DAY ENVIRONMENTAL, INC.

REMEDIAL INVESTIGATION / FEASIBILITY STUDY WORK PLAN

OBI, LLC PROPERTIES
245-265 HOLLENBECK STREET, 271 HOLLENBECK STREET, AND 50 BALFOUR DRIVE
ROCHESTER, NEW YORK 14621-3257
NYSDEC SITE NO. 828188

Aerial View - OBI, LLC Property
245-265 Hollenbeck Street, 271 Hollenbeck Street, and 50 Balfour Drive, Rochester, New York

Prepared for:
OBI, LLC
ROCHESTER, NEW YORK

Prepared by:
DAY ENVIRONMENTAL, INC.
1563 LYELL AVENUE
ROCHESTER, NY 14606

Date: August 13, 2015

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 8
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December 21, 2015

Mr. Mike McAlpin
OBI, LLC
255 Hollenbeck Street
Rochester, New York 14621

Dear Mr. McAlpin;

Re: OBI, LLC Site #828188
Remedial Investigation/Feasibility Study Work Plan;
August 13, 2015
245-265 & 271 Hollenbeck Street and 50 Balfour Drive
City of Rochester, Monroe County

The New York State Departments of Environmental Conservation (NYSDEC) and Health (NYSDOH), collectively referred to as the Departments, have completed their review of the document entitled "*Remedial Investigation Work Plan/Feasibility Study*" (the Work Plan) dated August 13, 2015 and prepared by Day Environmental, Inc for the OBI, LLC site in the City of Rochester, Monroe County. Based on the information and representations provided in the Work Plan, and in accordance with 6 NYCRR 375-1.6, the Departments have determined that the Work Plan, with modifications, substantially addresses the requirements of the Order-on-Consent. The modifications are outlined as follows:

1. The Work Plan includes the Health and Safety Plan (HASP) dated August 2015 and submitted to the Departments on December 18, 2015. Except for the Community Air Monitoring Plan, approval of the Work Plan does not extend to the HASP as the Departments are not responsible for the health and safety of remediation workers.

2. **Section 1.6 RI Objectives:** This section is modified as follows:
    - The first bullet is changed to "Define the nature and extent of site-related contamination."
    - The seventh bullet is changed to "Evaluate and characterize the extent and magnitude of the overburden and bedrock groundwater contamination associated with the site."
    - The tenth bullet is changed to "Define the extent to which site-related contaminants have migrated and whether future migration may pose a threat to human health or the environment."

3. **Section 1.7 Applicable Project Standards, Criteria, and Guidance:** Updates and revisions to the SCGs identified in this section will also be used where applicable.

4. **Section 4.1 RI Overview:** The first bullet is changed to "a detailed evaluation of the nature and extent of site-related contamination."

5. **Section 4.2.1 Utility Assessment:** As part of the utility assessment, the integrity of the sump will be evaluated and the discharge location of the sump will be determined. Sump water samples will be collected and analyzed if: there appear to be lines plumbed into the sump in addition to the compressor cooling water/condensate; if the sump discharges to a storm sewer; or the integrity of the sump is suspect and it appears that groundwater could infiltrate into the sump. If collected, sump water samples will be analyzed for VOCs at a minimum. Additional analytical parameters will be included upon NYSDEC request based the conditions observed.

6. **Section 4.2.1 Utility Assessment:** The two shallow test borings discussed in this section are identified as TB-DD and TB-EE in other sections of the Work Plan.

7. **Section 4.2.3 Site Groundwater Characterization Work:** At least two rounds of groundwater sampling will be completed. A Supplemental RI Work Plan will be submitted to the Departments within 60 days after the Respondent or the Respondent's consultant receives the unvalidated analytical results from the laboratory for the first round of groundwater samples. The Supplemental RI Work Plan will identify the monitoring wells and analytical parameters for the second round of sampling and provide a schedule for collecting the samples and submitting either the next Supplemental RI Work Plan or the RI Report and Feasibility Study.

8. **Figure 9:** Geoprobe test boring TB-F is relocated to the approximate footprint of the former TCE degreaser.

9. **Appendix C Project Decision Statements:** Statement 4, the second sentence is changed from "Wastes may also be evaluated…" to "Wastes will also be evaluated…"

With the understanding that the above noted modifications are agreed to, the Work Plan is hereby approved.

If OBI, LLC chooses not to accept the modifications proposed by the Departments, you are required to notify this office within 20 days after the date of this letter. In this event I suggest a meeting be scheduled to discuss your concerns prior to the end of this 20 day period.

Prior to the start of field work, please attach this letter and the HASP to the Work Plan and distribute as follows:

- Frank Sowers (NYSDEC, Avon) - 2 hard copies;
- Jacquelyn Nealon (NYSDOH, Albany) – 1 hard copy and 1 electronic copy on CD;
- John Frazer (MCHD) - 1 electronic copy;
- Wade Silkworth (MCHD); and
- Lincoln Branch Library - 1 hard copy.

The hard copies should be submitted double-sided.

Please notify me at least 7 days in advance of the start of field activities.

Thank you for your cooperation in this matter and please contact me at (585) 226-5357 if you have any questions.

Sincerely,

Frank Sowers, P.E.
Environmental Engineer 2

ec:
B. Schilling
J. Mahoney
M. Cruden
J. Nealon
P. Sylvestri
R. Kampff
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REMEDIAL INVESTIGATION/FEASIBILITY STUDY
WORK PLAN

OBI, LLC PROPERTIES
245-265 HOLLENBECK STREET, 271 HOLLENBECK
STREET, AND 50 BALFOUR DRIVE
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NYSDEC SITE NO. 828188

I, David D. Day, P.E., certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Remedial Investigation/Feasibility Study Work Plan was prepared in accordance with applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

David D. Day, Pres.

David D. Day, P.E.
President
Day Environmental, Inc.

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1.0 INTRODUCTION

This Remedial Investigation (RI) Work Plan (i.e., "Work Plan") was prepared by Day Environmental, Inc. (DAY) for the three contiguous parcels located at 245-265 Hollenbeck Street, 271 Hollenbeck Street, and 50 Balfour Drive, Rochester, New York (i.e., the "Site"), which are further described below. The Site is currently owned by OBI, LLC. A Project Locus map is included as Figure 1.

This Work Plan was prepared in partial fulfillment of the work requirements described in the Order on Consent and Administrative Settlement entered into on November 16, 2013 between the New York State Department of Environmental Conservation (NYSDEC) and OBI, LLC (Index #B8-0815-13-10; Site No. 828188).

Upon approval of this Work Plan by the NYSDEC, the scope of work described herein will be implemented on behalf of OBI, LLC. This Work Plan was prepared based on data and other information that has been developed through a series of environmental studies that have been performed at the Site on behalf of OBI, LLC since 1997. A summary of the data generated by those studies, and the information collected through that work, is presented in Section 2.0 of this Work Plan.

This Work Plan: 1) summarizes the known environmental conditions that exist at the Site based on the information and data that are available at this time, 2) presents the investigative approach, quality control procedures, and scope of work for the completion of the RI, 3) identifies potential areas of concern (AOCs) in accordance with Section 1.8 of DER-10 and includes an investigation approach for the AOCs, 4) references a site-specific Health and Safety Plan (HASP) that was previously provided to NYSDEC and which has been revised as necessary to reflect the scope of work identified in this workplan and the Site's regulatory status as a Class 2 Inactive Hazardous Waste Disposal site, and 5) includes an Environmental Protection Agency (EPA) Quality Assurance Project Plan (QAPP). Implementation of the work described in this Work Plan will result in a greater understanding of the environmental impacts to the surface soil, subsurface soil, overburden groundwater, and bedrock groundwater associated with the Site. The findings of the RI will assist in the determination of appropriate remedial measures to address the identified environmental impacts. Completion of a Feasibility Study (FS) and preparation of a RI/FS report is included as part of the scope of work presented in this Work Plan.

The remainder of this introduction contains the following information:

1.1 Site Description

As shown on Figure 2, the Site is located on Hollenbeck Street and Balfour Drive in Rochester, New York and is defined as consisting of the following three parcels:

1. 245-265 Hollenbeck Street
   Tax Map Parcel No. Section 091 Subsection 70 Block 1 Lot 5

2. 271 Hollenbeck Street
   Tax Map Parcel No. Section 091 Subsection 70 Block 1 Lot 4

3. 50 Balfour Drive
   Tax Map Parcel No. Section 091 Subsection 69 Block 2 Lot 23.001

These three parcels cover approximately 6.95 acres of land, and as shown on the Site Plan (Figure 2), the Site is developed as described below:

- **<u>Main Building</u>.** This approximate 134,000-square foot building is located at 50 Balfour Drive. This building is comprised of an approximate 65,700-square foot one and two-story concrete block building and two connecting one-story metal buildings, which are located west of the concrete block building. The concrete block building is currently used for electroplating and metal stamping. Historically, this building was used for a variety of activities including a printing and lithographing facility, and a manufacturing facility for small kitchen appliances. The metal buildings have been used for sheet metal fabrication, stamping, and assembly since the construction of the buildings.

- **<u>Hollenbeck Building</u>.** This approximate 8,000-square foot one-story building is located at 245-265 Hollenbeck Street on the eastern portion of the Site. This building is currently used as a warehouse and equipment storage facility. In the past (i.e., between about 1974 and 1995), parts machining operations were conducted in this building, however, parts cleaning was reportedly not completed at this location.

- **Parking Lot.** There is an approximate 10,500-square foot asphalt-paved parking area on the southwestern portion of the Site (located on the 50 Balfour Drive parcel).

- **Roadway.** There is a gravel roadway on the northern portion of the Site (located on the 271 Hollenbeck Street parcel). This portion of the Site previously contained a railroad spur line and a building that was used for various activities including crate storage for a canning plant, a garage, a brush manufacturer, printing, silk screening and as occupational space for building supply, welding construction, and heating and cooling companies. This building was destroyed by a fire sometime before June 15, 1998.

- **Vegetation.** The remainder of the Site is covered by vegetation, primarily grass and closely-spaced trees on the northern portion of the Site (50 Balfour Drive) and the eastern portion of the Site (245-265 Hollenbeck Street).

- **Topography.** The Site is generally level. There is one elongated mounded area covered with vegetation (i.e., field grass) along the western portion of the Site adjacent to the railroad tracks that runs along the western boundary of the Site.

The following information has been collected regarding operations conducted at the Site.

Waste Disposal. The facility is currently a Resource Conservation and Recovery Act (RCRA) Large Quantity Generator (LQG) of hazardous waste for the disposal of primarily wastewater treatment plant sludge and plating line waste. The facility has received two United States Environmental Protection Agency (USEPA) identification numbers for the generation of hazardous waste: Code #NYD986933000 is inactive, and Code #NYD091662726 is active.

Previous disposal documentation indicates that trichloroethene (TCE) waste was generated at the facility, and that TCE was last used at the Site around 1992.

Other wastes generated at the Site are currently handled and disposed as described below:

- **Scrap Metal.** The current operator of the facility at the Site uses Metallica to recover scrap metal. Bins are located at work centers in the Main Building where they are used to store scrap metal. When full, the bins are moved to the metal loading area of the Main Building at the facility prior to transportation by the recycling operators to the Metallica facility. In addition, there is one large dumpster that is used for large scrap metal parts located outside the loading dock area of the Main Building.

- **Recyclables.** The facility operator at the Site uses Cascades Recovery to recycle paper and plastic. A bailer is used to prepare cardboard for shipment to the recycling facility. Separate totes are used in various areas of the Main Building to store paper and plastic. When full, the facility operator transports these totes to the recycling facility.
- **Scrap Skids.** A large roll-off dumpster provided by the City of Rochester is located at the Site and is used for scrap wood and skids.

Site Utilities. The Site is serviced by the public water supply system and the public sewer system. The buildings at the Site are currently heated with natural gas.

Waste Storage. Waste materials awaiting disposal are currently stored in the area between the main chemical storage room and the wastewater treatment area in the Main Building. The southern end of the aisle is the 90-day hazardous waste storage area, and the northern end is utilized to store non-hazardous waste and used oil. A concrete floor underlies this area, and it does not have a floor drain. A large spill/discharge in this area would be transported to the floor spill holding tank. Since 1997 (ownership by OBI, LLC), waste materials awaiting disposal have been stored in generally the same locations.

Solid waste generated at the facility is stored in dumpsters located in exterior portions of the Site. During a Phase I ESA conducted in 1997, one dumpster was observed in a loading dock on the south side of the Main Building. Other dumpsters were observed to be located on asphalt pavement on the exterior of the Main Building. Those dumpsters were labeled Waste Management of New York. Currently, dumpsters used to collect solid waste generated at the facility are located outside the loading dock area (southern portion of the Main Building).

Wastewater Pre-Treatment. Water used during the plating process conducted in the Main Building discharges into an on-site wastewater pre-treatment plant prior to being discharged to the Monroe County Pure Waters (MCPW) sanitary sewer system in accordance with the terms of a sewer use permit. Piping and trench-drain systems located in the vicinity of the plating operations collect wastewater that is generated by the plating operations and drain this wastewater to the on-site wastewater pre-treatment system.

Former Railroad Siding. Railroad tracks once extended from the former railroad line that forms the western border of the Site to an area along the northern portion of the Site. The railroad tracks that had been located on the Site formed a siding that was used to deliver and ship materials to and from the facility. These tracks have since been removed. The railroad line that forms the western border of the Site is a former New York Central Railroad Line that was removed from service since at least 1999. This former railroad line is now part of the Genesee Riverway Trail.

Permits. The following permits are in effect and apply to operations at the Site: NYSDEC air discharge permit; City of Rochester Fire Department permit; and County of Monroe sewer use permit.

Site Security. Site security consists of three components: fencing, an access control system, and security cameras. The entire Site perimeter is secured by fencing, including an electronic gate for the main entrance. The Main Building is secured with an access control system. Security cameras are positioned in key areas around the Site.

Soil, Bedrock, and Groundwater. Studies conducted at the Site to date have identified the following soil, bedrock, and groundwater conditions at the Site.

- **Fill Material.** Fill material containing slag, coal, wood, and other debris was found in various locations across the Site at depths up to 4 feet (ft.) below ground surface (bgs).

- **Native Soil.** Native soil consisting of soil with lesser amounts of fine sand, clay, and gravel (i.e., glacial till) was found at depths extending from about 4 ft. to 10 ft. bgs.

- **Fractured Bedrock.** A 2 to 5-foot layer of fractured (weathered) bedrock intermixed with soil (sand) was encountered at depths below the native soil described above.

- **Bedrock.** Bedrock (i.e., Gray Dolomitic Mudstone, or Rochester Shale) was encountered at the Site beginning at depths ranging from about 10 ft. to 12.5 ft. bgs.

- **Groundwater.** Depending on the season and location, groundwater has been encountered at about 5 ft. to 10 ft. bgs across various areas of the Site.

1.2 Site History

The Site was primarily vacant land prior to development in 1923, although a 1918 Plat Book indicates that a portion of the property was developed as athletic fields by Baush and Lomb Optical Company at that time. Addison Lithographing Company originally developed the 50 Balfour Drive portion of the Site in 1923 with the construction of the original approximate 31,750-square foot structure that is part of the current 134,000-square foot building. Addison Lithographing Company operated a printing and lithographing facility at the current 50 Balfour Drive property between 1923 and 1950. Within this period, building permits were issued on: April 11, 1923 to construct a brick lithographing plant (i.e., the original building); December 29, 1926 for an addition to the factory building; and November 15, 1945 for a brick addition to a factory building.

Toledo Scale (House and Kitchen Division) owned and performed operations at the current 50 Balfour Drive portion of the Site between 1950 and 1969. Toledo Scale (House and Kitchen Division) manufactured kitchen machines and retail/industrial scales at this location. Between 1951 and 1969, building permits were issued on: November 9, 1951 for a masonry addition to a factory building; October 22, 1952 for a brick addition to a factory building; July 18, 1957 for a cement block addition to a warehouse; and March 17, 1965 to erect an addition to the rear masonry warehouse and office.

From about 1970 to the present, operations conducted at 50 Balfour Drive have generally included plastic injection molding, tool and die operations, sheet metal stamping, fabrication, assembly, and electro plating. The companies that have operated in this period include: Puente Plastics, a plastic packaging manufacturer (approximately 1970 – approximately 1979), McAlpin-Derleth Tool and Die Corporation (1972-1980), Monroe Plating (1979-present), and McAlpin Industries (1999–present). OBI, LLC has owned the Site since 1997. Between 1973 and 2014, three additions to the Main Building were completed. The additions occurred in 1974 (7,200 square feet), 1987 (25,100 square feet), and 1998 (approximately 36,000 square feet). In addition, a building permit was issued on November 7, 1974 to erect an addition for a wastewater treatment plant.

German Tool and Die, Inc. constructed the 8,000-square foot building on the 245-265 Hollenbeck Street property in 1973, and operated at this facility between 1973 and 1995 when the business was sold to German Machine, Inc., which operated at this location through 1999. German Tool and Die, Inc. and German Machine, Inc. both machined parts, but reportedly did not conduct parts cleaning at this location. In 2000, OBI, LLC purchased the building at 245-265 Hollenbeck Street and currently uses it as a warehouse facility for dry storage.

The 271 Hollenbeck Street parcel was originally developed with a residence. By 1926, an approximate 6,500-square foot building and a railroad spur line, running generally from east to west on the southern side of the building, were constructed on this portion of the Site. The railroad spur line was removed from the Site before 1988 (i.e., the railroad line is not visible in the 1988 aerial photograph). The 1932 Sanborn map listed W.N. Clark Company (a canning plant) as the occupant of 271 Hollenbeck Street at that time, and identified the use of the building as "crate storage and a garage". The structure at 271 Hollenbeck was owned and occupied by a building supply company (Herbert R E and Company), with a welding company and a construction company as tenants between at least 1950 and 1964. In 1969, the building was partially vacant and two of the rooms were occupied by Vaccaro James Mutual Funds and Pro-Weld Corporation. By at least 1974/1975, the building at 271 Hollenbeck Street was vacant. According to City of Rochester directories, O'Grady Heating and Cooling occupied the property between at least 1979 and 1984. [Note: City of Rochester Fire Department records also identify O'Grady Heating and Cooling as an occupant of this property in 1989 and 1990.] Walker Brush Company, a manufacturer of brushes, with printing and silk screening operations, was located at 271 Hollenbeck Street from at least 1985 through 1997. In addition to the Walker Brush Company, various tenants were located within the 271 Hollenbeck Street building between 1987 and 1991. These include Gary J. Enterprises, a printer, between about 1987 and 1990; O'Grady Heating and Cooling apparently through 1990; and Van Epps Construction, Inc. between about 1990 and 1991. [Note: City of Rochester Fire Department records indicate that Walker Brush Company was cited on April 20, 1989 for improper storage and grounding of acetone containers, and Gary J. Enterprises was cited on June 2, 1989 for an acetone clean-up tank that was not properly disposed. In addition, a Monroe County Department of Health document dated December 14, 1988 indicates that a complaint was received stating that cleaning solvents were dumped on the ground at the Gary J. Enterprises facility.] According to City of Rochester records, the building on the 271 Hollenbeck Street parcel was destroyed by fire and demolished sometime before June 15, 1998. OBI, LLC purchased the property on November 18, 1998. Currently, the 271 Hollenbeck Street portion of the Site is vacant land covered with a gravel access roadway and vegetation.

A summary of the ownership history of the three parcels that comprise the Site is included as Table 1 in this Work Plan. As identified on this table, the operations that have been conducted at each of the three parcels are summarized below:

Property: 245- 265 Hollenbeck Street

Operations: Tool and Die (1973 – 1999)
Storage (2000 – 2015)

Property: 50 Balfour Drive

Operations: Printing (1923 – 1950)
Manufacturing, Plastic Injection Molding, Tool and Die, Stamping, Plating, Welding, and Assembly (1950 – 2015)

Property: 271 Hollenbeck Street

Operations: Railroad Siding (dates unknown)
Storage (1932)
Building Supply Company, welding and construction companies (~1950 – 1964)
Vacant (~1974 – 1975)
Heating Contractor (1978 – ~1990)
Printing (~1987 – ~1990)
Construction Contractor (~1990 – 1991)
Brush Manufacturer, with printing and silk screening (~1985 – 1997)
Vacant (1998 – 2015)

Note: The building at 271 Hollenbeck Street was destroyed by fire and demolished sometime before June 15, 1998, and the railroad tracks that made up the siding that had been located on this property had been removed by that time.

Three spills occurred at the Site that were reported to the NYSDEC. Each of these spills was subsequently remediated and the spill files have been closed by the NYSDEC. These spills include:

- **Diesel Fuel – 1993.** Diesel fuel spilled into the roadway at 255 Hollenbeck Street from a traffic accident on December 20, 1993. The spill was remediated and the spill file (#9311372) was closed by the NYSDEC.

- **Heating Oil - 2002.** Contaminated soil was reportedly encountered at the bottom of the excavation after a 6,000-gallon underground heating oil storage tank (UST) was removed from the 245-265 Hollenbeck Street property on February 28, 2002. Additional soil was removed and this spill file (#0111008) was closed by the NYSDEC.

- **Isopropyl Alcohol – 2004.** Two 55-gallon drums of isopropyl alcohol were punctured by a fork lift, and the contents spilled onto the floor of the Main Building on June 4, 2004. The spill was remediated and this spill file (#0470098) was closed by the NYSDEC.

1.3 Previous Studies

The various studies, sampling/monitoring events, and documents that have been prepared, which describe historic and environmental conditions at the Site since 1997, are discussed in Section 2.0 of this Work Plan.

1.4 Current Regulatory Status

An Order on Consent and Administrative Settlement (NYSDEC; 2013) was issued by NYSDEC to OBI, LLC in 2013 to address the presence of Site-related constituents in environmental media at the Site at concentrations above NYSDEC Standards, Criteria, and Guidance. The Site is listed on the Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 site.

The Order on Consent outlines the following work to be performed to comply with NYSDEC regulatory requirements.

- **Records Search Report.** A Records Search Report (DAY; 2014), which was submitted to the NYSDEC in March 2014.

- **Work Plans.** Work plans must be prepared and approved by the NYSDEC for investigations and remedial measures that may be implemented at the Site.

- **Site Management Plan.** This document will identify and implement the institutional and engineering controls, including monitoring and operation and maintenance of the remedy, which may be required based on the results of the Site investigation work to be performed.

- **Progress Reports.** Progress reports are to be submitted monthly and will contain the following information:
    - All activities taken pursuant to the Order on Consent during the reporting period.
    - All activities planned to be taken pursuant to the Order on Consent during the next reporting period.
    - All approved modifications to work plans and schedules.
    - All results of sampling and testing.
    - Percent of completion.
    - Unresolved delays.
    - Citizen's Participation Plan activities.

The progress reports are to be submitted to the NYSDEC on the 10th day of each month

- **Final Engineering Report.** A final report and a final engineering report are to be submitted to the NYSDEC at the completion of the work.

- **Periodic Review Report (PRR).** A PRR documenting that the site management controls that may be required by the remedy for the Site are in place will need to be submitted to the NYSDEC, if an SMP is part of the final remedy for the Site.

- **ROD Assistance.** OBI, LLC shall cooperate with the NYSDEC and provide reasonable assistance, consistent with the Citizen's Participation Plan, in soliciting public comments on the proposed remedial action plan ("PRAP") that would be used by the NYSDEC to select a final remedy for the Site in a Record of Decision (ROD).

This RI/FS Work Plan is submitted in accordance with the terms and conditions outlined in the Order on Consent to fulfill some of the conditions outlined above. The investigations described in this Work Plan, and any additional investigations and remedial measures that may be implemented at the Site, will be conducted in accordance with the terms and conditions established in the Order on Consent and under the direction of the NYSDEC.

Subject to the terms and conditions of the Order on Consent, OBI, LLC shall obtain the benefits conferred by the provisions of 6 NYCRR Part 375-1.9 and 375.2.9 when the NYSDEC issues a Certificate of Completion at the completion of the remedy. This includes the provision (Part 375-2.9) that OBI, LLC shall not be liable to the NYSDEC upon any statutory or common law cause of action, except for natural resource damages, arising out of the presence of any contaminants in, on, or emanating from the Site.

1.5 Future Site Use

The Site is currently used as an industrial facility where electroplating, metal stamping, and related manufacturing processes are conducted. This industrial use is expected to remain the same for the foreseeable future, and no major capital projects or other changes that would affect environmental conditions or potential exposure pathways are currently planned or anticipated at the Site.

1.6 *RI Objectives*

The objectives of the remedial investigation work defined in this Work Plan are described below.

- Define the nature and extent of on-site contamination.
- Characterization of the surface and subsurface characteristics of the Site, including topography, surface drainage, stratigraphy and depth to groundwater.
- Identify the contaminant source areas, if any.
- Produce data of sufficient quantity and quality for remedial decision-making.
- Identify and characterize soil contamination that may be acting as contaminant source areas. Delineate the areal and vertical extent of soil contamination that may be leaching to and impacting groundwater quality at the Site.
- Evaluate and outline the scope of potential Interim Remedial Measures (IRM), if any, which could be used to potentially remediate or mitigate contaminated source areas present in subsurface soil.
- Evaluate and characterize the extent and magnitude of the overburden and bedrock groundwater contamination at the Site.
- Describe the volume, concentration, persistence, mobility, state, and other significant characteristics of the on-site contamination.
- Determine the extent to which natural or anthropogenic barriers currently contain or impact migration or mobility of the contamination.
- Define the extent to which the contaminants have migrated on the Site or are expected to migrate off-Site, and whether future migration may pose a threat to human health or the environment.
- Perform an exposure assessment to identify potential routes of exposure, populations, and environmental receptors at risk.
- Define hydrogeological factors (e.g., groundwater flow, response of the groundwater system to extraction, depth to saturated zone, hydrologic gradients, hydraulic conductivity; and proximity to a drinking water aquifer, flood plain, or wetland).
- Describe groundwater characteristics, and current and potential groundwater use, including the identification of private wells and public water supply wells in the area.

- Describe the Site's contribution to an air, land, water, biota, or bioaccumulation contamination problem.

- Upon completion of the RI the potential for off-site impacts will also be assessed.

The goal of the RI is to obtain sufficient information to evaluate remedial alternatives, and ultimately recommend and select a remedial alternative that is protective of public health and the environment.

Upon NYSDEC request, additional investigation activities will be completed in accordance with addenda to this Work Plan until these objectives are successfully achieved.

1.7 Applicable Project Standards, Criteria, and Guidance

Applicable standards, criteria, and guidance (SCG) values that will be used for this project are outlined below:

- Appropriate Soil Cleanup Objectives (SCOs) and other guidance as set forth in 6 NYCRR Part 375-2 Inactive Hazardous Waste Disposal Program dated December 14, 2006.

- Appropriate Soil Cleanup Levels (SCL) and other guidance as set forth in NYSDEC CP-51 Soil Cleanup Guidance dated October 21, 2010.

- Guidelines referenced in the NYSDEC document titled "DER-10 Technical Guidance for Site Investigation and Remediation" dated May 10, 2010.

- Appropriate water quality standards and guidance values (WQS/GV) as set forth in the NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) document titled "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" dated June 1998, and amended by a January 1999 Errata Sheet, an April 2000 Addendum, and a June 2004 Addendum.

- City of Rochester Sewer Use Permit requirements.

- New York State Department of Health (NYSDOH) document entitled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" dated October 2006.

The work described in this Work Plan will be performed in accordance with the SCGs listed above.

2.0 PREVIOUS INVESTIGATIONS AND ENVIRONMENTAL CONDITIONS

This section describes the sampling, analyses, biostimulation evaluation and phytoremediation project that have been conducted at the Site since 1997 (Section 2.1), and presents a summary of current environmental conditions at the Site based on a review of the Site environmental quality data generated to date (Section 2.2).

2.1 Previous Investigations

This section describes the seven soil and groundwater sampling and analyses events that have been conducted at the Site, the biostimulation evaluation, and the phytoremediation project that have been performed at the Site since 1997, as well as the tank removals that have been conducted at the Site. Listed below are the sections of the Work Plan in which this work is described.

- Section 2.1.1: Underground Storage Tank Removals
- Section 2.1.2: 1997 Phase II ESA
- Section 2.1.3: 1998 Subsurface Soil Sampling
- Section 2.1.4: 2005-2006 Soil Sampling
- Section 2.1.5: 2008-2014 Soil Sampling
- Section 2.1.6: 2004-2013 Groundwater Sampling
- Section 2.1.7: 2009-2012 Biostimulation Evaluation
- Section 2.1.8: 2010 Phytoremediation Project

A total of 68 soil samples and 119 groundwater samples have been collected at the Site over this time period (i.e., since 1997). Most of the samples have been analyzed for VOCs but some of these samples have been analyzed for metals, cyanide, zinc, and total petroleum hydrocarbons (TPH). A list of the number of soil and groundwater samples collected per sampling event, and the parameters for which these samples were analyzed, are listed in Table 4. A list of the soil and groundwater samples collected at the Site since 1997 is presented in Appendix B.

The other work that has been conducted at the Site has consisted of a biostimulation evaluation and a phytoremediation project. Both of these measures were designed to enhance the effects of natural biological processes to remove Site-related constituents (i.e., VOCs) from overburden groundwater at the Site.

The tables and figures that present the information discussed in this section are provided at the end of the text of this Work Plan. The figures and tables relevant to this section are as follows:

Tables:

- Table 4: List of the Number of Samples Analyzed Per Parameter
- Table 5: Summary of Soil Quality Data (1997-2014)
- Table 6: Summary of Groundwater Quality Data (1997-2014)
- Table 7: Soil Constituents Exceeding SCOs
- Table 8: Halogenated VOCs in Groundwater

Figures:

- Figure 1: Project Locus Map
- Figure 2: Site Plan
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- Figure 4: 2014 Off-Site Soil and Groundwater Sampling Locations
- Figure 5: Site Plan with Soil Sample Locations Exceeding Unrestricted Use Soil Cleanup Objectives for Volatile Organic Compounds (VOCs)
- Figure 6: Site Plan with Groundwater Sample Locations Exceeding Halogenated VOC SCG Values for the Most Recent Sampling Event Associated with that Well

These sampling and analyses events, the biostimulation evaluation, the phytoremediation project and the underground storage tank removals that have been conducted at the Site since 1997, are described below. The overall approach used to characterize environmental conditions at the Site has been to perform sampling and analyses programs that defined soil and groundwater quality conditions in specific, limited areas. This RI scope of work is designed to complete the characterization of Site environmental conditions.

These data, described below and used in Section 2.2 to summarize current environmental conditions at the Site, provided the understanding of the type, concentrations, and location of Site-related constituents that was used to design the scope of the remedial investigation work presented in Section 4.0 of this Work Plan.

2.1.1 Underground Storage Tank Removals

Two 3,000-gallon fuel oil USTs were installed at the Site in 1974 during a natural gas shortage. The USTs were located immediately west of the boiler room (i.e., in the courtyard area located north of the Main Building; refer to Figure 8). The USTs were filled with fuel oil but were never actively used at the facility. These USTs were removed sometime between 1980 and 1985. Prior to removal, the fuel oil was pumped out, and sold and reused by the adjacent business (i.e., German Tool & Die, Inc.) which was located at the 245-265 Hollenbeck Street portion of the Site. It was reported that the soils beneath the USTs were tested at the time the USTs were removed, and that no contamination was detected. However; as summarized in Section 2.1.2 (see below), several test pits excavated in this area contained evidence of petroleum contamination, an indication that fuel oil might have been released in this area. (Refer to the Records Search Report dated March 2014 that was prepared by DAY.)

In addition, as summarized in the Records Search Report dated March 2014, a 6,000-gallon fuel oil UST was located east of the building that is located on the 245-265 Hollenbeck Street portion of the Site (refer to Figure 8). This UST was installed in 1974 and removed in 2002 by New York Environmental Technologies, Inc. (NYETECH). A spill file (Spill #0111008) was opened by the NYSDEC during the removal of this tank. Groundwater was not tested at the time of the UST removal; however, a sheen was noted by NYETECH on groundwater in the excavation. Soil samples were collected from the excavation and analyzed. Petroleum contamination was detected in the soil sample collected from the west wall of the excavation (closest to the building foundation). A copy of the NYETECH report is included in the Records Search Report.

2.1.2 1997 Phase II ESA

As part of a real estate transaction in 1997, a Phase I Environmental Site Assessment (ESA) was prepared and a Phase II ESA level sampling and analyses program was conducted.

The sampling and analyses work performed as part of the Phase II ESA consisted of the installation of six groundwater monitoring wells, the collection and analyses of groundwater samples from each of these six wells, and the collection and analyses of 13 soil samples. The samples that were collected and the parameters for which these samples were analyzed are shown on the chart below.

1997 Phase II ESA Samples					
Soil Samples			Groundwater Samples		
Sample Designation	**Sample Date**	**Test Parameters**	**Sample Designation**	**Sample Date**	**Test Parameters**
BH-01 (6-8')	08/22/97	TCL/STARS VOCs, TCL SVOCs	MW-1	10/02/97	TCL VOCs*, Total Zinc
TP-7 (9.5-10.5')	08/25/97	TCL/STARS VOCs, TPH	MW-2	10/02/97	TCL VOCs*, Total Zinc
BH-04 (6-8')	08/22/97	TCL VOCs*, TPH	MW-3	10/02/97	TCL VOCs*, Total Zinc
BH-09 (4-6')	08/25/97	TCL VOCs*	MW-4	10/02/97	TCL VOCs*, Total Zinc
TP-4 (3-4.5')	08/25/97	PCBs	MW-5	10/02/97	TCL VOCs*, Total Zinc
BH-01 (0-2')	08/22/97	Total Cyanide	MW-6	10/02/97	TCL VOCs*, Total Zinc
BH-01 (2-4')	08/22/97	TAL Metals	*STARS: NYSDEC Spill Technology and Remediation Series		
BH-04 (0-2')	08/22/97	TAL Metals			
BH-06 (2-4')	08/23/97	TAL Metals			
TP-2 (9-10')	08/25/97	TPH			
BH-11 (0-2)	09/17/97	TCL VOCs*			
BH-13 (6-8')	09/17/97	TCL VOCs*, Total Zinc			
BH-15 (9-11')	09/18/97	TCL VOCs*, Total Zinc			

As shown on Figure 3, the sampling locations identified above are primarily located in the northern/central section of the Main Building, and in the adjacent courtyard and unpaved areas north of the Main Building. The results of the laboratory analyses of the soil samples for VOCs are presented in Table 5, and the results of the analyses of the groundwater samples are presented in Table 6.

Table 5 highlights the constituents detected in soil at concentrations above applicable NYSDEC SCOs, and Table 6 highlights the constituents detected in groundwater at concentrations above the NYSDEC water quality standards. These highlighted constituent concentrations have been reduced into a condensed table for soil (i.e., Table 7), and a condensed table for groundwater (i.e., Table 8). Table 7 identifies the nine soil samples that have been collected on-Site that contained VOC constituents, primarily TCE, at concentrations above the NYSDEC Unrestricted SCOs. The TCE concentrations in these soil samples ranged from 0.555

milligrams per kilogram (mg/kg) to about 124.6 mg/kg. The NYSDEC Unrestricted Use SCO for TCE is 0.47 mg/kg, and the Industrial use SCO for TCE is 400 mg/kg.

Similarly, Table 8 lists the highest concentrations of the five halogenated VOCs that have been detected at concentrations above the NYSDEC water quality standards. These five halogenated VOCs are:

- tetrachloroethene (PCE)
- trichloroethene (TCE)
- trans-1,2-Dichloroethene (DCE)
- cis-1,2-DCE (DCE)
- vinyl chloride (VC)

As shown in Table 8, the highest concentrations of the halogenated VOCs detected in any of the groundwater samples collected from Site wells to date were primarily detected in monitoring wells MW-1 through MW-6 in 1997.

Overall, the Phase II ESA data demonstrated that halogenated VOCs were present in subsurface soil at the Site, at least in areas beneath and adjacent to the northern/central section of the Main Building, and in overburden groundwater at concentrations, above NYSDEC SCGs. The studies described below provided additional information on other specific Site soil areas, and on the extent, fate, and transport of VOCs in Site groundwater.

In addition, detectable concentrations of TPH were present in soil samples from TP-2 and BH-04, at a maximum concentration of 285 parts per million (ppm) (BH-04). Also, free product was observed in Test Pits TP-1, TP-2 and TP-3. These test pits were located in the area of two former 3,000 gallon fuel oil USTs (refer to Section 2.1.1).

2.1.3 1998 Subsurface Soil Sampling

Soil borings were advanced and four soil samples were collected in 1998 in order to collect additional information on Site soil quality, particularly in the northern central section of the Main Building (refer to Figure 3). The following chart lists the four soil samples that were collected and analyzed in 1998 and the parameters for which these samples were analyzed.

Sample No.	Sample Date	Test Parameters
TB-2 (12-12.5')	04/22/98	TCL/STARS VOCs
TB-6 (4-8')	04/22/98	TCL/STARS VOCs, STARS SVOCs
TB-8 (8-10')	04/22/98	TCL/STARS VOCs
TB-6 (8-10')	04/22/98	TPH

The results of the laboratory analyses of these four soil samples are presented in Table 5. None of the 1998 soil samples contained VOCs at a concentration above the NYSDEC Unrestricted Use SCOs. However; a detectable concentration of TPH was present in the soil sample from TB-6 at a concentration of 1,806 ppm.

2.1.4 2005–2006 Soil Sampling

Soil borings were advanced and 22 subsurface soil samples were collected from various areas of the Site, primarily in the northern/central Main Building area, in February 2005. The following chart lists the 22 soil samples that were collected and analyzed in 2005, and the parameters for which these samples were analyzed. These soil sample locations are shown on Figure 3.

2005 Soil Samples					
Sample Designation	**Sample Date**	**Test Parameters**	**Sample Designation**	**Sample Date**	**Test Parameters**
TB-101 (6.5')	02/01/05	TCL/STARS VOCs + TICs, Total Zinc, Total Cyanide	TB-114 (9.3')	02/02/05	Halogenated VOCs + TICs
TB-102 (11.7')	02/01/05	Halogenated VOCs + TICs, Total Zinc, Total Cyanide	TB-115 (1.0')	02/02/05	Total Zinc
TB-104 (6.0')	02/01/05	Total Zinc	TB-115 (7.0')	02/02/05	Total Zinc
TB-104 (11.0')	02/01/05	Halogenated VOCs + TICs, TPH	TB-115 (10.7')	02/02/05	Halogenated VOCs + TICs
TB-106 (9.3')	02/01/05	Halogenated VOCs + TICs	TB-11 7(6.5')	02/02/05	Total Zinc
TB-109 (9.6')	02/01/05	Halogenated VOCs + TICs	TB-117 (9.9')	02/02/05	Halogenated VOCs + TICs
TB-110 (9.3')	02/01/05	Halogenated VOCs + TICs	TB-119 (3.5')	02/02/05	TPH
TB-112 (7.5')	02/01/05	Total Zinc	TB-119 (10.5')	02/02/05	Halogenated VOCs + TICs
TB-113(6.5')	02/01/05	Total Zinc	TB-120 (12.0')	02/02/05	Halogenated VOCs + TICs
TB-114 (2.0')	02/02/05	Total Zinc	TB-121 (6.5')	02/02/05	TPH
TB-114 (6.5')	02/02/05	Total Zinc	TB-122 (11.0')	02/02/05	Halogenated VOCs + TICs, TPH

The results of the laboratory analyses of these 22 soil samples for VOCs are presented in Table 5. Also, shown in Table 7, only two of the 22 soil samples collected in 2005 contained halogenated VOCs at concentrations above the NYSDEC Unrestricted Use SCOs, and none of the soil samples contained halogenated VOCs at concentrations that exceeded the Industrial Use SCOs. Sample TB-101 collected from the soil beneath the northern/central section of the Main Building contained TCE at a concentration of 1.5 mg/kg, and sample TB-117 in the same general area contained TCE at a concentration of 0.555 mg/kg. The NYSDEC Unrestricted Use SCO for TCE is 0.47 mg/kg, and the Industrial Use SCO for TCE is 400 mg/kg.

Also, detectable concentrations of TPH were present in the four soil samples submitted for TPH analysis. TPH was detected in soil sample TB-

104 at 231 ppm, in soil sample TB-119 at 502 ppm, in soil sample TB-121 at 29.3 ppm, and in soil sample TB-122 at 807 ppm.

Although the limited number of 2005 soil samples containing halogenated VOC constituents at concentrations above NYSDEC SCOs indicated that the presence of halogenated VOCs in subsurface soil at concentrations above NYSDEC SCOs may be limited in extent, groundwater data collected at this time (as discussed in Section 2.1.6) indicated that halogenated VOCs could possibly be present at concentrations above NYSDEC SCOs in subsurface soil. In response, an additional 20 subsurface soil samples were collected from various Site areas in August 2006. Those sample locations are shown on Figure 3. The following chart lists the 20 soil samples that were collected and analyzed in 2006, and the parameters for which these samples were analyzed.

2006 Soil Samples					
Sample Designation	Sample Date	Test Parameters	Sample Designation	Sample Date	Test Parameters
TB-200 (4.0')	08/09/06	Halogenated VOCs, Total Zinc	TB-207(0-2')	08/10/06	Halogenated VOCs
TB-200 (8.0')	08/09/06	Halogenated VOCs, Total Zinc	TB-208 (0-2')	08/10/06	Halogenated VOCs
TB-201 (8.0')	08/09/06	Halogenated VOCs, Total Zinc	TB-209 (0-2')	08/10/06	Halogenated VOCs
TB-202 (10.5')	08/09/06	Halogenated VOCs, Total Zinc, Total Cyanide	TB-210 (11.9')	08/10/06	TCL/STARS VOCs
TB-203 (4.0')	08/09/06	Halogenated VOCs, Total Zinc, Total Cyanide	TB-211 (11.0')	08/10/06	Halogenated VOCs, Total Zinc, Total Cyanide
TB-203 (8.0')	08/09/06	Halogenated VOCs, Total Zinc	TB-212 (11.5')	08/10/06	Halogenated VOCs, Total Zinc
TB-203 (12.0')	08/09/06	Halogenated VOCs, Total Zinc, Total Cyanide	TB-213 (11.9')	08/10/06	Halogenated VOCs, Total Zinc
TB-204 (12.0')	08/09/06	Halogenated VOCs, Total Zinc	TB-214 (11.0')	08/10/06	TCL/STARS VOCs
TB-205 (0-2')	08/10/06	Halogenated VOCs	TB-215 (8.0')	08/10/06	Halogenated VOCs
TB-206 (0-2')	08/10/06	Halogenated VOCs	TB-215 (11.9')	08/10/06	Halogenated VOCs

The results of the laboratory analyses of these 20 soil samples are presented in Table 5. As shown in Table 7, only two of the 20 soil samples collected in 2006 contained halogenated VOCs at concentrations above the NYSDEC Unrestricted Use SCOs, and none of the soil samples contained halogenated VOCs at concentrations that exceeded Industrial Use SCOs.

Sample TB-202 collected from the soil beneath the northern/central section of the Main Building contained cis-1,2-DCE at a concentration of

2.34 mg/kg, and sample TB-213 in the same general area contained methylene chloride at a concentration of 0.219 mg/kg. The NYSDEC Unrestricted Use SCO for cis-1,2-DCE is 0.25 mg/kg, and the NYSDEC Unrestricted Use SCO for methylene chloride is 0.05 mg/kg. The chemical cis-1,2-DCE is often found as a product of the breakdown of TCE by natural biodegradation or other processes. Methylene chloride is often caused by laboratory operations and is probably not a Site-related constituent.

2.1.5 2008-2014 Soil Sampling

Soil borings were advanced and four subsurface soil samples were collected from various areas of the Site, primarily in the northern/central Main Building area in 2008, and one soil sample was collected in 2011. Refer to Figure 3 for the location of these soil samples. An additional four soil samples were collected in 2014 from off-site sections in right-of-way areas adjacent to the Site (i.e., the 2014 "ROW" samples as shown in Appendix B). The following chart lists the nine soil samples that were collected and analyzed from 2008 through 2014, and the parameters for which these samples were analyzed.

2008-2014 Soil Samples					
Sample Designation	**Sample Date**	**Test Parameters**	**Sample Designation**	**Sample Date**	**Test Parameters**
SS-1 (0-2")	10/01/08	TCL/STARS VOCs	TB-402 (11')	03/07/11	Halogenated VOCs
SS-4 (2-4")	10/01/08	TCL/STARS VOCs	ROW-5 (10.7')	02/10/14	Halogenated VOCs
IB-100 (2-4')	10/01/08	TCL/STARS VOCs	ROW-3 (8.0')	02/10/14	Halogenated VOCs
IB-100 (5-7')	10/01/08	Halogenated VOCs	ROW-6 (10.7')	02/10/14	Halogenated VOCs
			ROW-7 (10.7')	02/10/14	Halogenated VOCs

The results of the laboratory analyses of these nine soil samples are presented in Table 5. As shown in Table 7, only two of the nine soil samples collected from 2008 through 2014 contained VOCs at concentrations above the NYSDEC Unrestricted Use SCOs, and none of the soil samples contained VOC concentrations that exceeded the Industrial Use SCOs. Acetone was detected in soil sample SS-1 at a concentration of 0.723 ppm, which exceeded the NYSDEC Unrestricted Use SCO. Chloroform was detected above the NYSDEC Unrestricted Use

SCO in an off-Site area (refer to the 2014 ROW-6 sample results shown on Table 7); however, chloroform has not been detected in Site soil samples and documented use of chloroform at the Site has not been obtained/recorded. As a result, it is unlikely that the presence of chloroform is related to Site conditions.

2.1.6 2004-2013 Groundwater Sampling

There is an existing groundwater monitoring well network at the Site consisting of 17 groundwater monitoring wells. Sixteen of these wells are screened in the shallow (i.e., up to 10 ft. bgs) overburden aquifer and one of these wells (i.e., MW-7) is screened in the bedrock aquifer. The first six wells in the network were installed as part of the 1997 Phase II ESA, as discussed in Section 2.1.2.

The remaining wells were installed in various stages starting in 2007 and continuing through 2011 in order to provide additional information on groundwater quality in the shallow overburden aquifer at the Site. This does not include five groundwater monitoring wells installed in 2014 in off-site right-of-way areas adjacent to the Site. These wells, referred to as the ROW wells, were installed to estimate the extent to which Site-related constituents may be migrating with groundwater to off-site areas. These ROW wells do not characterize Site groundwater quality.

The Site groundwater monitoring wells have been used to collect groundwater samples during 20 sampling events conducted from October 2004 to February 2014. The charts below show the wells used to collect groundwater samples during each of these sampling events.

October 2004 to July 2009 Groundwater Sampling Periods											
Well No.	10/15/04	06/07/06	06/27/07	07/31/07	05/01/08	08/21/08	12/03/08	01/29/09	03/31/09	05/08/09	07/20/09
MW-1	x	x	x		x	x					
MW-3	x	x			x	x					
MW-4						x					
MW-5	x	x		x	x	x	x	x	x	x	x
MW-6									x		
MW-7*			x	x	x	x			x		
MW-8			x		x	x			x		x
MW-9			x		x	x			x		
MW-10			x		x	x			x		
MW-11			x		x	x					
MW-12			x		x	x					
MW-13			x		x	x					
MW-14							x				

Note: Wells MW-16, MW-17, and MW-18 are not listed above because they were not installed until 2011.

September 2009 to February 2014 Sampling Periods

Well No.	09/14/09	12/21/09	03/24/10	04/14/10	10/25/10	03/28/11	98/22/11	11/29/12	01/04/13	02/10/14
MW-1				x	x		x	x	x	See note 1.
MW-3					x		x	x		
MW-5	x	x	x	x	x		x	x	x	
MW-6	x		x		x		x	x		
MW-7*	x		x		x		x	x		
MW-8	x	x	x		x		x	x		
MW-9	x		x		x		x	x		
MW-10	x		x		x		x	x		
MW-12				x	x					
MW-13					x		x	x		
MW-14							x	x		
MW-16						x	x	x		
MW-17 *						x	x	x		
MW-18						x	x	x	x	

* MW-7 is a bedrock well. The other Site wells are screened in the shallow overburden aquifer.

1. Groundwater samples were collected from the following off-site monitoring wells on 02/10/14: ROW-1, ROW-4, ROW-5, ROW-8, and ROW-9.

These groundwater samples were analyzed for halogenated VOCs, except for the samples collected in 2004 and 2006. The groundwater samples collected on October 15, 2004 were analyzed for TCL/STARS VOCs, total zinc, and total cyanide. The groundwater samples analyzed on June 7, 2006 were analyzed for TCL/STARS VOCs and total zinc.

The results of the analyses of these groundwater samples are presented in Table 6. The table shows that five halogenated VOCs have been detected in groundwater samples collected from each of the Site groundwater monitoring wells at concentrations above the NYSDEC groundwater quality standards. No other constituents were detected in Site groundwater at concentrations above the NYSDEC groundwater quality standards. These five halogenated VOCs, and the highest concentration at which these halogenated VOCs have been detected in groundwater samples collected at the Site since the Phase II ESA was conducted in 1997, are shown in the chart below.

Constituent	Highest Detected Concentration (µg/L)	Date of Sampling	Well No.
PCE	11.9	10/02/97	MW-1
TCE	4,917.1	10/02/97	MW-6
Trans 1,2-DCE	43.5 E	10/02/97	MW-6
cis 1,2-DCE	11,500	03/31/09	MW-6
Vinyl Chloride	5,400	09/14/09	MW-6

The groundwater quality data presented in Table 6 were compared to the NYSDEC groundwater quality standards. The results of this comparison are summarized in Table 8, which lists: (1) the highest concentration of the five halogenated VOCs detected in groundwater samples collected from each of the Site monitoring wells; and (2) the current concentration of these halogenated VOCs as represented by the results of the analyses of the most recent groundwater sample collected from these wells.

Figure 6 shows the location of the monitoring wells that contained halogenated VOC constituents at concentrations above NYSDEC groundwater quality standards in the most recent sampling event for that well, and the concentrations at which these halogenated VOCs were detected. The figure shows that the monitoring wells containing the highest halogenated VOC concentrations are basically located in the northern/central section of the Main Building, or in the unpaved area north of the Main Building.

As shown in Table 8, one of the halogenated VOCs (i.e., PCE) was not detected above NYSDEC groundwater quality standards in any of the Site monitoring wells during the most recent groundwater sampling events. The concentrations of the other four halogenated VOCs have basically decreased during the most recent sampling events, but remain at concentrations that exceed NYSDEC groundwater quality standards.

As discussed in Section 2.2.2, three halogenated VOCs (i.e., trans-1,2-DCE, cis-1,2-DCE and Vinyl Chloride) are products of the chemical and/or biological degradation of PCE and TCE and, consequently, their presence in Site groundwater may be the result of the natural biodegradation of

PCE and TCE and/or to the enhanced bioremediation that occurred in response to the biostimulation evaluation discussed in Section 2.1.7.

Overall, the 2004 through 2014 groundwater data shows:

- The horizontal extent of groundwater containing Site-related constituents at concentrations above the NYSDEC groundwater quality standards appears to be basically limited to the boundary of the Site.
- The highest concentrations of halogenated VOCs in shallow overburden groundwater are located beneath the northern/central section of the Main Building.
- Although the concentrations of the halogenated VOCs have decreased since 1997, the halogenated VOC concentrations are still present in Site groundwater at concentrations above NYSDEC groundwater quality standards.

The 1997 through 2014 groundwater quality data described above are used in Section 2.2.2 to describe current groundwater quality and to estimate the general fate and transport of the halogenated VOCs in Site groundwater. The additional shallow aquifer and bedrock groundwater monitoring wells to be installed and sampled as part of this RI scope of work (as described in Section 4.0) are designed to augment the existing 1997 through 2014 groundwater quality data base. This work is expected to complete the characterization of groundwater quality in the shallow overburden and the bedrock aquifer at the Site.

2.1.7 2009-2012 Biostimulation Evaluation

A biostimulation evaluation was conducted at the Site beginning in August 2008 and continued through August 2009. The biostimulation evaluation focused on the uppermost groundwater zone (overburden) beneath the northern central section of the Main Building, and the adjacent exterior area north of the Main Building. The purpose of this evaluation was to evaluate the degree to which halogenated VOC concentrations in groundwater could be reduced through the introduction of nutrients (i.e., sugar and vegetable oil) into the overburden groundwater zone to promote the natural anaerobic biodegradation of these constituents in groundwater.

The biostimulation evaluation consisted of the following activities:

- Initially, groundwater samples were collected from monitoring wells MW-5, MW-6, MW-7R, and MW-8 on August 21, 2008. These samples were tested in the field for dissolved oxygen, Oxidation Reduction Potential (ORP), pH, and specific conductance. A separate groundwater sample from each of these monitoring wells was submitted to an analytical laboratory and analyzed for VOCs and bioremediation assessment parameters (e.g., boron, nitrate, sulfate, etc.).

