

Division of Environmental Remediation

**Phase I
Remedial Investigation
Scope of Work**

**Highland Plaza Off-Site Area
Tonawanda, Erie County, New York
Site Number C915293A**

April 2017

New York State Department of Environmental Conservation
Region 9
270 Michigan Avenue
Buffalo, New York 14203

TABLE OF CONTENTS

SECTION	PAGE
1.0 OBJECTIVES	1
2.0 SITE HISTORY AND BACKGROUND.....	3
2.1 SITE DESCRIPTION	3
2.2 SITE FEATURES	3
2.3 SITE HISTORY	3
2.4 REMEDIAL HISTORY.....	4
2.4.1 <i>Shallow Soil & Fill Analytical Results</i>	4
2.4.2 <i>Subsurface Soil Analytical Results</i>	5
2.4.3 <i>Groundwater Analytical Results</i>	6
2.5 SITE GEOLOGY AND HYDROGEOLOGY	6
3.0 SCOPE OF WORK.....	8
3.1 INITIAL SITE SURVEY	10
3.2 SURFACE SOIL SAMPLING AND ANALYSIS	11
3.3 SOIL BORING PROGRAM	12
3.3.1 <i>Drilling Methods</i>	13
3.3.2 <i>Shallow Fill & Subsurface Soil Sample Collection and Analysis</i>	13
3.3.3 <i>Completion of the Soil Boring Program</i>	14
3.3.4 <i>Geologic Logging</i>	14
3.3.5 <i>Decontamination</i>	14
3.4 OVERBURDEN MONITORING WELLS	15
3.4.1 <i>Well Construction</i>	16
3.4.2 <i>Geologic Logging and Well Construction Diagrams</i>	16
3.4.3 <i>Well Development</i>	16
3.4.4 <i>Groundwater Sample Collection and Analysis</i>	17
3.4.5 <i>Decontamination</i>	18
3.5 FINAL SITE SURVEY AND MAPPING.....	18
3.6 HEALTH & SAFETY	19
3.7 DATA USABILITY SUMMARY REPORTS (DUSRs)	19
3.8 REPORT PREPARATION	21

LIST OF FIGURES (Following Text)

Figure 1	Location of the Highland Plaza BCP Site
Figure 2	Highland Plaza BCP Site with Surrounding Properties
Figure 3	Detailed Site Map Showing Site Features
Figure 4	Sample Location Map, Limited Site Investigation and Vapor Intrusion Study (2014)
Figure 5	Sample Location Map, Remedial Investigation (2015-16)
Figure 6	Groundwater Contour Map
Figure 7	Proposed Surface Soil Sample Location Map
Figure 8	Proposed Soil Boring Location Map
Figure 9	Proposed Monitoring Well Location Map

LIST OF TABLES (Following Text)

Table 1	Summary of Samples Collected from the Highland Plaza Off-Site Area
Table 2	Summary of Shallow Soil & Fill Analytical Results from the Highland Plaza Off-Site Area
Table 3	Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
Table 4	Summary of Groundwater Analytical Results
Table 5	Soil Boring Stratigraphic Summary
Table 6	Summary of Water Level Data in Monitoring Wells
Table 7	Monitoring Well Construction Summary
Table 8	Sample, Soil Boring and Monitoring Well Location Data

LIST OF APPENDICES

Appendix A	Generic Health and Safety Plan
Appendix B	NYSDOH Community Air Monitoring Plan
Appendix C	Soil Boring Logs & Well Construction Diagrams
Appendix D	Analytical Results for Soil & Groundwater Samples Collected from the Highland Plaza Off-Site Area

1.0 OBJECTIVES

During a 2015/16 Remedial Investigation completed at the Highland Plaza BCP Site (Site no. C915293), significant concentrations of chlorinated volatile organic compounds (VOCs) were detected in soil and groundwater in the service alleyway behind the Highland Plaza BCP Site. The New York State Department of Environmental Conservation (NYSDEC) has assigned this off-site area site number C915293A and called it the Highland Plaza Off-Site Area. The BCP applicant, as a volunteer, was required to investigate off-site areas to determine if contaminants had migrated from the site, but was not required to complete a full remedial investigation or remediate off-site impacts.

The NYSDEC is preparing to begin a Remedial Investigation (RI) at the C915293A Site. The overall objective of the RI is to determine the nature and extent of soil, groundwater and soil vapor/air contamination at the off-site area for purposes of evaluating and selecting a remedial alternative. The specific objectives of the RI are to:

- Evaluate the nature and extent of surface soil (0" to 2" depth) contamination at the site;
- Further evaluate the nature and extent of shallow fill contamination at the site;
- Further evaluate the nature and extent of subsurface soil contamination at the site;
- Further evaluate the nature and extent of groundwater contamination at the site;
- Complete soil vapor intrusion investigations in occupied structures on properties surrounding the Highland Plaza BCP Site and Highland Plaza Off-Site Area to determine if contaminants have adversely impacted these structures; and
- Complete a comprehensive hydrogeologic evaluation of the site.

Soil vapor intrusion investigations were completed in March and April 2017, and are not part of the field activities described in this scope of work.

To meet the Remedial Investigation objectives a phased investigation will be completed

at the Highland Plaza Off-Site Area. During the Phase I RI, the nature and extent (both horizontal and vertical) of contamination in surface soil, shallow fill, subsurface soil and groundwater in the service alleyway will be evaluated. This information will be used to prepare a scope of work for the Phase II RI, which will likely include the investigation of adjacent properties (both residential and commercial) to fully delineate the nature and extent of contamination associated with the Highland Plaza Off-Site Area.

The specific responsibilities of the NYSDEC and its Standby Remedial Contractors are given in Section 3.0 of this Scope of Work. The NYSDEC is the lead agency for this investigation.

2.0 SITE HISTORY AND BACKGROUND

2.1 Site Description

The Highland Plaza BCP Site (Site no. C915293) is located at 215 Highland Parkway in the Town of Tonawanda, Erie County, New York (Figure 1). The site is bordered by Highland Parkway and commercial properties to the north, commercial properties to the east, a service alleyway and residential properties to the south, and a Getty Service Station and Colvin Boulevard to the west (Figure 2). The site is approximately 250 feet long by 100 feet wide, and covers an area of approximately 0.7 acres.

The service alleyway behind the Highland Plaza BCP Site is significantly contaminated with chlorinated VOCs and has been assigned site number C915293A by the NYSDEC. This site is bordered by the Highland Plaza BCP Site to the north, commercial and residential properties to the east, residential properties and Grimsby Road to the south, and commercial properties and Colvin Boulevard to the west. The service alleyway property is approximately 320 feet long by 25 feet wide. The exact area of the C915293A site is unknown, however, as the extent of contamination has not yet been delineated.

2.2 Site Features

Approximately 50% of the Highland Plaza BCP Site is occupied by a one story strip plaza, with most of the remaining space covered by concrete sidewalks and an asphalt parking lot (Figure 3). The strip plaza consists of three separate but connected slab on grade cinder block buildings that are subdivided into eight commercial tenant spaces. The C915293A site is vacant, although a service road runs through the center of the site (Figure 3). A narrow strip of vegetation is located between the service road and fences that separate the alleyway from the adjacent residential properties to the south. The topography of both sites is generally flat.

2.3 Site History

A 1928 Sanborn map indicates that neither site was developed, although the C915293 property was subdivided into parcels for future residential development. By 1950 the C915293 site was fully developed into a strip plaza, and all of the homes on Grimsby Road had been

constructed. Existing information suggests that the service alleyway (Site no. C915293A) was always vacant.

One of the former tenants in the plaza was High Park Dry Cleaners, which closed in March 2010. It is unknown, however, when dry cleaning operations at the plaza began.

2.4 Remedial History

In 2014, a Limited Site Investigation and Vapor Intrusion Study (SI-VIS) was completed to evaluate the strip plaza prior to its purchase by the current owner. During this study, twelve soil borings were completed throughout the property to facilitate sample collection, while three shallow (6" to 12" depth) fill samples were collected from the alleyway behind the plaza (Figure 4). In addition, a soil vapor intrusion investigation was completed in the former dry cleaner tenant space. Soil and fill samples collected from the plaza property contained trichloroethene and tetrachloroethene, while soil vapor contained elevated concentrations of dichloroethene, tetrachloroethene, and trichloroethene.

Based upon the results of the SI-VIS, the current owner applied to the NYSDEC's Brownfield Cleanup Program (BCP) in February 2015. The Highland Plaza property was accepted into the BCP in April 2015 and was assigned site number C915293 by the NYSDEC.

During the Remedial Investigation completed at the Highland Plaza BCP Site in the fall of 2015 and spring of 2016, soil outside the strip plaza building and on adjacent properties to the east and south were evaluated. In addition, monitoring wells were installed both on-site and off-site to evaluate groundwater quality and flow direction. The locations of the shallow soil and fill samples, soil borings and monitoring wells collected/completed during the RI are shown on Figure 5.

The results of the previous investigations (SI-VIS and RI) as they pertain to the Highland Plaza Off-Site Area (Site no. C915293A) are summarized in the subsections below. Information concerning sample collection and analysis is given in Table 1.

2.4.1 Shallow Soil & Fill Analytical Results

Shallow soil and fill (<1' depth) in the service alleyway is contaminated with volatile

organic compounds, semi-volatile organic compounds, pesticides and metals (Table 2). Tetrachloroethene (PCE) was the only volatile organic compound detected that exceeded its NYSDEC Part 375 residential soil cleanup objective (Table 2). Concentrations of this contaminant also exceeded the NYSDEC Part 375 groundwater protection soil cleanup objective (Table 2). Tetrachloroethene is the chemical historically used in dry cleaning operations.

The principal semi-volatile organic compounds detected in shallow soil and fill were polycyclic aromatic hydrocarbons (PAHs), which exceeded both the NYSDEC Part 375 residential and groundwater protection soil cleanup objectives (Table 2). PAHs are a group of over 100 different chemicals that are ubiquitous in the environment. Sources of PAHs include incomplete combustion of coal, oil, gasoline, garbage and wood from stoves, automobiles and incinerators. PAHs are also found in coal tar, crude oil, creosote, roofing tar, asphalt, medicines, dyes, plastics and pesticides. The PAHs detected in shallow soil and fill of the service alleyway are likely related to the presence of asphalt millings used to construct the road through the property.

Cadmium and mercury in one sample were the only metals detected at concentrations that exceeded the NYSDEC Part 375 residential soil cleanup objectives (Table 2). The concentration of mercury also exceeded its NYSDEC Part 375 groundwater protection soil cleanup objective (Table 2).

Pesticide concentrations did not exceed the NYSDEC Part 375 residential or groundwater protection soil cleanup objectives, while herbicides and polychlorinated biphenyls (PCBs) were not detected (Table 2).

2.4.2 Subsurface Soil Analytical Results

Subsurface soil in the service alleyway is contaminated with volatile organic compounds, semi-volatile organic compounds, pesticides and metals (Table 3). Chlorinated VOCs, primarily PCE, trichloroethene (TCE) and 1,2-dichloroethene (DCE), were detected at concentrations that exceeded the NYSDEC Part 375 residential soil cleanup objectives (Table 3). Concentrations of these contaminants also exceeded the NYSDEC Part 375 groundwater protection soil cleanup objectives (Table 3).

The principal semi-volatile organic compounds detected in subsurface soil were again PAHs, which exceeded both the NYSDEC Part 375 residential and groundwater protection soil

cleanup objectives (Table 3).

Pesticide and metal concentrations did not exceed the NYSDEC Part 375 residential or groundwater protection soil cleanup objectives, while herbicides and polychlorinated biphenyls (PCBs) were not detected (Table 3).

The high concentrations of chlorinated VOCs detected in soil behind the former dry cleaner tenant space suggest that the disposal of spent dry cleaner fluids took place in this area of the C915293A Site. There were no impacts to soil at the adjacent property to the east (257 Highland Parkway; Table 3).

2.4.3 Groundwater Analytical Results

The monitoring wells installed during the Remedial Investigation of the Highland Plaza BCP Site (Site no. C915293) were only analyzed for VOCs due to the low volume of groundwater in the wells. Groundwater was found to be contaminated with PCE, TCE and DCE at concentrations that exceeded the NYSDEC groundwater standards (Table 4).

Impacts to groundwater from chlorinated VOCs related to the former dry cleaner operations were documented on the eastern end of the strip plaza (Site no. C915293) under the parking lot in front of the building, and in the two off-site wells located in the service alleyway (Site no. C915293A) behind the former dry cleaner tenant space (Figure 5; Table 4). The most significant impact to groundwater was documented in the off-site wells in the alleyway.

2.5 Site Geology and Hydrogeology

The entire Highland Plaza BCP Site (Site no. C915293) is covered by either 1 foot of asphalt and crushed stone (the parking lot area) or 0.5 feet of concrete (the building floor slab and sidewalks; Table 5). The service road in the C915293A site consists of crushed stone and asphalt millings. The remaining areas of the service alleyway are covered with topsoil and/or reworked soil mixed with crushed stone and asphalt millings.

Native soil at both sites consists of very dense, reddish brown silty clay that has very low permeability. The thickness of this deposit is unknown, but is greater than 23 feet (Table 5). At the Town of Tonawanda Landfill approximately 2.3 miles northwest of the Highland Plaza BCP

Site, the reddish brown silty clay deposit ranges in thickness from 39.0 to 65.7 feet, while approximately 2.9 miles west-southwest of the site at the E.I. DuPont Yerkes Plant, the reddish brown silty clay deposit ranges from 43.5 to 76.0 feet thick.

Depth to groundwater at the site ranges from 2.8 feet to 5.4 feet (Table 6). Groundwater appears to be mounded around off-site monitoring well MW-5 and flows to the northwest, north, and northeast (Figure 6). This is misleading, however, as excavation of underground storage tanks at the adjacent gas station to the west was completed to approximately 10 feet depth with no groundwater encountered. Monitoring well construction details are given in Table 7.

3.0 SCOPE OF WORK

To meet the Remedial Investigation objectives a phased investigation will be completed at the Highland Plaza Off-Site Area that includes the following activities: (1) the completion of an initial site survey that includes property boundaries, site features, and the locations of the soil samples, soil borings and monitoring wells collected/completed during the Remedial Investigation of the Highland Plaza BCP Site; (2) the collection of surface soil (0" to 2" depth) and shallow fill (<2' depth) samples from throughout the site for chemical analysis; (3) the completion of soil borings throughout the site; (4) the collection of subsurface soil samples for chemical analysis; (5) the installation of monitoring wells throughout the site; (6) the collection of groundwater samples from all site monitoring wells for chemical analysis; (7) the completion of a final site survey; and (8) the preparation of a Phase I Remedial Investigation Report.

