PHASE II ENVIRONMENTAL SITE INVESTIGATION

OF

PROPOSED P.S. 19X ADDITION
BLOCK 3386, PART OF LOT 1
4318 KATONAH AVENUE
BRONX, NY 10470

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EXECUTIVE SUMMARY

At the request of the New York City School Construction Authority (NYCSCA), AKRF Engineering, P.C. (AKRF) conducted a Phase II Environmental Site Investigation (ESI) at 4318 Katonah Avenue in the Bronx, New York 10470 (the "Site"). The Site consists of the outdoor portions of an approximately 47,500-square foot (SF) lot, improved with an asphalt-paved playground area. Land use in the general area of the Site is primarily residential and commercial.

AKRF previously performed a Phase I Environmental Site Assessment (ESA) for the Site dated December 2014. On-site Recognized Environmental Conditions (RECs) identified by the Phase I ESA included: historical fill of unknown origin associated with historical buildings on the Site and a tributary of the Bronx River; and Department of Buildings records indicating the potential presence of dry wells. Off-site RECs included: nearby dry cleaners; a nearby carpet sales and cleaning facility; one open-status and two closed-status New York Spill listings and three PBS facilities in close proximity to the Site; and a fuel tank fill port not associated with the existing AST in the P.S. 19X building, which may have been associated with historical fuel oil use predating the existing tank. The Phase I ESA also revealed environmental concerns associated with: suspect asbestos-containing materials (ACM), lead based paint (LBP), and polychlorinated biphenyl (PCB)-containing electrical fixtures, light ballasts, and/or window caulking in the existing structure.

The purpose of the Phase II ESI was to determine whether the RECs identified in the Phase I ESA Report have affected the suitability of the Site for use as a public school facility and to preliminarily characterize the soil anticipated to be excavated for construction of the school facility. Phase II ESI field activities were performed on March 11 and 12, 2016, and consisted of a geophysical survey and the completion of five soil borings, four temporary monitoring wells, and five soil vapor sampling points. A total of five soil samples, four groundwater samples, and five soil vapor samples were collected for laboratory analysis.

Based on the results of the Phase II ESI, AKRF concludes the following:

- Groundwater was encountered at approximately 8 to 11 feet below ground surface (bgs) in the temporary wells installed on-site during the Phase II ESI.
- Subsurface soil generally consisted of fill material (silt and sand with brick and schist fragments) to approximately 3 to 10 feet bgs, underlain by apparent native brown sand.
- No anomalies indicative of underground storage tanks were identified during the geophysical survey.
- All VOC concentrations detected in soil vapor were below their respective New York State Department of Health (NYSDOH) Air Guideline Values (AGVs). Petroleum-related VOCs and chlorinated compounds detected in soil vapor above the corresponding NYSDOH background ranges are attributed to off-site sources.
- Metals (arsenic, barium, beryllium, chromium, copper, lead, manganese, mercury, and nickel) detected in the groundwater samples above the Class GA Water Quality Standard are attributed to sediment entrained in the samples or to naturally occurring (background) conditions and are not indicative of an on-site release or spill.

AKRF recommends the following measures to make the Site suitable for use as a public school facility.

- Consistent with NYCSCA standard practice, a soil vapor barrier should be incorporated into the new building design and appropriately integrated with any proposed damp-proofing or waterproofing design components.

- All material excavated during construction activities should be properly characterized prior to transportation to an off-site disposal facility. Results from the limited soil sampling conducted during this investigation should not be used in lieu of data from a full soil waste characterization.
- Fill material should be evaluated for the presence of asbestos-containing materials (ACM). In addition, any suspect ACM, lead based paint (LBP) and/or PCB-containing materials affected by the proposed demolition or construction work should be identified prior to and properly managed during construction activities.
- Any dewatering required during construction should be minimized to mitigate influx of potentially contaminated water from off-site sources. Treatment to remove sediment and other potential contaminants from dewatering effluent may be required prior to discharge to the municipal sewer. All appropriate permits should be procured and pre-treatment should be conducted as required to meet applicable sewer effluent limitations for discharge of the dewatering fluids.
- After the proposed new building and grounds are constructed, if exposed soil (landscaped areas) is incorporated into the development of the Site, a minimum of two feet of environmentally clean fill should be placed over existing soil in these areas.

1.0 INTRODUCTION

1.1 Purpose

At the request of the New York City School Construction Authority (NYCSCA), AKRF Engineering, P.C. (AKRF) conducted a Phase II Environmental Site Investigation (ESI) of the property located at 4318 Katonah Avenue in the Bronx, New York (the "Site"). The legal description of the Site is a portion of Block 3386, Lot 1. A Site Location map is provided as Figure 1. The Site consists of the outdoor portions of an approximately 47,500-square foot (SF) lot, improved with an asphalt-paved playground area. The existing P.S. 19X building (constructed between 1924 and 1925) is located on the same lot west-adjacent to the Site, on an approximately 16,210-SF footprint, and contains three stories and a basement. Land use in the general area of the Site is primarily residential and commercial. Historically, the Site was occupied by five buildings (a bowling alley, two commercial and residential buildings, and two sheds), which were demolished between 1900 and 1914 (bowling alley) and between 1914 and 1941 (the remaining buildings). A Site plan indicating Site features and the tax block and lot numbers is provided as Figure 2.

This Phase II ESI was performed to determine whether the recognized environmental conditions (RECs) and/or Vapor Encroachment Conditions (VECs) identified in the Phase I Environmental Site Assessment (ESA) Report prepared by AKRF for the NYCSCA, dated December 5, 2014, have affected the suitability of the Site for use as a public school facility and to preliminarily characterize the soil anticipated to be excavated for construction of the school facility. Soil, groundwater, and soil vapor were sampled as part of the Phase II ESI to accomplish these objectives.

1.2 Recognized Environmental Conditions and Environmental Concerns

A Phase I ESA of the Site was previously performed by AKRF. The Phase I ESA Report, dated December 5, 2014, identified several RECs associated with the Site, which are as follows:

<u>On-Site RECs:</u>

- A tributary of the Bronx River (but no associated wetlands) was shown on or adjacent to the Site on the 1897 United States Geological Survey (USGS) map, and historic use interviews indicate that an "underground stream" is present beneath the P.S. 19X school building. This stream may have been filled with materials of unknown origin.
- Historical buildings were depicted on-site on the 1896 through 1914 Sanborn maps, and were no longer shown on the 1941 topographic map or 1945 Sanborn map. Potential buried debris associated with demolition of these structures could include underground storage tanks (USTs) and/or historic fill material of unknown origin.
- Computerized New York City Department of Buildings (NYCDOB) records indicating the potential presence of drywells at the Site.

<u>Off-Site RECs:</u>

- A fuel tank fill port not associated with the existing aboveground storage tank (AST) in the P.S. 19X building was observed west-adjacent to the building in the Katonah Avenue sidewalk. This fill port may be associated with a historical fuel tank predating the existing tank. The potential for historical fuel oil use is considered a REC/VEC.
- A dry cleaner observed approximately 200 feet west of the Site at 4311 Katonah Avenue was shown on the 1977-2007 Sanborn maps, and was listed in the regulatory database as a hazardous waste generator and Registered Drycleaner. The regulatory database also identified two historical

dry cleaners at 4330 Katonah Avenue, approximately 100 feet northwest of the Site, and 243 East 237th Street, approximately 570 feet west-southwest of the Site.

- A carpet sales and cleaning facility was observed at 4331 Katonah Avenue, approximately 200 feet northwest of the Site.
- The regulatory database identified one active-status New York State Department of Environmental Conservation (NYSDEC) Spill, two closed-status NYSDEC Spills, and three petroleum bulk storage (PBS) listings in close proximity to the Site.

The Phase I ESA Update also revealed environmental concerns associated with suspect asbestos-containing materials (ACM), suspect interior and exterior lead-based paint (LBP), and suspect polychlorinated biphenyl- (PCB-) containing light ballasts and caulking material.

Based on these findings, a Phase II ESI was recommended to determine whether the identified have affected the suitability of the Site for use as a public school facility.

2.0 DESCRIPTION OF PHASE II ESI FIELD ACTIVITIES

Phase II ESI field activities were performed on March 11 and 12, 2016. The field activities included the following:

- A geophysical survey of accessible areas of the Site;
- Advancement of five soil borings and collection and analysis of five soil samples from those borings;
- Installation of four temporary monitoring wells and collection and analysis of groundwater samples from each well; and
- Installation of five soil vapor sampling points and collection and analysis of five soil vapor samples.

A Site Plan showing all the sampling locations, Site features, tax block and lot numbers, and anticipated groundwater flow direction is provided as Figure 2. Representative Site photographs are included in Appendix A. The soil boring, temporary well, and soil vapor sampling locations were located within or directly adjacent to the proposed addition footprint as depicted in the NYCSCA Test Fit/Sketch Study, dated October 28, 2014.

The Phase II ESI was conducted in accordance with the AKRF's Phase II ESI Scope of Work (SOW) dated November 17, 2014, with the following exceptions:

- A temporary monitoring well was not installed at the location of SB/SV-3, as groundwater was not encountered before refusal on bedrock at 8 feet below ground surface.
- No filtered samples were analyzed at the temporary well locations.

2.1 Geophysical Survey

A geophysical survey was performed on March 11, 2016 by Nova Geophysical Services of Douglaston, NY, to attempt to locate potential abandoned underground storage tanks (USTs) or other buried structures, and to verify that the proposed boring locations were clear of subsurface structures and utilities. The investigation was conducted in accessible areas of the Site using a Noggin's cart-mounted Ground Penetrating Radar (GPR) unit with a 250 MHz shielded antenna and the 3M Dynatel locator. GPR profiles were collected and inspected for reflections that could be indicative of USTs, utility lines, or other subsurface structures. Sample locations were established in areas that did not conflict with subsurface structures or utilities. A copy of the geophysical survey report is attached as Appendix B.

2.2 Soil Vapor Sampling

Soil vapor sampling was conducted as part of the Phase II ESI to determine the concentration of volatile organic compounds (VOCs) in soil vapor beneath the Site. Figure 2 shows the locations of the five soil vapor sampling points (SV-1 through SV-5) installed at the Site as a part of this Phase II ESI.

Soil vapor sampling points were installed and sampled on March 12, 2016. All sampling was conducted in conformance with the applicable procedures described in ASTM E 2600-08 "Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions" and the October 2006 New York State Department of Health (NYSDOH) Soil Vapor Intrusion Guidance Document protocols. Zebra Technical Services LLC of Lynnbrook, New York (Zebra) was retained as a subcontractor for drilling services.

All soil vapor sampling points were installed using a direct-push probe (i.e., Geoprobe®) system to advance a 0.75-inch diameter hollow probe rod fitted with an expendable 6-inch long stainless steel

screened implant to a depth of 5 feet below ground surface (bgs). Dedicated Teflon tubing with threaded fittings was connected to the probe. The hollow probe rod was then removed and the boring was backfilled with clean silica sand to one foot above the screen. Hydrated bentonite was used to fill the remaining void around the sampling tubing to ground surface.

Prior to sampling, each soil vapor point was purged of three sample volumes using a peristaltic pump. During purging, an inverted one-gallon bucket was placed over the sampling point and helium gas was introduced through a small hole in the bucket to saturate the atmosphere around the sample port with helium gas. The purged vapors were collected into a Tedlar bag and monitored using a portable helium detector to check for short-circuiting of ambient air into the vapor sampling point and to verify the adequacy of the bentonite seal. Helium concentrations of less than 10 percent were considered sufficient to verify a tight seal. All soil vapor points passed the seal integrity tests with no helium detections. Purged vapors were also field-screened for organic vapors using a photoionization detector (PID) calibrated with 100 parts per million (ppm) isobutylene. PID readings between 2.0 to 5.6 ppm were detected at the soil vapor points. After purging, each probe was connected via Teflon tubing to a laboratory-supplied 6-liter SUMMA canister equipped with a 0.1 liter per minute (L/min) flow regulator. Soil vapor samples were collected in individually-certified clean Summa canisters for an approximately one-hour sampling period. Five (5) samples (SV-1 to SV-5) were submitted for laboratory analysis for the following VOCs by USEPA Method TO-15:

Summary of VOCs Analyzed for in Soil Vapor Samples

Chloromethane	1,2-Dichloroethane	Ethylbenzene
Vinyl Chloride	1,1,1-Trichloroethane	*m,p*-Xylenes
Chloroethane	Benzene	o-Xylene
1,1-Dichloroethene	Carbon Tetrachloride	1,3,5-Trimethylbenzene
Methylene chloride	1,2-Dichloropropane	1,2,4-Trimethylbenzene
trans-1,2-Dichloroethene	Trichloroethene	1,3-Dichlorobenzene
1,1-Dichloroethane	Toluene	1,2-Dichlorobenzene
Methyl tert-Butyl Ether	Tetrachloroethene	Naphthalene
cis-1,2-Dichloroethene	Chlorobenzene	

The Summa canisters were properly labeled and delivered by courier to Alpha Analytical of Mansfield, Massachusetts (Alpha). Alpha Analytical is a NYSDOH Environmental Laboratory Approval Program-(ELAP) certified analytical laboratory.

Soil vapor sampling logs are provided in Appendix C. A summary of the soil vapor sample analytical results is provided in Table 1, and copies of the analytical laboratory reports are attached in Appendix D.

2.3 Soil Investigation

Soil samples were collected to assess the current environmental conditions and to characterize subsurface soil at the Site. Figure 2 shows the locations of the five soil borings (SB-1 through SB-5) advanced at the Site as part of the Phase II ESI. The subsurface soil sampling program was performed on March 12, 2016. Zebra was retained as a subcontractor for drilling services.

A track-mounted Geoprobe® drill rig was used to advance the soil borings and retrieve soil samples to approximately 15 to 20 feet below ground surface (bgs) at borings SB-1, SB-2, SB-4, and SB-5 and to approximately 8 feet bgs at boring SB-3, where shallow refusal on suspected bedrock was encountered. Soil samples were collected and screened for evidence of field contamination continuously from the

ground surface to the boring completion depth in 5-foot long, 2-inch diameter macro-core samplers lined with acetate sleeves. A description of the soil retained in each Geoprobe® sample core was logged by AKRF's on-site environmental scientist, and the soil was screened in the field for the presence of VOCs with a PID calibrated at the start of the work day with 100 ppm isobutylene. Soil boring logs, including the PID responses for each sample, are provided in Appendix C. A description of each boring location is presented in the following table:

Summary of Soil Boring Locations and Rationale

Soil Boring	Location	Rationale
SB-1	Northwestern corner of the proposed building addition, in the existing play area	• General fill conditions • Potential contamination from off-site RECs to the west/northwest
SB-2	Northeastern corner of the proposed building addition, in the existing play area	• General fill conditions • Potential contamination from off-site RECs to the north/northeast
SB-3	Center of the proposed building addition, in the existing play area	• General fill conditions • Potential contamination from off-site RECS to the south/southeast
SB-4	Southwestern corner of the proposed building addition, in the existing play area	• General fill conditions • Potential contamination from off-site RECs to the south/west
SB-5	Southeastern corner of the proposed building addition, in the existing play area	• General fill conditions • Potential contamination from discharges to floor drains

No evidence of obvious contamination (elevated PID readings, odors, staining, etc.) was observed in any of the soil borings advanced during the investigation; therefore, one soil sample from each boring was selected for laboratory analysis between the ground surface and 10 feet bgs (within the historic fill layer). Care was taken to avoid including asphalt or asphaltic sub-base materials in the samples collected for laboratory analysis.