- Subsequently, Phase I of the biostimulation evaluation was initiated on December 4, 2008 with the injection of a sugar-water solution followed by the injection of vegetable oil into well MW-15. The vegetable oil was flushed into the subsurface by hot water, and a specialized well cap secured to the top of MW-15 that allowed low-pressure (i.e., typically less than 25 psi) injection of compressed air to force the sugar/vegetable oil water solution into the groundwater. This Phase I of the biostimulation evaluation was extended through January 9, 2009 in which time, approximately 145 gallons of sugar solution and 45 gallons of vegetable oil were placed into well MW-15.

- A Phase II component of the biostimulation evaluation was performed from June 18, 2009 through August 11, 2009 when approximately 51 gallons of vegetable oil was injected into MW-15 using low-pressure compressed air. Vegetable oil was also injected into monitoring wells MW-4 (approximately 59 gallons), MW-11 (approximately 30 gallons) and MW-14 (approximately 35 gallons) during this period. [Note: Monitoring wells MW-4, MW-11 and MW-14 are located hydraulically upgradient of MW-15 and the target evaluation area.]

- In conjunction with the injection process, downgradient monitoring wells MW-5, MW-6, MW-7R, MW-8 and MW-9 were routinely monitored to measure in-situ parameters of pH, ORP and dissolved oxygen, and testing was completed on several occasions to assess microbe populations.

<u>Evaluation Results</u>

- Field parameter measurements suggest that the addition of amendments promoted the desired anaerobic environment (i.e., particularly in proximity of the injection locations, with less evidence in locations further downgradient).

- During, and subsequent to, the evaluation, samples were collected from MW-5, MW-7R, MW-8 and MW-9 and submitted to Microbial Insights, Inc. (MI) for testing of *Dehalococcoides* populations and functional groups. These test results are summarized in the following table.

	MW-5			
	3-31-09	7-20-09	9-28-11	11-29-12
	2.98E+04	1.32E+05	8.12E+02	2.98E+05
tceA	NT	2.00E-01	<4.53E-1	1.23E+03
bvcA	NT	3.77E+04	6.56E+02	8.96E+04
VCR	NT	1.72E+05	5.69E+01	1.06E+05

	MW-7R		*MW-8*			*MW-9*	
	9-28-11	11-29-12	3-31-09	9-28-11	11-29-12	9-28-11	11-29-12
	1.63E+04	1.88E+01	3.00E+00	6.78E+03	8.50E+00	2.97E+04	8.60E+00
tceA	1.20E+03	4.20E+00	NT	1.75E+01	4.70E+00	2.63E+03	4.70E+00
bvcA	4.23E+03	8.30E+00	NT	1.28E+03	<4.0E+00	2.16E+03	<3.7E+00
VCR	2.42E+03	9.80E+00	NT	9.79E+04	4.60E+00	2.92E+04	1.1E+00 J

Notes:

Units = cells/mL TCE = Trichlorethene

NT = Sample not tested cis-DCE = cis-1,2-Dichlorethene

DHC = *Dehalococcodies* spp. VC = Vinyl Chloride

J = Estimated Value

Functional Genes

tceA = The tceA gene encodes the enzyme responsible for reductive dechlorination of TCE to cis-DCE in some strains of *Dehalococcodies*. Detection of the tceA gene provides evidence of the potential dechlorination of TCE.

bvcA = Presence of the bvcA gene indicates the potential reductive dechlorination of VC to ethene.

VCR = Presence of the VCR gene indicates the potential for reductive dechlorination of DCE and/or VC to ethene.

E+04 = Concentration >10^4 cells/mL indicates dechlorination is occurring and conditions are favorable for complete degradation to ethene

E+01 = Concentration 10^1 cells/mL to <10^4 cells/mL indicates marginal conditions for dechlorination and biostimualtion may be necessary

E+00 = Concentration <10^1 cells/mL is low and not favorable for dechlorination; biostimulation and/or bioaugmentation required

- The halogenated VOCs measured in samples collected from monitoring wells MW-5, decreased immediately following the Phase I and Phase II evaluations, but the most-recent testing indicates an increase in concentrations. The test results for MW-6 suggest that concentrations increased following the Phase I evaluation, but since March 31, 2009 steadily decreasing concentrations were measured. The results for MW-8 and MW-7R are inconclusive. The concentrations in samples from MW-8 indicate an apparent increasing trend, and although the most-recent samples collected from MW-7R on 11/29/2012 contained higher concentrations than previous sample events, the concentrations measured in the samples collected from this well were generally consistent throughout the evaluation.

Although some of the test results for the most-recent sampling event (i.e., samples collected on November 29, 2012) indicated a decrease in *Dehalococcoides* populations and the desired functional groups, the results for samples collected during the evaluation were favorable suggesting that biostimulation is viable remedial alternative for the Site.

2.1.8 2010 Phytoremediation Project

Beginning in 2010, a phytoremediation project was performed at the Site in consultation with Dr. Louis A. Licht of Ecolotree, Inc. A summary of the tasks performed as part of this phytoremediation project, and a chronology of this work is presented below.

- In June 2010, a total of 150 male hybrid poplar whips were planted within three trenches. (A whip is a slender, unbranched shoot or plant. This term is used in forestry to refer to unbranched young tree seedlings that have been grown for planting). Each trench was approximately 500 feet long, and the trench extended from the ground surface into the top of the water table such that the bottoms of the whips were within the water table. The whips were approximately 10 to 12 feet high and they were purchased from Ecolotree, Inc. The whips were planted at approximate 10-foot intervals, and a combination of mineral fertilizer, compost, and granular sugar was added to the soil backfill as the whips were planted.

- In April 2011, 117 male hybrid poplar replacement whips purchased from Ecolotree, Inc. were planted to replace trees that either died due to the hot and dry weather encountered in June and July 2010, or did not appear to be thriving.
- In May 2012, 25 additional hybrid poplar and 10 hybrid willow trees purchased from Ecolotree, Inc., and whips removed from established trees, were planted to supplement the trees planted previously, and to add trees on the north side of the 245-265 Hollenbeck Street property.
- In the 2013 growing season, the trees appeared to be generally well established and growing.

Analytical laboratory test results for groundwater samples collected from monitoring wells located downgradient of the phytoremediation project suggest that phytoremediation may be effective in reducing VOC concentrations in Site groundwater. Well MW-10 is located downgradient of the phytoremediation area located on the northern boundary of the Site, and well MW-12 is located downgradient of the phytoremediation area on the eastern boundary of the Site.

As shown in Table 6, VOC concentrations in the MW-10 samples have decreased since the planting of the phytoremediation trees. For example, the cis-1,2-DCE concentration has dropped from 76 ug/l or higher to non-detect; and, Vinyl Chloride has dropped from 51.4 ug/l or higher to 2.78 ug/l.

Similarly, the most recent groundwater data shown in Table 6 for well MW-12 shows that the concentrations of the three VOCs that have been detected in groundwater samples collected from well MW-12 at concentrations above NYSDEC water quality standards have decreased by about 50% since the hybrid poplar whips were first planted in June 2010.

2.2 Summary of Current Site Environmental Conditions

This section presents a summary of current environmental conditions at the Site that was developed based on the data generated through the implementation of the various soil and groundwater studies described in Sections 2.1.1 through 2.1.6. The Site has been occupied by manufacturing operations where processes such as printing, electroplating, metal stamping, and other on-site industrial operations have been conducted since 1923.

Previous investigations have identified VOCs in soil and groundwater as environmental conditions at the Site to be investigated and possibly remediated. Soil vapor and indoor air issues at the Site have been addressed as described in other documents that have been previously submitted to the NYSDEC. The key tables and figures used in this summary are as follows:

Environmental Conditions Summary Tables:

- Table 5: Summary of Soil Quality Data (1997-2014)
- Table 6: Summary of Groundwater Quality Data (1997-2014)
- Table 7: Soil Constituents Exceeding SCOs
- Table 8: Halogenated VOCs in Groundwater

Environmental Conditions Summary Figures:

- Figure 5: Site Plan with Soil Sample Locations Exceeding Unrestricted Use Soil Cleanup Objectives for Volatile Organic Compounds (VOCs)
- Figure 6: Site Plan with Groundwater Sample Locations Exceeding Halogenated VOC SCG Values for the Most Recent Sampling Event Associated with that Well
- Figure 7: Potentiometric Groundwater Contour Map for December 7, 2012

Section 2.2.1 presents a summary of current soil quality conditions at the Site and Section 2.2.2 presents a summary of current groundwater quality conditions at the Site.

2.2.1 Summary of Site Soil Environmental Conditions

A total of 64 soil samples have been collected from the Site since 1997, and four soil samples were collected from off-site right-of-way areas adjacent to the Site in 2014. The results of the laboratory analyses of these samples for VOCs are presented in Table 5. These data were evaluated by comparing constituent concentrations to NYSDEC Unrestricted Use SCOs and Industrial Use SCOs. The constituents that were detected in these samples at concentrations above the NYSDEC Unrestricted Use SCOs in any of these 68 soil samples are listed in Table 7. Note, none of the soil samples had constituents (i.e., VOCs) that exceeded Industrial Use SCOs.

There are 10 soil samples shown in Table 7 that contained a constituent at a concentration above the Unrestricted Use SCOs, and eight soil samples that contained a Site-related constituent at a concentration above the Unrestricted Use SCOs. Of the seven constituents whose concentrations exceeded its Unrestricted Use SCO, two of them (i.e., methylene chloride and chloroform) are unlikely to be Site-related constituents since these materials are not known to have been used at the Site, have not been detected in the other Site soil samples at these concentrations, and/or are from off-Site areas.

The remaining VOC constituents detected in Site soil samples at concentrations above Unrestricted Use SCOs (i.e., PCE, TCE, cis-1,2 DCE, xylenes and acetone) are known to have been used at the Site in the past (i.e., PCE, TCE, xylenes and acetone) and/or are breakdown products (cis-1,2-DCE) of PCE and TCE. The laboratory analytical results for the five Site-related constituents detected in Site soil samples at concentrations above the Unrestricted Use SCOs are listed in Table 7, and are shown on Figure 5.

In addition, field evidence of apparent petroleum-impacted soils (i.e., free product, staining, odors, elevated TPH concentrations, etc.) were identified in test pits TP-1, TP-2 and TP-3; and, test borings TB-6, TB-104, BH-01, BH-04, TB-119, TB-121 and TB-122.

The following information summarizes Site soil environmental conditions that were developed based on a review and evaluation of these data.

- **Surface Soil Sample**. Only two near surface (0′ – 2′ below ground surface) soil samples (i.e., BH-11 and SS-1) contained site-related VOC constituents at concentrations above the NYSDEC Unrestricted Use SCOs. The other six soil samples that contained Site-related VOC constituents at concentrations above the NYSDEC Unrestricted Use SCOs were collected from beneath the Main Building at depths that were likely below the water table (i.e., 6′ to 11.9′ below ground surface). For example, the sample depth and water table levels listed below for the three subsurface soil samples collected in 1997 that contained VOC constituents at concentrations above NYSDEC Unrestricted Use SCOs show that these samples were saturated soil samples.

Sample No.	Boring Log Water Table Level *	Sample Depth *
BH-01	4.5′	6′ – 8′
BH-13	4.8′	6′ – 8′
BH-15	9.5′	9′ – 11′

* Measured as feet below ground surface.

As a result, the majority of the soil samples collected at the Site since 1997 that contain VOC constituents at concentrations above the NYSDEC Unrestricted Use SCO were of saturated soil located beneath the floor of the Main Building.

- **<u>TCE</u>**. TCE was detected at a concentration above NYSDEC SCOs in six of the eight soil samples that contained Site-related constituents at concentrations above NYSDECC Unrestricted Use SCOs.

- **<u>Breakdown Products</u>**. A breakdown product of PCE and TCE (i.e., cis-1,2-DCE) was only detected in one of the soil samples collected since 1997 at a concentration above NYSDEC Unrestricted Use SCOs. This is in contrast to the groundwater quality data discussed in Section 2.2.2, which presents data showing that the concentrations of PCE and TCE in Site groundwater have now basically decreased or were not detected in the most recent groundwater samples collected from each well at the Site; however, the concentrations of breakdown products (e.g., cis-1,2-DCE) have continued to be present. As discussed in Section 2.2.2, the presence of these breakdown products in groundwater, and not in soil, is likely to be a function of the natural and enhanced microbial biodegradation that appears to be occurring in Site groundwater.

- **<u>Main Building Area</u>.** Except for the two near surface soil samples discussed above (i.e., BH-11 and SS-1), the remaining six soil samples that contained constituents at concentrations above the NYSDEC Unrestricted Use SCOs were located beneath the floor of the northern/central section of the Main Building.

To summarize, 68 soil samples have been collected and analyzed. Of these 68 soil samples, two near surface soil samples contained site related constituents at concentrations above the NYSDEC Unrestricted Use SCOs, and six soil samples collected from beneath the Main Building and most likely beneath the water table (i.e., saturated soil samples) contained constituents at concentrations above NYSDEC Unrestricted Use SCOs. Except for the two near surface soil samples (i.e., BH-11 and SS-1), the data indicate that the northern/central section of the Main Building and, more likely, the soil beneath this section of the Main Building, was and may continue to be the source of at least some of the halogenated VOCs in Site groundwater. The additional RI tasks described in this Work Plan to investigate subsurface soil areas beneath the Main Building are expected to complete the partial characterization of Site soil present here.

2.2.2 *Summary of Site Groundwater Environmental Conditions*

2.2.2.1 Petroleum Constituents in Groundwater

In 1997, evidence of potential free petroleum product and/or a sheen was observed in three test pits (TP-1, TP-2 and TP-3) excavated in the vicinity of two underground fuel oil storage tanks that were formerly located on the north side of the 50 Balfour Drive building and immediately west of the boiler room (refer to Section 2.1.1, Section 2.1.2 and Figure 3). However, free petroleum product has not been detected in the groundwater monitoring wells that were sampled as part of previous studies. Additional investigation will be conducted in this area as described in this Work Plan in order to further assess groundwater in the location of the two former 3,000 gallon fuel oil USTs.

Also, a sheen was noted on groundwater in the excavation related to the removal of a 6,000 gallon fuel oil UST formerly located to the east of the building that is located on the 245-265 Hollenbeck Street portion of the Site (refer to Section 2.1.1). Additional investigation will be conducted in the location of this former 6,000 gallon fuel oil UST in order to further assess soil and groundwater conditions.

2.2.2.2 Halogenated Volatile Organic Compounds in Groundwater

A total of 114 groundwater samples have been collected from the Site since 1997, and five groundwater samples were collected from off-site right-of-way areas adjacent to the Site in 2014. The results of the laboratory analyses of these samples are presented in Table 6. These data were evaluated by comparing constituent concentrations to NYSDEC groundwater quality standards. The constituents that were detected in these samples at concentrations above the NYSDEC groundwater quality standards in any of these 119 groundwater samples are listed in Table 8 and shown on Figure 6.

The table shows that the following five halogenated VOCs have been detected in groundwater samples collected from the Site at concentrations above the NYSDEC groundwater quality standards:

PCE	trans-1,2-DCE	Vinyl Chloride
TCE	cis-1,2-DCE	

The constituents detected in the most recent Site groundwater samples at concentrations above groundwater quality standards have been used at the Site in the past (i.e., PCE and TCE) and/or are breakdown products (trans-1,2-DCE, cis-1,2-DCE and Vinyl Chloride) of PCE and TCE. Groundwater flow direction is east, toward Hollenbeck Street. A groundwater contour plan is provided as Figure 7.

The key Site groundwater quality issues listed below were evaluated based on a review of the Site groundwater data generated through the implementation of the groundwater sampling programs described above that have been conducted at the Site since 1997.

- Halogenated VOCs in Groundwater
- PCE and TCE
- Breakdown Products
- Uncontaminated Wells
- Potential Source Areas
- Possible Release Period
- Groundwater Quality Trends (Fate and Transport)
- Biodegradation/Biostimulation Effects (Fate and Transport)
- Site Boundary Groundwater Quality Conditions
- Dense Non-Aqueous Phase Liquid (DNAPL)
- Bedrock Groundwater Quality

These Site groundwater quality issues are discussed below.

Halogenated VOCs in Groundwater. Halogenated VOCs are constituents of concern in Site groundwater. The halogenated VOCs that still remain in Site groundwater that are constituents of concern are PCE and TCE, and their breakdown products (e.g., cis-1,2-DCE and Vinyl Chloride).

PCE and TCE. PCE was not detected above NYSDEC SCGs in the most recent groundwater sampling events. Also, based on the most recent groundwater sampling events, TCE was only present in five monitoring wells at the Site, and TCE concentrations are decreasing (refer to Table 8). For example, 4,917.1 μg/l of TCE was detected in the groundwater sample collected from well MW-6 in 1997; however, TCE was not detected in the groundwater sample collected from well MW-6 in 2013.

Breakdown Products. The PCE and TCE breakdown products trans-1,2-DCE, cis-1,2-DCE and/or Vinyl Chloride remain at concentrations that exceed NYSDEC SCGs in the most recent groundwater sampling events at 11 of the 15 Site monitoring wells (refer to Table 8). Although VOCs are still present at concentrations above NYSDEC groundwater quality standards, the concentrations of cis-1,2-DCE in most wells have decreased in the past few years. The continued presence of these breakdown compounds and the decrease in some breakdown compound concentrations indicate that natural and enhanced biodegradation processes continue to reduce VOC concentrations in Site groundwater.

Uncontaminated Wells. No halogenated VOCs were detected in the most recent groundwater samples collected from Site monitoring wells MW-4, MW-9, MW-11, and MW-13. As shown in Table 8, halogenated VOCs that had been detected in groundwater samples collected from these wells in previous years were not detected in the most recent groundwater samples collected from these wells.

Potential Source Areas. The highest concentrations of halogenated VOCs detected in the most recent groundwater samples are located in the unpaved area immediately north of the Main Building (e.g., well MW-3), in the northern/central section of the Main Building (e.g., well MW-5), and immediately downgradient of these areas (e.g., MW-8). These data indicate that these adjacent areas (i.e., the northern/central section of the Main Building and the unpaved area immediately north of the Main Building) that contain the highest concentrations of halogenated VOCs are probably the source areas or very close to the source areas of the halogenated VOCs in Site groundwater. The additional RI work to be performed in accordance with this Work Plan will determine whether other source areas are present beneath the Main Building, as described in Section 4.0.

Possible Release Period. The elevated concentrations of the PCE and TCE breakdown products (i.e., cis-1,2-DCE and Vinyl Chloride), and the absence or decrease in concentration of the parent compounds PCE and TCE, indicate that the initial release of PCE and TCE to soil at the Site occurred some time ago. The reason for this assessment is that the natural biodegradation process that converts PCE and TCE to their breakdown products is a relatively slow process, and it probably requires decades or more to achieve the current groundwater quality conditions at the Site (i.e., the absence or a decrease in concentrations of the parent compounds with the continued presence of breakdown products).

Groundwater Quality Trends (Fate and Transport). The Site groundwater quality data presented in Table 6 has been condensed in

Table 8 to list only the constituents that have been detected in any of these samples at concentrations above NYSDEC groundwater quality standards, and on Figure 6 using only the most recent groundwater sampling data for each well. This Site groundwater quality data has been reviewed to determine whether constituent concentrations have increased, decreased, or remained the same since sampling began in 1997. The chart below presents a summary of the results of that review.

Qualitative Groundwater Quality Assessment

Well No. (1)	PCE	TCE	trans-1,2-DCE	cis-1,2-DCE	Vinyl Chloride
MW-1	↓	↓		↓	
MW-3	↓	↓		↑	↑
MW-4		↓	↓	↓	↓
MW-5		↓	↓	↓	↓
MW-6		↓	↓	↓	↓
MW-7 *	↓	↓		↑	↑
MW-8				↓	↑
MW-9		↓		↓	↓
MW-10		↓		↓	↑
MW-11		↓		↓	
MW-12		↓		↓	↑
MW-13		↓		↓	
MW-16		↓	↑	↑	↑
MW-17	↓	↓	↑	↑	↑
MW-18				↓	↓

Legend:

↓	Indicates that VOC concentrations have decreased.
	Indicates that VOCs have not been detected in groundwater samples collected from this well.
↑	Indicates that VOC concentrations have increased.

* Well No. MW-7 is screened in the bedrock aquifer. The other wells are screened in the shallow overburden aquifer.

1. Only one sample has been collected from well MW-2 and from well MW-14. As a result, a groundwater concentration trend cannot be identified for these two wells.

It is clear from a review of the chart shown above that groundwater quality at the Site has generally improved since sampling began in 1997. The majority of the cells in this chart show the positive trends described below.

- The parent compounds PCE and TCE have not been detected and/or have decreased in concentration in the most recent groundwater samples collected at the Site.

- The majority of the cells in this chart show one or more of the following positive concentration trends for each of the five halogenated VOC constituents of concern in each of the Site monitoring wells:

    1. Concentrations have decreased.

    2. Constituents have not been detected in any of the groundwater samples collected from these wells.

- Even most of the breakdown compound trans-1,2-DCE has been removed to levels below NYSDEC groundwater quality standards. This indicates that bioremediation continues to de-chlorinate these compounds, and continues the conversion of these Site-related halogenated VOCs to carbon dioxide, water, and chlorine.

The only perceived negative groundwater quality trend shown in this chart is the increase in the concentrations of the breakdown compounds in some of the active Site monitoring wells. Although increasing constituent concentrations are typically a negative groundwater trend, in this case it is an expected generally temporary impact resulting from the conversion of the parent compounds PCE and TCE to their breakdown compounds through natural and enhanced bioremediation.

This limited negative effect can be expected to improve as bioremediation continues the conversion of breakdown products to carbon dioxide, water, and chlorine, as shown by the general decline in breakdown compound concentrations that has occurred in other Site monitoring wells.

Biodegradation/Biostimulation Effects (Fate and Transport). As described in Section 2.1.7, a biostimulation evaluation using the injection of nutrients into groundwater to enhance the natural biodegradation of halogenated VOCs in Site groundwater was conducted from 2008 through 2009. The concentrations of halogenated VOCs in groundwater samples collected from one well (MW-6) decreased since the evaluation but halogenated VOC levels, specifically the concentrations of the breakdown products cis-1,2-DCE and Vinyl Chloride, have remained at concentrations that exceed NYSDEC SCGs.

As described below, the persistent presence of these breakdown products is consistent with the conditions that would occur if natural and enhanced biodegradation processes were continuing to biodegrade PCE, TCE, and their breakdown products. In addition, the decrease in cis-1,2-DCE concentrations as shown in Table 8 for some wells, and the persistence of the presence of Vinyl Chloride would be expected since biodegradation converts cis-1,2-DCE to Vinyl Chloride.

A USEPA guidance document (USEPA; 1992) states that it is possible to use bioremediation technologies that result in the complete mineralization of TCE to carbon dioxide, water, and chlorine, thus removing TCE from contaminated environments. Bioremediation removes chlorine and converts PCE and TCE to their breakdown products (i.e., trans-1,2-DCE; cis-1,2-DCE; and Vinyl Chloride). Bioremediation eventually converts these breakdown products into the carbon dioxide, water, and chlorine as referenced in the USEPA guidance document.

Bioremediation occurs naturally in groundwater aquifers or it can be enhanced by adding nutrients to the aquifer, as conducted at the Site from 2008 to 2009 and as described in Section 2.1.7.

The current Site groundwater quality (see Table 8 and Figure 6), and trends described above, are consistent with the water quality conditions that would be expected if natural or enhanced bioremediation were occurring. These conditions are:

1. The concentrations of the parent compounds PCE and TCE have decreased, in some cases to levels below NYSDEC groundwater quality standards.
2. The concentrations of one of the breakdown compounds (i.e., trans-1,2-DCE) have decreased in three of the monitoring wells to concentrations below NYSDEC groundwater quality standards, indicating that bioremediation may now be converting even the breakdown products.
3. The concentrations of two of the breakdown compounds (i.e., cis-1,2-DCE, and Vinyl Chloride) have generally decreased, but the concentrations of these two constituents increased in seven of the 15 groundwater monitoring wells. These are the conditions that would occur if, as expected, bioremediation in Site groundwater has caused the breakdown of the parent compounds PCE and TCE.

These conditions are consistent with the assumption that natural and enhanced biodegradation are converting the parent compounds, PCE and TCE, to their breakdown compounds.

To summarize, a review of the type of halogenated VOCs present in Site groundwater, and the changes in the concentrations of these halogenated VOCs since sampling began in 1997, indicate that natural and enhanced bioremediation is occurring in the shallow overburden aquifer at the Site. Natural and enhanced bioremediation has reduced PCE and TCE concentrations in Site groundwater, and these bioremediation processes are expected to continue the conversion (mineralization) of the breakdown products present in Site groundwater to carbon dioxide, water, and chlorine.

Site Boundary Groundwater Quality Conditions. Groundwater quality at the downgradient Site boundary (i.e., the eastern Site boundary) is characterized by the results of the analyses of the groundwater samples collected from wells MW-12, MW-18 and ROW-4, as shown below:

Parameter	NYSDEC Standard or Guidance Value (1)	Concentration (µg/L)		
		MW-12	MW-18	ROW-4
TCE	5	83.6	ND	ND
cis 1,2-DCE	5	60.8	33	ND
Vinyl Chloride	2	35.4	75	ND
Chloroform (2)	5	ND	ND	27
Sampling Date =		11/29/12	01/04/13	02/10/14

Notes:

1. NYSDEC Division of Water Technical Operations Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Class GA (source of drinking water from groundwater).
2. Chloroform has not been detected in groundwater samples collected from Site monitoring wells and it is unlikely that it has been used at the Site. As a result, chloroform is not considered a Site-related constituent of concern in Site groundwater, and the chloroform detected in the off-site well ROW-4 is, therefore, not expected to be related to Site conditions.

These data show that the Site-related constituent TCE, and its breakdown compounds cis-1,2-DCE and Vinyl Chloride, have migrated with Site groundwater to approximately 100 feet west of the downgradient boundary of the Site (i.e., wells MW-12 and MW-18) at concentrations above the NYSDEC groundwater quality standards, but have not migrated to the downgradient off-site monitoring well ROW-4 located approximately 300 feet east of the Site.

Dense Non-Aqueous Phase Liquid (DNAPL). The highest concentration of either of the parent compounds PCE or TCE detected in Site groundwater is 4,917.1 ug/l in well MW-6 in 1997. This highest detected TCE concentration is less than one-half of the 1% of solubility used as an indicator of dense non-aqueous phase liquid (DNAPL). Since the highest concentration of TCE detected of 4,917.1 ug/l is less than 0.45% of the 1,100,000 µg/l solubility of TCE in water, it is unlikely that DNAPL is present at the Site. In addition, neither PCE nor TCE were detected in the most recent groundwater sample collected from well MW-6 (Refer to Tables 6 and 8).

Bedrock Groundwater Quality. Well MW-7 is the only Site monitoring well screened in the bedrock aquifer. As shown in Table 8, PCE and the breakdown compound trans-1,2-DCE were not detected in the most recent groundwater sample collected from this well, but TCE and the breakdown compounds cis-1,2-DCE and Vinyl Chloride were detected in the most recent MW-7 groundwater sample at concentrations above NYSDEC groundwater quality standards. Since well MW-7 is the only Site bedrock monitoring well, the extent of groundwater in the bedrock aquifer affected by Site-related constituents is not known. As described in Section 4.0, a key component of the RI work to be performed in accordance with this Work Plan is the installation and sampling of six new bedrock monitoring wells. It is expected that this work will complete the characterization of the bedrock aquifer groundwater quality at the Site.

To summarize, halogenated VOCs are constituents of concern in Site groundwater, and natural and enhanced biodegradation appears to be removing the primary constituents of concern in Site groundwater (i.e., the parent compounds PCE and TCE). In addition, the breakdown of these parent compounds has generated concentrations of the breakdown compounds trans-1,2-DCE, cis-1,2-DCE, and Vinyl Chloride that exceed NYSDEC SCGs in some wells. Biodegradation appears to be occurring, and is the likely reason why the concentrations of even these breakdown compounds have decreased in the most recent groundwater samples collected from many of the Site monitoring wells (refer to the chart above).

Overall, groundwater quality has improved since 1997, and there is no indication that DNAPL is present at the Site. The data indicate that soil beneath the northern/central section of the Main Building is a source of halogenated VOCs to groundwater, and that the groundwater in this area is a source of the halogenated VOCs in groundwater in the eastern (downgradient) portion of the Site. It is likely that these natural and possibly enhanced bioremediation measures will continue to be effective in improving ground water quality at the Site.

Groundwater containing Site-related constituents at concentrations above NYSDEC groundwater quality standards extends horizontally to at least approximately 100 feet west of the eastern, downgradient, boundary of the Site but does not extend to the area about 300 feet east of this boundary where well

ROW-4 is located. Finally, groundwater samples collected from the one bedrock well (MW-7) contained halogenated VOCs at concentrations above NYSDEC groundwater quality standards, and the additional bedrock RI work described in this Work Plan is expected to complete the characterization of bedrock aquifer groundwater quality.

3.0 CONCEPTUAL SITE MODEL

The preliminary conceptual site model presented in this section identifies and describes the following:

1. The known or potential sources of contamination.
2. The types of contaminants and affected media.
3. Release mechanisms and potential migration pathways.
4. Actual/potential human health and environmental receptors.

This preliminary conceptual site model was used as the basis for the proposed studies described in this Work Plan. The data collected during the RI will be used to refine this model as the project progresses and assist in evaluating remedial options for the Site.

The Site is developed as described in Section 1.1. The key structures and Site features are listed below.

- A single two story concrete block Main Building covering, approximately 140,000 square feet. There are two metal buildings attached to the Main Building. The Main Building and attached metal buildings are used for manufacturing operations (e.g., electroplating, metal stamping) at 50 Balfour Drive.
- A separate building located at 245-265 Hollenbeck Street that is used for storage.
- A parking lot at 50 Balfour Drive.
- A gravel roadway at 271 Hollenbeck Street.
- The Site is serviced by the public water supply system and the public sewer system. The buildings at the Site are currently heated with natural gas.
- A Site security system consisting of:
  - A perimeter fence;
  - An electronically controlled entrance gate;
  - A building access control system; and
  - Security cameras.

The remainder of the Site is covered with vegetation, primarily grass and trees. The Site is generally level and the land surface slopes gently to the east. There is one elongated mounded area covered with vegetation (i.e., field grass) along the western portion of the Site adjacent to the former railroad tracks that run along the western boundary of the Site.

The Site was vacant land until the initial portion of the existing Main Building was constructed in 1923. As discussed in Section 1.2 and shown on Table 1, the Site has been used for a variety of manufacturing operations, including printing, electroplating, tool and die, metal stamping, and welding. The types of chemicals that have been used at the Site include lubricating and cutting oils, acids, alkalis, zinc and cyanide. TCE was also used at the Site in the past but disposal records indicate that TCE was last used at the Site around 1992.

As shown on Figure 2, there is a former main railroad line adjacent to the western boundary of the site. Spur tracks that were once located on the Site formed a siding that connected to the former main railroad line located on the western boundary of the Site. These spur tracks and the tracks of the main railroad line have been removed.

The 271 Hollenbeck Street property is now vacant following a fire that destroyed the building at that property sometime between 1992 and 1998. The former main railroad line is now part of the Genesee Riverway Trail. Regulatory guidance provided by other states (MaDEP; 2003) regarding former railroad lines contains the following information:

- Leaks of lubricating oil and diesel fuel from trains are likely sources of these types of constituents in soil along these lines.
- Coal ash from steam locomotives is a source of PAHs and metals in railroad track bed soil.
- Creosote and creosote constituents from railroad ties are often found in track bed soil.
- PAHs from diesel exhaust and from the earlier coal and possibly even wood burning steam locomotives are often found in track bed soil.

Some current and former Site features shown on Figure 3 are identified below.

- Property and approximate site boundaries.
- Main Building and attached metal buildings at 50 Balfour Drive.
- Storage building at 245-265 Hollenbeck Street.
- The automatic and manual plating areas.

Potential or known AOCs shown on Figure 8 are listed below. Additional information is provided on Table 10.

- Former TCE vapor degreaser location.
- The former area of two 3,000 gallon fuel oil USTs.

- The former area of one 6,000 gallon fuel oil UST.
- Assumed location of former acetone tank.
- Assumed location where cleaning solvents were dumped on the ground at 271 Hollenbeck Street.
- Railroad tracks/siding formerly located on the Site.
- Mounded area.
- Floor spill/holding tank.
- The industrial wastewater treatment plant.
- The interior drum storage areas.
- Former pad-mounted transformer location.
- Surface soil area containing elevated TCE concentrations
- Compressor discharge and associated oil-water separator and sump.
- Former Toledo Scale Oven Room and Spray Booth.
- Former oil room (1932 Sanborn Map).
- Location of spillage through wall.
- Spillage/leakage area.
- Former oil and grease room near northeast corner of the 50 Balfour St. building.
- 90-day hazardous waste storage area.
- Chemical storage area.
- Assumed boiler discharge location.
- Observed areas of petroleum impacts including former test pits TP-1, TP-2 and TP-3 and former test boring TB-6, TB-104, BH-01, BH-04, TB-119, TB-121 and TB-122.
- SSV-06 (sub-slab concentration of TCE of 19,200 ug/m^3).
- The drainage system including floor drains, trenches, roof leader discharges and storm sewers has also been identified as an AOC. The location of the drainage system cannot be provided on Figure 8 because a subsurface utility assessment has not yet been completed.

The locations of the Site soil and groundwater samples that have been collected at the Site since 1997 are described in Section 2.0. Current manufacturing operations (e.g., electroplating, metal stamping) are expected to continue at the Site for the foreseeable future.

The remainder of this section addresses the following issues:

- Subsurface Conditions
- Potential Sources of Site-Related Constituents
- Potential Current and Future Exposure Pathways
- Potential Human and Environmental Receptors

Information presented in this section was used to develop the scope of the RI work described in Section 4.0.

3.1 Subsurface Conditions

Information collected during the installation of soil borings advanced across the Site during the 1997 Phase II ESA (DAY; 1997a) identified a layer of fill material extending from the ground surface to depths up to 4 feet below ground surface. In addition to naturally occurring silt, sand, and gravel, the fill layer was characterized to contain materials such as ash, coal, slag, wood, and cinders. These types of materials often contain constituents such as metals and PAHs. Examples of the descriptions used to characterize this fill material based on observations of soil encountered in test borings and test pits advanced and excavated at the Site in 1997 and 1998 are provided in Table 2.

3.2 Potential Sources of Site-Related Constituents

This conceptual Site model is based on historic documentation regarding use of the Site, the findings of previous studies conducted at the Site, including the Phase II ESA conducted (DAY; 1997a) in 1997, and subsequent soil and groundwater studies performed at the Site. Known or suspected sources of Site-related constituents detected in environmental media at the Site, including a summary of the petroleum and VOC constituents present in Site soil and groundwater, is presented below.

Petroleum Constituents.

As discussed in section 2.1.1, two 3,000-gallon fuel oil USTs and one 6,000 gallon UST were installed at the Site in 1974 during a natural gas shortage. The two 3,000 gallon USTs were located immediately west of the boiler room (i.e., in the courtyard area located north of the Main Building) and were removed sometime between 1980 and 1985. The 6,000-gallon fuel oil UST was installed east of the building located on the 245-265 Hollenbeck Street portion of the Site and was removed in 2002. Additional soil and groundwater sampling outlined in the RI scope of work presented in Section 4.0 is designed to address the possible presence of petroleum constituents in Site environmental media.

Halogenated Volatile Organic Compounds (VOCs).

Halogenated volatile organic compounds (VOCs) associated with some of the manufacturing operations formerly conducted at the Site in the past within the Main Building at the Site have been detected in soil and groundwater samples collected at the Site since 1997. The identification of the presence and extent of these halogenated VOCs in Site environmental media is a primary focus of the RI work outlined in Section 4.0. Current operations at the Site do not use the halogenated VOC constituents, primarily TCE, that have been detected in environmental media at the Site. Additional soil and groundwater sampling outlined in the RI scope of work presented in Section 4.0 is designed to address the possible presence of halogenated VOC constituents in Site environmental media.

The RI scope of work will also collect data on soil and aquifer characteristics that will be used to evaluate the presence and potential migration pathways of these Site-related constituents.

3.3 *Potential Current and Future Exposure Pathways*

Potential release mechanisms and migration pathways for Site-related constituents away from known or suspected source areas include one or more of the following:

- Volatilization directly from the ground surface into the air.
- Volatilization from impacted soil and/or groundwater into the soil vapor that collects beneath the floor slab of the buildings at the Site and potentially discharges into the indoor air.
- Surficial flow across exterior surfaces, which is possibly enhanced by precipitation and snow melt events.
- Direct contact with fill material exposed at the ground surface that contains Site-related constituents.
- Preferential subsurface migration within subsurface utilities or their bedding materials could occur along active and abandoned structures depending on the depth and extent of the impact.
- Migration horizontally and vertically through the overburden soil, fill material, bedrock, or groundwater.
- Migration along impermeable subsurface layers (e.g. bedrock).

These potential exposure pathways were evaluated during the development of the RI scope of work.

3.4 Potential Human and Environmental Receptors

Most of the Site is covered with a 140,000-square foot, two-story building with isolated parking and landscape areas on the eastern, western and southern sides of the building, and a gravel roadway on the northern side of the property (i.e., across the 271 Hollenbeck Street property). As described in Section 1.1, access to the exterior portion of the Site is restricted by a perimeter fence and security cameras. As a result, direct contact of human receptors to exposed environmental media (e.g., soil) containing Site-related constituents is unlikely. There is a potential that off-site migration of Site-related constituents could impact environmental and/or human receptors via the groundwater. Potential impacts from soil vapor and indoor air have been characterized through soil vapor and indoor air studies that have already been completed, and the results of these studies have already been submitted to NYSDEC. NYSDEC has indicated that these studies have adequately addressed the soil vapor and indoor air issues at the Site.

Views of structures that occupy the streets adjacent to the Site are shown in Appendix A. As shown in Appendix A, some of the areas surrounding the Site are occupied by single family residences; however, a vehicle repair shop and a printer adjoin the Site to the south (refer to Figure 4). A vacant property adjoins the Site to the north (i.e., 315 Hollenbeck Street) that was once occupied by a recycling facility. That recycling facility was destroyed by a fire that occurred in June 2007. Also, a former and current industrial/manufacturing operation (i.e., 282 Hollenbeck Street) adjoins the Site to the east.

Active and closed utilities at the Site may serve as preferential pathways for Site-related constituents that may have been discharged into the sewer system or are flowing along the bedding of the utility lines. Site-related constituents from the Site could also migrate via groundwater and surface water flows. These migration pathways have been identified during development of the RI scope of work (refer to Section 4.0).

Based on review of mapping and other information, the churches/schools located within one-half mile of the Site are listed in Table 3. Other potentially sensitive environmental receptors that were identified during development of this Work Plan include the Genesee River, which is located approximately 2,500 ft. to the west (hydraulically upgradient) of the Site. Note, there are no State wetlands or records of documented potable water supply wells within one-half mile of the Site based on a review of available information.

4.0 REMEDIAL INVESTIGATION SCOPE OF WORK

This section presents the proposed scope of work to meet the project objectives presented in Section 1.6 of the Work Plan. This work will be completed in substantial conformance with provisions and guidance outlined in the NYSDEC document titled *DER-10 Technical Guidance for Site Investigation and Remediation* dated May 2010, and the scope of work will be adjusted as necessary based upon regular communication with the NYSDEC.

The implementation of the scope-of-work outlined in this Work Plan will follow the site-specific Health and Safety Plan, and the Community Air Monitoring program (CAMP), outlined in the document titled, *Health and Safety Plan, Remedial Investigation/Corrective Actions, 245-265 & 271 Hollenbeck Street and 50 Balfour Drive, Rochester, New York, NYSDEC Site #828188* dated January 2014. The HASP was prepared by DAY as part of previous work that was conducted at the Site in 2014 under NYSDEC oversight, and has been revised as necessary to reflect the scope of work developed in this Work Plan and the Site's regulatory status as a Class 2 Inactive Hazardous Waste Disposal Site. The HASP outlines the policies and procedures to protect workers and the public from potential environmental hazards during activities that have the potential to disturb contaminated materials. The HASP includes a Community Air Monitoring Plan (CAMP) that is required for intrusive activities at the Site during this project, and also an Emergency Contingency Plan (ECP) should unanticipated emergencies occur.

The EPA Quality Assurance Project Plan (QAPP) included in Appendix C describes the procedures to be used to provide for the integrity of the field data and analytical laboratory data to be collected. The QAPP includes the following information:

- specific information pertaining to the collection and handling of samples (i.e., including the collection of soil samples for VOC analysis using EPA Method 5035A);
- analytical methods to be used;
- Quality Assurance/Quality Control (QA/QC) procedures to be followed;
- analytical laboratory reporting limits;
- documentation procedures;
- project organization;
- decontamination procedures;
- sampling procedures, and

- a sampling and analysis plan.

As described in the QAPP, analytical laboratory results will be provided in an EQUIS database format in accordance with the Electronic Data Deliverable (EDD) requirements of the NYSDEC. Any available EDDs for historic data will also be submitted upon NYSDEC request.

4.1 RI Overview

The RI will include the following information:

- a detailed evaluation of the nature and extent of contamination at the Site;
- a review of existing records of utilities on and adjacent to the Site;
- advancement of test borings;
- soil sampling with analytical laboratory analyses;
- overburden and bedrock groundwater monitoring well installation;
- groundwater sampling with analytical laboratory analyses;
- hydraulic conductivity testing of the overburden and bedrock aquifers;
- investigation derived waste (IDW) management;
- data evaluation; and
- report preparation.

A summary of the analytical laboratory-testing program anticipated for this RI is provided in the Brownfield QAPP Template #5a, included in Appendix C. The NYSDEC will be notified at least seven days in advance of any field activities so that it can arrange to have a representative on-site, if desired.

The RI scope of work is summarized in Table 9. This RI scope of work is described in the following two sections of this Work Plan. The first section (Section 4.2) describes the RI scope of work in terms of the assessment of the utilities at the Site, and the Site environmental media to be characterized through the implementation of this Work Plan. The second section (Section 4.3) presents the RI scope of work in terms of the specific type, number, and location of the soil and groundwater samples to be collected and the parameters for which these samples will be analyzed. The remaining sections describe: (1) the Fish and Wildlife Impact Analysis to be performed as part of this work (Section 4.4); and (2) the methods to be used to handle and dispose of the waste expected to be generated by the work to be performed during the implementation of the RI scope of work (Section 4.5).

4.2 RI Scope of Work – Utility Assessment / Environmental Media

The RI will characterize conditions in soil and groundwater at the Site. As shown on Figures 5 and 6 and in Tables 7 and 8, a number of soil and groundwater samples collected at the Site since 1997 have contained VOC constituents (primarily halogenated VOCs) at concentrations above the NYSDEC SCGs. The areas of Site environmental media to be characterized as part of this RI work are described below for soil and groundwater. In addition, the scope of work associated with the assessment of the utilities at the Site is described below.

4.2.1 Utility Assessment

Identifying potential preferred contamination migration pathways is an objective of the RI, and understanding active and former utility infrastructure at the Site is critical for identifying potential preferred contamination pathways. Initially, current and historical site plans and utility drawings of the Site in the possession of OBI, LLC will be compiled. Subsequently, publicly available utility records will be obtained from the City of Rochester, Monroe County, and Utility Companies that service the Site. Utility records obtained will be reviewed and verified with field observations in order to identify utilities on-site and immediately off-site, including buried sewer systems (e.g., storm, sanitary or combined), electric lines, natural gas lines, water delivery lines, etc.

Depending on the completeness of the available documentation, utility accessibility and utility field testing may be implemented. In addition, studies including non-toxic and biodegradable dye testing, Summa Canister vapor sampling, and/or remote video examination of accessible utilities and drains may be implemented in order to evaluate the flow path, presence and concentration of VOCs in the bedding of the utilities, as well as, the discharge location and/or integrity of select utilities. Two shallow test borings/probes will be advanced in potential source areas for the purpose of assessing impacts to utility bedding. The location of these shallow test borings/probe will be determined following completion of the utility assessment. Should additional shallow test borings/probes be warranted, a supplemental work plan will be developed and provided to the NYSDEC for review.

4.2.2 Site Soil Characterization Work

The additional soil samples described in the Work Plan are designed to produce data that will characterize soil quality in areas where there is little to no data at the present time. The proposed sample locations, as shown on Figure 9, are described below. The rationale for the selection of the proposed soil sample locations is presented in Appendix D, and further discussed below.

- **<u>Surface Soil (0-2"): Exposure Assessment Samples</u>.** Five samples of surface soil (i.e., from 0 to 2 inches below the vegetative cover) will be collected from the vegetative areas surrounding the Main Building and the building at 245-265 Hollenbeck Street. Refer to Figure 9 for the proposed locations of these surface soil samples. These samples will be submitted for laboratory analysis of TCL VOCs plus TICs, TCL SVOCs & TICs, TAL Metals and cyanide, pesticides, and PCBs (Note, pesticides and PCBs analysis will be performed on only four of the five exposure assessment samples). The exposure assessment samples are intended to allow an evaluation of possible health effects to humans from exposure to surface soil.

- **<u>Surface Soil (0-1'): Historic Fill Material.</u>** Fifteen samples of surface soil (i.e., from 0 to 1 foot below the vegetative cover or asphalt-pavement) will be collected from exterior locations. If historic fill material is identified in the 0 to 1 foot sample, the test boring will be extended in depth to establish the vertical limit of historic fill material. As per Section 3.11 of DER-10, the laboratory program for the historic fill material samples will be dictated by the fill type as described below:

    - For all fill material, the soil samples will be analyzed for TPH and a minimum of 25% of soil samples will be analyzed for full TCL/TAL (biased towards highest TPH concentrations).

    - For any soil sample, if the field instrument measurements for VOCs are greater than five times background, then that soil sample will be submitted for laboratory analysis of TCL VOCs (i.e., even if it results in more than 25% of the samples being analyzed for VOCs).

    - If rubble, ash, cinders or dredge spoils are identified within the fill material, then the soil sample will need to be submitted for laboratory analysis of TCL SVOCs and TAL Metals and cyanide (Note, therefore the number of samples analyzed for TCL SVOCs, TAL metals and cyanide will be between 25% and 100% of the total number of samples, based on the nature of the historic fill material identified).

This work is expected to complete the characterization of surface soil, including historic fill material, at the Site.

- **Subsurface Soil.** Thirty two samples of subsurface soil (i.e., greater than 1 foot below ground surface) will be collected from the soil beneath the floor of the Main Building and in exterior areas. Refer to Figure 9 for the proposed locations of the test borings that will be advanced in order to collect these subsurface soil samples. These subsurface soil samples will be collected from areas where TCE and other VOCs have been detected in subsurface soil samples above NYSDEC Unrestricted Use SCOs in the past, in the vicinity where VOCs were detected in subslab vapor samples, and in other potential source areas (i.e., the area of a former degreaser that was located in the Main Building in the past, the locations of potential petroleum impacts in soil, etc.). Note, as shown on Figure 5, only 3 of the approximately 25 subsurface soil samples collected from beneath the original section of the Main Building located in the northwestern portion of that original building contained halogenated VOCs at concentrations above the NYSDEC Unrestricted Use SCOs for soil. Also, halogenated VOCs were not detected in subsurface soil samples collected from the following areas:
    - Beneath the metal building attached to the western side of the Main Building.
    - In test pits excavated across various areas of the Site to depths of 10 feet below ground surface.
    - In the open paved (south) and grass (west) areas adjacent to the Main Building.

  Based on the information presented above, the collection and analyses of 32 subsurface soil samples is expected to complete the characterization of subsurface soil quality at the Site.

The results of the laboratory analyses of these samples will be evaluated by comparing them to applicable NYSDEC SCOs for soil.

4.2.3 Site Groundwater Characterization Work

The additional groundwater monitoring wells and groundwater samples described in the Work Plan are designed to produce data that will characterize groundwater quality in areas where there is little to no data at the present time as well as to investigate known and potential AOCs. The proposed groundwater sample locations, as shown on Figure 9, are described below. The rational for the selection of the proposed groundwater sample locations is presented in Appendix D, and further discussed below.

- **Overburden Groundwater – Main Building Area.** Eight overburden groundwater monitoring wells (i.e., up to 10 feet below ground surface) will be installed in various locations throughout the Site, including four within the Main Building as shown on Figure 9. The collection and analyses of groundwater samples from these areas of the overburden groundwater aquifer is expected to complete the characterization of overburden groundwater at the Site. To the extent possible, groundwater monitoring wells have been located downgradient of AOCs (Note, physical constraints dictated the location of some of the overburden monitoring wells). A schematic design of the overburden groundwater monitoring wells to be installed as part of this work is presented on Figure 10.

- **Bedrock Groundwater.** Only one of the existing wells (i.e., MW-7) has been advanced to and screened in the bedrock groundwater aquifer. As shown in Table 8, the most recent (i.e., 11/29/12) groundwater sample collected from this well contained VOCs at concentrations above the NYSDEC groundwater quality standards. Bedrock at the Site is generally located at depths of approximately 10 feet below ground surface. The other wells at the Site are screened in and characterize the shallow overburden groundwater aquifer. As a result, six new bedrock groundwater monitoring wells will be installed across the Site as part of this work. Refer to Figure 9 for the proposed locations of the six bedrock groundwater monitoring wells. Although additional bedrock groundwater RI work may be needed, the bedrock RI work described here (i.e., the installation of six new bedrock wells, and the sampling and analyses of groundwater samples collected from these six new bedrock wells and from the existing bedrock well) is expected to complete the characterization of bedrock groundwater at the Site. A schematic design of the bedrock groundwater monitoring wells to be installed as part of this work is presented on Figure 11.

- **Sampling of Existing Monitoring Wells.** As shown in Table 6, groundwater samples have been collected from different sets of Site monitoring wells at various times since 1997, but a groundwater sample has not been collected from each and every functional well at the same approximate time. (Note, MW-2 no longer exists at the Site. Also, monitoring wells MW-4, MW-11, MW-14 and MW-15 have been used as injection points for the biostimulation pilot test. Once vegetable oil is injected into a well, it is no longer suitable for use as a monitoring well due to the residual vegetable oil that remains in the well)., Groundwater quality can change over time as groundwater flows through an aquifer, and also due to other changes in Site conditions. As a result, this RI scope of work will include the collection and analyses of groundwater samples from thirteen existing Site-wide groundwater monitoring wells (MW-1, MW-3, MW-5, MW-6, MW-7R, MW-8, MW-9, MW-10, MW-12, MW-13, MW-16, MW-17 and MW-18) as well as the eight new overburden monitoring wells and the six new bedrock monitoring wells. Thus, the groundwater sampling event for the 27 monitoring wells described above will occur at the same approximate time (i.e., during the same sampling event).

The results of the laboratory analyses of these 27 groundwater samples will be evaluated by comparing them to applicable NYSDEC groundwater quality standards.

4.2.4 Soil Vapor and Indoor Air Sampling

As shown in Table 9, the results of the sampling and analyses of soil vapor and indoor air samples collected at the Site, and an Interim Remedial Measure (IRM) Work Plan, have been submitted to NYSDEC under separate cover. Consequently, soil vapor and indoor air issues will not be addressed as part of the RI work described in this Work Plan.

4.3 RI Scope of Work – Sample Type, Number, and Locations

The previous section described the environmental media at the Site to be characterized through the implementation of this Work Plan. It also described the reasons why these environmental media samples will be collected and analyzed, and why the data this work will generate is expected to complete the characterization of the environmental media at the Site. Provided below is a list of the environmental media to be sampled and analyzed:

<u>Soil</u>

Surface soil in vegetative areas for the purpose of assessing potential human exposure

Surface soil in exterior areas for the purpose of characterizing historic fill material

Subsurface soil in the Main Building area, in an exterior area just north of the central area of the Main Building and east of 245-265 Hollenbeck Street

Groundwater

Overburden groundwater in the Main Building area and exterior areas

Bedrock groundwater site-wide

Sampling of Thirteen Existing Monitoring Wells

Table 9 provides the following information on each type of soil and groundwater sample to be collected and analyzed as part of this work:

- Number of samples
- Sample Depth and/or Screened Interval
- Analytical Laboratory Testing Protocol

  Note: The RI samples will be analyzed by a laboratory approved in accordance with the NYSDOH Environmental Laboratory Approval Program (ELAP). Samples will be analyzed for the parameters shown on Table 9. Sampling and laboratory analytical protocols to be used during implementation of this Work Plan are described in the QAPP, Appendix C.

- Rationale. This section of Table 9 describes the reason each type of soil and groundwater sample will be collected and analyzed.

The following is a summary of the RI work to be performed in accordance with this Work Plan as shown in Table 9 and on Figure 9:

- Surface soil (5 exposure assessment samples)
- Surface soil (15 historic fill material samples)
- Subsurface soil (32 samples)
- Sampling of eight new overburden groundwater monitoring wells (eight groundwater samples)
- Sampling of six new bedrock groundwater monitoring wells (six groundwater samples)
- Sampling of existing monitoring wells (13 groundwater samples including bedrock well MW-7R)

4.4 Fish and Wildlife Impact Analyses

An evaluation will be performed using the Fish and Wildlife Resource Impact Analyses (FWRIA) Decision Key to determine whether a Fish and Wildlife Resource Impact Analysis is needed. If this evaluation concludes that a Fish and Wildlife Resource Impact Analyses is required, then that document will be prepared and submitted to NYSDEC as part of the work to be implemented in accordance with this Work Plan.

