REMEDIAL INVESTIGATION/ INTERIM REMEDIAL MEASURES WORK PLAN

FOR

QUEEN CITY LANDING
1005 FUHRMANN BLVD (SBL: 132.06-1-1.2)
AND A PORTION OF
975 FUHRMANN BLVD (SBL: 132.06-1-1.1)
CITY OF BUFFALO, ERIE COUNTY, NEW YORK
SITE NO. C915304

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ACRONYM LIST

AAR	Alternatives Analysis Report
ACM	Asbestos-containing Material
ASP	Analytical Services Protocol
BGS	Below Ground Surface
BSA	Buffalo Sewer Authority
CAMP	Community Air Monitoring Plan
CPP	Citizen Participation Plan
DER	Department of Environmental Remediation
DUSR	Data Usability and Summary Report
EDD	Electronic Data Deliverable
ELAP	Environmental Laboratory Accreditation Program
HASP	Health and Safety Plan
IRM	Interim Remedial Measures
MS/MSD	Matrix Spike / Matrix Spike Duplicate
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PAH	Polycyclic Aromatic Hydrocarbons
PID	Photo-ionization Detector
RI	Remedial Investigation
RI/AAR/RWP	Remedial Investigation / Alternative Analysis Report/ Remedial Work Plan
SCO	Soil Cleanup Objectives
Site	3.43-Acre portion of 903 Ellicott Street, Buffalo, New York
SVOC	Semi-volatile Organic Compounds
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

This document presents the Remedial Investigation and Interim Remedial Measures Work Plan for the Brownfield Cleanup Program Site No. C915304 located on 1005 Fuhrmann Boulevard and the eastern portion of 975 Fuhrmann Boulevard in Buffalo, New York (the "Site"). The parcels within the BCP Site total 7.72 acres. The project details are summarized below:

Contaminant Source and Constituents

The contamination is associated with urban and construction fill located on the Site. In addition, petroleum contamination associated with historic underground storage tanks (USTs) is present on the Site (Petroleum Spill Area). Constituents in the fill requiring remediation include semi-volatile organic compounds (SVOCs) and metals. Constituents requiring remediation in the petroleum impacted soils include SVOCs.

Extent of Contamination

The urban fill generally extends to 8 to 17 feet below ground surface and is underlain by construction fill. These fill materials are present across the Site and contain elevated concentrations of SVOCs and metals. The aerial extent of petroleum contamination impacts are not known.

Proposed Site Redevelopment

The Site's developers intend to demolish the existing structures at the Site in order to construct a new 23-story apartment building called Queen City Landing. The development will contain residential units and two restaurants and will help to meet the growing demand for housing and services in the neighborhood, driven primarily by recent commercial development along Ohio Street, greenspace development Fuhrmann Boulevard, and development along the Buffalo River.

Remedial Investigation

To characterize site conditions and identify the appropriate remedy for the Site, a Remedial Investigation (RI) will be implemented. The RI will include the collection and analysis of urban and construction fill, Petroleum Spill Area soils, and groundwater.

Interim Remedial Measures

Because the contaminants are understood to exist within the urban fill and in a discrete petroleum "hotspot" at the Site, this document presents the proposed plan to address these contaminants through removal and off-site disposal.

1 INTRODUCTION

This Remedial Investigation/Interim Remedial Measures (RI/IRM) Work Plan provides a description of the procedures that will be implemented to characterize the nature and extent of contamination of soil at the Queen City Landing Site (the "Site") and the proposed methods to address that contamination. The Site has been assigned New York State Department of Environmental Conservation (NYSDEC) Site No. C915304. This RI/IRM Work Plan has been prepared in accordance with Division of Environmental Remediation "Technical Guidance for Site Investigation and Remediation" (DER-10). To effectively characterize the environmental conditions, this RI/IRM Work Plan discusses the following:

- Current and historic site conditions
- Contaminants of concern and the extent of the contamination
- Extent of RI activities
- Quality controls and protocols for analytical sampling
- Health and safety procedures to protect site workers and the local community
- Community participation activities
- Proposed remedial measures

On February 9, 2016, Queen City Landing, LLC. ("Applicant") acting as a BCP Volunteer, submitted a BCP Application to remediate and develop 1005 Fuhrmann Boulevard and the eastern portion of 975 Fuhrmann Boulevard in the City of Buffalo, New York. The BCP Site parcel extends approximately 65 feet south and 90 feet north into the Outer Harbor of Lake Erie. The approximately 7.72 acre parcel is comprised of fill that was historically placed into the Outer Harbor to facilitate shipping access. Investigative and remedial actions covered under this IRM will include the entire 7.72 acre Site.

The Site is the location of the planned construction of a mixed use residential and commercial structure. An RI will be implemented to further evaluate the extent of the contaminated fill material and to aid in the preparation of an Alternatives Analysis Report (AAR). **Section 4 Remedial Investigation** describes the scope of the investigation during remediation. This document also described proposed IRM actions intended to address the contamination present at the Site.

1.1 Site Description

The Site is located in the City of Buffalo on Fuhrmann Boulevard, just north of the Port of Buffalo Small Boat Harbor. The entrance to the parcel is just north of the intersection of Fuhrmann Boulevard and Ohio Street.

The Site is occupied by a large manufacturing building, a small office building, two connected parking lots, and a former water treatment facility. The majority of the remainder of the Site is surrounded by Lake Erie (Buffalo Outer Harbor). **Figure** 1 shows the location of the Site and **Figure 2** shows the Site Boundaries.

Redevelopment will include the demolition of the existing six-story building to facilitate the performance of the RI under the building, and the construction of a new 23-story apartment building and a new covered parking areas for residents, surface parking for visitors, a new

roadway looping out toward the end of the pier, and an extension of the existing public bike path providing public waterfront access.

The main level of the building will house a mix of restaurant, bar, and fitness center tenants, and the remaining floors will be programmed as one and two-bedroom luxury apartments, totaling more than 150 units. One additional restaurant will be constructed on the fifth floor of the building. The apartments will be well appointed, and designed to take full advantage of the water front views with floor to ceiling glass, high ceilings, and balconies. Along with the penthouse units, plans call for a resident club house and roof top terrace.

1.2 Site History

Between the 1920s and 1960s, the proposed BCP Site was created with fill to allow for shipping access from the Outer Harbor. The BCP Site was purchased in June 1927 by Terminals and Transportation Corporation of America, a Michigan-based company, to build a Great Lakes shipping terminal and warehouse storage for perishables. At the time of purchase, the property was almost entirely water, with approximately an acre of land. Since that time, the property has been filled and developed to include cold storage and then a frozen food manufacturing plant with rail and lake shipping access. The use of the Site since has included food manufacturing, boat storage and repair, and the Site is presently vacant.

1.3 Site Geography, Geology, and Hydrogeology

The Site generally slopes to the south-southwest, although certain minor variations in elevation are present. The Site contains a mix of buildings, asphalt parking/driveway areas and landscaped/lawn areas.

Heterogeneous urban fill is present at the Site at depths ranging from eight to seventeen feet below grade. Urban fill is defined as material coming from anthropogenic sources of the material re-worked to build a site to a defined grade. The urban fill material at the Site contains:

- Crushed Rock
- Sand
- Silt
- Clay
- Plastics
- Construction Debris
- Lumber
- Ash/Cinders
- Ceramics
- Bricks
- Metal

Construction fill was placed in Lake Erie to create the bulk of the land that contains the Site. This construction fill consists of fine to coarse sand. Native soil encountered beneath the construction fill consisted of Silty Clay – organic clays of medium to high plasticity and variable silt content with a grey appearance.

Groundwater is present at approximately five to seven feet below grade. Based on a review of NYSDEC data, the Site is not underlain by any mapped principal or primary aquifers. Groundwater at and in the vicinity of the Site is not used for public drinking water supply.

2 SUMMARY OF ENVIRONMENTAL CONDITIONS

2.1 Previous Environmental Reports

Preliminary environmental information currently exists for the Site. A Phase I Environmental Site Assessments (ESA) was completed for the BCP Site by AMD Environmental Consultants, Inc. (AMD) in 2015. The Phase I indicated areas containing Recognized Environmental Conditions (RECs) which were subsequently investigated in the November 2015 Phase II ESA. A previous Phase II ESA was also conducted at the Site in 2008 by WSP Environmental Services. Additional investigation that included soil sampling, well installation, and groundwater sampling was conducted by C&S Engineers in 2016. The associated documents are attached in **Appendix A.**

FEBRUARY 2008 – WSP ENVIRONMENTAL SERVICES PHASE II ENVIRONMENTAL SITE ASSESSMENT

WSP Environmental Services conducted a Phase II ESA to address RECs found during a site visit and record review. The Phase II consisted of nine subsurface samples from nine borings and four groundwater samples from four temporary wells drilled at the Site. Soil and groundwater samples were analyzed for US Environmental Protection Agency (EPA) Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), and Target Analyte List (TAL) metals including mercury. Soil samples were also analyzed for polychlorinated biphenyls (PCBs). The following summarizes the results and findings of the investigation:

- Nine subsurface soil samples were collected from the Site in 2008. The soil samples were analyzed for TCL VOCs, SVOCs, TAL Metals, and PCBs depending on the sample location.
- Four of the seven samples analyzed for TCL VOCs contained Acetone at concentrations exceeding Unrestricted Use SCOs.
- Three of the seven samples analyzed for TCL SVOCs contained at least one contaminant at concentrations that exceeded Residential Use SCOs. Two of those samples contained a PAH at concentrations exceeding Commercial Use SCOs.
- Five of the seven samples analyzed for TAL Metals contained at least one contaminant at concentrations that exceeded Unrestricted Use SCOs. One sample contained Lead above Residential Use SCOs.
- No PCBs were detected in the two samples analyzed for PCBs.

SEPTEMBER 2015 – AMD ENVIRONMENTAL PHASE I ESA REPORT

The Phase I ESA for the BCP Site identified the following RECs:

- Exterior and interior transformers are located throughout the facility, which need to be sampled for PCB oils and properly disposed of.
- There is an abandoned water treatment facility on-site with a water treatment tank and associated underground apparatus still in-place.
- The area behind the existing building was used to house a metal warehouse building that was demolished. This rear area of the property needs to be excavated to determine the characteristics of the fill material.
- Construction debris from a previous demolition may contain possible asbestos containing materials.

- The area north of the building has two fill ports that typically indicate underground tanks. This area should be excavated to determine what type and size of tanks are present.
- The area in the rear portion of the property has a 3-inch pipe extruding from the ground. This needs to be further investigated to determine the use.
- There are miscellaneous drums, paint and unlabeled liquid waste throughout the building. These materials need to be consolidated and sampled to determine contents.
- Universal wastes (bulbs, ballasts, mercury devices) are located throughout the site.
- The site is filled with construction hard fill (concrete, bricks and slag) these materials should be identified and sampled.
- Numerous fuel tanks were on the property and removed some test pits in those areas should be investigated.
- The basement area is flooded and the water needs to be sampled and properly disposed.

NOVEMBER 2015 – AMD ENVIRONMENTAL PHASE II ENVIRONMENTAL SITE ASSESSMENT

AMD Environmental conducted a Phase II ESA to characterize RECs found during the Phase I ESA. This included characterizing subsurface soil, possible PCBs, water in the basement of the facility, construction and demolition materials on the Site and the former water treatment area. The characterization program included the sampling and analysis of sixteen subsurface soil samples at the Site. Sixteen soil samples were analyzed for differing combinations of Commissioner's Policy (CP) 51 VOCs, CP-51 SVOCs, Resource Conservation and Recovery Act (RCRA) Metals, and PCBs. The following summarizes the results and findings of the investigation:

- Six soil samples were collected from test pits at the Site in 2015.
- Visual petroleum contamination was observed around a 10,000-gallon diesel fuel UST. The NYSDEC Spill No. 1509303 was opened for the Site.
- All of the test pit samples collected contained at least one SVOC at concentrations that exceeded Restricted Residential Use SCOs.
- Four of the six samples contained concentrations of certain PAHs at levels exceeding Commercial Use SCOs.
- One sample contained benzo(a)pyrene at a concentration exceeding Industrial Use SCOs.
- One soil sample collected from the test pits was also analyzed for RCRA metals. Barium and Cadmium were detected at concentrations exceeding Commercial Use SCOs.
- Arsenic and lead were detected at concentrations significantly exceeding Industrial Use SCOs.
- Ten additional soil samples were collected from borings at the Site in 2015. One sample contained SVOCs at concentrations exceeding Residential Use and Restricted Residential Use SCOs.
- One soil sample collected from soil borings was also analyzed for RCRA metals. Selenium was detected at concentrations exceeding Unrestricted Use SCOs.

MARCH 2016 – C&S GROUNDWATER MONITORING WELL INSTALLATION

C&S Engineers, Inc. conducted an environmental investigation to further characterize soil and groundwater conditions. Eight groundwater monitoring wells were installed throughout the Site. Twenty four soil and eight groundwater samples were collected for VOCs, SVOCs, TAL metals, pesticides and PCBs. The following summarizes the results and findings of the investigation:

- Ten soil samples within the urban and construction fill contained PAHs that exceeded Restricted Residential Use and Commercial Use SCOs.
- Four soil samples within the urban and construction fill exceeded Industrial Use SCO for benzo(a)pyrene.
- Two samples in the urban fill contained pesticides above Unrestricted Use SCOs.
- Metals such as arsenic, lead, mercury and zinc were detected in the urban and construction fill above Unrestricted Use SCOs.
- One soil sample in the construction fill exceeded Commercial Use for copper.
- One soil sample in the urban fill exceeded Industrial Use for arsenic.
- No VOCs or PCBs were detected in the soil samples.
- Two groundwater samples exceed Technical and Operational Guidance Series (TOGS) for lead (guidance value 35 ug/L). Concentrations range from 25.7 to 41.9 ug/L.
- Four groundwater samples exceeded the TOGS value for manganese (300 ug/L). Concentrations range from 318 to 870 ug/L.
- One groundwater sample slightly exceeded for benzene (1 ug/L) at 1.95 ug/L.
- One groundwater sample exceeded the guidance value for naphthalene (10 ug/L) at 29.5 ug/L.

2.2 Nature and Extent of Contamination

2.2.1 Fill Material

Soils consist of eight to seventeen feet of urban fill material, and beneath the urban fill is a sandy construction fill material. Urban and construction fill material contains SVOC, pesticide and metal contamination, as shown in recent sampling. No discrete contamination layer was observed, and therefore, the extent of contamination within the fill materials is difficult to identify.

Analytes exceeding Restricted Residential SCOs (or higher) for PAHs were detected in soil samples collected throughout the Site. Metals, including lead, mercury, zinc, copper and selenium were present at concentrations exceeding Unrestricted Use SCOs. One soil sample exceeded Industrial Use for arsenic.

The variation in analyte concentrations across the Site indicates that the source of contamination is the variable urban fill material and no discrete source is located on-site or off-site. Contaminated urban fill is expected to exist on-site from surface to approximate depths of eight to seventeen feet below grade.

2.2.2 Petroleum Spill Area

During the 2015 Phase II ESA, two USTs were discovered adjacent to a demolished building floor slab. One UST was determined to be a 10,000-gallon diesel tank; the size and contents of the second tank is unknown. Visible petroleum contamination was observed during the test pit excavation around the floor slab. Soil samples collected from the test pits indicate that VOC and SVOC contamination exceeds Restricted Residential Use (or higher). One soil sample contained benzo(a)pyrene at a concentration exceeding Industrial Use SCOs. The extent of petroleum contamination is unknown at this time.

In addition, records indicate that multiple USTs were located toward the northern border of the Site. Since the status of these historic tanks are unknown it is possible that additional petroleum releases have occurred.

3 OBJECTIVES, SCOPE AND RATIONALE

The objectives of the Remedial Investigation described in this Work Plan are to evaluate contaminant impacts to soil and groundwater in order to identify and evaluate appropriate remedial actions for the Site. The investigation work will include evaluating the magnitude and extent of soil and groundwater impacts, conducting a qualitative exposure assessment for actual or potential exposures to contaminants at the Site and/or emanating from the Site, and producing data that will support the development of an acceptable RI Report.

The RI scope of work is based on information previously gathered regarding historical operations conducted at the Site, the results of the limited site characterization, and the project objectives. The RI will include the following:

- A geophysical survey – A geophysical survey will be conducted across the Site to investigate the possible presence of buried metal materials and debris.

- Surface Soil Evaluation - This task will consist of the collection and analysis of surface soil samples.

- Subsurface Soil Evaluation – This task will consist of the advancement of soil borings and the collection and analysis of subsurface soil samples to characterize soil conditions at the Site.

- Groundwater Evaluation – Eight groundwater monitoring wells will be installed and sampled to characterize groundwater conditions and help determine groundwater flow and contaminant conditions.

The RI work will be completed in general accordance with NYSDEC Division of Environmental Remediation: Technical Guidance for Site Investigation and Remediation dated May 2010 (DER-10).