All soil samples were submitted for laboratory analysis and were analyzed for: combined Target Compound List (TCL) and CP-51 list VOCs plus tentatively identified compounds (TICs) and semivolatile organic compounds (SVOCs) plus TICs by EPA Methods 8260 and 8270, respectively; polychlorinated biphenyls (PCBs) by EPA Method 8082; and Target Analyte List (TAL) metals by EPA Method 6000/7000 series. For waste characterization purposes, samples were also analyzed for cyanide by EPA Method 9012, hexavalent chromium by EPA Method 7196, and diesel and gasoline range total petroleum hydrocarbons (TPH) by EPA Method 8015-modified. A summary of the soil sampling program is presented in the following table:

Summary of PID Screening and Soil Sample Analytical Plan

Sample ID/ Soil Boring Number	Boring Depth* (feet bgs)	Boring Depth Relative to Street Level (ft)	Sample Depth Interval Selected for Analysis* (ft)	Max PID Reading (PPM)	TCL/CP-51 VOCs[1]	TCL/CP-51 SVOCs[1]	PCBs	TAL Metals	Cyanide	Hexavalent Chromium	DRO and GRO TPH
SB-1	20	20	8-9	ND	X	X	X	X	X	X	X
SB-2	15	15	8-9	ND	X	X	X	X	X	X	X
SB-3	8	8	7-8	ND	X	X	X	X	X	X	X
SB-4	20	20	7-8	ND	X	X	X	X	X	X	X
SB-5	20	20	9-10	ND	X	X	X	X	X	X	X

ND – Not Detected
X – Sample analysis performed
PPM – Parts per million
*Approximate depths were reported in the field relative to street level for exterior borings and bottom of basement slab for interior borings
[1]Plus tentatively identified compounds (TICs)

The samples were collected and containerized in accordance with NYSDEC/USEPA protocols. Each container was properly labeled, preserved, and placed in an ice-filled cooler for transport via courier to Chemtech of Mountainside, New Jersey, a NYSDOH ELAP-certified analytical laboratory. Standard chain-of-custody procedures were followed. Summaries of the analytical results for the soil samples are provided in Tables 2 through 6, and copies of the analytical laboratory reports are attached in Appendix D.

2.4 Groundwater Investigation

A groundwater sampling program was conducted as part of the Phase II ESI to assess the current environmental condition of groundwater beneath the Site. Figure 2 shows the locations of the groundwater samples collected at the Site as part of the Phase II ESI. The groundwater sampling program was completed on March 12, 2016. Zebra was retained by AKRF as a subcontractor for drilling services.

Temporary groundwater monitoring wells TW-1, TW-2, TW-4, and TW-5 were installed at or adjacent to soil boring locations SB-1, SB-2, SB-4, and SB-5, respectively. All temporary wells were installed using a track-mounted Geoprobe® rig. After encountering groundwater at each location, a temporary well was installed using 1-inch diameter PVC well screen set approximately 5 to 10 feet below the observed water table. Following installation, a peristaltic pump was used to purge three well volumes from each well, and the purged water was monitored for temperature, pH, and conductivity using a water quality meter (YSI Pro Plus Quatro, 4m). Turbidity measurements could not be collected due to malfunctioning of the turbidity parameter function of the Lamotte 2020WE meter; however, the purge water was monitored for visual clarity. Measurements were recorded every five minutes, and purging continued until water quality indicators stabilized. Following completion of the groundwater sampling, the temporary wells were removed from the ground and each boring was backfilled with drill cuttings and sand.

The four groundwater samples were analyzed for combined TCL and CP-51 list VOCs and SVOCs by EPA Methods 8260 and 8270, respectively, TAL metals by EPA Method 6000/7000 series (unfiltered

samples), and PCBs by EPA Method 8082. In addition, in support of potential dewatering for school construction, additional sample volume was collected at TW-2 and analyzed for the New York City Department of Environmental Protection (NYCDEP) Industrial Pretreatment Program's "Limitations for Effluent to Sanitary or Combined Sewers" parameters, per NYCDEP's Dewatering Permit Guidelines. One aqueous trip blank accompanied the sample shipment and was analyzed for TCL/CP-51 list VOCs. A summary of groundwater field screening results and the groundwater sample analytical plan is presented in the following table:

Groundwater Sample Analytical Plan

Sample ID/ Well Number	Depth to Water (ft bgs)	Screened Interval (ft bgs)	Field Observations (PID readings, sheen, odor, etc.)	TCL CP-51 VOCs	TCL CP-51 SVOCs	TAL Metals[1]	PCBs	NYCDEP Parameters
TW-1	10.71	10-20	ND	X	X	X	X	
TW-2	10.35	5-15	ND	X	X	X	X	X
TW-4	9.84	10-20	ND	X	X	X	X	
TW-5	8.83	10-20	ND	X	X	X	X	

Notes:
X - Sample analysis performed
ND - Not Detected
[1]Unfiltered samples

The samples were collected and containerized in accordance with NYSDEC/USEPA protocols. Each container was properly labeled, preserved, and placed in a cooler for transport via courier to Chemtech of Mountainside, New Jersey a NYSDOH ELAP-certified analytical laboratory. Standard chain-of-custody procedures were followed. Summaries of the analytical results for the groundwater samples are provided in Tables 7 through 11, and copies of the analytical laboratory reports are attached in Appendix D.

3.0 SITE DESCRIPTION AND PHYSICAL CHARACTERISTICS

The Site is located at 4318 Katonah Avenue in the Bronx, New York. The legal description of the Site is portion of Block 3386, Lot 1. The Site consists of the outdoor portions of an approximately 47,500-SF lot, improved with a playground area paved with asphalt. The Site was previously occupied by five buildings (a bowling alley, two commercial and residential buildings, and two sheds), which were demolished prior to 1941. The Site is located in an area primarily characterized by residential and commercial uses, and is bounded: to the north by East 238th Street, followed by private dwellings and a commercial and residential building fronting Katonah Avenue; to the west by P.S. 19X, followed by Katonah Avenue and commercial and residential buildings; to the south by East 237th Street, followed by private dwellings and a commercial and residential building fronting Katonah Avenue; and to the east by private dwellings.

The NYCSCA is proposing an addition to the existing adjacent public school facility. Based on the NYCSCA Test Fit/Sketch Study, dated October 28, 2014, the proposed school building would be located in the southern portion of the school's play area, fronting East 237th Street.

3.1 Topography

According to the United States Geological Survey (USGS) 7.5-Minute Quadrangle Maps, *Mount Vernon, NY*, dated 2010, the elevation of the Site is approximately 150 feet above the North American Datum of 1983 (an approximation of mean sea level). The topography of the immediate Site is nearly flat with a gentle downward slope to the southeast and southwest. The nearest surface water body is the Bronx River, approximately 0.3 mile east of the Site.

3.2 Geology

According to the *USGS Bedrock and Engineering Maps of Bronx County and Parts of New York and Queens Counties* (1992), bedrock is approximately 20 feet below grade in the vicinity of the Site and consists of pre-Cambrian rocks, primarily Fordham Gneiss. Bedrock in Bronx County is typically overlain by a relatively thin covering of glacial deposits, mainly till.

Soil samples were collected to a maximum depth of 20 feet below grade (i.e., below street level) during the Phase II ESI field program. Subsurface soil generally consisted of fill material (sand with brick and gravel fragments) to approximately 3 to 10 feet below grade, underlain by apparent native brown sand. Refusal on bedrock was encountered at approximately 8 feet below grade at SB-3, located in the central portion of the Site.

3.3 Hydrology

Groundwater was measured at approximately 8 to 11 feet bgs in temporary wells installed during the Phase II ESI, and was noted at approximately 13.5 feet below grade in a geotechnical soil boring from a 1925 investigation. Based on surface topography, groundwater is anticipated to flow in a southeasterly direction toward the Bronx River (approximately 0.3 mile east of the Site) or in a southwesterly direction toward Woodlawn Lake, approximately 0.4 mile southwest of the Site. There are no surface water bodies on or immediately adjacent to the Site. During AKRF's Phase I ESA reconnaissance, Mr. Tom Courtney (the P.S. 19X fireman) indicated that an "underground stream" runs beneath the off-site P.S. 19X building; however, this may be related to a high water table under the building, and not an actual stream. The nearest surface water body is the Bronx River, approximately 0.3 mile east of the Site. Stormwater in the Site vicinity flows to the New York City combined sewer system. New York City Buildings

Department (NYCDOB) records summarized in the December 2014 Phase I ESA also note the presence of dry wells at the Site. Groundwater in the Bronx is not used as a source of potable water.

4.0 DISCUSSION OF FINDINGS

This section presents a discussion of the findings of the Phase II ESI. A summary of the laboratory results is presented in Tables 1 to 11. The definitions of all data qualifiers/acronyms contained in the tables are provided on the first page of the tables section of the report. The sample collection logs and the complete laboratory analytical data packages are included in Appendices D and E, respectively.

4.1 Applicable Regulatory Standards

This subsection identifies the USEPA, NYSDEC, NYSDOH and/or NYCDEP regulatory standards and guidelines used to evaluate the results of the soil vapor, subsurface soil, and groundwater sampling. The standards and guidelines used to evaluate the specific data are described individually below.

4.1.1 Soil Vapor Guidelines

Analytical results for VOCs in the soil vapor samples were compared to the NYSDOH Air Guideline Values (AGVs) and to background levels of VOCs in indoor air presented in Appendix C of the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006 "NYSDOH Vapor Intrusion Guidance Document", including:

- Upper Fence Limit indoor air values from "Table C-1. NYSDOH 2003: Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes";
- 90th Percentile indoor air values from "Table C-2. EPA 2001: Building Assessment and Survey Evaluation (BASE) Database, SUMMA canister method"; and
- The 95th Percentile Indoor Air Values from Table C-5, Health Effects Institute (HEI) 2005: Relationship of Indoor, Outdoor and Personal Air".

Tetrachloroethene (PCE) and trichloroethene (TCE) levels were compared to the AGV presented in the NYSDOH Fact Sheet on Tetrachloroethene in Indoor and Outdoor Air, dated September 2013 and the August 2015 NYSDOH Fact Sheet update for trichloroethene (TCE).

4.1.2 Soil Cleanup Objectives (SCOs)

The Unrestricted Use Soil Cleanup Objectives (SCOs) found in 6 NYCRR 375-6, Remedial Program Soil Cleanup Objectives, are the appropriate standards for use in evaluating the results of the analyses of the Phase II ESI soil samples. Soil that is free of contaminants above these standards is suitable for "unrestricted use", which is the land use category without imposed restrictions, such as environmental easements or other land use controls. Soil analytical results for compounds not listed in 6 NYCRR 375-6 were compared to the lower of the Supplemental Soil Cleanup Objectives (SSCOs) for Protection of Groundwater or Ecological Resources established by NYSDEC Commissioners Policy CP-51 – Soil Cleanup Guidance, dated October 21, 2010.

4.1.3 Groundwater Quality Standards and Guidance Values

Analytical results for groundwater were compared to New York State Class GA groundwater standards and guidance values, provided in the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values." Ambient water quality standards are enforceable regulatory limits. Where ambient water quality standards do not exist, ambient water quality guidance values were used to evaluate the groundwater results. Groundwater data for

sample TW-3-DEP were also compared to the daily limits set forth in the NYCDEP Bureau of Wastewater Treatment "Limitations for Effluent to Sanitary or Combined Sewers."

4.2 Geophysical Survey Findings

During the March 11, 2016 geophysical survey, the proposed boring locations were identified within the survey area. An area of approximately 10 feet by 10 feet around each boring location was investigated with the GPR to clear for utilities. All designated anomalies were marked on-site with spray paint. No subsurface conflicts were detected at any of the soil boring locations. Linear anomalies indicative of two storm sewer lines were identified in the play yard area of the Site, and gas and electric connections were identified in front of the school building, along Katonah Avenue. No anomalies indicative of underground storage tanks were identified. The suspected stormsewer, gas, and electric lines identified during the geophysical survey are depicted on Figure 2, and a copy of the geophysical report is provided in Appendix B.

4.3 Soil Vapor Survey Findings

A review of the soil vapor sample analytical results indicates that 15 of the 26 VOCs analyzed for utilizing USEPA Method TO-15 were detected in one or more of the samples. Ten VOCs were detected at concentrations greater than the anticipated background ranges, as summarized in the following table:

Detected VOC Concentrations
Greater than Background Range in Soil Vapor

Client ID Date Sampled Units = µg/m^3	NYSDOH Background Range	SV-1 3/12/16	SV-2 3/12/16	SV-3 3/12/16	SV-4 3/12/16	SV-5 3/12/16
1,2,4-Trimethylbenzene	***9.5 - 9.8***	9.09	**10.7**	**15.6**	7.87	7.42
1,3,5-Trimethylbenzene	***3.7 - 3.9***	2.9	3.17	**4.61**	2.23	2.04
Benzene	***9.4 - 13***	12.8	**45.7**	**44.1**	3.93	**23.6**
Chloroethane	***0.4-1.1***	0.177	0.697	**3.3**	0.124	0.438
Chloromethane	***3.7-4.2***	**5.33**	**15.3**	**55.8**	0.582	**4.61**
Ethylbenzene	***5.7 - 7.62***	**177**	**105**	**169**	**51.3**	**53**
Toluene	***39.8 - 57***	**132**	**203**	**249**	**155**	**196**
Vinyl Chloride	***0.4-1.9***	0.156	0.741	**3.76**	0.12	0.281
Xylene (m,p)	***11 - 22.2***	**660**	**382**	**569**	**185**	**185**
Xylene (o)	***7.1 - 7.9***	**296**	**125**	**202**	**34.6**	**32.8**

Notes:
U – Not detected.
µg/m^3 – micrograms per cubic meter
Bold = result exceeds background range

The NYSDOH has established AGVs for three of the VOCs analyzed (methylene chloride, PCE, and TCE). PCE was detected in all of the soil vapor samples at levels ranging from 1.59 to 5.82 micrograms per cubic meter (µg/m^3), below the AGV of 30 µg/m^3. TCE was detected in two of the soil vapor samples at levels ranging from 0.322 to 1.19 µg/m^3, below the AGV of 2 µg/m^3. Methylene Chloride was not detected in any of the samples.

The petroleum-related compounds (trimethylbenzenes, benzene, ethylbenzene, toluene, and xylenes) identified above their background concentrations in soil vapor are likely associated with multiple historic spills identified in the Site vicinity, and not to an on-site release or spill. Chloroethane, chloromethane,

and vinyl chloride identified in soil vapor may be attributed to former dry cleaning uses in the site vicinity, and is not likely to be associated with an on-site release based on the Site's history and review of the laboratory results for on-site soil and groundwater samples collected as part of this investigation.

Analytical results for VOCs in soil vapor are summarized in Table 1. The complete analytical data report is presented in Appendix D.

4.4 Soil Sampling Findings

4.4.1 Volatile Organic Compounds (VOCs) in Soil

A review of the subsurface soil sampling analytical results indicates that one of the VOCs (methylene chloride) analyzed for was detected in one of the soil samples. Methylene chloride was detected in sample SB-5 (9-10) at an estimated concentration of 2.9 micrograms per kilogram (ug/kg), which is below the Unrestricted Use SCO of 50 ug/kg. This sample was rerun and methylene chloride was not detected in the rerun. No other VOCs were detected in any soil samples. Analytical results for VOCs in soil are summarized in Table 2.

