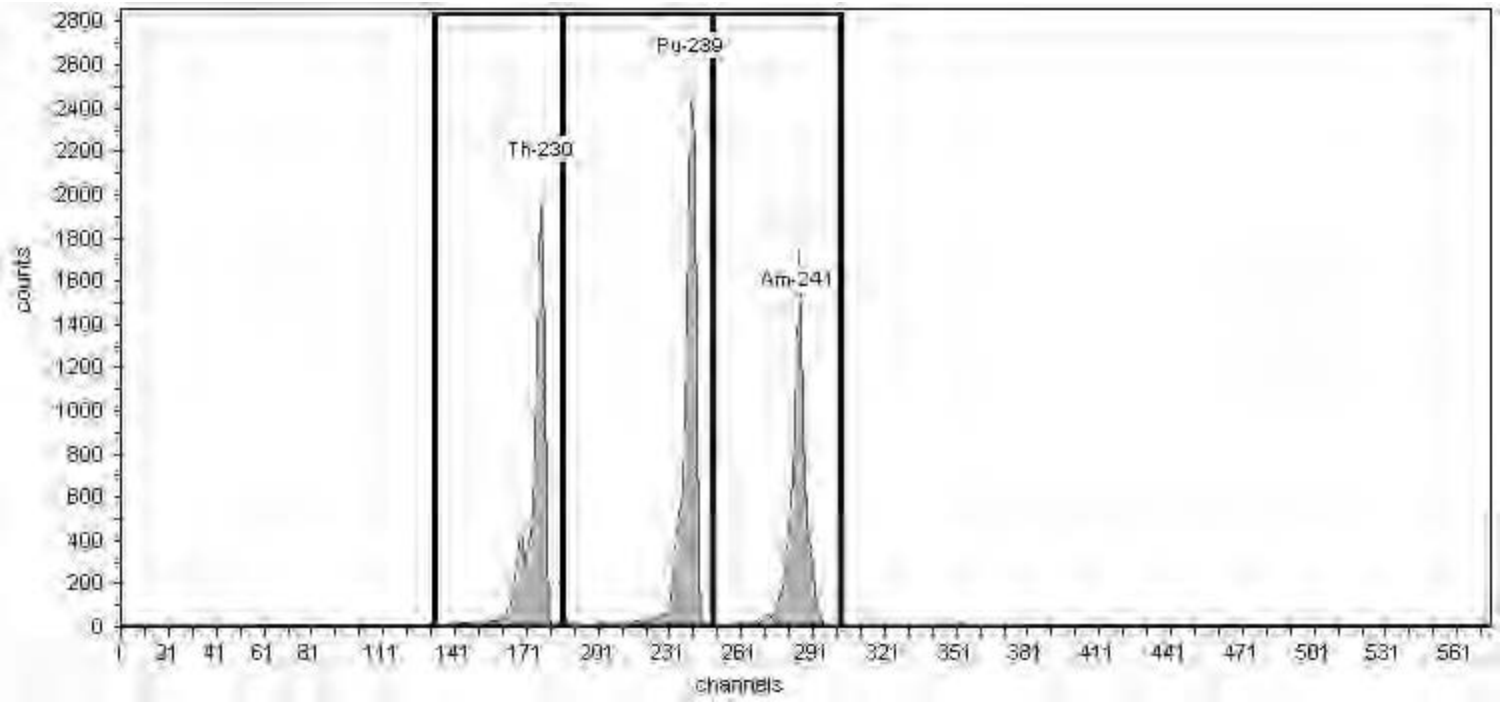
Detector: AV167 , SN: 50-112 G3
Acquisition Start Date: 11/13/2017 12:46:16PM

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 / Ch^2

Efficiency Calibration Name: IC-9520;AV167-20171113

Efficiency: 22.92% +/- 0.33% 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	28.63	10,808.00	77.20
Pu-239	240	5,155.40	186	249	31.39	13,087.00	93.48
Am-241	284	5,485.70	249	303	29.96	10,447.00	74.62

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:17:09PM 11/13/2017

Calibration

Sample Name: IC-9793;AV170-20171113
Description:
Detector: AV170

Analyst: 60040
Analysis Date: 11/13/2017 3:17:08PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82241-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

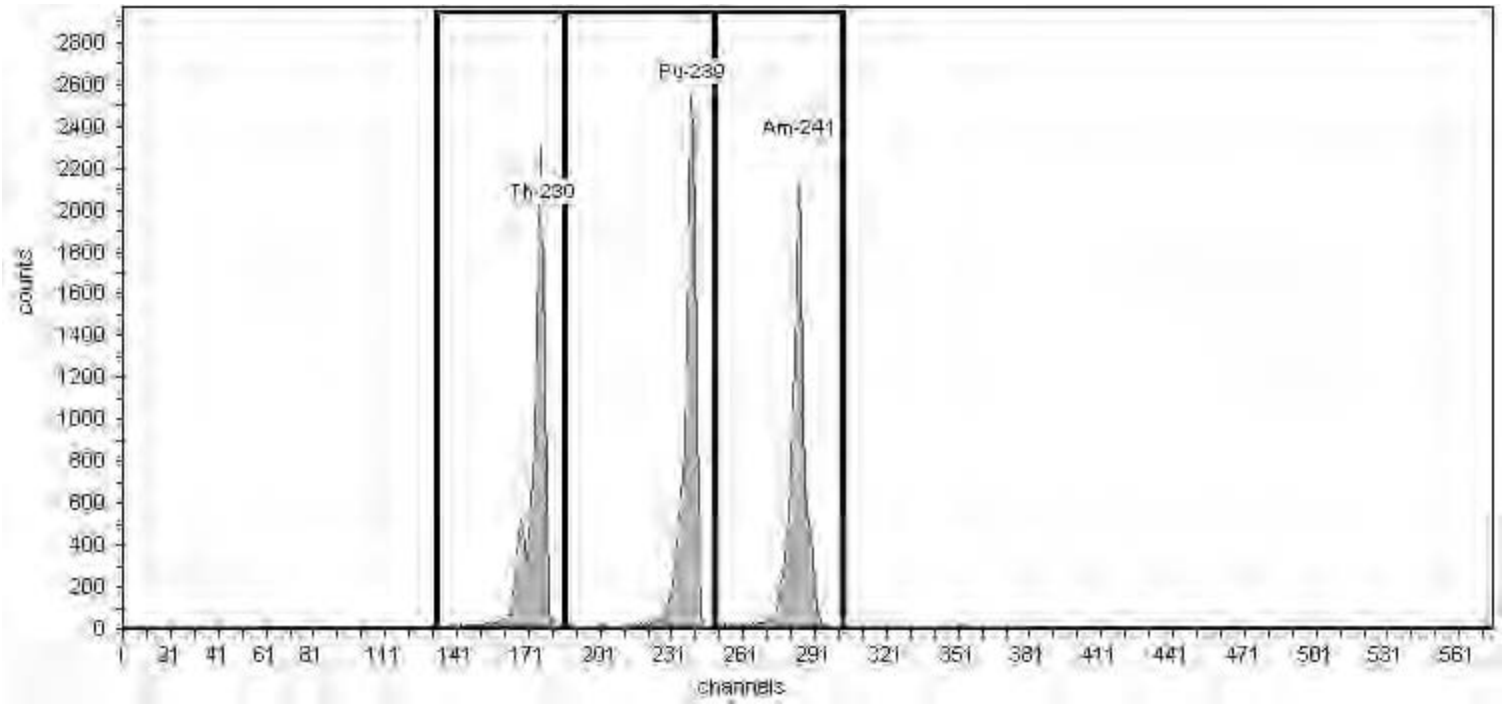
Detector: AV170 , SN: 50-112 G7
Acquisition Start Date: 11/13/2017 12:47:16PM

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 / Ch^2

Efficiency Calibration Name: IC-9793;AV170-20171113

Efficiency: 23.18% +/- 0.30% 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	29.03	12,822.00	91.59
Pu-239	240	5,155.40	186	249	29.89	13,320.00	95.14
Am-241	284	5,485.70	249	303	29.79	12,780.00	91.29

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:17:25PM 11/13/2017

Calibration

Sample Name: IC-9885;AV175-20171113
Description:
Detector: AV175

Analyst: 60040
Analysis Date: 11/13/2017 3:17:24PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

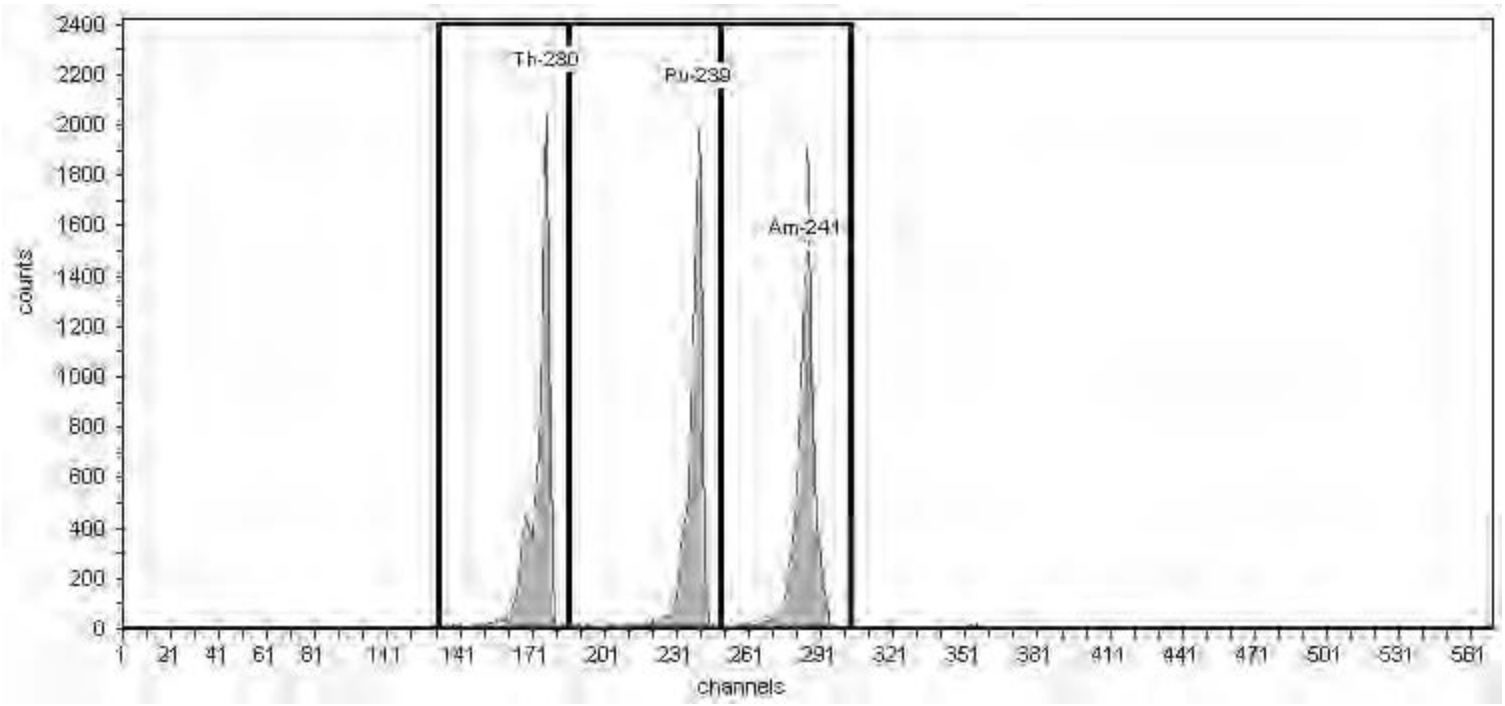
Detector: AV175 , SN: 50-117H1
Acquisition Start Date: 11/13/2017 12:49:03PM

Live Time: 140.00 min.
Real Time: 140.02 min.

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency Calibration Name: IC-9885;AV175-20171113

Efficiency: 24.43% +/- 0.36% 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	28.16	11,514.00	82.24
Pu-239	240	5,155.40	186	249	31.89	11,002.00	78.59
Am-241	284	5,485.70	249	303	31.33	12,087.00	86.34

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:46:55AM 11/14/2017

Calibration

Sample Name: IC-8875;AV187-20171113
Description:
Detector: AV187

Analyst: 60040
Analysis Date: 11/14/2017 8:46:54AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82234-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

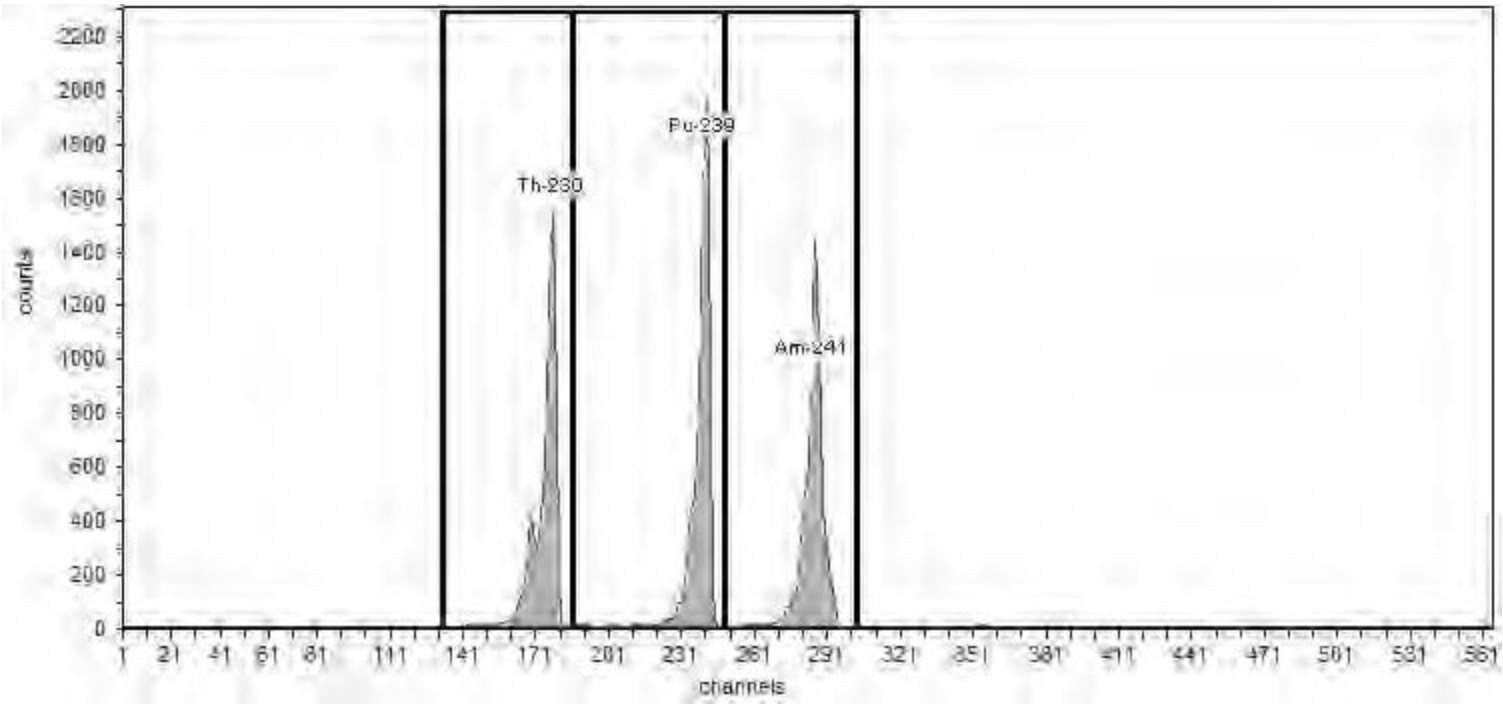
Detector: AV187 , SN: 50-119I2
Acquisition Start Date: 11/13/2017 3:34:05PM

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 / Ch^2

Efficiency Calibration Name: IC-8875;AV187-20171113

Efficiency: 21.07% +/- 0.31% 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	32.48	9,637.00	68.84
Pu-239	240	5,155.40	186	249	32.33	11,126.00	79.47
Am-241	284	5,485.70	249	303	34.65	9,767.00	69.76

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:47:00AM 11/14/2017

Calibration

Sample Name: IC-8877;AV189-20171113
Description:
Detector: AV189

Analyst: 60040
Analysis Date: 11/14/2017 8:46:59AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82236-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

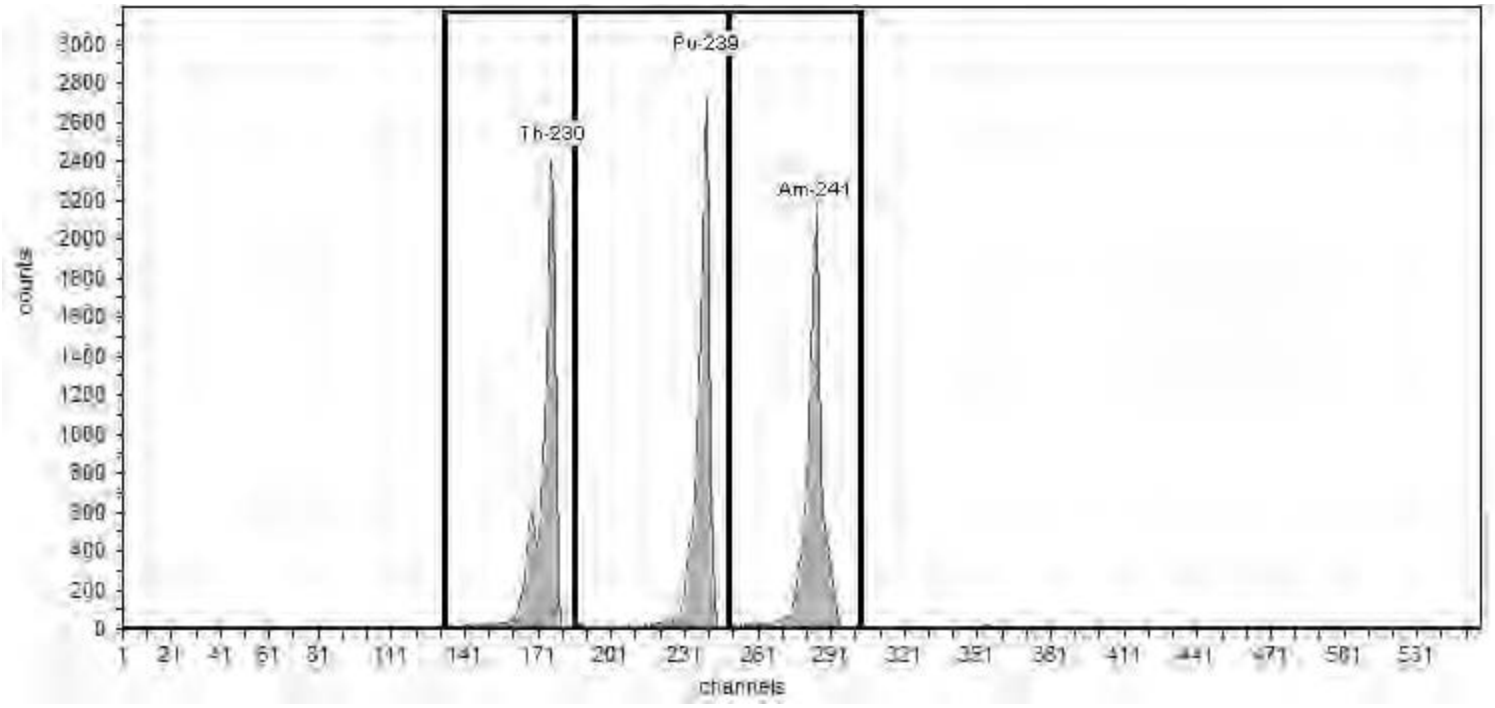
Detector: AV189 , SN: 50-112A3
Acquisition Start Date: 11/13/2017 3:34:45PM

Live Time: 140.00 min.
Real Time: 140.01 min.

Efficiency Calibration Name: IC-8877;AV189-20171113

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.49% +/- 0.30% 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	29.37	14,110.00	100.79
Pu-239	240	5,155.40	186	249	31.75	14,537.00	103.84
Am-241	284	5,485.70	249	303	31.90	13,830.00	98.79

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:47:06AM 11/14/2017

Calibration

Sample Name: IC-9520;AV190-20171113
Description:
Detector: AV190

Analyst: 60040
Analysis Date: 11/14/2017 8:47:05AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82237-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

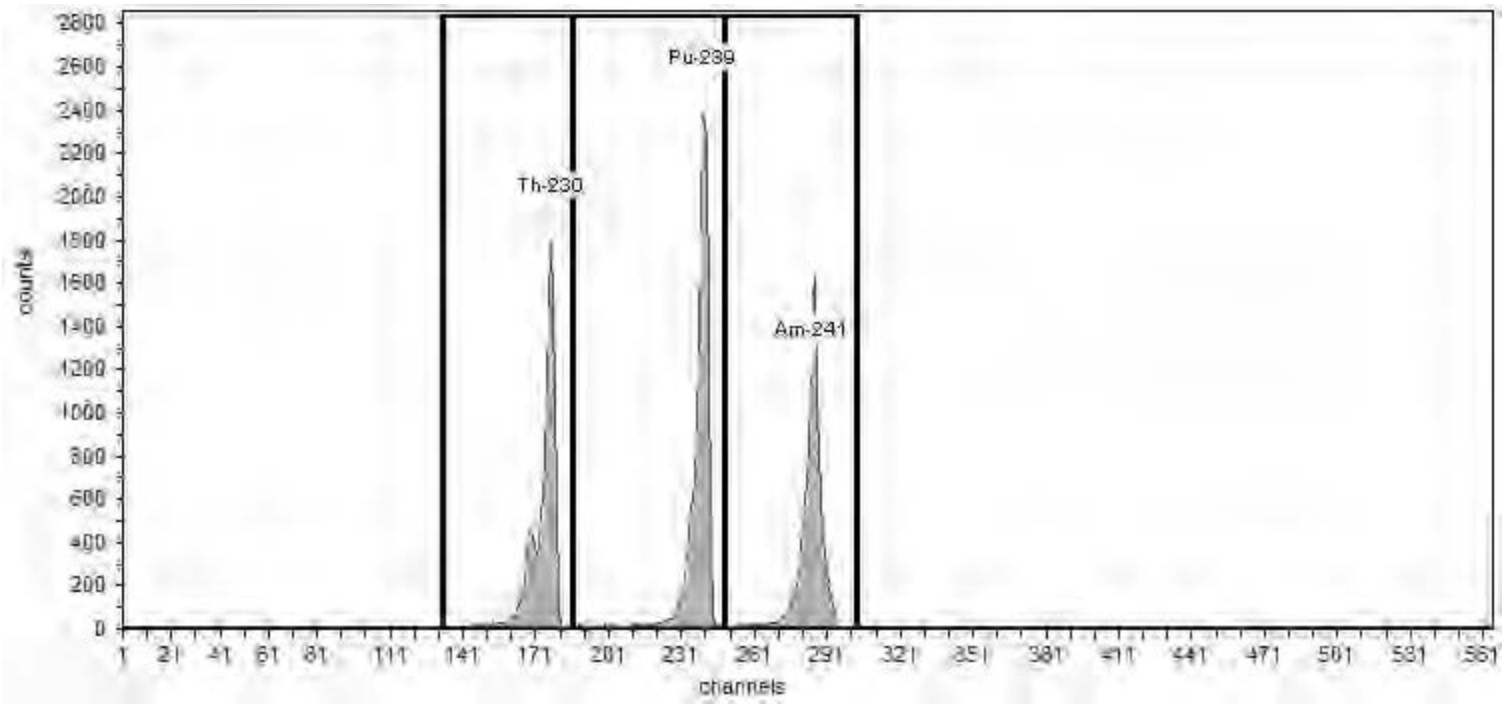
Detector: AV190 , SN: 50-119I7
Acquisition Start Date: 11/13/2017 3:35:19PM

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 / Ch^2

Efficiency Calibration Name: IC-9520;AV190-20171113

Efficiency: 23.30% +/- 0.33% 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	31.43	10,978.00	78.41
Pu-239	240	5,155.40	186	249	32.73	13,418.00	95.84
Am-241	284	5,485.70	249	303	32.92	10,535.00	75.25

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:47:11AM 11/14/2017

Calibration

Sample Name: IC-8879;AV191-20171113
Description:
Detector: AV191

Analyst: 60040
Analysis Date: 11/14/2017 8:47:10AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82238-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

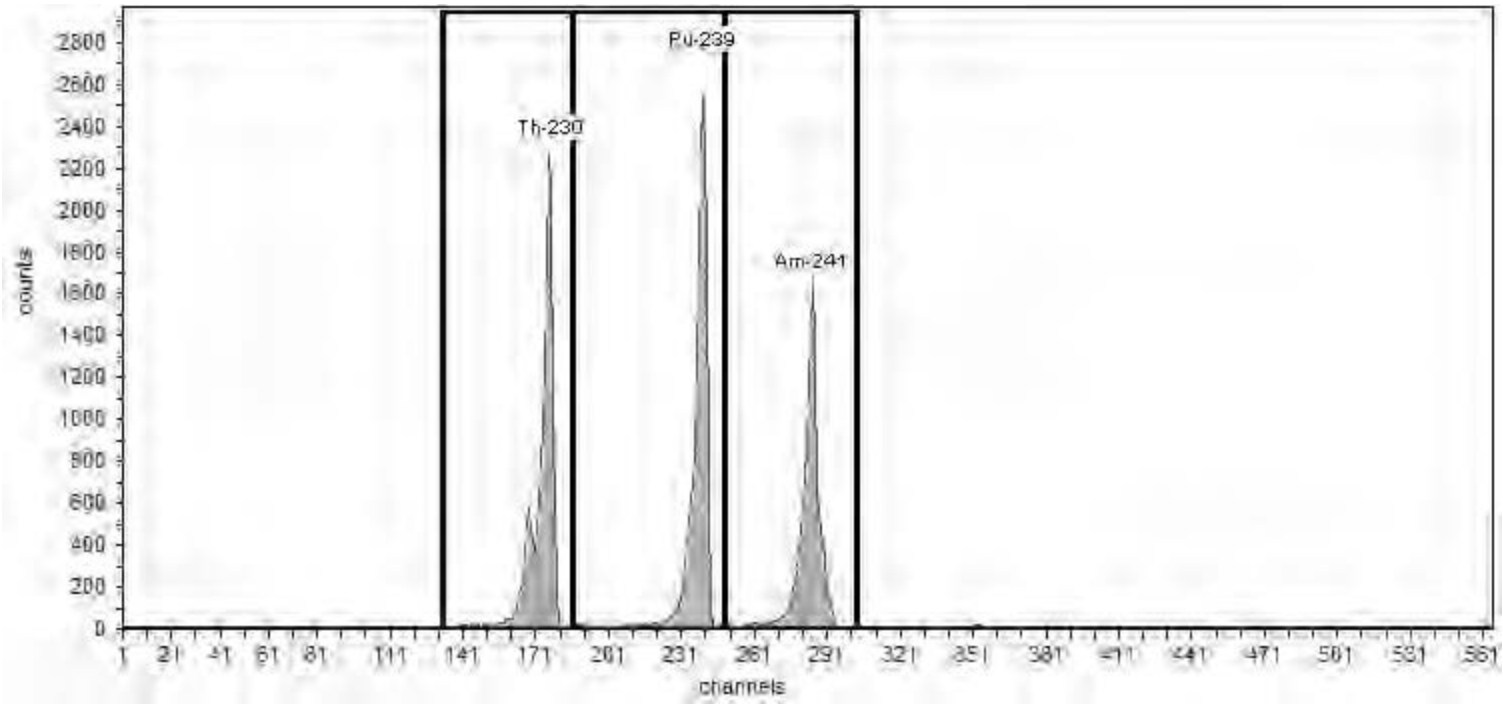
Detector: AV191 , SN: 50-112A2
Acquisition Start Date: 11/13/2017 3:35:38PM

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 / Ch^2

Efficiency Calibration Name: IC-8879;AV191-20171113

Efficiency: 22.90% +/- 0.31% 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	29.46	13,301.00	95.01
Pu-239	240	5,155.40	186	249	32.26	13,769.00	98.35
Am-241	284	5,485.70	249	303	31.34	10,961.00	78.29

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:47:17AM 11/14/2017

Calibration

Sample Name: IC-9792;AV192-20171113
Description:
Detector: AV192

Analyst: 60040
Analysis Date: 11/14/2017 8:47:16AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82240-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

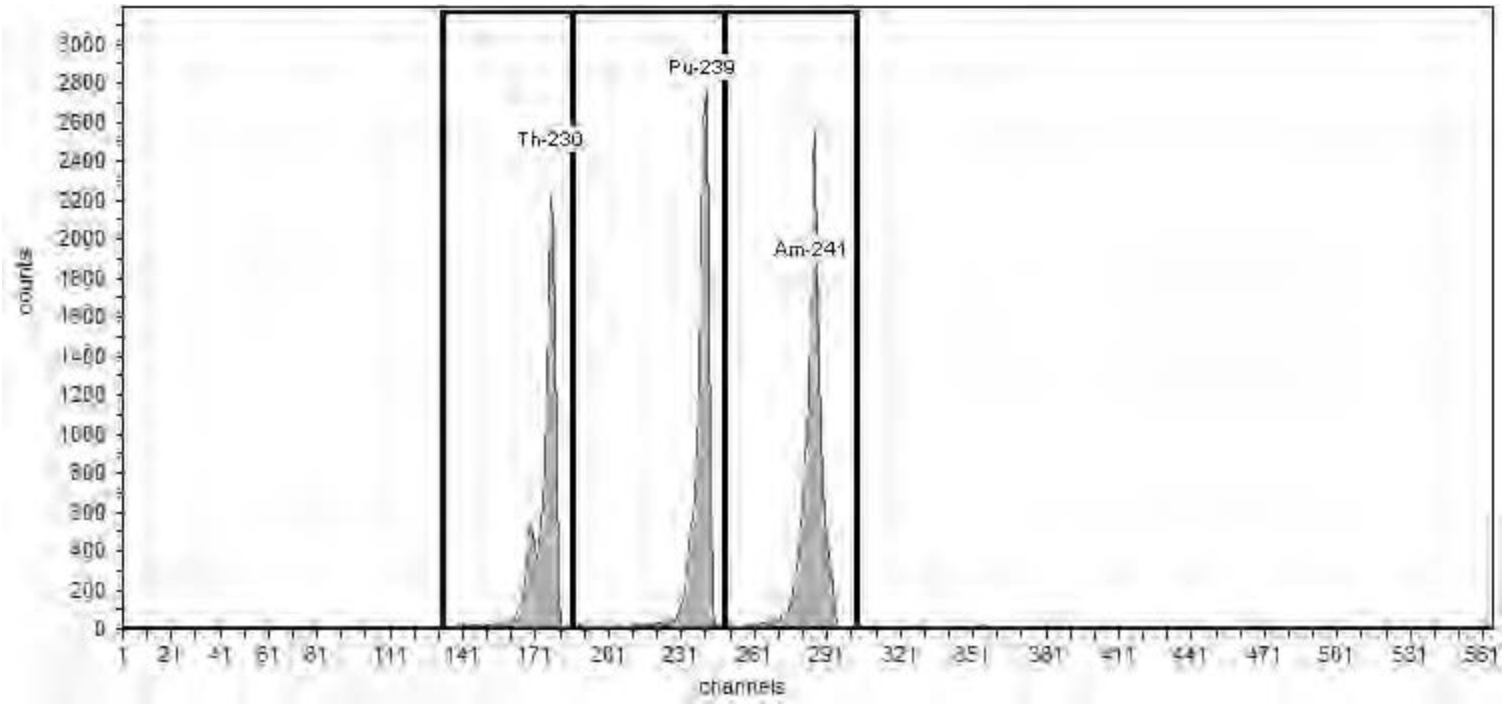
Detector: AV192 , SN: 50-119J7
Acquisition Start Date: 11/13/2017 3:35:58PM

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 / Ch^2

Efficiency Calibration Name: IC-9792;AV192-20171113

Efficiency: 24.09% +/- 0.29% 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	30.19	12,919.00	92.28
Pu-239	240	5,155.40	186	249	30.70	14,591.00	104.22
Am-241	284	5,485.70	249	303	32.62	16,371.00	116.94

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:47:43AM 11/14/2017

Calibration

Sample Name: IC-9794;AV194-20171113a
Description:
Detector: AV194

Analyst: 60040
Analysis Date: 11/14/2017 8:47:42AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82242-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

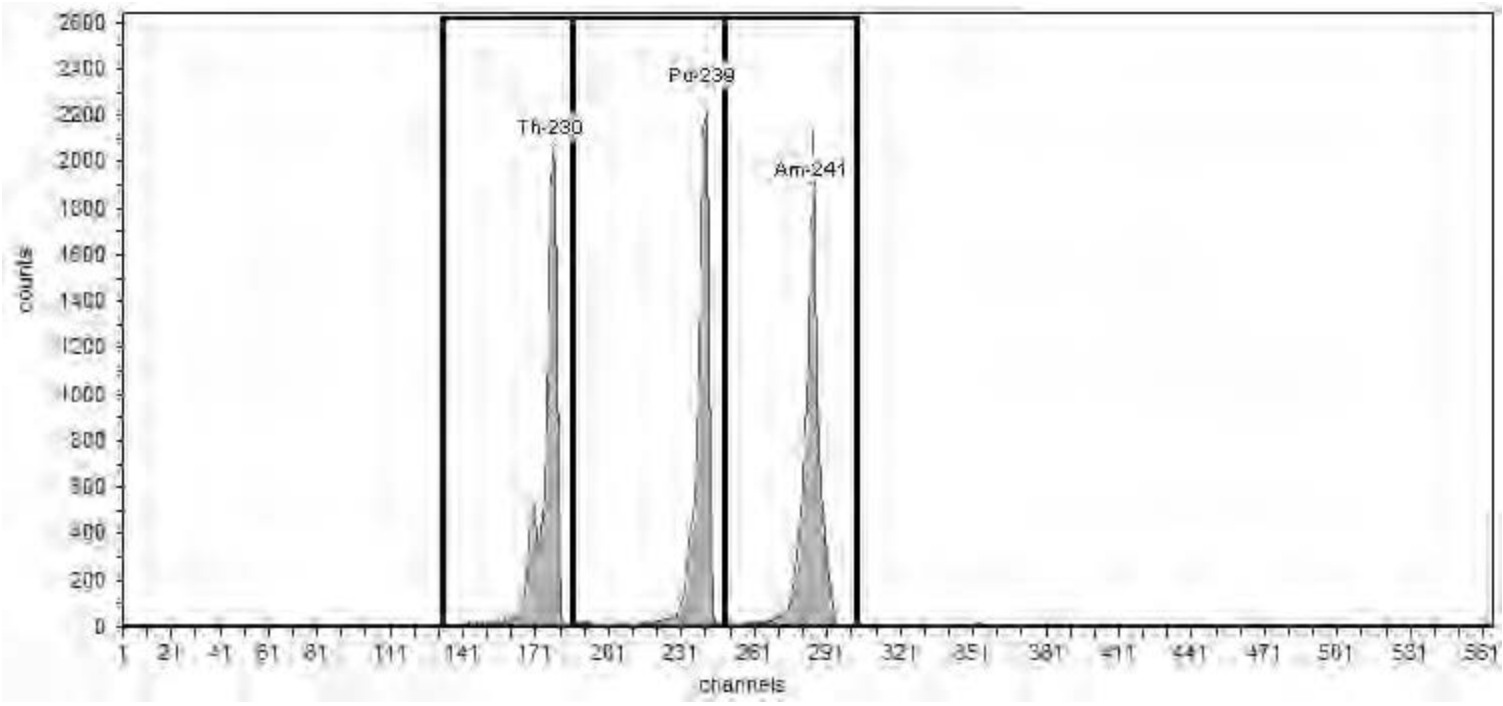
Detector: AV194 , SN: 50-119J2
Acquisition Start Date: 11/13/2017 3:47:18PM

Live Time: 140.00 min.
Real Time: 140.01 min.

Efficiency Calibration Name: IC-9794;AV194-20171113a

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 21.81% +/- 0.29% 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	28.78	11,939.00	85.28
Pu-239	240	5,155.40	186	249	31.75	11,844.00	84.60
Am-241	284	5,485.70	249	303	30.07	12,974.00	92.67

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:47:48AM 11/14/2017

Calibration

Sample Name: IC-9885;AV198-20171113a
Description:
Detector: AV198

Analyst: 60040
Analysis Date: 11/14/2017 8:47:47AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

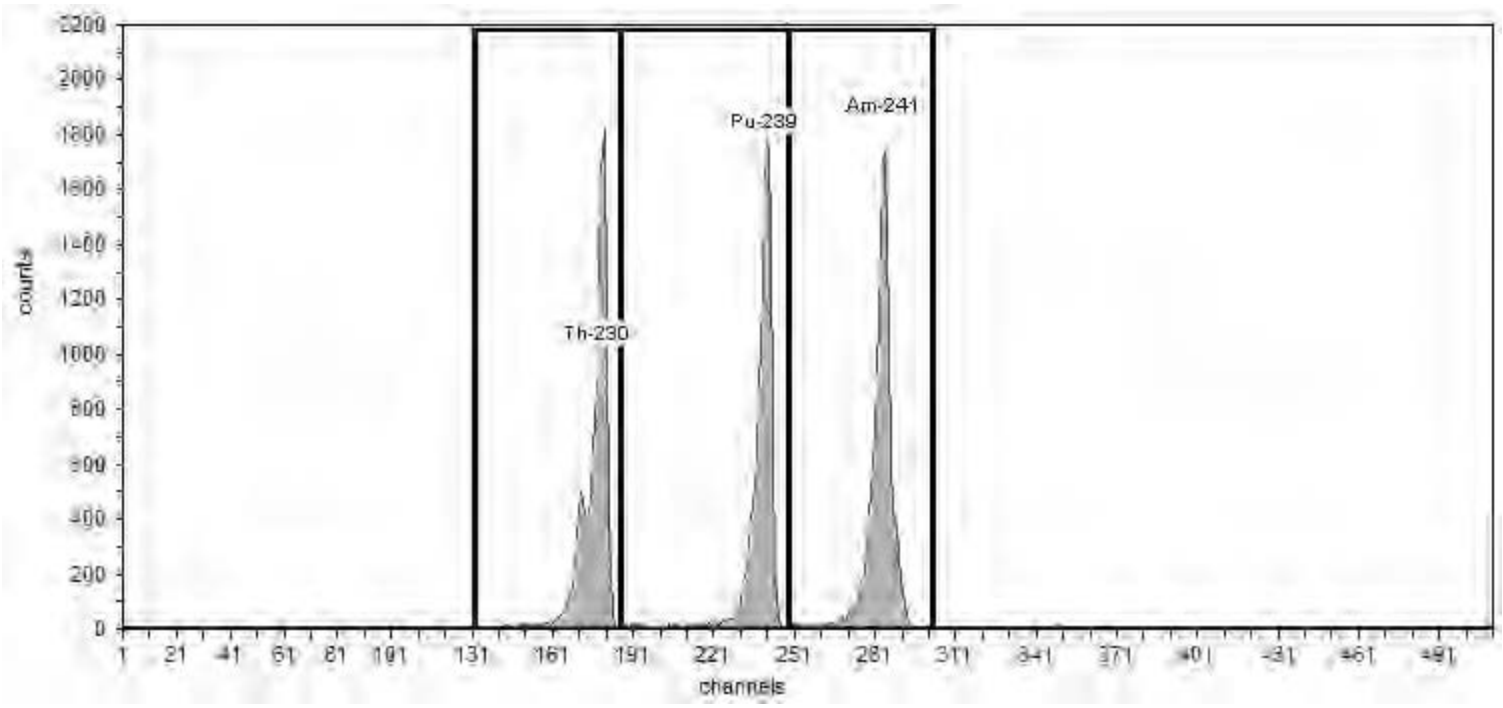
Detector: AV198 , SN: 50-117AA7
Acquisition Start Date: 11/13/2017 3:48:13PM

Live Time: 140.00 min.
Real Time: 140.01 min.

Efficiency Calibration Name: IC-9885;AV198-20171113a

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.75% +/- 0.36% 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	31.31	11,265.00	80.46
Pu-239	240	5,155.40	186	249	33.97	10,642.00	76.01
Am-241	284	5,485.70	249	303	35.15	11,728.00	83.77

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:01:14PM 11/14/2017

Calibration

Sample Name: IC-8876;AV203-20171114
Description:
Detector: AV203

Analyst: 60040
Analysis Date: 11/14/2017 12:01:12PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82235-334
Prepared by: Analytics
Description:

Certification Date: 6/4/2010 12:00:00PM

Acquisition

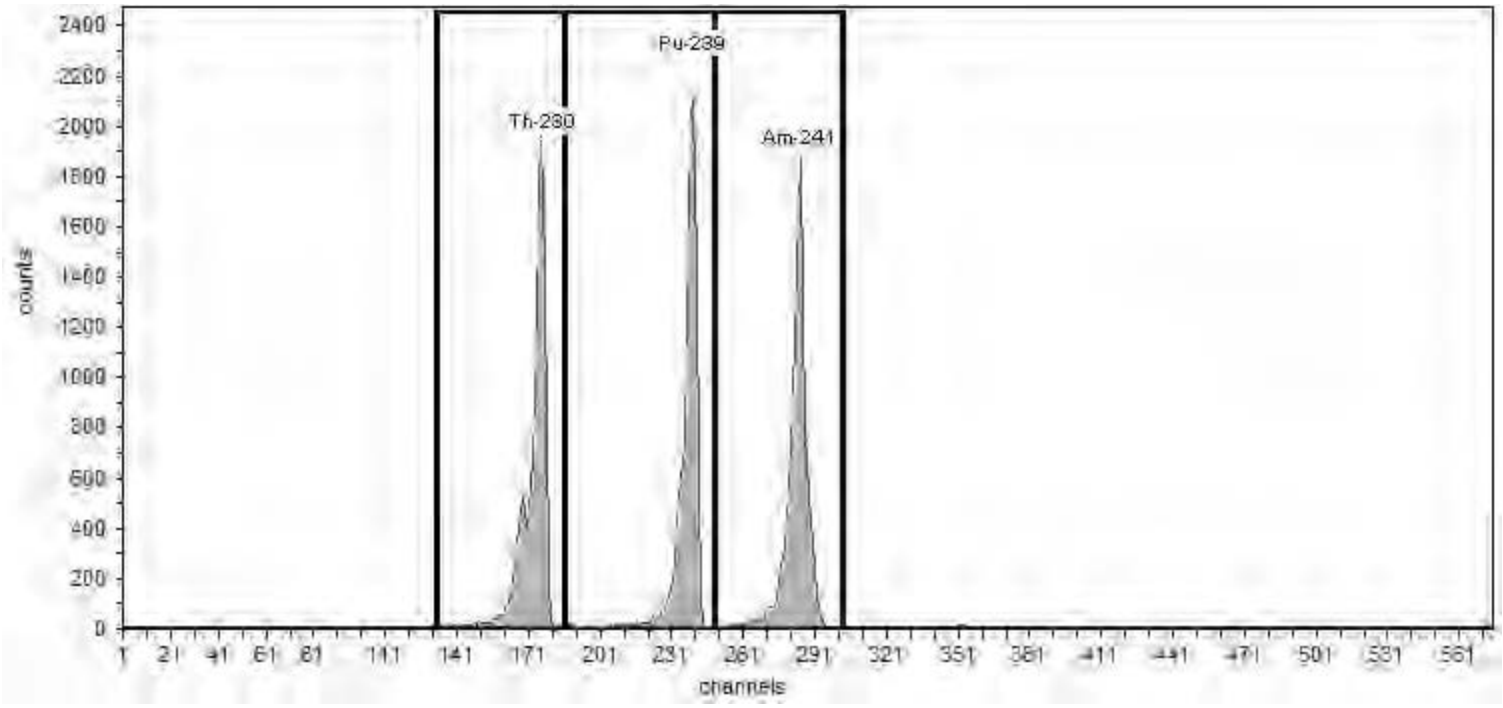
Detector: AV203 , SN: 50-117J4
Acquisition Start Date: 11/14/2017 9:01:33AM

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 / Ch^2

Efficiency Calibration Name: IC-8876;AV203-20171114

Efficiency: 21.22% +/- 0.27% 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	32.37	12,960.00	92.57
Pu-239	240	5,155.40	186	249	34.56	12,485.00	89.18
Am-241	284	5,485.70	249	303	34.43	12,812.00	91.51

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:00:56PM 11/14/2017

Calibration

Sample Name: IC-8879;AV206-20171114
Description:
Detector: AV206

Analyst: 60040
Analysis Date: 11/14/2017 12:00:54PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82238-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

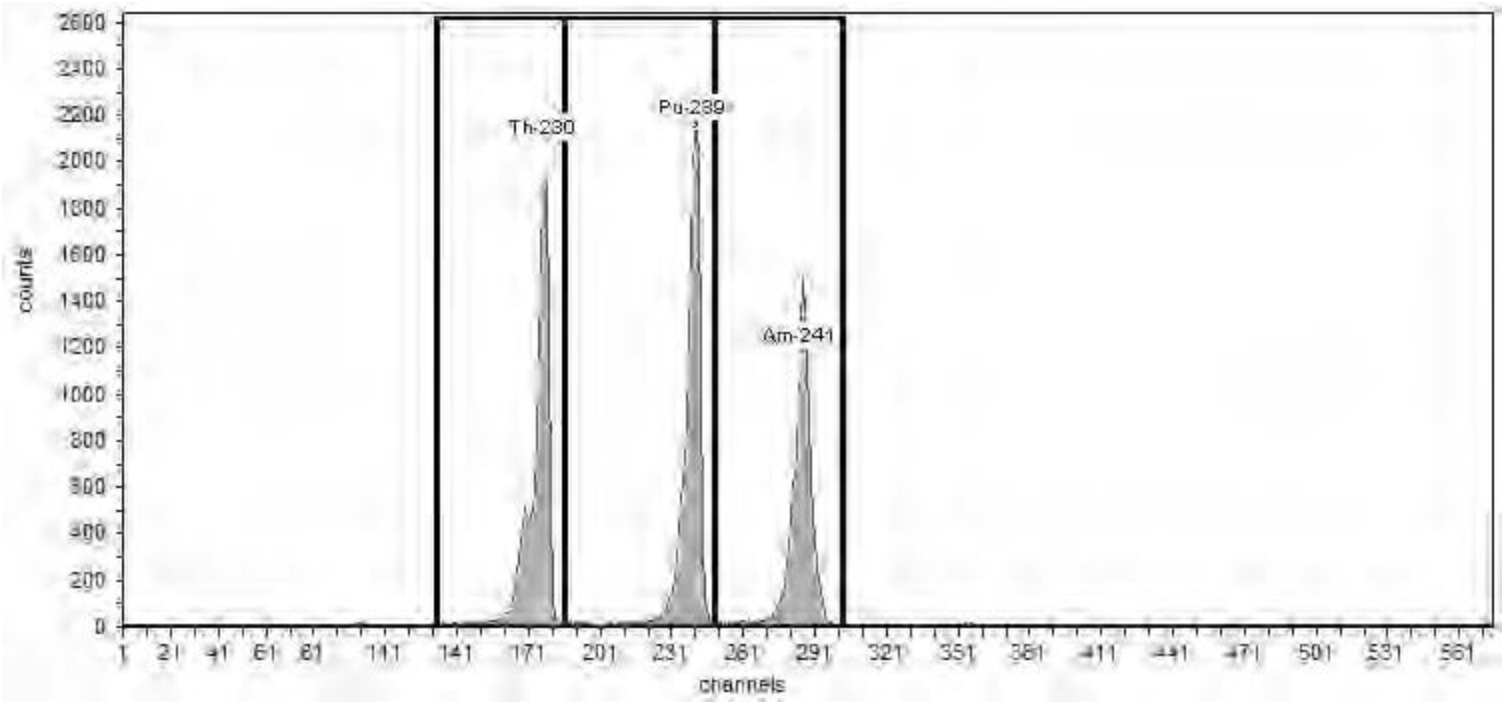
Detector: AV206 , SN: 5604420
Acquisition Start Date: 11/14/2017 9:00:34AM

Live Time: 140.00 min.
Real Time: 140.21 min.

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency Calibration Name: IC-8879;AV206-20171114

Efficiency: 23.42% +/- 0.32% 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	36.39	13,422.00	95.87
Pu-239	240	5,155.40	186	249	38.62	14,237.00	101.69
Am-241	284	5,485.70	249	303	40.22	11,283.00	80.59

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:00:44PM 11/14/2017

Calibration

Sample Name: IC-9793;AV208-20171114
Description:
Detector: AV208

Analyst: 60040
Analysis Date: 11/14/2017 12:00:42PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82241-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

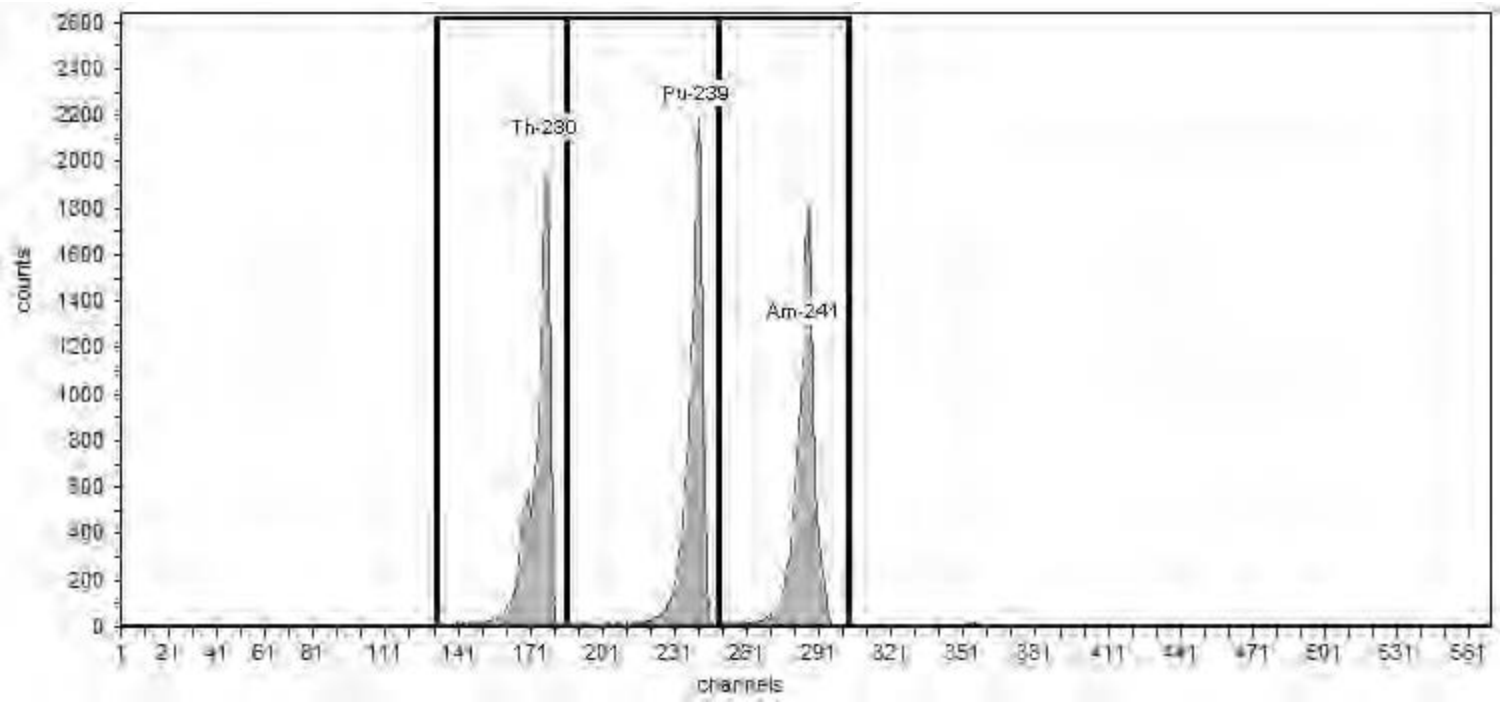
Detector: AV208 , SN: 50-112Z6
Acquisition Start Date: 11/14/2017 8:59:57AM

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 / Ch^2

Efficiency Calibration Name: IC-9793;AV208-20171114

Efficiency: 24.28% +/- 0.31% 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	34.62	13,337.00	95.26
Pu-239	240	5,155.40	186	249	37.14	14,000.00	100.00
Am-241	284	5,485.70	249	303	37.83	13,434.00	95.96

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:01:42PM 11/14/2017

Calibration

Sample Name: IC-9884;AV212-20171114
Description:
Detector: AV212

Analyst: 60040
Analysis Date: 11/14/2017 12:01:41PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82245-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

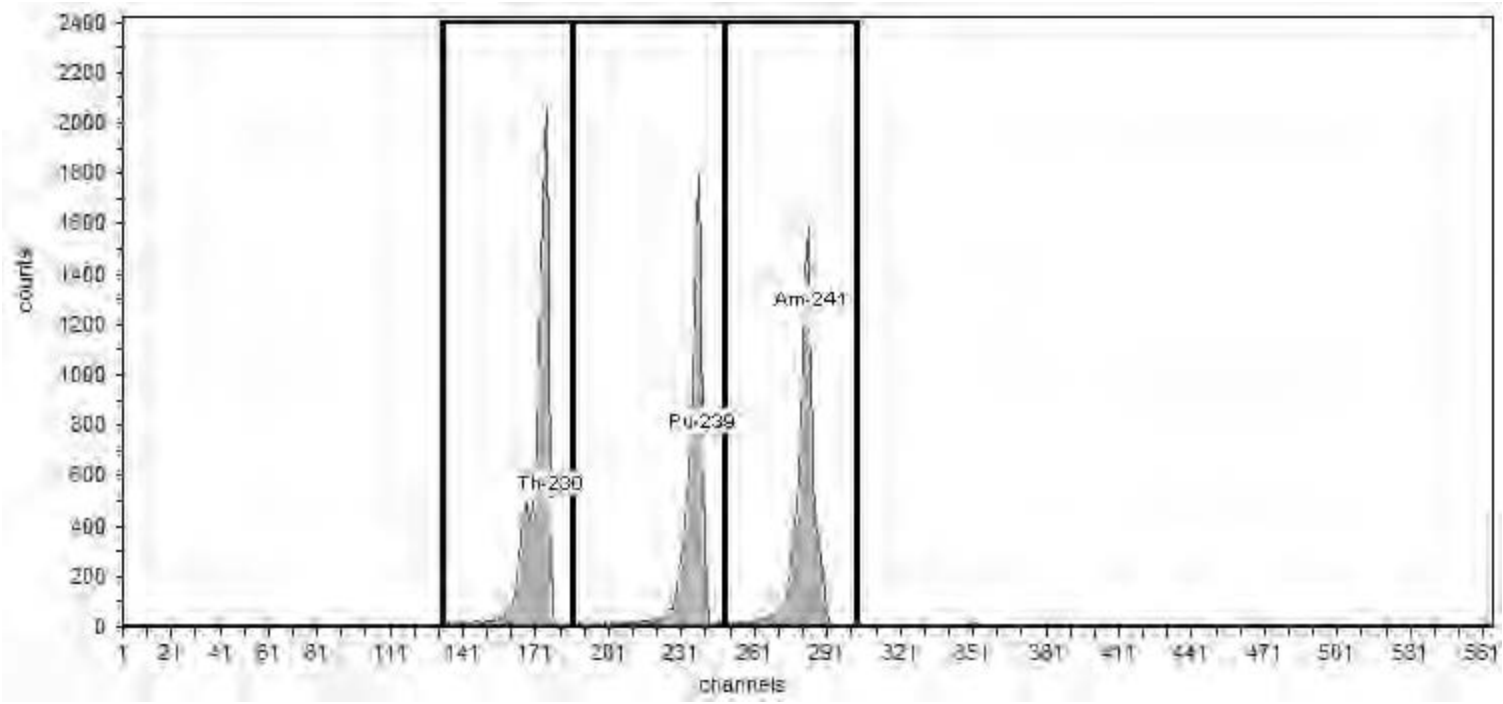
Detector: AV212 , SN: 49-155m5
Acquisition Start Date: 11/14/2017 8:58:33AM

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 / Ch^2

Efficiency Calibration Name: IC-9884;AV212-20171114

Efficiency: 22.41% +/- 0.33% 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	32.19	12,658.00	90.41
Pu-239	240	5,155.40	186	249	32.03	10,206.00	72.90
Am-241	284	5,485.70	249	303	34.93	10,334.00	73.81

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:01:30PM 11/14/2017

Calibration

Sample Name: IC-9885;AV213-20171114
Description:
Detector: AV213

Analyst: 60040
Analysis Date: 11/14/2017 12:01:29PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

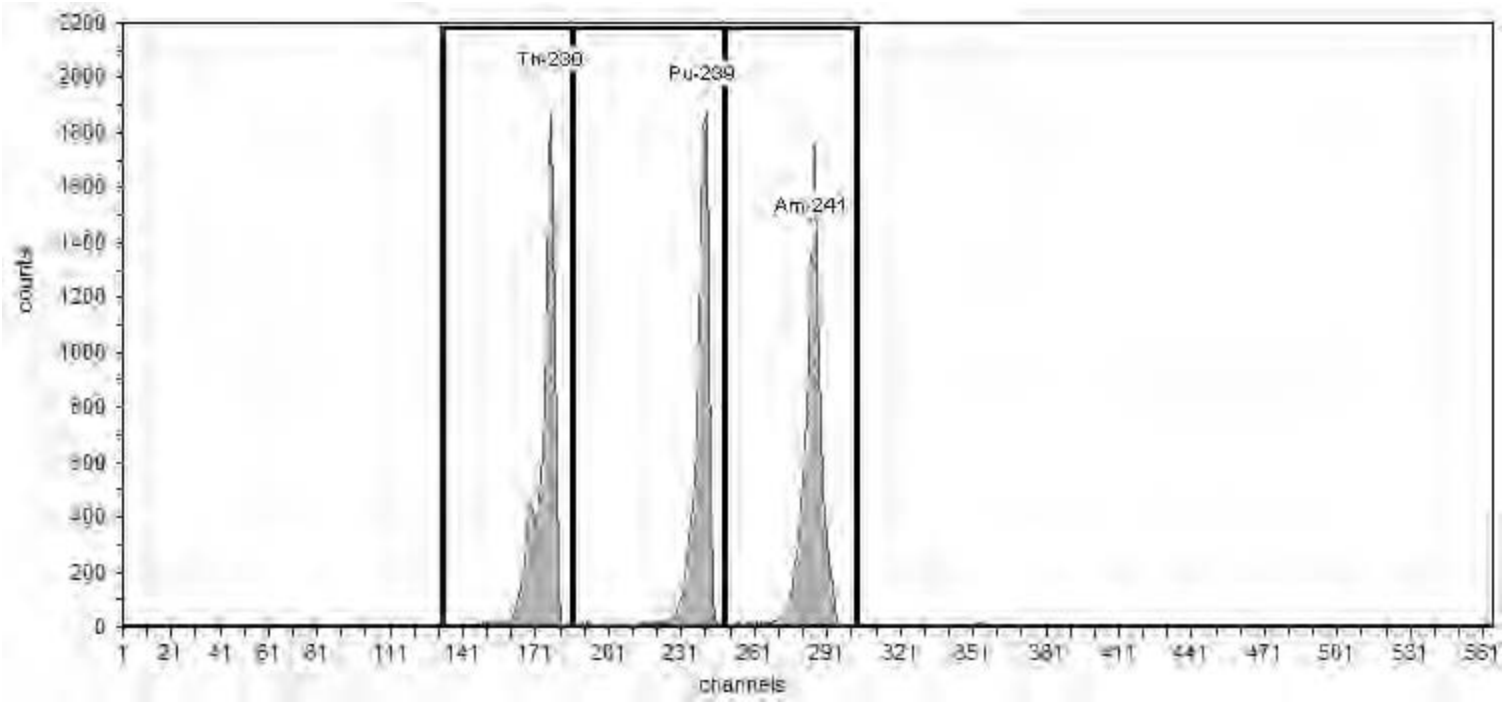
Detector: AV213 , SN: 54-011 Y1
Acquisition Start Date: 11/14/2017 8:58:16AM

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 / Ch^2

Efficiency Calibration Name: IC-9885;AV213-20171114

Efficiency: 24.04% +/- 0.36% 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	31.19	11,416.00	81.54
Pu-239	240	5,155.40	186	249	34.32	10,571.00	75.51
Am-241	284	5,485.70	249	303	35.97	12,063.00	86.16

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:23:30PM 11/14/2017

Calibration

Sample Name: IC-7107;AV215-20171114
Description:
Detector: AV215

Analyst: 60040
Analysis Date: 11/14/2017 3:23:29PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82232-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

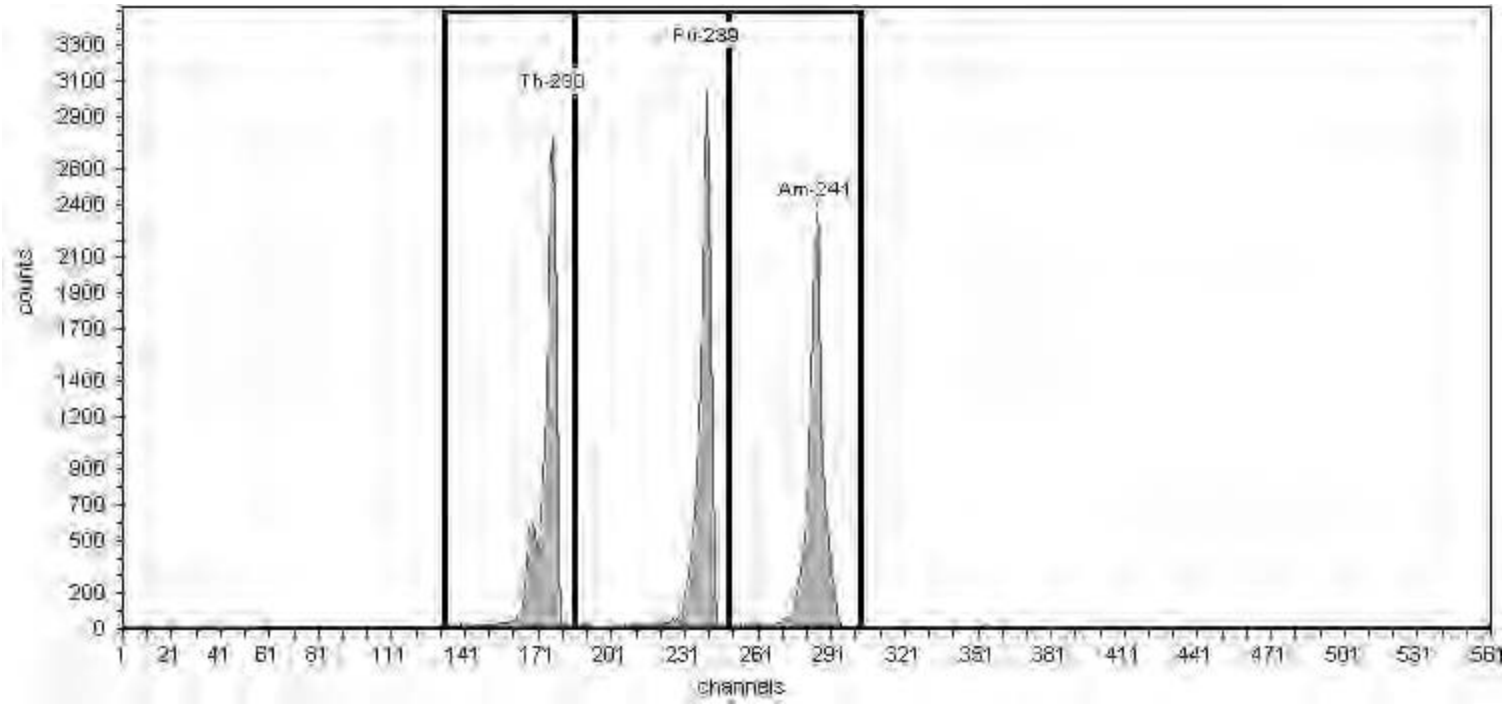
Detector: AV215 , SN: 50-119J4
Acquisition Start Date: 11/14/2017 12:26:05PM

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 / Ch^2

Efficiency Calibration Name: IC-7107;AV215-20171114

Efficiency: 25.45% +/- 0.29% 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	29.87	15,884.00	113.46
Pu-239	240	5,155.40	186	249	30.40	15,738.00	112.41
Am-241	284	5,485.70	249	303	30.91	15,390.00	109.93

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:23:23PM 11/14/2017

Calibration

Sample Name: IC-8874;AV216-20171114
Description:
Detector: AV216

Analyst: 60040
Analysis Date: 11/14/2017 3:23:21PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82233-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

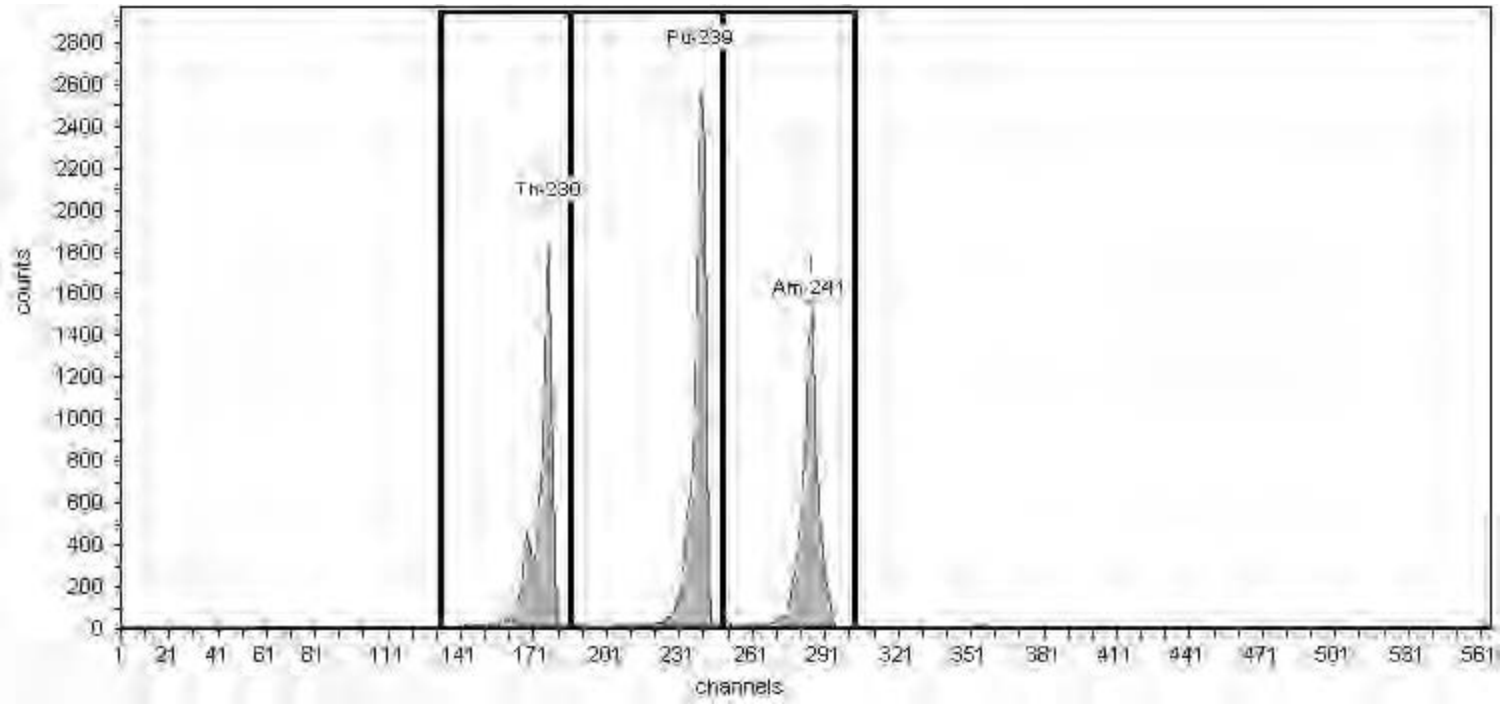
Detector: AV216 , SN: 50-117J5
Acquisition Start Date: 11/14/2017 12:25:42PM

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 / Ch^2

Efficiency Calibration Name: IC-8874;AV216-20171114

Efficiency: 26.89% +/- 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	29.99	10,807.00	77.19
Pu-239	240	5,155.40	186	249	32.21	14,121.00	100.86
Am-241	284	5,485.70	249	303	32.03	11,361.00	81.15

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:23:18PM 11/14/2017

Calibration

Sample Name: IC-8875;AV217-20171114
Description:
Detector: AV217

Analyst: 60040
Analysis Date: 11/14/2017 3:23:16PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82234-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

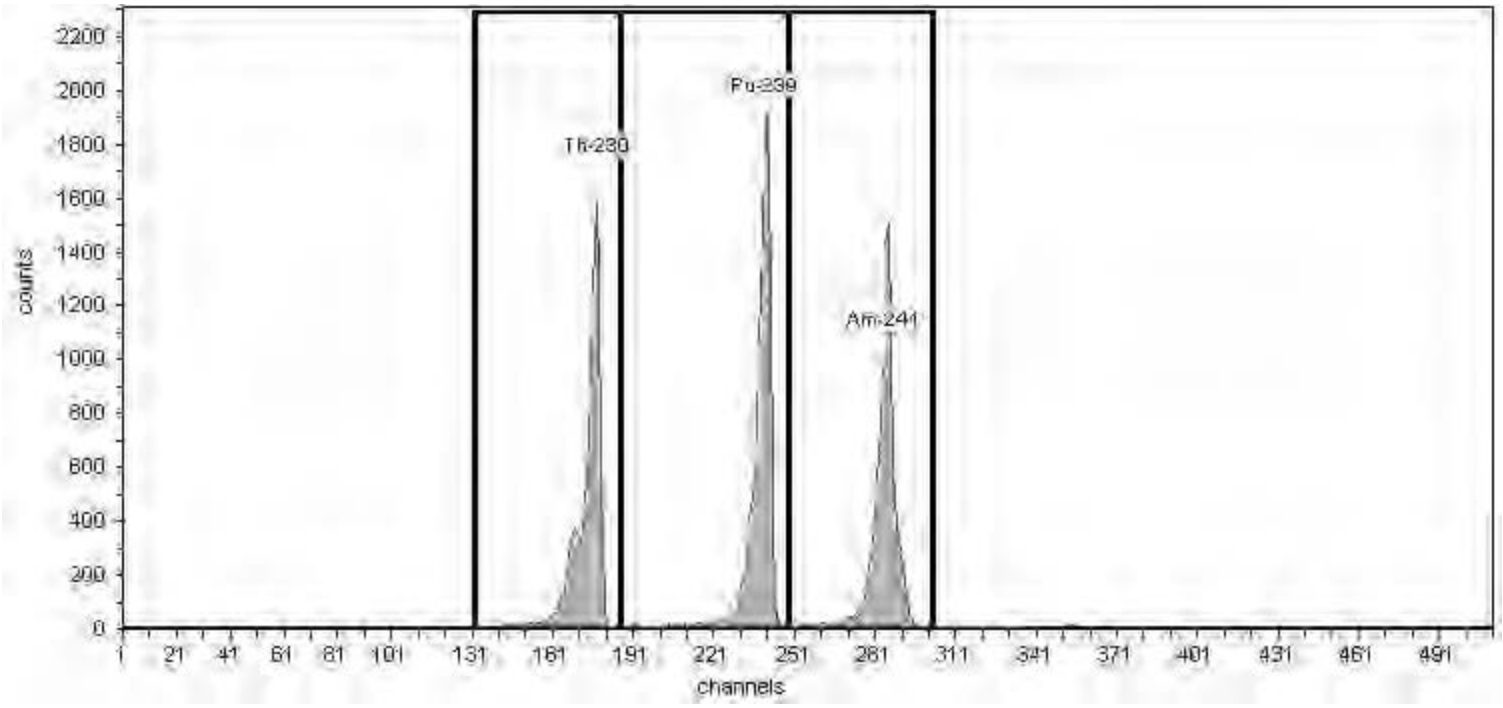
Detector: AV217 , SN: 50-117I2
Acquisition Start Date: 11/14/2017 12:25:24PM

Live Time: 140.00 min.
Real Time: 140.02 min.

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency Calibration Name: IC-8875;AV217-20171114

Efficiency: 21.21% +/- 0.31% 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	30.98	9,697.00	69.26
Pu-239	240	5,155.40	186	249	34.94	11,197.00	79.98
Am-241	284	5,485.70	249	303	33.71	9,836.00	70.26

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:23:37PM 11/14/2017

Calibration

Sample Name: IC-8876;AV218-20171114a
Description:
Detector: AV218

Analyst: 60040
Analysis Date: 11/14/2017 3:23:35PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82235-334
Prepared by: Analytics
Description:

Certification Date: 6/4/2010 12:00:00PM

Acquisition

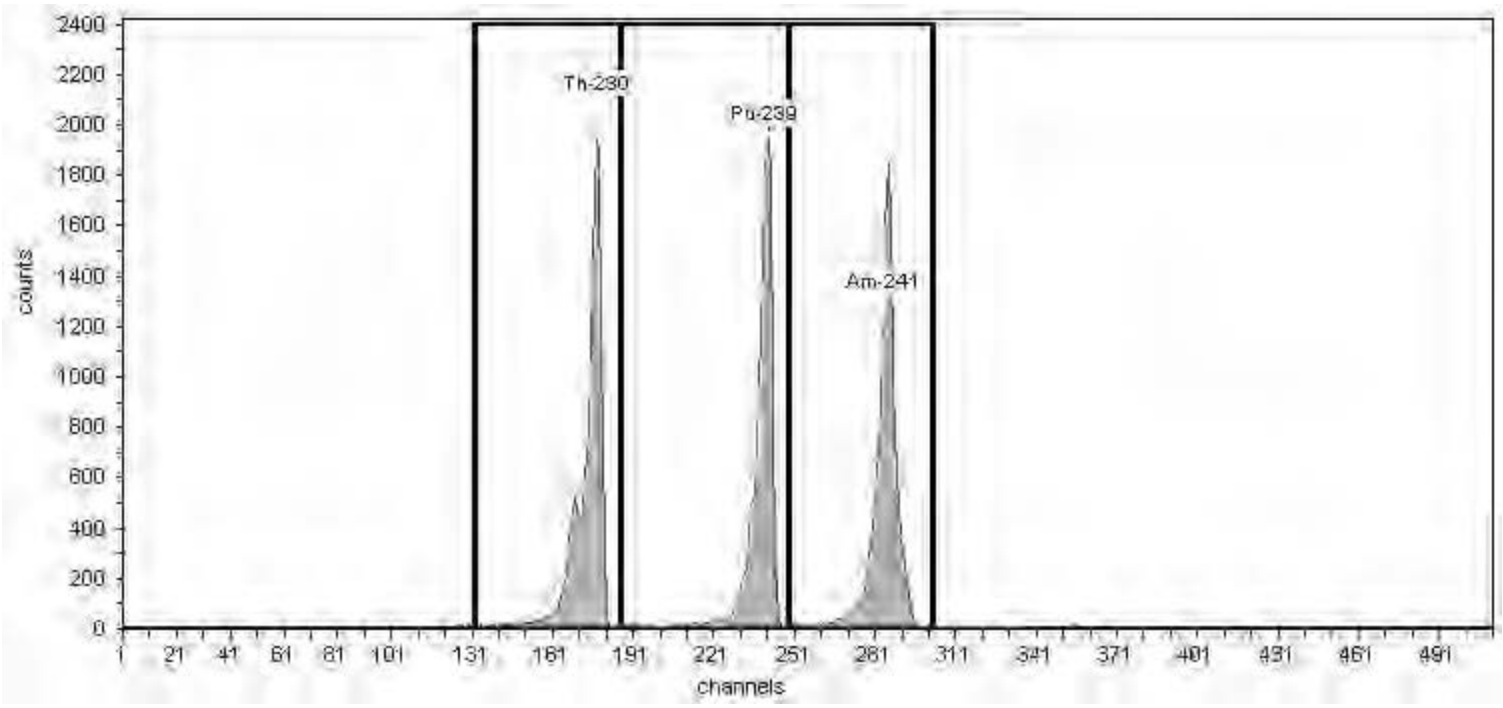
Detector: AV218 , SN: 50-117Z7
Acquisition Start Date: 11/14/2017 12:33:22PM

Live Time: 140.00 min.
Real Time: 140.01 min.

Efficiency Calibration Name: IC-8876;AV218-20171114a

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 21.31% +/- 0.27% 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	33.47	13,001.00	92.86
Pu-239	240	5,155.40	186	249	34.77	12,511.00	89.36
Am-241	284	5,485.70	249	303	35.80	12,899.00	92.14

Initial Calibration Verifications

Alpha Spectroscopy Calibration Summary

Detector: AV1

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371830/1	05/14/18 15:44	82232-334_00001	0.2436	0.20-0.32		
ICV 160-371933/1	05/18/18 19:25	82236-334_00001	0.2326	0.20-0.32	95.5	95-105
CCV 160-382694/1	08/14/18 14:05	82232-334_00001	0.2385	0.20-0.32	97.9	95-105

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 160-382709/1	08/14/18 14:06	82236-334_00001	0.2445	0.20-0.32	100.1	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: AV10

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371831/1	05/14/18 15:48	82246-334_00001	0.2349	0.20-0.32		
ICV 160-371947/1	05/19/18 16:12	82240-334_00001	0.2344	0.20-0.32	99.8	95-105
CCV 160-375335/1	07/10/18 16:57	82246-334_00001	0.2379	0.20-0.32	101.2	95-105

Detector: AV15

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371836/1	05/14/18 15:57	108347_00001	0.2726	0.20-0.32		
ICV 160-371939/1	05/18/18 19:34	108348_00001	0.2659	0.20-0.32	97.5	95-105
CCV 160-375340/1	07/10/18 17:03	108347_00001	0.2713	0.20-0.32	99.5	95-105

Detector: AV19

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371840/1	05/14/18 18:35	82236-334_00001	0.2360	0.20-0.32		
ICV 160-371952/1	05/20/18 16:11	82232-334_00001	0.2370	0.20-0.32	100.4	95-105
CCV 160-375375/1	07/11/18 11:08	82236-334_00001	0.2361	0.20-0.32	100.0	95-105

Detector: AV20

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371842/1	05/14/18 18:36	82237-334_00003	0.2215	0.20-0.32		
ICV 160-371953/1	05/20/18 16:11	82244-334_00001	0.2191	0.20-0.32	98.9	95-105
CCV 160-375376/1	07/11/18 11:08	82237-334_00003	0.2242	0.20-0.32	101.2	95-105

Alpha Spectroscopy Calibration Summary

Detector: AV23

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371845/1	05/14/18 18:37	82243-334_00001	0.2446	0.20-0.32		
ICV 160-371956/1	05/20/18 16:12	82233-334_00001	0.2512	0.20-0.32	102.7	95-105
CCV 160-375379/1	07/11/18 11:09	82243-334_00001	0.2463	0.20-0.32	100.7	95-105

Detector: AV24

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371846/1	05/14/18 18:37	82244-334_00001	0.2221	0.20-0.32		
ICV 160-371957/1	05/20/18 16:12	82241-334_00001	0.2277	0.20-0.32	102.5	95-105
CCV 160-375380/1	07/11/18 11:09	82244-334_00001	0.2214	0.20-0.32	99.7	95-105

Detector: AV43

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371849/1	05/14/18 18:37	82246-334_00001	0.2351	0.20-0.32		
ICV 160-371958/1	05/20/18 16:13	82240-334_00001	0.2311	0.20-0.32	98.3	95-105
CCV 160-375381/1	07/11/18 11:10	82246-334_00001	0.2352	0.20-0.32	100.0	95-105

Detector: AV44

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371850/1	05/14/18 18:38	108001_00001	0.2749	0.20-0.32		
ICV 160-371959/1	05/20/18 16:13	108002_00001	0.2781	0.20-0.32	101.2	95-105
CCV 160-375382/1	07/11/18 11:10	108001_00001	0.2758	0.20-0.32	100.3	95-105

Detector: AV45

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371851/1	05/14/18 18:51	108002_00001	0.2795	0.20-0.32		
ICV 160-371960/1	05/20/18 16:13	108001_00001	0.2753	0.20-0.32	98.5	95-105
CCV 160-375383/1	07/11/18 11:10	108002_00001	0.2829	0.20-0.32	101.2	95-105

Detector: AV47

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371853/1	05/14/18 18:40	108346_00001	0.2702	0.20-0.32		
ICV 160-371962/1	05/20/18 16:15	108345_00001	0.2686	0.20-0.32	99.4	95-105
CCV 160-375385/1	07/11/18 11:10	108346_00001	0.2662	0.20-0.32	98.5	95-105

Detector: AV48

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371854/1	05/14/18 18:40	108347_00001	0.2706	0.20-0.32		
ICV 160-371963/1	05/20/18 16:15	108348_00001	0.2668	0.20-0.32	98.6	95-105
CCV 160-375386/1	07/11/18 12:36	108347_00001	0.2707	0.20-0.32	100.1	95-105

Detector: AV49

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-375897/1	05/14/18 18:41	108348_00001	0.2627	0.20-0.32		
ICV 160-371964/1	05/20/18 16:15	108347_00001	0.2682	0.20-0.32	102.1	95-105
CCV 160-375387/1	07/11/18 12:36	108348_00001	0.2624	0.20-0.32	99.9	95-105

Alpha Spectroscopy Calibration Summary

Detector: AV52

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371861/1	05/15/18 12:36	82236-334_00001	0.2450	0.20-0.32		
ICV 160-371998/1	05/23/18 11:26	82232-334_00001	0.2478	0.20-0.32	101.1	95-105
CCV 160-375390/1	07/11/18 12:40	82236-334_00001	0.2500	0.20-0.32	102.0	95-105

Detector: AV53

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371862/1	05/15/18 12:37	82237-334_00003	0.2327	0.20-0.32		
ICV 160-371999/1	05/23/18 11:27	82244-334_00001	0.2260	0.20-0.32	97.1	95-105
CCV 160-375391/1	07/11/18 12:38	82237-334_00003	0.2334	0.20-0.32	100.3	95-105

Detector: AV54

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371863/1	05/15/18 12:37	82240-334_00001	0.2362	0.20-0.32		
ICV 160-372000/1	05/23/18 11:27	82246-334_00001	0.2348	0.20-0.32	99.4	95-105
CCV 160-375392/1	07/11/18 12:38	82240-334_00001	0.2343	0.20-0.32	99.2	95-105

Detector: AV56

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371865/1	05/15/18 12:38	82243-334_00001	0.2525	0.20-0.32		
ICV 160-372002/1	05/23/18 11:28	82233-334_00001	0.2610	0.20-0.32	103.4	95-105
CCV 160-375394/1	07/11/18 12:40	82243-334_00001	0.2521	0.20-0.32	99.8	95-105

Detector: AV57

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371866/1	05/15/18 12:38	82244-334_00001	0.2240	0.20-0.32		
ICV 160-372003/1	05/23/18 11:29	82241-334_00001	0.2283	0.20-0.32	101.9	95-105
CCV 160-375395/1	07/11/18 12:39	82244-334_00001	0.2256	0.20-0.32	100.7	95-105

Detector: AV58

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371867/1	05/15/18 12:39	82246-334_00001	0.2405	0.20-0.32		
ICV 160-372004/1	05/23/18 11:29	82240-334_00001	0.2410	0.20-0.32	100.2	95-105
CCV 160-375396/1	07/11/18 12:42	82246-334_00001	0.2406	0.20-0.32	100.0	95-105

Detector: AV60

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371868/1	05/15/18 12:39	108001_00001	0.2828	0.20-0.32		
ICV 160-371965/1	05/21/18 10:36	108002_00001	0.2815	0.20-0.32	99.5	95-105
CCV 160-375397/1	07/11/18 12:39	108001_00001	0.2827	0.20-0.32	100.0	95-105

Detector: AV62

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371869/1	05/15/18 12:40	108002_00001	0.2840	0.20-0.32		
ICV 160-371966/1	05/21/18 10:36	108001_00001	0.2808	0.20-0.32	98.9	95-105
CCV 160-375398/1	07/11/18 12:41	108002_00001	0.2859	0.20-0.32	100.7	95-105

Alpha Spectroscopy Calibration Summary

Detector: AV69

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371875/1	05/15/18 15:45	82233-334_00001	0.2643	0.20-0.32		
ICV 160-372006/1	05/23/18 12:55	82243-334_00001	0.2601	0.20-0.32	98.4	95-105
CCV 160-375404/1	07/11/18 14:03	82233-334_00001	0.2651	0.20-0.32	100.3	95-105

Detector: AV70

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371876/1	05/15/18 15:45	82236-334_00001	0.2440	0.20-0.32		
ICV 160-372007/1	05/23/18 12:55	82232-334_00001	0.2478	0.20-0.32	101.6	95-105
CCV 160-375405/1	07/11/18 14:04	82236-334_00001	0.2501	0.20-0.32	102.5	95-105

Detector: AV71

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371877/1	05/15/18 15:46	82237-334_00003	0.2300	0.20-0.32		
ICV 160-372008/1	05/23/18 12:56	82244-334_00001	0.2266	0.20-0.32	98.5	95-105
CCV 160-375406/1	07/11/18 14:04	82237-334_00003	0.2291	0.20-0.32	99.6	95-105

Detector: AV72

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-371878/1	05/15/18 15:46	82240-334_00001	0.2458	0.20-0.32		
ICV 160-372009/1	05/23/18 12:56	82246-334_00001	0.2463	0.20-0.32	100.2	95-105
CCV 160-375407/1	07/11/18 14:04	82240-334_00001	0.2453	0.20-0.32	99.8	95-105

Detector: AV165

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337268/1	11/13/17 12:45	82235-334_00001	0.2177	0.20-0.32		
ICV 160-337600/1	11/15/17 13:11	82234-334_00001	0.2166	0.20-0.32	99.5	95-105
CCV 160-378514/1	07/27/18 10:46	82235-334_00001	0.2085	0.20-0.32	95.8	95-105

Detector: AV166

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337269/1	11/13/17 12:45	82236-334_00001	0.2428	0.20-0.32		
ICV 160-337601/1	11/15/17 13:11	82232-334_00001	0.2475	0.20-0.32	101.9	95-105
CCV 160-378445/1	07/24/18 11:58	82236-334_00001	0.2372	0.20-0.32	97.7	95-105

Detector: AV167

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337270/1	11/13/17 12:46	82237-334_00003	0.2292	0.20-0.32		
ICV 160-337602/1	11/15/17 13:09	82241-334_00001	0.2362	0.20-0.32	103.0	95-105
CCV 160-378446/1	07/24/18 11:58	82237-334_00003	0.2244	0.20-0.32	97.9	95-105

Detector: AV170

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337273/1	11/13/17 12:47	82241-334_00001	0.2318	0.20-0.32		
ICV 160-337605/1	11/15/17 13:12	82237-334_00003	0.2271	0.20-0.32	98.0	95-105
CCV 160-378449/1	07/24/18 11:59	82241-334_00001	0.2264	0.20-0.32	97.7	95-105

Alpha Spectroscopy Calibration Summary

Detector: AV175

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337277/1	11/13/17 12:49	82246-334_00001	0.2443	0.20-0.32		
ICV 160-337610/1	11/15/17 13:13	82240-334_00001	0.2371	0.20-0.32	97.1	95-105
CCV 160-378453/1	07/24/18 17:04	82246-334_00001	0.2363	0.20-0.32	96.7	95-105

Detector: AV187

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337281/1	11/13/17 15:34	82234-334_00001	0.2107	0.20-0.32		
ICV 160-337614/1	11/15/17 14:30	82242-334_00001	0.2154	0.20-0.32	102.3	95-105
CCV 160-378456/1	07/24/18 13:51	82234-334_00001	0.2043	0.20-0.32	97.0	95-105

Detector: AV189

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337283/1	11/13/17 15:34	82236-334_00001	0.2449	0.20-0.32		
ICV 160-337616/1	11/15/17 14:27	82232-334_00001	0.2498	0.20-0.32	102.0	95-105
CCV 160-378458/1	07/24/18 13:19	82236-334_00001	0.2492	0.20-0.32	101.8	95-105

Detector: AV190

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337284/1	11/13/17 15:35	82237-334_00003	0.2330	0.20-0.32		
ICV 160-337617/1	11/15/17 14:30	82241-334_00001	0.2394	0.20-0.32	102.7	95-105
CCV 160-378459/1	07/24/18 13:20	82237-334_00003	0.2269	0.20-0.32	97.4	95-105

Detector: AV191

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337285/1	11/13/17 15:35	82238-334_00001	0.2290	0.20-0.32		
ICV 160-337618/1	11/15/17 14:31	82244-334_00001	0.2380	0.20-0.32	103.9	95-105
CCV 160-378460/1	07/24/18 13:20	82238-334_00001	0.2203	0.20-0.32	96.2	95-105

Detector: AV192

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337286/1	11/13/17 15:35	82240-334_00001	0.2409	0.20-0.32		
ICV 160-337619/1	11/15/17 14:31	82246-334_00001	0.2377	0.20-0.32	98.7	95-105
CCV 160-378461/1	07/24/18 13:21	82240-334_00001	0.2312	0.20-0.32	96.0	95-105

Detector: AV194

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337288/1	11/13/17 15:47	82242-334_00001	0.2181	0.20-0.32		
ICV 160-337621/1	11/15/17 14:28	82235-334_00001	0.2083	0.20-0.32	95.5	95-105
CCV 160-378462/1	07/24/18 13:51	82242-334_00001	0.2084	0.20-0.32	95.5	95-105

Detector: AV198

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337292/1	11/13/17 15:48	82246-334_00001	0.2375	0.20-0.32		
ICV 160-337624/1	11/15/17 14:29	82240-334_00001	0.2344	0.20-0.32	98.7	95-105
CCV 160-378465/1	07/24/18 13:22	82246-334_00001	0.2382	0.20-0.32	100.3	95-105

Alpha Spectroscopy Calibration Summary

Detector: AV203

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337297/1	11/14/17 09:01	82235-334_00001	0.2122	0.20-0.32		
ICV 160-337629/1	11/15/17 15:49	82234-334_00001	0.2117	0.20-0.32	99.8	95-105
CCV 160-378468/1	07/24/18 15:13	82235-334_00001	0.2025	0.20-0.32	95.4	95-105

Detector: AV206

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337300/1	11/14/17 09:00	82238-334_00001	0.2342	0.20-0.32		
ICV 160-337632/1	11/15/17 15:53	82244-334_00001	0.2374	0.20-0.32	101.4	95-105
CCV 160-378469/1	07/24/18 15:14	82238-334_00001	0.2246	0.20-0.32	95.9	95-105

Detector: AV208

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337302/1	11/14/17 08:59	82241-334_00001	0.2428	0.20-0.32		
ICV 160-337634/1	11/15/17 15:50	82237-334_00003	0.2379	0.20-0.32	98.0	95-105
CCV 160-378470/1	07/24/18 15:14	82241-334_00001	0.2389	0.20-0.32	98.4	95-105

Detector: AV212

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337306/1	11/14/17 08:58	82245-334_00001	0.2241	0.20-0.32		
ICV 160-337638/1	11/15/17 15:52	82247-334_00001	0.2256	0.20-0.32	100.7	95-105
CCV 160-378472/1	07/24/18 15:23	82245-334_00001	0.2200	0.20-0.32	98.2	95-105

Detector: AV213

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337307/1	11/14/17 08:58	82246-334_00001	0.2404	0.20-0.32		
ICV 160-337639/1	11/15/17 15:52	82240-334_00001	0.2411	0.20-0.32	100.3	95-105
CCV 160-378473/1	07/24/18 15:15	82246-334_00001	0.2340	0.20-0.32	97.3	95-105

Detector: AV215

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337309/1	11/14/17 12:26	82232-334_00001	0.2545	0.20-0.32		
ICV 160-337643/1	11/16/17 08:34	82236-334_00001	0.2486	0.20-0.32	97.7	95-105
CCV 160-378475/1	07/25/18 10:24	82232-334_00001	0.2504	0.20-0.32	98.4	95-105

Detector: AV216

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337310/1	11/14/17 12:25	82233-334_00001	0.2689	0.20-0.32		
ICV 160-337644/1	11/16/17 08:34	82243-334_00001	0.2577	0.20-0.32	95.8	95-105
CCV 160-378476/1	07/25/18 10:25	82233-334_00001	0.2670	0.20-0.32	99.3	95-105

Detector: AV217

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337311/1	11/14/17 12:25	82234-334_00001	0.2121	0.20-0.32		
ICV 160-337645/1	11/16/17 08:33	82242-334_00001	0.2138	0.20-0.32	100.8	95-105
CCV 160-378477/1	07/25/18 10:25	82234-334_00001	0.2042	0.20-0.32	96.3	95-105

Alpha Spectroscopy Calibration Summary

Detector: AV218

Lab Sample ID	Analysis Date	Reagent ID	Efficiency	Efficiency Limits	Efficiency Recovery	Recovery Limits
IC 160-337312/1	11/14/17 12:33	82235-334_00001	0.2131	0.20-0.32		
ICV 160-337646/1	11/16/17 08:34	82234-334_00001	0.2112	0.20-0.32	99.1	95-105
CCV 160-378478/1	07/25/18 10:26	82235-334_00001	0.2060	0.20-0.32	96.7	95-105

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:58:09PM 5/19/2018

Calibration

Sample Name: ICV-8877;AV1-05182018
Description:
Detector: AV1

Calibration Date: 5/19/2018 3:58:05PM
Analyst: 60040

Source Info

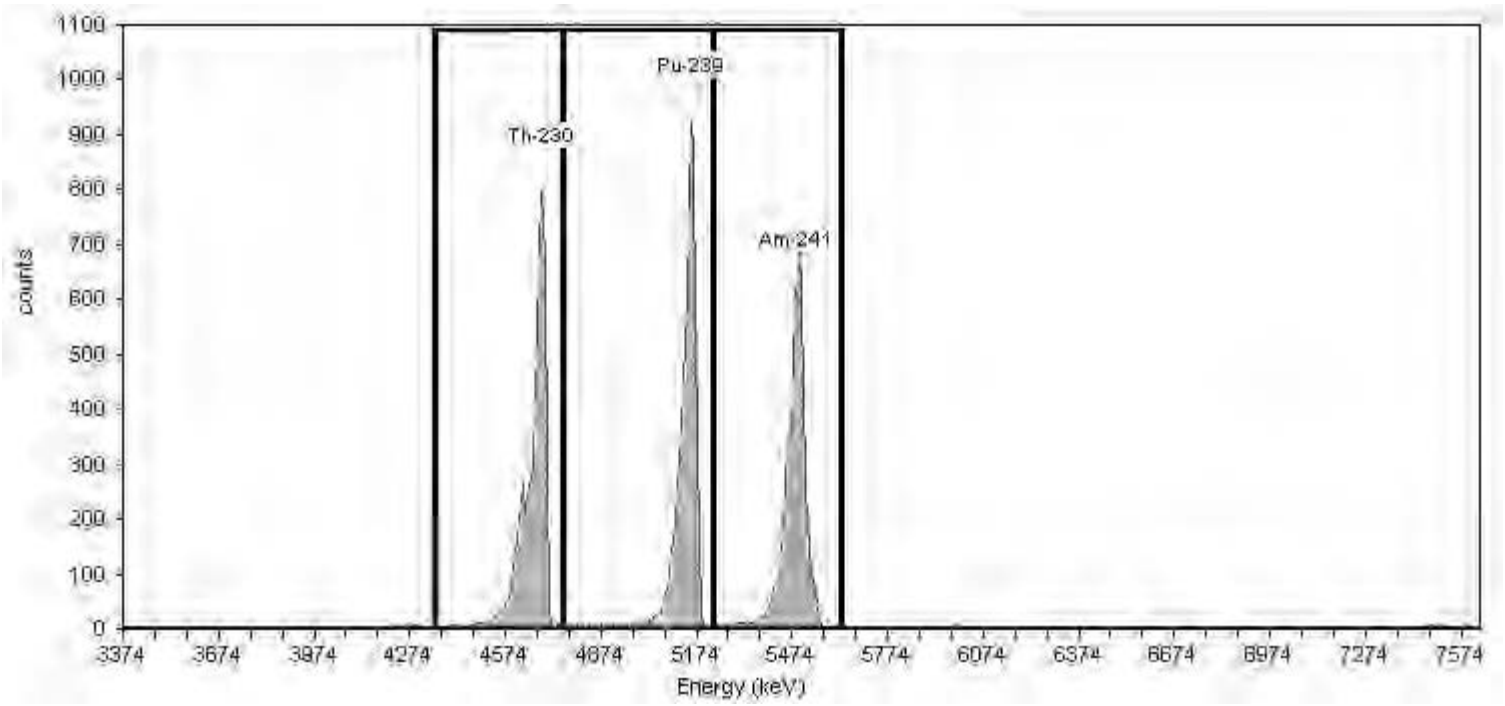
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 5/18/2018 7:25:01PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 23.26% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,697.00	94.95
Pu-239	240	5.16	186	249	0.00	6,038.00	100.63
Am-241	284	5.49	249	303	0.00	5,570.00	92.83

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:58:37PM 5/19/2018

Calibration

Sample Name: ICV-7107;AV3-05182018
Description:
Detector: AV3

Calibration Date: 5/19/2018 3:58:34PM
Analyst: 60040

Source Info

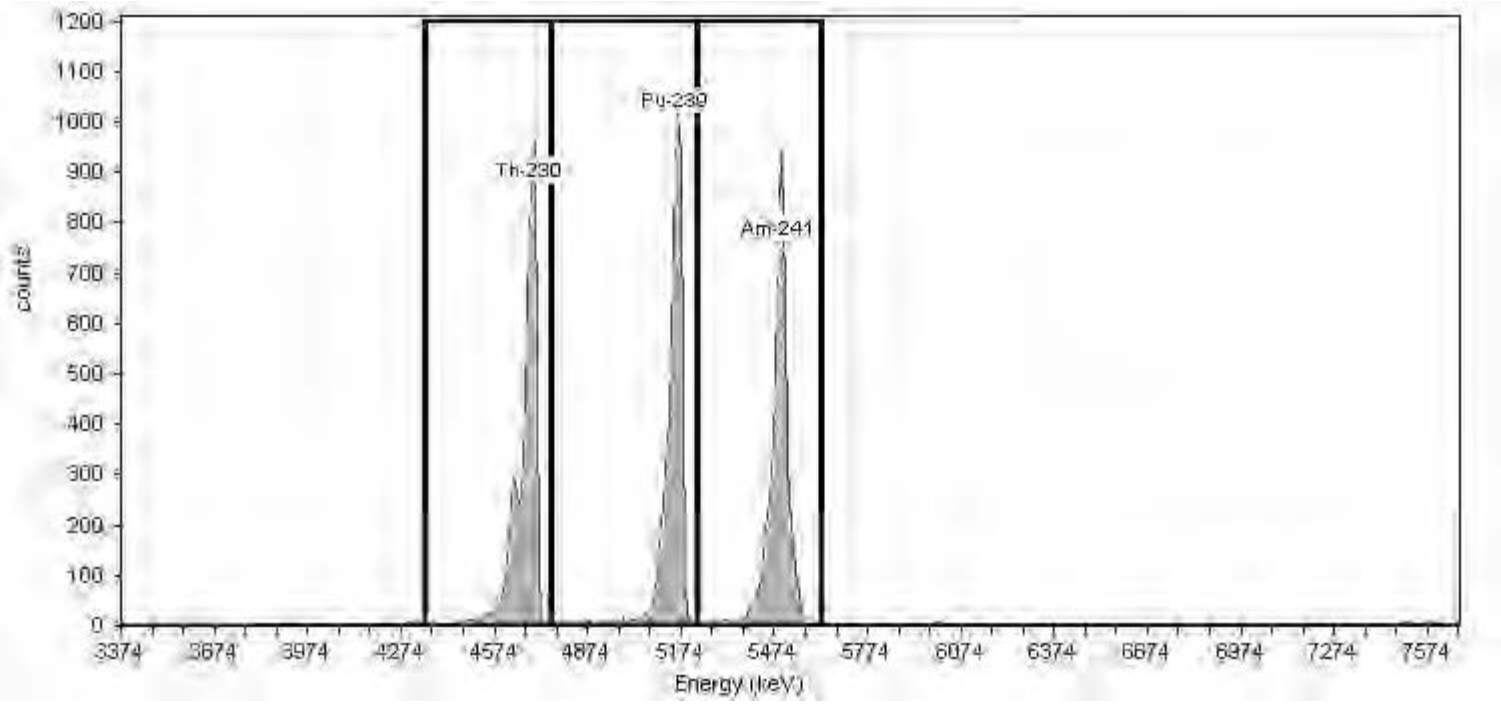
Certificate ID: 82232-334
Prepared by: Analytics

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 / Ch^2



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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:59:12PM 5/19/2018

Calibration

Sample Name: ICV-9520;AV7-05182018
Description:
Detector: AV7

Calibration Date: 5/19/2018 3:59:09PM
Analyst: 60040

Source Info

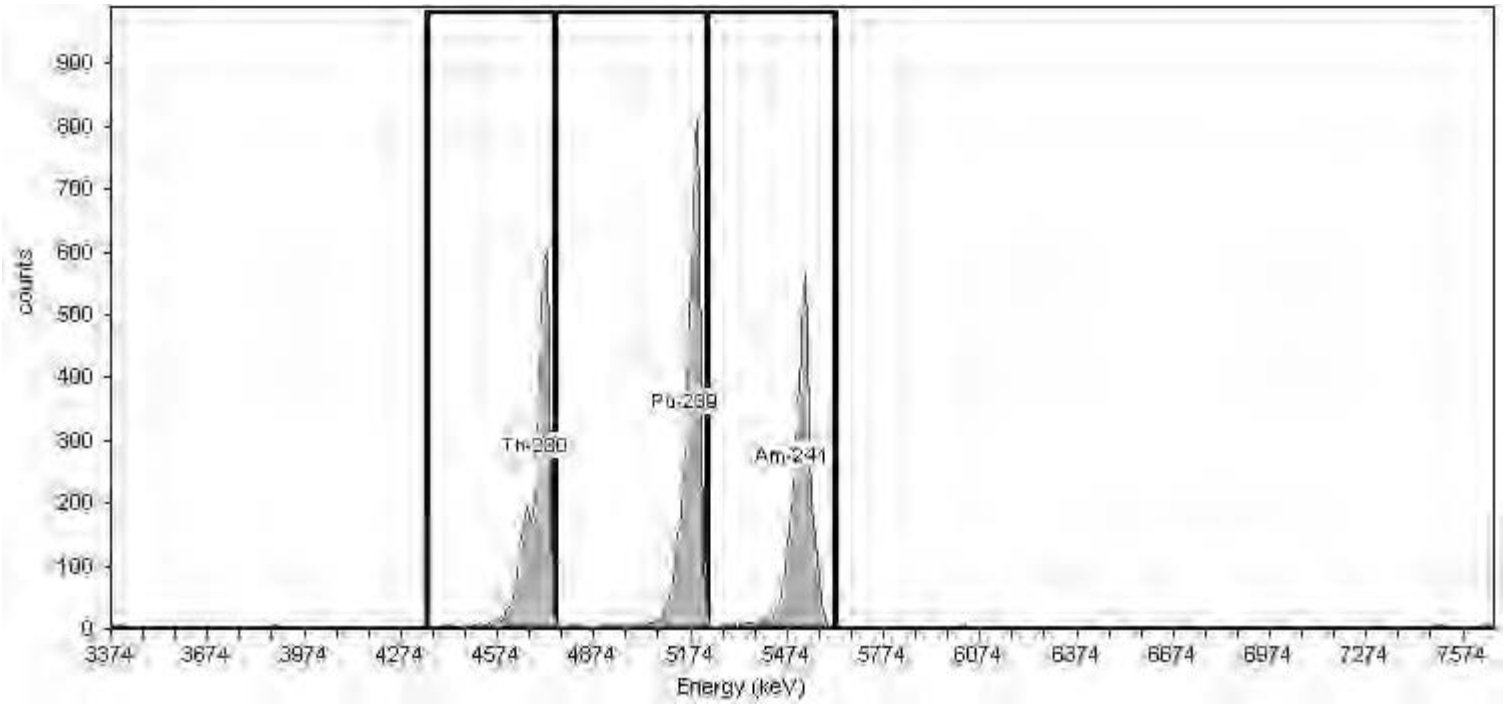
Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



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	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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:59:31PM 5/19/2018

Calibration

Sample Name: ICV-8874;AV8-05182018
Description:
Detector: AV8

Calibration Date: 5/19/2018 3:59:26PM
Analyst: 60040

Source Info

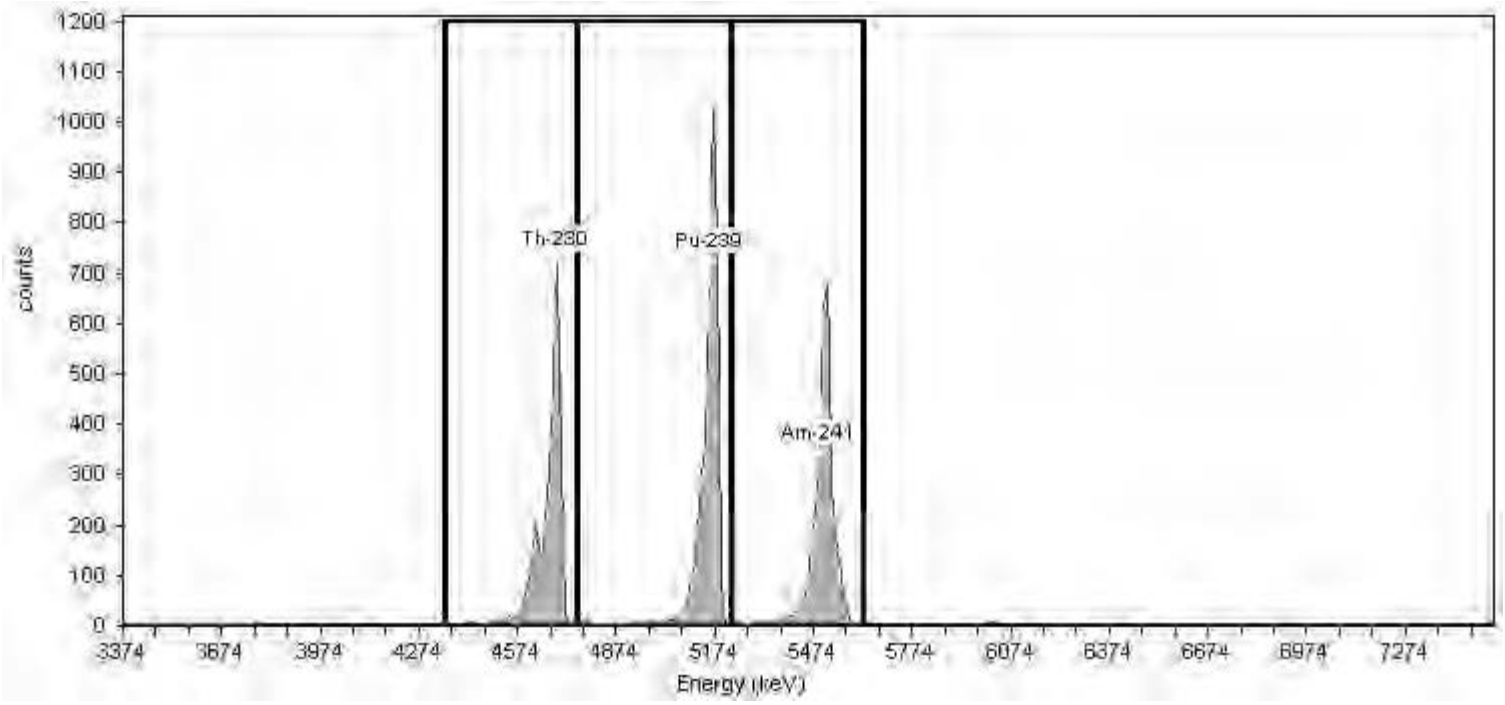
Certificate ID: 82233-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



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	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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:34:51AM 5/20/2018

Calibration

Sample Name: ICV-9792;AV10-05192018
Description:
Detector: AV10

Calibration Date: 5/20/2018 11:34:48AM
Analyst: 60040

Source Info

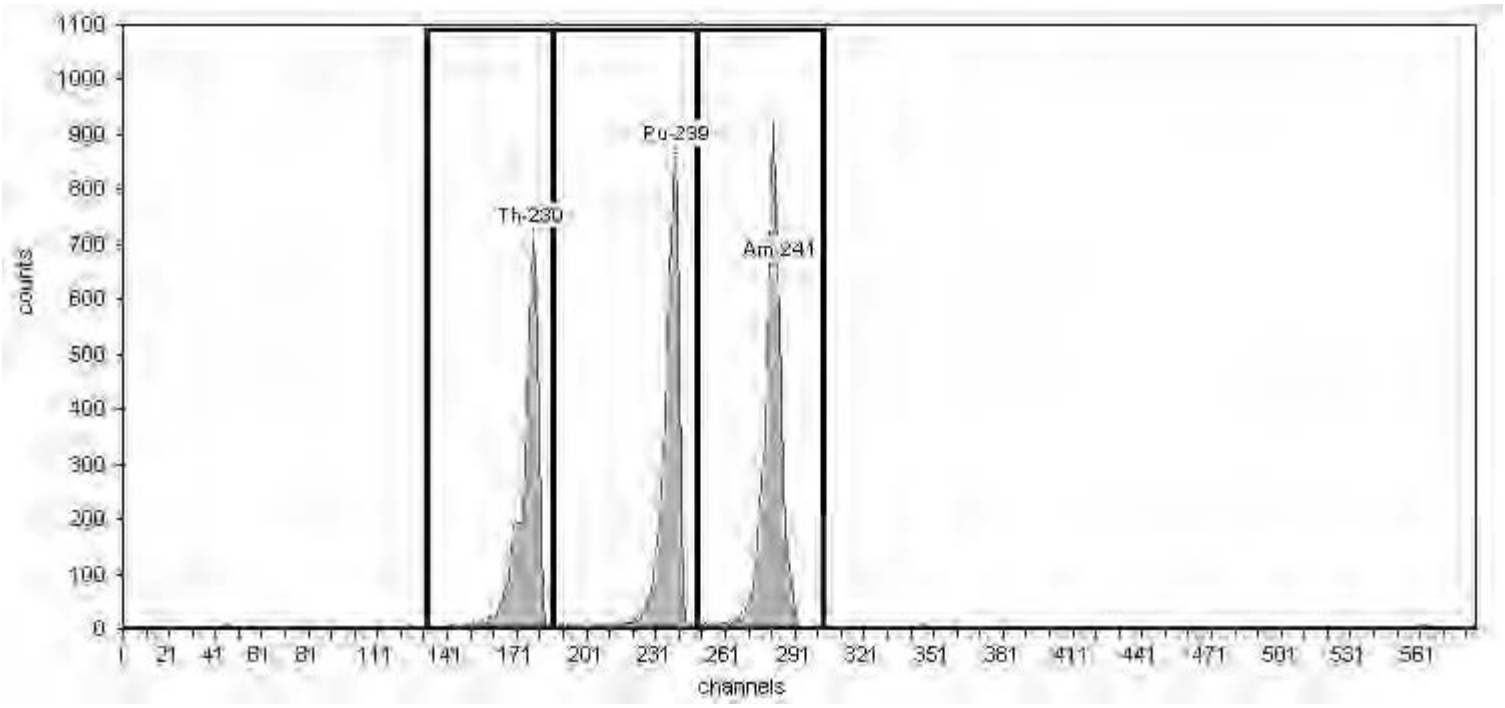
Certificate ID: 82240-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV10 , SN: 49-155N2
Acquisition Start Date: 5/19/2018 4:12:06PM
Live Time: 60.00 min.
Real Time: 60.21 min.
Efficiency: 23.44% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,349.00	89.15
Pu-239	240	5.16	186	249	0.00	6,073.00	101.22
Am-241	284	5.49	249	303	0.00	6,863.00	114.38

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:00:35PM 5/19/2018

Calibration

Sample Name: ICV-1370620;AV15-05182018
Description:
Detector: AV15

Calibration Date: 5/19/2018 4:00:31PM
Analyst: 60040

Source Info

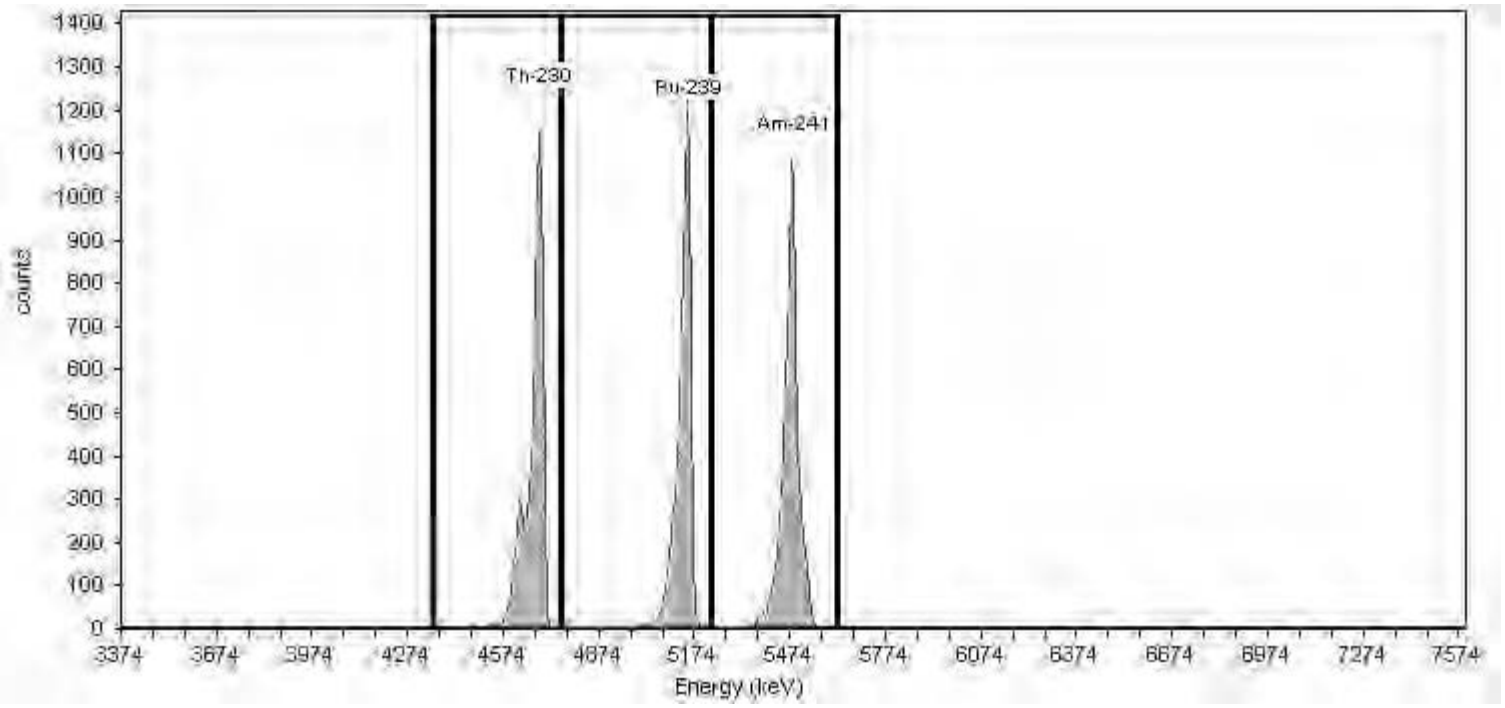
Certificate ID: 108348_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00PM
Description:

Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 5/18/2018 7:34:31PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 26.59% +/- 0.37% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,757.00	112.62
Pu-239	240	5.16	186	249	0.00	6,806.00	113.43
Am-241	284	5.49	249	303	0.00	7,041.00	117.35

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:29:26AM 5/21/2018

Calibration

Sample Name: ICV-7107;AV19-05202018
Description:
Detector: AV19

Calibration Date: 5/21/2018 10:29:23AM
Analyst: 60040

Source Info

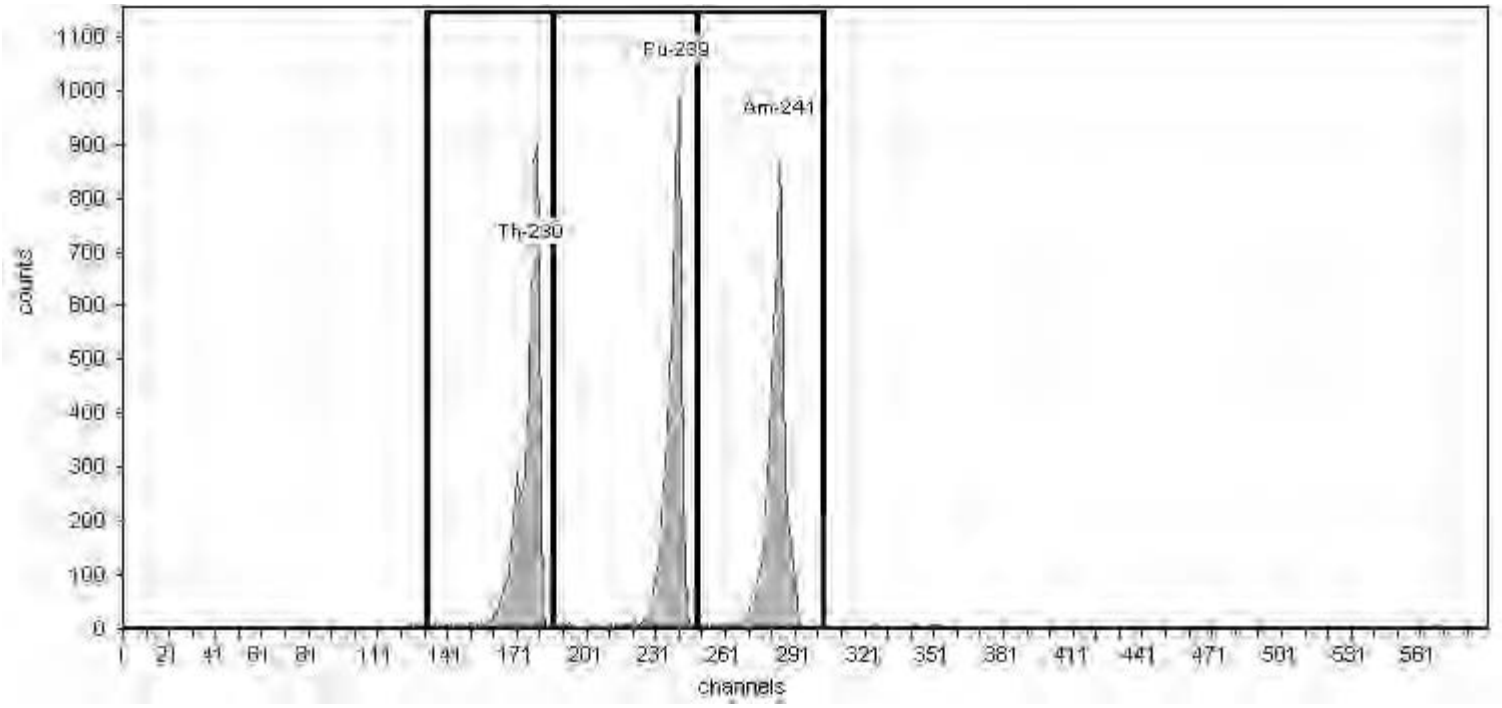
Certificate ID: 82232-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV19 , SN: 50-025FF5
Acquisition Start Date: 5/20/2018 4:11:20PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 23.70% +/- 0.38% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,294.00	104.90
Pu-239	240	5.16	186	249	0.00	6,305.00	105.08
Am-241	284	5.49	249	303	0.00	6,161.00	102.68

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:29:50AM 5/21/2018

Calibration

Sample Name: ICV-9817;AV20-05202018
Description:
Detector: AV20

Calibration Date: 5/21/2018 10:29:46AM
Analyst: 60040

Source Info

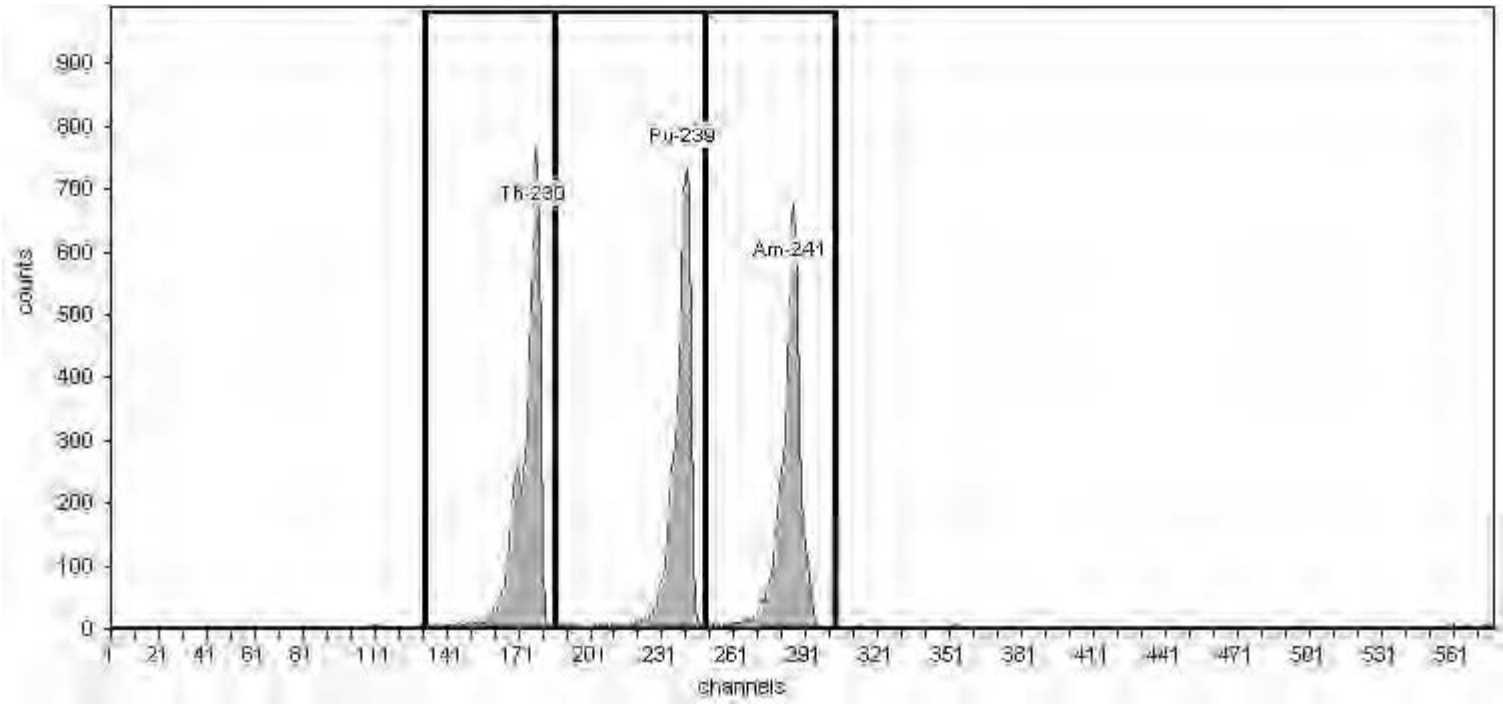
Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV20 , SN: 48-121A7
Acquisition Start Date: 5/20/2018 4:11:44PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 21.91% +/- 0.38% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,775.00	96.25
Pu-239	240	5.16	186	249	0.00	5,313.00	88.55
Am-241	284	5.49	249	303	0.00	5,386.00	89.77

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:30:30AM 5/21/2018

Calibration

Sample Name: ICV-8874;AV23-05202018
Description:
Detector: AV23

Calibration Date: 5/21/2018 10:30:24AM
Analyst: 60040

Source Info

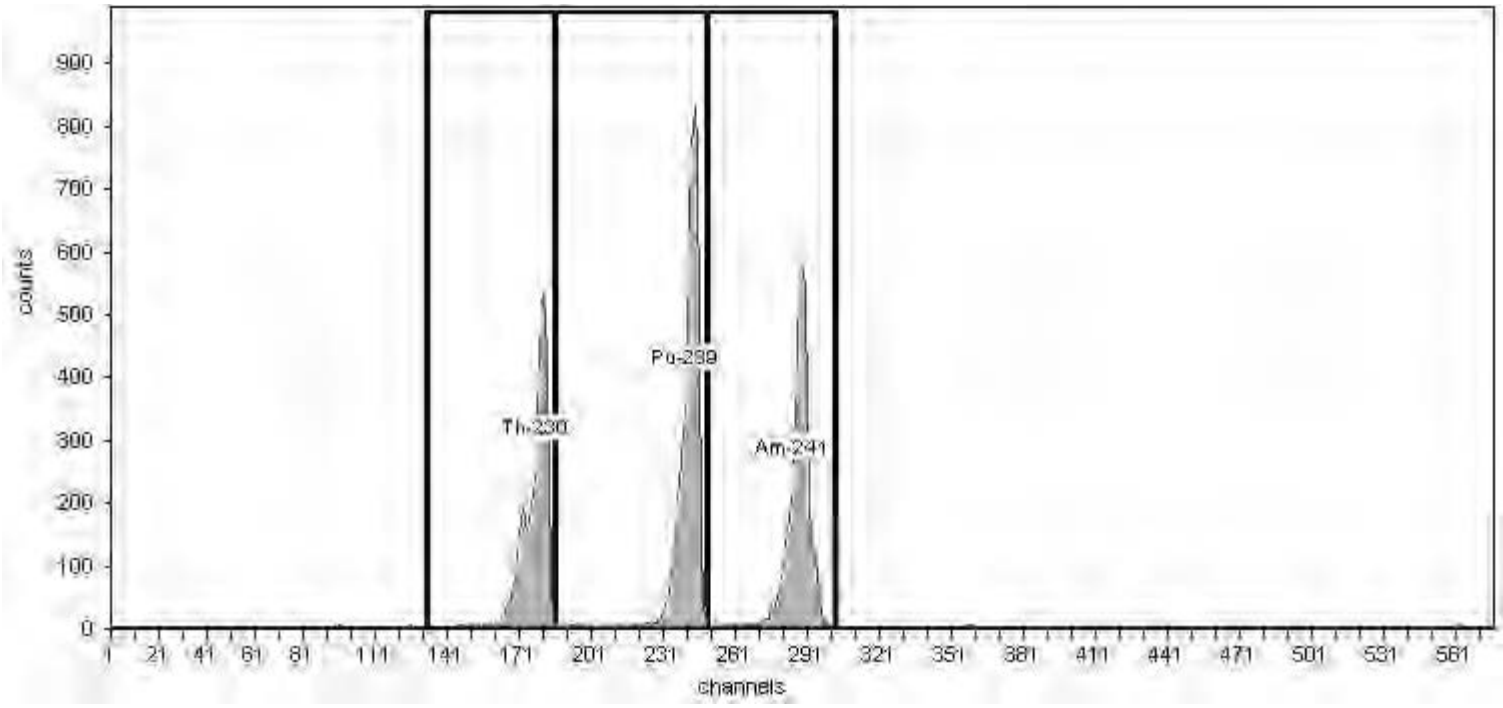
Certificate ID: 82233-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV23 , SN: 48-158FF3
Acquisition Start Date: 5/20/2018 4:12:39PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 25.12% +/- 0.48% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,251.00	70.85
Pu-239	240	5.16	186	249	0.00	5,708.00	95.13
Am-241	284	5.49	249	303	0.00	4,582.00	76.37

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:30:44AM 5/21/2018

Calibration

Sample Name: ICV-9793;AV24-05202018
Description:
Detector: AV24

Calibration Date: 5/21/2018 10:30:40AM
Analyst: 60040

Source Info

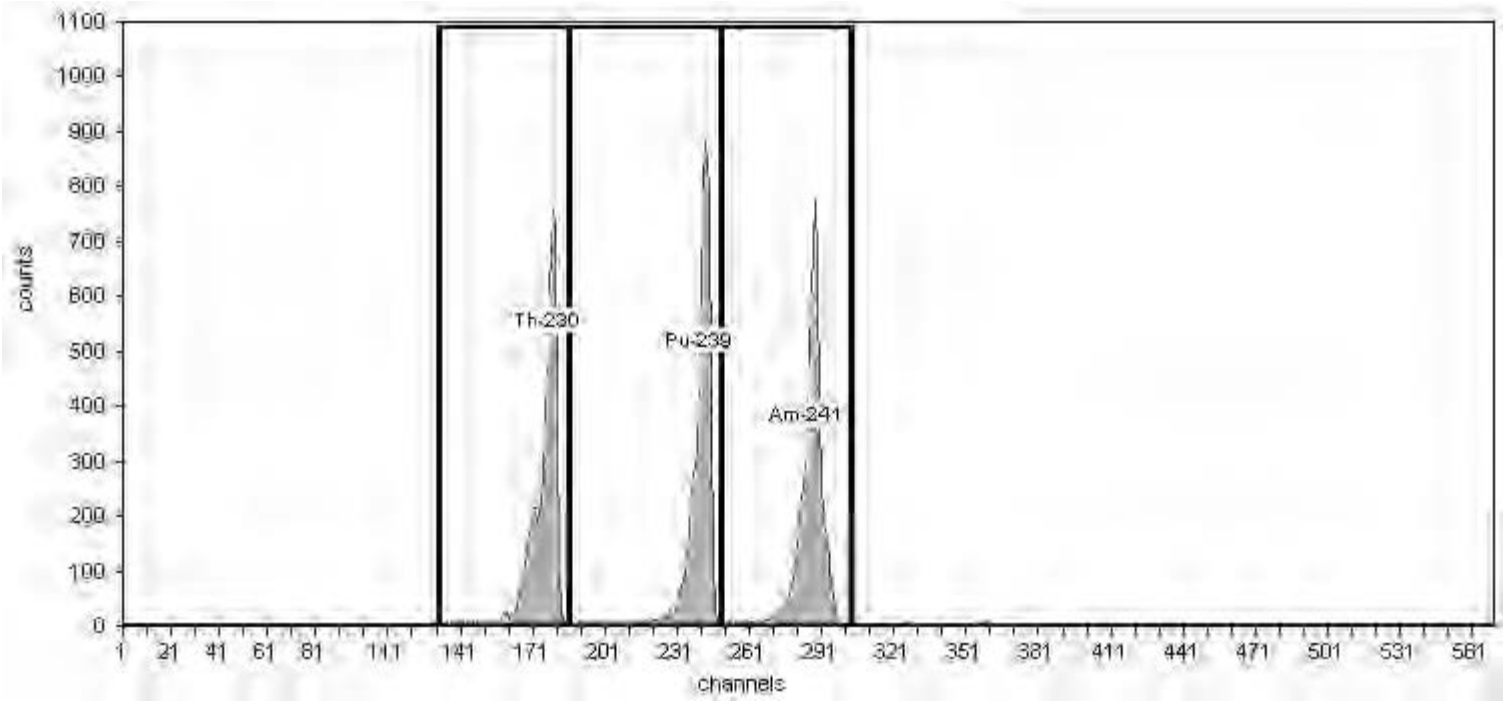
Certificate ID: 82241-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV24 , SN: 47-137Q4
Acquisition Start Date: 5/20/2018 4:12:51PM
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 / Ch^2



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	5,356.00	89.27
Pu-239	240	5.16	186	249	0.00	5,558.00	92.63
Am-241	284	5.49	249	303	0.00	5,475.00	91.25

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:31:00AM 5/21/2018

Calibration

Sample Name: ICV-9792;AV43-05202018
Description:
Detector: AV43

Calibration Date: 5/21/2018 10:30:57AM
Analyst: 60040

Source Info

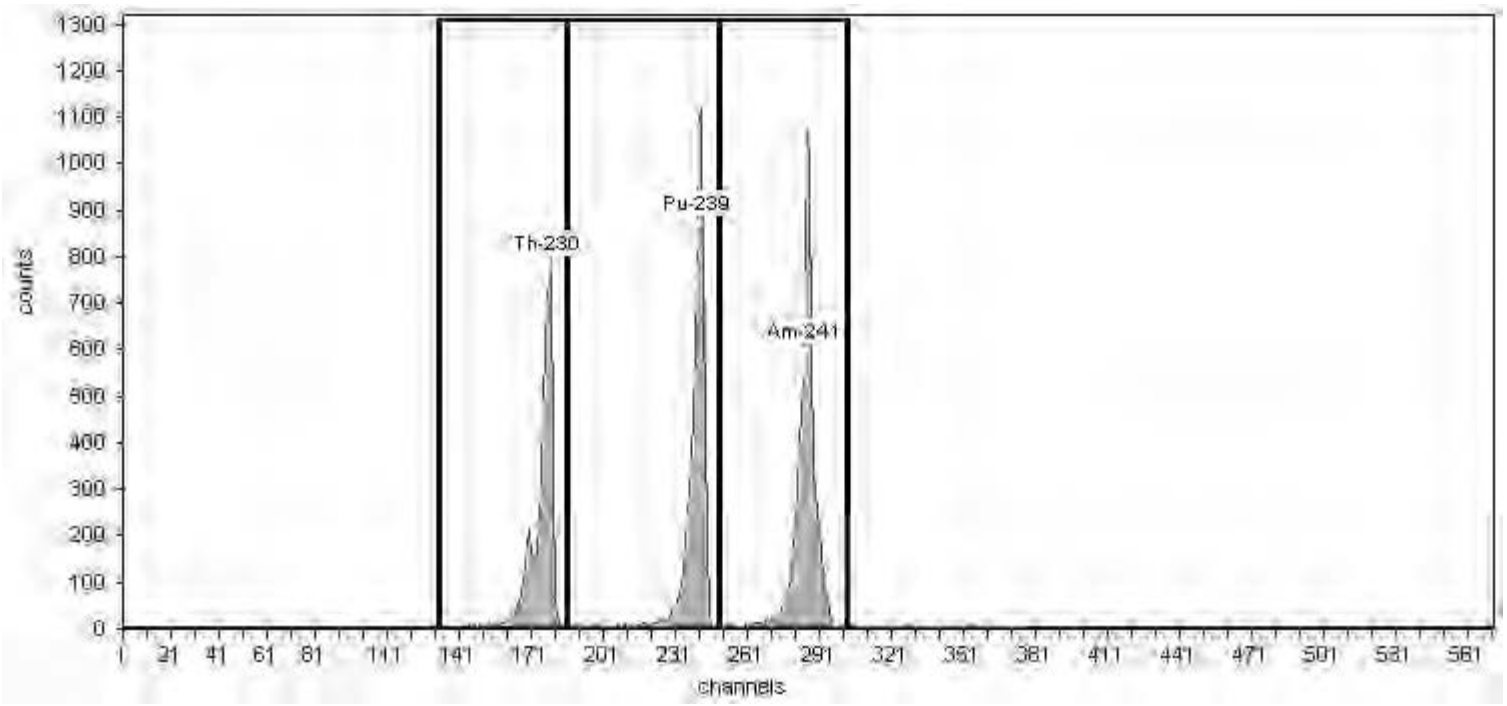
Certificate ID: 82240-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV43 , SN: 49-190X4
Acquisition Start Date: 5/20/2018 4:13:06PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 23.11% +/- 0.38% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,141.00	85.68
Pu-239	240	5.16	186	249	0.00	6,116.00	101.93
Am-241	284	5.49	249	303	0.00	6,772.00	112.87

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:31:12AM 5/21/2018

Calibration

Sample Name: ICV-1368447;AV44-05202018
Description:
Detector: AV44

Calibration Date: 5/21/2018 10:31:08AM
Analyst: 60040

Source Info

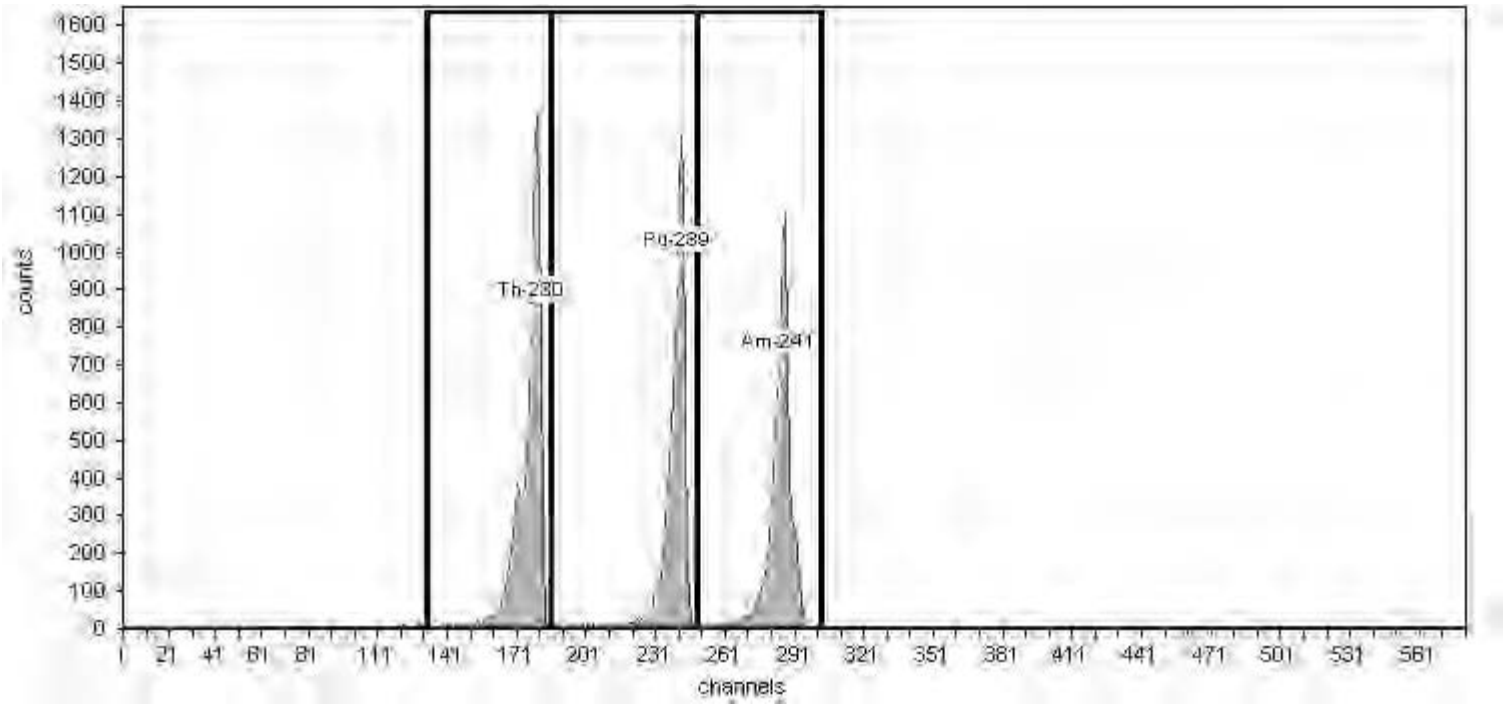
Certificate ID: 108002_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/1/2017 11:00:00AM
Description:

Acquisition

Detector: AV44 , SN: 50-051JJ1
Acquisition Start Date: 5/20/2018 4:13:34PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 27.81% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	9,438.00	157.30
Pu-239	240	5.16	186	249	0.00	8,527.00	142.12
Am-241	284	5.49	249	303	0.00	8,024.00	133.73

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:31:30AM 5/21/2018

Calibration

Sample Name: ICV-1368446;AV45-05202018
Description:
Detector: AV45

Calibration Date: 5/21/2018 10:31:27AM
Analyst: 60040

Source Info

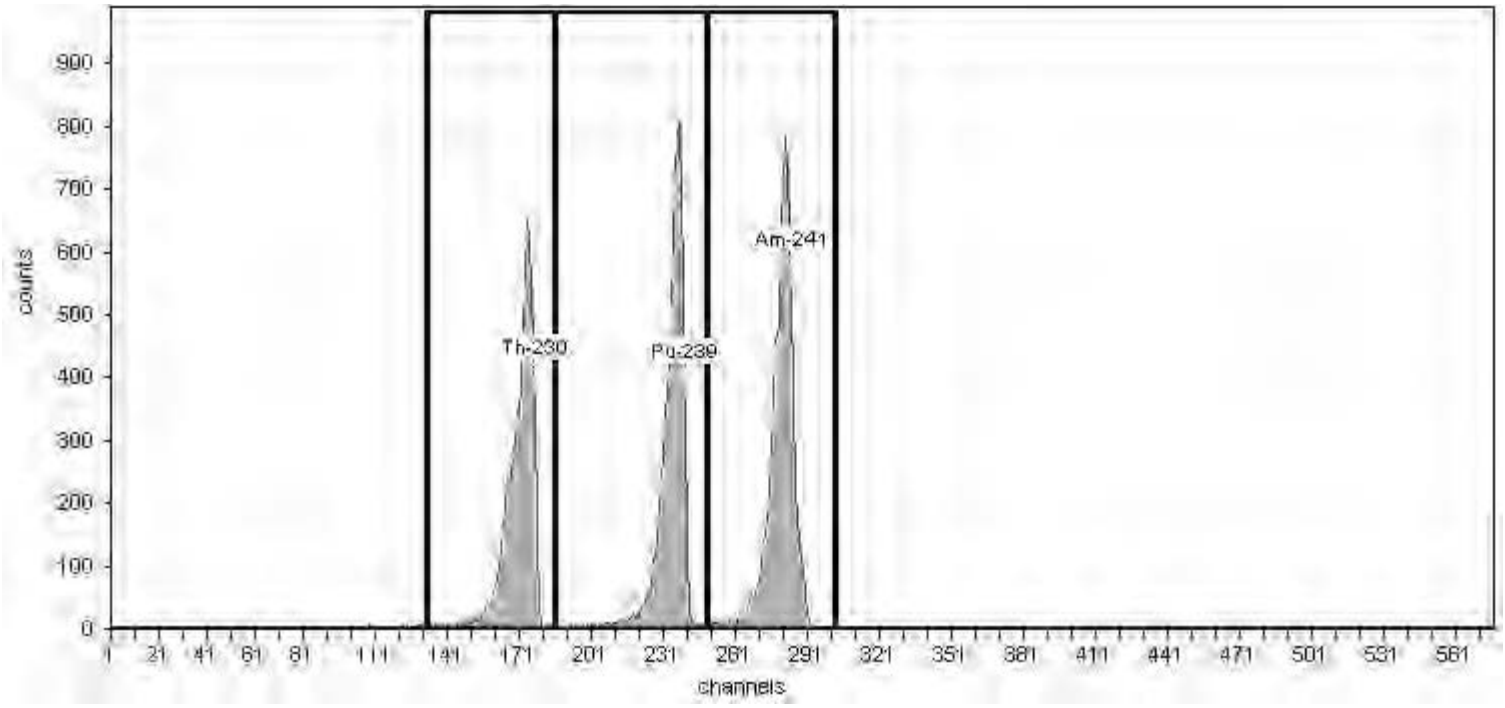
Certificate ID: 108001_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/6/2017 11:00:00AM
Description:

Acquisition

Detector: AV45 , SN: 48-158FF2
Acquisition Start Date: 5/20/2018 4:13:59PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 27.53% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,035.00	100.58
Pu-239	240	5.16	186	249	0.00	6,623.00	110.38
Am-241	284	5.49	249	303	0.00	7,111.00	118.52

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:31:54AM 5/21/2018

Calibration

Sample Name: ICV-1370621;AV47-05202018
Description:
Detector: AV47

Calibration Date: 5/21/2018 10:31:51AM
Analyst: 60040

Source Info

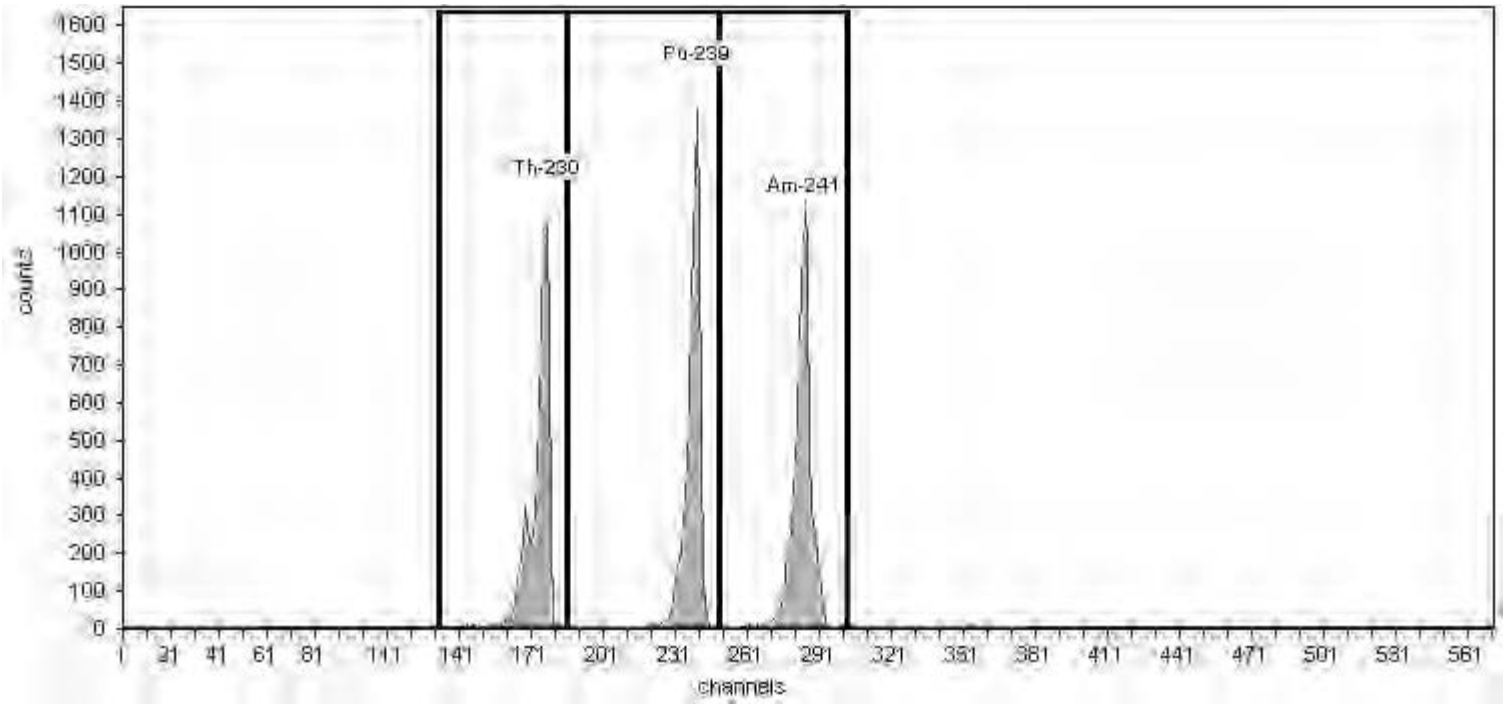
Certificate ID: 108345_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV47 , SN: 46-032336
Acquisition Start Date: 5/20/2018 4:15:04PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 26.86% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,975.00	116.25
Pu-239	240	5.16	186	249	0.00	7,481.00	124.68
Am-241	284	5.49	249	303	0.00	7,719.00	128.65

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:32:19AM 5/21/2018

Calibration

Sample Name: ICV-1370620;AV48-05202018
Description:
Detector: AV48

Calibration Date: 5/21/2018 10:32:15AM
Analyst: 60040

Source Info

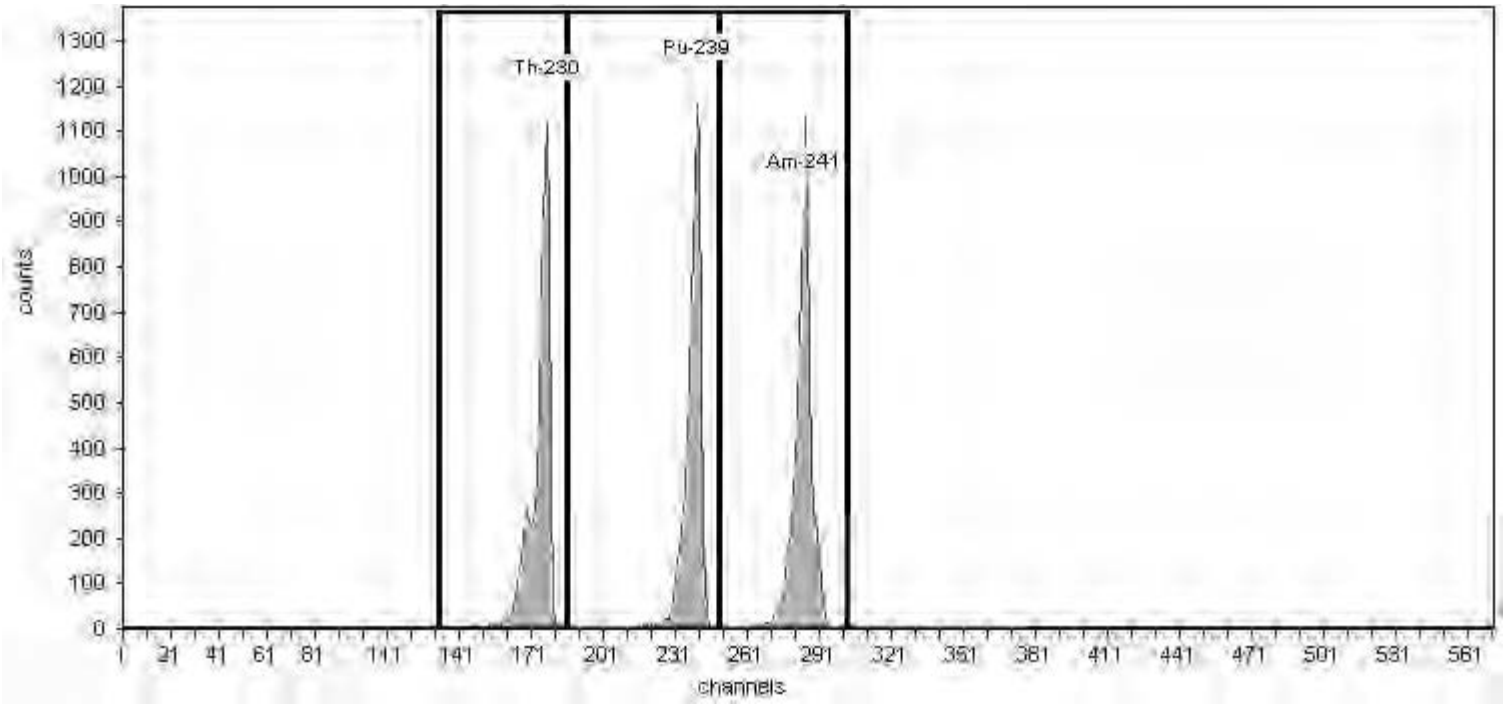
Certificate ID: 108348_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00PM
Description:

Acquisition

Detector: AV48 , SN: 46-033P6
Acquisition Start Date: 5/20/2018 4:15:27PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 26.68% +/- 0.37% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,607.00	110.12
Pu-239	240	5.16	186	249	0.00	6,842.00	114.03
Am-241	284	5.49	249	303	0.00	7,223.00	120.38

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:32:30AM 5/21/2018

Calibration

Sample Name: ICV-1370619;AV49-05202018
Description:
Detector: AV49

Calibration Date: 5/21/2018 10:32:27AM
Analyst: 60040

Source Info

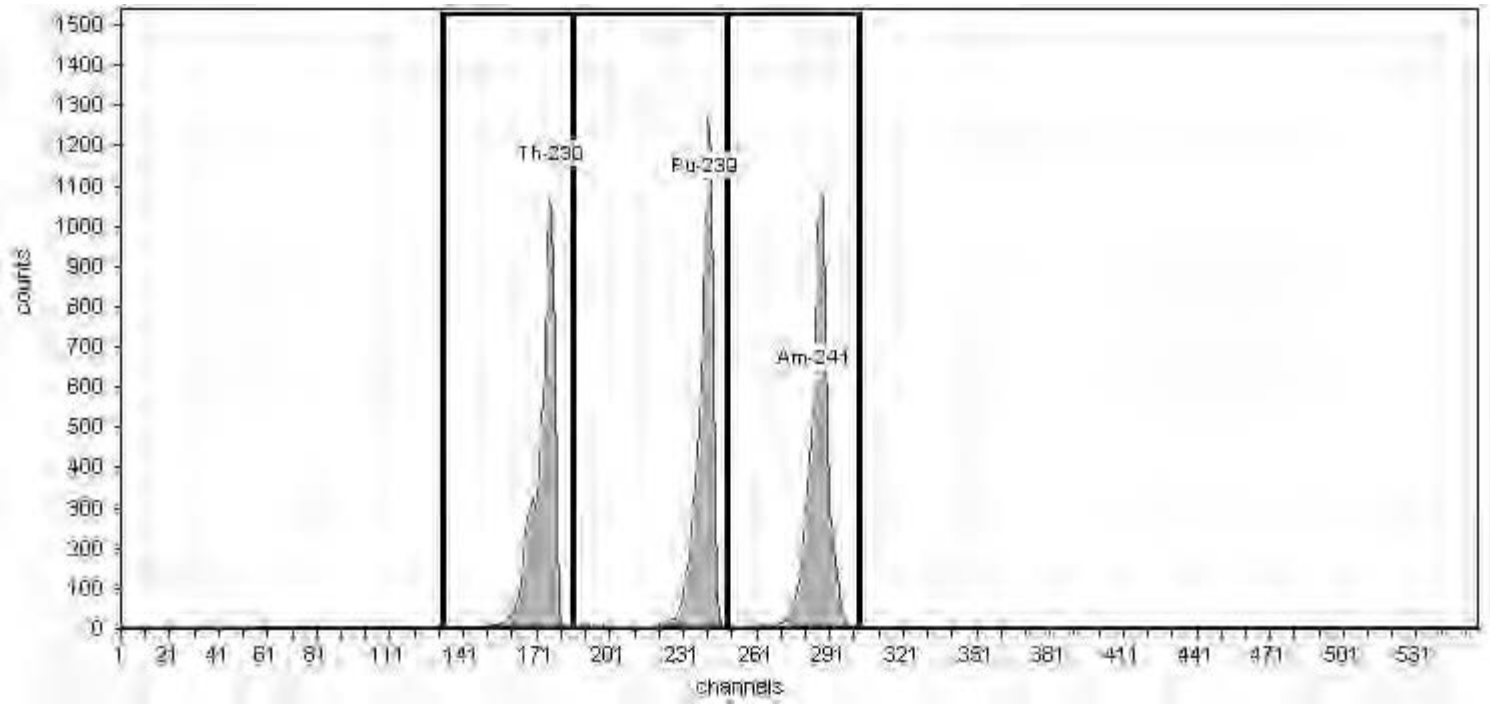
Certificate ID: 108347_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00AM
Description:

Acquisition

Detector: AV49 , SN: 47-043hh4
Acquisition Start Date: 5/20/2018 4:15:44PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 26.82% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	7,803.00	130.05
Pu-239	240	5.16	186	249	0.00	7,817.00	130.28
Am-241	284	5.49	249	303	0.00	8,306.00	138.43

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:45:18PM 5/23/2018

Calibration

Sample Name: ICV-7107;AV52-05232018
Description:
Detector: AV52

Calibration Date: 5/23/2018 12:36:43PM
Analyst: 60040

Source Info

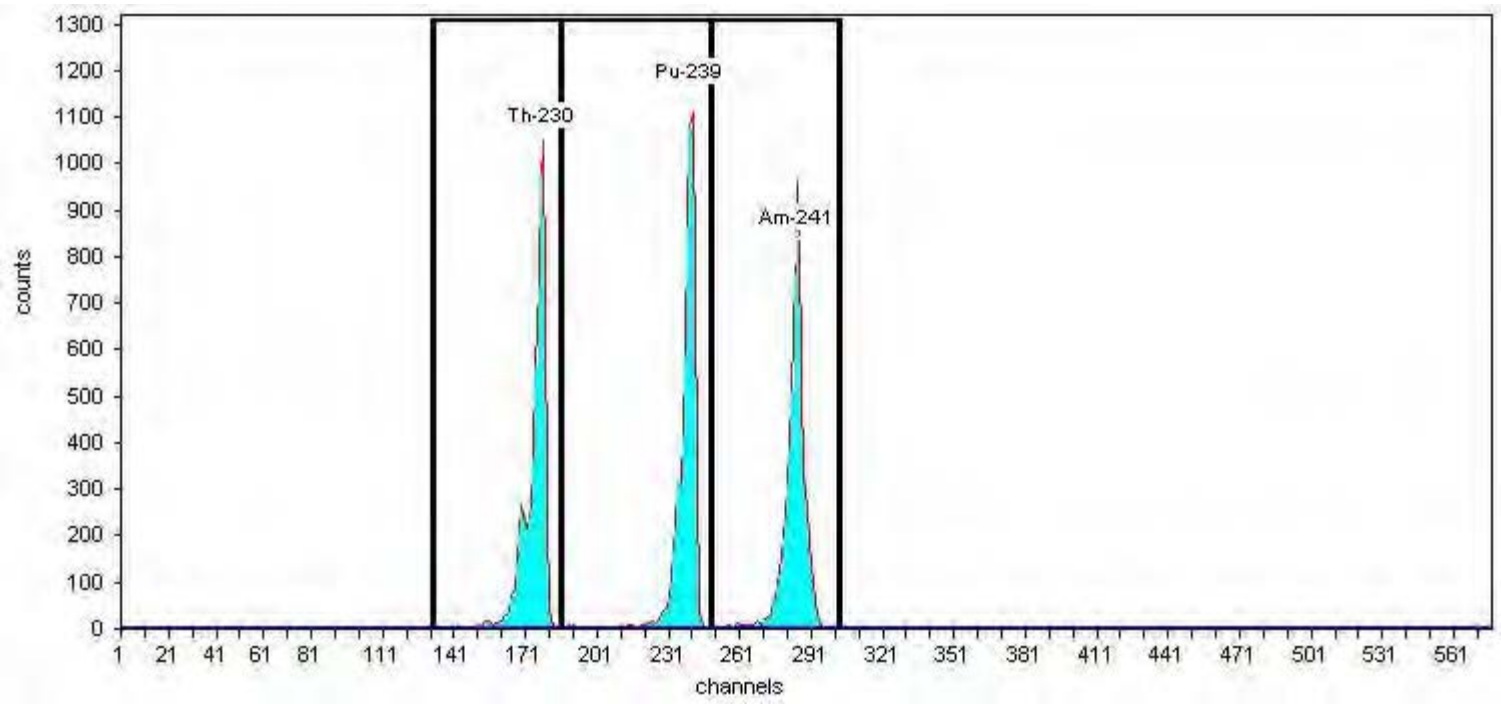
Certificate ID: 82232-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV52 , SN: 49-155N7
Acquisition Start Date: 5/23/2018 11:26:49AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 24.78% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,649.00	110.82
Pu-239	240	5.16	186	249	0.00	6,607.00	110.12
Am-241	284	5.49	249	303	0.00	6,357.00	105.95

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:45:39PM 5/23/2018

Calibration

Sample Name: ICV-9817;AV53-05232018
Description:
Detector: AV53

Calibration Date: 5/23/2018 12:36:55PM
Analyst: 60040

Source Info

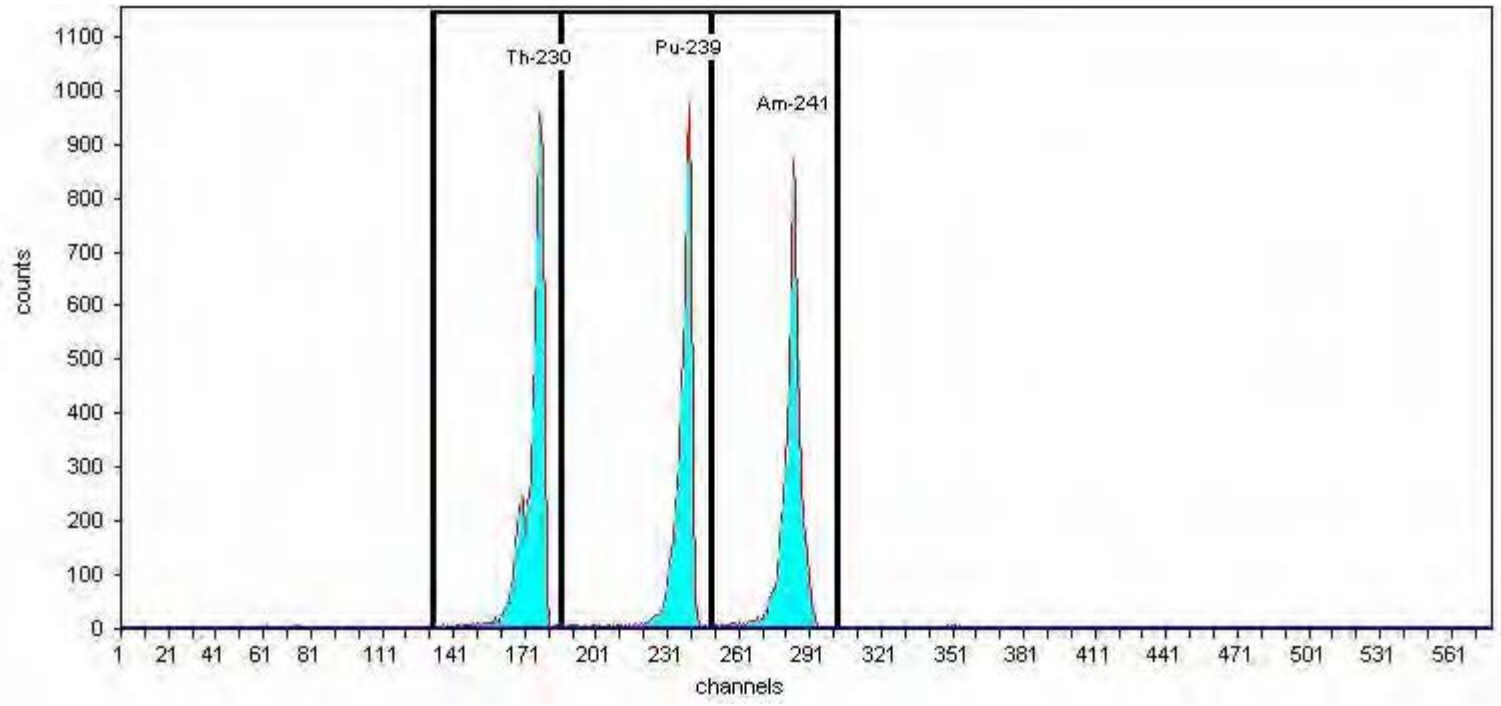
Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV53 , SN: 50-051A6
Acquisition Start Date: 5/23/2018 11:27:10AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 22.60% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,971.00	99.52
Pu-239	240	5.16	186	249	0.00	5,438.00	90.63
Am-241	284	5.49	249	303	0.00	5,582.00	93.03

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:45:51PM 5/23/2018

Calibration

Sample Name: ICV-9885;AV54-05232018
Description:
Detector: AV54

Calibration Date: 5/23/2018 12:37:06PM
Analyst: 60040

Source Info

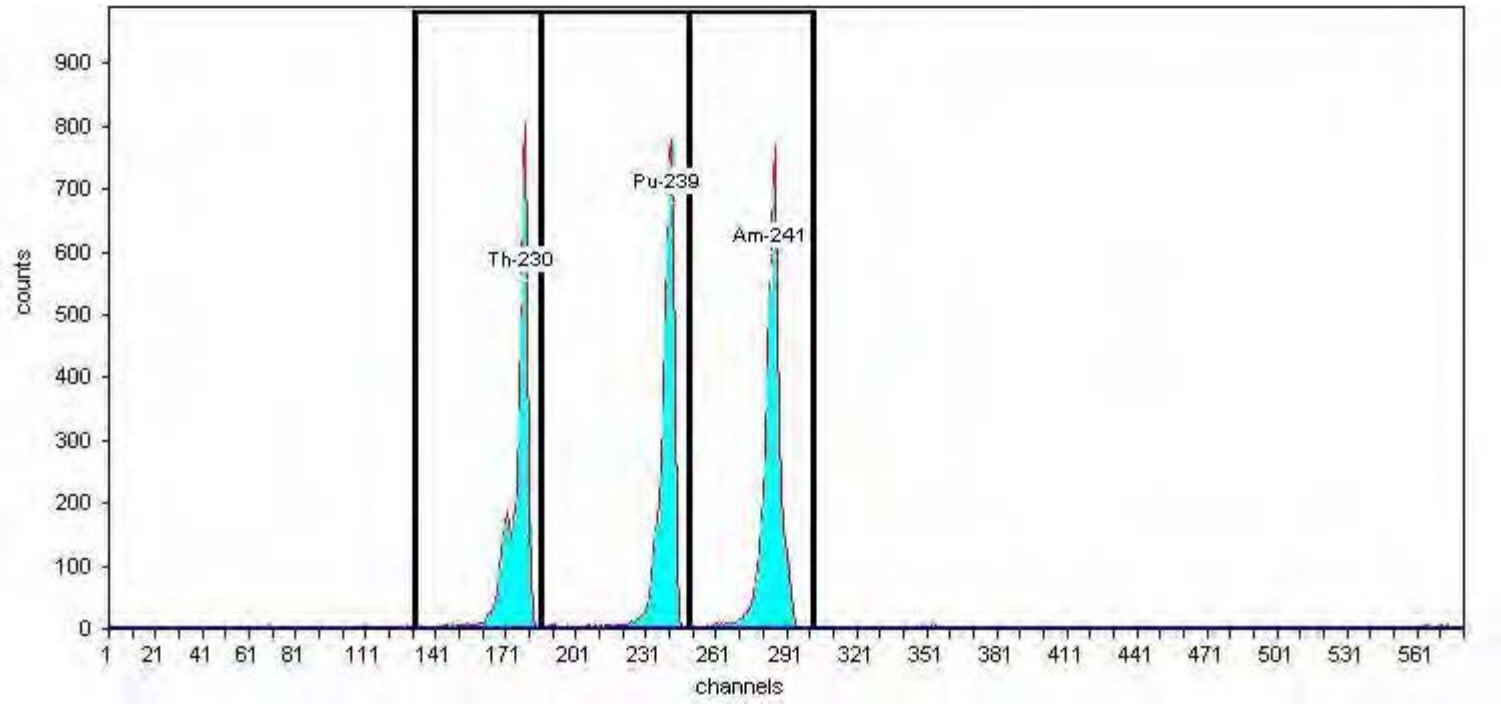
Certificate ID: 82246-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV54 , SN: 46-033P4
Acquisition Start Date: 5/23/2018 11:27:55AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 23.48% +/- 0.46% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,671.00	77.85
Pu-239	240	5.16	186	249	0.00	4,552.00	75.87
Am-241	284	5.49	249	303	0.00	5,021.00	83.68

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:47:34PM 5/23/2018

Calibration

Sample Name: ICV-8874;AV56-05232018
Description:
Detector: AV56

Calibration Date: 5/23/2018 12:37:46PM
Analyst: 60040

Source Info

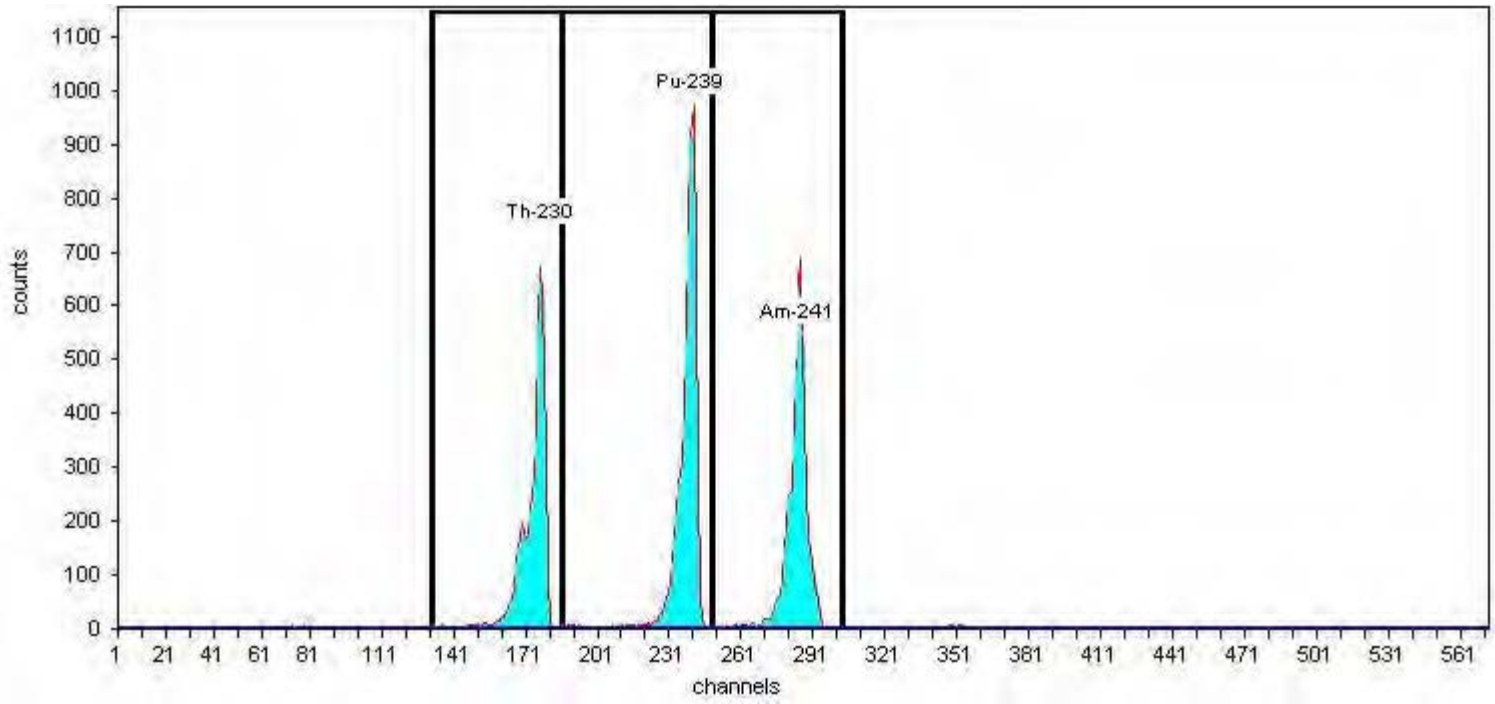
Certificate ID: 82233-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV56 , SN: 52-059EE5
Acquisition Start Date: 5/23/2018 11:28:59AM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 26.10% +/- 0.49% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,451.00	74.18
Pu-239	240	5.16	186	249	0.00	5,941.00	99.02
Am-241	284	5.49	249	303	0.00	4,711.00	78.52

