

# **CHURCH-DIVISION STREET – TOWER A**

**26 SOUTH DIVISION STREET  
NEW ROCHELLE, NEW YORK**

---

## **Remedial Investigation Work Plan**

**BCP Site Number: C360187  
AKRF Project Number: 170295**

### **Prepared for:**

RXR Church-Division Tower A Holdings LLC  
% RXR Development Services  
75 Rockefeller Plaza, Suite 1300  
New York, New York 10019

### **Prepared by:**



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

---

**MAY 2019**

**REVISED SEPTEMBER 2019**

**CERTIFICATIONS**

I, Michelle Lapin, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Remedial Investigation Work Plan (RIWP) 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).

---

Michelle Lapin, P.E.*Name*  
*Signature*

9/11/2019

*Date*

I, Axel Schwendt, QEP, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation Work Plan (RIWP) 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).

---

Axel Schwendt, QEP*Name*  
*Signature*

9/11/2019

*Date*

## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	SITE DESCRIPTION AND HISTORY .....	2
2.1	Site Description and Surrounding Land Use .....	2
2.2	Proposed Site Redevelopment .....	2
2.3	Site Geology, Hydrogeology, and Subsurface Characteristics .....	2
2.4	Nearby Areas of Public Concern .....	2
2.5	Site History .....	2
3.0	PREVIOUS INVESTIGATIONS .....	3
4.0	FIELD PROGRAM .....	5
4.1	Field Program Summary .....	5
4.2	Soil Sampling .....	5
4.3	Groundwater Sampling .....	6
4.4	Soil Vapor Sampling .....	6
4.5	Quality Assurance / Quality Control (QA/QC) .....	7
4.6	Decontamination Procedures .....	7
4.7	Management of Investigation-Derived Waste (IDW) .....	7
5.0	REPORTING REQUIREMENTS .....	8
5.1	Remedial Investigation Report (RIR) .....	8
5.1.1	Description of Field Activities .....	8
5.1.2	Soil Boring Assessment .....	8
5.1.3	Groundwater Assessment .....	8
5.1.4	Qualitative Human Health Exposure Assessment .....	8
6.0	SCHEDULE OF WORK .....	9
7.0	REFERENCES .....	10

## FIGURES

Figure 1 – Site Location

Figure 2 – Site Plan and Existing Land Use

Figure 3 – Phase II Soil Concentrations Exceeding NYSDEC SCOs

Figure 4 – Phase II Groundwater Concentrations Exceeding NYSDEC AWQS

Figure 5 – Phase II Soil Vapor Concentrations Exceeding AGVs

Figure 6 – Proposed Sample Locations

## APPENDICES

Appendix A – Quality Assurance Project Plan (QAPP)

Appendix B – Health and Safety Plan (HASP)

## 1.0 INTRODUCTION

This Remedial Investigation Work Plan (RIWP) has been prepared by AKRF, Inc. (AKRF) on behalf of RXR Church-Division Tower A Holdings LLC (the “Volunteer”) for the Church-Division – Tower A project in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP), located at 26 South Division Street in New Rochelle, New York (the “Site”). The 0.992-acre Site is also identified as Block 414, p/o Lot 8 (proposed future Lot 8). The Site is located in a mixed-use commercial and residential neighborhood and is bounded to the north by mixed-use residential and retail buildings; to the east by Church Street; to the south by a vacant lot followed by residential buildings and to the west by South Division Street. A Site Location Plan is provided as Figure 1.

RXR Church-Division Tower A Holdings LLC has entered into a Brownfield Cleanup Agreement (BCA) with the NYSDEC as a Volunteer to remediate the Site. A Subsurface (Phase II) Investigation was conducted in November and December 2018 and a report was submitted to the NYSDEC as part of the Brownfield Cleanup Program (BCP) application. The investigation identified significantly elevated concentrations of lead and mercury in the soil samples. A subsurface anomaly consistent with an underground storage tank (UST) was identified by the geophysical survey in the northwestern portion of the Site. The anomaly was investigated by carefully excavating the suspected location, but no tank was found; however, the area appeared to have been disturbed and backfilled in the past with debris, suggesting that a tank may have been removed in the past. Additionally, chlorinated solvents (tetrachloroethylene and trichloroethylene) were detected in the analyzed soil vapor samples.

This RIWP describes the procedures to be used to further investigate and define the nature and extent of the contamination in on-site soil, soil vapor, and groundwater and to establish remedial action objectives, determine the remedial soil excavation quantities, evaluate remedial action alternatives, and select a remedy pursuant to the BCP. The data compiled from the Remedial Investigation (RI) will be used to complete a Remedial Action Work Plan (RAWP), and to update the Interim Remedial Measures (IRM) Work Plan. The remedial investigation (RI) would be completed prior to start of any remedial action/excavation at the Site. 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). The Community Air Monitoring Plan (CAMP) detailed in the HASP will be implemented during all subsurface disturbance activities at the Site, including, but not limited to, soil boring advancement, soil/soil vapor/groundwater sampling, and backfilling of boreholes.



## **2.0 SITE DESCRIPTION AND HISTORY**

### **2.1 Site Description and Surrounding Land Use**

The 0.992-acre vacant Site is bounded to the north by mixed-use residential and retail buildings; to the east by Church Street; to the south by a vacant lot followed by residential buildings and to the west by South Division Street. A Site Location Map is provided as Figure 1. Properties in the surrounding areas are predominantly mixed-use residential and commercial.

The Property is zoned DO-2 (Downtown Overlay Zone District). A Site Plan that shows the surrounding land usage is provided as Figure 2.

### **2.2 Proposed Site Redevelopment**

The proposed redevelopment includes the construction of a new mixed-use building and a public pedestrian area.

### **2.3 Site Geology, Hydrogeology, and Subsurface Characteristics**

The topography in the general area slopes downward to the southwest. Based on the U.S. Geological Survey, Mount Vernon, NY Quadrangle map (2013), the Site is approximately 100 feet above the National Geodetic Vertical Datum of 1988 (an approximation of sea level).

Soil observed during previous subsurface investigations consisted of historical fill (sand with silt, gravel, glass, and brick) to a maximum depth of approximately 9.5 feet below grade. The fill was underlain by presumed native sand and silt with some cobbles. Groundwater was encountered above bedrock in only one soil boring and one test pit, both advanced in the northeastern portion of the Site at approximately 8.5 and 7 feet below grade, respectively. Groundwater is assumed to flow in a southeasterly direction towards the New Rochelle Harbor, approximately 2,000 feet away. However, actual groundwater flow can be affected by many factors including underground utilities, bedrock, and other factors beyond the scope of this study. There are no surface water bodies or streams at or adjacent to the Site.

### **2.4 Nearby Areas of Public Concern**

A Citizen Participation Plan (CPP) for the Site will be prepared for submittal to the NYSDEC for review and approval. This redevelopment project represents a key piece in the continued revitalization of New Rochelle. Current issues include underutilization of land, and potential remediation and construction-related issues, including handling contaminated soil and generation of vapors and/or dust during excavation activities, truck traffic, and noise. In addition, Environmental justice and language-barrier issues will be evaluated and addressed in the CPP. The CPP provides this information to the public and allows for involvement regarding the environmental investigation and cleanup of the Site. No sensitive receptors or areas of concern such as schools, daycare facilities or hospital were identified downgradient or within a 500-foot radius of the proposed development.

### **2.5 Site History**

The historic uses at the Site included dwellings, a garage with tire repairs, several upholsterers between circa 1892 and 1951, and a public parking garage (most recent). No underground storage tanks (USTs) or aboveground storage tanks (ASTs) were registered for the Site; however, the former buildings likely included undocumented USTs and/or ASTs with potential associated releases. Such tanks may have been associated with heating and automotive-related uses (petroleum, chemical and waste oil storage).

### 3.0 PREVIOUS INVESTIGATIONS

#### Phase I Environmental Site Assessment (ESA), 26 South Division Street, AKRF, Inc., August 2017

A Phase I Environmental Site Assessment (ESA) was completed by AKRF of the larger 1.8-acre lot in August 2017 in accordance with ASTM Standard E1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Practice*. A summary of the on-site findings were:

- Industrial and automotive uses were located on-site historically, including a garage with tire repairs and several upholsterers circa 1892 to 1951. No underground storage tanks (USTs) or aboveground storage tanks (ASTs) were registered for the Site; however, the former buildings likely included undocumented USTs and/or ASTs with potential associated releases. Such tanks may have been associated with heating and automotive-related uses (petroleum, chemical and waste oil).
- Historical on-site (and nearby) manufacturing/industrial uses with suspected solvent or petroleum use were identified, suggesting the potential for vapor encroachment into future on-site buildings.
- The regulatory database identified a drycleaner listed as a Small Quantity Generator (SQG) of hazardous waste located at 1 Leroy Place, approximately 100 feet west of the Site (on the west-adjacent block) at the intersection of South Division Street and Leroy Place. The facility was reported to have generated 675 pounds of spent halogenated wastes, with a maximum of 1,475 pounds generated in 1991. No further information was provided in the listing.

#### Draft Phase II Environmental Site Assessment Report, 26 South Division Street, SESI Consulting Engineers, DPC (SESI), January 2019, and Limited Subsurface (Phase II) Investigation, AKRF, Inc., January 2019

A Subsurface (Phase II) Investigation was conducted by SESI in December 2018 (the report was issued in January 2019). The investigation included the advancement of 4 soil borings with the collection of 8 soil samples. A limited Phase II investigation was conducted by AKRF on November 1 and 2, and on December 17 and 18, 2018, which included the advancement of 12 soil borings and 6 test pits with the collection and laboratory analysis of 34 soil samples, 1 groundwater sample and 4 soil vapor samples. A summary of the analytical results of both AKRF's and SESI's investigations is as follows:

- A significantly elevated lead concentration of 7,550 parts per million (ppm) was detected in soil sample SESI-B-A1 (3-4) located in the southwestern portion of the Site, above its RRSCO of 400 ppm, and mercury was detected at a concentration of 22.7 ppm in soil sample SB-12 (0-2) located in the central portion of the Site. Both of these locations are considered "hot spots". The higher concentrations could represent a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) under Title 40 of the Code of Federal Regulations (CFR) when analyzed via the Toxicity Characteristic Leaching Procedure (TCLP) (not conducted for this preliminary study). In addition, elevated mercury concentrations were detected above the NYSDEC 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs) or Restricted Residential Use (RRSCOs) in 6 soil samples analyzed from within the historic fill, suggesting a Site-wide concern. Similarly, lead was detected in one additional soil sample at a concentration exceeding the RRSCO, and in 11 additional samples below the RRSCO but above the UUSCO. As such, elevated concentrations of mercury and lead may be present in the historic fill layer in other areas of the Site not tested during this limited investigation. Barium was also detected at a concentration of 2,590 ppm in one soil sample at a depth of 3 to 4 feet below grade in the southwestern portion of the Site, well above its RRSCO of 400 ppm. Concentrations of SVOCs and other metals in the shallow soil samples are also indicative of a contaminated historic fill layer, which reaches a maximum thickness of up to 9.5 feet at the Site.

- Tetrachloroethylene (TCE) was detected in two soil vapor samples at concentrations of 80.6 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and 4.61  $\mu\text{g}/\text{m}^3$ . Tetrachloroethylene (PCE) was detected in three soil vapor samples at concentrations ranging from 6.06 to 437  $\mu\text{g}/\text{m}^3$ . Using EPA's 0.03 attenuation factor, the detected TCE levels in sample SV-05 (437  $\mu\text{g}/\text{m}^3$ ) exceeded its NYSDOH 2006 Guidance for Evaluating Soil Vapor Intrusion indoor Air Guidance Value (AGV) of 60  $\mu\text{g}/\text{m}^3$  and is expected to result in future indoor air levels exceeding the AGV. The detection of chlorinated solvents at the Site can be attributed, at least in part, to the historic on-site operations (a garage with tire repairs, and several upholsterers circa 1892 to 1951). Low levels of TCE and PCE were also detected in the analyzed soil samples.
- A subsurface anomaly consistent with an underground storage tank (UST) was identified by the geophysical survey in the northwestern portion of the Site. The anomaly was investigated by carefully excavating the area, but no tank was found; however, the area appeared to have been disturbed and backfilled in the past with debris, suggesting that a tank may have been removed in the past. No petroleum-related VOCs were detected in the soil samples collected from the borings and test pits advanced adjacent to the suspect UST located in the northwestern portion of the Site; however, petroleum contamination from a historic release may be present in untested areas. Low levels of petroleum-related compounds were detected in the soil vapor samples collected at this location.
- Low levels of organic compounds and metals were detected in the analyzed groundwater sample, in a few cases at concentrations above the Ambient Water Quality Standards (AWQS). These findings are either naturally occurring (in the case of the metals) and/or may be attributable to suspended sediment/historic fill in the samples; however, some influence from historic on-site operations was not ruled out.

The soil exceedances above the SCOs are shown on Figure 3, groundwater exceedances above the Class GA Standards are shown on Figure 4, and soil vapor exceedances above the AGVs are shown on Figure 5. Based on the results of the subsurface investigation, approximately 5,000 cubic yards of soil/fill materials exceeding the RRSCOs will be excavated and removed as part of Site remediation. However, this quantity will be adjusted upon completion of the RI and receipt of the laboratory analytical data.

## 4.0 FIELD PROGRAM

The RI field program will focus on collecting soil, soil vapor and groundwater data to determine the nature and extent of Site contamination and to assist with determining the appropriate remedial action. The findings of the RI will be used to inform the Interim Remedial Measures (IRM) Work Plan (IRMWP) and the Remedial Action Work Plan (RAWP), as applicable.

### 4.1 Field Program Summary

The field sampling scope of work consists of: the advancement of 10 soil borings with the collection and analysis of 4 to 6 soil samples per boring (depending on boring depth) and the collection and analysis of one groundwater sample (if encountered). The proposed sample locations are shown on Figure 5.

### 4.2 Soil Sampling

A Geoprobe™ direct-push drill rig will be used to advance 10 soil borings at the approximate locations shown on Figure 6 to assess soil quality throughout the Site. Soil borings will be advanced at each boring until bedrock or the proposed excavation depth (15 feet below grade) is reached, whichever is shallower. Soil cores will be collected in five-foot long, two-inch diameter, stainless steel macrocore piston rod samplers fitted with an internal acetate liner. Soil samples will be inspected by AKRF field personnel for evidence of contamination (e.g., odors, staining), screened for volatile organic compounds (VOCs) with a photoionization detector (PID) equipped with a 11.7 electron volt (eV) lamp, and logged using the modified Burmister soil classification system. The PID will be calibrated in accordance with manufacturer's recommendations prior to sampling.

Four to six soil samples will be collected from each soil boring depending on the boring depth. To assess the potential for human contact exposure, surface soil samples will be collected from 0 to 2 inches below ground surface at all boring locations. Samples will be collected continuously from every subsequent two-foot interval to a depth of eight feet below grade (or lesser depending on the depth to bedrock). Additionally, a sample will be collected from every four-foot interval at the deeper boring locations extending beyond eight feet below grade.

It should be noted that the samples below the 8-foot depth will be collected from the 2-foot interval exhibiting the highest evidence of contamination (visual, olfactory, or elevated PID reading). All sampling equipment (e.g., drilling rods and casing, macro core samplers and probe rods) will be either dedicated or decontaminated between sampling locations.

Samples slated for laboratory analysis will be labeled and placed in laboratory-supplied containers and shipped to the laboratory via courier with appropriate chain-of-custody documentation in accordance with appropriate USEPA protocols to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory. The samples will be analyzed for VOCs by EPA Method 8260, semi-volatile organic compounds (SVOCs) by EPA Method 8270, polychlorinated biphenyls (PCBs) by EPA Method 8082, pesticides by EPA Method 8081, the total analyte list (TAL) of metals by EPA Method 6000/7000 series plus hexavalent chromium by EPA Method 7196A, 1,4-dioxane by EPA Method 8270, and the standard list of 21 per- and polyfluoroalkyl substances (PFAS) compounds by modified EPA Method 537 using Category B deliverables. A standard turnaround time will be requested from the laboratory.

The 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 soil boring locations will be surveyed using the Global Positioning System (GPS).

After each boring is completed, the soil boring holes will be filled with on-site materials (if not noticeably contaminated). Soil cuttings to be managed will be containerized in properly labeled Department of Transportation (DOT)-approved 55-gallon drums for future off-site disposal at a permitted facility or stockpiled awaiting analysis for off-site disposal. Disposable sampling equipment, including spoons, gloves, bags, paper towels, etc. that come in contact with environmental media will be double bagged and disposed of as municipal trash in a facility trash dumpster as non-hazardous refuse.

#### **4.3 Groundwater Sampling**

Up to three temporary wells will be installed within the shallow bedrock to collect groundwater samples (one upgradient and two downgradient). The sample 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 sample 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, 1,4-dioxane by EPA Method 8270D Selective Ion Monitoring (SIM), and the standard list of 21 per- and polyfluoroalkyl substances (PFAS) compounds by modified EPA Method 537 using Category B deliverables. Filtering will occur in the field.

#### **4.4 Soil Vapor Sampling**

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”. Seven soil vapor samples will be collected from temporary monitoring points. The soil vapor point will be installed at the proposed excavation depth or a minimum of one foot above the observed bedrock or a minimum of two feet above the observed water table, whichever is shallower. The soil vapor sampling locations are shown on Figure 6, including two boring locations (SV-104 and SV-105) near the dry cleaner listed as a SQG of hazardous waste. The location of this dry cleaner is also identified on Figure 6.

All soil vapor monitoring points will be installed by advancing an expendable drive point using a direct-push drilling rig to the specified depth below grade. At each monitoring point, a six-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.

The soil vapor samples will be collected over a two-hour time period from each monitoring point using a six-liter (6L), batch-certified SUMMA 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 sampling points will be purged of three sample volumes using a peristaltic pump. During purging, an inverted five-gallon bucket will be placed over the sampling point and helium gas will be introduced through a small hole in the bucket to saturate the atmosphere around the sample port with helium gas. Purged vapors will be collected into a Tedlar bag and field-screened for organic vapors using a PID and for methane using a landfill gas meter or similar instrument. 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 be 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 canister. Immediately after opening the flow control valve equipped with a two-hour regulator, the initial SUMMA 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.

All samples will be analyzed for VOCs according to USEPA Method TO-15 by a NYSDOH-certified laboratory with Category B deliverables. Samples will be shipped to the laboratory with appropriate chain of custody documentation. No sample preservation is required for soil vapor or ambient air samples. The data will be reviewed by a third-party validator and a DUSR will be prepared to document the suitability of using the data.

#### **4.5 Quality Assurance / Quality Control (QA/QC)**

Additional analysis will be included for quality control measures, as required by the Category B sampling techniques. The QA/QC samples for soil and groundwater will include one field blank, one trip blank, one MS/MSD, and one blind duplicate sample at a frequency of one sample per 20 field samples per media. The field blank, blind duplicate, and MS/MSD samples will be analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, pesticides by EPA Method 8081, PCBs by EPA Method 8082, and TAL metals by EPA Method 6000/7000s series (plus hexavalent chromium by EPA Method 7196 for soil) using Category B deliverables. One laboratory-prepared trip blank will be submitted for analysis of VOCs to determine the potential for cross-contamination. The QA/QC sample for soil vapor will include the collection of one ambient air sample analyzed for VOCs by EPA Method TO-15. The QAPP describes the QA/QC protocols and procedures that will be followed during implementation of the RIWP. The QAPP is included as Appendix A.