The Phase I RI field activities will focus on the service alleyway behind the Highland Plaza BCP Site to determine the nature and extent of contamination, especially from chlorinated VOCs, on this property. This information will be used to determine which adjacent properties need to be investigated (Phase II RI) to limit the number of access agreements required.

The NYSDEC will task Standby Remedial Contractors (Groundwater & Environmental Services as the prime contractor; EmpireGeo as the drilling and support contractor) to complete the following activities as part of the Phase I Remedial Investigation. These activities are listed in the general order in which they should be completed:

- Subcontract with a surveyor licensed in the State of New York to complete an initial survey of the site that includes: (1) the property boundaries; (2) site features such as buildings, fences, parking lots, sidewalks, etc; (3) the locations of shallow soil and fill samples collected in the alleyway during the Remedial Investigation of the Highland Plaza BCP Site; (4) soil borings and monitoring wells (both on-site and off-site) completed during the Remedial Investigation of the Highland Plaza BCP Site; and (5) utilities on and immediately adjacent to the alleyway. A base map of the site will be prepared that includes the items listed above;
- Provide a technician to collect surface soil (0" to 2" depth) samples from the site,

complete the appropriate paper work, and transport the samples and paper work to a NYSDEC contract lab for analysis. All sample locations will be staked or otherwise marked for later surveying by the licensed surveyor. The soil sample locations should also be surveyed by the Standby Remedial Contractor with a hand held Global Positioning System (GPS) unit as a contingency should the stakes or markings disappear before surveying takes place;

- Provide and mobilize to the site a direct-push unit to complete soil borings throughout the alleyway, and install micro-wells where overhead power lines cause access limitations;
- Provide and mobilize to the site a rotary drill rig to install 2-inch diameter overburden monitoring wells where access from overhead power lines is not restricted;
- Provide a geologist to complete stratigraphic logs and well construction diagrams during the soil boring and well installation activities;
- Provide a technician during the soil boring and well installation activities to collect subsurface soil samples, complete the appropriate paper work, and transport the samples and paper work to a NYSDEC contract lab for analysis;
- Provide a technician and appropriate equipment to develop, purge and sample the new and existing monitoring wells at the site. The technician will also complete the appropriate paper work, and transport the samples and paper work to a NYSDEC contract lab for analysis;
- Subcontract with a surveyor licensed in the State of New York to survey the locations of all surface soil and shallow fill samples, soil borings and monitoring wells collected/completed during the Phase I Remedial Investigation;
- Subcontract with a company that is qualified to complete a Data Usability Summary Report (DUSR) to determine if the analytical data meets the criteria for data quality and use; and
- Prepare a Phase I Remedial Investigation Report that also includes the results of

the soil vapor intrusion investigation that was completed outside of this scope of work.

Specific details of the work to be completed during the Phase I Remedial Investigation, including those activities to be conducted by the Standby Remedial Contractors, are described in the following subsections in the general order in which they should be completed.

3.1 Initial Site Survey

A surveyor licensed in the State of New York will complete a site survey that includes: (1) property boundaries; (2) site features such as buildings, fences, parking lots, sidewalks, etc.; (3) locations of shallow soil and fill samples collected from the alleyway during the Remedial Investigation of the Highland Plaza BCP Site; (4) locations of all soil borings and monitoring wells completed during the Remedial Investigation of the Highland Plaza BCP Site; and (5) utilities on and immediately adjacent to the alleyway. The boundaries of the site extend from Highland Parkway to the north, Colvin Boulevard to the west, Grimsby Road to the south, and the eastern boundary of the 245 Grimsby Road property to the east (Figure 2).

For properties in which access was granted for the soil vapor intrusion investigation, property boundary survey pins (if easily located), buildings, driveways, sidewalks, fences, etc. will be surveyed. For properties without access, property boundaries will be determined from Erie County tax maps, the Erie County On-Line Mapping website, or other equivalent sources for property boundary information.

Surface soil samples and soil boring locations not identified in the field will be added to the base map using the measurements obtained during the Remedial Investigation of the Highland Plaza BCP Site. These measurements are given in Table 8.

Dig Safely New York will be contacted to identify any underground utilities on and immediately adjacent to the alleyway. Utility flags and other markings will be surveyed as part of the utility survey. This survey should also include utility poles and meters affixed to the Highland Plaza structure.

Surveying of the existing monitoring wells will include ground surface elevation and the elevation of the inner PVC riser of each well.

A base map of the site will be prepared that includes the items described above. The survey map should be prepared as a sheet with a maximum size of 24" x 36" and at a sufficient scale to show necessary details.

Vertical control should be established to the nearest ± 0.1 foot for all ground surface elevations, while monitoring well riser elevations should be reported to the nearest ± 0.01 foot. Elevations will be determined relative to the North American Vertical Datum of 1988 (NAVD 88), with reference made to an existing monument in the vicinity of the site. Horizontal coordinates will be given in the State Plane East Zone (feet), North American Datum (NAD) of 1983 to an accuracy of ± 0.5 foot.

The survey should also be provided to the NYSDEC in electronic format (AutoCAD and PDF) on CD or via e-mail.

Additional survey requirements are discussed in Section 3.5.

3.2 Surface Soil Sampling and Analysis

Seventeen (17) surface soil (0" to 2" depth) samples will be collected from throughout the service alleyway during the Phase I Remedial Investigation to evaluate potential direct contact exposures. Six (6) of these samples will be collected from soil placed behind the plaza to level the ground surface and to inhibit surface water infiltration into the building from the alleyway. This soil originated from under the floor slab of the former dry cleaner tenant space when a sub-slab depressurization system was installed. The approximate locations of these samples are shown on Figure 7. The surface soil samples will be collected from 0" to 2" depth following the removal of the vegetative cover, if present.

The surface soil samples will be collected by the Prime Standby Remedial Contractor with disposable scoops or other appropriate sampling equipment. All samples will be placed into laboratory supplied, pre-cleaned sample jars. Please note that all samples collected for VOC analysis should be discrete, non-homogenized grab samples. The jars will be labeled with a unique sample identification code, packed in a cooler with ice, and shipped under chain-of-custody control to a NYSDEC contract lab for analysis. The Prime Standby Remedial Contractor will be responsible for obtaining the appropriate sample bottles from the lab. All invoicing from the lab will be completed in accordance with its Standby Contract with the NYSDEC.

All sample locations will be staked or otherwise marked, and surveyed by the Standby Remedial Contractor with a hand held GPS unit as a contingency should the stakes or markings disappear before surveying by the licensed surveyor takes place (see Section 3.5 below).

All surface soil samples will be analyzed for Target Compound List (TCL) volatile organic compounds, TCL semi-volatile organic compounds, TCL pesticides, TCL PCBs, and Target Analyte List (TAL) metals. All samples will be analyzed for 1,4-dioxane using analytical method 8260-SIM, while 5 samples will be analyzed for PFCs using analytical method 537.

3.3 Soil Boring Program

Twenty-two (22) subsurface soil samples were collected from the alleyway during the Remedial Investigation of the Highland Plaza BCP Site. The locations of the soil borings from which these samples were collected are shown on Figures 5 and 8, while the analytical results from the samples are summarized in Table 3. These results indicate that neither the horizontal extent nor the depth of contamination have been delineated.

One of the objectives of the Phase I Remedial Investigation, therefore, is to better delineate the extent of contamination, especially from chlorinated VOCs, in the service alleyway. To accomplish this objective, fourteen (14) soil borings will be completed throughout the alleyway at the approximate locations shown on Figure 8.

Unfortunately, there was a poor correlation between PID readings and the analytical results obtained during the Remedial Investigation of the Highland Plaza BCP Site (compare the PID readings on the soil boring logs in Appendix C with the analytical results in Table 3). For purposes of completing cost estimates for this project, it is assumed that soil borings will be completed to a depth of 32 feet.

Based upon visual and/or monitoring evidence (i.e., staining, elevated PID readings or odors), and at the direction of the NYSDEC field representative, additional soil borings may be completed to help delineate the areal extent of contamination in the alleyway.

The Drilling Contractor will be responsible for identifying and avoiding all underground utilities in the areas where the soil borings will be completed.

3.3.1 Drilling Methods

The direct-push technique is the most cost and time effective method of completing the soil borings shown on Figure 8. Based upon the subsurface conditions encountered, alternative drilling and sampling methods may be required. Either a truck or track mounted direct-push vehicle can be used for the Phase I Remedial Investigation.

3.3.2 Shallow Fill & Subsurface Soil Sample Collection and Analysis

Continuous soil cores will be collected with dedicated acetate liners in a Geoprobe MacroCore sampling system, or equivalent. The Drilling Contractor will be responsible for opening these liners. Each soil boring will be advanced to a depth of 32 feet for the purpose of geologic logging and sample collection. Soil cores will be screened for organic vapors using a PID supplied by the Standby Remedial or Drilling Contractor.

At each boring location, shallow fill samples will be collected to determine the nature and extent of contamination in the fill material. Shallow fill samples will be collected that exhibit staining, elevated PID readings or odors. In the absence of these evidences of contamination, fill samples will be collected from immediately above the native, reddish brown silty clay deposit. Existing information indicates that native soils are encountered at depths ranging from 1.5' to 2.17' in the service alleyway (Table 5).

Native subsurface soil samples will be collected from each soil boring from the most contaminated interval (based upon instrument readings, visible staining, odors, etc.) for chemical analysis. Additional samples will be collected if multiple or distinct zones of gross contamination are encountered. At a depth of 24 feet, samples for analysis will be collected from the following intervals: 23 to 24 feet, 27 to 28 feet, and 31 to 32 feet.

Samples will be collected by the Standby Remedial Contractor in consultation with the NYSDEC field representative and placed into laboratory supplied, pre-cleaned sample jars. Please note that all samples collected for VOC analysis should be discrete, non-homogenized grab samples. The jars will be labeled with a unique sample identification code, packed in a cooler with ice, and shipped under chain-of-custody control to a NYSDEC contract lab for analysis. The Standby Remedial Contractor will be responsible for obtaining the appropriate sample bottles from the lab. All invoicing from the lab will be completed in accordance with its Standby Contract

with the NYSDEC.

Fourteen (14) shallow fill samples (1 from each boring) will be analyzed for TCL volatile organic compounds, TCL semi-volatile organic compounds, TCL pesticides, TCL PCBs, and Target Analyte List (TAL) metals. All samples will be analyzed for 1,4-dioxane using analytical method 8260-SIM, while 7 samples will be analyzed for PFCs using analytical method 537.

Ninety-eight (98) subsurface soil samples (7 from each soil boring) will be analyzed for TCL volatile organic compounds, with forty-two of those samples (3 from each soil boring) also analyzed for 1,4-dioxane using analytical method 8260-SIM. Two (2) subsurface soil samples from each boring will also be analyzed for TCL semi-volatile organic compounds, TCL pesticides, TCL PCBs and Target Analyte List (TAL) metals. Seven (7) subsurface soil samples will be analyzed for PFCs using analytical method 537.

3.3.3 Completion of the Soil Boring Program

Upon completion of each soil boring, the Drilling Contractor will backfill the boring with excess soil from the samples, bentonite pellets and/or grout. Each soil boring will be staked or otherwise marked for future surveying (see Section 3.5 below).

To the extent possible, the site will be restored to conditions similar to those encountered prior to the start of the investigation. All excess material will be containerized in 55-gallon drums for later off-site disposal at a NYSDEC approved facility. The Drilling Subcontractor will supply the drums.

3.3.4 Geologic Logging

All geologic logging will be completed by a geologist employed by one of the Standby Remedial Contractors. At the completion of the Remedial Investigation field activities, the Standby Remedial Contractor will computer generate these logs and include them in the Phase I Remedial Investigation Report as an appendix.

3.3.5 Decontamination

The direct-push vehicle and sampling equipment will be decontaminated prior to arriving

at the site as there is no on-site location available for decontaminating large equipment. Reusable sampling equipment will be decontaminated between sampling locations using an appropriate detergent and 5-gallon buckets. Decontamination wastes, used PPE, sampling equipment and garbage generated during the Soil Boring Program will be bagged and removed from the site at the end of each work day. Construction of a decon pad will not be required.

3.4 Overburden Monitoring Wells

Five (5) overburden monitoring wells have been installed at the Highland Plaza BCP Site and Highland Plaza Off-Site Area (Figures 5 and 9), and monitor the reddish brown silty clay deposit (Table 7). One of the objectives of the Remedial Investigation is to complete a comprehensive hydrogeologic evaluation of the site to determine the full impact of the site on groundwater quality. To partially accomplish this objective, five (5) overburden monitoring wells will be installed during the Phase I Remedial Investigation at the approximate locations shown on Figure 9 to expand the existing monitoring well network at the site. The monitoring wells to be installed are distributed as follows:

- One monitoring well in the alleyway near RI soil boring location SB-28;
- One monitoring well in the alleyway near RI surface soil location AWSS-8;
- One monitoring well in the alleyway north of the service road and between monitoring wells MW-4 and MW-5;
- One monitoring well in the alleyway south of the service road and east of monitoring well MW-4; and
- One monitoring well in the alleyway south of the service road and west of monitoring well MW-5.

Well locations may be modified during the investigation based upon site conditions and access limitations posed by the presence of overhead and underground utilities. It is expected that additional monitoring wells will be installed during the Phase II Remedial Investigation, in which case access from adjacent property owners will be required.

The Drilling Contractor will be responsible for identifying and avoiding all overhead and

underground utility lines in the areas where monitoring wells are to be installed.

3.4.1 Well Construction

For locations where overhead utilities do not provide access limitations, monitoring wells will be installed by advancing 4¼-inch diameter augers (or other appropriate size) with continuous split spoon sampling. For locations where access limitations exist, micro-wells will be installed using the direct-push drilling technique and will be completed during the soil boring program.

The estimated depth of all wells is 24 feet, but may be deeper depending upon the findings of the soil boring program. Wells will be constructed of either 1-inch or 2-inch diameter threaded/flush joint Schedule 40 PVC screen (10 slot), threaded bottom plugs, and flush-threaded PVC riser pipe. The wells will be constructed with 10-foot long screens unless a thinner, more permeable deposit is encountered during the soil boring program (e.g., a sand or gravel lens). An appropriately graded silica sand filter pack will be placed around the screen and extend to approximately 2 feet above the screen (or less depending upon the thickness of the water-bearing zone being monitored). A minimum 2-foot thick seal of bentonite will be placed above the filter pack, followed by a cement/5% bentonite grout mixture to grade. The bentonite will be allowed to hydrate prior to placing the cement/bentonite grout. The wells will be completed with protective road boxes surrounded by concrete pads.