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:47:47PM 5/23/2018

Calibration

Sample Name: ICV-9793;AV57-05232018
Description:
Detector: AV57

Calibration Date: 5/23/2018 12:38:02PM
Analyst: 60040

Source Info

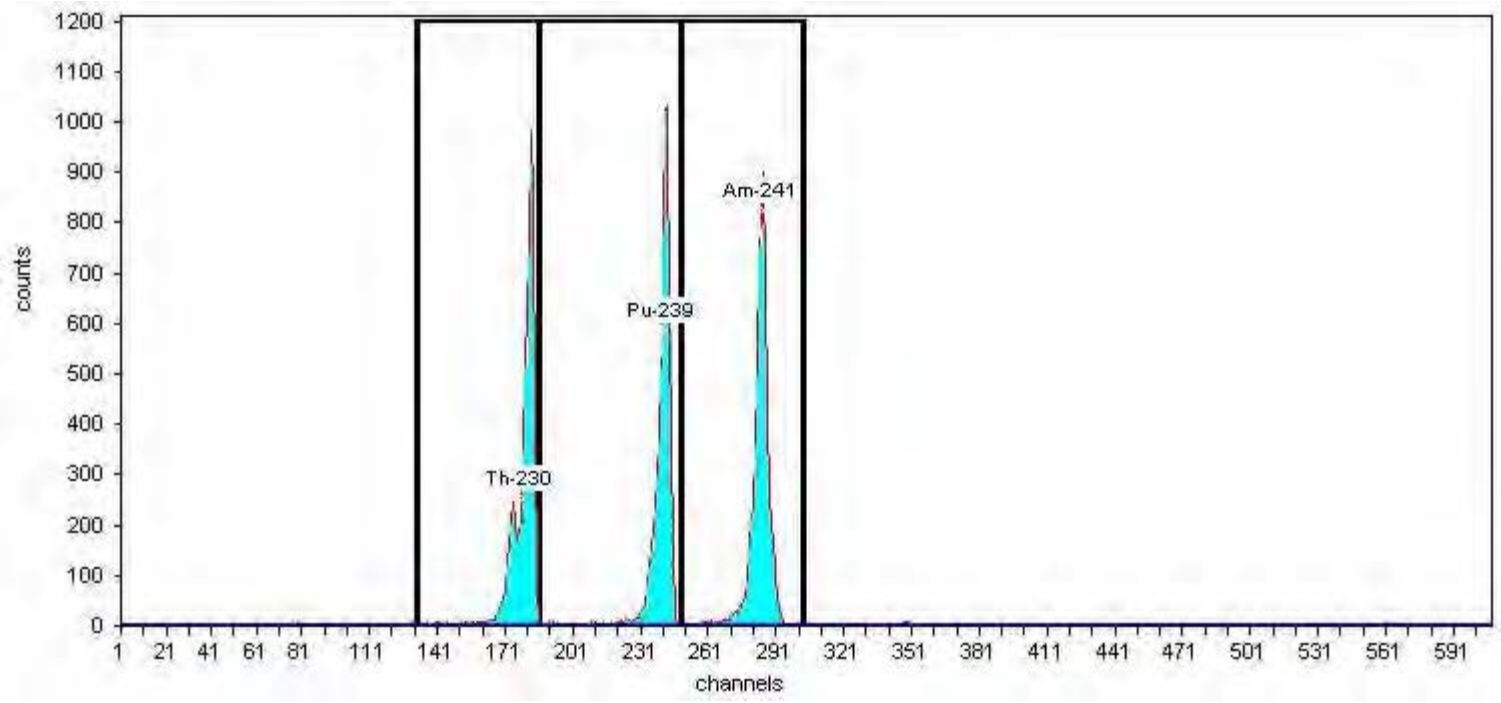
Certificate ID: 82241-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV57 , SN: 48-158EE3
Acquisition Start Date: 5/23/2018 11:29:28AM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 22.83% +/- 0.40% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,505.00	91.75
Pu-239	240	5.16	186	249	0.00	5,549.00	92.48
Am-241	284	5.49	249	303	0.00	5,372.00	89.53

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:48:09PM 5/23/2018

Calibration

Sample Name: ICV-9792;AV58-05232018
Description:
Detector: AV58

Calibration Date: 5/23/2018 12:38:17PM
Analyst: 60040

Source Info

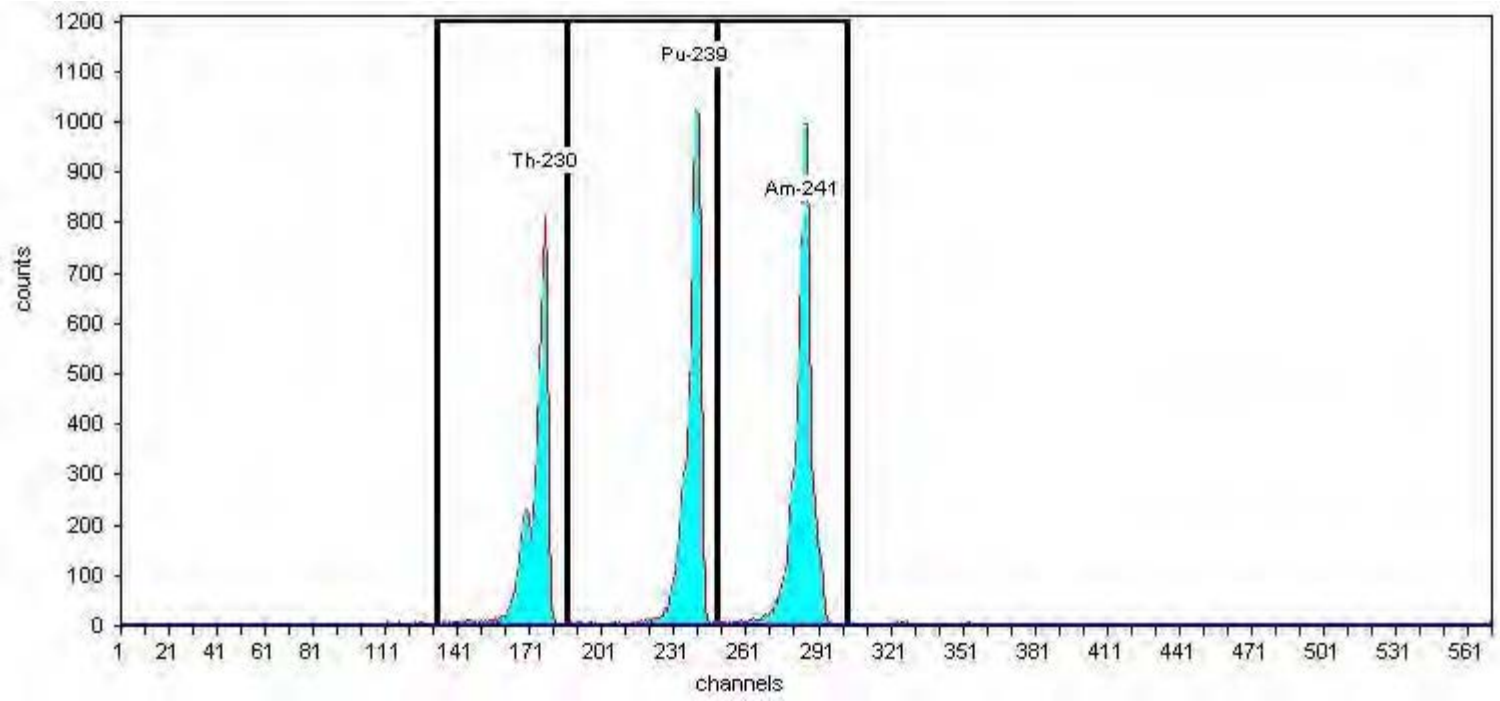
Certificate ID: 82240-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV58 , SN: 52-102 C5
Acquisition Start Date: 5/23/2018 11:29:48AM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 24.10% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,316.00	88.60
Pu-239	240	5.16	186	249	0.00	6,366.00	106.10
Am-241	284	5.49	249	303	0.00	7,114.00	118.57

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:15:32PM 5/21/2018

Calibration

Sample Name: ICV-1368447;AV60-05212018
Description:
Detector: AV60

Calibration Date: 5/21/2018 12:15:28PM
Analyst: 60040

Source Info

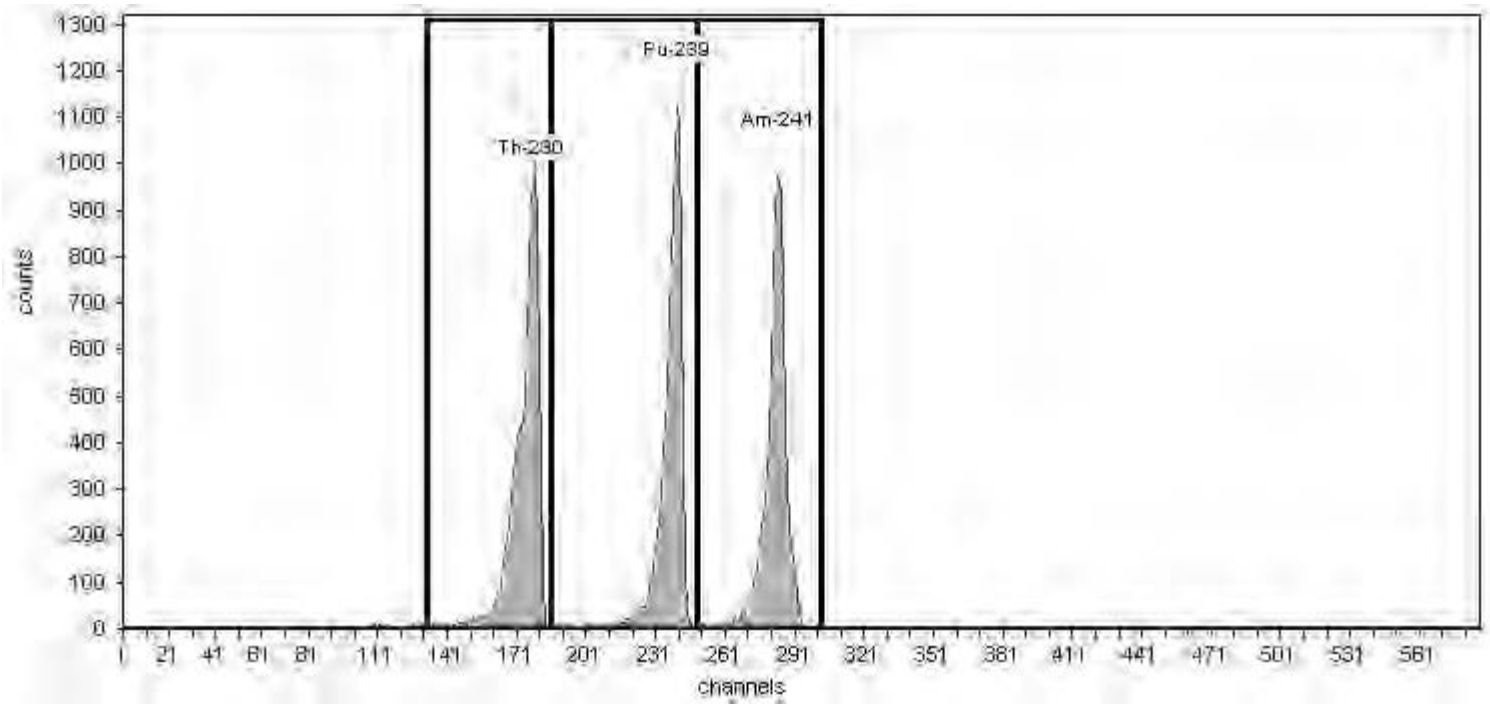
Certificate ID: 108002_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/1/2017 11:00:00AM
Description:

Acquisition

Detector: AV60 , SN: 49-027117
Acquisition Start Date: 5/21/2018 10:36:05AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 28.15% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	9,480.00	158.00
Pu-239	240	5.16	186	249	0.00	8,623.00	143.72
Am-241	284	5.49	249	303	0.00	8,202.00	136.70

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:16:02PM 5/21/2018

Calibration

Sample Name: ICV-1368446;AV62-05212018
Description:
Detector: AV62

Calibration Date: 5/21/2018 12:15:56PM
Analyst: 60040

Source Info

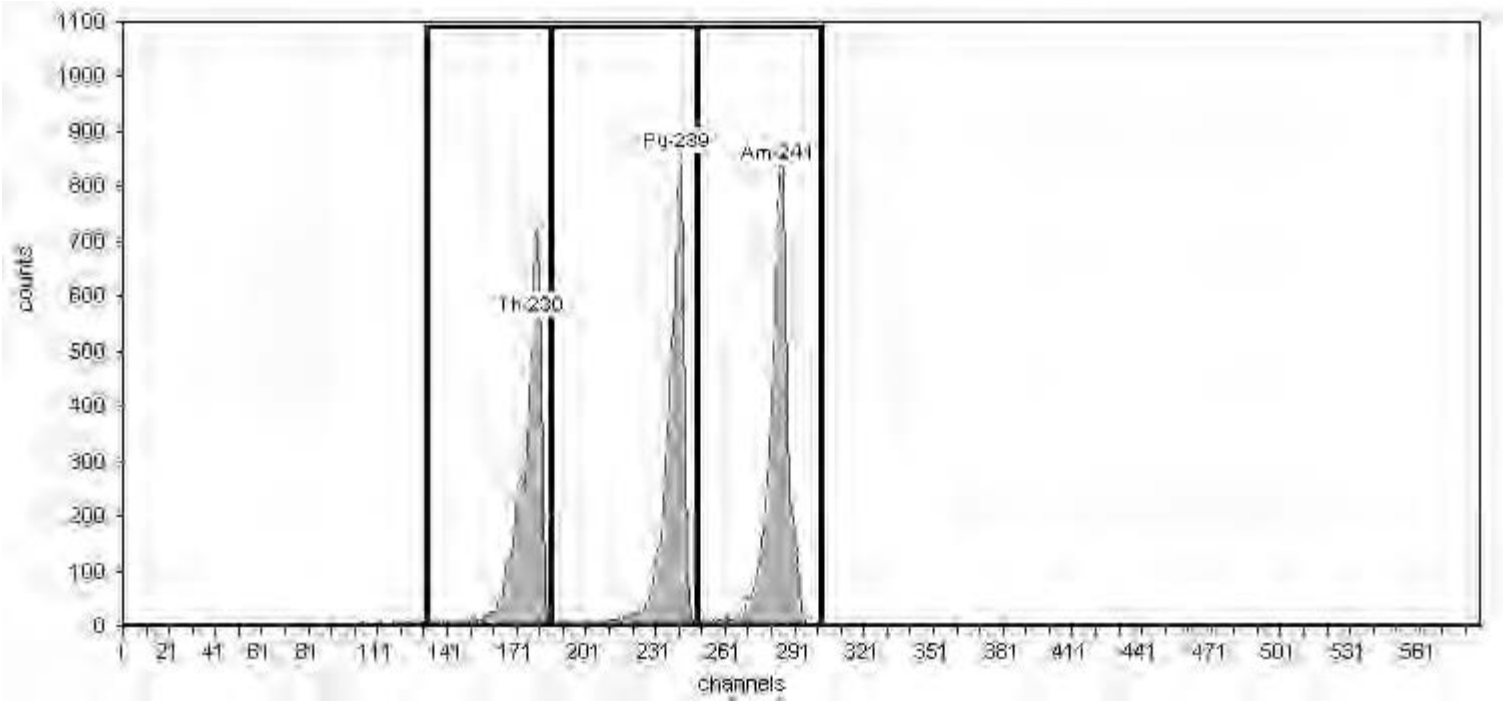
Certificate ID: 108001_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/6/2017 11:00:00AM
Description:

Acquisition

Detector: AV62 , SN: 52-060FF2
Acquisition Start Date: 5/21/2018 10:36:30AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 28.08% +/- 0.40% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,095.00	101.58
Pu-239	240	5.16	186	249	0.00	6,782.00	113.03
Am-241	284	5.49	249	303	0.00	7,286.00	121.43

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:05:48PM 5/23/2018

Calibration

Sample Name: ICV-9795;AV69-05232018
Description:
Detector: AV69

Calibration Date: 5/23/2018 3:05:43PM
Analyst: 60040

Source Info

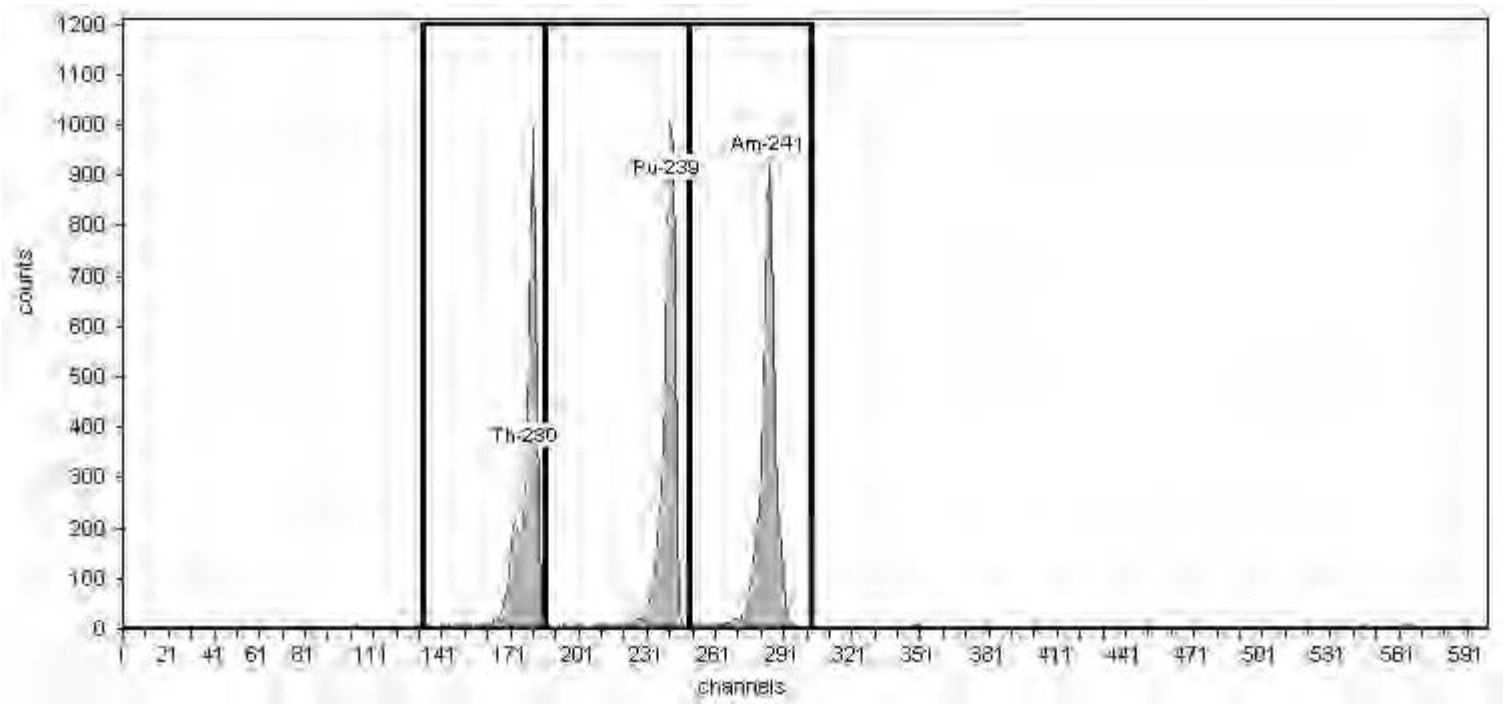
Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV69 , SN: 49-155DD5
Acquisition Start Date: 5/23/2018 12:55:19PM
Live Time: 60.00 min.
Real Time: 60.50 min.
Efficiency: 26.01% +/- 0.46% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,454.00	90.90
Pu-239	240	5.16	186	249	0.00	5,614.00	93.57
Am-241	284	5.49	249	303	0.00	5,923.00	98.72

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:06:12PM 5/23/2018

Calibration

Sample Name: ICV-7107;AV70-05232018
Description:
Detector: AV70

Calibration Date: 5/23/2018 3:06:09PM
Analyst: 60040

Source Info

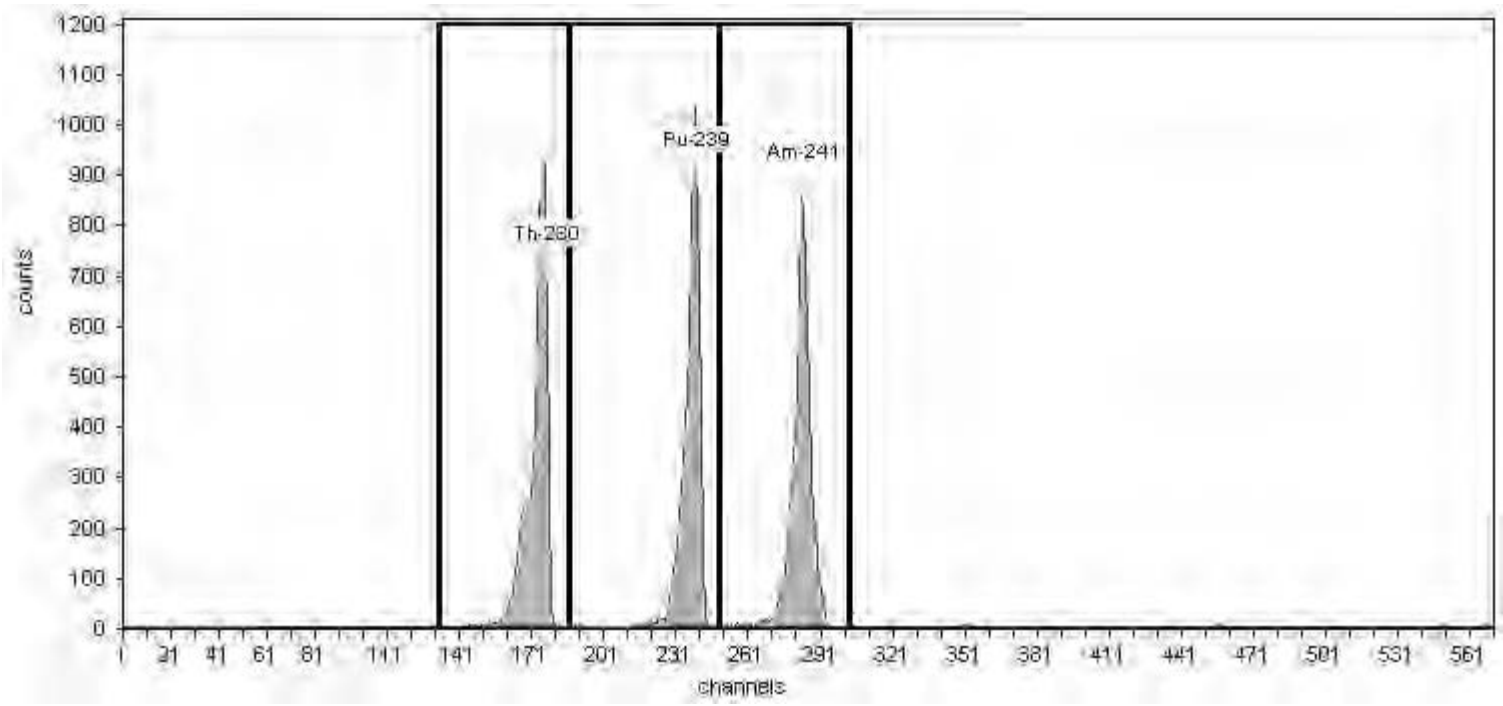
Certificate ID: 82232-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV70 , SN: 48-158FF1
Acquisition Start Date: 5/23/2018 12:55:36PM
Live Time: 60.00 min.
Real Time: 60.52 min.
Efficiency: 24.78% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,661.00	111.02
Pu-239	240	5.16	186	249	0.00	6,531.00	108.85
Am-241	284	5.49	249	303	0.00	6,413.00	106.88

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:06:36PM 5/23/2018

Calibration

Sample Name: ICV-9817;AV71-05232018
Description:
Detector: AV71

Calibration Date: 5/23/2018 3:06:33PM
Analyst: 60040

Source Info

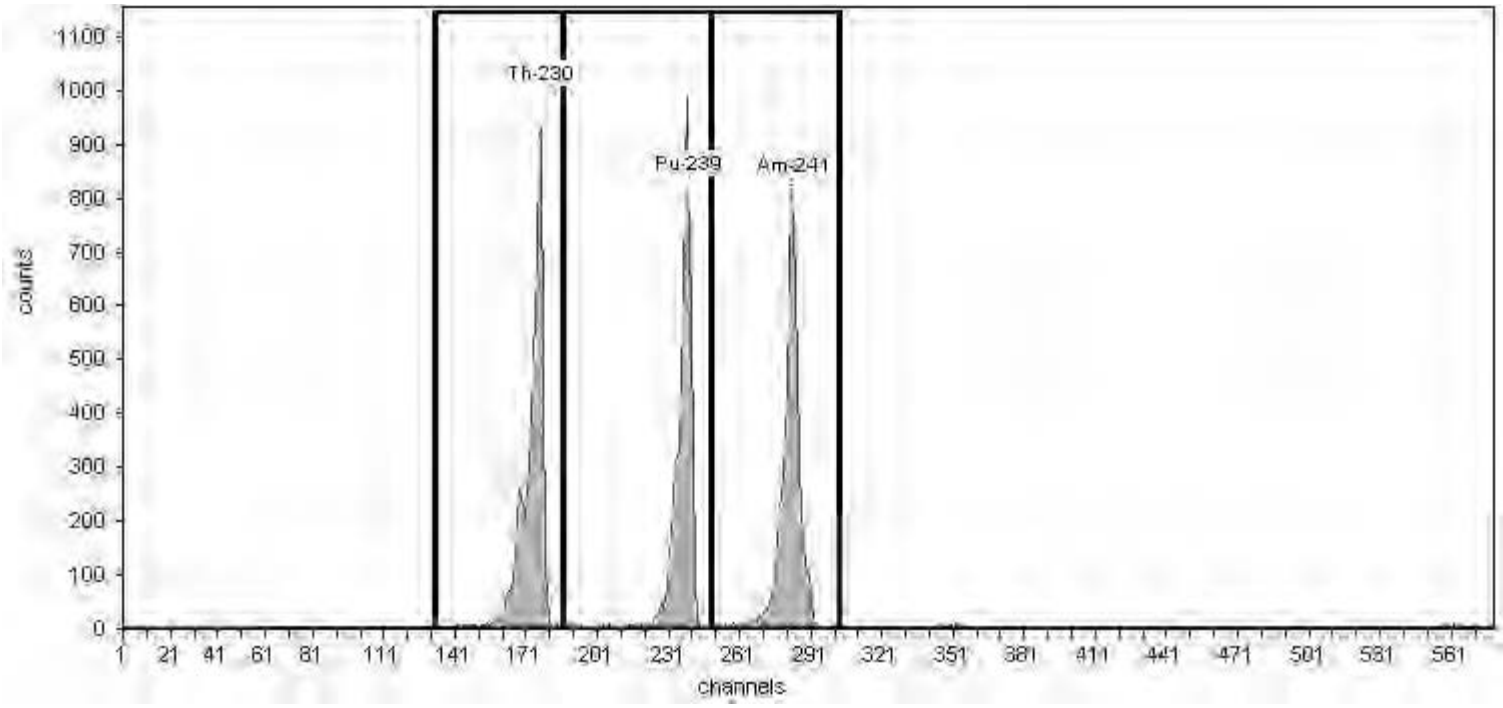
Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV71 , SN: 48-158EE6
Acquisition Start Date: 5/23/2018 12:56:03PM
Live Time: 60.00 min.
Real Time: 60.52 min.
Efficiency: 22.66% +/- 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	5,922.00	98.70
Pu-239	240	5.16	186	249	0.00	5,556.00	92.60
Am-241	284	5.49	249	303	0.00	5,565.00	92.75

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:07:33PM 5/23/2018

Calibration

Sample Name: ICV-9885;AV72-05232018
Description:
Detector: AV72

Calibration Date: 5/23/2018 3:07:28PM
Analyst: 60040

Source Info

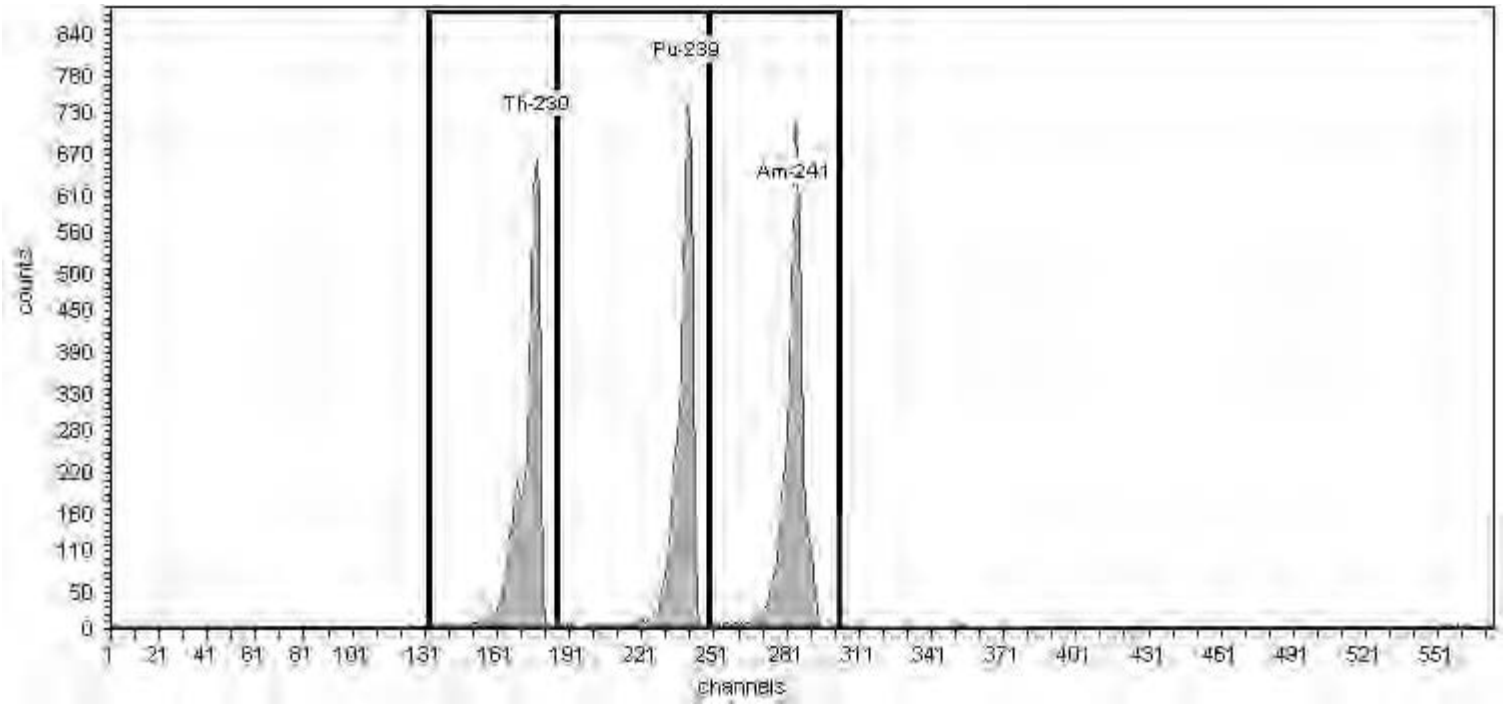
Certificate ID: 82246-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV72 , SN: 48-05a21
Acquisition Start Date: 5/23/2018 12:56:54PM
Live Time: 60.00 min.
Real Time: 60.50 min.
Efficiency: 24.63% +/- 0.48% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,923.00	82.05
Pu-239	240	5.16	186	249	0.00	4,871.00	81.18
Am-241	284	5.49	249	303	0.00	5,161.00	86.02

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:11:43PM 11/15/2017

Calibration

Sample Name: ICV-8875;AV165-20171115
Description:
Detector: AV165

Analyst: 60040
Analysis Date: 11/15/2017 2:11:40PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82234-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

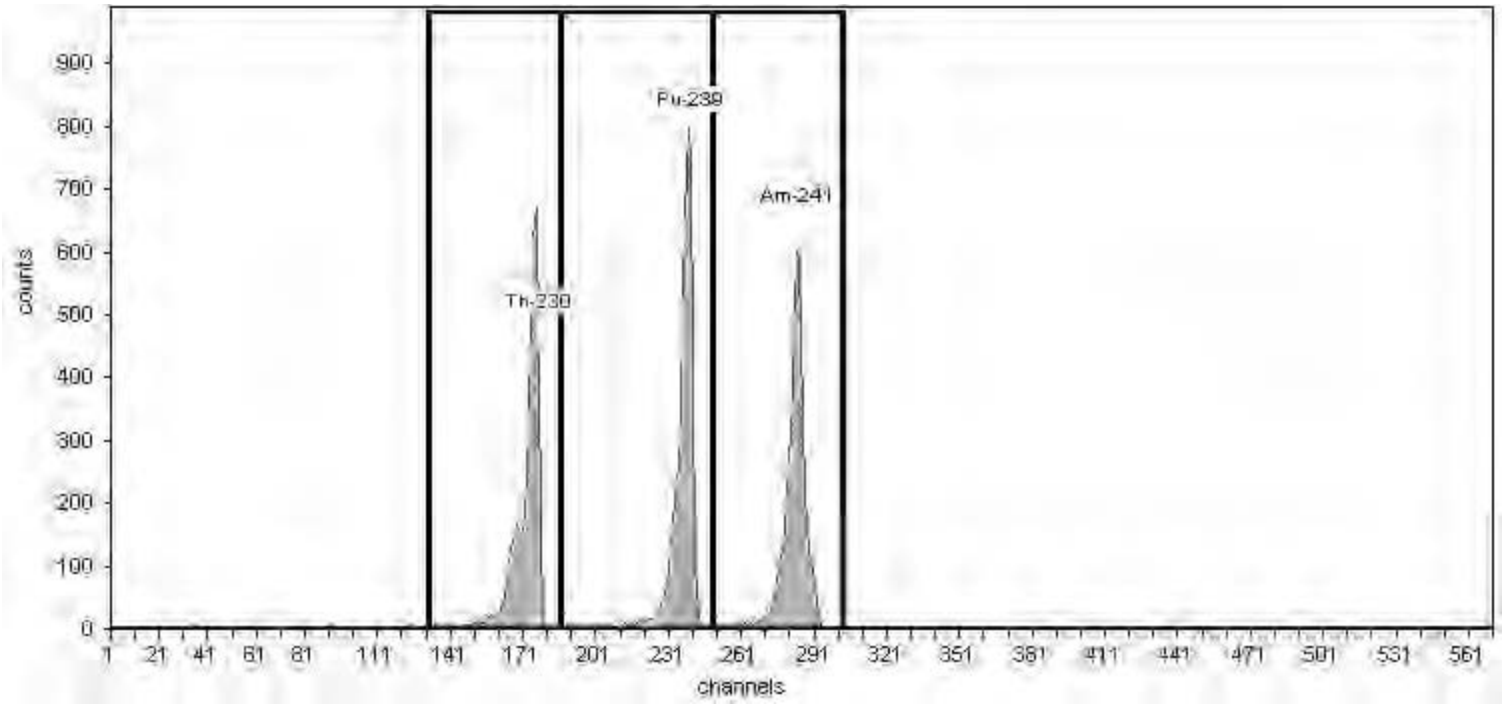
Detector: AV165 , SN: 50-112F7
Acquisition Start Date: 11/15/2017 1:11:27PM

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 / Ch^2

Efficiency Calibration Name: ICV-8875;AV165-2017111

Efficiency: 21.66% +/- 0.43% 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	33.10	4,262.00	71.03
Pu-239	240	5,155.40	186	249	34.85	4,855.00	80.92
Am-241	284	5,485.70	249	303	36.71	4,326.00	72.10

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:12:00PM 11/15/2017

Calibration

Sample Name: ICV-7107;AV166-20171115
Description:
Detector: AV166

Analyst: 60040
Analysis Date: 11/15/2017 2:11:58PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82232-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

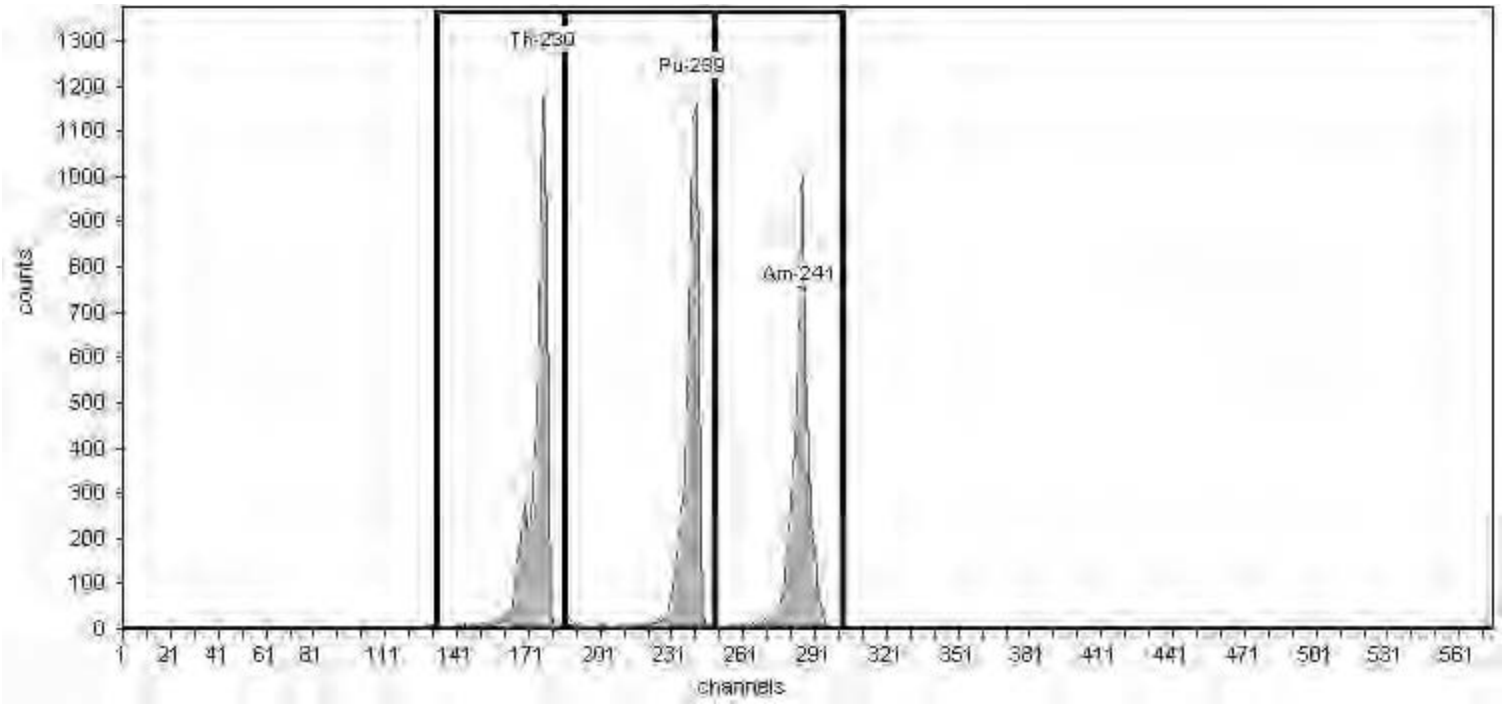
Detector: AV166 , SN: 50-112 G1
Acquisition Start Date: 11/15/2017 1:11:46PM

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-7107;AV166-2017111

Efficiency: 24.75% +/- 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	27.86	6,687.00	111.45
Pu-239	240	5,155.40	186	249	34.18	6,583.00	109.72
Am-241	284	5,485.70	249	303	31.85	6,321.00	105.35

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:10:44PM 11/15/2017

Calibration

Sample Name: ICV-9793;AV167-20171115
Description:
Detector: AV167

Analyst: 60040
Analysis Date: 11/15/2017 2:10:42PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82241-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

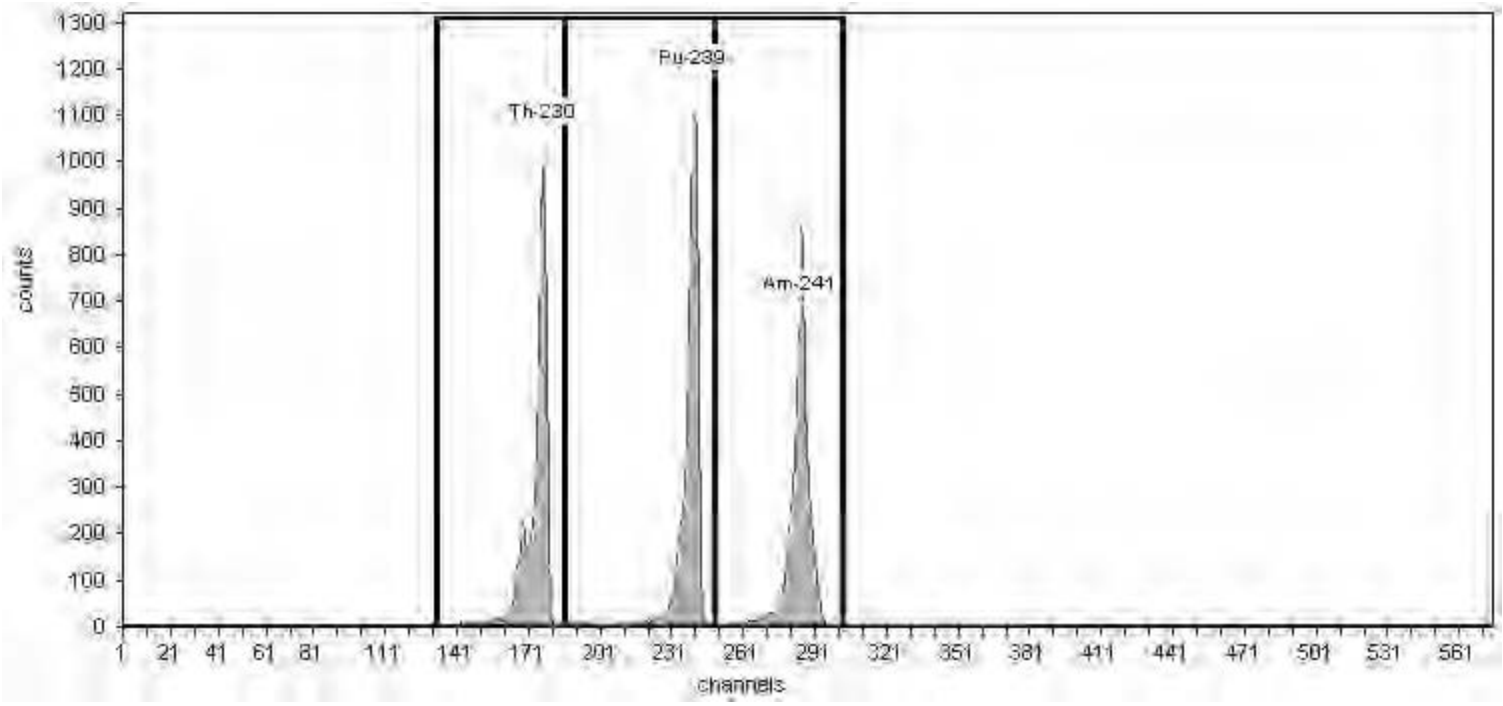
Detector: AV167 , SN: 50-112 G3
Acquisition Start Date: 11/15/2017 1:09:57PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9793;AV167-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 23.62% +/- 0.41% 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	27.81	5,446.00	90.77
Pu-239	240	5,155.40	186	249	31.65	5,955.00	99.25
Am-241	284	5,485.70	249	303	32.95	5,611.00	93.52

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:12:14PM 11/15/2017

Calibration

Sample Name: ICV-9520;AV170-20171115
Description:
Detector: AV170

Analyst: 60040
Analysis Date: 11/15/2017 2:12:11PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82237-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

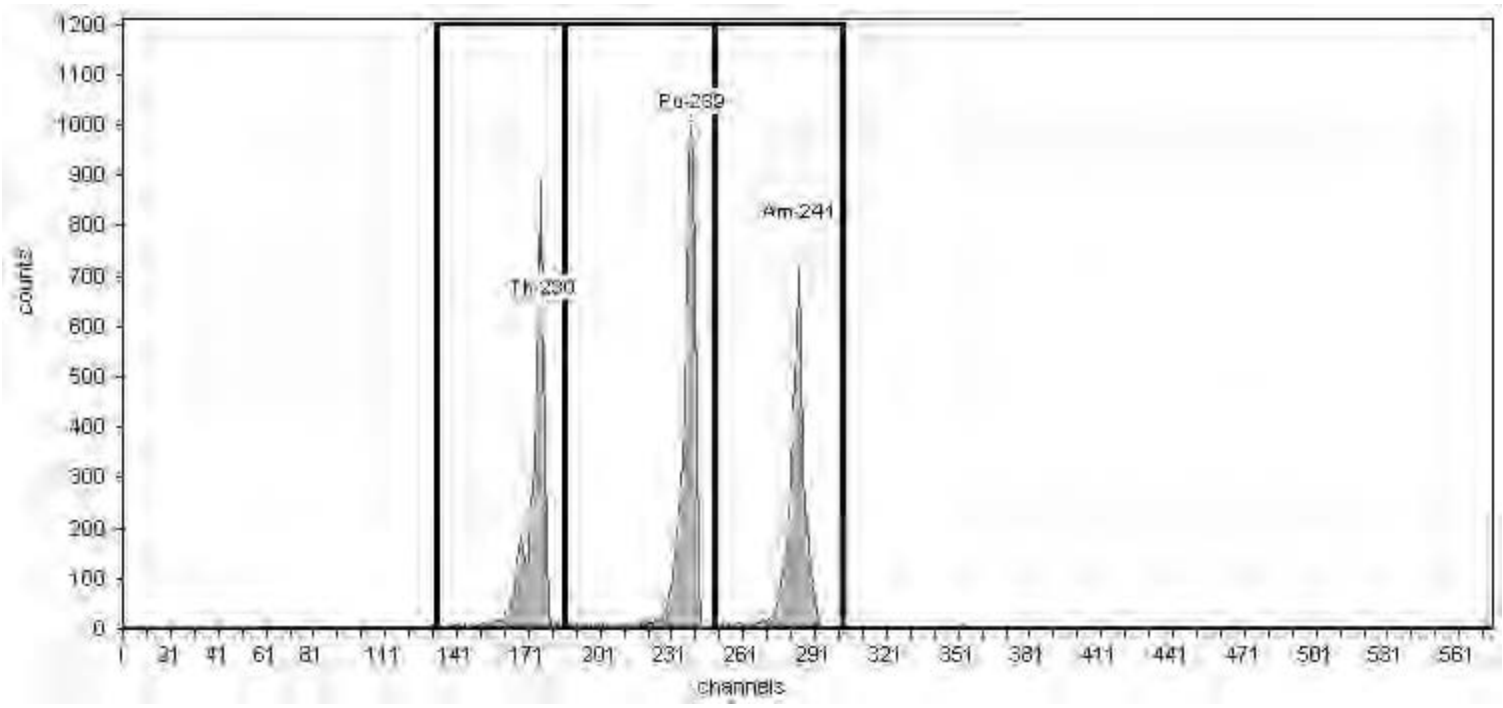
Detector: AV170 , SN: 50-112 G7
Acquisition Start Date: 11/15/2017 1:12:03PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9520;AV170-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 22.71% +/- 0.43% 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	25.67	4,554.00	75.90
Pu-239	240	5,155.40	186	249	32.41	5,629.00	93.82
Am-241	284	5,485.70	249	303	31.99	4,421.00	73.68

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:13:34PM 11/15/2017

Calibration

Sample Name: ICV-9792;AV175-20171115
Description:
Detector: AV175

Analyst: 60040
Analysis Date: 11/15/2017 2:13:32PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82240-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

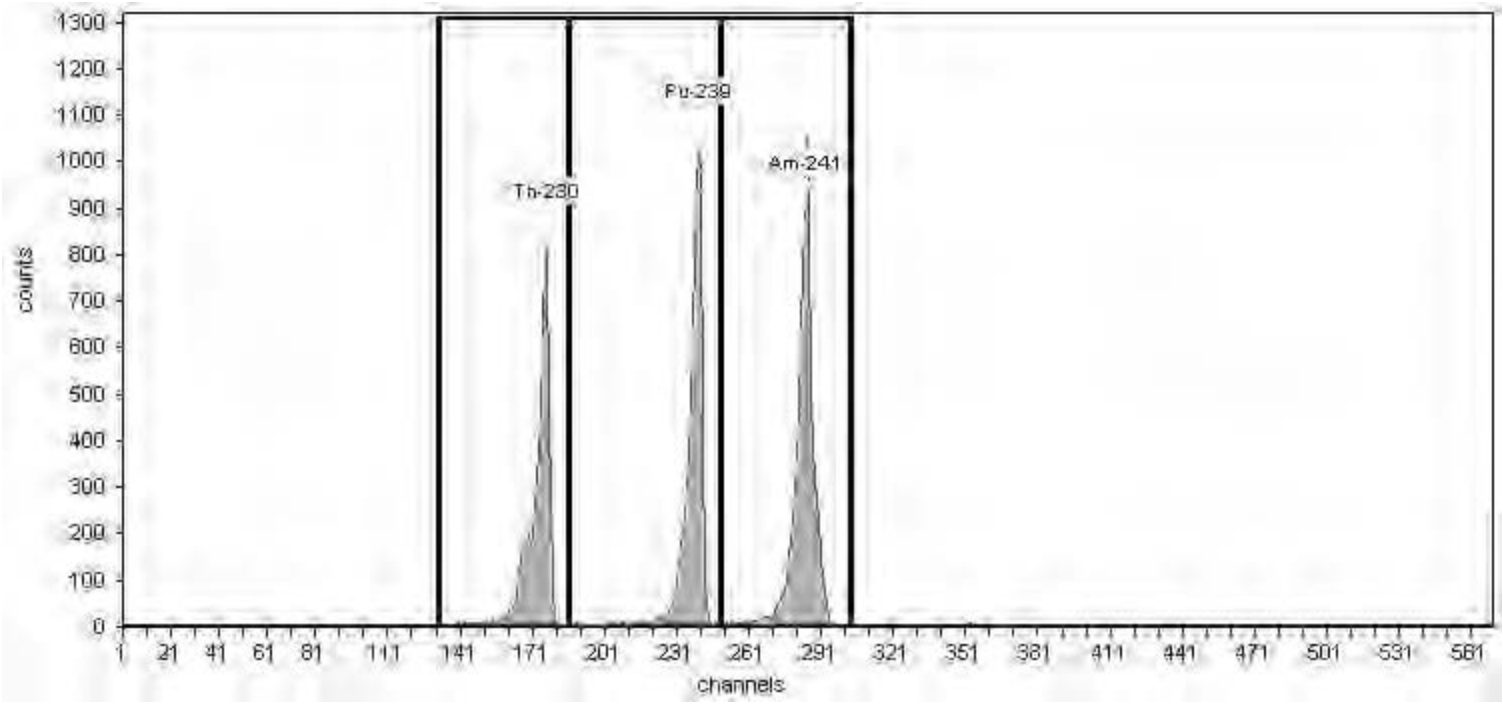
Detector: AV175 , SN: 50-117H1
Acquisition Start Date: 11/15/2017 1:13:26PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9792;AV175-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 23.71% +/- 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	32.65	5,306.00	88.43
Pu-239	240	5,155.40	186	249	33.59	6,141.00	102.35
Am-241	284	5,485.70	249	303	33.06	7,051.00	117.52

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:38:03PM 11/15/2017

Calibration

Sample Name: ICV-9794;AV187-20171115
Description:
Detector: AV187

Analyst: 60040
Analysis Date: 11/15/2017 3:38:00PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82242-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

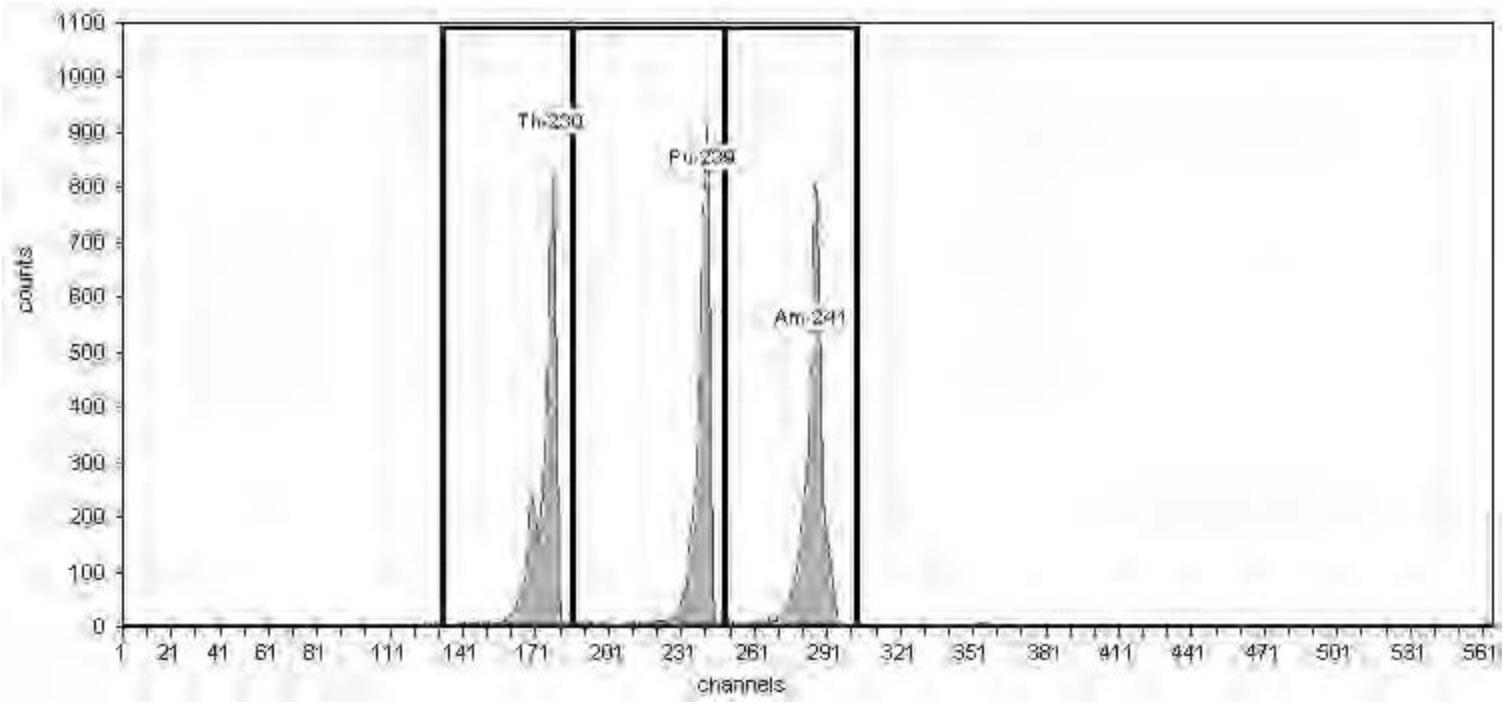
Detector: AV187 , SN: 50-119I2
Acquisition Start Date: 11/15/2017 2:30:42PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9794;AV187-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 21.54% +/- 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	29.00	5,052.00	84.20
Pu-239	240	5,155.40	186	249	31.81	5,030.00	83.83
Am-241	284	5,485.70	249	303	33.75	5,481.00	91.35

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:37:04PM 11/15/2017

Calibration

Sample Name: ICV-7107;AV189-20171115
Description:
Detector: AV189

Analyst: 60040
Analysis Date: 11/15/2017 3:37:02PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82232-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

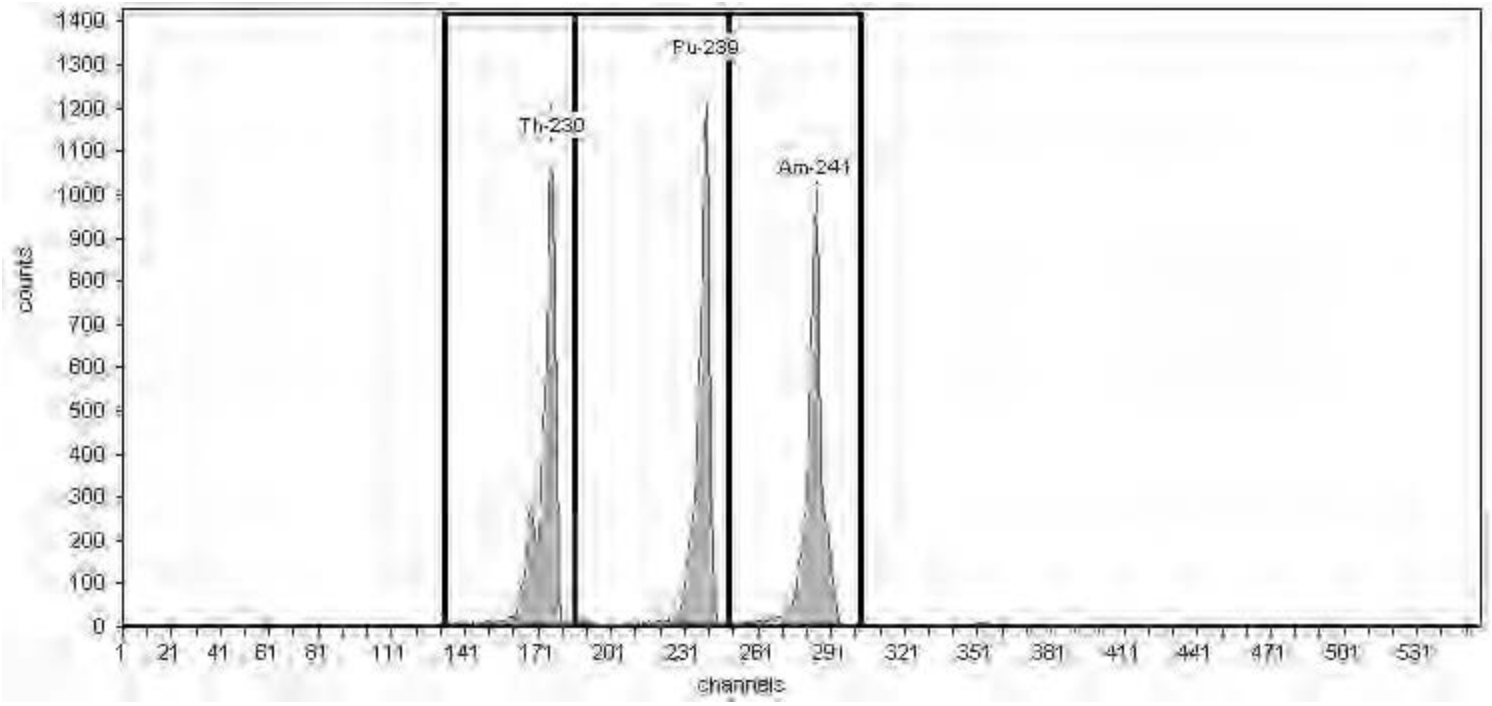
Detector: AV189 , SN: 50-112A3
Acquisition Start Date: 11/15/2017 2:27:56PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-7107;AV189-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 24.98% +/- 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	27.84	6,735.00	112.25
Pu-239	240	5,155.40	186	249	31.66	6,585.00	109.75
Am-241	284	5,485.70	249	303	30.62	6,442.00	107.37

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:38:12PM 11/15/2017

Calibration

Sample Name: ICV-9793;AV190-20171115
Description:
Detector: AV190

Analyst: 60040
Analysis Date: 11/15/2017 3:38:09PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82241-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

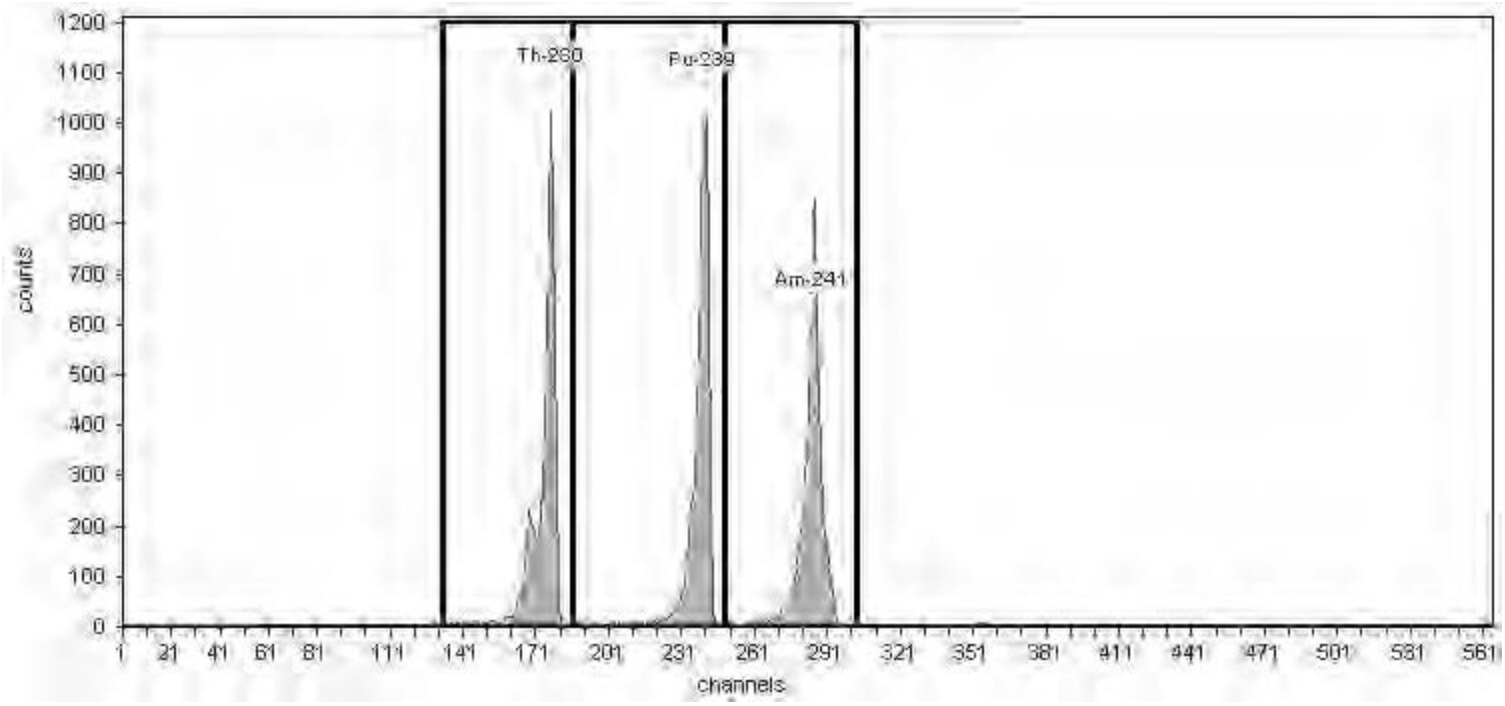
Detector: AV190 , SN: 50-119I7
Acquisition Start Date: 11/15/2017 2:30:59PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9793;AV190-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 23.94% +/- 0.41% 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	28.60	5,677.00	94.62
Pu-239	240	5,155.40	186	249	34.33	5,930.00	98.83
Am-241	284	5,485.70	249	303	33.59	5,626.00	93.77

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:38:20PM 11/15/2017

Calibration

Sample Name: ICV-9817;AV191-20171115
Description:
Detector: AV191

Analyst: 60040
Analysis Date: 11/15/2017 3:38:17PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82244-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

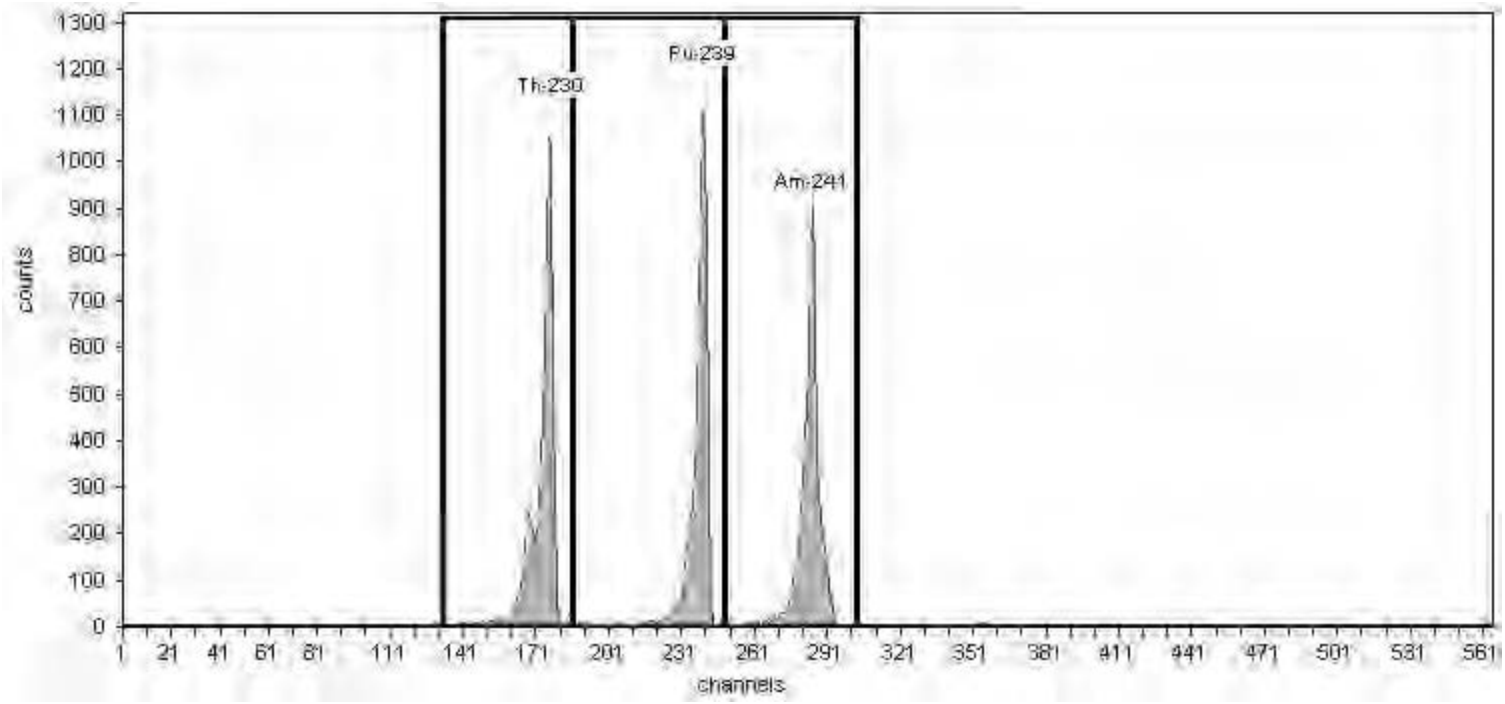
Detector: AV191 , SN: 50-112A2
Acquisition Start Date: 11/15/2017 2:31:22PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9817;AV191-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.80% +/- 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	30.30	6,251.00	104.18
Pu-239	240	5,155.40	186	249	30.56	5,775.00	96.25
Am-241	284	5,485.70	249	303	30.50	5,875.00	97.92

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:38:28PM 11/15/2017

Calibration

Sample Name: ICV-9885;AV192-20171115
Description:
Detector: AV192

Analyst: 60040
Analysis Date: 11/15/2017 3:38:25PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

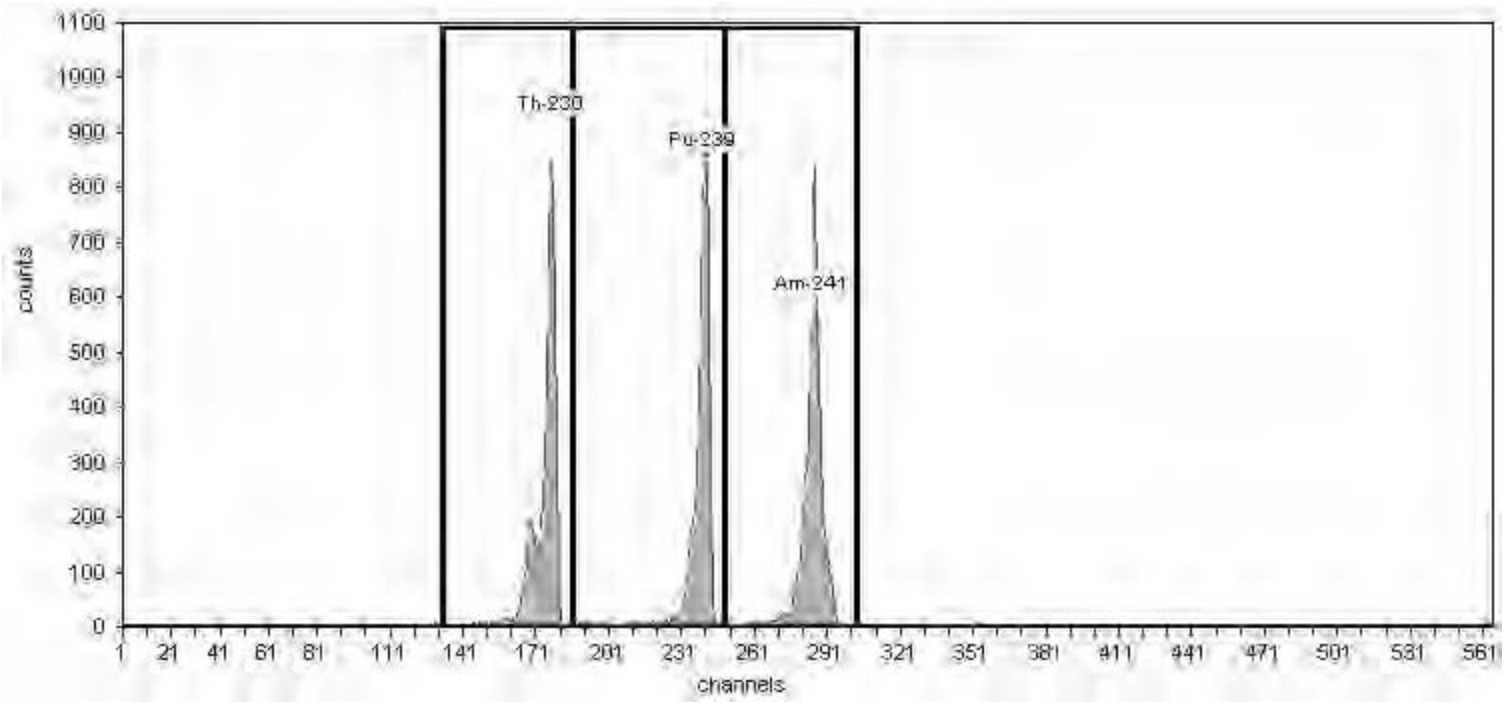
Detector: AV192 , SN: 50-119J7
Acquisition Start Date: 11/15/2017 2:31:38PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9885;AV192-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.77% +/- 0.46% 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	28.08	4,773.00	79.55
Pu-239	240	5,155.40	186	249	31.05	4,623.00	77.05
Am-241	284	5,485.70	249	303	31.03	5,031.00	83.85

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:37:19PM 11/15/2017

Calibration

Sample Name: ICV-8876;AV194-20171115
Description:
Detector: AV194

Analyst: 60040
Analysis Date: 11/15/2017 3:37:17PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82235-334
Prepared by: Analytics
Description:

Certification Date: 6/4/2010 12:00:00PM

Acquisition

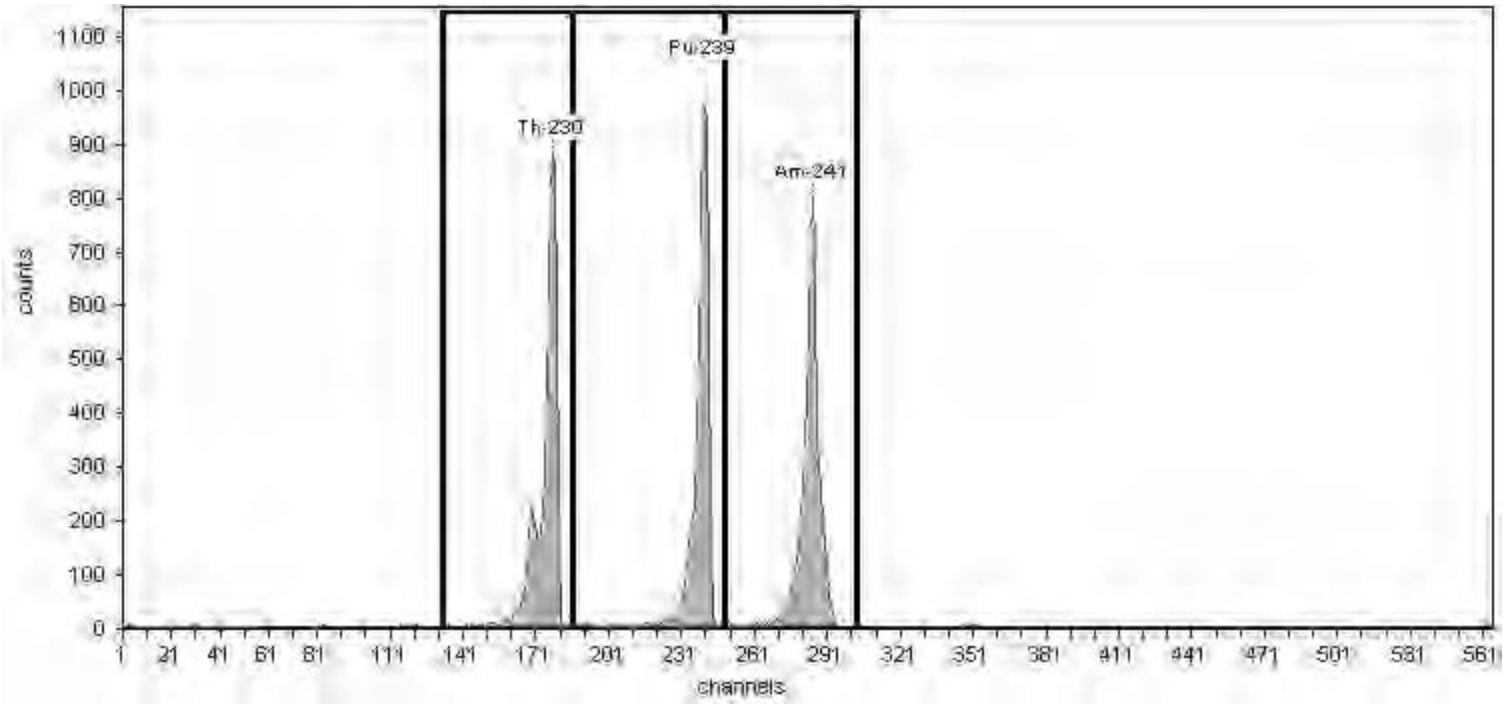
Detector: AV194 , SN: 50-119J2
Acquisition Start Date: 11/15/2017 2:28:40PM

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 / Ch^2

Efficiency Calibration Name: ICV-8876;AV194-2017111

Efficiency: 20.83% +/- 0.36% 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	30.97	5,410.00	90.17
Pu-239	240	5,155.40	186	249	31.89	5,313.00	88.55
Am-241	284	5,485.70	249	303	31.28	5,376.00	89.60

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:37:40PM 11/15/2017

Calibration

Sample Name: ICV-9792;AV198-20171115
Description:
Detector: AV198

Analyst: 60040
Analysis Date: 11/15/2017 3:37:38PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82240-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

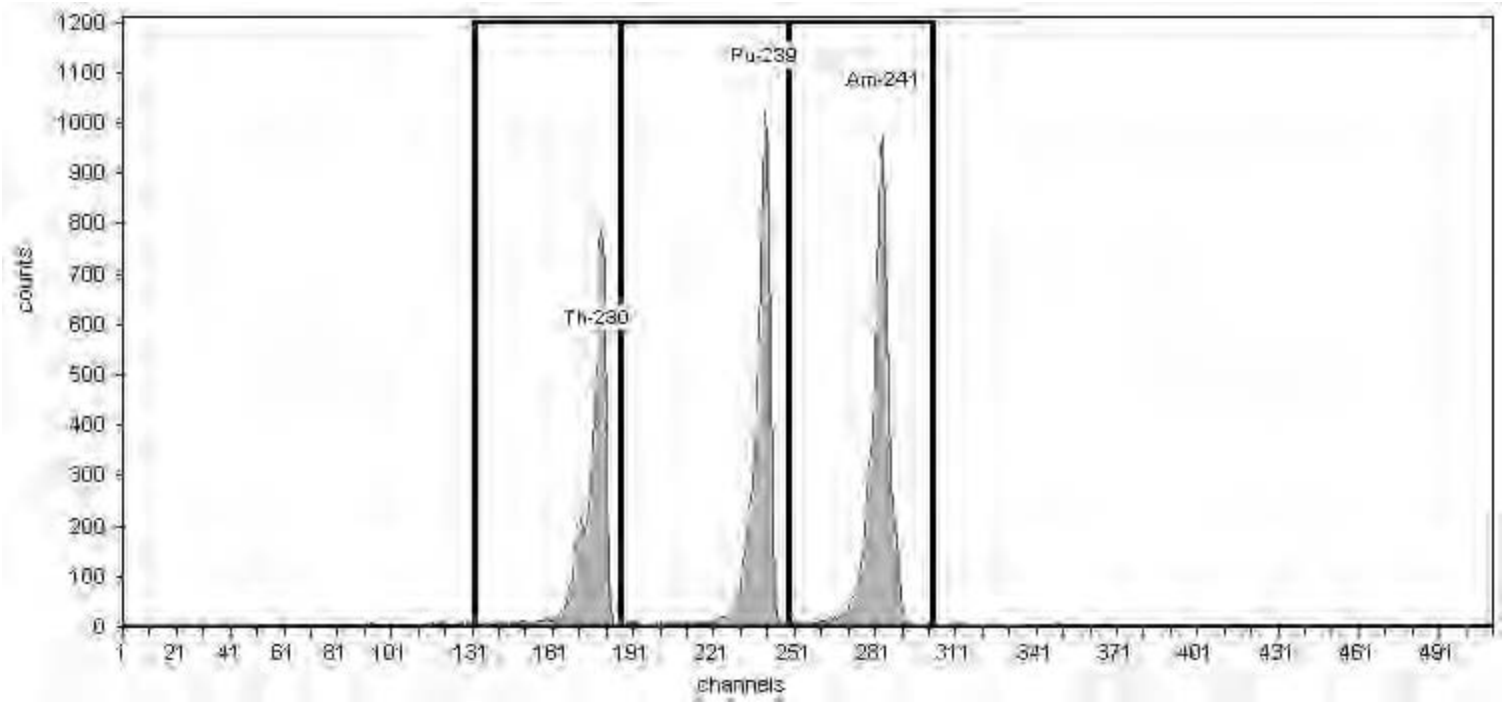
Detector: AV198 , SN: 50-117AA7
Acquisition Start Date: 11/15/2017 2:29:40PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9792;AV198-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 23.44% +/- 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	33.32	5,338.00	88.97
Pu-239	240	5,155.40	186	249	33.97	6,088.00	101.47
Am-241	284	5,485.70	249	303	36.37	6,865.00	114.42

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:17:17AM 11/16/2017

Calibration

Sample Name: ICV-8875;AV203-20171115
Description:
Detector: AV203

Analyst: 60040
Analysis Date: 11/16/2017 8:17:14AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82234-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

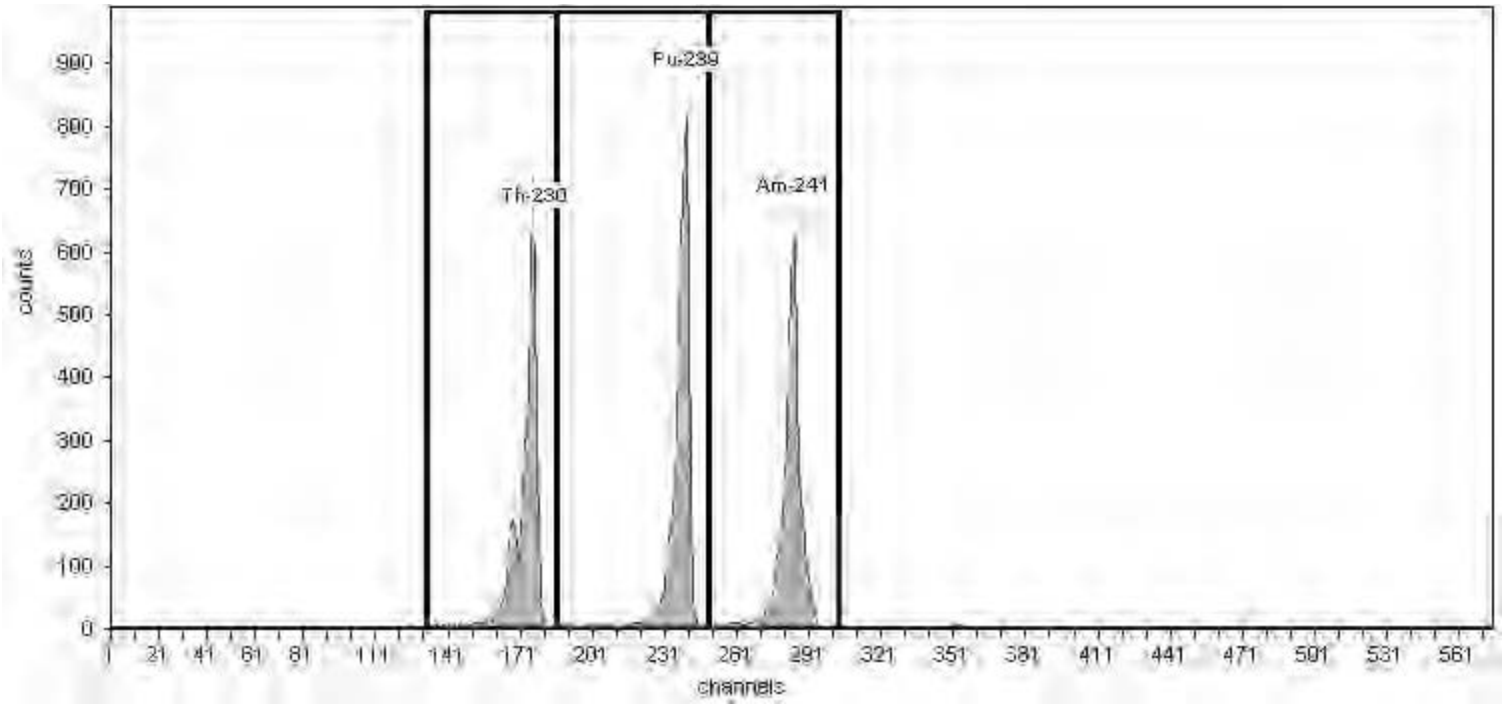
Detector: AV203 , SN: 50-117J4
Acquisition Start Date: 11/15/2017 3:49:50PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-8875;AV203-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 21.17% +/- 0.42% 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	27.72	4,198.00	69.97
Pu-239	240	5,155.40	186	249	34.95	4,751.00	79.18
Am-241	284	5,485.70	249	303	32.77	4,189.00	69.82

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:18:51AM 11/16/2017

Calibration

Sample Name: ICV-9817;AV206-20171115
Description:
Detector: AV206

Analyst: 60040
Analysis Date: 11/16/2017 8:18:49AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82244-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

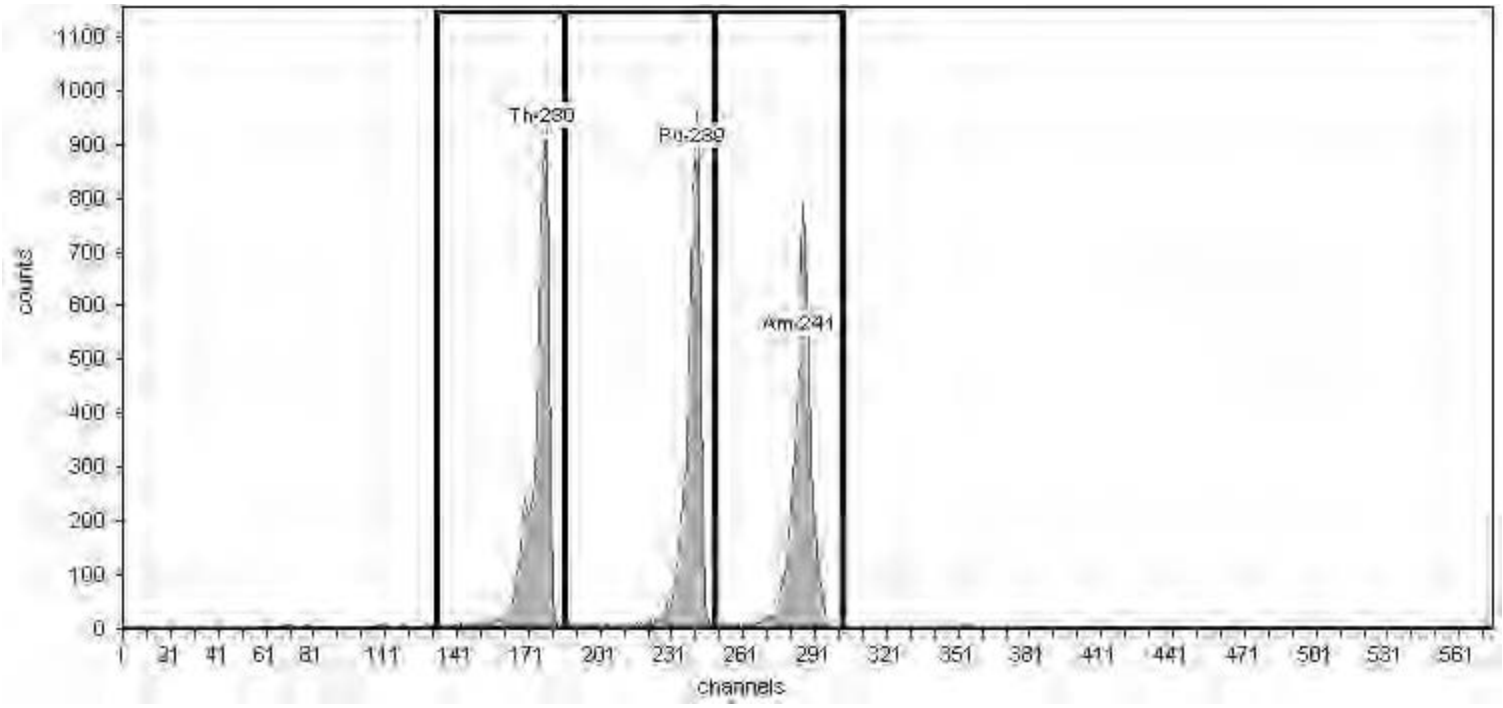
Detector: AV206 , SN: 5604420
Acquisition Start Date: 11/15/2017 3:53:18PM

Live Time: 60.00 min.
Real Time: 60.04 min.

Efficiency Calibration Name: ICV-9817;AV206-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 23.74% +/- 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	35.17	6,251.00	104.18
Pu-239	240	5,155.40	186	249	37.57	5,837.00	97.28
Am-241	284	5,485.70	249	303	39.88	5,773.00	96.22

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:17:33AM 11/16/2017

Calibration

Sample Name: ICV-9520;AV208-20171115
Description:
Detector: AV208

Analyst: 60040
Analysis Date: 11/16/2017 8:17:30AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82237-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

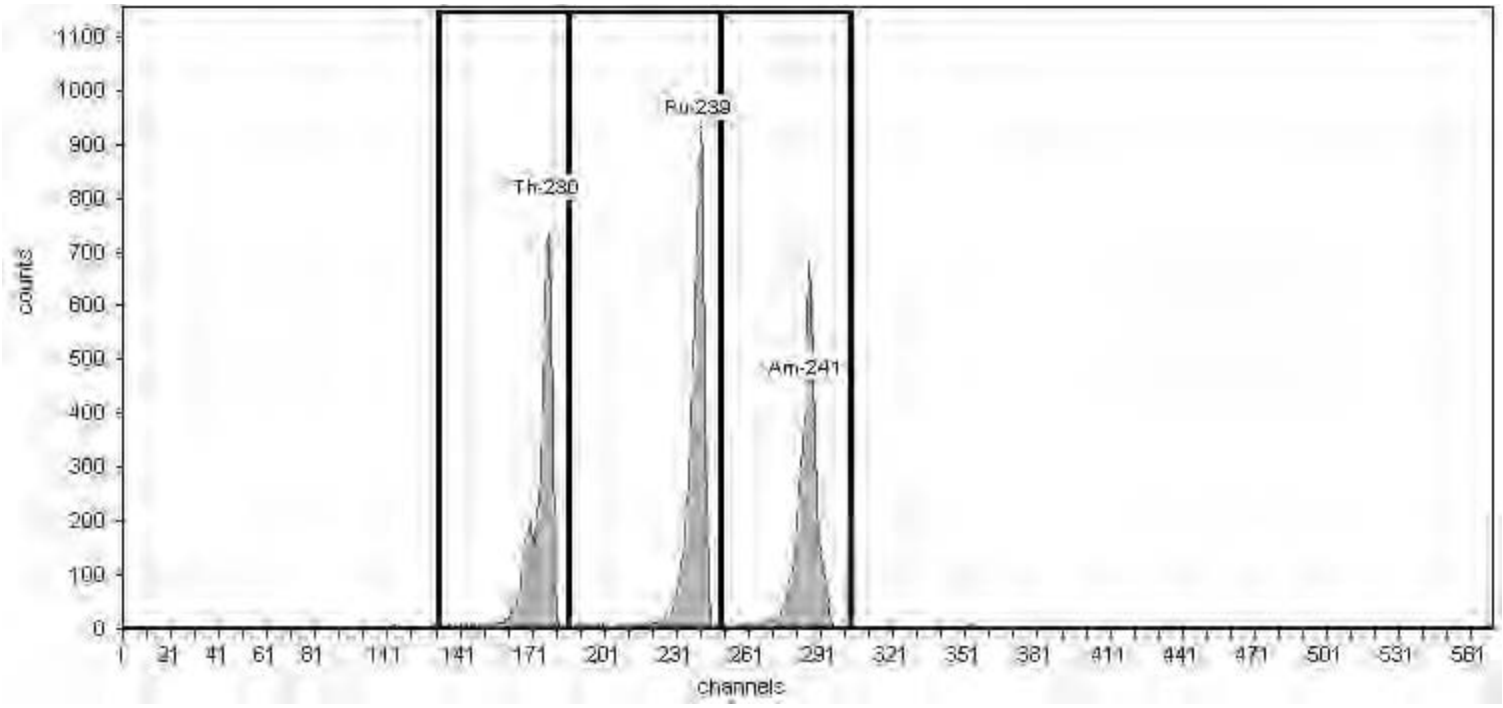
Detector: AV208 , SN: 50-112Z6
Acquisition Start Date: 11/15/2017 3:50:36PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9520;AV208-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 23.79% +/- 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	32.82	4,776.00	79.60
Pu-239	240	5,155.40	186	249	35.87	5,834.00	97.23
Am-241	284	5,485.70	249	303	34.38	4,677.00	77.95

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:18:26AM 11/16/2017

Calibration

Sample Name: ICV-9886;AV212-20171115
Description:
Detector: AV212

Analyst: 60040
Analysis Date: 11/16/2017 8:18:23AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82247-334
Prepared by: Analytics
Description:

Certification Date: 6/10/2010 12:00:00PM

Acquisition

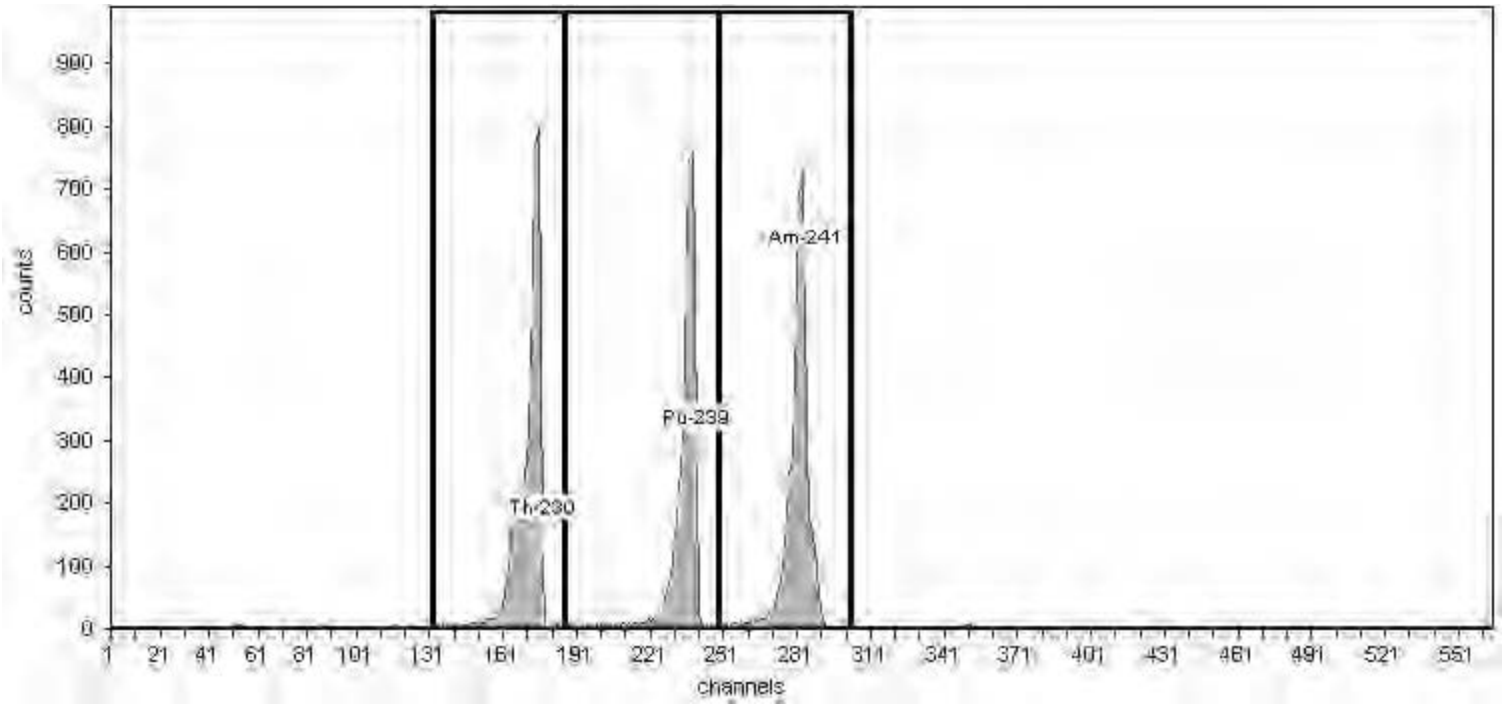
Detector: AV212 , SN: 49-155m5
Acquisition Start Date: 11/15/2017 3:52:45PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9886;AV212-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 22.56% +/- 0.42% 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	32.48	5,058.00	84.30
Pu-239	240	5,155.40	186	249	34.94	4,675.00	77.92
Am-241	284	5,485.70	249	303	35.51	5,066.00	84.43

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:18:14AM 11/16/2017

Calibration

Sample Name: ICV-9792;AV213-20171115
Description:
Detector: AV213

Analyst: 60040
Analysis Date: 11/16/2017 8:18:12AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82240-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

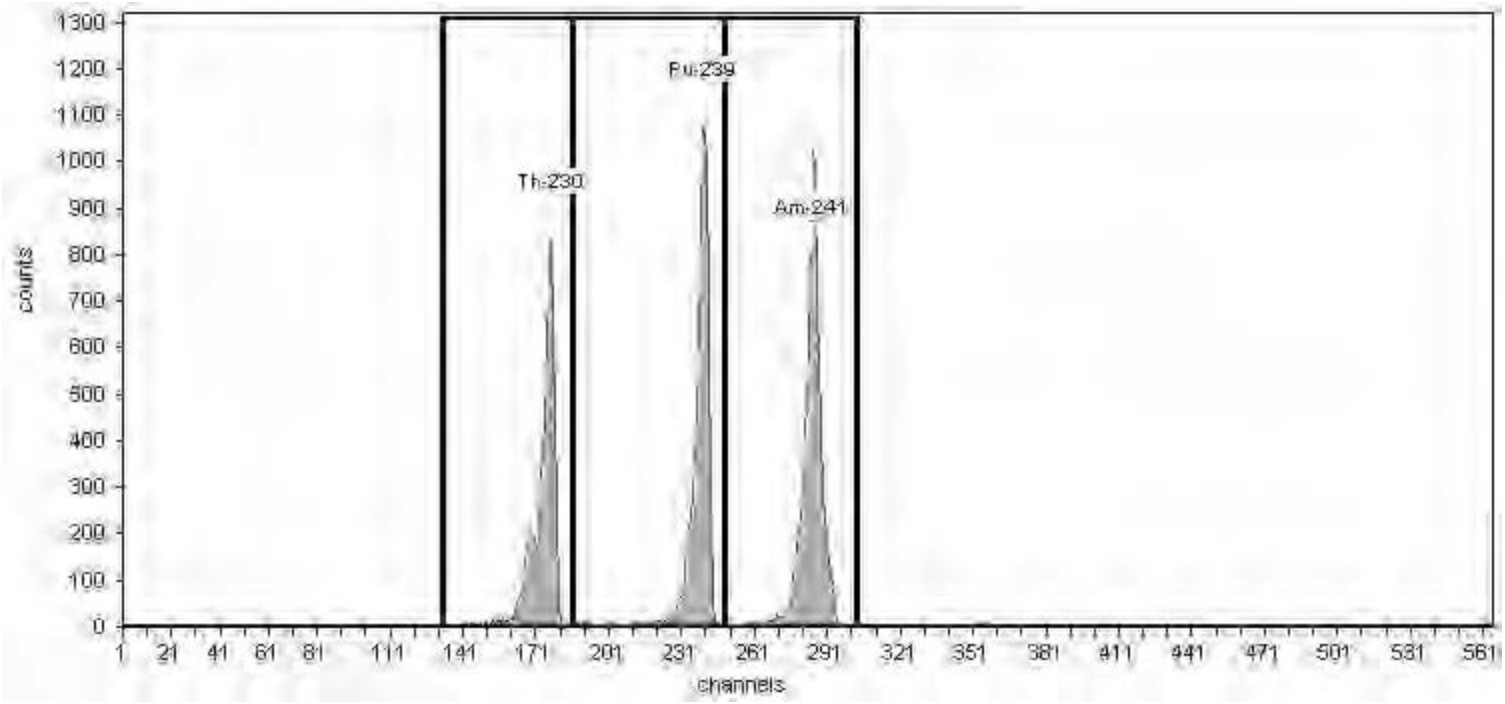
Detector: AV213 , SN: 54-011 Y1
Acquisition Start Date: 11/15/2017 3:52:26PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9792;AV213-2017111

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 24.11% +/- 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	34.19	5,418.00	90.30
Pu-239	240	5,155.40	186	249	34.36	6,318.00	105.30
Am-241	284	5,485.70	249	303	37.65	7,075.00	117.92

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:45:17AM 11/16/2017

Calibration

Sample Name: ICV-8877;AV215-20171116
Description:
Detector: AV215

Analyst: 60040
Analysis Date: 11/16/2017 9:45:14AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82236-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

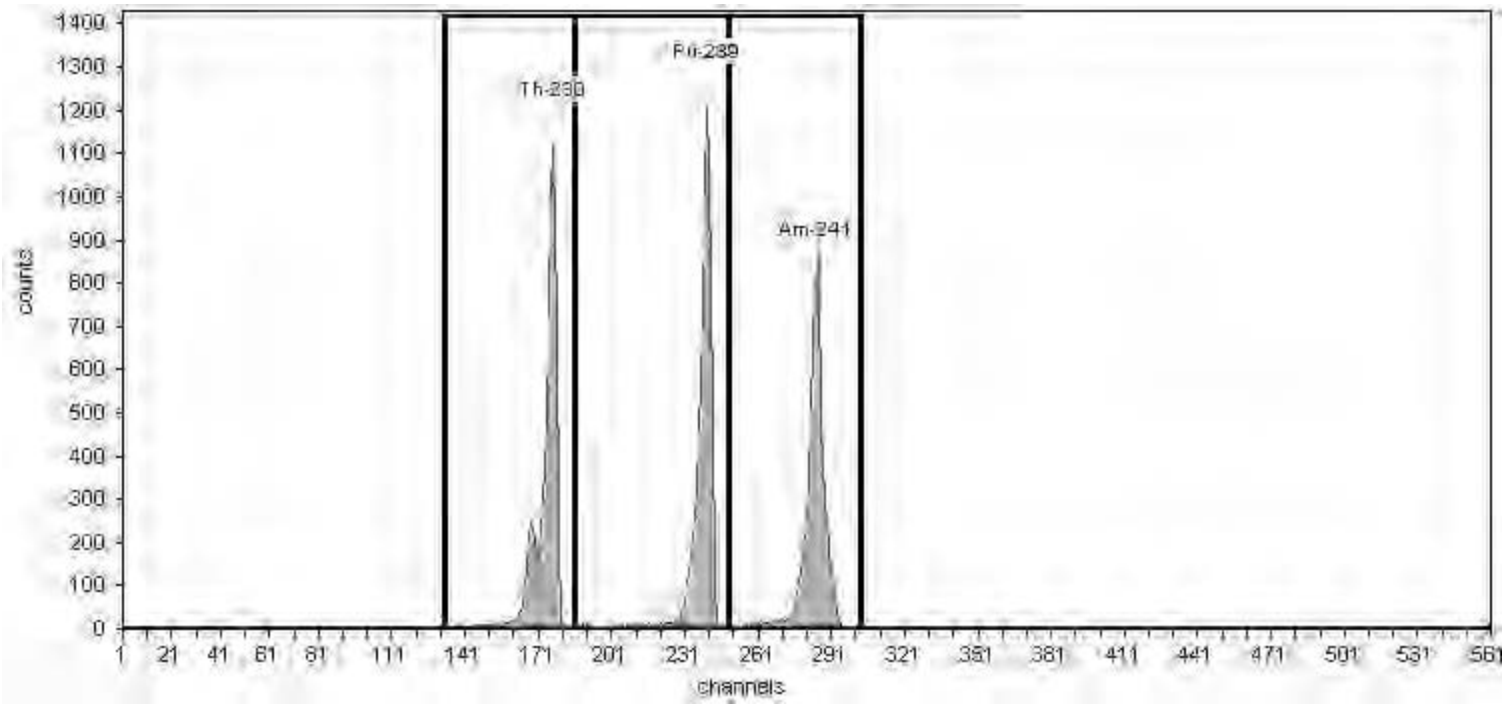
Detector: AV215 , SN: 50-119J4
Acquisition Start Date: 11/16/2017 8:34:20AM

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 / Ch^2

Efficiency Calibration Name: ICV-8877;AV215-2017111(

Efficiency: 24.86% +/- 0.41% 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	29.22	6,180.00	103.00
Pu-239	240	5,155.40	186	249	31.32	6,348.00	105.80
Am-241	284	5,485.70	249	303	31.03	5,942.00	99.03

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:45:08AM 11/16/2017

Calibration

Sample Name: ICV-9795;AV216-20171116
Description:
Detector: AV216

Analyst: 60040
Analysis Date: 11/16/2017 9:45:05AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82243-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

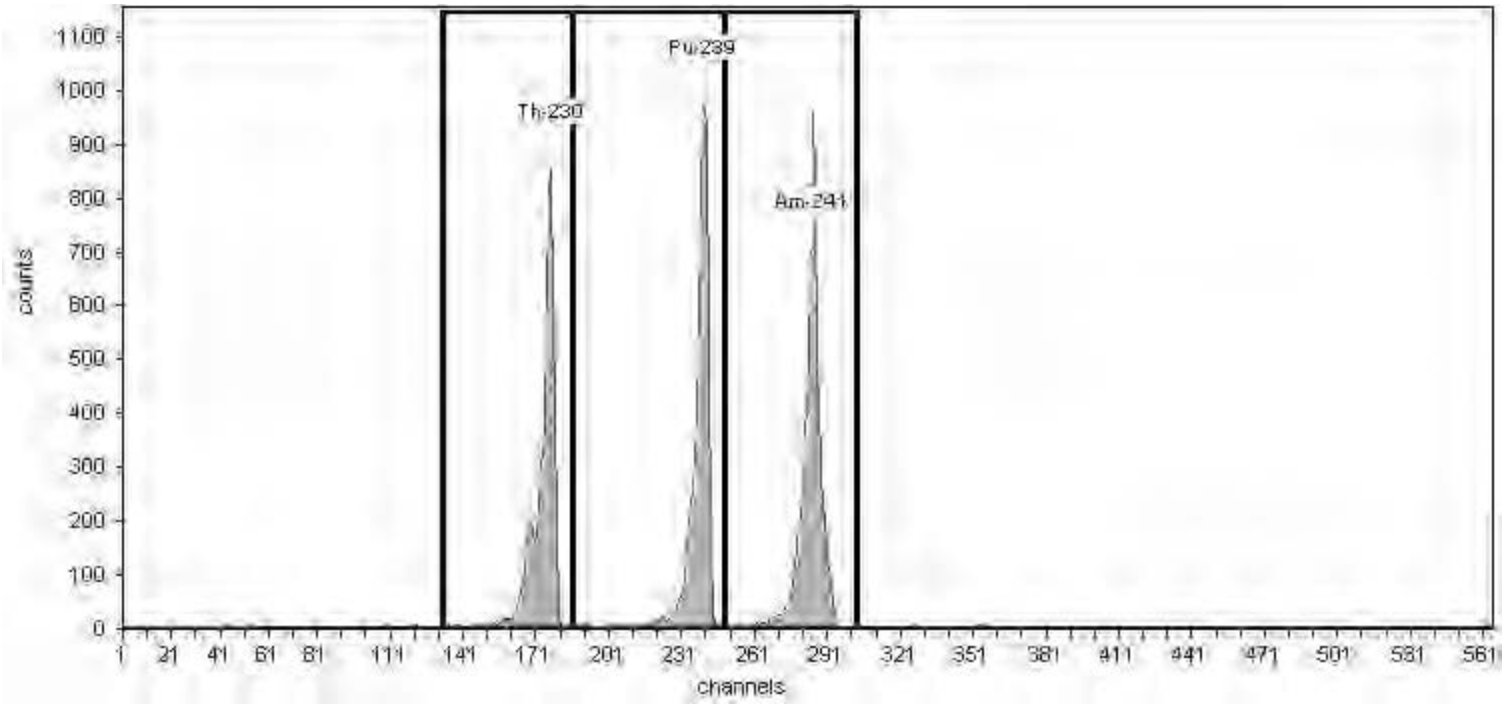
Detector: AV216 , SN: 50-117J5
Acquisition Start Date: 11/16/2017 8:34:01AM

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;AV216-2017111(

Efficiency: 25.77% +/- 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	30.69	5,257.00	87.62
Pu-239	240	5,155.40	186	249	32.93	5,609.00	93.48
Am-241	284	5,485.70	249	303	30.30	5,985.00	99.75

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:44:57AM 11/16/2017

Calibration

Sample Name: ICV-9794;AV217-20171116
Description:
Detector: AV217

Analyst: 60040
Analysis Date: 11/16/2017 9:44:55AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82242-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

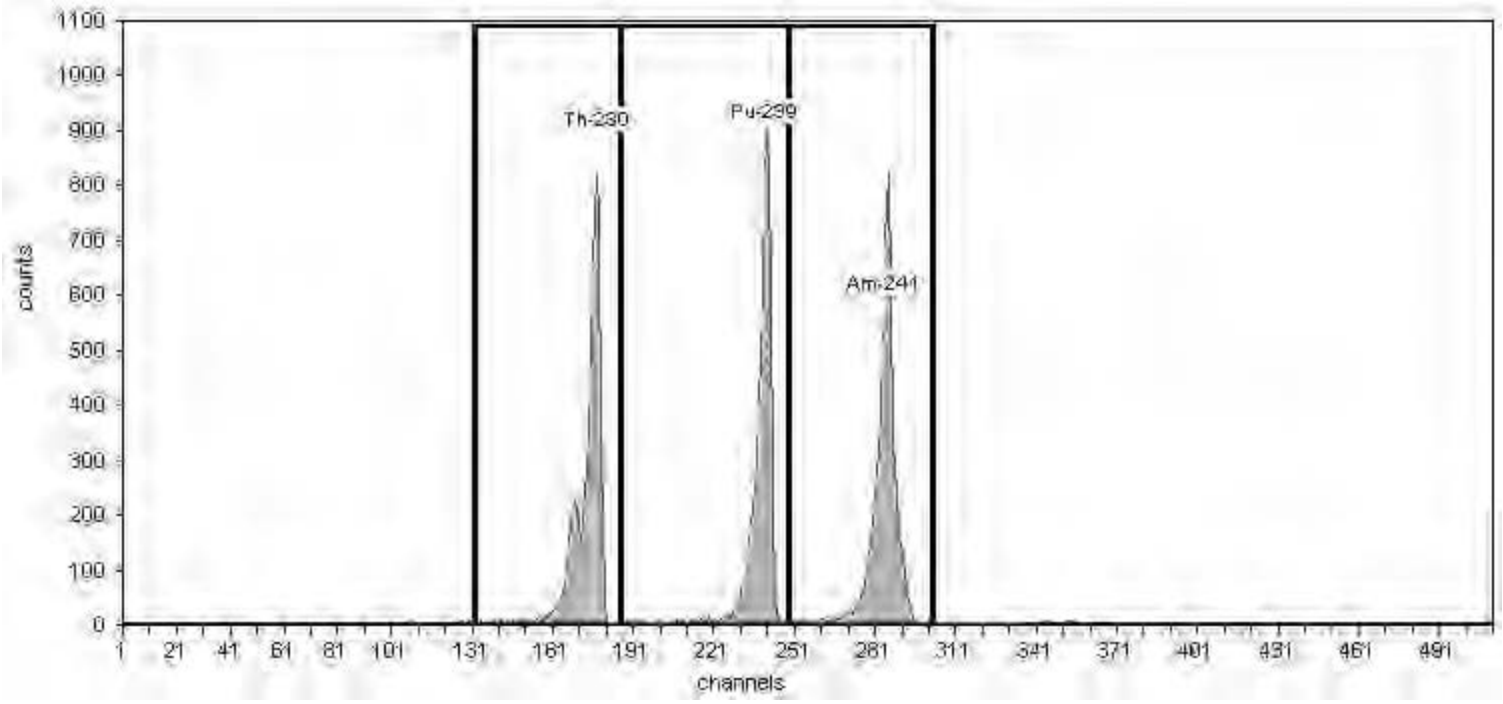
Detector: AV217 , SN: 50-117I2
Acquisition Start Date: 11/16/2017 8:33:44AM

Live Time: 60.00 min.
Real Time: 60.03 min.

Efficiency Calibration Name: ICV-9794;AV217-2017111(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 21.38% +/- 0.38% 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	31.52	5,166.00	86.10
Pu-239	240	5,155.40	186	249	30.38	4,939.00	82.32
Am-241	284	5,485.70	249	303	32.85	5,344.00	89.07

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:45:25AM 11/16/2017

Calibration

Sample Name: ICV-8875;AV218-20171116
Description:
Detector: AV218

Analyst: 60040
Analysis Date: 11/16/2017 9:45:23AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82234-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

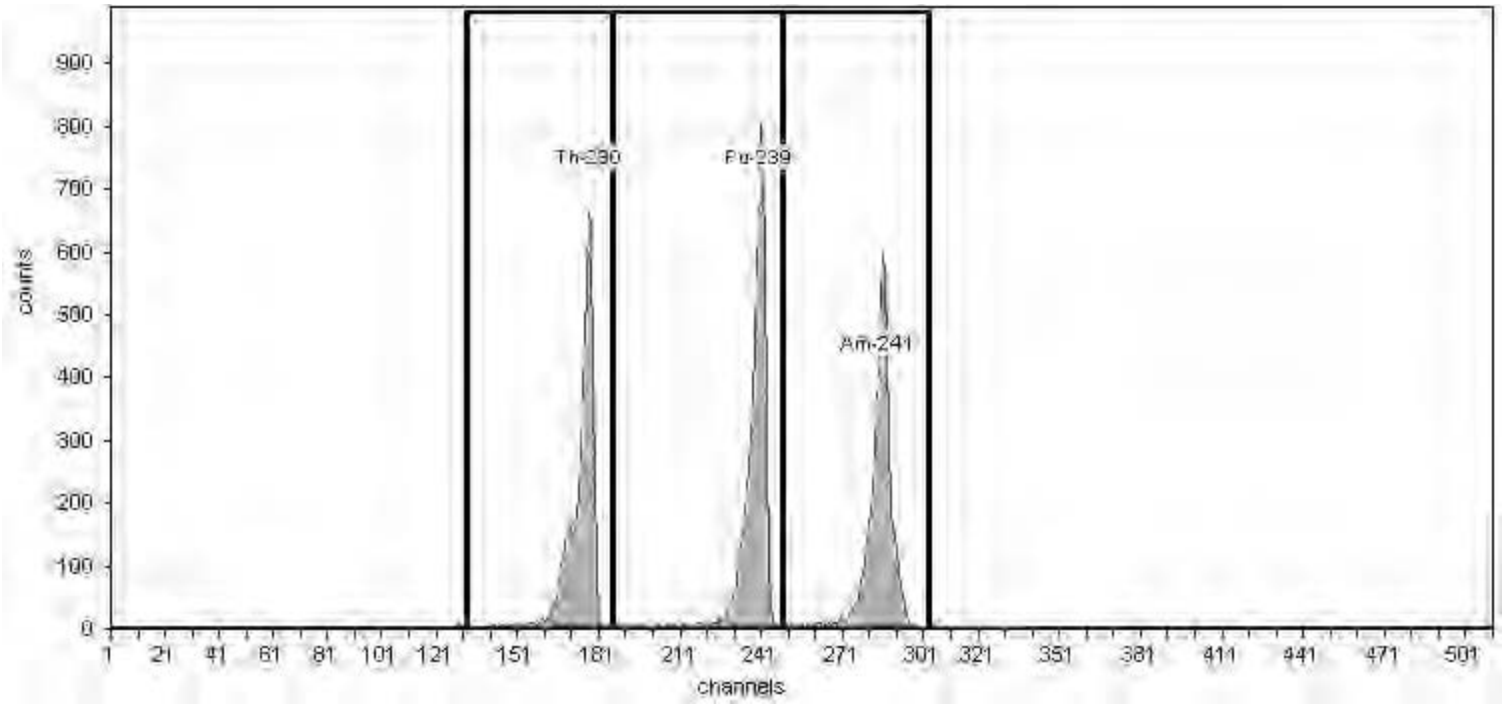
Detector: AV218 , SN: 50-117Z7
Acquisition Start Date: 11/16/2017 8:34:40AM

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-8875;AV218-2017111(

Efficiency: 21.12% +/- 0.42% 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	33.85	4,167.00	69.45
Pu-239	240	5,155.40	186	249	33.43	4,703.00	78.38
Am-241	284	5,485.70	249	303	35.90	4,232.00	70.53

Monthly Calibration Verifications

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:21:46PM 8/14/2018

Calibration

Sample Name: CCV-7107;AV1-08142018c
Description:
Detector: AV1

Calibration Date: 8/14/2018 3:10:30PM
Analyst: 60040

Source Info

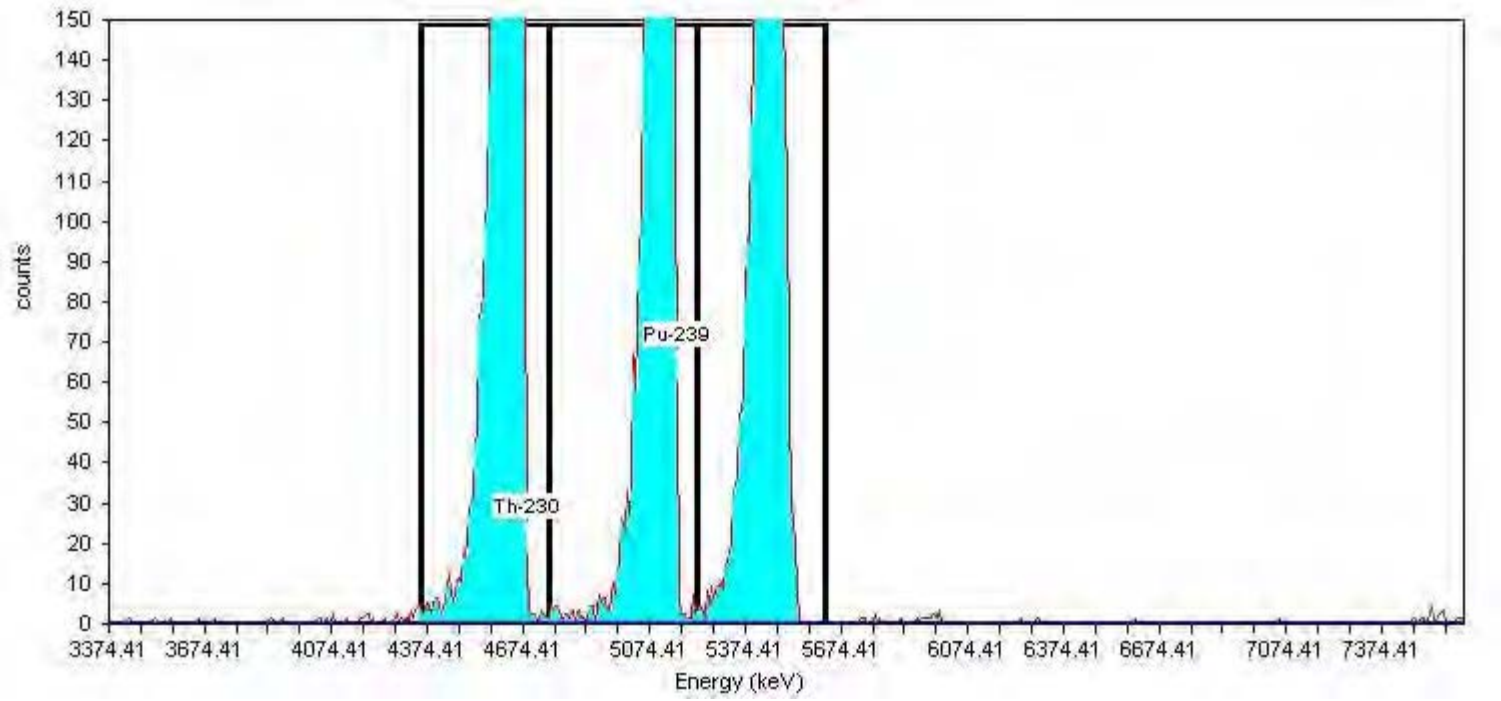
Certificate ID: 82232-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 8/14/2018 2:05:28PM
Live Time: 60.00 min.
Real Time: 60.02 min.
Efficiency: 23.85% +/- 0.38% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,305.00	105.08
Pu-239	240	5.16	186	249	0.00	6,479.00	107.98
Am-241	284	5.49	249	303	0.00	6,108.00	101.80

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:21:58PM 8/14/2018

Calibration

Sample Name: CCV-8877;AV3-08142018b
Description:
Detector: AV3

Calibration Date: 8/14/2018 3:10:42PM
Analyst: 60040

Source Info

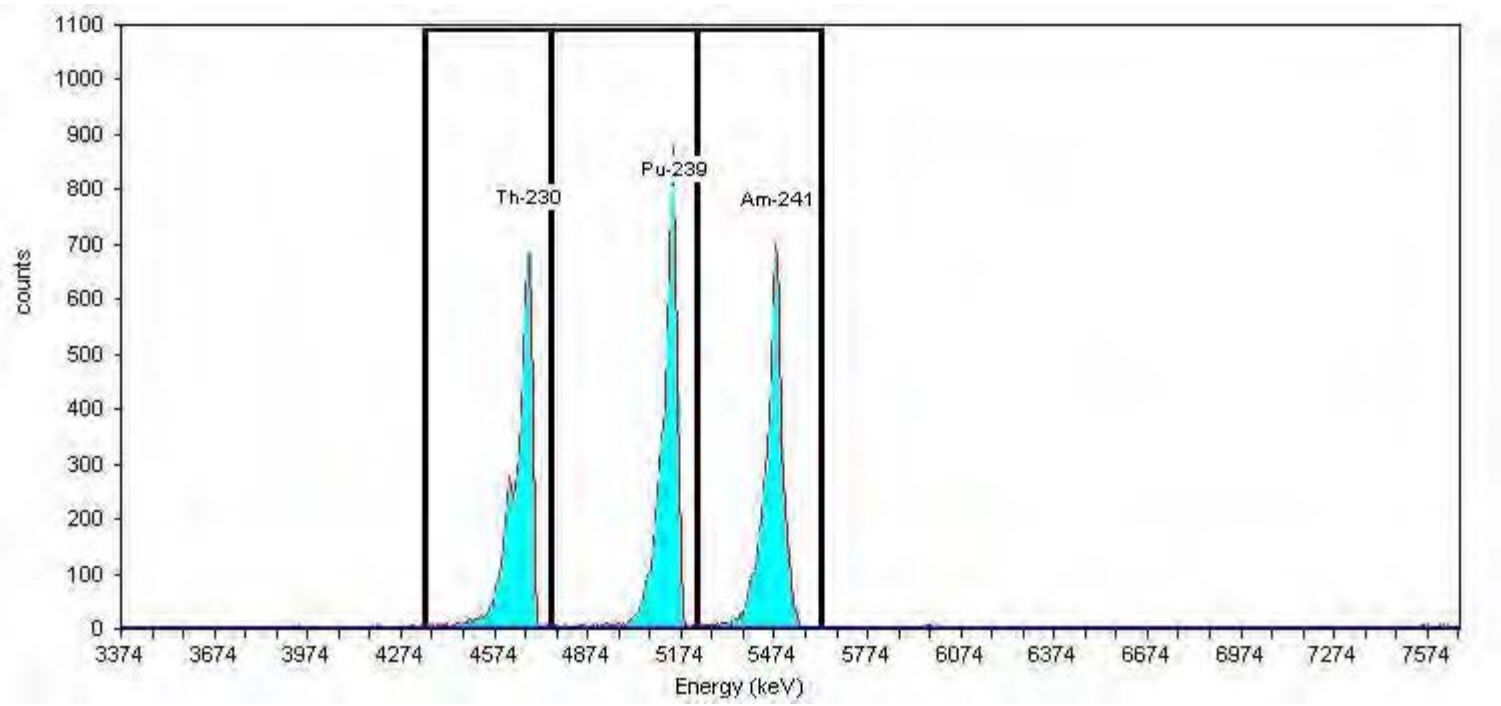
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV3 , SN: 49-202 FF7
Acquisition Start Date: 8/14/2018 2:06:15PM
Live Time: 60.00 min.
Real Time: 60.02 min.
Efficiency: 24.45% +/- 0.41% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,866.00	97.77
Pu-239	240	5.16	186	249	0.00	6,391.00	106.52
Am-241	284	5.49	249	303	0.00	5,952.00	99.20

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:52:56AM 7/11/2018

Calibration

Sample Name: CCV-9793;AV7-07102018
Description:
Detector: AV7

Calibration Date: 7/11/2018 10:52:53AM
Analyst: 60040

Source Info

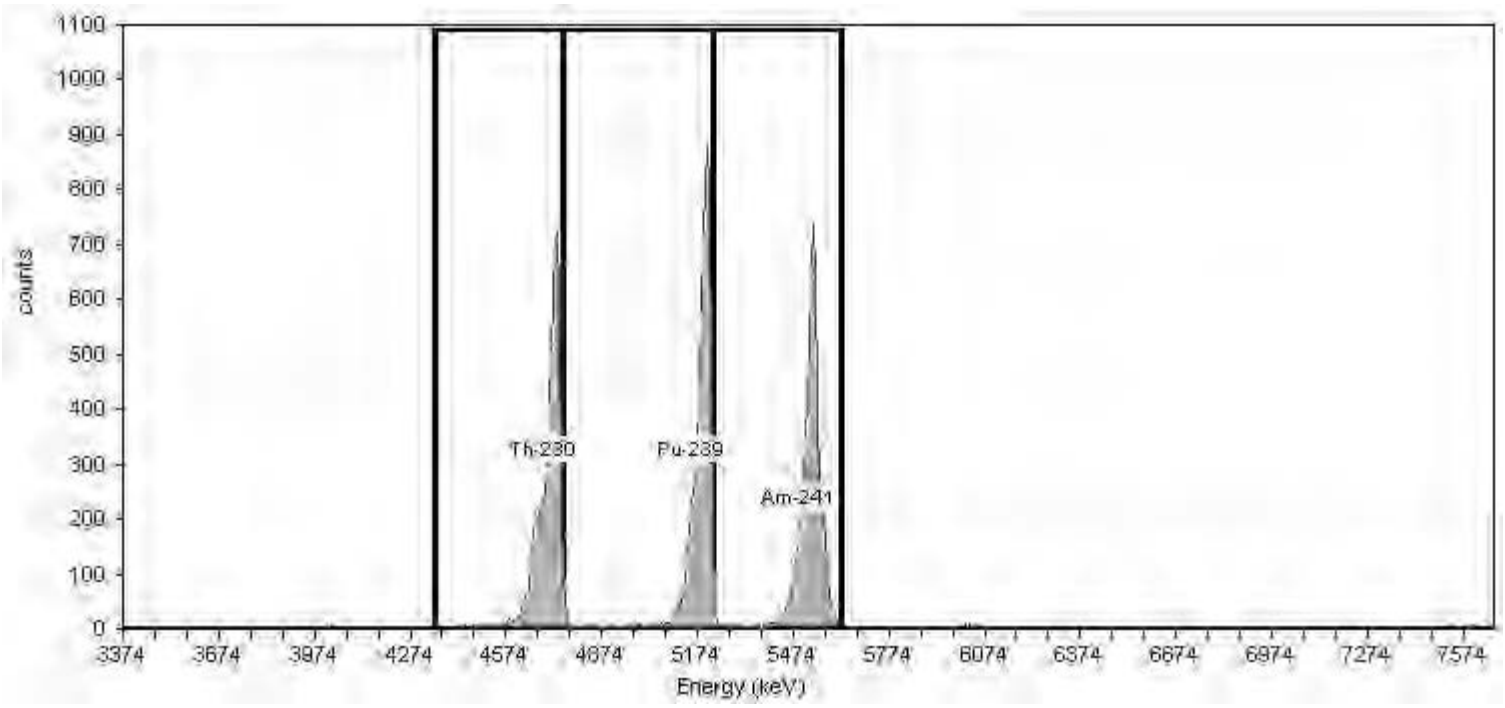
Certificate ID: 82241-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



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	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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:53:07AM 7/11/2018

Calibration

Sample Name: CCV-9795;AV8-07102018
Description:
Detector: AV8

Calibration Date: 7/11/2018 10:53:03AM
Analyst: 60040

Source Info

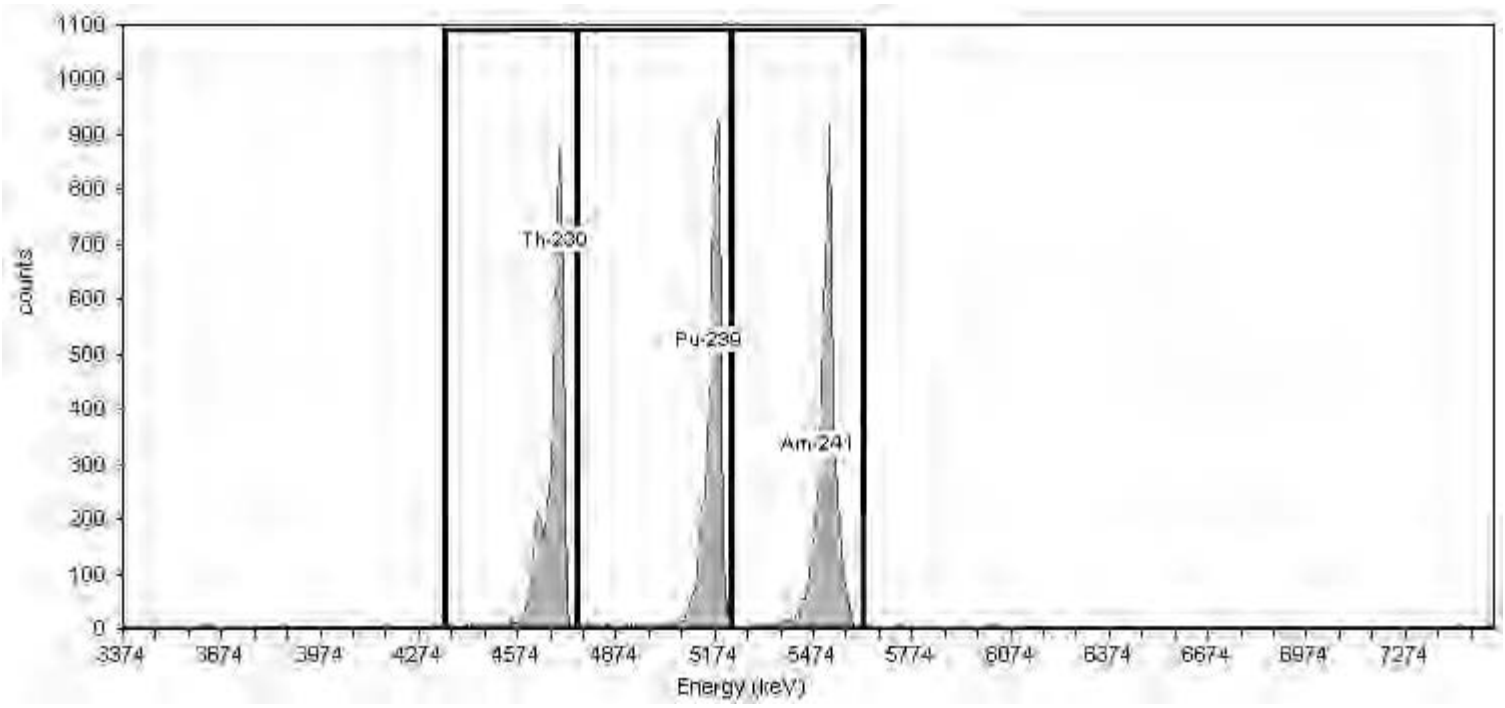
Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

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 / Ch^2



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	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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:53:37AM 7/11/2018

Calibration

Sample Name: CCV-9885;AV10-07102018
Description:
Detector: AV10

Calibration Date: 7/11/2018 10:53:33AM
Analyst: 60040

Source Info

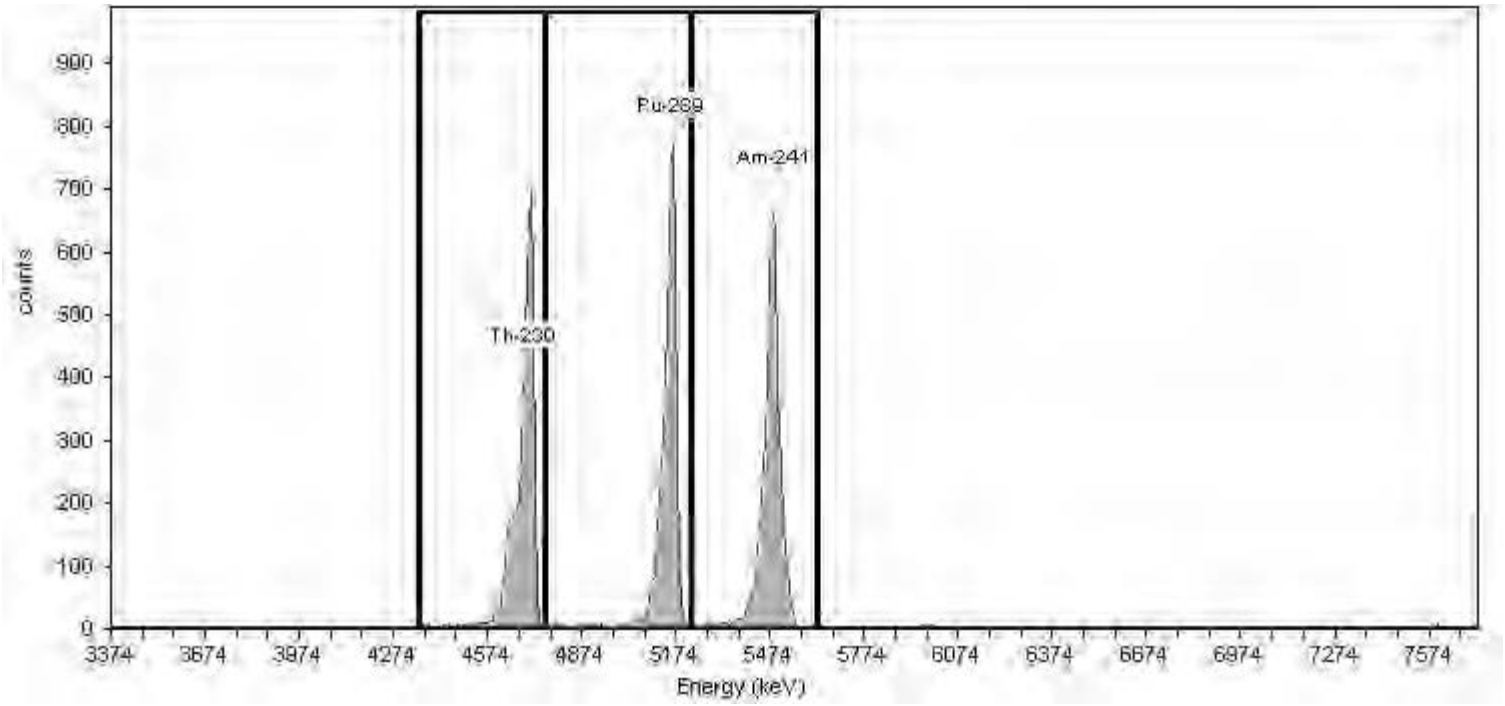
Certificate ID: 82246-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV10 , SN: 49-155N2
Acquisition Start Date: 7/10/2018 4:57:19PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 23.79% +/- 0.46% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,677.00	77.95
Pu-239	240	5.16	186	249	0.00	4,733.00	78.88
Am-241	284	5.49	249	303	0.00	5,033.00	83.88

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:55:14AM 7/11/2018

Calibration

Sample Name: CCV-1370619;AV15-07102018
Description:
Detector: AV15

Calibration Date: 7/11/2018 10:55:10AM
Analyst: 60040

Source Info

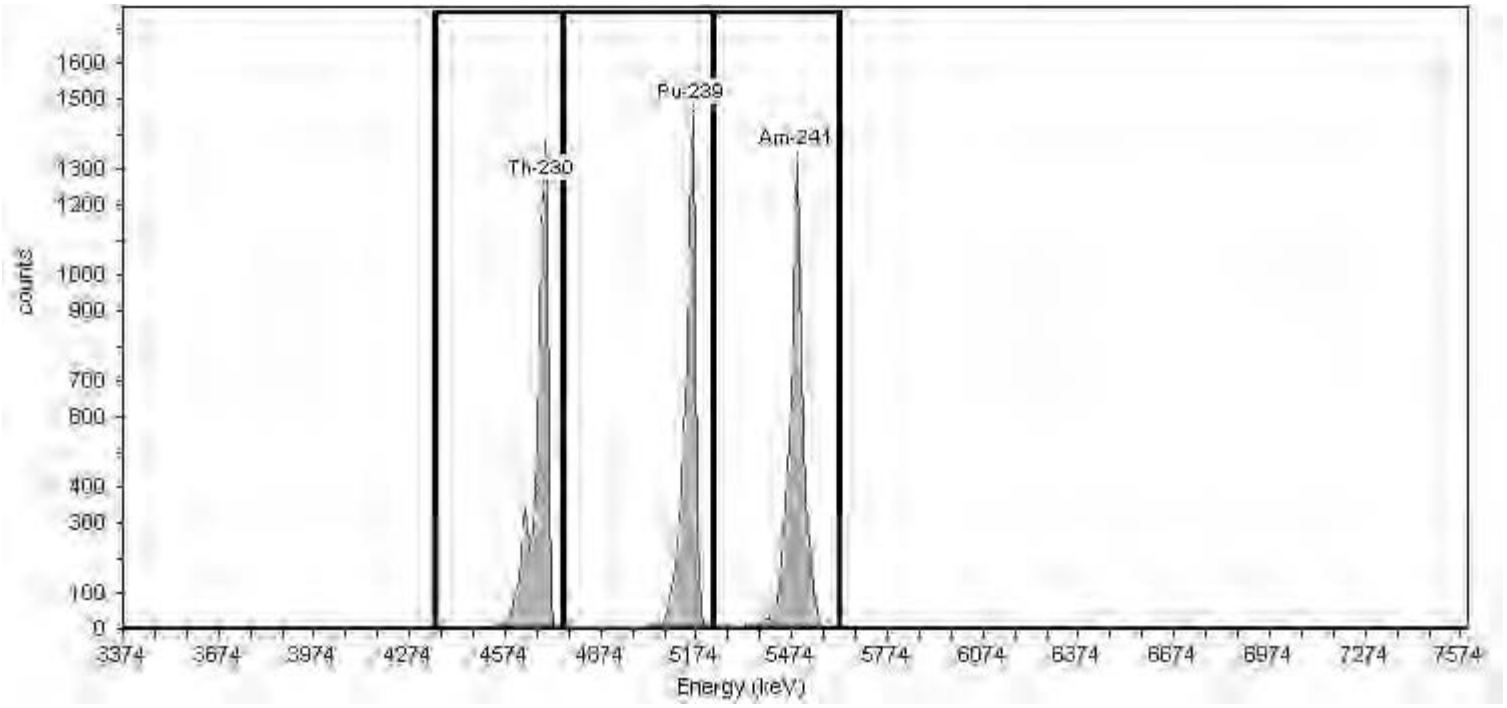
Certificate ID: 108347_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00AM
Description:

Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 7/10/2018 5:03:46PM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 27.13% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	7,892.00	131.53
Pu-239	240	5.16	186	249	0.00	7,850.00	130.83
Am-241	284	5.49	249	303	0.00	8,460.00	141.00

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:27:32PM 7/11/2018

Calibration

Sample Name: CCV-8877;AV19-07112018
Description:
Detector: AV19

Calibration Date: 7/11/2018 12:27:29PM
Analyst: 60040

Source Info

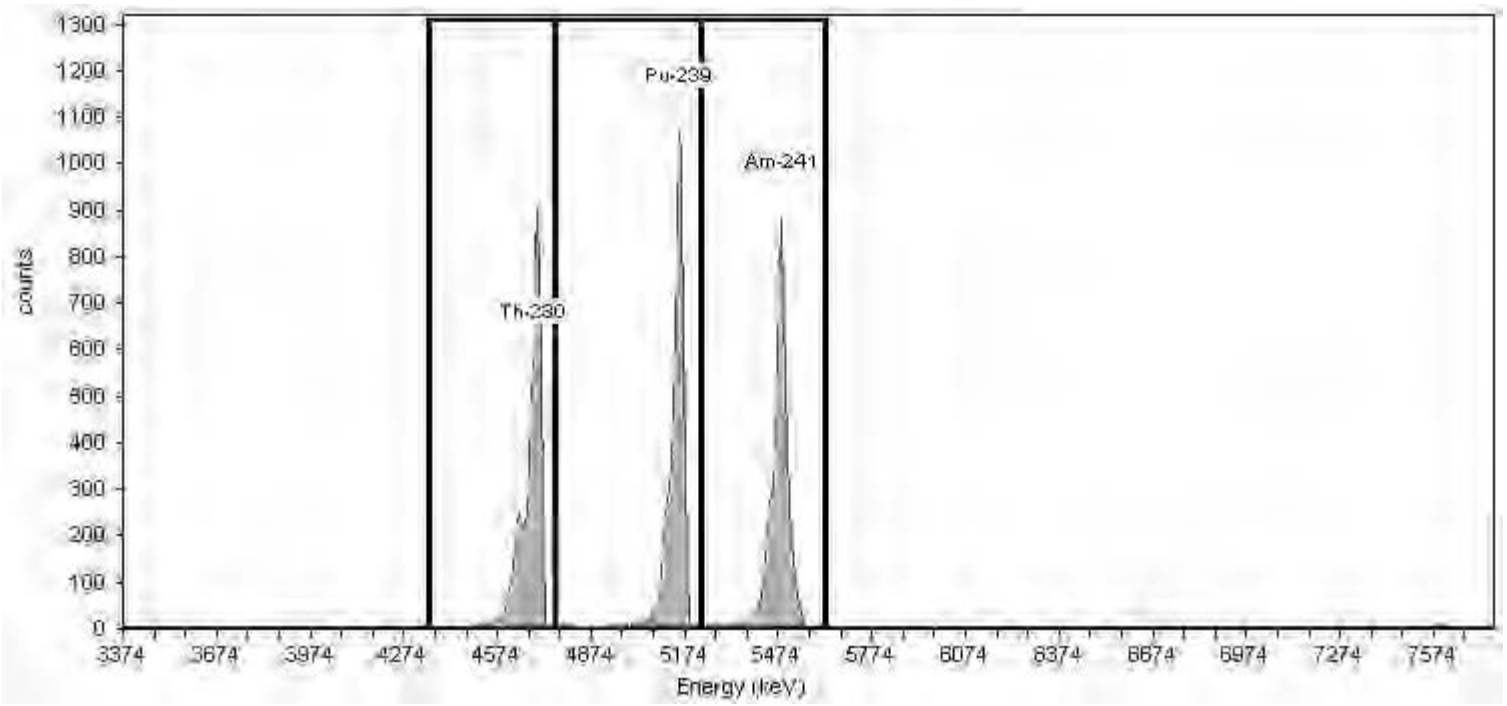
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV19 , SN: 50-025FF5
Acquisition Start Date: 7/11/2018 11:08:20AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 23.61% +/- 0.40% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,681.00	94.68
Pu-239	240	5.16	186	249	0.00	6,119.00	101.98
Am-241	284	5.49	249	303	0.00	5,772.00	96.20

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:27:45PM 7/11/2018

Calibration

Sample Name: CCV-9520;AV20-07112018
Description:
Detector: AV20

Calibration Date: 7/11/2018 12:27:41PM
Analyst: 60040

Source Info

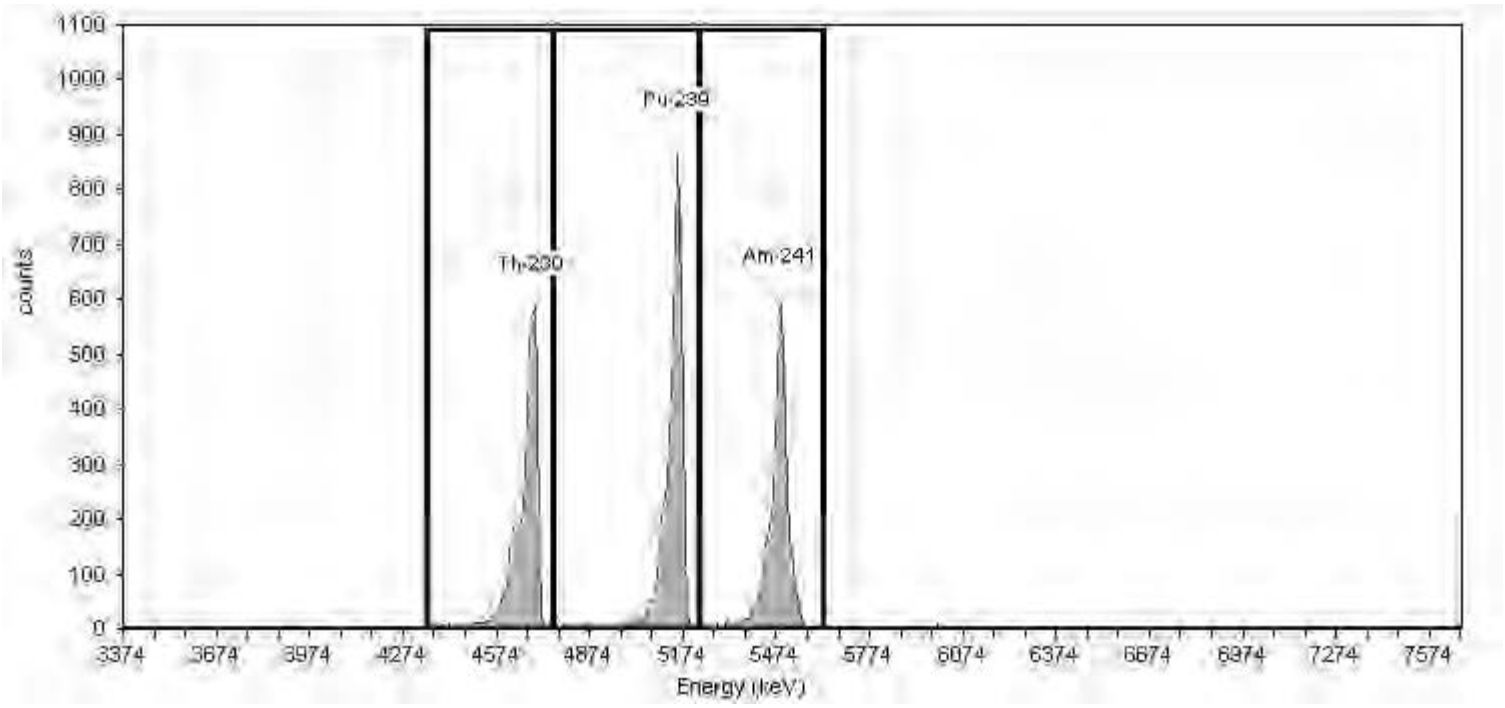
Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Acquisition

Detector: AV20 , SN: 48-121A7
Acquisition Start Date: 7/11/2018 11:08:38AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 22.42% +/- 0.43% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,551.00	75.85
Pu-239	240	5.16	186	249	0.00	5,432.00	90.53
Am-241	284	5.49	249	303	0.00	4,410.00	73.50

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:28:24PM 7/11/2018

Calibration

Sample Name: CCV-9795;AV23-07112018
Description:
Detector: AV23

Calibration Date: 7/11/2018 12:28:19PM
Analyst: 60040

Source Info

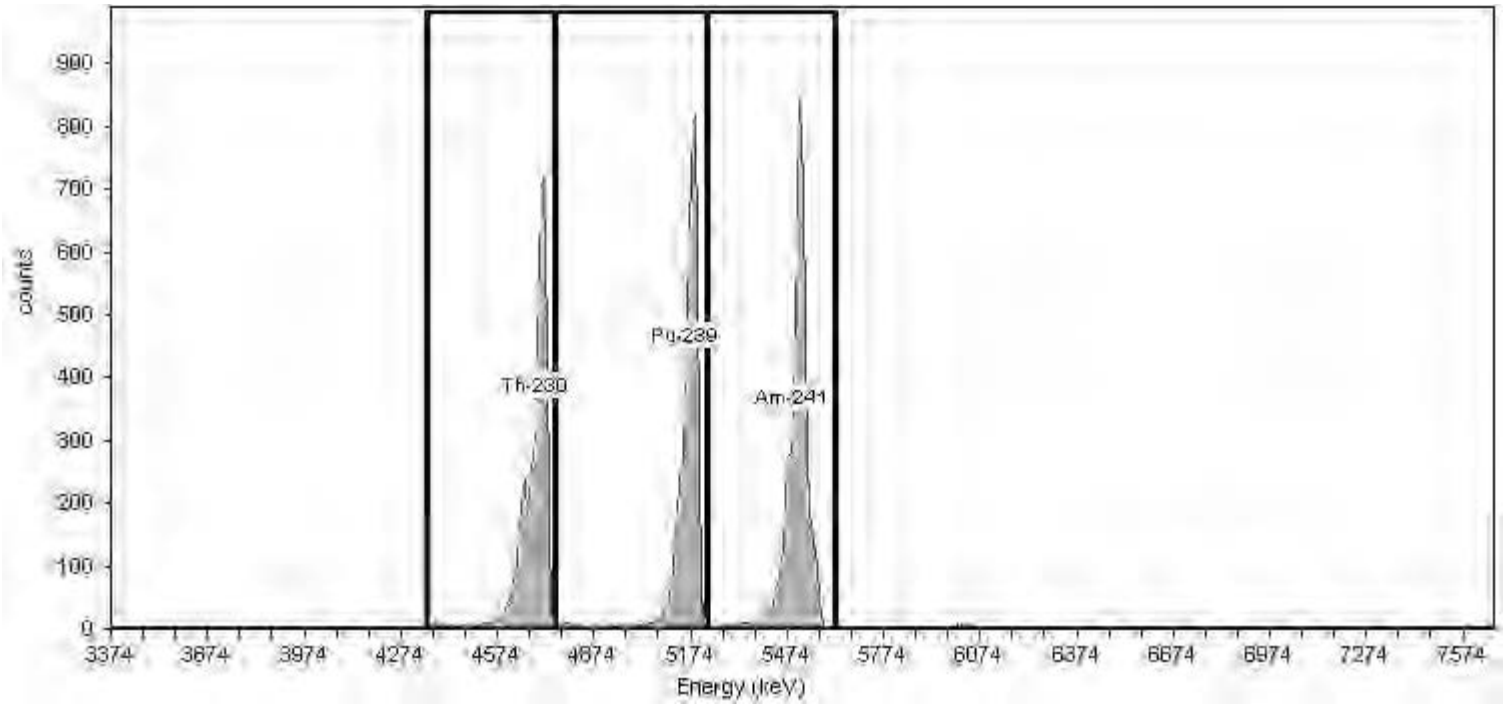
Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV23 , SN: 48-158FF3
Acquisition Start Date: 7/11/2018 11:09:23AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 24.63% +/- 0.44% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,108.00	85.13
Pu-239	240	5.16	186	249	0.00	5,296.00	88.27
Am-241	284	5.49	249	303	0.00	5,687.00	94.78

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:28:45PM 7/11/2018

Calibration

Sample Name: CCV-9817;AV24-07112018
Description:
Detector: AV24

Calibration Date: 7/11/2018 12:28:40PM
Analyst: 60040

Source Info

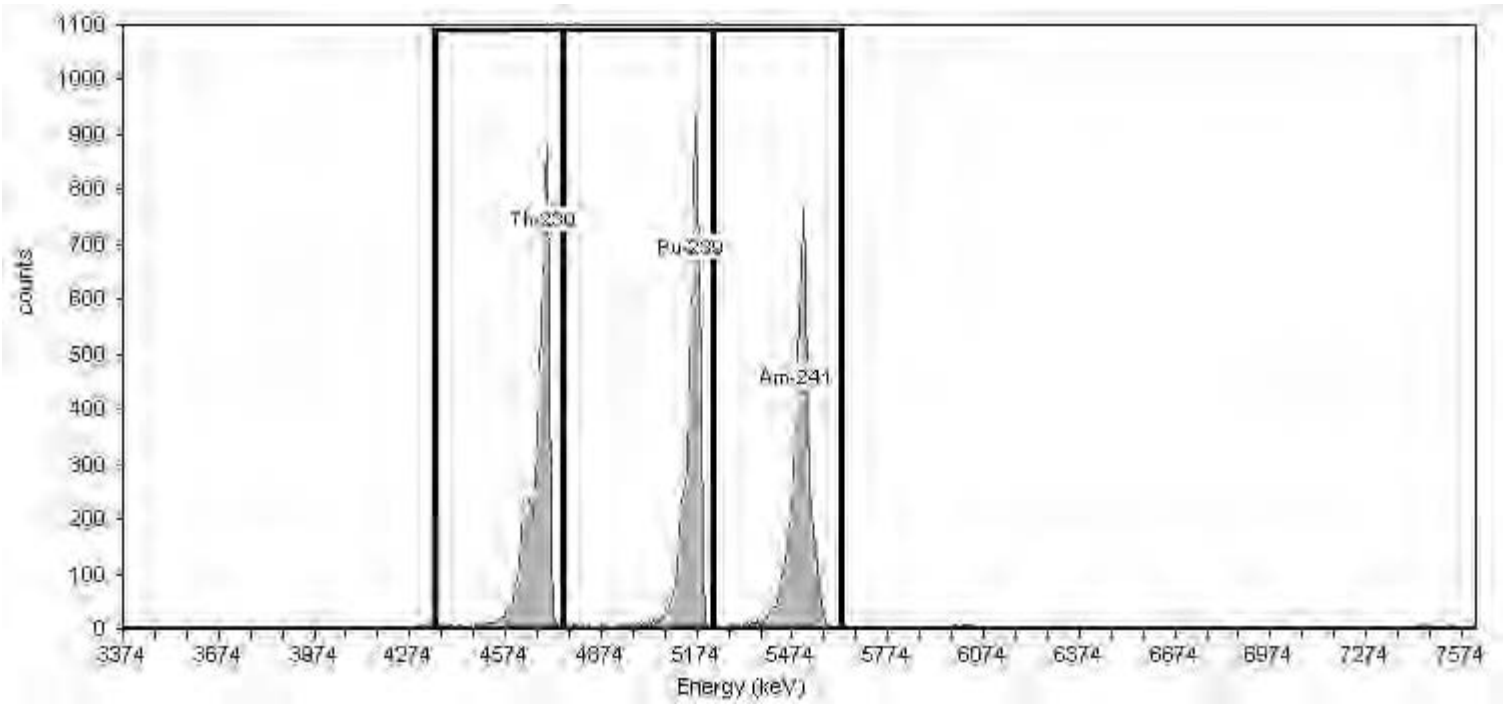
Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV24 , SN: 47-137Q4
Acquisition Start Date: 7/11/2018 11:09:36AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 22.14% +/- 0.38% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,856.00	97.60
Pu-239	240	5.16	186	249	0.00	5,391.00	89.85
Am-241	284	5.49	249	303	0.00	5,400.00	90.00

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:28:57PM 7/11/2018

Calibration

Sample Name: CCV-9885;AV43-07112018
Description:
Detector: AV43

Calibration Date: 7/11/2018 12:28:53PM
Analyst: 60040

Source Info

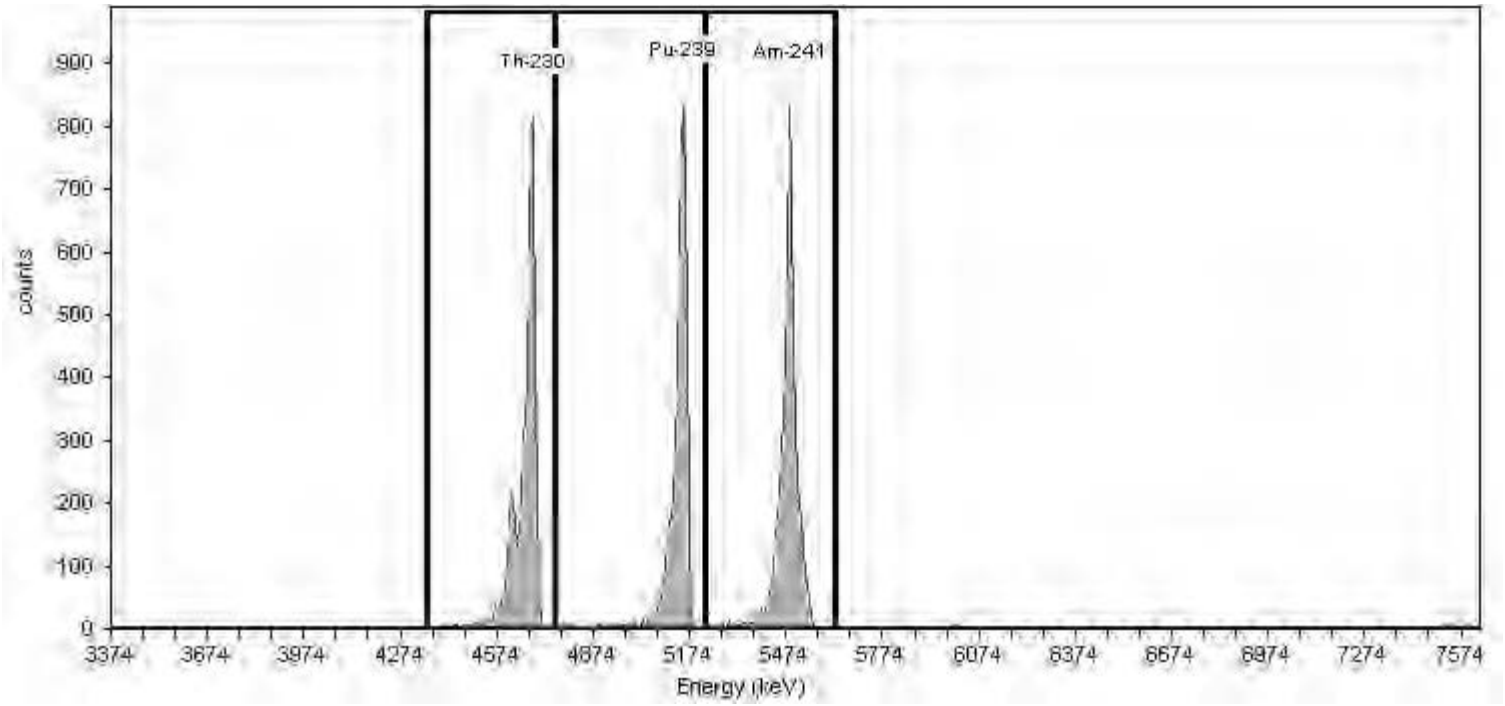
Certificate ID: 82246-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV43 , SN: 49-190X4
Acquisition Start Date: 7/11/2018 11:10:08AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 23.52% +/- 0.46% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,765.00	79.42
Pu-239	240	5.16	186	249	0.00	4,485.00	74.75
Am-241	284	5.49	249	303	0.00	5,021.00	83.68

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:29:12PM 7/11/2018

Calibration

Sample Name: CCV-1368446;AV44-07112018
Description:
Detector: AV44

Calibration Date: 7/11/2018 12:29:07PM
Analyst: 60040

Source Info

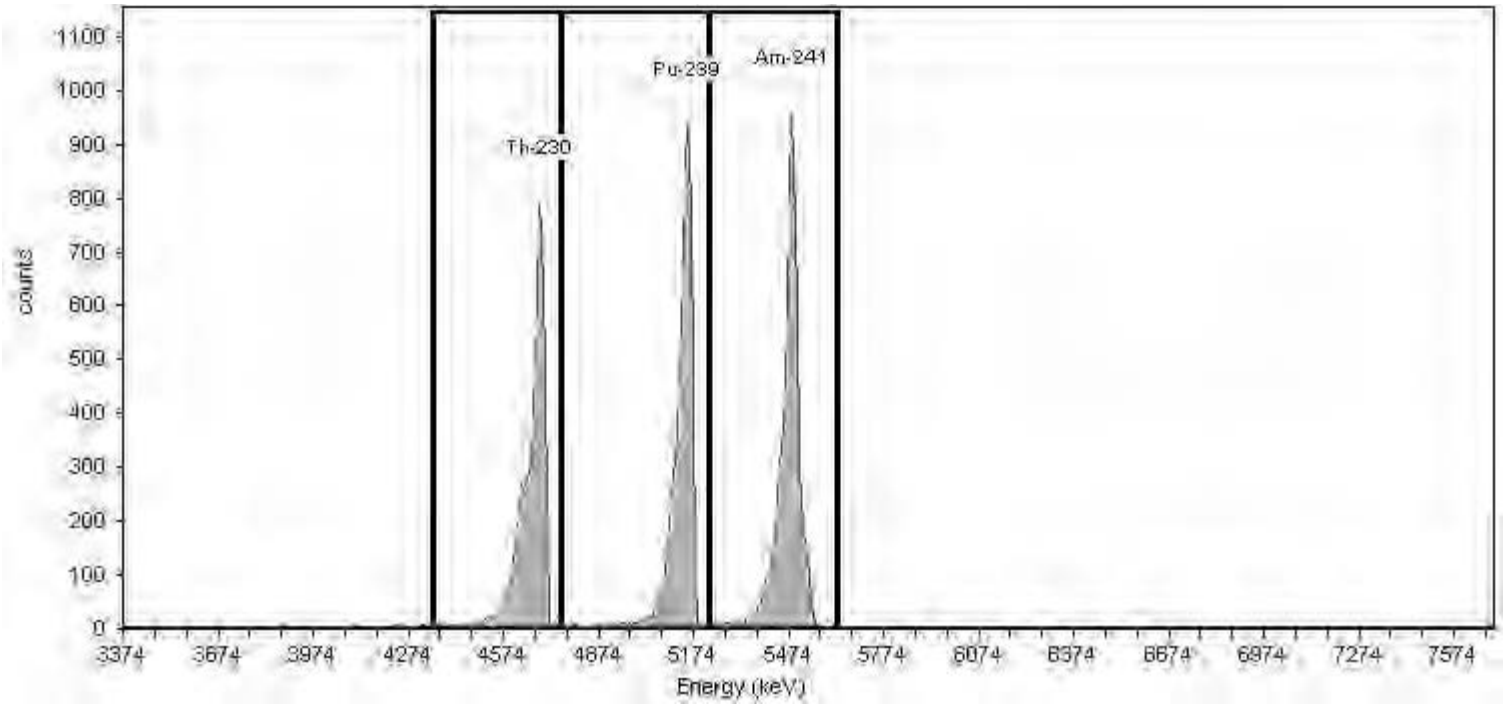
Certificate ID: 108001_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/6/2017 11:00:00AM
Description:

Acquisition

Detector: AV44 , SN: 50-051JJ1
Acquisition Start Date: 7/11/2018 11:10:10AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 27.58% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,086.00	101.43
Pu-239	240	5.16	186	249	0.00	6,556.00	109.27
Am-241	284	5.49	249	303	0.00	7,160.00	119.33

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:29:25PM 7/11/2018

Calibration

Sample Name: CCV-1368447;AV45-07112018
Description:
Detector: AV45

Calibration Date: 7/11/2018 12:29:21PM
Analyst: 60040

Source Info

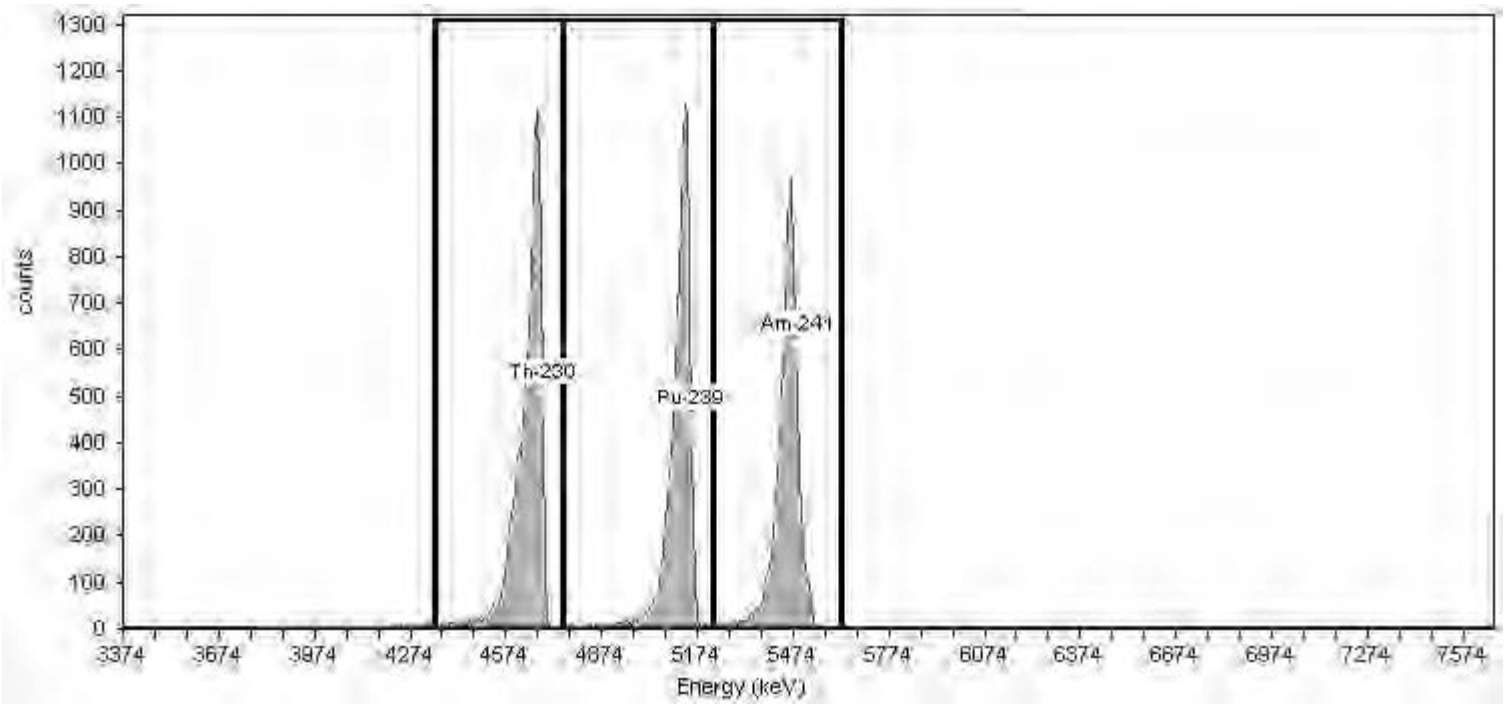
Certificate ID: 108002_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/1/2017 11:00:00AM
Description:

Acquisition

Detector: AV45 , SN: 48-158FF2
Acquisition Start Date: 7/11/2018 11:10:27AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 28.29% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	9,463.00	157.72
Pu-239	240	5.16	186	249	0.00	8,832.00	147.20
Am-241	284	5.49	249	303	0.00	8,145.00	135.75

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:30:01PM 7/11/2018

Calibration

Sample Name: CCV-1370622;AV47-07112018
Description:
Detector: AV47

Calibration Date: 7/11/2018 12:29:57PM
Analyst: 60040

Source Info

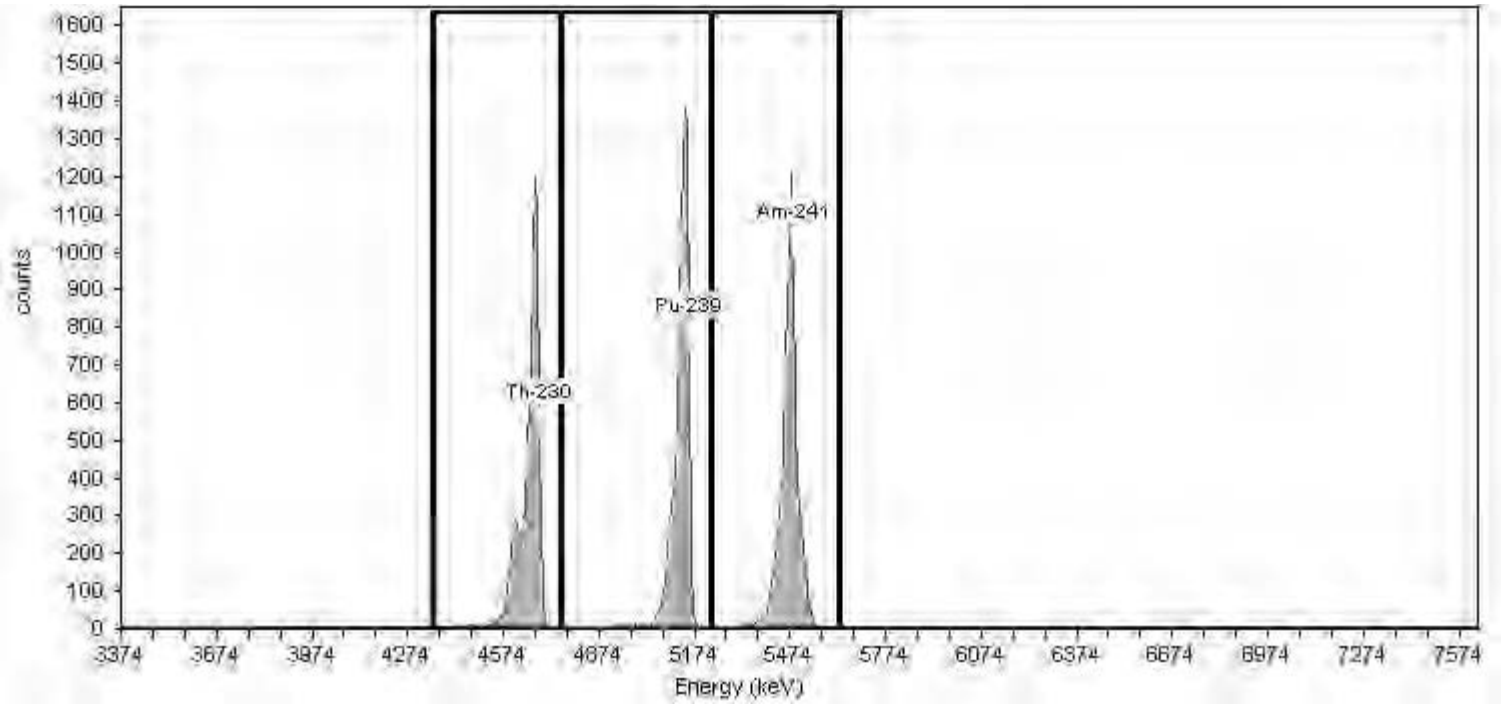
Certificate ID: 108346_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV47 , SN: 46-032336
Acquisition Start Date: 7/11/2018 11:10:55AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 26.62% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	7,236.00	120.60
Pu-239	240	5.16	186	249	0.00	7,711.00	128.52
Am-241	284	5.49	249	303	0.00	7,499.00	124.98

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:46:42PM 7/11/2018

Calibration

Sample Name: CCV-1370619;AV48-07112018
Description:
Detector: AV48

Calibration Date: 7/11/2018 1:46:38PM
Analyst: 60040

Source Info

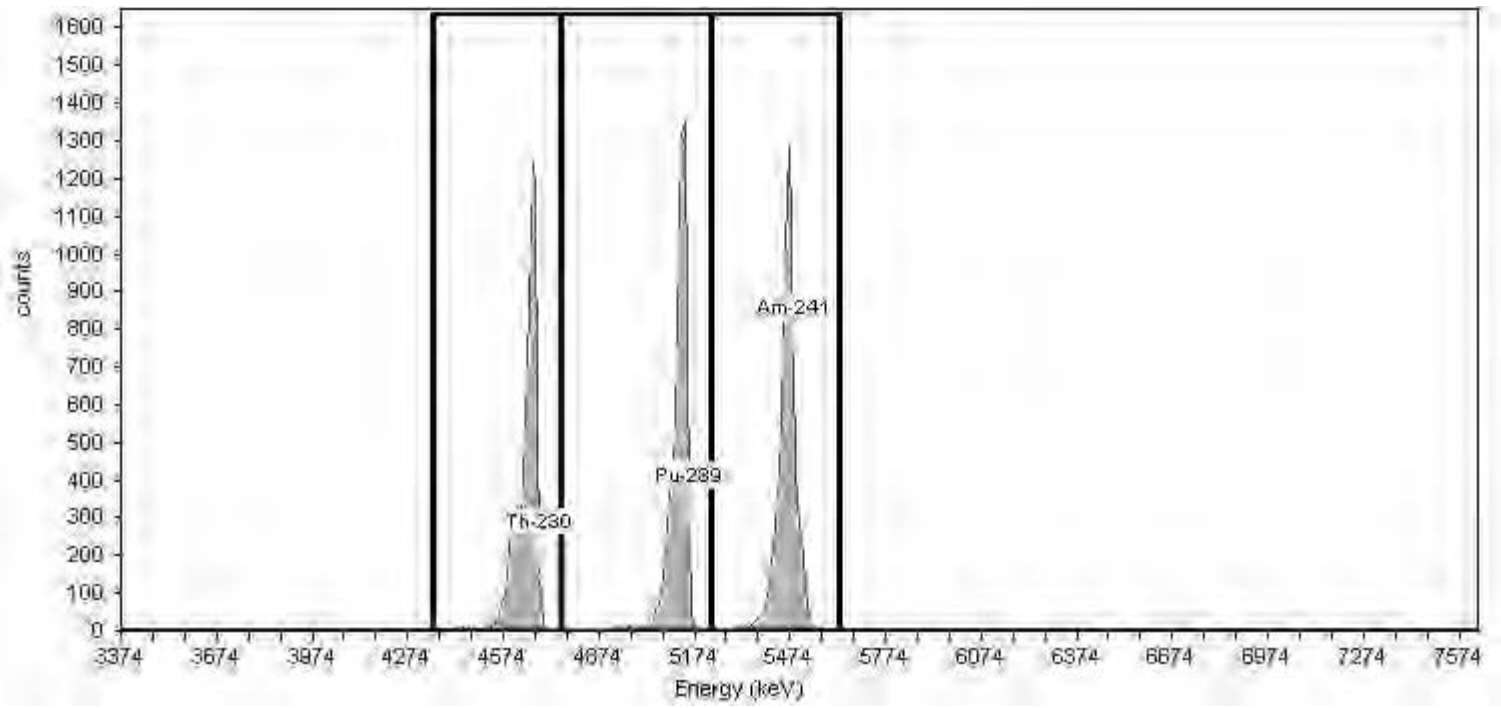
Certificate ID: 108347_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00AM
Description:

Acquisition

Detector: AV48 , SN: 46-033P6
Acquisition Start Date: 7/11/2018 12:36:39PM
Live Time: 60.00 min.
Real Time: 60.02 min.
Efficiency: 27.07% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	7,892.00	131.53
Pu-239	240	5.16	186	249	0.00	7,827.00	130.45
Am-241	284	5.49	249	303	0.00	8,433.00	140.55

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:47:05PM 7/11/2018

Calibration

Sample Name: CCV-1370620;AV49-07112018
Description:
Detector: AV49

Calibration Date: 7/11/2018 1:47:02PM
Analyst: 60040

Source Info

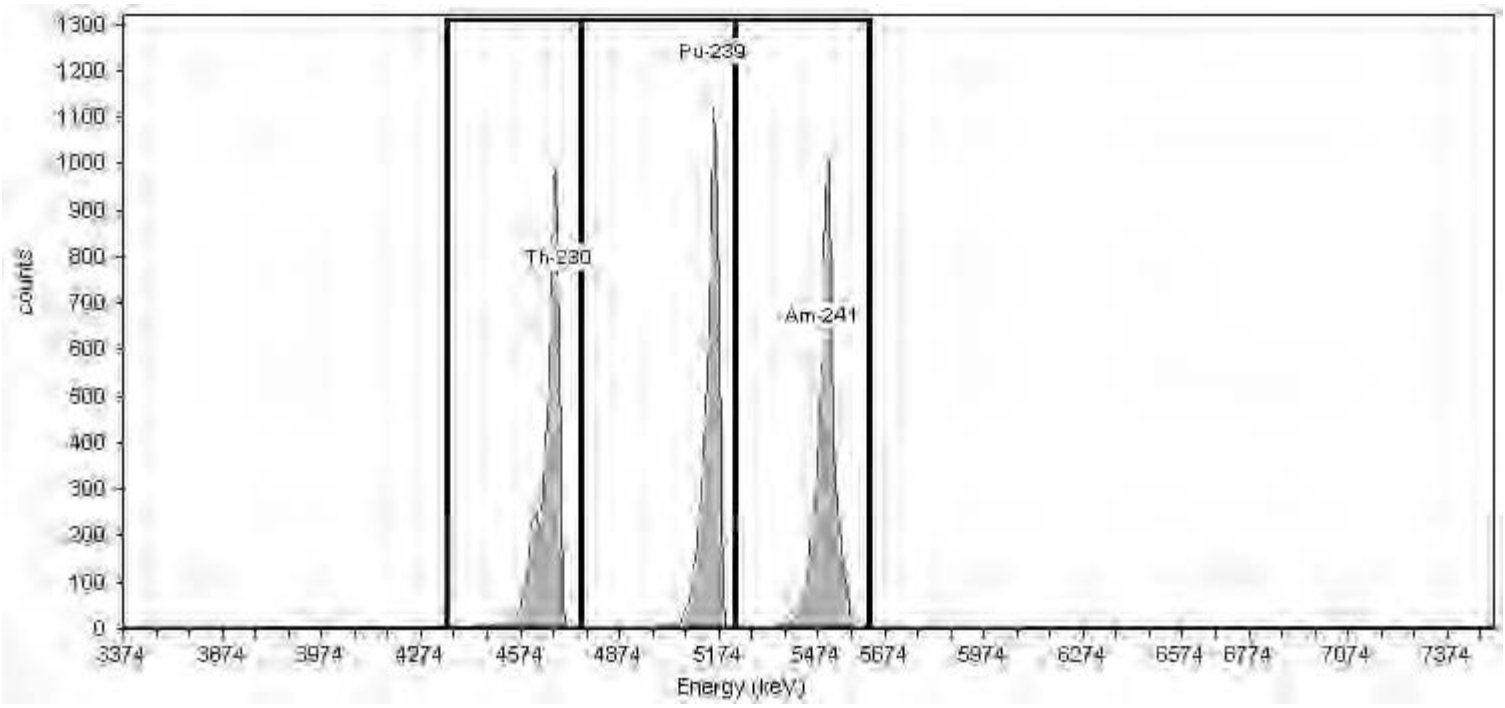
Certificate ID: 108348_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00PM
Description:

Acquisition

Detector: AV49 , SN: 47-043hh4
Acquisition Start Date: 7/11/2018 12:36:53PM
Live Time: 60.00 min.
Real Time: 60.02 min.
Efficiency: 26.24% +/- 0.37% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,558.00	109.30
Pu-239	240	5.16	186	249	0.00	6,671.00	111.18
Am-241	284	5.49	249	303	0.00	7,099.00	118.32

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:49:46PM 7/11/2018

Calibration

Sample Name: CCV-8877;AV52-07112018a
Description:
Detector: AV52

Calibration Date: 7/11/2018 1:49:42PM
Analyst: 60040

Source Info

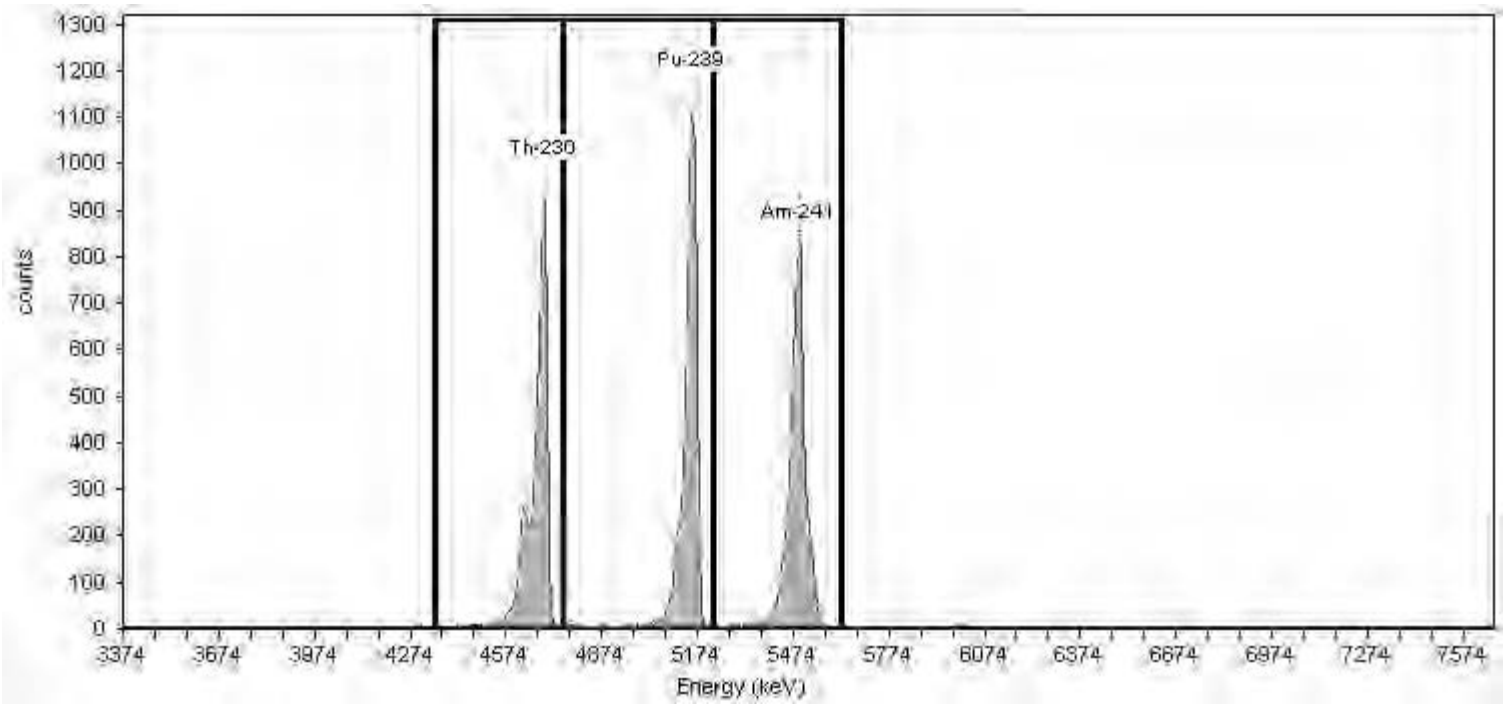
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV52 , SN: 49-155N7
Acquisition Start Date: 7/11/2018 12:40:07PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 25.00% +/- 0.41% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,121.00	102.02
Pu-239	240	5.16	186	249	0.00	6,373.00	106.22
Am-241	284	5.49	249	303	0.00	6,077.00	101.28

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:47:50PM 7/11/2018

Calibration

Sample Name: CCV-9520;AV53-07112018
Description:
Detector: AV53

Calibration Date: 7/11/2018 1:47:47PM
Analyst: 60040

Source Info

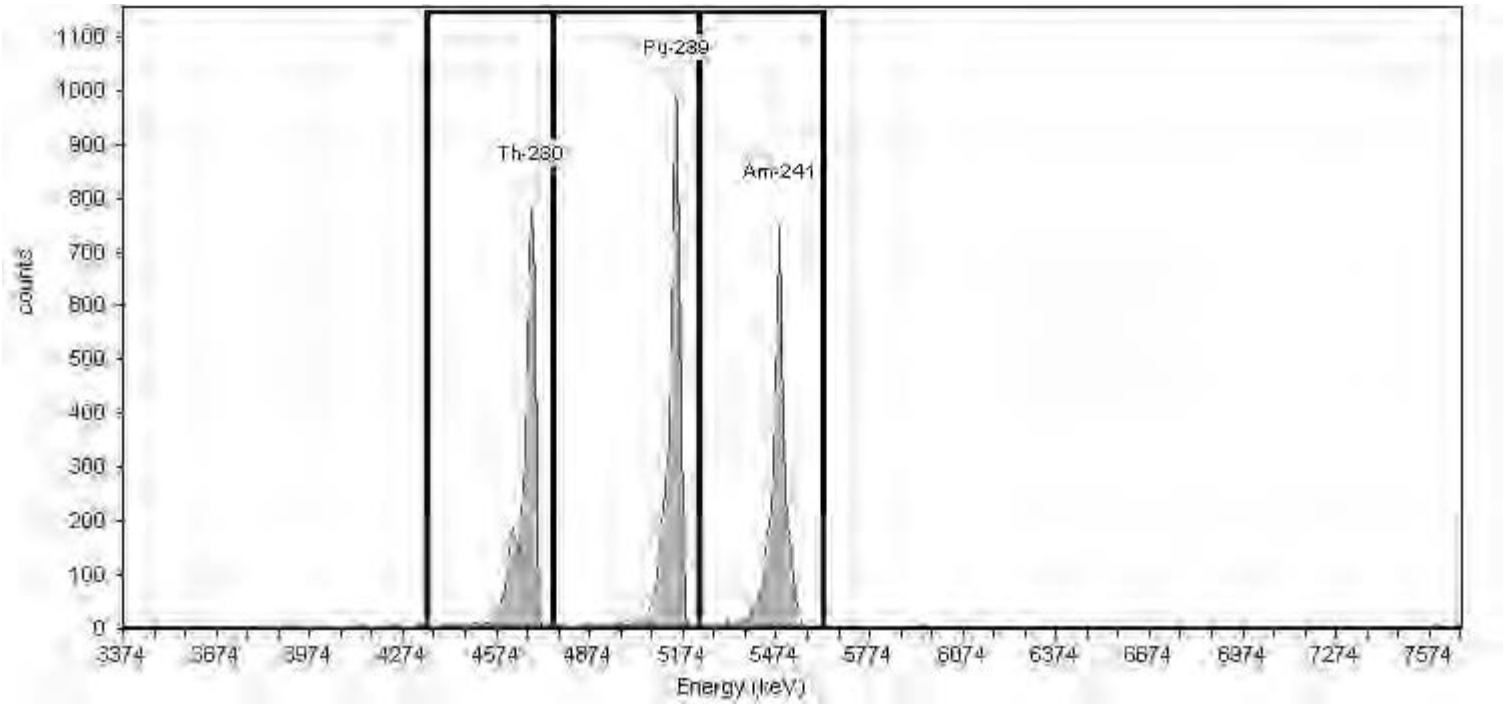
Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Acquisition

Detector: AV53 , SN: 50-051A6
Acquisition Start Date: 7/11/2018 12:38:03PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 23.34% +/- 0.44% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,750.00	79.17
Pu-239	240	5.16	186	249	0.00	5,638.00	93.97
Am-241	284	5.49	249	303	0.00	4,594.00	76.57

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:48:11PM 7/11/2018

Calibration

Sample Name: CCV-9792;AV54-07112018
Description:
Detector: AV54

Calibration Date: 7/11/2018 1:48:01PM
Analyst: 60040

Source Info

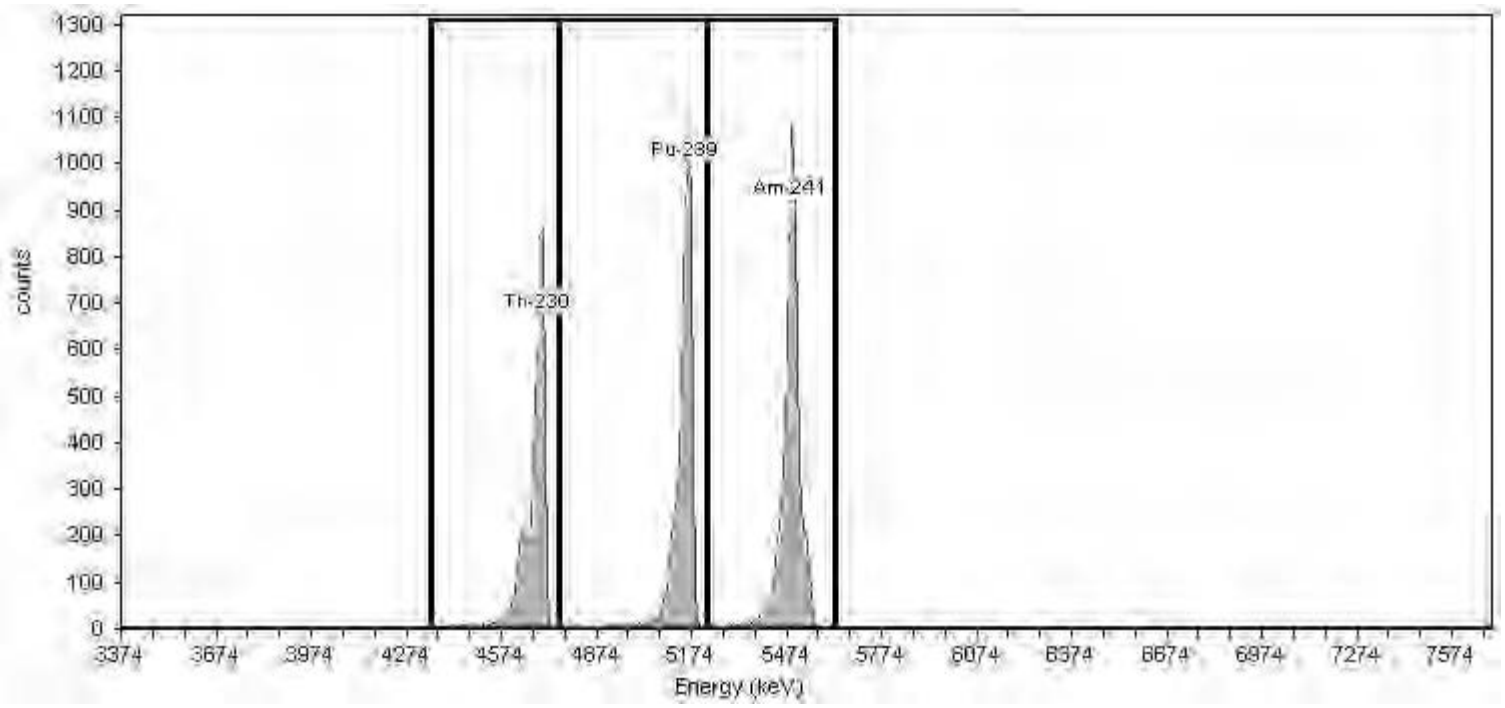
Certificate ID: 82240-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV54 , SN: 46-033P4
Acquisition Start Date: 7/11/2018 12:38:13PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 23.43% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,231.00	87.18
Pu-239	240	5.16	186	249	0.00	6,099.00	101.65
Am-241	284	5.49	249	303	0.00	6,944.00	115.73

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:50:06PM 7/11/2018

Calibration

Sample Name: CCV-9795;AV56-07112018a
Description:
Detector: AV56

Calibration Date: 7/11/2018 1:50:01PM
Analyst: 60040

Source Info

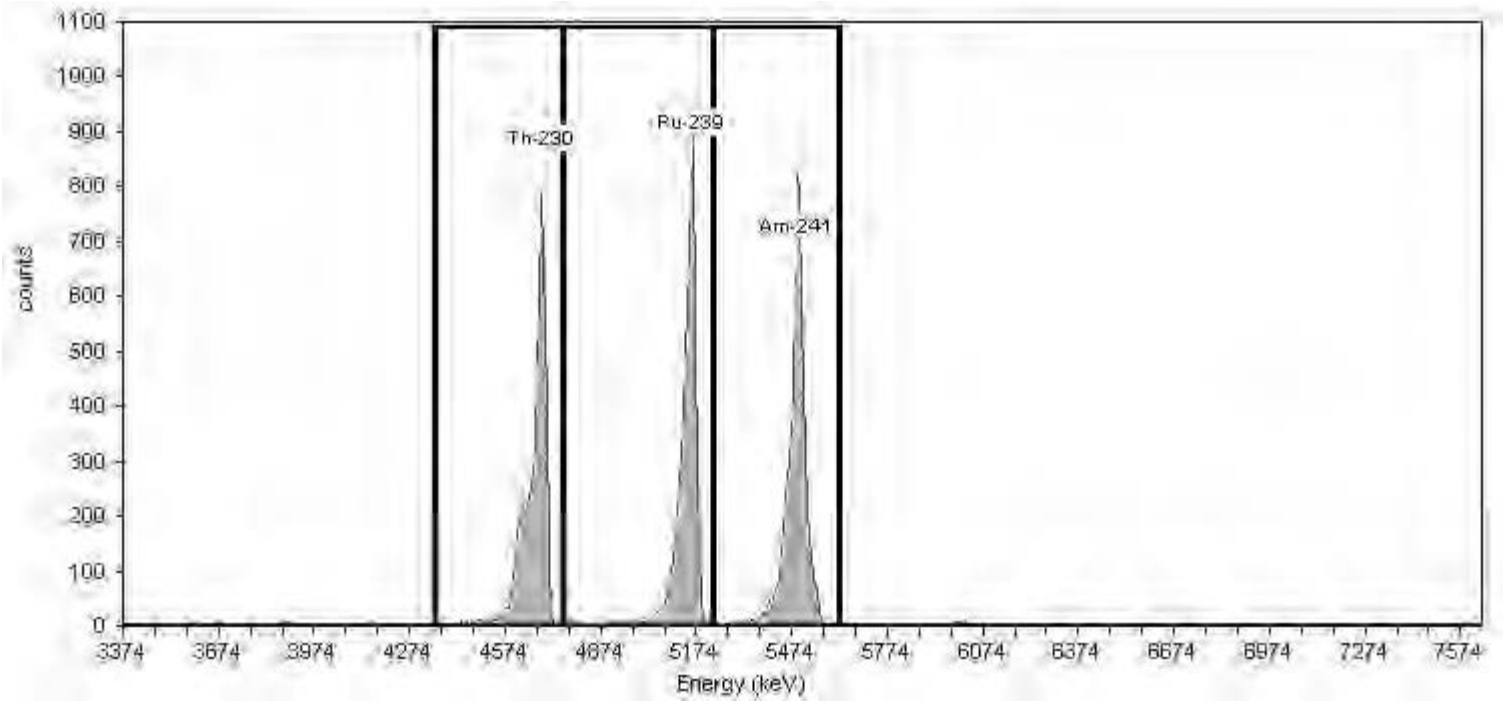
Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV56 , SN: 52-059EE5
Acquisition Start Date: 7/11/2018 12:40:33PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 25.21% +/- 0.45% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,301.00	88.35
Pu-239	240	5.16	186	249	0.00	5,441.00	90.68
Am-241	284	5.49	249	303	0.00	5,725.00	95.42

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:48:57PM 7/11/2018

Calibration

Sample Name: CCV-9817;AV57-07112018
Description:
Detector: AV57

Calibration Date: 7/11/2018 1:48:53PM
Analyst: 60040

Source Info

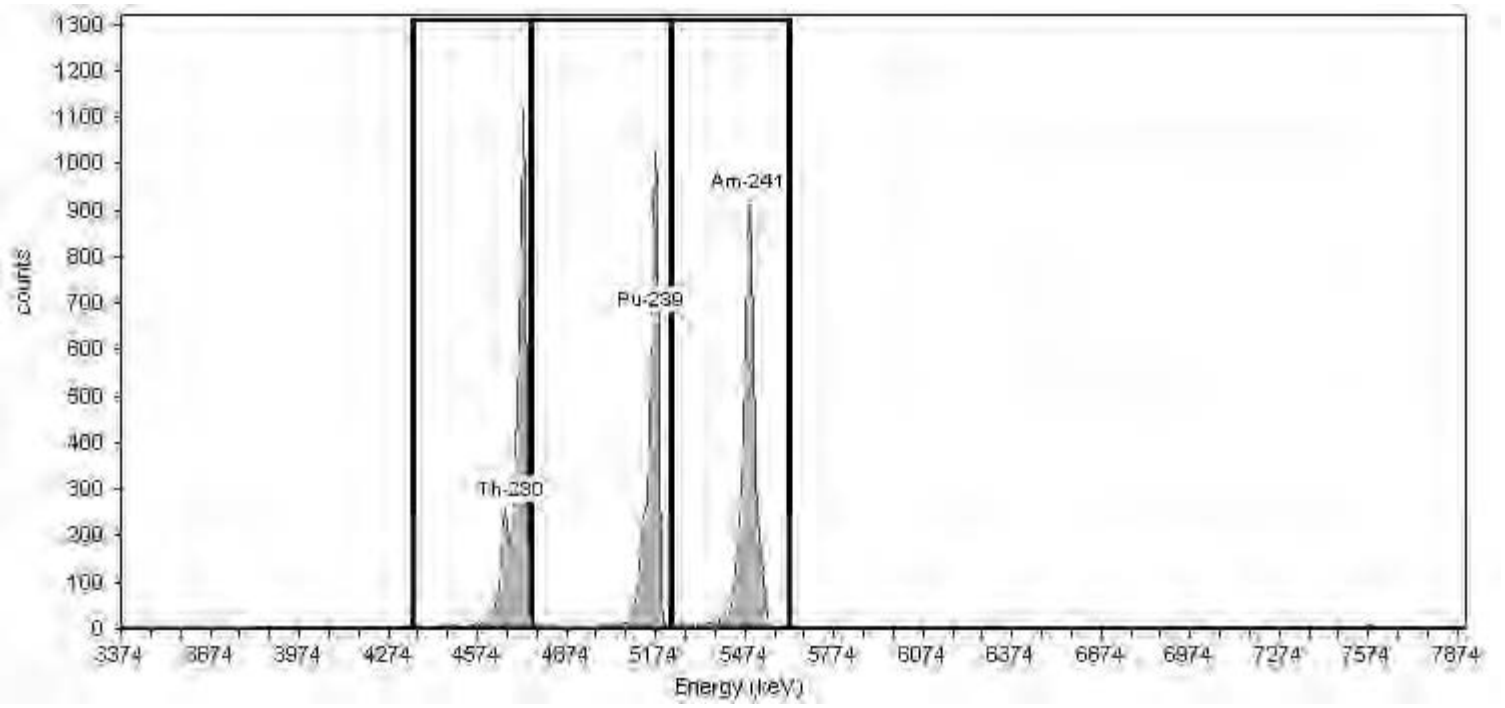
Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV57 , SN: 48-158EE3
Acquisition Start Date: 7/11/2018 12:39:03PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 22.56% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,941.00	99.02
Pu-239	240	5.16	186	249	0.00	5,425.00	90.42
Am-241	284	5.49	249	303	0.00	5,598.00	93.30

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:51:40PM 7/11/2018

Calibration

Sample Name: CCV-9885;AV58-07112018b
Description:
Detector: AV58

Calibration Date: 7/11/2018 1:51:36PM
Analyst: 60040

Source Info

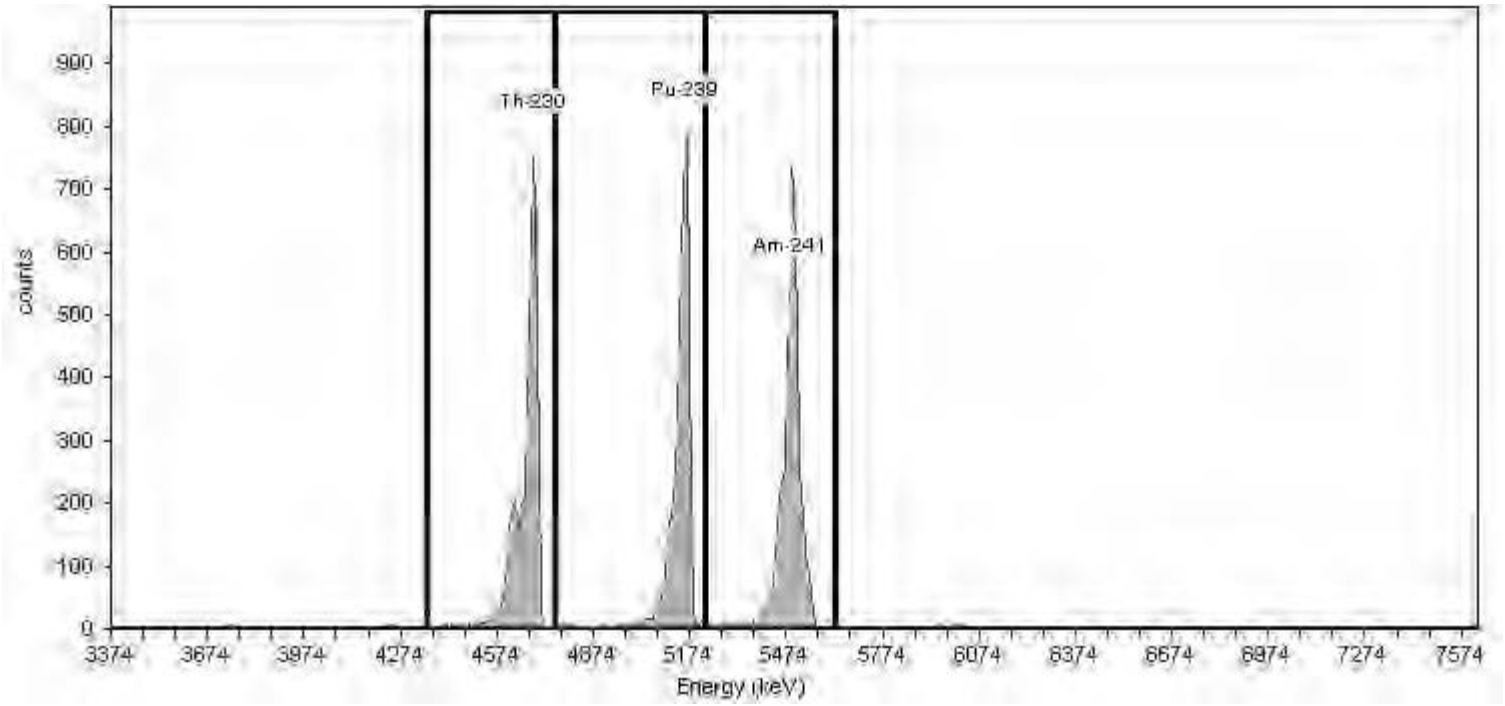
Certificate ID: 82246-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV58 , SN: 52-102 C5
Acquisition Start Date: 7/11/2018 12:42:31PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 24.06% +/- 0.47% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,796.00	79.93
Pu-239	240	5.16	186	249	0.00	4,746.00	79.10
Am-241	284	5.49	249	303	0.00	5,061.00	84.35

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:49:29PM 7/11/2018

Calibration

Sample Name: CCV-1368446;AV60-07112018
Description:
Detector: AV60

Calibration Date: 7/11/2018 1:49:24PM
Analyst: 60040

Source Info

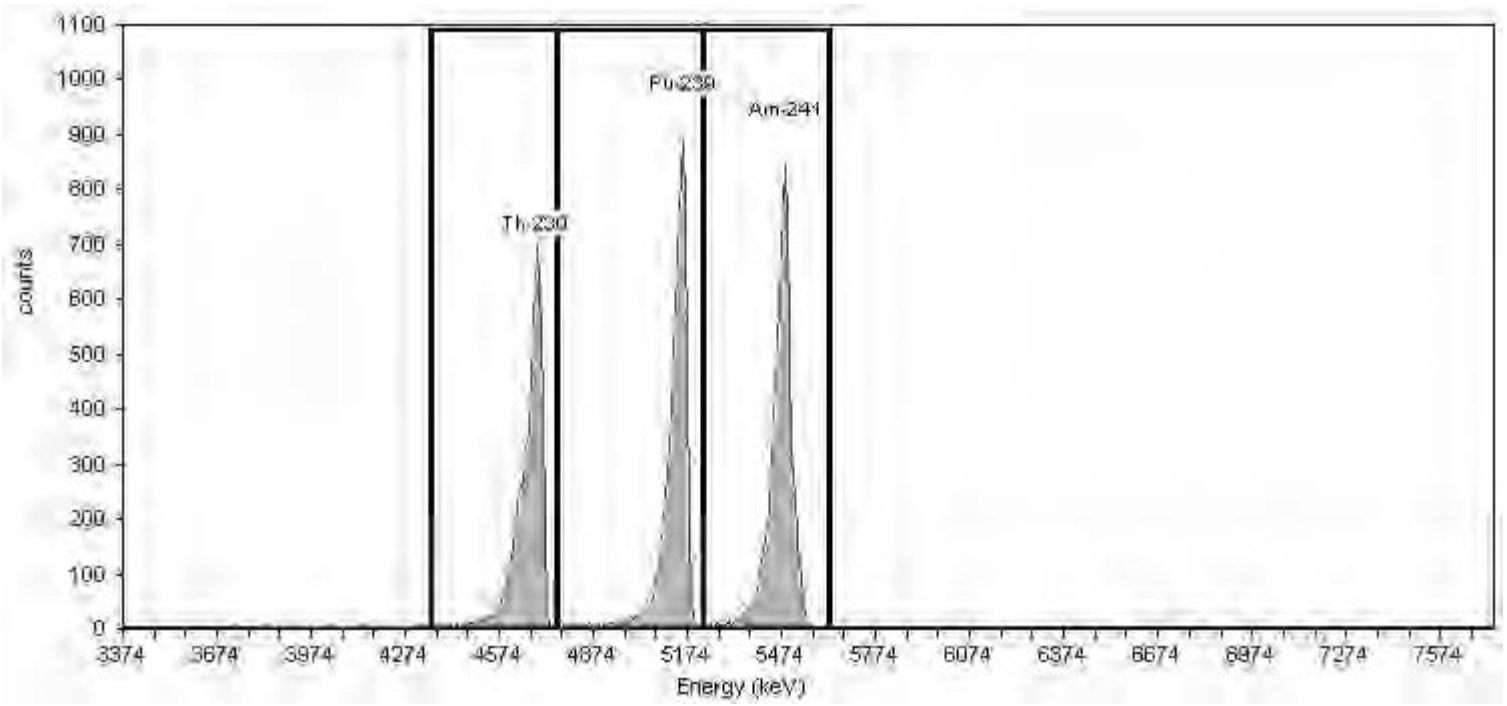
Certificate ID: 108001_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/6/2017 11:00:00AM
Description:

Acquisition

Detector: AV60 , SN: 49-027117
Acquisition Start Date: 7/11/2018 12:39:38PM
Live Time: 60.00 min.
Real Time: 60.03 min.
Efficiency: 28.27% +/- 0.40% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,202.00	103.37
Pu-239	240	5.16	186	249	0.00	6,823.00	113.72
Am-241	284	5.49	249	303	0.00	7,277.00	121.28

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:50:58PM 7/11/2018

Calibration

Sample Name: CCV-1368447;AV62-07112018
Description:
Detector: AV62

Calibration Date: 7/11/2018 1:50:53PM
Analyst: 60040

Source Info

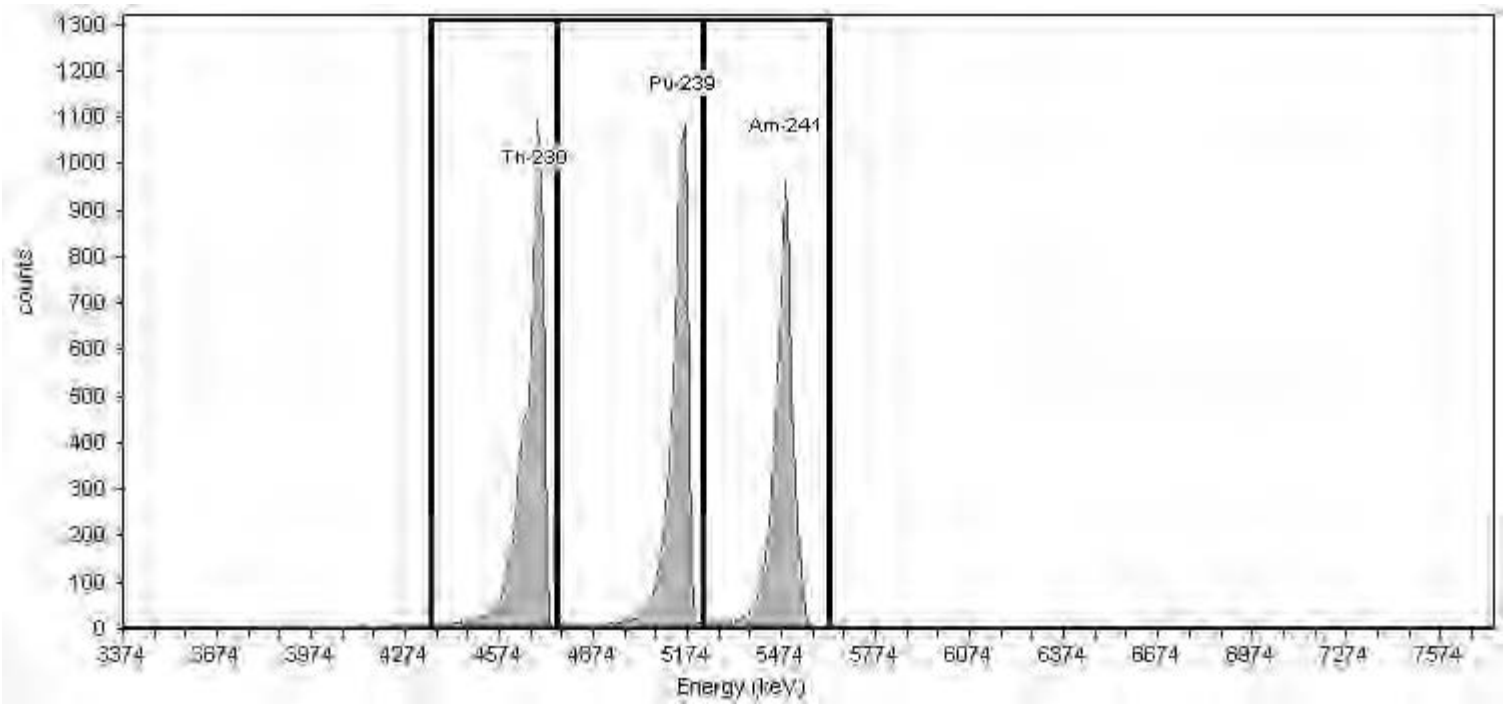
Certificate ID: 108002_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/1/2017 11:00:00AM
Description:

Acquisition

Detector: AV62 , SN: 52-060FF2
Acquisition Start Date: 7/11/2018 12:41:10PM
Live Time: 60.00 min.
Real Time: 60.03 min.
Efficiency: 28.59% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	9,586.00	159.77
Pu-239	240	5.16	186	249	0.00	8,827.00	147.12
Am-241	284	5.49	249	303	0.00	8,304.00	138.40

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:26:03PM 7/11/2018

Calibration

Sample Name: CCV-8874;AV69-07112018
Description:
Detector: AV69

Calibration Date: 7/11/2018 3:25:59PM
Analyst: 60040

Source Info

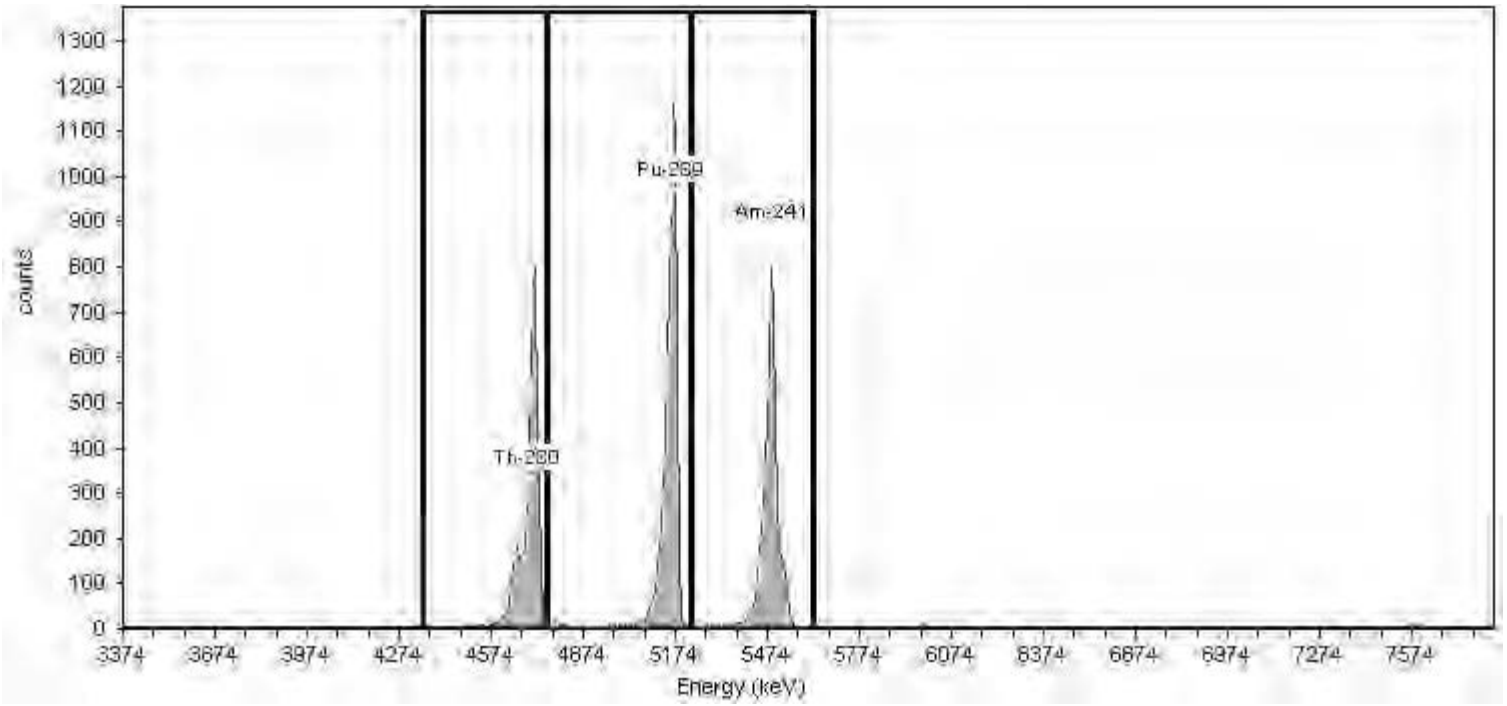
Certificate ID: 82233-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV69 , SN: 49-155DD5
Acquisition Start Date: 7/11/2018 2:03:52PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 26.51% +/- 0.50% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,558.00	75.97
Pu-239	240	5.16	186	249	0.00	6,051.00	100.85
Am-241	284	5.49	249	303	0.00	4,731.00	78.85

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:26:17PM 7/11/2018

Calibration

Sample Name: CCV-8877;AV70-07112018
Description:
Detector: AV70

Calibration Date: 7/11/2018 3:26:13PM
Analyst: 60040

Source Info

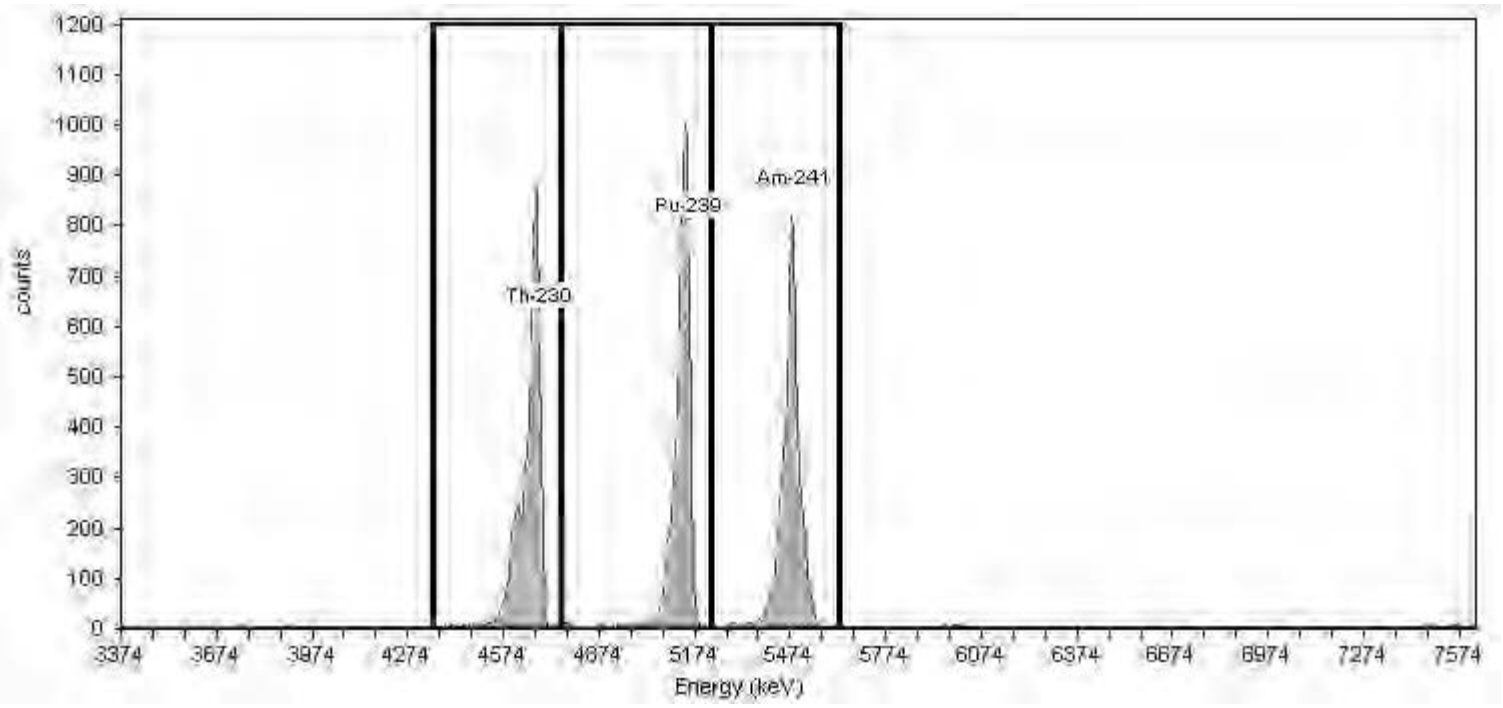
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV70 , SN: 48-158FF1
Acquisition Start Date: 7/11/2018 2:04:18PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 25.01% +/- 0.41% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	6,243.00	104.05
Pu-239	240	5.16	186	249	0.00	6,324.00	105.40
Am-241	284	5.49	249	303	0.00	5,997.00	99.95

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:26:35PM 7/11/2018

Calibration

Sample Name: CCV-9520;AV71-07112018
Description:
Detector: AV71

Calibration Date: 7/11/2018 3:26:31PM
Analyst: 60040

Source Info

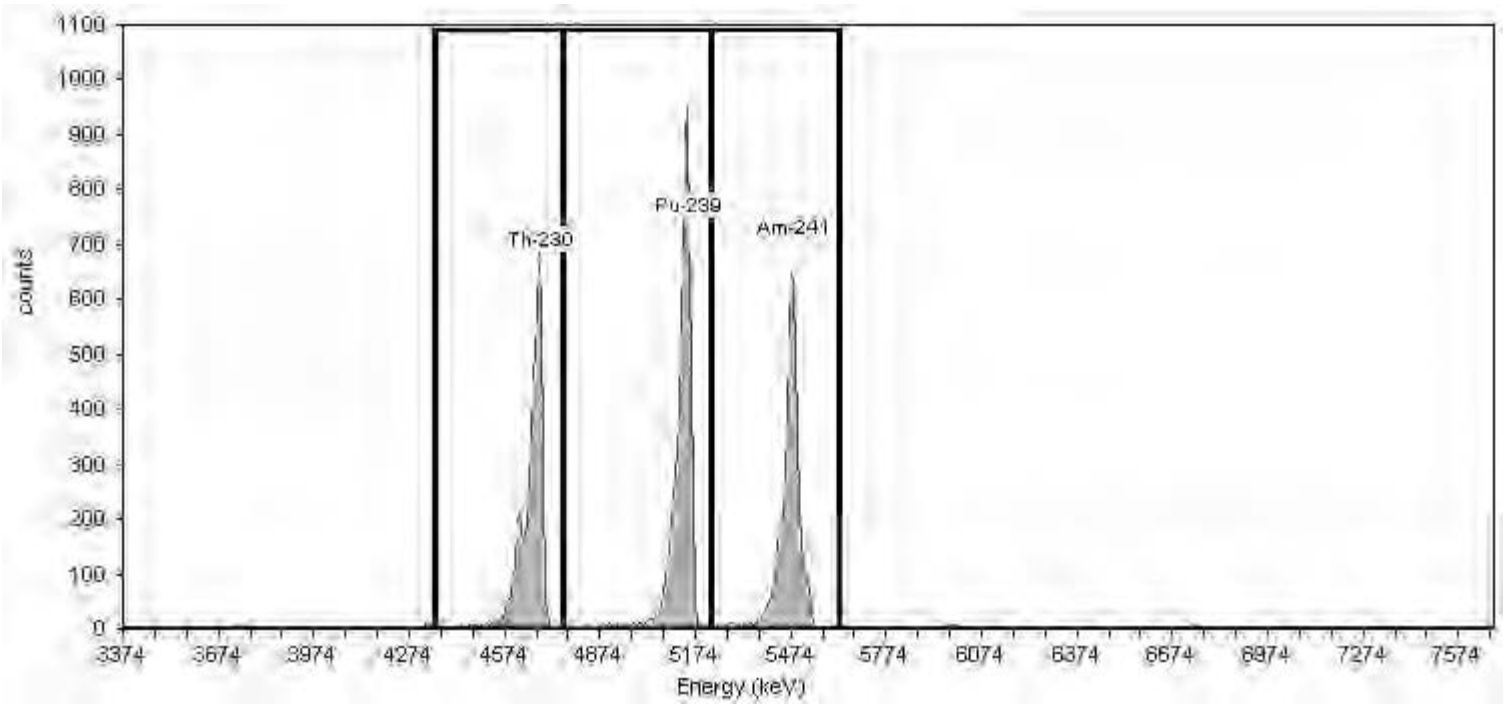
Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Acquisition

Detector: AV71 , SN: 48-158EE6
Acquisition Start Date: 7/11/2018 2:04:28PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 22.91% +/- 0.44% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	4,598.00	76.63
Pu-239	240	5.16	186	249	0.00	5,643.00	94.05
Am-241	284	5.49	249	303	0.00	4,478.00	74.63

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:26:48PM 7/11/2018

Calibration

Sample Name: CCV-9792;AV72-07112018
Description:
Detector: AV72

Calibration Date: 7/11/2018 3:26:45PM
Analyst: 60040

Source Info

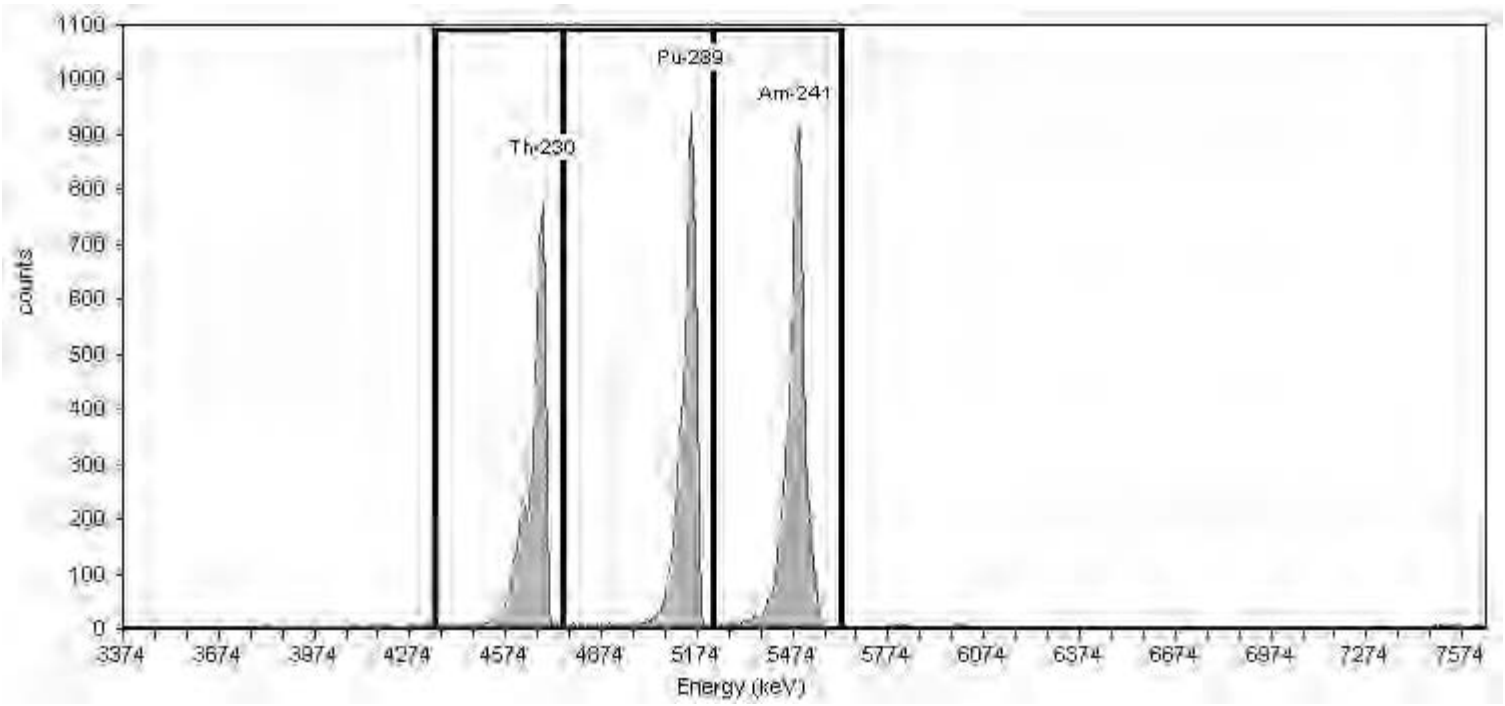
Certificate ID: 82240-334
Prepared by: Analytics

Certification Date: 6/8/2010 12:00:00PM
Description:

Acquisition

Detector: AV72 , SN: 48-05a21
Acquisition Start Date: 7/11/2018 2:04:51PM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 24.53% +/- 0.40% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



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	5,534.00	92.23
Pu-239	240	5.16	186	249	0.00	6,333.00	105.55
Am-241	284	5.49	249	303	0.00	7,259.00	120.98

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:49:29AM 7/27/2018

Calibration

Sample Name: CCV-8876;AV165-20180727
Description:
Detector: AV165

Analyst: 60040
Analysis Date: 7/27/2018 11:49:26AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82235-334
Prepared by: Analytics
Description:

Certification Date: 6/4/2010 12:00:00PM

Acquisition

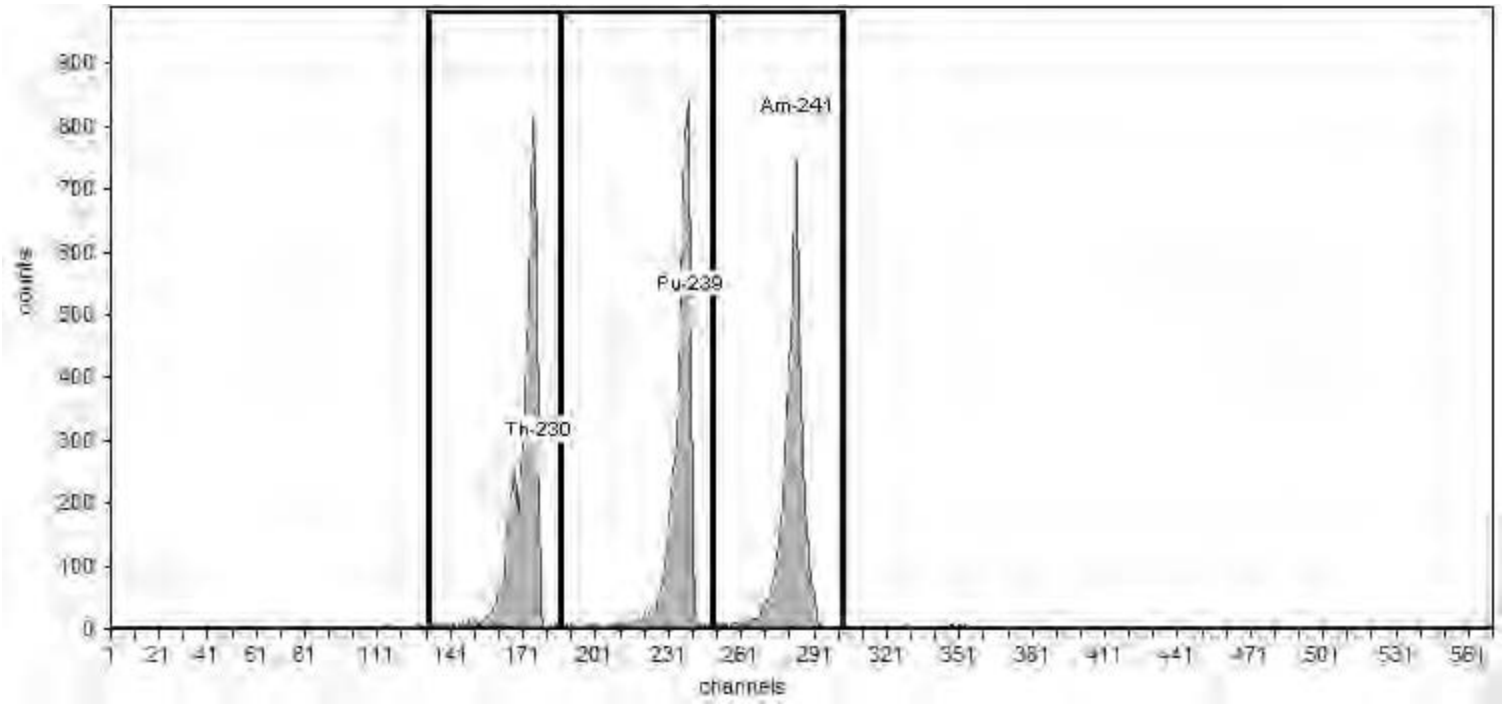
Detector: AV165 , SN: 50-112F7
Acquisition Start Date: 7/27/2018 10:46:49AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8876;AV165-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 20.85% +/- 0.36% 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	35.54	5,487.00	91.45
Pu-239	240	5,155.40	186	249	35.62	5,311.00	88.52
Am-241	284	5,485.70	249	303	37.29	5,312.00	88.53

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:02:44PM 7/24/2018

Calibration

Sample Name: CCV-8877;AV166-20180724
Description:
Detector: AV166

Analyst: 60040
Analysis Date: 7/24/2018 1:02:43PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82236-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

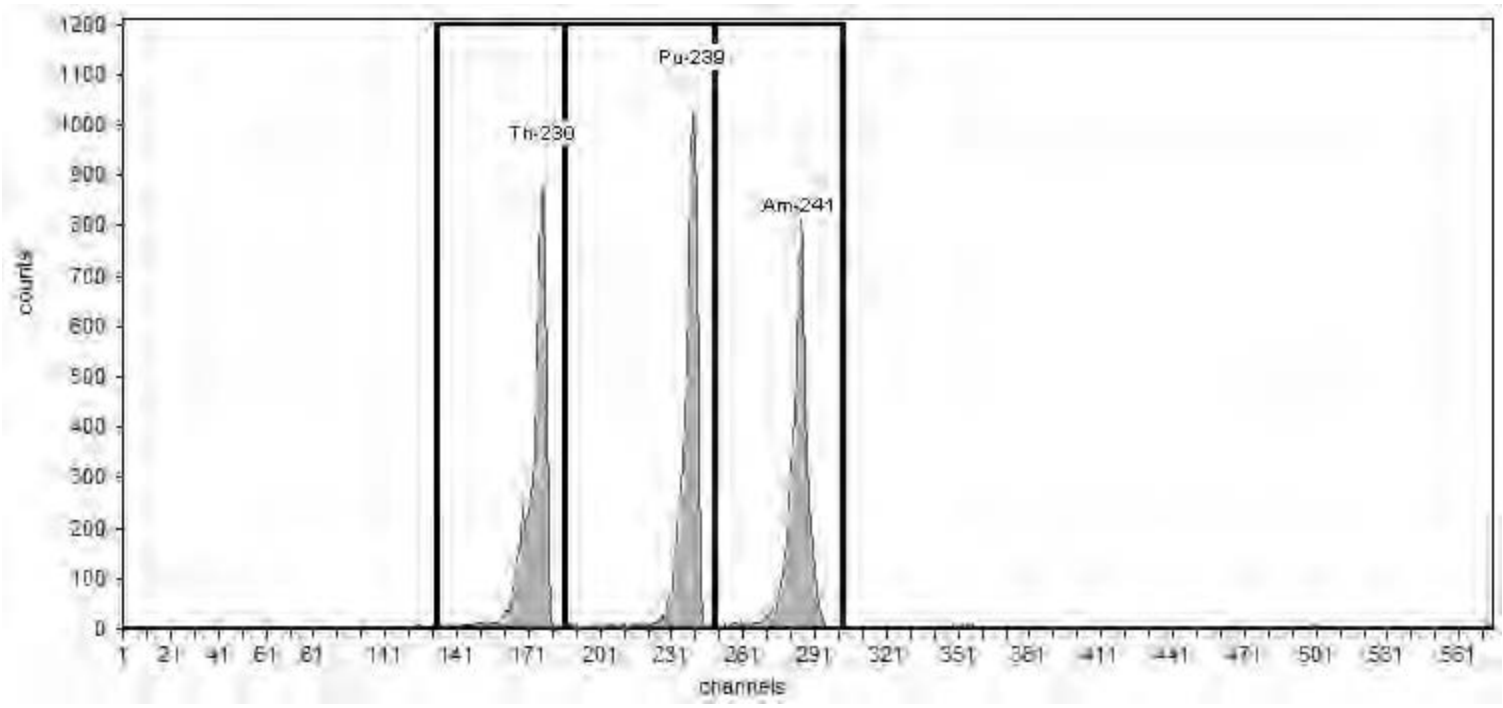
Detector: AV166 , SN: 50-112 G1
Acquisition Start Date: 7/24/2018 11:58:08AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8877;AV166-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.72% +/- 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	34.44	5,808.00	96.80
Pu-239	240	5,155.40	186	249	35.09	6,103.00	101.72
Am-241	284	5,485.70	249	303	33.69	5,721.00	95.35

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:02:48PM 7/24/2018

Calibration

Sample Name: CCV-9520;AV167-20180724
Description:
Detector: AV167

Analyst: 60040
Analysis Date: 7/24/2018 1:02:47PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82237-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

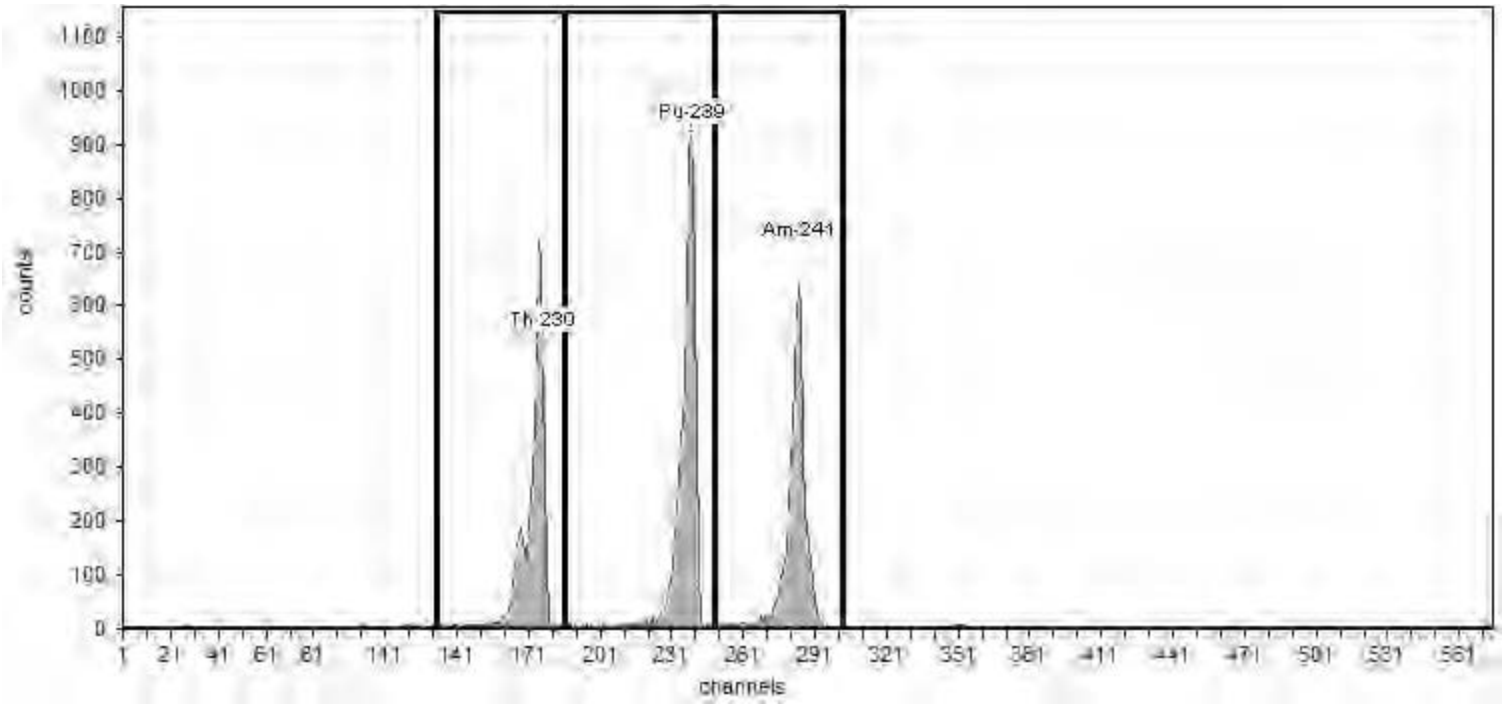
Detector: AV167 , SN: 50-112 G3
Acquisition Start Date: 7/24/2018 11:58:47AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9520;AV167-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 22.44% +/- 0.43% 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	31.55	4,431.00	73.85
Pu-239	240	5,155.40	186	249	33.53	5,649.00	94.15
Am-241	284	5,485.70	249	303	36.35	4,367.00	72.78

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:48:48PM 7/27/2018

Calibration

Sample Name: CCV-9793;AV170-20180724
Description:
Detector: AV170

Analyst: 60040
Analysis Date: 7/24/2018 1:03:00PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82241-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

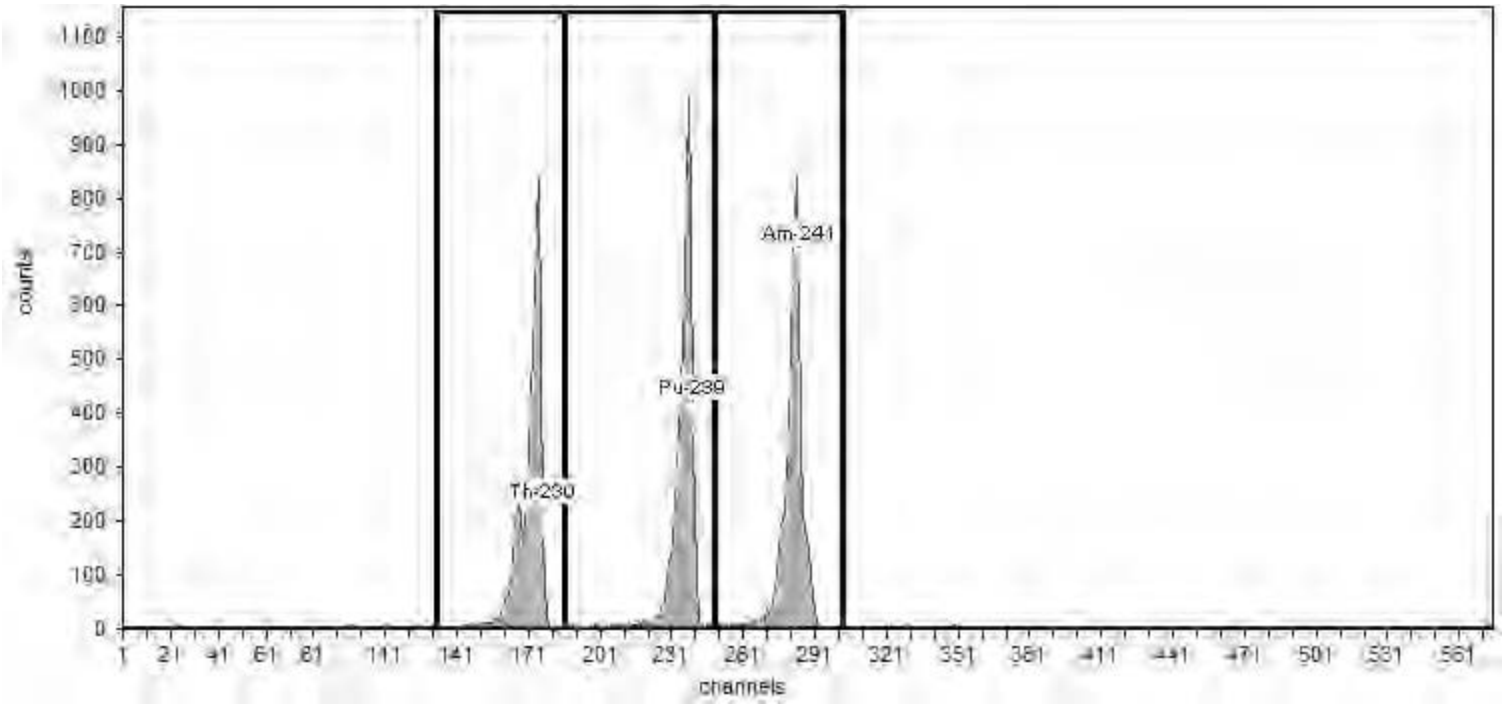
Detector: AV170 , SN: 50-112 G7
Acquisition Start Date: 7/24/2018 11:59:39AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9793;AV170-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 22.64% +/- 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	33.06	5,334.00	88.90
Pu-239	240	5,155.40	186	249	32.45	5,631.00	93.85
Am-241	284	5,485.70	249	303	32.40	5,328.00	88.80

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:11:02PM 7/24/2018

Calibration

Sample Name: CCV-9885;AV175-20180724a
Description:
Detector: AV175

Analyst: 60040
Analysis Date: 7/24/2018 6:11:01PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

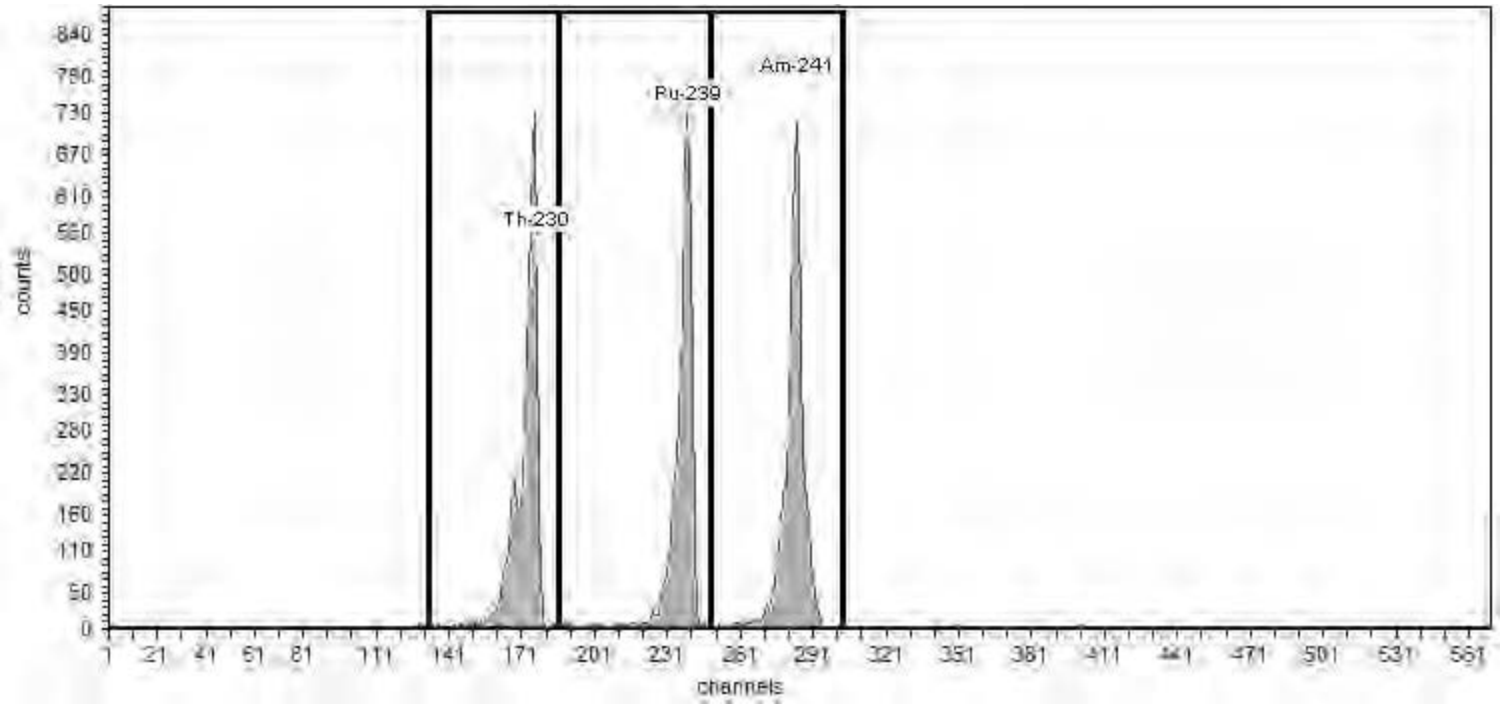
Detector: AV175 , SN: 50-117H1
Acquisition Start Date: 7/24/2018 5:04:14PM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: CCV-9885;AV175-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 23.63% +/- 0.46% 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	32.94	4,839.00	80.65
Pu-239	240	5,155.40	186	249	37.39	4,565.00	76.08
Am-241	284	5,485.70	249	303	35.61	4,938.00	82.30

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:58:48PM 7/24/2018

Calibration

Sample Name: CCV-8875;AV187-20180724a
Description:
Detector: AV187

Analyst: 60040
Analysis Date: 7/24/2018 2:58:47PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82234-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

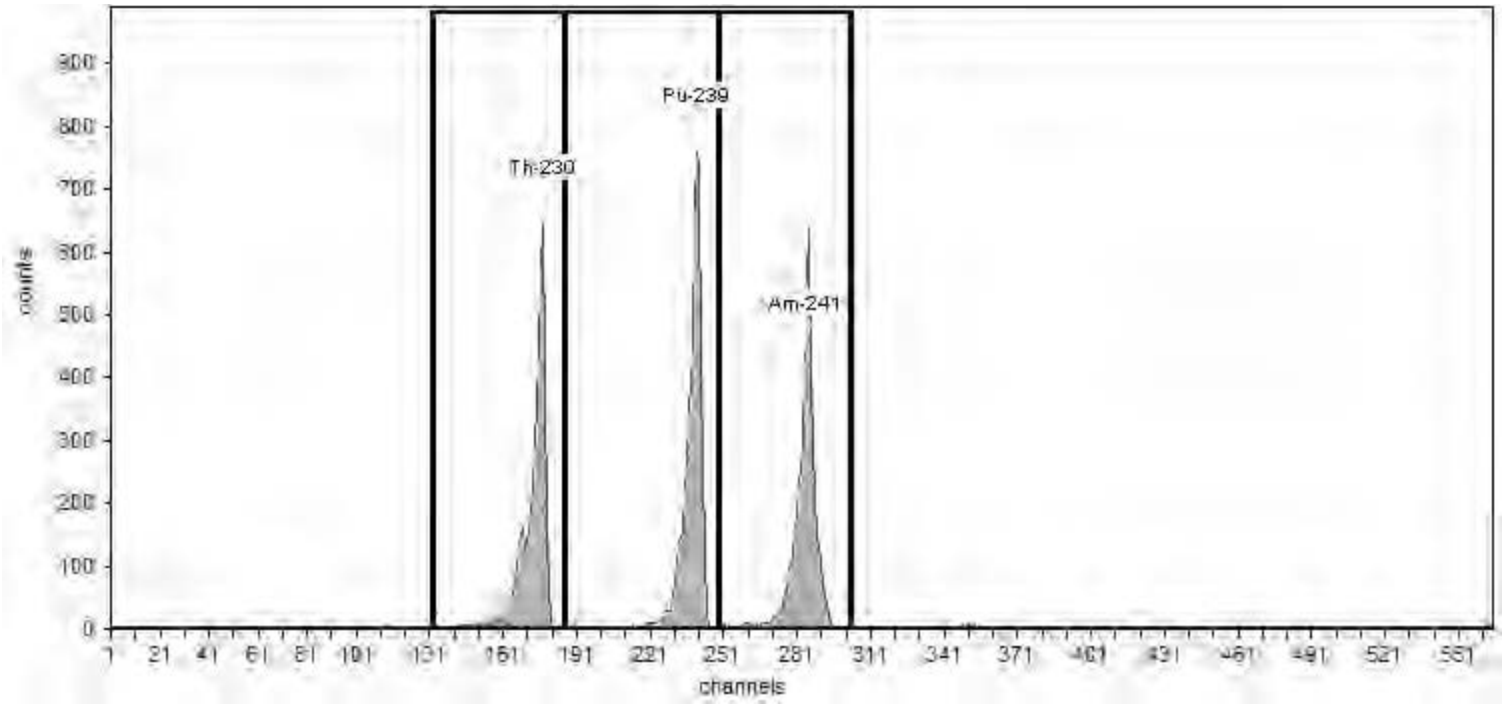
Detector: AV187 , SN: 50-119I2
Acquisition Start Date: 7/24/2018 1:51:08PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8875;AV187-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 20.43% +/- 0.41% 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	30.73	3,986.00	66.43
Pu-239	240	5,155.40	186	249	35.05	4,632.00	77.20
Am-241	284	5,485.70	249	303	30.68	4,065.00	67.75

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:38:54PM 7/24/2018

Calibration

Sample Name: CCV-8877;AV189-20180724
Description:
Detector: AV189

Analyst: 60040
Analysis Date: 7/24/2018 2:38:53PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82236-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

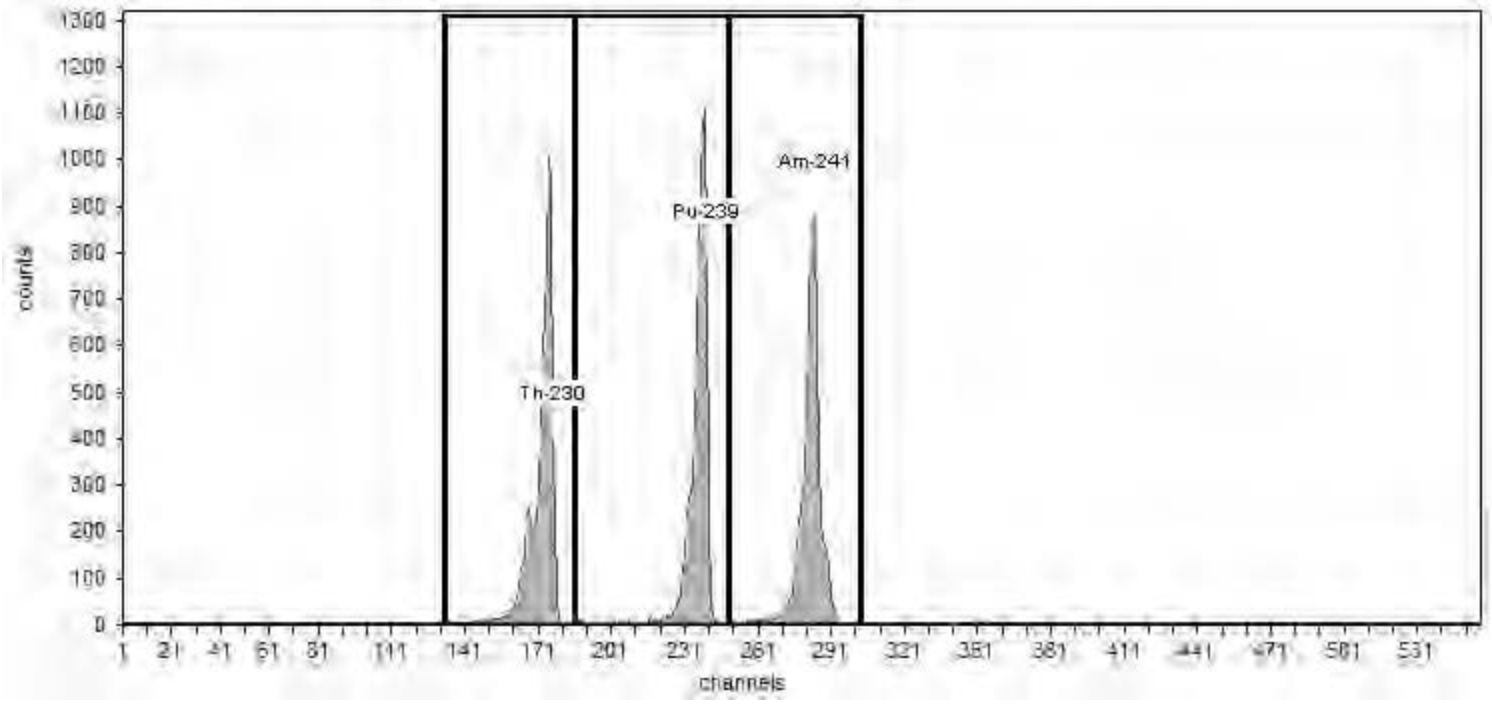
Detector: AV189 , SN: 50-112A3
Acquisition Start Date: 7/24/2018 1:19:51PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8877;AV189-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.92% +/- 0.41% 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	31.91	6,173.00	102.88
Pu-239	240	5,155.40	186	249	34.09	6,385.00	106.42
Am-241	284	5,485.70	249	303	35.37	5,961.00	99.35

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:39:01PM 7/24/2018

Calibration

Sample Name: CCV-9520;AV190
Description:
Detector: AV190

Analyst: 60040
Analysis Date: 7/24/2018 2:38:59PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82237-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

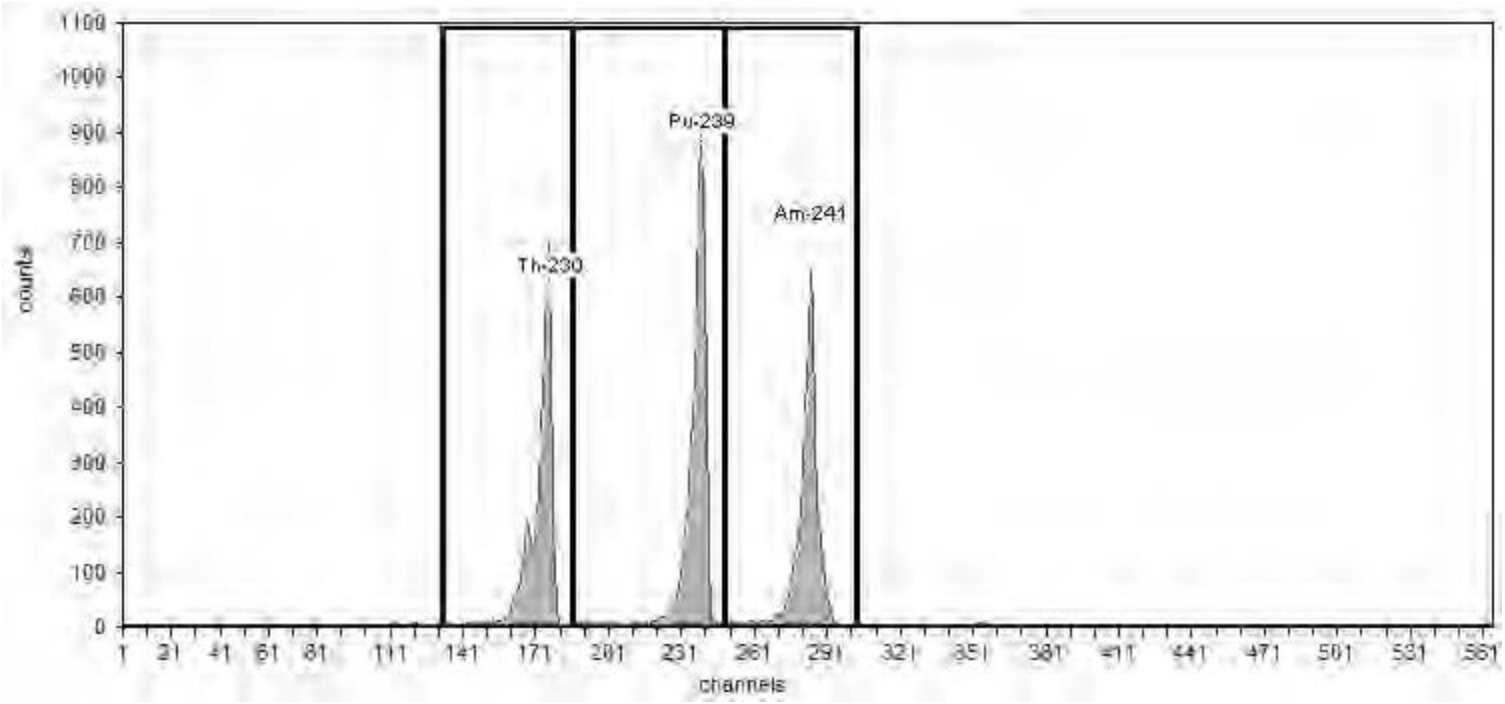
Detector: AV190 , SN: 50-119I7
Acquisition Start Date: 7/24/2018 1:20:13PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9520;AV190

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.69% +/- 0.43% 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	34.49	4,682.00	78.03
Pu-239	240	5,155.40	186	249	36.27	5,514.00	91.90
Am-241	284	5,485.70	249	303	35.52	4,373.00	72.88

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:48:55PM 7/27/2018

Calibration

Sample Name: CCV-8879;AV191-20180724
Description:
Detector: AV191

Analyst: 60040
Analysis Date: 7/24/2018 2:39:05PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82238-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

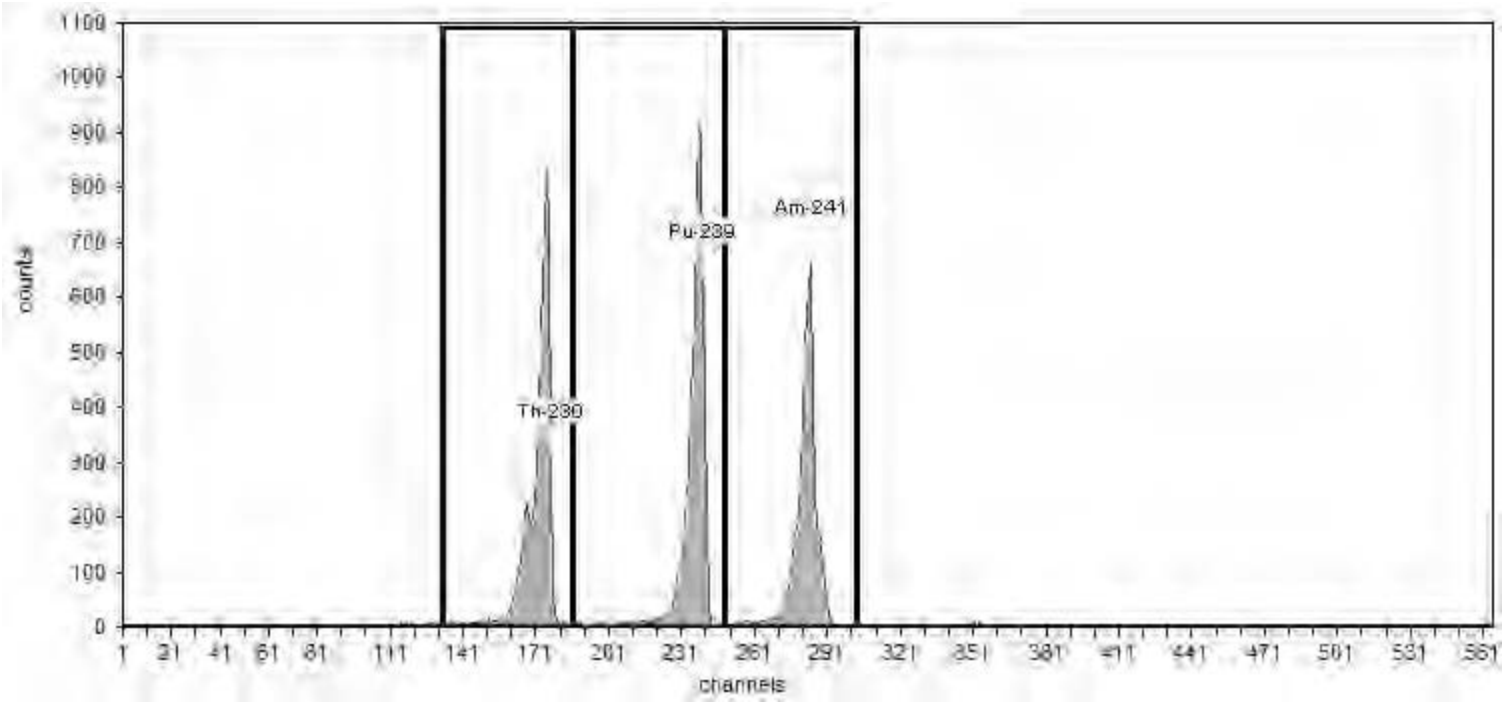
Detector: AV191 , SN: 50-112A2
Acquisition Start Date: 7/24/2018 1:20:35PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8879;AV191-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 22.03% +/- 0.40% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 0

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	33.01	5,425.00	90.42
Pu-239	240	5,155.40	186	249	37.75	5,692.00	94.87
Am-241	284	5,485.70	249	303	35.96	4,556.00	75.93

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:39:10PM 7/24/2018

Calibration

Sample Name: CCV-9792;AV192-20180724
Description:
Detector: AV192

Analyst: 60040
Analysis Date: 7/24/2018 2:39:09PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82240-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

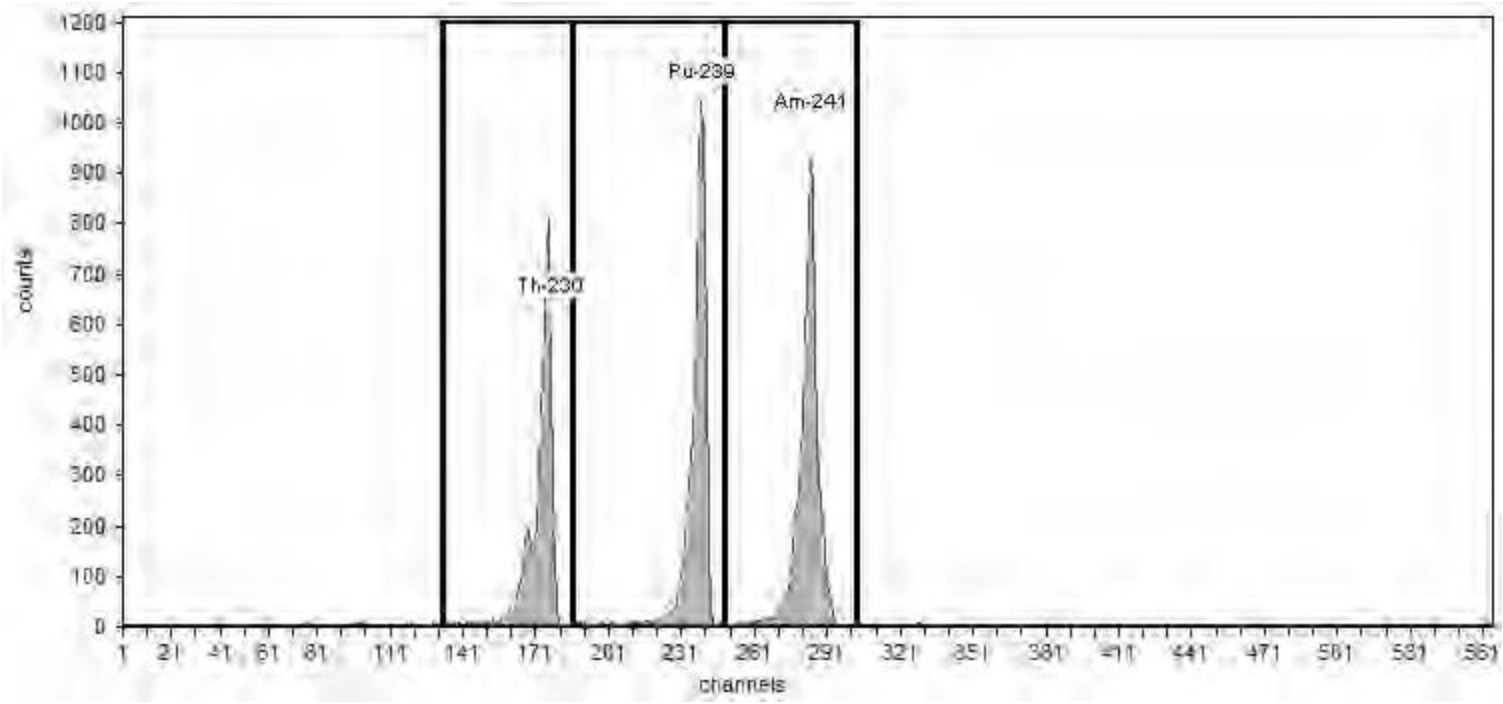
Detector: AV192 , SN: 50-119J7
Acquisition Start Date: 7/24/2018 1:21:02PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9792;AV192-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.12% +/- 0.38% 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	34.41	5,159.00	85.98
Pu-239	240	5,155.40	186	249	34.82	6,207.00	103.45
Am-241	284	5,485.70	249	303	37.65	6,680.00	111.33

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:48:58PM 7/27/2018

Calibration

Sample Name: CCV-9794;AV194-20180724a
Description:
Detector: AV194

Analyst: 60040
Analysis Date: 7/24/2018 2:58:51PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82242-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

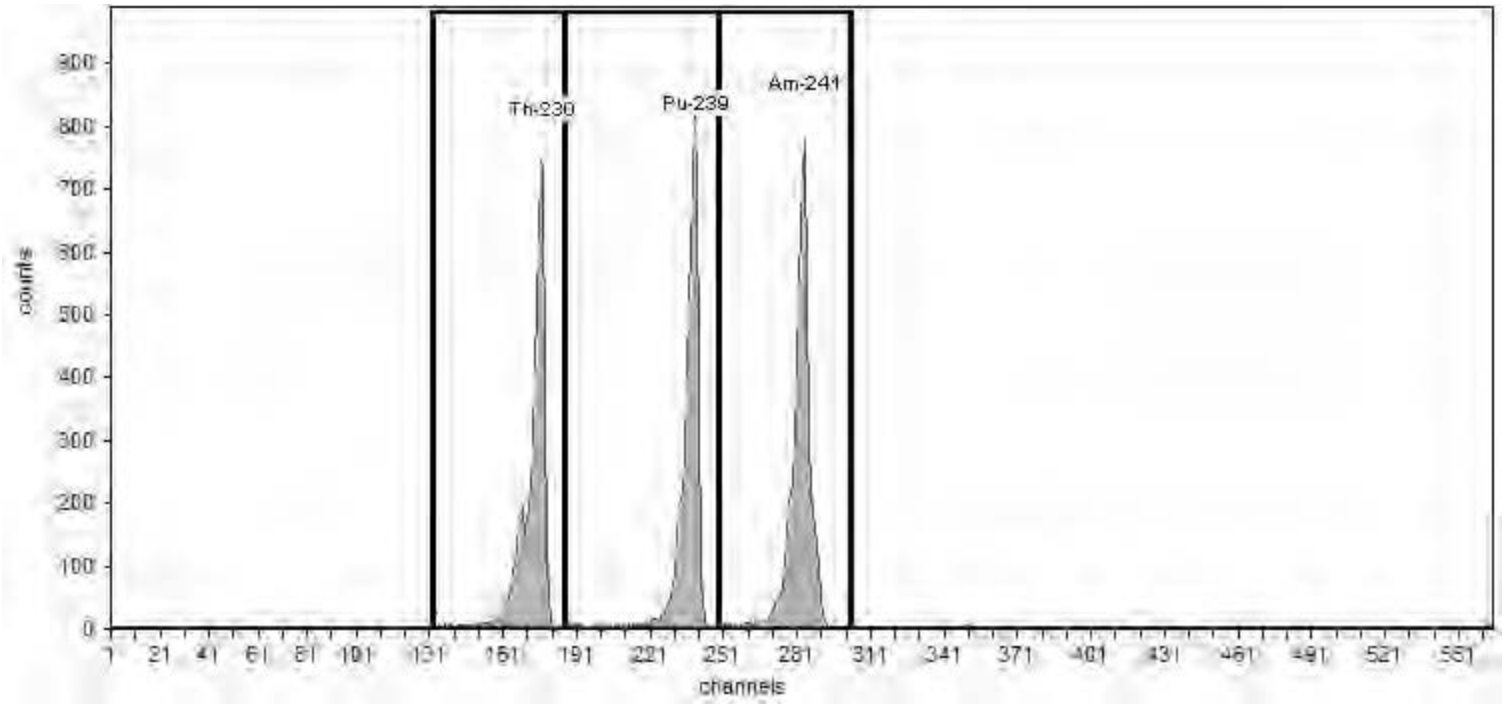
Detector: AV194 , SN: 50-119J2
Acquisition Start Date: 7/24/2018 1:51:43PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9794;AV194-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 20.84% +/- 0.38% 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	32.44	4,903.00	81.72
Pu-239	240	5,155.40	186	249	35.15	4,872.00	81.20
Am-241	284	5,485.70	249	303	35.48	5,270.00	87.83

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:39:14PM 7/24/2018

Calibration

Sample Name: CCV-9885;AV198-20180724
Description:
Detector: AV198

Analyst: 60040
Analysis Date: 7/24/2018 2:39:13PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

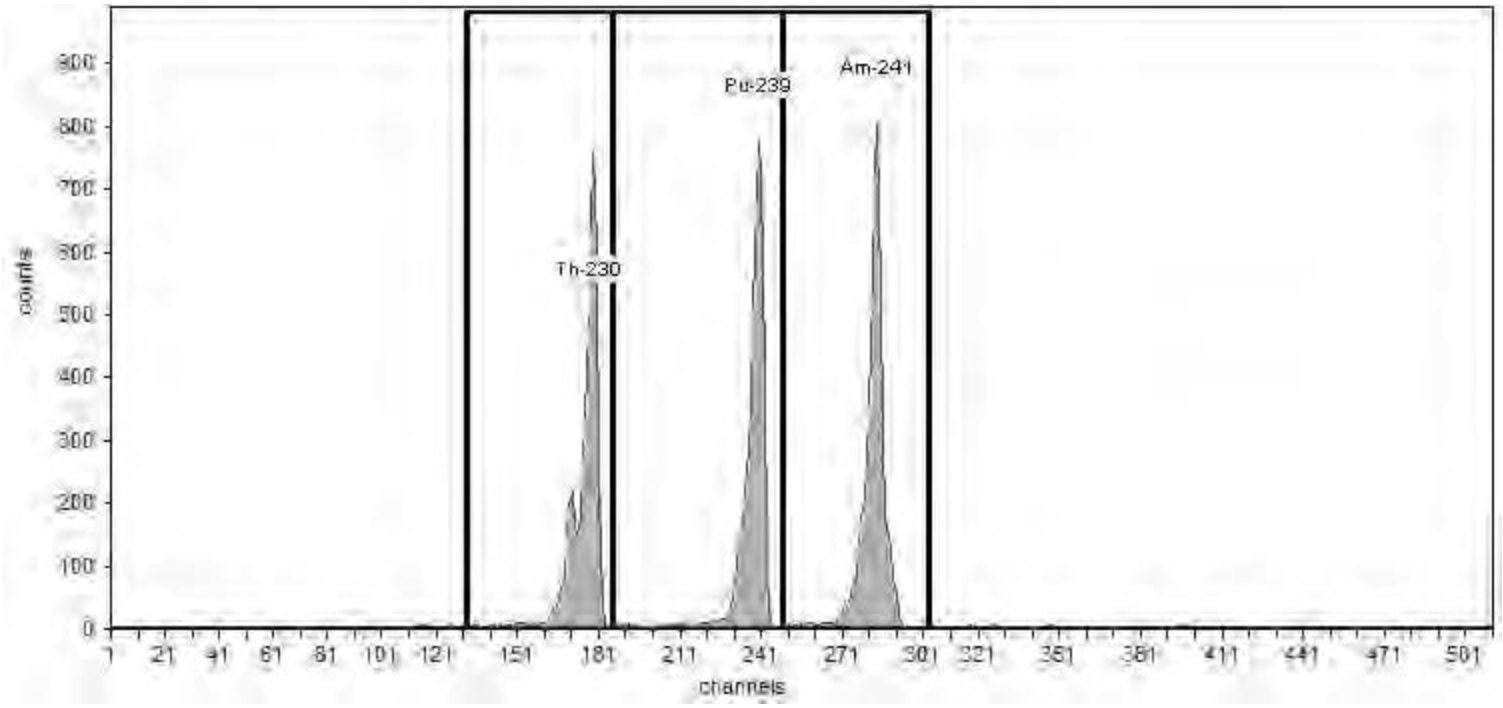
Detector: AV198 , SN: 50-117AA7
Acquisition Start Date: 7/24/2018 1:22:26PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9885;AV198-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.82% +/- 0.47% 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	31.88	4,756.00	79.27
Pu-239	240	5,155.40	186	249	35.54	4,673.00	77.88
Am-241	284	5,485.70	249	303	32.21	5,028.00	83.80

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:57:58PM 7/24/2018

Calibration

Sample Name: CCV-8876;AV203-20180724
Description:
Detector: AV203

Analyst: 60040
Analysis Date: 7/24/2018 4:57:57PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82235-334
Prepared by: Analytics
Description:

Certification Date: 6/4/2010 12:00:00PM

Acquisition

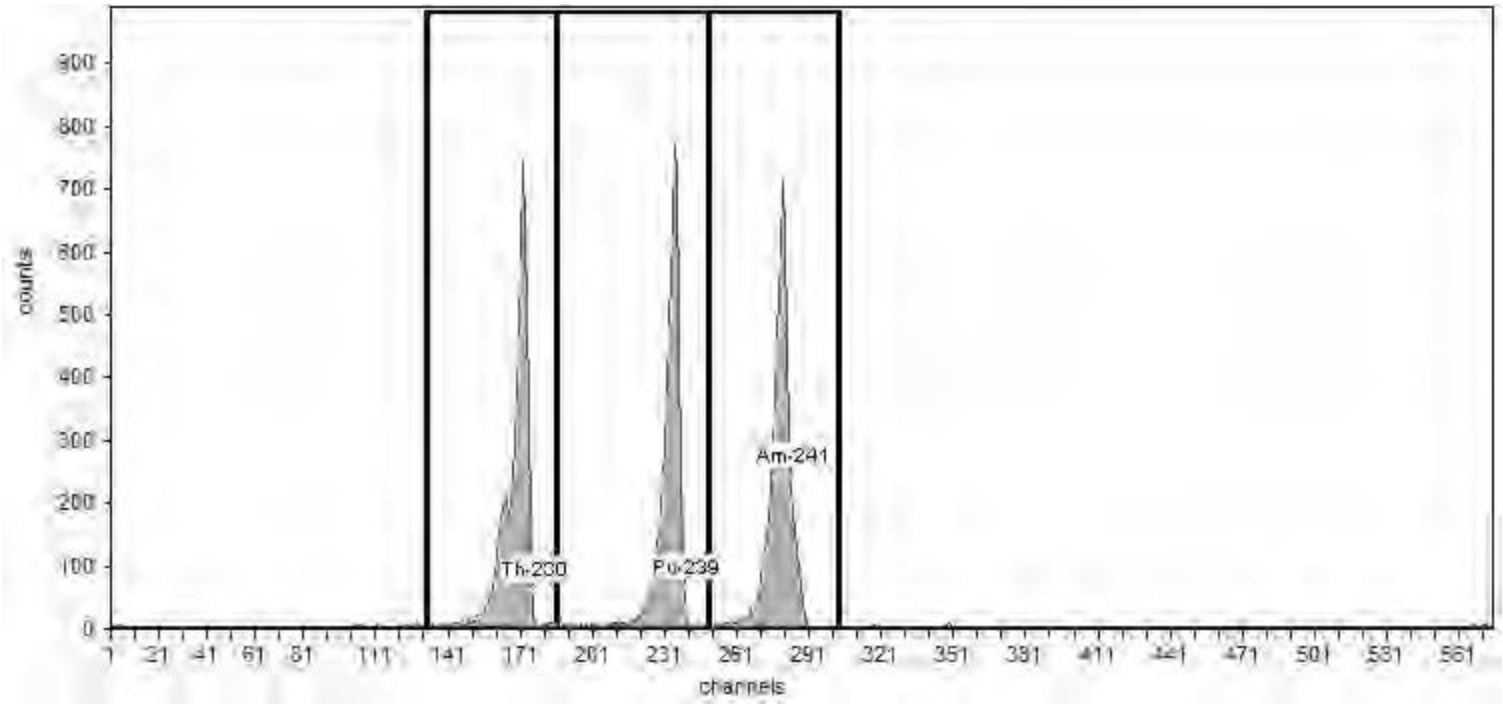
Detector: AV203 , SN: 50-117J4
Acquisition Start Date: 7/24/2018 3:13:46PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8876;AV203-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 20.25% +/- 0.36% 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	36.27	5,204.00	86.73
Pu-239	240	5,155.40	186	249	39.34	5,081.00	84.68
Am-241	284	5,485.70	249	303	41.13	5,345.00	89.08

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:49:05PM 7/27/2018

Calibration

Sample Name: CCV-8879;AV206-20180724
Description:
Detector: AV206

Analyst: 60040
Analysis Date: 7/24/2018 4:58:02PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82238-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

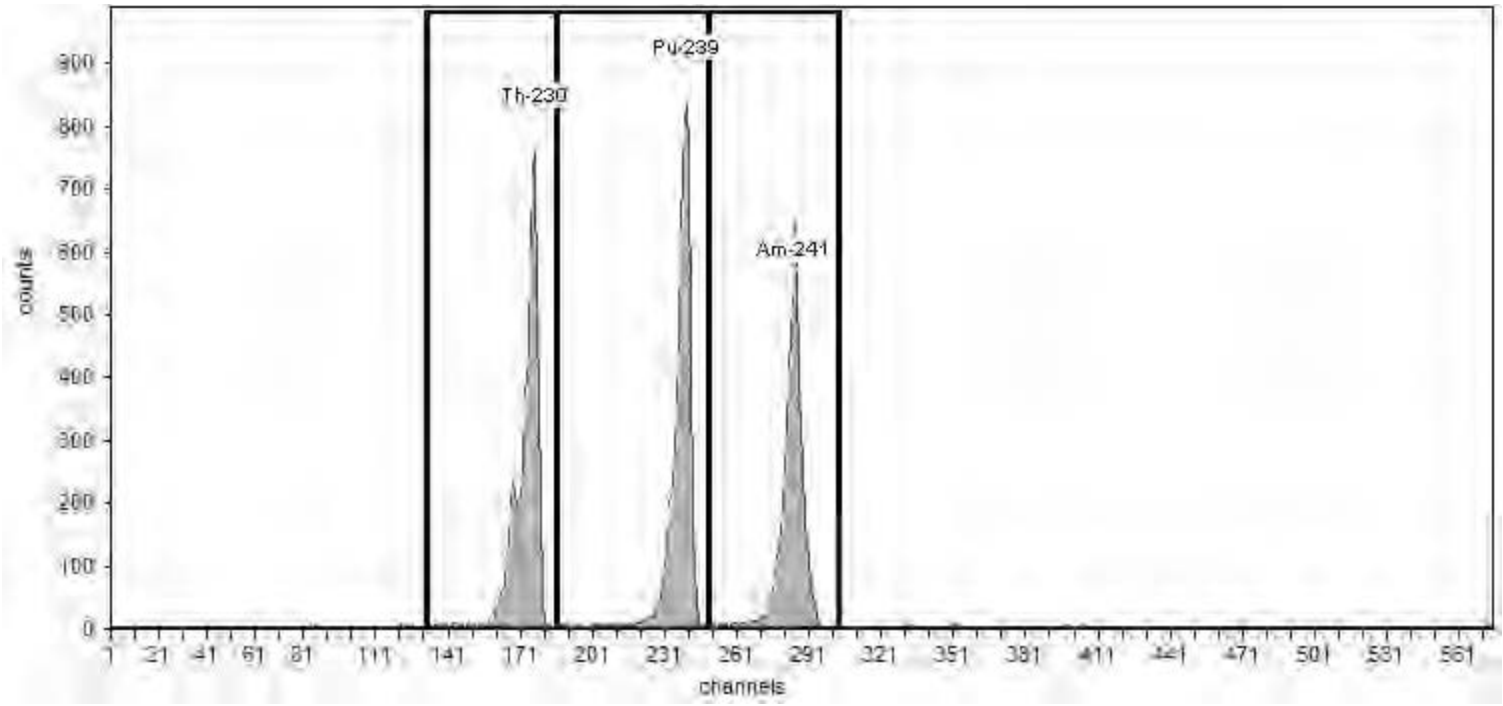
Detector: AV206 , SN: 5604420
Acquisition Start Date: 7/24/2018 3:14:05PM

Live Time: 60.00 min.
Real Time: 60.08 min.

Efficiency Calibration Name: CCV-8879;AV206-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 22.46% +/- 0.41% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 0

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	38.75	5,509.00	91.82
Pu-239	240	5,155.40	186	249	40.21	5,762.00	96.03
Am-241	284	5,485.70	249	303	39.44	4,708.00	78.47

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:58:21PM 7/24/2018

Calibration

Sample Name: CCV-9793;AV208-20180724
Description:
Detector: AV208

Analyst: 60040
Analysis Date: 7/24/2018 4:58:20PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82241-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

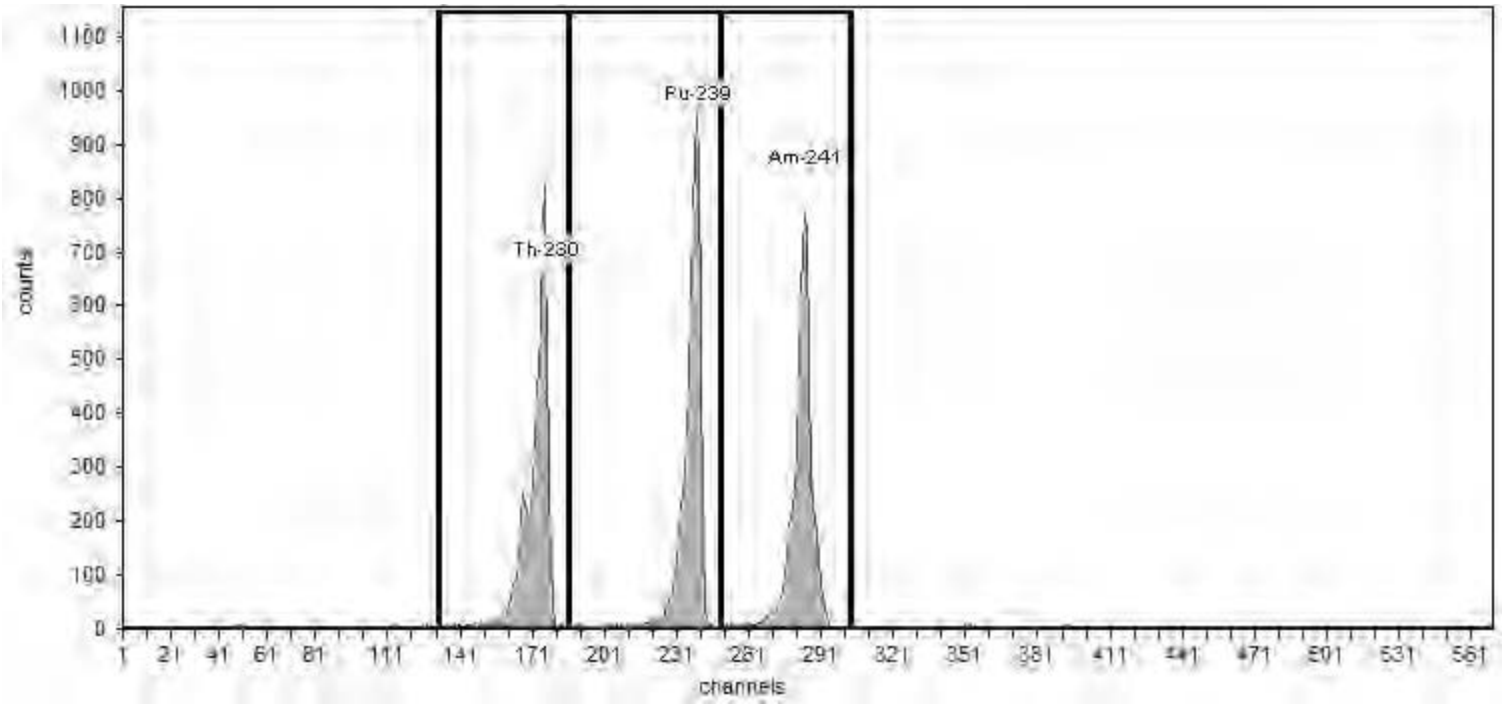
Detector: AV208 , SN: 50-112Z6
Acquisition Start Date: 7/24/2018 3:14:24PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9793;AV208-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.89% +/- 0.41% 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	34.99	5,649.00	94.15
Pu-239	240	5,155.40	186	249	37.11	5,989.00	99.82
Am-241	284	5,485.70	249	303	37.48	5,558.00	92.63

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:58:42PM 7/24/2018

Calibration

Sample Name: CCV-9884;AV212-20180724a
Description:
Detector: AV212

Analyst: 60040
Analysis Date: 7/24/2018 4:58:41PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82245-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

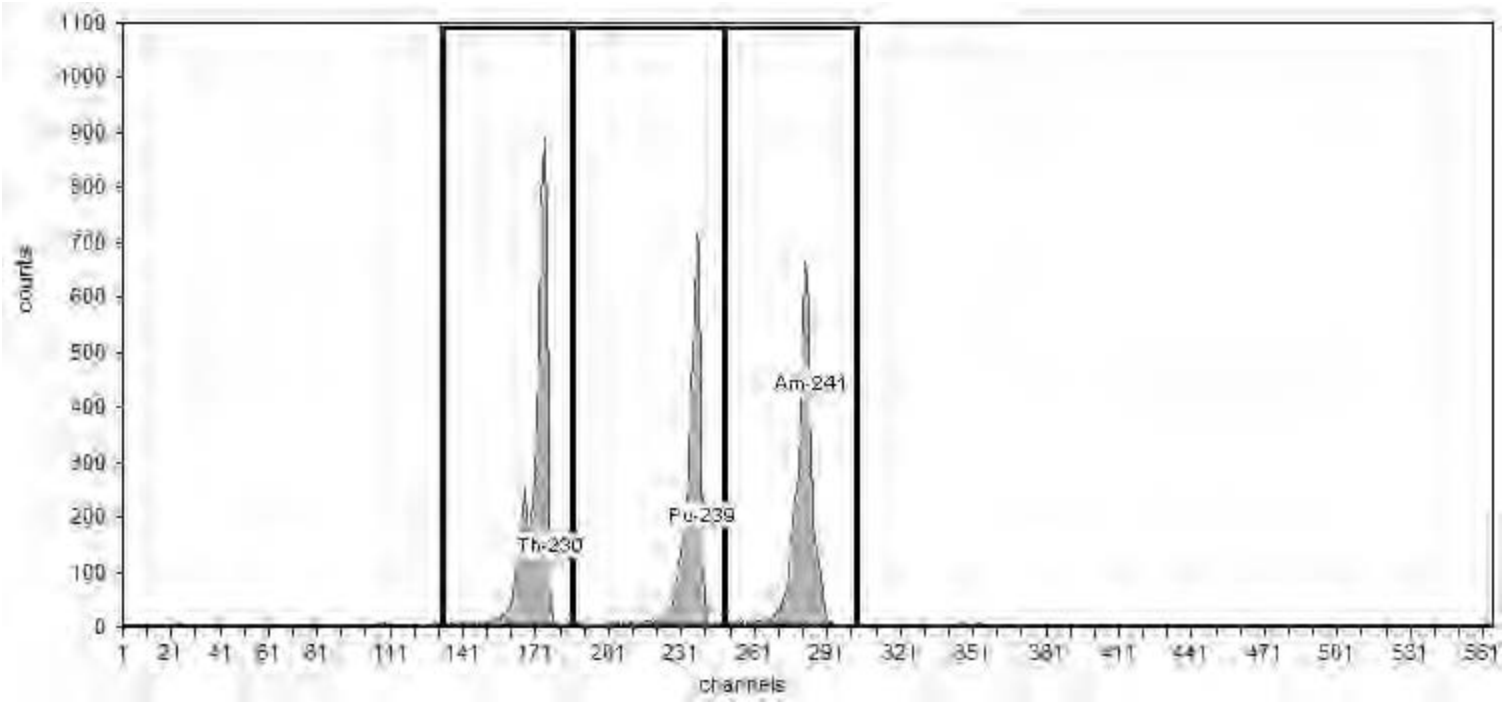
Detector: AV212 , SN: 49-155m5
Acquisition Start Date: 7/24/2018 3:23:54PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9884;AV212-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 22.00% +/- 0.43% 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	29.21	5,392.00	89.87
Pu-239	240	5,155.40	186	249	33.49	4,164.00	69.40
Am-241	284	5,485.70	249	303	33.20	4,407.00	73.45

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:49:11PM 7/27/2018

Calibration

Sample Name: CCV-9885;AV213-20180724
Description:
Detector: AV213

Analyst: 60040
Analysis Date: 7/24/2018 4:58:37PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

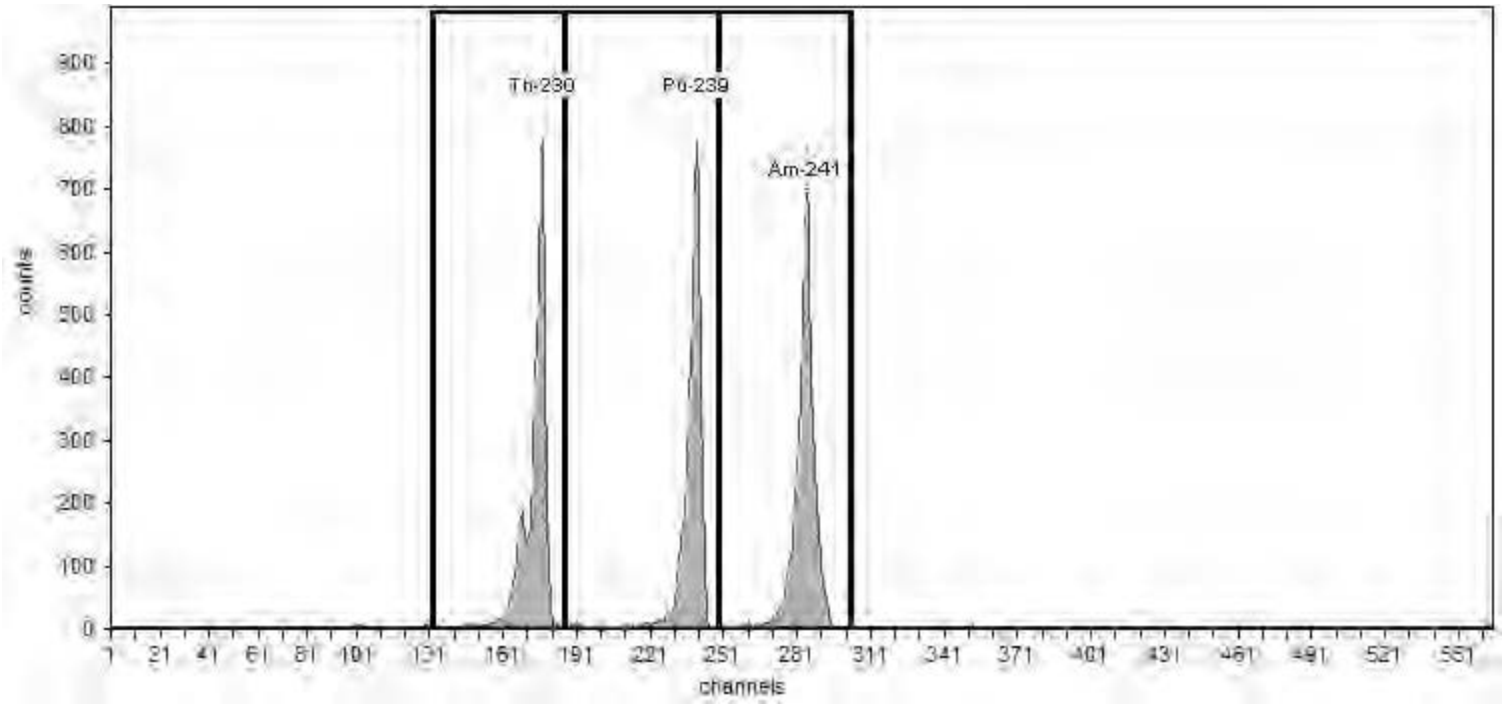
Detector: AV213 , SN: 54-011 Y1
Acquisition Start Date: 7/24/2018 3:15:19PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9885;AV213-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 23.40% +/- 0.46% 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	32.65	4,738.00	78.97
Pu-239	240	5,155.40	186	249	35.37	4,480.00	74.67
Am-241	284	5,485.70	249	303	33.61	4,976.00	82.93

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:31:41PM 7/25/2018

Calibration

Sample Name: CCV-7107;AV215-20180725a
Description:
Detector: AV215

Analyst: 60040
Analysis Date: 7/25/2018 12:31:39PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82232-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

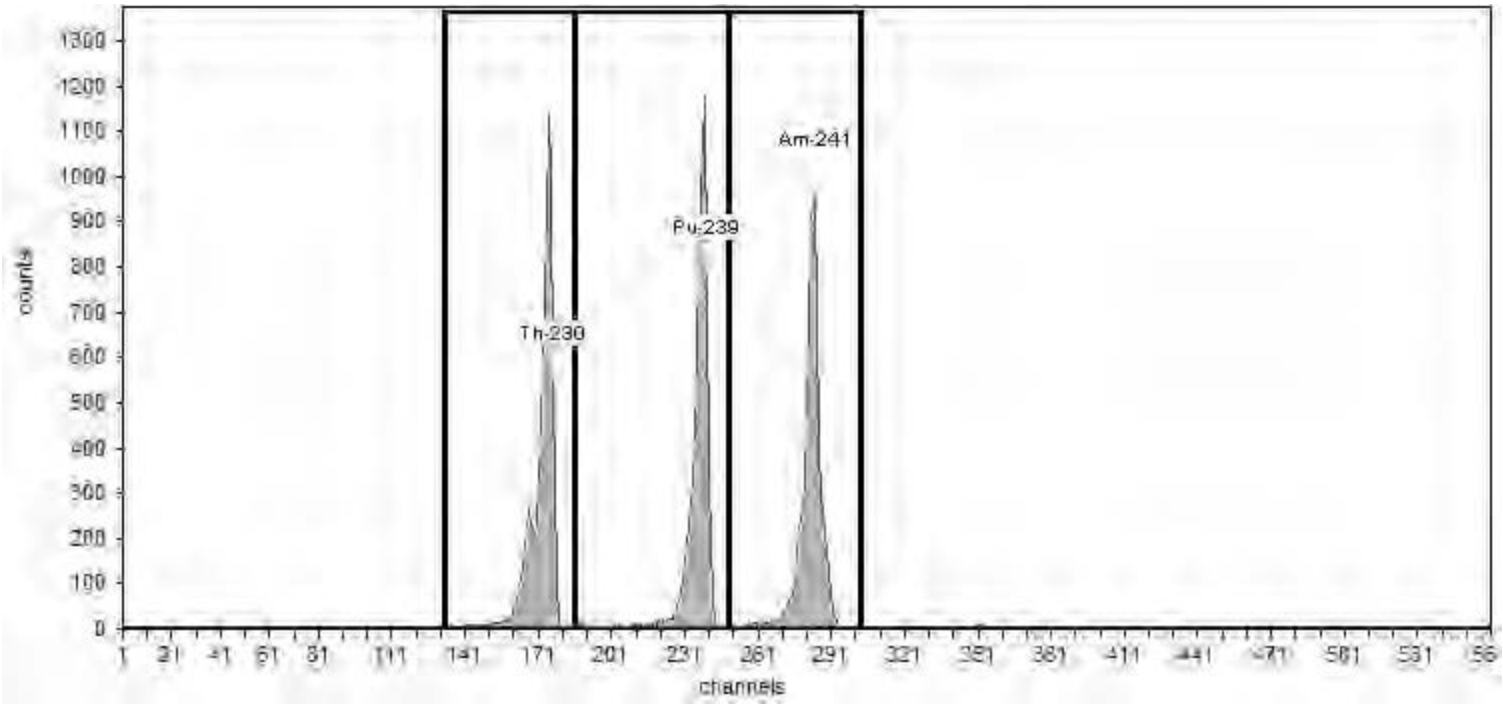
Detector: AV215 , SN: 50-119J4
Acquisition Start Date: 7/25/2018 10:24:53AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-7107;AV215-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.04% +/- 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	30.70	6,840.00	114.00
Pu-239	240	5,155.40	186	249	32.11	6,593.00	109.88
Am-241	284	5,485.70	249	303	35.46	6,371.00	106.18

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:49:16PM 7/27/2018

Calibration

Sample Name: CCV-8874;AV216-20180725a
Description:
Detector: AV216

Analyst: 60040
Analysis Date: 7/25/2018 12:31:44PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82233-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

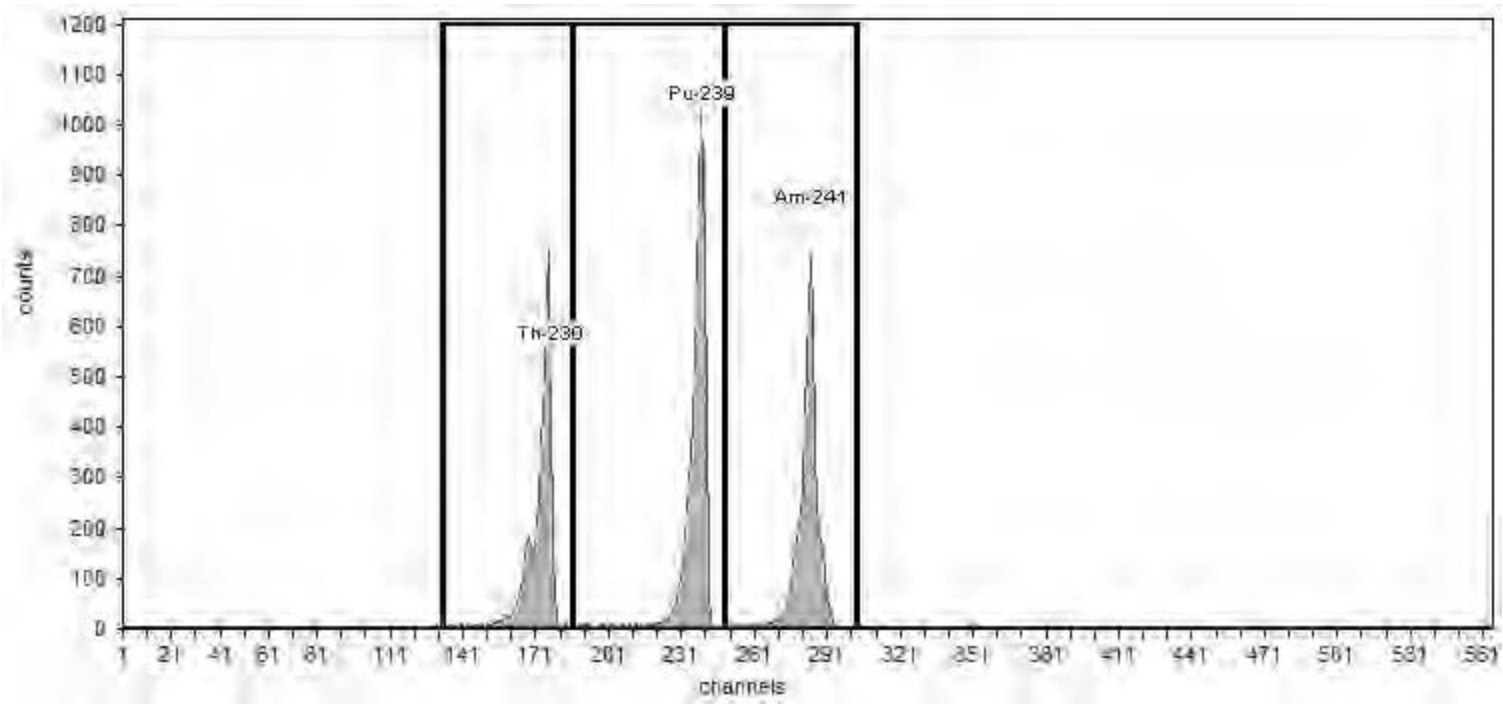
Detector: AV216 , SN: 50-117J5
Acquisition Start Date: 7/25/2018 10:25:33AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8874;AV216-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.70% +/- 0.50% 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	31.14	4,528.00	75.47
Pu-239	240	5,155.40	186	249	35.93	6,083.00	101.38
Am-241	284	5,485.70	249	303	32.32	4,840.00	80.67

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:31:49PM 7/25/2018

Calibration

Sample Name: CCV-8875;AV217-20180725a
Description:
Detector: AV217

Analyst: 60040
Analysis Date: 7/25/2018 12:31:49PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82234-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

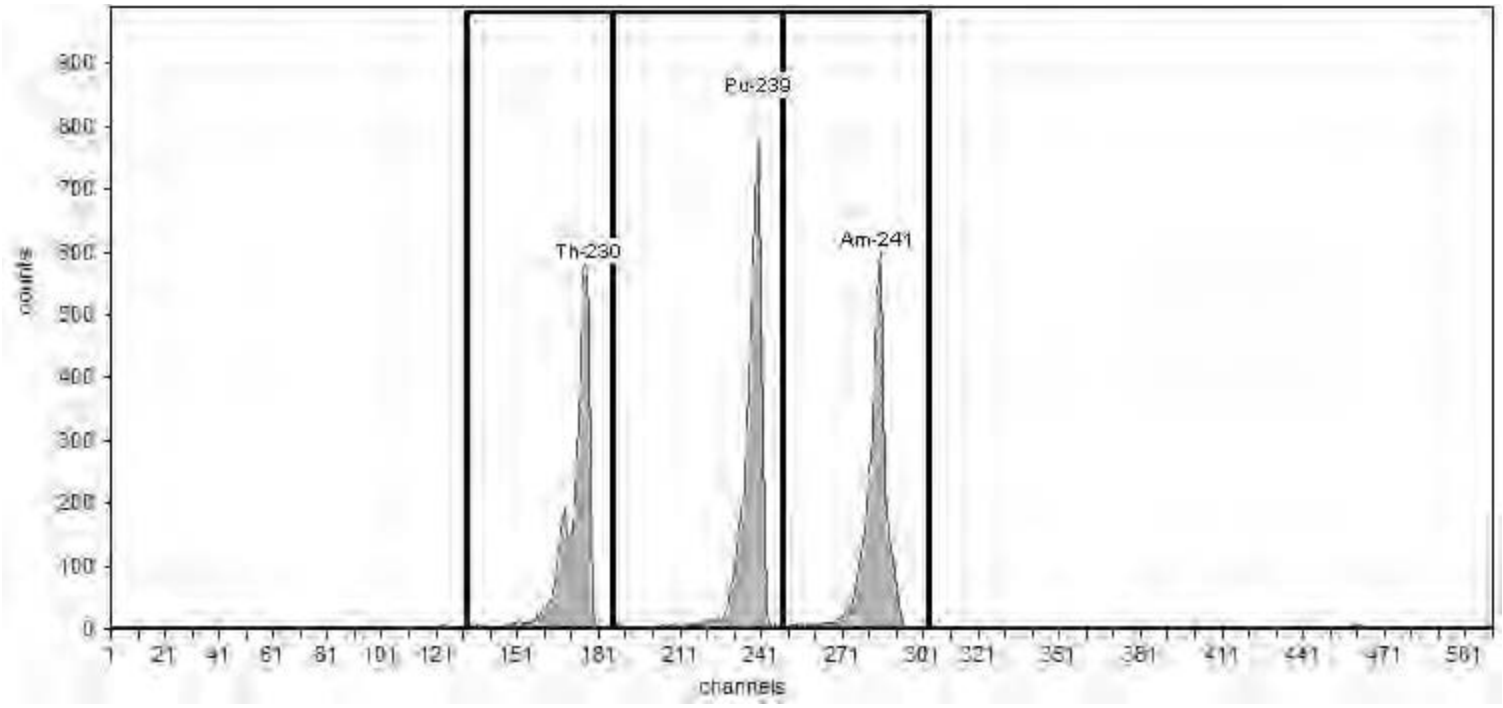
Detector: AV217 , SN: 50-117I2
Acquisition Start Date: 7/25/2018 10:25:55AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8875;AV217-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 20.42% +/- 0.41% 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	33.08	4,026.00	67.10
Pu-239	240	5,155.40	186	249	35.38	4,584.00	76.40
Am-241	284	5,485.70	249	303	33.79	4,057.00	67.62

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:31:54PM 7/25/2018

Calibration

Sample Name: CCV-8876;AV218-20180725a
Description:
Detector: AV218

Analyst: 60040
Analysis Date: 7/25/2018 12:31:53PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82235-334
Prepared by: Analytics
Description:

Certification Date: 6/4/2010 12:00:00PM

Acquisition

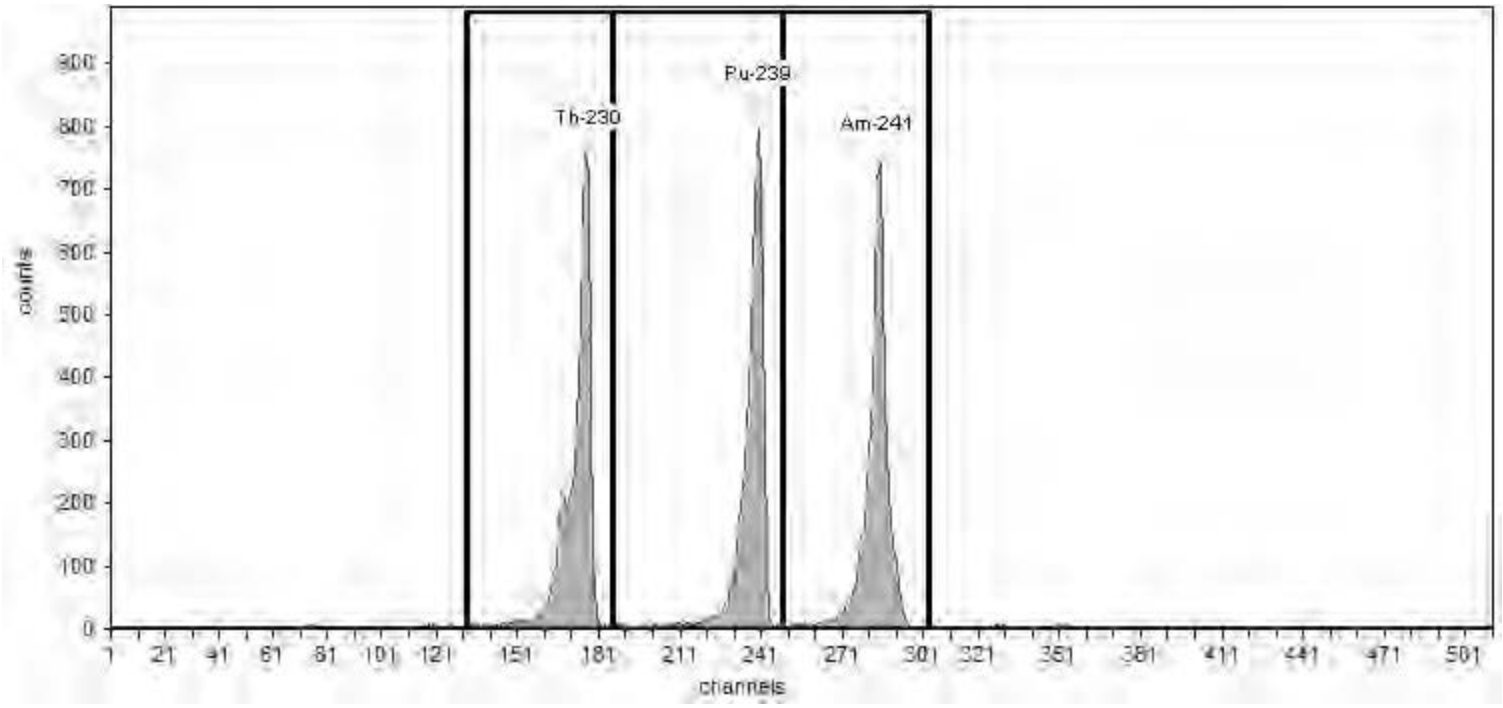
Detector: AV218 , SN: 50-117Z7
Acquisition Start Date: 7/25/2018 10:26:14AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8876;AV218-201807

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 20.60% +/- 0.36% 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	34.45	5,374.00	89.57
Pu-239	240	5,155.40	186	249	38.36	5,237.00	87.28
Am-241	284	5,485.70	249	303	37.29	5,299.00	88.32

Monthly Backgrounds

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:32:46AM 8/12/2018

Sample

Sample Name: ICB;AV1
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: August2018
Description:

Analyst: 60040

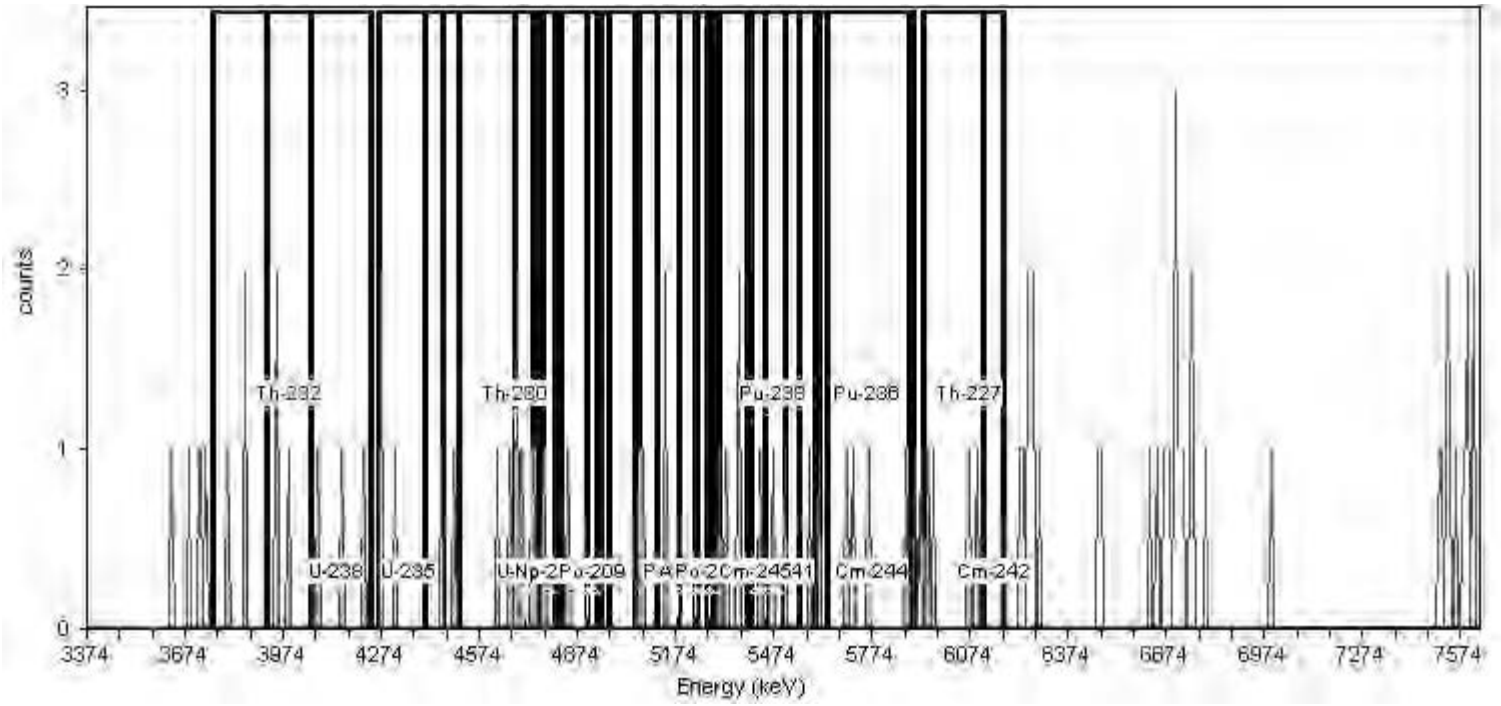
Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 8/11/2018 5:19:02PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.36% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 96.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	6.00	6.250E-003	2.756E-003
U-235	4.36	4.26	4.46	4.00	4.167E-003	2.329E-003
Th-230	4.68	4.40	4.75	10.00	1.042E-002	3.455E-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	8.00	8.333E-003	3.125E-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	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	5.00	5.208E-003	2.552E-003
Am-243	5.23	5.05	5.31	6.00	6.250E-003	2.756E-003
U-232	5.25	5.06	5.40	9.00	9.375E-003	3.294E-003
Th-228	5.45	5.19	5.51	7.00	7.292E-003	2.946E-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	7.00	7.292E-003	2.946E-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	1.00	1.042E-003	1.473E-003
Pu-236	5.76	5.61	5.89	7.00	7.292E-003	2.946E-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	5.00	5.208E-003	2.552E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:33:31AM 8/12/2018

Sample

Sample Name: ICB;AV3
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: August2018
Description:

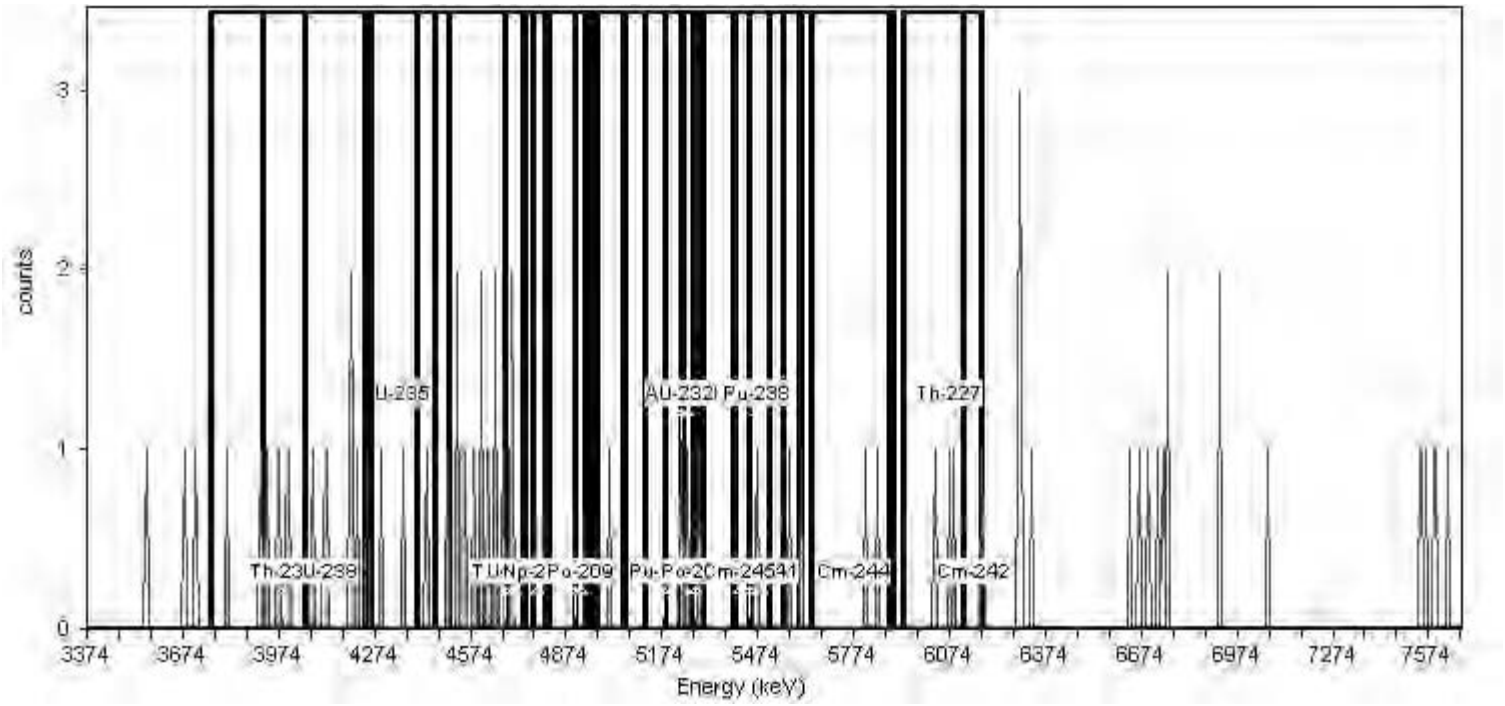
Analyst: 60040

Acquisition

Detector: AV3 , SN: 49-202 FF7
Acquisition Start Date: 8/11/2018 5:16:27PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.36% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 69.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	12.00	1.250E-002	3.756E-003
U-235	4.36	4.26	4.46	3.00	3.125E-003	2.083E-003
Th-230	4.68	4.40	4.75	15.00	1.563E-002	4.167E-003
U-234	4.71	4.51	4.82	13.00	1.354E-002	3.898E-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	1.00	1.042E-003	1.473E-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	0.00	0.000E+000	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	3.00	3.125E-003	2.083E-003
U-232	5.25	5.06	5.40	3.00	3.125E-003	2.083E-003
Th-228	5.45	5.19	5.51	4.00	4.167E-003	2.329E-003
Po-210	5.28	5.23	5.29	3.00	3.125E-003	2.083E-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	3.00	3.125E-003	2.083E-003
Cm-244	5.78	5.64	5.90	2.00	2.083E-003	1.804E-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	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:56:36AM 7/13/2018

Sample

Sample Name: ICB;AV7
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

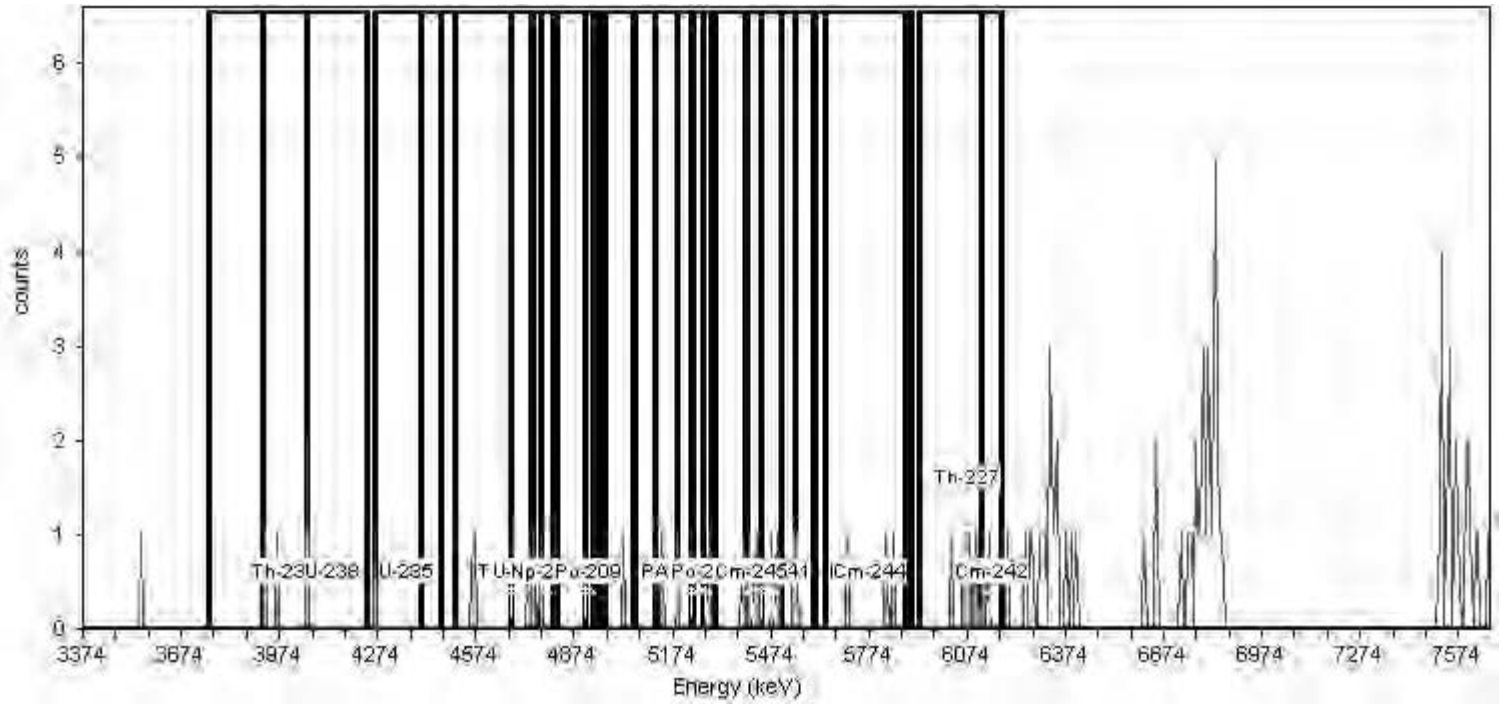
Acquisition

Detector: AV7 , SN: 48-158EE5
Acquisition Start Date: 7/12/2018 1:39:27PM
Live Time: 960.00 min.
Real Time: 960.02 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 / Ch^2

Efficiency: 22.98% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 101.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:56:47AM 7/13/2018

Sample

Sample Name: ICB;AV8
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

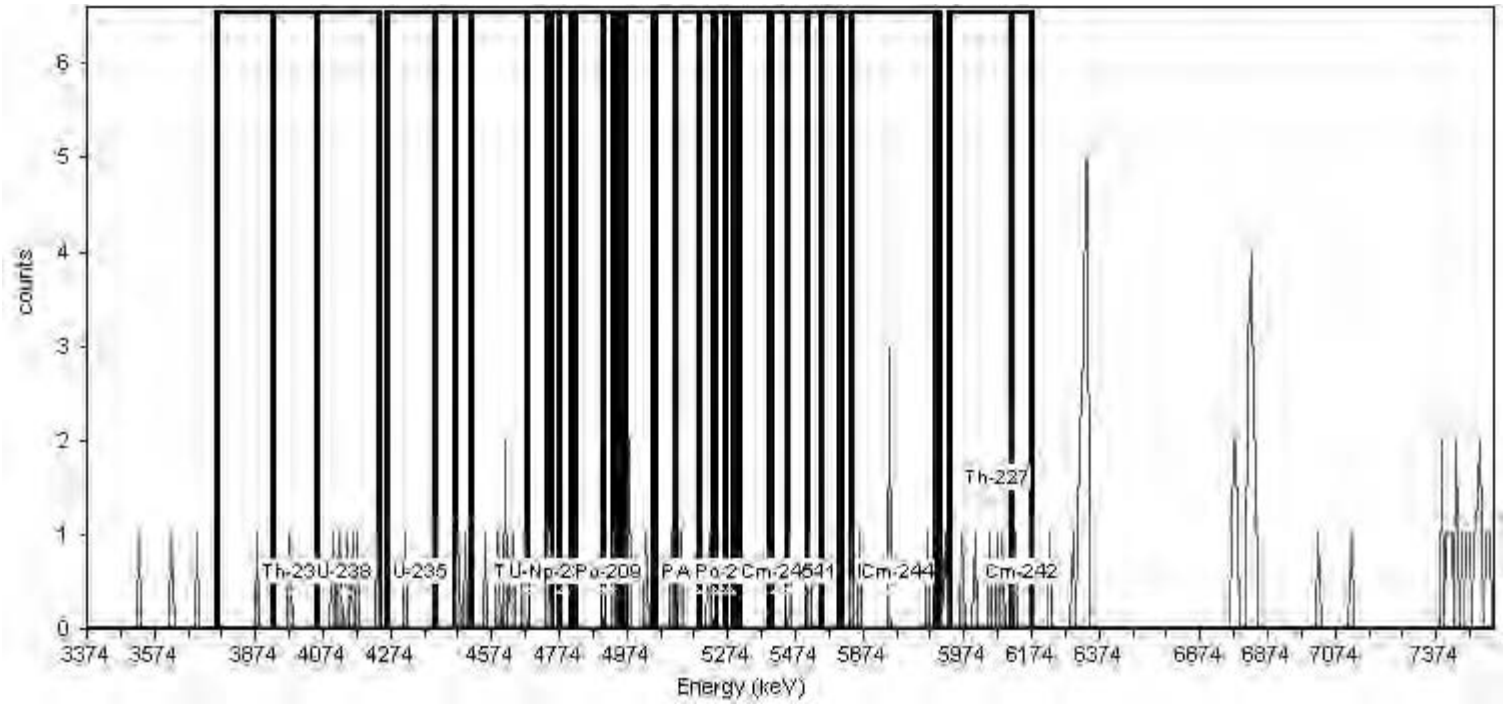
Acquisition

Detector: AV8 , SN: 41-137Q6
Acquisition Start Date: 7/12/2018 1:39:28PM
Live Time: 960.00 min.
Real Time: 960.02 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 / Ch^2

Efficiency: 25.96% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 99.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:57:05AM 7/13/2018

Sample

Sample Name: ICB;AV10
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

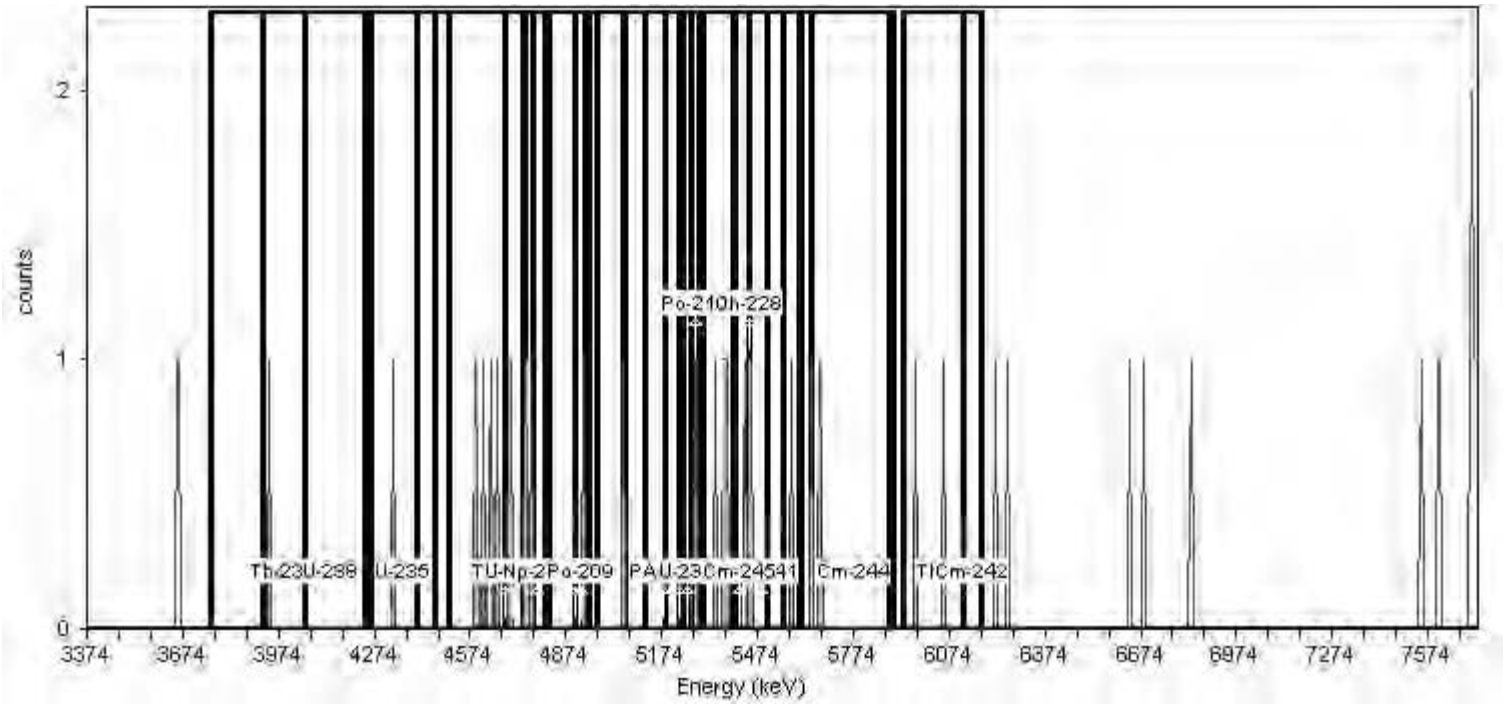
Acquisition

Detector: AV10 , SN: 49-155N2
Acquisition Start Date: 7/12/2018 1:39:32PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-9885;AV10-05142018
Calibration Date: 5/14/2018 6:26:57PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.49% +/- 0.35% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 39.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-230	4.68	4.40	4.75	7.00	7.292E-003	2.946E-003
U-234	4.71	4.51	4.82	8.00	8.333E-003	3.125E-003
Pu-242	4.90	4.68	4.95	5.00	5.208E-003	2.552E-003
Th-229	4.86	4.74	5.12	4.00	4.167E-003	2.329E-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	1.00	1.042E-003	1.473E-003
Th-232	3.99	3.75	4.05	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	1.00	1.042E-003	1.473E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-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	5.00	5.208E-003	2.552E-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	8.00	8.333E-003	3.125E-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	2.00	2.083E-003	1.804E-003
Pu-236	5.76	5.61	5.89	2.00	2.083E-003	1.804E-003
Cm-244	5.78	5.64	5.90	2.00	2.083E-003	1.804E-003
Th-227	6.07	5.93	6.18	2.00	2.083E-003	1.804E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:58:05AM 7/13/2018

Sample

Sample Name: ICB;AV15
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

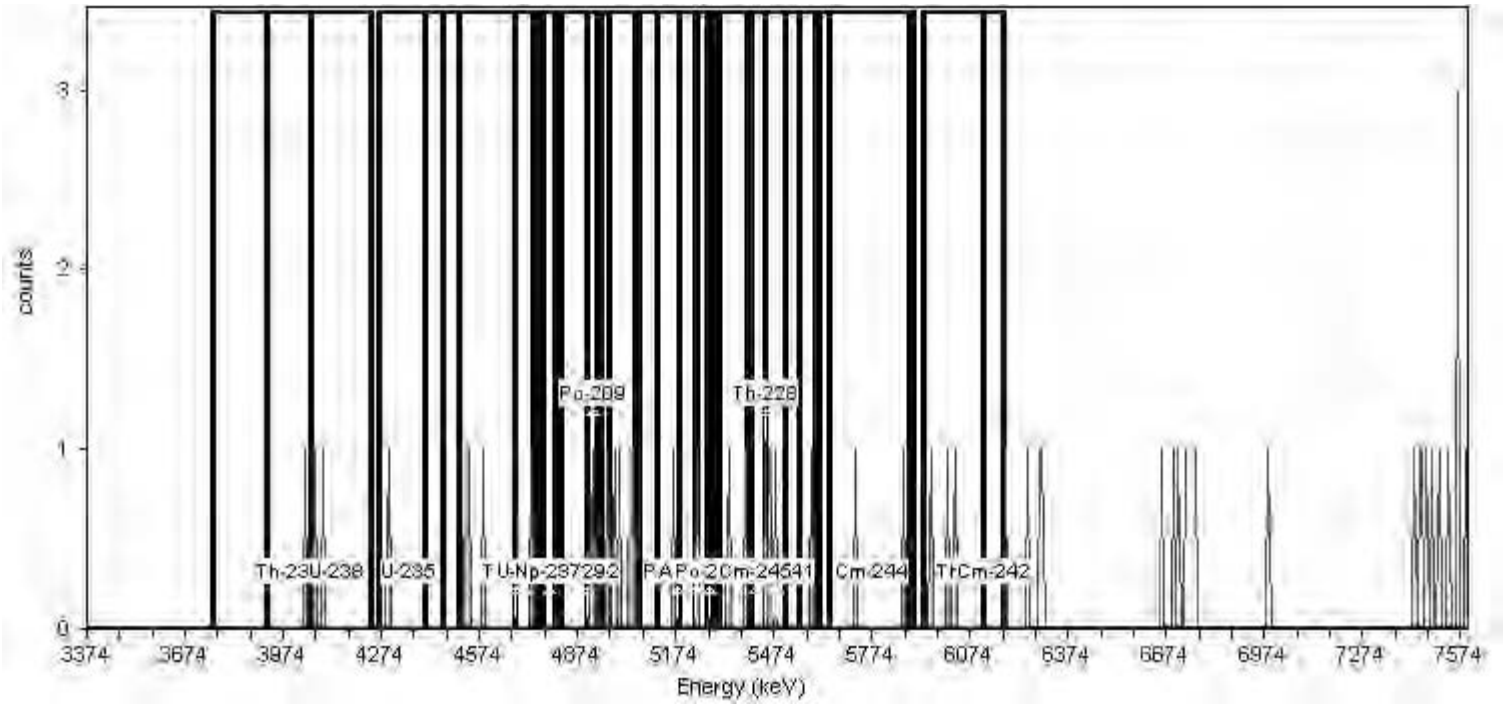
Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 7/12/2018 1:39:30PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-1370619;AV15-05142018
Calibration Date: 5/14/2018 6:28:04PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.26% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 52.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	3.00	3.125E-003	2.083E-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	4.00	4.167E-003	2.329E-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	7.00	7.292E-003	2.946E-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	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	6.00	6.250E-003	2.756E-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	5.00	5.208E-003	2.552E-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	1.00	1.042E-003	1.473E-003
Pu-236	5.76	5.61	5.89	2.00	2.083E-003	1.804E-003
Cm-244	5.78	5.64	5.90	2.00	2.083E-003	1.804E-003
Th-227	6.07	5.93	6.18	3.00	3.125E-003	2.083E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:58:34AM 7/13/2018

Sample

Sample Name: ICB;AV19
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

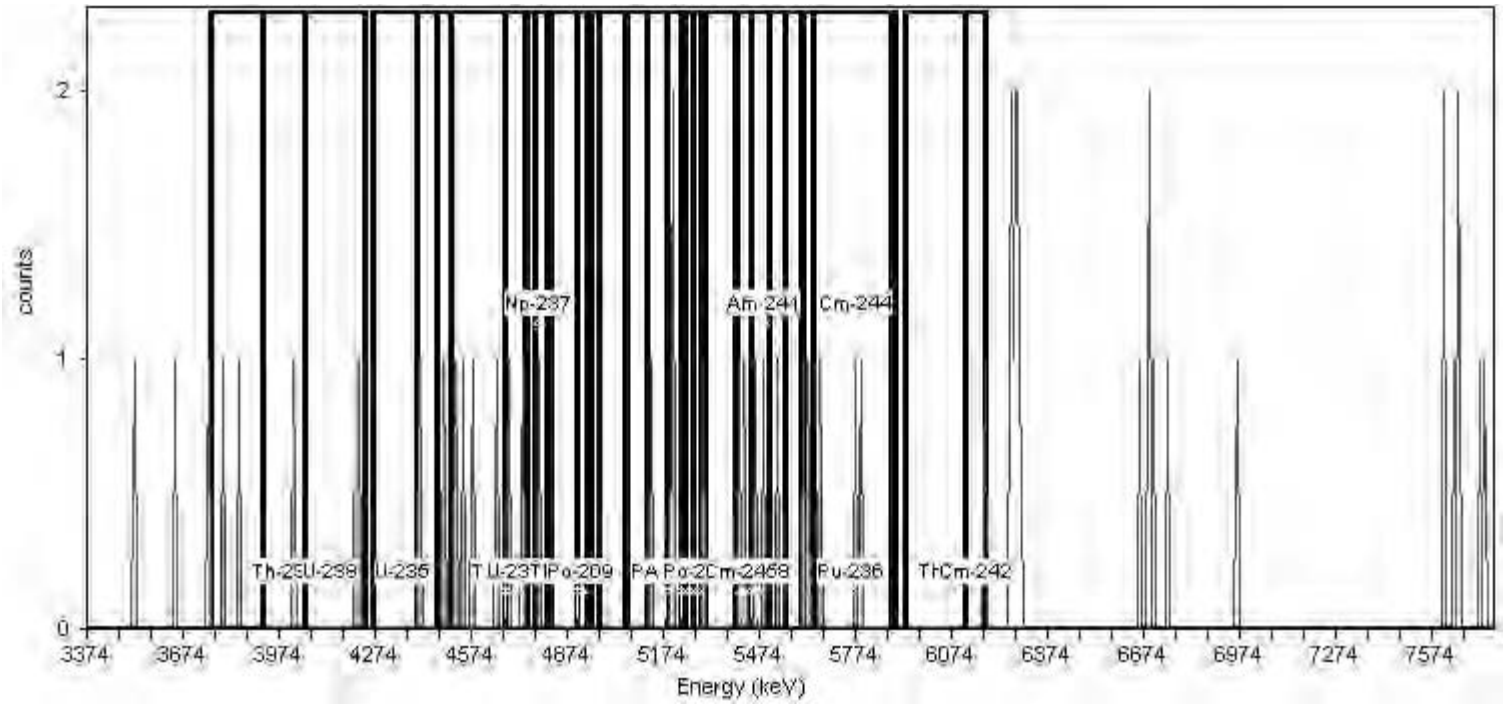
Acquisition

Detector: AV19 , SN: 50-025FF5
Acquisition Start Date: 7/12/2018 1:39:36PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-8877;AV19-05142018
Calibration Date: 5/15/2018 12:27:55PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.60% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 53.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-230	4.68	4.40	4.75	8.00	8.333E-003	3.125E-003
U-234	4.71	4.51	4.82	7.00	7.292E-003	2.946E-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	1.00	1.042E-003	1.473E-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
Th-232	3.99	3.75	4.05	3.00	3.125E-003	2.083E-003
U-238	4.14	3.92	4.24	3.00	3.125E-003	2.083E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-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	7.00	7.292E-003	2.946E-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	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	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	3.00	3.125E-003	2.083E-003
Th-227	6.07	5.93	6.18	1.00	1.042E-003	1.473E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:58:43AM 7/13/2018

Sample

Sample Name: ICB;AV20
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

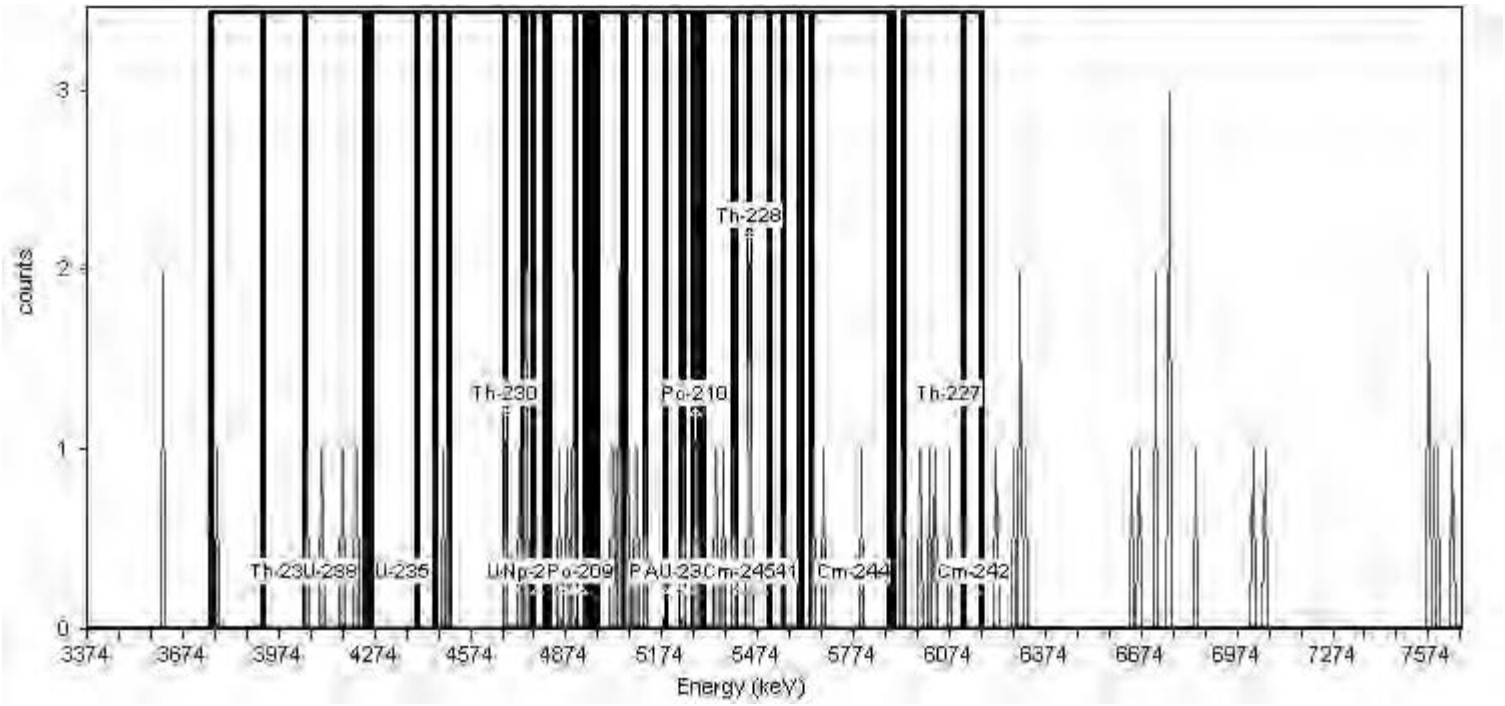
Acquisition

Detector: AV20 , SN: 48-121A7
Acquisition Start Date: 7/12/2018 1:39:38PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-9520;AV20-05142018
Calibration Date: 5/15/2018 12:28:08PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.15% +/- 0.32% 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)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	6.00	6.250E-003	2.756E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.68	4.40	4.75	6.00	6.250E-003	2.756E-003
U-234	4.71	4.51	4.82	4.00	4.167E-003	2.329E-003
Pu-242	4.90	4.68	4.95	8.00	8.333E-003	3.125E-003
Th-229	4.86	4.74	5.12	14.00	1.458E-002	4.034E-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	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	9.00	9.375E-003	3.294E-003
Am-243	5.23	5.05	5.31	7.00	7.292E-003	2.946E-003
U-232	5.25	5.06	5.40	10.00	1.042E-002	3.455E-003
Th-228	5.45	5.19	5.51	10.00	1.042E-002	3.455E-003
Po-210	5.28	5.23	5.29	3.00	3.125E-003	2.083E-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	7.00	7.292E-003	2.946E-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	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	4.00	4.167E-003	2.329E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:59:17AM 7/13/2018