4 REMEDIAL INVESTIGATION

This RI describes the scope of work necessary to collect sufficient data to determine the extent of contaminated fill material, which will support the identification and implementation of a remedy

that facilitates the redevelopment of the Site. This RI will provide an outline for the following sections:

- Field Investigation
- Sampling Plan
- Laboratory Analysis

4.1 Field Investigation

The RI intends to characterize site conditions by the advancement of soil borings, installing monitoring wells, and collecting and analyzing soil and groundwater samples.

4.1.1 Building Demolition

Because concern exists regarding the presence of numerous sumps and other structures in the basement of the building that may have discharged contaminants to the underlying soils and that much of the basement is inaccessible and/or unsafe to access, the Remedial Investigation will require the demolition of the building. The presence of asbestos has been confirmed within the building and will be removed using appropriate techniques prior to demolition.

The scope of the actual demolition is currently being developed and will be provided to the NYSDEC prior to implementation. Additionally, a request for a Beneficial Use Determination will be submitted to the NYSDEC for the reuse of the concrete from the building following crushing.

4.1.2 Geophysical Survey

The geophysical survey will be conducted by a qualified subcontractor. The subcontractor will scan the entire Site with an electromagnetic metal detector. Any metallic anomalies that may be USTs will be further investigated with a ground penetrating radar (GPR). The GPR will delineate the approximate width, length and depth of the UST.

4.1.3 Surface Soil Sampling

Surface soil samples will be collected across the Site. The 12 surface soil samples will be spatially distributed across the Site in areas not "capped" by asphalt or buildings. The samples will be collected from 0 to 2 inches below grade using a decontaminated, stainless steel spoon or spatula. Surface soil samples will be collected within grid locations shown on **Figure 2**.

The surface soil samples will be analyzed for the following analyte list:

- Target Compound List (TCL) volatile organic compounds (VOC)
- TCL semivolatile organic compounds (SVOCs)
- TCL pesticides/herbicides
- Polychlorinated biphenyls (PCBs)
- Target Analyte List (TAL) metals, including total mercury
- Total cyanide
- Hexavalent chromium (from 4 of 12 samples only)

4.1.4 Subsurface Soil Characterization

The advancement of soil borings across the Site will facilitate sampling of typical urban fill and construction fill, as well as the construction of groundwater monitoring wells. To ensure complete coverage of the Site, a 100-foot by 100-foot grid will be established across the Site, as shown on **Figure 2**, resulting in 42 grid locations. From the borings, fill samples will be collected to document Site conditions. Eight locations will also be used for the construction of groundwater monitoring wells, as discussed in **Section 4.1.6 Groundwater Monitoring.**

The building occupies approximately eight grid locations. Access to the basement floor slab is limited and in some areas dangerous. Sampling within the building footprint will be conducted after demolition and debris cleanup.

For the borings in which wells will not be installed, a direct-push drilling rig will be used to advance the borings. Each boring location will continuously sampled in four-foot intervals using a one-inch by four-foot steel sampling tube fitted with a disposable acetate liner. All non-disposable sampling equipment will be decontaminated between runs and between drill locations to avoid potential cross contamination of samples.

In locations where direct-push techniques are not feasible and/or groundwater wells will be constructed, a rotary drill will be used to advance 4-1/4-inch hollow stem augers. Split-spoon samples will be advanced at two-foot intervals using a 140-pound hammer ahead of the augers. The augers and drilling rods will be decontaminated prior to use via high pressure sprayer. The split-spoons will be decontaminated prior to use via an Alconox wash followed by a potable water rinse. Between each soil sample and soil boring, decontamination procedures will be repeated.

Soils from the split-spoons and acetate liners will be screened in the field for visible impairment, olfactory indications of impairment, evidence of NAPLs, and/or indication of detectable VOCs with a PID, collectively referred to as "evidence of impairment" and the results will be recorded on boring logs. The boring logs will be included in the RI Report.

Urban Fill Sampling

Urban fill samples will be collected from the borings based on evidence of impairment and to provide characterization across the Site. From each of the 42 grids, one fill sample will be collected and analyzed for the following:

- TCL VOCs
- TCL SVOCs
- TCL pesticides
- PCBs
- TAL metals, including total mercury
- Total cyanide
- Hexavalent chromium (from 12 of 42 samples only)

Additionally, six samples will be collected from the fill for waste disposal characteristics. The waste characterization analysis will include:

- Toxicity Characteristic Leaching Procedure (TCLP) VOCs
- TCLP SVOCs

- TCLP pesticides/herbicides
- PCBs
- TCLP metals
- Reactivity
- Corrosivity
- Ignitability

Construction Fill Sampling (15-Foot Below Grade Sampling)

Below the typical urban fill, a construction-type fill exists throughout the Site. This layer of sandy soil will be visually assessed and sampled in each grid locations, consistent with the methods above. In 12 locations spatially distributed across the Site, samples of this material will be collected at 15 feet below grade. Samples will be analyzed for:

- TCL VOCs
- TCL SVOCs
- TCL pesticides
- PCBs
- TAL metals, including total mercury
- Total cyanide
- Hexavalent chromium (from 4 of 12 samples only)

4.1.5 Petroleum Spill Delineation

Two NYSDEC spill files are on record related to historic petroleum storage on the Site. Spill file 8704197 was opened in 1987 and closed in May 1988 following a tank test failure. Spill file 0175401 was opened and closed a day later on November 1, 2001.

There is also an open spill file at the Site, Spill #1509303. This spill file was opened in response to the discovery of a 10,000-gallon UST at the Site during the 2015 Phase II ESA.

Test pits will be excavated to investigate known USTs and any possible USTs encountered during geophysical survey. Up to 12 test pits will be excavated in areas known to have contained USTs and up to 24 additional samples will be collected to delineate any areas of concern or "hotspots" related to past spills.

The test pit soil samples will be analyzed for the following analyte list:

- CP-51 VOCs
- CP-51 SVOCs

4.1.6 Groundwater Monitoring

To characterize groundwater conditions at the Site, eight monitoring wells were installed in 2016. The wells were installed from soil borings drilled in accordance with the procedures described in **Section 4.1.4 Subsurface Soil Characterization**. The wells were located throughout the Site, including areas near suspected contamination and suspected historic tanks, as shown in **Figure 2**.

The overburden wells were constructed to intersect the top of the water table. Each well was completed with ten feet of 2-inch Schedule 40 0.010-slot well screen connected to an appropriate length of schedule 40 PVC well riser to complete the well. The annulus was sand packed with quartz sand to approximately one to two feet above the screened section, and one to two feet of bentonite chips or pellets above the sand. Each well was completed with a stick-up protective casing.

Following installation, the monitoring wells were developed through the removal of up to ten well volumes using dedicated bailers or a peristaltic or submersible pump.

C&S completed one round of groundwater sampling following well development and using low-flow purging and sampling techniques[1]. Before purging the well, water levels were measured using an electric water level sounder capable of measuring to the 0.01 foot accuracy. Peristaltic or bladder pumps using manufacturer-specified tubing were used for purging and sampling groundwater. Calibration, purging and sampling procedures were performed as specified by the USEPA[2] for low-flow sampling. Decontamination was conducted after each well is sampled to reduce the likelihood of cross contamination. Calibration times, purging volumes, water levels and field measurements were recorded in a field log and will be provided in the Remedial Investigation Report.

The groundwater samples were analyzed for the following analyte list:

- TCL VOCs
- TCL SVOCs
- TCL pesticides/herbicides
- PCBs
- TAL metals including total mercury
- Total cyanide
- Hexavalent chromium (from one of the eight wells only)

Drilling decontamination, development, and purge fluids were allowed to infiltrate the ground surface of the Site in the vicinity of each soil sampling location.

As part of the RI, a second round of groundwater sampling will be performed in accordance with the procedures described above. The resulting samples will be analyzed for the same contaminants as in the first round.

4.2 Sampling Plan and Laboratory Analysis

Table 1 summarizes the sampling program described in the sections above. Additionally, Quality Assurance/Quality Control (QA/QC) samples will be collected, and the following describes the minimum number of samples per media type:

- Surface soil samples
    - Blind duplicate – 1 per 20
    - Matrix Spike/Matrix Spike Duplicate (MS/MSD) – 1 per 20
- Subsurface soil samples

[2] U.S. EPA Region 1 Low Stress (low-flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, January 19, 2010.

  - Blind duplicate – 1 per 20
  - Matrix Spike/Matrix Spike Duplicate (MS/MSD) – 1 per 20
- Groundwater samples
  - Trip blank – 1 per shipment
  - Blind Duplicate – 1 per 20
  - Matrix Spike/Matrix Spike Duplicate (MS/MSD) – 1 per 20

C&S will utilize the services of an NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory for analytical testing. The laboratory results for the samples will be reported in a Category B deliverables package to facilitate validation of the data, and a third party validator will review the laboratory data and prepare a Data Usability Summary Report (DUSR). The validator will evaluate the analytical results for the field samples and quality assurance/quality control samples and compare the findings to USEPA guidance to determine the accuracy and validity of the results.

A summary of the RI activities will be submitted to the NYSDEC as monthly progress reports and will be included in the Final Engineering Report. All data submitted to the NYSDEC will be in approved electronic data deliverable (EDD) format.

5 QUALITY ASSURANCE AND QUALITY CONTROL PROTOCOLS

To ensure that suitable and verifiable data results are obtained from the information collected at the Site, quality assurance procedures are detailed in this section.

5.1 Sampling Methods, Analytical Procedures and Documentation

5.1.1 Sampling Methods

Sampling procedures will be conducted in accordance with the NYSDEC *Sampling Guidelines and Protocols Manual*. Collection of representative samples will include the following procedures:

- Ensuring that the sample taken is representative of the material being sampled;
- Using proper sampling, handling and preservation techniques;
- Properly identifying the collected samples and documenting their collection in field records;
- Maintaining chain-of-custody; and
- Properly preserving samples after collection.

Soil Sampling

Soil sampling will be performed using two methods: (1) field screening using a PID; and (2) grab samples. Whether soil samples are collected from the excavator bucket, direct-push rig sleeves, or split-spoons, they will be collected as grab samples that are split and placed into jars supplied by the laboratory as well as into individual zip-lock bags for screening. Screening soil samples will be allowed to sit in sealed zip-lock bag for a short period of time (minimum of five minutes). Head space measurements will then be taken from each zip-lock bag. To prevent cross contamination, zip-lock bags will not be reused and will be properly disposed. Calibration of all electronic field screening equipment will be completed daily and will be done to manufacturer's specifications.

As detailed in the *Sampling Guidelines and Protocols Manual*, grab samples will be placed in 4-ounce and 8-ounce, wide-mouth, glass jars. Sample jars will immediately be placed on ice in a cooler.

Water Sampling

Groundwater sampling will be conducted in accordance with USEPA guidance for low-flow purging and sampling, as described in **Section 4**.

Water samples will be collected via pouring directly into pre-cleaned bottles provided by the laboratory and immediately placing the bottles on ice. The bottles and associated preservatives, if any, used will be based on the requirements of the analytical methods.

QA/QC Sampling

As described in **Section 4.2**, QA/QC samples will be collected to help evaluate the validity of the laboratory data. Trip blanks, duplicate samples, and MS/MSD samples will be analyzed per the various media as described in **Section 4.2**.

Sample Nomenclature

Because a variety of types of samples will be generated during the course of this project, strict adherence to a planned nomenclature scheme is necessary. The following presents the planned sample nomenclature:

- Surface soil samples – SS-A1
  - SS – Surface soil
  - A1 – Grid location
- Subsurface soil samples (soil borings) – SB-A1-1FT
  - SB – Soil boring soil sample
  - A1 – Grid location A1
  - 1FT – Sample depth in feet
- Groundwater samples – GW-MW02-01
  - GW – Groundwater
  - MW01 – Monitoring Well 02
  - 01 – First sampling event

5.1.2 Analytical Procedures

Laboratory Analysis

Laboratory analysis will be conducted by a third-party laboratory that is accredited by the NYSDOH Environmental Laboratory Accreditation Program (ELAP). Laboratory analytical methods will include the most current NYSDEC Analytical Services Protocol (ASP).

Soil and groundwater samples sent to a certified laboratory will be analyzed in accordance with EPA SW-846 methodology for the following contaminants:

- Target Compound List for Volatile Organic Compounds (EPA Method 8260);

- Target Compound List for Semi-volatile Compounds (EPA Method 8270);
- TCL Pesticides (USEPA 8081);
- PCBs (USEPA 8082); and
- Target Analytes List for Metals (EPA Method 6010).

Category B deliverable will be requested to be used in a third-party data validation.

Data Usability

Data Usability Summary Report (DUSR) will be performed by a third-party data consultant using the most recent methods and criteria from the U.S. EPA. The DUSR will assess all sample analytical data, blanks, duplicates and laboratory control samples and evaluate the completeness of the data package. The waste characterization samples will not be validated.

5.1.3 Documentation

Custody Procedures

As outlined in NYSDEC *Sampling Guidelines and Protocols*, a sample is in custody under the following conditions:

- It is in your actual possession;
- It is in your view after being in your physical possession;
- It was in your possession and then you locked or sealed it up to prevent tampering; or
- It is in a secure area.

The environmental professional will maintain all chain-of-custody documents that will be completed for all samples that will leave the Site to be tested in the laboratory.

Air Monitoring

Air monitoring will be conducted for on-site health and safety. Air monitoring will be conducted during active invasive activities periods. The monitoring will include VOC screening. The specifics of the air monitoring procedures and criteria are detailed in the Health and Safety Plan (HASP) in **Appendix C** and Community Air Monitoring Plan (CAMP) in **Appendix D.**

6 HEALTH AND SAFETY

To verify the safety of the workers and the local community during the performance of the work, monitoring practices of the work environment will be in place during all phases of RI activities. A Health and Safety Plan (HASP) was prepared that details procedures for maintaining safe working conditions and minimizing the potential for exposure to hazardous material. The HASP is provided in **Appendix D**.

Air monitoring during RI activities will be conducted using PID and an aerosol particle meter. Details on air monitoring are provided in the Community Air Monitoring Plan (CAMP). The CAMP is provided in **Appendix C**.

7 INTERIM REMEDIAL MEASURES

The following steps will be implemented to address the known contamination within the urban fill at the Site:

- Remove and properly dispose off-site petroleum contaminated soils in the Petroleum Spill Area, as well as other areas if identified during the RI.
- Remove surface fill material that is unsuitable for construction and dispose off-site.
- Remove fill from the surface where necessary to meet planned grades following placement of two feet of the clean soil cover.
- Crush and re-use clean concrete from the building demolition activities.
- Place a minimum of two feet of certified clean soil or concrete or asphalt across the Site.
- Prepare a Site Management Plan (SMP) for the Site.
- Prepare an Environmental Easement to restrict Site use to Restricted Residential Use and to ensure that the Site cover remains in place and that the soil excavated in future redevelopment is properly handled.

This section of the report will identify the steps to be taken to remediate the Site and how the actions will successfully achieve the stated Restricted Residential Use Soil Cleanup Objectives.

7.1 Site Control

Site control is an important aspect of this remedial program. In order to safeguard the health and safety of site workers and the general public, access to all remedial work areas will be restricted. Perimeter fencing will be installed to facilitate site control. Additionally, temporary construction fencing will be erected around accessible excavations and staging areas to prevent unauthorized personnel from entering these areas as appropriate.

7.2 Site Preparation

Site preparation activities will include the following:

7.2.1 Water Collection and Treatment System

Contingent plans will be created to address stormwater, if any, in the excavation. These plans include the potential for pumping the excavation water using temporary sumps or a vacuum truck into steel holding tanks. Stored water may be shipped for off-site treatment at a licensed treatment facility; characterized and treated, if necessary, on-site and discharged to the Lake Erie or to the sanitary sewer under a Buffalo Sewer Authority permit, as appropriate.

7.3 Excavation

Excavation is planned to occur across the Site and will include the removal and off-site disposal of petroleum impacted fill, fill that is unsuitable for construction, and any fill necessary to meet

final grades following installation of the two-foot clean soil cover. Fill excavated from the Site will not be re-used at other sites.

A C&S scientist or engineer will screen the removed fill for visual and olfactory observations and for total volatile compounds using a photoionization detector (PID). If grossly contaminated fill is observed, the impacted material will be evaluated and may be handled separately from the remaining fill at the Site.

Excavated fill may be direct-loaded onto trucks for off-site disposal or stockpiled and loaded onto trucks for off-site disposal. Excavated fill to be stockpiled on-site will be placed on and covered by a minimum of double 6-mil polyethylene sheeting which is sufficiently anchored to prevent any wind and water erosion. The cover will be inspected at least once per day with corrective action taken as needed. The inspections and any corrective actions will be documented in logs and will occur until the fill materials have been properly removed and disposed off-site.

Good housekeeping practices will be followed during excavation activities to prevent leaving contaminated material on the ground surface (e.g., precautions will be taken to prevent impacts to the ground surface due to material spilled from the excavator bucket).

Transportation of all wastes will be completed by properly permitted vehicles. To the extent practicable, trucks will travel along routes that avoid residential areas.