3.4.2 Geologic Logging and Well Construction Diagrams

All geologic logging will be completed by a geologist employed by one of the Standby Remedial Contractors. The geologist will also be responsible for completing well construction diagrams. At the completion of the Phase I Remedial Investigation field activities, the Standby Remedial Contractor will computer generate these logs and diagrams and include them in the Phase I Remedial Investigation Report as an appendix.

3.4.3 Well Development

Each newly installed and existing monitoring well will be developed by bailing, pumping or other appropriate method such as mechanical surging using a surge block device. During

development the purged water will be monitored for pH, temperature, conductivity and turbidity. These data will be recorded on Well Development Logs. All well development water will be containerized in 55-gallon drums for later off-site disposal at a NYSDEC approved facility.

Well development activities will be completed by one of the Standby Remedial Contractors. At the completion of the Phase I Remedial Investigation field activities, the Standby Remedial Contractor will computer generate the Well Development Logs and include them in the Phase I Remedial Investigation Report as an appendix.

3.4.4 Groundwater Sample Collection and Analysis

Groundwater samples will be collected from each newly installed and existing monitoring well to evaluate groundwater impacts related to the site. Prior to sampling, the wells will be purged of at least three (3) well volumes, with the purged water monitored for pH, temperature, conductivity and turbidity. These data will be recorded on Well Purge and Sampling Logs. If it appears that turbidity, pH, and conductivity are stabilizing and will benefit from further purging, additional well volumes should be purged. If the turbidity is greater than 50 NTU after purging, the well will be sampled for all parameters except metals, which will be collected within 24 hours after the completion of purging to allow suspended sediment in the well to settle out. All purging activities will be completed by the Prime Standby Remedial Contractor using standard well purging procedures (e.g., disposable bailer or the low-flow method). At the completion of the Phase I Remedial Investigation field activities, the Standby Remedial Contractor will computer generate the Well Purge and Sampling Logs and include them in the Phase I Remedial Investigation Report as an appendix.

The groundwater samples will be collected by the Prime Standby Remedial Contractor using standard groundwater sampling procedures (e.g., disposable bailer or the low-flow method) and placed into laboratory supplied, pre-cleaned sample jars. The jars will be labeled with a unique sample identification code, packed in a cooler with ice, and shipped under chain-of-custody control to a NYSDEC contract lab for analysis. The Standby Remedial Contractor will be responsible for obtaining the appropriate sample bottles from the lab. All invoicing from the lab will be completed in accordance with its Standby Contract with the NYSDEC.

All samples will be analyzed for TCL volatile organic compounds, TCL semi-volatile

organic compounds, TCL pesticides, TCL PCBs, TAL metals, 1,4-dioxane using analytical method 8260-SIM, and PFCs using analytical method 537.

3.4.5 Decontamination

The drill rig, direct-push vehicle, and sampling equipment will be decontaminated prior to arriving at the site as there is no on-site location available for decontaminating large equipment. Reusable sampling equipment will be decontaminated between sampling locations using an appropriate detergent and 5-gallon buckets. Decontamination wastes, used PPE, sampling equipment and garbage generated during the well installation activities will be bagged and removed from the site at the end of each work day. Construction of a decon pad will not be required.

3.5 Final Site Survey and Mapping

The licensed surveyor retained by the Prime Standby Remedial Contractor will complete a final survey of the site after all Phase I Remedial Investigation field activities are complete. The final survey should include the following:

- Horizontal locations and ground surface elevations of all surface soil samples collected during the Phase I Remedial Investigation;
- Horizontal locations and ground surface elevations of all soil borings completed during the Phase I Remedial Investigation; and
- Horizontal locations and vertical elevations of all monitoring wells installed during the Phase I Remedial Investigation. This will include ground surface elevation and the elevation of the inner PVC riser of each well.

The locations of all surface soil samples, soil borings and monitoring wells should be added to the base map described in Section 3.1 above.

Vertical control should be established to the nearest ± 0.1 foot for all ground surface elevations, while monitoring well riser elevations should be reported to the nearest ± 0.01 foot. Elevations should be determined relative to the North American Vertical Datum of 1988 (NAVD)

88), with reference made to an existing monument in the vicinity of the Subject Property. Horizontal coordinates should be given in the State Plane East Zone (feet), North American Datum (NAD) of 1983 to an accuracy of ± 0.5 foot.

At the completion of all surveying activities, a final site survey map should be prepared as a sheet with a maximum size of 24" x 36" and at a sufficient scale to show necessary details. The survey should also be provided to the NYSDEC in both hard copy and electronic formats (AutoCAD and PDF) on CD or via e-mail.

3.6 Health & Safety

It is anticipated that all field work can be performed in Level D personal protective equipment with Level C backup. All field work will be conducted in accordance with the Standby Remedial Contractor's Corporate Health & Safety Plan. The Standby Remedial Contractors will provide appropriate personal protective equipment (PPE) suitable for working in and around contaminated liquids, wastes and soils.

All field personnel will be informed of the location of the hospital listed in the Generic Health and Safety Plan included as Appendix A, and be made aware of the list of emergency contacts contained therein. Field supervisory personnel will become thoroughly familiar with the route to the hospital.

The Standby Remedial Contractors will be responsible for clearly delineating the work area to prevent unauthorized access. During all intrusive activities, continuous air monitoring will be conducted for organic vapors by the Standby Remedial Contractor to determine the necessity to upgrade personal protective equipment. The contractor will also comply with the NYSDOH Community Air Monitoring Plan (CAMP) during all intrusive activities. The CAMP is included as Appendix B.

3.7 Data Usability Summary Reports (DUSRs)

Data Usability Summary Reports (DUSRs) will be prepared for all analytical results by an Environmental Scientist having a Bachelor's Degree in a relevant natural or physical science or field of engineering and also having experience in environmental sampling, analysis and data review. The DUSRs provide a thorough evaluation of analytical data without the costly and time

consuming process of third party data validation. The primary objective of the DUSRs is to determine if the analytical data meets the criteria for data quality and use. The Prime Standby Remedial Contractor will retain an individual qualified to complete a DUSR. The NYSDEC will provide the DUSR Subcontractor with the necessary analytical data.

DUSRs are developed by reviewing and evaluating the analytical data packages. During the course of this review the following questions must be asked and answered:

- Is the data package complete as defined under the requirements for the NYSDEC ASP Category B or USEPA CLP deliverables?
- Have all holding times been met?
- Do all QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?
- Have all data been generated using established and agreed upon analytical protocols?
- Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?
- Have the correct data qualifiers been used?

Any Quality Control exceedances must be numerically specified in the DUSRs with the corresponding QC summary sheet from the data package attached to the DUSRs. All data that would be rejected by the EPA Region 2 Data Validation Guidelines must also be rejected in the DUSRs.

Once the data packages have been reviewed and the above questions asked and answered the DUSRs proceed to describe the samples and the analytical parameters. Data deficiencies, analytical protocol deviations and quality control problems are identified and their effect on the data will be discussed. The DUSRs will also include recommendations on resampling/reanalysis. All data qualifications must be documented following the NYSDEC ASP (1995 revision)

guidelines.

3.8 Report Preparation

Following the completion of all Phase I Remedial Investigation activities, the Prime Standby Remedial Contractor will prepare a Phase I Remedial Investigation Report that details the results of the investigation. The report will include, at a minimum, the following:

- Executive Summary and Introductory sections;
- A Site Description and History section that describes the salient features of the Highland Plaza BCP Site and off-site area, and presents a summary of the remedial history;
- A Study Objectives and Scope of Work section that describes the objectives of the Phase I Remedial Investigation and the activities that were completed during the investigation;
- A Geology and Hydrogeology section that describes the regional and site geology and hydrogeology;
- An Investigation Results section that describes the findings of the Phase I Remedial Investigation, including general observations and a summary of the analytical results obtained from various environmental media;
- A Discussion and Recommendation section that summarizes the findings of the Phase I Remedial Investigation as they relate to the investigation objectives, and discusses recommendations for future activities regarding the site;
- A References section that contains a list of references utilized or cited in the report; and
- Soil boring logs, well construction diagrams, field sampling logs, well development logs, raw analytical data (i.e., lab reports) and the DUSRs will be incorporated into the Phase I Remedial Investigation Report as appendices.

FIGURES

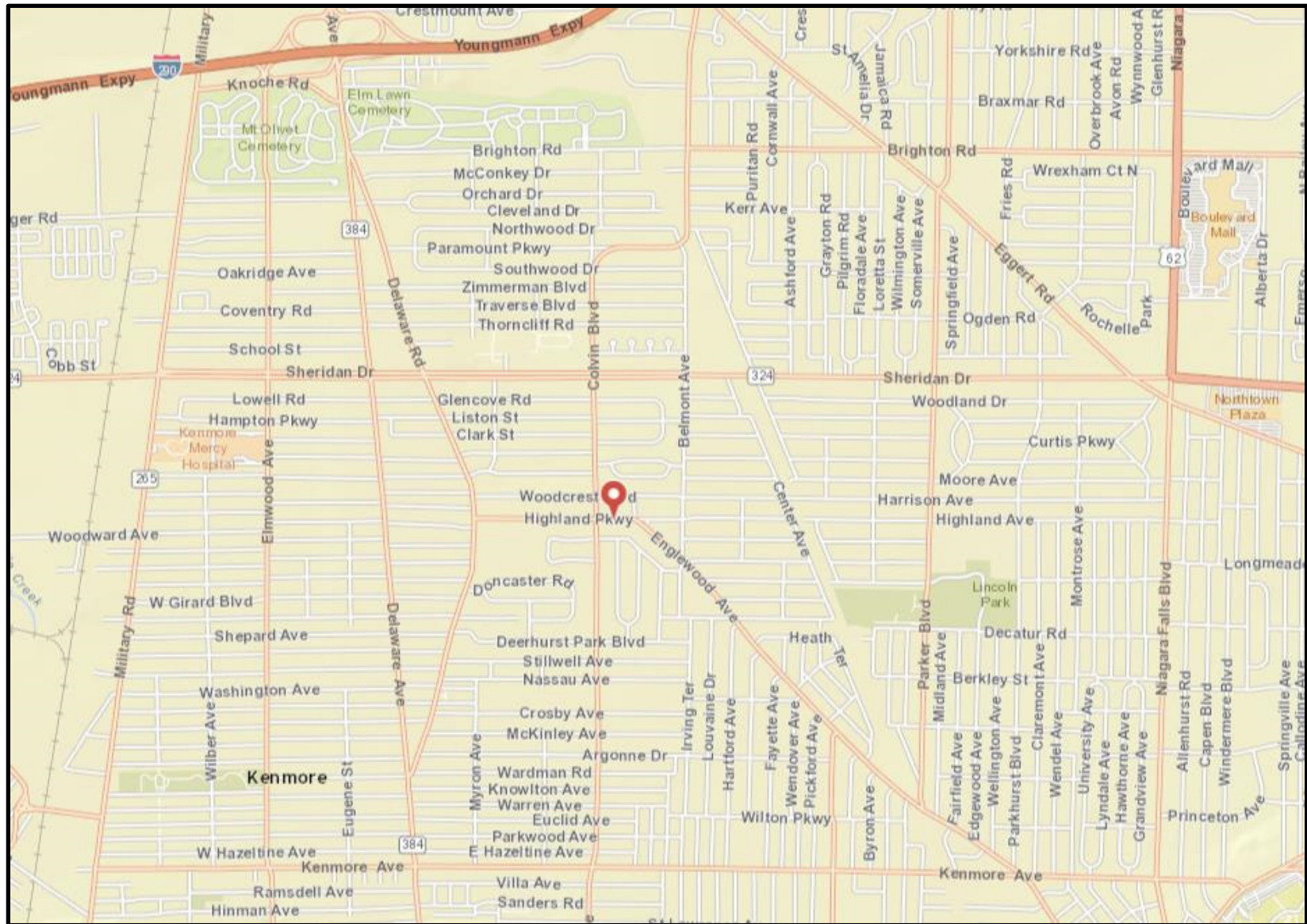


Figure 1. Location of the Highland Plaza BCP Site in Tonawanda, Erie County, New York.

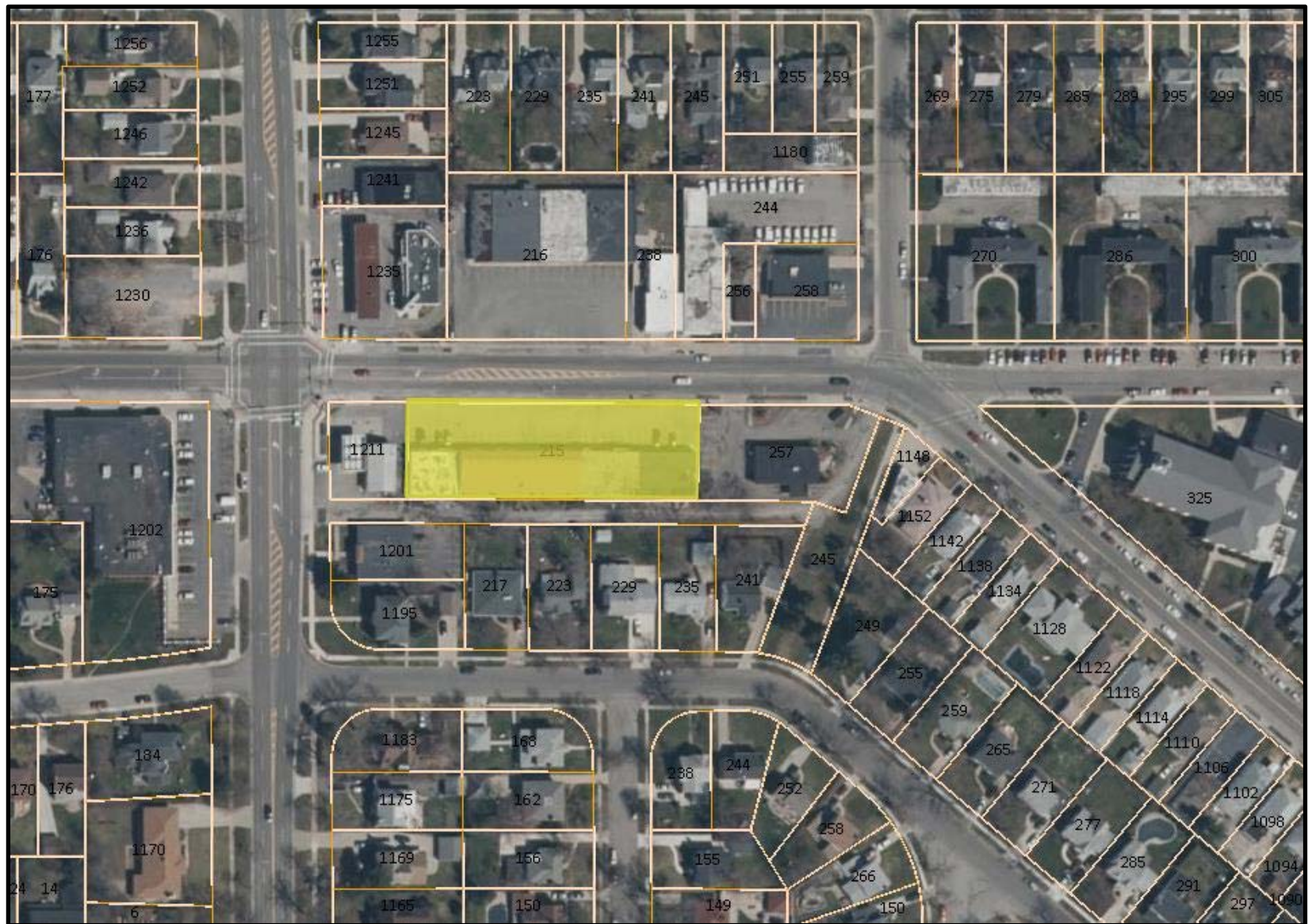


Figure 2. Highland Plaza BCP Site with Surrounding Properties.