Sample

Sample Name: ICB;AV23
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

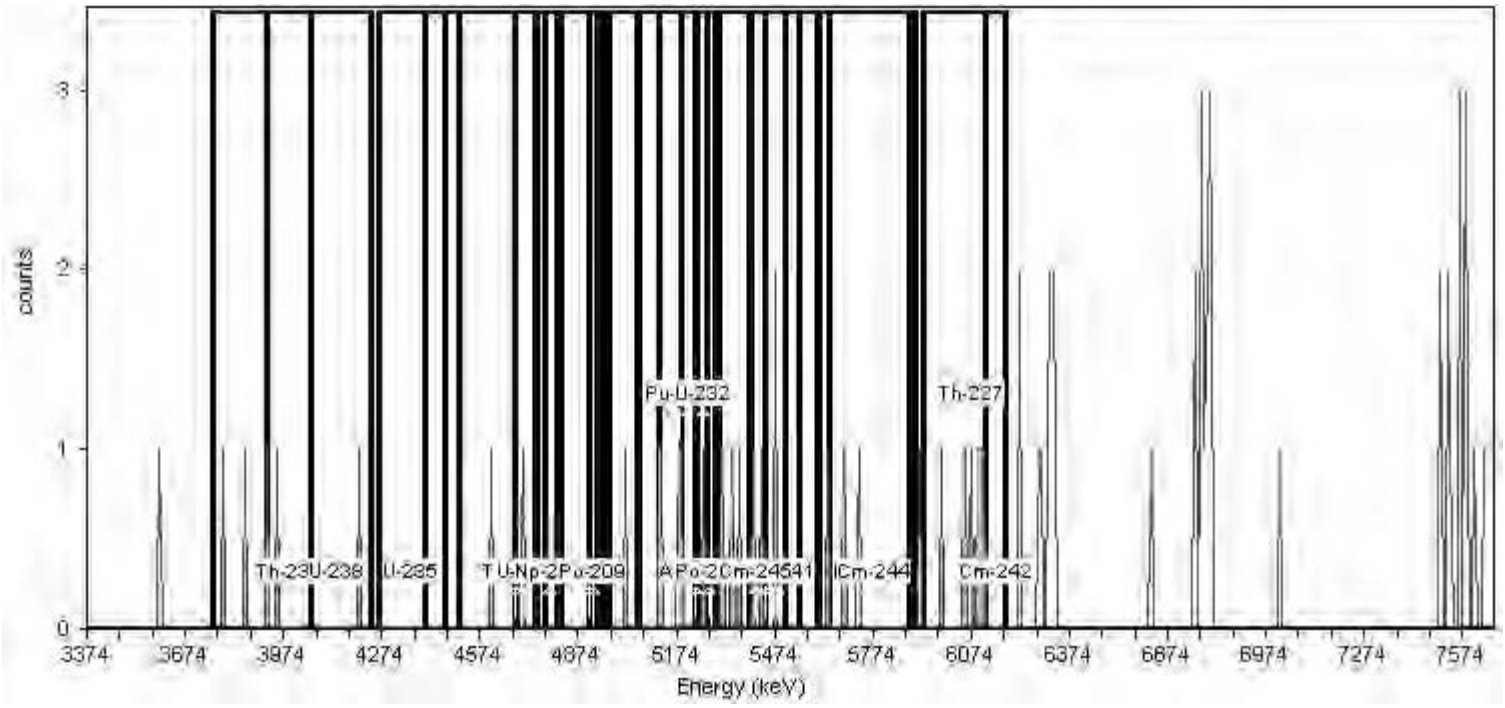
Analyst: 60040

Acquisition

Detector: AV23 , SN: 48-158FF3
Acquisition Start Date: 7/12/2018 1:39:44PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-9795;AV23-05142018
Calibration Date: 5/15/2018 12:28:43PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.46% +/- 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: 76.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-230	4.68	4.40	4.75	2.00	2.083E-003	1.804E-003
U-234	4.71	4.51	4.82	2.00	2.083E-003	1.804E-003
Pu-242	4.90	4.68	4.95	1.00	1.042E-003	1.473E-003
Th-229	4.86	4.74	5.12	2.00	2.083E-003	1.804E-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	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	5.00	5.208E-003	2.552E-003
Am-243	5.23	5.05	5.31	5.00	5.208E-003	2.552E-003
U-232	5.25	5.06	5.40	8.00	8.333E-003	3.125E-003
Th-228	5.45	5.19	5.51	9.00	9.375E-003	3.294E-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	7.00	7.292E-003	2.946E-003
Am-241	5.48	5.30	5.60	7.00	7.292E-003	2.946E-003
Cm-245	5.42	5.40	5.45	2.00	2.083E-003	1.804E-003
Th-232	3.99	3.75	4.05	4.00	4.167E-003	2.329E-003
U-238	4.14	3.92	4.24	3.00	3.125E-003	2.083E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-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	2.00	2.083E-003	1.804E-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	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:59:26AM 7/13/2018

Sample

Sample Name: ICB;AV24
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

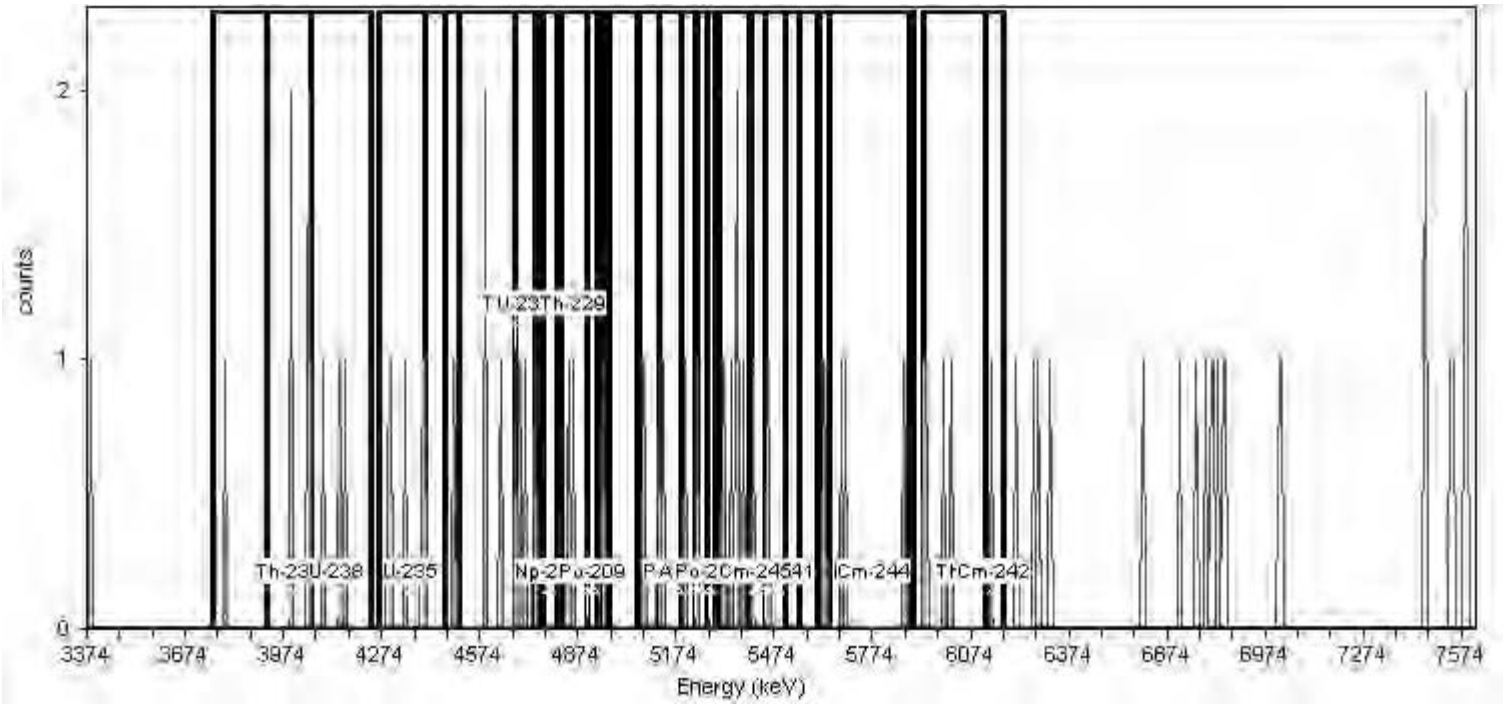
Analyst: 60040

Acquisition

Detector: AV24 , SN: 47-137Q4
Acquisition Start Date: 7/12/2018 1:39:46PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-9817;AV24-05142018
Calibration Date: 5/15/2018 12:28:57PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.21% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 69.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	5.00	5.208E-003	2.552E-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	5.00	5.208E-003	2.552E-003
Th-230	4.68	4.40	4.75	9.00	9.375E-003	3.294E-003
U-234	4.71	4.51	4.82	7.00	7.292E-003	2.946E-003
Pu-242	4.90	4.68	4.95	7.00	7.292E-003	2.946E-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	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	5.00	5.208E-003	2.552E-003
Am-243	5.23	5.05	5.31	5.00	5.208E-003	2.552E-003
U-232	5.25	5.06	5.40	10.00	1.042E-002	3.455E-003
Th-228	5.45	5.19	5.51	9.00	9.375E-003	3.294E-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	7.00	7.292E-003	2.946E-003
Am-241	5.48	5.30	5.60	7.00	7.292E-003	2.946E-003
Cm-245	5.42	5.40	5.45	1.00	1.042E-003	1.473E-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	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:59:38AM 7/13/2018

Sample

Sample Name: ICB;AV43
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

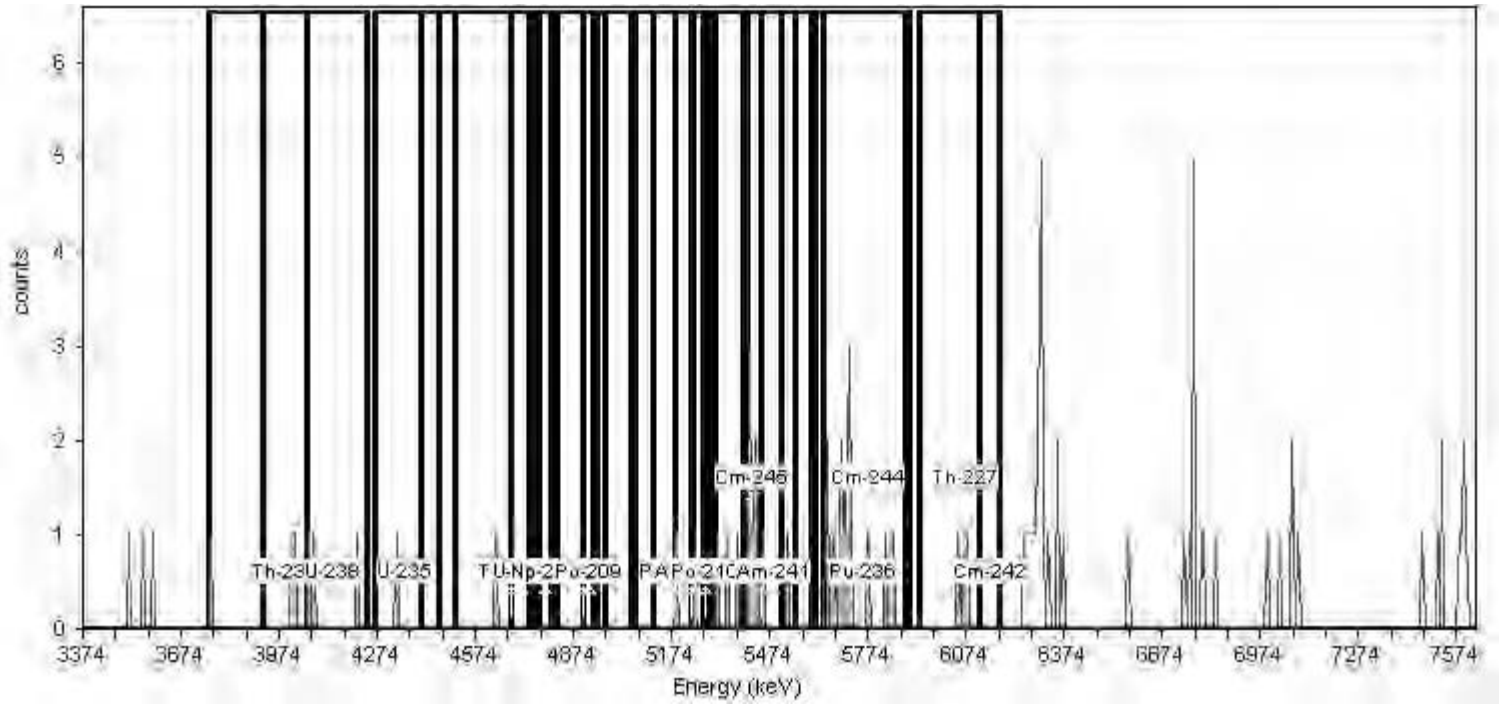
Analyst: 60040

Acquisition

Detector: AV43 , SN: 49-190X4
Acquisition Start Date: 7/12/2018 1:39:53PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-9885;AV43-05142018
Calibration Date: 5/15/2018 12:26:18PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.51% +/- 0.35% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 90.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-230	4.68	4.40	4.75	1.00	1.042E-003	1.473E-003
U-234	4.71	4.51	4.82	1.00	1.042E-003	1.473E-003
Pu-242	4.90	4.68	4.95	0.00	0.000E+000	1.473E-003
Th-229	4.86	4.74	5.12	0.00	0.000E+000	1.473E-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	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	1.00	1.042E-003	1.473E-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	5.00	5.208E-003	2.552E-003
Th-228	5.45	5.19	5.51	13.00	1.354E-002	3.898E-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	12.00	1.250E-002	3.756E-003
Am-241	5.48	5.30	5.60	12.00	1.250E-002	3.756E-003
Cm-245	5.42	5.40	5.45	7.00	7.292E-003	2.946E-003
Pu-236	5.76	5.61	5.89	17.00	1.771E-002	4.419E-003
Cm-244	5.78	5.64	5.90	17.00	1.771E-002	4.419E-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
Th-232	3.99	3.75	4.05	3.00	3.125E-003	2.083E-003
U-238	4.14	3.92	4.24	5.00	5.208E-003	2.552E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:59:47AM 7/13/2018

Sample

Sample Name: ICB;AV44
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

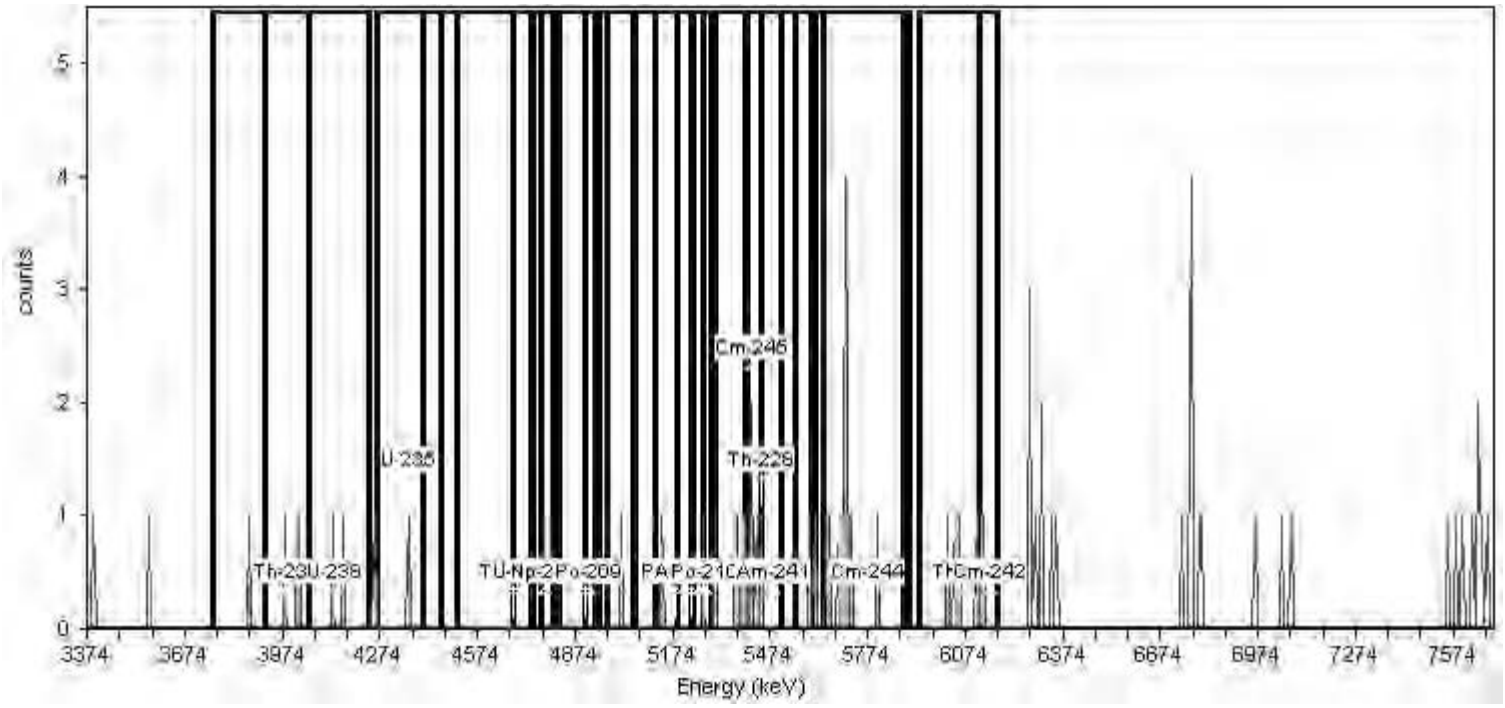
Analyst: 60040

Acquisition

Detector: AV44 , SN: 50-051JJ1
Acquisition Start Date: 7/12/2018 1:39:54PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-1368446;AV44-05142018
Calibration Date: 5/15/2018 12:26:50PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.49% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 71.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	5.00	5.208E-003	2.552E-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	0.00	0.000E+000	1.473E-003
U-234	4.71	4.51	4.82	0.00	0.000E+000	1.473E-003
Pu-242	4.90	4.68	4.95	0.00	0.000E+000	1.473E-003
Th-229	4.86	4.74	5.12	1.00	1.042E-003	1.473E-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	0.00	0.000E+000	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	3.00	3.125E-003	2.083E-003
U-232	5.25	5.06	5.40	7.00	7.292E-003	2.946E-003
Th-228	5.45	5.19	5.51	10.00	1.042E-002	3.455E-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	10.00	1.042E-002	3.455E-003
Am-241	5.48	5.30	5.60	10.00	1.042E-002	3.455E-003
Cm-245	5.42	5.40	5.45	5.00	5.208E-003	2.552E-003
Pu-236	5.76	5.61	5.89	12.00	1.250E-002	3.756E-003
Cm-244	5.78	5.64	5.90	11.00	1.146E-002	3.608E-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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:59:56AM 7/13/2018

Sample

Sample Name: ICB;AV45
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

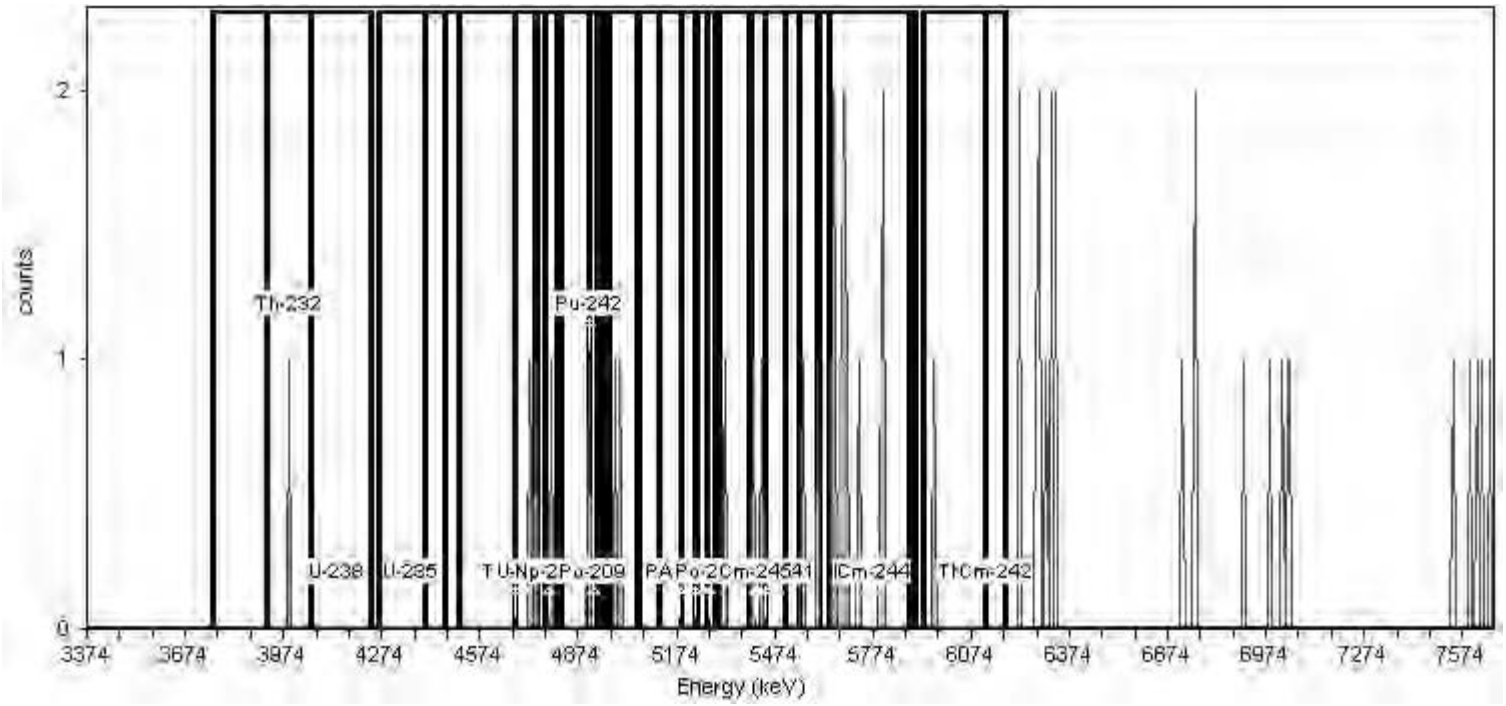
Acquisition

Detector: AV45 , SN: 48-158FF2
Acquisition Start Date: 7/12/2018 1:39:55PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-1368447;AV45-05142018a
Calibration Date: 5/15/2018 12:29:34PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.95% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 47.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	1.00	1.042E-003	1.473E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.68	4.40	4.75	2.00	2.083E-003	1.804E-003
U-234	4.71	4.51	4.82	3.00	3.125E-003	2.083E-003
Pu-242	4.90	4.68	4.95	4.00	4.167E-003	2.329E-003
Th-229	4.86	4.74	5.12	5.00	5.208E-003	2.552E-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	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	0.00	0.000E+000	1.473E-003
U-232	5.25	5.06	5.40	1.00	1.042E-003	1.473E-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	3.00	3.125E-003	2.083E-003
Am-241	5.48	5.30	5.60	5.00	5.208E-003	2.552E-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	11.00	1.146E-002	3.608E-003
Cm-244	5.78	5.64	5.90	11.00	1.146E-002	3.608E-003
Th-227	6.07	5.93	6.18	1.00	1.042E-003	1.473E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:00:21AM 7/13/2018

Sample

Sample Name: ICB;AV47
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

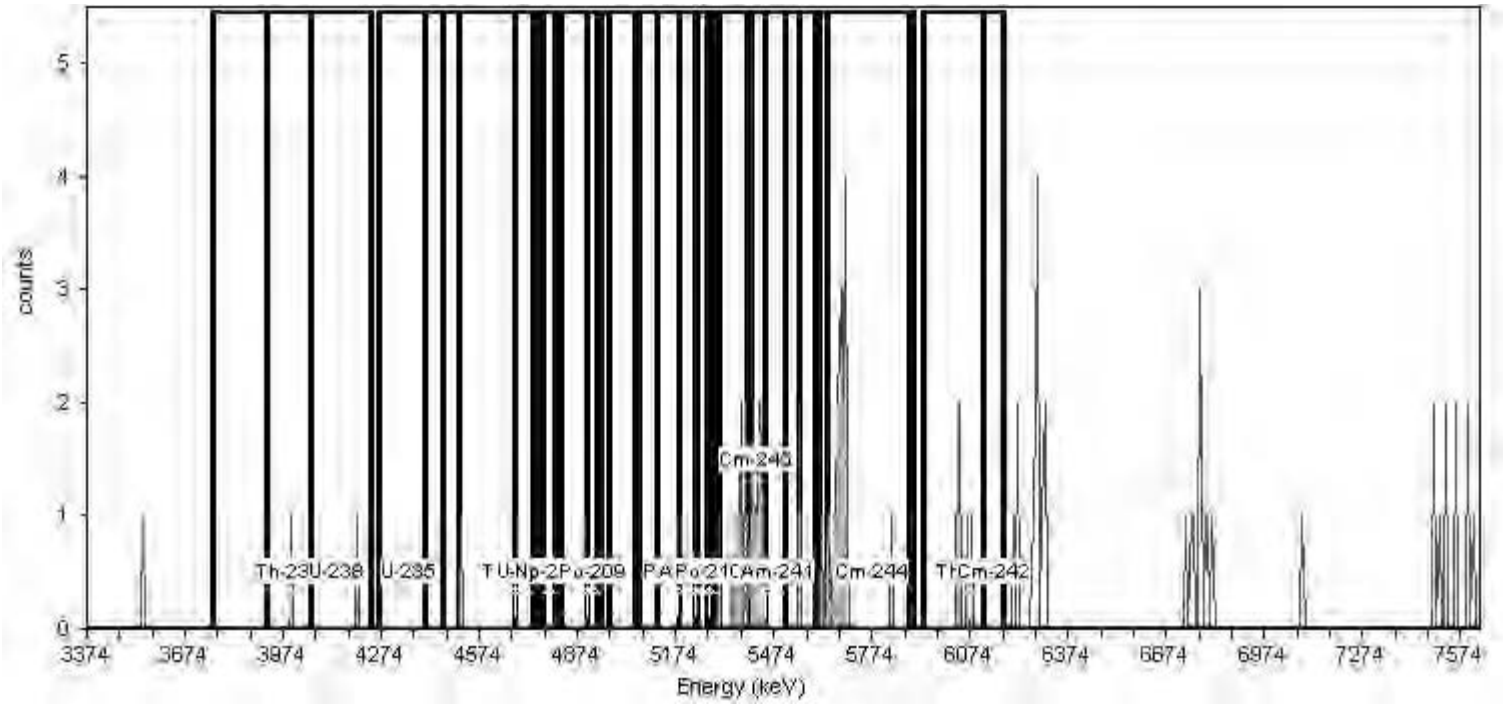
Analyst: 60040

Acquisition

Detector: AV47 , SN: 46-032336
Acquisition Start Date: 7/12/2018 1:39:57PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-1370622;AV47-05142018
Calibration Date: 5/15/2018 12:27:14PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.02% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 78.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	2.00	2.083E-003	1.804E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.68	4.40	4.75	1.00	1.042E-003	1.473E-003
U-234	4.71	4.51	4.82	1.00	1.042E-003	1.473E-003
Pu-242	4.90	4.68	4.95	0.00	0.000E+000	1.473E-003
Th-229	4.86	4.74	5.12	0.00	0.000E+000	1.473E-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	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	0.00	0.000E+000	1.473E-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	9.00	9.375E-003	3.294E-003
Th-228	5.45	5.19	5.51	16.00	1.667E-002	4.295E-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	18.00	1.875E-002	4.541E-003
Am-241	5.48	5.30	5.60	18.00	1.875E-002	4.541E-003
Cm-245	5.42	5.40	5.45	8.00	8.333E-003	3.125E-003
Pu-236	5.76	5.61	5.89	17.00	1.771E-002	4.419E-003
Cm-244	5.78	5.64	5.90	16.00	1.667E-002	4.295E-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	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:00:30AM 7/13/2018

Sample

Sample Name: ICB;AV48
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

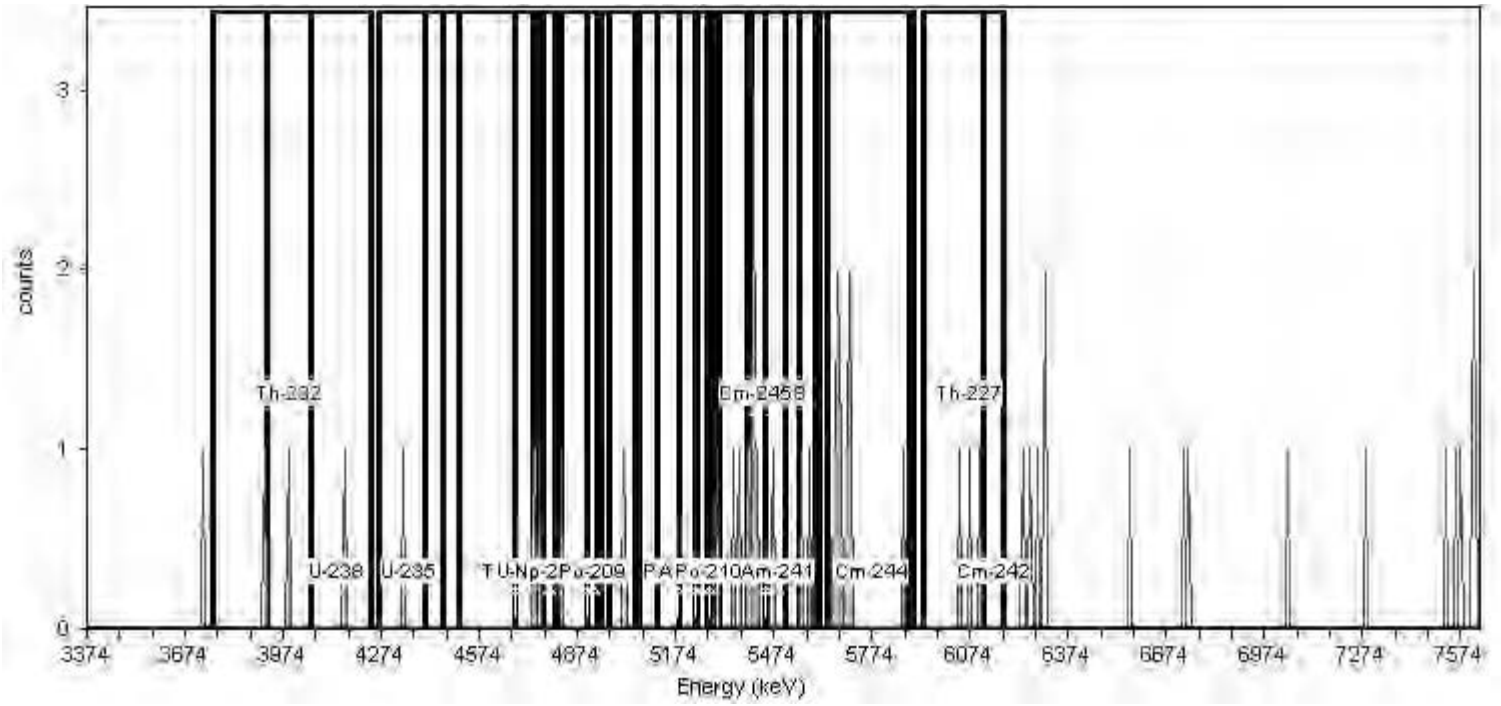
Acquisition

Detector: AV48 , SN: 46-033P6
Acquisition Start Date: 7/12/2018 1:39:58PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-1370619;AV48-05142018
Calibration Date: 5/15/2018 12:27:25PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.06% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 50.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	2.00	2.083E-003	1.804E-003
U-238	4.14	3.92	4.24	2.00	2.083E-003	1.804E-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	1.00	1.042E-003	1.473E-003
U-234	4.71	4.51	4.82	3.00	3.125E-003	2.083E-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	4.00	4.167E-003	2.329E-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	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	1.00	1.042E-003	1.473E-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	4.00	4.167E-003	2.329E-003
Th-228	5.45	5.19	5.51	10.00	1.042E-002	3.455E-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	10.00	1.042E-002	3.455E-003
Am-241	5.48	5.30	5.60	12.00	1.250E-002	3.756E-003
Cm-245	5.42	5.40	5.45	6.00	6.250E-003	2.756E-003
Pu-236	5.76	5.61	5.89	10.00	1.042E-002	3.455E-003
Cm-244	5.78	5.64	5.90	10.00	1.042E-002	3.455E-003
Th-227	6.07	5.93	6.18	3.00	3.125E-003	2.083E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:00:47AM 7/13/2018

Sample

Sample Name: ICB;AV49
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

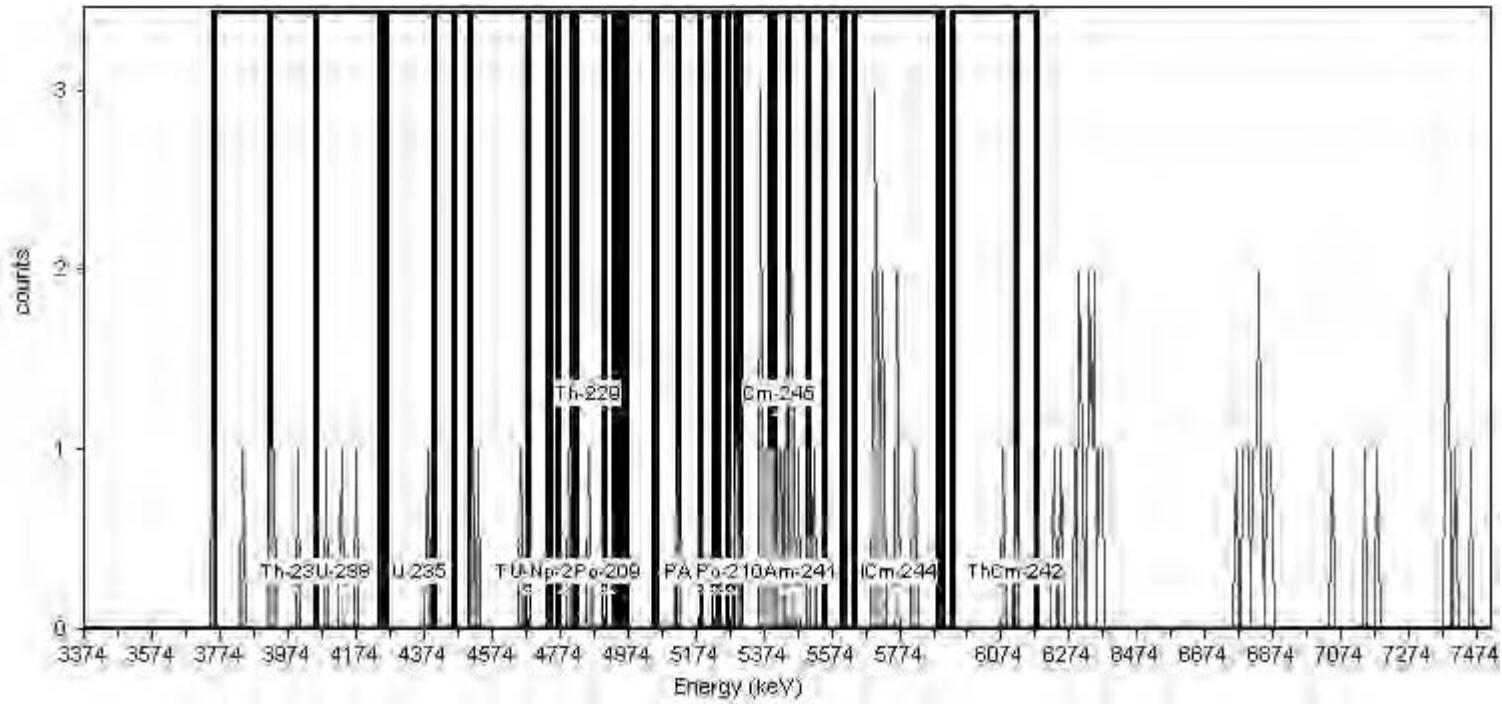
Analyst: 60040

Acquisition

Detector: AV49 , SN: 47-043hh4
Acquisition Start Date: 7/12/2018 1:40:00PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-1370620;AV49-05142018
Calibration Date: 5/15/2018 12:27:36PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.27% +/- 0.24% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 84.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-230	4.68	4.40	4.75	3.00	3.125E-003	2.083E-003
U-234	4.71	4.51	4.82	4.00	4.167E-003	2.329E-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	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	1.00	1.042E-003	1.473E-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	11.00	1.146E-002	3.608E-003
Th-228	5.45	5.19	5.51	19.00	1.979E-002	4.658E-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	20.00	2.083E-002	4.774E-003
Am-241	5.48	5.30	5.60	19.00	1.979E-002	4.658E-003
Cm-245	5.42	5.40	5.45	6.00	6.250E-003	2.756E-003
Th-232	3.99	3.75	4.05	4.00	4.167E-003	2.329E-003
U-238	4.14	3.92	4.24	6.00	6.250E-003	2.756E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003
Pu-236	5.76	5.61	5.89	14.00	1.458E-002	4.034E-003
Cm-244	5.78	5.64	5.90	14.00	1.458E-002	4.034E-003
Th-227	6.07	5.93	6.18	2.00	2.083E-003	1.804E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:01:15AM 7/13/2018

Sample

Sample Name: ICB;AV52
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

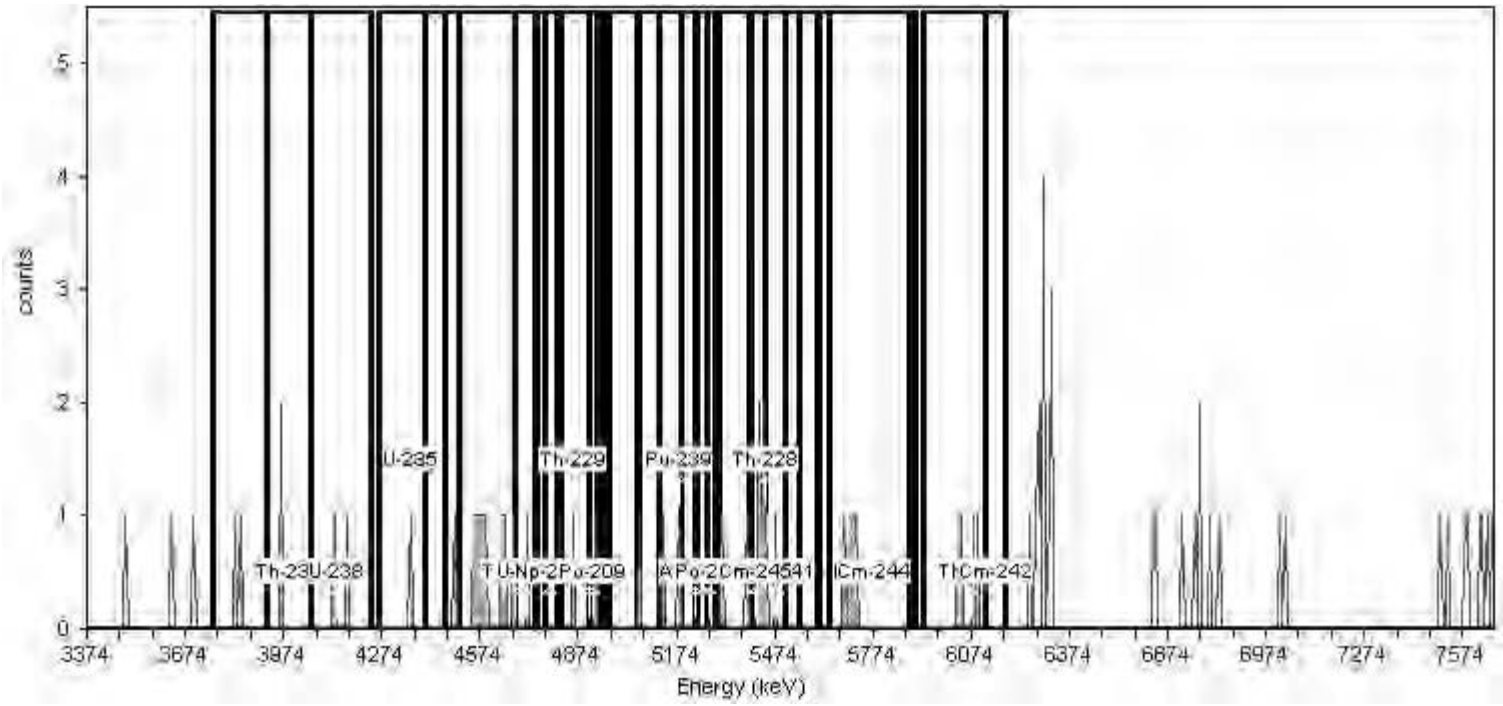
Acquisition

Detector: AV52 , SN: 49-155N7
Acquisition Start Date: 7/12/2018 1:40:02PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-8877;AV52-05152018
Calibration Date: 5/15/2018 3:36:50PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.50% +/- 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: 76.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	5.00	5.208E-003	2.552E-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	12.00	1.250E-002	3.756E-003
U-234	4.71	4.51	4.82	11.00	1.146E-002	3.608E-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	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	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	5.00	5.208E-003	2.552E-003
Th-228	5.45	5.19	5.51	9.00	9.375E-003	3.294E-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	9.00	9.375E-003	3.294E-003
Am-241	5.48	5.30	5.60	9.00	9.375E-003	3.294E-003
Cm-245	5.42	5.40	5.45	6.00	6.250E-003	2.756E-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	5.00	5.208E-003	2.552E-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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:14:35AM 7/14/2018

Sample

Sample Name: ICB;AV53
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

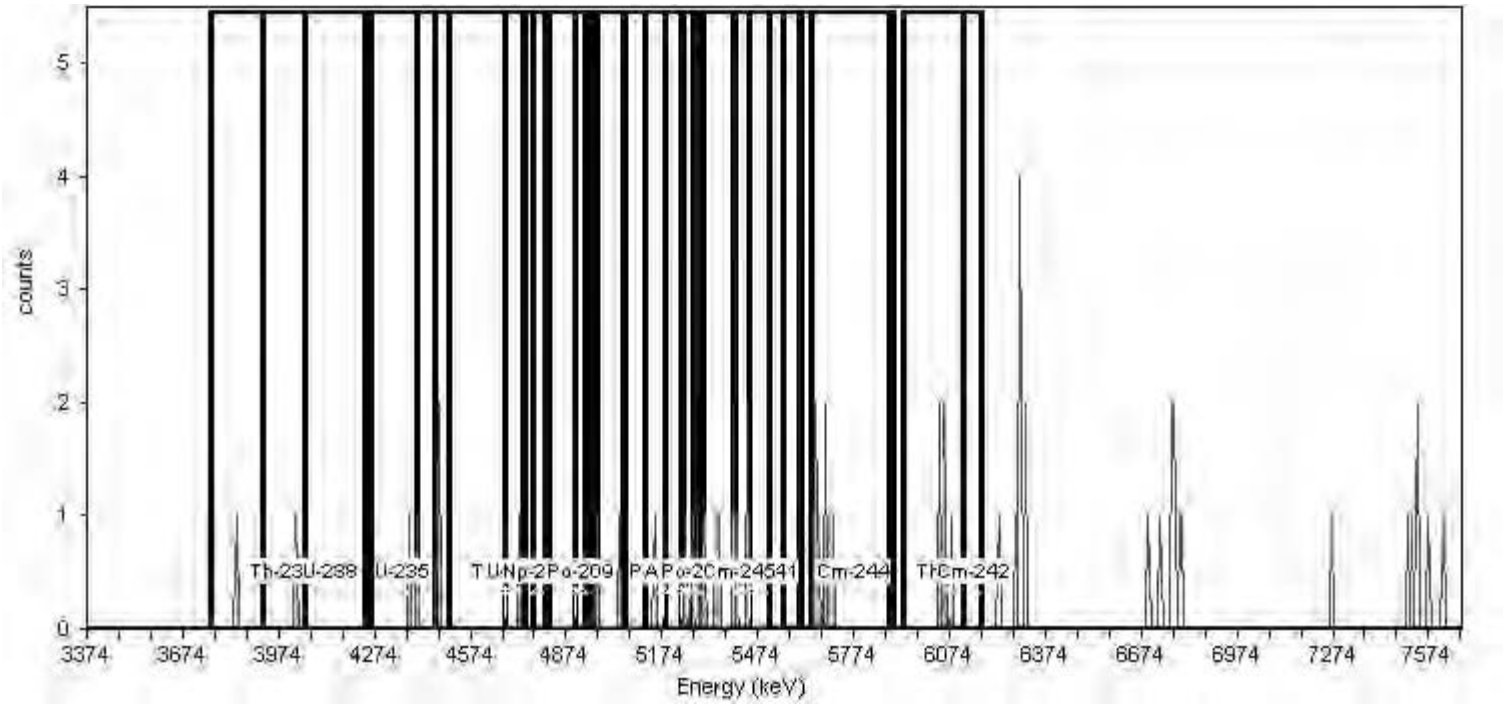
Acquisition

Detector: AV53 , SN: 50-051A6
Acquisition Start Date: 7/13/2018 12:11:28PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-9520;AV53-05152018
Calibration Date: 5/15/2018 3:37:10PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.27% +/- 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: 56.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	2.00	2.083E-003	1.804E-003
U-238	4.14	3.92	4.24	1.00	1.042E-003	1.473E-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	4.00	4.167E-003	2.329E-003
U-234	4.71	4.51	4.82	1.00	1.042E-003	1.473E-003
Pu-242	4.90	4.68	4.95	1.00	1.042E-003	1.473E-003
Th-229	4.86	4.74	5.12	2.00	2.083E-003	1.804E-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	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	5.00	5.208E-003	2.552E-003
U-232	5.25	5.06	5.40	9.00	9.375E-003	3.294E-003
Th-228	5.45	5.19	5.51	11.00	1.146E-002	3.608E-003
Po-210	5.28	5.23	5.29	3.00	3.125E-003	2.083E-003
Pu-238	5.47	5.27	5.55	10.00	1.042E-002	3.455E-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	5.00	5.208E-003	2.552E-003
Pu-236	5.76	5.61	5.89	7.00	7.292E-003	2.946E-003
Cm-244	5.78	5.64	5.90	7.00	7.292E-003	2.946E-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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:01:35AM 7/13/2018

Sample

Sample Name: ICB;AV54
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

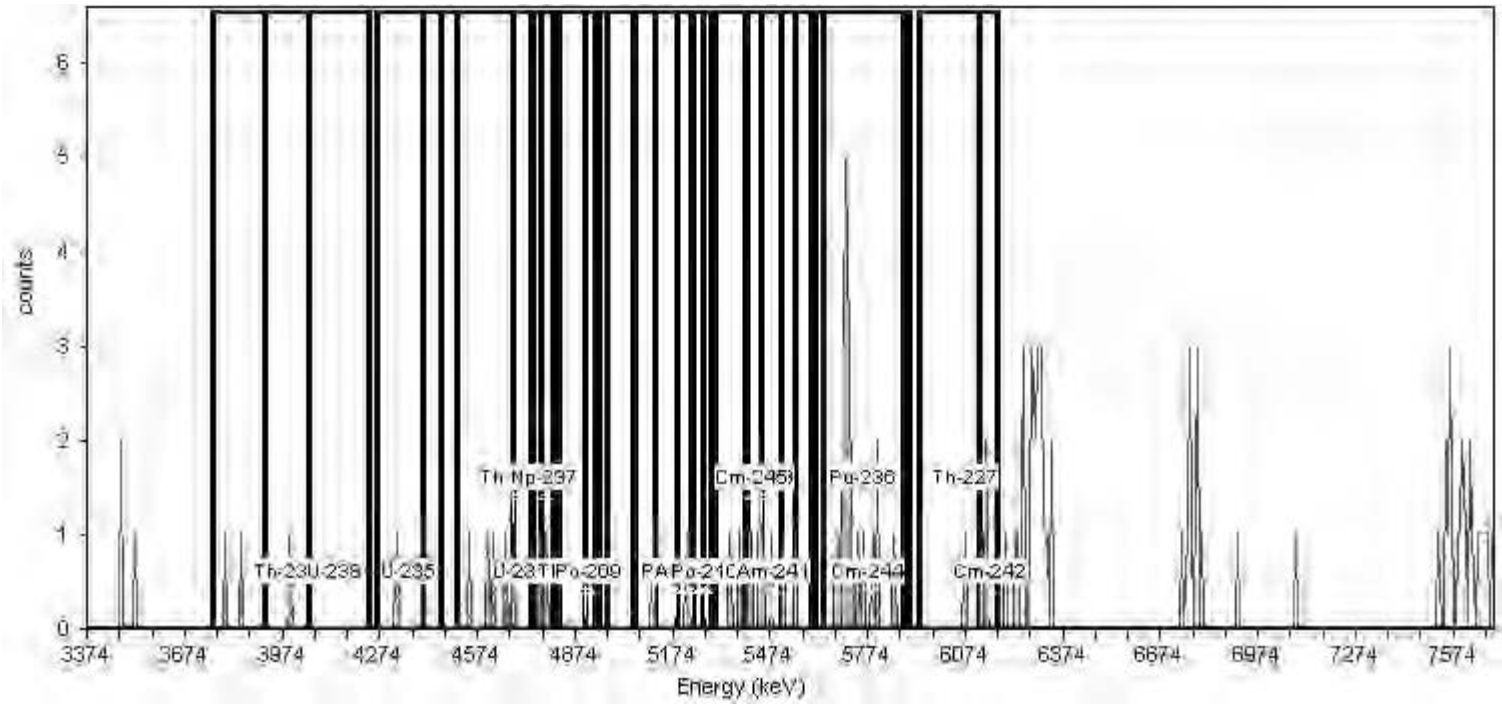
Acquisition

Detector: AV54 , SN: 46-033P4
Acquisition Start Date: 7/12/2018 1:40:04PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-9792;AV54-05152018
Calibration Date: 5/15/2018 3:37:57PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.62% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 110.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	3.00	3.125E-003	2.083E-003
U-238	4.14	3.92	4.24	1.00	1.042E-003	1.473E-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	5.00	5.208E-003	2.552E-003
U-234	4.71	4.51	4.82	7.00	7.292E-003	2.946E-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	5.00	5.208E-003	2.552E-003
Th-228	5.45	5.19	5.51	11.00	1.146E-002	3.608E-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	11.00	1.146E-002	3.608E-003
Am-241	5.48	5.30	5.60	11.00	1.146E-002	3.608E-003
Cm-245	5.42	5.40	5.45	5.00	5.208E-003	2.552E-003
Pu-236	5.76	5.61	5.89	20.00	2.083E-002	4.774E-003
Cm-244	5.78	5.64	5.90	20.00	2.083E-002	4.774E-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	3.00	3.125E-003	2.083E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:01:59AM 7/13/2018

Sample

Sample Name: ICB;AV56
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

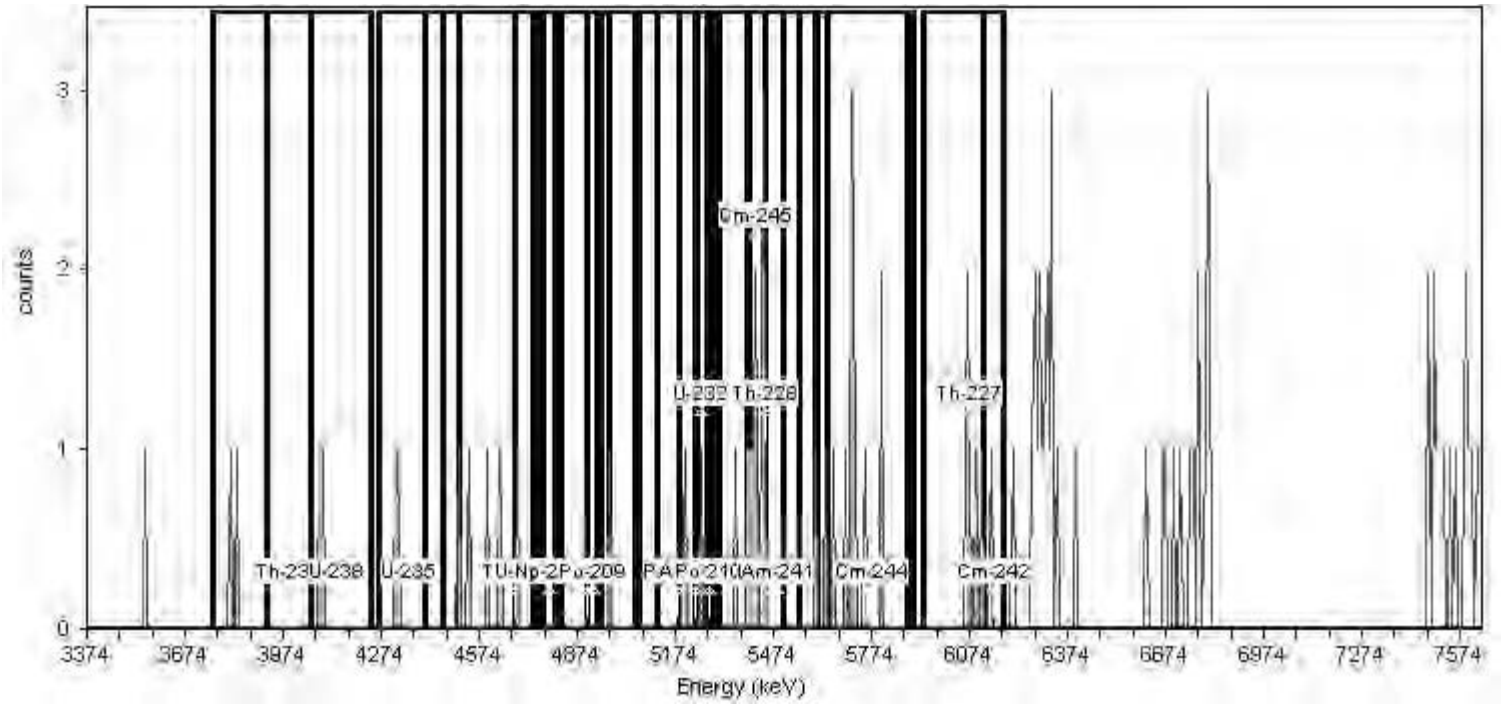
Acquisition

Detector: AV56 , SN: 52-059EE5
Acquisition Start Date: 7/12/2018 1:40:09PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-9795;AV56-05152018
Calibration Date: 5/15/2018 3:38:31PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.25% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 93.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	2.00	2.083E-003	1.804E-003
U-238	4.14	3.92	4.24	2.00	2.083E-003	1.804E-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	5.00	5.208E-003	2.552E-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	1.00	1.042E-003	1.473E-003
Th-229	4.86	4.74	5.12	1.00	1.042E-003	1.473E-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	0.00	0.000E+000	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	5.00	5.208E-003	2.552E-003
Th-228	5.45	5.19	5.51	13.00	1.354E-002	3.898E-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	11.00	1.146E-002	3.608E-003
Am-241	5.48	5.30	5.60	12.00	1.250E-002	3.756E-003
Cm-245	5.42	5.40	5.45	10.00	1.042E-002	3.455E-003
Pu-236	5.76	5.61	5.89	10.00	1.042E-002	3.455E-003
Cm-244	5.78	5.64	5.90	9.00	9.375E-003	3.294E-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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:02:08AM 7/13/2018

Sample

Sample Name: ICB;AV57
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

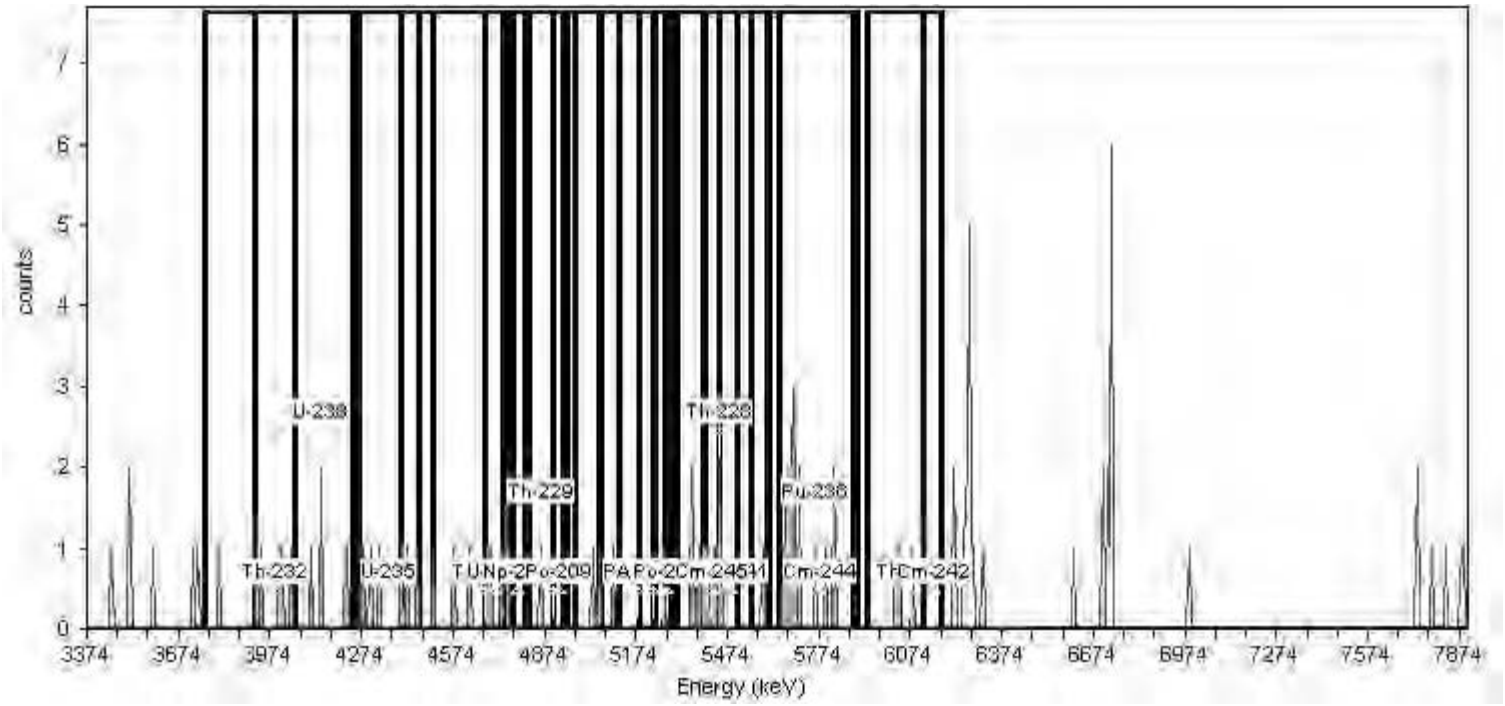
Analyst: 60040

Acquisition

Detector: AV57 , SN: 48-158EE3
Acquisition Start Date: 7/12/2018 1:40:11PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-9817;AV57-05152018
Calibration Date: 5/15/2018 3:38:42PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.40% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 103.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	8.00	8.333E-003	3.125E-003
Pu-242	4.90	4.68	4.95	6.00	6.250E-003	2.756E-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	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	7.00	7.292E-003	2.946E-003
Th-228	5.45	5.19	5.51	12.00	1.250E-002	3.756E-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	11.00	1.146E-002	3.608E-003
Am-241	5.48	5.30	5.60	12.00	1.250E-002	3.756E-003
Cm-245	5.42	5.40	5.45	7.00	7.292E-003	2.946E-003
Th-232	3.99	3.75	4.05	6.00	6.250E-003	2.756E-003
U-238	4.14	3.92	4.24	10.00	1.042E-002	3.455E-003
U-235	4.36	4.26	4.46	6.00	6.250E-003	2.756E-003
Pu-236	5.76	5.61	5.89	18.00	1.875E-002	4.541E-003
Cm-244	5.78	5.64	5.90	18.00	1.875E-002	4.541E-003
Th-227	6.07	5.93	6.18	3.00	3.125E-003	2.083E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:14:53AM 7/14/2018

Sample

Sample Name: ICB;AV58
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

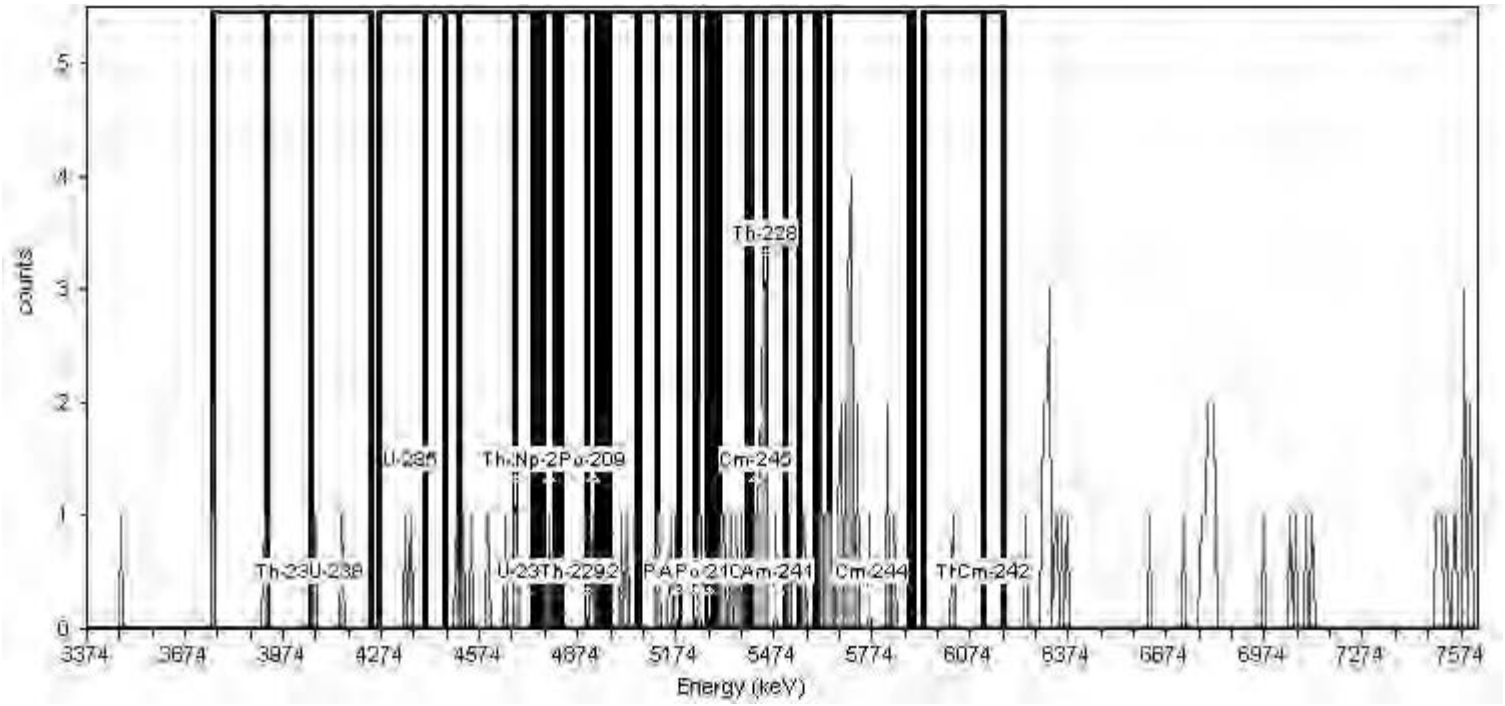
Acquisition

Detector: AV58 , SN: 52-102 C5
Acquisition Start Date: 7/13/2018 12:11:31PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-9885;AV58-05152018
Calibration Date: 5/15/2018 3:38:55PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.05% +/- 0.36% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 109.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-230	4.68	4.40	4.75	7.00	7.292E-003	2.946E-003
U-234	4.71	4.51	4.82	7.00	7.292E-003	2.946E-003
Pu-242	4.90	4.68	4.95	4.00	4.167E-003	2.329E-003
Th-229	4.86	4.74	5.12	5.00	5.208E-003	2.552E-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	1.00	1.042E-003	1.473E-003
Pu-239	5.18	4.97	5.24	5.00	5.208E-003	2.552E-003
Am-243	5.23	5.05	5.31	5.00	5.208E-003	2.552E-003
U-232	5.25	5.06	5.40	10.00	1.042E-002	3.455E-003
Th-228	5.45	5.19	5.51	18.00	1.875E-002	4.541E-003
Po-210	5.28	5.23	5.29	2.00	2.083E-003	1.804E-003
Pu-238	5.47	5.27	5.55	17.00	1.771E-002	4.419E-003
Am-241	5.48	5.30	5.60	18.00	1.875E-002	4.541E-003
Cm-245	5.42	5.40	5.45	10.00	1.042E-002	3.455E-003
Pu-236	5.76	5.61	5.89	23.00	2.396E-002	5.103E-003
Cm-244	5.78	5.64	5.90	20.00	2.083E-002	4.774E-003
Th-227	6.07	5.93	6.18	1.00	1.042E-003	1.473E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003
Th-232	3.99	3.75	4.05	3.00	3.125E-003	2.083E-003
U-238	4.14	3.92	4.24	2.00	2.083E-003	1.804E-003
U-235	4.36	4.26	4.46	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:15:11AM 7/14/2018

Sample

Sample Name: ICB;AV60
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: July2018
Description:

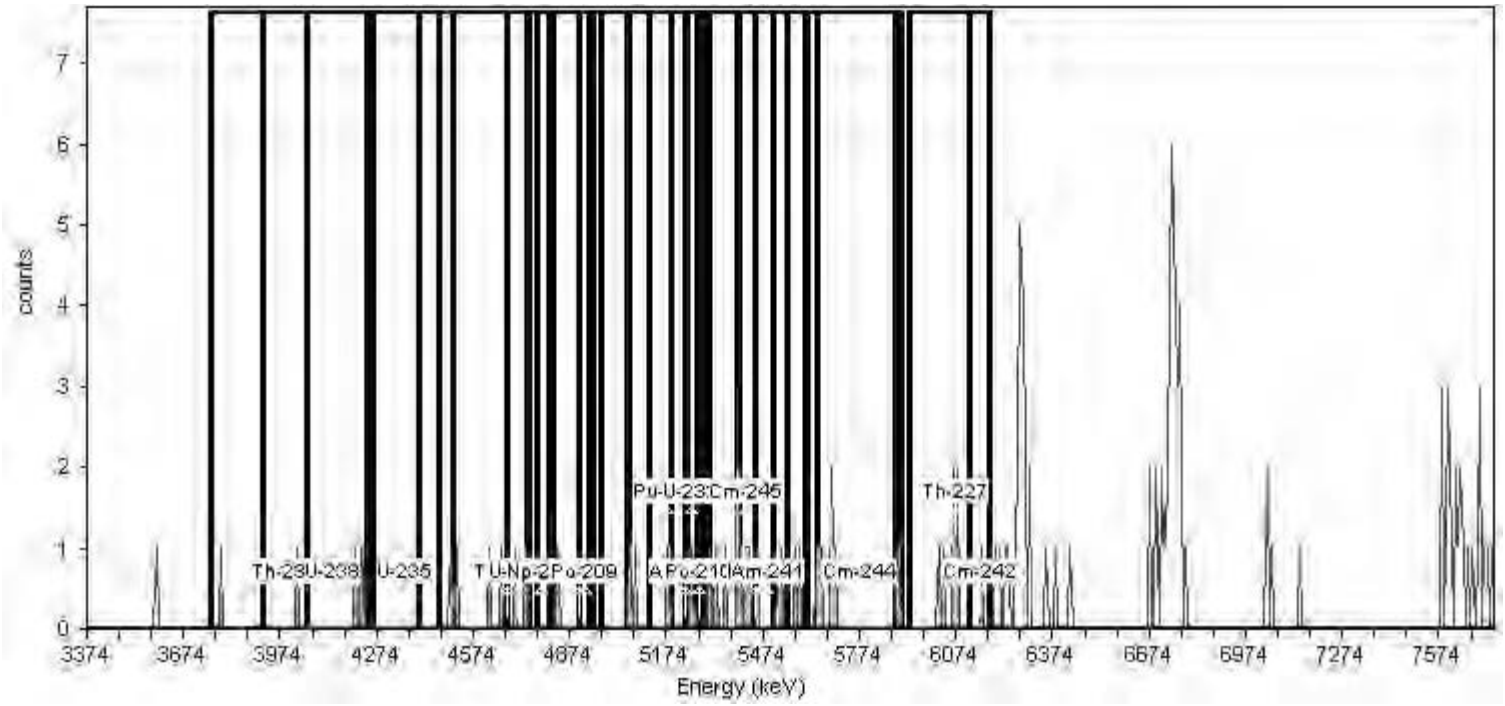
Analyst: 60040

Acquisition

Detector: AV60 , SN: 49-027117
Acquisition Start Date: 7/13/2018 12:11:34PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-1368446;AV60-05152018
Calibration Date: 5/15/2018 3:39:06PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.28% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 130.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	2.00	2.083E-003	1.804E-003
U-238	4.14	3.92	4.24	3.00	3.125E-003	2.083E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.68	4.40	4.75	6.00	6.250E-003	2.756E-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	0.00	0.000E+000	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	5.00	5.208E-003	2.552E-003
U-232	5.25	5.06	5.40	11.00	1.146E-002	3.608E-003
Th-228	5.45	5.19	5.51	12.00	1.250E-002	3.756E-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	13.00	1.354E-002	3.898E-003
Am-241	5.48	5.30	5.60	15.00	1.563E-002	4.167E-003
Cm-245	5.42	5.40	5.45	7.00	7.292E-003	2.946E-003
Pu-236	5.76	5.61	5.89	7.00	7.292E-003	2.946E-003
Cm-244	5.78	5.64	5.90	8.00	8.333E-003	3.125E-003
Th-227	6.07	5.93	6.18	8.00	8.333E-003	3.125E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:02:38AM 7/13/2018

Sample

Sample Name: ICB;AV62
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

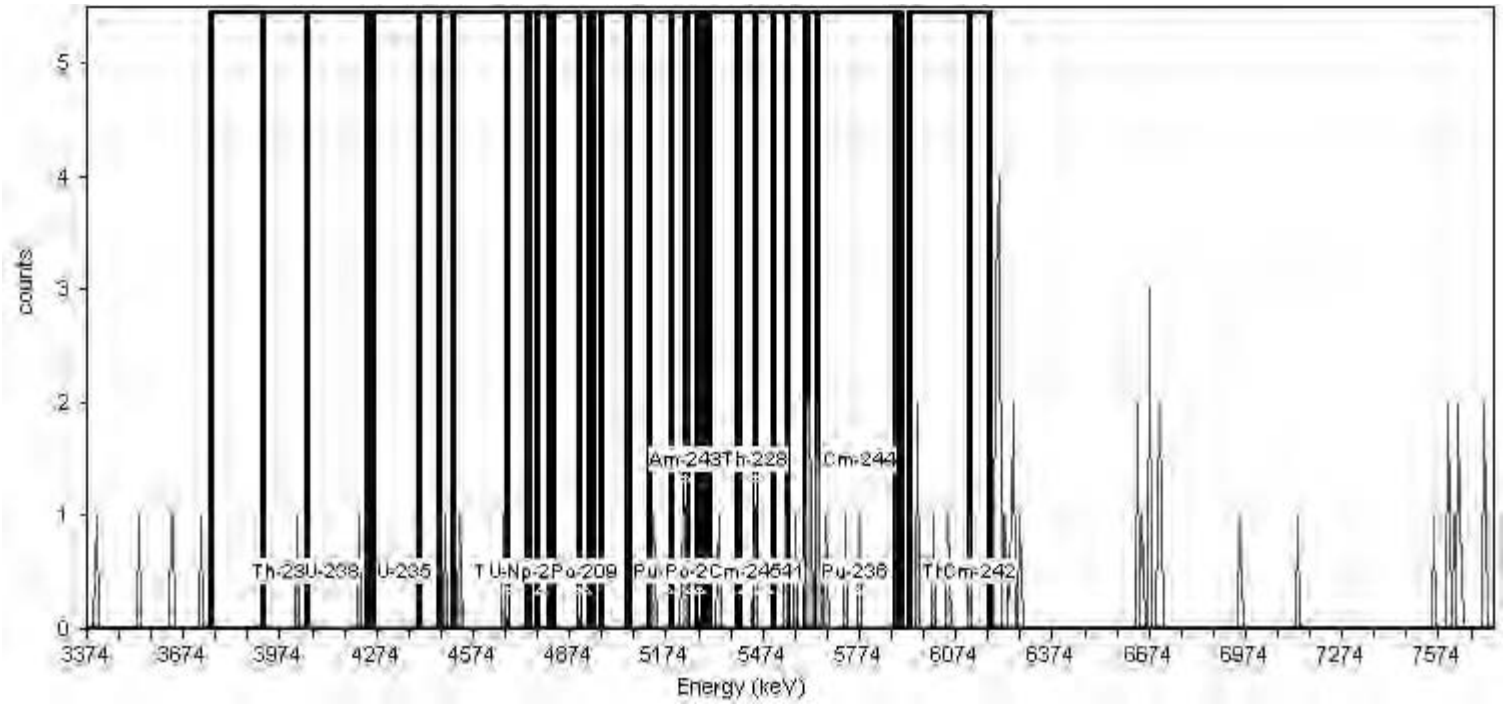
Acquisition

Detector: AV62 , SN: 52-060FF2
Acquisition Start Date: 7/12/2018 1:40:16PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-1368447;AV62-05152018
Calibration Date: 5/15/2018 3:39:22PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.40% +/- 0.23% 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)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	2.00	2.083E-003	1.804E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.68	4.40	4.75	3.00	3.125E-003	2.083E-003
U-234	4.71	4.51	4.82	2.00	2.083E-003	1.804E-003
Pu-242	4.90	4.68	4.95	0.00	0.000E+000	1.473E-003
Th-229	4.86	4.74	5.12	0.00	0.000E+000	1.473E-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	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	4.00	4.167E-003	2.329E-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	3.00	3.125E-003	2.083E-003
Am-241	5.48	5.30	5.60	4.00	4.167E-003	2.329E-003
Cm-245	5.42	5.40	5.45	1.00	1.042E-003	1.473E-003
Pu-236	5.76	5.61	5.89	11.00	1.146E-002	3.608E-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	5.00	5.208E-003	2.552E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:03:45AM 7/13/2018

Sample

Sample Name: ICB;AV69
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

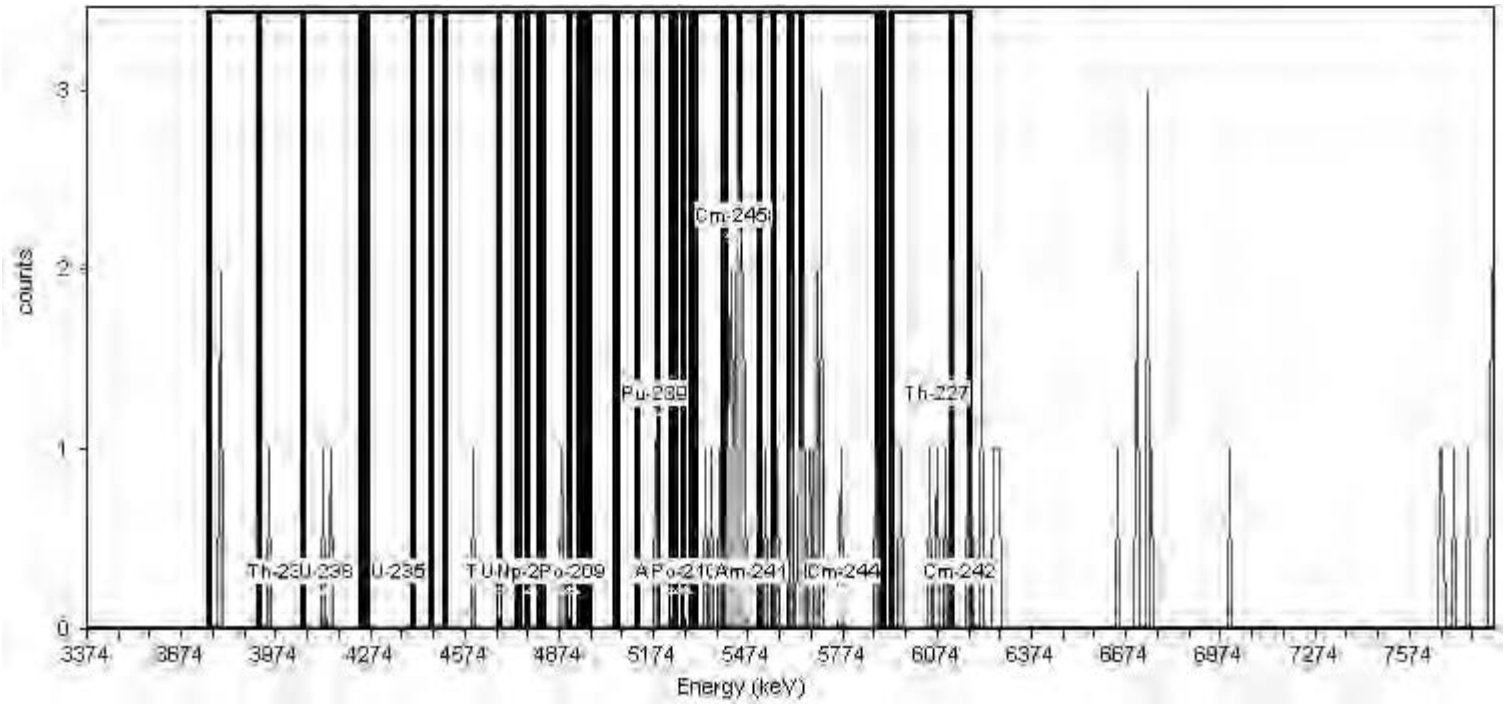
Acquisition

Detector: AV69 , SN: 49-155DD5
Acquisition Start Date: 7/12/2018 1:40:25PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-8874;AV69-05152018
Calibration Date: 5/15/2018 6:39:25PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.43% +/- 0.38% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 71.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	3.00	3.125E-003	2.083E-003
U-238	4.14	3.92	4.24	3.00	3.125E-003	2.083E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.68	4.40	4.75	1.00	1.042E-003	1.473E-003
U-234	4.71	4.51	4.82	1.00	1.042E-003	1.473E-003
Pu-242	4.90	4.68	4.95	1.00	1.042E-003	1.473E-003
Th-229	4.86	4.74	5.12	1.00	1.042E-003	1.473E-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	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	1.00	1.042E-003	1.473E-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	4.00	4.167E-003	2.329E-003
Th-228	5.45	5.19	5.51	16.00	1.667E-002	4.295E-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	17.00	1.771E-002	4.419E-003
Am-241	5.48	5.30	5.60	18.00	1.875E-002	4.541E-003
Cm-245	5.42	5.40	5.45	10.00	1.042E-002	3.455E-003
Pu-236	5.76	5.61	5.89	16.00	1.667E-002	4.295E-003
Cm-244	5.78	5.64	5.90	13.00	1.354E-002	3.898E-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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:04:03AM 7/13/2018

Sample

Sample Name: ICB;AV70
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

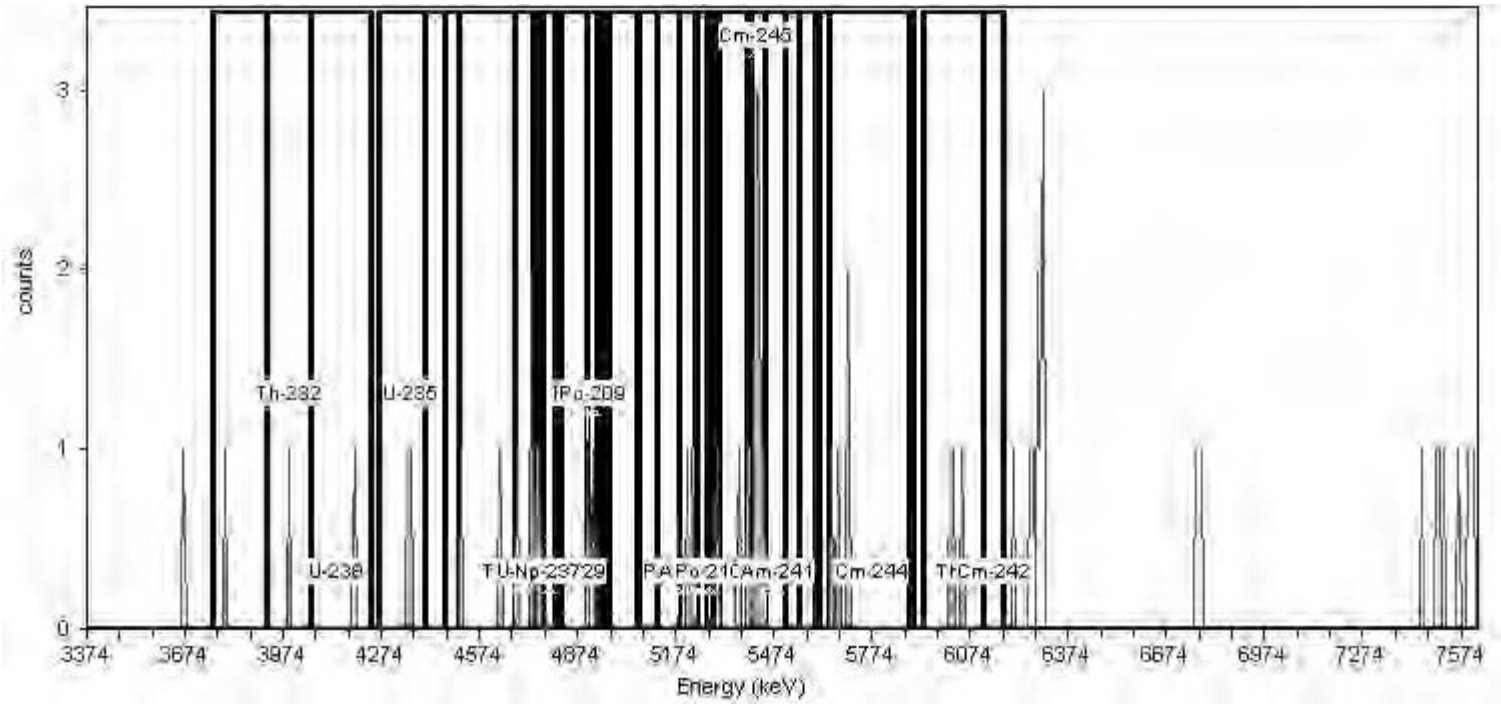
Acquisition

Detector: AV70 , SN: 48-158FF1
Acquisition Start Date: 7/12/2018 1:40:26PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-8877;AV70-05152018
Calibration Date: 5/15/2018 6:36:23PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.40% +/- 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: 55.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	2.00	2.083E-003	1.804E-003
U-238	4.14	3.92	4.24	2.00	2.083E-003	1.804E-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	6.00	6.250E-003	2.756E-003
U-234	4.71	4.51	4.82	7.00	7.292E-003	2.946E-003
Pu-242	4.90	4.68	4.95	7.00	7.292E-003	2.946E-003
Th-229	4.86	4.74	5.12	4.00	4.167E-003	2.329E-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	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	3.00	3.125E-003	2.083E-003
U-232	5.25	5.06	5.40	5.00	5.208E-003	2.552E-003
Th-228	5.45	5.19	5.51	13.00	1.354E-002	3.898E-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	11.00	1.146E-002	3.608E-003
Am-241	5.48	5.30	5.60	11.00	1.146E-002	3.608E-003
Cm-245	5.42	5.40	5.45	9.00	9.375E-003	3.294E-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	4.00	4.167E-003	2.329E-003
Th-227	6.07	5.93	6.18	3.00	3.125E-003	2.083E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:03:54AM 7/13/2018

Sample

Sample Name: ICB;AV71
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

Analyst: 60040

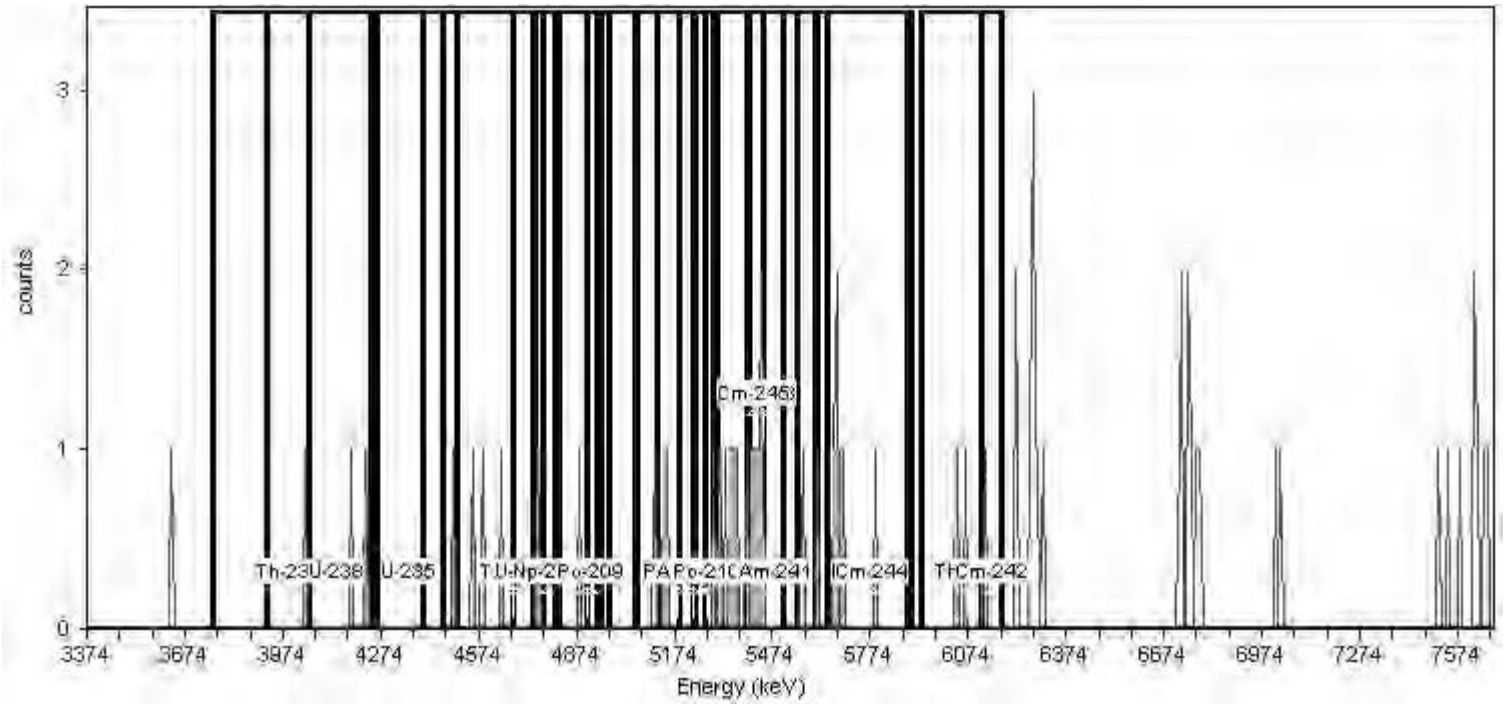
Acquisition

Detector: AV71 , SN: 48-158EE6
Acquisition Start Date: 7/12/2018 1:40:28PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-9520;AV71-05152018
Calibration Date: 5/15/2018 6:36:40PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.00% +/- 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: 69.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-230	4.68	4.40	4.75	4.00	4.167E-003	2.329E-003
U-234	4.71	4.51	4.82	4.00	4.167E-003	2.329E-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	3.00	3.125E-003	2.083E-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	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	4.00	4.167E-003	2.329E-003
U-232	5.25	5.06	5.40	11.00	1.146E-002	3.608E-003
Th-228	5.45	5.19	5.51	15.00	1.563E-002	4.167E-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	15.00	1.563E-002	4.167E-003
Am-241	5.48	5.30	5.60	15.00	1.563E-002	4.167E-003
Cm-245	5.42	5.40	5.45	8.00	8.333E-003	3.125E-003
Pu-236	5.76	5.61	5.89	7.00	7.292E-003	2.946E-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	4.00	4.167E-003	2.329E-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	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	3.00	3.125E-003	2.083E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:04:14AM 7/13/2018

Sample

Sample Name: ICB;AV72
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: July2018
Description:

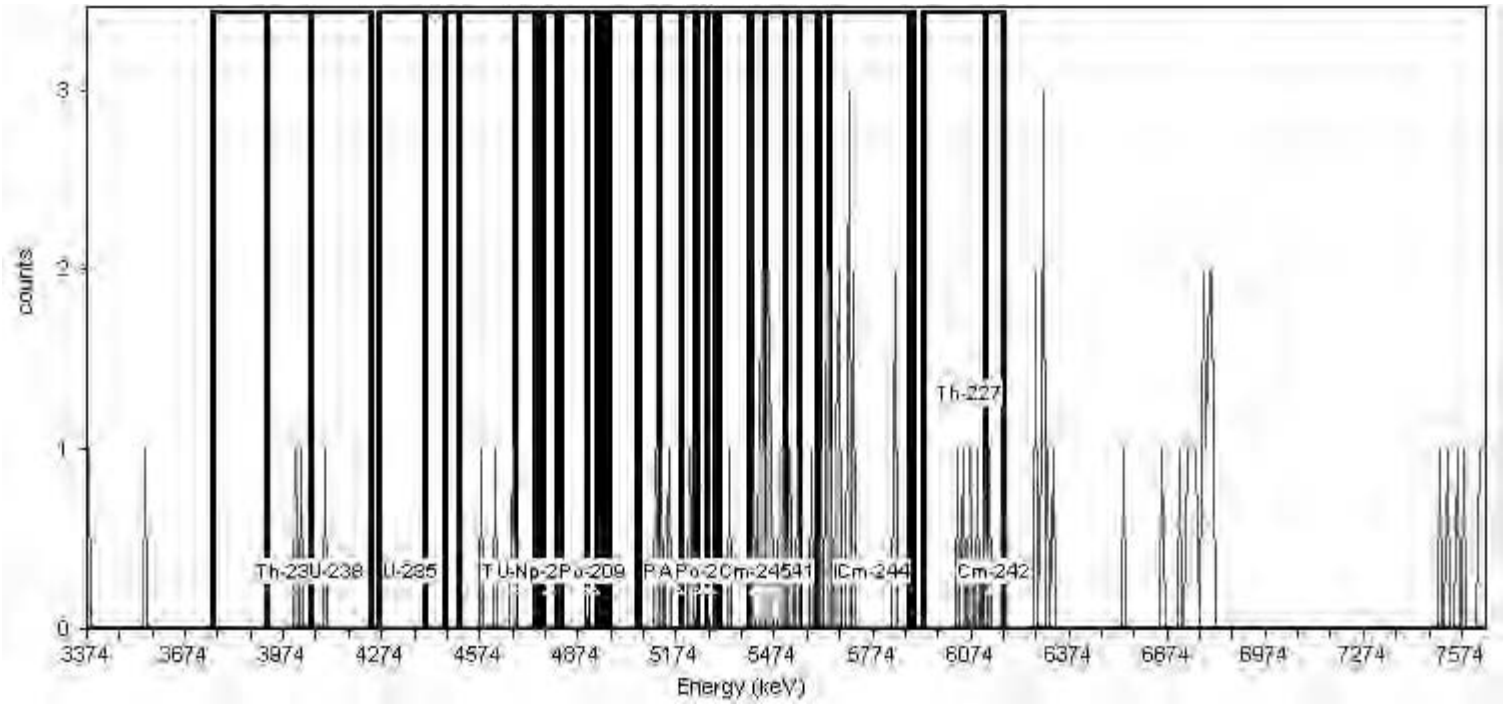
Analyst: 60040

Acquisition

Detector: AV72 , SN: 48-05a21
Acquisition Start Date: 7/12/2018 1:40:30PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-9792;AV72-05152018
Calibration Date: 5/15/2018 6:36:51PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.58% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 80.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-230	4.68	4.40	4.75	3.00	3.125E-003	2.083E-003
U-234	4.71	4.51	4.82	3.00	3.125E-003	2.083E-003
Pu-242	4.90	4.68	4.95	0.00	0.000E+000	1.473E-003
Th-229	4.86	4.74	5.12	1.00	1.042E-003	1.473E-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	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	4.00	4.167E-003	2.329E-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	3.00	3.125E-003	2.083E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-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	5.00	5.208E-003	2.552E-003
Th-228	5.45	5.19	5.51	13.00	1.354E-002	3.898E-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	14.00	1.458E-002	4.034E-003
Am-241	5.48	5.30	5.60	15.00	1.563E-002	4.167E-003
Cm-245	5.42	5.40	5.45	6.00	6.250E-003	2.756E-003
Pu-236	5.76	5.61	5.89	15.00	1.563E-002	4.167E-003
Cm-244	5.78	5.64	5.90	12.00	1.250E-002	3.756E-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	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:41:55PM 7/22/2018

Sample

Sample Name: ICB;AV165
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

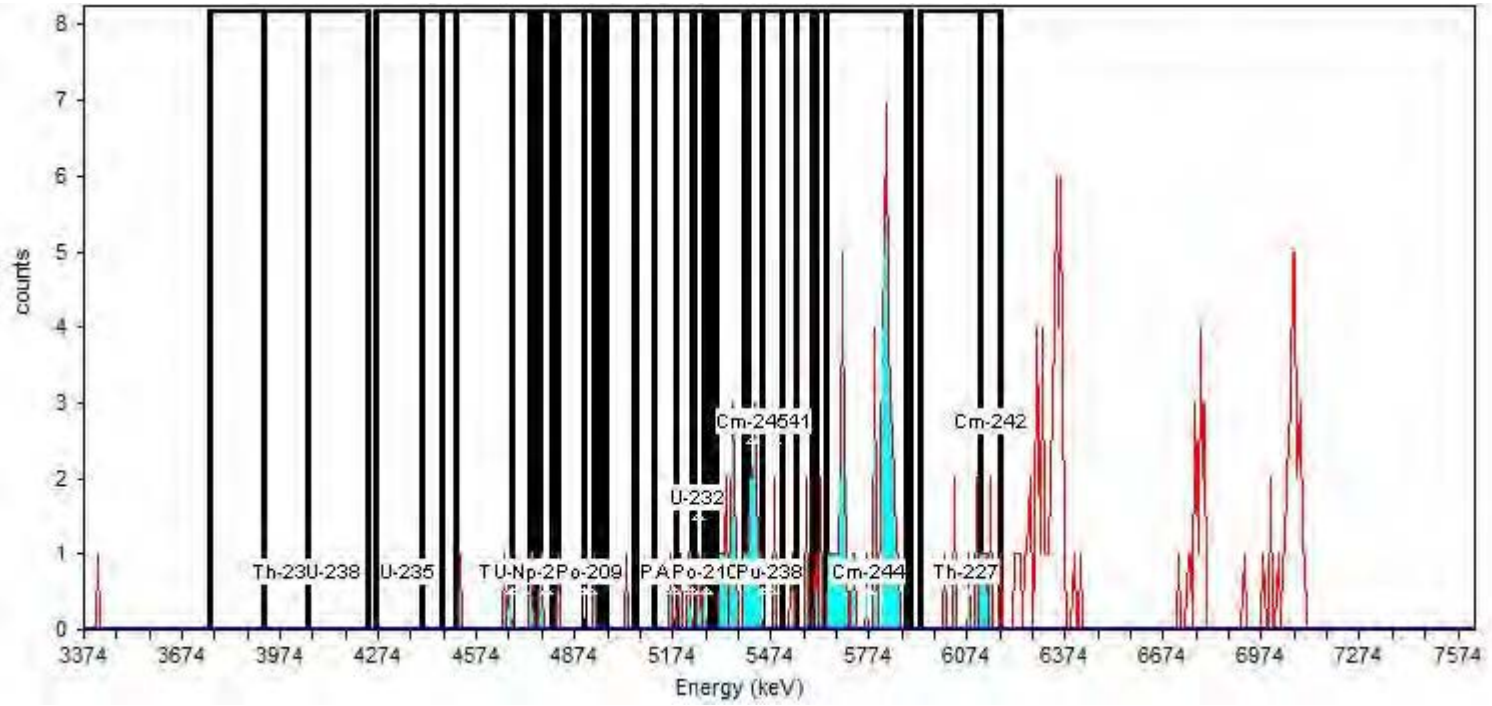
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV165 , SN: 50-112F7
Acquisition Start Date: 7/21/2018 9:28:15PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8876;AV165-20171113
Calibration Date: 11/13/2017 3:16:40PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 194.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-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	4.00	4.167E-003	2.329E-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	1.00	1.042E-003	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	4.00	4.167E-003	2.329E-003
Am-243	5,231.34	5,052.36	5,305.92	5.00	5.208E-003	2.552E-003
U-232	5,253.71	5,059.82	5,402.86	16.00	1.667E-002	4.295E-003
Th-228	5,447.61	5,186.59	5,507.27	26.00	2.708E-002	5.413E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-003
Pu-238	5,469.98	5,268.63	5,552.01	24.00	2.500E-002	5.208E-003
Am-241	5,484.90	5,298.46	5,604.22	25.00	2.604E-002	5.311E-003
Cm-245	5,417.78	5,395.41	5,447.61	11.00	1.146E-002	3.608E-003
Pu-236	5,760.83	5,611.67	5,887.60	52.00	5.417E-002	7.583E-003
Cm-244	5,775.74	5,641.51	5,902.52	49.00	5.104E-002	7.366E-003
Th-227	6,074.04	5,932.35	6,178.45	12.00	1.250E-002	3.756E-003
Cm-242	6,148.62	6,118.79	6,178.45	6.00	6.250E-003	2.756E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:42:04PM 7/22/2018

Sample

Sample Name: ICB;AV166
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

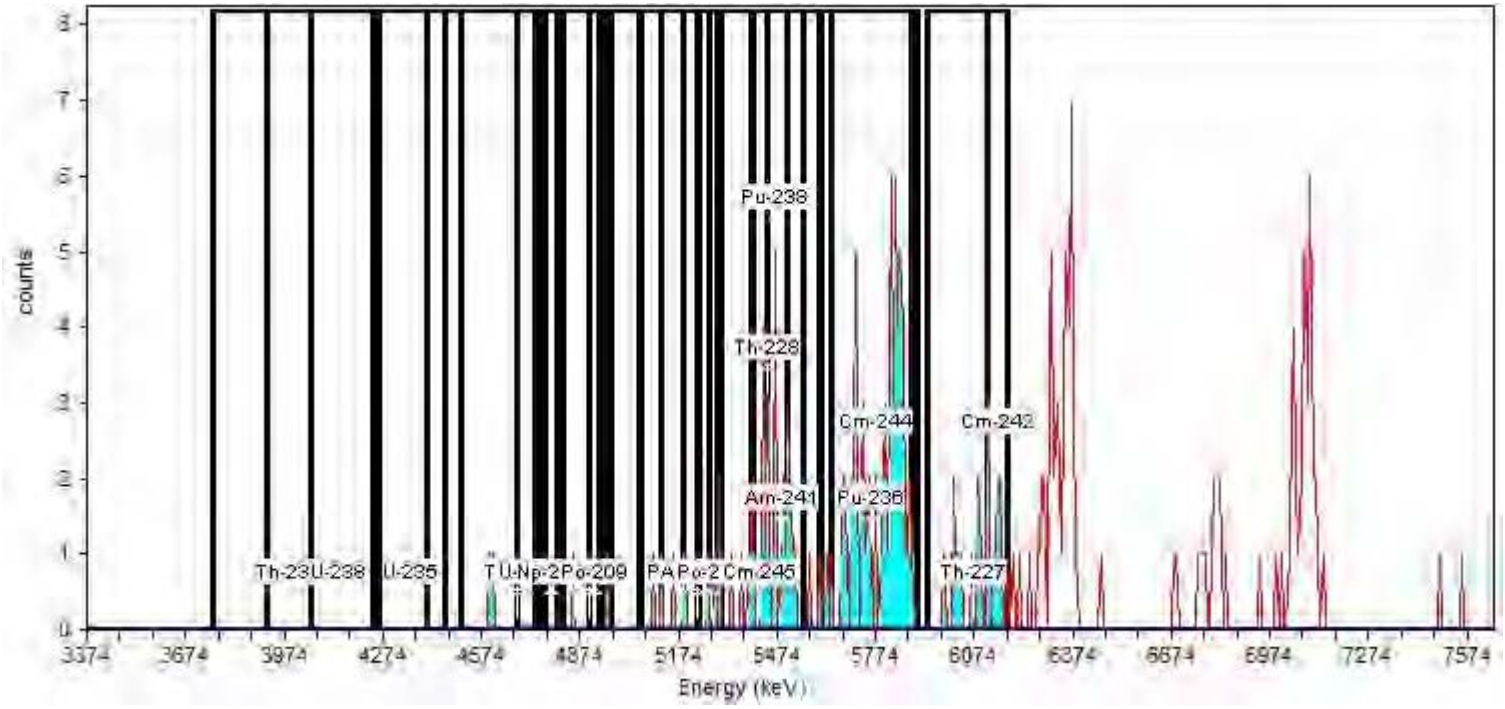
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV166 , SN: 50-112 G1
Acquisition Start Date: 7/21/2018 9:28:15PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8877;AV166-20171113
Calibration Date: 11/13/2017 3:16:45PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 242.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	2.00	2.083E-003	1.804E-003
Pu-242	4,903.21	4,679.48	4,947.95	1.00	1.042E-003	1.473E-003
Th-229	4,858.46	4,739.14	5,119.48	4.00	4.167E-003	2.329E-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	5.00	5.208E-003	2.552E-003
Am-243	5,231.34	5,052.36	5,305.92	9.00	9.375E-003	3.294E-003
U-232	5,253.71	5,059.82	5,402.86	15.00	1.563E-002	4.167E-003
Th-228	5,447.61	5,186.59	5,507.27	34.00	3.542E-002	6.163E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-003
Pu-238	5,469.98	5,268.63	5,552.01	35.00	3.646E-002	6.250E-003
Am-241	5,484.90	5,298.46	5,604.22	36.00	3.750E-002	6.336E-003
Cm-245	5,417.78	5,395.41	5,447.61	12.00	1.250E-002	3.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	67.00	6.979E-002	8.590E-003
Cm-244	5,775.74	5,641.51	5,902.52	65.00	6.771E-002	8.463E-003
Th-227	6,074.04	5,932.35	6,178.45	20.00	2.083E-002	4.774E-003
Cm-242	6,148.62	6,118.79	6,178.45	10.00	1.042E-002	3.455E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:41:59PM 7/22/2018

Sample

Sample Name: ICB;AV167
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

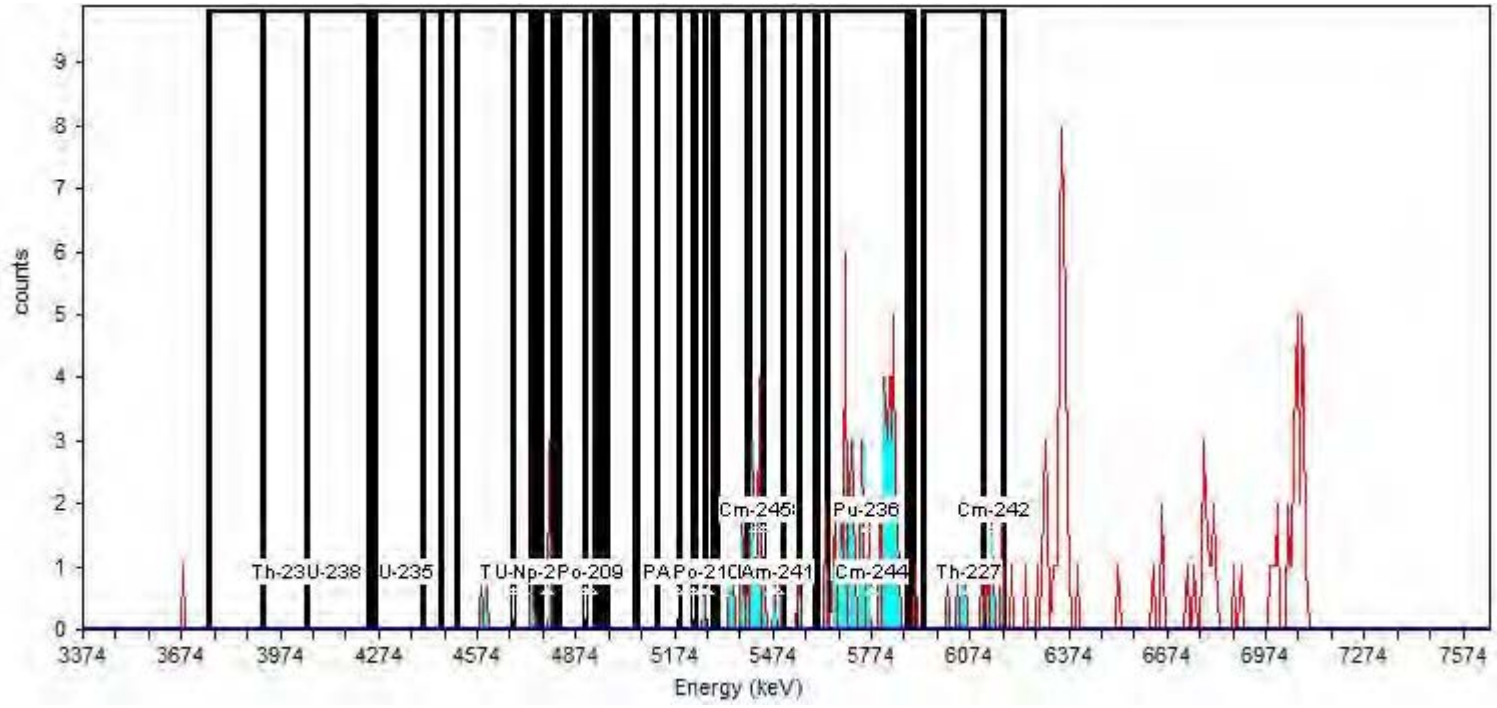
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV167 , SN: 50-112 G3
Acquisition Start Date: 7/21/2018 9:28:15PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-9520;AV167-20171113
Calibration Date: 11/13/2017 3:16:50PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 173.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	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	6.00	6.250E-003	2.756E-003
Pu-242	4,903.21	4,679.48	4,947.95	4.00	4.167E-003	2.329E-003
Th-229	4,858.46	4,739.14	5,119.48	4.00	4.167E-003	2.329E-003
Np-237	4,783.89	4,768.97	4,806.26	3.00	3.125E-003	2.083E-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	0.00	0.000E+000	1.473E-003
Am-243	5,231.34	5,052.36	5,305.92	1.00	1.042E-003	1.473E-003
U-232	5,253.71	5,059.82	5,402.86	6.00	6.250E-003	2.756E-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	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	18.00	1.875E-002	4.541E-003
Am-241	5,484.90	5,298.46	5,604.22	18.00	1.875E-002	4.541E-003
Cm-245	5,417.78	5,395.41	5,447.61	11.00	1.146E-002	3.608E-003
Pu-236	5,760.83	5,611.67	5,887.60	51.00	5.313E-002	7.512E-003
Cm-244	5,775.74	5,641.51	5,902.52	49.00	5.104E-002	7.366E-003
Th-227	6,074.04	5,932.35	6,178.45	11.00	1.146E-002	3.608E-003
Cm-242	6,148.62	6,118.79	6,178.45	6.00	6.250E-003	2.756E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:42:22PM 7/22/2018

Sample

Sample Name: ICB;AV170
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

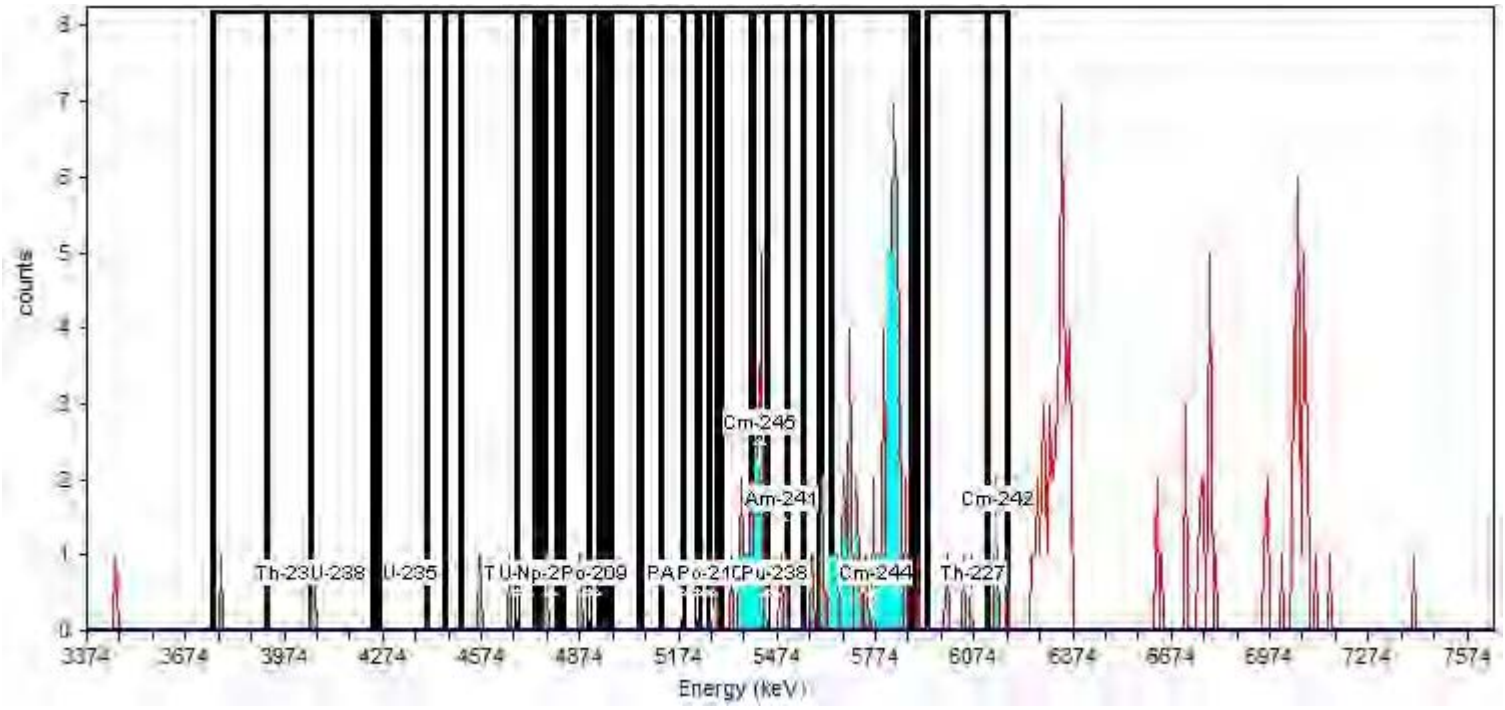
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV170 , SN: 50-112 G7
Acquisition Start Date: 7/21/2018 9:28:15PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9793;AV170-20171113
Calibration Date: 11/13/2017 3:17:08PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 201.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-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	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	3.00	3.125E-003	2.083E-003
Pu-242	4,903.21	4,679.48	4,947.95	2.00	2.083E-003	1.804E-003
Th-229	4,858.46	4,739.14	5,119.48	2.00	2.083E-003	1.804E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	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	0.00	0.000E+000	1.473E-003
Am-243	5,231.34	5,052.36	5,305.92	1.00	1.042E-003	1.473E-003
U-232	5,253.71	5,059.82	5,402.86	11.00	1.146E-002	3.608E-003
Th-228	5,447.61	5,186.59	5,507.27	24.00	2.500E-002	5.208E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	24.00	2.500E-002	5.208E-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	14.00	1.458E-002	4.034E-003
Pu-236	5,760.83	5,611.67	5,887.60	63.00	6.563E-002	8.333E-003
Cm-244	5,775.74	5,641.51	5,902.52	61.00	6.354E-002	8.202E-003
Th-227	6,074.04	5,932.35	6,178.45	7.00	7.292E-003	2.946E-003
Cm-242	6,148.62	6,118.79	6,178.45	4.00	4.167E-003	2.329E-003

Sample

Sample Name: ICB;AV175
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

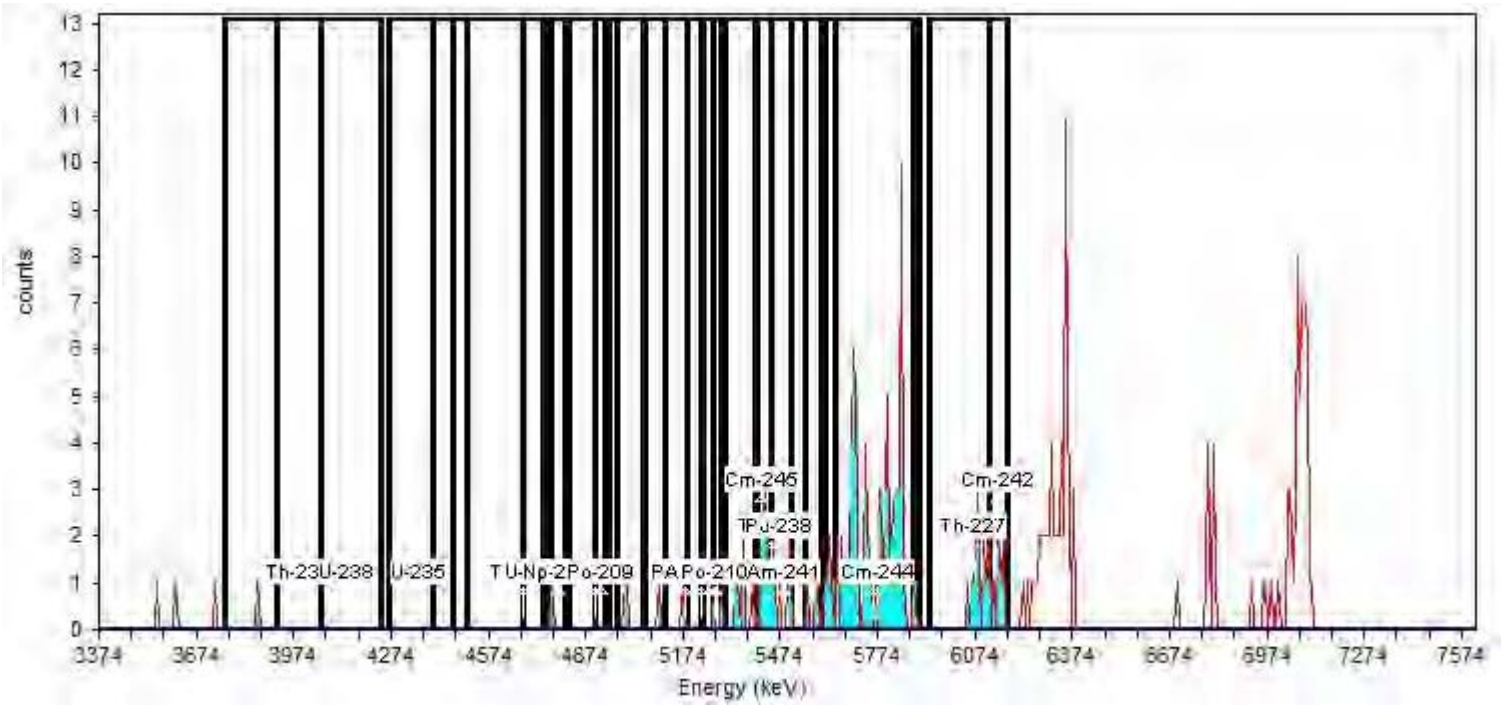
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV175 , SN: 50-117H1
Acquisition Start Date: 7/21/2018 9:28:16PM
Live Time: 960.00 min.
Real Time: 960.09 min.
Calibration Name: IC-9885;AV175-20171113
Calibration Date: 11/13/2017 3:17:24PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 234.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	0.00	0.000E+000	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	1.00	1.042E-003	1.473E-003
Pu-242	4,903.21	4,679.48	4,947.95	1.00	1.042E-003	1.473E-003
Th-229	4,858.46	4,739.14	5,119.48	4.00	4.167E-003	2.329E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	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	4.00	4.167E-003	2.329E-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	9.00	9.375E-003	3.294E-003
Th-228	5,447.61	5,186.59	5,507.27	21.00	2.188E-002	4.886E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-003
Pu-238	5,469.98	5,268.63	5,552.01	21.00	2.188E-002	4.886E-003
Am-241	5,484.90	5,298.46	5,604.22	22.00	2.292E-002	4.996E-003
Cm-245	5,417.78	5,395.41	5,447.61	8.00	8.333E-003	3.125E-003
Pu-236	5,760.83	5,611.67	5,887.60	72.00	7.500E-002	8.900E-003
Cm-244	5,775.74	5,641.51	5,902.52	67.00	6.979E-002	8.590E-003
Th-227	6,074.04	5,932.35	6,178.45	18.00	1.875E-002	4.541E-003
Cm-242	6,148.62	6,118.79	6,178.45	8.00	8.333E-003	3.125E-003

Sample

Sample Name: ICB;AV187
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

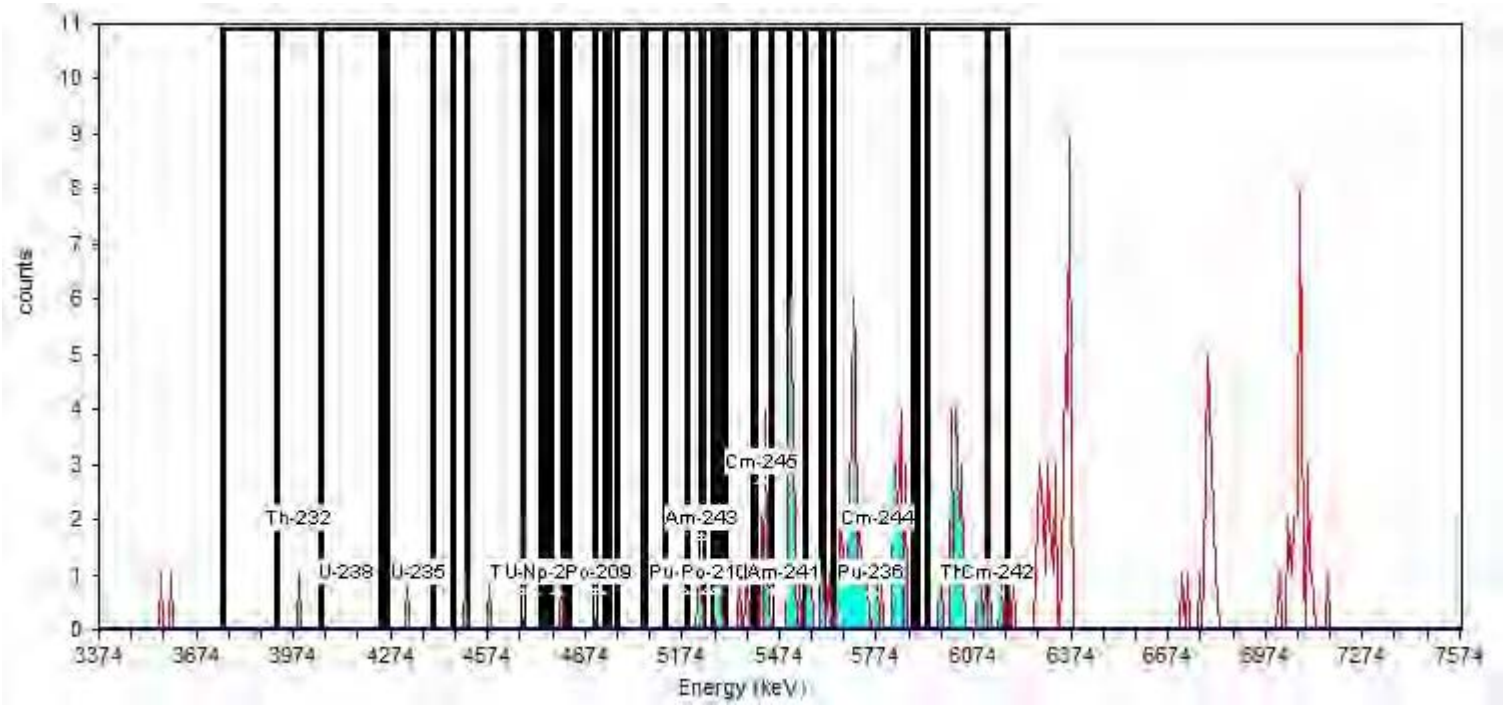
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV187 , SN: 50-119I2
Acquisition Start Date: 7/21/2018 9:28:17PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8875;AV187-20171113
Calibration Date: 11/14/2017 8:46:54AM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 191.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-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	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	2.00	2.083E-003	1.804E-003
Pu-242	4,903.21	4,679.48	4,947.95	1.00	1.042E-003	1.473E-003
Th-229	4,858.46	4,739.14	5,119.48	1.00	1.042E-003	1.473E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	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	4.00	4.167E-003	2.329E-003
U-232	5,253.71	5,059.82	5,402.86	6.00	6.250E-003	2.756E-003
Th-228	5,447.61	5,186.59	5,507.27	20.00	2.083E-002	4.774E-003
Po-210	5,276.09	5,231.34	5,291.00	3.00	3.125E-003	2.083E-003
Pu-238	5,469.98	5,268.63	5,552.01	24.00	2.500E-002	5.208E-003
Am-241	5,484.90	5,298.46	5,604.22	26.00	2.708E-002	5.413E-003
Cm-245	5,417.78	5,395.41	5,447.61	7.00	7.292E-003	2.946E-003
Pu-236	5,760.83	5,611.67	5,887.60	45.00	4.688E-002	7.065E-003
Cm-244	5,775.74	5,641.51	5,902.52	43.00	4.479E-002	6.910E-003
Th-227	6,074.04	5,932.35	6,178.45	23.00	2.396E-002	5.103E-003
Cm-242	6,148.62	6,118.79	6,178.45	3.00	3.125E-003	2.083E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:17:10PM 7/21/2018

Sample

Sample Name: ICB;AV189
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

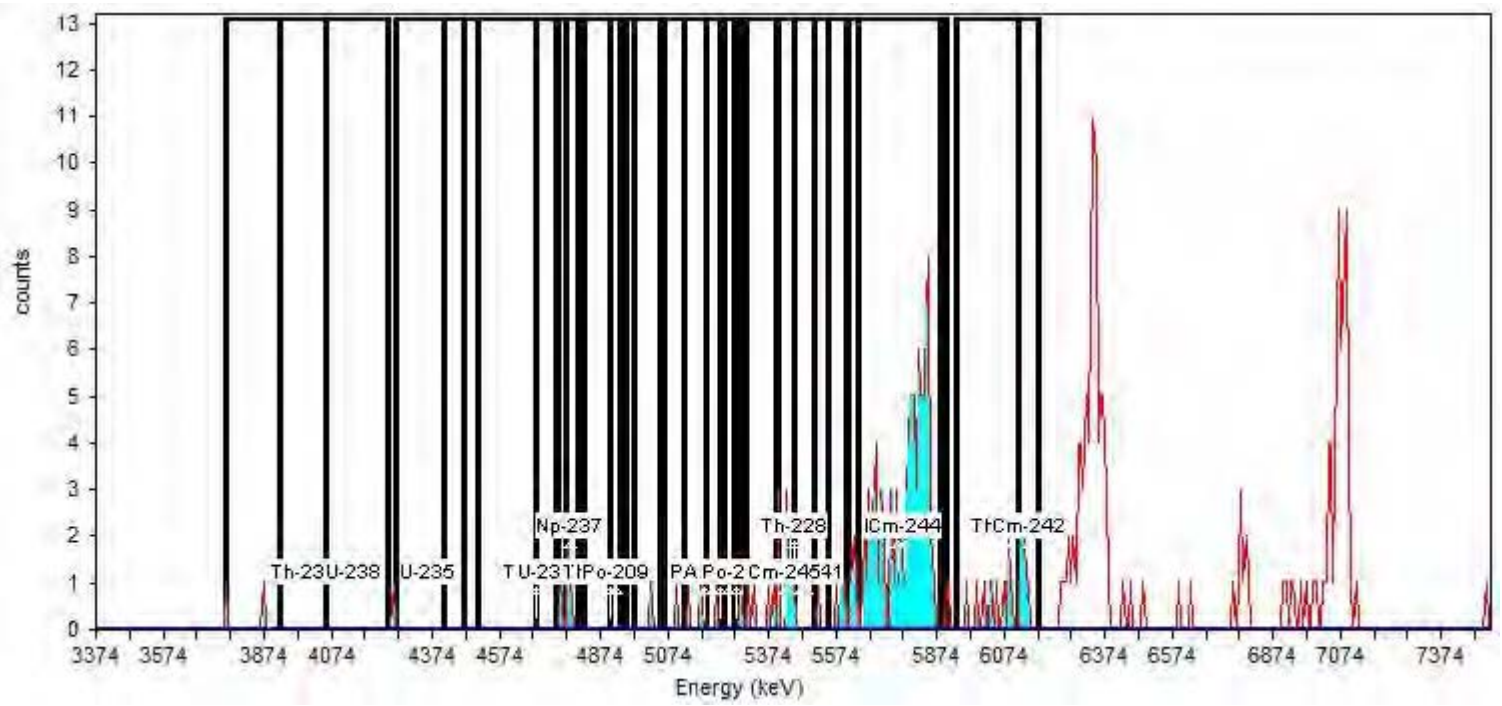
Batch

Batch Name: July2018
Description:

Acquisition

Detector: AV189 , SN: 50-112A3
Acquisition Start Date: 7/20/2018 9:02:37PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8877;AV189-20171113
Calibration Date: 11/14/2017 8:46:59AM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 289.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	0.00	0.000E+000	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	4.00	4.167E-003	2.329E-003
Th-229	4,858.46	4,739.14	5,119.48	6.00	6.250E-003	2.756E-003
Np-237	4,783.89	4,768.97	4,806.26	3.00	3.125E-003	2.083E-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	5.00	5.208E-003	2.552E-003
Am-243	5,231.34	5,052.36	5,305.92	5.00	5.208E-003	2.552E-003
U-232	5,253.71	5,059.82	5,402.86	12.00	1.250E-002	3.756E-003
Th-228	5,447.61	5,186.59	5,507.27	15.00	1.563E-002	4.167E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	15.00	1.563E-002	4.167E-003
Am-241	5,484.90	5,298.46	5,604.22	17.00	1.771E-002	4.419E-003
Cm-245	5,417.78	5,395.41	5,447.61	9.00	9.375E-003	3.294E-003
Pu-236	5,760.83	5,611.67	5,887.60	90.00	9.375E-002	9.937E-003
Cm-244	5,775.74	5,641.51	5,902.52	87.00	9.062E-002	9.772E-003
Th-227	6,074.04	5,932.35	6,178.45	15.00	1.563E-002	4.167E-003
Cm-242	6,148.62	6,118.79	6,178.45	6.00	6.250E-003	2.756E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:26PM 7/22/2018

Sample

Sample Name: ICB;AV190
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

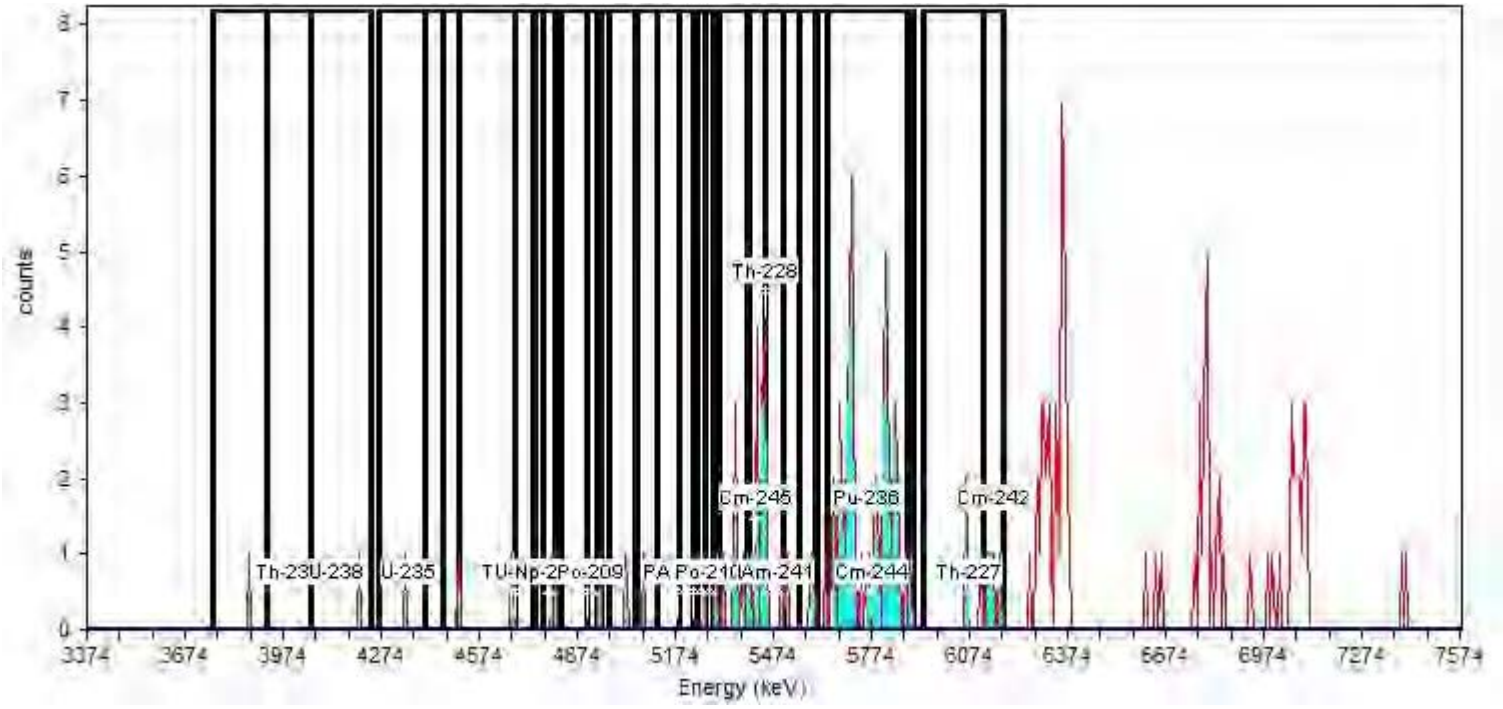
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV190 , SN: 50-119I7
Acquisition Start Date: 7/21/2018 9:28:17PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9520;AV190-20171113
Calibration Date: 11/14/2017 8:47:05AM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 180.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-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	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	3.00	3.125E-003	2.083E-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	2.00	2.083E-003	1.804E-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	3.00	3.125E-003	2.083E-003
U-232	5,253.71	5,059.82	5,402.86	12.00	1.250E-002	3.756E-003
Th-228	5,447.61	5,186.59	5,507.27	25.00	2.604E-002	5.311E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	25.00	2.604E-002	5.311E-003
Am-241	5,484.90	5,298.46	5,604.22	27.00	2.812E-002	5.512E-003
Cm-245	5,417.78	5,395.41	5,447.61	14.00	1.458E-002	4.034E-003
Pu-236	5,760.83	5,611.67	5,887.60	51.00	5.313E-002	7.512E-003
Cm-244	5,775.74	5,641.51	5,902.52	51.00	5.313E-002	7.512E-003
Th-227	6,074.04	5,932.35	6,178.45	7.00	7.292E-003	2.946E-003
Cm-242	6,148.62	6,118.79	6,178.45	4.00	4.167E-003	2.329E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:42:44PM 7/22/2018

Sample

Sample Name: ICB;AV191
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

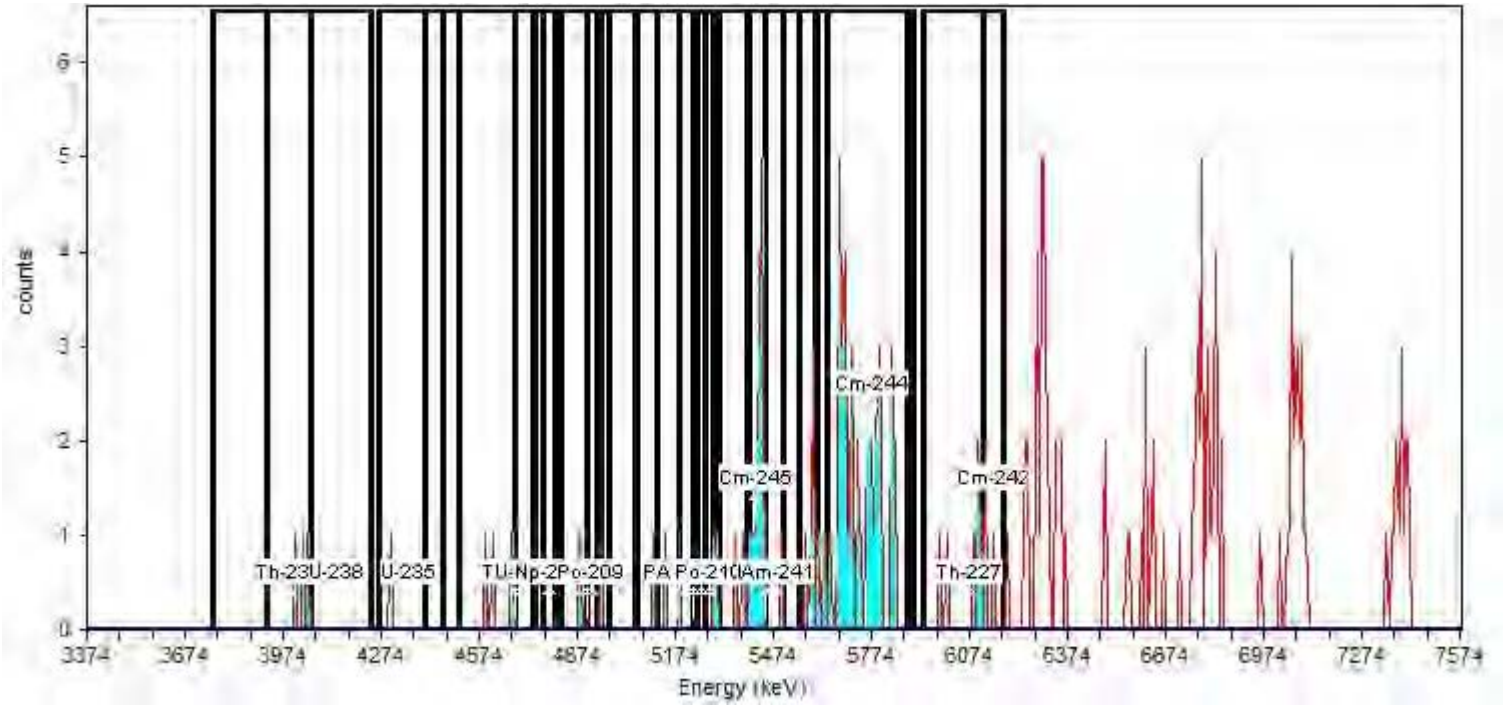
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV191 , SN: 50-112A2
Acquisition Start Date: 7/21/2018 9:28:18PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8879;AV191-20171113
Calibration Date: 11/14/2017 8:47:10AM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 195.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	3.00	3.125E-003	2.083E-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	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	3.00	3.125E-003	2.083E-003
Pu-242	4,903.21	4,679.48	4,947.95	2.00	2.083E-003	1.804E-003
Th-229	4,858.46	4,739.14	5,119.48	3.00	3.125E-003	2.083E-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	3.00	3.125E-003	2.083E-003
Am-243	5,231.34	5,052.36	5,305.92	5.00	5.208E-003	2.552E-003
U-232	5,253.71	5,059.82	5,402.86	8.00	8.333E-003	3.125E-003
Th-228	5,447.61	5,186.59	5,507.27	19.00	1.979E-002	4.658E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	18.00	1.875E-002	4.541E-003
Am-241	5,484.90	5,298.46	5,604.22	22.00	2.292E-002	4.996E-003
Cm-245	5,417.78	5,395.41	5,447.61	13.00	1.354E-002	3.898E-003
Pu-236	5,760.83	5,611.67	5,887.60	47.00	4.896E-002	7.217E-003
Cm-244	5,775.74	5,641.51	5,902.52	44.00	4.583E-002	6.988E-003
Th-227	6,074.04	5,932.35	6,178.45	9.00	9.375E-003	3.294E-003
Cm-242	6,148.62	6,118.79	6,178.45	3.00	3.125E-003	2.083E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:42:30PM 7/22/2018

Sample

Sample Name: ICB;AV192
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

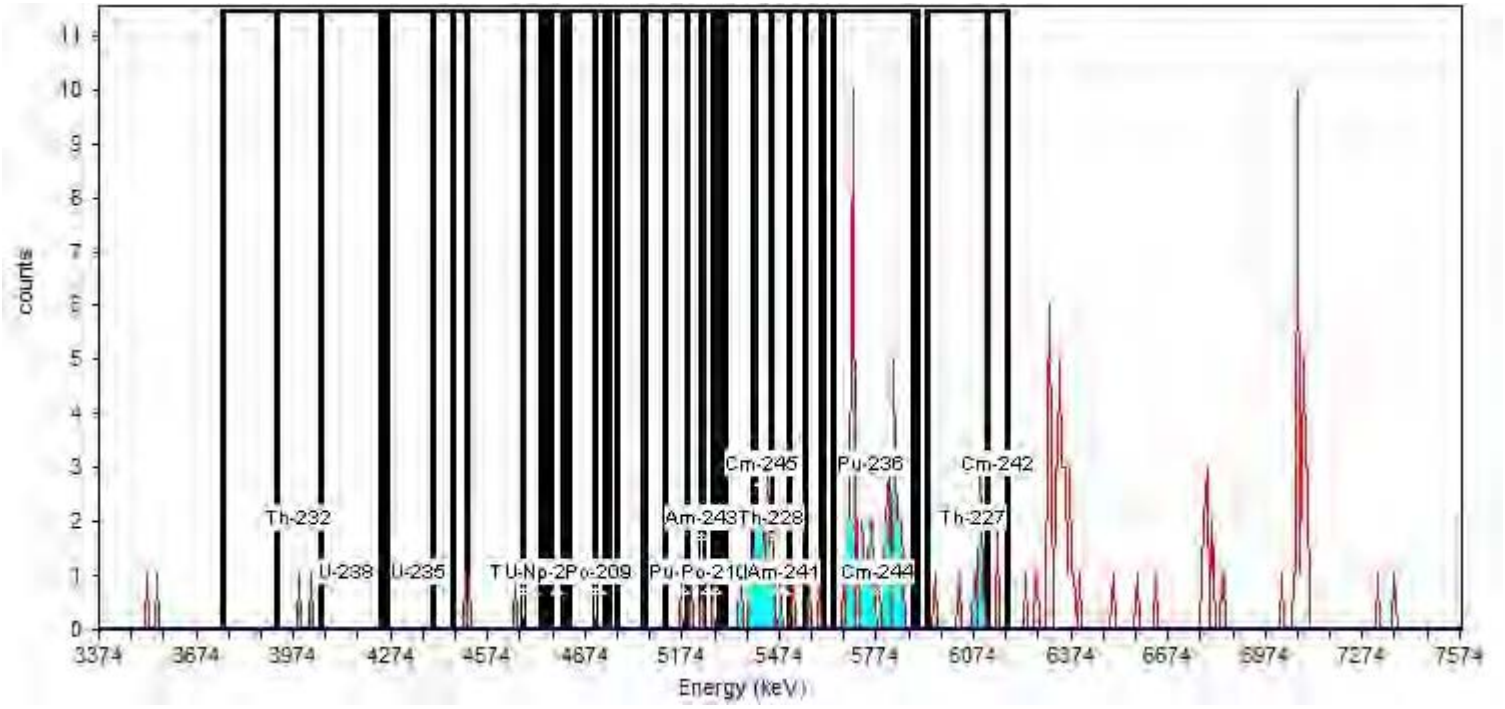
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV192 , SN: 50-119J7
Acquisition Start Date: 7/21/2018 9:28:18PM
Live Time: 960.00 min.
Real Time: 960.04 min.
Calibration Name: IC-9792;AV192-20171113
Calibration Date: 11/14/2017 8:47:16AM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 169.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	2.00	2.083E-003	1.804E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	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	2.00	2.083E-003	1.804E-003
Pu-242	4,903.21	4,679.48	4,947.95	0.00	0.000E+000	1.473E-003
Th-229	4,858.46	4,739.14	5,119.48	0.00	0.000E+000	1.473E-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	3.00	3.125E-003	2.083E-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	11.00	1.146E-002	3.608E-003
Th-228	5,447.61	5,186.59	5,507.27	24.00	2.500E-002	5.208E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-003
Pu-238	5,469.98	5,268.63	5,552.01	23.00	2.396E-002	5.103E-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	14.00	1.458E-002	4.034E-003
Pu-236	5,760.83	5,611.67	5,887.60	46.00	4.792E-002	7.141E-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	10.00	1.042E-002	3.455E-003
Cm-242	6,148.62	6,118.79	6,178.45	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:32PM 7/22/2018

Sample

Sample Name: ICB;AV194
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

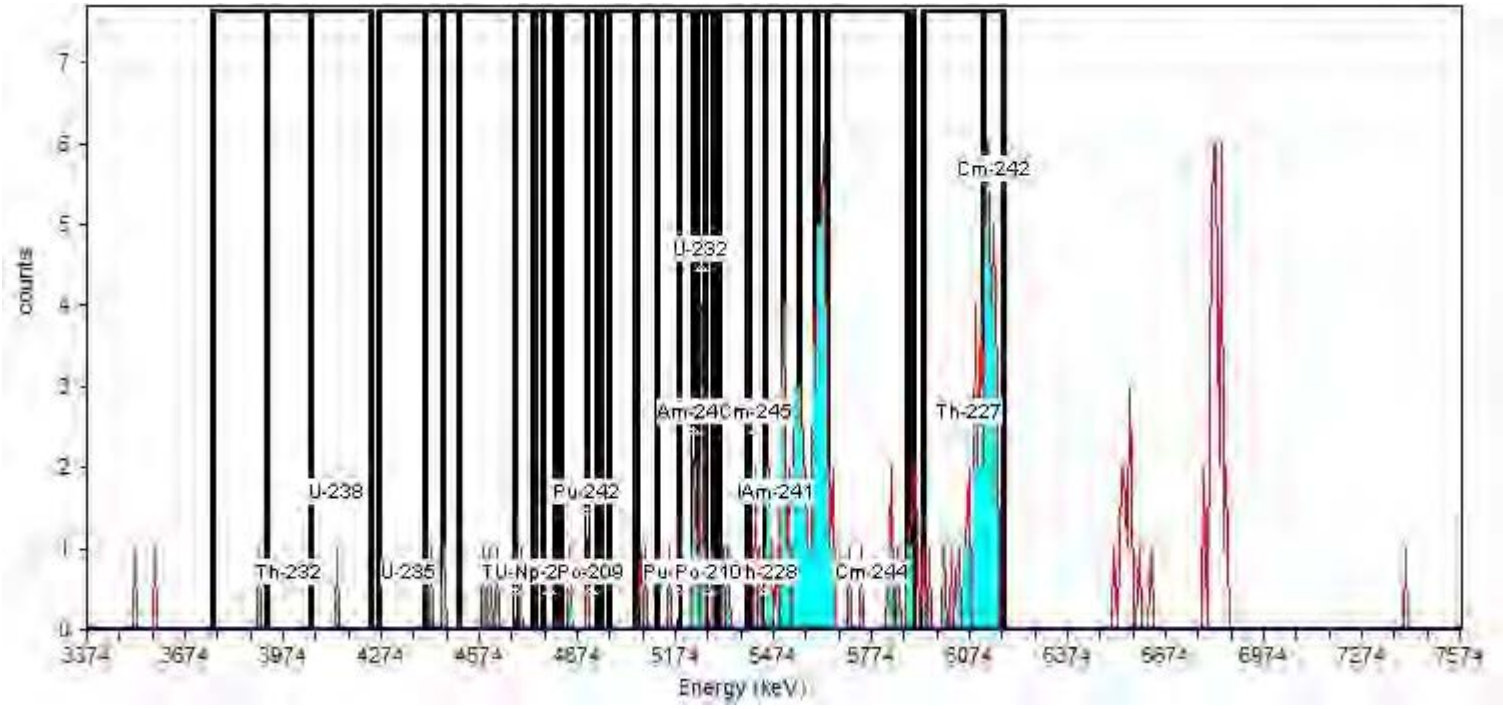
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV194 , SN: 50-119J2
Acquisition Start Date: 7/21/2018 9:28:18PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9794;AV194-20171113a
Calibration Date: 11/14/2017 8:47:42AM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 209.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-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	2.00	2.083E-003	1.804E-003
Th-230	4,679.48	4,403.55	4,746.60	6.00	6.250E-003	2.756E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	3.00	3.125E-003	2.083E-003
Th-229	4,858.46	4,739.14	5,119.48	4.00	4.167E-003	2.329E-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	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	6.00	6.250E-003	2.756E-003
Am-243	5,231.34	5,052.36	5,305.92	13.00	1.354E-002	3.898E-003
U-232	5,253.71	5,059.82	5,402.86	15.00	1.563E-002	4.167E-003
Th-228	5,447.61	5,186.59	5,507.27	28.00	2.917E-002	5.610E-003
Po-210	5,276.09	5,231.34	5,291.00	10.00	1.042E-002	3.455E-003
Pu-238	5,469.98	5,268.63	5,552.01	30.00	3.125E-002	5.800E-003
Am-241	5,484.90	5,298.46	5,604.22	45.00	4.688E-002	7.065E-003
Cm-245	5,417.78	5,395.41	5,447.61	3.00	3.125E-003	2.083E-003
Pu-236	5,760.83	5,611.67	5,887.60	34.00	3.542E-002	6.163E-003
Cm-244	5,775.74	5,641.51	5,902.52	16.00	1.667E-002	4.295E-003
Th-227	6,074.04	5,932.35	6,178.45	51.00	5.313E-002	7.512E-003
Cm-242	6,148.62	6,118.79	6,178.45	29.00	3.021E-002	5.705E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:28PM 7/22/2018

Sample

Sample Name: ICB;AV198
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

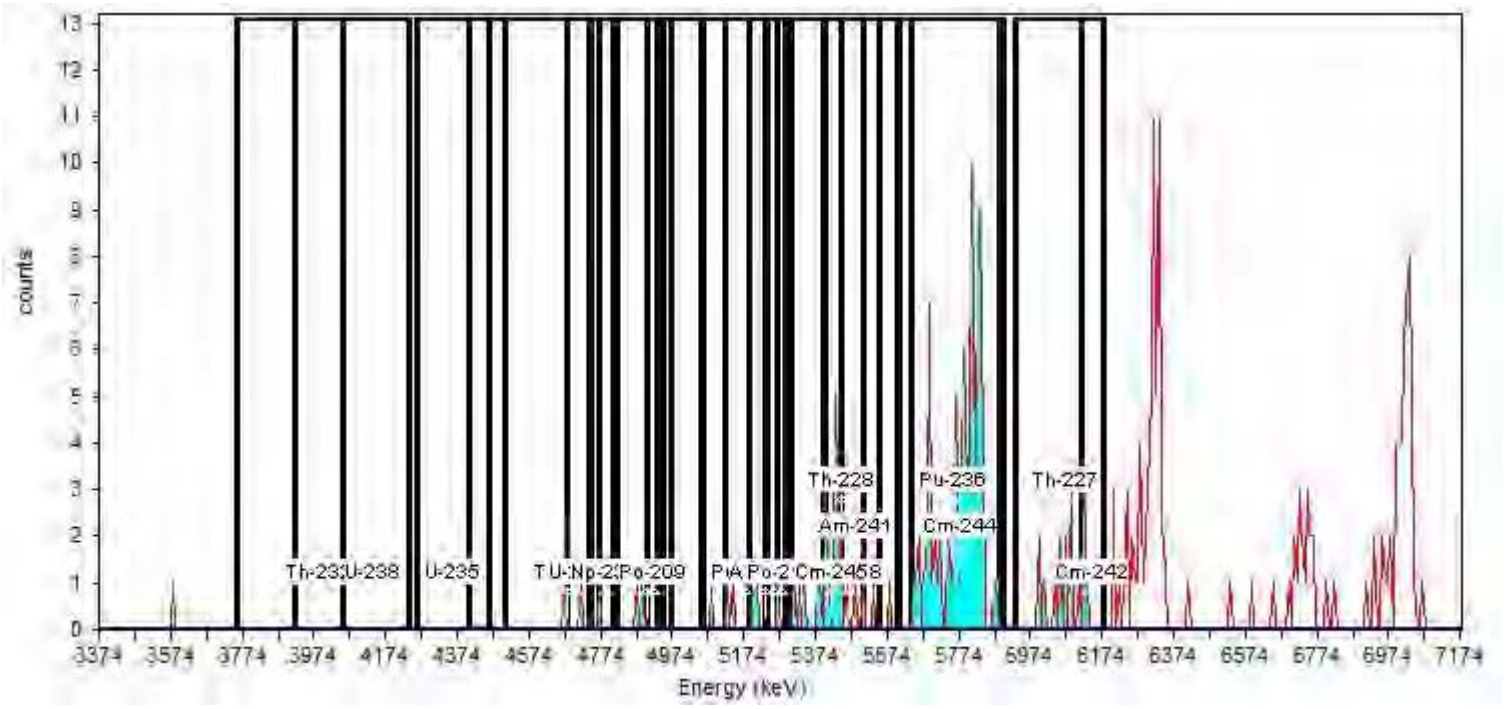
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV198 , SN: 50-117AA7
Acquisition Start Date: 7/21/2018 9:28:19PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9885;AV198-20171113a
Calibration Date: 11/14/2017 8:47:47AM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 265.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	3.00	3.125E-003	2.083E-003
Pu-242	4,903.21	4,679.48	4,947.95	4.00	4.167E-003	2.329E-003
Th-229	4,858.46	4,739.14	5,119.48	4.00	4.167E-003	2.329E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	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	5.00	5.208E-003	2.552E-003
Am-243	5,231.34	5,052.36	5,305.92	6.00	6.250E-003	2.756E-003
U-232	5,253.71	5,059.82	5,402.86	14.00	1.458E-002	4.034E-003
Th-228	5,447.61	5,186.59	5,507.27	25.00	2.604E-002	5.311E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	24.00	2.500E-002	5.208E-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	14.00	1.458E-002	4.034E-003
Pu-236	5,760.83	5,611.67	5,887.60	83.00	8.646E-002	9.547E-003
Cm-244	5,775.74	5,641.51	5,902.52	83.00	8.646E-002	9.547E-003
Th-227	6,074.04	5,932.35	6,178.45	16.00	1.667E-002	4.295E-003
Cm-242	6,148.62	6,118.79	6,178.45	4.00	4.167E-003	2.329E-003

Sample

Sample Name: ICB;AV203
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

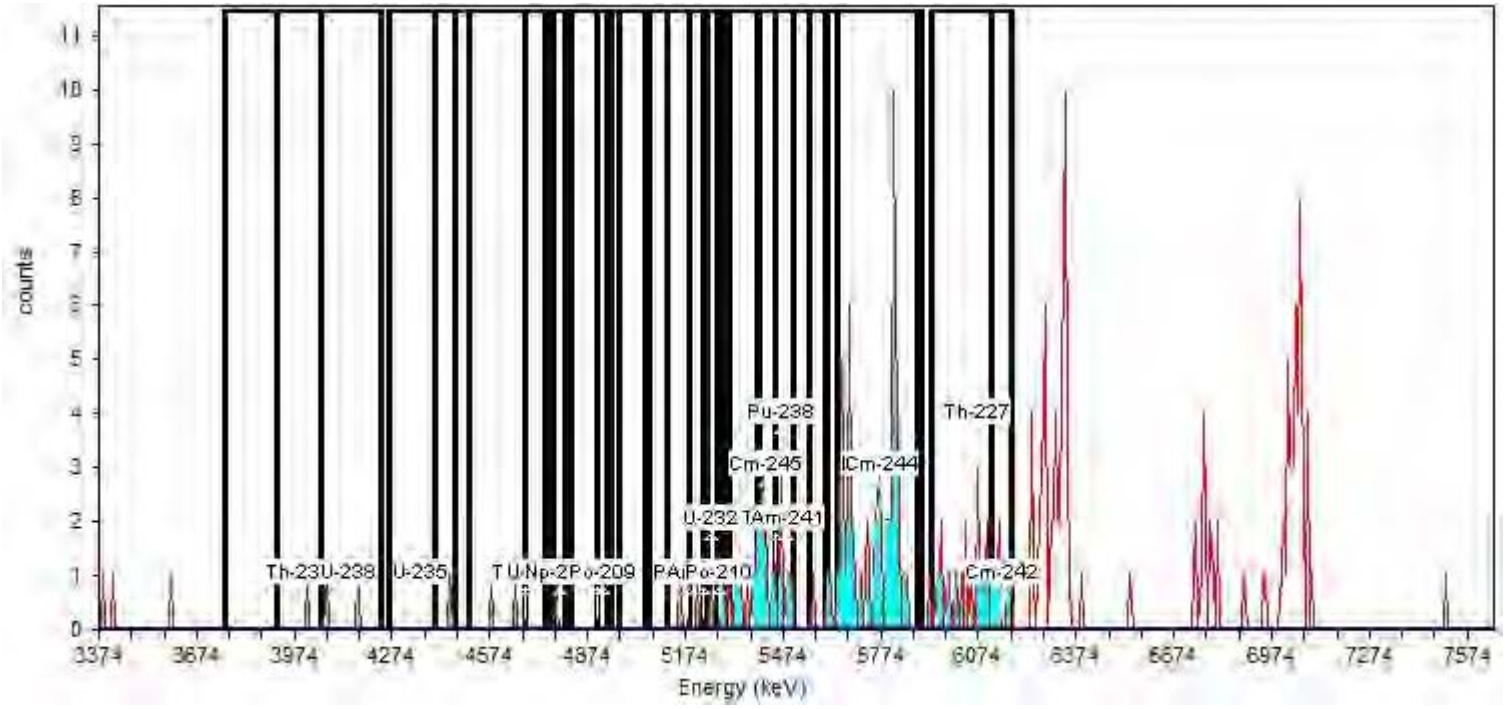
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV203 , SN: 50-117J4
Acquisition Start Date: 7/21/2018 9:28:20PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8876;AV203-20171114
Calibration Date: 11/14/2017 12:01:12PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 249.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	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	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	3.00	3.125E-003	2.083E-003
Pu-242	4,903.21	4,679.48	4,947.95	1.00	1.042E-003	1.473E-003
Th-229	4,858.46	4,739.14	5,119.48	1.00	1.042E-003	1.473E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	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	6.00	6.250E-003	2.756E-003
U-232	5,253.71	5,059.82	5,402.86	16.00	1.667E-002	4.295E-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	3.00	3.125E-003	2.083E-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	27.00	2.812E-002	5.512E-003
Cm-245	5,417.78	5,395.41	5,447.61	12.00	1.250E-002	3.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	63.00	6.563E-002	8.333E-003
Cm-244	5,775.74	5,641.51	5,902.52	61.00	6.354E-002	8.202E-003
Th-227	6,074.04	5,932.35	6,178.45	27.00	2.812E-002	5.512E-003
Cm-242	6,148.62	6,118.79	6,178.45	8.00	8.333E-003	3.125E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:42:58PM 7/22/2018

Sample

Sample Name: ICB;AV206
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

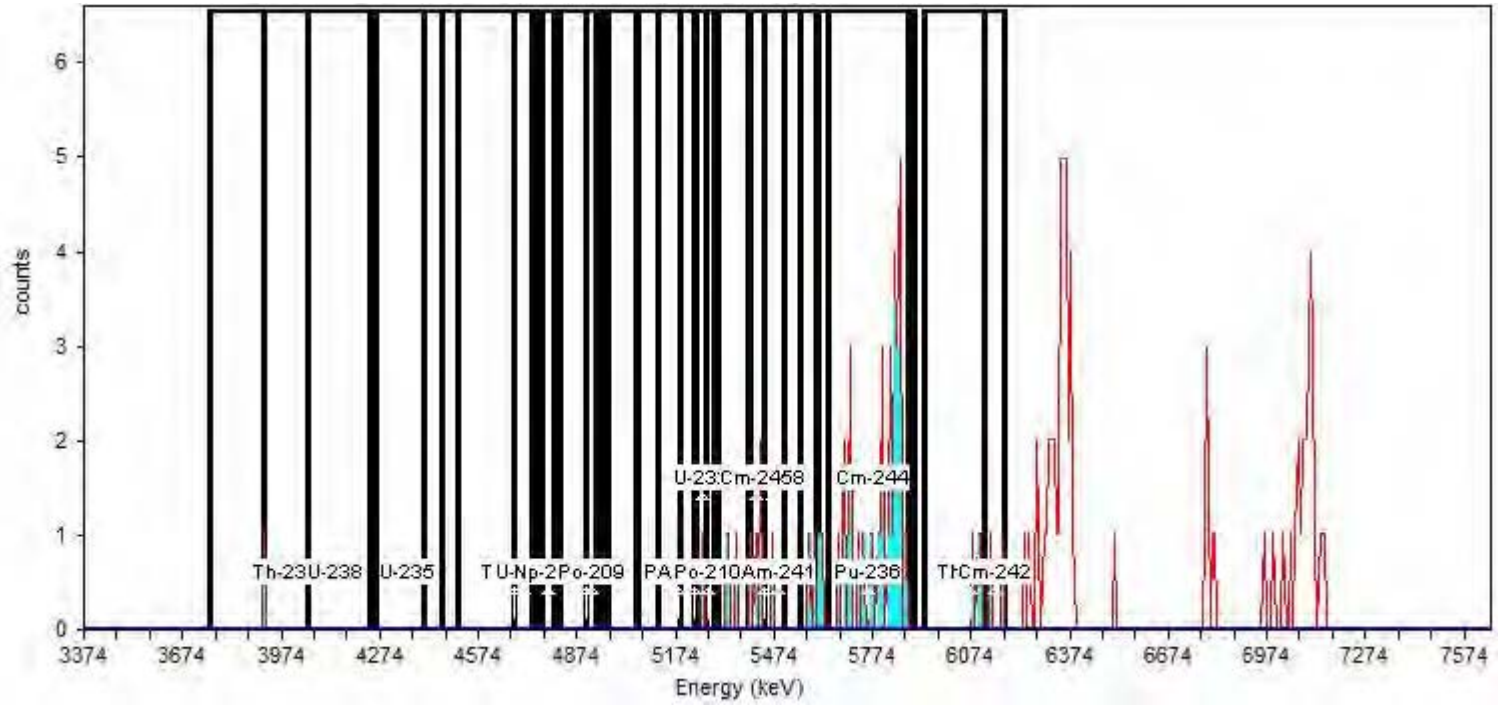
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV206 , SN: 5604420
Acquisition Start Date: 7/21/2018 9:28:21PM
Live Time: 960.00 min.
Real Time: 960.54 min.
Calibration Name: IC-8879;AV206-20171114
Calibration Date: 11/14/2017 12:00:54PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 123.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-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	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	0.00	0.000E+000	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	0.00	0.000E+000	1.473E-003
Pu-242	4,903.21	4,679.48	4,947.95	0.00	0.000E+000	1.473E-003
Th-229	4,858.46	4,739.14	5,119.48	0.00	0.000E+000	1.473E-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	0.00	0.000E+000	1.473E-003
Am-243	5,231.34	5,052.36	5,305.92	1.00	1.042E-003	1.473E-003
U-232	5,253.71	5,059.82	5,402.86	5.00	5.208E-003	2.552E-003
Th-228	5,447.61	5,186.59	5,507.27	9.00	9.375E-003	3.294E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	8.00	8.333E-003	3.125E-003
Am-241	5,484.90	5,298.46	5,604.22	10.00	1.042E-002	3.455E-003
Cm-245	5,417.78	5,395.41	5,447.61	4.00	4.167E-003	2.329E-003
Pu-236	5,760.83	5,611.67	5,887.60	37.00	3.854E-002	6.421E-003
Cm-244	5,775.74	5,641.51	5,902.52	35.00	3.646E-002	6.250E-003
Th-227	6,074.04	5,932.35	6,178.45	5.00	5.208E-003	2.552E-003
Cm-242	6,148.62	6,118.79	6,178.45	2.00	2.083E-003	1.804E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:41PM 7/22/2018

Sample

Sample Name: ICB;AV208
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

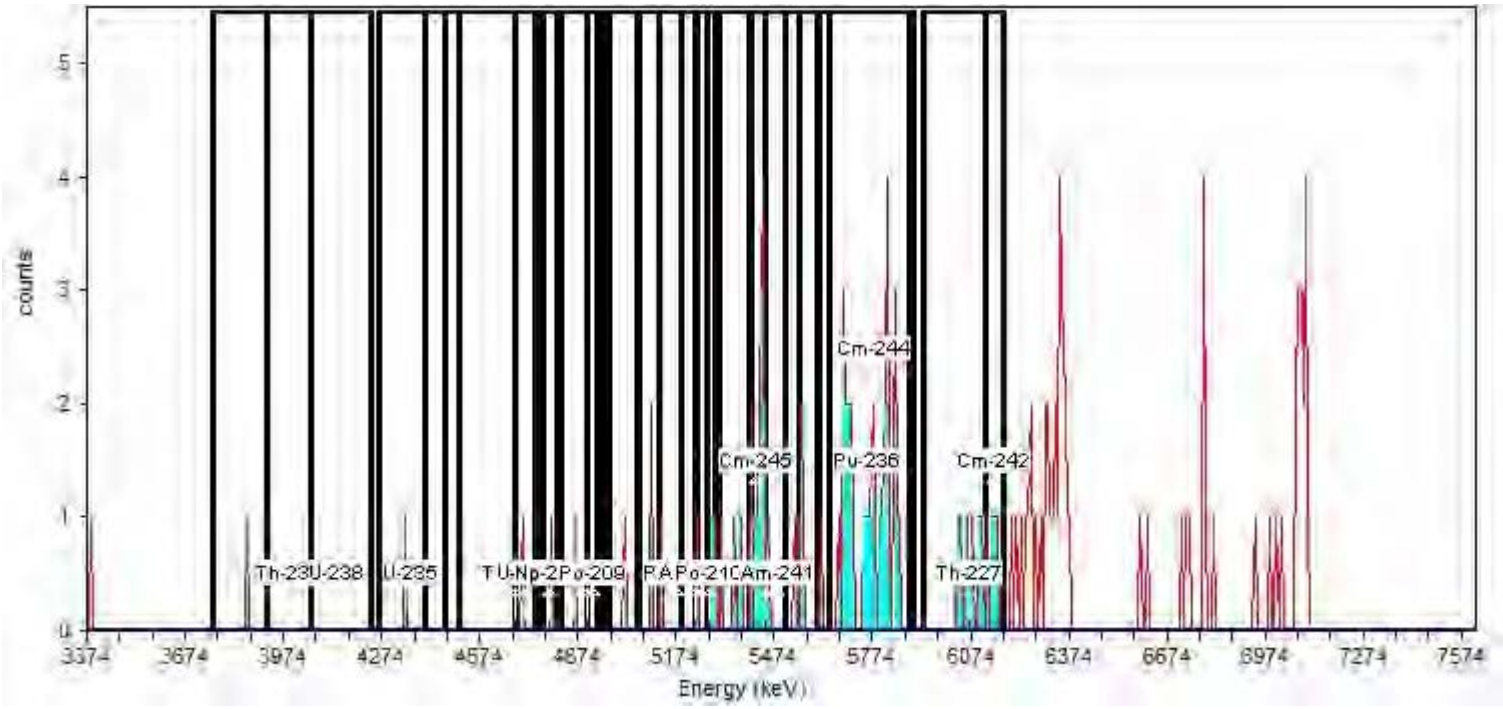
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV208 , SN: 50-112Z6
Acquisition Start Date: 7/21/2018 9:28:21PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9793;AV208-20171114
Calibration Date: 11/14/2017 12:00:42PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 135.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	0.00	0.000E+000	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	1.00	1.042E-003	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	2.00	2.083E-003	1.804E-003
Pu-242	4,903.21	4,679.48	4,947.95	3.00	3.125E-003	2.083E-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	1.00	1.042E-003	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	5.00	5.208E-003	2.552E-003
Am-243	5,231.34	5,052.36	5,305.92	6.00	6.250E-003	2.756E-003
U-232	5,253.71	5,059.82	5,402.86	12.00	1.250E-002	3.756E-003
Th-228	5,447.61	5,186.59	5,507.27	19.00	1.979E-002	4.658E-003
Po-210	5,276.09	5,231.34	5,291.00	3.00	3.125E-003	2.083E-003
Pu-238	5,469.98	5,268.63	5,552.01	19.00	1.979E-002	4.658E-003
Am-241	5,484.90	5,298.46	5,604.22	19.00	1.979E-002	4.658E-003
Cm-245	5,417.78	5,395.41	5,447.61	11.00	1.146E-002	3.608E-003
Pu-236	5,760.83	5,611.67	5,887.60	33.00	3.437E-002	6.074E-003
Cm-244	5,775.74	5,641.51	5,902.52	32.00	3.333E-002	5.984E-003
Th-227	6,074.04	5,932.35	6,178.45	11.00	1.146E-002	3.608E-003
Cm-242	6,148.62	6,118.79	6,178.45	4.00	4.167E-003	2.329E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:18:24PM 7/21/2018

Sample

Sample Name: ICB;AV212
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

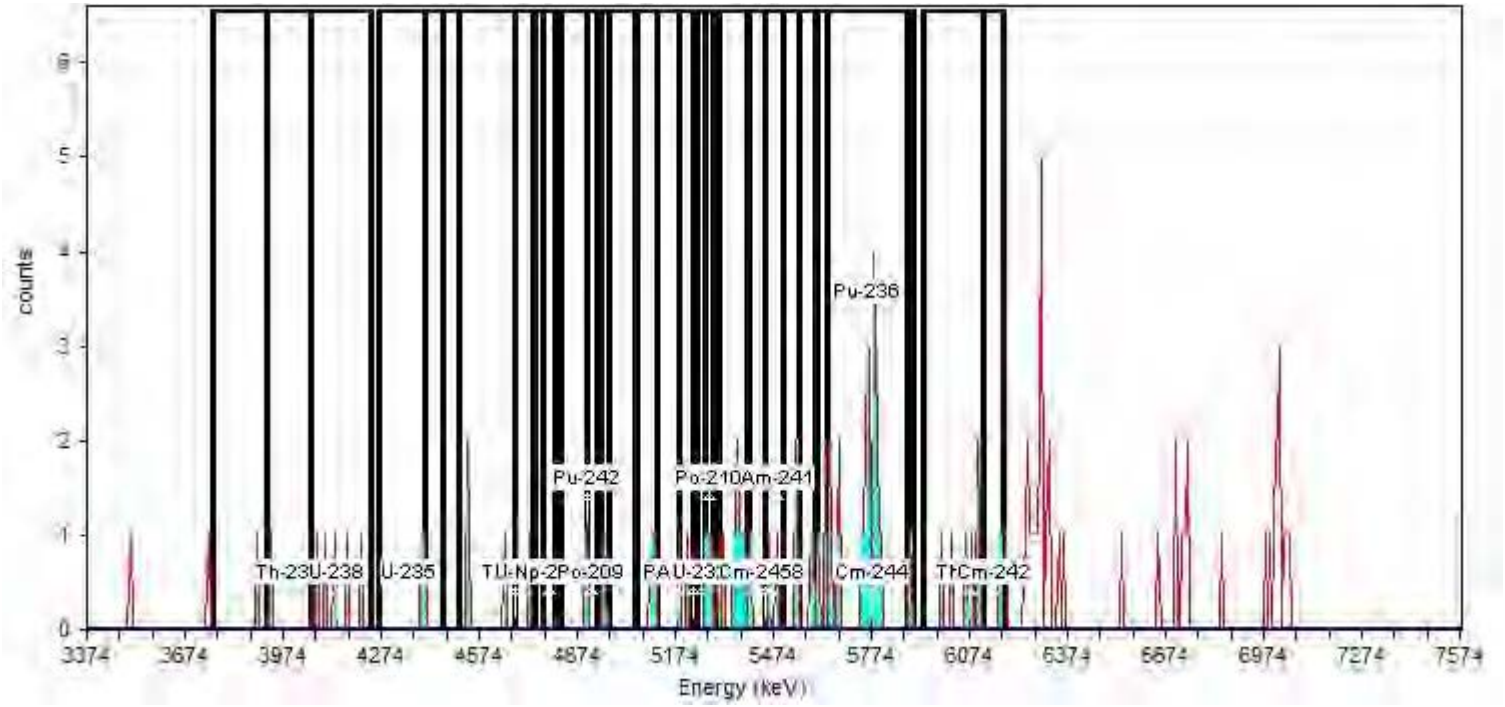
Batch

Batch Name: July2018
Description:

Acquisition

Detector: AV212 , SN: 49-155m5
Acquisition Start Date: 7/20/2018 9:02:42PM
Live Time: 960.00 min.
Real Time: 960.26 min.
Calibration Name: IC-9884;AV212-20171114
Calibration Date: 11/14/2017 12:01:41PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 117.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	6.00	6.250E-003	2.756E-003
U-235	4,358.81	4,261.86	4,463.21	2.00	2.083E-003	1.804E-003
Th-230	4,679.48	4,403.55	4,746.60	5.00	5.208E-003	2.552E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	3.00	3.125E-003	2.083E-003
Th-229	4,858.46	4,739.14	5,119.48	6.00	6.250E-003	2.756E-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	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	5.00	5.208E-003	2.552E-003
Am-243	5,231.34	5,052.36	5,305.92	9.00	9.375E-003	3.294E-003
U-232	5,253.71	5,059.82	5,402.86	18.00	1.875E-002	4.541E-003
Th-228	5,447.61	5,186.59	5,507.27	17.00	1.771E-002	4.419E-003
Po-210	5,276.09	5,231.34	5,291.00	3.00	3.125E-003	2.083E-003
Pu-238	5,469.98	5,268.63	5,552.01	17.00	1.771E-002	4.419E-003
Am-241	5,484.90	5,298.46	5,604.22	16.00	1.667E-002	4.295E-003
Cm-245	5,417.78	5,395.41	5,447.61	1.00	1.042E-003	1.473E-003
Pu-236	5,760.83	5,611.67	5,887.60	25.00	2.604E-002	5.311E-003
Cm-244	5,775.74	5,641.51	5,902.52	23.00	2.396E-002	5.103E-003
Th-227	6,074.04	5,932.35	6,178.45	8.00	8.333E-003	3.125E-003
Cm-242	6,148.62	6,118.79	6,178.45	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:16:36PM 7/21/2018

Sample

Sample Name: ICB;AV213
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

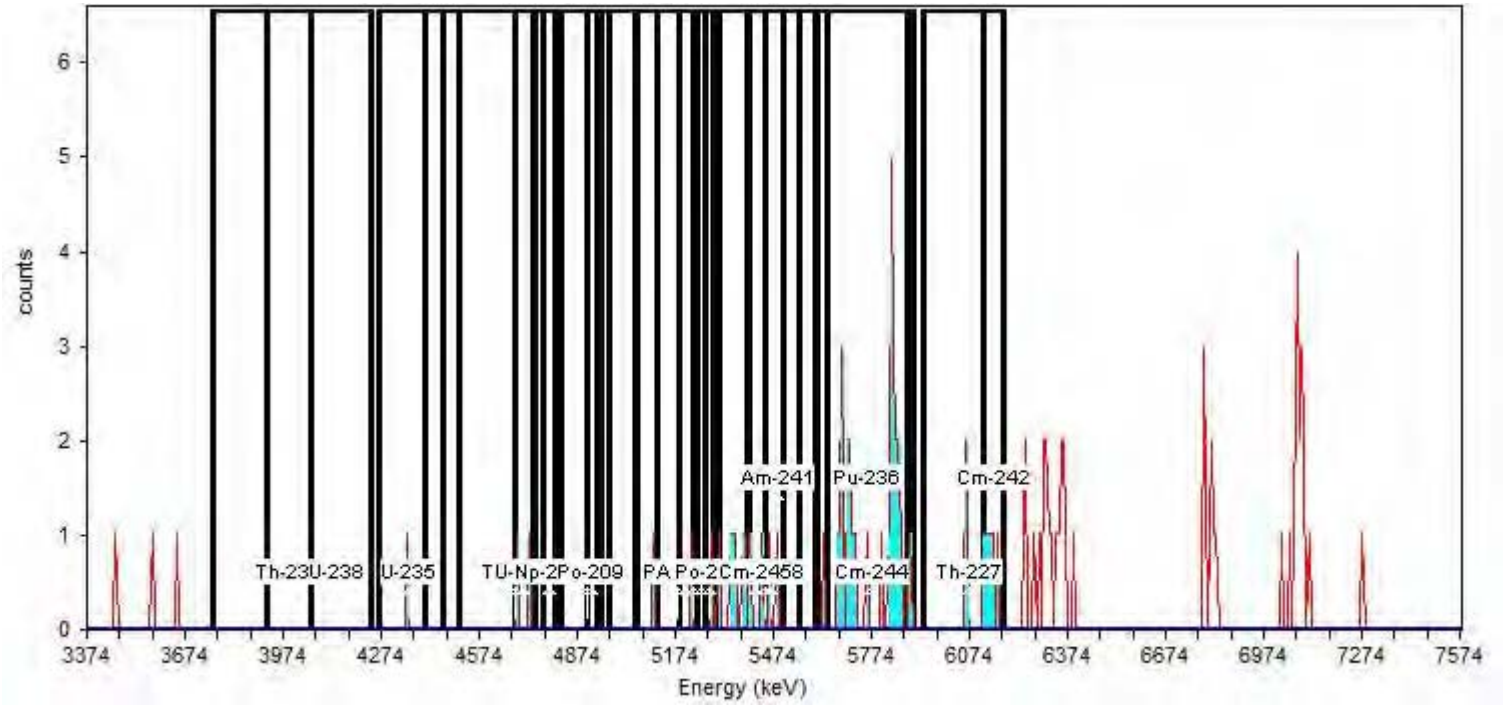
Batch

Batch Name: July2018
Description:

