
# Generic Template for Remedial Investigation Report

# New York City Voluntary Cleanup Program

## Instructions

This document is a generic template for the development of a Remedial Investigation Report (RIR) for projects enrolled in the New York City Voluntary Cleanup Program (NYC VCP) under the management of the Mayor's Office of Environmental Remediation (OER). The purpose of this document is to expedite the development of a RIR by providing specific guidelines. This template will:

- Standardize the submission format and content requirements;
- Decrease the preparation time spent by Enrollees by providing guidance for the drafting process;
- Improve the quality of draft RIR submittals, which will shorten OER's review period and expedite approval of the report.

This template is intended to be generic and not Site-specific. It does not address every public health or environmental issue of concern to OER or the New York City Department of Health and Mental Hygiene. It is not intended to replace relevant guidance documents that govern the procedures for environmental investigations including DER-10, and it is not a substitute for the OER review and comment process.

Throughout the template there is text of different colors and highlighted bracketed items that are used to signify specific directions to adhere to while drafting the RIR. Black text signifies

exact text that is acceptable to OER to use in the RIR submission. Retention of black text in the final submission with minimal changes will promote the timely acceptance of the RIR by OER; however, it still must be edited where appropriate to reflect Site-specific conditions. Green text provides guidance to be used in the drafting process as a guide in the development of content in each section or sub-section of the RIR. All green text should be deleted from the final document prior to the submission of the RIR to OER. Text highlighted in yellow is a placeholder for Site-specific information and should be used as a prompt to insert requested information.

The RIR submitted to OER should adhere to the following conventions:

- Remove all green text and this cover sheet prior to editing
- Once green text is removed, use a 'track changes' redline/strikeout method for editing (removal or replacement) of any black text. Multiple editors and redline colors are fine;
- Replace text highlighted in yellow with site-specific information as requested and remove highlighting; and
- Submit the track changes version as a Word file.

Adhering to this template is intended to significantly shorten the review period and approval process. The generic RIR template will be subject to periodic modification and improvements. To ensure that you have the most updated version contact OER directly. As you work with this template, comments and suggestions regarding improvement of this document are welcome.

# KIMCO KISSENA CENTER

**QUEENS, NEW YORK**

# Remedial Investigation Report

**NYC VCP Site Number: 18TMP151Q**

**Prepared for:**

Kimco Kissena Center, LLC

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New Hyde Park, New York 11042

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September 2018

# REMEDIAL INVESTIGATION REPORT

# TABLE OF CONTENTS

# FIGURES

# TABLES

# APPENDICES

Appendix 1: Site Redevelopment Plans

Appendix 2: Phase I Environmental Site Assessment

Appendix 3: Boring Logs

Appendix 4: Laboratory Reports (Volumes 1 to 5)

# 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, Robert Carvalho, 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 Kissena Center Site (NYC OER Site No. 18TMP151Q). 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 46-15 to 46-31 Kissena Boulevard in the Flushing section in Queens, New York and is identified as Block 5208 and Lot 45 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 68,200 square feet (1.57 acres) and is bounded by residences to the north, Kissena Boulevard to the south, a restaurant to the east, and a commercial building and residences to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is used for a neighborhood shopping center with tenants including Gold City Supermarket, Star Laundromat and Cleaners, Ming Xing Gift Shop, and Fay DA Bakery and contains one-story 22,520 commercial building fronted by a surface parking lot.

**Summary of Proposed Redevelopment Plan**

The proposed future use of the Site will consist of the demolition of the existing structure and construction of a new commercial and residential mixed use building. Layout of the proposed site development is presented in Appendix 1. The current zoning designation is R3-2/C2-2 (commercial overlay within residential district). The proposed use is consistent with existing zoning for the property.

The development project consists of demolition of the existing structure and construction of a new commercial and residential mixed use building. The redevelopment will include the construction of an eight-story mixed used building on Block 5208, Lot 45. The new building will consist of approximately 244,339 sf dedicated to residential use; approximately 57,827 sf of ground floor commercial use; approximately 15,675 sf of community facility use; and two below grade levels of parking (to approximately 25 to 28 feet below grade). The residential floor areas will comprise approximately 244 dwelling units with 25 to 30 percent designated as affordable. Site location and existing condition plans are attached as Figures 1 and 2. The proposed redevelopment plans are depicted in Appendix 1.

