

**521 EAST TREMONT AVENUE  
BRONX, NEW YORK**

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**Draft Remedial Investigation Work Plan**

**NYSDEC BCP Site No.: TBD  
AKRF Project Number: 190204**

**Prepared For:**

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## 1.0 INTRODUCTION

This Remedial Investigation Work Plan (RIWP) has been prepared by AKRF, Inc. (AKRF) on behalf of M521 Tremont LLC (the Applicant), for the property located at 521 East Tremont Avenue in the Tremont section of the Bronx, New York, hereafter referred to as the “Site.” The Site is identified by the City of New York as Borough of the Bronx, Tax Block 3043, Lot 77 (formerly Lots 46, 72, 77, and 80).

Currently, the Site consists of two commercial buildings in the southern portion of the Site, and adjacent parking lots to the north and east. The southeastern portion of the Site (formerly Lot 77) is improved with a three-story commercial building (with a cellar) currently occupied by a pizzeria, check cashing facility, and brokerage firm on the first floor; and a healthcare facility on the second floor. The third floor is currently vacant. The southwestern portion of the Site (formerly Lot 80) is improved with a slab-on-grade one-story commercial building occupied by a restaurant, a cellular telephone store, and a party supply store. The Site is abutted to the north by a funeral home, a school, and an active construction site; to the south by East Tremont Avenue, followed by commercial use buildings; to the east by Third Avenue, followed by mixed-use buildings and a church; and to the west by commercial uses and Bathgate Avenue, followed by commercial uses and a daycare center. The surrounding area comprises predominantly mixed-use commercial/residential with some industrial uses and public facilities. A Site Location Map is provided as Figure 1, and a Site Plan is provided as Figure 2.

The Applicant is applying for entry into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as a Volunteer. A Subsurface (Phase II) Investigation was conducted by AKRF in July 2019 and documented in a Subsurface (Phase II) Investigation Report dated August 2019. The previous investigation identified elevated levels of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and metals in soil; chlorinated volatile organic compounds (CVOCs) and metals in groundwater; and petroleum-related VOCs and CVOCs in soil vapor.

This RIWP describes the procedures to be used to define the nature and extent of contamination at the Site. The data compiled from the Remedial Investigation (RI), as described in this RIWP, will be used to prepare an RI Report (RIR). All work will be completed in accordance with this RIWP, which includes a Quality Assurance Project Plan (QAPP) (Appendix A) and a Health and Safety Plan (HASP) (Appendix B) and Community Air Monitoring Plan (CAMP) (Appendix C). The CAMP will be implemented during all subsurface investigation activities involving soil disturbance at the Site.

Contact information for the parties responsible for the work described in this RIWP are included in Table 1:

**Table 1**  
**Remedial Investigation Personnel Contact Information**

Company	Individual Name	Title	Contact Number
NYSDEC	TBD	Project Manager	TBD
NYSDOH	TBD	Project Manager	TBD
AKRF	Deborah Shapiro	Project Director, QEP	(646) 388-9544
	Adrianna Bosco	Project Manager	(646) 388-9576
	Claire Bearden	Field Team Leader/Site Safety Officer (SSO)	(336)-266-9330 (cell)
	Antonio Cardenas	Alternate Field Team Leader/SSO	(718) 551-7193 (cell)
M521 Tremont LLC	Michelle Ponce	Applicant’s Representative	(718) 663-2065

## 2.0 SITE DESCRIPTION AND HISTORY

### 2.1 Site Description and Surrounding Land Use

The Site consists of an approximately 0.57-acre parcel located at 521 East Tremont Avenue in the Tremont section of the Bronx, New York, and is identified by the City of New York as Borough of Bronx Tax Block 3043, Lot 77 (formerly Lots 46, 72, 77, and 80). Currently, the Site consists of two commercial buildings in the southern portion of the Site, and adjacent parking lots to the north and east. The southeastern portion of the Site (formerly Lot 77) is improved with a three-story commercial building (with a cellar) currently occupied by a pizzeria, check cashing facility, and brokerage firm on the first floor; and a healthcare facility on the second floor. The third floor is currently vacant. The southwestern portion of the Site (formerly Lot 80) is improved with a slab-on-grade one-story commercial building occupied by a restaurant, a cellular telephone store, and a party supply store. The surrounding area comprises predominantly residential and commercial uses. A surrounding land use map is provided as Figure 3.

### 2.2 Site Geology, Hydrogeology, and Subsurface Characteristics

The Site is approximately 60 to 70 feet above the North American Vertical Datum (NAVD) of 1988 (an approximation of mean sea level).

During AKRF's July 2019 Subsurface (Phase II) Investigation, the stratigraphy beneath the Site consisted of fill material (comprising sand, silt, gravel, ash, and brick) from just below the pavement surface to approximately 5 to 20 feet below grade, underlain by apparent native material consisting of sand, gravel, and silt. Groundwater was measured in three temporary wells between approximately 1 foot below cellar level and 18 feet below street grade. Based on topography, groundwater would be anticipated to flow in a southwesterly direction. However, actual groundwater flow direction can be affected by many factors, including subsurface openings or obstructions such as subway tunnels, basements, utilities, bedrock geology, and other factors beyond the scope of this assessment. Groundwater in the Bronx is not used as a source of potable water.

### 2.3 Proposed Development Plan

Redevelopment plans are still being prepared; however, the anticipated use post-remediation will include construction of a 14-story mixed-use residential/commercial building with at-grade parking. Commercial space will occupy the first floor. The second floor will contain community facility space and residential units and the remaining upper floors will contain only residential units.

### 2.4 Site History

Available records indicated that the Site was developed with residential buildings as early as 1901 and various commercial uses between approximately 1915 through present-day. Historical site operations included a printing facility (Tremont Printing Co.) in the southeastern portion of the Site between approximately 1915 and 1927. A dry cleaner was located in the northeastern portion of the Site between approximately 1961 and 1980.

Historic City Directories indicated that the Site was operated by various offices, and commercial uses throughout its history, including retail, bakeries, a locksmith, a butcher, and an auto repair shop in approximately 2010.

### 3.0 PREVIOUS ENVIRONMENTAL REPORTS

Copies of previous reports prepared for the Site are included in Appendix D, and summarized below:

*Geotechnical Investigation Report – Proposed 14-Story Mixed-Use Building, 521 East Tremont Ave., Bronx, New York, SESI Consulting Engineers, May 2019*

SESI Consulting Engineers (SESI) conducted a geotechnical investigation at the Site in May 2019. Nine borings were advanced within the footprint of the proposed building and within the adjacent sidewalks to a maximum depth of approximately 68 feet below grade. One test pit was excavated in the western portion of the Site down to approximately 8 feet below grade to determine the depth of the adjacent building's footing. The stratigraphy beneath the Site consisted of surficial materials (asphalt and concrete) between 4 and 10 inches thick, underlain by historic fill material up to approximately 8 to 14 feet below grade. Underlying the fill layer was a light brown/gray alluvial deposit clayey-silt with varying amounts of fine sand. The alluvial layer was encountered in two borings located along the northeastern portion of the Site, adjacent to Third Avenue. Glacial till, consisting of brown/gray fine to medium sand with clayey-silt and fine to medium gravel, was found to be underlying the existing fill. Glacial till ranged in thickness from 2 to 27 feet thick. Bedrock was encountered at depths ranging from approximately 10 feet below grade in the western portion of the Site to approximately 63 feet below grade in the eastern portion of the Site. Groundwater was encountered in four of the borings at depths between 9 to 20 feet below grade. Split-spoon soil samples were collected in accordance with ASTM D1586.

*Phase I Environmental Site Assessment – 521 East Tremont Avenue, Block 3043, Lots 46, 72, 77, and 80, Bronx, New York, ALC Environmental, May 2019*

ALC Environmental (ALC) was contracted by M521 Tremont LLC to conduct a Phase I Environmental Site Assessment (ESA) of the Site. The Phase I ESA was performed in general conformance with the scope and limitations of the American International (ASTM) Practice E1527-13. The report identified the following Recognized Environmental Conditions (RECs):

- According to the historical Fire Insurance (Sanborn) maps and city directories reviewed, a printing facility (identified as 'Tremont Printing Co.')
- The historical records reviewed indicated that Lot 72 (4223-4229 Third Avenue) was previously improved with a single-story commercial building. This former building was occupied by a dry cleaning facility identified as 'Hyvee French Cleaners' between at least 1961 and 1980. Dry cleaning activities typically generated hazardous wastes consisting of halogenated solvents such as tetrachloroethylene (PCE). This former building was razed sometime between 1981 and 1984, and the site was converted into the existing paved, outdoor parking lot. Based on the lack of hazardous waste regulations prior to the 1970s and the length of operation of this former drycleaners, the historical use of the Site for dry-cleaning purposes constitutes a REC.

*Subsurface (Phase II) Site Investigation, 521 East Avenue, Bronx, New York 10457, AKRF, Inc., August 2019.*

AKRF conducted a Subsurface Investigation at the Site in July 2019. The scope of work for the investigation included a geophysical survey; the advancement of 6 soil borings with the collection and laboratory analysis of 11 soil samples; the installation of 3 temporary groundwater monitoring wells, with the collection and

laboratory analysis of 3 groundwater samples; and the installation of 4 soil vapor samples, with the collection and laboratory analysis of 4 soil vapor samples.

Two soil samples were collected for laboratory analysis from each boring: one from the top 2 feet of soil below existing pavement, and one from the 2-foot interval below the proposed excavation depth (approximately 10 feet below grade). Due to shallow groundwater encountered in boring SB-03, only one shallow soil sample was collected at that location. The soil samples were analyzed for Target Compound List (TCL) VOCs by United States Environmental Protection Agency (EPA) Method 8260, TCL semivolatile organic compounds (SVOCs) by EPA Method 8270, polychlorinated biphenyls (PCBs) by EPA Method 8082, pesticides by EPA Method 8081, Target Analyte List (TAL) metals (6000/7000 series), and hexavalent chromium by EPA Method 7196, in accordance with Category B deliverables.

The temporary monitoring wells were installed approximately 5 feet below the water table. One groundwater sample was collected from each temporary monitoring well and analyzed for TCL VOCs by EPA Method 8260, TCL SVOCs by EPA Method 8270, PCBs by EPA Method 8082, pesticides by EPA Method 8081, and total and dissolved TAL metals (6000/7000 series) in accordance with Category B deliverables. For Quality Assurance/Quality Control (QA/QC) purposes, one trip blank sample was submitted with the collected groundwater samples and analyzed for VOCs only.

Four soil vapor points were installed to approximate depths ranging from 1.5 to 10 feet below grade, depending on depth to groundwater. The soil vapor samples were analyzed for VOCs by EPA Method TO-15.

The following is a summary of the findings:

- The stratigraphy beneath the Site consisted of historic fill comprising sand, silt, gravel, brick, with trace amounts of wood, metal, glass, and ceramic fragments from just below surface grade to approximately 3 to 15 feet below grade. The fill material was underlain by apparent native soil consisting of brown sand, silt, gravel, and clay between approximately 3 and 30 feet below grade (boring terminus). Groundwater was measured in three temporary wells between approximately 1 foot below basement grade and 15 to 18 feet below street grade. Based on topography, groundwater would be anticipated to flow in a southwesterly direction. Presumed shallow bedrock was encountered in 4 of the 6 soil borings at depths ranging from approximately 7 to 18.5 feet below grade.
- Photoionization detector (PID) readings up to 96.7 parts per million (ppm) and a petroleum-like odor were detected between 5 and 6 feet below grade in boring SB-06 (located on the southwestern portion of Lot 80). No visual or olfactory evidence of contamination was noted in any other soil boring.

#### Soil Analytical Results

- Nine VOCs were detected in the soil samples above laboratory reporting limits at concentrations ranging from 0.00054 milligrams per kilogram (mg/kg) to 33 mg/kg. Acetone, cis-1,2-dichloroethylene, methylene chloride, toluene, and total xylenes were detected above the NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs) in one or more samples. No other VOCs were detected above UUSCOs and/or Restricted Residential SCOs (RRSCOs).
- Twenty-five SVOCs were detected in the soil samples at concentrations ranging from 0.0081 mg/kg to 6.4 mg/kg. Detections primarily consisted of polycyclic aromatic hydrocarbons (PAHs), a class of compounds commonly found in some petroleum products, ash, and historic fill material. Seven PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were detected at concentrations exceeding UUSCOs and/or RRSCOs, ranging from 0.40 mg/kg to 5.1 mg/kg.

- Four pesticides, dieldrin, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT, were detected above the UUSCOs at concentrations ranging from 0.0077 mg/kg to 0.23 mg/kg. No pesticides were detected above their respective RRSCOs.
- Total PCBs were detected above laboratory reporting in two samples (SB-05\_0-2\_20190710 and SB-06\_5-7\_20190712). PCBs were not detected above the UUSCOs or RRSCOs.
- Twenty-three metals were detected in the soil samples at concentrations ranging from 0.19 mg/kg to 1,410 mg/kg, above UUSCOs and/or RRSCOs. The following metals were detected at concentrations above RRSCOs: arsenic (maximum concentration of 51.7 mg/kg), barium (maximum concentration of 1,410 mg/kg), lead (maximum concentration of 933 mg/kg), and mercury (maximum concentration of 0.95 mg/kg).

#### Groundwater Analytical Results

- Eight VOCs were detected above laboratory reporting limits in the groundwater samples at concentrations ranging from 0.50 to 200 micrograms per liter ( $\mu\text{g/L}$ ). Cis-1,2-dichloroethylene, PCE, trichloroethylene (TCE), and vinyl chloride were detected in groundwater sample TW-02\_20190710 at concentrations ranging from 14 to 200  $\mu\text{g/L}$ , above the NYSDEC Ambient Water Quality Standards and Guidance Values (AWQSGVs). PCE was also detected in sample TW-05\_20190710 above the AWQSGV of 5  $\mu\text{g/L}$ . No other VOCs were detected above laboratory reporting limits in the groundwater samples. No VOCs were detected in the aqueous trip blank.
- SVOCs, pesticides, and PCBs were not detected above laboratory reporting limits in any groundwater samples.
- Six metals (chromium, iron, lead, magnesium, manganese, and sodium) detected at concentrations above their respective AWQSGVs in the unfiltered (total) metals analysis in groundwater. Four metals (iron, magnesium, manganese, and sodium) were detected at concentrations above their respective AWQSGVs in the filtered (dissolved) metals analysis in groundwater.

#### Soil Vapor Analytical Results

- Twenty-six VOCs were detected in the soil vapor samples. VOCs associated with petroleum, including 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-ethyltoluene, benzene, ethylbenzene, m,p-xylenes, n-heptane, n-hexane, o-xylene, and toluene were detected at individual concentrations up to 180 micrograms per cubic meter ( $\mu\text{g/m}^3$ ) (toluene detected in sample SV-03\_20190712). Solvent-related VOCs, including acetone, PCE, and TCE were detected at individual concentrations up to 1,800  $\mu\text{g/m}^3$  (acetone detected in sample SV-01\_20190710).

Soil concentrations above the UUSCOs and RRSCOs, and groundwater concentrations above the AWQSGVs are shown on Figure 4 and 5, respectively. Soil vapor detections are shown on Figure 6.

### **3.1 Areas of Concern (AOCs)**

Based on the Site's history and previous reports prepared for the Site, the AOCs for the RI include:

1. The Site's historic use as a dry cleaner and printer.
2. Elevated concentrations of chlorinated solvents in groundwater.
3. Elevated concentrations of VOCs and PAHs in soil.



## 4.0 FIELD PROGRAM

The RI field program will focus on collecting soil, groundwater, and soil vapor data to further define and characterize the nature and extent of Site contamination and to assist with determining the appropriate remedial action.

### 4.1 Field Program Summary

The field scope of work (SOW) includes: a geophysical survey; the advancement of 11 soil borings with continuous sample collection and laboratory analysis of soil samples from each boring; the installation of 7 permanent groundwater monitoring wells with the collection and laboratory analysis of 7 groundwater samples; the installation of 8 temporary soil vapor probes with the collection and laboratory analysis of 4 soil vapor and 4 sub-slab soil vapor samples; and the collection and the laboratory analysis of 3 indoor air samples. The proposed sample locations are shown on Figure 7.

The soil boring and temporary soil vapor point locations will be surveyed using a Global Positioning System (GPS) and will be measured using fixed points in the field. The groundwater monitoring wells will be surveyed by a New York State-licensed surveyor. Any field evidence of contamination (visual, olfactory, and/or elevated PID readings) will be recorded on logs for inclusion in the RIR. All sampling equipment will be either dedicated or decontaminated between sampling locations.

The aforementioned SOW will be conducted by AKRF and its subcontractors. Qualifications for AKRF personnel are included in Section 2.0 of Attachment A. The following sections describe the methods that will be used to complete the aforementioned SOW.

### 4.2 Geophysical Survey

A geophysical survey, including ground-penetrating radar (GPR) and magnetometry, will be performed across exterior portions of the Site, that were previously inaccessible, to investigate the presence of potential USTs and underground utilities, and to clear the proposed sampling locations. GPR uses electromagnetic wave propagation and scattering to image and identify changes in electrical and magnetic properties in the ground. Magnetometers measure irregularities in the magnetic field in a given area. Any anomalies indicative of UST(s) will be marked in the field, measures from fixed points in the field, and surveyed using GPS.

### 4.3 Soil Boring Advancement and Soil Sampling

A Geoprobe™ direct-push drill rig will be used to advance soil borings RI-SB-01 through RI-SB-11 at the approximate locations shown on Figure 7. Additional drilling techniques may be required for soil borings that are converted into permanent groundwater monitoring wells. Soil cores will be collected in 5-foot long, 2-inch diameter, stainless steel macrocore piston rod samplers fitted with internal, dedicated acetate liners. Soil borings will be advanced to bedrock or the groundwater table, whichever is encountered first. Soil samples will be inspected by AKRF field personnel for evidence of contamination (e.g., odors, staining, etc.), screened for the presence of VOCs with a calibrated PID with an 11.7 eV lamp, and logged using the modified Burmister soil classification system.

At each soil boring location, discrete grab samples will be collected every 2 feet down to the groundwater table or bedrock, whichever is encountered first. Soil samples slated for laboratory analysis will be labeled and placed in laboratory-supplied containers and shipped to the laboratory via a courier with chain-of-custody (COC) documentation in accordance with appropriate United

States Environmental Protection Agency (EPA) protocols to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory.

Soil samples collected from 0-2 feet, 10-12 feet, 14-15 feet (if the water table is greater than 15 feet), and the 2-foot interval above the water table or bedrock surface will be analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, PCBs by EPA Method 8082, pesticides by EPA Method 8081, Target Analyte List (TAL) metals by EPA Method 6000/7000 series, hexavalent chromium by EPA Method 7196A, per- and polyfluorinated compounds (PFAS) by Modified EPA Method 537.1, and 1,4-dioxane by EPA Method 8270. Soil samples collected from the remaining intervals will be placed on hold pending laboratory analytical results of the initial analysis. The soil samples placed on hold will be activated for VOC analysis as necessary to further delineate any VOCs identified above RRSCOs or Protection of Groundwater Soil Cleanup Objectives (PGWSCOs) in the analyzed soil samples. If field evidence of contamination is encountered, the sampling interval will be analyzed for the full suite of parameters listed above, not just VOCs.

After each boring is completed, the boreholes will be filled with on-site materials (if not noticeably contaminated) in accordance with Section 3.3(e) of DER-10. Soil cuttings displaying field evidence of contamination will be containerized in properly labeled Department of Transportation (DOT)-approved 55-gallon drums for off-site disposal at a permitted facility. Boreholes that require drill cutting disposal will be filled with bentonite chips (hydrated). Disposable sampling equipment that comes in contact with environmental media will be double bagged and disposed of as municipal trash as non-hazardous refuse.

The rationale for the proposed soil sample locations is summarized in Table 2.

**Table 2**  
**Proposed Soil Sample Rationale**

<b>Sample Location</b>	<b>Sample Intervals for Laboratory Analysis<sup>1</sup></b>	<b>Location</b>	<b>Rationale</b>
RI-SB-01	Every 2 feet between grade and the water table or bedrock	Northern	To assess soil quality in the northern portion of the Site
RI-SB-02	Every 2 feet between grade and the water table or bedrock	Northeastern	To assess soil quality in the northeastern portion of the Site
RI-SB-03	Every 2 feet between grade and the water table or bedrock	Northeastern	To assess soil quality in the northeastern portion of the Site
RI-SB-04	Every 2 feet between grade and the water table or bedrock	Western	To assess soil quality in the western portion of the Site
RI-SB-05	Every 2 feet between grade and the water table or bedrock	Central	To assess soil quality in the central portion of the Site
RI-SB-06	Every 2 feet between grade and the water table or bedrock	Eastern	To assess soil quality in the eastern portion of the Site
RI-SB-07	Every 2 feet between grade and the water table or bedrock	Southern	To assess soil quality in the southern portion of the Site

**Table 2**  
**Proposed Soil Sample Rationale**

Sample Location	Sample Intervals for Laboratory Analysis <sup>1</sup>	Location	Rationale
RI-SB-08	Every 2 feet between grade and the water table or bedrock	Northwestern	To assess soil quality in the northwestern portion of the Site
RI-SB-09	Every 2 feet between grade and the water table or bedrock	Central	To assess soil quality in the central portion of the Site
RI-SB-10	Every 2 feet between grade and the water table or bedrock	Eastern	To assess soil quality in the eastern portion of the Site
RI-SB-11	Every 2 feet between grade and the water table or bedrock	Southwestern	To assess soil quality in the southwestern portion of the Site
Note: 1. Soil samples will be collected every 2 feet between grade and the groundwater table or bedrock surface, whichever is encountered first.			

#### 4.4 Groundwater Monitoring Well Installation and Development

Seven permanent monitoring wells (denoted as RI-MW-01 through RI-MW-07) will be installed using a Geoprobe™ direct-push drill rig or Sonic drill rig at the proposed locations shown on Figure 7. The wells will be constructed with 10 feet of 2-inch diameter 0.002-inch slotted polyvinyl chloride (PVC) well screen set approximately 5 feet below the water table and 5 feet above the water table, and a 2-inch diameter solid PVC riser installed to grade. The boreholes will be at least 6 inches in diameter to allow for a minimum 2-inch annular space surrounding the monitoring well. A No. 2 morie sandpack will be installed from the base of the well to approximately 2 feet above the well screen. The annular space around the solid well riser above the sandpack will be sealed with approximately 2 feet of bentonite followed by a non-shrinking grout/cement mixture to approximately one foot below grade. Each of the wells will be finished with a locking j-plug and flush-mounted well cover with a concrete pad. Well construction logs will be prepared and included as an appendix to the RIR.

Following installation, each groundwater monitoring well will be developed via pumping and surging to remove any accumulated fines and establish a hydraulic connection with the surrounding aquifer. Development will continue until turbidity within the well is less than 50 nephelometric turbidity units (NTUs) for three successive readings; and until water quality indicators have stabilized to within 10% for pH, temperature, and specific conductivity for three successive readings. In the event that 50 NTUs cannot be achieved, at least three well volumes will be purged from the well. Well development details will be noted on groundwater development logs, included as an appendix to the RIR.

The rationale for the proposed soil sample locations is summarized in Table 3.

**Table 3**  
**Proposed Groundwater Sample Rationale**

<b>Groundwater Monitoring Well ID</b>	<b>Location</b>	<b>Rationale</b>
RI-MW-01	Northern	To assess groundwater quality on the northern portion of the Site near the former dry cleaner; and determine Site-specific groundwater flow direction and elevation.
RI-MW-02	Northeastern	To assess groundwater quality on the northeastern portion of the Site near the former dry cleaner; and determine Site-specific groundwater flow direction and elevation.
RI-MW-03	Northeastern	To assess groundwater quality on the northeastern portion of the Site; and determine Site-specific groundwater flow direction and elevation.
RI-MW-04	Western	To assess groundwater quality on the western portion of the Site; and determine Site-specific groundwater flow direction and elevation.
RI-MW-05	Central	To assess groundwater quality on the central portion of the Site; and determine Site-specific groundwater flow direction and elevation.
RI-MW-06	Eastern	To assess groundwater quality on the eastern portion of the Site; and determine Site-specific groundwater flow direction and elevation.
RI-MW-07	Southern	To assess groundwater quality on the southern portion of the Site; and determine Site-specific groundwater flow direction and elevation.