Acquisition

Detector: AV213 , SN: 54-011 Y1
Acquisition Start Date: 7/20/2018 9:02:43PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9885;AV213-20171114
Calibration Date: 11/14/2017 12:01:29PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 98.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	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	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	2.00	2.083E-003	1.804E-003
Pu-242	4,903.21	4,679.48	4,947.95	2.00	2.083E-003	1.804E-003
Th-229	4,858.46	4,739.14	5,119.48	1.00	1.042E-003	1.473E-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	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	12.00	1.250E-002	3.756E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	11.00	1.146E-002	3.608E-003
Am-241	5,484.90	5,298.46	5,604.22	10.00	1.042E-002	3.455E-003
Cm-245	5,417.78	5,395.41	5,447.61	2.00	2.083E-003	1.804E-003
Pu-236	5,760.83	5,611.67	5,887.60	28.00	2.917E-002	5.610E-003
Cm-244	5,775.74	5,641.51	5,902.52	28.00	2.917E-002	5.610E-003
Th-227	6,074.04	5,932.35	6,178.45	8.00	8.333E-003	3.125E-003
Cm-242	6,148.62	6,118.79	6,178.45	6.00	6.250E-003	2.756E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:50PM 7/22/2018

Sample

Sample Name: ICB;AV215
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

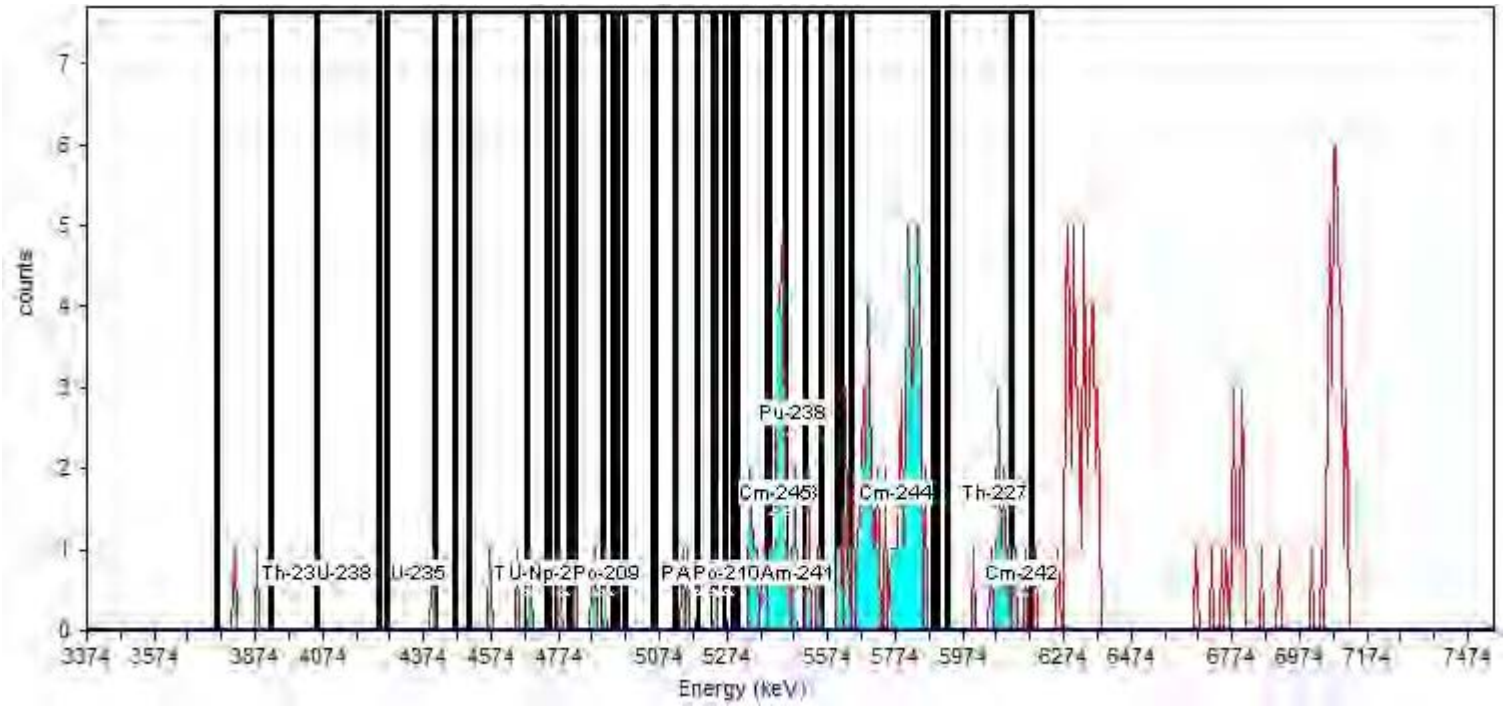
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV215 , SN: 50-119J4
Acquisition Start Date: 7/21/2018 9:28:22PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-7107;AV215-20171114
Calibration Date: 11/14/2017 3:23:29PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 224.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	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	5.00	5.208E-003	2.552E-003
Pu-242	4,903.21	4,679.48	4,947.95	6.00	6.250E-003	2.756E-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	1.00	1.042E-003	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	3.00	3.125E-003	2.083E-003
Am-243	5,231.34	5,052.36	5,305.92	3.00	3.125E-003	2.083E-003
U-232	5,253.71	5,059.82	5,402.86	11.00	1.146E-002	3.608E-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	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	32.00	3.333E-002	5.984E-003
Am-241	5,484.90	5,298.46	5,604.22	33.00	3.437E-002	6.074E-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	63.00	6.563E-002	8.333E-003
Cm-244	5,775.74	5,641.51	5,902.52	58.00	6.042E-002	8.001E-003
Th-227	6,074.04	5,932.35	6,178.45	14.00	1.458E-002	4.034E-003
Cm-242	6,148.62	6,118.79	6,178.45	3.00	3.125E-003	2.083E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:16:47PM 7/21/2018

Sample

Sample Name: ICB;AV216
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

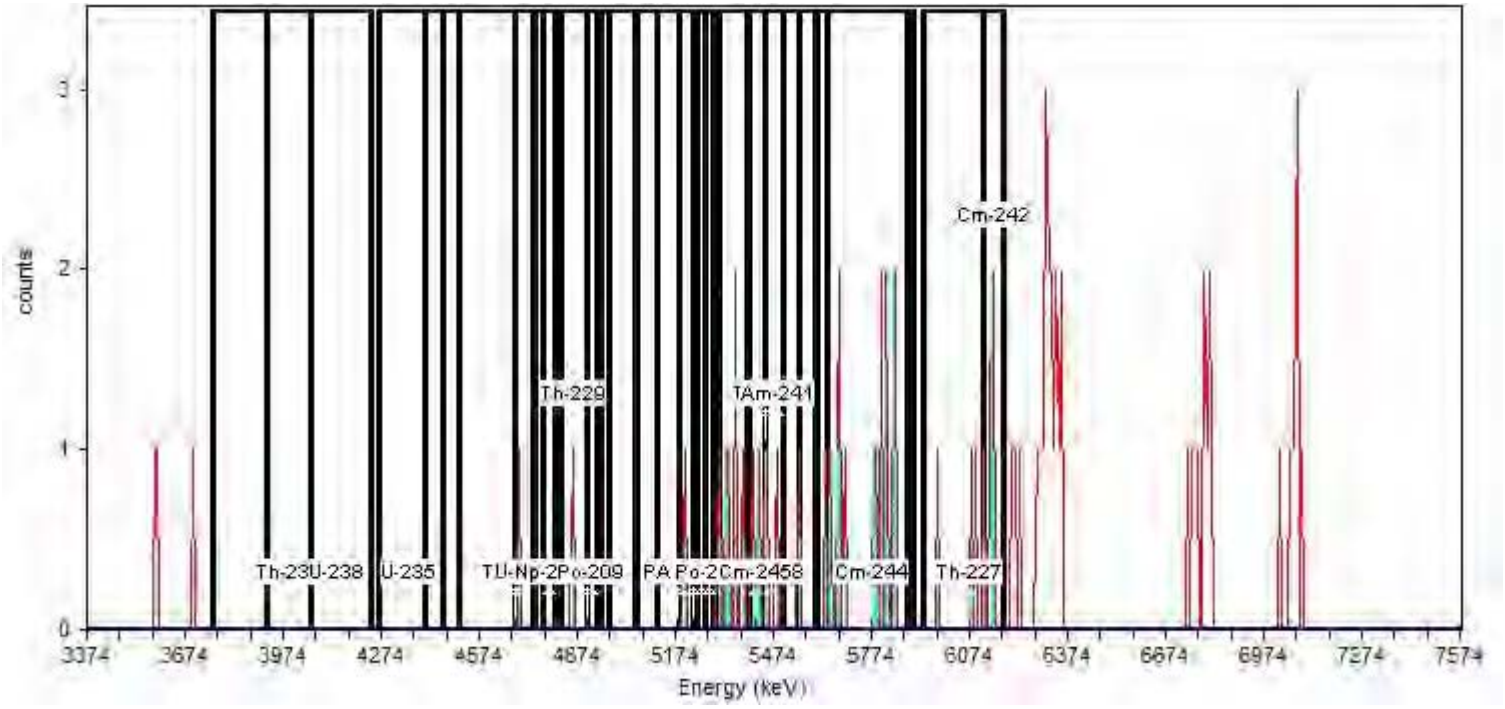
Batch

Batch Name: July2018
Description:

Acquisition

Detector: AV216 , SN: 50-117J5
Acquisition Start Date: 7/20/2018 9:02:43PM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: IC-8874;AV216-20171114
Calibration Date: 11/14/2017 3:23:21PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 81.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	1.00	1.042E-003	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	1.00	1.042E-003	1.473E-003
Pu-242	4,903.21	4,679.48	4,947.95	2.00	2.083E-003	1.804E-003
Th-229	4,858.46	4,739.14	5,119.48	1.00	1.042E-003	1.473E-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	1.00	1.042E-003	1.473E-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	7.00	7.292E-003	2.946E-003
Th-228	5,447.61	5,186.59	5,507.27	13.00	1.354E-002	3.898E-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	13.00	1.354E-002	3.898E-003
Am-241	5,484.90	5,298.46	5,604.22	13.00	1.354E-002	3.898E-003
Cm-245	5,417.78	5,395.41	5,447.61	4.00	4.167E-003	2.329E-003
Pu-236	5,760.83	5,611.67	5,887.60	16.00	1.667E-002	4.295E-003
Cm-244	5,775.74	5,641.51	5,902.52	15.00	1.563E-002	4.167E-003
Th-227	6,074.04	5,932.35	6,178.45	8.00	8.333E-003	3.125E-003
Cm-242	6,148.62	6,118.79	6,178.45	5.00	5.208E-003	2.552E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:16:51PM 7/21/2018

Sample

Sample Name: ICB;AV217
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

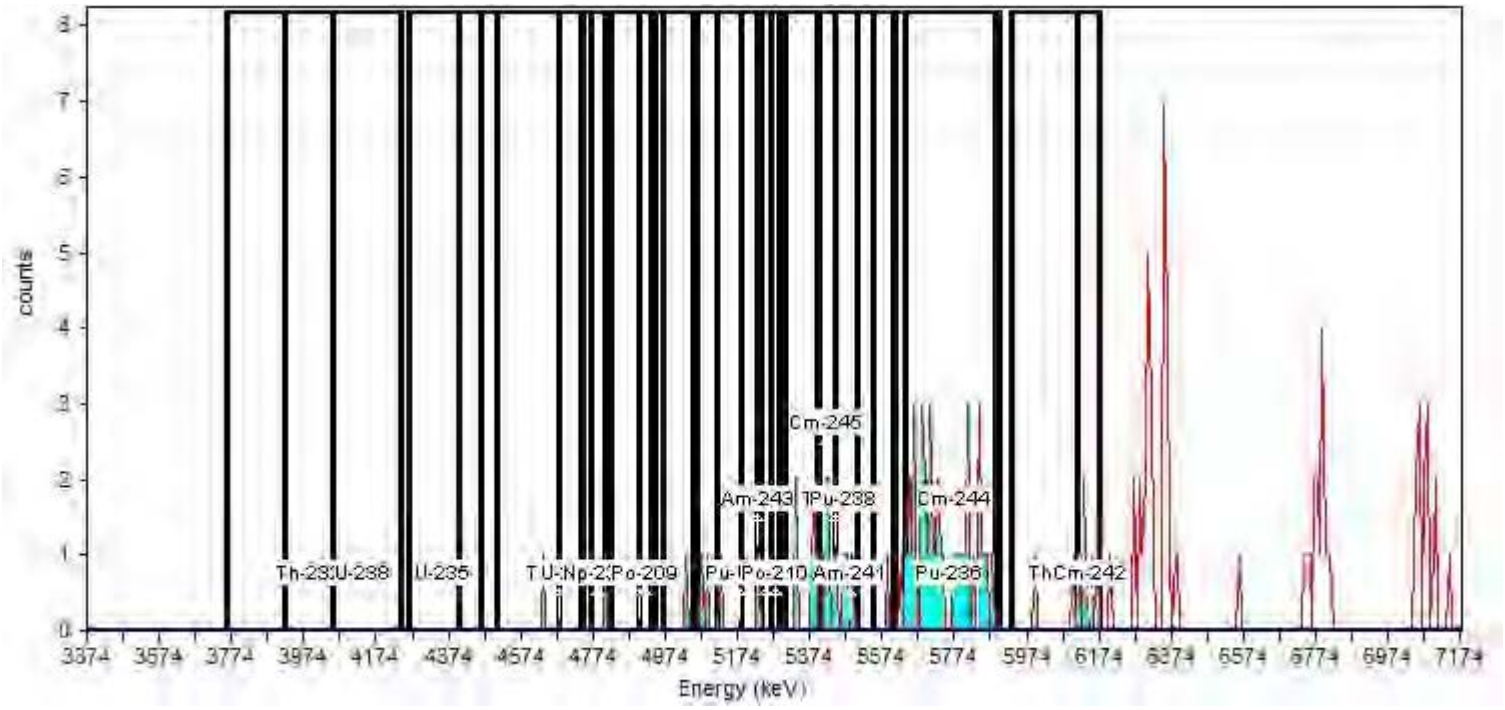
Batch

Batch Name: July2018
Description:

Acquisition

Detector: AV217 , SN: 50-117I2
Acquisition Start Date: 7/20/2018 9:02:44PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8875;AV217-20171114
Calibration Date: 11/14/2017 3:23:16PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 131.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	1.00	1.042E-003	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	2.00	2.083E-003	1.804E-003
Pu-242	4,903.21	4,679.48	4,947.95	1.00	1.042E-003	1.473E-003
Th-229	4,858.46	4,739.14	5,119.48	4.00	4.167E-003	2.329E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	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	5.00	5.208E-003	2.552E-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	9.00	9.375E-003	3.294E-003
Th-228	5,447.61	5,186.59	5,507.27	15.00	1.563E-002	4.167E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	14.00	1.458E-002	4.034E-003
Am-241	5,484.90	5,298.46	5,604.22	15.00	1.563E-002	4.167E-003
Cm-245	5,417.78	5,395.41	5,447.61	6.00	6.250E-003	2.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	39.00	4.062E-002	6.588E-003
Cm-244	5,775.74	5,641.51	5,902.52	38.00	3.958E-002	6.505E-003
Th-227	6,074.04	5,932.35	6,178.45	8.00	8.333E-003	3.125E-003
Cm-242	6,148.62	6,118.79	6,178.45	6.00	6.250E-003	2.756E-003

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:43PM 7/22/2018

Sample

Sample Name: ICB;AV218
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

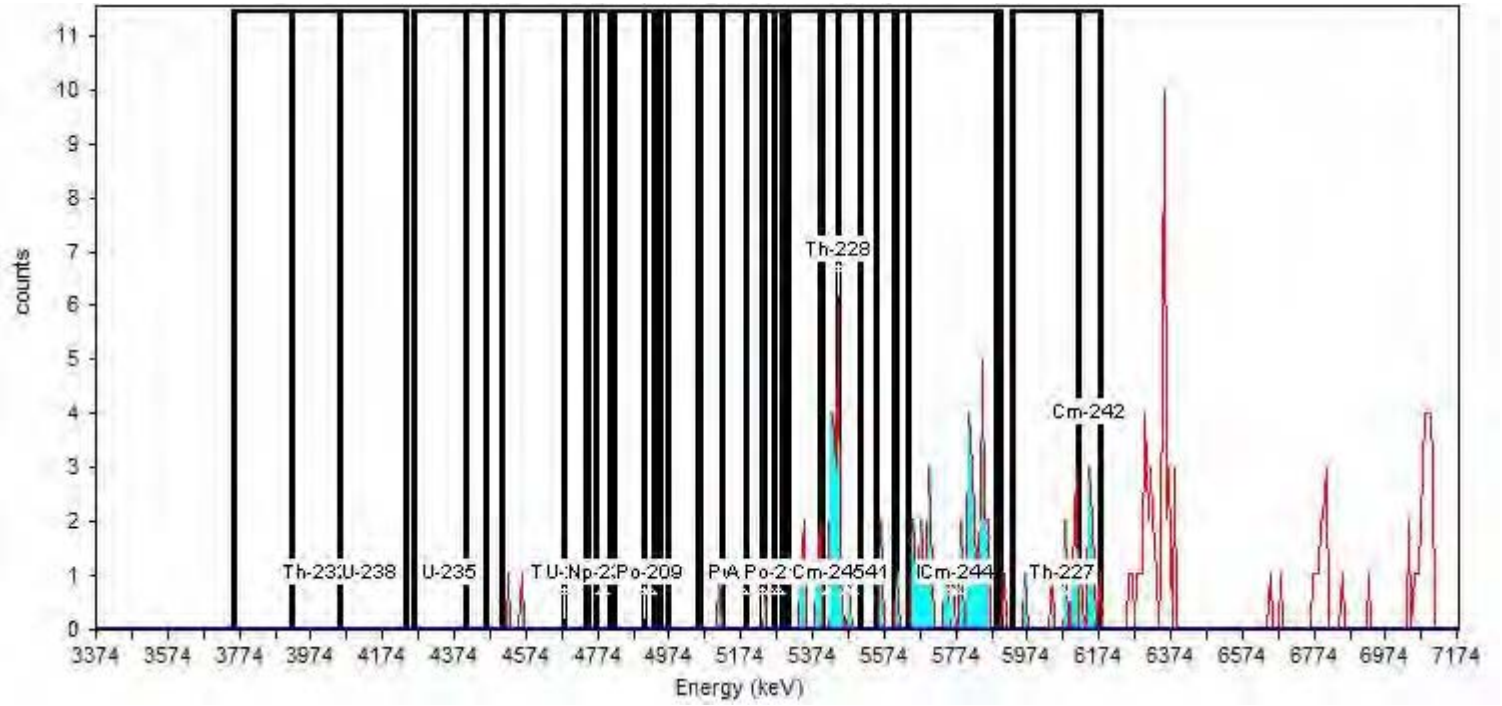
Batch

Batch Name: July2018b
Description:

Acquisition

Detector: AV218 , SN: 50-117Z7
Acquisition Start Date: 7/21/2018 9:28:23PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8876;AV218-20171114a
Calibration Date: 11/14/2017 3:23:35PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 161.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (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	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	2.00	2.083E-003	1.804E-003
Pu-242	4,903.21	4,679.48	4,947.95	0.00	0.000E+000	1.473E-003
Th-229	4,858.46	4,739.14	5,119.48	1.00	1.042E-003	1.473E-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	8.00	8.333E-003	3.125E-003
Th-228	5,447.61	5,186.59	5,507.27	26.00	2.708E-002	5.413E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	25.00	2.604E-002	5.311E-003
Am-241	5,484.90	5,298.46	5,604.22	27.00	2.812E-002	5.512E-003
Cm-245	5,417.78	5,395.41	5,447.61	19.00	1.979E-002	4.658E-003
Pu-236	5,760.83	5,611.67	5,887.60	40.00	4.167E-002	6.670E-003
Cm-244	5,775.74	5,641.51	5,902.52	39.00	4.062E-002	6.588E-003
Th-227	6,074.04	5,932.35	6,178.45	16.00	1.667E-002	4.295E-003
Cm-242	6,148.62	6,118.79	6,178.45	8.00	8.333E-003	3.125E-003

Run Logs

Alpha Spectroscopy Run Log

Detector: AV1

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:44	140	IC 160-371830/1		371830			RTM
05/18/18 19:25	60	ICV 160-371933/1		371933			PS
08/11/18 17:19	960	ICB 160-381939/1		381939			PS
08/14/18 14:05	60	CCV 160-382694/1		382694			PS
08/15/18 18:36	1	PULSER 160-382801/1		382801			ALS
08/15/18 19:24	180	LCS 160-378572/2-A		382801	378572	A-01-R	ALS

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
08/11/18 17:16	960	ICB 160-381984/1		381984			PS
08/14/18 14:06	60	CCV 160-382709/1		382709			PS
08/15/18 18:36	1	PULSER 160-382816/1		382816			ALS
08/15/18 19:24	180	160-29521-6	CRC-B3-0608	382816	378572	A-01-R	ALS

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
08/04/18 11:00	1	PULSER 160-380567/1		380567			ALS
08/04/18 14:31	180	MB 160-377729/1-A		380567	377729	A-01-R	ALS

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
08/04/18 11:00	1	PULSER 160-380576/1		380576			ALS
08/04/18 14:30	180	LCS 160-377729/2-A		380576	377729	A-01-R	ALS

Detector: AV10

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:48	140	IC 160-371831/1		371831			PS
05/19/18 16:12	60	ICV 160-371947/1		371947			PS
07/10/18 16:57	60	CCV 160-375335/1		375335			PS
07/12/18 13:39	960	ICB 160-375438/1		375438			PS
08/04/18 11:00	1	PULSER 160-380507/1		380507			ALS
08/04/18 14:30	180	490-155782-F-2-F DU		380507	377729	A-01-R	ALS

Detector: AV15

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:57	140	IC 160-371836/1		371836			PS
05/18/18 19:34	60	ICV 160-371939/1		371939			PS

Alpha Spectroscopy Run Log

Detector: AV15 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
07/10/18 17:03	60	CCV 160-375340/1		375340			PS
07/12/18 13:39	960	ICB 160-375472/1		375472			PS
08/10/18 14:23	1	PULSER 160-381881/1		381881			RTM
08/10/18 18:53	180	MB 160-378572/1-A		381881	378572	A-01-R	RTM

Detector: AV19

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:35	140	IC 160-371840/1		371840			PS
05/20/18 16:11	60	ICV 160-371952/1		371952			PS
07/11/18 11:08	60	CCV 160-375375/1		375375			PS
07/12/18 13:39	960	ICB 160-375475/1		375475			PS
08/10/18 14:23	1	PULSER 160-381883/1		381883			RTM
08/10/18 18:53	180	160-29521-5	CRC-B3-0204	381883	378572	A-01-R	RTM

Detector: AV20

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:36	140	IC 160-371842/1		371842			PS
05/20/18 16:11	60	ICV 160-371953/1		371953			PS
07/11/18 11:08	60	CCV 160-375376/1		375376			PS
07/12/18 13:39	960	ICB 160-375477/1		375477			PS
08/10/18 14:23	1	PULSER 160-381884/1		381884			RTM
08/10/18 18:54	180	160-29521-5 DU	CRC-B3-0204 DU	381884	378572	A-01-R	RTM

Detector: AV23

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:37	140	IC 160-371845/1		371845			PS
05/20/18 16:12	60	ICV 160-371956/1		371956			PS
07/11/18 11:09	60	CCV 160-375379/1		375379			PS
07/12/18 13:39	960	ICB 160-375480/1		375480			PS
08/10/18 14:23	1	PULSER 160-381886/1		381886			RTM
08/10/18 18:54	180	160-29521-7	CRC-B3-1618	381886	378572	A-01-R	RTM

Detector: AV24

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:37	140.003 336588 542	IC 160-371846/1		371846			PS
05/20/18 16:12	60	ICV 160-371957/1		371957			PS
07/11/18 11:09	60	CCV 160-375380/1		375380			PS
07/12/18 13:39	960	ICB 160-375481/1		375481			PS
08/04/18 11:01	1	PULSER 160-380546/1		380546			ALS
08/04/18 14:31	180	160-29521-1	CRC-B9-1416	380546	377729	A-01-R	ALS
08/10/18 14:23	1	PULSER 160-381887/1		381887			RTM
08/10/18 18:54	180	160-29521-8	CRC-B13-0305	381887	378572	A-01-R	RTM

Alpha Spectroscopy Run Log

Detector: AV43

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:37	140	IC 160-371849/1		371849			PS
05/20/18 16:13	60	ICV 160-371958/1		371958			PS
07/11/18 11:10	60	CCV 160-375381/1		375381			PS
07/12/18 13:39	960	ICB 160-375484/1		375484			PS
08/04/18 11:01	1	PULSER 160-380549/1		380549			ALS
08/04/18 14:30	180	160-29521-2	CRC-B9-2022	380549	377729	A-01-R	ALS
08/10/18 14:23	1	PULSER 160-381890/1		381890			RTM
08/10/18 18:54	180	160-29521-9	CRC-B13-0608	381890	378572	A-01-R	RTM

Detector: AV44

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:38	140	IC 160-371850/1		371850			PS
05/20/18 16:13	60	ICV 160-371959/1		371959			PS
07/11/18 11:10	60	CCV 160-375382/1		375382			PS
07/12/18 13:39	960	ICB 160-375485/1		375485			PS
08/04/18 11:01	1	PULSER 160-380550/1		380550			ALS
08/04/18 14:30	180	160-29521-3	CRC-B6-1618	380550	377729	A-01-R	ALS
08/10/18 14:23	1	PULSER 160-381891/1		381891			RTM
08/10/18 18:54	180	160-29521-10	CRC-B15-0204	381891	378572	A-01-R	RTM

Detector: AV45

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:51	140	IC 160-371851/1		371851			PS
05/20/18 16:13	60	ICV 160-371960/1		371960			PS
07/11/18 11:10	60	CCV 160-375383/1		375383			PS
07/12/18 13:39	960	ICB 160-375486/1		375486			PS
08/04/18 11:01	1	PULSER 160-380551/1		380551			ALS
08/04/18 14:30	180	160-29521-4	CRC-B6-2426	380551	377729	A-01-R	ALS
08/10/18 14:23	1	PULSER 160-381892/1		381892			RTM
08/10/18 18:54	180	160-29521-11	CRC-B15-0608	381892	378572	A-01-R	RTM

Detector: AV47

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:40	140	IC 160-371853/1		371853			PS
05/20/18 16:15	60	ICV 160-371962/1		371962			PS
07/11/18 11:10	60	CCV 160-375385/1		375385			PS
07/12/18 13:39	960	ICB 160-375488/1		375488			PS
08/04/18 11:01	1	PULSER 160-380552/1		380552			ALS
08/04/18 14:34	180	MB 160-377742/1-A		380552	377742	A-01-R	ALS
08/10/18 14:23	1	PULSER 160-381893/1		381893			RTM
08/10/18 18:54	180	160-29521-12	CRC-B15-1214	381893	378572	A-01-R	RTM

Detector: AV48

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:40	140	IC 160-371854/1		371854			PS
05/20/18 16:15	60	ICV 160-371963/1		371963			PS
07/11/18 12:36	60	CCV 160-375386/1		375386			PS
07/12/18 13:39	960	ICB 160-375489/1		375489			PS
08/04/18 11:01	1	PULSER 160-380553/1		380553			ALS

Alpha Spectroscopy Run Log

Detector: AV48 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
08/04/18 14:34	180	LCS 160-377742/2-A		380553	377742	A-01-R	ALS
08/10/18 14:23	1	PULSER 160-381894/1		381894			RTM
08/10/18 18:54	180	160-29521-13	CRC-B16-0608	381894	378572	A-01-R	RTM

Detector: AV49

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:41	140	IC 160-375897/1		375897			PS
05/20/18 16:15	60	ICV 160-371964/1		371964			PS
07/11/18 12:36	60	CCV 160-375387/1		375387			PS
07/12/18 13:40	960	ICB 160-375490/1		375490			PS
08/10/18 14:23	1	PULSER 160-381895/1		381895			RTM
08/10/18 18:54	180	160-29521-14	CRC-B16-0204	381895	378572	A-01-R	RTM

Detector: AV52

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 12:36	140	IC 160-371861/1		371861			PS
05/23/18 11:26	60	ICV 160-371998/1		371998			PS
07/11/18 12:40	60	CCV 160-375390/1		375390			PS
07/12/18 13:40	960	ICB 160-375493/1		375493			PS
08/04/18 11:01	1	PULSER 160-380555/1		380555			ALS
08/04/18 14:34	180	490-155782-F-2-H DU		380555	377742	A-01-R	ALS
08/10/18 14:23	1	PULSER 160-381897/1		381897			RTM
08/10/18 18:54	180	160-29521-15	CRC-B16-1416	381897	378572	A-01-R	RTM

Detector: AV53

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 12:37	140	IC 160-371862/1		371862			PS
05/23/18 11:27	60	ICV 160-371999/1		371999			PS
07/11/18 12:38	60	CCV 160-375391/1		375391			PS
07/13/18 12:11	960	ICB 160-375882/1		375882			PS
08/10/18 14:23	1	PULSER 160-381898/1		381898			RTM
08/10/18 18:54	180	160-29521-16	CRC-B18-0204	381898	378572	A-01-R	RTM

Detector: AV54

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 12:37	140	IC 160-371863/1		371863			PS
05/23/18 11:27	60	ICV 160-372000/1		372000			PS
07/11/18 12:38	60	CCV 160-375392/1		375392			PS
07/12/18 13:40	960	ICB 160-375495/1		375495			PS
08/10/18 14:23	1	PULSER 160-381899/1		381899			RTM
08/10/18 18:54	180	160-29521-17	CRC-B18-0608	381899	378572	A-01-R	RTM

Detector: AV56

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 12:38	140	IC 160-371865/1		371865			PS
05/23/18 11:28	60	ICV 160-372002/1		372002			PS
07/11/18 12:40	60	CCV 160-375394/1		375394			PS

Alpha Spectroscopy Run Log

Detector: AV56 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
07/12/18 13:40	960	ICB 160-375497/1		375497			PS
08/10/18 14:23	1	PULSER 160-381900/1		381900			RTM
08/10/18 18:54	180	160-29521-18	CRC-B18-0809	381900	378572	A-01-R	RTM

Detector: AV57

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 12:38	140	IC 160-371866/1		371866			PS
05/23/18 11:29	60	ICV 160-372003/1		372003			PS
07/11/18 12:39	60	CCV 160-375395/1		375395			PS
07/12/18 13:40	960	ICB 160-375498/1		375498			PS
08/10/18 14:23	1	PULSER 160-381901/1		381901			RTM
08/10/18 18:54	180	160-29521-19	CRC-B19-0204	381901	378572	A-01-R	RTM

Detector: AV58

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 12:39	140.002 994791 667	IC 160-371867/1		371867			PS
05/23/18 11:29	60	ICV 160-372004/1		372004			PS
07/11/18 12:42	60	CCV 160-375396/1		375396			PS
07/13/18 12:11	960	ICB 160-375884/1		375884			PS
08/10/18 14:23	1	PULSER 160-381902/1		381902			RTM
08/10/18 18:54	180	160-29521-20	CRC-B19-0810	381902	378572	A-01-R	RTM

Detector: AV60

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 12:39	140	IC 160-371868/1		371868			PS
05/21/18 10:36	60	ICV 160-371965/1		371965			PS
07/11/18 12:39	60	CCV 160-375397/1		375397			PS
07/13/18 12:11	960	ICB 160-375886/1		375886			PS
08/10/18 14:23	1	PULSER 160-381903/1		381903			RTM
08/10/18 18:54	180	160-29521-21	CRC-B19-1618	381903	378572	A-01-R	RTM

Detector: AV62

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 12:40	140	IC 160-371869/1		371869			PS
05/21/18 10:36	60	ICV 160-371966/1		371966			PS
07/11/18 12:41	60	CCV 160-375398/1		375398			PS
07/12/18 13:40	960	ICB 160-375502/1		375502			PS
08/10/18 14:23	1	PULSER 160-381904/1		381904			RTM
08/10/18 18:54	180	160-29521-22	CRC-B19-2224	381904	378572	A-01-R	RTM

Detector: AV69

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 15:45	140	IC 160-371875/1		371875			PS
05/23/18 12:55	60	ICV 160-372006/1		372006			PS
07/11/18 14:03	60	CCV 160-375404/1		375404			PS

Alpha Spectroscopy Run Log

Detector: AV69 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
07/12/18 13:40	960	ICB 160-375508/1		375508			PS
08/04/18 11:01	1	PULSER 160-380566/1		380566			ALS
08/04/18 14:34	180	160-29521-1	CRC-B9-1416	380566	377742	A-01-R	ALS

Detector: AV70

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 15:45	140	IC 160-371876/1		371876			PS
05/23/18 12:55	60	ICV 160-372007/1		372007			PS
07/11/18 14:04	60	CCV 160-375405/1		375405			PS
07/12/18 13:40	960	ICB 160-375510/1		375510			PS
08/04/18 11:01	1	PULSER 160-380568/1		380568			ALS
08/04/18 14:34	180	160-29521-2	CRC-B9-2022	380568	377742	A-01-R	ALS

Detector: AV71

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 15:46	140	IC 160-371877/1		371877			PS
05/23/18 12:56	60	ICV 160-372008/1		372008			PS
07/11/18 14:04	60	CCV 160-375406/1		375406			PS
07/12/18 13:40	960	ICB 160-375511/1		375511			PS
08/04/18 11:01	1	PULSER 160-380569/1		380569			ALS
08/04/18 14:34	180	160-29521-3	CRC-B6-1618	380569	377742	A-01-R	ALS

Detector: AV72

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 15:46	140	IC 160-371878/1		371878			PS
05/23/18 12:56	60	ICV 160-372009/1		372009			PS
07/11/18 14:04	60	CCV 160-375407/1		375407			PS
07/12/18 13:40	960	ICB 160-375512/1		375512			PS
08/04/18 11:01	1	PULSER 160-380570/1		380570			ALS
08/04/18 14:34	180	160-29521-4	CRC-B6-2426	380570	377742	A-01-R	ALS

Detector: AV165

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 12:45	140	IC 160-337268/1		337268			PS
11/15/17 13:11	60	ICV 160-337600/1		337600			PS
07/21/18 21:28	960	ICB 160-378386/1		378386			PS
07/27/18 10:46	60	CCV 160-378514/1		378514			PS
08/13/18 14:20	1	PULSER 160-382200/1		382200			ALS
08/13/18 20:10	180	LCS 160-378574/2-A		382200	378574	A-01-R	ALS

Detector: AV166

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 12:45	140	IC 160-337269/1		337269			PS
11/15/17 13:11	60	ICV 160-337601/1		337601			PS
07/21/18 21:28	960	ICB 160-378387/1		378387			PS
07/24/18 11:58	60	CCV 160-378445/1		378445			PS
08/13/18 14:20	1	PULSER 160-382201/1		382201			ALS

Alpha Spectroscopy Run Log

Detector: AV166 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
08/13/18 20:10	180	160-29521-5 DU	CRC-B3-0204 DU	382201	378574	A-01-R	ALS

Detector: AV167

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 12:46	140	IC 160-337270/1		337270			PS
11/15/17 13:09	60	ICV 160-337602/1		337602			PS
07/21/18 21:28	960	ICB 160-378388/1		378388			PS
07/24/18 11:58	60	CCV 160-378446/1		378446			PS
08/13/18 14:20	1	PULSER 160-382202/1		382202			ALS
08/13/18 20:10	180	160-29521-11	CRC-B15-0608	382202	378574	A-01-R	ALS

Detector: AV170

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 12:47	140	IC 160-337273/1		337273			PS
11/15/17 13:12	60	ICV 160-337605/1		337605			PS
07/21/18 21:28	960	ICB 160-378390/1		378390			PS
07/24/18 11:59	60	CCV 160-378449/1		378449			PS
08/13/18 14:20	1	PULSER 160-382204/1		382204			ALS
08/13/18 20:10	180	160-29521-13	CRC-B16-0608	382204	378574	A-01-R	ALS

Detector: AV175

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 12:49	140	IC 160-337277/1		337277			PS
11/15/17 13:13	60	ICV 160-337610/1		337610			PS
07/21/18 21:28	960	ICB 160-378395/1		378395			PS
07/24/18 17:04	60	CCV 160-378453/1		378453			PS
08/10/18 14:24	1	PULSER 160-381662/1		381662			RTM
08/10/18 19:21	180	MB 160-378574/1-A		381662	378574	A-01-R	RTM

Detector: AV187

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 15:34	140	IC 160-337281/1		337281			PS
11/15/17 14:30	60	ICV 160-337614/1		337614			PS
07/21/18 21:28	960	ICB 160-378397/1		378397			PS
07/24/18 13:51	60	CCV 160-378456/1		378456			PS
08/10/18 14:24	1	PULSER 160-381664/1		381664			RTM
08/10/18 19:21	180	160-29521-5	CRC-B3-0204	381664	378574	A-01-R	RTM

Detector: AV189

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 15:34	140	IC 160-337283/1		337283			PS
11/15/17 14:27	60	ICV 160-337616/1		337616			PS
07/20/18 21:02	960	ICB 160-377122/1		377122			PS
07/24/18 13:19	60	CCV 160-378458/1		378458			PS
08/10/18 14:25	1	PULSER 160-381666/1		381666			RTM
08/10/18 19:21	180	160-29521-6	CRC-B3-0608	381666	378574	A-01-R	RTM

Alpha Spectroscopy Run Log

Detector: AV190

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 15:35	140	IC 160-337284/1		337284			PS
11/15/17 14:30	60	ICV 160-337617/1		337617			PS
07/21/18 21:28	960	ICB 160-378399/1		378399			PS
07/24/18 13:20	60	CCV 160-378459/1		378459			PS
08/10/18 14:25	1	PULSER 160-381667/1		381667			RTM
08/10/18 19:21	180	160-29521-7	CRC-B3-1618	381667	378574	A-01-R	RTM

Detector: AV191

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 15:35	140	IC 160-337285/1		337285			PS
11/15/17 14:31	60	ICV 160-337618/1		337618			PS
07/21/18 21:28	960	ICB 160-378400/1		378400			PS
07/24/18 13:20	60	CCV 160-378460/1		378460			PS
08/10/18 14:25	1	PULSER 160-381668/1		381668			RTM
08/10/18 19:21	180	160-29521-8	CRC-B13-0305	381668	378574	A-01-R	RTM

Detector: AV192

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 15:35	140	IC 160-337286/1		337286			PS
11/15/17 14:31	60	ICV 160-337619/1		337619			PS
07/21/18 21:28	960	ICB 160-378401/1		378401			PS
07/24/18 13:21	60	CCV 160-378461/1		378461			PS
08/10/18 14:25	1	PULSER 160-381669/1		381669			RTM
08/10/18 19:21	180	160-29521-9	CRC-B13-0608	381669	378574	A-01-R	RTM

Detector: AV194

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 15:47	140	IC 160-337288/1		337288			PS
11/15/17 14:28	60	ICV 160-337621/1		337621			PS
07/21/18 21:28	960	ICB 160-378403/1		378403			PS
07/24/18 13:51	60	CCV 160-378462/1		378462			PS
08/10/18 14:25	1	PULSER 160-381670/1		381670			RTM
08/10/18 19:21	180	160-29521-10	CRC-B15-0204	381670	378574	A-01-R	RTM

Detector: AV198

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/17 15:48	140	IC 160-337292/1		337292			PS
11/15/17 14:29	60	ICV 160-337624/1		337624			PS
07/21/18 21:28	960	ICB 160-378405/1		378405			PS
07/24/18 13:22	60	CCV 160-378465/1		378465			PS
08/10/18 14:25	1	PULSER 160-381673/1		381673			RTM
08/10/18 19:21	180	160-29521-12	CRC-B15-1214	381673	378574	A-01-R	RTM

Detector: AV203

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/17 09:01	140	IC 160-337297/1		337297			PS
11/15/17 15:49	60	ICV 160-337629/1		337629			PS

Alpha Spectroscopy Run Log

Detector: AV203 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
07/21/18 21:28	960	ICB 160-378409/1		378409			PS
07/24/18 15:13	60	CCV 160-378468/1		378468			PS
08/10/18 14:25	1	PULSER 160-381676/1		381676			RTM
08/10/18 19:21	180	160-29521-14	CRC-B16-0204	381676	378574	A-01-R	RTM

Detector: AV206

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/17 09:00	140	IC 160-337300/1		337300			PS
11/15/17 15:53	60	ICV 160-337632/1		337632			PS
07/21/18 21:28	960	ICB 160-378412/1		378412			PS
07/24/18 15:14	60	CCV 160-378469/1		378469			PS
08/10/18 14:25	1	PULSER 160-381677/1		381677			RTM
08/10/18 19:21	180	160-29521-15	CRC-B16-1416	381677	378574	A-01-R	RTM

Detector: AV208

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/17 08:59	140	IC 160-337302/1		337302			PS
11/15/17 15:50	60	ICV 160-337634/1		337634			PS
07/21/18 21:28	960	ICB 160-378414/1		378414			PS
07/24/18 15:14	60	CCV 160-378470/1		378470			PS
08/10/18 14:25	1	PULSER 160-381678/1		381678			RTM
08/10/18 19:21	180	160-29521-16	CRC-B18-0204	381678	378574	A-01-R	RTM

Detector: AV212

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/17 08:58	140	IC 160-337306/1		337306			PS
11/15/17 15:52	60	ICV 160-337638/1		337638			PS
07/20/18 21:02	960	ICB 160-377143/1		377143			PS
07/24/18 15:23	60	CCV 160-378472/1		378472			PS
08/10/18 14:25	1	PULSER 160-381680/1		381680			RTM
08/10/18 19:21	180	160-29521-17	CRC-B18-0608	381680	378574	A-01-R	RTM

Detector: AV213

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/17 08:58	140	IC 160-337307/1		337307			PS
11/15/17 15:52	60	ICV 160-337639/1		337639			PS
07/20/18 21:02	960	ICB 160-377144/1		377144			PS
07/24/18 15:15	60	CCV 160-378473/1		378473			PS
08/10/18 14:25	1	PULSER 160-381681/1		381681			RTM
08/10/18 19:21	180	160-29521-18	CRC-B18-0809	381681	378574	A-01-R	RTM

Detector: AV215

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/17 12:26	140	IC 160-337309/1		337309			PS
11/16/17 08:34	60	ICV 160-337643/1		337643			PS
07/21/18 21:28	960	ICB 160-378418/1		378418			PS
07/25/18 10:24	60	CCV 160-378475/1		378475			PS

Alpha Spectroscopy Run Log

Detector: AV215 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
08/10/18 14:25	1	PULSER 160-381682/1		381682			RTM
08/10/18 19:21	180	160-29521-19	CRC-B19-0204	381682	378574	A-01-R	RTM

Detector: AV216

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/17 12:25	140	IC 160-337310/1		337310			PS
11/16/17 08:34	60	ICV 160-337644/1		337644			PS
07/20/18 21:02	960	ICB 160-377147/1		377147			PS
07/25/18 10:25	60	CCV 160-378476/1		378476			PS
08/10/18 14:25	1	PULSER 160-381683/1		381683			RTM
08/10/18 19:21	180	160-29521-20	CRC-B19-0810	381683	378574	A-01-R	RTM

Detector: AV217

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/17 12:25	140	IC 160-337311/1		337311			PS
11/16/17 08:33	60	ICV 160-337645/1		337645			PS
07/20/18 21:02	960	ICB 160-377148/1		377148			PS
07/25/18 10:25	60	CCV 160-378477/1		378477			PS
08/10/18 14:25	1	PULSER 160-381684/1		381684			RTM
08/10/18 19:21	180	160-29521-21	CRC-B19-1618	381684	378574	A-01-R	RTM

Detector: AV218

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/17 12:33	140	IC 160-337312/1		337312			PS
11/16/17 08:34	60	ICV 160-337646/1		337646			PS
07/21/18 21:28	960	ICB 160-378419/1		378419			PS
07/25/18 10:26	60	CCV 160-378478/1		378478			PS
08/10/18 14:25	1	PULSER 160-381685/1		381685			RTM
08/10/18 19:21	180	160-29521-22	CRC-B19-2224	381685	378574	A-01-R	RTM

GAMMA SPECTROSCOPY

Method 901.1
Ra-226

Radium-226 & Other Gamma Emitters (GS) by Method 901.1

Prep Batch: 376740

Fill Geometry, 21-Day In-Growth

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Lab ID: MB 160-376740/1-A Analyzed: 08/09/18 01:24 Ts: 30 Sigma: 2
Client ID: Detector: GV12 Decay Corrected: No

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.1402	0.289	0.289	U	pCi/g		1.43	381202
Radium-226	-0.1323	0.149	0.149	U	pCi/g	1.00	0.490	381202
Radium-228	-0.01752	0.246	0.246	U	pCi/g		0.306	381202
Thallium-208	-0.004696	0.00383	0.00386	U	pCi/g		0.131	381202
Thorium-232	-0.01752	0.246	0.246	U	pCi/g		0.306	381202
Thorium-234	0.5011	0.905	0.907	U	pCi/g		1.38	381202
Uranium-235	0.07006	0.107	0.107	U	pCi/g		0.669	381202
Uranium-238	0.5011	0.905	0.907	U	pCi/g		1.38	381202
Actinium-228	-0.01752	0.246	0.246	U	pCi/g		0.306	381202
Bismuth-212	-0.4385	1.02	1.02	U	pCi/g		1.75	381202
Bismuth-214	-0.1323	0.149	0.149	U	pCi/g		0.490	381202
Lead-210	0.9041	1.49	1.49	U	pCi/g		2.30	381202
Lead-212	-0.05787	0.0648	0.0651	U	pCi/g		0.179	381202
Lead-214	0.009031	0.128	0.128	U	pCi/g		0.186	381202
Potassium-40	0.5436	0.384	0.388		pCi/g		0.501	381202
Protactinium-231	0.3578	1.36	1.36	U	pCi/g		4.55	381202

Lab ID: LCS 160-376740/2-A Analyzed: 08/09/18 01:24 Ts: 30 Sigma: 2
Client ID: Detector: GV19 Decay Corrected: No

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Americium-241	99.26	1.70	11.7		pCi/g		1.22	381207
Cesium-137	31.67	0.817	3.34		pCi/g		0.273	381207
Cobalt-60	13.89	0.444	1.45		pCi/g		0.137	381207

Lab ID: 160-29479-A-2-E DU Analyzed: 08/09/18 06:35 Ts: 30 Sigma: 2
Client ID: Detector: GV9 Decay Corrected: No

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.0000	0.338	0.338	U	pCi/g		1.08	381204
Radium-226	0.2690	0.0991	0.103		pCi/g	1.00	0.111	381204
Radium-228	0.1903	0.164	0.166		pCi/g		0.176	381204
Thallium-208	0.07889	0.0732	0.0737		pCi/g		0.0607	381204
Thorium-232	0.1903	0.164	0.166		pCi/g		0.176	381204
Thorium-234	0.4880	1.06	1.07	U	pCi/g		1.79	381204
Uranium-235	-0.1655	0.281	0.282	U	pCi/g		0.893	381204

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Lab ID: 160-29479-A-2-E DU | Analyzed: 08/09/18 06:35 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV9 | Decay Corrected: No

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Uranium-238	0.4880	1.06	1.07	U	pCi/g		1.79	381204
Actinium-228	0.1903	0.164	0.166		pCi/g		0.176	381204
Bismuth-212	0.1810	0.390	0.390	U	pCi/g		0.678	381204
Bismuth-214	0.2690	0.0991	0.103		pCi/g		0.111	381204
Lead-210	-0.4156	1.31	1.31	U	pCi/g		2.22	381204
Lead-212	0.1927	0.0599	0.0649		pCi/g		0.0731	381204
Lead-214	0.4207	0.0992	0.108		pCi/g		0.0790	381204
Potassium-40	13.23	1.48	2.01		pCi/g		0.611	381204
Protactinium-231	0.5503	1.97	1.97	U	pCi/g		3.33	381204

Lab ID: 160-29521-1 | Analyzed: 08/09/18 06:38 | Ts: 30 | Sigma: 2
Client ID: CRC-B9-1416 | Detector: GV7 | Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	-0.0440	0.696	0.696	U	pCi/g		1.20	381209
Radium-226	0.342	0.104	0.110		pCi/g	1.00	0.0736	381209
Radium-228	0.140	0.189	0.189	U	pCi/g		0.357	381209
Thallium-208	0.116	0.0494	0.0508		pCi/g		0.0490	381209
Thorium-232	0.140	0.189	0.189	U	pCi/g		0.357	381209
Thorium-234	-0.384	0.920	0.921	U	pCi/g		1.63	381209
Uranium-235	0.135	0.294	0.294	U	pCi/g		0.595	381209
Uranium-238	-0.384	0.920	0.921	U	pCi/g		1.63	381209
Actinium-228	0.140	0.189	0.189	U	pCi/g		0.357	381209
Bismuth-212	-0.446	0.914	0.916	U	pCi/g		1.55	381209
Bismuth-214	0.342	0.104	0.110		pCi/g		0.0736	381209
Lead-210	0.0992	1.35	1.35	U	pCi/g		2.33	381209
Lead-212	0.216	0.104	0.107		pCi/g		0.113	381209
Lead-214	0.211	0.108	0.110		pCi/g		0.158	381209
Potassium-40	11.6	1.75	2.12		pCi/g		0.921	381209
Protactinium-231	0.566	1.53	1.54	U	pCi/g		3.51	381209

Lab ID: 160-29521-2 | Analyzed: 08/09/18 06:39 | Ts: 30 | Sigma: 2
Client ID: CRC-B9-2022 | Detector: GV5 | Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.0456	0.204	0.205	U	pCi/g		1.27	381208

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Lab ID: 160-29521-2 Analyzed: 08/09/18 06:39 Ts: 30 Sigma: 2
Client ID: CRC-B9-2022 Detector: GV5 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	0.592	0.160	0.172		pCi/g	1.00	0.112	381208
Radium-228	0.356	0.265	0.267		pCi/g		0.283	381208
Thallium-208	0.136	0.126	0.127		pCi/g		0.108	381208
Thorium-232	0.356	0.265	0.267		pCi/g		0.283	381208
Thorium-234	1.21	0.699	0.711	U	pCi/g		1.62	381208
Uranium-235	0.128	0.319	0.320	U	pCi/g		0.679	381208
Uranium-238	1.21	0.699	0.711	U	pCi/g		1.62	381208
Actinium-228	0.356	0.265	0.267		pCi/g		0.283	381208
Bismuth-212	0.415	0.892	0.893	U	pCi/g		1.55	381208
Bismuth-214	0.592	0.160	0.172		pCi/g		0.112	381208
Lead-210	0.758	1.48	1.49	U	pCi/g		2.20	381208
Lead-212	0.351	0.103	0.113		pCi/g		0.118	381208
Lead-214	0.669	0.147	0.163		pCi/g		0.160	381208
Potassium-40	12.9	2.15	2.52		pCi/g		0.978	381208
Protactinium-231	0.661	2.08	2.08	U	pCi/g		4.81	381208

Lab ID: 160-29521-3 Analyzed: 08/09/18 07:15 Ts: 30 Sigma: 2
Client ID: CRC-B6-1618 Detector: GV9 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.288	0.206	0.208	U	pCi/g		1.11	381204
Radium-226	0.405	0.132	0.139		pCi/g	1.00	0.118	381204
Radium-228	0.432	0.142	0.149		pCi/g		0.0794	381204
Thallium-208	0.132	0.0487	0.0506		pCi/g		0.0422	381204
Thorium-232	0.432	0.142	0.149		pCi/g		0.0794	381204
Thorium-234	0.000	0.804	0.804	U	pCi/g		2.41	381204
Uranium-235	0.150	0.455	0.455	U	pCi/g		0.762	381204
Uranium-238	0.000	0.804	0.804	U	pCi/g		2.41	381204
Actinium-228	0.432	0.142	0.149		pCi/g		0.0794	381204
Bismuth-212	0.0348	0.595	0.595	U	pCi/g		1.07	381204
Bismuth-214	0.405	0.132	0.139		pCi/g		0.118	381204
Lead-210	0.162	1.49	1.49	U	pCi/g		2.55	381204
Lead-212	0.249	0.0754	0.0820		pCi/g		0.0969	381204
Lead-214	0.423	0.102	0.111		pCi/g		0.132	381204
Potassium-40	14.9	1.63	2.23		pCi/g		0.654	381204
Protactinium-231	0.000	0.306	0.306	U	pCi/g		3.87	381204

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Lab ID: 160-29521-4 Analyzed: 08/09/18 07:17 Ts: 30 Sigma: 2
Client ID: CRC-B6-2426 Detector: GV12 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.356	1.06	1.06	U	pCi/g		1.79	381202
Radium-226	0.885	0.204	0.223		pCi/g	1.00	0.170	381202
Radium-228	0.530	0.210	0.217		pCi/g		0.426	381202
Thallium-208	0.180	0.0630	0.0656		pCi/g		0.0448	381202
Thorium-232	0.530	0.210	0.217		pCi/g		0.426	381202
Thorium-234	2.01	1.16	1.18		pCi/g		1.54	381202
Uranium-235	0.0488	0.196	0.196	U	pCi/g		1.14	381202
Uranium-238	2.01	1.16	1.18		pCi/g		1.54	381202
Actinium-228	0.530	0.210	0.217		pCi/g		0.426	381202
Bismuth-212	0.392	0.973	0.974	U	pCi/g		1.67	381202
Bismuth-214	0.885	0.204	0.223		pCi/g		0.170	381202
Lead-210	2.27	1.99	2.01	U	pCi/g		2.74	381202
Lead-212	0.375	0.111	0.118		pCi/g		0.140	381202
Lead-214	0.870	0.179	0.199		pCi/g		0.176	381202
Potassium-40	15.1	2.10	2.59		pCi/g		0.898	381202
Protactinium-231	0.000	0.411	0.411	U	pCi/g		6.34	381202

Lab ID: 160-29521-5 Analyzed: 08/09/18 07:16 Ts: 30 Sigma: 2
Client ID: CRC-B3-0204 Detector: GV15 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	-0.486	1.12	1.12	U	pCi/g		1.88	381205
Radium-226	1.19	0.217	0.250		pCi/g	1.00	0.140	381205
Radium-228	0.411	0.302	0.305		pCi/g		0.312	381205
Thallium-208	0.268	0.0871	0.0915		pCi/g		0.0682	381205
Thorium-232	0.411	0.302	0.305		pCi/g		0.312	381205
Thorium-234	1.10	0.721	0.730	U	pCi/g		2.17	381205
Uranium-235	0.151	0.294	0.295	U	pCi/g		1.09	381205
Uranium-238	1.10	0.721	0.730	U	pCi/g		2.17	381205
Actinium-228	0.411	0.302	0.305		pCi/g		0.312	381205
Bismuth-212	0.00945	1.18	1.18	U	pCi/g		2.09	381205
Bismuth-214	1.19	0.217	0.250		pCi/g		0.140	381205
Lead-210	1.84	1.39	1.41	U	pCi/g		1.91	381205
Lead-212	0.616	0.124	0.147		pCi/g		0.129	381205
Lead-214	1.36	0.205	0.249		pCi/g		0.119	381205
Potassium-40	14.2	2.07	2.53		pCi/g		0.743	381205

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Lab ID: 160-29521-5 Analyzed: 08/09/18 07:16 Ts: 30 Sigma: 2
Client ID: CRC-B3-0204 Detector: GV15 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Protactinium-231	0.000	0.880	0.880	U	pCi/g		6.58	381205

Lab ID: 160-29521-6 Analyzed: 08/09/18 07:16 Ts: 30 Sigma: 2
Client ID: CRC-B3-0608 Detector: GV17 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.132	0.676	0.676	U	pCi/g		0.983	381206
Radium-226	0.260	0.112	0.115		pCi/g	1.00	0.143	381206
Radium-228	0.182	0.192	0.193	U	pCi/g		0.274	381206
Thallium-208	0.0207	0.0739	0.0739	U	pCi/g		0.0972	381206
Thorium-232	0.182	0.192	0.193	U	pCi/g		0.274	381206
Thorium-234	1.40	0.847	0.860		pCi/g		1.29	381206
Uranium-235	-0.0377	0.339	0.339	U	pCi/g		0.586	381206
Uranium-238	1.40	0.847	0.860		pCi/g		1.29	381206
Actinium-228	0.182	0.192	0.193	U	pCi/g		0.274	381206
Bismuth-212	-0.0204	0.609	0.609	U	pCi/g		1.11	381206
Bismuth-214	0.260	0.112	0.115		pCi/g		0.143	381206
Lead-210	0.444	1.14	1.14	U	pCi/g		1.81	381206
Lead-212	0.212	0.0780	0.0827		pCi/g		0.103	381206
Lead-214	0.288	0.105	0.109		pCi/g		0.111	381206
Potassium-40	11.7	1.57	1.97		pCi/g		0.781	381206
Protactinium-231	0.000	0.788	0.788	U	pCi/g		3.85	381206

Lab ID: 160-29521-7 Analyzed: 08/09/18 07:16 Ts: 30 Sigma: 2
Client ID: CRC-B3-1618 Detector: GV19 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.393	1.19	1.19	U	pCi/g		2.01	381207
Radium-226	0.594	0.198	0.207		pCi/g	1.00	0.196	381207
Radium-228	0.227	0.304	0.305	U	pCi/g		0.337	381207
Thallium-208	0.140	0.0680	0.0695		pCi/g		0.0657	381207
Thorium-232	0.227	0.304	0.305	U	pCi/g		0.337	381207
Thorium-234	0.416	0.481	0.484	U	pCi/g		3.51	381207
Uranium-235	-0.323	0.438	0.440	U	pCi/g		0.917	381207
Uranium-238	0.416	0.481	0.484	U	pCi/g		3.51	381207
Actinium-228	0.227	0.304	0.305	U	pCi/g		0.337	381207

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Lab ID: 160-29521-7 Analyzed: 08/09/18 07:16 Ts: 30 Sigma: 2
Client ID: CRC-B3-1618 Detector: GV19 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Bismuth-212	0.809	1.59	1.60	U	pCi/g		2.69	381207
Bismuth-214	0.594	0.198	0.207		pCi/g		0.196	381207
Lead-210	1.58	2.36	2.37	U	pCi/g		3.15	381207
Lead-212	0.416	0.145	0.152		pCi/g		0.153	381207
Lead-214	0.719	0.167	0.182		pCi/g		0.111	381207
Potassium-40	15.6	2.26	2.76		pCi/g		1.21	381207
Protactinium-231	1.09	2.79	2.79	U	pCi/g		6.34	381207

Lab ID: 160-29521-8 Analyzed: 08/09/18 07:17 Ts: 30 Sigma: 2
Client ID: CRC-B13-0305 Detector: GV8 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.376	0.346	0.349	U	pCi/g		1.45	381210
Radium-226	0.433	0.142	0.149		pCi/g	1.00	0.125	381210
Radium-228	0.304	0.243	0.245		pCi/g		0.262	381210
Thallium-208	0.168	0.0594	0.0619		pCi/g		0.0529	381210
Thorium-232	0.304	0.243	0.245		pCi/g		0.262	381210
Thorium-234	0.985	0.673	0.681	U	pCi/g		1.64	381210
Uranium-235	0.0292	0.550	0.550	U	pCi/g		0.929	381210
Uranium-238	0.985	0.673	0.681	U	pCi/g		1.64	381210
Actinium-228	0.304	0.243	0.245		pCi/g		0.262	381210
Bismuth-212	-0.0383	0.793	0.793	U	pCi/g		1.58	381210
Bismuth-214	0.433	0.142	0.149		pCi/g		0.125	381210
Lead-210	-0.417	1.32	1.32	U	pCi/g		3.32	381210
Lead-212	0.295	0.0808	0.0894		pCi/g		0.0882	381210
Lead-214	0.640	0.146	0.160		pCi/g		0.125	381210
Potassium-40	9.82	1.61	1.90		pCi/g		0.713	381210
Protactinium-231	0.401	1.65	1.65	U	pCi/g		4.72	381210

Lab ID: 160-29521-9 Analyzed: 08/09/18 07:18 Ts: 30 Sigma: 2
Client ID: CRC-B13-0608 Detector: GV7 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Actinium-227	0.145	0.371	0.371	U	pCi/g		0.999	381209
Radium-226	0.207	0.119	0.121		pCi/g	1.00	0.176	381209
Radium-228	0.0817	0.158	0.158	U	pCi/g		0.346	381209

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Lab ID: 160-29521-9 Analyzed: 08/09/18 07:18 Ts: 30 Sigma: 2
Client ID: CRC-B13-0608 Detector: GV7 Decay Corrected: No

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Thallium-208	0.0323	0.107	0.107	U	pCi/g		0.0899	381209
Thorium-232	0.0817	0.158	0.158	U	pCi/g		0.346	381209
Thorium-234	-0.188	0.819	0.819	U	pCi/g		1.44	381209
Uranium-235	0.119	0.239	0.240	U	pCi/g		0.520	381209
Uranium-238	-0.188	0.819	0.819	U	pCi/g		1.44	381209
Actinium-228	0.0817	0.158	0.158	U	pCi/g		0.346	381209
Bismuth-212	-0.572	0.962	0.964	U	pCi/g		1.61	381209
Bismuth-214	0.207	0.119	0.121		pCi/g		0.176	381209
Lead-210	-0.264	1.36	1.36	U	pCi/g		2.37	381209
Lead-212	0.0722	0.0718	0.0724	U	pCi/g		0.116	381209
Lead-214	0.241	0.105	0.108		pCi/g		0.147	381209
Potassium-40	11.7	1.63	2.02		pCi/g		0.629	381209
Protactinium-231	-0.747	2.81	2.81	U	pCi/g		4.72	381209

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

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 160-376740/1-A	Actinium-227			0.1402	U	pCi/g							.96894531
MB 160-376740/1-A	Radium-226			-0.1323	U	pCi/g							-1.7736483
MB 160-376740/1-A	Radium-228			-0.01752	U	pCi/g							-.14237
MB 160-376740/1-A	Thallium-208			-0.004696	U	pCi/g							-2.4307159
MB 160-376740/1-A	Thorium-232			-0.01752	U	pCi/g							-.14237
MB 160-376740/1-A	Thorium-234			0.5011	U	pCi/g							1.1051717
MB 160-376740/1-A	Uranium-235			0.07006	U	pCi/g							1.3107283
MB 160-376740/1-A	Uranium-238			0.5011	U	pCi/g							1.1051717
MB 160-376740/1-A	Actinium-228			-0.01752	U	pCi/g							-.14237
MB 160-376740/1-A	Bismuth-212			-0.4385	U	pCi/g							-.861731
MB 160-376740/1-A	Bismuth-214			-0.1323	U	pCi/g							-1.7736483
MB 160-376740/1-A	Lead-210			0.9041	U	pCi/g							1.2137360
MB 160-376740/1-A	Lead-212			-0.05787	U	pCi/g							-1.7777789
MB 160-376740/1-A	Lead-214			0.009031	U	pCi/g							.1410421
MB 160-376740/1-A	Potassium-40			0.5436		pCi/g							2.8000019
MB 160-376740/1-A	Protactinium-231			0.3578	U	pCi/g							.52460852

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-376740/2-A	Americium-241		96.8	99.26		pCi/g	103	87 - 116					.3028552534
LCS 160-376740/2-A	Cesium-137		28.2	31.67		pCi/g	112	87 - 120					1.550867582
LCS 160-376740/2-A	Cobalt-60		12.9	13.89		pCi/g	108	87 - 115					1.0109586728

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29479-A-2-E DU	Actinium-227	-0.325		0.0000	U	pCi/g			200	0.31	0.82	1	
160-29479-A-2-E DU	Radium-226	0.329		0.2690		pCi/g			20	0.25	0.70	1	
160-29479-A-2-E DU	Radium-228	0.272		0.1903		pCi/g			35	0.19	0.52	1	
160-29479-A-2-E DU	Thallium-208	0.0719		0.07889		pCi/g			9	0.05	0.15	1	
160-29479-A-2-E DU	Thorium-232	0.272		0.1903		pCi/g			35	0.19	0.52	1	
160-29479-A-2-E DU	Thorium-234	0.667		0.4880	U	pCi/g			31	0.11	0.30	1	
160-29479-A-2-E DU	Uranium-235	-0.0465		-0.1655	U	pCi/g			112	0.20	0.56	1	
160-29479-A-2-E DU	Uranium-238	0.667		0.4880	U	pCi/g			31	0.11	0.30	1	

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 376740

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-29479-A-2-E DU	Actinium-228	0.272		0.1903		pCi/g			35	0.19	0.52	1	
160-29479-A-2-E DU	Bismuth-212	0.341		0.1810	U	pCi/g			61	0.16	0.45	1	
160-29479-A-2-E DU	Bismuth-214	0.329		0.2690		pCi/g			20	0.25	0.70	1	
160-29479-A-2-E DU	Lead-210	0.349		-0.4156	U	pCi/g			2310	0.29	0.82	1	
160-29479-A-2-E DU	Lead-212	0.212		0.1927		pCi/g			9	0.13	0.36	1	
160-29479-A-2-E DU	Lead-214	0.371		0.4207		pCi/g			12	0.22	0.63	1	
160-29479-A-2-E DU	Potassium-40	13.1		13.23		pCi/g			1	0.04	0.11	1	
160-29479-A-2-E DU	Protactinium-231	-0.0000000405		0.5503	U	pCi/g			200	0.13	0.36	1	

Glossary:

Ts = Count Duration, Sample

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 376740 Batch Start Date: 07/19/18 15:00 Batch Analyst: Small, Sean J

Batch Method: Fill_Geo-21 Batch End Date: 07/19/18 17:29

Lab Sample ID	Client Sample ID	Method Chain	Basis	TareWeight	GrossWeight	InitialAmount	IngDecDate1	IngDecDate3	Geometry
MB 160-376740/1		Fill_Geo-21, 901.1				291.18 g	7/19/18 16:36	8/9/18	Tuna Can
LCS 160-376740/2		Fill_Geo-21, 901.1				341.9 g	7/19/18 16:36	8/9/18	Tuna Can
160-29479-A-2-B DU		Fill_Geo-21, 901.1	T	46.5 g	409.4 g	362.9 g	7/19/18 16:36	8/9/18	Tuna can
160-29521-B-1-B	CRC-B9-1416	Fill_Geo-21, 901.1	T	46.7 g	388.8 g	342.1 g	7/19/18 16:36	8/9/18	Tuna can
160-29521-B-2-A	CRC-B9-2022	Fill_Geo-21, 901.1	T	46.6 g	368.5 g	321.9 g	7/19/18 16:36	8/9/18	Tuna can
160-29521-B-3-A	CRC-B6-1618	Fill_Geo-21, 901.1	T	46.6 g	385.7 g	339.1 g	7/19/18 16:36	8/9/18	Tuna can
160-29521-A-4-B	CRC-B6-2426	Fill_Geo-21, 901.1	T	46.7 g	358.0 g	311.3 g	7/19/18 16:36	8/9/18	Tuna can
160-29521-A-5-B	CRC-B3-0204	Fill_Geo-21, 901.1	T	46.6 g	375.3 g	328.7 g	7/19/18 16:36	8/9/18	Tuna can
160-29521-A-6-B	CRC-B3-0608	Fill_Geo-21, 901.1	T	46.5 g	408.1 g	361.6 g	7/19/18 16:36	8/9/18	Tuna can
160-29521-A-7-B	CRC-B3-1618	Fill_Geo-21, 901.1	T	46.6 g	357.0 g	310.4 g	7/19/18 16:36	8/9/18	Tuna can
160-29521-A-8-B	CRC-B13-0305	Fill_Geo-21, 901.1	T	46.5 g	408.2 g	361.7 g	7/19/18 16:36	8/9/18	Tuna can
160-29521-A-9-B	CRC-B13-0608	Fill_Geo-21, 901.1	T	46.6 g	399.8 g	353.2 g	7/19/18 16:36	8/9/18	Tuna can

Lab Sample ID	Client Sample ID	Method Chain	Basis	Tuna Can LCS 00007					
MB 160-376740/1		Fill_Geo-21, 901.1							
LCS 160-376740/2		Fill_Geo-21, 901.1		# g					
160-29479-A-2-B DU		Fill_Geo-21, 901.1	T						
160-29521-B-1-B	CRC-B9-1416	Fill_Geo-21, 901.1	T						
160-29521-B-2-A	CRC-B9-2022	Fill_Geo-21, 901.1	T						
160-29521-B-3-A	CRC-B6-1618	Fill_Geo-21, 901.1	T						
160-29521-A-4-B	CRC-B6-2426	Fill_Geo-21, 901.1	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.

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: TestAmerica St. Louis Job No.: 160-29521-1

SDG No.:

Batch Number: 376740 Batch Start Date: 07/19/18 15:00 Batch Analyst: Small, Sean J

Batch Method: Fill_Geo-21 Batch End Date: 07/19/18 17:29

Lab Sample ID	Client Sample ID	Method Chain	Basis	Tuna Can LCS 00007					
160-29521-A-5-B	CRC-B3-0204	Fill_Geo-21, 901.1	T						
160-29521-A-6-B	CRC-B3-0608	Fill_Geo-21, 901.1	T						
160-29521-A-7-B	CRC-B3-1618	Fill_Geo-21, 901.1	T						
160-29521-A-8-B	CRC-B13-0305	Fill_Geo-21, 901.1	T						
160-29521-A-9-B	CRC-B13-0608	Fill_Geo-21, 901.1	T						

Batch Notes	
Balance ID	1121432711
SOP Number	ST-RC-0003, ST-RC-0025

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.

Test America St. Louis Spectrum ID: 12_Gamma_20181337

Sample Description: 376740_Gamma_MB 160-376740~1-A
Detector: Detector #12
Batch ID: 376740
Work Order Number: Gamma
Lot Number: MB 160-376740~1-A

Decay to Time: 8/9/2018 01:23 Live Time: 1800 sec
Acquisition Time: 8/9/2018 01:24:00 Real Time: 1801 sec
Analysis Time: 8/9/2018 01:54 Dead Time: 0.04 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: Client_Long_Rev14.lib
Bkgd Correction File: 12_2018-07-14_1810.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-1.081E-01	2733.1	2.955E+00	2.955E+00	1.060E+01
NA-22	0.000E+00	1.#INF	7.024E-02	7.024E-02	5.177E-01
K-40	5.857E+00	35.4	2.071E+00	2.092E+00	5.395E+00
Sc-46	3.587E-02	839.6	3.012E-01	3.012E-01	1.128E+00
CR-51	2.213E+00	188.1	4.164E+00	4.165E+00	1.418E+01
MN-54	3.085E-01	40.8	1.259E-01	1.269E-01	3.789E-01
FE-59	7.411E-02	796.9	5.905E-01	5.906E-01	1.498E+00
Co-56	-4.128E-01	94.3	3.894E-01	3.900E-01	1.224E+00
CO-57	2.153E-01	104.4	2.248E-01	2.251E-01	5.081E-01
CO-58	3.433E-01	38.4	1.318E-01	1.330E-01	3.729E-01
CO-60	0.000E+00	1.#INF	7.266E-02	7.267E-02	5.355E-01
ZN-65	0.000E+00	1.#INF	1.775E-01	1.775E-01	2.366E+00
NB-94	-1.236E-01	349.1	4.315E-01	4.316E-01	1.059E+00
ZR-95	0.000E+00	1.#INF	8.792E-02	8.792E-02	1.771E+00
NB-95	-1.452E-01	173.2	2.515E-01	2.516E-01	9.124E-01
RU-103	2.469E-01	95.4	2.354E-01	2.358E-01	6.147E-01
RH-106	4.341E+00	90.2	3.914E+00	3.920E+00	2.476E+01
AG-108M	-3.156E-01	111.7	3.524E-01	3.528E-01	8.956E-01
AG-110M	1.348E-02	564.7	7.610E-02	7.610E-02	1.531E+00
SN-113	3.813E-01	120.8	4.607E-01	4.611E-01	1.579E+00
SB-124	-2.191E-01	276.6	6.060E-01	6.061E-01	2.084E+00
SB-125	1.211E+00	30.2	3.652E-01	3.703E-01	1.685E+00
I-131	1.908E-01	161.9	3.090E-01	3.092E-01	6.408E-01
Gd-153	-4.190E-01	167.6	7.022E-01	7.026E-01	2.400E+00
Ga-68	3.667E+00	324.3	1.189E+01	1.189E+01	2.964E+01
Tc-99m	1.165E-01	180.7	2.104E-01	2.105E-01	7.251E-01
BA-133	-4.346E-01	116.5	5.063E-01	5.068E-01	1.278E+00
CS-134	-2.758E-01	102.9	2.839E-01	2.842E-01	2.302E+00
CS-137	3.647E-01	95.3	3.476E-01	3.481E-01	1.192E+00
CE-139	1.826E-01	107.7	1.967E-01	1.969E-01	6.713E-01
Ba-140	6.621E-01	146.8	9.717E-01	9.723E-01	2.510E+00
La-140	6.796E-01	35.3	2.396E-01	2.422E-01	6.487E-01
CE-141	3.215E-02	1473.1	4.735E-01	4.735E-01	1.644E+00

CE-144	8.916E-01	170.8	1.523E+00	1.523E+00	5.254E+00
PM-144	-1.974E-01	241.3	4.763E-01	4.764E-01	1.149E+00
EU-152	2.662E+00	28.9	7.686E-01	7.804E-01	3.355E+00
EU-154	1.515E+00	135.5	2.053E+00	2.054E+00	7.388E+00
EU-155	0.000E+00	1.#INF	5.538E-01	5.538E-01	3.495E+00
HF-181	2.935E-02	100.2	2.940E-02	2.944E-02	1.211E+00
Ta-182	0.000E+00	1.#INF	1.826E-01	1.826E-01	2.648E+00
Hg-203	-2.972E-01	96.3	2.863E-01	2.868E-01	9.701E-01
TL-208	-5.059E-02	40.8	2.065E-02	2.081E-02	1.413E+00
pm-146	7.442E-01	96.2	7.161E-01	7.171E-01	1.783E+00
y-88	1.157E-01	354.7	4.103E-01	4.103E-01	1.009E+00
Cd-113m	4.833E+02	673.6	3.256E+03	3.256E+03	1.162E+04
Cd-109	0.000E+00	1.#INF	1.003E+00	1.003E+00	2.232E+01
Cf-251	7.257E-01	134.4	9.754E-01	9.761E-01	2.604E+00
Cf-249	2.183E-01	115.3	2.516E-01	2.519E-01	1.778E+00
Sn-126	1.283E+00	181.2	2.325E+00	2.326E+00	8.000E+00
PB-210	9.740E+00	82.2	8.002E+00	8.025E+00	2.474E+01
PB-212	-6.235E-01	56.0	3.492E-01	3.507E-01	1.929E+00
PB-214	9.729E-02	709.0	6.898E-01	6.898E-01	2.005E+00
BI-207	5.212E-01	28.9	1.505E-01	1.528E-01	7.981E-01
BI-212	-4.724E+00	115.9	5.477E+00	5.482E+00	1.882E+01
U-235	7.548E-01	76.1	5.746E-01	5.759E-01	7.206E+00
BI-214	-1.426E+00	56.2	8.006E-01	8.039E-01	5.276E+00
BI-210M	-5.157E-01	90.8	4.681E-01	4.689E-01	1.580E+00
AC-228	-1.888E-01	702.4	1.326E+00	1.326E+00	3.294E+00
TH-227	1.511E+00	103.0	1.557E+00	1.559E+00	1.539E+01
TH-229	-4.635E+00	107.2	4.968E+00	4.974E+00	1.299E+01
TH-234	5.399E+00	90.3	4.876E+00	4.885E+00	1.482E+01
PA-231	3.854E+00	190.5	7.345E+00	7.347E+00	4.905E+01
PA-233	3.129E-01	304.9	9.538E-01	9.539E-01	4.002E+00
PA-234	-9.055E-01	122.7	1.111E+00	1.112E+00	3.774E+00
PA-234M	2.101E+01	140.1	2.944E+01	2.946E+01	1.074E+02
AM-241	3.300E-01	190.3	6.280E-01	6.282E-01	2.170E+00
Np-237	-1.382E+00	151.7	2.095E+00	2.097E+00	7.097E+00
Ir-192	-4.697E-02	94.6	4.444E-02	4.452E-02	1.936E+00
Cs-136	-2.820E-01	149.5	4.216E-01	4.219E-01	1.470E+00
Np-239	5.471E-01	164.1	8.978E-01	8.983E-01	3.069E+00
Nd-147	-3.126E+00	99.3	3.104E+00	3.109E+00	7.523E+00
TL-210	1.141E-01	178.6	2.037E-01	2.038E-01	1.484E+00
Total	5.569E+02				

Analyst: Morgan Reichert

TestAmerica Inc Spectrum name: 12_Gamma_20181337.An1

Sample description
376740_Gamma_MB 160-376740~1-A

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20181337.An1

Acquisition information
Start time:	8/9/2018 1:24:00 AM
Live time:	1800
Real time:	1801
Dead time:	0.04 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration
Filename: 12_Soil_TunaCan.Clb
12_TunaCan_108513

Energy Calibration
Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration
Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files
Main analysis library:	Client_Long_Rev14.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 1:23:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2018-07-14_1810.PBC 7/14/2018 6:10:12 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 4 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0416

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.50	13.	82.15	0.82	1.805E-02	46.54	4.250	PBC<MDA	PB210
50.14	2.	700.00	0.85	2.193E-02	50.14	8.000	PBC<MDA	TH227
59.54	6.	190.28	0.86	2.817E-02	59.54	35.900	PBC<MDA	AM241
63.59	33.	26.10	0.74	2.989E-02	63.29	3.810	PBC<MDA	TH234
					64.28	9.700	6.268E+00	Sn126
80.99	20.	49.18	0.89	3.466E-02	80.99	34.060	PBC<MDA	BA133
92.48	2.	555.36	1.34	3.637E-02	92.59	5.584	PBC<MDA	TH234
93.35	7.	208.60	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
106.13	8.	164.10	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
121.78	7.	104.91	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.257E-01	CO57
122.06	7.	117.35	0.93	3.724E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.257E-01	CO57
133.02	7.	179.60	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
133.54	7.	170.77	0.94	3.670E-02	133.54	11.090	PBC<MDA	CE144
136.30	7.	167.49	0.94	3.652E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	9.333E-01	CO57
136.47	7.	172.81	0.94	3.651E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	9.333E-01	CO57
140.51	7.	180.67	0.95	3.623E-02	140.51	89.300	PBC<MDA	Tc99m
163.38	8.	112.06	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
165.85	9.	107.73	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
176.60	7.	134.42	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	7.	156.98	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
205.33	7.	134.42	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235
210.85	6.	147.47	1.02	2.980E-02	210.85	2.990	PBC<MDA	TH229
242.28	3.	355.38	1.05	2.716E-02	242.00	7.430	PBC<MDA	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
256.24	8.	103.04	1.06	2.608E-02	256.24	7.000	PBC<MDA	TH227
263.70	1.	673.61	1.07	2.554E-02	263.70	0.006	PBC<MDA	Cd113m
277.28	8.	94.06	1.08	2.462E-02	277.28	6.310	PBC<MDA	TL208
284.30	4.	224.62	1.09	2.416E-02	284.30	6.140	PBC<MDA	I131
293.78	2.	708.99	1.10	2.350E-02	295.09	19.300	PBC<MDA	PB214
296.00	9.	178.57	1.10	2.345E-02	296.00	79.000	PBC<MDA	TL210
300.03	9.	184.34	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.367E+00	PA231
					300.18	6.200	3.321E+00	PA233
300.07	9.	190.55	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.367E+00	PA231
					300.18	6.200	3.321E+00	PA233
300.18	6.	304.85	1.11	2.320E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	5.365E+00	PA231
					300.18	6.200	2.129E+00	PA233
320.08	9.	188.12	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
328.76	7.	93.55	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
333.44	7.	115.28	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
344.29	7.	140.00	1.15	2.090E-02	344.29	26.500	PBC<MDA	EU152
364.48	3.	233.33	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
391.69	8.	120.82	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
427.88	1.	562.73	1.23	1.770E-02	427.88	29.600	PBC<MDA	SB125
453.88	3.	233.33	1.26	1.692E-02	453.88	65.000	PBC<MDA	pm146
468.06	6.	94.61	1.27	1.653E-02	468.06	51.750	PBC<MDA	Ir192
497.05	6.	95.36	1.30	1.580E-02	497.05	90.900	PBC<MDA	RU103
511.86	39.	41.33	2.56	1.546E-02	511.86	20.000	6.949E+00	RH106
537.26	4.	146.76	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
563.24	5.	153.84	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.47	1.	932.74	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.163E-01	PA234
					569.70	97.740	2.655E-02	BI207
569.70	4.	135.41	1.37	1.427E-02	569.32	15.380	1.054E+00	CS134
					569.47	8.200	1.977E+00	PA234
					569.70	97.740	1.659E-01	BI207
635.89	11.	30.15	1.43	1.317E-02	635.89	11.310	4.104E+00	SB125
661.66	7.	95.31	1.45	1.279E-02	661.66	85.210	PBC<MDA	CS137
747.16	5.	96.22	1.53	1.171E-02	747.16	34.000	PBC<MDA	pm146
763.94	0.	932.74	1.55	1.152E-02	763.94	22.280	PBC<MDA	AG110M
810.78	7.	38.39	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58
815.77	15.	35.26	1.60	1.099E-02	815.77	23.280	3.304E+00	La140
834.85	6.	40.82	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
860.56	6.	40.82	1.64	1.057E-02	860.56	12.420	PBC<MDA	TL208
873.23	4.	135.53	1.65	1.046E-02	873.23	12.270	PBC<MDA	EU154
880.53	4.	112.22	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
889.28	1.	839.64	1.66	1.033E-02	889.28	99.984	PBC<MDA	Sc46
898.04	2.	354.73	1.67	1.025E-02	898.04	93.700	PBC<MDA	y88
964.11	9.	33.33	1.73	9.739E-03	964.11	14.605	3.515E+00	EU152
1001.00	3.	140.11	1.76	9.476E-03	1001.00	0.837	PBC<MDA	PA234M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1037.84	2.	324.35	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1050.36	9.	90.15	1.81	9.147E-03	1050.36	1.560	PBC<MDA	RH106
1063.66	12.	28.87	1.82	9.063E-03	1063.66	74.500	9.874E-01	BI207
1077.40	2.	324.35	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	1.	796.87	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1112.07	12.	28.87	1.86	8.770E-03	1112.07	13.644	5.572E+00	EU152
1460.83	8.	35.36	2.16	7.112E-03	1460.83	10.670	5.857E+00	K40
1764.49	7.	37.80	2.40	6.075E-03	1764.49	15.400	PBC<MDA	BI214

No unknown peaks passed sensitivity test.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.65	46.50	46.	13.	0.007	82.15	0.823
TH-227	200.18	50.14	97.	2.	0.001	700.00	0.855
AM-241	237.74	59.54	62.	6.	0.003	190.28	0.865s
TH-234	253.94	63.59	35.	11.	0.006	90.31	0.744s
Sn-126	256.71	64.28	72.	7.	0.004	181.18	0.869s
BA-133	323.50	80.99	23.	20.	0.011	49.18	0.887s
Np-237	345.49	86.49	149.	-12.	-0.006	151.67	0.892s
EU-155	345.70	86.54	137.	-12.	-0.006	145.83	0.892s
Sn-126	347.29	86.94	126.	-12.	-0.006	139.75	0.892s
Sn-126	349.81	87.57	115.	-9.	-0.005	170.78	0.893s
Cd-109	351.68	88.04	124.	0.	0.000	1000.00	0.894s
Nd-147	363.92	91.10	124.	0.	0.000	1000.00	0.897s
TH-234	369.44	92.48	40.	2.	0.001	555.36	1.338s
AC-228	372.91	93.35	113.	7.	0.004	208.60	0.899s
Gd-153	389.50	97.50	93.	-8.	-0.005	167.57	0.903s
Np-239	397.50	99.50	102.	0.	0.000	1000.00	0.905s
Gd-153	412.29	103.20	102.	0.	0.000	1000.00	0.909s
Np-239	414.29	103.70	102.	0.	0.000	1000.00	0.909s
EU-155	420.73	105.31	102.	0.	0.000	1000.00	0.911s
Np-239	424.00	106.13	89.	8.	0.005	164.10	0.912s
EU-152	486.55	121.78	25.	7.	0.004	104.91	0.928
CO-57	487.69	122.06	32.	7.	0.004	117.35	0.928
EU-154	491.84	123.10	64.	-11.	-0.006	105.80	0.929s
PA-234	524.60	131.29	82.	-11.	-0.006	122.71	0.938s
HF-181	531.51	133.02	65.	7.	0.004	179.60	0.939s
CE-144	533.57	133.54	59.	7.	0.004	170.77	0.940s
HF-181	544.61	136.30	57.	7.	0.004	167.49	0.943s
CO-57	545.30	136.47	61.	7.	0.004	172.81	0.943s
Tc-99m	561.44	140.51	67.	7.	0.004	180.67	0.947s
U-235	574.53	143.79	108.	-7.	-0.004	146.72	0.950s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ba-140	649.99	162.66	76.	-12.	-0.006	109.66	0.969s
U-235	652.87	163.38	39.	8.	0.005	112.06	0.970s
CE-139	662.76	165.85	42.	9.	0.005	107.73	0.973s
Cf-251	705.72	176.60	26.	7.	0.004	134.42	0.983s
U-235	742.18	185.72	34.	7.	0.004	156.98	0.992s
TH-229	773.32	193.51	40.	-12.	-0.006	107.20	1.000s
U-235	820.59	205.33	26.	7.	0.004	134.42	1.012s
TH-229	842.65	210.85	18.	6.	0.003	147.47	1.018s
Cf-251	907.22	227.00	26.	-2.	-0.001	573.93	1.034s
PB-212	953.73	238.63	68.	-13.	-0.007	56.01	1.046s
PB-214	967.18	242.00	55.	3.	0.002	355.38	1.049s
TH-227	1024.13	256.24	18.	8.	0.005	103.04	1.063s
Cd-113m	1053.96	263.70	40.	1.	0.001	673.61	1.070s
BI-210M	1062.48	265.83	51.	-12.	-0.007	90.78	1.072s
TL-208	1108.27	277.28	21.	8.	0.004	94.06	1.084s
Hg-203	1115.93	279.20	48.	-11.	-0.006	96.35	1.086s
I-131	1136.32	284.30	18.	4.	0.002	224.62	1.091s
PB-214	1179.47	295.09	111.	2.	0.001	708.99	1.101s
TL-210	1183.11	296.00	113.	9.	0.005	178.57	1.102s
PB-212	1199.22	300.03	121.	9.	0.005	184.34	1.106
PA-231	1199.38	300.07	130.	9.	0.005	190.55	1.106s
PA-233	1199.82	300.18	138.	6.	0.003	304.85	1.107s
PA-231	1209.70	302.65	144.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	144.	0.	0.000	1000.00	1.109s
Ba-140	1218.49	304.85	144.	0.	0.000	1000.00	1.111s
Ir-192	1232.85	308.44	143.	0.	0.000	1000.00	1.115s
PA-233	1247.13	312.01	143.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	194.	-11.	-0.006	180.94	1.123s
CR-51	1279.41	320.08	131.	9.	0.005	188.12	1.126s
La-140	1314.10	328.76	17.	7.	0.004	93.55	1.135s
Cf-249	1332.81	333.44	28.	7.	0.004	115.28	1.139s
AC-228	1352.33	338.32	55.	-10.	-0.005	112.35	1.144s
Cs-136	1361.32	340.57	65.	-10.	-0.005	120.92	1.146
EU-152	1376.18	344.29	43.	7.	0.004	140.00	1.150s
HF-181	1382.35	345.83	67.	-10.	-0.005	121.97	1.151s
BA-133	1423.02	356.00	32.	-10.	-0.005	116.51	1.162s
I-131	1456.95	364.48	12.	3.	0.002	233.33	1.170s
BA-133	1534.35	383.84	56.	-9.	-0.005	122.22	1.189s
Cf-249	1550.79	387.95	65.	0.	0.000	1000.00	1.193s
SN-113	1565.74	391.69	46.	8.	0.005	120.82	1.196s
SB-125	1710.45	427.88	8.	1.	0.001	562.73	1.232s
AG-108M	1734.69	433.94	24.	-9.	-0.005	111.67	1.238s
pm-146	1814.45	453.88	12.	3.	0.002	233.33	1.257s
SB-125	1852.39	463.37	22.	0.	0.000	1000.00	1.266s
Ir-192	1871.16	468.06	14.	6.	0.003	94.61	1.271s
HF-181	1926.90	482.00	30.	-5.	-0.003	173.21	1.284
La-140	1946.98	487.02	49.	-8.	-0.004	128.70	1.289s
RU-103	1987.11	497.05	8.	6.	0.004	95.36	1.298s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	2046.35	511.86	33.	39.	0.021	41.33	2.563
Nd-147	2122.88	531.00	26.	-11.	-0.006	99.31	1.331s
Ba-140	2147.92	537.26	9.	4.	0.002	146.76	1.337s
CS-134	2251.82	563.24	13.	5.	0.003	153.84	1.362s
PA-234	2276.75	569.47	19.	1.	0.000	932.74	1.368s
BI-207	2277.68	569.70	14.	4.	0.002	135.41	1.368s
TL-208	2330.96	583.02	35.	-14.	-0.008	92.60	1.381s
SB-125	2400.87	600.50	94.	-11.	-0.006	129.95	1.397s
SB-124	2409.79	602.73	105.	-5.	-0.003	276.60	1.399s
CS-134	2417.71	604.71	127.	-12.	-0.007	136.76	1.401s
BI-214	2436.11	609.31	148.	-16.	-0.009	56.15	1.405s
AG-108M	2455.99	614.28	146.	0.	0.000	1000.00	1.410s
PM-144	2471.12	618.06	146.	0.	0.000	1000.00	1.414s
SB-125	2542.43	635.89	0.	11.	0.006	30.15	1.430s
I-131	2546.77	636.97	11.	0.	0.000	1000.00	1.432s
AG-110M	2629.92	657.76	29.	-6.	-0.003	140.07	1.451s
CS-137	2645.51	661.66	20.	7.	0.004	95.31	1.455s
PM-144	2785.05	696.54	23.	-4.	-0.002	241.30	1.487s
NB-94	2809.41	702.63	19.	-3.	-0.001	349.11	1.493s
SB-124	2890.04	722.79	22.	-5.	-0.003	140.00	1.512s
AG-108M	2890.65	722.94	27.	0.	0.000	1000.00	1.512s
EU-154	2892.32	723.36	27.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	27.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	36.	-8.	-0.004	115.93	1.516
pm-146	2941.78	735.72	23.	-12.	-0.007	91.24	1.524s
pm-146	2987.55	747.16	5.	5.	0.003	96.22	1.535
ZR-95	3025.83	756.73	14.	0.	0.000	1000.00	1.543s
AG-110M	3054.69	763.94	5.	0.	0.000	932.74	1.550s
NB-95	3062.08	765.79	12.	-3.	-0.002	173.21	1.552s
PA-234M	3064.57	766.41	3.	0.	0.000	1000.00	1.552s
EU-152	3114.61	778.92	14.	-5.	-0.003	164.92	1.564s
BI-212	3140.62	785.42	14.	-8.	-0.004	105.33	1.570s
CS-134	3182.42	795.87	26.	-8.	-0.004	101.98	1.579s
TL-210	3197.35	799.60	33.	0.	0.000	1000.00	1.583s
CS-134	3206.76	801.95	34.	-1.	-0.001	830.66	1.585s
CO-58	3242.06	810.78	0.	7.	0.004	38.39	1.593s
La-140	3262.05	815.77	7.	15.	0.008	35.26	1.598s
Cs-136	3272.97	818.50	32.	-6.	-0.003	149.54	1.600s
MN-54	3338.38	834.85	0.	6.	0.003	40.82	1.615s
Co-56	3386.08	846.77	20.	-11.	-0.006	94.33	1.626s
TL-208	3441.27	860.56	0.	6.	0.003	40.82	1.638s
NB-94	3483.41	871.10	10.	-3.	-0.002	159.86	1.648s
EU-154	3491.95	873.23	10.	4.	0.002	135.53	1.650s
PA-234	3521.16	880.53	10.	4.	0.002	112.22	1.657s
PA-234	3532.00	883.24	15.	0.	0.000	1000.00	1.659s
AG-110M	3537.78	884.68	15.	0.	0.000	1000.00	1.660
Sc-46	3556.17	889.28	15.	1.	0.000	839.64	1.664s
y-88	3591.22	898.04	10.	2.	0.001	354.73	1.672s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	3643.36	911.07	10.	-1.	-0.001	702.38	1.684s
AG-110M	3749.09	937.49	15.	-6.	-0.003	147.67	1.708s
PA-234	3783.21	946.02	10.	-3.	-0.002	238.82	1.716s
EU-152	3855.60	964.11	0.	9.	0.005	33.33	1.732s
AC-228	3875.05	968.97	9.	0.	0.000	1000.00	1.736s
PA-234M	4003.22	1001.00	7.	3.	0.002	140.11	1.765s
EU-154	4018.33	1004.77	3.	0.	0.000	1000.00	1.768s
Co-56	4150.66	1037.84	5.	2.	0.001	324.35	1.798s
Cs-136	4191.60	1048.07	32.	-14.	-0.008	62.60	1.807s
RH-106	4200.76	1050.36	28.	9.	0.005	90.15	1.809s
BI-207	4253.99	1063.66	0.	12.	0.007	28.87	1.820s
Ga-68	4308.98	1077.40	5.	2.	0.001	324.35	1.833s
FE-59	4396.44	1099.25	5.	1.	0.000	796.87	1.852s
EU-152	4447.76	1112.07	0.	12.	0.007	28.87	1.863s
ZN-65	4461.66	1115.55	12.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	34.	-9.	-0.005	95.09	1.870s
Sc-46	4481.68	1120.55	27.	-12.	-0.006	80.30	1.870s
Ta-182	4484.69	1121.30	6.	0.	0.000	1000.00	1.871s
CO-60	4692.57	1173.24	11.	-6.	-0.003	137.58	1.916s
Ta-182	4755.86	1189.05	0.	0.	0.000	1000.00	1.930s
Ta-182	4885.39	1221.41	11.	-4.	-0.002	188.42	1.957s
Co-56	4952.92	1238.28	11.	-6.	-0.004	130.84	1.972s
NA-22	5098.03	1274.53	0.	0.	0.000	1000.00	2.003s
EU-154	5098.09	1274.54	0.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	0.	0.	0.000	1000.00	2.017s
TL-210	5252.04	1313.00	6.	-2.	-0.001	343.80	2.036s
CO-60	5330.11	1332.50	0.	0.	0.000	1000.00	2.052s
AG-110M	5537.48	1384.30	0.	0.	0.000	1000.00	2.096s
EU-152	5632.39	1408.00	6.	-1.	-0.001	600.00	2.115s
K-40	5843.92	1460.83	0.	8.	0.004	35.36	2.159s
La-140	6386.02	1596.21	0.	0.	0.000	1000.00	2.269s
SB-124	6765.58	1690.98	0.	0.	0.000	1000.00	2.345s
BI-214	7060.00	1764.49	0.	7.	0.004	37.80	2.403s
Co-56	7087.48	1771.35	18.	-8.	-0.005	79.16	2.408s
y-88	7346.69	1836.06	0.	0.	0.000	1000.00	2.459s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide -		Average	Peak			
Name	Code	Activity Bq/Sample	Energy keV	Activity Bq/Sample	MDA Value Bq/Sample	COMMENTS
BE-7	C	-1.0811E-01			5.31E+01	
			477.60	-1.081E-01	%(1.060E+01	2.73E+03 1.05E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	N	5.8566E+00					4.66E+11	
			1460.83	5.857E+00	?(	5.395E+00	3.54E+01	1.07E+01 G
Sc-46	F	3.5874E-02					8.38E+01	
			889.28	3.587E-02	?(	1.128E+00	8.40E+02	1.00E+02 G
			1120.55	-7.384E-01	+ P	1.721E+00	8.03E+01	1.00E+02 G
CR-51	F	2.2135E+00					2.77E+01	
			320.08	2.213E+00	?(	1.418E+01	1.88E+02	9.94E+00 G
MN-54	C	3.0847E-01					3.12E+02	
			834.85	3.085E-01	?(	3.789E-01	4.08E+01	1.00E+02 G
FE-59	F	7.4108E-02					4.45E+01	
			1099.25	7.411E-02	?(	1.498E+00	7.97E+02	5.65E+01 G
			1291.60	0.000E+00	-	1.210E+00	1.00E+03	4.32E+01 G
Co-56	C	-4.1284E-01					7.73E+01	
			846.77	-5.716E-01	?(	1.224E+00	9.43E+01	9.99E+01 G
			1238.28	-6.583E-01	+	1.912E+00	1.31E+02	6.61E+01 G
			1037.84	7.101E-01	&(	5.740E+00	3.24E+02	1.41E+01 G
			1771.35	-4.970E+00	+	1.327E+01	7.92E+01	1.55E+01 A
CO-57	C	2.1528E-01					2.72E+02	
			122.06	1.257E-01	(	5.081E-01	1.17E+02	8.56E+01 G
			136.47	9.333E-01	?(	5.563E+00	1.73E+02	1.07E+01 G
CO-58	C	3.4330E-01					7.09E+01	
			810.78	3.433E-01	?(	3.729E-01	3.84E+01	9.95E+01 G
NB-94	I	-1.2361E-01					7.41E+06	
			702.63	-1.236E-01	?(	1.059E+00	3.49E+02	9.79E+01 G
			871.10	-1.592E-01	+	9.257E-01	1.60E+02	9.99E+01 G
NB-95	I	-1.4519E-01					6.40E+01	
			765.79	-1.452E-01	?(	9.124E-01	1.73E+02	9.98E+01 G
RU-103	I	2.4690E-01					3.93E+01	
			497.05	2.469E-01	?(	6.147E-01	9.54E+01	9.09E+01 G
			610.30	-2.717E-06	%	4.203E+01	4.48E+08	5.75E+00 GA
RH-106	I	4.3413E+00					3.74E+02	
			621.92	-4.181E-01	%(	2.476E+01	1.72E+03	9.93E+00 G
			1050.36	3.464E+01	?(	1.061E+02	9.02E+01	1.56E+00 G
			511.86	6.949E+00	?	5.322E+00	4.13E+01	2.00E+01 GA

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
AG-108M	C	-3.1561E-01						1.53E+05	
			433.94	-3.156E-01	?(	8.956E-01	1.12E+02	9.05E+01	G
			722.94	0.000E+00	+	1.373E+00	1.00E+03	9.08E+01	G
			614.28	0.000E+00	+	2.702E+00	1.00E+03	8.98E+01	G
AG-110M	F	1.3476E-02						2.50E+02	
			884.68	0.000E+00	?(	1.531E+00	1.00E+03	7.27E+01	G
			657.76	-2.590E-01	+	1.264E+00	1.40E+02	9.46E+01	G
			937.49	-9.761E-01	+	3.377E+00	1.48E+02	3.44E+01	G
			1384.30	0.000E+00	?(	2.271E+00	1.00E+03	2.43E+01	G
			763.94	7.213E-02	?(	2.765E+00	9.33E+02	2.23E+01	G
SN-113	F	3.8132E-01						1.15E+02	
			391.69	3.813E-01	?(	1.579E+00	1.21E+02	6.40E+01	G
SB-124	F	-2.1908E-01						6.02E+01	
			602.73	-2.191E-01	?(	2.084E+00	2.77E+02	9.83E+01	G
			1690.98	0.000E+00	+	1.359E+00	1.00E+03	4.78E+01	G
			722.79	-2.142E+00	+	1.053E+01	1.40E+02	1.08E+01	G
SB-125	I	1.2114E+00						1.01E+03	
			427.88	1.061E-01	?(	1.685E+00	5.63E+02	2.96E+01	G
			600.50	-2.461E+00	+	1.086E+01	1.30E+02	1.79E+01	G
			635.89	4.104E+00	?(	2.750E+00	3.02E+01	1.13E+01	G
			463.37	0.000E+00	&	7.825E+00	1.00E+03	1.05E+01	G
I-131	I	1.9081E-01						8.02E+00	
			364.48	1.020E-01	?(	6.408E-01	2.33E+02	8.17E+01	G
			284.30	1.373E+00	?(	8.486E+00	2.25E+02	6.14E+00	G
			636.97	0.000E+00	-	1.071E+01	1.00E+03	7.17E+00	G
Gd-153	F	-4.1904E-01						2.42E+02	
			97.50	-4.190E-01	?(	2.400E+00	1.68E+02	3.00E+01	G
			103.20	0.000E+00	+	3.407E+00	1.00E+03	2.18E+01	G
Ga-68	C	3.6665E+00						4.71E-02	
			1077.40	3.667E+00	?(	2.964E+01	3.24E+02	3.30E+00	G
Tc-99m	I	1.1648E-01						2.51E-01	
			140.51	1.165E-01	?(	7.251E-01	1.81E+02	8.93E+01	G
BA-133	F	-4.3458E-01						3.85E+03	
			356.00	-4.346E-01	&(	1.278E+00	1.17E+02	6.20E+01	G
			302.85	0.000E+00	+	7.711E+00	1.00E+03	1.83E+01	G
			383.84	-2.908E+00	+	1.215E+01	1.22E+02	8.94E+00	GA
			80.99	9.256E-01	?	1.187E+00	4.92E+01	3.41E+01	GA

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	I -2.7585E-01					7.54E+02	
		604.71	-4.971E-01	&(	2.302E+00	1.37E+02	9.76E+01 G
		795.87	-4.354E-01	+	1.524E+00	1.02E+02	8.55E+01 G
		569.32	-8.432E-02	%	5.868E+00	1.87E+03	1.54E+01 G
		801.95	-5.746E-01	+	1.717E+01	8.31E+02	8.69E+00 G
		563.24	2.311E+00	?(	9.019E+00	1.54E+02	8.35E+00 G
CS-137	I 3.6467E-01					1.10E+04	
		661.66	3.647E-01	?(	1.192E+00	9.53E+01	8.52E+01 G
CE-139	F 1.8256E-01					1.38E+02	
		165.85	1.826E-01	?(	6.713E-01	1.08E+02	7.99E+01 G
Ba-140	I 6.6212E-01					1.28E+01	
		537.26	6.621E-01	?(	2.510E+00	1.47E+02	2.44E+01 G
		162.66	-3.034E+00	+	1.127E+01	1.10E+02	6.22E+00 G
		304.85	0.000E+00	&	3.311E+01	1.00E+03	4.29E+00 G
La-140	I 6.7957E-01					1.28E+01	
		1596.21	0.000E+00	?(	6.487E-01	1.00E+03	9.54E+01 G
		487.02	-6.088E-01	+	2.689E+00	1.29E+02	4.55E+01 G
		328.76	8.634E-01	&(	2.771E+00	9.35E+01	2.03E+01 G
		815.77	3.304E+00	?(	3.224E+00	3.53E+01	2.33E+01 G
CE-141	I 3.2146E-02					3.25E+01	
		145.44	3.215E-02	%(	1.644E+00	1.47E+03	4.82E+01 G
CE-144	I 8.9160E-01					2.85E+02	
		133.54	8.916E-01	?(	5.254E+00	1.71E+02	1.11E+01 G
PM-144	C -1.9738E-01					3.63E+02	
		696.54	-1.974E-01	?(	1.149E+00	2.41E+02	9.90E+01 G
		618.06	0.000E+00	+	2.461E+00	1.00E+03	9.91E+01 G
EU-152	F 2.6623E+00					4.94E+03	
		344.29	6.943E-01	?(	3.355E+00	1.40E+02	2.65E+01 G
		1112.07	5.572E+00	?(	3.422E+00	2.89E+01	1.36E+01 G
		121.78	3.763E-01	-	1.357E+00	1.05E+02	2.86E+01 G
		778.92	-1.889E+00	+	7.612E+00	1.65E+02	1.29E+01 G
		964.11	3.515E+00	?(	2.879E+00	3.33E+01	1.46E+01 G
		244.69	-3.242E-08	%	1.014E+01	8.80E+09	7.58E+00 G
		1408.00	-3.611E-01	-	5.101E+00	6.00E+02	2.10E+01 GA
EU-154	I 1.5146E+00					3.14E+03	
		873.23	1.515E+00	?(	7.388E+00	1.36E+02	1.23E+01 G
		123.10	-4.095E-01	-	1.468E+00	1.06E+02	4.08E+01 G
		1274.54	0.000E+00	-	1.470E+00	1.00E+03	3.52E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.36	0.000E+00	-	6.171E+00	1.00E+03	2.02E+01 G
		1004.77	0.000E+00	-	3.445E+00	1.00E+03	1.80E+01 G
		996.33	-9.187E-02	%	9.684E+00	2.72E+03	1.06E+01 G
HF-181	F 2.9354E-02					4.24E+01	
		482.00	-1.992E-01	?(	1.211E+00	1.73E+02	8.05E+01 G
		133.02	2.280E-01	?(	1.412E+00	1.80E+02	4.33E+01 G
		345.83	-1.735E+00	+	7.209E+00	1.22E+02	1.51E+01 G
		136.30	1.703E+00	?(	9.846E+00	1.67E+02	5.85E+00 G
Hg-203	F -2.9719E-01					4.66E+01	
		279.20	-2.972E-01	?(	9.701E-01	9.63E+01	8.15E+01 G
TL-208	N -5.0592E-02					6.98E+02	
		583.02	-6.361E-01	?(	1.413E+00	9.26E+01	8.45E+01 G
		277.28	2.694E+00	(	8.667E+00	9.41E+01	6.31E+00 G
		860.56	2.538E+00	?(	3.118E+00	4.08E+01	1.24E+01 G
pm-146	C 7.4421E-01					2.02E+03	
		747.16	7.442E-01	&(	1.783E+00	9.62E+01	3.40E+01 G
		735.72	-2.471E+00	+	5.259E+00	9.12E+01	2.25E+01 G
		453.88	1.515E-01	-	9.522E-01	2.33E+02	6.50E+01 G
y-88	F 1.1566E-01					1.07E+02	
		898.04	1.157E-01	?(	1.009E+00	3.55E+02	9.37E+01 G
		1836.06	0.000E+00	-	7.036E-01	1.00E+03	9.92E+01 G
Cd-113m	4.8334E+02					5.33E+03	
		263.70	4.833E+02	?(	1.162E+04	6.74E+02	6.00E-03 K
Cf-251	T 7.2565E-01					3.28E+05	
		176.60	7.257E-01	?(	2.604E+00	1.34E+02	1.70E+01 G
		227.00	-5.178E-01	+	8.176E+00	5.74E+02	6.30E+00 GA
Cf-249	T 2.1825E-01					1.28E+05	
		387.95	0.000E+00	&(	1.778E+00	1.00E+03	6.60E+01 G
		333.44	1.147E+00	?(	4.564E+00	1.15E+02	1.55E+01 G
Sn-126	1.2830E+00					3.65E+07	
		87.57	-3.746E-01	-	2.180E+00	1.71E+02	3.75E+01 GA
		64.28	1.283E+00	&(	8.000E+00	1.81E+02	9.70E+00 G
		86.94	-1.999E+00	+	9.469E+00	1.40E+02	9.04E+00 GA
PB-210	N 9.7401E+00					8.14E+03	
		46.54	9.740E+00	(P	2.474E+01	8.22E+01	4.25E+00 G

(Page 13 of 21)

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	N	-6.2351E-01					6.98E+02	
			238.63	-6.235E-01	?(P	1.929E+00	5.60E+01	4.33E+01 G
			300.03	6.275E+00		3.943E+01	1.84E+02	3.28E+00 GA
PB-214	N	9.7294E-02					5.84E+05	
			351.93	1.412E-02	%(P	2.005E+00	3.95E+03	3.76E+01 G
			295.09	2.593E-01	&(P	6.335E+00	7.09E+02	1.93E+01 G
			242.00	8.259E-01	?	1.029E+01	3.55E+02	7.43E+00 GA
BI-207	C	5.2122E-01					1.18E+04	
			569.70	1.659E-01	&(	7.981E-01	1.35E+02	9.77E+01 G
			1063.66	9.874E-01	?(	6.064E-01	2.89E+01	7.45E+01 G
BI-212	N	-4.7241E+00					6.98E+02	
			727.17	-4.724E+00	?(	1.882E+01	1.16E+02	7.55E+00 G
			785.42	-3.074E+01	+	7.742E+01	1.05E+02	1.28E+00 GA
U-235	N	7.5479E-01					2.57E+11	
			143.79	-9.978E-01	?(P	7.206E+00	1.47E+02	1.10E+01 G
			205.33	2.684E+00	?(	9.632E+00	1.34E+02	5.01E+00 G
			163.38	2.634E+00	?(	1.011E+01	1.12E+02	5.08E+00 G
			185.72	2.099E-01	P	9.619E-01	1.57E+02	5.40E+01 GA
BI-214	N	-1.4258E+00					5.84E+05	
			609.31	-1.426E+00	?(P	5.276E+00	5.62E+01	4.61E+01 G
			1120.29	-3.881E+00	+	1.255E+01	9.51E+01	1.51E+01 G
			1764.49	4.157E+00	+	4.376E+00	3.78E+01	1.54E+01 G
BI-210M	T	-5.1567E-01					1.10E+09	
			265.83	-5.157E-01	?(	1.580E+00	9.08E+01	5.00E+01 G
			304.90	5.769E-02	%	5.046E+00	2.53E+03	2.80E+01 G
AC-228	N	-1.8880E-01					2.10E+03	
			911.07	-1.888E-01	?(	3.294E+00	7.02E+02	2.90E+01 G
			968.97	0.000E+00	+	5.473E+00	1.00E+03	1.75E+01 G
			338.32	-2.127E+00	+	8.139E+00	1.12E+02	1.20E+01 G
			93.35	2.010E+00	?	1.434E+01	2.09E+02	5.56E+00 XA
TH-227	N	1.5107E+00					7.95E+03	
			50.14	6.332E-01	?(	1.539E+01	7.00E+02	8.00E+00 G
			256.24	2.514E+00	?(	6.897E+00	1.03E+02	7.00E+00 G
TH-229	N	-4.6346E+00					2.68E+06	
			193.51	-4.635E+00	?(	1.299E+01	1.07E+02	4.40E+00 G
			210.85	3.534E+00	+	1.413E+01	1.47E+02	2.99E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	N	5.3991E+00					1.63E+12	
			63.29	5.399E+00	*(P	1.482E+01	9.03E+01	3.81E+00 G
			92.59	4.855E-01	- P	8.825E+00	5.55E+02	5.58E+00 G
PA-231	N	3.8544E+00					1.20E+07	
			302.65	0.000E+00	?(	4.905E+01	1.00E+03	2.88E+00 G
			300.07	8.367E+00	?(	5.432E+01	1.91E+02	2.46E+00 G
PA-233	C	3.1286E-01					7.82E+08	
			312.01	0.000E+00	?(	4.002E+00	1.00E+03	3.60E+01 G
			300.18	2.129E+00	?(	2.223E+01	3.05E+02	6.20E+00 G
PA-234	N	-9.0551E-01					1.63E+12	
			131.29	-9.055E-01	?(	3.774E+00	1.23E+02	1.80E+01 G
			946.02	-1.260E+00	+	7.326E+00	2.39E+02	1.34E+01 G
			569.47	3.163E-01	+	1.092E+01	9.33E+02	8.20E+00 G
			883.24	0.000E+00	+	1.158E+01	1.00E+03	9.60E+00 G
			880.53	4.006E+00	?	1.586E+01	1.12E+02	6.00E+00 GA
PA-234M	N	2.1014E+01					1.63E+12	
			1001.00	2.101E+01	?(	1.074E+02	1.40E+02	8.37E-01 G
			766.41	0.000E+00	-	1.696E+02	1.00E+03	2.94E-01 G
AM-241	T	3.3002E-01					1.58E+05	
			59.54	3.300E-01	&(	2.170E+00	1.90E+02	3.59E+01 G
Np-237	F	-1.3815E+00					2.14E+06	
			86.49	-1.382E+00	?(	7.097E+00	1.52E+02	1.31E+01 G
Ir-192	F	-4.6973E-02					7.40E+01	
			316.49	-3.160E-01	?(	1.936E+00	1.81E+02	8.70E+01 G
			468.06	4.056E-01	?(	1.322E+00	9.46E+01	5.18E+01 G
			308.44	0.000E+00	+	4.499E+00	1.00E+03	3.18E+01 G
Cs-136	F	-2.8196E-01					1.30E+01	
			818.50	-2.820E-01	?(	1.470E+00	1.50E+02	1.00E+02 G
			1048.07	-1.065E+00	+	2.193E+00	6.26E+01	8.00E+01 G
			340.57	-5.485E-01	+	2.260E+00	1.21E+02	4.69E+01 G
Np-239	T	5.4709E-01					2.36E+00	
			103.70	0.000E+00	-	3.093E+00	1.00E+03	2.40E+01 X
			106.13	5.471E-01	?(	3.069E+00	1.64E+02	2.27E+01 G
			99.50	0.000E+00	-	4.980E+00	1.00E+03	1.50E+01 X
Nd-147		-3.1260E+00					1.11E+01	
			531.00	-3.126E+00	?(	7.523E+00	9.93E+01	1.30E+01 G
			91.10	0.000E+00	+	2.957E+00	1.00E+03	2.83E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-210	N 1.1407E-01					5.84E+05	
		799.60	0.000E+00	?(	1.484E+00	1.00E+03	9.90E+01 G
		296.00	2.569E-01	?(	1.565E+00	1.79E+02	7.90E+01 G
		1313.00	-5.700E-01	+	4.721E+00	3.44E+02	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity
TH-227	50.14	97.	2.	0.001	700.00	6.332E-01
AM-241	59.54	62.	6.	0.003	190.28	3.300E-01
Sn-126	64.28	72.	7.	0.004	181.18	1.283E+00
BA-133	80.99	23.	20.	0.011	49.18	9.256E-01
Np-237	86.49	149.	-12.	-0.006	151.67	-1.382E+00
EU-155	86.54	137.	-12.	-0.006	145.83	-5.896E-01
Sn-126	86.94	126.	-12.	-0.006	139.75	-1.999E+00
Sn-126	87.57	115.	-9.	-0.005	170.78	-3.746E-01
AC-228	93.35	113.	7.	0.004	208.60	2.010E+00
Gd-153	97.50	93.	-8.	-0.005	167.57	-4.190E-01

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Np-239	106.13	89.	8.	0.005	164.10	5.471E-01	
EU-152	121.78	25.	7.	0.004	104.91	3.763E-01	
CO-57	122.06	32.	7.	0.004	117.35	1.257E-01	
EU-154	123.10	64.	-11.	-0.006	105.80	-4.095E-01	
PA-234	131.29	82.	-11.	-0.006	122.71	-9.055E-01	
HF-181	133.02	65.	7.	0.004	179.60	2.280E-01	
CE-144	133.54	59.	7.	0.004	170.77	8.916E-01	
HF-181	136.30	57.	7.	0.004	167.49	1.703E+00	
CO-57	136.47	61.	7.	0.004	172.81	9.333E-01	
Tc-99m	140.51	67.	7.	0.004	180.67	1.165E-01	
U-235	143.79	108.	-7.	-0.004	146.72	-9.978E-01	P
Ba-140	162.66	76.	-12.	-0.006	109.66	-3.034E+00	
U-235	163.38	39.	8.	0.005	112.06	2.634E+00	
CE-139	165.85	42.	9.	0.005	107.73	1.826E-01	
Cf-251	176.60	26.	7.	0.004	134.42	7.257E-01	
U-235	185.72	34.	7.	0.004	156.98	2.099E-01	P
TH-229	193.51	40.	-12.	-0.006	107.20	-4.635E+00	
U-235	205.33	26.	7.	0.004	134.42	2.684E+00	
TH-229	210.85	18.	6.	0.003	147.47	3.534E+00	
Cf-251	227.00	26.	-2.	-0.001	573.93	-5.178E-01	
TH-227	256.24	18.	8.	0.005	103.04	2.514E+00	
Cd-113m	263.70	40.	1.	0.001	673.61	4.833E+02	
BI-210M	265.83	51.	-12.	-0.007	90.78	-5.157E-01	
TL-208	277.28	21.	8.	0.004	94.06	2.694E+00	
Hg-203	279.20	48.	-11.	-0.006	96.35	-2.972E-01	
I-131	284.30	18.	4.	0.002	224.62	1.373E+00	
TL-210	296.00	113.	9.	0.005	178.57	2.569E-01	
PA-231	300.07	130.	9.	0.005	190.55	8.367E+00	
PA-233	300.18	138.	6.	0.003	304.85	2.129E+00	
Ir-192	316.49	194.	-11.	-0.006	180.94	-3.160E-01	
CR-51	320.08	131.	9.	0.005	188.12	2.213E+00	
Cf-249	333.44	28.	7.	0.004	115.28	1.147E+00	
AC-228	338.32	55.	-10.	-0.005	112.35	-2.127E+00	
Cs-136	340.57	65.	-10.	-0.005	120.92	-5.485E-01	
EU-152	344.29	43.	7.	0.004	140.00	6.943E-01	
HF-181	345.83	67.	-10.	-0.005	121.97	-1.735E+00	
BA-133	356.00	32.	-10.	-0.005	116.51	-4.346E-01	
I-131	364.48	12.	3.	0.002	233.33	1.020E-01	
BA-133	383.84	56.	-9.	-0.005	122.22	-2.908E+00	
SN-113	391.69	46.	8.	0.005	120.82	3.813E-01	
SB-125	427.88	8.	1.	0.001	562.73	1.061E-01	
AG-108M	433.94	24.	-9.	-0.005	111.67	-3.156E-01	
pm-146	453.88	12.	3.	0.002	233.33	1.515E-01	
Ir-192	468.06	14.	6.	0.003	94.61	4.056E-01	
HF-181	482.00	30.	-5.	-0.003	173.21	-1.992E-01	
RU-103	497.05	8.	6.	0.004	95.36	2.469E-01	
RH-106	511.86	33.	39.	0.021	41.33	6.949E+00	
Nd-147	531.00	26.	-11.	-0.006	99.31	-3.126E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Ba-140	537.26	9.	4.	0.002	146.76	6.621E-01		
CS-134	563.24	13.	5.	0.003	153.84	2.311E+00		
PA-234	569.47	19.	1.	0.000	932.74	3.163E-01		
BI-207	569.70	14.	4.	0.002	135.41	1.659E-01		
TL-208	583.02	35.	-14.	-0.008	92.60	-6.361E-01		
SB-125	600.50	94.	-11.	-0.006	129.95	-2.461E+00		
SB-124	602.73	105.	-5.	-0.003	276.60	-2.191E-01		
CS-134	604.71	127.	-12.	-0.007	136.76	-4.971E-01		
BI-214	609.31	148.	-16.	-0.009	56.15	-1.426E+00		P
SB-125	635.89	0.	11.	0.006	30.15	4.104E+00		
AG-110M	657.76	29.	-6.	-0.003	140.07	-2.590E-01		
CS-137	661.66	20.	7.	0.004	95.31	3.647E-01		
PM-144	696.54	23.	-4.	-0.002	241.30	-1.974E-01		
NB-94	702.63	19.	-3.	-0.001	349.11	-1.236E-01		
SB-124	722.79	22.	-5.	-0.003	140.00	-2.142E+00		
BI-212	727.17	36.	-8.	-0.004	115.93	-4.724E+00		
pm-146	735.72	23.	-12.	-0.007	91.24	-2.471E+00		
pm-146	747.16	5.	5.	0.003	96.22	7.442E-01		
AG-110M	763.94	5.	0.	0.000	932.74	7.213E-02		
NB-95	765.79	12.	-3.	-0.002	173.21	-1.452E-01		
EU-152	778.92	14.	-5.	-0.003	164.92	-1.889E+00		
BI-212	785.42	14.	-8.	-0.004	105.33	-3.074E+01		
CS-134	795.87	26.	-8.	-0.004	101.98	-4.354E-01		
CS-134	801.95	34.	-1.	-0.001	830.66	-5.746E-01		
CO-58	810.78	0.	7.	0.004	38.39	3.433E-01		
Cs-136	818.50	32.	-6.	-0.003	149.54	-2.820E-01		
MN-54	834.85	0.	6.	0.003	40.82	3.085E-01		
Co-56	846.77	20.	-11.	-0.006	94.33	-5.716E-01		
TL-208	860.56	0.	6.	0.003	40.82	2.538E+00		
NB-94	871.10	10.	-3.	-0.002	159.86	-1.592E-01		
EU-154	873.23	10.	4.	0.002	135.53	1.515E+00		
PA-234	880.53	10.	4.	0.002	112.22	4.006E+00		
Sc-46	889.28	15.	1.	0.000	839.64	3.587E-02		
y-88	898.04	10.	2.	0.001	354.73	1.157E-01		
AC-228	911.07	10.	-1.	-0.001	702.38	-1.888E-01		
AG-110M	937.49	15.	-6.	-0.003	147.67	-9.761E-01		
PA-234	946.02	10.	-3.	-0.002	238.82	-1.260E+00		
EU-152	964.11	0.	9.	0.005	33.33	3.515E+00		
PA-234M	1001.00	7.	3.	0.002	140.11	2.101E+01		
Co-56	1037.84	5.	2.	0.001	324.35	7.101E-01		
Cs-136	1048.07	32.	-14.	-0.008	62.60	-1.065E+00		
RH-106	1050.36	28.	9.	0.005	90.15	3.464E+01		
BI-207	1063.66	0.	12.	0.007	28.87	9.874E-01		
Ga-68	1077.40	5.	2.	0.001	324.35	3.667E+00		
FE-59	1099.25	5.	1.	0.000	796.87	7.411E-02		
EU-152	1112.07	0.	12.	0.007	28.87	5.572E+00		
BI-214	1120.29	34.	-9.	-0.005	95.09	-3.881E+00		
Sc-46	1120.55	27.	-12.	-0.006	80.30	-7.384E-01		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	1173.24	11.	-6.	-0.003	137.58	-3.740E-01	
Ta-182	1221.41	11.	-4.	-0.002	188.42	-1.091E+00	
Co-56	1238.28	11.	-6.	-0.004	130.84	-6.583E-01	
TL-210	1313.00	6.	-2.	-0.001	343.80	-5.700E-01	
EU-152	1408.00	6.	-1.	-0.001	600.00	-3.611E-01	
BI-214	1764.49	0.	7.	0.004	37.80	4.157E+00	
Co-56	1771.35	18.	-8.	-0.005	79.16	-4.970E+00	

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

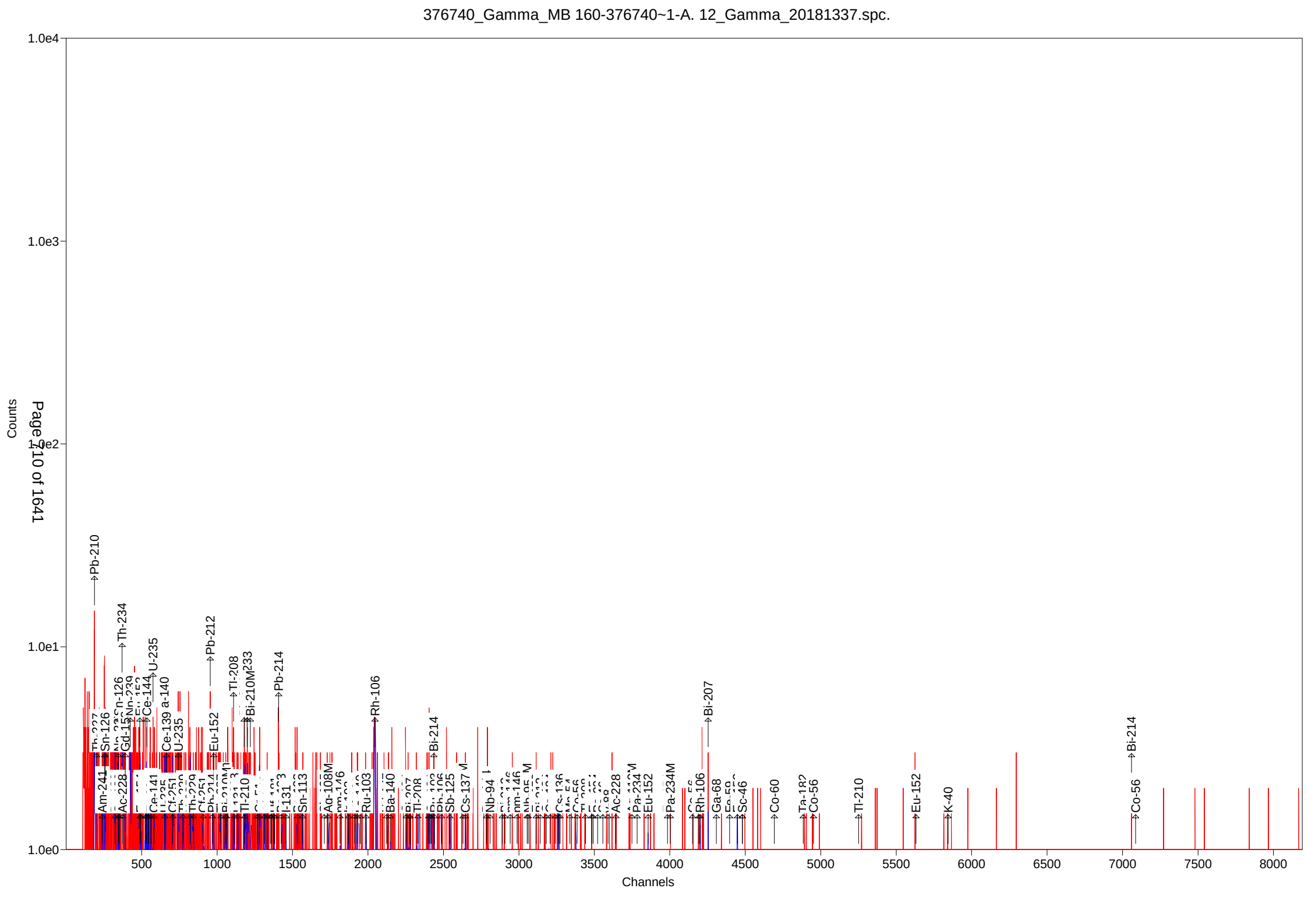
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-1.0811E-01	-1.0811E-01	2.733E+03%	1.06E+01
NA-22	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.18E-01
K-40	#	5.8566E+00	5.8566E+00	3.536E+01%	5.40E+00
Sc-46	#A	3.5873E-02	3.5874E-02	8.396E+02%	1.13E+00
CR-51	#A	2.2134E+00	2.2135E+00	1.881E+02%	1.42E+01
MN-54	#A	3.0847E-01	3.0847E-01	4.082E+01%	3.79E-01
FE-59	#A	7.4107E-02	7.4108E-02	7.969E+02%	1.50E+00
Co-56	#A	-4.1284E-01	-4.1284E-01	9.433E+01%	1.22E+00
CO-57	#A	2.1528E-01	2.1528E-01	1.044E+02%	5.08E-01
CO-58	#A	3.4329E-01	3.4330E-01	3.839E+01%	3.73E-01
CO-60	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.36E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.37E+00
NB-94	#A	-1.2361E-01	-1.2361E-01	3.491E+02%	1.06E+00
ZR-95	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.77E+00
NB-95	#A	-1.4519E-01	-1.4519E-01	1.732E+02%	9.12E-01
RU-103	#A	2.4690E-01	2.4690E-01	9.536E+01%	6.15E-01
RH-106	#A	4.3413E+00	4.3413E+00	9.015E+01%	2.48E+01
AG-108M	#A	-3.1561E-01	-3.1561E-01	1.117E+02%	8.96E-01
AG-110M	#A	1.3476E-02	1.3476E-02	5.647E+02%	1.53E+00
SN-113	#A	3.8132E-01	3.8132E-01	1.208E+02%	1.58E+00
SB-124	#A	-2.1908E-01	-2.1908E-01	2.766E+02%	2.08E+00
SB-125	#A	1.2114E+00	1.2114E+00	3.015E+01%	1.69E+00
I-131	#A	1.9080E-01	1.9081E-01	1.619E+02%	6.41E-01
Gd-153	#A	-4.1904E-01	-4.1904E-01	1.676E+02%	2.40E+00
Ga-68	#A	3.6293E+00	3.6665E+00	3.243E+02%	2.96E+01
Tc-99m	#A	1.1625E-01	1.1648E-01	1.807E+02%	7.25E-01
BA-133	#A	-4.3458E-01	-4.3458E-01	1.165E+02%	1.28E+00
CS-134	#A	-2.7585E-01	-2.7585E-01	1.029E+02%	2.30E+00
CS-137	#A	3.6467E-01	3.6467E-01	9.531E+01%	1.19E+00
CE-139	#A	1.8256E-01	1.8256E-01	1.077E+02%	6.71E-01
Ba-140	#A	6.6210E-01	6.6212E-01	1.468E+02%	2.51E+00
La-140	#C	6.7955E-01	6.7957E-01	3.526E+01%	6.49E-01
CE-141	#A	3.2145E-02	3.2146E-02	1.473E+03%	1.64E+00

CE-144 #A	8.9160E-01	8.9160E-01	1.708E+02%		5.25E+00
PM-144 #A	-1.9738E-01	-1.9738E-01	2.413E+02%		1.15E+00
EU-152 #A	2.6623E+00	2.6623E+00	2.887E+01%		3.35E+00
EU-154 #A	1.5146E+00	1.5146E+00	1.355E+02%		7.39E+00
EU-155 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.50E+00
HF-181 #A	2.9354E-02	2.9354E-02	1.002E+02%		1.21E+00
Ta-182 #A	0.0000E+00	0.0000E+00	7.071E+02%		2.65E+00
Hg-203 #A	-2.9719E-01	-2.9719E-01	9.635E+01%		9.70E-01
TL-208 #A	-5.0592E-02	-5.0592E-02	4.082E+01%		1.41E+00
pm-146 #A	7.4421E-01	7.4421E-01	9.622E+01%		1.78E+00
y-88 #A	1.1566E-01	1.1566E-01	3.547E+02%		1.01E+00
Cd-113m#A	4.8334E+02	4.8334E+02	6.736E+02%		1.16E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		2.23E+01
Cf-251 #A	7.2565E-01	7.2565E-01	1.344E+02%		2.60E+00
Cf-249 #A	2.1825E-01	2.1825E-01	1.153E+02%		1.78E+00
Sn-126 #A	1.2830E+00	1.2830E+00	1.812E+02%		8.00E+00
PB-210 A	9.7401E+00	9.7401E+00	8.215E+01%		2.47E+01
PB-212 A	-6.2351E-01	-6.2351E-01	5.601E+01%		1.93E+00
PB-214 #A	9.7294E-02	9.7294E-02	7.090E+02%		2.00E+00
BI-207 #A	5.2122E-01	5.2122E-01	2.887E+01%		7.98E-01
BI-212 #A	-4.7241E+00	-4.7241E+00	1.159E+02%		1.88E+01
U-235 #A	7.5479E-01	7.5479E-01	7.612E+01%		7.21E+00
BI-214 #A	-1.4258E+00	-1.4258E+00	5.615E+01%		5.28E+00
BI-210M#A	-5.1567E-01	-5.1567E-01	9.078E+01%		1.58E+00
AC-228 #A	-1.8880E-01	-1.8880E-01	7.024E+02%		3.29E+00
TH-227 #A	1.5107E+00	1.5107E+00	1.030E+02%		1.54E+01
TH-229 #A	-4.6346E+00	-4.6346E+00	1.072E+02%		1.30E+01
TH-234 #A	5.3991E+00	5.3991E+00	9.031E+01%		1.48E+01
PA-231 #A	3.8544E+00	3.8544E+00	1.905E+02%		4.91E+01
PA-233 #A	3.1286E-01	3.1286E-01	3.049E+02%		4.00E+00
PA-234 #A	-9.0551E-01	-9.0551E-01	1.227E+02%		3.77E+00
PA-234M#A	2.1014E+01	2.1014E+01	1.401E+02%		1.07E+02
AM-241 #A	3.3002E-01	3.3002E-01	1.903E+02%		2.17E+00
Np-237 #A	-1.3815E+00	-1.3815E+00	1.517E+02%		7.10E+00
Ir-192 #A	-4.6973E-02	-4.6973E-02	9.461E+01%		1.94E+00
Cs-136 #A	-2.8195E-01	-2.8196E-01	1.495E+02%		1.47E+00
Np-239 #A	5.4698E-01	5.4709E-01	1.641E+02%		3.07E+00
Nd-147 #A	-3.1259E+00	-3.1260E+00	9.931E+01%		7.52E+00
TL-210 #A	1.1407E-01	1.1407E-01	1.786E+02%		1.48E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.1 keV) 0.000E+00 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 0.0000000E+00 Bq/Sample


376740_Gamma_MB 160-376740~1-A. 12_Gamma_20181337.spc.
Counts
Channels
Page 10 of 1641
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-210
Th-234
U-235
Pb-212
Eu-152
Tl-208
Bi-214
Pb-214
Rh-106
Bi-207
Co-60
Co-56
Eu-152
K-40
Bi-214
Co-56

Test America St. Louis Spectrum ID: 19_Gamma_20181430

Sample Description: 376740_Gamma_LCS 160-376740~2-A
Detector: Detector #19
Batch ID: 376740
Work Order Number: Gamma
Lot Number: LCS 160-376740~2-A

Decay to Time: 8/9/2018 01:24 Live Time: 1800 sec
Acquisition Time: 8/9/2018 01:24:38 Real Time: 1807 sec
Analysis Time: 8/9/2018 01:54 Dead Time: 0.39 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 19_Soil_TunaCan.Clb
Efficiency Cal Desc: 19_TunaCan_108513
Efficiency Cal Date: 4/16/2018 12:11
Energy Cal Date: 4/16/2018 11:22
Library: Client_Long_Rev14.lib
Bkgd Correction File: 19_2018-07-14_1824.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-1.733E+01	103.3	1.790E+01	1.793E+01	5.942E+01
NA-22	-8.579E-01	89.2	7.654E-01	7.666E-01	2.589E+00
K-40	-8.758E+00	117.7	1.031E+01	1.032E+01	2.260E+01
Sc-46	-1.965E+00	103.2	2.027E+00	2.029E+00	6.749E+00
CR-51	-1.029E-01	19726.8	2.029E+01	2.029E+01	6.779E+01
MN-54	6.870E-02	2282.0	1.568E+00	1.568E+00	3.608E+00
FE-59	-2.738E+00	124.9	3.421E+00	3.423E+00	8.341E+00
Co-56	1.615E+00	60.1	9.717E-01	9.751E-01	3.113E+00
CO-57	0.000E+00	1.#INF	2.645E-01	2.645E-01	2.982E+00
CO-58	-1.965E+00	69.7	1.369E+00	1.373E+00	5.414E+00
CO-60	1.758E+02	1.6	2.809E+00	9.194E+00	1.731E+00
ZN-65	-5.404E+00	74.6	4.032E+00	4.041E+00	1.336E+01
NB-94	2.298E+00	49.6	1.140E+00	1.146E+00	2.529E+00
ZR-95	6.529E-01	384.9	2.513E+00	2.513E+00	5.771E+00
NB-95	1.520E+00	69.6	1.057E+00	1.060E+00	3.501E+00
RU-103	1.657E-01	995.9	1.651E+00	1.651E+00	3.892E+00
RH-106	-1.645E+01	62.3	1.025E+01	1.029E+01	4.216E+01
AG-108M	9.753E-01	111.6	1.088E+00	1.089E+00	3.975E+00
AG-110M	2.056E+00	84.6	1.738E+00	1.741E+00	8.054E+00
SN-113	2.211E+00	101.7	2.249E+00	2.251E+00	7.467E+00
SB-124	-1.623E+00	130.0	2.109E+00	2.111E+00	7.019E+00
SB-125	4.263E+00	90.2	3.846E+00	3.852E+00	1.213E+01
I-131	8.053E-01	142.0	1.143E+00	1.144E+00	3.802E+00
Gd-153	1.511E+00	342.2	5.170E+00	5.171E+00	1.716E+01
Ga-68	-2.844E+01	250.6	7.128E+01	7.129E+01	1.570E+02
Tc-99m	0.000E+00	1.#INF	6.690E-01	6.690E-01	4.962E+00
BA-133	-2.159E+00	97.9	2.112E+00	2.115E+00	7.012E+00
CS-134	2.789E-01	94.2	2.626E-01	2.630E-01	6.957E+00
CS-137	4.007E+02	1.3	5.169E+00	2.110E+01	3.450E+00
CE-139	1.100E+00	97.3	1.071E+00	1.072E+00	3.551E+00
Ba-140	2.189E+00	236.3	5.172E+00	5.173E+00	1.221E+01
La-140	-1.907E+00	65.2	1.244E+00	1.247E+00	3.211E+00
CE-141	1.726E+00	151.1	2.607E+00	2.609E+00	8.649E+00

CE-144	0.000E+00	1.#INF	2.755E+00	2.755E+00	3.817E+01
PM-144	9.322E-01	89.4	8.337E-01	8.351E-01	2.485E+00
EU-152	2.666E+00	97.8	2.607E+00	2.611E+00	2.248E+01
EU-154	9.128E+00	78.9	7.201E+00	7.216E+00	4.008E+01
EU-155	1.707E+00	130.8	2.233E+00	2.235E+00	2.416E+01
HF-181	-2.287E+00	105.1	2.404E+00	2.407E+00	7.978E+00
Ta-182	6.026E+00	87.5	5.273E+00	5.282E+00	2.012E+01
Hg-203	4.552E-01	299.9	1.365E+00	1.365E+00	3.322E+00
TL-208	3.828E+00	32.0	1.225E+00	1.241E+00	2.796E+00
pm-146	-5.523E+00	65.3	3.606E+00	3.617E+00	1.086E+01
y-88	0.000E+00	1.#INF	1.977E+00	1.977E+00	4.375E+00
Cd-113m	3.103E+04	44.8	1.391E+04	1.403E+04	3.384E+04
Cd-109	2.367E+01	130.7	3.094E+01	3.097E+01	1.026E+02
Cf-251	-1.735E+00	295.7	5.131E+00	5.132E+00	1.303E+01
Cf-249	1.432E+00	148.2	2.122E+00	2.123E+00	7.804E+00
Sn-126	-2.254E+01	217.0	4.891E+01	4.893E+01	1.616E+02
PB-210	1.112E+04	1.0	1.128E+02	7.035E+02	2.161E+02
PB-212	1.935E+00	131.5	2.544E+00	2.546E+00	8.456E+00
PB-214	1.107E+01	22.3	2.470E+00	2.533E+00	6.562E+00
BI-207	-5.575E-01	164.6	9.174E-01	9.179E-01	3.102E+00
BI-212	1.083E+01	139.0	1.506E+01	1.507E+01	5.071E+01
U-235	4.671E+00	196.4	9.173E+00	9.176E+00	3.930E+01
BI-214	1.001E+01	18.4	1.840E+00	1.909E+00	5.178E+00
BI-210M	-2.262E+00	88.7	2.007E+00	2.010E+00	6.655E+00
AC-228	8.181E+00	47.9	3.922E+00	3.944E+00	1.577E+01
TH-227	1.834E+01	155.9	2.859E+01	2.861E+01	9.476E+01
TH-229	-1.055E+00	2037.8	2.151E+01	2.151E+01	5.477E+01
TH-234	-6.875E+01	113.3	7.791E+01	7.801E+01	4.129E+02
PA-231	3.606E+00	705.8	2.545E+01	2.545E+01	2.238E+02
PA-233	1.717E+00	319.8	5.489E+00	5.490E+00	1.826E+01
PA-234	2.305E+00	118.5	2.732E+00	2.735E+00	7.934E+00
PA-234M	2.787E+02	63.7	1.776E+02	1.782E+02	7.164E+02
AM-241	1.256E+03	0.9	1.076E+01	7.389E+01	1.546E+01
Np-237	6.879E+00	129.4	8.901E+00	8.910E+00	2.952E+01
Ir-192	1.279E+00	88.5	1.132E+00	1.135E+00	7.672E+00
Cs-136	2.831E-01	76.5	2.166E-01	2.172E-01	5.873E+00
Np-239	3.819E+00	174.8	6.675E+00	6.679E+00	2.212E+01
Nd-147	1.009E+01	92.1	9.298E+00	9.315E+00	2.171E+01
TL-210	6.070E-01	167.7	1.018E+00	1.018E+00	4.992E+00
Total	4.443E+04				

Analyst: Morgan Reichert

TestAmerica Inc Spectrum name: 19_Gamma_20181430.An1

Sample description
376740_Gamma_LCS 160-376740~2-A

Spectrum Filename: C:\User\SPC\Det19\19_Gamma_20181430.An1

Acquisition information
Start time:	8/9/2018 1:24:38 AM
Live time:	1800
Real time:	1807
Dead time:	0.39 %
Detector ID:	19

Detector system
Ge19 SN/11146715

Calibration
Filename: 19_Soil_TunaCan.Clb
19_TunaCan_108513

Energy Calibration
Created:	4/16/2018 11:22:57 AM
Zero offset:	0.177 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration
Created:	4/16/2018 12:11:21 PM
Type:	Polynomial
Uncertainty:	0.841 %
Coefficients:	-0.371612 -4.869309 0.466742
	-0.049787 0.002234 -0.000039

Library Files
Main analysis library:	Client_Long_Rev14.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	150 (37.71keV)
Stop channel:	8000 (1999.42keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 1:24:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	19_2018-07-14_1824.PBC 7/14/2018 6:24:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 31 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1441

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.72	14542.	1.01	0.93	1.720E-02	46.54	4.250	1.112E+04	PB210
49.95	53.	154.62	0.94	2.030E-02	50.14	8.000	1.780E+01	TH227
59.69	21205.	0.86	0.91	2.620E-02	59.54	35.900	1.256E+03	AM241
80.99	20.	279.79	0.97	3.218E-02	80.99	34.060	PBC<MDA	BA133
86.49	54.	129.41	0.97	3.300E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	2.935E+00	EU155
					86.94	9.040	9.951E+00	Sn126
86.54	54.	130.84	0.97	3.301E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	2.935E+00	EU155
					86.94	9.040	9.951E+00	Sn126
86.89	54.	131.94	0.97	3.306E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	2.936E+00	EU155
					86.94	9.040	9.955E+00	Sn126
87.96	77.	44.74	0.47	3.319E-02	87.57	37.500	3.442E+00	Sn126
					88.04	3.790	3.400E+01	Cd109
91.10	45.	147.54	0.97	3.352E-02	91.10	28.300	PBC<MDA	Nd147
93.35	54.	175.82	0.98	3.372E-02	93.35	5.561	PBC<MDA	AC228
97.50	28.	342.15	0.98	3.401E-02	97.50	30.000	PBC<MDA	Gd153
106.13	54.	174.77	0.99	3.430E-02	106.13	22.700	PBC<MDA	Np239
112.36	46.	55.54	0.61	3.429E-02				
121.78	25.	185.26	1.00	3.401E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	4.772E-01	CO57
131.24	25.	118.55	0.28	3.348E-02	131.29	18.000	PBC<MDA	PA234
143.79	39.	196.37	1.02	3.254E-02	143.79	10.960	PBC<MDA	U235
145.44	49.	151.07	1.02	3.240E-02	145.44	48.200	PBC<MDA	CE141
163.38	5.	881.49	1.04	3.076E-02	163.38	5.080	PBC<MDA	U235
165.85	48.	97.33	1.04	3.053E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.44	66.	58.35	0.98	2.864E-02	185.72	54.000	PBC<MDA	U235
227.00	46.	95.24	1.10	2.503E-02	227.00	6.300	PBC<MDA	Cf251
238.65	36.	131.50	1.11	2.413E-02	238.63	43.300	PBC<MDA	PB212
242.01	46.	103.84	1.11	2.388E-02	242.00	7.430	PBC<MDA	PB214
263.21	75.	44.84	1.58	2.238E-02	263.70	0.006	PBC<MDA	Cd113m
279.20	14.	299.89	1.14	2.141E-02	279.20	81.460	PBC<MDA	Hg203
294.85	107.	30.89	2.97	2.050E-02	295.09	19.300	1.505E+01	PB214
					296.00	79.000	3.685E+00	TL210
296.00	40.	167.69	1.16	2.045E-02	296.00	79.000	PBC<MDA	TL210
300.03	40.	170.27	1.16	2.023E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
300.07	7.	996.40	1.16	2.023E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	7.828E+00	PA231
					300.18	6.200	3.107E+00	PA233
313.00	22.	319.75	1.17	1.962E-02	312.01	36.000	PBC<MDA	PA233
328.76	41.	140.47	1.18	1.882E-02	328.76	20.300	PBC<MDA	La140
333.44	39.	148.16	1.19	1.861E-02	333.44	15.510	PBC<MDA	Cf249
338.40	62.	47.94	1.71	1.839E-02	338.32	12.010	PBC<MDA	AC228
351.63	109.	32.23	1.27	1.782E-02	351.93	37.600	9.021E+00	PB214
391.69	42.	101.69	1.24	1.637E-02	391.69	64.000	PBC<MDA	SN113
433.59	22.	182.76	1.27	1.510E-02	433.94	90.480	PBC<MDA	AG108M
453.88	30.	128.13	1.29	1.458E-02	453.88	65.000	PBC<MDA	pm146
463.37	47.	90.20	1.30	1.434E-02	463.37	10.470	PBC<MDA	SB125
468.06	45.	88.54	1.30	1.423E-02	468.06	51.750	PBC<MDA	Ir192
497.05	4.	995.92	1.33	1.358E-02	497.05	90.900	PBC<MDA	RU103
511.86	73.	74.11	2.59	1.328E-02	511.86	20.000	PBC<MDA	RH106
531.00	30.	92.10	1.35	1.291E-02	531.00	13.000	PBC<MDA	Nd147
537.26	12.	236.29	1.36	1.279E-02	537.26	24.390	PBC<MDA	Ba140
563.24	21.	129.36	1.38	1.234E-02	563.24	8.350	PBC<MDA	CS134
569.32	11.	156.52	1.38	1.224E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	6.274E+00	PA234
					569.70	97.740	5.265E-01	BI207
583.05	70.	32.01	1.45	1.202E-02	583.02	84.500	3.828E+00	TL208
609.32	95.	18.37	1.42	1.163E-02	609.31	46.090	9.800E+00	BI214
618.06	14.	153.92	1.42	1.151E-02	618.06	99.100	PBC<MDA	PM144
636.97	16.	141.95	1.44	1.125E-02	636.97	7.170	PBC<MDA	I131
657.76	27.	439.49	1.46	1.098E-02	657.76	94.640	PBC<MDA	AG110M
661.75	6719.	1.29	1.40	1.093E-02	661.66	85.210	4.007E+02	CS137
696.54	23.	91.13	1.49	1.052E-02	696.54	99.000	PBC<MDA	PM144
702.63	42.	49.63	1.49	1.045E-02	702.63	97.900	PBC<MDA	NB94
722.02	18.	127.95	1.51	1.024E-02	722.94	90.840	PBC<MDA	AG108M
727.17	15.	139.04	1.51	1.019E-02	727.17	7.550	PBC<MDA	BI212
735.72	20.	108.01	1.52	1.010E-02	735.72	22.500	PBC<MDA	pm146
756.73	6.	384.93	1.53	9.896E-03	756.73	54.460	PBC<MDA	ZR95
765.79	27.	69.56	1.54	9.809E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	5.163E+02	PA234M
766.41	22.	86.88	1.54	9.803E-03	765.79	99.790	PBC<MDA	NB95

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					766.41	0.294	4.153E+02	PA234M
779.42	22.	97.81	1.55	9.687E-03	778.92	12.940	PBC<MDA	EU152
785.42	26.	88.16	1.56	9.628E-03	785.42	1.280	PBC<MDA	BI212
801.95	8.	290.41	1.57	9.481E-03	801.95	8.690	PBC<MDA	CS134
846.77	27.	84.73	1.60	9.108E-03	846.77	99.935	PBC<MDA	Co56
884.68	33.	84.55	1.63	8.818E-03	884.68	72.680	PBC<MDA	AG110M
911.95	15.	216.45	1.65	8.629E-03	911.07	29.000	PBC<MDA	AC228
964.11	6.	400.59	1.69	8.274E-03	964.11	14.605	PBC<MDA	EU152
969.65	29.	72.13	1.69	8.244E-03	968.97	17.460	PBC<MDA	AC228
996.33	32.	78.89	1.71	8.075E-03	996.33	10.600	PBC<MDA	EU154
1001.00	28.	93.26	1.72	8.047E-03	1001.00	0.837	PBC<MDA	PA234M
1048.07	21.	76.52	1.75	7.775E-03	1048.07	80.000	PBC<MDA	Cs136
1121.30	30.	95.07	1.80	7.389E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	6.355E+00	Ta182
1173.37	2293.	2.23	1.84	7.138E-03	1173.24	99.900	1.787E+02	CO60
1189.05	11.	146.93	1.85	7.065E-03	1189.05	16.200	PBC<MDA	Ta182
1238.28	13.	85.40	1.89	6.848E-03	1238.28	66.070	PBC<MDA	Co56
1332.63	2011.	2.29	1.86	6.465E-03	1332.50	99.980	1.728E+02	CO60
1690.98	4.	158.45	2.18	5.307E-03	1690.98	47.790	PBC<MDA	SB124
1764.69	15.	41.47	2.22	5.112E-03	1764.49	15.400	PBC<MDA	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
448.39	112.36	260.	46.	1.341E+03	55.54	0.605	- sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.30	46.54	3607.	14542.	8.079	1.01	0.935D
TH-227	199.70	50.14	3531.	54.	0.030	155.88	0.938D
AM-241	237.86	59.69	3074.	21205.	11.780	0.86	0.909
TH-234	252.25	63.29	27998.	-130.	-0.072	113.33	0.950s
Sn-126	256.21	64.28	28514.	-110.	-0.061	216.98	0.951

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	323.00	80.99	957.	20.	0.011	279.79	0.966s
Np-237	344.99	86.49	2373.	54.	0.030	129.41	0.971s
EU-155	345.20	86.54	2426.	54.	0.030	130.84	0.971s
Sn-126	346.79	86.94	2470.	54.	0.030	131.94	0.971s
Sn-126	349.31	87.57	2482.	54.	0.030	69.49	0.972D
Cd-109	351.19	88.04	2429.	54.	0.030	130.72	0.972A
Nd-147	363.42	91.10	2167.	45.	0.025	147.54	0.975s
TH-234	369.37	92.59	2351.	-84.	-0.047	66.44	0.976s
AC-228	372.41	93.35	4440.	54.	0.030	175.82	0.977
Gd-153	389.00	97.50	4494.	28.	0.015	342.15	0.981s
Np-239	396.99	99.50	4522.	0.	0.000	1000.00	0.982
Gd-153	411.78	103.20	4522.	0.	0.000	1000.00	0.986s
Np-239	413.78	103.70	4522.	0.	0.000	1000.00	0.986s
Np-239	423.49	106.13	4348.	54.	0.030	174.77	0.988s
EU-152	486.04	121.78	1060.	25.	0.014	185.26	1.002
CO-57	487.18	122.06	1085.	0.	0.000	1000.00	1.003s
EU-154	491.33	123.10	1146.	-55.	-0.031	88.03	1.004s
PA-234	524.09	131.29	320.	25.	0.014	118.55	0.280D
HF-181	531.00	133.02	2950.	-44.	-0.024	175.21	1.013s
CE-144	533.06	133.54	2906.	0.	0.000	1000.00	1.013s
HF-181	544.09	136.30	2906.	0.	0.000	1000.00	1.015s
CO-57	544.79	136.47	2906.	0.	0.000	1000.00	1.016s
Tc-99m	560.92	140.51	2906.	0.	0.000	1000.00	1.019s
U-235	574.02	143.79	2867.	39.	0.022	196.37	1.022s
CE-141	580.63	145.44	2661.	49.	0.027	151.07	1.024s
Ba-140	649.47	162.66	1011.	-48.	-0.027	94.23	1.039s
U-235	652.34	163.38	929.	5.	0.003	881.49	1.040s
CE-139	662.23	165.85	1081.	48.	0.027	97.33	1.042
Cf-251	705.19	176.60	609.	-16.	-0.009	295.69	1.051s
U-235	740.53	185.44	413.	66.	0.037	58.35	0.983s
TH-229	842.11	210.85	653.	-22.	-0.012	214.25	1.082
Cf-251	906.68	227.00	524.	46.	0.025	95.24	1.096
PB-212	953.18	238.63	1126.	36.	0.020	131.50	1.106
PB-214	966.63	242.00	1122.	46.	0.026	103.84	1.109s
EU-152	977.41	244.69	1390.	-50.	-0.028	106.00	1.111s
Cd-113m	1051.43	263.21	288.	75.	0.042	44.84	1.581s
BI-210M	1061.92	265.83	784.	-45.	-0.025	88.73	1.130s
Hg-203	1115.37	279.20	475.	14.	0.008	299.89	1.141
I-131	1135.76	284.30	512.	-41.	-0.023	109.18	1.146s
PB-214	1177.94	294.85	258.	107.	0.060	30.89	2.974s
TL-210	1182.54	296.00	2204.	40.	0.022	167.69	1.156s
PB-212	1198.65	300.03	2244.	40.	0.022	170.27	1.159
PA-231	1198.81	300.07	2438.	7.	0.004	996.40	1.159s
PA-233	1199.25	300.18	2445.	0.	0.000	1000.00	1.159
PA-231	1209.13	302.65	2445.	0.	0.000	1000.00	1.162
BA-133	1209.93	302.85	2445.	0.	0.000	1000.00	1.162
Ba-140	1217.92	304.85	2445.	0.	0.000	1000.00	1.164s
BI-210M	1218.11	304.90	2445.	0.	0.000	1000.00	1.164s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ir-192	1232.27	308.44	2445.	0.	0.000	1000.00	1.167s
PA-233	1246.56	312.01	2423.	22.	0.012	319.75	1.170s
Ir-192	1264.46	316.49	2445.	0.	0.000	1000.00	1.173s
La-140	1313.52	328.76	1617.	41.	0.023	140.47	1.184s
Cf-249	1332.23	333.44	1658.	39.	0.022	148.16	1.188
AC-228	1352.04	338.40	224.	62.	0.034	47.94	1.709s
Cs-136	1360.74	340.57	1697.	0.	0.000	1000.00	1.194s
HF-181	1381.77	345.83	432.	-14.	-0.008	281.71	1.199s
PB-214	1404.97	351.63	269.	109.	0.060	32.23	1.266
BA-133	1422.43	356.00	847.	-43.	-0.024	97.86	1.207s
BA-133	1533.76	383.84	1023.	-17.	-0.009	272.46	1.231s
Cf-249	1550.19	387.95	1039.	0.	0.000	1000.00	1.235s
SN-113	1565.14	391.69	878.	42.	0.023	101.69	1.238s
AG-108M	1734.08	433.94	416.	22.	0.012	182.76	1.273s
pm-146	1813.83	453.88	372.	30.	0.017	128.13	1.290s
SB-125	1851.76	463.37	872.	47.	0.026	90.20	1.298
Ir-192	1870.53	468.06	788.	45.	0.025	88.54	1.302
BE-7	1908.66	477.60	1105.	-46.	-0.026	103.31	1.310s
HF-181	1926.26	482.00	1151.	-46.	-0.026	105.11	1.313
La-140	1946.35	487.02	1121.	-45.	-0.025	105.51	1.317s
RU-103	1986.48	497.05	323.	4.	0.002	995.92	1.326s
RH-106	2045.71	511.86	440.	73.	0.041	74.11	2.588s
Nd-147	2122.23	531.00	182.	30.	0.017	92.10	1.354
Ba-140	2147.27	537.26	200.	12.	0.007	236.29	1.359s
CS-134	2251.16	563.24	178.	21.	0.012	129.36	1.380s
CS-134	2275.49	569.32	152.	11.	0.006	156.52	1.385s
BI-207	2277.02	569.70	189.	-12.	-0.007	164.57	1.385s
TL-208	2330.40	583.05	108.	70.	0.039	32.01	1.454
SB-125	2400.20	600.50	973.	-34.	-0.019	86.11	1.410
SB-124	2409.12	602.73	940.	-34.	-0.019	129.97	1.412s
CS-134	2417.03	604.71	906.	-34.	-0.019	127.52	1.414
BI-214	2435.44	609.31	103.	95.	0.053	18.37	1.417D
RU-103	2439.39	610.30	872.	-34.	-0.019	124.78	1.418s
PM-144	2470.44	618.06	212.	14.	0.008	153.92	1.424s
RH-106	2485.86	621.92	322.	-34.	-0.019	62.34	1.427
SB-125	2541.74	635.89	236.	-31.	-0.017	68.50	1.439
I-131	2546.08	636.97	235.	16.	0.009	141.95	1.440
AG-110M	2629.23	657.76	6915.	27.	0.015	439.49	1.456s
CS-137	2645.18	661.75	140.	6719.	3.733	1.29	1.401
PM-144	2784.35	696.54	89.	23.	0.013	91.13	1.487s
NB-94	2808.70	702.63	89.	42.	0.024	49.63	1.492s
SB-124	2889.33	722.79	250.	-15.	-0.008	154.58	1.507s
AG-108M	2889.93	722.94	247.	18.	0.010	127.95	1.507s
EU-154	2891.61	723.36	235.	0.	0.000	1000.00	1.508s
ZR-95	2894.98	724.20	235.	0.	0.000	1000.00	1.508s
BI-212	2906.86	727.17	210.	15.	0.008	139.04	1.511s
pm-146	2941.07	735.72	103.	20.	0.011	108.01	1.518s
pm-146	2986.83	747.16	187.	-34.	-0.019	65.28	1.526s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZR-95	3025.11	756.73	131.	6.	0.004	384.93	1.534
AG-110M	3053.97	763.94	149.	-14.	-0.008	123.43	1.539s
NB-95	3061.35	765.79	160.	27.	0.015	69.56	1.541s
PA-234M	3063.85	766.41	164.	22.	0.012	86.88	1.541s
EU-152	3113.88	778.92	98.	22.	0.012	97.81	1.551s
BI-212	3139.88	785.42	112.	26.	0.015	88.16	1.556s
CS-134	3181.68	795.87	288.	-20.	-0.011	122.07	1.564s
TL-210	3196.61	799.60	308.	0.	0.000	1000.00	1.567s
CS-134	3206.02	801.95	289.	8.	0.005	290.41	1.569
CO-58	3241.32	810.78	360.	-33.	-0.018	69.68	1.575s
La-140	3261.30	815.77	319.	-18.	-0.010	127.87	1.579s
Cs-136	3272.22	818.50	424.	-17.	-0.009	174.80	1.581s
Co-56	3385.32	846.77	107.	27.	0.015	84.73	1.603s
TL-208	3440.51	860.56	201.	-23.	-0.013	98.29	1.614
NB-94	3482.65	871.10	187.	-27.	-0.015	75.00	1.621s
PA-234	3520.39	880.53	527.	-38.	-0.021	86.99	1.628
PA-234	3531.23	883.24	489.	-38.	-0.021	83.81	1.630
AG-110M	3537.01	884.68	375.	33.	0.018	84.55	1.632
Sc-46	3555.40	889.28	498.	-31.	-0.017	103.16	1.635s
y-88	3590.45	898.04	175.	0.	0.000	1000.00	1.642
AC-228	3642.58	911.07	215.	15.	0.008	216.45	1.651s
AG-110M	3748.30	937.49	220.	-11.	-0.006	297.97	1.671
PA-234	3782.42	946.02	250.	-28.	-0.016	125.58	1.677
EU-152	3854.81	964.11	319.	6.	0.004	400.59	1.691
AC-228	3874.26	968.97	202.	29.	0.016	72.13	1.694s
EU-154	3983.73	996.33	294.	32.	0.018	78.89	1.714s
PA-234M	4002.41	1001.00	326.	28.	0.016	93.26	1.718s
EU-154	4017.53	1004.77	433.	-35.	-0.020	84.84	1.721s
Co-56	4149.84	1037.84	185.	-37.	-0.021	82.67	1.745s
Cs-136	4190.78	1048.07	120.	21.	0.012	76.52	1.752s
RH-106	4199.94	1050.36	229.	-34.	-0.019	64.99	1.754s
BI-207	4253.17	1063.66	165.	-27.	-0.015	106.35	1.763s
Ga-68	4308.15	1077.40	155.	-11.	-0.006	250.65	1.773s
FE-59	4395.60	1099.25	171.	-21.	-0.012	124.94	1.789s
EU-152	4446.92	1112.07	400.	-35.	-0.020	81.73	1.798
ZN-65	4460.81	1115.55	353.	-37.	-0.020	74.61	1.800s
Ta-182	4483.84	1121.30	378.	30.	0.016	95.07	1.804s
CO-60	4692.22	1173.37	47.	2293.	1.274	2.23	1.838
Ta-182	4754.99	1189.05	48.	11.	0.006	146.93	1.852s
Ta-182	4884.51	1221.41	70.	-24.	-0.013	67.46	1.874s
Co-56	4952.04	1238.28	21.	13.	0.007	85.40	1.886s
NA-22	5097.14	1274.53	37.	-10.	-0.006	89.22	1.910s
EU-154	5097.19	1274.54	48.	0.	0.000	1000.00	1.910s
FE-59	5165.45	1291.60	27.	-5.	-0.003	255.75	1.922s
TL-210	5251.13	1313.00	43.	-19.	-0.011	81.22	1.936s
CO-60	5329.73	1332.63	14.	2011.	1.117	2.29	1.864
AG-110M	5536.55	1384.30	11.	-3.	-0.002	243.10	1.984s
EU-152	5631.44	1408.00	45.	-20.	-0.011	83.37	1.999s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	5842.95	1460.83	25.	-10.	-0.006	117.69	2.033s
La-140	6385.01	1596.21	36.	-18.	-0.010	65.22	2.119s
SB-124	6764.54	1690.98	6.	4.	0.002	158.45	2.176s
BI-214	7058.94	1764.49	12.	15.	0.008	41.47	2.219s
Co-56	7086.41	1771.35	18.	0.	0.000	1000.00	2.223s
y-88	7345.60	1836.06	12.	-7.	-0.004	87.53	2.261

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	-1.7331E+01				5.31E+01	
			477.60	-1.733E+01	?(	5.942E+01	1.03E+02 1.05E+01 G
NA-22	C	-8.5792E-01				9.50E+02	
			1274.53	-8.579E-01	?(	2.589E+00	8.92E+01 9.99E+01 G
K-40	N	-8.7584E+00				4.66E+11	
			1460.83	-8.758E+00	?(P	2.260E+01	1.18E+02 1.07E+01 G
Sc-46	F	-1.9648E+00				8.38E+01	
			889.28	-1.965E+00	&(	6.749E+00	1.03E+02 1.00E+02 G
			1120.55	0.000E+00	} P	7.404E+00	1.44E+03 1.00E+02 G
CR-51	F	-1.0285E-01				2.77E+01	
			320.08	-1.029E-01	%(P	6.779E+01	1.97E+04 9.94E+00 G
MN-54	C	6.8702E-02				3.12E+02	
			834.85	6.870E-02	&(P	3.608E+00	2.28E+03 1.00E+02 G
FE-59	F	-2.7378E+00				4.45E+01	
			1099.25	-2.738E+00	?(P	8.341E+00	1.25E+02 5.65E+01 G
			1291.60	-9.057E-01	+	5.196E+00	2.56E+02 4.32E+01 G
Co-56	C	1.6154E+00				7.73E+01	
			846.77	1.627E+00	?(P	3.113E+00	8.47E+01 9.99E+01 G
			1238.28	1.598E+00	&(P	2.982E+00	8.54E+01 6.61E+01 G
			1037.84	-1.853E+01	+	3.318E+01	8.27E+01 1.41E+01 G
			1771.35	0.000E+00	-	1.603E+01	1.00E+03 1.55E+01 A
CO-58	C	-1.9653E+00				7.09E+01	
			810.78	-1.965E+00	?(P	5.414E+00	6.97E+01 9.95E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	F	1.7575E+02					1.93E+03	
			1332.50	1.728E+02	(	1.731E+00	2.29E+00	1.00E+02 G
			1173.24	1.787E+02	(	2.691E+00	2.23E+00	9.99E+01 G
ZN-65	F	-5.4043E+00					2.44E+02	
			1115.55	-5.404E+00	?(	1.336E+01	7.46E+01	5.06E+01 G
NB-94	I	2.2978E+00					7.41E+06	
			702.63	2.298E+00	&(	2.529E+00	4.96E+01	9.79E+01 G
			871.10	-1.663E+00	-	4.139E+00	7.50E+01	9.99E+01 G
ZR-95	I	6.5288E-01					6.40E+01	
			756.73	6.529E-01	?(	5.771E+00	3.85E+02	5.45E+01 G
			724.20	0.000E+00	&	9.127E+00	1.00E+03	4.42E+01 G
NB-95	I	1.5202E+00					6.40E+01	
			765.79	1.520E+00	&(	3.501E+00	6.96E+01	9.98E+01 G
RU-103	I	1.6574E-01					3.93E+01	
			497.05	1.657E-01	?(P	3.892E+00	9.96E+02	9.09E+01 G
			610.30	-2.811E+01	+	1.167E+02	1.25E+02	5.75E+00 GA
RH-106	I	-1.6450E+01					3.74E+02	
			621.92	-1.645E+01	&(P	4.216E+01	6.23E+01	9.93E+00 G
			1050.36	-1.567E+02	+	3.361E+02	6.50E+01	1.56E+00 G
			511.86	1.529E+01	+	2.102E+01	7.41E+01	2.00E+01 GA
AG-108M	C	9.7525E-01					1.53E+05	
			433.94	8.947E-01	?(	3.975E+00	1.83E+02	9.05E+01 G
			722.94	1.056E+00	&(	4.535E+00	1.28E+02	9.08E+01 G
			614.28	-8.197E-02	&	7.638E+00	2.78E+03	8.98E+01 G
AG-110M	F	2.0556E+00					2.50E+02	
			884.68	2.868E+00	?(	8.054E+00	8.46E+01	7.27E+01 G
			657.76	1.432E+00	?(	2.086E+01	4.39E+02	9.46E+01 G
			937.49	-2.105E+00	&	1.375E+01	2.98E+02	3.44E+01 G
			1384.30	-1.216E+00	-	6.709E+00	2.43E+02	2.43E+01 G
			763.94	-3.637E+00	+	1.514E+01	1.23E+02	2.23E+01 G
SN-113	F	2.2114E+00					1.15E+02	
			391.69	2.211E+00	?(	7.467E+00	1.02E+02	6.40E+01 G
SB-124	F	-1.6227E+00					6.02E+01	
			602.73	-1.623E+00	&(	7.019E+00	1.30E+02	9.83E+01 G
			1690.98	8.645E-01	+ P	3.105E+00	1.58E+02	4.78E+01 G
			722.79	-7.363E+00	&	3.832E+01	1.55E+02	1.08E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
SB-125	I	4.2635E+00						1.01E+03	
			427.88	-3.688E-01	%(		1.213E+01	1.35E+03	2.96E+01 G
			600.50	-8.928E+00	+ P		3.918E+01	8.61E+01	1.79E+01 G
			635.89	-1.340E+01	+ P		3.239E+01	6.85E+01	1.13E+01 G
			463.37	1.736E+01	(P		5.192E+01	9.02E+01	1.05E+01 G
I-131	I	8.0534E-01						8.02E+00	
			364.48	-6.223E-02	%(P		3.802E+00	4.40E+03	8.17E+01 G
			284.30	-1.757E+01	&		4.636E+01	1.09E+02	6.14E+00 G
			636.97	1.069E+01	(P		5.106E+01	1.42E+02	7.17E+00 G
Gd-153	F	1.5111E+00						2.42E+02	
			97.50	1.511E+00	?(		1.716E+01	3.42E+02	3.00E+01 G
			103.20	0.000E+00	-		2.352E+01	1.00E+03	2.18E+01 G
Ga-68	C	-2.8437E+01						4.71E-02	
			1077.40	-2.844E+01	&(		1.570E+02	2.51E+02	3.30E+00 G
BA-133	F	-2.1585E+00						3.85E+03	
			356.00	-2.159E+00	&(		7.012E+00	9.79E+01	6.20E+01 G
			302.85	0.000E+00	+		3.518E+01	1.00E+03	1.83E+01 G
			383.84	-6.226E+00	&		5.668E+01	2.72E+02	8.94E+00 GA
			80.99	1.001E+00	+ P		7.445E+00	2.80E+02	3.41E+01 GA
CS-134	I	2.7895E-01						7.54E+02	
			604.71	-1.639E+00	?(		6.957E+00	1.28E+02	9.76E+01 G
			795.87	-1.363E+00	+		5.572E+00	1.22E+02	8.55E+01 G
			569.32	3.344E+00	?(		1.773E+01	1.57E+02	1.54E+01 G
			801.95	5.619E+00	?(		5.522E+01	2.90E+02	8.69E+00 G
			563.24	1.150E+01	&(		3.495E+01	1.29E+02	8.35E+00 G
CS-137	I	4.0069E+02						1.10E+04	
			661.66	4.007E+02	(		3.450E+00	1.29E+00	8.52E+01 G
CE-139	F	1.0999E+00						1.38E+02	
			165.85	1.100E+00	&(		3.551E+00	9.73E+01	7.99E+01 G
Ba-140	I	2.1887E+00						1.28E+01	
			537.26	2.189E+00	?(P		1.221E+01	2.36E+02	2.44E+01 G
			162.66	-1.399E+01	+		4.371E+01	9.42E+01	6.22E+00 G
			304.85	0.000E+00	&		1.511E+02	1.00E+03	4.29E+00 G
La-140	I	-1.9067E+00						1.28E+01	
			1596.21	-1.907E+00	?(P		3.211E+00	6.52E+01	9.54E+01 G
			487.02	-4.011E+00	+		1.405E+01	1.06E+02	4.55E+01 G
			328.76	5.925E+00	&		2.765E+01	1.40E+02	2.03E+01 G
			815.77	-4.598E+00	& P		2.190E+01	1.28E+02	2.33E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	I	1.7259E+00					3.25E+01	
			145.44	1.726E+00	?(	8.649E+00	1.51E+02	4.82E+01 G
PM-144	C	9.3215E-01					3.63E+02	
			696.54	1.202E+00	&(	2.485E+00	9.11E+01	9.90E+01 G
			618.06	6.631E-01	?(P	3.442E+00	1.54E+02	9.91E+01 G
EU-152	F	2.6657E+00					4.94E+03	
			344.29	4.045E-01	%(	2.248E+01	1.66E+03	2.65E+01 G
			1112.07	-1.937E+01	+	5.254E+01	8.17E+01	1.36E+01 G
			121.78	1.429E+00	(	8.826E+00	1.85E+02	2.86E+01 G
			778.92	9.751E+00	?(	2.165E+01	9.78E+01	1.29E+01 G
			964.11	2.912E+00	(	3.949E+01	4.01E+02	1.46E+01 G
			244.69	-1.553E+01	+	5.460E+01	1.06E+02	7.58E+00 G
			1408.00	-8.411E+00	&	1.457E+01	8.34E+01	2.10E+01 GA
EU-154	I	9.1281E+00					3.14E+03	
			873.23	-6.781E-01	&(	4.008E+01	1.73E+03	1.23E+01 G
			123.10	-2.207E+00	&	6.436E+00	8.80E+01	4.08E+01 G
			1274.54	0.000E+00	+	8.225E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	1.991E+01	1.00E+03	2.02E+01 G
			1004.77	-1.361E+01	+	3.833E+01	8.48E+01	1.80E+01 G
			996.33	2.048E+01	*(	5.362E+01	7.89E+01	1.06E+01 G
EU-155	I	1.7068E+00					1.81E+03	
			105.31	-7.113E-02	%(P	2.416E+01	6.00E+03	2.12E+01 G
			86.54	2.935E+00	&(	1.273E+01	1.31E+02	3.07E+01 G
HF-181	F	-2.2873E+00					4.24E+01	
			482.00	-2.287E+00	?(	7.978E+00	1.05E+02	8.05E+01 G
			133.02	-1.692E+00	+	9.838E+00	1.75E+02	4.33E+01 G
			345.83	-2.957E+00	+	2.030E+01	2.82E+02	1.51E+01 G
			136.30	0.000E+00	&	7.279E+01	1.00E+03	5.85E+00 G
Ta-182	F	6.0265E+00					1.14E+02	
			1121.30	6.355E+00	&(	2.012E+01	9.51E+01	3.49E+01 G
			1221.41	-7.108E+00	+ P	1.238E+01	6.75E+01	2.70E+01 G
			1189.05	5.318E+00	&(P	1.699E+01	1.47E+02	1.62E+01 G
Hg-203	F	4.5515E-01					4.66E+01	
			279.20	4.552E-01	&(	3.322E+00	3.00E+02	8.15E+01 G
TL-208	N	3.8279E+00					6.98E+02	
			583.02	3.828E+00	(	2.796E+00	3.20E+01	8.45E+01 G
			277.28	-1.345E+00	%	4.854E+01	1.07E+03	6.31E+00 G
			860.56	-1.143E+01	- P	3.418E+01	9.83E+01	1.24E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
pm-146	C	-5.5234E+00						2.02E+03	
			747.16	-5.523E+00	?(P	1.086E+01	6.53E+01	3.40E+01	G
			735.72	4.969E+00	&	1.220E+01	1.08E+02	2.25E+01	G
			453.88	1.747E+00	+ P	5.432E+00	1.28E+02	6.50E+01	G
Cd-113m		3.1031E+04						5.33E+03	
			263.70	3.103E+04	(	3.384E+04	4.48E+01	6.00E-03	K
Cd-109	F	2.3672E+01						4.53E+02	
									Derived Ave Activity
			88.04	2.367E+01	}(	1.026E+02	1.31E+02	3.79E+00	G
Cf-251	T	-1.7353E+00						3.28E+05	
			176.60	-1.735E+00	?(	1.303E+01	2.96E+02	1.70E+01	G
			227.00	1.604E+01		3.854E+01	9.52E+01	6.30E+00	GA
Cf-249	T	1.4320E+00						1.28E+05	
			387.95	0.000E+00	(	7.804E+00	1.00E+03	6.60E+01	G
			333.44	7.525E+00	&(	3.705E+01	1.48E+02	1.55E+01	G
Sn-126		-2.2542E+01						3.65E+07	
			87.57	2.395E+00	}	1.050E+01	6.95E+01	3.75E+01	GA
			64.28	-2.254E+01	(	1.616E+02	2.17E+02	9.70E+00	G
			86.94	9.955E+00	&	4.355E+01	1.32E+02	9.04E+00	GA
PB-210	N	1.1123E+04						8.14E+03	
			46.54	1.112E+04	(P	2.161E+02	1.01E+00	4.25E+00	G
PB-212	N	1.9348E+00						6.98E+02	
			238.63	1.935E+00	?(P	8.456E+00	1.31E+02	4.33E+01	G
			300.03	3.308E+01	P	1.870E+02	1.70E+02	3.28E+00	GA
PB-214	N	1.1065E+01						5.84E+05	
			351.93	9.021E+00	(	6.562E+00	3.22E+01	3.76E+01	G
			295.09	1.505E+01	*(	1.089E+01	3.09E+01	1.93E+01	G
			242.00	1.443E+01	?	4.971E+01	1.04E+02	7.43E+00	GA
BI-207	C	-5.5747E-01						1.18E+04	
			569.70	-5.575E-01	&(	3.102E+00	1.65E+02	9.77E+01	G
			1063.66	-2.619E+00	+	6.068E+00	1.06E+02	7.45E+01	G
BI-212	N	1.0830E+01						6.98E+02	
			727.17	1.083E+01	&(	5.071E+01	1.39E+02	7.55E+00	G
			785.42	1.178E+02	& P	2.349E+02	8.82E+01	1.28E+00	GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
U-235	N	4.6713E+00					2.57E+11	
			143.79	6.030E+00	?(P	3.930E+01	1.96E+02	1.10E+01 G
			205.33	5.800E-01	& P	5.047E+01	3.42E+03	5.01E+00 G
			163.38	1.741E+00	&(P	5.145E+01	8.81E+02	5.08E+00 G
			185.72	2.379E+00	* P	3.498E+00	5.84E+01	5.40E+01 GA
BI-214	N	1.0014E+01					5.84E+05	
			609.31	9.800E+00	(P	5.178E+00	1.84E+01	4.61E+01 G
			1120.29	0.000E+00	} P	4.740E+01	1.46E+03	1.51E+01 G
			1764.49	1.066E+01	?(P	1.326E+01	4.15E+01	1.54E+01 G
BI-210M	T	-2.2618E+00					1.10E+09	
			265.83	-2.262E+00	?(	6.655E+00	8.87E+01	5.00E+01 G
			304.90	0.000E+00	&	2.315E+01	1.00E+03	2.80E+01 G
AC-228	N	8.1815E+00					2.10E+03	
			911.07	3.330E+00	&(	1.577E+01	2.16E+02	2.90E+01 G
			968.97	1.114E+01	?(	2.663E+01	7.21E+01	1.75E+01 G
			338.32	1.559E+01	(	1.822E+01	4.79E+01	1.20E+01 G
			93.35	1.593E+01		9.279E+01	1.76E+02	5.56E+00 XA
TH-227	N	1.8341E+01					7.95E+03	
			50.14	1.834E+01	!(	9.476E+01	1.56E+02	8.00E+00 G
			256.24	-1.156E+00	%	3.796E+01	1.29E+03	7.00E+00 G
TH-229	N	-1.0554E+00					2.68E+06	
			193.51	-1.055E+00	&(	5.477E+01	2.04E+03	4.40E+00 G
			210.85	-1.578E+01	& P	8.584E+01	2.14E+02	2.99E+00 G
TH-234	N	-6.8750E+01					1.63E+12	
			63.29	-6.875E+01	(P	4.129E+02	1.13E+02	3.81E+00 G
			92.59	-2.484E+01	+ P	6.759E+01	6.64E+01	5.58E+00 G
PA-231	N	3.6062E+00					1.20E+07	
			302.65	0.000E+00	?(	2.238E+02	1.00E+03	2.88E+00 G
			300.07	7.828E+00	(	2.599E+02	9.96E+02	2.46E+00 G
PA-233	C	1.7166E+00					7.82E+08	
			312.01	1.717E+00	&(P	1.826E+01	3.20E+02	3.60E+01 G
			300.18	0.000E+00	-	1.033E+02	1.00E+03	6.20E+00 G
PA-234	N	2.3046E+00					1.63E+12	
			131.29	2.305E+00	(	7.934E+00	1.19E+02	1.80E+01 G
			946.02	-1.383E+01	-	3.774E+01	1.26E+02	1.34E+01 G
			569.47	0.000E+00	}	3.546E+01	1.51E+03	8.20E+00 G
			883.24	-2.493E+01	-	6.932E+01	8.38E+01	9.60E+00 G
			880.53	-3.975E+01	-	1.148E+02	8.70E+01	6.00E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234M	N	2.7868E+02					1.63E+12	
			1001.00	2.307E+02	?(P	7.164E+02	9.33E+01	8.37E-01 G
			766.41	4.153E+02	&(	1.204E+03	8.69E+01	2.94E-01 G
AM-241	T	1.2557E+03					1.58E+05	
			59.54	1.256E+03	(	1.546E+01	8.57E-01	3.59E+01 G
Np-237	F	6.8786E+00					2.14E+06	
			86.49	6.879E+00	&(	2.952E+01	1.29E+02	1.31E+01 G
Ir-192	F	1.2791E+00					7.40E+01	
			316.49	0.000E+00	?(	7.672E+00	1.00E+03	8.70E+01 G
			468.06	3.431E+00	(	1.007E+01	8.85E+01	5.18E+01 G
			308.44	0.000E+00	&	2.061E+01	1.00E+03	3.18E+01 G
Cs-136	F	2.8310E-01					1.30E+01	
			818.50	-1.001E+00	?(	5.873E+00	1.75E+02	1.00E+02 G
			1048.07	1.889E+00	&(	4.808E+00	7.65E+01	8.00E+01 G
			340.57	0.000E+00	-	1.260E+01	1.00E+03	4.69E+01 G
Np-239	T	3.8194E+00					2.36E+00	
			103.70	0.000E+00	-	2.136E+01	1.00E+03	2.40E+01 X
			106.13	3.819E+00	&(	2.212E+01	1.75E+02	2.27E+01 G
			99.50	0.000E+00	&	3.432E+01	1.00E+03	1.50E+01 X
Nd-147		1.0095E+01					1.11E+01	
			531.00	1.009E+01	(	2.171E+01	9.21E+01	1.30E+01 G
			91.10	2.627E+00	-	1.286E+01	1.48E+02	2.83E+01 G
TL-210	N	6.0703E-01					5.84E+05	
			799.60	0.000E+00	?(	4.992E+00	1.00E+03	9.90E+01 G
			296.00	1.367E+00	&(	7.615E+00	1.68E+02	7.90E+01 G
			1313.00	-7.706E+00	+	1.341E+01	8.12E+01	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
    negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
    failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.

& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-234	63.29	27998.	-130.	-0.072	113.33	-6.875E+01	P
BA-133	80.99	957.	20.	0.011	279.79	1.001E+00	P
Np-237	86.49	2373.	54.	0.030	129.41	6.879E+00	
EU-155	86.54	2426.	54.	0.030	130.84	2.935E+00	
Nd-147	91.10	2167.	45.	0.025	147.54	2.627E+00	
TH-234	92.59	2351.	-84.	-0.047	66.44	-2.484E+01	P
Gd-153	97.50	4494.	28.	0.015	342.15	1.511E+00	
Np-239	106.13	4348.	54.	0.030	174.77	3.819E+00	
EU-154	123.10	1146.	-55.	-0.031	88.03	-2.207E+00	
HF-181	133.02	2950.	-44.	-0.024	175.21	-1.692E+00	
Ba-140	162.66	1011.	-48.	-0.027	94.23	-1.399E+01	
Cf-251	176.60	609.	-16.	-0.009	295.69	-1.735E+00	
TH-229	210.85	653.	-22.	-0.012	214.25	-1.578E+01	P
Cf-251	227.00	524.	46.	0.025	95.24	1.604E+01	
BI-210M	265.83	784.	-45.	-0.025	88.73	-2.262E+00	
I-131	284.30	512.	-41.	-0.023	109.18	-1.757E+01	
TL-210	296.00	2204.	40.	0.022	167.69	1.367E+00	
PA-231	300.07	2438.	7.	0.004	996.40	7.828E+00	
La-140	328.76	1617.	41.	0.023	140.47	5.925E+00	
Cf-249	333.44	1658.	39.	0.022	148.16	7.525E+00	
HF-181	345.83	432.	-14.	-0.008	281.71	-2.957E+00	
BA-133	356.00	847.	-43.	-0.024	97.86	-2.159E+00	
BA-133	383.84	1023.	-17.	-0.009	272.46	-6.226E+00	
SN-113	391.69	878.	42.	0.023	101.69	2.211E+00	
pm-146	453.88	372.	30.	0.017	128.13	1.747E+00	P
Ir-192	468.06	788.	45.	0.025	88.54	3.431E+00	
BE-7	477.60	1105.	-46.	-0.026	103.31	-1.733E+01	
HF-181	482.00	1151.	-46.	-0.026	105.11	-2.287E+00	
La-140	487.02	1121.	-45.	-0.025	105.51	-4.011E+00	
RU-103	497.05	323.	4.	0.002	995.92	1.657E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
RH-106	511.86	440.	73.	0.041	74.11	1.529E+01		
Nd-147	531.00	182.	30.	0.017	92.10	1.009E+01		
Ba-140	537.26	200.	12.	0.007	236.29	2.189E+00	P	
CS-134	563.24	178.	21.	0.012	129.36	1.150E+01		
CS-134	569.32	152.	11.	0.006	156.52	3.344E+00		
BI-207	569.70	189.	-12.	-0.007	164.57	-5.575E-01		
SB-124	602.73	940.	-34.	-0.019	129.97	-1.623E+00		
CS-134	604.71	906.	-34.	-0.019	127.52	-1.639E+00		
RU-103	610.30	872.	-34.	-0.019	124.78	-2.811E+01		
PM-144	618.06	212.	14.	0.008	153.92	6.631E-01	P	
RH-106	621.92	322.	-34.	-0.019	62.34	-1.645E+01	P	
I-131	636.97	235.	16.	0.009	141.95	1.069E+01	P	
AG-110M	657.76	6915.	27.	0.015	439.49	1.432E+00		
PM-144	696.54	89.	23.	0.013	91.13	1.202E+00		
NB-94	702.63	89.	42.	0.024	49.63	2.298E+00		
SB-124	722.79	250.	-15.	-0.008	154.58	-7.363E+00		
BI-212	727.17	210.	15.	0.008	139.04	1.083E+01		
pm-146	735.72	103.	20.	0.011	108.01	4.969E+00		
pm-146	747.16	187.	-34.	-0.019	65.28	-5.523E+00	P	
ZR-95	756.73	131.	6.	0.004	384.93	6.529E-01		
AG-110M	763.94	149.	-14.	-0.008	123.43	-3.637E+00		
NB-95	765.79	160.	27.	0.015	69.56	1.520E+00		
PA-234M	766.41	164.	22.	0.012	86.88	4.153E+02		
BI-212	785.42	112.	26.	0.015	88.16	1.178E+02	P	
CS-134	795.87	288.	-20.	-0.011	122.07	-1.363E+00		
CS-134	801.95	289.	8.	0.005	290.41	5.619E+00		
CO-58	810.78	360.	-33.	-0.018	69.68	-1.965E+00	P	
La-140	815.77	319.	-18.	-0.010	127.87	-4.598E+00	P	
Cs-136	818.50	424.	-17.	-0.009	174.80	-1.001E+00		
Co-56	846.77	107.	27.	0.015	84.73	1.627E+00	P	
NB-94	871.10	187.	-27.	-0.015	75.00	-1.663E+00		
AG-110M	884.68	375.	33.	0.018	84.55	2.868E+00		
AG-110M	937.49	220.	-11.	-0.006	297.97	-2.105E+00		
EU-154	996.33	294.	32.	0.018	78.89	2.048E+01		
PA-234M	1001.00	326.	28.	0.016	93.26	2.307E+02	P	
EU-154	1004.77	433.	-35.	-0.020	84.84	-1.361E+01		
Co-56	1037.84	185.	-37.	-0.021	82.67	-1.853E+01		
Cs-136	1048.07	120.	21.	0.012	76.52	1.889E+00		
RH-106	1050.36	229.	-34.	-0.019	64.99	-1.567E+02		
BI-207	1063.66	165.	-27.	-0.015	106.35	-2.619E+00		
Ga-68	1077.40	155.	-11.	-0.006	250.65	-2.844E+01		
FE-59	1099.25	171.	-21.	-0.012	124.94	-2.738E+00	P	
ZN-65	1115.55	353.	-37.	-0.020	74.61	-5.404E+00		
Ta-182	1121.30	378.	30.	0.016	95.07	6.355E+00		
Ta-182	1189.05	48.	11.	0.006	146.93	5.318E+00	P	
Ta-182	1221.41	70.	-24.	-0.013	67.46	-7.108E+00	P	
Co-56	1238.28	21.	13.	0.007	85.40	1.598E+00	P	
NA-22	1274.53	37.	-10.	-0.006	89.22	-8.579E-01		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
FE-59	1291.60	27.	-5.	-0.003	255.75	-9.057E-01		
TL-210	1313.00	43.	-19.	-0.011	81.22	-7.706E+00		
AG-110M	1384.30	11.	-3.	-0.002	243.10	-1.216E+00		
K-40	1460.83	25.	-10.	-0.006	117.69	-8.758E+00		P
La-140	1596.21	36.	-18.	-0.010	65.22	-1.907E+00		P
SB-124	1690.98	6.	4.	0.002	158.45	8.645E-01		P
y-88	1836.06	12.	-7.	-0.004	87.53	-8.176E-01		P

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

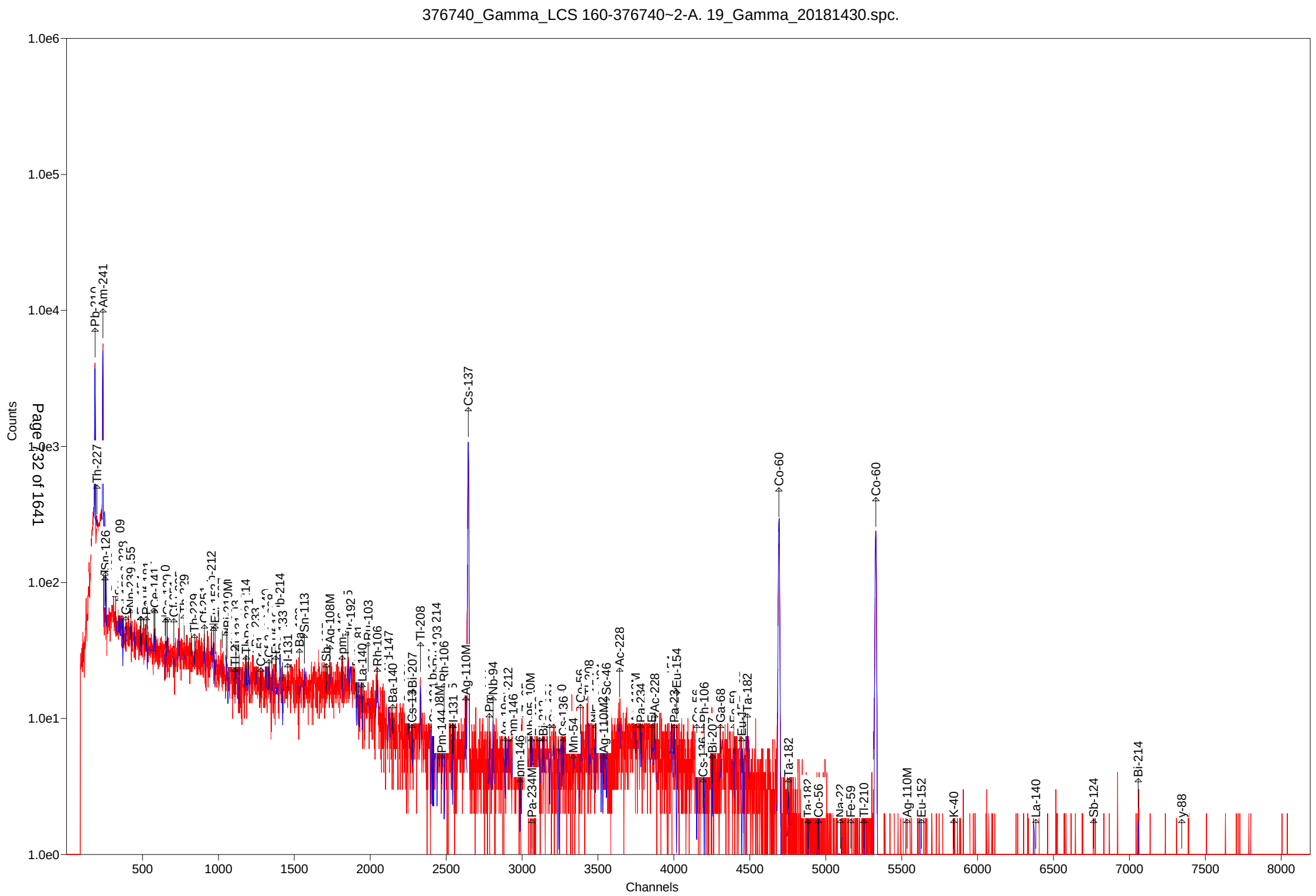
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-1.7331E+01	-1.7331E+01	1.033E+02%	5.94E+01
NA-22	#A	-8.5792E-01	-8.5792E-01	8.922E+01%	2.59E+00
K-40	#A	-8.7584E+00	-8.7584E+00	1.177E+02%	2.26E+01
Sc-46	#A	-1.9648E+00	-1.9648E+00	1.032E+02%	6.75E+00
CR-51	#A	-1.0285E-01	-1.0285E-01	1.973E+04%	6.78E+01
MN-54	#A	6.8702E-02	6.8702E-02	2.282E+03%	3.61E+00
FE-59	#A	-2.7378E+00	-2.7378E+00	1.249E+02%	8.34E+00
Co-56	#A	1.6154E+00	1.6154E+00	6.015E+01%	3.11E+00
CO-57	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.98E+00
CO-58	#A	-1.9653E+00	-1.9653E+00	6.968E+01%	5.41E+00
CO-60		1.7575E+02	1.7575E+02	1.598E+00%	1.73E+00
ZN-65	#A	-5.4043E+00	-5.4043E+00	7.461E+01%	1.34E+01
NB-94	#A	2.2978E+00	2.2978E+00	4.963E+01%	2.53E+00
ZR-95	#A	6.5287E-01	6.5288E-01	3.849E+02%	5.77E+00
NB-95	#A	1.5202E+00	1.5202E+00	6.956E+01%	3.50E+00
RU-103	#A	1.6574E-01	1.6574E-01	9.959E+02%	3.89E+00
RH-106	#A	-1.6450E+01	-1.6450E+01	6.234E+01%	4.22E+01
AG-108M	#A	9.7525E-01	9.7525E-01	1.116E+02%	3.98E+00
AG-110M	#A	2.0556E+00	2.0556E+00	8.455E+01%	8.05E+00
SN-113	#A	2.2114E+00	2.2114E+00	1.017E+02%	7.47E+00
SB-124	#A	-1.6227E+00	-1.6227E+00	1.300E+02%	7.02E+00
SB-125	A	4.2635E+00	4.2635E+00	9.020E+01%	1.21E+01
I-131	#A	8.0531E-01	8.0534E-01	1.420E+02%	3.80E+00
Gd-153	#A	1.5111E+00	1.5111E+00	3.422E+02%	1.72E+01
Ga-68	#A	-2.8253E+01	-2.8437E+01	2.506E+02%	1.57E+02
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.96E+00
BA-133	#A	-2.1585E+00	-2.1585E+00	9.786E+01%	7.01E+00
CS-134	#A	2.7895E-01	2.7895E-01	9.415E+01%	6.96E+00
CS-137		4.0069E+02	4.0069E+02	1.290E+00%	3.45E+00
CE-139	A	1.0999E+00	1.0999E+00	9.733E+01%	3.55E+00
Ba-140	#A	2.1886E+00	2.1887E+00	2.363E+02%	1.22E+01
La-140	#A	-1.9067E+00	-1.9067E+00	6.522E+01%	3.21E+00
CE-141	#A	1.7258E+00	1.7259E+00	1.511E+02%	8.65E+00

CE-144 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.82E+01
PM-144 #A	9.3215E-01	9.3215E-01	8.944E+01%		2.48E+00
EU-152 A	2.6657E+00	2.6657E+00	9.781E+01%		2.25E+01
EU-154 #A	9.1281E+00	9.1281E+00	7.889E+01%		4.01E+01
EU-155 #A	1.7068E+00	1.7068E+00	1.308E+02%		2.42E+01
HF-181 #A	-2.2873E+00	-2.2873E+00	1.051E+02%		7.98E+00
Ta-182 #A	6.0265E+00	6.0265E+00	8.750E+01%		2.01E+01
Hg-203 #A	4.5515E-01	4.5515E-01	2.999E+02%		3.32E+00
TL-208	3.8279E+00	3.8279E+00	3.201E+01%		2.80E+00
pm-146 #A	-5.5234E+00	-5.5234E+00	6.528E+01%		1.09E+01
y-88 #A	0.0000E+00	0.0000E+00	1.000E+03%		4.38E+00
Cd-113m A	3.1031E+04	3.1031E+04	4.484E+01%		3.38E+04
Cd-109 #A	2.3672E+01	2.3672E+01	1.307E+02%		1.03E+02
Cf-251 #A	-1.7353E+00	-1.7353E+00	2.957E+02%		1.30E+01
Cf-249 #A	1.4320E+00	1.4320E+00	1.482E+02%		7.80E+00
Sn-126 #A	-2.2542E+01	-2.2542E+01	2.170E+02%		1.62E+02
PB-210	1.1123E+04	1.1123E+04	1.014E+00%		2.16E+02
PB-212 A	1.9348E+00	1.9348E+00	1.315E+02%		8.46E+00
PB-214	1.1065E+01	1.1065E+01	2.232E+01%		6.56E+00
BI-207 #A	-5.5747E-01	-5.5747E-01	1.646E+02%		3.10E+00
BI-212 #A	1.0830E+01	1.0830E+01	1.390E+02%		5.07E+01
U-235 #A	4.6713E+00	4.6713E+00	1.964E+02%		3.93E+01
BI-214	1.0014E+01	1.0014E+01	1.837E+01%		5.18E+00
BI-210M#A	-2.2618E+00	-2.2618E+00	8.873E+01%		6.66E+00
AC-228 A	8.1815E+00	8.1815E+00	4.794E+01%		1.58E+01
TH-227 #A	1.8341E+01	1.8341E+01	1.559E+02%		9.48E+01
TH-229 #A	-1.0554E+00	-1.0554E+00	2.038E+03%		5.48E+01
TH-234 #A	-6.8750E+01	-6.8750E+01	1.133E+02%		4.13E+02
PA-231 #A	3.6062E+00	3.6062E+00	7.058E+02%		2.24E+02
PA-233 #A	1.7166E+00	1.7166E+00	3.198E+02%		1.83E+01
PA-234 A	2.3046E+00	2.3046E+00	1.185E+02%		7.93E+00
PA-234M#A	2.7868E+02	2.7868E+02	6.373E+01%		7.16E+02
AM-241	1.2557E+03	1.2557E+03	8.565E-01%		1.55E+01
Np-237 #A	6.8786E+00	6.8786E+00	1.294E+02%		2.95E+01
Ir-192 #A	1.2791E+00	1.2791E+00	8.854E+01%		7.67E+00
Cs-136 #A	2.8309E-01	2.8310E-01	7.652E+01%		5.87E+00
Np-239 #A	3.8189E+00	3.8194E+00	1.748E+02%		2.21E+01
Nd-147 #A	1.0095E+01	1.0095E+01	9.210E+01%		2.17E+01
TL-210 #A	6.0703E-01	6.0703E-01	1.677E+02%		4.99E+00

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.7 to 1999.4 keV)	4.401E+04	Bq/Sample
Total Decayed Activity (37.7 to 1999.4 keV)	4.4010684E+04	Bq/Sample


376740_Gamma_LCS 160-376740~2-A. 19_Gamma_20181430.spc.
Counts
Channels
1.0e6
1.0e5
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-210
Am-241
Th-227
Sn-126
Cs-137
Co-60
Co-60
Ag-110M
Ta-182
Ta-182
Co-56
Na-22
Fe-59
Tl-210
Ag-110M
Eu-152
K-40
La-140
Sb-124
Bi-214
y-88
Th-229
Ra-223
Ce-141
Th-229
Cf-251
Eu-152
Bi-210M
Th-232
Ce-144
Pb-214
I-131
Ba-133
Sn-113
Sb-125
Ag-108M
La-140
Rh-106
Ba-140
Bi-207
Tl-208
Pm-144
Rh-106
I-131
Ag-110M
Nb-94
Pa-234M
Mn-54
Co-56
Sc-46
Ac-228
Pa-234
Ac-228
Eu-154
Cs-136
Rh-106
Bi-207
Ga-68
Eu-152
Ta-182

Test America St. Louis Spectrum ID: 9_Gamma_20183355

Sample Description: 376740_Gamma_160-29479-A-2-E DU
Detector: Detector # 9
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29479-A-2-E DU

Decay to Time: 8/9/2018 06:34 Live Time: 1800 sec
Acquisition Time: 8/9/2018 06:35:06 Real Time: 1803 sec
Analysis Time: 8/9/2018 07:05 Dead Time: 0.17 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 9_Soil_TunaCan.Clb
Efficiency Cal Desc: 9_Soil_TunaCan_90099_050312
Efficiency Cal Date: 6/14/2012 10:19
Energy Cal Date: 3/1/2012 13:57
Library: Client_Long_Rev14.lib
Bkgd Correction File: 9_2018-07-14_1810.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-3.513E+00	100.9	3.545E+00	3.549E+00	1.192E+01
NA-22	5.108E-02	591.6	3.022E-01	3.022E-01	1.120E+00
K-40	1.777E+02	5.6	9.961E+00	1.349E+01	8.205E+00
Sc-46	1.351E-01	290.8	3.931E-01	3.931E-01	1.377E+00
CR-51	2.520E+00	164.4	4.142E+00	4.144E+00	1.396E+01
MN-54	3.663E-02	988.3	3.620E-01	3.620E-01	8.626E-01
FE-59	3.201E-01	233.8	7.481E-01	7.483E-01	1.715E+00
Co-56	8.009E-01	35.7	2.862E-01	2.891E-01	9.636E-01
CO-57	-7.343E-02	223.6	1.642E-01	1.642E-01	5.651E-01
CO-58	-3.600E-01	103.9	3.742E-01	3.746E-01	1.272E+00
CO-60	3.604E-01	91.3	3.290E-01	3.295E-01	7.463E-01
ZN-65	1.942E-01	519.9	1.010E+00	1.010E+00	3.544E+00
NB-94	3.504E-01	98.1	3.438E-01	3.442E-01	1.164E+00
ZR-95	4.893E-01	95.9	4.692E-01	4.699E-01	1.095E+00
NB-95	-5.849E-01	68.7	4.021E-01	4.033E-01	1.333E+00
RU-103	-1.458E-01	215.2	3.138E-01	3.138E-01	7.757E-01
RH-106	1.270E+00	166.1	2.110E+00	2.111E+00	1.905E+01
AG-108M	9.728E-02	201.6	1.961E-01	1.962E-01	6.591E-01
AG-110M	4.137E-01	83.7	3.464E-01	3.470E-01	1.268E+00
SN-113	1.539E-01	265.2	4.081E-01	4.082E-01	1.412E+00
SB-124	4.598E-01	109.4	5.030E-01	5.035E-01	1.664E+00
SB-125	1.498E+00	35.7	5.355E-01	5.410E-01	1.242E+00
I-131	2.587E-01	95.9	2.481E-01	2.485E-01	6.269E-01
Gd-153	3.224E-01	119.8	3.860E-01	3.865E-01	3.745E+00
Ga-68	3.709E+00	324.8	1.205E+01	1.205E+01	2.850E+01
Tc-99m	-2.819E-01	156.5	4.411E-01	4.413E-01	1.474E+00
BA-133	-2.304E-02	121.2	2.793E-02	2.795E-02	1.999E+00
CS-134	4.593E-01	60.0	2.755E-01	2.766E-01	1.730E+00
CS-137	-1.286E-02	3201.0	4.117E-01	4.117E-01	1.312E+00
CE-139	2.338E-01	107.4	2.512E-01	2.522E-01	8.448E-01
Ba-140	2.273E-01	127.6	2.900E-01	2.903E-01	2.632E+00
La-140	1.521E-02	146.8	2.233E-02	2.234E-02	1.220E+00
CE-141	4.187E-01	167.2	7.000E-01	7.003E-01	2.346E+00

CE-144	-2.146E+00	148.6	3.189E+00	3.191E+00	1.066E+01
PM-144	-4.710E-01	78.4	3.692E-01	3.700E-01	1.302E+00
EU-152	8.850E-01	72.0	6.376E-01	6.393E-01	4.658E+00
EU-154	2.608E+00	68.8	1.796E+00	1.801E+00	5.962E+00
EU-155	-1.643E-02	5613.1	9.221E-01	9.221E-01	3.318E+00
HF-181	-4.860E-01	103.5	5.031E-01	5.037E-01	1.691E+00
Ta-182	2.044E+00	69.1	1.413E+00	1.417E+00	4.710E+00
Hg-203	-3.436E-01	85.5	2.937E-01	2.944E-01	9.829E-01
TL-208	1.059E+00	46.4	4.916E-01	4.947E-01	8.150E-01
pm-146	5.937E-01	138.4	8.220E-01	8.226E-01	1.994E+00
y-88	3.074E-01	102.6	3.153E-01	3.157E-01	7.540E-01
Cd-113m	3.841E+03	85.9	3.298E+03	3.307E+03	1.107E+04
Cd-109	0.000E+00	1.#INF	8.977E+00	8.977E+00	3.037E+01
Cf-251	-6.227E-01	196.8	1.226E+00	1.227E+00	3.202E+00
Cf-249	2.879E-01	122.4	3.524E-01	3.527E-01	1.203E+00
Sn-126	1.919E+00	160.3	3.077E+00	3.079E+00	1.038E+01
PB-210	-5.581E+00	157.2	8.772E+00	8.779E+00	2.974E+01
PB-212	2.587E+00	15.5	4.020E-01	4.355E-01	9.817E-01
PB-214	5.649E+00	11.8	6.660E-01	7.278E-01	1.061E+00
BI-207	-7.820E-02	268.0	2.096E-01	2.096E-01	7.786E-01
BI-212	2.430E+00	107.6	2.616E+00	2.619E+00	9.106E+00
U-235	-2.223E+00	85.0	1.889E+00	1.893E+00	1.198E+01
BI-214	3.612E+00	18.4	6.657E-01	6.916E-01	1.497E+00
BI-210M	-1.515E-02	2685.3	4.068E-01	4.068E-01	1.425E+00
AC-228	2.556E+00	43.2	1.104E+00	1.111E+00	2.357E+00
TH-227	0.000E+00	1.#INF	2.272E+00	2.272E+00	1.454E+01
TH-229	4.523E+00	86.0	3.891E+00	3.907E+00	1.182E+01
TH-234	6.553E+00	109.0	7.146E+00	7.154E+00	2.398E+01
PA-231	7.390E+00	179.1	1.323E+01	1.324E+01	4.469E+01
PA-233	-1.271E-01	111.3	1.414E-01	1.416E-01	4.127E+00
PA-234	8.530E-01	84.3	7.191E-01	7.205E-01	6.264E+00
PA-234M	-8.508E+01	45.4	3.862E+01	3.885E+01	2.382E+02
AM-241	-9.157E-01	108.7	9.952E-01	9.964E-01	3.329E+00
Np-237	0.000E+00	1.#INF	2.867E+00	2.867E+00	9.599E+00
Ir-192	1.747E-02	103.1	1.801E-02	1.804E-02	1.682E+00
Cs-136	4.199E-01	90.8	3.811E-01	3.819E-01	1.286E+00
Np-239	-3.986E-01	229.6	9.152E-01	9.155E-01	3.107E+00
Nd-147	1.737E+00	91.5	1.590E+00	1.593E+00	3.914E+00
TL-210	2.320E-01	98.1	2.276E-01	2.280E-01	7.441E-01
Total	4.081E+03				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 9_Gamma_20183355.An1

Sample description
376740_Gamma_160-29479-A-2-E DU

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20183355.An1

Acquisition information
Start time: 8/9/2018 6:35:06 AM
Live time: 1800
Real time: 1803
Dead time: 0.17 %
Detector ID: 9

Detector system
Ge9 S/N100228730

Calibration
Filename: 9_Soil_TunaCan.Clb
9_Soil_TunaCan_90099_050312

Energy Calibration
Created: 3/1/2012 1:57:17 PM
Zero offset: 0.074 keV
Gain: 0.250 keV/channel
Quadratic: -2.269E-08 keV/channel^2

Efficiency Calibration
Created: 6/14/2012 10:19:51 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.30 %
Log(Eff): -8.079856E-01 + (-2.367265E-01*Log(E)) + (-3.950640E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.42 %
Log(Eff): -2.387916E+01 + (8.875647E+00*Log(E)) + (-9.401100E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev14.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.08keV)
Stop channel: 8000 (1999.34keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 6:34:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2018-07-14_1810.PBC 7/14/2018 6:10:12 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.1657

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
63.29	18.	109.04	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
64.28	13.	160.32	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
77.25	94.	18.16	0.97	4.682E-02				
87.62	30.	40.25	1.04	5.038E-02	87.57	37.500	PBC<MDA	Sn126
93.04	17.	187.06	1.04	5.171E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	3.220E+00	AC228
99.50	16.	114.77	1.05	5.266E-02	99.50	15.000	PBC<MDA	Np239
103.20	16.	119.76	1.05	5.303E-02	103.20	21.800	PBC<MDA	Gd153
					103.70	24.000	6.954E-01	Np239
121.78	10.	144.73	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.265E-01	CO57
145.44	18.	167.17	1.09	5.012E-02	145.44	48.200	PBC<MDA	CE141
165.85	16.	107.44	1.11	4.736E-02	165.85	79.900	PBC<MDA	CE139
185.72	39.	36.50	1.13	4.403E-02	185.72	54.000	9.191E-01	U235
193.51	15.	105.56	1.14	4.287E-02	193.51	4.400	PBC<MDA	TH229
205.33	3.	395.81	1.15	4.123E-02	205.33	5.010	PBC<MDA	U235
210.85	10.	135.84	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
238.42	76.	17.70	0.53	3.734E-02	238.63	43.300	2.613E+00	PB212
241.74	29.	31.93	1.18	3.697E-02	242.00	7.430	5.792E+00	PB214
263.70	14.	85.87	1.20	3.489E-02	263.70	0.006	PBC<MDA	Cd113m
277.28	13.	85.41	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
295.01	7.	283.68	1.23	3.232E-02	295.09	19.300	PBC<MDA	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
296.00	12.	166.42	1.23	3.225E-02	296.00	79.000	PBC<MDA	TL210
300.00	1.	632.46	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.854E-01	PA231
					300.18	6.200	3.514E-01	PA233
300.18	12.	178.32	1.24	3.194E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.585E+00	PA231
					300.18	6.200	3.407E+00	PA233
302.57	12.	179.09	1.24	3.176E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.162E+00	BA133
302.85	12.	183.59	1.24	3.175E-02	302.65	2.880	7.391E+00	PA231
					302.85	18.330	1.162E+00	BA133
304.85	12.	187.74	1.24	3.160E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	7.652E-01	BI210M
320.08	14.	164.37	1.25	3.056E-02	320.08	9.940	PBC<MDA	CR51
328.76	12.	146.82	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
338.08	8.	222.07	1.27	2.940E-02	338.32	12.010	PBC<MDA	AC228
351.70	109.	11.79	1.43	2.860E-02	351.93	37.600	5.649E+00	PB214
364.48	11.	95.91	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
383.84	17.	56.86	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
387.95	9.	122.39	1.31	2.671E-02	387.95	66.000	PBC<MDA	Cf249
391.69	5.	265.18	1.32	2.653E-02	391.69	64.000	PBC<MDA	SN113
427.88	21.	35.75	1.35	2.491E-02	427.88	29.600	1.602E+00	SB125
468.06	10.	103.07	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
511.86	49.	39.98	2.67	2.188E-02	511.86	20.000	6.220E+00	RH106
531.00	9.	91.52	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
563.24	9.	96.03	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
569.16	2.	322.89	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	7.173E-01	PA234
					569.70	97.740	PBC<MDA	BI207
569.32	9.	68.54	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.965E+00	PA234
					569.70	97.740	PBC<MDA	BI207
569.70	-3.	268.00	1.47	2.023E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	PBC<MDA	PA234
					569.70	97.740	PBC<MDA	BI207
582.93	21.	51.01	1.48	1.989E-02	583.02	84.500	PBC<MDA	TL208
600.50	9.	180.25	1.50	1.946E-02	600.50	17.860	PBC<MDA	SB125
602.73	9.	192.22	1.50	1.940E-02	602.73	98.260	PBC<MDA	SB124
604.71	9.	191.40	1.50	1.936E-02	604.71	97.620	PBC<MDA	CS134
609.02	61.	18.43	1.76	1.925E-02	609.31	46.090	3.840E+00	BI214
610.30	9.	196.48	1.51	1.922E-02	610.30	5.750	PBC<MDA	RU103
614.28	9.	201.60	1.51	1.913E-02	614.28	89.850	PBC<MDA	AG108M
618.06	4.	494.35	1.51	1.904E-02	618.06	99.100	PBC<MDA	PM144
635.89	5.	114.89	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
702.63	11.	98.11	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
722.79	8.	109.39	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.769E-01	AG108M
					723.36	20.220	1.245E+00	EU154

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
727.17	6.	107.62	1.60	1.686E-02	727.17	7.550	PBC<MDA	BI212
747.16	6.	138.44	1.62	1.651E-02	747.16	34.000	PBC<MDA	pm146
756.73	8.	95.90	1.62	1.635E-02	756.73	54.460	PBC<MDA	ZR95
785.42	8.	88.51	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
795.87	6.	83.72	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
799.60	6.	103.80	1.66	1.568E-02	799.60	98.960	PBC<MDA	TL210
818.50	12.	90.77	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136
834.85	1.	988.26	1.69	1.517E-02	834.85	99.980	PBC<MDA	MN54
860.49	8.	97.42	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
873.23	8.	68.84	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
882.92	7.	159.25	1.72	1.453E-02	883.24	9.600	PBC<MDA	PA234
884.68	8.	83.74	1.73	1.451E-02	884.68	72.680	PBC<MDA	AG110M
889.28	4.	290.84	1.73	1.445E-02	889.28	99.984	PBC<MDA	Sc46
898.04	7.	102.57	1.74	1.434E-02	898.04	93.700	PBC<MDA	y88
910.98	19.	43.19	1.75	1.418E-02	911.07	29.000	2.567E+00	AC228
937.49	3.	238.82	1.77	1.387E-02	937.49	34.360	PBC<MDA	AG110M
946.02	8.	112.15	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
964.11	12.	72.04	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
968.83	11.	86.83	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
1037.84	9.	91.07	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1050.36	3.	166.13	1.85	1.269E-02	1050.36	1.560	PBC<MDA	RH106
1077.40	2.	324.82	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1099.25	4.	233.75	1.89	1.224E-02	1099.25	56.500	PBC<MDA	FE59
1115.55	2.	519.93	1.90	1.210E-02	1115.55	50.600	PBC<MDA	ZN65
1120.29	10.	112.02	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.30	13.	80.45	1.90	1.205E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.747E+00	Ta182
1189.05	9.	112.49	1.95	1.150E-02	1189.05	16.200	PBC<MDA	Ta182
1221.41	3.	327.45	1.97	1.126E-02	1221.41	27.000	PBC<MDA	Ta182
1238.28	26.	35.73	1.98	1.114E-02	1238.28	66.070	1.997E+00	Co56
1274.53	1.	591.61	2.01	1.088E-02	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.451E-01	EU154
1332.50	7.	91.28	2.05	1.050E-02	1332.50	99.980	PBC<MDA	CO60
1384.30	2.	324.47	2.08	1.018E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	2.	248.63	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.50	333.	5.61	1.92	9.749E-03	1460.83	10.670	1.777E+02	K40
1764.16	18.	28.24	2.31	8.350E-03	1764.49	15.400	7.593E+00	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
308.59	77.25	53.	94.	2.001E+03	18.16	0.975	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.80	46.54	144.	-11.	-0.006	157.20	0.998s
TH-227	200.20	50.14	155.	0.	0.000	1000.00	1.001s
AM-241	237.77	59.54	266.	-22.	-0.012	108.69	1.010s
TH-234	252.77	63.29	176.	18.	0.010	109.04	1.014s
Sn-126	256.74	64.28	223.	13.	0.007	160.32	1.015
BA-133	323.56	80.99	315.	-23.	-0.013	82.66	1.031s
Np-237	345.55	86.49	564.	0.	0.000	177.66	1.036A
EU-155	345.76	86.54	526.	-19.	-0.011	171.72	1.036s
Sn-126	349.87	87.57	491.	30.	0.017	40.25	1.037D
Cd-109	351.75	88.04	478.	0.	0.000	1000.00	1.038A
Nd-147	363.99	91.10	491.	0.	0.000	1000.00	1.041s
TH-234	369.94	92.59	491.	0.	0.000	1000.00	1.042s
AC-228	372.98	93.35	478.	17.	0.009	187.06	1.043s
Np-239	397.58	99.50	158.	16.	0.009	114.77	1.049s
Gd-153	412.37	103.20	174.	16.	0.009	119.76	1.052
Np-239	424.09	106.13	194.	-9.	-0.005	229.61	1.055s
EU-152	486.65	121.78	107.	10.	0.006	144.73	1.070s
CO-57	487.80	122.06	87.	-6.	-0.003	223.61	1.070s
EU-154	491.95	123.10	112.	-12.	-0.007	124.82	1.071s
PA-234	524.72	131.29	490.	-22.	-0.012	84.31	1.079s
HF-181	531.64	133.02	512.	-22.	-0.012	145.60	1.081
CE-144	533.69	133.54	534.	-22.	-0.012	148.59	1.081s
HF-181	544.74	136.30	557.	-22.	-0.012	151.23	1.084s
CO-57	545.43	136.47	579.	-22.	-0.012	154.17	1.084s
Tc-99m	561.57	140.51	601.	-22.	-0.012	156.48	1.088s
U-235	574.67	143.79	624.	-22.	-0.012	85.00	1.091s
CE-141	581.29	145.44	454.	18.	0.010	167.17	1.092s
Ba-140	650.15	162.66	169.	-20.	-0.011	94.65	1.108s
U-235	653.03	163.38	189.	-20.	-0.011	101.36	1.109s
CE-139	662.92	165.85	138.	16.	0.009	107.44	1.111s
Cf-251	705.90	176.60	81.	-9.	-0.005	196.83	1.122
U-235	742.37	185.72	48.	39.	0.022	36.50	1.130s
TH-229	773.52	193.51	64.	15.	0.009	105.56	1.137s
U-235	820.80	205.33	36.	3.	0.002	395.81	1.148
TH-229	842.87	210.85	45.	10.	0.005	135.84	1.153s
Cf-251	907.45	227.00	92.	-16.	-0.009	120.00	1.168s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-212	953.97	238.63	31.	75.	0.042	15.54	1.179D
PB-214	967.43	242.00	27.	29.	0.016	31.93	1.182D
EU-152	978.21	244.69	233.	-16.	-0.009	133.31	1.185s
TH-227	1024.40	256.24	92.	-20.	-0.011	96.89	1.195s
Cd-113m	1054.23	263.70	70.	14.	0.008	85.87	1.202
TL-208	1108.55	277.28	58.	13.	0.007	85.41	1.215
Hg-203	1116.22	279.20	96.	-17.	-0.009	85.49	1.216s
I-131	1136.61	284.30	52.	-3.	-0.002	474.15	1.221
PB-214	1179.77	295.09	190.	7.	0.004	283.68	1.231
TL-210	1183.41	296.00	197.	12.	0.007	166.42	1.231s
PB-212	1199.52	300.03	216.	0.	0.000	761.58	1.235D
PA-231	1199.68	300.07	209.	1.	0.001	632.46	1.235D
PA-233	1200.12	300.18	228.	12.	0.007	178.32	1.235s
PA-231	1210.00	302.65	231.	12.	0.007	179.09	1.237s
BA-133	1210.81	302.85	243.	12.	0.007	183.59	1.238s
Ba-140	1218.80	304.85	256.	12.	0.007	187.74	1.240s
BI-210M	1218.99	304.90	326.	-14.	-0.008	180.72	1.240s
Ir-192	1233.16	308.44	312.	-14.	-0.008	176.36	1.243s
PA-233	1247.44	312.01	298.	-15.	-0.008	133.19	1.246s
Ir-192	1265.35	316.49	283.	-11.	-0.006	211.86	1.250s
CR-51	1279.73	320.08	249.	14.	0.008	164.37	1.253s
La-140	1314.43	328.76	139.	12.	0.006	146.82	1.261s
Cf-249	1333.15	333.44	210.	-15.	-0.008	143.05	1.265s
AC-228	1352.66	338.32	173.	8.	0.005	222.07	1.270
Cs-136	1361.66	340.57	176.	0.	0.000	1000.00	1.272s
EU-152	1376.53	344.29	176.	0.	0.000	1000.00	1.275s
HF-181	1382.70	345.83	176.	0.	0.000	1000.00	1.276s
PB-214	1406.17	351.70	15.	109.	0.061	11.79	1.431s
BA-133	1423.37	356.00	169.	-12.	-0.007	158.36	1.285s
I-131	1457.31	364.48	24.	11.	0.006	95.91	1.293s
BA-133	1534.73	383.84	40.	17.	0.010	56.86	1.310s
Cf-249	1551.17	387.95	58.	9.	0.005	122.39	1.314s
SN-113	1566.12	391.69	75.	5.	0.003	265.18	1.317s
SB-125	1710.86	427.88	9.	21.	0.012	35.75	1.349s
AG-108M	1735.10	433.94	26.	0.	0.000	1000.00	1.354s
pm-146	1814.87	453.88	30.	-6.	-0.004	181.90	1.372s
SB-125	1852.82	463.37	73.	-15.	-0.008	51.34	1.380s
Ir-192	1871.59	468.06	44.	10.	0.005	103.07	1.384s
BE-7	1909.73	477.60	112.	-15.	-0.009	100.91	1.392s
HF-181	1927.34	482.00	131.	-16.	-0.009	103.52	1.396s
La-140	1947.43	487.02	147.	-7.	-0.004	244.54	1.400s
RU-103	1987.56	497.05	30.	-5.	-0.003	215.19	1.409s
RH-106	2046.81	511.86	49.	49.	0.027	39.98	2.672s
Nd-147	2123.35	531.00	13.	9.	0.005	91.52	1.438s
Ba-140	2148.39	537.26	22.	-6.	-0.003	172.86	1.444s
CS-134	2252.30	563.24	14.	9.	0.005	96.03	1.466s
CS-134	2276.64	569.32	14.	9.	0.005	68.54	1.471s
PA-234	2277.24	569.47	23.	2.	0.001	322.89	1.471s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	2278.16	569.70	29.	-3.	-0.002	268.00	1.471s
TL-208	2331.45	583.02	22.	21.	0.012	51.01	1.482
SB-125	2401.36	600.50	128.	9.	0.005	180.25	1.497s
SB-124	2410.29	602.73	136.	9.	0.005	192.22	1.499s
CS-134	2418.21	604.71	145.	9.	0.005	191.40	1.500s
BI-214	2435.46	609.02	21.	61.	0.034	18.43	1.756
RU-103	2440.56	610.30	154.	9.	0.005	196.48	1.505s
AG-108M	2456.49	614.28	163.	9.	0.005	201.60	1.508s
PM-144	2471.62	618.06	172.	4.	0.002	494.35	1.512s
SB-125	2542.94	635.89	14.	5.	0.003	114.89	1.526s
I-131	2547.28	636.97	43.	-14.	-0.008	78.58	1.527s
AG-110M	2630.43	657.76	45.	-8.	-0.005	137.10	1.544s
PM-144	2785.58	696.54	65.	-15.	-0.008	78.39	1.576s
NB-94	2809.93	702.63	49.	11.	0.006	98.11	1.581s
SB-124	2890.57	722.79	31.	8.	0.004	109.39	1.598
AG-108M	2891.17	722.94	39.	0.	0.000	1000.00	1.598
EU-154	2892.85	723.36	39.	0.	0.000	1000.00	1.598
ZR-95	2896.22	724.20	39.	0.	0.000	1000.00	1.599s
BI-212	2908.11	727.17	15.	6.	0.003	107.62	1.601s
pm-146	2942.31	735.72	28.	-5.	-0.003	228.91	1.608s
pm-146	2988.08	747.16	14.	6.	0.003	138.44	1.617s
ZR-95	3026.36	756.73	10.	8.	0.004	95.90	1.625s
AG-110M	3055.23	763.94	24.	-3.	-0.002	238.05	1.631s
NB-95	3062.61	765.79	60.	-17.	-0.009	68.75	1.632s
PA-234M	3065.10	766.41	73.	-4.	-0.002	285.38	1.633s
EU-152	3115.14	778.92	20.	-3.	-0.002	332.78	1.643s
BI-212	3141.15	785.42	22.	8.	0.005	88.51	1.648s
CS-134	3182.95	795.87	9.	6.	0.003	83.72	1.656s
TL-210	3197.88	799.60	15.	6.	0.003	103.80	1.659s
CS-134	3207.29	801.95	12.	0.	0.000	1000.00	1.661s
CO-58	3242.59	810.78	49.	-10.	-0.006	103.92	1.668s
La-140	3262.58	815.77	60.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	50.	12.	0.006	90.77	1.674s
MN-54	3338.91	834.85	20.	1.	0.001	988.26	1.687s
Co-56	3386.61	846.77	25.	-7.	-0.004	161.52	1.696s
TL-208	3441.80	860.56	11.	8.	0.004	97.42	1.707s
NB-94	3483.94	871.10	20.	0.	0.000	1000.00	1.715s
EU-154	3492.47	873.23	13.	8.	0.005	68.84	1.717s
PA-234	3521.68	880.53	61.	-9.	-0.005	133.64	1.722s
PA-234	3532.53	883.24	62.	7.	0.004	159.25	1.724s
AG-110M	3538.30	884.68	21.	8.	0.005	83.74	1.725s
Sc-46	3556.69	889.28	50.	4.	0.002	290.84	1.729s
y-88	3591.74	898.04	11.	7.	0.004	102.57	1.736s
AC-228	3643.88	911.07	10.	19.	0.011	43.19	1.746s
AG-110M	3749.60	937.49	10.	3.	0.002	238.82	1.766s
PA-234	3783.72	946.02	15.	8.	0.004	112.15	1.772
EU-152	3856.11	964.11	34.	12.	0.007	72.04	1.786s
AC-228	3875.56	968.97	38.	11.	0.006	86.83	1.790s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	3985.03	996.33	75.	-17.	-0.009	77.35	1.810
PA-234M	4003.71	1001.00	92.	-17.	-0.009	45.39	1.814s
EU-154	4018.82	1004.77	110.	-9.	-0.005	174.94	1.816s
Co-56	4151.13	1037.84	11.	9.	0.005	91.07	1.841s
Cs-136	4192.07	1048.07	16.	0.	0.000	1000.00	1.848s
RH-106	4201.23	1050.36	14.	3.	0.002	166.13	1.850
BI-207	4254.46	1063.66	28.	-7.	-0.004	120.77	1.860s
Ga-68	4309.44	1077.40	11.	2.	0.001	324.82	1.870s
FE-59	4396.88	1099.25	16.	4.	0.002	233.75	1.886s
EU-152	4448.20	1112.07	69.	-6.	-0.003	166.57	1.895s
ZN-65	4462.09	1115.55	61.	2.	0.001	519.93	1.897s
BI-214	4481.06	1120.29	52.	10.	0.005	112.02	1.901s
Sc-46	4482.12	1120.55	76.	-14.	-0.008	92.67	1.901s
Ta-182	4485.12	1121.30	50.	13.	0.007	80.45	1.901s
Ta-182	4756.25	1189.05	17.	9.	0.005	112.49	1.949s
Ta-182	4885.75	1221.41	17.	3.	0.002	327.45	1.972s
Co-56	4953.27	1238.28	12.	26.	0.015	35.73	1.984s
NA-22	5098.35	1274.53	17.	1.	0.001	591.61	2.008s
EU-154	5098.40	1274.54	18.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	23.	-2.	-0.001	674.39	2.020s
TL-210	5252.32	1313.00	11.	-3.	-0.002	243.10	2.034s
CO-60	5330.37	1332.50	6.	7.	0.004	91.28	2.047s
AG-110M	5537.69	1384.30	6.	2.	0.001	324.47	2.082s
EU-152	5632.56	1408.00	7.	2.	0.001	248.63	2.097s
K-40	5842.70	1460.50	7.	333.	0.185	5.61	1.917
La-140	6385.95	1596.21	12.	-3.	-0.002	579.84	2.215s
BI-214	7059.65	1764.49	3.	18.	0.010	28.24	2.314s
Co-56	7087.11	1771.35	32.	-5.	-0.003	171.24	2.318s
y-88	7346.20	1836.06	13.	-5.	-0.003	104.30	2.354s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	-3.5128E+00				5.31E+01	
			477.60	-3.513E+00	?(	1.192E+01 1.01E+02	1.05E+01 G
NA-22	C	5.1077E-02				9.50E+02	
			1274.53	5.108E-02	?(	1.120E+00 5.92E+02	9.99E+01 G
K-40	N	1.7765E+02				4.66E+11	
			1460.83	1.777E+02	(P	8.205E+00 5.61E+00	1.07E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sc-46	F 1.3515E-01					8.38E+01	
		889.28	1.351E-01	&(	1.377E+00	2.91E+02	1.00E+02 G
		1120.55	-6.400E-01	&	1.995E+00	9.27E+01	1.00E+02 G
CR-51	F 2.5200E+00					2.77E+01	
		320.08	2.520E+00	&(	1.396E+01	1.64E+02	9.94E+00 G
MN-54	C 3.6628E-02					3.12E+02	
		834.85	3.663E-02	?(	8.626E-01	9.88E+02	1.00E+02 G
FE-59	F 3.2005E-01					4.45E+01	
		1099.25	3.201E-01	?(P	1.715E+00	2.34E+02	5.65E+01 G
		1291.60	-1.991E-01	+	2.973E+00	6.74E+02	4.32E+01 G
Co-56	C 8.0093E-01					7.73E+01	
		846.77	-2.593E-01	?(	9.636E-01	1.62E+02	9.99E+01 G
		1238.28	1.997E+00	?(P	1.400E+00	3.57E+01	6.61E+01 G
		1037.84	2.707E+00	?(P	5.554E+00	9.11E+01	1.41E+01 G
		1771.35	-2.084E+00	+	1.251E+01	1.71E+02	1.55E+01 A
CO-57	C -7.3431E-02					2.72E+02	
		122.06	-7.343E-02	&(	5.651E-01	2.24E+02	8.56E+01 G
		136.47	-2.251E+00	&	1.160E+01	1.54E+02	1.07E+01 G
CO-58	C -3.6003E-01					7.09E+01	
		810.78	-3.600E-01	?(	1.272E+00	1.04E+02	9.95E+01 G
CO-60	F 3.6041E-01					1.93E+03	
		1332.50	3.604E-01	?(P	7.463E-01	9.13E+01	1.00E+02 G
		1173.24	-4.121E-02	% P	1.172E+00	1.25E+03	9.99E+01 G
ZN-65	F 1.9420E-01					2.44E+02	
		1115.55	1.942E-01	?(	3.544E+00	5.20E+02	5.06E+01 G
NB-94	I 3.5040E-01					7.41E+06	
		702.63	3.504E-01	?(P	1.164E+00	9.81E+01	9.79E+01 G
		871.10	0.000E+00	-	8.921E-01	1.00E+03	9.99E+01 G
ZR-95	I 4.8927E-01					6.40E+01	
		756.73	4.893E-01	?(P	1.095E+00	9.59E+01	5.45E+01 G
		724.20	0.000E+00	-	2.368E+00	1.00E+03	4.42E+01 G
NB-95	I -5.8493E-01					6.40E+01	
		765.79	-5.849E-01	?(	1.333E+00	6.87E+01	9.98E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
RU-103	I	-1.4580E-01						3.93E+01	
			497.05	-1.458E-01	?(	7.757E-01	2.15E+02	9.09E+01	G
			610.30	4.556E+00	?	3.043E+01	1.96E+02	5.75E+00	GA
RH-106	I	1.2700E+00						3.74E+02	
			621.92	-2.252E-06	%(	1.905E+01	2.46E+08	9.93E+00	G
			1050.36	9.354E+00	&(	5.595E+01	1.66E+02	1.56E+00	G
			511.86	6.220E+00	?	4.485E+00	4.00E+01	2.00E+01	GA
AG-108M	C	9.7276E-02						1.53E+05	
			433.94	0.000E+00	?(	6.591E-01	1.00E+03	9.05E+01	G
			722.94	0.000E+00	&(	1.149E+00	1.00E+03	9.08E+01	G
			614.28	2.936E-01	?(	2.011E+00	2.02E+02	8.98E+01	G
AG-110M	F	4.1369E-01						2.50E+02	
			884.68	4.471E-01	?(	1.268E+00	8.37E+01	7.27E+01	G
			657.76	-2.682E-01	- P	1.100E+00	1.37E+02	9.46E+01	G
			937.49	3.497E-01	?(	2.034E+00	2.39E+02	3.44E+01	G
			1384.30	4.042E-01	?(P	3.215E+00	3.24E+02	2.43E+01	G
			763.94	-4.607E-01	-	3.922E+00	2.38E+02	2.23E+01	G
SN-113	F	1.5391E-01						1.15E+02	
			391.69	1.539E-01	?(P	1.412E+00	2.65E+02	6.40E+01	G
SB-124	F	4.5979E-01						6.02E+01	
			602.73	2.544E-01	?(P	1.664E+00	1.92E+02	9.83E+01	G
			1690.98	-2.252E-02	% P	9.906E-01	1.11E+04	4.78E+01	G
			722.79	2.327E+00	&(	8.739E+00	1.09E+02	1.08E+01	G
SB-125	I	1.4982E+00						1.01E+03	
			427.88	1.602E+00	?(P	1.242E+00	3.57E+01	2.96E+01	G
			600.50	1.441E+00	?(	8.846E+00	1.80E+02	1.79E+01	G
			635.89	1.317E+00	?(	5.308E+00	1.15E+02	1.13E+01	G
			463.37	-3.385E+00	- P	9.569E+00	5.13E+01	1.05E+01	G
I-131	I	2.5868E-01						8.02E+00	
			364.48	2.587E-01	?(P	6.269E-01	9.59E+01	8.17E+01	G
			284.30	-8.188E-01	&	9.912E+00	4.74E+02	6.14E+00	G
			636.97	-6.009E+00	+ P	1.380E+01	7.86E+01	7.17E+00	G
Gd-153	F	3.2235E-01						2.42E+02	
			97.50	-2.022E-07	%(	3.745E+00	5.48E+08	3.00E+01	G
			103.20	7.660E-01	(	3.086E+00	1.20E+02	2.18E+01	G
Ga-68	C	3.7093E+00						4.71E-02	
			1077.40	3.709E+00	(	2.850E+01	3.25E+02	3.30E+00	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Tc-99m	I	-2.8186E-01					2.51E-01	
			140.51	-2.819E-01	&(	1.474E+00	1.56E+02	8.93E+01 G
BA-133	F	-2.3036E-02					3.85E+03	
			356.00	-3.730E-01	*(	1.999E+00	1.58E+02	6.20E+01 G
			302.85	1.162E+00	&(	7.201E+00	1.84E+02	1.83E+01 G
			383.84	4.034E+00	? P	7.471E+00	5.69E+01	8.94E+00 GA
			80.99	-7.631E-01	+ P	2.884E+00	8.27E+01	3.41E+01 GA
CS-134	I	4.5935E-01					7.54E+02	
			604.71	2.657E-01	?(	1.730E+00	1.91E+02	9.76E+01 G
			795.87	2.426E-01	?(	6.942E-01	8.37E+01	8.55E+01 G
			569.32	1.581E+00	?(	3.595E+00	6.85E+01	1.54E+01 G
			801.95	0.000E+00	-	7.606E+00	1.00E+03	8.69E+00 G
			563.24	2.878E+00	?(	6.570E+00	9.60E+01	8.35E+00 G
CS-137	I	-1.2863E-02					1.10E+04	
			661.66	-1.286E-02	%(P	1.312E+00	3.20E+03	8.52E+01 G
CE-139	F	2.3384E-01					1.38E+02	
			165.85	2.338E-01	?(	8.448E-01	1.07E+02	7.99E+01 G
Ba-140	I	2.2731E-01					1.28E+01	
			537.26	-6.111E-01	?(	2.632E+00	1.73E+02	2.44E+01 G
			162.66	-3.785E+00	& P	1.206E+01	9.46E+01	6.22E+00 G
			304.85	4.994E+00	?(	3.164E+01	1.88E+02	4.29E+00 G
La-140	I	1.5208E-02					1.28E+01	
			1596.21	-2.067E-01	?(P	1.220E+00	5.80E+02	9.54E+01 G
			487.02	-3.817E-01	&	3.185E+00	2.45E+02	4.55E+01 G
			328.76	1.058E+00	?(	5.263E+00	1.47E+02	2.03E+01 G
			815.77	0.000E+00	&	5.997E+00	1.00E+03	2.33E+01 G
CE-141	I	4.1870E-01					3.25E+01	
			145.44	4.187E-01	?(	2.346E+00	1.67E+02	4.82E+01 G
CE-144	I	-2.1461E+00					2.85E+02	
			133.54	-2.146E+00	&(	1.066E+01	1.49E+02	1.11E+01 G
PM-144	C	-4.7101E-01					3.63E+02	
			696.54	-4.710E-01	?(P	1.302E+00	7.84E+01	9.90E+01 G
			618.06	1.111E-01	+	1.880E+00	4.94E+02	9.91E+01 G
EU-152	F	8.8503E-01					4.94E+03	
			344.29	0.000E+00	?(	4.658E+00	1.00E+03	2.65E+01 G
			1112.07	-1.882E+00	+ P	1.386E+01	1.67E+02	1.36E+01 G
			121.78	3.786E-01	?(	1.863E+00	1.45E+02	2.86E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			778.92	-8.051E-01	+	6.320E+00	3.33E+02	1.29E+01 G
			964.11	3.482E+00	&(	8.357E+00	7.20E+01	1.46E+01 G
			244.69	-3.289E+00	+	1.474E+01	1.33E+02	7.58E+00 G
			1408.00	6.313E-01	? P	3.867E+00	2.49E+02	2.10E+01 GA
EU-154	I	2.6082E+00					3.14E+03	
			873.23	2.608E+00	&(	5.962E+00	6.88E+01	1.23E+01 G
			123.10	-3.172E-01	-	1.340E+00	1.25E+02	4.08E+01 G
			1274.54	0.000E+00	-	3.261E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	&	5.165E+00	1.00E+03	2.02E+01 G
			1004.77	-2.032E+00	-	1.213E+01	1.75E+02	1.80E+01 G
			996.33	-6.599E+00	-	1.703E+01	7.74E+01	1.06E+01 G
EU-155	I	-1.6427E-02					1.81E+03	
			105.31	-1.643E-02	%(P	3.318E+00	5.61E+03	2.12E+01 G
			86.54	-6.885E-01	+	3.959E+00	1.72E+02	3.07E+01 G
HF-181	F	-4.8597E-01					4.24E+01	
			482.00	-4.860E-01	?(	1.691E+00	1.04E+02	8.05E+01 G
			133.02	-5.487E-01	&	2.671E+00	1.46E+02	4.33E+01 G
			345.83	0.000E+00	+	8.216E+00	1.00E+03	1.51E+01 G
			136.30	-4.107E+00	&	2.077E+01	1.51E+02	5.85E+00 G
Ta-182	F	2.0436E+00					1.14E+02	
			1121.30	1.747E+00	?(	4.710E+00	8.05E+01	3.49E+01 G
			1221.41	5.482E-01	-	4.006E+00	3.27E+02	2.70E+01 G
			1189.05	2.683E+00	?(	6.535E+00	1.12E+02	1.62E+01 G
Hg-203	F	-3.4359E-01					4.66E+01	
			279.20	-3.436E-01	?(	9.829E-01	8.55E+01	8.15E+01 G
TL-208	N	1.0592E+00					6.98E+02	
			583.02	6.885E-01	?(P	8.150E-01	5.10E+01	8.45E+01 G
			277.28	3.486E+00	(	1.000E+01	8.54E+01	6.31E+00 G
			860.56	2.349E+00	?(P	5.399E+00	9.74E+01	1.24E+01 G
pm-146	C	5.9372E-01					2.02E+03	
			747.16	5.937E-01	?(	1.994E+00	1.38E+02	3.40E+01 G
			735.72	-7.389E-01	+	4.045E+00	2.29E+02	2.25E+01 G
			453.88	-2.267E-01	-	1.016E+00	1.82E+02	6.50E+01 G
y-88	F	3.0736E-01					1.07E+02	
			898.04	3.074E-01	?(P	7.540E-01	1.03E+02	9.37E+01 G
			1836.06	-3.322E-01	+ P	1.343E+00	1.04E+02	9.92E+01 G
Cd-113m		3.8407E+03					5.33E+03	
			263.70	3.841E+03	(	1.107E+04	8.59E+01	6.00E-03 K

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-251	T	-6.2265E-01					3.28E+05	
			176.60	-6.227E-01	&(	3.202E+00	1.97E+02	1.70E+01 G
			227.00	-3.657E+00	&	1.083E+01	1.20E+02	6.30E+00 GA
Cf-249	T	2.8791E-01					1.28E+05	
			387.95	2.879E-01	&(	1.203E+00	1.22E+02	6.60E+01 G
			333.44	-1.759E+00	+	8.479E+00	1.43E+02	1.55E+01 G
Sn-126		1.9193E+00					3.65E+07	
			87.57	8.828E-01	}	3.116E+00	4.02E+01	3.75E+01 GA
			64.28	1.919E+00	(	1.038E+01	1.60E+02	9.70E+00 G
			86.94	0.000E+00	}	1.287E+01	1.34E+03	9.04E+00 GA
PB-210	N	-5.5805E+00					8.14E+03	
			46.54	-5.581E+00	(	2.974E+01	1.57E+02	4.25E+00 G
PB-212	N	2.5869E+00					6.98E+02	
			238.63	2.587E+00	(	9.817E-01	1.55E+01	4.33E+01 G
			300.03	0.000E+00	}	3.777E+01	7.62E+02	3.28E+00 GA
PB-214	N	5.6487E+00					5.84E+05	
			351.93	5.649E+00	@(P	1.061E+00	1.18E+01	3.76E+01 G
			295.09	6.190E-01	- P	5.962E+00	2.84E+02	1.93E+01 G
			242.00	5.792E+00	P	5.478E+00	3.19E+01	7.43E+00 GA
BI-207	C	-7.8203E-02					1.18E+04	
			569.70	-7.820E-02	?(P	7.786E-01	2.68E+02	9.77E+01 G
			1063.66	-4.021E-01	+ P	1.618E+00	1.21E+02	7.45E+01 G
BI-212	N	2.4304E+00					6.98E+02	
			727.17	2.430E+00	?(	9.106E+00	1.08E+02	7.55E+00 G
			785.42	2.212E+01	?	6.662E+01	8.85E+01	1.28E+00 GA
U-235	N	-2.2227E+00					2.57E+11	
			143.79	-2.223E+00	?(P	1.198E+01	8.50E+01	1.10E+01 G
			205.33	8.068E-01	&	8.248E+00	3.96E+02	5.01E+00 G
			163.38	-4.598E+00	+	1.560E+01	1.01E+02	5.08E+00 G
			185.72	9.191E-01	+	8.151E-01	3.65E+01	5.40E+01 GA
BI-214	N	3.6122E+00					5.84E+05	
			609.31	3.840E+00	(P	1.497E+00	1.84E+01	4.61E+01 G
			1120.29	2.917E+00	&(P	1.111E+01	1.12E+02	1.51E+01 G
			1764.49	7.593E+00	+ P	4.897E+00	2.82E+01	1.54E+01 G
BI-210M	T	-1.5149E-02					1.10E+09	
			265.83	-1.515E-02	%(	1.425E+00	2.69E+03	5.00E+01 G
			304.90	-8.973E-01	+	5.456E+00	1.81E+02	2.80E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	N	2.5557E+00					2.10E+03	
			911.07	2.567E+00	?(	2.357E+00	4.32E+01	2.90E+01 G
			968.97	2.538E+00	?(	7.437E+00	8.68E+01	1.75E+01 G
			338.32	1.336E+00	-	1.008E+01	2.22E+02	1.20E+01 G
			93.35	3.220E+00	?	2.020E+01	1.87E+02	5.56E+00 XA
TH-229	N	4.5231E+00					2.68E+06	
			193.51	4.516E+00	?(P	1.182E+01	1.06E+02	4.40E+00 G
			210.85	4.534E+00	&(P	1.554E+01	1.36E+02	2.99E+00 G
TH-234	N	6.5528E+00					1.63E+12	
			63.29	6.553E+00	*(	2.398E+01	1.09E+02	3.81E+00 G
			92.59	0.000E+00	-	2.045E+01	1.00E+03	5.58E+00 G
PA-231	N	7.3896E+00					1.20E+07	
			302.65	7.390E+00	&(	4.469E+01	1.79E+02	2.88E+00 G
			300.07	8.854E-01	}	4.954E+01	6.32E+02	2.46E+00 G
PA-233	C	-1.2710E-01					7.82E+08	
			312.01	-7.358E-01	?(P	4.127E+00	1.33E+02	3.60E+01 G
			300.18	3.407E+00	?(	2.052E+01	1.78E+02	6.20E+00 G
PA-234	N	8.5298E-01					1.63E+12	
			131.29	-1.314E+00	?(P	6.264E+00	8.43E+01	1.80E+01 G
			946.02	2.408E+00	(	6.249E+00	1.12E+02	1.34E+01 G
			569.47	7.173E-01	?(	8.366E+00	3.23E+02	8.20E+00 G
			883.24	2.862E+00	?(	1.568E+01	1.59E+02	9.60E+00 G
			880.53	-5.416E+00	+	2.478E+01	1.34E+02	6.00E+00 GA
PA-234M	N	-8.5078E+01					1.63E+12	
			1001.00	-8.508E+01	?(P	2.382E+02	4.54E+01	8.37E-01 G
			766.41	-5.024E+01	+	4.973E+02	2.85E+02	2.94E-01 G
AM-241	T	-9.1567E-01					1.58E+05	
			59.54	-9.157E-01	?(	3.329E+00	1.09E+02	3.59E+01 G
Ir-192	F	1.7472E-02					7.40E+01	
			316.49	-2.352E-01	?(	1.682E+00	2.12E+02	8.70E+01 G
			468.06	4.425E-01	?(	1.552E+00	1.03E+02	5.18E+01 G
			308.44	-7.997E-01	+	4.746E+00	1.76E+02	3.18E+01 G
Cs-136	F	4.1990E-01					1.30E+01	
			818.50	4.199E-01	?(	1.286E+00	9.08E+01	1.00E+02 G
			1048.07	0.000E+00	-	1.166E+00	1.00E+03	8.00E+01 G
			340.57	0.000E+00	-	2.612E+00	1.00E+03	4.69E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Np-239	T -3.9858E-01					2.36E+00	
		103.70	8.022E-02 %		2.922E+00	1.06E+03	2.40E+01 X
		106.13	-3.986E-01 &(		3.107E+00	2.30E+02	2.27E+01 G
		99.50	1.118E+00 ?		4.316E+00	1.15E+02	1.50E+01 X
Nd-147	1.7374E+00					1.11E+01	
		531.00	1.737E+00 &(		3.914E+00	9.15E+01	1.30E+01 G
		91.10	0.000E+00 -		4.060E+00	1.00E+03	2.83E+01 G
TL-210	N 2.3205E-01					5.84E+05	
		799.60	2.065E-01 ?(		7.441E-01	1.04E+02	9.90E+01 G
		296.00	2.640E-01 ?(		1.485E+00	1.66E+02	7.90E+01 G
		1313.00	-8.298E-01 +		4.580E+00	2.43E+02	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
    negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
    failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the
    library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
    to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	144.	-11.	-0.006	157.20	-5.581E+00	
AM-241	59.54	266.	-22.	-0.012	108.69	-9.157E-01	
TH-234	63.29	176.	18.	0.010	109.04	6.553E+00	
BA-133	80.99	315.	-23.	-0.013	82.66	-7.631E-01	P
EU-155	86.54	526.	-19.	-0.011	171.72	-6.885E-01	
Np-239	99.50	158.	16.	0.009	114.77	1.118E+00	
Gd-153	103.20	174.	16.	0.009	119.76	7.660E-01	
Np-239	106.13	194.	-9.	-0.005	229.61	-3.986E-01	
EU-152	121.78	107.	10.	0.006	144.73	3.786E-01	
CO-57	122.06	87.	-6.	-0.003	223.61	-7.343E-02	
EU-154	123.10	112.	-12.	-0.007	124.82	-3.172E-01	
HF-181	133.02	512.	-22.	-0.012	145.60	-5.487E-01	
CE-144	133.54	534.	-22.	-0.012	148.59	-2.146E+00	
HF-181	136.30	557.	-22.	-0.012	151.23	-4.107E+00	
CO-57	136.47	579.	-22.	-0.012	154.17	-2.251E+00	
Tc-99m	140.51	601.	-22.	-0.012	156.48	-2.819E-01	
U-235	143.79	624.	-22.	-0.012	85.00	-2.223E+00	P
CE-141	145.44	454.	18.	0.010	167.17	4.187E-01	
Ba-140	162.66	169.	-20.	-0.011	94.65	-3.785E+00	P
U-235	163.38	189.	-20.	-0.011	101.36	-4.598E+00	
CE-139	165.85	138.	16.	0.009	107.44	2.338E-01	
Cf-251	176.60	81.	-9.	-0.005	196.83	-6.227E-01	
U-235	185.72	48.	39.	0.022	36.50	9.191E-01	
TH-229	193.51	64.	15.	0.009	105.56	4.516E+00	P
U-235	205.33	36.	3.	0.002	395.81	8.068E-01	
TH-229	210.85	45.	10.	0.005	135.84	4.534E+00	P
Cf-251	227.00	92.	-16.	-0.009	120.00	-3.657E+00	
EU-152	244.69	233.	-16.	-0.009	133.31	-3.289E+00	
TH-227	256.24	92.	-20.	-0.011	96.89	-4.444E+00	
Cd-113m	263.70	70.	14.	0.008	85.87	3.841E+03	
Hg-203	279.20	96.	-17.	-0.009	85.49	-3.436E-01	
I-131	284.30	52.	-3.	-0.002	474.15	-8.188E-01	
TL-210	296.00	197.	12.	0.007	166.42	2.640E-01	
PA-233	300.18	228.	12.	0.007	178.32	3.407E+00	
BA-133	302.85	243.	12.	0.007	183.59	1.162E+00	
Ba-140	304.85	256.	12.	0.007	187.74	4.994E+00	
BI-210M	304.90	326.	-14.	-0.008	180.72	-8.973E-01	
Ir-192	308.44	312.	-14.	-0.008	176.36	-7.997E-01	
PA-233	312.01	298.	-15.	-0.008	133.19	-7.358E-01	P
Ir-192	316.49	283.	-11.	-0.006	211.86	-2.352E-01	
CR-51	320.08	249.	14.	0.008	164.37	2.520E+00	
La-140	328.76	139.	12.	0.006	146.82	1.058E+00	
Cf-249	333.44	210.	-15.	-0.008	143.05	-1.759E+00	
BA-133	356.00	169.	-12.	-0.007	158.36	-3.730E-01	

(Page 18 of 22)

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	364.48	24.	11.	0.006	95.91	2.587E-01	P
BA-133	383.84	40.	17.	0.010	56.86	4.034E+00	P
Cf-249	387.95	58.	9.	0.005	122.39	2.879E-01	
SN-113	391.69	75.	5.	0.003	265.18	1.539E-01	P
pm-146	453.88	30.	-6.	-0.004	181.90	-2.267E-01	
Ir-192	468.06	44.	10.	0.005	103.07	4.425E-01	
BE-7	477.60	112.	-15.	-0.009	100.91	-3.513E+00	
HF-181	482.00	131.	-16.	-0.009	103.52	-4.860E-01	
La-140	487.02	147.	-7.	-0.004	244.54	-3.817E-01	
RU-103	497.05	30.	-5.	-0.003	215.19	-1.458E-01	
RH-106	511.86	49.	49.	0.027	39.98	6.220E+00	
Nd-147	531.00	13.	9.	0.005	91.52	1.737E+00	
Ba-140	537.26	22.	-6.	-0.003	172.86	-6.111E-01	
CS-134	563.24	14.	9.	0.005	96.03	2.878E+00	
CS-134	569.32	14.	9.	0.005	68.54	1.581E+00	
BI-207	569.70	29.	-3.	-0.002	268.00	-7.820E-02	P
SB-124	602.73	136.	9.	0.005	192.22	2.544E-01	P
CS-134	604.71	145.	9.	0.005	191.40	2.657E-01	
RU-103	610.30	154.	9.	0.005	196.48	4.556E+00	
AG-108M	614.28	163.	9.	0.005	201.60	2.936E-01	
PM-144	618.06	172.	4.	0.002	494.35	1.111E-01	
I-131	636.97	43.	-14.	-0.008	78.58	-6.009E+00	P
AG-110M	657.76	45.	-8.	-0.005	137.10	-2.682E-01	P
PM-144	696.54	65.	-15.	-0.008	78.39	-4.710E-01	P
NB-94	702.63	49.	11.	0.006	98.11	3.504E-01	P
SB-124	722.79	31.	8.	0.004	109.39	2.327E+00	
BI-212	727.17	15.	6.	0.003	107.62	2.430E+00	
pm-146	735.72	28.	-5.	-0.003	228.91	-7.389E-01	
pm-146	747.16	14.	6.	0.003	138.44	5.937E-01	
ZR-95	756.73	10.	8.	0.004	95.90	4.893E-01	P
AG-110M	763.94	24.	-3.	-0.002	238.05	-4.607E-01	
NB-95	765.79	60.	-17.	-0.009	68.75	-5.849E-01	
PA-234M	766.41	73.	-4.	-0.002	285.38	-5.024E+01	
EU-152	778.92	20.	-3.	-0.002	332.78	-8.051E-01	
BI-212	785.42	22.	8.	0.005	88.51	2.212E+01	
CS-134	795.87	9.	6.	0.003	83.72	2.426E-01	
TL-210	799.60	15.	6.	0.003	103.80	2.065E-01	
CO-58	810.78	49.	-10.	-0.006	103.92	-3.600E-01	
Cs-136	818.50	50.	12.	0.006	90.77	4.199E-01	
MN-54	834.85	20.	1.	0.001	988.26	3.663E-02	
Co-56	846.77	25.	-7.	-0.004	161.52	-2.593E-01	
EU-154	873.23	13.	8.	0.005	68.84	2.608E+00	
AG-110M	884.68	21.	8.	0.005	83.74	4.471E-01	
Sc-46	889.28	50.	4.	0.002	290.84	1.351E-01	
y-88	898.04	11.	7.	0.004	102.57	3.074E-01	P
AG-110M	937.49	10.	3.	0.002	238.82	3.497E-01	
EU-152	964.11	34.	12.	0.007	72.04	3.482E+00	
EU-154	996.33	75.	-17.	-0.009	77.35	-6.599E+00	

(Page 19 of 22)

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
PA-234M	1001.00	92.	-17.	-0.009	45.39	-8.508E+01	P	
EU-154	1004.77	110.	-9.	-0.005	174.94	-2.032E+00		
Co-56	1037.84	11.	9.	0.005	91.07	2.707E+00	P	
RH-106	1050.36	14.	3.	0.002	166.13	9.354E+00		
BI-207	1063.66	28.	-7.	-0.004	120.77	-4.021E-01	P	
Ga-68	1077.40	11.	2.	0.001	324.82	3.709E+00		
FE-59	1099.25	16.	4.	0.002	233.75	3.201E-01	P	
EU-152	1112.07	69.	-6.	-0.003	166.57	-1.882E+00	P	
Sc-46	1120.55	76.	-14.	-0.008	92.67	-6.400E-01		
Ta-182	1121.30	50.	13.	0.007	80.45	1.747E+00		
Ta-182	1189.05	17.	9.	0.005	112.49	2.683E+00		
Ta-182	1221.41	17.	3.	0.002	327.45	5.482E-01		
Co-56	1238.28	12.	26.	0.015	35.73	1.997E+00	P	
NA-22	1274.53	17.	1.	0.001	591.61	5.108E-02		
FE-59	1291.60	23.	-2.	-0.001	674.39	-1.991E-01		
TL-210	1313.00	11.	-3.	-0.002	243.10	-8.298E-01		
CO-60	1332.50	6.	7.	0.004	91.28	3.604E-01	P	
AG-110M	1384.30	6.	2.	0.001	324.47	4.042E-01	P	
EU-152	1408.00	7.	2.	0.001	248.63	6.313E-01	P	
La-140	1596.21	12.	-3.	-0.002	579.84	-2.067E-01	P	
Co-56	1771.35	32.	-5.	-0.003	171.24	-2.084E+00		
y-88	1836.06	13.	-5.	-0.003	104.30	-3.322E-01	P	

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-3.5128E+00	-3.5128E+00	1.009E+02%	1.19E+01
NA-22	#A	5.1077E-02	5.1077E-02	5.916E+02%	1.12E+00
K-40		1.7765E+02	1.7765E+02	5.607E+00%	8.20E+00
Sc-46	#A	1.3515E-01	1.3515E-01	2.908E+02%	1.38E+00
CR-51	#A	2.5200E+00	2.5200E+00	1.644E+02%	1.40E+01
MN-54	#A	3.6628E-02	3.6628E-02	9.883E+02%	8.63E-01
FE-59	#A	3.2005E-01	3.2005E-01	2.338E+02%	1.72E+00
Co-56	#A	8.0093E-01	8.0093E-01	3.573E+01%	9.64E-01
CO-57	#A	-7.3431E-02	-7.3431E-02	2.236E+02%	5.65E-01
CO-58	#A	-3.6002E-01	-3.6003E-01	1.039E+02%	1.27E+00
CO-60	#A	3.6041E-01	3.6041E-01	9.128E+01%	7.46E-01
ZN-65	#A	1.9420E-01	1.9420E-01	5.199E+02%	3.54E+00
NB-94	#A	3.5040E-01	3.5040E-01	9.811E+01%	1.16E+00
ZR-95	#A	4.8926E-01	4.8927E-01	9.590E+01%	1.09E+00
NB-95	#A	-5.8492E-01	-5.8493E-01	6.875E+01%	1.33E+00
RU-103	#A	-1.4580E-01	-1.4580E-01	2.152E+02%	7.76E-01
RH-106	#A	1.2700E+00	1.2700E+00	1.661E+02%	1.90E+01
AG-108M	#A	9.7276E-02	9.7276E-02	2.016E+02%	6.59E-01

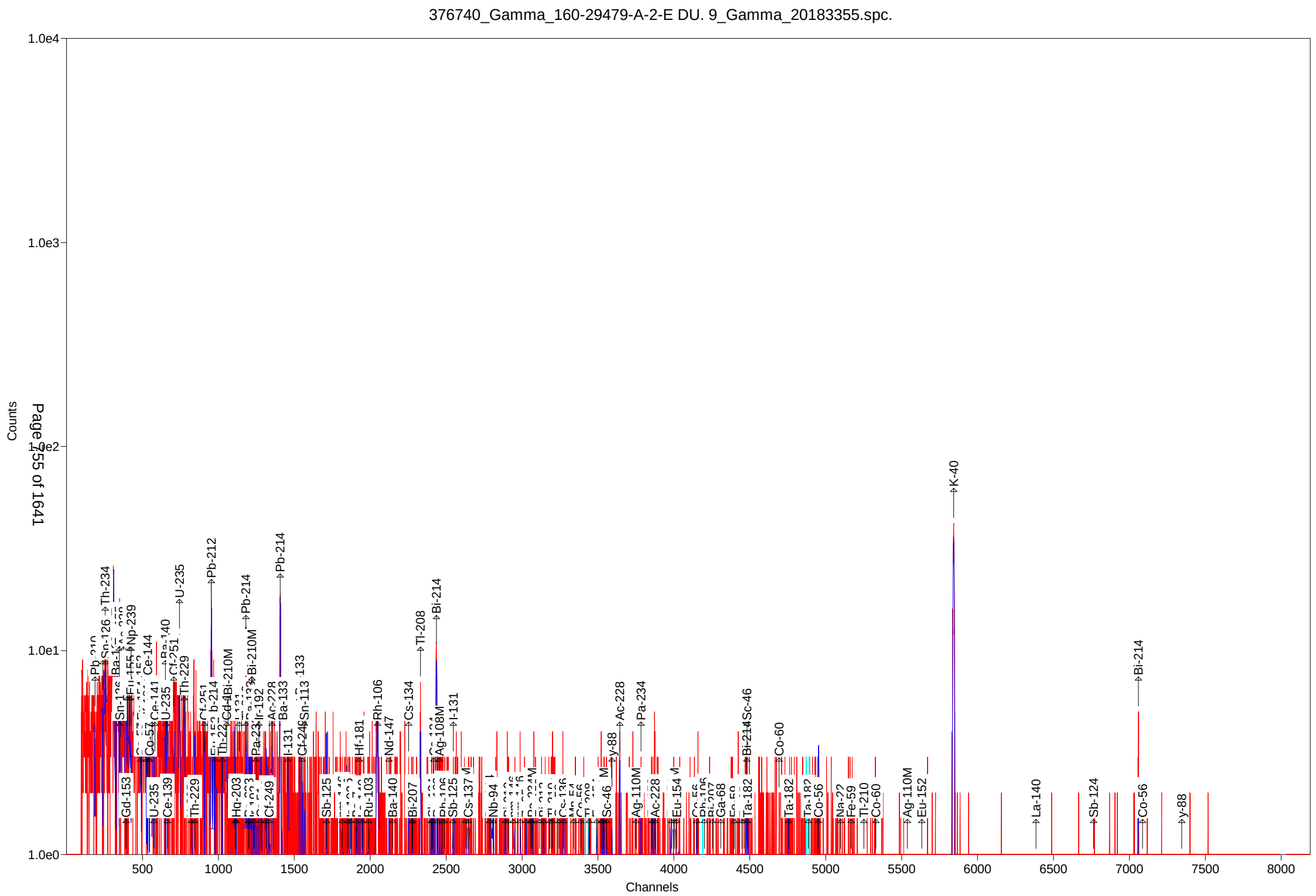
AG-110M#A	4.1369E-01	4.1369E-01	8.374E+01%	1.27E+00
SN-113 #A	1.5391E-01	1.5391E-01	2.652E+02%	1.41E+00
SB-124 #A	4.5979E-01	4.5979E-01	1.094E+02%	1.66E+00
SB-125 #	1.4982E+00	1.4982E+00	3.575E+01%	1.24E+00
I-131 #A	2.5866E-01	2.5868E-01	9.591E+01%	6.27E-01
Gd-153 #A	3.2235E-01	3.2235E-01	1.198E+02%	3.75E+00
Ga-68 #A	3.6679E+00	3.7093E+00	3.248E+02%	2.85E+01
Tc-99m #A	-2.8127E-01	-2.8186E-01	1.565E+02%	1.47E+00
BA-133 #A	-2.3036E-02	-2.3036E-02	1.212E+02%	2.00E+00
CS-134 #A	4.5935E-01	4.5935E-01	5.998E+01%	1.73E+00
CS-137 #A	-1.2863E-02	-1.2863E-02	3.201E+03%	1.31E+00
CE-139 #A	2.3384E-01	2.3384E-01	1.074E+02%	8.45E-01
Ba-140 #A	2.2730E-01	2.2731E-01	1.276E+02%	2.63E+00
La-140 #A	1.5207E-02	1.5208E-02	1.468E+02%	1.22E+00
CE-141 #A	4.1869E-01	4.1870E-01	1.672E+02%	2.35E+00
CE-144 #A	-2.1461E+00	-2.1461E+00	1.486E+02%	1.07E+01
PM-144 #A	-4.7101E-01	-4.7101E-01	7.839E+01%	1.30E+00
EU-152 #A	8.8503E-01	8.8503E-01	7.204E+01%	4.66E+00
EU-154 #A	2.6082E+00	2.6082E+00	6.884E+01%	5.96E+00
EU-155 #A	-1.6427E-02	-1.6427E-02	5.613E+03%	3.32E+00
HF-181 #A	-4.8596E-01	-4.8597E-01	1.035E+02%	1.69E+00
Ta-182 #A	2.0436E+00	2.0436E+00	6.915E+01%	4.71E+00
Hg-203 #A	-3.4358E-01	-3.4359E-01	8.549E+01%	9.83E-01
TL-208	1.0592E+00	1.0592E+00	4.641E+01%	8.15E-01
pm-146 #A	5.9372E-01	5.9372E-01	1.384E+02%	1.99E+00
y-88 #A	3.0736E-01	3.0736E-01	1.026E+02%	7.54E-01
Cd-113m#A	3.8407E+03	3.8407E+03	8.587E+01%	1.11E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	3.04E+01
Cf-251 #A	-6.2265E-01	-6.2265E-01	1.968E+02%	3.20E+00
Cf-249 #A	2.8791E-01	2.8791E-01	1.224E+02%	1.20E+00
Sn-126 A	1.9193E+00	1.9193E+00	1.603E+02%	1.04E+01
PB-210 #A	-5.5805E+00	-5.5805E+00	1.572E+02%	2.97E+01
PB-212	2.5869E+00	2.5869E+00	1.554E+01%	9.82E-01
PB-214	5.6487E+00	5.6487E+00	1.179E+01%	1.06E+00
BI-207 #A	-7.8203E-02	-7.8203E-02	2.680E+02%	7.79E-01
BI-212 #A	2.4304E+00	2.4304E+00	1.076E+02%	9.11E+00
U-235 #A	-2.2227E+00	-2.2227E+00	8.500E+01%	1.20E+01
BI-214	3.6122E+00	3.6122E+00	1.843E+01%	1.50E+00
BI-210M#A	-1.5149E-02	-1.5149E-02	2.685E+03%	1.43E+00
AC-228 #	2.5557E+00	2.5557E+00	4.319E+01%	2.36E+00
TH-227 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.45E+01
TH-229 #A	4.5231E+00	4.5231E+00	8.602E+01%	1.18E+01
TH-234 #A	6.5528E+00	6.5528E+00	1.090E+02%	2.40E+01
PA-231 #A	7.3896E+00	7.3896E+00	1.791E+02%	4.47E+01
PA-233 #A	-1.2710E-01	-1.2710E-01	1.113E+02%	4.13E+00
PA-234 A	8.5298E-01	8.5298E-01	8.431E+01%	6.26E+00
PA-234M#A	-8.5078E+01	-8.5078E+01	4.539E+01%	2.38E+02
AM-241 #A	-9.1567E-01	-9.1567E-01	1.087E+02%	3.33E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%	9.60E+00

Ir-192 #A	1.7472E-02	1.7472E-02	1.031E+02%	1.68E+00
Cs-136 #A	4.1988E-01	4.1990E-01	9.077E+01%	1.29E+00
Np-239 #A	-3.9849E-01	-3.9858E-01	2.296E+02%	3.11E+00
Nd-147 #A	1.7373E+00	1.7374E+00	9.152E+01%	3.91E+00
TL-210 #A	2.3205E-01	2.3205E-01	9.807E+01%	7.44E-01

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.3 keV) 1.931E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 1.9311758E+02 Bq/Sample


376740_Gamma_160-29479-A-2-E DU. 9_Gamma_20183355.spc.
Counts
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
Channels
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Th-234
Sn-126
Np-239
Ce-144
Ce-141
U-235
Ra-140
U-235
Cf-251
Th-229
Pb-212
Th-227
Cd-109
Bi-210M
Pa-233
Ir-192
Pb-214
Ac-228
Ba-133
I-131
Cf-249
Sn-113
Pb-214
Hf-181
Rh-106
Ru-103
Nd-147
Ba-140
Cs-134
Tl-208
Bi-214
Bi-207
Ag-108M
Pb-106
Sb-125
I-131
Cs-137
Nb-94
Sc-46
y-88
Ac-228
Ag-110M
Pa-234
Ac-228
Eu-154
Co-56
Pb-106
Bi-207
Ga-68
Ta-182
Bi-214
Sc-46
Co-60
Ta-182
Ta-182
Co-56
Na-22
Fe-59
Tl-210
Co-60
Ag-110M
Eu-152
K-40
La-140
Sb-124
Bi-214
Co-56
y-88

Test America St. Louis Spectrum ID: 7_Gamma_20182924

Sample Description: 376740_Gamma_160-29521-B-1-C
Detector: Detector # 7
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29521-B-1-C

Decay to Time: 8/9/2018 06:38 Live Time: 1800 sec
Acquisition Time: 8/9/2018 06:38:37 Real Time: 1825 sec
Analysis Time: 8/9/2018 07:09 Dead Time: 1.39 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 7_Soil_TunaCan.Clb
Efficiency Cal Desc: 7_TunaCan_90099_032712
Efficiency Cal Date: 3/16/2012 11:45
Energy Cal Date: 2/23/2012 08:40
Library: Client_Long_Rev14.lib
Bkgd Correction File: 7_2018-07-14_1851.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	2.051E+00	109.0	2.235E+00	2.237E+00	7.671E+00
NA-22	3.133E-01	112.0	3.510E-01	3.513E-01	1.235E+00
K-40	1.463E+02	7.6	1.111E+01	1.339E+01	1.166E+01
Sc-46	-3.947E-01	109.0	4.302E-01	4.306E-01	1.474E+00
CR-51	1.558E+00	229.1	3.568E+00	3.569E+00	1.215E+01
MN-54	-1.068E-01	285.4	3.049E-01	3.049E-01	7.760E-01
FE-59	1.419E+00	47.0	6.665E-01	6.703E-01	1.398E+00
Co-56	3.085E-02	147.3	4.544E-02	4.547E-02	1.064E+00
CO-57	1.097E-01	132.1	1.449E-01	1.450E-01	5.998E-01
CO-58	2.477E-01	90.3	2.236E-01	2.239E-01	7.712E-01
CO-60	2.128E-01	196.8	4.188E-01	4.189E-01	1.295E+00
ZN-65	3.432E-02	2857.8	9.807E-01	9.807E-01	3.543E+00
NB-94	-4.199E-02	770.0	3.233E-01	3.233E-01	9.243E-01
ZR-95	1.110E-01	226.5	2.515E-01	2.516E-01	1.551E+00
NB-95	0.000E+00	1.#INF	1.589E-01	1.589E-01	5.427E-01
RU-103	5.308E-02	515.8	2.738E-01	2.738E-01	7.042E-01
RH-106	3.032E+00	85.9	2.605E+00	2.610E+00	8.836E+00
AG-108M	1.270E-01	91.3	1.160E-01	1.162E-01	7.864E-01
AG-110M	4.016E-01	37.8	1.518E-01	1.532E-01	1.624E+00
SN-113	3.405E-01	121.3	4.131E-01	4.135E-01	1.410E+00
SB-124	-2.467E-01	101.2	2.496E-01	2.499E-01	2.268E+00
SB-125	1.722E+00	22.3	3.843E-01	3.943E-01	2.045E+00
I-131	-1.100E-01	295.7	3.254E-01	3.254E-01	7.419E-01
Gd-153	-2.781E-01	186.1	5.175E-01	5.178E-01	1.422E+00
Ga-68	1.703E+01	95.6	1.628E+01	1.631E+01	3.664E+01
Tc-99m	1.358E-01	122.4	1.662E-01	1.664E-01	5.638E-01
BA-133	1.900E-02	137.1	2.604E-02	2.606E-02	1.811E+00
CS-134	-3.585E-02	83.4	2.990E-02	2.995E-02	2.208E+00
CS-137	-7.281E-02	460.9	3.356E-01	3.356E-01	1.208E+00
CE-139	1.076E-01	183.8	1.977E-01	1.980E-01	6.772E-01
Ba-140	4.312E-01	110.2	4.751E-01	4.756E-01	2.812E+00
La-140	1.608E-01	108.2	1.740E-01	1.742E-01	1.221E+00
CE-141	-3.461E-01	155.9	5.394E-01	5.397E-01	1.814E+00

CE-144	-7.539E-01	248.0	1.870E+00	1.870E+00	6.349E+00
PM-144	2.333E-02	396.6	9.252E-02	9.253E-02	1.001E+00
EU-152	1.902E+00	75.2	1.431E+00	1.434E+00	3.413E+00
EU-154	2.107E+00	66.1	1.392E+00	1.396E+00	8.516E+00
EU-155	3.125E-01	139.9	4.372E-01	4.375E-01	3.169E+00
HF-181	2.711E-01	119.9	3.250E-01	3.253E-01	1.117E+00
Ta-182	-1.141E+00	121.9	1.390E+00	1.391E+00	4.807E+00
Hg-203	1.370E-01	180.7	2.475E-01	2.476E-01	8.542E-01
TL-208	1.465E+00	21.3	3.125E-01	3.217E-01	6.198E-01
pm-146	6.499E-01	96.3	6.258E-01	6.267E-01	1.558E+00
y-88	2.545E-01	40.8	1.039E-01	1.047E-01	1.368E+00
Cd-113m	-4.020E+03	79.5	3.194E+03	3.204E+03	1.068E+04
Cd-109	7.254E-01	960.3	6.966E+00	6.967E+00	2.365E+01
Cf-251	-8.934E-01	126.4	1.130E+00	1.132E+00	2.934E+00
Cf-249	0.000E+00	1.#INF	1.582E-01	1.582E-01	1.462E+00
Sn-126	2.170E+00	101.2	2.196E+00	2.199E+00	7.385E+00
PB-210	1.255E+00	682.9	8.572E+00	8.573E+00	2.944E+01
PB-212	2.737E+00	24.0	6.557E-01	6.792E-01	1.426E+00
PB-214	2.669E+00	25.7	6.852E-01	6.991E-01	2.003E+00
BI-207	2.248E-01	77.7	1.747E-01	1.751E-01	5.905E-01
BI-212	-5.647E+00	102.5	5.788E+00	5.795E+00	1.964E+01
U-235	1.706E+00	109.0	1.860E+00	1.862E+00	7.530E+00
BI-214	4.334E+00	15.2	6.608E-01	6.981E-01	9.320E-01
BI-210M	3.974E-01	102.0	4.053E-01	4.060E-01	1.371E+00
AC-228	1.775E+00	67.3	1.196E+00	1.199E+00	4.516E+00
TH-227	-5.564E-01	791.9	4.406E+00	4.406E+00	1.513E+01
TH-229	4.028E-01	106.3	4.283E-01	4.295E-01	1.193E+01
TH-234	-4.864E+00	119.7	5.825E+00	5.830E+00	2.058E+01
PA-231	7.163E+00	135.6	9.712E+00	9.720E+00	4.445E+01
PA-233	4.512E-01	192.0	8.662E-01	8.665E-01	3.864E+00
PA-234	3.989E-01	81.4	3.247E-01	3.253E-01	3.808E+00
PA-234M	-1.029E+02	49.3	5.069E+01	5.095E+01	2.806E+02
AM-241	5.665E-01	113.2	6.412E-01	6.419E-01	1.743E+00
Np-237	1.368E+00	135.6	1.856E+00	1.857E+00	6.235E+00
Ir-192	3.774E-02	492.2	1.858E-01	1.858E-01	1.618E+00
Cs-136	-9.805E-02	80.9	7.935E-02	7.955E-02	1.284E+00
Np-239	5.435E-01	144.9	7.877E-01	7.884E-01	2.663E+00
Nd-147	3.067E+00	27.7	8.507E-01	8.687E-01	1.739E+00
TL-210	2.975E-01	97.5	2.900E-01	2.905E-01	1.153E+00
Total	2.154E+02				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 7_Gamma_20182924.An1

Sample description
376740_Gamma_160-29521-B-1-C

Spectrum Filename: C:\User\SPC\Det7\7_Gamma_20182924.An1

Acquisition information
Start time: 8/9/2018 6:38:37 AM
Live time: 1800
Real time: 1825
Dead time: 1.39 %
Detector ID: 7

Detector system
Ge 7 SN/154

Calibration
Filename: 7_Soil_TunaCan.Clb
7_TunaCan_90099_032712

Energy Calibration
Created: 2/23/2012 8:40:56 AM
Zero offset: 0.117 keV
Gain: 0.250 keV/channel
Quadratic: 3.508E-09 keV/channel^2

Efficiency Calibration
Created: 3/16/2012 11:45:14 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.716580E-01 + (-6.166540E-01*Log(E)) + (-2.065917E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.48 %
Log(Eff): -2.689695E+01 + (1.019544E+01*Log(E)) + (-1.081671E+00*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev14.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.61keV)
Stop channel: 8000 (2000.13keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 6:38:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	7_2018-07-14_1851.PBC 7/14/2018 6:51:14 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.1190

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.54	2.	682.89	0.84	2.483E-02	46.54	4.250	PBC<MDA	PB210
59.23	14.	113.19	0.85	3.701E-02	59.54	35.900	PBC<MDA	AM241
63.29	-13.	119.75	0.85	4.005E-02	63.29	3.810	PBC<MDA	TH234
64.28	15.	101.22	0.86	4.080E-02	64.28	9.700	PBC<MDA	Sn126
86.49	17.	135.65	0.88	5.279E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	5.836E-01	EU155
86.54	17.	139.91	0.88	5.281E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	5.836E-01	EU155
					86.94	9.040	1.977E+00	Sn126
86.94	17.	139.95	0.88	5.294E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	2.009E+00	Sn126
87.57	17.	143.88	0.88	5.314E-02	87.57	37.500	PBC<MDA	Sn126
88.04	3.	960.35	0.88	5.329E-02	88.04	3.790	PBC<MDA	Cd109
92.59	-24.	72.16	0.89	5.452E-02	92.59	5.584	PBC<MDA	TH234
104.24	13.	156.40	0.90	5.626E-02	103.70	24.000	PBC<MDA	Np239
106.67	13.	144.94	0.90	5.643E-02	106.13	22.700	PBC<MDA	Np239
136.47	14.	132.09	0.93	5.410E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.360E+00	CO57
140.51	11.	122.44	0.94	5.336E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	14.	171.69	0.94	5.271E-02	143.79	10.960	PBC<MDA	U235
162.66	13.	110.17	0.96	4.843E-02	162.66	6.220	PBC<MDA	Ba140
165.85	8.	183.81	0.96	4.881E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.72	32.	45.91	0.99	4.443E-02	185.72	54.000	PBC<MDA	U235
205.33	10.	134.47	1.01	4.086E-02	205.33	5.010	PBC<MDA	U235
210.85	11.	106.33	1.01	3.997E-02	210.85	2.990	PBC<MDA	TH229
238.75	77.	23.96	0.69	3.600E-02	238.63	43.300	2.737E+00	PB212
242.00	13.	151.55	1.04	3.560E-02	242.00	7.430	PBC<MDA	PB214
244.69	11.	169.71	1.05	3.526E-02	244.69	7.580	PBC<MDA	EU152
264.31	12.	101.99	1.07	3.288E-02	265.83	50.000	PBC<MDA	BI210M
279.20	6.	180.72	1.08	3.154E-02	279.20	81.460	PBC<MDA	Hg203
295.09	10.	173.63	1.10	3.009E-02	295.09	19.300	PBC<MDA	PB214
296.00	10.	179.07	1.10	3.001E-02	296.00	79.000	PBC<MDA	TL210
300.07	10.	186.79	1.10	2.966E-02				
300.18	10.	191.98	1.10	2.965E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	7.737E+00	PA231
					300.18	6.200	3.071E+00	PA233
300.73	10.	183.26	1.10	2.966E-02	300.18	6.200	PBC<MDA	PA233
302.65	10.	196.59	1.11	2.945E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.049E+00	BA133
302.85	10.	201.48	1.11	2.943E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.049E+00	BA133
304.85	4.	493.03	1.11	2.926E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	2.871E-01	BI210M
320.08	8.	229.06	1.13	2.807E-02	320.08	9.940	PBC<MDA	CR51
338.32	9.	120.64	1.14	2.677E-02	338.32	12.010	PBC<MDA	AC228
340.57	10.	120.91	1.15	2.662E-02	340.57	46.900	PBC<MDA	Cs136
344.29	10.	128.70	1.15	2.637E-02	344.29	26.500	PBC<MDA	EU152
351.93	47.	25.68	1.16	2.588E-02	351.93	37.600	2.669E+00	PB214
391.69	9.	121.32	1.20	2.360E-02	391.69	64.000	PBC<MDA	SN113
427.88	7.	123.66	1.23	2.186E-02	427.88	29.600	PBC<MDA	SB125
463.37	21.	22.32	1.27	2.040E-02	463.37	10.470	5.493E+00	SB125
468.06	2.	492.24	1.27	2.022E-02	468.06	51.750	PBC<MDA	Ir192
477.60	8.	108.96	1.28	1.987E-02	477.60	10.520	PBC<MDA	BE7
482.00	8.	119.88	1.29	1.971E-02	482.00	80.500	PBC<MDA	HF181
487.02	6.	139.69	1.29	1.954E-02	487.02	45.500	PBC<MDA	La140
497.05	2.	515.75	1.30	1.919E-02	497.05	90.900	PBC<MDA	RU103
511.86	52.	28.70	2.56	1.870E-02	511.86	20.000	7.772E+00	RH106
531.00	13.	27.74	1.33	1.811E-02	531.00	13.000	3.067E+00	Nd147
569.32	1.	640.31	1.37	1.704E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.977E-01	PA234
					569.70	97.740	3.338E-02	BI207
569.70	7.	77.72	1.37	1.703E-02	569.32	15.380	1.428E+00	CS134
					569.47	8.200	2.679E+00	PA234
					569.70	97.740	2.248E-01	BI207
583.02	37.	21.33	1.38	1.669E-02	583.02	84.500	1.465E+00	TL208
609.29	60.	15.25	1.77	1.605E-02	609.31	46.090	4.481E+00	BI214
618.06	2.	396.58	1.42	1.585E-02	618.06	99.100	PBC<MDA	PM144
621.92	9.	85.92	1.42	1.576E-02	621.92	9.930	PBC<MDA	RH106
635.89	3.	136.38	1.43	1.546E-02	635.89	11.310	PBC<MDA	SB125
657.76	1.	512.35	1.45	1.500E-02	657.76	94.640	PBC<MDA	AG110M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
722.79	4.	136.52	1.51	1.380E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.901E-01	AG108M
					723.36	20.220	8.546E-01	EU154
722.94	7.	91.30	1.51	1.380E-02	722.79	10.810	2.767E+00	SB124
					722.94	90.840	3.293E-01	AG108M
					723.36	20.220	1.480E+00	EU154
723.36	7.	104.99	1.51	1.379E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.294E-01	AG108M
					723.36	20.220	1.481E+00	EU154
724.20	4.	226.52	1.51	1.378E-02	724.20	44.150	PBC<MDA	ZR95
747.16	5.	96.29	1.53	1.340E-02	747.16	34.000	PBC<MDA	pm146
763.94	5.	112.03	1.55	1.314E-02	763.94	22.280	PBC<MDA	AG110M
766.41	1.	591.61	1.55	1.310E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.443E+01	PA234M
778.92	2.	396.48	1.56	1.291E-02	778.92	12.940	PBC<MDA	EU152
785.42	7.	104.64	1.57	1.281E-02	785.42	1.280	PBC<MDA	BI212
795.87	8.	83.39	1.58	1.266E-02	795.87	85.530	PBC<MDA	CS134
799.60	8.	97.46	1.58	1.261E-02	799.60	98.960	PBC<MDA	TL210
810.78	6.	90.25	1.59	1.246E-02	810.78	99.460	PBC<MDA	CO58
815.77	6.	108.20	1.59	1.239E-02	815.77	23.280	PBC<MDA	La140
873.23	8.	80.30	1.64	1.166E-02	873.23	12.270	PBC<MDA	EU154
880.53	6.	89.61	1.65	1.157E-02	880.53	6.000	PBC<MDA	PA234
883.24	6.	107.19	1.65	1.154E-02	883.24	9.600	PBC<MDA	PA234
884.68	2.	308.86	1.65	1.152E-02	884.68	72.680	PBC<MDA	AG110M
911.07	9.	127.05	1.68	1.122E-02	911.07	29.000	PBC<MDA	AC228
964.11	8.	75.24	1.72	1.066E-02	964.11	14.605	PBC<MDA	EU152
968.97	8.	100.59	1.72	1.062E-02	968.97	17.460	PBC<MDA	AC228
1037.84	4.	190.28	1.78	9.978E-03	1037.84	14.130	PBC<MDA	Co56
1077.40	8.	95.58	1.81	9.646E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	14.	46.98	1.83	9.472E-03	1099.25	56.500	1.419E+00	FE59
1112.07	9.	85.94	1.84	9.373E-03	1112.07	13.644	PBC<MDA	EU152
1119.28	9.	82.72	1.85	9.311E-03	1120.29	15.100	PBC<MDA	BI214
1120.55	2.	357.50	1.85	9.309E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	3.938E-01	Ta182
1173.24	3.	316.64	1.89	8.929E-03	1173.24	99.900	PBC<MDA	CO60
1276.43	5.	112.03	1.96	8.280E-03	1274.53	99.940	PBC<MDA	NA22
1313.00	2.	248.05	1.99	8.059E-03	1313.00	21.000	PBC<MDA	TL210
1332.50	3.	233.72	2.01	7.951E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	7.	37.80	2.04	7.678E-03	1384.30	24.290	PBC<MDA	AG110M
1461.29	205.	7.59	2.14	7.309E-03	1460.83	10.670	1.463E+02	K40
1765.15	8.	36.37	2.29	6.141E-03	1764.49	15.400	4.627E+00	BI214
1836.06	6.	40.82	2.33	5.919E-03	1836.06	99.200	PBC<MDA	y88

No unknown peaks passed sensitivity test.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.71	46.54	130.	2.	0.001	682.89	0.836s
TH-227	200.12	50.14	161.	-2.	-0.001	791.91	0.840s
AM-241	237.70	59.54	70.	14.	0.008	113.19	0.850s
TH-234	252.71	63.29	133.	-13.	-0.007	119.75	0.854s
Sn-126	256.68	64.28	115.	15.	0.009	101.22	0.856s
BA-133	323.52	80.99	120.	-16.	-0.009	124.37	0.874s
Np-237	345.53	86.49	258.	17.	0.009	135.65	0.880s
EU-155	345.74	86.54	275.	17.	0.009	139.91	0.880
Sn-126	347.33	86.94	285.	17.	0.010	139.95	0.880s
Sn-126	349.85	87.57	302.	17.	0.010	143.88	0.881s
Cd-109	351.73	88.04	319.	3.	0.001	960.35	0.881
Nd-147	363.97	91.10	322.	0.	0.000	1000.00	0.885s
TH-234	369.93	92.59	346.	-24.	-0.014	72.16	0.886s
AC-228	372.97	93.35	322.	0.	0.000	1000.00	0.887s
Gd-153	389.57	97.50	73.	-8.	-0.005	186.12	0.892s
Np-239	397.57	99.50	205.	-11.	-0.006	179.31	0.894
Gd-153	412.38	103.20	185.	-7.	-0.004	265.12	0.898s
Np-239	414.38	103.70	206.	13.	0.007	156.40	0.898s
Np-239	424.10	106.13	159.	13.	0.007	144.94	0.901
EU-152	486.69	121.78	110.	-11.	-0.006	138.17	0.918s
CO-57	487.83	122.06	111.	-4.	-0.002	375.83	0.918s
EU-154	491.98	123.10	115.	0.	0.000	1000.00	0.919s
PA-234	524.77	131.29	195.	-16.	-0.009	122.54	0.928s
HF-181	531.68	133.02	187.	-16.	-0.009	122.28	0.930s
CE-144	533.74	133.54	203.	-8.	-0.005	248.02	0.930
HF-181	544.79	136.30	212.	0.	0.000	1000.00	0.933s
CO-57	545.48	136.47	168.	14.	0.008	132.09	0.933s
Tc-99m	561.63	140.51	90.	11.	0.006	122.44	0.938s
U-235	574.73	143.79	263.	14.	0.008	171.69	0.941
CE-141	581.35	145.44	292.	-16.	-0.009	155.86	0.943s
Ba-140	650.24	162.66	89.	13.	0.007	110.17	0.961s
U-235	653.11	163.38	130.	-18.	-0.010	131.49	0.962s
CE-139	663.01	165.85	93.	8.	0.004	183.81	0.965s
Cf-251	706.00	176.60	70.	-13.	-0.007	126.44	0.976s
U-235	742.49	185.72	51.	32.	0.018	45.91	0.986
TH-229	773.64	193.51	66.	-9.	-0.005	257.47	0.994s
U-235	820.94	205.33	44.	10.	0.005	134.47	1.007s
TH-229	843.01	210.85	33.	11.	0.006	106.33	1.012s
Cf-251	907.62	227.00	55.	-13.	-0.007	110.27	1.029s
PB-212	954.64	238.75	64.	77.	0.043	23.96	0.693s
PB-214	967.61	242.00	190.	13.	0.007	151.55	1.045s
EU-152	978.39	244.69	176.	11.	0.006	169.71	1.048s
TH-227	1024.59	256.24	48.	-4.	-0.002	356.12	1.060s
Cd-113m	1054.43	263.70	58.	-14.	-0.008	79.45	1.067s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1062.96	265.83	66.	12.	0.007	101.99	1.070s
TL-208	1108.77	277.28	52.	-5.	-0.003	385.35	1.081s
Hg-203	1116.44	279.20	62.	6.	0.004	180.72	1.083s
PB-214	1180.00	295.09	149.	10.	0.006	173.63	1.100s
TL-210	1183.64	296.00	159.	10.	0.006	179.07	1.101
PB-212	1199.76	300.03	165.	10.	0.006	183.26	1.105
PA-231	1199.92	300.07	175.	10.	0.006	186.79	1.105
PA-233	1200.36	300.18	185.	10.	0.006	191.98	1.105
PA-231	1210.24	302.65	195.	10.	0.006	196.59	1.107s
BA-133	1211.05	302.85	206.	10.	0.006	201.48	1.108s
Ba-140	1219.04	304.85	216.	4.	0.002	493.03	1.110
BI-210M	1219.23	304.90	220.	0.	0.000	1000.00	1.110
Ir-192	1233.41	308.44	220.	0.	0.000	1000.00	1.113s
PA-233	1247.69	312.01	220.	0.	0.000	1000.00	1.117s
Ir-192	1265.61	316.49	220.	0.	0.000	1000.00	1.122s
CR-51	1279.99	320.08	157.	8.	0.004	229.06	1.125s
La-140	1314.69	328.76	95.	-14.	-0.008	100.69	1.134s
Cf-249	1333.41	333.44	110.	-15.	-0.008	103.41	1.139s
AC-228	1352.93	338.32	56.	9.	0.005	120.64	1.144s
Cs-136	1361.93	340.57	65.	10.	0.005	120.91	1.146s
EU-152	1376.80	344.29	74.	10.	0.005	128.70	1.150s
HF-181	1382.97	345.83	84.	-2.	-0.001	685.37	1.151s
PB-214	1407.39	351.93	48.	47.	0.026	25.68	1.157s
BA-133	1423.66	356.00	111.	-8.	-0.005	185.90	1.162s
I-131	1457.59	364.48	28.	-4.	-0.002	295.70	1.170s
BA-133	1535.03	383.84	65.	-3.	-0.002	347.27	1.189s
Cf-249	1551.47	387.95	69.	0.	0.000	1000.00	1.193s
SN-113	1566.43	391.69	58.	9.	0.005	121.32	1.197s
SB-125	1711.18	427.88	21.	7.	0.004	123.66	1.233
AG-108M	1735.43	433.94	29.	-3.	-0.001	348.29	1.239
pm-146	1815.20	453.88	32.	-9.	-0.005	127.50	1.258
SB-125	1853.15	463.37	0.	21.	0.012	22.32	1.268s
Ir-192	1871.93	468.06	43.	2.	0.001	492.24	1.272s
BE-7	1910.07	477.60	32.	8.	0.004	108.96	1.282s
HF-181	1927.68	482.00	39.	8.	0.004	119.88	1.286s
La-140	1947.77	487.02	36.	6.	0.004	139.69	1.291
RU-103	1987.91	497.05	17.	2.	0.001	515.75	1.301s
RH-106	2047.15	511.86	27.	52.	0.029	28.70	2.565s
Nd-147	2123.70	531.00	0.	13.	0.007	27.74	1.333s
Ba-140	2148.74	537.26	17.	-2.	-0.001	200.58	1.339s
CS-134	2252.65	563.24	30.	-10.	-0.006	113.16	1.364s
CS-134	2276.99	569.32	20.	1.	0.001	640.31	1.369s
PA-234	2277.59	569.47	21.	0.	0.000	1000.00	1.370s
BI-207	2278.51	569.70	10.	7.	0.004	77.72	1.370s
TL-208	2331.79	583.02	8.	37.	0.021	21.33	1.382s
SB-125	2401.71	600.50	192.	-13.	-0.007	154.63	1.399s
SB-124	2410.64	602.73	179.	-13.	-0.007	149.30	1.401s
CS-134	2418.55	604.71	166.	-13.	-0.007	143.82	1.403s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2436.86	609.29	4.	60.	0.033	15.25	1.774s
RU-103	2440.91	610.30	153.	-12.	-0.007	150.47	1.408s
PM-144	2471.96	618.06	36.	2.	0.001	396.58	1.415s
RH-106	2487.38	621.92	23.	9.	0.005	85.92	1.419
SB-125	2543.28	635.89	9.	3.	0.002	136.38	1.432s
I-131	2547.62	636.97	29.	-11.	-0.006	74.83	1.433s
AG-110M	2630.77	657.76	23.	1.	0.001	512.35	1.452s
CS-137	2646.36	661.66	29.	-2.	-0.001	460.87	1.455s
NB-94	2810.25	702.63	19.	-1.	-0.001	770.02	1.493s
SB-124	2890.87	722.79	15.	4.	0.002	136.52	1.511s
AG-108M	2891.48	722.94	19.	7.	0.004	91.30	1.511s
EU-154	2893.15	723.36	27.	7.	0.004	104.99	1.511s
ZR-95	2896.52	724.20	34.	4.	0.002	226.52	1.512s
BI-212	2908.41	727.17	53.	-11.	-0.006	102.49	1.515
pm-146	2942.61	735.72	19.	-11.	-0.006	78.13	1.523s
pm-146	2988.37	747.16	5.	5.	0.003	96.29	1.533s
ZR-95	3026.65	756.73	14.	-1.	-0.001	800.00	1.541s
AG-110M	3055.51	763.94	11.	5.	0.003	112.03	1.548s
NB-95	3062.89	765.79	5.	0.	0.000	1000.00	1.549s
PA-234M	3065.38	766.41	17.	1.	0.001	591.61	1.550s
EU-152	3115.41	778.92	9.	2.	0.001	396.48	1.561s
BI-212	3141.41	785.42	9.	7.	0.004	104.64	1.567s
CS-134	3183.20	795.87	17.	8.	0.004	83.39	1.576
TL-210	3198.14	799.60	25.	8.	0.004	97.46	1.579s
CS-134	3207.54	801.95	42.	-6.	-0.003	157.83	1.581s
CO-58	3242.84	810.78	10.	6.	0.003	90.25	1.589s
La-140	3262.82	815.77	15.	6.	0.003	108.20	1.593s
Cs-136	3273.74	818.50	31.	-8.	-0.004	107.60	1.596s
MN-54	3339.13	834.85	9.	-2.	-0.001	285.36	1.610s
Co-56	3386.82	846.77	19.	-4.	-0.002	224.89	1.620s
NB-94	3484.13	871.10	24.	-4.	-0.002	180.28	1.641s
EU-154	3492.66	873.23	17.	8.	0.004	80.30	1.643
PA-234	3521.86	880.53	10.	6.	0.003	89.61	1.649s
PA-234	3532.70	883.24	16.	6.	0.003	107.19	1.652s
AG-110M	3538.47	884.68	22.	2.	0.001	308.86	1.653s
Sc-46	3556.86	889.28	35.	-8.	-0.005	108.99	1.657s
y-88	3591.90	898.04	25.	-1.	-0.001	588.44	1.664s
AC-228	3644.02	911.07	26.	9.	0.005	127.05	1.675s
AG-110M	3749.71	937.49	15.	-2.	-0.001	431.57	1.697s
PA-234	3783.82	946.02	25.	-10.	-0.006	114.38	1.704s
EU-152	3856.18	964.11	16.	8.	0.005	75.24	1.719s
AC-228	3875.62	968.97	26.	8.	0.004	100.59	1.724s
EU-154	3985.06	996.33	61.	-15.	-0.008	78.68	1.746s
PA-234M	4003.73	1001.00	77.	-16.	-0.009	49.27	1.750s
EU-154	4018.84	1004.77	104.	-11.	-0.006	136.05	1.753s
Co-56	4151.10	1037.84	10.	4.	0.002	190.28	1.780s
Cs-136	4192.02	1048.07	13.	-2.	-0.001	264.58	1.788s
RH-106	4201.18	1050.36	16.	-1.	0.000	848.53	1.790s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	4254.38	1063.66	21.	-8.	-0.005	86.65	1.801s
Ga-68	4309.34	1077.40	11.	8.	0.005	95.58	1.812s
FE-59	4396.74	1099.25	5.	14.	0.008	46.98	1.829s
EU-152	4448.04	1112.07	26.	9.	0.005	85.94	1.839s
BI-214	4480.88	1120.29	24.	9.	0.005	82.72	1.845s
Sc-46	4481.94	1120.55	33.	2.	0.001	357.50	1.846s
Ta-182	4484.94	1121.30	30.	-7.	-0.004	121.86	1.846s
CO-60	4692.68	1173.24	16.	3.	0.002	316.64	1.886s
Ta-182	4885.37	1221.41	21.	-3.	-0.002	273.35	1.923s
Co-56	4952.84	1238.28	27.	-7.	-0.004	137.25	1.936s
NA-22	5097.84	1274.53	11.	5.	0.003	112.03	1.963s
EU-154	5097.89	1274.54	16.	0.	0.000	1000.00	1.963s
FE-59	5166.10	1291.60	23.	-11.	-0.006	109.06	1.975s
TL-210	5251.71	1313.00	6.	2.	0.001	248.05	1.991s
CO-60	5329.71	1332.50	12.	3.	0.002	233.72	2.005s
AG-110M	5536.89	1384.30	0.	7.	0.004	37.80	2.042s
K-40	5844.86	1461.29	9.	205.	0.114	7.59	2.141
La-140	6384.49	1596.21	6.	-2.	-0.001	304.14	2.185s
SB-124	6763.55	1690.98	6.	-3.	-0.002	205.48	2.245s
BI-214	7057.56	1764.49	0.	8.	0.004	36.37	2.290s
Co-56	7084.99	1771.35	8.	0.	0.000	1000.00	2.294s
y-88	7343.81	1836.06	0.	6.	0.003	40.82	2.332s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	Peak MDA Value Bq/Sample		COMMENTS
BE-7	C	2.0511E+00				5.31E+01		
			477.60	2.051E+00	?(	7.671E+00	1.09E+02	1.05E+01 G
NA-22	C	3.1329E-01				9.50E+02		
			1274.53	3.133E-01	&(	1.235E+00	1.12E+02	9.99E+01 G
K-40	N	1.4634E+02				4.66E+11		
			1460.83	1.463E+02	(P	1.166E+01	7.59E+00	1.07E+01 G
Sc-46	F	-3.9468E-01				8.38E+01		
			889.28	-3.947E-01	?(	1.474E+00	1.09E+02	1.00E+02 G
			1120.55	1.374E-01	+	1.752E+00	3.57E+02	1.00E+02 G
CR-51	F	1.5578E+00				2.77E+01		
			320.08	1.558E+00	&(	1.215E+01	2.29E+02	9.94E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	C	-1.0685E-01					3.12E+02	
			834.85	-1.068E-01	?(	7.760E-01	2.85E+02	1.00E+02 G
FE-59	F	1.4187E+00					4.45E+01	
			1099.25	1.419E+00	?(	1.398E+00	4.70E+01	5.65E+01 G
			1291.60	-1.677E+00	-	3.914E+00	1.09E+02	4.32E+01 G
Co-56	C	3.0848E-02					7.73E+01	
			846.77	-1.772E-01	?(P	1.064E+00	2.25E+02	9.99E+01 G
			1238.28	-6.699E-01	+ P	2.653E+00	1.37E+02	6.61E+01 G
			1037.84	1.502E+00	?(P	6.929E+00	1.90E+02	1.41E+01 G
			1771.35	0.000E+00	-	9.320E+00	1.00E+03	1.55E+01 A
CO-57	C	1.0971E-01					2.72E+02	
			122.06	-4.631E-02	&(	5.998E-01	3.76E+02	8.56E+01 G
			136.47	1.360E+00	(	6.060E+00	1.32E+02	1.07E+01 G
CO-58	C	2.4772E-01					7.09E+01	
			810.78	2.477E-01	&(	7.712E-01	9.03E+01	9.95E+01 G
CO-60	F	2.1281E-01					1.93E+03	
			1332.50	2.434E-01	?(P	1.295E+00	2.34E+02	1.00E+02 G
			1173.24	1.822E-01	?(P	1.332E+00	3.17E+02	9.99E+01 G
ZN-65	F	3.4318E-02					2.44E+02	
			1115.55	3.432E-02	%(	3.543E+00	2.86E+03	5.06E+01 G
NB-94	I	-4.1991E-02					7.41E+06	
			702.63	-4.199E-02	?(P	9.243E-01	7.70E+02	9.79E+01 G
			871.10	-1.904E-01	+	1.216E+00	1.80E+02	9.99E+01 G
ZR-95	I	1.1105E-01					6.40E+01	
			756.73	-7.701E-02	?(	1.551E+00	8.00E+02	5.45E+01 G
			724.20	3.430E-01	?(P	2.739E+00	2.27E+02	4.42E+01 G
RU-103	I	5.3079E-02					3.93E+01	
			497.05	5.308E-02	?(	7.042E-01	5.16E+02	9.09E+01 G
			610.30	-7.139E+00	+	3.636E+01	1.50E+02	5.75E+00 GA
RH-106	I	3.0319E+00					3.74E+02	
			621.92	3.032E+00	?(	8.836E+00	8.59E+01	9.93E+00 G
			1050.36	-2.405E+00	-	7.633E+01	8.49E+02	1.56E+00 G
			511.86	7.772E+00	?	3.976E+00	2.87E+01	2.00E+01 GA
AG-108M	C	1.2703E-01					1.53E+05	
			433.94	-7.605E-02	?(P	7.864E-01	3.48E+02	9.05E+01 G
			722.94	3.293E-01	?(	1.027E+00	9.13E+01	9.08E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		614.28	3.700E-08 %		2.252E+00	1.76E+09	8.98E+01 G
AG-110M	F 4.0156E-01					2.50E+02	
		884.68	1.454E-01 ?(		1.624E+00	3.09E+02	7.27E+01 G
		657.76	5.217E-02 &(		9.742E-01	5.12E+02	9.46E+01 G
		937.49	-2.957E-01 +		3.069E+00	4.32E+02	3.44E+01 G
		1384.30	2.085E+00 ?(		2.195E+00	3.78E+01	2.43E+01 G
		763.94	8.859E-01 ?(		3.492E+00	1.12E+02	2.23E+01 G
SN-113	F 3.4054E-01					1.15E+02	
		391.69	3.405E-01 &(P		1.410E+00	1.21E+02	6.40E+01 G
SB-124	F -2.4672E-01					6.02E+01	
		602.73	-4.496E-01 ?(		2.268E+00	1.49E+02	9.83E+01 G
		1690.98	-5.460E-01 +		2.571E+00	2.05E+02	4.78E+01 G
		722.79	1.597E+00 ?(		7.731E+00	1.37E+02	1.08E+01 G
SB-125	I 1.7218E+00					1.01E+03	
		427.88	6.411E-01 ?(P		2.045E+00	1.24E+02	2.96E+01 G
		600.50	-2.462E+00 +		1.286E+01	1.55E+02	1.79E+01 G
		635.89	1.059E+00 ?(		5.221E+00	1.36E+02	1.13E+01 G
		463.37	5.493E+00 ?(P		1.917E+00	2.23E+01	1.05E+01 G
I-131	I -1.1003E-01					8.02E+00	
		364.48	-1.100E-01 ?(P		7.419E-01	2.96E+02	8.17E+01 G
		284.30	4.995E-02 & P		9.029E+00	6.62E+03	6.14E+00 G
		636.97	-5.592E+00 +		1.400E+01	7.48E+01	7.17E+00 G
Gd-153	F -2.7807E-01					2.42E+02	
		97.50	-2.781E-01 (		1.422E+00	1.86E+02	3.00E+01 G
		103.20	-3.324E-01 +		2.999E+00	2.65E+02	2.18E+01 G
Ga-68	C 1.7030E+01					4.71E-02	
		1077.40	1.703E+01 ?(		3.664E+01	9.56E+01	3.30E+00 G
Tc-99m	I 1.3576E-01					2.51E-01	
		140.51	1.358E-01 &(		5.638E-01	1.22E+02	8.93E+01 G
BA-133	F 1.8999E-02					3.85E+03	
		356.00	-2.853E-01 &(		1.811E+00	1.86E+02	6.20E+01 G
		302.85	1.049E+00 ?(		7.160E+00	2.01E+02	1.83E+01 G
		383.84	-8.625E-01 +		1.045E+01	3.47E+02	8.94E+00 GA
		80.99	-5.148E-01 +		1.730E+00	1.24E+02	3.41E+01 GA
CS-134	I -3.5849E-02					7.54E+02	
		604.71	-4.545E-01 ?(		2.208E+00	1.44E+02	9.76E+01 G
		795.87	3.974E-01 ?(		1.124E+00	8.34E+01	8.55E+01 G
		569.32	2.120E-01 ?(		4.992E+00	6.40E+02	1.54E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		801.95	-3.055E+00	+	1.673E+01	1.58E+02	8.69E+00 G
		563.24	-3.997E+00	+	1.098E+01	1.13E+02	8.35E+00 G
CS-137	I -7.2813E-02					1.10E+04	
		661.66	-7.281E-02	?(	1.208E+00	4.61E+02	8.52E+01 G
CE-139	F 1.0757E-01					1.38E+02	
		165.85	1.076E-01	?(	6.772E-01	1.84E+02	7.99E+01 G
Ba-140	I 4.3123E-01					1.28E+01	
		537.26	-3.007E-01	&(P	2.812E+00	2.01E+02	2.44E+01 G
		162.66	2.306E+00	?(	8.592E+00	1.10E+02	6.22E+00 G
		304.85	1.874E+00	?(	3.149E+01	4.93E+02	4.29E+00 G
La-140	I 1.6079E-01					1.28E+01	
		1596.21	-1.729E-01	?(	1.221E+00	3.04E+02	9.54E+01 G
		487.02	3.967E-01	?(	1.920E+00	1.40E+02	4.55E+01 G
		328.76	-1.418E+00	&	4.809E+00	1.01E+02	2.03E+01 G
		815.77	1.067E+00	?(	4.021E+00	1.08E+02	2.33E+01 G
CE-141	I -3.4606E-01					3.25E+01	
		145.44	-3.461E-01	?(	1.814E+00	1.56E+02	4.82E+01 G
CE-144	I -7.5390E-01					2.85E+02	
		133.54	-7.539E-01	(	6.349E+00	2.48E+02	1.11E+01 G
PM-144	C 2.3330E-02					3.63E+02	
		696.54	-3.002E-02	%(P	1.001E+00	1.05E+03	9.90E+01 G
		618.06	7.663E-02	&(	1.082E+00	3.97E+02	9.91E+01 G
EU-152	F 1.9015E+00					4.94E+03	
		344.29	7.783E-01	?(	3.413E+00	1.29E+02	2.65E+01 G
		1112.07	3.928E+00	?(	1.143E+01	8.59E+01	1.36E+01 G
		121.78	-3.813E-01	-	1.788E+00	1.38E+02	2.86E+01 G
		778.92	5.543E-01	?(	5.636E+00	3.96E+02	1.29E+01 G
		964.11	3.016E+00	?(	7.616E+00	7.52E+01	1.46E+01 G
		244.69	2.335E+00	?(P	1.341E+01	1.70E+02	7.58E+00 G
		1408.00	1.166E-01	%	4.829E+00	1.68E+03	2.10E+01 GA
EU-154	I 2.1065E+00					3.14E+03	
		873.23	3.138E+00	?(	8.516E+00	8.03E+01	1.23E+01 G
		123.10	0.000E+00	-	1.282E+00	1.00E+03	4.08E+01 G
		1274.54	0.000E+00	-	4.071E+00	1.00E+03	3.52E+01 G
		723.36	1.481E+00	?(	5.339E+00	1.05E+02	2.02E+01 G
		1004.77	-3.271E+00	-	1.511E+01	1.36E+02	1.80E+01 G
		996.33	-7.527E+00	+	1.980E+01	7.87E+01	1.06E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
EU-155	I	3.1248E-01						1.81E+03	
			105.31	-8.016E-02	%(P	3.169E+00	1.03E+03	2.12E+01	G
			86.54	5.836E-01	(	2.743E+00	1.40E+02	3.07E+01	G
HF-181	F	2.7112E-01						4.24E+01	
			482.00	2.711E-01	?(	1.117E+00	1.20E+02	8.05E+01	G
			133.02	-3.794E-01	+	1.560E+00	1.22E+02	4.33E+01	G
			345.83	-2.256E-01	+ P	6.360E+00	6.85E+02	1.51E+01	G
			136.30	0.000E+00	-	1.237E+01	1.00E+03	5.85E+00	G
Ta-182	F	-1.1407E+00						1.14E+02	
			1121.30	-1.141E+00	&(	4.807E+00	1.22E+02	3.49E+01	G
			1221.41	-8.112E-01	+ P	5.800E+00	2.73E+02	2.70E+01	G
			1189.05	-1.296E-01	%	9.422E+00	3.15E+03	1.62E+01	G
Hg-203	F	1.3696E-01						4.66E+01	
			279.20	1.370E-01	?(	8.542E-01	1.81E+02	8.15E+01	G
TL-208	N	1.4654E+00						6.98E+02	
			583.02	1.465E+00	*(P	6.198E-01	2.13E+01	8.45E+01	G
			277.28	-1.376E+00	& P	1.007E+01	3.85E+02	6.31E+00	G
			860.56	-1.293E-01	% P	7.940E+00	2.53E+03	1.24E+01	G
pm-146	C	6.4986E-01						2.02E+03	
			747.16	6.499E-01	?(	1.558E+00	9.63E+01	3.40E+01	G
			735.72	-1.992E+00	+ P	4.188E+00	7.81E+01	2.25E+01	G
			453.88	-3.703E-01	-	1.196E+00	1.27E+02	6.50E+01	G
y-88	F	2.5449E-01						1.07E+02	
			898.04	-7.710E-02	&(P	1.368E+00	5.88E+02	9.37E+01	G
			1836.06	5.677E-01	?(	6.973E-01	4.08E+01	9.92E+01	G
Cd-113m		-4.0196E+03						5.33E+03	
			263.70	-4.020E+03	?(	1.068E+04	7.95E+01	6.00E-03	K
Cd-109	F	7.2541E-01						4.53E+02	
			88.04	7.254E-01	?(	2.365E+01	9.60E+02	3.79E+00	G
Cf-251	T	-8.9338E-01						3.28E+05	
			176.60	-8.934E-01	&(	2.934E+00	1.26E+02	1.70E+01	G
			227.00	-3.052E+00	+	8.749E+00	1.10E+02	6.30E+00	GA
Sn-126		2.1697E+00						3.65E+07	
			87.57	4.830E-01	&	2.333E+00	1.44E+02	3.75E+01	GA
			64.28	2.170E+00	&(	7.385E+00	1.01E+02	9.70E+00	G
			86.94	2.009E+00	?	9.443E+00	1.40E+02	9.04E+00	GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-210	N	1.2553E+00					8.14E+03	
			46.54	1.255E+00	*(P	2.944E+01	6.83E+02	4.25E+00 G
PB-212	N	2.7365E+00					6.98E+02	
			238.63	2.737E+00	*(P	1.426E+00	2.40E+01	4.33E+01 G
			300.03	5.747E+00	& P	3.573E+01	1.83E+02	3.28E+00 GA
PB-214	N	2.6687E+00					5.84E+05	
			351.93	2.669E+00	*(P	2.003E+00	2.57E+01	3.76E+01 G
			295.09	9.677E-01	-	5.704E+00	1.74E+02	1.93E+01 G
			242.00	2.752E+00	?	1.408E+01	1.52E+02	7.43E+00 GA
BI-207	C	2.2483E-01					1.18E+04	
			569.70	2.248E-01	&(	5.905E-01	7.77E+01	9.77E+01 G
			1063.66	-6.412E-01	+ P	1.854E+00	8.67E+01	7.45E+01 G
BI-212	N	-5.6468E+00					6.98E+02	
			727.17	-5.647E+00	?(	1.964E+01	1.02E+02	7.55E+00 G
			785.42	2.258E+01	?	5.740E+01	1.05E+02	1.28E+00 GA
U-235	N	1.7056E+00					2.57E+11	
			143.79	1.302E+00	&(P	7.530E+00	1.72E+02	1.10E+01 G
			205.33	2.590E+00	&(P	9.167E+00	1.34E+02	5.01E+00 G
			163.38	-4.011E+00	+ P	1.266E+01	1.31E+02	5.08E+00 G
			185.72	7.332E-01	&	8.358E-01	4.59E+01	5.40E+01 GA
BI-214	N	4.3336E+00					5.84E+05	
			609.31	4.481E+00	(	9.320E-01	1.52E+01	4.61E+01 G
			1120.29	3.585E+00	&(	1.002E+01	8.27E+01	1.51E+01 G
			1764.49	4.627E+00	?(P	4.329E+00	3.64E+01	1.54E+01 G
BI-210M	T	3.9740E-01					1.10E+09	
			265.83	3.974E-01	&(	1.371E+00	1.02E+02	5.00E+01 G
			304.90	0.000E+00	-	4.871E+00	1.00E+03	2.80E+01 G
AC-228	N	1.7755E+00					2.10E+03	
			911.07	1.544E+00	?(P	4.516E+00	1.27E+02	2.90E+01 G
			968.97	2.300E+00	?(P	7.923E+00	1.01E+02	1.75E+01 G
			338.32	1.573E+00	?(P	6.475E+00	1.21E+02	1.20E+01 G
			93.35	0.000E+00	-	1.577E+01	1.00E+03	5.56E+00 XA
TH-227	N	-5.5636E-01					7.95E+03	
			50.14	-5.564E-01	?(	1.513E+01	7.92E+02	8.00E+00 G
			256.24	-8.580E-01	+	8.163E+00	3.56E+02	7.00E+00 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
TH-229	N	4.0280E-01						2.68E+06	
			193.51	-2.659E+00	?(P	1.193E+01	2.57E+02	4.40E+00	G
			210.85	4.909E+00	?(	1.371E+01	1.06E+02	2.99E+00	G
TH-234	N	-4.8641E+00						1.63E+12	
			63.29	-4.864E+00	*(P	2.058E+01	1.20E+02	3.81E+00	G
			92.59	-4.459E+00	+ P	1.632E+01	7.22E+01	5.58E+00	G
PA-231	N	7.1631E+00						1.20E+07	
			302.65	6.673E+00	?(	4.445E+01	1.97E+02	2.88E+00	G
			300.07	7.737E+00	&(	4.901E+01	1.87E+02	2.46E+00	G
PA-233	C	4.5117E-01						7.82E+08	
			312.01	0.000E+00	(	3.864E+00	1.00E+03	3.60E+01	G
			300.18	3.071E+00	?(	1.998E+01	1.92E+02	6.20E+00	G
PA-234	N	3.9888E-01						1.63E+12	
			131.29	-9.244E-01	?(	3.808E+00	1.23E+02	1.80E+01	G
			946.02	-3.822E+00	+	9.941E+00	1.14E+02	1.34E+01	G
			569.47	0.000E+00	+	9.571E+00	1.00E+03	8.20E+00	G
			883.24	2.880E+00	?(	1.073E+01	1.07E+02	9.60E+00	G
			880.53	4.589E+00	?	1.416E+01	8.96E+01	6.00E+00	GA
PA-234M	N	-1.0288E+02						1.63E+12	
			1001.00	-1.029E+02	?(P	2.806E+02	4.93E+01	8.37E-01	G
			766.41	1.443E+01	+	3.163E+02	5.92E+02	2.94E-01	G
AM-241	T	5.6650E-01						1.58E+05	
			59.54	5.665E-01	?(	1.743E+00	1.13E+02	3.59E+01	G
Np-237	F	1.3682E+00						2.14E+06	
			86.49	1.368E+00	?(	6.235E+00	1.36E+02	1.31E+01	G
Ir-192	F	3.7741E-02						7.40E+01	
			316.49	0.000E+00	?(	1.618E+00	1.00E+03	8.70E+01	G
			468.06	1.012E-01	?(	1.768E+00	4.92E+02	5.18E+01	G
			308.44	0.000E+00	-	4.338E+00	1.00E+03	3.18E+01	G
Cs-136	F	-9.8046E-02						1.30E+01	
			818.50	-3.477E-01	?(	1.284E+00	1.08E+02	1.00E+02	G
			1048.07	-1.404E-01	+	1.370E+00	2.65E+02	8.00E+01	G
			340.57	4.343E-01	?(	1.789E+00	1.21E+02	4.69E+01	G
Np-239	T	5.4348E-01						2.36E+00	
			103.70	5.423E-01	?	2.863E+00	1.56E+02	2.40E+01	X
			106.13	5.435E-01	?(	2.663E+00	1.45E+02	2.27E+01	G
			99.50	-7.609E-01	+	4.614E+00	1.79E+02	1.50E+01	X

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Nd-147	3.0672E+00					1.11E+01	
		531.00	3.067E+00	&(	1.739E+00	2.77E+01	1.30E+01 G
		91.10	0.000E+00	-	3.130E+00	1.00E+03	2.83E+01 G
TL-210 N	2.9751E-01					5.84E+05	
		799.60	3.456E-01	?(	1.153E+00	9.75E+01	9.90E+01 G
		296.00	2.373E-01	?(	1.442E+00	1.79E+02	7.90E+01 G
		1313.00	7.660E-01	?	4.531E+00	2.48E+02	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	130.	2.	0.001	682.89	1.255E+00	P
TH-227	50.14	161.	-2.	-0.001	791.91	-5.564E-01	
TH-234	63.29	133.	-13.	-0.007	119.75	-4.864E+00	P
Sn-126	64.28	115.	15.	0.009	101.22	2.170E+00	
BA-133	80.99	120.	-16.	-0.009	124.37	-5.148E-01	
Np-237	86.49	258.	17.	0.009	135.65	1.368E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Sn-126	86.94	285.	17.	0.010	139.95	2.009E+00		
Sn-126	87.57	302.	17.	0.010	143.88	4.830E-01		
Cd-109	88.04	319.	3.	0.001	960.35	7.254E-01		
TH-234	92.59	346.	-24.	-0.014	72.16	-4.459E+00		P
Gd-153	97.50	73.	-8.	-0.005	186.12	-2.781E-01		
Gd-153	103.20	185.	-7.	-0.004	265.12	-3.324E-01		
EU-152	121.78	110.	-11.	-0.006	138.17	-3.813E-01		
CO-57	122.06	111.	-4.	-0.002	375.83	-4.631E-02		
PA-234	131.29	195.	-16.	-0.009	122.54	-9.244E-01		
HF-181	133.02	187.	-16.	-0.009	122.28	-3.794E-01		
CE-144	133.54	203.	-8.	-0.005	248.02	-7.539E-01		
CO-57	136.47	168.	14.	0.008	132.09	1.360E+00		
Tc-99m	140.51	90.	11.	0.006	122.44	1.358E-01		
U-235	143.79	263.	14.	0.008	171.69	1.302E+00		P
CE-141	145.44	292.	-16.	-0.009	155.86	-3.461E-01		
Ba-140	162.66	89.	13.	0.007	110.17	2.306E+00		
U-235	163.38	130.	-18.	-0.010	131.49	-4.011E+00		P
CE-139	165.85	93.	8.	0.004	183.81	1.076E-01		
Cf-251	176.60	70.	-13.	-0.007	126.44	-8.934E-01		
U-235	185.72	51.	32.	0.018	45.91	7.332E-01		
TH-229	193.51	66.	-9.	-0.005	257.47	-2.659E+00		P
U-235	205.33	44.	10.	0.005	134.47	2.590E+00		P
TH-229	210.85	33.	11.	0.006	106.33	4.909E+00		
Cf-251	227.00	55.	-13.	-0.007	110.27	-3.052E+00		
EU-152	244.69	176.	11.	0.006	169.71	2.335E+00		P
TH-227	256.24	48.	-4.	-0.002	356.12	-8.580E-01		
Cd-113m	263.70	58.	-14.	-0.008	79.45	-4.020E+03		
Hg-203	279.20	62.	6.	0.004	180.72	1.370E-01		
TL-210	296.00	159.	10.	0.006	179.07	2.373E-01		
PA-231	300.07	175.	10.	0.006	186.79	7.737E+00		
PA-233	300.18	185.	10.	0.006	191.98	3.071E+00		
PA-231	302.65	195.	10.	0.006	196.59	6.673E+00		
BA-133	302.85	206.	10.	0.006	201.48	1.049E+00		
Ba-140	304.85	216.	4.	0.002	493.03	1.874E+00		
CR-51	320.08	157.	8.	0.004	229.06	1.558E+00		
La-140	328.76	95.	-14.	-0.008	100.69	-1.418E+00		
Cf-249	333.44	110.	-15.	-0.008	103.41	-1.957E+00		
AC-228	338.32	56.	9.	0.005	120.64	1.573E+00		P
Cs-136	340.57	65.	10.	0.005	120.91	4.343E-01		
EU-152	344.29	74.	10.	0.005	128.70	7.783E-01		
HF-181	345.83	84.	-2.	-0.001	685.37	-2.256E-01		P
BA-133	356.00	111.	-8.	-0.005	185.90	-2.853E-01		
I-131	364.48	28.	-4.	-0.002	295.70	-1.100E-01		P
BA-133	383.84	65.	-3.	-0.002	347.27	-8.625E-01		
SN-113	391.69	58.	9.	0.005	121.32	3.405E-01		P
SB-125	427.88	21.	7.	0.004	123.66	6.411E-01		P
AG-108M	433.94	29.	-3.	-0.001	348.29	-7.605E-02		P
pm-146	453.88	32.	-9.	-0.005	127.50	-3.703E-01		

(Page 18 of 22)

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
SB-125	463.37	0.	21.	0.012	22.32	5.493E+00		P
Ir-192	468.06	43.	2.	0.001	492.24	1.012E-01		
BE-7	477.60	32.	8.	0.004	108.96	2.051E+00		
HF-181	482.00	39.	8.	0.004	119.88	2.711E-01		
La-140	487.02	36.	6.	0.004	139.69	3.967E-01		
RU-103	497.05	17.	2.	0.001	515.75	5.308E-02		
RH-106	511.86	27.	52.	0.029	28.70	7.772E+00		
Ba-140	537.26	17.	-2.	-0.001	200.58	-3.007E-01		P
CS-134	563.24	30.	-10.	-0.006	113.16	-3.997E+00		
CS-134	569.32	20.	1.	0.001	640.31	2.120E-01		
BI-207	569.70	10.	7.	0.004	77.72	2.248E-01		
SB-125	600.50	192.	-13.	-0.007	154.63	-2.462E+00		
SB-124	602.73	179.	-13.	-0.007	149.30	-4.496E-01		
CS-134	604.71	166.	-13.	-0.007	143.82	-4.545E-01		
RU-103	610.30	153.	-12.	-0.007	150.47	-7.139E+00		
PM-144	618.06	36.	2.	0.001	396.58	7.663E-02		
RH-106	621.92	23.	9.	0.005	85.92	3.032E+00		
SB-125	635.89	9.	3.	0.002	136.38	1.059E+00		
I-131	636.97	29.	-11.	-0.006	74.83	-5.592E+00		
AG-110M	657.76	23.	1.	0.001	512.35	5.217E-02		
CS-137	661.66	29.	-2.	-0.001	460.87	-7.281E-02		
NB-94	702.63	19.	-1.	-0.001	770.02	-4.199E-02		P
SB-124	722.79	15.	4.	0.002	136.52	1.597E+00		
AG-108M	722.94	19.	7.	0.004	91.30	3.293E-01		
EU-154	723.36	27.	7.	0.004	104.99	1.481E+00		
ZR-95	724.20	34.	4.	0.002	226.52	3.430E-01		P
BI-212	727.17	53.	-11.	-0.006	102.49	-5.647E+00		
pm-146	735.72	19.	-11.	-0.006	78.13	-1.992E+00		P
pm-146	747.16	5.	5.	0.003	96.29	6.499E-01		
ZR-95	756.73	14.	-1.	-0.001	800.00	-7.701E-02		
AG-110M	763.94	11.	5.	0.003	112.03	8.859E-01		
PA-234M	766.41	17.	1.	0.001	591.61	1.443E+01		
EU-152	778.92	9.	2.	0.001	396.48	5.543E-01		
BI-212	785.42	9.	7.	0.004	104.64	2.258E+01		
CS-134	795.87	17.	8.	0.004	83.39	3.974E-01		
TL-210	799.60	25.	8.	0.004	97.46	3.456E-01		
CS-134	801.95	42.	-6.	-0.003	157.83	-3.055E+00		
CO-58	810.78	10.	6.	0.003	90.25	2.477E-01		
La-140	815.77	15.	6.	0.003	108.20	1.067E+00		
Cs-136	818.50	31.	-8.	-0.004	107.60	-3.477E-01		
MN-54	834.85	9.	-2.	-0.001	285.36	-1.068E-01		
Co-56	846.77	19.	-4.	-0.002	224.89	-1.772E-01		P
NB-94	871.10	24.	-4.	-0.002	180.28	-1.904E-01		
EU-154	873.23	17.	8.	0.004	80.30	3.138E+00		
PA-234	880.53	10.	6.	0.003	89.61	4.589E+00		
PA-234	883.24	16.	6.	0.003	107.19	2.880E+00		
AG-110M	884.68	22.	2.	0.001	308.86	1.454E-01		
Sc-46	889.28	35.	-8.	-0.005	108.99	-3.947E-01		

(Page 19 of 22)

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
y-88	898.04	25.	-1.	-0.001	588.44	-7.710E-02		P
AC-228	911.07	26.	9.	0.005	127.05	1.544E+00		P
AG-110M	937.49	15.	-2.	-0.001	431.57	-2.957E-01		
PA-234	946.02	25.	-10.	-0.006	114.38	-3.822E+00		
EU-152	964.11	16.	8.	0.005	75.24	3.016E+00		
AC-228	968.97	26.	8.	0.004	100.59	2.300E+00		P
EU-154	996.33	61.	-15.	-0.008	78.68	-7.527E+00		
PA-234M	1001.00	77.	-16.	-0.009	49.27	-1.029E+02		P
EU-154	1004.77	104.	-11.	-0.006	136.05	-3.271E+00		
Co-56	1037.84	10.	4.	0.002	190.28	1.502E+00		P
Cs-136	1048.07	13.	-2.	-0.001	264.58	-1.404E-01		
RH-106	1050.36	16.	-1.	0.000	848.53	-2.405E+00		
BI-207	1063.66	21.	-8.	-0.005	86.65	-6.412E-01		P
Ga-68	1077.40	11.	8.	0.005	95.58	1.703E+01		
EU-152	1112.07	26.	9.	0.005	85.94	3.928E+00		
Sc-46	1120.55	33.	2.	0.001	357.50	1.374E-01		
Ta-182	1121.30	30.	-7.	-0.004	121.86	-1.141E+00		
CO-60	1173.24	16.	3.	0.002	316.64	1.822E-01		P
Ta-182	1221.41	21.	-3.	-0.002	273.35	-8.112E-01		P
Co-56	1238.28	27.	-7.	-0.004	137.25	-6.699E-01		P
TL-210	1313.00	6.	2.	0.001	248.05	7.660E-01		
CO-60	1332.50	12.	3.	0.002	233.72	2.434E-01		P
AG-110M	1384.30	0.	7.	0.004	37.80	2.085E+00		
La-140	1596.21	6.	-2.	-0.001	304.14	-1.729E-01		
SB-124	1690.98	6.	-3.	-0.002	205.48	-5.460E-01		
y-88	1836.06	0.	6.	0.003	40.82	5.677E-01		

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	2.0511E+00	2.0511E+00	1.090E+02%	7.67E+00
NA-22	#A	3.1329E-01	3.1329E-01	1.120E+02%	1.24E+00
K-40		1.4634E+02	1.4634E+02	7.589E+00%	1.17E+01
Sc-46	#A	-3.9467E-01	-3.9468E-01	1.090E+02%	1.47E+00
CR-51	#A	1.5577E+00	1.5578E+00	2.291E+02%	1.22E+01
MN-54	#A	-1.0685E-01	-1.0685E-01	2.854E+02%	7.76E-01
FE-59	#	1.4187E+00	1.4187E+00	4.698E+01%	1.40E+00
Co-56	#A	3.0848E-02	3.0848E-02	1.473E+02%	1.06E+00
CO-57	#A	1.0971E-01	1.0971E-01	1.321E+02%	6.00E-01
CO-58	#A	2.4772E-01	2.4772E-01	9.025E+01%	7.71E-01
CO-60	#A	2.1281E-01	2.1281E-01	1.968E+02%	1.29E+00
ZN-65	#A	3.4318E-02	3.4318E-02	2.858E+03%	3.54E+00
NB-94	#A	-4.1991E-02	-4.1991E-02	7.700E+02%	9.24E-01
ZR-95	#A	1.1105E-01	1.1105E-01	2.265E+02%	1.55E+00

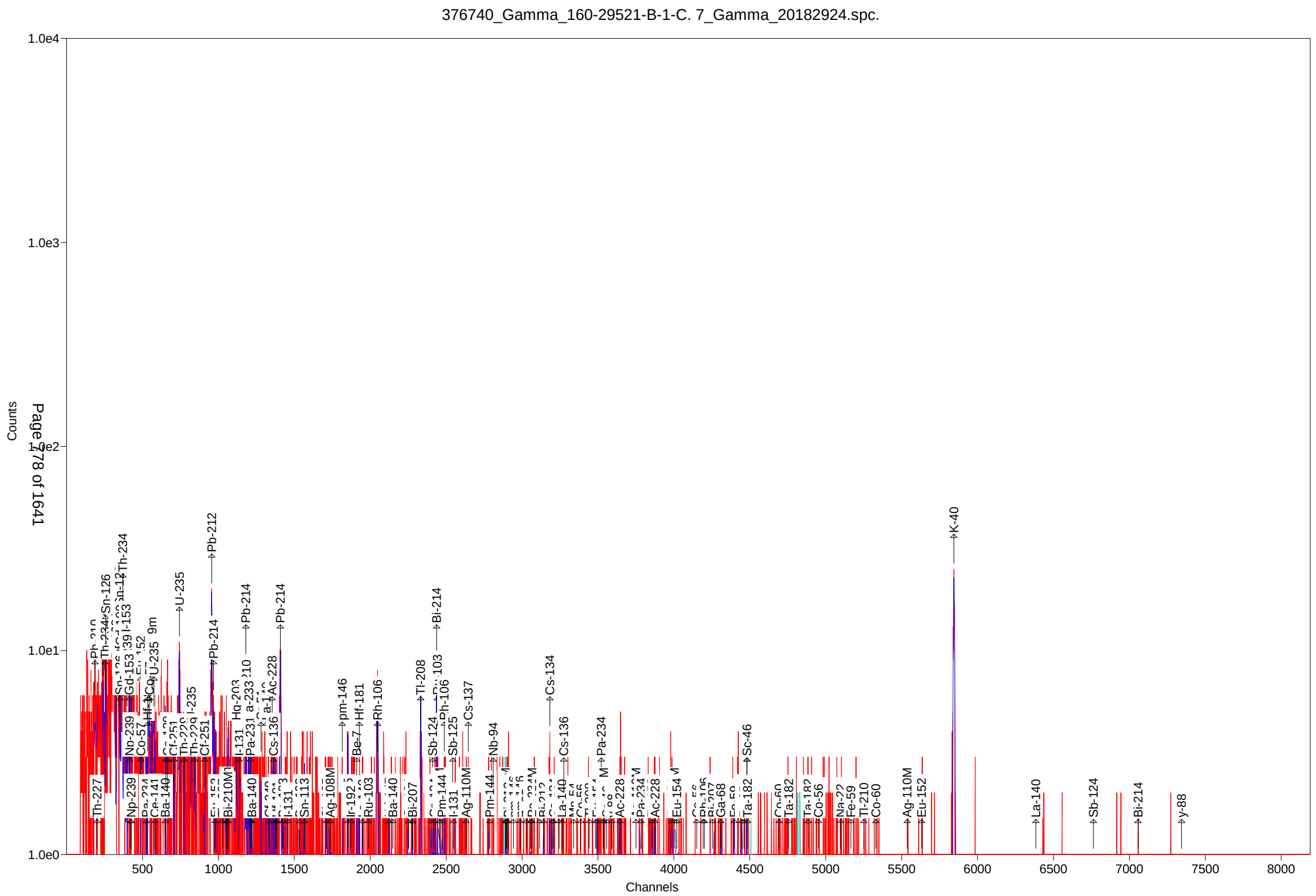
NB-95 #A	0.0000E+00	0.0000E+00	1.000E+03%		5.43E-01
RU-103 #A	5.3079E-02	5.3079E-02	5.158E+02%		7.04E-01
RH-106 #A	3.0319E+00	3.0319E+00	8.592E+01%		8.84E+00
AG-108M#A	1.2703E-01	1.2703E-01	9.130E+01%		7.86E-01
AG-110M#A	4.0156E-01	4.0156E-01	3.780E+01%		1.62E+00
SN-113 #A	3.4054E-01	3.4054E-01	1.213E+02%		1.41E+00
SB-124 #A	-2.4672E-01	-2.4672E-01	1.012E+02%		2.27E+00
SB-125 #A	1.7218E+00	1.7218E+00	2.232E+01%		2.05E+00
I-131 #A	-1.1003E-01	-1.1003E-01	2.957E+02%		7.42E-01
Gd-153 #A	-2.7807E-01	-2.7807E-01	1.861E+02%		1.42E+00
Ga-68 #A	1.6923E+01	1.7030E+01	9.558E+01%		3.66E+01
Tc-99m #A	1.3560E-01	1.3576E-01	1.224E+02%		5.64E-01
BA-133 #A	1.8999E-02	1.8999E-02	1.371E+02%		1.81E+00
CS-134 #A	-3.5849E-02	-3.5849E-02	8.339E+01%		2.21E+00
CS-137 #A	-7.2813E-02	-7.2813E-02	4.609E+02%		1.21E+00
CE-139 #A	1.0757E-01	1.0757E-01	1.838E+02%		6.77E-01
Ba-140 #A	4.3122E-01	4.3123E-01	1.102E+02%		2.81E+00
La-140 #A	1.6079E-01	1.6079E-01	1.082E+02%		1.22E+00
CE-141 #A	-3.4605E-01	-3.4606E-01	1.559E+02%		1.81E+00
CE-144 #A	-7.5390E-01	-7.5390E-01	2.480E+02%		6.35E+00
PM-144 #A	2.3330E-02	2.3330E-02	3.966E+02%		1.00E+00
EU-152 #A	1.9015E+00	1.9015E+00	7.524E+01%		3.41E+00
EU-154 #A	2.1065E+00	2.1065E+00	6.609E+01%		8.52E+00
EU-155 A	3.1248E-01	3.1248E-01	1.399E+02%		3.17E+00
HF-181 #A	2.7112E-01	2.7112E-01	1.199E+02%		1.12E+00
Ta-182 #A	-1.1407E+00	-1.1407E+00	1.219E+02%		4.81E+00
Hg-203 #A	1.3696E-01	1.3696E-01	1.807E+02%		8.54E-01
TL-208 #	1.4654E+00	1.4654E+00	2.133E+01%		6.20E-01
pm-146 #A	6.4986E-01	6.4986E-01	9.629E+01%		1.56E+00
y-88 #A	2.5449E-01	2.5449E-01	4.082E+01%		1.37E+00
Cd-113m#A	-4.0196E+03	-4.0196E+03	7.945E+01%		1.07E+04
Cd-109 #A	7.2541E-01	7.2541E-01	9.603E+02%		2.37E+01
Cf-251 #A	-8.9338E-01	-8.9338E-01	1.264E+02%		2.93E+00
Cf-249 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.46E+00
Sn-126 #A	2.1697E+00	2.1697E+00	1.012E+02%		7.38E+00
PB-210 #A	1.2553E+00	1.2553E+00	6.829E+02%		2.94E+01
PB-212 #	2.7365E+00	2.7365E+00	2.396E+01%		1.43E+00
PB-214 #	2.6687E+00	2.6687E+00	2.568E+01%		2.00E+00
BI-207 #A	2.2483E-01	2.2483E-01	7.772E+01%		5.90E-01
BI-212 #A	-5.6468E+00	-5.6468E+00	1.025E+02%		1.96E+01
U-235 #A	1.7056E+00	1.7056E+00	1.090E+02%		7.53E+00
BI-214	4.3336E+00	4.3336E+00	1.525E+01%		9.32E-01
BI-210M#A	3.9740E-01	3.9740E-01	1.020E+02%		1.37E+00
AC-228 #A	1.7755E+00	1.7755E+00	6.734E+01%		4.52E+00
TH-227 #A	-5.5636E-01	-5.5636E-01	7.919E+02%		1.51E+01
TH-229 #A	4.0280E-01	4.0280E-01	1.063E+02%		1.19E+01
TH-234 #A	-4.8641E+00	-4.8641E+00	1.197E+02%		2.06E+01
PA-231 #A	7.1631E+00	7.1631E+00	1.356E+02%		4.44E+01
PA-233 #A	4.5117E-01	4.5117E-01	1.920E+02%		3.86E+00

PA-234 #A	3.9888E-01	3.9888E-01	8.140E+01%	3.81E+00
PA-234M#A	-1.0288E+02	-1.0288E+02	4.927E+01%	2.81E+02
AM-241 #A	5.6650E-01	5.6650E-01	1.132E+02%	1.74E+00
Np-237 #A	1.3682E+00	1.3682E+00	1.356E+02%	6.23E+00
Ir-192 #A	3.7741E-02	3.7741E-02	4.922E+02%	1.62E+00
Cs-136 #A	-9.8044E-02	-9.8046E-02	8.093E+01%	1.28E+00
Np-239 #A	5.4341E-01	5.4348E-01	1.449E+02%	2.66E+00
Nd-147 #	3.0671E+00	3.0672E+00	2.774E+01%	1.74E+00
TL-210 #A	2.9751E-01	2.9751E-01	9.746E+01%	1.15E+00

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 2000.1 keV) 1.534E+02 Bq/Sample
Total Decayed Activity (37.6 to 2000.1 keV) 1.5340576E+02 Bq/Sample


376740_Gamma_160-29521-B-1-C. 7_Gamma_20182924.spc.
Counts
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
Channels
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Th-227
Np-239
Ce-141
Ba-140
U-235
Cf-251
Th-229
Pb-212
Pb-214
Ra-223
Hg-203
Pa-231
Ac-228
Cs-136
pm-146
Be-7
Hf-181
Rh-106
Ru-103
Sn-113
Ag-108M
Bi-207
Tl-208
Sb-124
Bi-214
Sb-125
Cs-137
Nb-94
Pm-144
Ag-110M
Cs-134
La-140
Pa-234
Eu-154
Ga-68
Sc-46
Ta-182
Co-56
Na-22
Fe-59
Tl-210
Co-60
K-40
Eu-152
Sb-124
Bi-214
y-88

Test America St. Louis Spectrum ID: 5_Gamma_20182722

Sample Description: 376740_Gamma_160-29521-B-2-B
Detector: Detector # 5
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29521-B-2-B

Decay to Time: 8/9/2018 06:39 Live Time: 1800 sec
Acquisition Time: 8/9/2018 06:39:57 Real Time: 1823 sec
Analysis Time: 8/9/2018 07:10 Dead Time: 1.28 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev14.lib
Bkgd Correction File: 5_2018-07-14_1831.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	1.013E+00	269.8	2.734E+00	2.734E+00	9.856E+00
NA-22	1.618E-01	210.7	3.410E-01	3.411E-01	1.308E+00
K-40	1.536E+02	8.3	1.281E+01	1.503E+01	1.165E+01
Sc-46	9.924E-02	455.1	4.516E-01	4.517E-01	1.919E+00
CR-51	1.725E+00	136.8	2.360E+00	2.362E+00	8.220E+00
MN-54	1.540E-01	296.8	4.571E-01	4.572E-01	1.173E+00
FE-59	-6.066E-01	250.8	1.522E+00	1.522E+00	3.572E+00
Co-56	8.101E-01	64.6	5.233E-01	5.249E-01	8.799E-01
CO-57	-4.928E-03	5458.5	2.690E-01	2.690E-01	9.349E-01
CO-58	-8.897E-02	474.3	4.220E-01	4.220E-01	1.548E+00
CO-60	7.823E-01	37.1	2.905E-01	2.932E-01	7.427E-01
ZN-65	-6.593E-01	237.7	1.567E+00	1.567E+00	5.508E+00
NB-94	3.585E-01	73.6	2.637E-01	2.644E-01	1.173E+00
ZR-95	-1.235E-01	656.2	8.105E-01	8.105E-01	2.250E+00
NB-95	0.000E+00	1.#INF	2.536E-01	2.536E-01	1.781E+00
RU-103	2.795E-01	105.6	2.950E-01	2.954E-01	7.802E-01
RH-106	2.923E+00	298.9	8.739E+00	8.740E+00	2.995E+01
AG-108M	2.864E-01	153.6	4.401E-01	4.403E-01	1.191E+00
AG-110M	4.526E-01	77.5	3.506E-01	3.514E-01	2.368E+00
SN-113	-4.989E-01	132.3	6.598E-01	6.603E-01	2.256E+00
SB-124	3.593E-01	146.6	5.267E-01	5.270E-01	2.489E+00
SB-125	1.995E+00	32.0	6.389E-01	6.469E-01	2.806E+00
I-131	6.734E-01	48.8	3.283E-01	3.302E-01	7.614E-01
Gd-153	-3.020E-01	267.5	8.078E-01	8.080E-01	2.770E+00
Ga-68	1.500E+01	146.1	2.190E+01	2.192E+01	5.232E+01
Tc-99m	2.303E-01	122.7	2.825E-01	2.828E-01	9.563E-01
BA-133	-2.355E-01	141.1	3.323E-01	3.325E-01	3.418E+00
CS-134	2.435E-01	302.5	7.367E-01	7.368E-01	2.542E+00
CS-137	-1.595E-01	289.2	4.614E-01	4.614E-01	1.722E+00
CE-139	2.211E-01	112.5	2.487E-01	2.496E-01	8.466E-01
Ba-140	1.407E+00	110.8	1.559E+00	1.561E+00	2.391E+00
La-140	-5.849E-01	84.0	4.914E-01	4.924E-01	2.696E+00
CE-141	0.000E+00	1.#INF	2.837E-01	2.837E-01	1.885E+00

