

37-23 TO 37-29 33RD STREET

QUEENS, NEW YORK

Remedial Investigation Report

NYC VCP Site Number: N/A

Prepared for:

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REMEDIAL INVESTIGATION REPORT

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
DER-10	New York State Department of Environmental Conservation Technical Guide 10
FID	Flame Ionization Detector
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IRM	Interim Remedial Measure
NAPL	Non-aqueous Phase Liquid
NYC VCP	New York City Voluntary Cleanup Program
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
NYS DOH ELAP	New York State Department of Health Environmental Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
QEP	Qualified Environmental Professional
RI	Remedial Investigation
RIR	Remedial Investigation Report
SCO	Soil Cleanup Objective
SPEED	Searchable Property Environmental Electronic Database

CERTIFICATION

I, Mark Robbins, am a Qualified Environmental Professional, as defined in RCNY § 43-1402(ar). I have primary direct responsibility for implementation of the Remedial Investigation for the 337 West 36th Street, Manhattan, (NYC VCP Site No. N/A). I am responsible for the content of this Remedial Investigation Report (RIR), have reviewed its contents and certify that this RIR is accurate to the best of my knowledge and contains all available environmental information and data regarding the property.

Qualified Environmental Professional

Date

Signature

EXECUTIVE SUMMARY

The Remedial Investigation Report (RIR) provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy pursuant to RCNY§ 43-1407(f). The remedial investigation (RI) described in this document is consistent with applicable guidance.

Site Location and Current Usage

The Site is located at 37-23 to 37-29 33rd Street in the Long Island City section in Queens, New York and is identified as Block 375 and Lots 1 and 5 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 9,765-square feet in area and is bounded by a one-story warehouse to the north, a parking lot to the south, two-story warehouses to the east, and 33rd Street to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is a vacant one story warehouse. There are four units in the warehouse, each containing a partial basement. The entire site is covered by the building.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of a seven story residential building with a full cellar. The cellar will be used for utility space and parking. The first floor will be used for a lobby, and parking space. The second through seventh floors will be used as apartments. The cellar slab will be located 10 feet below grade. Layout of the proposed site development is presented in Figure 3. The current zoning designation is M1-2/R6A. The proposed use is consistent with existing zoning for the property.

Summary of Past Uses of Site and Areas of Concern

Based upon the review of the Fire Insurance Maps and Regulatory Agency documents from the Phase I Environmental Site Assessment (ESA) Report prepared by Athenica Environmental Services, Inc. on April 8, 2013 a site history was established. The Site was developed between 1936 and 1947 with the existing building. The Site was noted as a metal products manufacturer from 1947 to 2006. The Site was also used as a tool manufacturer, a crating facility, a chemical company, and as a non descript warehouse. The same building has remained in place since the original development.

The AOCs identified for this site include:

1. The historical use of the property as manufacturing facility and chemical company;
2. The listing of the property as an E-Designation;

Summary of the Work Performed under the Remedial Investigation

The scope of work implemented by Hydro Tech included:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed four soil borings across the entire project Site, and collected eight soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed four groundwater monitoring wells throughout the Site to establish groundwater flow and collected four groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed five sub slab soil vapor probes around Site perimeter and collected five sub slab soil vapor samples for chemical analysis.
5. Collected one (1) outdoor ambient air sample.

Summary of Environmental Findings

1. Elevation of the property is 31 feet.
2. Depth to groundwater ranges from 19.93 feet bgs to 20.3 feet bgs at the Site.
3. Groundwater flow is generally from east to west beneath the Site.
4. Bedrock was not encountered during the investigation.
5. The stratigraphy of the Site, from surface down, consists of brown fine grained sand with from 0 to 12 feet below grade.
6. Soil/fill samples show no Pesticides or PCBs were detected in any of the soil samples at concentrations exceeding their MDLs. One VOC, specifically Tetrachloroethene (maximum 8.8 mg/kg) was identified in the shallow soil sample from SP-2 at a

concentration exceeding its Restricted Use SCO. One VOC, specifically Acetone (maximum 0.086 mg/kg) was detected in the soil samples at concentrations exceeding their respective Unrestricted Use SCOs but less than Restricted Residential SCOs. Three VOCs, specifically Naphthalene (maximum 0.81 mg/kg), Toluene (maximum 0.015 mg/kg), and Trichloroethene (0.01 mg/kg) were detected in the shallow and deep soil samples from SP-1 and the shallow sample from SP-2 at concentrations exceeding their method detection limits (MDLs) but less than their respective SCOs.