7.3.1 Underground Storage Tank Removal

USTs discovered during the RI will be removed from the Site. Prior to removal tank liquids and sediments will be removed and properly disposed. The internal atmosphere of the tank will be rendered inert using the methods outlined in the NYSDEC Memorandum "Permanent Closure of Petroleum Storage Tanks," modified December 3, 2003. Once the tanks have been removed, the inside of the tanks will be cleaned and placed on trucks for disposal at a recycling facility.

7.4 Concrete Re-use

The demolition of the building will produce a significant amount of clean concrete. Clean concrete will be crushed on-site and used for the installation of stabilized construction roads and laydown areas. Prior to the building demolition, areas of acceptable concrete will be evaluated. Concrete with significant stains will not be used. A petition for a Beneficial Use Determination for the re-use of concrete will be submitted to the NYSDEC prior to demolition.

7.5 Backfilling

The excavation at the Site will be backfilled with material such as clean soil, crushed stone, and/or concrete.

For each source of backfill that is imported to the Site, one of the following will be completed prior to importing the backfill.

a. Documentation will be provided to NYSDEC as to the source of the material and the consistency of the material in accordance with the exemption for no chemical testing listed in DER-10 Section 5.4(e)(5); **OR**

b. Chemical testing will be completed in accordance with the following table:

Recommended Number of Soil Samples for Soil Imported To or Exported From a Site			
Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		

Taken from DER-10 - Table 5.4(e)10

In the event that laboratory analytical testing is conducted, the results for each new source of fill must meet the values provided in Appendix 5 of DER-10 (provided as Appendix C in this Work Plan) for Restricted Residential use and must receive approval by the NYSDEC.

7.5.1 Soil Cover

The soil cover system will consist of a geotextile demarcation layer covered by the approved backfill material discussed above. A minimum of two feet of clean soil will be placed in areas not covered by structures such as buildings, sidewalks or pavement. In areas covered by impervious structures the cover will be concrete or asphalt on top of a gravel sub-base.

7.6 Air Monitoring

Continuous air monitoring will be conducted at upwind and downwind locations during all ground intrusive activities as per DOH Generic CAMP (CAMP) included in **Appendix C**. A particulate monitor will be used at a downwind location on the perimeter of the Site. Another handheld detector was used in the excavation to ensure that the worker area was safe.

The action threshold for VOCs established in the CAMP is 5 ppm above background. If this value is exceeded for the 15-minute average work will be halted and work may resume once instantaneous readings fall below 5 ppm work. The action level for dust is 100 micrograms per cubic meter over background during a 15-minute average. If this limit is exceeded, dust suppression techniques will be employed, including using water to wet the area.

7.7 Erosion and Dust Controls

As part of the remedial actions to be performed at the Site, measures will be needed to limit erosion and dust generation. Erosion control and dust suppression techniques will be employed as necessary to limit erosion and fugitive dust generated in disturbed areas during remediation and redevelopment activities. Such techniques may be employed even if the community air monitoring results indicate that particulate levels are below action levels. Techniques may include but are not limited to:

- Using silt fencing, hay bales, and/or mulching
- Applying water on haul roads
- Wetting equipment and excavation surfaces
- Hauling materials in properly tarped or watertight containers
- Limiting vehicle speed on the Site
- Limiting the size of excavations
- Covering excavated areas and materials following excavation

Effectiveness of the dust suppression measures will be evaluated based on the results of the air monitoring that will be conducted under the Site-Specific Community Air Monitoring Plan provided in **Appendix C**.

7.8 Confirmatory Sampling

Confirmatory sampling will only be necessary within the petroleum excavation area. It is anticipated that the sampling results for the 24 petroleum area delineation samples collected during the RI (Section 4.1.4) will act as the confirmatory samples and additional sampling will not be necessary.

Additionally, it is not expected that additional confirmatory samples will be required for the fill across the Site due to the construction of the engineering control (viz., soil cover).

7.9 Summary of Interim Remedial Measures

The IRM as described above will be effective in remediating the Site.

The petroleum impacted, fill material unsuitable for construction, and fill excavated to create appropriate final site grades will be excavated and properly disposed off-site. Residual soil contamination will be covered with a minimum of two feet of soil or asphalt or concrete. Backfill materials will meet NYSDEC requirements for backfill at BCP sites. The SMP and Environmental Easement will ensure that the Site cover remains in place and that the soil excavated in future redevelopment is properly handled.

8 REPORTING

Based on the results of the work described above, one report will be prepared to describe the methodologies and results of the RI and IRM. The RI and IRM portions of the Report will describe:

- Investigative methods;
- Observations and findings;
- Inspection/Monitoring observations of the remedial measures;
- Results of the community air monitoring program; and
- Analytical results.

The AAR portion of the Report will include the following elements:

- An Alternatives Analysis
  - Description of remaining contamination, if any
  - Identification of potential, additional remedial measures
  - Evaluation of potential, additional remedial measures, including no action following the remediation
  - Identification of recommended additional remedy

The documents will be submitted to the NYSDEC for review and approval.

9 SCHEDULE

It is assumed that NYSDEC will promptly review this RI/IRM Work Plan followed by a 30-day comment period. Below is an anticipated schedule of milestones for the remediation of the Site.

Anticipated Date **Milestone**

June – July 2016: Preparation/execution of Brownfield Cleanup Agreement

July 2016: Sampling/data collection and preparation of RI/AAR/IRM report.

July 2016: Beginning of demolition of existing improvements

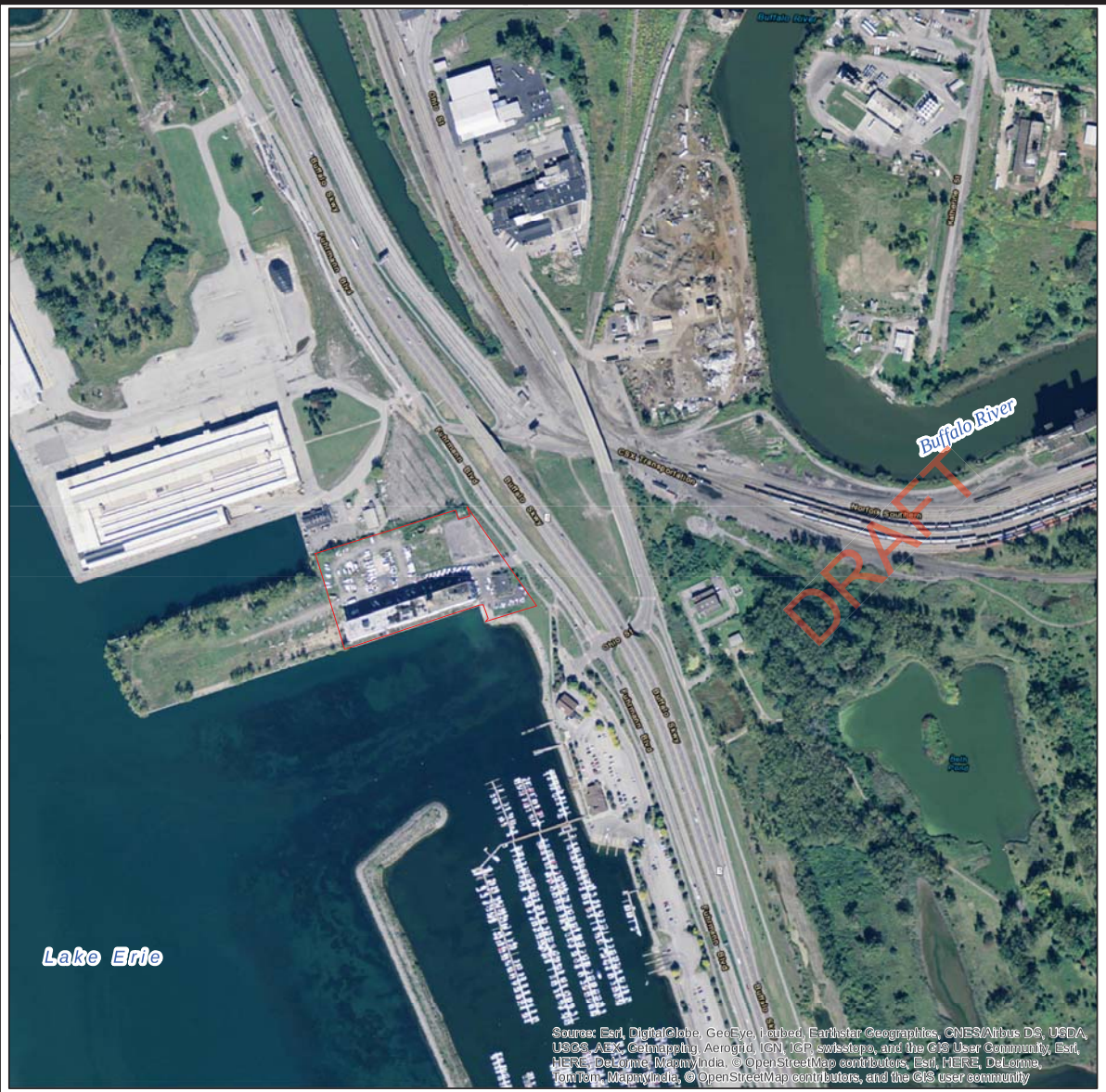
August – September 2016: Implement Interim Remedial Measures

October 2016 – February 2017: Completion and approval of Final Engineering Report and other Brownfield Cleanup Program requirements as needed (e.g., Environmental Easement, Site Management Plan, etc.);

June 2017: Receipt of Certificate of Completion

September 2016 – September 2017 Construction of new mixed-use building

FIGURES



LEGEND

PROPOSED BCP BOUNDARY

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

0 425 850 1,700 Feet

C&S Engineers, Inc.
141 Elm Street
Buffalo, New York 14203
Phone: 716-847-1630
Fax: 716-847-1454
www.cscos.com

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QUEEN CITY LANDING
REMEDIAL INVESTIGATION / INTERIM REMEDIAL MEASURE WORK PLAN
BUFFALO, NEW YORK

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	J53.002.001
DATE:	JANUARY 7, 2016
DRAWN BY:	A.DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	M. COLMERAUER

SITE LOCATION

FIGURE 1

LEGEND

- PROPOSED BCP BOUNDARY
- HISTORIC TANKS
- HISTORIC BUILDINGS AT PROPERTY
- HISTORIC RAIL LINES AT PROPERTY
- EXISTING STRUCTURES/CONCRETE

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) LOCATIONS OF HISTORIC BUILDINGS, TANKS AND RAIL LINES AT THE PROPERTY WERE DIGITIZED FROM 1940-1950S SANBORN FIRE INSURANCE MAPPING.

3) LOCATION OF CURRENT STRUCTURES AND CONCRETE AT THE PROPERTY TAKEN FROM JUNE 2015 SURVEY COMPLETED BY NUSSBAUMER AND CLARKE, INC.

0 60 120 240
Feet

C&S Engineers, Inc.
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N

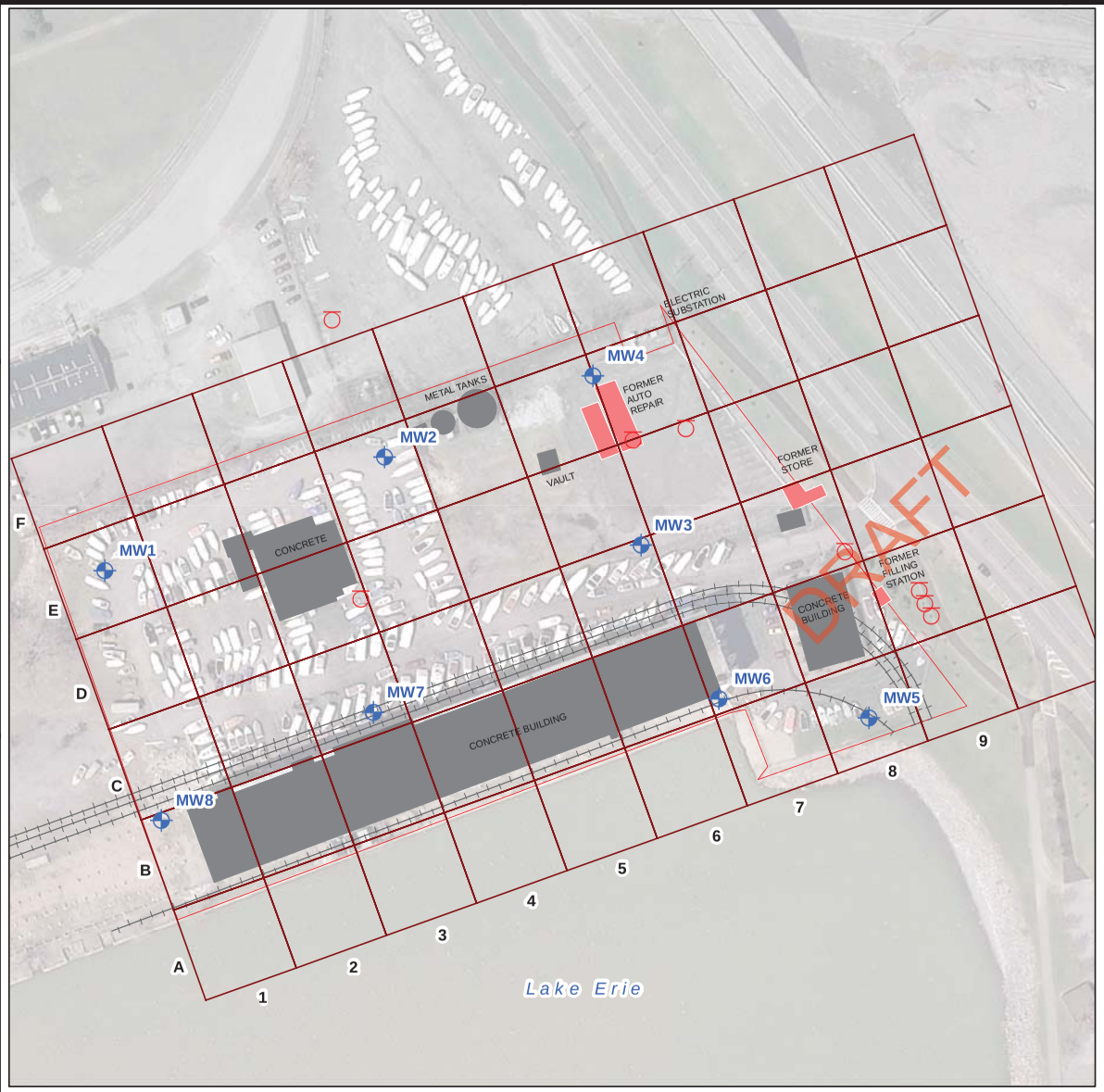
QUEEN CITY LANDING
REMEDIAL INVESTIGATION / INTERIM REMEDIAL MEASURE
WORK PLAN
BUFFALO, NEW YORK

MARK	DATE	DESCRIPTION
REVISIONS		

PROJECT NO:	J53.002.001
DATE:	FEBRUARY 25, 2016
DRAWN BY:	A DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	M. COLMERAUER

SITE MAP

FIGURE 2



LEGEND

- BCP BOUNDARY
- HISTORIC TANKS
- HISTORIC BUILDINGS AT PROPERTY
- HISTORIC RAIL LINES AT PROPERTY
- EXISTING STRUCTURES/CONCRETE
- GROUNDWATER WELLS

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) LOCATIONS OF HISTORIC BUILDINGS, TANKS AND RAIL LINES AT THE PROPERTY WERE DIGITIZED FROM 1940-1950S SANBORN FIRE INSURANCE MAPPING.