4.4.2 Semivolatile Organic Compounds (SVOCs) in Soil

A review of the subsurface soil sampling analytical results indicates that two of the SVOCs analyzed for were detected in one or more of the samples. Specifically, bis(2-ethylhexyl)phthalate and dimethylphthalate were detected at estimated concentrations ranging from 190 to 680 ug/kg, well below the respective CP-51 SSCOs. Analytical results for SVOCs in soil are summarized in Table 3.

4.4.3 PCBs in Soil

A review of the analytical results indicates that no PCBs were detected in any of the samples. Analytical results for PCBs in soil are summarized in Table 4.

4.4.4 Metals and Cyanide in Soil

A review of the subsurface soil sampling analytical results indicates that 20 of the 24 metals analyzed for were detected in one or more of the samples. Cyanide was detected in one of the soil samples analyzed for this compound at an estimated concentration of 0.044 milligrams per kilogram (mg/kg), well below the Part 360 UUSCO of 27 mg/kg. Hexavalent chromium was detected in all of the samples at estimated concentrations ranging from 0.088 to 0.306 mg/kg, below the Part 360 UUSCO of 1 mg/kg. Of the 16 metals typically of concern for NYCSCA Phase II ESIs (arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, thallium, selenium, silver, vanadium, and zinc), none were detected at concentrations exceeding their respective Part 375 Unrestricted Use SCOs in the samples.

In the absence of other indications of contamination, the reported concentrations of these metals are not indicative of a spill or other source area, but are likely related to the presence of historic fill or background conditions. Analytical results for metals (including hexavalent chromium) and cyanide in soil are summarized in Table 5.

4.4.5 Total Petroleum Hydrocarbons in Soil

Analytical results for TPH analysis of the soil samples collected from the fill material are included in Table 6. GRO TPH was not detected in any of the samples analyzed. DRO TPH was detected in all samples at concentrations ranging from 2,191 and 5,184 mg/kg, respectively.

There are no applicable regulatory criteria for TPH in New York State. TPH results provide information on soil disposal options for soil excavated during construction, since disposal facilities in the New York City metropolitan area typically require TPH analyses prior to accepting soil for disposal. The concentrations of TPH noted in the samples are not anticipated to impact potential soil disposal options.

4.5 Groundwater Sampling Findings

Groundwater was measured at approximately 8 to 11 feet below grade in temporary wells installed during the Phase II ESI. The scope of work did not include surveying elevations for the temporary wells; therefore, the site-specific groundwater flow direction was not determined. The regional groundwater flow direction in the areas surrounding the Site is assumed to be southeast (with potential local variations). No visual evidence of contamination (discoloration, free product, orange precipitate, etc.) was observed in any of the groundwater samples. The results of the analyses of the groundwater samples are presented in Tables 7 through 11. The complete analytical data reports are presented in Appendix D. A review of the groundwater analytical results is presented in the following sections.

4.5.1 Volatile Organic Compounds (VOCs) in Groundwater

The laboratory analytical results indicate that two of the VOCs analyzed were detected in one of the groundwater samples (TW-1). Specifically, 1,2,4-trichlorobenzene was detected at a concentration of 4.9 (estimated) micrograms per liter (µg/L), which is below the Class GA Standard of 5 µg/L; and naphthalene was detected at a concentration of 6.9 µg/L, which is below the Class GA standard of 10 µg/L. No other VOCs were detected in the groundwater samples. A summary of the analytical results for VOCs in groundwater is presented in Table 7.

4.5.2 Semi-Volatile Organic Compounds (SVOCs) in Groundwater

SVOCs were not detected in any of the groundwater samples. A summary of the analytical results for SVOCs in groundwater is presented in Table 8.

4.5.3 Polychlorinated Biphenyls (PCBs) in Groundwater

PCBs were not detected in any of the groundwater samples. A summary of the analytical results for PCBs in groundwater is presented in Table 9.

4.5.4 Metals in Groundwater

A review of the analytical results for the groundwater samples indicates that 19 of the 23 metals analyzed were detected in one or more samples. Of the 16 metals typically of concern for NYCSCA Phase II ESIs (arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, thallium, selenium, silver, vanadium, and zinc), nine were detected at concentrations exceeding their respective Class GA ambient water quality standards, as follows:

Total Metals in Groundwater Exceeding Class GA Standards

Sample ID Date Units	NYSDEC Class GA Standard µg/L	TW-1 3/12/16 µg/L	TW-2 3/12/16 µg/L	TW-4 3/12/16 µg/L	TW-5 3/12/16 µg/L
Arsenic	***25***	**26.4**	2.5 U	22.3	24.7
Barium	***1,000***	**1,540**	110	1,510	**2,450**
Beryllium	***3***	**3.36**	0.75 U	**3.62**	**9.43**
Chromium	***50***	**685**	16.2	**413**	**444**
Copper	***200***	**266**	6.7 J	**469**	**312**
Lead	***25***	**49.2**	2.3 J	**208**	**167**
Manganese	***300***	**4,410**	**656**	**3,790**	**1,690**
Mercury	***0.7***	**4.69**	0.1 U	**1.78**	0.53
Nickel	***100***	**659**	13.8 J	**737**	**1,140**

Notes:
µg/L – micrograms per liter
J = Estimated Value
U = Not Detected
Bold = Results exceeds the Class GA Ambient Water Quality Standard

Based on these observations, the metals detected in the groundwater samples are primarily attributed to sediment entrained in the samples or to naturally occurring or background conditions in groundwater, and not to an on-site release. A summary of the analytical results for metals in groundwater is presented in Table 10.

4.5.5 NYCDEP Discharge Parameters in Groundwater

A summary of the analytical results for NYCDEP sewer discharge parameters in groundwater is presented in Table 11. No exceedances of the NYCDEP Discharge criteria were detected in the groundwater sample collected from TW-2. Nevertheless, treatment of dewatering effluent, particularly for sediment/suspended solids, may be required prior to discharge to the municipal sewers under a Waste Water Quality Control Application submitted to the NYCDEP for approval.

4.6 Summary of Findings

AKRF performed a Phase II ESI consisting of a soil, groundwater, and soil vapor sampling at the Site. The results of the Phase II ESI indicate the following:

- Linear anomalies indicative of storm sewer lines were noted within the play yard area (with the gas and electric connections noted in front of the school building). No anomalies indicative of underground storage tanks were identified.
- Groundwater was measured at approximately 8 to 11 feet below grade in temporary wells installed during the Phase II ESI. The scope of work did not include surveying elevations for the temporary wells; therefore, the site-specific groundwater flow direction was not determined. The regional groundwater flow direction in the areas surrounding the Site is assumed to be southeast (with potential local variations).
- Subsurface soil generally consisted of fill material (sand with brick and gravel fragments) to approximately 3 to 10 feet below grade, underlain by apparent native brown sand. Refusal on bedrock was encountered at approximately 8 feet below grade at SB-3, located in the central portion of the Site.

- Petroleum-related compounds (trimethylbenzenes, benzene, ethylbenzene, toluene, and xylenes) detected in soil vapor at concentrations above their anticipated background levels are likely associated with multiple historic spills identified in the Site vicinity, and not to an on-site release or spill. Chloroethane, chloromethane, and vinyl chloride identified in soil vapor above the anticipated background level may be attributed to former dry cleaning uses in the Site vicinity, and is not likely to be associated with an on-site release based on the Site's history. No VOCs were detected in soil vapor above the NYSDOH AGVs.
- All detected VOC concentrations in soil were below their respective Part 375 Unrestricted Use SCOs and CP-51 Supplemental SCOs.
- Two SVOCs were detected in one or more of the samples. All detected SVOC concentrations were below their respective Unrestricted Use SCOs/CP-51 Supplemental SCOs.
- Cyanide was detected in one of the soil samples analyzed for this compound below the Part 360 Unrestricted Use SCO. Hexavalent chromium was detected in all of the samples at concentrations below the Part 360 Unrestricted Use SCO. None of the 16 metals typically of concern for NYCSCA Phase II ESIs were detected at concentrations exceeding their respective Part 360 Unrestricted Use SCOs.
- No PCBs were detected in any of the soil samples.
- None of the groundwater samples collected during the Phase II ESI exceeded the New York State Class GA Ambient Water Quality Standards for VOCs. SVOCs and PCBs were not detected in any of the samples.
- Of the 16 metals typically of concern for NYCSCA Phase II ESIs, nine (arsenic, barium, beryllium, chromium, copper, lead, manganese, mercury, and nickel) were detected at concentrations exceeding their respective Class GA Ambient Water Quality Standards. The detections can be attributed to sediment entrained in the samples or to naturally occurring or background conditions in groundwater, and not to a release or spill.
- The groundwater sample analyzed for the discharge parameters did not exceed the NYCDEP sewer discharge criteria.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the Phase II ESI, AKRF concludes the following:

- Groundwater was encountered at approximately 8 to 11 feet below grade in the temporary wells installed on-site during the Phase II ESI.
- Subsurface soil generally consisted of fill material (silt and sand with brick and schist fragments) to approximately 3 to 10 feet below grade, underlain by apparent native brown sand.
- No anomalies indicative of underground storage tanks were identified during the geophysical survey.
- All VOC concentrations detected in soil vapor were below their respective NYSDOH Air Guideline Values (AGVs). Petroleum-related VOCs and chlorinated compounds detected in soil vapor above the corresponding NYSDOH background ranges are attributed to off-site sources.
- Metals (arsenic, barium, beryllium, chromium, copper, lead, manganese, mercury, and nickel) detected in the groundwater samples above the Class GA Water Quality Standard are attributed to sediment entrained in the samples or to naturally occurring (background) conditions and are not indicative of an on-site release or spill.

AKRF recommends the following measures to make the Site suitable for use as a public school facility.

- Consistent with NYCSCA standard practice, a soil vapor barrier should be incorporated into the new building design and appropriately integrated with any proposed damp-proofing or waterproofing design components.
- All material excavated during construction activities should be properly characterized prior to transportation to an off-site disposal facility. Results from the limited soil sampling conducted during this investigation should not be used in lieu of data from a full soil waste characterization.
- Fill material should be evaluated for the presence of asbestos-containing materials (ACM). In addition, any suspect ACM, lead based paint (LBP) and/or PCB-containing materials affected by the proposed demolition or construction work should be identified prior to and properly managed during construction activities.
- Any dewatering required during construction should be minimized to mitigate influx of potentially contaminated water from off-site sources. Treatment to remove sediment and other potential contaminants from dewatering effluent may be required prior to discharge to the municipal sewer. All appropriate permits should be procured and pre-treatment should be conducted as required to meet applicable sewer effluent limitations for discharge of the dewatering fluids.
- After the proposed new building and grounds are constructed, if exposed soil (landscaped areas) is incorporated into the development of the Site, a minimum of two feet of environmentally clean fill should be placed over existing soil in these areas.

6.0 LIMITATIONS

AKRF has prepared this Phase II ESI using reasonable efforts in each phase of its work to investigate RECs/VECs associated with hazardous substances, wastes and petroleum products at the Site. Findings within this report are based on information collected from observations made at the time of the investigation and associated data. This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other construction purposes. This report was prepared for the sole use of NYCSCA and related New York City municipal agencies pursuant to the AKRF Contract dated August 1, 2014.

7.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

AKRF has performed a Phase II Environmental Site Investigation of the 4318 Katonah Avenue Site in the Bronx, New York. The scope of the Phase II ESI was consistent with the scope of work dated November 17, 2014, as stated in Section 2.0.

Elizabeth Matamoros

PREPARED BY: _____
Elizabeth Matamoros
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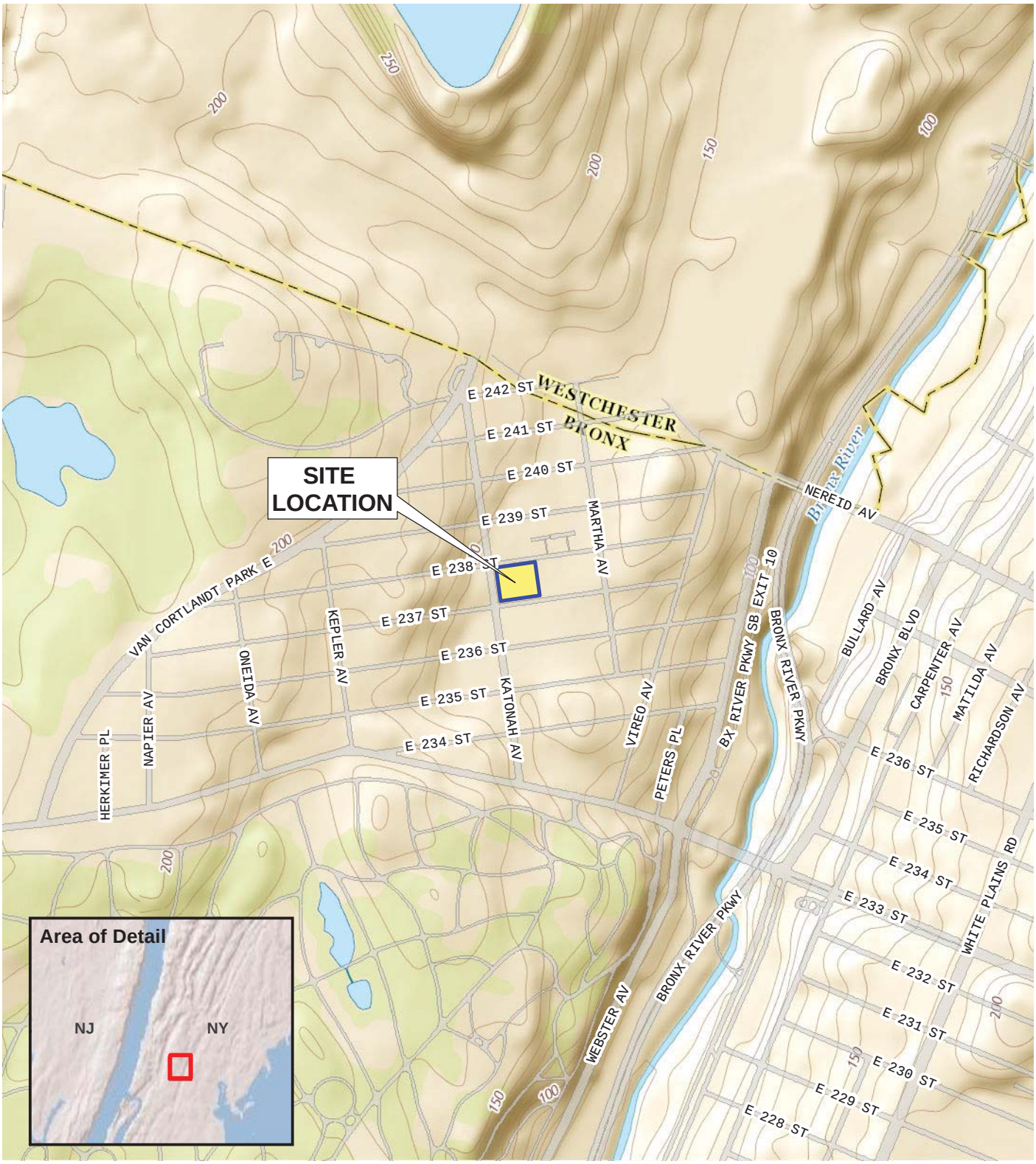
PREPARED BY: _____
Rebecca A. Kinal, P.E.
Vice President (Project Manager)

REVIEWED BY: _____
Marc Godick, LEP
Sr. Vice President (Acting QC Officer)

8.0 REFERENCES

- 6 NYCRR § 375, effective December 14, 2006, New York State Department of Environmental Conservation Rules and Regulations, Remedial Program Requirements.
- 6 NYCRR Chapter X § 700 – 706, New York State Department of Environmental Conservation Water Quality Regulations, Surface Water and Ground Water Classifications and Standards.
- ASTM E 2600-08 "Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions."
- ASTM Standards Related to the Phase II Environmental Site Assessment Process, 2nd Edition.
- CP-51/Soil Cleanup Guidance; New York State Department of Environmental Conservation, October 21, 2010.
- DER-10 Technical Guidance for Site Investigation and Remediation (5/3/2010).
- Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006, New York State Department of Health Center for Environmental Health, Bureau of Environmental Exposure Investigation.
- Phase I Environmental Site Assessment Report of 4318 Katonah Avenue, Bronx NY, 10470, AKRF Engineering, P.C., December 5, 2014.
- Phase II Environmental Site Investigation Proposal/Scope of Work for 4318 Katonah Avenue, Bronx NY, 10470, AKRF Engineering, P.C., November 17, 2014.