Seven (7) SVOCs consisting of Polycyclic Aromatic Hydrocarbons (PAHs) that are typically linked with the presence of historic fill material were identified in the shallow soil in SP-2 at concentrations exceeding Restricted Residential SCOs. These include Benzo(a)anthracene (maximum 8 mg/kg), Benzo(a)pyrene (maximum 7.5 mg/kg), Benzo(b)fluoranthene (maximum 6.1 mg/kg), Benzo(k)fluoranthene (maximum 5.9 mg/kg), Chrysene (maximum 8 mg/kg), and Dibenzo(a,h)anthracene (0.99 mg/kg), and Indeno(1,2,3-cd)pyrene (3.9 mg/kg). Ten (10) SVOCs, specifically: 2-Methylnaphthalene (maximum 0.31 mg/kg), Acenaphthene (maximum 2 mg/kg), Acenaphthylene (maximum 0.47 mg/kg), Anthracene (4.6 mg/kg), Bis(2-ethylhexyl)phthalate (3.3 mg/kg), Carbazole (maximum 1.2 mg/kg), Dibenzofuran (maximum 1.4 mg/kg), Fluoranthene (maximum 19 mg/kg), Fluorene (maximum 2.2 mg/kg), Phenanthrene (maximum 18 mg/kg), and Pyrene (maximum 15 mg/kg) were detected in the shallow soil sample from SP-2 at concentrations exceeding their respective MDLs but less than their respective SCOs. Three (3) metals including Copper (maximum 79.7 mg/kg), Lead (maximum 203 mg/kg), and Zinc (maximum 317 mg/kg) were detected in the shallow soil samples from SP-2, SP-3 and SP-4 at concentrations exceeding Unrestricted Use SCOs.

7. Groundwater samples collected during the RI show one VOC, specifically Tetrachloroethene (maximum 23 ug/L) was detected in all four of the wells at concentrations exceeding Groundwater Quality Standards (GQS). Additionally, three VOCs specifically: Bromodichloromethane (maximum 0.58 ug/L), Chloroform (maximum 5.4 ug/L), and Trichloroethene (maximum 4.9 ug/L) were detected at concentrations exceeding MDLs, but less than GQS.

Six (6) SVOCs including Benz(a)anthracene (0.17 ug/L), Benzo(a)pyrene (maximum 0.13 ug/L), Benzo(b)fluoranthene (maximum 0.12 ug/L), Benzo(k)fluoranthene (maximum

0.11 ug/L), Chrysene (maximum 0.13 ug/L), and Indeno(1,2,3-cd)pyrene (maximum 0.06 ug/L) were detected at concentrations exceeding GQS. Acenaphthene (1.8 ug/L), Fluoranthene (0.52 ug/L), Fluorene (1.2 ug/L), Naphthalene (0.7 ug/L), Phenanthrene (1.8 ug/L), and Pyrene (0.41 ug/L) were detected at concentrations exceeding MDLs, but less than GQS.

One Pesticide, specifically Dieldrin (0.014 ug/L) was detected in one of the water samples at a concentration exceeding its GQS. No other pesticides were detected in any of the water samples.

Five metals including Chromium (maximum 135 ug/L), Chromium Hexvalent (maximum 140 ug/L), Iron (maximum 3040 ug/L), Magnesium (maximum 54,800 ug/L), and Sodium (maximum 184,000 ug/L) were detected at concentrations exceeding the New York State 6NYCRR Part 703.5 Groundwater Quality Standards (GQS).