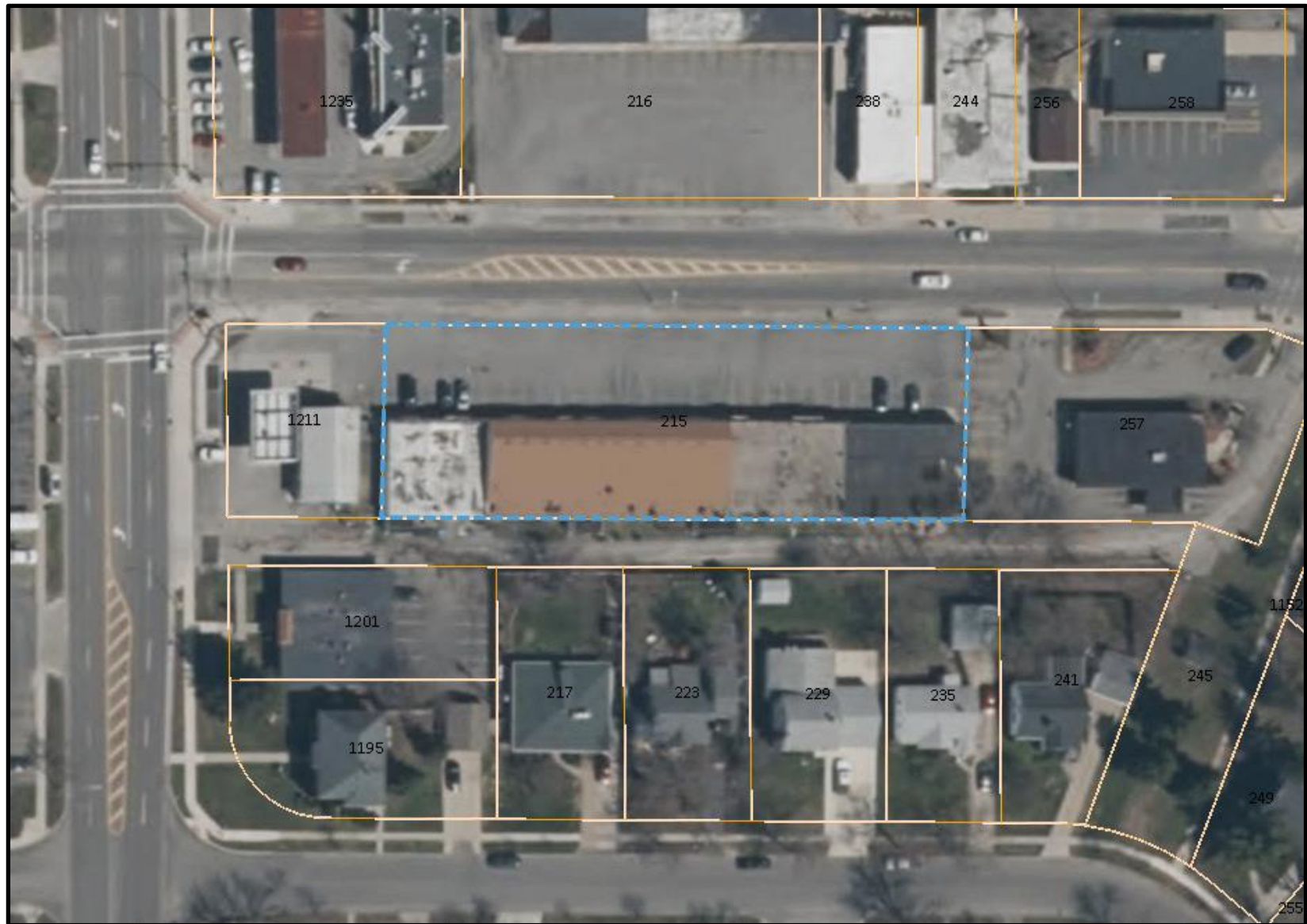
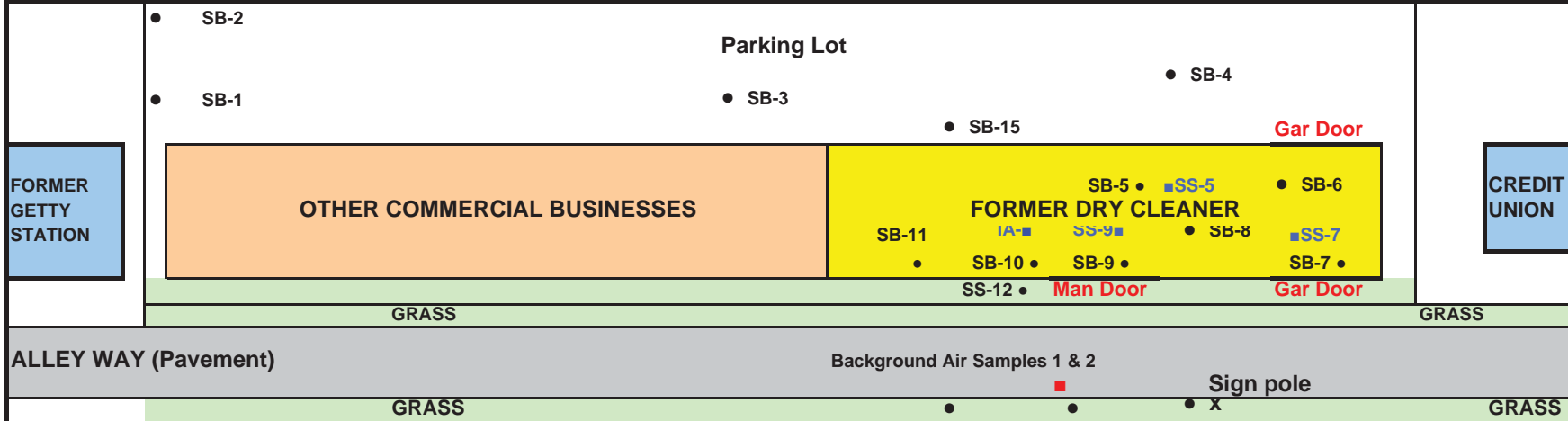


Figure 3. Detailed map of the Highland Plaza BCP Site showing site features. Note the service road behind the plaza.

EGMS

COMMERCIAL PROPERTIES

Highland Parkway



ALLEY WAY (Pavement)

Background Air Samples 1 & 2

Sign pole

GRASS

GRASS

FENCE

Fence

AWSS-2

AWSS-1

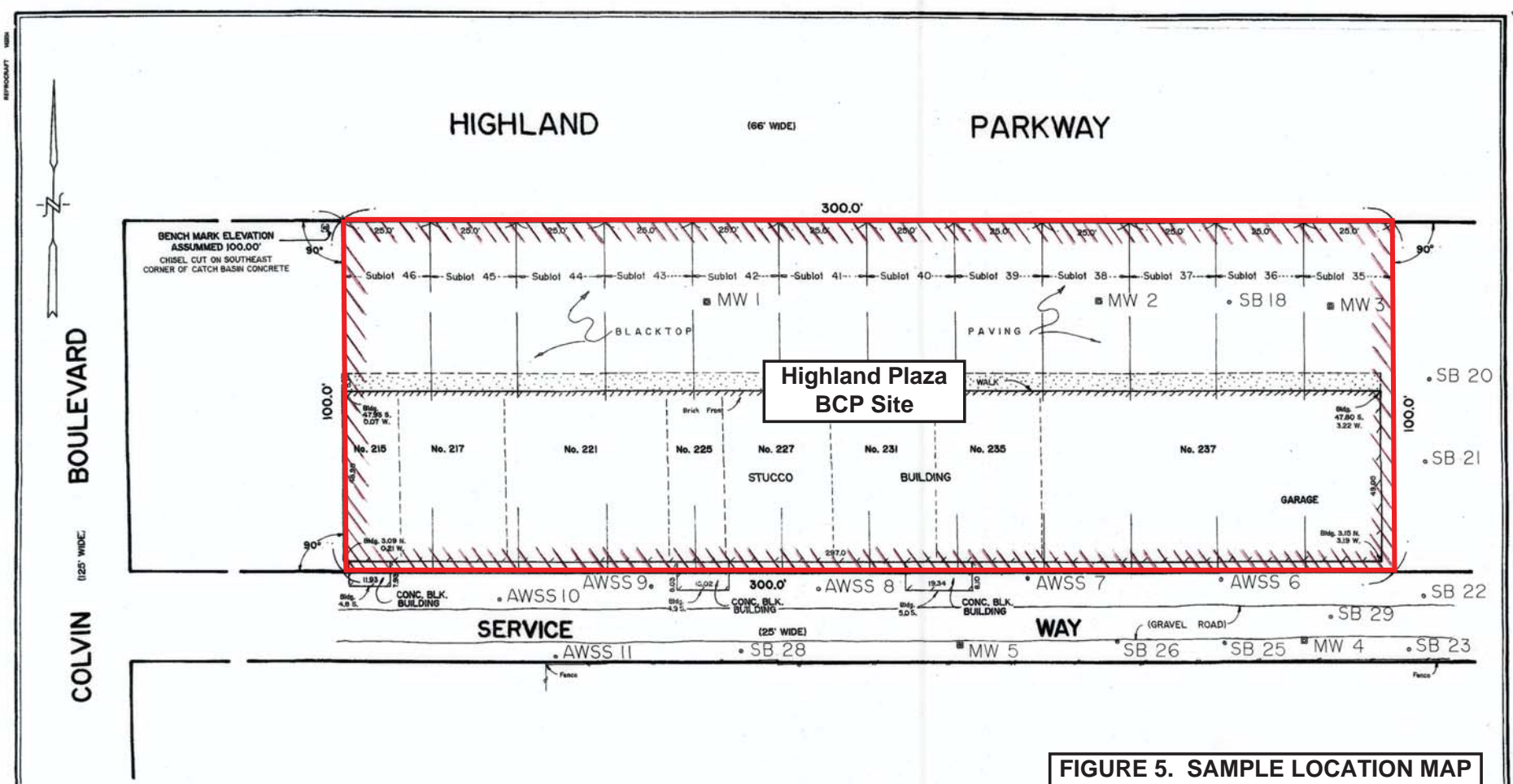
AWSS-3

Fence

RESIDENTIAL PROPERTIES (BACK YARDS)

- Soil Sampling Location
- IA - Indoor Air Sampling Location
- SS - Subslab Sampling Location
- Background Air Samples 1 & 2

FIGURE 4. SAMPLE LOCATION MAP
LIMITED SITE INVESTIGATION AND VAPOR
INTRUSION STUDY (2014)



**FIGURE 5. SAMPLE LOCATION MAP
REMEDIAL INVESTIGATION
(2015 & 2016)**

NOTE: DELINEATES BROWNFIELD AREA BOUNDARY

NOTE:
Tenant spaces/Addresses are as shown on EGMS Drawing
FIGURE 4: RI VAPOR INTRUSION SAMPLE LOCATIONS
SOIL VAPOR INTRUSION INVESTIGATION
HIGHLAND PLAZA IN TONAWANDA, N.Y.
Dated May 2016



This map void unless EMBOSSED with
New York State Licensed Land
Surveyor's Seal No. 049989

Altering any item on this map is in violation of
the law, excepting as provided in Section 7208,
Part 2 of the New York State Education Law.

This Survey was prepared without the benefit of a current
full abstract of title and is subject to any title of fact
that may be revealed by an examination of same.