4.5 Management of Investigation Derived Waste (IDW)

It is anticipated that solid and liquid study-derived wastes will be generated during the RI. IDW will be managed in general accordance with the applicable provisions set forth of DER-10 Section 3.3(e). The method for handling, characterization and disposal of IDW is described below.

- Potentially contaminated liquid wastes will likely include: decontamination water, drilling water, well development water, and purge water. Storage of liquid IDW will be generally collected in 55-gallon drums, which will be stored on the Site in a secure location. Liquids that are grossly contaminated or suspected to contain NAPL may be placed in separate drums, will be stored in an area with secondary containment and labeled accordingly. Management of liquid IDW following completion of the groundwater sampling may be modified following review of the RI results. It is anticipated that liquid IDW will be discharged to the City of Rochester sanitary sewer system under a sewer use permit.

- Obtaining a sewer use permit may require sampling the IDW for the parameters of concern. Sampling of IDW necessary to obtain a sewer use permit will be incorporated into the RI/FS Report. A copy of the sewer use permit will be provided to the NYSDEC prior to any discharge to the sanitary sewer system and will also be included in the Remedial Investigation Report. Drummed liquid IDW that is grossly contaminated or suspected to contain NAPL will also be characterized using the investigation test results and other sampling data as necessary to dispose or treat the material in accordance with applicable regulations.

- Potentially contaminated solid wastes will likely include disposable sampling equipment and personal protective equipment (PPE), soil samples that were collected but not selected for analytical laboratory testing, and soil cuttings from rotary drilling operations. It is anticipated that the solid IDW will be placed in a 55-gallon drum. As an exception, solids that are grossly contaminated or suspected to contain NAPL may be placed in separate drums and labeled accordingly. The IDW solids will be characterized and disposed off-site in accordance with applicable regulations. If re-use of the IDW is possible based on a review of the RI analytical results, the NYSDEC will be notified of the proposed re-use of IDW for approval prior to implementation.

5.0 REMEDIAL INVESTIGATION AND FEASIBILITY STUDY REPORT

The Remedial Investigation and Feasibility Study (RI/FS) report will be prepared in accordance with provisions set forth in DER-10. The RI/FS report will present the findings and outcome of the RI, the results of any IRM(s) completed, and an analysis and recommendation of remedial alternatives. An executive summary will be included in the RI/FS report.

The RI portion of the report will include, but will not be limited to, the following components:

- Technical overview and details on the investigative work performed;
- A description of the physical characteristics of the Site, including soil/fill types, hydrogeological characteristics, proximity to a drinking water aquifer, absence of surface water, floodplains, and wetlands for this specific Site, etc.;
- Identification of the nature and extent of contamination, including identification of known or suspected sources of contamination;
- A discussion on contaminant fate and transport, including potential routes of migration, contaminant persistence, and documented contaminant migration, as well as, factors that affect contaminant migration;
- A qualitative human health exposure assessment and completion of a Fish and Wildlife Resources Impact Analysis (FWRIA) Decision Key;
- A Summary and Conclusions section, including identification of data limitations or recommendations for future work;
- Identification of recommended Remedial Action Objectives (RAOs);
- Appropriate figures including a project locus map, site plan depicting Site features, sample location figures and results of various testing (e.g., contaminants of concern (if any) detected in soil, groundwater or other media, including isopleth maps), overburden potentiometric groundwater contour maps, extent of NAPL contamination if appropriate, etc.;
- Stratigraphic cross-sections prepared using information and data obtained during the investigation;
- Identification of SCG values that pertain to the Site;

- Data tables including:
  - tables providing specifics on each sample tested (e.g., sample designation;
  - locations specified by New York West FIPS 3103 NAD 83 coordinates;
  - table of sample point elevations in feet above mean sea level for surveyed locations, consistent with reference datum to be used for the EDD submittal;
  - date;
  - depth interval;
  - test parameters;
  - summary tables comparing detected constituents to appropriate regulatory SCG values;
  - tables summarizing the nature and extent of constituents detected at the Site; and
  - tables for other various investigation-related data or information.

  The analytical laboratory results for soil samples tested will be compared to appropriate NYSDEC Part 375 SCOs and CP-51 Supplemental SCOs. The analytical laboratory results for groundwater samples will be compared to NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 groundwater standards and guidance values;
- Analytical laboratory reports and associated QA/QC evaluation (e.g., DUSRs) as an electronic appendix in .pdf format;
- An opinion regarding the effectiveness of the biostimulation and phytoremediation pilot studies that have been performed at the Site;
- Field logs and data, including test boring logs, and well construction diagrams, well development logs, well sampling logs, hydraulic conductivity testing data, PID readings from soil screening, and CAMP monitoring;
- Photographs;
- Conclusions and recommendations regarding the extent of the areas of concern, identification of any complete or potentially complete exposure pathways, and recommendations for future work (e.g. none, additional investigation, or an evaluation of remedial alternatives);
- An updated conceptual site model; and
- Other information as deemed appropriate.

Data generated as part of the RI will be submitted to the NYSDEC in the appropriate EDD format. Analytical data will be submitted when the DUSR is received, but no later than 90 days after receipt of the laboratory data package.

Any required non-analytical data will be submitted within 90 days of being generated.

The FS portion of the report will discuss potential remediation options for addressing impacts documented in the RI portion of the report. A detailed evaluation will be conducted for each remedial alternative taking into consideration factors identified in DER-10. Evaluation criteria include, but are not limited to:

- Overall protection of human health and the environment, including potential exposures;
- Compliance with SCG values;
- Long-term effectiveness and permanence;
- Short-term impact and effectiveness;
- Reduction of toxicity, mobility and/or volume;
- Implementability;
- Land use;
- Community acceptance, and
- Cost effectiveness.

The FS will identify general response actions including an estimate of the volumes/areas of contaminated media. General response actions include categories such as treatment, containment, excavation, extraction, disposal, institutional controls, engineering controls, or various combinations. Cumulative data will be used as the project progresses to modify general response actions as deemed appropriate. Where presumptive remedies are available to address an area of contaminated media, they will be strongly considered; however, innovative technologies will also be considered. Applicable general response actions will be developed on a medium-specific basis, similar to the development of RAOs. For each medium addressed, the volumes or areas to be remediated will be identified and characterized with respect to requirements for protectiveness, taking into account the chemical and physical characterization. During this step, technologies that are not suitable for the Site will be eliminated from further consideration.

Technology types for each general response action associated with an impacted media will be screened for appropriateness. Technology types may include chemical treatment, enhanced biodegradation, capping, thermal destruction, dewatering, etc. The technologies that appear feasible and capable of meeting the SCG goals will be used in development of remedial alternatives for the Site. The technologies will then be assembled into site-wide remedial alternatives.

The following components of each alternative will be discussed: size and configuration of processes; anticipated remediation duration; spatial requirements; disposal options; permit requirements; and beneficial or adverse impacts on fish and wildlife.

A pre-disposal alternative and a No Action alternative will also be developed and evaluated for the Site. Other alternatives will be developed that consider the following hierarchy of preference:

- Source removal: Free product, concentrated solid or semi-solid hazardous substances, DNAPL, light non-aqueous phase liquid and/or grossly contaminated media will be removed and/or treated to the greatest extent feasible.
- Containment of source: Any source remaining following removal and/or treatment shall be contained to the greatest extent feasible.
- Eliminate/limit exposures to the source to the greatest extent feasible.
- Treatment at point of exposure as a last resort.

The remedial alternatives will then be compared to the evaluation criteria and a comparative analysis will be completed. Based on the remedial alternative analysis, a remedial alternative for the Site will be recommended, which will include a discussion on the reasons for selection. The criteria of community acceptance will be evaluated upon completion of the public comment period.

The objectives of the FS for this project are to identify, evaluate, and select a remedy or alternative remedies to address the contamination identified by the RI in accordance with the provision of Chapter 4 of DER-10. This includes:

1. Identifying remedial goals.
2. Identifying RAOs for the protection of public health and the environment.
3. Evaluating baseline considerations associated with:
    a. protection of public health and the environment;
    b. addressing sources of contamination;
    c. bulk storage tank and containment vessels; and
    d. groundwater protection and control measures.
4. Evaluating other considerations associated with remedial alternatives to address the contamination on the Site to the extent applicable, such as the potential for soil vapor intrusion, and impacts on adjacent properties.
5. Evaluating the need for a cover system, such as a soil cover, if contamination is present in exposed surface soil.

6. Evaluating the alternatives in relation to threshold criteria and primary balancing criteria listed in Section 4.2 of DER-10.

The RI/FS Report will be submitted to the NYSDEC for review and comment. Following review and comment from the NYSDEC, the RI/FS Report will be finalized, stamped and signed by a currently-registered New York State licensed Professional Engineer (P.E.) prior to approval by the NYSDEC. Based on the findings of the RI/FS Report, the NYSDEC will prepare a Proposed Remedial Action Plan (PRAP) summarizing the proposed remedy for the Site. The final RI/FS Report will include an electronic copy in the appropriate PDF format required by the NYSDEC.

6.0 *PROJECT SCHEDULE*

The project schedule for the RI scope of work described in this Work Plan is presented in Figure 12. The specific tasks, task duration, and completion dates shown on Figure 12 are summarized below.

Task	Duration (weeks)	Completion Date *
Work Plan Approval	0	- -
Site Investigation		
Utility Assessment and Contractor Selection	6	6
Well Installation (16 bedrock)	4	10
Soil Borings and Well Installation (i.e., 8 overburden wells)	8	18
Surface Soil Sample Collection	2	20
Soil Sample Lab Analyses and begin DUSR Preparation	12	22
Monitoring Well Development	2	22
Groundwater Sampling	4	26
Groundwater Sample Lab Analyses and begin DUSR Preparation	8	30
RI/FS Report		
Prepare and Submit Draft RI/FS Report	18	48

* Weeks following NYSDEC approval of this Work Plan.

Adherence to this schedule will be monitored and the status of the work will be described in monthly progress reports to be submitted to NYSDEC in accordance with the Order on Consent.

7.0 REFERENCES

DAY; 1997. Phase I Environmental Site Assessment, 255-265 Hollenbeck Street and 47, 50, 53, and 88 Balfour Drive, Rochester, NY; Day Environmental, Inc.; August 5, 1997.

DAY; 1997a. Phase II Environmental Site Assessment, 255-265 Hollenbeck Street and 47, 50, 53, and 88 Balfour Drive, Rochester, NY – data tables only; Day Environmental, Inc.; 1997.

DAY; 1998. Subsurface Study Results, 271 Hollenbeck Street, Rochester, NY; Day Environmental, Inc.; May 11, 1998.

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TABLES

REMEDIAL INVESTIGATION WORK PLAN

OBI, LLC FACILITY

245-265 HOLLENBECK STREET,

271 HOLLENBECK STREET, AND

50 BALFOUR DRIVE

ROCHESTER, NY 14621

AUGUST 2015

TABLE 1
Historic Ownership and Use of the Site
245-265 and 271 Hollenbeck Street and 50 Balfour Drive
Rochester, New York
NYSDEC Site #828188

	OWNER	DATES OF OWNERSHIP	OPERATOR/OCCUPANT	DATES OF OPERATION	REMARKS
245 - 265 Hollenbeck Street	245 Hollenbeck, Inc.	1973 - 1974	German Tool & Die	1973 - 1995	Building Erected in 1973 and used for the manufature of precision machined metal parts
	Francis K. McAlpin and Ralph Derleth	1974 - 1995			
	Francis K. McAlpin	1995 - 2000	German Machine, Inc.	1995 - 2000	Manufacture of precision machined metal parts
	OBI, LLC	2000 - Current	McAlpin Industries, Inc.	2000 - Current	Warehouse for the storage of dry materials
271 Hollenbeck Street			W.N. Clark Company	~1932 - ?	Crate storage and a garage
	Herbert Construction Corp.	1950-1964	Herbert RE and Company	~ 1950 - 1964	Building Supply (a welding company, and a construction company were also tenants)
			Vaccaro James Mutual Funds and Pro-Weld Corporation	~ 1969	
				~1974 - 1975	Vacant
	R. Pat Trimaldo	1975- 1977	Trimaldi Landscaping	1975 - 1977	
	Richard F. O'Grady	1978 - 1984?	O'Grady Heating and Cooling	1978 - 1990?	HVAC Contractor
	Thomas Erb	1984 - 1994	Gary J. Enterprises	~1987 - ~ 1990	Printer
			VanEpps Construction	~ 1990 - 1991	Contractor
			Walker Brush Company	~1985 - 1997	Manufacturer of brushes with associated printing and silk screening operations
	T Real Estate	1994 - 1998			Building destroyed by fire ~1997
	OBI, LLC	1998 - Current			Vacant
50 Balfour Drive	Addison Lithographing Co.	1923 - 1950	Addison Lithographing Co.	1923 - 1950	Printing and Lithography
	Toledo Scale Kitchen Machine Division/McGraw-Edison Company[1]	1950 - 1972	Toledo Scale	1950 - 1969	Manufactured kitchen machines, retail and industrial scales
	Frank McAlpin and Ralph Derleth	1972 - 1980	Puente Plastics (tenant)	~ 1970? - ~1979?	Plastic injection molding
			McAlpin-Derleth Tool & Die Corp	1972 - 1980	Metal stamping assembly and plating
	Frank McAlpin	1980 - 1997	McAlpin-Derleth Tool & Tie Corp.	1980 - 1997	Sheet metal stamping, assembly and plating
	OBI, LLC	1997 - Current	McAlpin Industries, Inc.[2]	1980 - Current	Sheet metal stamping, fabrication, assembly and plating

[1] McGraw-Edison Company aquired Toledo Scale Kitchen Division in 1968.

[2] This also includes Monroe Plating, which is a DBA of McAlpin Industries, Inc.

Table 2: Examples of Fill Layer Characerization
1997 and 1998 Test Borings and Test Pits
OBI, LLC Site, Rochester, New York

Test Boring or Test Pit No.	Depth (bgs)	Fill Description [1]
TB-1	0' - 1'	Brown reworked silty medium sand, little ash, and coal (fill).
TB-2	0' - 2'	Black reworked sand, gravel, and slag (fill).
TB-3	0' - 1'	Black slag and sand (fill).
TB-3	1' - 2'	Brown reworked silt, sand, and coal (fill).
TB-4	0' - 4'	Black brown reworked silt, sand, gravel, and slag, little ash (fill).
TB-5	0.2' - 1'	Black brown reworked slag and sand (fill). Dark brown reworked silt, some gravel, little coal, and sand (fill).
TB-6	0' - 2.5'	Dark brown reworked silt, some sand and slag, little gravel (fill).
TB-7	0' - 1'	Dark brown reworked silt, sand, and gravel (fill).
TB-8	0' - 2.5'	Dark brown reworked silt, some sand, gravel, coal, and clay (fill).
TB-9	0' - 1'	Dark brown reworked silt, some sand, some gravel, wood, and slag (fill).
TB-10	0' - 2'	Brown reworked silt, sand, slag, cinders, and trace ash (fill).
TB-11	0' - 2'	Black brown reworked silt, sand and slag (fill).
TB-12	0' - 2.5'	Dark brown reworked silt and sand, little gravel, cinders, ash, and slag (fill).
TP-1	0' - 2'	Brown reworked Sand, Silt, Gravel, Brick, Cinders, and Ash (fill).
	2' - 3'	Seam of Coal Cinders, and ash (fill).
	4' - 5'	Seam of Yellowish-tan Ash and Cinders (fill).
TP-4	0' - 2'	Sand, Brick, Cinders, and Coal (fill).
TP-5	1' - 2'	Tan Gray Sand, Silt, Ash, Coal fragments (fill).
BH-07	0' - 1'	Tan reworked Sand, Silt, fine Gravel, Cinders, Ash (fill).
BH-12	0' - 2'	Brown Tan Sand, Silt, Cinders, gravel Coal, Plastic (fill) under 6" concrete floor.

Notes:
1. Refer to Appendix I of the Records Search Report (DAY; 2014).

Table 3: Distance of Schools and Churches From Site
OBI, LLC Site, Rochester, New York

Name of Church/School	Street	Distance From Site [1]
Charity Bible Baptist Church	Avenue D	1,000 feet
Roberto Clemente School No. 8	St. Paul Street	2,500 feet
Bethesda Church of God-Christ	No. Clinton Avenue	2,000 feet
Upper Room Family Worship	Joseph Avenue	2,700 feet
Lincoln School No. 22	Leo Street	2,500 feet
Iglesia Metodista Unida Emmanuel	Farbridge Street	2,700 feet
Tabernacle Worship	Joseph Avenue	3,000 feet
New Born Fellowship Church	Bastian Street	2,500 feet

Notes:

1. Indicates approximate distance of church or school from Site, as measured from the center of the 50 Balfour Drive property.

Table 4: List of the Number of Samples Analyzed Per Parameter
OBI, LLC Site, Rochester, New York

Sample Date	Number of Soil Samples Analyzed Per Parameter					
	VOCs	Metals	CN	Zn	TPH	Total No. of Samples
08/22/97	4	3	1	0	2	10
09/17/97	3	0	0	2	0	3
04/22/98	3	0	0	0	1	4
02/01/05	12	0	2	7	4	22
08/09/06	20	0	4	11	0	20
10/01/08	4	0	0	0	0	4
03/07/11	1	0	0	0	0	1
02/10/14	4	0	0	0	0	4
Totals =	51	3	7	20	7	68

Sample Date	Number of Groundwater Samples Analyzed Per			
	VOCs	CN	Zn	Total No. of Samples
10/02/97	6	0	6	6
10/15/04	3	3	3	3
06/07/06	3	0	3	3
06/27/07	8	0	0	8
07/31/07	3	0	0	3
05/01/08	10	0	0	10
08/02/08	11	0	0	11
12/03/08	1	0	0	1
01/23/09	1	0	0	1
03/31/09	6	0	0	6
05/08/09	1	0	0	1
07/20/09	2	0	0	2
09/14/09	6	0	0	6
12/12/09	2	0	0	2
03/24/10	6	0	0	6
04/14/10	3	0	0	3
10/25/10	10	0	0	10
03/28/11	3	0	0	3
09/22/11	13	0	0	13
11/29/12	13	0	0	13
01/04/13	3	0	0	3
02/10/14	5	0	0	5
Totals =	119	3	12	119

Table 5: Summary of Soil Quality Data (1997 - 2014)
OBI, LLC Site, Rochester, NY; NYSDEC Site No. 282188

Compound	Unrestricted Use SCO(1)	Protection of Groundwater SCO(2)	Industrial Use SCO(3)	Sample Designation and Date of Collection																				
				BH-01(6-8') 08/22/97	TP-7(9.5-10.5') 08/25/97	BH-04(6-8') 08/22/97	BH-09(4-6') 08/25/97	TP-2(9-10') 08/25/97	BH-11(0-2) 09/17/97	BH-13(6-8') 09/17/97	BH-15(9-11') 09/18/97	TB-2(12-12.5') 4/22/1998	TB-6(4-8') 4/22/1998	TB-6(8-10') 4/22/1998	TB-8(8-10') 4/22/1998	TB-101(6.5') 02/01/05	TB-102(11.7') 02/01/05	TB-104(11.0') 02/01/05	TB-106(9.3') 02/01/05	TB-109(9.6') 02/01/05	TB-110(9.3') 02/01/05	TB-114(9.3') 02/02/05	TB-115(10.7') 02/02/05	TB-117(9.9') 02/02/05
PCE	1.3	1.3	300	ND	ND	ND	ND	NT	**2.797**	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCE	0.47	0.47	400	**63.394**	ND	ND	0.267	NT	**124.582**	**23.400**	**2.284**	0.210	0.093	NT	0.022	**1.500**	ND	ND	0.0581	0.0207	0.071	ND	ND	**0.555**
trans 1,2-DCE	0.19	0.19	1000	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis 1,2-DCE	0.25	0.25	1000	NT	NT	NT	NT	NT	NT	NT	NT	0.060	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
VC	0.02	0.02	27	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
acetone	0.05	0.05	1000	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
2-hexanone	NS	NS	NS	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
Methylene Chloride	0.05	0.05	1000	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND
n-Butylbenzene	12	12	1000	ND	ND	NT	NT	NT	NT	NT	NT	ND	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
sec-Butylbenzene	11	11	1000	ND	ND	NT	NT	NT	NT	NT	NT	ND	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
n-propylbenzene	3.9	3.9	1000	ND	ND	NT	NT	NT	NT	NT	NT	ND	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
Isopropylbenzene	NS	2.3	NS	ND	ND	NT	NT	NT	NT	NT	NT	ND	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
1,2,4-Trimethylbenzen	3.6	3.6	380	ND	ND	NT	NT	NT	NT	NT	NT	ND	0.100	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
Naphthalene	12	12	1000	ND	ND	NT	NT	NT	NT	NT	NT	ND	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
Toluene	0.7	0.7	1000	ND	ND	0.114	ND	NT	ND	ND	ND	ND	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
Total Xylenes	0.26	1.6	1000	**1.262**	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
TOTAL VOCs	NS	NS	NS	64.656	--	0.114	0.267	--	127.379	23.400	2.284	0.270	0.193	--	0.022	1.500	--	--	0.0581	0.0207	0.071	--	--	0.555
Total TICs	NS	NS	NS	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	10.309	8.611	0.883	0.291	26.19	ND	27.23	1.732
TPH	NS	NS	NS	NT	ND	285.198	NT	162.341	NT	NT	NT	NT	NT	1806.460	NT	NT	NT	231	NT	NT	NT	NT	NT	NT

Compound	TB-119(3.5') 02/02/05	TB-119(10.5') 02/02/05	TB-120(12.0') 02/02/05	TB-121(6.5') 02/02/05	TB-122(11.0') 02/02/05	TB-200(4.0') 08/09/06	TB-200(8.0') 08/09/06	TB-201(8.0') 08/09/06	TB-202(10.5') 08/09/06	TB-203(4.0') 08/09/06	TB-203(8.0') 08/09/06	TB-203(12.0') 08/09/06	TB-204(12.0') 08/09/06	TB-205(0-2') 08/10/06	TB-206(0-2') 08/10/06	TB-207(0-2') 08/10/06	TB-208(0-2') 08/10/06	TB-209(0-2') 08/10/06	TB-210(11.9') 08/10/06	TB-211(11.0') 08/10/06	TB-212(11.5') 08/10/06	TB-213(11.9') 08/10/06	TB-214(11.0') 08/10/06	TB-215(8.0') 08/10/06
PCE	NT	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCE	NT	0.0754	0.0086	NT	ND	0.192	0.0733	ND	ND	ND	0.348	ND	0.014	ND	ND	ND	ND	ND	ND	ND	0.281	ND	0.154	ND
trans 1,2-DCE	NT	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis 1,2-DCE	NT	NT	NT	NT	NT	ND	ND	ND	**2.34**	ND	ND	ND	0.0151	ND	ND	ND	ND	ND	0.0312	ND	ND	0.148	0.0476	ND
VC	NT	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
acetone	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	ND	NT
2-hexanone	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	ND	NT
Methylene Chloride	NT	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	ND	**0.219**	ND	ND
n-Butylbenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	0.0261	NT
sec-Butylbenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	0.0175	NT
n-propylbenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	0.0238	NT
Isopropylbenzene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	0.0104	NT
1,2,4-Trimethylbenzen	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	0.0753	NT
Naphthalene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	0.109	NT
Toluene	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	ND	NT
Total Xylenes	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	ND	NT
TOTAL VOCs	N/A	0.0754	0.0086	N/A	--	0.192	0.0733	--	2.34	--	0.348	--	0.0291	--	--	--	--	--	0.312	0.02	0.281	0.367	0.4637	--
Total TICs	NT	ND	ND	NT	20.912	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH	502	NT	NT	29.3	807	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Compound	TB-215(11.9') 08/10/06	SS-1(0-2") 10/01/08	SS-4(2-4") 10/01/08	TB-100(2-4') 10/01/08	IB-100(5-7') 10/01/08	TB-402(11') 03/07/11
PCE	ND	ND	ND	ND	0.0498	ND
TCE	ND	ND	ND	ND	0.0808	0.129
trans 1,2-DCE	ND	ND	ND	ND	ND	ND
Cis 1,2-DCE	0.021	ND	ND	ND	ND	ND
VC	ND	ND	ND	ND	ND	ND
acetone	NT	**0.723**	ND	ND	ND	ND
2-hexanone	NT	0.28	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND
n-Butylbenzene	NT	ND	ND	ND	ND	ND
sec-Butylbenzene	NT	ND	ND	ND	ND	ND
n-propylbenzene	NT	ND	ND	ND	ND	ND
Isopropylbenzene	NT	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzen	NT	ND	ND	ND	ND	ND
Naphthalene	NT	ND	ND	ND	ND	ND
Toluene	NT	ND	ND	ND	ND	ND
Total Xylenes	NT	ND	ND	ND	ND	ND
TOTAL VOCs	0.021	1.003	--	--	0.1306	0.129
Total TICs	NT	NT	NT	NT	NT	NT
TPH	NT	NT	NT	NT	NT	NT

Notes:
Results and SCOs are reported as parts per million (ppm) or mg/Kg
(1) = Soil Cleanup Objective (SCO) for Unrestricted Use as referenced in 6 NYCRR Part 375 dated 12/14/06.
(2) = Soil Cleanup Objective (SCO) for Protection of Groundwater as referenced in 6 NYCRR Part 375 dated 12/14/06.
(3) = Soil Cleanup Objective (SCO) for Industrial Use as referenced in 6 NYCRR Part 375 dated 12/14/06.
(4) **2014 Soil Sampling**. Four soil samples were collected from off-site locations in right-of-way areas addjacent to the Site in 2014 (i.e., the "ROW" soil samples. These samples were analyzed for VOCs. The only constiuent detected in any of these samples was chloroform. Chloroform was detected in sample ROW-6 at a concentration of 5.8 mg/kg at a depth of 10.7 feet below ground surface. The NYSDEC Unrestricted Use SCO for Chloroform is 0.37 mg/kg.
PCE = tetrachloroethene
TCE = trichloroethene
Trans 1,2-DCE = trans 1,2-dichloroethene
Cis 1,2 DCE = Cis 1,2-dichloroethene
VC = vinyl chloride
TIC = Tentatively Identified Compound
ND = Not Detected at a concentration greater than the method detection limit.
NT = Not Tested
NS = No Standard
Bold Type = Concentration exceeds the respective Unrestricted Use SCO
0.723 = Concentration exceeds the respective Unrestricted Use SCO and Protection of Groundwater SCO.

Table 6: Summary of Groundwater Quality Data (1997 to 2014)
OBI, LLC Site, Rochester, NY; NYSDEC Site No. 828188

SAMPLE LOCATIONS AND SAMPLE DATES

COMPOUND	NYSDEC Standard or Guidance Value[(1)]	MW-1										MW-2	MW-3								MW-4	
		10/2/97	10/15/04	6/7/06	6/28/07	5/1/08	8/21/08	4/14/10	10/25/10	9/22/11	11/29/12	10/2/97	10/2/97	10/15/04	6/7/06	5/1/08	8/21/08	10/25/10	9/22/11	11/29/12	10/2/97	8/21/08
PCE	5	11.9	5.4	3.85	*ND (20)*	ND (2.0)	2.34	7.61	8.87	7.02	4.1	ND (2.0)	9.7E	7.1	ND (2.0)	ND (2.0)	2.70	*ND (20.0)*	*ND (10)*	4.15	ND (2.0)	ND (2.0)
TCE	5	546.9	78	112	216	23.2	46.3	123	119	97.2	61.1	206.3	607.4	170	95.4	28.9	98.3	156	190	214	11.2	ND (2.0)
trans 1,2-DCE	5	*ND (10)*	ND (1.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	*ND (10)*	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	*ND (20.0)*	*ND (10)*	ND (2.0)	6.4	ND (2.0)
Cis 1,2-DCE	5	14.8 E	15	19.1	45.2	5.46	13.5	21.6	18.6	22.3	39.4	38.2 E	39.9 E	33	17.7	8.29	25.2	40.8	47.1	57.7	295 E	ND (2.0)
VC	2	*ND (10)*	ND (2.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	*ND (10)*	*ND (4.0)*	ND (2.0)	ND (2.0)	2.35	*ND (20.0)*	*ND (10)*	2.79	229.6	ND (2.0)
TOTAL VOCs	--	573.6	98.4	134.95	261.2	28.66	62.14	152.21	146.47	126.52	104.6	244.5	657	210.1	113.1	37.19	128.55	196.8	237.1	278.64	542.2	0
Cyanide	200	NT	ND (100)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND (100)	NT	NT	NT	NT	NT	NT	NT	NT
Zinc	2,000	22	ND (100)	ND (20)	NT	NT	NT	NT	NT	NT	NT	ND (10)	ND (10)	245	98	NT	NT	NT	NT	NT	12	NT

SAMPLE LOCATIONS AND SAMPLE DATES

COMPOUND	NYSDEC Standard or Guidance Value[(1)]	MW-5																	MW-6								
		10/2/97	10/15/04	6/7/06	7/31/07	5/1/08	8/21/08	1/23/09	3/31/09	5/8/09	7/20/09	9/14/09	3/24/10	4/14/10	10/26/10	9/22/11	11/29/12	1/4/13	10/2/97	10/1/08	3/31/09	9/14/09	3/24/10	10/26/10	9/22/11	11/29/12	1/4/13
PCE	5	*ND (10)*	ND (2.5)	*ND (200)*	*ND (200)*	*ND (200)*	*ND (50)*	*ND (20)*	*ND (40)*	*ND (20)*	*ND (20)*	*ND (20)*	*ND (100)*	*ND (50)*	*ND (20)*	*ND (10)*	*ND (400)*	*ND (50)*	*ND (50)*	*ND (200)*	*ND (400)*	*ND (100)*	*ND (100)*	*ND (400)*	*ND (200)*	ND (2.0)	ND (2.0)
TCE	5	909.5	5.5	*ND (200)*	*ND (200)*	*ND (200)*	*ND (50)*	*ND (20)*	136	51.7	*ND (20)*	*ND (20)*	632	205	*ND (20)*	*ND (10)*	*ND (400)*	*ND (50)*	4,917.1	*ND (200)*	*ND (400)*	*ND (100)*	*ND (100)*	*ND (400)*	*ND (200)*	ND (2.0)	ND (2.0)
trans 1,2-DCE	5	15.0	4.0	*ND (200)*	*ND (200)*	*ND (200)*	*ND (50)*	*ND (20)*	*ND (40)*	*ND (20)*	*ND (20)*	*ND (20)*	*ND (100)*	*ND (50)*	*ND (20)*	*ND (10)*	*ND (400)*	*ND (50)*	43.5E	*ND (200)*	*ND (400)*	*ND (100)*	*ND (100)*	*ND (400)*	*ND (200)*	ND (2.0)	ND (2.0)
Cis 1,2-DCE	5	2,840 E	260	11,300	2,130	4,020	3,600	845	2,820	1,880	2,150	240	6,330	5,800	736	909	10,000	4,600	4,390E	6,230	11,500	7,200	7,960	6,040	5,410	42.7	5.3
VC	2	654.8	43	1,080	457	289	764	179	168	192	365	129	412	447	126	153	668	390	837	4,300	4,730	5,400	4,110	3,570	4,440	24.8	ND (2.0)
TOTAL VOCs	--	4,419.30	312.5	12,380	2,587	4,309	4,364	1,024	3,144	2,124	2,515	369	7,374	6,452	862	1,062	10,668	4,990	10,187.6	10,530	16,230	12,600	12,070	9,610	0	67.5	5.3
Cyanide	200	NT	ND (100)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Zinc	2,000	11.00	283	35	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	128.0	NT	NT	NT	NT	NT	NT	NT	NT

SAMPLE LOCATIONS AND SAMPLE DATES

COMPOUND	NYSDEC Standard or Guidance Value[(1)]	MW-7 (ROCK)											MW-8									
		6/27/07	7/31/07 (14-15')	7/31/07 (25.5-26.5')	5/1/08	8/21/08	3/31/09	9/14/09	3/24/10	10/26/10	9/22/11	11/29/12	6/27/07	5/1/08	8/21/08	3/31/09	7/20/09	9/14/09	3/24/10	10/26/10	9/22/11	11/29/12
PCE	5	*ND (20)*	*ND (10)*	ND (2.0)	ND (5.0)	ND (5.0)	ND (5.0)	3.84	6.19	ND (5.0)	ND (5.0)	ND (4.0)	*ND (20)*	*ND (20)*	*ND (20)*	*ND (20)*	*ND (20)*	*ND (200)*	*ND (10)*	*ND (20)*	*ND (20)*	*ND (20)*
TCE	5	175	282	127	367	ND (5.0)	183	135	160	108	42.3	204	*ND (20)*	*ND (20)*	*ND (20)*	*ND (20)*	*ND (20)*	*ND (200)*	*ND (10)*	*ND (20)*	*ND (20)*	*ND (20)*
trans 1,2-DCE	5	*ND (20)*	*ND (10)*	ND (2.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (2.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (4.0)	*ND (20)*	*ND (20)*	*ND (20)*	*ND (20)*	*ND (20)*	*ND (200)*	*ND (10)*	*ND (20)*	*ND (20)*	*ND (20)*
Cis 1,2-DCE	5	103	144	78.2	135	139	69	117	86	130	114	330	1,220	220	862	1,460	2,330	1,600	727	841	1,080	808
VC	2	*ND (20)*	37.6	21.4	25.4	19.7	10.2	27	15	31	47.9	107	321	102	352	479	1,250	1,030	506	845	1,560	1,050
TOTAL VOCs	--	278	463.2	226.8	527.4	158.7	261.8	282.8	267.5	269.0	204.2	641.0	1,541	322	1,214	1,939	3,580	2,630	1,233	1,686	2,640	1,858
Cyanide	200	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Zinc	2,000	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Notes:

(1) NYSDEC Division of Water Technical Operations and Guidance Series (1.1.1): Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations; Class GA (source of drinking water from groundwater)

Concentrations are shown in ug/l or parts per billion (ppb)

ND(2.5) - constituent not detected at the concentration shown in parenthesis

ND(200) - concentration shown in parenthesis exceeds the respective ambient water quality standard or guidance value

E = Denotes an estimated concentration | TCE = trichloroethene | Cis 1,2 DCE = Cis 1,2-dichloroethene

PCE = tetrachloroethene | Trans 1,2-DCE = trans 1,2-dichloroethene | VC = vinyl chloride

909.5 = Concentration exceeds the respective ambient water quality standard or guidance value.

COMPOUND	NYSDEC Standard or Guidance Value(1)	SAMPLE LOCATIONS AND SAMPLE DATES																				
		MW-9									MW-10									MW-11		
		6/27/07	5/1/08	8/21/08	3/31/09	9/14/09	3/24/10	10/25/10	9/22/11	11/29/12	6/27/07	5/1/08	8/21/08	3/31/09	9/14/09	3/24/10	10/25/10	9/22/11	11/29/12	6/27/07	5/1/08	8/21/08
PCE	5	*ND (20)*	ND (2.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)
TCE	5	57.6	47.5	79.9	45.0	87.8	56.4	ND (2.0)	ND (2.0)	ND (2.0)	86.3	37.9	62.0	33.0	56.9	32.7	ND (2.0)	ND (2.0)	ND (2.0)	50.3	ND (2.0)	ND (2.0)
trans 1,2-DCE	5	*ND (20)*	ND (2.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	*ND (20)*	ND (2.0)	ND (2.0)
Cis 1,2-DCE	5	*ND (20)*	15.2	32.3	26.8	30.9	24.9	ND (2.0)	ND (2.0)	ND (2.0)	202	158	196	106	122	76	ND (2.0)	ND (2.0)	ND (2.0)	101	ND (2.0)	ND (2.0)
VC	2	*ND (20)*	ND (2.0)	3.48	*ND (20)*	4.18	2.4	ND (2.0)	ND (2.0)	ND (2.0)	227	96.5	103	59.8	116	51.4	ND (2.0)	ND (2.0)	2.78	*ND (20)*	ND (2.0)	ND (2.0)
TOTAL VOCs	--	57.6	62.7	115.68	71.80	122.88	83.70	0	0	0	515.3	292.4	361	198.8	294.9	160.2	0	0	2.78	151.3	0	0
Cyanide	200	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Zinc	2,000	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

COMPOUND	NYSDEC Standard or Guidance Value(1)	SAMPLE LOCATIONS AND SAMPLE DATES																							
		MW-12							MW-13						MW-14	MW-16			MW-17			MW-18			
		6/27/07	5/1/08	8/21/08	4/14/10	10/25/10	9/22/11	11/29/12	6/27/07	5/1/08	8/21/08	10/25/10	9/22/11	11/29/12	12/3/08	3/28/11	9/22/11	11/29/12	3/28/11	9/22/11	11/29/12	3/28/11	9/22/11	11/29/12	1/4/13
PCE	5	*ND (20)*	ND (2.0)	2.81	*ND (20)*	*ND (20)*	*ND (10)*	*ND (10)*	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	3.26	*ND (20)*	*ND (10)*	*ND (10)*	2.68	ND (2.0)	ND (2.0)	*ND (20)*	*ND (20)*	*ND (20)*	ND (2.0)
TCE	5	289	196	229	218	314	170	83.6	5.48	3.99	4.54	21.9	12.8	ND (2.0)	18.9	495	282	18.8	103	63.6	ND (2.0)	*ND (20)*	*ND (20)*	*ND (20)*	ND (2.0)
trans 1,2-DCE	5	*ND (20)*	ND (2.0)	ND (2.0)	*ND (20)*	*ND (20)*	*ND (10)*	*ND (10)*	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (20)	26.9	32.4	4.92	4.79	5.14	*ND (20)*	*ND (20)*	*ND (20)*	ND (2.0)
Cis 1,2-DCE	5	83.6	53.7	85.6	133.0	128.0	83.9	60.8	6.40	3.97	11.1	16.9	13.0	ND (2.0)	10.9	156	253	280	49.3	62.4	78.4	1,080	384	11.8	33
VC	2	*ND (20)*	18.4	27.5	36.4	53.6	47.8	35.4	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	4.54	28.1	29.2	60.7	8.85	27.3	26.9	1,520	1,200	29.1	75
TOTAL VOCs	--	372.6	268.1	344.91	387.4	495.6	301.70	179.8	11.88	7.96	15.54	38.80	25.80	0	37.6	679.1	591.1	391.9	168.75	158.09	110.04	2,600	1,584	40.9	108
Cyanide	200	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Zinc	2,000	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Notes:

(1) NYSDEC Division of Water Technical Operations and Guidance Series (1.1.1): Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations; Class GA (source of drinking water from groundwater)

(2) **2014 Groundwater Sampling Data** - The following are the results of the laboratory analyses of groundwater samples collected from 5 off-site wells installed in right-of-way areas adjacent to the Site.

Compound	NYSDEC Standard or Guidance Value(1)	Sample Locations and Sample Dates					
		ROW-1	ROW-4	ROW-4 (DUP)	ROW-5	ROW-8	ROW-9
		2/10/14	2/12/14	2/12/14	2/13/14	2/13/14	2/10/14
Benzene	1	**1.1 J**	U (5.0)	U (5.0)	U (5.0)	U (5.0)	U (5.0)
Chloroform	7	U (5.0)	**27**	**27**	U (5.0)	**7.1**	U (5.0)
Toluene	5	1.5 J	U (5.0)	U (5.0)	U (5.0)	1.9 J	1.2 J
Trichloroethene	5	U (5.0)	U (5.0)	U (5.0)	U (5.0)	U (5.0)	**88**
Cis 1,2-Dichroroeth	5	U (5.0)	U (5.0)	U (5.0)	U (5.0)	U (5.0)	**39**
Vinyl Chloride	2	U (5.0)	U (5.0)	U (5.0)	U (5.0)	U (5.0)	1.5 J
TOTAL VOCs	--	2.6	27	27	0	9.0	129.7
Total TICs	--	171	--	--	--	--	59.1

Concentrations are shown in ug/l or parts per billion (ppb)
ND(2.5) - constituent not detected at the concentration shown in parenthesis
ND(200) - concentration shown in parenthesis exceeds the respective ambient water quality standard or guidance value
E = Denotes an estimated concentration
PCE = tetrachloroethene

909.5 = Concentration exceeds the respective ambient water quality standard or guidance value.

Table 7: Soil Constituents Exceeding SCOs
OBI, LLC Site, Rochester, NY

Sample No.	Date	Depth	Results	Unrestricted SCO (1)	Industrial SCO (2)
BH-01	08/22/97	6' - 8'	TCE - 63.394	0.47	400
			Total Xylene - 1.262	0.26	1000
BH-11	09/17/97	0' - 2'	PCE - 2.797	1.30	300
			TCE - 124.582	0.47	400
BH-13	09/17/97	6' - 8'	TCE - 23.4	0.47	400
BH-15	09/18/97	9' - 11'	TCE - 2.284	0.47	400
TB-101	02/01/05	6.5'	TCE - 1.500	0.47	400
TB-117	07/02/05	9.9'	TCE - 0.555	0.47	400
TB-202	08/09/06	10.5'	cis-1,2-DCE - 2.34	0.25	1000
TB-213	08/10/06	11.9'	Methylene Chloride - 0.219	0.05	1000
SS-01	10/01/08	0' - 2'	Acetone - 0.723	0.05	1000
ROW-6 (3)	02/10/14	10.7'	Chloroform - 5.8	0.37	700

Notes:

1. Soil Cleanup Objective (SCO) for Unrestricted Use as referenced in 6 NYCRR Part 375 dated 12/14/06.

2. SCO for Restricted Industrial Use as referenced in 6 NYCRR Part 375 dated 12/14/06.

3. The ROW samples were collected from adjacent off-site areas and do not reflect Site soil quality conditions. In addition, chloroform has not been detected above NYSDEC Unrestricted Use SCOs in soil samples collected from Site areas. As a result, it is unlikely that the chloroform detected in this sample is Site-related.

All units are in milligrams per kilogram (mg/kg), or parts per million (ppm).

TCE = trichloroethene
PCE = tetrachloroethene
cis-1,2-DCE = cis-1,2-dichloroethene

Table 8: Halogenated VOCs in Groundwater
OBI, LLC Site, Rochester, New York

MW	PCE (5 ug/L) [1]				TCE (5 ug/L) [1]				trans 1,2-DCE (5 ug/L) [1]			
	Highest		Most Recent		Highest		Most Recent		Highest		Most Recent	
	Conc.	Date [3]	Conc.	Date [3]	Conc.	Date [3]	Conc.	Date [3]	Conc.	Date [3]	Conc.	Date [3]
MW-1	11.9	1997	4.1	2012	546.9	1997	61.1	2012	ND	1997	ND	2012
MW-2+	ND	1997	See note 2.		206.3	1997	See note 2.		ND	1997	See note 2.	
MW-3	7.1	2004	4.15	2012	607.4	1997	214	2012	ND	1997	ND	2012
MW-4+	ND	1997	ND	2008	11.2	1997	ND	2008	6.4	1997	ND	2008
MW-5	ND	1997	ND	2013	909.5	1997	ND	2013	15.0	1997	ND	2013
MW-6	ND	1997	ND	2013	4,917.1	1997	ND	2013	43.5 E	1997	ND	2013
MW-7 *	6.19	2010	ND	2012	367	2008	204	2012	ND	2007	ND	2012
MW-8	ND	1997	ND	2012	ND	1997	ND	2012	ND	1997	ND	2012
MW-9	ND	1997	ND	2012	878	2009	ND	2012	ND	1997	ND	2012
MW-10	ND	2007	ND	2012	86.3	2007	ND	2012	ND	2007	ND	2012
MW-11+	ND	2007	ND	2008	50.3	2007	ND	2008	ND	2007	ND	2008
MW-12	ND	2007	ND	2012	314	2010	83.6	2012	ND	2007	ND	2012
MW-13	ND	2007	ND	2012	21.9	2010	ND	2012	ND	2007	ND	2012
MW-14+	3.26	2008	See note 2.		18.9	2008	See note 2.		ND	2008	See note 2.	
MW-16	ND	2011	ND	2012	495	2001	18.8	2012	32.4	2012	32.4	2012
MW-17	2.68	2011	ND	2012	103	2011	ND	2012	5.14	2012	5.14	2012
MW-18	ND	2011	ND	2013	ND	2011	ND	2013	ND	2011	ND	2013

MW	cis-1,2-DCE (5 ug/L) [1]				Vinyl Chloride (2 ug/L) [1]			
	Highest		Most Recent		Highest		Most Recent	
	Conc.	Date [3]	Conc.	Date	Conc.	Date [3]	Conc.	Date [3]
MW-1	45.2	2007	39.4	2012	ND	1997	ND	2012
MW-2+	38.2 E	1997	See note 2.		ND	1997	See note 2.	
MW-3	57.7	2012	57.7	2012	2.79	2012	2.79	2012
MW-4+	295E	1997	ND	2008	229.6	1997	ND	2008
MW-5	11,300	2006	4,600	2013	1,080	2006	390	2013
MW-6	11,500	2009	5.3	2013	5,400	2009	ND	2013
MW-7 *	330	2012	330	2012	107	2012	107	2012
MW-8	2,330	2009	808	2012	1,560	2011	1,050	2012
MW-9	32.3	2008	ND	2012	4.18	2009	ND	2012
MW-10	202	2007	ND	2012	227	2006	2.78	2012
MW-11+	101	2007	ND	2008	ND	2007	ND	2008
MW-12	133	2010	60.8	2012	53.6	2010	35.4	2012
MW-13	16.9	2010	ND	2012	ND	2007	ND	2012
MW-14+	10.9	2008	See note 2.		4.54	2008	See note 2.	
MW-16	280	2012	280	2012	60.7	2012	60.7	2012
MW-17	78.4	2012	78.4	2012	27.3	2011	26.9	2012
MW-18	1,080	2011	33	2013	1,520	2011	75	2013

See page 2 for notes.

S:\Project PDFs\4845S-13Mcalpn\RI Work Plan (3-19-15)\OBI tables (8-7-15)_updated/Table 8 - GW exceedances

Table 8: Halogenated VOCs in Groundwater
OBI, LLC Site, Rochester, New York

Notes:

All units are in micrograms per liter (ug/L).

+	Well MW-2 no longer exists. Wells MW-4, MW-11, MW-14 and MW-15 were used as injection wells for the biostimulation pilot test and, thus, are no longer suitable for use as monitoring wells.
*	This well (MW7) is a bedrock well. All other monitoring wells listed on this table are shallow overburden aquifer groundwater monitoring wells.
ND	Indicates that the constituent was not detected above the Method Detection Limit (MDL).
E	Denotes an Estimated Concentration.
1.	**(5 ug/L)** = These are the New York State Department of Environmental Conservation (NYSDEC) Division of Water Technical Operations and Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations; Class GA (source of drinking water from groundwater). The NYSDEC water quality standard for Vinyl Chloride is 2 ug/L; the NYSDEC water quality standard for the other four constituents listed on this table is 5 ug/L.
2.	Only one groundwater sample has been collected from well MW-2 and from well MW-14. Well MW-2 has been abandoned.
3.	Specific dates associated with the sampling events are shown on Table 6.
45.2	Indicates that the constituent was detected at a concentration above the NYSDEC water quality standard for that constituent.

