



Illinois Environmental Protection Agency

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Site Remediation Program Form (DRM-2)

(To be Submitted with all Plans and Reports)

You may complete this form in Acrobat, save a copy, print, sign, and mail it to the address above.

I. Site Identification

Site Name: North Kimball Brownfield Site

Street Address: 1807-1815 N. Kimball Avenue

City: Chicago

State: IL

Zip Code: 60647

Phone: _____

Bureau of Land ID Number: 0316225292

II. Remediation Applicant

Applicant's Name: Ms. Kimberly Worthington, PE LEED AP

Company: City of Chicago

Street Address: 30 N. LaSalle, Suite 300

P.O. Box: _____

City: Chicago

State: IL

Zip Code: 60602

Phone: 312-744-9139

Email Address: Kimberly.Worthington@cityofchicago.org

I hereby request that the Illinois EPA review and evaluate the attached project documents in accordance with the terms and conditions of the Environmental Protection Act (415 ILCS 5), implementing regulations, and the review and evaluation services agreement.

Remediation Applicant's Signature: _____

Date: _____

3/25/21

III. Consultant

Contact's Name: Mr. Matthew Hildreth

Company: AECOM

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P.O. Box: _____

City: Lisle

State: IL

Zip Code: 60532

Phone: 630-829-2692

Email Address: matthew.hildreth@aecom.com

IV. Professional Engineer's or Geologist's Seal or Stamp

Documents Submitted

- | | |
|---|---|
| <input checked="" type="checkbox"/> Site Investigation Report - Comprehensive | <input type="checkbox"/> Remedial Action Completion Report |
| <input type="checkbox"/> Site Investigation Report - Focused | <input type="checkbox"/> Sampling Plan |
| <input checked="" type="checkbox"/> Remediation Objectives Report - Tier 1 or 2 | <input type="checkbox"/> Dry Cleaner Trust Fund - Budget |
| <input type="checkbox"/> Remediation Objectives Report - Tier 3 | <input type="checkbox"/> Dry Cleaner Trust Fund - Reimbursement Request |
| <input checked="" type="checkbox"/> Remedial Action Plan | <input type="checkbox"/> Other: _____ |

I attest that all site investigations or remedial activities that are subject of this plan(s) or report(s) were performed under my direction, and this document and all attachments were prepared under my direction or reviewed by me, and to the best of my knowledge and belief, the work described in the plan and report has been designed or completed in accordance with the Illinois Environmental Protection Act (415 ILCS 5), 35 Ill. Adm. Code 740, and generally accepted engineering practices or principles of professional geology, and the information presented is accurate and complete.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 Felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Engineer's or
Geologist's Name: Laura C. Drumm

Company: AECOM

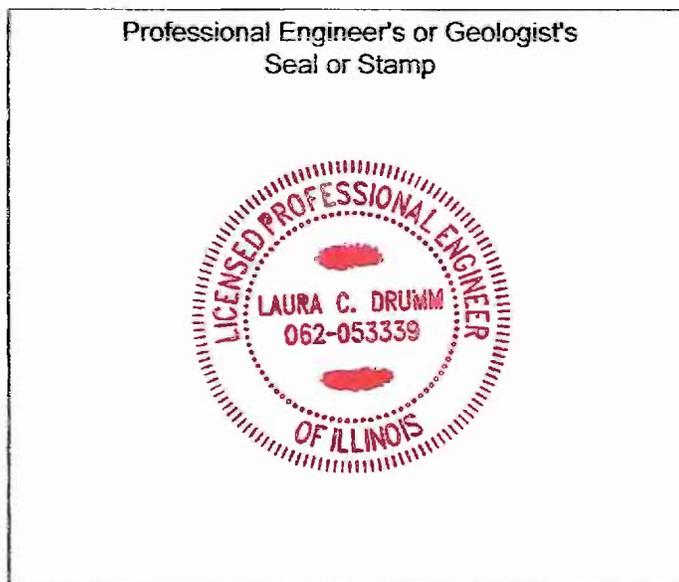
Registration Number: 062053339

Phone: 312-861-4029

License Expiration Date: 11/30/2021

Signature: *Laura C. Drumm* Date: 3/31/2021

Note: The authority of a Licensed Professional Geologist to certify documents submitted to the Illinois Environmental Protection Agency for review and evaluation pursuant to Title XVII of the Environmental Protection Act is limited to Site Investigation Reports (415 ILCS 58.7(f), as amended by P.A. 92-0735, effective July 25, 2002. A Licensed Professional Geologist cannot certify to Remediation Objectives Reports, Remedial Action Plans or Remedial Action Completion Reports.

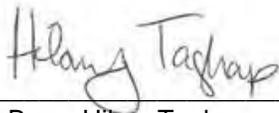


Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan

North Kimball Brownfield Site
1807-1815 N. Kimball Avenue
Chicago, Illinois

Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan

North Kimball Brownfield Site
1807-1815 N. Kimball Avenue
Chicago, Illinois



Prepared By: Hilary Taghap



Reviewed By: Matthew Hildreth, P.G.

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Executive Summary

The City of Chicago Department of Assets, Information and Services (AIS) contracted with AECOM Technical Services, Inc. (AECOM) to complete a Comprehensive Site Investigation and subsequent Illinois Environmental Protection Agency (IEPA) Site Remediation Program (SRP) reporting for the property located at 1807-1815 N. Kimball Avenue, Chicago, Illinois (the "Site"), which is enrolled in the SRP under the Site name "North Kimball Brownfield Site", and LPC # 0316225292.

The Site is mostly vacant with some portions covered in concrete and some portions covered in grass/soil. Following remediation, the City intends to redevelop the Site as a public park that will connect to the adjacent Bloomingdale Trail, allowing it to serve as an access point to the elevated greenway and multi-use recreational path (The 606).

Subsurface environmental investigations, including Phase II ESAs and sampling associated with the CSIR and recent, additional investigations were completed for this Site and its adjacent properties between August 2010 and October 2018. The horizontal and vertical extent of contamination has been delineated on the Site, with the exception of soil gas and groundwater concentrations exceeding indoor inhalation ROs at the eastern site boundary. Offsite soil gas delineation to address this on the east adjacent property is ongoing. The data collected is sufficient to characterize the nature and extent of impact present at the Site.

A TACO Tier 1 soil and groundwater evaluation was completed as part of the Endangerment Assessment presented in Section 6. Based on that evaluation, COC concentrations at the Site exceeded Tier 1 SROs for the residential ingestion and outdoor inhalation exposure routes, construction worker ingestion and inhalation exposure routes, and soil component to groundwater ingestion exposure route. Concentrations of TCE exceeded Csat values in several soil samples located on the east portion of the Site (TCE Source Area). COC concentrations at the Site exceeded the Tier 1 GROs for the Class II groundwater ingestion exposure route and the residential indoor inhalation exposure route.

Proposed SROs for COCs are the TACO Tier 1 SROs for residential properties in 35 IAC 742. Appendix B, Table A, and Appendix B, Table D (pH-specific SROs) with the exception of the calculated Tier 2 SROs listed below for cPAHs.

| Constituent | Tier 2 SRO – Ingestion (mg/kg) |
|------------------------|--------------------------------|
| | Residential |
| Benzo(a)anthracene | 8.5 |
| Benzo(a)pyrene | 1.3* |
| Benzo(b)fluoranthene | 8.5 |
| Dibenz(a,h)anthracene | 0.85 |
| Indeno(1,2,3-cd)pyrene | 8.5 |

*The calculated Tier 2 value for benzo(a)pyrene is less than the background value. The background value is the selected RO.

The Groundwater Remediation Objectives for the site will be the TACO Tier 1, Class II GROs as defined in 35 IAC 742, Appendix B, Table E and H.

The Soil Gas Remediation Objectives for the site will be the TACO Tier 1 SGROs as defined in 35 IAC 742, Appendix B, Table G and H.

The steps to cleanup and redevelop this site include TCE source area remediation, engineered barrier installation and institutional control implementation. The first phase of remediation, funded in part by a USEPA Brownfields Cleanup Grant, will include in-situ treatment of the TCE Source Area. An Interim RACR documenting the TCE source area remediation activities will be submitted for IEPA review and approval following completion of that step. Current conditions at the Site do not meet the requirements for pathway exclusion. Following TCE source remediation, the requirements will be evaluated again to confirm pathway exclusion and the use of engineered barriers and institutional controls. Following the later completion of engineered barriers (expected to be completed during site redevelopment), a final RACR will be submitted which will include a request for a Comprehensive No Further Remediation letter.

1.0 Introduction

The City of Chicago Department of Assets, Information and Services (AIS) contracted with AECOM Technical Services, Inc. (AECOM) to complete Remedial Site Investigation and subsequent Illinois Environmental Protection Agency (IEPA) Site Remediation Program (SRP) reporting for the property located at 1807-1815 N. Kimball Avenue, Chicago, Illinois (the "Site"), which is enrolled in the SRP under the Site name "North Kimball Brownfield Site", and LPC # 0316225292. In accordance with SRP regulations, because the City of Chicago seeks a Comprehensive NFR for the Site, the initial investigation included analysis of soil and groundwater for the Target Analyte List (TAL), including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), TAL metals, pesticides, herbicides, and polychlorinated biphenyls (PCBs).

1.1 Previous Reports and Sources Reviewed

The following previous environmental investigations have been completed for this Site and its adjacent properties:

- Clean World Engineering, Ltd. (CWE), 2010, Phase I ESA Report, 1807-1815 North Kimball Avenue, Chicago, Illinois, April 2010
- Brecheisen Engineering, Inc. (Brecheisen), 2010, Phase II ESA, 1807-1815 North Kimball Avenue, Chicago, Illinois, September 2010
- Weston Solutions, Inc. (Weston), 2012, Comprehensive Site Investigations Report (CSIR), 1807-1815 North Kimball Avenue, Chicago, Illinois, July 2012
- Terracon Consultants, Inc. (Terracon), 2012, Phase I Environmental Site Assessment (ESA), 1809-1815 North Kimball Avenue, Chicago, Illinois, August 2012
- Terracon, 2013, Phase II Site Investigation Summary, 1809 North Kimball Avenue, Chicago, Illinois, January 2013

These previous environmental investigations are further described in the following sections.

1.1.1 Recognized Environmental Conditions

The following recognized environmental conditions (RECs) were identified based on the Phase I ESA Reports, prepared by Northern (2003), CWE (2010), and Terracon (2012):

- Long term historical Site uses that included metals, painting, automobile or other warehousing, lumber storage and warehousing, storage operations and other industrial uses assumed to be associated with historic and adjoining Site operations by ELC, ALMC, Compco and others.
- Records for two heating oil underground storage tanks (USTs) (23,000-gallon and 25,000-gallon) installed on the eastern adjacent property in 1952 were identified, with no documentation on the disposition.
- Listings of the eastern adjacent property a Resource Conservation and Recovery Act (RCRA) Small Quantity Generator (SQG) of hazardous waste and a RCRA non-generator.

- Light industrial facility (manufactured fluorescent light bulbs and fixtures) adjoining to the east is listed as a former small quantity RCRA generator facility,
- History of long term uses that include lumber storage and warehousing and storage operations,
- Documented soil and groundwater contamination onsite, documented onsite fill material, and
- Potential for USTs located southeast of the site.

Based on the historical Site use and RECs, the primary sources of contamination are likely derived from paint, lumber, and automobile warehouse operations at the Site, urban fill, potential petroleum releases from two heating oil USTs (23,000-gallon and 25,000-gallon) installed on the eastern adjacent Site in 1952, and potential historical releases from the Site and adjacent property formerly occupied by ELC, ALMC, Compco and others.

1.1.2 Phase II ESAs, CSIR and Additional Investigation

Subsurface environmental investigations, including the Phase II ESAs and sampling associated with the CSIR and recent, additional investigations were completed for this site and its adjacent properties between August 2010 and October 2018. The 2012 CSIR, completed by Weston, was funded under a Targeted Brownfields Assessments (TBA) Grant and the 2013 Terracon Phase I and Phase II ESAs were funded under the City’s 2008 Hazardous and Petroleum Area Wide Assessment Grant.

The scope of work and results of each of these investigations are summarized below:

| Investigation | Scope of Work | Results |
|--|---|--|
| <i>Brecheisen 2010, Phase II ESA, 1807-1815 N Kimball Ave</i> | Advancement of eight soil borings to depths of 6 to 24 feet Collection of soil samples Installation of three monitoring wells Collection of groundwater samples | Soil analytical results exceed applicable Illinois Tiered approach to corrective action objectives (TACO) Soil Remediation Objectives (SROs) for SVOCs and Metals Groundwater analytical exceed applicable Class II Groundwater Remediation Objectives (GROs) for VOCs and metals |
| <i>Weston, 2012, CSIR, 1807-1815 N Kimball Ave</i> | Advancement of ten soil borings to a maximum depth of 20 feet Collection of soil samples including fraction of organic carbon analyses Collection of groundwater samples, field parameters and hydraulic conductivity | Soil analytical results exceed applicable Illinois TACO SROs for VOCs and SVOCs Groundwater analytical exceed applicable Class II GROs for VOCs |
| <i>Terracon, 2013, Phase II Site Investigation Summary, 1809 N Kimball Ave</i> | Advancement of five soil borings to depths of 15 to 30 feet Collection of soil samples Collection of six soil gas samples Installation of four monitoring wells Collection of groundwater samples | Soil analytical results exceed applicable Illinois TACO SROs for VOCs and SVOCs Soil gas analytical results exceed Tier 1 ROs for Residential Indoor Inhalation for VOCs Groundwater analytical exceed applicable Class II GROs for VOCs |

The investigations listed above found that concentrations of VOCs, SVOCs, and inorganics in soil at the site exceeded applicable Illinois TACO SROs, and trichloroethene (TCE) concentrations in some soil on the eastern portion of the Site exceeded the C_{sat} limit. Groundwater results from the site investigations exceeded the applicable Class II Groundwater Remediation Objectives (GROs). Soil gas samples at two locations exceeded Tier 1 Remediation Objectives (ROs) for Indoor Inhalation for residential properties for TCE, and at one location also for vinyl chloride.

A summary of the analytical results from prior Site investigations, including the Phase II ESAs and the 2012 CSIR sampling event are provided in **Appendix A**.

2.0 Site Characterization

2.1 Site Description

The Site occupies three parcels (PINs 13-35-409-037, 13-35-409-039, 13-35-409-042) in the northwestern portion of Chicago, Illinois, and is located adjacent to residential properties to the north and to the east, Kimball Avenue to the west, and The Bloomingdale Trail to the south. The Bloomingdale Trail is an elevated greenway constructed on a former railroad running east-west on the northwest side of Chicago that forms the main line of a park and trail network called The 606. The Site is secured by a fence, with locked gate access along N. Kimball Avenue. The location of the Site is depicted on **Figure 1**.

The Site encompasses approximately 0.4 acres and is mostly vacant with some portions covered in concrete and some portions covered in grass/soil. The Site's topography is generally flat on the northern and eastern portions, with a sloped embankment connecting the Site to the Bloomingdale Trail (approximately 15 to 16 feet above the Site grade).

The closest surface water body is a small pond in Humboldt Park approximately 0.75 miles southeast of the Site. The north branch of the Chicago River is approximately 2.8 miles east of the Site. The North Branch of the Chicago River flows south into the Chicago Sanitary and Ship Canal, away from Lake Michigan. Lake Michigan is approximately 4.5 miles east of the Site. Lake Michigan is the sole source of the City of Chicago's drinking water.

2.2 Site Geology

According to the Surficial Geology Map of the Chicago Region (Willman and Lineback, 1970), the site is located within an area composed of Wisconsin-age glacial lake deposits (the Yorkville member of the Wedron Formation). These deposits are typically grey to dark grey clayey till, with silty clayey till in some locations, abundant small pebbles, and local lenses of silt, with less commonly seen lenses of sand and gravel.

The thickness of the Pleistocene-age deposits in the area is between 25 and 50 feet, according to the online ISGS Glacial Drift Thickness and Character Map (ISGS, 1998). The bedrock underlying the site is Silurian-age dolomite, which is documented to be quite extensive in the Chicago-land region, with thicknesses of several hundred feet (Kolata, 2005).

Soil beneath the site as described in the Weston CSIR consists of fill material including crushed concrete, gravel, and sand underlain by native material consisting primarily of silty clay (Weston, 2012). In 2018, deeper soil borings performed by EDI and overseen by AECOM, primarily in the eastern portion of the Site, identified clay/silty clay below shallow fill, followed by one to two-foot intervals of sandy clay/clayey sand, below which was clay/silty clay to the bottom of the soil borings at approximately 30 ft bgs.

The topography of the site is relatively flat with a sloping embankment to the southwest of the Site. The elevation of the flat portion of the Site is between 600 and 605 ft above mean sea level (amsl).

2.2.1 Site Hydrogeology

Hydrogeologic conditions at the Site were evaluated by Weston and Terracon and described in the 2012 CSIR and 2013 Phase II ESA, respectively. Weston installed three, two inch monitoring wells (KP-MW01, KP-MW-02, and KP-MW-03) in May 2012. Slug tests were performed on the three wells using rising and falling head tests. The results indicated hydraulic conductivity ranging from 2.8×10^{-4} to 8.4×10^{-7} centimeters per second (cm/s) with a geometric mean of 1.3×10^{-5} cm/sec.

Terracon installed four additional monitoring wells MW-04, MW-05, MW-06, and MW-07 in August 2012. Terracon surveyed the wells and presented a potentiometric map showing groundwater flow direction to the southwest.

Water levels measured in the monitoring wells in November 2018 indicate depth to groundwater varies across the site from approximately 5 to 20 feet below ground surface (bgs). Groundwater elevations measured at the Site suggest that groundwater generally flows south/southwest across the Site consistent with results presented by Terracon. **Table 1** provides well construction details and a summary of groundwater levels for the Site.

2.2.2 Groundwater Classification

At the Site, depth to groundwater in the monitoring wells ranged from approximately 5 to 20 feet bgs. As discussed in the Weston CSIR, the hydraulic conductivity calculated for the site (1.3×10^{-5} cm/sec) is less than 1×10^{-4} cm/sec based on the geometric mean (Weston, 2012). In accordance with 35 IAC Section 620.210, groundwater underlying the Site is not considered Class I (Potable Resource Groundwater) and is therefore considered Class II (General Resource Groundwater).

2.2.3 Potential Migration Pathways

The potential migration pathways at the Site are through natural pathways (i.e. soil and groundwater).

There are no rivers, streams, or other surface water bodies within 1,000 feet of the Site. The closest surface water body is a small pond in Humboldt Park approximately 0.75 miles southeast of the Site. The north branch of the Chicago River is approximately 2.8 miles east of the Site. The North Branch of the Chicago River flows south into the Chicago Sanitary and Ship Canal, away from Lake Michigan. Lake Michigan is approximately 4.5 miles east of the Site. Lake Michigan is the sole source of the City of Chicago's drinking water.

2.2.4 Current and Post Remediation Use of the Site

The Site is currently mostly vacant with some portions covered in concrete and some portions covered in grass/soil. Following the multi-phased remediation described in the Executive Summary and Conclusions sections of this report the Site is intended to be redeveloped as a public park that will connect to the adjacent Bloomingdale Trail, allowing it to serve as an access point to the elevated greenway and multi-use recreational path (The 606).

2.3 Site History

The City of Chicago acquired the Site in 2005 through foreclosure. Prior to the City of Chicago's ownership, land use at the site was primarily industrial. The known historic uses of the Site based on historic fire insurance maps are provided below:

- In 1896, the Site was utilized as a lumberyard for the Elsmere Lumber Company (ELC) and contained a single-family dwelling on the northern portion.
- By 1921, the Site was vacant, and a concrete retaining wall existed along the southern Site boundary. Railroad spurs from the Chicago, Milwaukee, and St. Paul railroad were present to the south.
- By 1950, American Laundry Machinery Company (ALMC), which had occupied the eastern adjacent property, expanded to occupy the Site. Historical operations at ALMC included woodworking, testing, painting, crating, shipping, lumber storage, casting storage, and machine shop operations.
- By 1975, the Compco Corporation (Compco) was present in place of ALMC in the vicinity of the Site and the eastern adjacent site. Compco is described on the 1975 Sanborn Map as "Manufacturers of Fluorescent Fixtures."
- By 2003, the Site was vacant. Two small structures were demolished by the City of Chicago, one in 2001, and one in 2002/2003.

The Site was occupied for nearly a century by industrial and manufacturing operations associated with ELC, ALMC, Compco and others that occurred on the Site and the adjoining east and south properties. The property to the west (across North Kimball Avenue) was historically industrial until recent development as a multi-family apartment complex. The properties to the north have historically been single-family residential.

2.4 Remediation Site Base Map

The Remediation Site Base Map is attached as **Figure 2**. In accordance with 35 IAC Part 740, the map shows the following:

1. A distance of at least 1,000 feet around the remediation site at a scale no smaller than one inch equal to 200 feet;
2. Map scale, north arrow orientation, date, and location of the site with respect to township, range, and section;
3. Remediation site boundary lines, with the owners of property adjacent to the remediation site clearly indicated, if reasonably identifiable; and
4. Surrounding land uses (e.g., residential property, industrial/commercial property, agricultural property, and conservation property).

2.5 Well Search

A potable water well survey was performed to locate and identify community water supply (CWS) wells and other potable wells (private, semi-private, and non-community water supply wells) within a minimum distance of 1,000 feet (ft) from the Site in accordance with 35 IAC 740.425(b)(2)(D). The search for CWS wells was extended to 2,500 feet in accordance with 1600.210(a) guidelines.

The following potable water well database sources were searched and reviewed as part of the potable well survey: (1) IEPA Source Water Assessment Program (SWAP); (2) Illinois State Geological Survey (ISGS) Digital Water Well Records; and (3) Illinois State Water Survey (ISWS) Domestic Well Database.

The IEPA SWAP Mapping Tool was used to search the location of CWS, Non-CWS and ISGS wells within 1,000 ft of the Site. The map generated from this online search is provided in **Appendix B**. The potable well search did not identify any ISGS, non-CWS wells, or CWS wells within 1,000 feet of the Site, and the Site is not located within a CWS wellhead protection area. There are no CWS wells located within 2,500 ft of the Site.

The ISWS database provides information on well locations based on a 10-Acre Plot Location System. No domestic wells were identified in the database within the same Section, Township and Range as the Site. The ISWS search results are provided in **Appendix B**.

In addition, a Water Well Survey conducted in 2007 by the former City of Chicago Department of Environment reviewed well records provided by the ISGS and the City's Department of Water Management. The 2007 Well Survey included the evaluation of CWS, non-CWS and approximately 1,400 private well records. The Potable Well Map prepared by the City of Chicago in 2009 as a result of the 2007 survey confirms there are no potable wells at or near the Site. The Potable Well Map (Chicago, 2009) is provided in **Appendix B**.

2.6 Legal Description or Reference to a Plat

The Site is made up of three parcels of land identified by Parcel Identification Numbers (PINs) PINs 13-35-409-037, 13-35-409-039, 13-35-409-042.

The property is located in Section 35, Township 40 North, and Range 13 East. A legal description of the Site is provided in **Appendix C**.