FIGURES



SOURCE
USGS 7.5 Minute Topographic Map
Flushing Quad 2011

0 1,000 2,000 Feet

Proposed Addition to P.S. 19X
4318 Katonah Avenue
Bronx, New York

SITE LOCATION

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE
4/01/2016

PROJECT No.
89030

FIGURE
1

© 2014 AKRF, Inc. Environmental Consultants O:\Projects\89030 - 19X ADDITION\89030 Fig 1 site loc map.mxd

Map Source:
NYCDCP (NYC Dept. of City Planning 2014) GIS database

LEGEND:

- PROJECT SITE BOUNDARY
- LOT LINE
- BUILDING LINE
- PROPOSED BUILDING ADDITION LINE
- PRESUMED GROUNDWATER FLOW DIRECTION
- SB/TW/SV-1 — SOIL BORING/TEMPORARY WELL/ SOIL VAPOR POINT
- SB/SV-3 — SOIL BORING/ SOIL VAPOR POINT
- E, G, SW — APPROXIMATE LOCATION OF UNDERGROUND UTILITIES (Electric, Gas, Storm Sewer)

0' 20' 40' 80'
SCALE IN FEET

P.S.19X
4318 KATONAH AVENUE
New York, New York

SITE PLAN AND SAMPLE LOCATIONS

AKRF Engineering, P.C.
440 Park Avenue South, New York, N.Y. 10016

DATE 4/01/2016
PROJECT No. 89030
SCALE as shown
FIGURE 2

©2016 AKRF, Inc. Environmental Consultants M:\AKRF Project Files\89030 - 19X Addition\Phase II ES\CAD\89030 Fig Sampling Location.dwg

TABLES

Tables 1-11
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY

Phase II Environmental Site Investigation

Analytical Results

Notes

GENERAL

NS : No standard, guidance value or criteria listed.

ND : Non Detect

NA : Not Analyzed

U : The analyte was not detected at the indicated concentration.

J : The concentration given is an estimated value.

P : For dual column analysis, the percent difference between the quantitated concentrations on the two columns is greater than 40%.

*** :** Recovery or RPD exceeds control limits

SOIL

Exceedences of NYSDEC SCOs and CP-51 SCLs are highlighted in bold font.

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

CP-51 Supplemental Soil Cleanup Objectives : Supplemental Soil Clean-up Objectives listed in Table 1 of NYSDEC "CP-51/Soil Cleanup Guidance".

µg/kg : micrograms per kilogram = parts per billion (ppb)

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

GROUNDWATER

Exceedences of NYSDEC Class GA Ambient Standards are highlighted in bold font.

NYSDEC Class GA Ambient Standard : New York State Department of Environmental Conservation Technical and Operational Guidance Series (1.1.1): Class GA Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.

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

SOIL VAPOR

Exceedences of NYSDOH Background Range are highlighted in bold font.

NYSDOH Soil Vapor Intrusion Air Guidance Value : NYSDOH Air Guideline Values (AGVs) presented in the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006 ("NYSDOH Vapor Intrusion Guidance Document"). Exceedance are indicated by gray shading.

NYSDOH 2003 Soil Vapor Indoor Upper Fence : Upper fence indoor air values from "Table C1. NYSDOH 2003: Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes", published in the NYSDOH Soil Vapor Intrusion Guidance Document, Appendix C" (October 2006).

EPA 2001 BASE 90th percentile : 90th Percentile indoor air values from "Table C-2. EPA 2001: Building Assessment and Survey Evaluation (BASE) Database, SUMMA canister method", published in the NYSDOH Soil Vapor Intrusion Guidance Document, Appendix C" (October 2006).

HEI RIOPA 2005 95th percentile : 95th Percentile Indoor Air Values from Table C-5, Health Effects Institute (HEI) 2005: Relationship of Indoor, Outdoor and Personal Air, published in the NYSDOH Soil Vapor Intrusion Guidance Document, Appendix C" (October 2006).

µg/m^3 : micrograms per cubic meter of air

Table 1
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY
Phase II Environmental Site Investigation
Analytical Results
Volatile Organic Compounds in Soil Vapor

Client ID Lab Sample ID Date Sampled Dilution ug/m3	NYSDOH 2003 Soil Vapor Intrusion Air Guideline Value ug/m3	EPA 2001 BASE 90th percentile ug/m3	NYSDOH 2003 Soil Vapor Indoor Upper Fence ug/m3	HEI RIOPA 2005 95th Percentile Indoor ug/m3	L1607277-01 SV-1 3/12/2016 1	L1607277-02 SV-2 3/12/2016 1	L1607277-03 SV-3 3/12/2016 1	L1607277-04 SV-4 3/12/2016 1	L1607277-05 SV-5 3/12/2016 1
1,1,1-Trichloroethane	NS	20.6	2.5	NS	0.109 U	0.218 U	0.218 U	0.109 U	0.218 U
1,1-Dichloroethane	NS	<0.7	0.4	NS	0.0809 U	0.162 U	0.162 U	0.0809 U	0.162 U
1,1-Dichloroethene	NS	<1.4	0.4	NS	0.0793 U	0.159 U	0.159 U	0.0793 U	0.159 U
1,2,4-Trimethylbenzene	NS	9.5	9.8	NS	9.09	**10.7**	**15.6**	7.87	7.42
1,2-Dichlorobenzene	NS	<1.2	0.5	NS	0.12 U	0.24 U	0.24 U	0.12 U	0.24 U
1,2-Dichloroethane	NS	<0.9	0.4	NS	0.0809 U	0.162 U	0.162 U	0.0809 U	0.162 U
1,2-Dichloroethene, cis-	NS	<1.9	0.4	NS	0.0793 U	0.159 U	0.159 U	0.0793 U	0.159 U
1,2-Dichloroethene, trans-	NS	NS	NS	NS	0.0793 U	0.159 U	0.159 U	0.0793 U	0.159 U
1,2-Dichloropropane	NS	<1.6	0.4	NS	0.0924 U	0.185 U	0.185 U	0.0924 U	0.185 U
1,3,5-Trimethylbenzene	NS	3.7	3.9	NS	2.9	3.17	**4.61**	2.23	2.04
1,3-Dichlorobenzene	NS	<2.4	0.5	NS	0.132	0.24 U	0.24 U	0.12 U	0.24 U
Benzene	NS	9.4	13	10	12.8	**45.7**	**44.1**	3.93	**23.6**
Carbon tetrachloride	NS	<1.3	1.3	1.1	0.126 U	0.252 U	0.428	0.346	0.252 U
Chlorobenzene	NS	<0.9	0.4	NS	0.0921 U	0.184 U	0.184 U	0.0921 U	0.184 U
Chloroethane	NS	<1.1	0.4	NS	0.177	0.697	**3.3**	0.124	0.438
Chloromethane	NS	3.7	4.2	NS	**5.33**	**15.3**	**55.8**	0.582	4.61
Ethylbenzene	NS	5.7	6.4	7.62	**177**	**105**	**169**	**51.3**	**53**
Methyl tert butyl ether	NS	11.5	14	36	0.721 U	1.44 U	1.44 U	0.721 U	1.44 U
Methylene chloride	60	10	16	7.5	1.74 U	3.47 U	3.47 U	1.74 U	3.47 U
Naphthalene	NS	5.1	NS	NS	0.666	1.1	0.524	0.378	0.944
Tetrachloroethene	30	15.9	2.5	6.01	1.59	5.82	3.25	3.33	3.01
Toluene	NS	43	57	39.8	**132**	**203**	**249**	**155**	**196**
Trichloroethene	2	4.2	0.5	1.36	0.107 U	0.322	1.19	0.107 U	0.215 U
Vinyl chloride	NS	<1.9	0.4	NS	0.156	0.741	**3.76**	0.12	0.281
Xylene, o-	NS	7.9	7.1	7.24	**296**	**125**	**202**	**34.6**	**32.8**
Xylene, p/m-	NS	22.2	11	22.2	**660**	**382**	**569**	**185**	**185**

Table 2
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY
Phase II Environmental Site Investigation
Analytical Results
Volatile Organic Compounds in Soil

Client ID Lab Sample ID Date Sampled Dilution ug/kg	NYSDEC Part 375 Unrestricted SCO ug/kg	NYSDEC CP-51 Supplemental SCO ug/kg	SB-1(8-9) H1788-01 3/12/2016 1	SB-2(8-9) H1788-02 3/12/2016 1	SB-3(7-8) H1788-03 3/12/2016 1	SB-4(7-8) H1788-04 3/12/2016 1	SB-5(9-10) H1788-05 3/12/2016 1	SB-5(9-10)RE H1788-05RE 3/12/2016 1
1,1,1-Trichloroethane	680	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,1,2,2-Tetrachloroethane	NS	600	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,1,2-Trichloroethane	NS	NS	1.3 U	1.1 U	1.2 U	1 U	1 U	1 U
1,1,2-Trichlorotrifluoroethane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,1-Dichloroethane	270	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,1-Dichloroethene	330	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,2,3-Trichlorobenzene	NS	20000	1.3 U	1.1 U	1.2 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	NS	20000	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,2,4-Trimethylbenzene	3600	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,2-Dibromo-3-Chloropropane	NS	NS	6.3 U	5.7 U	5.8 U	5.2 U	5 U	5.1 U
1,2-Dibromoethane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,2-Dichlorobenzene	1100	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,2-Dichloroethane	20	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,2-Dichloropropane	NS	700000	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,3,5-Trimethylbenzene	8400	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,3-Dichlorobenzene	2400	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,4-Dichlorobenzene	1800	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
1,4-Dioxane	100	NS	130 U	110 U	120 U	100 U	100 U	100 U
2-Butanone	120	NS	9.4 U	8.6 U	8.8 U	7.8 U	7.5 U	7.6 U
2-Hexanone	NS	NS	3.1 U	2.9 U	2.9 U	2.6 U	2.5 U	2.5 U
4-Methyl-2-Pentanone	NS	1000	3.1 U	2.9 U	2.9 U	2.6 U	2.5 U	2.5 U
Acetone	50	NS	3.1 U	2.9 U	2.9 U	2.6 U	2.5 U	2.5 U
Benzene	60	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Bromochloromethane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Bromodichloromethane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Bromoform	NS	NS	1.9 U	1.7 U	1.8 U	1.6 U	1.5 U	1.5 U
Bromomethane	NS	NS	1.3 U	1.1 U	1.2 U	1 U	1 U	1 U
Carbon Disulfide	NS	2700	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Carbon Tetrachloride	760	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Chlorobenzene	1100	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Chloroethane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Chloroform	370	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Chloromethane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
cis-1,2-Dichloroethene	250	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
cis-1,3-Dichloropropene	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Cyclohexane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Dibromochloromethane	NS	10000	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Dichlorodifluoromethane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Ethyl Benzene	1000	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Isopropylbenzene	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
m/p-Xylenes	260	2300	1.3 U	1.1 U	1.2 U	1 U	1 U	1 U
Methyl Acetate	NS	NS	1.3 U	1.1 U	1.2 U	1 U	1 U	1 U
Methyl tert-butyl Ether	930	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Methylcyclohexane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Methylene Chloride	50	NS	0.63 U	0.57 U	0.58 U	0.52 U	2.9 J	0.51 U
Naphthalene	12000	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
n-Butylbenzene	12000	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
n-propylbenzene	3900	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
o-Xylene	260	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
p-Isopropyltoluene	NS	10000	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
sec-Butylbenzene	11000	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Styrene	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
tert-Butylbenzene	5900	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Tetrachloroethene	1300	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Toluene	700	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
trans-1,2-Dichloroethene	190	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
trans-1,3-Dichloropropene	NS	300000	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Trichloroethene	470	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Trichlorofluoromethane	NS	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U
Vinyl Chloride	20	NS	0.63 U	0.57 U	0.58 U	0.52 U	0.5 U	0.51 U

Table 3
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY
Phase II Environmental Site Investigation
Analytical Results
Semi-Volatile Organic Compounds in Soil

Client ID Lab Sample ID Date Sampled Dilution ug/kg	NYSDEC Part 375 Unrestricted SCO ug/kg	NYSDEC CP-51 Supplemental SCO ug/kg	SB-1(8-9) H1788-01 3/12/2016 1	SB-2(8-9) H1788-02 3/12/2016 1	SB-3(7-8) H1788-03 3/12/2016 1	SB-4(7-8) H1788-04 3/12/2016 1	SB-5(9-10) H1788-05 3/12/2016 1
1,1-Biphenyl	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
1,2,4,5-Tetrachlorobenzene	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2,2-oxybis(1-Chloropropane)	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2,3,4,6-Tetrachlorophenol	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2,4,5-Trichlorophenol	NS	100	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2,4,6-Trichlorophenol	NS	10,000	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2,4-Dichlorophenol	NS	400	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2,4-Dimethylphenol	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2,4-Dinitrophenol	NS	200	310 U	320 U	290 U	300 U	320 U
2,4-Dinitrotoluene	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2,6-Dinitrotoluene	NS	1000	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2-Chloronaphthalene	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2-Chlorophenol	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2-Methylnaphthalene	NS	410	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2-Methylphenol	330	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2-Nitroaniline	NS	400	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
2-Nitrophenol	NS	300	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
3,3-Dichlorobenzidine	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
3+4-Methylphenols	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
3-Nitroaniline	NS	500	76.8 U	79.9 U	73.2 U	75.3 U	80.3 U
4,6-Dinitro-2-methylphenol	NS	NS	190 U	200 U	180 U	190 U	200 U
4-Bromophenyl-phenylether	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
4-Chloro-3-methylphenol	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
4-Chloroaniline	NS	220	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
4-Chlorophenyl-phenylether	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
4-Nitroaniline	NS	NS	76.8 U	79.9 U	73.2 U	75.3 U	80.3 U
4-Nitrophenol	NS	100	190 U	200 U	180 U	190 U	200 U
Acenaphthene	20,000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Acenaphthylene	100,000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Acetophenone	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Anthracene	100,000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Atrazine	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Benzaldehyde	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Benzo(a)anthracene	1000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Benzo(a)pyrene	1000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Benzo(b)fluoranthene	1000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Benzo(g,h,i)perylene	100,000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Benzo(k)fluoranthene	800	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
bis(2-Chloroethoxy)methane	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
bis(2-Chloroethyl)ether	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Bis(2-ethylhexyl)phthalate	NS	50,000	38.4 U	39.9 U	36.6 U	37.6 U	190 J
Butylbenzylphthalate	NS	100,000	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Caprolactam	NS	NS	76.8 U	79.9 U	73.2 U	75.3 U	80.3 U
Carbazole	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Chrysene	1000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Dibenzo(a,h)anthracene	330	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Dibenzofuran	7000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Diethylphthalate	NS	7100	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Dimethylphthalate	NS	27,000	380	550	680	410	570
Di-n-butylphthalate	NS	14	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Di-n-octyl phthalate	NS	100,000	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Fluoranthene	100,000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Fluorene	30,000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Hexachlorobenzene	330	410	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Hexachlorobutadiene	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Hexachlorocyclopentadiene	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Hexachloroethane	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Indeno(1,2,3-cd)pyrene	500	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Isophorone	NS	4400	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Naphthalene	12,000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Nitrobenzene	NS	170	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
n-Nitroso-di-n-propylamine	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
n-Nitrosodiphenylamine	NS	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Pentachlorophenol	800	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Phenanthrene	100,000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Phenol	330	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U
Pyrene	100,000	NS	38.4 U	39.9 U	36.6 U	37.6 U	40.2 U