#### **4.6 Decontamination Procedures**

All non-dedicated sampling equipment (e.g., submersible pumps and oil/water interface probe) will be decontaminated between sampling locations using the following procedure:

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

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

IDW that does not exhibit evidence of contamination (e.g., staining, presence of ash, oily sheens, odors, etc.) will be used to fill in the corresponding borehole. Soil and groundwater IDW exhibiting evidence of contamination will be containerized in DOT-approved 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 IDW will be disposed of or treated according to applicable local, state, and federal regulations.

## **5.0 REPORTING REQUIREMENTS**

### **5.1 Remedial Investigation Report (RIR)**

Upon completion of all field work and receipt of laboratory analytical results, an RIR will be prepared that will: document field activities; present field and laboratory data; evaluate exposure pathways in an exposure assessment; and discuss conclusions and recommendations drawn from the results of the investigation.

#### **5.1.1 Description of Field Activities**

This section of the RIR 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.

#### **5.1.2 Soil Boring 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 illustrating 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.

#### **5.1.3 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 sample locations. Category B deliverables will be provided by the laboratory and a third-party DUSR will be prepared.

#### **5.1.4 Qualitative Human Health Exposure Assessment**

A Qualitative Human Health Exposure Assessment will be performed in accordance with DER-10 Section 3.3. The assessment will be included in the RIR.

## 6.0 SCHEDULE OF WORK

The following tentative schedule has been developed for the project. This schedule is subject to change.

Activity	Time To Complete
BCP Application Public Comment Period Ends	May 17, 2019
Draft RIWP and IRMWP Submitted	June, 2019
Draft RIWP Approved/Remedial Investigation Initiated	September 11, 2019
Issue IRM/Construction Notice Fact Sheet/IRM Initiated	October 15, 2019
Draft Remedial Investigation Report (RIR) Submitted to NYSDEC	October 30, 2019
Submittal of Draft Remedial Action Work Plan (RAWP) and Fact Sheet	November 15, 2019
45-day Public Comment Period for RIR and RAWP is Initiated	November 15, 2019
Public Comment Period for RIR and RAWP Ends	January 30, 2020
Final RAWP Submitted/DEC Approves and Issues Decision Document	February 2020
Issue RAWP/Construction Notice Fact Sheet	February 2020
Continue Redevelopment/Construction with Implementation of RAWP	February 2020
Draft Site Management Plan (SMP) Submitted to NYSDEC	July 2020
Execution of Environmental Easement	August 2020
Draft Final Engineering Report and Fact Sheet	August 2020
Certificate of Completion and Fact Sheet	December 2020

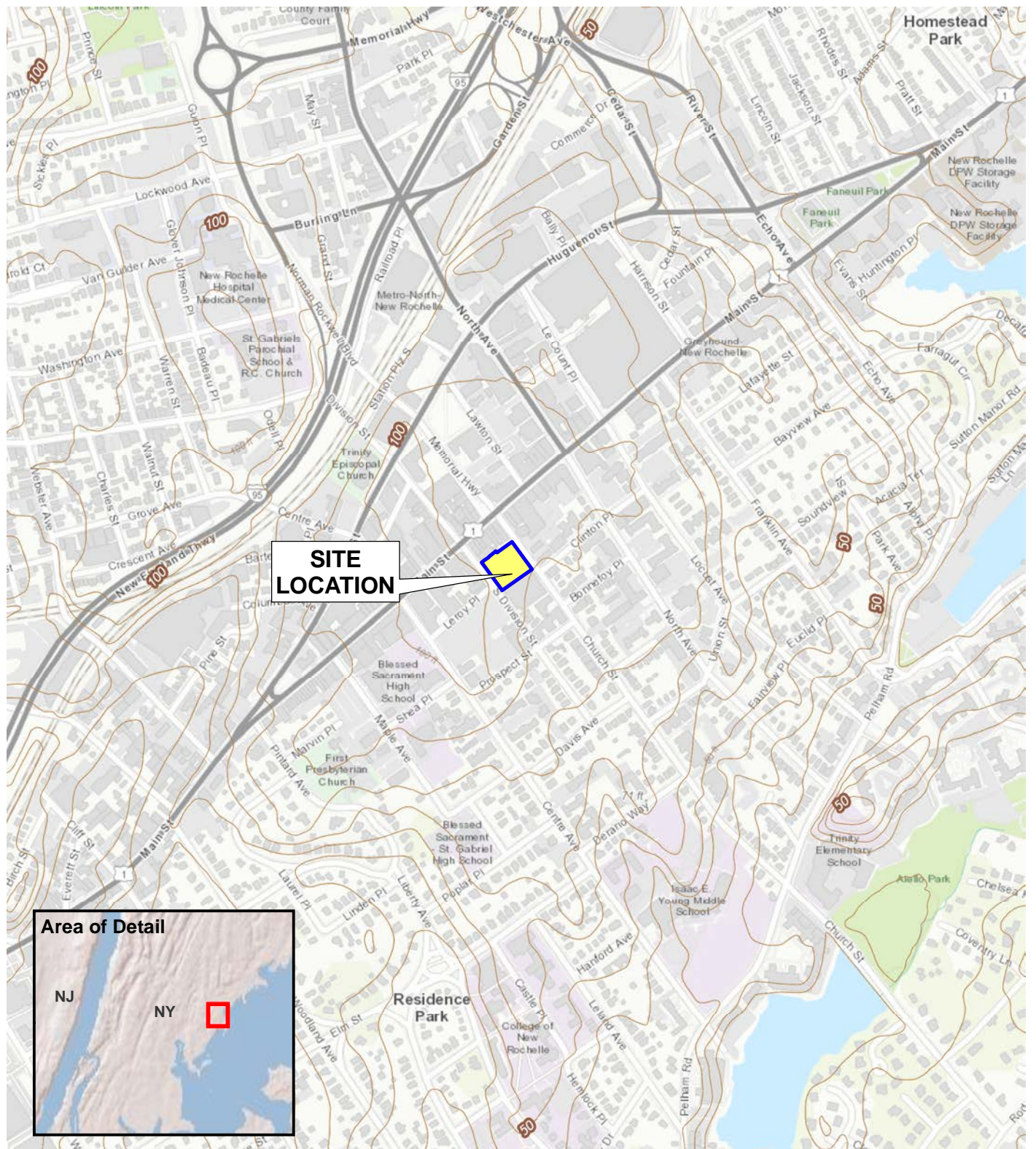


## 7.0 REFERENCES

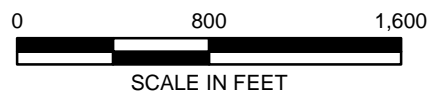
- Phase I Environmental Site Assessment – 26 South Division Street, New Rochelle, NY, AKRF, Inc., August 2017.
- Draft Phase II Environmental Site Assessment Report, 26 South Division Street, SESI Consulting Engineers, DPC (SESI), January 2019.
- Limited Subsurface (Phase II) Investigation, 26 South Division Street, New Rochelle, NY, AKRF, Inc., January 2019.
- NYSDEC, 6 NYCRR Section 375-6: *Remedial Program Soil Cleanup Objectives (SCOs)*, December 14, 2006.
- NYSDEC, Division of Water Technical and Operational Guidance Series (1.1.1), June 1998.
- NYSDOH, Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

## FIGURES

©2019 AKRF W:\projects\170295 - CHURCH-DIVISION STREET SITE\Technical\GIS and Graphics\Hazmat\RIWP tower A\170295 Fig 1 site loc map RIWP.mxd5/21/2019 2:53:34 PM iszalus



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



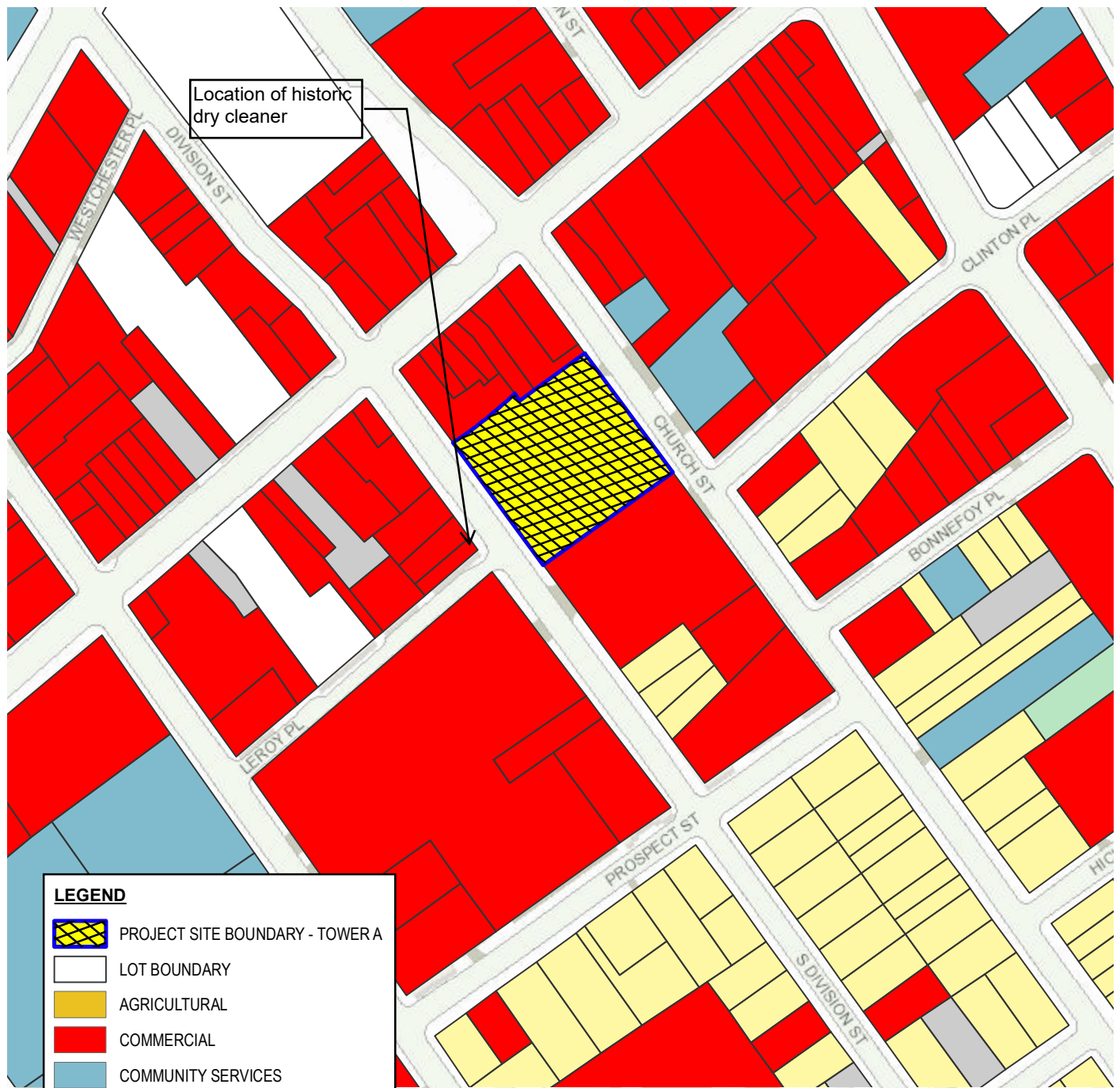
440 Park Avenue South, New York, NY 10016

**Church Division Street - Tower A**  
26 South Division Street  
New Rochelle, New York

**SITE LOCATION**

DATE
<b>5/21/2019</b>
PROJECT NO.
<b>170295</b>
FIGURE
<b>1</b>





#### LEGEND

-  PROJECT SITE BOUNDARY - TOWER A
-  LOT BOUNDARY
-  AGRICULTURAL
-  COMMERCIAL
-  COMMUNITY SERVICES
-  INDUSTRIAL
-  PUBLIC SERVICES
-  RECREATION & ENTERTAINMENT
-  RESIDENTIAL
-  VACANT LAND
-  WILD, FORESTED, CONSERVATION LANDS & PUBLIC PARKS
-  NO DATA

Map Source:  
giswww.westchestergov.com (GIS database)

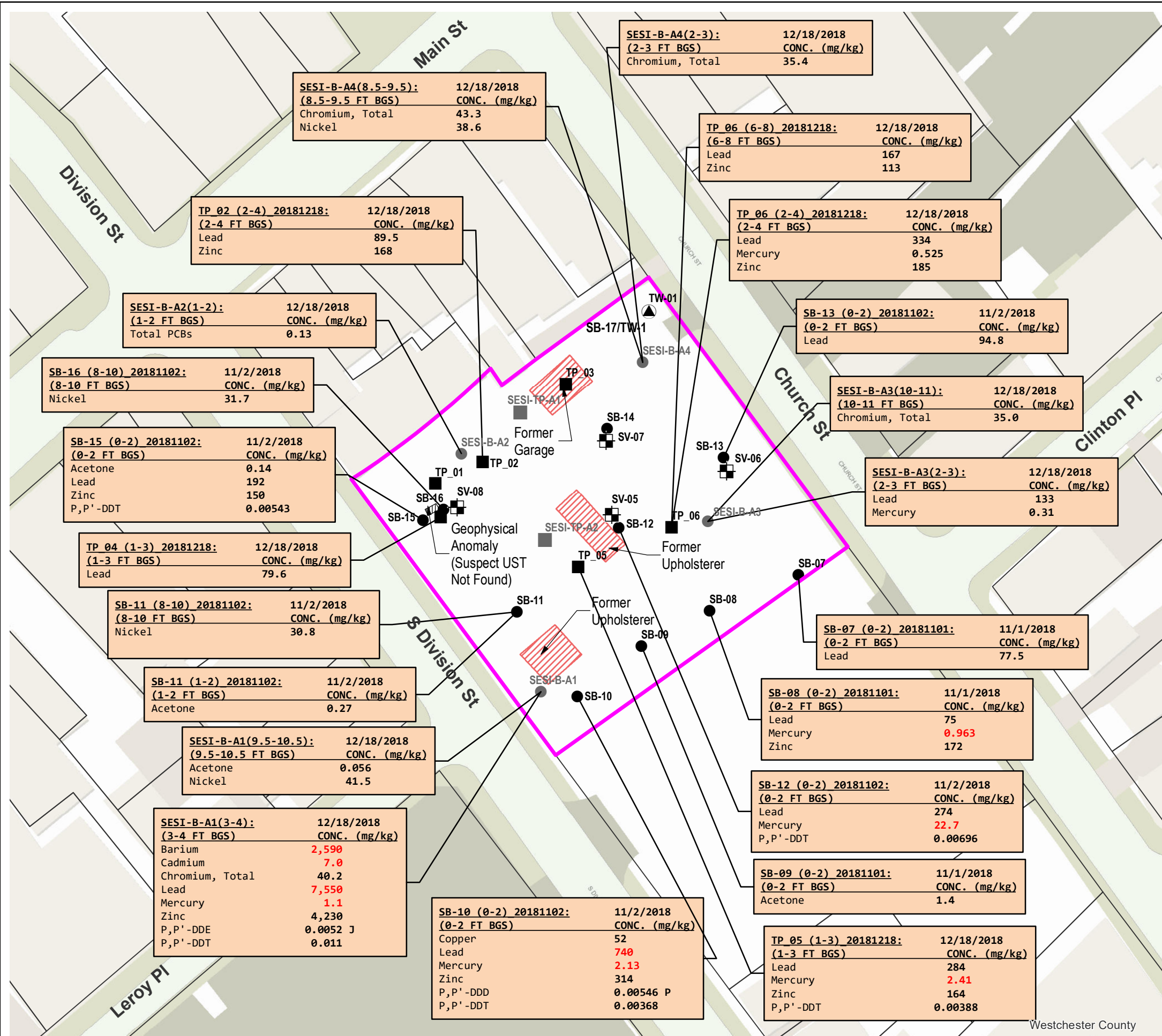


440 Park Avenue South, New York, NY 10016

**Church Division Street - Tower A**  
26 South Division Street  
New Rochelle, New York

### SITE PLAN AND EXISTING LAND USE

DATE	5/21/2019
PROJECT NO.	170295
FIGURE	2



LEGEND

- BCP PROJECT BOUNDARY TOWER A
- SOIL BORING
- TEMPORARY WELL
- TEST PIT LOCATION
- SOIL VAPOR POINT
- SOIL BORING (SESI DECEMBER 2018)
- TEST PIT LOCATION (SESI DECEMBER 2018)
- LOT BOUNDARY
- APPROXIMATE LOCATION OF FORMER STRUCTURE

	Part 375 Restricted Residential mg/kg	Part 375 Unrestricted mg/kg
<b>Volatile Organic Compounds</b>		
Acetone	100	0.05
<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>Metals</b>		
Chromium, Total	180	30
Copper	270	50
Lead	400	63
Mercury	0.81	0.18
Nickel	310	30
Zinc	10000	109
<b>Pesticides</b>		
P,P'-DDD	13	0.0033
P,P'-DDE	8.9	0.0033
P,P'-DDT	7.9	0.0033

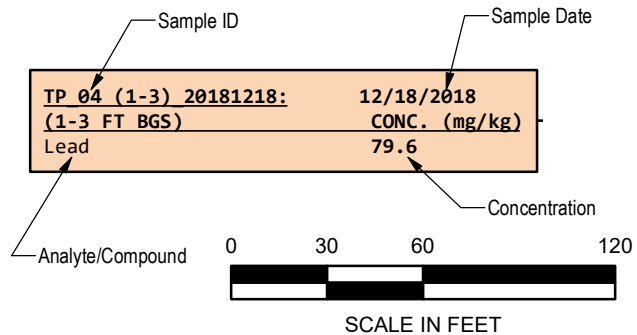
SOIL

**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 shown in Black.**  
**Exceedances of Part 375 Restricted Residential SCOs (RRSCOs) are highlighted in red.**

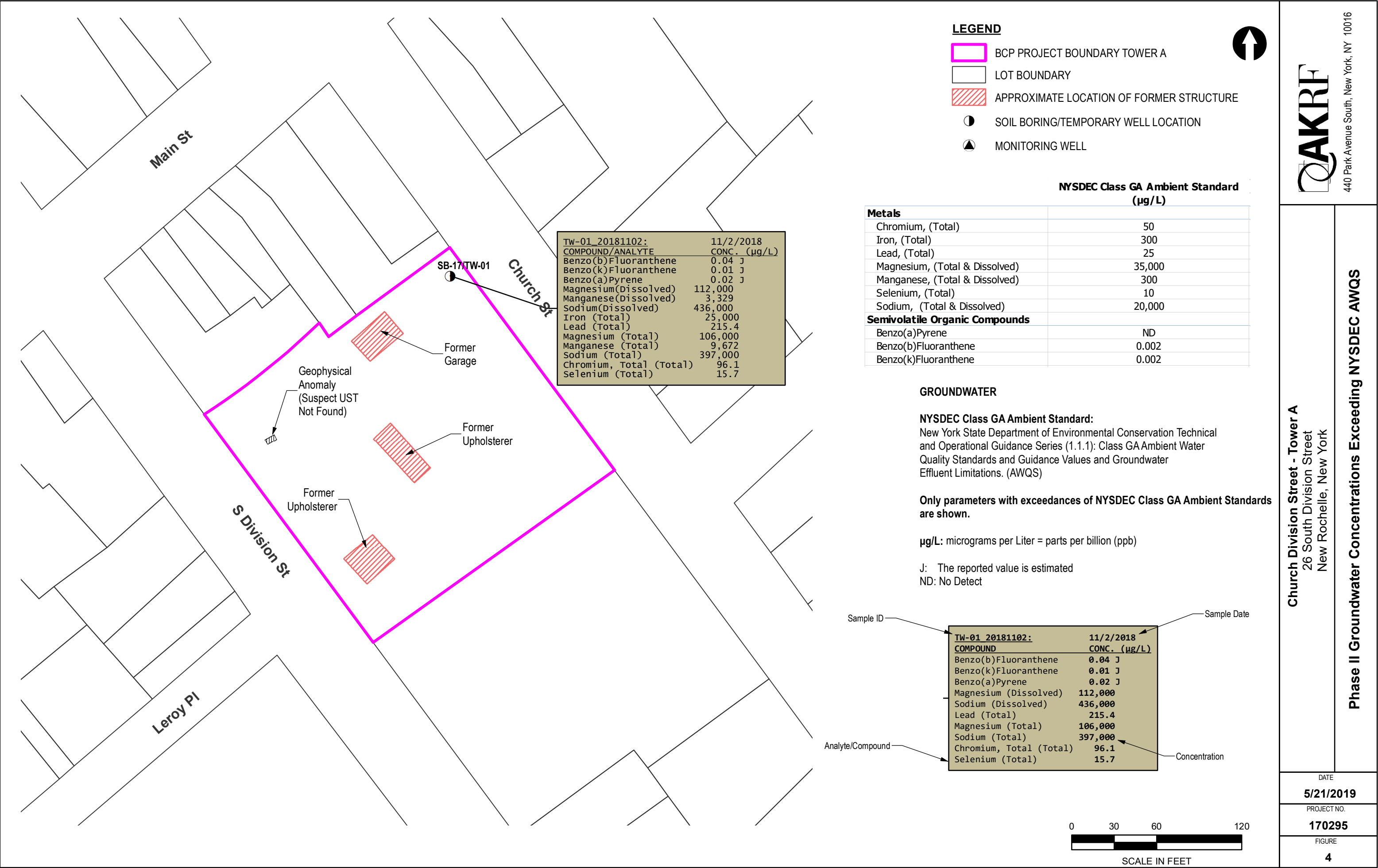
mg/kg: milligrams per kilogram = parts per million (ppm)

J: The reported value is estimated  
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.