3.0 Site Specific Sampling Plan

A subsurface investigation was conducted in November 2018 to fill data gaps and further evaluate soil, groundwater, and soil gas at the Site, including further evaluating the distribution of TCE exceeding C_{sat} in soil in the eastern portion of the Site for remediation planning purposes. The investigation included the advancement of 22 soil borings (DB-01 through DB-22) to a maximum depth of 30 feet. Two to four soil samples were collected from each soil boring location for a total of 66 total soil samples. Soil samples were submitted to STAT Analysis Corporation (STAT) for VOCs, SVOCs/PAHs, metals, waste characterization parameters, total oxidant demand (TOD), and/or fraction of organic carbon (foc). Four of the 66 total samples were submitted for the complete target analyte list (TAL) which includes VOCs, SVOCs, metals, pesticides, and polychlorinated biphenyls.

Groundwater samples were collected from four existing, two-inch monitoring wells (KP-MW02, MW-4, MW-5, and MW-6) using the low-flow sampling method. Groundwater samples were submitted to STAT for TAL analysis.

Four semi-permanent soil gas implants (SV-07 through SV-10) were installed to a depth of four feet bgs. Four soil gas samples were collected and submitted for VOC analysis.

4.0 Documentation of Field Activities

4.1 Subsurface Investigation – November 2018

On November 5 through 8, 2018, Earth Solutions, Inc. (Earth Solutions) advanced 22 soil borings (DB-01 through DB-22) to a depth of 30 feet below ground surface (bgs) at the Site. Environmental Design International (EDI) provided direction and oversight. The soil borings were advanced to fill data gaps and evaluate soil at the Site. Two to four soil samples were collected from each boring including duplicate and quality control/assurance samples.

Soil borings were advanced using direct push techniques with a Geoprobe drill rig with 5-foot long, 2-inch diameter Macro-core sample liners. A new liner was used for each sample interval and the probes were decontaminated before each use with an Alconox® and potable water solution. Soil samples were screened with a photoionization detector (PID) with measurements documented on the soil boring logs. An EDI environmental scientist visually inspected and documented characteristics of the environmental soil samples in accordance with the Unified Soil Classification System. Samples were placed on ice and submitted to STAT Analysis Corporation (STAT), Chicago, Illinois under proper chain of custody procedures.

Soil samples were analyzed using the following analytical methods:

- VOCs by USEPA Method 8260;
- SVOCs/Polycyclic aromatic hydrocarbons (PAHs) by USEPA Method 8270C;
- TAL metals by USEPA Method 6020/7471;
- Cyanide by USEPA Method 9012A;
- Soil pH by USEPA Method 9045C;
- PCBs by USEPA method 8082; and
- Pesticides by USEPA method 8081.

Groundwater samples were analyzed using the following analytical methods:

- VOCs by USEPA Method 8260;
- SVOCs/Polycyclic aromatic hydrocarbons (PAHs) by USEPA Method 8270C;
- TAL metals/RCRA metals by USEPA Method 6020/7471;
- Cyanide by USEPA Method 9012A;
- PCBs by USEPA method 8082; and
- Pesticides by USEPA method 8081.

Soil gas samples were analyzed using the following analytical method:

- VOCs by TO-15.

In addition, two soil samples (DB211820 and DB212325) were analyzed for organic carbon content by ASTM method D 2974. One composite soil sample was analyzed for the Illinois "Green Sheet" to evaluate soil for future waste characterization purposes, and a composite soil sample was submitted to AECOM's Austin, Texas treatability laboratory for the completion of a bench-scale pilot test to evaluate TCE treatability using chemical oxidizing agents. A detailed sampling and analysis summary is provided in **Table 2-1**. The soil boring, monitoring well, and soil gas sample locations are included in **Figure 3**. A comprehensive summary table including soil sample depth and analysis for soil samples collected during the 2018 investigation as well as previous 2010, 2012, and 2013 investigations is provided in **Table 2-2**.

Additional details of the 2018 Investigation are included in the January 14, 2019 Field Work Summary prepared by EDI and attached to this report as **Appendix D**.

5.0 Results and Observations

In this section, the soil and groundwater analytical results from the 2018 Investigation are summarized and compared to the most stringent cleanup objectives given in 35 IAC Part 742, Tiered Approach to Corrective Action Objectives (TACO). The analytical results were compared to the TACO Tier 1 soil remediation objectives (SROs) for the ingestion and inhalation exposure routes for construction workers and residential receptors, and to the soil migration to Class II groundwater ingestion exposure routes for all applicable chemical constituents. Groundwater results are compared to the Class II TACO Tier 1 Groundwater Remediation Objectives (GROs) for the Groundwater Ingestion Route and the Tier 1 GROs for the Indoor Inhalation Exposure Route found in Section 742, Appendix B, Table H. Soil Gas samples were compared to residential soil gas remediation objectives (SGROs) for the Groundwater Ingestion Route and the Tier 1 GROs for the Indoor Inhalation Exposure Route found in Section 742, Appendix B, Table H. The rationale for the groundwater classification is provided in Section 2.2.2. A discussion of exposure routes is given in Section 6.0, and the Remediation Objectives for the Site are presented in Section 7.0.

5.1 Soil Analytical Results

The soil analytical results were compared to the most stringent IEPA TACO Tier 1 SROs for the ingestion, inhalation, and soil component of the groundwater ingestion exposure routes. This includes the PAH background values established for Metropolitan Areas and included in TACO, Appendix A, Table H.

Soil samples were collected at depths ranging from 10 to 28 feet to fill data gaps as part of the 2018 Subsurface Investigation. Concentrations of SVOCs, pesticides and PCBs were below laboratory detection limits in soil samples collected during the 2018 Investigation. Detected metal concentrations were below the most stringent Tier 1 SROs. Three analytes (cis-1,2 dichloroethene, trichloroethene, and vinyl chloride) were detected at concentrations above the most stringent Tier 1 SROs in one or more soil samples collected during the 2018 investigation. The remaining VOC concentrations were below Tier 1 SROs.

The cis-1,2-dichloroethene concentration detected in one soil sample, DB-18 (10-12), collected from soil boring DB-18 (10-12 ft bgs) was above the Tier 1 soil component of the groundwater ingestion ROs. The cis-1,2-dichloroethene concentrations were below laboratory detection limits in the deeper samples collected from soil boring DB-18 (16-18 ft and 22-24 ft bgs).

The vinyl chloride concentration detected in one soil sample, DB-06 (14-16), collected from soil boring DB-06 (14-16 ft bgs) was above the Tier 1 residential outdoor inhalation RO. The vinyl chloride concentration was below the laboratory detection limit in the deeper sample collected from soil boring DB-16 (22-24 ft bgs).

Trichloroethene (TCE) concentrations in four soil samples: DB-09 (11-13), DB-11 (12-14), and DB-18 (10-12), were above the Tier 1 residential ingestion/inhalation, construction worker ingestion/inhalation and the soil component of the groundwater ingestion ROs. TCE concentrations in deeper samples collected at each of these soil boring locations were below Tier 1 SROs. The TCE concentration in one additional sample, DB-17 (12-14), was also above the residential ingestion/inhalation, construction worker inhalation, and soil component of groundwater ingestion. The TCE concentration

in DB-17 (12-14) was below the construction worker ingestion SRO. TCE concentrations in the deeper samples collected from DB-17 were below Tier 1 SROs.

Analytical results for the 2018 investigation are summarized in tables included in the investigation summary documents provided in **Appendix D**. A summary of analyte concentrations detected above Tier 1 SROs during the 2018 Investigations is provided along with previous investigation exceedances in **Tables 3.1 to 3.3**. Sample locations are provided in **Figure 3**. **Figures 4 through 8** identify soil sample locations (including locations sampled during previous investigations) that exceeded Tier 1 ROs.

5.2 Groundwater Analytical Results

Four groundwater samples were collected during the 2018 Investigation from groundwater monitoring wells KP-MW-02, MW-04, MW-05, and MW-06.

Groundwater Ingestion Exposure Route

The groundwater analytical results were compared to the IEPA TACO Tier 1 GROs for Class II groundwater.

SVOCs, pesticides, and PCBs concentrations were below laboratory detection limits in groundwater samples collected during the 2018 investigation. Detected metal concentrations were below Class II Tier 1 GROs.

The following summarizes VOC concentrations above Tier 1 Class II GROs:

- KPMW02: 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2dichloroethene, trans-1,2-dichloroethene, tetrachloroethene, 1,1,2-trichloroethane, trichloroethene, and vinyl chloride
- MW5: trichloroethene
- MW6: cis-1,2dichloroethene, trichloroethene, and vinyl chloride

Analytical results are summarized in tables included in the investigation summary documents provided in **Appendix D**. A summary of analyte concentrations detected above Tier 1 GROs during the most recent groundwater sample collected at each location is provided in **Table 4**. Sample locations are provided in **Figure 3**, and **Figures 9 and 10** identify groundwater sample locations that exceeded Tier 1 ROs.

5.3 Soil Gas Analytical Results

The soil gas analytical results were compared to the Outdoor Inhalation and Indoor Inhalation Exposure Route ROs for residential properties found in Section 742, Appendix B, Tables G and H (Diffusion and Advection). Trichloroethene and vinyl chloride concentrations detected in SV-09 exceeded Tier 1 ROs for indoor inhalation.

Analytical results are summarized in tables included in the investigation summary documents provided in **Appendix D**. Sample locations are provided in **Figure 3**, and **Figure 10** identifies soil vapor points that exceeded Tier 1 ROs.

6.0 Endangerment Assessment

The horizontal and vertical extent of contamination has been delineated on the Site, with the exception of soil gas and groundwater exceeding indoor inhalation ROs at the eastern Site boundary. Offsite delineation of VOCs in soil gas on the adjacent property to the east is ongoing. The data collected is sufficient to characterize the nature and extent of impact present at the Site. Soil and groundwater impacts are described below in more specific terms.

Pursuant to TACO, potential risks to human health and the environment resulting from soil or groundwater impacts were evaluated by assessing the following modes of potential exposure: Soil Ingestion, Soil Inhalation, Indoor Inhalation, and Groundwater Ingestion (via the soil and groundwater components). The Site is planned to be redeveloped as a public park that will connect to the adjacent Bloomingdale Trail, allowing it to serve as an access point to the elevated greenway and multi-use recreational path (The 606). The following assessment compares analytical results to the applicable Tier 1 ROs for the Residential and Construction Worker Receptors. The results of the Exposure Route Evaluation are discussed below.

6.1 Extent of Affected Media Evaluation

6.1.1 Extent of Affected Soil

The extent of affected soil was defined by soil sample locations where at least one analyte concentration exceeds its most stringent Tier 1 SRO. The following sections discuss the delineation of the extent of affected soil on an analyte-specific basis. A comprehensive summary of soil sample depths and analysis with Tier 1 exceedances highlighted is provided in **Table 2-2**. Soil samples that were collected below the observed water table are highlighted blue in the summary table. The observed water table depth for each location was determined based on soil boring log descriptions, and all samples below 20 ft bgs were assumed to be saturated based on groundwater elevation data collected at the Site. These exceedances in saturated soil samples were included for the initial delineation of impacted soil but will not be considered to be representative of exceedances of soil inhalation or soil ingestion ROs for the purposes of remedial action planning.

6.1.1.1 VOCs

VOC concentrations detected above Tier 1 SROs are summarized in **Tables 3-1 to 3-3**. VOC exceedances were detected in deep soil, ranging from 3 to 20 feet below ground surface (bgs), in the north and east portions of the Site as shown in **Figure 4.1, Figure 5, Figure 6.1, Figure 7.1 and Figure 8.1**. The following VOCs were detected at concentrations in one or more soil samples above the most stringent Tier 1 SROs at the Site:

- benzene
- chloroform
- 1,1-dichloroethene
- cis-1,2-dichloroethene
- tetrachloroethene

- trans-1,2-dichloroethene
- trichloroethene
- vinyl chloride

Trichloroethene concentrations also exceeded site-specific C_{sat} values in several soil samples located on the east portion of the Site, as shown in **Figure 11** and summarized in **Table 6**. The site-specific C_{sat} values were calculated using SSL equation S29. The following f_{oc} values were used to calculate the site-specific C_{sat} values:

| Soil Sample ID | Soil description | f_{oc} |
|----------------|------------------|-----------------------|
| DB 21 18-20 | silty clay | 5.16×10^{-3} |
| DB 21 23-25 | clayey sand | 3.31×10^{-3} |

Additional details regarding the C_{sat} calculations are provided in **Appendix E**.

The remaining VOC concentrations were below the most stringent Tier 1 SROs.

6.1.1.2 SVOCs (PAHs)

PAH concentrations detected above Tier 1 SROs are summarized in **Tables 3-1 to 3-3**. PAHs were detected at concentrations above Tier 1 SROs in shallow soil samples (0 to 3 feet bgs) collected from five soil boring locations (B-1, B-4, B-6, B-7, and B-8). PAHs were detected at concentrations above Tier 1 SROs in deep soil samples (> 3 feet bgs) from three soil boring locations (KP-SB10, B-7, and B-4). The locations of these exceedances are shown on **Figure 4.2** and **Figure 8.2**.

The following PAHs were detected at concentrations in one or more soil samples above the most stringent Tier 1 SROs at the Site:

- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Dibenz(a,h)anthracene
- Indeno(1,2,3-cd)pyrene

The remaining SVOC concentrations were below the most stringent Tier 1 SROs.

6.1.1.3 Metals

Metal concentrations detected above Tier 1 SROs are summarized in **Tables 3-1 to 3-3**. Metals were detected at concentrations above Tier 1 SROs in shallow soil samples (0 to 3 feet bgs) collected from three soil boring locations (B-4, B-6, and B-7). Metals were detected at concentrations above Tier 1 SROs in deep soil samples (> 3 feet bgs) from four soil boring locations (B-2, B-4, B-5, and B-6). The locations of these exceedances are shown on **Figure 4.3**, **Figure 6.2**, **Figure 7.2** and **Figure 8.3**.

The following metals were detected at concentrations in one or more soil samples above the most stringent Tier 1 SROs at the Site:

- Antimony
- Arsenic
- Lead
- Mercury
- Selenium

The remaining metal concentrations were below the most stringent Tier 1 SROs.

6.1.2 Extent of Affected Groundwater

Temporary groundwater monitoring wells (TMW-1, TMW-2, and TMW-3) were installed and sampled during BEI's August 2010 investigation. The wells were one inch in diameter and samples were collected utilizing a disposable bailer. Weston installed permanent, two-inch diameter wells at the same three locations in May 2012 (KP-MW-01, KP-MW-02, and KP-MW-03). Samples were then collected in June 2012 utilizing a low flow purge and sampling technique. The groundwater samples collected from the two-inch wells are considered more representative of actual groundwater conditions, because these wells were constructed with industry-standard sand packs and bentonite seals in the annular space, were properly developed, and the samples were collected using low flow techniques to reduce sample turbidity and increase the likelihood that the sample represents unaltered formation water. Groundwater data evaluated for this endangerment assessment include the most recent available groundwater results from the permanent wells installed at the Site.

6.1.2.1 VOCs

VOC concentrations detected above Tier 1 GROs are summarized in **Tables 4-1 to 4-2**. VOC concentrations were detected above Tier 1 GROs in four permanent monitoring wells at the Site: KP-MW-01, KP-MW-02, MW-05, and MW-06. The locations of these exceedances are shown on **Figure 9.1** and **Figure 10**.

The following VOCs were detected at concentrations in one or more groundwater samples above Tier 1 GROs at the Site:

- chloroform
- 1,1-dichloroethene
- 1,2 - dichloroethane
- cis-1,2-dichloroethene
- tetrachloroethene
- trans-1,2-dichloroethene
- 1,1,2-trichloroethane
- trichloroethene
- vinyl chloride

The remaining VOCs concentrations were below the most stringent Tier 1 GROs.

6.1.2.2 Metals

The iron concentration detected in KP-MW-01 was above the Tier 1 GRO as summarized in **Table 4-1**. The location of this exceedance is shown on **Figure 9.2**.

The remaining metal concentrations were below the most stringent Tier 1 GROs.

6.2 Soil Exposure Routes Evaluation

The analytical results for all soil samples collected at the site have been compared to Tier 1 TACO SROs for residential properties and construction workers. A summary of all samples exceeding the Tier 1 SROs for the Residential Ingestion, Construction Worker Ingestion, Residential Inhalation, and Construction Worker Inhalation exposure routes follows. The following comparisons include exceedances of all potential soil exposure routes.

Residential Tier 1 SRO – Soil Ingestion Route

Tier 1 SRO exceedances for the residential ingestion exposure route are summarized in **Table 3-1** and **Figures 4-1, 4-2, and 4-3**.

VOCs were detected at concentrations above Tier 1 SROs for residential ingestion at B-2 and KP-SB07 between 6 and 12 ft bgs on the western portion of the Site. VOC concentrations detected in the deeper sample, KP-SB07 14-16 ft, were below Tier 1 SROs. VOC concentrations detected in samples collected from boring locations to the west (KP-SB01, DB-20) and east (TB-1, DB-22) were below Tier 1 SROs for residential ingestion.

VOCs were detected at concentrations above Tier 1 SROs for residential ingestion at ten soil boring located on the eastern portion of the Site (KP-SB04, B-4, DB-9, DB-11, KP-SB05, KP-SB02, B-5, KP-SB06, DB-18, and DB-17) between 6 and 20 ft bgs. VOC concentrations detected in samples collected from boring locations to the north (DB-2, DB-3), east (DB-6, DB-12), south (TB-4, B-6, DB-19), and west (DB-1, DB-4, DB-10, DB-16) were below Tier 1 SROs.

PAHs were detected at concentrations above Tier 1 SROs for residential ingestion in the shallow soil (0-3 ft) at five locations (B-1, B-4, B-6, B-7, and B-8). The deeper samples collected at boring locations B-1 and B-6 (3-6 ft), B-7 (6-9 ft), and B-4 (9-12 ft) were below Tier 1 SROs. The deeper samples collected from TB-5 (15-17 ft) near B-8 was below Tier 1 SROs.

Metals were detected at concentrations above Tier 1 SROs for residential ingestion in three soil borings (B-4, B-5, B-6) on the east portion of the Site between 0 and 6 ft bgs. Metal concentrations detected in the deeper samples (6-9 ft) at each location were below Tier 1 SROs.

Residential Tier 1 SRO – Inhalation Route

Tier 1 SRO exceedances for the residential inhalation exposure route are summarized in **Table 3-1** and **Figure 5**.

VOCs were detected at concentrations above Tier 1 SROs for residential inhalation on the western portion of the Site at KP-SB-01, B-2, and KP-SB07. VOC concentrations detected in the deeper sample, KP-SB07 14-16 ft, were below Tier 1 SROs. VOC concentrations detected in samples collected from boring locations to the west (DB-20) and east (KP-SB-08) were below Tier 1 SROs for residential inhalation.

VOCs were detected at concentrations above Tier 1 SROs for residential inhalation at ten soil borings located on the eastern portion of the Site (KP-SB04, B-4, DB-9, DB-11, KP-SB05, KP-SB02, B-5, KP-SB06, DB-18, and DB-17) between 3 and 20 ft bgs. VOC concentrations detected in samples collected from boring locations to the north (DB-2, DB-3), east (DB-6, DB-12), south (TB-4, B-6, DB-19), and west (DB-1, DB-4, DB-10, DB-16) were below Tier 1 SROs.

Construction Worker Tier 1 SRO – Soil Ingestion Route

Tier 1 SRO exceedances for the construction worker ingestion exposure route are summarized in **Table 3-2** and **Figures 6-1** and **6-2**.

TCE concentrations were detected above the Tier 1 SRO for construction worker ingestion in six soil samples (KP-SB04, DB-09, DB-11, KP-SB05, KP-SB06, and DB-18) on the east portion of the Site between 10 and 16 ft bgs. The deeper samples collected at boring locations DB-09 (16-18 ft), DB-11 (18-20 ft), and DB-18 (16-18 ft) were below Tier 1 SROs. In addition, TCE concentrations detected in samples collected from boring locations to the north (DB-2, DB-3), east (DB-6, DB-12), south (TB-4, B-6, DB-19), and west (DB-1, DB-4, DB-10, DB-16) were below Tier 1 SROs.

Metals were detected at concentrations above Tier 1 SROs for construction worker ingestion in three soil borings (B-4, B-5, B-6) on the east portion of the Site between 0 and 6 ft bgs. Metal concentrations detected in the deeper samples (6-9 ft) at each location were below Tier 1 SROs.

Construction Worker Tier 1 SRO – Inhalation Route

Tier 1 SRO exceedances for the construction worker inhalation exposure route are summarized in **Table 3-2** and **Figures 7-1** and **7-2**.

VOCs were detected at concentrations above Tier 1 SROs for construction worker inhalation at B-2 and KP-SB07 between 6 and 12 ft bgs on the western portion of the Site. VOC concentrations detected in the deeper sample, KP-SB07 14-16 ft, were below Tier 1 SROs. VOC concentrations detected in samples collected from boring locations to the west (KP-SB01, DB-20) and east (TB-1, DB-22) were below Tier 1 SROs for construction worker inhalation.

VOCs were detected at concentrations above Tier 1 SROs for construction worker inhalation at ten soil boring located on the eastern portion of the Site (KP-SB04, B-4, DB-9, DB-11, KP-SB05, KP-SB02, B-5, KP-SB06, DB-18, and DB-17) between 3 and 20 ft bgs. VOC concentrations detected in samples collected from boring locations to the north (DB-2, DB-3), east (DB-6, DB-12), south (TB-4, B-6, DB-19), and west (DB-1, DB-4, DB-10, DB-16) were below Tier 1 SROs.

With the exception of the exceedances summarized in the tables and figures listed above, no other sample contained any contaminants of concern (COCs) at concentrations above the Residential and Construction Worker Inhalation or Ingestion SROs.

Given the analytical results summarized above, the Residential Ingestion, Construction Worker Ingestion, Residential Inhalation, and Construction Worker Inhalation exposure routes cannot be excluded from consideration, and will be further evaluated in Section 7.0 of this report.

6.3 Groundwater Exposure Route Evaluation

On-site groundwater impacts were investigated through monitoring well installation and groundwater sampling. Groundwater at the site is proposed to be classified as Class II.

Tier 1 SRO exceedances for the soil component of the groundwater ingestion exposure route are summarized in **Table 3-3** and **Figures 8-1, 8-2** and **8-3**.

Tier 1 GRO exceedances for the groundwater ingestion exposure route are summarized in **Table 4-1** and **Figures 9-1** and **9-2**.

The City of Chicago groundwater ordinance prohibits the use of groundwater as a potable water source, which will be used to exclude/address the groundwater ingestion exposure route for the Site in a later submittal.

Following completion of the first phase of remediation, which will treat the areas where soil concentrations exceed soil saturation levels, we anticipate collecting an updated round of groundwater samples and completing R-26 modeling to evaluate the potential for groundwater and SCGWI exceedances to migrate offsite based on the post-source area remediation conditions.

6.4 Indoor Inhalation Exposure Route Evaluation

The Indoor Inhalation Exposure Route was evaluated with both groundwater and soil gas samples.

Tier 1 GRO and SGRO exceedances for the indoor inhalation residential exposure route are summarized in **Table 4-2** and **Table 5**, respectively. Locations of these exceedances are highlighted in **Figure 10**.