**Summary of Past Uses of Site and Areas of Concern**

Based on previous documentation presented in the Phase I ESA, the current commercial shopping center structure was built in approximately 1961. Prior to that time, residences, sheds and a greenhouse operation had been present on the property (dating back to the 1920's).

The AOCs identified for this site include:

- The historic presence of an on-site dry cleaner.
- A dry well is present in the alley behind the dry cleaner. Potentially, this dry well may have been used for disposal purposes.
- A former greenhouse operation.
- Historic City Directory records suggest that portions of the current site building may have formerly been occupied by a printing operation.

**Summary of the Work Performed under the Remedial Investigation**

Kimco Kissena Center, LLC performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed 10 soil borings across the entire project Site, and collected 21 soil samples (including duplicates) for chemical analysis from the soil borings to evaluate soil quality;
3. Installed four groundwater temporary wellpoints throughout the Site and collected four groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed 11 soil vapor probes around Site perimeter and collected 13 samples (including duplicates) for chemical analysis. One indoor air and 2 ambient air samples also were collected.

**Summary of Environmental Findings**

1. Elevation of the property ranges from approximately 40 to 45 feet.
2. Depth to groundwater ranges from 28 to 30 feet at the Site.
3. Groundwater flow is anticipated from north to south beneath the Site.
4. Depth to bedrock is unknown at the site.

~~The stratigraphy of the site, from the surface down, consists of unconsolidated Quaternary stratified glacial deposits underlain by the unconsolidated sediments of the late Cretaceous Magothy and Raritan Formations.~~

5.

~~5. Soil/fill samples collected during the RI showed:~~

~~The soil sampling analytical results for~~ May 2018 and August 2018 ~~RI~~ investigations were compared to the New York State Department of Environmental Conservation (NYSDEC) 6NYCRR Part 375 Section 6.8. Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCOs). The results ~~are listed in Tables 2 and 3 with the formal analytical report provided in Appendix 4 (Volume 1 of 5 and Volume 2 of 5). The analytical results are summarized as follows:~~showed:

6.

- No pesticides, PCBs or VOCs with the exception of one VOC, acetone (max. 0.073mg/kg) were detected exceeding ~~exceedances of Unrestricted Use~~ Soil Cleanup Objectives (SCOs) in any sample.
- Several SVOCs including Benzo(a)anthracene at 2.7 mg/kg, Benzo(a)pyrene at 2.8 mg/kg, Benzo(b)fluoranthene at 3.7 mg/kg, Benzo(k)fluoranthene at 1.4 mg/kg, Chrysene at 2.6 mg/kg, Dibenzo(a,h)anthracene at 0.41 mg/kg, and Indeno(1,2,3-cd)pyrene at 2.1 mg/kg were detected exceeding Unrestricted Use SCOs in one shallow sample.

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- Three metals including mercury at 1.66 mg/kg, zinc at 207 mg/kg, and lead at 394 mg/kg were detected at concentrations exceeding Unrestricted Use SCOs in shallow samples. Of these metals, mercury also exceeded Restricted Residential SCOs.
- Overall, soil chemistry is similar to sites with historic urban fill material in New York City and does not indicate disposal.

~~were identified in the soil samples collected from Borings B-1, B-2, B-4, B-5 and B-7 to B-10 with the exception of the lab contaminant acetone (in samples B-2A and B-6A).~~

~~Estimated and minor concentrations of select SVOCs along with lead, mercury and zinc were reported in shallow soil sample B-3A. These constituents apparently are related to minor chips/flakes of asphalt rather than a discharge/release. Additionally, lead concentrations exceeding the unrestricted use SCO was reported in the shallow sample SB-6A.~~

~~Accordingly, with the exception of the select SVOCs in Sample B-3A, lead in SB-6A, and lab contaminant acetone in B-2A and B-6A, the remaining soil results conform unrestricted use standards. These select exceedances (in the shallow 0 to 2 fbgs zone) of unrestricted use SCOs will be excavated/removed as part of site redevelopment activities.~~

~~1.~~7. Groundwater samples collected during the May 2018 RI were compared to the NYSDEC Technical and Operational Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS). The results showed: ~~showed:~~

- No pesticides or PCBs were detected in any of the samples.
- Several VOCs including chloroform at 7.6 µg/L, tetrachloroethene (max. of 36 µg/L), benzene (max. of 12 µg/L), trichloroethene at 13 µg/L, cis-1,2-Dichloroethene at 11 µg/L, and 1,2,4,5-Tetramethylbenzene at 20 µg/L were detected exceeding their respective GQS's in several samples.