8. Soil vapor samples collected during the RI show seventeen (17) VOCs including 1,1,1-trichloroethane (maximum 37.8 ug/m³), 1,1-Dichloroethane (maximum 72 ug/m³), 1,2,4-Trimethylbenzene (maximum 11.2 ug/m³), 1,3,5-Trimethylbenzene (maximum 3.66 ug/m³), Acetone (maximum 546 ug/m³), Benzene (6.74 maximum ug/m³), Carbon Tetrachloride (34 maximum ug/m³), Chloroform (maximum 125 ug/m³), Dichlorodifluoromethane (maximum 322 ug/m³), Ethylbenzene (128 maximum ug/m³), Isopropylbenzene (maximum 4.3 ug/m³), m,p-Xylene (maximum 716 ug/m³), Methyl Ethyl Ketone (maximum 11.7 ug/m³) o-Xylene (maximum 229 ug/m³), Tetrachloroethene (maximum 46,000 ug/mg³), Toluene (maximum 1,480 ug/m³), and Trichloroethene (666 ug/m³) were detected at concentrations exceeding the NYSDOH soil vapor intrusion guidelines. Tetrachloroethylene was detected in all four (4) soil vapor samples at concentrations exceeding NYSDOH guidance values. The greatest concentrations of gasoline related compounds (BTEX) were noted in the (SSB-2) eastern portion of the property. The VOC Carbon Tetrachloride (0.62 ug/m³) was the only compound detected in the ambient outdoor air sample at a concentration exceeding its NYSDOH guidance value.

REMEDIAL INVESTIGATION REPORT

1.0 SITE BACKGROUND

D.M.A. General Contracting, Inc has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 9,765 square foot site located at 37-23 to 37-29 33rd Street in the Long Island City section of Queens, New York. Residential use is proposed for the property. The RI work was performed between November 22 to November 25, 2015. This RIR summarizes the nature and extent of contamination and provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy that is protective of human health and the environment consistent with the use of the property pursuant to RCNY§ 43-1407(f).

1.1 Site Location and Current Usage

The Site is located at 37-23 to 37-29 33rd Street in the Long Island City section in Queens, New York and is identified as Block 375 and Lots 1 and 5 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 9,765-square feet in area and is bounded by a one-story warehouse to the north, a parking lot to the south, two-story warehouses to the east, and 33rd Street to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is a vacant one story warehouse. There are four units in the warehouse, each containing a partial basement. The entire site is covered by the building.

1.2 Proposed Redevelopment Plan

The proposed future use of the Site will consist of a seven story residential building with a full cellar. The cellar will be used for utility space and parking. The first floor will be used for a lobby, and parking space. The second through seventh floors will be used as apartments. The cellar slab will be located 10 feet below grade. Layout of the proposed site development is presented in Figure 3. The current zoning designation is M1-2/R6A. The proposed use is consistent with existing zoning for the property.

1.3 Description of Surrounding Property

The site is located in a mixed use area that is zoned M1-2/R6A. The site is bounded by a 3 by a one-story warehouse to the north, a parking lot to the south, two-story warehouses to the east,

and 33rd Street to the west. There are no sensitive receptors such as schools, hospitals and day care facilities within a 500-foot radius of the site.

Figure 2 shows the surrounding land usage.

2.0 SITE HISTORY

2.1 Past Uses and Ownership

Based upon the review of the Fire Insurance Maps and Regulatory Agency documents from the Phase I Environmental Site Assessment (ESA) Report prepared by Athenica Environmental Services, Inc. on April 8, 2013 a site history was established. The site was developed between 1936 and 1947 with the existing building. The site was noted as a metal products manufacturer from 1947 to 2006. The Site was also used as a tool manufacturer, a crating facility, a chemical company, and as a non descript warehouse. The same building has remained in place since the original development.

2.2 Previous Investigations

- Phase I Environmental Site Assessment, April 8, 2013, Athenica Environmental Services Inc.
- Focused Phase II Subsurface Site Investigation, May 7, 2013, Athenica Environmental Services Inc.

2.3 Site Inspection

Erica Johnston of Hydro Tech performed the site inspection on November 16, 2015 The reconnaissance included a visual inspection of the Site. At the time of inspection, the Site contained a vacant 1-story warehouse with four store fronts. Each store front contains a partial basement used for utility face.

2.4 Areas of Concern

The AOCs identified for this site include:

1. The historical use of the property as manufacturing facility and chemical company;
2. The listing of the property as an E-Designation;

The previous reports are presented in **Appendix A**. A map showing areas of concern is presented in **Figure 4**.

3.0 PROJECT MANAGEMENT

3.1 Project Organization

The Qualified Environmental Profession (QEP) responsible for preparation of this RIR is Mark E. Robins.

3.2 Health and Safety

All work described in this RIR was performed in full compliance with applicable laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements.

3.3 Materials Management

All material encountered during the RI was managed in accordance with applicable laws and regulations.