The TCE concentration detected in soil gas sample SV-01 during the Terracon 2013 investigation exceeded the indoor inhalation residential exposure route RO. In 2018, EDI installed a soil vapor point, SV-07, located in the vicinity of SV-01 and closer to the west property boundary. The TCE concentration detected in soil gas sample SV-07 was below Tier 1 soil gas ROs.

Additional investigation activities to delineate the indoor inhalation exposure route exceedances east of the Site is ongoing. The offsite investigation results will be provided in a CSIR addendum once complete.

7.0 Remediation Objectives Report

Remediation objectives for the Site were developed using the human health risk-based procedures established in Title 35 of the IAC, Part 742 (TACO). TACO provides a framework for developing remediation objectives for impacted soil and groundwater that are protective of human health and take into account contaminant characteristics, human exposure routes, and land use considerations to develop ROs that will provide adequate protection of human health and the environment.

A TACO Tier 1 soil and groundwater evaluation was completed as part of the Endangerment Assessment presented in Section 6. Based on that evaluation, COC concentrations at the Site exceeded Tier 1 SROs for the residential ingestion and outdoor inhalation exposure routes, construction worker ingestion and inhalation exposure routes, and soil component to groundwater ingestion exposure route. COC concentrations at the Site exceeded the Tier 1 GROs for the Class II groundwater ingestion exposure route and the residential indoor inhalation exposure route. These exposure routes were carried forward for additional consideration. A summary of COCs in soil and/or groundwater above Tier 1 ROs is provided in **Tables 3 to 5**.

The TACO process is a tiered approach that potentially involves a three-tiered evaluation of chemicals against published or calculated remediation objectives. Using the TACO tiered approach, the COIs with concentrations above Tier 1 ROs were further evaluated. The Tier 2 Evaluation involves the derivation of Tier 2 ROs using site-specific soil physical data and the same equations used by the IEPA in the calculation of Tier 1 ROs. The construction worker exposure routes will be addressed using a construction worker caution statement and were not further evaluated. The residential ingestion exposure route was evaluated using the new benzo(a)pyrene toxicity criteria published by USEPA in 2017, which is listed below. Risk evaluation conducted for the Site is consistent with the scope of a Tier 2 Evaluation as defined in 35 IAC Part 742. Subpart F and includes the following:

- Calculation of Tier 2 SROs for carcinogenic PAHs (cPAHs) with concentrations detected above the Tier 1 SROs for the ingestion route, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene. Tier 2 SROs for cPAHs for the ingestion route are derived using the latest toxicity criteria for PAHs. This approach is consistent with the guidance provided in 35 IAC Part 742.705(d)(2);

The soil and groundwater components of the groundwater ingestion exposure route will be addressed by excluding the exposure route in accordance with 35 IAC 742.320 (Subpart C); additional explanation of this exclusion will be provided following completion of the remediation activities described in Section 8.0.

7.1 Tier 2 Evaluation

Tier 2 SROs for the soil ingestion pathway were derived for cPAHs through the use of the same equations used by the IEPA when developing Tier 1 SROs for the soil ingestion pathway and the toxicity criteria for benzo(a)pyrene that were published in the Integrated Risk Information System (IRIS) on January 19, 2017 (US EPA, 2017). Detailed information regarding the ingestion exposure route calculations is presented in **Appendix F**. COC concentrations that remain above SROs after the Tier 2 evaluation for the residential soil ingestion exposure pathway are highlighted in **Table 7**.

7.2 Soil Remediation Objectives

Proposed SROs for COCs are the TACO Tier 1 SROs for residential properties in 35 IAC 742. Appendix B, Table A, and Appendix B, Table D (pH-specific SROs) with the exception of the calculated Tier 2 SROs listed below for cPAHs.

| Constituent | Tier 2 SRO – Ingestion (mg/kg) |
|------------------------|--------------------------------|
| | Residential |
| Benzo(a)anthracene | 8.5 |
| Benzo(a)pyrene | 1.3* |
| Benzo(b)fluoranthene | 8.5 |
| Dibenz(a,h)anthracene | 0.85 |
| Indeno(1,2,3-cd)pyrene | 8.5 |

*The calculated Tier 2 value for benzo(a)pyrene is less than the background value. The background value is the selected RO.

PAH analyte concentrations compared to the calculated Tier 2 SROs are presented in **Table 7**.

7.3 Groundwater Remediation Objectives

The Groundwater Remediation Objectives for the site will be the TACO Tier 1, Class II GROs as defined in 35 IAC 742, Appendix B, Table E and H.

7.4 Soil Gas Remediation Objectives

The Soil Gas Remediation Objectives for the site will be the TACO Tier 1, SGROs as defined in 35 IAC 742, Appendix B, Table G and H.

7.5 Exposure Route Exclusion

The City of Chicago groundwater ordinance prohibits the use of groundwater as a potable water source. In accordance with the 35 IAC 742 Subpart C, no exposure route shall be excluded from consideration relative to a COC unless the requirements of Section 742.300 and Section 742.305 are met. Site conditions currently do not meet the requirements due to the presence of soil exceeding the TCE soil saturation value in the eastern portion of the site. These concentrations will be remediated as described in the RAP. Exposure route exclusion will be evaluated following the completion of the planned source area remediation activities, at which time the potential for GRO and SCGWI RO exceedances to migrate offsite will also be evaluated.

8.0 Remedial Action Plan

As noted in the previous section, COCs exceed Site-specific ROs for five potential exposure pathways. The areas of the exceedances, exposure pathways, and the remedial actions are summarized in **Table 8** and described in detail in the following subsections.

8.1 Selected Remedial Technologies

The City plans to first remediate the TCE source material in soil located in the eastern portion of the Site, which is funded partly by a USEPA Brownfields Cleanup Grant. At some point following the completion of source material remediation, the City intends to install engineered barriers and implement institutional controls as needed to address the remaining applicable RO exceedances. The timing of the engineered barrier and institutional controls implementation is not currently known, and will depend upon funding availability, among other factors, but it will be completed prior to the future opening of the Site as a park.

Current conditions at the Site do not meet the requirements for pathway exclusion. Following the TCE source material remediation described below, the requirements will be reevaluated to confirm pathway exclusion and the use of engineered barriers and institutional controls to address the remaining exceedances. An evaluation of the potential for GRO and SCGWI exceedances to migrate offsite in groundwater will also be completed following completion of source area remediation. The Site is located within the City's Groundwater Ordinance, and we anticipate relying on the Ordinance to exclude the groundwater ingestion exposure route on-Site and on adjacent properties as needed.

8.1.1 In-Situ Treatment

Soil in the eastern portion of the Site will be treated to reduce TCE soil concentrations to a level below C_{sat} using an in-site chemical oxidant applied via soil mixing. The proposed TCE source material remediation activities include the following:

- Reduction of TCE to below the C_{sat} limit in approximately 981 cubic yards (CY) of soil in the 3,200 square-foot "TCE-impacted zone" located in the eastern portion of the Site between 8 and 20 feet below the ground surface (bgs) by applying In-Situ Chemical Oxidation (ISCO) via soil mixing.
- Confirmation soil sampling/analysis to confirm TCE concentrations in the remediation area are below the C_{sat} limit following the completion of ISCO treatment.
- The use of a construction worker caution statement and soil management plan to ensure the safe handling and disposal of soils during these activities and during any future subsurface work.

Implementation will include the temporary removal and onsite stockpiling of the top 8 feet of soil, dewatering if necessary, design and installation of an excavation support system, and treatment of soil exceeding the TCE C_{sat} limit using ISCO applied by soil mixing. Following ISCO application and mixing and confirmation sampling, additional treatment will be applied if needed to any areas that remain above the soil saturation limit for TCE.

The selected remedy's effectiveness was tested and demonstrated in a bench-scale study conducted in AECOM's treatability laboratory in Austin, Texas in 2018, using soil and groundwater collected from the eastern portion of the Site. AECOM's lab ran bench scale treatment tests using several different doses of the oxidizer potassium permanganate in order to test the effectiveness of the chemical at reducing TCE concentrations. The pilot study concluded that potassium permanganate was effective at reducing TCE concentrations in Site soil sufficiently to eliminate exceedances of the soil saturation limit and provided a dose recommendation for the oxidant.

Soil mixing allows for physically delivering the oxidant to the selected treatment zones and ensuring sufficient contact between the oxidant and the source area soil material. This approach is especially effective in low permeability soils where other delivery methods (e.g., injections) are less effective. The planned treatment area is shown on **Figure 11** and is divided into two soil units (SU): SU1 is the larger area where exceedances of the TCE soil saturation limit were detected between 8 and 16 ft bgs. SU2 is the smaller area where exceedances of the limit were detected between 8 and 20 ft bgs.

8.1.2 Engineered Barriers

Following completion of source area remediation, an engineered barrier (either a 3-foot clean fill barrier, a paved surface, or an 18-inch-thick equivalent geotextile and clean soil barrier, with prior IEPA approval) will be installed over all areas of the Site where soil COC concentrations exceed residential ingestion ROs in accordance with 35 IAC 742 subpart K. This is an effective way to eliminate the soil ingestion exposure route. Areas of the Site where soil is present that exceeds the residential outdoor inhalation RO for one or more COCs will have an enhanced engineered barrier consisting of either 10' of clean soil or clean fill plus a vapor barrier, with IEPA approval, in order to eliminate the soil inhalation exposure route in those areas. These engineered barriers will effectively protect human health and the environment by preventing human exposure to contaminated soil as long as the barrier is maintained. **Figure 12** shows the areas where engineered barriers are anticipated to be installed during a later phase of site development in order to address soil ingestion and/or soil inhalation RO exceedances. This map will be updated as needed following the completion of source area remediation and/or the development of site redevelopment and landscaping designs.

8.1.3 Institutional Controls

The following exposure pathways will be addressed using institutional controls as summarized in **Table 8**: residential soil ingestion/inhalation exposure pathways (via commitments to maintain engineered barriers), groundwater ingestion, indoor inhalation, and construction worker soil ingestion/inhalation. We expect these will include a Construction Worker caution statement, a commitment to not construct buildings in portions of the site with indoor inhalation RO exceedances unless a building control technology is included in the structure, and a reliance on the City's Groundwater Ordinance.

8.2 Remedial Action Feasibility, Schedule, and Effectiveness

The planned remedial actions presented in this RAP are feasible and achievable based on the Site conditions and AECOM's experience with similar sites. The effectiveness of ISCO to remediate soil exceeding the TCE Csat limit is high. ISCO has been proven to be effective at reducing TCE concentrations to below the Csat limit when reactants are applied at the correct dose and can physically reach the contaminants. AECOM's bench scale pilot testing helped to confirm that this will be an effective treatment for soil from the Site. Soil mixing is the preferable reactant delivery method in low-permeability soils like those found at the Site.

A partial Remedial Action Completion Report (RACR) documenting the completion of source area soil remediation will be submitted to IEPA first, which will ask for IEPA's review and concurrence on the completion of TCE source area soil remediation only. We understand that a NFR will not be issued in response to the first, partial RACR. A second RACR will be submitted to IEPA at a later date, after engineered barriers and institutional controls have been implemented at the Site. At that time, the RA will ask for issuance of a Comprehensive NFR Letter.

8.3 Confirmation Sampling and Analysis Plan

Following the completion of soil treatment, confirmation soil samples will be collected at two-foot intervals at 10 boring locations across the TCE source remediation area. Confirmation sample locations will correspond to historical soil borings where TCE soil saturation exceedances were detected, as well as additional sampling locations to enhance spatial and vertical delineation and support the remedy performance assessment. The samples will be collected within the treated mass to confirm the remaining levels of TCE in soil are below the Csat limit, and will be collected from the depth ranges of 8-16 ft bgs in SU 1 and 8-20 ft bgs in SU 2. If an area fails confirmation sampling, reagent will be added to re-treat the area and subsequent confirmation samples will be collected until TCE concentrations below Csat are achieved.

8.4 Current and Post-Remediation Use of the Property

The Site is currently mostly vacant with some portions covered in concrete and some portions covered in grass/soil. The Site is secured by a fence with a locked gate on N. Kimball Avenue. Following the completion of source area remediation and the later implementation of engineered barriers and institutional controls, the City's intent is to redevelop the property as a public park that will connect to the adjacent Bloomingdale Trail, allowing it to serve as an access point to the elevated greenway and multi-use recreational path (The 606).

8.5 Completion of Remediation Activities

A partial RACR will be submitted to the IEPA following completion of the source area remediation. A second RACR will be submitted later, to document the completion of engineered barrier and institutional control implementation and request a Comprehensive NFR.

9.0 CSIR ROR RAP Summary and Conclusions

The City of Chicago Department of AIS contracted with AECOM to complete a Comprehensive Site Investigation and subsequent IEPA SRP reporting for the property located at 1807-1815 N. Kimball Avenue, Chicago, Illinois (the "Site"), which is enrolled in the SRP under the Site name "North Kimball Brownfield Site", and LPC # 0316225292.

The Site is mostly vacant with some portions covered in concrete and some portions covered in grass/soil. Following remediation, the City intends to redevelop the Site as a public park that will connect to the adjacent Bloomingdale Trail, allowing it to serve as an access point to the elevated greenway and multi-use recreational path (The 606).

Subsurface environmental investigations, including Phase II ESAs and sampling associated with the CSIR and recent, additional investigations were completed for this Site and its adjacent properties between August 2010 and October 2018. The horizontal and vertical extent of contamination has been delineated on the Site, with the exception of soil gas and groundwater concentrations exceeding indoor inhalation ROs at the eastern site boundary. Offsite soil gas delineation to address this on the east adjacent property is ongoing. The data collected is sufficient to characterize the nature and extent of impact present at the Site.

A TACO Tier 1 soil and groundwater evaluation was completed as part of the Endangerment Assessment presented in Section 6. Based on that evaluation, COC concentrations at the Site exceeded Tier 1 SROs for the residential ingestion and outdoor inhalation exposure routes, construction worker ingestion and inhalation exposure routes, and soil component to groundwater ingestion exposure route. Concentrations of TCE exceeded Csat values in several soil samples located on the east portion of the Site (the TCE Source Area). COC concentrations at the Site exceeded the Tier 1 GROs for the Class II groundwater ingestion exposure route and the residential indoor inhalation exposure route.

Proposed SROs for COCs are the TACO Tier 1 SROs for residential properties in 35 IAC 742. Appendix B, Table A, and Appendix B, Table D (pH-specific SROs) with the exception of the calculated Tier 2 SROs listed below for cPAHs.

| Constituent | Tier 2 SRO – Ingestion (mg/kg) |
|------------------------|-----------------------------------|
| | Residential |
| Benzo(a)anthracene | 8.5 |
| Benzo(a)pyrene | 1.3* |
| Benzo(b)fluoranthene | 8.5 |
| Dibenz(a,h)anthracene | 0.85 |
| Indeno(1,2,3-cd)pyrene | 8.5 |

*The calculated Tier 2 value for benzo(a)pyrene is less than the background value. The background value is the selected RO.

The Groundwater Remediation Objectives for the site will be the TACO Tier 1, Class II GROs as defined in 35 IAC 742, Appendix B, Table E and H.

The Soil Gas Remediation Objectives for the site will be the TACO Tier 1, SGROs as defined in 35 IAC 742, Appendix B, Table G and H.

The steps to cleanup and redevelop this site include TCE source area remediation, engineered barrier installation and institutional control implementation. The first phase of remediation, funded in part by a USEPA Brownfields Cleanup Grant, will include in situ treatment of the TCE Source Area. An Interim RACR documenting the TCE source area remediation activities will be submitted for IEPA review and approval following completion of that step. Current conditions at the Site do not meet the requirements for pathway exclusion. Following TCE source remediation, the requirements will be evaluated again to confirm pathway exclusion and the use of engineered barriers and institutional controls. Following the later completion of engineered barriers (expected to be completed during site redevelopment), a final RACR will be submitted which will include a request for a Comprehensive No Further Remediation letter.

10.0 References

- Clean World Engineering, Ltd. (CWE), 2010, Phase I ESA Report, 1807-1815 North Kimball Avenue, Chicago, Illinois, April 2010.
- Brecheisen Engineering, Inc. (Brecheisen), 2010, Phase II ESA, 1807-1815 North Kimball Avenue, Chicago, Illinois, September 2010.
- Illinois State Geological Survey (ISGS), 1998. Glacial Drift Thickness and Character. Data originally from ISGS Circular 490 by Piskin and Bergstrom (1975). ISGS 1994, revised 1998. <http://clearinghouse.isgs.illinois.edu/data/geology/glacial-drift-thickness-and-character>
- Kolata, D. 2005. Bedrock Geology Map of Illinois. Contributions by: F. Brett Denny, et al., Cartography by: Curtis C. Abert et al. <http://isgs.illinois.edu/content/bedrock-geology-map-illinois>
- Terracon Consultants, Inc. (Terracon), 2012, Phase I Environmental Site Assessment (ESA), 1809-1815 North Kimball Avenue, Chicago, Illinois, August 2012.
- Terracon, 2013, Phase II Site Investigation Summary, 1809 North Kimball Avenue, Chicago, Illinois, January 2013.
- Weston Solutions, Inc. (Weston), 2012, Comprehensive Site Investigations Report (CSIR), 1807-1815 North Kimball Avenue, Chicago, Illinois, July 2012.
- Willman, H.B. and Jerry A. Lineback, 1970. Surficial Geology of the Chicago Region, ISGS, 1970.

Tables

**Table 1
Groundwater Elevation Summary
1807-1815 North Kimball Avenue
Chicago, Illinois**

| Location | Reference Elevation | | Screened Interval | | | | Screen Length | Depth to Water | | | | | Groundwater Elevation | | | | | Date Installed |
|----------|---------------------|---------------|-------------------|----|-----------|------|---------------|----------------|-----------|-----------|-----------|-----------|-----------------------|-----------|-----------|-----------|-----------|----------------|
| | Ground Surface | Top of Casing | Depth | | Elevation | | | 6/1/2012 | 6/21/2012 | 7/12/2012 | 9/10/2012 | 11/9/2018 | 6/1/2012 | 6/21/2012 | 7/12/2012 | 9/10/2012 | 11/9/2018 | |
| | | | From | To | From | To | | | | | | | | | | | | |
| KP-MW01 | 20.92 | 20.41 | 8 | 18 | 12.92 | 2.92 | 10 | 3.64 | 11.05 | 12.99 | NM | NM | 17.28 | 9.87 | 7.93 | NM | NM | Weston 2012 |
| KP-MW02 | 21.95 | 21.38 | 9 | 19 | 12.95 | 2.95 | 10 | 14.25 | 17.84 | 17.63 | NM | 4.76 | 7.7 | 4.11 | 4.32 | NM | 16.62 | Weston 2012 |
| KP-MW03 | 21.83 | 21.21 | 8 | 18 | 13.83 | 3.83 | 10 | 14.64 | 19.12 | 18.87 | NM | NM | 7.19 | 2.71 | 2.96 | NM | NM | Weston 2012 |
| MW-4 | NA | 99.35 | 10 | 20 | NA | NA | 10 | NM | NM | NM | NA | 5.32 | NM | NM | NM | 85.36 | 94.03 | Terracon 2012 |
| MW-5 | NA | 99.24 | 10 | 20 | NA | NA | 10 | NM | NM | NM | NA | 6.25 | NM | NM | NM | 91.63 | 92.99 | Terracon 2012 |
| MW-6 | NA | 99.96 | 10 | 20 | NA | NA | 10 | NM | NM | NM | NA | 6.98 | NM | NM | NM | 85.26 | 92.98 | Terracon 2012 |
| MW-7 | NA | 99.80 | 10 | 20 | NA | NA | 10 | NM | NM | NM | NA | NM | NM | NM | NM | 84.65 | NM | Terracon 2012 |

Notes:

CCD = Chicago City Datum

NM = not measured

NA = Not Available

Not CCD, based on local benchmark

**Table 2-1. 2018 Investigation Sample and Analysis Summary
1807-1815 N. Kimball Avenue Site
Chicago, Illinois**

| Sample Location | Type | Sample ID | Analytes |
|---------------------------------|------------------|--|---|
| DB-02, DB-07, DB-17, DB21 | Soil | DB021012, DB071618, DB171214, DB211820 | TCL: VOCs, SVOCs, metals, PCBs, pesticides and pH (DB211820 also analyzed for foc) |
| DB-13 | Soil | sent soil to Austin, TX treatability lab | Bench scale pilot test |
| DB-21 | Soil | DB212325 | VOCs, SVOCs, foc |
| Remaining soil boring locations | Soil | Remaining soil samples | VOCs |
| DB-10 and DB-13 (WC-1) | Soil Boring | composited two borings depth 10-16' (or most impacted) | Illinois Green Sheet (Waste Characterization) |
| KP-MW-02, MW-04 | Groundwater | KPMW02, MW4 | TCL (VOCs, SVOCs, metals, PCBs, pesticides) |
| MW-05, MW-06 | Groundwater | MW5, MW6 | VOCs, PAHs, RCRA Metals |
| SV-7, SV-8, SV-9, SV-10 | Soil Vapor Point | SV-7, SV-8, SV-9, SV-10 | VOCs by TO-15 |