~~The May 2018 groundwater sampling analytical results are listed in Table 4 with the formal analytical report provided in Appendix 4 (Volume 3 of 5). The analytical results are summarized as follows:~~

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- Several SVOCs including Bis(2-ethylhexyl)phthalate (max. of 12 µg/L), Benzo(a)anthracene at 0.06 µg/L, Benzo(a)pyrene (max. of 0.07 µg/L), Benzo(b)fluoranthene (max. of 0.11 µg/L), Benzo(k)fluoranthene (max. of 0.04 µg/L), Chrysene (max. of 0.08 µg/L), and Indeno(1,2,3-cd)pyrene (max. of 0.04 µg/L) were detected exceeding their respective GQS's in several samples.
- Three metals including magnesium (max. of 58,400 µg/L), manganese (max. of 15,220 µg/L), and sodium (max. of 1,700,000 µg/L) were detected exceeding their respective GQS's in several samples.

~~• elect chlorinated volatile organic compound (CVOCs) slightly exceeding Class GA Ambient Groundwater Quality Standards (AWQS) were reported in groundwater samples B-1GW, B-2GW and/or B-3GW. These included chloroform (7.6 ppb), tetrachloroethylene (9.5 to 36 ppb), trichloroethylene (13 ppb), and cis-1,2-DCE (11 ppb). The highest levels were reported in the samples collected adjacent to Star Laundromat and Cleaners.~~

~~• Minor benzene exceedances of AWQS ranging from 2.9 ppb to 12 ppb were reported in groundwater samples B-2GW and B-3GW. Additionally, 1,2,4,5 trimethylbenzene (20 ppb) was reported in groundwater sample B-2GW.~~

~~• Elevated metals concentrations were identified in unfiltered/total TAL metals analyses. The corresponding filtered/dissolved samples did not exhibit similar elevated levels and are more indicative of background groundwater conditions.~~

~~• Estimated and/or low levels of select SVOCs were identified in all of the groundwater samples. These minor SVOC levels apparently are related to slightly turbid conditions in the temporary wellpoint samples rather than a contaminant concern.~~

~~The groundwater results suggest low level CVOC/solvent contamination~~ emanating from the cleaner/laundromat area.

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~~2.~~8. Soil vapor samples collected during the May 2018 and August 2018 ~~the~~ RI were compared to New York State Department of Health (NYSDOH) Final Guidance on Soil Vapor Intrusion (May 2017) Matrix A, B, and C guidance values. Samples showed:

**May 2018 Soil Gas Vapor Sampling**

- Samples identified petroleum-related VOCs and chlorinated VOCs present at low concentrations. Petroleum-related VOCs such as BTEX were detected at concentrations ranging from 39.7 µg/m$^3$ to 64.5 µg/m$^3$.

~~The May 2018 soil gas vapor sampling analytical results are listed in Table 4 with the formal analytical report provided in Appendix 4 (Volume 4 of 5). The analytical results are summarized as follows:~~

- The chlorinated VOC, ~~Elevated CVOC levels exceeding New York State Department of Health (NYSDOH) Matrix A, B and C sub-slab vapor guidance levels were identified in samples SV-1 and SV-2 which were collected from adjacent to Star Laundromat and Cleaners. The SV-1 exceedances included~~ vinyl chloride was detected at concentrations ranging from 4.96 µg/m$^3$ to ~~(~~1,420 µg/m$^3$ ~~ug/m3),~~ in two out of five samples.
- 1~~1~~,1-DCE was detected at a concentration of ~~(~~89.6 µg/m$^3$ ~~ug/m3),~~ in one sample.
- The chlorinated VOC, c~~e~~is-1,2-DCE was detected at concentrations ranging from 125 µg/m$^3$ to 14,600 µg/m$^3$ in two out of five soil vapor samples.
- Trichloroethene ~~((14,600 ug/m3),~~ TCE) was detected at concentrations ranging from 1.25 µg/m$^3$ ~~-~~to 29,600 µg/m$^3$ in three soil vapor samples.
- ~~-~~The chlorinated VOC, tetrachloroethene ~~(29,600 ug/m3), and~~ (~~-~~PCE) was detected in all samples at concentrations ranging from ~~E-~~ 3.43 µg/m$^3$ to ~~(~~37,300 µg/m$^3$ ~~ug/m3). The exceedances in SV-2 included cis-1,2-DCE (125 ug/m3), TCE (470 ug/m3), and PCE (452 ug/m3. ).~~
- ~~-~~The chlorinated VOCs methylene chloride, 1,1,1-TCA, and carbon tetrachloride were not detected in any sample.