CE-144	9.774E-01	228.3	2.231E+00	2.232E+00	7.636E+00
PM-144	8.854E-01	25.8	2.286E-01	2.332E-01	4.350E-01
EU-152	5.050E+00	19.6	9.905E-01	1.025E+00	5.453E+00
EU-154	-7.147E+00	57.7	4.124E+00	4.140E+00	1.828E+01
EU-155	-1.224E+00	93.6	1.146E+00	1.148E+00	6.158E+00
HF-181	-9.186E-02	84.3	7.748E-02	7.762E-02	1.523E+00
Ta-182	2.723E+00	27.7	7.551E-01	7.673E-01	7.673E+00
Hg-203	1.016E-01	311.1	3.162E-01	3.163E-01	1.114E+00
TL-208	1.618E+00	46.4	7.506E-01	7.552E-01	1.289E+00
pm-146	-1.519E+00	107.7	1.636E+00	1.638E+00	4.030E+00
y-88	-5.441E-01	102.6	5.580E-01	5.587E-01	1.779E+00
Cd-113m	-3.469E+03	117.3	4.068E+03	4.074E+03	1.396E+04
Cd-109	-7.795E+00	145.9	1.137E+01	1.138E+01	3.814E+01
Cf-251	5.859E-01	206.6	1.211E+00	1.212E+00	3.398E+00
Cf-249	0.000E+00	1.#INF	1.537E-01	1.537E-01	2.092E+00
Sn-126	2.251E+00	145.1	3.266E+00	3.269E+00	1.109E+01
PB-210	9.025E+00	97.8	8.831E+00	8.847E+00	2.623E+01
PB-212	4.176E+00	14.7	6.141E-01	6.709E-01	1.400E+00
PB-214	7.967E+00	11.0	8.754E-01	9.683E-01	1.903E+00
BI-207	0.000E+00	1.#INF	1.751E-01	1.751E-01	1.108E+00
BI-212	4.948E+00	107.4	5.312E+00	5.319E+00	1.840E+01
U-235	1.529E+00	124.5	1.902E+00	1.904E+00	8.093E+00
BI-214	7.051E+00	13.5	9.544E-01	1.022E+00	1.337E+00
BI-210M	-1.274E-02	171.0	2.177E-02	2.179E-02	2.108E+00
AC-228	4.235E+00	37.2	1.575E+00	1.590E+00	3.370E+00
TH-227	5.437E-01	223.9	1.218E+00	1.218E+00	1.515E+01
TH-229	-4.577E+00	152.2	6.967E+00	6.977E+00	1.909E+01
TH-234	1.440E+01	28.9	4.165E+00	4.233E+00	1.933E+01
PA-231	7.869E+00	157.7	1.241E+01	1.242E+01	5.728E+01
PA-233	1.412E-01	156.6	2.210E-01	2.212E-01	2.450E+00
PA-234	2.801E+00	64.8	1.814E+00	1.819E+00	4.240E+00
PA-234M	7.981E+01	69.3	5.533E+01	5.548E+01	2.012E+02
AM-241	5.399E-01	165.6	8.939E-01	8.944E-01	2.605E+00
Np-237	-2.269E+00	160.4	3.638E+00	3.640E+00	1.220E+01
Ir-192	2.549E-01	105.1	2.679E-01	2.683E-01	9.207E-01
Cs-136	4.298E-01	96.2	4.136E-01	4.144E-01	1.928E+00
Np-239	-9.004E-01	187.4	1.687E+00	1.688E+00	5.683E+00
Nd-147	3.806E-01	145.2	5.526E-01	5.530E-01	7.650E+00
TL-210	1.157E-01	204.6	2.368E-01	2.369E-01	1.755E+00
Total	3.431E+02				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 5_Gamma_20182722.An1

Sample description
376740_Gamma_160-29521-B-2-B

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20182722.An1

Acquisition information
Start time: 8/9/2018 6:39:57 AM
Live time: 1800
Real time: 1823
Dead time: 1.28 %
Detector ID: 5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_Soil_TunaCan.Clb
5_Soil_TunaCan_90099_032612

Energy Calibration
Created: 2/28/2012 7:35:48 PM
Zero offset: 0.158 keV
Gain: 0.250 keV/channel
Quadratic: 3.911E-08 keV/channel^2

Efficiency Calibration
Created: 3/27/2012 5:20:37 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.466115E-01 + (-7.830454E-01*Log(E)) +
(-4.117504E-03*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.43 %
Log(Eff): -2.462251E+01 + (9.075211E+00*Log(E)) +
(-9.664422E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev14.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.62keV)
Stop channel: 8000 (2000.81keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 6:39:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2018-07-14_1831.PBC 7/14/2018 6:31:50 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.2181

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.64	12.	97.85	0.57	1.788E-02	46.54	4.250	PBC<MDA	PB210
59.61	9.	165.56	0.80	2.533E-02	59.54	35.900	PBC<MDA	AM241
63.18	24.	53.00	0.52	2.708E-02	63.29	3.810	PBC<MDA	TH234
64.28	11.	145.12	0.80	2.757E-02	64.28	9.700	PBC<MDA	Sn126
77.19	85.	19.60	0.81	3.221E-02				
91.10	16.	145.20	0.83	3.508E-02	91.10	28.300	PBC<MDA	Nd147
92.63	55.	28.93	1.27	3.527E-02	92.59	5.584	1.538E+01	TH234
93.35	16.	139.13	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
123.10	4.	306.45	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
131.29	11.	130.02	0.87	3.509E-02	131.29	18.000	PBC<MDA	PA234
133.02	11.	136.61	0.87	3.492E-02	133.02	43.300	PBC<MDA	HF181
133.54	7.	228.26	0.87	3.487E-02	133.54	11.090	PBC<MDA	CE144
140.51	12.	122.65	0.88	3.411E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	5.	334.68	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235
163.38	11.	124.46	0.90	3.102E-02	163.38	5.080	PBC<MDA	U235
165.85	10.	112.53	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139
176.60	5.	206.63	0.92	2.975E-02	176.60	17.000	PBC<MDA	Cf251
185.72	13.	104.58	0.93	2.854E-02	185.72	54.000	PBC<MDA	U235
205.33	2.	500.06	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
227.00	8.	117.79	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
238.82	76.	15.58	1.18	2.318E-02	238.63	43.300	4.186E+00	PB212
242.23	20.	41.42	0.98	2.293E-02	242.00	7.430	PBC<MDA	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
244.69	10.	180.97	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
256.24	4.	223.94	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
277.28	8.	123.97	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
279.20	3.	311.10	1.02	2.036E-02	279.20	81.460	PBC<MDA	Hg203
284.30	19.	48.76	1.02	2.006E-02	284.30	6.140	PBC<MDA	I131
295.28	46.	17.51	0.55	1.944E-02	295.09	19.300	6.781E+00	PB214
					296.00	79.000	1.661E+00	TL210
300.03	7.	227.35	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
300.07	7.	216.97	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.500E+00	PA231
					300.18	6.200	3.374E+00	PA233
300.18	7.	223.27	1.04	1.917E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.500E+00	PA231
					300.18	6.200	3.374E+00	PA233
302.65	7.	228.86	1.04	1.904E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.152E+00	BA133
302.85	7.	234.77	1.04	1.903E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.152E+00	BA133
304.85	7.	240.14	1.04	1.893E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	7.601E-01	BI210M
304.90	6.	308.72	1.04	1.893E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	6.038E-01	BI210M
316.49	7.	105.11	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
320.08	6.	136.83	1.06	1.818E-02	320.08	9.940	PBC<MDA	CR51
328.76	8.	111.27	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.32	9.	128.19	1.07	1.736E-02	338.32	12.010	PBC<MDA	AC228
340.57	10.	124.05	1.08	1.727E-02	340.57	46.900	PBC<MDA	Cs136
344.29	7.	197.88	1.08	1.711E-02	344.29	26.500	PBC<MDA	EU152
352.10	98.	13.28	0.92	1.679E-02	351.93	37.600	8.575E+00	PB214
364.48	2.	293.06	1.10	1.632E-02	364.48	81.700	PBC<MDA	I131
383.84	2.	538.52	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
433.94	7.	153.65	1.16	1.411E-02	433.94	90.480	PBC<MDA	AG108M
453.88	3.	228.00	1.18	1.360E-02	453.88	65.000	PBC<MDA	pm146
463.37	7.	92.77	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
477.60	2.	269.81	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
497.05	6.	105.55	1.22	1.260E-02	497.05	90.900	PBC<MDA	RU103
511.86	47.	34.77	2.48	1.230E-02	511.86	20.000	1.054E+01	RH106
537.26	4.	110.82	1.26	1.181E-02	537.26	24.390	PBC<MDA	Ba140
583.02	20.	46.39	1.30	1.103E-02	583.02	84.500	PBC<MDA	TL208
600.50	5.	288.54	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
602.73	2.	584.09	1.32	1.073E-02	602.73	98.260	PBC<MDA	SB124
604.71	5.	302.51	1.32	1.070E-02	604.71	97.620	PBC<MDA	CS134
609.87	62.	13.53	1.25	1.063E-02	609.31	46.090	7.051E+00	BI214
					610.30	5.750	5.660E+01	RU103
610.30	5.	308.54	1.32	1.062E-02	609.31	46.090	PBC<MDA	BI214
					610.30	5.750	4.182E+00	RU103

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
614.28	5.	314.70	1.33	1.056E-02	614.28	89.850	PBC<MDA	AG108M
618.06	4.	334.02	1.33	1.051E-02	618.06	99.100	PBC<MDA	PM144
621.92	5.	298.95	1.33	1.045E-02	621.92	9.930	PBC<MDA	RH106
635.89	16.	32.02	1.34	1.026E-02	635.89	11.310	7.868E+00	SB125
657.76	7.	87.08	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
661.66	-2.	289.22	1.37	9.924E-03	661.66	85.210	PBC<MDA	CS137
696.54	15.	25.82	1.40	9.507E-03	696.54	99.000	8.854E-01	PM144
702.63	3.	252.03	1.40	9.438E-03	702.63	97.900	PBC<MDA	NB94
722.79	5.	146.57	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.986E-01	AG108M
					723.36	20.220	1.342E+00	EU154
727.48	6.	107.36	1.42	9.170E-03	727.17	7.550	PBC<MDA	BI212
766.41	7.	87.58	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.538E+02	PA234M
785.21	5.	164.92	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
818.50	7.	113.90	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
834.85	2.	296.81	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54
846.77	5.	97.15	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
860.56	7.	103.16	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
871.10	8.	73.56	1.54	7.882E-03	871.10	99.890	PBC<MDA	NB94
880.53	5.	95.05	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
883.24	5.	112.81	1.55	7.791E-03	883.24	9.600	PBC<MDA	PA234
884.68	5.	128.17	1.55	7.781E-03	884.68	72.680	PBC<MDA	AG110M
889.28	1.	536.90	1.55	7.747E-03	889.28	99.984	PBC<MDA	Sc46
911.07	17.	37.19	1.57	7.591E-03	911.07	29.000	4.235E+00	AC228
946.02	8.	90.05	1.60	7.355E-03	946.02	13.400	PBC<MDA	PA234
964.11	26.	19.61	1.61	7.239E-03	964.11	14.605	1.366E+01	EU152
996.33	6.	89.86	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1001.00	6.	107.49	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	4.	136.69	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	2.	234.52	1.67	6.749E-03	1048.07	80.000	PBC<MDA	Cs136
1077.40	5.	146.06	1.69	6.594E-03	1077.40	3.300	PBC<MDA	Ga68
1120.31	8.	113.71	1.72	6.381E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	1.	734.91	1.72	6.380E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	9.975E-02	Sc46
					1121.30	34.900	2.859E-01	Ta182
1121.33	7.	124.44	1.72	6.376E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.789E+00	Ta182
1173.24	2.	268.22	1.76	6.138E-03	1173.24	99.900	PBC<MDA	CO60
1186.78	13.	27.74	1.77	6.069E-03	1189.05	16.200	7.345E+00	Ta182
1218.68	3.	229.35	1.79	5.934E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	8.	97.08	1.80	5.866E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	2.	210.71	1.83	5.725E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	4.596E-01	EU154
1332.50	8.	37.14	1.87	5.514E-03	1332.50	99.980	7.823E-01	CO60
1408.00	0.	807.45	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1461.42	151.	8.35	1.42	5.103E-03	1460.83	10.670	1.536E+02	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.09	5.	102.30	2.11	4.351E-03	1764.49	15.400	PBC<MDA	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
308.40	77.19	55.	85.	2.639E+03	19.60	0.812	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	186.11	46.64	51.	12.	0.007	97.85	0.571s
AM-241	237.72	59.54	73.	9.	0.005	165.56	0.797s
TH-234	252.33	63.18	51.	24.	0.013	53.00	0.523s
Sn-126	256.71	64.28	118.	11.	0.006	145.12	0.802
BA-133	323.61	80.99	113.	-7.	-0.004	260.96	0.819s
Np-237	345.63	86.49	425.	-18.	-0.010	160.37	0.825s
EU-155	345.84	86.54	407.	-18.	-0.010	156.94	0.825s
Sn-126	347.43	86.94	388.	-18.	-0.010	153.39	0.825s
Sn-126	349.95	87.57	370.	-18.	-0.010	149.66	0.826s
Cd-109	351.83	88.04	351.	-18.	-0.010	145.89	0.826s
Nd-147	364.08	91.10	255.	16.	0.009	145.20	0.829s
TH-234	370.19	92.63	64.	55.	0.030	28.93	1.269s
AC-228	373.09	93.35	243.	16.	0.009	139.13	0.832s
Gd-153	389.70	97.50	119.	-6.	-0.003	267.51	0.836
Np-239	397.71	99.50	127.	-12.	-0.007	130.68	0.838s
Gd-153	412.52	103.20	140.	-9.	-0.005	188.89	0.842s
Np-239	414.52	103.70	149.	0.	0.000	1000.00	0.842s
EU-155	420.98	105.31	312.	-17.	-0.009	93.63	0.844s
Np-239	424.25	106.13	305.	-13.	-0.007	187.39	0.845s
EU-152	486.88	121.78	97.	-13.	-0.007	107.34	0.861s
EU-154	492.18	123.10	93.	4.	0.002	306.45	0.862
PA-234	524.99	131.29	95.	11.	0.006	130.02	0.871s
HF-181	531.91	133.02	106.	11.	0.006	136.61	0.872s
CE-144	533.97	133.54	117.	7.	0.004	228.26	0.873s
HF-181	545.02	136.30	124.	0.	0.000	1000.00	0.876s
CO-57	545.72	136.47	179.	-14.	-0.008	135.00	0.876s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Tc-99m	561.88	140.51	107.	12.	0.007	122.65	0.880s
U-235	574.99	143.79	120.	5.	0.003	334.68	0.883s
CE-141	581.61	145.44	125.	0.	0.000	1000.00	0.885
Ba-140	650.54	162.66	150.	-16.	-0.009	113.19	0.902s
U-235	653.42	163.38	87.	11.	0.006	124.46	0.903s
CE-139	663.32	165.85	58.	10.	0.006	112.53	0.905s
Cf-251	706.34	176.60	37.	5.	0.003	206.63	0.916s
U-235	742.85	185.72	57.	13.	0.007	104.58	0.925
TH-229	774.03	193.51	70.	-10.	-0.006	152.21	0.933s
U-235	821.35	205.33	41.	2.	0.001	500.06	0.945s
TH-229	843.44	210.85	43.	-6.	-0.004	189.18	0.950s
Cf-251	908.08	227.00	23.	8.	0.004	117.79	0.966s
PB-212	954.64	238.63	24.	75.	0.042	14.71	0.978D
PB-214	968.10	242.00	25.	20.	0.011	41.42	0.981D
EU-152	978.89	244.69	167.	10.	0.006	180.97	0.984s
TH-227	1025.11	256.24	26.	4.	0.002	223.94	0.995s
Cd-113m	1054.97	263.70	40.	-8.	-0.004	117.26	1.002s
BI-210M	1063.50	265.83	65.	-7.	-0.004	170.98	1.005s
TL-208	1109.33	277.28	41.	8.	0.004	123.97	1.016s
Hg-203	1117.00	279.20	43.	3.	0.002	311.10	1.017s
I-131	1137.41	284.30	18.	19.	0.010	48.76	1.022s
PB-214	1181.38	295.28	6.	46.	0.025	17.51	0.546s
TL-210	1184.24	296.00	105.	7.	0.004	204.63	1.034s
PB-212	1200.37	300.03	112.	7.	0.004	227.35	1.038
PA-231	1200.53	300.07	119.	7.	0.004	216.97	1.038s
PA-233	1200.97	300.18	126.	7.	0.004	223.27	1.038s
PA-231	1210.86	302.65	134.	7.	0.004	228.86	1.040s
BA-133	1211.66	302.85	141.	7.	0.004	234.77	1.040s
Ba-140	1219.66	304.85	148.	7.	0.004	240.14	1.042s
BI-210M	1219.85	304.90	155.	6.	0.003	308.72	1.042s
PA-233	1248.32	312.01	33.	-5.	-0.003	219.55	1.049s
Ir-192	1266.25	316.49	26.	7.	0.004	105.11	1.053s
CR-51	1280.63	320.08	27.	6.	0.003	136.83	1.057s
La-140	1315.35	328.76	23.	8.	0.005	111.27	1.065s
Cf-249	1334.08	333.44	33.	-9.	-0.005	123.98	1.070s
AC-228	1353.61	338.32	62.	9.	0.005	128.19	1.074
Cs-136	1362.62	340.57	71.	10.	0.006	124.05	1.077s
EU-152	1377.49	344.29	80.	7.	0.004	197.88	1.080s
HF-181	1383.66	345.83	87.	0.	0.000	1000.00	1.082s
PB-214	1408.76	352.10	16.	98.	0.054	13.28	0.922
BA-133	1424.36	356.00	170.	-12.	-0.007	156.50	1.091s
I-131	1458.32	364.48	11.	2.	0.001	293.06	1.099s
BA-133	1535.78	383.84	57.	2.	0.001	538.52	1.117s
Cf-249	1552.22	387.95	59.	0.	0.000	1000.00	1.121s
SN-113	1567.19	391.69	64.	-9.	-0.005	132.26	1.125s
SB-125	1711.99	427.88	16.	-1.	-0.001	639.45	1.158s
AG-108M	1736.25	433.94	28.	7.	0.004	153.65	1.164s
pm-146	1816.05	453.88	13.	3.	0.002	228.00	1.182s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	1854.01	463.37	18.	7.	0.004	92.77	1.191s
Ir-192	1872.79	468.06	57.	-11.	-0.006	101.94	1.195s
BE-7	1910.94	477.59	22.	2.	0.001	269.81	1.204s
HF-181	1928.56	482.00	31.	-7.	-0.004	98.98	1.208s
La-140	1948.65	487.02	16.	-6.	-0.003	106.47	1.212s
RU-103	1988.80	497.05	8.	6.	0.003	105.55	1.221s
RH-106	2048.06	511.86	33.	47.	0.026	34.77	2.485s
Nd-147	2124.62	531.00	16.	-2.	-0.001	397.91	1.252s
Ba-140	2149.67	537.26	4.	4.	0.002	110.82	1.258s
CS-134	2253.60	563.24	20.	-8.	-0.004	115.02	1.280s
CS-134	2277.94	569.32	16.	0.	0.000	1000.00	1.286s
BI-207	2279.47	569.70	17.	0.	0.000	1000.00	1.286s
TL-208	2332.76	583.02	16.	20.	0.011	46.39	1.298
SB-125	2402.69	600.50	84.	5.	0.003	288.54	1.313s
SB-124	2411.61	602.73	91.	2.	0.001	584.09	1.315s
CS-134	2419.53	604.71	94.	5.	0.003	302.51	1.317s
BI-214	2440.17	609.87	4.	62.	0.035	13.53	1.250
RU-103	2441.89	610.30	98.	5.	0.003	308.54	1.322s
AG-108M	2457.82	614.28	103.	5.	0.003	314.70	1.325s
PM-144	2472.94	618.06	108.	4.	0.002	334.02	1.328s
RH-106	2488.37	621.92	131.	5.	0.003	298.95	1.332s
SB-125	2544.26	635.89	6.	16.	0.009	32.02	1.344s
AG-110M	2631.76	657.76	14.	7.	0.004	87.08	1.362s
CS-137	2647.36	661.66	25.	-2.	-0.001	289.22	1.366s
PM-144	2786.90	696.54	0.	15.	0.008	25.82	1.395s
NB-94	2811.25	702.63	13.	3.	0.002	252.03	1.400s
SB-124	2891.88	722.79	20.	5.	0.003	146.57	1.417s
AG-108M	2892.48	722.94	24.	0.	0.000	1000.00	1.417s
EU-154	2894.16	723.36	24.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	17.	0.	0.000	1000.00	1.418s
BI-212	2909.41	727.17	19.	6.	0.003	107.36	1.421
pm-146	2943.61	735.72	30.	-12.	-0.007	95.50	1.428s
pm-146	2989.37	747.16	17.	-8.	-0.005	107.70	1.437s
ZR-95	3027.65	756.73	13.	-1.	-0.001	656.18	1.445s
AG-110M	3056.50	763.94	25.	-4.	-0.002	171.14	1.451s
NB-95	3063.89	765.79	30.	0.	0.000	1000.00	1.453s
PA-234M	3066.38	766.41	16.	7.	0.004	87.58	1.453s
EU-152	3116.41	778.92	14.	-2.	-0.001	403.11	1.463s
BI-212	3142.41	785.42	14.	5.	0.003	164.92	1.468s
TL-210	3199.12	799.60	26.	0.	0.000	1000.00	1.480s
CO-58	3243.82	810.78	19.	-1.	-0.001	474.34	1.489s
La-140	3263.80	815.77	34.	-10.	-0.006	85.29	1.493s
Cs-136	3274.72	818.50	31.	7.	0.004	113.90	1.495s
MN-54	3340.10	834.85	10.	2.	0.001	296.81	1.508s
Co-56	3387.78	846.77	5.	5.	0.003	97.15	1.518s
TL-208	3442.95	860.56	10.	7.	0.004	103.16	1.529s
NB-94	3485.08	871.10	12.	8.	0.004	73.56	1.537s
EU-154	3493.61	873.23	39.	-12.	-0.007	57.70	1.539s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234	3522.80	880.53	10.	5.	0.003	95.05	1.544
PA-234	3533.64	883.24	16.	5.	0.003	112.81	1.547s
AG-110M	3539.41	884.68	21.	5.	0.003	128.17	1.547s
Sc-46	3557.79	889.28	27.	1.	0.001	536.90	1.551s
y-88	3592.83	898.04	19.	-7.	-0.004	102.56	1.558s
AC-228	3644.94	911.07	5.	17.	0.009	37.19	1.568s
AG-110M	3750.60	937.49	19.	-10.	-0.005	100.12	1.589s
PA-234	3784.70	946.02	9.	8.	0.004	90.05	1.595s
EU-152	3857.05	964.11	0.	26.	0.014	19.61	1.609s
AC-228	3876.48	968.97	34.	-6.	-0.003	152.76	1.612s
EU-154	3985.88	996.33	10.	6.	0.003	89.86	1.633s
PA-234M	4004.55	1001.00	16.	6.	0.003	107.49	1.636s
EU-154	4019.65	1004.77	43.	-10.	-0.005	99.60	1.639s
Co-56	4151.87	1037.84	5.	4.	0.002	136.69	1.664s
Cs-136	4192.77	1048.07	10.	2.	0.001	234.52	1.671s
RH-106	4201.93	1050.36	22.	-6.	-0.004	108.24	1.673s
BI-207	4255.11	1063.66	11.	-4.	-0.002	151.63	1.682
Ga-68	4310.04	1077.40	10.	5.	0.003	146.06	1.692s
FE-59	4397.41	1099.25	20.	-4.	-0.002	250.83	1.708s
EU-152	4448.68	1112.07	50.	-10.	-0.006	101.80	1.717
ZN-65	4462.56	1115.55	40.	-4.	-0.002	237.69	1.720s
BI-214	4481.51	1120.29	41.	8.	0.005	113.71	1.723s
Sc-46	4482.57	1120.55	35.	1.	0.001	734.91	1.723s
Ta-182	4485.56	1121.30	36.	7.	0.004	124.44	1.724s
CO-60	4693.21	1173.24	5.	2.	0.001	268.22	1.760s
Ta-182	4756.42	1189.05	0.	13.	0.007	27.74	1.771s
Ta-182	4885.79	1221.41	11.	3.	0.002	229.35	1.793s
Co-56	4953.23	1238.28	11.	8.	0.005	97.08	1.804s
NA-22	5098.13	1274.53	5.	2.	0.001	210.71	1.828s
EU-154	5098.19	1274.54	7.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	21.	-11.	-0.006	69.78	1.840s
CO-60	5329.85	1332.50	0.	8.	0.004	37.14	1.866s
AG-110M	5536.88	1384.30	0.	0.	0.000	1000.00	1.899s
EU-152	5631.62	1408.00	0.	0.	0.000	807.45	1.914s
K-40	5845.09	1461.42	3.	151.	0.084	8.35	1.418s
La-140	6383.73	1596.21	17.	-8.	-0.004	125.93	2.024s
SB-124	6762.39	1690.98	0.	0.	0.000	1000.00	2.076s
BI-214	7056.06	1764.49	10.	5.	0.003	102.30	2.114s
Co-56	7083.46	1771.35	17.	-2.	-0.001	260.69	2.117s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	1.0132E+00				5.31E+01	
			477.60	1.013E+00 ?(		9.856E+00 2.70E+02 1.05E+01	G
NA-22	C	1.6184E-01				9.50E+02	
			1274.53	1.618E-01 ?(		1.308E+00 2.11E+02 9.99E+01	G
K-40	N	1.5356E+02				4.66E+11	
			1460.83	1.536E+02 (P		1.165E+01 8.35E+00 1.07E+01	G
Sc-46	F	9.9242E-02				8.38E+01	
			889.28	9.873E-02 ?(		1.919E+00 5.37E+02 1.00E+02	G
			1120.55	9.975E-02 ?(		2.632E+00 7.35E+02 1.00E+02	G
CR-51	F	1.7248E+00				2.77E+01	
			320.08	1.725E+00 ?(P		8.220E+00 1.37E+02 9.94E+00	G
MN-54	C	1.5402E-01				3.12E+02	
			834.85	1.540E-01 ?(P		1.173E+00 2.97E+02 1.00E+02	G
FE-59	F	-6.0663E-01				4.45E+01	
			1099.25	-6.066E-01 &(		3.572E+00 2.51E+02 5.65E+01	G
			1291.60	-2.605E+00 + P		5.520E+00 6.98E+01 4.32E+01	G
Co-56	C	8.1011E-01				7.73E+01	
			846.77	3.634E-01 ?(		8.799E-01 9.72E+01 9.99E+01	G
			1238.28	1.178E+00 ?(P		2.582E+00 9.71E+01 6.61E+01	G
			1037.84	2.250E+00 ?(P		7.650E+00 1.37E+02 1.41E+01	G
			1771.35	-1.931E+00 +		1.830E+01 2.61E+02 1.55E+01	A
CO-57	C	-4.9279E-03				2.72E+02	
			122.06	-4.928E-03 %(		9.349E-01 5.46E+03 8.56E+01	G
			136.47	-2.151E+00 &		9.790E+00 1.35E+02 1.07E+01	G
CO-58	C	-8.8967E-02				7.09E+01	
			810.78	-8.897E-02 ?(		1.548E+00 4.74E+02 9.95E+01	G
CO-60	F	7.8227E-01				1.93E+03	
			1332.50	7.823E-01 ?(P		7.427E-01 3.71E+01 1.00E+02	G
			1173.24	1.734E-01 - P		1.198E+00 2.68E+02 9.99E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
ZN-65	F	-6.5926E-01					2.44E+02	
			1115.55	-6.593E-01	?(	5.508E+00	2.38E+02	5.06E+01 G
NB-94	I	3.5852E-01					7.41E+06	
			702.63	1.804E-01	?(	1.173E+00	2.52E+02	9.79E+01 G
			871.10	5.331E-01	?(	1.314E+00	7.36E+01	9.99E+01 G
ZR-95	I	-1.2351E-01					6.40E+01	
			756.73	-1.235E-01	?(P	2.250E+00	6.56E+02	5.45E+01 G
			724.20	0.000E+00	+	2.985E+00	1.00E+03	4.42E+01 G
RU-103	I	2.7953E-01					3.93E+01	
			497.05	2.795E-01	&(P	7.802E-01	1.06E+02	9.09E+01 G
			610.30	4.182E+00	?	4.449E+01	3.09E+02	5.75E+00 GA
RH-106	I	2.9232E+00					3.74E+02	
			621.92	2.923E+00	?(	2.995E+01	2.99E+02	9.93E+00 G
			1050.36	-3.436E+01	&	1.286E+02	1.08E+02	1.56E+00 G
			511.86	1.054E+01		6.689E+00	3.48E+01	2.00E+01 GA
AG-108M	C	2.8640E-01					1.53E+05	
			433.94	3.029E-01	?(P	1.191E+00	1.54E+02	9.05E+01 G
			722.94	0.000E+00	-	1.695E+00	1.00E+03	9.08E+01 G
			614.28	2.698E-01	?(	2.925E+00	3.15E+02	8.98E+01 G
AG-110M	F	4.5257E-01					2.50E+02	
			884.68	5.285E-01	?(	2.368E+00	1.28E+02	7.27E+01 G
			657.76	3.943E-01	?(	1.173E+00	8.71E+01	9.46E+01 G
			937.49	-2.109E+00	+	4.984E+00	1.00E+02	3.44E+01 G
			1384.30	0.000E+00	-	3.157E+00	1.00E+03	2.43E+01 G
			763.94	-1.228E+00	+	7.415E+00	1.71E+02	2.23E+01 G
SN-113	F	-4.9887E-01					1.15E+02	
			391.69	-4.989E-01	?(	2.256E+00	1.32E+02	6.40E+01 G
SB-124	F	3.5935E-01					6.02E+01	
			602.73	1.228E-01	?(P	2.489E+00	5.84E+02	9.83E+01 G
			1690.98	0.000E+00	-	1.899E+00	1.00E+03	4.78E+01 G
			722.79	2.509E+00	?(	1.299E+01	1.47E+02	1.08E+01 G
SB-125	I	1.9953E+00					1.01E+03	
			427.88	-1.321E-01	?(P	2.806E+00	6.39E+02	2.96E+01 G
			600.50	1.320E+00	?(	1.316E+01	2.89E+02	1.79E+01 G
			635.89	7.868E+00	?(P	6.561E+00	3.20E+01	1.13E+01 G
			463.37	2.819E+00	?(P	8.943E+00	9.28E+01	1.05E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	I	6.7340E-01					8.02E+00	
			364.48	9.118E-02	?(P	7.614E-01	2.93E+02	8.17E+01 G
			284.30	8.420E+00	?(	1.022E+01	4.88E+01	6.14E+00 G
			636.97	-2.169E-02	& P	1.859E+01	2.32E+04	7.17E+00 G
Gd-153	F	-3.0197E-01					2.42E+02	
			97.50	-3.020E-01	(	2.770E+00	2.68E+02	3.00E+01 G
			103.20	-6.351E-01	&	4.082E+00	1.89E+02	2.18E+01 G
Ga-68	C	1.4996E+01					4.71E-02	
			1077.40	1.500E+01	?(	5.232E+01	1.46E+02	3.30E+00 G
Tc-99m	I	2.3034E-01					2.51E-01	
			140.51	2.303E-01	(	9.563E-01	1.23E+02	8.93E+01 G
BA-133	F	-2.3554E-01					3.85E+03	
			356.00	-6.456E-01	?(	3.418E+00	1.57E+02	6.20E+01 G
			302.85	1.152E+00	(	9.235E+00	2.35E+02	1.83E+01 G
			383.84	7.951E-01		1.506E+01	5.39E+02	8.94E+00 GA
			80.99	-3.603E-01	+	2.570E+00	2.61E+02	3.41E+01 GA
CS-134	I	2.4353E-01					7.54E+02	
			604.71	2.435E-01	&(	2.542E+00	3.03E+02	9.76E+01 G
			795.87	3.820E-02	%	2.005E+00	1.44E+03	8.55E+01 G
			569.32	0.000E+00	-	6.853E+00	1.00E+03	1.54E+01 G
			801.95	3.784E-01	%	1.762E+01	1.26E+03	8.69E+00 G
			563.24	-4.688E+00	+	1.380E+01	1.15E+02	8.35E+00 G
CS-137	I	-1.5952E-01					1.10E+04	
			661.66	-1.595E-01	&(P	1.722E+00	2.89E+02	8.52E+01 G
CE-139	F	2.2106E-01					1.38E+02	
			165.85	2.211E-01	&(	8.466E-01	1.13E+02	7.99E+01 G
Ba-140	I	1.4067E+00					1.28E+01	
			537.26	7.816E-01	?(P	2.391E+00	1.11E+02	2.44E+01 G
			162.66	-4.504E+00	+	1.715E+01	1.13E+02	6.22E+00 G
			304.85	4.961E+00	(	4.064E+01	2.40E+02	4.29E+00 G
La-140	I	-5.8489E-01					1.28E+01	
			1596.21	-9.838E-01	?(	2.696E+00	1.26E+02	9.54E+01 G
			487.02	-5.981E-01	+ P	2.049E+00	1.06E+02	4.55E+01 G
			328.76	1.290E+00	?(P	3.834E+00	1.11E+02	2.03E+01 G
			815.77	-2.975E+00	+	8.563E+00	8.53E+01	2.33E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-144	I 9.7741E-01					2.85E+02	
		133.54	9.774E-01	(	7.636E+00	2.28E+02	1.11E+01 G
PM-144	C 8.8542E-01					3.63E+02	
		696.54	8.854E-01	?(	4.350E-01	2.58E+01	9.90E+01 G
		618.06	2.368E-01	- P	2.724E+00	3.34E+02	9.91E+01 G
EU-152	F 5.0504E+00					4.94E+03	
		344.29	8.012E-01	?(	5.453E+00	1.98E+02	2.65E+01 G
		1112.07	-6.554E+00	+	2.265E+01	1.02E+02	1.36E+01 G
		121.78	-7.266E-01	+	2.632E+00	1.07E+02	2.86E+01 G
		778.92	-9.918E-01	+	9.991E+00	4.03E+02	1.29E+01 G
		964.11	1.366E+01	?(	3.873E+00	1.96E+01	1.46E+01 G
		244.69	3.313E+00	?(	2.033E+01	1.81E+02	7.58E+00 G
		1408.00	-1.882E-01	- P	3.703E+00	8.07E+02	2.10E+01 GA
EU-154	I -7.1474E+00					3.14E+03	
		873.23	-7.147E+00	?(P	1.828E+01	5.77E+01	1.23E+01 G
		123.10	1.714E-01	+	1.814E+00	3.06E+02	4.08E+01 G
		1274.54	0.000E+00	+	4.147E+00	1.00E+03	3.52E+01 G
		723.36	0.000E+00	+	7.618E+00	1.00E+03	2.02E+01 G
		1004.77	-4.353E+00	&	1.473E+01	9.96E+01	1.80E+01 G
		996.33	4.224E+00	+	1.308E+01	8.99E+01	1.06E+01 G
EU-155	I -1.2242E+00					1.81E+03	
		105.31	-1.224E+00	?(P	6.158E+00	9.36E+01	2.12E+01 G
		86.54	-9.677E-01	&	5.092E+00	1.57E+02	3.07E+01 G
HF-181	F -9.1859E-02					4.24E+01	
		482.00	-3.575E-01	?(P	1.523E+00	9.90E+01	8.05E+01 G
		133.02	4.020E-01	?(	1.864E+00	1.37E+02	4.33E+01 G
		345.83	0.000E+00	+	9.985E+00	1.00E+03	1.51E+01 G
		136.30	0.000E+00	&	1.499E+01	1.00E+03	5.85E+00 G
Ta-182	F 2.7225E+00					1.14E+02	
		1121.30	1.789E+00	?(	7.673E+00	1.24E+02	3.49E+01 G
		1221.41	1.156E+00	&(	6.217E+00	2.29E+02	2.70E+01 G
		1189.05	7.345E+00	&(	4.164E+00	2.77E+01	1.62E+01 G
Hg-203	F 1.0165E-01					4.66E+01	
		279.20	1.016E-01	?(P	1.114E+00	3.11E+02	8.15E+01 G
TL-208	N 1.6180E+00					6.98E+02	
		583.02	1.163E+00	?(P	1.289E+00	4.64E+01	8.45E+01 G
		277.28	3.296E+00	?(	1.405E+01	1.24E+02	6.31E+00 G
		860.56	3.860E+00	?(P	9.790E+00	1.03E+02	1.24E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
pm-146	C	-1.5189E+00						2.02E+03	
			747.16	-1.519E+00	?(4.030E+00		1.08E+02	3.40E+01	G
			735.72	-3.353E+00	+ 7.715E+00		9.55E+01	2.25E+01	G
			453.88	1.969E-01	+ P 1.221E+00		2.28E+02	6.50E+01	G
y-88	F	-5.4406E-01						1.07E+02	
			898.04	-5.441E-01	?(P 1.779E+00		1.03E+02	9.37E+01	G
			1836.06	-1.022E-02	% P 9.809E-01		6.57E+03	9.92E+01	G
Cd-113m		-3.4694E+03						5.33E+03	
			263.70	-3.469E+03	?(1.396E+04		1.17E+02	6.00E-03	K
Cd-109	F	-7.7951E+00						4.53E+02	
			88.04	-7.795E+00	?(3.814E+01		1.46E+02	3.79E+00	G
Cf-251	T	5.8590E-01						3.28E+05	
			176.60	5.859E-01	&(3.398E+00		2.07E+02	1.70E+01	G
			227.00	2.797E+00	? 9.201E+00		1.18E+02	6.30E+00	GA
Sn-126		2.2508E+00						3.65E+07	
			87.57	-7.891E-01	- 3.960E+00		1.50E+02	3.75E+01	GA
			64.28	2.251E+00	&(1.109E+01		1.45E+02	9.70E+00	G
			86.94	-3.281E+00	+ 1.687E+01		1.53E+02	9.04E+00	GA
PB-210	N	9.0252E+00						8.14E+03	
			46.54	9.025E+00	(P 2.623E+01		9.78E+01	4.25E+00	G
PB-212	N	4.1759E+00						6.98E+02	
			238.63	4.176E+00	(P 1.400E+00		1.47E+01	4.33E+01	G
			300.03	5.911E+00	P 4.601E+01		2.27E+02	3.28E+00	GA
PB-214	N	7.9666E+00						5.84E+05	
			351.93	8.575E+00	(P 1.903E+00		1.33E+01	3.76E+01	G
			295.09	6.781E+00	(P 2.116E+00		1.75E+01	1.93E+01	G
			242.00	6.579E+00	8.457E+00		4.14E+01	7.43E+00	GA
BI-212	N	4.9481E+00						6.98E+02	
			727.17	4.948E+00	?(1.840E+01		1.07E+02	7.55E+00	G
			785.42	2.524E+01	? 1.017E+02		1.65E+02	1.28E+00	GA
U-235	N	1.5286E+00						2.57E+11	
			143.79	7.040E-01	&(P 8.093E+00		3.35E+02	1.10E+01	G
			205.33	9.649E-01	?(P 1.370E+01		5.00E+02	5.01E+00	G
			163.38	3.864E+00	?(P 1.632E+01		1.24E+02	5.08E+00	G
			185.72	4.786E-01	1.362E+00		1.05E+02	5.40E+01	GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	N	7.0514E+00					5.84E+05	
			609.31	7.051E+00	(P	1.337E+00	1.35E+01	4.61E+01 G
			1120.29	4.855E+00	- P	1.886E+01	1.14E+02	1.51E+01 G
			1764.49	4.069E+00	- P	1.452E+01	1.02E+02	1.54E+01 G
BI-210M	T	-1.2735E-02					1.10E+09	
			265.83	-3.580E-01	?(	2.108E+00	1.71E+02	5.00E+01 G
			304.90	6.038E-01	(	6.370E+00	3.09E+02	2.80E+01 G
AC-228	N	4.2355E+00					2.10E+03	
			911.07	4.235E+00	?(P	3.370E+00	3.72E+01	2.90E+01 G
			968.97	-2.473E+00	-	1.316E+01	1.53E+02	1.75E+01 G
			338.32	2.391E+00	- P	1.047E+01	1.28E+02	1.20E+01 G
			93.35	4.552E+00	&	2.130E+01	1.39E+02	5.56E+00 XA
TH-227	N	5.4370E-01					7.95E+03	
			50.14	-3.569E-01	%(P	1.515E+01	1.17E+03	8.00E+00 G
			256.24	1.573E+00	?(	9.553E+00	2.24E+02	7.00E+00 G
TH-229	N	-4.5774E+00					2.68E+06	
			193.51	-4.577E+00	?(	1.909E+01	1.52E+02	4.40E+00 G
			210.85	-4.580E+00	+	2.414E+01	1.89E+02	2.99E+00 G
TH-234	N	1.4399E+01					1.63E+12	
			63.29	1.296E+01	(P	1.933E+01	5.30E+01	3.81E+00 G
			92.59	1.538E+01	*(P	1.132E+01	2.89E+01	5.58E+00 G
PA-231	N	7.8688E+00					1.20E+07	
			302.65	7.329E+00	&(	5.728E+01	2.29E+02	2.88E+00 G
			300.07	8.500E+00	(	6.306E+01	2.17E+02	2.46E+00 G
PA-233	C	1.4119E-01					7.82E+08	
			312.01	-4.155E-01	*(	2.450E+00	2.20E+02	3.60E+01 G
			300.18	3.374E+00	(	2.574E+01	2.23E+02	6.20E+00 G
PA-234	N	2.8009E+00					1.63E+12	
			131.29	9.605E-01	?(	4.240E+00	1.30E+02	1.80E+01 G
			946.02	4.419E+00	&(	9.552E+00	9.00E+01	1.34E+01 G
			569.47	2.007E-01	%	1.309E+01	1.74E+03	8.20E+00 G
			883.24	3.993E+00	?(	1.573E+01	1.13E+02	9.60E+00 G
			880.53	6.363E+00	?	2.097E+01	9.50E+01	6.00E+00 GA
PA-234M	N	7.9814E+01					1.63E+12	
			1001.00	5.382E+01	?(	2.012E+02	1.07E+02	8.37E-01 G
			766.41	1.538E+02	&(	4.597E+02	8.76E+01	2.94E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	T 5.3993E-01					1.58E+05	
		59.54	5.399E-01	?(P	2.605E+00	1.66E+02	3.59E+01 G
Np-237	F -2.2686E+00					2.14E+06	
		86.49	-2.269E+00	&(	1.220E+01	1.60E+02	1.31E+01 G
Ir-192	F 2.5488E-01					7.40E+01	
		316.49	2.549E-01	?(	9.207E-01	1.05E+02	8.70E+01 G
		468.06	-8.909E-01	+	3.078E+00	1.02E+02	5.18E+01 G
		308.44	-7.121E-07	%	5.772E+00	2.35E+08	3.18E+01 G
Cs-136	F 4.2978E-01					1.30E+01	
		818.50	4.918E-01	?(	1.928E+00	1.14E+02	1.00E+02 G
		1048.07	2.058E-01	?(	1.795E+00	2.35E+02	8.00E+01 G
		340.57	6.797E-01	?(	2.871E+00	1.24E+02	4.69E+01 G
Np-239	T -9.0039E-01					2.36E+00	
		103.70	0.000E+00	+	3.818E+00	1.00E+03	2.40E+01 X
		106.13	-9.004E-01	(	5.683E+00	1.87E+02	2.27E+01 G
		99.50	-1.289E+00	+	5.699E+00	1.31E+02	1.50E+01 X
Nd-147	3.8056E-01					1.11E+01	
		531.00	-7.166E-01	?(	7.650E+00	3.98E+02	1.30E+01 G
		91.10	8.846E-01	?(	4.320E+00	1.45E+02	2.83E+01 G
TL-210	N 1.1572E-01					5.84E+05	
		799.60	0.000E+00	?(	1.755E+00	1.00E+03	9.90E+01 G
		296.00	2.607E-01	?(	1.826E+00	2.05E+02	7.90E+01 G
		1313.00	-1.579E-01	%	6.383E+00	1.58E+03	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
    negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
    failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the
    library energy centroid for positive identification.
P - Peakbackground subtraction

} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
Sn-126	64.28	118.	11.	0.006	145.12	2.251E+00	
BA-133	80.99	113.	-7.	-0.004	260.96	-3.603E-01	
Np-237	86.49	425.	-18.	-0.010	160.37	-2.269E+00	
EU-155	86.54	407.	-18.	-0.010	156.94	-9.677E-01	
Sn-126	86.94	388.	-18.	-0.010	153.39	-3.281E+00	
Sn-126	87.57	370.	-18.	-0.010	149.66	-7.891E-01	
Cd-109	88.04	351.	-18.	-0.010	145.89	-7.795E+00	
Nd-147	91.10	255.	16.	0.009	145.20	8.846E-01	
Gd-153	97.50	119.	-6.	-0.003	267.51	-3.020E-01	
Np-239	99.50	127.	-12.	-0.007	130.68	-1.289E+00	
Gd-153	103.20	140.	-9.	-0.005	188.89	-6.351E-01	
EU-155	105.31	312.	-17.	-0.009	93.63	-1.224E+00	P
Np-239	106.13	305.	-13.	-0.007	187.39	-9.004E-01	
EU-152	121.78	97.	-13.	-0.007	107.34	-7.266E-01	
EU-154	123.10	93.	4.	0.002	306.45	1.714E-01	
PA-234	131.29	95.	11.	0.006	130.02	9.605E-01	
HF-181	133.02	106.	11.	0.006	136.61	4.020E-01	
CE-144	133.54	117.	7.	0.004	228.26	9.774E-01	
CO-57	136.47	179.	-14.	-0.008	135.00	-2.151E+00	
Tc-99m	140.51	107.	12.	0.007	122.65	2.303E-01	
U-235	143.79	120.	5.	0.003	334.68	7.040E-01	P
Ba-140	162.66	150.	-16.	-0.009	113.19	-4.504E+00	
U-235	163.38	87.	11.	0.006	124.46	3.864E+00	P
CE-139	165.85	58.	10.	0.006	112.53	2.211E-01	
Cf-251	176.60	37.	5.	0.003	206.63	5.859E-01	
U-235	185.72	57.	13.	0.007	104.58	4.786E-01	
TH-229	193.51	70.	-10.	-0.006	152.21	-4.577E+00	
U-235	205.33	41.	2.	0.001	500.06	9.649E-01	P
TH-229	210.85	43.	-6.	-0.004	189.18	-4.580E+00	
Cf-251	227.00	23.	8.	0.004	117.79	2.797E+00	
EU-152	244.69	167.	10.	0.006	180.97	3.313E+00	
TH-227	256.24	26.	4.	0.002	223.94	1.573E+00	
Cd-113m	263.70	40.	-8.	-0.004	117.26	-3.469E+03	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
BI-210M	265.83	65.	-7.	-0.004	170.98	-3.580E-01		
Hg-203	279.20	43.	3.	0.002	311.10	1.016E-01	P	
I-131	284.30	18.	19.	0.010	48.76	8.420E+00		
TL-210	296.00	105.	7.	0.004	204.63	2.607E-01		
PA-231	300.07	119.	7.	0.004	216.97	8.500E+00		
PA-233	300.18	126.	7.	0.004	223.27	3.374E+00		
PA-231	302.65	134.	7.	0.004	228.86	7.329E+00		
BA-133	302.85	141.	7.	0.004	234.77	1.152E+00		
Ba-140	304.85	148.	7.	0.004	240.14	4.961E+00		
BI-210M	304.90	155.	6.	0.003	308.72	6.038E-01		
PA-233	312.01	33.	-5.	-0.003	219.55	-4.155E-01		
Ir-192	316.49	26.	7.	0.004	105.11	2.549E-01		
CR-51	320.08	27.	6.	0.003	136.83	1.725E+00	P	
La-140	328.76	23.	8.	0.005	111.27	1.290E+00	P	
Cf-249	333.44	33.	-9.	-0.005	123.98	-1.835E+00		
Cs-136	340.57	71.	10.	0.006	124.05	6.797E-01		
EU-152	344.29	80.	7.	0.004	197.88	8.012E-01		
BA-133	356.00	170.	-12.	-0.007	156.50	-6.456E-01		
I-131	364.48	11.	2.	0.001	293.06	9.118E-02	P	
BA-133	383.84	57.	2.	0.001	538.52	7.951E-01		
SN-113	391.69	64.	-9.	-0.005	132.26	-4.989E-01		
SB-125	427.88	16.	-1.	-0.001	639.45	-1.321E-01	P	
AG-108M	433.94	28.	7.	0.004	153.65	3.029E-01	P	
pm-146	453.88	13.	3.	0.002	228.00	1.969E-01	P	
SB-125	463.37	18.	7.	0.004	92.77	2.819E+00	P	
Ir-192	468.06	57.	-11.	-0.006	101.94	-8.909E-01		
BE-7	477.59	22.	2.	0.001	269.81	1.013E+00		
HF-181	482.00	31.	-7.	-0.004	98.98	-3.575E-01	P	
La-140	487.02	16.	-6.	-0.003	106.47	-5.981E-01	P	
RU-103	497.05	8.	6.	0.003	105.55	2.795E-01	P	
RH-106	511.86	33.	47.	0.026	34.77	1.054E+01		
Nd-147	531.00	16.	-2.	-0.001	397.91	-7.166E-01		
Ba-140	537.26	4.	4.	0.002	110.82	7.816E-01	P	
CS-134	563.24	20.	-8.	-0.004	115.02	-4.688E+00		
SB-125	600.50	84.	5.	0.003	288.54	1.320E+00		
SB-124	602.73	91.	2.	0.001	584.09	1.228E-01	P	
CS-134	604.71	94.	5.	0.003	302.51	2.435E-01		
RU-103	610.30	98.	5.	0.003	308.54	4.182E+00		
AG-108M	614.28	103.	5.	0.003	314.70	2.698E-01		
RH-106	621.92	131.	5.	0.003	298.95	2.923E+00		
SB-125	635.89	6.	16.	0.009	32.02	7.868E+00	P	
AG-110M	657.76	14.	7.	0.004	87.08	3.943E-01		
CS-137	661.66	25.	-2.	-0.001	289.22	-1.595E-01	P	
NB-94	702.63	13.	3.	0.002	252.03	1.804E-01		
SB-124	722.79	20.	5.	0.003	146.57	2.509E+00		
pm-146	735.72	30.	-12.	-0.007	95.50	-3.353E+00		
pm-146	747.16	17.	-8.	-0.005	107.70	-1.519E+00		
ZR-95	756.73	13.	-1.	-0.001	656.18	-1.235E-01	P	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
AG-110M	763.94	25.	-4.	-0.002	171.14	-1.228E+00		
PA-234M	766.41	16.	7.	0.004	87.58	1.538E+02		
EU-152	778.92	14.	-2.	-0.001	403.11	-9.918E-01		
CO-58	810.78	19.	-1.	-0.001	474.34	-8.897E-02		
La-140	815.77	34.	-10.	-0.006	85.29	-2.975E+00		
Cs-136	818.50	31.	7.	0.004	113.90	4.918E-01		
MN-54	834.85	10.	2.	0.001	296.81	1.540E-01	P	
Co-56	846.77	5.	5.	0.003	97.15	3.634E-01		
NB-94	871.10	12.	8.	0.004	73.56	5.331E-01		
EU-154	873.23	39.	-12.	-0.007	57.70	-7.147E+00	P	
PA-234	880.53	10.	5.	0.003	95.05	6.363E+00		
PA-234	883.24	16.	5.	0.003	112.81	3.993E+00		
AG-110M	884.68	21.	5.	0.003	128.17	5.285E-01		
Sc-46	889.28	27.	1.	0.001	536.90	9.873E-02		
y-88	898.04	19.	-7.	-0.004	102.56	-5.441E-01	P	
AG-110M	937.49	19.	-10.	-0.005	100.12	-2.109E+00		
PA-234	946.02	9.	8.	0.004	90.05	4.419E+00		
EU-152	964.11	0.	26.	0.014	19.61	1.366E+01		
EU-154	996.33	10.	6.	0.003	89.86	4.224E+00		
PA-234M	1001.00	16.	6.	0.003	107.49	5.382E+01		
EU-154	1004.77	43.	-10.	-0.005	99.60	-4.353E+00		
Co-56	1037.84	5.	4.	0.002	136.69	2.250E+00	P	
Cs-136	1048.07	10.	2.	0.001	234.52	2.058E-01		
RH-106	1050.36	22.	-6.	-0.004	108.24	-3.436E+01		
BI-207	1063.66	11.	-4.	-0.002	151.63	-4.020E-01	P	
Ga-68	1077.40	10.	5.	0.003	146.06	1.500E+01		
FE-59	1099.25	20.	-4.	-0.002	250.83	-6.066E-01		
EU-152	1112.07	50.	-10.	-0.006	101.80	-6.554E+00		
ZN-65	1115.55	40.	-4.	-0.002	237.69	-6.593E-01		
Sc-46	1120.55	35.	1.	0.001	734.91	9.975E-02		
Co-56	1238.28	11.	8.	0.005	97.08	1.178E+00	P	
NA-22	1274.53	5.	2.	0.001	210.71	1.618E-01		
FE-59	1291.60	21.	-11.	-0.006	69.78	-2.605E+00	P	
EU-152	1408.00	0.	0.	0.000	807.45	-1.882E-01	P	
La-140	1596.21	17.	-8.	-0.004	125.93	-9.838E-01		
Co-56	1771.35	17.	-2.	-0.001	260.69	-1.931E+00		

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	1.0132E+00	1.0132E+00	2.698E+02%	9.86E+00
NA-22	#A	1.6184E-01	1.6184E-01	2.107E+02%	1.31E+00
K-40		1.5356E+02	1.5356E+02	8.345E+00%	1.16E+01
Sc-46	#A	9.9242E-02	9.9242E-02	4.551E+02%	1.92E+00

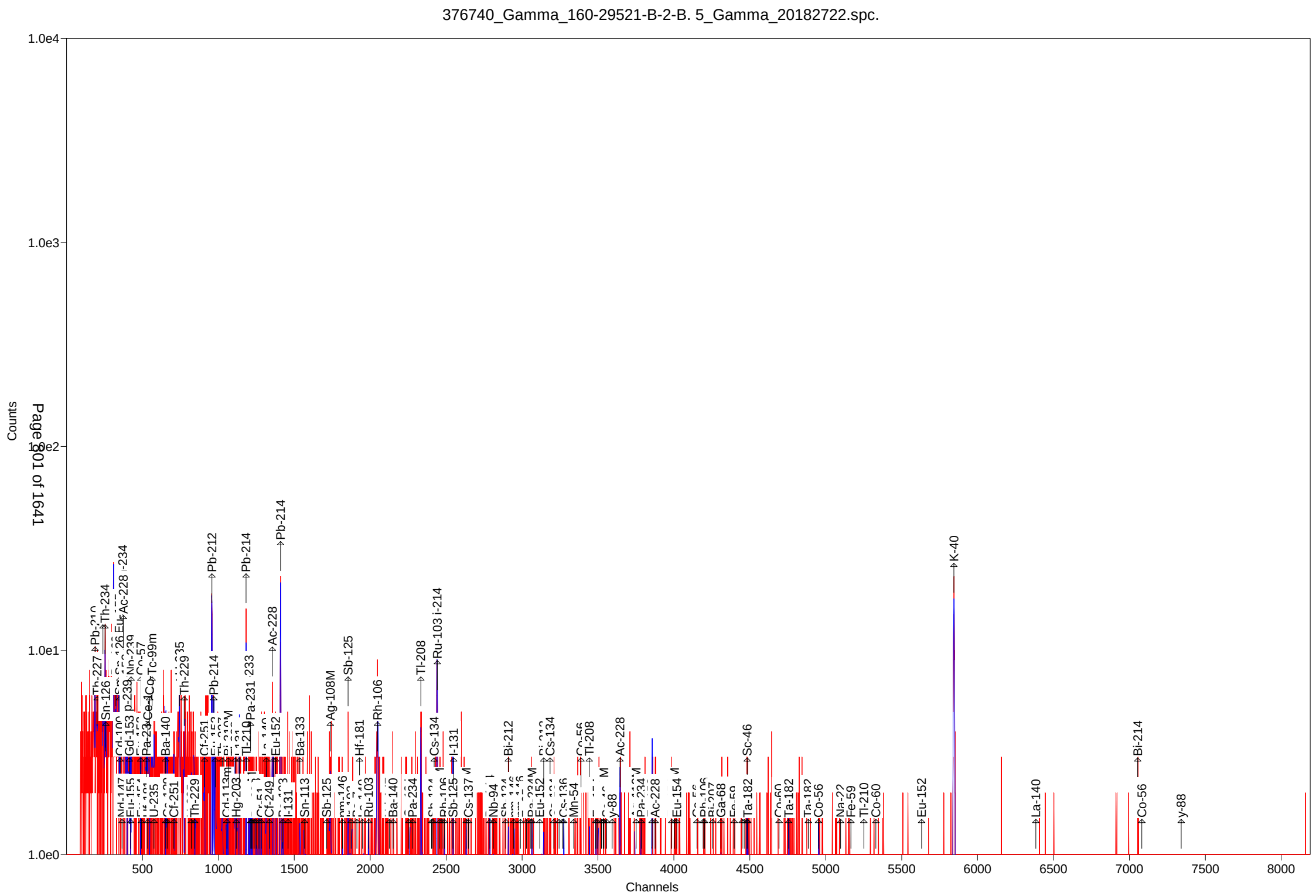
CR-51	#A	1.7248E+00	1.7248E+00	1.368E+02%	8.22E+00
MN-54	#A	1.5402E-01	1.5402E-01	2.968E+02%	1.17E+00
FE-59	#A	-6.0662E-01	-6.0663E-01	2.508E+02%	3.57E+00
Co-56	#A	8.1011E-01	8.1011E-01	6.459E+01%	8.80E-01
CO-57	#A	-4.9279E-03	-4.9279E-03	5.459E+03%	9.35E-01
CO-58	#A	-8.8966E-02	-8.8967E-02	4.743E+02%	1.55E+00
CO-60	#	7.8227E-01	7.8227E-01	3.714E+01%	7.43E-01
ZN-65	#A	-6.5926E-01	-6.5926E-01	2.377E+02%	5.51E+00
NB-94	#A	3.5852E-01	3.5852E-01	7.356E+01%	1.17E+00
ZR-95	#A	-1.2351E-01	-1.2351E-01	6.562E+02%	2.25E+00
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.78E+00
RU-103	#A	2.7953E-01	2.7953E-01	1.056E+02%	7.80E-01
RH-106	#A	2.9232E+00	2.9232E+00	2.989E+02%	2.99E+01
AG-108M	#A	2.8640E-01	2.8640E-01	1.536E+02%	1.19E+00
AG-110M	#A	4.5257E-01	4.5257E-01	7.748E+01%	2.37E+00
SN-113	#A	-4.9887E-01	-4.9887E-01	1.323E+02%	2.26E+00
SB-124	#A	3.5935E-01	3.5935E-01	1.466E+02%	2.49E+00
SB-125	#A	1.9953E+00	1.9953E+00	3.202E+01%	2.81E+00
I-131	#A	6.7336E-01	6.7340E-01	4.876E+01%	7.61E-01
Gd-153	#A	-3.0197E-01	-3.0197E-01	2.675E+02%	2.77E+00
Ga-68	#A	1.4851E+01	1.4996E+01	1.461E+02%	5.23E+01
Tc-99m	#A	2.2992E-01	2.3034E-01	1.227E+02%	9.56E-01
BA-133	#A	-2.3554E-01	-2.3554E-01	1.411E+02%	3.42E+00
CS-134	#A	2.4353E-01	2.4353E-01	3.025E+02%	2.54E+00
CS-137	#A	-1.5952E-01	-1.5952E-01	2.892E+02%	1.72E+00
CE-139	#A	2.2106E-01	2.2106E-01	1.125E+02%	8.47E-01
Ba-140	#A	1.4067E+00	1.4067E+00	1.108E+02%	2.39E+00
La-140	#A	-5.8487E-01	-5.8489E-01	8.402E+01%	2.70E+00
CE-141	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.89E+00
CE-144	#A	9.7741E-01	9.7741E-01	2.283E+02%	7.64E+00
PM-144	#	8.8542E-01	8.8542E-01	2.582E+01%	4.35E-01
EU-152	#A	5.0504E+00	5.0504E+00	1.961E+01%	5.45E+00
EU-154	#A	-7.1474E+00	-7.1474E+00	5.770E+01%	1.83E+01
EU-155	#A	-1.2242E+00	-1.2242E+00	9.363E+01%	6.16E+00
HF-181	#A	-9.1858E-02	-9.1859E-02	8.435E+01%	1.52E+00
Ta-182	#A	2.7225E+00	2.7225E+00	2.774E+01%	7.67E+00
Hg-203	#A	1.0165E-01	1.0165E-01	3.111E+02%	1.11E+00
TL-208	#	1.6179E+00	1.6180E+00	4.639E+01%	1.29E+00
pm-146	#A	-1.5189E+00	-1.5189E+00	1.077E+02%	4.03E+00
y-88	#A	-5.4406E-01	-5.4406E-01	1.026E+02%	1.78E+00
Cd-113m	#A	-3.4694E+03	-3.4694E+03	1.173E+02%	1.40E+04
Cd-109	#A	-7.7950E+00	-7.7951E+00	1.459E+02%	3.81E+01
Cf-251	#A	5.8590E-01	5.8590E-01	2.066E+02%	3.40E+00
Cf-249	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.09E+00
Sn-126	#A	2.2508E+00	2.2508E+00	1.451E+02%	1.11E+01
PB-210	A	9.0252E+00	9.0252E+00	9.785E+01%	2.62E+01
PB-212		4.1759E+00	4.1759E+00	1.471E+01%	1.40E+00
PB-214		7.9666E+00	7.9666E+00	1.099E+01%	1.90E+00
BI-207	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.11E+00

BI-212 #A	4.9481E+00	4.9481E+00	1.074E+02%	1.84E+01
U-235 #A	1.5286E+00	1.5286E+00	1.245E+02%	8.09E+00
BI-214	7.0514E+00	7.0514E+00	1.353E+01%	1.34E+00
BI-210M#A	-1.2735E-02	-1.2735E-02	1.710E+02%	2.11E+00
AC-228 #	4.2355E+00	4.2355E+00	3.719E+01%	3.37E+00
TH-227 #A	5.4370E-01	5.4370E-01	2.239E+02%	1.51E+01
TH-229 #A	-4.5774E+00	-4.5774E+00	1.522E+02%	1.91E+01
TH-234 A	1.4399E+01	1.4399E+01	2.893E+01%	1.93E+01
PA-231 #A	7.8688E+00	7.8688E+00	1.577E+02%	5.73E+01
PA-233 #A	1.4119E-01	1.4119E-01	1.566E+02%	2.45E+00
PA-234 #A	2.8009E+00	2.8009E+00	6.476E+01%	4.24E+00
PA-234M#A	7.9814E+01	7.9814E+01	6.933E+01%	2.01E+02
AM-241 #A	5.3993E-01	5.3993E-01	1.656E+02%	2.61E+00
Np-237 #A	-2.2686E+00	-2.2686E+00	1.604E+02%	1.22E+01
Ir-192 #A	2.5488E-01	2.5488E-01	1.051E+02%	9.21E-01
Cs-136 #A	4.2977E-01	4.2978E-01	9.624E+01%	1.93E+00
Np-239 #A	-9.0021E-01	-9.0039E-01	1.874E+02%	5.68E+00
Nd-147 #A	3.8054E-01	3.8056E-01	1.452E+02%	7.65E+00
TL-210 #A	1.1572E-01	1.1572E-01	2.046E+02%	1.75E+00

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 2000.8 keV) 1.872E+02 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 1.8715260E+02 Bq/Sample


376740_Gamma_160-29521-B-2-B. 5_Gamma_20182722.spc.
Counts
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Channels
Pb-214
Pb-212
Ac-228
Tl-208
Ru-103
Cs-134
K-40
Bi-214
Co-56
Co-60
Sc-46
Eu-152
La-140
y-88
Th-234
Th-227
Sn-126
Ac-228
Pb-214
Ag-108M
Sb-125
Hf-181
Rh-106
Ba-133
Ba-140
Cf-251
Th-229
Sn-113
I-131
Cs-137
Nb-94
Bi-212
Mn-54
Ta-182
Na-22
Fe-59
Tl-210

Test America St. Louis Spectrum ID: 9_Gamma_20183356

Sample Description: 376740_Gamma_160-29521-B-3-B
Detector: Detector # 9
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29521-B-3-B

Decay to Time: 8/9/2018 07:15 Live Time: 1800 sec
Acquisition Time: 8/9/2018 07:15:43 Real Time: 1803 sec
Analysis Time: 8/9/2018 07:45 Dead Time: 0.16 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 9_Soil_TunaCan.Clb
Efficiency Cal Desc: 9_Soil_TunaCan_90099_050312
Efficiency Cal Date: 6/14/2012 10:19
Energy Cal Date: 3/1/2012 13:57
Library: Client_Long_Rev14.lib
Bkgd Correction File: 9_2018-07-14_1810.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	2.222E+00	102.8	2.283E+00	2.286E+00	7.769E+00
NA-22	-1.192E-01	329.2	3.923E-01	3.924E-01	1.405E+00
K-40	1.873E+02	5.5	1.022E+01	1.401E+01	8.205E+00
Sc-46	3.270E-01	114.2	3.733E-01	3.737E-01	1.278E+00
CR-51	-1.642E-02	14607.4	2.398E+00	2.398E+00	8.396E+00
MN-54	-5.263E-01	87.9	4.624E-01	4.632E-01	1.034E+00
FE-59	-9.382E-01	80.8	7.581E-01	7.596E-01	2.151E+00
Co-56	3.234E-01	40.0	1.295E-01	1.306E-01	8.724E-01
CO-57	-2.276E-01	83.8	1.907E-01	1.910E-01	6.368E-01
CO-58	-4.669E-01	82.0	3.827E-01	3.834E-01	1.284E+00
CO-60	-3.409E-02	1601.9	5.461E-01	5.461E-01	9.848E-01
ZN-65	5.987E-01	146.3	8.757E-01	8.762E-01	3.027E+00
NB-94	3.021E-01	88.5	2.672E-01	2.676E-01	9.047E-01
ZR-95	-6.329E-01	80.6	5.100E-01	5.111E-01	1.765E+00
NB-95	-1.145E-02	2264.9	2.594E-01	2.594E-01	9.452E-01
RU-103	2.369E-01	103.8	2.459E-01	2.462E-01	6.045E-01
RH-106	0.000E+00	1.#INF	7.229E-01	7.229E-01	1.996E+01
AG-108M	1.872E-01	96.0	1.796E-01	1.799E-01	5.506E-01
AG-110M	-8.364E-01	77.8	6.507E-01	6.521E-01	2.172E+00
SN-113	-1.136E-01	491.7	5.584E-01	5.584E-01	1.195E+00
SB-124	3.391E-01	78.2	2.652E-01	2.658E-01	1.972E+00
SB-125	7.704E-01	72.9	5.620E-01	5.633E-01	1.669E+00
I-131	1.473E-01	103.3	1.522E-01	1.524E-01	7.510E-01
Gd-153	0.000E+00	1.#INF	2.179E-01	2.179E-01	3.955E+00
Ga-68	1.030E+01	89.7	9.241E+00	9.259E+00	2.133E+01
Tc-99m	0.000E+00	1.#INF	5.037E-02	5.038E-02	1.301E+00
BA-133	-4.459E-01	136.3	6.076E-01	6.081E-01	2.049E+00
CS-134	1.798E-01	150.1	2.699E-01	2.700E-01	1.988E+00
CS-137	-1.286E-02	1475.1	1.897E-01	1.897E-01	1.358E+00
CE-139	1.965E-01	103.1	2.026E-01	2.034E-01	6.834E-01
Ba-140	7.909E-01	134.7	1.065E+00	1.066E+00	2.632E+00
La-140	1.536E-01	122.9	1.887E-01	1.889E-01	9.203E-01
CE-141	1.687E-01	392.7	6.626E-01	6.627E-01	2.236E+00

CE-144	-1.953E+00	146.1	2.855E+00	2.857E+00	9.559E+00
PM-144	-7.348E-02	233.6	1.716E-01	1.717E-01	1.087E+00
EU-152	4.802E-01	64.8	3.110E-01	3.120E-01	5.035E+00
EU-154	4.292E-01	106.1	4.553E-01	4.558E-01	9.516E+00
EU-155	3.857E-01	170.4	6.574E-01	6.577E-01	5.515E+00
HF-181	4.985E-02	636.1	3.171E-01	3.171E-01	1.119E+00
Ta-182	3.242E-01	411.8	1.335E+00	1.335E+00	4.732E+00
Hg-203	1.016E-02	2073.6	2.107E-01	2.107E-01	7.477E-01
TL-208	1.660E+00	18.4	3.058E-01	3.177E-01	5.301E-01
pm-146	3.762E-02	260.0	9.782E-02	9.784E-02	2.496E+00
y-88	-4.177E-01	35.9	1.499E-01	1.514E-01	1.096E+00
Cd-113m	3.326E+03	86.5	2.877E+03	2.885E+03	9.679E+03
Cd-109	5.338E+00	179.5	9.582E+00	9.587E+00	3.209E+01
Cf-251	-9.579E-01	139.7	1.338E+00	1.341E+00	3.464E+00
Cf-249	-1.877E-02	2486.7	4.669E-01	4.669E-01	1.622E+00
Sn-126	-5.268E-01	625.7	3.296E+00	3.296E+00	1.121E+01
PB-210	2.029E+00	461.0	9.355E+00	9.355E+00	3.202E+01
PB-212	3.125E+00	15.1	4.728E-01	5.142E-01	1.216E+00
PB-214	5.305E+00	12.0	6.383E-01	6.953E-01	1.656E+00
BI-207	1.113E-01	242.3	2.697E-01	2.698E-01	7.213E-01
BI-212	4.365E-01	854.4	3.730E+00	3.730E+00	1.339E+01
U-235	1.878E+00	151.8	2.852E+00	2.853E+00	9.558E+00
BI-214	5.087E+00	16.3	8.294E-01	8.705E-01	1.481E+00
BI-210M	3.511E-01	97.0	3.404E-01	3.410E-01	1.153E+00
AC-228	5.424E+00	16.4	8.916E-01	9.336E-01	9.956E-01
TH-227	3.611E+00	35.8	1.292E+00	1.307E+00	1.395E+01
TH-229	4.038E-01	81.6	3.296E-01	3.312E-01	1.311E+01
TH-234	0.000E+00	1.#INF	5.044E+00	5.044E+00	3.019E+01
PA-231	0.000E+00	1.#INF	1.921E+00	1.921E+00	4.850E+01
PA-233	-2.305E-02	2312.8	5.330E-01	5.330E-01	3.965E+00
PA-234	-1.197E+00	31.4	3.752E-01	3.802E-01	5.582E+00
PA-234M	-1.030E+00	1816.2	1.871E+01	1.871E+01	1.625E+02
AM-241	-6.486E-01	153.2	9.938E-01	9.943E-01	3.343E+00
Np-237	1.555E+00	167.2	2.600E+00	2.602E+00	8.714E+00
Ir-192	-2.987E-01	78.5	2.346E-01	2.352E-01	7.843E-01
Cs-136	3.636E-01	100.2	3.644E-01	3.650E-01	1.238E+00
Np-239	-9.388E-01	169.7	1.593E+00	1.594E+00	5.328E+00
Nd-147	8.617E-01	120.1	1.035E+00	1.036E+00	4.436E+00
TL-210	0.000E+00	1.#INF	8.770E-02	8.770E-02	1.191E+00
Total	3.570E+03				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 9_Gamma_20183356.An1

Sample description
376740_Gamma_160-29521-B-3-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20183356.An1

Acquisition information
Start time:	8/9/2018 7:15:43 AM
Live time:	1800
Real time:	1803
Dead time:	0.16 %
Detector ID:	9

Detector system
Ge9 S/N100228730

Calibration
Filename: 9_Soil_TunaCan.Clb
9_Soil_TunaCan_90099_050312

Energy Calibration
Created:	3/1/2012 1:57:17 PM
Zero offset:	0.074 keV
Gain:	0.250 keV/channel
Quadratic:	-2.269E-08 keV/channel^2

Efficiency Calibration
Created:	6/14/2012 10:19:51 AM
Knee Energy:	165.85 keV
Above the Knee:	Quadratic Uncertainty = 1.30 %
Log(Eff):	-8.079856E-01 + (-2.367265E-01*Log(E)) + (-3.950640E-02*Log(E)^2)
Below the Knee:	Quadratic Uncertainty = 1.42 %
Log(Eff):	-2.387916E+01 + (8.875647E+00*Log(E)) + (-9.401100E-01*Log(E)^2)

Library Files
Main analysis library:	Client_Long_Rev14.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.34keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 7:15:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2018-07-14_1810.PBC 7/14/2018 6:10:12 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.1341

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.54	4.	460.98	1.00	2.577E-02	46.54	4.250	PBC<MDA	PB210
50.14	3.	564.70	1.00	2.900E-02	50.14	8.000	PBC<MDA	TH227
77.15	102.	18.95	1.03	4.678E-02				
86.49	18.	167.20	1.04	5.008E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.634E-01	EU155
					86.94	9.040	2.248E+00	Sn126
86.54	18.	170.43	1.04	5.010E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.634E-01	EU155
					86.94	9.040	2.248E+00	Sn126
86.94	18.	173.55	1.04	5.021E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.636E-01	EU155
					86.94	9.040	2.248E+00	Sn126
87.57	18.	176.54	1.04	5.038E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	5.335E+00	Cd109
88.04	18.	179.51	1.04	5.051E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	5.338E+00	Cd109
91.10	17.	199.81	1.04	5.124E-02	91.10	28.300	PBC<MDA	Nd147
121.78	16.	91.27	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.984E-01	CO57
143.79	19.	151.82	1.09	5.039E-02	143.79	10.960	PBC<MDA	U235
145.44	7.	392.71	1.09	5.012E-02	145.44	48.200	PBC<MDA	CE141
165.85	13.	103.11	1.11	4.736E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.72	43.	32.64	1.13	4.403E-02	185.72	54.000	1.005E+00	U235
210.38	9.	167.88	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
227.00	27.	40.40	1.17	3.858E-02	227.00	6.300	6.171E+00	Cf251
238.41	91.	15.13	1.18	3.732E-02	238.63	43.300	3.125E+00	PB212
241.78	12.	161.69	1.18	3.697E-02	242.00	7.430	PBC<MDA	PB214
244.69	14.	150.63	1.18	3.670E-02	244.69	7.580	PBC<MDA	EU152
256.24	31.	35.78	1.20	3.558E-02	256.24	7.000	6.916E+00	TH227
263.70	13.	86.49	1.20	3.489E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	11.	96.95	1.20	3.470E-02	265.83	50.000	PBC<MDA	BI210M
277.28	7.	126.97	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
284.30	6.	210.38	1.22	3.315E-02	284.30	6.140	PBC<MDA	I131
294.95	62.	17.17	1.23	3.232E-02	295.09	19.300	5.540E+00	PB214
338.23	41.	30.95	1.10	2.940E-02	338.32	12.010	6.450E+00	AC228
351.77	100.	16.86	1.51	2.860E-02	351.93	37.600	5.184E+00	PB214
427.88	9.	97.27	1.35	2.491E-02	427.88	29.600	PBC<MDA	SB125
433.94	9.	95.95	1.35	2.466E-02	433.94	90.480	PBC<MDA	AG108M
463.37	4.	108.72	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
468.06	7.	100.31	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
477.60	10.	102.78	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
482.00	2.	636.08	1.40	2.286E-02	482.00	80.500	PBC<MDA	HF181
487.02	7.	122.85	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
497.05	9.	103.77	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	67.	26.12	2.67	2.188E-02	511.86	20.000	8.505E+00	RH106
531.00	7.	133.23	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
537.26	7.	134.72	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
563.24	6.	150.07	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
569.32	2.	417.13	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	5.580E-01	PA234
					569.70	97.740	PBC<MDA	BI207
569.70	1.	988.05	1.47	2.023E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	PBC<MDA	PA234
					569.70	97.740	PBC<MDA	BI207
583.11	50.	18.43	1.17	1.989E-02	583.02	84.500	1.647E+00	TL208
609.29	75.	16.30	1.51	1.925E-02	609.31	46.090	4.685E+00	BI214
636.97	5.	103.32	1.53	1.862E-02	636.97	7.170	PBC<MDA	I131
702.63	9.	88.45	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
722.79	10.	78.20	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.476E-01	AG108M
					723.36	20.220	1.562E+00	EU154
722.94	4.	215.94	1.60	1.693E-02	722.79	10.810	1.177E+00	SB124
					722.94	90.840	1.401E-01	AG108M
					723.36	20.220	6.296E-01	EU154
727.17	1.	854.40	1.60	1.686E-02	727.17	7.550	PBC<MDA	BI212
735.72	3.	270.80	1.61	1.671E-02	735.72	22.500	PBC<MDA	pm146
763.94	3.	238.05	1.63	1.624E-02	763.94	22.280	PBC<MDA	AG110M
785.42	3.	350.45	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
818.50	10.	100.22	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136
889.28	9.	114.17	1.73	1.445E-02	889.28	99.984	PBC<MDA	Sc46

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
910.86	37.	16.44	1.94	1.418E-02	911.07	29.000	4.998E+00	AC228
967.48	6.	89.30	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.33	8.	106.07	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1037.84	7.	40.04	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1063.66	4.	242.30	1.86	1.257E-02	1063.66	74.500	PBC<MDA	BI207
1077.40	7.	89.75	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1112.07	6.	138.72	1.89	1.213E-02	1112.07	13.644	PBC<MDA	EU152
1115.55	7.	146.27	1.90	1.210E-02	1115.55	50.600	PBC<MDA	ZN65
1120.23	21.	28.26	1.90	1.206E-02	1120.29	15.100	6.314E+00	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	1.	690.37	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	6.692E-02	Sc46
					1121.30	34.900	1.918E-01	Ta182
1121.27	2.	674.95	1.90	1.205E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.981E-01	Ta182
1221.41	3.	472.11	1.97	1.126E-02	1221.41	27.000	PBC<MDA	Ta182
1238.28	12.	87.63	1.98	1.114E-02	1238.28	66.070	PBC<MDA	Co56
1460.33	358.	5.29	1.85	9.751E-03	1460.83	10.670	1.873E+02	K40
1596.21	1.	771.45	2.22	9.069E-03	1596.21	95.400	PBC<MDA	La140
1690.98	3.	187.28	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124
1763.36	18.	28.24	2.31	8.350E-03	1764.49	15.400	7.593E+00	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
308.22	77.15	75.	102.	2.187E+03	18.95	1.035	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.80	46.54	168.	4.	0.002	460.98	0.998
TH-227	200.20	50.14	142.	3.	0.002	564.70	1.001
AM-241	237.77	59.54	268.	-15.	-0.009	153.23	1.010s
TH-234	252.77	63.29	284.	0.	0.000	1000.00	1.014s
Sn-126	256.74	64.28	261.	-4.	-0.002	625.69	1.015s
BA-133	323.56	80.99	359.	-24.	-0.013	25.80	1.031

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Np-237	345.55	86.49	462.	18.	0.010	167.20	1.036s
EU-155	345.76	86.54	481.	18.	0.010	170.43	1.036s
Sn-126	347.35	86.94	499.	18.	0.010	173.55	1.037s
Sn-126	349.87	87.57	517.	18.	0.010	176.54	1.037s
Cd-109	351.75	88.04	536.	18.	0.010	179.51	1.038s
Nd-147	363.99	91.10	554.	17.	0.009	199.81	1.041s
TH-234	369.94	92.59	588.	-19.	-0.011	180.33	1.042s
AC-228	372.98	93.35	566.	-17.	-0.009	205.28	1.043s
Gd-153	389.58	97.50	549.	0.	0.000	1000.00	1.047s
Np-239	397.58	99.50	549.	0.	0.000	1000.00	1.049s
Gd-153	412.37	103.20	549.	0.	0.000	1000.00	1.052s
Np-239	414.37	103.70	549.	0.	0.000	1000.00	1.053s
Np-239	424.09	106.13	590.	-20.	-0.011	169.67	1.055s
EU-152	486.65	121.78	101.	16.	0.009	91.27	1.070s
CO-57	487.80	122.06	112.	-19.	-0.010	83.77	1.070s
EU-154	491.95	123.10	133.	-18.	-0.010	93.03	1.071s
PA-234	524.72	131.29	387.	-20.	-0.011	31.35	1.079
HF-181	531.64	133.02	407.	-20.	-0.011	142.78	1.081s
CE-144	533.69	133.54	427.	-20.	-0.011	146.14	1.081s
HF-181	544.74	136.30	447.	-19.	-0.011	158.98	1.084
CO-57	545.43	136.47	466.	0.	0.000	1000.00	1.084
Tc-99m	561.57	140.51	466.	0.	0.000	1000.00	1.088s
U-235	574.67	143.79	392.	19.	0.010	151.82	1.091
CE-141	581.29	145.44	411.	7.	0.004	392.71	1.092s
Ba-140	650.15	162.66	150.	-19.	-0.010	151.66	1.108s
CE-139	662.92	165.85	88.	13.	0.007	103.11	1.111
Cf-251	705.90	176.60	95.	-13.	-0.007	139.71	1.122s
U-235	742.37	185.72	44.	43.	0.024	32.64	1.130s
TH-229	773.52	193.51	80.	-7.	-0.004	81.62	1.137s
U-235	820.80	205.33	80.	-12.	-0.007	148.76	1.148s
TH-229	842.87	210.85	61.	9.	0.005	167.88	1.153s
Cf-251	907.45	227.00	24.	27.	0.015	40.40	1.168s
PB-212	953.97	238.63	49.	91.	0.051	15.13	1.179D
PB-214	967.43	242.00	185.	12.	0.007	161.69	1.182
EU-152	978.21	244.69	205.	14.	0.008	150.63	1.185
TH-227	1024.40	256.24	24.	31.	0.017	35.78	1.195
Cd-113m	1054.23	263.70	52.	13.	0.007	86.49	1.202s
BI-210M	1062.75	265.83	51.	11.	0.006	96.95	1.204
TL-208	1108.55	277.28	36.	7.	0.004	126.97	1.215
I-131	1136.61	284.30	40.	6.	0.003	210.38	1.221s
PB-214	1179.77	295.09	25.	62.	0.035	17.17	1.231D
TL-210	1183.41	296.00	304.	-14.	-0.008	175.61	1.231s
PB-212	1199.52	300.03	284.	-10.	-0.006	236.90	1.235s
PA-231	1199.68	300.07	274.	0.	0.000	1000.00	1.235s
PA-233	1200.12	300.18	274.	0.	0.000	1000.00	1.235s
PA-231	1210.00	302.65	274.	0.	0.000	1000.00	1.237s
BA-133	1210.81	302.85	274.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	274.	0.	0.000	1000.00	1.240s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1218.99	304.90	274.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	274.	0.	0.000	1000.00	1.243s
Ir-192	1265.35	316.49	57.	-14.	-0.008	78.54	1.250s
La-140	1314.43	328.76	184.	-13.	-0.007	148.27	1.261s
Cf-249	1333.15	333.44	170.	-9.	-0.005	200.10	1.265s
AC-228	1352.30	338.23	20.	41.	0.023	30.95	1.095
Cs-136	1361.66	340.57	161.	0.	0.000	1000.00	1.272s
EU-152	1376.53	344.29	207.	-16.	-0.009	129.75	1.275s
PB-214	1406.46	351.77	40.	100.	0.056	16.86	1.512
BA-133	1423.37	356.00	178.	-14.	-0.008	136.28	1.285s
I-131	1457.31	364.48	36.	-5.	-0.003	314.48	1.293s
BA-133	1534.73	383.84	96.	-16.	-0.009	109.76	1.310s
SN-113	1566.12	391.69	53.	-3.	-0.002	491.70	1.317s
SB-125	1710.86	427.88	17.	9.	0.005	97.27	1.349s
AG-108M	1735.10	433.94	17.	9.	0.005	95.95	1.354s
pm-146	1814.87	453.88	43.	-11.	-0.006	122.23	1.372s
SB-125	1852.82	463.37	9.	4.	0.002	108.72	1.380s
Ir-192	1871.59	468.06	20.	7.	0.004	100.31	1.384s
BE-7	1909.73	477.60	45.	10.	0.005	102.78	1.392s
HF-181	1927.34	482.00	54.	2.	0.001	636.08	1.396s
La-140	1947.43	487.02	32.	7.	0.004	122.85	1.400
RU-103	1987.56	497.05	17.	9.	0.005	103.77	1.409s
RH-106	2046.81	511.86	35.	67.	0.037	26.12	2.672s
Nd-147	2123.35	531.00	17.	7.	0.004	133.23	1.438s
Ba-140	2148.39	537.26	22.	7.	0.004	134.72	1.444s
CS-134	2252.30	563.24	19.	6.	0.004	150.07	1.466s
CS-134	2276.64	569.32	23.	2.	0.001	417.13	1.471s
PA-234	2277.24	569.47	25.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	24.	1.	0.000	988.05	1.471s
TL-208	2331.82	583.11	8.	50.	0.028	18.43	1.168s
SB-125	2401.36	600.50	198.	-4.	-0.002	570.36	1.497s
CS-134	2418.21	604.71	194.	0.	0.000	1000.00	1.500s
BI-214	2436.51	609.29	20.	75.	0.042	16.30	1.505s
RU-103	2440.56	610.30	194.	0.	0.000	1000.00	1.505s
AG-108M	2456.49	614.28	194.	0.	0.000	1000.00	1.508s
PM-144	2471.62	618.06	194.	0.	0.000	1000.00	1.512s
RH-106	2487.04	621.92	194.	0.	0.000	1000.00	1.515s
SB-125	2542.94	635.89	23.	-5.	-0.003	151.52	1.526s
I-131	2547.28	636.97	10.	5.	0.003	103.32	1.527s
AG-110M	2630.43	657.76	45.	-12.	-0.007	42.05	1.544s
PM-144	2785.58	696.54	44.	-2.	-0.001	233.56	1.576s
NB-94	2809.93	702.63	28.	9.	0.005	88.45	1.581s
SB-124	2890.57	722.79	24.	10.	0.005	78.20	1.598s
AG-108M	2891.17	722.94	33.	4.	0.002	215.94	1.598s
EU-154	2892.85	723.36	37.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	37.	0.	0.000	1000.00	1.599s
BI-212	2908.11	727.17	36.	1.	0.001	854.40	1.601s
pm-146	2942.31	735.72	14.	3.	0.002	270.80	1.608s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
pm-146	2988.08	747.16	23.	-2.	-0.001	444.01	1.617s
ZR-95	3026.36	756.73	30.	-10.	-0.006	80.58	1.625s
AG-110M	3055.23	763.94	24.	3.	0.002	238.05	1.631s
EU-152	3115.14	778.92	20.	-5.	-0.003	201.66	1.643s
BI-212	3141.15	785.42	42.	3.	0.001	350.45	1.648s
CS-134	3182.95	795.87	36.	-7.	-0.004	126.97	1.656s
TL-210	3197.88	799.60	43.	0.	0.000	1000.00	1.659s
CS-134	3207.29	801.95	52.	-7.	-0.004	150.51	1.661s
CO-58	3242.59	810.78	50.	-13.	-0.007	81.95	1.668s
La-140	3262.58	815.77	63.	-3.	-0.002	374.69	1.672s
Cs-136	3273.50	818.50	46.	10.	0.006	100.22	1.674s
MN-54	3338.91	834.85	30.	-14.	-0.008	87.86	1.687s
Co-56	3386.61	846.77	20.	-8.	-0.004	127.88	1.696s
TL-208	3441.80	860.56	26.	-9.	-0.005	37.81	1.707s
NB-94	3483.94	871.10	27.	-5.	-0.003	163.20	1.715s
EU-154	3492.47	873.23	36.	0.	0.000	1000.00	1.717s
PA-234	3521.68	880.53	53.	-5.	-0.003	198.43	1.722s
PA-234	3532.53	883.24	59.	0.	0.000	1000.00	1.724s
AG-110M	3538.30	884.68	68.	-16.	-0.009	77.80	1.725s
Sc-46	3556.69	889.28	43.	9.	0.005	114.17	1.729s
y-88	3591.74	898.04	26.	-10.	-0.006	35.89	1.736s
AC-228	3643.03	910.86	0.	37.	0.021	16.44	1.937
AG-110M	3749.60	937.49	20.	-5.	-0.003	201.66	1.766s
PA-234	3783.72	946.02	20.	-1.	-0.001	988.26	1.772s
EU-152	3856.11	964.11	38.	-4.	-0.002	242.41	1.786s
AC-228	3875.56	968.97	12.	6.	0.003	89.30	1.790s
EU-154	3985.03	996.33	32.	8.	0.004	106.07	1.810s
EU-154	4018.82	1004.77	32.	-13.	-0.007	102.72	1.816s
Co-56	4151.13	1037.84	0.	7.	0.004	40.04	1.841
Cs-136	4192.07	1048.07	16.	-1.	-0.001	574.46	1.848s
RH-106	4201.23	1050.36	28.	-6.	-0.004	125.33	1.850s
BI-207	4254.46	1063.66	17.	4.	0.002	242.30	1.860s
Ga-68	4309.44	1077.40	5.	7.	0.004	89.75	1.870s
FE-59	4396.88	1099.25	27.	-12.	-0.006	80.81	1.886s
EU-152	4448.20	1112.07	37.	6.	0.004	138.72	1.895s
ZN-65	4462.09	1115.55	43.	7.	0.004	146.27	1.897s
BI-214	4481.06	1120.29	6.	21.	0.012	28.26	1.901D
Sc-46	4482.12	1120.55	50.	1.	0.001	690.37	1.901
Ta-182	4485.12	1121.30	50.	2.	0.001	674.95	1.901s
CO-60	4692.96	1173.24	33.	-10.	-0.005	62.56	1.938s
Ta-182	4756.25	1189.05	28.	-9.	-0.005	137.70	1.949
Ta-182	4885.75	1221.41	28.	3.	0.001	472.11	1.972
Co-56	4953.27	1238.28	17.	12.	0.007	87.63	1.984s
NA-22	5098.35	1274.53	28.	-2.	-0.001	329.19	2.008s
EU-154	5098.40	1274.54	31.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	17.	0.	0.000	1000.00	2.020s
AG-110M	5537.69	1384.30	6.	-2.	-0.001	471.72	2.082s
EU-152	5632.56	1408.00	24.	-13.	-0.007	83.14	2.097s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	5842.04	1460.33	7.	351.	0.195	5.45	1.848
La-140	6385.95	1596.21	6.	1.	0.000	771.45	2.215s
SB-124	6765.35	1690.98	7.	3.	0.002	187.28	2.272s
BI-214	7059.65	1764.49	3.	18.	0.010	28.24	2.314s
Co-56	7087.11	1771.35	43.	-11.	-0.006	86.23	2.318s
y-88	7346.20	1836.06	6.	-2.	-0.001	203.29	2.354s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	2.2217E+00				5.31E+01	
			477.60	2.222E+00	?(	7.769E+00 1.03E+02	1.05E+01 G
NA-22	C	-1.1918E-01				9.50E+02	
			1274.53	-1.192E-01	?(	1.405E+00 3.29E+02	9.99E+01 G
K-40	N	1.8727E+02				4.66E+11	
			1460.83	1.873E+02	(P	8.205E+00 5.45E+00	1.07E+01 G
Sc-46	F	3.2699E-01				8.38E+01	
			889.28	3.270E-01	?(	1.278E+00 1.14E+02	1.00E+02 G
			1120.55	6.692E-02	-	1.636E+00 6.90E+02	1.00E+02 G
CR-51	F	-1.6418E-02				2.77E+01	
			320.08	-1.642E-02	%(	8.396E+00 1.46E+04	9.94E+00 G
MN-54	C	-5.2626E-01				3.12E+02	
			834.85	-5.263E-01	?(	1.034E+00 8.79E+01	1.00E+02 G
FE-59	F	-9.3817E-01				4.45E+01	
			1099.25	-9.382E-01	?(P	2.151E+00 8.08E+01	5.65E+01 G
			1291.60	0.000E+00	+	2.618E+00 1.00E+03	4.32E+01 G
Co-56	C	3.2343E-01				7.73E+01	
			846.77	-2.964E-01	?(	8.724E-01 1.28E+02	9.99E+01 G
			1238.28	8.861E-01	?(P	1.664E+00 8.76E+01	6.61E+01 G
			1037.84	2.076E+00	?(P	2.262E+00 4.00E+01	1.41E+01 G
			1771.35	-4.918E+00	+	1.429E+01 8.62E+01	1.55E+01 A
CO-57	C	-2.2761E-01				2.72E+02	
			122.06	-2.276E-01	(	6.368E-01 8.38E+01	8.56E+01 G
			136.47	0.000E+00	&	1.044E+01 1.00E+03	1.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-58	C	-4.6692E-01					7.09E+01	
			810.78	-4.669E-01	?(	1.284E+00	8.20E+01	9.95E+01 G
CO-60	F	-3.4091E-02					1.93E+03	
			1332.50	-3.409E-02	%(P	9.848E-01	1.60E+03	1.00E+02 G
			1173.24	-4.557E-01	+ P	1.401E+00	6.26E+01	9.99E+01 G
ZN-65	F	5.9868E-01					2.44E+02	
			1115.55	5.987E-01	?(	3.027E+00	1.46E+02	5.06E+01 G
NB-94	I	3.0207E-01					7.41E+06	
			702.63	3.021E-01	?(P	9.047E-01	8.85E+01	9.79E+01 G
			871.10	-1.768E-01	-	1.014E+00	1.63E+02	9.99E+01 G
ZR-95	I	-6.3294E-01					6.40E+01	
			756.73	-6.329E-01	?(P	1.765E+00	8.06E+01	5.45E+01 G
			724.20	0.000E+00	+	2.311E+00	1.00E+03	4.42E+01 G
NB-95	I	-1.1451E-02					6.40E+01	
			765.79	-1.145E-02	%(	9.452E-01	2.26E+03	9.98E+01 G
RU-103	I	2.3693E-01					3.93E+01	
			497.05	2.369E-01	?(	6.045E-01	1.04E+02	9.09E+01 G
			610.30	0.000E+00	-	3.398E+01	1.00E+03	5.75E+00 GA
AG-108M	C	1.8718E-01					1.53E+05	
			433.94	2.345E-01	&(	5.506E-01	9.60E+01	9.05E+01 G
			722.94	1.401E-01	?(	1.067E+00	2.16E+02	9.08E+01 G
			614.28	0.000E+00	-	2.185E+00	1.00E+03	8.98E+01 G
AG-110M	F	-8.3642E-01					2.50E+02	
			884.68	-8.364E-01	?(	2.172E+00	7.78E+01	7.27E+01 G
			657.76	-3.974E-01	+ P	1.100E+00	4.20E+01	9.46E+01 G
			937.49	-5.829E-01	+	2.745E+00	2.02E+02	3.44E+01 G
			1384.30	-4.942E-01	+ P	3.215E+00	4.72E+02	2.43E+01 G
			763.94	4.607E-01	+	3.922E+00	2.38E+02	2.23E+01 G
SN-113	F	-1.1357E-01					1.15E+02	
			391.69	-1.136E-01	(P	1.195E+00	4.92E+02	6.40E+01 G
SB-124	F	3.3915E-01					6.02E+01	
			602.73	-8.623E-03	%(P	1.972E+00	3.12E+03	9.83E+01 G
			1690.98	4.703E-01	?(P	1.961E+00	1.87E+02	4.78E+01 G
			722.79	2.920E+00	?(	7.679E+00	7.82E+01	1.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	7.7042E-01					1.01E+03	
			427.88	7.010E-01	&(P	1.669E+00	9.73E+01	2.96E+01 G
			600.50	-5.596E-01	-	1.090E+01	5.70E+02	1.79E+01 G
			635.89	-1.229E+00	+	6.559E+00	1.52E+02	1.13E+01 G
			463.37	9.666E-01	?(P	3.696E+00	1.09E+02	1.05E+01 G
I-131	I	1.4733E-01					8.02E+00	
			364.48	-1.314E-01	?(P	7.510E-01	3.14E+02	8.17E+01 G
			284.30	1.638E+00	?(	8.784E+00	2.10E+02	6.14E+00 G
			636.97	2.047E+00	?(P	7.378E+00	1.03E+02	7.17E+00 G
Ga-68	C	1.0297E+01					4.71E-02	
			1077.40	1.030E+01	?(	2.133E+01	8.97E+01	3.30E+00 G
BA-133	F	-4.4587E-01					3.85E+03	
			356.00	-4.459E-01	?(	2.049E+00	1.36E+02	6.20E+01 G
			302.85	0.000E+00	+	7.623E+00	1.00E+03	1.83E+01 G
			383.84	-3.587E+00	+ P	1.118E+01	1.10E+02	8.94E+00 GA
			80.99	-8.101E-01	+ P	3.074E+00	2.58E+01	3.41E+01 GA
CS-134	I	1.7982E-01					7.54E+02	
			604.71	0.000E+00	?(	1.988E+00	1.00E+03	9.76E+01 G
			795.87	-2.889E-01	+	1.266E+00	1.27E+02	8.55E+01 G
			569.32	2.974E-01	?(	4.501E+00	4.17E+02	1.54E+01 G
			801.95	-2.860E+00	+	1.484E+01	1.51E+02	8.69E+00 G
			563.24	2.065E+00	?(	7.450E+00	1.50E+02	8.35E+00 G
CS-137	I	-1.2863E-02					1.10E+04	
			661.66	-1.286E-02	%(P	1.358E+00	1.48E+03	8.52E+01 G
CE-139	F	1.9646E-01					1.38E+02	
			165.85	1.965E-01	?(	6.834E-01	1.03E+02	7.99E+01 G
Ba-140	I	7.9086E-01					1.28E+01	
			537.26	7.909E-01	?(	2.632E+00	1.35E+02	2.44E+01 G
			162.66	-3.562E+00	& P	1.138E+01	1.52E+02	6.22E+00 G
			304.85	0.000E+00	-	3.272E+01	1.00E+03	4.29E+00 G
La-140	I	1.5361E-01					1.28E+01	
			1596.21	5.015E-02	?(P	9.203E-01	7.71E+02	9.54E+01 G
			487.02	3.705E-01	?(	1.572E+00	1.23E+02	4.55E+01 G
			328.76	-1.200E+00	+	6.007E+00	1.48E+02	2.03E+01 G
			815.77	-4.684E-01	+	6.134E+00	3.75E+02	2.33E+01 G
CE-141	I	1.6872E-01					3.25E+01	
			145.44	1.687E-01	?(	2.236E+00	3.93E+02	4.82E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-144	I -1.9535E+00					2.85E+02	
		133.54	-1.953E+00	?(	9.559E+00	1.46E+02	1.11E+01 G
PM-144	C -7.3478E-02					3.63E+02	
		696.54	-7.348E-02	?(P	1.087E+00	2.34E+02	9.90E+01 G
		618.06	0.000E+00	+	1.990E+00	1.00E+03	9.91E+01 G
EU-152	F 4.8024E-01					4.94E+03	
		344.29	-1.154E+00	?(	5.035E+00	1.30E+02	2.65E+01 G
		1112.07	2.167E+00	?(P	1.040E+01	1.39E+02	1.36E+01 G
		121.78	5.939E-01	(	1.818E+00	9.13E+01	2.86E+01 G
		778.92	-1.342E+00	+	6.320E+00	2.02E+02	1.29E+01 G
		964.11	-1.028E+00	&	8.776E+00	2.42E+02	1.46E+01 G
		244.69	2.727E+00	?(	1.386E+01	1.51E+02	7.58E+00 G
		1408.00	-3.318E+00	+ P	6.675E+00	8.31E+01	2.10E+01 GA
EU-154	I 4.2924E-01					3.14E+03	
		873.23	0.000E+00	?(	9.516E+00	1.00E+03	1.23E+01 G
		123.10	-4.658E-01	&	1.451E+00	9.30E+01	4.08E+01 G
		1274.54	0.000E+00	?(	4.137E+00	1.00E+03	3.52E+01 G
		723.36	0.000E+00	?(	5.042E+00	1.00E+03	2.02E+01 G
		1004.77	-3.052E+00	+	6.825E+00	1.03E+02	1.80E+01 G
		996.33	3.170E+00	?(	1.152E+01	1.06E+02	1.06E+01 G
EU-155	I 3.8571E-01					1.81E+03	
		105.31	-1.643E-02	%(P	5.515E+00	1.89E+03	2.12E+01 G
		86.54	6.634E-01	(	3.788E+00	1.70E+02	3.07E+01 G
HF-181	F 4.9854E-02					4.24E+01	
		482.00	4.985E-02	?(	1.119E+00	6.36E+02	8.05E+01 G
		133.02	-4.995E-01	+	2.388E+00	1.43E+02	4.33E+01 G
		345.83	6.131E-02	&	7.791E+00	3.69E+03	1.51E+01 G
		136.30	-3.505E+00	&	1.867E+01	1.59E+02	5.85E+00 G
Ta-182	F 3.2424E-01					1.14E+02	
		1121.30	1.981E-01	?(	4.732E+00	6.75E+02	3.49E+01 G
		1221.41	4.873E-01	(	5.028E+00	4.72E+02	2.70E+01 G
		1189.05	-2.782E+00	+	8.202E+00	1.38E+02	1.62E+01 G
Hg-203	F 1.0160E-02					4.66E+01	
		279.20	1.016E-02	%(	7.477E-01	2.07E+03	8.15E+01 G
TL-208	N 1.6597E+00					6.98E+02	
		583.02	1.647E+00	@(P	5.301E-01	1.84E+01	8.45E+01 G
		277.28	1.828E+00	(	8.008E+00	1.27E+02	6.31E+00 G
		860.56	-2.599E+00	- P	7.936E+00	3.78E+01	1.24E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
pm-146 C	3.7619E-02					2.02E+03	
		747.16	-2.309E-01	?(	2.496E+00	4.44E+02	3.40E+01 G
		735.72	4.434E-01	?(	2.977E+00	2.71E+02	2.25E+01 G
		453.88	-4.057E-01	+	1.195E+00	1.22E+02	6.50E+01 G
y-88 F	-4.1769E-01					1.07E+02	
		898.04	-4.177E-01	?(P	1.096E+00	3.59E+01	9.37E+01 G
		1836.06	-1.704E-01	+ P	1.009E+00	2.03E+02	9.92E+01 G
Cd-113m	3.3261E+03					5.33E+03	
		263.70	3.326E+03	?(	9.679E+03	8.65E+01	6.00E-03 K
Cd-109 F	5.3378E+00					4.53E+02	
		88.04	5.338E+00	&(	3.209E+01	1.80E+02	3.79E+00 G
Cf-251 T	-9.5793E-01					3.28E+05	
		176.60	-9.579E-01	&(	3.464E+00	1.40E+02	1.70E+01 G
		227.00	6.171E+00	&	5.837E+00	4.04E+01	6.30E+00 GA
Cf-249 T	-1.8774E-02					1.28E+05	
		387.95	-1.877E-02	&(	1.622E+00	2.49E+03	6.60E+01 G
		333.44	-1.128E+00	+	7.662E+00	2.00E+02	1.55E+01 G
Sn-126	-5.2677E-01					3.65E+07	
		87.57	5.406E-01		3.197E+00	1.77E+02	3.75E+01 GA
		64.28	-5.268E-01	*(	1.121E+01	6.26E+02	9.70E+00 G
		86.94	2.248E+00		1.307E+01	1.74E+02	9.04E+00 GA
PB-210 N	2.0293E+00					8.14E+03	
		46.54	2.029E+00	?(	3.202E+01	4.61E+02	4.25E+00 G
PB-212 N	3.1252E+00					6.98E+02	
		238.63	3.125E+00	(	1.216E+00	1.51E+01	4.33E+01 G
		300.03	-5.382E+00	-	4.308E+01	2.37E+02	3.28E+00 GA
PB-214 N	5.3046E+00					5.84E+05	
		351.93	5.184E+00	(P	1.656E+00	1.69E+01	3.76E+01 G
		295.09	5.540E+00	(P	2.318E+00	1.72E+01	1.93E+01 G
		242.00	2.447E+00	- P	1.337E+01	1.62E+02	7.43E+00 GA
BI-207 C	1.1131E-01					1.18E+04	
		569.70	2.014E-02	?(P	7.213E-01	9.88E+02	9.77E+01 G
		1063.66	2.309E-01	&(P	1.305E+00	2.42E+02	7.45E+01 G
BI-212 N	4.3655E-01					6.98E+02	
		727.17	4.365E-01	?(	1.339E+01	8.54E+02	7.55E+00 G
		785.42	7.281E+00	?	9.018E+01	3.50E+02	1.28E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
U-235	N	1.8783E+00					2.57E+11	
			143.79	1.878E+00	?(P	9.558E+00	1.52E+02	1.10E+01 G
			205.33	-3.227E+00	+	1.194E+01	1.49E+02	5.01E+00 G
			163.38	-5.749E-03	%	1.476E+01	7.46E+04	5.08E+00 G
			185.72	1.005E+00		7.856E-01	3.26E+01	5.40E+01 GA
BI-214	N	5.0874E+00					5.84E+05	
			609.31	4.685E+00	*(P	1.481E+00	1.63E+01	4.61E+01 G
			1120.29	6.314E+00	(P	4.448E+00	2.83E+01	1.51E+01 G
			1764.49	7.593E+00	+ P	4.897E+00	2.82E+01	1.54E+01 G
BI-210M	T	3.5111E-01					1.10E+09	
			265.83	3.511E-01	&(	1.153E+00	9.70E+01	5.00E+01 G
			304.90	0.000E+00	-	5.014E+00	1.00E+03	2.80E+01 G
AC-228	N	5.4235E+00					2.10E+03	
			911.07	4.998E+00	(	9.956E-01	1.64E+01	2.90E+01 G
			968.97	1.465E+00	&	4.490E+00	8.93E+01	1.75E+01 G
			338.32	6.450E+00	(	3.705E+00	3.09E+01	1.20E+01 G
			93.35	-3.188E+00	-	2.193E+01	2.05E+02	5.56E+00 XA
TH-227	N	3.6105E+00					7.95E+03	
			50.14	7.184E-01	?(	1.395E+01	5.65E+02	8.00E+00 G
			256.24	6.916E+00	&(	5.698E+00	3.58E+01	7.00E+00 G
TH-229	N	4.0378E-01					2.68E+06	
			193.51	-2.204E+00	?(P	1.311E+01	8.16E+01	4.40E+00 G
			210.85	4.241E+00	?(P	1.790E+01	1.68E+02	2.99E+00 G
PA-233	C	-2.3046E-02					7.82E+08	
			312.01	-2.305E-02	%(P	3.965E+00	2.31E+03	3.60E+01 G
			300.18	0.000E+00	+	2.240E+01	1.00E+03	6.20E+00 G
PA-234	N	-1.1967E+00					1.63E+12	
			131.29	-1.197E+00	?(P	5.582E+00	3.14E+01	1.80E+01 G
			946.02	-3.010E-01	+	7.089E+00	9.88E+02	1.34E+01 G
			569.47	0.000E+00	+	8.708E+00	1.00E+03	8.20E+00 G
			883.24	0.000E+00	+	1.530E+01	1.00E+03	9.60E+00 G
			880.53	-3.392E+00	-	2.336E+01	1.98E+02	6.00E+00 GA
PA-234M	N	-1.0299E+00					1.63E+12	
			1001.00	-1.030E+00	%(P	1.625E+02	1.82E+03	8.37E-01 G
			766.41	-3.889E+00	%	3.261E+02	2.30E+03	2.94E-01 G
AM-241	T	-6.4856E-01					1.58E+05	
			59.54	-6.486E-01	(	3.343E+00	1.53E+02	3.59E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Np-237	F 1.5552E+00					2.14E+06	
		86.49	1.555E+00	&(	8.714E+00	1.67E+02	1.31E+01 G
Ir-192	F -2.9867E-01					7.40E+01	
		316.49	-2.987E-01	?(	7.843E-01	7.85E+01	8.70E+01 G
		468.06	3.129E-01	+	1.080E+00	1.00E+02	5.18E+01 G
		308.44	0.000E+00	+	4.457E+00	1.00E+03	3.18E+01 G
Cs-136	F 3.6364E-01					1.30E+01	
		818.50	3.636E-01	?(	1.238E+00	1.00E+02	1.00E+02 G
		1048.07	-5.463E-02	-	1.166E+00	5.74E+02	8.00E+01 G
		340.57	0.000E+00	-	2.503E+00	1.00E+03	4.69E+01 G
Np-239	T -9.3882E-01					2.36E+00	
		103.70	0.000E+00	+	4.881E+00	1.00E+03	2.40E+01 X
		106.13	-9.388E-01	?(	5.328E+00	1.70E+02	2.27E+01 G
		99.50	0.000E+00	&	7.871E+00	1.00E+03	1.50E+01 X
Nd-147	8.6166E-01					1.11E+01	
		531.00	1.337E+00	?(	4.436E+00	1.33E+02	1.30E+01 G
		91.10	6.431E-01	&(	4.307E+00	2.00E+02	2.83E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
    negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
    failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the
    library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
    to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line

M - No MDA Calculation A - Not in Average
R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	168.	4.	0.002	460.98	2.029E+00	
TH-227	50.14	142.	3.	0.002	564.70	7.184E-01	
AM-241	59.54	268.	-15.	-0.009	153.23	-6.486E-01	
Sn-126	64.28	261.	-4.	-0.002	625.69	-5.268E-01	
BA-133	80.99	359.	-24.	-0.013	25.80	-8.101E-01	P
Np-237	86.49	462.	18.	0.010	167.20	1.555E+00	
EU-155	86.54	481.	18.	0.010	170.43	6.634E-01	
Sn-126	86.94	499.	18.	0.010	173.55	2.248E+00	
Sn-126	87.57	517.	18.	0.010	176.54	5.406E-01	
Cd-109	88.04	536.	18.	0.010	179.51	5.338E+00	
Nd-147	91.10	554.	17.	0.009	199.81	6.431E-01	
TH-234	92.59	588.	-19.	-0.011	180.33	-3.698E+00	
Np-239	106.13	590.	-20.	-0.011	169.67	-9.388E-01	
EU-152	121.78	101.	16.	0.009	91.27	5.939E-01	
CO-57	122.06	112.	-19.	-0.010	83.77	-2.276E-01	
EU-154	123.10	133.	-18.	-0.010	93.03	-4.658E-01	
PA-234	131.29	387.	-20.	-0.011	31.35	-1.197E+00	P
HF-181	133.02	407.	-20.	-0.011	142.78	-4.995E-01	
CE-144	133.54	427.	-20.	-0.011	146.14	-1.953E+00	
HF-181	136.30	447.	-19.	-0.011	158.98	-3.505E+00	
U-235	143.79	392.	19.	0.010	151.82	1.878E+00	P
CE-141	145.44	411.	7.	0.004	392.71	1.687E-01	
Ba-140	162.66	150.	-19.	-0.010	151.66	-3.562E+00	P
CE-139	165.85	88.	13.	0.007	103.11	1.965E-01	
Cf-251	176.60	95.	-13.	-0.007	139.71	-9.579E-01	
U-235	185.72	44.	43.	0.024	32.64	1.005E+00	
U-235	205.33	80.	-12.	-0.007	148.76	-3.227E+00	
Cf-251	227.00	24.	27.	0.015	40.40	6.171E+00	
EU-152	244.69	205.	14.	0.008	150.63	2.727E+00	
TH-227	256.24	24.	31.	0.017	35.78	6.916E+00	
Cd-113m	263.70	52.	13.	0.007	86.49	3.326E+03	
BI-210M	265.83	51.	11.	0.006	96.95	3.511E-01	
I-131	284.30	40.	6.	0.003	210.38	1.638E+00	
TL-210	296.00	304.	-14.	-0.008	175.61	-3.096E-01	
Ir-192	316.49	57.	-14.	-0.008	78.54	-2.987E-01	
La-140	328.76	184.	-13.	-0.007	148.27	-1.200E+00	
Cf-249	333.44	170.	-9.	-0.005	200.10	-1.128E+00	
EU-152	344.29	207.	-16.	-0.009	129.75	-1.154E+00	
BA-133	356.00	178.	-14.	-0.008	136.28	-4.459E-01	
I-131	364.48	36.	-5.	-0.003	314.48	-1.314E-01	P
BA-133	383.84	96.	-16.	-0.009	109.76	-3.587E+00	P
SN-113	391.69	53.	-3.	-0.002	491.70	-1.136E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
SB-125	427.88	17.	9.	0.005	97.27	7.010E-01		P
AG-108M	433.94	17.	9.	0.005	95.95	2.345E-01		
pm-146	453.88	43.	-11.	-0.006	122.23	-4.057E-01		
SB-125	463.37	9.	4.	0.002	108.72	9.666E-01		P
Ir-192	468.06	20.	7.	0.004	100.31	3.129E-01		
BE-7	477.60	45.	10.	0.005	102.78	2.222E+00		
HF-181	482.00	54.	2.	0.001	636.08	4.985E-02		
La-140	487.02	32.	7.	0.004	122.85	3.705E-01		
RU-103	497.05	17.	9.	0.005	103.77	2.369E-01		
RH-106	511.86	35.	67.	0.037	26.12	8.505E+00		
Nd-147	531.00	17.	7.	0.004	133.23	1.337E+00		
Ba-140	537.26	22.	7.	0.004	134.72	7.909E-01		
CS-134	563.24	19.	6.	0.004	150.07	2.065E+00		
CS-134	569.32	23.	2.	0.001	417.13	2.974E-01		
BI-207	569.70	24.	1.	0.000	988.05	2.014E-02		P
SB-125	600.50	198.	-4.	-0.002	570.36	-5.596E-01		
SB-125	635.89	23.	-5.	-0.003	151.52	-1.229E+00		
I-131	636.97	10.	5.	0.003	103.32	2.047E+00		P
AG-110M	657.76	45.	-12.	-0.007	42.05	-3.974E-01		P
PM-144	696.54	44.	-2.	-0.001	233.56	-7.348E-02		P
NB-94	702.63	28.	9.	0.005	88.45	3.021E-01		P
SB-124	722.79	24.	10.	0.005	78.20	2.920E+00		
AG-108M	722.94	33.	4.	0.002	215.94	1.401E-01		
BI-212	727.17	36.	1.	0.001	854.40	4.365E-01		
pm-146	735.72	14.	3.	0.002	270.80	4.434E-01		
pm-146	747.16	23.	-2.	-0.001	444.01	-2.309E-01		
ZR-95	756.73	30.	-10.	-0.006	80.58	-6.329E-01		P
AG-110M	763.94	24.	3.	0.002	238.05	4.607E-01		
EU-152	778.92	20.	-5.	-0.003	201.66	-1.342E+00		
BI-212	785.42	42.	3.	0.001	350.45	7.281E+00		
CS-134	795.87	36.	-7.	-0.004	126.97	-2.889E-01		
CS-134	801.95	52.	-7.	-0.004	150.51	-2.860E+00		
CO-58	810.78	50.	-13.	-0.007	81.95	-4.669E-01		
La-140	815.77	63.	-3.	-0.002	374.69	-4.684E-01		
Cs-136	818.50	46.	10.	0.006	100.22	3.636E-01		
MN-54	834.85	30.	-14.	-0.008	87.86	-5.263E-01		
Co-56	846.77	20.	-8.	-0.004	127.88	-2.964E-01		
NB-94	871.10	27.	-5.	-0.003	163.20	-1.768E-01		
PA-234	880.53	53.	-5.	-0.003	198.43	-3.392E+00		
AG-110M	884.68	68.	-16.	-0.009	77.80	-8.364E-01		
Sc-46	889.28	43.	9.	0.005	114.17	3.270E-01		
y-88	898.04	26.	-10.	-0.006	35.89	-4.177E-01		P
AG-110M	937.49	20.	-5.	-0.003	201.66	-5.829E-01		
PA-234	946.02	20.	-1.	-0.001	988.26	-3.010E-01		
EU-152	964.11	38.	-4.	-0.002	242.41	-1.028E+00		
EU-154	996.33	32.	8.	0.004	106.07	3.170E+00		
EU-154	1004.77	32.	-13.	-0.007	102.72	-3.052E+00		
Co-56	1037.84	0.	7.	0.004	40.04	2.076E+00		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Cs-136	1048.07	16.	-1.	-0.001	574.46	-5.463E-02		
RH-106	1050.36	28.	-6.	-0.004	125.33	-1.777E+01		
BI-207	1063.66	17.	4.	0.002	242.30	2.309E-01	P	
Ga-68	1077.40	5.	7.	0.004	89.75	1.030E+01		
FE-59	1099.25	27.	-12.	-0.006	80.81	-9.382E-01	P	
EU-152	1112.07	37.	6.	0.004	138.72	2.167E+00	P	
ZN-65	1115.55	43.	7.	0.004	146.27	5.987E-01		
Sc-46	1120.55	50.	1.	0.001	690.37	6.692E-02		
CO-60	1173.24	33.	-10.	-0.005	62.56	-4.557E-01	P	
Co-56	1238.28	17.	12.	0.007	87.63	8.861E-01	P	
NA-22	1274.53	28.	-2.	-0.001	329.19	-1.192E-01		
AG-110M	1384.30	6.	-2.	-0.001	471.72	-4.942E-01	P	
EU-152	1408.00	24.	-13.	-0.007	83.14	-3.318E+00	P	
La-140	1596.21	6.	1.	0.000	771.45	5.015E-02	P	
SB-124	1690.98	7.	3.	0.002	187.28	4.703E-01	P	
Co-56	1771.35	43.	-11.	-0.006	86.23	-4.918E+00		
y-88	1836.06	6.	-2.	-0.001	203.29	-1.704E-01	P	

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

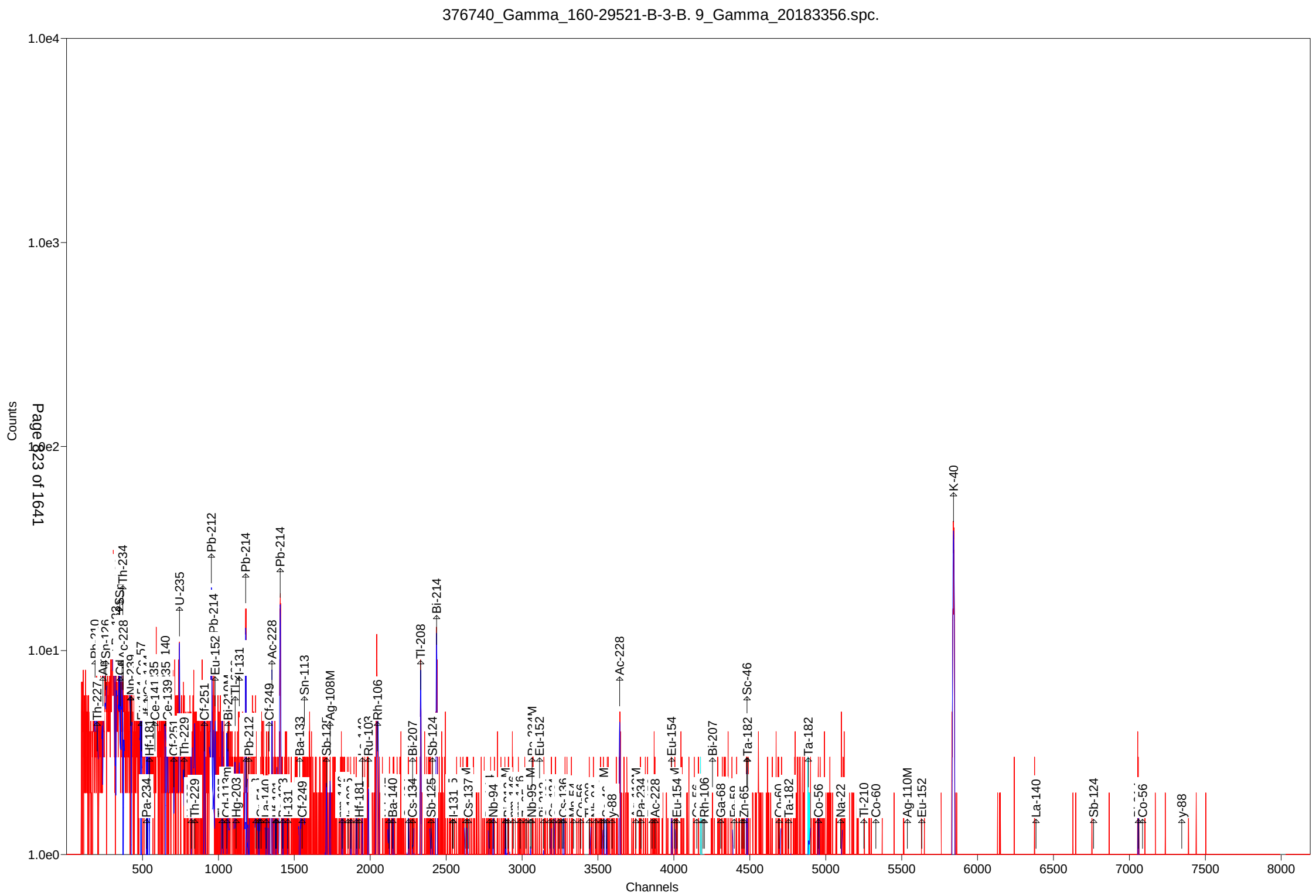
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	2.2217E+00	2.2217E+00	1.028E+02%	7.77E+00
NA-22	#A	-1.1918E-01	-1.1918E-01	3.292E+02%	1.41E+00
K-40		1.8727E+02	1.8727E+02	5.455E+00%	8.20E+00
Sc-46	#A	3.2699E-01	3.2699E-01	1.142E+02%	1.28E+00
CR-51	#A	-1.6418E-02	-1.6418E-02	1.461E+04%	8.40E+00
MN-54	#A	-5.2626E-01	-5.2626E-01	8.786E+01%	1.03E+00
FE-59	#A	-9.3816E-01	-9.3817E-01	8.081E+01%	2.15E+00
Co-56	#A	3.2343E-01	3.2343E-01	4.004E+01%	8.72E-01
CO-57	#A	-2.2760E-01	-2.2761E-01	8.377E+01%	6.37E-01
CO-58	#A	-4.6692E-01	-4.6692E-01	8.195E+01%	1.28E+00
CO-60	#A	-3.4091E-02	-3.4091E-02	1.602E+03%	9.85E-01
ZN-65	#A	5.9868E-01	5.9868E-01	1.463E+02%	3.03E+00
NB-94	#A	3.0207E-01	3.0207E-01	8.845E+01%	9.05E-01
ZR-95	#A	-6.3294E-01	-6.3294E-01	8.058E+01%	1.77E+00
NB-95	#A	-1.1451E-02	-1.1451E-02	2.265E+03%	9.45E-01
RU-103	#A	2.3693E-01	2.3693E-01	1.038E+02%	6.04E-01
RH-106	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.00E+01
AG-108M	#A	1.8718E-01	1.8718E-01	9.595E+01%	5.51E-01
AG-110M	#A	-8.3642E-01	-8.3642E-01	7.780E+01%	2.17E+00
SN-113	#A	-1.1357E-01	-1.1357E-01	4.917E+02%	1.20E+00
SB-124	#A	3.3915E-01	3.3915E-01	7.820E+01%	1.97E+00
SB-125	#A	7.7042E-01	7.7042E-01	7.294E+01%	1.67E+00
I-131	#A	1.4733E-01	1.4733E-01	1.033E+02%	7.51E-01

Gd-153 #A	0.0000E+00	0.0000E+00	7.071E+02%		3.95E+00
Ga-68 #A	1.0222E+01	1.0297E+01	8.975E+01%		2.13E+01
Tc-99m #A	0.0000E+00	0.0000E+00	1.000E+03%		1.30E+00
BA-133 #A	-4.4587E-01	-4.4587E-01	1.363E+02%		2.05E+00
CS-134 #A	1.7982E-01	1.7982E-01	1.501E+02%		1.99E+00
CS-137 #A	-1.2863E-02	-1.2863E-02	1.475E+03%		1.36E+00
CE-139 #A	1.9646E-01	1.9646E-01	1.031E+02%		6.83E-01
Ba-140 #A	7.9084E-01	7.9086E-01	1.347E+02%		2.63E+00
La-140 #A	1.5360E-01	1.5361E-01	1.229E+02%		9.20E-01
CE-141 #A	1.6872E-01	1.6872E-01	3.927E+02%		2.24E+00
CE-144 #A	-1.9535E+00	-1.9535E+00	1.461E+02%		9.56E+00
PM-144 #A	-7.3478E-02	-7.3478E-02	2.336E+02%		1.09E+00
EU-152 #A	4.8024E-01	4.8024E-01	6.476E+01%		5.03E+00
EU-154 #A	4.2924E-01	4.2924E-01	1.061E+02%		9.52E+00
EU-155 #A	3.8571E-01	3.8571E-01	1.704E+02%		5.52E+00
HF-181 #A	4.9854E-02	4.9854E-02	6.361E+02%		1.12E+00
Ta-182 A	3.2424E-01	3.2424E-01	4.118E+02%		4.73E+00
Hg-203 #A	1.0160E-02	1.0160E-02	2.074E+03%		7.48E-01
TL-208	1.6597E+00	1.6597E+00	1.843E+01%		5.30E-01
pm-146 #A	3.7619E-02	3.7619E-02	2.600E+02%		2.50E+00
y-88 #A	-4.1769E-01	-4.1769E-01	3.589E+01%		1.10E+00
Cd-113m#A	3.3261E+03	3.3261E+03	8.649E+01%		9.68E+03
Cd-109 #A	5.3378E+00	5.3378E+00	1.795E+02%		3.21E+01
Cf-251 #A	-9.5793E-01	-9.5793E-01	1.397E+02%		3.46E+00
Cf-249 #A	-1.8774E-02	-1.8774E-02	2.487E+03%		1.62E+00
Sn-126 #A	-5.2677E-01	-5.2677E-01	6.257E+02%		1.12E+01
PB-210 #A	2.0293E+00	2.0293E+00	4.610E+02%		3.20E+01
PB-212	3.1252E+00	3.1252E+00	1.513E+01%		1.22E+00
PB-214	5.3046E+00	5.3046E+00	1.203E+01%		1.66E+00
BI-207 #A	1.1131E-01	1.1131E-01	2.423E+02%		7.21E-01
BI-212 #A	4.3655E-01	4.3655E-01	8.544E+02%		1.34E+01
U-235 #A	1.8783E+00	1.8783E+00	1.518E+02%		9.56E+00
BI-214	5.0874E+00	5.0874E+00	1.630E+01%		1.48E+00
BI-210M#A	3.5111E-01	3.5111E-01	9.695E+01%		1.15E+00
AC-228	5.4235E+00	5.4235E+00	1.644E+01%		9.96E-01
TH-227 #A	3.6105E+00	3.6105E+00	3.578E+01%		1.39E+01
TH-229 #A	4.0378E-01	4.0378E-01	8.162E+01%		1.31E+01
TH-234 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.02E+01
PA-231 #A	0.0000E+00	0.0000E+00	7.071E+02%		4.85E+01
PA-233 #A	-2.3046E-02	-2.3046E-02	2.313E+03%		3.97E+00
PA-234 #A	-1.1967E+00	-1.1967E+00	3.135E+01%		5.58E+00
PA-234M#A	-1.0299E+00	-1.0299E+00	1.816E+03%		1.62E+02
AM-241 #A	-6.4856E-01	-6.4856E-01	1.532E+02%		3.34E+00
Np-237 #A	1.5552E+00	1.5552E+00	1.672E+02%		8.71E+00
Ir-192 #A	-2.9867E-01	-2.9867E-01	7.854E+01%		7.84E-01
Cs-136 #A	3.6363E-01	3.6364E-01	1.002E+02%		1.24E+00
Np-239 #A	-9.3868E-01	-9.3882E-01	1.697E+02%		5.33E+00
Nd-147 #A	8.6163E-01	8.6166E-01	1.201E+02%		4.44E+00
TL-210 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.19E+00

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.3 keV) 2.079E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 2.0786905E+02 Bq/Sample


376740_Gamma_160-29521-B-3-B. 9_Gamma_20183356.spc.
Counts
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
Channels
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
K-40
Pb-214
Bi-214
Ac-228
Th-234
U-235
Pb-212
Tl-208
Sc-46
Ta-182
Eu-152
Eu-154
Bi-207
Sb-124
Co-56
Co-60
Ag-110M
Eu-152
La-140
y-88
Th-227
Th-229
Cf-251
Cf-249
Ba-133
Sn-113
Ag-108M
Rh-106
Sb-125
Cs-134
Cs-137
Nb-94
Nb-95
Zn-65
Na-22
Tl-210
Ga-68
Rh-106
Pa-234
Hg-203
Pb-210
Sn-126
Ra-223
Ra-224
Ac-228
Pb-214
Bi-214
Pb-212
Tl-208
Th-234
U-235
Eu-152
Eu-154
Bi-207
Sb-124
Co-56
Co-60
Ag-110M
Eu-152
La-140
y-88
Ta-182
Sc-46
K-40

Test America St. Louis Spectrum ID: 12_Gamma_20181339

Sample Description: 376740_Gamma_160-29521-A-4-C
Detector: Detector #12
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29521-A-4-C

Decay to Time: 8/9/2018 07:16 Live Time: 1800 sec
Acquisition Time: 8/9/2018 07:17:13 Real Time: 1801 sec
Analysis Time: 8/9/2018 07:47 Dead Time: 0.06 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: Client_Long_Rev14.lib
Bkgd Correction File: 12_2018-07-14_1810.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	2.162E+00	184.5	3.990E+00	3.991E+00	1.373E+01
NA-22	-2.341E-02	1438.7	3.369E-01	3.369E-01	1.292E+00
K-40	1.735E+02	7.0	1.207E+01	1.492E+01	1.034E+01
Sc-46	-5.395E-01	103.2	5.567E-01	5.574E-01	1.892E+00
CR-51	-3.834E+00	179.0	6.861E+00	6.864E+00	2.306E+01
MN-54	1.542E-01	270.8	4.177E-01	4.177E-01	1.036E+00
FE-59	-1.075E+00	125.6	1.350E+00	1.351E+00	2.976E+00
Co-56	2.846E-01	90.4	2.574E-01	2.578E-01	1.352E+00
CO-57	-6.202E-02	483.8	3.001E-01	3.001E-01	1.030E+00
CO-58	4.807E-01	85.8	4.126E-01	4.134E-01	1.396E+00
CO-60	-9.204E-01	92.5	8.515E-01	8.528E-01	1.809E+00
ZN-65	-1.096E-01	1160.1	1.271E+00	1.271E+00	4.511E+00
NB-94	6.776E-01	28.3	1.920E-01	1.951E-01	7.855E-01
ZR-95	7.034E-01	105.3	7.408E-01	7.417E-01	1.771E+00
NB-95	0.000E+00	1.#INF	9.680E-02	9.680E-02	1.593E+00
RU-103	-2.321E-01	189.1	4.388E-01	4.389E-01	1.124E+00
RH-106	2.475E+00	351.1	8.691E+00	8.692E+00	2.957E+01
AG-108M	3.548E-01	98.1	3.481E-01	3.486E-01	6.611E-01
AG-110M	1.470E+00	25.6	3.760E-01	3.833E-01	2.290E+00
SN-113	4.585E-02	1315.3	6.030E-01	6.030E-01	2.106E+00
SB-124	1.819E-01	133.2	2.423E-01	2.425E-01	2.999E+00
SB-125	1.140E+00	99.0	1.128E+00	1.130E+00	2.708E+00
I-131	5.682E-02	246.3	1.400E-01	1.400E-01	1.143E+00
Gd-153	-9.470E-01	106.0	1.004E+00	1.006E+00	2.703E+00
Ga-68	1.176E+01	145.8	1.714E+01	1.715E+01	3.953E+01
Tc-99m	0.000E+00	1.#INF	2.125E-01	2.125E-01	1.648E+00
BA-133	-6.638E-01	147.6	9.796E-01	9.801E-01	3.297E+00
CS-134	4.484E-01	83.1	3.724E-01	3.731E-01	3.006E+00
CS-137	-7.052E-01	91.1	6.428E-01	6.438E-01	1.540E+00
CE-139	2.008E-01	175.4	3.522E-01	3.523E-01	1.197E+00
Ba-140	-5.093E-02	2555.4	1.302E+00	1.302E+00	3.379E+00
La-140	-2.831E-02	102.0	2.888E-02	2.892E-02	1.659E+00
CE-141	5.099E-01	160.6	8.186E-01	8.191E-01	2.751E+00

CE-144	-2.316E+00	163.3	3.784E+00	3.785E+00	1.270E+01
PM-144	3.715E-01	96.0	3.568E-01	3.573E-01	7.719E-01
EU-152	7.925E-01	199.1	1.578E+00	1.579E+00	5.196E+00
EU-154	-5.552E+00	83.9	4.657E+00	4.666E+00	1.564E+01
EU-155	2.581E-01	571.8	1.476E+00	1.476E+00	5.033E+00
HF-181	-6.776E-02	108.1	7.327E-02	7.335E-02	1.909E+00
Ta-182	2.334E-01	47.1	1.098E-01	1.104E-01	6.791E+00
Hg-203	-2.434E-01	178.5	4.343E-01	4.345E-01	1.481E+00
TL-208	2.075E+00	17.5	3.626E-01	3.776E-01	5.155E-01
pm-146	1.670E-01	565.7	9.448E-01	9.448E-01	2.811E+00
y-88	-9.513E-01	88.0	8.376E-01	8.390E-01	1.861E+00
Cd-113m	6.055E+03	62.0	3.756E+03	3.772E+03	1.236E+04
Cd-109	6.821E-01	1650.1	1.126E+01	1.126E+01	3.816E+01
Cf-251	1.265E+00	108.5	1.373E+00	1.374E+00	3.572E+00
Cf-249	2.315E-01	190.4	4.407E-01	4.409E-01	2.027E+00
Sn-126	1.551E+00	289.3	4.486E+00	4.487E+00	1.519E+01
PB-210	2.615E+01	43.9	1.148E+01	1.160E+01	3.155E+01
PB-212	4.323E+00	14.8	6.415E-01	6.800E-01	1.614E+00
PB-214	1.002E+01	10.3	1.030E+00	1.148E+00	2.030E+00
BI-207	5.115E-01	62.8	3.210E-01	3.220E-01	1.039E+00
BI-212	4.519E+00	124.0	5.602E+00	5.607E+00	1.929E+01
U-235	5.619E-01	201.1	1.130E+00	1.130E+00	1.319E+01
BI-214	1.019E+01	11.5	1.173E+00	1.282E+00	1.954E+00
BI-210M	-3.082E-02	1818.6	5.606E-01	5.606E-01	1.962E+00
AC-228	6.101E+00	19.8	1.208E+00	1.247E+00	4.911E+00
TH-227	4.099E+00	149.0	6.106E+00	6.111E+00	2.062E+01
TH-229	-3.887E+00	176.8	6.871E+00	6.874E+00	1.792E+01
TH-234	2.318E+01	28.7	6.663E+00	6.790E+00	1.773E+01
PA-231	0.000E+00	1.#INF	2.366E+00	2.366E+00	7.299E+01
PA-233	0.000E+00	1.#INF	2.740E-01	2.740E-01	5.975E+00
PA-234	2.515E+00	82.0	2.063E+00	2.067E+00	5.243E+00
PA-234M	0.000E+00	1.#INF	4.203E+01	4.203E+01	2.625E+02
AM-241	-1.030E+00	139.6	1.438E+00	1.439E+00	4.823E+00
Np-237	2.056E+00	150.2	3.088E+00	3.090E+00	1.037E+01
Ir-192	3.920E-01	119.1	4.669E-01	4.674E-01	2.296E+00
Cs-136	8.121E-01	20.0	1.624E-01	1.688E-01	1.631E+00
Np-239	1.258E+00	45.7	5.755E-01	5.803E-01	1.821E+00
Nd-147	-1.326E+00	261.7	3.470E+00	3.471E+00	8.567E+00
TL-210	-3.944E-01	109.4	4.317E-01	4.322E-01	1.481E+00
Total	6.356E+03				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 12_Gamma_20181339.An1

Sample description
376740_Gamma_160-29521-A-4-C

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20181339.An1

Acquisition information
Start time:	8/9/2018 7:17:13 AM
Live time:	1800
Real time:	1801
Dead time:	0.06 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration
Filename:	12_Soil_TunaCan.Clb

12_TunaCan_108513

Energy Calibration
Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration
Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files
Main analysis library:	Client_Long_Rev14.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 7:16:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2018-07-14_1810.PBC 7/14/2018 6:10:12 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1758

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.50	36.	43.90	0.69	1.802E-02	46.54	4.250	PBC<MDA	PB210
50.14	13.	148.97	0.85	2.193E-02	50.14	8.000	PBC<MDA	TH227
63.39	25.	57.16	0.64	2.981E-02	63.29	3.810	PBC<MDA	TH234
64.28	8.	289.25	0.87	3.015E-02	64.28	9.700	PBC<MDA	Sn126
77.17	93.	21.16	0.81	3.387E-02				
86.41	17.	150.20	0.89	3.559E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	8.770E-01	EU155
87.38	54.	28.39	0.58	3.572E-02	86.54	30.700	2.728E+00	EU155
					86.94	9.040	9.249E+00	Sn126
					87.57	37.500	2.224E+00	Sn126
93.24	19.	139.35	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
99.50	14.	146.27	0.91	3.697E-02	99.50	15.000	PBC<MDA	Np239
103.20	11.	204.26	0.91	3.717E-02	103.20	21.800	PBC<MDA	Gd153
103.66	14.	147.66	0.91	3.720E-02	103.70	24.000	PBC<MDA	Np239
105.31	4.	571.85	0.91	3.726E-02	105.31	21.200	PBC<MDA	EU155
106.09	19.	45.74	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
131.29	9.	204.58	0.94	3.683E-02	131.29	18.000	PBC<MDA	PA234
133.02	16.	164.40	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
145.44	16.	160.56	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
165.85	10.	175.41	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
176.60	13.	108.51	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	-4.	548.88	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
205.33	9.	201.12	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235
227.00	2.	672.42	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
238.45	92.	14.88	1.05	2.746E-02	238.63	43.300	4.315E+00	PB212
241.98	49.	21.71	1.05	2.718E-02	242.00	7.430	1.348E+01	PB214
244.69	11.	199.11	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
263.70	17.	62.03	1.07	2.554E-02	263.70	0.006	PBC<MDA	Cd113m
295.27	87.	16.97	1.59	2.350E-02	295.09	19.300	1.064E+01	PB214
					296.00	79.000	PBC<MDA	TL210
316.49	14.	176.05	1.12	2.229E-02	316.49	87.040	PBC<MDA	Ir192
333.44	7.	190.42	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
338.32	4.	370.81	1.14	2.118E-02	338.32	12.010	PBC<MDA	AC228
340.57	10.	148.13	1.15	2.108E-02	340.57	46.900	PBC<MDA	Cs136
351.69	143.	10.74	1.06	2.056E-02	351.93	37.600	9.704E+00	PB214
427.88	4.	244.95	1.23	1.770E-02	427.88	29.600	PBC<MDA	SB125
433.94	7.	98.12	1.24	1.751E-02	433.94	90.480	PBC<MDA	AG108M
463.37	10.	98.99	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
468.06	6.	160.40	1.27	1.653E-02	468.06	51.750	PBC<MDA	Ir192
477.60	7.	184.53	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
487.02	11.	107.94	1.29	1.604E-02	487.02	45.500	PBC<MDA	La140
511.86	53.	35.41	2.56	1.546E-02	511.86	20.000	9.585E+00	RH106
569.70	10.	81.33	1.37	1.427E-02	569.32	15.380	2.406E+00	CS134
					569.47	8.200	4.513E+00	PA234
					569.70	97.740	3.788E-01	BI207
583.09	43.	17.48	0.97	1.403E-02	583.02	84.500	2.007E+00	TL208
609.43	115.	11.51	1.24	1.358E-02	609.31	46.090	1.019E+01	BI214
610.30	10.	198.24	1.41	1.357E-02	610.30	5.750	PBC<MDA	RU103
614.28	10.	202.79	1.41	1.350E-02	614.28	89.850	PBC<MDA	AG108M
618.06	10.	205.24	1.41	1.344E-02	618.06	99.100	PBC<MDA	PM144
621.92	6.	351.12	1.42	1.338E-02	621.92	9.930	PBC<MDA	RH106
635.89	3.	247.21	1.43	1.317E-02	635.89	11.310	PBC<MDA	SB125
636.97	3.	246.30	1.43	1.315E-02	636.97	7.170	PBC<MDA	I131
696.54	7.	96.02	1.49	1.232E-02	696.54	99.000	PBC<MDA	PM144
702.63	7.	95.69	1.49	1.224E-02	702.63	97.900	PBC<MDA	NB94
722.79	7.	133.25	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.570E-01	AG108M
					723.36	20.220	1.604E+00	EU154
727.17	7.	123.98	1.52	1.194E-02	727.17	7.550	PBC<MDA	BI212
735.72	1.	800.00	1.52	1.184E-02	735.72	22.500	PBC<MDA	pm146
747.16	1.	800.00	1.53	1.171E-02	747.16	34.000	PBC<MDA	pm146
756.73	8.	105.33	1.54	1.160E-02	756.73	54.460	PBC<MDA	ZR95
763.94	29.	25.57	1.55	1.152E-02	763.94	22.280	6.275E+00	AG110M
778.92	3.	270.80	1.56	1.136E-02	778.92	12.940	PBC<MDA	EU152
785.42	11.	50.17	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
801.95	10.	83.07	1.58	1.113E-02	801.95	8.690	PBC<MDA	CS134
810.78	10.	85.84	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58
818.50	1.	676.39	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
834.85	3.	270.80	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
859.81	6.	147.67	1.64	1.057E-02	860.56	12.420	PBC<MDA	TL208
871.10	19.	28.34	1.65	1.048E-02	871.10	99.890	1.008E+00	NB94
880.53	8.	86.92	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
883.24	8.	103.57	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
910.26	13.	88.36	1.68	1.015E-02	911.07	29.000	PBC<MDA	AC228
937.49	9.	114.22	1.71	9.939E-03	937.49	34.360	PBC<MDA	AG110M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
946.02	8.	89.29	1.72	9.873E-03	946.02	13.400	PBC<MDA	PA234
968.49	37.	19.81	1.74	9.703E-03	968.97	17.460	1.213E+01	AC228
1037.84	9.	90.44	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	25.	20.00	1.81	9.162E-03	1048.07	80.000	1.895E+00	Cs136
1063.66	8.	95.58	1.82	9.063E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	5.	145.77	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1120.38	43.	15.58	1.87	8.722E-03	1120.29	15.100	1.808E+01	BI214
					1120.55	99.987	2.580E+00	Sc46
					1121.30	34.900	7.830E+00	Ta182
1221.41	14.	47.06	1.96	8.175E-03	1221.41	27.000	3.608E+00	Ta182
1313.00	10.	31.62	2.04	7.735E-03	1313.00	21.000	3.420E+00	TL210
1460.55	245.	6.39	1.13	7.113E-03	1460.83	10.670	1.794E+02	K40
1763.53	25.	20.00	2.40	6.075E-03	1764.49	15.400	1.485E+01	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
308.24	77.17	96.	93.	2.754E+03	21.16	0.811	-	
348.70	87.38	49.	53.	1.497E+03	22.99	0.893	-	sD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.65	46.50	77.	36.	0.020	43.90	0.685
TH-227	200.18	50.14	180.	13.	0.007	148.97	0.855
AM-241	237.74	59.54	333.	-19.	-0.010	139.56	0.865
TH-234	253.14	63.39	52.	47.	0.026	28.74	0.643
Sn-126	256.71	64.28	275.	8.	0.005	289.25	0.869
BA-133	323.50	80.99	364.	-21.	-0.012	128.30	0.887
Np-237	345.49	86.49	327.	17.	0.010	150.20	0.892s
EU-155	345.70	86.54	402.	-20.	-0.011	146.46	0.892s
Sn-126	347.29	86.94	383.	-4.	-0.002	728.36	0.892
Sn-126	349.81	87.57	379.	0.	0.000	1000.00	0.893
Nd-147	363.92	91.10	379.	0.	0.000	1000.00	0.897s
TH-234	369.87	92.59	445.	-54.	-0.030	39.73	0.898
AC-228	372.91	93.35	356.	19.	0.011	139.35	0.899

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Gd-153	389.50	97.50	120.	-19.	-0.010	106.05	0.903s
Np-239	397.50	99.50	215.	14.	0.008	146.27	0.905
Gd-153	412.29	103.20	229.	11.	0.006	204.26	0.909s
Np-239	414.29	103.70	221.	14.	0.008	147.66	0.909s
EU-155	420.73	105.31	218.	4.	0.002	571.85	0.911s
Np-239	424.00	106.13	29.	19.	0.011	45.74	0.912D
EU-152	486.55	121.78	130.	-16.	-0.009	101.13	0.928s
CO-57	487.69	122.06	146.	-4.	-0.002	483.84	0.928s
EU-154	491.84	123.10	141.	-6.	-0.003	290.67	0.929s
PA-234	524.60	131.29	165.	9.	0.005	204.58	0.938s
HF-181	531.51	133.02	323.	16.	0.009	164.40	0.939s
CE-144	533.57	133.54	376.	-17.	-0.009	163.33	0.940s
HF-181	544.61	136.30	359.	-17.	-0.009	159.22	0.943s
CO-57	545.30	136.47	360.	-16.	-0.009	173.24	0.943s
Tc-99m	561.44	140.51	376.	0.	0.000	1000.00	0.947s
U-235	574.53	143.79	380.	-4.	-0.002	485.47	0.950s
CE-141	581.15	145.44	316.	16.	0.009	160.56	0.952
Ba-140	649.99	162.66	158.	-17.	-0.009	108.45	0.969s
CE-139	662.76	165.85	144.	10.	0.005	175.41	0.973s
Cf-251	705.72	176.60	51.	13.	0.007	108.51	0.983
U-235	742.18	185.72	130.	-4.	-0.002	548.88	0.992s
TH-229	773.32	193.51	81.	-10.	-0.005	176.77	1.000s
U-235	820.59	205.33	84.	9.	0.005	201.12	1.012s
TH-229	842.65	210.85	92.	-5.	-0.003	386.61	1.018s
Cf-251	907.22	227.00	70.	2.	0.001	672.42	1.034s
PB-212	953.73	238.63	47.	92.	0.051	14.84	1.045D
PB-214	967.18	242.00	27.	51.	0.028	20.28	1.049D
EU-152	977.96	244.69	233.	11.	0.006	199.11	1.051s
TH-227	1024.13	256.24	92.	-18.	-0.010	99.74	1.063s
Cd-113m	1053.96	263.70	45.	17.	0.009	62.03	1.070s
TL-208	1108.27	277.28	80.	-17.	-0.010	77.36	1.084
Hg-203	1115.93	279.20	117.	-9.	-0.005	178.45	1.086s
I-131	1136.32	284.30	62.	-7.	-0.004	204.77	1.091s
PB-214	1180.17	295.27	33.	87.	0.048	16.97	1.594s
TL-210	1183.11	296.00	378.	-14.	-0.008	193.62	1.102s
PB-212	1199.22	300.03	364.	-14.	-0.008	189.31	1.106
PA-231	1199.38	300.07	349.	-14.	-0.008	185.60	1.106s
PA-233	1199.82	300.18	335.	-6.	-0.003	441.08	1.107s
PA-231	1209.70	302.65	329.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	329.	0.	0.000	1000.00	1.109s
Ba-140	1218.49	304.85	329.	0.	0.000	1000.00	1.111s
BI-210M	1218.68	304.90	329.	0.	0.000	1000.00	1.111s
Ir-192	1232.85	308.44	329.	0.	0.000	1000.00	1.115s
PA-233	1247.13	312.01	329.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	276.	14.	0.008	176.05	1.123s
CR-51	1279.41	320.08	360.	-15.	-0.008	178.97	1.126s
La-140	1314.10	328.76	108.	-15.	-0.008	99.35	1.135s
Cf-249	1332.81	333.44	92.	7.	0.004	190.42	1.139s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1352.33	338.32	108.	4.	0.002	370.81	1.144
Cs-136	1361.32	340.57	101.	10.	0.005	148.13	1.146s
EU-152	1376.18	344.29	111.	0.	0.000	1000.00	1.150s
HF-181	1382.35	345.83	140.	-15.	-0.008	114.64	1.151s
PB-214	1405.81	351.69	30.	135.	0.075	11.59	1.060
BA-133	1423.02	356.00	241.	-15.	-0.008	147.56	1.162s
I-131	1456.95	364.48	44.	-3.	-0.002	436.74	1.170s
BA-133	1534.35	383.84	84.	-2.	-0.001	651.92	1.189s
Cf-249	1550.79	387.95	86.	0.	0.000	1000.00	1.193s
SB-125	1710.45	427.88	24.	4.	0.002	244.95	1.232s
AG-108M	1734.69	433.94	12.	7.	0.004	98.12	1.238s
pm-146	1814.45	453.88	36.	-5.	-0.003	239.17	1.257s
SB-125	1852.39	463.37	44.	10.	0.006	98.99	1.266s
Ir-192	1871.16	468.06	46.	6.	0.003	160.40	1.271s
BE-7	1909.29	477.60	72.	7.	0.004	184.53	1.280s
HF-181	1926.90	482.00	81.	-9.	-0.005	140.52	1.284s
La-140	1946.98	487.02	65.	11.	0.006	107.94	1.289s
RU-103	1987.11	497.05	32.	-6.	-0.003	189.05	1.298s
RH-106	2046.35	511.86	47.	53.	0.030	35.41	2.563s
Nd-147	2122.88	531.00	35.	-5.	-0.003	261.67	1.331s
CS-134	2276.15	569.32	30.	-5.	-0.003	152.33	1.367s
PA-234	2276.75	569.47	37.	-1.	-0.001	741.48	1.368s
BI-207	2277.68	569.70	25.	10.	0.005	81.33	1.368s
TL-208	2331.24	583.09	3.	43.	0.024	17.48	0.968s
SB-125	2400.87	600.50	237.	-12.	-0.007	185.27	1.397s
SB-124	2409.79	602.73	225.	-3.	-0.002	686.30	1.399s
CS-134	2417.71	604.71	222.	0.	0.000	1000.00	1.401s
BI-214	2436.60	609.43	17.	115.	0.064	11.51	1.238s
RU-103	2440.06	610.30	183.	10.	0.005	198.24	1.406s
AG-108M	2455.99	614.28	193.	10.	0.005	202.79	1.410s
PM-144	2471.12	618.06	199.	10.	0.005	205.24	1.414s
RH-106	2486.54	621.92	213.	6.	0.003	351.12	1.417s
SB-125	2542.43	635.89	26.	3.	0.002	247.21	1.430s
I-131	2546.77	636.97	29.	3.	0.002	246.30	1.432s
CS-137	2645.51	661.66	35.	-14.	-0.008	91.15	1.455
PM-144	2785.05	696.54	9.	7.	0.004	96.02	1.487s
NB-94	2809.41	702.63	9.	7.	0.004	95.69	1.493s
SB-124	2890.04	722.79	40.	7.	0.004	133.25	1.512s
AG-108M	2890.65	722.94	47.	0.	0.000	1000.00	1.512s
EU-154	2892.32	723.36	47.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	47.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	38.	7.	0.004	123.98	1.516s
pm-146	2941.78	735.72	14.	1.	0.001	800.00	1.524s
pm-146	2987.55	747.16	14.	1.	0.001	800.00	1.535s
ZR-95	3025.83	756.73	14.	8.	0.004	105.33	1.543s
AG-110M	3054.69	763.94	13.	29.	0.016	25.57	1.550s
NB-95	3062.08	765.79	42.	0.	0.000	1000.00	1.552s
EU-152	3114.61	778.92	14.	3.	0.002	270.80	1.564s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	3140.62	785.42	5.	11.	0.006	50.17	1.570
TL-210	3197.35	799.60	33.	-8.	-0.004	109.45	1.583s
CS-134	3206.76	801.95	27.	10.	0.005	83.07	1.585s
CO-58	3242.06	810.78	28.	10.	0.005	85.84	1.593s
La-140	3262.05	815.77	42.	-10.	-0.006	95.62	1.598s
Cs-136	3272.97	818.50	40.	1.	0.001	676.39	1.600s
MN-54	3338.38	834.85	14.	3.	0.002	270.80	1.615s
Co-56	3386.08	846.77	25.	-4.	-0.002	279.32	1.626s
TL-208	3441.27	860.56	15.	6.	0.003	147.67	1.638s
NB-94	3483.41	871.10	5.	19.	0.011	28.34	1.648s
EU-154	3491.95	873.23	52.	-13.	-0.007	83.88	1.650s
PA-234	3521.16	880.53	21.	8.	0.005	86.92	1.657s
PA-234	3532.00	883.24	29.	8.	0.004	103.57	1.659s
AG-110M	3537.78	884.68	37.	0.	0.000	1000.00	1.660s
Sc-46	3556.17	889.28	48.	-10.	-0.006	103.18	1.664s
y-88	3591.22	898.04	40.	-16.	-0.009	88.04	1.672s
AC-228	3643.36	911.07	25.	13.	0.007	88.36	1.684s
AG-110M	3749.09	937.49	20.	9.	0.005	114.22	1.708s
PA-234	3783.21	946.02	10.	8.	0.005	89.29	1.716s
EU-152	3855.60	964.11	42.	-8.	-0.005	115.72	1.732s
AC-228	3875.05	968.97	8.	37.	0.021	19.81	1.736s
EU-154	3984.54	996.33	51.	-5.	-0.003	213.51	1.761s
PA-234M	4003.22	1001.00	56.	0.	0.000	1000.00	1.765s
EU-154	4018.33	1004.77	68.	-10.	-0.006	118.78	1.768s
Co-56	4150.66	1037.84	11.	9.	0.005	90.44	1.798s
Cs-136	4191.60	1048.07	0.	25.	0.014	20.00	1.807s
RH-106	4200.76	1050.36	25.	0.	0.000	1000.00	1.809s
BI-207	4253.99	1063.66	11.	8.	0.005	95.58	1.820s
Ga-68	4308.98	1077.40	11.	5.	0.003	145.77	1.833
FE-59	4396.44	1099.25	27.	-10.	-0.005	125.61	1.852s
EU-152	4447.76	1112.07	64.	-13.	-0.007	91.50	1.863s
BI-214	4480.63	1120.29	1.	43.	0.024	15.58	1.870s
Sc-46	4481.68	1120.55	61.	-14.	-0.008	98.21	1.870s
Ta-182	4484.69	1121.30	55.	-13.	-0.007	85.02	1.871
CO-60	4692.57	1173.24	21.	-7.	-0.004	147.85	1.916s
Ta-182	4755.86	1189.05	27.	-10.	-0.005	125.61	1.930
Ta-182	4885.39	1221.41	6.	14.	0.008	47.06	1.957
Co-56	4952.92	1238.28	40.	-6.	-0.003	264.02	1.972s
EU-154	5098.09	1274.54	12.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	51.	-21.	-0.012	82.47	2.017s
TL-210	5252.04	1313.00	0.	10.	0.006	31.62	2.036s
CO-60	5330.11	1332.50	23.	-13.	-0.007	92.52	2.052s
AG-110M	5537.48	1384.30	11.	-3.	-0.002	243.10	2.096s
EU-152	5632.39	1408.00	12.	-4.	-0.002	215.06	2.115s
K-40	5843.92	1460.83	6.	237.	0.132	6.96	2.159s
La-140	6386.02	1596.21	12.	-5.	-0.003	173.21	2.269s
SB-124	6765.58	1690.98	0.	0.	0.000	1000.00	2.345s
BI-214	7060.00	1764.49	0.	25.	0.014	20.00	2.403s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	7087.48	1771.35	25.	0.	0.000	1000.00	2.408s
y-88	7346.69	1836.06	7.	-4.	-0.002	186.97	2.459s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	2.1622E+00				5.31E+01	
			477.60	2.162E+00	(	1.373E+01 1.85E+02 1.05E+01	G
NA-22	C	-2.3414E-02				9.50E+02	
			1274.53	-2.341E-02	%(	1.292E+00 1.44E+03 9.99E+01	G
K-40	N	1.7350E+02				4.66E+11	
			1460.83	1.735E+02	?(	1.034E+01 6.96E+00 1.07E+01	G
Sc-46	F	-5.3951E-01				8.38E+01	
			889.28	-5.395E-01	?(	1.892E+00 1.03E+02 1.00E+02	G
			1120.55	-8.701E-01	+ P	2.489E+00 9.82E+01 1.00E+02	G
CR-51	F	-3.8338E+00				2.77E+01	
			320.08	-3.834E+00	&(	2.306E+01 1.79E+02 9.94E+00	G
MN-54	C	1.5424E-01				3.12E+02	
			834.85	1.542E-01	?(	1.036E+00 2.71E+02 1.00E+02	G
FE-59	F	-1.0746E+00				4.45E+01	
			1099.25	-1.075E+00	?(	2.976E+00 1.26E+02 5.65E+01	G
			1291.60	-3.457E+00	+	5.908E+00 8.25E+01 4.32E+01	G
Co-56	C	2.8458E-01				7.73E+01	
			846.77	-2.079E-01	?(	1.352E+00 2.79E+02 9.99E+01	G
			1238.28	-5.890E-01	+	3.332E+00 2.64E+02 6.61E+01	G
			1037.84	3.767E+00	?(	7.639E+00 9.04E+01 1.41E+01	G
			1771.35	0.000E+00	-	1.542E+01 1.00E+03 1.55E+01	A
CO-57	C	-6.2017E-02				2.72E+02	
			122.06	-6.202E-02	?(	1.030E+00 4.84E+02 8.56E+01	G
			136.47	-2.232E+00	+	1.299E+01 1.73E+02 1.07E+01	G
CO-58	C	4.8071E-01				7.09E+01	
			810.78	4.807E-01	&(	1.396E+00 8.58E+01 9.95E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	F	-9.2041E-01					1.93E+03	
			1332.50	-9.204E-01	?(	1.809E+00	9.25E+01	1.00E+02 G
			1173.24	-4.840E-01	+	1.599E+00	1.48E+02	9.99E+01 G
ZN-65	F	-1.0957E-01					2.44E+02	
			1115.55	-1.096E-01	%(	4.511E+00	1.16E+03	5.06E+01 G
NB-94	I	6.7759E-01					7.41E+06	
			702.63	3.403E-01	?(	7.855E-01	9.57E+01	9.79E+01 G
			871.10	1.008E+00	?(	6.967E-01	2.83E+01	9.99E+01 G
ZR-95	I	7.0338E-01					6.40E+01	
			756.73	7.034E-01	?(	1.771E+00	1.05E+02	5.45E+01 G
			724.20	0.000E+00	-	3.641E+00	1.00E+03	4.42E+01 G
RU-103	I	-2.3209E-01					3.93E+01	
			497.05	-2.321E-01	?(	1.124E+00	1.89E+02	9.09E+01 G
			610.30	6.964E+00	?	4.682E+01	1.98E+02	5.75E+00 GA
RH-106	I	2.4752E+00					3.74E+02	
			621.92	2.475E+00	?(	2.957E+01	3.51E+02	9.93E+00 G
			1050.36	0.000E+00	&	1.013E+02	1.00E+03	1.56E+00 G
			511.86	9.585E+00	?	6.208E+00	3.54E+01	2.00E+01 GA
AG-108M	C	3.5480E-01					1.53E+05	
			433.94	2.613E-01	?(	6.611E-01	9.81E+01	9.05E+01 G
			722.94	0.000E+00	-	1.767E+00	1.00E+03	9.08E+01 G
			614.28	4.490E-01	?(	3.087E+00	2.03E+02	8.98E+01 G
AG-110M	F	1.4702E+00					2.50E+02	
			884.68	0.000E+00	?(	2.290E+00	1.00E+03	7.27E+01 G
			657.76	7.617E-03	%	1.399E+00	5.09E+03	9.46E+01 G
			937.49	1.464E+00	?(	3.831E+00	1.14E+02	3.44E+01 G
			1384.30	-1.027E+00	+	5.669E+00	2.43E+02	2.43E+01 G
			763.94	6.275E+00	?(	4.222E+00	2.56E+01	2.23E+01 G
SN-113	F	4.5847E-02					1.15E+02	
			391.69	4.585E-02	%(	2.106E+00	1.32E+03	6.40E+01 G
SB-124	F	1.8187E-01					6.02E+01	
			602.73	-1.281E-01	?(	2.999E+00	6.86E+02	9.83E+01 G
			1690.98	0.000E+00	+	1.359E+00	1.00E+03	4.78E+01 G
			722.79	2.999E+00	?(	1.379E+01	1.33E+02	1.08E+01 G
SB-125	I	1.1398E+00					1.01E+03	
			427.88	4.242E-01	?(	2.708E+00	2.45E+02	2.96E+01 G
			600.50	-2.696E+00	+	1.687E+01	1.85E+02	1.79E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		635.89	1.119E+00	*(	9.877E+00	2.47E+02	1.13E+01 G
		463.37	3.185E+00	?(	1.071E+01	9.90E+01	1.05E+01 G
I-131	I 5.6821E-02					8.02E+00	
		364.48	-1.020E-01	(	1.143E+00	4.37E+02	8.17E+01 G
		284.30	-2.746E+00	+	1.479E+01	2.05E+02	6.14E+00 G
		636.97	1.866E+00	?(	1.634E+01	2.46E+02	7.17E+00 G
Gd-153	F -9.4699E-01					2.42E+02	
		97.50	-9.470E-01	?(	2.703E+00	1.06E+02	3.00E+01 G
		103.20	7.271E-01	+	5.024E+00	2.04E+02	2.18E+01 G
Ga-68	C 1.1759E+01					4.71E-02	
		1077.40	1.176E+01	?(	3.953E+01	1.46E+02	3.30E+00 G
BA-133	F -6.6383E-01					3.85E+03	
		356.00	-6.638E-01	?(	3.297E+00	1.48E+02	6.20E+01 G
		302.85	0.000E+00	+	1.147E+01	1.00E+03	1.83E+01 G
		383.84	-6.463E-01	&	1.468E+01	6.52E+02	8.94E+00 GA
		80.99	-1.004E+00	+	4.313E+00	1.28E+02	3.41E+01 GA
CS-134	I 4.4836E-01					7.54E+02	
		604.71	0.000E+00	&(	3.006E+00	1.00E+03	9.76E+01 G
		795.87	9.677E-03	%	1.777E+00	5.09E+03	8.55E+01 G
		569.32	-1.349E+00	+	7.177E+00	1.52E+02	1.54E+01 G
		801.95	5.485E+00	?(	1.538E+01	8.31E+01	8.69E+00 G
		563.24	-1.541E-01	%	1.022E+01	2.56E+03	8.35E+00 G
CS-137	I -7.0522E-01					1.10E+04	
		661.66	-7.052E-01	?(	1.540E+00	9.11E+01	8.52E+01 G
CE-139	F 2.0079E-01					1.38E+02	
		165.85	2.008E-01	?(	1.197E+00	1.75E+02	7.99E+01 G
Ba-140	I -5.0933E-02					1.28E+01	
		537.26	-5.093E-02	&(	3.379E+00	2.56E+03	2.44E+01 G
		162.66	-4.379E+00	+	1.595E+01	1.08E+02	6.22E+00 G
		304.85	0.000E+00	+	4.927E+01	1.00E+03	4.29E+00 G
La-140	I -2.8306E-02					1.28E+01	
		1596.21	-4.401E-01	?(	1.659E+00	1.73E+02	9.54E+01 G
		487.02	8.351E-01	&(	3.058E+00	1.08E+02	4.55E+01 G
		328.76	-1.931E+00	+	6.450E+00	9.94E+01	2.03E+01 G
		815.77	-2.208E+00	+	7.160E+00	9.56E+01	2.33E+01 G
CE-141	I 5.0986E-01					3.25E+01	
		145.44	5.099E-01	?(	2.751E+00	1.61E+02	4.82E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
CE-144	I	-2.3164E+00						2.85E+02	
			133.54	-2.316E+00	?(		1.270E+01	1.63E+02	1.11E+01 G
PM-144	C	3.7155E-01						3.63E+02	
			696.54	3.331E-01	?(		7.719E-01	9.60E+01	9.90E+01 G
			618.06	4.099E-01	?(		2.852E+00	2.05E+02	9.91E+01 G
EU-152	F	7.9252E-01						4.94E+03	
			344.29	0.000E+00	?(		5.196E+00	1.00E+03	2.65E+01 G
			1112.07	-6.017E+00	+		1.854E+01	9.15E+01	1.36E+01 G
			121.78	-8.580E-01	+		2.914E+00	1.01E+02	2.86E+01 G
			778.92	1.134E+00	?(		7.612E+00	2.71E+02	1.29E+01 G
			964.11	-3.255E+00	+		1.290E+01	1.16E+02	1.46E+01 G
			244.69	2.981E+00	&(		2.007E+01	1.99E+02	7.58E+00 G
			1408.00	-1.445E+00	+		6.808E+00	2.15E+02	2.10E+01 GA
EU-154	I	-5.5524E+00						3.14E+03	
			873.23	-5.552E+00	?(		1.564E+01	8.39E+01	1.23E+01 G
			123.10	-2.135E-01	+		2.124E+00	2.91E+02	4.08E+01 G
			1274.54	0.000E+00	+		3.716E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+		7.944E+00	1.00E+03	2.02E+01 G
			1004.77	-3.319E+00	+		1.341E+01	1.19E+02	1.80E+01 G
			996.33	-2.664E+00	+		1.981E+01	2.14E+02	1.06E+01 G
EU-155	I	2.5809E-01						1.81E+03	
			105.31	2.581E-01	?(		5.033E+00	5.72E+02	2.12E+01 G
			86.54	-9.965E-01	+		4.890E+00	1.46E+02	3.07E+01 G
HF-181	F	-6.7760E-02						4.24E+01	
			482.00	-3.983E-01	?(		1.909E+00	1.41E+02	8.05E+01 G
			133.02	5.468E-01	?(		3.022E+00	1.64E+02	4.33E+01 G
			345.83	-2.650E+00	+		1.023E+01	1.15E+02	1.51E+01 G
			136.30	-4.425E+00	+		2.365E+01	1.59E+02	5.85E+00 G
Ta-182	F	2.3336E-01						1.14E+02	
			1121.30	-2.377E+00	(		6.791E+00	8.50E+01	3.49E+01 G
			1221.41	3.608E+00	(		3.474E+00	4.71E+01	2.70E+01 G
			1189.05	-3.974E+00	+		1.101E+01	1.26E+02	1.62E+01 G
Hg-203	F	-2.4338E-01						4.66E+01	
			279.20	-2.434E-01	&(		1.481E+00	1.78E+02	8.15E+01 G
TL-208	N	2.0750E+00						6.98E+02	
			583.02	2.007E+00	(		5.155E-01	1.75E+01	8.45E+01 G
			277.28	-6.173E+00	-		1.592E+01	7.74E+01	6.31E+00 G
			860.56	2.538E+00	?(		8.781E+00	1.48E+02	1.24E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
pm-146	C	1.6701E-01				2.02E+03		
			747.16	1.395E-01	?(	2.811E+00	8.00E+02	3.40E+01 G
			735.72	2.085E-01	&(	4.201E+00	8.00E+02	2.25E+01 G
			453.88	-2.525E-01	+	1.549E+00	2.39E+02	6.50E+01 G
y-88	F	-9.5130E-01				1.07E+02		
			898.04	-9.513E-01	?(	1.861E+00	8.80E+01	9.37E+01 G
			1836.06	-3.501E-01	+	1.407E+00	1.87E+02	9.92E+01 G
Cd-113m		6.0555E+03				5.33E+03		
			263.70	6.055E+03	&(	1.236E+04	6.20E+01	6.00E-03 K
Cd-109	F	6.8213E-01				4.53E+02		
			88.04	6.821E-01	&(	3.816E+01	1.65E+03	3.79E+00 G
Cf-251	T	1.2651E+00				3.28E+05		
			176.60	1.265E+00	&(	3.572E+00	1.09E+02	1.70E+01 G
			227.00	7.249E-01	?	1.293E+01	6.72E+02	6.30E+00 GA
Cf-249	T	2.3145E-01				1.28E+05		
			387.95	0.000E+00	*(	2.027E+00	1.00E+03	6.60E+01 G
			333.44	1.216E+00	?(	7.939E+00	1.90E+02	1.55E+01 G
Sn-126		1.5510E+00				3.65E+07		
			87.57	0.000E+00	-	3.872E+00	1.00E+03	3.75E+01 GA
			64.28	1.551E+00	(	1.519E+01	2.89E+02	9.70E+00 G
			86.94	-6.563E-01	+	1.618E+01	7.28E+02	9.04E+00 GA
PB-210	N	2.6155E+01				8.14E+03		
			46.54	2.615E+01	(P	3.155E+01	4.39E+01	4.25E+00 G
PB-212	N	4.3234E+00				6.98E+02		
			238.63	4.323E+00	(P	1.614E+00	1.48E+01	4.33E+01 G
			300.03	-1.050E+01	-	6.683E+01	1.89E+02	3.28E+00 GA
PB-214	N	1.0023E+01				5.84E+05		
			351.93	9.704E+00	(P	2.030E+00	1.16E+01	3.76E+01 G
			295.09	1.064E+01	(P	3.616E+00	1.70E+01	1.93E+01 G
			242.00	1.394E+01	+	7.458E+00	2.03E+01	7.43E+00 GA
BI-207	C	5.1151E-01				1.18E+04		
			569.70	3.788E-01	?(	1.039E+00	8.13E+01	9.77E+01 G
			1063.66	6.857E-01	?(	1.475E+00	9.56E+01	7.45E+01 G
BI-212	N	4.5187E+00				6.98E+02		
			727.17	4.519E+00	&(	1.929E+01	1.24E+02	7.55E+00 G
			785.42	4.355E+01	?	4.910E+01	5.02E+01	1.28E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
U-235	N	5.6188E-01					2.57E+11	
			143.79	-6.312E-01	*(P	1.319E+01	4.85E+02	1.10E+01 G
			205.33	3.172E+00	?(	1.665E+01	2.01E+02	5.01E+00 G
			163.38	-1.576E-01	%	2.054E+01	3.79E+03	5.08E+00 G
			185.72	-1.208E-01	+ P	1.786E+00	5.49E+02	5.40E+01 GA
BI-214	N	1.0190E+01					5.84E+05	
			609.31	1.019E+01	(P	1.954E+00	1.15E+01	4.61E+01 G
			1120.29	1.808E+01	+	3.109E+00	1.56E+01	1.51E+01 G
			1764.49	1.485E+01	+	4.376E+00	2.00E+01	1.54E+01 G
BI-210M	T	-3.0823E-02					1.10E+09	
			265.83	-3.082E-02	%(	1.962E+00	1.82E+03	5.00E+01 G
			304.90	0.000E+00	+	7.549E+00	1.00E+03	2.80E+01 G
AC-228	N	6.1007E+00					2.10E+03	
			911.07	2.473E+00	?(	4.911E+00	8.84E+01	2.90E+01 G
			968.97	1.213E+01	?(	5.300E+00	1.98E+01	1.75E+01 G
			338.32	8.735E-01	-	1.117E+01	3.71E+02	1.20E+01 G
			93.35	5.316E+00	?	2.482E+01	1.39E+02	5.56E+00 XA
TH-227	N	4.0988E+00					7.95E+03	
			50.14	4.099E+00	?(	2.062E+01	1.49E+02	8.00E+00 G
			256.24	-5.621E+00	+	1.440E+01	9.97E+01	7.00E+00 G
TH-229	N	-3.8866E+00					2.68E+06	
			193.51	-3.887E+00	?(	1.792E+01	1.77E+02	4.40E+00 G
			210.85	-2.910E+00	+	2.951E+01	3.87E+02	2.99E+00 G
TH-234	N	2.3180E+01					1.63E+12	
			63.29	2.318E+01	(P	1.773E+01	2.87E+01	3.81E+00 G
			92.59	-1.480E+01	+ P	2.764E+01	3.97E+01	5.58E+00 G
PA-234	N	2.5146E+00					1.63E+12	
			131.29	7.542E-01	*(	5.243E+00	2.05E+02	1.80E+01 G
			946.02	3.543E+00	?(	7.326E+00	8.93E+01	1.34E+01 G
			569.47	-5.536E-01	-	1.471E+01	7.41E+02	8.20E+00 G
			883.24	4.379E+00	&(	1.554E+01	1.04E+02	9.60E+00 G
			880.53	7.254E+00	?	2.143E+01	8.69E+01	6.00E+00 GA
AM-241	T	-1.0305E+00					1.58E+05	
			59.54	-1.030E+00	?(	4.823E+00	1.40E+02	3.59E+01 G
Np-237	F	2.0558E+00					2.14E+06	
			86.49	2.056E+00	?(	1.037E+01	1.50E+02	1.31E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ir-192	F 3.9205E-01					7.40E+01	
		316.49	3.871E-01	?(	2.296E+00	1.76E+02	8.70E+01 G
		468.06	4.004E-01	?(	2.225E+00	1.60E+02	5.18E+01 G
		308.44	0.000E+00	&	6.716E+00	1.00E+03	3.18E+01 G
Cs-136	F 8.1215E-01					1.30E+01	
		818.50	6.757E-02	&(	1.631E+00	6.76E+02	1.00E+02 G
		1048.07	1.895E+00	?(	5.586E-01	2.00E+01	8.00E+01 G
		340.57	5.527E-01	?(	2.787E+00	1.48E+02	4.69E+01 G
Np-239	T 1.2582E+00					2.36E+00	
		103.70	9.014E-01	?	4.484E+00	1.48E+02	2.40E+01 X
		106.13	1.258E+00	(	1.821E+00	4.57E+01	2.27E+01 G
		99.50	1.444E+00		7.118E+00	1.46E+02	1.50E+01 X
Nd-147	-1.3262E+00					1.11E+01	
		531.00	-1.326E+00	?(	8.567E+00	2.62E+02	1.30E+01 G
		91.10	0.000E+00	+	5.066E+00	1.00E+03	2.83E+01 G
TL-210	N -3.9441E-01					5.84E+05	
		799.60	-3.944E-01	&(	1.481E+00	1.09E+02	9.90E+01 G
		296.00	-4.300E-01	+	2.799E+00	1.94E+02	7.90E+01 G
		1313.00	3.420E+00	?	2.521E+00	3.16E+01	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the
library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-227	50.14	180.	13.	0.007	148.97	4.099E+00	
AM-241	59.54	333.	-19.	-0.010	139.56	-1.030E+00	
BA-133	80.99	364.	-21.	-0.012	128.30	-1.004E+00	
EU-155	86.54	402.	-20.	-0.011	146.46	-9.965E-01	
Gd-153	97.50	120.	-19.	-0.010	106.05	-9.470E-01	
Gd-153	103.20	229.	11.	0.006	204.26	7.271E-01	
EU-155	105.31	218.	4.	0.002	571.85	2.581E-01	
EU-152	121.78	130.	-16.	-0.009	101.13	-8.580E-01	
CO-57	122.06	146.	-4.	-0.002	483.84	-6.202E-02	
EU-154	123.10	141.	-6.	-0.003	290.67	-2.135E-01	
PA-234	131.29	165.	9.	0.005	204.58	7.542E-01	
HF-181	133.02	323.	16.	0.009	164.40	5.468E-01	
CE-144	133.54	376.	-17.	-0.009	163.33	-2.316E+00	
HF-181	136.30	359.	-17.	-0.009	159.22	-4.425E+00	
CO-57	136.47	360.	-16.	-0.009	173.24	-2.232E+00	
U-235	143.79	380.	-4.	-0.002	485.47	-6.312E-01	P
CE-141	145.44	316.	16.	0.009	160.56	5.099E-01	
Ba-140	162.66	158.	-17.	-0.009	108.45	-4.379E+00	
CE-139	165.85	144.	10.	0.005	175.41	2.008E-01	
Cf-251	176.60	51.	13.	0.007	108.51	1.265E+00	
U-235	185.72	130.	-4.	-0.002	548.88	-1.208E-01	P
TH-229	193.51	81.	-10.	-0.005	176.77	-3.887E+00	
U-235	205.33	84.	9.	0.005	201.12	3.172E+00	
TH-229	210.85	92.	-5.	-0.003	386.61	-2.910E+00	
Cf-251	227.00	70.	2.	0.001	672.42	7.249E-01	
EU-152	244.69	233.	11.	0.006	199.11	2.981E+00	
TH-227	256.24	92.	-18.	-0.010	99.74	-5.621E+00	
Cd-113m	263.70	45.	17.	0.009	62.03	6.055E+03	
Hg-203	279.20	117.	-9.	-0.005	178.45	-2.434E-01	
I-131	284.30	62.	-7.	-0.004	204.77	-2.746E+00	
TL-210	296.00	378.	-14.	-0.008	193.62	-4.300E-01	
PA-231	300.07	349.	-14.	-0.008	185.60	-1.400E+01	
PA-233	300.18	335.	-6.	-0.003	441.08	-2.276E+00	
Ir-192	316.49	276.	14.	0.008	176.05	3.871E-01	
CR-51	320.08	360.	-15.	-0.008	178.97	-3.834E+00	
La-140	328.76	108.	-15.	-0.008	99.35	-1.931E+00	
Cf-249	333.44	92.	7.	0.004	190.42	1.216E+00	
Cs-136	340.57	101.	10.	0.005	148.13	5.527E-01	
HF-181	345.83	140.	-15.	-0.008	114.64	-2.650E+00	
BA-133	356.00	241.	-15.	-0.008	147.56	-6.638E-01	