Table 4
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY

Phase II Environmental Site Investigation
Analytical Results
Polychlorinated Biphenyls in Soil

Client ID Lab Sample ID Date Sampled Dilution Analyte	NYSDEC Part 375 Unrestricted SCO	NYSDEC CP-51 Supplemental SCO	SB-1(8-9) H1788-01 3/12/2016 1	SB-2(8-9) H1788-02 3/12/2016 1	SB-3(7-8) H1788-03 3/12/2016 1	SB-4(7-8) H1788-04 3/12/2016 1	SB-5(9-10) H1788-05 3/12/2016 1
Aroclor-1016	**NS**	**NS**	3.8 U	4 U	3.7 U	3.8 U	4 U
Aroclor-1221	**NS**	**NS**	3.8 U	4 U	3.7 U	3.8 U	4 U
Aroclor-1232	**NS**	**NS**	3.8 U	4 U	3.7 U	3.8 U	4 U
Aroclor-1242	**NS**	**NS**	3.8 U	4 U	3.7 U	3.8 U	4 U
Aroclor-1248	**NS**	**NS**	3.8 U	4 U	3.7 U	3.8 U	4 U
Aroclor-1254	**NS**	**NS**	3.8 U	4 U	3.7 U	3.8 U	4 U
Aroclor-1260	**NS**	**NS**	3.8 U	4 U	3.7 U	3.8 U	4 U
Total Concentration	**100**	**NS**	ND	ND	ND	ND	ND

Table 5
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY
Phase II Environmental Site Investigation
Analytical Results
Metals and Cyanide in Soil

Client ID Lab Sample ID Date Sampled Dilution mg/kg	NYSDEC Part 375 Unrestricted SCO mg/kg	NYSDEC CP-51 Supplemental SCO mg/kg	SB-1(8-9) H1788-01 3/12/2016 1	SB-2(8-9) H1788-02 3/12/2016 1	SB-3(7-8) H1788-03 3/12/2016 1	SB-4(7-8) H1788-04 3/12/2016 1*	SB-5(9-10) H1788-05 3/12/2016 1
Aluminum	**NS**	**10000**	4190	**10100**	7000	3050	**12700**
Antimony	**NS**	**12**	0.6 U	0.628 U	0.569 U	0.614 U	0.627 U
Arsenic	**13**	**NS**	2.21	3.95	2.19	2.46	1.72
Barium	**350**	**NS**	28.3	95.1	39.9	23.7	70.4
Beryllium	**7.2**	**NS**	0.271 J	0.452	0.278	0.227 J	0.488
Cadmium	**2.5**	**NS**	0.072 U	0.075 U	0.068 U	0.074 U	0.075 U
Calcium	**NS**	**10000**	763	1930	877	1380	1210
Chromium	**30**	**NS**	12.3	23	18.1	7.23	20.2
Cobalt	**NS**	**20**	7.14	6.21	8.92	4.36	4.62
Copper	**50**	**NS**	9.15	11.5	15.9	5.74	7.4
Cyanide	**27**	**NS**	0.143 U	0.044 J	0.125 U	0.13 U	0.15 U
Hexavalent Chromium	**1**	**NS**	0.183 J	0.188 J	0.306 J	0.088 J	0.144 J
Iron	**NS**	**2000**	**11500**	**18800**	**10400**	**9270**	**11100**
Lead	**63**	**NS**	4.07	8.03	3.53	2.57	6.6
Magnesium	**NS**	**NS**	1010	1680	1900	951	1680
Manganese	**1,600**	**NS**	116	50.4	168	98.3	46.2
Mercury	**0.18**	**NS**	0.007 U	0.012 J	0.007 U	0.007 U	0.051
Nickel	**30**	**NS**	13.4	18.3	17.5	8.84	16.2
Potassium	**NS**	**NS**	455	385	584	801	277
Selenium	**3.9**	**NS**	0.24 U	0.251 U	0.228 U	0.246 U	0.251 U
Silver	**2**	**NS**	0.12 U	0.392 J	0.114 U	0.123 U	0.125 U
Sodium	**NS**	**NS**	62 J	215	97.8	135	115
Thallium	**NS**	**5**	0.48 U	0.502 U	0.455 U	0.491 U	0.502 U
Vanadium	**NS**	**39**	12	25.2	16.3	8.99	20.4
Zinc	**109**	**NS**	39.4	91.4	30.7	39.8	43.4

***Dilution factor varies**

Table 6
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY

Phase II Environmental Site Investigation
Analytical Results
Total Petroleum Hydrocarbons in Soil

Client ID	SB-1(8-9)	SB-2(8-9)	SB-3(7-8)	SB-4(7-8)	SB-5(9-10)
Lab Sample ID	H1788-01	H1788-02	H1788-03	H1788-04	H1788-05
Date Sampled	3/12/2016	3/12/2016	3/12/2016	3/12/2016	3/12/2016
Dilution	1	1	1	1	1
ug/Kg					
GRO	26 U	27 U	24.5 U	25.5 U	27 U
DRO	2191	2915	2679	3309	5184

Table 7
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY
Phase II Environmental Site Investigation
Analytical Results
Volatile Organic Compounds in Groundwater

Client ID Lab Sample ID Date Sampled Dilution ug/L	NYSDEC Class GA Ambient Standard	TW-1 H1788-06 3/12/2016 1	TW-2 H1788-07 3/12/2016 1	TW-4 H1788-08 3/12/2016 1	TW-5 H1788-09 3/12/2016 1
1,1,1-Trichloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	1	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichlorotrifluoroethane	5	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	5	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	5	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	5	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	5	4.9 J	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene	5	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	0.04	2 U	2 U	2 U	2 U
1,2-Dibromoethane	0.0006	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	3	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	0.6	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloropropane	1	0.5 U	0.5 U	0.5 U	0.5 U
1,3,5-Trimethylbenzene	5	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	3	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	3	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane	NS	100 U	100 U	100 U	100 U
2-Butanone	50	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	50	3.8 U	3.8 U	3.8 U	3.8 U
4-Methyl-2-Pentanone	NS	2.5 U	2.5 U	2.5 U	2.5 U
Acetone	50	2.5 U	2.5 U	2.5 U	2.5 U
Benzene	1	0.5 U	0.5 U	0.5 U	0.5 U
Bromochloromethane	5	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	50	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	50	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	5	0.5 U	0.5 U	0.5 U	0.5 U
Carbon Disulfide	60	0.5 U	0.5 U	0.5 U	0.5 U
Carbon Tetrachloride	5	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	5	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	5	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	7	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	5	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	5	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	NS	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	NS	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	50	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane	5	0.5 U	0.5 U	0.5 U	0.5 U
Ethyl Benzene	5	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	5	0.5 U	0.5 U	0.5 U	0.5 U
m/p-Xylenes	5	1 U	1 U	1 U	1 U
Methyl Acetate	NS	2 U	2 U	2 U	2 U
Methyl tert-butyl Ether	10	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	NS	0.5 U	0.5 U	0.5 U	0.5 U
Methylene Chloride	5	0.5 U	0.5 U	0.5 U	0.5 U
Naphthalene	10	6.9	0.5 U	0.5 U	0.5 U
n-Butylbenzene	5	0.5 U	0.5 U	0.5 U	0.5 U
n-propylbenzene	5	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	5	0.5 U	0.5 U	0.5 U	0.5 U
p-Isopropyltoluene	5	0.5 U	0.5 U	0.5 U	0.5 U
sec-Butylbenzene	5	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	5	0.5 U	0.5 U	0.5 U	0.5 U
t-1,3-Dichloropropene	NS	0.5 U	0.5 U	0.5 U	0.5 U
tert-Butylbenzene	5	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	5	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	5	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	5	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	5	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	5	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	2	0.5 U	0.5 U	0.5 U	0.5 U

Table 8
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY
Phase II Environmental Site Investigation
Analytical Results
Semi-Volatile Organic Compound in Groundwater

Client ID Lab Sample ID Date Sampled Dilution Analyte	NYSDEC Class GA Ambient Standard	TW-1 H1788-06 3/12/2016 1	TW-2 H1788-07 3/12/2016 1	TW-4 H1788-08 3/12/2016 1	TW-5 H1788-09 3/12/2016 1
1,1-Biphenyl	5	1 U	1 U	1 U	1 U
1,2,4,5-Tetrachlorobenzene	5	1 U	1 U	1 U	1 U
2,2-oxybis(1-Chloropropane)	5	1 U	1 U	1 U	1 U
2,3,4,6-Tetrachlorophenol	NS	1 U	1 U	1 U	1 U
2,4,5-Trichlorophenol	NS	1 U	1 U	1 U	1 U
2,4,6-Trichlorophenol	NS	1 U	1 U	1 U	1 U
2,4-Dichlorophenol	5	1 U	1 U	1 U	1 U
2,4-Dimethylphenol	50	1 U	1 U	1 U	1 U
2,4-Dinitrophenol	10	8.1 U	8.2 U	8.2 U	8.1 U
2,4-Dinitrotoluene	5	1 U	1 U	1 U	1 U
2,6-Dinitrotoluene	5	1 U	1 U	1 U	1 U
2-Chloronaphthalene	10	1 U	1 U	1 U	1 U
2-Chlorophenol	NS	1 U	1 U	1 U	1 U
2-Methylnaphthalene	NS	1 U	1 U	1 U	1 U
2-Methylphenol	NS	1 U	1 U	1 U	1 U
2-Nitroaniline	5	1 U	1 U	1 U	1 U
2-Nitrophenol	NS	1 U	1 U	1 U	1 U
3,3-Dichlorobenzidine	5	1 U	1 U	1 U	1 U
3+4-Methylphenols	NS	1 U	1 U	1 U	1 U
3-Nitroaniline	5	1 U	1 U	1 U	1 U
4,6-Dinitro-2-methylphenol	NS	2 U	2.1 U	2 U	2 U
4-Bromophenyl-phenylether	NS	1 U	1 U	1 U	1 U
4-Chloro-3-methylphenol	NS	1 U	1 U	1 U	1 U
4-Chloroaniline	5	1 U	1 U	1 U	1 U
4-Chlorophenyl-phenylether	NS	1 U	1 U	1 U	1 U
4-Nitroaniline	5	2 U	2.1 U	2 U	2 U
4-Nitrophenol	NS	5.1 U	5.2 U	5.1 U	5.1 U
Acenaphthene	20	1 U	1 U	1 U	1 U
Acenaphthylene	NS	1 U	1 U	1 U	1 U
Acetophenone	NS	1 U	1 U	1 U	1 U
Anthracene	50	1 U	1 U	1 U	1 U
Atrazine	7.5	1 U	1 U	1 U	1 U
Benzaldehyde	NS	1 U	1 U	1 U	1 U
Benzo(a)anthracene	0.002	1 U	1 U	1 U	1 U
Benzo(a)pyrene	ND	1 U	1 U	1 U	1 U
Benzo(b)fluoranthene	0.002	1 U	1 U	1 U	1 U
Benzo(g,h,i)perylene	NS	1 U	1 U	1 U	1 U
Benzo(k)fluoranthene	0.002	1 U	1 U	1 U	1 U
bis(2-Chloroethoxy)methane	5	1 U	1 U	1 U	1 U
bis(2-Chloroethyl)ether	1	1 U	1 U	1 U	1 U
Bis(2-ethylhexyl)phthalate	5	1 U	1 U	1 U	1 U
Butylbenzylphthalate	50	1 U	1 U	1 U	1 U
Caprolactam	NS	1 U	1 U	1 U	1 U
Carbazole	NS	1 U	1 U	1 U	1 U
Chrysene	0.002	1 U	1 U	1 U	1 U
Dibenzo(a,h)anthracene	NS	1 U	1 U	1 U	1 U
Dibenzofuran	NS	1 U	1 U	1 U	1 U
Diethylphthalate	50	1 U	1 U	1 U	1 U
Dimethylphthalate	50	1 U	1 U	1 U	1 U
Di-n-butylphthalate	50	1 U	1 U	1 U	1 U
Di-n-octyl phthalate	50	1 U	1 U	1 U	1 U
Fluoranthene	50	1 U	1 U	1 U	1 U
Fluorene	50	1 U	1 U	1 U	1 U
Hexachlorobenzene	0.04	1 U	1 U	1 U	1 U
Hexachlorobutadiene	0.5	1 U	1 U	1 U	1 U
Hexachlorocyclopentadiene	5	1 U	1 U	1 U	1 U
Hexachloroethane	5	1 U	1 U	1 U	1 U
Indeno(1,2,3-cd)pyrene	0.002	1 U	1 U	1 U	1 U
Isophorone	50	1 U	1 U	1 U	1 U
Naphthalene	10	1 U	1 U	1 U	1 U
Nitrobenzene	0.4	1 U	1 U	1 U	1 U
n-Nitroso-di-n-propylamine	NS	1 U	1 U	1 U	1 U
n-Nitrosodiphenylamine	50	1 U	1 U	1 U	1 U
Pentachlorophenol	NS	1 U	1 U	1 U	1 U
Phenanthrene	50	1 U	1 U	1 U	1 U
Phenol	NS	1 U	1 U	1 U	1 U
Pyrene	50	1 U	1 U	1 U	1 U

Table 9
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY

Phase II Environmental Site Investigation

Analytical Results

Polychlorinated Biphenyls in Groundwater

Client ID Lab Sample ID Date Sampled Dilution ug/L	NYSDEC Class GA Ambient Standard ug/L	TW-1 H1788-06 3/12/2016 1	TW-2 H1788-07 3/12/2016 1	TW-4 H1788-08 3/12/2016 1	TW-5 H1788-09 3/12/2016 1
Aroclor-1016	**NS**	0.103 U	0.1 U	0.102 U	0.102 U
Aroclor-1221	**NS**	0.103 U	0.1 U	0.102 U	0.102 U
Aroclor-1232	**NS**	0.103 U	0.1 U	0.102 U	0.102 U
Aroclor-1242	**NS**	0.103 U	0.1 U	0.102 U	0.102 U
Aroclor-1248	**NS**	0.103 U	0.1 U	0.102 U	0.102 U
Aroclor-1254	**NS**	0.103 U	0.1 U	0.102 U	0.102 U
Aroclor-1260	**NS**	0.103 U	0.1 U	0.102 U	0.102 U
Total PCBs	**0.09**	ND	ND	ND	ND