Notes

VOCs - Volatile organic compounds

SVOCs - Semi-volatile organic compounds

TCL - Target Compound List

PCBs - polychlorinated biphenyls

foc - fraction of organic carbon

**Table 2-2. Comprehensive Soil Sample and Analysis Summary
1807-1815 N. Kimball Avenue Site
Chicago, Illinois**

| Soil Boring Location | Sample ID | Sample Depth | VOC | BTEX | SVOC | PAHs | TPH (GRO and DRO) | PCBs | Pesticides | Herbicides | TCL Metals | RCRA Metals | Select Metals | TCLP Metals | Cyanide | foc | pH | Reference |
|------------------------|------------------------|----------------|-----|------|------|------|-------------------|------|------------|------------|------------|-------------|--------------------|-------------|---------|-----|----|-------------|
| B-1 | B-1 (0-3) | 0 - 3 | X | | | X | | X | X | | | X | | Cr | | | X | BEI 2010 |
| | B-1 (3-6) | 3 - 6 | | | | X | | | | | | X | | | | | X | BEI 2010 |
| | B-1 (6-9) | 6 - 9 | X | | | | | | | | | | Cr | | | | X | BEI 2010 |
| | B-1 (9-12) | 9 - 12 | X | | | | | | | | | | Cr | | | | | BEI 2010 |
| B-2/KP-SB01 | B-2 (3-6) | 3 - 6 | X | | X | | | X | X | | X | | | | X | | X | BEI 2010 |
| | B-2 (6-9) | 6 - 9 | X | | X | | | | | | | X | | | | | X | BEI 2010 |
| | KP-SB01(6-9) | 6 - 9 | | | | | X | | | | | | | | | | | Weston 2012 |
| | B-2 (9-12) | 9 - 12 | X | | | | | | | | | | | | | | | BEI 2010 |
| | KP-SB01(18-20) | 18 - 20 | X | | | | | | | | | | | | | | | |
| KP-SB01(18-20)D | 18 - 20 | X | | | | | | | | | | | | | | | | Weston 2012 |
| B-3/KP-SB09 | KP-SB09(0-3) | 0 - 3 | X | | X | | | | | | | | | | | X | | Weston 2012 |
| | B-3 (3-6) | 3 - 6 | X | | | X | | X | X | | | X | | | | | X | BEI 2010 |
| | KP-SB09(3-6) | 3 - 6 | | | | | | | | | | | | | | X | | Weston 2012 |
| | B-3 (6-9) | 6 - 9 | X | | | X | | | | | | X | | | | | X | BEI 2010 |
| B-4 | B-4 (0-3) | 0 - 3 | | | X | | | X | X | | | X | | | | | X | BEI 2010 |
| | B-4 (3-6) | 3 - 6 | | | | X | | | | | X | | | | X | | X | BEI 2010 |
| | B-4 (6-9) | 6 - 9 | X | | | | | | | | | | Sb, As, Fe, Pb, Hg | | | | | BEI 2010 |
| | B-4 (9-12) | 9 - 12 | X | | X | | | | | | | | | | | | | BEI 2010 |
| B-5/KP-SB02 | B-5 (0-3) | 0 - 3 | | | | X | | | | | X | | | | X | X | X | BEI 2010 |
| | B-5 (3-6) | 3 - 6 | X | | X | | | X | X | | X | | | | X | | X | BEI 2010 |
| | B-5 (6-9) | 6 - 9 | X | | X | | | X | X | | | | Sb, As, Pb, Hg, Se | | | | | BEI 2010 |
| | B-5 (9-12) | 9 - 12 | X | | | | | | | | | | | | | | | BEI 2010 |
| | KP-SB02(9-12) | 9 - 12 | | | | | X | | | | | | | | | | | Weston 2012 |
| | KP-SB02(18-20) | 18 - 20 | X | | | | | | | | | | | | | | | Weston 2012 |
| B-6 | B-6 (0-3) | 0 - 3 | X | | X | | | X | X | | | X | | | | | X | BEI 2010 |
| | B-6 (3-6) | 3 - 6 | X | | X | | | X | X | | | X | | RCRA | | | X | BEI 2010 |
| | B-6 (6-9) | 6 - 9 | X | | | | | | | | | | As, Cr, Pb, Hg | | | | X | BEI 2010 |
| | B-6 (9-12) | 9 - 12 | X | | | | | | | | | | | | | | | BEI 2010 |
| B-7/KP-SB03 | B-7 (0-3) | 0 - 3 | X | | X | | | X | X | X | | X | | | | | X | BEI 2010 |
| | B-7 (3-6) | 3 - 6 | X | | X | | | | | | | X | | | | | X | BEI 2010 |
| | B-7 (6-9) | 6 - 9 | X | | | X | | | | | | | | | | X | | BEI 2010 |
| | B-7 (9-12) | 9 - 12 | X | | | | | | | | | | | | | | | BEI 2010 |
| | KP-SB03(9-12) | 9 - 12 | | | X | | | | | | | | | | | X | | Weston 2012 |
| B-8/KP-SB10 | B-8 (0-3) | 0 - 3 | | X | | X | | | | X | | X | | | | | X | BEI 2010 |
| | KP-SB10(3-5) | 3 - 5 | | | | X | | | | | | | | | | | | Weston 2012 |
| | KP-SB10(12-14) | 12 - 14 | | | | X | | | | | | | | | | | | Weston 2012 |
| | KP-SB10(12-14)D | 12 - 14 | | | | X | | | | | | | | | | | | Weston 2012 |
| KP-SB04 | KP-SB04(10-12) | 10 - 12 | X | | | | | | | | | | | | | | | Weston 2012 |
| | KP-SB04(14-16) | 14 - 16 | X | | | | | | | | | | | | | | | Weston 2012 |
| KP-SB05 | KP-SB05(11-13) | 11 - 13 | X | | | | | | | | | | | | | | | Weston 2012 |
| | KP-SB05(14-16) | 14 - 16 | X | | | | | | | | | | | | | | | Weston 2012 |
| KP-SB06 | KP-SB06(10-12) | 10 - 12 | X | | | | | | | | | | | | | | | Weston 2012 |
| | KP-SB06(14-16) | 14 - 16 | X | | | | | | | | | | | | | | | Weston 2012 |
| KP-SB07 | KP-SB07(8-10) | 8 - 10 | X | | | | | | | | | | | | | | | Weston 2012 |
| | KP-SB07(14-16) | 14 - 16 | X | | | | | | | | | | | | | | | Weston 2012 |

**Table 2-2. Comprehensive Soil Sample and Analysis Summary
1807-1815 N. Kimball Avenue Site
Chicago, Illinois**

| Soil Boring Location | Sample ID | Sample Depth | VOC | BTEX | SVOC | PAHs | TPH (GRO and DRO) | PCBs | Pesticides | Herbicides | TCL Metals | RCRA Metals | Select Metals | TCLP Metals | Cyanide | foc | pH | Reference |
|----------------------|---------------------------|----------------|-----|------|------|------|-------------------|------|------------|------------|------------|-------------|---------------|-------------|---------|-----|----|---------------|
| KP-SB08 | KP-SB08(4-6) | 4 - 6 | X | | | | | | | | | | | | | | | Weston 2012 |
| | KP-SB08(15-17) | 15 - 17 | X | | | | X | | | | | | | | | | | Weston 2012 |
| TB-1 | TB-1 | 23-25 | X | | | | | | | | | | | | | | | Terracon 2013 |
| TB-2 | TB-2 | 13-15 | X | | | | | | | | | | | | | | | Terracon 2013 |
| | TB-2-Dup | 13-15 | X | | | | | | | | | | | | | | | Terracon 2013 |
| TB-3 | TB-3 | 23-25 | X | | | | | | | | | | | | | | | Terracon 2013 |
| TB-4 | TB-4 | 28-30 | X | | | | | | | | | | | | | | | Terracon 2013 |
| TB-5 | TB-5 | 15-17 | | | X | | | | | | | | | | | | | Terracon 2013 |
| | TB-5-Dup | 15-17 | | | X | | | | | | | | | | | | | Terracon 2013 |
| DB-01 | DB011012 | 10-12 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB011012D (Duplicate) | 10-12 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB011618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB012224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-02 | DB021012 | 10-12 | X | | X | | | X | X | | X | | | | | | | EDI 2018 |
| | DB021618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB022224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-03 | DB031012 | 10-12 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB031618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB031618D (Duplicate) | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB032224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-04 | DB041012 | 10-12 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB041618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB042224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB041618D (Duplicate) | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-05 | DB052022 | 20-22 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB052426 | 24-26 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-06 | DB061416 | 14-16 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB062224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-07 | DB071113 | 11-13 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB071618 | 16-18 | X | | X | | | X | X | | X | | | | | | | EDI 2018 |
| | DB072224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-08 | DB081113 | 11-13 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB081618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB082224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-09 | DB091113 | 11-13 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB091618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB092224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-10 | DB101820 | 18-20 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB102628 | 26-28 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-11 | DB111214 | 12-14 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB111820 | 18-20 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB112628 | 26-28 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-12 | DB121214 | 12-14 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB121214D (Duplicate) | 12-14 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB121820 | 18-20 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB122628M (MS/MSD) | 26-28 | X | | | | | | | | | | | | | | | EDI 2018 |

**Table 2-2. Comprehensive Soil Sample and Analysis Summary
1807-1815 N. Kimball Avenue Site
Chicago, Illinois**

| Soil Boring Location | Sample ID | Sample Depth | VOC | BTEX | SVOC | PAHs | TPH (GRO and DRO) | PCBs | Pesticides | Herbicides | TCL Metals | RCRA Metals | Select Metals | TCLP Metals | Cyanide | foc | pH | Reference |
|----------------------|--------------------------|--------------|-----|------|------|------|-------------------|------|------------|------------|------------|-------------|---------------|-------------|---------|-----|----|-----------|
| DB-13 | DB131820 | 18-20 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB132426 | 24-26 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-14 | DB141416 | 14-16 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB141820 | 18-20 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-15 | DB151012 | 10-12 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB151618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB152224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-16 | DB161012 | 10-12 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB161618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB161618D (Duplicate) | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB162224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-17 | DB171214 | 12-14 | X | X | | | | X | X | | X | | | | | | | EDI 2018 |
| | DB171618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB172224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-18 | DB181012 | 10-12 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB181618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB182224 | 22-24 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-19 | DB191416 | 14-16 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB191820 | 18-20 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-20 | DB201012 | 10-12 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB201618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB201618M (MS/MSD) | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB202426 | 24-26 | X | | | | | | | | | | | | | | | EDI 2018 |
| DB-21 | DB211820 | 18-20 | X | | X | | | X | X | | X | | | | | X | | EDI 2018 |
| | DB212325 | 23-25 | X | | X | | | | | | | | | | | X | | EDI 2018 |
| DB-22 | DB221012 | 10-12 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB221618 | 16-18 | X | | | | | | | | | | | | | | | EDI 2018 |
| | DB222426 | 24-26 | X | | | | | | | | | | | | | | | EDI 2018 |

Source: Table 2-1, Weston 2012. Updated March 2021

Exceeds Tier 1 RO

Sample collected below observed water table

Table 3-1
Summary of Soil Tier 1 Residential Remediation Objective Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois

| Constituents | Depth | Residential | | Reference |
|---------------------------------------|-----------------------------|------------------------------|------------------------------|-------------|
| | | Ingestion | Inhalation | |
| Volatile Organic Compounds | | | | |
| Chloroform | Deep | | B-2 (9-12) = 6.13 [0.3] | BEI 2010 |
| cis-1,2-Dichloroethene | Deep | B-4 (6-9) = 872 [780] | | BEI 2010 |
| | Deep | B-5 (6-9) = 942 [780] | | BEI 2010 |
| Tetrachloroethene | Deep | B-5 (9-12) = 990 [780] | | BEI 2010 |
| | Deep | B-5 (9-12) = 14 [12] | B-5 (9-12) = 14 [11] | BEI 2010 |
| Trichloroethene | Deep | DB-09 (11-13) = 2300 [58] | DB-09 (11-13) = 2300 [5] | EDI 2018 |
| | Deep | DB-11 (12-14) = 2300 [58] | DB-11 (12-14) = 2300 [5] | EDI 2018 |
| | Deep | DB-17 (12-14) = 980 [58] | DB-17 (12-14) = 980 [5] | EDI 2018 |
| | Deep | DB-18 (10-12) = 3200 [58] | DB-18 (10-12) = 3200 [5] | EDI 2018 |
| | Deep | B-2 (6-9) = 599 [58] | B-2 (6-9) = 599 [5] | BEI 2010 |
| | Deep | B-2 (9-12) = 408 [58] | B-2 (9-12) = 408 [5] | BEI 2010 |
| | Deep | B-5 (3-6) = 73 [58] | B-5 (3-6) = 73 [5] | BEI 2010 |
| | Deep | | KP-SB01 (18-20) = 8.2 [5] | Weston 2012 |
| | Deep | | KP-SB01(18-20)D = 9.6 [5] | Weston 2012 |
| | Deep | KP-SB02(18-20) = 803 [58] | KP-SB02(18-20) = 803 [5] | Weston 2012 |
| | Deep | KP-SB04(10-12) = 3510 [58] | KP-SB04(10-12) = 3510 [5] | Weston 2012 |
| | Deep | KP-SB04(14-16) = 894 [58] | KP-SB04(14-16) = 894 [5] | Weston 2012 |
| | Deep | KP-SB05(11-13) = 3590 [58] | KP-SB05(11-13) = 3590 [5] | Weston 2012 |
| | Deep | KP-SB05(14-16) = 338 [58] | KP-SB05(14-16) = 338 [5] | Weston 2012 |
| | Deep | KP-SB06(10-12) = 4230 [58] | KP-SB06(10-12) = 4230 [5] | Weston 2012 |
| Deep | KP-SB06(14-16) = 1220 [58] | KP-SB06(14-16) = 1220 [5] | Weston 2012 | |
| Deep | KP-SB07(8-10) = 68.3 [58] | KP-SB07(8-10) = 68.3 [5] | | |
| Vinyl Chloride | Deep | | DB-06 (14-16) = 0.29 [0.28] | EDI 2018 |
| | Deep | B-2 (6-9) = 11 [0.46] | B-2 (6-9) = 11 [0.28] | BEI 2010 |
| | Deep | B-4 (6-9) = 10 [0.46] | B-4 (6-9) = 10 [0.28] | BEI 2010 |
| | Deep | B-5 (3-6) = 26 [0.46] | B-5 (3-6) = 26 [0.28] | BEI 2010 |
| | Deep | B-5 (6-9) = 44.2 [0.46] | B-5 (6-9) = 44.2 [0.28] | BEI 2010 |
| | Deep | KP-SB02(18-20) = 3 [0.46] | KP-SB02(18-20) = 3 [0.28] | Weston 2012 |
| | Deep | | KP-SB04(14-16) = 0.41 [0.28] | Weston 2012 |
| | Deep | | KP-SB05(11-13) = 0.38 [0.28] | Weston 2012 |
| | Deep | KP-SB06(10-12) = 0.58 [0.46] | KP-SB06(10-12) = 0.58 [0.28] | Weston 2012 |
| | Deep | KP-SB06(14-16) = 0.49 [0.46] | KP-SB06(14-16) = 0.49 [0.28] | Weston 2012 |
| Deep | KP-SB07(8-10) = 2 [0.46] | KP-SB07(8-10) = 2 [0.28] | Weston 2012 | |
| Semivolatile Organic Compounds | | | | |
| Benzo(a)anthracene | Shallow | B-1 (0-3) = 2.42 [1.1] | | BEI 2010 |
| | Shallow | B-4 (0-3) = 1.28 [1.1] | | BEI 2010 |
| | Deep | B-4 (3-6) = 2.83 [1.1] | | BEI 2010 |
| | Shallow | B-6 (0-3) = 2.42 [1.1] | | BEI 2010 |
| | Shallow | B-7 (0-3) = 1.76 [1.1] | | BEI 2010 |
| | Deep | B-7 (3-6) = 1.65 [1.1] | | BEI 2010 |
| | Shallow | B-8 (0-3) = 9.27 [1.1] | | BEI 2010 |
| | Deep | KP-SB10(3-5) = 2.4 [1.1] | | Weston 2012 |
| | Deep | KP-SB10(12-14) = 2.2 [1.1] | | Weston 2012 |
| Deep | KP-SB10(12-14)D = 2.1 [1.1] | | Weston 2012 | |
| Benzo(a)pyrene | Shallow | B-1 (0-3) = 4.58 [1.3] | | BEI 2010 |
| | Deep | B-4 (3-6) = 2.77 [1.3] | | BEI 2010 |
| | Shallow | B-6 (0-3) = 2.21 [1.3] | | BEI 2010 |
| | Shallow | B-7 (0-3) = 1.91 [1.3] | | BEI 2010 |
| | Deep | B-7 (3-6) = 1.88 [1.3] | | BEI 2010 |
| | Shallow | B-8 (0-3) = 9.36 [1.3] | | BEI 2010 |
| | Deep | KP-SB10(3-5) = 2.2 [1.3] | | Weston 2012 |
| | Deep | KP-SB10(12-14) = 2 [1.3] | | Weston 2012 |
| Deep | KP-SB10(12-14)D = 1.9 [1.3] | | Weston 2012 | |
| Benzo(b)fluoranthene | Shallow | B-1 (0-3) = 6.29 [1.5] | | BEI 2010 |
| | Shallow | B-4 (0-3) = 1.57 [1.5] | | BEI 2010 |
| | Deep | B-4 (3-6) = 3.48 [1.5] | | BEI 2010 |
| | Shallow | B-6 (0-3) = 2.67 [1.5] | | BEI 2010 |
| | Shallow | B-7 (0-3) = 2.24 [1.5] | | BEI 2010 |
| | Deep | B-7 (3-6) = 2.03 [1.5] | | BEI 2010 |
| | Shallow | B-8 (0-3) = 11.5 [1.5] | | BEI 2010 |
| | Deep | KP-SB10(3-5) = 2.4 [1.5] | | Weston 2012 |
| Deep | KP-SB10(12-14) = 1.9 [1.5] | | Weston 2012 | |
| Deep | KP-SB10(12-14)D = 2.1 [1.5] | | Weston 2012 | |

Table 3-1
Summary of Soil Tier 1 Residential Remediation Objective Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois

| Constituents | Depth | Residential | | Reference |
|------------------------|---------|------------------------|------------------------|-------------|
| | | Ingestion | Inhalation | |
| Dibenz(a,h)anthracene | Shallow | B-1 (0-3) = 0.25 | [0.2] | BEI 2010 |
| | Shallow | B-8 (0-3) = 0.35 | [0.2] | BEI 2010 |
| | Deep | KP-SB10(3-5) = 0.77 | [0.2] | Weston 2012 |
| | Deep | KP-SB10(12-14) = 0.66 | [0.2] | Weston 2012 |
| | Deep | KP-SB10(12-14)D = 0.66 | [0.2] | Weston 2012 |
| Indeno(1,2,3-cd)pyrene | Shallow | B-1 (0-3) = 3.45 | [0.86] | BEI 2010 |
| | Deep | B-4 (3-6) = 1.43 | [0.86] | BEI 2010 |
| | Shallow | B-6 (0-3) = 0.88 | [0.86] | BEI 2010 |
| | Deep | B-7 (3-6) = 0.87 | [0.86] | BEI 2010 |
| | Shallow | B-8 (0-3) = 4.29 | [0.86] | BEI 2010 |
| | Deep | KP-SB10(3-5) = 1.4 | [0.86] | Weston 2012 |
| | Deep | KP-SB10(12-14) = 1.1 | [0.86] | Weston 2012 |
| | Deep | KP-SB10(12-14)D = 1.2 | [0.86] | Weston 2012 |
| Metals | | | | |
| Antimony | Deep | B-4 (3-6) = 59 | [31] | BEI 2010 |
| Arsenic | Shallow | B-4 (0-3) = 15 | [13] | BEI 2010 |
| | Deep | B-4 (3-6) = 18 | [13] | BEI 2010 |
| | Deep | B-5 (3-6) = 17 | [13] | BEI 2010 |
| | Shallow | B-6 (0-3) = 14 | [13] | BEI 2010 |
| | Deep | B-6 (3-6) = 29 | [13] | BEI 2010 |
| Iron | Deep | B-4 (3-6) = 86,000 | [55,000 ^a] | BEI 2010 |
| Lead | Deep | B-4 (3-6) = 1,100 | [400] | BEI 2010 |
| | Deep | B-5 (3-6) = 840 | [400] | BEI 2010 |
| | Shallow | B-6 (0-3) = 910 | [400] | BEI 2010 |
| | Deep | B-6 (3-6) = 2,800 | [400] | BEI 2010 |

[Tier 1 RO], [[Chicago Background value](#)]

Exceeds Tier 1 RO

Exceeds Tier 1 RO, saturated sample based on observed water table

^a NonTaco table value

Shallow (0-3 ft bgs)

Deep (> 3 ft bgs)

**Table 3-2
Summary of Soil Tier 1 Construction Worker Remediation Objective Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois**

| Constituents | Depth | Construction Worker | | Reference | |
|-----------------------------------|---------|-----------------------|----------------------|-----------------------|-------------------|
| | | Ingestion | Inhalation | | |
| Volatile Organic Compounds | | | | | |
| 1,1-Dichloroethene | Deep | | B-5 (9-12) = 4 | [3.0] BEI 2010 | |
| Chloroform | Deep | | B-2 (9-12) = 6.13 | [0.76] BEI 2010 | |
| Trichloroethene | Deep | DB-09 (11-13) = 2300 | [1200] | DB-09 (11-13) = 2300 | [12] EDI 2018 |
| | Deep | DB-11 (12-14) = 2300 | [1200] | DB-11 (12-14) = 2300 | [12] EDI 2018 |
| | Deep | | | DB-17 (12-14) = 980 | [12] EDI 2018 |
| | Deep | DB-18 (10-12) = 3200 | [1200] | DB-18 (10-12) = 3200 | [12] EDI 2018 |
| | Deep | | | B-2 (6-9) = 599 | [12] BEI 2010 |
| | Deep | | | B-2 (9-12) = 408 | [12] BEI 2010 |
| | Deep | | | B-5 (3-6) = 73 | [12] BEI 2010 |
| | Deep | | | KP-SB02(18-20) = 803 | [12] Weston 2012 |
| | Deep | KP-SB04(10-12) = 3510 | [1200] | KP-SB04(10-12) = 3510 | [12] Weston 2012 |
| | Deep | | | KP-SB04(14-16) = 894 | [12] Weston 2012 |
| | Deep | KP-SB05(11-13) = 3590 | [1200] | KP-SB05(11-13) = 3590 | [12] Weston 2012 |
| | Deep | | | KP-SB05(14-16) = 338 | [12] Weston 2012 |
| | Deep | KP-SB06(10-12) = 4230 | [1200] | KP-SB06(10-12) = 4230 | [12] Weston 2012 |
| | Deep | KP-SB06(14-16) = 1220 | [1200] | KP-SB06(14-16) = 1220 | [12] Weston 2012 |
| Deep | | | KP-SB07(8-10) = 68.3 | [12] Weston 2012 | |
| Vinyl Chloride | Deep | | | B-2 (6-9) = 11 | [1.1] BEI 2010 |
| | Deep | | | B-4 (6-9) = 10 | [1.1] BEI 2010 |
| | Deep | | | B-5 (3-6) = 26 | [1.1] BEI 2010 |
| | Deep | | | B-5 (6-9) = 44.2 | [1.1] BEI 2010 |
| | Deep | | | KP-SB02(18-20) = 3 | [1.1] Weston 2012 |
| | Deep | | | KP-SB07(8-10) = 2 | [1.1] Weston 2012 |
| Metals | | | | | |
| Lead | Deep | B-4 (3-6) = 1,100 | [700] | | BEI 2010 |
| | Deep | B-5 (3-6) = 840 | [700] | | BEI 2010 |
| | Shallow | B-6 (0-3) = 910 | [700] | | BEI 2010 |
| | Deep | B-6 (3-6) = 2,800 | [700] | | BEI 2010 |
| Mercury | Deep | | | B-2 (3-6) = 0.84 | [0.1] BEI 2010 |
| | Shallow | | | B-4 (0-3) = 0.17 | [0.1] BEI 2010 |
| | Deep | | | B-4 (3-6) = 0.38 | [0.1] BEI 2010 |
| | Deep | | | B-5 (3-6) = 0.42 | [0.1] BEI 2010 |
| | Shallow | | | B-6 (0-3) = 0.82 | [0.1] BEI 2010 |
| | Deep | | | B-6 (3-6) = 3 | [0.1] BEI 2010 |
| | Shallow | | | B-7 (0-3) = 0.15 | [0.1] BEI 2010 |

[Tier 1 RO]

Exceeds Tier 1 RO

Exceeds Tier 1 RO, saturated sample based on observed water table

Shallow (0-3 ft bgs)

Deep (> 3 ft bgs)