4.0 REMEDIAL INVESTIGATION ACTIVITIES

The scope of work implemented by Hydro Tech included:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Completed a GPR survey;
3. Installed four soil borings across the entire project Site, and collected eight soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed four groundwater monitoring wells throughout the Site to establish groundwater flow and collected four groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed five sub slab soil vapor probes around Site perimeter and collected five sub slab soil vapor samples for chemical analysis.
6. Collected one (1) outdoor ambient air sample.

Photographs were taken during RI activities and are provide in **Appendix B**.

4.1 Geophysical Investigation

The survey was performed over a grid pattern that was determined immediately prior to the survey. The GPR operator wheeled the antenna over the predetermined grid. The GPR takes one “scan” per set unit. The number of scans per unit is based upon the estimated size of targets. As each scan is performed, the antenna emits specific radar amplitude into the subsurface. The amplitude of the radar reflected back to the antenna is based upon the differences in the dielectric constants of the subsurface materials. The differences in amplitude obtained during each scan are graphically displayed on the Control Unit, which are then interpreted by the GPR operator. Additional interpretations are then conducted in the office using computer software.

The GPR survey was performed successfully over the entire property due to the presence of parked vehicles and inaccessibility of the commercial units. No anomalies indicative of suspect

USTs were identified during the GPR survey. ASTs were identified in the partial basements of each building. **Appendix C** includes the GPR summary report.

4.2 Borings and Monitoring Wells

Drilling and Soil Logging

A total of four (4) soil probes designated SP-1 to SP-4 were installed and sampled at the Site. All soil probes were installed to 12 feet bgs utilizing Hydro Tech's fleet of Geoprobe® fitted with Geoprobe® tooling and sampling equipment. Soil samples were collected utilizing a 4-foot long Macro Core sampler fitted with dedicated acetate liners. Each Macro Core was cut open and immediately screened with a Photo Ionization Detector (PID) for VOCs, prior to collecting the required samples for laboratory analysis. The soil was screened and characterized at two-foot intervals. Continuous soil samples were collected during soil probe installation.

Boring logs were prepared by a geologist and are attached in **Appendix D**. A map showing the location of soil borings is shown in **Figure 5**.

Groundwater Monitoring Well Construction

Four (4) monitoring wells designated MW-1 to MW-4 were installed at the Site. All monitoring wells were installed to 25 feet bgs and were constructed of 1-inch diameter PVC. The well screens consist of 0.010-inch slots extending up 15 feet from the bottom of each well. The remaining portion of each of these wells consists of a solid riser.

Monitoring wells construction logs are attached in **Appendix E**. Groundwater sampling log with information on purging and sampling of groundwater monitor well is included in **Appendix F**. A map showing the location of monitoring wells is shown in **Figure 5**.

Survey

Land survey was used to identify the location of all monitor wells. The elevation of all installed monitoring wells were surveyed relative to a permanent surface benchmark.

Water Level Measurement

One round of static water levels was obtained prior to groundwater purging and sampling from monitoring wells to determine groundwater elevation and groundwater flow direction.

Groundwater head measurements were collected utilizing a Solinst® 122 Oil/Water Interface Probe (Interface Probe). The Interface Probe can measure depths to water to 0.01 inch. The depth to water was measured in each well from the northern portion of the casing top. Water level data is included in Table 10.

Soil Vapor Boring Construction

Five soil (5) sub slab soil vapor probes designated SSB-1 through SSB-5 were installed during the remedial investigation. The sub slab soil vapor probes were installed in accordance with the NYSDOH guidance for evaluating soil vapor intrusion dated October 2006. Each soil vapor sampling point consisted of a 1½-inch diameter stainless steel screen, or implant, fitted with dedicated polyethylene tubing. Glass beads were poured into the hole to fully encompass the screen implant and the hole was sealed with bentonite and quick dry-lock non-VOC quick set cement. A map showing the locations of soil vapor borings is shown in **Figure 5**.

4.3 Sample Collection and Chemical Analysis

Sampling performed as part of the field investigation was conducted for all Areas of Concern and also considered other means for bias of sampling based on professional judgment, area history, discolored soil, stressed vegetation, drainage patterns, field instrument measurements, odor, or other field indicators. All media including soil, groundwater and soil vapor have been sampled and evaluated in the RIR. Discrete (grab) samples have been used for final delineation of the nature and extent of contamination and to determine the impact of contaminants on public health and the environment. The sampling performed and presented in this RIR provides sufficient basis for evaluation of remedial action alternatives, establishment of a qualitative human health exposure assessment, and selection of a final remedy.