Church Division Street - Tower A  
26 South Division Street  
New Rochelle, New York





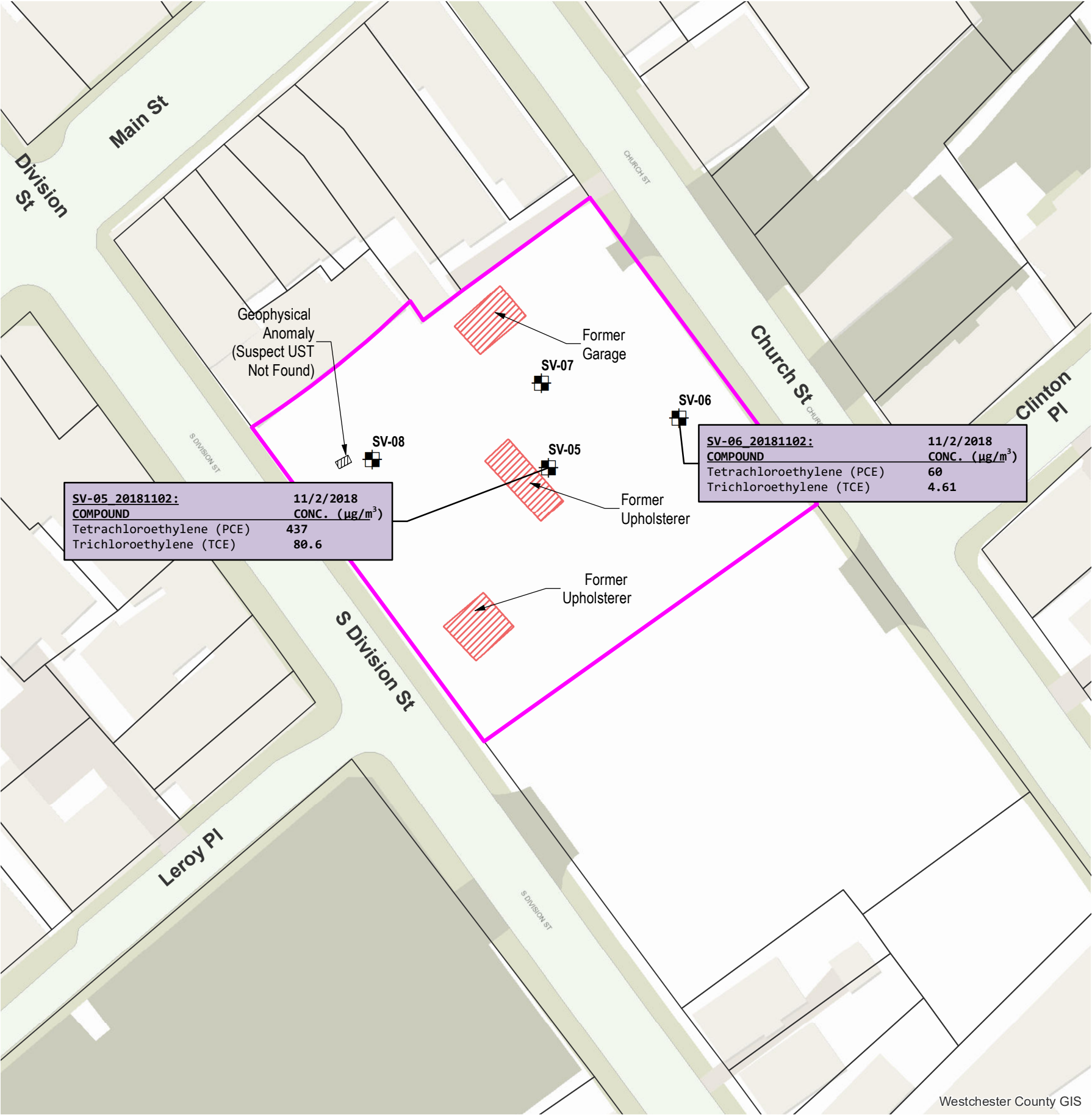
Church Division Street - Tower A  
26 South Division Street  
New Rochelle, New York

Phase II Groundwater Concentrations Exceeding NYSDEC AWQS



440 Park Avenue South, New York, NY 10016

© 2019 AKRF W:\Projects\170295 - CHURCH-DIVISION STREET SITE\Technical\GIS and Graphics\Hazmat\RWP tower A\170295 Fig 5 Phase II Soil Vapor Concentrations Exceeding AGVs.mxd 5/21/2019 3:10:22 PM isalus



**LEGEND**

- BCP PROJECT BOUNDARY TOWER A
- LOT BOUNDARY
- APPROXIMATE LOCATION OF FORMER STRUCTURE
- SOIL VAPOR POINT

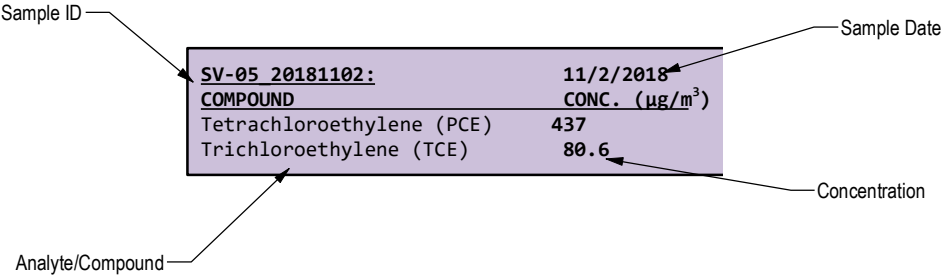
**NYSDOH 2006 SV INTRUSION AIR GUIDELINE**  
( $\mu\text{g}/\text{m}^3$ )

Volatile Organic Compounds	
Tetrachloroethylene (PCE)	30
Trichloroethylene (TCE)	2

**SOIL VAPOR**  
**NYSDOH Soil Vapor Intrusion Value:**  
NYSDOH Soil Vapor Intrusion Matrix Values presented in the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006, updated May 2017.

**Exceedances of NYSDOH Soil Vapor Intrusion Air Guidance Values are shown.**

$\mu\text{g}/\text{m}^3$ - micrograms per cubic meter



**Church Division Street - Tower A**  
26 South Division Street  
New Rochelle, New York

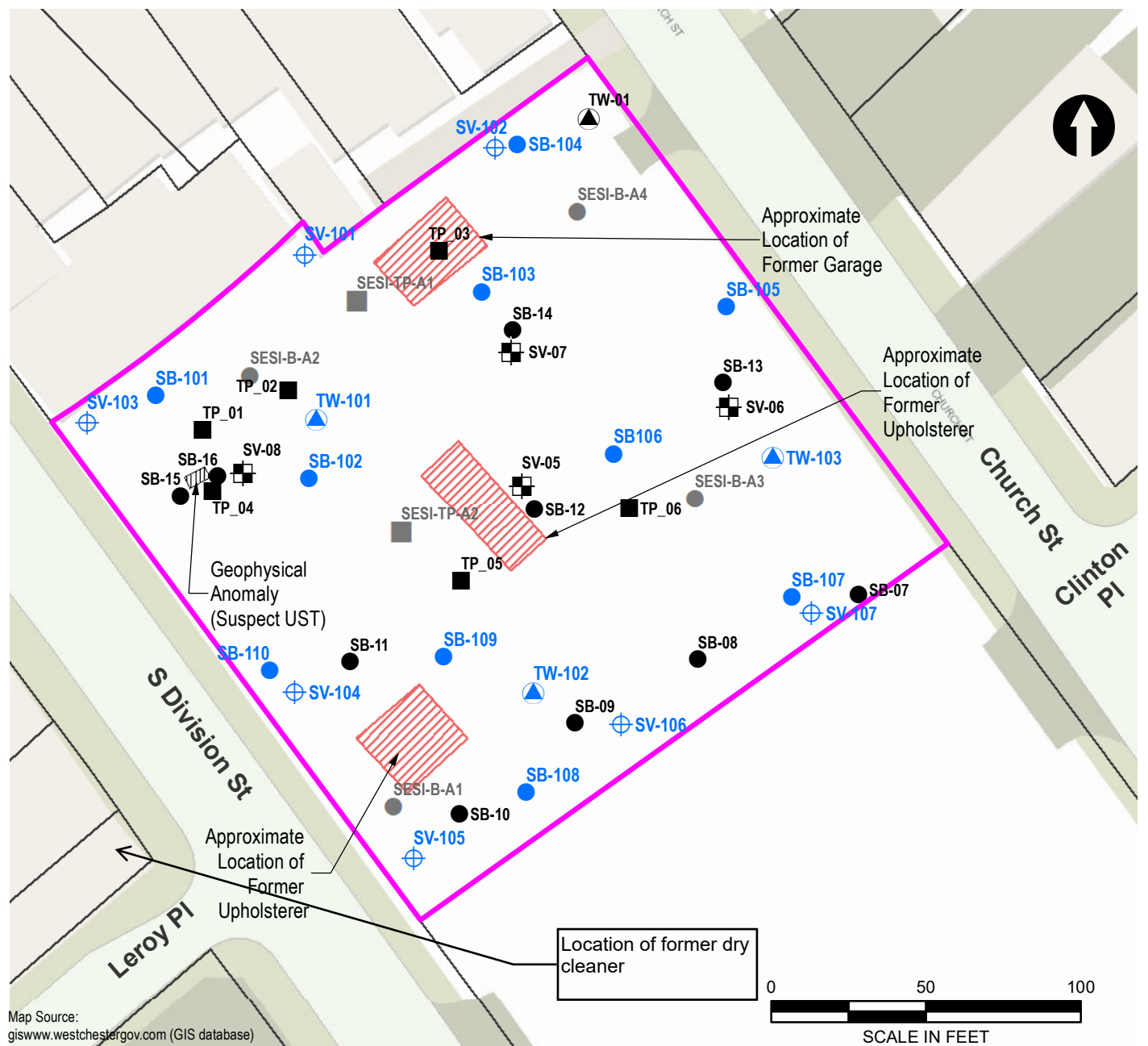


440 Park Avenue South, New York, NY 10016

**Phase II Soil Vapor Concentrations Exceeding AGVs**

DATE	5/21/2019
PROJECT NO.	170295
FIGURE	5

© 2019 AKRF. W:\Projects\170295 - CHURCH-DIVISION STREET SITE\Technical\GIS and Graphics\Hazmat\RIWP tower A\170295 Fig 6 Proposed Sample Locations RIWP.mxd 8/19/2019 12:05:21 PM iszalus



### LEGEND

- |  |                                    |  |   |
|--|------------------------------------|--|---|
|  | TOWER A SITE BOUNDARY              |  | SOIL BORING (SESI 2018)                   |
|  | PROPOSED SOIL BORING LOCATION      |  | MONITORING WELL (SESI 2018)               |
|  | PROPOSED SOIL VAPOR POINT LOCATION |  | TEST PIT LOCATION (SESI 2018)             |
|  | PROPOSED TEMPORARY WELL LOCATION   |  | SOIL VAPOR POINT (SESI 2018)              |
|  | SOIL BORING (AKRF 2018)            |  | APPROXIMATE LOCATION OF FORMER STRUCTURES |
|  | TEMPORARY WELL (AKRF 2018)         |  | LOT BOUNDARY                              |
|  | TEST PIT LOCATION (AKRF 2018)      |  | UST UNDERGROUND STORAGE TANK              |
|  | SOIL VAPOR POINT (AKRF 2018)       |  |   |



440 Park Avenue South, New York, NY 10016

**Church Division Street - Tower A**  
26 South Division Street  
New Rochelle, New York

### PROPOSED SAMPLE LOCATIONS

DATE

**8/19/2019**

PROJECT NO.

**170295**

FIGURE

**6**



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

# **CHURCH-DIVISION STREET – TOWER A**

**26 SOUTH DIVISION STREET**

**NEW ROCHELLE, NEW YORK**

---

**Quality Assurance Project Plan**

**NYSDEC BCP Number: C360187**

**AKRF Project Number: 170295**

**Prepared for:**

RXR Church-Division Tower A Holdings LLC  
% RXR Development Services  
75 Rockefeller Plaza, Suite 1300  
New York, New York 10019

**Prepared by:**



**AKRF, Inc.**  
440 Park Avenue South  
New York, New York 10016  
(212) 696-0670

---

**SEPTEMBER 2019**

**TABLE OF CONTENTS**

1.0	INTRODUCTION .....	1
2.0	PROJECT TEAM .....	1
2.1	Project Director .....	1
2.2	Project Manager.....	1
2.3	Remedial Engineer .....	1
2.4	Field Team Leader.....	1
2.5	Project Quality Assurance/Quality Control Officer .....	2
2.6	Laboratory Quality Assurance/Quality Control Officer .....	2
3.0	STANDARD OPERATING PROCEDURES .....	2
3.1	Soil Sampling .....	2
3.1.1	Soil Sampling.....	2
3.2	Decontamination of Sampling Equipment.....	3
3.3	Management of Investigation Derived Waste .....	3
4.0	SAMPLING AND LABORATORY PROCEDURES .....	3
4.1	Soil Sampling .....	3
4.2	Groundwater Sampling.....	3
4.3	Soil Vapor Sampling .....	4
4.4	Laboratory Methods .....	5
4.5	Quality Control Sampling.....	6
4.6	Sample Handling .....	6
4.6.1	Sample Identification .....	6
4.6.2	Sample Labeling and Shipping .....	7
4.6.3	Sample Custody .....	7
4.7	Field Instrumentation.....	7

**TABLES**

Table 1 -	Laboratory Analytical Methods for Field Samples
Table 2 -	Field Sample and QC Sample Quantities
Table 3 -	Examples of Sample Names

**ATTACHMENTS**

Attachment A -	Resumes for Project QA/QC Officer, Project Director, 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) at the 0.992-acre Church-Division Street – Tower A site (the “Site”) by RXR Church-Division Tower A Holdings LLC (the “Volunteer”). The work is being done in support of the Site’s enrollment into the New York State Department of Environmental Conservation’s (NYSDEC’s) Brownfield Cleanup Program (BCP). The Site is also identified as Block 414, p/o Lot 8 (proposed future Lot 8) with the address of 26 South Division Street in New Rochelle, New York. The objective of the QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) of environmental investigative, sampling, and remedial activities conducted during Site remediation and excavation. Adherence to the QAPP will ensure that defensible data will be obtained while completing the remedial work.

## **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**

The project director will be responsible for the general oversight of all aspects of the project, including scheduling, budgeting, data management, and decision-making regarding the field program. The project director will communicate regularly with all members of the AKRF project team and the New York State Department of Environmental Conservation (NYSDEC) to ensure a smooth flow of information between involved parties. Axel Schwendt will serve as the project director for the RIWP. Mr. Schwendt’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. She will prepare reports and participate in meetings with the Site owner and/or the NYSDEC. Ashutosh Sharma will serve as the project manager for the RIWP. Mr. Sharma’s resume is included in Attachment A.

### **2.3 Remedial Engineer**

The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program. The Remedial Engineer will certify in the Final Engineering Report (FER) that the remedial activities were observed by qualified environmental professionals under her supervision and that the remediation requirements set forth in the RIWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. The Remedial Engineer for this project will be Michelle Lapin, P.E. Ms. Lapin’s resume is included in Attachment A.

### **2.4 Field Team Leader**

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). He will report to the Project Manager on a regular basis regarding daily progress and any deviations from the work plan. The field team leader will be a qualified, responsible person, able to act professionally and promptly during soil disturbing activities. Thomas Giordano will be the field team leader for the RIWP. Mr. Giordano's resume is included in Attachment A.

## **2.5 Project Quality Assurance/Quality Control Officer**

The Quality Assurance/Quality Control (QA/QC) Officer will be responsible for adherence to the QAPP. He will review the procedures with all personnel prior to commencing any fieldwork and will assess implementation of the required procedures. Marcus Simons will serve as the QA/QC officer for the RIWP.

## **2.6 Laboratory Quality Assurance/Quality Control Officer**

The laboratory QA/QC officer will be responsible for quality control procedures and checks in the laboratory and ensuring adherence to laboratory protocols. He/she will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued. He/she will conduct a final check on the analytical calculations and sign off on the laboratory reports. The laboratory QA/QC officer will be determined upon selection of a contract laboratory(s) for the RIWP.

# **3.0 STANDARD OPERATING PROCEDURES**

The following sections describe the standard operating procedures (SOPs) for the sampling activities included in the RIWP. During these operations, safety monitoring will be performed as described in the project Health and Safety Plan (HASP) and all field personnel will wear appropriate personal protective equipment.

## **3.1 Soil Sampling**

### **3.1.1 Soil Sampling**

Soil sampling will be conducted according to the following procedures:

- Characterize the sample according to the modified Burmister soil classification system.
- Collect an aliquot of soil from each sampling location and place in labeled sealable plastic bags. The bag should be labeled with the soil boring number and the depth the sample was collected. Place the plastic bags in a chilled cooler to await selection of samples for laboratory analysis.
- After selecting which samples will be analyzed in the laboratory, fill the required laboratory-supplied sample jars with the soil from the selected sampling location or labeled sealable plastic bags. Seal and label the sample jars as described in Section 4.4 of this QAPP and place in an ice-filled cooler.
- Decontaminate any soil sampling equipment between sample locations as described in Section 3.2 of this QAPP.
- Record boring number, sample depth and sample observations (evidence of contamination, PID readings, soil classification) in field log book and boring log data sheet, if applicable.