#### 4.5 Groundwater Elevation Survey

The groundwater monitoring wells will be surveyed by a New York State-licensed surveyor to determine their accurate location and elevation. Two elevation measurements will be taken at each well location: the at-grade elevation; and the elevation of the top of PVC casing (north side at marking), to facilitate preparation of a groundwater contour map and to determine the direction of groundwater flow. The elevation datum for the sampling points will be based on NAVD 88 Elevation Datum. The groundwater elevation survey will be included as an appendix to the RIR.

#### 4.6 Groundwater Sampling

In accordance with EPA low-flow sampling protocols, the wells will be sampled one to two weeks following their development. Prior to sampling, an electronic interface meter will be used to measure water levels and a bailer will be used to measure any separate phase liquid. The purge water will be monitored for turbidity and water quality indicators [i.e., pH, dissolved oxygen, oxidation-reduction potential (ORP), temperature, and specific conductivity] with measurements collected approximately every five minutes. The criteria for stabilization will be three successive readings within  $\pm 10\%$  for pH, temperature, and specific conductivity. All purge water will be containerized in properly labeled, DOT-approved 55-gallon drums for off-site disposal at a permitted facility.

Groundwater samples slated for laboratory analysis will be placed in laboratory-supplied containers and shipped in accordance with appropriate EPA protocols to a NYSDOH ELAP-certified laboratory. The samples will be analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, PCBs by EPA Method 8082, pesticides by EPA Method 8081, total and dissolved TAL metals by EPA Method 6000/7000 series, PFAS by Modified EPA Method 537.1, and 1,4-dioxane

by EPA Method 8270 selected ion monitoring (SIM) using Category B deliverables. Filtering will occur in the field. Sampling for PFAS will be conducted in accordance with the June 2021 NYSDEC-issued sampling protocol, with the exception that a low-density polyethylene (LDPE) bladder will be used as no industry-approved high-density polyethylene (HDPE) alternative currently exists. Well sampling details will be noted on groundwater sampling logs, included as an appendix to the RIR.

#### 4.7 Soil Vapor Sampling

Eight soil vapor samples (denoted as RI-SV-01 through RI-SV-08) will be collected from eight temporary vapor monitoring probes at the approximate locations shown on Figure 7. Interior soil vapor point RI-SV-05 through RI-SV-08 will be installed as a sub-slab point approximately 6 inches beneath the building slab. The remaining four locations will be installed at approximately 2 feet above the water table or bedrock, whichever is encountered first. Soil vapor sampling will be performed in accordance with the guidelines provided in the NYSDOH document entitled, "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," (October 2006, revised 2017)." One indoor air sample will be collected to evaluate vapor intrusion (for a total of three indoor air samples).

The temporary sub-slab and soil vapor points will be installed by advancing an expendable drive point using either a direct-push drill rig, a slide hammer, or hammer drill to the target sampling depth. At each monitoring point, a 6-inch stainless steel screen implant, connected to Teflon tubing will be installed by hand or through the drilling rods and threaded into the drive point. The sampling tubing will extend from the end of the screen to above grade. The push probe rods will then be removed and the boring will be backfilled with clean silica sand to 3 to 6 inches above the screen. Hydrated bentonite will be used to fill the remaining void around the sampling tubing to the ground surface. Three indoor air samples will be co-located with sub-slab soil vapor samples RI-SV-05, RI-SV-06, and RI-SV-08, and will be collected concurrently. One ambient air sample will be collected from an exterior portion of the Site.

The sub-slab soil vapor, indoor air, and ambient air samples will be collected over a 8-hour time period and the soil vapor samples will be collected over a 2-hour time period using a 6-Liter, batch-certified SUMMA<sup>®</sup> canister equipped with a vacuum gauge and flow regulator set at a maximum rate of 0.2 liter per minute. Prior to sample collection, the sub-slab soil vapor and soil vapor sampling points will be purged of three sample volumes using a GilAir air sampling pump. During purging, a shroud will be placed over the sampling point and helium gas will be introduced to saturate the atmosphere around the sample port with helium gas. Purged vapors will be collected into a Tedlar<sup>™</sup> bag and field-screened for organic vapors using a PID. The purged air will also be monitored using a portable helium detector to check for short-circuiting of ambient air into the vapor sampling point. If the purged soil vapor contains greater than 10% helium, additional bentonite will used to enhance the surface seal, and the point will be retested.

Following purging, a soil vapor sample will be collected using the vacuum from the SUMMA<sup>®</sup> canister. Immediately after opening the flow control valve equipped with a two-hour regulator, the initial SUMMA<sup>®</sup> canister vacuum (inches of mercury) will be noted. After two hours, the flow controller valve will be closed, the final vacuum noted, and the canister placed in a shipping carton for delivery to the laboratory. One ambient air sample (RI-AA-01) will be collected from an exterior portion of the Site concurrently with the soil vapor and indoor air samples to establish background conditions.

The sub-slab soil vapor, soil vapor, indoor air, and ambient air samples will be analyzed for VOCs by EPA Method TO-15 by a NYSDOH ELAP-certified laboratory with Category B deliverables. Samples will be shipped to the laboratory with appropriate COC documentation.

The rationale for the proposed soil vapor samples is summarized in Table 4.

**Table 4**  
**Proposed Soil Vapor Sample Rationale**

<b>Vapor Point ID</b>	<b>Sample Location</b>	<b>Rationale</b>
RI-SV-01	Northern	To determine concentrations of VOCs on the northern portion of the Site and evaluate the potential for off-site exposure to the north and northwest.
RI-SV-02	Northeastern	To determine concentrations of VOCs on the northern portion of the Site and evaluate the potential for off-site exposure to the north.
RI-SV-03	Western	To determine concentrations of VOCs on the western portion of the Site and evaluate the potential for off-site exposure to the north.
RI-SV-04	Western	To determine concentrations of VOCs on the western portion of the Site.
RI-SV-05	Southwestern	To determine concentrations of VOCs on the southwestern portion of the Site, evaluate the potential for off-site exposure to the west, and determine if there is a vapor intrusion concern.
RI-SV-06	Southern	To determine concentrations of VOCs on the southern portion of the Site and determine if there is a vapor intrusion concern.
RI-SV-07	Southern	To determine concentrations of VOCs on the southern portion of the Site and determine if there is a vapor intrusion concern.
RI-SV-08	Southeastern	To determine concentrations of VOCs on the southeastern portion of the Site and determine if there is a vapor intrusion concern.

#### 4.8 Quality Assurance/Quality Control (QA/QC)

The analytical results will be reported using Category B deliverables. As required by the Category B sampling techniques, additional analysis will be included for QC measures. The QA/QC samples for soil and groundwater will include one field blank, one trip blank, one matrix spike/matrix spike duplicate (MS/MSD), and one blind duplicate sample at a frequency of at least one sample per 20 field samples per media. The QA/QC sample for soil vapor will include one ambient air sample collected from an exterior portion of the Site. The ambient air sample will be analyzed for the same duration and analyte list as the sub-slab soil vapor, soil vapor, and indoor air samples. The field blank, blind duplicate, and MS/MSD samples will be analyzed for the same analyte list as the accompanying field samples. The laboratory-prepared trip blanks will be submitted for analysis of VOCs only to determine the potential for cross-contamination. QA/QC samples accompanying the soil and groundwater samples will also be analyzed for PFAS by Modified EPA Method 537 (or EPA Method 1633 if the selected laboratory is certified for this method) and 1,4-dioxane by EPA

Method 8270 (SIM analysis will be used for groundwater samples). Additionally, one equipment blank will be collected for each day of groundwater sampling and analyzed for PFAS by Modified EPA Method 537.1 only.

Upon receipt of the analytical data from the laboratory, it will be reviewed by a third-party data validator, who will prepare a Data Usability summary Report (DUSR). The QAPP, included as Appendix A, describes the QA/QC protocols and procedures that will be followed during implementation of this RIWP.

#### **4.9 Decontamination Procedures**

All non-dedicated sampling equipment will be decontaminated between sampling locations using the following procedure:

1. Scrub equipment with a bristle brush using a tap water/Alconox<sup>®</sup> solution.
2. Rinse with tap water.
3. Scrub again with a bristle brush using a tap water/Alconox<sup>®</sup> solution.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment.

Non-dedicated equipment used for soil and groundwater sampling of emerging contaminants will be decontaminated with laboratory-certified PFAS-free water.

#### **4.10 Management of Investigation-Derived Waste (IDW)**

IDW that does not exhibit field evidence of contamination will be used to backfill the corresponding borehole that generated them to within 12 inches of the surface. Soil IDW exhibiting evidence of gross contamination will be containerized in DOT-approved 55-gallon drums. All development and purge groundwater will be containerized in 55-gallon drums. The drums will be sealed at the end of each work day and labeled with the date, the well or boring number(s), the type of waste (i.e., drill cuttings, decontamination fluids, development water, or purge water) and the name of an AKRF point-of-contact. All drums will be labeled "pending analysis" until laboratory data is available. All boreholes will be restored after backfill. Handling of IDW and backfilling of boreholes will be conducted in accordance with Section 3.3(e) of DER-10.

## 5.0 REPORTING REQUIREMENTS

### 5.1 Daily Field Reports

During the field activities, daily reports will be submitted to the NYSDEC and NYSDOH Project Managers by noon the following day, and will include:

- A summary of progress made during the reporting day (e.g., borings advanced, monitoring wells installed, sample collection, etc.);
- An updated Site plan;
- A summary of CAMP data and response actions (if necessary);
- An explanation of notable findings; and
- Photographs of the Site documenting daily activities.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RIWP or other sensitive or time critical information. However, such conditions will also be included in the daily reports. Emergency conditions and changes to the RIWP will be addressed directly with the NYSDEC Project Manager via personal communication.

### 5.2 Remedial Investigation Report (RIR)

Upon completion of all field work and receipt of laboratory analytical results, an RIR will be prepared in compliance with Section 3.14 of DER-10 that will: document field activities; present field and laboratory data; evaluate exposure pathways in an exposure assessment; identify and characterize the source(s) of contamination; a summary of the overall nature and extent of contamination using the applicable standards, criteria, and guidance; and discuss conclusions and recommendations drawn from the results of the RI.

#### 5.2.1 Description of Field Activities

The RIR will include a section that will describe the field methods used to characterize the Site conditions, including: sampling techniques; field screening equipment; drilling and excavation equipment; monitoring well installation procedures; and management of IDW. This section will also include descriptions of hydrogeologic factors of the Site.

#### 5.2.2 Soil Assessment

The RIR will include a section that presents field and laboratory data for soil results. The section will include a description of soil characteristics and figures will be provided that illustrate soil boring locations. Field and laboratory analytical results will be presented in the body of the report, summarized in tables and figures, and the detected concentrations will be compared to regulatory standards and/or guidance values. Soil boring logs and laboratory analytical reports will be provided as attachments. Category B deliverables will be provided by the laboratory and a third-party DUSR will be prepared and discussed.

#### 5.2.3 Groundwater Assessment

The RIR will include a section that presents field and laboratory data from the groundwater monitoring results. The section will include a description of groundwater characteristics and figures will be provided that illustrate monitoring well locations. Well survey data and water level measurements will be used to create a groundwater elevation contour map and determine the inferred groundwater flow direction. Field and laboratory analytical results



will be presented and compared with regulatory standards and/or guidance values. Well construction, well development, and groundwater sampling logs, and laboratory analytical reports will be provided as attachments. Category B deliverables will be provided by the laboratory and a third-party DUSR will be prepared and discussed.

#### **5.2.4 Sub-Slab Soil Vapor/Soil Vapor/Indoor Air and Ambient Air Assessment**

The RIR will include a section that presents field and laboratory data from the soil vapor and indoor/ambient air results. The section will include a description of soil vapor characteristics and will provide a comparison of soil vapor and indoor air sample analytical data. Figures will be provided that illustrate the soil vapor point and indoor/ambient air locations. Field and laboratory analytical results will be presented and compared with regulatory standards and/or guidance values. Sub-slab soil vapor, soil vapor and indoor/ambient air logs and laboratory analytical reports will be provided as attachments. Category B deliverables will be provided by the laboratory and a third-party DUSR will be prepared and discussed.

#### **5.2.5 Qualitative Human Health Exposure Assessment (QHHEA)**

The RIR will include a QHHEA, which will be performed in accordance with DER-10 Section 3.3(c)4 and Appendix 3B.

#### **5.2.6 Fish and Wildlife Impact Analysis**

The RIR will include an assessment of the Fish and Wildlife Resources Impact Analysis (FWRIA) Decision Key located within DER-10, Appendix 3C to determine if an FWRIA is required.

## 6.0 PROPOSED PROJECT SCHEDULE

**Table 5**  
**Proposed Project Schedule**

<b>Activity</b>	<b>Time To Complete</b>
Submittal of BCP Application and draft RIWP	September 2022
30-day Completeness Review	October 2022
30-day Public Notice/Public Comment Period is Initiated	November 2022
30-day Public Comment Period Ends	December 2022
BCA Execution	January/February 2023
Submittal of Citizen Participation Plan and Final RIWP	February 2023
Implementation of Remedial Investigation (RI)	March 2023
Draft RI Report (RIR) and Remedial Action Work Plan (RAWP) Submitted to NYSDEC	June 2023
45-Day Public Comment Period for RAWP	August 2023
NYSDEC Approves RIR	August 2023
RAWP Public Comment Period Ends	September 2023
Submittal of Final RAWP and Issuance of Decision Document	October/November 2023
Issue Remedial/Construction Notice Fact Sheet	December 2023
Begin Redevelopment (Construction) with Implementation of RAWP	January 2024
Execution of Environmental Easement (if required)	July 2024
Draft Site Management Plan (SMP) Submitted to NYSDEC	August 2024
Draft Final Engineering Report and Fact Sheet	September 2024
Certificate of Completion and Fact Sheet	December 2024
Completion of Building (first occupancy)	November 2027

## 7.0 CERTIFICATION

I, Deborah Shapiro, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Deborah Shapiro

DRAFT

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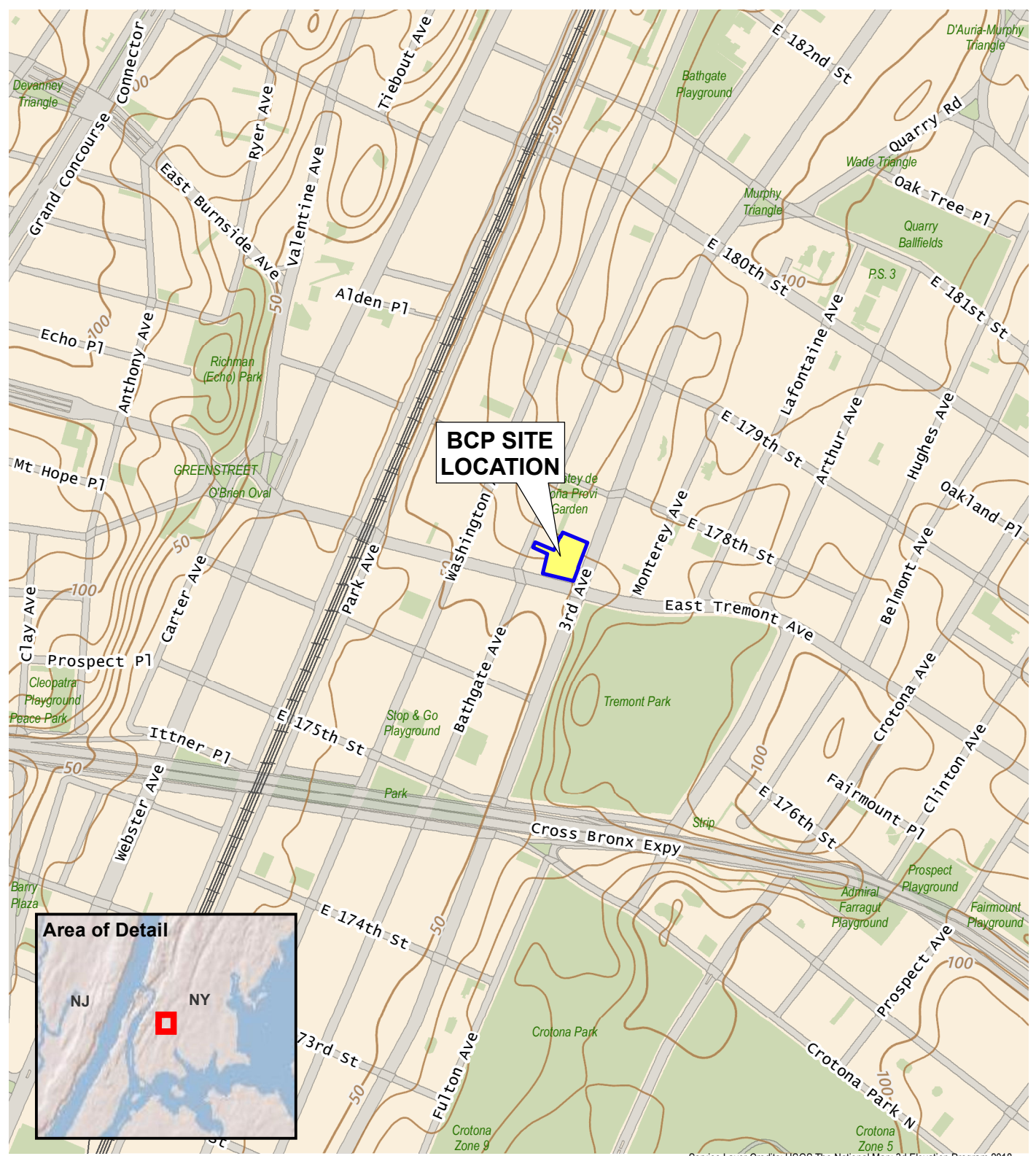
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*Signature*

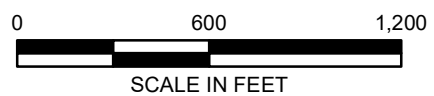
*Date*

## FIGURES

© 2022 AKRF Q:\Projects\190204 - 521 EAST TREMONT AVENUE\Technical\GIS and Graphics\hazmat\190204 Fig 1 site loc map.mxd/8/23/2022 9:13:30 AM mveilleux



Service Layer Credits: USGS The National Map: 3d Elevation Program 2018



440 Park Avenue South, New York, NY 10016

**521 East Tremont Avenue**  
Bronx, New York

**SITE LOCATION**




DATE	<b>8/23/2022</b>
PROJECT NO.	<b>190204</b>
FIGURE	<b>1</b>

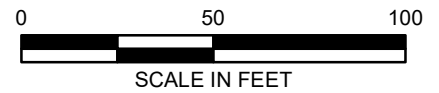
© 2022 AKRF. Q:\Projects\190204 - 521 EAST TREMONT AVENUE\Technical\GIS and Graphics\hazmat\190204 Fig 2 BCP Site Plan.mxd 9/7/2022 3:33:23 PM mvelleux



Map Source:  
NYC DCP (NYC Dept. of City Planning) GIS database

**LEGEND**

-  BCP SITE BOUNDARY
-  BUILDING
-  LOT BOUNDARY AND TAX LOT NUMBER
- 3043** BLOCK NUMBER



440 Park Avenue South, New York, NY 10016

**521 East Tremont Avenue**  
Bronx, New York

**SITE PLAN**

DATE

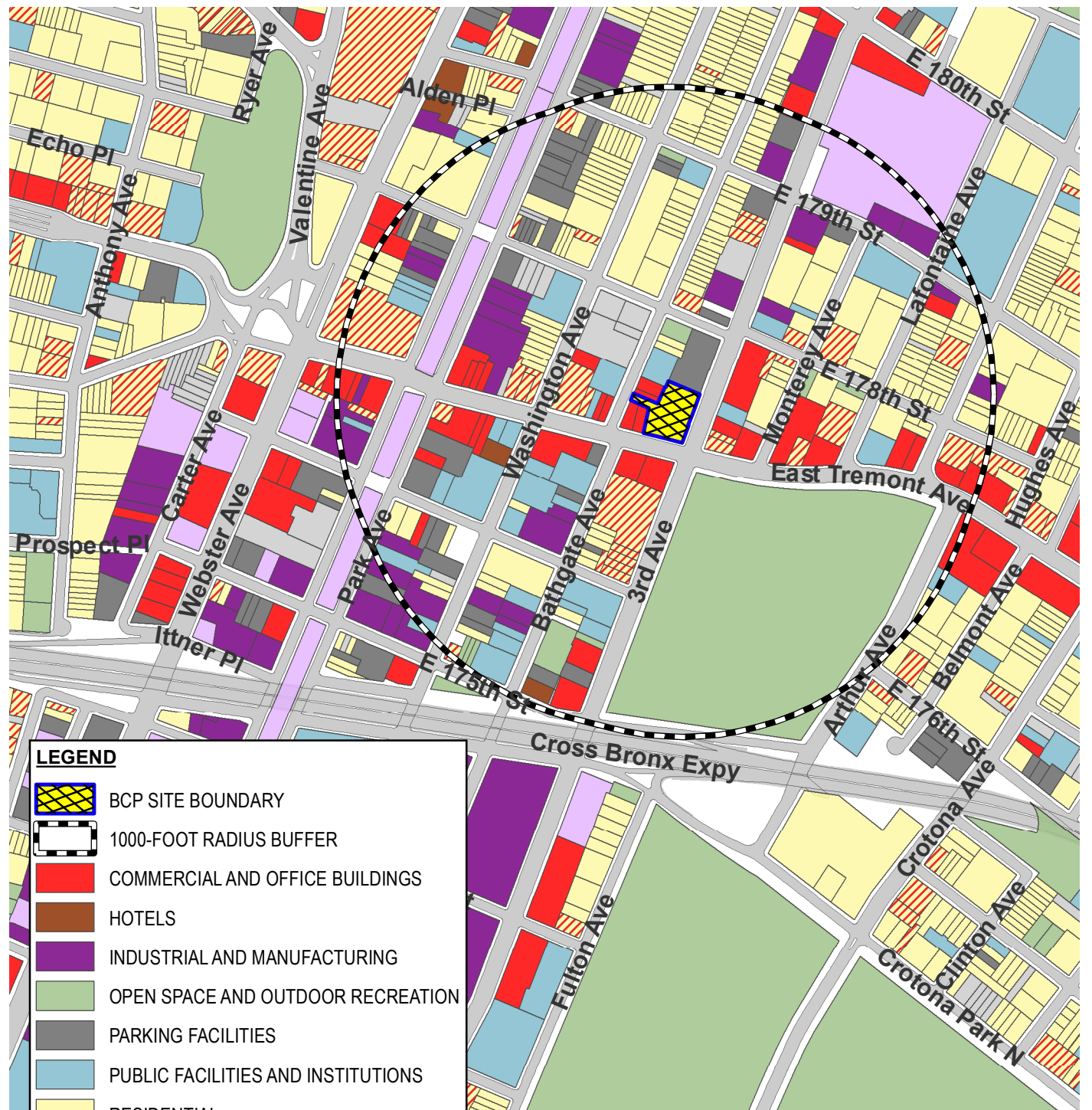
**9/7/2022**

PROJECT NO.