**Table 3-3
Summary of Soil Component of Groundwater Ingestion Remediation Objective Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois**

| Constituents | Depth | Soil Component of Groundwater Ingestion Class II | Reference |
|-----------------------------------|-----------------------|--|-------------------|
| Volatile Organic Compounds | | | |
| Benzene | Deep | B-2 (6-9) = 0.2 | [0.17] BEI 2010 |
| | Deep | B-5 (3-6) = 0.4 | [0.17] BEI 2010 |
| Chloroform | Deep | B-2 (9-12) = 6.13 | [2.9] BEI 2010 |
| | Deep | B-4 (6-9) = 2 | [0.3] BEI 2010 |
| 1,1-Dichloroethene | Deep | B-5 (9-12) = 4 | [0.3] BEI 2010 |
| | Deep | KP-SB04(10-12) = 0.35 | [0.3] Weston 2012 |
| | Deep | KP-SB05(11-13) = 0.32 | [0.3] Weston 2012 |
| | Deep | KP-SB06(10-12) = 1.2 | [0.3] Weston 2012 |
| cis-1,2-Dichloroethene | Deep | DB-18 (10-12) = 31 | [1.1] EDI 2018 |
| | Deep | B-2 (6-9) = 368 | [1.1] BEI 2010 |
| | Deep | B-2 (9-12) = 1.16 | [1.1] BEI 2010 |
| | Deep | B-4 (6-9) = 872 | [1.1] BEI 2010 |
| | Deep | B-4 (9-12) = 20 | [1.1] BEI 2010 |
| | Deep | B-5 (3-6) = 8 | [1.1] BEI 2010 |
| | Deep | B-5 (6-9) = 942 | [1.1] BEI 2010 |
| | Deep | B-5 (9-12) = 990 | [1.1] BEI 2010 |
| | Deep | KP-SB02(18-20) = 56.6 | [1.1] Weston 2012 |
| | Deep | KP-SB04(10-12) = 2.6 | [1.1] Weston 2012 |
| | Deep | KP-SB05(11-13) = 6.3 | [1.1] Weston 2012 |
| | Deep | KP-SB06(10-12) = 22.2 | [1.1] Weston 2012 |
| | Deep | KP-SB06(14-16) = 22.4 | [1.1] Weston 2012 |
| | Deep | KP-SB07(8-10) = 31.2 | [1.1] Weston 2012 |
| Deep | KP-SB08(15-17) = 28.1 | [1.1] Weston 2012 | |
| Tetrachloroethene | Deep | B-2 (6-9) = 1 | [0.3] BEI 2010 |
| | Deep | B-4 (6-9) = 5 | [0.3] BEI 2010 |
| | Deep | B-5 (3-6) = 0.5 | [0.3] BEI 2010 |
| | Deep | B-5 (9-12) = 14 | [0.3] BEI 2010 |
| | Deep | KP-SB04(10-12) = 4.1 | [0.3] Weston 2012 |
| | Deep | KP-SB05(11-13) = 2.7 | [0.3] Weston 2012 |
| | Deep | KP-SB06(10-12) = 3.8 | [0.3] Weston 2012 |
| Deep | KP-SB06(14-16) = 0.82 | [0.3] Weston 2012 | |
| trans-1,2-Dichloroethene | Deep | B-2 (6-9) = 8 | [3.4] BEI 2010 |
| | Deep | B-4 (6-9) = 15 | [3.4] BEI 2010 |
| | Deep | B-5 (6-9) = 7.34 | [3.4] BEI 2010 |
| | Deep | B-5 (9-12) = 14 | [3.4] BEI 2010 |
| Trichloroethene | Deep | DB-09 (11-13) = 2300 | [0.3] EDI 2018 |
| | Deep | DB-11 (12-14) = 2300 | [0.3] EDI 2018 |
| | Deep | DB-17 (12-14) = 980 | [0.3] EDI 2018 |
| | Deep | DB-18 (10-12) = 3200 | [0.3] EDI 2018 |
| | Deep | B-2 (6-9) = 599 | [0.3] BEI 2010 |
| | Deep | B-2 (9-12) = 408 | [0.3] BEI 2010 |
| | Deep | KP-SB01 (18-20) = 8.2 | [0.3] Weston 2012 |
| | Deep | KP-SB01(18-20)D = 9.6 | [0.3] Weston 2012 |
| | Deep | B-3 (6-9) = 2 | [0.3] BEI 2010 |
| | Deep | B-5 (3-6) = 73 | [0.3] BEI 2010 |
| | Deep | B-6 (3-6) = 1 | [0.3] BEI 2010 |
| | Deep | KP-SB02(18-20) = 803 | [0.3] Weston 2012 |
| | Deep | KP-SB04(10-12) = 3510 | [0.3] Weston 2012 |
| | Deep | KP-SB04(14-16) = 894 | [0.3] Weston 2012 |
| | Deep | KP-SB05(11-13) = 3590 | [0.3] Weston 2012 |
| | Deep | KP-SB05(14-16) = 338 | [0.3] Weston 2012 |
| | Deep | KP-SB06(10-12) = 4230 | [0.3] Weston 2012 |
| | Deep | KP-SB06(14-16) = 1220 | [0.3] Weston 2012 |
| Deep | KP-SB07(8-10) = 68.3 | [0.3] Weston 2012 | |

Table 3-3
Summary of Soil Component of Groundwater Ingestion Remediation Objective Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois

| Constituents | Depth | Soil Component of Groundwater Ingestion Class II | Reference |
|---------------------------------------|------------------------------|--|-------------|
| Vinyl Chloride | Deep | DB-06 (14-16) = 0.29 [0.07] | EDI 2018 |
| | Deep | B-2 (6-9) = 11 [0.07] | BEI 2010 |
| | Deep | B-2 (9-12) = 0.16 [0.07] | BEI 2010 |
| | Deep | B-4 (6-9) = 10 [0.07] | BEI 2010 |
| | Deep | B-4 (9-12) = 0.2 [0.07] | BEI 2010 |
| | Deep | B-5 (3-6) = 26 [0.07] | BEI 2010 |
| | Deep | B-5 (6-9) = 44.2 [0.07] | BEI 2010 |
| | Deep | KP-SB02(18-20) = 3 [0.07] | Weston 2012 |
| | Deep | KP-SB04(10-12) = 0.088 [0.07] | Weston 2012 |
| | Deep | KP-SB04(14-16) = 0.41 [0.07] | Weston 2012 |
| | Deep | KP-SB05(11-13) = 0.38 [0.07] | Weston 2012 |
| | Deep | KP-SB05(14-16) = 0.23 [0.07] | Weston 2012 |
| | Deep | KP-SB06(10-12) = 0.58 [0.07] | Weston 2012 |
| | Deep | KP-SB06(14-16) = 0.49 [0.07] | Weston 2012 |
| | Deep | KP-SB07(8-10) = 2 [0.07] | Weston 2012 |
| Deep | KP-SB08(15-17) = 0.14 [0.07] | Weston 2012 | |
| Semivolatile Organic Compounds | | | |
| Benzo(a)anthracene | Shallow | B-8 (0-3) = 9.27 [8] | BEI 2010 |
| Metals | | | |
| Antimony | Deep | B-4 (3-6) = 59 [20] | BEI 2010 |
| | Deep | B-5 (3-6) = 26 [20] | BEI 2010 |
| Lead | Deep | B-6 (3-6) = 2,800, pH 8.5 [1420] | BEI 2010 |
| Selenium | Deep | B-2 (3-6) = 3, pH 8.1 [2.4] | BEI 2010 |

[Tier 1 RO]

Exceeds Tier 1 RO

Exceeds Tier 1 RO, saturated sample based on observed water table

Shallow (0-3 ft bgs)

Deep (> 3 ft bgs)

**Table 4-1
Summary of Groundwater Ingestion Remediation Objective Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois**

| Constituents | Sample Date | Groundwater Ingestion Class II | Reference |
|-----------------------------------|-------------|-----------------------------------|---------------------|
| Volatile Organic Compounds | | | |
| Chloroform | 8/10/2010 | TMW-1 = 0.64 | [0.001] BEI 2010 |
| | 6/1/2012 | TMW-1/KP-MW01 = 0.0098 | [0.001] Weston 2012 |
| 1,1-Dichloroethene | 11/9/2018 | KPMW02 = 4.4 | [0.035] EDI 2018 |
| 1,2-Dichloroethane | 11/9/2018 | KPMW02 = 0.030 | [0.025] EDI 2018 |
| cis-1,2-Dichloroethene | 11/9/2018 | MW-6 = 0.50 | [0.2] EDI 2018 |
| | 11/9/2018 | KPMW02 = 69 | [0.2] EDI 2018 |
| Tetrachloroethene | 11/9/2018 | KPMW02 = 0.10 | [0.025] EDI 2018 |
| trans-1,2-Dichloroethene | 11/9/2018 | KPMW02 = 6.3 | [0.5] EDI 2018 |
| 1,1,2-Trichloroethane | 11/9/2018 | KPMW02 = 0.13 | [0.05] EDI 2018 |
| Trichloroethene | 11/9/2018 | MW-5 = 0.033 | [0.025] EDI 2018 |
| | 11/9/2018 | MW-6 = 0.26 | [0.025] EDI 2018 |
| | 8/10/2010 | TMW-1 = 4 | [0.025] BEI 2010 |
| | 6/1/2012 | TMW-1/KP-MW01 = 0.22 | [0.025] Weston 2012 |
| | 11/9/2018 | KPMW02 = 350 | [0.025] EDI 2018 |
| Vinyl Chloride | 11/9/2018 | MW-6 = 0.062 | [0.01] EDI 2018 |
| | 8/10/2010 | TMW-1 = 0.12 | [0.01] BEI 2010 |
| | 6/1/2012 | TMW-1/KP-MW01 = 0.022 | [0.01] Weston 2012 |
| | 11/9/2018 | KPMW02 = 7.4 | [0.01] EDI 2018 |
| Metals | | | |
| Iron | 6/1/2012 | TMW-1/KP-MW01 = 10.9 | [5] Weston 2012 |

All units mg/L

Most recent groundwater data evaluated for each location

[Tier 1 RO]

Exceeds Tier 1 RO

Table 4-2
Summary of Groundwater Indoor Inhalation Remediation Objective Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois

| Constituents | Sample Date | Indoor Inhalation Remediation Objective - Diffusion and Advection Residential | Reference |
|-----------------------------------|-------------|---|-----------|
| Volatile Organic Compounds | | | |
| Trichloroethene | 11/9/2018 | KPMW02 = 350 [0.34] | EDI 2018 |
| Vinyl Chloride | 11/9/2018 | MW-6 =0.062 [0.028] | EDI 2018 |
| | 11/9/2018 | KPMW02 = 7.4 [0.028] | EDI 2018 |

All units mg/L

Most recent groundwater data evaluated for each location

[Tier 1 RO]

Exceeds Tier 1 RO

Table 5
Summary of Soil Gas Remediation Objective Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois

| Constituents | Sample Date | Residential Outdoor Inhalation | Indoor Inhalation Remediation Objective - Diffusion and Advection Residential | Reference |
|-----------------------------------|-------------|--------------------------------|---|---------------|
| Volatile Organic Compounds | | | | |
| Trichloroethene | 8/21/2012 | | SV-01 = 17 [1.5] | Terracon 2013 |
| | 8/21/2012 | | SV-04/SV-04 DUP = 4.9 [1.5] | Terracon 2013 |
| | 11/8/2018 | | SV-09 = 110 [1.5] | EDI 2018 |
| Vinyl Chloride | 8/21/2012 | | SV-04/SV-04 DUP = 1.6 [0.29] | Terracon 2013 |
| | 11/8/2018 | | SV-09 = 52 [0.29] | EDI 2018 |

All units mg/m³

[Tier 1 RO] 35 IAC 742 Appendix B Tables G and H

Exceeds Tier 1 RO

Table 6
Summary of Csat Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois

| | | Client Sample ID : | DB091113 | DB111214 | DB171214 | DB181012 | KP-SB02(18-20) | | |
|-----------------|--------------------|--------------------|---------------------|-----------------|--------------|--------------|----------------|--------------|-----|
| | | Boring Location : | DB-09 | DB-11 | DB-17 | DB-18 | KP-SB02 | | |
| | | Sample Interval : | 11-13 | 12-14 | 12-14 | 10-12 | 18-20 | | |
| | | Date Collected : | 11/05/2018 | 11/05/2018 | 11/06/2018 | 11/07/2018 | 2012 | | |
| | | Csat | Site Specific Csat* | | | | | | |
| Analyte | Outdoor Inhalation | SCGI | SCGI Clayey Sand | SCGI Silty Clay | | | | | |
| Trichloroethene | 1200 | 650 | 700 | 1000 | 2,300 | 2,300 | 980 | 3,200 | 803 |

| | | Client Sample ID : | KP-SB04(10-12) | KP-SB04(14-16) | KP-SB05(11-13) | KP-SB06(10-12) | KP-SB06(14-16) | | |
|-----------------|--------------------|--------------------|---------------------|-----------------|----------------|----------------|----------------|--------------|--------------|
| | | Boring Location : | KP-SB04 | KP-SB04 | KP-SB05 | KP-SB06 | KP-SB06 | | |
| | | Sample Interval : | 10-12 | 14-16 | 11-13 | 10-12 | 14-16 | | |
| | | Date Collected : | 2012 | 2012 | 2012 | 2012 | 2012 | | |
| | | Csat | Site Specific Csat* | | | | | | |
| Analyte | Outdoor Inhalation | SCGI | SCGI Clayey Sand | SCGI Silty Clay | | | | | |
| Trichloroethene | 1200 | 650 | 700 | 1000 | 3,510 | 894 | 3,590 | 4,230 | 1,220 |

Notes:
 NA = Not applicable
 SCGI = Soil Component of the Groundwater Ingestion
 Csat = Soil Saturation Concentration
 Shaded Values exceeded Csat
 Values that exceed Csat for Outdoor inhalation are shown in **Bold**.
 Results in mg/kg
 *Additional details regarding site specific Csat calculations are provided in Appendix E.

Table 7
Summary of Tier 2 Residential Remediation Objective Exceedances
1807-1815 N. Kimball Avenue, Chicago, Illinois

| Constituents | Residential | | Reference |
|---------------------------------------|------------------------|-------------|-------------|
| | Ingestion | | |
| Semivolatile Organic Compounds | | | |
| Benzo(a)anthracene | B-1 (0-3) = 2.42 | [1.1, 8.5] | BEI 2010 |
| | B-4 (0-3) = 1.28 | [1.1, 8.5] | BEI 2010 |
| | B-4 (3-6) = 2.83 | [1.1, 8.5] | BEI 2010 |
| | B-6 (0-3) = 2.42 | [1.1, 8.5] | BEI 2010 |
| | B-7 (0-3) = 1.76 | [1.1, 8.5] | BEI 2010 |
| | B-7 (3-6) = 1.65 | [1.1, 8.5] | BEI 2010 |
| | B-8 (0-3) = 9.27 | [1.1, 8.5] | BEI 2010 |
| | KP-SB10(3-5) = 2.4 | [1.1, 8.5] | Weston 2012 |
| | KP-SB10(12-14) = 2.2 | [1.1, 8.5] | Weston 2012 |
| KP-SB10(12-14)D = 2.1 | [1.1, 8.5] | Weston 2012 | |
| Benzo(a)pyrene | B-1 (0-3) = 4.58 | [1.3, 0.85] | BEI 2010 |
| | B-4 (3-6) = 2.77 | [1.3, 0.85] | BEI 2010 |
| | B-6 (0-3) = 2.21 | [1.3, 0.85] | BEI 2010 |
| | B-7 (0-3) = 1.91 | [1.3, 0.85] | BEI 2010 |
| | B-7 (3-6) = 1.88 | [1.3, 0.85] | BEI 2010 |
| | B-8 (0-3) = 9.36 | [1.3, 0.85] | BEI 2010 |
| | KP-SB10(3-5) = 2.2 | [1.3, 0.85] | Weston 2012 |
| | KP-SB10(12-14) = 2 | [1.3, 0.85] | Weston 2012 |
| | KP-SB10(12-14)D = 1.9 | [1.3, 0.85] | Weston 2012 |
| Benzo(b)fluoranthene | B-1 (0-3) = 6.29 | [1.5, 8.5] | BEI 2010 |
| | B-4 (0-3) = 1.57 | [1.5, 8.5] | BEI 2010 |
| | B-4 (3-6) = 3.48 | [1.5, 8.5] | BEI 2010 |
| | B-6 (0-3) = 2.67 | [1.5, 8.5] | BEI 2010 |
| | B-7 (0-3) = 2.24 | [1.5, 8.5] | BEI 2010 |
| | B-7 (3-6) = 2.03 | [1.5, 8.5] | BEI 2010 |
| | B-8 (0-3) = 11.5 | [1.5, 8.5] | BEI 2010 |
| | KP-SB10(3-5) = 2.4 | [1.5, 8.5] | Weston 2012 |
| | KP-SB10(12-14) = 1.9 | [1.5, 8.5] | Weston 2012 |
| KP-SB10(12-14)D = 2.1 | [1.5, 8.5] | Weston 2012 | |
| Dibenz(a,h)anthracene | B-1 (0-3) = 0.25 | [0.2, 0.85] | BEI 2010 |
| | B-8 (0-3) = 0.35 | [0.2, 0.85] | BEI 2010 |
| | KP-SB10(3-5) = 0.77 | [0.2, 0.85] | Weston 2012 |
| | KP-SB10(12-14) = 0.66 | [0.2, 0.85] | Weston 2012 |
| | KP-SB10(12-14)D = 0.66 | [0.2, 0.85] | Weston 2012 |
| Indeno(1,2,3-cd)pyrene | B-1 (0-3) = 3.45 | [0.86, 8.5] | BEI 2010 |
| | B-4 (3-6) = 1.43 | [0.86, 8.5] | BEI 2010 |
| | B-6 (0-3) = 0.88 | [0.86, 8.5] | BEI 2010 |
| | B-7 (3-6) = 0.87 | [0.86, 8.5] | BEI 2010 |
| | B-8 (0-3) = 4.29 | [0.86, 8.5] | BEI 2010 |
| | KP-SB10(3-5) = 1.4 | [0.86, 8.5] | Weston 2012 |
| | KP-SB10(12-14) = 1.1 | [0.86, 8.5] | Weston 2012 |
| KP-SB10(12-14)D = 1.2 | [0.86, 8.5] | Weston 2012 | |

[Tier 1 RO], [Chicago Background value, Tier 2 RO]

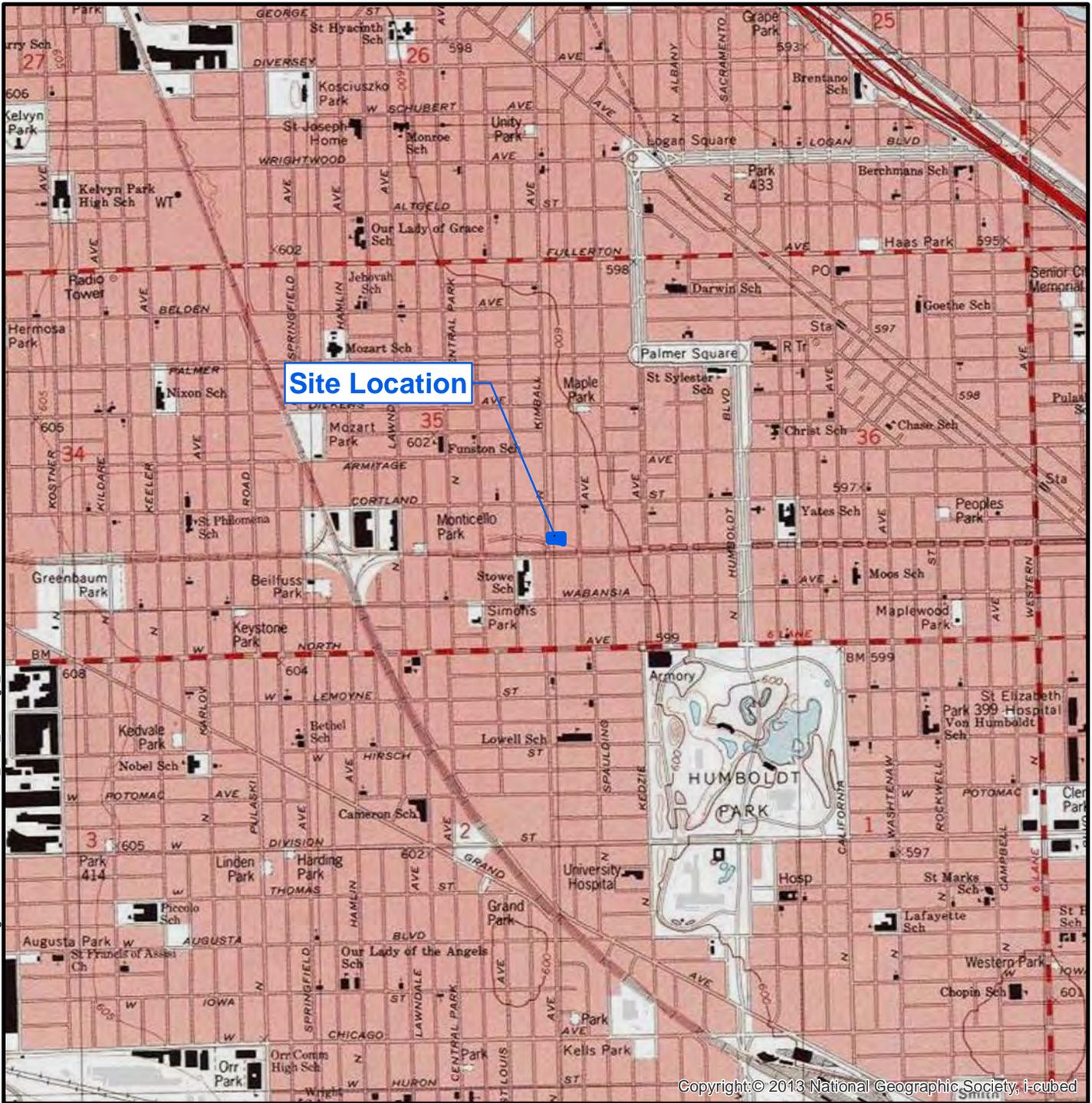
Exceeds Tier 1 and 2 RO

^a NonTaco table value

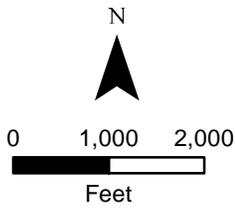
Table 8
Summary of Proposed Remedial Action
1807-1815 N. Kimball Avenue, Chicago, Illinois

| Constituents | Sample Type | Remaining Concern | Proposed Remedial Action |
|--------------------------|---|---|---|
| Trichloroethene | Deep Soil (> 3ft bgs) | Csat Exceedances | In situ chemical oxidation (soil mixing) remediation |
| Chlorinated VOCs | Deep Soil (> 3ft bgs) | Residential, soil component of the groundwater ingestion (SCGI), construction worker, groundwater ingestion, and indoor inhalation RO Exceedances | Remaining exceedances after ISCO remediation will be addressed with engineered barriers and institutional controls. |
| Benzo(a)anthracene | Shallow (0-3 ft) | Residential Ingestion RO Exceedances | Engineered Barrier |
| Benzo(a)pyrene | Shallow (0-3 ft) Deep Soil (> 3ft bgs) | | |
| Lead, Mercury | Shallow (0-3 ft) Deep Soil (> 3ft bgs) | Construction Worker RO Exceedances | Construction Worker institutional control applied to the Site |
| Benzo(a)pyrene | Shallow (0-3 ft) | SCGI Exceedances | Institutional Control to rely on City Groundwater Ordinance to exclude GW Ingestion route |
| Antimony, Lead, Selenium | Deep Soil (> 3ft bgs) | | |
| Iron | Groundwater (KP-MW01) | Groundwater Ingestion Exceedance | Institutional Control to rely on City Groundwater Ordinance to exclude GW Ingestion route |