### **3.2 Decontamination of Sampling Equipment**

All non-disposable sampling equipment (hand augers, sampling spoons, etc.) will be either dedicated or decontaminated between sampling locations. The decontamination procedure will be as follows:

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

Decontamination will be conducted within five-gallon buckets to capture decontamination water.

### **3.3 Management of Investigation Derived Waste**

If field evidence of gross contamination is identified, decontamination wastewater will be drummed and staged near the point of generation, and will be properly disposed of off-site based on laboratory results. If free of visible contamination, disposable personal protective equipment (PPE) and sampling equipment (scoops, gloves, rope, etc.) will be placed in heavy-duty plastic bags and disposed of properly.

## **4.0 SAMPLING AND LABORATORY PROCEDURES**

### **4.1 Soil Sampling**

Soil sampling will be conducted according to the following procedures:

- Field screening the soil for evidence of contamination (e.g., odors, staining, elevated PID measurements). Soil cores will be collected using 3- or 5-foot long, 2-inch diameter, stainless steel, macrocore, piston rod samplers fitted with an internal acetate liner.
- After selecting which samples will be analyzed in the laboratory, fill the required laboratory-supplied sample jars with the soil from the selected sampling location or labeled sealable plastic bags. Seal and label the sample jars as described in Section 4.4 of this QAPP and place in an ice-filled cooler.
- Decontaminate any soil sampling equipment between sample locations as described in Section 3.2 of this QAPP.
- Record boring number, sample depth and sample observations (evidence of contamination, PID readings, soil classification) in field log book and boring log data sheet, if applicable.

### **4.2 Groundwater Sampling**

Temporary monitoring well(s) will be sampled immediately after installation in accordance with the United States Environmental Protection Agency (USEPA) low flow sampling techniques. The expected targeted purge rate will be around 500 milliliters per minute (ml/min) and water quality parameters will be monitored during purging. Prior to collecting the sample, the well headspace will be screened for the presence of VOCs using a PID after removing the well cap. The depth to groundwater and depth to product, if any, will then be measured in the well using an electronic

oil/water interface probe attached to a measuring tape accurate to 0.01 foot. A representative groundwater sample will be collected from each temporary well with a peristaltic pump and dedicated tubing. After sampling, the temporary PVC well will be removed and the borehole backfilled.

The groundwater samples will be analyzed for the following:

- VOCs by EPA Method 8260B;
- SVOCs by EPA Method 8270C;
- Pesticides by EPA Method 8081A;
- PCBs by EPA Method 8082;
- TAL Metals by EPA Method 6000/7000 series (plus hexavalent chromium by EPA Method 7196A);
- 1,4-Dioxane by EPA Method 8260; and
- The standard list of 21 per- and polyfluoroalkyl substances (PFAS) compounds by EPA Method 537.

#### 4.3 Soil Vapor Sampling

Soil vapor samples will be collected from each of the temporary vapor monitoring points. The proposed soil vapor sampling locations are shown on Figure 6.

All soil vapor monitoring points will be installed by advancing an expendable drive point using a direct-push drilling rig to the specified depth below grade. At each monitoring point, a six-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.

The soil vapor samples will be collected over a two-hour time period from each monitoring point using a six-liter (6L), batch-certified SUMMA 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 sampling points will be purged of three sample volumes using a peristaltic pump. During purging, an inverted five-gallon bucket will be placed over the sampling point and helium gas will be introduced through a small hole in the bucket to saturate the atmosphere around the sample port with helium gas. Purged vapors will be collected into a Tedlar bag and field-screened for organic vapors using a PID and for methane using a landfill gas meter or similar instrument. 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 be 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 canister. Immediately after opening the flow control valve equipped with a two-hour regulator, the initial SUMMA 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.

All samples will be analyzed for VOCs according to USEPA Method TO-15 by a NYSDOH-certified laboratory with Category B deliverables. Samples will be shipped to the laboratory with

appropriate chain of custody documentation. No sample preservation is required for soil vapor or ambient air samples. The data will be reviewed by a third-party validator and a DUSR will be prepared to document the suitability of using the data.

#### 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. An Environmental Laboratory Approval Program (ELAP)-certified laboratory will be used for all chemical analyses in accordance with DER-10 2.1(b) and 2.1(f), including Category B Deliverables.

**TABLE 1**  
**LABORATORY ANALYTICAL METHODS FOR ANALYSIS GROUPS**

Matrix	Analysis	EPA Method	Bottle Type	Preservative	Hold Time
Soil	TCL VOCs	8260	Encore sampler (3) or Terracore Sampler (1)	4 °C 0 °C within 24 hrs	48 hours to extract 14 days to analyze
	TCL SVOCs and 1,4 Dioxane	8270	Glass 8 oz. Jar	4 °C	14 days to extract 40 days to analyze
	TAL Metals	6000/7000	Glass 8 oz. Jar	4 °C	6 months (28 days for Hg)
	Pesticides	8081	Glass 8 oz. Jar	4 °C	14 days to extract 40 days to analyze
	PCBs	8082	Glass 8 oz. Jar	4 °C	14 days to extract 40 days to analyze
	PFAS	Modified 537	Plastic 8 oz. Jar	4 °C	14 days to extract 40 days to analyze
Groundwater	VOCs	SW846 8260C	3, 40-ml VOAs	HCl, 4 °C	14 days
	SVOCs and 1,4-Dioxane	SW846 8270D; plus 8270D Selective Ion Monitoring (SIM)	2, 1L Amber Glass	4°C	7 days
	PCBs	SW846 8082A	1L Amber Glass	4°C	7 days
	Pesticides	SW846 8081B	1L Amber Glass	4°C	7 days
	Metals	SW846 6000/7000 series	1, 250 mL, Plastic	HNO <sub>3</sub> , 4°C	6 months
	Hexavalent Chromium	SW7196A 7196A	1, 500 mL, Plastic	4°C	30 days
	PFAS	Modified 537	3, 250mL Polypropylene Bottles	≤ 6 °C, Trizma	14 days to analyze



Matrix	Analysis	EPA Method	Bottle Type	Preservative	Hold Time
Soil Vapor	VOCs	TO-15	6-L Summa Canister	None	30 days

#### 4.5 Quality Control Sampling

In addition to the laboratory analysis of the characterization soil samples for reuse and off-site disposal, additional analysis will be included for quality control measures, as required by the Category B sampling techniques. These samples will include field blanks, trip blanks, equipment blanks, matrix spike/matrix spike duplicates (MS/MSD), and blind duplicate samples at a frequency of one sample per 20 field samples collected. Table 2 provides a summary of the field samples and QA/QC samples to be analyzed by the laboratory.

**TABLE 2**  
**FIELD SAMPLE AND QC SAMPLE QUANTITIES**

Sample Type	Parameters	EPA Method	Field Samples	QC Samples				
				Field Blank	Trip Blank	MS/MSD	Blind Duplicate	Equipment Blank
Soil/Groundwater	VOCs	EPA 8260	20	1	1	1	1	1
	SVOCs	EPA 8270	20	--	--	1	1	1
	TAL Metals	EPA 6000/7000	20	--	--	1	1	1
	Pesticides	EPA 8081	20	--	--	1	1	1
	PCBs	EPA 8082	20	--	--	1	1	1
	PFAS	EPA 537	20	--	--	1	1	1
	1,4-Dioxane	EPA 8270D	20	--	--	1	1	1

#### 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 using an alpha-numeric code. Groundwater samples will be identified by the monitoring well number, and soil samples will be identified with the sample depth interval (in parenthesis). Soil samples will be labeled with the depth interval and its location carefully measured and logged in the field book.

The blind duplicate samples will be labeled with a dummy sample location to ensure that they are submitted as blind samples to the laboratory. The dummy identification will consist of the sample type followed by a letter. Trip blanks and field blanks will be identified with “TB” and “FB”, respectively, with the collection date in a YYYY/MM/DD format (e.g., TB20190516 for a trip blank collected on May 16, 2019).

Table 3 provides examples of the sampling identification scheme.

**TABLE 3**  
**EXAMPLES OF SAMPLE NAMES**

Sample Description	Sample Designation
Soil sample SB-101 collected from two to four feet on May 30, 2019	RI-SB-101(2-4)_20190530
Matrix spike/matrix spike duplicate sample from SB-101 on May 30, 2019	RI-SB-101-MS/MSD_20190530
Blind duplicate sample from four feet at SB-101 on May 30, 2019	RI-SB-X (2-4)_ 20190530

#### **4.6.2 Sample Labeling and Shipping**

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

- Project identification
- 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 coolers as needed.

The samples will be prepared for shipment by placing each sample in a sealable plastic bag, then wrapping each container in bubble wrap to prevent breakage, adding freezer packs and/or fresh ice in sealable plastic bags and the chain-of-custody (COC) form. 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 coolers remain sealed during delivery.

#### **4.6.3 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 applicable. 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 calibrated each day using 100 ppm isobutylene standard gas.

**ATTACHMENT A**

**RESUMES OF PROJECT QA/QC OFFICER, PROJECT DIRECTOR, PROJECT MANAGER, AND FIELD  
TEAM LEADER**

# MICHELLE LAPIN, P.E.

## SENIOR VICE PRESIDENT

Michelle Lapin is a Senior Vice President with more than 25 years of experience in the assessment and remediation of hazardous waste issues. She leads the firm's Hazardous Materials group and offers extensive experience providing strategic planning and management for clients. Ms. Lapin has been responsible for the administration of technical solutions to contaminated soil, groundwater, air and geotechnical problems. Her other duties have included technical and report review, proposal writing, scheduling, budgeting, and acting as liaison between clients and regulatory agencies, and project coordination with federal, state, and local authorities.

Ms. Lapin's hydrogeologic experience includes groundwater investigations, formulation and administration of groundwater monitoring programs and remediation throughout the Northeast. Her experience with groundwater contamination includes Level B hazardous waste site investigations; leaking underground storage tank studies, including hazardous soil removal and disposal and associated soil and water issues; soil gas/vapor intrusion surveys; and wetlands issues. Ms. Lapin is experienced in coordinating and monitoring field programs concerning hazardous waste cell closures. She has directed hundreds of Phase I, Phase II, and Phase III investigations and remediations, many of them in conjunction with developers, law firms, lending institutions, and national retail chains. She is also experienced in the cleanup of contaminated properties under Brownfield Cleanup Program (BCP) regulations.

## RELEVANT EXPERIENCE

### West 61st Street Rezoning/Residential Development, New York, NY

Ms. Lapin is directing the firm's hazardous materials work for this mixed-use development in Manhattan. The Algin Management Company hired AKRF to prepare an environmental impact statement (EIS) for the proposed rezoning of the western portion of the block between West 60th and 61st Streets, between Amsterdam and West End Avenues. The purpose of the proposed action was to facilitate the development of two 30-story residential towers with accessory parking spaces, and landscaped open space. The EIS examined a "worst case" condition for rezoning the block, which allowed Algin to build a residential building of approximately 375,000 square feet at their site. The building now contains 475 apartments, 200 accessory parking spaces, a health club, and community facility space. This site, with the services of AKRF, entered into New York State's Brownfield Cleanup Program (BCP). On-site issues included underground storage tanks remaining from previous on-site buildings, petroleum contamination from these tanks and possibly from off-site sources, and other soil contaminants (metals, semi-volatile organic compounds, etc.) from fill materials and previous on-site buildings. AKRF oversaw the adherence to the Construction Health and Safety Plan (HASp), which was submitted to and approved by the New York State Department of Environmental Conservation (NYSDEC), and

## BACKGROUND

### Education

M.S., Civil Engineering, Syracuse University, 1985

B.S., Civil Engineering, Clarkson University, 1983

### Professional Licenses/Certifications

New York State P.E.

State of Connecticut P.E.

### Professional Memberships

Member, National Society of Professional Engineers (NSPE), National and CT Chapters

Member, American Society of Civil Engineers (ASCE), National and CT Chapters

Member, Connecticut Business & Industry Association (CBIA), CBIA Environmental Policies Council (EPC)

Board Member, New York City Brownfield Partnership

### Years of Experience

Year started in company: 1994

Year started in industry: 1986

monitored the waste streams, to ensure that the different types of waste were disposed of at the correct receiving facilities. This oversight also included confirmation and characteristic soil sampling for the receiving facilities and NYSDEC. A “Track 1” Clean up of the majority of the property (the portion including the buildings) was completed and the final Engineering Report was approved by the NYSDEC. AKRF has also completed a smaller portion of the property as a “Track 4” cleanup, which includes a tennis court and landscaped areas.

#### Hudson River Park, New York, NY

Ms. Lapin is directing AKRF’s hazardous materials work during construction of Hudson River Park, a five-mile linear park along Manhattan’s West Side. As the Hudson River Park Trust’s (HRPT’s) environmental consultant, AKRF is overseeing preparation and implementation of additional soil and groundwater investigations (working with both NYSDEC and the New York City Department of Environmental Protection (NYCDEP)), all health and safety activities, and removal of both known underground storage tanks and those encountered during construction. Previously, the firm performed hazardous materials assessments as part of the environmental impact statement (EIS) process, including extensive database and historical research, and soil and groundwater investigations. Ms. Lapin has been the senior consultant for the soil and groundwater investigations and remediation, and the asbestos investigations and abatement oversight.

#### Fiterman Hall Deconstruction and Decontamination Project, New York, NY

The 15-story Fiterman Hall building, located at 30 West Broadway, originally constructed as an office building in the 1950s, had served as an extension of the City University of New York (CUNY) Borough of Manhattan Community College (BMCC) since 1993. The building was severely damaged during the September 11, 2001, World Trade Center (WTC) attack when 7 WTC collapsed and struck the south façade of the building, resulting in the partial collapse of the southwest corner of the structure. The building was subsequently stabilized, with breaches closed and major debris removed. Because extensive mold and WTC dust contaminants remain within the building, it must be taken down. The project required the preparation of two environmental assessment statements (EASs)—one for the deconstruction and decontamination of Fiterman Hall and one for the construction of a replacement building on the site. AKRF prepared the EAS for the Deconstruction and Decontamination project, which included the decontamination of the interior and exterior of the building, the removal and disposal of all building contents, and the deconstruction of the existing, approximately 377,000-gross-square-foot partially collapsed structure. Ms. Lapin reviewed the EAS’s deconstruction and decontamination plans. The cleanup plan was submitted to the United States Environmental Protection Agency (USEPA).

#### Columbia University Manhattanville Academic Mixed-Use Development, New York, NY

Ms. Lapin served as Hazardous Materials Task Leader on this EIS for approximately 4 million square feet of new academic, research and neighborhood uses to be constructed north of Columbia University’s existing Morningside campus. The Hazardous Materials work included Phase I Environmental Site Assessments for the properties within the site boundaries, and estimates for a Subsurface (Phase II) Investigation of the entire development area. The firm’s Hazardous Materials group has performed over 30 individual Phase I Environmental Site Assessments for properties within the development area. In addition, a Preliminary Environmental Site Assessment (PESA) was completed in conjunction with the EIS. Based on the Phase I studies, AKRF conducted a subsurface (Phase II) investigation in accordance with an NYCDEP-approved investigative work plan and health and safety plan. Subsurface activities included the advancement of soil borings, groundwater monitor wells, and the collection of soil and groundwater samples for laboratory analysis. This study estimated costs to remediate contaminated soil, groundwater and hazardous building materials, including lead-based paint and asbestos-containing materials.

#### Yonkers Waterfront Redevelopment Project, Yonkers, NY

For this redevelopment along Yonkers’ Hudson River waterfront, Ms. Lapin headed the remedial investigation and remediation work that included Phase I assessments of 12 parcels, investigations of underground storage tank removals and

associated soil remediation, remedial alternatives reports, and remedial work plans for multiple parcels. Several of the city-owned parcels were remediated under a Voluntary Cleanup Agreement; others were administered with state Brownfields grants. Hazardous waste remediation was completed on both brownfield and voluntary clean-up parcels, which enabled construction of mixed-use retail, residential development, and parking.

#### East 75th/East 76th Street Site, New York, NY

Ms. Lapin served as Senior Manager for this project that encompassed coordination and direct remediation efforts of this former dry cleaning facility and parking garage prior to the sale of the property and its ultimate redevelopment for use as a private school. A preliminary site investigation identified 20 current and former petroleum and solvent tanks on the property. A soil and groundwater testing program was designed and implemented to identify the presence and extent of contamination resulting from potential tank spills. This investigation confirmed the presence of subsurface petroleum contamination in the soil and solvent contamination from former dry cleaning activities in the bedrock. AKRF completed oversight of the remediation under the State's Voluntary Cleanup Program. Remediation, consisting of tank removals and excavation of contaminated soil and the removal of solvent-contaminated bedrock down to 30 feet below grade, has been completed. AKRF completed oversight of the pre-treatment of groundwater prior to discharge to the municipal sewer system and an off-site study to determine impacts to groundwater in downgradient locations.

#### Avalon on the Sound, New Rochelle, NY

For Avalon Bay Communities, Ms. Lapin managed the investigations and remediation of two luxury residential towers and an associated parking garage. Remediation of the first phase of development (the first residential tower and the parking garage) included gasoline contamination from a former taxi facility, fuel oil contamination from multiple residential underground storage tanks, and chemical contamination from former on-site manufacturing facilities. The remediation and closure of the tank spills was coordinated with the New York State Department of Environmental Conservation (NYSDEC). The initial investigation of the Phase II development—an additional high-rise luxury residential building—detected petroleum contamination. A second investigation was conducted to delineate the extent of the contamination and estimate the costs for remediation. AKRF oversaw the remediation and conducted the Health and Safety monitoring. The remediation was completed with closure and approvals of the NYSDEC.

#### East River Science Park, New York, NY

Originally, New York University School of Medicine (NYUSOM) retained the firm to prepare a full Environmental Impact Statement (EIS) for its proposed East River Science Park (ERSP). As originally contemplated, the proposed complex was to occupy a portion of the Bellevue Hospital campus between East 30th Street and approximately East 28th Street and would have included a clinical practice, research, and biotech facilities, housing units, a child care center, and a conference center and parking.

Ms. Lapin managed the Phase I Environmental Site Assessment and other hazardous materials-related issues. Events relating to September 11, 2001 delayed the project for several years. When it resurfaced with a new developer and a diminished scope, Ms. Lapin updated the hazardous materials issues and consulted with the new developer regarding remediation strategies and involvement of regulatory agencies. For the actual remediation/development, the city requested oversight by AKRF to represent its interests (the city is retaining ownership of the land). Ms. Lapin completed directing the remediation oversight on behalf of the City of New York for the remediation of this former psychiatric hospital building, laundry building and parking areas. The new 550,000 square-foot development includes a biotechnology center, street level retail, and an elevated plaza.