**190204**

FIGURE

**2**



**LEGEND**

-  BCP SITE BOUNDARY
-  1000-FOOT RADIUS BUFFER
-  COMMERCIAL AND OFFICE BUILDINGS
-  HOTELS
-  INDUSTRIAL AND MANUFACTURING
-  OPEN SPACE AND OUTDOOR RECREATION
-  PARKING FACILITIES
-  PUBLIC FACILITIES AND INSTITUTIONS
-  RESIDENTIAL
-  RESIDENTIAL WITH COMMERCIAL BELOW
-  TRANSPORTATION AND UTILITY
-  VACANT LAND
-  VACANT BUILDING
-  UNDER CONSTRUCTION

Map Source: NYCDPC (NYC Dept. of City Planning) GIS database



440 Park Avenue South, New York, NY 10016

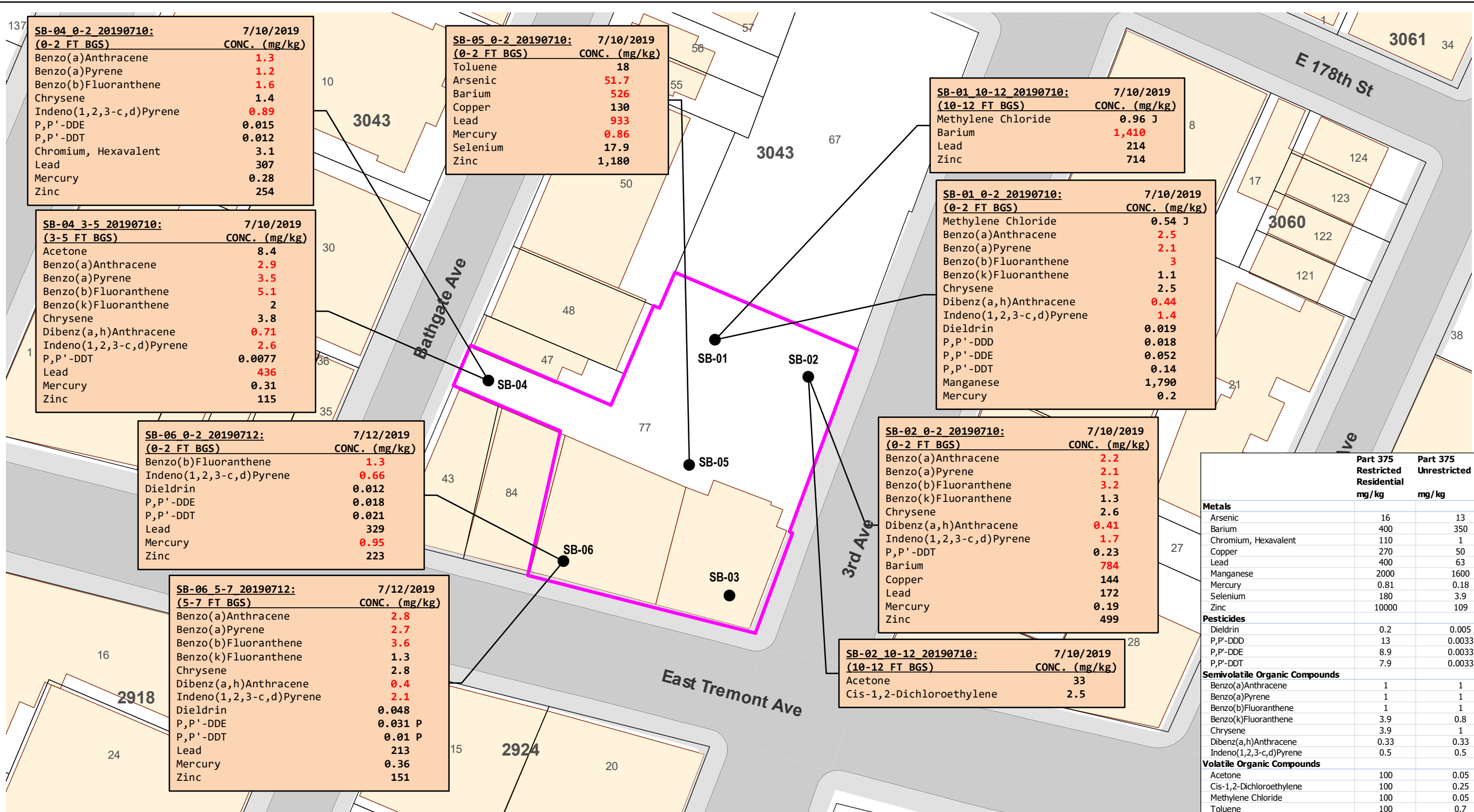
**521 East Tremont Avenue**  
Bronx, New York

**SURROUNDING LAND USE**

DATE	9/1/2022
PROJECT NO.	190204
FIGURE	3



© 2022 AKRF. Q:\Projects\190204 - 521 EAST TREMONT AVENUE\Technical\GIS and Graphics\thesatmap\190204\_Fig 4 Soil Samples above NYSDEC UUSCOS and RRSCOS.mxd 09/11/2022 9:56:13 AM mvelieux



Map Source:  
NYC DCP (NYC Dept. of City Planning) GIS database

**LEGEND**

- BCP SITE BOUNDARY
- 77 LOT BOUNDARY AND TAX LOT NUMBER
- 3043** BLOCK NUMBER
- BUILDING
- SUBSURFACE INVESTIGATION SOIL BORING LOCATION

**SOIL**  
Part 375 Soil Cleanup Objectives:  
Soil Clean-up Objectives listed in NYSDEC  
(New York State Department of Environmental Conservation)  
"Part 375" Regulations (6 NYCRR Part 375).

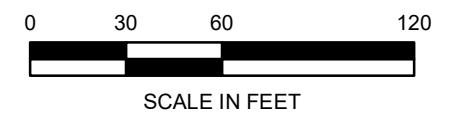
**Exceedances of Part 375 Unrestricted Use SCOs (UUSCOS) are highlighted in black.**  
**Exceedances of Part 375 Restricted Residential SCOs (RRSCOS) are highlighted in red.**

mg/kg: milligrams per kilogram = parts per million (ppm)

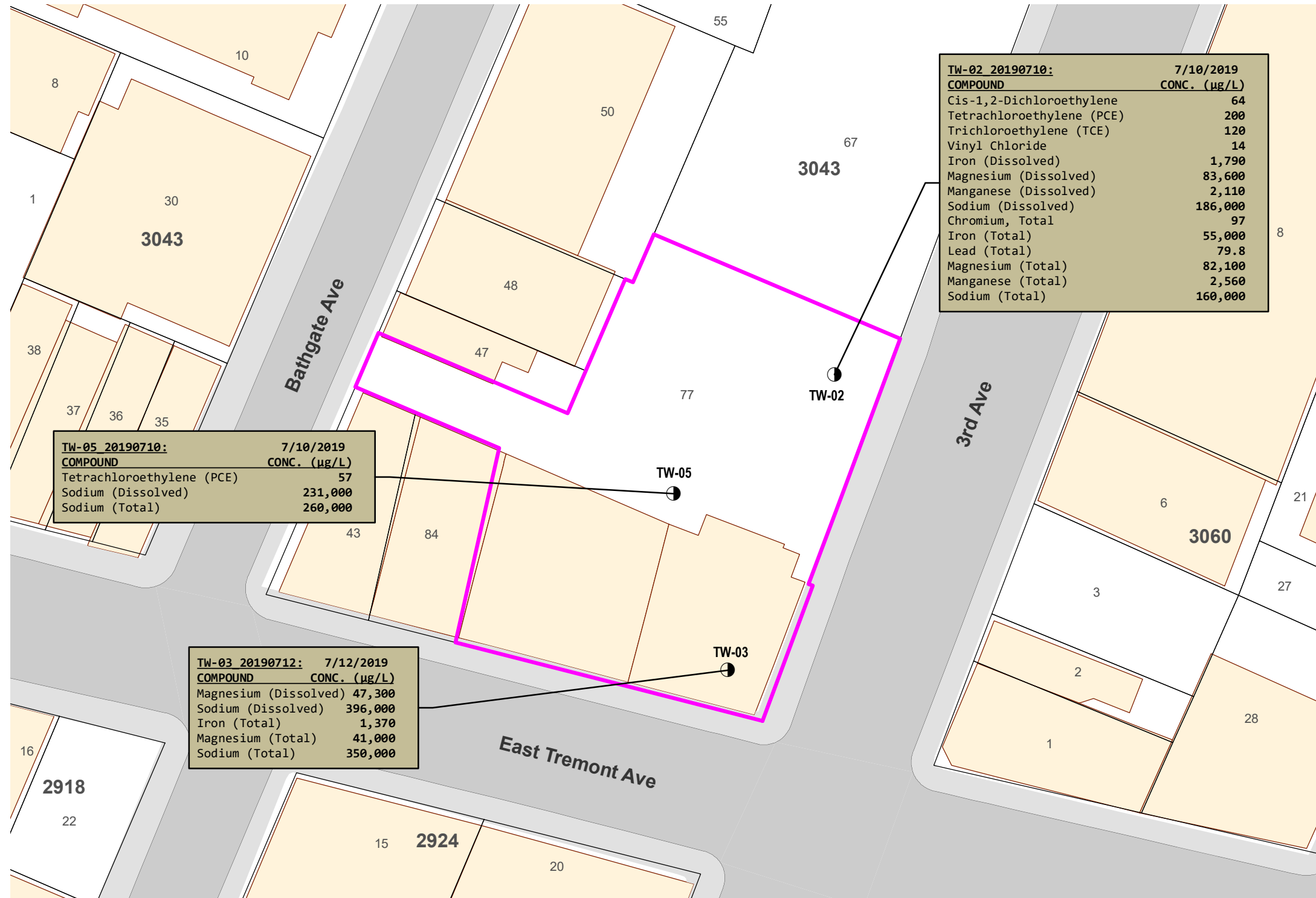
P: Indicates a pesticide/aroclor target analyte had a percent difference greater than 25% between the two gc columns.  
The lower of the two results is reported.  
J: The reported value is estimated

	Part 375 Restricted Residential mg/kg	Part 375 Unrestricted mg/kg
<b>Metals</b>		
Arsenic	16	13
Barium	400	350
Chromium, Hexavalent	110	1
Copper	270	50
Lead	400	63
Manganese	2000	1600
Mercury	0.81	0.18
Selenium	180	3.9
Zinc	10000	109
<b>Pesticides</b>		
Dieldrin	0.2	0.005
P,P'-DDD	13	0.0033
P,P'-DDE	8.9	0.0033
P,P'-DDT	7.9	0.0033
<b>Semivolatile Organic Compounds</b>		
Benzo(a)Anthracene	1	1
Benzo(a)Pyrene	1	1
Benzo(b)Fluoranthene	1	1
Benzo(k)Fluoranthene	3.9	0.8
Chrysene	3.9	1
Dibenz(a,h)Anthracene	0.33	0.33
Indeno(1,2,3-c,d)Pyrene	0.5	0.5
<b>Volatile Organic Compounds</b>		
Acetone	100	0.05
Cis-1,2-Dichloroethylene	100	0.25
Methylene Chloride	100	0.05
Toluene	100	0.7

Sample ID	Sample Date
SB-02 10-12 20190710: (10-12 FT BGS)	7/10/2019
Acetone	33
Cis-1,2-Dichloroethylene	2.5







**TW-02 20190710:** 7/10/2019

COMPOUND	CONC. (µg/L)
Cis-1,2-Dichloroethylene	64
Tetrachloroethylene (PCE)	200
Trichloroethylene (TCE)	120
Vinyl Chloride	14
Iron (Dissolved)	1,790
Magnesium (Dissolved)	83,600
Manganese (Dissolved)	2,110
Sodium (Dissolved)	186,000
Chromium, Total	97
Iron (Total)	55,000
Lead (Total)	79.8
Magnesium (Total)	82,100
Manganese (Total)	2,560
Sodium (Total)	160,000

**TW-05 20190710:** 7/10/2019

COMPOUND	CONC. (µg/L)
Tetrachloroethylene (PCE)	57
Sodium (Dissolved)	231,000
Sodium (Total)	260,000

**TW-03 20190712:** 7/12/2019

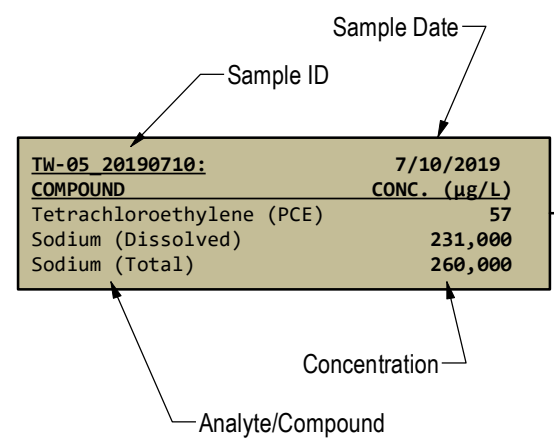
COMPOUND	CONC. (µg/L)
Magnesium (Dissolved)	47,300
Sodium (Dissolved)	396,000
Iron (Total)	1,370
Magnesium (Total)	41,000
Sodium (Total)	350,000

**GROUNDWATER**  
**NYSDEC TOGS Class GA Ambient Water Quality Standard and Guidance Values (AWQSGVs):**  
 New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) (1.1.1):

ug/L : micrograms per Liter = parts per billion (ppb)

**Exceedances of NYSDEC AWQSGVs are shown in bold font.**

	NYSDEC AWQSGVs µg/l
<b>Metals</b>	
Chromium, Total	50
Iron	300
Lead	25
Magnesium	35000
Manganese	300
Sodium	20000
<b>Volatile Organic Compounds</b>	
Cis-1,2-Dichloroethylene	5
Tetrachloroethylene (PCE)	5
Trichloroethylene (TCE)	5
Vinyl Chloride	2

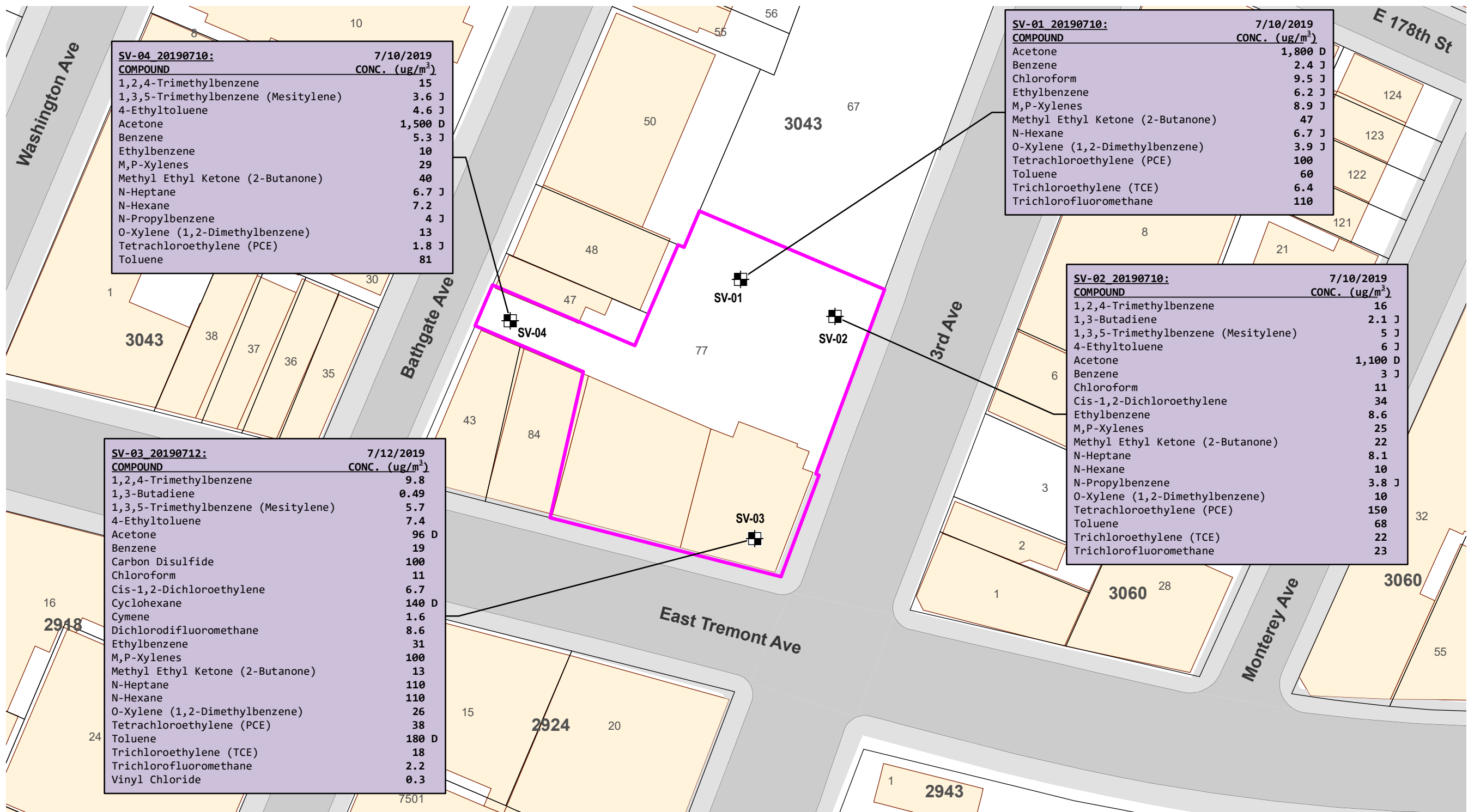


**LEGEND**

- BCP SITE BOUNDARY
- BUILDING
- 77 LOT BOUNDARY AND TAX LOT NUMBER
- 3043** BLOCK NUMBER
- SUBSURFACE INVESTIGATION TEMPORARY WELL LOCATION



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**SV-04 20190710:** 7/10/2019

COMPOUND	CONC. (ug/m <sup>3</sup> )
1,2,4-Trimethylbenzene	15
1,3,5-Trimethylbenzene (Mesitylene)	3.6 J
4-Ethyltoluene	4.6 J
Acetone	1,500 D
Benzene	5.3 J
Ethylbenzene	10
M,P-Xylenes	29
Methyl Ethyl Ketone (2-Butanone)	40
N-Heptane	6.7 J
N-Hexane	7.2
N-Propylbenzene	4 J
O-Xylene (1,2-Dimethylbenzene)	13
Tetrachloroethylene (PCE)	1.8 J
Toluene	81

**SV-01 20190710:** 7/10/2019

COMPOUND	CONC. (ug/m <sup>3</sup> )
Acetone	1,800 D
Benzene	2.4 J
Chloroform	9.5 J
Ethylbenzene	6.2 J
M,P-Xylenes	8.9 J
Methyl Ethyl Ketone (2-Butanone)	47
N-Hexane	6.7 J
O-Xylene (1,2-Dimethylbenzene)	3.9 J
Tetrachloroethylene (PCE)	100
Toluene	60
Trichloroethylene (TCE)	6.4
Trichlorofluoromethane	110

**SV-02 20190710:** 7/10/2019

COMPOUND	CONC. (ug/m <sup>3</sup> )
1,2,4-Trimethylbenzene	16
1,3-Butadiene	2.1 J
1,3,5-Trimethylbenzene (Mesitylene)	5 J
4-Ethyltoluene	6 J
Acetone	1,100 D
Benzene	3 J
Chloroform	11
Cis-1,2-Dichloroethylene	34
Ethylbenzene	8.6
M,P-Xylenes	25
Methyl Ethyl Ketone (2-Butanone)	22
N-Heptane	8.1
N-Hexane	10
N-Propylbenzene	3.8 J
O-Xylene (1,2-Dimethylbenzene)	10
Tetrachloroethylene (PCE)	150
Toluene	68
Trichloroethylene (TCE)	22
Trichlorofluoromethane	23

**SV-03 20190712:** 7/12/2019

COMPOUND	CONC. (ug/m <sup>3</sup> )
1,2,4-Trimethylbenzene	9.8
1,3-Butadiene	0.49
1,3,5-Trimethylbenzene (Mesitylene)	1.7
4-Ethyltoluene	7.4
Acetone	96 D
Benzene	19
Carbon Disulfide	100
Chloroform	11
Cis-1,2-Dichloroethylene	6.7
Cyclohexane	140 D
Cymene	1.6
Dichlorodifluoromethane	8.6
Ethylbenzene	31
M,P-Xylenes	100
Methyl Ethyl Ketone (2-Butanone)	13
N-Heptane	110
N-Hexane	110
O-Xylene (1,2-Dimethylbenzene)	26
Tetrachloroethylene (PCE)	38
Toluene	180 D
Trichloroethylene (TCE)	18
Trichlorofluoromethane	2.2
Vinyl Chloride	0.3

Map Source:  
NYCDCP (NYC Dept. of City Planning) GIS database



- LEGEND**
- BCP SITE BOUNDARY
  - BUILDING
  - LOT BOUNDARY AND TAX LOT NUMBER
  - 3043** BLOCK NUMBER

+
 SUBSURFACE INVESTIGATION SOIL VAPOR LOCATION

**SOIL VAPOR**

J: The reported value is estimated  
D: Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.

µg/m<sup>3</sup> - micrograms per cubic meter

Sample ID: SV-02\_20190710      Sample Date: 7/10/2019

COMPOUND	CONC. (ug/m <sup>3</sup> )
1,2,4-Trimethylbenzene	16
1,3-Butadiene	2.1 J
1,3,5-Trimethylbenzene (Mesitylene)	5 J
4-Ethyltoluene	6 J
Acetone	1,100 D
Benzene	3 J
Chloroform	11

Analyte/Compound      Concentration



**AKRF**  
440 Park Avenue South, New York, NY 10016

**521 East Tremont Avenue**  
Bronx, New York

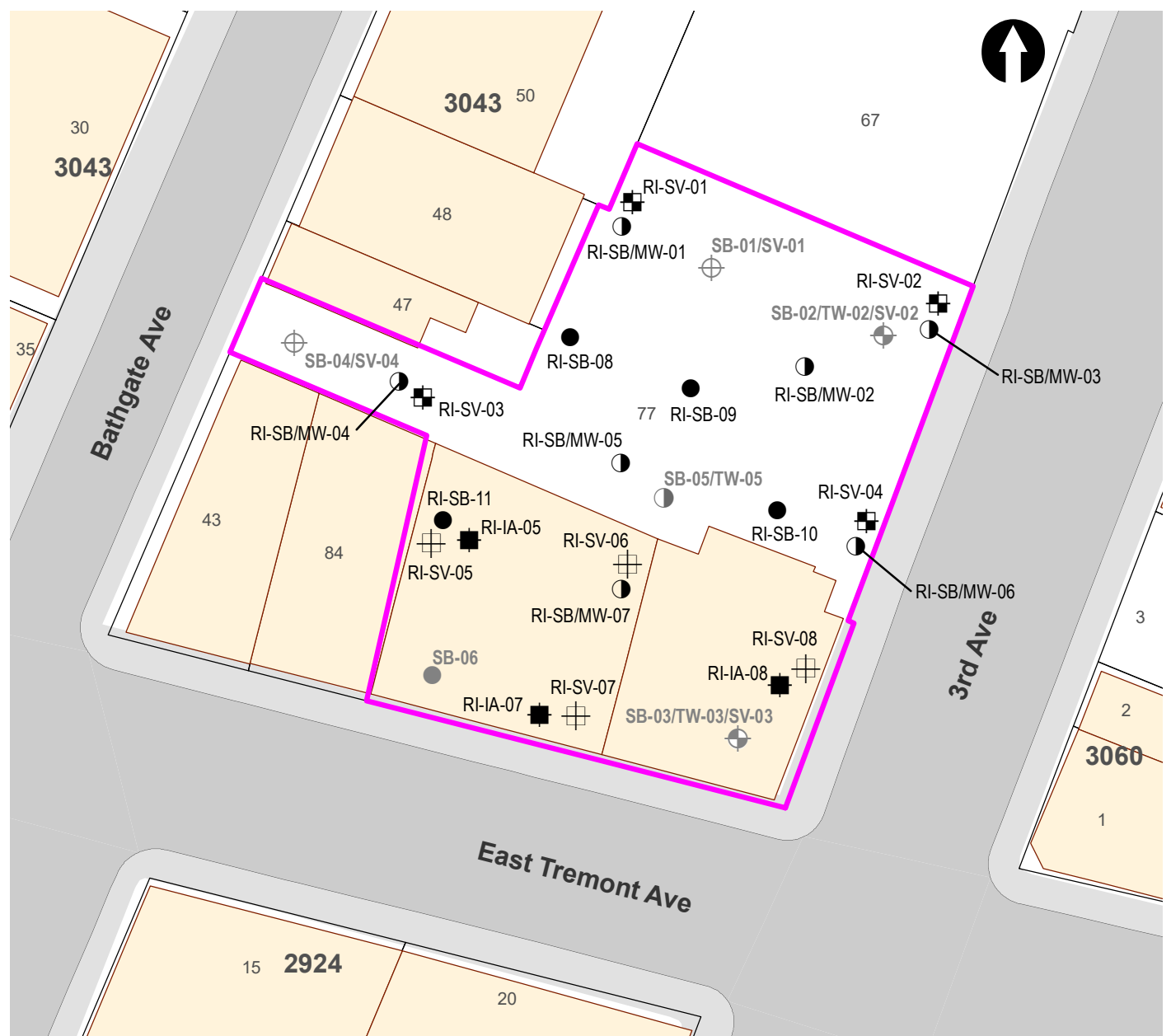
**SOIL VAPOR DETECTIONS**

DATE  
**9/1/2022**













PROJECT NO.  
**190204**

FIGURE  
**6**

© 2022 AKRF Q:\Projects\190204 - 521 East Tremont Avenue\Technical\GIS and Graphics\hazmat\RIWP\190204 Fig 7 Proposed Sample Location Plan.mxd 9/12/2022 1:21:38 PM mveilleux



**LEGEND**

- |   |   |   |  |
|---|---|---|--|
|  | PROJECT SITE BOUNDARY                         |  | BUILDING   |
|  | LOT BOUNDARY AND TAX LOT NUMBER               |  | SUBSURFACE INVESTIGATION SOIL BORING LOCATION                                    |
| <b>3043</b>   | BLOCK NUMBER                                  |  | SUBSURFACE INVESTIGATION SOIL BORING LOCATION/SOIL VAPOR LOCATION                |
|  | PROPOSED INDOOR AMBIENT AIR SAMPLE LOCATION   |  | SUBSURFACE INVESTIGATION SOIL BORING LOCATION/TEMPORARY WELL                     |
|  | PROPOSED SOIL BORING LOCATION                 |  | SUBSURFACE INVESTIGATION SOIL BORING LOCATION/TEMPORARY WELL/SOIL VAPOR LOCATION |
|  | PROPOSED SOIL BORING/MONITORING WELL LOCATION |   |  |
|  | PROPOSED SUB-SLAB SOIL VAPOR POINT LOCATION   |   |  |
|  | PROPOSED SOIL VAPOR POINT LOCATION            |   |  |

Map Source: NYCDP (NYC Dept. of City Planning) GIS database.