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- Concentrations of PCE and TCE exceed NYSDOH Guidance matrix values and will require monitoring or remediation. The soil gas vapor results suggest a hot-spot associated with the cleaners.
- ~~No exceedances of NYSDOH sub-slab soil vapor guidance values were reported for samples SV-3 and SV-4.~~

**August 2018 Soil Gas Vapor Sampling**

~~The August 2018 soil gas vapor sampling analytical results are listed in Table 6 with the formal analytical report provided in Appendix 4 (Volume 5 of 5). The analytical results are summarized as follows:~~

- Samples identified petroleum-related VOCs and chlorinated VOCs present at low concentrations. Petroleum-related VOCs such as BTEX were detected at concentrations ranging from 118.58 µg/m$^3$ to 309.6 µg/m$^3$ in soil vapor samples and from 2.94 µg/m$^3$ to 22.12 µg/m$^3$ in ambient air samples.
- ~~No exceedances of NYSDOH sub-slab soil vapor guidance values were reported for samples SV-5 to SV-10.~~
- The ~~sub~~chlorinated VOC, methylene chloride was detected at concentrations ranging from 3.45 µg/m$^3$ to 3.89 µg/m$^3$ in two out of seven soil vapor samples and at 2.11 µg/m$^3$ in the indoor air sample.
- cis-1,2-Dichloroethene was detected at a concentration of 2.84 µg/m$^3$ in one soil vapor sample.
- The chlorinated VOCs trichloroethene (TCE) was detected at a concentration of 27.2 µg/m$^3$ in one soil vapor sample. Tetrachloroethene (PCE) was detected at concentrations ranging from 2.41 µg/m$^3$ to 753 µg/m$^3$ in four out of seven soil vapor samples and at 3.4 µg/m$^3$ in the indoor air sample.
- The chlorinated VOCs vinyl chloride, 1,1-Dichloroethene, 1-1-1, TCA, and carbon tetrachloride were not detected in any samples.
- Concentrations of PCE and TCE exceed NYSDOH Guidance matrix values and will require monitoring or remediation. ~~-slab sample (SV-11) collected in the basement below the cleaner contained 753 ug/m3 of PCE and 27.2 ug/m3 of TCE.~~

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~~The corresponding indoor air sample (AA-1) contained PCE at 3.4 ug/m3 and was non-detect for TCE.~~

- The soil gas vapor results suggest a hot-spot associated with the cleaners.

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# REMEDIAL INVESTIGATION REPORT

## 1.0 SITE BACKGROUND

Kimco Kissena Center, LLC ~~has enrolled~~ is applying to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 1.57-acre site located at 46-15 to 46-31 Kissena Boulevard in Flushing section of Queens, New York. Mixed commercial/ residential use is proposed for the property. The RI work was performed between May 2018 and August 2018. 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 46-15 to 46-31 Kissena Boulevard in the Flushing section in Queens, New York and is identified as Block 5208 and Lot 45 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 68,200 square feet (1.57 acres) and is bounded by residences to the north, Kissena Boulevard to the south, a restaurant to the east, and a commercial building and residences to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is used for a neighborhood shopping center with tenants including Gold City Supermarket, Star Laundromat and Cleaners, Ming Xing Gift Shop, and Fay DA Bakery and contains one-story 22,520 commercial building fronted by a surface parking lot.

### 1.2 Proposed Redevelopment Plan

The proposed future use of the Site will consist of the demolition of the existing structure and construction of a new commercial and residential mixed use building. Layout of the proposed site development is presented in Appendix 1. The current zoning designation is as R3-2/C2-2 (commercial overlay within residential district). The proposed use is consistent with existing zoning for the property.