## **AXEL E. SCHWENDT**

### **VICE PRESIDENT**

Mr. Schwendt is a Vice President for AKRF with over 20 years of experience in the environmental consulting field. Mr. Schwendt has extensive experience in Phase II studies involving subsurface soil and groundwater investigations, and has been involved in all aspects of soil and groundwater remediation, including those related to manufactured gas plants (MGP). He has designed, managed and implemented large-scale site investigations and remedial measures for various properties, including those under different regulatory programs such as the New York State Department of Environmental Conservation's (NYSDEC) Voluntary Cleanup Program and Brownfield Cleanup Program, New York State's Spill Response Program, the Mayor's Office of Environmental Remediation (OER) E-Designation Program, New Jersey's Industrial Site Recovery Act (ISRA), and Pennsylvania's Land Recycling program. Mr. Schwendt manages the hazardous materials tasks for the company's Environmental Impact Statements (EISs) and also conducts and manages Phase I Environmental Site Assessments (ESAs) for various individual clients and industries as well as for area-wide rezoning projects.

Mr. Schwendt has extensive experience in underground and aboveground storage tank (UST and AST) management, including tank removals, installations, and upgrades. He has designed and implemented remedial investigations surrounding UST and AST releases and overseen the installation and maintenance of pump-and-treat and other remedial systems. He has performed storage tank compliance audits and maintenance inspections all across the country and prepared Spill Prevention, Control, and Countermeasures Plans (SPCC Plans) for over 100 individual facilities, including designing and conducting the personnel training programs.

Mr. Schwendt worked with several other firms prior to joining AKRF, which provided him with a variety of skills. He has expertise with Chemical Bulk Storage Spill Prevention Reports, Environmental Emergency Response Plans, Integrated Contingency Plans, and multi-phase compliance audits, including some international projects. He has also performed various types of hydrogeologic testing, including pilot tests, slug tests, pump tests and groundwater modeling, and has been responsible for data review and management.

### **BACKGROUND**

#### **Education**

B.A., Earth Science and Environmental Studies, Tulane University, 1991

M.S., Geology, University of Delaware, 2002

#### **Years of Experience**

Year started in company: 2002

Year started in industry: 1995

### **RELEVANT EXPERIENCE**

#### **New York City Department of Design and Construction (NYCDDC) Feasibility and Pre-Scoping Services for East Side Coastal Resiliency, New York, NY**

Mr. Schwendt assisted with the subsurface exploration program for a multidisciplinary design team selected by the New York City agency partnership of NYCDDC, New York City Department of Parks and Recreation (NYCDPR), and Office of Recovery and Resiliency (ORR) for the Feasibility Study and Pre-Scoping Services for East Side Coastal Resiliency (ESCR) project. The AKRF Team provided technical analysis and pre-scoping





## **AXEL E. SCHWENDT**

**VICE PRESIDENT**

| p. 2

services, including complex conceptual design services, for 100+ year storm protection with anticipated sea level rise along the east side of Lower Manhattan. The ESCR subsurface exploration program involved a review of available utility plans and environmental reports involving manufactured gas plant (MGP) and petroleum-related contamination along a 2.5 mile study area from Montgomery Street to East 23rd Street to develop a Subsurface Investigation Work Plan for approval by the New York City Department of Environmental Protection (NYCDEP). The program included both public and private utility mark-out services across vast areas of the project containing critical infrastructure to enable the installation of 81 deep borings, 515 shallow borings, and 10 temporary groundwater wells.

### **New York City Health and Hospitals Corporation (NYCHHC)'s Post-Sandy mitigation program at Bellevue, Coler-Goldwater, Coney Island, and Metropolitan Hospitals**

AKRF is assisting the NYCHHC in the recovery, reconstruction and hazard mitigation of Bellevue Hospital, Coler Hospital, and Coney Island Hospital and other NYCHHC facilities, which were damaged as a result of the Hurricane Sandy disaster. The majority of the funding for these projects will be reimbursed from the Federal Emergency Management Agency (FEMA). AKRF is collecting baseline information and develop study plan and approach, including assessing for critical path approvals, preparing FEMA NEPA Environmental Assessments (EAs), conducting additional studies required by Federal Regulations for FEMA, permitting, and providing design/bid support. Mr. Schwendt is responsible for the hazardous materials tasks associated with the program, including conducting Phase I ESAs and subsurface (Phase II) investigations, and preparing necessary work plans and Remedial Action Plans (RAPs)/Construction Health and Safety Plans (CHASPs) for federal, state and city agency review and approval.

### **NYCDEP Task Order Contracts (TOCs) for Design and Construction Management Services Professional Engineering Design Services and Construction Management (PEDS)**

AKRF is currently serving as environmental review and permitting subcontractor under all four NYCDEP TOCs contracts and both PEDS contracts that were recently awarded. In addition to the preparation of environmental review/ULURP documentation and permit applications, AKRF's responsibilities include site selection support, site/civil design, and the preparation of various permit management plans and regulatory compliance tracking in accordance with DEP's Project Delivery Manual. Mr. Schwendt is providing Hazardous Materials consulting services for the TOCs and PEDS contracts, including:

- Prospect Expressway Pump Station Upgrade;
- Clearview Pump Station Reconstruction;
- Rockaway Wastewater Treatment Plant Level 1 Biological Nutrient Removal (BNR) Upgrade; and
- Oakwood Beach Wastewater Treatment Plant Headworks Improvements.

### **Verdopolis JFK Airport Facility, Queens, NY**

On behalf of Verdopolis JFK, AKRF prepared documentation for a New York State Department of Environmental Conservation (NYSDEC) Part 360 Solid Waste Management Facility Permit application. The facility, which would be constructed at the abandoned Hangar 16 site of the John F. Kennedy International Airport (JFK Airport), would process 180,000 tons per year of source separated, pre-consumer organic waste generated largely by food preparation facilities at JFK Airport. Using an anaerobic digestion process, the proposed facility would convert the food waste, which would otherwise be discarded in a landfill or incinerated, into three usable products. Mr. Schwendt assisted in preparing the application package, including preparation of the Engineering Report, Operations and Maintenance Plan, Contingency Plan, Facility Closure Plan, Hiring and Training Plan,



## **AXEL E. SCHWENDT**

**VICE PRESIDENT**

| p. 3

Chemical Bulk Storage Spill Prevention Report, and the Spill Control Prevention and Countermeasure Plan (SPCC Plan). Mr. Schwendt also prepared a Phase I Environmental Site Assessment (ESA) of the property to ascertain potential environmental conditions that may be exposed during site development activities.

### **2477 Third Avenue, Bronx, NY**

Mr. Schwendt prepared the application to enter the former 2477 Third Avenue gasoline station property into the New York State Department of Environmental Conservation's (NYSDEC) Brownfield Cleanup Program (BCP). Since its acceptance into the program, Mr. Schwendt has been managing and coordinating the remedial investigation of the site, including shallow and deep aquifer groundwater testing, delineation of known areas of soil contamination, soil vapor analyses, and investigation for potential non-aqueous phase liquid (DNAPL) from past industrial activities in the surrounding area. Mr. Schwendt was responsible for developing work plans for approval by the NYSDEC and New York State Department of Health (NYSDOH), and for preparing summary reports for public comment. As part of the project, Mr. Schwendt coordinated with the client, lawyers, and architects of the planned development, tenants of neighboring properties, NYSDEC, NYSDOH, and the New York City Department of Environmental Protection (NYCDEP). Mr. Schwendt is also conducting the work necessary to address a hazardous materials E-Designation assigned to the property.

### **E-Designation Properties/Voluntary Cleanup Program, New York City, NY**

Mr. Schwendt has assisted various public and private clients with addressing E-Designations assigned by the New York City Department of Environmental Protection (NYCDEP) to properties throughout New York City. He has prepared the required Phase I Environmental Site Assessments (Phase I ESAs) and implemented Phase II testing to the satisfaction of the New York Office of Environmental Remediation (OER). Based on the results of the testing, he has prepared Remedial Action Plans (RAPs) and Construction Health and Safety Plans (CHASPs) for approval by the NYCOER, which included strategies for mitigating on-site environmental conditions and plans for incorporating environmental engineering controls into proposed construction projects. Mr. Schwendt's clients promptly receive the Notice of Satisfaction necessary to acquire building permits from the New York City Department of Buildings (DOB). Mr. Schwendt has also managed several projects enrolled in the New York City Voluntary Cleanup Program.

### **St. George Ferry Terminal, Staten Island, NY**

Mr. Schwendt prepared a Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) for the Department of Transportation's (DOT) St. George Ferry Terminal facility in Staten Island. The facility's bulk containers store over 600,000-gallons of petroleum used to fuel boilers and emergency generators, provide oil for maintenance and repair of equipment and vessels, and to fuel the ferry vessels. Mr. Schwendt also consulted the DOT on how to upgrade the facility's fueling systems to comply with the SPCC and New York State Department of Environmental Conservation (NYSDEC) regulations.

### **Mount Sinai Medical Center, Manhattan, NY**

Mr. Schwendt managed the Hazardous Materials task for the environmental assessment of the Mount Sinai Medical Center, which is constructing a 700,000 sf, mixed-use residential and bio-medical research facility building. His work included managing the Phase I Environmental Site Assessment (ESA), Phase II investigation, and preparing the Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) approved by the New York City Department of Environmental Protection (NYCDEP).

### **Lincoln Center Development Project, New York, NY**

On behalf of the Lincoln Center Development Project, Inc., Mr. Schwendt conducted a Subsurface (Phase II) Investigation in the area of an underground storage tank (UST) farm located beneath the lower garage level of the West 62nd Street parking garage at Lincoln Center. The Phase II study was prompted by a request from the New York State Department of Environmental Conservation (NYSDEC) to properly close out the tanks. The tank farm includes seventeen (17) 550-gallon gasoline USTs and one (1) 550-gallon waste oil UST. The purpose of this Phase



## **AXEL E. SCHWENDT**

**VICE PRESIDENT**

| p. 4

II investigation was to determine whether historic leaks from the tanks had affected the subsurface and to assist with future tank closure activities. The Phase II report was submitted to the NYSDEC for review and included a request to close the tanks in-place instead of removing them due to the structural constraints of the tank farm location. Mr. Schwendt also managed the closure of the 18 UST's to the satisfaction of the NYSDEC.

### **512-522 Vanderbilt Avenue, Brooklyn, NY**

On behalf of the Empire State Development Corporation (ESDC), AKRF was retained to provide hazardous material consulting services in connection with the former gasoline station property located at 512-522 Vanderbilt Avenue. Mr. Schwendt performed a Phase I Environmental Site Assessment (ESA), a geophysical survey of the site, and a soil and groundwater subsurface investigation. Data from the investigation would be used to assess remedial strategies during development of the site.

### **Whitney Museum of American Art, Gansevoort Facility, New York, NY**

AKRF has provided various consulting services in support of the Whitney Museum of American Art's long-term planning requirements. Tasks have included transportation surveys, traffic counts, attendance projections, visual impact and shadow studies, economic benefit studies, and two Environmental Assessment Statements (EASs) for proposed new facilities for the Museum. Mr. Schwendt was responsible for the hazardous materials elements of the assessment, including preparing a Phase I ESA and conducting several Subsurface (Phase II) Investigations for review by the New York City department of Environmental Protection (NYCDEP) and Mayor's Office of Environmental Remediation (OER). Mr. Schwendt prepared and managed the implementation of the OER-approved Remedial Action Plan (RAP) for the construction project and is responsible for satisfying all of the associated regulatory reporting requirements. Environmental work at the site also included mitigating a petroleum spill discovered during site excavation activities and coordinating all remedial efforts with the New York State Department of Environmental Conservation's (NYSDEC) Department of Environmental Remediation (DER).

### **New York Botanical Garden, Bronx, NY**

The New York Botanical Garden (NYBG) proposed to construct an accessory parking garage of approximately 825 spaces at Bedford Park Boulevard and Webster Avenue in the Bronx to provide a parking garage for staff and visitors who cannot be accommodated within NYBG's on-site facilities. Mr. Schwendt was the Project Manager for the environmental assessment's hazardous materials work, which included a Phase I Environmental Site Assessment (ESA), Phase II Investigation and the preparation of a Remedial Action Plan (RAP) and a Construction Health and Safety Plan (CHASP) to the satisfaction of the New York City Department of Environmental Protection (NYCDEP). As construction proceeds, Mr. Schwendt will be responsible for managing the environmental monitoring during all subsurface work and preparing the post-construction Closure Report required by the NYCDEP in order to receive the Notice of Satisfaction necessary to obtain occupancy permits from the New York City Department of Buildings (DOB).

### **Roberto Clemente State Park, Bronx, NY**

AKRF participated in the rehabilitation of an existing ballfield, redevelopment of the existing picnic areas, and shoreline restoration along the Harlem River at Roberto Clemente State Park. AKRF is charged with preparing the Joint Permit Application which is necessary to procure the federal, state and local permits and approvals for the shoreline redevelopment. Mr. Schwendt worked with the firm's engineering group to conduct testing to pre-characterize soil to assist with the management of soil during construction. The testing included pre-characterization of soil for on-site reuse in accordance with the New York State Department of Environmental Conservation (NYSDEC) tidal wetland permit requirements and testing for physical parameters required for landscape planning.

### **Long Island Power Authority (LIPA), Long Island, NY**



## **AXEL E. SCHWENDT**

**VICE PRESIDENT**

| p. 5

Mr. Schwendt managed the preparation of Phase I Environmental Site Assessments and Phase II Investigations, along with the Hazardous Materials chapters for Environmental Impact Statements, for properties owned or to be acquired by LIPA to identify potential sources of environmental contaminants prior to power station and power line installation.

### **Rose Plaza on the River, Brooklyn, NY**

Mr. Schwendt conducted a Subsurface (Phase II) Investigation at the 470 Kent Avenue property located in Brooklyn, New York. The objective of the subsurface investigation was to characterize the subsurface soil and groundwater conditions and determine whether past or present on-site and/or off-site potential sources of contamination have adversely affected the site. Results of the Phase II study were also used to evaluate any potential environmental risks and/or the need for remedial action at the site prior to future development. The proposed development of the site includes the construction of approximately 665 market rate dwelling units and approximately 33,750 square feet of commercial uses. The scope of the Phase II study was based on a Phase I Environmental Site Assessment (January 2004) performed by AKRF, which identified recognized environmental conditions for the site, including the potential for soil and groundwater contamination from a historical on-site manufactured gas plant, and potential underground storage tanks. Phase II activities were conducted in accordance with AKRF's Sampling Protocol and site-specific Health and Safety Plan (HASP), which was reviewed and approved by the New York City Department of Environmental Protection (NYCDEP).

### **Albert Einstein College of Medicine Environmental Investigation, Bronx, NY**

Mr. Schwendt managed a Subsurface (Phase II) Investigation at an approximately eight-acre portion of the Jacobi Medical Center fronting on Eastchester Road in the Bronx, New York. The site, owned by New York City, contained an old boiler house, a storage warehouse, a laundry facility, and several paved parking areas. The objective of the subsurface investigation was to characterize the subsurface conditions on the property and determine whether past or present on-site and/or off-site potential sources of contamination have adversely affected the site.

### **Storage Deluxe, Various Locations, NY**

Mr. Schwendt is currently the project manager for assisting Storage Deluxe with the ongoing expansion of their self-storage facilities primarily in the five boroughs of New York City and Westchester County. He conducts and manages environmental due diligence needs related to their property transactions, including Phase I Environmental Site Assessments (ESAs), Phase II investigations, and geophysical surveys, as well as consulting on petroleum bulk storage tank management. He assists Storage Deluxe in making decisions with respect to environmental risk issues.

### **South Bronx Overall Economic Development Corporation (SoBRO) Port Morris Brownfield Opportunity Areas (BOA), Bronx, NY**

Mr. Schwendt is assisting SoBRO with the in-depth and thorough analysis of existing conditions, opportunities, and reuse potential for properties located in the proposed Port Morris Brownfield Opportunity Area with an emphasis on the identification and reuse potential of strategic brownfield sites that may be catalysts for revitalization. His work so far has included the preparation of Phase I Environmental Site Assessments (ESAs) and conducting Phase II investigations for the catalyst sites and advising on the suitability of enacting zoning changes to permit various property uses. Mr. Schwendt also assisted SoBRO with the BOA application process.

### **Kings Plaza, LLC Total Energy Plant, Brooklyn, NY**

Mr. Schwendt has conducted regular environmental compliance reviews of the Kings Plaza Total Energy Plant (TEP) in Brooklyn, New York. The reviews were conducted to observe operations and to review environmental permits, agency correspondence, operating records, recordkeeping and monitoring procedures, and regulatory reporting requirements. As a result of the review, Mr. Schwendt provided the TEP with recommendations for the



## **AXEL E. SCHWENDT**

**VICE PRESIDENT**

| p. 6

management of various waste streams and petroleum/chemical bulk storage associated with facility operations and prepared a Spill Control Prevention and Countermeasure Plan (SPCC Plan) for the facility.

### **270 Greenwich Street, New York NY**

Mr. Schwendt conducted a subsurface (Phase II) investigation that included the advancement of soil borings and the collection of soil and groundwater samples from the 270 Greenwich Street property in the Tribeca neighborhood of New York City. The site will be developed with approximately 402 dwelling units (172 rental units and 230 for sale condominiums), approximately 224,084 gross square feet of destination and local retail space, and below-grade public parking. The purpose of this Phase II subsurface investigation was to ascertain subsurface soil and groundwater quality beneath the site and determine whether past on- or off-site operations have affected the property. The subsurface investigation was also intended to determine whether there are any special handling or disposal requirements for pumped groundwater, should dewatering be necessary during site development. The Phase II study included soil and groundwater sampling as well as a geophysical investigation to determine whether unknown underground storage tanks were present at the site. Field activities were performed in accordance with Mr. Schwendt's Sampling Protocol and Health and Safety Plan (HASP), which were approved by the New York City Department of Environmental Protection (NYCDEP).

### **Columbia University Manhattanville Rezoning and Academic Mixed-Use Development, New York, NY**

Mr. Schwendt managed the hazardous materials task on the Environmental Impact Statement (EIS) for approximately 4 million square feet of new academic, research and neighborhood uses to be constructed north of Columbia University's existing Morningside Heights campus. The work included more than 25 Phase I Environmental Site Assessments (ESAs) for the properties within the rezoning area and estimates for upcoming investigation and remediation. In addition, a Preliminary Environmental Site Assessment (PESA) was completed for the whole project area. Recognized environmental concerns in the area included: current and historical underground storage tanks; current and historical auto-related use such as repair shops and gasoline stations; two historical manufactured gas holders; and a Consolidated Edison cooling plant located on West 132nd Street. Mr. Schwendt conducted a subsurface investigation at the site to characterize the subsurface conditions on the property and determine whether past or present on-site and/or off-site potential sources of contamination have adversely affected the study site, and to use the analytical data to evaluate any potential environmental risks and/or the need for remedial action at the site prior to future development. Based on the results of the investigation, Mr. Schwendt prepared a Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) for the project, which was approved by the New York City Department of Environmental Protection (NYCDEP).

### **Hudson River Park, New York, NY**

Mr. Schwendt serves as the on-call environmental consultant for the ongoing development of the Hudson River Park, the approximately 5 to 6 mile section of waterfront property from Battery Place to 59th Street along the western edge of Manhattan. He conducts subsurface investigations, coordinates tank removals, implements soil and groundwater remediations, provides guidance on construction and environmental health and safety issues, interfaces with regulatory agencies as necessary, and manages the mitigation of environmental conditions encountered during site development activities.