Table 10
P.S. 19X Addition, 4318 Katonah Avenue
Bronx, NY

Phase II Environmental Site Investigation
Analytical Results
Metals in Groundwater

Client ID Lab Sample ID Date Sampled Dilution ug/L	NYSDEC Class GA Ambient Standard	TW-1 H1788-06 3/12/2016 1	TW-2 H1788-07 3/12/2016 1	TW-4 H1788-08 3/12/2016 1	TW-5 H1788-09 3/12/2016 1
Aluminum	**NS**	83900	3090	70300	156000
Antimony	**3**	6.25 U	6.25 U	6.25 U	6.25 U
Arsenic	**25**	**26.4**	2.5 U	22.3	24.7
Barium	**1,000**	**1540**	110	**1510**	**2450**
Beryllium	**3**	**3.36**	0.75 U	**3.62**	**9.43**
Cadmium	**5**	0.75 U	0.75 U	2.18 J	0.725 J
Calcium	**NS**	90400	52300	138000	25500
Chromium	**50**	**685**	16.2	**413**	**444**
Cobalt	**NS**	143	10.2 J	161	161
Copper	**200**	**266**	6.7 J	**469**	**312**
Iron	**300+**	**198000**	**12200**	**199000**	**326000**
Lead	**25**	**49.2**	2.3 J	**208**	**167**
Magnesium	**35,000**	**70500**	29000	**75200**	**44000**
Manganese	**300+**	**4410**	**656**	**3790**	**1690**
Mercury	**0.7**	**4.69**	0.1 U	**1.78**	0.53
Nickel	**100**	**659**	13.8 J	**737**	**1140**
Potassium	**NS**	28700	7100	25300	22700
Selenium	**10**	5 U	5 U	5 U	5 U
Silver	**50**	20.2	1.25 U	21.6	36.7
Sodium	**20,000**	14900	**31300**	**22300**	5390
Thallium	**0.5**	5 U	5 U	5 U	5 U
Vanadium	**NS**	376	12.5 J	382	416
Zinc	**2,000**	440	15.5 J	939	624

Table 11

P.S. 19X Addition, 4318 Katonah Avenue

Bronx, NY

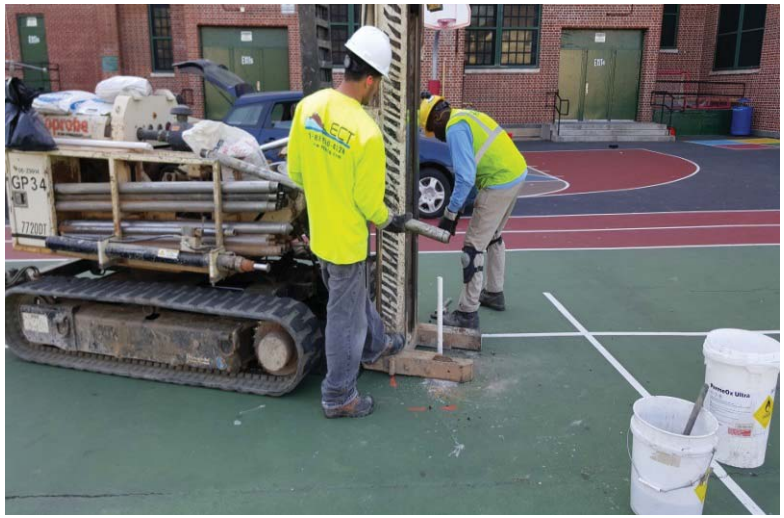
Phase II Environmental Site Investigation

Analytical Results

NYCDEP Sewer Discharge Parameters in Groundwater

Client ID Lab Sample ID Date Sampled Dilution Units as shown	DEP Combined Sewer Discharge	TW-2 H1782-01 3/12/2016
1,1,1-Trichloroethane - µg/L	NS	2.5 U
1,4-Dichlorobenzene µg/L	NS	2.5 U
Benzene - µg/L	134	2.5 U
Carbon Tetrachloride - µg/L	NS	2.5 U
Chloroform - µg/L	NS	2.5 U
Ethyl Benzene - µg/L	380	2.5 U
Methyl tert-Butyl Ether - µg/L	50	2.5 U
Tetrachloroethene - µg/L	20	NA
Toluene - µg/L	74	2.5 U
Xylene, Total - µg/L	74	7.5 U
1,2,4-Trichlorobenzene - µg/L	NS	2.5 U
Naphthalene - µg/L	47	1.3 U
Phenol - µg/L	NS	1.3 U
Cadmium - - µg/L	2000	1.5 U
Chromium, Hexavalent - mg/L	5	0.002 J
Copper - µg/L	5000	19.9
Lead - µg/L	2000	4.98 J
Mercury - µg/L	50	0.25
Nickel - mg/L	3000	30.5
Zinc - µg/L	5000	34.9
Total PCBs - µg/L	1	0.025 U
CBOD5	NS	2 U
Chloride - mg/L	NS	91
Nitrate+Nitrite - mg/L	NS	0.25 U
Total Nitrogen mg/L	5000	0.223 J
Flashpoint °F	>140°	>212
Nonpolar Material - mg/L	50	1.11 J
Phenolics - mg/L	NS	0.025 U
TKN - mg/L	NS	0.223 J
TS - mg/L	NS	612
TSS - mg/L	350	77.3

Appendix A
Photographic Log



Photograph 1: Zebra sets a temporary well at location TW-1.

Photograph 2: AKRF performs helium leak test on soil vapor point SV-3.

Photograph 3: AKRF logs soil borings at location SB-2.

Photograph 4: Soil cuttings from SB-4.

Photograph 5: Zebra sets soil vapor point SV-3.

Photograph 6: Zebra patches all holes in the courtyard using patch asphalt.

Appendix B
Geophysical Survey Report

GEOPHYSICAL ENGINEERING SURVEY REPORT

P.S. 19X

4318 Katonah Avenue
Bronx, New York 10470

NOVA PROJECT NUMBER
16-0197

DATED
March 18, 2016

PREPARED FOR:

AKRF, Inc.
34 South Broadway
Suite 401
White Plains, New York 10601

PREPARED BY:

NOVA
GEOPHYSICAL
ENGINEERING
Subsurface Mapping Solutions

56-01 Marathon Parkway # 765
Douglaston, New York 11362
347-556-7787 (PHONE)
718-261-1527(FAX)
www.nova-gsi.com

NOVA GEOPHYSICAL SERVICES

SUBSURFACE MAPPING SOLUTIONS
56-01 Marathon Parkway, # 765, Douglaston, New York 11362
Ph. 347-556-7787 Fax. 718-261-1527
www.nova-gsi.com

March 18, 2016

Rebecca A. Kinal, P.E.
Vice President
AKRF, Inc.
34 South Broadway
Suite 401
White Plains, New York 10601
Direct: 914.922.2362

Re: Geophysical Engineering Survey (GES) Report
P.S. 19x
4318 Katonah Avenue
Bronx, New York 10470

Dear Ms. Kinal:

Nova Geophysical Services (NOVA) is pleased to provide findings of the geophysical engineering survey (GES) at the above referenced project site: P.S. 19X, 4318 Katonah Avenue, Bronx, New York (the "Site"). Please see attached Site Location and Geophysical Survey maps for more details.

INTRODUCTION TO GEOPHYSICAL ENGINEERING SURVEY (GES)

NOVA performed a Geophysical engineering surveys (GES) consisting of a Ground Penetrating Radar (GPR) survey at the site. The purpose of this survey is to locate and identify USTs, anomalies, utilities and other substructures and to clear and mark proposed environmental boring areas on March 11, 2016.

The equipment selected for this investigation was a Noggin 250 MHz ground penetrating radar (GPR) shielded antenna and 3M DYNATL.

A GPR system consists of a radar control unit, control cable and a transducer (antenna). The control unit transmits a trigger pulse at a normal repetition rate of 250 MHz. The trigger pulse is sent to the transmitter electronics in the transducer via the control cable. The transmitter electronics amplify the trigger pulses into bipolar pulses that are radiated to the surface. The transformed pulses vary in shape and frequency according to the transducer used. In the subsurface, variations of the signal occur at boundaries where there is a dielectric contrast (void, steel, soil type, etc.). Signal reflections travel back to the control unit and are represented as color graphic images for interpolation.

GEOPHYSICAL METHODS

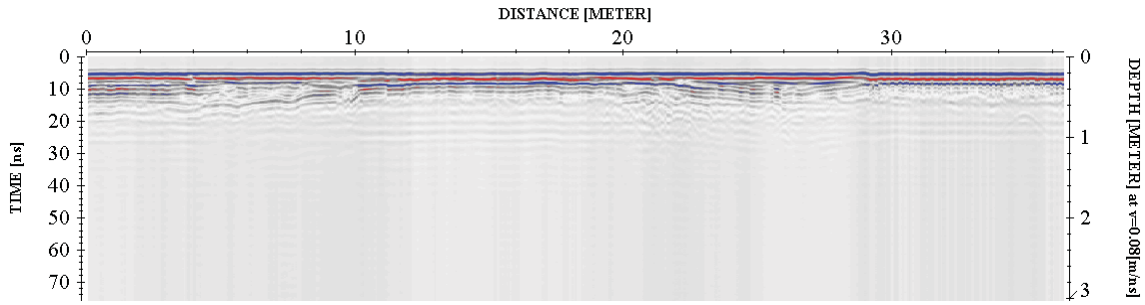
The project site was screened using the GPR to search the entire area and inspected for reflections, which could be indicative of major anomalies and substructures.

GPR data profiles were collected for the areas of the Site specified by the client. The surveyed areas consisted of asphalt surfaces.

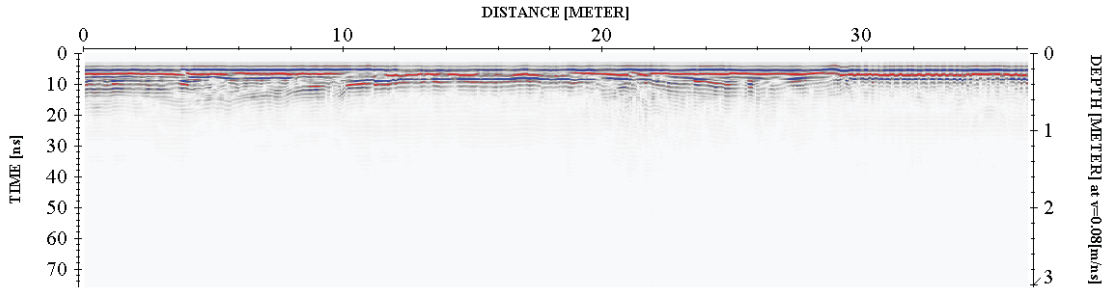
DATA PROCESSING

In order to improve the quality of the results and to better identify subsurface anomalies NOVA processed the collected data. The processes flow is briefly described at this section.

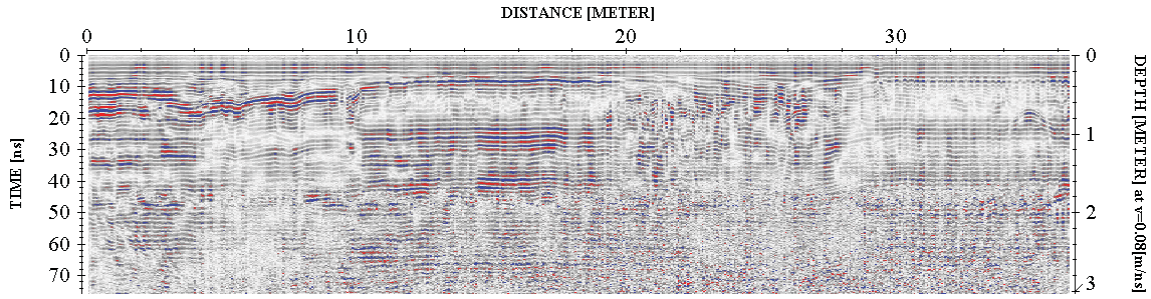
Step 1. Import raw RAMAC data to standard processing format



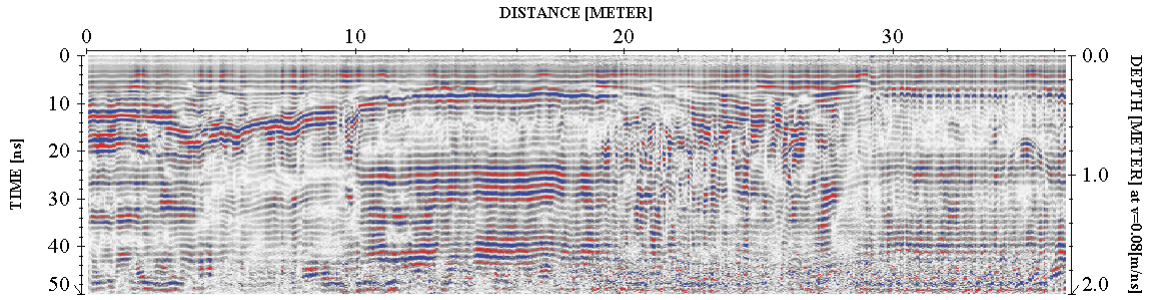
Step 2. Remove instrument noise *(dewow)*



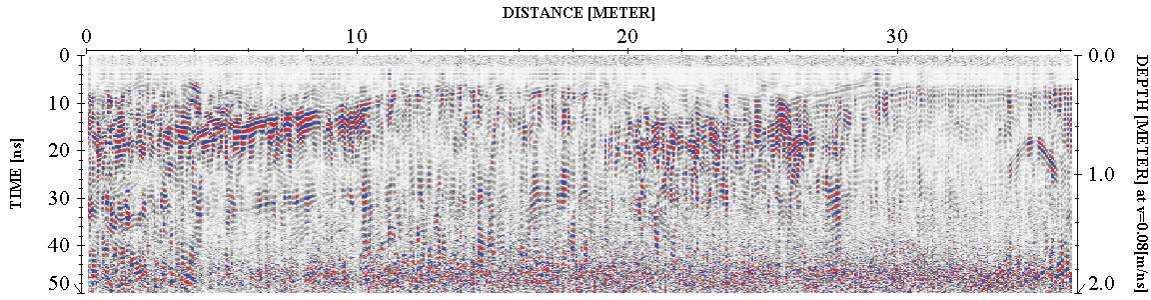
Step 3. Correct for attenuation losses *(energy decay function)*



Step 4. Remove static from bottom of profile *(time cut)*



Step 5. Mute horizontal ringing/noise *(subtracting average)*



The above example shows the significance of data processing. The last image (step 5) has higher resolution than the starting image (raw data – step 1) and describes the subsurface anomalies more accurately.

PHYSICAL SETTINGS

Nova observed following physical conditions at the time of the survey:

The weather: Sunny

Temp: 45 Degrees (F).

Surface: Asphalt surfaces

Geophysical Noise Level (GNL): Geophysical Noise Level (GNL) was medium to high at the site. The noise was a result of the site being located in an urban environment.