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~~The development project consists of demolition of the existing structure and construction of a new commercial and residential mixed use building.~~ The redevelopment will include the construction of an eight-story mixed used building on Block 5208, Lot 45. The new building will consist of approximately 244,339 sf [please use building footprint not gross sf and include if the footprint covers the entire site] dedicated to residential use; approximately 57,827 sf of ground floor commercial use; approximately 15,675 sf of community facility use; and two below grade levels of ventilated parking. [please describe uses by floors]. ~~(to approximately 25 to 28 feet below grade).~~ Excavation will be performed to a depth of 25-28 feet [across the entire site?] for construction of the sub-grade parking lots. Approximately [X] tons of soil is anticipated to be excavated and removed as part of the redevelopment. Groundwater is located at [X] feet and therefore will not be encountered during excavation activities. The residential floor areas will comprise approximately 244 dwelling units with 25 to 30 percent designated as affordable. Site location and existing condition plans are attached as Figures 1 and 2. The proposed redevelopment plans are depicted in Appendix 1.

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### 1.3 Description of Surrounding Property

The properties adjacent to the subject site include:

Residences to the north; ~~.~~

a~~A~~ restaurant, parking lot and residences to the east; ~~.~~

c~~C~~ommercial facilities including auto repair shop, salon, pharmacy, insurance companies and offices to the south across Kissena Boulevard, and ~~.~~

a ~~A~~ commercial building with restaurants and residences to the west.

Figure 2 shows the surrounding land usage.

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## 2.0 SITE HISTORY

### 2.1 Past Uses and Ownership

Based on previous documentation presented in the Phase I ESA, the current commercial shopping center structure was built in approximately 1961. Prior to that time, residences, sheds and a greenhouse operation had been present on the property (dating back to the 1920's).

### 2.2 Previous Investigations

A Phase I ESA was issued for the subject property by EAI, Inc. on January 16, 2018. Recognized environmental concerns (RECs) identified in the Phase I ESA included the historic presence of a cleaning operation, a nearby dry well, a former greenhouse operation and the possible historic printing operations. EAI recommended follow-up soil, soil gas vapor and groundwater sampling to evaluate potential impacts associated with these RECs.

### 2.3 Site Inspection

A site inspection was performed on the entire 1.57 acre property as part of the Phase I ESA activities at the subject property by EAI, Inc. on January 9, 2018. Recognized environmental concerns (RECs) identified in the Phase I ESA included the historic presence of a cleaning operation, a nearby dry well, a former greenhouse operation and the possible historic printing operations.

Subsequent site inspections have been conducted by EAI in conjunction with the Site Investigations at the site in May and August 2108. At present, the site consists of a neighborhood shopping center with tenants including Gold City Supermarket, Star Laundromat and Cleaners, Ming Xing Gift Shop, and Fay DA Bakery and contains a one-story 22,520 commercial building fronted by a surface parking lot.

EAI's activities have been implemented to investigate soil, soil gas vapor, indoor air and groundwater conditions associated with current and historic site uses and proposed redevelopment efforts.

## 2.4 Areas of Concern

The AOCs identified for this site include:

1. The historic presence of an on-site dry cleaner.

2. A dry well is present in the alley behind the dry cleaner. Potentially, this dry well may have been used for disposal purposes.

3. A former greenhouse operation.

4. Historic City Directory records suggest that portions of the current site building may have formerly been occupied by a printing operation.

A Phase I ESA Report is presented in Appendix 2. A map showing areas of concern is presented in Figure 2 of the Phase I ESA report.

# 3.0 PROJECT MANAGEMENT

## 3.1 Project Organization

The Qualified Environmental Profession (QEP) responsible for preparation of this RIR is Robert Carvalho.

## 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

Kimco Kissena Center, LLC performed the following scope of work on [date]:

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1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed 10 soil borings across the entire project Site, and collected 21 soil samples (including duplicates) for chemical analysis from the soil borings to evaluate soil quality;
3. Installed four groundwater temporary wellpoints throughout the Site and collected four groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed 11 soil vapor probes around Site perimeter and collected 13 samples (including duplicates) for chemical analysis. One indoor air and two ambient air samples also were collected.

### 4.1 Geophysical Investigation

A ground penetrating radar (GPR) was used strictly to identify potential utilities and clear boring locations during the May 2018 and August 2018 sampling events. No other subsurface appurtenances were investigated. The GPR survey was conducted by Enviroprobe Service Inc. using a cart mounted GPR unit with a 250 MHz antenna, FisherTW-6 metallic locator, Radiodection multi-frequency transmitter and receiver.