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QUEEN CITY LANDING
REMEDIAL INVESTIGATION / INTERIM REMEDIAL MEASURE WORK PLAN
BUFFALO, NEW YORK

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	J53.002.001
DATE:	APRIL 11, 2016
DRAWN BY:	A DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

GROUNDWATER MONITORING WELL LOCATIONS

FIGURE 3

TABLES

Table 1 – Proposed Remedial Investigation Sampling Program

Task	Location	Number of Samples	Lab Analysis
Urban Fill Samples	50-foot by 50-foot grid	12 (surface)	TCL VOCs, SVOCs and pesticides, PCBs, TAL Metals, Cyanide, Hex Chromium (subset only - 4 samples)
		42 (subsurface)	TCL VOCs, SVOCs and pesticides, PCBs, TAL Metals, Cyanide, Hex Chromium (subset only - 12 samples)
	Site-wide	6	TCLP VOCs, SVOCs, pesticides, herbicides, and metals, PCBs, reactivity, corrosivity, ignitability
Construction Fill	50-foot by 50-foot grid	12	TCL VOCs, SVOCs and pesticides, PCBs, TAL Metals, Cyanide, Hex Chromium (subset only-4 samples)
Petroleum Spill Delineation	Site-wide	24	CP-51 VOCs and CP-51 SVOCs
Groundwater Samples	Site-wide	16 (Two Events - one of which was previously completed)	TCL VOCs, SVOCs and pesticides, PCBs, TAL Metals, Cyanide, Hex Chromium (subset only - 1 sample)

APPENDICES

APPENDIX A
PREVIOUS SUBSURFACE CHARACTERIZATION REPORTS

ENVIRONMENTAL STRATEGIES

6459 West Quaker Street, Suite 2B · Orchard Park, NY 14127 · (716) 662-6887 · Fax (716) 608-1387

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER FREEZER QUEEN, INC. PROPERTY
BUFFALO, NEW YORK

DRAFT

PREPARED

BY

WSP ENVIRONMENTAL STRATEGIES LLC

FEBRUARY 28, 2008

Contents

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(continued)

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Acronym List

AOC	area of concern
AST	aboveground storage tank
bgs	below ground surface
EDR	Environmental Data Resources, Inc.
EPA	U.S. Environmental Protection Agency
ft	feet
FINDS	Facility Index Data System
µg/kg	micrograms per kilogram
µg/l	micrograms per liter
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
mcf/dat	million cubic feet per day
NYSDEC	New York State Department of Environmental Conservation
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector
RCRA	Resource Conservation Recovery Act
SOP	standard operating procedure
SQG	small-quantity generator
SVOCs	semi-volatile organic compounds
TAL	Target Analyte List
TOGS	Technical and Operating Guidance Series
UST	underground storage tank
VOCs	volatile organic compounds

1.0 Introduction

WSP Environmental Strategies LLC was retained by Ontario Specialty Contracting, Inc., to conduct a Phase II Investigation for the Former Freezer Queen, Inc., property in Buffalo, New York (the site). The objective of the investigation was to evaluate potential recognized environmental conditions identified during a site visit conducted by CompCo of WNY, Inc., on October 12, 2007, and a site visit conducted by WSP Environmental Strategies on December 19, 2007. A formal Phase I Environmental Site Assessment was never conducted for the site. In preparation for the Phase II Investigation activities, WSP Environmental Strategies retained Environmental Data Resources, Inc. (EDR) to search federal and state regulatory databases to identify environmental issues that have been reported for the subject property or properties in the vicinity of the site. This report includes the results of the EDR database search, a brief site history, description of the scope of work, discussion of the results, and WSP Environmental Strategies' conclusions with regard to the environmental conditions at, and recommendations for management of, the site.

1.1 Site Background

The site is located at 975-1000 Fuhrman Boulevard in Buffalo, New York (Figure 1). The approximate 16-acre site consists of a main food manufacturing building, an administrative building, a garage, a small office structure near the former wastewater treatment area, and a guard shack (Figure 2). The site facilities also include a former wastewater treatment area, a former bulk petroleum storage area, an inactive natural gas well, and power substations. The remainder of the property includes asphalt parking lots, grassy areas, and shoreline. Lake Erie forms the northern, western, and southern borders of the property, which is a rectangular-shaped peninsula into the Buffalo Outer Harbor of the lake. Access to the property is from the eastern side along Fuhrman Boulevard.

A Phase I investigation has never been conducted for the site. Ontario Specialty Contracting retained CompCo of WNY, Inc., to complete an Environmental Investigation Report for the site. A site visit was conducted by Mr. Vincent J. Grandinetti of CompCo of WNY, Inc., on October 12, 2007. The report included a visual site inspection, a photographic record, and a

record review. The findings of the site visit and record review are summarized in Section 1.2 of this report.

There are no known designated wetlands on or near the property. The nearest perennial surface water is Lake Erie's Buffalo Outer Harbor, which borders the property on three sides. The Buffalo River runs just northeast of the site, less than half a mile away.

1.1.1 Site Topography, Geology, and Hydrogeology

The property is located approximately 590 feet above mean sea level, and the topography slopes slightly to the north. The property is a man-made peninsula that is surrounded on three sides by Lake Erie. A concrete seawall bounds the property to the south. The topography of the area is generally flat-lying with occasional small hills.

The property is located in the Lake Erie-Niagara River basin of the Central Lowland Province. The basin is bordered by Lake Erie and the Niagara River on the west and extends eastward to Genesee County (Olcott, Perry G. 1995. Ground Water Atlas of the United States – Segment 12.)

The borings at the property encountered fill consisting of chunks of concrete, pieces of asphalt, brick and brick fragments, chunks of glass, cobbles to boulders and rock fragments, coal slag and cinders, ash, wood fragments (railroad ties), and possible foundry sand intermixed with sand and clay to a maximum depth of 11 feet below ground surface (bgs). The greatest depth of debris fill was present in the borings along the shoreline and near the demolished maintenance garage (B-6 and B-7). Other than these areas, the overall depth of the debris fill was 4 feet bgs. Underlying the debris fill was fine- to medium-grained sand with occasional shell fragments and pebbles, and occasional silt layers. In the borings at the southern end of the property, black fine-grained sand (possibly foundry casting sand) was encountered below 7 feet bgs.

Bedrock consists of layers of Paleozoic-age sedimentary rock (limestone, dolomite, and shale) that dip very slightly to the south. Some of these layers are oil- or gas-producing. Bedrock was not encountered in any boring installed by WSP Environmental Strategies; however, the onsite gas well is completed in the sedimentary rock. The bedrock surface was deeply eroded by streams and weathering before glaciation and was scoured during glaciation. Thin layers of glacial till were left in upland areas and thicker units are found in filled valleys.

The depth to the water table at the property ranged from 2 feet bgs in the borings on the shoreline to 4 feet bgs at the northern end of the property to 7 feet bgs at the southern end

(Appendix A and Table 1). The groundwater flow direction on the property, based on measurements in the monitoring wells, is to the north, west, and south (Figure 3). The groundwater gradient is shallow, at an average of 0.007. Groundwater flow direction is to the west where the peninsula is attached to the mainland. At the center of the peninsula, groundwater flows to the southeast. In general, groundwater flow is towards the lake.

The principal aquifer in the Lake Erie-Niagara River basin in the area of the property consists of the Onondaga, Akron, and Bertie Limestones. The maximum thickness of the aquifer is approximately 175 feet. This aquifer typically produces from bedding planes or horizontal fractures and can yield up to 300 gallons per minute to wells, but typically produces 30 gallon per minute. The aquifer is overlain and underlain by thick unit of shale that act as confining units.

1.1.2 Previous Site Investigation

Mr. Vincent J. Grandinetti of CompCo of WNY, Inc., visited the site on October 12, 2007, to obtain information for an Environmental Investigation Report. The Environmental Investigation Report included a site visit for a visual site inspection and a photographic record, and a record review. The findings of the site visit and record review were summarized in a letter to Ontario Specialty Contracting, Inc dated October 29, 2007. The visual site inspection included an inspection of outdoor facilities only. CompCo observed various areas that were graded with hard fill materials. It was observed that no areas on the property could be classified as wetlands. Aboveground storage tanks (ASTs) were physically observed near a former wastewater treatment plant area. CompCo speculated that there was evidence of underground storage tanks (USTs) related to the treatment facility, just west of the wastewater treatment area's frame building.

CompCo's record review included requests from the City of Buffalo, New York, including the Office of Permits and Compliance, Buffalo Sewer Authority, and the Department of Fire Prevention. In addition, records were requested from the Region 9 New York State Department of Environmental Conservation (NYSDEC), including Petroleum Bulk Storage, Air Resources, Legal Affairs, DEC Spill Record Website, and DEC Division of Mineral Resources (Oil and Gas). According to the record review, various ASTs and USTs were put into and out of use at the facility since 1934. As of 1996, three petroleum bulk storage tanks remained in service, including one 5,000-gallon waste oil UST, one 2,000-gallon gasoline AST, and one

10,000-gallon diesel AST. These three tanks were taken out of service and removed in 1998. CompCo observed an AST near the former wastewater treatment area during the visual inspection, but was not able to determine its nature from the record review. CompCo also observed a natural gas well-head and its associated pumping equipment on the western portion of the site. According to records from the NYSDEC Division of Mineral Resources – Oil and Gas in Alleghany, New York, the natural gas well was associated with the Well Drilling and Completion Report 31-029-11782 dated April 29, 1976. The report details that the natural gas well was installed approximately 200 feet east of Lake Erie and constructed to a depth of 1,109 feet. Well production was approximately 546 mcf/day. Finally, a record review related to refrigeration revealed that as of 2006, all ammonia and oil were removed from the refrigeration system. There were no records related to NYSDEC air resources or regulatory affairs.

1.2 Environmental Database Search

WSP Environmental Strategies retained EDR to search federal and state regulatory databases to identify environmental issues that have been reported for the subject property or properties in the vicinity of the site. The results of the EDR search are presented in the following sections.

1.2.1 Past Uses

Based on a review of aerial photographs from 1959, 1966, 1978, 1983, and 1995; topographic maps from 1901, 1948, 1950, and 1965; Sanborn fire insurance maps from 1900, 1917, 1940, 1950, and 1986; city directories from 1968, 1976, 1985, 1990, 1995, 2000, and 2006, the facility was in existence in 1940, or before. The subject facility is first present on the 1948 topographic map and on the 1940 Sanborn. The 1959 aerial photograph shows the main facility building. No recognized environmental conditions associated with past uses of the subject property were identified.

1.2.2 Regulatory Database Search

WSP Environmental Strategies retained EDR to search federal and state regulatory databases to identify environmental issues that have been reported for the subject property or properties in the vicinity of the site. The search radii specified by the ASTM E-1527-00 were used. The complete database report, which provides detailed descriptions of the databases searched, subject property, and surrounding properties, is provided in Appendix B.

The Former Freezer Queen site was listed on the Resource Conservation, and Recovery Act Small Quantity Generator (RCRA-SQG), Facility Index Systems/Facility Registry Systems (FINDS), UST, Spills Information Database for Leaking Storage Tanks and New York Spills (LTANKS, NY SPILLS), Facility and Manifest Data (NY MANIFEST), Historical ASTs, Historical USTs, New York Historical Spills (NY HIST SPILLS), Historical Leaking Storage Tanks (HIST LTANKS), and Integrated Compliance Information System databases. As Penske Truck Leasing, the facility was also listed on the RCRA-SQG, FINDS, NY MANIFEST, and Emergency Response Notification System databases. A truck at the facility was located on the NY SPILLS and NY HIST SPILLS databases. However, no violations or open cases were identified for the subject property and all spills have been closed by the NYSDEC.

Twenty-one sites within a 1-mile radius of the facility are listed on the databases searched by EDR. Sixteen of the 21 sites have not reported any releases or spills of hazardous substances or petroleum products. Four of the remaining five sites have reported releases of petroleum products; however, all of these incidents have been closed by the NYSDEC. The fifth remaining site, located just less than one half mile away from the Former Freezer Queen site at 710 Ohio Street, had a spill of volatile organic compounds (VOCs), which was also closed by the NYSDEC. The site is currently undergoing a voluntary cleanup program. Soil affected by VOCs and semi-volatile organic compounds (SVOCs) was excavated in 1999. A groundwater treatment system was installed at the 710 Ohio Street site in 2004 to treat groundwater affected by VOCs and SVOCs. There is no evidence that impacted groundwater has affected any surface water body nearby.

There are several sites of interest in the vicinity of the Former Freezer Queen property. The Buffalo Outer Harbor at 901 Fuhrman Boulevard, located within a one-quarter mile radius of the Former Freezer Queen site, which is an active Brownfields site. The Buffalo Outer Harbor was affected by SVOCs, including polycyclic aromatic hydrocarbons (PAHs), and metals, including lead, zinc, and copper, resulting from past fill operations of dredge spoils and debris disposal. Under the Brownfields program, the site is being remedied by stabilization of the eroding shore and covering an embankment with clean soil. The Buffalo Outer Harbor also has a Radio Tower area, which has nitrobenzene-affected soils. The soils were treated by excavation and stabilization activities in 2004, and disposed of at an offsite landfill. Studies have shown nitrobenzene from the site has not affected groundwater. The Radio Tower is currently

monitored by a soil management program and is under deed restrictions, limiting the site to industrial or commercial use only. Approximately one-eighth mile from the site is the Tifft Farm Nature Preserve, which was formerly a disposal site for Republic Steel. Republic Steel disposed of slag, fly ash, and other garbage on the site from 1955 to 1972. In 1972, Tifft Farm was purchased by the City of Buffalo, and was later used for disposal of acid sludge from a local Chevrolet plant. Other contaminants of concern were identified when drums containing heavy metals, PAHs, and phenolics were uncovered. The drums were removed and the site currently has a clay cap and leachate collection system to manage contaminants that are still present. Finally, the Lehigh Valley Railroad on Tifft Street, which is located just less than 1 mile from the Former Freezer Queen property, was affected by wastes, including chlorobenzenes, chloroanilines, nitroanilines and PAHs. The wastes were removed and affected soil was excavated. Groundwater monitoring showed no impact to groundwater. However, oil stained soils remain at the Lehigh Valley Railroad site.

2.0 Scope of Work

Based on a site visit conducted by WSP Environmental Strategies on December 19, 2007, the following areas of potential concern requiring investigation were identified at the site:

- Electrical Substation
- Former Wastewater Treatment Plant Area
- Former UST and AST Locations
- General Site Investigation

The first area of potential concern was the electrical substation located at the northern corner of the site. Based on information provided by the site owners, the existing electrical transformers do not contain polychlorinated biphenyls (PCBs). However, historic use of PCB-containing components was unknown. It was determined that the electrical substation be investigated to determine if there were any PCB-impacted soils. According to public and private utility locators, the substation was actively supplying power to the site.

The second portion of investigation was completed at the former wastewater treatment plant area that had been used for treatment of waste streams produced in food production. Based on site visits by WSP Environmental Strategies and CompCo's summary letter, there was evidence of non-petroleum ASTs and USTs still present in the wastewater treatment area. The USTs had visible trap doors and pump apparatus still in place. Upon further inspection, the USTs still contained waste materials that appeared to be remnant from prior operation. The former wastewater treatment plant was a potential area of concern because it was unknown if its operation had impacted soil or groundwater.

The third area of potential concern was the former petroleum bulk storage tank area, which formerly contained petroleum ASTs and USTs. The area consisted of a concrete pad with miscellaneous piping sticking out that may have been associated with a fueling station or waste oil collection. The concrete pad likely held the ASTs used in operation. Based on record reviews for the property conducted by CompCo, USTs in the petroleum bulk storage tank area had been properly closed in the ground and ASTs had been removed. This storage area was of potential concern because it was unknown if any of the former USTs or ASTs had releases that could have affected soil or groundwater.

The fourth area of potential concern involved a general investigation of the western portion of the site. This area consisted of an abandoned natural gas well and miscellaneous 55-gallon drums that were scattered in the western portion of the property. CompCo's record review determined that the natural gas well was installed in 1976, but did not include any documentation on well abandonment. In addition, there was an oil/water separator located at the western wall of the main plant building that was associated with the natural gas well's operation. This area was investigated to determine if operation of the former natural gas well had impacted soil or groundwater. In addition, the contents of 55-gallon drums in the area were unknown.

From January 7 to 9, 2008, WSP Environmental Strategies advanced nine soil borings and installed temporary groundwater monitoring wells at four of these locations. Soil boring locations were selected to coincide with the potential areas of concern described above. All investigation and sampling activities were completed in accordance with WSP Environmental Strategies' Standard Operating Procedures (SOPs) that were applicable to the activity. Applicable portions of the SOP can be found in Appendix D.

An overview of the scope of work, including the methods used, is presented below. Details of the sampling and analysis for each potential area of concern, including sample locations and descriptions, parameters analyzed, and sample collection rationale, are presented in Table 2.

2.1 Soil Investigation

The investigations of potential impacts to soils at the site were facilitated by observations made during advancement of soil borings and test pits. Where appropriate, WSP Environmental Strategies collected soils for laboratory analytical testing.

WSP Environmental Strategies drilled nine soil borings, designated B-7 through B-15, at the facility from January 8 through January 9, 2008 (Figure 2). The borings were drilled by Zebra Environmental Corporation of Niagara Falls, New York, using direct-push sampling equipment and a macro-core sampler. Continuous soil samples were collected from each boring beginning at ground surface. The soil samples were logged in the field for color, texture, and moisture content in accordance with the Unified Soil Classification System and screened in the field for organic vapors using a photoionization detector (PID) equipped with a 10.6 eV lamp.

Headspace readings and a lithologic description, which included soil color, texture, and moisture content, were recorded in the field book. Boring logs are presented in Appendix A.

Soil samples were collected for chemical laboratory analysis from B-7 at 8 to 10 feet bgs, from B-8 at 6 to 8 feet bgs, B-9 at 0 to 2 feet bgs, B-10 at 2 to 4 feet bgs, B-11 at 0 to 2 feet bgs, B-12 at 6 to 8 feet bgs, B-13 at 4 to 6 feet bgs, B-14 at 0 to 2 feet bgs, and B-15 at 0 to 2 feet bgs. The analytical soil samples were collected using stainless steel spoons or trowels in accordance with WSP Environmental Strategies SOP 10 (Appendix D), placed in the appropriate laboratory-supplied, pre-cleaned, labeled glassware, and packed on ice. The samples were submitted for laboratory analysis to TestAmerica, Inc., located in Amherst, New York. Depending on the soil boring locations, samples were analyzed for VOCs by U.S. Environmental Protection Agency (EPA) method 8260, SVOCs by EPA method 8270, target analyte list (TAL) metals by EPA method 6010, mercury by EPA method 7471, and PCBs by EPA method 8082. All samples were maintained and delivered to the laboratory by WSP Environmental Strategies in accordance with SOP 20 (Appendix D). At the completion of sampling activities, each boring was backfilled with bentonite chips hydrated with potable water and capped with material to match the surrounding surface (either cold patch asphalt or concrete).