Table 9: Remedial Investigation Scope of Work
OBI, LLC Site, Rochester, New York

Sample Description	Number of Samples *	Sample Depth/ Screened interval	Laboratory Program	Rationale
Soil Samples				
Surface Soil: Exposure Assessment	5	0-2 inches below vegetative cover	TCL VOCs & TICs TCL SVOCs & TICs TAL Metals & cyanide Pesticides/PCBs(2)	Delineate surface soil characteristics in relation to possible human health exposure
Surface Soil: Historic Fill Material	15	0-1 ft. (3)	*Fill material: All Samples* TPH Full TCL/TAL(4) *Fill material: field screening greater than 5x background* (5) TCL VOCs & TICs *Rubble, ash, cinders or dredge spoils identified within sample* (5) TCL SVOCs & TICs TAL Metals & cyanide	Delineate nature and extent of historic fill material
Subsurface Soil	32	2 to 10 feet bgs to Equipment Refusal (assumed to be approximately 10 ft. bgs)	Full TCL/TAL	Investigate known and potential AOCs, fill in data gaps
Groundwater Samples				
Overburden Groundwater	8	between 5 and 10 ft. bgs.	Full TCL/TAL	Fill in overburden groundwater monitoring well network data gap, investigate known and potential AOCs, delineate potential vertical migration of contamination
Bedrock Groundwater	6	between 10 ft. and 30 ft. bgs.	Full TCL/TAL	Delineate bedrock groundwater nature and extent and fill-in existing data gaps
Existing Monitoring Wells	12	samples only	Full TCL/TAL	Characterize current groundwater quality across the Site, investigate known and potential AOCs
Existing Bedrock Monitoring Wells	1	sample only	Full TCL/TAL	Delineate bedrock groundwater nature and extent and fill-in existing data gaps
Vapor Intrusion Samples				
Soil Vapor	0	NA	NA	Previously Evaluated- refer to summary report (1)
Indoor Air	TBD	NA	TO-15	In accordance with existing IRM Work Plan
Sub-Slab Vapor	0	NA	NA	Previously Evaluated- refer to summary report (1)

Notes:
* Refer to Figure 9 for locations of proposed environmental samples
1. "Right-of-Way and Soil Perimeter Soil Vapor and Groundwater Evaluation Report"; Day Environmental, Inc.; June 2014.
2. Four of five samples will be analyzed for pesticides/PCBs.
3. If historic fill material is identified at depths greater than 1 ft below vegetative cover, additional samples may be collected and the boring will be extended in depth to establish vertical limit of the historic fill material.
4. 25% of samples only, biased towards highest TPH concentrations.
5. Additional laboratory analysis required, which could result in more than 25% of the soil samples being anlayzed for TCL VOCs and TICs, TCL SVOCs and TICs, or TAL metals and cyanide.

ft. = feet
TBD = To Be Determined
TPH = Total Petroleum Hydrocarbons
PAHs = Polycyclic Aromatic Hydrocarbons
NA = Not Applicable
TAL = Target Analyte List
PCBs = Polychlorinated Biphenyls
SVOCs = Semivolatile Organic Compounds
bgs = below ground surface
TCL = Target Compound List
VOCs = Volatile Organic Compounds

Table 10: Known and Potential Areas of Concern
OBI, LLC Site, Rochester, NY

Area of Concern	Approximate Location*	Approximate Dimensions (square feet)	Suspected Contaminants	Suspected Source of Discharge	Potential Receptors
Former TCE vapor degreaser	Central portion of 50 Balfour St building.	40	TCE	Leaks and spills	Human
Former area of two 3,000 gallon fuel oil USTs	Courtyard on north portion of 50 Balfour St.	500	Petroleum	Leaks and spills	Human
Former area of one 6,000 gallon fuel oil UST	East exterior portion of 245-265 Hollenbeck St.	650	Petroleum	Leaks and spills	Human
Assumed docation of former acetone tank	West of former building located at 271 Hollenbeck St. (1)	550(1)	Acetone	Leaks and spills	Human
Assumed location where cleaning solvents were dumped on the ground at 271 Hollenbeck Street	West of former building located at 271 Hollenbeck St. (1)	550(1)	VOCs	Dumping to ground surface	Human
Railroad tracks/siding formerly located on the Site	West and partial north exterior and northwest portion of building at 50 Balfour St.	Length ~ 787 feet	VOCs, SVOCs, Metals	Hydraulic leaks, contaminated fill material, treated railway ties	Human
Mounded area	Northwest exterior portion of 50 Balfour St.	4500	VOCs, SVOCs, Metals	Leaching	Human
Floor spill/holding tank	Central portion of 50 Balfour St building.	100	VOCs, SVOCs, Metals	Leaks	Human
Industrial wastewater pre-treatment plant	Central portion of 50 Balfour St building.	1500	VOCs, SVOCs, Metals	Leaks and spills	Human
Interior drum storage area	North-central portion of 50 Balfour St building.	620	VOCs	Leaks and spills	Human
Former pad-mounted transformer location	Northwest portion of courtyard in north exterior of 50 Balfour St building	40	PCBs	Leaks	Human
Location of TCE concentration above Unrestricted SCOs in surface soil sample	North exterior of western portion of 50 Balfour St building	100	TCE, PCE	Unknown	Human
Compressor discharge, boiler discharge and associated sump and oil water separator	Central portion of 50 Balfour St building.	1100	VOCs, SVOCs, Metals	Leaks and spills	Human
Former Toledo Scale oven room and spray booth	Central portion of 50 Balfour St building.	1150	VOCs, SVOCs, Metals	Leaks and spills	Human
Former oil room (1932 Sanborn Map)	Central portion of 50 Balfour St building.	375	Petroleum	Leaks and spills	Human
Location of spillage through wall	Central portion of 50 Balfour St building.	110	VOCs, SVOCs, Metals	Leaks and spills	Human
Spillage/leakage area	North-central portion of 50 Balfour St building.	3550	VOCs, SVOCs, Metals	Leaks and spills	Human
Former oil and grease room	North-east portion of 50 Balfour St building	500	Petroleum	Leaks and spills	Human
90-day hazardous waste storage area	Central portion of 50 Balfour St building.	1500	VOCs, SVOCs, Metals	Leaks and spills	Human
Chemical storage area	Central portion of 50 Balfour St building.	1150	VOCs, SVOCs	Leaks and spills	Human
Observed areas of petroleum impacts	TP-1, TP-2, TP-3, TB-6, TB-104- BH-01, BH-04, TB-119, TB-121 and TB-122	130	Petroleum	Leaks and spills	Human
TCE concentration in sub-slab vapor probe sample (SSV-06)of 19,200 $\mu g/m^3$	Central portion of 50 Balfour St building.	40	TCE	Unknown	Human
Drainage system including floor drains, trenches, roof leader discharges, storm sewers	Within north and central portions of 50 Balfour St building(2)	To be determined	VOCs, SVOCs, Metals	Leaks	Human

Notes
* Refer to Figure 8 for location of Areas of Concern
(1) Exact location and size not known
(2) Locations to be confirmed following utility assessment

FIGURES

Remedial Investigation Work Plan

OBI, LLC Facility

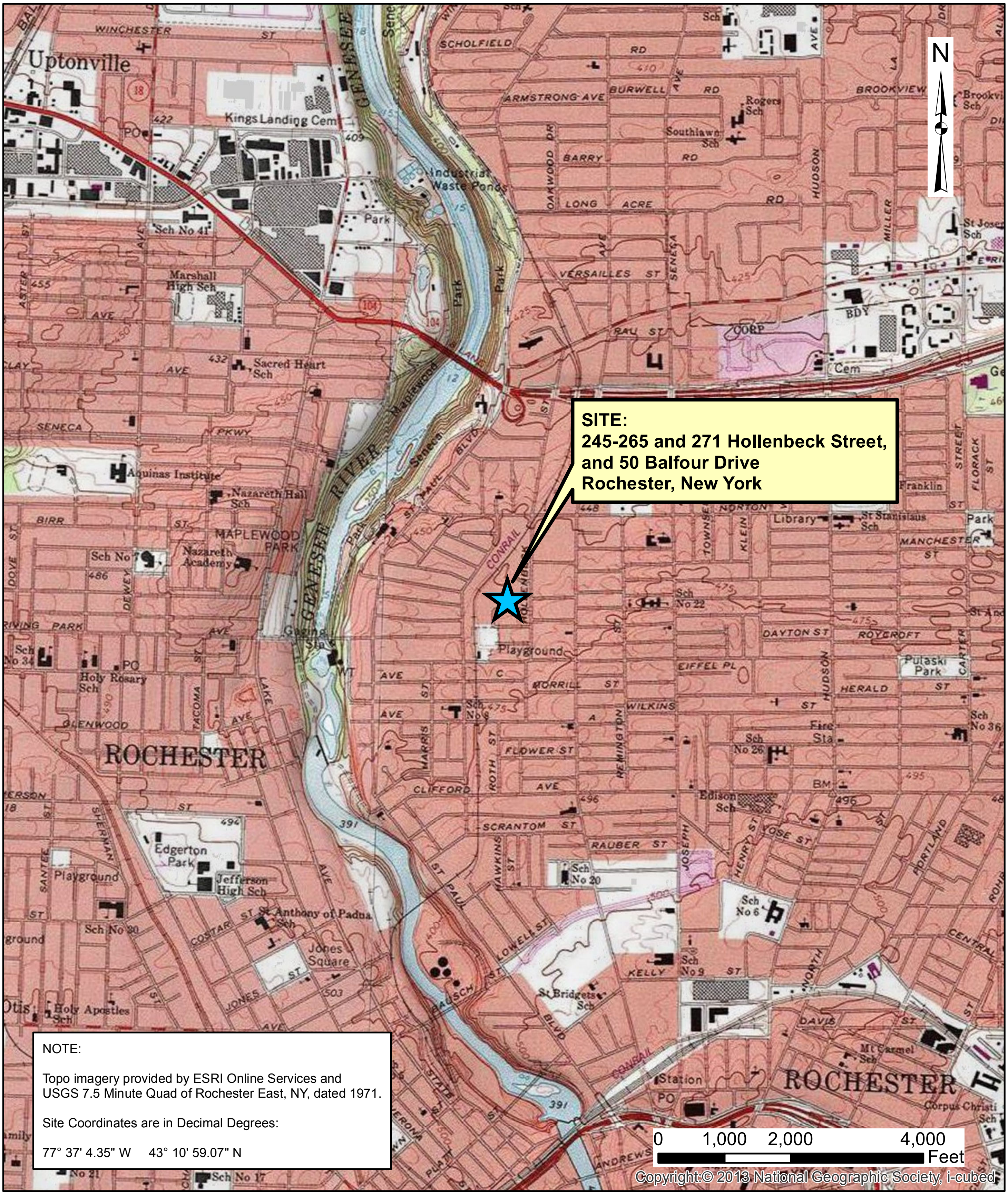
245-265 Hollenbeck Street,

271 Hollenbeck Street, And

50 Balfour Drive

Rochester, NY 14621

AUGUST 2015



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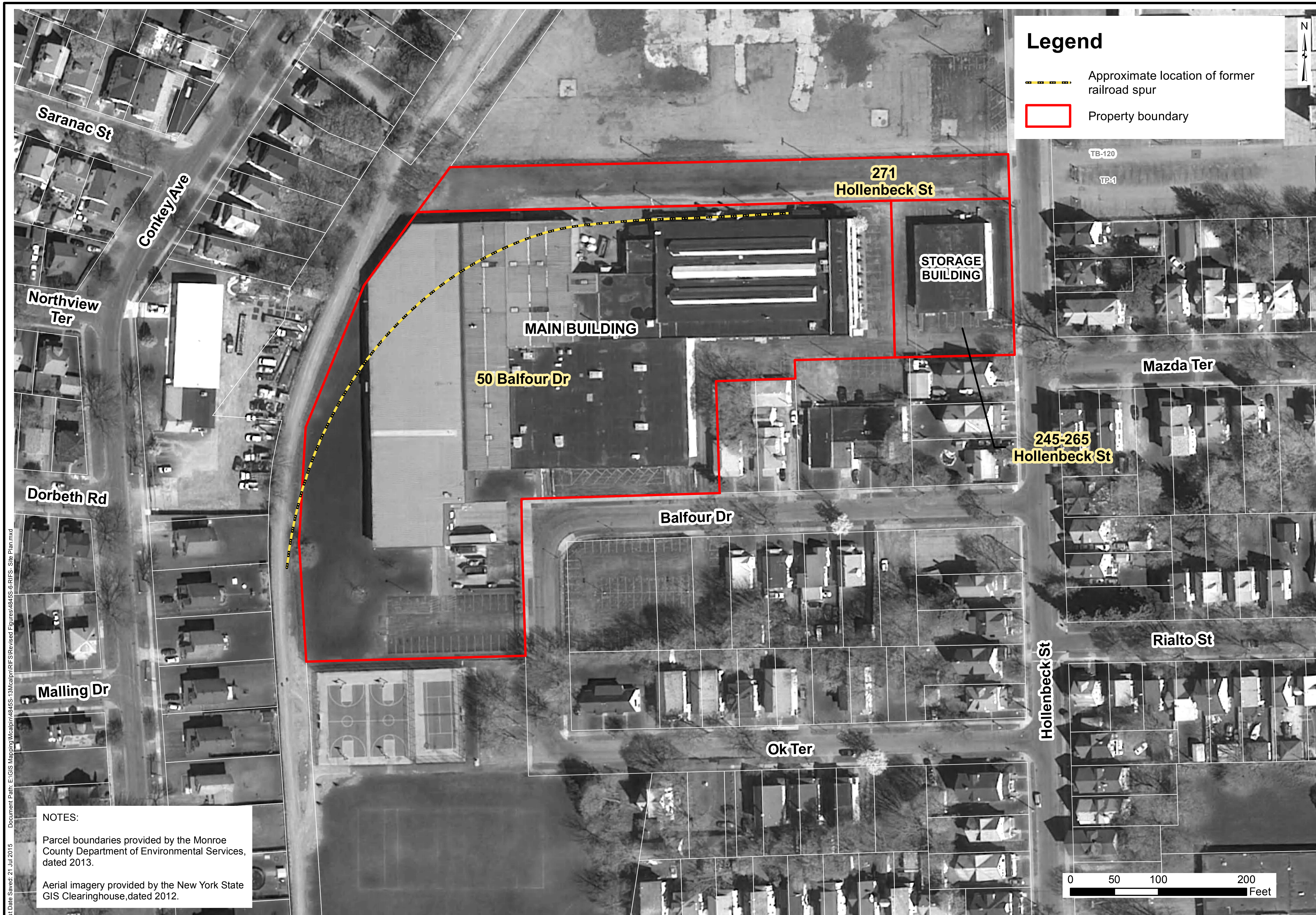
Date 07-21-2015	DAY ENVIRONMENTAL, INC. Environmental Consultants Rochester, New York 14606 New York, New York 10170	Project Title OBI, LLC SITE 245 - 265 AND 271 HOLLENBECK ST, AND 50 BALFOUR DR ROCHESTER, NEW YORK	Project No. 4845S-13 FIGURE 1
Drawn By CPS			
Scale AS NOTED		Drawing Title Project Locus Map	



DATE	DATE DRAWN	DATE ISSUED
07-2015	07-2015	07-21-2015

DESIGNED BY	DRAWN BY	SCALE
JJI	CPS	AS NOTED

day

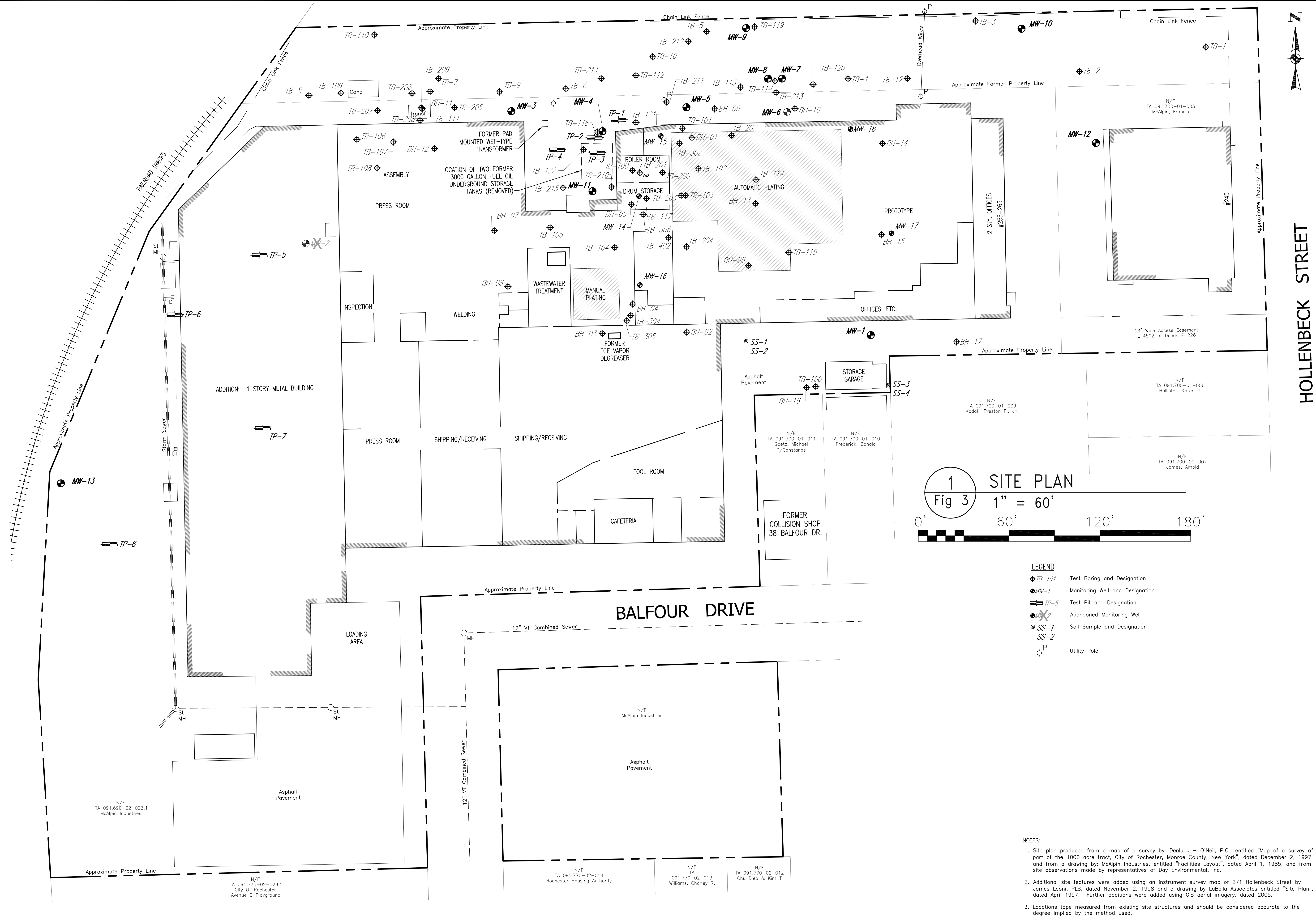
DAY ENVIRONMENTAL, INC.
Environmental Consultants
Rochester, New York 14606
New York, New York 10170

Project Title
OBI, LLC SITE
245 - 265 AND 271 HOLLENBECK ST,
AND 50 BALFOUR DR
ROCHESTER, NEW YORK

Drawing Title
Site Plan

Project No.
4845S-13

FIGURE 2



NOTES:

1. Site plan produced from a map of a survey by: Denluck – O'Neil, P.C., entitled "Map of a survey of part of the 1000 acre tract, City of Rochester, Monroe County, New York", dated December 2, 1997 and from a drawing by: McAlpin Industries, entitled "Facilities Layout", dated April 1, 1985, and from site observations made by representatives of Day Environmental, Inc.
2. Additional site features were added using an instrument survey map of 271 Hollenbeck Street by James Leoni, PLS, dated November 2, 1998 and a drawing by LaBella Associates entitled "Site Plan", dated April 1997. Further additions were added using GIS aerial imagery, dated 2005.
3. Locations tape measured from existing site structures and should be considered accurate to the degree implied by the method used.

DATE 7-2015
DATE DRAWN 7-23-2015
DATE ISSUED 7-23-2015
PROJECT MANAGER RLK
DRAWN BY RJM/Tw/CPS
SCALE As Noted

day
DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14606
NEW YORK, NEW YORK 10170

PROJECT TITLE
OBI, LLC 245 - 265 AND 271 HOLLENBECK ST, AND 50 BALFOUR DR

DRAWING TITLE
1997 - 2014 Soil and Groundwater Sampling Locations

PROJECT NO. 4845S-13

FIGURE 3

Time Plotted: Thursday, July 23, 2015 3:43:24 PM
File Name: P:\Drawings\McAlpin\4845S-13 – Prior Sample Locations 7-23-2015.dwg
Xerox432AnsiB-2; 11 x 17
Layout Name: 11x17
Pen Setting File: McAlpin
Ref1:
Ref2:
Ref3:

NOTES:

Parcel boundaries provided by the Monroe County Department of Environmental Services, dated 2013.

Aerial imagery provided by the New York State GIS Clearinghouse,dated 2012.

Last Date Saved: 21 Jul 2015 Document Path: E:\GIS Mapping\Mcalpin\4845S-13Mcalpn\RIFS\Revised Figures\4845S-5-RIFS- 2014 Off-Site Soil and GW Samples.mxd

DESIGNED BY	JJI
DATE	07-2015
DRAWN BY	CPS
DATE DRAWN	07-2015
SCALE	AS NOTED
DATE ISSUED	07-21-2015

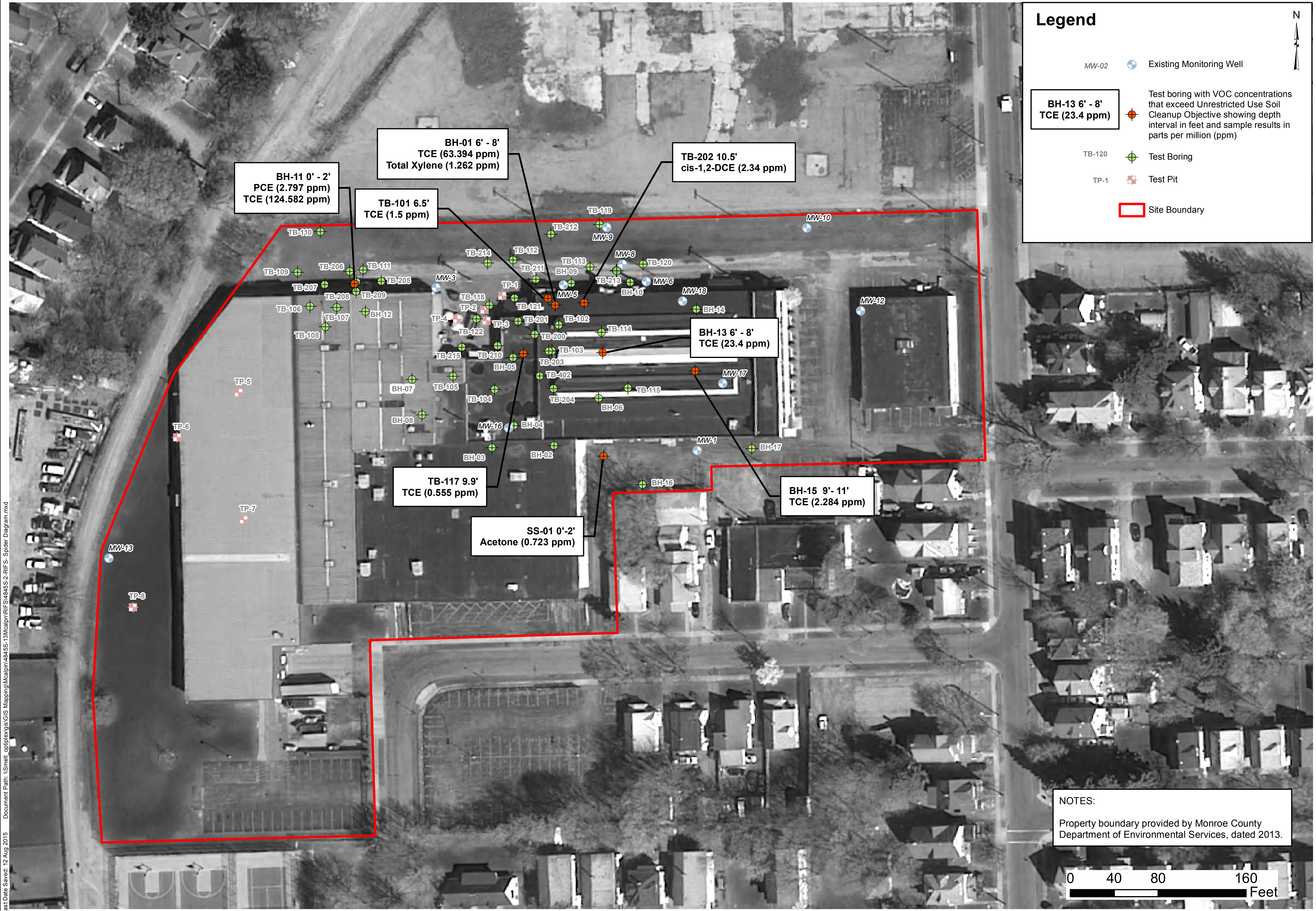
day
DAY ENVIRONMENTAL, INC.
Environmental Consultants
Rochester, New York 14606
New York, New York 10170

Project Title
OBI, LLC SITE
245 - 265 AND 271 HOLLENBECK ST,
AND 50 BALFOUR DR
ROCHESTER, NEW YORK

Drawing Title
2014 Off-Site Soil and Groundwater Sampling Locations

Project No.
4845S-13

FIGURE 4



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DATE 03-2015	DATE DRAWN 03-2015	DATE ISSUED 03-17-2015
DESIGNED BY JJI	DRAWN BY CPS/ANM	SCALE AS NOTED

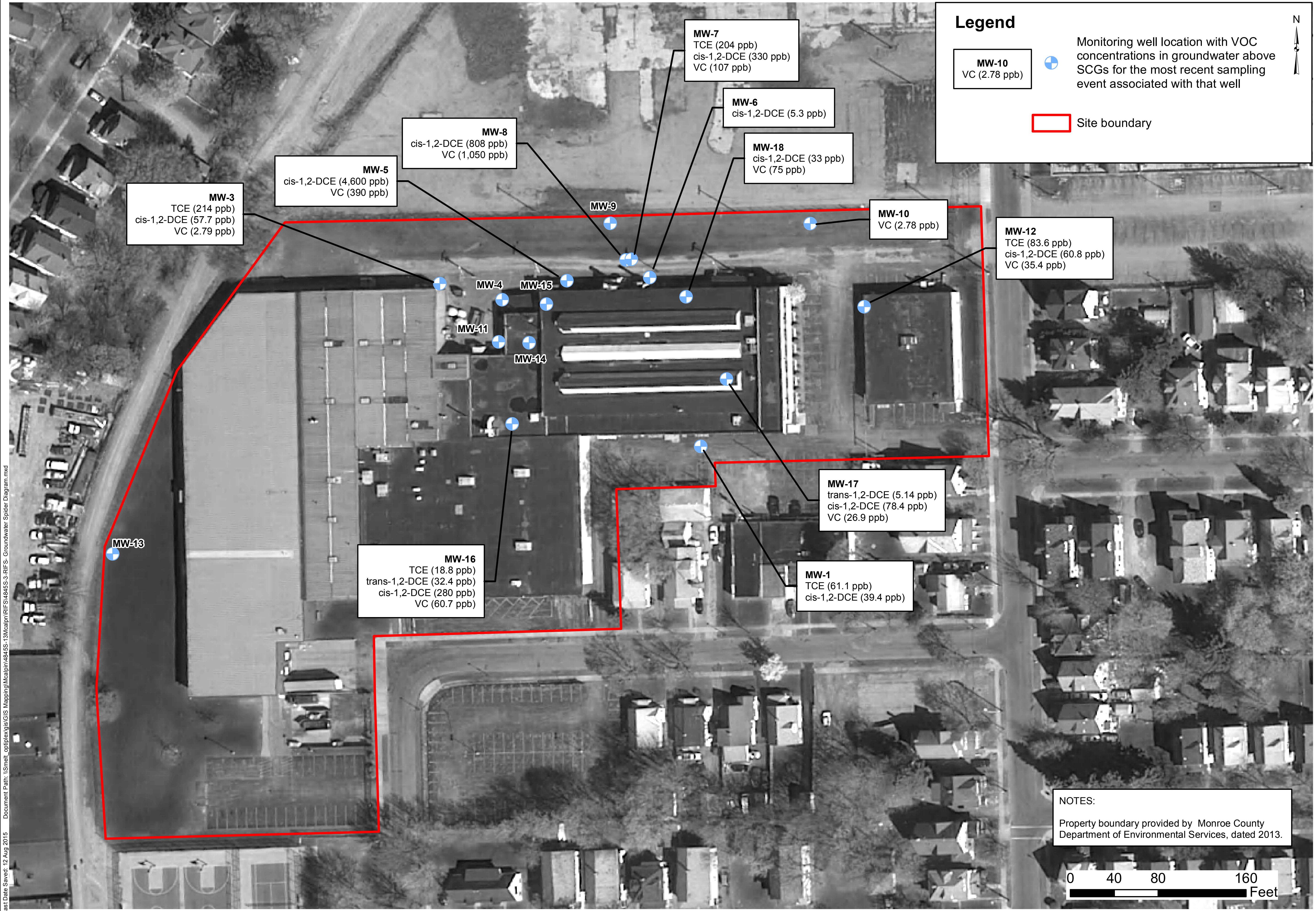
day
DAY ENVIRONMENTAL, INC.
Environmental Consultants
Rochester, New York 14606
New York, New York 10170

Project Title
OBI, LLC SITE
245 - 265 AND 271 HOLLENBECK ST,
AND 50 BALFOUR DR
ROCHESTER, NEW YORK

Drawing Title
Site Plan with Soil Sample Locations Exceeding Unrestricted Use Soil Cleanup Objectives for Volatile Organic Compounds (VOCs)

Project No.
4845S-13

FIGURE 5



Last Date Saved: 12 Aug 2015 Document Path: \\Smelt_optiplex\gis\GIS Mapping\Mcalpin\4845S-13Mcalpn\RIFS\4845S-3-RIFS- Groundwater Spider Diagram.mxd

DATE 03-2015	DATE DRAWN 03-2015	DATE ISSUED 03-17-2015
DESIGNED BY JJI	DRAWN BY CPS	SCALE AS NOTED

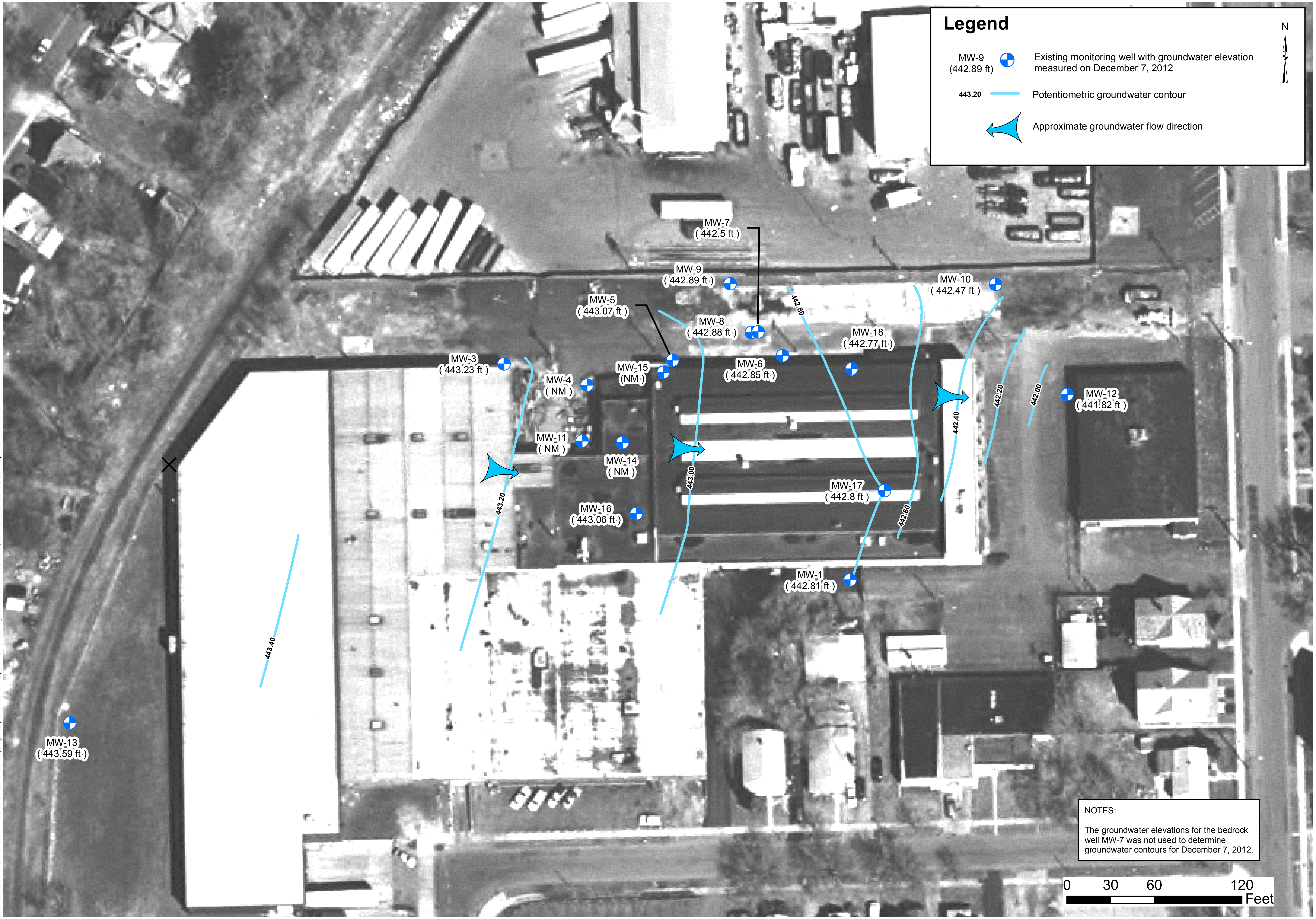
DAY ENVIRONMENTAL, INC.
Environmental Consultants
Rochester, New York 14606
New York, New York 10170

Project Title
OBI, LLC SITE
245 - 265 AND 271 HOLLENBECK ST,
AND 50 BALFOUR DR
ROCHESTER, NEW YORK

Drawing Title
Site Plan with Groundwater Sample Locations Exceeding Halogenated VOC SCG Values for the Most Recent Sampling Event Associated with that Well

Project No.
4845S-13

FIGURE 6



Last Date Saved: 21 Jul 2015 Document Path: E:\GIS Mapping\Mcalpin\4845S-13Mcalpin\RIFS\Revised Figures\4845S-8 -December 7, 2012 Groundwater Contour Map.mxd

DESIGNED BY	DATE
RLK	12-2013
DRAWN BY	DATE DRAWN
CPS	12-2013
SCALE	DATE ISSUED
AS NOTED	07-21-2015

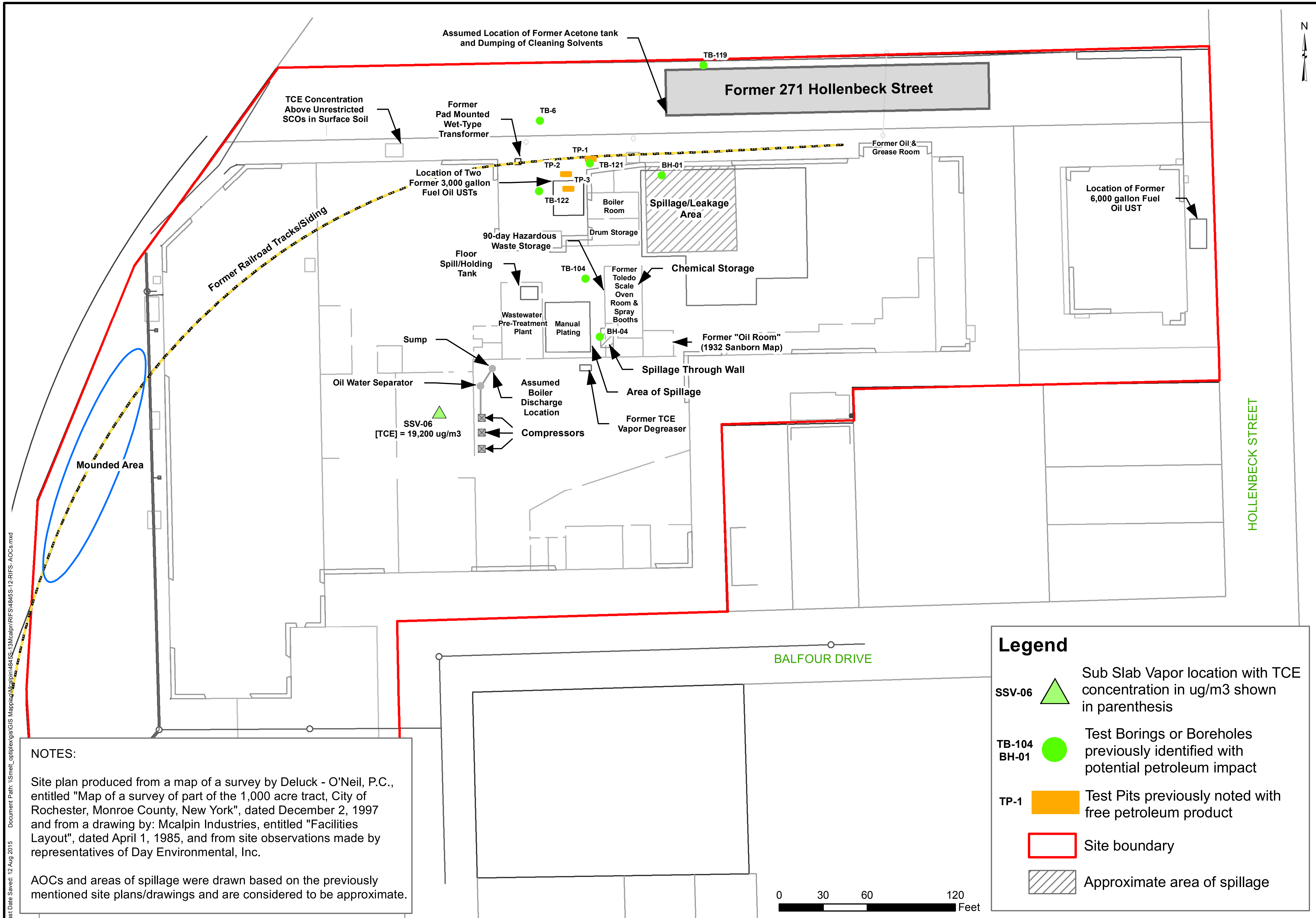
day
DAY ENVIRONMENTAL, INC.
Environmental Consultants
Rochester, New York 14606
New York, New York 10170

Project Title
50 BALFOUR DRIVE
245-265 AND 271 HOLLENBECK STREET
ROCHESTER, NEW YORK

Drawing Title
Potentiometric Groundwater Contour Map for December 7, 2012

Project No.
4845S-13

FIGURE 7



NOTES:

Site plan produced from a map of a survey by Deluck - O'Neil, P.C., entitled "Map of a survey of part of the 1,000 acre tract, City of Rochester, Monroe County, New York", dated December 2, 1997 and from a drawing by: Mcalpin Industries, entitled "Facilities Layout", dated April 1, 1985, and from site observations made by representatives of Day Environmental, Inc.

AOCs and areas of spillage were drawn based on the previously mentioned site plans/drawings and are considered to be approximate.

DATE	07-2015
DATE DRAWN	07-2015
DATE ISSUED	07-21-2015
DESIGNED BY	JJI
DRAWN BY	ANM
SCALE	AS NOTED

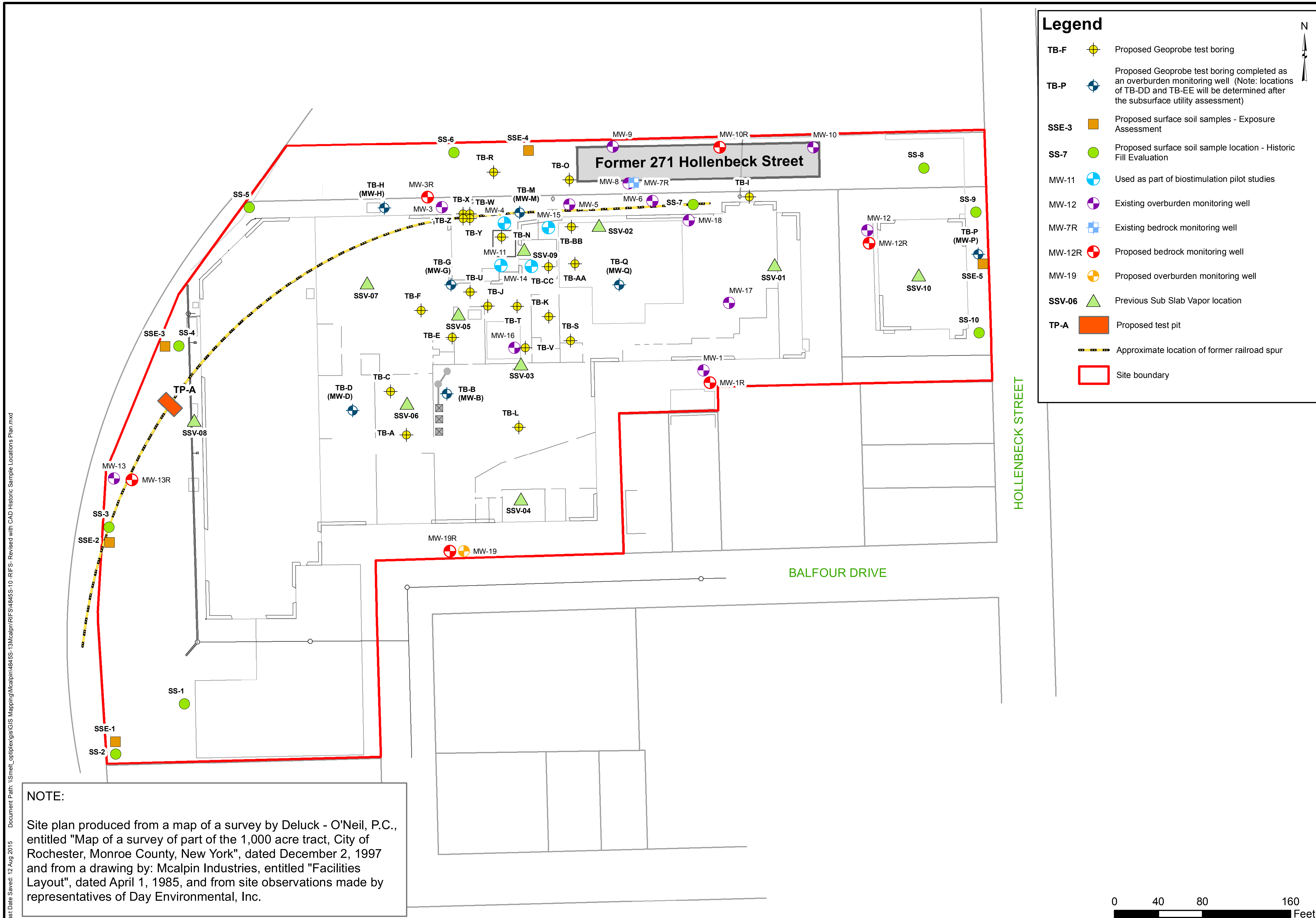
DAY ENVIRONMENTAL, INC.
Environmental Consultants
Rochester, New York 14606
New York, New York 10170

Project Title
OBI, LLC SITE
245 - 265 AND 271 HOLLENBECK ST, AND 50 BALFOUR DR
ROCHESTER, NEW YORK

Drawing Title
Site Plan Showing Locations of Known and Potential Areas of Concern (AOCs)

Project No.
4845S-13

FIGURE 8



NOTE:

Site plan produced from a map of a survey by Deluck - O'Neil, P.C., entitled "Map of a survey of part of the 1,000 acre tract, City of Rochester, Monroe County, New York", dated December 2, 1997 and from a drawing by: Mcalpin Industries, entitled "Facilities Layout", dated April 1, 1985, and from site observations made by representatives of Day Environmental, Inc.

Last Date Saved: 12 Aug 2015 Document Path: \\Smelt_optiplex\gis\GIS Mapping\Mcalpin\4845S-13Mcalpin\RIFS\4845S-10 -RIFS - Revised with CAD Historic Sample Locations Plan.mxd

DATE	07-2015
DATE DRAWN	07-2015
DATE ISSUED	07-21-2015
DESIGNED BY	JJI
DRAWN BY	CPS/ANM
SCALE	AS NOTED

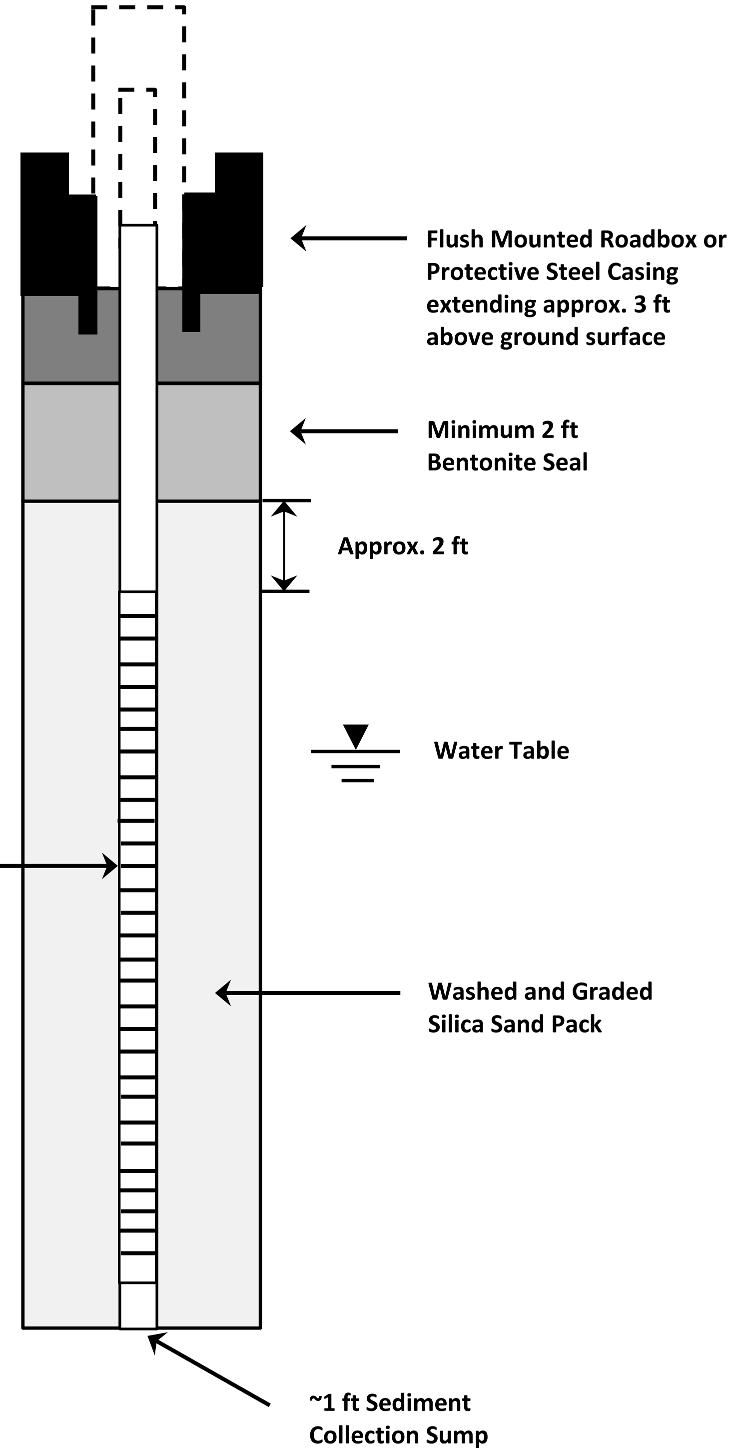
day
DAY ENVIRONMENTAL, INC.
Environmental Consultants
Rochester, New York 14606
New York, New York 10170

Project Title
OBI, LLC SITE
245 - 265 AND 271 HOLLENBECK ST,
AND 50 BALFOUR DR
ROCHESTER, NEW YORK

Drawing Title
Site Plan Showing the Proposed Sample Locations
(and Some Prevous Sample Locations)

Project No.
4845S-13

FIGURE 9



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NOT TO SCALE

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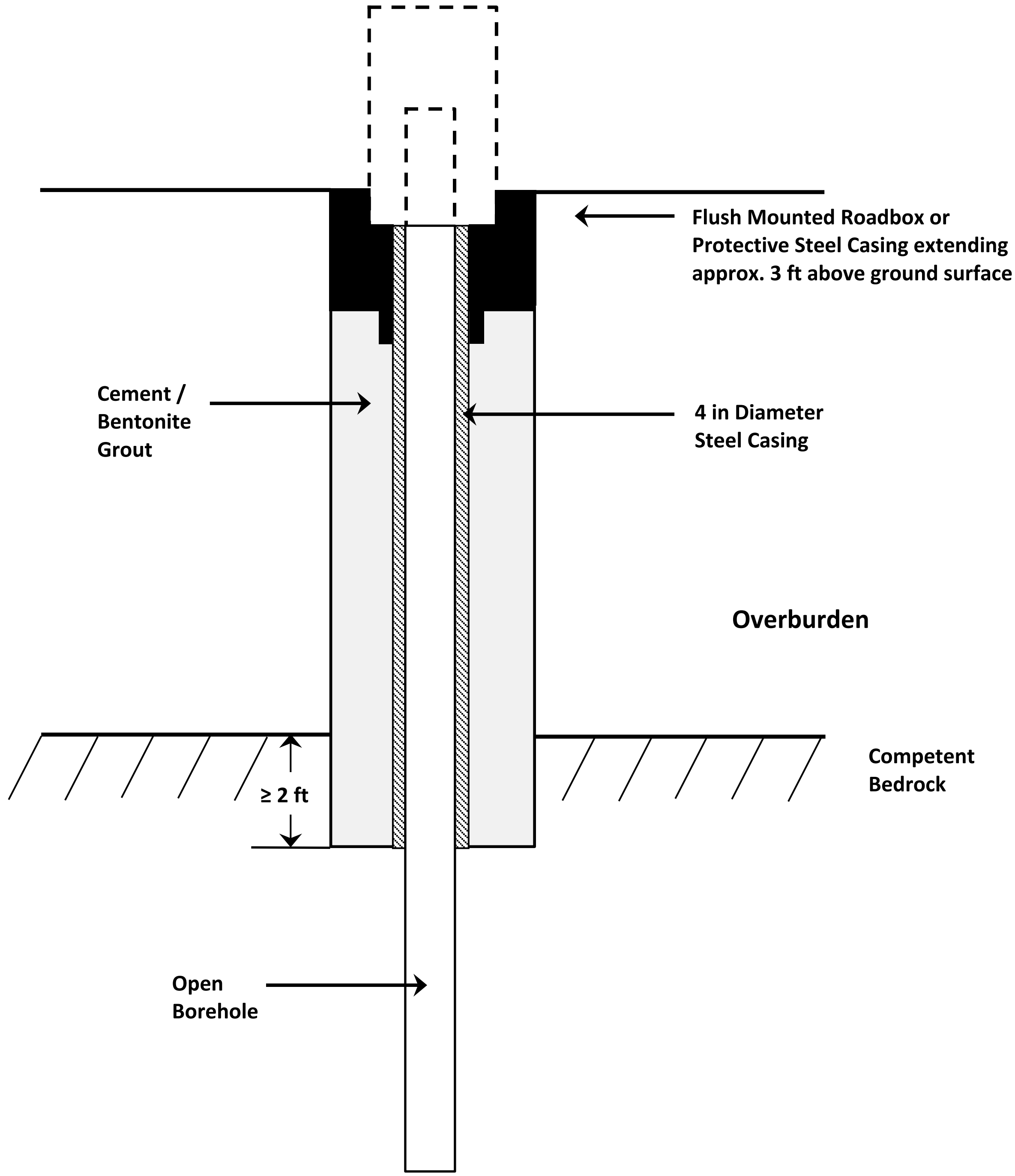
DATE 03-13-2015	DAY ENVIRONMENTAL, INC. Environmental Consultants Rochester, New York 14606 New York, New York 10170	PROJECT TITLE OBI, LLC SITE 245 - 265 AND 271 HOLLENBECK ST, AND 50 BALFOUR DR ROCHESTER, NEW YORK	PROJECT NO. 4845S-13
DRAWN BY CPS		DRAWING TITLE Schematic Overburden Well Design	FIGURE 10
SCALE Not to Scale			



DRAFT

NOT TO SCALE

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DATE 03-13-2015 DRAWN BY CPS SCALE Not to Scale	day DAY ENVIRONMENTAL, INC. Environmental Consultants Rochester, New York 14606 New York, New York 10170	PROJECT TITLE OBI, LLC SITE 245 - 265 AND 271 HOLLENBECK ST, AND 50 BALFOUR DR ROCHESTER, NEW YORK DRAWING TITLE Schematic Bedrock Well Design	PROJECT NO. 4845S-13 FIGURE 11

Figure 12: Project Schedule
Remedial Investigation/Feasibility Study (RI/FS)
245 - 265 and 271 Hollenbeck Street and 50 Balfour Drive
Rochester, New York
NYSDEC Site No. 828188

TASK	Duration (weeks)	Duration (weeks) following NYSDEC approval																																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
- Approval of Work Plan	0																																																
Site Investigation																																																	
Utility Assessment and Contractor Selection	6																																																
Bedrock Well Installation (6 bedrock)	4																																																
Soil Borings, overburden well installation and test pit	8																																																
Surface Soil Sample Collection	2																																																
Soil Sample Lab Analyses and begin DUSR preparation	12																																																
Monitoring Well Development	2																																																
Groundwater Sampling	4																																																
Groundwater Sample Lab Analyses and begin DUSR Preparation	8																																																
RI/FS Report																																																	
Prepare and Submit Draft RI/FS Report	18																																																

APPENDIX A

REMEDIAL INVESTIGATION WORK PLAN

OBI, LLC FACILITY

245-265 HOLLENBECK STREET,

271 HOLLENBECK STREET, AND

50 BALFOUR DRIVE

ROCHESTER, NY 14621

AUGUST 2015

Street View - 10 Balfour Drive

Street View - 20 Balfour Drive

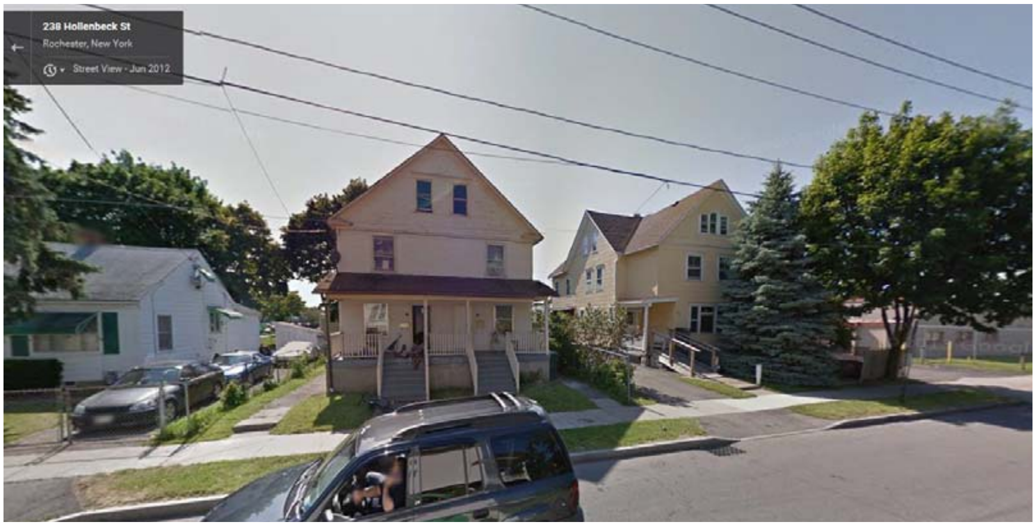
Street View – OBI, LLC Facility at 50 Balfour Drive

Street View – 283 Hollenbeck Street
OBI, LLC Facility in left of street view

Street View – Industrial facility at 282 Hollenbeck Street
Across the street from the OBI, LLC facility at 245-265 Hollenbeck Street

Street View – OBI, LLC Facility at 245-265 Hollenbeck Street

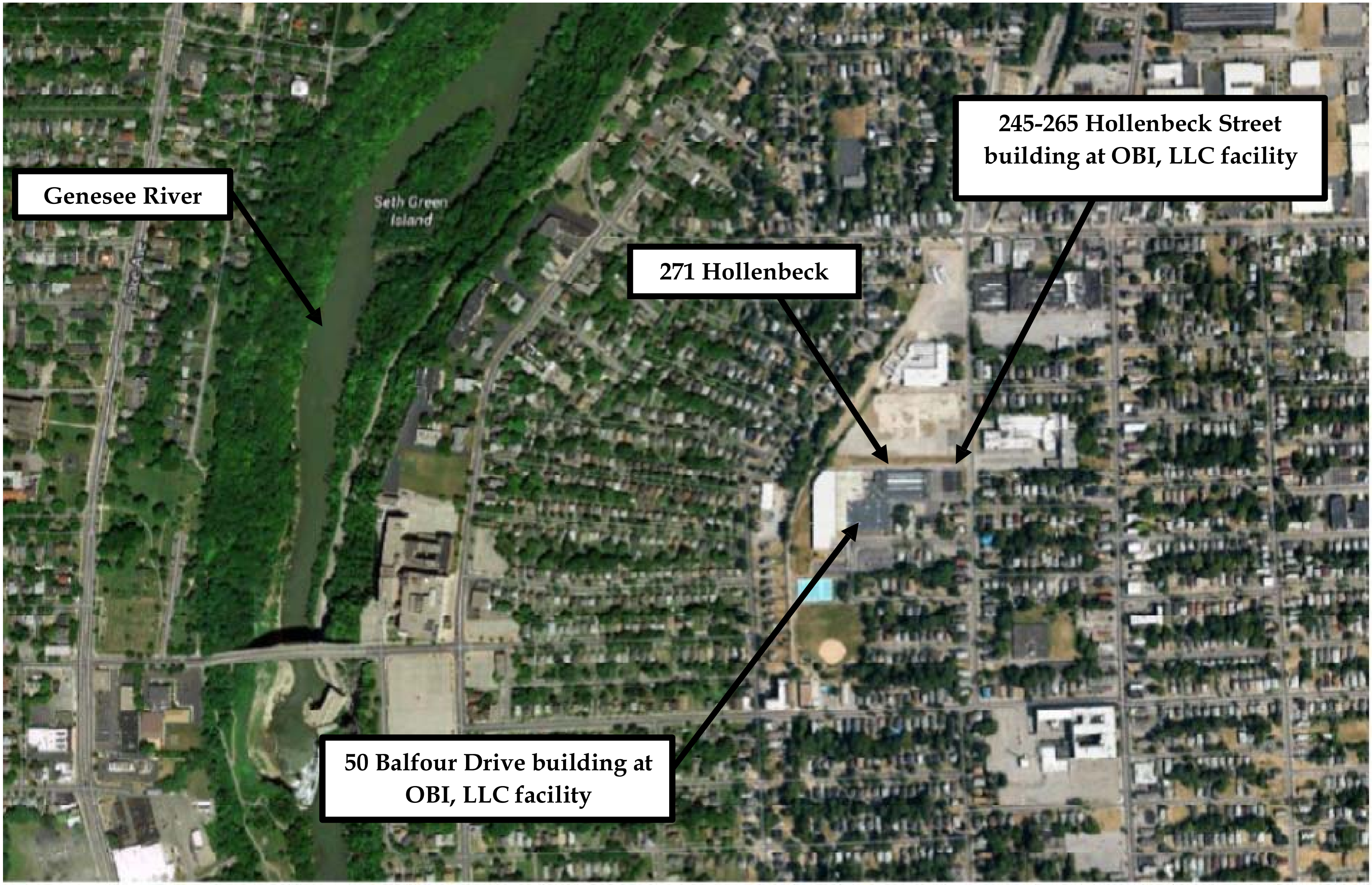
Street View – Hollenbeck Street across the road from the OBI, LLC facility at 245-265 Hollenbeck Street