### 4.2 Borings and Monitoring Wells

**Drilling and Soil Logging**

The borings were installed with direct-push Geoprobe equipment contracted from Tri-State Drilling Technologies, Inc. Continuous soil samples were collected as the borings were advanced by driving a two inch diameter by four foot long stainless steel sampler with dedicated liners through the soil column. The soil samples were screened with a photoionization detector (PID). Boring logs are provided in Appendix 3 with a boring/sampling summary details provided in Table 1.

An upper soil sample was collected from each boring at the 0 to 2 feet below ground surface (fbgs) interval (immediately below the asphalt surface) in each boring. A deeper soil sample was collected beneath the maximum proposed excavation depth.

Boring logs were prepared by a geologist are attached in Appendix 3. A map showing the location of soil borings and temporary wellpoints is shown in Figure 2.

**Groundwater Monitoring Well Construction**

Temporary wellpoint locations are shown in Figure 2. Temporary wellpoints consisting of one inch diameter PVC screened across the groundwater interface were installed in Borings SB-1 to SB-4.

**Survey**

The location of each boring/wellpoint/soil vapor point was determined with a global positioning system (GPS) unit.

**Water Level Measurement**

Water level data is included in Table 2. Depth to groundwater was measured with a groundwater level indicator and also observed in the Geoprobe samples during boring installation.

### 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**

21 soil samples were collected for chemical analysis during this RI. Data on soil sample collection for chemical analyses, including dates of collection and sample depths, is reported in Tables 1 to 3. Figure 3 shows the location of samples collected in this investigation. Laboratories and analytical methods are shown below. [include methods of decontamination between samples, sample preservation, chain of custody, etc.]

~~The borings were installed with direct push Geoprobe equipment contracted from Tri State Drilling Technologies, Inc. Continuous soil samples were collected as the borings were advanced by driving a two inch diameter by four foot long stainless steel sampler with dedicated liners through the soil column. The soil samples were screened with a photoionization detector (PID).~~

~~An upper soil sample was collected from each boring at the 0 to 2 feet below ground surface (fbgs) interval (immediately below the asphalt surface) in each boring. A deeper soil sample was collected beneath the maximum proposed excavation depth.~~

The soil samples were submitted to Alpha Analytical, New York State Department of Health (NYSDOH) Certified Laboratory #11148, for analyses for volatile organic compounds (VOCs) by USEPA Method 8260, semi-volatile organic compounds (SVOCs) by USEPA Method 8270, pesticides by USEPA Method 8081, polychlorinated biphenyls (PCBs) by USEPA Method 8082, and Target Analyte (TAL) metals by USEPA Method 6020. Soil samples collected from borings SB-1 to SB-4 also were analyzed for herbicides by USEPA Method 8151 to evaluate potential impact associated with a former site greenhouse. The soil sampling analytical results are summarized in Tables 2 and 3 with the laboratory report provided in Appendix 4 (Volumes 1 and 2).

**Groundwater Sampling**

Four temporary wellpoints were installed and four groundwater samples were collected for chemical analysis during this RI. [Describe the methods of groundwater sampling here and include methods of decontamination between samples, sample preservation, chain of custody,

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etc.] -Groundwater sample collection data is reported in Table 4. Figure 4 shows the location of groundwater sampling. Laboratories and analytical methods are shown below.

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Temporary wellpoints consisting of one-inch diameter slotted PVC were installed to span the groundwater interface in borings B-1 to B-4. Following wellpoint purging, groundwater samples were collected at each wellpoint and submitted for analyses for VOCs, SVOCs, pesticides, PCBs, herbicides and filtered and unfiltered TAL metals using the USEPA analytical methodologies designated below. Groundwater sampling results are summarized in Table 4 with the laboratory report provided in Appendix 4 (Volume 3).

**Soil Vapor Sampling**

11 soil vapor probes were installed and 13 soil vapor samples (including duplicates) were collected for chemical analysis during this RI. Soil vapor sampling locations are shown in Figure 5. Soil vapor sample collection data is reported in Tables 5 and 6. Soil vapor sampling data are included in Appendix 4 (Volumes 4 and 5). Methodologies used for soil vapor assessment conform to the *NYS DOH Final Guidance on Soil Vapor Intrusion, October 2006* and subsequent updates.