2.2 Groundwater Investigation

The investigations of potential impacts to groundwater at the site were facilitated by observations made during advancement of soil borings and sampling of groundwater from temporary monitoring wells.

On January 9, 2008, groundwater samples were collected from temporary wells established at soil boring locations B-9, B-10, B-11, and B-12. These wells are designated on Figure 2 as MW-9, MW-10, MW-11, and MW-12. A duplicate groundwater sample of MW-12 was collected and labeled MW-D. The temporary wells were 1.5-inch diameter "pre-packed" groundwater monitoring wells set at the soil boring locations in order to collect groundwater samples and groundwater elevation data.

Before the samples were collected, the water level in each well was measured from the top of the PVC well casing using an electronic water sensing tape. The measurements were recorded in the field book and were used to determine the volume of water in the well. Water level measurements are included in Table 1. Water was purged from the monitoring wells at a

rate no greater than 0.5 liter per minute. Water temperature, pH, specific conductance, turbidity, dissolved oxygen, and oxidation-reduction potential were measured of the initial purge water and at 3- to 5-minute intervals using a Horiba U-22 meter with a flow-through cell. Groundwater was purged until the measurements stabilized to within 10 percent on successive readings. All groundwater sampling activities were performed in accordance with WSP Environmental Strategies SOP 3 (Appendix D). Groundwater monitoring logs can be found in Appendix E. The groundwater samples were analyzed for VOCs by EPA method 8260, SVOCs by EPA method 8270, TAL metals by EPA method 6010, and mercury by EPA method 7471. Each monitoring well was surveyed by a licensed New York surveyor in order to allow a determination of groundwater elevation and flow direction. Monitoring well data can be found in Table 1 and monitoring well logs in Appendix F.

2.3 Sample Locations

Impacts to soil and groundwater were investigated in different areas of potential concern identified during site visits. Sample analysis varied, depending on the investigation area. The following section details the sample collection process.

2.3.1 Electrical Substation

As stated, an electrical substation was identified at the northern corner of the site. According to public and private utility locators, the substation was actively supplying power to the site, which limited the soil exploration to shallow depths outside the fenced area. On January 9, 2008, two shallow soil borings were advanced near the substation and two soil samples were collected. B-14 was advanced just south of the fenced area to a depth of 3 feet and B-15 was advanced just west of the fenced area to a depth of 3 feet. One soil sample was collected from each of these boring locations at a depth of 0 to 2 feet. These soil samples were collected according to WSP Environmental Strategies' SOP 10 (Appendix D) and analyzed for PCBs by EPA method 8082.

2.3.2 Former Wastewater Treatment Plant Area

On January 8, 2008, one soil boring, identified as B-11, was advanced to a total depth of 16 feet in the former wastewater treatment plant area. A temporary groundwater monitoring well, MW-11, was installed at this soil boring location. A soil sample was collected on January 8, 2008 at a depth of 0 to 2 feet. The soil samples were collected according to WSP

Environmental Strategies' SOP 10 (Appendix D) and analyzed for VOCs by EPA method 8260, SVOCs by EPA method 8270, and metals by EPA method 6010. A groundwater sample was collected from MW-11 on January 9, 2008, according to WSP Environmental Strategies' SOP 3 and analyzed for VOCs by EPA method 8260, SVOCs by EPA method 8270, and metals by EPA method 6010.

2.3.3 Former UST and AST Locations

On January 8, 2008, two soil borings were advanced near the former petroleum bulk storage tank area to investigate the influence of former USTs and ASTs. One soil boring, B-13, was advanced east of the concrete pad to a total depth of 12 feet. Soil boring B-12 was advanced near the northwest corner of the pad to a total depth of 16 feet north of the concrete pad. A temporary monitoring well, MW-12, was placed at soil boring B-12. One soil sample was collected from each soil boring location on January 8, 2008 according to WSP Environmental Strategies' SOP 10 (Appendix D) and analyzed for VOCs by EPA method 8260, SVOCs by EPA method 8270, TAL metals by EPA method 6010, and mercury by EPA method 7471. One groundwater sample and a duplicate groundwater sample were collected from MW-12 on January 9, 2008 according to WSP Environmental Strategies' SOP 3 (Appendix D) and analyzed for VOCs by EPA method 8260, SVOCs by EPA method 8270, and metals by EPA method 6010.

2.3.4 General Site Investigation

An inactive natural gas well and its associated oil/water separator are located in the western area of the site. In addition, miscellaneous 55-gallon storage drums were identified during site visits. On January 8, 2008, soil boring B-9, was advanced to a total depth of 16 feet northwest of the natural gas well enclosure. A temporary monitoring well, MW-9, was placed at this soil boring location. Near the oil/water separator, soil boring B-10 was advanced to a depth of 16 feet and a temporary monitoring well, MW-10, was placed in this soil boring location. Soil boring B-8 was advanced to a total depth of 8 feet at the southwestern corner of the property near the miscellaneous 55-gallon storage drums. Soil boring B-7 was advanced to a total depth of 12 feet in the vicinity of a former railroad spur, just west of the building extension. One soil sample was collected in January 8, 2008 from each soil boring location according to WSP Environmental Strategies' SOP 10 (Appendix D) and analyzed for SVOCs by EPA method 8270, TAL metals by EPA method 6010, and mercury by EPA method 7471. One groundwater sample

was collected from each temporary monitoring well on January 9, 2008 according to WSP Environmental Strategies' SOP 3 (Appendix D) and analyzed for VOCs by EPA method 8260, SVOCs by EPA method 8270, and metals by EPA method 6010.

2.4 Sample Location Survey

WSP Environmental Strategies retained a New York State licensed surveyor from Advanced Survey Group LLC of Niagara Falls, New York to conduct a site survey following investigation activities. Temporary monitoring wells installed at soil borings were surveyed for location and elevation to provide a baseline to create a groundwater contour map.

2.5 Laboratory Analysis and Data Validation

Nine soil samples, four groundwater samples, one duplicate groundwater sample, and one trip blank groundwater sample were analyzed by TestAmerica Laboratories, Inc., of Buffalo, New York. The samples were analyzed under EPA Test Methods.

The data were reviewed in accordance with method and chain-of-custody criteria following the Contract Laboratory Program National Functional Guidelines of Organic (and Inorganic) Data Review (October 1999 and October 2004, respectively). The Data Usability Report (DUSR) is provided in Appendix C.

3.0 Investigation Results

The soil analytical results from the January 2008 investigation are presented in Tables 2 through 5. Groundwater investigation results are presented in Tables 6 through 8. Each table contains the appropriate evaluation criteria for comparison. A copy of the laboratory analytical results is presented in Appendix C.

The soil sampling results were compared to the NYSDEC's Brownfield and Superfund Regulation 6 NYCRR Subpart 375-6.8: Remedial Program Soil Cleanup Objectives for Unrestricted Use Table 375-6.8(a) (Subpart 375-6.8, effective December 14, 2006). The groundwater sampling results were compared to the New York State ambient water quality standards and guidance values for Class GA groundwater provided in the NYSDEC Division of Water Technical and Operation Guidance Series (TOGS 1.1.1), dated June 1998 and the April 2002 addendum to TOGS 1.1.1.

3.1 Soil Investigation

Nine soil samples were collected from direct push soil borings. All analytical results from soil results can be found in Tables 2 through 5. This section summarizes the laboratory analysis for soil samples collected in each potential area of concern.

3.1.1 Electrical Substation

One soil sample was collected from each soil boring, B-14 and B-15, near the electrical substation and analyzed for PCBs. There were no PCBs detected above laboratory detection limits in either sample.

3.1.2 Former Wastewater Treatment Plant Area

Soil boring B-11 was advanced near the former wastewater treatment plant area and one soil sample was collected from this location. The soil sample was analyzed for SVOCs, VOCs, and metals. There were five SVOCs detected above Subpart 375-6.8 criteria found in the soil sample collected from B-11. These SVOCs included 2,100 µg/kg of benzo(a)anthracene, 1,700 µg/kg of benzo(a)pyrene, 2,200 µg/kg of benzo(b)fluoranthene, 1,800 µg/kg of chrysene, and 960 µg/kg ideno(1,2,3-cd)pyrene. There were no VOCs detected above Subpart 375-6.8 criteria in the soil sample.

There was one metal detected above Subpart 375-6.8 criteria in the soil sample, which was 0.232 mg/kg of mercury. Total chromium was detected at 11 mg/kg, which was not above the criteria for trivalent chromium. It was unknown what the fraction of hexavalent chromium was, which has a standard of 1 mg/kg in Subpart 375-6.8 criteria.

3.1.3 Former UST and AST Locations

Soil borings B-12 and B-13 were advanced in the former petroleum bulk storage area and one soil sample was collected from each soil boring location. There were no SVOCs detected in either sample above Subpart 375-6.8 criteria. Acetone was the only VOC detected above Subpart 375-6.8 criteria. 170 µg/kg of acetone was detected in the soil sample collected from B-12 and 70 µg/kg of acetone was detected in the soil sample collected from B-13.

There were three metals detected above Subpart 375-6.8 criteria in the soil sample collected from B-12, including 77.2 mg/kg of copper, 0.232 mg/kg of mercury, and 204 mg/kg of zinc. Total chromium was detected at 18.4 mg/kg in the soil sample collected from B-12, but it was unknown what fraction was hexavalent and trivalent. The soil sample collected from B-13 contained two metals above criteria, including 0.536 mg/kg of mercury and 155 mg/kg of zinc. Total chromium was detected at 14.4 mg/kg in the soil sample collected from B-13, but was below the trivalent chromium criteria.

3.1.4 General Site Investigation

As described, soil borings B-7, B-8, B-9, and B-10 were installed in the western portion of the site near observed areas of potential concern. Soil samples collected from soil borings B-7 and B-8 did not contain any SVOCs exceeding Subpart 375-6.8 criteria, but did have detections of SVOCs below criteria. Soil samples collected from soil borings B-9 and B-10 contained SVOCs exceeding Subpart 375-6.8 criteria. The soil sample collected from B-9 contained only one SVOC above criteria, which was 1,400 µg/kg of benzo(b)fluoranthene. The soil sample collected from B-10 contained 1,400 µg/kg of benzo(a)anthracene, 1,100 µg/kg of benzo(a)pyrene, 1,600 µg/kg of benzo(b)fluoranthene, 1,200 µg/kg of chrysene, and 640 µg/kg of ideno(1,2,3-cd)pyrene. There were no VOCs detected above criteria in the soil samples collected from B-9 and B-10. The soil samples collected from B-7 and B-8 each had one VOC above criteria, which was 71 µg/kg of acetone detected in the soil sample collected from B-7 and 59 µg/kg of acetone detected in the soil sample collected from B-8.

There were no metals detected above Subpart 375-6.8 criteria found in the soil samples collected from B-7, B-8, or B-9. The soil samples collected from B-10 contained one metal above criteria, which was 0.302 mg/kg of mercury. The soil sample collected from all four soil borings had detections of total chromium above laboratory detection limits, but below the trivalent chromium standard.

3.2 Groundwater Investigation

Analytical groundwater data can be found in Tables 6 through 8. The groundwater data for the well samples are summarized in the following sections for each area of potential concern where a temporary groundwater monitoring well was installed.

3.2.1 Former Wastewater Treatment Plant Area

Monitoring well MW-11 was installed in the former wastewater treatment plant area. The groundwater sample collected from MW-11 did not contain any SVOCs or VOCs exceeding TOGS criteria. The groundwater sample contained three metals exceeding TOGS criteria, including 1,350 µg/L of iron, 333 µg/L of manganese, and 25,700 µg/L of sodium.

3.2.2 Former UST and AST Locations

Monitoring well MW-12 was installed near the former petroleum bulk storage area to investigate any affect of former USTs and ASTs on groundwater. A duplicate groundwater sample identified as MW-D was collected from MW-12 in addition to the original groundwater sample. The groundwater sample identified as MW-12, contained two SVOCs exceeding TOGS criteria, which were 0.2 µg/L of benzo(a)anthracene and 0.2 µg/L of benzo(b)fluoranthene. The duplicate groundwater sample did not contain any SVOCs above TOGS criteria. The groundwater sample and its duplicate did not contain any VOCs exceeding criteria. Both the original groundwater sample and its duplicate contained five metals exceeding TOGS criteria. The original groundwater sample, MW-12, contained 87.8 µg/L of arsenic, 4,820 µg/L of iron, 40,200 µg/L of magnesium, 603 µg/L of manganese, and 88,700 µg/L of sodium. The duplicate groundwater sample, MW-D, contained 88.6 µg/L of arsenic, 4,730 µg/L of iron, 39,300 µg/L of magnesium, 602 µg/L of manganese, and 88,500 µg/L of sodium.

3.2.3 General Site Investigation

Two temporary groundwater monitoring wells were installed as part of the general site investigation, including MW-9 adjacent to the natural gas well and MW-10 adjacent to the

oil/water separator for the natural gas well. The groundwater samples collected from MW-9 and MW-10 did not contain any SVOCs or VOCs exceeding TOGS criteria. There were two metals exceeding TOGS criteria detected in each groundwater samples. These metals include 2,520 µg/L of iron and 442 µg/L of manganese in the sample collected from MW-9, and 5,910 µg/L of iron and 843 µg/L of manganese in the sample collected from MW-10.

4.0 Conclusions and Recommendations

The investigation results indicate that there are SVOCs and metals detected in both soil and groundwater exceeding Subpart 375-6 and TOGS criteria across the site. SVOCs, which include PAHs such as benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and ideno(1,2,3-cd)pyrene, were detected in soil samples across the site. Mercury was detected in various locations in soil, and arsenic was detected in groundwater samples. Detections of PAHs and metals were not limited to one location, but instead were present across the site.

Based on the sample results collected, the site may have been impacted by the former operations conducted at the site.

4.1 Soil Investigation

All soil samples analyzed for SVOCs had levels of PAHs above laboratory detection limits. Soil samples collected from soil borings B-9, B-10, and B-11 contained PAHs above Subpart 375-6.8 soil criteria. The locations of these soil borings were scattered across the site and detections exceeding criteria were present in each area of potential concern where SVOCs were analyzed.

Metals were detected above Subpart 375-6.8 criteria in each soil sample collected. Mercury, chromium, and arsenic were seen at locations scattered across the entire site. Mercury was detected in soil samples collected at soil boring locations B-9, B-10, B-11, B-12, and B-13. Arsenic was detected above laboratory detection limits in all soil samples, but did not exceed criteria at any location. Chromium was detected above laboratory detection limits in all the soil samples. Chromium is report in laboratory results as total chromium, which would include both hexavalent and trivalent forms. Subpart 375-6.8 has a standard of 1 mg/kg for hexavalent chromium and 30 mg/kg for trivalent chromium for unrestricted use. It is unknown what fraction of the total chromium in each soil sample is of the hexavalent form, which has the most conservative standard. Arsenic was also detected above laboratory detection limits, but below criteria, in all the soil samples collected onsite.

4.2 Groundwater Investigation

Groundwater samples demonstrated that concentrations of PAHs above TOGS criteria were detected in the groundwater sample collected from MW-12, which was located near the former petroleum bulk storage tank area. Arsenic was detected significantly above criteria in the groundwater sample collected from MW-12 and as well as in the duplicate sample of MW-12, which was identified as MW-D. Arsenic was also detected in groundwater samples collected from MW-9 and MW-10, but did not exceed criteria.

4.3 Recommendations

For the purpose of presenting the investigation data with respect to future use of the site, the soil sample data was compared to NYSDEC Subpart 375-6.8 unrestricted use criteria. The unrestricted use soil cleanup objectives represent the concentration of a contaminant in soil which, when achieved at a site, will require no use restrictions on the site for the protection of public health, groundwater and ecological resources due to the presence of contaminants in soil. When compared to Subpart 375-6.8 standards, only SVOCs would exceed criteria for residential or restricted residential use. All compounds are below restricted industrial use criteria. The presence of SVOCs in fill materials is typical in industrial settings.

Based on the laboratory results, it is recommended that further soil samples be collected and analyzed specifically for hexavalent chromium. It is unknown if chromium detections onsite include hexavalent chromium, which could pose a considerable risk if present onsite. Mercury was also detected in several soil samples and it may be worth determining site background mercury levels to determine if this compound should be addressed. Levels of mercury are above unrestricted use criteria, but are below restricted use criteria. In addition, SVOCs in soil samples collected from soil boring locations B-9, B-10, and B-11 are in excess of residential and restricted residential criteria and should be addressed if that is the proposed future use of the site.