(Page 17 of 21)

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	364.48	44.	-3.	-0.002	436.74	-1.020E-01	
BA-133	383.84	84.	-2.	-0.001	651.92	-6.463E-01	
SB-125	427.88	24.	4.	0.002	244.95	4.242E-01	
AG-108M	433.94	12.	7.	0.004	98.12	2.613E-01	
pm-146	453.88	36.	-5.	-0.003	239.17	-2.525E-01	
SB-125	463.37	44.	10.	0.006	98.99	3.185E+00	
Ir-192	468.06	46.	6.	0.003	160.40	4.004E-01	
BE-7	477.60	72.	7.	0.004	184.53	2.162E+00	
HF-181	482.00	81.	-9.	-0.005	140.52	-3.983E-01	
La-140	487.02	65.	11.	0.006	107.94	8.351E-01	
RU-103	497.05	32.	-6.	-0.003	189.05	-2.321E-01	
RH-106	511.86	47.	53.	0.030	35.41	9.585E+00	
Nd-147	531.00	35.	-5.	-0.003	261.67	-1.326E+00	
CS-134	569.32	30.	-5.	-0.003	152.33	-1.349E+00	
PA-234	569.47	37.	-1.	-0.001	741.48	-5.536E-01	
BI-207	569.70	25.	10.	0.005	81.33	3.788E-01	
SB-125	600.50	237.	-12.	-0.007	185.27	-2.696E+00	
SB-124	602.73	225.	-3.	-0.002	686.30	-1.281E-01	
RU-103	610.30	183.	10.	0.005	198.24	6.964E+00	
AG-108M	614.28	193.	10.	0.005	202.79	4.490E-01	
PM-144	618.06	199.	10.	0.005	205.24	4.099E-01	
RH-106	621.92	213.	6.	0.003	351.12	2.475E+00	
SB-125	635.89	26.	3.	0.002	247.21	1.119E+00	
I-131	636.97	29.	3.	0.002	246.30	1.866E+00	
CS-137	661.66	35.	-14.	-0.008	91.15	-7.052E-01	
PM-144	696.54	9.	7.	0.004	96.02	3.331E-01	
NB-94	702.63	9.	7.	0.004	95.69	3.403E-01	
SB-124	722.79	40.	7.	0.004	133.25	2.999E+00	
BI-212	727.17	38.	7.	0.004	123.98	4.519E+00	
pm-146	735.72	14.	1.	0.001	800.00	2.085E-01	
pm-146	747.16	14.	1.	0.001	800.00	1.395E-01	
ZR-95	756.73	14.	8.	0.004	105.33	7.034E-01	
AG-110M	763.94	13.	29.	0.016	25.57	6.275E+00	
EU-152	778.92	14.	3.	0.002	270.80	1.134E+00	
BI-212	785.42	5.	11.	0.006	50.17	4.355E+01	
TL-210	799.60	33.	-8.	-0.004	109.45	-3.944E-01	
CS-134	801.95	27.	10.	0.005	83.07	5.485E+00	
CO-58	810.78	28.	10.	0.005	85.84	4.807E-01	
La-140	815.77	42.	-10.	-0.006	95.62	-2.208E+00	
Cs-136	818.50	40.	1.	0.001	676.39	6.757E-02	
MN-54	834.85	14.	3.	0.002	270.80	1.542E-01	
Co-56	846.77	25.	-4.	-0.002	279.32	-2.079E-01	
NB-94	871.10	5.	19.	0.011	28.34	1.008E+00	
EU-154	873.23	52.	-13.	-0.007	83.88	-5.552E+00	
PA-234	880.53	21.	8.	0.005	86.92	7.254E+00	
PA-234	883.24	29.	8.	0.004	103.57	4.379E+00	
Sc-46	889.28	48.	-10.	-0.006	103.18	-5.395E-01	
y-88	898.04	40.	-16.	-0.009	88.04	-9.513E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
AG-110M	937.49	20.	9.	0.005	114.22	1.464E+00		
PA-234	946.02	10.	8.	0.005	89.29	3.543E+00		
EU-152	964.11	42.	-8.	-0.005	115.72	-3.255E+00		
EU-154	996.33	51.	-5.	-0.003	213.51	-2.664E+00		
EU-154	1004.77	68.	-10.	-0.006	118.78	-3.319E+00		
Co-56	1037.84	11.	9.	0.005	90.44	3.767E+00		
Cs-136	1048.07	0.	25.	0.014	20.00	1.895E+00		
BI-207	1063.66	11.	8.	0.005	95.58	6.857E-01		
Ga-68	1077.40	11.	5.	0.003	145.77	1.176E+01		
FE-59	1099.25	27.	-10.	-0.005	125.61	-1.075E+00		
EU-152	1112.07	64.	-13.	-0.007	91.50	-6.017E+00		
Sc-46	1120.55	61.	-14.	-0.008	98.21	-8.701E-01	P	
CO-60	1173.24	21.	-7.	-0.004	147.85	-4.840E-01		
Co-56	1238.28	40.	-6.	-0.003	264.02	-5.890E-01		
FE-59	1291.60	51.	-21.	-0.012	82.47	-3.457E+00		
TL-210	1313.00	0.	10.	0.006	31.62	3.420E+00		
CO-60	1332.50	23.	-13.	-0.007	92.52	-9.204E-01		
AG-110M	1384.30	11.	-3.	-0.002	243.10	-1.027E+00		
EU-152	1408.00	12.	-4.	-0.002	215.06	-1.445E+00		
La-140	1596.21	12.	-5.	-0.003	173.21	-4.401E-01		
y-88	1836.06	7.	-4.	-0.002	186.97	-3.501E-01		

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	2.1622E+00	2.1622E+00	1.845E+02%	1.37E+01
NA-22	#A	-2.3414E-02	-2.3414E-02	1.439E+03%	1.29E+00
K-40	#	1.7350E+02	1.7350E+02	6.959E+00%	1.03E+01
Sc-46	#A	-5.3951E-01	-5.3951E-01	1.032E+02%	1.89E+00
CR-51	#A	-3.8337E+00	-3.8338E+00	1.790E+02%	2.31E+01
MN-54	#A	1.5424E-01	1.5424E-01	2.708E+02%	1.04E+00
FE-59	#A	-1.0746E+00	-1.0746E+00	1.256E+02%	2.98E+00
Co-56	#A	2.8457E-01	2.8458E-01	9.044E+01%	1.35E+00
CO-57	#A	-6.2017E-02	-6.2017E-02	4.838E+02%	1.03E+00
CO-58	#A	4.8071E-01	4.8071E-01	8.584E+01%	1.40E+00
CO-60	#A	-9.2041E-01	-9.2041E-01	9.252E+01%	1.81E+00
ZN-65	#A	-1.0957E-01	-1.0957E-01	1.160E+03%	4.51E+00
NB-94	#A	6.7759E-01	6.7759E-01	2.834E+01%	7.86E-01
ZR-95	#A	7.0337E-01	7.0338E-01	1.053E+02%	1.77E+00
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.59E+00
RU-103	#A	-2.3208E-01	-2.3209E-01	1.891E+02%	1.12E+00
RH-106	#A	2.4752E+00	2.4752E+00	3.511E+02%	2.96E+01
AG-108M	#A	3.5480E-01	3.5480E-01	9.812E+01%	6.61E-01
AG-110M	#A	1.4702E+00	1.4702E+00	2.557E+01%	2.29E+00

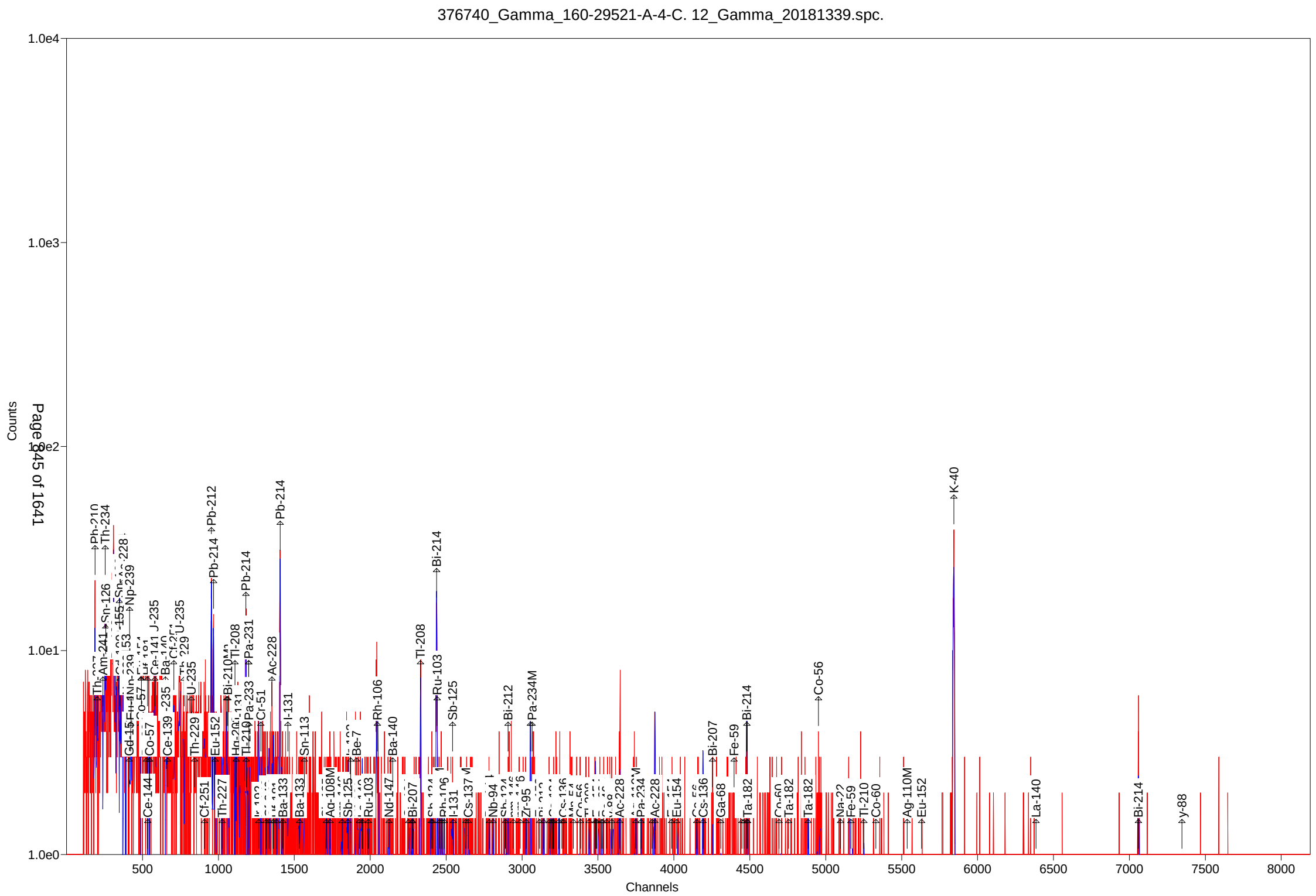
SN-113 #A	4.5847E-02	4.5847E-02	1.315E+03%		2.11E+00
SB-124 #A	1.8186E-01	1.8187E-01	1.332E+02%		3.00E+00
SB-125 #A	1.1398E+00	1.1398E+00	9.899E+01%		2.71E+00
I-131 #A	5.6817E-02	5.6821E-02	2.463E+02%		1.14E+00
Gd-153 #A	-9.4699E-01	-9.4699E-01	1.060E+02%		2.70E+00
Ga-68 #A	1.1614E+01	1.1759E+01	1.458E+02%		3.95E+01
Tc-99m #A	0.0000E+00	0.0000E+00	1.000E+03%		1.65E+00
BA-133 #A	-6.6383E-01	-6.6383E-01	1.476E+02%		3.30E+00
CS-134 #A	4.4836E-01	4.4836E-01	8.307E+01%		3.01E+00
CS-137 #A	-7.0522E-01	-7.0522E-01	9.115E+01%		1.54E+00
CE-139 #A	2.0079E-01	2.0079E-01	1.754E+02%		1.20E+00
Ba-140 #A	-5.0931E-02	-5.0933E-02	2.555E+03%		3.38E+00
La-140 #A	-2.8305E-02	-2.8306E-02	1.020E+02%		1.66E+00
CE-141 #A	5.0986E-01	5.0986E-01	1.606E+02%		2.75E+00
CE-144 #A	-2.3164E+00	-2.3164E+00	1.633E+02%		1.27E+01
PM-144 #A	3.7155E-01	3.7155E-01	9.602E+01%		7.72E-01
EU-152 #A	7.9252E-01	7.9252E-01	1.991E+02%		5.20E+00
EU-154 #A	-5.5524E+00	-5.5524E+00	8.388E+01%		1.56E+01
EU-155 #A	2.5809E-01	2.5809E-01	5.718E+02%		5.03E+00
HF-181 #A	-6.7759E-02	-6.7760E-02	1.081E+02%		1.91E+00
Ta-182 A	2.3336E-01	2.3336E-01	4.706E+01%		6.79E+00
Hg-203 #A	-2.4338E-01	-2.4338E-01	1.785E+02%		1.48E+00
TL-208	2.0750E+00	2.0750E+00	1.748E+01%		5.16E-01
pm-146 #A	1.6701E-01	1.6701E-01	5.657E+02%		2.81E+00
y-88 #A	-9.5130E-01	-9.5130E-01	8.804E+01%		1.86E+00
Cd-113m#A	6.0555E+03	6.0555E+03	6.203E+01%		1.24E+04
Cd-109 #A	6.8213E-01	6.8213E-01	1.650E+03%		3.82E+01
Cf-251 #A	1.2651E+00	1.2651E+00	1.085E+02%		3.57E+00
Cf-249 #A	2.3145E-01	2.3145E-01	1.904E+02%		2.03E+00
Sn-126 A	1.5510E+00	1.5510E+00	2.893E+02%		1.52E+01
PB-210 A	2.6155E+01	2.6155E+01	4.390E+01%		3.16E+01
PB-212 #	4.3234E+00	4.3234E+00	1.484E+01%		1.61E+00
PB-214	1.0023E+01	1.0023E+01	1.027E+01%		2.03E+00
BI-207 #A	5.1151E-01	5.1151E-01	6.275E+01%		1.04E+00
BI-212 #A	4.5187E+00	4.5187E+00	1.240E+02%		1.93E+01
U-235 #A	5.6188E-01	5.6188E-01	2.011E+02%		1.32E+01
BI-214 #	1.0190E+01	1.0190E+01	1.151E+01%		1.95E+00
BI-210M#A	-3.0823E-02	-3.0823E-02	1.819E+03%		1.96E+00
AC-228	6.1007E+00	6.1007E+00	1.981E+01%		4.91E+00
TH-227 #A	4.0988E+00	4.0988E+00	1.490E+02%		2.06E+01
TH-229 #A	-3.8866E+00	-3.8866E+00	1.768E+02%		1.79E+01
TH-234 #	2.3180E+01	2.3180E+01	2.874E+01%		1.77E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%		7.30E+01
PA-233 #A	0.0000E+00	0.0000E+00	1.000E+03%		5.98E+00
PA-234 #A	2.5146E+00	2.5146E+00	8.202E+01%		5.24E+00
PA-234M#A	0.0000E+00	0.0000E+00	1.000E+03%		2.63E+02
AM-241 #A	-1.0305E+00	-1.0305E+00	1.396E+02%		4.82E+00
Np-237 #A	2.0558E+00	2.0558E+00	1.502E+02%		1.04E+01
Ir-192 #A	3.9204E-01	3.9205E-01	1.191E+02%		2.30E+00

Cs-136	#A	8.1211E-01	8.1215E-01	2.000E+01%	1.63E+00
Np-239	A	1.2579E+00	1.2582E+00	4.574E+01%	1.82E+00
Nd-147	#A	-1.3261E+00	-1.3262E+00	2.617E+02%	8.57E+00
TL-210	#A	-3.9441E-01	-3.9441E-01	1.094E+02%	1.48E+00

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.1 keV) 2.568E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 2.5680756E+02 Bq/Sample


376740_Gamma_160-29521-A-4-C. 12_Gamma_20181339.spc.
Counts
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
Channels
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-210
Th-234
Sn-126
Np-239
Ce-141
U-235
Ba-140
Th-229
Pb-214
Pb-212
Bi-214
Tl-208
Pa-231
Pa-233
Cr-51
Ac-228
I-131
Sn-113
Rh-106
Ba-140
Ru-103
Sb-125
Be-7
Nd-147
Bi-207
Cs-137
Nb-94
Zr-95
Pa-234M
Co-56
Bi-212
Cs-136
Ga-68
Fe-59
Ta-182
Na-22
Co-60
Ag-110M
Eu-152
La-140
y-88
K-40

Test America St. Louis Spectrum ID: 15_Gamma_20182597

Sample Description: 376740_Gamma_160-29521-A-5-C
Detector: Detector #15
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29521-A-5-C

Decay to Time: 8/9/2018 07:15 Live Time: 1800 sec
Acquisition Time: 8/9/2018 07:16:06 Real Time: 1801 sec
Analysis Time: 8/9/2018 07:46 Dead Time: 0.08 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 15_Soil_TunaCan.Clb
Efficiency Cal Desc: 15_TunaCan_90099_032212
Efficiency Cal Date: 3/22/2012 13:03
Energy Cal Date: 2/28/2012 16:29
Library: Client_Long_Rev14.lib
Bkgd Correction File: 15_2018-07-21_1011.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-2.959E+00	158.2	4.683E+00	4.685E+00	1.603E+01
NA-22	-8.450E-02	574.5	4.854E-01	4.854E-01	1.804E+00
K-40	1.729E+02	7.3	1.260E+01	1.540E+01	9.037E+00
Sc-46	3.564E-02	1525.6	5.437E-01	5.437E-01	1.952E+00
CR-51	-4.336E+00	43.8	1.897E+00	1.911E+00	2.530E+01
MN-54	-1.366E-01	444.0	6.064E-01	6.064E-01	1.476E+00
FE-59	-1.313E+00	132.4	1.738E+00	1.739E+00	3.816E+00
Co-56	-3.874E-01	35.7	1.385E-01	1.399E-01	2.047E+00
CO-57	-3.719E-01	84.6	3.148E-01	3.154E-01	1.050E+00
CO-58	3.873E-01	38.5	1.491E-01	1.504E-01	4.230E-01
CO-60	-3.261E-01	259.9	8.477E-01	8.478E-01	1.578E+00
ZN-65	-2.628E+00	85.0	2.234E+00	2.238E+00	7.471E+00
NB-94	5.121E-01	98.4	5.041E-01	5.048E-01	1.196E+00
ZR-95	1.161E+00	49.7	5.768E-01	5.799E-01	1.324E+00
NB-95	-7.703E-01	100.0	7.706E-01	7.716E-01	2.595E+00
RU-103	-1.256E-01	351.7	4.416E-01	4.416E-01	1.108E+00
RH-106	0.000E+00	1.#INF	2.159E+00	2.159E+00	3.263E+01
AG-108M	1.508E-01	224.5	3.385E-01	3.386E-01	8.876E-01
AG-110M	2.330E-01	209.0	4.869E-01	4.870E-01	2.641E+00
SN-113	9.346E-02	701.8	6.558E-01	6.559E-01	2.281E+00
SB-124	-5.022E-01	198.5	9.968E-01	9.972E-01	3.370E+00
SB-125	1.244E+00	92.9	1.156E+00	1.158E+00	2.910E+00
I-131	5.666E-01	140.9	7.982E-01	7.987E-01	1.057E+00
Gd-153	1.082E+00	173.9	1.881E+00	1.882E+00	6.283E+00
Ga-68	-3.372E+01	89.0	3.001E+01	3.006E+01	6.746E+01
Tc-99m	0.000E+00	1.#INF	1.305E-01	1.305E-01	1.663E+00
BA-133	7.781E-01	150.0	1.167E+00	1.168E+00	3.589E+00
CS-134	2.195E-01	78.8	1.730E-01	1.734E-01	3.323E+00
CS-137	5.003E-01	87.6	4.381E-01	4.389E-01	1.486E+00
CE-139	-1.332E-01	290.1	3.865E-01	3.867E-01	1.317E+00
Ba-140	3.033E+00	79.1	2.397E+00	2.403E+00	4.064E+00
La-140	7.540E-01	41.0	3.088E-01	3.114E-01	7.974E-01
CE-141	5.098E-01	112.5	5.735E-01	5.741E-01	1.479E+00

CE-144	0.000E+00	1.#INF	1.556E+00	1.556E+00	1.272E+01
PM-144	5.492E-01	108.3	5.946E-01	5.953E-01	1.392E+00
EU-152	1.981E+00	59.2	1.172E+00	1.177E+00	7.510E+00
EU-154	4.244E+00	76.0	3.225E+00	3.232E+00	1.410E+01
EU-155	-1.645E+00	172.4	2.836E+00	2.837E+00	9.462E+00
HF-181	6.500E-01	127.5	8.289E-01	8.296E-01	2.066E+00
Ta-182	4.213E+00	39.9	1.681E+00	1.694E+00	1.160E+01
Hg-203	1.418E-01	356.7	5.057E-01	5.058E-01	1.733E+00
TL-208	3.265E+00	16.2	5.298E-01	5.562E-01	8.289E-01
pm-146	-2.611E-01	555.3	1.450E+00	1.450E+00	3.579E+00
y-88	5.662E-01	106.3	6.021E-01	6.028E-01	1.399E+00
Cd-113m	4.837E+03	88.2	4.266E+03	4.277E+03	1.436E+04
Cd-109	8.768E+00	174.3	1.528E+01	1.529E+01	5.105E+01
Cf-251	-4.034E-01	441.6	1.781E+00	1.782E+00	4.682E+00
Cf-249	4.805E-01	132.1	6.350E-01	6.355E-01	2.161E+00
Sn-126	0.000E+00	1.#INF	2.500E+00	2.500E+00	1.731E+01
PB-210	2.239E+01	37.8	8.468E+00	8.570E+00	2.326E+01
PB-212	7.489E+00	10.0	7.524E-01	8.949E-01	1.569E+00
PB-214	1.652E+01	7.5	1.246E+00	1.513E+00	1.449E+00
BI-207	1.740E-01	276.1	4.805E-01	4.806E-01	1.675E+00
BI-212	1.149E-01	6230.5	7.162E+00	7.162E+00	2.545E+01
U-235	1.832E+00	97.7	1.790E+00	1.792E+00	1.331E+01
BI-214	1.453E+01	9.1	1.322E+00	1.522E+00	1.703E+00
BI-210M	6.854E-01	112.6	7.719E-01	7.729E-01	1.587E+00
AC-228	5.001E+00	36.7	1.836E+00	1.854E+00	3.793E+00
TH-227	-5.913E+00	115.3	6.818E+00	6.825E+00	2.287E+01
TH-229	7.072E+00	86.2	6.095E+00	6.121E+00	1.776E+01
TH-234	1.337E+01	32.8	4.384E+00	4.439E+00	2.633E+01
PA-231	0.000E+00	1.#INF	5.353E+00	5.353E+00	8.008E+01
PA-233	0.000E+00	1.#INF	4.002E-01	4.002E-01	6.486E+00
PA-234	2.661E+00	90.1	2.399E+00	2.403E+00	6.676E+00
PA-234M	8.153E+01	100.0	8.149E+01	8.160E+01	2.275E+02
AM-241	-5.560E-01	274.3	1.525E+00	1.525E+00	5.144E+00
Np-237	-2.895E+00	180.0	5.209E+00	5.212E+00	1.737E+01
Ir-192	0.000E+00	1.#INF	2.287E-01	2.287E-01	2.712E+00
Cs-136	-7.116E-01	94.9	6.753E-01	6.766E-01	2.279E+00
Np-239	6.733E-01	368.6	2.482E+00	2.482E+00	8.320E+00
Nd-147	1.477E+00	102.2	1.510E+00	1.512E+00	6.025E+00
TL-210	0.000E+00	1.#INF	8.062E-02	8.062E-02	1.726E+00
Total	5.221E+03				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 15_Gamma_20182597.An1

Sample description
376740_Gamma_160-29521-A-5-C

Spectrum Filename: C:\User\SPC\Det15\15_Gamma_20182597.An1

Acquisition information
Start time:	8/9/2018 7:16:06 AM
Live time:	1800
Real time:	1801
Dead time:	0.08 %
Detector ID:	15

Detector system
Ge15 SN/11012216

Calibration
Filename: 15_Soil_TunaCan.Clb
15_TunaCan_90099_032212

Energy Calibration
Created:	2/28/2012 4:29:17 PM
Zero offset:	0.044 keV
Gain:	0.250 keV/channel
Quadratic:	-3.267E-08 keV/channel^2

Efficiency Calibration
Created:	3/22/2012 1:03:01 PM
Knee Energy:	165.85 keV
Above the Knee:	Quadratic Uncertainty = 1.00 %
Log(Eff):	-6.894897E-01 + (-3.290613E-01*Log(E)) + (-3.875629E-02*Log(E)^2)
Below the Knee:	Quadratic Uncertainty = 1.13 %
Log(Eff):	-2.362677E+01 + (8.666669E+00*Log(E)) + (-9.214638E-01*Log(E)^2)

Library Files
Main analysis library:	Client_Long_Rev14.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	100 (25.06keV)
Stop channel:	8000 (1999.52keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 7:15:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	15_2018-07-21_1011.PBC 7/21/2018 10:11:36 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff: 5.00E+01 %

Energy Calibration

Normalized diff: 0.1292

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.70	34.	37.82	0.68	1.967E-02	46.54	4.250	PBC<MDA	PB210
63.15	24.	80.00	0.61	2.924E-02	63.29	3.810	PBC<MDA	TH234
77.19	122.	19.37	0.94	3.454E-02				
88.04	22.	174.29	0.98	3.706E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	8.768E+00	Cd109
91.10	22.	171.21	0.99	3.755E-02	91.10	28.300	PBC<MDA	Nd147
92.74	54.	32.78	0.86	3.776E-02	92.59	5.584	1.417E+01	TH234
93.35	22.	171.99	0.99	3.785E-02	93.35	5.561	PBC<MDA	AC228
97.50	22.	173.90	0.99	3.829E-02	97.50	30.000	PBC<MDA	Gd153
99.50	14.	273.48	1.00	3.846E-02	99.50	15.000	PBC<MDA	Np239
106.13	11.	368.59	1.00	3.878E-02	106.13	22.700	PBC<MDA	Np239
121.99	20.	59.16	1.90	3.848E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	3.375E-01	CO57
131.29	16.	148.99	1.02	3.775E-02	131.29	18.000	PBC<MDA	PA234
145.44	16.	112.50	1.04	3.618E-02	145.44	48.200	PBC<MDA	CE141
162.66	17.	110.83	1.05	3.378E-02	162.66	6.220	PBC<MDA	Ba140
185.72	67.	30.35	1.07	3.123E-02	185.72	54.000	2.207E+00	U235
193.18	17.	98.52	1.08	3.030E-02	193.51	4.400	PBC<MDA	TH229
205.33	17.	97.66	1.09	2.900E-02	205.33	5.010	PBC<MDA	U235
210.85	11.	141.42	1.10	2.844E-02	210.85	2.990	PBC<MDA	TH229
238.60	151.	11.16	1.04	2.592E-02	238.63	43.300	7.457E+00	PB212
242.02	62.	19.26	1.12	2.565E-02	242.00	7.430	1.815E+01	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
244.72	11.	88.80	1.13	2.543E-02	244.69	7.580	PBC<MDA	EU152
256.24	4.	314.25	1.14	2.456E-02	256.24	7.000	PBC<MDA	TH227
263.70	13.	88.19	1.14	2.403E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	9.	112.62	1.14	2.388E-02	265.83	50.000	PBC<MDA	BI210M
279.20	5.	356.65	1.16	2.301E-02	279.20	81.460	PBC<MDA	Hg203
284.30	6.	278.08	1.16	2.269E-02	284.30	6.140	PBC<MDA	I131
295.12	94.	16.90	1.38	2.205E-02	295.09	19.300	1.227E+01	PB214
302.85	14.	183.05	1.18	2.161E-02	302.65	2.880	1.210E+01	PA231
					302.85	18.330	1.901E+00	BA133
304.85	14.	186.76	1.18	2.150E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	1.253E+00	BI210M
304.90	13.	203.74	1.18	2.150E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	1.172E+00	BI210M
344.69	8.	258.00	1.21	1.956E-02	344.29	26.500	PBC<MDA	EU152
345.83	14.	134.21	1.21	1.949E-02	345.83	15.070	PBC<MDA	HF181
351.85	215.	7.54	1.23	1.923E-02	351.93	37.600	1.652E+01	PB214
356.00	9.	237.67	1.22	1.906E-02	356.00	62.050	PBC<MDA	BA133
364.48	4.	281.37	1.23	1.871E-02	364.48	81.700	PBC<MDA	I131
387.95	10.	132.15	1.25	1.781E-02	387.95	66.000	PBC<MDA	Cf249
391.77	2.	701.75	1.25	1.767E-02	391.69	64.000	PBC<MDA	SN113
427.88	11.	92.90	1.28	1.647E-02	427.88	29.600	PBC<MDA	SB125
433.94	4.	224.54	1.29	1.629E-02	433.94	90.480	PBC<MDA	AG108M
482.00	6.	216.88	1.33	1.497E-02	482.00	80.500	PBC<MDA	HF181
511.86	72.	22.54	2.60	1.426E-02	511.86	20.000	1.403E+01	RH106
531.00	7.	111.73	1.37	1.384E-02	531.00	13.000	PBC<MDA	Nd147
537.26	11.	95.27	1.37	1.371E-02	537.26	24.390	PBC<MDA	Ba140
569.70	4.	276.13	1.40	1.307E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.073E+00	PA234
					569.70	97.740	1.740E-01	BI207
583.30	64.	16.23	0.73	1.282E-02	583.02	84.500	3.265E+00	TL208
609.09	149.	9.10	1.23	1.237E-02	609.31	46.090	1.453E+01	BI214
					610.30	5.750	1.166E+02	RU103
636.97	6.	148.71	1.45	1.192E-02	636.97	7.170	PBC<MDA	I131
657.76	4.	209.00	1.47	1.160E-02	657.76	94.640	PBC<MDA	AG110M
661.66	9.	87.57	1.47	1.155E-02	661.66	85.210	PBC<MDA	CS137
696.54	11.	108.27	1.50	1.106E-02	696.54	99.000	PBC<MDA	PM144
702.63	10.	98.43	1.50	1.098E-02	702.63	97.900	PBC<MDA	NB94
724.20	1.	834.71	1.52	1.071E-02	724.20	44.150	PBC<MDA	ZR95
756.73	12.	49.68	1.54	1.032E-02	756.73	54.460	PBC<MDA	ZR95
766.09	12.	99.96	1.55	1.021E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.233E+02	PA234M
778.92	5.	224.40	1.56	1.007E-02	778.92	12.940	PBC<MDA	EU152
795.87	8.	92.26	1.57	9.887E-03	795.87	85.530	PBC<MDA	CS134
801.95	8.	99.34	1.58	9.823E-03	801.95	8.690	PBC<MDA	CS134
810.78	7.	38.49	1.59	9.733E-03	810.78	99.460	PBC<MDA	CO58
815.77	7.	68.63	1.59	9.682E-03	815.77	23.280	PBC<MDA	La140
860.15	26.	19.61	2.75	9.252E-03	860.56	12.420	1.257E+01	TL208
873.23	6.	126.40	1.63	9.137E-03	873.23	12.270	PBC<MDA	EU154

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
880.53	8.	88.52	1.64	9.072E-03	880.53	6.000	PBC<MDA	PA234
883.24	8.	101.48	1.64	9.048E-03	883.24	9.600	PBC<MDA	PA234
898.04	9.	106.34	1.65	8.921E-03	898.04	93.700	PBC<MDA	y88
911.07	23.	36.72	1.66	8.811E-03	911.07	29.000	5.001E+00	AC228
964.11	12.	73.82	1.70	8.393E-03	964.11	14.605	PBC<MDA	EU152
996.33	8.	84.33	1.72	8.158E-03	996.33	10.600	PBC<MDA	EU154
1000.56	4.	202.97	1.72	8.125E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	9.	35.74	1.75	7.875E-03	1037.84	14.130	4.300E+00	Co56
1048.07	6.	65.78	1.75	7.808E-03	1048.07	80.000	PBC<MDA	Cs136
1121.05	17.	96.35	1.80	7.362E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	3.588E+00	Ta182
1221.22	17.	39.90	1.87	6.830E-03	1221.41	27.000	5.021E+00	Ta182
1238.28	10.	97.38	1.88	6.748E-03	1238.28	66.070	PBC<MDA	Co56
1313.00	3.	229.35	1.93	6.408E-03	1313.00	21.000	PBC<MDA	TL210
1384.30	2.	248.05	1.97	6.114E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	10.	31.62	1.98	6.023E-03	1408.00	21.005	4.392E+00	EU152
1460.90	193.	7.29	1.38	5.828E-03	1460.83	10.670	1.729E+02	K40
1596.21	5.	44.72	2.09	5.382E-03	1596.21	95.400	PBC<MDA	La140
1765.03	14.	31.17	2.18	4.916E-03	1764.49	15.400	1.052E+01	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
308.36	77.19	136.	122.	3.517E+03	19.37	0.939	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	186.47	46.70	47.	34.	0.019	37.82	0.683s
TH-227	200.23	50.14	222.	-19.	-0.010	115.31	0.950s
AM-241	237.79	59.54	359.	-10.	-0.005	274.29	0.958s
TH-234	252.23	63.15	116.	24.	0.014	80.00	0.606s
Sn-126	256.75	64.28	349.	0.	0.000	1000.00	0.963s
BA-133	323.54	80.99	635.	-33.	-0.018	60.39	0.978
Np-237	345.53	86.49	1008.	-25.	-0.014	179.97	0.983s
EU-155	345.74	86.54	983.	-25.	-0.014	177.74	0.983s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Sn-126	347.33	86.94	958.	-25.	-0.014	175.45	0.984s
Sn-126	349.84	87.57	939.	-25.	-0.014	173.65	0.984s
Cd-109	351.72	88.04	735.	22.	0.012	174.29	0.985s
Nd-147	363.95	91.10	713.	22.	0.012	171.21	0.987s
TH-234	370.51	92.74	90.	54.	0.030	32.78	0.860
AC-228	372.95	93.35	723.	22.	0.012	171.99	0.990
Gd-153	389.54	97.50	745.	22.	0.012	173.90	0.993s
Np-239	397.53	99.50	768.	14.	0.008	273.48	0.995s
Gd-153	412.32	103.20	782.	0.	0.000	1000.00	0.998s
Np-239	414.32	103.70	782.	0.	0.000	1000.00	0.999s
EU-155	420.77	105.31	867.	-24.	-0.014	172.35	1.001s
Np-239	424.03	106.13	767.	11.	0.006	368.59	1.001s
EU-152	487.43	121.99	40.	20.	0.011	59.16	1.903s
CO-57	487.72	122.06	163.	-22.	-0.012	84.65	1.016s
EU-154	491.87	123.10	175.	-22.	-0.012	86.46	1.017s
PA-234	524.63	131.29	287.	16.	0.009	148.99	1.024s
HF-181	531.54	133.02	398.	-3.	-0.002	900.28	1.026s
CE-144	533.60	133.54	395.	0.	0.000	1000.00	1.026s
HF-181	544.63	136.30	395.	0.	0.000	1000.00	1.029
CO-57	545.33	136.47	395.	0.	0.000	1000.00	1.029
Tc-99m	561.46	140.51	395.	0.	0.000	1000.00	1.032s
CE-141	581.17	145.44	88.	16.	0.009	112.50	1.037
Ba-140	650.01	162.66	169.	17.	0.009	110.83	1.053s
U-235	652.88	163.38	186.	0.	0.000	1000.00	1.053s
CE-139	662.77	165.85	174.	-6.	-0.004	290.07	1.055s
Cf-251	705.73	176.60	88.	-4.	-0.002	441.59	1.065s
U-235	742.19	185.72	99.	67.	0.037	30.35	1.073s
TH-229	773.33	193.51	73.	17.	0.009	98.52	1.080s
U-235	820.60	205.33	70.	17.	0.009	97.66	1.091
TH-229	842.65	210.85	66.	11.	0.006	141.42	1.096
Cf-251	907.22	227.00	95.	-13.	-0.007	139.71	1.110s
PB-212	953.72	238.63	39.	151.	0.084	10.05	1.120D
PB-214	967.17	242.00	41.	62.	0.035	19.26	1.123D
EU-152	977.95	244.69	39.	11.	0.006	88.80	1.126D
TH-227	1024.12	256.24	44.	4.	0.002	314.25	1.136s
Cd-113m	1053.94	263.70	55.	13.	0.007	88.19	1.142s
BI-210M	1062.46	265.83	45.	9.	0.005	112.62	1.144s
TL-208	1108.25	277.28	104.	-20.	-0.011	73.91	1.154s
Hg-203	1115.91	279.20	143.	5.	0.003	356.65	1.156
I-131	1136.30	284.30	64.	6.	0.003	278.08	1.160s
PB-214	1179.56	295.12	38.	94.	0.052	16.90	1.376
TL-210	1183.08	296.00	374.	-15.	-0.008	188.23	1.170s
PB-212	1199.19	300.03	355.	-6.	-0.003	117.53	1.174s
PA-231	1199.35	300.07	349.	0.	0.000	1000.00	1.174s
PA-233	1199.79	300.18	349.	0.	0.000	1000.00	1.174s
PA-231	1209.66	302.65	349.	0.	0.000	1000.00	1.176
BA-133	1210.47	302.85	301.	14.	0.008	183.05	1.176
Ba-140	1218.46	304.85	315.	14.	0.008	186.76	1.178s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1218.64	304.90	328.	13.	0.007	203.74	1.178s
Ir-192	1232.81	308.44	341.	0.	0.000	1000.00	1.181s
PA-233	1247.09	312.01	341.	0.	0.000	1000.00	1.184s
Ir-192	1265.00	316.49	341.	0.	0.000	1000.00	1.188s
CR-51	1279.37	320.08	381.	-16.	-0.009	43.75	1.191s
La-140	1314.06	328.76	210.	-8.	-0.004	91.88	1.199s
Cf-249	1332.77	333.44	202.	0.	0.000	1000.00	1.203s
AC-228	1352.28	338.32	202.	0.	0.000	1000.00	1.207s
Cs-136	1361.28	340.57	202.	0.	0.000	1000.00	1.209s
EU-152	1376.13	344.29	209.	8.	0.004	258.00	1.212s
HF-181	1382.30	345.83	169.	14.	0.008	134.21	1.213s
PB-214	1406.36	351.85	12.	215.	0.119	7.54	1.233
BA-133	1422.97	356.00	250.	9.	0.005	237.67	1.222s
I-131	1456.89	364.48	32.	4.	0.002	281.37	1.229s
BA-133	1534.29	383.84	100.	-6.	-0.004	227.17	1.246s
Cf-249	1550.72	387.95	85.	10.	0.006	132.15	1.249s
SN-113	1565.67	391.69	88.	2.	0.001	701.75	1.253s
SB-125	1710.36	427.88	24.	11.	0.006	92.90	1.283s
AG-108M	1734.60	433.94	20.	4.	0.002	224.54	1.288s
pm-146	1814.35	453.88	30.	-4.	-0.002	263.85	1.304s
SB-125	1852.29	463.37	42.	0.	0.000	1000.00	1.312
Ir-192	1871.05	468.06	75.	-14.	-0.008	88.65	1.316s
BE-7	1909.18	477.60	85.	-8.	-0.005	158.24	1.324s
HF-181	1926.79	482.00	82.	6.	0.003	216.88	1.328s
La-140	1946.87	487.02	109.	-15.	-0.008	104.19	1.332s
RU-103	1987.00	497.05	26.	-3.	-0.002	351.72	1.340s
RH-106	2046.22	511.86	28.	72.	0.040	22.54	2.602s
Nd-147	2122.75	531.00	13.	7.	0.004	111.73	1.368s
Ba-140	2147.78	537.26	22.	11.	0.006	95.27	1.373s
CS-134	2251.67	563.24	26.	-7.	-0.004	153.42	1.394s
CS-134	2276.00	569.32	43.	-15.	-0.009	65.71	1.399
PA-234	2276.59	569.47	60.	-2.	-0.001	680.24	1.399s
BI-207	2277.52	569.70	59.	4.	0.002	276.13	1.399s
TL-208	2331.92	583.30	8.	64.	0.035	16.23	0.727s
SB-125	2400.69	600.50	249.	-11.	-0.006	203.91	1.424s
SB-124	2409.62	602.73	236.	-11.	-0.006	198.50	1.425s
CS-134	2417.53	604.71	225.	-11.	-0.006	193.68	1.427s
BI-214	2435.07	609.09	10.	149.	0.083	9.10	1.230s
AG-108M	2455.81	614.28	214.	0.	0.000	1000.00	1.435s
PM-144	2470.93	618.06	214.	0.	0.000	1000.00	1.437s
RH-106	2486.35	621.92	214.	0.	0.000	1000.00	1.440s
I-131	2546.57	636.97	18.	6.	0.003	148.71	1.452s
AG-110M	2629.71	657.76	36.	4.	0.002	209.00	1.469s
CS-137	2645.30	661.66	26.	9.	0.005	87.57	1.472s
PM-144	2784.82	696.54	28.	11.	0.006	108.27	1.499s
NB-94	2809.17	702.63	19.	10.	0.006	98.43	1.503s
AG-108M	2890.40	722.94	55.	0.	0.000	1000.00	1.519s
EU-154	2892.07	723.36	55.	0.	0.000	1000.00	1.519s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZR-95	2895.44	724.20	47.	1.	0.001	834.71	1.520s
pm-146	2941.53	735.72	24.	-2.	-0.001	628.83	1.529s
pm-146	2987.29	747.16	19.	-2.	-0.001	555.34	1.537s
ZR-95	3025.56	756.73	5.	12.	0.007	49.68	1.544
AG-110M	3054.42	763.94	91.	-22.	-0.012	27.69	1.550s
NB-95	3061.80	765.79	93.	-14.	-0.008	100.04	1.551
PA-234M	3064.30	766.41	67.	12.	0.007	99.96	1.552s
EU-152	3114.33	778.92	23.	5.	0.003	224.40	1.561
BI-212	3140.33	785.42	33.	-10.	-0.005	129.48	1.566
CS-134	3182.12	795.87	26.	8.	0.005	92.26	1.574s
TL-210	3197.05	799.60	35.	0.	0.000	1000.00	1.577s
CS-134	3206.46	801.95	26.	8.	0.004	99.34	1.578s
CO-58	3241.75	810.78	0.	7.	0.004	38.49	1.585s
La-140	3261.74	815.77	7.	7.	0.004	68.63	1.589s
Cs-136	3272.66	818.50	63.	-12.	-0.007	94.90	1.591s
MN-54	3338.05	834.85	23.	-2.	-0.001	444.01	1.603s
Co-56	3385.75	846.77	47.	-18.	-0.010	85.17	1.612s
TL-208	3439.26	860.15	0.	26.	0.014	19.61	2.750s
NB-94	3483.06	871.10	25.	-11.	-0.006	71.00	1.629s
EU-154	3491.60	873.23	30.	6.	0.004	126.40	1.631s
PA-234	3520.80	880.53	21.	8.	0.004	88.52	1.636s
PA-234	3531.64	883.24	29.	8.	0.004	101.48	1.638s
y-88	3590.85	898.04	15.	9.	0.005	106.34	1.649s
AC-228	3642.98	911.07	10.	23.	0.013	36.72	1.658
AG-110M	3748.69	937.49	40.	-15.	-0.008	96.23	1.677s
PA-234	3782.81	946.02	20.	-7.	-0.004	145.45	1.683s
EU-152	3855.18	964.11	32.	12.	0.007	73.82	1.696
AC-228	3874.63	968.97	53.	-5.	-0.003	194.16	1.699
EU-154	3984.09	996.33	21.	8.	0.005	84.33	1.718s
PA-234M	4002.77	1001.00	29.	4.	0.002	202.97	1.722s
EU-154	4017.88	1004.77	44.	-9.	-0.005	106.07	1.724s
Co-56	4150.18	1037.84	0.	9.	0.005	35.74	1.747s
Cs-136	4191.11	1048.07	5.	6.	0.003	65.78	1.754s
BI-207	4253.49	1063.66	15.	0.	0.000	1000.00	1.765s
Ga-68	4308.47	1077.40	25.	-13.	-0.007	88.99	1.774s
FE-59	4395.90	1099.25	32.	-10.	-0.006	132.41	1.789s
EU-152	4447.22	1112.07	122.	-18.	-0.010	91.52	1.797
ZN-65	4461.11	1115.55	104.	-18.	-0.010	85.01	1.800s
BI-214	4480.08	1120.29	108.	-5.	-0.003	174.49	1.803
Ta-182	4484.13	1121.30	120.	17.	0.009	96.35	1.803
CO-60	4691.97	1173.24	27.	-10.	-0.005	125.61	1.838s
Ta-182	4755.25	1189.05	16.	0.	0.000	1000.00	1.848s
Ta-182	4884.75	1221.41	5.	17.	0.009	39.90	1.869s
Co-56	4952.26	1238.28	16.	10.	0.005	97.38	1.879s
NA-22	5097.34	1274.53	16.	-1.	-0.001	574.46	1.902s
EU-154	5097.40	1274.54	17.	0.	0.000	1000.00	1.902s
FE-59	5165.64	1291.60	27.	-8.	-0.004	157.30	1.913s
TL-210	5251.31	1313.00	11.	3.	0.002	229.35	1.926s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	5329.36	1332.50	11.	-4.	-0.002	259.93	1.938s
AG-110M	5536.68	1384.30	6.	2.	0.001	248.05	1.970s
EU-152	5631.56	1408.00	0.	10.	0.006	31.62	1.984
K-40	5843.30	1460.90	3.	193.	0.107	7.29	1.384s
La-140	6384.98	1596.21	0.	5.	0.003	44.72	2.092s
SB-124	6764.43	1690.98	0.	0.	0.000	1000.00	2.142s
BI-214	7058.76	1764.49	3.	14.	0.008	31.17	2.181s
Co-56	7086.23	1771.35	17.	0.	0.000	1000.00	2.184s
y-88	7345.35	1836.06	6.	-4.	-0.002	156.12	2.216s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	-2.9592E+00				5.31E+01	
			477.60	-2.959E+00	?(P	1.603E+01	1.58E+02 1.05E+01 G
NA-22	C	-8.4496E-02				9.50E+02	
			1274.53	-8.450E-02	?(	1.804E+00	5.74E+02 9.99E+01 G
K-40	N	1.7286E+02				4.66E+11	
			1460.83	1.729E+02	(P	9.037E+00	7.29E+00 1.07E+01 G
Sc-46	F	3.5642E-02				8.38E+01	
			889.28	3.564E-02	%(P	1.952E+00	1.53E+03 1.00E+02 G
			1120.55	2.514E-02	%	3.896E+00	4.46E+03 1.00E+02 G
CR-51	F	-4.3364E+00				2.77E+01	
			320.08	-4.336E+00	?(P	2.530E+01	4.38E+01 9.94E+00 G
MN-54	C	-1.3657E-01				3.12E+02	
			834.85	-1.366E-01	?(	1.476E+00	4.44E+02 1.00E+02 G
FE-59	F	-1.3126E+00				4.45E+01	
			1099.25	-1.313E+00	&(	3.816E+00	1.32E+02 5.65E+01 G
			1291.60	-1.516E+00	+	5.296E+00	1.57E+02 4.32E+01 G
Co-56	C	-3.8738E-01				7.73E+01	
			846.77	-1.050E+00	?(	2.047E+00	8.52E+01 9.99E+01 G
			1238.28	1.233E+00	+ P	2.668E+00	9.74E+01 6.61E+01 G
			1037.84	4.300E+00	?(P	3.680E+00	3.57E+01 1.41E+01 G
			1771.35	0.000E+00	+	1.606E+01	1.00E+03 1.55E+01 A

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	C -3.7192E-01					2.72E+02	
		122.06	-3.719E-01	(	1.050E+00	8.46E+01	8.56E+01 G
		136.47	0.000E+00	+	1.332E+01	1.00E+03	1.07E+01 G
CO-58	C 3.8734E-01					7.09E+01	
		810.78	3.873E-01	?(	4.230E-01	3.85E+01	9.95E+01 G
CO-60	F -3.2611E-01					1.93E+03	
		1332.50	-3.261E-01	?(P	1.578E+00	2.60E+02	1.00E+02 G
		1173.24	-7.597E-01	+	2.104E+00	1.26E+02	9.99E+01 G
ZN-65	F -2.6280E+00					2.44E+02	
		1115.55	-2.628E+00	?(	7.471E+00	8.50E+01	5.06E+01 G
NB-94	I 5.1210E-01					7.41E+06	
		702.63	5.121E-01	&(P	1.196E+00	9.84E+01	9.79E+01 G
		871.10	-6.682E-01	&	1.580E+00	7.10E+01	9.99E+01 G
ZR-95	I 1.1610E+00					6.40E+01	
		756.73	1.161E+00	&(P	1.324E+00	4.97E+01	5.45E+01 G
		724.20	1.371E-01	&	4.067E+00	8.35E+02	4.42E+01 G
NB-95	I -7.7025E-01					6.40E+01	
		765.79	-7.703E-01	?(	2.595E+00	1.00E+02	9.98E+01 G
RU-103	I -1.2556E-01					3.93E+01	
		497.05	-1.256E-01	?(	1.108E+00	3.52E+02	9.09E+01 G
		610.30	-7.701E-02	%	5.548E+01	2.10E+04	5.75E+00 GA
AG-108M	C 1.5077E-01					1.53E+05	
		433.94	1.508E-01	?(	8.876E-01	2.25E+02	9.05E+01 G
		722.94	0.000E+00	-	2.126E+00	1.00E+03	9.08E+01 G
		614.28	0.000E+00	-	3.569E+00	1.00E+03	8.98E+01 G
AG-110M	F 2.3295E-01					2.50E+02	
		884.68	4.793E-02	%(	2.641E+00	1.53E+03	7.27E+01 G
		657.76	2.108E-01	?(	1.548E+00	2.09E+02	9.46E+01 G
		937.49	-2.821E+00	+	6.052E+00	9.62E+01	3.44E+01 G
		1384.30	8.728E-01	?(	5.163E+00	2.48E+02	2.43E+01 G
		763.94	-5.246E+00	+ P	1.147E+01	2.77E+01	2.23E+01 G
SN-113	F 9.3458E-02					1.15E+02	
		391.69	9.346E-02	?(P	2.281E+00	7.02E+02	6.40E+01 G
SB-124	F -5.0218E-01					6.02E+01	
		602.73	-5.022E-01	?(	3.370E+00	1.98E+02	9.83E+01 G
		1690.98	0.000E+00	+	1.677E+00	1.00E+03	4.78E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		722.79	7.988E-02 %		1.784E+01	6.29E+03	1.08E+01 G
SB-125	I 1.2441E+00					1.01E+03	
		427.88	1.244E+00 ?(		2.910E+00	9.29E+01	2.96E+01 G
		600.50	-2.751E+00 +		1.896E+01	2.04E+02	1.79E+01 G
		635.89	-1.372E-01 %		9.102E+00	1.77E+03	1.13E+01 G
		463.37	0.000E+00 -		1.130E+01	1.00E+03	1.05E+01 G
I-131	I 5.6657E-01					8.02E+00	
		364.48	1.454E-01 ?(		1.057E+00	2.81E+02	8.17E+01 G
		284.30	2.276E+00 ?(P		1.598E+01	2.78E+02	6.14E+00 G
		636.97	3.902E+00 ?(		1.450E+01	1.49E+02	7.17E+00 G
Gd-153	F 1.0816E+00					2.42E+02	
		97.50	1.082E+00 (		6.283E+00	1.74E+02	3.00E+01 G
		103.20	0.000E+00 -		8.765E+00	1.00E+03	2.18E+01 G
Ga-68	C -3.3718E+01					4.71E-02	
		1077.40	-3.372E+01 ?(		6.746E+01	8.90E+01	3.30E+00 G
BA-133	F 7.7805E-01					3.85E+03	
		356.00	4.462E-01 &(		3.589E+00	2.38E+02	6.20E+01 G
		302.85	1.901E+00 ?(		1.172E+01	1.83E+02	1.83E+01 G
		383.84	-2.191E+00 +		1.709E+01	2.27E+02	8.94E+00 GA
		80.99	-1.490E+00 + P		5.511E+00	6.04E+01	3.41E+01 GA
CS-134	I 2.1954E-01					7.54E+02	
		604.71	-5.074E-01 ?(		3.323E+00	1.94E+02	9.76E+01 G
		795.87	5.584E-01 &(		1.754E+00	9.23E+01	8.55E+01 G
		569.32	-4.248E+00 &		9.225E+00	6.57E+01	1.54E+01 G
		801.95	5.050E+00 ?(		1.718E+01	9.93E+01	8.69E+00 G
		563.24	-3.531E+00 +		1.335E+01	1.53E+02	8.35E+00 G
CS-137	I 5.0034E-01					1.10E+04	
		661.66	5.003E-01 ?(		1.486E+00	8.76E+01	8.52E+01 G
CE-139	F -1.3325E-01					1.38E+02	
		165.85	-1.332E-01 &(		1.317E+00	2.90E+02	7.99E+01 G
Ba-140	I 3.0328E+00					1.28E+01	
		537.26	1.755E+00 &(P		4.064E+00	9.53E+01	2.44E+01 G
		162.66	4.496E+00 ?(		1.674E+01	1.11E+02	6.22E+00 G
		304.85	8.178E+00 ?(		5.142E+01	1.87E+02	4.29E+00 G
La-140	I 7.5396E-01					1.28E+01	
		1596.21	5.410E-01 ?(		7.974E-01	4.47E+01	9.54E+01 G
		487.02	-1.204E+00 &		4.224E+00	1.04E+02	4.55E+01 G
		328.76	-1.040E+00 & P		9.473E+00	9.19E+01	2.03E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			815.77	1.627E+00	?(P	3.688E+00	6.86E+01	2.33E+01 G
CE-141	I	5.0976E-01					3.25E+01	
			145.44	5.098E-01	?(	1.479E+00	1.12E+02	4.82E+01 G
PM-144	C	5.4918E-01					3.63E+02	
			696.54	5.492E-01	&(P	1.392E+00	1.08E+02	9.90E+01 G
			618.06	0.000E+00	-	3.252E+00	1.00E+03	9.91E+01 G
EU-152	F	1.9811E+00					4.94E+03	
			344.29	8.573E-01	?(	7.510E+00	2.58E+02	2.65E+01 G
			1112.07	-9.707E+00	+	2.976E+01	9.15E+01	1.36E+01 G
			121.78	1.010E+00	(	1.626E+00	5.92E+01	2.86E+01 G
			778.92	1.990E+00	(	1.075E+01	2.24E+02	1.29E+01 G
			964.11	5.345E+00	(	1.318E+01	7.38E+01	1.46E+01 G
			244.69	3.073E+00	(P	9.209E+00	8.88E+01	7.58E+00 G
			1408.00	4.392E+00		3.237E+00	3.16E+01	2.10E+01 GA
EU-154	I	4.2443E+00					3.14E+03	
			873.23	3.221E+00	?(	1.410E+01	1.26E+02	1.23E+01 G
			123.10	-7.925E-01	-	2.285E+00	8.65E+01	4.08E+01 G
			1274.54	0.000E+00	-	5.261E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	9.556E+00	1.00E+03	2.02E+01 G
			1004.77	-3.555E+00	+	1.285E+01	1.06E+02	1.80E+01 G
			996.33	5.429E+00	?(	1.551E+01	8.43E+01	1.06E+01 G
EU-155	I	-1.6453E+00					1.81E+03	
			105.31	-1.645E+00	?(	9.462E+00	1.72E+02	2.12E+01 G
			86.54	-1.235E+00	+	7.320E+00	1.78E+02	3.07E+01 G
HF-181	F	6.5002E-01					4.24E+01	
			482.00	2.766E-01	&(	2.066E+00	2.17E+02	8.05E+01 G
			133.02	-1.072E-01	+	3.266E+00	9.00E+02	4.33E+01 G
			345.83	2.645E+00	&(	1.197E+01	1.34E+02	1.51E+01 G
			136.30	0.000E+00	-	2.430E+01	1.00E+03	5.85E+00 G
Ta-182	F	4.2129E+00					1.14E+02	
			1121.30	3.588E+00	?(	1.160E+01	9.64E+01	3.49E+01 G
			1221.41	5.021E+00	?(	4.058E+00	3.99E+01	2.70E+01 G
			1189.05	0.000E+00	-	1.047E+01	1.00E+03	1.62E+01 G
Hg-203	F	1.4180E-01					4.66E+01	
			279.20	1.418E-01	&(	1.733E+00	3.57E+02	8.15E+01 G
TL-208	N	3.2651E+00					6.98E+02	
			583.02	3.265E+00	(	8.289E-01	1.62E+01	8.45E+01 G
			277.28	-7.785E+00	-	1.912E+01	7.39E+01	6.31E+00 G
			860.56	1.257E+01	+	3.563E+00	1.96E+01	1.24E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
pm-146	C	-2.6114E-01						2.02E+03	
			747.16	-2.611E-01	?(3.579E+00	5.55E+02	3.40E+01	G	
			735.72	-3.637E-01	+ P 5.919E+00	6.29E+02	2.25E+01	G	
			453.88	-2.357E-01	& 1.543E+00	2.64E+02	6.50E+01	G	
y-88	F	5.6622E-01						1.07E+02	
			898.04	5.662E-01	?(P 1.399E+00	1.06E+02	9.37E+01	G	
			1836.06	-4.725E-01	- 1.668E+00	1.56E+02	9.92E+01	G	
Cd-113m		4.8366E+03						5.33E+03	
			263.70	4.837E+03	?(1.436E+04	8.82E+01	6.00E-03		K
Cd-109	F	8.7684E+00						4.53E+02	
			88.04	8.768E+00	?(5.105E+01	1.74E+02	3.79E+00	G	
Cf-251	T	-4.0341E-01						3.28E+05	
			176.60	-4.034E-01	?(4.682E+00	4.42E+02	1.70E+01	G	
			227.00	-4.369E+00	& 1.580E+01	1.40E+02	6.30E+00	GA	
Cf-249	T	4.8054E-01						1.28E+05	
			387.95	4.805E-01	?(2.161E+00	1.32E+02	6.60E+01	G	
			333.44	0.000E+00	- 1.231E+01	1.00E+03	1.55E+01	G	
PB-210	N	2.2392E+01						8.14E+03	
			46.54	2.239E+01	(P 2.326E+01	3.78E+01	4.25E+00	G	
PB-212	N	7.4895E+00						6.98E+02	
			238.63	7.489E+00	(P 1.569E+00	1.00E+01	4.33E+01	G	
			300.03	-4.527E+00	- P 7.041E+01	1.18E+02	3.28E+00	GA	
PB-214	N	1.6521E+01						5.84E+05	
			351.93	1.652E+01	(1.449E+00	7.54E+00	3.76E+01	G	
			295.09	1.227E+01	- 4.104E+00	1.69E+01	1.93E+01	G	
			242.00	1.815E+01	9.464E+00	1.93E+01	7.43E+00	GA	
BI-207	C	1.7401E-01						1.18E+04	
			569.70	1.740E-01	?(1.675E+00	2.76E+02	9.77E+01	G	
			1063.66	0.000E+00	- 2.008E+00	1.00E+03	7.45E+01	G	
BI-212	N	1.1495E-01						6.98E+02	
			727.17	1.149E-01	&(2.545E+01	6.23E+03	7.55E+00	G	
			785.42	-4.196E+01	+ 1.274E+02	1.29E+02	1.28E+00	GA	
U-235	N	1.8324E+00						2.57E+11	
			143.79	-2.178E-01	%(P 1.331E+01	1.13E+03	1.10E+01	G	
			205.33	6.317E+00	?(1.591E+01	9.77E+01	5.01E+00	G	
			163.38	0.000E+00	& 2.152E+01	1.00E+03	5.08E+00	G	

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			185.72	2.207E+00 *		1.617E+00	3.04E+01	5.40E+01 GA
BI-214	N	1.4525E+01					5.84E+05	
			609.31	1.453E+01 @	(P	1.703E+00	9.10E+00	4.61E+01 G
			1120.29	-2.299E+00 &	P	2.557E+01	1.74E+02	1.51E+01 G
			1764.49	1.052E+01 -	P	7.573E+00	3.12E+01	1.54E+01 G
BI-210M	T	6.8536E-01					1.10E+09	
			265.83	4.129E-01	(P	1.587E+00	1.13E+02	5.00E+01 G
			304.90	1.172E+00 ?(		8.042E+00	2.04E+02	2.80E+01 G
AC-228	N	5.0006E+00					2.10E+03	
			911.07	5.001E+00 ?(		3.793E+00	3.67E+01	2.90E+01 G
			968.97	-2.079E+00 -		1.401E+01	1.94E+02	1.75E+01 G
			338.32	0.000E+00 -		1.608E+01	1.00E+03	1.20E+01 G
			93.35	5.880E+00 ?		3.378E+01	1.72E+02	5.56E+00 XA
TH-227	N	-5.9125E+00					7.95E+03	
			50.14	-5.913E+00 ?(		2.287E+01	1.15E+02	8.00E+00 G
			256.24	1.293E+00 +		1.086E+01	3.14E+02	7.00E+00 G
TH-229	N	7.0722E+00					2.68E+06	
			193.51	6.994E+00 ?(		1.776E+01	9.85E+01	4.40E+00 G
			210.85	7.188E+00 (		2.651E+01	1.41E+02	2.99E+00 G
TH-234	N	1.3372E+01					1.63E+12	
			63.29	1.220E+01	(P	2.633E+01	8.00E+01	3.81E+00 G
			92.59	1.417E+01	(P	1.238E+01	3.28E+01	5.58E+00 G
PA-234	N	2.6613E+00					1.63E+12	
			131.29	1.333E+00 ?(		6.676E+00	1.49E+02	1.80E+01 G
			946.02	-3.402E+00 +		1.145E+01	1.45E+02	1.34E+01 G
			569.47	-8.430E-01 +		2.017E+01	6.80E+02	8.20E+00 G
			883.24	5.152E+00 ?(		1.789E+01	1.01E+02	9.60E+00 G
			880.53	8.211E+00 &		2.473E+01	8.85E+01	6.00E+00 GA
PA-234M	N	8.1525E+01					1.63E+12	
			1001.00	3.172E+01 ?(		2.275E+02	2.03E+02	8.37E-01 G
			766.41	2.233E+02 ?(		7.546E+02	1.00E+02	2.94E-01 G
AM-241	T	-5.5597E-01					1.58E+05	
			59.54	-5.560E-01 ?(		5.144E+00	2.74E+02	3.59E+01 G
Np-237	F	-2.8945E+00					2.14E+06	
			86.49	-2.895E+00 &(		1.737E+01	1.80E+02	1.31E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cs-136	F -7.1164E-01					1.30E+01	
		818.50	-7.116E-01 ?(		2.279E+00	9.49E+01	1.00E+02 G
		1048.07	5.425E-01 +		1.168E+00	6.58E+01	8.00E+01 G
		340.57	0.000E+00 +		4.140E+00	1.00E+03	4.69E+01 G
Np-239	T 6.7325E-01					2.36E+00	
		103.70	0.000E+00 -		7.959E+00	1.00E+03	2.40E+01 X
		106.13	6.733E-01 ?(		8.320E+00	3.69E+02	2.27E+01 G
		99.50	1.387E+00 ?		1.270E+01	2.73E+02	1.50E+01 X
Nd-147	1.4769E+00					1.11E+01	
		531.00	2.162E+00 ?(		6.025E+00	1.12E+02	1.30E+01 G
		91.10	1.162E+00 ?(		6.648E+00	1.71E+02	2.83E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went
    negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide
    failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the
    library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
    to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-227	50.14	222.	-19.	-0.010	115.31	-5.913E+00	
AM-241	59.54	359.	-10.	-0.005	274.29	-5.560E-01	
BA-133	80.99	635.	-33.	-0.018	60.39	-1.490E+00	P
Np-237	86.49	1008.	-25.	-0.014	179.97	-2.895E+00	
EU-155	86.54	983.	-25.	-0.014	177.74	-1.235E+00	
Sn-126	86.94	958.	-25.	-0.014	175.45	-4.186E+00	
Sn-126	87.57	939.	-25.	-0.014	173.65	-1.007E+00	
Cd-109	88.04	735.	22.	0.012	174.29	8.768E+00	
Nd-147	91.10	713.	22.	0.012	171.21	1.162E+00	
Gd-153	97.50	745.	22.	0.012	173.90	1.082E+00	
Np-239	99.50	768.	14.	0.008	273.48	1.387E+00	
EU-155	105.31	867.	-24.	-0.014	172.35	-1.645E+00	
Np-239	106.13	767.	11.	0.006	368.59	6.733E-01	
CO-57	122.06	163.	-22.	-0.012	84.65	-3.719E-01	
EU-154	123.10	175.	-22.	-0.012	86.46	-7.925E-01	
PA-234	131.29	287.	16.	0.009	148.99	1.333E+00	
HF-181	133.02	398.	-3.	-0.002	900.28	-1.072E-01	
CE-141	145.44	88.	16.	0.009	112.50	5.098E-01	
Ba-140	162.66	169.	17.	0.009	110.83	4.496E+00	
CE-139	165.85	174.	-6.	-0.004	290.07	-1.332E-01	
Cf-251	176.60	88.	-4.	-0.002	441.59	-4.034E-01	
U-235	185.72	99.	67.	0.037	30.35	2.207E+00	
U-235	205.33	70.	17.	0.009	97.66	6.317E+00	
Cf-251	227.00	95.	-13.	-0.007	139.71	-4.369E+00	
TH-227	256.24	44.	4.	0.002	314.25	1.293E+00	
Cd-113m	263.70	55.	13.	0.007	88.19	4.837E+03	
BI-210M	265.83	45.	9.	0.005	112.62	4.129E-01	P
Hg-203	279.20	143.	5.	0.003	356.65	1.418E-01	
I-131	284.30	64.	6.	0.003	278.08	2.276E+00	P
TL-210	296.00	374.	-15.	-0.008	188.23	-4.689E-01	
BA-133	302.85	301.	14.	0.008	183.05	1.901E+00	
Ba-140	304.85	315.	14.	0.008	186.76	8.178E+00	
BI-210M	304.90	328.	13.	0.007	203.74	1.172E+00	
CR-51	320.08	381.	-16.	-0.009	43.75	-4.336E+00	P
La-140	328.76	210.	-8.	-0.004	91.88	-1.040E+00	P
HF-181	345.83	169.	14.	0.008	134.21	2.645E+00	
BA-133	356.00	250.	9.	0.005	237.67	4.462E-01	
I-131	364.48	32.	4.	0.002	281.37	1.454E-01	
BA-133	383.84	100.	-6.	-0.004	227.17	-2.191E+00	
Cf-249	387.95	85.	10.	0.006	132.15	4.805E-01	
SB-125	427.88	24.	11.	0.006	92.90	1.244E+00	
AG-108M	433.94	20.	4.	0.002	224.54	1.508E-01	
pm-146	453.88	30.	-4.	-0.002	263.85	-2.357E-01	
Ir-192	468.06	75.	-14.	-0.008	88.65	-1.013E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
BE-7	477.60	85.	-8.	-0.005	158.24	-2.959E+00		P
HF-181	482.00	82.	6.	0.003	216.88	2.766E-01		
La-140	487.02	109.	-15.	-0.008	104.19	-1.204E+00		
RU-103	497.05	26.	-3.	-0.002	351.72	-1.256E-01		
RH-106	511.86	28.	72.	0.040	22.54	1.403E+01		
Nd-147	531.00	13.	7.	0.004	111.73	2.162E+00		
Ba-140	537.26	22.	11.	0.006	95.27	1.755E+00		P
CS-134	563.24	26.	-7.	-0.004	153.42	-3.531E+00		
CS-134	569.32	43.	-15.	-0.009	65.71	-4.248E+00		
PA-234	569.47	60.	-2.	-0.001	680.24	-8.430E-01		
BI-207	569.70	59.	4.	0.002	276.13	1.740E-01		
SB-125	600.50	249.	-11.	-0.006	203.91	-2.751E+00		
SB-124	602.73	236.	-11.	-0.006	198.50	-5.022E-01		
CS-134	604.71	225.	-11.	-0.006	193.68	-5.074E-01		
I-131	636.97	18.	6.	0.003	148.71	3.902E+00		
AG-110M	657.76	36.	4.	0.002	209.00	2.108E-01		
CS-137	661.66	26.	9.	0.005	87.57	5.003E-01		
PM-144	696.54	28.	11.	0.006	108.27	5.492E-01		P
NB-94	702.63	19.	10.	0.006	98.43	5.121E-01		P
ZR-95	724.20	47.	1.	0.001	834.71	1.371E-01		
pm-146	735.72	24.	-2.	-0.001	628.83	-3.637E-01		P
pm-146	747.16	19.	-2.	-0.001	555.34	-2.611E-01		
ZR-95	756.73	5.	12.	0.007	49.68	1.161E+00		P
AG-110M	763.94	91.	-22.	-0.012	27.69	-5.246E+00		P
NB-95	765.79	93.	-14.	-0.008	100.04	-7.703E-01		
BI-212	785.42	33.	-10.	-0.005	129.48	-4.196E+01		
CS-134	795.87	26.	8.	0.005	92.26	5.584E-01		
CS-134	801.95	26.	8.	0.004	99.34	5.050E+00		
CO-58	810.78	0.	7.	0.004	38.49	3.873E-01		
La-140	815.77	7.	7.	0.004	68.63	1.627E+00		P
Cs-136	818.50	63.	-12.	-0.007	94.90	-7.116E-01		
MN-54	834.85	23.	-2.	-0.001	444.01	-1.366E-01		
Co-56	846.77	47.	-18.	-0.010	85.17	-1.050E+00		
NB-94	871.10	25.	-11.	-0.006	71.00	-6.682E-01		
EU-154	873.23	30.	6.	0.004	126.40	3.221E+00		
PA-234	880.53	21.	8.	0.004	88.52	8.211E+00		
PA-234	883.24	29.	8.	0.004	101.48	5.152E+00		
y-88	898.04	15.	9.	0.005	106.34	5.662E-01		P
AG-110M	937.49	40.	-15.	-0.008	96.23	-2.821E+00		
PA-234	946.02	20.	-7.	-0.004	145.45	-3.402E+00		
EU-154	996.33	21.	8.	0.005	84.33	5.429E+00		
EU-154	1004.77	44.	-9.	-0.005	106.07	-3.555E+00		
Co-56	1037.84	0.	9.	0.005	35.74	4.300E+00		P
Cs-136	1048.07	5.	6.	0.003	65.78	5.425E-01		
Ga-68	1077.40	25.	-13.	-0.007	88.99	-3.372E+01		
FE-59	1099.25	32.	-10.	-0.006	132.41	-1.313E+00		
ZN-65	1115.55	104.	-18.	-0.010	85.01	-2.628E+00		
CO-60	1173.24	27.	-10.	-0.005	125.61	-7.597E-01		

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Co-56	1238.28	16.	10.	0.005	97.38	1.233E+00		P
NA-22	1274.53	16.	-1.	-0.001	574.46	-8.450E-02		
FE-59	1291.60	27.	-8.	-0.004	157.30	-1.516E+00		
TL-210	1313.00	11.	3.	0.002	229.35	1.376E+00		
CO-60	1332.50	11.	-4.	-0.002	259.93	-3.261E-01		P
AG-110M	1384.30	6.	2.	0.001	248.05	8.728E-01		
La-140	1596.21	0.	5.	0.003	44.72	5.410E-01		
y-88	1836.06	6.	-4.	-0.002	156.12	-4.725E-01		

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

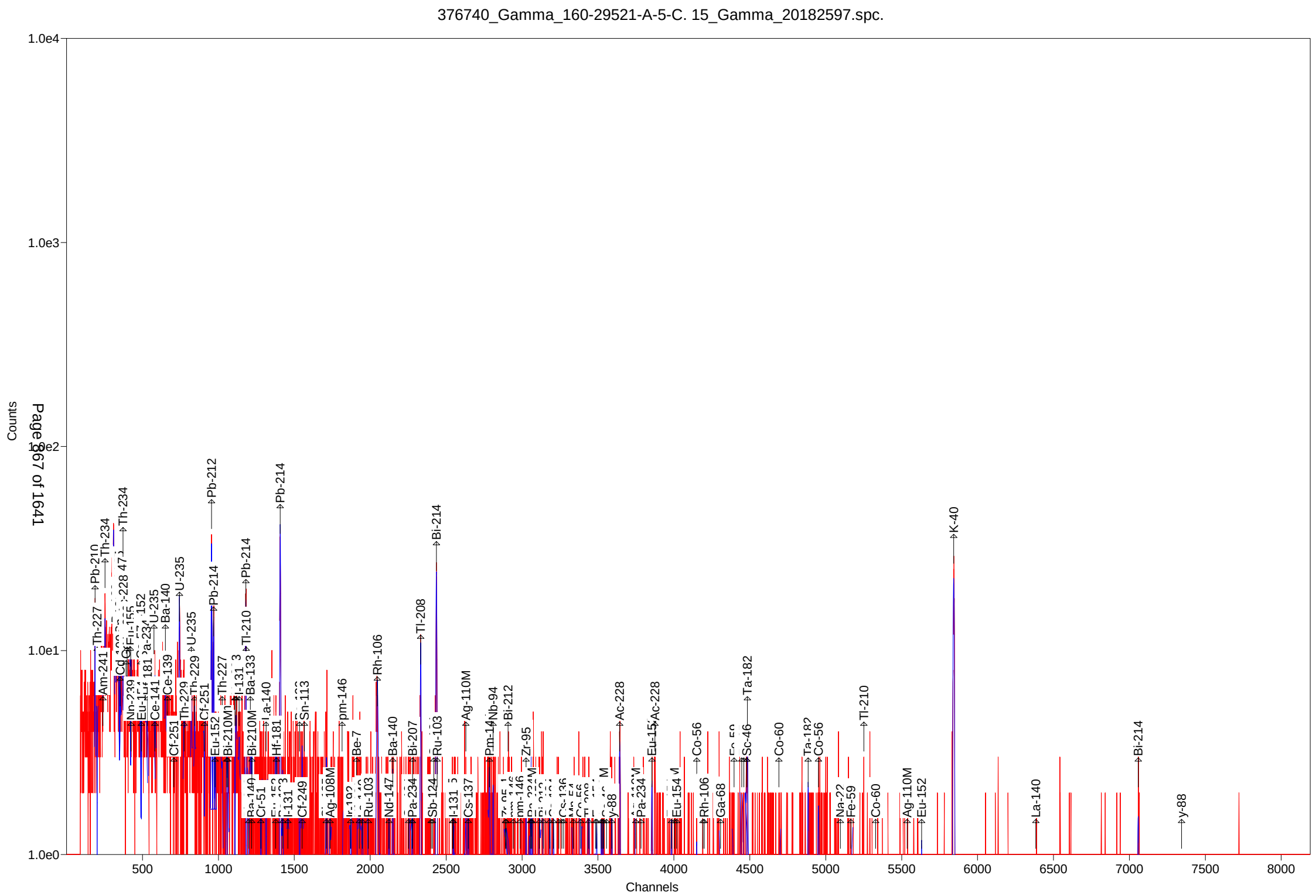
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	-2.9592E+00	-2.9592E+00	1.582E+02%	1.60E+01
NA-22	#A	-8.4496E-02	-8.4496E-02	5.745E+02%	1.80E+00
K-40		1.7286E+02	1.7286E+02	7.290E+00%	9.04E+00
Sc-46	#A	3.5642E-02	3.5642E-02	1.526E+03%	1.95E+00
CR-51	#A	-4.3363E+00	-4.3364E+00	4.375E+01%	2.53E+01
MN-54	#A	-1.3657E-01	-1.3657E-01	4.440E+02%	1.48E+00
FE-59	#A	-1.3126E+00	-1.3126E+00	1.324E+02%	3.82E+00
Co-56	#A	-3.8738E-01	-3.8738E-01	3.574E+01%	2.05E+00
CO-57	#A	-3.7192E-01	-3.7192E-01	8.465E+01%	1.05E+00
CO-58	#A	3.8734E-01	3.8734E-01	3.849E+01%	4.23E-01
CO-60	#A	-3.2611E-01	-3.2611E-01	2.599E+02%	1.58E+00
ZN-65	#A	-2.6280E+00	-2.6280E+00	8.501E+01%	7.47E+00
NB-94	#A	5.1210E-01	5.1210E-01	9.843E+01%	1.20E+00
ZR-95	#A	1.1610E+00	1.1610E+00	4.968E+01%	1.32E+00
NB-95	#A	-7.7024E-01	-7.7025E-01	1.000E+02%	2.60E+00
RU-103	#A	-1.2555E-01	-1.2556E-01	3.517E+02%	1.11E+00
RH-106	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.26E+01
AG-108M	#A	1.5077E-01	1.5077E-01	2.245E+02%	8.88E-01
AG-110M	#A	2.3295E-01	2.3295E-01	2.090E+02%	2.64E+00
SN-113	#A	9.3458E-02	9.3458E-02	7.018E+02%	2.28E+00
SB-124	#A	-5.0218E-01	-5.0218E-01	1.985E+02%	3.37E+00
SB-125	#A	1.2441E+00	1.2441E+00	9.290E+01%	2.91E+00
I-131	#A	5.6653E-01	5.6657E-01	1.409E+02%	1.06E+00
Gd-153	#A	1.0816E+00	1.0816E+00	1.739E+02%	6.28E+00
Ga-68	#A	-3.3341E+01	-3.3718E+01	8.899E+01%	6.75E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.66E+00
BA-133	#A	7.7805E-01	7.7805E-01	1.500E+02%	3.59E+00
CS-134	#A	2.1954E-01	2.1954E-01	7.881E+01%	3.32E+00
CS-137	#A	5.0034E-01	5.0034E-01	8.757E+01%	1.49E+00
CE-139	#A	-1.3325E-01	-1.3325E-01	2.901E+02%	1.32E+00
Ba-140	#A	3.0326E+00	3.0328E+00	7.905E+01%	4.06E+00
La-140	#A	7.5393E-01	7.5396E-01	4.096E+01%	7.97E-01

CE-141 #A	5.0975E-01	5.0976E-01	1.125E+02%	1.48E+00
CE-144 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.27E+01
PM-144 #A	5.4918E-01	5.4918E-01	1.083E+02%	1.39E+00
EU-152 A	1.9811E+00	1.9811E+00	5.916E+01%	7.51E+00
EU-154 #A	4.2443E+00	4.2443E+00	7.597E+01%	1.41E+01
EU-155 #A	-1.6453E+00	-1.6453E+00	1.724E+02%	9.46E+00
HF-181 #A	6.5001E-01	6.5002E-01	1.275E+02%	2.07E+00
Ta-182 #A	4.2128E+00	4.2129E+00	3.990E+01%	1.16E+01
Hg-203 #A	1.4180E-01	1.4180E-01	3.567E+02%	1.73E+00
TL-208	3.2651E+00	3.2651E+00	1.623E+01%	8.29E-01
pm-146 #A	-2.6114E-01	-2.6114E-01	5.553E+02%	3.58E+00
y-88 #A	5.6622E-01	5.6622E-01	1.063E+02%	1.40E+00
Cd-113m#A	4.8366E+03	4.8366E+03	8.819E+01%	1.44E+04
Cd-109 #A	8.7684E+00	8.7684E+00	1.743E+02%	5.11E+01
Cf-251 #A	-4.0341E-01	-4.0341E-01	4.416E+02%	4.68E+00
Cf-249 #A	4.8054E-01	4.8054E-01	1.321E+02%	2.16E+00
Sn-126 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.73E+01
PB-210 A	2.2392E+01	2.2392E+01	3.782E+01%	2.33E+01
PB-212 #	7.4895E+00	7.4895E+00	1.005E+01%	1.57E+00
PB-214	1.6521E+01	1.6521E+01	7.543E+00%	1.45E+00
BI-207 #A	1.7401E-01	1.7401E-01	2.761E+02%	1.68E+00
BI-212 #A	1.1495E-01	1.1495E-01	6.231E+03%	2.55E+01
U-235 #A	1.8324E+00	1.8324E+00	9.766E+01%	1.33E+01
BI-214 #	1.4525E+01	1.4525E+01	9.099E+00%	1.70E+00
BI-210M#A	6.8536E-01	6.8536E-01	1.126E+02%	1.59E+00
AC-228 #	5.0006E+00	5.0006E+00	3.672E+01%	3.79E+00
TH-227 #A	-5.9125E+00	-5.9125E+00	1.153E+02%	2.29E+01
TH-229 A	7.0722E+00	7.0722E+00	8.618E+01%	1.78E+01
TH-234 A	1.3372E+01	1.3372E+01	3.278E+01%	2.63E+01
PA-231 #A	0.0000E+00	0.0000E+00	7.071E+02%	8.01E+01
PA-233 #A	0.0000E+00	0.0000E+00	7.071E+02%	6.49E+00
PA-234 #A	2.6613E+00	2.6613E+00	9.013E+01%	6.68E+00
PA-234M#A	8.1525E+01	8.1525E+01	9.996E+01%	2.28E+02
AM-241 #A	-5.5597E-01	-5.5597E-01	2.743E+02%	5.14E+00
Np-237 #A	-2.8945E+00	-2.8945E+00	1.800E+02%	1.74E+01
Ir-192 #A	0.0000E+00	0.0000E+00	7.071E+02%	2.71E+00
Cs-136 #A	-7.1162E-01	-7.1164E-01	9.490E+01%	2.28E+00
Np-239 #A	6.7310E-01	6.7325E-01	3.686E+02%	8.32E+00
Nd-147 #A	1.4768E+00	1.4769E+00	1.022E+02%	6.03E+00
TL-210 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.73E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.5 keV)	2.370E+02	Bq/Sample
Total Decayed Activity (25.1 to 1999.5 keV)	2.3704886E+02	Bq/Sample


376740_Gamma_160-29521-A-5-C. 15_Gamma_20182597.spc.
Counts
Channels
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Pb-210
Th-234
Am-241
Th-234
Th-227
Pb-212
Pb-214
Bi-214
Tl-208
Pb-214
Tl-210
Pb-214
U-235
Ba-140
U-235
Ce-139
U-235
Rh-106
Th-229
Th-229
Cf-251
Cf-251
Eu-152
Th-227
Bi-210M
Bi-210M
Ba-133
Hf-181
Sn-113
pm-146
Be-7
Ba-140
Bi-207
Ru-103
Ag-110M
Pm-14
Nb-94
Bi-212
Zr-95
Ac-228
Ac-228
Ac-228
Co-56
Ta-182
Sc-46
Co-60
Ta-182
Co-56
Tl-210
K-40
Bi-214
La-140
y-88
Ag-110M
Eu-152
Co-60
Na-22
Fe-59
Rh-106
Ga-68
Cs-137
Cr-51
Cf-249
Ru-103
Nd-147
Pa-234
Sb-124
Eu-154
y-88

Sample Description: 376740_Gamma_160-29521-A-6-C
Detector: Detector #17
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29521-A-6-C

Decay to Time: 8/9/2018 07:16 Live Time: 1800 sec
Acquisition Time: 8/9/2018 07:16:56 Real Time: 1823 sec
Analysis Time: 8/9/2018 07:47 Dead Time: 1.25 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 17_Soil_TunaCan.Clb
Efficiency Cal Desc: 17_TunaCan_90099_032612
Efficiency Cal Date: 4/12/2012 09:28
Energy Cal Date: 2/29/2012 10:33
Library: Client_Long_Rev14.lib
Bkgd Correction File: 17_2018-07-14_1832.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	2.033E+00	101.3	2.060E+00	2.063E+00	7.083E+00
NA-22	4.053E-01	64.5	2.616E-01	2.624E-01	8.531E-01
K-40	1.563E+02	6.7	1.050E+01	1.320E+01	1.046E+01
Sc-46	-3.920E-01	123.7	4.849E-01	4.853E-01	1.663E+00
CR-51	2.170E+00	116.3	2.524E+00	2.526E+00	8.606E+00
MN-54	1.833E-01	204.6	3.750E-01	3.751E-01	9.230E-01
FE-59	-6.995E-01	145.5	1.017E+00	1.018E+00	2.353E+00
Co-56	7.611E-01	35.5	2.704E-01	2.732E-01	1.058E+00
CO-57	0.000E+00	1.#INF	6.789E-02	6.789E-02	8.246E-01
CO-58	4.505E-02	755.0	3.402E-01	3.402E-01	1.233E+00
CO-60	4.440E-01	35.4	1.570E-01	1.585E-01	4.829E-01
ZN-65	0.000E+00	1.#INF	1.129E-01	1.129E-01	3.673E+00
NB-94	-5.484E-02	643.2	3.527E-01	3.527E-01	9.094E-01
ZR-95	1.325E-01	91.2	1.208E-01	1.210E-01	1.536E+00
NB-95	-5.213E-01	77.0	4.016E-01	4.025E-01	1.344E+00
RU-103	-3.435E-02	964.4	3.312E-01	3.312E-01	8.772E-01
RH-106	-6.111E+00	57.3	3.504E+00	3.519E+00	2.789E+01
AG-108M	-4.466E-01	76.5	3.415E-01	3.423E-01	1.092E+00
AG-110M	5.806E-01	84.5	4.907E-01	4.916E-01	1.859E+00
SN-113	-5.257E-01	85.2	4.477E-01	4.486E-01	2.179E+00
SB-124	-5.154E-01	155.4	8.010E-01	8.014E-01	2.699E+00
SB-125	6.420E-01	99.2	6.370E-01	6.378E-01	1.720E+00
I-131	2.971E-01	85.5	2.541E-01	2.546E-01	8.050E-01
Gd-153	-7.111E-01	115.1	8.187E-01	8.198E-01	2.753E+00
Ga-68	-5.936E+00	289.6	1.719E+01	1.720E+01	4.108E+01
Tc-99m	-2.383E-01	123.9	2.953E-01	2.956E-01	9.942E-01
BA-133	-1.518E-01	405.4	6.155E-01	6.155E-01	2.119E+00
CS-134	2.091E-01	58.5	1.223E-01	1.228E-01	2.613E+00
CS-137	1.777E-01	119.7	2.127E-01	2.129E-01	7.555E-01
CE-139	5.453E-02	486.5	2.653E-01	2.653E-01	9.173E-01
Ba-140	-1.176E-01	257.5	3.027E-01	3.027E-01	3.938E+00
La-140	9.201E-01	33.3	3.067E-01	3.106E-01	5.828E-01
CE-141	-4.920E-01	127.2	6.260E-01	6.265E-01	2.103E+00

CE-144	0.000E+00	1.#INF	1.028E+00	1.028E+00	7.684E+00
PM-144	-2.020E-01	212.9	4.302E-01	4.303E-01	1.070E+00
EU-152	1.162E+00	129.5	1.505E+00	1.506E+00	3.579E+00
EU-154	2.040E+00	87.7	1.790E+00	1.793E+00	9.894E+00
EU-155	7.374E-01	102.7	7.573E-01	7.584E-01	3.362E+00
HF-181	2.414E-01	120.2	2.903E-01	2.906E-01	1.149E+00
Ta-182	1.345E+00	79.2	1.064E+00	1.066E+00	3.550E+00
Hg-203	2.120E-01	148.4	3.146E-01	3.149E-01	1.077E+00
TL-208	2.776E-01	178.0	4.941E-01	4.943E-01	1.301E+00
pm-146	3.406E-01	39.7	1.354E-01	1.365E-01	2.741E+00
y-88	3.158E-01	114.9	3.628E-01	3.632E-01	8.969E-01
Cd-113m	9.957E+02	381.5	3.799E+03	3.799E+03	1.327E+04
Cd-109	1.611E+00	576.4	9.287E+00	9.287E+00	3.148E+01
Cf-251	-1.782E-01	633.1	1.128E+00	1.128E+00	3.178E+00
Cf-249	1.221E-01	103.8	1.267E-01	1.269E-01	1.860E+00
Sn-126	2.546E+00	119.1	3.033E+00	3.036E+00	1.023E+01
PB-210	5.936E+00	128.8	7.643E+00	7.651E+00	2.424E+01
PB-212	2.830E+00	18.4	5.221E-01	5.533E-01	1.383E+00
PB-214	3.847E+00	18.2	7.008E-01	7.287E-01	1.481E+00
BI-207	1.537E-01	106.9	1.643E-01	1.645E-01	5.797E-01
BI-212	-2.735E-01	1490.0	4.076E+00	4.076E+00	1.485E+01
U-235	-5.048E-01	449.2	2.267E+00	2.268E+00	7.834E+00
BI-214	3.484E+00	21.5	7.497E-01	7.712E-01	1.914E+00
BI-210M	3.757E-01	110.4	4.149E-01	4.155E-01	1.413E+00
AC-228	2.440E+00	52.7	1.287E+00	1.293E+00	3.669E+00
TH-227	1.768E+00	255.8	4.522E+00	4.523E+00	1.316E+01
TH-229	6.163E-01	443.5	2.733E+00	2.734E+00	1.421E+01
TH-234	1.873E+01	30.3	5.669E+00	5.753E+00	1.722E+01
PA-231	0.000E+00	1.#INF	5.273E+00	5.273E+00	5.146E+01
PA-233	-1.433E-02	8449.5	1.210E+00	1.210E+00	4.208E+00
PA-234	1.404E+00	50.2	7.046E-01	7.083E-01	4.582E+00
PA-234M	3.756E+01	94.9	3.565E+01	3.570E+01	1.807E+02
AM-241	3.140E-01	269.3	8.455E-01	8.457E-01	2.455E+00
Np-237	0.000E+00	1.#INF	2.538E+00	2.538E+00	8.647E+00
Ir-192	-5.588E-02	91.3	5.100E-02	5.110E-02	1.102E+00
Cs-136	-5.641E-01	92.1	5.195E-01	5.205E-01	1.751E+00
Np-239	6.268E-01	152.3	9.549E-01	9.556E-01	3.239E+00
Nd-147	-2.268E+00	119.8	2.718E+00	2.721E+00	6.897E+00
TL-210	-6.396E-01	82.0	5.244E-01	5.257E-01	1.757E+00
Total	1.252E+03				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 17_Gamma_20182704.An1

Sample description
376740_Gamma_160-29521-A-6-C

Spectrum Filename: C:\User\SPC\Det17\17_Gamma_20182704.An1

Acquisition information
Start time:	8/9/2018 7:16:56 AM
Live time:	1800
Real time:	1823
Dead time:	1.25 %
Detector ID:	17

Detector system
Ge17 SN/11080671

Calibration
Filename: 17_Soil_TunaCan.Clb
17_TunaCan_90099_032612

Energy Calibration
Created:	2/29/2012 10:33:23 AM
Zero offset:	0.108 keV
Gain:	0.250 keV/channel
Quadratic:	-2.584E-08 keV/channel^2

Efficiency Calibration
Created:	4/12/2012 9:28:42 AM
Knee Energy:	165.85 keV
Above the Knee:	Quadratic Uncertainty = 0.91 %
Log(Eff):	-5.264190E-01 + (-4.024164E-01*Log(E)) + (-2.604461E-02*Log(E)^2)
Below the Knee:	Quadratic Uncertainty = 1.00 %
Log(Eff):	-2.343889E+01 + (8.582715E+00*Log(E)) + (-9.075430E-01*Log(E)^2)

Library Files
Main analysis library:	Client_Long_Rev14.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	100 (25.12keV)
Stop channel:	8000 (1999.54keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 7:16:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	17_2018-07-14_1832.PBC 7/14/2018 6:32:39 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1883

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.58	10.	128.76	0.82	2.100E-02	46.54	4.250	PBC<MDA	PB210
50.14	6.	255.77	0.78	2.357E-02	50.14	8.000	PBC<MDA	TH227
59.54	6.	269.26	0.79	2.957E-02	59.54	35.900	PBC<MDA	AM241
63.31	7.	221.43	0.73	3.166E-02	63.29	3.810	PBC<MDA	TH234
64.38	14.	119.12	0.79	3.216E-02	64.28	9.700	PBC<MDA	Sn126
77.23	49.	32.63	0.71	3.766E-02				
80.99	7.	214.06	0.81	3.884E-02	80.99	34.060	PBC<MDA	BA133
86.54	15.	166.95	0.81	4.027E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.716E-01	EU155
87.78	18.	60.83	0.81	4.050E-02	87.57	37.500	PBC<MDA	Sn126
88.25	4.	576.37	0.81	4.060E-02	88.04	3.790	PBC<MDA	Cd109
92.75	15.	155.76	0.82	4.156E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	3.620E+00	AC228
99.50	13.	118.79	0.82	4.234E-02	99.50	15.000	PBC<MDA	Np239
103.70	14.	123.66	0.83	4.269E-02	103.70	24.000	PBC<MDA	Np239
105.31	14.	119.66	0.83	4.278E-02	105.31	21.200	PBC<MDA	EU155
106.13	11.	152.35	0.83	4.282E-02	106.13	22.700	PBC<MDA	Np239
143.79	-4.	449.21	0.87	4.080E-02	143.79	10.960	PBC<MDA	U235
162.66	4.	354.26	0.88	3.813E-02	162.66	6.220	PBC<MDA	Ba140
163.19	-5.	307.02	0.88	3.802E-02	163.38	5.080	PBC<MDA	U235
165.85	3.	486.48	0.89	3.825E-02	165.85	79.900	PBC<MDA	CE139
185.77	19.	83.79	1.41	3.545E-02	185.72	54.000	PBC<MDA	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
210.85	3.	443.53	0.93	3.253E-02	210.85	2.990	PBC<MDA	TH229
238.55	75.	17.71	0.91	2.989E-02	238.63	43.300	3.206E+00	PB212
241.82	18.	46.30	0.96	2.960E-02	242.00	7.430	PBC<MDA	PB214
244.69	11.	176.61	0.96	2.938E-02	244.69	7.580	PBC<MDA	EU152
263.70	3.	381.52	0.98	2.790E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	9.	110.43	0.98	2.774E-02	265.83	50.000	PBC<MDA	BI210M
279.20	8.	148.43	0.99	2.681E-02	279.20	81.460	PBC<MDA	Hg203
284.30	10.	108.00	1.00	2.648E-02	284.30	6.140	PBC<MDA	I131
295.09	62.	18.56	1.05	2.580E-02	295.09	19.300	6.961E+00	PB214
296.00	9.	204.38	1.01	2.574E-02	296.00	79.000	PBC<MDA	TL210
300.03	9.	225.29	1.01	2.550E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
320.08	9.	116.28	1.03	2.437E-02	320.08	9.940	PBC<MDA	CR51
328.76	9.	106.58	1.04	2.391E-02	328.76	20.300	PBC<MDA	La140
333.44	10.	103.79	1.04	2.368E-02	333.44	15.510	PBC<MDA	Cf249
344.29	9.	129.52	1.05	2.315E-02	344.29	26.500	PBC<MDA	EU152
345.83	10.	120.23	1.05	2.308E-02	345.83	15.070	PBC<MDA	HF181
351.81	59.	18.22	1.05	2.279E-02	351.93	37.600	3.847E+00	PB214
427.88	7.	99.21	1.13	1.983E-02	427.88	29.600	PBC<MDA	SB125
453.88	21.	39.74	1.15	1.900E-02	453.88	65.000	9.295E-01	pm146
468.06	8.	162.83	1.16	1.859E-02	468.06	51.750	PBC<MDA	Ir192
477.60	7.	101.34	1.17	1.832E-02	477.60	10.520	PBC<MDA	BE7
487.02	20.	36.58	1.18	1.806E-02	487.02	45.500	1.323E+00	La140
511.86	46.	31.99	2.45	1.742E-02	511.86	20.000	7.389E+00	RH106
563.03	6.	102.89	1.25	1.624E-02	563.24	8.350	PBC<MDA	CS134
569.70	4.	106.93	1.25	1.611E-02	569.32	15.380	9.761E-01	CS134
					569.47	8.200	1.831E+00	PA234
					569.70	97.740	1.537E-01	BI207
582.95	7.	178.01	1.26	1.584E-02	583.02	84.500	PBC<MDA	TL208
609.14	43.	21.52	1.29	1.533E-02	609.31	46.090	3.415E+00	BI214
636.97	6.	156.23	1.31	1.484E-02	636.97	7.170	PBC<MDA	I131
657.76	2.	434.61	1.33	1.449E-02	657.76	94.640	PBC<MDA	AG110M
661.66	4.	119.73	1.33	1.443E-02	661.66	85.210	PBC<MDA	CS137
724.20	6.	106.03	1.39	1.349E-02	724.20	44.150	PBC<MDA	ZR95
763.94	4.	128.62	1.42	1.296E-02	763.94	22.280	PBC<MDA	AG110M
766.41	9.	94.90	1.42	1.293E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	2.	347.53	1.43	1.278E-02	778.92	12.940	PBC<MDA	EU152
785.42	6.	106.88	1.44	1.270E-02	785.42	1.280	PBC<MDA	BI212
795.64	6.	113.42	1.45	1.257E-02	795.87	85.530	PBC<MDA	CS134
801.95	10.	95.57	1.45	1.250E-02	801.95	8.690	PBC<MDA	CS134
810.78	1.	754.98	1.46	1.240E-02	810.78	99.460	PBC<MDA	CO58
834.85	4.	204.63	1.48	1.213E-02	834.85	99.980	PBC<MDA	MN54
846.77	1.	692.82	1.49	1.200E-02	846.77	99.935	PBC<MDA	Co56
873.23	5.	141.57	1.51	1.172E-02	873.23	12.270	PBC<MDA	EU154
884.68	7.	109.67	1.52	1.161E-02	884.68	72.680	PBC<MDA	AG110M
898.04	6.	114.90	1.53	1.148E-02	898.04	93.700	PBC<MDA	y88

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
911.60	15.	59.88	1.55	1.135E-02	911.07	29.000	PBC<MDA	AC228
946.02	11.	50.17	1.57	1.103E-02	946.02	13.400	PBC<MDA	PA234
964.11	1.	754.98	1.59	1.088E-02	964.11	14.605	PBC<MDA	EU152
968.61	7.	86.85	1.59	1.083E-02	968.97	17.460	PBC<MDA	AC228
996.33	8.	87.73	1.62	1.061E-02	996.33	10.600	PBC<MDA	EU154
1004.77	3.	254.28	1.62	1.054E-02	1004.77	18.010	PBC<MDA	EU154
1050.36	6.	98.51	1.66	1.019E-02	1050.36	1.560	PBC<MDA	RH106
1112.07	5.	165.64	1.71	9.752E-03	1112.07	13.644	PBC<MDA	EU152
1120.41	-3.	189.21	1.72	9.697E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	PBC<MDA	Ta182
1120.91	6.	104.37	1.72	9.691E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	3.424E-01	Sc46
					1121.30	34.900	9.815E-01	Ta182
1173.24	6.	89.92	1.76	9.359E-03	1173.24	99.900	PBC<MDA	CO60
1221.41	8.	119.02	1.80	9.073E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	19.	35.53	1.81	8.977E-03	1238.28	66.070	1.819E+00	Co56
1274.53	6.	64.54	1.84	8.779E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.151E+00	EU154
1274.54	1.	393.02	1.84	8.779E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	2.276E-01	EU154
1332.50	8.	35.36	1.89	8.481E-03	1332.50	99.980	5.242E-01	CO60
1408.00	5.	46.92	1.94	8.125E-03	1408.00	21.005	PBC<MDA	EU152
1460.73	237.	6.72	1.84	7.894E-03	1460.83	10.670	1.563E+02	K40
1596.21	9.	33.33	2.09	7.364E-03	1596.21	95.400	7.117E-01	La140
1764.28	7.	52.41	2.21	6.804E-03	1764.49	15.400	PBC<MDA	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
308.34	77.23	71.	49.	1.307E+03	32.63	0.711	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev14.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.78	46.58	60.	10.	0.005	128.76	0.822
TH-227	200.03	50.14	81.	6.	0.003	255.77	0.778s
AM-241	237.59	59.54	90.	6.	0.003	269.26	0.787s
TH-234	252.59	63.29	55.	41.	0.023	30.27	0.791D
Sn-126	256.56	64.28	138.	14.	0.008	119.12	0.792s
BA-133	323.36	80.99	79.	7.	0.004	214.06	0.807s
Np-237	345.35	86.49	290.	0.	0.000	1000.00	0.813A
EU-155	345.56	86.54	304.	15.	0.008	166.95	0.813s
Sn-126	349.67	87.57	322.	18.	0.010	60.83	0.814D
Cd-109	351.55	88.04	329.	4.	0.002	576.37	0.814A
Nd-147	363.79	91.10	333.	0.	0.000	1000.00	0.817s
TH-234	369.74	92.59	397.	-57.	-0.032	31.34	0.818s
AC-228	372.78	93.35	268.	15.	0.008	155.76	0.819s
Gd-153	389.37	97.50	165.	-16.	-0.009	115.13	0.823
Np-239	397.37	99.50	110.	13.	0.007	118.79	0.825s
Gd-153	412.16	103.20	181.	-16.	-0.009	119.56	0.828s
Np-239	414.16	103.70	139.	14.	0.008	123.66	0.829s
EU-155	420.61	105.31	125.	14.	0.008	119.66	0.830s
Np-239	423.88	106.13	134.	11.	0.006	152.35	0.831s
CO-57	487.57	122.06	123.	0.	0.000	1000.00	0.846s
EU-154	491.73	123.10	121.	-16.	-0.009	102.59	0.847s
PA-234	524.49	131.29	165.	-10.	-0.005	187.38	0.855
HF-181	531.41	133.02	175.	0.	0.000	1000.00	0.856
CE-144	533.46	133.54	175.	0.	0.000	1000.00	0.857s
HF-181	544.50	136.30	175.	0.	0.000	1000.00	0.859s
CO-57	545.20	136.47	215.	-16.	-0.009	129.10	0.859s
Tc-99m	561.34	140.51	172.	-15.	-0.008	123.92	0.863s
U-235	574.43	143.79	168.	-4.	-0.002	449.21	0.866s
CE-141	581.05	145.44	234.	-17.	-0.010	127.24	0.868s
Ba-140	649.90	162.66	116.	4.	0.002	354.26	0.884s
U-235	652.78	163.38	125.	-5.	-0.003	307.02	0.885s
CE-139	662.67	165.85	105.	3.	0.002	486.48	0.887s
Cf-251	705.64	176.60	50.	-2.	-0.001	633.11	0.897s
U-235	742.31	185.77	71.	19.	0.010	83.79	1.408s
TH-229	773.25	193.51	60.	0.	0.000	1000.00	0.913s
U-235	820.52	205.33	81.	-17.	-0.009	31.47	0.924s
TH-229	842.58	210.85	43.	3.	0.001	443.53	0.929s
Cf-251	907.16	227.00	70.	-15.	-0.008	102.37	0.944s
PB-212	953.67	238.63	40.	66.	0.037	18.45	0.954D
PB-214	967.13	242.00	24.	18.	0.010	46.30	0.957D
EU-152	977.91	244.69	168.	11.	0.006	176.61	0.960s
TH-227	1024.08	256.24	44.	-6.	-0.003	213.56	0.971
Cd-113m	1053.91	263.70	64.	3.	0.002	381.52	0.978s
BI-210M	1062.44	265.83	49.	9.	0.005	110.43	0.979

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1108.23	277.28	71.	-4.	-0.002	256.02	0.990
Hg-203	1115.89	279.20	72.	8.	0.005	148.43	0.992s
I-131	1136.28	284.30	33.	10.	0.006	108.00	0.996s
PB-214	1179.43	295.09	18.	62.	0.035	18.56	1.048
TL-210	1183.07	296.00	174.	9.	0.005	204.38	1.007s
PB-212	1199.19	300.03	184.	9.	0.005	225.29	1.011
PA-233	1199.79	300.18	194.	0.	0.000	1000.00	1.011s
PA-231	1209.66	302.65	194.	0.	0.000	1000.00	1.013s
BA-133	1210.47	302.85	194.	0.	0.000	1000.00	1.013s
Ba-140	1218.46	304.85	194.	0.	0.000	1000.00	1.015s
BI-210M	1218.64	304.90	194.	0.	0.000	1000.00	1.015s
Ir-192	1232.82	308.44	194.	0.	0.000	1000.00	1.019s
Ir-192	1265.01	316.49	72.	-14.	-0.008	91.26	1.026s
CR-51	1279.38	320.08	56.	9.	0.005	116.28	1.029s
La-140	1314.07	328.76	22.	9.	0.005	106.58	1.037s
Cf-249	1332.79	333.44	29.	10.	0.006	103.79	1.041s
AC-228	1352.30	338.32	108.	-10.	-0.005	104.59	1.046
Cs-136	1361.30	340.57	114.	0.	0.000	1000.00	1.048s
EU-152	1376.16	344.29	62.	9.	0.005	129.52	1.051s
HF-181	1382.33	345.83	62.	10.	0.005	120.23	1.053s
PB-214	1406.25	351.81	19.	59.	0.033	18.22	1.047s
BA-133	1423.00	356.00	119.	-4.	-0.002	405.40	1.062s
I-131	1456.93	364.48	26.	-6.	-0.003	172.45	1.070s
BA-133	1534.34	383.84	94.	-12.	-0.007	88.01	1.087s
Cf-249	1550.77	387.95	90.	-5.	-0.003	253.17	1.091s
SN-113	1565.73	391.69	117.	-13.	-0.007	85.18	1.094s
SB-125	1710.44	427.88	11.	7.	0.004	99.21	1.127s
AG-108M	1734.69	433.94	48.	-14.	-0.008	76.47	1.132s
pm-146	1814.44	453.88	12.	21.	0.011	39.74	1.150s
SB-125	1852.38	463.37	81.	-13.	-0.007	98.97	1.158s
Ir-192	1871.15	468.06	78.	8.	0.004	162.83	1.163s
BE-7	1909.29	477.59	22.	7.	0.004	101.34	1.171s
La-140	1946.98	487.02	8.	20.	0.011	36.58	1.180s
RU-103	1987.11	497.05	24.	-1.	-0.001	964.37	1.188s
RH-106	2046.35	511.86	27.	46.	0.026	31.99	2.452
Nd-147	2122.88	531.00	28.	-9.	-0.005	119.84	1.219s
Ba-140	2147.92	537.26	32.	-3.	-0.002	373.67	1.224s
CS-134	2251.82	563.24	8.	6.	0.003	102.89	1.247s
CS-134	2276.15	569.32	23.	-4.	-0.002	164.80	1.252s
PA-234	2276.75	569.47	28.	0.	0.000	1000.00	1.253
BI-207	2277.67	569.70	9.	4.	0.002	106.93	1.253s
TL-208	2330.95	583.02	38.	7.	0.004	178.01	1.264
SB-125	2400.86	600.50	166.	-4.	-0.002	452.84	1.280
SB-124	2409.78	602.73	233.	-14.	-0.008	155.39	1.282s
CS-134	2417.70	604.71	214.	-14.	-0.008	148.85	1.284s
BI-214	2436.10	609.31	22.	43.	0.024	21.52	1.287D
RU-103	2440.05	610.30	199.	-14.	-0.008	143.48	1.288s
AG-108M	2455.98	614.28	185.	-14.	-0.008	138.11	1.292s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-144	2471.11	618.06	192.	-11.	-0.006	180.25	1.295s
RH-106	2486.52	621.92	243.	-16.	-0.009	57.34	1.299s
SB-125	2542.41	635.89	31.	-9.	-0.005	108.68	1.311s
I-131	2546.75	636.97	34.	6.	0.003	156.23	1.312s
AG-110M	2629.90	657.76	20.	2.	0.001	434.61	1.330s
CS-137	2645.49	661.66	9.	4.	0.002	119.73	1.333s
PM-144	2785.03	696.54	26.	-5.	-0.003	212.92	1.363s
NB-94	2809.38	702.63	17.	-1.	-0.001	643.23	1.368s
SB-124	2890.01	722.79	28.	-1.	-0.001	754.98	1.386s
AG-108M	2890.61	722.94	29.	0.	0.000	1000.00	1.386s
EU-154	2892.29	723.36	29.	0.	0.000	1000.00	1.386s
ZR-95	2895.66	724.20	20.	6.	0.004	106.03	1.387s
pm-146	2941.74	735.72	17.	-6.	-0.004	139.94	1.397s
pm-146	2987.51	747.16	17.	-6.	-0.004	139.94	1.407s
ZR-95	3025.79	756.73	13.	-3.	-0.002	148.40	1.415s
AG-110M	3054.64	763.94	14.	4.	0.002	128.62	1.421s
NB-95	3062.03	765.79	38.	-12.	-0.007	77.03	1.423s
PA-234M	3064.52	766.41	32.	9.	0.005	94.90	1.423s
EU-152	3114.56	778.92	18.	2.	0.001	347.53	1.434s
BI-212	3140.56	785.42	10.	6.	0.003	106.88	1.440s
CS-134	3182.35	795.87	22.	6.	0.003	113.42	1.448s
TL-210	3197.29	799.60	61.	-14.	-0.008	81.99	1.451s
CS-134	3206.69	801.95	42.	10.	0.006	95.57	1.454
CO-58	3241.99	810.78	28.	1.	0.001	754.98	1.461s
La-140	3261.97	815.77	29.	0.	0.000	1000.00	1.465s
Cs-136	3272.90	818.50	60.	-12.	-0.007	92.10	1.467s
MN-54	3338.30	834.85	14.	4.	0.002	204.63	1.481s
Co-56	3385.99	846.77	19.	1.	0.001	692.82	1.491s
TL-208	3441.18	860.56	19.	-6.	-0.003	41.83	1.503s
NB-94	3483.32	871.10	23.	-6.	-0.003	126.03	1.512s
EU-154	3491.85	873.23	24.	5.	0.003	141.57	1.514s
PA-234	3521.06	880.53	41.	-11.	-0.006	91.36	1.520
PA-234	3531.90	883.24	52.	-2.	-0.001	582.37	1.522
AG-110M	3537.67	884.68	30.	7.	0.004	109.67	1.523s
Sc-46	3556.06	889.28	47.	-8.	-0.005	123.71	1.527s
y-88	3591.11	898.04	10.	6.	0.003	114.90	1.534s
AC-228	3643.24	911.07	17.	15.	0.009	59.88	1.545s
AG-110M	3748.95	937.49	19.	-9.	-0.005	111.07	1.567
PA-234	3783.07	946.02	5.	11.	0.006	50.17	1.574
EU-152	3855.45	964.11	28.	1.	0.001	754.98	1.589s
AC-228	3874.90	968.97	17.	7.	0.004	86.85	1.593s
EU-154	3984.36	996.33	20.	8.	0.004	87.73	1.616s
EU-154	4018.15	1004.77	14.	3.	0.002	254.28	1.623s
Co-56	4150.45	1037.84	20.	-6.	-0.003	168.87	1.650s
RH-106	4200.55	1050.36	6.	6.	0.003	98.51	1.661s
BI-207	4253.77	1063.66	11.	-2.	-0.001	443.65	1.671s
Ga-68	4308.74	1077.40	15.	-3.	-0.002	289.64	1.683s
FE-59	4396.18	1099.25	20.	-7.	-0.004	145.45	1.700s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	4447.49	1112.07	36.	5.	0.003	165.64	1.711s
ZN-65	4461.38	1115.55	41.	0.	0.000	1000.00	1.713s
BI-214	4480.35	1120.29	9.	-3.	-0.002	189.21	1.717s
Sc-46	4481.41	1120.55	6.	0.	0.000	1000.00	1.717s
Ta-182	4484.41	1121.30	16.	6.	0.003	104.37	1.718s
CO-60	4692.24	1173.24	5.	6.	0.003	89.92	1.760s
Ta-182	4755.52	1189.05	25.	-6.	-0.003	187.70	1.772
Ta-182	4885.02	1221.41	16.	8.	0.004	119.02	1.798
Co-56	4952.53	1238.28	6.	19.	0.011	35.53	1.812
NA-22	5097.60	1274.53	5.	6.	0.004	64.54	1.840s
EU-154	5097.66	1274.54	12.	1.	0.001	393.02	1.840s
FE-59	5165.90	1291.60	11.	-2.	-0.001	452.11	1.854s
TL-210	5251.56	1313.00	11.	-3.	-0.001	285.04	1.870s
CO-60	5329.61	1332.50	0.	8.	0.004	35.36	1.886s
AG-110M	5536.92	1384.30	16.	-8.	-0.004	119.02	1.926s
EU-152	5631.79	1408.00	0.	5.	0.003	46.92	1.944s
K-40	5842.85	1460.73	8.	237.	0.132	6.72	1.843
La-140	6385.15	1596.21	0.	9.	0.005	33.33	2.087s
SB-124	6764.55	1690.98	0.	0.	0.000	1000.00	2.157s
BI-214	7058.84	1764.49	3.	7.	0.004	52.41	2.211s
Co-56	7086.31	1771.35	10.	0.	0.000	1000.00	2.216s
y-88	7345.39	1836.06	6.	-2.	-0.001	304.14	2.262s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	Peak MDA Value Bq/Sample	COMMENTS
BE-7	C	2.0328E+00				5.31E+01	
			477.60	2.033E+00	?(	7.083E+00 1.01E+02	1.05E+01 G
NA-22	C	4.0534E-01				9.50E+02	
			1274.53	4.053E-01	&(	8.531E-01 6.45E+01	9.99E+01 G
K-40	N	1.5635E+02				4.66E+11	
			1460.83	1.563E+02	(P	1.046E+01 6.72E+00	1.07E+01 G
Sc-46	F	-3.9199E-01				8.38E+01	
			889.28	-3.920E-01	?(	1.663E+00 1.24E+02	1.00E+02 G
			1120.55	0.000E+00	+	8.160E-01 1.00E+03	1.00E+02 G
CR-51	F	2.1704E+00				2.77E+01	
			320.08	2.170E+00	&(	8.606E+00 1.16E+02	9.94E+00 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	C 1.8327E-01					3.12E+02	
		834.85	1.833E-01	?(	9.230E-01	2.05E+02	1.00E+02 G
FE-59	F -6.9953E-01					4.45E+01	
		1099.25	-6.995E-01	?(	2.353E+00	1.45E+02	5.65E+01 G
		1291.60	-2.467E-01	+	2.654E+00	4.52E+02	4.32E+01 G
Co-56	C 7.6111E-01					7.73E+01	
		846.77	6.177E-02	&(	1.058E+00	6.93E+02	9.99E+01 G
		1238.28	1.819E+00	?(P	1.285E+00	3.55E+01	6.61E+01 G
		1037.84	-2.294E+00	+	9.005E+00	1.69E+02	1.41E+01 G
		1771.35	0.000E+00	-	9.230E+00	1.00E+03	1.55E+01 A
CO-58	C 4.5055E-02					7.09E+01	
		810.78	4.505E-02	?(	1.233E+00	7.55E+02	9.95E+01 G
CO-60	F 4.4395E-01					1.93E+03	
		1332.50	5.242E-01	?(	4.829E-01	3.54E+01	1.00E+02 G
		1173.24	3.637E-01	?(	7.802E-01	8.99E+01	9.99E+01 G
NB-94	I -5.4835E-02					7.41E+06	
		702.63	-5.484E-02	?(	9.094E-01	6.43E+02	9.79E+01 G
		871.10	-2.683E-01	+	1.179E+00	1.26E+02	9.99E+01 G
ZR-95	I 1.3252E-01					6.40E+01	
		756.73	-2.516E-01	?(P	1.536E+00	1.48E+02	5.45E+01 G
		724.20	6.063E-01	?(	2.221E+00	1.06E+02	4.42E+01 G
NB-95	I -5.2128E-01					6.40E+01	
		765.79	-5.213E-01	?(	1.344E+00	7.70E+01	9.98E+01 G
RU-103	I -3.4347E-02					3.93E+01	
		497.05	-3.435E-02	?(	8.772E-01	9.64E+02	9.09E+01 G
		610.30	-8.935E+00	+	4.322E+01	1.43E+02	5.75E+00 GA
RH-106	I -6.1112E+00					3.74E+02	
		621.92	-6.111E+00	?(P	2.789E+01	5.73E+01	9.93E+00 G
		1050.36	2.018E+01	&	4.767E+01	9.85E+01	1.56E+00 G
		511.86	7.389E+00	+	4.270E+00	3.20E+01	2.00E+01 GA
AG-108M	C -4.4662E-01					1.53E+05	
		433.94	-4.466E-01	?(P	1.092E+00	7.65E+01	9.05E+01 G
		722.94	0.000E+00	+	1.259E+00	1.00E+03	9.08E+01 G
		614.28	-5.761E-01	+	2.683E+00	1.38E+02	8.98E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-110M	F 5.8061E-01					2.50E+02	
		884.68	4.932E-01	?(	1.859E+00	1.10E+02	7.27E+01 G
		657.76	6.077E-02	-	9.645E-01	4.35E+02	9.46E+01 G
		937.49	-1.261E+00	+	3.324E+00	1.11E+02	3.44E+01 G
		1384.30	-2.222E+00	+	5.931E+00	1.19E+02	2.43E+01 G
		763.94	8.656E-01	?(	3.935E+00	1.29E+02	2.23E+01 G
SN-113	F -5.2568E-01					1.15E+02	
		391.69	-5.257E-01	?(P	2.179E+00	8.52E+01	6.40E+01 G
SB-124	F -5.1545E-01					6.02E+01	
		602.73	-5.154E-01	?(	2.699E+00	1.55E+02	9.83E+01 G
		1690.98	0.000E+00	+	1.218E+00	1.00E+03	4.78E+01 G
		722.79	-3.804E-01	+	1.041E+01	7.55E+02	1.08E+01 G
SB-125	I 6.4203E-01					1.01E+03	
		427.88	6.420E-01	&(	1.720E+00	9.92E+01	2.96E+01 G
		600.50	-8.126E-01	+	1.260E+01	4.53E+02	1.79E+01 G
		635.89	-2.897E+00	+ P	9.441E+00	1.09E+02	1.13E+01 G
		463.37	-3.785E+00	+	1.263E+01	9.90E+01	1.05E+01 G
I-131	I 2.9714E-01					8.02E+00	
		364.48	-1.733E-01	?(	8.050E-01	1.72E+02	8.17E+01 G
		284.30	3.550E+00	?(	1.008E+01	1.08E+02	6.14E+00 G
		636.97	2.872E+00	?(	1.564E+01	1.56E+02	7.17E+00 G
Gd-153	F -7.1107E-01					2.42E+02	
		97.50	-7.111E-01	?(	2.753E+00	1.15E+02	3.00E+01 G
		103.20	-9.728E-01	+	3.911E+00	1.20E+02	2.18E+01 G
Ga-68	C -5.9363E+00					4.71E-02	
		1077.40	-5.936E+00	?(	4.108E+01	2.90E+02	3.30E+00 G
Tc-99m	I -2.3827E-01					2.51E-01	
		140.51	-2.383E-01	?(	9.942E-01	1.24E+02	8.93E+01 G
BA-133	F -1.5182E-01					3.85E+03	
		356.00	-1.518E-01	?(	2.119E+00	4.05E+02	6.20E+01 G
		302.85	0.000E+00	+	8.090E+00	1.00E+03	1.83E+01 G
		383.84	-3.579E+00	& P	1.387E+01	8.80E+01	8.94E+00 GA
		80.99	2.977E-01	P	1.852E+00	2.14E+02	3.41E+01 GA
CS-134	I 2.0911E-01					7.54E+02	
		604.71	-5.208E-01	?(	2.613E+00	1.49E+02	9.76E+01 G
		795.87	3.218E-01	?(P	1.263E+00	1.13E+02	8.55E+01 G
		569.32	-9.712E-01	+	5.652E+00	1.65E+02	1.54E+01 G
		801.95	5.169E+00	(	1.676E+01	9.56E+01	8.69E+00 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		563.24	2.426E+00	?(P	6.578E+00	1.03E+02	8.35E+00 G
CS-137	I 1.7767E-01					1.10E+04	
		661.66	1.777E-01	?(P	7.555E-01	1.20E+02	8.52E+01 G
CE-139	F 5.4533E-02					1.38E+02	
		165.85	5.453E-02	?(	9.173E-01	4.86E+02	7.99E+01 G
Ba-140	I -1.1757E-01					1.28E+01	
		537.26	-4.064E-01	?(	3.938E+00	3.74E+02	2.44E+01 G
		162.66	1.015E+00	?(	1.237E+01	3.54E+02	6.22E+00 G
		304.85	0.000E+00	+	3.473E+01	1.00E+03	4.29E+00 G
La-140	I 9.2015E-01					1.28E+01	
		1596.21	7.117E-01	?(	5.828E-01	3.33E+01	9.54E+01 G
		487.02	1.323E+00	?(P	1.098E+00	3.66E+01	4.55E+01 G
		328.76	9.969E-01	*(P	2.818E+00	1.07E+02	2.03E+01 G
		815.77	0.000E+00	-	5.377E+00	1.00E+03	2.33E+01 G
CE-141	I -4.9203E-01					3.25E+01	
		145.44	-4.920E-01	?(	2.103E+00	1.27E+02	4.82E+01 G
PM-144	C -2.0204E-01					3.63E+02	
		696.54	-2.020E-01	?(	1.070E+00	2.13E+02	9.90E+01 G
		618.06	-4.077E-01	&	2.488E+00	1.80E+02	9.91E+01 G
EU-152	F 1.1622E+00					4.94E+03	
		344.29	8.093E-01	?(P	3.579E+00	1.30E+02	2.65E+01 G
		1112.07	2.208E+00	?(	1.276E+01	1.66E+02	1.36E+01 G
		121.78	-6.060E-02	&	2.456E+00	1.17E+03	2.86E+01 G
		778.92	8.384E-01	?(P	7.462E+00	3.48E+02	1.29E+01 G
		964.11	3.497E-01	?(	9.572E+00	7.55E+02	1.46E+01 G
		244.69	2.632E+00	(	1.576E+01	1.77E+02	7.58E+00 G
		1408.00	1.583E+00	? P	2.399E+00	4.69E+01	2.10E+01 GA
EU-154	I 2.0401E+00					3.14E+03	
		873.23	1.995E+00	?(	9.894E+00	1.42E+02	1.23E+01 G
		123.10	-4.997E-01	-	1.724E+00	1.03E+02	4.08E+01 G
		1274.54	2.276E-01	&	3.358E+00	3.93E+02	3.52E+01 G
		723.36	0.000E+00	-	5.658E+00	1.00E+03	2.02E+01 G
		1004.77	9.602E-01	?(	5.845E+00	2.54E+02	1.80E+01 G
		996.33	3.927E+00	?(	1.172E+01	8.77E+01	1.06E+01 G
EU-155	I 7.3738E-01					1.81E+03	
		105.31	8.327E-01	(P	3.362E+00	1.20E+02	2.12E+01 G
		86.54	6.716E-01	?(	3.772E+00	1.67E+02	3.07E+01 G

Nuclide		Ave activity	Energy		Activity	Code	Peak	MDA	Comments
HF-181	F	2.4145E-01						4.24E+01	
			482.00	-1.928E-03	%(	1.149E+00	1.65E+04	8.05E+01	G
			133.02	0.000E+00	+	1.966E+00	1.00E+03	4.33E+01	G
			345.83	1.542E+00	?(P	6.312E+00	1.20E+02	1.51E+01	G
			136.30	0.000E+00	-	1.466E+01	1.00E+03	5.85E+00	G
Ta-182	F	1.3447E+00						1.14E+02	
			1121.30	9.815E-01	?(	3.550E+00	1.04E+02	3.49E+01	G
			1221.41	1.814E+00	(	4.842E+00	1.19E+02	2.70E+01	G
			1189.05	-2.221E+00	+	9.630E+00	1.88E+02	1.62E+01	G
Hg-203	F	2.1197E-01						4.66E+01	
			279.20	2.120E-01	?(	1.077E+00	1.48E+02	8.15E+01	G
TL-208	N	2.7757E-01						6.98E+02	
			583.02	2.776E-01	?(P	1.301E+00	1.78E+02	8.45E+01	G
			277.28	-1.348E+00	+ P	1.373E+01	2.56E+02	6.31E+00	G
			860.56	-2.180E+00	+ P	8.643E+00	4.18E+01	1.24E+01	G
pm-146	C	3.4062E-01						2.02E+03	
			747.16	-7.852E-01	?(	2.741E+00	1.40E+02	3.40E+01	G
			735.72	-1.173E+00	+	4.095E+00	1.40E+02	2.25E+01	G
			453.88	9.295E-01	(P	8.579E-01	3.97E+01	6.50E+01	G
y-88	F	3.1578E-01						1.07E+02	
			898.04	3.158E-01	&(P	8.969E-01	1.15E+02	9.37E+01	G
			1836.06	-1.699E-01	-	1.200E+00	3.04E+02	9.92E+01	G
Cd-113m		9.9573E+02						5.33E+03	
			263.70	9.957E+02	?(	1.327E+04	3.82E+02	6.00E-03	K
Cd-109	F	1.6113E+00						4.53E+02	
								Derived Ave Activity	
			88.04	1.611E+00	}(	3.148E+01	5.76E+02	3.79E+00	G
Cf-251	T	-1.7821E-01						3.28E+05	
			176.60	-1.782E-01	?(	3.178E+00	6.33E+02	1.70E+01	G
			227.00	-4.285E+00	+	1.189E+01	1.02E+02	6.30E+00	GA
Cf-249	T	1.2207E-01						1.28E+05	
			387.95	-2.132E-01	?(	1.860E+00	2.53E+02	6.60E+01	G
			333.44	1.549E+00	?(	4.228E+00	1.04E+02	1.55E+01	G
Sn-126		2.5459E+00						3.65E+07	
			87.57	6.639E-01	}	3.158E+00	6.08E+01	3.75E+01	GA
			64.28	2.546E+00	&(	1.023E+01	1.19E+02	9.70E+00	G
			86.94	0.000E+00	}	1.288E+01	1.22E+03	9.04E+00	GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-210	N	5.9358E+00					8.14E+03	
			46.54	5.936E+00	(P	2.424E+01	1.29E+02	4.25E+00 G
PB-212	N	2.8298E+00					6.98E+02	
			238.63	2.830E+00	(P	1.383E+00	1.84E+01	4.33E+01 G
			300.03	5.730E+00	+ P	4.384E+01	2.25E+02	3.28E+00 GA
PB-214	N	3.8471E+00					5.84E+05	
			351.93	3.847E+00	(P	1.481E+00	1.82E+01	3.76E+01 G
			295.09	6.961E+00	+ P	2.485E+00	1.86E+01	1.93E+01 G
			242.00	4.445E+00		6.499E+00	4.63E+01	7.43E+00 GA
BI-207	C	1.5367E-01					1.18E+04	
			569.70	1.537E-01	?(	5.797E-01	1.07E+02	9.77E+01 G
			1063.66	-1.353E-01	+ P	1.334E+00	4.44E+02	7.45E+01 G
BI-212	N	-2.7355E-01					6.98E+02	
			727.17	-2.735E-01	%(	1.485E+01	1.49E+03	7.55E+00 G
			785.42	2.126E+01	? P	5.843E+01	1.07E+02	1.28E+00 GA
U-235	N	-5.0475E-01					2.57E+11	
			143.79	-5.048E-01	?(P	7.834E+00	4.49E+02	1.10E+01 G
			205.33	-5.614E+00	+ P	1.495E+01	3.15E+01	5.01E+00 G
			163.38	-1.473E+00	+ P	1.577E+01	3.07E+02	5.08E+00 G
			185.72	5.446E-01	* P	1.220E+00	8.38E+01	5.40E+01 GA
BI-214	N	3.4837E+00					5.84E+05	
			609.31	3.415E+00	(P	1.914E+00	2.15E+01	4.61E+01 G
			1120.29	-1.129E+00	- P	6.360E+00	1.89E+02	1.51E+01 G
			1764.49	3.689E+00	?(P	5.746E+00	5.24E+01	1.54E+01 G
BI-210M	T	3.7570E-01					1.10E+09	
			265.83	3.757E-01	&(P	1.413E+00	1.10E+02	5.00E+01 G
			304.90	0.000E+00	-	5.321E+00	1.00E+03	2.80E+01 G
AC-228	N	2.4397E+00					2.10E+03	
			911.07	2.584E+00	?(P	3.669E+00	5.99E+01	2.90E+01 G
			968.97	2.199E+00	?(P	6.496E+00	8.68E+01	1.75E+01 G
			338.32	-1.917E+00	- P	1.008E+01	1.05E+02	1.20E+01 G
			93.35	3.620E+00	&	1.898E+01	1.56E+02	5.56E+00 XA
TH-227	N	1.7680E+00					7.95E+03	
			50.14	1.768E+00	?(	1.316E+01	2.56E+02	8.00E+00 G
			256.24	-1.596E+00	+ P	9.350E+00	2.14E+02	7.00E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	6.1626E-01					2.68E+06	
			193.51	0.000E+00	?(	1.421E+01	1.00E+03	4.40E+00 G
			210.85	1.523E+00	?(	1.907E+01	4.44E+02	2.99E+00 G
TH-234	N	1.8727E+01					1.63E+12	
			63.29	1.873E+01	?(P	1.722E+01	3.03E+01	3.81E+00 G
			92.59	-1.368E+01	+ P	2.294E+01	3.13E+01	5.58E+00 G
PA-233	C	-1.4325E-02					7.82E+08	
			312.01	-1.433E-02	%(P	4.208E+00	8.45E+03	3.60E+01 G
			300.18	0.000E+00	&	2.377E+01	1.00E+03	6.20E+00 G
PA-234	N	1.4043E+00					1.63E+12	
			131.29	-7.205E-01	(	4.582E+00	1.87E+02	1.80E+01 G
			946.02	4.258E+00	(	4.801E+00	5.02E+01	1.34E+01 G
			569.47	0.000E+00	-	1.145E+01	1.00E+03	8.20E+00 G
			883.24	-8.784E-01	+	1.806E+01	5.82E+02	9.60E+00 G
			880.53	-8.400E+00	+	2.596E+01	9.14E+01	6.00E+00 GA
PA-234M	N	3.7561E+01					1.63E+12	
			1001.00	4.360E+00	%(P	1.807E+02	1.15E+03	8.37E-01 G
			766.41	1.321E+02	?(P	4.259E+02	9.49E+01	2.94E-01 G
AM-241	T	3.1401E-01					1.58E+05	
			59.54	3.140E-01	?(	2.455E+00	2.69E+02	3.59E+01 G
Ir-192	F	-5.5881E-02					7.40E+01	
			316.49	-3.588E-01	?(	1.102E+00	9.13E+01	8.70E+01 G
			468.06	4.537E-01	?(	2.532E+00	1.63E+02	5.18E+01 G
			308.44	0.000E+00	+	4.731E+00	1.00E+03	3.18E+01 G
Cs-136	F	-5.6410E-01					1.30E+01	
			818.50	-5.641E-01	?(	1.751E+00	9.21E+01	1.00E+02 G
			1048.07	3.402E-02	%	1.473E+00	1.16E+03	8.00E+01 G
			340.57	0.000E+00	+	2.664E+00	1.00E+03	4.69E+01 G
Np-239	T	6.2679E-01					2.36E+00	
			103.70	7.491E-01	?	3.126E+00	1.24E+02	2.40E+01 X
			106.13	6.268E-01	?(	3.239E+00	1.52E+02	2.27E+01 G
			99.50	1.121E+00	&	4.503E+00	1.19E+02	1.50E+01 X
Nd-147		-2.2679E+00					1.11E+01	
			531.00	-2.268E+00	?(	6.897E+00	1.20E+02	1.30E+01 G
			91.10	0.000E+00	+	4.182E+00	1.00E+03	2.83E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-210	N -6.3963E-01					5.84E+05	
		799.60	-6.396E-01	?(	1.757E+00	8.20E+01	9.90E+01 G
		296.00	2.530E-01	+	1.756E+00	2.04E+02	7.90E+01 G
		1313.00	-8.224E-01	+	5.529E+00	2.85E+02	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-227	50.14	81.	6.	0.003	255.77	1.768E+00	
AM-241	59.54	90.	6.	0.003	269.26	3.140E-01	
BA-133	80.99	79.	7.	0.004	214.06	2.977E-01	P
EU-155	86.54	304.	15.	0.008	166.95	6.716E-01	
Gd-153	97.50	165.	-16.	-0.009	115.13	-7.111E-01	
Np-239	99.50	110.	13.	0.007	118.79	1.121E+00	
Gd-153	103.20	181.	-16.	-0.009	119.56	-9.728E-01	
Np-239	103.70	139.	14.	0.008	123.66	7.491E-01	
EU-155	105.31	125.	14.	0.008	119.66	8.327E-01	P
Np-239	106.13	134.	11.	0.006	152.35	6.268E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	123.10	121.	-16.	-0.009	102.59	-4.997E-01	
CO-57	136.47	215.	-16.	-0.009	129.10	-2.044E+00	
Tc-99m	140.51	172.	-15.	-0.008	123.92	-2.383E-01	
CE-141	145.44	234.	-17.	-0.010	127.24	-4.920E-01	
Ba-140	162.66	116.	4.	0.002	354.26	1.015E+00	
CE-139	165.85	105.	3.	0.002	486.48	5.453E-02	
Cf-251	176.60	50.	-2.	-0.001	633.11	-1.782E-01	
TH-229	210.85	43.	3.	0.001	443.53	1.523E+00	
Cf-251	227.00	70.	-15.	-0.008	102.37	-4.285E+00	
EU-152	244.69	168.	11.	0.006	176.61	2.632E+00	
TH-227	256.24	44.	-6.	-0.003	213.56	-1.596E+00	P
Cd-113m	263.70	64.	3.	0.002	381.52	9.957E+02	
BI-210M	265.83	49.	9.	0.005	110.43	3.757E-01	P
Hg-203	279.20	72.	8.	0.005	148.43	2.120E-01	
I-131	284.30	33.	10.	0.006	108.00	3.550E+00	
TL-210	296.00	174.	9.	0.005	204.38	2.530E-01	
Ir-192	316.49	72.	-14.	-0.008	91.26	-3.588E-01	
CR-51	320.08	56.	9.	0.005	116.28	2.170E+00	
Cf-249	333.44	29.	10.	0.006	103.79	1.549E+00	
EU-152	344.29	62.	9.	0.005	129.52	8.093E-01	P
HF-181	345.83	62.	10.	0.005	120.23	1.542E+00	P
BA-133	356.00	119.	-4.	-0.002	405.40	-1.518E-01	
I-131	364.48	26.	-6.	-0.003	172.45	-1.733E-01	
BA-133	383.84	94.	-12.	-0.007	88.01	-3.579E+00	P
Cf-249	387.95	90.	-5.	-0.003	253.17	-2.132E-01	
SN-113	391.69	117.	-13.	-0.007	85.18	-5.257E-01	P
SB-125	427.88	11.	7.	0.004	99.21	6.420E-01	
AG-108M	433.94	48.	-14.	-0.008	76.47	-4.466E-01	P
pm-146	453.88	12.	21.	0.011	39.74	9.295E-01	P
SB-125	463.37	81.	-13.	-0.007	98.97	-3.785E+00	
Ir-192	468.06	78.	8.	0.004	162.83	4.537E-01	
BE-7	477.59	22.	7.	0.004	101.34	2.033E+00	
RU-103	497.05	24.	-1.	-0.001	964.37	-3.435E-02	
RH-106	511.86	27.	46.	0.026	31.99	7.389E+00	
Nd-147	531.00	28.	-9.	-0.005	119.84	-2.268E+00	
Ba-140	537.26	32.	-3.	-0.002	373.67	-4.064E-01	
BI-207	569.70	9.	4.	0.002	106.93	1.537E-01	
SB-125	600.50	166.	-4.	-0.002	452.84	-8.126E-01	
SB-124	602.73	233.	-14.	-0.008	155.39	-5.154E-01	
RU-103	610.30	199.	-14.	-0.008	143.48	-8.935E+00	
AG-108M	614.28	185.	-14.	-0.008	138.11	-5.761E-01	
PM-144	618.06	192.	-11.	-0.006	180.25	-4.077E-01	
RH-106	621.92	243.	-16.	-0.009	57.34	-6.111E+00	P
SB-125	635.89	31.	-9.	-0.005	108.68	-2.897E+00	P
I-131	636.97	34.	6.	0.003	156.23	2.872E+00	
AG-110M	657.76	20.	2.	0.001	434.61	6.077E-02	
CS-137	661.66	9.	4.	0.002	119.73	1.777E-01	P
PM-144	696.54	26.	-5.	-0.003	212.92	-2.020E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
NB-94	702.63	17.	-1.	-0.001	643.23	-5.484E-02		
SB-124	722.79	28.	-1.	-0.001	754.98	-3.804E-01		
ZR-95	724.20	20.	6.	0.004	106.03	6.063E-01		
pm-146	735.72	17.	-6.	-0.004	139.94	-1.173E+00		
pm-146	747.16	17.	-6.	-0.004	139.94	-7.852E-01		
ZR-95	756.73	13.	-3.	-0.002	148.40	-2.516E-01	P	
AG-110M	763.94	14.	4.	0.002	128.62	8.656E-01		
NB-95	765.79	38.	-12.	-0.007	77.03	-5.213E-01		
PA-234M	766.41	32.	9.	0.005	94.90	1.321E+02	P	
EU-152	778.92	18.	2.	0.001	347.53	8.384E-01	P	
BI-212	785.42	10.	6.	0.003	106.88	2.126E+01	P	
TL-210	799.60	61.	-14.	-0.008	81.99	-6.396E-01		
CO-58	810.78	28.	1.	0.001	754.98	4.505E-02		
Cs-136	818.50	60.	-12.	-0.007	92.10	-5.641E-01		
MN-54	834.85	14.	4.	0.002	204.63	1.833E-01		
Co-56	846.77	19.	1.	0.001	692.82	6.177E-02		
NB-94	871.10	23.	-6.	-0.003	126.03	-2.683E-01		
EU-154	873.23	24.	5.	0.003	141.57	1.995E+00		
AG-110M	884.68	30.	7.	0.004	109.67	4.932E-01		
Sc-46	889.28	47.	-8.	-0.005	123.71	-3.920E-01		
y-88	898.04	10.	6.	0.003	114.90	3.158E-01	P	
AG-110M	937.49	19.	-9.	-0.005	111.07	-1.261E+00		
EU-152	964.11	28.	1.	0.001	754.98	3.497E-01		
EU-154	996.33	20.	8.	0.004	87.73	3.927E+00		
EU-154	1004.77	14.	3.	0.002	254.28	9.602E-01		
Co-56	1037.84	20.	-6.	-0.003	168.87	-2.294E+00		
RH-106	1050.36	6.	6.	0.003	98.51	2.018E+01		
BI-207	1063.66	11.	-2.	-0.001	443.65	-1.353E-01	P	
Ga-68	1077.40	15.	-3.	-0.002	289.64	-5.936E+00		
FE-59	1099.25	20.	-7.	-0.004	145.45	-6.995E-01		
EU-152	1112.07	36.	5.	0.003	165.64	2.208E+00		
CO-60	1173.24	5.	6.	0.003	89.92	3.637E-01		
Co-56	1238.28	6.	19.	0.011	35.53	1.819E+00	P	
NA-22	1274.53	5.	6.	0.004	64.54	4.053E-01		
EU-154	1274.54	12.	1.	0.001	393.02	2.276E-01		
FE-59	1291.60	11.	-2.	-0.001	452.11	-2.467E-01		
TL-210	1313.00	11.	-3.	-0.001	285.04	-8.224E-01		
CO-60	1332.50	0.	8.	0.004	35.36	5.242E-01		
AG-110M	1384.30	16.	-8.	-0.004	119.02	-2.222E+00		
EU-152	1408.00	0.	5.	0.003	46.92	1.583E+00	P	
y-88	1836.06	6.	-2.	-0.001	304.14	-1.699E-01		

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

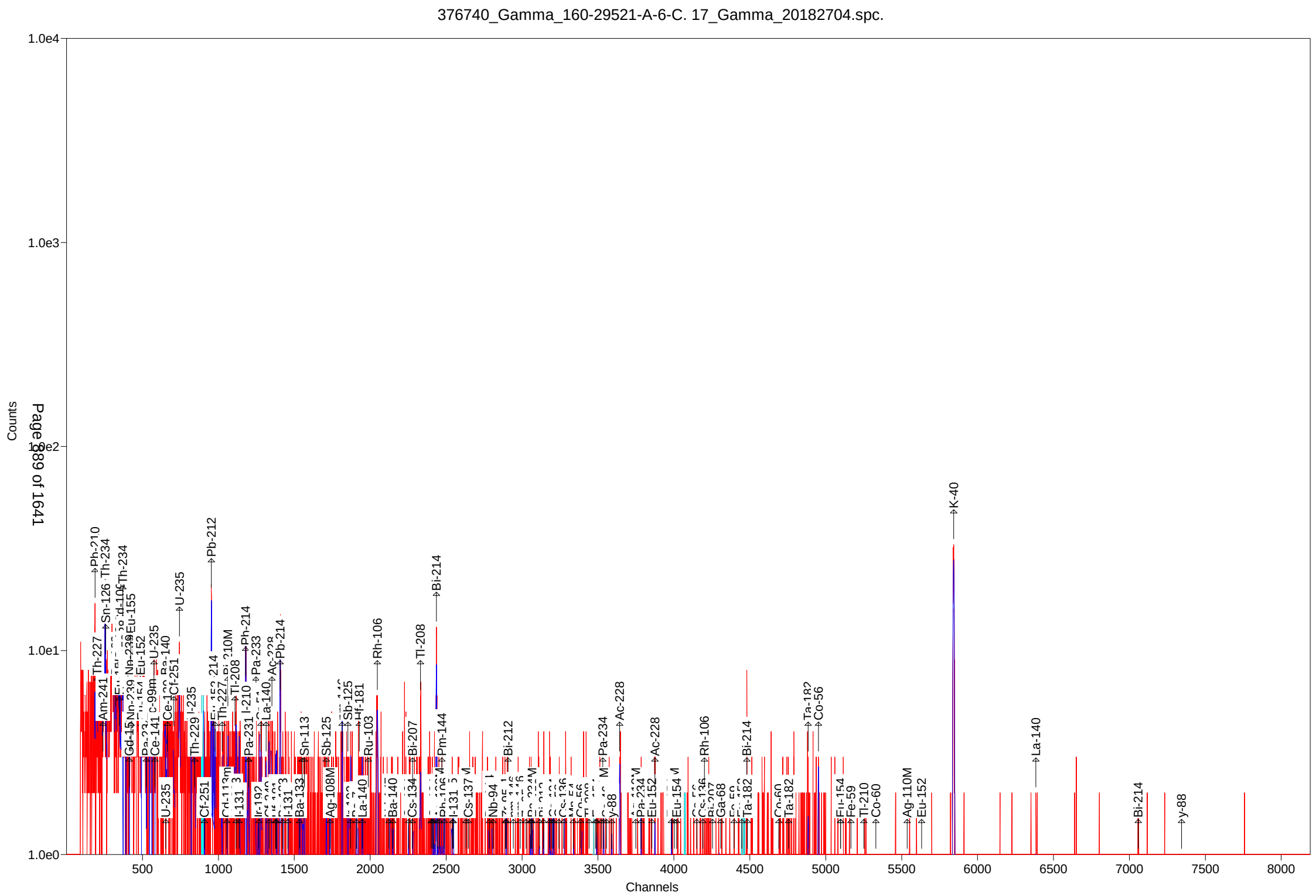
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	2.0328E+00	2.0328E+00	1.013E+02%	7.08E+00
NA-22	#A	4.0534E-01	4.0534E-01	6.454E+01%	8.53E-01
K-40		1.5635E+02	1.5635E+02	6.716E+00%	1.05E+01
Sc-46	#A	-3.9199E-01	-3.9199E-01	1.237E+02%	1.66E+00
CR-51	#A	2.1704E+00	2.1704E+00	1.163E+02%	8.61E+00
MN-54	#A	1.8327E-01	1.8327E-01	2.046E+02%	9.23E-01
FE-59	#A	-6.9953E-01	-6.9953E-01	1.455E+02%	2.35E+00
Co-56	#A	7.6110E-01	7.6111E-01	3.553E+01%	1.06E+00
CO-57	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.25E-01
CO-58	#A	4.5054E-02	4.5055E-02	7.550E+02%	1.23E+00
CO-60	#A	4.4395E-01	4.4395E-01	3.536E+01%	4.83E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.67E+00
NB-94	#A	-5.4835E-02	-5.4835E-02	6.432E+02%	9.09E-01
ZR-95	#A	1.3252E-01	1.3252E-01	9.119E+01%	1.54E+00
NB-95	#A	-5.2128E-01	-5.2128E-01	7.703E+01%	1.34E+00
RU-103	#A	-3.4346E-02	-3.4347E-02	9.644E+02%	8.77E-01
RH-106	#A	-6.1112E+00	-6.1112E+00	5.734E+01%	2.79E+01
AG-108M	#A	-4.4662E-01	-4.4662E-01	7.647E+01%	1.09E+00
AG-110M	#A	5.8060E-01	5.8061E-01	8.451E+01%	1.86E+00
SN-113	#A	-5.2567E-01	-5.2568E-01	8.518E+01%	2.18E+00
SB-124	#A	-5.1544E-01	-5.1545E-01	1.554E+02%	2.70E+00
SB-125	#A	6.4203E-01	6.4203E-01	9.921E+01%	1.72E+00
I-131	#A	2.9712E-01	2.9714E-01	8.551E+01%	8.05E-01
Gd-153	#A	-7.1107E-01	-7.1107E-01	1.151E+02%	2.75E+00
Ga-68	#A	-5.8799E+00	-5.9363E+00	2.896E+02%	4.11E+01
Tc-99m	#A	-2.3785E-01	-2.3827E-01	1.239E+02%	9.94E-01
BA-133	#A	-1.5182E-01	-1.5182E-01	4.054E+02%	2.12E+00
CS-134	A	2.0911E-01	2.0911E-01	5.849E+01%	2.61E+00
CS-137	#A	1.7767E-01	1.7767E-01	1.197E+02%	7.55E-01
CE-139	#A	5.4533E-02	5.4533E-02	4.865E+02%	9.17E-01
Ba-140	#A	-1.1756E-01	-1.1757E-01	2.575E+02%	3.94E+00
La-140	#	9.2011E-01	9.2015E-01	3.333E+01%	5.83E-01
CE-141	#A	-4.9202E-01	-4.9203E-01	1.272E+02%	2.10E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	7.68E+00
PM-144	#A	-2.0204E-01	-2.0204E-01	2.129E+02%	1.07E+00
EU-152	#A	1.1622E+00	1.1622E+00	1.295E+02%	3.58E+00
EU-154	#A	2.0401E+00	2.0401E+00	8.773E+01%	9.89E+00
EU-155	#A	7.3738E-01	7.3738E-01	1.027E+02%	3.36E+00
HF-181	#A	2.4145E-01	2.4145E-01	1.202E+02%	1.15E+00
Ta-182	A	1.3447E+00	1.3447E+00	7.915E+01%	3.55E+00
Hg-203	#A	2.1197E-01	2.1197E-01	1.484E+02%	1.08E+00
TL-208	#A	2.7757E-01	2.7757E-01	1.780E+02%	1.30E+00
pm-146	#A	3.4062E-01	3.4062E-01	3.974E+01%	2.74E+00

y-88	#A	3.1578E-01	3.1578E-01	1.149E+02%	8.97E-01
Cd-113m	#A	9.9573E+02	9.9573E+02	3.815E+02%	1.33E+04
Cd-109	#A	1.6113E+00	1.6113E+00	5.764E+02%	3.15E+01
Cf-251	#A	-1.7821E-01	-1.7821E-01	6.331E+02%	3.18E+00
Cf-249	#A	1.2207E-01	1.2207E-01	1.038E+02%	1.86E+00
Sn-126	A	2.5459E+00	2.5459E+00	1.191E+02%	1.02E+01
PB-210	A	5.9358E+00	5.9358E+00	1.288E+02%	2.42E+01
PB-212		2.8298E+00	2.8298E+00	1.845E+01%	1.38E+00
PB-214		3.8471E+00	3.8471E+00	1.822E+01%	1.48E+00
BI-207	#A	1.5367E-01	1.5367E-01	1.069E+02%	5.80E-01
BI-212	#A	-2.7355E-01	-2.7355E-01	1.490E+03%	1.49E+01
U-235	#A	-5.0475E-01	-5.0475E-01	4.492E+02%	7.83E+00
BI-214		3.4837E+00	3.4837E+00	2.152E+01%	1.91E+00
BI-210M	#A	3.7570E-01	3.7570E-01	1.104E+02%	1.41E+00
AC-228	#A	2.4397E+00	2.4397E+00	5.274E+01%	3.67E+00
TH-227	#A	1.7680E+00	1.7680E+00	2.558E+02%	1.32E+01
TH-229	#A	6.1626E-01	6.1626E-01	4.435E+02%	1.42E+01
TH-234	#	1.8727E+01	1.8727E+01	3.027E+01%	1.72E+01
PA-231	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.15E+01
PA-233	#A	-1.4325E-02	-1.4325E-02	8.449E+03%	4.21E+00
PA-234	A	1.4043E+00	1.4043E+00	5.017E+01%	4.58E+00
PA-234M	#A	3.7561E+01	3.7561E+01	9.490E+01%	1.81E+02
AM-241	#A	3.1401E-01	3.1401E-01	2.693E+02%	2.46E+00
Np-237	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.65E+00
Ir-192	#A	-5.5880E-02	-5.5881E-02	9.126E+01%	1.10E+00
Cs-136	#A	-5.6408E-01	-5.6410E-01	9.210E+01%	1.75E+00
Np-239	#A	6.2667E-01	6.2679E-01	1.523E+02%	3.24E+00
Nd-147	#A	-2.2679E+00	-2.2679E+00	1.198E+02%	6.90E+00
TL-210	#A	-6.3963E-01	-6.3963E-01	8.199E+01%	1.76E+00

  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.5 keV) 1.877E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.5 keV) 1.8767200E+02 Bq/Sample


376740_Gamma_160-29521-A-6-C. 17_Gamma_20182704.spc.
Counts
Channels
1.0e4
1.0e3
1.0e2
1.0e1
1.0e0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
K-40
Pb-212
Bi-214
Pb-214
Tl-208
Ac-228
Th-234
U-235
Th-227
Pb-210
Am-241
Sn-126
Eu-155
Eu-152
Ce-141
Ce-144
Cf-251
Th-229
Ra-223
Ra-224
Pa-231
Pa-233
Pa-234
Pa-234M
La-140
Rh-106
Ru-103
Sb-125
Hf-181
Sn-113
Ba-133
Ba-140
Cs-134
Cs-137
Cs-136
Bi-207
Bi-212
Pm-144
Nb-94
Ag-108M
Ag-110M
Eu-154
Ta-182
Co-56
Co-60
Ga-68
Fe-59
Tl-210
Y-88
Be-7
Ti-44
Mn-54
Na-22
Cd-109
Cd-113m
I-131
Ir-192
Au-198
Au-199

Test America St. Louis Spectrum ID: 19_Gamma_20181432

Sample Description: 376740_Gamma_160-29521-A-7-C
Detector: Detector #19
Batch ID: 376740
Work Order Number: Gamma
Lot Number: 160-29521-A-7-C

Decay to Time: 8/9/2018 07:16 Live Time: 1800 sec
Acquisition Time: 8/9/2018 07:16:29 Real Time: 1802 sec
Analysis Time: 8/9/2018 07:46 Dead Time: 0.10 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 19_Soil_TunaCan.Clb
Efficiency Cal Desc: 19_TunaCan_108513
Efficiency Cal Date: 4/16/2018 12:11
Energy Cal Date: 4/16/2018 11:22
Library: Client_Long_Rev14.lib
Bkgd Correction File: 19_2018-07-14_1824.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	3.432E+00	106.0	3.637E+00	3.641E+00	1.241E+01
NA-22	3.874E-01	83.9	3.251E-01	3.257E-01	1.118E+00
K-40	1.794E+02	7.2	1.298E+01	1.583E+01	1.385E+01
Sc-46	6.627E-01	67.7	4.487E-01	4.499E-01	1.847E+00
CR-51	2.809E+00	101.7	2.857E+00	2.861E+00	9.709E+00
MN-54	4.413E-01	97.2	4.290E-01	4.296E-01	1.047E+00
FE-59	-3.344E-01	315.4	1.055E+00	1.055E+00	3.191E+00
Co-56	2.043E-01	109.5	2.237E-01	2.239E-01	1.397E+00
CO-57	-2.782E-01	104.0	2.893E-01	2.897E-01	9.744E-01
CO-58	-7.407E-01	57.2	4.233E-01	4.250E-01	2.122E+00
CO-60	-2.865E-01	243.1	6.965E-01	6.966E-01	1.581E+00
ZN-65	0.000E+00	1.#INF	6.619E-01	6.620E-01	5.180E+00
NB-94	3.981E-01	95.8	3.812E-01	3.818E-01	9.198E-01
ZR-95	0.000E+00	1.#INF	1.458E-01	1.458E-01	2.077E+00
NB-95	0.000E+00	1.#INF	1.135E-01	1.135E-01	1.908E+00
RU-103	-6.142E-01	68.5	4.209E-01	4.221E-01	1.475E+00
RH-106	-1.997E+00	282.8	5.648E+00	5.649E+00	1.402E+01
AG-108M	-3.253E-01	142.9	4.649E-01	4.651E-01	1.182E+00
AG-110M	6.394E-01	37.8	2.417E-01	2.439E-01	3.185E+00
SN-113	-6.035E-01	116.6	7.035E-01	7.041E-01	2.386E+00
SB-124	2.105E-01	417.2	8.782E-01	8.782E-01	3.005E+00
SB-125	2.654E-01	190.2	5.047E-01	5.049E-01	2.895E+00
I-131	-5.966E-01	65.1	3.886E-01	3.898E-01	1.381E+00
Gd-153	-1.016E+00	188.2	1.912E+00	1.913E+00	6.399E+00
Ga-68	-7.740E+00	332.8	2.576E+01	2.576E+01	6.076E+01
Tc-99m	1.863E-08	2623536386.5	4.888E-01	4.888E-01	1.663E+00
BA-133	-2.739E-01	145.5	3.985E-01	3.988E-01	2.963E+00
CS-134	5.916E-01	88.3	5.223E-01	5.232E-01	3.071E+00
CS-137	-7.156E-01	82.5	5.904E-01	5.915E-01	1.984E+00
CE-139	-4.515E-01	97.8	4.415E-01	4.421E-01	1.478E+00
Ba-140	2.604E+00	27.0	7.019E-01	7.142E-01	1.312E+00
La-140	-1.561E+00	100.2	1.564E+00	1.566E+00	2.677E+00
CE-141	2.609E-01	221.8	5.788E-01	5.790E-01	1.977E+00

CE-144	2.537E+00	151.5	3.843E+00	3.845E+00	1.290E+01
PM-144	3.733E-01	119.5	4.462E-01	4.466E-01	1.074E+00
EU-152	6.105E-01	73.5	4.489E-01	4.500E-01	8.271E+00
EU-154	1.264E+00	84.2	1.064E+00	1.066E+00	1.605E+01
EU-155	-7.113E-02	1674.1	1.191E+00	1.191E+00	8.589E+00
HF-181	9.236E-01	112.8	1.041E+00	1.042E+00	1.787E+00
Ta-182	1.912E+00	102.9	1.968E+00	1.971E+00	6.715E+00
Hg-203	3.573E-01	91.2	3.257E-01	3.262E-01	1.100E+00
TL-208	1.604E+00	24.4	3.907E-01	3.992E-01	7.548E-01
pm-146	7.847E-01	172.3	1.352E+00	1.353E+00	3.316E+00
y-88	1.360E-01	255.8	3.478E-01	3.478E-01	8.927E-01
Cd-113m	-1.655E+03	300.0	4.965E+03	4.966E+03	1.725E+04
Cd-109	7.152E+00	195.2	1.396E+01	1.397E+01	4.683E+01
Cf-251	8.492E-01	212.1	1.801E+00	1.801E+00	4.720E+00
Cf-249	4.895E-01	110.2	5.393E-01	5.399E-01	1.837E+00
Sn-126	3.151E-01	1447.8	4.562E+00	4.562E+00	1.248E+01
PB-210	1.815E+01	74.6	1.354E+01	1.359E+01	3.613E+01
PB-212	4.773E+00	17.5	8.345E-01	8.709E-01	1.754E+00
PB-214	8.262E+00	11.6	9.591E-01	1.047E+00	1.271E+00
BI-207	-5.032E-02	246.6	1.241E-01	1.241E-01	1.416E+00
BI-212	9.289E+00	98.6	9.157E+00	9.169E+00	3.090E+01
U-235	-3.705E+00	67.9	2.517E+00	2.524E+00	1.053E+01
BI-214	6.824E+00	16.7	1.138E+00	1.189E+00	2.256E+00
BI-210M	5.884E-01	90.2	5.305E-01	5.314E-01	1.790E+00
AC-228	2.606E+00	67.1	1.747E+00	1.752E+00	3.873E+00
TH-227	4.519E+00	151.6	6.851E+00	6.857E+00	2.312E+01
TH-229	-8.868E+00	99.3	8.805E+00	8.817E+00	2.258E+01
TH-234	4.783E+00	57.8	2.763E+00	2.776E+00	4.030E+01
PA-231	1.248E+01	128.1	1.600E+01	1.601E+01	7.281E+01
PA-233	7.747E-01	181.4	1.405E+00	1.406E+00	6.172E+00
PA-234	-1.619E+00	155.3	2.514E+00	2.516E+00	8.436E+00
PA-234M	7.863E+01	81.0	6.370E+01	6.382E+01	2.326E+02
AM-241	-5.034E-01	273.3	1.375E+00	1.376E+00	4.657E+00
Np-237	2.451E+00	139.3	3.414E+00	3.416E+00	1.144E+01
Ir-192	1.227E-01	264.6	3.245E-01	3.246E-01	1.216E+00
Cs-136	5.666E-01	112.4	6.366E-01	6.374E-01	2.170E+00
Np-239	-1.106E+00	218.3	2.414E+00	2.415E+00	8.094E+00
Nd-147	1.346E+00	119.3	1.606E+00	1.607E+00	7.320E+00
TL-210	1.840E-01	167.6	3.084E-01	3.086E-01	1.643E+00
Total	3.680E+02				

Analyst: kody Saulters

TestAmerica Inc Spectrum name: 19_Gamma_20181432.An1

Sample description
376740_Gamma_160-29521-A-7-C

Spectrum Filename: C:\User\SPC\Det19\19_Gamma_20181432.An1

Acquisition information
Start time:	8/9/2018 7:16:29 AM
Live time:	1800
Real time:	1802
Dead time:	0.10 %
Detector ID:	19

Detector system
Ge19 SN/11146715

Calibration
Filename: 19_Soil_TunaCan.Clb
19_TunaCan_108513

Energy Calibration
Created:	4/16/2018 11:22:57 AM
Zero offset:	0.177 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration
Created:	4/16/2018 12:11:21 PM
Type:	Polynomial
Uncertainty:	0.841 %
Coefficients:	-0.371612 -4.869309 0.466742
	-0.049787 0.002234 -0.000039

Library Files
Main analysis library:	Client_Long_Rev14.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters
Analysis engine:	Env32 G800W064
Start channel:	150 (37.71keV)
Stop channel:	8000 (1999.42keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	8/9/2018 7:16:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	19_2018-07-14_1824.PBC 7/14/2018 6:24:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1245

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.69	24.	74.61	0.68	1.721E-02	46.54	4.250	PBC<MDA	PB210
50.14	13.	151.62	0.94	2.049E-02	50.14	8.000	PBC<MDA	TH227
77.31	79.	24.26	0.52	3.150E-02				
86.49	19.	139.26	0.97	3.300E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	1.046E+00	EU155
					86.94	9.040	3.546E+00	Sn126
87.57	16.	192.15	0.97	3.314E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	7.148E+00	Cd109
88.04	16.	195.25	0.97	3.320E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	7.152E+00	Cd109
91.10	16.	197.84	0.97	3.352E-02	91.10	28.300	PBC<MDA	Nd147
93.05	55.	25.96	0.50	3.370E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	1.639E+01	AC228
121.78	16.	94.27	1.00	3.401E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.973E-01	CO57
123.10	6.	239.21	1.00	3.395E-02	123.10	40.790	PBC<MDA	EU154
133.97	17.	151.46	1.01	3.333E-02	133.54	11.090	PBC<MDA	CE144
136.30	9.	282.70	1.02	3.313E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.380E+00	CO57
145.44	7.	221.84	1.02	3.240E-02	145.44	48.200	PBC<MDA	CE141
162.66	3.	584.05	1.04	3.083E-02	162.66	6.220	PBC<MDA	Ba140
176.60	8.	212.07	1.05	2.950E-02	176.60	17.000	PBC<MDA	Cf251
185.72	32.	52.87	1.06	2.864E-02	185.72	54.000	PBC<MDA	U235
238.46	90.	17.48	0.85	2.415E-02	238.63	43.300	4.773E+00	PB212
244.69	14.	146.61	1.11	2.369E-02	244.69	7.580	PBC<MDA	EU152
265.83	12.	90.17	1.13	2.224E-02	265.83	50.000	PBC<MDA	BI210M
277.31	9.	78.57	0.24	2.153E-02	277.28	6.310	PBC<MDA	TL208

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
279.20	11.	91.16	1.14	2.141E-02	279.20	81.460	PBC<MDA	Hg203
284.30	3.	373.67	1.15	2.111E-02	284.30	6.140	PBC<MDA	I131
294.83	12.	162.74	1.16	2.050E-02	295.09	19.300	PBC<MDA	PB214
296.00	12.	167.64	1.16	2.045E-02	296.00	79.000	PBC<MDA	TL210
300.03	12.	177.59	1.16	2.023E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
300.07	12.	176.75	1.16	2.023E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.349E+01	PA231
					300.18	6.200	5.355E+00	PA233
300.18	12.	181.37	1.16	2.023E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.349E+01	PA231
					300.18	6.200	5.355E+00	PA233
302.65	12.	185.54	1.16	2.010E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.827E+00	BA133
302.85	6.	413.01	1.16	2.009E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	8.351E-01	BA133
316.49	4.	264.58	1.17	1.940E-02	316.49	87.040	PBC<MDA	Ir192
320.08	10.	101.71	1.18	1.922E-02	320.08	9.940	PBC<MDA	CR51
345.83	14.	145.40	1.20	1.808E-02	345.83	15.070	PBC<MDA	HF181
351.81	100.	11.61	0.78	1.783E-02	351.93	37.600	8.262E+00	PB214
383.84	9.	109.14	1.23	1.664E-02	383.84	8.940	PBC<MDA	BA133
387.95	10.	110.17	1.23	1.650E-02	387.95	66.000	PBC<MDA	Cf249
453.88	3.	346.26	1.29	1.458E-02	453.88	65.000	PBC<MDA	pm146
468.06	1.	798.34	1.30	1.423E-02	468.06	51.750	PBC<MDA	Ir192
477.60	9.	105.98	1.31	1.401E-02	477.60	10.520	PBC<MDA	BE7
482.00	9.	115.58	1.31	1.391E-02	482.00	80.500	PBC<MDA	HF181
487.02	9.	129.68	1.32	1.380E-02	487.02	45.500	PBC<MDA	La140
511.86	79.	18.30	2.59	1.328E-02	511.86	20.000	1.653E+01	RH106
531.00	7.	133.23	1.35	1.291E-02	531.00	13.000	PBC<MDA	Nd147
537.26	15.	26.95	1.36	1.279E-02	537.26	24.390	2.604E+00	Ba140
563.24	8.	95.13	1.38	1.234E-02	563.24	8.350	PBC<MDA	CS134
569.32	7.	97.06	1.38	1.224E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	4.059E+00	PA234
					569.70	97.740	3.407E-01	BI207
583.41	29.	24.36	1.54	1.202E-02	583.02	84.500	1.604E+00	TL208
602.73	4.	417.19	1.41	1.172E-02	602.73	98.260	PBC<MDA	SB124
609.40	68.	16.67	1.38	1.163E-02	609.31	46.090	7.077E+00	BI214
635.89	3.	190.17	1.44	1.126E-02	635.89	11.310	PBC<MDA	SB125
696.54	7.	119.52	1.49	1.052E-02	696.54	99.000	PBC<MDA	PM144
702.63	7.	95.77	1.49	1.045E-02	702.63	97.900	PBC<MDA	NB94
727.17	13.	98.58	1.51	1.019E-02	727.17	7.550	PBC<MDA	BI212
747.16	5.	172.30	1.53	9.989E-03	747.16	34.000	PBC<MDA	pm146
766.41	11.	81.01	1.54	9.803E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.066E+02	PA234M
778.92	8.	92.37	1.55	9.687E-03	778.92	12.940	PBC<MDA	EU152
785.42	7.	97.23	1.56	9.628E-03	785.42	1.280	PBC<MDA	BI212
795.87	2.	374.17	1.56	9.534E-03	795.87	85.530	PBC<MDA	CS134

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
801.95	8.	88.29	1.57	9.481E-03	801.95	8.690	PBC<MDA	CS134
818.50	10.	112.37	1.58	9.339E-03	818.50	100.000	PBC<MDA	Cs136
834.85	7.	97.20	1.59	9.204E-03	834.85	99.980	PBC<MDA	MN54
889.28	8.	106.05	1.63	8.785E-03	889.28	99.984	PBC<MDA	Sc46
898.04	2.	255.77	1.64	8.721E-03	898.04	93.700	PBC<MDA	y88
911.07	8.	92.51	1.65	8.629E-03	911.07	29.000	PBC<MDA	AC228
968.97	10.	97.10	1.69	8.244E-03	968.97	17.460	PBC<MDA	AC228
996.33	8.	84.22	1.71	8.075E-03	996.33	10.600	PBC<MDA	EU154
1001.00	4.	196.07	1.72	8.047E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	1.	702.38	1.74	7.832E-03	1037.84	14.130	PBC<MDA	Co56
1063.66	1.	702.38	1.76	7.689E-03	1063.66	74.500	PBC<MDA	BI207
1120.33	10.	96.31	1.80	7.394E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	11.	84.21	1.80	7.393E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	8.168E-01	Sc46
					1121.30	34.900	2.341E+00	Ta182
1121.34	9.	102.94	1.80	7.389E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.912E+00	Ta182
1238.28	7.	109.49	1.89	6.848E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	5.	83.91	1.91	6.696E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.100E+00	EU154
1384.30	7.	37.80	1.98	6.272E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	2.	248.05	2.00	6.187E-03	1408.00	21.005	PBC<MDA	EU152
1460.69	207.	7.23	1.95	6.004E-03	1460.83	10.670	1.794E+02	K40
1763.51	9.	46.09	2.22	5.112E-03	1764.49	15.400	PBC<MDA	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
308.32	77.31	91.	79.	2.508E+03	24.26	0.517	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev14.lib