Temporary soil gas vapor points (SV-1 to SV-10) were installed between May 2018 and August 2018 with Geoprobe equipment at the locations shown on Figure 5. A temporary vapor point consisting of a screen/intake and dedicated Teflon tubing was installed at each location. The temporary point was completed by placing clean sand to one foot above the intake then placing bentonite to surface. A sub-slab vapor point (SV-11) also was installed in the basement beneath the cleaning facility in August 2018. Following leak/helium testing and line purging, a soil gas sample was collected in a Summa canister at each location and submitted for VOC analyses by USEPA Method TO-15. The soil vapor sampling results are listed in Tables 5 and 6 with the analytical report provided in Appendix 4 (Volumes 4 and 5).

Ambient air sample AA-1 (5/18) and AA-2 (8/18) also were collected for TO-15 analyses during the May and August 2018 sampling rounds. Additionally, duplicate soil gas vapor samples (SV-D corresponding to SV-4, and SV-7D corresponding to SV-7) were collected and analyzed for

TO-15. Indoor air sample AA-1 (8/18) also was collected in the basement beneath the cleaner in August 2018 and analyzed for VOCs by Method TO-15.

**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 Zarah Thanasides |
| Chemical Analytical Laboratory | Chemical analytical laboratory used in the RI is NYS ELAP certified and was Alpha Analytical |
| Chemical Analytical Methods | Soil and Groundwater analytical methods:<br>• TAL Metals by EPA Method 6010C (rev. 2007);<br>• VOCs by EPA Method 8260C (rev. 2006);<br>• SVOCs by EPA Method 8270D (rev. 2007);<br>• Pesticides by EPA Method 8081B (rev. 2000);<br>• PCBs by EPA Method 8082A (rev. 2000);<br>• Herbicides by EPA Method 8151 (in borings B-1 to B-4). |

| | |
|---|---|
| | ~~Groundwater analytical methods:~~<br>• ~~TAL Metals by EPA Method 6010C (rev. 2007);~~<br>• ~~VOCs by EPA Method 8260C (rev. 2006);~~<br>• ~~SVOCs by EPA Method 8270D (rev. 2007);~~<br>• ~~Pesticides by EPA Method 8081B (rev. 2000);~~<br>• ~~PCBs by EPA Method 8082A (rev. 2000);~~<br>• ~~Herbicides by EPA Method 8151.~~<br>Soil vapor analytical methods:<br>• VOCs by TO-15 VOC parameters. |

**Results of Chemical Analyses**

Laboratory data for soil, groundwater and soil vapor are summarized in Tables 2 to 6, respectively. Laboratory data deliverables for all samples evaluated in this RIR are provided in digital form in Appendix 4 (Volumes 1 to 5).

## 5.0 ENVIRONMENTAL EVALUATION

### 5.1 Geological and Hydrogeological Conditions

**Stratigraphy**

The subject site is located at an elevation of approximately 40 to 45 feet above sea level. The topography of the site is relatively flat. The property is situated in the Coastal Plain Physiographic Province. The Coastal Plain is characterized by unconsolidated late Cretaceous and Tertiary clay, silt, sand and gravel overlain by a Quaternary stratified sequence.

The May and August 2018 investigations identified that subsurface conditions at the property (beneath the asphalt pavement) consist of approximately four to five feet of clay fill underlain by dense sand with clay, silt and gravel. Groundwater was encountered at approximately 28 to 30 fbgs.

**Hydrogeology**

A table of water level data for all temporary wellpoints is included in Table 2. The average depth to groundwater is 29 fbgs and the range in depth is 28 to 30 fbgs. Groundwater flow is anticipated from north to south.

### 5.2 Soil Chemistry

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 and 3. Figure 3 shows the location and posts the values for soil/fill that exceed the 6NYCRR Part 375-6.8 Track 2 Soil Cleanup Objectives.

The soil sampling analytical results for May 2018 and August 2018 are listed in Tables 2 and 3 with the formal analytical report provided in Appendix 4 (Volumes 1 and 2). The analytical results are summarized as follows:

- No exceedances of Unrestricted Use Soil Cleanup Objectives (SCOs) were identified in the soil samples collected from Borings B-1, B-2, B-4, B-5 and B-7 to B-10 with the exception of the lab contaminant acetone (in samples B-2A and B-6A).