RESULTS

The results of the geophysical engineering survey (GES) identified following at the project Site:

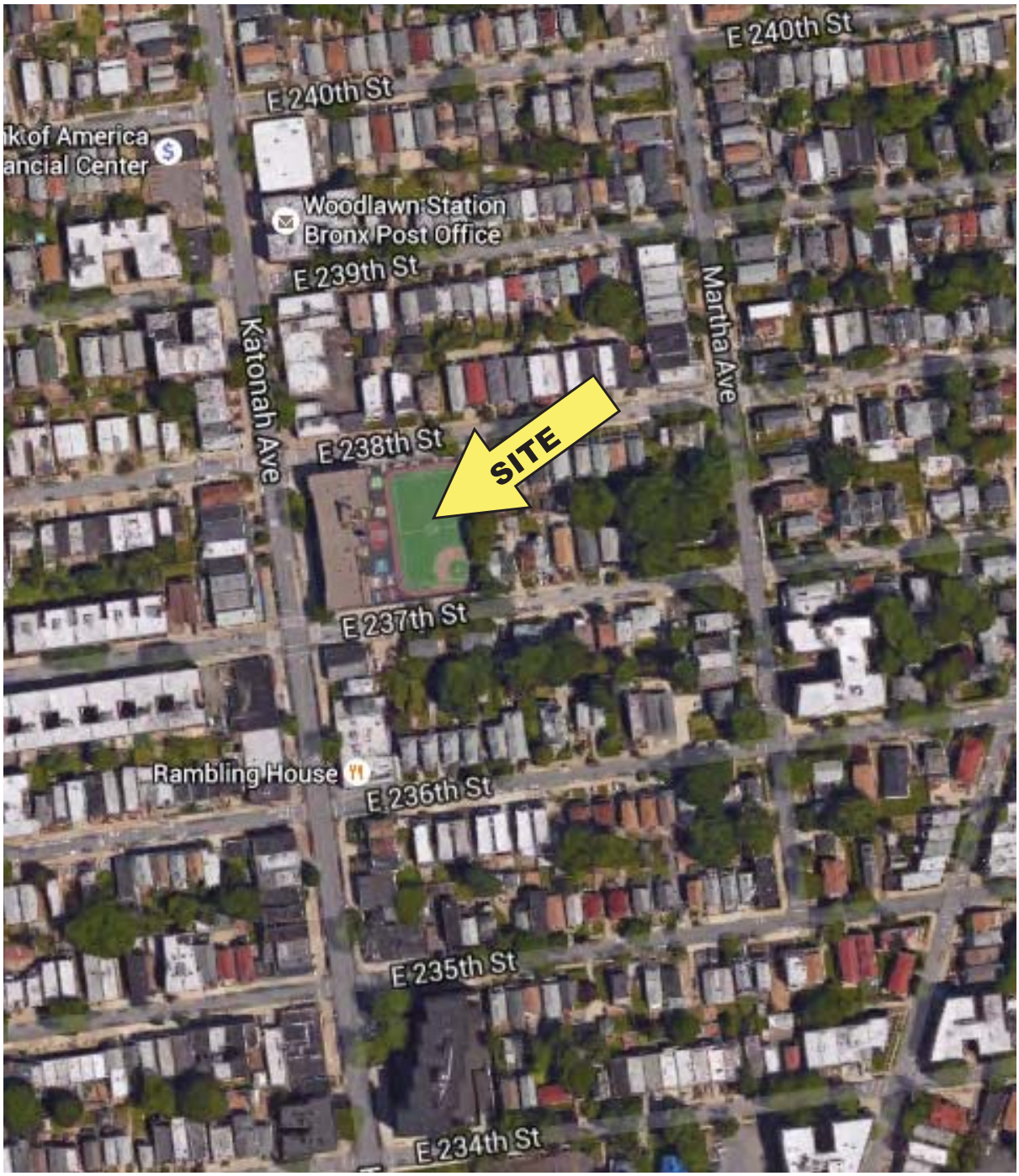
- GES survey identified scattered anomalies located throughout the project site. Based on their rates and proximity, these anomalies were inconsistent with any USTs. These areas were indicated on the on-site markout.
- Several utilities (sewer, gas, water and electric) were located on the site. These utilities were marked out both at the site and on the survey map (subsurface only).
- Geophysical Survey Plan portrays the areas investigated during the geophysical survey.

If you have any questions please do not hesitate to contact the undersigned.
Sincerely,

NOVA Geophysical Services

Levent Eskicakit, P.G., E.P.
Project Engineer

Attachments:
Figure 1 Site Location Map
Geophysical Survey Plan
Geophysical Images



N

200 ft.

FIGURE 1
SITE LOCATION MAP

NOVA
Geophysical Services
Subsurface Mapping Solutions
56-01 Marathon Pkwy, # 765, Douglaston, NY11362
(347) 556-7787 Fax (718) 261-1528
www.nova-gsi.com

SITE: **P.S. 19X**
4318 Katonah Avenue
Bronx, New York 10470

SCALE: See Map

1- All anomalies were marked in the field.

NOVA
Geophysical Services
Subsurface Mapping Solutions
56-01 Marathon Parkway, PO Box 765
Douglaston, New York11362
Phone (347) 556-7787 * Fax (718) 261-1527
www.nova-gsi.com

GEOPHYSICAL SURVEY PLAN

SITE : **P.S. 19X**
4318 Katonah Avenue
Bronx, New York 10470

CLIENT: **AKRF, Inc.**
DATE: March 11, 2016
Scale See Map

INFORMATION

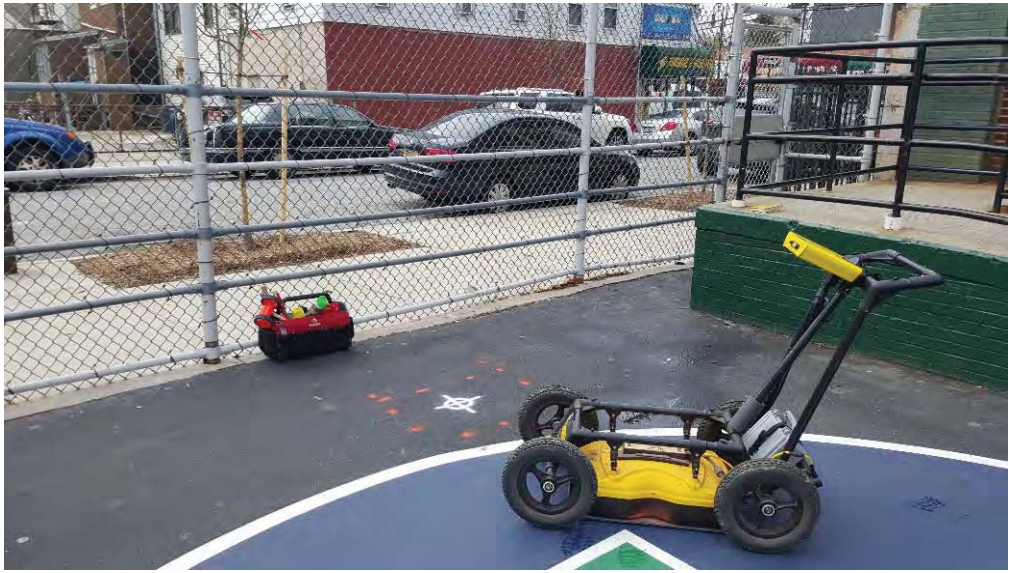
- Survey Area
- Electric Line
- Sewer Line
- Gas Line
- Water Line
- Possible Fill Port

N

40 ft.

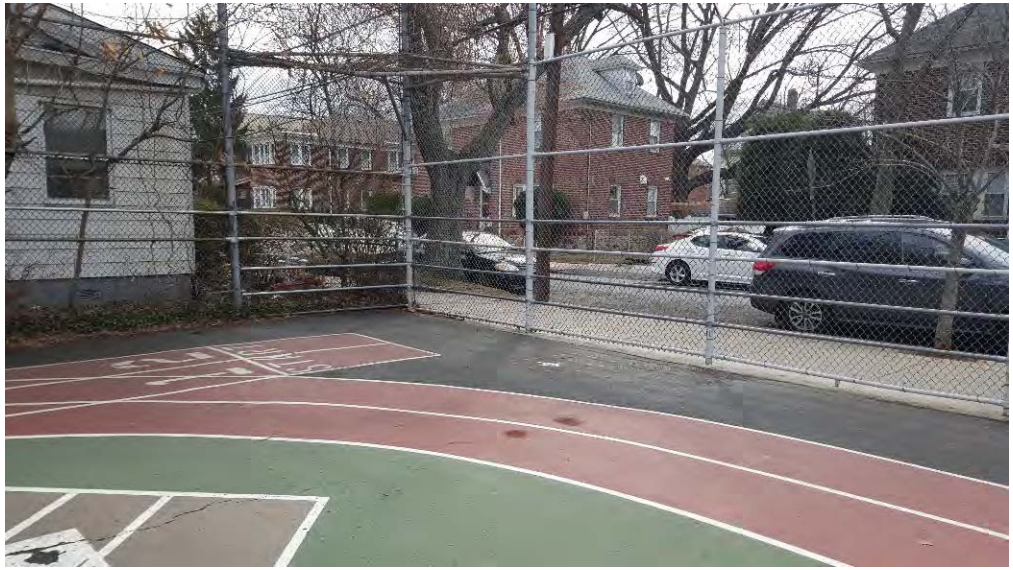
GEOPHYSICAL IMAGES

P.S. 19X
4318 Katonah Avenue
Bronx, New York 10470
March 11th, 2016



GEOPHYSICAL IMAGES

P.S. 19X
4318 Katonah Avenue
Bronx, New York 10470
March 11th, 2016



Appendix C

Soil Boring Logs, Soil Vapor and Groundwater Sample Collection Logs

AKRF, Inc.
Environmental Consultants

Soil Gas Sampling Log

Job No:	89030	**Client:**	SCA
Project Location:	19X Bronx NY	**Sampled By:**	E. Matamoros/W. Grossett
Date:	3/12/2016		

Sample ID: SV-1

Canister ID: 1528

Flow Controller ID: 0228

Purging

Time Started: 13:20

Time Stopped: 13:30

Vol. Purged: 1.5 liters

Flow Rate: 0.1 L/min

Laboratory Sample (Summa Canister)

Time Started:	13:30	**Vacuum:**	-30.00 inHg
Time Stopped:	14:29	**Vacuum:**	-4.16 inHg

Field Sample

PID Reading: 5.6 ppm

He Reading: 0.0%

AKRF, Inc.
Environmental Consultants

Soil Gas Sampling Log

Job No:	89030	**Client:**	SCA
Project Location:	19X Bronx NY	**Sampled By:**	E. Matamoros/W. Grossett
Date:	3/12/2016		

Sample ID: SV-2

Canister ID: 1981

Flow Controller ID: 0448

Purging

Time Started: 13:10

Time Stopped: 13:20

Vol. Purged: 1.5 liters

Flow Rate: 0.1 L/min

Laboratory Sample (Summa Canister)

Time Started:	13:23	**Vacuum:**	-29.25 inHg
Time Stopped:	14:27	**Vacuum:**	-2.94 inHg

Field Sample

PID Reading: 5.3 ppm

He Reading: 0.0%

AKRF, Inc.
Environmental Consultants

Soil Gas Sampling Log

Job No:	89030	**Client:**	SCA
Project Location:	19X Bronx NY	**Sampled By:**	E. Matamoros/W. Grossett
Date:	3/12/2016		

Sample ID: SV-3

Canister ID: 0193

Flow Controller ID: 1583

Purging

Time Started: 13:00

Time Stopped: 13:10

Vol. Purged: 1.5 liters

Flow Rate: 0.1 L/min

Laboratory Sample (Summa Canister)

Time Started:	13:12	**Vacuum:**	-29.86 inHg
Time Stopped:	14:15	**Vacuum:**	-7.03 inHg

Field Sample

PID Reading: 2.8 ppm

He Reading: 0.0%

AKRF, Inc.
Environmental Consultants

Soil Gas Sampling Log

Job No:	89030	**Client:**	SCA
Project Location:	19X Bronx NY	**Sampled By:**	E. Matamoros/W. Grossett
Date:	3/12/2016		

Sample ID: SV-4

Canister ID: 0066

Flow Controller ID: 1858

Purging

Time Started: 13:25

Time Stopped: 13:35

Vol. Purged: 1.5 liters

Flow Rate: 0.1 L/min

Laboratory Sample (Summa Canister)

Time Started:	13:35	**Vacuum:**	-29.93 inHg
Time Stopped:	14:35	**Vacuum:**	-5.90 inHg

Field Sample

PID Reading: 2.0 ppm

He Reading: 0.0%

AKRF, Inc.
Environmental Consultants

Soil Gas Sampling Log

Job No:	89030	**Client:**	SCA
Project Location:	19X Bronx NY	**Sampled By:**	E. Matamoros/W. Grossett
Date:	3/12/2016		

Sample ID: SV-5

Canister ID: 1706

Flow Controller ID: 0156

Purging

Time Started: 13:10

Time Stopped: 13:20

Vol. Purged: 1.5 liters

Flow Rate: 0.1 L/min

Laboratory Sample (Summa Canister)

Time Started:	13:20	**Vacuum:**	-30.00 inHg
Time Stopped:	14:22	**Vacuum:**	-7.62 inHg

Field Sample

PID Reading: 2.4 ppm

He Reading: 0.0%

SOIL BORING LOG

19X Addition

AKRF Project Number: 89030

Boring No. **SB-1**

Sheet 1 **of 1**

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method:	Geoprobe - DPP
Sampling Method:	5' Macrocore
Driller :	Zebra
Weather:	60 °F, Clear
Sampler:	E. Matamoros/W. Grossett

Drilling			
Start	15:40	**Finish**	16:00
Time		**Time**	
Date	3/12/2016		

Depth (feet)	Recovery (Inches)	**Surface Condition:** **Asphalt**	Odor	Moisture	PID	NAPL	Samples Collected for Lab Analysis
1	45	Top 4" ASPHALT	ND	Dry	ND	ND	
2		Next 18" Brown SAND and GRAVEL (FILL)	ND	Dry	ND	ND	
3		Bottom 23" Brown medium SAND, little gravel (FILL)	ND	Dry	ND	ND	
4			ND	Dry	ND	ND	
5							
6	43	43" Brown medium SAND, trace gravel	ND	Dry	ND	ND	
7			ND	Dry	ND	ND	**SB-1 (8'-9') at 16:30**
8			ND	Dry	ND	ND	
9			ND	Wet	ND	ND	
10							
11	40	40" Brown medium SAND, little gravel	ND	Wet	ND	ND	
12			ND	Wet	ND	ND	
13			ND	Wet	ND	ND	
14			ND	Wet	ND	ND	
15							
16	48	48" Brown medium SAND	ND	Wet	ND	ND	
17			ND	Wet	ND	ND	
18			ND	Wet	ND	ND	
19			ND	Wet	ND	ND	
20							

Notes: **End of boring at 20 feet below ground surface.**

Soil samples were analyzed for VOCs (8260), SVOCs (8270), PCBs (8082), TAL metals (6000/7000), Cyanide (9012), Hexavalent Chromium (7196), and TPH DRO/GRO (8015-modified).

Groundwater was encountered at 10 feet below grade.