Figures



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QUADRANGLE LOCATION

NORTH KIMBALL BROWNFIELD SITE
 1807 - 1815 N. KIMBALL AVENUE
 CHICAGO, ILLINOIS

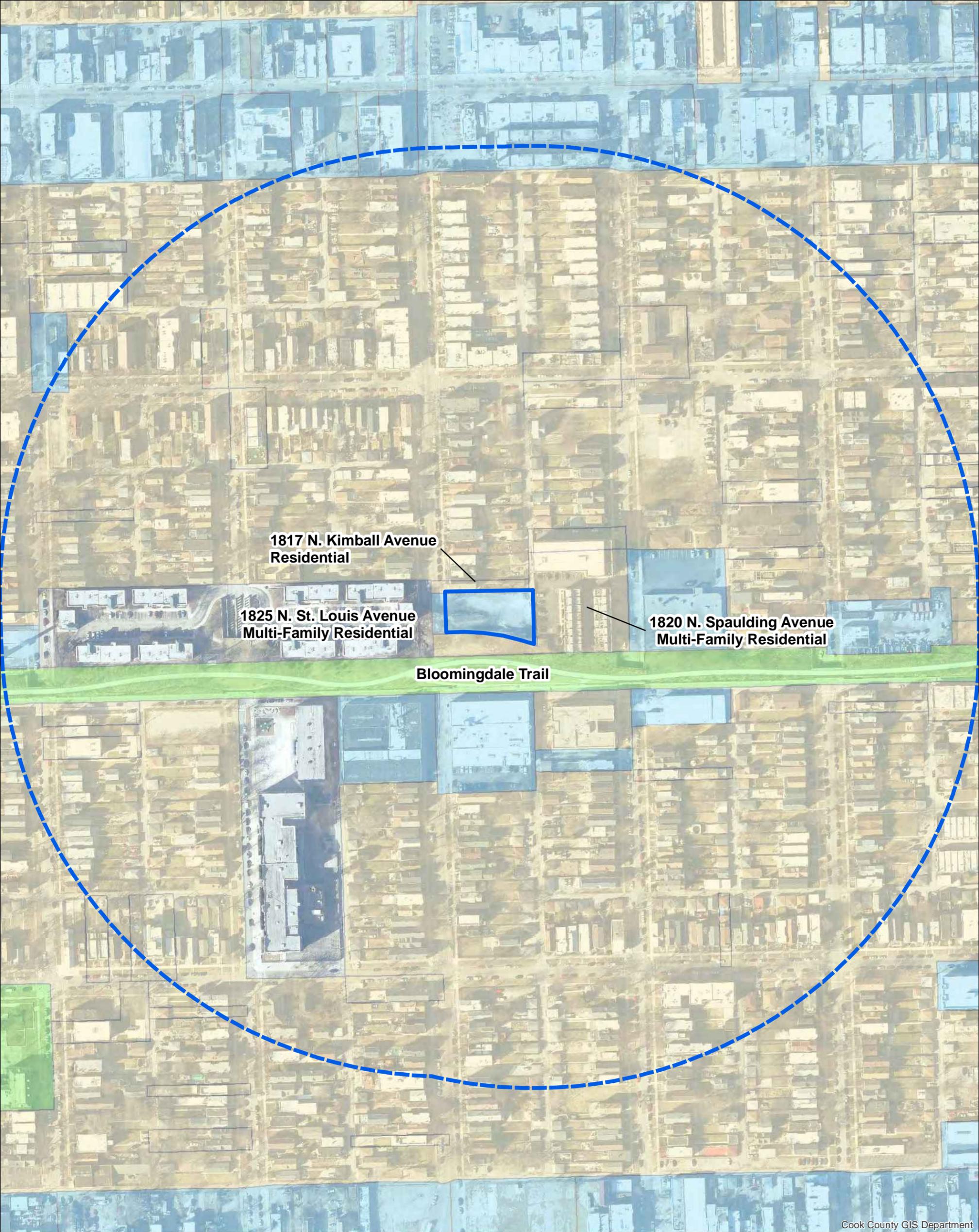
FIGURE 1
SITE LOCATION MAP

DATE: 12/7/2020
 JOB NO: 60623205
 DRAWN BY: CC
 CHK'D BY: MH
 SCALE: AS SHOWN



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 FAX: (312) 373-6800

MAP REFERENCE:
 PORTION OF U.S.G.S QUADRANGLE MAP
 7½ MINUTE SERIES (TOPOGRAPHIC)
 CHICAGO LOOP, IL
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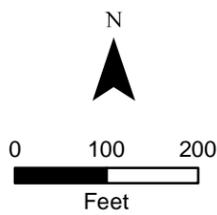
Cook County GIS Department

Legend

-  Remediation Site Boundary
-  1,000-Foot Buffer

Zoning Type

-  Industrial/Commercial
-  Parks and Open Space
-  Residential



1807-1815 N. KIMBALL AVENUE
CHICAGO, ILLINOIS
TOWNSHIP 40 N, RANGE 13E, SECTION 35

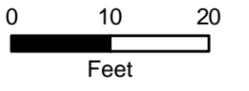
**FIGURE 2
SITE BASE MAP**

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SCALE: AS SHOWN

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- Legend**
- A Soil Sample Location
 - # Soil Vapor Point
 - D Groundwater Monitoring Well
 - D Temporary Monitoring Well
 - Remediation Site Boundary

NORTH KIMBALL BROWNFIELD SITE
1807 - 1815 N. KIMBALL AVENUE
CHICAGO, ILLINOIS

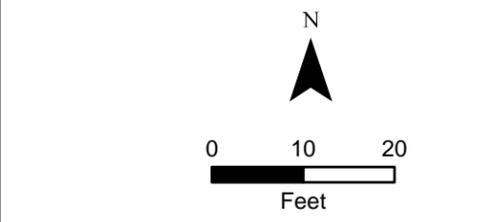
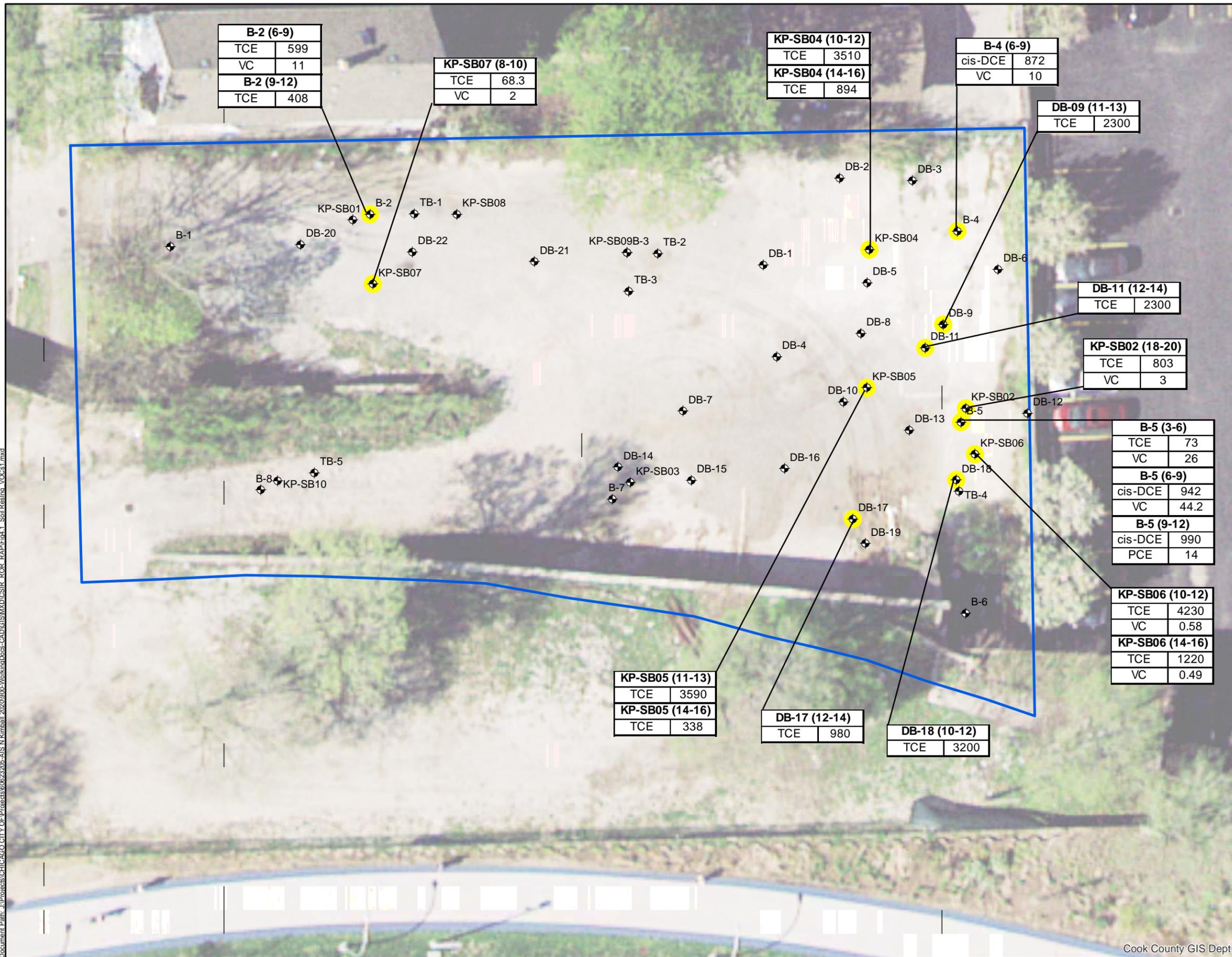
FIGURE 3
SOIL SAMPLE AND
GROUNDWATER WELL LOCATION MAP

| | |
|-----------|-----------|
| DATE: | 3/18/2021 |
| JOB NO: | 60623205 |
| DRAWN BY: | HT |
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- Legend**
- Soil Sample Location
 - Deep (> 3 ft) Tier 1 Residential Ingestion SRO Exceedance: VOCs
 - Remediation Site Boundary

Notes:
 cis-DCE = cis-1,2-dichloroethene
 PCE = tetrachloroethene
 TCE = trichloroethene
 VC = vinyl chloride

KP-SB06 (10-12) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Tier 1 Residential Ingestion SRO |
|---------|----------------------------------|
| cis-DCE | 780 |
| PCE | 12 |
| TCE | 58 |
| VC | 0.46 |

| B-2 (6-9) | |
|------------|-----|
| TCE | 599 |
| VC | 11 |
| B-2 (9-12) | |
| TCE | 408 |

| KP-SB07 (8-10) | |
|----------------|------|
| TCE | 68.3 |
| VC | 2 |

| KP-SB04 (10-12) | |
|-----------------|------|
| TCE | 3510 |
| KP-SB04 (14-16) | |
| TCE | 894 |

| B-4 (6-9) | |
|-----------|-----|
| cis-DCE | 872 |
| VC | 10 |

| DB-09 (11-13) | |
|---------------|------|
| TCE | 2300 |

| DB-11 (12-14) | |
|---------------|------|
| TCE | 2300 |

| KP-SB02 (18-20) | |
|-----------------|-----|
| TCE | 803 |
| VC | 3 |

| B-5 (3-6) | |
|-----------|----|
| TCE | 73 |
| VC | 26 |

| B-5 (6-9) | |
|-----------|------|
| cis-DCE | 942 |
| VC | 44.2 |

| B-5 (9-12) | |
|------------|-----|
| cis-DCE | 990 |
| PCE | 14 |

| KP-SB06 (10-12) | |
|-----------------|------|
| TCE | 4230 |
| VC | 0.58 |

| KP-SB06 (14-16) | |
|-----------------|------|
| TCE | 1220 |
| VC | 0.49 |

| KP-SB05 (11-13) | |
|-----------------|------|
| TCE | 3590 |
| KP-SB05 (14-16) | |
| TCE | 338 |

| DB-17 (12-14) | |
|---------------|-----|
| TCE | 980 |

| DB-18 (10-12) | |
|---------------|------|
| TCE | 3200 |

Cook County GIS Dept.

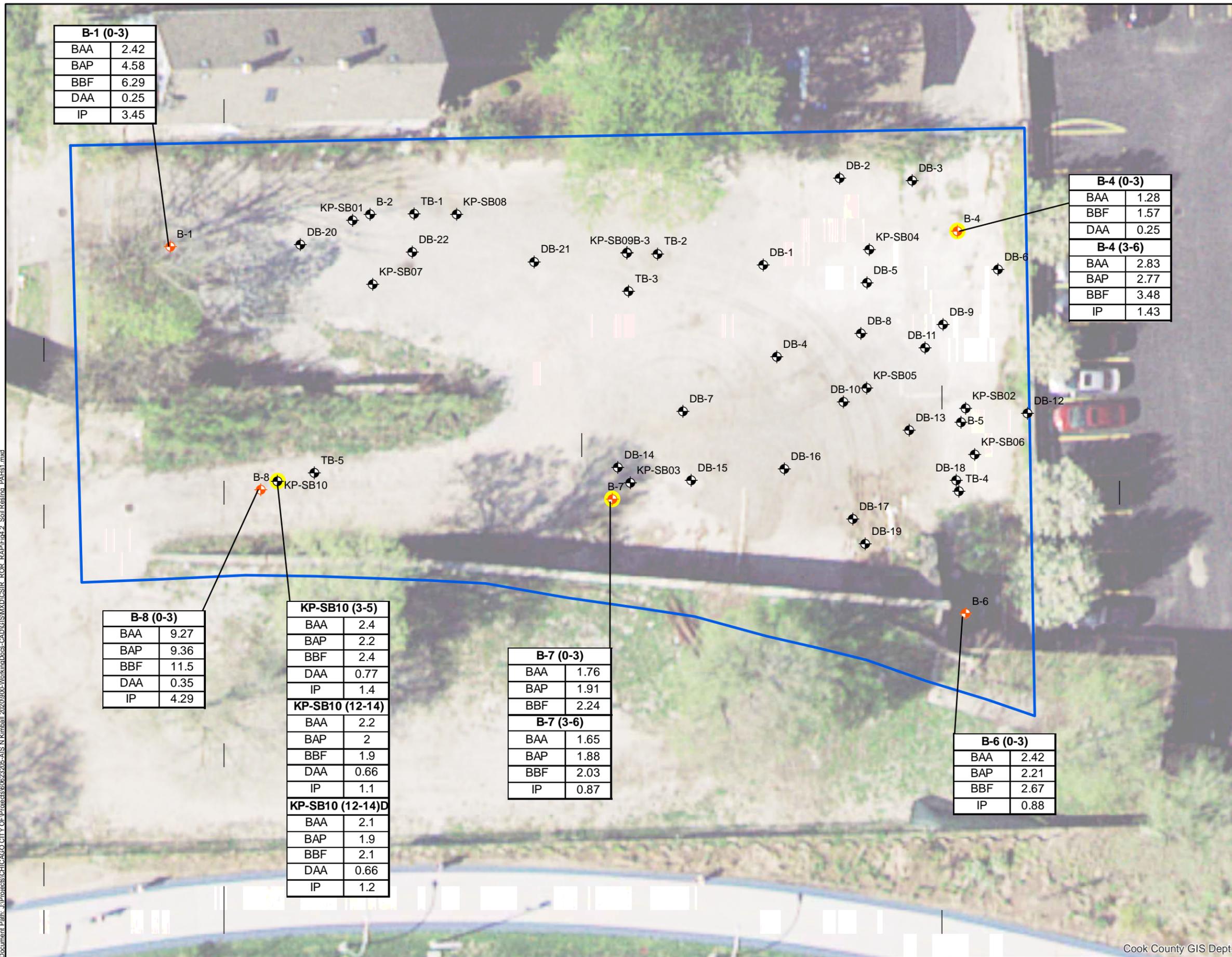
NORTH KIMBALL BROWNFIELD SITE
 1807 - 1815 N. KIMBALL AVENUE
 CHICAGO, ILLINOIS

FIGURE 4-1
SOIL SAMPLES EXCEEDING TIER 1
RESIDENTIAL INGESTION SROS: VOCs

| | |
|-----------|------------|
| DATE: | 12/16/2020 |
| JOB NO: | 60623205 |
| DRAWN BY: | HT |
| CHK'D BY: | MH |
| SCALE: | AS SHOWN |

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| B-1 (0-3) | |
|-----------|------|
| BAA | 2.42 |
| BAP | 4.58 |
| BBF | 6.29 |
| DAA | 0.25 |
| IP | 3.45 |

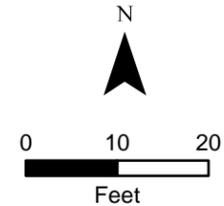
| B-4 (0-3) | |
|-----------|------|
| BAA | 1.28 |
| BBF | 1.57 |
| DAA | 0.25 |
| B-4 (3-6) | |
| BAA | 2.83 |
| BAP | 2.77 |
| BBF | 3.48 |
| IP | 1.43 |

| B-8 (0-3) | |
|-----------|------|
| BAA | 9.27 |
| BAP | 9.36 |
| BBF | 11.5 |
| DAA | 0.35 |
| IP | 4.29 |

| KP-SB10 (3-5) | |
|------------------|------|
| BAA | 2.4 |
| BAP | 2.2 |
| BBF | 2.4 |
| DAA | 0.77 |
| IP | 1.4 |
| KP-SB10 (12-14) | |
| BAA | 2.2 |
| BAP | 2 |
| BBF | 1.9 |
| DAA | 0.66 |
| IP | 1.1 |
| KP-SB10 (12-14)D | |
| BAA | 2.1 |
| BAP | 1.9 |
| BBF | 2.1 |
| DAA | 0.66 |
| IP | 1.2 |

| B-7 (0-3) | |
|-----------|------|
| BAA | 1.76 |
| BAP | 1.91 |
| BBF | 2.24 |
| B-7 (3-6) | |
| BAA | 1.65 |
| BAP | 1.88 |
| BBF | 2.03 |
| IP | 0.87 |

| B-6 (0-3) | |
|-----------|------|
| BAA | 2.42 |
| BAP | 2.21 |
| BBF | 2.67 |
| IP | 0.88 |



Legend

- Soil Sample Location
- Shallow (0-3 ft) Tier 1 Residential Ingestion SRO Exceedance: PAHs
- Deep (> 3 ft) Tier 1 Residential Ingestion SRO Exceedance: PAHs
- Remediation Site Boundary

Notes:
 BAA = benzo(a)anthracene
 BAP = benzo(a)pyrene
 BBF = benzo(b)fluoranthene
 DAA = dibenz(a,h)anthracene
 IP = indeno(1,2,3-cd)pyrene

KP-SB06 (10-12) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Residential Ingestion SRO |
|---------|---------------------------|
| BAA | 1.1 |
| BAP | 1.3 |
| BBF | 1.5 |
| DAA | 0.2 |
| IP | 0.86 |

NORTH KIMBALL BROWNFIELD SITE
 1807 - 1815 N. KIMBALL AVENUE
 CHICAGO, ILLINOIS

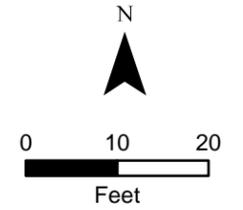
FIGURE 4-2
SOIL SAMPLES EXCEEDING TIER 1
RESIDENTIAL INGESTION SROS: PAHS

| | |
|-----------|------------|
| DATE: | 12/16/2020 |
| JOB NO: | 60623205 |
| DRAWN BY: | CHK'D BY: |
| HT | MH |
| SCALE: | AS SHOWN |



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Legend

- ◆ Soil Sample Location
- ◆ Shallow (0-3 ft) Tier 1 Residential Ingestion SRO Exceedance: Metals
- ◆ Deep (>3 ft) Tier 1 Residential Ingestion SRO Exceedance: Metals
- ▭ Remediation Site Boundary

| B-4 (0-3) | |
|-----------|--------|
| As | 15 |
| B-4 (3-6) | |
| Sb | 59 |
| As | 18 |
| Fe | 86,000 |
| Pb | 1,100 |

| B-5 (3-6) | |
|-----------|-----|
| As | 17 |
| Pb | 840 |

| B-6 (0-3) | |
|-----------|-------|
| As | 14 |
| Pb | 910 |
| B-6 (3-6) | |
| As | 29 |
| Pb | 2,800 |

Notes:
 Sb = antimony
 As = arsenic
 Fe = iron
 Pb = lead

KP-SB06 (10-12) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Tier 1 Residential Ingestion SRO |
|---------|----------------------------------|
| Sb | 31 |
| As | 13 |
| Fe | 55,000* |
| Pb | 400 |

*Non-taco table value

NORTH KIMBALL BROWNFIELD SITE
 1807 - 1815 N. KIMBALL AVENUE
 CHICAGO, ILLINOIS

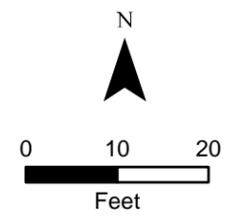
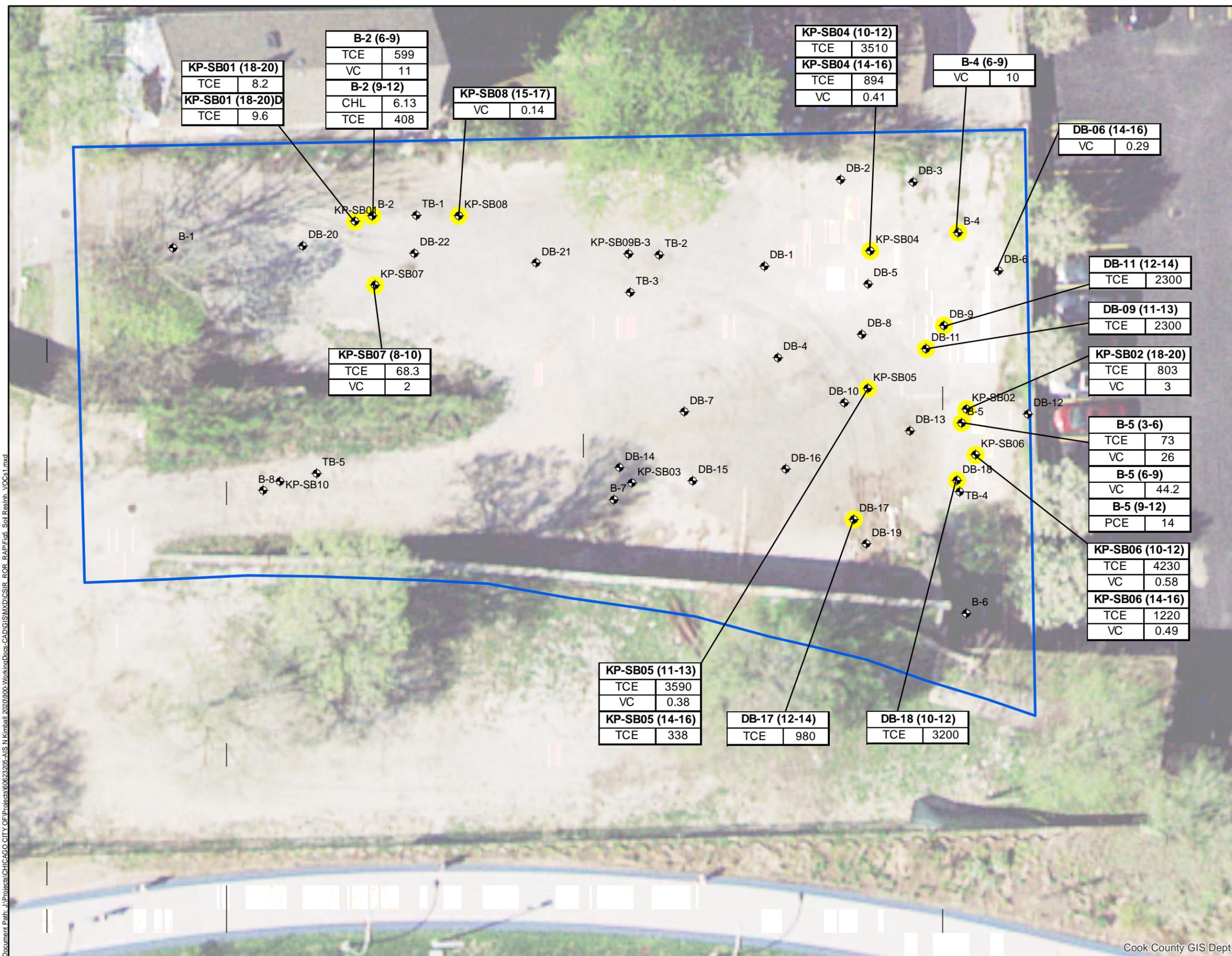
FIGURE 4-3
SOIL SAMPLES EXCEEDING TIER 1
RESIDENTIAL INGESTION SROS: METALS