Soil Sampling

Eight (8) soil samples were collected from the soil borings on-Site for laboratory analysis; these included four (4) shallow soil samples from zero to 2 feet bgs, and four (4) deep soil samples from 10 to 12 feet bgs. Samples were collected utilizing a 4-foot long Macro Core sampler fitted with dedicated acetate liners.

All samples were properly handled and placed into the appropriately labeled containers. One field blank sample and one trip blank were collected and submitted to the laboratory as

specified in the work plan. The samples were placed in a cooler filled with ice and maintained at a maximum 4 degrees Celsius. All samples were transmitted under proper chain of custody procedures to a State-certified (ELAP) laboratory for confirmatory laboratory analyses. All holding times were met. The laboratory did not report any irregularities with respect to their internal Quality Assurance/Quality Control.

The data on soil sample collection for chemical analyses, including dates of collection and sample depths, is reported in Table 2. **Figure 5** shows the location of samples collected in this investigation. Laboratories and analytical methods are shown below.

Groundwater Sampling

Four (4) groundwater samples were collected for chemical analysis during this RI. Groundwater samples from monitoring wells were collected using the low stress (low flow) purging and sampling procedure. The low flow was accomplished with a Geopump peristaltic pump and the continuous flow was monitored with a Horiba U50 series flow cell until water quality readings had stabilized.

All water samples were collected in laboratory supplied jars, properly labeled with the sample number, the date and time of sampling, the analytical requirements, and then placed on ice for the duration of the sampling and transport to the laboratory. A chain of custody form was completed at the time of sampling and maintained until disposition of the samples at the laboratory.

Groundwater sample collection data is reported in Table 3. **Figure 5** shows the location of groundwater sampling locations. Laboratories and analytical methods are shown below.

Soil Vapor Sampling

Five (5) sub slab soil vapor samples, and one (1) ambient outdoor air were collected for chemical analysis during this RI. Soil vapor sampling locations are shown in **Figure 5**. Soil vapor sampling log is included in **Appendix G**. Methodologies used for soil vapor assessment conform to the *NYS DOH Final Guidance on Soil Vapor Intrusion, October 2006*.

A soil vapor sample from each vapor probe was collected utilizing 6 liter pre-cleaned, passivated, evacuated whole air Summa[®] Canister. In order to insure the integrity of the borehole seal and to verify that ambient air is not inadvertently drawn into the sample, a tracer gas,

Helium, was used to enrich the atmosphere in the immediate vicinity of the sampling location. Plastic sheeting was used to keep the tracer gas in contact with the soil vapor probe during the sampling while continuously monitoring air drawn from the implant with a helium detector (Dielectric Model MGD-2002, Multi-gas Detector). Helium Detector readings did not exceed zero ppm indicating Helium was not detected. Following verification that the surface seal was tight and prior to soil vapor sampling, approximately 0.3 ml of air was purged out of all vapor points utilizing a syringe.

One (1) outdoor air sample AO-1 was collected at the same time as the soil vapor samples utilizing 6-liter Summa Canisters.

The Summa Canisters were calibrated for 4 hours and the soil vapor sampling was run on each canister for the duration of 4 hours. The initial vacuum (inches of mercury) and start time was recorded immediately after opening each Summa Canister. After the sampling was complete, the final vacuum and top time was recorded. After the soil vapor sampling, each Summa was labeled and sent to a laboratory certified to perform air analysis in New York State.

Chemical Analysis

Chemical analytical work presented in this RIR has been performed in the following manner:

Factor	Description
Quality Assurance Officer	The chemical analytical quality assurance is directed by Phoenix Environmental Laboratories
Chemical Analytical Laboratory	Chemical analytical laboratory(s) used in the RI is NYS ELAP certified and were Phoenix Environmental Laboratories
Chemical Analytical Methods	Soil analytical methods: <ul style="list-style-type: none"> • TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007);

	<ul style="list-style-type: none"> • Pesticides by EPA Method 8081B (rev. 2000); • PCBs by EPA Method 8082A (rev. 2000); <p>Groundwater analytical methods:</p> <ul style="list-style-type: none"> • TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007); • Pesticides by EPA Method 8081B (rev. 2000); • PCBs by EPA Method 8082A (rev. 2000); <p>Soil vapor analytical methods:</p> <ul style="list-style-type: none"> • VOCs by TO-15 VOC parameters..
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Results of Chemical Analyses

Laboratory data for soil, groundwater and soil vapor are summarized in **Tables 2** through **10**. Laboratory data deliverables for all samples evaluated in this RIR are provided in digital form in **Appendix H**.