Street View – 238 Hollenbeck Street down the road from the OBI, LLC facility at 245-265 Hollenbeck Street

Street View – 221 Hollenbeck Street down the road from the OBI, LLC facility at 245-265 Hollenbeck Street

Street View – 215 Hollenbeck Street down the road from the OBI, LLC facility at 245-265 Hollenbeck Street at the intersection with Balfour Drive



Aerial View of OBI, LLC facility at 245 Hollenbeck Street and 50 Balfour Drive, Rochester, New York

APPENDIX B

REMEDIAL INVESTIGATION WORK PLAN

OBI, LLC FACILITY

245-265 HOLLENBECK STREET,

271 HOLLENBECK STREET, AND

50 BALFOUR DRIVE

ROCHESTER, NY 14621

AUGUST 2015

LIST OF SOIL, GROUNDWATER, AND SOIL VAPOR/INDOOR AIR SAMPLES (1997-2014)

245-265 HOLLENBECK STREET, 271 HOLLENBECK STREET AND 50 BALFOUR DRIVE
ROCHESTER, NEW YORK
NYSDEC SITE #828188

Analytical Laboratory Testing Program
Soil Samples

Sample Designation	Matrix	Sample Date	Test Parameters
BH-01(6-8')	Soil	08/22/97	TCL/STARS VOCs, TCL SVOCs
TP-7(9.5-10.5')	Soil	08/25/97	TCL/STARS VOCs, TPH
BH-04(6-8')	Soil	08/22/97	TCL VOCs*, TPH
BH-09(4-6')	Soil	08/25/97	TCL VOCs*
TP-4 (3-4.5')	Soil	08/25/97	PCBs
BH-01(0-2')	Soil	08/22/97	Total Cyanide
BH-01 (2-4')	Soil	08/22/97	TAL Metals
BH-04(0-2')	Soil	08/22/97	TAL Metals
BH-06(2-4')	Soil	08/23/97	TAL Metals
TP-2(9-10')	Soil	08/25/97	TPH
BH-11(0-2)	Soil	09/17/97	TCL VOCs*
BH-13(6-8')	Soil	09/17/97	TCL VOCs*, Total Zinc
BH-15(9-11')	Soil	09/18/97	TCL VOCs*, Total Zinc
TB-2(12-12.5')	Soil	04/22/98	TCL/STARS VOCs
TB-6(4-8')	Soil	04/22/98	TCL/STARS VOCs, STARS SVOCs
TB-8(8-10')	Soil	04/22/98	TCL/STARS VOCs
TB-6(8-10')	Soil	04/22/98	TPH
TB-101(6.5')	Soil	02/01/05	TCL/STARS VOCs+TICs, Total Zinc, Total Cyanide
TB-102(11.7')	Soil	02/01/05	Halogenated VOCs+TICs, Total Zinc, Total Cyanide
TB-104(6.0')	Soil	02/01/05	Total Zinc
TB-104(11.0')	Soil	02/01/05	Halogenated VOCs+TICs, TPH
TB-106(9.3')	Soil	02/01/05	Halogenated VOCs+TICs
TB-109(9.6')	Soil	02/01/05	Halogenated VOCs+TICs
TB-110(9.3')	Soil	02/01/05	Halogenated VOCs+TICs
TB-112(7.5')	Soil	02/01/05	Total Zinc
TB-113(6.5')	Soil	02/01/05	Total Zinc
TB-114(2.0')	Soil	02/02/05	Total Zinc
TB-114(6.5')	Soil	02/02/05	Total Zinc
TB-114(9.3')	Soil	02/02/05	Halogenated VOCs+TICs
TB-115(1.0')	Soil	02/02/05	Total Zinc
TB-115(7.0')	Soil	02/02/05	Total Zinc
TB-115(10.7')	Soil	02/02/05	Halogenated VOCs+TICs
TB-117(6.5')	Soil	02/02/05	Total Zinc
TB-117(9.9')	Soil	02/02/05	Halogenated VOCs+TICs
TB-119(3.5')	Soil	02/02/05	TPH
TB-119(10.5')	Soil	02/02/05	Halogenated VOCs+TICs
TB-120(12.0')	Soil	02/02/05	Halogenated VOCs+TICs
TB-121(6.5')	Soil	02/02/05	TPH
TB-122(11.0')	Soil	02/02/05	Halogenated VOCs+TICs, TPH
TB-200(4.0')	Soil	08/09/06	Halogenated VOCs, Total Zinc

LIST OF SOIL, GROUNDWATER, AND SOIL VAPOR/INDOOR AIR SAMPLES (1997-2014)

245-265 HOLLENBECK STREET, 271 HOLLENBECK STREET AND 50 BALFOUR DRIVE
ROCHESTER, NEW YORK
NYSDEC SITE #828188

Analytical Laboratory Testing Program
Soil Samples

Sample Designation	Matrix	Sample Date	Test Parameters
TB-200(8.0')	Soil	08/09/06	Halogenated VOCs, Total Zinc
TB-201(8.0')	Soil	08/09/06	Halogenated VOCs, Total Zinc
TB-202(10.5')	Soil	08/09/06	Halogenated VOCs, Total Zinc, Total Cyanide
TB-203(4.0')	Soil	08/09/06	Halogenated VOCs, Total Zinc, Total Cyanide
TB-203(8.0')	Soil	08/09/06	Halogenated VOCs, Total Zinc
TB-203(12.0')	Soil	08/09/06	Halogenated VOCs, Total Zinc, Total Cyanide
TB-204(12.0')	Soil	08/09/06	Halogenated VOCs, Total Zinc
TB-205(0-2')	Soil	08/10/06	Halogenated VOCs
TB-206(0-2')	Soil	08/10/06	Halogenated VOCs
TB-207(0-2')	Soil	08/10/06	Halogenated VOCs
TB-208(0-2')	Soil	08/10/06	Halogenated VOCs
TB-209(0-2')	Soil	08/10/06	Halogenated VOCs
TB-210(11.9')	Soil	08/10/06	TCL/STARS VOCs
TB-211(11.0')	Soil	08/10/06	Halogenated VOCs, Total Zinc, Total Cyanide
TB-212(11.5')	Soil	08/10/06	Halogenated VOCs, Total Zinc
TB-213(11.9')	Soil	08/10/06	Halogenated VOCs, Total Zinc
TB-214(11.0')	Soil	08/10/06	TCL/STARS VOCs
TB-215(8.0')	Soil	08/10/06	Halogenated VOCs
TB-215(11.9')	Soil	08/10/06	Halogenated VOCs
SS-1(0-2")	Soil	10/01/08	TCL/STARS VOCs
SS-4(2-4")	Soil	10/01/08	TCL/STARS VOCs
IB-100(2-4')	Soil	10/01/08	TCL/STARS VOCs
IB-100(5-7')	Soil	10/01/08	Halogenated VOCs
TB-402(11')	Soil	03/07/11	Halogenated VOCs
ROW-2 (10.7')	Soil	02/10/14	TCL VOCs + TICs
ROW-3 (8')	Soil	02/11/14	TCL VOCs + TICs
ROW-6 (10.7')	Soil	02/11/14	TCL VOCs + TICs
ROW-7 (10.7')	Soil	02/12/14	TCL VOCs + TICs

TCL VOCs = USEPA Target Compound List (TCL) Volatile Organic Compounds (VOCs) by USEPA Method 8260
PCBs = Polychlorinated biphenyls by United States Environmental Protection Agency (USEPA) Method 8082A
TCL SVOCs = USEPA Target Compound List (TCL) Semi-Volatile Organic Compounds (VOCs)
TICs = Tentatively Identified Compounds
TAL Metals = USEPA Target Analyate List (TAL) Metals
THP = Total Petroleum Hydrocarbons
STARS = NYSDEC Spill Technology and Remediation Series (STARS) List
*run as USEPA Method 8240

LIST OF SOIL, GROUNDWATER, AND SOIL VAPOR/INDOOR AIR SAMPLES (1997-2014)

245-265 HOLLENBECK STREET, 271 HOLLENBECK STREET AND 50 BALFOUR DRIVE
ROCHESTER, NEW YORK
NYSDEC SITE #828188

Analytical Laboratory Testing Program - Groundwater Samples

Sample Designation	Matrix	Sample Date	Test Parameters
MW-1	Groundwater	10/02/97	TCL VOCs*, Total Zinc
MW-2	Groundwater	10/02/97	TCL VOCs*, Total Zinc
MW-3	Groundwater	10/02/97	TCL VOCs*, Total Zinc
MW-4	Groundwater	10/02/97	TCL VOCs*, Total Zinc
MW-5	Groundwater	10/02/97	TCL VOCs*, Total Zinc
MW-6	Groundwater	10/02/97	TCL VOCs*, Total Zinc
MW-1	Groundwater	10/15/04	VOCs**, Total Zinc, Total Cyanide
MW-3	Groundwater	10/15/04	VOCs**, Total Zinc, Total Cyanide
MW-5	Groundwater	10/15/04	VOCs**, Total Zinc, Total Cyanide
MW-1	Groundwater	06/07/06	TCL/STARS VOCs, Total Zinc
MW-3	Groundwater	06/07/06	TCL/STARS VOCs, Total Zinc
MW-5	Groundwater	06/07/06	TCL/STARS VOCs, Total Zinc
MW-7	Groundwater	06/27/07	Halogenated VOCs
MW-8	Groundwater	06/27/07	Halogenated VOCs
MW-9	Groundwater	06/27/07	Halogenated VOCs
MW-10	Groundwater	06/27/07	Halogenated VOCs
MW-11	Groundwater	06/27/07	Halogenated VOCs
MW-12	Groundwater	06/27/07	Halogenated VOCs
MW-13	Groundwater	06/27/07	Halogenated VOCs
MW-1	Groundwater	06/28/07	Halogenated VOCs
MW-5	Groundwater	07/31/07	Halogenated VOCs
MW-7(14-15')	Groundwater	07/31/07	Halogenated VOCs
MW-7(25.5-26.5')	Groundwater	07/31/07	Halogenated VOCs
MW-1	Groundwater	05/01/08	Halogenated VOCs
MW-3	Groundwater	05/01/08	Halogenated VOCs
MW-5	Groundwater	05/01/08	Halogenated VOCs
MW-7	Groundwater	05/01/08	Halogenated VOCs
MW-8	Groundwater	05/01/08	Halogenated VOCs
MW-9	Groundwater	05/01/08	Halogenated VOCs
MW-10	Groundwater	05/01/08	Halogenated VOCs
MW-11	Groundwater	05/01/08	Halogenated VOCs
MW-12	Groundwater	05/01/08	Halogenated VOCs
MW-13	Groundwater	05/01/08	Halogenated VOCs
MW-1	Groundwater	08/21/08	Halogenated VOCs
MW-3	Groundwater	08/21/08	Halogenated VOCs
MW-4	Groundwater	08/21/08	Halogenated VOCs
MW-5	Groundwater	08/21/08	Halogenated VOCs
MW-7	Groundwater	08/21/08	Halogenated VOCs
MW-8	Groundwater	08/21/08	Halogenated VOCs,
MW-9	Groundwater	08/21/08	Halogenated VOCs
MW-10	Groundwater	08/21/08	Halogenated VOCs
MW-11	Groundwater	08/21/08	Halogenated VOCs
MW-12	Groundwater	08/21/08	Halogenated VOCs
MW-13	Groundwater	08/21/08	Halogenated VOCs

LIST OF SOIL, GROUNDWATER, AND SOIL VAPOR/INDOOR AIR SAMPLES (1997-2014)

245-265 HOLLENBECK STREET, 271 HOLLENBECK STREET AND 50 BALFOUR DRIVE
ROCHESTER, NEW YORK
NYSDEC SITE #828188

Analytical Laboratory Testing Program - Groundwater Samples

Sample Designation	Matrix	Sample Date	Test Parameters
MW-14	Groundwater	12/03/08	Halogenated VOCs
MW-5	Groundwater	01/23/09	Halogenated VOCs
MW-5	Groundwater	03/31/09	Halogenated VOCs
MW-6	Groundwater	03/31/09	Halogenated VOCs
MW-7	Groundwater	03/31/09	Halogenated VOCs
MW-8	Groundwater	03/31/09	Halogenated VOCs
MW-9	Groundwater	03/31/09	Halogenated VOCs
MW-10	Groundwater	03/31/09	Halogenated VOCs
MW-5	Groundwater	05/08/09	Halogenated VOCs
MW-5	Groundwater	07/20/09	Halogenated VOCs
MW-8	Groundwater	07/20/09	Halogenated VOCs
MW-5	Groundwater	09/14/09	Halogenated VOCs
MW-6	Groundwater	09/14/09	Halogenated VOCs
MW-7	Groundwater	09/14/09	Halogenated VOCs
MW-8	Groundwater	09/14/09	Halogenated VOCs
MW-9	Groundwater	09/14/09	Halogenated VOCs
MW-10	Groundwater	09/14/09	Halogenated VOCs
MW-5	Groundwater	12/21/09	TCL/STARS VOCs
MW-8	Groundwater	12/21/09	Halogenated VOCs
MW-5	Groundwater	03/24/10	Halogenated VOCs
MW-6	Groundwater	03/24/10	Halogenated VOCs
MW-7	Groundwater	03/24/10	Halogenated VOCs
MW-8	Groundwater	03/24/10	Halogenated VOCs
MW-9	Groundwater	03/24/10	Halogenated VOCs
MW-10	Groundwater	03/24/10	Halogenated VOCs
MW-1	Groundwater	04/14/10	Halogenated VOCs
MW-5	Groundwater	04/14/10	Halogenated VOCs
MW-12	Groundwater	04/14/10	Halogenated VOCs
MW-1	Groundwater	10/25/10	Halogenated VOCs
MW-3	Groundwater	10/25/10	Halogenated VOCs
MW-5	Groundwater	10/25/10	Halogenated VOCs
MW-6	Groundwater	10/25/10	Halogenated VOCs
MW-7	Groundwater	10/25/10	Halogenated VOCs
MW-8	Groundwater	10/25/10	Halogenated VOCs
MW-9	Groundwater	10/25/10	Halogenated VOCs
MW-10	Groundwater	10/25/10	Halogenated VOCs
MW-12	Groundwater	10/25/10	Halogenated VOCs
MW-13	Groundwater	10/25/10	Halogenated VOCs
MW-16	Groundwater	03/28/11	Halogenated VOCs
MW-17	Groundwater	03/28/11	Halogenated VOCs
MW-18	Groundwater	03/28/11	Halogenated VOCs
MW-1	Groundwater	09/22/11	Halogenated VOCs
MW-3	Groundwater	09/22/11	Halogenated VOCs
MW-5	Groundwater	09/22/11	Halogenated VOCs

LIST OF SOIL, GROUNDWATER, AND SOIL VAPOR/INDOOR AIR SAMPLES (1997-2014)

245-265 HOLLENBECK STREET, 271 HOLLENBECK STREET AND 50 BALFOUR DRIVE
ROCHESTER, NEW YORK
NYSDEC SITE #828188

Analytical Laboratory Testing Program - Groundwater Samples

Sample Designation	Matrix	Sample Date	Test Parameters
MW-6	Groundwater	09/22/11	Halogenated VOCs
MW-7	Groundwater	09/22/11	Halogenated VOCs
MW-8	Groundwater	09/22/11	Halogenated VOCs
MW-9	Groundwater	09/22/11	Halogenated VOCs
MW-10	Groundwater	09/22/11	Halogenated VOCs
MW-12	Groundwater	09/22/11	Halogenated VOCs
MW-13	Groundwater	09/22/11	Halogenated VOCs
MW-16	Groundwater	09/22/11	Halogenated VOCs
MW-17	Groundwater	09/22/11	Halogenated VOCs
MW-18	Groundwater	09/22/11	Halogenated VOCs
MW-1	Groundwater	11/29/12	Halogenated VOCs
MW-3	Groundwater	11/29/12	Halogenated VOCs
MW-5	Groundwater	11/29/12	Halogenated VOCs
MW-6	Groundwater	11/29/12	Halogenated VOCs
MW-7	Groundwater	11/29/12	Halogenated VOCs
MW-8	Groundwater	11/29/12	Halogenated VOCs
MW-9	Groundwater	11/29/12	Halogenated VOCs
MW-10	Groundwater	11/29/12	Halogenated VOCs
MW-12	Groundwater	11/29/12	Halogenated VOCs
MW-13	Groundwater	11/29/12	Halogenated VOCs
MW-16	Groundwater	11/29/12	Halogenated VOCs
MW-17	Groundwater	11/29/12	Halogenated VOCs
MW-18	Groundwater	11/29/12	Halogenated VOCs
MW-1	Groundwater	01/04/13	Halogenated VOCs
MW-6	Groundwater	01/04/13	Halogenated VOCs
MW-18	Groundwater	01/04/13	Halogenated VOCs
ROW-1	Groundwater	02/10/14	TCL VOCs + TICs
ROW-4	Groundwater	02/12/14	TCL VOCs + TICs
ROW-5	Groundwater	02/13/14	TCL VOCs + TICs
ROW-8	Groundwater	02/13/14	TCL VOCs + TICs
ROW-9	Groundwater	02/10/14	TCL VOCs + TICs
Duplicate	Groundwater	02/12/14	TCL VOCs + TICs
FB021114	Groundwater	02/11/14	TCL VOCs + TICs

Notes:
TCL VOCs = USEPA Target Compound List (TCL) Volatile Organic Compounds (VOCs) by USEPA Method 8260
STARS = NYSDEC Spill Technology and Remediation Series (STARS) List
TICs = Tentatively Identified Compounds
*run as USEPA Method 8240
**run as USEPA Method 8021

LIST OF SOIL, GROUNDWATER, AND SOIL VAPOR/INDOOR AIR SAMPLES (1997-2014)

245-265 HOLLENBECK STREET, 271 HOLLENBECK STREET AND 50 BALFOUR DRIVE
ROCHESTER, NEW YORK
NYSDEC SITE #828188

Analytical Laboratory Testing Program
Soil Vapor/Indoor Air

Sample Designation	Matrix	Sample Date	Test Parameters
ROW-1	Soil Vapor	02/14/14	TO-15 VOCs
ROW-2	Soil Vapor	02/14/14	TO-15 VOCs
ROW-3	Soil Vapor	02/14/14	TO-15 VOCs
ROW-4	Soil Vapor	02/14/14	TO-15 VOCs
ROW-5	Soil Vapor	02/14/14	TO-15 VOCs
ROW-6	Soil Vapor	02/14/14	TO-15 VOCs
ROW-7	Soil Vapor	02/14/14	TO-15 VOCs
ROW-8	Soil Vapor	02/14/14	TO-15 VOCs
ROW-9	Soil Vapor	02/14/14	TO-15 VOCs
Duplicate	Soil Vapor	02/14/14	TO-15 VOCs
BG-021414	Air	02/14/14	TO-15 VOCs
SS-1	Soil Vapor	03/26/14	TO-15 VOCs
SS-2	Soil Vapor	03/26/14	TO-15 VOCs
SS-3	Soil Vapor	03/26/14	TO-15 VOCs
SS-4	Soil Vapor	03/26/14	TO-15 VOCs
SS-5	Soil Vapor	03/26/14	TO-15 VOCs
SS-6	Soil Vapor	03/26/14	TO-15 VOCs
SS-7	Soil Vapor	03/26/14	TO-15 VOCs
SS-8	Soil Vapor	03/26/14	TO-15 VOCs
SS-9	Soil Vapor	03/26/14	TO-15 VOCs
SS-10	Soil Vapor	03/26/14	TO-15 VOCs
IA-1	Air	03/26/14	TO-15 VOCs
IA-2	Air	03/26/14	TO-15 VOCs
IA-3	Air	03/26/14	TO-15 VOCs
IA-4	Air	03/26/14	TO-15 VOCs
IA-5	Air	03/26/14	TO-15 VOCs
IA-6	Air	03/26/14	TO-15 VOCs
IA-7	Air	03/26/14	TO-15 VOCs
IA-8	Air	03/26/14	TO-15 VOCs
IA-9	Air	03/26/14	TO-15 VOCs
IA-10	Air	03/26/14	TO-15 VOCs
BG-1	Air	03/26/14	TO-15 VOCs
BG-2	Air	03/26/14	TO-15 VOCs

TO-15 VOCs = Volatile Organic Compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method TO-15

APPENDIX C

REMEDIAL INVESTIGATION WORK PLAN

OBI, LLC FACILITY

245-265 HOLLENBECK STREET,

271 HOLLENBECK STREET, AND

50 BALFOUR DRIVE

ROCHESTER, NY 14621

AUGUST 2015

Appendix C

Brownfields Site-Specific
Environmental Protection Agency Quality Assurance Project Plan
(QAPP)

245-265 & 271 Hollenbeck Street and 50 Balfour Drive
Rochester, New York

NYSDEC Site #828188

Brownfields QAPP Template #1
Title and Approval Page

Title: OBI, LLC Quality Assurance Project Plan (QAPP)
Project Name/Property Name: 245-265 & 271 Hollenbeck Street, and 50 Balfour Drive
Property/Site Location: Rochester, New York
Revision Number:
Revision Date:

Brownfields Cooperative Agreement Number: USEPA #___________________________________

OBI, LLC.
Brownfields Recipient

Day Environmental, Inc., 1563 Lyell Avenue, Rochester, New York, 14606 (585) 454-0210
dday@daymail.net
Preparer's Name and Organizational Affiliation
Preparer's Address, Telephone Number, and E-mail Address

12/08/2015
Preparation Date (Day/Month/Year)

Brownfields Recipient Program Manager: ______________________________
Signature

Mike McAlpin/OBI, LLC.
Printed Name/Organization/Date

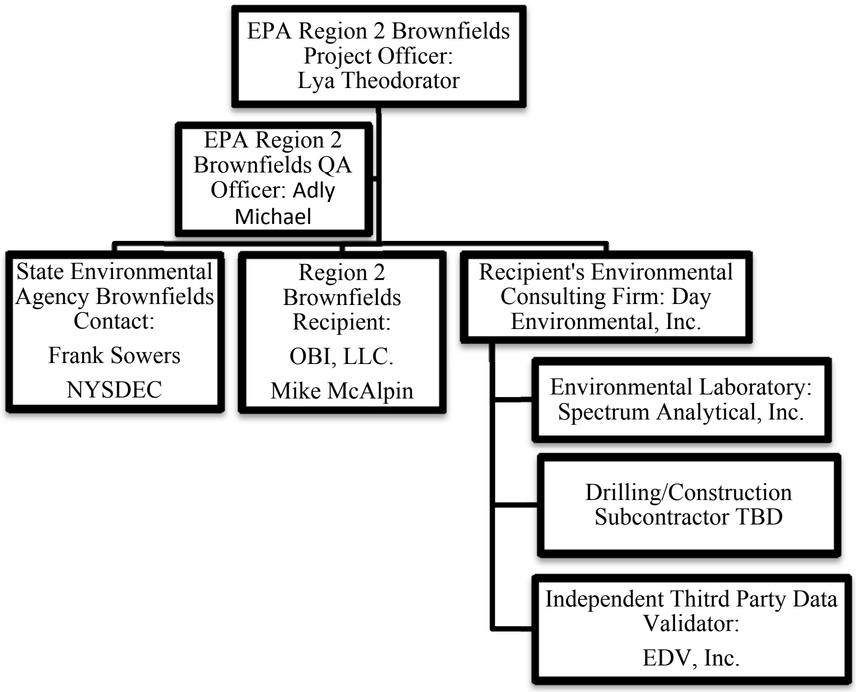
Environmental Consultant Quality Assurance Officer:
(QAO) ______________________________
Signature

Barton Kline/Day Environmental, Inc.
Printed Name/Organization/Date

EPA Region 2 Brownfields Project Officer: ______________________________
Signature

Lya Theodorato/USEPA
Printed Name/Organization/Date

Brownfields QAPP Template #2a
Project Organizational Chart



Brownfields QAPP Template #2b
Personnel Responsibilities

Name	Title	Telephone Number	Organizational Affiliation	Responsibilities
Raymond Kampff and David D. Day, P.E.*	Environmental Consultant Project Manager	585-454-0210	Day Environmental, Inc.	Overall responsibility for implementing the project and ensuring the objectives are met. Primary point of contact and control.
Nathan Simon	Environmental Consultant Project Engineer	585-454-0210	Day Environmental, Inc.	Responsible for implementation and/or deliverables for specific work tasks
Mike McAlpin	Brownfields Recipient Program Manager	585-287-9342	OBI, LLC	Review of project documents; assist in key decisions, etc.
Frank Sowers	State Brownfields Contact	585-226-5357	NYSDEC	Provide regulatory oversight of the project; review/approval of documents.
Lya Therodorator	EPA Brownfields Project Officer (BPO)	(212) 637-3260	EPA Region 2	Oversee and monitoring the grant.
Adly Michael	EPA Brownfields Quality Assurance Officer (QAO)	(732) 906-6161	EPA Region 2	Provide QA/QC technical assistance to the Project Manager and provide internal review/approval of the QAPP.
Agnes Huntley	Environmental Laboratory Contact	(401) 732-3400	Spectrum Analytical, Inc.	Work in conjunction with the lab QA unit regarding QA elements of specific analytical tasks.
Dr. Maxine Wright-Walters*	Third Party Data Validator	(412) 341-5281	Environmental Data Validation, Inc. (EDV)	Completion of a data usability summary report for data generated as part of the project.

*Consultant and sub-consultant resumes included in Attachment C-3.

Brownfields QAPP Template #3a
Problem Definition/Project Description

PROBLEM DEFINITION

Samples will be collected for laboratory analysis to determine concentration of contaminants as part of a remedial investigation (RI) being conducted at the Site. The goal of the RI is to delineate the areal and vertical extent of contamination at the Site within the surface soils, subsurface soils and groundwater at the Site sufficient to evaluate remedial alternatives, and ultimately recommend and select a remedial alternative that is protective of public health and the environment. Remedial investigation soil samples will be collected at various locations and depths and compared to applicable New York State Department of Environmental Conservation (NYSDEC) Part 375 Soil Cleanup Objectives (SCOs) for the Site to assess soil contamination requiring remediation. Remedial investigation groundwater samples will be collected at various locations and depths and compared to applicable NYSDEC Technical and Operational Guidance Series 1.1.1 (TOGs 1.1.1) for the Site to assess groundwater contamination requiring remediation.

Sampling is also needed to determine appropriate on-site re-use or off-site disposal options for excavated material.

PROJECT DESCRIPTION

The Site is currently owned by OBI, LLC. The focus of this RI project is to delineate the extent of contamination within the Site's surface soil, unsaturated overburden soil, saturated zone overburden soils, overburden groundwater and bedrock groundwater. It is anticipated that Day Environmental, Inc. (DAY) will collect 5 surface soil samples 2 inches below the vegetative cover, 15 surface soil samples from 0-1 ft below the vegetative cover, 32 subsurface soil samples and 27 groundwater samples, and submit the collected samples for analytical laboratory testing of select parameters. Soil sample locations will be selected based on the requirements in NYSDEC *Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation*, dated May 2010. A site plan showing proposed sample locations is provided as Figure 9 in the Remedial Investigation/Feasibility Study (RI/FS) Work Plan.

Samples will also be collected from excavated soil (e.g., drill cuttings) staged on-site within New York State Department of Transportation (NYSDOT)-approved 55-gallon drums to determine disposal and/or reuse options. Waste characterization sampling frequency and analyses will be determined based on the requirements set forth in NYSDEC DER0-10 guidance and the selected disposal facility.

The soil and groundwater samples will be analyzed by Spectrum Analytical, Inc. of Agawam, Massachusetts. National Environmental Laboratory Accreditation Program (NELAP) #RI001; and New York State Environmental Laboratory Approval Program (ELAP) Certification #11522.

In accordance with the Quality Assurance Project Plan (QAPP), Quality Assurance/Quality Control (QA/QC) samples including field duplicates, matrix spike/matrix spike duplicate (MS/MSD) samples, and equipment rinsate blanks will be collected for soil and groundwater samples collected as part of the RI/FS Work Plan. QA/QC samples are not deemed necessary for waste characterization sampling. Samples will be collected in accordance with established standard operating procedures (SOPs) (see Template #6 for SOP information).

Site Location and Description

The Site consists of three parcels (245-265 Hollenbeck Street, 271 Hollenbeck Street and 50 Balfour Drive) totaling approximately 6.95 acres, and is located in an urban area in Rochester, Monroe County, New York. The Site is currently developed with an approximate 134,000 square foot, combined one-story and two-story concrete block building currently used for electroplating and metal stamping, with two attached one-story metal buildings that house a sheet metal fabrication, stamping and assembly business (50 Balfour Drive). A second, approximate 8,000 square foot, one-story, brick building is also located on the Site, and this building is currently used as a warehouse and equipment storage facility (245-265 Hollenbeck Street). The 271 Hollenbeck Street parcel is currently vacant land covered with a gravel access roadway and vegetation. The remaining portions of the Site are currently vacant land covered with asphalt-paved parking areas, a gravel roadway and/or vegetation (grass and trees).

Site History

The Site was primarily vacant land prior to development in 1923. Addison Lithographing Company originally developed the 50 Balfour Drive portion of the Site in 1923 with the construction of the original approximate 31,750 square foot structure that is part of the current 134,000 square foot building. Addison Lithographing Company operated a printing and lithographing facility at the current 50 Balfour Drive property between 1923 and 1950. Toledo Scale Company (House and Kitchen Division) owned and performed operations at the current 50 Balfour Drive portion of the Site between 1950 and 1969, and manufactured kitchen machines and retail/industrial scales. From 1970 to the present, operations conducted at 50 Balfour Drive have generally included plastic injection molding, tool and die operations, sheet metal stamping, fabrication, assembly, and electro plating. OBI, LLC has owned the Site since 1997.

Two 3,000-gallon fuel oil USTs were installed at the 50 Balfour Drive in 1974 during a natural gas shortage. The USTs were filled with fuel oil but were never actively used at the facility. The USTs were located immediately west of the boiler room (i.e., in the courtyard area located north of the Main Building). These USTs were removed sometime between 1980 and 1985. Prior to removal, the fuel oil was pumped out, and sold and reused by an adjacent business.

German Tool and Die, Inc. constructed the 8,000 square foot building on the 245-265 Hollenbeck Street property in 1973, and operated at this facility between 1973 and 1995 when the business was sold to German Machine, Inc., which operated at this location through 1999. German Tool and Die, Inc. and German Machine, Inc. both machined parts, but reportedly did not conduct parts cleaning at this location. In 2000, OBI LLC purchased the building at 245-265 Hollenbeck Street and currently uses it as a warehouse facility for dry storage.

The 271 Hollenbeck Street parcel was originally developed with a residence. By 1926, an approximate 6,500 sq. ft. building and a railroad spur line, running generally from east to west located on the southern side of the building, were constructed on this portion of the Site. The railroad spur line was removed from the Site before 1988. Between 1932 and 1991, the 271 Hollenbeck Street parcel was used for “crate storage and a garage”, a building supply company, a welding company, a heating and cooling contractor company, construction companies, office space, a brush manufacturer with printing and silk screening operations, and a printer. According to City of Rochester records, the building on the 271 Hollenbeck Street parcel was destroyed by fire and demolished sometime before June 15, 1998. OBI, LLC purchased the property on November 18, 1998. Currently the 271 Hollenbeck Street portion of the Site is vacant land covered with a gravel access roadway and vegetation.

Information collected during the advancement of soil borings across the Site identified a layer of fill material extending from the ground surface to depths up to 4 feet below ground surface. In addition to naturally occurring silt, sand, and gravel, the fill layer was characterized to contain materials such as ash, coal, slag, wood, and cinders. These types of materials often contain constituents such as metals and PAHs.

Based on historic documentation regarding use of the Site and the findings of soil and groundwater studies performed at the Site, volatile organic compounds (VOCs) associated with some of the historical manufacturing operations conducted at the Site have been identified as the primary contaminants of concern in soil and groundwater. Specifically, TCE and its associated breakdown compounds (cis-1,2-dichlororethene and vinyl chloride) have been detected above NYSDEC TOGs 1.1.1 guidance values in on-site overburden monitoring wells and the bedrock monitoring well. Historically, groundwater flow has generally been observed to flow east. [Note: current operations at the Site do not use TCE.] In addition, several soil boring samples contained Total Petroleum Hydrocarbons (TPH), an indication that fuel oil might have been released at the Site in the past. The presence and extent of these constituents in the Site’s environmental media is the main focus of the RI/FS work, and information collected during the RI will be used to evaluate the presence and potential migration pathways of these Site-related constituents.

A comprehensive site history and summary of previous subsurface investigations are provided in the RI/FS Work Plan.

PROJECT DECISION STATEMENTS

Future use of the Site is anticipated to consist of industrial uses.

1. If the concentration of VOCs, semi-volatile organic compounds (SVOCs), metals, poly-chlorinated biphenyls (PCBs) and/or pesticides in soil samples are above their respective Unrestricted Use SCOs, then remedial actions may be required.
2. If the concentrations of VOCs, SVOCs, metals, PCBs or pesticides in the tested groundwater samples are above their respective TOGs 1.1.1 Groundwater Standard and/or Guidance value, then remedial actions may be required.
3. If the waste characterization soil samples fail the Toxicity characteristic leaching procedure (TCLP) analysis, then the soil will be considered characteristic hazardous waste.
4. If waste characterization soil samples pass TCLP analysis and other testing, then the soil will be considered non-hazardous waste and acceptable for off-site disposal at a permitted landfill. Wastes may also be evaluated to determine if they are a Listed Hazardous Waste. Soils that are a Listed Hazardous Waste will be managed as hazardous waste unless NYSDEC issues a contained-in determination allowing them to be managed as a non-hazardous solid waste.
5. If well development and purge waters are below the sewer use permit limits established by Monroe County Pure Waters (MCPW), then the water can be discharged directly to the MCPW sewer system.
6. If well development and purge waters are above the sewer use permit limits established by MCPW, then the water will be treated/filtered and re-tested prior to discharge to the municipal sewer system; or sent off-site for treatment and disposal at a permitted facility.

Brownfields QAPP Template #3b

Project Quality Objectives/Systematic Planning Process Statements

Overall project objectives include:

- Obtain data representative of Site related constituent concentrations in soil.
- Obtain data representative of Site related constituent concentrations in groundwater.
- Obtain data to evaluate possible remedial alternatives for the Site.
- Obtain purge and development water data to determine disposal options.
- Obtain data representative of staged soil to determine disposal options.

Who will use the data?

Data will be used by OBI, LLC, the NYSDEC and Day Environmental, Inc. (DAY) to determine if additional investigation actions are warranted, and also evaluate appropriate remedial alternatives that could be implemented to meet applicable NYSDEC Standards, Criteria and Guidance (SCG) values. Waste characterization data will be utilized by DAY and the disposal facility(s) to determine appropriate waste disposal methods.

What will the data be used for?

The data will be used to define the current site model, select an appropriate remedy for the Site and determine soil and groundwater disposal options. Soil data will be compared to applicable NYSDEC Part 375 SCOs. The groundwater samples will be compared to TOGs 1.1.1 Standards and Guidance values.

The Code of Federal Regulations (CFR) Part 261 Resource Conservation and Recovery Act (RCRA) toxicity characteristic criteria for determining if a solid waste is hazardous requires collection of a “representative portion” of the waste and performance of Toxicity Characteristic Leaching Procedure (TCLP). TCLP data collected from drummed soil cuttings will be used to determine if the staged materials are hazardous waste and additional waste characterization may be completed to determine if the staged materials are a listed hazardous waste.

What types of data are needed?

- Soil concentrations of VOCs, SVOCs, Metals, PCBs and pesticides.
- Groundwater concentrations of VOCs, SVOCs, Metals, PCBs and pesticides.
- Off-site laboratory techniques and field screening via photoionization detector (PID) and a Horiba U-22XD water quality meter.
- Monitoring well purge and development water.
- Drummed soil concentrations of TCLP VOCs and other disposal facility requested analytical laboratory parameters.

How “good” do the data need to be in order to support the environmental decision?

Soil and groundwater samples can be considered “final delineation” samples; therefore, NYSDEC Analytical Services Protocol (ASP) Category B data deliverables are required. QA/QC samples (duplicates, MS/MSD, blanks) will be necessary. Waste characterization samples do not require NYSDEC ASP Category B deliverables or QA/QC samples. As such, NYSDEC Category A deliverables are anticipated for waste characterization samples.

The quantitative analytical data quality objectives (DQOs) will be determined by the method detection limits (MDLs) and reporting limits (RLs) to be specified by the analytical laboratory. MDLs and RLs are highly dependent upon the sample matrix and concentrations of target constituents present. The MDL is a statistically derived value, representing the theoretical minimum level at which a particular analyte can be detected. MDL studies are performed annually by the laboratory. The RL [also referred to as the Contract Required Quantitation

Limits (CRQL) for the Contract Laboratory Program (CLP)] is a detection limit that the laboratory is confident can be accurately achieved consistently over time.

How much data are needed?

It is planned that 32 subsurface soil samples will be collected for analysis of target compound list (TCL) VOCs + tentatively identified compounds (TICS) by EPA Method 8260, TCL SVOCs + TICs by EPA Method 8270, target analyte list (TAL) metals by SW-846 Method 6010/747, cyanide by SW-846 Method 9012, PCBs by SW-846 Method 8082 and pesticides by SW-846 Method 8081. It is planned that five surface soil samples (0-2 inches below vegetative cover) will be collected for analysis of TCL VOCs + TICs by EPA Method 8260, TCL SVOCs + TICs by EPA Method 8270, TAL metals by SW-846 Method 6010/7470. Four of the five surface soil samples (0-2 inches below vegetative cover) will also be analyzed for PCBs by SW-846 Method 8082, cyanide by SW-846 Method 9012, and pesticides by SW-846 Method 8081. It is planned that fifteen surface soil samples (0-1 foot below vegetative cover) will be collected for analysis of total petroleum hydrocarbons (TPH). A minimum of 25% of the fifteen surface soil samples (0-1 foot below vegetative cover) will also be analyzed for TCL VOCs + TICs by EPA Method 8260, TCL SVOCs + TICs by EPA Method 8270, TAL metals by SW-846 Method 6010/7470, PCBs by SW-846 Method 8082, cyanide by SW-846 Method 9012, and pesticides by SW-846 Method 808. It is planned that 27 groundwater samples will be collected for analysis of TCL VOCs + TICs by EPA Method 8260, TCL SVOCs + TICs by EPA Method 8270, TAL metals by SW-846 Method 6010/7470, PCBs by SW-846 Method 8082, cyanide by SW-846 Method 9012, and pesticides by SW-846 Method 8081. Proposed sample locations are presented on Figure 9 of the RI/FS Work Plan.

The number of waste characterization soil samples and specific analysis are based on the requirements of the disposal facility.

Where, when, and how should the data be collected/generated?

Proposed soil sample and groundwater locations are presented on Figure 9. These samples will be collected immediately after test boring advancement and submitted to the analytical laboratory as soon as possible after collection. Standard turn-around-time (15 days) is anticipated for soil and groundwater samples. Soil samples submitted to the analytical laboratory for VOC analysis will be collected using EPA Method 5035A.

Waste characterization samples will be collected after test boring program in the RI/FS Work Plan is complete and the monitoring wells have been developed, purged and sampled. Grab soil samples will be collected from staged material for analysis of one or more of the following parameters: TCL VOCs (EPA Method 8260), TCLP VOCs, TCLP metals and/or SVOCs.

Who will collect and generate the data?

DAY will collect the soil, groundwater and waste characterization samples. Spectrum Analytical Inc. will generate the laboratory data.

How will the data be reported?

Data will be reported in accordance with the NYSDEC ASP Category B or Category A deliverable data packages. Electronic data will be provided in the NYSDEC EQuiS Electronic Data Deliverable (EDD) format and portable document format (PDF).

How will the data be archived?

Data will be archived in electronic version by DAY. EDDs will be loaded into the EQuiS database for the Site. Lab deliverables will be maintained on disc and in the project file.

Laboratory projects completed in the current year are maintained by Spectrum Analytical Inc. in the Report Production filing area. Other analytical data, reports and logbooks are stored on the laboratory file server. The electronically scanned data are archived of the file server. Levels of authorization limit access to the Document Storage Areas and the Laboratory Information Management System (LIMIS) server.

Brownfields QAPP Template #4

Project Schedule/Timeline

Activities	Organization	Dates (MM/DD/YY) Anticipated Date(s) of Initiation	Dates (MM/DD/YY) Anticipated Date of Completion	Deliverable	Deliverable Due Date
Preparation of QAPP	Day Environmental, Inc.	2/23/15	8/14/15	QAPP	
Review of QAPP	Lya Theodorator and Adly Michael, EPA Region 2	8/14/15	10/14/15	Approved QAPP by EPA Region BPO	
Preparation of Health and Safety Plan	Day Environmental, Inc. and OBI, LLC.	12/2/13	8/2015	HASP	Revised August 2015
Procurement of Equipment	Day Environmental, Inc.	9/21/15	3/21/16	N/A	
Laboratory Request	Day Environmental, Inc.	10/19/15	4/18/16	N.A	
Field Reconnaissance/ Access	Day Environmental, Inc.	9/21/15	3/21/16	N/A	N/A
Collection of Field Samples	Day Environmental, Inc.	11/2/15	4/18/16	N/A	N/A
Laboratory Package Received	Day Environmental, Inc.	2/22/16	4/18/16	Unvalidated data packages	
Validation of Laboratory Results	EDV, Inc.	3/28/16	5/23/16	Validated data packages	
Data Evaluation/ Preparation of Final Report	Day Environmental, Inc.	4/18/16	8/19/16	Draft Remedial Investigation /Feasibility Study Report	

Brownfields QAPP Template #5a
Sampling Methods and Locations

Matrix	Sampling Location(s)	Depth (*units*)	Analytical Group	No. of Samples (*identify field duplicates*)	Sampling SOP Reference	Rationale for Sampling Location
Surface Soil	SSE-1 through SSE-5	0-2 inches below vegetative cover	VOCs, SVOCs, Metals, cyanide, PCBs and Pesticides[1].	5 (field QA/QC for these samples will be part of the historic fill material QA/QC, see below)	NYSDEC DER-10 Section 3.5.1(b) and DAY field sampling SOP.	Delineate surface soil characterization in relation to possible human health exposure
Surface Soil	SS-1 through SS-10, MW-1R, TP-A, MW-19, TB-P, TB-H	0-12 inches[2]	*Fill Material:* *<u>All Samples</u>* TPH Full TCL/TAL[3] *Fill Material: field screening greater than 5X <u>background</u>* [4] VOCs *Rubble, ash, cinders or dredge spoils identified <u>within sample</u>* [4] SVOCs TAL Metals and Cyanide	15 + 1 field duplicate + 1 MS/MSD + 1 rinsate blank	NYSDEC DER-10 Section 3.5.1(b) and DAY field sampling SOP.	Delineate nature and extent of historic fill material.
Subsurface Soil	TB-A through TB-EE, TP-A	2-10 ft.	VOCs, SVOCs, Metals, cyanide, PCBs and Pesticides.	32 + 2 field duplicate + 2 MS/MSD + 2 rinsate blank	NYSDEC DER-10 Section 3.5.1 (c) and DAY field sampling SOP.	Investigate known and potential AOCs, fill in data gaps
Overburden Groundwater	MW-1, MW-3, MW-5, MW-6, MW-8, MW-9, MW-10, MW-12, MW-13, MW-16, MW-17, MW-18, MW-19, MW-B, MW-D, MW-G, MW-H, MW-M, MW-P, MW-Q	5-10 ft.	VOCs, SVOCs, Metals, cyanide, PCBs and Pesticides.	20 + 1 field duplicate + 1 MS/MSD + 1 rinsate blank	NYSDEC DER-10 Section 3.7 and DAY field sampling SOP.	Fill in overburden groundwater monitoring well network data gap, investigate known and potential AOCs, delineate potential vertical migration of contamination.
Bedrock Groundwater	MW-1R, MW-3R, MW-7R, MW-10R, MW-12R, MW-13R, MW-19R	10-30 ft.	VOCs, SVOCs, Metals, cyanide, PCBs and Pesticides.	7 + 1 field duplicate + 1 MS/MSD + 1 rinsate blank	NYSDEC DER-10 Section 3.7 and DAY field sampling SOP.	Delineate bedrock groundwater nature and extent and fill-in existing data gaps.
Water	Investigative Derived Waste	NA	Sewer Use Permit Requirements (VOCs, SVOCs, Metals)	TBD	NA	Waste Characterization; based on sewer use permit requirements

Matrix	Sampling Location(s)	Depth (*units*)	Analytical Group	No. of Samples (*identify field duplicates*)	Sampling SOP Reference	Rationale for Sampling Location
Soil	Investigative Derived Waste	NA	Disposal facility requirements	TBD	NA	Waste Characterization; based on disposal facility requirements

1. Four of five samples will be analyzed for PCBs/pesticides.
2. If historic fill material is identified at depths greater than 1 ft below vegetative cover, additional samples may be collected and the boring will be extended in depth to establish the vertical limit of the historic fill material.
3. 25% of samples only, biased towards highest TPH concentrations.
4. Additional laboratory analysis required, which could result in more than 25% of the soil samples being analyzed for VOCs, SVOCs, or TAL Metals and Cyanide.

Brownfields QAPP Template #5b
Analytical Methods and Requirements

Spectrum Analytical Inc., of North Kingstown, Rhode Island will provide analytical services for the project. On-site screening for VOCs via a photoionization detector will be performed by Day Environmental, Inc. personnel. Analytical methods, sample volumes, containers, and holding times for the project are shown in the following table.

Matrix	**Analytical Group**	**Concentration Level**	**Analytical & Preparation Method/ SOP Reference**	**Sample Volume**	**Containers (*number, size, type*)**	**Preservation Requirements (*chemical, temperature, light protected)***	**Maximum Holding Time (*preparation/ analysis)***
Groundwater	VOCs	Low	SW-846 Method 8260	80 ml	(2) 40 ml VOA vials w/Teflon lined septum	1:1 HCl to pH<2; cool to 4°C	14 days
Groundwater	SVOCs	Low	SW-846 Method 8270	2000 ml	(2) 1000 ml glass bottles with w/Teflon lined cap	cool to 4°C	7 days to extraction, 40 days to analysis
Groundwater	Pesticides	Low	SW-846 Method 8081	2000 ml	(2) 1000 ml glass bottles with w/Teflon lined cap	cool to 4°C	7 days to extraction, 40 days to analysis
Groundwater	PCBs	Low	SW-846 Method 8082	2000 ml	(2) 1000 ml glass bottles with w/Teflon lined cap	cool to 4°C	7 days to extraction, 40 days to analysis
Groundwater	Herbicides	Low	SW-846 Method 8151	2000 ml	(2) 1000 ml glass bottles with w/Teflon lined cap	cool to 4°C	7 days to extraction, 40 days to analysis
Groundwater	Metals & mercury	Low	SW-846 Method 6010/7470	250 ml	250 mL plastic bottle	HNO3 to pH <2; cool to 4°C	180 days (28 days for mercury)
Groundwater	Cyanide	Low	SW-846 Method 9012	250 mL	250 mL plastic bottle	NaOH to pH >12; cool to 4°C	14 days

Matrix	**Analytical Group**	**Concentration Level**	**Analytical & Preparation Method/ SOP Reference**	**Sample Volume**	**Containers (*number, size, type*)**	**Preservation Requirements (*chemical, temperature, light protected)***	**Maximum Holding Time (*preparation/ analysis)***
Soil	VOCs	Low	SW-846 Method 8260	10 g	(2) preweighed 40 ml VOA vials w/Teflon lined septum, stir bar and 5mL DI water*	cool to 4°C, frozen within 48hours of collection	48 hours until frozen, total of 14 days
Soil	VOCs	Medium	SW-846 Method 8260	5 g	(1) preweighed 40 ml VOA vials w/Teflon lined septum, and 5mL Methanol*	cool to 4°C	14 days
Soil	SVOCs	Low	SW-846 Method 8270	30 g	8 oz glass jar w/Teflon lined cap	cool to 4°C	14 days until extraction, 40 days until analysis
Soil	Pesticides	Low	SW-846 Method 8081	30 g	8 oz glass jar w/Teflon lined cap	cool to 4°C	14 days until extraction, 40 days until analysis
Soil	PCBs	Low	SW-846 Method 8082	30 g	8 oz glass jar w/Teflon lined cap	cool to 4°C	14 days until extraction, 40 days until analysis
Soil	Herbicides	Low	SW-846 Method 8151	30 g	8 oz glass jar w/Teflon lined cap	cool to 4°C	14 days until extraction, 40 days until analysis
Soil	Metals & mercury	Low	SW-846 Method 6010/7471	5 g	4 oz glass jar w/Teflon lined cap	cool to 4°C	180 days (28 days for mercury)
Soil	Cyanide	Low	SW-846 Method 9012	5 g	4 oz glass jar w/Teflon lined cap	cool to 4°C	14 days

*Soil samples submitted to the analytical laboratory for VOC analysis will be collected using EPA Method 5035A.

Brownfields QAPP Template #5c
Reference Limits and Evaluation Table

The target analytes, applicable state regulatory criteria (project-required action limits), and the published achievable detection limits and reporting limits for each analyte are shown below.