DATE: 12/16/2020
 JOB NO: 60623205
 DRAWN BY: CC
 CHK'D BY: MH
 SCALE: AS SHOWN



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- Legend**
- ◆ Soil Sample Location
 - Deep (> 3 ft) Tier 1 Residential Inhalation SRO Exceedance: VOCs
 - ▭ Remediation Site Boundary

Notes:
 CHL = Chloroform
 PCE = tetrachloroethene
 TCE = trichloroethene
 VC = vinyl chloride
 KP-SB06 (10-12) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Tier 1 Residential Inhalation SRO |
|---------|-----------------------------------|
| CHL | 0.3 |
| PCE | 11 |
| TCE | 5 |
| VC | 0.28 |

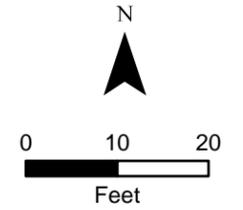
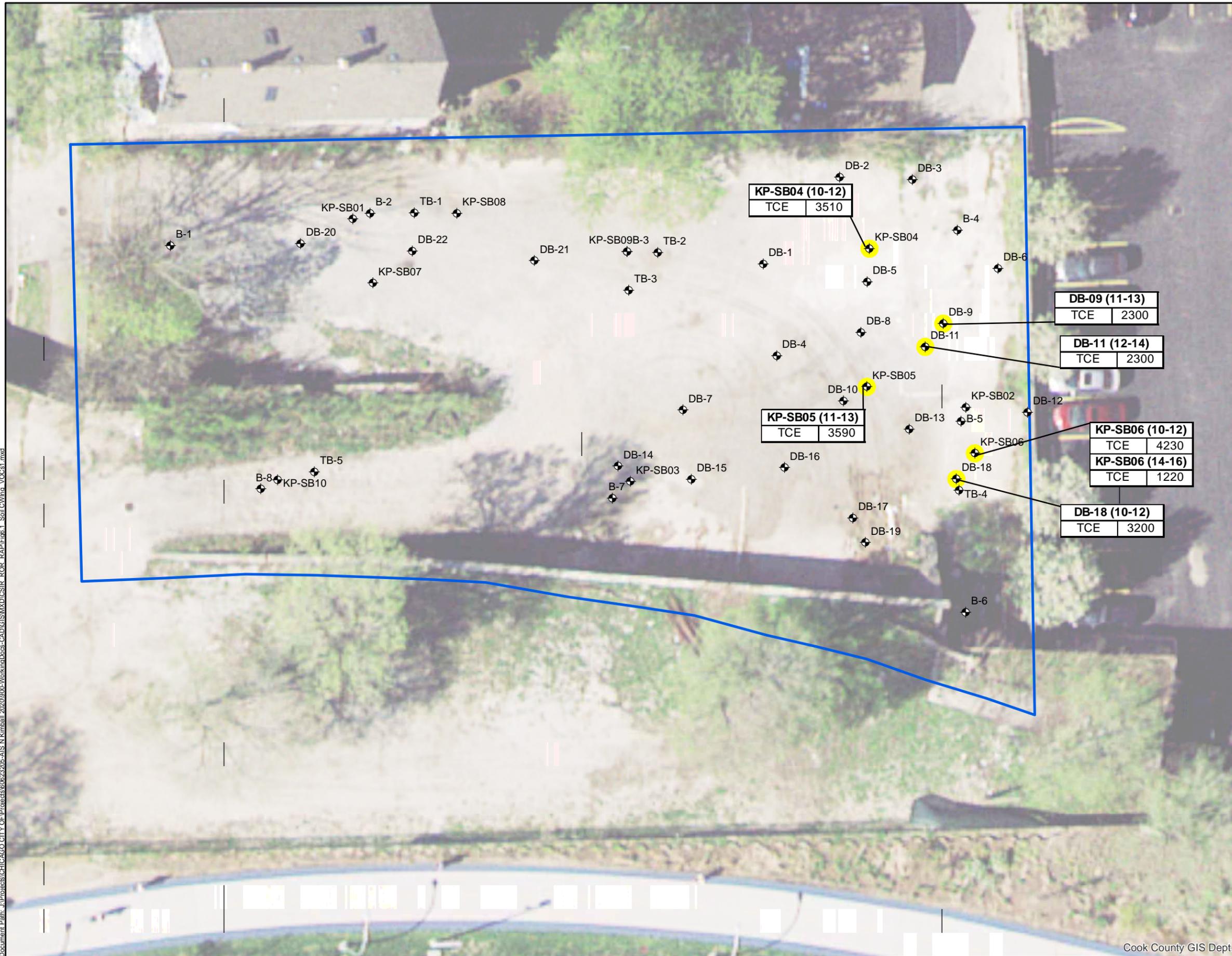
NORTH KIMBALL BROWNFIELD SITE
 1807 - 1815 N. KIMBALL AVENUE
 CHICAGO, ILLINOIS

FIGURE 5
SOIL SAMPLES EXCEEDING TIER 1
RESIDENTIAL INHALATION SROS: VOCs

| | |
|-----------|------------|
| DATE: | 12/16/2020 |
| JOB NO: | 60623205 |
| DRAWN BY: | CHK'D BY: |
| CC | MH |
| SCALE: | AS SHOWN |

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Legend

- ◆ Soil Sample Location
- Deep (> 3 ft) Tier 1 CW Ingestion SRO Exceedance: VOCs
- ▭ Remediation Site Boundary

| | |
|----------------------|------|
| DB-09 (11-13) | |
| TCE | 2300 |

| | |
|----------------------|------|
| DB-11 (12-14) | |
| TCE | 2300 |

| | |
|------------------------|------|
| KP-SB04 (10-12) | |
| TCE | 3510 |

| | |
|------------------------|------|
| KP-SB05 (11-13) | |
| TCE | 3590 |

| | |
|------------------------|------|
| KP-SB06 (10-12) | |
| TCE | 4230 |
| KP-SB06 (14-16) | |
| TCE | 1220 |

| | |
|----------------------|------|
| DB-18 (10-12) | |
| TCE | 3200 |

Notes:
TCE= Trichloroethene
KP-SB06 (10-12) = Sample Location (Depth)
Concentrations shown in mg/kg
Depth shown in feet below ground surface

| Analyte | Tier 1 CW Ingestion SRO |
|---------|-------------------------|
| TCE | 1200 mg/kg |

NORTH KIMBALL BROWNFIELD SITE
1807 - 1815 N. KIMBALL AVENUE
CHICAGO, ILLINOIS

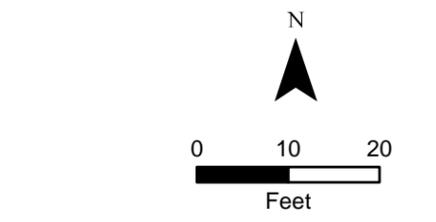
FIGURE 6.1
SOIL SAMPLES EXCEEDING TIER 1
CONSTRUCTION WORKER INGESTION
SROS: VOCs

| | |
|-----------|------------|
| DATE: | 12/16/2020 |
| JOB NO: | 60623205 |
| DRAWN BY: | CC |
| CHK'D BY: | MH |
| SCALE: | AS SHOWN |



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- Legend**
- ◆ Soil Sample Location
 - ◆ Shallow (0-3 ft) Tier 1 CW Ingestion SRO Exceedance: Metals
 - Deep (> 3 ft) Tier 1CW Ingestion SRO Exceedance: Metals
 - ▭ Remediation Site Boundary

Notes:
 Pb = lead
 B-4 (3-6) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Tier 1 CW Ingestion SRO |
|---------|-------------------------|
| Pb | 700 |

| B-4 (3-6) | |
|-----------|-------|
| Pb | 1,100 |

| B-5 (3-6) | |
|-----------|-----|
| Pb | 840 |

| B-6 (0-3) | |
|-----------|-----|
| Pb | 910 |

| B-6 (3-6) | |
|-----------|-------|
| Pb | 2,800 |

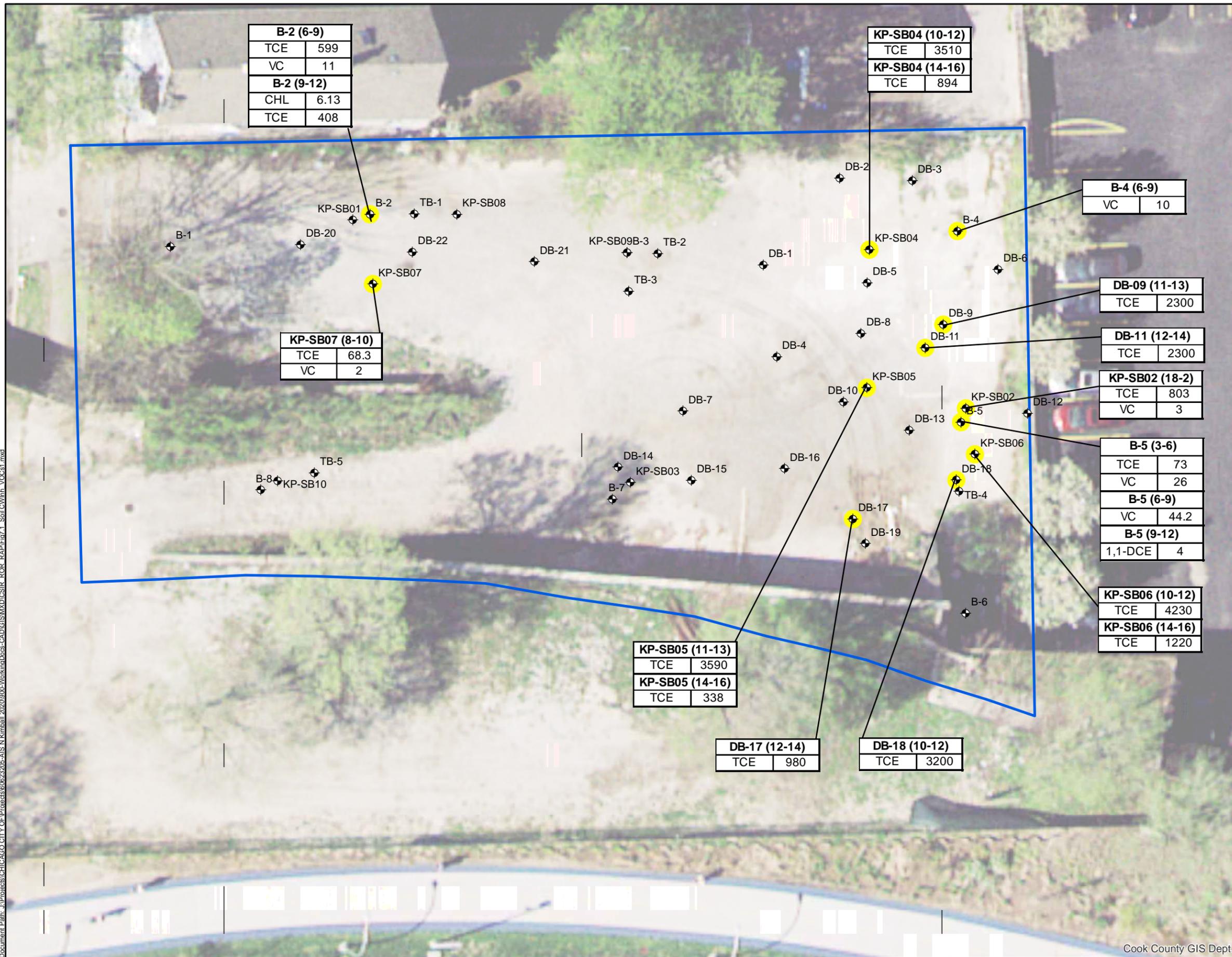
NORTH KIMBALL BROWNFIELD SITE
 1807 - 1815 N. KIMBALL AVENUE
 CHICAGO, ILLINOIS

FIGURE 6-2
SOIL SAMPLES EXCEEDING TIER 1
CONSTRUCTION WORKER INGESTION
SROS: METALS

DATE: 12/16/2020
 JOB NO: 60623205
 DRAWN BY: CC
 CHK'D BY: MH
 SCALE: AS SHOWN

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| B-2 (6-9) | |
|------------|------|
| TCE | 599 |
| VC | 11 |
| B-2 (9-12) | |
| CHL | 6.13 |
| TCE | 408 |

| KP-SB04 (10-12) | |
|-----------------|------|
| TCE | 3510 |
| KP-SB04 (14-16) | |
| TCE | 894 |

| B-4 (6-9) | |
|-----------|----|
| VC | 10 |

| KP-SB07 (8-10) | |
|----------------|------|
| TCE | 68.3 |
| VC | 2 |

| DB-09 (11-13) | |
|---------------|------|
| TCE | 2300 |

| DB-11 (12-14) | |
|---------------|------|
| TCE | 2300 |

| KP-SB02 (18-2) | |
|----------------|-----|
| TCE | 803 |
| VC | 3 |

| B-5 (3-6) | |
|-----------|----|
| TCE | 73 |
| VC | 26 |

| B-5 (6-9) | |
|-----------|------|
| VC | 44.2 |

| B-5 (9-12) | |
|------------|---|
| 1,1-DCE | 4 |

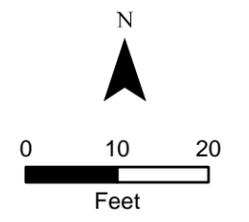
| KP-SB06 (10-12) | |
|-----------------|------|
| TCE | 4230 |

| KP-SB06 (14-16) | |
|-----------------|------|
| TCE | 1220 |

| KP-SB05 (11-13) | |
|-----------------|------|
| TCE | 3590 |
| KP-SB05 (14-16) | |
| TCE | 338 |

| DB-17 (12-14) | |
|---------------|-----|
| TCE | 980 |

| DB-18 (10-12) | |
|---------------|------|
| TCE | 3200 |



Legend

- ⊕ Soil Sample Location
- Deep (>3 ft) Tier 1 CW Inhalation SRO Exceedance: VOCs
- ▭ Remediation Site Boundary

Notes:

1,1-DCE = 1,1-dichloroethene
 CHL = chloroform
 TCE = trichloroethene
 VC = vinyl chloride
 B-4 (8-9) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Tier 1 Residential Inhalation SRO |
|---------|-----------------------------------|
| 1,1-DCE | 3.0 |
| CHL | 0.76 |
| TCE | 12 |
| VC | 1.1 |

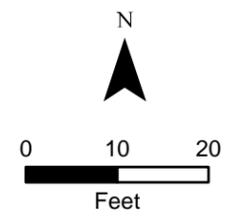
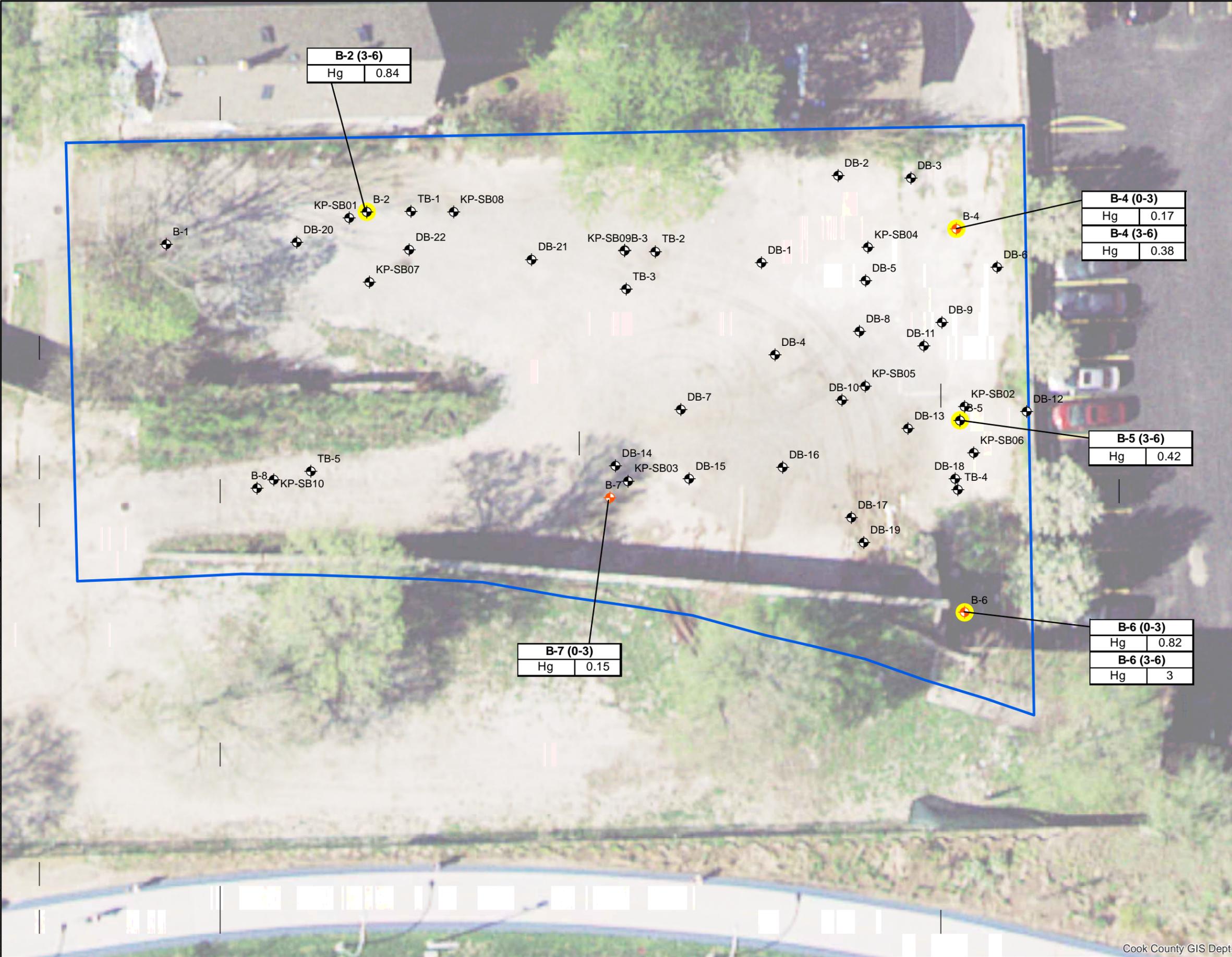
NORTH KIMBALL BROWNFIELD SITE
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 CHICAGO, ILLINOIS

FIGURE 7-1
SOIL SAMPLES EXCEEDING TIER 1
CONSTRUCTION WORKER INHALATION
SROS: VOCs

| | |
|-----------|------------|
| DATE: | 12/16/2020 |
| JOB NO: | 60623205 |
| DRAWN BY: | CC |
| CHK'D BY: | MH |
| SCALE: | AS SHOWN |

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- Legend**
- Soil Sample Location
 - Shallow (0-3 ft) Tier 1 CW Inhalation SRO Exceedance: Metals
 - Deep (> 3 ft) Tier 1 CW Inhalation SRO Exceedance: Metals
 - Remediation Site Boundary

Notes:
 Hg = Mercury
 B-4 (8-9) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Tier 1 CW Inhalation SRO |
|---------|--------------------------|
| Hg | 0.1 |

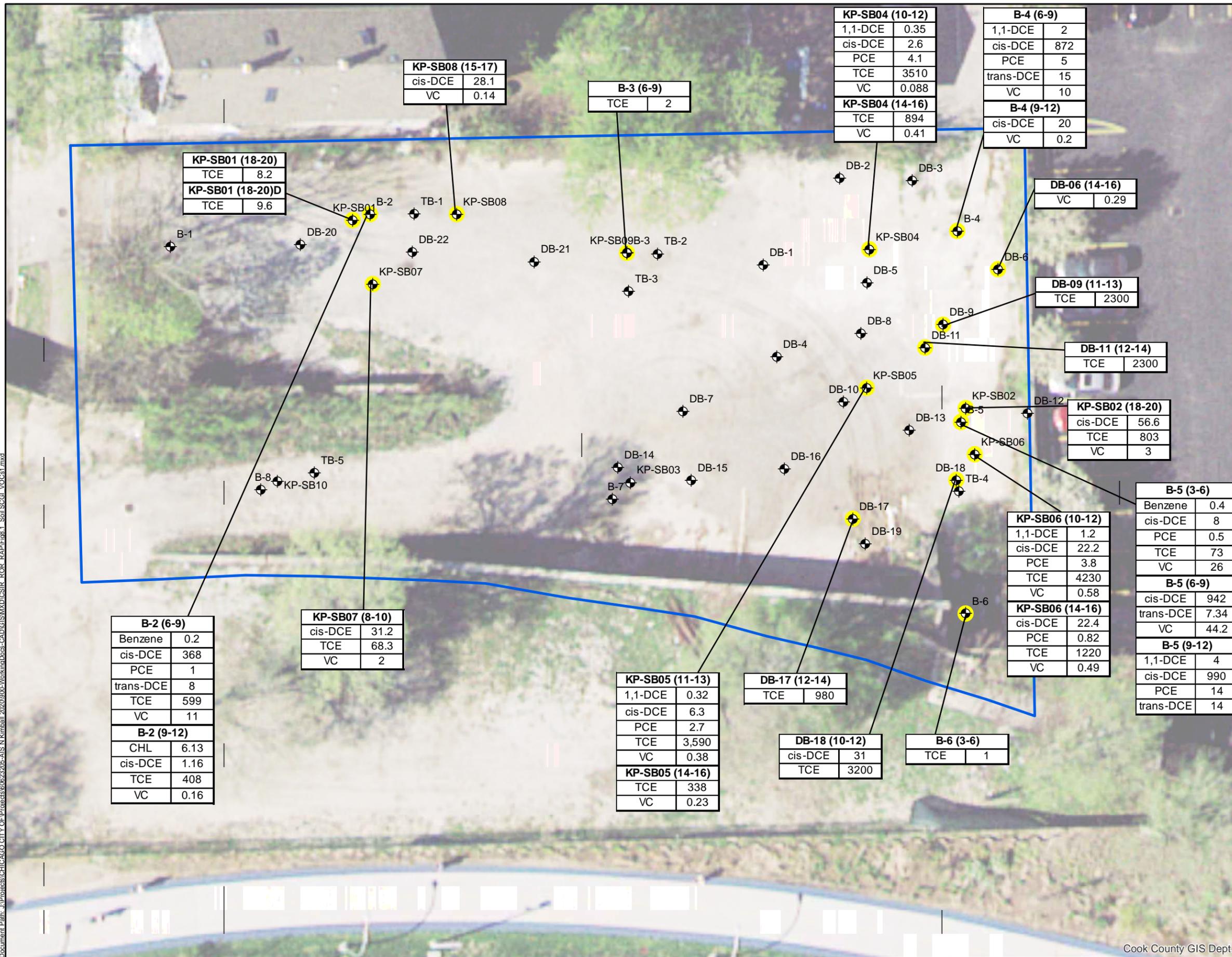
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FIGURE 7-2
SOIL SAMPLES EXCEEDING TIER 1
CONSTRUCTION WORKER INHALATION
SROS: METALS

| | |
|-----------|------------|
| DATE: | 12/16/2020 |
| JOB NO: | 60623205 |
| DRAWN BY: | CHK'D BY: |
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N