440 Park Avenue South, New York, NY 10016

**521 East Tremont Avenue**  
Bronx, New York

**PROPOSED SAMPLE LOCATION PLAN**

DATE	<b>9/12/2022</b>
PROJECT NO.	<b>190204</b>
FIGURE	<b>7</b>

**APPENDIX A**  
**QUALITY ASSURANCE PROJECT PLAN**

**521 EAST TREMONT AVENUE  
BRONX, NEW YORK**

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**Quality Assurance Project Plan**

**NYSDEC BCP Site Number: TBD  
AKRF Project Number: 190204**

**Prepared For:**

New York State Department of Environmental Conservation  
Division of Environmental Remediation, Remedial Bureau B  
625 Broadway, 12<sup>th</sup> Floor  
Albany, New York 12233

**Prepared On Behalf Of:**

M521 Tremont LLC  
48-02 25<sup>th</sup> Avenue, Suite 400  
Astoria, NY 11103

**Prepared by:**



**AKRF, Inc.**  
440 Park Avenue South, 7<sup>th</sup> Floor  
New York, New York 10016  
212-696-0670

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**SEPTEMBER 2022**

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## ATTACHMENTS

Attachment A – Resumes for Project Director / QA/QC Officer, Project Manager, and Field Team Leader

## **1.0 INTRODUCTION**

This Quality Assurance Project Plan (QAPP) describes the protocols and procedures that will be followed during implementation of the Remedial Investigation Work Plan (RIWP) for the property located at 521 East Tremont Avenue in the East Tremont section of the Bronx, New York, hereafter referred to as the "Site." The Site is identified by the City of New York as Borough of the Bronx, Block 3043, Lot 77. The objective of this QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) of environmental investigative and sampling activities conducted under the New York State Department of Environmental Conservation (NYSDEC) oversight in the Brownfield Cleanup Program (BCP) (BCP Site No. TBD). Adherence to this QAPP will ensure that defensible data will be obtained during environmental work at the Site.

## **2.0 PROJECT TEAM**

The project team will be drawn from AKRF professional and technical personnel, and AKRF's subcontractors. All field personnel and subcontractors will have completed a 40-hour training course and updated 8-hour refresher course that meet the Occupational Safety and Health Administration (OSHA) requirements of 29 CFR Part 1910. The following sections describe the key project personnel and their responsibilities.

### **2.1 Project Director**

Ms. Deborah Shapiro, QEP, will serve as the project director and will be responsible for adherence to the QAPP including quality assurance/quality control (QC/QC). The project director will review the procedures with all personnel prior to commencing any fieldwork and will conduct periodic Site visits to assess implementation of the procedures. The project director will also be responsible for reviewing the Data Usability Summary Reports (DUSRs) prepared by a third-party data validator for soil, groundwater, and soil vapor analytical results. Ms. Shapiro's resume is included in Attachment A.

### **2.2 Project Manager**

The project manager will be responsible for directing and coordinating all elements of the RIWP. The project manager will prepare reports and participate in meetings with the Site owner/Applicant, and/or the NYSDEC. Adrianna Bosco will serve as the project manager for the RIWP. Ms. Bosco's resume is included in Attachment A.

### **2.3 Field Team Leader, Field Technician, Site Safety Officer (SSO), and Alternates**

The field team leader will be responsible for supervising the daily sampling and health and safety activities in the field and will ensure adherence to the work plan and Health and Safety Plan (HASP), included as Appendix A of the RIWP. The field team leader will also act as the field technician and Site Safety Officer (SSO) and will report to the project manager or project manager alternate on a regular basis regarding daily progress and any deviations from the work plan. The field team leader will be a qualified and responsible person able to act professionally and promptly during environmental work at the Site. Claire Bearden will be the field team leader. The field team leader alternate is Antonio Cardenas of AKRF. Ms. Bearden and Mr. Cardenas' resumes are included in Attachment A.

### **2.4 Laboratory Quality Assurance/Quality Control (QA/QC) Officer**

The laboratory QA/QC officer will be responsible for quality control procedures and checks in the laboratory and ensuring adherence to laboratory protocols. The QA/QC officer will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued, and will conduct a final check on the analytical calculations and sign off on the laboratory reports. The laboratory QA/QC officer will be Carl Ambruster of Eurofins TestAmerica Laboratories (TestAmerica), the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory being employed for all environmental sampling at the Site.

### **2.5 Thirty-Party Data Validator**

The third-party data validator will be responsible for reviewing the final data packages for soil, groundwater, and soil vapor and preparing a DUSR that will provide performance information with regard to accuracy, precision, sensitivity, representation, completeness, and comparability



associated with the laboratory analyses for the investigation. The third-party data validator will be Lori Beyer of L.A.B. Validation Corporation of East Northport, New York.

### **3.0 STANDARD OPERATING PROCEDURES (SOPS)**

The following sections describe the SOPs for the remedial activities included in the RIWP. During these activities, safety monitoring will be performed as described in the HASP, included as Appendix B of the RIWP.

#### **3.1 Decontamination of Sampling Equipment**

All sampling equipment (augers, drilling rods, split spoon samplers, probe rods, pumps, etc.) will be either dedicated or decontaminated between sampling locations. Decontamination will be conducted on plastic sheeting (or equivalent) that is bermed to prevent discharge to the ground. The decontamination procedure will be as follows:

1. Scrub using tap water/Alconox<sup>®</sup> mixture and bristle brush.
2. Rinse with tap water.
3. Scrub again with tap water/Alconox<sup>®</sup> mixture and bristle brush.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment, if possible.

#### **3.2 Management of Investigation-Derived Waste (IDW)**

IDW will be containerized in New York State Department of Transportation (NYSDOT)-approved 55-gallon drums. The drums will be sealed at the end of each work day and labeled with the date, the excavation grid(s), the type of waste (i.e., drill cuttings), and the name and phone number of an AKRF point-of-contact. All IDW exhibiting field evidence of contamination will be disposed of or treated according to applicable local, state, and federal regulations.

## 4.0 SAMPLING AND LABORATORY PROCEDURES

### 4.1 Soil Sampling

Soil sampling will be conducted according to the following procedures:

- Characterize the sample according to the modified Burmister soil classification system.
- Field screen the sample for evidence of contamination (e.g., odors, staining, etc.) using visual and olfactory methods and screen for volatile organic compounds (VOCs) using a photoionization detector (PID) equipped with a 11.7 electron Volt (eV) lamp.
- Collect an aliquot of soil from each proposed sample location, place in laboratory-supplied glassware, label the sample in accordance with Section 4.6.1, and place in an ice-filled cooler for shipment to the laboratory. Samples analyzed for the emerging contaminants, per- and polyfluorinated compounds (PFAS), should be contained in a separate cooler and the sample containers should be labeled with ballpoint pen, not permanent marker.
- Complete the proper chain of custody (COC) paperwork and seal the cooler.
- Record sample location, sample depth, and sample observations (evidence of contamination, PID readings, soil classification, etc.) in field log book and boring log data sheet, if applicable.
- Decontaminate any soil sampling equipment between sample locations as described in Section 3.1 of this QAPP.

### 4.2 Groundwater Sampling

Groundwater sampling will be conducted according to the following procedures:

- Field screen the sample for evidence of contamination (e.g., odors, staining, etc.) using visual and olfactory methods and screen the well headspace for VOCs using a PID equipped with a 10.6 eV lamp.
- Collect the groundwater sample from each proposed sample location in laboratory-supplied glassware, label the sample in accordance with Section 4.6.1, and place in an ice-filled cooler for shipment to the laboratory. Samples analyzed for the emerging contaminants, PFAS, should be contained in a separate cooler and the sample containers should be labeled with ballpoint pen, not permanent marker.
- Complete the proper COC paperwork and seal the cooler.
- Record sample location, sample depth, and sample observations (evidence of contamination, PID readings, free phase liquid, etc.) in field log book and boring log data sheet, if applicable.
- Decontaminate any groundwater sampling equipment between sample locations as described in Section 3.1 of this QAPP.

### 4.3 Sub-slab Soil Vapor, Soil Vapor, Indoor Air, and Ambient Air Sampling

Sub-slab soil vapor, soil vapor, indoor air, and ambient air sampling will be conducted according to the following procedures:

- Field screen the sample for evidence of contamination (e.g., odors, etc.) using olfactory methods and screen the purged vapors for VOCs using a PID equipped with an 11.7 eV lamp.
- Collect the sub-slab soil vapor, soil vapor, indoor air, and ambient air samples from each proposed sample locations in laboratory-supplied SUMMA<sup>®</sup> canisters, label the sample in accordance with Section 4.6.1, and place in shipment container for shipment to the laboratory.
- Complete the proper COC paperwork and seal the shipment container.
- Record sample location, sample depth, and sample observations (odors, PID readings, etc.) in field log book and boring log data sheet, if applicable.

#### 4.4 Laboratory Methods

Table 1 summarizes the laboratory methods that will be used to analyze field samples and the sample container type, preservation, and applicable holding times. TestAmerica of Edison, New Jersey, a NYSDOH ELAP-certified laboratory subcontracted to AKRF, will be used for all chemical analyses in accordance with the Division of Environmental Remediation (DER)-10 2.1(b) and 2.1(f) with Category B Deliverables.

**Table 1**  
**Laboratory Analytical Methods for Analysis Groups**

Matrix	Analysis	EPA Method	Bottle Type	Preservative	Hold Time
Soil and Soil QA/QC	Volatile Organic Compounds (VOCs)	8260C	EnCore® samplers (3) and 2 oz. plastic jar	≤ 6 °C	48 hours to extract; 14 days to analyze
	Semivolatile Organic Compounds (SVOCs)	8270D	8 oz. Glass Jar	≤ 6 °C	14 days to extract; 40 days to analyze
	1,4-Dioxane	8270D; 0.1 mg/kg RL	4 oz. Glass Jar	≤ 6 °C	14 days to extract; 40 days to analyze
	Total Analyte List (TAL) Metals, and Hexavalent Chromium	6000/7000 Series, 6010C, and 7196A	8 oz. Glass Jar	≤ 6 °C	6 months holding time; Mercury 28 days holding time; Hexavalent chromium 30 days to extract, 7 days to analyze
	Pesticides	8081B	8 oz. Glass Jar	≤ 6 °C	14 days to extract; 40 days to analyze
	Polychlorinated Biphenyls (PCBs)	8082A	8 oz. Glass Jar	≤ 6 °C	14 days to extract; 40 days to analyze
	Per- and Polyfluorinated Compounds (PFAS)	Modified 537.1; 0.2 ng/L RL	4 oz. HDPE Plastic Container	≤ 6 °C	14 days to extract; 40 days to analyze
Groundwater and Groundwater QA/QC	VOCs	8260C	5 40 mL Glass Vials	HCl to pH < 2 and ≤ 6 °C	48 hours to extract; 14 days to analyze
	SVOCs	8270D	2,000 mL Amber Jar	≤ 6 °C	7 days to extract; 40 days to analyze
	1,4-Dioxane	8270D plus Selective Ion Monitoring (SIM); 0.35 µg/L RL	1 L Amber Jar	≤ 6 °C	7 days to extract; 40 days to analyze
	TAL Metals	6000/7000 Series	2,000 mL Amber Jar	HNO <sub>3</sub> to pH < 2	6 months for metals; 28 days for mercury; 24 hours for hex. chromium
	Pesticides	8081B	2,000 mL Amber Jar	≤ 6 °C	7 days to extract; 40 days to analyze
	PCBs	8082A	2,000 mL Amber Jar	≤ 6 °C	7 days to extract; 40 days to analyze
	Per- and Polyfluorinated Compounds (PFAS)	Modified 537; 0.2 ng/L RL	3 x 250 mL Polypropylene Bottles	≤ 6 °C, Trizma	14 days to analyze
Sub-slab Soil Vapor/Soil Vapor/Indoor Air/Ambient Air	VOCs	TO-15	6L SUMMA® Canister	None	14 days

Notes:

QA/QC samples will be analyzed for the same parameters as the parent sample, with the exception of the trip blank(s), which will be analyzed for VOCs by EPA Method 8260C only.

EPA – Environmental Protection Agency

mg/kg – milligrams per kilogram (parts per million)

µg/L – parts per billion

ng/L – parts per trillion

#### 4.5 Quality Control (QC) Sampling

In addition to the laboratory analysis of the soil and groundwater samples, additional analysis will be included for QC measures, as required by the Category B sampling techniques. These samples will include a field blank, trip blank, matrix spike/matrix spike duplicate (MS/MSD), and blind duplicate samples at a frequency of one sample per 20 field samples collected. QC samples will be analyzed for the same parameters as the accompanying samples, with the exception of any trip blanks, which will be analyzed for the VOC list only. Additionally, one equipment blank will be collected during each day of groundwater sampling.

#### 4.6 Sample Handling

##### 4.6.1 Sample Identification

All samples will be consistently identified in all field documentation, chain-of-custody (COC) documents, and laboratory reports. Soil, groundwater, and soil vapor samples collected during the RI will be identified with “RI-” and “SB-” for soil borings “MW-” for groundwater monitoring wells, and “SV-” for soil vapor points, and the soil boring, groundwater monitoring well number, or soil vapor point sample number. All samples will be amended with the collection date at the end of the sample name in a year, month, day (YYYYMMDD) format. Blind duplicate sample nomenclature will consist of the sample type, followed by an “X”; MS/MSD samples nomenclature will consist of the parent sample name only, but triplicate sample volume will be collected and the COC comment section will explain that the additional volume is for running the MS/MSD; and trip and field blanks will consist of “TB-” and “FB-”, respectively, followed by “S” for soil and “GW” for groundwater, and a sequential number of the trip/field blanks collected. Special characters, including primes/apostrophes (’), will not be used for sample nomenclature. Table 2 provides examples of the sampling identification scheme for samples collected during the RI.

**Table 2  
Remedial Investigation Sample Nomenclature**

Sample Description	Sample Designation
Groundwater sample collected from groundwater monitoring well RI-MW-01 on April 24, 2023	RI-MW-01_20230424
Blind duplicate sample of groundwater sample collected from groundwater monitoring well RI-MW-01 on April 24, 2023	RI-MW-X_20230424
Second field blank collected during the RI on April 17, 2023 with the soil samples	RI-FB-S-02_20230417
Soil sample collected from soil boring RI-SB-01 between 0 and 2 feet below grade on April 17, 2023	RI-SB-01_0-2_20230417
Second blind duplicate soil sample collected from soil boring RI-SB-05 between 0 and 2 feet below grade on April 21, 2023	RI-SB-X2_0-2_20230421
Soil vapor sample collected from temporary soil vapor point RI-SV-01 on April 17, 2023	RI-SV-01_20230417

##### Sample Labeling and Shipping

All sample containers will be provided with labels containing the following information:

- Project identification, including Site name and Site address
- Sample identification
- Date and time of collection
- Analysis(es) to be performed
- Sampler's initials

Once the samples are collected and labeled, they will be placed in chilled coolers and stored in a cool area away from direct sunlight to await shipment to the laboratory. All samples will be shipped to the laboratory at least twice per week. At the start and end of each workday, field personnel will add ice to the cooler(s) as needed.

The samples will be prepared for shipment by placing each sample in laboratory-supplied glassware, then wrapping each container in bubble wrap to prevent breakage, and adding freezer packs and/or fresh ice in sealable plastic bags. The COC form will be properly completed by the sampler in ink, and all sample shipment transactions will be documented with signatures, and the date and time of custody transfer. Samples will be shipped overnight (e.g., Federal Express) or transported by a laboratory courier. All coolers shipped to the laboratory will be sealed with mailing tape and a COC seal to ensure that the samples remain under strict COC protocol.

#### Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured location until they are picked up and/or sent to the laboratory. The record of possession of samples from the time they are obtained in the field to the time they are delivered to the laboratory or shipped off-site will be documented on COC forms. The COC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection and matrix; and signatures of individuals involved in sample transfer, and the dates and times of transfers. Laboratory personnel will note the condition of the custody seal and sample containers at sample check-in.

#### **4.7 Field Instrumentation**

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. Instruction manuals for the equipment will be on file at the Site for referencing proper operation, maintenance, and calibration procedures. The equipment will be calibrated according to manufacturer specifications at the start of each day of fieldwork. If an instrument fails calibration, the project manager or QA/QC officer will be contacted immediately to obtain a replacement instrument. A calibration log will be maintained to record the date of each calibration, any failure to calibrate and corrective actions taken. The PID will be equipped with an 11.7 eV lamp and will be calibrated each day using 100 parts per million (ppm) isobutylene standard gas in accordance with the manufacturer's standards.

#### **4.8 Quality Assurance (QA)**

All soil, groundwater, soil vapor, and ambient air laboratory analytical data will be reviewed by a third-party validator and a Data Usability Summary Report (DUSR) will be prepared to document the usability and validity of the data. The Remedial Investigation Report (RIR) will include a detailed description of endpoint sampling activities, data summary tables, concentration map showing sample locations and concentrations, DUSR, and laboratory reports.

**ATTACHMENT A**

**RESUMES OF QA/QC OFFICER AND PROJECT DIRECTOR, PROJECT MANAGER, AND FIELD TEAM  
LEADER/FIELD TECHNICIAN/SITE SAFETY OFFICER/ALTERNATE**



# **DEBORAH SHAPIRO, QEP**

## **SENIOR VICE PRESIDENT**

Deborah Shapiro is a Senior Vice President in the Site Assessment and Remediation Department. Ms. Shapiro supervises project teams and manages all aspects of assessment and remediation projects across the New York Metropolitan Area. Ms. Shapiro works with developers, non-profit organizations, architects, local community groups, local businesses, and government agencies. Her projects fall under the regulatory oversight of NYSDEC, NYCDEP, and NYCOER including the New York State Brownfield Cleanup Program (BCP), New York City Voluntary Cleanup Program (VCP), NYSDEC petroleum spills program, RCRA/UIC closures, and NYCOER's E-designation program. Ms. Shapiro has also assisted commercial and industrial property owners with maintaining the integrity of their portfolios by providing compliance related cleanup and chemical storage management services. Ms. Shapiro has also been a moderator and panelist at numerous conferences.

Ms. Shapiro manages all aspects of redevelopment projects from the initial Phase I ESA, Phase II, and remediation through post-remedial site management. In addition, her experience includes groundwater investigations, monitoring, and sampling programs; Brownfield and hazardous waste site investigations; In-Situ Chemical Oxidation; underground storage tank studies, including soil contamination delineation, classification, removal and disposal; waste characterization sampling; exposure assessments; on-going remedial action (especially AS/SVE), and permitting.

## **BACKGROUND**

### **Education**

M.S., Environmental Science, American University, 2001

B.A., Environmental Studies, American University, 1998

### **Professional Licenses/Certifications**

Qualified Environmental Professional

Health and Safety Operations at Hazardous Materials Sites 29 CFR 1910.120

OSHA 8 Hour HAZWOPER Supervisor

OSHA 10 Hour Occupational Construction Safety and Health

CPR

### **Professional Memberships**

Past President, New York City Brownfield Partnership

Board Member, Residents for a More Beautiful Port Washington

Member, Institute of Professional Environmental Practitioners (IPEP)

### **Awards**

Big Apple Brownfield Award recipient as part of the Elton Crossing redevelopment team 2017

Big Apple Brownfield Award recipient as part of the Courtlandt Crescent redevelopment team 2013

Big Apple Brownfield Award recipient as part of the Via Verde redevelopment team 2012

Big Apple Brownfield Award recipient as part of the Cornerstone B1 (LaTerraza) redevelopment team 2011

### **Years of Experience**

Year started in company: 2013

Year started in industry: 1998



# **DEBORAH SHAPIRO, QEP**

**SENIOR VICE PRESIDENT**

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## **RELEVANT EXPERIENCE**

### **Elton Crossing, Bronx, NY**

AKRF provided environmental consulting services in connection with the purchase and redevelopment of the Elton Crossing site at 899 Elton Avenue in the Bronx, NY. The work initially involved the preparation of a Phase II subsurface investigation including soil and soil vapor testing to determine if the site would be eligible for the New York State Brownfield Cleanup Program (NYSBCP). Upon completion of the investigation, AKRF prepared a NYCBCP Application and the site was accepted into the NYSBCP. AKRF managed all aspects of the brownfield cleanup including; development of Investigation Work Plans, performing Remedial Investigations and Reports, preparation of Phase I ESAs, preparation of a Citizen Participation Plan, distribution of public notices, preparation and implementation of a Remedial Action Work Plan (RAWP), design of a sub-slab depressurization system, preparation of the Final Engineering Report and Site Management Plan, and sampling and management of soil disposal. AKRF is in the midst of implementing the Site Management Plan. As project manager, Ms. Shapiro was responsible for managing all technical components of the project, communication with NYSDEC and the Client, and managing the budget.

### **Second Farms, Bronx, NY**

AKRF, Inc. was initially contracted by the New York City Office of Environmental Remediation (NYCOER) to conduct a subsurface investigation of a 1.12-acre parcel in the Bronx, New York under the United States Environmental Protection Agency (USEPA) Brownfield Assessment Grant program. The investigation included a geophysical survey and utility mark-outs, and the collection and analysis of soil, groundwater, soil vapor, indoor air and ambient air samples. AKRF continued working on the project for the developer by preparing a Remedial Action Plan and Environmental Assessment Statement. AKRF is in the midst of implementing the remedy. As project manager, Ms. Shapiro was responsible for managing all technical components of the project, communication with OER, NYCDEP, and the Client, and managing the budget.

### **Bradhurst Cornerstone II Residences, Manhattan, NY**

AKRF, Inc. prepared a Part 58 Environmental Assessment and a City Environmental Quality Review Environmental Assessment Statement for the Bradhurst Cornerstone II Apartments project. Issues of concern for the environmental review included the identification of project commitments for certain of the four sites related to historic resources, hazardous materials, air quality, and building attenuation. As part of the mitigation of hazardous materials, AKRF conducted a Phase II investigation, and prepared a Remedial Action Plan and Construction Health and Safety Plan. As project manager, Ms. Shapiro was responsible for managing all technical components of the hazardous materials portion of the project, communication with the regulatory agency and the Client, and managing the budget.

### **Lambert Houses, Bronx, NY**

AKRF performed an EIS of the Lambert Houses affordable housing complex located in the West Farms section of the Bronx, NY. Lambert Houses consisted of multi-story apartment buildings, parking garage, and a multi-tenant retail/commercial building alongside the elevated NYC subway. AKRF also conducted a Phase I ESA with a vapor intrusion screen of the Property to satisfy HUD's vapor intrusion requirements. The Phase I and vapor intrusion screens were prepared in accordance with ASTM E1527-05, ASTM E2600, and EPA's All Appropriate Inquiry (AAI) rule. After completion of the EIS, an E designation for hazardous materials was placed on the Site. A Subsurface Investigation was conducted and a Remedial Action Work Plan was prepared under OER oversight. The Site was subsequently entered in the NYC Voluntary Cleanup Program. AKRF is in the midst of implementing the RAWP, which included remediation of a hydraulic oil spill. As project manager, Ms. Shapiro was responsible for managing all technical components of the hazardous materials portion of the project, communication with the regulatory agency and the Client, and managing the budget.