### **Brooklyn Bridge Park, Brooklyn, NY**

AKRF is providing environmental planning and review services for the development of a new 70-acre park that will revitalize 1.5 miles of the East River waterfront between Jay Street and Atlantic Avenue. When completed, the park will provide open space, recreational facilities, a hotel, restaurants, and retail, historic, and educational venues. Mr. Schwendt was involved with the completion of the Environmental Impact Statement (EIS) and conducted a Phase I Environmental Site Assessment (ESA) and Phase II Subsurface Investigation for the proposed Brooklyn





## **AXEL E. SCHWENDT**

**VICE PRESIDENT**

| p. 7

Bridge Park area. He serves as the park's on-call consultant for addressing environmental conditions as development progresses and has conducted several tank removals and contaminated soil delineation and remediation projects for various sections of the park.

### **Titan Property Management, Rego Park, NY**

Mr. Schwendt was involved with an extensive site investigation for a property involved in the New York State Voluntary Cleanup Program. The property was resting on a plume of PCE contamination. The goal of the investigation was to determine whether the property is the source of the contamination and to collect data to provide information for the design and implementation of a site remedial system. The investigation involved extensive soil, soil gas, and groundwater investigation, and included the investigation of surrounding properties.

### **ABCO Refrigeration Company, Long Island, NY**

Mr. Schwendt managed a tank closure and dry well assessment and remediation project for the ABCO Refrigeration Company. Historic contamination was found seeping from the ground in the location of an old underground storage tank, which is believed to be a source of adverse impact. An adjacent drywell was impacted by the tank as well as from past dumping activities of a former typewriter ribbon ink manufacturing company. A site-wide investigation of the ten drywells was also implemented at the request of the Nassau County Department of Health. Mr. Schwendt undertook soil remedial activities that led to the property receiving closure with respect to the underground storage tank. Drywell remedial activities were successful and the site received approval from the United States Environmental Protection Agency (USEPA) to continue use of on-site drywells.

### **Levin Management Corporation Property—Site Investigation, Pelham Manor, NY**

Mr. Schwendt was involved in the site investigation of a former manufactured gas plant (MGP) that handled petroleum off-loading and storage until the late 1950s. Soils have also been observed to have been affected by non-aqueous phase liquid (NAPL) consisting of oil- and tar-like material. Floating or light NAPL (LNAPL) has also been detected in on-site groundwater. The objectives of the site investigation were to collect additional data to further determine the extent of NAPL-affected soil both above and below the water table throughout the site and to further delineate groundwater contamination throughout the site. The site investigation also sought to confirm the on-site groundwater flow direction and that NAPL had not migrated to the downgradient perimeter of the site, including Eastchester Creek. Mr. Schwendt was brought on board for this project for his expertise in soil and groundwater MGP contaminant delineation.

### **NYCDEP Bureau of Environmental Engineering 26th Ward Wastewater Treatment Plant—Site Investigation, Brooklyn, New York**

Mr. Schwendt managed and conducted environmental sampling and testing at the 26th Ward Wastewater Treatment Plant property located in Brooklyn, New York. This investigation was performed to determine the presence or absence of contamination in the soil and groundwater that would affect the proposed construction of a new raw sewage pump station. Mr. Schwendt provided the 26th Ward with the protocol necessary for the special handling and disposal of the excavated soil as well as for the groundwater that would be pumped during dewatering operations.

### **Olnick Organization, New York, NY**

AKRF was retained by the Olnick Organization to prepare and implement an Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) for their aboveground storage tank system for an office building in Manhattan. Mr. Schwendt performed the site inspections and provided the Olnick Organization with a list of recommendations for upgrades to their fuel transfer piping system that would bring the facility into compliance with SPCC regulations. He also provided Olnick with a plan for implementing the required SPCC training program for their facility personnel.



## **AXEL E. SCHWENDT**

**VICE PRESIDENT**

| p. 8

### **Site investigations of former MGP Facilities/Properties for Consolidated Edison, New York City, NY & Westchester County, NY**

While with another firm, Mr. Schwendt worked on this project, which included a service station in New York City and an electrical substation in Westchester County, New York. Mr. Schwendt performed the site characterizations, including subsurface soil and groundwater impact delineation and aquifer testing. The findings from these characterizations are being used by Consolidated Edison to make appropriate changes to the design specifications and to plan for appropriate handling of impacted materials and health and safety protocols during future construction activities.

### **UST Site Investigation and Remediation for Consolidated Edison Service Center, Queens, NY**

While with another firm, Mr. Schwendt worked on this project, which included due diligence site reviews, soil boring installation, monitoring well installation, hydrogeologic testing, and water quality sampling. Risk-based closures incorporating natural attenuation and groundwater monitoring activities have been proposed. Remedial work plans are under development for other facilities where more aggressive remedial actions are required. Mr. Schwendt also performed subsurface investigations and site characterizations for several other Consolidated Edison facilities including soil-gas surveys and a radiological scoping survey.

### **Petroleum Bulk Storage Management Program for Bell Atlantic-New York (now Verizon), Manhattan, Brooklyn, Queens, Bronx, Staten Island, and Long Island, NY**

While with another firm, Mr. Schwendt personally designed and conducted subsurface investigations for underground storage tank (UST) remediations including characterization of releases, soil and ground water investigations, pilot tests, slug tests, pump tests, groundwater modeling, horizontal and vertical impact delineation, and preparation of compliance documentation for regulatory agencies. He performed oversight of the installation of 'pump and treat' remedial systems and performed maintenance activities. He also supervised UST installations, upgrades and closures; implemented tank tightness testing programs; addressed on-site health and safety issues and other regulatory requirements; prepared closure reports; and managed soil disposal.

### **Hertz Rent-A-Car Corporate Headquarters, Park Ridge, NJ**

While with another firm, Mr. Schwendt served as an in-house consultant/project manager for the environmental department at Hertz's corporate office in Park Ridge, New Jersey. He managed Phase I and Phase II investigations for real estate purchases, leases and acquisitions throughout the United States and Canada. He coordinated Hertz's subcontractors and environmental consulting firms, reviewed reports, and made recommendations to the legal and real estate departments with respect to environmental risk issues.

### **Temple University, Philadelphia, PA**

Mr. Schwendt was a lead auditor for a multi-phase compliance audit of the five campuses of Temple University. The audit included an assessment of all of the Temple University Hospitals, the School of Medicine, the College of Science and Technology, the Tyler School of Art, the College of Engineering, Ambler College (Community and Regional Planning, Horticulture, and Landscape Architecture), the Physical Plant Department, and all university facilities and maintenance departments. Regulatory programs targeted as part of the audit included, but were not limited to, federal and state air and water programs, hazardous waste management, hazardous chemicals and substances, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) for pesticides, emergency response, Community Right-to-Know, Toxic Substance Control Act (TSCA), and petroleum bulk storage regulations. Following completion of the audit, Mr. Schwendt prepared and implemented an environmental management system that conformed to the needs and culture of the Temple University organization.

### **University of Pennsylvania, Philadelphia, PA**



## **AXEL E. SCHWENDT**

**VICE PRESIDENT**

| p. 9

Mr. Schwendt was the lead auditor for an environmental compliance audit of the University of Pennsylvania's Department of Environmental Health and Radiation Safety. The audit included an assessment for the preparation and implementation of the university's Spill Prevention, Control, and Countermeasures Plans (SPCC Plans). Mr. Schwendt prepared and implemented the university's environmental management program and provided training for the facility personnel.

### **Wistar Institute, Philadelphia, PA**

Mr. Schwendt was the lead auditor for an environmental compliance audit of the Wistar Institute, an independent non-profit biomedical research institute in West Philadelphia, Pennsylvania. The multi-phase audit comprised an assessment of the entire facility for compliance with federal, state and local environmental regulations and included the development of an environmental management system.

### **Seton Hall University, South Orange, NJ**

Mr. Schwendt was a lead auditor for a multi-phase compliance audit of the Seton Hall University campus. The audit comprised an assessment of the entire facility for compliance with federal and state air and water programs, hazardous waste management programs, hazardous chemicals and substances programs, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) for pesticides, emergency response and Community Right-to-Know regulations, the Toxic Substance Control Act (TSCA), and petroleum bulk storage regulations. The audit included the development and implementation of an environmental management system for the Seton Hall University faculty and staff.

### **New York City College of Technology (City Tech) Academic Building, Brooklyn, New York**

Mr. Schwendt is assisting the City University of New York (CUNY) and the Dormitory Authority of the State of New York (DASNY) in addressing the E-Designation assigned to the New York City College of Technology (City Tech) redevelopment project site in Brooklyn, New York. CUNY is proposing to construct an eight-story academic building with classrooms, laboratories, administrative space, and underground parking. Mr. Schwendt conducted the required Phase I Environmental Site Assessment (ESA) and Phase II testing to the satisfaction of the Mayor's Office of Environmental Remediation (OER) and will assist CUNY with entering the project site in the City's Voluntary Cleanup Program (VCP). The work will include preparing the required Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) and conducting the necessary environmental monitoring during construction. Mr. Schwendt will also prepare the closure documentation required for CUNY to receive the Notice of Satisfaction necessary to obtain occupancy permits from the New York City Department of Buildings (DOB).

### **New York University Langone Medical Center, New York, NY**

Mr. Schwendt managed the hazardous materials task on the EAS for the NYU Langone Medical Center (NYULMC) development project in Manhattan, New York. NYULMC is in the process of developing the Kimmel Program, which consists of two new buildings on its main campus: the Kimmel Pavilion to house hospital functions and an Energy Building to house a combined heat and power (CHP) plant, primary electric service and emergency generators to support the campus, as well as space for patient care (specifically, radiation oncology). The work included conducting Phase I Environmental Site Assessments and Phase II subsurface investigations at each site to characterize the subsurface environmental conditions at the project site. Based on the results of the investigations, a Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) were prepared for each project phase for submission to the New York City Department of Environmental Protection (NYCDEP) and Mayor's Office of Environmental Remediation (OER). Mr. Schwendt will assist NYULMC by conducting the environmental monitoring required by the agency-approved RAPs/CHASPs as construction progresses, and will prepare the closure documentation required by the agencies to obtain Certificates of Occupancy from the New York City Department of Buildings (DOB).

### **DASNY Term Environmental Consultant 2006-2012 and 2012-2016, Various Locations, NY**





## **AXEL E. SCHWENDT**

**VICE PRESIDENT**

| p. 10

Mr. Schwendt serves as a hazardous materials task leader under the firm's on-call contract with DASNY, through which AKRF is providing State Environmental Quality Review Act (SEQRA) and City Environmental Quality Review (CEQR) environmental review services for a wide range of educational, healthcare and other institutional projects, as well as specialized technical services in historic and archaeological resources, hazardous materials, traffic, air quality, noise, and natural resources. Mr. Schwendt has also assisted DASNY with addressing E-Designations and by conducting various types of environmental investigations, including Phase I and Phase II assessments.

### **NYCDEP Permit Resource Division On-Call Contract, New York, NY**

Under subcontract to a national engineering firm, and as part of two successive Program Management contracts, AKRF is providing support in a wide range of technical areas related to environmental and engineering permits for NYCDEP capital projects. These services fall into two major categories: preparing detailed guidance documents that will be used by project designers and construction managers on future projects, in order to expedite permit approvals and prevent delays; and providing expert review and guidance regarding permits for current projects, in order to ensure completeness of permit applications and effective coordination with regulatory agencies. The technical areas covered by AKRF include: wetlands, groundwater, surface water, and other natural resources; hazardous materials; traffic and transportation; air quality; noise and vibration; historic and archaeological resources; stormwater management; open space and parkland; and a broad range of permits and approvals from the New York City Fire Department (FDNY), the New York City Police Department (NYPD), the New York City Department of Buildings (NYCDOB), and other municipal agencies. AKRF is also helping NYCDEP improve the overall process for tracking environmental and engineering permits and approvals, from the planning and design phases of a project to construction and long-term operation. Mr. Schwendt provides consulting services related to the hazardous materials issues.



# **ASHUTOSH SHARMA**

## **SENIOR ENVIRONMENTAL SCIENTIST**

Ashutosh Sharma is an Environmental Scientist providing expertise in Phase I and Phase II (subsurface) site investigation, remediation and cleanup of contaminated sites, and construction oversight. He has experience with subsurface soil, groundwater and sub-slab air/vapor sampling procedures, coordinating and running Community Air Monitoring Plans (CAMP) and is familiar with relevant United States Environmental Protection Agency (USEPA), New York State Department of Environmental Conservation (NYSDEC), and New York City Department of Environmental Protection (NYCDEP) environmental laws and regulations.

## **BACKGROUND**

## **EDUCATION**

M.S., Environmental Science, New Jersey Institute of Technology, 2007  
B.Tech, Dr. B.R. Ambedkar National Institute of Technology, India, 2005

## **Years of Experience**

Year started in industry: 2007  
Year started in company: 2007

## **RELEVANT EXPERIENCE**

### **NYU Langone Medical Center (NYULMC) – Kimmel Pavilion, New York, NY**

New York University Langone Medical Center enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate the property located at 424 East 34<sup>th</sup> Street in Manhattan. The proposed development consisted of a new medical facility. Mr. Sharma provided construction oversight during site excavation, spill investigation and remediation, coordination and management of soil removal, oversight of the on-site air monitoring program, identification and proper management of contamination encountered during excavation work, and maintenance of critical paperwork.

### **551 Tenth Avenue, New York, NY**

Extell 4110 LLC enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate the property located at 547-551 Tenth Avenue in Manhattan. The property was developed with a 52-story residential building with one sub-grade level. Mr. Sharma provided construction oversight during site excavation, spill remediation, coordination and management of soil removal and fill material imports, oversight of the on-site air monitoring program, identification and proper management of contamination encountered during excavation work, and maintenance of critical paperwork and preparation of the final closure report.

### **New York City School Construction Authority, Various Locations, NY**

Under contract with the School Construction Authority (SCA) of New York City, AKRF is providing assistance with water disinfection projects for new schools and for plumbing upgrades for existing school buildings. Mr. Sharma has been providing assistance with contractor oversight work during the disinfection process as per the contract agreement.

#### **Yankee Stadium Demolition, Bronx, NY**

The New York City Economic Development Corporation (NYCEDC) project include demolition of the old Yankee Stadium and construction of a ball field known as Heritage Field. Mr. Sharma provided air monitoring and remedial action plan (RAP) oversight during the demolition and soil disturbance work.

#### **East River Science Park, New York, NY**

The New York City Economic Development Corporation (NYCEDC) proposed to construct two seventeen-story buildings to serve as a biomedical research center. The space between the two towers included an elevated atrium and an outdoor plaza on top of a parking garage. Mr. Sharma provided construction oversight during site excavation, coordination and management of soil removal and fill material imports, oversight of the on-site air monitoring program, identification and proper management of contamination encountered during excavation work, and maintenance of critical paperwork and preparation of the final closure report.

#### **Whitney Museum of American Art, NY**

Mr. Sharma provided assistance with subsurface soil and groundwater investigation, construction oversight and soil disposal management during the remediation phase of the project. The project included the construction of approximately 230,000-square foot museum building with one sub-grade level with exhibition galleries, administrative offices, accessory use (café and bookstore), storage space, and an approximately 4,000-square foot restaurant.

#### **W 61<sup>st</sup> Street Site, NY**

Mr. Sharma provided assistance with construction oversight during site excavation activities and helped prepare the final closure report for the site which, as part of the Brownfield Cleanup Program (BCP), was slated for redevelopment as two residential buildings with a courtyard and a tennis court.

#### **164 Kent Avenue, Brooklyn, NY**

The site was developed as mixed-use residential-commercial high rise towers with an esplanade and a pier on the East River. Mr. Sharma provided assistance with construction oversight during soil handling activities and running the Community Air Monitoring Plan (CAMP).

#### **285 Jay Street, Brooklyn, NY**

Under contract with the Dormitory Authority of the State New York (DASNY), AKRF completed a Phase II Subsurface investigation at the site of a proposed CUNY educational building to satisfy New York City E-designation requirements. As part of the work AKRF performed at the site, Mr. Sharma conducted subsurface soil and groundwater investigation work and coordinated with the driller and the property owner for successful completion of the work.

#### **MTA Long Island Railroad, East Side Access Project, New York, NY**

The Metropolitan Transportation Authority (MTA) sponsored the East Side Access project to connect the Long Island Railroad to the Grand Central Terminal, thereby allowing Long Island commuters direct access to the East Side of Manhattan. Mr. Sharma provided assistance with the execution of the Community Air Monitoring Plan (CAMP) at various locations during the construction phase.

#### **2341–2357 Adam Clayton Powell Jr. Boulevard, New York, NY**

AKRF performed a Phase II study to meet the requirements of the New York City Department of Environmental Protection (NYCDEP) and to determine whether subsurface conditions had been affected by the on-site and/or off-site petroleum storage tanks and to ascertain whether current or

former on- or off-site activities had adversely affected the subject property. Mr. Sharma conducted sub-surface soil and groundwater investigation at the abandoned site slated for future development. He was responsible for coordinating with the driller and the property owner for successful completion of the work.

## **MARCUS SIMONS**

### **SENIOR VICE PRESIDENT**

Marcus Simons is a Senior Vice President of AKRF with more than 25 years of environmental consulting experience, specializing in the assessment and cleanup of contaminated sites, including federal and state superfund, RCRA, TSCA, brownfield, voluntary cleanup and spill sites. His expertise includes health risk assessment, development of sampling plans, economic evaluations of remedial alternatives, and regulatory analysis. He is also AKRF's Health and Safety Officer with extensive experience of Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) issues during sampling and remediation of contaminated sites.

Mr. Simons directs much of AKRF environmental due diligence work (recently managing environmental due diligence for the Peter Cooper/Stuyvesant Town acquisition, reportedly the largest real estate transaction in US history), including supervising preparation of numerous Phase I and Phase II Environmental Site Assessments, as well as more complex multi-site and litigation-related projects. Mr. Simons manages preparation of the contaminated-materials portions of AKRF's Environmental Impact Statements and Environmental Assessments and has experience with procedures for hazardous material requirements under NEPA and New York SEQRA/CEQR, E-designation, BCP and VCP programs. He also has extensive experience in statistics, selection of sites for controversial facilities, and federal and state wetland regulations and waterfront permitting. In addition to analytical work, Mr. Simons has considerable experience in presenting results to regulatory agencies and the general public.

Mr. Simons has managed some of the most complex cleanup sites in New York State including: the cleanup of a 12-acre PCB-contaminated former utility property in Flushing, Queens where a 3 million square foot retail/residential building was constructed (remediation was performed under the State Brownfield Cleanup Program, though the site was also subject to City jurisdiction under its E-Designation program); cleanup of the nation's largest former dental factory in Staten Island for reuse as single family housing; the investigation of several former manufactured gas plants; and the investigation and remediation associated with the reconstruction of the West Side Highway and Hudson River Park in Manhattan (from the Battery to 59th Street), Brooklyn Bridge Park, and Governors Island. Mr. Simons also has extensive experience with transportation projects (Second Avenue Subway, MTA/LIRR East Side Access, 7-Train Extension, Cross Harbor Freight Movement Study, Route 9A Reconstruction), large-scale rezoning projects (Long Island City, Greenpoint/Williamsburg, Downtown Brooklyn, Jamaica) and public and private redevelopment work (World Trade Center Reconstruction, The New York Wheel, Atlantic Yards, School Construction Authority, Queens West)

### **BACKGROUND**

#### **Education**

M.S., Engineering and Public Policy, Carnegie-Mellon University, 1988

M.A. and B.A. (Honors), Mathematics/Engineering, Cambridge University, England, 1986

#### **Certifications**

Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) – 40 Hour Site Worker and 8 Hour Site Supervisor

#### **Years of Experience**

Year started in company: 1995

Year started in industry: 1988



## **MARCUS SIMONS**

**SENIOR VICE PRESIDENT**

| p. 2

### **RELEVANT EXPERIENCE**

#### **CE Flushing Site, Flushing, NY**

Mr. Simons directed the remediation of a former industrial site in Flushing, Queens, NY prior to its redevelopment as a 3 million square foot retail/residential complex. The property was cleaned up under the NYS Department of Environmental Conservation Brownfield Cleanup Program and the NYC Department of Environmental Protection's E-Designation requirements. The remedial measures included the removal of aboveground and underground storage tanks, excavation and off-site disposal of TSCA, RCRA and non-hazardous wastes, NAPL removal, and removal and investigation of on-site drainage structures. The remediation and subsequent construction involved obtaining (or obtaining waivers from) numerous permits including those for NYSDEC Tidal Wetlands, NYSDEC Long Island Wells, NYSDEC SPDES/Stormwater and NYCDEP Sewer Use.