5.0 ENVIRONMENTAL EVALUATION

5.1 Geological and Hydrogeological Conditions

The Subject Property is located in the western portion of the Borough of Queens, New York. The elevation of the Subject Property is approximately 31 feet above mean sea level (USGS 7.5-Minute Central Park, New York Quadrangle, 1995).

Stratigraphy

The stratigraphy of the Site, from surface down, consists of brown fine grained sand with from 0 to 12 feet below grade. Boring logs describing surface conditions are presented in **Appendix D**.

Hydrogeology

A table of water level data for all monitor wells is included in **Table 1**. The average depth to groundwater is 20.08 feet and the range in depth is 19.93 to 20.30 feet. A map of groundwater level elevations with groundwater contours and inferred flow lines is shown in **Figure 6**. Groundwater flow is from east to west.

5.2 Soil Chemistry

Soil/fill samples collected during the remedial investigation were compared to the 6NYCRR Part 375 Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs) as well as to Track 2 Restricted Residential Use SCOs. 6. No Pesticides or PCBs were detected in any of the soil samples at concentrations exceeding their MDLs. One VOC, specifically Tetrachloroethene (maximum 8.8 mg/kg) was identified in the shallow soil sample from SP-2 at a concentration exceeding its Restricted Use SCO. One VOC, specifically Acetone (maximum 0.086 mg/kg) was detected in the soil samples at concentrations exceeding their respective Unrestricted Use SCOs but less than Restricted Residential SCOs. Three VOCs, specifically Naphthalene (maximum 0.81 mg/kg), Toluene (maximum 0.015 mg/kg), and Trichloroethene (0.01 mg/kg) were detected in the shallow and deep soil samples from SP-1 and the shallow sample from SP-2 at concentrations exceeding their method detection limits (MDLs) but less than their respective SCOs.

Seven (7) SVOCs consisting of Polycyclic Aromatic Hydrocarbons (PAHs) that are typically linked with the presence of historic fill material were identified in the shallow soil in SP-2 at concentrations exceeding Restricted Residential SCOs. These include

Benzo(a)anthracene (maximum 8 mg/kg), Benzo(a)pyrene (maximum 7.5 mg/kg), Benzo(b)fluoranthene (maximum 6.1 mg/kg), Benzo(k)fluoranthene (maximum 5.9 mg/kg), Chrysene (maximum 8 mg/kg), and Dibenzo(a,h)anthracene (0.99 mg/kg), and Indeno(1,2,3-cd)pyrene (3.9 mg/kg). Ten (10) SVOCs, specifically: 2-Methylnaphthalene (maximum 0.31 mg/kg), Acenaphthene (maximum 2 mg/kg), Acenaphthylene (maximum 0.47 mg/kg), Anthracene (4.6 mg/kg), Bis(2-ethylhexyl)phthalate (3.3 mg/kg), Carbazole (maximum 1.2 mg/kg), Dibenzofuran (maximum 1.4 mg/kg), Fluoranthene (maximum 19 mg/kg), Fluorene (maximum 2.2 mg/kg), Phenanthrene (maximum 18 mg/kg), and Pyrene (maximum 15 mg/kg) were detected in the shallow soil sample from SP-2 at concentrations exceeding their respective MDLs but less than their respective SCOs.

Three (3) metals including Copper (maximum 79.7 mg/kg), Lead (maximum 203 mg/kg), and Zinc (maximum 317 mg/kg) were detected in the shallow soil samples from SP-2, SP-3 and SP-4 at concentrations exceeding Unrestricted Use SCOs. Data collected during the RI is sufficient to delineate the vertical and horizontal distribution of contaminants in soil/fill at the Site. A summary table of data for chemical analyses performed on soil samples is included in **Tables 2** through **5**. **Figures 7** through **9** show the location and posts the values for soil/fill that exceed the 6NYCRR Part 375-6.8 Track 1 and Track 2 Soil Cleanup Objectives.