## **DEBORAH SHAPIRO, QEP**

**SENIOR VICE PRESIDENT**

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### **Brook 156, Bronx, NY**

AKRF was retained to provide environmental consulting services in connection with the purchase and development of the Site. AKRF prepared a Phase I Environmental Site Assessment (ESA) of the NYC-owned former gasoline service station and a former railroad. A Tier 1 Vapor Encroachment Screening was also conducted to satisfy HUD's vapor intrusion requirements. AKRF prepared a Remedial Investigation Work Plan (RIWP) and conducted a Remedial Investigation (RI) at the site, which included the collection and analysis of soil, soil vapor, and groundwater. The results of the RI, which were documented in a Remedial Investigation Report (RIR), were used to prepare a New York City Brownfield Cleanup Program (NYCBCP) application. The site was accepted into the New York State Brownfield Cleanup Program (NYSBCP). AKRF prepared a Citizen Participation Plan (CPP), distributed public notices, and conducted multiple Remedial Investigations to further investigate soil, soil vapor, and groundwater at the site prior to redevelopment. The results of the investigations were used to prepare a Remedial Action Work Plan (RAWP), which is undergoing review and approval by NYSDEC. The proposed remedy includes excavation of soil, design and installation of a soil vapor extraction system and sub-slab depressurization system, contingent groundwater treatment program, and installation of a vapor barrier and composite cover system. As project manager, Ms. Shapiro is responsible for managing all technical components of the project, communication with NYSDEC and the Client, and managing the budget.

### **On-Call Environmental Consulting Services (Various Locations), New York City Mayor's Office of Environmental Remediation (OER) (administered by NYCEDC)**

Ms. Shapiro is managing an on-call contract with the OER for brownfields environmental assessment and remediation. The work has included conducting Phase I environmental site assessments (ESAs) and multi-media sampling of soil, groundwater, and soil vapor for various sites funded by EPA grants. The work plans and investigation reports were completed in accordance with OER and EPA requirements. AKRF also implemented a remedial plan for capping a park site in Staten Island. In addition, AKRF provided support to OER and an affordable housing developer to expedite an application for entry into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP), as well as preparation and implementation of the remedial investigation and remedial plan.

### **Atlantic Chestnut, Brooklyn, NY**

AKRF was retained to provide environmental consulting services in connection with the purchase and redevelopment of former burned manufacturing buildings encompassing an entire city block in Brooklyn, New York. As part of due diligence, AKRF prepared a Phase I Environmental Site Assessment (ESA) Report for the property. After acquisition, the property was divided into three separate sites (3264 Fulton Street, 235 Chestnut Street, and 3301 Atlantic Avenue). AKRF prepared a Subsurface (Phase II) Investigation Work Plans and conducted Phase IIs at each of the sites, which included the collection and analysis of soil, soil vapor, and groundwater samples. Based on the results of the Phase IIs, which were documented in Subsurface (Phase II) Reports, New York State Brownfield Cleanup Program (NYSBCP) applications were prepared for each of the sites. After acceptance into the NYSBCP, AKRF prepared Citizen Participation Plans (CPPs) and distributed public notices. AKRF prepared Remedial Investigation (RI) Work Plans (RIWPs) and implemented numerous Remediation Investigations for each of the sites to further investigate contaminated media at the site prior to redevelopment, and prepared the RI Reports (RIRs). AKRF is in the midst of preparing Interim Remedial Work Plans for each Site, which include installation of a Soil Vapor Extraction to prevent the off-site migration of contaminants. As project manager, Ms. Shapiro was responsible for managing all technical components of the project, communication with NYSDEC and the Client, and managing the budget.



## **ADRIANNA BOSCO**

### **SENIOR PROFESSIONAL**

Adrianna Bosco is a Senior Professional in AKRF's Site Assessment and Remediation Department. She has experience in navigating redevelopment projects through regulatory requirements under local and state programs. Ms. Bosco has worked closely with projects enrolled in the NYSDEC Brownfield Cleanup Program, the New York City Voluntary Cleanup Program (VCP), and NYSDEC petroleum spills program, from initial stages of investigation and remediation, through site closure and post-remedial management. Ms. Bosco also has experience in preparing Phase I Environmental Site Assessments and Subsurface (Phase II) Investigations, in addition to conducting environmental/construction oversight and the associated reporting elements. Prior to joining AKRF, she worked as an Environmental Scientist for PS&S Engineering, Inc.

### **BACKGROUND**

#### **Education**

B.S., Environmental Engineering, Manhattan College, Bronx, New York, 2011

#### **Licenses/Certifications**

40 Hour OSHA HAZWOPER Certified, September 2011

10 Hour OSHA Construction Program Certified, October 2013

#### **Years of Experience**

Date started at AKRF: July 2014

Prior industry experience: PS&S Engineering, Inc. December 2011 – July 2014 (2 years, 7 months)

### **RELEVANT EXPERIENCE – AKRF**

#### **147-25 94<sup>th</sup> Avenue, Queens, NY**

This historical meat refrigeration facility is enrolled in the Brownfield Cleanup Program to remediate the property and construct a 23-story affordable residential building. Although the site has an E-Designation for hazardous materials, noise, and air quality, AKRF assisted with applying for entry into the NYSDEC Brownfield Cleanup Program, due to the presence of contaminated soil and soil vapor beneath the site. AKRF is providing environmental consulting services throughout the project. As the Deputy Project Manager, Ms. Bosco prepared the Brownfield Cleanup Program application and Remedial Work Plan. Ms. Bosco also managed field activities associated with the Remedial Investigation, to determine the vertical and horizontal extent of on-site contamination. Once construction begins, Ms. Bosco will also manage the on-site remediation and prepare NYSDEC-required submittals and reports.

#### **1888 Bathgate Avenue Redevelopment Site, Bronx, NY**

AKRF is providing environmental consulting services in connection to the investigation and remediation of an approximately 36,000-square foot parcel enrolled in the Brownfield Cleanup Program. This former steel door manufacturing facility is contaminated with chlorinated solvents, including tetrachloroethene. The selected remedy included site-wide excavation of soil and bedrock, continuous air monitoring, collection of post-excavation endpoint samples, and implementation of an in-situ groundwater treatment program. As the Deputy Project Manager for this project, Ms. Bosco is managing various field efforts, including a Remedial Design Investigation to develop the groundwater treatment program and implementation of the Remedial Action Work Plan. Upon



## **ADRIANNA BOSCO**

**SENIOR PROFESSIONAL**

| p. 2

completion of the remediation, Ms. Bosco will prepare the Final Engineering Report and Site Management Plan for submission to the NYSDEC.

### **East Side Coastal Resiliency, Manhattan, NY**

Ms. Bosco served as an Environmental Scientist and conducted a portion of the 2016 subsurface investigation of the 2.5 mile study area from Montgomery Street to East 23<sup>rd</sup> Street. The ESCR subsurface exploration program involved a review of available utility plans and environmental reports involving manufactured gas plant (MGP) and petroleum-related contamination. Responsibilities included groundwater sampling, soil boring and temporary well installation, and compliance with the Supplemental Subsurface Investigation Work Plan.

### **Elton Crossing, Bronx, NY**

AKRF's work includes the implementation of the NYSDEC-approved Remedial Action Work Plan for this former industrial property, including: in-situ testing, off-site transport, the closure of two petroleum spills; the registration, removal, and closure of five petroleum storage tanks encountered during excavation; and the delineation of soil contaminants, including hazardous lead, petroleum, and pesticides. As the Environmental Scientist, Ms. Bosco provided remedial oversight during soil excavation, confirmatory endpoint sampling, SSDS piping installation and inspections, vapor barrier installation, and air monitoring for particulates and volatile organic compounds (VOCs).

### **145 West Street, Greenpoint, Brooklyn, NY**

As the Environmental Scientist and Deputy Project Manager for this project, Ms. Bosco conducted a supplemental remedial investigation, including soil and groundwater sampling, and several rounds of waste characterization soil sampling. Ms. Bosco also performed remedial oversight during activities such as soil excavation and off-site disposal, underground storage tank (UST) removal, SSDS piping installation and testing, and routine air monitoring. Ms. Bosco also aided in the preparation of the Final Engineering Report (FER) and Site Management Plan (SMP).

### **Former Laundry/Dry Cleaning Plant, New York, NY**

Ms. Bosco served as the Environmental Scientist of the only New York State Department of Environmental Conservation's (NYSDEC) listed inactive hazardous waste (State Superfund) site in Manhattan, a former laundry/dry cleaning plant in Harlem. Remedial investigation included evaluation of soil, groundwater, soil vapor, indoor air, and building materials. Interim remediation included the removal of contaminated building materials and operation of an innovative sub-slab vapor extraction system retrofitted into the existing building. As the Environmental Scientist, Ms. Bosco performed remedial action oversight, including SSDS piping installation inspections and Health and Safety Plan (HASP) air monitoring for volatiles and particulates. Remedial action work was completed in 2014 and documented in a Final Engineering Report. NYSDEC issued Certificate of Completion in January 2015 and the site has been reclassified to a "Class 4" site (site properly closed – requires continued management). Ongoing activities continue under the NYSDEC-approved Site Management Plan, including operations, maintenance and monitoring of the SSDS and SVE system.

## **RELEVANT EXPERIENCE – OTHER**

### **PS&S Engineering, Inc. (PS&S), Yonkers, NY**

Before joining AKRF, Ms. Bosco was an Environmental Scientist in the Environmental Department at PS&S. She was responsible for conducting site investigations and providing construction oversight for remediation projects in New York and New Jersey. As a staff scientist, she was responsible for sampling and analysis of various media, preparing technical reports and work plans, and conducting Phase I Environmental Site Assessments.



# **CLAIRE BEARDEN**

## **PROFESSIONAL II**

Claire Bearden is an Environmental Scientist in AKRF's Hazardous Materials Department with experience in preparing Phase I environmental site assessments, Phase II Site Investigations, Remedial Investigations, and technical reporting.

## **BACKGROUND**

### **Education**

BS, Syracuse University, Earth Science with Environmental Focus, 2016

### **Licenses/Certifications**

OSHA 10-hour Construction Industry  
OSHA 40-hour HAZWOPER Certified  
OSHA 8-Hour Supervisor Training Certified

### **Professional Memberships**

Programs Committee Member, Society of Women Environmental Professionals, NJSWEP Programs Committee

### **Years of Experience**

5 years in the industry  
1 year with AKRF

## **RELEVANT EXPERIENCE**

### **Remedial Construction Oversight and Certification Under NYSDEC of Regional Food Hub Warehouse on Former MGP Site, Bronx, NY**

Remedial construction oversight and certification under NYSDEC of regional food hub warehouse on former MGP site. Claire Bearden performed remedial construction oversight to satisfy NYSDEC Brownfield Cleanup Program (BCP) program requirements during the initial redevelopment stages of a former Manufactured Gas Plant (MGP) facility. Claire's duties have included administering a Community Air Monitoring Program (CAMP) with continuous data collection and automated telemetry for airborne particulates and volatile organics during remedial activities. Claire has completed progress reporting for NYSDEC, and assisted with the collection of soil and concrete samples proposed for reuse and/or off-site disposal during the redevelopment.

### **Raritan Rail Yard SIWP, Raritan, NJ**

AKRF is performing a Site Investigation for NJ Transit under NJDEP's Site Remediation Program to evaluate several historic petroleum releases at this active rail yard. Claire Bearden has been responsible for conducting preliminary review of historic investigation activities on file with NJ Transit dating back to the early 1980s. Claire has also submitted requests to NJDEP to review regulatory files for active and inactive remedial cases on and adjacent to the site. As part of the initial phase of the site investigation, Claire completed rail safety training and helped retrieve passive soil gas samplers at the site.





# **CLAIRE BEARDEN**

## **PROFESSIONAL II**

### **Hudson Piers, Yonkers, NY**

AKRF is providing site assessment/remediation services for the southern half of the Hudson Piers site along the Yonkers waterfront. The 17.4-acre, \$585 million project will yield a mix of market-rate housing, affordable apartments, and retail space. Claire Bearden collected soil vapor and groundwater samples.

### **167 North Broadway, Yonkers, NY**

Claire Bearden performed remedial construction oversight for a structurally complicated 20-foot-deep excavation, which required a sliding rail shoring system for support of excavation to protect adjacent buildings and structures. Claire's responsibilities included direct oversight of the contractor performing the excavation, implementation of community air monitoring, and collection of post-excavation end point samples. Upon completion of the remediation, Claire drafted the remedial action report for submission to NYSDEC.

### **Hunters Point South Towers, Queens, NY**

AKRF provided environmental analysis and documentation pursuant to CEQR and NEPA guidelines, prepared the construction protection plan for adjacent infrastructure, provided facade noise attenuation consulting, and has been providing site assessment and remediation consulting for 52-41 Center Boulevard and 52-03 Center Boulevard in Long Island City as part of the Hunter's Point waterfront development. AKRF completed on-site Phase I and Phase II investigations, drafted the NYCDEP Remedial Action Plans, are conducting construction monitoring work, and will be preparing closure reports when the construction work is complete.

Claire Bearden performed construction oversight and air monitoring during the excavation work required for installation of utilities in the courtyard. For this project, Claire screened and oversaw the trenching and stockpiling of soil as a representative of the generator. She also performed a Air Monitoring Program for airborne particulates and VOCs during soil handling activities.

### **1000-1006 Westchester Avenue, Bronx, NY**

A new commercial and community building is planned for 1000-1006 Westchester Avenue in the Bronx, including a Democracy Prep Public Schools charter school. AKRF is providing site assessment/remediation and civil engineering services for the project. Claire Bearden drafted the waste classification report for this project.

### **1941 & 1959 Jerome Avenue, Bronx, NY**

AKRF conducted a Supplemental Remedial Investigation (RI) on behalf of the Client to support an application to the NYSDEC Brownfield Cleanup Program (BCP) for this automotive facility in the Bronx. Claire Bearden logged soils cores and collected soil vapor, soil and groundwater samples.



## **ANTONIO CARDENAS**

### **ENVIRONMENTAL SCIENTIST**

Mr. Cardenas is an Environmental Scientist in the AKRF, Inc. Site Assessment and Remediation Group. His experience includes Phase I Environmental Site Assessments, soil, groundwater, and soil gas sampling, and environmental monitoring of construction sites.

### **BACKGROUND**

#### **Education**

B.S., Geology, City College of the City University of New York, NY, 2017

#### **Certifications**

OSHA 40-hour Health & Safety Training for Hazardous Waste Operations

OSHA 10-hour Health & Safety Training for Hazardous Waste Operations

USEPA Air Monitoring for Emergency Response Training Program, AMFER Certificate

#### **Years of experience**

Year started in company: 2018

Year started in the industry: 2018

### **RELEVANT EXPERIENCE – AKRF**

#### **85 Jay Street, Brooklyn, NY – NYS Brownfield Redevelopment**

Remediation of a former lead smelter is being conducted under the New York State Brownfield Cleanup Program (BCP). AKRF completed a Phase II Subsurface Investigation, Remedial Investigation, and prepared a Remedial Action Work Plan (RAWP) to address subsurface contamination during site redevelopment including in-situ stabilization of lead impacted soil. For this project, Mr. Cardenas served as an on-site environmental monitor who conducted work zone and community air monitoring, and oversaw excavation and export of soil. Additionally, Mr. Cardenas collected confirmatory soil samples at the bottom of excavation and throughout soil stabilization. The project is in the midst of remediation, and Mr. Cardenas assists in overseeing the soil conditioning program, the excavation monitoring (CAMP and CHASP), and the daily reporting obligation to NYSDEC. The project anticipates a 12-month construction period and is projected to achieve a Track 1 cleanup in 2019.

#### **Rego Park Home Depot, Queens, NY**

Solvent contamination was encountered during retail development of a former industrial property in Rego Park, Queens, New York. The site work included an extensive investigation and a multi-phase remediation performed under the NYSDEC Voluntary Cleanup Program (VCP). Remediation included removal of aboveground and underground storage tanks (ASTs and USTs) and hotspot soil removal. An Air Sparging/Soil Vapor Extraction (AS/SVE) groundwater remediation system designed by AKRF was installed as part of the building construction. Continued remediation work included upgrading and expanding the AS/SVE system after the store was opened. AKRF continues operations, maintenance, and monitoring under the NYSDEC-approved Site Management Plan. Mr. Cardenas performed low flow sampling as part this process.





## **ANTONIO CARDENAS**

**ENVIRONMENTAL SCIENTIST** | p. 2

### **Manhattan West, Manhattan, NY**

AKRF is providing environmental consulting services to Brookfield Office Properties in connection with the Manhattan West development site, which encompasses an entire city-block above the Amtrak approach to Penn Station. The four towers that comprise the Manhattan west development site are being remediated as four different sites under the New York City Office of Environmental Remediation (NYCOER), due to an E-Designation for hazardous materials, air quality, and noise attenuation. Mr. Cardenas provided environmental oversight.

### **34 Berry Street, Brooklyn, NY**

AKRF was retained to prepare close-out documentation for this former industrial/warehouse facility in Williamsburg, which was remediated under the NYCOER E-designation and NYSDEC Spills programs. The closure report, which was based on documentation provided by the environmental contractor, was prepared on an expedited basis so that the developer could obtain a Certificate of Occupancy in time for the scheduled opening of the new building. AKRF is currently providing on-going remediation monitoring services to fulfill NYSDEC Spill closure requirements. For this project, Mr. Cardenas performed soil sampling.

### **Queens Animal Shelter Site, Queens, NY**

The Queens Animal Shelter Site is currently an automobile wrecking facility. AKRF is assisting the Client in taking the Site into the BCP to investigate and remediate the property as part of redevelopment into a new state-of-the-art animal shelter and care facility. For this project, Mr. Cardenas performed low flow sampling for laboratory analyses as part of the Remedial Investigation at the Site.

## **RELEVANT EXPERIENCE – OTHER**

### **Interior Management Inc. (2011-2013)**

Before joining AKRF, Mr. Cardenas worked in the maintenance department of Interior Management Inc. He learned how to manage a work site, detect and report leaks, identify building damages, and foster a positive work environment for employees.



**APPENDIX B**  
**HEALTH AND SAFETY PLAN**

# **521 EAST TREMONT AVENUE**

## **BRONX, NEW YORK**

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### **Health and Safety Plan**

**NYSDEC BCP Site No: TBD**  
**AKRF Project Number: 210138**

**Prepared For:**

New York State Department of Environmental Conservation  
Division of Environmental Remediation, Remedial Bureau B  
625 Broadway, 12<sup>th</sup> Floor  
Albany, New York 12233

**Prepared On Behalf Of:**

M521 Tremont LLC  
48-02 25<sup>th</sup> Avenue, Suite 400  
Astoria, NY 11103

**Prepared by:**



**AKRF, Inc.**  
440 Park Avenue South, 7<sup>th</sup> Floor  
New York, New York 10016  
212-696-0670

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**SEPTEMBER 2022**

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## FIGURES

- Figure 1 – Site Location Map
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## ATTACHMENTS

- Attachment A – Potential Health Effects from On-Site Contaminants
- Attachment B – Report Forms
- Attachment C – Emergency Hand Signals
- Attachment D – Special Requirements for COVID-19

## 1.0 INTRODUCTION

This environmental Health and Safety Plan (HASP) has been developed for the implementation of a Remedial Investigation (RI) by AKRF, Inc. (AKRF) personnel and its subcontractors at the property located at 521 East Tremont Avenue in the Tremont section of the Bronx, New York, hereafter referred to as the "Site." The Site is identified by the City of New York as Borough of the Bronx, Block 3043, Lot 77.

Currently, the Site consists of two commercial buildings in the southern portion of the Site, and adjacent parking lots to the north and east. The southeastern portion of the Site (formerly Lot 77) is improved with a three-story commercial building (with a cellar) currently occupied by a pizzeria, check cashing facility, and brokerage firm on the first floor; and a healthcare facility on the second floor. The third floor is currently vacant. The southwestern portion of the Site (formerly Lot 80) is improved with a slab-on-grade one-story commercial building occupied by a restaurant, a cellular telephone store, and a party supply store. A Site Location Map is provided as Figure 1.

The Applicant is applying for entry into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as a Volunteer. A Subsurface (Phase II) Investigation was conducted by AKRF in July 2019 and documented in a Subsurface (Phase II) Investigation Report dated August 2019. The previous investigation identified elevated levels of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and metals in soil; chlorinated volatile organic compounds (CVOCs) and metals in groundwater; and petroleum-related VOCs and CVOCs in soil vapor.

This HASP does not discuss routine health and safety issues common to general construction and excavation, including, but not, limited to slips, trips, falls, shoring, and other physical hazards. All AKRF employees are directed that all work must be performed in accordance with the AKRF's Generic HASP and all Occupation Safety and Health Administration (OSHA)-applicable regulations for the work activities required for the project. This HASP also includes supplemental requirements to minimize potential exposure related to COVID-19 (see Attachment D). All project personnel are furthermore directed that they are not permitted to enter Permit Required Confined Spaces (as defined by OSHA). For issues unrelated to contaminated materials, all non-AKRF employees are to be bound by all applicable OSHA regulations as well as any more stringent requirements specified by their employer in their corporate HASP or otherwise. AKRF is not responsible for providing oversight for issues unrelated to contaminated materials for non-employees. This oversight shall be the responsibility of the employer of that worker or other official designated by that employer.

## 2.0 HEALTH AND SAFETY GUIDELINES AND PROCEDURES

### 2.1 Hazard Evaluation

#### 2.1.1 Hazards of Concern

Hazards of concern include: organic and inorganic chemicals, and heat and/or cold stress.

#### 2.1.2 Physical Characteristics

Physical characteristics of the hazards of concern include solid, aqueous, and vapor states.

#### 2.1.3 Hazardous Materials

The Site-specific hazardous materials that may be encountered during RI implementation include: historical fill material, solvent-related VOCs, SVOCs, petroleum, polychlorinated biphenyls (PCBs), and/or metals.

#### 2.1.4 Chemicals of Concern

Chemical	REL/PEL/STEL	Health Hazards
Arsenic	REL C: 0.002 mg/m <sup>3</sup> PEL: 0.010 mg/m <sup>3</sup>	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen].
Asbestos	No exposure limits listed.	Asbestosis (chronic exposure): dyspnea (breathing difficulty), interstitial fibrosis, restricted pulmonary function, finger clubbing; irritation eyes; [potential occupational carcinogen].
Benzene	REL: 0.1 ppm N STEL: 1 ppm PEL: 1 ppm O STEL: 5 ppm	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen].
Carbon Tetrachloride	N STEL: 2 ppm PEL: 10 ppm PEL C: 25 ppm; 5-min max peak 200 ppm	Irritation eyes, skin; central nervous system depression; nausea, vomiting; liver, kidney injury; drowsiness, dizziness, incoordination; [potential occupational carcinogen].
Cis-1,2-Dichloroethylene	PEL: 790 mg/m <sup>3</sup> REL: 790 mg/m <sup>3</sup>	Irritation eyes, respiratory system; central nervous system depression.
DDD, DDE, & DDT	REL: 0.5 mg/m <sup>3</sup> PEL: 1 mg/m <sup>3</sup>	Irritation eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis hands; vomiting; [potential occupational carcinogen].

Chemical	REL/PEL/STEL	Health Hazards
Fuel Oils	REL: 100 mg/m <sup>3</sup>	Irritation eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid).
Lead	REL: 0.050 mg/m <sup>3</sup> PEL: 0.050 mg/m <sup>3</sup>	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension.
Mercury	REL: 0.05 mg/m <sup>3</sup> REL C: 0.1 mg/m <sup>3</sup> PEL: 0.1 mg/m <sup>3</sup>	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria.
Methylene Chloride	PEL: 25 ppm O STEL: 125 ppm	Irritation eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numb, tingle limbs; nausea; [potential occupational carcinogen].
PAHs	REL: 0.1 mg/m <sup>3</sup> PEL: 0.2 mg/m <sup>3</sup>	Effects reported from occupational exposure to PAHs include chronic bronchitis, chronic cough irritation, bronchogenic cancer, dermatitis, cutaneous photosensitization, and pilosebaceous reactions. Reported health effects associated with chronic exposure to coal tar and its by-products (e.g., PAHs): Skin: erythema, burns, and warts on sun-exposed areas with progression to cancer. The toxic effects of coal tar are enhanced by exposure to ultraviolet light. Eyes: irritation and photosensitivity. Respiratory system: cough, bronchitis, and bronchogenic cancer. Gastrointestinal system: leukoplakia, buccal-pharyngeal cancer, and cancer of the lip. Hematopoietic system: leukemia (inconclusive) and lymphoma. Genitourinary system: hematuria and kidney and bladder cancers.
PCBs	REL: 0.001 mg/m <sup>3</sup> PEL: 0.5 mg/m <sup>3</sup>	Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen].
Tetrachloroethylene	PEL: 100 ppm PEL C: 200 ppm; max peak: 300 ppm	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen].