Matrix *Aqueous*
Analytical Group *VOCs*
Concentration Level *Low*

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, ug/L	Achievable Laboratory Reporting Limit, ug/L
1,1,1-Trichloroethane	71-55-6	New York State Department of Environmental Conservation Technical and Operation Guidance Series 1.1.1 Groundwater Standards and Guidance Values	0.5	5
1,1,2,2-Tetrachloroethane	79-34-5		0.42	5
1,1,2-Trichloroethane	79-00-5		0.38	5
1,1-Dichloroethane	75-34-3		0.25	5
1,1-Dichloroethene	75-35-4		0.39	5
1,2,3-Trichlorobenzene	87-61-6		0.33	5
1,2,4-Trichlorobenzene	120-82-1		0.26	5
1,2-Dibromo-3-chloropropane	96-12-8		0.75	5
1,2-Dibromoethane	106-93-4		0.5	5
1,2-Dichlorobenzene	95-50-1		0.33	5
1,2-Dichloroethane	107-06-2		0.41	5
1,2-Dichloropropane	78-87-5		0.61	5
1,3-Dichlorobenzene	541-73-1		0.29	5
1,4-Dichlorobenzene	106-46-7		0.4	5
2-Butanone	78-93-3		2.1	5
2-Hexanone	591-78-6		1.7	5
4-Methyl-2-pentanone	108-10-1		0.82	5
Acetone	67-64-1		2.2	5
Benzene	71-43-2		0.33	5
Bromochloromethane	74-97-5		0.43	5
Bromodichloromethane	75-27-4		0.26	5
Bromoform	75-25-2		0.77	5
Bromomethane	74-83-9		0.8	5
Carbon disulfide	75-15-0		0.34	5
Carbon tetrachloride	56-23-5		0.54	5

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, ug/L	Achievable Laboratory Reporting Limit, ug/L
Chlorobenzene	108-90-7	New York State Department of Environmental Conservation Technical and Operation Guidance Series 1.1.1 Groundwater Standards and Guidance Values	0.26	5
Chloroethane	75-00-3		0.48	5
Chloroform	67-66-3		0.33	5
Chloromethane	74-87-3		0.26	5
cis-1,2-Dichloroethene	156-59-2		0.48	5
cis-1,3-Dichloropropene	10061-01-5		0.45	5
Dibromochloromethane	124-48-1		0.57	5
Dichlorodifluoromethane	75-71-8		0.66	5
Ethylbenzene	100-41-4		0.35	5
Isopropylbenzene	98-82-8		0.38	5
m,p-Xylene	179601-23-1		0.77	5
Methyl tert-butyl ether	1634-04-4		0.24	5
Methylene chloride	75-09-2		0.41	5
o-Xylene	95-47-6		0.36	5
Styrene	100-42-5		0.5	5
Tetrachloroethene	127-18-4		0.65	5
Toluene	108-88-3		0.32	5
trans-1,2-Dichloroethene	156-60-5		0.65	5
trans-1,3-Dichloropropene	10061-02-6		0.48	5
Trichloroethene	79-01-6		0.36	5
Trichlorofluoromethane	75-69-4		0.54	5
Vinyl chloride	75-01-4		0.5	5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		0.82	5
1,4-Dioxane	123-91-1		34	100
Cyclohexane	110-82-7		0.71	5
Methyl acetate	79-20-9		0.29	5
Methylcyclohexane	108-87-2		0.76	5

Matrix *Aqueous*				
Analytical Group *SVOCs*				
Concentration Level *Low*				
Analyte	**CAS Number**	**Name of State/Territory/Tribal: Regulatory Standards/Criteria**	**Achievable Laboratory Method Detection Limit, ug/L**	**Achievable Laboratory Reporting Limit, ug/L**
2,2´-oxybis(1-Chloropropane)	108-60-1	New York State Department of Environmental Conservation Technical and Operation Guidance Series 1.1.1 Groundwater Standards and Guidance Values	0.78	10
2,4-Dichlorophenol	120-83-2		0.57	10
2,4-Dimethylphenol	105-67-9		1.8	10
2,4-Dinitrophenol	51-28-5		3.5	20
2,4-Dinitrotoluene	121-14-2		0.41	10
2,6-Dinitrotoluene	606-20-2		0.52	10
2-Chloronaphthalene	91-58-7		0.81	10
2-Chlorophenol	95-57-8		0.61	10
2-Methylnaphthalene	91-57-6		0.94	10
2-Methylphenol	95-48-7		0.96	10
2-Nitroaniline	88-74-4		0.71	20
2-Nitrophenol	88-75-5		0.6	10
3,3´-Dichlorobenzidine	91-94-1		1.7	10
3-Nitroaniline	99-09-2		0.97	20
4,6-Dinitro-2-methylphenol	534-52-1		0.79	20
4-Bromophenyl-phenylether	101-55-3		0.54	10
4-Chloro-3-methylphenol	59-50-7		0.6	10
4-Chloroaniline	106-47-8		2	10
4-Chlorophenyl-phenylether	7005-72-3		0.41	10
4-Methylphenol	106-44-5		1.4	10
4-Nitroaniline	100-01-6		0.96	20
4-Nitrophenol	100-02-7		0.53	20
Acenaphthene	83-32-9		0.65	10
Acenaphthylene	208-96-8		0.42	10
Anthracene	120-12-7		0.48	10
Benzo(a)anthracene	56-55-3		0.4	10
Benzo(a)pyrene	50-32-8		1.2	10
Benzo(b)fluoranthene	205-99-2		0.94	10
Benzo(g,h,i)perylene	191-24-2		0.39	10
Benzo(k)fluoranthene	207-08-9		1.2	10
Bis(2-chloroethoxy)methane	111-91-1		1.1	10

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, ug/L	Achievable Laboratory Reporting Limit, ug/L
Bis(2-chloroethyl)ether	111-44-4	New York State Department of Environmental Conservation Technical and Operation Guidance Series 1.1.1 Groundwater Standards and Guidance Values	0.75	10
Bis(2-ethylhexyl)phthalate	117-81-7		1.3	10
Butylbenzylphthalate	85-68-7		0.32	10
Carbazole	86-74-8		0.64	10
Chrysene	218-01-9		0.42	10
Di-n-butylphthalate	84-74-2		0.48	10
Di-n-octylphthalate	117-84-0		0.47	10
Dibenzo(a,h)anthracene	53-70-3		0.44	10
Dibenzofuran	132-64-9		0.52	10
Diethylphthalate	84-66-2		0.45	10
Dimethylphthalate	131-11-3		0.37	10
Fluoranthene	206-44-0		0.33	10
Fluorene	86-73-7		0.44	10
Hexachlorobenzene	118-74-1		0.44	10
Hexachlorobutadiene	87-68-3		0.75	10
Hexachlorocyclopentadiene	77-47-4		1	10
Hexachloroethane	67-72-1		0.55	10
Indeno(1,2,3-cd)pyrene	193-39-5		0.38	10
Isophorone	78-59-1		0.47	10
N-Nitroso-di-n-propylamine	621-64-7		0.63	10
N-Nitrosodiphenylamine	86-30-6		1.1	10
Naphthalene	91-20-3		0.96	10
Nitrobenzene	98-95-3		1.6	10
Pentachlorophenol	87-86-5		1.7	20
Phenanthrene	85-01-8		0.45	10
Phenol	108-95-2		0.75	10
Pyrene	129-00-0		0.44	10
1,1´-Biphenyl	92-52-4		0.65	10
2,4,5-Trichlorophenol	95-95-4		0.26	20
2,4,6-Trichlorophenol	88-06-2		0.53	10
1,2,4,5-Tetrachlorobenzene	95-94-3		0.92	10
2,3,4,6-Tetrachlorophenol	58-90-2		0.65	25
Acetophenone	98-86-2		0.51	10
Atrazine	1912-24-9		1.3	10
Benzaldehyde	100-52-7		0.51	10
Caprolactam	105-60-2		1.1	10

Matrix *Aqueous*
Analytical Group *Pesticides*
Concentration Level *Low*

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, ug/L	Achievable Laboratory Reporting Limit, ug/L
4,4′-DDD	72-54-8	New York State Department of Environmental Conservation Technical and Operation Guidance Series 1.1.1 Groundwater Standards and Guidance Values	0.0064	0.1
4,4′-DDE	72-55-9		0.0056	0.1
4,4′-DDT	50-29-3		0.007	0.1
Aldrin	309-00-2		0.0043	0.05
alpha-BHC	319-84-6		0.0018	0.05
alpha-Chlordane	5103-71-9		0.0024	0.05
beta-BHC	319-85-7		0.002	0.05
delta-BHC	319-86-8		0.0027	0.05
Dieldrin	60-57-1		0.0056	0.1
Endosulfan I	959-98-8		0.0029	0.05
Endosulfan II	33213-65-9		0.0031	0.1
Endosulfan sulfate	1031-07-8		0.0045	0.1
Endrin	72-20-8		0.0035	0.1
Endrin aldehyde	7421-93-4		0.015	0.1
Endrin ketone	53494-70-5		0.0046	0.1
gamma-BHC (Lindane)	58-89-9		0.0019	0.05
gamma-Chlordane	5103-74-2		0.0026	0.05
Heptachlor	76-44-8		0.0039	0.05
Heptachlor epoxide	1024-57-3		0.0028	0.05
Methoxychlor	72-43-5		0.031	0.5
Toxaphene	8001-35-2		0.14	5

Matrix *Aqueous*				
Analytical Group *PCBs*				
Concentration Level *Low*				
Analyte	**CAS Number**	**Name of State/Territory/Tribal: Regulatory Standards/Criteria**	**Achievable Laboratory Method Detection Limit, ug/L**	**Achievable Laboratory Reporting Limit, ug/L**
Aroclor-1016	12674-11-2	New York State Department of Environmental Conservation Technical and Operation Guidance Series 1.1.1 Groundwater Standards and Guidance Values	0.119	1
Aroclor-1221	11104-28-2		0.095	1
Aroclor-1232	11141-16-5		0.185	1
Aroclor-1242	53469-21-9		0.03	1
Aroclor-1248	12672-29-6		0.063	1
Aroclor-1254	11097-69-1		0.204	1
Aroclor-1260	11096-82-5		0.105	1
Aroclor-1262	37324-23-5		0.042	1
Aroclor-1268	11100-14-4		0.102	1

Matrix *Aqueous*				
Analytical Group *Herbidides*				
Concentration Level *Low*				
Analyte	**CAS Number**	**Name of State/Territory/Tribal: Regulatory Standards/Criteria**	**Achievable Laboratory Method Detection Limit, ug/L**	**Achievable Laboratory Reporting Limit, ug/L**
2,4,5-T	93-76-5	New York State Department of Environmental Conservation Technical and Operation Guidance Series 1.1.1 Groundwater Standards and Guidance Values	0.017	0.1
2,4,5-TP (Silvex)	93-72-1		0.01	0.1
2,4-D	94-75-7		0.13	1
2,4-DB	94-82-6		0.16	1
Dalapon	1918-02-1		0.13	2.5
Dicamba	1918-00-9		0.013	0.1

Matrix *Aqueous*	
Analytical Group *Metals*	
Concentration Level *Low*	

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, ug/L	Achievable Laboratory Reporting Limit, ug/L
Aluminum	7429-90-5	New York State Department of Environmental Conservation Technical and Operation Guidance Series 1.1.1 Groundwater Standards and Guidance Values	66	200
Antimony	7440-36-0		9.3	20
Arsenic	7440-38-2		4.3	20
Barium	7440-39-3		1.1	200
Beryllium	7440-41-7		0.26	5
Cadmium	7440-43-9		0.89	5
Calcium	7440-70-2		110	800
Chromium	7440-47-3		0.64	20
Cobalt	7440-48-4		0.67	50
Copper	7440-50-8		3.6	30
Iron	7439-89-6		31	200
Lead	7439-92-1		4.2	10
Magnesium	7439-95-4		76	500
Manganese	7439-96-5		10	50
Nickel	7440-02-0		0.85	50
Potassium	7440-09-7		76	1000
Selenium	7782-49-2		12	30
Silver	7440-22-4		6.9	30
Sodium	7440-23-5		29	1000
Thallium	7440-28-0		6.2	20
Vanadium	7440-62-2		1.1	50
Zinc	7440-66-6		4.9	50
Mercury	7439-97-6		0.028	0.2
Cyanide	57-12-5		7.5	20

Matrix *Soil*				
Analytical Group *VOCs*				
Concentration Level *Low*				
Analyte	**CAS Number**	**Name of State/Territory/Tribal: Regulatory Standards/Criteria**	**Achievable Laboratory Method Detection Limit, ug/Kg**	**Achievable Laboratory Reporting Limit, ug/Kg**
1,1,1-Trichloroethane	71-55-6	6 NYCRR Part 375 Soil Cleanup Objectives	0.53	5
1,1,2,2-Tetrachloroethane	79-34-5		0.68	5
1,1,2-Trichloroethane	79-00-5		0.48	5
1,1-Dichloroethane	75-34-3		0.67	5
1,1-Dichloroethene	75-35-4		0.95	5
1,2,3-Trichlorobenzene	87-61-6		0.64	5
1,2,4-Trichlorobenzene	120-82-1		0.63	5
1,2-Dibromo-3-chloropropane	96-12-8		1.3	5
1,2-Dibromoethane	106-93-4		0.74	5
1,2-Dichlorobenzene	95-50-1		0.62	5
1,2-Dichloroethane	107-06-2		0.54	5
1,2-Dichloropropane	78-87-5		0.69	5
1,3-Dichlorobenzene	541-73-1		0.7	5
1,4-Dichlorobenzene	106-46-7		0.8	5
2-Butanone	78-93-3		2	5
2-Hexanone	591-78-6		0.83	5
4-Methyl-2-pentanone	108-10-1		0.73	5
Acetone	67-64-1		1.6	5
Benzene	71-43-2		0.61	5
Bromochloromethane	74-97-5		0.76	5
Bromodichloromethane	75-27-4		0.97	5
Bromoform	75-25-2		2	5
Bromomethane	74-83-9		1.1	5
Carbon disulfide	75-15-0		0.3	5
Carbon tetrachloride	56-23-5		0.33	5
Chlorobenzene	108-90-7		0.51	5
Chloroethane	75-00-3		1	5
Chloroform	67-66-3		0.64	5
Chloromethane	74-87-3		0.8	5
cis-1,2-Dichloroethene	156-59-2		0.75	5
cis-1,3-Dichloropropene	10061-01-5		0.67	5
Dibromochloromethane	124-48-1		0.65	5

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, ug/Kg	Achievable Laboratory Reporting Limit, ug/Kg
Dichlorodifluoromethane	75-71-8	6 NYCRR Part 375 Soil Cleanup Objectives	0.98	5
Ethylbenzene	100-41-4		0.5	5
Isopropylbenzene	98-82-8		0.58	5
m,p-Xylene	179601-23-1		1.6	5
Methyl tert-butyl ether	1634-04-4		0.61	5
Methylene chloride	75-09-2		1.3	5
o-Xylene	95-47-6		0.47	5
Styrene	100-42-5		0.52	5
Tetrachloroethene	127-18-4		0.62	5
Toluene	108-88-3		0.47	5
trans-1,2-Dichloroethene	156-60-5		0.53	5
trans-1,3-Dichloropropene	10061-02-6		0.68	5
Trichloroethene	79-01-6		0.62	5
Trichlorofluoromethane	75-69-4		0.42	5
Vinyl chloride	75-01-4		0.63	5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		3	5
1,4-Dioxane	123-91-1		61	100
Cyclohexane	110-82-7		1.7	5
Methyl acetate	79-20-9		1.4	5
Methylcyclohexane	108-87-2		1.8	5

Matrix *Soil*
Analytical Group *SVOCs*
Concentration Level *Low*

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, ug/Kg	Achievable Laboratory Reporting Limit, ug/Kg
2,2´-oxybis(1-Chloropropane)	108-60-1	6 NYCRR Part 375 Soil Cleanup Objectives	51	330
2,4-Dichlorophenol	120-83-2		38	330
2,4-Dimethylphenol	105-67-9		36	330
2,4-Dinitrophenol	51-28-5		180	670
2,4-Dinitrotoluene	121-14-2		23	330
2,6-Dinitrotoluene	606-20-2		28	330
2-Chloronaphthalene	91-58-7		38	330
2-Chlorophenol	95-57-8		41	330
2-Methylnaphthalene	91-57-6		42	330
2-Methylphenol	95-48-7		38	330
2-Nitroaniline	88-74-4		21	670
2-Nitrophenol	88-75-5		36	330
3,3´-Dichlorobenzidine	91-94-1		35	330
3-Nitroaniline	99-09-2		24	670
4,6-Dinitro-2-methylphenol	534-52-1		25	670
4-Bromophenyl-phenylether	101-55-3		32	330
4-Chloro-3-methylphenol	59-50-7		26	330
4-Chloroaniline	106-47-8		24	330
4-Chlorophenyl-phenylether	7005-72-3		40	330
4-Methylphenol	106-44-5		35	330
4-Nitroaniline	100-01-6		25	670
4-Nitrophenol	100-02-7		22	670
Acenaphthene	83-32-9		39	330
Acenaphthylene	208-96-8		37	330
Anthracene	120-12-7		27	330
Benzo(a)anthracene	56-55-3		33	330
Benzo(a)pyrene	50-32-8		31	330
Benzo(b)fluoranthene	205-99-2		40	330
Benzo(g,h,i)perylene	191-24-2		38	330
Benzo(k)fluoranthene	207-08-9		43	330

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, ug/Kg	Achievable Laboratory Reporting Limit, ug/Kg
Bis(2-chloroethoxy)methane	111-91-1	6 NYCRR Part 375 Soil Cleanup Objectives	39	330
Bis(2-chloroethyl)ether	111-44-4		42	330
Bis(2-ethylhexyl)phthalate	117-81-7		29	330
Butylbenzylphthalate	85-68-7		26	330
Carbazole	86-74-8		28	330
Chrysene	218-01-9		29	330
Di-n-butylphthalate	84-74-2		28	330
Di-n-octylphthalate	117-84-0		28	330
Dibenzo(a,h)anthracene	53-70-3		35	330
Dibenzofuran	132-64-9		36	330
Diethylphthalate	84-66-2		24	330
Dimethylphthalate	131-11-3		30	330
Fluoranthene	206-44-0		29	330
Fluorene	86-73-7		33	330
Hexachlorobenzene	118-74-1		32	330
Hexachlorobutadiene	87-68-3		45	330
Hexachlorocyclopentadiene	77-47-4		96	330
Hexachloroethane	67-72-1		35	330
Indeno(1,2,3-cd)pyrene	193-39-5		37	330
Isophorone	78-59-1		34	330
N-Nitroso-di-n-propylamine	621-64-7		32	330
N-Nitrosodiphenylamine	86-30-6		29	330
Naphthalene	91-20-3		41	330
Nitrobenzene	98-95-3		38	330
Pentachlorophenol	87-86-5		140	670
Phenanthrene	85-01-8		26	330
Phenol	108-95-2		37	330
Pyrene	129-00-0		32	330
1,1´-Biphenyl	92-52-4		42	330
2,4,5-Trichlorophenol	95-95-4		37	670
2,4,6-Trichlorophenol	88-06-2		39	330
1,2,4,5-Tetrachlorobenzene	95-94-3		59	330
2,3,4,6-Tetrachlorophenol	58-90-2		31	330
Acetophenone	98-86-2		31	330
Atrazine	1912-24-9		47	330
Benzaldehyde	100-52-7		44	330
Caprolactam	105-60-2		21	330

Matrix *Soil*	
Analytical Group *Pesticides*	
Concentration Level *Low*	

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, ug/Kg	Achievable Laboratory Reporting Limit, ug/Kg
4,4´-DDD	72-54-8	6 NYCRR Part 375 Soil Cleanup Objectives	0.22	3.3
4,4´-DDE	72-55-9		0.25	3.3
4,4´-DDT	50-29-3		0.33	3.3
Aldrin	309-00-2		0.11	1.7
alpha-BHC	319-84-6		0.056	1.7
alpha-Chlordane	5103-71-9		0.087	1.7
beta-BHC	319-85-7		0.063	1.7
delta-BHC	319-86-8		0.12	1.7
Dieldrin	60-57-1		0.16	3.3
Endosulfan I	959-98-8		0.06	1.7
Endosulfan II	33213-65-9		0.15	3.3
Endosulfan sulfate	1031-07-8		0.13	3.3
Endrin	72-20-8		0.14	3.3
Endrin aldehyde	7421-93-4		0.23	3.3
Endrin ketone	53494-70-5		0.12	3.3
gamma-BHC (Lindane)	58-89-9		0.055	1.7
gamma-Chlordane	5103-74-2		0.21	1.7
Heptachlor	76-44-8		0.072	1.7
Heptachlor epoxide	1024-57-3		0.16	1.7
Methoxychlor	72-43-5		0.88	17
Toxaphene	8001-35-2		8.8	170

Matrix *Soil*
Analytical Group *PCBs*
Concentration Level *Low*

Analyte	**CAS Number**	**Name of State/Territory/Tribal: Regulatory Standards/Criteria**	**Achievable Laboratory Method Detection Limit, ug/Kg**	**Achievable Laboratory Reporting Limit, ug/Kg**
Aroclor-1016	12674-11-2	6 NYCRR Part 375 Soil Cleanup Objectives	2.5	33
Aroclor-1221	11104-28-2		4.4	33
Aroclor-1232	11141-16-5		2.4	33
Aroclor-1242	53469-21-9		2.5	33
Aroclor-1248	12672-29-6		3.8	33
Aroclor-1254	11097-69-1		4.4	33
Aroclor-1260	11096-82-5		1.8	33
Aroclor-1262	37324-23-5		2	33
Aroclor-1268	11100-14-4		1.6	33

Matrix *Soil*
Analytical Group *Herbicides*
Concentration Level *Low*

Analyte	**CAS Number**	**Name of State/Territory/Tribal: Regulatory Standards/Criteria**	**Achievable Laboratory Method Detection Limit, ug/Kg**	**Achievable Laboratory Reporting Limit, ug/Kg**
2,4,5-T	93-76-5	6 NYCRR Part 375 Soil Cleanup Objectives	0.31	3.3
2,4,5-TP (Silvex)	93-72-1		0.18	3.3
2,4-D	94-75-7		3.2	33
2,4-DB	94-82-6		6.1	33
Dalapon	1918-02-1		5.9	83
Dicamba	1918-00-9		0.56	3.3

Matrix *Soil*	
Analytical Group *Metals*	
Concentration Level *Low*	

Analyte	CAS Number	Name of State/Territory/Tribal: Regulatory Standards/Criteria	Achievable Laboratory Method Detection Limit, mg/Kg	Achievable Laboratory Reporting Limit, mg/Kg
Aluminum	7429-90-5	6 NYCRR Part 375 Soil Cleanup Objectives	1.2	10
Antimony	7440-36-0		0.38	1
Arsenic	7440-38-2		0.41	1
Barium	7440-39-3		0.031	10
Beryllium	7440-41-7		0.0015	0.25
Cadmium	7440-43-9		0.015	0.25
Calcium	7440-70-2		6.1	40
Chromium	7440-47-3		0.019	1
Cobalt	7440-48-4		0.044	2.5
Copper	7440-50-8		0.11	1.5
Iron	7439-89-6		1.5	10
Lead	7439-92-1		0.17	0.5
Magnesium	7439-95-4		0.63	25
Manganese	7439-96-5		0.13	2.5
Nickel	7440-02-0		0.043	2.5
Potassium	7440-09-7		3.4	50
Selenium	7782-49-2		0.64	1.5
Silver	7440-22-4		0.064	1.5
Sodium	7440-23-5		1.1	50
Thallium	7440-28-0		0.22	1
Vanadium	7440-62-2		0.06	2.5
Zinc	7440-66-6		0.18	2.5
Mercury	7439-97-6		0.0021	0.033
Cyanide	57-12-5		0.45	1.0

Brownfields QAPP Template #5d
Analytical Laboratory Sensitivity and Project Criteria

The following tables define the data quality indicators, performance criteria within the analytical method, and the associated QC sample(s) used to assess the specific performance criteria.

Matrix Aqueous	
Analytical Group VOCs	
Concentration Level Low	

Analytical Method/SOP 8260 90.0012	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=2X QL	Method Blank	A
	Accuracy	Laboratory In-house Limits	Laboratory Control Sample	A
	Accuracy / Precision	Laboratory In-house Limits, 40% RPD	Matrix Spike / Matrix Spike Duplicate	A
	Accuracy	Factor of two (-50% to +100%) from most recent calibration	Internal Standards	A
	Accuracy	Laboratory In-house Limits	Surrogate Standards	A

Matrix Soil
Analytical Group VOCs
Concentration Level Low

Analytical Method/SOP 8260 90.0012	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=2X QL QL	Method Blank	A
	Accuracy	Laboratory In-house Limits	Laboratory Control Sample	A
	Accuracy / Precision	Laboratory In-house Limits, 40% RPD	Matrix Spike / Matrix Spike Duplicate	A
	Accuracy	Factor of two (-50% to +100%) from most recent calibration	Internal Standards	A
	Accuracy	Laboratory In-house Limits	Surrogate Standards	A

Matrix Aqueous				
Analytical Group SVOCs				
Concentration Level Low				
Analytical Method/SOP 8270 70.0011	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration, Common lab contaminants <=5X QL	Method Blank	A
	Accuracy	Laboratory In-house Limits	Laboratory Control Sample	A
	Accuracy / Precision	Laboratory In-house Limits, RPD 40%	Matrix Spike / Matrix Spike Duplicate	A
	Accuracy	Factor of two (-50% to +100%) from most recent calibration	Internal Standards	A
	Accuracy	Laboratory In-house Limits	Surrogate Standards	A

Matrix Soil
Analytical Group SVOCs
Concentration Level Low

Analytical Method/SOP 8270 70.0011	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration, Common lab contaminants <=5X QL	Method Blank	A
	Accuracy	Laboratory In-house Limits	Laboratory Control Sample	A
	Accuracy / Precision	Laboratory In-house Limits, RPD 40%	Matrix Spike / Matrix Spike Duplicate	A
	Accuracy	Factor of two (-50% to +100%) from most recent calibration	Internal Standards	A
	Accuracy	Laboratory In-house Limits	Surrogate Standards	A

Matrix Aqueous	
Analytical Group Pesticides, PCBs, Herbicides	
Concentration Level Low	

Analytical Method/SOP 8081, 60.0006 8082, 60.0003 8151, 60.0034	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration,	Method Blank	A
	Accuracy	Laboratory In-house Limits	Laboratory Control Sample	A
	Accuracy / Precision	Laboratory In-house Limits, RPD 30%	Matrix Spike / Matrix Spike Duplicate	A
	Accuracy	Laboratory In-house Limits	Surrogate Standards	A

Matrix Soil				
Analytical Group Pesticides, PCBs, Herbicides				
Concentration Level Low				
Analytical Method/SOP 8081, 60.0006 8082, 60.0003 8151, 60.0034	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration	Method Blank	A
	Accuracy	Laboratory In-house Limits	Laboratory Control Sample	A
	Accuracy / Precision	Laboratory In-house Limits, Pesticides, PCBs RPD 30%; Herbicides RPD 50%	Matrix Spike / Matrix Spike Duplicate	A
	Accuracy	Laboratory In-house Limits	Surrogate Standards	A

Matrix Aqueous				
Analytical Group: Metals				
Concentration Level Low				
Analytical Method/SOP 6010, 100.0111	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration	Method Blank	A
	Accuracy	80% - 120%	Laboratory Control Sample	A
	Accuracy	75% - 125%	Matrix Spike (salts Na,K,Mg,Ca not spiked)	A
	Accuracy	75% - 125%	Post-digestion Spike	A
	Accuracy	<10%D when analyte is >=50X QL	Serial Dilution	A
	Precision	< 20% RPD	Duplicate	A

Matrix Soil	
Analytical Group: Metals	
Concentration Level Low	

Analytical Method/SOP 6010, 100.0111	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration	Method Blank	A
	Accuracy	80% - 120%	Laboratory Control Sample	A
	Accuracy	75% - 125%	Matrix Spike (salts Na,K,Mg,Ca,Fe,Al,Mn not spiked)	A
	Accuracy	75% - 125%	Post-digestion Spike	A
	Accuracy	<10%D when analyte is >=50X QL	Serial Dilution	A
	Precision	< 20% RPD	Duplicate	A

Matrix Aqueous				
Analytical Group: Mercury				
Concentration Level Low				
Analytical Method/SOP 7470, 100.0012	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration	Method Blank	A
	Accuracy	80% - 120%	Laboratory Control Sample	A
	Accuracy	75% - 125%	Matrix Spike	A
	Precision	< 20% RPD	Duplicate	A

Matrix Soil				
Analytical Group: Mercury				
Concentration Level Low				
Analytical Method/SOP 7471, 100.0012	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration	Method Blank	A
	Accuracy	80% - 120%	Laboratory Control Sample	A
	Accuracy	75% - 125%	Matrix Spike	A
	Precision	< 20% RPD	Duplicate	A

Matrix Aqueous				
Analytical Group: Cyanide				
Concentration Level Low				
Analytical Method/SOP 9012, 100.0004	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration	Method Blank	A
	Accuracy	80% - 120%	Laboratory Control Sample	A
	Accuracy	75% - 125%	Matrix Spike	A
	Precision	< 20% RPD	Duplicate	A

Matrix Soil				
Analytical Group: Cyanide				
Concentration Level Low				
Analytical Method/SOP 9012, 100.0004	**Data Quality Indicators**	**Performance Criteria (related to analytical method)**	**QC Sample such as Duplicate, Matrix Spike, Surrogates etc.) Used To Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
	Precision	RPD <20	Field Duplicate	S & A
	Accuracy / Representativeness	<=10 degree C	Cooler Temperature	S
	Accuracy / Contamination	Analytes < = QL	Field Equipment Blank	S
	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration	Method Blank	A
	Accuracy	80% - 120%	Laboratory Control Sample	A
	Accuracy	75% - 125%	Matrix Spike	A
	Precision	< 20% RPD	Duplicate	A

Brownfields QAPP Template #5e
Secondary Data Criteria and Limitations Table

Data generated during previous investigations was used to delineate areas to be addressed during the RI, and to identify contaminants of concern for soil and groundwater sampling. Secondary data sources are shown in the following table.

Secondary Data	Data Source (Originating Organization, Report Title, and Date)	Data Generator(s) (Originating Org., Data Types, Data Generation/ Collection Dates)	How Data Will Be Used	Limitations on Data Use
Previous Investigation Sampling Results	Day Environmental Inc. Records Research Report, March 2014	Paradigm Environmental Services and Columbia Analytical Services – 114 groundwater samples, 64 soil samples; collected between 8/22/1997 and 01/4/2013.	To assess existing site conditions and contamination.	1. Unvalidated data used to generate the report. 2. Limited number of data points and sample depths.

Brownfields QAPP Template #6
Project Specific Method and Standard Operating Procedures (SOPs) Reference Table

Field sampling SOPs, analytical methods references (for preparation and analysis of the samples) and corresponding analytical laboratory SOPs that will be used for the project are indicated below. Copies of the field sampling SOPs are included in Appendix C-2.

ANALYTICAL METHOD REFERENCE (*Include document title, method name/number, revision number, date)*
1a. SW846 Method 8260C GCMS Volatiles, August 2006
2a. SW846 Method 8270D GCMS Semivolatiles, August 2006
3a. SW846 Method 8081, GC Pesticides, February, 2007
4a. SW846 Method 8082A, GC PCBs, February 2007
5a. SW846 Method 8151 Herbicides, December, 1996
6a. SW846 Method 6010C, ICP-AES Metals, August 2008
7a. SW846 Methods 7470/7471 CVAA Mercury, February 2007
8a. SW846 Method 9012, Cyanide, November, 2004
ANALYTICAL LABORATORY SOPs (*Include document title, date, revision number, and originator=s name)*
1b. 90.0012, Revision 13, 9/7/12
2b. 70.0011, Revision 11, 7/18/12
3b. 60.0006, Revision 10, 4/8/11
4b. 60.0003, Revision 10, 4/11/11
5b. 60.0034, Revision 8, 4/8/11
6b. 100.0111, Revision 14, 1/28/15
7b. 100.0012, Revision 11, 2/12/15
8b. 100.0004, Revision 9, 5/13/13
FIELD SAMPLING SOPs (*Include document title, date, revision number, and originator's name)*
1c. Field Sampling and Decontamination SOP, Day Environmental, Inc. (refer to Appendix C-2)
2c. NYSDEC DER-10/Technical Guidance for Site Investigation and Remediation

Brownfields QAPP Template #7
Field Equipment Calibration, Maintenance, Testing, and Inspection

Field instruments to be used for field screening include a Horiba U-22 Water quality meter for screening of water quality parameters during groundwater sample collection and a photoionization detector for seeing of volatiles in test boring samples. Field instruments to be used for health and safety monitoring include: MiniRAE PIDs for volatiles and DataRAMs for particulates.

Field Equipment	Calibration Activity	Maintenance Activity	Testing/ Inspection Activity	Frequency	Acceptance Criteria		Corrective Action	SOP Reference
Horiba U-22XD Water Quality Meter or equivalent	*Calibrate with standard solutions.*	*NA*	*NA*	*Annually, Anytime anomaly suspected.*	*pH Meter*	*+/- 0.1 units*	*Clean probe, replace battery, replace membrane, replace probe*	Horiba U-22XD User's Guide
					Dissolved Oxygen	*± 0.2 mg/L*		
					Specific Conductivity	*± 3%*		
					Temperature	*± 1.0 °C*		
					Turbidity	*± 5%*		
					Oxidation Reduction Potential	*± 15mV*		
Data RAM, or equivalent	*Internal Span Check; Zero Calibration*	Optical Sensor chamber and cyclone cleaning, as needed.	*NA*	*Prior to day's activities; anytime anomaly suspected.*	*"Calibration OK" output*		*Repair as necessary*	*Thermo Anderson DataRAM Operator Manual*
MiniRAE 2000 PID, or equivalent	Zero Calibration, span calibrate with isobutylene standard gas.	NA.	NA	Prior to day's activities, anytime anomaly suspected.	± 10%		Replace filter, blow-dry the sensor module, recalibrate	MiniRAE 2000 User's Guide

Brownfields QAPP Template #8
Analytical Laboratory Instrument and Equipment Maintenance, Testing, and Inspection

Instrument/ Equipment	Maintenance Activity	Testing/Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
GCMS-VOC, SVOC	Check for leaks, replace gas line filters, recondition or replace trap, replace column, clean injection port/liner and replace septum as needed, replace Electron Mulitplier	Tune (BFB or DFTPP), Continuing Calibration Verification	Tune, CCV after every 12 hours of operation	Ion abundance within acceptance limits for tune, CCV %D ≤20%	As needed, replace connections, gas line filters, trap, or GC column. Clip column, replace injection port liner, clean injection port, clean source. Repeat tune, calibration or CCV and any affected samples. See Attachment in SOP for more details.	Spectrum Department Supervisor	90.0012; 70.0011
GC/ECD – Pesticides, PCBs, Herbicides	Check for leaks, replace gas line filters, clip end of column, recondition or replace column, clean injection port/liner, replace septum	Continuing Calibration Verification	Daily, after every 10 Samples	%D <20%	As needed, check GC conditions, check for leaks, clip column, clean/replace injection port/ liner. Repeat calibration or CCV and affected samples. See Attachment 1 of SOP for more details.	Spectrum Department Supervisor	60.0006; 60.0003; 60.0034
ICP	Perform leak test, change pump tubing, change torch and window, clean filters	Calibration Verification and Calibration Blank	Daily, after every 10 samples	CV: all analytes ±10% CB: no analytes > quantitation limit	Check/replace pump tubing, clean torch and window, clean all filters. Repeat calibration or CCV and any affected samples. See section 6.2 of	Spectrum Department Supervisor	100.0111

Instrument/ Equipment	Maintenance Activity	Testing/Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
					SOP for more details.		
Mercury Analyzer	Perform leak test, change tubing, clean window, clean filters	Initial Calibration Verification and Initial Calibration Blank	Daily, after every 10 samples	ICV: Hg within ±10% CCV: Hg within ±20% ICB: Hg < QL	Replace connections, replace pump tubing, clean all filters. Repeat calibration or CCV.	Spectrum Department Supervisor	100.0012
Cyanide Analysis, Distillation System	Clean glassware prior to reuse; Rinse tubing connecting distillation heads and dispersion tube assemblies with reagent water, inspect spectrophotometer	Initial Calibration Verification and Initial Calibration Blank	Daily, after every 10 samples	CV: all analytes ±10% CB: no analytes > quantitation limit	Replace tubing and connections. Repeat calibration or CCV	Spectrum Department Supervisor	100.0004

Analytical Laboratory Instrument Calibration

Identify all analytical instrumentation that requires calibration and provide the SOP reference number for each. Document the frequency, acceptance criteria, and corrective action requirements on the template. **Below (in italics) is an example of such information.**

Instrument/ Equipment	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
GC/MS – VOCs, SVOCs	ICAL - 5-point calibration	Instrument receipt, instrument change (new column, source cleaning, etc.), when CCV is out of criteria.	%RSD <20% with a maximum of 10% of the target analytes and/or surrogate compounds allowed %RSD <50%. Relative Retention Times must meet ±0.06 RRT units for each compound and surrogate. Minimum RRFs are suggested in Table 4 of the method (and SOP).	Recalibrate and/or perform the necessary equipment maintenance. Check the calibration standards. Reanalyze data.	Spectrum Department Supervisor	90.0012, 70.0011
GC/MS – VOCs, SVOCs	ICV (Second Source)	Once after each ICAL.	The %R must be within 70-130% for all target compounds.	Correct problem and verify second source standard. Rerun second source verification. If that fails, correct problem and repeat ICAL unless problem can be verified as due to ICV solution and not ICAL.	Spectrum Department Supervisor	90.0012, 70.0011

Instrument/	Calibration	Frequency	Acceptance	Corrective	Responsible	Analytica

Equipment	Procedure	of Calibration	Criteria	Action	Person	l SOP Reference
GC/MS – VOCs, SVOCs	CCV	Analyze a standard at the beginning of each 12-hour shift after tune.	%D <20% with a maximum of 20% of the target analytes and/or surrogate compounds allowed %D < 50% D. Minimum RRFs are suggested in Table 4 of the method.	Correct problem, then rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since last acceptable CCV.	Spectrum Department Supervisor	90.0012, 70.0011
GC/MS – VOCs, SVOCs	Instrument Tune (BVB for VOCs, DFTPP for SVOCs)	Prior to ICAL and every 12 hours.	Criteria listed in Section 8.2.2, of current revision of SOPs 90.0012 and 70.0011.	Retune and/or clean source.	Spectrum Department Supervisor	90.0012, 70.0011
GC/ECD – Pesticides, PCBs, Herbicides	ICAL - 5-point calibration	Instrument receipt, instrument change (new column, source cleaning, etc.), when CCV is out of criteria.	%RSD <20%, or linear regression with r≥0.995 or COD ≥0.99 Retention time windows per section 8.2.5.1 of 8081and 8082 SOP, section 8.2.8.1 of 8151 SOP.	Recalibrate and/or perform the necessary equipment maintenance. Check the calibration standards. Reanalyze data.	Spectrum Department Supervisor	60.0006, 60.0003, 60.0034

Instrument/ Equipment	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
GC/ECD – Pesticides, PCBs, Herbicides	ICV (Second Source)	Once after each ICAL.	The %R must be within 80-120% for all target compounds.	Correct problem and verify second source standard. Rerun second source verification. If that fails, correct problem and repeat ICAL unless problem can be verified as due to ICV solution and not ICAL.	Spectrum Department Supervisor	60.0006, 60.0003, 60.0034
GC/ECD – Pesticides, PCBs, Herbicides	CCV	Analyze a standard at the beginning of each 12-hour shift and after 20 field samples	%D <20% on at least one GC column. If %D causes a high bias, and samples are ND at QL, then reanalysis is not necessary	Correct problem, then rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since last acceptable CCV.	Spectrum Department Supervisor	60.0006, 60.0003, 60.0034
ICP-AES Metals	ICAL - 3 point calibration plus blank	Daily prior to sample analysis.	Correlation coefficient (r) must be ≥ 0.998.	Recalibrate and/or perform necessary equipment maintenance. Check calibration standards.	Spectrum Department Supervisor	100.0111

Instrument/ Equipment	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
ICP-AES Metals	ICV (Second Source)	Once after each ICAL, and before beginning a sample run.	%R must be within 90-110% of true values.	Do not use results for failing elements unless the ICV > 110% and the sample results are non-detect. Investigate and correct problem.	Spectrum Department Supervisor	100.0111
ICP-AES Metals	Calibration Blanks (initial and continuing)	After ICV/CCV. Before beginning a sample sequence, after every 10 field samples and at end of the analysis sequence. Following each CCV	No analytes detected > QL. For negative blanks, absolute value < QL.	Correct the problem, then re-prepare and reanalyze.	Spectrum Department Supervisor	100.0111
ICP-AES Metals	CCV	At the beginning and end of each run sequence and after every 10 field samples.	%D must be within 90-110% of true values.	Correct problem, rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	Spectrum Department Supervisor	100.0111

Instrument/ Equipment	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
ICP-AES Metals	Low-level Calibration Check Standard	Daily, after ICAL.	%R must within 70%-130% of true value.	Do not use results for failing elements, unless low-level standard recovery > upper limit and sample results are non-detect. Investigate and correct the problem.	Spectrum Department Supervisor	100.0111
ICP-AES Metals	ICS - ICSA & ICSAB	Daily, before sample analysis	ICSA results must be less than +/- the absolute value of the QL, or if the QL is <10ppb, +/- 2X the QL. ICSAB %Rs must be within 80-120% of the true value.	Correct the problem, then re-prepare checks and reanalyze all affected samples.	Spectrum Department Supervisor	100.0111
CVAAS Mercury	ICAL - 5 point calibration plus a blank	Upon instrument receipt, major instrument change, at the start of each day.	Correlation coefficient (r) must be ≥ 0.995.	Recalibrate and/or perform necessary equipment maintenance. Check calibration standards.	Spectrum Department Supervisor	100.0012
CVAAS Mercury	ICV (Second Source)	Once after each ICAL, prior to beginning a sample run.	%R must be within 90-110% of the true value.	Correct problem and verify second source standard. Rerun ICV. If that fails, correct problem and repeat ICAL.	Spectrum Department Supervisor	100.0012

Instrument/ Equipment	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
CVAAS Mercury	Calibration Blank	Before beginning a sample sequence, after every 10 field samples and at end of the analysis sequence. following each CCV	No analytes detected > QL.	Correct problem. Re-prepare and reanalyze calibration blank. All samples following the last acceptable calibration blank must be reanalyzed.	Spectrum Department Supervisor	100.0012
CVAAS Mercury	CCV	Beginning and end of each run sequence and every 10 field samples.	%D must be within 80-120% of the true value.	Correct problem, rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	Spectrum Department Supervisor	100.0012
Spectrophotometer Cyanide	ICAL - 5 point calibration plus a blank	Upon instrument receipt, major instrument change, at the start of each day.	Correlation coefficient (r) must be ≥ 0.995.	Recalibrate and/or perform necessary equipment maintenance. Check calibration standards.	Spectrum Department Supervisor	100.0004
Spectrophotometer Cyanide	ICV (Second Source)	Once after each ICAL, prior to beginning a sample run.	%R must be within 85-115% of the true value.	Correct problem and verify second source standard. Rerun ICV. If that fails, correct problem and repeat ICAL.	Spectrum Department Supervisor	100.0004

Instrument/ Equipment	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Responsible Person	Analytical SOP Reference
Spectrophotometer Cyanide	Calibration Blank	Before beginning a sample sequence, after every 10 field samples and at end of the analysis sequence. Following each CCV	No analytes detected > QL.	Correct problem. Re-prepare and reanalyze calibration blank. All samples following the last acceptable calibration blank must be reanalyzed.	Spectrum Department Supervisor	100.0004
Spectrophotometer Cyanide	CCV	Beginning and end of each run sequence and every 10 field samples.	%D must be within 85-115% of the true value.	Correct problem, rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	Spectrum Department Supervisor	100.0004

Brownfields QAPP Template #9a
Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): Technician/Day Environmental, Inc.
Sample Packaging (Personnel/Organization): Technician/Day Environmental, Inc.
Coordination of Shipment (Personnel/Organization): Technician/Day Environmental, Inc.
Type of Shipment/Carrier: FedEx, UPS or Spectrum Analytical Inc. Courier
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): Sample receiving staff/Spectrum Analytical, RI Division
Sample Custody and Storage (Personnel/Organization): Sample receiving staff/Spectrum Analytical, RI Division
Sample Preparation (Personnel/Organization): Sample Preparation Technicians (Organics, Inorganics)/Spectrum Analytical, RI Division
Sample Determinative Analysis (Personnel/Organization): Instrument Lab Staff (Organics, Inorganics)/Spectrum Analytical, RI Division
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): Samples to be shipped at the end of each sampling day, and arrive at laboratory within 24 hours (1 day) of sample shipment.
Sample Extract/Digestate Storage (No. of days from extraction/digestion): Six months from delivery of final laboratory report.
SAMPLE DISPOSAL
Personnel/Organization: Sample receiving staff/Spectrum Analytical, RI Division
Number of Days from Analysis: 30 days from delivery of final laboratory report.

Brownfields QAPP Template #9b
Sample Custody Requirements

Sample Identification Procedures: Test boring soil samples and groundwater samples will have the following format: sample number-matrix-sample location (sample depth).

Sample Number: a 3-digit number provided by DAY prior to collection of the first RI/FS sample; the remaining sample numbers will follow in sequential order (e.g., 101, 102, 103, etc.).

Sample Matrix: denotes the matrix [e.g., surface soil(ss), sub-surface soil(TB), groundwater(gw)].

Sample Depth: the depth in feet and tenths of a foot referenced from the ground surface.[Note: do not use tic marks ‘ or “ to indicate sample depth on chain-of-custody or field notes. Tic marks are not an acceptable character in NYSDEC EQUIS.]

For example, if a soil sample was collected from test boring TB-202 at 8.5 feet below the ground surface and the next sample is 115, the sample ID would be **115-TB-202(8.5)**.

Waste characterization samples will have the following format: [sample number]-IDW-#(matrix).

Matrix: denotes the matrix (e.g., soil, water) of the IDW sample.

Sample IDs will be recorded in the field logbook, on sample labels and chain-of-custody (COC) forms.

Field Sample Custody/Tracking Procedures (sample collection, packaging, shipment, and delivery to laboratory):

Sample containers will be obtained from the contract laboratory and are certified pre-cleaned by the manufacture according to USEPA specifications.

Field samples will be in direct control of the environmental specialist(s) until relinquished to FedEx or UPS for delivery to Spectrum Analytical, Inc. A sample is in custody if it is: in someone’s physical possession; in someone’s view; locked up; or kept in a secured area that is restricted to authorized personnel.

After samples are carefully collected, sample jars will be tightly sealed and the outside wiped clean before placing inside the cooler. The samples will be packed in ice in coolers to maintain the samples’ integrity during shipment. Samples will be packaged carefully to avoid breakage or cross-contamination and arrive at the laboratory at proper temperatures. Glass bottles or jars will be protected with bubble wrap or foam to prevent breakage during shipment. A duplicate COC will be placed in a plastic bag and taped to the inside of the cooler lid prior to shipment. Once the cooler is closed, custody seals will be placed on the cooler and protected from accidental damage by placing strapping tape over them an example custody seal is included in Appendix C-1.

Sample shipments will be sent via overnight delivery to arrive at the laboratory within 24 to 48 hours or picked-up by a courier of the analytical laboratory for delivery to the laboratory within 24 to 48 hours.

Sample Custody Requirements

Describe the procedures that will be used to maintain sample custody and integrity for the site-specific project. Include examples of chain-of-custody forms, traffic reports, sample identification, custody seals, laboratory sample receipt forms, and laboratory sample transfer forms. Attach these items, or reference the applicable SOPs where these items can be found.

Sample Identification Procedures: Describe the sample identification procedure in this section for the site-specific project. Provide an example.

Field Sample Custody/Tracking Procedures (sample collection, packaging, shipment, and delivery to laboratory): Describe the field sample custody/tracking procedures in this section for the site-specific project. Provide examples.

Laboratory Sample Custody/Tracking Procedures (receipt of samples, archiving, and disposal): Laboratory sample custody procedures (receipt of samples, archiving, and disposal) will be used according Spectrum Analytical standard procedures. Coolers are received and checked for proper temperature. A sample cooler receipt form will be filled out to note conditions and any discrepancies. The chain-of-custody form will be checked against the sample containers for accuracy. Samples will be logged into the laboratory information management system and given a unique log number which can be tracked through processing. The laboratory project manager will notify the client verbally or via email immediately if any problems are identified. Discrepancies and resolutions will be documented on the sample receiving checklist. Samples will remain under custody until the completion of analysis, and following analysis until sample remnants are ultimately disposed. The Spectrum Analytical laboratory facility is a secured, limited access facility.

Chain-of-Custody Procedures:

After collection, each sample will be maintained in the sampler's custody until formally transferred to another party (e.g., FedEx). For all samples collected, chain-of-custody forms will document the date and time of sample collection, the sampler's name, and the names of all others who subsequently held custody of the sample. Specifications for chemical analyses will also be documented on the chain-of-custody form.

Samples to be delivered to the laboratory(s) will be made by a public courier (e.g., FedEx).
After samples have been collected, they will be sent to the laboratory(s) within 24 hours.

Once received by the laboratory, receipt will be documented on the chain-of-custody form
and the samples will be checked in. The samples will remain under chain-of-custody throughout
the analysis period to ensure their integrity is preserved.

Brownfields QAPP Template #10
Field and Analytical Laboratory Quality Control Summary

Matrix	Aqueous
Analytical Group	VOCs
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	90.0012
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency /Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=2X QL	If sufficient holding time remains, reanalyze batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=2X QL

Quality Control (QC) Sample:	Frequency /Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Laboratory Control Sample	One per batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reanalyze batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 40% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 40% RPD
Internal Standards	Every sample, standard, QC sample	Factor of two (-50% to +100%) from most recent calibration	Reanalyze sample. If determined to be matrix interference, note in narrative.	Spectrum Department Supervisor	Accuracy	Factor of two (-50% to +100%) from most recent calibration
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. No exceedances for MB or LCS, one exceedance allowed for field samples	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. No exceedances for MB or LCS, one exceedance allowed for field samples

Matrix	Soil
Analytical Group	VOCs
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	90.0012
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=2X QL	If sufficient holding time remains, reanalyze batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=2X QL
Laboratory Control Sample	One per batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reanalyze batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 40% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 40% RPD
Internal Standards	Every sample, standard, QC sample	Factor of two (-50% to +100%) from most recent calibration	Reanalyze sample. If determined to be matrix interference, note in narrative.	Spectrum Department Supervisor	Accuracy	Factor of two (-50% to +100%) from most recent calibration
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. No exceedances for MB or LCS, one exceedance allowed for field samples	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. No exceedances for MB or LCS, one exceedance allowed for field samples

Matrix	Aqueous
Analytical Group	SVOCs
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	70.0011
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=5X QL	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=5X QL
Laboratory Control Sample	One per preparation batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 40% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 40% RPD
Internal Standards	Every sample, standard, QC sample	Factor of two (-50% to +100%) from most recent calibration, unless obvious matrix interference	Reanalyze sample. If determined to be matrix interference, note in narrative.	Spectrum Department Supervisor	Accuracy	Factor of two (-50% to +100%) from most recent calibration, unless obvious matrix interference
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. No exceedances for MB or LCS, one acid and one base/neutral exceedance allowed for field samples, unless obvious matrix interference	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. No exceedances for MB or LCS, one acid and one base/neutral exceedance allowed for field samples, unless obvious matrix interference

Matrix	Soil
Analytical Group	SVOCs
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	70.0011
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	**Frequency/ Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=5X QL	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration, common lab contaminants <=5X QL
Laboratory Control Sample	One per preparation batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 40% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 40% RPD
Internal Standards	Every sample, standard, QC sample	Factor of two (-50% to +100%) from most recent calibration, unless obvious matrix interference	Reanalyze sample. If determined to be matrix interference, note in narrative.	Spectrum Department Supervisor	Accuracy	Factor of two (-50% to +100%) from most recent calibration, unless obvious matrix interference
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. No exceedances for MB or LCS, one acid and one base/neutral exceedance allowed for field samples, unless obvious matrix interference	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. No exceedances for MB or LCS, one acid and one base/neutral exceedance allowed for field samples, unless obvious matrix interference

Matrix	Aqueous
Analytical Group	Pesticides
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	60.0006
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration
Laboratory Control Sample	One per preparation batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 30% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 30% RPD
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze

Matrix	Soil
Analytical Group	Pesticides
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	60.0006
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration
Laboratory Control Sample	One per preparation batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 30% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 30% RPD
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze

Matrix	Aqueous
Analytical Group	PCBs
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	60.0003
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration
Laboratory Control Sample	One per preparation batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 30% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 30% RPD
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze

Matrix	Soil
Analytical Group	PCBs
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	60.0003
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration
Laboratory Control Sample	One per preparation batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 30% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 30% RPD
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze

Matrix	Aqueous
Analytical Group	Herbicides
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	60.0034
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency /Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration
Laboratory Control Sample	One per preparation batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits

Quality Control (QC) Sample:	Frequency /Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 30% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 30% RPD
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze

Matrix	Soil
Analytical Group	Herbicides
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	60.0034
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency /Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL, or less than 1/10 sample concentration	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL, or less than 1/10 sample concentration
Laboratory Control Sample	One per preparation batch of <=20 samples	Laboratory In-house Limits	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory In-house Limits

Quality Control (QC) Sample:	Frequency /Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike / Matrix Spike Duplicate	One set per 20 samples, as determined by sampler	Laboratory In-house Limits, 50% RPD	flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Precision	Laboratory In-house Limits, 50% RPD
Surrogate Standards	Every sample, standard, QC sample	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze	Flag result, note in narrative	Spectrum Department Supervisor	Accuracy	Laboratory in-house limits. One surrogate must be within limits on at least one GC column for all field samples, otherwise reanalyze

Matrix	Aqueous
Analytical Group	Metals
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	100.0111
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency /Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL
Laboratory Control Sample	One per preparation batch of <=20 samples	80% - 120%	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	80% - 120%

Quality Control (QC) Sample:	Frequency /Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike (salts Na,K,Mg,Ca not spiked)	One per 20 samples, as determined by sampler	75% - 125%	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	75% - 125%
Post-digestion Spike	For each MS analyte out of QC limits	75% - 125%	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	75% - 125%
Serial Dilution	One per batch of 20 samples, as determined by sampler	<10%D when analyte is >=50X QL	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	<10%D when analyte is >=50X QL
Duplicate	One per 20 samples, as determined by sampler	< 20% RPD	flag result, note in narrative	Spectrum Department Supervisor	Precision	< 20% RPD

Matrix	Soil
Analytical Group	Metals
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	100.0111
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL
Laboratory Control Sample	One per preparation batch of <=20 samples	80% - 120%	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	80% - 120%

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike (salts Na,K,Mg,Ca ,Fe,Al,Mn not spiked)	One per 20 samples, as determined by sampler	75% - 125%	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	75% - 125%
Post-digestion Spike	For each MS analyte out of QC limits	75% - 125%	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	75% - 125%
Serial Dilution	One per batch of 20 samples, as determined by sampler	<10%D when analyte is >=50X QL	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	<10%D when analyte is >=50X QL
Duplicate	One per 20 samples, as determined by sampler	< 20% RPD	flag result, note in narrative	Spectrum Department Supervisor	Precision	< 20% RPD

Matrix	Aqueous
Analytical Group	Mercury
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	100.0012
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL
Laboratory Control Sample	One per preparation batch of <=20 samples	80% - 120%	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	80% - 120%

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike	One per 20 samples, as determined by sampler	75% - 125%	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	75% - 125%
Duplicate	One per 20 samples, as determined by sampler	< 20% RPD	flag result, note in narrative	Spectrum Department Supervisor	Precision	< 20% RPD

Matrix	Soil
Analytical Group	Mercury
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	100.0012
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL
Laboratory Control Sample	One per preparation batch of <=20 samples	80% - 120%	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	80% - 120%

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike	One per 20 samples, as determined by sampler	75% - 125%	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	75% - 125%
Duplicate	One per 20 samples, as determined by sampler	< 20% RPD	flag result, note in narrative	Spectrum Department Supervisor	Precision	< 20% RPD

Matrix	Aqueous
Analytical Group	Cyanide
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	100.0004
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL
Laboratory Control Sample	One per preparation batch of <=20 samples	80% - 120%	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	80% - 120%

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike	One per 20 samples, as determined by sampler	75% - 125%	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	75% - 125%
Duplicate	One per 20 samples, as determined by sampler	< 20% RPD	flag result, note in narrative	Spectrum Department Supervisor	Precision	< 20% RPD

Matrix	Soil
Analytical Group	Cyanide
Concentration Level	Low
Sampling SOP(s)	
Analytical Method/SOP Reference	100.0004
Sampler's Name	
Field Sampling Organization	
Analytical Organization	Spectrum Analytical, RI Division
No. of Sample Locations	

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate		RPD <20			Precision	RPD <20
Cooler Temperature	1 per shipping cooler	<=10 degree C	Note in report		Accuracy / Representativeness	<=10 degree C
Field Equipment Blank		Analytes < = QL			Accuracy / Contamination	Analytes < = QL
Method Blank	One per preparation batch of <=20 samples	Analytes < = QL	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy / Contamination	Analytes < = QL
Laboratory Control Sample	One per preparation batch of <=20 samples	80% - 120%	If sufficient holding time remains, reprepare batch. If insufficient holding time, flag result, note in narrative	Spectrum Department Supervisor	Accuracy	80% - 120%

Quality Control (QC) Sample:	Frequency/ Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike	One per 20 samples, as determined by sampler	75% - 125%	flag result, note in narrative	Spectrum Department Supervisor	Accuracy	75% - 125%
Duplicate	One per 20 samples, as determined by sampler	< 20% RPD	flag result, note in narrative	Spectrum Department Supervisor	Precision	< 20% RPD

Brownfields QAPP Template #11a
Data Management and Documentation

Copies of chain-of-custody (COC) forms, air monitoring logs, test boring logs and well sampling and development logs will be included in the final report. Field notes and Site logbook will be maintained in the project file. Data Usability Summary Reports and the analytical laboratory Category B Deliverable package will be submitted with the final report.