The only groundwater sample that contained SVOCs above criteria was that collected from MW-12. No other groundwater sample contained SVOCs or VOCs exceeding criteria. The groundwater sample collected from MW-12 and its duplicate had high levels of arsenic, which could pose a problem if contact was possible with groundwater in this area.

5.0 References

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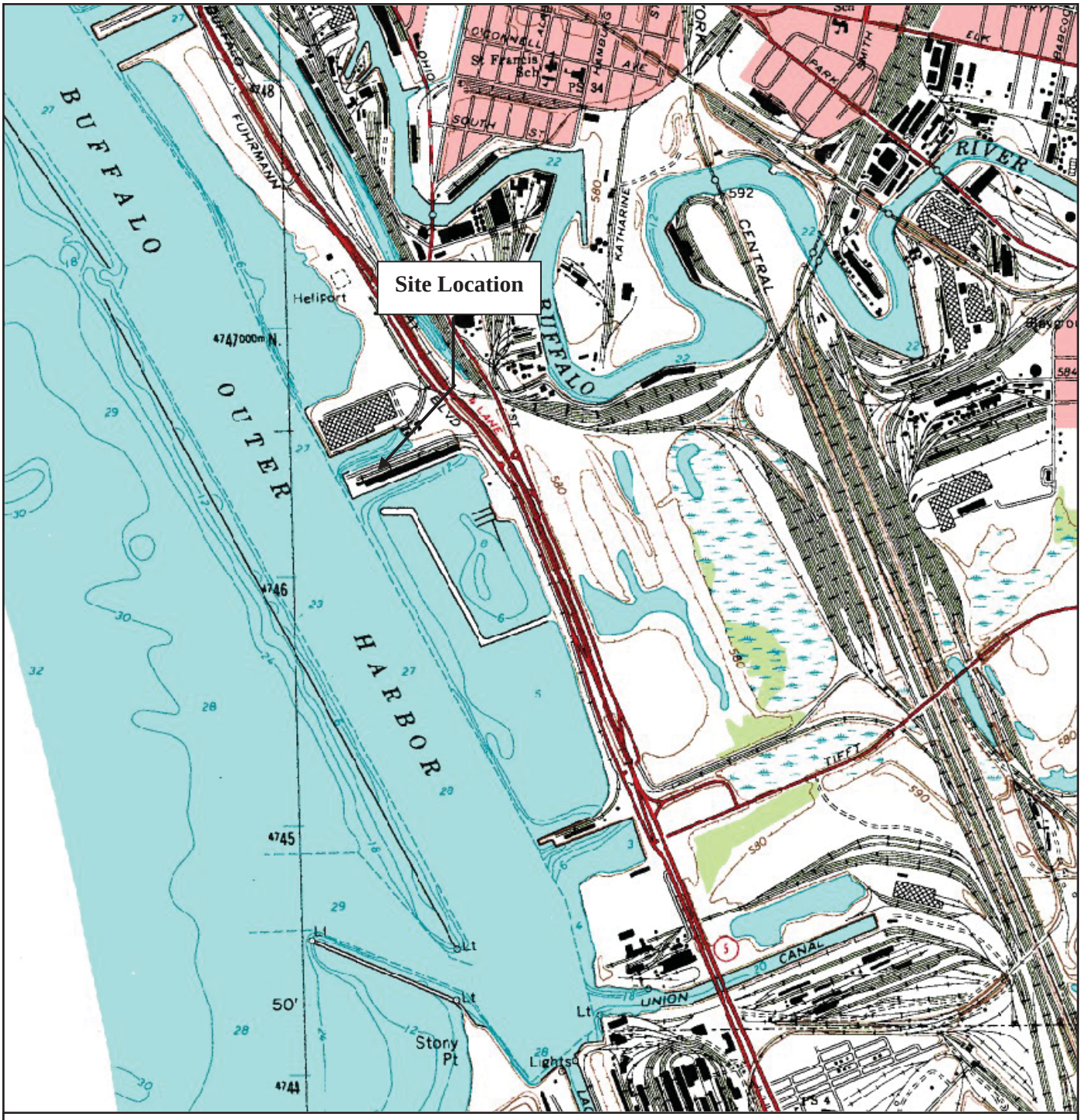
Figures



Reference
7.5 Minute Series Topographic Quadrangle
Buffalo SE, New York
Photorevised 1995 Scale 1:24,000

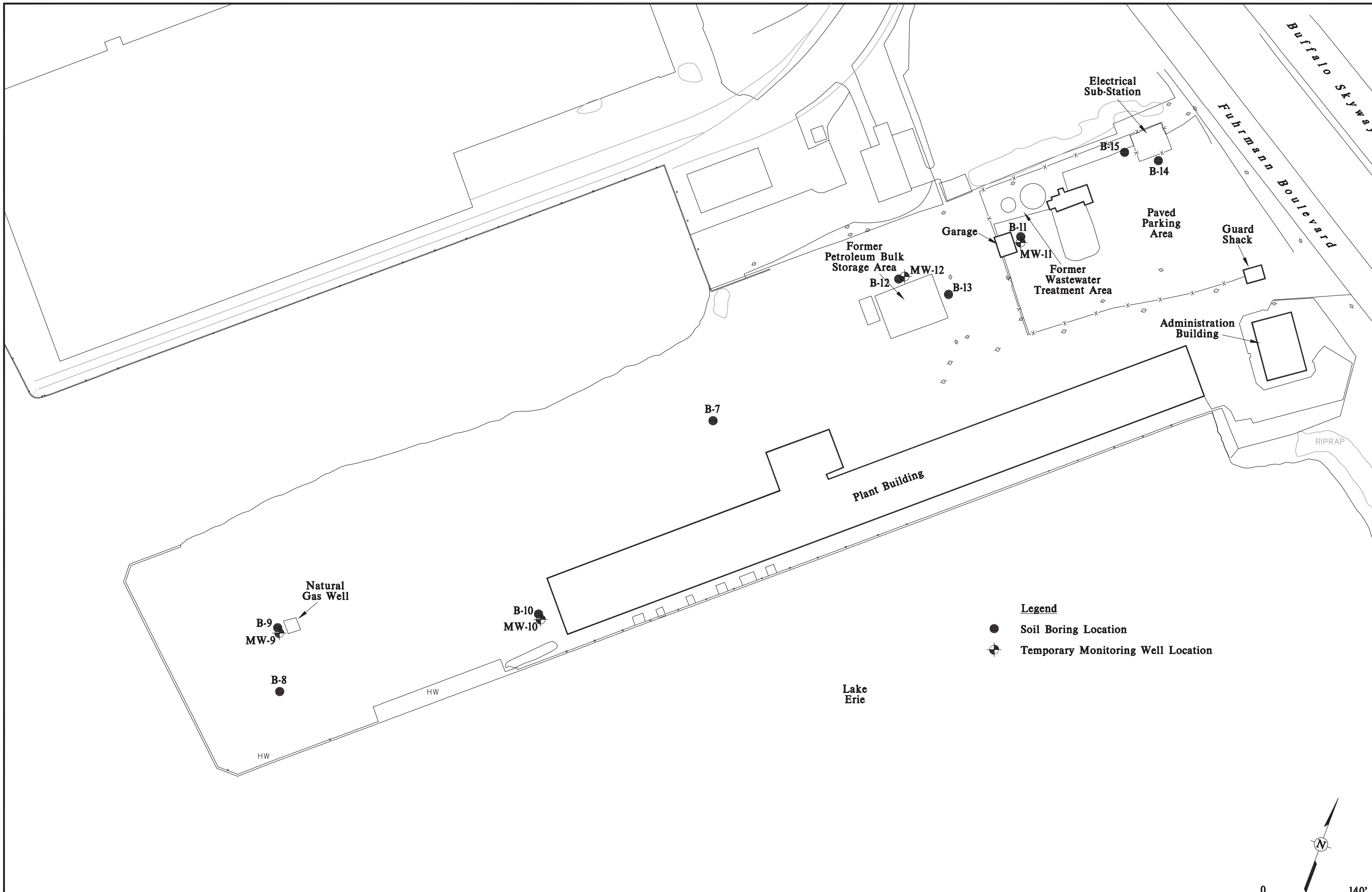
Quadrangle Location

1000 0 2000 4000

Scale in Feet

WSP
ENVIRONMENTAL STRATEGIES
6459 WEST QUAKER STREET, SUITE 2B
ORCHARD PARK, NY 14127
716-662-6876

Figure 1
Site Location
975-1000 Fuhrman Blvd.
Buffalo, New York



REFERENCE: HATCH ACRES CORPORATION DRAWING, TITLED BOREHOLE LOCATIONS, DRAWING NO. C328356-003, DATED 12/21/07.

Figure 2
Site Layout with Soil Borings and Temporary Monitoring Well Locations
Freezer Queen
Buffalo, New York

WSP Environmental Strategies
11911 Freedom Drive Suite 900
Reston, Virginia 20190
(703) 709-6500

08001902.DWG

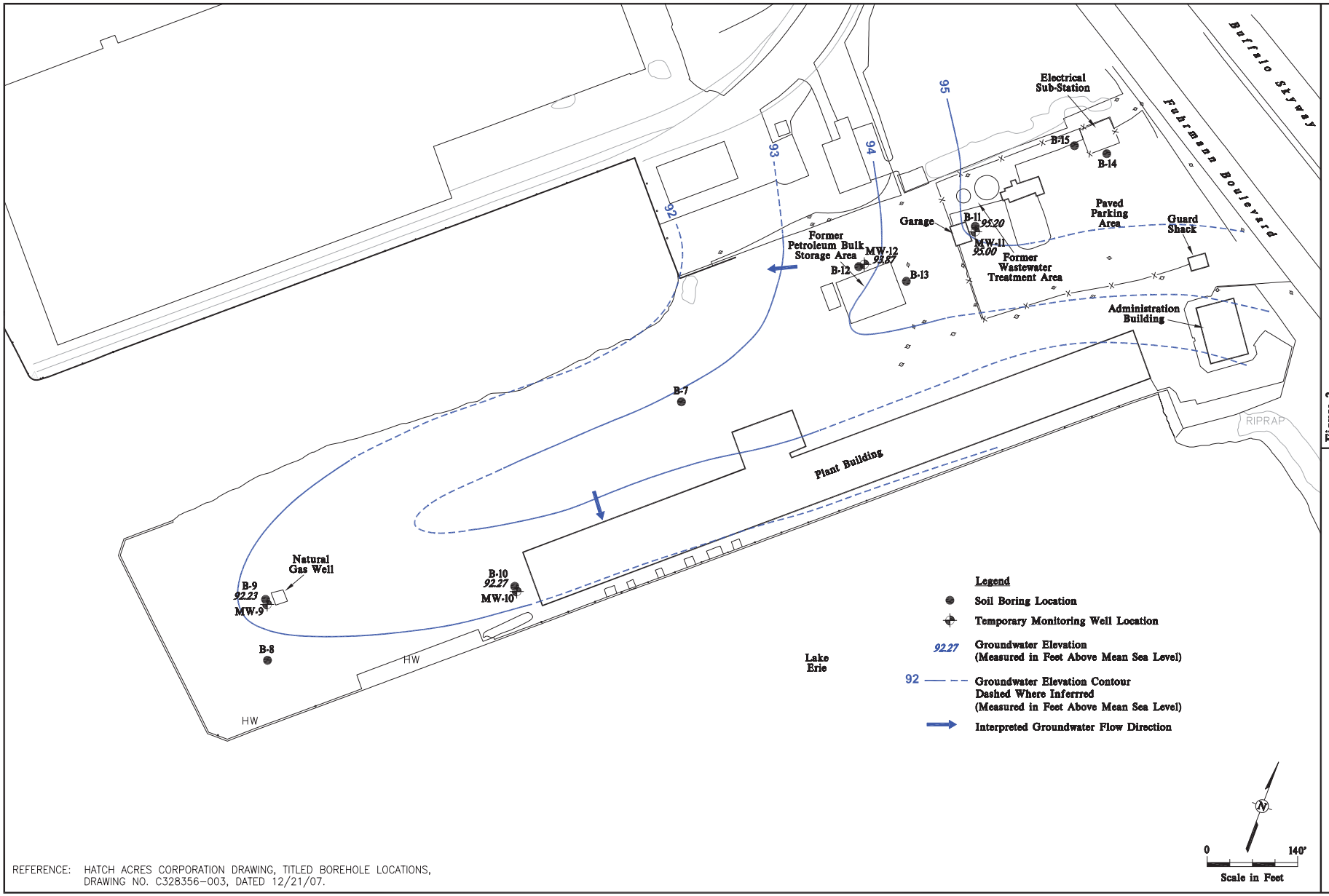


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Figure 3
Groundwater Elevation Contour Map
January 2008
Freezer Queen
Buffalo, New York

08001903.DWG

WSP
ENVIRONMENTAL STRATEGIES
11911 FREEDOM DRIVE, SUITE 900
RESTON, VIRGINIA 20190
(703) 709-6500

Tables

Table 1

Groundwater Elevations
Former Freezer Queen Site
Buffalo, New York

Well ID	Top of Casing Elevation (ft)	Total Depth (ft btoc)	Depth to Groundwater (ft)	Groundwater Elevation (ft)
MW-9	102.35	20.0	10.12	92.23
MW-10	103.70	20.0	11.43	92.27
MW-11	103.19	20.0	7.99	95.20
MW-12	105.50	20.0	11.63	93.87

a/ ft = feet; btoc = below top of casing.
b/ Top of casing elevation based on a bench mark with assumed datum of 100 feet
c/ Elevations surveyed by Advanced Survey Group LLC of Niagara Falls, New York.

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Table 2

Semi-Volatile Organic Compounds in Soil
Former Freezer Queen Site
Buffalo, New York

Sample ID:	Evaluation Criteria (b)	B-7		B-8		B-9		B-10		B-11		B-12		B-13	
Date:		1/8/2008		1/8/2008		1/8/2008		1/8/2008		1/9/2008		1/8/2008		1/8/2008	
Depth (ft):		8-10		6-8		0-2		2-4		0-2		6-8		4-6	
Unit:	µg/kg	ug/kg		ug/kg		ug/kg		ug/kg		ug/kg		ug/kg		ug/kg	
TCL SVOA ORGANICS															
2,2'-Oxybis(1-Chloropropane)	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
2,4,5-Trichlorophenol	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
2,4,6-Trichlorophenol	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
2,4-Dichlorophenol	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
2,4-Dimethylphenol	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
2,4-Dinitrophenol	NVL	400	UJ	390	UJ	3,700	UJ	1,700	UJ	1,900	UJ	4,300	UJ	4,000	UJ
2,4-Dinitrotoluene	NVL	210	U	200	U	1,900	U	1,300		960	U	2,200	U	2,000	U
2,6-Dinitrotoluene	NVL	210	U	200	U	1,900	U	450	J	960	U	2,200	U	2,000	U
2-Chloronaphthalene	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
2-Chlorophenol	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
2-Methylnaphthalene	NVL	210	U	200	U	350	J	78	J	210	J	350	J	2,000	U
2-Methylphenol	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
2-Nitroaniline	NVL	400	U	390	U	1,900	U	1,700	U	1,900	U	4,300	U	4,000	U
2-Nitrophenol	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
3,3'-Dichlorobenzidine	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
3-Nitroaniline	NVL	400	U	390	U	3,700	U	1,700	U	1,900	U	4,300	U	4,000	U
4,6-Dinitro-2-methylphenol	NVL	400	UJ	390	UJ	3,700	UJ	1,700	UJ	1,900	UJ	4,300	UJ	4,000	UJ
4-Bromophenylphenylether	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
4-Chloro-3-methylphenol	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
4-Chloroaniline	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
4-Chlorophenylphenylether	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
4-Methylphenol	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
4-Nitroaniline	NVL	400	U	390	U	3,700	U	1,700	U	1,900	U	4,300	U	4,000	U
4-Nitrophenol	NVL	400	U	390	U	3,700	U	1,700	U	1,900	U	4,300	U	4,000	U
Acenaphthene	20,000	210	U	200	U	1,900	U	130	J	620	J	800	J	2,000	U
Acenaphthylene	100,000	210	U	200	U	1,900	U	190	J	87	J	2,200	U	2,000	U
Acetophenone	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Anthracene	100,000	14	J	200	U	170	J	380	J	1,100		310	J	160	J
Atrazine	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Benzaldehyde	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Benzo(a)anthracene	1,000	50	J	200	U	770	J	**1,400**		**2,100**		760	J	570	J
Benzo(a)pyrene	1,000	37	J	200	U	740	J	**1,100**		**1,700**		570	J	480	J
Benzo(b)fluoranthene	1,000	48	J	200	U	**1,400**	**J**	**1,600**		**2,200**		650	J	580	J
Benzo(g,h,i)perylene	100,000	29	J	200	U	600	J	670	J	1,100		370	J	300	J
Benzo(k)fluoranthene	800	23	J	200	U	1,900	U	460	J	600	J	340	J	180	J
Biphenyl	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Bis(2-chloroethoxy) methane	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Bis(2-chloroethyl) ether	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Bis(2-ethylhexyl) phthalate	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Butylbenzylphthalate	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Caprolactam	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Carbazole	NVL	8	J	200	U	94	J	150	J	530	J	2,200	U	2,000	U
Chrysene	1,000	44	J	200	U	770	J	**1,200**		**1,800**		670	J	480	J
Di-n-butylphthalate	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Di-n-octylphthalate	NVL	82	J	20	J	1,900	U	900	U	76	J	2,200	U	2,000	U
Dibenzo(a,h)anthracene	330	8	J	200	U	170	J	220	J	310	J	110	J	100	J
Dibenzofuran	NVL	210	U	200	U	78	J	84	J	400	J	520	J	2,000	U
Diethylphthalate	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Dimethylphthalate	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Fluoranthene	100,000	86	J	200	U	1,400	J	2,400		4,600		1,500	J	940	J
Fluorene	30,000	8	J	200	U	1,900	U	170	J	620	J	760	J	2,000	U
Hexachlorobenzene	330 (c)	210	U	200	U	1,900	U	51	J	960	U	2,200	U	2,000	U
Hexachlorobutadiene	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Hexachlorocyclopentadiene	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Hexachloroethane	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Indeno (1,2,3-cd)pyrene	500	25	J	200	U	480	J	**640**	**J**	**960**		320	J	280	J
Isophorone	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
N-Nitroso-Di-n-propylamine	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
N-nitrosodiphenylamine	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Naphthalene	12,000	13	J	200	U	150	J	430	J	340	J	340	J	2,000	U
Nitrobenzene	NVL	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Pentachlorophenol	800	400	U	390	U	3,700	U	1,700	U	1,900	U	4,300	U	4,000	U
Phenanthrene	100,000	67	J	200	U	870	J	1,400		4,600		790	J	570	J
Phenol	330	210	U	200	U	1,900	U	900	U	960	U	2,200	U	2,000	U
Pyrene	100,000	65	J	200	U	1,100	J	2,000		3,800		1,200	J	810	J

a/ U = not detected at laboratory detection limit; NVL = no value listed; J = estimated concentration; ft = feet;υg/kg = micrograms per kilograms
b/ Brownfield and Superfund Regulation 6 NYCRR Subpart 375-6.8: Remedial Program Soil Cleanup Objectives for Unrestricted Use (December 2006).
c/ The evaluation criteria for hexachlorobenzene is reported as a VOC in Subpart 375-6.
d/ Bold-faced values are reported concentrations that exceed Subpart 375-6 criteria.