Chemical	REL/PEL/STEL	Health Hazards
Toluene	REL: 100 ppm N STEL: 150 ppm PEL: 200 ppm PEL C: 300 ppm; 10-min max peak: 500 ppm	Irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage.
Trichloroethylene	PEL: 100 ppm PEL C: 200 ppm; 5-min max peak: 300 ppm	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen].
Vinyl Chloride	PEL: 1 ppm PEL C: 5 ppm	Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen].
Xylene	REL: 100 ppm N STEL: 150 ppm PEL: 100 ppm	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.
Notes: REL: Recommended exposure limit (NIOSH) PEL: Permissible exposure limits (OSHA) STEL: Short-term exposure limit N: NIOSH O: OSHA C: Ceiling		

The potential health effects from these known and suspected on-site contaminants are provided in Attachment A.

## 2.2 Designated Personnel

AKRF will appoint one of its on-site personnel as the Site Safety Officer (SSO). This individual will be responsible for the implementation of the HASP. The SSO will work under the direction of a Qualified Environmental Professional (QEP) and will be experienced in the implementation of air monitoring and hazardous materials sampling programs. Health and safety training required for the SSO and all field personnel are outlined in Section 2.3 of this HASP.

## 2.3 Training

All personnel who enter the work area while intrusive activities are being performed will have completed a 40-hour training course that meets OSHA requirements of 29 CFR Part 1910, Occupational Safety and Health Standards. In addition, all personnel will have up-to-date 8-hour refresher training. The training will allow personnel to recognize and understand the potential hazards to health and safety. All field personnel must attend a training program, whose purpose is to:

- Make them aware of the potential hazards they may encounter;
- Provide the knowledge and skills necessary for them to perform the work with minimal risk to health and safety;
- Make them aware of the purpose and limitations of safety equipment; and



- Ensure that they can safely avoid or escape from emergencies.

Each member of the field crew will be instructed in these objectives before work begins. A Site safety meeting will be conducted at the start of the project work. Additional meetings shall be conducted, as necessary, for new personnel working at the Site.

#### **2.4 Medical Surveillance Program**

All AKRF and subcontractor personnel performing field work involving subsurface disturbance at the Site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120 (f). A physician's medical release for work will be confirmed by the SSO before an employee can begin Site activities. The medical release shall consider the type of work to be performed and the required personal protective equipment (PPE). The medical examination will, at a minimum, be provided annually and upon termination of hazardous waste Site work.

#### **2.5 Site Work Zones**

During any activities involving subsurface disturbance, the work area must be divided into various zones to prevent the spread of any contamination, ensure that proper PPE is donned, and provide an area for decontamination.

The Exclusion Zone is defined as the area where exposure to impacted media could be encountered. The Contamination Reduction Zone (CRZ) is the area where decontamination procedures take place and is located next to the Exclusion Zone. The Support is the zone area where support facilities such as vehicles, fire extinguisher, and first aid supplies are located. The emergency staging area (part of the Support Zone) is the area where all workers on-site would assemble in the event of an emergency. A summary of these areas is provided below. These zones may be changed by the SSO, depending on that day's activities. All field personnel will be informed of the location of these zones before work begins. The exclusion zone and CRZ are 10 and 25 feet from the drill rig during the RI, respectively. Control measures such as caution tape and/or traffic cones will be placed around the perimeter of the work area when needed.

#### **2.6 Personal Protection Equipment (PPE)**

The PPE required for various kinds of investigation tasks are based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear."

AKRF field personnel and other site personnel shall wear, at a minimum, Level D PPE. The protection will be based on the air monitoring described in Section 2.6.

Level D PPE includes donning of the following during drilling and sampling:

- Steel Toed Boots
- Hard Hat
- Work Gloves
- Safety Glasses
- Ear Plugs
- Nitrile Gloves
- Tyvek Suit [if non-aqueous phase liquid (NAPL) is present]

If PID readings exceed 5 ppm in the breathing zone, personnel will don Level C PPE, which includes Level D PPE and a half- or full-face respirator with a dual organic and particulate cartridge.

## 2.7 General Work Practices

To protect the health and safety of the field personnel, field personnel will adhere to the guidelines listed below during activities involving subsurface disturbance:

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited, except in designated areas on the Site. These areas will be designated by the SSO.
- Workers must wash their hands thoroughly on leaving the work area and before eating, drinking, or any other such activity.
- The workers should shower as soon as possible after leaving the Site. Contact with contaminated or suspected surfaces should be avoided.
- The buddy system should always be used; each buddy should watch for signs of fatigue, exposure, and heat/cold stress.

### 3.0 EMERGENCY PROCEDURES AND EMERGENCY RESPONSE PLAN

The field crew will be equipped with emergency equipment, such as a first aid kit and disposable eye washes. In the case of a medical emergency, the SSO will determine the nature of the emergency and he/she will have someone call for an ambulance, if needed. If the nature of the injury is not serious, i.e., the person can be moved without expert emergency medical personnel, he/she should be taken to a hospital by on-site personnel. Directions to the hospital are provided below, and a Hospital Location Map showing the more direct route to the hospital is included as Figure 2.

#### 3.1 Hospital Information

<b>Hospital Name:</b>	St. Barnabas Hospital
<b>Phone Number:</b>	(718) 960-9000
<b>Address:</b>	4422 3 <sup>rd</sup> Avenue, Bronx, NY 10457
<b>Directions:</b>	1. Turn LEFT out of the Site onto 3 <sup>rd</sup> Avenue toward East 178 <sup>th</sup> Street. 2. Continue STRAIGHT.  The emergency room will be on the RIGHT at the intersection of 3 <sup>rd</sup> Avenue and East 183 <sup>rd</sup> Street.

#### 3.2 Emergency Contacts

Company	Individual Name	Title	Contact Number
AKRF	Deborah Shapiro	Project Director, QEP	(646) 388-9544
	Adrianna Bosco	Project Manager	(646) 388-9576
	Claire Bearden	Field Team Leader/Site Safety Officer (SSO)	(336) 266-9330 (cell)
	Antonio Cardenas	Alternate Field Team Leader/SSO	(718) 551-7193 (cell)
M521 Tremont LLC	Michelle Ponce	Applicant's Representative	(718) 663-2065
Ambulance, Fire Department & Police Department	-	-	911
NYSDEC Spill Hotline	-	-	800-457-7362

## 4.0 APPROVAL & ACKNOWLEDGMENTS OF HASP

### 4.1 Approval

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
AKRF Project Manager

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
AKRF Health and Safety Officer

Below is an affidavit that must be signed by all workers who enter the site. A copy of the HASP must be on-site at all times and will be kept by the SSO.

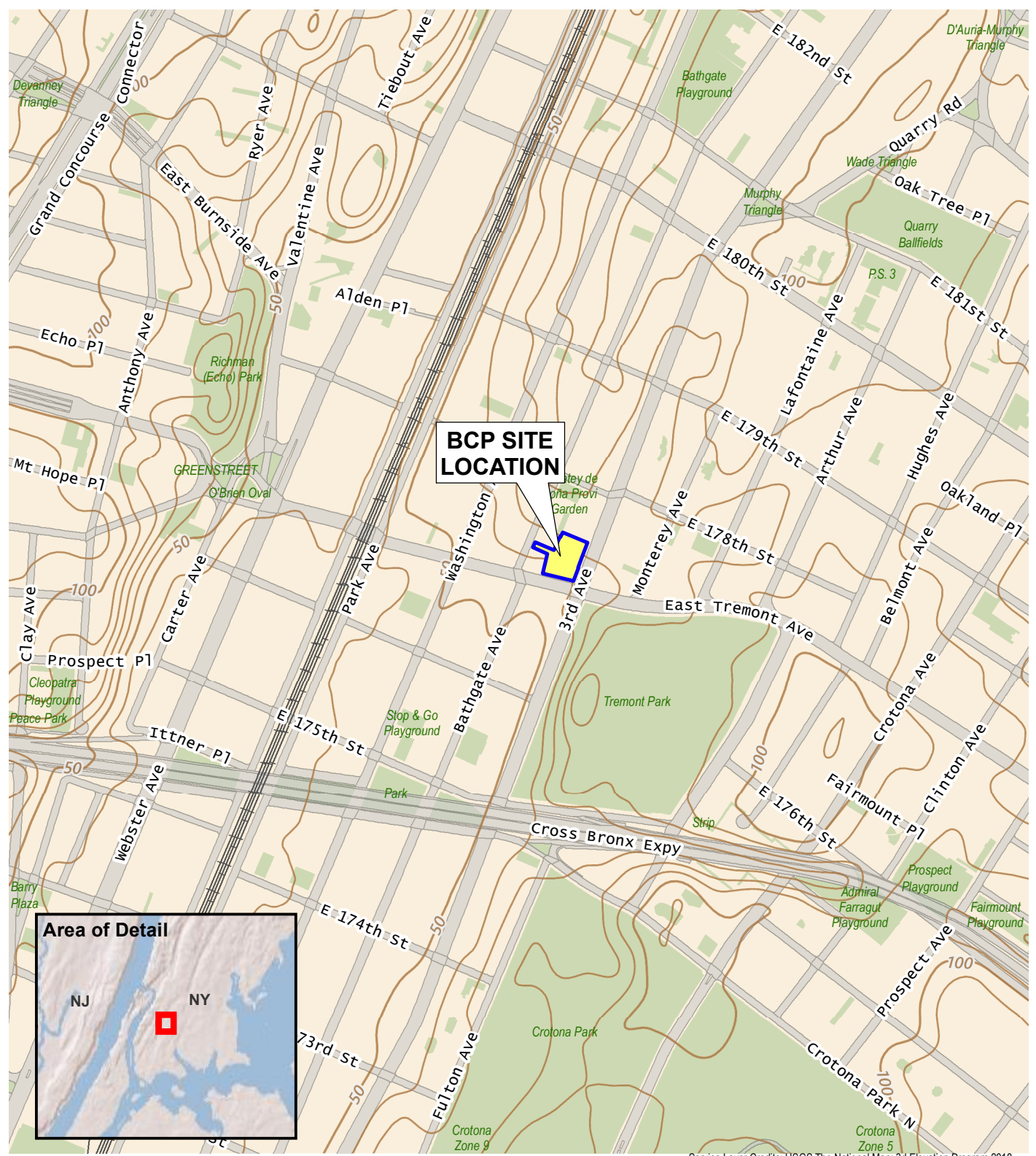
### 4.2 Affidavit

I have read the Health and Safety Plan (HASP) for the project located at 521 East Tremont Avenue, Bronx, NY. I agree to conduct all on-site work in accordance with the requirements set forth in this HASP and understand that failure to comply with this HASP could lead to my removal from the site.

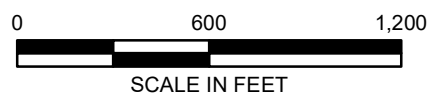
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## FIGURES

© 2022 AKRF Q:\Projects\190204 - 521 EAST TREMONT AVENUE\Technical\GIS and Graphics\hazmat\190204 Fig 1 site loc map.mxd/8/23/2022 9:13:30 AM mveilleux



Service Layer Credits: USGS The National Map: 3d Elevation Program 2018



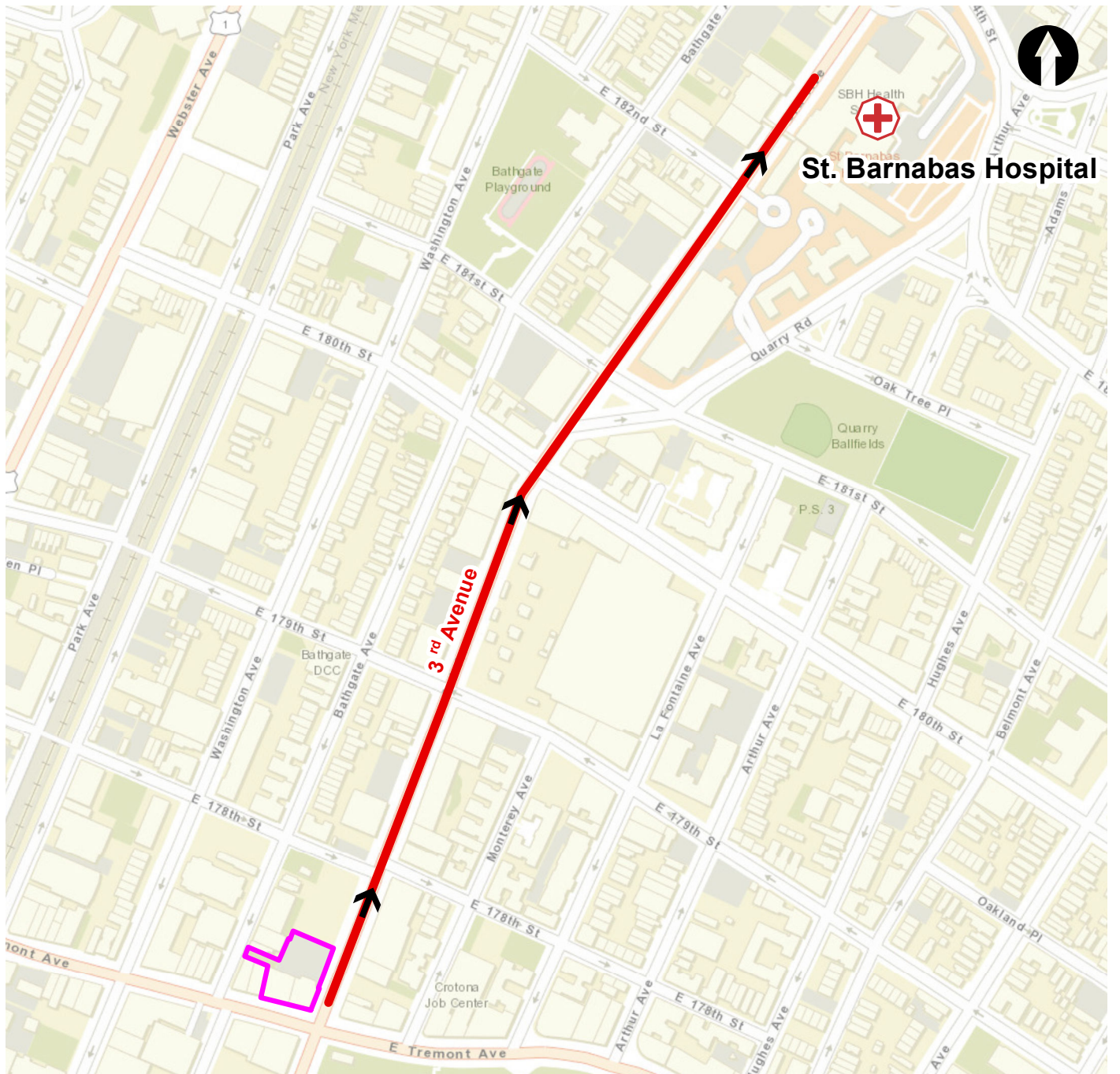

440 Park Avenue South, New York, NY 10016

**521 East Tremont Avenue**  
Bronx, New York

**SITE LOCATION**

DATE	<b>8/23/2022</b>
PROJECT NO.	<b>190204</b>
FIGURE	<b>1</b>








SBH Health  
**St. Barnabas Hospital**

**3<sup>rd</sup> Avenue**

Service Layer Credits: ESRI World Street Map 2021

St. Barnabas Hospital  
 4422 3<sup>rd</sup> Avenue  
 Bronx, NY 10457  
 (718) 960-9000

**LEGEND**

-  PROJECT SITE BOUNDARY
-  HOSPITAL LOCATION
-  ROUTE TO HOSPITAL



440 Park Avenue South, New York, NY 10016

**521 East Tremont Avenue**  
 Bronx, New York

**HOSPITAL ROUTE MAP**

DATE

**9/1/2022**

PROJECT NO.

**190204**

FIGURE

**2**

**ATTACHMENT A**  
**POTENTIAL HEALTH EFFECTS FROM ON-SITE CONTAMINANTS**



This fact sheet answers the most frequently asked health questions (FAQs) about 1,2-dichloroethene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Exposure to 1,2-dichloroethene occurs mainly in workplaces where it is made or used. Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired. *cis*-1,2-Dichloroethene has been found in at least 146 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA). *trans*-1,2-Dichloroethene was found in at least 563 NPL sites. 1,2-Dichloroethene was found at 336 sites, but the isomer (*cis*- or *trans*-) was not specified.

## What is 1,2-dichloroethene?

(Pronounced 1,2-dī-klôr' õ-ěth'ēn)

1,2-Dichloroethene, also called 1,2-dichloroethylene, is a highly flammable, colorless liquid with a sharp, harsh odor. It is used to produce solvents and in chemical mixtures. You can smell very small amounts of 1,2-dichloroethene in air (about 17 parts of 1,2-dichloroethene per million parts of air [17 ppm]).

There are two forms of 1,2-dichloroethene; one is called *cis*-1,2-dichloroethene and the other is called *trans*-1,2-dichloroethene. Sometimes both forms are present as a mixture.

## What happens to 1,2-dichloroethene when it enters the environment?

- 1,2-Dichloroethene evaporates rapidly into air.
- In the air, it takes about 5-12 days for half of it to break down.
- Most 1,2-dichloroethene in the soil surface or bodies of water will evaporate into air.
- 1,2-Dichloroethene can travel through soil or dissolve in water in the soil. It is possible that it can contaminate groundwater.
- In groundwater, it takes about 13-48 weeks to break down.

- There is a slight chance that 1,2-dichloroethene will break down into vinyl chloride, a different chemical which is believed to be more toxic than 1,2-dichloroethene.

## How might I be exposed to 1,2-dichloroethene?

- Breathing 1,2-dichloroethene that has leaked from hazardous waste sites and landfills.
- Drinking contaminated tap water or breathing vapors from contaminated water while cooking, bathing, or washing dishes.
- Breathing 1,2-dichloroethene, touching it, or touching contaminated materials in the workplace.

## How can 1,2-dichloroethene affect my health?

Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired; breathing very high levels can kill you.

When animals breathed high levels of *trans*-1,2-dichloroethene for short or longer periods of time, their livers and lungs were damaged and the effects were more severe with longer exposure times. Animals that breathed very high

ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>

levels of *trans*-1,2-dichloroethene had damaged hearts.

Animals that ingested extremely high doses of *cis*- or *trans*-1,2-dichloroethene died.

Lower doses of *cis*-1,2-dichloroethene caused effects on the blood, such as decreased numbers of red blood cells, and also effects on the liver.

The long-term (365 days or longer) human health effects after exposure to low concentrations of 1,2-dichloroethene aren't known. One animal study suggested that an exposed fetus may not grow as quickly as one that hasn't been exposed.

Exposure to 1,2-dichloroethene hasn't been shown to affect fertility in people or animals.

### **How likely is 1,2-dichloroethene to cause cancer?**

The EPA has determined that *cis*-1,2-dichloroethene is not classifiable as to its human carcinogenicity.

No EPA cancer classification is available for *trans*-1,2-dichloroethene.

### **Is there a medical test to show whether I've been exposed to 1,2-dichloroethene?**

Tests are available to measure concentrations of the breakdown products of 1,2-dichloroethene in blood, urine, and tissues. However, these tests aren't used routinely to determine whether a person has been exposed to this compound. This is because after you are exposed to 1,2-dichloroethene, the breakdown products in your body that are detected with these tests may be the same as those that come from exposure to other chemicals. These tests aren't available in most doctors' offices, but can be done at special laboratories that have the right equipment.

### **Has the federal government made recommendations to protect human health?**

The EPA has set the maximum allowable level of *cis*-1,2-dichloroethene in drinking water at 0.07 milligrams per liter of water (0.07 mg/L) and *trans*-1,2-dichloroethene at 0.1 mg/L.

The EPA requires that any spills or accidental release of 1,000 pounds or more of 1,2-dichloroethene must be reported to the EPA.

The Occupational Health Safety and Health Administration (OSHA) has set the maximum allowable amount of 1,2-dichloroethene in workroom air during an 8-hour workday in a 40-hour workweek at 200 parts of 1,2-dichloroethene per million parts of air (200 ppm).

### **Glossary**

Carcinogenicity: Ability of a substance to cause cancer.

CAS: Chemical Abstracts Service.

Fertility: Ability to reproduce.

Ingest: To eat or drink something.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Solvent: A chemical that can dissolve other substances.

### **References**

This ToxFAQs information is taken from the 1996 Toxicological Profile for 1,2-Dichloroethene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html> ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



This fact sheet answers the most frequently asked health questions (FAQs) about arsenic. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS: Exposure to higher than average levels of arsenic occurs mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts. Arsenic has been found at 1,014 of the 1,598 National Priority List sites identified by the Environmental Protection Agency (EPA).**

### What is arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Organic arsenic compounds are used as pesticides, primarily on cotton plants.

### What happens to arsenic when it enters the environment?

- Arsenic cannot be destroyed in the environment. It can only change its form.
- Arsenic in air will settle to the ground or is washed out of the air by rain.
- Many arsenic compounds can dissolve in water.
- Fish and shellfish can accumulate arsenic, but the arsenic in fish is mostly in a form that is not harmful.

### How might I be exposed to arsenic?

- Eating food, drinking water, or breathing air containing arsenic.
- Breathing contaminated workplace air.
- Breathing sawdust or burning smoke from wood treated with arsenic.
- Living near uncontrolled hazardous waste sites containing arsenic.
- Living in areas with unusually high natural levels of arsenic in rock.

### How can arsenic affect my health?

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs. Ingesting high levels of inorganic arsenic can result in death. Lower levels of arsenic can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the

ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>

appearance of small “corns” or “warts” on the palms, soles, and torso.

Skin contact with inorganic arsenic may cause redness and swelling.

Organic arsenic compounds are less toxic than inorganic arsenic compounds. Exposure to high levels of some organic arsenic compounds may cause similar effects as inorganic arsenic.

### How likely is arsenic to cause cancer?

Several studies have shown that inorganic arsenic can increase the risk of lung cancer, skin cancer, bladder cancer, liver cancer, kidney cancer, and prostate cancer. The World Health Organization (WHO), the Department of Health and Human Services (DHHS), and the EPA have determined that inorganic arsenic is a human carcinogen.

### How can arsenic affect children?

We do not know if exposure to arsenic will result in birth defects or other developmental effects in people. Birth defects have been observed in animals exposed to inorganic arsenic.

It is likely that health effects seen in children exposed to high amounts of arsenic will be similar to the effects seen in adults.

### How can families reduce the risk of exposure to arsenic?

- If you use arsenic-treated wood in home projects, you should wear dust masks, gloves, and protective clothing to decrease exposure to sawdust.
- If you live in an area with high levels of arsenic in water or soil, you should use cleaner sources of water and limit contact with soil.

### Is there a medical test to show whether I've been exposed to arsenic?

There are tests to measure the level of arsenic in blood, urine, hair, or fingernails. The urine test is the most reliable test for arsenic exposure within the last few days. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. These tests can determine if you have been exposed to above-average levels of arsenic. They cannot predict how the arsenic levels in your body will affect your health.

### Has the federal government made recommendations to protect human health?

EPA has set limits on the amount of arsenic that industrial sources can release to the environment and has restricted or canceled many uses of arsenic in pesticides. EPA has set a limit of 0.01 parts per million (ppm) for arsenic in drinking water.

The Occupational Safety and Health Administration has set limits of 10 µg arsenic per cubic meter of workplace air (10 µg/m<sup>3</sup>) for 8 hour shifts and 40 hour work weeks.