Field Sample Collection Documents and Records	Analytical Laboratory Documents and Records	Data Assessment Documents and Records	Project File
• Site and field logbooks • Boring logs • Well construction diagrams • COC forms • Well sampling logs • Well development logs • Air monitoring data logs	• Sample receipt logs • Internal and external COC forms • Equipment calibration logs • Sample preparation worksheets/logs • Sample analysis worksheets/run logs • Telephone/email logs • Corrective action documentation	• Data validation reports • Field inspection checklist(s) • Laboratory Audit checklist (if performed) • Review forms for electronic entry of data into database • Corrective action documentation	• Project File will be maintained and stored at Day Environmental, Inc. offices for a minimum of 5 years after the completion of the project. • Laboratory data, logbooks and client reports are retained for 5 year unless specified otherwise.

Brownfields QAPP Template #11b
Project Reports

This table identifies the types of reports that will be provided during the Order of Consent project.

Type of Report	Frequency (Daily, weekly, monthly, quarterly, annually, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (Title and Organizational Affiliation)	Report Recipient(s) (Title and Organizational Affiliation)
Data Usability Summary Report	Twice. When final Category B Deliverable data packages are received from the laboratory for soil and groundwater.	10/12/2015 and 11/2/2015	Dr. Maxine Wright-Walters, Environmental Data Validation, Inc. (EDV)	Raymond Kampff and/or David D. Day, P.E., Day Environmental, Inc.
Remedial Investigation/ Feasibility Report	Upon Project Completion	12/27/2015	Raymond Kampff and/or David D. Day, P.E., Day Environmental, Inc.	Mike McAlpin, OBI, LLC.

Brownfields QAPP Template #12a
Planned Project Assessments Table

Not applicable to this project. This is a relatively short-term order on consent project; therefore assessment activities will be limited to oversight of filed team, subcontractors and peer review of the final report. No performance evaluation (PE) samples are planned for this project. However, the results of Spectrum Analytical, Inc.'s PE samples can be provided upon request.

Brownfields QAPP Template #12b
Assessment Findings and Corrective Action Responses

Not applicable to this project.

Brownfields QAPP Template #13a
Project Data Verification Process (Step I)

Verification Input	Description	Internal/ External	Responsible for Verification (Name, Organization)
Site/Field Logbooks	Field notes will be prepared daily by the Day Environmental, Inc. and will be complete, appropriate, legible and pertinent. Upon completion of field work, logbooks will be placed in the project files.	Internal	Raymond Kampff and/or David D. Day, P.E., Day Environmental, Inc.
Chains of custody	COC forms will be reviewed against the samples packed in the specific cooler prior to shipment. The reviewer will initial the form. An original COC will be sent with the samples to the laboratory, while copies are retained for (1) the Sampling Trip Report and (2) the project files.	Internal	Raymond Kampff and/or David D. Day, P.E., Day Environmental, Inc.
Laboratory analytical data package	Data packages will be reviewed/verified internally by the laboratory performing the work for completeness and technical accuracy prior to submittal.	Internal	Spectrum Analytical, Inc.
Laboratory analytical data package	Data packages will be reviewed as to content and sample information upon receipt by Day Environmental, Inc. and the Third Party Data Validation Personnel.	External	Raymond Kampff and/or David D. Day, P.E., Day Environmental, Inc.; Dr. Maxine Wright-Walters, EDV Inc.
EQUIS Electronic Data Deliverable (EDD)	Electronic data packages will be reviewed using the Equis Electronic Data Processor (EDP) to check for errors and omissions prior to submission to the NYSDEC.	Internal	Raymond Kampff and/or David D. Day, P.E., Day Environmental, Inc.
Final Sample Report	The project data results will be compiled in a sample report for the project. Entries will be reviewed/verified against hardcopy information.	Internal	Raymond Kampff and/or David D. Day, P.E., Day Environmental, Inc.

Refer to Table 1 for additional examples of data elements.

Brownfields QAPP Template #13b
Project Data Validation Process (Steps IIa and IIb)

Step IIa/IIb[1]	Validation Input	Description	Responsible for Validation (Name, Organization)
IIa	SOPs	Ensure that the sampling methods/procedures outlined in QAPP were followed, and that any deviations were noted/approved.	Raymond Kampff and/or David D. Day, P.E., Day Environmental, Inc.
IIb	SOPs	Determine potential impacts from noted/approved deviations, in regard to PQOs.	Raymond Kampff and/or David D. Day, P.E., Day Environmental, Inc.
IIa	Chains of custody	Examine COC forms against QAPP and laboratory contract requirements (e.g., analytical methods, sample identification, etc.).	Dr. Maxine Wright-Walters, EDV Inc.
IIa	Laboratory data package	Examine packages against QAPP and laboratory contract requirements, and against COC forms (e.g., holding times, sample handling, analytical methods, sample identification, data qualifiers, QC samples, etc.).	Dr. Maxine Wright-Walters, EDV Inc.
IIb	Laboratory data package	Determine potential impacts from noted/approved deviations, in regard to PQOs. Examples include PQLs and QC sample limits (precision/accuracy).	Dr. Maxine Wright-Walters, EDV Inc.
IIb	Field duplicates	Compare results of field duplicate (or replicate) analyses with RPD criteria	Dr. Maxine Wright-Walters, EDV Inc.

Step 1Ia – Compliance with Methods, Procedures and Contracts
Step IIb – Comparison with Performance Criteria in QAPP

Refer to Table 1 for additional examples of data elements.

Brownfields QAPP Template #13c
Project Matrix and Analytical Validation (Steps IIa and IIb) [1] Summary

This table identifies the matrices, analytical groups and concentration levels that each entity performing validation will be responsible for, as well as criteria that will be used to validate those data.

Step IIa/IIb[1]	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (title and organizational affiliation)
IIa / IIb	Soil/Aqueous	VOCs	Low-Med	National Functional Guidelines for Superfund Organic Methods Data Review – June 2008	Dr. Maxine Wright-Walters, EDV Inc.
IIa / IIb	Soil/Aqueous	SVOCs	Low	National Functional Guidelines for Superfund Organic Methods Data Review – June 2008	Dr. Maxine Wright-Walters, EDV Inc.
IIa / IIb	Soil/Aqueous	Metals	Low-Med	National Functional Guidelines for Superfund Inorganic Superfund Data Review – January 2012	Dr. Maxine Wright-Walters, EDV Inc.
IIa / IIb	Soil/Aqueous	PCBs	Low-Med	National Functional Guidelines for Superfund Organic Methods Data Review – June 2008	Dr. Maxine Wright-Walters, EDV Inc.
IIa / IIb	Soil/Aqueous	Pesticides	Low-Med	National Functional Guidelines for Superfund Organic Methods Data Review – June 2008	Dr. Maxine Wright-Walters, EDV Inc.

[1] Step IIa – Compliance with Methods, Procedures, and Contracts
[1] Step IIb – Comparison with Performance Criteria in QAPP

Refer to Table 1 for additional examples of data elements.

Brownfields QAPP Template #13d
Usability Assessment (Step III) [1]

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used:

Determine if any detectable amounts of contaminant(s) are present. If no detectable amounts are indicated and all data are acceptable for the verification and validation, then the data is usable. If verification and validation are not acceptable then take corrective action (determine cause, data impact, evaluate the impact and document the rationale for resampling).

Describe the evaluative procedures used to assess overall measurement error associated with the project:
Determine if the quality control data is within the performance criteria (precision, accuracy, etc.) through validation process IIb (Validation Activities).

Identify the personnel responsible for performing the usability assessment:
Project Management Team :
Raymond Kampff, Day Environmental, Inc.
David D. Day, P.E., Day Environmental, Inc.
Mike McAlpin, OBI LLC.
Dr. Maxine Wright-Walters, EDV Inc**.**

Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies:
The Data Usability Report (DUSR) will describe the rationale for the data and the presentation of data limitations. For example, if the performance criteria are not usable to address the regulatory requirements or support the project-decision for OBI, LLC., then the DUSR should address how this problem will be resolved and discuss the alternative approach.

[1] Step III – Usability Assessment

Table 1

Data Elements for Data Review Process				
Item	Step I - Data Verification	Step IIa - Data Validation Compliance	Step IIb - Data Validation Comparison	Step III - Data Usability
Planning Documents				
Evidence of approval of QAPP	X			Use outputs from previous steps
Identification of personnel	X			
Laboratory name	X			
Methods (sampling & analytical)	X	X	X	
Performance requirements (including QC criteria)	X	X		
Project quality objectives	X		X	
Reporting forms	X	X		
Sampling plans – locations, maps grids, sample ID numbers	X	X		
Site identification	X			
SOPs (sampling & analytical)	X	X		
Staff training & certification	X			
List of project-specific analytes	X	X		
Analytical Data Package				
Case narrative	X	X	X	Use outputs from previous steps
Internal lab chain of custody	X	X		
Sample condition upon receipt, & storage records	X	X		
Sample chronology (time of receipt, extraction/digestion, analysis)	X	X		
Identification of QC samples (sampling /lab)	X	X		
Associated PE sample results	X	X	X	
Communication Logs	X	X		
Copies of lab notebook, records, prep sheets	X	X		
Corrective action reports	X	X		
Definition of laboratory qualifiers	X	X	X	
Documentation of corrective action results	X	X	X	
Documentation of individual QC results (e.g., spike, duplicate, LCS)	X	X	X	
Documentation of laboratory method deviations	X	X	X	
Electronic data deliverables	X	X		
Instrument calibration reports	X	X	X	
Laboratory name	X	X		
Laboratory sample identification no.	X	X		
QC sample raw data	X	X	X	
QC summary report	X	X	X	

Data Elements for Data Review Process				
Raw data	X	X	X	Use outputs from previous steps
Reporting forms, completed with actual results	X	X	X	
Signatures for laboratory sign-off (e.g., laboratory QA manager)	X	X		
Standards traceability records (to trace standard source form NIST, for example)	X	X	X	
Sampling Documents				
Chain of custody	X	X		Use outputs from previous steps
Communication logs	X	X		
Corrective action reports	X	X	X	
Documentation of corrective action results	X	X	X	
Documentation of deviation from methods	X	X	X	
Documentation of internal QA review	X	X	X	
Electronic data deliverables	X	X		
Identification of QC samples	X	X	X	
Meteorological data from field (e.g., wind, temperature)	X	X	X	
Sampling instrument decontamination records	X	X		
Sampling instrument calibration logs	X	X		
Sampling location and plan	X	X	X	
Sampling notes & drilling logs	X	X	X	
Sampling report (from field team leader to project manager describing sampling activities)	X	X	X	
External Reports				
External audit report	X	X	X	Use outputs from previous steps
External PT sample results	X	X		
Laboratory assessment	X	X		
Laboratory QA plan	X	X		
MDL study information	X	X	X	
NELAP accreditation	X	X		

Appendix C-1

Brownfields Site-Specific
Environmental Protection Agency Quality Assurance Project Plan
(QAPP)

245-265 & 271 Hollenbeck Street and 50 Balfour Drive
Rochester, New York

NYSDEC Site #828188

Example of Chain-of-Custody and Custody Seal

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page ____ of ____

Special Handling:

☐ Standard TAT - 7 to 10 business days

☐ Rush TAT - Date Needed: __________

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed.

Report To: __________

Telephone #: __________
Project Mgr: __________

Invoice To: __________

P.O No.: __________ Quote/RQN: __________

Project No: __________
Site Name: __________
Location: __________ State: __________
Sampler(s): __________

F=Field Filtered 1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11=__________ 12=__________

DW=Dinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1=__________ X2=__________ X3=__________

G= Grab C=Compsite

List Preservative Code below:

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? ☐ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☐ Standard ☐ No QC
☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☐ Other: __________
State-specific reporting standards:

						Containers					Analysis									
Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic										Check if chlorinated	
																			☐	
																			☐	
																			☐	
																			☐	
																			☐	
																			☐	
																			☐	
																			☐	
																			☐	
																			☐	

Relinquished by:	Received by:	Date:	Time:	Temp °C
				Observed
				Correction Factor
				Corrected
				IR ID#

☐ EDD format: __________

☐ E-mail to: __________

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☐ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

CHAIN OF CUSTODY SEAL

Initials ____________ Date ____________

Appendix C-2

Brownfields Site-Specific
Environmental Protection Agency Quality Assurance Project Plan
(QAPP)

245-265 & 271 Hollenbeck Street and 50 Balfour Drive
Rochester, New York

NYSDEC Site #828188

Standard Operating Procedures

INTRODUCTION

This standard operating procedure (SOP) document was prepared in accordance with Section 2.4 of the New York State Department of Environmental Conservation (NYSDEC) Technical Guidance for Site Investigation and Remediation DER-10 dated May 2010 and supplements the Environmental Protection Agency (EPA) Quality Assurance Project Plan (QAPP) for 245-265 & 271 Hollenbeck Street and 50 Balfour Drive, Rochester, New York (the Site). This SOP document provides procedures to be used during sampling of environmental media and other field activities during implementation of the Site's Remedial Investigation/Feasibility Study Work Plan (RI/FS Work Plan) to ensure that data of a known and acceptable precision and accuracy are generated.

As part of the EPA QAPP, QA/QC protocol and procedures have been developed and are described below. The objective of the QA/QC protocol and procedures is to ensure that the information, data, and decisions associated with this project are technically sound and properly documented. The QA/QC protocol and procedures also pertain to the collection, evaluation, and review of activities and data that are part of this project.

OPERATION AND CALIBRATION OF ON-SITE MONITORING EQUIPMENT

On-site monitoring equipment will play a significant role in meeting the Remedial Investigation (RI) objectives and to determine the appropriate personal protective equipment (PPE) as noted in the health and safety plan (HASP). The on-site monitoring equipment includes volatile organic compound (VOC) monitors, particulate monitors, oil/water interface probes, an electronic static water level indicator; water quality monitors, and global position system (GPS). Operation and calibration of on-site monitoring equipment that are anticipated for use during the RI are discussed below.

VOC Monitoring Equipment

Real-time monitoring for VOCs will be conducted to evaluate the nature and extent of petroleum and chlorinated solvents discharges at the Site and to determine the appropriate personal protective equipment as noted in the HASP. The primary field instrument for monitoring VOCs during the RI will be a photoionization detector (PID). It is anticipated that a MiniRAE 2000 PID (or equivalent) equipped with a 10.6 eV lamp will be used during this project. An accredited firm/testing laboratory calibrates the equipment on a yearly basis. During fieldwork, the PID will be calibrated on a daily basis in accordance with the manufacturer's specifications. Isobutylene gas will be used to calibrate the PID prior to use and as necessary during fieldwork. Measurements will be collected before operations begin in an area to determine the amount of VOCs naturally occurring in the air (i.e., background concentrations).

Particulate Monitoring Equipment

Particulate monitoring will be conducted during intrusive activities as noted in the Community Air Monitoring Plan (CAMP) portion of the HASP. It is anticipated that the particulate air monitoring will be conducted using a real-time aerosol monitor (RTAM) particulate meter. An accredited firm/testing laboratory will calibrate the equipment on a yearly basis. During fieldwork, the particulate meter will be regularly calibrated in accordance with the manufacturer's specifications. Measurements will be collected along the upwind perimeter of the intrusive investigation activities to determine the amount of particulates naturally occurring in the air (i.e., background concentrations) as per the requirements of the CAMP.

Global Positioning System Equipment

A GPS unit will be used to obtain the precise locations of sampling points and significant site features. It is anticipated that a Trimble GeoXH will be used during this project. The GPS location accuracy of less than 1 horizontal foot is the data quality objective for this project. The GPS unit will be calibrated as needed in accordance with the manufacturer's specifications. The GPS location data will conform to Rochester's GIS coordinate system (NAD 1983 State Plane New York West).

Miscellaneous Field Monitoring Equipment

Several other pieces of miscellaneous field monitoring equipment will be used as part of the project. It is anticipated that the other field monitoring equipment utilized during portions of the project include:

- An electronic static water level indicator;
- An oil/water interface meter, and;
- A Horiba U-22 water quality meter that measures pH, specific conductivity, temperature, dissolved oxygen, oxygen-reduction potential, and turbidity.

These meters will be calibrated, operated, and maintained in accordance with the manufacturer's recommendations.

SOIL, GROUNDWATER AND WASTE SAMPLING AND LOGGING

A qualified Day Environmental, Inc. (DAY) representative will: document visual observations; screen the split spoon and/or macro-core samples with a PID; collect selected portions of the samples for possible laboratory analysis; collect other portions of the samples (and process and screen the headspace of these selected samples with a PID); photograph the test boring work; and prepare test boring logs that provide pertinent field information. In general, soil samples will be collected from the most impacted zones; however additional soil samples may be collected for delineation purposes. Soil samples collected for VOC analysis will be collected using EPA Method 5035A. Pertinent information will be recorded on test boring/well logs, and will include:

- Date, boring/well identification, and project identification;
- Name of individual developing the log;
- Name of drilling contractor;
- Drill make and model, and auger size;
- Identification of alternative drilling methods used and justification thereof;
- Depths recorded in feet and fractions thereof (tenths of inches) referenced to ground surface;
- Standard penetration test (ASTM D-1586) blow counts;
- The length of the sample interval and the percentage of the sample recovered;
- Description of soil type using the Unified Soil Classification System;
- The depth of the first encountered water table, along with the method of determination, referenced to ground surface;
- Drilling and borehole characteristics;
- Sequential stratigraphic boundaries and soil types consistent with logging performed on other project elements;
- Well specifications (materials; screened interval; amount of Portland cement, bentonite and water used to mix grout; etc.); and
- PID screening results of ambient air above selected soil samples for the entire length of the soil in the spilt spoon/sleeve.

The logs described above for wells advanced into bedrock will also include pertinent information pertaining to the following characteristics noted on the bedrock cores:

- Bedrock type and lithology;
- Core Recovery Calculations and Rock Quality Determinations (RQDs);
- Bedrock color and texture;
- Bedrock degree of decomposition, weathering, and disintegration;
- Bedrock fracture types (e.g., vertical, lateral, diagonal, mechanical), density, and fracture infilling (e.g., mineralization, which is common in certain layers of Lockport Dolomite); and,
- The anticipated formation name.

Soil Sample Screening

The recovered soil samples will be visually examined by a DAY representative for evidence of suspect contamination (e.g., staining, unusual odors) and screened with a PID. Ambient soil sample PID screening will be completed for the entire length of the soil in the spilt spoon/sleeve by making small cracks in the soil and placing the PID intake near each crack and loosely covering with a gloved hand Portions of the recovered soil samples may be placed in containers for possible analytical laboratory testing. Different portions of the soil samples will concurrently be placed in sealable Ziploc®-type plastic baggies, and will be field screened the same day they are collected. Each sample will be agitated and homogenized for at least 30 seconds and allowed to equilibrate for at least three minutes. The ambient headspace air inside the baggie above each sample will be screened for total VOC vapors with the PID equipped with a 10.6 eV lamp. The sampling port for the PID will be placed in the ambient air headspace inside the bag by opening a corner of the "locked" portion of the bag. The PID will monitor air inside the baggie for a period of at least 15 seconds and the peak readings measured will be recorded on a log sheet or log book.

NAPL Screening Shake Test

Field evidence of suspect non-aqueous phase liquid (NAPL) will be confirmed in the field utilizing a hydrophobic dye shake test. Field evidence of suspect NAPL include, but not limited to, elevated PID readings (i.e., greater than 1,000 parts per million (ppm)), saturated soil with petroleum or solvent odors or significant staining, and apparent free phase or residual NAPL. The NAPL screening shake test is applicable for both light non-aqueous phase liquid (LNAPL) and DNAPL. If field evidence suggests the presence of LNAPL or DNAPL, DAY will perform a shake test on an aliquot of the corresponding soil sample using hydrophobic dye. The sample aliquot will be mixed with approximately two ounces potable water, and a pinch of Sudan IV or equivalent hydrophobic dye will be placed in a sealable plastic baggie, agitated for approximately 10 seconds, and then noted for pigment staining. If organic NAPL is present, the Sudan IV Pigment should result in pigment staining. The NAPL screening shake test results will be documented and if possible photographed for documentation purposes. The hydrophobic dye will be handled with care using a new pair of disposable gloves. Following the shake test, the plastic baggie containing the soil-dye moisture and associated PPE should be managed as investigation derived waste (IDW). Soils containing hydrophobic dye and PPE will not be used for confirmatory analytical analyses or headspace readings.

Well Development

Monitoring wells will be developed by utilizing either a new dedicated disposable bailer with dedicated cord, and/or a pump and dedicated disposable tubing depending on the field conditions. Monitoring well development can occur a minimum of 48 hours after installation. No fluids will be added to the wells during development without prior approval of the NYSDEC, and well development equipment will be decontaminated prior to development of each well.

The well development procedure is listed below:

- Obtain pre-development static water level and oil/water interface reading for presence of LNAPL or DNAPL using a Heron Model HO1.L oil/water interface probe or similar instrument;
- Calculate water/sediment volume in the well;
- Obtain initial field water quality measurements (e.g., pH, specific conductivity, turbidity, temperature, and PID readings). The pH, specific conductivity, turbidity and temperature readings will be obtained using Horiba U-22 water quality meter (or similar equipment);
- Select development method and set up equipment depending on method used;
- Alternate water agitation methods (e.g., moving a bailer or pump tubing up and down inside the screened interval) and water removal methods (e.g., pumping or bailing) in order to suspend and remove solids from the well;
- Obtain field water quality measurements for every two to five gallons of water removed. Record water quantities and rates removed;

- Stop development when the following water quality criteria are met and at least 10 well volumes have been removed;
- Water is clear and free of sediment and turbidity is less than 50 nephelometric turbidity units (NTUs);
- pH is ±0.1 standard unit between readings;
- Specific conductivity is ±3% between readings, and;
  - Temperature is ±10% between readings.
- Obtain post-development water level readings; and
- Document development procedures, measurements, quantities, etc.

The volume of water lost during well installation of bedrock wells will be measured and recorded. At a minimum, the volume of water lost plus an additional five well volumes will be removed during development. NYSDEC will be contacted if this appears to be infeasible. In a case where considerable drill water is lost to the formation (i.e. greater than 10 well volumes) during boring advancement activities, the above well development procedures may be modified. Prior to modifying the well development procedures, the NYSDEC will be consulted on whether to attempt to remove a volume of water greater than the volume of water lost, or to conduct conventional development and allow a greater amount of time between development and the first round of initial groundwater sampling.

Pertinent information for each well will be recorded on well development logs.

Low-Flow Groundwater Purging and Sampling

The low-flow procedures that will be utilized are outlined below:

- In order to minimize the potential re-suspension of solids in the bottom of the well, well depths will not be measured prior to or during low-flow purging and sampling. Well depth information will be obtained from measurements collected during well development or the well logs.
- PID readings will be obtained from the well headspace immediately following opening the well. The peak PID readings will be noted on the field logbook.
- Prior to purging and sampling, static water level measurements will be taken from each well using a Heron Model HO1.L oil/water interface probe or similar instrument. The presence or absence of LNAPL will be determined. If present, the thickness of LNAPL will be obtained.
- If necessary to confirm whether NAPL is present in groundwater that contain PID measurements greater than 500 ppm or other field indications of NAPL, hydrophobic dye (i.e., Sudan IV) may be introduced to an aliquot of the sample. If LNAPL or DNAPL is detected, the NYSDEC will be notified to determine whether analytical characterization of the NAPL is warranted.
- A portable bladder pump connected to new disposable polyethylene tubing will be lowered and positioned at or slightly above the mid-point of the well screen or cored open bedrock when this interval is set in relatively homogeneous material. The location of the pump will be identified on the groundwater sample collection log. When the screened interval or cored open bedrock interval is set in heterogeneous materials, the pump will be positioned adjacent to the zone of highest hydraulic conductivity (as defined by geologic samples). Care will be taken to install and lower the bladder pump slowly in order to minimize disturbance of the water column.
- The pump will be connected to a control box that is operated on compressed gas (nitrogen, air, etc.) and is capable of varying pumping rates. An in-line flow-through cell attached to a Horiba U-22 water quality meter (or similar equipment) will be connected to the bladder pump effluent tubing to measure water quality data.
- The pump will be started at a low pumping rate of 100 ml/min or less (for pumps that cannot achieve a flow rate this low, the pump will be started at the lowest pump rate possible). The water level in the well will be measured and the pump rate will be adjusted (i.e., increased or decreased) until the drawdown is stabilized. In order to establish the optimum flow-rate for purging and sampling, the water level in the well will be measured on a periodic basis (i.e., every one or two minutes) using an electronic water level meter or the Heron Model HO1.L oil/water interface meter (or equivalent). When the water level in the well has stabilized (i.e., use goal of < 0.33 feet of constant drawdown), the water level measurements will be collected less frequently.

- While purging the well at the stabilized water level, water quality indicator parameters will be monitored on a three to five minute basis with a Horiba U-22 water quality meter (or similar equipment). Water quality indicator parameters will be considered stabilized after three consecutive readings for each of the following parameters are generally achieved:
  - pH (± 0.1);
  - specific conductance (± 3%);
  - dissolved oxygen (± 10 %);
  - oxidation-reduction potential (± 10 mV);
  - temperature (± 10%); and
  - turbidity (± 10%, when turbidity is greater than 10 NTUs).
- Following stabilization of the water quality parameters, the flow-through cell will be disconnected and a groundwater sample will be collected from the bladder pump effluent tubing. The pumping rate during sampling will remain at the established purging rate or it may be adjusted downward to minimize aeration, bubble formation, or turbulent filling of sample containers. A pumping rate below 250 ml/min will be used when collecting VOC samples.
- To minimize the potential for re-suspension of solids in the bottom of the well, the presence of DNAPL will be determined following purging and sampling at each well location using the Heron oil/water interface probe (or equivalent).
- Field observations, real-time parameter readings, and other pertinent information obtained during the sampling effort will be noted in the field logbook and a low-flow groundwater purge and sample form.

Waste Characterization Sampling

IDW will be managed in accordance with the guidelines outlined in Section 4.5 of the RI/FS Work Plan. Supplemental sampling of the IDW is anticipated in order to obtain approvals for disposal and/or recycling at an authorized solid waste management facility or publicly owned wastewater treatment works (liquids). The following protocols likely apply to IDW sampling:

- The objective of IDW sampling is to characterize a substantial mass of waste requiring disposal. Consequently, the sample should be collected in a manner that is representative of the entire waste mass and not limited to a specific zone of concern or observed contamination.
- Grab samples may be composited to form one sample for analytical analyses.

EQUIPMENT DECONTAMINATION PROCEDURES

In order to reduce the potential for cross-contamination of samples collected during this project, the following procedures will be implemented to ensure that the data collected (primarily the laboratory data) is acceptable.

It is anticipated that most of the materials used to assist in obtaining samples will be disposable one-time use materials (e.g., sampling containers, bailers, rope, pump tubing, latex gloves, etc.). However, when equipment must be re-used (e.g., drill rigs, static water level indicator, split spoon samplers, etc.), it will be decontaminated by at least one of the following methods:

- Steam clean the equipment within a dedicated decontamination area; or
- Rough wash in tap water; wash in mixture of tap water and Alconox-type soap; double rinse with deionized or distilled water; and air dry and/or dry with clean paper towel.

The effectiveness of the equipment decontamination of non-dedicated sampling equipment such as split-spoon samplers will be evaluated via analytical laboratory testing of field blanks (e.g., rinsate samples). Decontamination liquids and disposable equipment and PPE will be containerized and left on-site until a proper disposal method is determined.

SAMPLE HANDLING AND CUSTODY REQUIREMENTS

During sampling activities, personnel will wear disposable latex or nitrile gloves. Between collection of samples, personnel performing the sampling will discard used latex gloves and put on new gloves to preclude cross-contamination between samples. As few personnel as possible will handle samples or be in charge of their custody prior to shipment to the analytical laboratory.

New laboratory-grade sample containers will be used to collect samples. Sufficient volume (i.e., as specified by the analytical laboratory) will be collected to ensure that the laboratory has adequate sample volume to perform the specified analyses. Samples with zero headspace will be collected when VOC analysis is going to be performed. Samples will be kept on ice in a cooler for shipment to the analytical laboratory.

Samples will be preserved as specified by the analytical laboratory for the type of parameters and matrices being tested. The required amount of preservatives will be added by the analytical laboratory to the sample containers prior to delivery to the Site. The sample preservation requirements and holding times that will be adhered are provided in Attachment 6.

Chain-Of-Custody

Samples that are collected for subsequent testing as part of this project will be handled using chain-of-custody control. Chain-of-custody documentation will accompany samples from their inception to their analysis, and copies of chain-of-custody documentation will be included with the laboratory's report. The chain-of-custody will include the date and time the sample was collected, the sample identity and sampling location, the requested analysis, and any request for accelerated turnaround time.

Sample Labels

Sample labels for field samples and QC samples with adhesive backing will be placed on sample containers in order to identify the sample. Sample information will be clearly written on the sample labels using waterproof ink. Sufficient sample information will be provided on the label to allow for cross-reference with the field sampling records or sample logbook.

The following information will be provided on each sample label:

- Name of company;
- Initials of sampler;
- Date and time of collection;
- Sample identification;
- Intended analyses; and
- Preservation required.

Custody Seals

Custody seals are preprinted adhesive-backed seals that are designed to break if disturbed. Seals will be signed and dated before being placed on the shipping cooler. Seals will be placed on one or more location on each shipping cooler as necessary to ensure security. Shipping tape will be placed over the seals on the coolers to ensure that the seals are not accidentally broken during shipment. Sample receipt personnel at the laboratory will check and document whether the seals on the shipping coolers are intact when received.

Sample Identification

The following format will be used on the labels affixed to sample containers to identify samples:

Each sample will be numbered starting at the next number that follows the last number used. The number will then continue in succession (i.e., if the last number used is 049, then the first number to be used during the RI will be 050, and then continue on with 051, 052, 053, etc.). The sample test location will also be provided after the sample number using the following test location designations:

TB-xx (x-x)	Test Boring soil sample with depth interval in parentheses below ground surface in tenths of a foot (x – x)
MW-XX	Groundwater sample with monitoring well number
TBxx/xx/xx-	Trip Blank sample with month/day/year
FBxx/xx/xx-	Field Blank sample (rinsate) with month/day/year

As an example, assuming the first project sample is a soil sample collected from a test boring TB-1 at a depth of 10 feet, the sample will be designated as 051/TB-1(10).

Transportation of Samples

Samples will be handled, packaged and shipped in accordance with applicable regulations, and in a manner that does not diminish their quality or integrity. Samples will be delivered to the laboratory no later than 48 hours from the day of collection.

RECORD KEEPING AND DATA MANAGEMENT

DAY will document project activities in a bound field book on a daily basis. Information that will be recorded in the field book will include:

- Dates and time work is performed;
- Details on work being performed;
- Details on field equipment being used;
- Field evidence of contamination such as staining, odors, degree of saturation, etc.
- Field meter measurements collected during monitoring activities;
- Sampling locations and depths measured in tenths of feet;
- Measurements of sample locations, and test locations, excavations, etc.;
- Personnel and equipment on-site;
- Weather conditions; and
- Other pertinent information as warranted.

In addition, the field notes will be converted into logs for each test pit excavation, soil test boring and monitoring well completed as part of the RI.

Differential GPS, swing ties from existing surveyed site structures, and/or a licensed surveyor will be used to collect spatial data. The spatial data will be plotted using integrated GIS and/or computer-aided design (CAD) mapping. Electronic and hard copy files will be maintained by the DAY.

As noted above, DAY will utilize a Trimble Geo-XH sub-foot accuracy GPS (or equivalent) with ESRI ArcPad installed software with GIS shape files that have been developed for the Site.

Appendix C-3

Brownfields Site-Specific
Environmental Protection Agency Quality Assurance Project Plan
(QAPP)

245-265 & 271 Hollenbeck Street and 50 Balfour Drive
Rochester, New York

NYSDEC Site #828188

Resumes

DAVID D. DAY, P.E.

EXPERIENCE

Day Engineering, P.C./Day Environmental, Inc.: 1985 to present
Years with Other Companies: 10 years

AREAS OF SPECIALIZATION

-Environmental Due Diligence for Mergers or Acquisitions
-Environmental Restoration/Remediation
-Environmental Site Assessment
-Environmental Compliance

EDUCATION

University of Michigan, M.S. Environmental Engineering, 1975
Michigan State University, B.S. Civil/Sanitary Engineering, 1974

REGISTRATION/AFFILIATIONS

Licensed Professional Engineer in New York
40-Hour OSHA Hazardous Waste Site Worker Training
8-Hour OSHA Hazardous Waste Site Supervisor Training
8-Hour OSHA Hazardous Waste Site Worker Refresher Training

Water Environment Federation
Rochester Engineering Society, Inc.
National Society of Professional Engineers

RESPONSIBILITIES AND PROJECT EXPERIENCE

President of Day Engineering, P.C. and Day Environmental, Inc. (DAY). As a founder and principal of these firms, Mr. Day is responsible for their overall management and operation. He also provides technical guidance and support to the Industrial Compliance Group, Phase I Assessment Group, and the Phase II/Remediation Group. In addition, he periodically serves as Project Manager on some of the firm's larger or more complicated projects.

Mr. Day has about 40 years of experience working on environmental projects for industry or as a consultant. Examples of the types of environmental projects that he has worked on are described below.

Due Diligence for Mergers or Acquisitions, Primarily in New York State. Principal for a variety of projects associated with the merger or acquisition of manufacturing and/or industrial operations. These projects involved representing the buyers of the operations, as well as working with the buyer’s lenders and environmental legal counsel. The work entailed such things as obtaining and generating environmental information and data, evaluating the information and data, developing opinion-of-probable costs for addressing environmental issues, assessing environmental risks in relation to the client’s merger or acquisition, and working with the environmental legal counsel to develop environmental risk management programs (e.g., indemnifications, escrow accounts, environmental liability insurance, deal structure, etc.).

Environmental Management Services for the Operation of Commuter Rail Facilities, Maryland and Florida. Principal for projects to assist an operator of major transportation systems in establishing environmental programs at commuter railway facilities in Maryland and Florida. The work includes such things as establishing compliance and permitting needs; developing the plans and programs needed for compliance; preparing the needed permits for submission to appropriate regulatory authorities; developing an Environmental Services Work Plan (Work Plan); and assisting the operator in implementing the Work Plan.

Environmental Services for Scrap Yard Operations, New York State. Principal of projects to assist scrap yard operations in complying with applicable state and Federal regulations. DAY has worked with a variety of scrap yard operations over a 20+ year period. The work has entailed such things as investigation and remediation of spills of petroleum/gasoline products and PCBs; preparing environmental plans and programs for the scrap facilities (e.g., SPCC Plans, Best Management Plans, etc.); assisting in stormwater and wastewater discharge issues (e.g., meeting SPDES permit or Multi-Sector General Permit requirements); assisting with the characterization and disposal of waste materials (e.g., auto fluff and contaminated soil); and, compliance audits.

Brownfield Assistance Program, City of Rochester. Principal for a project to assist the City of Rochester (City) in implementing its EPA funded Brownfield Assistance Program (BAP). The project has involved working with the City's Department of Environmental Services and Department of Economic Development to evaluate potential sites as candidates for the BAP program. DAY has conducted and/or prepared Phase I Environmental Site Assessments, Phase I confirmational intrusive studies, environmental management plans, and health and safety plans for this project at under-utilized sites within the City. This work has led to the redevelopment of BAP sites into active, tax-producing sites.

Investigation/Remediation of Former Department of Defense Site, Rochester, NY. Principal for a project to conduct investigation/remediation at a site that was formerly used by the Department of Defense (DOD) for the production of ocean-going ships, and missiles. DAY negotiated with the New York State Department of Environmental Conservation (NYSDEC) to conduct this work under a Voluntary Clean-Up Agreement. Soil, groundwater, and wetlands in the vicinity of the site are contaminated with a variety of contaminants including volatile organic compounds, metals, and PCBs. The work included investigation and delineation of contamination, and the design and implementation of interim remedial measures.

Remediation at a Former Printed Circuit Board Facility, Rochester, NY. Principal for a project to conduct remedial activities at a NYSDEC listed inactive hazardous waste disposal site. The remediation is being conducted under the Brownfield Cleanup Program (BCP). DAY completed a Remedial Investigation/Feasibility Study (RI/FS), and a remedial alternative was proposed for the site. The NYSDEC approved the proposed remedial alternative, and remedial activities are currently being implemented. After remedial activities are completed, operation of a groundwater remedial system and on-going monitoring will continue for 20+ years.

Phase I/Phase II/Remediation Services, City of Rochester, NY. Principal for a contract to conduct Phase I, Phase II, and remediation services for the City of Rochester on an as-needed basis. These services have been provided on a variety of different types of sites within the City.

Slag and Fill Management Project, Greece and Rochester, NY. Principal for a project to coordinate and oversee the removal of 25,000+ yards of slag-contaminated fill material from a residential site in Greece, NY. The fill material was contaminated with slag that came from a site that was being redeveloped in the City of Rochester. The contaminated fill material was removed from the residential site to a site within the City, where the fill material was screened, and the separated slag was transported to a solid waste facility for disposal. DAY worked closely with City officials, the NYSDEC, contractors, the public, and other regulatory authorities on this project.

Compliance Audits at Various Industrial Facilities in New York. Project Manager/Principal for compliance audits conducted at industrial facilities. The compliance audits encompassed the following types of environmental issues: air pollution, water pollution, hazardous and solid waste management, tank management, and petroleum handling and storage. The compliance audits have been conducted at a variety of different types of facilities including: plating facilities, auto dealerships, heat treating facilities, packaging/printing facilities, power generating facilities, tool and die operations, and other types of manufacturing operations.

Phase I Assessments Throughout New York State. Principal to review 2,000+ environmental assessments conducted for the purpose of real estate transactions. These assessments were conducted on a variety of different types of facilities, including industrial sites, manufacturing operations, and former railroad properties.

Electric Utility SPCC Plan Implementation, Western, New York. Project Manager/Principal and certifying professional engineer for a Spill Prevention Control and Countermeasures (SPCC) Plan covering 162 electrical substations located throughout western New York. The project involved identifying potential spill pathways at each of the substations, and ranking the potential for a spill to impact navigable water (i.e., low, medium or high risk). When needed, recommendations were also developed to reduce the risk of navigable water impact. The approach utilized on this project was very cost effective and resulted in the certification of one SPCC plan for 162 electrical substations.

Hazardous Waste and Hazardous Material Compliance Audit at a Major Railroad Yard Facility. Project Manager/Principal for conducting a compliance audit at a Railroad Yard facility to assess hazardous waste and hazardous material handling and storage. The audit report outlined recommendations for improving the handling and storage of hazardous materials and wastes.

RCRA Training For a Major Railroad Operation in New York and Connecticut. For several years, provided training to over 400 railroad personnel on handling and storage of hazardous waste as required by the Resource, Conservation, and Recovery Act (RCRA).

Hazardous Waste Tank Certification Project at Large Industrial Facility, Rochester, NY. Project Manager/Principal responsible for developing tank certification reports for 50 hazardous waste storage tanks as required by the New York State hazardous waste regulations.

Remedial Investigation on a New York State Inactive Hazardous Waste Site, Clarendon, NY. Project Manager/Principal for a $300,000 remedial investigation at a site where groundwater was contaminated by volatile organic compounds. Worked with client's attorney to secure funding of this project by insurance companies. The project was completed as required by the New York State Department of Environmental Conservation (NYSDEC) Order-on-Consent.

Drain Study at a Major Manufacturing Facility, New York. Project Manager/Principal for conducting a $200,000+ investigation to determine the discharge location (i.e., sanitary sewer, storm sewer, drywells, subsurface, etc.) of the various operations (i.e., processes, floor drains, hub drains, roof drains, sumps, scrubber drains, sinks, etc.) at a 5 million square foot manufacturing facility that contained over 40 buildings. A database was established to identify and track the discharge sources and locations to ensure compliance with local, State, and federal regulations.

Remediation at a Scrap Yard, Olean, NY. Project Manager/Principal for investigation and remediation of several hundred drums and containers that were abandoned at a scrap yard. The drums and containers contained a variety of types of hazardous wastes. The investigation and clean-up was conducted and completed under an USEPA Order-On-Consent.

RAYMOND L. KAMPFF

EXPERIENCE

Day Environmental, Inc.: May 1994 to present
Years with Other Firms: 18 years

AREAS OF SPECIALIZATION

- Environmental Site Assessment
- Environmental Restoration
- Geology

EDUCATION

University of Rochester, B. A. Geology 1974
Monroe Community College, Civil Engineering Technology 1976
Various continuing education courses/seminars in environmental regulations, remediation techniques and other technical issues

REGISTRATION/AFFILIATIONS

- 40-Hour OSHA Hazardous Waste Site Worker Training
- 8-Hour OSHA Hazardous Waste Site Supervisor Training
- 8 Hour OSHA Hazardous Waste Site Worker Refresher Training

RESPONSIBILITIES AND PROJECT EXPERIENCE

Mr. Kampff has over 38 years of professional experience and is currently responsible for the overall technical and administrative direction of DAY's Site Evaluation/Environmental Restoration Group. Mr. Kampff's experience includes environmental studies and remediation at inactive hazardous waste sites, industrial facilities, petroleum spill sites, Brownfield sites and municipal properties. Some of his representative projects are described below.

Environmental Site Assessment

Environmental Site Assessment for a Manufacturing Facility: Olean, New York. Responsible for a Phase I Environmental Site Assessment (ESA) and a Limited Phase II ESA for this 14-acre site currently developed with a 280,000 square foot industrial facility. The site was originally developed in the 1890s, and historically it has been used for various purposes including the manufacture of chemicals, metal furniture and industrial coatings. These studies were done to characterize the site in sufficient detail to prepare an application to enter the New York State Brownfield Cleanup Program (BCP).

Site Evaluation and Assessment of PCB Impact: Innis-Arden Golf Course. Reviewed documents and evaluated analytical laboratory data presented as part of a claim that discharges from a nearby railroad line operated by Metro-North Railroad (MNR) caused PCB-impact identified within ponds and streams on the golf course. The evaluation completed determined that nearby industrial facilities, and not MNR, were the responsible for the PCB contamination on the golf course.

Environmental Evaluation, Precast Concrete Facility, Manchester, New York. Responsible for the environmental evaluation of this 105-acre former railroad yard that was re-developed with an approximate 70,500 square foot structure in the late 1980s for use as a pre-cast concrete manufacturing facility. The site assessment studies conducted included testing of soil, groundwater and soil vapors to evaluate areas of potential environmental concern pursuant to the sale of the property. These studies included the delineation of an area of the site impacted with petroleum that resulted in the New York State Department of Environmental Conservation (NYSDEC) opening a spill file, and another area on the site where groundwater impacted with chlorinated solvents was identified.

Petroleum Spills

Petroleum Spill Remediation and Closure: Metro-North Railroad's Brewster Yard, North White Plains Yard and Harmon Yard in New York. Assisted MNR with the assessment and remediation of various petroleum spills at these railroad yards where petroleum impact from historic operations resulted in the accumulation of several feet of free product in some locations. The work included the design and construction of a combination of active and passive removal systems, design and operation of long-term monitoring networks to document the effectiveness of remedial efforts and, the preparation of status reports for submittal to the NYSDEC to document remedial efforts pursuant to spill closure.

Seneca-Cayuga ARC Spill Remediation: Waterloo, New York. Responsible for site characterization studies to assess the nature and extent of historic petroleum releases resulting from leaking tanks and discharges into septic systems. Subsequently, designed and implemented a remedial action plan to address petroleum impacts and to mitigate vapors in an adjacent building under construction. The remedial activities included the removal of underground storage tanks and petroleum-impacted soil/groundwater, the installation of a sub-slab depressurization system, and the preparation of a Site Management Plan (SMP) to address future impacts (if encountered).

Remedial Action Plan Development and Implementation: Mott Haven Yard, Bronx, New York. Completed site characterization studies to define the nature and extent of petroleum spills resulting from a combination of leaking tanks and discharges from railroad equipment. Based on the findings of the characterization studies, a removal of soil impacted with free product was conducted in accessible areas and systems were designed and implemented to preclude future discharges (e.g., installation of state-of the art fueling system, development of SPCC plans, construction of secondary containment systems). Subsequently, a Remedial Action Plan (RAP) describing methods to be implemented to collect residual free product from the groundwater was prepared for submittal to the NYSDEC.

York Oil Superfund Site RI/FS: Moira, New York. Managed several studies to evaluate on-site contamination and off-site pathways at this former waste oil recycling facility where large quantities of PCB and solvent-laden oils spilled onto the ground and migrated into adjacent wetlands.

Brownfield and RI/FS Projects

Interim Remedial Measure (IRM) Construction, Confidential Industrial Client: Akron, New York. Responsible for construction oversight during the implementation of IRM activities at an approximate 3-acre former waste disposal area used to dispose of hazardous and industrial wastes. Work included construction oversight during waste consolidation and capping activities, coordination with the NYSDEC, implementation of design modifications and preparation of various closure reports. Also, responsible for long term monitoring and the preparation of Periodic Review Reports.

Dry Cleaners: Jamestown, New York: Responsible for studies completed to evaluate the extent of chlorinated solvents in the soil and groundwater at this dry cleaning facility that has operated for the past 50 years. Also developed and implemented remediation system to actively remove more than 200 gallons of Dense Non-Aqueous Liquid (DNAPL), the design and construction of a permeable reactive barrier to preclude off-site migration, and the implementation of in-situ bioremediation to address residual impacts.

Harmon Railroad Yard Former Wastewater Lagoon: Croton-on-Hudson, New York. Responsible for the preparation of the Site Management Plan (SMP), long-term monitoring, preparation of status and Periodic Review Report reports, and implementation of corrective actions for Operation Units OU-I and OU II at this NYSDEC Inactive Hazardous Waste Site.

Manufacturing Facility: Rochester, New York. Responsible for the Remedial Investigation conducted at this facility where groundwater is impacted with elevated concentration of chlorinated solvents and heavy metals. Work includes studies designed to assess the nature and extent of impact with the soil, groundwater and soil vapor (including sub-slab studies within on-site structures and assessment of potential off-site impacts). Studies also included the design and implementation of pilot studies to evaluate bioaugmentation and phytoremediation as potential long-term remedial options.

Environmental Restoration Projects

Remediation of Petroleum Contaminated Soils, DePaul Community Facilities: Rochester, New York. Responsible for the design and construction of a combined active and passive soil vapor extraction system at this facility constructed on the site of a former gasoline station.

Track Platform Assessment and Encapsulation, Grand Central Terminal: New York, New York. Project Manager for a testing program designed to define the extent of PCB contamination and develop a comprehensive remedial program consisting of the initial cleaning of the impacted track area following by a double epoxy coating was required for this site. Due to the location of the site, care was taken to limit potential exposure to the public during remedial activities

Former Dry Cleaners: Canandaigua, New York. Responsible for site characterization studies to define subsurface conditions and the nature and extent of chlorinated solvent impact (tetrachloroethene and breakdown products), implementation of a soil removal interim remedial measure (IRM), installation of a sub-slab vapor mitigation system and implementation of biostimulation to address residual contamination.

Former Gasoline Station: Hornell, New York. Responsible for the completion of site investigations and the development and implementation of remedial options including source removal with the subsequent installation of an air sparging system augmented the injection of microbes designed to expedite the remediation process.

CURRICULUM VITAE

Maxine Wright-Walters, PhD

Educational Background

University of Pittsburgh	2008 PhD. Environmental and Occupational Health (EOH)/Environmental Health Sciences (EHS)
Graduate School of Public Health Pittsburgh, PA	Dissertation Topic: Exposure Concentrations of Pharmaceutical Estrogens and Xenoestrogens in Municipal Wastewater Treatment Plant Sources, the Aquatic Environment and an Aquatic Health Risk Assessment of Bisphenol-A: Implications for Wildlife and Public Health
Duquesne University Pittsburgh, PA	1997 MSc. Environmental Science & Management Internship: Allegheny County Emergency Preparedness, and Response Center, Pittsburgh PA
New York Institute of Technology, Old Westbury, NY	1989 BS, Chemistry,
University of Technology (College of Arts Science and Technology) Jamaica W.I.	1986 Diploma in Pharmacy Thesis: Antimicrobial Properties of the *Mimosa Pudica* and its effect on the *neissera gonorrhea* organism.

Additional Training

RAB Certified EMS Lead Auditor	1998
American Chemical Society's short course in Microwave Enhanced Chemistry	1997
ISO 14000 Lead Auditor	1997
ISO 9000 auditor	1997
PACS data Validation	1997
Radiochemistry	1989
Radioactivity safety	1989
OSHA 40hr Health and Safety	1987
Data Validation	1987

Employment History

1991-present President/Project Manager, EDV, Inc., PA
Responsible for the day to day operation and management of this small environmental consulting business. Duties include: Recruiting and mentoring of staff, budgeting, marketing, environmental consulting to include development of Data Quality Objectives (DQOs), development of QA/QC and laboratory training programs and manuals, laboratory auditing, remedial investigation/feasibility studies (RI/FS), QAPPs and SAPs development. Environmental Health Assessments and Risk Assessments, ISO 9000 consulting to include implementation, training and auditing of quality systems, ISO 14000 consulting to include implementation, training and auditing of Environmental Management Systems (EMS). Environmental Health and Occupational Safety training and consulting. Laboratory consulting to include development of Good Laboratory Practices (GLP), methods development, auditing and training. Data validation of all types of parameters such as volatile target compounds (TCL), semi-volatile target compounds, pesticide/PCBs, dioxins & furans, conventional general/wet chemistry, TAL metals, leachate and reactivity characteristics (TCLP) priority pollutants-metals & organics; radiological parameters including gross alpha/beta,. gamma spectroscopy parameters; thermal ionization mass spectroscopy, fluorometric uranium,, alpha spectroscopy-strontium 89/90; alpha spectrometry- thorium-237, uranium-234, 238, neptunium-237, plutonium-238, 239, 240, americium-241 and curium-242, 243, 244 and, liquid scintillation counting parameters-tritium. QA/QC consulting under various programs such as CERCLA (superfund), RCRA and Brownfield. Sales, proposal writing, and general project management. Conduct training courses at college and professional levels in areas such as: QMS (ISO 900:2000), EMS (ISO 14001) implementation, Introduction to ISO 14001, ISO14001 Internal auditing, laboratory auditing, organic/inorganic and radiochemical data validation and many others.