Table 3

Volatile Organic Compounds in Soil
Former Freezer Queen Site
Buffalo, New York

Sample ID:	Evaluation Criteria (b)	B-7		B-8		B-9		B-10		B-11		B-12		B-13	
Date:		1/8/2008		1/8/2008		1/8/2008		1/8/2008		1/9/2008		1/8/2008		1/8/2008	
Depth (ft):		8-10		6-8		0-2		2-4		0-2		6-8		4-6	
Unit:	µg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
TCL VOLATILES															
1,1,1-Trichloroethane	680	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,1,2,2-Tetrachloroethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,1,2-Trichloro-1,2,2-trifluoroethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,1,2-Trichloroethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,1-Dichloroethane	270	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,1-Dichloroethene	330	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,2,4-Trichlorobenzene	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,2-Dibromoethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,2-Dibromo-3-chloropropane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,2-Dichlorobenzene	1,100	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,2-Dichloroethane	20	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,2-Dichloropropane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,3-Dichlorobenzene	2,400	6	U	6	U	6	U	5	U	6	U	6	U	6	U
1,4-Dichlorobenzene	1,800	6	U	6	U	6	U	5	U	6	U	6	U	6	U
2-Butanone	NVL	29	U	30	U	28	U	26	U	29	U	32	U	30	U
2-Hexanone	NVL	29	U	30	U	28	U	26	U	29	U	32	U	30	U
4-Methyl-2-pentanone	NVL	29	U	30	U	28	U	26	U	29	U	32	U	30	U
Acetone	50	**71**		**59**		11	J	14	J	14	J	**170**		**70**	
Benzene	60	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Bromodichloromethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Bromoform	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Bromomethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Carbon Disulfide	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Carbon Tetrachloride	760	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Chlorobenzene	1,100	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Chloroethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Chloroform	370	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Chloromethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Cyclohexane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
cis-1,2-Dichloroethene	250	6	U	6	U	6	U	5	U	6	U	6	U	6	U
cis-1,3-Dichloropropene	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Dibromochloromethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Dichlorodifluoromethane	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Ethylbenzene	1,000	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Isopropylbenzene	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Methyl acetate	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Methylcyclohexane	NVL	2	J	6	U	6	U	5	U	6	U	6	U	6	U
Methylene chloride	50	10		10		12		9		15		10		11	
Methyl-t-Butyl Ether (MTBE)	930	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Styrene	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Tetrachloroethene	1,300	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Toluene	700	6	U	6	U	6	U	5	U	1	J	6	U	6	U
Total Xylenes	260	18	U	18	U	17	U	16	U	17	U	19	U	18	U
trans-1,2-Dichloroethene	190	6	U	6	U	6	U	5	U	6	U	6	U	6	U
trans-1,3-Dichloropropene	NVL	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Trichloroethene	470	6	U	6	U	6	U	5	U	6	U	6	U	6	U
Trichlorofluoromethane	NVL	6	UJ	6	UJ	6	UJ	5	UJ	6	UJ	6	UJ	6	UJ
Vinyl chloride	20	12	U	12	U	11	U	10	U	12	U	13	U	12	U

a/ U = not detected at laboratory detection limit; NVL = no value listed; J = estimated concentration; ft = feet;
µg/kg = micrograms per kilograms.
b/ Brownfield and Superfund Regulation 6 NYCRR Subpart 375-6.8: Remedial Program Soil Cleanup Objectives for Unrestricted Use (December 2006).
c/ Bold-faced values are reported concentrations that exceed Subpart 375-6 criteria.

Table 4

Metals in Soil
Former Freezer Queen Site
Buffalo, New York

Sample ID:	Evaluation Criteria (b)	B-7		B-8		B-9		B-10		B-11		B-12		B-13	
Date:		**1/8/2008**		**1/8/2008**		**1/8/2008**		**1/8/2008**		**1/9/2008**		**1/8/2008**		**1/8/2008**	
Depth (ft):		**8-10**		**6-8**		**0-2**		**2-4**		**0-2**		**6-8**		**4-6**	
Unit:	**mg/kg**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
Metals Analysis															
Aluminum - Total	NVL	2,150		1,770		4,600		2,270		7,750		4,170		9,760	
Antimony - Total	NVL	19	UJ	19.5	UJ	17.3	UJ	16.2	UJ	17.5	UJ	21.9	UJ	19.9	UJ
Arsenic - Total	13	3.4		2.7		5.4		5.8		3.1		9		7.1	
Barium - Total	350	12.2		7		47.3		30.5		69.3		101		99.1	
Beryllium - Total	7.2	0.25	UJ	0.26	UJ	0.38	J	0.22	UJ	1.4	J	0.29	UJ	0.63	J
Cadmium - Total	2.5	0.25	U	0.26	U	0.28		0.22	U	0.23	U	1.4		0.27	U
Calcium - Total	NVL	11,000	*	7,500	*	16,300	*	31,600	*	82,400	*	7,830	*	39,200	*
Chromium - Total	30(c)	4.6		2.5		6		6.5		11		18.4		14.4	
Cobalt - Total	NVL	3.4		3.4		4		3		2.5		3.1		7.2	
Copper - Total	50	7.4		1.8		27		19.6		12.4		**77.2**		26.4	
Iron - Total	NVL	8,870		8,070		10,200		9,120		23,300		11,200		17,600	
Lead - Total	63	13.4		4.3		64.5		49.9		26.4		406		212	
Magnesium - Total	NVL	3,560		2,940		5,840		14,700		33,200		1,550		11,300	
Manganese - Total	1,600	169		113		210		204		631		157		498	
Mercury - Total	0.18	0.020	U	0.020	U	0.109		**0.302**		**0.422**		**0.232**		**0.536**	
Nickel - Total	30	8.1		6.9		10.2		7		5.3		11.4		16.3	
Potassium - Total	NVL	402		343		626		467		784		409		1370	
Selenium - Total	3.9	5.1	UJ	5.2	UJ	4.6	UJ	4.3	UJ	4.7	UJ	5.9	UJ	5.3	UJ
Silver - Total	2	0.63	U	0.65	U	0.58	U	0.54	U	0.58	U	0.73	U	0.66	U
Sodium - Total	NVL	178	UJ	182	UJ	162	UJ	151	UJ	323	J	204	UJ	700	J
Thallium - Total	NVL	7.6	UJ	7.8	UJ	6.9	UJ	6.5	UJ	7	UJ	8.8	UJ	8	UJ
Vanadium - Total	NVL	5.6		5.2		10.2		6.1		9.3		10.8		17.9	
Zinc - Total	109	29		22.1		69		93.3		56.6		**204**		**155**	

a/ U = not detected at laboratory detection limit; * = not within the quality control limits; J = estimated concentration;
ft = feet; mg/kg = milligrams/kilogram; NVL = no value listed.
b/ Brownfield and Superfund Regulation 6 NYCRR Subpart 375-6.8: Remedial Program Soil Cleanup Objectives for Unrestricted Use (December 2006).
c/ Soil cleanup objective is for trivalent Chromium is 30 mg/kg. The soil cleanup objective for hexavalent Chromium is 1 mg/kg.
d/ Bold-faced values are reported concentrations that exceed Subpart 375-6 criteria.

Table 5

PCBs in Soil
Former Freezer Queen Site
Buffalo, New York

Sample ID:	**B-14**		**B-15**	
Date:	**1/9/2008**		**1/9/2008**	
Depth (ft):	**0-2**		**0-2**	
Unit:	**µg/kg**		**µg/kg**	
PCBs				
Aroclor 1016	19	U	21	U
Aroclor 1221	19	U	21	U
Aroclor 1232	19	U	21	U
Aroclor 1242	19	U	21	U
Aroclor 1248	19	U	21	U
Aroclor 1254	19	U	21	U
Aroclor 1260	19	U	21	U
Total PCBs	0		0	

a/ U = not detected at laboratory detection limit; J = estimated concentration; ft = feet; mg/kg = micrograms per kilograms.
Subpart 375-6.8: Remedial Program Soil Cleanup Objectives for Unrestricted Use (December 2006). The criteria for Total PCBs is 100 µg/kg.

Table 6

Semi-Volatile Organic Compounds in Groundwater
Former Freezer Queen Site
Buffalo, New York

Sample ID:	Evaluation Criteria (c)	MW-9		MW-10		MW-11		MW-12		MW-D	
Date:		1/9/2008		1/9/2008		1/9/2008		1/9/2008		1/9/2008	
Units:	µg/l	µg/l		µg/l		µg/l		µg/l		µg/l	
TCL SVOA ORGANICS											
2,2'-Oxybis(1-Chloropropane)	NVL	5	U	5	U	5	U	5	U	5	U
2,4,5-Trichlorophenol	1	5	U	5	U	5	U	5	U	5	U
2,4,6-Trichlorophenol	NVL	5	U	5	U	5	U	5	U	5	U
2,4-Dichlorophenol	1	5	U	5	U	5	U	5	U	5	U
2,4-Dimethylphenol	50	5	U	5	U	5	U	5	U	5	U
2,4-Dinitrophenol	5	9	U	10	U	10	U	10	U	10	U
2,4-Dinitrotoluene	5	5	U	5	U	5	U	5	U	5	U
2,6-Dinitrotoluene	5	5	U	5	U	5	U	5	U	5	U
2-Chloronaphthalene	10	5	U	5	U	5	U	5	U	5	U
2-Chlorophenol	50	5	U	5	U	5	U	5	U	5	U
2-Methylnaphthalene	50	5	U	5	U	5	U	5	U	5	U
2-Methylphenol	5	5	U	5	U	5	U	5	U	5	U
2-Nitroaniline	5	9	U	10	U	10	U	10	U	10	U
2-Nitrophenol	5	5	U	5	U	5	U	5	U	5	U
3,3 '-Dichlorobenzidine	NVL	5	U	5	U	5	U	5	U	5	U
3-Nitroaniline	5	9	U	10	U	10	U	10	U	10	U
4,6-Dinitro-2-methylphenol	NVL	9	U	10	U	10	U	10	U	10	U
4-Bromophenylphenylether	NVL	5	U	5	U	5	U	5	U	5	U
4-Chloro-3-methylphenol	5	5	U	5	U	5	U	5	U	5	U
4-Chloroaniline	5	5	U	5	U	5	U	5	U	5	U
4-Chlorophenylphenylether	NVL	5	U	5	U	5	U	5	U	5	U
4-Methylphenol	50	5	U	5	U	5	U	5	U	5	U
4-Nitroaniline	5	9	U	10	U	10	U	10	U	10	U
4-Nitrophenol	5	9	U	10	U	10	U	10	U	10	U
Acenaphthene	20	5	U	5	U	5	U	2	J	1	J
Acenaphthylene	20	5	U	5	U	5	U	5	U	5	U
Acetophenone	NVL	5	U	5	U	5	U	5	U	5	U
Anthracene	50	5	U	5	U	5	U	0.3	J	0.3	J
Atrazine	7.5	5	U	5	U	5	U	5	U	5	U
Benzaldehyde	NVL	5	U	5	U	5	U	5	U	5	U
Benzo(a)anthracene	0.002	5	U	5	U	5	U	**0.2**	**J**	5	U
Benzo(a)pyrene	0.002 (ND)	5	U	5	U	5	U	5	U	5	U
Benzo(b)fluoranthene	0.002	5	U	5	U	5	U	**0.2**	**J**	5	U
Benzo(ghi)perylene	5	5	U	5	U	5	U	5	U	5	U
Benzo(k)fluoranthene	0.002	5	U	5	U	5	U	5	U	5	U
Biphenyl	NVL	5	U	5	U	5	U	5	U	5	U
Bis(2-chloroethoxy) methane	5	5	U	5	U	5	U	5	U	5	U
Bis(2-chloroethyl) ether	1	5	U	5	U	5	U	5	U	5	U
Bis(2-ethylhexyl) phthalate	50	5	U	5	U	5	U	5	U	5	U
Butylbenzylphthalate	50	5	U	5	U	5	U	5	U	5	U
Caprolactam	NVL	5	U	5	U	5	U	5	U	5	U
Carbazole	NVL	5	U	5	U	5	U	5	U	0.2	J
Chrysene	0.002	5	U	5	U	5	U	5	U	5	U
Di-n-butylphthalate	50	0.4	J	0.3	J	0.4	J	0.5	J	0.4	J
Di-n-octylphthalate	50	5	U	5	U	5	U	0.2	J	5	U
Dibenzo(a,h)anthracene	50	5	U	5	U	5	U	5	U	5	U
Dibenzofuran	5	5	U	5	U	5	U	0.9	J	0.6	J
Diethylphthalate	50	1	J	0.5	J	0.9	J	2	J	1	J
Dimethylphthalate	50	5	U	5	U	5	U	0.7	J	0.4	J
Fluoranthene	50	5	U	5	U	5	U	0.5	J	0.4	J
Fluorene	50	5	U	5	U	5	U	1	J	1	J
Hexachlorobenzene	0.35	5	U	5	U	5	U	5	U	5	U
Hexachlorobutadiene	0.5	5	U	5	U	5	U	5	U	5	U
Hexachlorocyclopentadiene	5	5	U	5	U	5	U	5	U	5	U
Hexachloroethane	5	5	U	5	U	5	U	5	U	5	U
Indeno (1,2,3-cd)pyrene	0.002	5	U	5	U	5	U	5	U	5	U
Isophorone	50	5	U	5	U	5	U	5	U	5	U
N-Nitroso-di-n-propylamine	NVL	5	U	5	U	5	U	5	U	5	U
N-Nitrosodiphenylamine	50 (G)	5	U	5	U	5	U	5	U	5	U
Naphthalene	10	5	U	5	U	5	U	5	U	5	U
Nitrobenzene	5	5	U	5	U	5	U	5	U	5	U
Pentachlorophenol	1	9	U	10	U	10	U	10	U	10	U
Phenanthrene	50	5	U	5	U	5	U	0.2	J	0.2	J
Phenol	1	5	U	5	U	5	U	5	U	5	U
Pyrene	50	5	U	5	U	5	U	0.4	J	0.3	J

a/ ND = not detected at laboratory detection limit; U = not detected at laboratory detection limit; NVL = no value listed; G = guidance value;
J = estimated concentration;µg/l = micrograms per liter.
b/ MW-D is a duplicate of MW-12.
c/ Evaluation criteria are the New York State Ambient Water Quality Standards or Guidance Values for Class GA groundwater provided in the New York State Department of Environmental Conservation Division of Water Technical and Operational Guidance Series (1.1.1), dated June 1998, and the April 2000 Addendum.
d/ Bold-faced values are reported concentrations that exceed TOGS Class GA groundwater standards or guidance values.