### Source of Information

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for Arsenic. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



**This fact sheet answers the most frequently asked health questions (FAQs) about asbestos. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, individual susceptibility and personal habits, and whether other chemicals are present.**

**HIGHLIGHTS: Exposure to asbestos usually occurs by breathing contaminated air in workplaces that make or use asbestos. Asbestos is also found in the air of buildings that are being torn down or renovated. Asbestos exposure can cause serious lung problems and cancer. This substance has been found at 83 of the 1,585 National Priorities List sites identified by the Environmental Protection Agency (EPA).**

### **What is asbestos?**

Asbestos is the name given to a group of six different fibrous minerals (amosite, chrysotile, crocidolite, and the fibrous varieties of tremolite, actinolite, and anthophyllite) that occur naturally in the environment. Asbestos minerals have separable long fibers that are strong and flexible enough to be spun and woven and are heat resistant. Because of these characteristics, asbestos has been used for a wide range of manufactured goods, mostly in building materials (roofing shingles, ceiling and floor tiles, paper products, and asbestos cement products), friction products (automobile clutch, brake, and transmission parts), heat-resistant fabrics, packaging, gaskets, and coatings. Some vermiculite or talc products may contain asbestos.

### **What happens to asbestos when it enters the environment?**

Asbestos fibers can enter the air or water from the breakdown of natural deposits and manufactured asbestos products. Asbestos fibers do not evaporate into air or dissolve in water. Small diameter fibers and particles may remain suspended in the air for a long time and be carried long distances by wind or water before settling down. Larger diameter fibers and particles tend to settle more quickly.

Asbestos fibers are not able to move through soil. Asbestos fibers are generally not broken down to other compounds and will remain virtually unchanged over long periods.

### **How might I be exposed to asbestos?**

We are all exposed to low levels of asbestos in the air we breathe. These levels range from 0.00001 to 0.0001 fibers per milliliter of air and generally are highest in cities and industrial areas.

People working in industries that make or use asbestos products or who are involved in asbestos mining may be exposed to high levels of asbestos. People living near these industries may also be exposed to high levels of asbestos in air.

Asbestos fibers may be released into the air by the disturbance of asbestos-containing material during product use, demolition work, building or home maintenance, repair, and remodeling. In general, exposure may occur only when the asbestos-containing material is disturbed in some way to release particles and fibers into the air.

Drinking water may contain asbestos from natural sources or from asbestos-containing cement pipes.

### **How can asbestos affect my health?**

Asbestos mainly affects the lungs and the membrane that surrounds the lungs. Breathing high levels of asbestos fibers for a long time may result in scar-like tissue in the lungs and in the pleural membrane (lining) that surrounds the lung. This disease is called asbestosis and is usually found in workers exposed to asbestos, but not in the general public. People with asbestosis have difficulty breathing, often a cough, and in severe cases heart enlargement. Asbestosis is a serious disease and can eventually lead to disability and death.

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Breathing lower levels of asbestos may result in changes called plaques in the pleural membranes. Pleural plaques can occur in workers and sometimes in people living in areas with high environmental levels of asbestos. Effects on breathing from pleural plaques alone are not usually serious, but higher exposure can lead to a thickening of the pleural membrane that may restrict breathing.

### How likely is asbestos to cause cancer?

The Department of Health and Human Services (DHHS), the World Health Organization (WHO), and the EPA have determined that asbestos is a human carcinogen.

It is known that breathing asbestos can increase the risk of cancer in people. There are two types of cancer caused by exposure to asbestos: lung cancer and mesothelioma. Mesothelioma is a cancer of the thin lining surrounding the lung (pleural membrane) or abdominal cavity (the peritoneum). Cancer from asbestos does not develop immediately, but shows up after a number of years. Studies of workers also suggest that breathing asbestos can increase chances of getting cancer in other parts of the body (stomach, intestines, esophagus, pancreas, and kidneys), but this is less certain. Early identification and treatment of any cancer can increase an individual's quality of life and survival.

Cigarette smoke and asbestos together significantly increase your chances of getting lung cancer. Therefore, if you have been exposed to asbestos you should stop smoking. This may be the most important action that you can take to improve your health and decrease your risk of cancer.

### How can asbestos affect children?

We do not know if exposure to asbestos will result in birth defects or other developmental effects in people. Birth defects have not been observed in animals exposed to asbestos.

It is likely that health effects seen in children exposed to high levels of asbestos will be similar to the effects seen in adults.

### How can families reduce the risk of exposure to asbestos?

Materials containing asbestos that are not disturbed or deteriorated do not, in general, pose a health risk and can be left alone. If you

suspect that you may be exposed to asbestos in your home, contact your state or local health department or the regional offices of EPA to find out how to test your home and how to locate a company that is trained to remove or contain the fibers.

### Is there a medical test to show whether I've been exposed to asbestos?

Low levels of asbestos fibers can be measured in urine, feces, mucus, or lung washings of the general public. Higher than average levels of asbestos fibers in tissue can confirm exposure but not determine whether you will experience any health effects.

A thorough history, physical exam, and diagnostic tests are needed to evaluate asbestos-related disease. Chest x-rays are the best screening tool to identify lung changes resulting from asbestos exposure. Lung function tests and CAT scans also assist in the diagnosis of asbestos-related disease.

### Has the federal government made recommendations to protect human health?

In 1989, EPA banned all new uses of asbestos; uses established before this date are still allowed. EPA established regulations that require school systems to inspect for damaged asbestos and to eliminate or reduce the exposure by removing the asbestos or by covering it up. EPA regulates the release of asbestos from factories and during building demolition or renovation to prevent asbestos from getting into the environment.

EPA has proposed a concentration limit of 7 million fibers per liter of drinking water for long fibers (lengths greater than or equal to 5 µm). The Occupational Safety and Health Administration has set limits of 100,000 fibers with lengths greater than or equal to 5 µm per cubic meter of workplace air for 8-hour shifts and 40-hour work weeks.

### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2001. Toxicological Profile for Asbestos. Update. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.





**This fact sheet answers the most frequently asked health questions (FAQs) about carbon tetrachloride. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.**

**HIGHLIGHTS: Carbon tetrachloride does not occur naturally. Exposure to this substance results mostly from breathing air, drinking water, or coming in contact with soil that is contaminated with it. Exposure to very high amounts of carbon tetrachloride can damage the liver, kidneys, and nervous system. Carbon tetrachloride can cause cancer in animals. Carbon tetrachloride has been found in at least 425 of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).**

### **What is carbon tetrachloride?**

Carbon tetrachloride is a manufactured chemical that does not occur naturally. It is a clear liquid with a sweet smell that can be detected at low levels. It is also called carbon chloride, methane tetrachloride, perchloromethane, tetrachloroethane, or benziform.

Carbon tetrachloride is most often found in the air as a colorless gas. It is not flammable and does not dissolve in water very easily. It was used in the production of refrigeration fluid and propellants for aerosol cans, as a pesticide, as a cleaning fluid and degreasing agent, in fire extinguishers, and in spot removers. Because of its harmful effects, these uses are now banned and it is only used in some industrial applications.

### **What happens to carbon tetrachloride when it enters the environment?**

- It moves very quickly into the air upon release, so most of it is in the air.
- It evaporates quickly surface water.
- Only a small amount sticks to soil particles; the rest evaporates or moves into the groundwater.
- It is very stable in air (lifetime 30-100 years).
- It can be broken down or transformed in soil and water within several days.
- When it does break down, it forms chemicals that can destroy ozone in the upper atmosphere.
- It does not build up in animals. We do not know if it build up in plants.

### **How might I be exposed to carbon tetrachloride?**

- Breathing contaminated air near manufacturing plants or waste sites.
- Breathing workplace air when it is used.
- Drinking contaminated water near manufacturing plants and waste sites.
- Breathing contaminated air and skin contact with water while showering or cooking with contaminated water.
- Swimming or bathing in contaminated water.
- Contact with or eating contaminated soil (pica child) at waste sites.

### **How can carbon tetrachloride affect my health?**

High exposure to carbon tetrachloride can cause liver, kidney, and central nervous system damage. These effects can occur after ingestion or breathing carbon tetrachloride, and possibly from exposure to the skin. The liver is especially sensitive to carbon tetrachloride because it enlarges and cells are damaged or destroyed. Kidneys also are damaged, causing a build up of wastes in the blood. If exposure is low and brief, the liver and kidneys can repair the damaged cells and function normally again. Effects of carbon tetrachloride are more severe in persons who drink large amounts of alcohol.

If exposure is very high, the nervous system, including the brain, is affected. People may feel intoxicated and experience headaches, dizziness, sleepiness, and nausea and vomiting. These effects may subside if exposure is stopped, but in severe cases, coma and even death may occur.

ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>

There have been no studies of the effects of carbon tetrachloride on reproduction in humans, but studies in rats showed that long-term inhalation may cause decreased fertility.

### **How likely is carbon tetrachloride to cause cancer?**

Studies in humans have not been able to determine whether or not carbon tetrachloride can cause cancer because usually there has been exposure to other chemicals at the same time. Swallowing or breathing carbon tetrachloride for years caused liver tumors in animals. Mice that breathed carbon tetrachloride also developed tumors of the adrenal gland. The Department of Health and Human Services (DHHS) has determined that carbon tetrachloride may reasonably be anticipated to be a carcinogen. The International Agency for Research on Cancer (IARC) has determined that carbon tetrachloride is possibly carcinogenic to humans, whereas the EPA determined that carbon tetrachloride is a probable human carcinogen.

### **How can carbon tetrachloride affect children?**

The health effects of carbon tetrachloride have not been studied in children, but they are likely to be similar to those seen in adults exposed to the chemical. We do not know whether children differ from adults in their susceptibility to carbon tetrachloride.

A few survey-type studies suggest that maternal drinking water exposure to carbon tetrachloride might possibly be related to certain birth defects. Studies in animals showed that carbon tetrachloride can cause early fetal deaths, but did not cause birth defects. A study with human breast milk in a test tube suggested that it would be possible for carbon tetrachloride to pass from the maternal circulation to breast milk, but there is no direct demonstration of this occurring.

### **How can families reduce the risks of exposure to carbon tetrachloride?**

- Discard any product that contains carbon tetrachloride that you may have at home and may have used in the past.
- Household chemicals should be stored out of the reach of children in their original containers.

Sometimes older children sniff household chemical products to get high. Talk to your children about the dangers of sniffing chemicals.

### **Is there a medical test to determine whether I've been exposed to carbon tetrachloride?**

Several sensitive and specific tests are available to measure carbon tetrachloride in exposed persons. The most convenient way is simply to measure carbon tetrachloride in the exhaled air. Carbon tetrachloride also can be measured in blood, fat, or other tissues. These tests are not usually done in the doctor's office because they require special equipment. Although these tests can show that a person has been exposed to carbon tetrachloride, the results cannot be used to reliably predict whether any adverse health effect might result. Because carbon tetrachloride leaves the body fairly quickly, these methods are best suited to detecting exposures that have occurred within the last several days.

### **Has the federal government made recommendations to protect human health?**

The EPA has set a limit for carbon tetrachloride in drinking water of 5 parts of carbon tetrachloride per billion parts of water (5 ppb). The EPA has also set limits on how much carbon tetrachloride can be released from an industrial plant into waste water and is preparing to set limits on how much carbon tetrachloride can escape from an industrial plant into outside air.

The Occupational Safety and Health Administration (OSHA) set a limit of 10 ppm for carbon tetrachloride in workplace air for an 8-hour workday, 40-hour workweek.

### **References**

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Carbon Tetrachloride (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-0093. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.





**This fact sheet answers the most frequently asked health questions (FAQs) about DDT, DDE, and DDD. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.**

**HIGHLIGHTS: Exposure to DDT, DDE, and DDD occurs mostly from eating foods containing small amounts of these compounds, particularly meat, fish and poultry. High levels of DDT can affect the nervous system causing excitability, tremors and seizures. In women, DDE can cause a reduction in the duration of lactation and an increased chance of having a premature baby. DDT, DDE, and DDD have been found in at least 441 of the 1,613 National Priorities List sites identified by the Environmental Protection Agency (EPA).**

### What are DDT, DDE, and DDD?

DDT (dichlorodiphenyltrichloroethane) is a pesticide once widely used to control insects in agriculture and insects that carry diseases such as malaria. DDT is a white, crystalline solid with no odor or taste. Its use in the U.S. was banned in 1972 because of damage to wildlife, but is still used in some countries.

DDE (dichlorodiphenyldichloroethylene) and DDD (dichlorodiphenyldichloroethane) are chemicals similar to DDT that contaminate commercial DDT preparations. DDE has no commercial use. DDD was also used to kill pests, but its use has also been banned. One form of DDD has been used medically to treat cancer of the adrenal gland.

### What happens to DDT, DDE, and DDD when they enter the environment?

- DDT entered the environment when it was used as a pesticide; it still enters the environment due to current use in other countries.
- DDE enters the environment as contaminant or breakdown product of DDT; DDD also enters the environment as a breakdown product of DDT.
- DDT, DDE, and DDD in air are rapidly broken down by sunlight. Half of what's in air breaks down within 2 days.
- They stick strongly to soil; most DDT in soil is broken down slowly to DDE and DDD by microorganisms; half the DDT in soil will break down in 2-15 years, depending on the type of soil.

- Only a small amount will go through the soil into groundwater; they do not dissolve easily in water.
- DDT, and especially DDE, build up in plants and in fatty tissues of fish, birds, and other animals.

### How might I be exposed to DDT, DDE, and DDD?

- Eating contaminated foods, such as root and leafy vegetables, fatty meat, fish, and poultry, but levels are very low.
- Eating contaminated imported foods from countries that still allow the use of DDT to control pests.
- Breathing contaminated air or drinking contaminated water near waste sites and landfills that may contain higher levels of these chemicals.
- Infants fed on breast milk from mothers who have been exposed.
- Breathing or swallowing soil particles near waste sites or landfills that contain these chemicals.

### How can DDT, DDE, and DDD affect my health?

DDT affects the nervous system. People who accidentally swallowed large amounts of DDT became excitable and had tremors and seizures. These effects went away after the exposure stopped. No effects were seen in people who took small daily doses of DDT by capsule for 18 months. A study in humans showed that women who had high amounts of a form of DDE in their breast milk were unable to

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breast feed their babies for as long as women who had little DDE in the breast milk. Another study in humans showed that women who had high amounts of DDE in breast milk had an increased chance of having premature babies. In animals, short-term exposure to large amounts of DDT in food affected the nervous system, while long-term exposure to smaller amounts affected the liver. Also in animals, short-term oral exposure to small amounts of DDT or its breakdown products may also have harmful effects on reproduction.

### How likely are DDT, DDE, and DDD to cause cancer?

Studies in DDT-exposed workers did not show increases in cancer. Studies in animals given DDT with the food have shown that DDT can cause liver cancer. The Department of Health and Human Services (DHHS) determined that DDT may reasonably be anticipated to be a human carcinogen. The International Agency for Research on Cancer (IARC) determined that DDT may possibly cause cancer in humans. The EPA determined that DDT, DDE, and DDD are probable human carcinogens.

### How can DDT, DDE, and DDD affect children?

There are no studies on the health effects of children exposed to DDT, DDE, or DDD. We can assume that children exposed to large amounts of DDT will have health effects similar to the effects seen in adults. However, we do not know whether children differ from adults in their susceptibility to these substances.

There is no evidence that DDT, DDE, or DDD cause birth defects in people. A study showed that teenage boys whose mothers had higher DDE amounts in the blood when they were pregnant were taller than those whose mothers had lower DDE levels. However, a different study found the opposite in preteen girls. The reason for the discrepancy between these studies is unknown.

Studies in rats have shown that DDT and DDE can mimic the action of natural hormones and in this way affect the development of the reproductive and nervous systems. Puberty was delayed in male rats given high amounts of DDE as juveniles. This could possibly happen in humans.

A study in mice showed that exposure to DDT during the first weeks of life may cause neurobehavioral problems later in life.

### How can families reduce the risk of exposure to DDT, DDE, and DDE?

- Most families will be exposed to DDT by eating food or drinking liquids contaminated with small amounts of DDT.
- Cooking will reduce the amount of DDT in fish.
- Washing fruit and vegetables will remove most DDT from their surface.
- Follow health advisories that tell you about consumption of fish and wildlife caught in contaminated areas.

### Is there a medical test to show whether I've been exposed to DDT, DDE, and DDD?

Laboratory tests can detect DDT, DDE, and DDD in fat, blood, urine, semen, and breast milk. These tests may show low, moderate, or excessive exposure to these compounds, but cannot tell the exact amount you were exposed to, or whether you will experience adverse effects. These tests are not routinely available at the doctor's office because they require special equipment.

### Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) sets a limit of 1 milligram of DDT per cubic meter of air (1 mg/m<sup>3</sup>) in the workplace for an 8-hour shift, 40-hour workweek.

The Food and Drug Administration (FDA) has set limits for DDT, DDE, and DDD in foodstuff at or above which the agency will take legal action to remove the products from the market.

### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for DDT/DDE/DDD (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



This fact sheet answers the most frequently asked health questions (FAQs) about methylene chloride. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Exposure to methylene chloride occurs mostly from breathing contaminated air, but may also occur through skin contact or by drinking contaminated water. Breathing in large amounts of methylene chloride can damage the central nervous system. Contact of eyes or skin with methylene chloride can result in burns. Methylene chloride has been found in at least 882 of 1,569 National Priorities List sites identified by the Environmental Protection Agency (EPA).

### What is methylene chloride?

Methylene chloride is a colorless liquid with a mild, sweet odor. Another name for it is dichloromethane. Methylene chloride does not occur naturally in the environment.

Methylene chloride is used as an industrial solvent and as a paint stripper. It may also be found in some aerosol and pesticide products and is used in the manufacture of photographic film.

### What happens to methylene chloride when it enters the environment?

- Methylene chloride is mainly released to the environment in air. About half of the methylene chloride in air disappears in 53 to 127 days.
- Methylene chloride does not easily dissolve in water, but small amounts may be found in drinking water.
- We do not expect methylene chloride to build up in plants or animals.

### How might I be exposed to methylene chloride?

- The most likely way to be exposed to methylene chloride is by breathing contaminated air.
- Breathing the vapors given off by products containing methylene chloride. Exposure to high levels of methylene chloride is likely if methylene chloride or a product containing it is used in a room with inadequate ventilation.

### How can methylene chloride affect my health?

If you breathe in large amounts of methylene chloride you may feel unsteady, dizzy, and have nausea and a tingling or numbness of your finger and toes. A person breathing smaller amounts of methylene chloride may become less attentive and less accurate in tasks requiring hand-eye coordination. Skin contact with methylene chloride causes burning and redness of the skin.

### How likely is methylene chloride to cause cancer?

We do not know if methylene chloride can cause cancer in humans. An increased cancer risk was seen in mice

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breathing large amounts of methylene chloride for a long time.

The World Health Organization (WHO) has determined that methylene chloride may cause cancer in humans.

The Department of Health and Human Services (DHHS) has determined that methylene chloride can be reasonably anticipated to be a cancer-causing chemical.

The EPA has determined that methylene chloride is a probable cancer-causing agent in humans.

### **How can methylene chloride affect children?**

It is likely that health effects seen in children exposed to high amounts of methylene chloride will be similar to the effects seen in adults. We do not know if methylene chloride can affect the ability of people to have children or if it causes birth defects. Some birth defects have been seen in animals inhaling very high levels of methylene chloride.

### **How can families reduce the risk of exposure to methylene chloride?**

- Families may be exposed to methylene chloride while using products such as paint removers. Such products should always be used in well-ventilated areas and skin contact should be avoided.
- Children should not be allowed to remain near indoor paint removal activities.

### **Is there a medical test to show whether I've been exposed to methylene chloride?**

- Several tests can measure exposure to methylene chloride.

These tests are not routinely available in your doctor's office.

- Methylene chloride can be detected in the air you breathe out and in your blood. These tests are only useful for detecting exposures that have occurred within a few days.
- It is also possible to measure carboxyhemoglobin (a chemical formed in the blood as methylene chloride breaks down in the body) in the blood or formic acid (a breakdown product of methylene chloride) in the urine. These tests are not specific for methylene chloride.

### **Has the federal government made recommendations to protect human health?**

- The EPA requires that releases of methylene chloride of 1,000 pounds or more be reported to the federal government.
- The EPA recommends that exposure of children to methylene chloride be limited to less than 10 milligrams per liter of drinking water (10 mg/L) for 1 day or 2 mg/L for 10 days.
- The Food and Drug Administration (FDA) has established limits on the amounts of methylene chloride that can remain after processing of spices, hops extract, and decaffeinated coffee.
- The Occupational Safety and Health Administration (OSHA) has set limits of 25 parts methylene chloride per million parts of workplace air (25 ppm) for 8-hour shifts and 40-hour work weeks.

### **References**

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for methylene chloride. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Polychlorinated biphenyls (PCBs) are a mixture of individual chemicals which are no longer produced in the United States, but are still found in the environment. Health effects that have been associated with exposure to PCBs include acne-like skin conditions in adults and neurobehavioral and immunological changes in children. PCBs are known to cause cancer in animals. PCBs have been found in at least 500 of the 1,598 National Priorities List sites identified by the Environmental Protection Agency (EPA).

### What are polychlorinated biphenyls?

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

### What happens to PCBs when they enter the environment?

- PCBs entered the air, water, and soil during their manufacture, use, and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs.
- PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators.
- PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil.
- PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these

aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

### How might I be exposed to PCBs?

- Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure.
- Eating contaminated food. The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat, and dairy products.
- Breathing air near hazardous waste sites and drinking contaminated well water.
- In the workplace during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights, and other old electrical devices; and disposal of PCB materials.

### How can PCBs affect my health?

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects

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of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

#### How likely are PCBs to cause cancer?

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens. The EPA and the International Agency for Research on Cancer (IARC) have determined that PCBs are probably carcinogenic to humans.

#### How can PCBs affect children?

Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies that weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. Transplacental transfers of PCBs were also reported. In most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk.

#### How can families reduce the risk of exposure to PCBs?

- You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued advisories to warn people about PCB-contaminated fish and fish-eating wildlife. You can reduce your family's exposure to PCBs by obeying these advisories.
- Children should be told not play with old appliances,

electrical equipment, or transformers, since they may contain PCBs.

- Children should be discouraged from playing in the dirt near hazardous waste sites and in areas where there was a transformer fire. Children should also be discouraged from eating dirt and putting dirty hands, toys or other objects in their mouths, and should wash hands frequently.
- If you are exposed to PCBs in the workplace it is possible to carry them home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

#### Is there a medical test to show whether I've been exposed to PCBs?

Tests exist to measure levels of PCBs in your blood, body fat, and breast milk, but these are not routinely conducted. Most people normally have low levels of PCBs in their body because nearly everyone has been environmentally exposed to PCBs. The tests can show if your PCB levels are elevated, which would indicate past exposure to above-normal levels of PCBs, but cannot determine when or how long you were exposed or whether you will develop health effects.

#### Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L). Discharges, spills or accidental releases of 1 pound or more of PCBs into the environment must be reported to the EPA. The Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Many states have established fish and wildlife consumption advisories for PCBs.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Trichloroethylene is a colorless liquid which is used as a solvent for cleaning metal parts. Drinking or breathing high levels of trichloroethylene may cause nervous system effects, liver and lung damage, abnormal heartbeat, coma, and possibly death. Trichloroethylene has been found in at least 852 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

### What is trichloroethylene?

Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers.

Trichloroethylene is not thought to occur naturally in the environment. However, it has been found in underground water sources and many surface waters as a result of the manufacture, use, and disposal of the chemical.

### What happens to trichloroethylene when it enters the environment?

- ❑ Trichloroethylene dissolves a little in water, but it can remain in ground water for a long time.
- ❑ Trichloroethylene quickly evaporates from surface water, so it is commonly found as a vapor in the air.
- ❑ Trichloroethylene evaporates less easily from the soil than from surface water. It may stick to particles and remain for a long time.
- ❑ Trichloroethylene may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- ❑ Trichloroethylene does not build up significantly in

plants and animals.

### How might I be exposed to trichloroethylene?

- ❑ Breathing air in and around the home which has been contaminated with trichloroethylene vapors from shower water or household products such as spot removers and typewriter correction fluid.
- ❑ Drinking, swimming, or showering in water that has been contaminated with trichloroethylene.
- ❑ Contact with soil contaminated with trichloroethylene, such as near a hazardous waste site.
- ❑ Contact with the skin or breathing contaminated air while manufacturing trichloroethylene or using it at work to wash paint or grease from skin or equipment.

### How can trichloroethylene affect my health?

Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating.

Breathing large amounts of trichloroethylene may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage.



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Drinking large amounts of trichloroethylene may cause nausea, liver damage, unconsciousness, impaired heart function, or death.