PID = photoionization detector ppm = parts per million ND = Not Detected

SOIL BORING LOG

19X Addition

AKRF Project Number: 89030

Boring No. **SB-2**

Sheet 1 **of 1**

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method:	Geoprobe - DPP
Sampling Method:	5' Macrocore
Driller :	Zebra
Weather:	60 °F, Clear
Sampler:	E. Matamoros/W. Grossett

Drilling			
Start	14:10	**Finish**	14:20
Time		**Time**	
Date	3/12/2016		

Depth (feet)	Recovery (Inches)	**Surface Condition:** **Asphalt**	Odor	Moisture	PID	NAPL	Samples Collected for Lab Analysis
1	38	Top 7" ASPHALT	ND	Dry	ND	ND	
2		Bottom 31" Brown medium SAND, trace gravel (FILL)	ND	Dry	ND	ND	
3			ND	Dry	ND	ND	
4			ND	Dry	ND	ND	
5							
6	40	Top 24" Brown fine SAND, little clay (FILL)	ND	Moist	ND	ND	
7		Bottom 16" Brown SAND, some gravel	ND	Dry	ND	ND	**SB-1 (8'-9') at 14:25**
8			ND	Dry	ND	ND	
9			ND	Dry	ND	ND	
10							
11	28	28" Brown SAND, little gravel	ND	Dry	ND	ND	
12			ND	Dry	ND	ND	
13			ND	Dry	ND	ND	
14			ND	Wet	ND	ND	
15							
16							
17							
18							
19							
20							

Notes: **End of boring at 15 feet below ground surface.**

Soil samples were analyzed for VOCs (8260), SVOCs (8270), PCBs (8082), TAL metals (6000/7000), Cyanide (9012), Hexavalent Chromium (7196), and TPH DRO/GRO (8015-modified).

Groundwater was encountered at 14 feet below grade.

PID = photoionization detector ppm = parts per million ND = Not Detected

SOIL BORING LOG

19X Addition

AKRF Project Number: 89030

Boring No. **SB-3**

Sheet 1 **of 1**

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method:	Geoprobe - DPP
Sampling Method:	5' Macrocore
Driller :	Zebra
Weather:	60 °F, Clear
Sampler:	E. Matamoros/W. Grossett

Drilling			
Start	13:34	**Finish**	14:00
Time		**Time**	
Date	3/12/2016		

Depth (feet)	Recovery (Inches)	**Surface Condition:** **Asphalt**	Odor	Moisture	PID	NAPL	Samples Collected for Lab Analysis
1	32	Top 6" ASPHALT	ND	Dry	ND	ND	
2		Next 12" Brown medium SAND, little gravel and brick (FILL)	ND	Dry	ND	ND	
3		Bottom 14" Brown SAND	ND	Dry	ND	ND	
4			ND	Dry	ND	ND	
5							
6	32	32" Brown medium SAND, trace gravel	ND	Dry	ND	ND	
7			ND	Dry	ND	ND	**SB-3 (7'-8') at 14:25**
8			ND	Dry	ND	ND	
9		Refusal at 8' bgs.					
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Notes: **End of boring at 8 feet below ground surface.**

Soil samples were analyzed for VOCs (8260), SVOCs (8270), PCBs (8082), TAL metals (6000/7000), Cyanide (9012), Hexavalent Chromium (7196), and TPH DRO/GRO (8015-modified).

Groundwater was not encountered.

PID = photoionization detector ppm = parts per million ND = Not Detected

SOIL BORING LOG

19X Addition

AKRF Project Number: 89030

Boring No. **SB-4**

Sheet 1 **of 1**

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method:	Geoprobe - DPP
Sampling Method:	5' Macrocore
Driller :	Zebra
Weather:	60 °F, Clear
Sampler:	E. Matamoros/W. Grossett

Drilling			
Start	15:13	**Finish**	15:25
Time		**Time**	
Date	3/12/2016		

Depth (feet)	Recovery (Inches)	**Surface Condition:** **Asphalt**	Odor	Moisture	PID	NAPL	Samples Collected for Lab Analysis
1	33	Top 6" ASPHALT	ND	Dry	ND	ND	
2			ND	Dry	ND	ND	
3		Bottom 27" Brown SAND, little gravel, trace brick (FILL)	ND	Dry	ND	ND	
4			ND	Dry	ND	ND	
5							
6	38	Top 12" Brown SAND, little gravel, trace brick (FILL)	ND	Dry	ND	ND	
7			ND	Dry	ND	ND	**SB-4 (7'-8') at 15:50**
8		Bottom 26" Brown SAND	ND	Dry	ND	ND	
9			ND	Dry	ND	ND	
10							
11	24	Top 10" Brown medium SAND	ND	Dry	ND	ND	
12		Bottom 14" Gray fine SAND	ND	Dry	ND	ND	
13			ND	Dry	ND	ND	
14			ND	Wet	ND	ND	
15							
16	45	25" Gray medium SAND, some gravel	ND	Wet	ND	ND	
17			ND	Wet	ND	ND	
18			ND	Wet	ND	ND	
19			ND	Wet	ND	ND	
20							

Notes: **End of boring at 20 feet below ground surface.**

Soil samples were analyzed for VOCs (8260), SVOCs (8270), PCBs (8082), TAL metals (6000/7000), Cyanide (9012), Hexavalent Chromium (7196), and TPH DRO/GRO (8015-modified).

Groundwater was encountered at 13 feet below grade.

PID = photoionization detector ppm = parts per million ND = Not Detected

SOIL BORING LOG

19X Addition

AKRF Project Number: 89030

Boring No. **SB-5**

Sheet 1 **of 1**

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method:	Geoprobe - DPP
Sampling Method:	5' Macrocore
Driller :	Zebra
Weather:	60 °F, Clear
Sampler:	E. Matamoros/W. Grossett

Drilling			
Start	14:40	**Finish**	14:55
Time		**Time**	
Date	3/12/2016		

Surface Condition: **Asphalt**

Depth (feet)	Recovery (Inches)		Odor	Moisture	PID	NAPL	Samples Collected for Lab Analysis
1	30	Top 6" ASPHALT	ND	Dry	ND	ND	
2			ND	Dry	ND	ND	
3		Bottom 24" Brown clayey SAND (FILL)	ND	Dry	ND	ND	
4			ND	Dry	ND	ND	
5							
6	45	Top 27" Brown clayey SAND, trace gravel (FILL)	ND	Dry	ND	ND	
7			ND	Dry	ND	ND	
8		Bottom 18" Brown medium SAND, little gravel (FILL)	ND	Dry	ND	ND	
9			ND	Dry	ND	ND	**SB-5 (9'-10') at 15:20**
10							
11	48	48" Brown SAND, trace gravel	ND	Wet	ND	ND	
12			ND	Wet	ND	ND	
13			ND	Wet	ND	ND	
14			ND	Wet	ND	ND	
15							
16	45	25" Brown and red SAND, little gravel	ND	Wet	ND	ND	
17			ND	Wet	ND	ND	
18			ND	Wet	ND	ND	
19			ND	Wet	ND	ND	
20							

Notes: **End of boring at 20 feet below ground surface.**

Soil samples were analyzed for VOCs (8260), SVOCs (8270), PCBs (8082), TAL metals (6000/7000), Cyanide (9012), Hexavalent Chromium (7196), and TPH DRO/GRO (8015-modified).

Groundwater was encountered at 10 feet below grade.

PID = photoionization detector ppm = parts per million ND = Not Detected

Well Sampling Log

Job No: 89030		**Client:** SCA	**Well No:** TW-1
Project Location:	4318 Katonah Avenue, Bronx NY	**Sampled By:** EM/WG	
Date:	3/12/2016	**Sampling Time:** 17:45	
PID at surface:	ND		
Total Depth:	18.17 ft. below top of casing	**Water Column (WC):** 7.46 feet	*= 0.163 * WC for 2" wells
Depth to Water:	10.71 ft. below top of casing	**Well Volume*:** 1.22 gallons	*= 0.653 * WC for 4" wells
Depth to Product:	ND ft. below top of casing	**Volume Purged:** 4 gallons	*= 1.469 * WC for 6" wells
Depth to top of screen:	10.00 ft. below top of casing	**Well Diam.:** 1 inch	Target maximum flow rate is 100 ml/min
Depth to bottom of screen:	20.00 ft. below top of casing	**Purging Device (pump type):** Geopump Peristaltic Pump	
Approx. Pump Intake:	14.00 ft. below top of casing		

Time	Depth to Water (Ft.)	Purge Rate (ml/min)	Temp (°C)	Conductivity (mS/cm)	pH	Turbidity (NTU)	Comments (problems, odor, sheen)
17:25	10.71	100	14.30	777.00	7.19	89	No odor/sheen
17:30	10.71	100	14.60	782.00	7.14	71	
17:35	10.71	100	14.65	872.00	7.11	42	
17:40	10.71	100	14.71	861.00	7.11	38	
17:45	10.71	100	14.71	866.00	7.12	12	
SAMPLING							
17:50	10.71	100	14.71	857.00	7.10	6	
Stabilization Criteria:				**+/- 3 mS/cm**	**+/- 0.1 pH units**	**<50 NTU**	If water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, discontinue purging and collect sample.

Groundwater samples analyzed for: TCL + CP21 VOCs + TICs 8260, TCL + CP21 SVOCs + TICs 8270, PCBs 8082, TAL Metals 6000/7000

Well Sampling Log

Job No: 89030		**Client:** SCA	**Well No:**
Project Location:	4318 Katonah Avenue, Bronx NY	**Sampled By:** EM/WG	
Date:	3/12/2016	**Sampling Time:** 16:00	**TW-2**
PID at surface:	ND		
Total Depth:	15.00 ft. below top of casing	**Water Column (WC):** 4.65 feet	*= 0.163 * WC for 2" wells
Depth to Water:	10.35 ft. below top of casing	**Well Volume*:** 0.76 gallons	*= 0.653 * WC for 4" wells
Depth to Product:	ND ft. below top of casing	**Volume Purged:** 4 gallons	*= 1.469 * WC for 6" wells
Depth to top of screen:	5.00 ft. below top of casing	**Well Diam.:** 1 inch	Target maximum flow rate is 100 ml/min
Depth to bottom of screen:	15.00 ft. below top of casing	**Purging Device (pump type):**	
Approx. Pump Intake:	13.00 ft. below top of casing	Geopump Peristaltic Pump	

Time	Depth to Water (Ft.)	Purge Rate (ml/min)	Temp (°C)	Conductivity (mS/cm)	pH	Turbidity (NTU)	Comments (problems, odor, sheen)
14:55	10.35	100	15.20	731.00	6.50	124	No odor/sheen
15:00	10.35	100	15.21	702.00	6.50	102	
15:05	10.35	100	14.89	684.00	6.50	76	
15:10	10.35	100	14.89	678.00	6.50	48	
15:15	10.35	100	14.89	675.00	6.50	31	
SAMPLING							
16:05	10.35	100	14.87	672.00	6.50	37	
Stabilization Criteria:				**+/- 3 mS/cm**	**+/- 0.1 pH units**	**<50 NTU**	If water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, discontinue purging and collect sample.

Groundwater samples analyzed for: TCL + CP21 VOCs + TICs 8260, TCL + CP21 SVOCs + TICs 8270, PCBs 8082, TAL Metals 6000/7000, + DEP Sewer Discharge Parameters (15:15)

Well Sampling Log

Job No: 89030		**Client:** SCA	**Well No:** TW-4
Project Location:	4318 Katonah Avenue, Bronx NY	**Sampled By:** EM/WG	
Date:	3/12/2016	**Sampling Time:** 17:15	
PID at surface:	ND		
Total Depth:	17.75 ft. below top of casing	**Water Column (WC):** 7.91 feet	*= 0.163 * WC for 2" wells
Depth to Water:	9.84 ft. below top of casing	**Well Volume*:** 1.29 gallons	*= 0.653 * WC for 4" wells
Depth to Product:	ND ft. below top of casing	**Volume Purged:** 4 gallons	*= 1.469 * WC for 6" wells
Depth to top of screen:	ft. below top of casing	**Well Diam.:** 1 inch	Target maximum flow rate is 100 ml/min
Depth to bottom of screen:	ft. below top of casing	**Purging Device (pump type):** Geopump Peristaltic Pump	
Approx. Pump Intake:	ft. below top of casing		

Time	Depth to Water (Ft.)	Purge Rate (ml/min)	Temp (°C)	Conductivity (mS/cm)	pH	Turbidity (NTU)	Comments (problems, odor, sheen)
16:55	9.84	100	13.80	221.00	7.04	211.0	No odor/sheen
17:00	9.84	100	13.81	158.00	7.05	158.0	
17:05	9.84	100	13.92	95.00	7.11	65.0	
17:10	9.84	100	13.95	88.00	7.11	72.0	
17:15	9.84	100	13.95	86.00	7.11	42.0	
SAMPLING							
17:20	9.84	100	13.95	81.00	7.11	31.0	
Stabilization Criteria:				**+/- 3 mS/cm**	**+/- 0.1 pH units**	**<50 NTU**	If water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, discontinue purging and collect sample.

Groundwater samples analyzed for: TCL + CP21 VOCs + TICs 8260, TCL + CP21 SVOCs + TICs 8270, PCBs 8082, TAL Metals 6000/7000

Well Sampling Log

Job No: 89030		**Client:** SCA	**Well No:** TW-5
Project Location:	4318 Katonah Avenue, Bronx NY	**Sampled By:** EM/WG	
Date:	3/12/2016	**Sampling Time:** 16:45	
PID at surface:	ND		
Total Depth:	17.80 ft. below top of casing	**Water Column (WC):** 8.97 feet	*= 0.163 * WC for 2" wells
Depth to Water:	8.83 ft. below top of casing	**Well Volume*:** 1.46 gallons	*= 0.653 * WC for 4" wells
Depth to Product:	ND ft. below top of casing	**Volume Purged:** 4 gallons	*= 1.469 * WC for 6" wells
Depth to top of screen:	10.00 ft. below top of casing	**Well Diam.:** 1 inch	Target maximum flow rate is 100 ml/min
Depth to bottom of screen:	20.00 ft. below top of casing	**Purging Device (pump type):** Geopump Peristaltic Pump	
Approx. Pump Intake:	14.00 ft. below top of casing		

Time	Depth to Water (Ft.)	Purge Rate (ml/min)	Temp (°C)	Conductivity (mS/cm)	pH	Turbidity (NTU)	Comments (problems, odor, sheen)
16:15	8.83	100	12.95	245.00	7.11	77.0	No odor/sheen
16:20	8.83	100	13.24	219.00	6.39	82.0	
16:25	8.83	100	13.25	187.00	6.41	64.0	
16:30	8.83	100	13.25	182.00	6.43	61.4	
16:35	8.83	100	13.25	175.00	6.44	49.0	
16:40	8.83	100	13.25	171.00	6.44	37.0	
16:45	8.83	100	13.25	168.00	6.44	46.0	
SAMPLING							
16:50	8.83	100	13.25	162.00	6.44	31	
Stabilization Criteria:				**+/- 3 mS/cm**	**+/- 0.1 pH units**	**<50 NTU**	If water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, discontinue purging and collect sample.

Groundwater samples analyzed for: TCL + CP21 VOCs + TICs 8260, TCL + CP21 SVOCs + TICs 8270, PCBs 8082, TAL Metals 6000/7000

Appendix D
Laboratory Analytical Data Reports