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Point Description	Distance East of Northwest Property Corner	Distance South of Northwest Property Corner	Elevation (PVC Pipe)
MW 1	104.45	22.36	100.51
MW 2	216.22	22.43	100.18
MW 3	282.43	24.29	100.08
MW 4	274.59	119.19	101.45
MW 5	176.13	120.15	102.06
SB 18	253.63	22.88	
SB 20	310.68	44.85	
SB 21	309.38	68.53	
SB 22	309.20	106.52	
SB 23	304.75	121.78	
SB 25	251.83	119.34	
SB 26	221.32	118.93	
SB 28	113.74	121.41	
SB 29	282.23	112.08	
AWSS 6	251.01	101.56	
AWSS 7	195.55	101.02	
AWSS 8	136.09	104.20	
AWSS 9	88.33	102.98	
AWSS 10	45.14	106.68	
AWSS 11	61.17	122.98	

SUBLOTS 35 to 46 INCLUSIVE
MAP COVER 1400
PART OF LOT 33, TOWNSHIP 12, RANGE 8
TOWN OF TONAWANDA
ERIE COUNTY, NEW YORK

SONNENBERGER LAND SURVEYING
60 NIAGARA STREET
BUFFALO, NEW YORK 14202
(716) 854-0159
SonnenbergerLandSurveying.com

SCALE: 1" = 20'
DATE: NOV. 10, 2015
SHEET: 69621
No. 15-221 ATS
REVISED 5/20/16

HIGHLAND

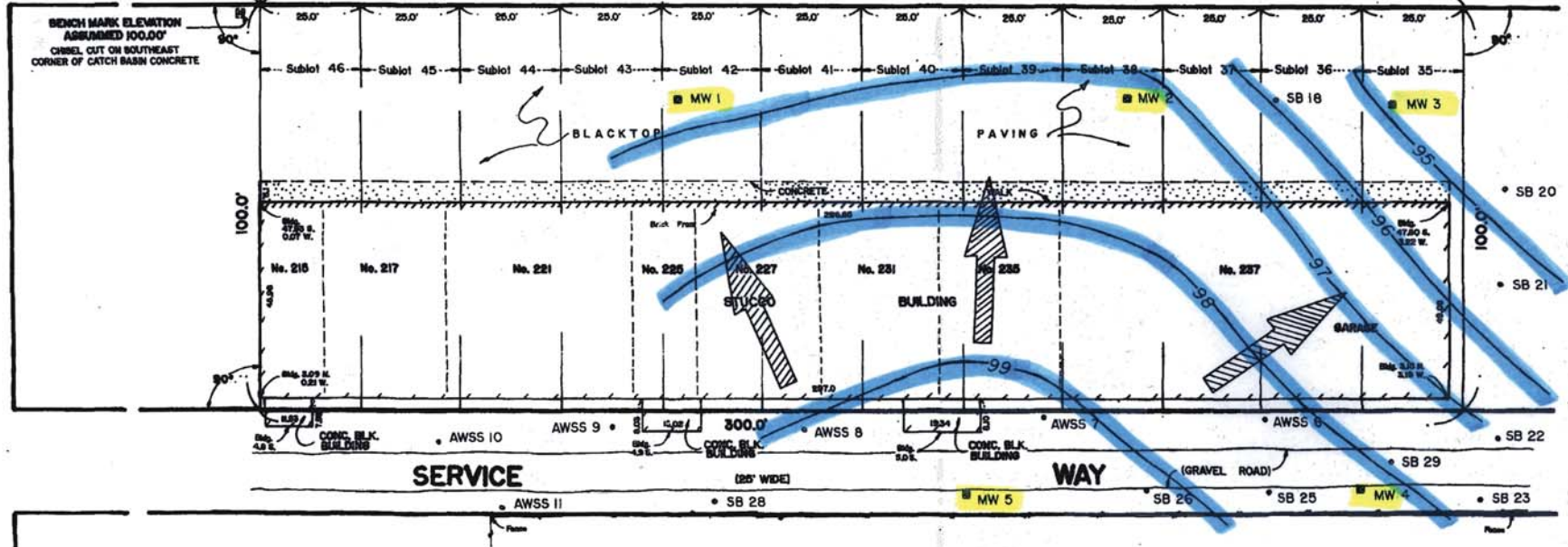
(66' WIDE)

PARKWAY

300.0'

BENCHMARK ELEVATION ASSUMED 100.00'
CHISEL CUT ON SOUTHEAST CORNER OF CATCH BASIN CONCRETE

BOULEVARD
COLVIN



NOTE:
The groundwater contour lines were provided to Sonnenberger Land Surveying by Environmental & Geological Management Services, LLC based on measurements shown on:
TABLE 3: REMEDIAL INVESTIGATION GROUNDWATER ELEVATIONS
HIGHLAND PLAZA IN TONAWANDA, N.Y.
Dated December 4, 2015

Sonnenberger Land Surveying accepts no responsibility for the accuracy or completeness of the contour lines shown.



This map, void unless EMBOSSED with New York State Licensed Land Surveyor's Seal No. 049989

Attaching any form on this map in violation of the law, excepting as provided in Section 720a, Part B of the New York State Real Property Law.

This Survey was prepared without the benefit of a current full abstract of title and is subject to any title of fact that may be revealed by an examination of same.

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Point Description	Distance East of Northwest Property Corner	Distance South of Northwest Property Corner	Elevation (PVC Pipe)	Groundwater Elevation as supplied by Environmental & Geological Management Services, LLC Table 3 Dated 12/4/15
MW 1	104.45	22.36	100.51	96.71
MW 2	216.22	22.43	100.18	97.38
MW 3	282.43	24.29	100.08	94.68
MW 4	274.59	119.19	101.43	98.35
MW 5	176.13	120.15	102.06	99.26
SB 18	253.63	22.88		
SB 20	310.68	44.85		
SB 21	309.38	68.53		
SB 22	309.20	106.52		
SB 23	304.75	121.78		
SB 25	251.83	119.34		
SB 26	221.32	113.93		
SB 28	113.24	121.41		
SB 29	282.23	112.08		
AWSS 6	251.01	101.56		
AWSS 7	195.55	101.02		
AWSS 8	136.09	104.20		
AWSS 9	88.35	102.98		
AWSS 10	45.14	106.68		
AWSS 11	61.17	122.58		

FIGURE 6. GROUNDWATER CONTOUR MAP

SUBLOTS 35 to 46 INCLUSIVE
MAP COVER 1400
PART OF LOT 33, TOWNSHIP 12, RANGE 8
TOWN OF TONAWANDA
ERIE COUNTY, NEW YORK

SONNENBERGER LAND SURVEYING
40 NIAGARA STREET
BUFFALO, NEW YORK 14202
(716) 854-0159
SonnenbergerLandSurveying.com

SCALE: 1" = 20'
DATE: NOV. 10, 2015
SHEET: 69621
No. 15-221 GW
REVISED 5/20/16



Figure 7. Proposed surface soil sample location map. Green dots are the approximate locations of the samples to be collected from soils placed behind Highland Plaza during construction of the sub-slab depressurization system in the former dry cleaner tenant space.



Figure 8. Proposed soil boring (red dots) location map. Green dots are the approximate locations of the soil borings completed during the Remedial Investigation of the Highland Plaza BCP Site.



Figure 9. Proposed monitoring well (red dots) location map. Green dots are the approximate locations of the monitoring wells completed during the Remedial Investigation of the Highland Plaza BCP Site.

TABLES

Table 1
Summary of Samples Collected from the Highland Plaza Off-Site Area
Highland Plaza Site, Site No. C915293A
Tonawanda, New York



Sample ID	Date Sampled	Time Sampled	Interval Sampled *	Analytical Parameters	Sample Description and/or Location	Table Reference
Shallow Soil & Fill Samples						
AWSS-1	07/08/14	1120	6" - 12"	VOCs	Central portion of the alley south of the service road. Sample description unknown.	Table 2
AWSS-2	07/08/14	1130	6" - 12"	VOCs	Central portion of the alley south of the service road. Sample description unknown.	Table 2
AWSS-3	07/08/14	1145	6" - 12"	VOCs	East end of the alley south of the service road. Sample description unknown.	Table 2
AWSS-6	10/18/15	0935	0" - 4"	VOCs, SVOCs, Pesticides, Herbicides, PCBs, Metals	Soil with gravel from the east end of the alley north of the service road.	Table 2
AWSS-7	10/18/15	0955	0" - 4"	VOCs, SVOCs, Pesticides, Herbicides, PCBs, Metals	Soil with gravel from the central portion of the alley north of the service road.	Table 2
AWSS-8	10/18/15	1020	0" - 4"	VOCs	Soil with gravel from the central portion of the alley north of the service road.	Table 2
AWSS-9	10/18/15	1030	0" - 4"	VOCs, SVOCs, Pesticides, Herbicides, PCBs, Metals	Soil with gravel from the west end of the alley north of the service road.	Table 2
AWSS-10	10/18/15	1100	0" - 4"	VOCs	Soil with gravel from the west end of the alley north of the service road.	Table 2
AWSS-11	10/18/15	1115	0" - 4"	VOCs, SVOCs, Pesticides, Herbicides, PCBs, Metals	Soil with gravel from the west end of the alley south of the service road.	Table 2
Subsurface Soil Samples						
SB-20	10/15/15	0930	6" - 18"	VOCs	Dark brown stained clay from boring on the 257 Highland Parkway property.	Table 3A
SB-20	10/15/15	0940	7' - 8'	VOCs	Reddish brown silty clay from boring on the 257 Highland Parkway property.	Table 3A
SB-21	10/15/15	0950	12" - 20"	VOCs	Dark brown stained clay from boring on the 257 Highland Parkway property.	Table 3A
SB-21	10/15/15	1000	7' - 8'	VOCs	Reddish brown silty clay from boring on the 257 Highland Parkway property.	Table 3A
SB-22	10/15/15	1010	6" - 18"	VOCs	Dark brown stained clay from boring at the east end of the alley north of the service road.	Table 3A
SB-22	10/15/15	1035	7' - 8'	VOCs	Reddish brown silty clay from boring at the east end of the alley north of the service road.	Table 3A
SB-23	10/15/15	1050	17" - 24"	VOCs	Dark gray stained clay from boring at the east end of the alley south of the service road.	Table 3A

Table 1
Summary of Samples Collected from the Highland Plaza Off-Site Area
Highland Plaza Site, Site No. C915293A
Tonawanda, New York



Sample ID	Date Sampled	Time Sampled	Interval Sampled *	Analytical Parameters	Sample Description and/or Location	Table Reference
Subsurface Soil Samples (continued)						
SB -23	10/15/15	1110	6' - 7'	VOCs	Reddish brown silty clay from boring at the east end of the alley south of the service road.	Table 3A
SB -24	10/15/15	1120	6" - 14"	VOCs, SVOCs, Pesticides, Herbicides, PCBs, Metals	Black course stained sand from boring at the east end of the alley south of the service road.	Table 3B
SB -24	10/15/15	1305	14' - 15'	VOCs	Reddish brown silty clay from boring at the east end of the alley south of the service road.	Table 3B
SB -24	10/15/15	1315	23' - 24'	VOCs, SVOCs, Pesticides, Herbicides, PCBs, Metals	Reddish brown silty clay from boring at the east end of the alley south of the service road.	Table 3B
SB -25	10/16/15	0900	16" - 20"	VOCs	Dark gray stained clay and gravel from boring at the east end of the alley south of the service road.	Table 3B
SB -25	10/16/15	0910	6' - 7'	VOCs	Reddish brown silty clay from boring at the east end of the alley south of the service road.	Table 3B
SB -26	10/16/15	0920	17" - 22"	VOCs	Reddish brown silty clay from boring at the east end of the alley south of the service road.	Table 3B
SB -26	10/16/15	0930	7' - 8'	VOCs	Reddish brown silty clay from boring at the east end of the alley south of the service road.	Table 3B
SB -27	10/15/15	1340	0" - 14"	VOCs, SVOCs, Pesticides, Herbicides, PCBs, Metals	Dark gray stained clay and reddish brown silty clay from boring at the central portion of the alley south of the service road.	Table 3B
SB -27	10/15/15	1405	14' - 15'	VOCs	Reddish brown silty clay from boring at the central portion of the alley south of the service road.	Table 3C
SB -27	10/15/15	1425	23' - 24'	VOCs	Reddish brown silty clay from boring at the central portion of the alley south of the service road.	Table 3C
SB -28	10/16/15	0945	10" - 22"	VOCs, SVOCs, Pesticides, Herbicides, PCBs, Metals	Gravel and reddish brown silty clay from boring at the central portion of the alley south of the service road.	Table 3C
SB -28	10/16/15	0958	7' - 8'	VOCs	Reddish brown silty clay from boring at the central portion of the alley south of the service road.	Table 3C

Table 1
Summary of Samples Collected from the Highland Plaza Off-Site Area
Highland Plaza Site, Site No. C915293A
Tonawanda, New York



Sample ID	Date Sampled	Time Sampled	Interval Sampled *	Analytical Parameters	Sample Description and/or Location	Table Reference
Subsurface Soil Samples (continued)						
SB -29	10/16/15	0820	17" - 22"	VOCs	Dark brown stained clay from boring at the east end of the alley in the service road.	Table 3C
SB -29	10/16/15	0830	7' - 8'	VOCs	Reddish brown silty clay from boring at the east end of the alley in the service road.	Table 3C
Groundwater Samples						
MW-1	12/22/15	1006	N/A	VOCs	Central portion of parking lot in front of the plaza at 512 Highland Parkway.	Table 4
MW-2	12/22/15	1006	N/A	VOCs	East end of parking lot in front of the former dry cleaner tenant space.	Table 4
MW-3	12/22/15	1006	N/A	VOCs	East end of parking lot in front of the former dry cleaner tenant space.	Table 4
MW-4	12/22/15	1006	N/A	VOCs	East end of the alley south of the service road.	Table 4
MW-5	12/22/15	1040	N/A	VOCS	Central portion of the alley south of the service road.	Table 4

Notes:

* = Sampled interval is given in inches or feet below ground surface.

VOCs = Volatile Organic Compounds.

SVOCs = Semivolatile Organic Compounds.

PCBs = Polychlorinated Biphenyls.

N/A = Not Applicable.