5.3 Groundwater Chemistry

Groundwater samples collected during the RI show no PCBs were detected in any of the water samples. One VOC, specifically Tetrachloroethene (maximum 23 ug/L) was detected in all four of the wells at concentrations exceeding Groundwater Quality Standards (GQS). Additionally, three VOCs specifically: Bromodichloromethane (maximum 0.58 ug/L), Chloroform (maximum 5.4 ug/L), and Trichloroethene (maximum 4.9 ug/L) were detected at concentrations exceeding MDLs, but less than GQS.

Six (6) SVOCs including Benz(a)anthracene (0.17 ug/L), Benzo(a)pyrene (maximum 0.13 ug/L), Benzo(b)fluoranthene (maximum 0.12 ug/L), Benzo(k)fluoranthene (maximum 0.11 ug/L), Chrysene (maximum 0.13 ug/L), and Indeno(1,2,3-cd)pyrene (maximum 0.06 ug/L) were detected at concentrations exceeding GQS. Acenaphthene (1.8 ug/L), Fluoranthene (0.52 ug/L), Fluorene (1.2 ug/L), Naphthalene (0.7 ug/L), Phenanthrene (1.8 ug/L), and Pyrene (0.41 ug/L) were detected at concentrations exceeding MDLs, but less than GQS.

One Pesticide, specifically Dieldrin (0.014 ug/L) was detected in one of the water samples at a concentration exceeding its GQS. No other pesticides were detected in any of the water samples.

Five metals including Chromium (maximum 135 ug/L), Chromium Hexvalent (maximum 140 ug/L), Iron (maximum 3040 ug/L), Magnesium (maximum 54,800 ug/L), and Sodium (maximum 184,000 ug/L) were detected at concentrations exceeding the New York State 6NYCRR Part 703.5 Groundwater Quality Standards (GQS). Data collected during the RI is sufficient to delineate the distribution of contaminants in groundwater at the Site. A summary table of data for chemical analyses performed on groundwater samples is included in Tables 6-9. Exceedances of applicable groundwater standards are shown.

Figures 10 through **13** show the location and posts the values for groundwater that exceed the New York State 6NYCRR Part 703.5 Class GA groundwater standards.

5.4 Soil Vapor Chemistry

Soil vapor results collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006.

Seventeen (17) VOCs including 1,1,1-trichloroethane (maximum 37.8 ug/m³), 1,1-Dichloroethane (maximum 72 ug/m³), 1,2,4-Trimethylbenzene (maximum 11.2 ug/m³), 1,3,5-Trimethylbenzene (maximum 3.66 ug/m³), Acetone (maximum 546 ug/m³), Benzene (6.74 maximum ug/m³), Carbon Tetrachloride (34 maximum ug/m³), Chloroform (maximum 125 ug/m³), Dichlorodifluoromethane (maximum 322 ug/m³), Ethylbenzene (128 maximum ug/m³), Isopropylbenzene (maximum 4.3 ug/m³), m,p-Xylene (maximum 716 ug/m³), Methyl Ethyl Ketone (maximum 11.7 ug/m³) o-Xylene (maximum 229 ug/m³), Tetrachloroethene (maximum 46,000 ug/mg³), Toluene (maximum 1,480 ug/m³), and Trichloroethene (666 ug/m³) were detected at concentrations exceeding the NYSDOH soil vapor intrusion guidelines.

Tetrachloroethylene was detected in all four (4) soil vapor samples at concentrations exceeding NYSDOH guidance values. The greatest concentrations of gasoline related compounds (BTEX) were noted in the (SSB-2) eastern portion of the property. The VOC Carbon Tetrachloride (0.62 ug/m³) was the only compound detected in the ambient outdoor air sample at a concentration exceeding its NYSDOH guidance value.

Data collected during the RI is sufficient to delineate the distribution of contaminants in soil vapor at the Site. A summary table of data for chemical analyses performed on soil vapor samples is included in Table 10. **Figure 14** shows the location and posts the values for soil vapor samples with detected concentrations.

5.5 Prior Activity

Based on an evaluation of the data and information from the RIR, disposal of significant amounts of hazardous waste is not suspected at this site.

5.6 Impediments to Remedial Action

There are no known impediments to remedial action at this property.