1990-1991 Senior Chemist, Ecotek LSI, GA
As a senior chemist responsibilities included; method development, troubleshooting, writing of SOPs for Sample Preparation laboratory and QC department, writing of training manuals; QC compliance and surveillance audits; radiological and chemical data validation for parameters such gross alpha/beta, . gamma spectroscopy parameters; thermal ionization mass spectroscopy, fluorometric uranium spectroscopy-strontium 89/90; alpha spectrometry- thorium-237, uranium-234, 238, neptunium-237, plutonium-238, 239, 240, americium-241 and curium-242, 243, 244 and, liquid scintillation counting parameters-tritium; volatile target compounds (TCL), semi-volatile target compounds, pesticide/PCBs, dioxins & furans, conventional general/wet chemistry, TAL metals, leachate and reactivity characteristics (TCLP) priority pollutants-metals & organics.

1989-1990 Chief Chemist/Safety Officer, Syosset Labs, NY.

Responsibilities for this position included Quality Control, research, method development and validations. Training of new chemists to ensure familiarity and understanding of USP and In House methods. Testing of raw materials, in-process and finished products to confirm non-compliant results obtained by other chemists. Monitor the set-up and testing of all stability samples. Familiar with FDA regulations. Write SOPs, implementation of a Health and Safety program. Ensure the general safety of the building and all its employees within as per OSHA guidelines.

1987-1989 QC Chemist, Nytest Environmental, Port Washington, NY.
As a QC chemist duties included; wet chemistry analysis, organic and inorganic sample extraction and preparation, preparation of base-neutral, acid and pesticide spikes. Analysis of organic compounds via GC/GCMS, data validation of organic compounds such as BNAs, VOAs, Pest/PCBs.

Research

"Antimicrobial Properties of the *Mimosa Pudica* and its effect on the *neissera gonorrhea* organism." Researched the Mimosa Pudica for its antimicrobial properties and looked at its effects on the *neissera gonorrhea* organism. This research was done in 1986 at the Microbiology Department of the University of the West Indies. It was a requirement for final year pharmacy students at the College of Arts Science and Technology.

Research in Organic Chemistry, investigating the different pathways in the synthesis of organic compounds with emphasis on Opium compounds. This Research was done in 1985-1986 at the College of Arts Science and Technology-Pharmacy Department.

Instrumentation research, working specifically with the Gas Chromatograph in determining the relationship between peak areas and concentrations of compounds. This research was done in 1988 and funded by the Life Science Department, New York Institute of Technology.

Professional Training/Teaching

Consad Research, Pittsburgh, PA
Risk Assessment Expert for Department of Labor (DOL) review of risk assessment best practices within various agencies of the Federal government. Consult on drafting an exposure factors and risk characterization handbook that will be used to assist DOL in its risk assessment practices. 2008

GlaxoSmithKline, Pittsburgh, PA
Implementation of a complete ISO 14001 EMS to include executive briefings, baseline assessment, identification of aspects and impacts and chemical inventory and waste management. Internal and Lead auditor EMS training. Environmental Health and Occupational Safety training and consulting. 2006.

United States Department of Energy -National Environmental Technology Laboratory (NETL)
ISO 14001 training course in Implementation, Identifying Aspects and Impacts and Internal and Lead auditing. Environmental Health and Safety training course. 2003.

Tech-Seal, WV
Implementation of a complete EHS program. Auditor internal auditor training. Implementation of an ISO 9000 Quality Management System.2002.

Jefferson Community College, OH
ISO14001/EHS Implementation Consulting and Auditing as part of an ISO9000/14000 Consortia provided by the college to local businesses in the Weirton, WV area. 1998-2002.

Cutler-Hammer Technology, Center, Pittsburgh, PA (A former Westinghouse/DOD facility)
Implementation of a complete ISO 14001 EMS to include; executive briefings, baseline assessment, identification of aspects and impacts, and waste management. Internal and Lead auditor EMS training. Environmental Health and Safety Implementation, training and consulting. Conducted Chemical inventory and audit. The site has been certified in ISO 9001 and 14001. 2001.

Cutler-Hammer, Horsehead, NY (A former Westinghouse/DOD facility):
Implementation of a complete ISO 14001 EMS to include executive briefings, baseline assessment, identification of aspects and impacts and waste management. Internal and Lead auditor EMS training. Environmental Health and Safety training and consulting. The site has been certified in ISO 9001 and 14001. 2001.

Curtiss-Wright, EMD, Cheswick, PA (A former Westinghouse/DOD facility)
Planned and implemented records management system for Marketing, Engineering, and Human Resources using standardized databases for all functions. 2001.

Graduate Appointments

Graduate Assistant: Research Assistant for the Center for Healthy Communities. 2008

Graduate Assistant: Research Assistant for the Community Awareness Allegheny River Stewardship Project. 2007-2008

Graduate Research Assistant: Teaching and Research Assistant for the department of Environmental and Occupational Health 2001-2007

Public Teaching Experience (Public Courses)

Organic Data Validation, 1999-2006
Environmental Health and Safety Program Implementation, 1997-2007
Inorganic/Inorganic Data Validation, 1999-present
Radiochemical Data Validation, 2000-2006
ISO 14001 Implementation, 2002-2005
Environmental Management Systems Auditing, 2000-2004
Quality Management Systems, 2002

Academic Teaching Experience

University of Pittsburgh, PA. Co-Presenter/Co-Instructor: Community Awareness Presentation of the Allegheny River Stewardship Project, Alle-Kiski Health Foundation, Heinz Endowments and Highmark Foundation, 2007

University of Pittsburgh, PA. Guest Lecturer. Exposure Assessment, 2007

University of Pittsburgh, PA. Guest Lecturer. Dose-response Assessment, 2007

University of Pittsburgh, PA. Guest lecturer. Exposure Assessment for Baseline Risk Assessment for Superfund Sites, 2005

University of Pittsburgh, PA. Guest Lecturer. Risk Assessment. 2004-2005

University of Pittsburgh, PA. Guest Lecturer. Risk Communication. 2005

University of Pittsburgh, PA. Guest Lecturer. Chemical Fate and Transport in the Environment, 2004-2005

Duquesne University, PA. Co-instructor. Environmental Management Systems, 1998

Jefferson Community College, OH. Guest Lecturer. ISO 14000 Implementation. 1998-1999

Publication

Maxine Wright-Walters and Conrad Volz. Exposure of aquatic receptors to Bisphenol A: Evidence that current risk models may not be sufficiently protective. Ohio River Basin Conference, Pittsburgh,2008.

Maxine Wright-Walters and Conrad Volz. Pharmaceutical Estrogens and Xeno Estrogens in Municipal Wastewater Treatment Plants: Implications for Wildlife and Humans. Third National Conference on Environmental Science and Technology. North Carolina A&T State University on September, 2007.pp.80. Abstracts Issue.

Maxine Wright-Walters and Conrad Volz. Pharmaceutical Estrogens and Xeno Estrogens in Municipal Wastewater Treatment Plants: Implications for Wildlife and Humans. "Proceedings of the 2007 National Conference on Environmental Science and Technology", p 103-113. Springer 2009.

Volz, CD., Dabney, B.,Cohen, P., Cude, C., Dooly, I., Kyprianou, R., Malecki, K., Richter, W., Schulman, A., Shaw, S., Vanderslice, J., **Walters, M.**, and Vyas, V., September 2007. Handling Left Censored Water Contaminant Data for Descriptive Statistics and (CDC), Environmental Public Health Tracking Network (EPHT) from the Water Working Group, Non-Detect Subgroup.

R.S. Carruth; **M. Wright-Walters**; N. B. Sussman; B.D. Goldstein. The Use of Relative Risk Greater Than 2.0 in the American Court System. August 2004. International Society of Environmental Epidemiology (ISEE) Conference Proceedings, New York, NY.

Maxine M. Wright-Walters, Nancy B. Sussman, Roger S. Day, Russellyn S. Carruth and Bernard D. Goldstein An Alternative Approach to Determining the Legal Criterion of "More likely than Not" in the Absence of Statistical Significance December 2004. Society of Risk Analysis (SRA) Conference Proceedings, Baltimore, MD.

Charles Tomljanovic, **Maxine Wright-Walters** & Jules Stephensky Anthropogenic Electromagnetic Fields (EMFs) and Cancer: A Perspective. "Risk: Health Safety & Environment "- Vol 8. Pp 287-289. Summer 1997.

Additional Skill

Knowledge and ability to operate the following instruments: GC, GC/MS, ICPMS, HPLC, AA, Potentiometer, Osmometer, Ion Analyzer, UV/IR Spectrophotometer, Mass Spectrophotometer and GPC (automated and manual). Knowledge in ISO 9000, ISO 14000 and regulatory programs such as CWA, CAA, TSCA, FIFRA RCRA, NEPA and CERCLA. Familiar with FDA, DOD, DOE and other federal programs. Proficient in the use of Statistical programs such as SAS and Stata.

Professional Affiliation

Member of the American Chemical Society
Member of the Air and Waste Management Association.
Member of the American Society for Quality
Society of Risk Analysis

APPENDIX D

REMEDIAL INVESTIGATION WORK PLAN

OBI, LLC FACILITY

245-265 HOLLENBECK STREET,

271 HOLLENBECK STREET, AND

50 BALFOUR DRIVE

ROCHESTER, NY 14621

AUGUST 2015

Rationale For the Selection of the Proposed Sample Locations

Sample Location	Rationale
SSE-1 through SSE-5	Surface soil samples collected from landscape/lawn areas and portions of the Site not covered with buildings or pavement to assess human exposure to soils (0-2”)
SS-1 through SS-10, MW-1R, TP-A, MW-19, TB-P, TB-H	Surface soil samples collected from portions of the Site not covered with buildings to assess and delineate historic fill material (0-1’). SS-3 and SS-7 will be located in former rail line.
TB-A	Test boring installed to evaluate/delineate the nature and extent of impact in proximity of SSV-06 (i.e., the sub-slab vapor sample containing the highest TCE concentration measured during the soil vapor intrusion study)
TB-B (MW-B)	Test boring and monitoring well installed to evaluate/delineate the nature and extent of impact in proximity of SSV-06, potential impacts from compressor discharges, boiler discharges, oil-water separator and sump.
TB-C	Test boring installed to evaluate/delineate the nature and extent of impact in proximity of SSV-06
TB-D (MW-D)	Site coverage, proximity to SSV-06.
TB-E	Site coverage, proximity to waste water treatment plant and floor spill/holding tank.
TB-F	Site coverage.
TB-G (MW-G)	Test boring and monitoring well installed to assess site coverage/ data gap in locations not previously evaluated (e.g., in proximity of the waste water treatment plant and waste storage areas).
TB-H (MW-H)	Site coverage, location of maximum TCE concentration in surface soil. Note, TB-H has been moved approximately 5 ft. east, due to the presence of equipment
TB-I	Site coverage, proximity to former oil and grease room. Note, TB-I has been moved approximately 5 ft north of the former oil and grease room due to limited access in the former oil and grease room.
TB-J	Proximity to wastewater control pit and floor spill/holding tank.

Rationale For the Selection of the Proposed Sample Locations

TB-K	Location of former Toledo Scale Oven Room and Spray Booths, location of chemical storage.
TB-L	Site coverage, transgradient of former TCE vapor degreaser.
TB-M (MW-M)*	Location of TP-1 and proximity to TP-2, previously identified petroleum impacts, possible free product. Downgradient/transgradient of TB-121 and TB-122 (i.e., historic location of potential petroleum impacted soil).
TB-N*	Test boring in location of TP-3, location of two former 3,000 gallon fuel oil USTs.
TB-O	Assumed location of former acetone UST and assumed location where cleaning solvents were dumped on the ground at 271 Hollenbeck St.
TB-P (MW-P)	Location of former 6000 gallon UST. Note, monitoring well has been shifted approximately 15 feet north due to access issues (presence of trees), however; it will remain in location of former UST.
TB-Q (MW-Q)	Test boring and monitoring well downgradient of former spillage/leakage area and other AOCs. Note, access in this location is limited. If drill rig is unable to access planned location, TB-Q may be shifted to the east or south.
TB-R	Location of TB-6, (i.e., historic location of potential petroleum impacted soil).
TB-S	Location of former oil room. Note, access in former oil room is limited and TB-S has been moved approximately 5 ft. to the north of the former oil room.
TB-T	Proximity to TB-104 (i.e., historic location of petroleum impacted soil), location of 90-day hazardous waste storage area.
TB-U	Proximity to waste water treatment plant and floor spill/holding tank
TB-V	Location of former spillage through wall, proximity to former TCE degreaser, proximity to BH-04 (i.e., historic location of potential petroleum impacted soil)
TB-W	Site coverage, test boring in location of former rail line, proximity to former wet transformer concrete pad
TB-X, TB-Y and TB-Z	Shallow test borings in location of former wet transformer concrete pad

Rationale For the Selection of the Proposed Sample Locations

TB-AA and TB-BB	Location of former spillage/leakage area, and near location of BH-01 (i.e., historic location of potential petroleum impacted soil). Note, access is limited in this location due to plating lines and both TP-AA and TP-BB have been shifted west
TB-CC	Test boring in location of drum storage
TB-DD and TB-EE	Test borings to be located in drain and trenches following subsurface utility assessment (not shown on Figure 8)
TP-A	Test pit through former rail line and mound on western portion of Site
MW-1	Site perimeter well, characterization of overburden groundwater zone
MW-3	Characterization of overburden groundwater zone
MW-5	Characterization of overburden groundwater zone, transgradient well (less than 25 ft) from assumed location of former acetone tank and dumping of cleaning solvents
MW-6	Characterization of overburden groundwater zone
MW-7R	Characterization of bedrock groundwater zone
MW-8	Characterization of overburden groundwater zone, downgradient well from former acetone tank and dumping of cleaning solvent
MW-9	Site perimeter well, characterization of overburden groundwater zone, proximity to TB-119 (i.e., historic location of potential petroleum impacted soil)
MW-10	Site perimeter well, characterization of overburden groundwater zone
MW-12	Characterization of overburden groundwater zone
MW-13	Site perimeter well, characterization of overburden groundwater zone

Rationale For the Selection of the Proposed Sample Locations

MW-16	Characterization of overburden groundwater zone, located in area of former leakage, cross gradient to former TCE vapor degreaser and downgradient to waste water treatment plant and floor spill/holding tank
MW-17	Characterization of overburden groundwater zone
MW-18	Characterization of overburden groundwater zone
MW-19	New overburden groundwater well installed in an apparent hydraulically cross-gradient location to complete the Site perimeter well field for the overburden groundwater zone
MW-1R, MW-3R, MW-10R, MW-12R, MW-13R, and MW-19R	Bedrock monitoring wells installed adjacent to the Site perimeter overburden monitoring wells in order to assess bedrock groundwater conditions at the perimeter of the Site. MW-13R will also be used to assess mounded area on western portion of 50 Balfour St.

*Location of TP-1 and TP-3 will be determined through use of GPS and/or swing-ties.

HEALTH AND SAFETY PLAN

REMEDIAL INVESTIGATION/CORRECTIVE ACTIONS
245-265 & 271 HOLLENBECK STREET AND 50 BALFOUR DRIVE
ROCHESTER, NEW YORK

NYSDEC SITE #828188

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1.0 INTRODUCTION

Day Environmental, Inc. (DAY) prepared this Health and Safety Plan (HASP) to outline policies and procedures to protect workers and the public from potential environmental hazards during the remedial investigation to be conducted at, and in the vicinity of, the property addressed 245-265 and 271 Hollenbeck Street and 50 Balfour Drive, City of Rochester, County of Monroe, New York (the Site). The Project Locus map presented as Figure 1 shows general location of the Site.

Although the HASP focuses on the specific work activities planned for the Site, it must remain flexible due to the nature of this work. Conditions may change and unforeseen situations can arise that require deviations from the original HASP.

1.1 Site Location and Description

The Site consists of three parcels (245-265 Hollenbeck Street, 271 Hollenbeck Street and 50 Balfour Drive) totaling approximately 6.95 acres, and it is located in an urban area in Rochester, Monroe County, New York. The Site is currently developed with an approximate 134,000 square foot, combined one-story and two-story concrete block building currently used for electroplating and metal stamping, with two attached one-story metal buildings that house a sheet metal fabrication, stamping and assembly business (50 Balfour Drive). A second, approximate 8,000 square foot, one-story, brick building is also located on the Site, and this building is currently used as a warehouse and equipment storage facility (245-265 Hollenbeck Street). The 271 Hollenbeck Street parcel is currently vacant land covered with a gravel access roadway and vegetation. The remaining portions of the Site are currently vacant land covered with asphalt-paved parking areas, a gravel roadway and/or vegetation (grass and trees).

1.2 SITE HISTORY/OVERVIEW

The Site was primarily vacant land prior to development in 1923. Addison Lithographing Company originally developed the 50 Balfour Drive portion of the Site in 1923 with the construction of the original approximate 31,750 square foot structure that is part of the current 134,000 square foot building. Addison Lithographing Company operated a printing and lithographing facility at the current 50 Balfour Drive property between 1923 and 1950. Toledo Scale Company (House and Kitchen Division) owned and performed operations at the current 50 Balfour Drive portion of the Site between 1950 and 1969, and manufactured kitchen machines and retail/industrial scales. From 1970 to the present, operations conducted at 50 Balfour Drive have generally included plastic injection molding, tool and die operations, sheet metal stamping, fabrication, assembly, and electro plating. OBI, LLC has owned the Site since 1997.

Two 3,000-gallon fuel oil USTs were installed at the 50 Balfour Drive in 1974 during a natural gas shortage. The USTs were filled with fuel oil but were never actively used at the facility. The USTs were located immediately west of the boiler room (i.e., in the courtyard area located north of the Main Building). These USTs were removed sometime between 1980 and 1985. Prior to removal, the fuel oil was pumped out, and sold and reused by an adjacent business.

German Tool and Die, Inc. constructed the 8,000 square foot building on the 245-265 Hollenbeck Street property in 1973, and operated at this facility between 1973 and 1995 when the business was sold to German Machine, Inc., which operated at this location through 1999. German Tool and Die, Inc. and German Machine, Inc. both machined parts, but reportedly did not conduct parts cleaning at this location. In 2000, OBI LLC purchased the building at 245-265 Hollenbeck Street and currently uses it as a warehouse facility for dry storage.

The 271 Hollenbeck Street parcel was originally developed with a residence. By 1926, an approximate 6,500 sq. ft. building and a railroad spur line, running generally from east to west located on the southern side of the building, were constructed on this portion of the Site. The railroad spur line was removed from the Site before 1988. Between 1932 and 1991, the 271 Hollenbeck Street parcel was used for “crate storage and a garage”, a building supply company, a welding company, a heating and cooling contractor company, construction companies, office space, a brush manufacturer with printing and silk screening operations, and a printer. According to City of Rochester records, the building on the 271 Hollenbeck Street parcel was destroyed by fire and demolished sometime before June 15, 1998. OBI, LLC purchased the property on November 18, 1998. Currently the 271 Hollenbeck Street portion of the Site is vacant land covered with a gravel access roadway and vegetation.

Information collected during the advancement of soil borings across the Site identified a layer of fill material extending from the ground surface to depths up to 4 feet below ground surface. In addition to naturally occurring silt, sand, and gravel, the fill layer was characterized to contain lesser amounts of materials such as ash, coal, slag, wood, and cinders. These types of materials often contain constituents such as heavy metals and PAHs.

Based on historic documentation regarding use of the Site and the findings of soil and groundwater studies performed at the Site to date, volatile organic compounds (VOCs) associated with some of the historical manufacturing operations conducted at the Site have been identified as the primary contaminants of concern in soil and groundwater. Specifically, TCE and its associated breakdown compounds (cis-1,2-dichlororethene and vinyl chloride) have been detected above NYSDEC TOGs 1.1.1 guidance values in on-site overburden monitoring wells and a bedrock monitoring well. Historically, groundwater flow has generally been observed to flow east. [Note: current operations at the Site do not use TCE.] In addition, several soil boring samples contained Total Petroleum Hydrocarbons (TPH), an indication that fuel oil might have been released at the Site in the past.

An Order on Consent and Administrative Settlement was issued by NYSDEC to OBI, LLC in 2013 to address the presence of Site-related constituents in environmental media at the Site at concentrations above NYSDEC Standards, Criteria, and Guidance. The Site is listed on the Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 site.

1.3 PLANNED ACTIVITIES COVERED BY HASP

This HASP is intended to be used during intrusive environmental studies and subsequent remedial activities (if any) conducted at the Site that have the potential to encounter contaminated materials. Currently, identified activities to be completed at the Site that have the potential to encounter contaminated materials include:

- Site Preparation Activities
- Advancement of test borings and installation of groundwater monitoring wells
- Soil, Groundwater and Soil Vapor sample collection
- Management of Investigation Derived Waste (IDW)

This HASP can be modified to cover other site activities as deemed appropriate. Site personnel implementing work the work described above must have the appropriate level of training required by OSHA including 40-hour HAZWOPER training and current 8-hour refresher training. The owner of the property, its contractors, and other workers at the Site will be responsible for the development and/or implementation of health and safety provisions associated with Site activities.

2.0 KEY PERSONNEL AND MANAGEMENT

The Project Manager (PM) and Site Safety Officer (SSO) are responsible for formulating health and safety requirements, and implementing the HASP.

2.1 PROJECT MANAGER

The PM has the overall responsibility for the project and will coordinate with the SSO to ensure that the goals of the project are attained in a manner consistent with the HASP requirements.

2.2 SITE SAFETY OFFICER

The SSO has responsibility for administering the HASP relative to site activities, and will be in the field while activities are in progress. The SSO's operational responsibilities will be monitoring, including personal and environmental monitoring, ensuring personal protective equipment (PPE) maintenance, and identification of protection levels. The air monitoring data obtained by the SSO will be available for review by regulatory agencies and other on-site personnel.

2.3 EMPLOYEE SAFETY RESPONSIBILITY

Each employee is responsible for personal safety as well as safety of others in the area. The employee will use the equipment provided in a safe and responsible manner as directed by the SSO.

2.4 KEY SAFETY PERSONNEL

The following individuals are anticipated to share responsibility for health and safety of DAY representatives at the Site.

DAY Project Manager	Raymond Kampff and/or David Day, P.E.
DAY Site Safety Officer	Charles Hampton, Nathan Simon, Heather McLennan or Samantha Shoemaker

3.0 SAFETY RESPONSIBILITY

Contractors, consultants, state or local agencies, or other parties, and their employees, involved with this project will be responsible for their own safety while on-site. Their employees will be required to understand the information contained in this HASP, and must follow the recommendations that are made in this document. As an alternative, contractors, consultants, state or local agencies, or other parties, and their employees, involved with this project can utilize their own health and safety plan for this project as long as it is found acceptable to the New York State Department of Health (NYSDOH), NYSDEC and/or the Monroe County Department of Public Health (MCDPH).

4.0 JOB HAZARD ANALYSIS

There are many hazards associated with environmental work on a site, and this HASP discusses some of the anticipated hazards for this Site. The hazards listed below deal specifically with those hazards associated with the management of potentially contaminated media (e.g. soil, fill, groundwater, etc.).

4.1 CHEMICAL HAZARDS

Chemical substances can enter the unprotected body by inhalation, skin absorption, ingestion, or injection (i.e., a puncture wound, etc.). A contaminant can cause damage to the point of contact or can act systemically, causing a toxic effect at a part of the body distant from the point of initial contact.

A list of selected constituents that have been detected at the Site at concentrations that exceed soil or groundwater standards, criteria and guidance (SCG) values are presented below. This list also presents the Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs), National Institute for Occupational Safety and Health (NIOSH) recommended exposure limits (RELs), and NIOSH immediately dangerous to life or health (IDLH) levels.

CONSTITUENT	OSHA PEL	NIOSH REL	IDLH
Tetrachloroethene (PCE)	678 mg/m^3	Minimize workplace exposure concentrations	1017 mg/m^3
Trichloroethene (TCE)	537 mg/m^3	134.25 mg/m^3	5370 mg/m^3
trans 1,2- Dichloroethene (trans 1,2-DCE)	790 mg/m^3	790 mg/m^3	3970 mg/m^3
cis 1,2- Dichloroethene (cis 1,2-DCE)	790 mg/m^3	790 mg/m^3	3970 mg/m^3
Vinyl Chloride	2.56 mg/m^3	NA	NA
Acetone	2400 mg/m^3	590 mg/m^3	2500 mg/m^3
2-hexanone	410 mg/m^3	4.10 mg/m^3	6560 mg/m^3
Methylene Chloride	1735 mg/m^3	NA	7981 mg/m^3
n-Butylbenzene	NA	NA	NA
n-propylbenzene	NA	NA	NA
Isopropylbenzene	245 mg/m^3	245 mg/m^3	4428 mg/m^3
1,2,4-Trimethylbenzene	NA	125 mg/m^3	NA
Naphthalene	50 mg/m^3	50 mg/m^3	1310 mg/m^3
Toluene	753 mg/m^3	375 mg/m^3	1885 mg/m^3

Total Xylenes[1]	435 mg/m^3	435 mg/m^3	3906 mg/m^3
Lead	0.05 mg/m^3	0.05 mg/m^3	100 mg/m^3
Mercury	0.1 mg/m^3	0.05 mg/m^3	10 mg/m^3
Zinc	5 mg/m^3	5 mg/m^3	500 mg/m^3

NA = Not Available

The potential routes of exposure for these analytes and chemicals include inhalation, ingestion, skin absorption and/or skin/eye contact. The potential for exposure through any one of these routes will depend on the activity conducted. The most likely routes of exposure for the anticipated environmental activities at the Site include inhalation and skin/eye contact.

4.2 Physical Hazards

There are physical hazards associated with this project, which might compound the chemical hazards. Hazard identification, training, adherence to the planned environmental measures, and careful housekeeping can prevent many problems or accidents arising from physical hazards. Potential physical hazards associated with this project and suggested preventative measures include:

- Slip/Trip/Fall Hazards – Some areas may have wet or frozen surfaces that will greatly increase the possibility of inadvertent slips. Caution must be exercised when using steps and stairs due to slippery surfaces in conjunction with the fall hazard. Good housekeeping practices are essential to minimize the trip hazards.
- Small Quantity Flammable Liquids – Small quantities of flammable liquids will be stored in "safety" cans and labeled according to contents.
- Electrical Hazards – Electrical devices and equipment shall be de-energized prior to working near them. All extension cords will be kept out of water, protected from crushing, and observed regularly to ensure structural integrity. Temporary electrical circuits will be protected with ground fault circuit interrupters. Only qualified electricians are authorized to work on electrical circuits. Heavy equipment (e.g., excavator, backhoe, drill rig) shall not be operated within 10 feet of high voltage lines, unless proper protection form the high voltage lines is provided by the appropriate utility company.
- Noise – Work around large equipment often creates excessive noise. The effects of noise can include:

- Workers being startled, annoyed, or distracted.
- Physical damage to the ear resulting in pain, or temporary and or/permanent hearing loss.
- Communication interference that may increase potential hazards due to the inability to warn of danger and proper safety precautions to be taken.

[1] Exposure limits for Total Xylenes was based on the lowest limits among the Xylene isomers (o-Xylene, m-Xylene, p-Xylene).

Proper hearing protection will be worn as deemed necessary. In general, feasible administrative or engineering controls shall be utilized when on-site personnel are subjected to noise exceeding an 8-hour time weighted average (TWA) sound level of 90 decibels on the A-weighted scale (dBA). In addition, whenever employee noise exposures equal or exceed an 8-hour TWA sound level of 85 dBA, employers shall administer a continuing, effective hearing conservation program as described in the OSHA Regulation 29 Code of Federal Rules (CFR) Part 1910.95.

- Heavy Equipment – Each morning before start-up, heavy equipment will be checked to ensure safety equipment and devices are operational and ready for immediate use.
- Subsurface and Overhead Hazards – Before any excavation activity, efforts will be made to determine whether underground utilities and potential overhead hazards will be encountered. Underground utility clearance must be obtained prior to subsurface work.

4.3 ENVIRONMENTAL HAZARDS

Environmental factors such as weather, wild animals, insects, snakes and irritant plants can pose a hazard when performing outdoor tasks. The SSO shall make reasonable efforts to alleviate these hazards should they arise.

4.3.1 Heat Stress

The combination of warm ambient temperature and protective clothing increases the potential for heat stress. In particular,

- Heat rash
- Heat cramps
- Heat exhaustion
- Heat stroke

Site workers will be encouraged to increase consumption of water or electrolyte-containing beverages such as Gatorade® when the potential for heat stress exists. In addition, workers are encouraged to take rests whenever they feel any adverse effects that may be heat-related. The frequency of breaks may need to be increased upon worker recommendation to the SSO.

4.3.2 Exposure to Cold

With outdoor work in the winter months, the potential exists for hypothermia and frostbite. Protective clothing greatly reduces the possibility of hypothermia in workers. However, personnel will be instructed to wear warm clothing and to stop work to obtain more clothing if they become too cold. Employees will also be advised to change into dry clothes if their clothing becomes wet from perspiration or from exposure to precipitation.

5.0 SITE CONTROLS

To prevent migration of contamination caused through tracking by personnel or equipment, work areas, and personal protective equipment staging/decontamination areas will be specified prior to beginning operations.

5.1 SITE ZONES

In the area where contaminated materials present the potential for worker exposure (work zone), personnel entering the area must wear the mandated level of protection for the area. A "transition zone" shall be established where personnel can begin and complete personal and equipment decontamination procedures. This can reduce potential off-site migration of contaminated media. Contaminated equipment or clothing will not be allowed outside the transition zone (e.g., on clean portions of the Site) unless properly containerized for disposal. Operational support facilities will be located outside the transition zone (i.e., in a "support zone"), and normal work clothing and support equipment are appropriate in this area. If possible, the support zone should be located upwind of the work zone and transition zone.

5.2 GENERAL

The following items will be requirements to protect the health and safety of workers during implementation of activities that disturb contaminated material.

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increased the probability of hand to mouth transfer and ingestion of contamination shall not occur in the work zone and/or transition zone during disturbance of contaminated material.
- Personnel admitted in the work zone shall be properly trained in health and safety techniques and equipment usage.
- No personnel shall be admitted in the work zone without the proper safety equipment.
- Proper decontamination procedures shall be followed before leaving the Site.

6.0 PROTECTIVE EQUIPMENT

This section addresses the various levels of PPE, which are or may be required at this job site. Personnel entering the work zone and transition zone shall be trained in the use of the anticipated PPE to be utilized.

6.1 ANTICIPATED PROTECTION LEVELS

The following table summarizes the protection levels (refer to Section 6.2) anticipated for tasks to be implemented during this project.

TASK	PROTECTION LEVEL	COMMENTS/MODIFICATIONS
Site mobilization	D	
Site preparation	D	
Intrusive work	C/Modified D/D	Based on air monitoring, and SSO discretion.
Decontamination Area	Modified D/D	
Site breakdown and demobilization	D	

It is anticipated that work conducted as part of this project will be performed in Level D or modified Level D PPE. If conditions are encountered that require Level A or Level B PPE, the work will immediately be stopped. The appropriate government agencies (e.g., NYSDEC, NYSDOH, MCDPH, etc.) will be notified and the proper health and safety measures will be implemented (e.g., develop and implement engineering controls, upgrade in PPE, etc.). If conditions are encountered that require Level C PPE, the work will be temporarily suspended and the work site will be evaluated to limit exposure prior to implementing Level C PPE.

6.2 PROTECTION LEVEL DESCRIPTIONS

This section lists the minimum requirements for each protection level. Modifications to these requirements can be made upon approval of the SSO. If Level A, Level B, and/or Level C PPE is required, Site personnel that enter the work zone and/or transition zone must be properly trained and certified in the use of those levels of PPE.

6.2.1 Level D

Level D consists of the following:

- Safety glasses
- Hard hat when working with heavy equipment
- Steel-toed or composite-toed work boots

- Protective gloves during sampling or handling of potentially contaminated media
- Work clothing as prescribed by weather

6.2.2 Modified Level D

Modified Level D consists of the following:

- Safety glasses with side shields
- Hard hat when working with heavy equipment
- Steel-toed or composite-toed work boots
- Protective gloves during sampling or handling of potentially contaminated media
- Outer protective wear, such as Tyvek coverall [Tyveks (Sarans) and polyvinyl chloride (PVC) acid gear will be required when workers have a potential to be exposed to impacted liquids or impacted particulates]

6.2.3 Level C

Level C consists of the following:

- Air-purifying respirator with appropriate cartridges
- Outer protective wear, such as Tyvek coverall [Tyveks (Sarans) and PVC acid gear will be required when workers have a potential to be exposed to impacted liquids or particulates]
- Hard hat when working with heavy equipment
- Steel-toed or composite-toed work boots
- Nitrile, neoprene, or PVC overboots, if appropriate
- Nitrile, neoprene, or PVC gloves, if appropriate
- Face shield (when projectiles or splashes pose a hazard) and/or safety glasses with side shields.

6.2.4 Level B

Level B protection consists of the items required for Level C protection with the exception that an air-supplied respirator is used in place of the air-purifying respirator. Level B PPE is not anticipated to be required during this project. If the need for level B PPE becomes evident, activities in the affected area will be stopped until conditions are further evaluated, and any necessary modifications to the HASP have been approved by the PM and SSO. Subsequently, the appropriate safety measures (including Level B PPE) must be implemented prior to commencing site activities.

6.2.5 Level A

Level A protection consists of the items required for Level B protection with the addition of a fully encapsulating, vapor-proof suit capable of maintaining positive pressure. Level A PPE is not anticipated to be required during this project. If the need for level A PPE becomes evident, activities in the affected area will be stopped until conditions are further evaluated, and any necessary modifications to the HASP have been approved by the PM and SSO. Subsequently, the appropriate safety measures (including Level A PPE) must be implemented prior to commencing site activities.

6.3 RESPIRATORY PROTECTION

Any respirator used will meet the requirements of the OSHA 29 CFR 1910.134. Both the respirator and cartridges specified shall be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910). Air purifying respirators shall not be worn if contaminant levels exceed designated respirator cartridge use concentrations. The workers will wear respirators with approval for: organic vapors less than 1,000 ppm; and dusts, fumes and mists with a TWA less than 0.05 milligrams per cubic meter (mg/m^3).

No personnel who have facial hair, which interferes with respirator sealing surface, will be permitted to wear a respirator and will not be permitted to work in areas requiring respirator use.

Only workers who have been certified by a physician as being physically capable of respirator usage shall be issued a respirator. Personnel unable to pass a respiratory fit test or without medical clearance for respirator use will not be permitted to enter or work in areas that require respirator protection.

7.0 DECONTAMINATION PROCEDURES

This section describes the procedures necessary to ensure that both personnel and equipment are free from contamination when they leave the work site.

7.1 PERSONNEL DECONTAMINATION

Personnel involved with activities that involve disturbing contaminated media will follow the decontamination procedures described herein to ensure that material which workers may have contacted in the work zone and/or transition zone does not result in personal exposure and is not spread to clean areas of the Site. This sequence describes the general decontamination procedure. The specific stages can vary depending on the Site, the task, and the protection level, etc.

1. Leave work zone and go to transition zone
2. Remove soil/debris from boots and gloves
3. Remove boots
4. Remove gloves
5. Remove Tyvek suit and discard, if applicable
6. Remove and wash respirator, if applicable
7. Go to support zone

7.2 EQUIPMENT DECONTAMINATION

In order to reduce the potential for cross-contamination of samples collected during this project, the following procedures will be implemented to ensure that the data collected (primarily the laboratory data) is acceptable.

It is anticipated that most of the materials used to assist in obtaining samples will be disposable one-time use materials (e.g., sampling containers, bailers, rope, pump tubing, latex gloves, etc.). However, when equipment must be re-used (e.g., drill rigs, static water level indicator, split spoon samplers, etc.), it will be decontaminated by at least one of the following methods:

- Steam clean the equipment within a dedicated decontamination area; or
- Rough wash in tap water; wash in mixture of tap water and Alconox-type soap; double rinse with deionized or distilled water; and air dry and/or dry with clean paper towel.

The decontamination area will be set-up in a location to minimize disturbance to properties surrounding the work area.

7.3 DISPOSAL

Disposable clothing will be disposed in accordance with applicable regulations. Liquids (e.g., decontamination water, etc.) or solids (e.g., soil) generated by remedial activities will be disposed in accordance with applicable regulations.

8.0 AIR MONITORING

During activities that have the potential to disturb contaminated soil, fill material, or groundwater, air monitoring will be conducted in order to determine airborne particulate and contamination levels. This ensures that respiratory protection is adequate to protect personnel against the chemicals that are encountered and that chemical contaminants are not migrating off-site. Additional air monitoring may be conducted at the discretion of the SSO. Readings will be recorded and be available for review.

The following chart describes the direct reading instrumentation that will be utilized and appropriate action levels.

Monitoring Device	Action Level	Response/Level of PPE
PID Volatile Organic Compound Meter	< 1 ppm in breathing zone, sustained 5 minutes	Level D
	1-25 ppm in breathing zone, sustained 5 minutes	Cease work, implement measures to reduce air emissions when the work is performed, etc. If levels can not be brought below 1 ppm in the breathing zone, then upgrade PPE to Level C
	26-250 ppm in breathing zone, sustained 5 minutes	Level B, Stop work, evaluate the use of engineering controls, etc.
	>250 ppm in breathing zone	Level A, Stop work, evaluate the use of engineering controls, etc.
RTAM Particulate Meter	< 100 μg/m^3 over an integrated period not to exceed 15 minutes.	Continue working
	> 100 μg/m^3	Cease work, implement dust suppression, change in way work performed, etc. If levels can not be brought below 150 μg/m^3, then upgrade PPE to Level C

8.1 PARTICULATE MONITORING

During activities where contaminated materials (e.g., soil, fill, etc.) may be disturbed, air monitoring will include real-time monitoring for particulates using a real-time aerosol monitor (RTAM) particulate meter at the perimeter of the work zone in accordance with the Final DER-10 Technical Guidance for Site Investigation and Remediation (DER-10) dated May 2010. DER-10 uses an action level of 100 μg/m^3 (0.10 mg/m^3) over background conditions for an integrated period not to exceed 15 minutes. If the action level is exceeded, or if visible dust is encountered, then work shall be discontinued until corrective actions are implemented. Corrective actions may include dust suppression, change in the way work is performed, and/or upgrade of personal protective equipment.

8.2 VOLATILE ORGANIC COMPOUND MONITORING

During activities where contaminated materials may be disturbed, a PID will be used to monitor total VOCs in the ambient air. The PID will prove useful as a direct reading instrument to aid in determining if current respiratory protection is adequate or needs to be upgraded. The SSO will take measurements before operations begin in an area to determine the amount of VOCs naturally occurring in the air. This is referred to as a background level. Levels of VOCs will periodically be measured in the air at active work sites, and at the transition zone when levels are detected above background in the work zone.

8.3 COMMUNITY AIR MONITORING PLAN

During activities that have the potential to disturb contaminated soil, fill material, or groundwater, this Community Air Monitoring Plan (CAMP) will be implemented. The CAMP includes real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when activities with the potential to release VOCs or dust are in progress at the Site. This CAMP is based on the NYSDOH Generic CAMP included as Appendix 1A DER-10. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences/businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of project activities.

Continuous monitoring will be conducted during ground intrusive activities involving potentially contaminated soil, fill material or groundwater. Ground intrusive activities include, but are not limited to, test pitting or trenching, advancement/installation of test borings or monitoring wells, etc.

Periodic monitoring for VOCs will be conducted during non-intrusive activities involving potentially contaminated soil, fill material or groundwater where deemed appropriate (e.g., during collection of soil samples or groundwater samples, etc.).

8.3.1 VOC Monitoring, Response Levels, and Actions

VOCs must be monitored at the downwind perimeter of the immediate work area (i.e., the work zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 ppm above background for the 15-minute average, work activities must be temporarily halted and monitoring must be continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source or vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less (but in no case less than 20 feet), is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

The 15-minute readings must be recorded and made available for NYSDEC and NYSDOH personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

8.3.2 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind perimeter of the work zone at temporary particulate monitoring stations. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter ($\mu g/m^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 $\mu g/m^3$ above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 μg/m^3 of the upwind level and in preventing visible dust migration.

Readings will be recorded and made available for review.

9.0 EMERGENCY CONTINGENCY PLAN

This section presents the emergency contingency plan (ECP) describing the procedures to be performed in the event of an emergency (e.g., fire, spill, tank/drum release, etc.). To provide first-line assistance to field personnel in the case of illness or injury, the following items will be made immediately available on the Site:

- First-aid kit;
- Portable emergency eye wash; and
- Supply of clean water.

9.1 EMERGENCY TELEPHONE NUMBERS

The following telephone numbers are listed in case there is an emergency at the Site:

Fire/Police Department:	911
Poison Control Center:	(800) 222-1222
NYSDEC	
Region 8: Environmental Remediation	(585) 226-5349
Spill Hotline	(800) 457-7362
NYSDOH	
Public Health Duty Officer	(866) 881-2809
MCDPH	
Public Health Engineering	(585) 753-5476
OBI, LCC	
Michael McAlpin	(585) 287-9342
DAY ENVIRONMENTAL, INC.	
Nathan Simon	(585) 454-0210 x109
Raymond Kampff	(585) 454-0210 x108
NEAREST HOSPITAL:	Rochester General Hospital 1425 Portland Avenue, Rochester, NY 14621 (585) 922-4000 (Main) (585) 922-2000 (Emergency Department)
Directions to the Hospital:	Head east on Balfour Drive toward Hollenbeck Street for approximately 0.1 miles. Turn left on Hollenbeck Street and proceed approximately 0.3 miles. Turn right on Norton Street and proceed approximately 1.2 miles and then turn left on Carter Street. Turn right into Rochester General Hospital after approximately 0.3 miles (Figure 1).

9.2 EVACUATION

During activities involving potential disturbance of contaminated soil, fill material, or groundwater, a log of each individual entering and leaving the Site will be kept for emergency accounting practices. Although unlikely, it is possible that a site emergency could require evacuating personnel from the Site. If required, the SSO will give the appropriate signal for site evacuation (i.e., hand signals, alarms, etc.).

All personnel shall exit the Site and shall congregate in an area designated by the SSO. The SSO shall ensure that all personnel are accounted for. If someone is missing, the SSO will alert emergency personnel. The appropriate government agencies will be notified as soon as possible regarding the evacuation, and any necessary measures that may be required to mitigate the reason for the evacuation.

9.3 MEDICAL EMERGENCY

In the event of a medical emergency involving illness or injury to one of the on-site personnel, Emergency Medical Services (EMS) and the appropriate government agencies should be notified immediately. The area in which the injury or illness occurred shall not be entered until the cause of the illness or injury is known. The nature of injury or illness shall be assessed. If the victim appears to be critically injured, administer first aid and/or cardio-pulmonary resuscitation (CPR) as needed. If appropriate, instantaneous real-time air monitoring shall be done in accordance with air monitoring outlined in Section 8.0 of this HASP.

9.4 CONTAMINATION EMERGENCY

It is unlikely that a contamination emergency will occur; however, if such an emergency does occur, the specific work area shall be shut down and immediately secured. If an emergency rescue is needed, notify Police, Fire Department and EMS units immediately. Advise them of the situation and request an expedient response. The appropriate government agencies shall be notified immediately. The area in which the contamination occurred shall not be entered until the arrival of trained personnel who are properly equipped with the appropriate PPE and monitoring instrumentation as outlined in Section 8.0 of this HASP.

9.5 FIRE EMERGENCY

In the event of a fire on-site, all non-essential site personnel shall be evacuated to a safe, secure area. The Fire Department will be notified immediately, and advised of the situation and the identification of any hazardous materials involved. The appropriate government agencies shall be notified as soon as possible.

The four classes of fire along with their constituents are as follows:

Class A:	Wood, cloth, paper, rubber, many plastics, and ordinary combustible materials.
Class B:	Flammable liquids, gases and greases.
Class C:	Energized electrical equipment.
Class D:	Combustible metals such as magnesium, titanium, sodium, potassium.

Small fires on-site may be actively extinguished; however, extreme care shall be taken while in this operation. Approaches to the fire shall be done from the upwind side if possible. Distance from on-site personnel to the fire shall be close enough to ensure proper application of the extinguishing material but far enough away to ensure that the personnel are safe. The proper extinguisher shall be utilized for the Class(es) of fire present on the site. If possible, the fuel source shall be cut off or separated from the fire. Care must be taken when performing operations involving the shut-off of valves and manifolds, if present.

Examples of proper extinguishing agent as follows:

Class A:	Water Water with 1% AFFF Foam (Wet Water) Water with 6% AFFF or Fluorprotein Foam ABC Dry Chemical
Class B:	ABC Dry Chemical Purple K Carbon Dioxide Water with 6% AFFF Foam
Class C:	ABC Dry Chemical Carbon Dioxide
Class D:	Metal-X Dry Powder

No attempt shall be made against large fires these shall be handled by the Fire Department.

9.6 SPILL OR AIR RELEASE

In the event of a spill or air release of hazardous materials on-site, the specific area of the spill or release shall be shut down and immediately secured. The area in which the spill or release occurred shall not be entered until the cause can be determined and site safety can be evaluated. Non-essential site personnel shall be evacuated to a safe and secure area. The appropriate government agencies shall be notified as soon as possible. The spilled or released material shall be immediately indentified and appropriate containment measures shall be implemented, if possible. Real-time air monitoring shall be implemented as outlined in Section 8.0 of this HASP. If the materials are unknown, Level B protection is mandatory. If warranted, samples of the materials shall be acquired to facilitate identification.

9.7 Locating Containerized Waste and/or Underground Storage Tanks

In the event that unanticipated containerized waster (e.g., drums) and/or underground storage tanks (USTs) are located during investigation and/or subsequent remedial activities, the work must be stopped in the specific area until site safety can be evaluated and addressed. Non-essential Site personnel shall not work in the immediate area until conditions including possible exposure hazards are addressed. The appropriate government agencies shall be notified as soon as possible. The SSO shall monitor the area as outlined in Section 8.0 of this HASP.

Prior to handling, unanticipated containers will be visually assessed by the SSO to gain as much information as possible about their contents. As a precautionary measure, personnel shall assume that unlabelled containers and/or tanks contain hazardous materials until their contents are characterized. To the extent possible based upon the nature of the containers encountered, actions may be taken to stabilize the area and prevent migration (e.g., placement of berms, etc.). Subsequent to initial visual assessment and any required stabilization, properly trained personnel will sample, test, remove, and dispose of any containers and/or tanks, and their contents. After visual assessment and air monitoring, if the material remains unknown, Level B protection (or higher) is mandatory.

10.0 ABBREVIATIONS

AFFF	Aqueous Film Forming Foams
bgs	Below Ground Surface
CAMP	Community Air Monitoring Program
CFR	Code of Federal Regulations
cis 1,2-DCE	cis 1,2-dichloroethene
CPR	Cardio-Pulmonary Resuscitation
DAY	Day Environmental, Inc.
dBA	Decibels on the A-Weighted Scale
ECP	Emergency Contingency Plan
EMS	Emergency Medical Service
ESA	Environmental Site Assessment
HASP	Health and Safety Plan
IDLH	Immediately Dangerous to Life or Heath
IDW	Investigative Derived Waste
MCDPH	Monroe County Department of Public Health
mg/m^3	Milligram Per Meter Cubed
NIOSH	National Institute for Occupational Safety and Health
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PCE	Tetrachloroethene
PEL	Permissible Exposure Limit
Phase I ESA	Phase I Environmental Site Assessment
PID	Photoionization Detector
PM	Project Manager
PM-10	Particulate Matter Less Than 10 Micrometers In Diameter
PPE	Personal Protection Equipment
ppm	Parts Per Million
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
REC	Recognized Environmental Condition
REL	Recommended Exposure Limit
RTAM	Real-Time Aerosol Monitor
SCG	Standards, Criteria and Guidance
SCO	Soil Cleanup Objective
SSO	Site Safety Officer
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethene
TIC	Tentatively Identified Compound
TCL	Target Compound List
Trans 1,2 DCE	trans 1,2-dicloroethene
TPH	Total Petroleum Hydrocarbons
TWA	Time-Weighted Average

UST	Underground Storage Tank
$\mu g/m^3$	Micrograms Per Meter Cubed
VC	Vinyl Chloride
VOC	Volatile Organic Compound

ATTACHMENT 1

Figure 1 – Route for Emergency Services

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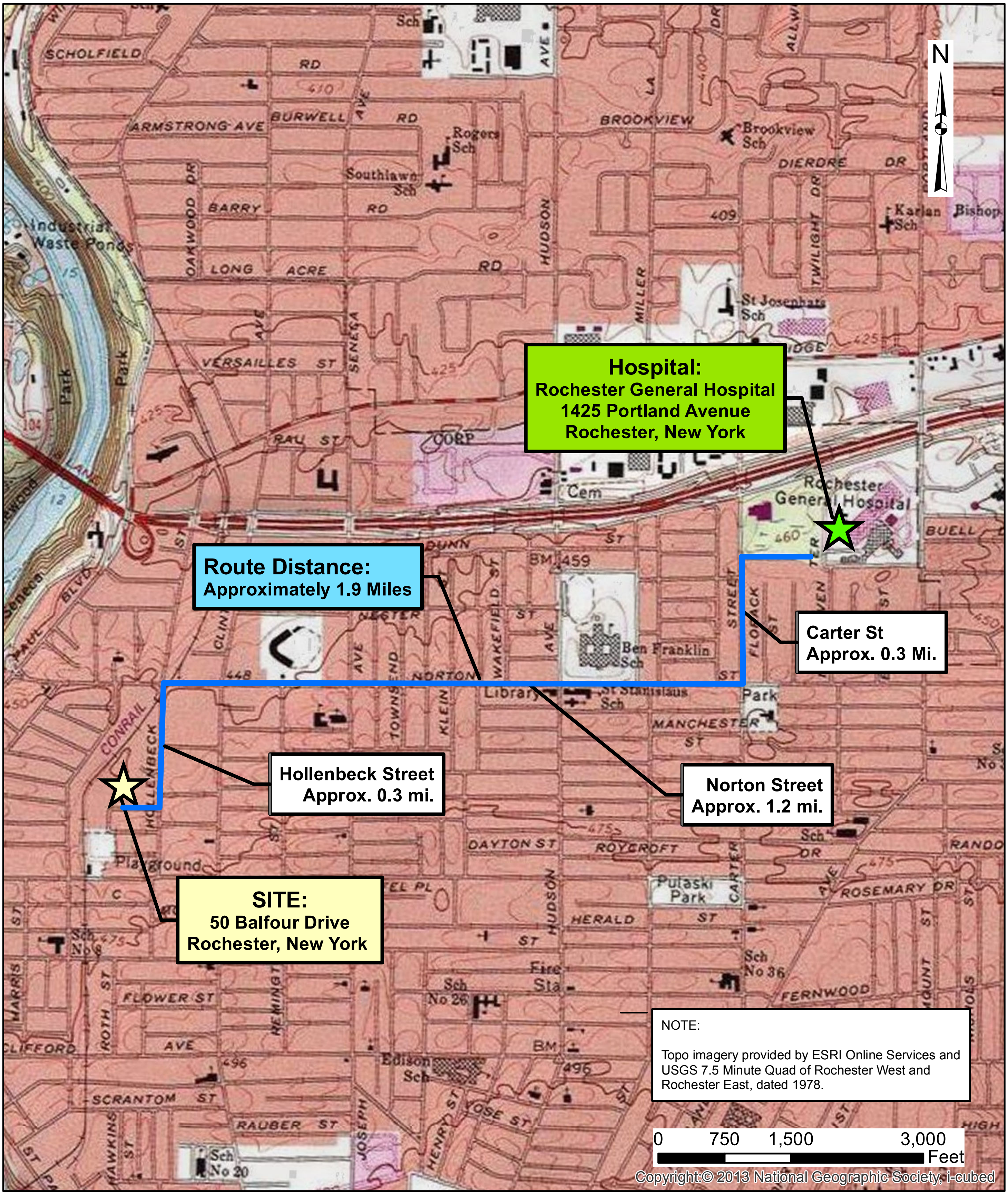

Date 12-20-2013 Drawn By RJM Scale AS NOTED	day **DAY ENVIRONMENTAL, INC.** **Environmental Consultants** **Rochester, New York 14606** **New York, New York 10170**	Project Title 245-265 & 271 HOLLENBECK STREET AND 50 BALFOUR DRIVE ROCHESTER, NEW YORK HEALTH AND SAFETY PLAN Drawing Title Route to Emergency Services	Project No. 4845S-13 FIGURE 1