#### **Peter Cooper Village/Stuyvesant Town, New York, NY**

Mr. Simons directed environmental due diligence efforts for the two most recent purchasers of this 80-acre property in Manhattan. Much of the 110-building complex is underlain by former manufactured gas plants and Con Edison entered the site into NYSDEC's Voluntary Cleanup Program. Going forward Mr. Simons manages oversight of activities that involve disturbance of MGP-contaminated soils, as well as future testing and potentially remediation.

#### **The New York Wheel, Staten Island, NY**

Mr. Simons directed the hazardous materials environmental review for the project which is being built on the site of an old railyard and is subject to both NYSDEC Brownfield Cleanup Program and NYCDEP remediation requirements. Remediation of the site is being performed during the ongoing construction.

#### **Governors Island, New York, NY**

Mr. Simons directed the hazardous materials environmental review for the project which involves converting one of the nation's oldest military bases to primarily park usage. In addition to managing the hazardous materials environmental review for the project's approvals, Mr. Simons developed testing requirements for the millions of yards of imported and reused soils/materials necessary to create the new park's topography and landscape.

#### **MTA New York City Transit Manhattan East Side Transit Alternative (MESA)/Second Avenue Subway, New York, NY**

Mr. Simons directed the contaminated material assessment for this multi-billion dollar transit initiative that would provide subway service to Manhattan's East Side. The assessment identified several hundred facilities along the alignment that could have impacted soil and/or groundwater and could require special materials handling and enhanced health and safety procedures. Additional evaluation of these sites is underway.

#### **Ferry Point Park, Bronx, NY**

Mr. Simons developed the material acceptance criteria (soil standards for capping materials) for the development of Ferry Point Park (including a golf course) in the Bronx. The New York City Department of Environmental Protection DEP and the New York State Departments of Health (DOH) and Environmental Conservation (DEC) agreed for the first time to relax their then strict (TAGM 4046) criteria for clean soil, based on statistical analyses of background conditions and risk-based modeling.

#### **Prince's Point, Staten Island, NY**

Mr. Simons managed the complex cleanup (including the relocation of a contaminated tidal creek) of the nation's largest former dental factory site on Staten Island's waterfront. The site was on the State Superfund list. The future use of the site as single-family residential property entailed extensive negotiations with NYSDEC and NYSDOH. The project required obtaining (or obtaining waivers from) numerous permits including those for NYSDEC Tidal



## **MARCUS SIMONS**

**SENIOR VICE PRESIDENT**

| p. 3

and Fresh Water Wetlands, USACOE (Nationwide) Permits, NYSDEC Coastal Erosion Hazard Area, NYSDEC SPDES and Stormwater, FEMA Modifications to Land in Floodplain, and USEPA Notification of PCB Waste Activity.

### **Route 9A Reconstruction, New York, NY**

AKRF directed extensive studies for the reconstruction in Lower Manhattan proposed by the New York State Department of Transportation (NYSDOT) in cooperation with the Federal Highway Administration (FHWA). The project is arguably the most complex environmental analyses performed for a federally funded transportation project in New York City in the last 10 years. The firm was responsible for all environmental tasks as well as the preparation for the Draft, Supplementary, and Final Environmental Impact Statements (EISs) and Section 4(f) Evaluation for this 5-mile \$250 million reconstruction of Route 9A as part of the recovery effort following the events of September 11th, 2001. Mr. Simons managed the extensive hazardous materials investigations and prepared the contract specifications for contaminated soil and tank removal, including Health and Safety oversight.

### **Hudson River Park, New York, NY**

Mr. Simons is managing hazardous materials issues for the ongoing Hudson River Park construction, located adjacent to the Route 9A roadway. Construction is ongoing and Mr. Simons directs health and safety oversight and remediation during construction.

### **Jamaica Rezoning, Queens, NY**

As part of the preparation of an Environmental Impact Statement, Mr. Simons managed the hazardous materials assessment of a multi-block area. In addition to conducting the assessment, Mr. Simons made recommendation as to the properties where “E-Designations” (city-recorded institutional controls on future development) should be placed.

### **Outlet City, Long Island City, Queens, NY**

In Long Island City, Mr. Simons managed the investigation and interim remediation of an old factory complex where large volumes of creosote were spilled. The investigations and interim remedial measures (IRMs) took place under the New York State’s Voluntary Cleanup Program (VCP).

### **MTA/LIRR East Side Access Project, New York, NY**

Mr. Simons managed the hazardous materials investigations for multiple sites in the Bronx, Manhattan, and Queens associated with the Environmental Impact Statement (EIS) for the Long Island Rail Road connection to Grand Central Terminal. Mr. Simons continues to be involved in health and safety oversight related to the construction of the project.

### **New York City Department of Transportation, Lead Paint Removal and Disposal on Bridges Project, New York, NY**

Mr. Simons conducted a regulatory analysis of related to the removal of lead paint from nearly 800 bridges. This analysis included an evaluation of the regulatory compliance of various proposed procedures with federal and state hazardous and solid waste management requirements.

### **American Felt and Filter Company, New Windsor, NY**

Mr. Simons prepared a Remedial Investigation (including exposure assessment) and Feasibility Study for the country’s oldest active felt manufacturing facility, located in Orange County. This solvent-contaminated site is on the State Superfund List.



## **THOMAS GIORDANO**

### **ENVIRONMENTAL SCIENTIST**

Thomas Giordano is an Environmental Scientist in AKRF's Hazardous Materials Department. He has experience in air monitoring and construction oversight. Mr. Giordano is a graduate of the Class of 2015 at the State University of New York, College at Oneonta, where he majored in both Environmental Science and Geography.

### **BACKGROUND**

#### **Education**

B.S., Environmental Science, State University of New York, College at Oneonta, Oneonta, NY

B.A., Geography, State University of New York, College at Oneonta, Oneonta, NY

#### **Certifications**

40-Hour OSHA HAZWOPER Certified

10-Hour OSHA Construction Certified

#### **Years of Experience**

Year started in company: 2015

Year started in industry: 2014

### **RELEVANT EXPERIENCE**

#### **Larkin Plaza, Yonkers, NY**

Mr. Giordano served as a field lead for this project, also a NYSDEC Brownfield Cleanup Program Site. His responsibilities included general construction oversight of excavation and foundation activities. Mr. Giordano also oversaw In-Situ Chemical Oxidation (ISCO) treatment of petroleum-contaminated groundwater and soils. He also conducted the implementation of Community Air Monitoring Program (CAMP) as well as oversight of non-hazardous soil disposal, installation of sections of the sub-slab depressurization system (SSDS) and the collection of confirmatory endpoint soil samples.

#### **145 West Street, Brooklyn, NY (June 2015-Present)**

Mr. Giordano received his 40-Hour OSHA HAZWOPER training in June 2015 and was placed as the field lead on this NYSDEC Brownfield Cleanup Program Site, an entire city block development in Greenpoint, Brooklyn. His responsibilities on-site included general construction oversight of excavation and foundation activities. He also conducted the oversight of the Community Air Monitoring Program (CAMP) as well as soil and vapor monitoring, signing of both hazardous and non-hazardous waste disposal manifests, oversight of the installation of the building's sub-slab depressurization system (SSDS) and the collection of field samples including soil and groundwater. Mr. Giordano has also conducted site turnover reporting after remedial completion at 145 West Street. Mr. Giordano is periodically involved with the project as it remains ongoing.

#### **Tres Puentes, L.P. Bronx, NY (April 2016-Present)**

Mr. Giordano served as the field lead for this project, a NYSDEC Brownfield Cleanup Program Site. His responsibilities included general construction oversight of excavation, foundation and deep foundation installation activities. He also conducted the oversight of the Community Air Monitoring Program (CAMP) as well as soil and





## **THOMAS GIORDANO**

**ENVIRONMENTAL SCIENTIST**

| p. 2

vapor monitoring, signing of non-hazardous waste disposal manifests, inspection of the installation of sub-slab vapor barrier products and the collection of field samples including soil, soil vapor and groundwater.

### **School Construction Association (SCA) Lead Water Sampling**

Mr. Giordano conducted lead water sampling for the School Construction Association (SCA) at various sites throughout the spring of 2016.

### **Metropolitan Transportation Authority (MTA) Paratransit Facility, Bronx, NY**

Mr. Giordano serves as the field lead on this project, under oversight of the NYSDEC. Mr. Giordano's responsibilities so far have included the firm's representative at contractor, client and on-site meetings, as well as conducting construction oversight during remedial work.

### **Miscellaneous Projects**

Mr. Giordano has served as field coverage on various projects in 2017, most notably: Brookfield Manhattan West Southeast Tower, New York, NY; The Crossing at Jamaica, Jamaica, Queens and 810 Fulton Street, Brooklyn, NY.

### **Rego Park, Queens**

Mr. Giordano conducted low-flow groundwater sampling in Rego Park, Queens.

### **Langan Engineering & Environmental Services (Summer 2014, Winter 2015)**

As an Environmental Intern, Mr. Giordano was exposed to all phases of the environmental remediation process. Mr. Giordano assisted with Phase I property inspections, including the Long Island College Hospital, and residential sites. He also participated/assisted in Phase II waste characterizations on several projects. Mr. Giordano was on-site for Phase III, during construction, most notably: 501 West 17th Street (MGP site for the DEC), 50 West Street, and the Hudson Yards. Mr. Giordano participated in setting up the Community Air Monitoring Program at various sites, endpoint soil sampling, and groundwater sampling.



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

# **CHURCH-DIVISION STREET – TOWER A**

**26 SOUTH DIVISION STREET  
NEW ROCHELLE, NEW YORK**

---

## **Health and Safety Plan and Community Air Monitoring Plan**

**AKRF Project Number: 170295**

**NYSDEC Site Number: C360187**

### **Prepared for:**

RXR Church-Division Tower A Holdings LLC  
% RXR Development Services  
75 Rockefeller Plaza, Suite 1300  
New York, New York 10019

### **Prepared by:**



**AKRF, Inc.**  
440 Park Avenue South, 7<sup>th</sup> Floor  
New York, New York 10016  
646-696-0670

---

**SEPTEMBER 2019**

## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	HEALTH AND SAFETY GUIDELINES AND PROCEDURES .....	2
2.1	Hazard Evaluation .....	2
2.1.1	Hazards of Concern .....	2
2.1.2	Physical Characteristics .....	2
2.1.3	Hazardous Materials .....	2
2.1.4	Chemicals of Concern .....	3
2.2	Designated Personnel .....	3
2.3	Training .....	3
2.4	Medical Surveillance Program .....	4
2.5	Site Work Zones .....	4
2.6	Air Monitoring .....	4
2.6.1	Work Zone Air Monitoring .....	5
2.6.2	Community Air Monitoring Plan .....	5
2.6.3	Personal Protection Equipment .....	6
2.7	General Work Practices .....	6
3.0	EMERGENCY PROCEDURES AND EMERGENCY RESPONSE PLAN .....	8
3.1	Hospital Directions .....	8
3.2	Emergency Contacts .....	8
4.0	APPROVAL & ACKNOWLEDGMENTS OF HASP .....	9

## FIGURE

Figure 1 – Hospital Route Map

## APPENDICES

Attachment A – Potential Health Effects from On-site Contaminants  
Attachment B – West Nile Virus/St. Louis Encephalitis Prevention  
Attachment C – Report Forms  
Attachment D – Emergency Hand Signals

## 1.0 INTRODUCTION

This Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) were prepared by AKRF, Inc. (AKRF) on behalf of RXR Church-Division Tower A Holdings LLC (the “Volunteer”) for the 0.992-acre Church-Division Street – Tower A site (the “Site”) located at 26 South Division Street in New Rochelle, New York (the “Site”). The Site is also identified as Block 414, p/o Lot 8 (proposed future Lot 8). The Site is bounded to the north by mixed-use residential and retail buildings; to the east by Church Street; to the south by a vacant lot followed by residential buildings; and to the west by South Division Street. Properties in the surrounding areas are predominantly mixed-use residential and commercial. This Health and Safety Plan (HASP) has been designed to provide workplace safety while completing the field requirements of the RIWP. The work is being done in support of the Site’s enrollment into the New York State Department of Environmental Conservation’s (NYSDEC’s) Brownfield Cleanup Program (BCP).

The historic uses at the Site included dwellings, a garage with tire repairs, several upholsterers circa 1892 to 1951, and a public parking garage (most recent). No underground storage tanks (USTs) or aboveground storage tanks (ASTs) were registered for the Site; however, the former buildings likely included undocumented USTs and/or ASTs with potential associated releases. Such tanks may have stored heating oil and automotive-related petroleum, chemicals and waste oil. Historical nearby uses included manufacturing/industrial uses with suspected solvent and petroleum use.

Based on an evaluation of the data and information from investigations conducted at the Site, significantly elevated concentrations of lead and mercury were noted in the soil. A subsurface anomaly consistent with an underground storage tank (UST) was identified by the geophysical survey in the northwestern portion of the Site. The anomaly was investigated by carefully excavating in the area, but no tank was found; however, the area appeared to have been disturbed and backfilled in the past with debris, suggesting that a tank may have been removed in the past. Additionally, chlorinated solvents (tetrachloroethylene and trichloroethylene) were detected in the analyzed soil vapor samples.

**2.0 HEALTH AND SAFETY GUIDELINES AND PROCEDURES****2.1 Hazard Evaluation****2.1.1 Hazards of Concern**

<b>Check all that apply</b>		
<input checked="" type="checkbox"/> Organic Chemicals	<input checked="" type="checkbox"/> Inorganic Chemicals	<input type="checkbox"/> Radiological
<input type="checkbox"/> Biological	<input type="checkbox"/> Explosive/Flammable	<input type="checkbox"/> Oxygen Deficient Atm.
<input checked="" type="checkbox"/> Heat Stress	<input checked="" type="checkbox"/> Cold Stress	<input type="checkbox"/> Carbon Monoxide
Comments: No personnel are permitted to enter permit confined spaces.		

**2.1.2 Physical Characteristics**

<b>Check all that apply</b>		
<input checked="" type="checkbox"/> Liquid	<input checked="" type="checkbox"/> Solid	<input type="checkbox"/> Sludge
<input checked="" type="checkbox"/> Vapors	<input type="checkbox"/> Unknown	<input type="checkbox"/> Other
Comments:		

**2.1.3 Hazardous Materials**

<b>Check all that apply</b>					
<b>Chemicals</b>	<b>Solids</b>	<b>Sludges</b>	<b>Solvents</b>	<b>Oils</b>	<b>Other</b>
<input type="checkbox"/> Acids	<input type="checkbox"/> Ash	<input type="checkbox"/> Paints	<input type="checkbox"/> Halogens	<input type="checkbox"/> Transformer	<input type="checkbox"/> Lab
<input type="checkbox"/> Caustics	<input type="checkbox"/> Asbestos	<input type="checkbox"/> Metals	<input checked="" type="checkbox"/> Petroleum	<input type="checkbox"/> Other DF	<input type="checkbox"/> Pharm
<input checked="" type="checkbox"/> Pesticides	<input type="checkbox"/> Tailings	<input type="checkbox"/> POTW	<input checked="" type="checkbox"/> Other Chlorinated	<input type="checkbox"/> Motor or Hydraulic Oil	<input type="checkbox"/> Hospital
<input checked="" type="checkbox"/> Petroleum	<input checked="" type="checkbox"/> Other	<input type="checkbox"/> Other	<input type="checkbox"/> Organic Solvents	<input checked="" type="checkbox"/> Gasoline	<input type="checkbox"/> Rad
<input type="checkbox"/> Inks	Fill material			<input checked="" type="checkbox"/> Fuel Oil	<input type="checkbox"/> MGP
<input type="checkbox"/> PCBs				<input checked="" type="checkbox"/> Waste Oil	<input type="checkbox"/> Mold
<input checked="" type="checkbox"/> Metals					<input type="checkbox"/> Cyanide
<input checked="" type="checkbox"/> Other: SVOCs					

**2.1.4 Chemicals of Concern**

Chemicals	REL/PEL/STEL (ppm)	Health Hazards
Lead	REL= 0.1 mg/m <sup>3</sup> PEL= 0.05 mg/m <sup>3</sup>	Weak, lassitude, insomnia; facial pallor, pale eye, anorexia, low-weight, malnutrition, constipation, abdominal pain, colic; anemia; gingival lead line; tremors, paralysis wrists and ankles; encephalopathy; kidney disease; irritation eyes; hypotension.
Mercury	REL= 0.05 mg/m <sup>3</sup> (Hg vapor) REL=0.1 mg/m <sup>3</sup> (other) 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
Fuel Oil	REL = 350 mg/m <sup>3</sup> PEL = 400 ppm	Nausea, irritation – eyes, hypertension, headache, light-headedness, loss of appetite, poor coordination; long-term exposure – kidney damage, blood clotting problems; potential carcinogen.
Polyaromatic Hydrocarbons (PAHs)	REL= 0.1 mg/m <sup>3</sup> PEL= 5 mg/m <sup>3</sup>	Harmful effects on the skin, body fluids, and ability to fight disease after both short and long term exposure, birth defects, and potential occupational carcinogen.
Tetrachloroethylene (PCE)	PEL = 100 ppm STEL = 200 ppm	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, poor coordination; headache, drowsiness; skin erythema (skin redness); liver damage; potential occupational carcinogen
Trichloroethylene (TCE)	REL = 25 ppm PEL = 100 ppm	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen].
DDD, DDE, DDT (pesticides)	REL = 0.5 mg/m <sup>3</sup> PEL = 1 mg/m <sup>3</sup> [skin]	Irritation of eyes, skin; paresthesia tongue, lips face; tremors, seizures; central nervous system, liver damage; impaired reproduction [probable carcinogen].
Comments: REL = NIOSH Recommended Exposure Limit PEL = OSHA Permissible Exposure Limit STEL = OSHA Short Term Exposure Limit		

**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 have a 4-year college degree in occupational safety or a related science/engineering field, and experience in implementation of air monitoring and hazardous materials sampling programs. Health and safety training required for the SSO and all field personnel is outlined in Section 2.3 of this HASP.

**2.3 Training**

All personnel who perform sampling activities in 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 and 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 he/she goes onto the Site. A site safety meeting will be conducted at the start of the project. 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 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 contamination, ensure that proper protective equipment 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 Zone is the 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 SSO, depending on that day's activities. All field personnel will be informed of the location of these zones before work begins.

Appropriate barriers will be set up to secure the area and prevent any unauthorized personnel from approaching within 15 feet of the work area.