0 10 20
Feet

Legend

- Soil Sample Location
- Deep (> 3 ft) Tier 1 SCGI SRO Exceedance: VOCs
- Remediation Site Boundary

Note:
 CHL = chloroform
 1,1-DCE = 1,1-dichloroethene
 cis-DCE = cis-1,2-dichloroethene
 PCE = tetrachloroethene
 trans-DCE = trans-1,2-dichloroethene
 TCE = trichloroethene
 VC = vinyl chloride

B-4 (8-9) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Tier 1 Soil Component of Groundwater Ingestion SRO |
|-----------|--|
| Benzene | 0.17 |
| CF | 2.9 |
| 1,1-DCE | 0.3 |
| cis-DCE | 1.1 |
| PCE | 0.3 |
| trans-DCE | 3.4 |
| TCE | 0.3 |
| VC | 0.07 |

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FIGURE 8-1
 SOIL SAMPLES EXCEEDING TIER 1 SOIL COMPONENT OF THE GROUNDWATER INGESTION SROS: VOCs

| | |
|-----------|------------|
| DATE: | 12/16/2020 |
| JOB NO: | 60623205 |
| DRAWN BY: | CHK'D BY: |
| HT | MH |
| SCALE: | AS SHOWN |

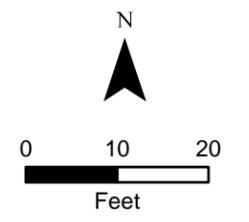
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| B-8 (0-3) | |
|-----------|------|
| BAA | 9.27 |



Legend

- ◆ Soil Sample Location
- ◆ Shallow (0-3 ft) Tier 1 SCGI SRO Exceedance: PAHs
- ▭ Remediation Site Boundary

Notes:
 BAA = benzo(a)anthracene
 B-4 (8-9) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Tier 1 Soil Component of Groundwater Ingestion SRO |
|---------|--|
| BAA | 8 |

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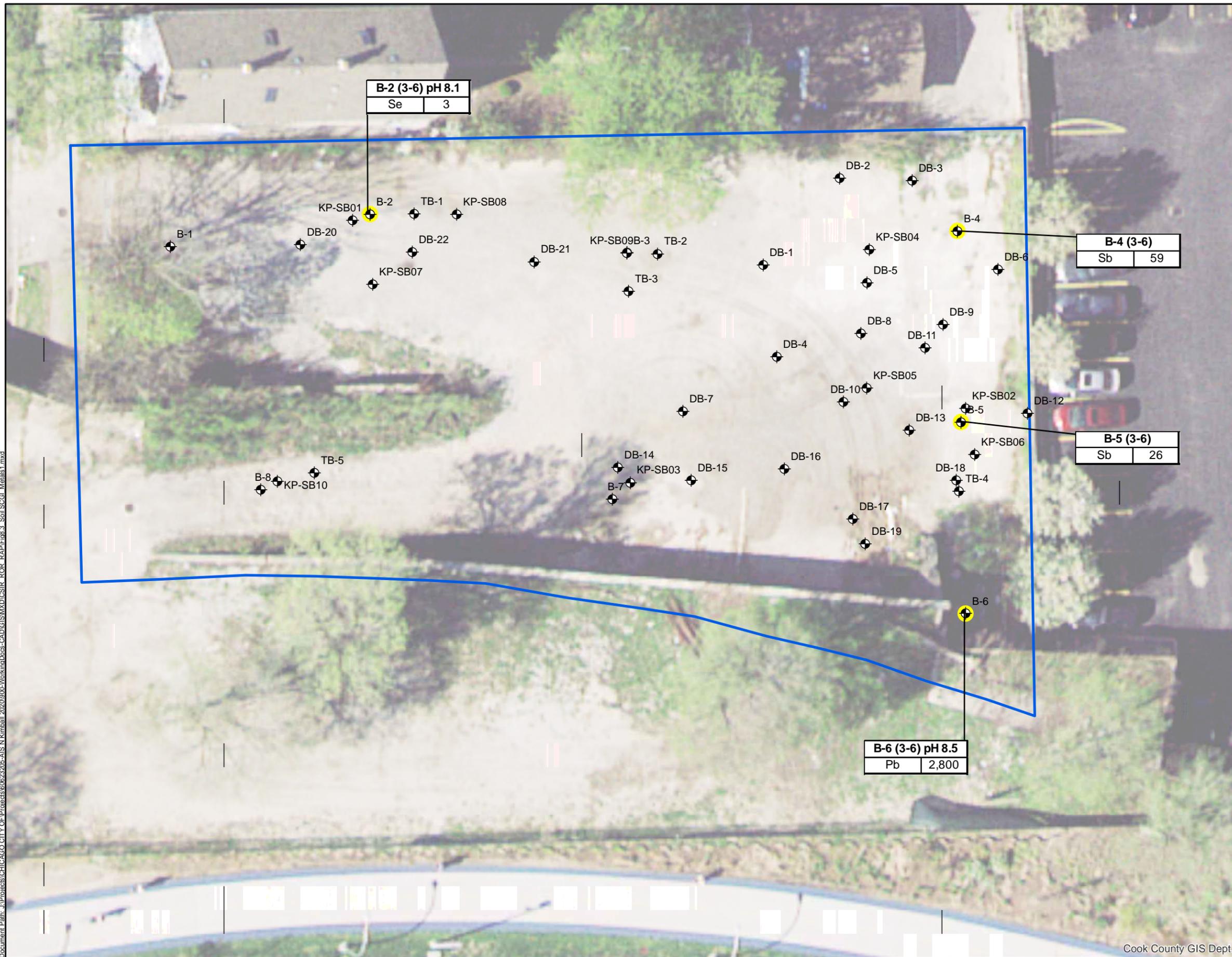
FIGURE 8-2
 SOIL SAMPLES EXCEEDING TIER 1 SOIL COMPONENT OF THE GROUNDWATER INGESTION SROS: PAHS

| | |
|-----------|------------|
| DATE: | 12/16/2020 |
| JOB NO: | 60623205 |
| DRAWN BY: | CHK'D BY: |
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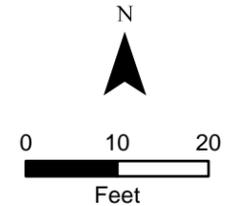


| B-2 (3-6) pH 8.1 | |
|------------------|---|
| Se | 3 |

| B-4 (3-6) | |
|-----------|----|
| Sb | 59 |

| B-5 (3-6) | |
|-----------|----|
| Sb | 26 |

| B-6 (3-6) pH 8.5 | |
|------------------|-------|
| Pb | 2,800 |



Legend

- ⊕ Soil Sample Location
- Deep (> 3 ft) Tier 1 SCGI SRO Exceedance: Metals
- ▭ Remediation Site Boundary

Notes:
 Sb = antimony
 Pb = lead
 Se = Selenium

B-4 (8-9) = Sample Location (depth in feet)
 Concentrations shown in mg/kg

| Analyte | Tier 1 Soil Component of Groundwater Ingestion SRO |
|---------|--|
| Sb | 20 |
| Pb | 1420 |
| Se | 2.4 |

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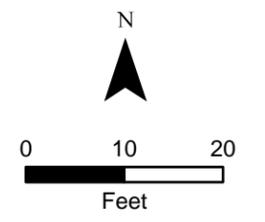
FIGURE 8-3
 SOIL SAMPLES EXCEEDING TIER 1 SOIL COMPONENT OF THE GROUNDWATER INGESTION SROS: METALS

| | |
|-----------|------------|
| DATE: | 12/16/2020 |
| JOB NO: | 60623205 |
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| CHK'D BY: | MH |
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Legend

- Groundwater Monitoring Well
- Tier 1 GW Ingestion Exceedance: VOCs
- Remediation Site Boundary

Notes:

CHL = chloroform
 1,1-DCE = 1,1-dichloroethene
 1,2-DCA = 1,2-dichloroethane
 cis-DCE = cis-1,2-dichloroethene
 PCE = tetrachloroethene
 TCE = trichloroethene
 VC = vinyl chloride

Concentrations shown in mg/L

| Analyte | Class II Groundwater Ingestion GRO |
|-----------|------------------------------------|
| CHL | 0.001 |
| 1,1-DCE | 0.035 |
| 1,2-DCA | 0.025 |
| cis-DCE | 0.2 |
| PCE | 0.025 |
| trans-DCE | 0.5 |
| 1,1,2-TCA | 0.05 |
| TCE | 0.025 |
| VC | 0.01 |

KP-MW-01

| | |
|-----|--------|
| CHL | 0.0098 |
| TCE | 0.22 |
| VC | 0.022 |

MW-5

| | |
|-----|-------|
| TCE | 0.033 |
|-----|-------|

MW-6

| | |
|---------|-------|
| cis-DCE | 0.50 |
| TCE | 0.26 |
| VC | 0.062 |

KP-MW-02

| | |
|-----------|-------|
| 1,1-DCE | 4.4 |
| 1,2-DCA | 0.030 |
| cis-DCE | 69 |
| PCE | 0.10 |
| trans-DCE | 6.3 |
| 1,1,2-TCA | 0.13 |
| TCE | 350 |
| VC | 7.4 |

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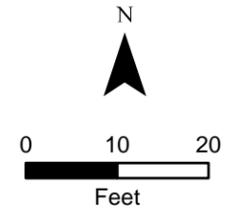
FIGURE 9-1
GROUNDWATER SAMPLES EXCEEDING TIER 1
GROUNDWATER INGESTION GROs: VOCs

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 JOB NO: 60623205
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 CHK'D BY: MH
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Legend

- Groundwater Monitoring
- Tier 1 GW Ingestion Exceedance: Metals
- Remediation Site

Notes:
Fe = Iron

Concentrations shown in mg/L

| Analyte | Class II Groundwater Ingestion GRO |
|---------|------------------------------------|
| Fe | 5 |

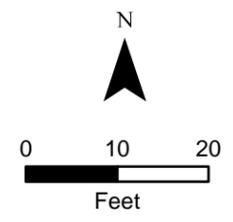
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FIGURE 9-2
GROUNDWATER SAMPLES EXCEEDING TIER 1
GROUNDWATER INGESTION GROs: METALS

| | |
|-----------|------------|
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| JOB NO: | 60623205 |
| DRAWN BY: | CHK'D BY: |
| HT | MH |
| SCALE: | AS SHOWN |

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- Legend**
- Groundwater Monitoring Well
 - Tier 1 GW Indoor Inhalation Exceedance: VOCs
 - ▲ Soil Vapor Point
 - ▲ Tier 1 SG Indoor Inhalation Exceedance: VOCs
 - Remediation Site Boundary

Notes:
 TCE = trichloroethene
 VC = vinyl chloride

Groundwater concentrations shown in mg/L
 Soil gas concentrations shown in mg/m³

| Analyte | Indoor Inhalation Residential GRO (mg/L) |
|---------|--|
| TCE | 0.025 |
| VC | 0.01 |

| Analyte | Indoor Inhalation Residential SGRO (mg/m ³) |
|---------|---|
| TCE | 1.5 |
| VC | 0.29 |

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 1807 - 1815 N. KIMBALL AVENUE
 CHICAGO, ILLINOIS

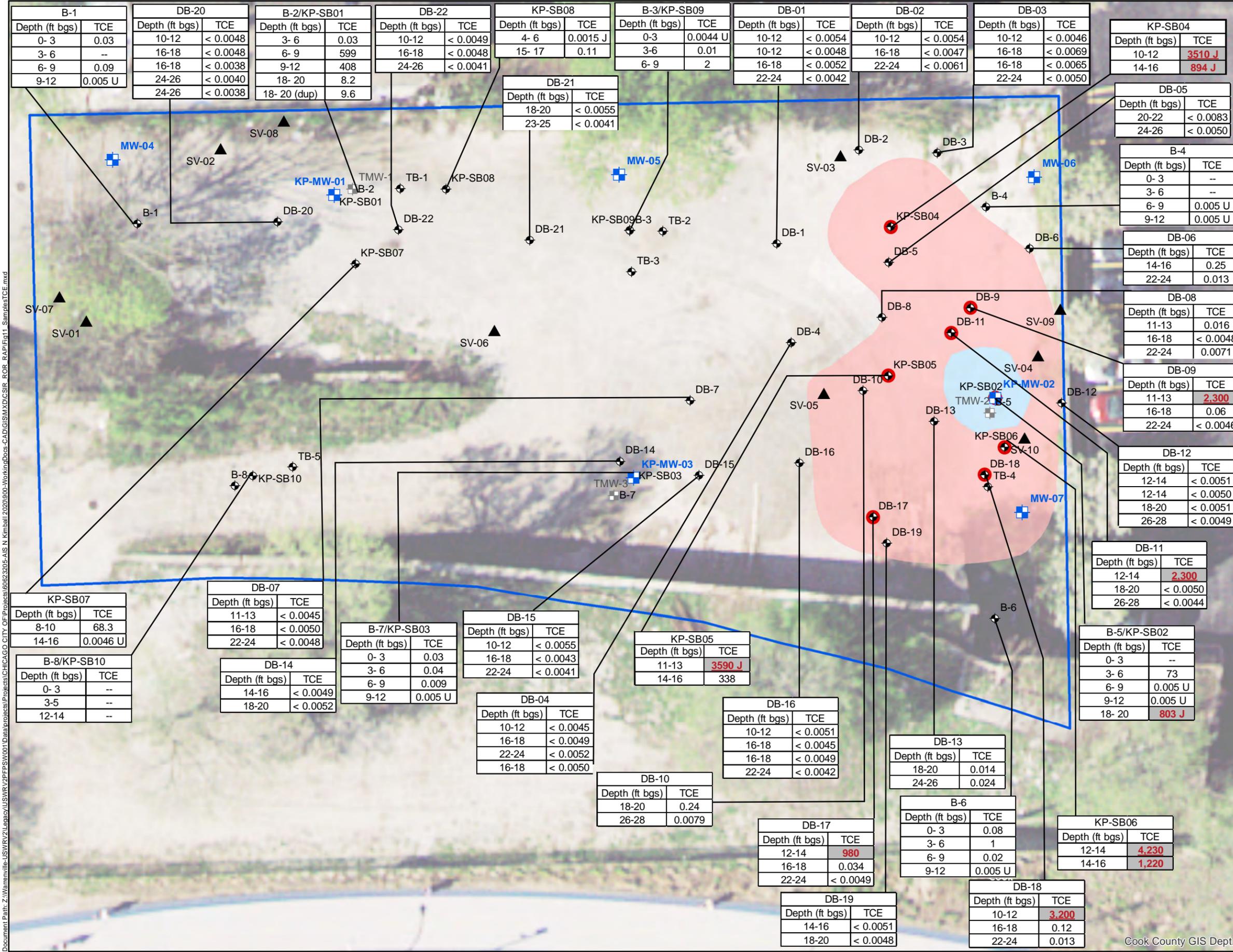
FIGURE 10
 GROUNDWATER AND SOIL GAS SAMPLES EXCEEDING TIER 1 INDOOR INHALATION ROS: VOCs

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 JOB NO: 60623205
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 CHK'D BY: MH
 SCALE: AS SHOWN



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Legend

- Temporary Monitoring Well
- Groundwater Monitoring Well
- Soil Vapor Point
- Soil Sample Location
- TCE exceeds C_{sat} limit
- TCE Cs_{at} Remediation Area Limit (8-20 ft bgs)
- TCE Cs_{at} Remediation Area Limit (8-16 ft bgs)
- Remediation Site Boundary

Note:

1. The locations of previously installed soil borings, monitoring wells and soil vapor points are based on:
 - a. Reports prepared by other firms as documented in the 2021 CSIR/ROR/RAP
 - b. Additional investigation completed by AECOM/EDI in October 2018. Soil borings included DB-1 to DB-22 and soil vapor points included SV-7, SV-8, SV-9 and SV-10.
2. Results that exceeded Trichloroethene (TCE) Cs_{at} limit are shown in red/bold. Results exceeding outdoor inhalation are underlined.
3. ft bgs = feet below ground surface
4. -- sample not collected and/or TCE not analyzed

NORTH KIMBALL BROWNFIELD SITE
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FIGURE 11
SUMMARY OF TCE SOIL CONCENTRATIONS & PROPOSED TCE CSAT REMEDIATION AREA

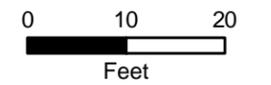
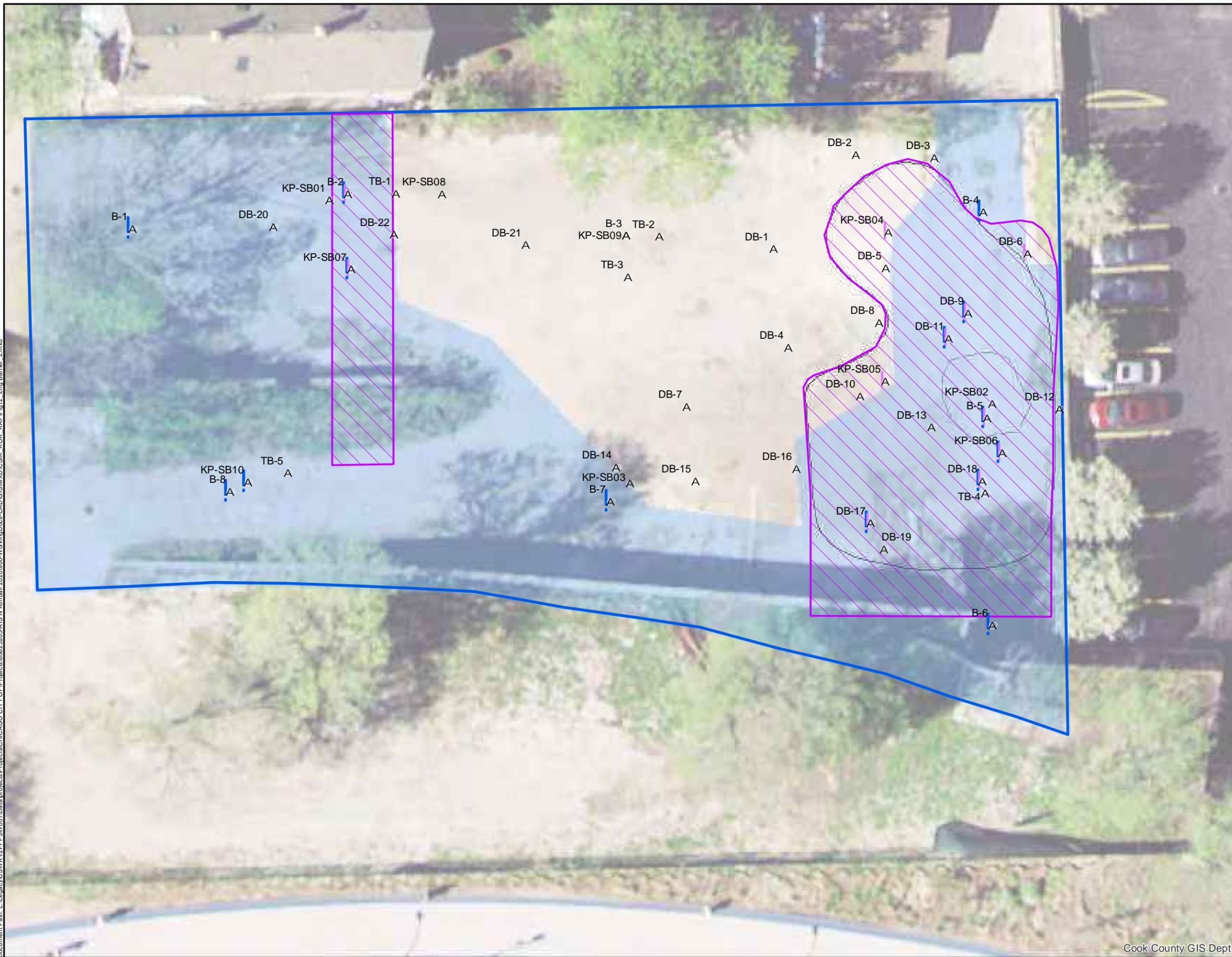
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 CHK'D BY: MH
 SCALE: AS SHOWN

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Legend

- A Soil Sample Location
- Residential Inhalation RO Exceedance
- Residential Ingestion RO Exceedance

Type

- Potential Engineered Barrier - Inhalation
- Potential Engineered Barrier - Ingestion

TCE Csat Remediation Area

- TCE Csat Remediation Area Limit (8-16 ft bgs)
- TCE Csat Remediation Area Limit (8-20 ft bgs)
- Remediation Site Boundary

Note:

1. The locations of previously installed soil borings, monitoring wells and soil vapor points are based on
 - a. Reports prepared by other firms as documented in the 2021 CSIR/ROR/RAP
 - b. Additional investigation completed by AECOM/EDI in October 2018. Soil borings included DB-1 to DB-22 and soil vapor points included SV-7, SV-8, SV-9 and SV-10.
2. ft bgs = feet below ground surface

NORTH KIMBALL BROWNFIELD SITE
 1807 - 1815 N. KIMBALL AVENUE
 CHICAGO, ILLINOIS

FIGURE 12
SUMMARY OF RESIDENTIAL RO EXCEEDANCES
AND POTENTIAL ENGINEERED BARRIERS

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