Table 7

Volatile Organic Compounds in Groundwater
Former Freezer Queen Site
Buffalo, New York

Sample ID:	Evaluation Criteria (c)	MW-9		MW-10		MW-11		MW-12		MW-D		Trip Blank	
Date:		1/9/2008		1/9/2008		1/9/2008		1/9/2008		1/9/2008		1/9/2008	
Units:	µg/l	µg/l		µg/l		µg/l		µg/l		µg/l		µg/l	
TCL VOLATILES + NAPH -													
1,1,1-T richloroethane	5	5	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	5	5	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	5	UJ	1	U	1	U	1	UJ	1	UJ	1	UJ
1,1,2-Trichloroethane	1	5	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	5	5	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	5	5	U	1	U	1	U	1	U	1	U	1	U
1,2,4-Trichlorobenzene	5	5	U	1	U	1	U	1	U	1	U	1	U
1,2-Dibromo-3-chloropropane	4.7	5	UJ	1	U	1	U	1	UJ	1	UJ	1	UJ
1,2-Dibromoethane	5	5	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene	3	5	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	5	5	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	5	5	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene	5	5	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	5	5	U	1	U	1	U	1	U	1	U	1	U
2-Butanone	50	25	U	5	U	5	U	5	U	5	U	5	U
2-Hexanone	50 (G)	25	UJ	5	U	5	U	5	UJ	5	UJ	5	UJ
4-Methyl-2-pentanone	50	25	U	5	U	5	U	5	U	5	U	5	U
Acetone	50	25	U	5	U	5	U	5	U	5	U	5	U
Benzene	0.7	5	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	50 (G)	5	U	1	U	1	U	1	U	1	U	1	U
Bromoform	5	5	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	50 (G)	5	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	50	5	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	5	5	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	5	5	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	50	5	U	1	U	1	U	1	U	1	U	1	U
Chloroform	7	5	U	1	U	1	U	1	U	1	U	1	U
Chloromethane	NVL	5	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	5	5	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-Dichloropropene	0.4	5	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	NVL	5	UJ	1	U	1	U	1	UJ	1	UJ	1	UJ
Dibromochloromethane	50	5	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	NVL	5	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	5	5	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	5	5	U	1	U	1	U	1	U	1	U	1	U
Methyl acetate	NVL	5	UJ	1	U	1	U	1	UJ	1	UJ	1	UJ
Methyl-t-Butyl Ether (MTBE)	10 (G)	5	U	1	U	1	U	1	U	1	U	1	U
MethyIcyclohexane	NVL	5	U	1	U	1	U	1	U	1	U	1	U
Methylene chloride	5	5	U	1	U	1	U	1	U	1	U	1	U
Styrene	5	5	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	5	5	U	1	U	1	U	1	U	1	U	1	U
Toluene	5	5	U	1	U	1	U	1	U	1	U	1	U
Total Xylenes	5	15	U	3	U	3	U	3	U	3	U	3	U
trans-1,2-Dichloroethene	5	5	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	0.4	5	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	5	U	1	U	1	U	1	U	1	U	1	U
Trichlorofluoromethane	5	5	U	1	U	1	U	1	U	1	U	1	U
Vinyl chloride	2	5	U	1	U	1	U	1	U	1	U	1	U

a/ U = not detected at laboratory detection limit; NVL = no value listed; G = guidance value; mg/l = micrograms per liter; J = estimated concentration.
b/ MW-D is a duplicate of MW-12.
c/ Evaluation criteria are the New York State Ambient Water Quality Standards or Guidance Values for Class GA groundwater provided in the New York State Department of Environmental Conservation Division of Water Technical and Operational Guidance Series (1.1.1), dated June 1998, and the April 2000 Addendum.
d/ Bold-faced values are reported concentrations that exceed TOGS Class GA groundwater standards or guidance values.

Table 8

Metals in Groundwater
Former Freezer Queen Site
Buffalo, New York

Sample ID:	Evaluation Criteria (c)	MW-9		MW-10		MW-11		MW-12		MW-D	
Date:		1/9/2008		1/9/2008		1/9/2008		1/9/2008		1/9/2008	
Units:	µg/l	µg/l		µg/l		µg/l		µg/l		µg/l	
Metals Analysis											
Aluminum - Total	NVL	200	U	200	U	613		200	U	200	U
Antimony - Total	3	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Arsenic - Total	25	19.8		14.3		10	U	**87.8**		**88.6**	
Barium - Total	1,000	134		69.5		92		322		319	
Beryllium - Total	3	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ
Cadmium - Total	5	1	U	1	U	1	U	1	U	1	U
Calcium - Total	NVL	82,100		89,800		105,000		147,000		146,000	
Chromium - Total	50	4	U	4	U	4	U	4	U	4	U
Cobalt - Total	NVL	4	U	4	U	4	U	4	U	4	U
Copper - Total	200	10	U	10	U	10	U	10	U	10	U
Iron - Total	300	**2,520**		**5,910**		**1,350**		**4,820**		**4,730**	
Lead - Total	25	5	U	5	U	26.3		5	U	5.0	U
Magnesium - Total	35,000 (G)	9,120		8,990		25,200		**40,200**		**39,300**	
Manganese - Total	300	**442**		**843**		**333**		**603**		**602**	
Mercury - Total	0.7	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Nickel - Total	100	10	U	10	U	10	U	10	U	10	U
Potassium - Total	NVL	3,260		3,260		8,510		14,900		14,900	
Selenium - Total	10	15	UJ	15	UJ	15	UJ	15	UJ	15	UJ
Silver - Total	50	3	U	3	U	3	U	3	U	3	U
Sodium - Total	20,000	8,360	J	9,990	J	**25,700**		**88,700**	J	**88,500**	J
Thallium - Total	0.5 (G)	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Vanadium - Total	NVL	5	U	5	U	5	U	5	U	5	U
Zinc - Total	2,000 (G)	10	U	10	U	12.8		10	U	10	U

a/ U = not detected at laboratory detection limit; NVL = no value listed; G = guidance value; J = estimated concentration; µg/l = micrograms per liter.
b/ MW-D is a duplicate of MW-12.
c/ Evaluation criteria are the New York State Ambient Water Quality Standards or Guidance Values for Class GA groundwater provided in the New York State Department of Environmental Conservation Division of Water Technical and Operational Guidance Series (1.1.1), dated June 1998, and the April 2000 Addendum.
d/ Bold-faced values are reported concentrations that exceed TOGS Class GA groundwater standards or guidance values.

Appendix A – Boring Logs

Boring Log: B-1

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 9, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 8
Borehole Diameter (inches): 2

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-1/0-4	0	- - - -	50		***Well-Graded Gravel with Clay and Sand (GW-GC)*** Brown, orange-brown, red-brown, and black. Concrete chunks, asphalt pieces, rock fragments, brick fragments, slag, with fine sand and clay. Wet at 2 ft bgs.
4						
6		0	- - - -	40		
8						Bottom of Boring at 8 feet
10						
12						
14						
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
6549 West Quaker Street, Suite 2B
Orchard Park, NY 14127

Boring Log: B-2

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 9, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 8
Borehole Diameter (inches): 2

**AMSL = Above mean sea level*

WSP ENVIRONMENTAL STRATEGIES

Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-2/0-4	0	- - - -	50		***Well-Graded Gravel (GW)*** Brown, red, and gray; asphalt chunks, crushed brick, rock fragments, and slag; dry to moist.
						Lean Clay with Gravel (CL) Brown dense clay with rock, brick fragments, and wood chunk. Moist.
4						***Well-Graded Gravel with Sand (GW)*** Brown, red-brown, gray, and black; fine to coarse sand with pebbles, brick, concrete, and rock fragments. Wet.
6			- - - -	75		
8						Bottom of Boring at 8 feet
10						
12						
14						
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
6549 West Quaker Street, Suite 2B
Orchard Park, NY 14127

Boring Log: B-3

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 8, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 8
Borehole Diameter (inches): 2

**AMSL = Above mean sea level*

WSP ENVIRONMENTAL STRATEGIES

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-3/0-5	0		75		***Organic Soil (OL/OH)*** Dark brown; moist. ***Well-Graded Gravel with Sand (GW)*** Dark brown, light brown, red-brown, greenish-blue, black, and gray; fine-grained sand with brick fragments, ash, slag, stones, concrete chunks, and asphalt pieces. Damp. Boggy odor.
4						
6		0		65		***Silty Sand (SM)*** Dark brown to pink-brown; silty fine-grained sand; wet. No odor. ***Well-Graded Gravel with Sand (GW)*** Dark brown to gray; concrete fragments, slag, and fine-grained sand; wet.
8						Bottom of Boring at 8 feet
10						
12						
14						
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
6549 West Quaker Street, Suite 2B
Orchard Park, NY 14127

Boring Log: B-4

Project: OSC/Former Freezer Queen

Project No.: 198016

Location: Buffalo, New York

Completion Date: January 8, 2008

Surface Elevation (feet AMSL*): Not Determined

Total Depth (feet): 8

Borehole Diameter (inches): 2

*AMSL = Above mean sea level

WSP ENVIRONMENTAL STRATEGIES

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-4/0-4	0		100		***Poorly-Graded Gravel with Sand (GP)*** Black, light-brown, and red-brown; soil w/roots, brick fragments, ash, and slag; moist. No odor.
4						***Well-Graded Sand (SW)*** Light brown becoming gray; fine- to medium-grained sand; wet at 6 ft bgs. No odor.
6		0		100		
8						Bottom of Boring at 8 feet
10						
12						
14						
16						
18						
20						

Geologist(s): Trevor Calamel

Subcontractor: Zebra Environmental Corporation

Driller/Operator: Phillip Orsi

Method: Direct Push

WSP Environmental Strategies

6549 West Quaker Street, Suite 2B

Orchard Park, NY 14127

Boring Log: B-5

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 8, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 8
Borehole Diameter (inches): 2

**AMSL = Above mean sea level*

WSP ENVIRONMENTAL STRATEGIES

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-5/0-4'	0	- - - -	100		***Poorly-Graded Gravel (GP)*** Gray, brown, and red-brown; soil with rock, brick, and wood fragments; moist. No odor.
						Poorly-Graded Sand with Gravel (SP) Light brown, yellow-brown, magenta, yellow, orange, and red-brown; fine-grained sand with ash, slag, and rock fragments. Dry becoming damp.
4						
6		0	- - - -	100		***Well-Graded Sand (SW)*** Light brown to yellowish-brown; fine- to medium-grained sand, trace coarse; wet.
8						
						Bottom of Boring at 8 feet
10						
12						
14						
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
6549 West Quaker Street, Suite 2B
Orchard Park, NY 14127

Boring Log: B-6

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 8, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 12
Borehole Diameter (inches): 2

*AMSL = Above mean sea level

WSP ENVIRONMENTAL STRATEGIES

Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-6/1-5	0	- - - -	95		***Poorly-Graded Gravel (GP)*** Dark brown, gray, light gray, and black. Gravel, pebbles, asphalt chunks, slag, brick fragments, and fine sand. Dry to moist. No odor.
						Poorly-Graded Sand with Gravel (SP) Light gray, red, dark brown, and black. Fine-grained sand with brick fragments and asphalt chunks, some silt. Moist to damp.
4						***Lean Clay with Gravel (CL)*** Red-brown, brown, and black; clay with brick fragments, some sand. Firm.
6		0	- - - -	75		***Poorly-Graded Sand with Silt (SP-SM)*** Brown to dark brown; silty fine sand; wet.
						Poorly-Graded Sand with Gravel (SP) Brown, gray, and red-brown; fine-grained sand with rock and brick fragments; wet.
8						***Lean Clay with Sand (CL)*** Light brown to red-brown; clay to sandy clay; firm; wet.
10		0	- - - -	100		***Poorly-Graded Gravel (GP)*** Brown and red-brown; fine sand with brick and rock fragments; wet.
12						***Silty Sand (SM)*** Light brown; silty fine sand; stiff; wet.
						Poorly-Graded Sand (SP) Black; fine-grained; wet. No odor.
14						Bottom of Boring at 12 feet
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
6549 West Quaker Street, Suite 2B
Orchard Park, NY 14127

Boring Log: B-7

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 8, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 12
Borehole Diameter (inches): 2

**AMSL = Above mean sea level*

WSP ENVIRONMENTAL STRATEGIES

Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-7/0-4	0	- - - -	100		***Poorly-Graded Sand with Silt and Gravel (SP-SM)*** Dark brown, yellow, red-brown, and black-brown; fine-grained sand with silt, rock fragments, roots, and slag. Stiff. Moist. No odor.
						Sandy Lean Clay (CL) Pinkish brown; very firm, some pebbles; damp.
4						***Poorly-Graded Sand with Gravel (SP)*** Gray to light gray; ash and pebbles; damp. No odor.
6		0	- - - -	65		***Poorly-Graded Sand with Clay and Gravel (SP-SC)*** Black; Very fine grained (foundry sand) with clay, rocks, and brick fragments. Wet at 6.5 ft bgs.
8						***Poorly-Graded Sand with Silt (SP-SM)*** Light brown; fine-grained sand to silty sand; stiff; wet.
						Poorly-Graded Sand (SP) Black; very fine-grained foundry sand with brick fragments; wet.
10		0	- - - -	100		***Lean Clay (CL)*** Brown to gray-brown; moderate plasticity; wet.
12						***Poorly-Graded Sand with Gravel (SP)*** Black to green-gray; fine-grained sand with pebbles and brick fragments, some silt; stiff; wet.
						Bottom of Boring at 12 feet
14						
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
6549 West Quaker Street, Suite 2B
Orchard Park, NY 14127

Boring Log: B-8

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 8, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 8
Borehole Diameter (inches): 2

**AMSL = Above mean sea level*

WSP ENVIRONMENTAL STRATEGIES

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-8/0-3	0	- - - -	100		***Well-Graded Sand with Gravel (SW)*** Dark brown, brown, light brown, and black; fine- to medium-grained sand with slag, wood fragments, and ash. Moist. No odor.
4						***Well-Graded Sand (SW)*** Light brown to yellow-brown to brown to gray; fine- to medium-grained sand. Wet at 5.5 ft bgs. No odor.
6	B-8/6-8	0	- - - -	100		
8						***Poorly-Graded Sand (SP)*** Dark gray to black; fine-grained (foundry sand); wet.
						Bottom of Boring at 8 feet
10						
12						
14						
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
6549 West Quaker Street, Suite 2B
Orchard Park, NY 14127

Boring Log: B-13

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 8, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 12
Borehole Diameter (inches): 2

**AMSL = Above mean sea level*

WSP ENVIRONMENTAL STRATEGIES

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2		0	- - - -	85		***Well-Graded Gravel with Sand (FILL)*** Light gray, black and red-brown. Gravel, asphalt chunks, brick fragments; fine to medium sand. No odor.
4						
6	B-13/4-6	0	- - - -	90		***Poorly-Graded Sand (SP)*** Brown; Fine-grained sand with wood fragments. ***Poorly-Graded Sand with Gravel (SP)*** Brown, dark brown, gray, light gray, and black. Fine-grained sand with ash, brick fragments, wood fragments, and glass chunks. Wet at 5 ft bgs.
8						
10		0	- - - -	100		***Poorly-Graded Sand (SP)*** Light brown to brown. Fine-grained sand, some brick fragments. Wet.
12						Bottom of Boring at 12 feet
14						
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
6549 West Quaker Street, Suite 2B
Orchard Park, NY 14127

Boring Log: B-14

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 9, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 3
Borehole Diameter (inches): 2

**AMSL = Above mean sea level*

WSP ENVIRONMENTAL STRATEGIES

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-14/0-2	0	- - - -	100		***Well-Graded Gravel with Sand (GW)*** Black and red-brown; sand with asphalt chunks, rocks, and brick fragments; dry. No odor.
						Silty Clay Brown to light brown; silty clay with pebbles and rock fragments; firm; moist to damp. No odor.
4						Bottom of Boring at 3 feet
6						
8						
10						
12						
14						
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
6549 West Quaker Street, Suite 2B
Orchard Park, NY 14127

Boring Log: B-15

Project: OSC/Former Freezer Queen
Project No.: 198016
Location: Buffalo, New York
Completion Date: January 9, 2008

Surface Elevation (feet AMSL*): Not Determined
Total Depth (feet): 3
Borehole Diameter (inches): 2

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	B-15/0-2	0	- - - -	100		***Well-Graded Gravel (GW)*** Black; asphalt and rock fragments; dry. No odor.
						Well-Graded Sand (SW) Light yellow to brown; fine- to medium-grained sand; moist.
4						***Silty Clay*** Brown, pink-brown, and light brown; silty clay with pebbles and concrete chunks; moist.
						Bottom of Boring at 3 feet
6						
8						
10						
12						
14						
16						
18						
20						

Geologist(s): Trevor Calamel
Subcontractor: Zebra Environmental Corporation
Driller/Operator: Phillip Orsi
Method: Direct Push

WSP Environmental Strategies
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