Table 2
 Summary of Shallow Soil and Fill Analytical Results from the Highland Plaza Off-Site Area
 Highland Plaza Site, Site No. C915293A
 Tonawanda, New York



Sample Point	Residential	Groundwater	AWSS-1	AWSS-2	AWSS-3	AWSS-6	AWSS-7	AWSS-8	AWSS-9	AWSS-10	AWSS-11
Sample Type	Soil Cleanup	Protection	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (ft)	Objectives	Soil Cleanup	6" - 12"	6" - 12"	6" - 12"	0" - 4"	0" - 4"	0" - 4"	0" - 4"	0" - 4"	0" - 4"
Sample Date	Objectives	Objectives	07/08/14	07/08/14	07/08/14	10/18/15	10/18/15	10/18/15	10/18/15	10/18/15	10/18/15
Volatile Organic Compounds (µg/kg)											
1,1,1-Trichloroethane	100,000	680.0									
1,1-Dichloroethene	100,000	330.0									
cis -1,2-Dichloroethene	59,000	250.0									
trans-1,2-Dichloroethene	100,000	190.0									
Acetone	100,000	50.0									
Benzene	2,900	60.0									
Chloroform	10,000	370.0									
Methyl ethyl ketone	100,000	120.0								16 J	
Methylene chloride	51,000	50.0						3.5 JB			9.7 JB
n-Propylbenzene	100,000	3,900									
Tetrachloroethene	5,500	1,300	40,200	19,300	89,300	2.0 J	6.3	6.2	1.0 J	0.62 J	
Toluene	100,000	700.0									
Trichloroethene	10,000	470.0									
1,2,4-Trimethylbenzene	47,000	3,600						1.4 J			
1,3,5-Trimethylbenzene	47,000	8,400									
Vinyl chloride	210.0	20.0									
Xylene (Total)	100,000	1,600						1.5 JB			1.9 JB
Semi-Volatile Organic Compounds (µg/kg)											
Bis(2-ethylhexyl) phthalate	NS	NS	NA	NA	NA			NA	6,900 J	NA	
Acenaphthene (PAH)	100,000	98,000	"	"	"			"	4,700 J	"	
Anthracene (PAH)	100,000	1,000,000	"	"	"		3,100 J	"	11,000	"	
Benzo[a]anthracene (PAH)	1,000	1,000	"	"	"		9,500 J	"	28,000	"	2,300 J
Benzo[a]pyrene (PAH)	1,000	22,000	"	"	"	2,000 J	9,600 J	"	26,000	"	3,400 J
Benzo[b]fluoranthene (PAH)	1,000	1,700	"	"	"	1,700 J	12,000	"	33,000	"	4,500 J
Benzo[g,h,i]perylene (PAH)	100,000	1,000,000	"	"	"		6,800 J	"	21,000	"	2,900 J
Benzo[k]fluoranthene (PAH)	1,000	1,700	"	"	"		5,300 J	"	16,000	"	1,100 J
Carbazole	NS	NS	"	"	"		2,600 J	"	5,700 J	"	
Chrysene (PAH)	1,000	1,000	"	"	"		9,700 J	"	28,000	"	2,800 J

Table 2
Summary of Shallow Soil and Fill Analytical Results from the Highland Plaza Off-Site Area
Highland Plaza Site, Site No. C915293A
Tonawanda, New York



Sample Point	Residential	Groundwater	AWSS-1	AWSS-2	AWSS-3	AWSS-6	AWSS-7	AWSS-8	AWSS-9	AWSS-10	AWSS-11
Sample Type	Soil Cleanup	Protection	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (ft)	Objectives	Soil Cleanup	6" - 12"	6" - 12"	6" - 12"	0" - 4"	0" - 4"	0" - 4"	0" - 4"	0" - 4"	0" - 4"
Sample Date	Objectives	Objectives	07/08/14	07/08/14	07/08/14	10/18/15	10/18/15	10/18/15	10/18/15	10/18/15	10/18/15
Semi-Volatile Organic Compounds (continued)											
Dibenzo[a,h]anthracene (PAH)	330.0	1,000,000	NA	NA	NA			NA	6,600 J	NA	2,200 J
Dibenzofuran	14,000	210,000	"	"	"			"	2,500 J	"	
Fluoranthene (PAH)	100,000	1,000,000	"	"	"	1,100 J	22,000	"	68,000	"	5,200 J
Fluorene (PAH)	100,000	386,000	"	"	"		1,200 J	"	4,600 J	"	
Indeno[1,2,3-cd]pyrene (PAH)	500.0	8,200	"	"	"		6,500 J	"	17,000	"	3,000 J
Naphthalene (PAH)	100,000	12,000	"	"	"			"	2,300 J	"	
Phenanthrene (PAH)	100,000	1,000,000	"	"	"		14,000	"	43,000	"	1,900 J
Pyrene (PAH)	100,000	1,000,000	"	"	"		16,000	"	50,000	"	4,000 J
Pesticides, Herbicides & PCBs (µg/kg)											
Aldrin	19.0	190.0	NA	NA	NA			NA		NA	
alpha-BHC	97.0	20.0	"	"	"			"		"	
alpha-Chlordane	910.0	2,900	"	"	"			"		"	
beta-BHC	72.0	90.0	"	"	"			"	50 J	"	
delta-BHC	100,000	250.0	"	"	"			"		"	
gamma-BHC (Lindane)	280.0	100.0	"	"	"			"		"	
4,4'-DDD	2,600	14,000	"	"	"			"		"	
4,4'-DDE	1,800	17,000	"	"	"		85 JB	"	74 JB	"	
4,4'-DDT	1,700	136,000	"	"	"		120 J	"	180 J	"	
Dieldrin	39.0	100.0	"	"	"			"		"	
Endosulfan I	4,800	102,000	"	"	"			"		"	
Endosulfan II	4,800	102,000	"	"	"			"		"	
Endosulfan Sulfate	4,800	1,000,000	"	"	"		44 J	"	67 J	"	
Endrin	2,200	60.0	"	"	"			"		"	
Heptachlor	420.0	380.0	"	"	"			"		"	
Silvex (2,4,5-TP)	58,000	3,800	"	"	"			"		"	
PCBs (Total)	1,000	3,200	"	"	"			"		"	

Table 2
 Summary of Shallow Soil and Fill Analytical Results from the Highland Plaza Off-Site Area
 Highland Plaza Site, Site No. C915293A
 Tonawanda, New York



Sample Point	Residential	Groundwater	AWSS-1	AWSS-2	AWSS-3	AWSS-6	AWSS-7	AWSS-8	AWSS-9	AWSS-10	AWSS-11
Sample Type	Soil Cleanup	Protection	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (ft)	Objectives	Soil Cleanup	6" - 12"	6" - 12"	6" - 12"	0" - 4"	0" - 4"	0" - 4"	0" - 4"	0" - 4"	0" - 4"
Sample Date	Objectives	Objectives	07/08/14	07/08/14	07/08/14	10/18/15	10/18/15	10/18/15	10/18/15	10/18/15	10/18/15
Metals (mg/kg)											
Arsenic ■	16.0	16.0	NA	NA	NA	2.8	6.7	NA	10.5	NA	8.5
Barium	350.0	820.0	"	"	"	78.8 F1	117.0	"	135.0	"	86.0
Beryllium ■	14.0	47.0	"	"	"	0.38	0.71	"	0.69	"	0.78
Cadmium ■	2.5	7.5	"	"	"	1.2	1.9	"	3.9	"	0.72
Chromium ■	36.0	NS	"	"	"			"		"	
Copper ■	270.0	1,720	"	"	"	27.8	30.5	"	41.6	"	46.2
Lead ■	400.0	450.0	"	"	"	275.0	197.0	"	331.0	"	60.9
Manganese	2,000	2,000	"	"	"	400 B	1,170 B	"	604 B	"	534 B
Mercury ■	0.81	0.73	"	"	"	0.08	0.30	"	0.85	"	0.34
Nickel	140.0	130.0	"	"	"	12.4	24.2	"	19.5	"	34.2
Selenium ■	36.0	4.0	"	"	"	0.72 J		"	1.0 J	"	
Silver ■	36.0	8.3	"	"	"		0.51 J	"	0.79 J	"	1.1 J
Zinc ■	2,200	2,480	"	"	"	349.0	271.0	"	838.0	"	230.0

Notes:

µg/kg = micrograms per kilogram or parts per billion.

mg/kg = milligrams per kilogram or parts per million.

■ = Environmental Protection Agency priority pollutant metal.

B = Analyte detected in the associated blank, as well as in the sample (organics); value is greater than or equal to the instrument detection limit, but less than the contract required detection limit (inorganics).

F1 = MS and/or MSD recovery is outside acceptance limits.

J = Compound is positively identified and reported at an estimated concentration below the reporting limit.

NA = Not analyzed.

NS = No standard given in 6 NYCRR Part 375 or Commissioner Policy CP-51.

Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.

Yellow shaded values exceed the 6 NYCRR Part 375 residential and groundwater protection soil cleanup objectives.

Orange shaded values exceed the 6 NYCRR Part 375 residential soil cleanup objectives but not the groundwater protection soil cleanup objectives.

Table 3A
Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
Highland Plaza Site, Site No. C915293A
Tonawanda, New York



**Department of
Environmental
Conservation**

Sample Point	Residential	Groundwater	SB-20	SB-20	SB-21	SB-21	SB-22	SB-22	SB-23	SB-23
Sample Type	Soil Cleanup	Protection	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (ft)	Objectives	Soil Cleanup	6" - 18"	7' - 8'	12" - 20"	7' - 8'	6" - 18"	7' - 8'	17" - 24"	6' - 7'
Sample Date	Objectives	Objectives	10/15/15	10/15/15	10/15/15	10/15/15	10/15/15	10/15/15	10/15/15	10/15/15
Volatiles Organic Compounds (µg/kg)										
1,1,1-Trichloroethane	100,000	680.0								
1,1-Dichloroethene	100,000	330.0							0.89 J	
cis -1,2-Dichloroethene	59,000	250.0					0.79 J		230 J	82 J
trans-1,2-Dichloroethene	100,000	190.0							0.78 J	
Acetone	100,000	50.0	47 B	3.3 J	84.0		39.0	4.4 J	49.0	10 J
Benzene	2,900	60.0								
Chloroform	10,000	370.0								
Methyl ethyl ketone	100,000	120.0	6.5 J		17 J					
Methylene chloride	51,000	50.0								
n-Propylbenzene	100,000	3,900								
Tetrachloroethene	5,500	1,300	1.9 J	0.95 J	0.92 J		0.86 J	0.63 J	19,000	4,900
Toluene	100,000	700.0								
Trichloroethene	10,000	470.0							3,000	490.0
1,2,4-Trimethylbenzene	47,000	3,600								
1,3,5-Trimethylbenzene	47,000	8,400								
Vinyl chloride	210.0	20.0								
Xylene (Total)	100,000	1,600								
Semi-Volatile Organic Compounds (µg/kg)										
Bis(2-ethylhexyl) phthalate	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene (PAH)	100,000	98,000	"	"	"	"	"	"	"	"
Anthracene (PAH)	100,000	1,000,000	"	"	"	"	"	"	"	"
Benzo[a]anthracene (PAH)	1,000	1,000	"	"	"	"	"	"	"	"
Benzo[a]pyrene (PAH)	1,000	22,000	"	"	"	"	"	"	"	"
Benzo[b]fluoranthene (PAH)	1,000	1,700	"	"	"	"	"	"	"	"
Benzo[g,h,i]perylene (PAH)	100,000	1,000,000	"	"	"	"	"	"	"	"
Benzo[k]fluoranthene (PAH)	1,000	1,700	"	"	"	"	"	"	"	"
Carbazole	NS	NS	"	"	"	"	"	"	"	"
Chrysene (PAH)	1,000	1,000	"	"	"	"	"	"	"	"

Table 3A
Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
Highland Plaza Site, Site No. C915293A
Tonawanda, New York



**Department of
Environmental
Conservation**

Sample Point Sample Type Depth (ft) Sample Date	Residential Soil Cleanup Objectives	Groundwater Protection Soil Cleanup Objectives	SB-20 Soil 6" - 18" 10/15/15	SB-20 Soil 7' - 8' 10/15/15	SB-21 Soil 12" - 20" 10/15/15	SB-21 Soil 7' - 8' 10/15/15	SB-22 Soil 6" - 18" 10/15/15	SB-22 Soil 7' - 8' 10/15/15	SB-23 Soil 17" - 24" 10/15/15	SB-23 Soil 6' - 7' 10/15/15
Semi-Volatile Organic Compounds (continued)										
Dibenzo[a,h]anthracene (PAH)	330.0	1,000,000	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	14,000	210,000	"	"	"	"	"	"	"	"
Fluoranthene (PAH)	100,000	1,000,000	"	"	"	"	"	"	"	"
Fluorene (PAH)	100,000	386,000	"	"	"	"	"	"	"	"
Indeno[1,2,3-cd]pyrene (PAH)	500.0	8,200	"	"	"	"	"	"	"	"
Naphthalene (PAH)	100,000	12,000	"	"	"	"	"	"	"	"
Phenanthrene (PAH)	100,000	1,000,000	"	"	"	"	"	"	"	"
Pyrene (PAH)	100,000	1,000,000	"	"	"	"	"	"	"	"
Pesticides, Herbicides & PCBs (µg/kg)										
Aldrin	19.0	190.0	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	97.0	20.0	"	"	"	"	"	"	"	"
alpha-Chlordane	910.0	2,900	"	"	"	"	"	"	"	"
beta-BHC	72.0	90.0	"	"	"	"	"	"	"	"
delta-BHC	100,000	250.0	"	"	"	"	"	"	"	"
gamma-BHC (Lindane)	280.0	100.0	"	"	"	"	"	"	"	"
4,4'-DDD	2,600	14,000	"	"	"	"	"	"	"	"
4,4'-DDE	1,800	17,000	"	"	"	"	"	"	"	"
4,4'-DDT	1,700	136,000	"	"	"	"	"	"	"	"
Dieldrin	39.0	100.0	"	"	"	"	"	"	"	"
Endosulfan I	4,800	102,000	"	"	"	"	"	"	"	"
Endosulfan II	4,800	102,000	"	"	"	"	"	"	"	"
Endosulfan Sulfate	4,800	1,000,000	"	"	"	"	"	"	"	"
Endrin	2,200	60.0	"	"	"	"	"	"	"	"
Heptachlor	420.0	380.0	"	"	"	"	"	"	"	"
Silvex (2,4,5-TP)	58,000	3,800	"	"	"	"	"	"	"	"
PCBs (Total)	1,000	3,200	"	"	"	"	"	"	"	"

Table 3A
 Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
 Highland Plaza Site, Site No. C915293A
 Tonawanda, New York



Sample Point	Residential	Groundwater	SB-20	SB-20	SB-21	SB-21	SB-22	SB-22	SB-23	SB-23
Sample Type	Soil Cleanup	Protection	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (ft)	Objectives	Soil Cleanup	6" - 18"	7' - 8'	12" - 20"	7' - 8'	6" - 18"	7' - 8'	17" - 24"	6' - 7'
Sample Date	Objectives	Objectives	10/15/15	10/15/15	10/15/15	10/15/15	10/15/15	10/15/15	10/15/15	10/15/15
Metals (mg/kg)										
Arsenic ■	16.0	16.0	NA	NA	NA	NA	NA	NA	NA	NA
Barium	350.0	820.0	"	"	"	"	"	"	"	"
Beryllium ■	14.0	47.0	"	"	"	"	"	"	"	"
Cadmium ■	2.5	7.5	"	"	"	"	"	"	"	"
Chromium ■	36.0	NS	"	"	"	"	"	"	"	"
Copper ■	270.0	1,720	"	"	"	"	"	"	"	"
Lead ■	400.0	450.0	"	"	"	"	"	"	"	"
Manganese	2,000	2,000	"	"	"	"	"	"	"	"
Mercury ■	0.81	0.73	"	"	"	"	"	"	"	"
Nickel	140.0	130.0	"	"	"	"	"	"	"	"
Selenium ■	36.0	4.0	"	"	"	"	"	"	"	"
Silver ■	36.0	8.3	"	"	"	"	"	"	"	"
Zinc ■	2,200	2,480	"	"	"	"	"	"	"	"

Notes:

µg/kg = micrograms per kilogram or parts per billion.

mg/kg = milligrams per kilogram or parts per million.

■ = Environmental Protection Agency priority pollutant metal.

B = Analyte detected in the associated blank, as well as in the sample (organics).

J = Compound is positively identified and reported at an estimated concentration below the reporting limit.

NA = Not analyzed.

NS = No standard given in 6 NYCRR Part 375 or Commissioner Policy CP-51.

Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.

Yellow shaded values exceed the 6 NYCRR Part 375 residential and groundwater protection soil cleanup objectives.

Orange shaded values exceed the 6 NYCRR Part 375 residential soil cleanup objectives but not the groundwater protection soil cleanup objectives.

Green shaded values exceed the 6 NYCRR Part 375 the groundwater protection soil cleanup objectives but not the residential soil cleanup objectives.

Table 3B
 Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
 Highland Plaza Site, Site No. C915293A
 Tonawanda, New York



Sample Point	Residential	Groundwater	SB -24	SB -24	SB -24	SB -25	SB -25	SB -26	SB -26	SB -27
Sample Type	Soil Cleanup	Protection	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (ft)	Objectives	Soil Cleanup	6" - 14"	14' - 15'	23' - 24'	16" - 20"	6' - 7'	17" - 22"	7' - 8'	0" - 14"
Sample Date	Objectives	Objectives	10/15/15	10/15/15	10/15/15	10/16/15	10/16/15	10/16/15	10/16/15	10/15/15
Volatile Organic Compounds (µg/kg)										
1,1,1-Trichloroethane	100,000	680.0								
1,1-Dichloroethene	100,000	330.0		0.82 J	1.8 J		2.9 J			
cis -1,2-Dichloroethene	59,000	250.0	29,000	7.8	1.1 J	1,600	290 E		0.57 J	3.9 J
trans-1,2-Dichloroethene	100,000	190.0					1.8 J			
Acetone	100,000	50.0		5.0 J	8.5 J		45.0			
Benzene	2,900	60.0								
Chloroform	10,000	370.0		0.49 J			1.3 J			
Methyl ethyl ketone	100,000	120.0								
Methylene chloride	51,000	50.0								3.2 JB
n-Propylbenzene	100,000	3,900					0.43 J			
Tetrachloroethene	5,500	1,300	1,600,000	170,000	140,000	1,400,000	740,000	220.0	5.4	29.0
Toluene	100,000	700.0	500 J	0.44 JB	0.39 JB		0.48 J			
Trichloroethene	10,000	470.0	15,000	23.0	61.0	1,400	210 E			11.0
1,2,4-Trimethylbenzene	47,000	3,600					1.5 J			
1,3,5-Trimethylbenzene	47,000	8,400					0.71 J			
Vinyl chloride	210.0	20.0								
Xylene (Total)	100,000	1,600	980 J							
Semi-Volatile Organic Compounds (µg/kg)										
Bis(2-ethylhexyl) phthalate	NS	NS		NA		NA	NA	NA	NA	
Acenaphthene (PAH)	100,000	98,000		"		"	"	"	"	
Anthracene (PAH)	100,000	1,000,000		"		"	"	"	"	
Benzo[a]anthracene (PAH)	1,000	1,000	760 J	"		"	"	"	"	460 J
Benzo[a]pyrene (PAH)	1,000	22,000	2,100 J	"		"	"	"	"	1,000 J
Benzo[b]fluoranthene (PAH)	1,000	1,700	2,500 J	"		"	"	"	"	980 J
Benzo[g,h,i]perylene (PAH)	100,000	1,000,000	2,600 J	"		"	"	"	"	930 J
Benzo[k]fluoranthene (PAH)	1,000	1,700	1,200 J	"		"	"	"	"	
Carbazole	NS	NS		"		"	"	"	"	
Chrysene (PAH)	1,000	1,000	1,100 J	"		"	"	"	"	

Table 3B
Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
Highland Plaza Site, Site No. C915293A
Tonawanda, New York



**Department of
Environmental
Conservation**

Sample Point Sample Type Depth (ft) Sample Date	Residential Soil Cleanup Objectives	Groundwater Protection Soil Cleanup Objectives	SB -24 Soil 6" - 14" 10/15/15	SB -24 Soil 14' - 15' 10/15/15	SB -24 Soil 23' - 24' 10/15/15	SB -25 Soil 16" - 20" 10/16/15	SB -25 Soil 6' - 7' 10/16/15	SB -26 Soil 17" - 22" 10/16/15	SB -26 Soil 7' - 8' 10/16/15	SB -27 Soil 0" - 14" 10/15/15
Semi-Volatile Organic Compounds (continued)										
Dibenzo[a,h]anthracene (PAH)	330.0	1,000,000		NA		NA	NA	NA	NA	
Dibenzofuran	14,000	210,000		"		"	"	"	"	
Fluoranthene (PAH)	100,000	1,000,000	1,500 J	"		"	"	"	"	690 J
Fluorene (PAH)	100,000	386,000		"		"	"	"	"	
Indeno[1,2,3-cd]pyrene (PAH)	500.0	8,200	2,500 J	"		"	"	"	"	1,100 J
Naphthalene (PAH)	100,000	12,000		"		"	"	"	"	
Phenanthrene (PAH)	100,000	1,000,000		"		"	"	"	"	
Pyrene (PAH)	100,000	1,000,000	1,600 J	"		"	"	"	"	580 J
Pesticides, Herbicides & PCBs (µg/kg)										
Aldrin	19.0	190.0		NA		NA	NA	NA	NA	
alpha-BHC	97.0	20.0		"	0.57 JB	"	"	"	"	
alpha-Chlordane	910.0	2,900		"		"	"	"	"	
beta-BHC	72.0	90.0		"		"	"	"	"	
delta-BHC	100,000	250.0		"	0.60 J	"	"	"	"	7.0 J
gamma-BHC (Lindane)	280.0	100.0	4.9 J	"		"	"	"	"	
4,4'-DDD	2,600	14,000	6.4 JB	"		"	"	"	"	
4,4'-DDE	1,800	17,000		"		"	"	"	"	
4,4'-DDT	1,700	136,000	8.4 J	"		"	"	"	"	
Dieldrin	39.0	100.0		"		"	"	"	"	
Endosulfan I	4,800	102,000		"		"	"	"	"	
Endosulfan II	4,800	102,000		"	0.48 JB	"	"	"	"	
Endosulfan Sulfate	4,800	1,000,000	4.9 J	"		"	"	"	"	
Endrin	2,200	60.0		"		"	"	"	"	
Heptachlor	420.0	380.0		"		"	"	"	"	
Silvex (2,4,5-TP)	58,000	3,800		"		"	"	"	"	
PCBs (Total)	1,000	3,200		"		"	"	"	"	

Table 3B
Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
Highland Plaza Site, Site No. C915293A
Tonawanda, New York



Sample Point	Residential	Groundwater	SB -24	SB -24	SB -24	SB -25	SB -25	SB -26	SB -26	SB -27
Sample Type	Soil Cleanup	Protection	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (ft)	Objectives	Soil Cleanup	6" - 14"	14' - 15'	23' - 24'	16" - 20"	6' - 7'	17" - 22"	7' - 8'	0" - 14"
Sample Date	Objectives	Objectives	10/15/15	10/15/15	10/15/15	10/16/15	10/16/15	10/16/15	10/16/15	10/15/15
Metals (mg/kg)										
Arsenic ■	16.0	16.0	5.0	NA	3.9	NA	NA	NA	NA	2.6
Barium	350.0	820.0	81.4	"	80.2	"	"	"	"	151.0
Beryllium ■	14.0	47.0	0.69	"	0.66	"	"	"	"	3.5
Cadmium ■	2.5	7.5	0.46	"	0.21 J	"	"	"	"	0.52
Chromium ■	36.0	NS		"		"	"	"	"	
Copper ■	270.0	1,720	8.2	"	12.9	"	"	"	"	9.2
Lead ■	400.0	450.0	28.2	"	10.8	"	"	"	"	47.1
Manganese	2,000	2,000	426 B	"	459 B	"	"	"	"	1,370 B
Mercury ■	0.81	0.73	0.010 J	"		"	"	"	"	0.098
Nickel	140.0	130.0	8.2	"	21.4	"	"	"	"	9.6
Selenium ■	36.0	4.0		"		"	"	"	"	
Silver ■	36.0	8.3		"		"	"	"	"	0.41 J
Zinc ■	2,200	2,480	77.8	"	45.5	"	"	"	"	66.5

Notes:

µg/kg = micrograms per kilogram or parts per billion.

mg/kg = milligrams per kilogram or parts per million.

■ = Environmental Protection Agency priority pollutant metal.

B = Analyte detected in the associated blank, as well as in the sample (organics); value is greater than or equal to the instrument detection limit, but less than the contract required detection limit (inorganics).

J = Compound is positively identified and reported at an estimated concentration below the reporting limit.

NA = Not analyzed.

NS = No standard given in 6 NYCRR Part 375 or Commissioner Policy CP-51.

Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.

Yellow shaded values exceed the 6 NYCRR Part 375 residential and groundwater protection soil cleanup objectives.

Orange shaded values exceed the 6 NYCRR Part 375 residential soil cleanup objectives but not the groundwater protection soil cleanup objectives.

Green shaded values exceed the 6 NYCRR Part 375 the groundwater protection soil cleanup objectives but not the residential soil cleanup objectives.

Table 3C
 Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
 Highland Plaza Site, Site No. C915293A
 Tonawanda, New York



Sample Point Sample Type Depth (ft) Sample Date	Residential Soil Cleanup Objectives	Groundwater Protection Soil Cleanup Objectives	SB -27 Soil 14' - 15' 10/15/15	SB -27 Soil 23' - 24' 10/15/15	SB -28 Soil 10" - 22" 10/16/15	SB -28 Soil 7' - 8' 10/16/15	SB -29 Soil 17" - 22" 10/16/15	SB -29 Soil 7' - 8' 10/16/15		
Volatile Organic Compounds (µg/kg)										
1,1,1-Trichloroethane	100,000	680.0								
1,1-Dichloroethene	100,000	330.0		1.2 J				0.50 J		
cis -1,2-Dichloroethene	59,000	250.0	3.0 J	880 J				1,200		
trans-1,2-Dichloroethene	100,000	190.0		30.0				1.2 J		
Acetone	100,000	50.0	6.2 JB	4.6 J		9.7 JB	11 J	3.5 J		
Benzene	2,900	60.0								
Chloroform	10,000	370.0								
Methyl ethyl ketone	100,000	120.0								
Methylene chloride	51,000	50.0								
n-Propylbenzene	100,000	3,900								
Tetrachloroethene	5,500	1,300	11.0	79,000	6.5 F1	0.62 J	1.5 JB	18,000		
Toluene	100,000	700.0								
Trichloroethene	10,000	470.0	2.7 J	5,400				590.0		
1,2,4-Trimethylbenzene	47,000	3,600						250 J		
1,3,5-Trimethylbenzene	47,000	8,400								
Vinyl chloride	210.0	20.0								
Xylene (Total)	100,000	1,600								
Semi-Volatile Organic Compounds (µg/kg)										
Bis(2-ethylhexyl) phthalate	NS	NS	NA	NA		NA	NA	NA		
Acenaphthene (PAH)	100,000	98,000	"	"	770 JF1	"	"	"		
Anthracene (PAH)	100,000	1,000,000	"	"	1,500 JF1	"	"	"		
Benzo[a]anthracene (PAH)	1,000	1,000	"	"	2,300 F1	"	"	"		
Benzo[a]pyrene (PAH)	1,000	22,000	"	"	2,100 F1	"	"	"		
Benzo[b]fluoranthene (PAH)	1,000	1,700	"	"	2,200 F1	"	"	"		
Benzo[g,h,i]perylene (PAH)	100,000	1,000,000	"	"	1,400 JF1	"	"	"		
Benzo[k]fluoranthene (PAH)	1,000	1,700	"	"	1,400 JF1	"	"	"		
Carbazole	NS	NS	"	"	620 JF1	"	"	"		
Chrysene (PAH)	1,000	1,000	"	"	2,100 F1	"	"	"		

Table 3C
 Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
 Highland Plaza Site, Site No. C915293A
 Tonawanda, New York



**Department of
Environmental
Conservation**

Sample Point Sample Type Depth (ft) Sample Date	Residential Soil Cleanup Objectives	Groundwater Protection Soil Cleanup Objectives	SB -27 Soil 14' - 15' 10/15/15	SB -27 Soil 23' - 24' 10/15/15	SB -28 Soil 10" - 22" 10/16/15	SB -28 Soil 7' - 8' 10/16/15	SB -29 Soil 17" - 22" 10/16/15	SB -29 Soil 7' - 8' 10/16/15		
Semi-Volatile Organic Compounds (continued)										
Dibenzo[a,h]anthracene (PAH)	330.0	1,000,000	NA	NA		NA	NA	NA		
Dibenzofuran	14,000	210,000	"	"	490 JF1	"	"	"		
Fluoranthene (PAH)	100,000	1,000,000	"	"	5,400 F1	"	"	"		
Fluorene (PAH)	100,000	386,000	"	"	790 JF1	"	"	"		
Indeno[1,2,3-cd]pyrene (PAH)	500.0	8,200	"	"	1,400 JF1	"	"	"		
Naphthalene (PAH)	100,000	12,000	"	"	990 JF1	"	"	"		
Phenanthrene (PAH)	100,000	1,000,000	"	"	5,100 F1	"	"	"		
Pyrene (PAH)	100,000	1,000,000	"	"	4,200 F1	"	"	"		
Pesticides, Herbicides & PCBs (µg/kg)										
Aldrin	19.0	190.0	NA	NA		NA	NA	NA		
alpha-BHC	97.0	20.0	"	"		"	"	"		
alpha-Chlordane	910.0	2,900	"	"	2.4 JF2F1	"	"	"		
beta-BHC	72.0	90.0	"	"		"	"	"		
delta-BHC	100,000	250.0	"	"	1.3 J	"	"	"		
gamma-BHC (Lindane)	280.0	100.0	"	"		"	"	"		
4,4'-DDD	2,600	14,000	"	"	9.9 F2F1B	"	"	"		
4,4'-DDE	1,800	17,000	"	"	8.0 F2F1	"	"	"		
4,4'-DDT	1,700	136,000	"	"	8.7 F1	"	"	"		
Dieldrin	39.0	100.0	"	"		"	"	"		
Endosulfan I	4,800	102,000	"	"		"	"	"		
Endosulfan II	4,800	102,000	"	"	0.89 JB	"	"	"		
Endosulfan Sulfate	4,800	1,000,000	"	"		"	"	"		
Endrin	2,200	60.0	"	"		"	"	"		
Heptachlor	420.0	380.0	"	"		"	"	"		
Silvex (2,4,5-TP)	58,000	3,800	"	"		"	"	"		
PCBs (Total)	1,000	3,200	"	"		"	"	"		

Table 3C
 Summary of Subsurface Soil Analytical Results from the Highland Plaza Off-Site Area
 Highland Plaza Site, Site No. C915293A
 Tonawanda, New York



Sample Point	Residential	Groundwater	SB -27	SB -27	SB -28	SB -28	SB -29	SB -29		
Sample Type	Soil Cleanup	Protection	Soil	Soil	Soil	Soil	Soil	Soil		
Depth (ft)	Objectives	Soil Cleanup	14' - 15'	23' - 24'	10" - 22"	7' - 8'	17" - 22"	7' - 8'		
Sample Date	Objectives	Objectives	10/15/15	10/15/15	10/16/15	10/16/15	10/16/15	10/16/15		
Metals (mg/kg)										
Arsenic ■	16.0	16.0	NA	NA	3.1	NA	NA	NA		
Barium	350.0	820.0	"	"	124 F1	"	"	"		
Beryllium ■	14.0	47.0	"	"	0.88	"	"	"		
Cadmium ■	2.5	7.5	"	"	0.20 J	"	"	"		
Chromium ■	36.0	NS	"	"		"	"	"		
Copper ■	270.0	1,720	"	"	10.5	"	"	"		
Lead ■	400.0	450.0	"	"	16.9	"	"	"		
Manganese	2,000	2,000	"	"	345 BF2	"	"	"		
Mercury ■	0.81	0.73	"	"	0.09	"	"	"		
Nickel	140.0	130.0	"	"	17.4 F1	"	"	"		
Selenium ■	36.0	4.0	"	"	0.93 J	"	"	"		
Silver ■	36.0	8.3	"	"		"	"	"		
Zinc ■	2,200	2,480	"	"	90.8 F1	"	"	"		

Notes:

mg/kg = milligrams per kilogram or parts per million.

ug/kg = micrograms per kilogram or parts per billion.