- Estimated and minor concentrations of select SVOCs along with lead, mercury and zinc were reported in shallow soil sample B-3A. These constituents apparently are related to minor chips/flakes of asphalt rather than a discharge/release. Additionally, lead concentrations exceeding the unrestricted use SCO was reported in the shallow sample SB-6A.

Accordingly, with the exception of the select SVOCs in Sample B-3A, lead in SB-6A, and lab contaminant acetone in B-2A and B-6A, the remaining soil results conform unrestricted use standards. These select exceedances (in the shallow 0 to 2 fbgs zone) of unrestricted use SCOs will be excavated/removed as part of site redevelopment activities.

## 5.3 Groundwater Chemistry

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 Table 4. Exceedences of applicable groundwater standards are shown.

Figure 4 shows the location and posts the values for groundwater that exceed the New York State 6NYCRR Part 703.5 Class GA groundwater standards.

The May 2018 groundwater sampling analytical results are listed in Table 4 with the formal analytical report provided in Appendix 4 (Volume 3). The analytical results are summarized as follows:

- Select chlorinated volatile organic compound (CVOCs) slightly exceeding Class GA Ambient Groundwater Quality Standards (AWQS) were reported in groundwater samples B-1GW, B-2GW and/or B-3GW. These included chloroform (7.6 ppb), tetrachloroethylene (9.5 to 36 ppb), trichloroethylene (13 ppb), and cis-1,2 DCE (11 ppb). The highest levels were reported in the samples collected adjacent to Star Laundromat and Cleaners.

- Minor benzene exceedances of AWQS ranging from 2.9 ppb to 12 ppb were reported in groundwater samples B-2GW and B-3GW. Additionally, 1,2,4,5 trimethylbenzene (20 ppb) was reported in groundwater sample B-2GW.

- Elevated metals concentrations were identified in unfiltered/total TAL metals analyses. The corresponding filtered/dissolved samples did not exhibit similar elevated levels and are more indicative of background groundwater conditions.

- Estimated and/or low levels of select SVOCs were identified in all of the groundwater samples. These minor SVOC levels apparently are related to slightly turbid conditions in the temporary wellpoint samples rather than a contaminant concern.

The groundwater results suggest low level CVOC/solvent contamination emanating from the cleaner/laundromat area.

## 5.4 Soil Vapor Chemistry

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 Tables 5 and 6. Figure 5 shows the location and posts the values for soil vapor samples with detected concentrations.

The results of the soil gas vapor sampling revealed:

**May 2018 Soil Gas Vapor Sampling**

The May 2018 soil gas vapor sampling analytical results are listed in Table 5 with the formal analytical report provided in Appendix 4 (Volume 4). The analytical results are summarized as follows:

- Elevated CVOC levels exceeding New York State Department of Health (NYSDOH) Matrix A, B and C sub-slab vapor guidance levels were identified in samples SV-1 and SV-2 which were collected from adjacent to Star Laundromat and Cleaners. The SV-1 exceedances included vinyl chloride (1,420 ug/$m^3$), 1,1-DCE (89.6 ug/$m^3$), cis-1,2-DCE (14,600 ug/$m^3$), TCE (29,600 ug/$m^3$), and PCE (37,300 ug/$m^3$). The exceedances in SV-2 include cis-1,2-DCE (125 ug/$m^3$), TCE (470 ug/$m^3$), and PCE (452 ug/$m^3$).

- No exceedances of NYSDOH sub-slab soil vapor guidance values were reported for samples SV-3 and SV-4.

**August 2018 Soil Gas Vapor Sampling**

The August 2018 soil gas vapor sampling analytical results are listed in Table 6 with the formal analytical report provided in Appendix 4 (Volume 5). The analytical results are summarized as follows:

- No exceedances of NYSDOH sub-slab soil vapor guidance values were reported for samples SV-5 to SV-10.
- The sub-slab sample (SV-11) collected in the basement below the cleaner contained 753 ug/$m^3$ of PCE and 27.2 ug/$m^3$ of TCE. The corresponding indoor air sample (AA-1) contained PCE at 3.4 ug/$m^3$ and was non-detect for TCE.

The soil vapor results suggest a hot-spot associated with the cleaners.

## 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.