Drinking small amounts of trichloroethylene for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear.

Skin contact with trichloroethylene for short periods may cause skin rashes.

### How likely is trichloroethylene to cause cancer?

Some studies with mice and rats have suggested that high levels of trichloroethylene may cause liver, kidney, or lung cancer. Some studies of people exposed over long periods to high levels of trichloroethylene in drinking water or in workplace air have found evidence of increased cancer. Although, there are some concerns about the studies of people who were exposed to trichloroethylene, some of the effects found in people were similar to effects in animals.

In its 9<sup>th</sup> Report on Carcinogens, the National Toxicology Program (NTP) determined that trichloroethylene is “reasonably anticipated to be a human carcinogen.” The International Agency for Research on Cancer (IARC) has determined that trichloroethylene is “probably carcinogenic to humans.”

### Is there a medical test to show whether I've been exposed to trichloroethylene?

If you have recently been exposed to trichloroethylene, it can be detected in your breath, blood, or urine. The breath test, if it is performed soon after exposure, can tell if you have been exposed to even a small amount of trichloroethylene.

Exposure to larger amounts is assessed by blood

and urine tests, which can detect trichloroethylene and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products, so their detection is not absolute proof of exposure to trichloroethylene. This test isn't available at most doctors' offices, but can be done at special laboratories that have the right equipment.

### Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level for trichloroethylene in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water.

The EPA has also developed regulations for the handling and disposal of trichloroethylene.

The Occupational Safety and Health Administration (OSHA) has set an exposure limit of 100 parts of trichloroethylene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

### Glossary

Carcinogenicity: The ability of a substance to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or gas.

Milligram (mg): One thousandth of a gram.

Nonflammable: Will not burn.

ppm: Parts per million.

Sediment: Mud and debris that have settled to the bottom of a body of water.

Solvent: A chemical that dissolves other substances.

### References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Trichloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



This fact sheet answers the most frequently asked health questions (FAQs) about vinyl chloride. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Exposure to vinyl chloride occurs mainly in the workplace. Breathing high levels of vinyl chloride for short periods of time can cause dizziness, sleepiness, unconsciousness, and at extremely high levels can cause death. Breathing vinyl chloride for long periods of time can result in permanent liver damage, immune reactions, nerve damage, and liver cancer. This substance has been found in at least 616 of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

### What is vinyl chloride?

Vinyl chloride is a colorless gas. It burns easily and it is not stable at high temperatures. It has a mild, sweet odor. It is a manufactured substance that does not occur naturally. It can be formed when other substances such as trichloroethane, trichloroethylene, and tetrachloroethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC). PVC is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

Vinyl chloride is also known as chloroethene, chloroethylene, and ethylene monochloride.

### What happens to vinyl chloride when it enters the environment?

- Liquid vinyl chloride evaporates easily. Vinyl chloride in water or soil evaporates rapidly if it is near the surface.
- Vinyl chloride in the air breaks down in a few days to other substances, some of which can be harmful.
- Small amounts of vinyl chloride can dissolve in water.
- Vinyl chloride is unlikely to build up in plants or animals that you might eat.

### How might I be exposed to vinyl chloride?

- Breathing vinyl chloride that has been released from plastics industries, hazardous waste sites, and landfills.
- Breathing vinyl chloride in air or during contact with your skin or eyes in the workplace.
- Drinking water from contaminated wells.

### How can vinyl chloride affect my health?

Breathing high levels of vinyl chloride can cause you to feel dizzy or sleepy. Breathing very high levels can cause you to pass out, and breathing extremely high levels can cause death.

Some people who have breathed vinyl chloride for several years have changes in the structure of their livers. People are more likely to develop these changes if they breathe high levels of vinyl chloride. Some people who work with vinyl chloride have nerve damage and develop immune reactions. The lowest levels that produce liver changes, nerve damage, and immune reaction in people are not known. Some workers exposed to very high levels of vinyl chloride have problems with the blood flow in their hands. Their fingers turn white and hurt when they go into the cold.

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The effects of drinking high levels of vinyl chloride are unknown. If you spill vinyl chloride on your skin, it will cause numbness, redness, and blisters.

Animal studies have shown that long-term exposure to vinyl chloride can damage the sperm and testes.

### How likely is vinyl chloride to cause cancer?

The U.S. Department of Health and Human Services has determined that vinyl chloride is a known carcinogen. Studies in workers who have breathed vinyl chloride over many years showed an increased risk of liver, brain, lung cancer, and some cancers of the blood have also been observed in workers.

### How can vinyl chloride affect children?

It has not been proven that vinyl chloride causes birth defects in humans, but studies in animals suggest that vinyl chloride might affect growth and development. Animal studies also suggest that infants and young children might be more susceptible than adults to vinyl chloride-induced cancer.

### How can families reduce the risk of exposure to vinyl chloride?

Tobacco smoke contains low levels of vinyl chloride, so limiting your family's exposure to cigarette or cigar smoke may help reduce their exposure to vinyl chloride.

### Is there a medical test to show whether I've been exposed to vinyl chloride?

The results of several tests can sometimes show if you have been exposed to vinyl chloride. Vinyl chloride can be measured in your breath, but the test must be done shortly after exposure. This is not helpful for measuring very low levels of vinyl chloride.

The amount of the major breakdown product of vinyl chloride, thiodiglycolic acid, in the urine may give some information about exposure. However, this test must be done shortly after exposure and does not reliably indicate the level of exposure.

### Has the federal government made recommendations to protect human health?

Vinyl chloride is regulated in drinking water, food, and air. The EPA requires that the amount of vinyl chloride in drinking water not exceed 0.002 milligrams per liter (mg/L) of water.

The Occupational Safety and Health Administration (OSHA) has set a limit of 1 part vinyl chloride per 1 million parts of air (1 ppm) in the workplace.

The Food and Drug Administration (FDA) regulates the vinyl chloride content of various plastics. These include plastics that carry liquids and plastics that contact food. The limits for vinyl chloride content vary depending on the nature of the plastic and its use.

### Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2006. Toxicological Profile for Vinyl Chloride (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



**ATTACHMENT B**  
**REPORT FORMS**

## WEEKLY SAFETY REPORT FORM

Week Ending: \_\_\_\_\_ Project Name/Number: \_\_\_\_\_

Report Date: \_\_\_\_\_ Project Manager Name: \_\_\_\_\_

Summary of any violations of procedures occurring that week:

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Summary of any job related injuries, illnesses, or near misses that week:

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Summary of air monitoring data that week (include and sample analyses, action levels exceeded, and actions taken):

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Comments:

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Name: \_\_\_\_\_ Company: \_\_\_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_

## INCIDENT REPORT FORM

Date of Report: \_\_\_\_\_

Injured: \_\_\_\_\_

Employer: \_\_\_\_\_

Site: \_\_\_\_\_ Site Location: \_\_\_\_\_

Report Prepared By: \_\_\_\_\_  
Signature Title

**ACCIDENT/INCIDENT CATEGORY (check all that applies)**

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Injury            | <input type="checkbox"/> Illness       | <input type="checkbox"/> Near Miss         |
| <input type="checkbox"/> Property Damage   | <input type="checkbox"/> Fire          | <input type="checkbox"/> Chemical Exposure |
| <input type="checkbox"/> On-site Equipment | <input type="checkbox"/> Motor Vehicle | <input type="checkbox"/> Electrical        |
| <input type="checkbox"/> Mechanical        | <input type="checkbox"/> Spill         | <input type="checkbox"/> Other             |

**DATE AND TIME OF ACCIDENT/INCIDENT:** Narrative report of Accident/Incident: Identify: 1) actions leading to or contributing to the accident/incident; 2) the accident/incident occurrence; and 3) actions following the accident/incident.

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**WITNESS TO ACCIDENT/INCIDENT:**

Name: _____	Company: _____
Address: _____	Address: _____
Phone No.: _____	Phone No.: _____
Name: _____	Company: _____
Address: _____	Address: _____
Phone No.: _____	Phone No.: _____

**INJURED - ILL:**

Name: \_\_\_\_\_ SSN: \_\_\_\_\_

Address: \_\_\_\_\_ Age: \_\_\_\_\_

Length of Service: \_\_\_\_\_ Time on Present Job: \_\_\_\_\_

Time/Classification: \_\_\_\_\_

**SEVERITY OF INJURY OR ILLNESS:**

\_\_\_ Disabling                      \_\_\_ Non-disabling                      \_\_\_ Fatality

\_\_\_ Medical Treatment                      \_\_\_ First Aid Only

**ESTIMATED NUMBER OF DAYS AWAY FROM JOB:** \_\_\_\_\_

**NATURE OF INJURY OR ILLNESS:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**CLASSIFICATION OF INJURY:**

- |                    |                       |                            |
|--------------------|-----------------------|----------------------------|
| ___ Abrasions      | _____ Dislocations    | _____ Punctures            |
| ___ Bites          | _____ Faint/Dizziness | _____ Radiation Burns      |
| ___ Blisters       | _____ Fractures       | _____ Respiratory Allergy  |
| ___ Bruises        | _____ Frostbite       | _____ Sprains              |
| ___ Chemical Burns | _____ Heat Burns      | _____ Toxic Resp. Exposure |
| ___ Cold Exposure  | _____ Heat Exhaustion | _____ Toxic Ingestion      |
| ___ Concussion     | _____ Heat Stroke     | _____ Dermal Allergy       |
| ___ Lacerations    |                       |                            |

Part of Body Affected: \_\_\_\_\_

Degree of Disability: \_\_\_\_\_

Date Medical Care was Received: \_\_\_\_\_

Where Medical Care was Received: \_\_\_\_\_

Address (if off-site): \_\_\_\_\_

(If two or more injuries, record on separate sheets)

**PROPERTY DAMAGE:**

Description of Damage: \_\_\_\_\_

Cost of Damage:                   \$ \_\_\_\_\_

**ACCIDENT/INCIDENT LOCATION:** \_\_\_\_\_

**ACCIDENT/INCIDENT ANALYSIS:** Causative agent most directly related to accident/incident  
(Object, substance, material, machinery, equipment, conditions)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Was weather a factor?: \_\_\_\_\_

Unsafe mechanical/physical/environmental condition at time of accident/incident (Be specific):

\_\_\_\_\_  
\_\_\_\_\_

Personal factors (Attitude, knowledge or skill, reaction time, fatigue):

\_\_\_\_\_

**ON-SITE ACCIDENTS/INCIDENTS:**

Level of personal protection equipment required in Site Safety Plan:

\_\_\_\_\_

Modifications:

Was injured using required equipment?:

\_\_\_\_\_

If not, how did actual equipment use differ from plan?:

\_\_\_\_\_  
\_\_\_\_\_

**ACTION TAKEN TO PREVENT RECURRENCE:** (Be specific. What has or will be done? When will it be done? Who is the responsible party to insure that the correction is made?)

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**ACCIDENT/INCIDENT REPORT REVIEWED BY:**

\_\_\_\_\_  
SSO Name Printed

\_\_\_\_\_  
SSO Signature

**OTHERS PARTICIPATING IN INVESTIGATION:**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

**ACCIDENT/INCIDENT FOLLOW-UP:**    Date: \_\_\_\_\_

Outcome of accident/incident: \_\_\_\_\_

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Physician's recommendations: \_\_\_\_\_

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Date injured returned to work: \_\_\_\_\_  
Follow-up performed by: \_\_\_\_\_

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

**ATTACH ANY ADDITIONAL INFORMATION TO THIS FORM**



**ATTACHMENT C**  
**EMERGENCY HAND SIGNALS**

## EMERGENCY SIGNALS

In most cases, field personnel will carry portable radios for communication. If this is the case, a transmission that indicates an emergency will take priority over all other transmissions. All other site radios will yield the frequency to the emergency transmissions.

Where radio communications is not available, the following air-horn and/or hand signals will be used:

### EMERGENCY HAND SIGNALS

**OUT OF AIR, CAN'T BREATHE!**



**Hand gripping throat**

**LEAVE AREA IMMEDIATELY,  
NO DEBATE!**

**(No Picture) Grip partner's wrist or place both hands around waist**

**NEED ASSISTANCE!**



**Hands on top of head**

**OKAY! – I'M ALL RIGHT!**

**- I UNDERSTAND!**



**Thumbs up**

**NO! - NEGATIVE!**



**Thumbs down**

**ATTACHMENT D**  
**SPECIAL REQUIREMENTS FOR COVID-19**

## ATTACHMENT E

### ON-SITE AND OFF-SITE PROCEDURES TO LIMIT CONTAMINATION AND POTENTIAL SPREAD OF COVID-19

Sources: [CDC - COVID-19 Spread and Prevention Information](#); [OSHA - Workplace Preparation](#)

[Guidance; CDC - Guidance on Extended Use/Limited Reuse of Respiratory Protection](#)

- 1) Maintain minimum 6-foot separation from others whenever possible (social distancing). The virus is thought to spread mainly from person-to-person, between people who are in close contact, through respiratory droplets produced when an infected person coughs or sneezes.
- 2) Wash your hands frequently with soap and water. Wash for at least 20 seconds and, if no soap is present, use a hand sanitizer that contains at least 60% alcohol.
- 3) Wear nitrile gloves whenever possible and be especially mindful of touching common surfaces.
- 4) Disinfect commonly touched surfaces frequently, and items frequently used in public immediately upon returning home.
- 5) Face Coverings and Masks:
  - a) On-site: Wear a cloth face covering or mask at all times when there is no issue with maintaining social distancing. N95/KN95 masks or respirators should be reserved for situations where social distancing on-site is difficult or impossible. Appropriate circumstances for donning an N95/KN95 mask or respirator on-site include, but are not necessarily limited to, going inside the Site trailer; and/or entering, exiting, or traversing the Site if proper social distancing cannot be achieved. This tiered approach will help maintain the supply of N95/KN95 masks so they are available for the highest risk scenarios.
  - b) Off-site During Work-related Commute: The CDC now recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html>). A mask or cloth face covering should be worn during your commute to and from the site if you are unable to achieve proper social distancing. Appropriate times to wear a mask or cloth face covering include, but are not necessarily limited to, walking on crowded sidewalks, traveling in a shared vehicle, and/or if you are required to enter an occupied indoor space to acquire supplies for the site.
- 6) Wear safety glasses or goggles at all times while on-site and some form of eye covering (e.g., sunglasses, prescription and non-prescription glasses, or safety glasses) should be considered when commuting.
- 7) Avoid touching your face (eyes, nose, and mouth).

- 8) Cover your nose and mouth when coughing, sneezing, etc./ cough into elbow.
- 9) Do not spit.
- 10) Try to take your temperature regularly.
- 11) Talk to your supervisor if you, your friends or family members that you live with or spend time with have displayed symptoms of COVID-19, tested positive, or are afflicted with even the common cold/flu.
- 12) Talk to your supervisor if anyone you know at the site tested positive for the COVID-19.
- 13) Follow any additional health & safety protocols required at the site or elsewhere.

**APPENDIX C**  
**COMMUNITY AIR MONITORING PLAN**

**521 EAST TREMONT AVENUE  
BRONX, NEW YORK**

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**Community Air Monitoring Plan**

**NYSDEC BCP Site No: TBD  
AKRF Project Number: 190204**

**Prepared For:**

New York State Department of Environmental Conservation  
Division of Environmental Remediation, Remedial Bureau B  
625 Broadway, 12<sup>th</sup> Floor  
Albany, New York 12233

**Prepared On Behalf Of:**

M521 Tremont LLC  
48-02 25<sup>th</sup> Avenue, Suite 400  
Astoria, NY 11103

**Prepared by:**



**AKRF, Inc.**  
440 Park Avenue South, 7<sup>th</sup> Floor  
New York, New York 10016  
212-696-0670

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**SEPTEMBER 2022**

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## TABLES

Table 1 – Work Zone Air Monitoring Action Levels



## **1.0 INTRODUCTION**

This Community Air Monitoring Plan (CAMP) has been developed for the implementation of a Remedial Investigation (RI) by AKRF, Inc. (AKRF) personnel and its subcontractors at the property located at 521 East Tremont Avenue in the Tremont section of the Bronx, New York, hereafter referred to as the “Site.” The Site is identified by the City of New York as Borough of the Bronx, Block 3043, Lot 77.

Currently, the Site consists of two commercial buildings in the southern portion of the Site, and adjacent parking lots to the north and east. The southeastern portion of the Site (formerly Lot 77) is improved with a three-story commercial building (with a cellar) currently occupied by a pizzeria, check cashing facility, and brokerage firm on the first floor; and a healthcare facility on the second floor. The third floor of the is currently vacant. The southwestern portion of the Site (formerly Lot 80) is improved with a slab-on-grade one-story commercial building occupied by a restaurant, a cellular telephone store, and a party supply store. The Site is abutted to the north by a funeral home, a school, and an active construction site; to the south by East Tremont Avenue, followed by commercial use buildings; to the east by Third Avenue, followed by mixed-use buildings and a church; and to the west by commercial uses and Bathgate Avenue, followed by commercial uses and a daycare center. The surrounding area comprises predominantly mixed-use commercial/residential with some industrial uses and public facilities.

A Subsurface (Phase II) Investigation was conducted by AKRF in July 2019 and documented in a Subsurface (Phase II) Investigation Report dated August 2019. The previous investigation identified elevated levels of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and metals in soil; chlorinated volatile organic compounds (CVOCs) and metals in groundwater; and petroleum-related VOCs and CVOCs in soil vapor.

## 2.0 AIR MONITORING PROGRAM

The purpose of the air monitoring program is to identify any exposure of the field personnel and the community to potential environmental hazards in the soil and groundwater. Air Monitoring will be conducted in accordance with the New York State Department of Health (NYSDOH) and New York State Department of Environmental Conservation (NYSDEC) guidance. Results of the air monitoring will be used to determine the appropriate response action, if needed. Field personnel will be trained in the proper operation of all field instruments at the start of the field program. The equipment will be calibrated according to manufacturer specifications at the start of each day of fieldwork. If an instrument fails calibration, the project manager will be contacted immediately to obtain a replacement instrument and arrange for repairs.

### 2.1 Work Zone Air Monitoring

#### 2.1.1 Volatile Organic Compound (VOC) Monitoring

Continuous monitoring for VOCs will be conducted using roving hand-held equipment during all ground-intrusive activities, including soil boring advancement and groundwater monitoring well installation. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background concentrations. VOCs will be monitored continuously at the downwind perimeter of the exclusion zone. Monitoring will be conducted with a photoionization detector (PID) equipped with a 10.6 electron Volt (eV) lamp capable of calculating 15-minute running average concentrations. More frequent intervals of monitoring will be conducted if required as determined by the SSO. All PID readings will be recorded and available for NYSDEC and NYSDOH personnel to review. Instantaneous readings will also be recorded.

#### 2.1.2 Airborne Particulate Monitoring

A DustTrak<sup>®</sup> or equivalent would be used to measure real-time concentrations of total particulates 10 micrometers or less (PM10). Measurements for particulates will be taken prior to commencement of the work and during the work in areas where contaminated soil would be disturbed. The action levels listed in Table 1 are based on 15-minute averages of the monitoring data. The measurements will be made at the breathing height of the workers and as close to their location as practicable. The Site Safety Officer (SSO) will set up the equipment and confirm that it is working properly. His/her qualified designee may oversee the air measurements during the day. The initial measurement for the day will be performed before the start of work and will establish background levels. The final measurement for the day will be performed after the end of work. The action levels for particulates and VOCs and required responses are listed in Table 1.

**Table 1**  
**Work Zone Action Levels and Required Responses**

Monitoring	Action Level <sup>1</sup>	Response Action
Particulate	Less than 0.125 mg/m <sup>3</sup> above background	<b>Level D or D-Modified</b> (Requires coveralls and steel toe boots) (As applicable: Chemical resistant gloves, chemical resistant boot covers, hard hat, safety glasses, face shield, or escape mask)
	Between 0.125 mg/m <sup>3</sup> and 0.150 mg/m <sup>3</sup> above background	<b>Level C</b> (Requires full face or half face respirator, hooded chemical resistant two piece Tyvek suit or overalls, chemical resistant inner and outer gloves, chemical resistant boot covers, steel toe and shank boots) (As applicable: hard hat, face shield, or escape mask) Apply dust suppression measures. Resume work or upgrade.
	Greater than 0.150 mg/m <sup>3</sup> above background	Stop work. Apply additional dust suppression measures. Resume work when less than 0.150 mg/m <sup>3</sup> and maintain Level C.
Volatile Organic Compound (VOC)	Less than 5 ppm in breathing zone	<b>Level D or D-Modified</b>
	Between 5 and 50 ppm	<b>Level C</b>
	More than 50 ppm	Stop work. Resume work when source of vapors is abated and readings are less than 50 ppm above background.
<b>Notes:</b> <sup>1</sup> - 15-minute time-weighted average parts per million = ppm milligrams per cubic meter = mg/m <sup>3</sup>		

## 2.2 Perimeter Community Air Monitoring

Fixed air monitoring stations will be set up at the upwind and downwind perimeters of the exclusion zone during all ground intrusive activities and will continuously log VOC and particulate levels. Each fixed monitoring station will be fully enclosed and equipped with the following:

- A PID equipped with a 10.6 eV lamp capable of calculating 15-minute running average VOC concentrations;
- A TSI 8530 DustTrak II or equivalent dust monitor capable of measuring the concentration of airborne respirable particulates less than 10 micrometers in size (PM10) and calculating 15-minute running average particulate concentrations; and
- A Netronix™ Thiamus™ ICU-820 or equivalent Global System for Mobile Communication (GSM)/Global Positioning System (GPS) device capable of recording air monitoring and location data.
- Each monitoring station will be capable of sending e-mail alerts to the SSO to indicate an exceedance of action levels. Additionally, the SSO will conduct an inspection of the monitoring stations on at least an hourly basis. Upon completion of Site activities, all air monitoring data will be available to download via the iEnvironet® website. All air monitoring data recorded at the fixed monitoring stations will be available for NYSDOH and NYSDEC review and will be included in the Remedial Investigation Report (RIR).

### 2.2.1 Perimeter Community Air Monitoring Action Levels

#### VOC Action Levels

The following actions will be taken based on organic vapor levels measured:

If total organic vapor levels exceed 5 parts per million (ppm) above background for the 15-minute average at the exclusion zone perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.

If total organic vapor levels at the downwind perimeter of the exclusion zone persist at levels in excess of 5 ppm above background, but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less – but in no case less than 20 feet – is below 5 ppm above background for the 15-minute average.

If the total organic vapor level is above 25 ppm at the perimeter of the exclusion zone, activities will be shutdown.

#### Particulate Action Levels

The following actions will be taken based on particulate levels measured:

If the downwind particulate concentrations are greater than 100 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) above background (upwind concentrations), and no other obvious source is apparent, then it will be assumed that the elevated particulate concentrations are a result of site activities. In such instances, dust suppression measures will be implemented and monitoring will be continued. Work will be allowed to continue with dust suppression if downwind particulate levels do not exceed  $150 \mu\text{g}/\text{m}^3$  above the background (upwind concentration) and provided that no visible dust is migrating from the work area.

If particulate levels persist at  $150 \mu\text{g}/\text{m}^3$  above the background, work must be stopped until dust suppression measures bring particulate levels to below  $150 \mu\text{g}/\text{m}^3$  above background.

### 2.3 Major Vapor Emission Response Plan

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work Site, or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted or vapor controls must be implemented.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the exclusion zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If either of the following criteria is exceeded in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be implemented:

- Sustained organic vapor levels approaching 1 ppm above background for a period of more than 30 minutes; or
- Organic vapor levels greater than 5 ppm above background for any time period.

Upon activation, the following activities shall be undertaken as part of the Major Vapor Emission Response Plan:

- The NYSDEC, NYSDOH, and local police authorities will be immediately contacted by the SSO and advised of the situation;
- Frequent air monitoring will be conducted at 30-minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Site Health and Safety Officer; and
- All Emergency contacts will go into effect as appropriate.
- All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review.

## 2.4 Reporting

CAMP summary reports will be prepared and submitted to NYSDEC and NYSDOH for review as part of the daily reports. In the event there is an action level exceedance or complaint, NYSDEC and NYSDOH will be notified within 24 hours (same day to the extent possible) of the exceedance or complaint. The notification will include a description of the exceedance or complaint, the cause of the exceedance, and any corrective actions taken. All recorded CAMP data will be included in the RIR.

**APPENDIX D**  
**PREVIOUS REPORTS**