■ = Environmental Protection Agency priority pollutant metal.

B = Analyte detected in the associated blank, as well as in the sample (organics); value is greater than or equal to the instrument detection limit, but less than the contract required detection limit (inorganics).

F1 = MS and/or MSD recovery is outside acceptance limits.

F2 = MS/MSD relative percent difference (RPD) exceeds control limits.

J = Compound is positively identified and reported at an estimated concentration below the reporting limit.

NA = Not analyzed.

NS = No standard given in 6 NYCRR Part 375 or Commissioner Policy CP-51.

Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.

Yellow shaded values exceed the 6 NYCRR Part 375 residential and groundwater protection soil cleanup objectives.

Orange shaded values exceed the 6 NYCRR Part 375 residential soil cleanup objectives but not the groundwater protection soil cleanup objectives.

Green shaded values exceed the 6 NYCRR Part 375 the groundwater protection soil cleanup objectives but not the residential soil cleanup objectives.

Table 4
Summary of Groundwater Analytical Results
Highland Plaza Site, Site Nos. C915293 and C915293A
Tonawanda, New York



Well Number	NYSDEC	MW-1	MW-2	MW-3	MW-4	MW-4 *	MW-5	MW-5 *
Sample Type	Groundwater	Water	Water	Water	Water	Water	Water	Water
Well Location	Standards	On-Site	On-Site	On-Site	Off-Site	Off-Site	Off-Site	Off-Site
Sample Date		12/22/15	12/22/15	12/22/15	12/22/15	12/22/15	12/22/15	12/22/15
Volatile Organic Compounds (ug/L)								
1,1,1-Trichloroethane	5.0							
1,1-Dichloroethene	5.0				10.0 J			
cis -1,2-Dichloroethene	5.0			24.0	900.0		1,100	910.0
trans-1,2-Dichloroethene	5.0						34.0	
Acetone	50.0	5.4 J						
Benzene	1.0							
Chloroform	7.0							
Methyl ethyl ketone	50.0							
Methylene chloride	5.0							
n-Propylbenzene	5.0							
Tetrachloroethene	5.0				22,000 E	58,000	3,200 E	3,000
Toluene	5.0							
Trichloroethene	5.0			0.85 J	740.0	560 J	1,700	1,500
1,2,4-Trimethylbenzene	5.0							
1,3,5-Trimethylbenzene	5.0							
Vinyl chloride	2.0							
Xylene (Total)	5.0							

Notes:

ug/L = micrograms per liter or parts per billion.

* = Results of a diluted sample analysis.

Blanks = Contaminant analyzed for but not detected at or above the laboratory detection limit.

Yellow shaded values exceed NYSDEC groundwater standards or guidance values.

Table 5
Soil Boring Stratigraphic Summary
Highland Plaza Site, Site Nos. C915293 and C915293A
Tonawanda, New York



Boring Number	Date Completed	Coordinates		Ground Surface Elevation (ft amsl)	Total Boring Depth (ft bgs)	Asphalt, Concrete and/or Crushed Stone			Reworked Soil			Reddish Brown Silty Clay		
		Northing	Easting			Depth (ft bgs)	Surface * Elevation	Thickness (ft)	Depth (ft bgs)	Surface * Elevation	Thickness (ft)	Depth (ft bgs)	Surface * Elevation	Thickness (ft)
Highland Plaza On-Site (C915293)														
SB-1	05/13/14	NS	NS	NS	8.0	0.0	N/A	1.0	----	-----	----	1.0	N/A	>7.0
SB-2	05/13/14	NS	NS	NS	8.0	0.0	N/A	1.0	----	-----	----	1.0	N/A	>7.0
SB-3	05/13/14	NS	NS	NS	8.0	0.0	N/A	1.0	----	-----	----	1.0	N/A	>7.0
SB-4	05/13/14	NS	NS	NS	12.0	0.0	N/A	1.0	----	-----	----	1.0	N/A	>11.0
SB-5	05/13/14	NS	NS	NS	12.0	0.0	N/A	1.0	1.0	N/A	0.5	1.5	N/A	>10.5
SB-6	05/13/14	NS	NS	NS	8.0	0.0	N/A	0.5	0.5	N/A	1.5	2.0	N/A	>6.0
SB-7	05/13/14	NS	NS	NS	8.0	0.0	N/A	0.5	0.5	N/A	1.0	1.5	N/A	>6.5
SB-8	05/13/14	NS	NS	NS	8.0	0.0	N/A	0.5	0.5	N/A	1.5	2.0	N/A	>6.0
SB-9	05/13/14	NS	NS	NS	8.0	0.0	N/A	0.5	0.5	N/A	1.5	2.0	N/A	>6.0
SB-10	05/13/14	NS	NS	NS	8.0	0.0	N/A	0.25	0.25	N/A	0.25	0.5	N/A	>7.5
SB-11	05/13/14	NS	NS	NS	8.0	0.0	N/A	0.5	0.5	N/A	1.5	2.0	N/A	>6.0
SB-15	05/13/14	NS	NS	NS	8.0	0.0	N/A	1.0	1.0	N/A	0.5	1.5	N/A	>6.5
SB-16	10/14/15	NS	NS	NS	24.0	0.0	N/A	1.0	----	-----	----	1.0	N/A	>23.0
SB-17	10/14/15	NS	NS	NS	24.0	0.0	N/A	1.0	----	-----	----	1.0	N/A	>23.0
SB-18	10/14/15	NS	NS	NS	8.0	0.0	N/A	1.0	1.0	N/A	0.33	1.33	N/A	>6.67
SB-19	10/14/15	NS	NS	NS	24.0	0.0	N/A	1.0	----	-----	----	1.0	N/A	>23.0
Highland Plaza Off-Site (C915293A)														
SB-20	10/15/15	NS	NS	NS	8.0	0.0	N/A	0.5	0.5	N/A	1.0	1.5	N/A	>6.5
SB-21	10/15/15	NS	NS	NS	8.0	0.0	N/A	0.67	0.67	N/A	1.0	1.67	N/A	>6.33
SB-22	10/15/15	NS	NS	NS	8.0	0.0	N/A	0.83	0.83	N/A	0.75	1.58	N/A	>6.42
SB-23	10/15/15	NS	NS	NS	8.0	----	-----	----	0.0	N/A	2.0	2.0	N/A	>6.0
SB-24	10/15/15	NS	NS	NS	24.0	0.0	N/A	1.0	1.0	N/A	1.0	2.0	N/A	>22.0
SB-25	10/16/15	NS	NS	NS	8.0	0.25	N/A	1.25	1.5	N/A	0.33	1.83	N/A	>6.17
SB-26	10/16/15	NS	NS	NS	8.0	0.25	N/A	1.13	----	-----	----	1.38	N/A	>6.62
SB-27	10/16/15	NS	NS	NS	24.0	0.5	N/A	0.5	1.0	N/A	0.58	1.58	N/A	>22.42
SB-28	10/16/15	NS	NS	NS	8.0	0.2	N/A	1.22	----	-----	----	1.42	N/A	>6.58
SB-29	10/16/15	NS	NS	NS	8.0	0.0	N/A	1.33	1.33	N/A	0.84	2.17	N/A	>5.83

Table 5
Soil Boring Stratigraphic Summary
Highland Plaza Site, Site Nos. C915293 and C915293A
Tonawanda, New York



Notes:

* = Surface elevations in feet above mean sea level.

bgs = Below ground surface.

NS = Not Surveyed.

N/A = Not Applicable.

There are no soil borings with the numbers SB-12, SB-13 or SB-14.

For soil borings SB-25 thru SB-28, crushed stone was encountered under a thin topsoil layer. The thickness of this layer is represented by the depth to crushed stone.

Yellow Shading = Estimated elevations.

Table 6
Summary of Water Level Data in Monitoring Wells
Highland Plaza Site, Site Nos. C915293 and C915293A
Tonawanda, New York



Well Number	Top of Riser Elevation * (feet)	December 4, 2015					
		Depth to Water (feet)	Elevation * (feet)	Depth to Water (feet)	Elevation * (feet)	Depth to Water (feet)	Elevation * (feet)
Reddish Brown Silty Clay Zone Wells							
MW-1	100.51	3.80	96.71		100.51		100.51
MW-2	100.18	2.80	97.38		100.18		100.18
MW-3	100.08	5.40	94.68		100.08		100.08
MW-4	101.45	3.10	98.35		101.45		101.45
MW-5	102.06	2.80	99.26		102.06		102.06

Notes:

* = All elevations are in feet relative to an assumed datum.

NC = Information not collected.

N/A = Not Applicable.

Table 7
Monitoring Well Construction Summary
Highland Plaza Site, Site Nos. C915293 and C915293A
Tonawanda, New York



Well Number	Installation Date	Ground Surface Elevation * (feet)	Top of Riser Elevation * (feet)	Total Boring Depth (ft. BGS)	Sandpack Interval (ft. BGS)	Sandpack Interval * (feet)	Well Screen Interval (ft. BGS)	Well Screen Interval * (feet)	Screened Deposit
Highland Plaza On-Site (C915293)									
MW-1	10/14/15	100.61	100.51	24.0	4.0 to 24.0	96.61 to 76.61	14.0 to 24.0	86.61 to 76.61	Reddish Brown Silty Clay
MW-2	10/14/15	100.28	100.18	24.0	4.0 to 24.0	96.28 to 76.28	14.0 to 24.0	86.28 to 76.28	Reddish Brown Silty Clay
MW-3	10/14/15	100.18	100.08	24.0	4.5 to 24.0	95.68 to 76.18	14.0 to 24.0	86.18 to 76.18	Reddish Brown Silty Clay
Highland Plaza Off-Site (C915293A)									
MW-4	10/16/15	101.55	101.45	24.0	4.5 to 24.0	97.05 to 77.55	14.0 to 24.0	87.55 to 77.55	Reddish Brown Silty Clay
MW-5	10/16/15	102.16	102.06	24.0	4.5 to 24.0	97.66 to 78.16	14.0 to 24.0	88.16 to 78.16	Reddish Brown Silty Clay

Notes:

* = All elevations are in feet relative to an assumed datum.

Ft. BGS = Feet below ground surface.

Yellow Shading = Estimated elevations assumed to be 0.1 feet above the top of riser.

Table 8
Sample, Soil Boring and Monitoring Well Location Data
Highland Plaza Site, Site Nos. C915293 and C915293A
Tonawanda, New York



Sample, Boring or Monitoring Well No.	Type	Distance East of Northwest Property Corner (ft)	Distance South of Northwest Property Corner (ft)	Elevation * (feet)
SS - 12	Surface Soil	NM - Behind building due west of dry cleaner man door		
AWSS - 1	Surface Soil	NM - Alley south of service road		
AWSS - 2	Surface Soil	NM - Alley south of service road		
AWSS - 3	Surface Soil	NM - Alley south of service road		
AWSS - 6	Surface Soil	251.01	101.56	
AWSS - 7	Surface Soil	195.55	101.02	
AWSS - 8	Surface Soil	136.09	104.20	
AWSS - 9	Surface Soil	88.35	102.98	
AWSS - 10	Surface Soil	45.14	106.68	
AWSS - 11	Surface Soil	61.17	122.98	
SB - 1	Soil Boring	NM - West property boundary in parking lot		
SB - 2	Soil Boring	NM - Northwest corner of property in parking lot		
SB - 3	Soil Boring	NM - Middle of parking lot north of building		
SB - 4	Soil Boring	NM - East parking lot north of building		
SB - 5	Soil Boring	NM - Inside former dry cleaner		
SB - 6	Soil Boring	NM - Inside former dry cleaner		
SB - 7	Soil Boring	NM - Inside former dry cleaner		
SB - 8	Soil Boring	NM - Inside former dry cleaner		
SB - 9	Soil Boring	NM - Inside former dry cleaner		
SB - 10	Soil Boring	NM - Inside former dry cleaner		
SB - 11	Soil Boring	NM - Inside former dry cleaner		
SB - 15	Soil Boring	NM - Middle of parking lot north of building		
SB - 16/MW - 1	Monitoring Well	104.45	23.36	100.51
SB - 17/MW - 2	Monitoring Well	216.22	22.43	100.18
SB - 18	Soil Boring	253.63	22.28	
SB - 19/MW - 3	Monitoring Well	282.43	24.29	100.08
SB - 20	Soil Boring	310.68	44.85	
SB - 21	Soil Boring	309.38	68.53	
SB - 22	Soil Boring	309.20	106.52	
SB - 23	Soil Boring	304.75	121.78	
SB - 24/MW - 4	Monitoring Well	274.59	119.19	101.45
SB - 25	Soil Boring	251.83	119.34	
SB - 26	Soil Boring	221.32	118.93	
SB - 27/MW - 5	Monitoring Well	176.13	120.15	102.06
SB - 28	Soil Boring	113.74	121.41	
SB - 29	Soil Boring	282.23	112.08	

Notes:

* = All elevations are in feet relative to an assumed datum.

NM = Not measured.