Site Work Zones			
Task	Exclusion Zone	CRZ	Support Zone
Subsurface Investigation	15 feet from the drill rig	25 feet from the drill rig	As Needed

## 2.6 Air Monitoring

The purpose of the air monitoring program is to identify any exposure of the field personnel to potential environmental hazards in the soil and soil vapor. Results of the air monitoring will be used to determine the appropriate response action, if needed.



**2.6.1 Work Zone Air Monitoring**

Real time air monitoring will be performed with the PID and Dust Trak. Measurements will be taken prior to commencement of work and continuously during the work, as outlined in the following table. Measurements will be made as close to the workers as practicable and at the breathing height of the workers. The SSO shall set up the equipment and confirm that it is working properly. His/her 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 the background level for that day. The final measurement for the day will be performed after the end of work. The action levels and required responses are listed in the following table:

<b>Instrument</b>	<b>Action Level</b>	<b>Response Action</b>
PID	Less than 5 ppm in breathing zone	Level D or D-Modified
	Between 5 ppm and 50 ppm	Level C
	More than 50 ppm	Stop work. Resume work when readings are less than 50 ppm.
Dust Trak	Less than 0.25 mg/m <sup>3</sup> above background in breathing zone	Level D or D-Modified
	More than 0.25 mg/m <sup>3</sup> above background in breathing zone	Stop work. Resume work when readings are less than 1.25 mg/m <sup>3</sup> .
mg/m <sup>3</sup> = milligrams per cubic meter ppm = parts per million		

**2.6.2 Community Air Monitoring Plan**

Periodic real-time air monitoring for VOCs and particulate levels will be performed at the perimeter of the exclusion zone or work area. Periodic roving community air monitoring will be performed during non-intrusive or minimally intrusive activities such as the installation of soil borings, monitoring wells, or drilled piles; the collection of soil and sediment samples; or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or drilling soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Continuous community air monitoring with fixed stations will not be performed during soil, groundwater and soil vapor investigation activities.

The community air monitoring action levels and required responses are listed in the following table:

<b>Instrument</b>	<b>Community Action Level</b>	<b>Response Action</b>
PID	Less than 5 ppm above background	Resume work activities with continued monitoring.
	More than 5 ppm above background, but less than 25 ppm	Vapor suppression and continuous monitoring.
	More than 25 ppm above background	Stop work. Resume work when readings are less than 25 ppm.

Instrument	Community Action Level	Response Action
Particulate Meter (Dust Trak or similar)	Less than 0.1 $\mu\text{g}/\text{m}^3$ above background	Dust suppression
	Greater than 0.15 $\mu\text{g}/\text{m}^3$ above background	Stop work. Resume work when readings are less than 0.15 $\mu\text{g}/\text{m}^3$ .
$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter ppm = parts per million		

### 2.6.3 Personal Protection Equipment

The personal protection equipment required for various kinds of site 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 personal protective equipment. The protection will be based on the air monitoring described in this section.

Personal Protection Equipment Requirements		
LEVEL OF PROTECTION & PPE		All Tasks
<b>Level D</b> (X) Steel Toe Shoes (X) Hard Hat (within 25 ft of drill rig/excavator) (X) Work Gloves	(X) Safety Glasses ( ) Face Shield (X) Ear Plugs (within 25 ft of drill rig/excavator) (X) Nitrile Gloves (X) Tyvek for drill operator if NAPL present	Yes
<b>Level C (in addition to Level D)</b> (X) Half-Face Respirator OR (X) Full Face Respirator ( ) Full-Face Powered Air Purifier Respirator (PAPR)	( ) Particulate Cartridge ( ) Organic Cartridge (X) Dual Organic/Particulate Cartridge	If PID > 5 ppm (breathing zone)
Comments: Cartridges to be changed out at least once per shift unless warranted beforehand (e.g., more difficult to breath or any odors detected).		

### 2.7 General Work Practices

To protect their health and safety, all 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 driven to the Montefiore New Rochelle Hospital in New Rochelle by on-site personnel. Directions to the hospital are provided below, and a hospital route map is attached.

#### 3.1 Hospital Directions

<b>Hospital Name:</b>	Montefiore New Rochelle Hospital
<b>Phone Number:</b>	(914) 378-7000
<b>Address/Location:</b>	16 Guion Pl, New Rochelle, NY 10801
<b>Directions:</b>	Head NORTH on Church Street toward Memorial Highway Continue onto Memorial Highway Turn LEFT onto Division Street Turn RIGHT onto Union Avenue Turn RIGHT onto Badeau Pl Continue onto Glover Johnson Pl Emergency room will be on the RIGHT

#### 3.2 Emergency Contacts

Company	Individual Name	Title	Contact Number
AKRF, Inc.	Axel Schwendt	Project Director	646-388-9529 (office)
	Ashutosh Sharma	Project Manager	646-388-9865 (office)
	Thomas Giordano	SSO	914-602-6956 (cell)
RXR Church-Division Tower A Holdings LLC	Joseph Graziose	Owner Representative	212-390-9654
New York State Department of Environmental Conservation	Michael Kilmer	845-633-5463	
New York State Department of Health	TBD	TBD	
Ambulance, Fire Department & Police Department	-	-	911
NYSDEC Spill Hotline	-	-	800-457-7362

**4.0 APPROVAL & ACKNOWLEDGMENTS OF HASP****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.

**AFFIDAVIT**

I, \_\_\_\_\_ (name), of \_\_\_\_\_ (company name), have read the Health and Safety Plan (HASP) for the Church-Division Tower A site. 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.

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_ Company: \_\_\_\_\_ Date: \_\_\_\_\_

**FIGURE 1 – HOSPITAL ROUTE MAP**



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



This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,272 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

### What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years. The use of lead as an additive to gasoline was banned in 1996 in the United States.

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

- ☐ Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- ☐ When lead is released to the air, it may travel long distances before settling to the ground.
- ☐ Once lead falls onto soil, it usually sticks to soil particles.
- ☐ Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

### How might I be exposed to lead?

- ☐ Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.

- ☐ Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.

- ☐ Working in a job where lead is used or engaging in certain hobbies in which lead is used, such as making stained glass.

- ☐ Using health-care products or folk remedies that contain lead.

### How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

### How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services

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

(DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

### **How can lead affect children?**

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

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

- ☐ Avoid exposure to sources of lead.
- ☐ Do not allow children to chew on mouth surfaces that may have been painted with lead-based paint.
- ☐ If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.
- ☐ Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children
- ☐ If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces

often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

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

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter ( $\mu\text{g/dL}$ ). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

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

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3–6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/or if they have a brother, sister, or playmate who has had lead poisoning. CDC considers a blood lead level of 10  $\mu\text{g/dL}$  to be a level of concern for children.

EPA limits lead in drinking water to 15  $\mu\text{g}$  per liter.

### **References**

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for lead (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

**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: 1-800-232-4636, 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 mercury. 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 mercury occurs from breathing contaminated air, ingesting contaminated water and food, and having dental and medical treatments. Mercury, at high levels, may damage the brain, kidneys, and developing fetus. This chemical has been found in at least 714 of 1,467 National Priorities List sites identified by the Environmental Protection Agency.**

## What is mercury?

(Pronounced mŭr'kyə-rē)

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas.

Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make.

Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

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

- ☐ Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- ☐ It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity.

- ☐ Methylmercury may be formed in water and soil by small organisms called bacteria.
- ☐ Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

## How might I be exposed to mercury?

- ☐ Eating fish or shellfish contaminated with methylmercury.
- ☐ Breathing vapors in air from spills, incinerators, and industries that burn mercury-containing fuels.
- ☐ Release of mercury from dental work and medical treatments.
- ☐ Breathing contaminated workplace air or skin contact during use in the workplace (dental, health services, chemical, and other industries that use mercury).
- ☐ Practicing rituals that include mercury.

## How can mercury affect my health?

The nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems.

Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea,

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

vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation.

### **How likely is mercury to cause cancer?**

There are inadequate human cancer data available for all forms of mercury. Mercuric chloride has caused increases in several types of tumors in rats and mice, and methylmercury has caused kidney tumors in male mice. The EPA has determined that mercuric chloride and methylmercury are possible human carcinogens.

### **How can mercury affect children?**

Very young children are more sensitive to mercury than adults. Mercury in the mother's body passes to the fetus and may accumulate there. It can also can pass to a nursing infant through breast milk. However, the benefits of breast feeding may be greater than the possible adverse effects of mercury in breast milk.

Mercury's harmful effects that may be passed from the mother to the fetus include brain damage, mental retardation, incoordination, blindness, seizures, and inability to speak. Children poisoned by mercury may develop problems of their nervous and digestive systems, and kidney damage.

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

Carefully handle and dispose of products that contain mercury, such as thermometers or fluorescent light bulbs. Do not vacuum up spilled mercury, because it will vaporize and increase exposure. If a large amount of mercury has been spilled, contact your health department. Teach children not to play with shiny, silver liquids.

Properly dispose of older medicines that contain mercury. Keep all mercury-containing medicines away from children.

Pregnant women and children should keep away from

rooms where liquid mercury has been used.

Learn about wildlife and fish advisories in your area from your public health or natural resources department.

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

Tests are available to measure mercury levels in the body. Blood or urine samples are used to test for exposure to metallic mercury and to inorganic forms of mercury. Mercury in whole blood or in scalp hair is measured to determine exposure to methylmercury. Your doctor can take samples and send them to a testing laboratory.

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

The EPA has set a limit of 2 parts of mercury per billion parts of drinking water (2 ppb).

The Food and Drug Administration (FDA) has set a maximum permissible level of 1 part of methylmercury in a million parts of seafood (1 ppm).

The Occupational Safety and Health Administration (OSHA) has set limits of 0.1 milligram of organic mercury per cubic meter of workplace air ( $0.1 \text{ mg/m}^3$ ) and  $0.05 \text{ mg/m}^3$  of metallic mercury vapor for 8-hour shifts and 40-hour work weeks.

### **References**

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 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 fuel oils. 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.

**SUMMARY:** Fuel oils are liquid mixtures produced from petroleum, and their use mostly involves burning them as fuels. Drinking or breathing fuel oils may cause nausea or nervous system effects. However, exposure under normal use conditions is not likely to be harmful. Fuel oils have been found in at least 26 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

### What are fuel oils?

(Pronounced fyoo'əl oilz)

Fuel oils are a variety of yellowish to light brown liquid mixtures that come from crude petroleum. Some chemicals found in fuel oils may evaporate easily, while others may more easily dissolve in water.

Fuel oils are produced by different petroleum refining processes, depending on their intended uses. Fuel oils may be used as fuel for engines, lamps, heaters, furnaces, and stoves, or as solvents.

Some commonly found fuel oils include kerosene, diesel fuel, jet fuel, range oil, and home heating oil. These fuel oils differ from one another by their hydrocarbon compositions, boiling point ranges, chemical additives, and uses.

### What happens to fuel oils when they enter the environment?

- ☐ Some chemicals found in fuel oils may evaporate into the air from open containers or contaminated soil or water.
- ☐ Some chemicals found in fuel oils may dissolve in water after spills to surface waters or leaks from underground storage tanks.

- ☐ Some chemicals found in fuel oils may stick to particles in water, which will eventually cause them to settle to the bottom sediment.
- ☐ Some of the chemicals found in fuel oils may be broken down slowly in air, water, and soil by sunlight or small organisms.
- ☐ Some of the chemicals found in fuel oils may build up significantly in plants and animals.

### How might I be exposed to fuel oils?

- ☐ Using a home kerosene heater or stove, or using fuel oils at work.
- ☐ Breathing air in home or building basements that has been contaminated with fuel oil vapors entering from the soil.
- ☐ Drinking or swimming in water that has been contaminated with fuel oils from a spill or a leaking underground storage tank.
- ☐ Touching soil contaminated with fuel oils.
- ☐ Using fuel oils to wash paint or grease from skin or equipment.

### How can fuel oils affect my health?

Little information is available about the health effects that may be caused by fuel oils. People who use kerosene



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

stoves for cooking do not seem to have any health problems related to their exposure.

Breathing some fuel oils for short periods may cause nausea, eye irritation, increased blood pressure, headache, light-headedness, loss of appetite, poor coordination, and difficulty concentrating. Breathing diesel fuel vapors for long periods may cause kidney damage and lower your blood's ability to clot.

Drinking small amounts of kerosene may cause vomiting, diarrhea, coughing, stomach swelling and cramps, drowsiness, restlessness, painful breathing, irritability, and unconsciousness. Drinking large amounts of kerosene may cause convulsions, coma, or death. Skin contact with kerosene for short periods may cause itchy, red, sore, or peeling skin.

### How likely are fuel oils to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that some fuel oils (heavy) may possibly cause cancer in humans, but for other fuel oils (light) there is not enough information to make a determination. IARC has also determined that occupational exposures to fuel oils during petroleum refining are probably carcinogenic in humans.

Some studies with mice have suggested that repeated contact with fuel oils may cause liver or skin cancer. However, other mouse studies have found this not to be the case. No studies are available in other animals or in people on the carcinogenic effects of fuel oils.

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

There is no medical test that shows if you have been exposed to fuel oils. Tests are available to determine if some of

the chemicals commonly found in fuel oils are in your blood. However, the presence of these chemicals in blood may not necessarily mean that you have been exposed to fuel oils.

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

The Occupational Safety and Health Administration (OSHA) and the Air Force Office of Safety and Health (AFOSH) have set a permissible exposure level (PEL) of 400 parts of petroleum distillates per million parts of air (400 ppm) for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that average workplace air levels not exceed 350 milligrams of petroleum distillates per cubic meter of air (350 mg/m<sup>3</sup>) for a 40-hour workweek.

The Department of Transportation (DOT) lists fuel oils as hazardous materials and, therefore, regulates their transportation.

### Glossary

Carcinogenic: Able to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or a gas.

Hydrocarbon: Any compound made up of hydrogen and carbon.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

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

### References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for fuel oils. 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 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 polycyclic aromatic hydrocarbons (PAHs). 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.

**SUMMARY:** Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

## What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl'ī-sī'klīk ār'ə-măt'īk hī'drə-kar'bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

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

- ☐ PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- ☐ PAHs can occur in air attached to dust particles.
- ☐ Some PAH particles can readily evaporate into the air from soil or surface waters.
- ☐ PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.

- ☐ PAHs enter water through discharges from industrial and wastewater treatment plants.
- ☐ Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- ☐ Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- ☐ In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- ☐ PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

## How might I be exposed to PAHs?

- ☐ Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smoke-houses; and municipal trash incineration facilities.
- ☐ Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- ☐ Coming in contact with air, water, or soil near hazardous waste sites.
- ☐ Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- ☐ Drinking contaminated water or cow's milk.

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

- ❑ Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

### How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

### How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

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

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any

health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

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

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air ( $0.2 \text{ mg/m}^3$ ). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is  $5 \text{ mg/m}^3$  averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed  $0.1 \text{ mg/m}^3$  for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

### Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

### References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 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 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

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

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 DDD?**

- ☐ 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 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.

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

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 tetrachloroethylene. 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:** Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing. Exposure to very high concentrations of tetrachloroethylene can cause dizziness, headaches, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Tetrachloroethylene has been found in at least 771 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

## What is tetrachloroethylene?

(Pronounced tět'rə-klôr' ō-ěth'ə-lēn')

Tetrachloroethylene is a manufactured chemical that is widely used for dry cleaning of fabrics and for metal-degreasing. It is also used to make other chemicals and is used in some consumer products.

Other names for tetrachloroethylene include perchloroethylene, PCE, and tetrachloroethene. It is a nonflammable liquid at room temperature. It evaporates easily into the air and has a sharp, sweet odor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part tetrachloroethylene per million parts of air (1 ppm) or more, although some can smell it at even lower levels.

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

- ☐ Much of the tetrachloroethylene that gets into water or soil evaporates into the air.
- ☐ Microorganisms can break down some of the tetrachloroethylene in soil or underground water.
- ☐ In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain.
- ☐ It does not appear to collect in fish or other animals that live in water.

## How might I be exposed to tetrachloroethylene?

- ☐ When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- ☐ When you drink water containing tetrachloroethylene, you are exposed to it.

## How can tetrachloroethylene affect my health?

High concentrations of tetrachloroethylene (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death.

Irritation may result from repeated or extended skin contact with it. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used tetrachloroethylene to get a "high."

In industry, most workers are exposed to levels lower than those causing obvious nervous system effects. The health effects of breathing in air or drinking water with low levels of tetrachloroethylene are not known.

Results from some studies suggest that women who work in dry cleaning industries where exposures to tetrachloroethyl-

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

ene can be quite high may have more menstrual problems and spontaneous abortions than women who are not exposed. However, it is not known if tetrachloroethylene was responsible for these problems because other possible causes were not considered.

Results of animal studies, conducted with amounts much higher than those that most people are exposed to, show that tetrachloroethylene can cause liver and kidney damage. Exposure to very high levels of tetrachloroethylene can be toxic to the unborn pups of pregnant rats and mice. Changes in behavior were observed in the offspring of rats that breathed high levels of the chemical while they were pregnant.

### **How likely is tetrachloroethylene to cause cancer?**

The Department of Health and Human Services (DHHS) has determined that tetrachloroethylene may reasonably be anticipated to be a carcinogen. Tetrachloroethylene has been shown to cause liver tumors in mice and kidney tumors in male rats.

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

One way of testing for tetrachloroethylene exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood.

Because it is stored in the body's fat and slowly released into the bloodstream, tetrachloroethylene can be detected in the breath for weeks following a heavy exposure.

Tetrachloroethylene and trichloroacetic acid (TCA), a breakdown product of tetrachloroethylene, can be detected in the blood. These tests are relatively simple to perform. These tests aren't available at most doctors' offices, but can be per-

formed at special laboratories that have the right equipment.

Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to tetrachloroethylene or the other chemicals.

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

The EPA maximum contaminant level for the amount of tetrachloroethylene that can be in drinking water is 0.005 milligrams tetrachloroethylene per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) has set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that tetrachloroethylene be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

### **Glossary**

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Milligram (mg): One thousandth of a gram.

Nonflammable: Will not burn.

### **References**

This ToxFAQs information is taken from the 1997 Toxicological Profile for Tetrachloroethylene (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 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**  
**WEST NILE VIRUS/ST. LOUIS ENCEPHALITIS PREVENTION**

## **WEST NILE VIRUS/ST. LOUIS ENCEPHALITIS PREVENTION**

The following section is based upon information provided by the CDC Division of Vector-Borne Infectious Diseases. Symptoms of West Nile Virus include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands, with most infections being mild. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death. Most infections of St. Louis encephalitis are mild without apparent symptoms other than fever with headache. More severe infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions (especially infants) and spastic (but rarely flaccid) paralysis. The only way to avoid infection of West Nile Virus and St. Louis encephalitis is to avoid mosquito bites. To reduce the chance of mosquito contact:

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET (N, N-diethyl-meta-toluamide), since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET. DEET in high concentrations (greater than 35%) provides no additional protection.
- Repellents may irritate the eyes and mouth.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's directions for use, as printed on the product.



**ATTACHMENT C**  
**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:

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

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

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

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

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

Comments:

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

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.

---

---

---

---

---

---

---

---

---

---

### 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?)

---

---

---

---

**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: \_\_\_\_\_

---

---

---

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

---

---

---

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

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

**ATTACH ANY ADDITIONAL INFORMATION TO THIS FORM**

**ATTACHMENT D**  
**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**